

User's Manual



MPX 866 A

Media Presentation Matrix Switcher

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.

Conservier 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 específicamente recomendados por el fabricante, ya que podrían 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'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un ype équivalent recommandé par le constructeur. Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

Vorsicht

Stromquellen • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden.

Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

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

Schutz des Netzkabels • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar 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 sobrecalentamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

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

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。不要用什么东西挡住通风孔。

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。

Quick Start — MPX 866 A

Media Presentation Matrix Switcher

Installation

Step 1

Turn off power to the input and output devices, and remove the power cords from them.

Step 2 — Inputs

- a. Connect up to 8 high resolution video inputs to the 15-pin HD connectors in the computer video group.



- b. Connect up to 6 S-video and composite video inputs to the female BNC connectors in the video group.



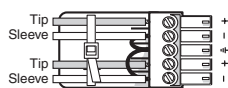
NOTE Inputs 9 and 10 are composite video only. Input 9 is designated as reference input for genlock.

Inputs 11 through 14 can be either S-video or composite video. See Selecting composite video or S-video in chapter 3, Operation.

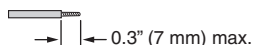
- c. Connect up to 14 stereo or mono audio inputs to the 5-pin captive screw connectors in either group.



Balanced Input
(high impedance)



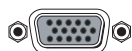
Unbalanced Input
(high impedance)



Do not tin the wires!

Step 3 — Outputs

- a. Connect up to 6 high resolution video devices to the 15-pin HD connectors in the computer/audio output subgroup.



- b. Connect up to 6 S-video and/or composite video devices to the female BNC connectors in the video group.



NOTE Outputs 7 and 8 encode an S-video input to composite video output and pass through a composite video input.

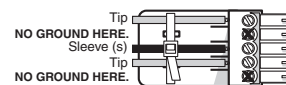
Outputs 9 and 10 decode a composite video input to a composite video output and pass through an S-video input.

Outputs 11 and 12 are pass through only. The output is in the same video format as the input.

- c. Connect up to 6 balanced or unbalanced stereo audio or mono audio devices to the 5-pin captive screw connectors in the computer/audio output subgroup.

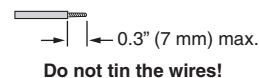


Balanced Stereo Output



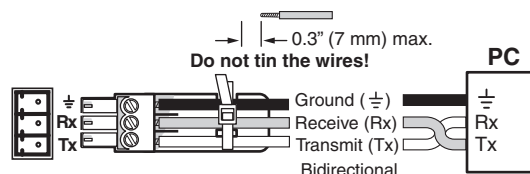
Unbalanced Stereo Output

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



Step 4 — RS-232

If desired, connect control systems and/or PCs to the rear panel RS-232 ports.



Step 5 — LAN

If desired, connect the switcher to a controlling device, either directly (using a crossover cable) or via a networked connection (using a patch cable).

Step 6 — Power

Plug the switcher into a grounded AC source.

Definitions

Tie — An input-to-output connection.

Set of ties — An input tied to 2 or more outputs.

Configuration — One or more ties or sets of ties.

Current configuration — The currently active configuration (also called **configuration 0**).

Global preset — A configuration that has been stored. One global preset can be assigned to each input button. When a global preset is retrieved from memory, it becomes the current configuration.

Quick Start — MPX 866 A

Media Presentation Matrix Switcher, cont'd

Front Panel Controls

Input and output buttons select inputs and outputs. Input and output LEDs light to indicate video and audio ties.

Input and output buttons also select presets.

Output buttons also toggle video and audio mutes on and off in View-Only mode.

Input LEDs also display the selected output's volume.

Output LEDs also display the selected input's audio level.

Enter button saves changes.

Preset button selects:

Save Preset mode to save a configuration as a preset.

Recall Preset mode to recall a previously-defined preset.

View button selects a view-only mode that prevents inadvertent configuration changes. The View button also decrements the level and volume. See *Viewing and adjusting the audio level* in the next column.

Esc button cancels selections in progress and resets the front panel button indications. The Esc button does **not** reset: the current configuration, the video and audio selection, any presets, or any audio level or volume settings. The Esc button also increments the level and volume. See *Viewing and adjusting the audio level* in the next column.

Video and Audio buttons select/deselect video and/or audio. The Audio LED blinks to indicate audio breakaway. The Audio button also selects the audio level/adjust mode. See *Viewing and adjusting the audio level* in the next column.

Select an input format

Inputs 11 through 14 are configurable as either composite video or S-video as follows:

1. Press and release the Esc button.
2. Press and **hold** the Video button until the Video LED starts to blink. Release the button.
3. Select the input to configure by pressing and releasing one of the Input 11 through Input 14 buttons.

Either the Output 7 LED or the Output 8 LED lights to indicate selected format:

Output 7 = Composite video

Output 8 = S-video

4. Press and release either the Output 7 button (**to select composite video**) or the Output 8 button (**to select S-video**).
5. Press and release the Video button to exit.

Create a tie

1. Press and release the Esc button.
2. Press and release the Video and/or Audio I/O button(s) to select or deselect video and/or audio as desired.
3. Press and release the desired input button.
4. Press and release the desired output button(s).
5. Press and release the Enter button. All input and output LEDs and the Enter LED go out.

Saving or recalling a preset

1. **Save** a preset — Press and **hold** the Preset button for 2 seconds until the Preset LED starts to blink. Release the button.
Recall a preset — Press and release the Preset button. The Preset LED lights.
2. Press and release the desired input or output button.
3. Press and release the Enter button.

Viewing and adjusting the audio level

1. Press and **hold** the Audio button.
2. Press an input or output button. See chapter 3 to read the displayed value.
3. Increase and decrease the level by pressing the Esc (▲) and View (▼) buttons.
4. Press and release the Audio button to exit.

Table of Contents

Chapter One • Introduction	1-1
About this Manual	1-2
About the Media Presentation Matrix Switcher	1-2
Definitions	1-4
Features	1-4
 Chapter Two • Installation	2-1
 Installation	2-1
Mounting the Switcher	2-2
UL requirements.....	2-2
Mounting instructions.....	2-2
Connection and Configuration	2-3
Video input and output	2-3
Computer video group.....	2-3
Low resolution video group.....	2-4
Audio input and output.....	2-5
Audio inputs (either input subgroup)	2-5
Audio outputs (computer/audio output subgroup only).....	2-6
Serial port.....	2-6
Ethernet port	2-8
Cabling and RJ-45 connector wiring	2-8
Reset button	2-9
Power	2-9
Front Panel Configuration Port	2-10
 Chapter Three • Operation	3-1
Front Panel Controls and Indicators	3-2
Definitions.....	3-2
Computer video input and output buttons and LEDs	3-2
Video input and output buttons and LEDs	3-3
Input and output label panels	3-3
Control buttons and LEDs.....	3-4
I/O controls.....	3-6
Front Panel Operations	3-7
Power	3-7
Creating a configuration	3-8
Example 1: Creating a set of computer video and audio ties.....	3-9
Example 2: Adding a tie to a set of computer video and audio ties.....	3-11
Example 3: Removing a tie from a set of computer video and audio ties.....	3-13
Example 4: Creating a set of low resolution video and audio ties.....	3-15
Viewing a configuration	3-17
Example 5: Viewing video and audio, audio only, and video only ties.....	3-18
Muting and unmuting video and/or audio outputs	3-20

Table of Contents, cont'd

Example 6: Muting and unmuting an output.....	3-21
Using global presets	3-23
Example 7: Saving a global preset.....	3-23
Example 8: Recalling a global preset.....	3-24
Selecting composite video or S-video	3-26
Example 9: Selecting the S-video format for an output	3-26
Viewing and adjusting the input audio level	3-28
Example 10: Viewing and adjusting an input audio level	3-30
Viewing and adjusting the output volume	3-32
Reading the displayed volume	3-32
Example 11: Viewing and adjusting an output volume level	3-34
Locking out the front panel (<i>Executive mode</i>).....	3-36
Performing a system reset from the front panel.....	3-36
Selecting the RS-232 Primary port's baud rate	3-37
Rear Panel Controls	3-38
Performing soft system resets	3-38
Performing a hard reset.....	3-40
Optimizing the Audio	3-41
Troubleshooting	3-41
General checks.....	3-41
Configuration Worksheets	3-42
Worksheet example 1: System equipment.....	3-42
Worksheet example 2: Daily configuration.....	3-43
Worksheet example 3: Test configuration	3-44
Blank configuration worksheet	3-45
 Chapter Four • SIS Programming and Control	4-1
RS-232 Links	4-2
Rear panel Remote ports	4-3
Front panel Configuration port	4-3
Ethernet Link	4-4
Ethernet connection	4-4
Default IP addresses.....	4-4
Host-to-Switcher Instructions	4-5
Switcher-Initiated Messages	4-5
Switcher Error Responses	4-6
Using the Command/Response Tables	4-6
Symbol definitions	4-7
Command/response table for SIS commands.....	4-8
Command/Response table for IP SIS commands.....	4-17
Symbol definitions.....	4-17
Special Characters	4-19

Chapter Five • Matrix Software	5-1
Matrix Switchers Control Program	5-2
Installing the software	5-2
Software operation via Ethernet	5-2
Ethernet protocol settings	5-3
Using the software	5-3
IP Settings/Options window	5-6
Matrix IP Address field	5-6
Extron Name/Descriptor field	5-7
Gateway IP address field	5-7
Subnet Mask field	5-7
Hardware Address field	5-7
Use DHCP checkbox	5-7
Date field	5-8
Time (local) field	5-8
Sync Time to PC button	5-8
GMT (offset) field	5-8
Use Daylight Savings checkbox	5-8
Administrator Password field	5-9
User Password field	5-9
Update firmware	5-10
Upload HTML files	5-11
Windows buttons, drop boxes, and trash	5-12
Windows menus	5-12
File menu	5-12
Tools menu	5-13
Audio Input Configuration Selection	5-15
Preferences menu	5-15
Master-Reset selection	5-17
Using emulation mode	5-17
Using the help system	5-18
Special Characters	5-18
Button-Label Generator	5-18

Table of Contents, cont'd

Chapter 6 • HTML Operation	6-1
Download the Startup Page	6-2
System Status Page	6-3
System Configuration Page	6-4
IP Settings fields	6-4
Unit Name field	6-4
DHCP radio buttons	6-5
IP Address field	6-5
Gateway IP Address field	6-5
Subnet Mask field	6-5
MAC Address field	6-5
Date/Time Settings fields	6-6
Video Input Settings Page	6-6
Passwords Page	6-7
Firmware Upgrade Page	6-8
File Management Page	6-9
Set and View Ties Page	6-10
Create a tie	6-11
RGB and Audio Settings page	6-12
Change the input gain and attenuation (audio models only)	6-12
Mute and unmute one or all outputs	6-14
Change the output volume level	6-15
Global Presets page	6-17
Save a preset	6-17
Recall a preset	6-17
Special Characters	6-18

Appendix A • Ethernet Connection	A-1
Ethernet Link	A-2
Ethernet connection	A-2
Default address	A-2
Pinging to determine Extron IP address	A-3
Pinging to determine Web IP address	A-3
Connecting as a Telnet client	A-4
Telnet tips	A-4
Open	A-4
Escape character and Esc key	A-5
Local echo	A-5
Set carriage return-line feed	A-5
Close	A-5
Help	A-5
Quit	A-5
Subnetting — A Primer	A-6
Gateways	A-6
Local and remote devices	A-6
IP addresses and octets	A-6
Subnet masks and octets	A-6
Determining whether devices are on the same subnet	A-7
 Appendix B • Reference Information	 B-1
Specifications	B-2
Part Numbers and Accessories	B-6
MPX 866 A part numbers	B-6
Optional accessories	B-6
Cables	B-7
Bulk cable and termination tools	B-7
Terminated cable assemblies	B-7
Button Labels	B-8

Table of Contents, cont'd

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

68-1270-01 B
09 06



MPX 866 A Media Presentation Matrix Switcher

1 **Chapter One**

Introduction

About this Manual

About the Media Presentation Matrix Switcher

Definitions

Features

Installation

About this Manual

This manual contains installation, configuration, and operating information for the Extron MPX 866 A media presentation matrix switcher.

In this manual, the MPX 866 A may be referred to as “the MPX” or “the switcher”.

About the Media Presentation Matrix Switcher

A media presentation switcher combines multiple A/V switchers, of different video formats, and a program audio switcher with mute controls in one box.

A matrix switcher distributes any input to any combination of outputs and can route multiple input/output configurations simultaneously.

The MPX 866 A media presentation matrix switcher combines three matrix switchers with the following switching capabilities in a single product:

- An 8-input by 6-output VGA matrix switcher, comprising the computer video group (computer inputs subgroup and computer/audio outputs subgroup)
- A 6-input by 6-output S-video and composite video matrix switcher, comprising the low resolution video group (low resolution video inputs subgroup and low resolution video outputs subgroup)
- A 14-input by 6-output primary audio matrix switcher

NOTE Video ties can only be made within the same group.
Audio ties can only be made to outputs in the computer/audio subgroup (outputs 1 through 6).

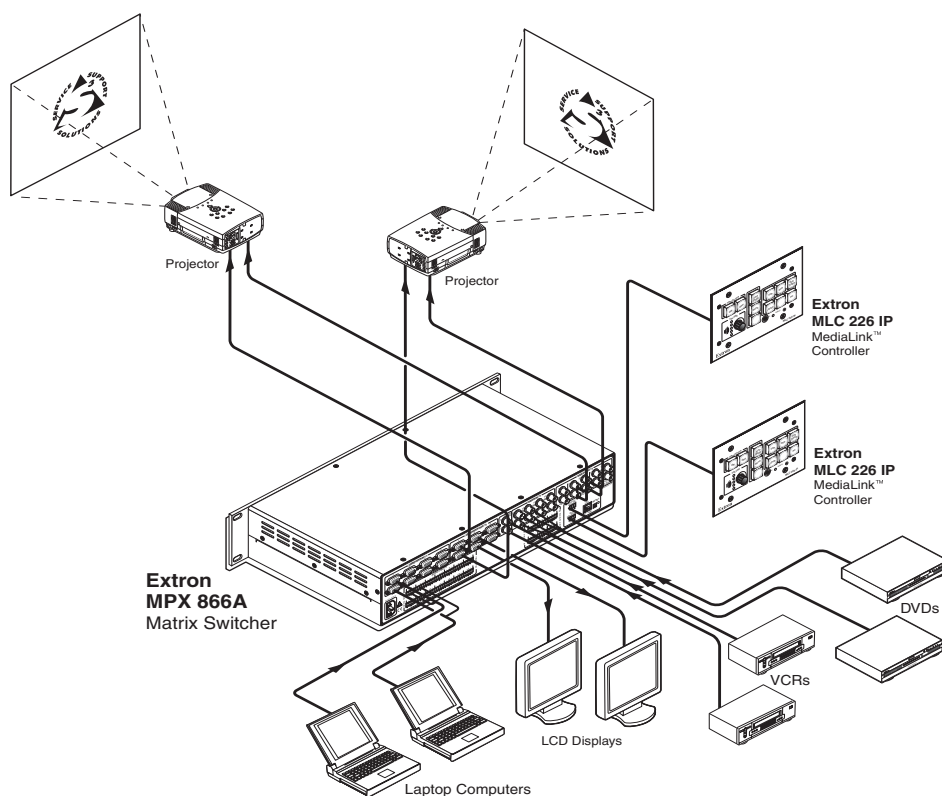


Figure 1-1 — Typical MPX 866 A application

The switcher is a solution to complex simultaneous computer video, low resolution video, and audio routing applications. Any input(s) within one of the two groups, computer video and video, can be switched to any one or all outputs within that same group. Each input and output is individually isolated and buffered; switching is accomplished with virtually no crosstalk or signal noise between channels.

The computer video group has a minimum bandwidth of 300 MHz (-3 dB).
The low resolution video group has a minimum bandwidth of 150 MHz (-3 dB).

The MPX inputs and outputs computer (VGA) video in the computer video group on 15-pin HD connectors. The switcher inputs and outputs S-video and composite video in the low resolution video group on female BNC connectors. The MPX inputs and outputs balanced or unbalanced stereo or mono audio on 5-pole, 3.5 mm captive screw connectors.

The audio switching can either be linked with the video (audio follow) or independent of the video (audio breakaway). The 14 audio inputs can be switched along with inputs from either video group (although ties can only be made to the computer/audio subgroup). Adjustable input audio gain and attenuation compensates for level differences between audio inputs.

The switcher has two, primary and secondary, RS-232 ports and a local area network (LAN) Ethernet port for remote control and reporting. The matrix switcher is programmed with Extron's Simple Instruction Set (SIS™), a set of basic ASCII code commands that provide simple control through a control system or PC without programming long, obscure strings of code. SIS commands can be entered via the RS-232 ports or the LAN port.

The LAN port can be connected through a LAN or wide area network (WAN).

The MPX can be operated by any of the following connected to either RS-232 ports or the LAN port:

- A control system
- A PC
- An Extron MKP 2000 remote control panel
- An Extron MKP 3000 remote control panel
- **(RS-232 only)** An Extron MCP 1000 remote control panel and/or MKP 1000 remote keypad

The switcher is housed in a rack-mountable, 2U high metal enclosure with mounting flanges for standard 19" racks. The appropriate rack mounting kit is included with the switcher.

The switcher has an internal 100 VAC to 240 VAC, 50/60 Hz, 15 watts autoswitchable power supply that provides worldwide power compatibility.

Definitions

The following terms, which apply to all Extron matrix switchers, are used throughout this manual:

Tie — An input-to-output connection.

Set of ties — An input **tied** to two or more outputs. (An output can never be tied to more than one input.)

Configuration — One or more **ties** or one or more **sets of ties**.

Current configuration — The **configuration** that is currently active in the switcher (also called **configuration 0**)

Global memory preset — A **configuration** that has been stored. Up to 32 **global memory presets** can be stored in memory. Preset locations are assigned to the input buttons and (where necessary) output buttons. Up to 26 presets can be selected from the front panel for either saving or retrieving. When a **preset** is retrieved from memory, it becomes the **current configuration**. The switcher has 32 presets; preset numbers larger than 26 are still accessible under RS-232 control.

Features

Video —

Computer video group — The switcher inputs and outputs RGBHV (VGA), RGBS, RGsB, RsGsBs, or Y, R-Y, B-Y video on 15-pin HD connectors.

Low resolution video group — The switcher inputs and outputs NTSC 3.58, NTSC 4.43, PAL, or SECAM S-video and/or composite video on BNC connectors.

- **Inputs 9 and 10** (the first two low resolution video group video inputs) are composite video only.
- **Input 9** is a genlock reference. All other low resolution inputs are synced to input 9.
- **Inputs 11 through 14** (the remaining low resolution video group video inputs) can accept either S-video or composite video.
- **Outputs 7 and 8** (the first two low resolution video group outputs) are composite video outputs only. If the tied input is S-video, the switcher encodes it to composite. If the tied input is composite video, the switcher passes it through unprocessed.
- **Outputs 9 and 10** (the third and fourth low resolution video group video outputs) are S-video outputs only. If the tied input is S-video, the switcher passes it through unprocessed. If the tied input is composite video, the switcher decodes it to S-video.
- **Outputs 11 and 12** (the fifth and sixth low resolution video group video outputs) are pass-through outputs only; the output is the same format (S-video or composite video) as the selected input.

Bandwidth —

- **Computer video group** — The switcher provides a minimum of 300 MHz (-3 dB) video bandwidth, fully loaded.
- **Low resolution video group** — The switcher provides a minimum of 150 MHz (-3 dB) video bandwidth, fully loaded.

Audio — Input and output balanced or unbalanced stereo audio on 3.5 mm, 5-pole captive screw terminals.

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

Audio output volume — The audio volume of each output can be displayed and adjusted through a range of full output to completely silent from the front panel or under RS-232 or Ethernet control.

Switching flexibility — Provides individually buffered, independent matrix switched outputs with audio follow and audio breakaway.

NOTE *Audio switching is independent of the video groups.*

- **Tie any input to any or all outputs within a video group**
- **Quick multiple tie** — Multiple inputs can be switched to multiple outputs within a video group simultaneously. This allows all displays (outputs) to change from source to source at the same time.
- **Audio follow** — Audio can be switched with its corresponding video input via front panel control or under Ethernet or RS-232 remote control.
- **Audio breakaway** — Audio can be broken away from its corresponding video signal. This feature allows any audio signal to be selected with any video signal simultaneously to one or all outputs in any combination. Audio breakaway switching can be done via front panel control or under Ethernet or RS-232 remote control.

Operational flexibility — Operations such as input/output selection, setting of presets, and adjustment of audio levels can be performed on the front panel or via the Ethernet or RS-232 link. The Ethernet and RS-232 links allow remote control via a PC or control system. The Ethernet link allows multiple remote links with two levels of password protection.

- **Front panel control** — The front panel controller supports input and output selection, preset creation and selection, and audio gain and attenuation and volume control. The front panel features slots for labels that can identify each input and output with text or graphics.
- **Windows-based control program** — For RS-232 remote control from a PC, the Extron Windows-based control software provides a graphical interface and drag-and-drop/point-and-click operation. The Windows-based control program also has an emulation mode that lets you create a switcher configuration file at the home office and then download it for use by the switcher on site.
- **Simple Instruction Set (SIS™)** — The remote control protocol uses Extron's SIS for easy programming and operation.
- **Remote control panels and keypads** — The switcher is remote controllable, using the optional MKP 2000 and MKP 3000 remote control panels. The remote control devices are easy to use and provide tactile buttons for quick selection. Each MKP can be used for input-to-output switching or one-touch switching for a particular output and selecting global presets.

Upgradable firmware — The firmware that controls all switcher operation can be upgraded in the field via RS-232 or Ethernet, without taking the switcher out of service. Firmware upgrades are available for download on the Extron Web site, www.extron.com, and they can be installed using the Windows-based control program.

Introduction, cont'd

Labeling — Extron's included label software lets you create labels to place in the front panel I/O buttons, with names, alphanumeric characters, or color bitmaps for easy and intuitive input and output selection. Alternatively, labels can be made with any Brother™ P-Touch™ or comparable labeler.

Global memory presets — 32 global memory presets are a time-saving feature that lets you set up and store input/output configurations in advance. You can then recall those configurations, when needed, with a few simple steps.

Rack mounting — Rack mountable in any conventional 19" wide rack.

Front panel security lockout (*Executive mode*) — If a switcher is installed in an open area, where operation by unauthorized personnel may be a problem, a security lockout feature can be implemented. When the front panel is locked, a special button combination or SIS command is required to unlock the switcher before it can be operated from the front panel.

Power — The matrix switcher's 100 VAC to 240 VAC, autoswitchable, internal power supply provides worldwide power compatibility.



MPX 866 A Media Presentation Matrix Switcher

2 **Chapter Two**

Installation

Mounting the Switcher

Connection and Configuration

Front Panel Port

Installation

Mounting the Switcher

The MPX is housed in a rack-mountable, 2U high, metal enclosures with 19" rack ears.

UL requirements

The following Underwriters Laboratories (UL) requirements pertain to the installation of the MPX transmitter or receiver into a wall or furniture (figure 2-1).

1. **Elevated operating ambient temperature** — If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consider installing the equipment in an environment compatible with the maximum ambient temperature (T_{ma}) specified by the manufacturer.
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 (e.g. use of power strips).

Mounting instructions

If desired, rack mount the switcher as follows:

1. Insert the switcher into the rack, aligning the holes in the mounting bracket with those in the rack.
2. Secure the switcher to the rack using the supplied bolts.

Connection and Configuration

All switcher connectors are on the rear panel (figure 2-1).

CAUTION Use electrostatic discharge precautions (be electrically grounded) when making connections. Electrostatic discharge (ESD) can damage equipment, even if you cannot feel, see, or hear it.

CAUTION Remove system power before making all connections.

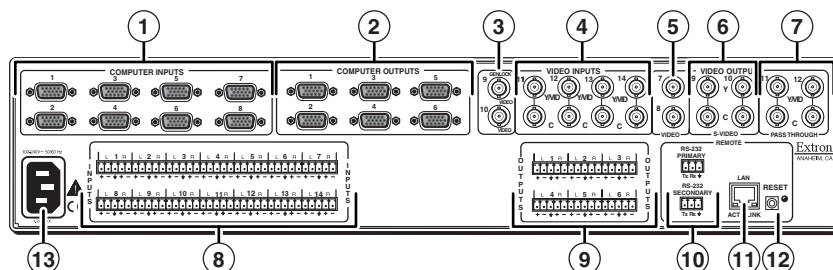


Figure 2-1 — MPX 866 A Media Presentation Matrix Switcher

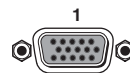
Video input and output

NOTE The switcher does not alter the computer video inputs in any way. The signal output is in the same format as the input.

The switcher can connect to up to as many as eight computer video sources and output to as many as six video devices.

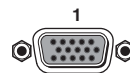
Computer video group

- ① **RGB video inputs** — Connect the analog computer-video sources to the Computer Input 1 through Computer Input 8 15-pin HD female connectors.



NOTE Most laptop or notebook computers have an external video port, but they require special commands to output the video to that connector. Also, a laptop's screen shuts off once that port is activated. See the computer's user's guide for details, or contact Extron for a list of common laptop keyboard commands.

- ② **RGB video outputs** — Connect RGBHV video displays to the Computer Output 1 through Computer Output 6 15-pin HD female connectors.



Installation, cont'd

Low resolution video group

The switcher can connect to up to as many as six S-video and/or composite video sources and output to as many as six video devices.

- ③ **Video Input 9 and Video Input 10 (composite video inputs)** — Connect composite video sources to these female BNC connectors.

NOTE Video Input 9 serves as a timing reference for all other low resolution video group inputs. If one of the inputs is synced to a blackburst generator, connect that source to Video Input 9.

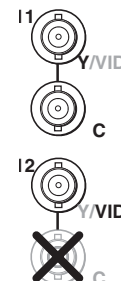


- ④ **Video Input 11 through Video Input 14** —

S-video inputs — Connect an S-video source to a pair of female BNC connectors. Connect luma (Y) and chroma (C) as shown at right.

Composite video inputs — Connect a composite video source to the Video (top) connector in a pair of female BNC connectors as shown at right.

NOTE The switcher must be set to accept video inputs 11 through 14 as either S-video or composite video. Composite video is the default. See Selecting composite video or S-video in chapter 3, Operation, to change the setting.



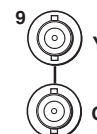
- ⑤ **Composite video outputs (Video Output 7 and Video Output 8)** — Connect composite video displays to these female BNC connectors.

NOTE If the input tied Video Output 7 or Video Output 8 is S-video, the switcher encodes the input to composite video. If the tied input is composite video, the switcher passes it through to the output with no processing.



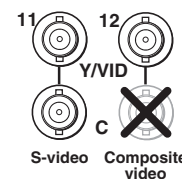
- ⑥ **S-video outputs (Video Output 9 and Video Output 10)** — Connect S-video displays to these female BNC connectors.

NOTE If the input tied Video Output 9 or Video Output 10 is composite video, the switcher decodes the input to S-video. If the tied input is S-video, the switcher passes it through to the output with no processing.



- ⑦ **Pass-through outputs (Video Output 11 and Video Output 12)** — Connect S-video or composite video displays to these female BNC connectors. Connect S-video Y and C or composite video as shown at right.

NOTE The switcher passes the tied input to these outputs with no signal processing; an S-video input is output as S-video, a composite video input is output as composite video.



Audio input and output

By default, the audio ties follow the video ties. Audio breakaway, which can be activated via the optional front panel or under Ethernet or RS-232 control, allows you to select from any one of the audio input sources, regardless of video group, and route it separately from its corresponding video source. See chapter 3, *Operation*; chapter 4, *SIS Programming and Control*; chapter 5, *Matrix Software*; and chapter 6, *HTML Operation* for details.

NOTE Audio ties can be made only to outputs in the computer/audio subgroup (outputs 1 through 6).

Audio inputs (either input subgroup)

- ⑧ **Connections for balanced and unbalanced audio inputs** — Each input has a 5-pole, 3.5 mm captive screw connector for balanced or unbalanced stereo or mono audio input. Connectors are included with each switcher, but you must supply the audio cable.

See figure 2-2 to wire a connector for the appropriate input type and impedance level. Use the supplied tie-wrap to strap the audio cable to the extended tail of the connector.

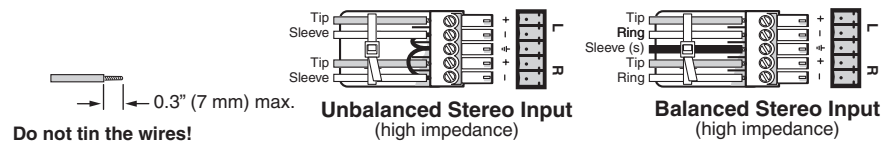


Figure 2-2 — Captive screw connector wiring for stereo audio inputs

CAUTION The captive screw audio connector can easily be inadvertently plugged partially into one receptacle and partially into an adjacent receptacle. This misconnection could damage the audio circuits. Ensure that the connector is plugged fully and only into the desired input or output.

NOTE The length of exposed wires is critical. The ideal length is 0.3" (7 mm).

- If the stripped section of wire is longer than 0.3", the exposed wires may touch, causing a short circuit between them.
- If the stripped section of wire is shorter than 0.3", wires can be easily pulled out even if tightly fastened by the captive screws.

NOTE See figure 2-3 to identify the tip, ring, and sleeve when you are making connections for the switcher from existing audio cables. A mono audio connector consists of the tip and sleeve. A stereo audio connector consists of the tip, ring and sleeve. The ring, tip, and sleeve wires are also shown on the captive screw audio connector diagrams, figure 2-2 and figure 2-4.

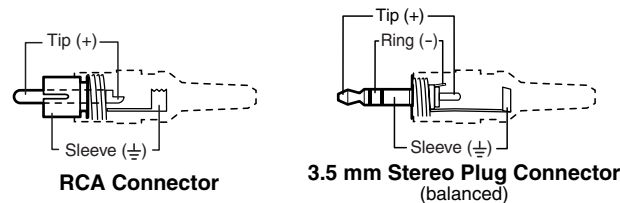


Figure 2-3 — Typical audio connectors

The audio level for each input can be individually set via the front panel or Ethernet or RS-232 control to ensure that the level on the output does not vary from input to input. See chapter 3, *Operation*; chapter 4, *SIS Programming and Control*; chapter 5, *Matrix Software*; and chapter 6, *HTML Operation* for details.

Installation, cont'd

Audio outputs (computer/audio output subgroup only)

- ⑨ **Connections for balanced and unbalanced audio outputs** — These 5-pole, 3.5 mm captive screw connectors output the selected, unamplified, line level audio. Connect audio devices, such as an audio amplifier or powered speakers.

See figure 2-4 to properly wire an output connector. Use the supplied tie-wrap to strap the audio cable to the extended tail of the connector.

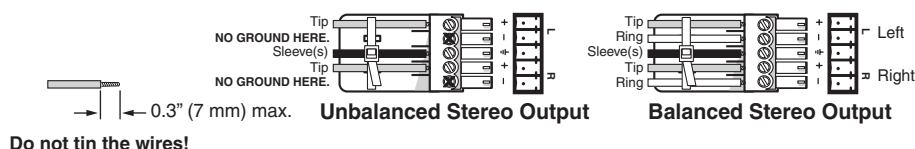


Figure 2-4 — Captive screw connector wiring for stereo audio output

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

NOTE The length of exposed wires is critical. The ideal length is 0.3" (7 mm).

- If the stripped section of wire is longer than 0.3", the exposed wires may touch, causing a short circuit between them.
- If the stripped section of wire is shorter than 0.3", wires can be easily pulled out even if tightly fastened by the captive screws.

The volume level for each output can be individually set via the front panel or Ethernet or RS-232 control. See chapter 3, *Operation*; chapter 4, *SIS Programming and Control*; chapter 5, *Matrix Software*; and chapter 6, *HTML Operation* for details.

Serial port

- ⑩ **Remote connector** — Connect one or two host devices, such as computers, touch panel controls, or RS-232 capable PDAs to the switcher via these 3-pole captive screw connectors for serial RS-232 (figure 2-5). Use the supplied tie-wrap to strap the serial cable to the extended tail of the connector.

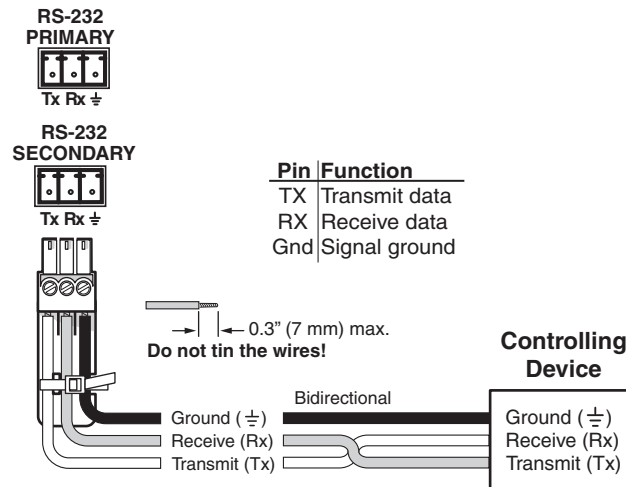


Figure 2-5 — RS-232 connector

NOTE The length of exposed wires is critical. The ideal length is 0.3" (7 mm).

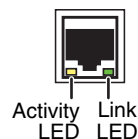
- If the stripped section of wire is longer than 0.3", the exposed wires may touch, causing a short circuit between them.
- If the stripped section of wire is shorter than 0.3", wires can be easily pulled out even if tightly fastened by the captive screws.

NOTE These two ports are hardwired for RS-232 only.

Installation, cont'd

The RS-232 Secondary port is active only if the front panel Configuration port is not in use. If a front panel configuration connection is made, the rear panel RS-232 Secondary port becomes inactive and the front panel Configuration port is active.

NOTE The switcher can operate at 9600, 19200, 38400, or 115200 baud rates.
See Selecting the RS-232 Primary port's baud rate in chapter 3, *Operation*, to configure the RS-232 Primary port from the front panel.
See Command/Response table for IP SIS commands, in chapter 4, *SIS Programming and Control*, to configure all ports under SIS control.



See chapter 4, *SIS Programming and Control*, for definitions of the SIS commands (serial commands to control the switcher via this connector) and chapter 5, *Matrix Software*, for details on how to install and use the control software.

If desired, connect an MKP 2000 or MKP 3000 remote control panel to the switcher's RS-232 connector. Refer to the *MKP 2000 Remote Control Panel User's Manual* or the *MKP 3000 Remote Control Panel User's Manual* for details.

Ethernet port

11 Ethernet port — If desired, connect the matrix switcher to a PC or to an Ethernet LAN, via this RJ-45 connector. You can use a PC to control the networked switcher with SIS commands from anywhere in the world. You can also control the switcher from a PC that is either running Extron's Windows-based control program or that has downloaded HTML pages from the switcher.

Ethernet connection indicators — The Link and Act LEDs indicate the status of the Ethernet connection. The Link LED indicates that the switcher is properly connected to an Ethernet LAN. This LED should light steadily. The Act LED indicates transmission of data packets on the RJ-45 connector. This LED should flicker as the switcher communicates.

Cabling and RJ-45 connector wiring

It is vital that your Ethernet cables be the correct cables and that they be properly terminated with the correct pinout. Fast Ethernet links use Category (CAT) 5e or CAT 6 unshielded twisted pair (UTP) or shielded twisted pair (STP) cables terminated with RJ-45 connectors. Ethernet cables are limited to a length 328' (100 m).

NOTE Do not use standard telephone cables. Telephone cables will not support Ethernet or Fast Ethernet.

Do not stretch or bend cables. Transmission errors can occur.

The cable used depends on your network speed. The switcher supports both 10 Mbps (10Base-T — Ethernet) and 100 Mbps (100Base-T — Fast Ethernet), half-duplex and full-duplex, Ethernet connections.

- 10Base-T Ethernet requires CAT 3 UTP or STP cable at minimum.
- 100Base-T Fast Ethernet requires CAT 5e UTP or STP cable at minimum.

The Ethernet cable can be terminated as a straight-through cable or a crossover cable and must be properly terminated for your application (figure 2-6).

- **Crossover cable** — Direct connection between the computer and the matrix switcher.
- **Patch (straight) cable** — Connection of the matrix switcher to an Ethernet LAN.

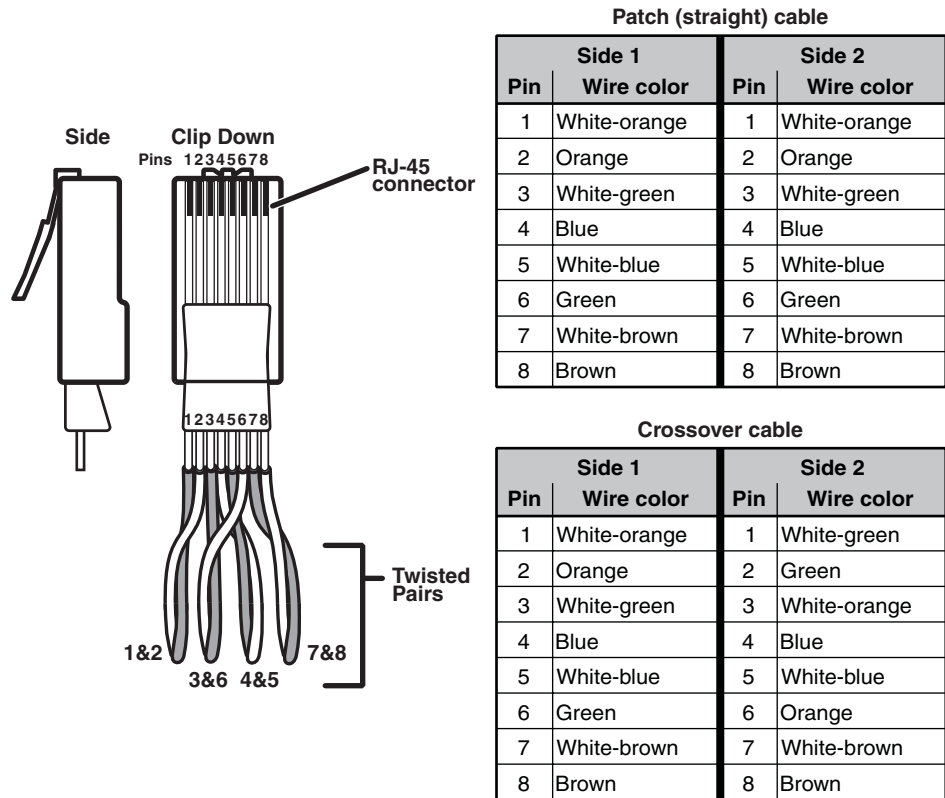


Figure 2-6 — RJ-45 connector and pinout tables

Reset button

- ⑫ **Reset button** — The Reset button initiates four levels of reset of the matrix switcher. Press and hold the button while the switcher is running or while you power up the switcher for different reset levels.



See *Performing soft system resets* in chapter 3, *Operation*, for details.

- **Events (mode 3) reset** — Hold Reset for 3 seconds then release and push again to toggle events monitoring on and off.
- **IP settings (mode 4) reset** — Hold Reset for 6 seconds then release and push again to reset the switcher's IP functions.

NOTE *IP settings reset does not replace any user-installed firmware.*

- **Absolute (mode 5) reset** — Hold Reset for 9 seconds then release and push again to restore the switcher to the default factory conditions.
- **Hard reset (mode 1)** — Hold Reset while powering up the switcher to restore the switcher to the default factory conditions.

Power

- ⑬ **AC power connector** — Plug a standard IEC power cord into this connector to connect the switcher to a 100 VAC to 240 VAC, 50 or 60 Hz power source.

Front Panel Configuration Port

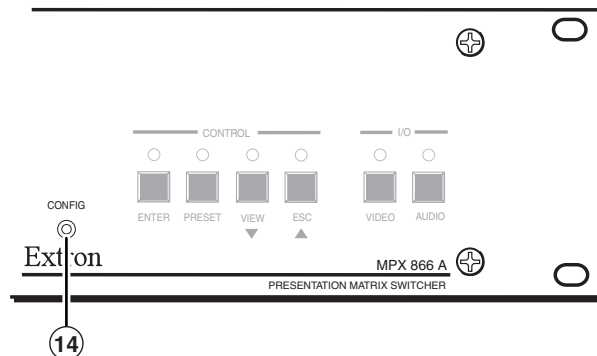
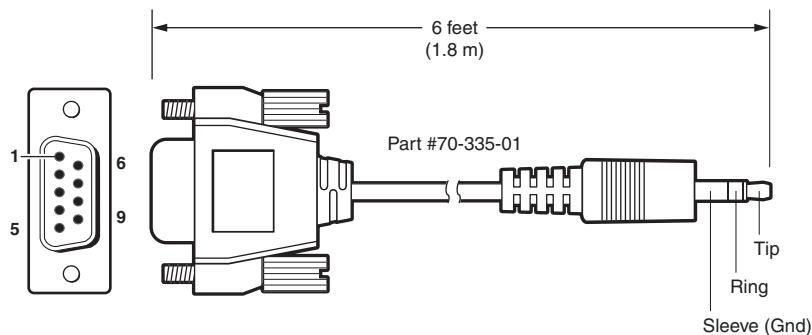


Figure 2-7 — Front panel configuration port

- 14 Configuration port** — This 2.5 mm mini stereo jack serves the same serial communications function as the rear panel Remote port, but it is easier to access than the rear port after the matrix switcher has been installed and cabled. The optional 9-pin D to 2.5 mm mini jack TRS RS-232 cable, part #70-335-01 (figure 2-8), can be used for this connection.



9-pin D	Connection	TRS Plug
Pin 2	Computer's RX line	Tip
Pin 3	Computer's TX line	Ring
Pin 5	Computer's signal ground	Sleeve

Figure 2-8 — Optional 9-pin TRS RS-232 cable

NOTE This port parallels the rear panel RS-232 Secondary port. If a front panel configuration connection is made, the rear panel RS-232 Secondary port becomes inactive and the front panel Configuration port is active..

This port is RS-232 only, with its default protocols as follows:

- 9600 baud
- no parity
- 8 data bits
- 1 stop bit
- no flow control

NOTE The Configuration port can operate at 9600, 19200, 38400, or 115200 baud rates. See Command/Response table for IP SIS commands, in chapter 4, SIS Programming and Control, to configure all ports under SIS control.

NOTE The maximum distances from the matrix switcher to the controlling device can vary up to 200 feet (61 m). Factors such as cable gauge, baud rates, environment, and output levels (from the switcher and the controlling device) all affect transmission distance. Distances of about 50 feet (15 m) are typically not a problem. In some cases the matrix switcher may be capable of serial communications via RS-232 up to 250 feet (76 m) away.



MPX 866 A Media Presentation Matrix Switcher

Chapter Three

Operation

Front Panel Controls and Indicators

Front Panel Operations

Rear Panel Controls

Optimizing the Audio

Troubleshooting

Configuration Worksheets

Operation

Front Panel Controls and Indicators

The front panel controls (figure 3-1) are grouped into two sets. The input and output buttons are on the left side of the control panel. The control buttons and video/audio (I/O) selection buttons are on the right side of the panel.

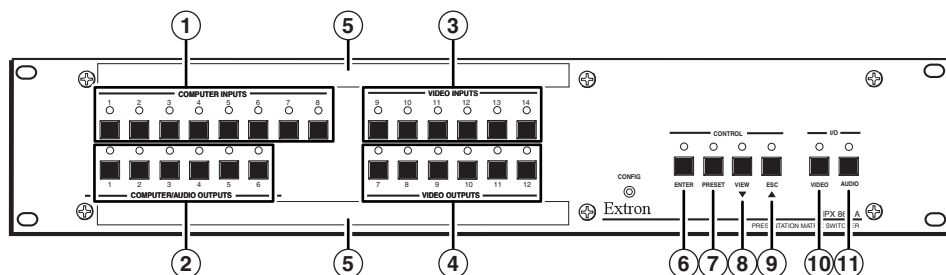


Figure 3-1 — MPX 866 A

Definitions

The following Extron matrix switcher terms are used throughout this manual:

Tie — An input-to-output connection.

Set of ties — An input **typed** to two or more outputs. (An output can never be tied to more than one input.)

Configuration — One or more **ties** or one or more **sets of ties**.

Current configuration — The **configuration** that is currently active in the switcher (also called **configuration 0**)

Global memory preset — A **configuration** that has been stored. Up to 32 **global memory presets** can be stored in memory. Preset locations are assigned to the input buttons and (where necessary) output buttons. Up to 26 presets can be selected from the front panel for either saving or retrieving. When a **preset** is retrieved from memory, it becomes the **current configuration**. Preset numbers larger than 26 are accessible under RS-232 and Ethernet control.

Computer video input and output buttons and LEDs

- ① **Computer input subgroup buttons and LEDs** — The computer video input buttons and LEDs have two primary functions (●) and two secondary (□) functions:
 - Select a computer video and/or audio input.
 - Identify the selected computer video and/or audio input.
 - Select a preset. See *Using global presets* on page 3-23.
 - Display the output volume level. See *Viewing and adjusting the output volume* on page 3-32.
- ② **Computer/audio output subgroup buttons and LEDs** — The computer / audio video output buttons and LEDs have two primary functions (●) and two secondary (□) functions:
 - Select computer video and/or audio output(s).
 - Identify the selected computer video and/or audio output(s).
 - Mute the output. See *Muting and unmuting video and/or audio outputs* on page 3-20.
 - Display the audio level of the selected input. See *Viewing and adjusting the input audio level* on page 3-28.

Video input and output buttons and LEDs

- ③ **Video input subgroup buttons and LEDs** — The video input buttons and LEDs have two primary functions (•) and two secondary (□) functions:
- Select a low resolution video and/or audio input.
 - Identify the selected low resolution video and/or audio input.
 - Select a preset. See *Using global presets* on page 3-23.
 - Display the output volume level. See *Viewing and adjusting the output volume* on page 3-32.
- ④ **Video output subgroup buttons and LEDs** — The video output buttons and LEDs have two primary functions (•) and four secondary (□) functions:
- Select low resolution video output(s).
 - Identify the selected low resolution video output(s).
 - Mute the output. See *Muting and unmuting video and/or audio outputs* on page 3-20.
 - (Output 7 and Output 8 buttons only) Select the video format (composite [Output 7] or S-video [Output 8]) for configurable inputs 11 through 14. See *Selecting composite video or S-video* on page 3-26.
 - (Output 7 and Output 8 LEDs only) Identify the selected video format (composite [Output 7] or S-video [Output 8]) for configurable inputs 11 through 14. See *Selecting composite video or S-video* on page 3-26.
 - Display the audio level of the selected input. See *Viewing and adjusting the input audio level* on page 3-28.

Input and output label panels

- ⑤ **Input and output label panels** — These translucent panels can be removed and replaced to insert labels behind the panels. To remove a panel, insert the Phillips-head end of an Extron Tweezer or small Phillips-head screwdriver into the hole in one end of the panel, and gently slide the tab at the edge of the panel out of the recess in the switcher housing.

Input and output labels can be created easily with Extron's button label generator software, which ships with every Extron Matrix Switcher, or with any Brother® P-Touch™ labeler. Each input and output can be labeled with names, alphanumeric characters, or even color bitmaps for easy and intuitive input and output selection (figure 3-2). See chapter 5, *Matrix Software*, for details on using the label software.

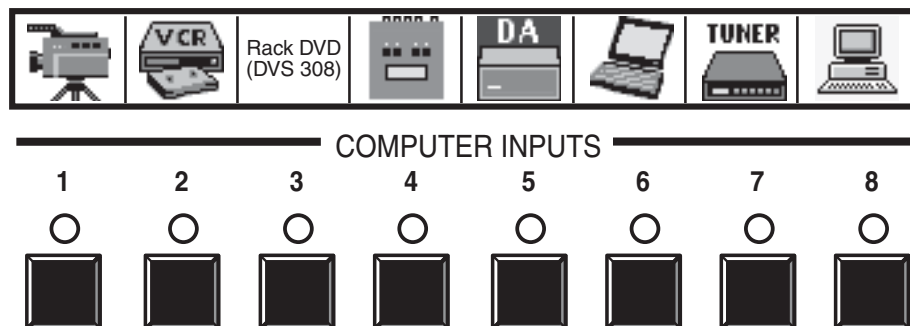


Figure 3-2 — Sample label

Control buttons and LEDs

- ⑥ **Enter button and LED** — The Enter button and LED have three primary functions (●) and three secondary (□) functions:
- Save changes that you make on the front panel. To create a simple configuration:
 - Specify video, audio, or both (see I/O selection buttons and LEDs [⑩] and [⑪])
 - Press the desired input button (① or ③)
 - Press the desired output button(s) (② or ④)
 - Press the Enter button.

NOTE Video outputs in the computer/audio subgroup (②) can **only** be tied to a computer video subgroup input (①).

Video outputs in the low resolution video subgroup (④) can **only** be tied to a low resolution video subgroup input (③).

When creating audio-only ties, the audio input in either video input subgroup (① or ③) can be tied to only outputs 1 through 6 in the computer video/audio output subgroup (②).

When creating video **and** audio ties in the low resolution video group (from ③ to ④), the switcher automatically breaks audio away (ties the audio input to a different output than the video input) to an output in the computer video/audio subgroup (②). This is because there are only audio outputs 1 through 6. See *Creating a configuration*, on page 3-8 to identify the outputs to which the inputs are tied.

- Indicate that a potential tie has been created but not saved.
 - Indicate that a global preset has been selected to be saved or recalled but that the preset action has not been accomplished.
 - With the Preset, View, and Esc buttons, select *Serial Port Configuration* mode. See *Selecting the RS-232 Primary port's baud rate* on page 3-37.
 - Select 9600 baud for the RS-232 Primary port in *Serial Port Configuration* mode. See *Selecting the RS-232 Primary port's baud rate* on page 3-37.
 - Indicate that the RS-232 Primary port is set to 9600 baud in *Serial Port Configuration* mode. See *Selecting the RS-232 Primary port's baud rate* on page 3-37.
- ⑦ **Preset button and LED** — The Preset button and LED have two primary functions (●) and three secondary (□) functions:
- Activates *Save Preset* mode to save a configuration as a preset and *Recall Preset* mode to activate a previously-defined preset.
 - Blinks when *Save Preset* mode is active and lights steadily when *Recall Preset* mode is active.
 - With the Enter, View, and Esc buttons, select *Serial Port Configuration* mode. See *Selecting the RS-232 Primary port's baud rate* on page 3-37.
 - Select 19200 baud for the RS-232 Primary port in *Serial Port Configuration* mode. See *Selecting the RS-232 Primary port's baud rate* on page 3-37.
 - Indicate that the RS-232 Primary port is set to 19200 baud in *Serial Port Configuration* mode. See *Selecting the RS-232 Primary port's baud rate* on page 3-37.

⑧ **View (▼) button and LED** — The View (▼) button and LED have two primary functions (●) and five secondary (□) functions:

- Select *View-Only* mode, which displays the current configuration. See *Viewing a configuration* on page 3-17.

NOTE *View-only mode also provides a way to mute and unmute the outputs. See Muting and unmuting video and/or audio outputs on page 3-20.*

- Indicate that *View-Only* mode is active.
- Decrease the audio level of the selected input. See *Viewing and adjusting the input audio level* on page 3-28.
- Decrease the volume of the selected output. See *Viewing and adjusting the output volume* on page 3-32.
- With the Enter, Preset, and Esc buttons, select *Serial Port Configuration* mode. See *Selecting the RS-232 Primary port's baud rate* on page 3-37.
- Select 38400 baud for the RS-232 Primary port in *Serial Port Configuration* mode. See *Selecting the RS-232 Primary port's baud rate* on page 3-37.
- Indicate that the RS-232 Primary port is set to 38400 baud in *Serial Port Configuration* mode. See *Selecting the RS-232 Primary port's baud rate* on page 3-37.

⑨ **Esc (▲) button and LED** — The Esc (▲) button and LED have two primary functions (●) and five secondary (□) functions:

- Cancel operations or selections in progress and reset the front panel button indicators.

NOTE *The Esc (▲) button does **not** reset the current configuration, the Video button and Audio button selection, any presets, or any audio gain or attenuation or volume settings.*

- The Esc LED flashes once to indicate that the escape function has been activated.
- Increase the audio level of the selected input. See *Viewing and adjusting the input audio level* on page 3-28.
- Increase the volume of the selected output. See *Viewing and adjusting the output volume* on page 3-32.
- With the Enter, Preset, and View buttons, select *Serial Port Configuration* mode. See *Selecting the RS-232 Primary port's baud rate* on page 3-37.
- Select 115200 baud for the RS-232 Primary port in *Serial Port Configuration* mode. See *Selecting the RS-232 Primary port's baud rate* on page 3-37.
- Indicate that the RS-232 Primary port is set to 115200 baud in *Serial Port Configuration* mode. See *Selecting the RS-232 Primary port's baud rate* on page 3-37.

Operation, cont'd

I/O controls

You must specify video, audio, or both when you are creating or viewing a configuration. This is done with the Video button (Ⓜ) and Audio (Ⓜ) buttons.

- ⑩ **Video button and LED** — The Video button and LED have two primary functions (•) and three secondary (□) functions:
- Selects and deselects video for a configuration that is being created or viewed.
 - The LED lights to indicate that video is available for configuring or for viewing.
 - Selects the *Video* mode, in which you can select the video format for configurable inputs 11 through 14. See *Selecting composite video or S-video* on page 3-26.
 - With the Audio button, toggles the front panel lock on or off. See *Locking out the front panel (Executive mode)* on page 3-36.
 - With the Audio button, commands the front panel system reset. See *Performing a system reset from the front panel* on page 3-36.
- ⑪ **Audio button and LED** — The Audio button and LED have two primary functions (•) and three secondary (□) functions
- Selects and deselects audio for a configuration that is being created or viewed.
 - The LED lights to indicate that audio is available for configuration or viewing.
 - Selects the *Audio* mode, in which you can adjust the input audio level and the output audio volume. See *Viewing and adjusting the input audio level* on page 3-28 and *Viewing and adjusting the output volume* on page 3-32.
 - With the Video button, toggles the front panel lock on or off. See *Locking out the front panel (Executive mode)* on page 3-36.
 - With the Video button, commands the front panel system reset. See *Performing a system reset from the front panel* on page 3-36.

Front Panel Operations

The following paragraphs detail the power-up process and then provide sample procedures for creating ties, viewing configurations, saving and recalling a preset, muting and unmuting outputs, selecting the composite or S-video format for inputs 11 through 14, viewing and adjusting the input audio level, viewing and adjusting the output volume, locking out the front panel, performing one of several resets, and reading and setting the RS-232 Primary port settings.

Power

Apply power by connecting the power cord to an AC source. The switcher performs a self-test that flashes the front panel LEDs on and off. An error-free power up self-test sequence leaves all I/O and control LEDs unlit. The lit/unlit status of the Video LED and the Audio LED is the same as when the switcher was powered off.

The current configuration and all presets are saved in non-volatile memory. When power is applied, the most recent configuration is retrieved. The previous presets remain intact.

If an error occurs during the self-test, the switcher locks up and does not operate. If your switcher locks up on power-up, call the Extron S³ Sales & Technical Support Hotline.

Creating a configuration

The current configuration can be changed using the front panel buttons. Change the current configuration as follows:

1. Press the Esc button to clear any input LEDs, output LEDs, or control LEDs that may be lit.
2. Select to configure video, audio, or both by pressing the Video button and/or Audio button.
3. Select the desired input and output(s) by pressing the input and output buttons.

To indicate **potential ties**, output LEDs **blink** when an output is selected but not tied to the input.

To indicate **current ties**, output LEDs **light** steadily when an input is tied to the output.

To clear unwanted outputs, press and release the output buttons associated with the lit LEDs. To indicate **potential unties**, output LEDs **blink** when an output is deselected but not untied from the input.

4. Press and release the Enter button to accept the tie or to break an existing tie.
5. Repeat steps 1 through 4 to create additional ties until the desired configuration is complete.

- NOTE**
- Video ties cannot be made between the computer video group and the low resolution video group.
 - Audio ties can only be made to the computer video/audio subgroup (outputs 1 through 6).
 - Video and audio ties between the low resolution video input subgroup and the low resolution video output subgroup are **always** made with the audio broken away. In such an operation, the switcher automatically ties the audio to an output in the computer video/audio outputs subgroup (outputs 1 through 6) as follows:
 - If the video is tied to output 7, the audio is tied to output 1.
 - If the video is tied to output 8, the audio is tied to output 2.
 - If the video is tied to output 9, the audio is tied to output 3.
 - If the video is tied to output 10, the audio is tied to output 4.
 - If the video is tied to output 11, the audio is tied to output 5.
 - If the video is tied to output 12, the audio is tied to output 6.
 - If video is selected for configuration (the Video LED is lit) and you press the input button for an input in one group and then try to select an output in the other group, the associated output button cannot be selected. The associated input LED remains lit.
 - Only one video input and one audio input can be tied to an output.
 - If a tie is made in which the selected output was previously tied to another input, the older tie is broken in favor of the newer tie.
 - If an input with no tie is selected, only that input's LED lights.
 - When the Video and Audio LEDs are lit, if an input with an audio tie but no video tie is selected, the input's LED lights and the output LED and I/O Audio LEDs blink.

- As each input and output is selected, the associated output LED blinks to indicate a tentative tie. LEDs for output(s) that were already tied to the input light steadily. Outputs that are already tied can be left on, along with new blinking selections, or toggled off by pressing the associated output button.

Example 1: Creating a set of computer video and audio ties

In the following example, input 5 is tied to outputs 3, 4, and 6. The steps show the front panel indications that result from your action.

NOTE This example assumes that there are no ties in the current configuration.

1. Press and release the Esc button (figure 3-3).

Press the Esc button to clear all selections.

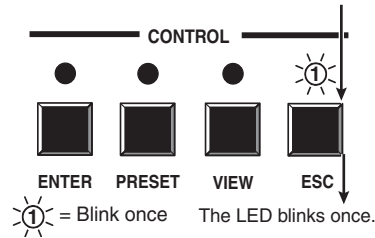


Figure 3-3 — Clear all selections

2. To select video and audio for the tie, if necessary, press and release the Video button and the Audio button until the LEDs light (figure 3-4).

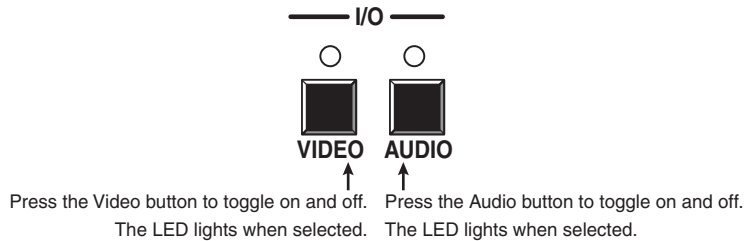


Figure 3-4 — Select video and audio

3. Press and release the input 5 button (figure 3-5).

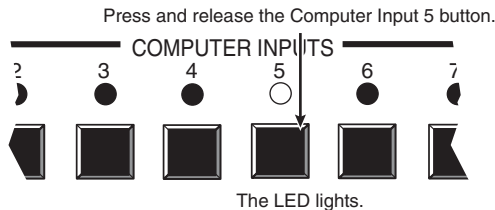


Figure 3-5 — Select an input

Operation, cont'd

- Press and release the output 3, output 4, and output 6 buttons (figure 3-6).

NOTE The entire set of ties can be canceled at this point by pressing and releasing the Esc button. The Esc LED flashes once.

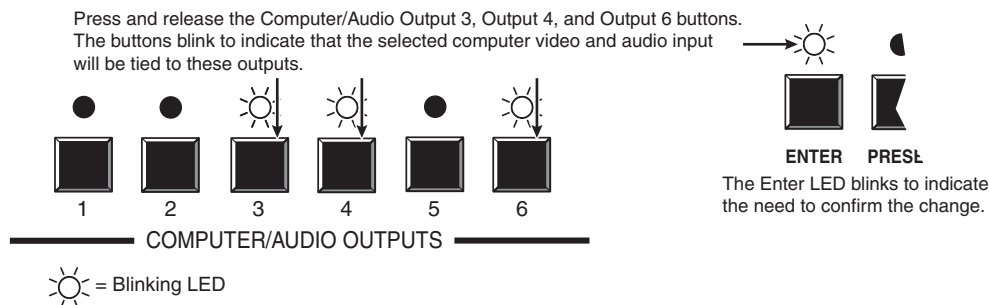


Figure 3-6 — Select the outputs

- Press and release the Enter button (figure 3-7).

Press the Enter button to confirm the configuration change.

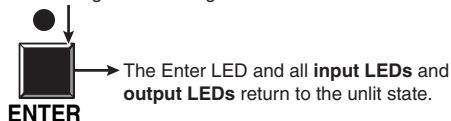


Figure 3-7 — Press the Enter button

The current configuration (figure 3-8) is now:

- Input 5 video and audio tied to output 3, output 4, and output 6

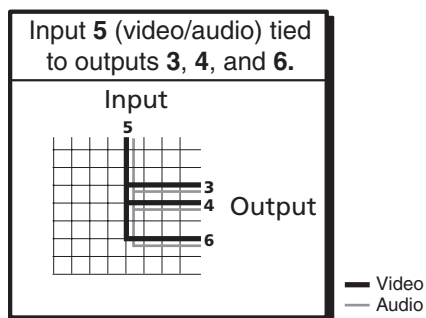


Figure 3-8 — Example 1, final configuration

Example 2: Adding a tie to a set of computer video and audio ties

In the following example, a new video tie is added to the current configuration. The steps show the front panel indications that result from your action.

NOTE This example assumes that you have performed example 1.

1. Press and release the Esc button (figure 3-9).

Press the Esc button to clear all selections.

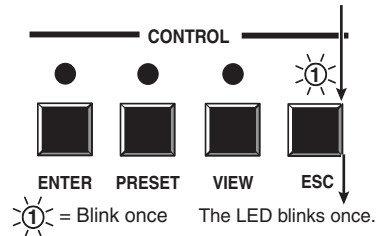


Figure 3-9 — Clear all selections

2. To select video only for the tie, if necessary, press and release the Video button and the Audio button (figure 3-10).

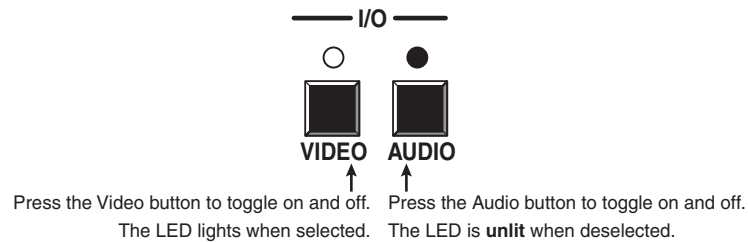


Figure 3-10 — Select video only

3. Press and release the input 5 button (figure 3-11).

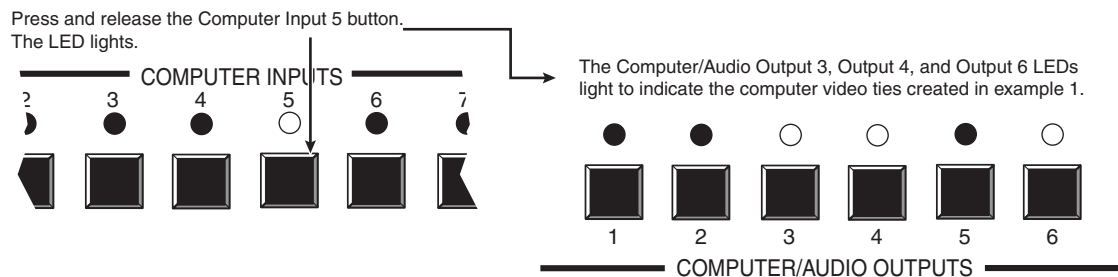


Figure 3-11 — Select an input

Operation, cont'd

4. Press and release the output 1 button (figure 3-12).

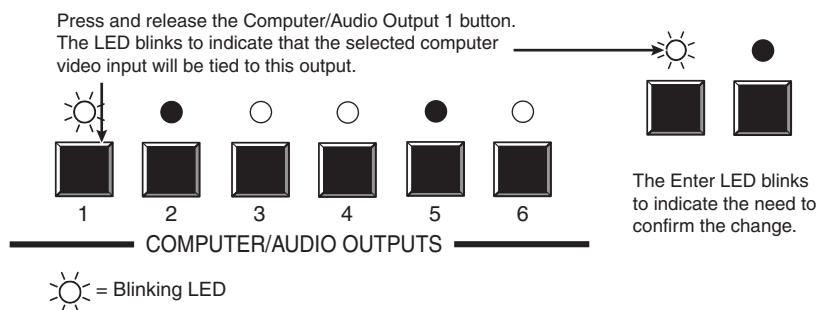


Figure 3-12 — Select the output

5. Press and release the Enter button (figure 3-13).

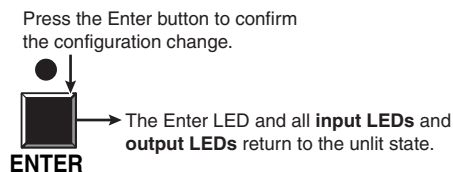


Figure 3-13 — Press the Enter button

The current configuration (figure 3-14) is now:

- Input 5 video tied to output 1, output 3, output 4, and output 6
- Input 5 audio tied to output 3, output 4, and output 6

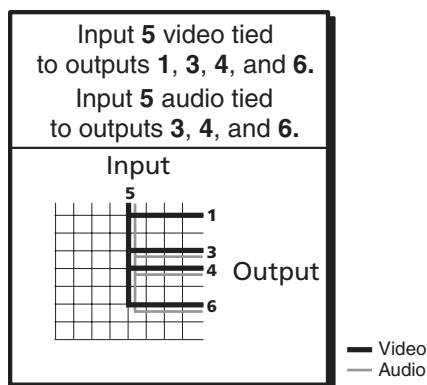


Figure 3-14 — Example 2, final configuration

Example 3: Removing a tie from a set of computer video and audio ties

In the following example, an existing audio tie is removed from the current configuration. The steps show the front panel indications that result from your action.

NOTE This example assumes that you have performed example 1 and example 2.

1. Press and release the Esc button (figure 3-15).

Press the Esc button to clear all selections.

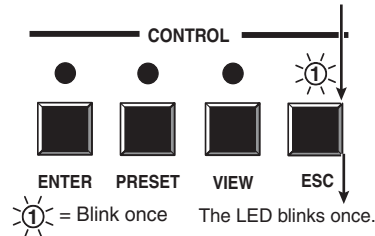


Figure 3-15 — Clear all selections

2. To select audio only for the tie, if necessary, press and release the Video button and the Audio button (figure 3-16).

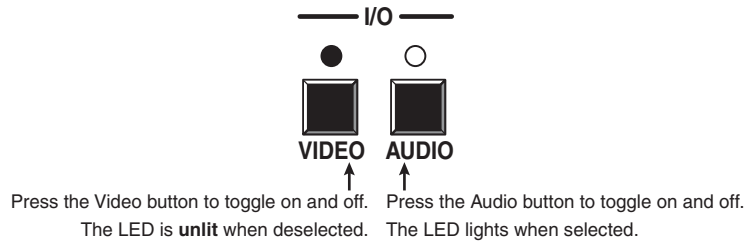


Figure 3-16 — Select audio only

3. Press and release the input 5 button (figure 3-17).

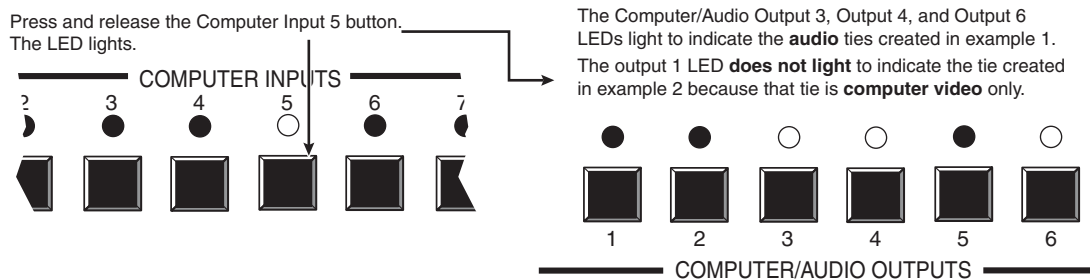


Figure 3-17 — Select an input

Operation, cont'd

4. Press and release the output 4 button (figure 3-18).

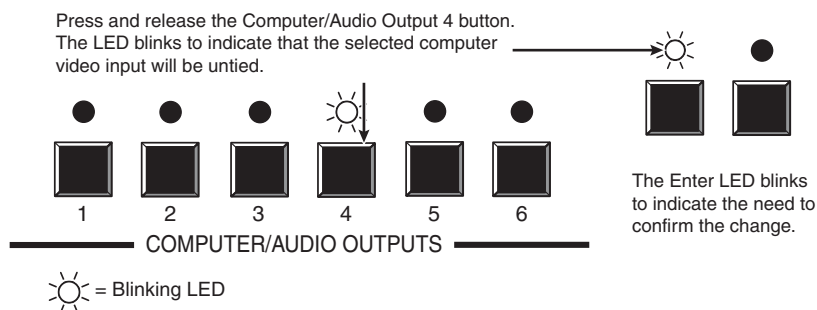


Figure 3-18 — Deselect the output

5. Press and release the Enter button (figure 3-19).

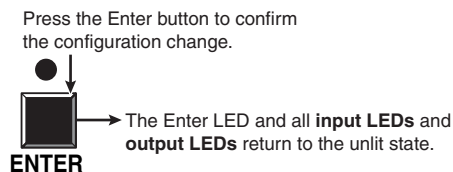


Figure 3-19 — Press the Enter button

The current configuration (figure 3-20) is now:

- **Video** — Input 5 video tied to output 1, output 3, output 4, and output 6
- **Audio** — Input 5 audio tied to output 3 and output 6

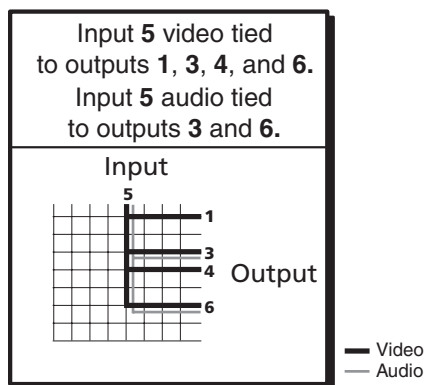


Figure 3-20 — Example 3, final configuration, audio switcher

Example 4: Creating a set of low resolution video and audio ties

NOTE This example shows the unusual indications that happen when you make video and audio ties in the low resolution video group.

In the following example, low resolution input 12 is tied to outputs 7 and 8. The steps show the front panel indications that result from your action.

NOTE This example does **not** build on examples 1, 2, and 3. It assumes that there are no ties in the current configuration.

NOTE When creating video **and** audio ties in the low resolution video group, audio must be broken away (tied to a different output than the video) because there are only audio outputs 1 through 6. In this case, the audio is tied to an output in the computer video/audio subgroup.

- If the video is tied to output 7, the audio is tied to output 1.
- If the video is tied to output 8, the audio is tied to output 2.
- If the video is tied to output 9, the audio is tied to output 3.
- If the video is tied to output 10, the audio is tied to output 4.
- If the video is tied to output 11, the audio is tied to output 5.
- If the video is tied to output 12, the audio is tied to output 6.

1. Press and release the Esc button (figure 3-21).

Press the Esc button to clear all selections.

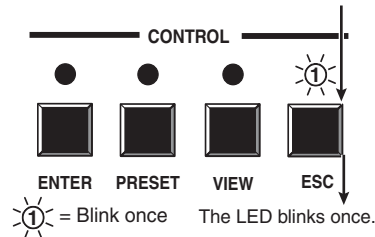


Figure 3-21 — Clear all selections

2. To select video and audio for the tie, if necessary, press and release the Video button and the Audio button until the LEDs light (figure 3-22).

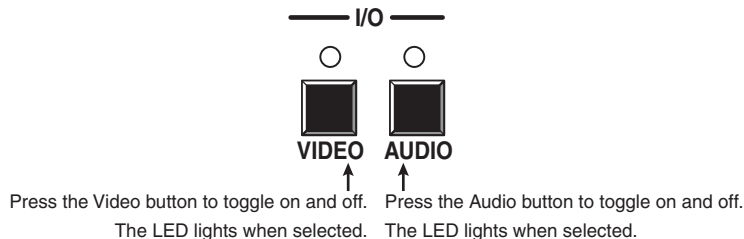


Figure 3-22 — Select video and audio

3. Press and release the low resolution Input 12 button (figure 3-23).

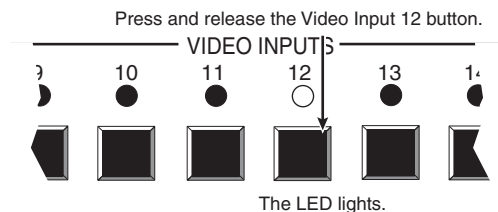


Figure 3-23 — Select an input

Operation, cont'd

4. Press and release the low resolution Output 7 and Output 8 buttons (figure 3-24).

NOTE *The entire set of ties can be canceled at this point by pressing and releasing the Esc button. The Esc LED flashes once.*

Press and release the Video Output 7 and Output 8 buttons. The Output 7 and Output 8 buttons blink to indicate that the selected low resolution video input will be tied to these outputs.

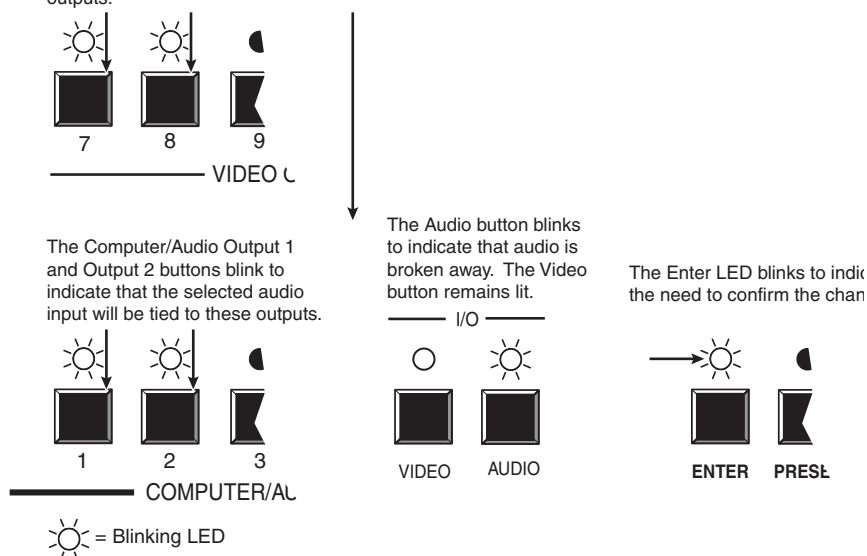


Figure 3-24 — Select the outputs

5. Press and release the Enter button (figure 3-25).

Press the Enter button to confirm the configuration change.

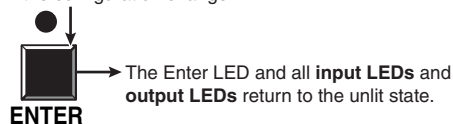


Figure 3-25 — Press the Enter button

The current configuration (figure 3-26) is now:

- Input 12 video tied to output 7 and output 8
- Input 12 audio tied to output 1 and output 2

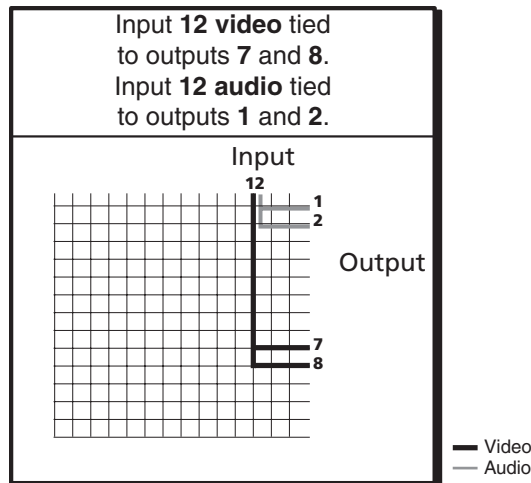


Figure 3-26 — Example 4, final configuration

Viewing a configuration

The current configuration can be viewed using the front panel buttons and LEDs. The *View-only* mode prevents inadvertent changes to the current configuration. *View-only* mode also provides a way to mute video and audio outputs (see *Muting and unmuting video and/or audio outputs* on page 3-20).

View the current configuration as follows:

1. Press the Esc button to clear any input LEDs, output LEDs, or control button LEDs that are lit.
2. Press and release the View button. All of the LEDs for outputs that are **not** tied light.
3. Select video, audio, or both to view by pressing the Video button and/or the Audio button.
4. Select the desired input or output(s) whose ties you wish to view by pressing the input and output buttons.

NOTE

- When you enter View-only mode, the output LEDs light for all outputs **without** ties. Likewise, when an output button for which there are no ties is pushed, the output LEDs turn on for all outputs **without** ties.
- To see all ties of the current configuration, press and release each input and output button, one at a time, with the Video LED and the Audio LED lit.
- In View-only mode, you can view video and audio, video-only, or audio-only ties. Pressing and releasing the Video button and the Audio button toggles each on and off.
- After 30 seconds of inactivity, View-only mode automatically deselects.

Operation, cont'd

Example 5: Viewing video and audio, audio only, and video only ties

The following example shows the viewing of the video and audio, audio-only, and video-only ties in the current configuration. The steps show the front panel indications that result from your action.

NOTE *This example assumes that you have performed example 1, example 2, and example 3.*

1. Press and release the Esc button (figure 3-27).

Press the Esc button to clear all selections.

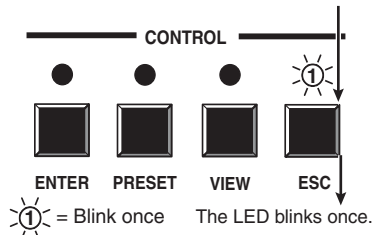


Figure 3-27 — Clear all selections

2. Press and release the View button to enter *View-Only* mode. The View button lights red.
3. To select both video and audio for viewing, if necessary, press and release the Video button and the Audio button (figure 3-28).

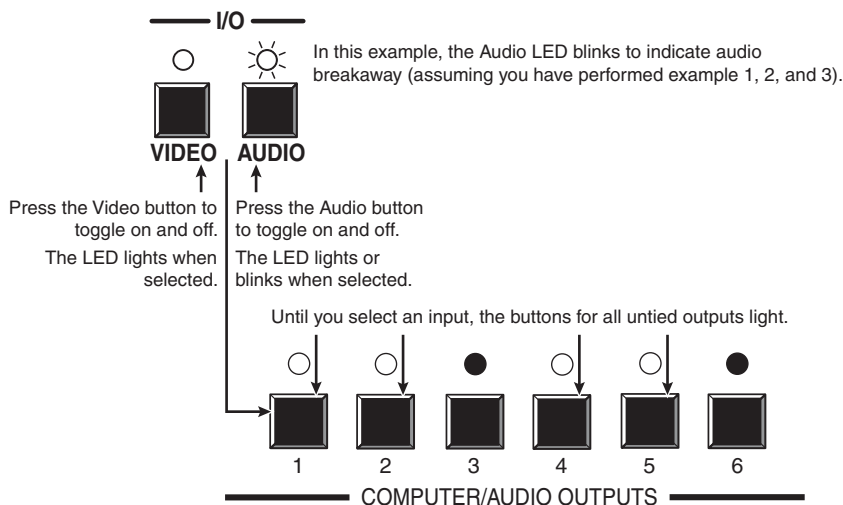


Figure 3-28 — Select video and audio

4. Press and release the input 5 button (figure 3-29).

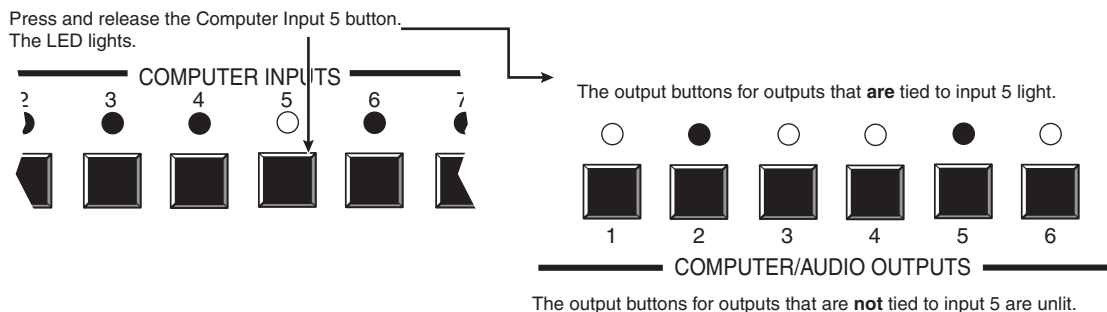


Figure 3-29 — Select an input

NOTE A set of ties can also be viewed by selecting a tied output. To demonstrate this, note the number of a lit output LED, and then press and release the output button for an untied (unlit LED) output. Observe that all of the untied outputs' LEDs light. Then press the output button that you noted previously and observe that the selected output LED, the tied input LED (input 5), and the output LEDs light for all of the outputs that are tied to the input.

5. Press and release the Video button to deselect video (figure 3-30).

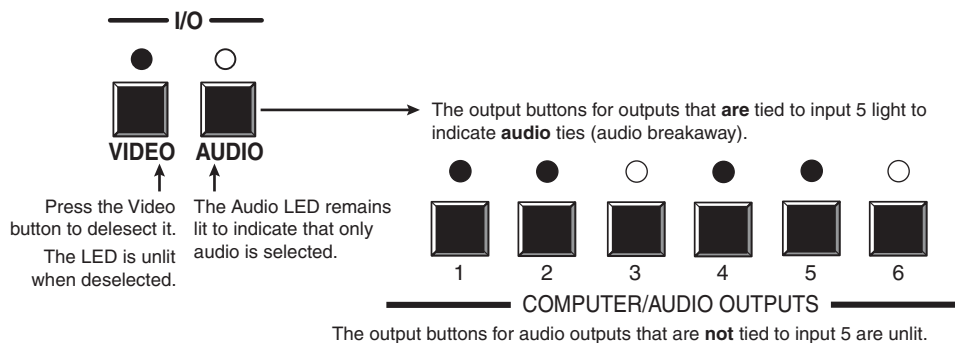


Figure 3-30 — Deselect video to view audio ties only

6. Press and release the Video button and the Audio button to toggle the Video LED on and the Audio LED unlit (figure 3-31).

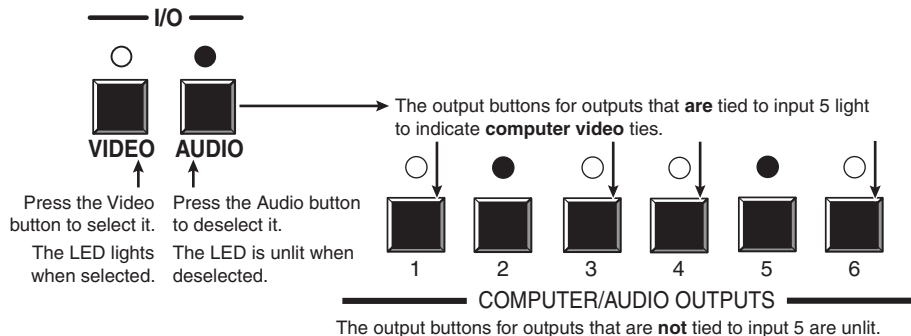


Figure 3-31 — Deselect audio and select video to view video only

If video ties are established for input 5, the output buttons for all video outputs tied to input 5 light green. If no ties are established for input 5, all output LEDs return to unlit.

7. Press and release the View button to exit *View-Only* mode (figure 3-32).

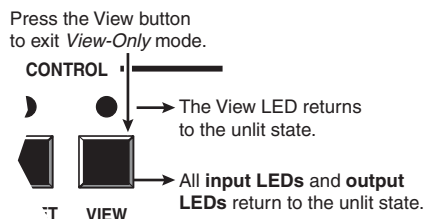


Figure 3-32 — Press the View button to exit View-Only mode

Muting and unmuting video and/or audio outputs

Individual video and outputs can be muted or unmuted as follows:

1. Press the Esc button to clear any input LEDs, output LEDs, or control LEDs that may be lit.
2. Press and release the View button.
3. Select video or audio to mute or unmute by pressing the Video button and/or the Audio button.
4. One at a time, press and **hold** the output button(s) for the desired output(s) for approximately 2 seconds. The output LED(s) for the selected output(s) blink to indicate the mute or return to their previous state to indicate the unmute.
5. Press and release the View button to return to normal switcher operation.

- NOTE**
- You can mute video-only or audio-only outputs only in a single operation.
 - Video and audio can both be muted, but in separate operations; one and then the other.
 - Pressing and releasing the Video button and the Audio button toggles each selection on and off.
 - If you select Video and Audio in View-Only mode and then attempt to mute an output, the mute function will not work.
 - When you enter View-Only mode, the output LEDs turn **on** for all outputs **without** ties.
 - In the computer video group, the video mute function mutes the R, G, and B planes only; the sync (H and V planes) are still active.
 - In the low resolution video group, the video mute function mutes all composite video and/or S-video planes.
 - Mutes are saved to non-volatile memory. When power is removed and restored, the mute settings are retained.

Example 6: Muting and unmuting an output

In the following example, several switcher outputs are muted and unmuted. The steps show the front panel indications that result from your action.

1. Press and release the Esc button (figure 3-33).

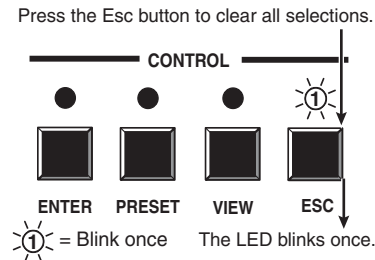


Figure 3-33 — Clear all selections

2. Press and release the View button to enter *View-Only* mode. The View LED lights.
3. To select either video or audio for viewing and muting, if necessary, press and release the Video button and the Audio button until one or the other is lit (figure 3-34).

NOTE This example shows the front panel indications if example 1, example 2, and example 3 have been completed.

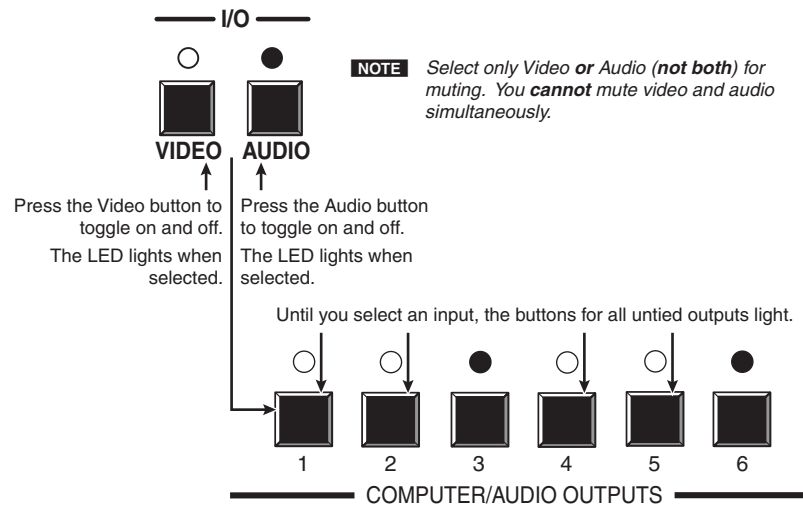


Figure 3-34 — Select video and audio

Operation, cont'd

4. **One at a time**, press and **hold** the Computer/Audio Output 3 and then the Computer/Audio Output 4 buttons (figure 3-35) for approximately 2 seconds until the LEDs begin to blink. The output 3 and output 4 video and audio signals are muted.

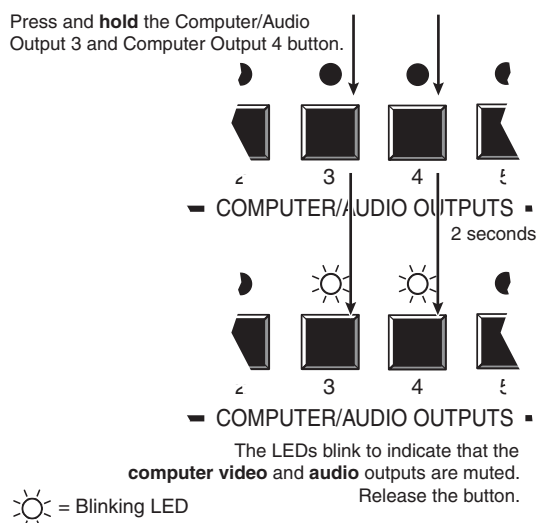


Figure 3-35 — Mute the outputs

5. **One at a time**, press and **hold** the Computer/Audio Output 3 and then the Computer/Audio Output 4 buttons (figure 3-36) for approximately 2 seconds until the buttons lights steadily. The output 3 and output 4 video and audio signals are unmuted.

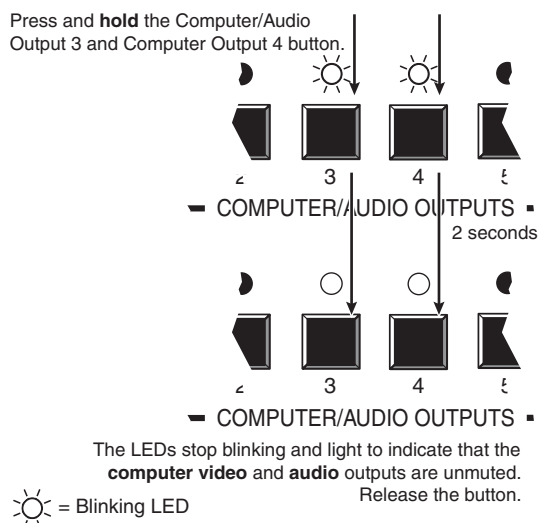


Figure 3-36 — Unmute the outputs

6. Press and release the View button to exit *View-Only* mode (figure 3-37).

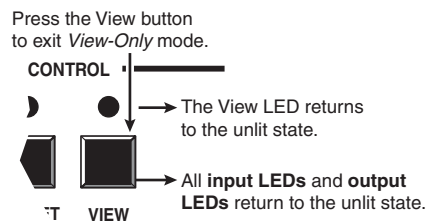


Figure 3-37 — Press the View button to exit View-Only mode

Using global presets

The current configuration (configuration 0) can be saved as a preset in any one of 32 global preset memory addresses. Up to 26 of those resets can be selected from the front panel to be either saved or retrieved. Global preset locations 1 through 14 are assigned to the input buttons. Global presets 15 through 26 are assigned to the output buttons. Global presets 27 through 32 are available via the RS-232 and Ethernet links only. When a **preset** is retrieved from memory, it becomes the **current configuration**.

- NOTE**
- Only the audio and video ties are stored and recalled.
 - Audio gain and volume settings are not saved, and they do not change when a preset is recalled.
 - The video format (composite or S-video) for outputs 11 through 14 are not saved, and they do not change when a preset is recalled.
 - Presets **cannot** be viewed from the front panel unless recalled as the current configuration. Presets **can** be viewed using Extron's Windows-based control program. See Chapter 5, Matrix Software, for more details.
 - The current configuration and all presets are stored in non-volatile memory. When power is removed and restored, the current configuration is still active and all presets are retained.
 - When a preset is recalled, it replaces the current configuration, which is lost unless it is also stored as a preset. The recalled preset overwrites all of the current configuration ties in favor of the preset configuration ties.

Example 7: Saving a global preset

In the following example, the current configuration is saved as a preset. The steps show the front panel indications that result from your action.

1. Press and release the Esc button (figure 3-38).

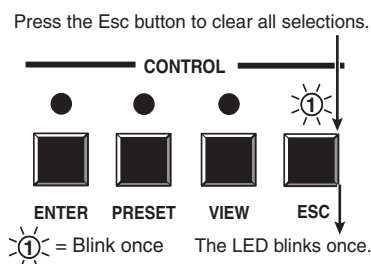


Figure 3-38 — Clear all selections

Operation, cont'd

2. Press and **hold** the Preset button for approximately 2 seconds until it blinks (figure 3-39).

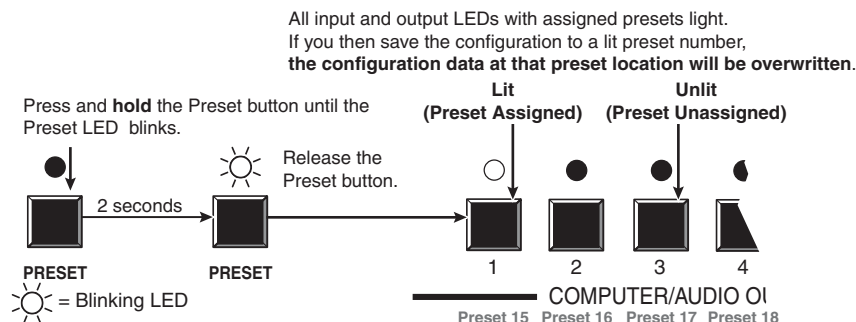


Figure 3-39 — Enter Save Preset mode

3. Press and release the input or output button for the desired preset (figure 3-40).

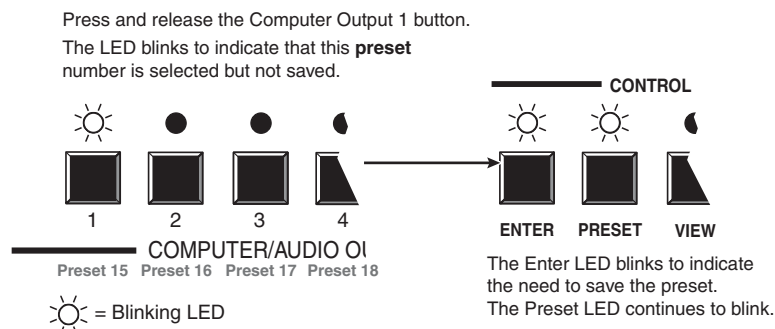


Figure 3-40 — Select the preset

4. Press and release the Enter button (figure 3-41). The current configuration is now stored in the selected memory location.

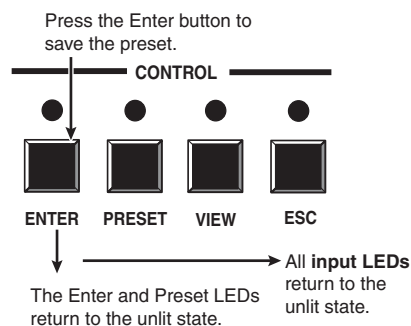


Figure 3-41 — Press the Enter button

Example 8: Recalling a global preset

In the following example, a preset is recalled to become the current configuration. The steps show the front panel indications that result from your action.

1. Press and release the Esc button (figure 3-42).

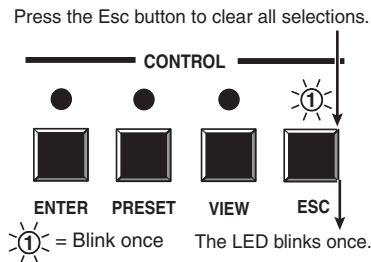


Figure 3-42 — Clear all selections

2. Press and release the Preset button (figure 3-43).

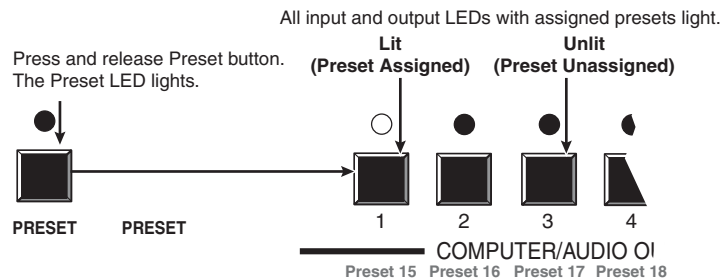


Figure 3-43 — Enter Recall Preset mode

3. Press and release the input or output button for the desired preset (figure 3-44).

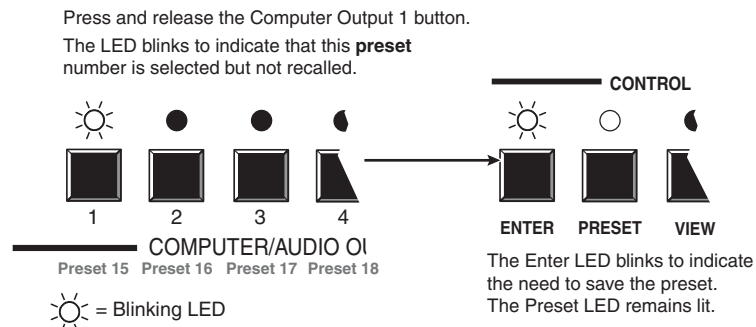


Figure 3-44 — Select the preset

4. Press and release the Enter button (figure 3-45). The configuration stored in selected memory location is now the current configuration and can be viewed in the *View-Only* mode (see example 5).

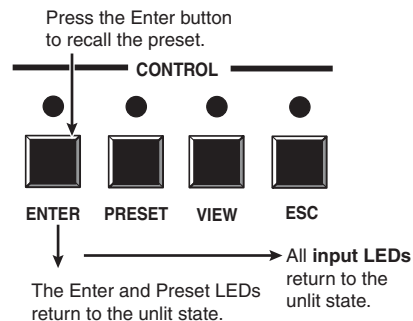


Figure 3-45 — Press the Enter button

Selecting composite video or S-video

Low resolution video inputs 11 through 14 are individually configurable as either composite video or S-video. View and change this variable from the front panel as follows:

1. Press the Esc button to clear any input buttons, output buttons, or control buttons that may be lit.
2. To enter *Video* mode, press and **hold** the Video button until the Video LED begins to blink, then release the button.
3. Press and release one of Video Input buttons 11 through 14 to select that input. Either Video Output button 7 or 8 lights to indicate the video format. Video Output 7 indicates composite video and Video Output 8 indicates S-video.
4. Press and release the Video Output 7 or 8 button to select the associated video format.
5. Press and release the Video button to exit the *Video* mode. The Video LED stops blinking.

- NOTE**
- Pressing the Enter or Preset button also exits Video mode. Pressing the Preset button changes to Recall Preset mode.
 - For the switcher to recognize the change and create a new configuration map, you must create a new tie for the input whose format was changed.
 - Exiting Video mode by pressing the Video button always returns the I/O configuration to video and audio selected for configuration.

Example 9: Selecting the S-video format for an output

In the following example, the S-video format is selected for video input 12. The steps show the front panel indications that result from your action.

1. Press and release the Esc button (figure 3-46).

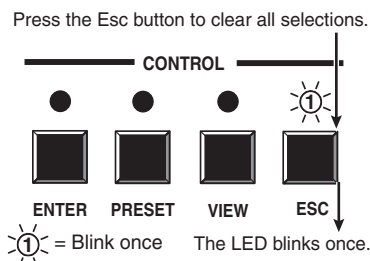


Figure 3-46 — Clear all selections

2. To enter *Video* mode, simultaneously press and **hold** the Video button (figure 3-47).

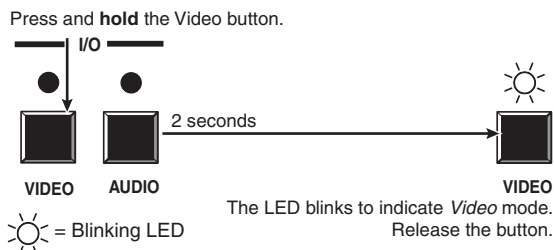


Figure 3-47 — Video mode selection

3. Press the Video Input button for one of the configurable inputs (11 through 14) (figure 3-48).

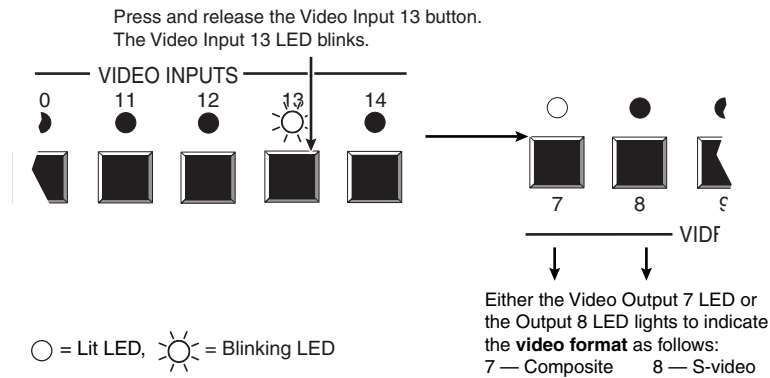


Figure 3-48 — Input selection and video format display

4. To change the format, press and release the Video Output button, 7 or 8, that relates to the desired format (figure 3-49).

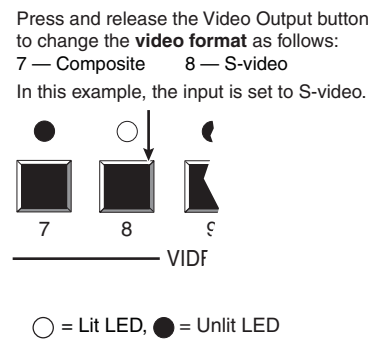


Figure 3-49 — Video format selection

NOTE If desired, select another of configurable video inputs 11 through 14 to view or change the video format for that input.

5. Press and release the Video button to exit the Video mode (figure 3-50).

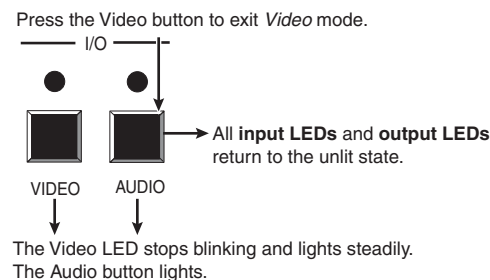


Figure 3-50 — Exit Video mode

NOTE For the switcher to recognize the change and create a new configuration map, you must create a new tie for the input whose format was changed.

Viewing and adjusting the input audio level

The audio level of each input can be displayed and adjusted through a range of -18 dB to +24 dB to ensure that there is no noticeable volume difference among sources (figure 3-51). The audio level can be adjusted from the front panel or under RS-232 or Ethernet control.

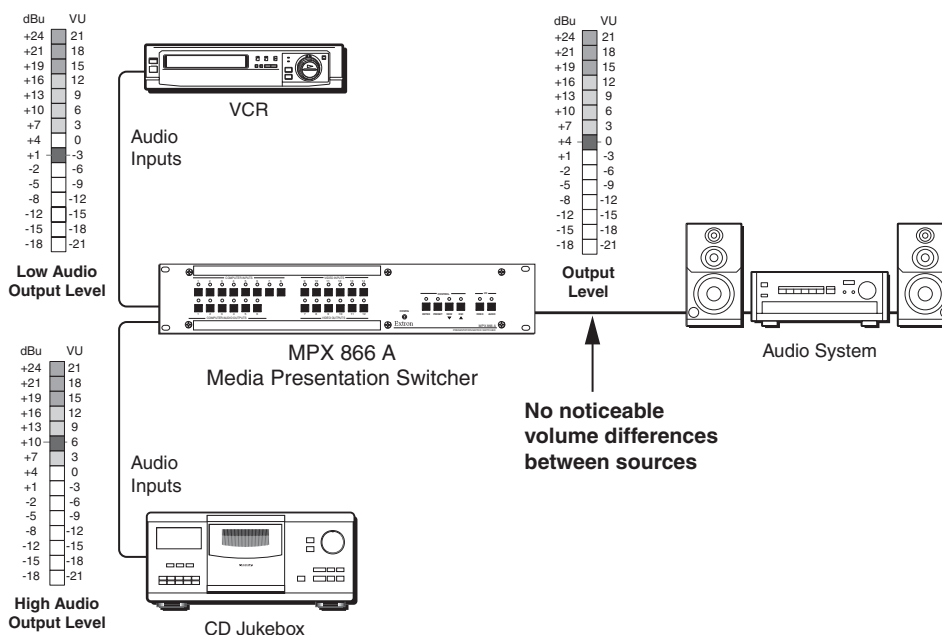


Figure 3-51 — Audio gain and attenuation

1. Press the Esc button to clear any input LEDs, output LEDs, or control LEDs that are lit.
2. To enter *Audio* mode, press and **hold** the Audio button until the Audio LED begins to blink, then release the button.
3. Press and release an input button to select an input. The output LEDs display the audio level for the selected input. Each output LED indicates 1 dB of gain or attenuation when blinking and another 1 dB when lit steadily. The Esc (▲) and View (▼) LEDs display the polarity (gain [+]) or attenuation [-]. See the table on the next page.
4. Press and release the Esc (▲) and View (▼) buttons to increase and decrease the audio level by 1 dB per each push of the button, or press and **hold** the button to change the level at a rate of 3 dB per second until the button is released or the upper or lower limit is reached.
5. Press and release the Audio button to exit the *Audio* mode. The Audio LED stops blinking.

- NOTE**
- Pressing the Enter or Preset button also exits Audio mode. Pressing the Preset button changes to Recall Preset mode.
 - There is one audio level setting per input. The audio level setting is shared by the left and right audio inputs.
 - The audio level settings are stored in non-volatile memory. When power is removed and restored, the audio level settings are retained.
 - Exiting Audio mode by pressing the Audio button always returns the I/O LEDs to Video and Audio lit (video and audio selected for configuration).

Input audio level adjustment displays

dB	Output LED								View Esc		dB
	1	2	3	4	5	6	7	8	▼	▲	
+24	○	○	○	○	○	○	○	○	●	○	+24
+23	○	○	○	○	○	○	○	○	●	○	+23
+22	○	○	○	○	○	○	○	⦿	●	○	+22
+21	○	○	○	○	○	○	○	●	●	○	+21
+20	○	○	○	○	○	○	○	●	●	○	+20
+19	○	○	○	○	○	○	⦿	●	●	○	+19
+18	○	○	○	○	○	○	●	●	●	○	+18
+17	○	○	○	○	○	⦿	●	●	●	○	+17
+16	○	○	○	○	○	⦿	●	●	●	○	+16
+15	○	○	○	○	○	●	●	●	●	○	+15
+14	○	○	○	○	⦿	●	●	●	●	○	+14
+13	○	○	○	○	⦿	●	●	●	●	○	+13
+12	○	○	○	○	●	●	●	●	●	○	+12
+11	○	○	○	⦿	●	●	●	●	●	○	+11
+10	○	○	○	⦿	●	●	●	●	●	○	+10
+9	○	○	○	●	●	●	●	●	●	○	+9
+8	○	○	⦿	●	●	●	●	●	●	○	+8
+7	○	○	⦿	●	●	●	●	●	●	○	+7
+6	○	○	●	●	●	●	●	●	●	○	+6
+5	○	⦿	●	●	●	●	●	●	●	○	+5
+4	○	⦿	●	●	●	●	●	●	●	○	+4
+3	○	●	●	●	●	●	●	●	●	○	+3
+2	⦿	●	●	●	●	●	●	●	●	○	+2
+1	⦿	●	●	●	●	●	●	●	●	○	+1
0	●	●	●	●	●	●	●	●	●	○	0
-1	⦿	●	●	●	●	●	●	●	○	●	-1
-2	⦿	●	●	●	●	●	●	●	○	●	-2
-3	○	●	●	●	●	●	●	●	○	●	-3
-4	○	⦿	●	●	●	●	●	●	○	●	-4
-5	○	⦿	●	●	●	●	●	●	○	●	-5
-6	○	○	●	●	●	●	●	●	○	●	-6
-7	○	○	⦿	●	●	●	●	●	○	●	-7
-8	○	○	⦿	●	●	●	●	●	○	●	-8
-9	○	○	○	●	●	●	●	●	○	●	-9
-10	○	○	○	⦿	●	●	●	●	○	●	-10
-11	○	○	○	⦿	●	●	●	●	○	●	-11
-12	○	○	○	○	●	●	●	●	○	●	-12
-13	○	○	○	○	⦿	●	●	●	○	●	-13
-14	○	○	○	○	⦿	●	●	●	○	●	-14
-15	○	○	○	○	○	●	●	●	○	●	-15
-16	○	○	○	○	○	⦿	●	●	○	●	-16
-17	○	○	○	○	○	⦿	●	●	○	●	-17
-18	○	○	○	○	○	○	●	●	○	●	-18

○ = on, ⦿ = blinking fast, ⦿ = blinking slowly, ● = off

Operation, cont'd

Example 10: Viewing and adjusting an input audio level

In the following example, an audio level is viewed and adjusted. The steps show the front panel indications that result from your action.

The output LEDs display the audio gain and attenuation by indicating 1 dB when blinking and 2 dB when lit. The Esc (▲) and View (▼) LEDs display the polarity (gain [+], or attenuation [-]).

1. Press and release the Esc button (figure 3-52).

Press the Esc button to clear all selections.

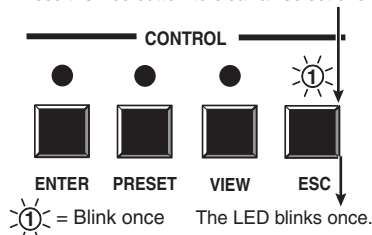


Figure 3-52 — Clear all selections

2. Press and **hold** the Audio button for approximately 2 seconds (figure 3-53).

Press and **hold** the Audio button.

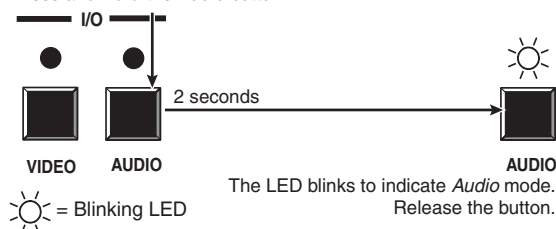


Figure 3-53 — Select Audio mode

3. Press and release the input 5 button (figure 3-54).

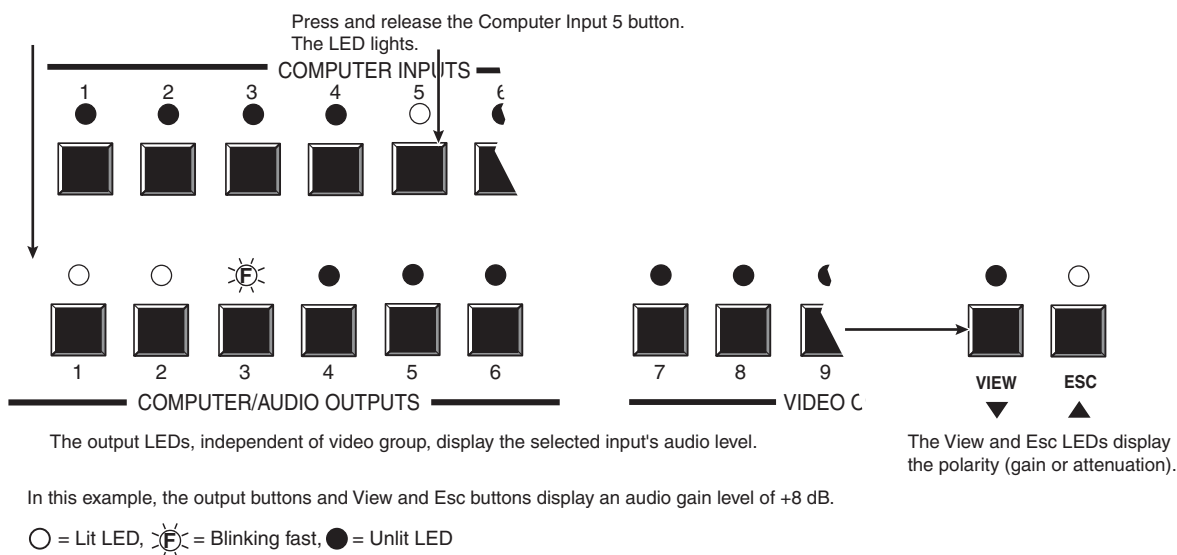


Figure 3-54 — Select an input

4. Press and release the View (▼) button once (figure 3-55) to decrease the input audio level by 1 dB.

Press and release the View (▼) button several more times (figure 3-55) to decrease the input audio level by 1 dB per push of the button. Note the output button indication changes that occur each time the View (▼) button is pressed.

Figure 3-55 shows the result of pressing the View (▼) button a total of 9 times. Note that the level is now displayed in red to indicate a negative level.

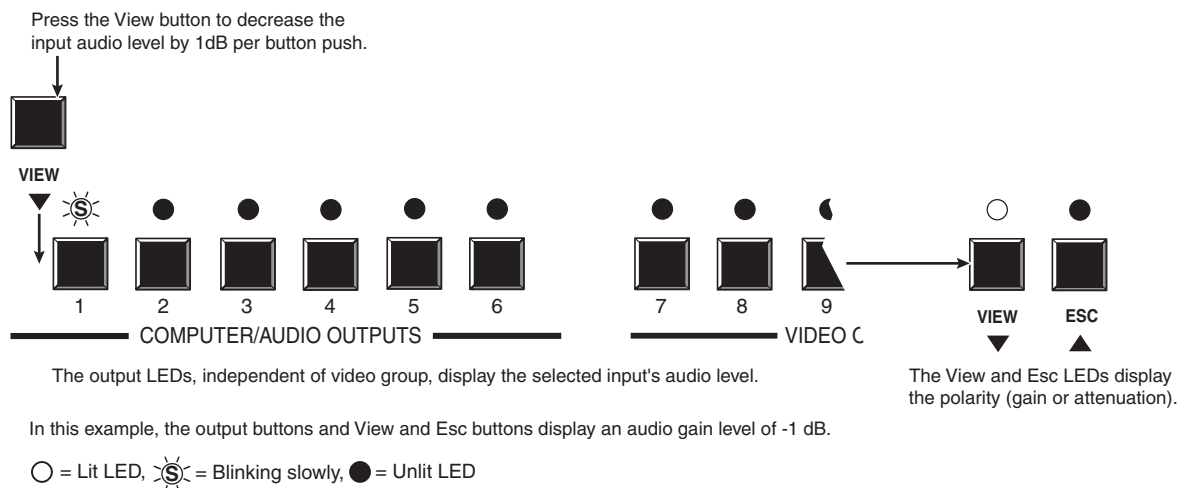


Figure 3-55 — Adjust the input audio level

5. Press and release the Audio button (figure 3-56).

Press the Audio button to exit audio mode.

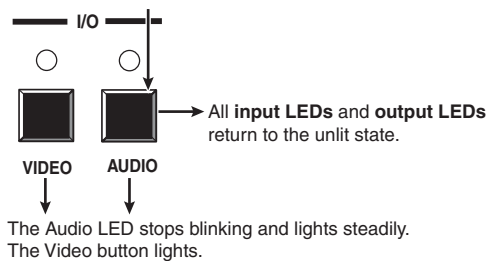


Figure 3-56 — Deselect Audio mode

Viewing and adjusting the output volume

The audio level of each output can be displayed and adjusted through a range of 100% (no attenuation) to 0% (maximum [98 dB] attenuation). The audio level can be adjusted from the front panel or under RS-232 or Ethernet control.

1. Press the Esc button to clear any input LEDs, output LEDs, or control LEDs that may be lit.
2. To enter *Audio* mode, press and **hold** the Audio button until the LED begins to blink, then release the button.
3. Press and release an output button to select an output. The input LEDs display the volume level for the selected output. The more buttons that are lit, the higher the volume. The fewer buttons that are lit, the lower the volume.

For a more detailed analysis of decoding the displayed value, see *Reading the displayed volume*, below.

4. Press and release the View (▼) and Esc (▲) buttons to increase and decrease the audio volume.
5. Press and release the Audio button to save the audio settings and exit the *Audio* mode. The Audio LED stops blinking.

- NOTE**
- *There is one audio volume level setting per output. The audio level setting is shared by the left and right audio inputs.*
 - *The audio volume levels are stored in non-volatile memory. When power is removed and restored, the audio level settings are retained.*
 - *Exiting Audio mode by pressing the Audio button always returns the I/O LEDs to the Video and Audio lit (video and audio selected for configuration).*
 - *Pressing the Enter or Preset button also exits Audio mode. Pressing the Preset button changes to Recall Preset mode.*

Reading the displayed volume

- NOTE** *This section is a detailed look at reading the displayed output volume display. If you do not need to read the exact value of the volume setting, skip this section.*

There are 65 steps of volume attenuation, with 1 dB per step (button push), except for 0-to-1, which is 35 dB. At maximum attenuation, no input LEDs are lit, 98 dB of attenuation is applied, and the audio output is effectively muted. At no attenuation, all input LEDs are lit and the output volume is equal to the input signal plus any gain or attenuation that is applied to that specific input using the input audio level adjustment. See *Viewing and adjusting the input audio level*. See the table on the next page to read the volume display for each display scheme.

The input LEDs light sequentially to indicate the approximate volume of the selected output. Volume is defined as a percentage of the input audio signal that is applied to the output. From 0% of volume, the first Esc (▲) button push applies 5.5% of the input audio signal and the Input 1 LED begins to blink slowly. From 5.5% on, each Esc (▲) push applies 1.5% more of the input audio signal to the output:

- **Push Esc (▲) button** — $5.5\% + 1.5\% = 7\%$ volume, indicated by the Input 1 LED continuing to blink slowly.
- **Push Esc (▲) button twice** — $7\% + 1.5\% + 1.5\% = 10\%$ volume, indicated by the Input 1 LED blinking fast.
- **Push Esc (▲) button nineteen times** — $10\% + (19 \cdot 1.5\%) = 38.5\%$ volume, indicated by the Input 1 through Input 4 LEDs lit steadily.

When all input LEDs are lit, the audio output is 100% of the audio input level.

Another way to think of the volume level is in terms of the attenuation applied to the output. Attenuation reduction is indicated by the lit or blinking input LEDs: when fewer input LEDs are lit, attenuation is greater (and the volume is decreased).

- At minimum volume, all input LEDs are unlit and 98 dB of attenuation is applied to the output. The audio output is effectively muted.
- The first step of volume increase causes the Input 1 button to blink slowly. Attenuation is reduced by 35 dB (63 dB of attenuation is applied to the output).
- The second step of volume increase reduces the attenuation by an additional 1 dB (62 dB of attenuation is applied to the output).
- Successive steps of volume increase cause consecutive LEDs to blink slowly, blink quickly, and then light steadily.
- At full volume, no attenuation is applied to the output and all input LEDs are lit steadily.

See the table at right to read the volume display.

Audio output volume settings

Output volume	dB of attenuation	Input LED											
		1	2	3	4	5	6	7	8	9	10	11	12
0%	98	●	●	●	●	●	●	●	●	●	●	●	●
5.5%	63	⦿	●	●	●	●	●	●	●	●	●	●	●
7%	62	⦿	●	●	●	●	●	●	●	●	●	●	●
8.5%	61	⦿	●	●	●	●	●	●	●	●	●	●	●
10%	60	⦿	●	●	●	●	●	●	●	●	●	●	●
11.5%	59	○	●	●	●	●	●	●	●	●	●	●	●
13%	58	○	⦿	●	●	●	●	●	●	●	●	●	●
14.5%	57	○	⦿	●	●	●	●	●	●	●	●	●	●
16%	56	○	⦿	●	●	●	●	●	●	●	●	●	●
17.5%	55	○	⦿	●	●	●	●	●	●	●	●	●	●
19%	54	○	○	●	●	●	●	●	●	●	●	●	●
20.5%	53	○	○	●	●	●	●	●	●	●	●	●	●
22%	52	○	○	⦿	●	●	●	●	●	●	●	●	●
23.5%	51	○	○	⦿	●	●	●	●	●	●	●	●	●
25%	50	○	○	⦿	●	●	●	●	●	●	●	●	●
26.5%	49	○	○	⦿	●	●	●	●	●	●	●	●	●
28%	48	○	○	○	●	●	●	●	●	●	●	●	●
29.5%	47	○	○	○	●	●	●	●	●	●	●	●	●
31%	46	○	○	○	⦿	●	●	●	●	●	●	●	●
32.5%	45	○	○	○	⦿	●	●	●	●	●	●	●	●
34%	44	○	○	○	⦿	●	●	●	●	●	●	●	●
35.5%	43	○	○	○	⦿	●	●	●	●	●	●	●	●
37%	42	○	○	○	○	●	●	●	●	●	●	●	●
38.5%	41	○	○	○	○	●	●	●	●	●	●	●	●
40%	40	○	○	○	○	⦿	●	●	●	●	●	●	●
41.5%	39	○	○	○	○	⦿	●	●	●	●	●	●	●
43%	38	○	○	○	○	⦿	●	●	●	●	●	●	●
44.5%	37	○	○	○	○	⦿	●	●	●	●	●	●	●
46%	36	○	○	○	○	○	●	●	●	●	●	●	●
47.5%	35	○	○	○	○	○	●	●	●	●	●	●	●
49%	34	○	○	○	○	○	⦿	●	●	●	●	●	●
50.5%	33	○	○	○	○	○	⦿	●	●	●	●	●	●
52%	32	○	○	○	○	○	⦿	●	●	●	●	●	●
53.5%	31	○	○	○	○	○	⦿	●	●	●	●	●	●
55%	30	○	○	○	○	○	○	●	●	●	●	●	●
56.5%	29	○	○	○	○	○	○	⦿	●	●	●	●	●
58%	28	○	○	○	○	○	○	⦿	●	●	●	●	●
59.5%	27	○	○	○	○	○	○	⦿	●	●	●	●	●
61%	26	○	○	○	○	○	○	⦿	●	●	●	●	●
62.5%	25	○	○	○	○	○	○	○	●	●	●	●	●
64%	24	○	○	○	○	○	○	○	⦿	●	●	●	●
65.5%	23	○	○	○	○	○	○	○	⦿	●	●	●	●
67%	22	○	○	○	○	○	○	○	⦿	●	●	●	●
68.5%	21	○	○	○	○	○	○	○	⦿	●	●	●	●
70%	20	○	○	○	○	○	○	○	○	●	●	●	●
71.5%	19	○	○	○	○	○	○	○	○	⦿	●	●	●
73%	18	○	○	○	○	○	○	○	○	⦿	●	●	●
74.5%	17	○	○	○	○	○	○	○	○	⦿	●	●	●
76%	16	○	○	○	○	○	○	○	○	⦿	●	●	●
77.5%	15	○	○	○	○	○	○	○	○	○	●	●	●
79%	14	○	○	○	○	○	○	○	○	○	⦿	●	●
80.5%	13	○	○	○	○	○	○	○	○	○	⦿	●	●
82%	12	○	○	○	○	○	○	○	○	○	⦿	●	●
83.5%	11	○	○	○	○	○	○	○	○	○	○	●	●
85%	10	○	○	○	○	○	○	○	○	○	○	●	●
86.5%	9	○	○	○	○	○	○	○	○	○	○	⦿	●
86%	8	○	○	○	○	○	○	○	○	○	○	⦿	●
89.5%	7	○	○	○	○	○	○	○	○	○	○	⦿	●
91%	6	○	○	○	○	○	○	○	○	○	○	⦿	●
92.5%	5	○	○	○	○	○	○	○	○	○	○	○	●
94%	4	○	○	○	○	○	○	○	○	○	○	○	⦿
95.5%	3	○	○	○	○	○	○	○	○	○	○	○	⦿
97%	2	○	○	○	○	○	○	○	○	○	○	○	⦿
98.5%	1	○	○	○	○	○	○	○	○	○	○	○	⦿
100%	0	○	○	○	○	○	○	○	○	○	○	○	○

○ = on, ⦿ = blinking fast, ⦿ = blinking slowly, ● = off

Operation, cont'd

Example 11: Viewing and adjusting an output volume level

In the following example, the audio output volume is viewed and adjusted. The steps show the front panel indications that result from your action. See the table on page 3-33 to read the displayed audio output volume.

1. Press and release the Esc button (figure 3-57).

Press the Esc button to clear all selections.

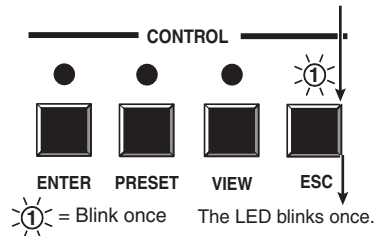


Figure 3-57 — Clear all selections

2. Press and **hold** the Audio button for approximately 2 seconds (figure 3-58).

Press and **hold** the Audio button.

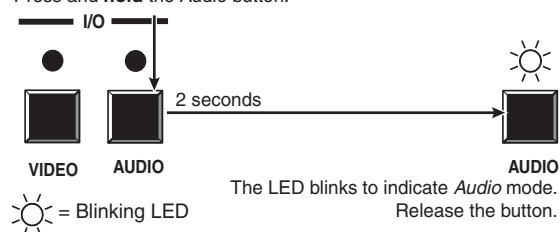


Figure 3-58 — Select Audio mode

3. Press and release the output 1 button (figure 3-59).

The input LEDs, independent of video group, display the selected output's audio volume level. In this example, the **lit** input buttons indicate 41.5 to 46.0 percent of the applied audio input. The **unlit** input buttons indicate an audio volume **attenuation** of 36 dB to 39 dB.

Press and release the Computer Output 1 button. The LED lights.

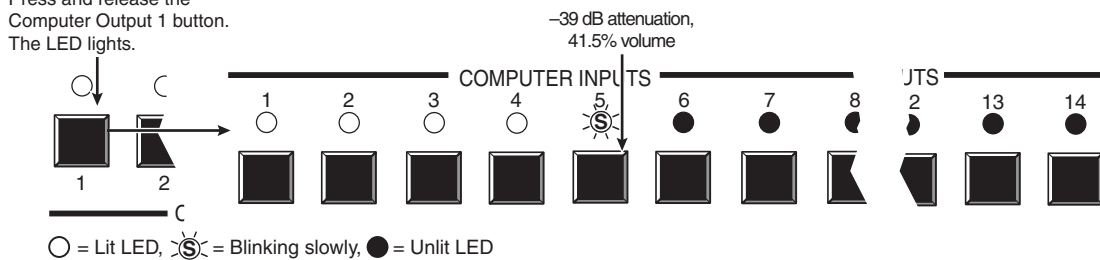


Figure 3-59 — Select output 1

4. Press and release the Esc (▲) button once (figure 3-60) to increase the volume by 1.5%.

Press and release the Esc (▲) button several more times (figure 3-60) to increase the volume by 1.5% per push of the button. Note the input LED indication changes that occur each time the Esc (▲) button is pressed and released.

NOTE You can press and **hold** the Esc (▲) or View (▼) button to ramp the level up or down by 3 dB per second to the high or low limit.

Figure 3-60 show the result of pressing the Esc (▲) button a total of 13 times.

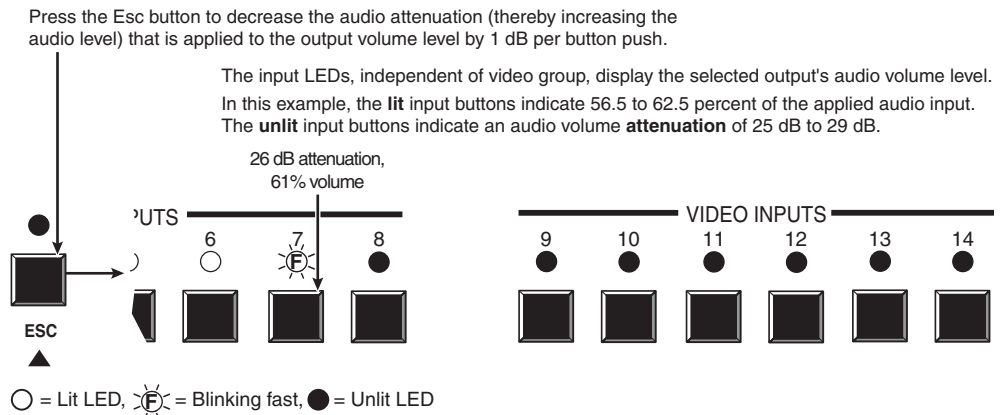


Figure 3-60 — Adjust the output audio volume

5. Press and release the Audio button (figure 3-61).

Press the Audio button to exit audio mode.

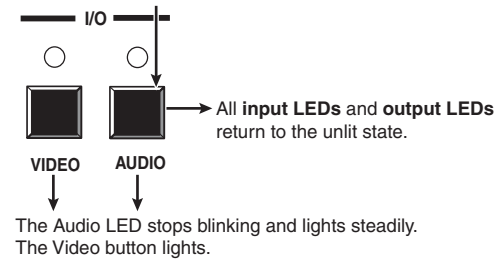


Figure 3-61 — Deselect Audio mode

Locking out the front panel (Executive mode)

The front panel security lockout limits the operation of the switcher system from the front panel controller. When the switcher is locked, all of the front panel functions are disabled except for the *View-Only* mode functions. See *Viewing a configuration* on page 3-17. Other than in *View-Only* mode, if the user pushes a front panel button when the switcher is locked, the Video and Audio LEDs flash twice and return to their previous state.

To toggle the lock on and off, press and hold the Video button and the Audio button for approximately two seconds (figure 3-62).

Press and **hold** the Video and Audio buttons simultaneously to toggle the front panel lock on or off.

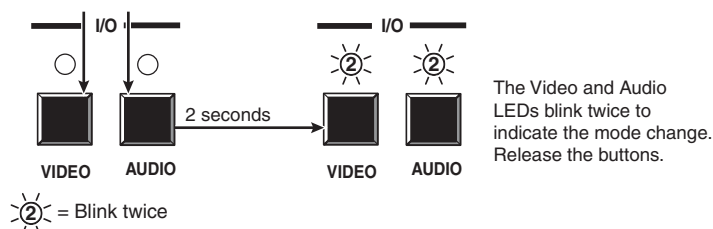


Figure 3-62 — Toggle front panel lock on or off

Performing a system reset from the front panel

The front panel reset is identical to the `[Esc]ZXXX← SIS` command (see chapter 4, *SIS Programming and Control*). A system reset:

- Clears all ties and presets
- Clears all video and audio mutes
- Sets all input audio levels to unity gain (+0 dB)
- Sets all output volume levels to 100% (0 dB of attenuation).

Reset the switcher to the factory default settings by pressing and **holding** the Video button and Audio button **while** you apply AC power to the switcher (figure 3-63).

NOTE System reset does not reset the Internet protocol (IP) settings or replace user-installed firmware.

Press and **hold** the Video and Audio buttons while you apply power to the switcher.

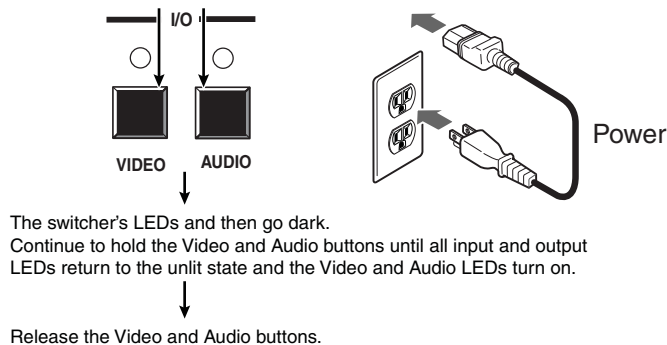


Figure 3-63 — System reset

Selecting the RS-232 Primary port's baud rate

The matrix switcher supports the RS-232 serial communication protocol on the front panel Configuration port and the rear panel RS-232 Primary and RS-232 Secondary ports. All three ports can operate at 9600, 19200, 38400, and 115200 baud rates. The baud rate for the primary port is variable can be viewed and changed from the front panel.

View and configure the switcher's serial communications settings as follows:

1. To enter *Serial Port Configuration* mode, simultaneously press and **hold all** Control buttons (Enter, Preset, View, and Esc) (figure 3-64).

Press and **hold** the Enter, Preset, View, and Esc buttons.

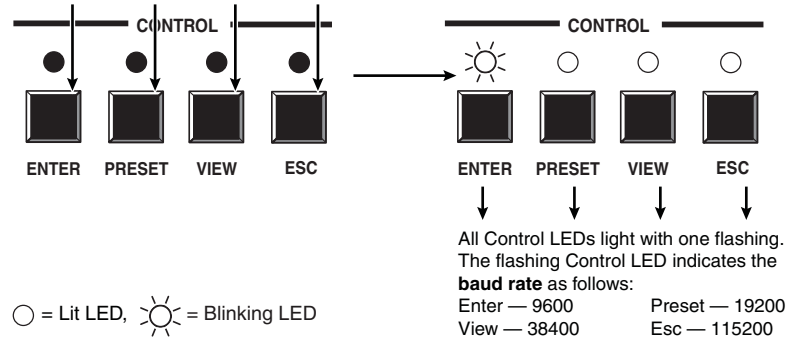


Figure 3-64 — Baud rate display

2. Release the Control buttons.
3. **To change a value**, press and release the button that relates to the desired value (figure 3-65).

Press and release the button to configure the baud rate as follows:

Enter — 9600 Preset — 19200
View — 38400 Esc — 115200

In this example, the port is set to 38400 baud.

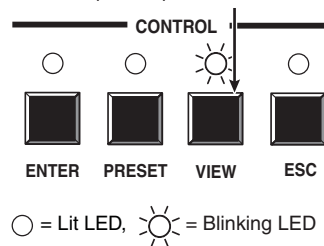


Figure 3-65 — Baud rate selection

Operation, cont'd

4. Press and release an input or output button to exit the *Serial Port Configuration* mode (figure 3-66).

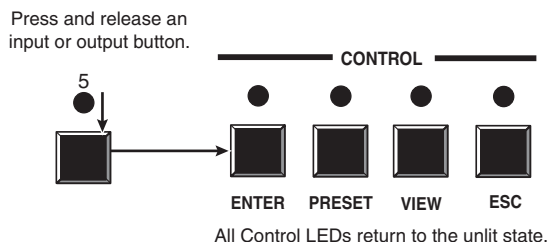


Figure 3-66 — Exit Serial Port Configuration mode

NOTE The switcher requires some time to save the new serial port settings. Wait at least 5 minutes before removing power from the switcher or the settings may be lost.

Rear Panel Controls

The rear panel has a Reset button that initiates four levels of matrix switcher resets. Press and hold the button while the switcher is running or while you apply power to the switcher for different reset levels.

Performing soft system resets

The MPX switcher has three soft resets available that restore various tiers of switcher settings to their default settings.

- **Events (mode 3) reset** — This function toggles the monitoring of events on or off (if events monitoring was on, this function turns it off; if it was off, it is turned on).
- **IP settings (mode 4) reset** — The IP settings reset performs the following functions:
 - Enables Arp program capability
 - Resets the IP address to the factory default (192.168.254.254)
 - Resets the subnet mask to the factory default (255.255.0.0)
 - Resets the gateway address to its factory default (0.0.0.0)
 - Resets port mapping to the factory default:
 - ☐ Rear RS-232 Primary port = primary (cannot be changed)
 - ☐ Rear RS-232 Secondary port = secondary
 - ☐ Front Configuration port = inactive
 - ☐ All ports = 9600 baud, 8 data bits, 1 stop bit, no parity

NOTE IP settings reset does not replace any user-installed firmware.

- **Absolute (mode 5) reset** — Absolute reset restores the switcher to the default factory conditions. This function is identical to the **[Esc]ZQQQ←** SIS command, see chapter 4, *SIS Programming and Control*).

Perform a soft reset of the switcher as follows:

1. Press and **hold** the Reset button until the front panel Video and Audio buttons blink once (events reset), twice (system reset), or three times (absolute reset) (figure 3-67).

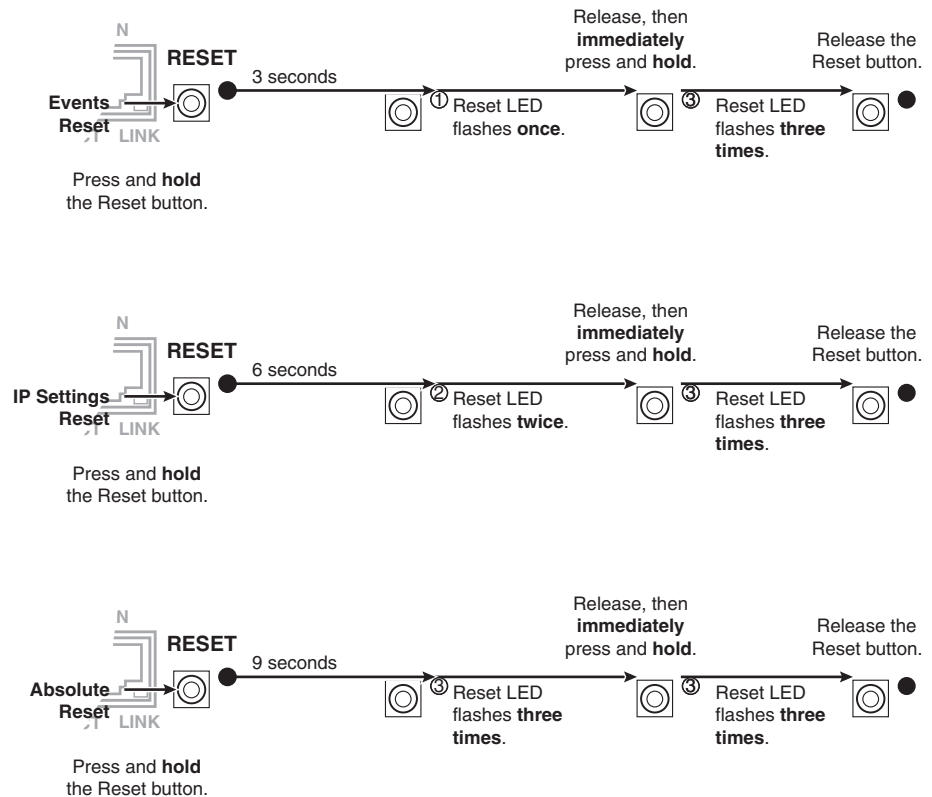


Figure 3-67 — Whole switcher and absolute resets

2. Release the Reset button and then immediately press and release the Reset button again. Nothing happens if the second momentary press does not occur within 1 second.

Performing a hard reset

The hard reset function restores the switcher to the base firmware that it shipped with. After a hard reset, events do not automatically start, but user settings and files are restored. Perform a hard reset as follows:

NOTE *The hard reset restores the factory-installed firmware. The switcher reverts to that factory firmware the next time power is cycled off and on unless a firmware update is performed before the power cycle.*

1. If necessary, turn off power to the switcher.
2. Press and **hold** the Reset button on the rear panel **while** you apply AC power to the switcher (figure 3-68).

Press and **hold** the Reset button while you apply power to the switcher.

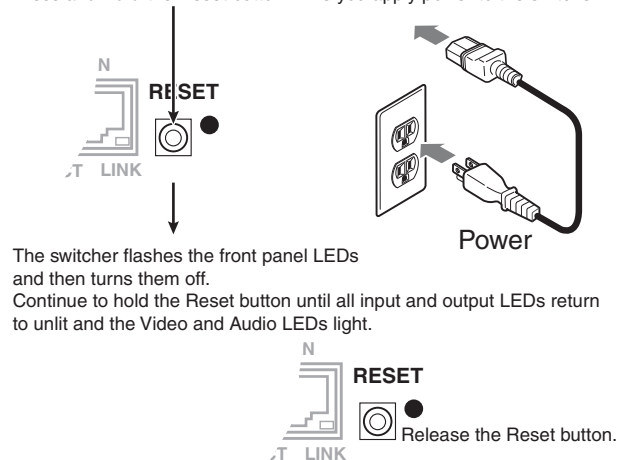


Figure 3-68 — Hard reset

Optimizing the Audio

Each individual input audio level can be adjusted within a range of -18 dB to +24 dB, so there are no noticeable volume differences between sources and for the best headroom and signal-to-noise ratio. Adjust the audio gain and attenuation as follows:

1. Connect audio sources to all desired inputs and connect the audio outputs to output devices such as audio players. See *Audio input and output*, in chapter 2, *Installation*. For best results, wire all of the inputs and the outputs balanced.
2. Power on the audio sources, the switcher, and the audio players.
3. Switch among the inputs (see *Creating ties*, in this chapter), listening to the audio with a critical ear or measuring the output audio level with test equipment, such as a VU meter.
4. As necessary, adjust the input audio level of each input (see *Viewing and adjusting the input audio level*, in this chapter) so that the approximate output level is the same for all selected inputs.
5. As necessary, adjust the output audio level of each input (see *Viewing and adjusting the output volume*, in this chapter).

Troubleshooting

This section gives recommendations on what to do if you have problems operating the switcher.

General checks

1. Ensure that all devices are plugged in and powered on. The switcher is receiving power if any of the front panel button indicators are lit.
2. Check to see if one or more outputs are muted.
3. Ensure an active input is selected for output on the switcher.
4. Ensure that the proper signal format is supplied.
5. Check the cabling and make corrections as necessary.
6. Call the Extron S³ Sales & Technical Support Hotline if necessary.

Operation, cont'd

Configuration Worksheets

Rather than trying to remember the configuration for each preset, use worksheets to record this information. Make copies of the blank worksheet on page 3-45 and use one for each preset configuration. Cross out all unused or inactive inputs and outputs. Use different colors for video and audio.

Worksheet example 1: System equipment

Figure 3-69 shows a worksheet in a fictional organization with the system hardware annotated. Input 3 and 7 and outputs 10 and 11 have no connections in this organization, so they have been crossed out on the worksheet.

Computer video group inputs include PCs, wall boxes and an Extron VTG 450. The low resolution video group inputs include cameras, a VCR, a DVD player, and an audio CD player. Computer video group output devices include monitors, projectors, a stereo, and a VCR for recording presentations. The low resolution video group includes low resolution monitors and audio tape,

The Extron VTG 450 video test generator connected to input 8 or to input 13 enables a video test pattern to be sent to one, several, or all output devices within the video group for problem isolation or adjustment purposes. An audio test tape or CD could be used in a similar manner to check out the audio components connected to the computer video/audio subgroup.

Computer video and/or audio subgroup input sources								Low resolution video and/or audio subgroup input sources					
PC 1 RGB 201	PC 2 RGB 201	~~X~~	ISS 408	Wallbox #1	Wallbox #2	~~X~~	VTG 450	Camera/ mic podium	Classrm VCR #1	Classrm DVD #1	Document camera	VTG 450	Audio CD
1	2	3	4	5	6	7	8	9	10	11	12	13	14

Computer video/audio subgroup output destinations						Low resolution video subgroup output destinations					
1	2	3	4	5	6	7	8	9	10	11	12
Main hall PJ #1	Main hall PJ #3	Lobby sound	Conf. room	Sound system #1	VCR (USP 405)	Main hall PJ#2	Conf. room monitor	Classrm #2 monitor	~~X~~	~~X~~	VCR

Preset # _____ Title: _____ Video: _____ Audio: _____
Fill in the preset number and use colors, or dashes, etc. to make connecting lines.
Indicate if the configuration is for video, audio, or both.

Figure 3-69 — Worksheet example 1: System equipment

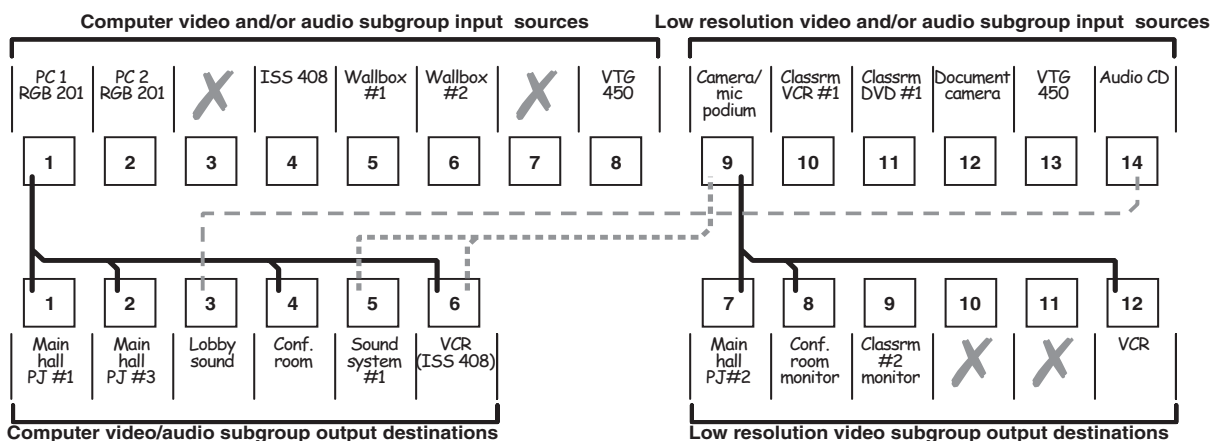
Worksheet example 2: Daily configuration

Figure 3-70 continues from worksheet example 1 by showing the video and audio ties that make up the configuration of preset 1. A solid ink line shows video ties and a dashed pencil line shows the audio ties.

NOTE Large size matrix sizes can become very complex. Extron suggests using various colors of ink and/or pencil and careful routing of drawn lines for ease of tracking connection lines.

In this example:

- The image of the presenter, from the main podium camera (low resolution video input 9), is:
 - Displayed in the main hall (low resolution output 7)
 - Displayed to the overflow crowd in the conference room (low resolution output 8)
 - Tied to the VCR (low resolution output 12) for recording
- The presenter has a presentation on her laptop computer (computer video input 1) that is displayed:
 - Displayed in the main hall (computer video outputs 1 and 2)
 - Displayed to the overflow crowd in the conference room (computer video output 4)
 - Tied, through a scaler, to a VCR (computer video output 6) for recording
- The audio from her microphone (input 9) is:
 - Played in the hall (output 5)
 - Sent to the VCR (output 6)
- Classical music from the CD player (input 14) is played in the lobby (output 3)



Preset # 1 Title: Sales pitch Video: ===== Audio: =====
 Fill in the preset number and use colors, or dashes, etc. to make connecting lines.
 Indicate if the configuration is for video, audio, or both.

Figure 3-70 — Worksheet example 2: Daily configuration

Operation, cont'd

Worksheet example 3: Test configuration

The A/V system in our fictional organization needs to be fine tuned on a regular basis. Figure 3-71 shows a typical test configuration, with an Extron video test generator (inputs 8 and 13) connected to each video group. Each VTG generates a test pattern of the appropriate resolution to all connected outputs. Sound checks are run from the CD player (input 14) to both output devices that accept audio, with the exception of the VCRs (outputs 3 and 4) regardless of video group.

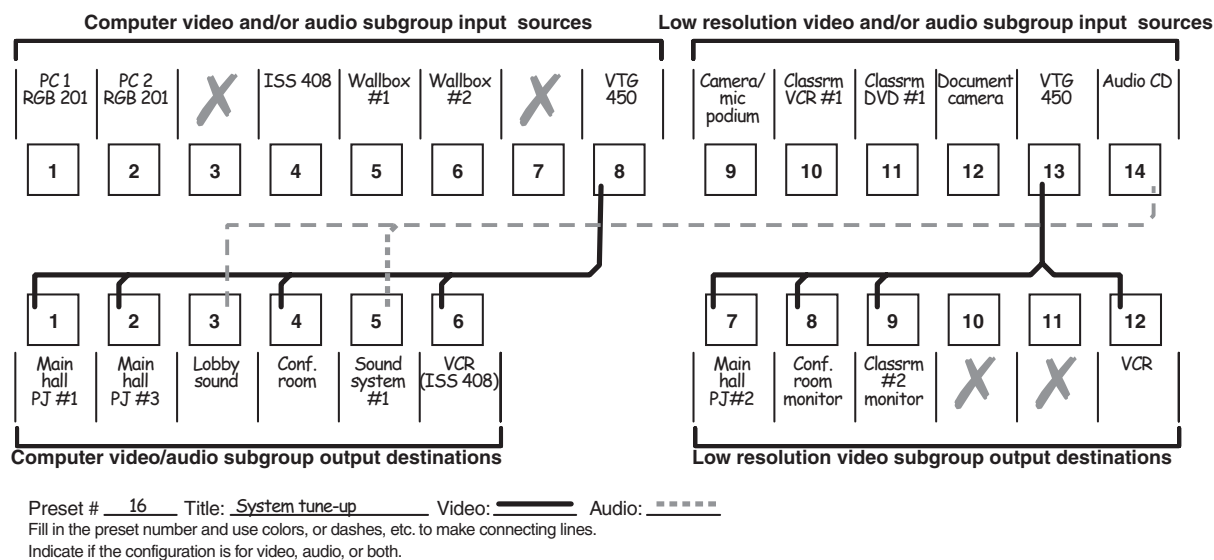


Figure 3-71 — Worksheet example 3: Test configuration

Preset # _____ Title: _____ Video: _____ Audio: _____

Fill in the preset number and use colors, or dashes, etc. to make connecting lines.

Indicate if the configuration is for video, audio, or both.

Blank configuration worksheet

Operation, cont'd



MPX 866 A Media Presentation Matrix Switcher

Chapter Four

SIS Programming and Control

RS-232 Links

Ethernet Link

Host-to-Switcher Instructions

Switcher-Initiated Messages

Switcher Error Responses

Using the Command/Response Tables

Special Characters

SIS™ Programming and Control

RS-232 Links

The switcher has three serial ports that can be connected to a host device such as a computer running the HyperTerminal utility, an RS-232 capable PDA, or a control system. These ports make serial control of the switcher possible. The serial ports are:

- Two (Primary and Secondary) rear panel RS-232 ports on 3-pin captive screw connectors
- The front panel Configuration (RS-232) port, a 2.5 mm mini stereo jack

The default protocol for all ports is as follows:

- 9600 baud
- no parity
- 8-bit
- 1 stop bit
- no flow control

The RS-232 ports can be configured to operate at the 9600, 19200, 38400, or 115200 baud rate.

NOTE *These three ports are hardwired for RS-232 only.*

The rear panel RS-232 Secondary port is active only if the front panel Configuration port is not in use. If a front panel configuration connection is made, the rear panel RS-232 Secondary port becomes inactive and the front panel Configuration port is active.

NOTE *The switcher can operate at 9600, 19200, 38400, or 115200 baud rates, but Extron recommends leaving these ports at 9600 baud only. See Selecting the RS-232 Primary port's baud rate in chapter 3, Operation, to configure the RS-232 Primary port from the front panel. See the Set serial port parameters command on page 4-18 to configure all of the ports using an SIS command.*

Rear panel Remote ports

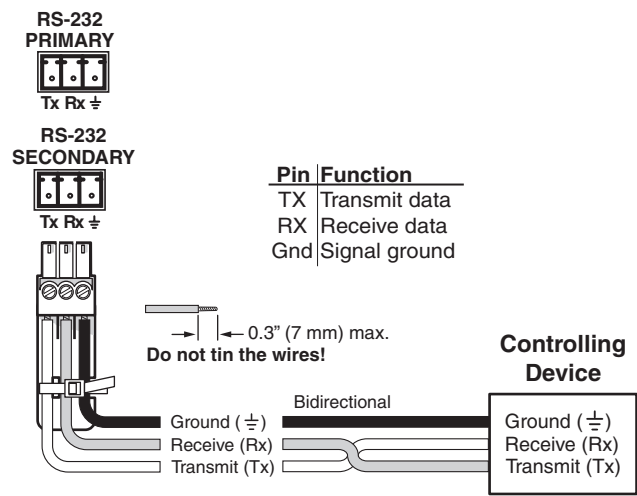


Figure 4-1 — Remote connector pin assignments

Front panel Configuration port

NOTE This port parallels the rear panel RS-232 Secondary port. If a front panel configuration connection is made, the rear panel RS-232 Secondary port becomes inactive and the front panel Configuration port is active.

The optional 9-pin D to 2.5 mm mini jack TRS RS-232 cable, part #70-335-01 (figure 4-2) can be used for connection to the Configuration port.

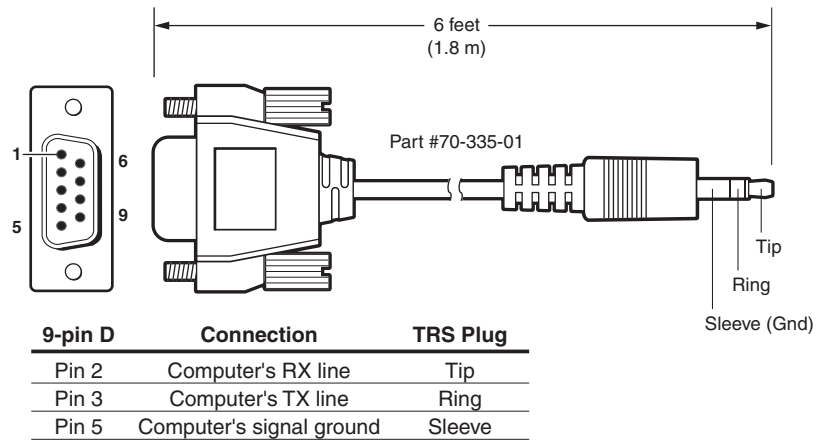


Figure 4-2 — Optional 9-pin TRS RS-232 cable

Ethernet Link

The rear panel LAN connector on the switcher can be connected to an Ethernet LAN or WAN. This connection makes SIS control of the switcher possible using a computer connected to the same LAN or WAN.

Ethernet connection

The Ethernet cable can be terminated as a straight-through cable or a crossover cable and must be properly terminated for your application (figure 4-3).

- **Crossover cable** — Direct connection between the computer and the MPX switcher.
- **Patch (straight) cable** — Connection of the MPX switcher to an Ethernet LAN.

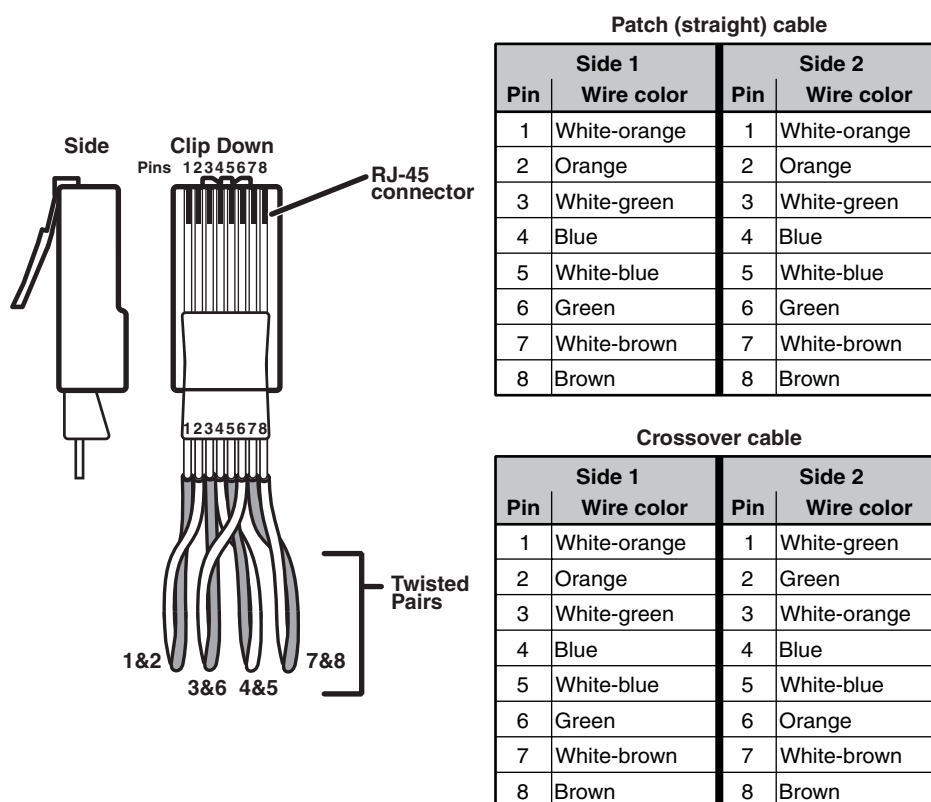


Figure 4-3 — RJ-45 Ethernet connector pin assignments

Default IP addresses

To access the via the Ethernet port, you will need the Extron IP address, and may need the subnet mask and the gateway address. If the IP address has been changed to an address comprised of words and characters, the actual numeric IP address can be determined using the ping (ICMP) utility (see appendix A, *Ethernet Connection*, for more details). If the addresses have not been changed, the factory-specified defaults are:

- IP address 192.168.254.254
- Subnet mask 255.255.0.0
- Gateway address 0.0.0.0

Host-to-Switcher Instructions

The switcher accepts SIS commands through the RS-232 ports and Ethernet port. SIS commands consist of one or more characters per command field. They do not require any special characters to begin or end the command character sequence. Each switcher response to an SIS command ends with a carriage return and a line feed (CR/LF = **↵**), which signals the end of the response character string. A string is one or more characters.

Switcher-Initiated Messages

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

(C) Copyright 2006, Extron Electronics, MPX 866 A, Vx.xx, 60-825-01, date/time↵

The switcher initiates the copyright message when it is first powered on or when connection via Internet protocol (IP) is established. "Vx.xx" is the firmware version number. "nn-nnn-nn" is the switcher's part number. "date/time" is the date and time of the connection and is only reported when the connection is made via the IP port.

↵Password:

The switcher initiates the password message immediately after the copyright message when the controlling system is connected using TCP/IP or Telnet and the switcher is password protected. This message means that the switcher requires an administrator or user level password before it will perform the commands entered via this link. The switcher repeats the password message response for every entry other than a valid password until a valid password is entered.

↵Login Administrator↵

↵Login User↵

The switcher initiates the login message when a correct administrator or user password has been entered. If the user and administrator passwords are the same, the switcher defaults to administrator privileges.

Qik↵

The switcher initiates the Qik message when a front panel switching operation has occurred.

Sprnn↵

The switcher initiates the Spr message when a memory preset has been saved from the front panel. "nn" is the preset number.

Rprnn↵

The switcher initiates the Rpr message when a memory preset has been recalled from the front panel. "nn" is the preset number.

Innn•Audxx↵

The switcher initiates the Aud message when a front panel input audio level change has occurred. "nn" is the input number, • is a space, and "xx" is the dB level.

Outnn•Volxx↵

The switcher initiates the Vol message when a front panel output audio volume change has occurred. "nn" is the output number, • is a space, and "xx" is the volume level.

SIS™ Programming and Control, cont'd

Typnn•x

The switcher initiates the Typ message when the video format for a video input is changed from the front panel. "nn" is the input number, • is a space, and "x" is the format: 1 = composite video, 0 = S-video.

Vmtnn•x

The switcher initiates the Vmt message when a video output mute is toggled on or off from the front panel. "nn" is the output number, • is a space, and "x" is the mute status: 1 = on, 0 = off.

Amtnn•x

The switcher initiates the Amt message when an audio output mute is toggled on or off from the front panel. "nn" is the output number, • is a space, and "x" is the mute status: 1 = on, 0 = off.

Exen

The switcher initiates the Exe message when executive mode is toggled on or off from the front panel. "n" is the executive mode status: 1 = on, 0 = off.

Switcher Error Responses

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

- E01 — Invalid input channel number (too large)
- E10 — Invalid command
- E11 — Invalid preset number
- E12 — Invalid output number (too large)
- E13 — Invalid value (out of range)
- E14 — Illegal command for this configuration
- E17 — Timeout (caused only by direct write of global presets)
- E24 — Privilege violation (Ethernet, Extron software only)

Using the Command/Response Tables

The command/response tables begin on page 4-8. Lower case letters are acceptable in the command field except where indicated for the gain and attenuation commands. The table below shows the hexadecimal equivalent of each ASCII character used in the command/response table.

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

Symbols are used throughout the table to represent variables in the command/response fields. Command and response examples are shown throughout the table.

Symbol definitions

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

← = Carriage return (no line feed, hex 0D)

• = Space character

Esc = Escape key (hex 1B)

X1 = Input number

01 – 08 for the computer video group

09 - 14 for the low resolution video group

NOTE *A video input from either of the two groups cannot be tied to an output in the other group.
Audio can be tied to any output, regardless of the video group to which it was input.*

X2 = Input number (for tie)

00 or 01 – 08 for the computer video group (00 = untied)

00 or 09 – 14 for the low resolution video group (00 = untied)

X3 = Output number

01 – 12 for video

01 - 06 for audio

X4 = Input signal format

1 = composite video

2 = S-video

X5 = Numeric dB value

–18 to +24 (45 steps of gain or attenuation)

X6 = Audio gain

0 – 24 (1 dB/step)

X7 = Audio attenuation

1 – 18 (1 dB/step)

X8 = Volume adjustment range

0 – 64 (1 dB/step except for 0-to-1, which is 34.5 dB)
(see the table on page 4-11)

X9 = Mute, executive mode, power supply

(0 = off/not OK, 1 = on/OK)

X10 = Global preset #

32 maximum (0 = current configuration)

X11 = Video/audio mute:

0 = no mutes

1 = video mute

2 = audio mute

3 = video and audio mute

X12 = Signal detection

0 = no input detected, 1 = input detected)

X13 = Firmware version number to second decimal place (x.xx)

X14 = Verbose firmware version-description-upload date/time. See page 4-15.

X15 = Name (for global presets, inputs, and outputs)

12 characters maximum

Upper- and lower-case alphanumeric characters and
_ : = / and space are valid.

NOTE *The following characters are invalid in the name: ~ , @ ' [] { } < > ' " ; | \ and ?.*

X16 = Voltage

Positive or negative voltage and magnitude

X17 = Temperature

Degrees Fahrenheit

SIS™ Programming and Control, cont'd

Command/response table for SIS commands

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
Create ties			
NOTE • Video ties cannot be made between the computer video group and the low resolution video group. • Audio ties can only be made to the computer/audio output subgroup (outputs 1 through 6). • Video and audio ties between the low resolution video input subgroup and the low resolution video outputs subgroup are <i>always</i> made with the audio broken away. In such an operation, the switcher automatically ties the audio to an output in the computer/audio outputs subgroup (outputs 1 through 6) as follows: ○ If the video is tied to output 7, the audio is tied to output 1. ○ If the video is tied to output 8, the audio is tied to output 2. ○ If the video is tied to output 9, the audio is tied to output 3. ○ If the video is tied to output 10, the audio is tied to output 4. ○ If the video is tied to output 11, the audio is tied to output 5. ○ If the video is tied to output 12, the audio is tied to output 6. • Commands can be entered back-to-back in a string, with no spaces. For example: 1*1!02*2&02*04%4*6\$. • The quick multiple tie and tie input to all output commands activate all I/O switches simultaneously. • The matrix switchers support 1-, 2-, and 3-digit numeric entries (1*1, 02*02, or 003*003).			
Tie input X2 to output X3 , video (V) and audio (A)	X2 * X3 !	Out X3 •In X2 •All← or Qik←	Tie input X2 's video and audio to output X3 .
NOTE The response is OutX3•InX2•All← when the video and audio ties are made between the computer video input group and the computer/audio output group, because audio always follows the video. The response is Qik← when video and audio ties are made between the low resolution video input group and the low resolution video output group, because audio is automatically broken away to the computer/audio group.			
Example: (computer video group tie)	1*3!	Out03•In01•All←	Tie input 1 video and audio to output 3.
Example: (low resolution video group tie)	9*9!	Qik←	Tie input 9 video to output 9. The switcher automatically breaks the audio away to output 3.
Tie input X2 to output X3 , computer video only	X2 * X3 &	Out X3 •In X2 •RGB←	Video breakaway.
Example (see Note below):	5*4&	Out04•In05•RGB←	Tie input 5 RGB to output 4.
Tie input X2 to output X3 , video only	X2 * X3 %	Out X3 •In X2 •Vid←	Video breakaway.
Example (see Note below):	9*7%	Out07•In09•Vid←	Tie input 9 video to output 7.
NOTE The & tie command for RGB and the % tie command for video can be used interchangeably on the matrix switcher for ties within the same group.			
Tie input X2 to output X3 , audio only	X2 * X3 \$	Out X3 •In X2 •Aud←	Audio breakaway.
NOTE Audio-only ties can only be made to outputs in the computer/audio output subgroup (outputs 1 through 6). The switcher responds with an E13 error if you try to make an audio-only tie to outputs 7 through 12.			
Example:	12*4\$	Out04•In12•Aud←	Tie input 12 audio to output 4.
Quick multiple tie	Esc +Q X2 * X3 !... X2 * X3 \$←	Qik←	
NOTE All video and audio group rules apply to the quick multiple tie command.			
Example:	Esc +Q3*4!11*12%13*6\$←	Qik←	Tie input 3 video and audio to output 4, tie input 11 video to output 12, and tie input 13 audio to output 6.

Command/response table for SIS commands (continued)

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
Create ties, continued			
Tie input to all outputs, V & A	[X2]*!	In [X2] •All↵	
NOTE All video and audio group rules apply to the tie input to all output command. Example:	5*!	In05•All↵	Tie input 5 video and audio to all Computer video/Audio group outputs only .
Example:	12*!	In12•All↵	Tie input 12 video to all low resolution video group outputs only . Tie input 12 audio to all Computer video/Audio group outputs only .
Tie input to all outputs, RGBHV only	[X2]*&	In [X2] •RGB↵	Video breakaway.
Example (see Note below):	8*&	In08•RGB↵	Tie input 8 video to all computer video group outputs.
Tie input to all outputs, video only	[X2]*%	In [X2] •Vid↵	Video breakaway.
Example (see Note below):	10*%	In10•Vid↵	Tie input 10 video to all low resolution video group outputs.
NOTE The & tie all command for RGB and the % tie all command for video can be used interchangeably on the switcher for ties within the same group.			
Tie input to all outputs, audio only	[X2]*\$	In [X2] •Aud↵	Audio breakaway.
Read ties			
Read RGB output tie	[X3]&	[X2] ↵	RGBHV input [X2] tied to output [X3] .
Read video output tie	[X3]%	[X2] ↵	Video input [X2] tied to output [X3] .
NOTE The & read tie command for RGB and the % read tie command for video can be used interchangeably on the switcher.			
Read audio output tie	[X3]\$	[X2] ↵	Audio input [X2] tied to output [X3] .
Set input format			
Set input video format	[X1]*[X4]\	Typ [X1] * [X4] ↵	Set the video format to [X4] for input [X1] . 1 = composite video 2 = S-video
NOTE The only valid input ([X1]) numbers are 11 through 14. Example:	11*1\ 11*1\	Typ11*1↵	Set input 11 to composite video.
Read input format	[X1]\	[X4] ↵	Show the video format of input [X1] .
Input signal active			
List input signal status for all inputs	0LS	[X12]¹, [X12]², [X12]³, ... , [X12]¹⁶↵	Each [X12] value is an input.

SIS™ Programming and Control, cont'd

Command/response table for SIS commands (continued)

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
Video mute			
Video mute	[X3]*1B	Vmt[X3]*1↵	Mute video, output [X3] (video off).
Video unmute	[X3]*0B	Vmt[X3]*0↵	Unmute video, output [X3] (video on).
Read video mute	[X3]B	[X9]↵	1 = mute on, 0 = mute off.
Global video mute	1*B	Vmt1↵	Mute all video outputs.
Global video unmute	0*B	Vmt0↵	Unmute all video outputs.
Audio input gain and attenuation			
NOTE The set gain (G) and attenuation (g) commands are case sensitive.			
Set input audio gain to + dB value Example:	[X1]*[X6]G 1*2G	In[X1]•Aud[X5]↵ In01•Aud+02↵	Set input 1 audio gain to +2 dB.
Set input audio attenuation to - dB value	[X1]*[X7]g	In[X1]•Aud[X5]↵	
Increment level Example:	[X1]+G 6+G	In[X1]•Aud[X5]↵ In06•Aud+03↵	Increase audio level by 1 dB. Increment audio input 6 level from +2 dB to +3 dB.
Decrement level Example:	[X1]-G 7-G	In[X1]•Aud[X5]↵ In07•Aud-09↵	Decrease audio level by 1 dB. Decrement audio input 7 level from -08 dB to -9 dB.
Read input gain	[X1]G	[X5]↵	
Audio output volume			
NOTE The table on the next page defines the value of each audio volume step.			
Set audio volume to a specific value Example:	[X3]*[X8]V 1*50v	Out[X3]•Vol[X8]↵ Out01•Vol50↵	Set output 1 volume to 79%.
Increment value Example:	[X3]+V 1+V	Out[X3]•Vol[X8]↵ Out01•Vol51↵	Increase volume by 0.5 dB. Increment audio volume 0.5 dB, from 79% to 80.5%.
Decrement volume	[X3]-V	Out[X3]•Vol[X8]↵	Decrease volume by 0.5 dB.
Read output volume	[X3]V	[X8]↵	
Audio mute			
Audio mute	[X3]*1Z	Amt[X3]*1↵	Mute audio output [X3] (audio off).
Audio unmute	[X3]*0Z	Amt[X3]*0↵	Unmute audio output [X3] (audio on).
Read audio mute	[X3]Z	[X9]↵	1 = mute on, 0 = mute off.
Global audio mute	1*Z	Amt1↵	Mute all audio outputs.
Global audio unmute	0*Z	Amt0↵	Unmute all audio outputs.

Audio output volume settings table

X8 value	dB of attenuation	Output volume	X8 value	dB of attenuation	Output volume	X8 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%			

SIS™ Programming and Control, cont'd

Command/response table for SIS commands (continued)

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
Save, directly write, name, and recall global presets			
NOTE • If the user tries to recall a preset that is not saved, the matrix switcher responds with the error code E11. • The following characters are invalid in preset names: + ~ , @ = ' [] { } < > ' " ; : \ and ?.			
Save current the current configuration as a global preset	[X10],	Spr[X10]↵	Command character is a comma.
Example:	9,	Spr09↵	Save current ties as preset 9.
Direct write process —			
NOTE The direct write of a global preset command should always be preceded by a clear global preset command of that same preset number, as shown below. In a directly-written preset, each output position's tied input (or no tied output) remains unchanged unless overwritten or cleared. If you do not clear a global preset number before you directly write a global preset to that number, ties that are part of the previous version of the specified preset can unexpectedly become part of the newly-created preset.			
Clear a global preset	[Esc]+[X10]P0*!↵	Spr[X10]↵	Clear all ties in preset [X10].
Directly write a global preset	[Esc]+[X10]P[X2]*[X3][X2]*[X3]%[X2]*[X3]\$... [X2]*[X3]&↵	Spr[X10]↵	Enter as many ties as are valid for this model. The tie all (!), tie RGBHV (&), tie video (%), and tie audio (\$) commands are all valid.
Example:	[Esc]+27P0*!↵ [Esc]+27P2*5!10*2\$13*11%3*6&↵	Spr27↵ Spr27↵	<u>Brackets are shown to separate ties for clarity only.</u> Create global preset 27, which ties video and audio input 2 to output 5, audio input 10 to output 2, video input 13 to output 11, and video input 3 to output 6.
Recall a global preset	[X10].	Rpr[X10]↵	Command character is a period.
Example:	5.	Rpr[X10]↵	Recall preset 5, which becomes the current configuration.
Write global preset name	[Esc][X10][X15]NG↵	Nmg[X10][X15]↵	Name global preset 1 "Security 1".
Example:	[Esc]1,Security 1NG↵	Nmg01,Security 1↵	
Read global preset name	[Esc][X10]NG↵	[X15]↵	
Example:	[Esc]2NG↵	Security 2↵	
Front panel security lockout (Executive mode)			
Lock front panel	1X	Exe1↵	Enable Executive mode.
Unlock front panel	0X	Exe0↵	Disable Executive mode.
View front panel lock	X	[X9]↵	

Command/response table for SIS commands (continued)

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
Resets			
Reset global presets and names	Esc ZG ←	Zpg ←	Clear all global presets and their names.
Reset and individual global preset	Esc X10ZG ←	ZpgX10 ←	Clear global preset X10.
Reset audio input levels	Esc ZA ←	Zpa ←	Reset all audio input levels (gain and attenuation) to 0 dB.
Reset audio output levels	Esc ZV ←	Zpv ←	Reset all audio output levels (volume) to 100% (no attenuation).
Reset all mutes	Esc ZZ ←	Zpz ←	Reset all video and audio mute.
Reset flash	Esc ZFFF ←	Zpf ←	Reset flash memory (erase user-supplied files).
Reset whole switcher	Esc ZXXX ←	Zpx ←	Clear all ties and presets, resets all audio gains to 0 dB, and resets the volume to 100%.
Absolute reset	Esc ZQQQ ←	Zpq ←	Similar to Reset whole switcher , plus sets the IP address to 192.168.254.254 and the subnet mask to 255.255.0.0.
View ties, gain, volume, mutes, video format, and presets			
View RGBHV output tie <i>Example:</i>	X3& 5&	X2 ← 07 ←	Input 7 computer video tied to output 5.
View video output tie <i>Example:</i>	X3% 7%	X2 ← 12 ←	Input 12 low resolution video tied to output 7.
View audio output tie <i>Example:</i>	X3\$ 3\$	X2 ← 06 ←	Input 6 audio tied to output 3.
View input gain <i>Example:</i>	X2G 4G	X5 ← -02 ←	Gain for input 4 is -2 dB.
View output volume <i>Example:</i>	X2V 7V	X8 ← 55 ←	Volume for output 7 is attenuated by 9 dB (86.5%).
View output mutes <i>Example:</i>	Esc VM ← Esc VM ←	X11 ¹ X11 ² X11 ³ ... X11 ¹² ← 023010000000 ←	Each X11 response is the mute status of an output, starting from output 1. Output 2 audio is muted, output 3 video and audio are muted, and output 5 video is muted. All other outputs are unmuted.
Read input video format	X1\	X4 ←	Show the video format of input X1.
NOTE The only valid input (X1) numbers are 11 through 14.			

SIS™ Programming and Control, cont'd

Command/response table for SIS commands (continued)

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
View ties, gain, volume, mutes, and presets (continued)			
View video global preset configuration	[Esc] [X10] *1*1VC ←	[X2] • [X2] • [X2] • ... • [X2] ¹⁶ •Vid ←	Show preset [X10]'s video configuration. Show the video input tied to 12 sequential outputs, starting from output 1. (Video outputs 13 through 16 are not present on this switcher model.) <i>Command description:</i> Preset# * starting output# (StO# [should be "1" for this switcher]) * 1(=video) VC <i>Response description:</i> Input# (I#) tied to StO#•I# tied to StO#+1•StO#+2•StO#+3• ... •StO#+15•Vid ← <i>Example:</i> [Esc]4*1*1VC ← Input 4 tied to output 3 No tied input Response = tied input: 08•08•04•08•08•00•09•00•10•10•10•10•...•...•...•Vid ← Output: 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 Computer/Audio Group Video Group Outputs not present Each position shown in the response is an output: left = starting, right = output 12 (outputs 13 through 16 are not present on this switcher model). The number in each position is the input tied to that output. Video — Input 8 is tied to outputs 1, 2, 4, and 5; input 4 to output 3; input 9 to output 7; and input 10 to outputs 10 through 12. No input is tied to outputs 6 and 8. NOTE If you enter [Esc][X10]*1*1VC ← where [X10] = 0, the switcher returns its current video configuration.
View audio global preset configuration	[Esc] [X10] *1*2VC ←	[X2] • [X2] • [X2] • ... • [X2] ¹⁶ •Aud ←	Show preset [X10]'s audio configuration. Show the audio input tied to 6 sequential outputs, starting from output 1. (Audio outputs 7 through 16 are not present on this switcher model.) <i>Command description:</i> Preset# * starting output# (StO# [should be "1" for this switcher]) * 2(=audio) VC <i>Response description:</i> Input# (I#) tied to StO#•I# tied to StO#+1•StO#+2•StO#+3• ... •StO#+15•Aud ← <i>Example:</i> [Esc]4*1*2VC ← Input 6 tied to output 3 Input 12 tied to output 6 Response = tied input: 02•04•06•08•10•12•...•...•...•Aud ← Output: 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 Computer/Audio Group Outputs not present Each position shown in the response is an output: left = starting, right = output 6 (outputs 7 through 16 are not present on this switcher model). The number in each position is the input tied to that output. Audio — Input 2 is tied to output 1, input 4 is tied to output 2, input 6 is tied to output 3, input 8 is tied to output 4, input 10 is tied to output 5, and input 12 is tied to output 6. NOTE If you enter [Esc][X10]*1*2VC ← where [X10] = 0, the switcher returns its current audio configuration.

Command/response table for SIS commands (continued)

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
View ties, gain, volume, mutes, and presets (continued)			
NOTE The response to the View file directory command differs, depending on whether the command is sent via an RS-232 or Telnet connection or sent via a Web browser connection.			
View file directory RS-232 and Telnet	[Esc] DF←	filename1,date/time,length← filename2,date/time,length← filename3,date/time,length← . . . filenamen,date/time,length← space_remaining Bytes•Left←	List user-supplied files.
View file directory Web browser	[Esc] DF←	Var file = new array (); File [1] = 'filename1,date1,filesize1', File [2] = 'filename2,date3,filesize2', File [3] = 'filename3,date3,filesize3', . . . File [n] = 'filenamen,daten,filesize', File [n+1] = space_remaining Bytes•Left	List user-supplied files.
Erase user-supplied Web pages/files	[Esc] /filenameEF←	Delfilename←	
Information requests			
Information request	I	V14X12•A14X06←	This matrix switcher has 14 video and audio inputs by 14 video and 6 audio outputs.
Request part number	N	60-825-01	The MPX part number is 68-825-01.
NOTE There are up to three separate sets of Extron firmware that the switcher can report on: the MPX controller firmware, which is the overall control firmware; the Ethernet protocol firmware, which handles the Ethernet interface; and the latest optional Extron firmware update, which is available at www.Extron.com .			
Query controller firmware version	Q	[X13] ←	
Example:	Q	1.23←	The factory-installed MPX controller firmware version is 1.23 (sample value only).
Query software version (verbose)	0Q	[X13] • [X14] • [X14] ←	Provide a detailed status of the Ethernet protocol firmware, the MPX 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 that the firmware is not loaded.
Response description: Ethernet protocol firmware version - controller firmware version - updated firmware version←			
Example: 0Q			
	Description	* indicates the version running	Upload date and time
Response: 1.23-0.14(0.20-MPX866 Series -Thu, 20 Jul 2006 00:00:00 GMT)-0.25*(0.24-64x64 Series -Fri, 28 Jul 2006 16:39:21 GMT),←	Ethernet protocol firmware	MPX firmware version	Updated firmware version

SIS™ Programming and Control, cont'd

Command/response table for SIS commands (continued)

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
Information requests (continued)			
Request system status	S	X16•X16•X16•X16•X16•X17↵	
Response description:	S	+3.3V•+5V•-5V•+2.5V•-15V•+15V•Temp↵	
Example:	S		-15V power system at -15.15V 3.29•5.04•-5.14•15.27•-15.15•120.20↵ 3.3V power system at 3.29V Temperature 120.20 degrees

Command/Response table for IP SIS commands

Symbol definitions

X21 = Web page priority	0 = internal 1 = user
X22 = Matrix name	(Up to 240 characters)
NOTE The following characters are invalid in the name: {space} ~ , @ = ` [] { } < > ' " ; : \ and ?.	
X23 = Default name	Factory default name (model name + last 3 pairs of MAC address)
X24 = Time and date (set)	In the format: MM/DD/YY•HH:MM:SS where: MM = month: 01 (January) through 12 (December) DD = day: 01 through 31 YY = year: 00 through 99 HH = hour: 00 through 24 MM = minutes: 00 through 59 SS = seconds: 00 through 59
X25 = Time and date (read)	In the format: Day•DD•Mmm•YYYY•HH:MM:SS where Day = weekday: Mon through Sun DD = day: 01 through 31 Mmm = month: Jan through Dec YYYY = year: 2000 through 2099 HH = hour: 00 through 24 MM = minutes: 00 through 59 SS = seconds: 00 through 59
X26 = GMT offset	-12.0 through +14.0 (hours and minutes removed from GMT)
X27 = Daylight Savings Time	0 = Daylight Savings Time off/ignore 1 = Daylight Savings Time on (northern hemisphere) 2 = Daylight Savings Time on (Europe) 3 = Daylight Savings Time on (Brazil)
X28 = IP address	###-###-###-###
X29 = Hardware (MAC) address	##-##-##-##-##-##
X30 = Number of open connections	0 - 255
X31 = Password	12 alphanumeric characters
NOTE The following characters are invalid in passwords: {space} ~ , @ = ` [] { } < > ' " ; : \ and ?.	
X32 = DHCP	0 = off, 1 = on
X33 = Port #	01 = rear panel RS-232 Primary port 02 = rear panel RS-232 Secondary port/front panel Configuration port
NOTE The rear panel RS-232 Secondary port (X33 = 02) is active only if the front panel Configuration port is not in use. If a front panel configuration connection is made, the rear panel RS-232 Secondary port becomes inactive and the front panel Configuration port is active.	
X34 = Baud rate	9600, 19200, 38400, 115200
X35 = Parity	Odd, even, none, mark, space (only first letter required)
X36 = Data bits	7, 8
X37 = Stop bits	1, 2
X38 = Verbose mode	0 = Clear/none (default for Telnet connection) 1 = Verbose mode (default for RS-232 connection) 2 = Tagged responses for queries 3 = Verbose mode and tagged for queries
NOTE If tagged responses is enabled, all read commands return the constant string and the value as the set command does (for example, the read matrix name command, Esc CN←, returns IPN• X22 ←).	
X39 = Security level	00 = Anonymous 10 = Extended security levels 1 through 10 11 = User 12 = Administrator
X40 = RAM status	0 = RAM dirty (needs saving to flash) 1 = RAM has been saved (ok to power off / reset)

SIS™ Programming and Control, cont'd

Command/response table for IP SIS commands

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
Set Web page priority	Esc X21 Cpag ←	Iwp X21 ←	
Read Web page priority	Esc Cpag ←	X21 ←	
Set matrix name (location)	Esc X22 CN ←	Ipn• X22 ←	
Read matrix name (location)	Esc CN ←	X22 ←	
Reset matrix name to factory default	Esc •CN ←	Ipn• X23 ←	
Set time and date	Esc X24 CT ←	Ipt X24 ←	
Read time and date	Esc CT ←	X25 ←	
Set GMT offset	Esc X26 CZ ←	Ipz X26 ←	The divider between hours and minutes is a period.
Read GMT offset	Esc CZ ←	X26 ←	
Set Daylight Savings Time	Esc X27 CX ←	Ipx X27 ←	Set the switcher to display the local time as Daylight Savings Time (+1 hour) in summer months.
Read Daylight Savings Time	Esc CX ←	X27 ←	
Set IP address	Esc X28 CI ←	Ipi X28 ←	
Read IP address	Esc CI ←	X28 ←	
Read hardware address	Esc CH ←	X29 ←	
Read # of open connections	Esc CC ←	X30 ←	
Set subnet mask	Esc X28 CS ←	Ips X28 ←	
Read subnet mask	Esc CS ←	X28 ←	
Set gateway IP address	Esc X28 CG ←	Ipg X28 ←	
Read gateway IP address	Esc CG ←	X28 ←	
Set administrator password	Esc X31 CA ←	Ipa• X31 ←	
Read administrator password	Esc CA ←	X31 ←	
Reset (clear) administrator password	Esc •CA ←	Ipa• X31 ←	
Set user password	Esc X31 CU ←	Ipu• X31 ←	
Read user password	Esc CU ←	X31 ←	
Reset (clear) user password	Esc •CU ←	Ipu• X31 ←	
Set DHCP on or off	Esc X32 DH ←	Idh X32 ←	
NOTE When you change DHCP from on to off, the switcher's IP address resets to its default value, 192.168.254.254.			
Read DHCP status	Esc DH ←	X32 ←	
Set serial port parameters	Esc X33 * X34 X35 X36 X37 CP ←	X34 X35 X36 X37 ←	
Read serial port parameters	Esc X33 CP ←	Cpn X33 •Ccp X34 X35 X36 X37 ←	
Set verbose mode	Esc X38 CV ←	Vrb X38 ←	
Read verbose mode	Esc CV ←	X38 ←	
Read connection's security level	Esc CK	X39 ←	
Commit RAM to flash memory	Esc 1FF ←	Nvr X40 ←	
Check RAM	Esc FF ←	X40 ←	

Special Characters

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

The switcher rejects the following characters:

{space (spaces **are** ok for names)} + } ~ , @ = ' [] { } < > ' " semicolon (;)
colon (:) | \ and ?.



MPX 866 A Media Presentation Matrix Switcher

5

Chapter Five

Matrix Software

Matrix Switchers Control Program

Special Characters

Button Label Generator

Matrix Software

Two software programs accompany the MPX 866 A:

- The Extron Matrix Switcher Control Program, which communicates with the switcher via the RS-232 ports and the Ethernet port, provides an easy way to set up ties and sets of ties.
- The Extron Button-Label Generator, which allows you to design and print labels for the buttons on the optional front panel.

Both programs are compatible with Windows 95/98, Windows NT, Windows ME, Windows 2000, and Windows XP. Updates to these programs can be downloaded from the Extron Web site (<http://www.extron.com>).

Matrix Switchers Control Program

Installing the software

The program is contained on a CD-ROM and is also available on the Extron Web site, www.extron.com. Load and run the program from the hard drive.

To install the program from the CD-ROM to the hard drive, run Launch.exe from the CD and follow the instructions that appear on the screen. The program occupies approximately 1 MB (megabyte) of hard-drive space.

By default, the Windows installation creates a C:\Program Files\Extron\Matrix Software directory and places two icons (MATRIX Switcher+ Control Program [MTRX.exe] and MATRIX+ Switcher Help [MTRX.hlp]) into a group or folder named "Extron Electronics".

NOTE *The program was designed to control most Extron matrix switchers, but its operation is limited to the features and configuration of your MPX switcher.*

NOTE *The MPX switcher can support either the front panel I/O Configuration port or the rear panel Remote RS-232 ports. The program can operate at 9600, 19200, 38400, or 115200 baud rates for either port. See Selecting the RS-232 Primary port's baud rate in chapter 3, Operation, to configure the rear panel Remote RS-232 ports from the front panel.*

Software operation via Ethernet

When a matrix switcher is connected to an Ethernet WAN or LAN, any number of users can operate it, locally or remotely, using the Matrix Switcher Control Program. See *Ethernet connection* in chapter 2, *Installation*, for installation details.

Connection to the switcher via the Ethernet is password protected. There are two levels of password protection: administrator and user. Administrators have full access to all switching capabilities and editing functions. Users can select inputs and outputs, set and recall presets, and view all settings with the exception of passwords. If the same password or no password is required for logging on, all personnel log on with administrator privileges. Fields and functions that exceed user privileges are grayed out in the Matrix Switcher Control Program when the operator is logged on as a user.

Ethernet protocol settings

The IP Settings/Options screen (figure 5-5 on page 5-6) provides a location for viewing and, if connected via the RS-232 link or if logged on via the Ethernet port as an administrator, editing settings unique to the Ethernet interface.

See *IP Settings/Options window* later in this chapter for more details.

Using the software

Many items found in the Matrix Switcher Control Program are also accessible via optional front panel controls (see chapter 3, *Operation*) and under SIS control (see chapter 4, *SIS Programming and Control*). The Matrix Switcher Help Program provides information on settings and on how to use the control program itself.

1. To run the Matrix Switcher Control Program, select *Start > Programs > Extron Electronics > Matrix Switchers > MATRIX Switcher+ Control Pgm.*

The Comm Port Selection window (figure 5-1) appears.

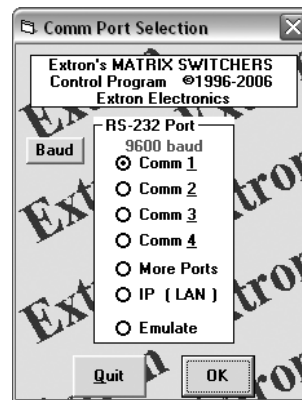


Figure 5-1 — Comm port selection window

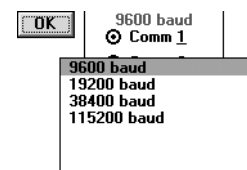
2. Choose either the comm port that is connected to the matrix switcher's RS-232 ports, *IP [LAN]*, or *Emulate*.

- If you selected a comm port, check the baud rate displayed in the comm port selection window. If you need to change the baud rate, click on the *Baud* button (the button changes to *OK*) and double-click on the desired baud rate.

Available rates are 9600, 19200, 38400, and 115200.
The default is 9600.

Click *Ok* and proceed to step 4.

- If you selected *IP [LAN]*, click *Ok* and proceed to step 3.
- If you selected *Emulate*, click *Ok* and see *Using emulation mode* on page 5-17.



3. If you selected IP [LAN] in step 2, the IP Connection window appears (figure 5-2).

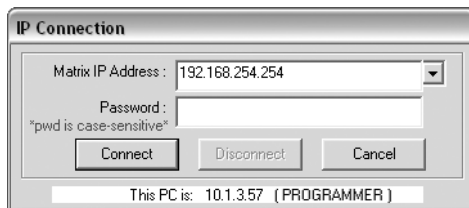


Figure 5-2 — Address and password entry

- a. Examine the Extron IP Address field in the IP Connection window. The field displays the last Extron IP address entered.

If the IP address is correct: Proceed to step 3b.

If the address is not correct: Either click in the Extron IP Address field and enter the IP address or click on the scroll down button (▼) and select from among the recently used addresses. Proceed to step 3b.

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.*

- b. If the switcher is password protected, click in the Password field and enter the appropriate administrator or user password.
- c. Click **Connect**.

If you logged on using the administrator password, the Windows program connects you to the matrix switcher with all of the administrator rights and privileges.

If you logged on using the user password, the Windows program connects you to the matrix switcher with only user capabilities.

If an incorrect password was entered, the program beeps and returns to the password entry display.

4. The Extron Matrix Switcher Control Program window (figure 5-3 and figure 5-4) appears. The window displays the current configuration of the attached matrix.
 - To set up audio in follow mode (audio and video have the same tie configuration), select the Follow box at the bottom of the window. To set up audio in breakaway mode (audio and video have different tie configurations), deselect the Follow box.
 - To make the control program easier to use, assign a device icon to each input and output. Click on a box that represents an input or output, and drag the desired icon onto the box from the icon palette that appears.
 - To create a tie, drag an input box to one or more output boxes. To remove a tie, drag the output box to its tied input box or to the trash can.
 - To quickly display a specific input or output's status, position the cursor over that device in the control program window. A pop-up opens that shows that device's ties and audio level. For outputs in the computer video group only, the pop-up also shows the frequency of the video signal tied to that device. See the inset box in figure 5-4.
 - If desired, on the task bar, click *Tools > IP Options* to set the switcher's IP parameters in the IP Settings/Options window (figure 5-5).

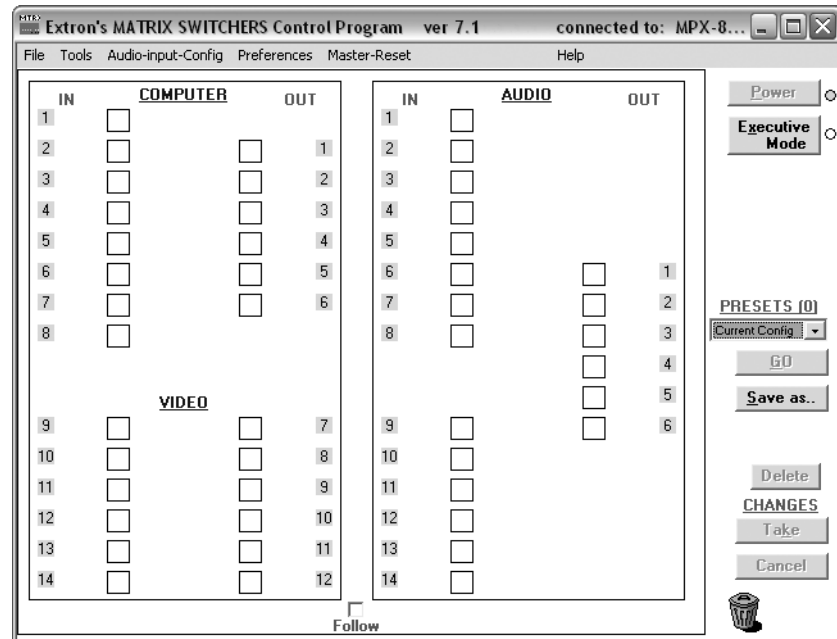


Figure 5-3 — Extron Matrix Switcher Control Program window (blank)

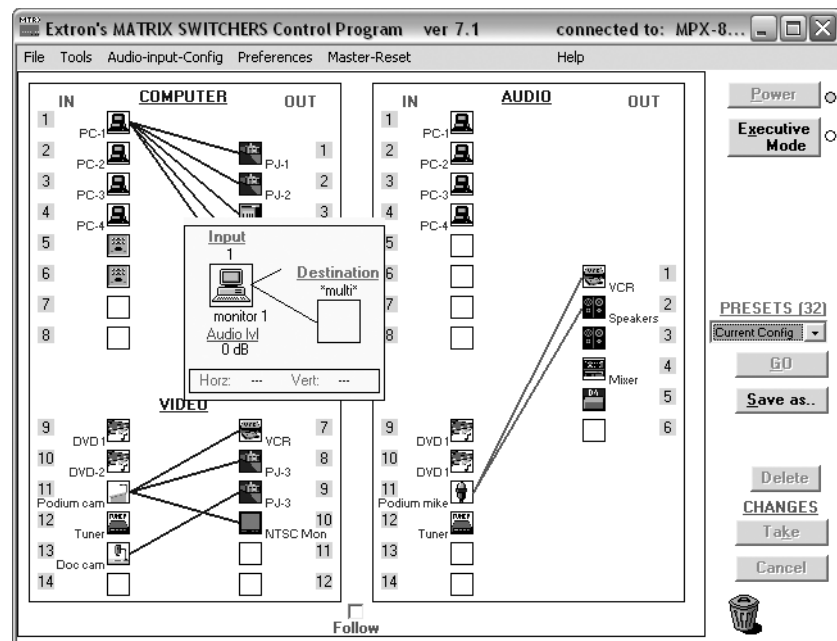


Figure 5-4 — Sample program window (complete)

IP Settings/Options window

The IP Settings/Options window (figure 5-5) provides a location for viewing and, if connected via the RS-232 link or if logged on via the Ethernet port as an administrator, editing settings unique to the Ethernet interface. See appendix A, *Ethernet Connection*, for basic information about IP addresses. None of the fields on this screen can be edited while you are logged on as a user.

The screenshot shows a window titled "IP Settings / Options". It contains several input fields and checkboxes. The "Matrix IP Address" field is set to "192.168.254.254". The "Gateway IP Address" is "192.168.0.0". The "Hardware Address" is "00-05-A6-01-51-42". The "Extron Name/Descriptor" is "MPX-866-A-01-51-42". The "Subnet Mask" is "255.255.0.0". There is a checkbox for "Use DHCP" which is unchecked, with the text "(Obtain an IP address automatically)" next to it. Below these are fields for "Date" (Fri, 04 Aug 2006), "Time (local)" (15:36:40), "GMT" (08:00), and a checkbox for "Use Daylight Saving" which is checked. There are also fields for "Administrator Password" and "User Password", both masked with asterisks. At the bottom of the window, it says "This PC is: 10.1.4.48 (PROGRAMMER)". There are "Close" and "Take" buttons at the bottom right.

Figure 5-5 — Control program IP settings/options window

NOTE Editing variables on the IP Settings/Options screen while connected via the Ethernet port can immediately disconnect the user from the switcher. Extron recommends editing the settings on this screen 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.

NOTE When the control program is connected to the switcher via the RS-232 link, the Administrator and User Password fields are not masked. If a password has been inadvertently changed to an unknown value, you can look up and, if desired, change a password in this window without knowing the current password.

Matrix IP Address field

The Matrix 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 The Matrix IP Address field is grayed out and uneditable when DHCP is selected.

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 Matrix 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 Matrix IP Address field.
4. Click on the *Take* button to make the address change take affect.

Extron Name/Descriptor field

The Extron Name/Descriptor field contains the name of the matrix switcher. This descriptor can be changed to any valid name, up to 12 alphanumeric characters.

NOTE *The following characters are invalid in the Extron Name/Descriptor field:*
{space} + ~ , @ = ' [] { } < > ' " ; : | \ and ?.

Edit this field as follows:

1. Click in the Extron name/descriptor field. The graphic cursor becomes a text cursor.
2. Edit the name as desired.
3. Press the Tab key on the keyboard or click in another field to exit the Extron Name/Descriptor field.
4. Click on the *Take* button to make the name change take effect.

Gateway IP address field

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

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.

Edit this field as follows:

1. Click in the Gateway 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 Gateway IP Address field.
4. Click the *Take* button to make the address change take affect.

Subnet Mask field

The Subnet Mask field is used to determine whether the matrix switcher is on the same subnet as the controlling PC when you are subnetting. For more information, see *Subnetting — A Primer*, in Appendix A, *Ethernet Connection*.

Edit this field as follows:

1. Click in the Subnet Mask field. The graphic cursor becomes a text cursor.
2. Edit the mask as desired.
3. Press the Tab key on the keyboard or click in another field to exit the Subnet Mask field.
4. Click the *Take* button to make the mask take affect.

Hardware Address field

The hardware address is hardcoded in the matrix switcher and cannot be changed.

Use DHCP checkbox

The Use DHCP checkbox directs the matrix switcher to ignore any entered IP addresses and to obtain its IP address from a Dynamic Host Configuration Protocol (DHCP) server (if the network is DHCP capable). Contact the local system administrator to see if DHCP should be used.

NOTE *When you change DHCP from on to off, the switcher's IP address resets to its default value, 192.168.254.254.*

Date field

The Date field displays the current date in the Greenwich Mean Time zone. If necessary, adjust the date as follows:

Date :

1. Click in the Date field. A set date field appears with the date in the format (M)M/(D)D/YYYY. Leading zeroes are not used. The graphic cursor becomes a text cursor in the set date field.
2. Edit the field as desired to set the proper date. Leading zeroes are optional.
3. Press the Tab key on the keyboard or click in another field to exit the set date field.
4. Click the *Take* button to make the date change take affect.

Time (local) field

The Time (local) field displays the current time in the local time zone. If necessary, click on the Sync Time to PC button to set the switcher to your computer's internal time or else adjust the time manually as follows:

Time (local) :

1. Click in the time field. A set time field appears with the date in the format HH:MM:SS (00:00:00 to 23:59:59). The graphic cursor becomes a text cursor in the set time field.
2. Edit the field as desired to set the proper time. Remember to use 24-hour time. Leading zeroes are optional.
3. Press the Tab key on the keyboard or click in another field to exit the set time field.
4. Click the *Take* button to make the time change take affect.

Sync Time to PC button

Clicking the mouse on the Sync Time to PC button causes the computer you are operating to send its internal time to the switcher in a set time command.

GMT (offset) field

The GMT field displays the amount of time, in hours and minutes, that the local time varies from the GMT international time reference. If necessary, adjust the offset as follows:

GMT

1. Click in the GMT field. A set offset field appears with the offset in the format ±HH:MM (−12:00 to +14:00). The graphic cursor becomes a text cursor in the set offset field.
2. Edit the field as desired to set the proper offset. Leading zeroes are optional. Some time zones are on the half-hour (30 minutes).
3. Press the Tab key on the keyboard or click in another field to exit the Set Offset field.
4. Click the *Take* button to make the offset change take affect.

Use Daylight Savings checkbox

Click in the Use Daylight Savings checkbox. When Daylight Savings Time is turned on, the switcher automatically updates its internal clock between Standard Time and Daylight Savings Time in the spring and fall on the date that the time change occurs in the country or region selected. When Daylight Savings Time is turned off, the switcher does not adjust its time reference.

Administrator Password field

The Administrator Password field displays the password required to log on to the matrix switcher via the Ethernet port with all of the administrator's rights and privileges. Passwords are case sensitive and are limited to 12 uppercase and lowercase alphanumeric characters.

While you are logged on as a user, this field is masked with asterisks (*****) as a security measure.

NOTE *Editing the Administrator Password field while connected via the Ethernet port can immediately disconnect the user from the 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.*

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

Edit this field as follows:

1. Click in the Administrator Password field. The graphic cursor becomes a text cursor.
2. Edit the case-sensitive password as desired.
3. Press the Tab key on the keyboard or click in another field to exit the Administrator Password field.
4. Click the *Take* button to make the password change take affect.

User Password field

The User Password field displays the password required to log on to the matrix switcher via the Ethernet port as a user, without all of the administrator's rights and privileges. Passwords are case sensitive and are limited to 12 upper-case and lower-case alphanumeric characters.

While you are logged on as a user, this field is masked with asterisks (*****) as a security measure.

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

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

Edit this field as follows:

1. Click in the User Password field. The graphic cursor becomes a text cursor.
2. Edit the case-sensitive password as desired.
3. Press the Tab key on the keyboard or click in another field to exit the User Password field.
4. Click the *Take* button to make the password change take affect.

Matrix Software, cont'd

Update firmware

The firmware upgrade utility 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.

Update the switcher firmware as follows:

NOTE *The update firmware utility is for replacing the firmware that controls all switcher operation. This is **not** the page to insert your own HTML pages. See Upload HTML files to insert custom HTML pages.*

1. Visit the Extron web site, www.extron.com, select the CrossPoint/MAV Plus product category, and select the latest firmware install package (*.exe file) for download. Note the folder to which you save the firmware file.
2. Run the executable (*.exe) file to decompress the firmware file.
3. Start the Matrix Switcher Control Program and connect to the matrix switcher. See *Using the software* in this chapter, steps 1 through 4, starting on page 5-3.

NOTE *The Ethernet connection is much faster than the RS-232 connection. Extron recommends using the Ethernet connection rather than the serial port for firmware uploads.*

4. Click **Tools > Update firmware**. The open file window appears (figure 5-6).

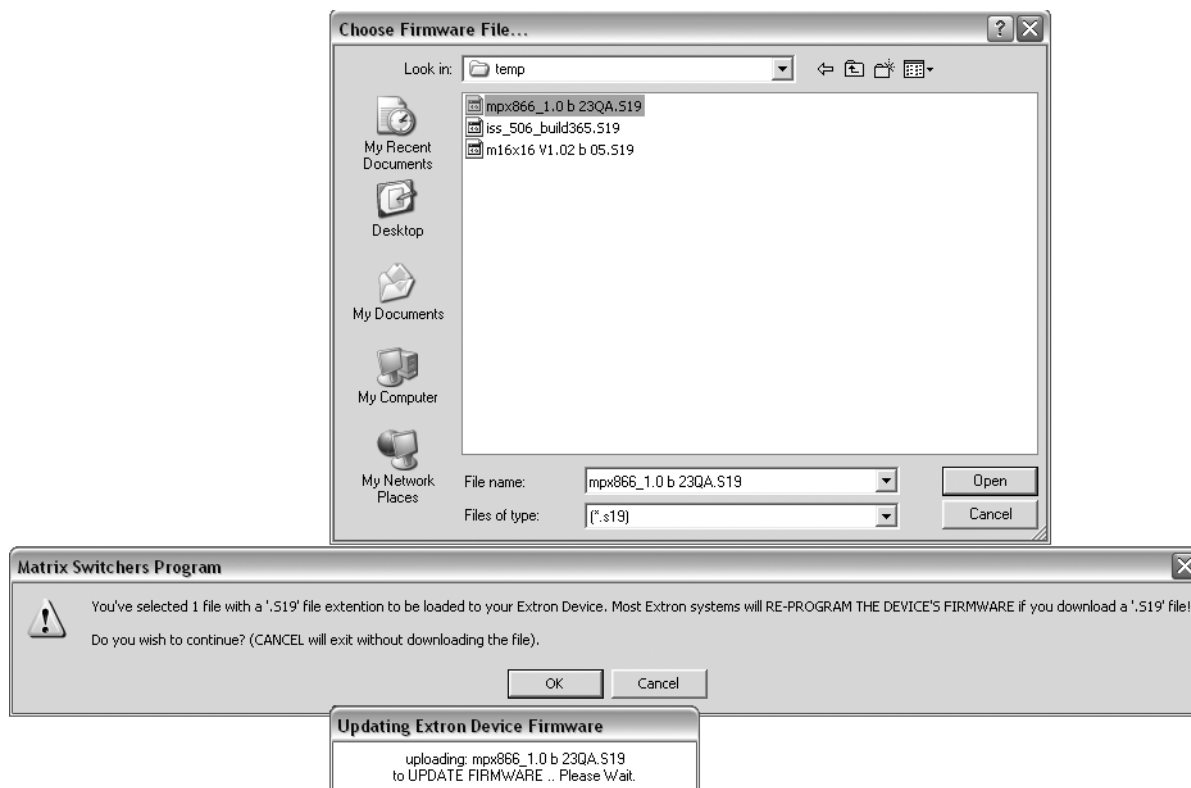


Figure 5-6 — Open file window and firmware load

5. Navigate to the folder where you saved the firmware upgrade file. Select the 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 matrix switcher. If the attempted firmware upload fails for any reason, the switcher reverts to the factory-installed firmware.

6. Click the *Open* button. The program presents a final opportunity for you to abort the firmware load. Click the *OK* button.
7. The program uploads the firmware. The switcher then automatically performs a system reset to activate the new firmware. The Matrix Switcher Control Program exits.

Upload HTML files

You can create customized HTML pages for the switcher to display. The HTML Files List window (figure 5-7) provides a way to view the contents of the switcher's file system and upload custom HTML pages to the switcher.

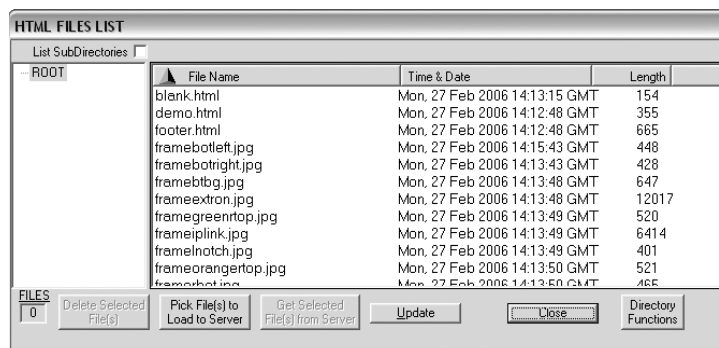


Figure 5-7 — HTML Files List window

Upload HTML pages as follows:

NOTE The files listed in figure 5-7 are shown for example only and may not be present on your switcher.

NOTE The HTML Files List window is for inserting your own HTML pages. This is *not* the window to replace the firmware that controls all switcher operation. See *Update firmware* in this chapter to replace the firmware.

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

1. Connect the PC to the matrix switcher via one of the switcher's RS-232 ports or the Ethernet port.
2. Start the Matrix Switcher Control Program and connect to the MPX switcher. See *Using the software* in this chapter, steps 1 through 4, starting on page 5-3.
3. Click on *Tools > HTML File Manager*.
4. Click on the *Pick File(s) to Load to Server* button. An open file window appears.

Matrix Software, cont'd

5. Navigate to the folder where you saved the HTML file(s). Select the file(s).

NOTE To select multiple files, hold the Ctrl key while you select the desired files.

NOTE If you want one of the HTML files that you created to be the default start-up page, name the file "index.html". The MPX switcher automatically looks for that file name when you first connect to it using an Internet browser.

6. Click on the *Open* button. The file(s) upload to the MPX switcher may take a few minutes.
7. Click on the *Update* button to confirm the upload.
8. Click on the *Close* button to exit the HTML Files List window.

Windows buttons, drop boxes, and trash

The buttons, drop boxes, and trash can on the right side of the program window perform the following functions:

Power — Unavailable for MPX 866 A switcher, because the switcher power cannot be controlled via software.

Executive mode — Allows you to lock out front panel operations, except for the view-only mode functions.

Presets menu — Displays a list of up to 32 global presets. You can select a preset from the list to display it in the window and either activate it (Go) or delete it (Delete).

Go — Activates the selected preset as the current configuration.

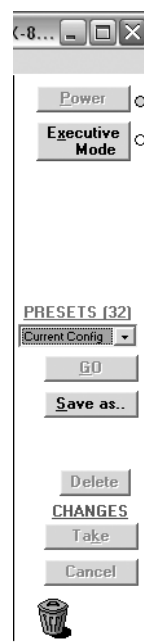
Save as — Allows the current set of ties to be saved as a preset. Enter the preset number when prompted to do so.

Delete — Allows the current preset to be deleted.

Changes – Take — Allows you to save to file any changes made to the displayed configuration.

Changes – Cancel — Returns to the previous screen, undoing any changes you have made.

Trash can — Drag and drop from an input or output button to the trash can to unmake all ties associated with that input or output.



Windows menus

File menu

Save matrix settings as — Saves a complete set of up to 32 presets, plus the last active setting (preset #0), to a file. Saved settings include audio gain settings (if specified), assigned icons, and icon captions.

Restore matrix settings from — Loads and activates a previously saved setting file.

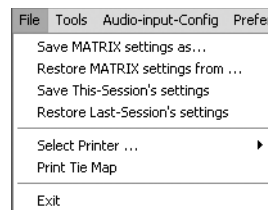
Save this-session's settings — Saves the current assigned icons and icon captions.

Restore last-session's settings — Loads the icons and icon captions that were saved during the last session. If you saved the previous session's changes to disk the last time you exited the program, the ties from that session are also loaded.

Select printer — Selects the target printer.

Print tie map — Prints the tie set that is displayed on the screen.

Exit — Closes the Matrix Switcher Control Program.



Tools menu

Assign device icons — Displays the complete set of input and output device icons. You can drag any of these icons to the input and output boxes.

Edit device palette — Allows you to add your own device icon graphics.

Audio-Input gain settings — Displays the audio gain level setting for a single input or for all inputs and allows you to change it (figure 5-8). The level is expressed as the magnitude (number of decibels) and polarity (positive, gain or negative, attenuation) of the audio adjustment.

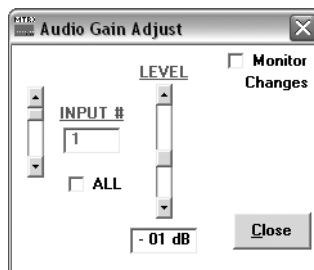


Figure 5-8 — Audio gain window

Audio-Output volume settings — Displays the audio output level setting for a single input or for all inputs and allows you to change it (figure 5-9). The level is expressed as a percentage of the input audio volume that is applied to the output; 0% is full attenuation (audio is silent), 100% is full volume.

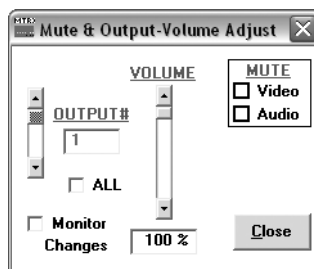


Figure 5-9 — Mute and Output Volume window

Mute-output settings — Displays the Mute and Output Volume window (figure 5-9), which allows you to mute and unmute the video and audio output for a single output or for all outputs. This window also displays the output volume level settings and allows you to change them.

Tools	Audio-Input-Config	Preferen
Assign Device Icons		
Edit Device Palette		
RGB Delay settings		
Audio-Input Gain settings		
Audio-Output Volume settings		
Mute-Output settings		
Video-Input Format		
View Input Frequencies		
Update Firmware ...		
IP Options		
HTML File Manager		
Hardware Status		
Name Presets		
Show RS-232 Strings		
I/O Group settings		
Initialize ...		

Matrix Software, cont'd

Video-Input Format — Displays the Mute and Output Volume window (figure 5-10), which allows you to select the video format, S-video or composite video, for the four configurable inputs in the low resolution video group, input 11 through input 14.

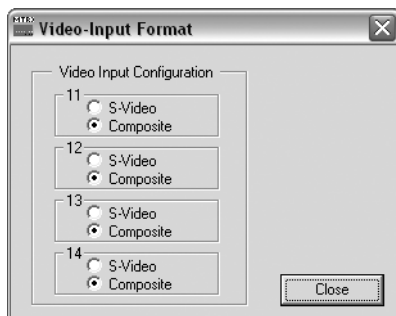


Figure 5-10 — Video Input Format window

Update firmware — Allows you to replace the firmware that is coded on the switcher's control board without taking the switcher out of service. See *Update firmware* on page 5-10.

IP options — Allows you to set IP options. See *IP Settings/Options window* on page 5-6.

HTML file manager — Displays a list of HTML files installed on the switcher and allows you to upload custom files from a connected PC to the switcher. See *Upload HTML files* on page 5-11.

Hardware status — Provides an overall view of the status of the matrix switcher, including the power supply status and the individual voltages, the operating temperature, the serial ports configuration, and the installed and updated firmware status (figure 5-11).

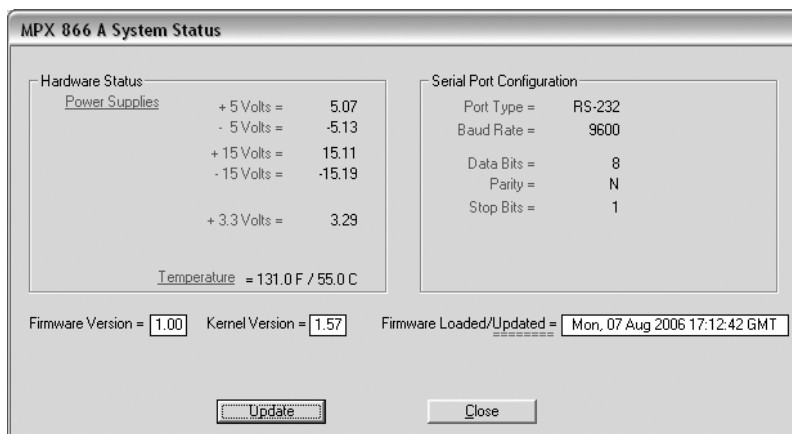


Figure 5-11 — Status window

Name presets — Allows you to assign a name to each of the 32 memory presets.

NOTE Preset names are limited to 12 upper- and lowercase alphanumeric characters, space, and the _ : = and / characters.

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

Show RS-232 strings — Displays the ASCII commands that are used by the current configuration. You can refer to these for RS-232 programming.

Initialize — Initializes and clears any or all of the following: ties, presets, audio configuration, preset names, icon names, and icons.

Audio Input Configuration Selection

Displays the Configure Audio Options window, which allows you to make audio input gain and attenuation adjustments to all inputs, either individually or all at once, from one window (figure 5-12).

Audio-input-Config

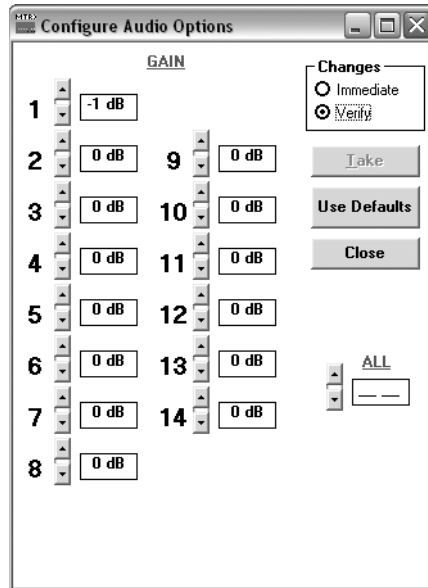


Figure 5-12 — Configure Audio Options window

Preferences menu

Immediate changes — Causes configuration changes to take effect immediately.

Hold/verify changes — Delays implementation of configuration changes until the Changes – Take button is pressed.

Ties as lines — Displays ties as lines (figure 5-13).

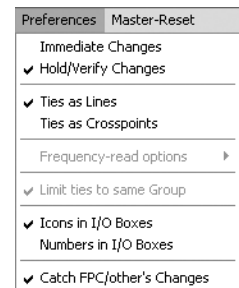


Figure 5-13 — Ties shown as lines

Matrix Software, cont'd

Ties as crosspoints — Displays ties as a matrix of inputs and outputs (figure 5-14).

Ties that have been made are indicated as **amber** (video and audio), **green** (video only), and **red** (audio only) boxes. Ties that will take effect when you click on the *Take* button are indicated by +. Ties that will be broken when you click on the *Take* button are indicated by –.

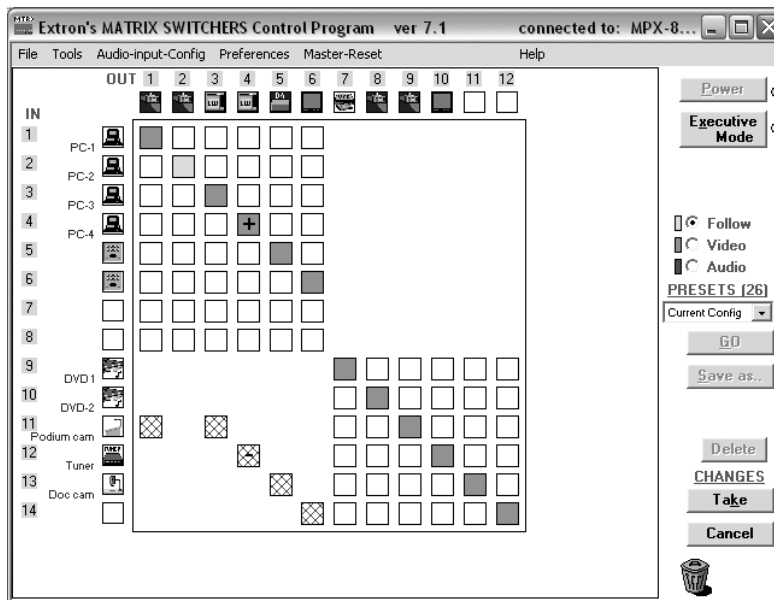


Figure 5-14 — Ties shown as crosspoints

- NOTE**
- Video ties can only be made *within* the following groups, *never between* the groups:
 - The computer video group (inputs 1 through 8 and outputs 1 through 6)
 - The low resolution video group (inputs 9 through 14 and outputs 7 through 12)
 - Audio ties can only be made to the computer video/audio subgroup (outputs 1 through 6).
 - Video and audio ties between the low resolution video input subgroup (inputs 9 through 14) and the low resolution video output subgroup (outputs 7 through 12) are **always** made with the audio broken away. In such an operation, the switcher automatically ties the audio to an output in the computer video/audio outputs subgroup (outputs 1 through 6) as follows:
 - If the video is tied to output 7, the audio is tied to output 1.
 - If the video is tied to output 8, the audio is tied to output 2.
 - If the video is tied to output 9, the audio is tied to output 3.
 - If the video is tied to output 10, the audio is tied to output 4.
 - If the video is tied to output 11, the audio is tied to output 5.
 - If the video is tied to output 12, the audio is tied to output 6.
 - When audio is broken away between groups, the audio tie is shown in crosshatched red boxes (⊠).

Icons in I/O boxes — Erases any numbers in the I/O boxes in the Control Program window (figure 5-4). You can place icons in the boxes. 1 

Numbers in I/O boxes — Erases any icons in the I/O boxes in the Control Program window and fills each box with the associated input or output number. 1 

Catch FPC/others changes — When checked, sets the switcher to report all configuration and setting changes to the Remote RS-232 or Ethernet connection that turned this selection on. These reports allow the Matrix Switcher Control Program to track the changes that occur in the switcher's configuration and settings, whether commanded via the front panel, the RS-232 ports, or the Ethernet port.

Master-Reset selection

Master reset clears all ties and presets, all video and audio mutes, sets all input audio levels to unity gain (+0 dB), and sets all output volume levels to 100% (0 dB of attenuation).

Master-Reset

NOTE *Master reset does not reset the Internet protocol (IP) settings.*

Using emulation mode

Emulation mode allows you to set up the software without attaching the switcher to the computer. To use emulation mode, do the following:

1. Double-click the Matrix Switcher Control Program icon in the Extron Electronics group or folder.
2. Choose Emulate, and click *Ok*.
3. Choose an emulation file to open, and click on *Ok*. The file DEMO.MTX provides a sample of a completed matrix setup. Selecting the file NEW.INI or clicking *Cancel* provides a blank setup to get you started.
4. Enter the file name under which you want to save any changes to the file, and click *Ok*.

Matrix Software, cont'd

5. Select the MPX 866 matrix model and click *Ok* (figure 5-15).

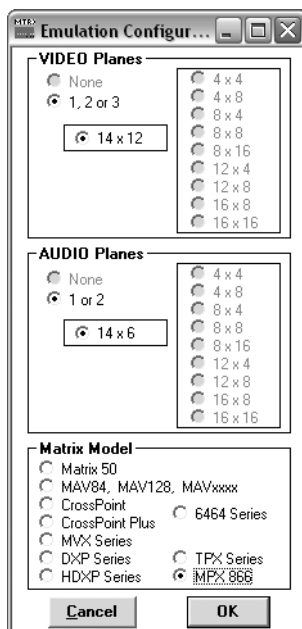


Figure 5-15 — Emulation Configuration window

6. Continue using the program as described on page 5-4.

Using the help system

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

- From the Extron Electronics program folder or group, double-click on the Matrix Switcher Help icon (shown at right).
- From within the Matrix Switcher Control Program, click on the Help menu on the main screen.
- From within the Matrix Switcher Control Program, press the F1 key.



Special Characters

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

The switcher rejects the following characters:

{space (spaces **are** ok for names)} + ~ , @ = ' [] { } < > ' " semicolon (;) colon (:) | \ and ?.

Button-Label Generator

The Button Label Generator software creates labels that you can place in the translucent covers of the input and output pushbuttons. You can create labels with names, alphanumeric characters, or even color bitmaps for easy and intuitive input and output selection. See appendix B, *Specifications, Part Numbers, and Accessories*, for blank labels and procedures for removing and replacing the button labels.

The program is contained on the same CD-ROM as the Matrix Switcher+ Control Program and is also available on the Extron Web site, www.extron.com.



MPX 866 A Media Presentation Matrix Switcher

6

Chapter 6

HTML Operation

Download the Startup Page

System Status Page

System Configuration Page

Video Input Settings Page

Passwords Page

Firmware Upgrade Page

File Management Page

Set and View Ties Page

Special Characters

HTML Operation

The switcher can be controlled and operated through its Ethernet port, connected via a LAN or WAN, using a web browser such as Microsoft's Internet Explorer. The browser's display of the switcher's status or operation has the appearance of web pages. This chapter describes the factory-installed HTML pages, which are always available and cannot be erased or overwritten.

NOTE *If your Ethernet connection to the matrix switcher is unstable, try turning off the proxy server in your Web browser. In Microsoft's Internet Explore, click Tools > Internet Options > Connections > LAN Settings, uncheck the "Use a proxy server..." box, and then click Ok.*

Downloading the Startup Page

Access the switcher using HTML pages as follows:

1. Start the Web browser program.
2. Click in the browser's Address field.
3. Enter the switcher's Matrix 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 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 switcher downloads the Enter Network Password page (figure 6-1).



Figure 6-1 — Enter Network Password page

NOTE *A User Name entry is not required.*

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

7. 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 HTML 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 startup page.
 - c. **If neither of the above conditions is true**, the switcher downloads the factory-installed default startup page, "nortxe_index.html" (figure 6-2), also known as the System Status page.

System Status Page

The System Status page (figure 6-2) provides an overall view of the status of the matrix switcher, including the power supply status, the individual voltages, the operating temperature, and RS-232 port status. The System Status page is the default page that the switcher downloads when you connect to the switcher. Access the System Status page from other pages by clicking the *Status* tab.

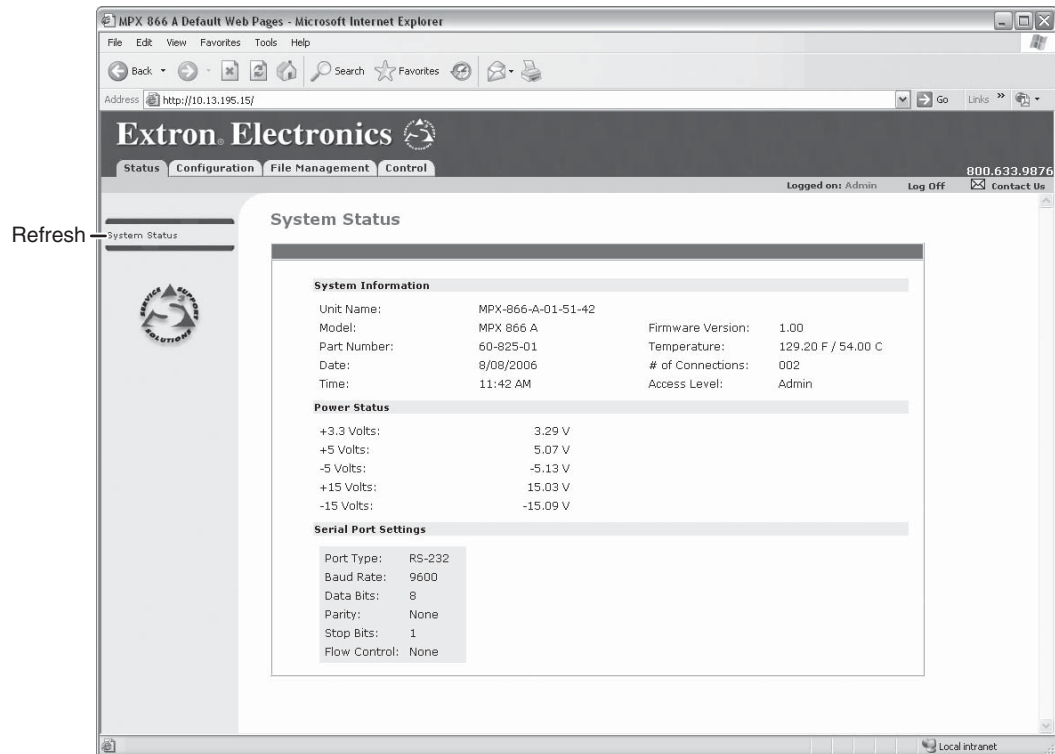


Figure 6-2 — System Status page

The status web page automatically updates itself periodically to reflect the latest status of the switcher components.

System Configuration Page

The matrix switcher downloads the System Configuration page (figure 6-3) when you click the *Configuration* tab. The screen consists of fields in which you can view and edit IP administration and system settings. The Passwords page can be accessed by clicking the appropriate link. See appendix A, *Ethernet Connection*, for basic information about IP addresses and subnetting.

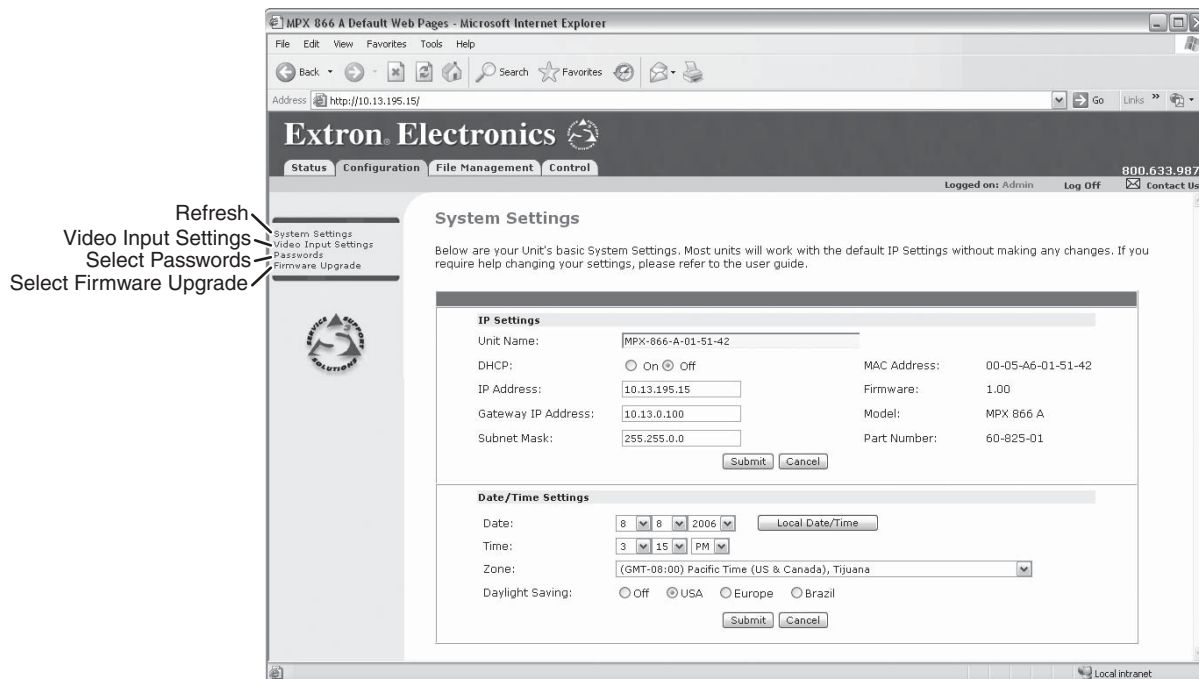


Figure 6-3 — System Configuration page

On password-protected connections, there are two levels of protection: administrator and user. Administrators have full access to all switching capabilities and editing functions. Users can create ties, create and recall presets, set RGB and audio mutes, and view all settings with the exception of passwords.

- Ethernet connection to the switcher, either entering SIS commands (see chapter 4, *SIS Programming and Control*) or using the Extron Matrix Switcher+ Control Program (see chapter 5, *Matrix Software*) **is** password protected.
- Connection via the RS-232 ports **is not** password protected.

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 at the bottom of the page.

Unit Name field

The Unit Name field contains the name used as the “from” information when the switcher e-mails notification of its failed or repaired status. 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:
+ ~ , @ = ' [] { } < > ' " ; : | \ and ?.

DHCP radio buttons

The DHCP On radio button directs the switcher to ignore any entered IP addresses and to obtain its IP address from a Dynamic Host Configuration Protocol (DHCP) server (if the network is DHCP capable). The DHCP Off radio button turns DHCP off. Contact the local system administrator to see if DHCP should be used

NOTE *When you change DHCP from on to off, the switcher's IP address resets to its default value, 192.168.254.254.*

IP Address field

The IP Address field contains the IP address of the connected switcher. This value is encoded in the switcher's flash memory.

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 factory-installed default address is 192.168.254.254, but if this creates a conflict, you can change the IP address to any valid value.

NOTE *IP address changes can cause conflicts with other equipment. Only local system administrators should change IP addresses.*

Gateway IP Address field

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

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

Subnet Mask field

The Subnet Mask field is used to determine whether the switcher is on the same subnet as the mail server when you are subnetting. For more information, see *Subnetting — A Primer*, in Appendix A, *Ethernet Connection*.

MAC Address field

The Media Access Control (MAC) Address is hardcoded in the switcher and cannot be changed.

HTML Operation, cont'd

Date/Time Settings fields

The Date/Time Settings fields (figure 6-4) provide a location for viewing and setting the time functions.

Figure 6-4 — Date/Time Settings fields

Change the date and time settings as follows:

1. Click the desired variable's drop box. The adjustable variables are month, day, year, hours, minutes, AM/PM, and (time) zone. A drop down scroll box appears (the month drop box is selected in figure 6-4).
2. Click and drag the slider or click the scroll up  button or scroll down  button until the desired variable is visible.
3. Click the desired variable.

NOTE If setting the time, set the local time. The Zone variable allows you to then enter the offset from Greenwich Mean Time (GMT).

NOTE The Zone field identifies the standard time zone selected and displays the amount of time, in hours and minutes, that the local time varies from the GMT international time reference.

4. Repeat steps 1 through 3 for other variables that need to be changed.
5. If appropriate, click in one of the Daylight Savings radio buttons to turn on the daylight savings time feature.

NOTE When daylight savings time is turned on, the switcher automatically updates its internal clock between Standard Time and Daylight Savings Time in the spring and fall on the date that the time change occurs in the country or region selected. When Daylight Savings Time is turned off, the switcher does not adjust its time reference.

6. Click the *Submit* button.

Video Input Settings page

Access the Video Input Settings page (figure 6-5) by clicking the Video Input Settings link on the System Settings page.

Low resolution video inputs 11 through 14 are individually configurable as either composite video or S-video. View and change this variable by clicking in the desired radio button for the desired input.

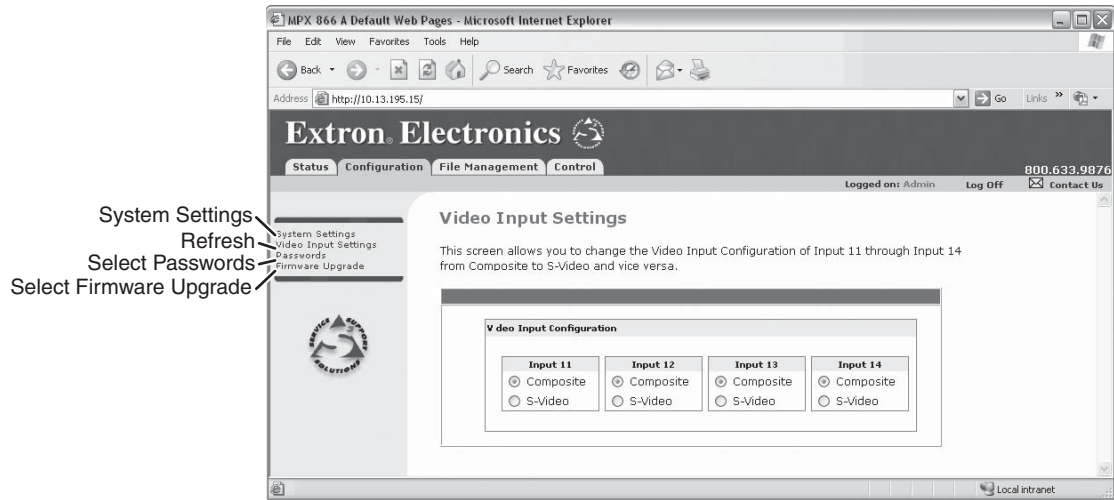


Figure 6-5 — Video Input Settings page

Passwords Page

Access the Passwords page (figure 6-6) by clicking the Passwords link on the System Settings page.

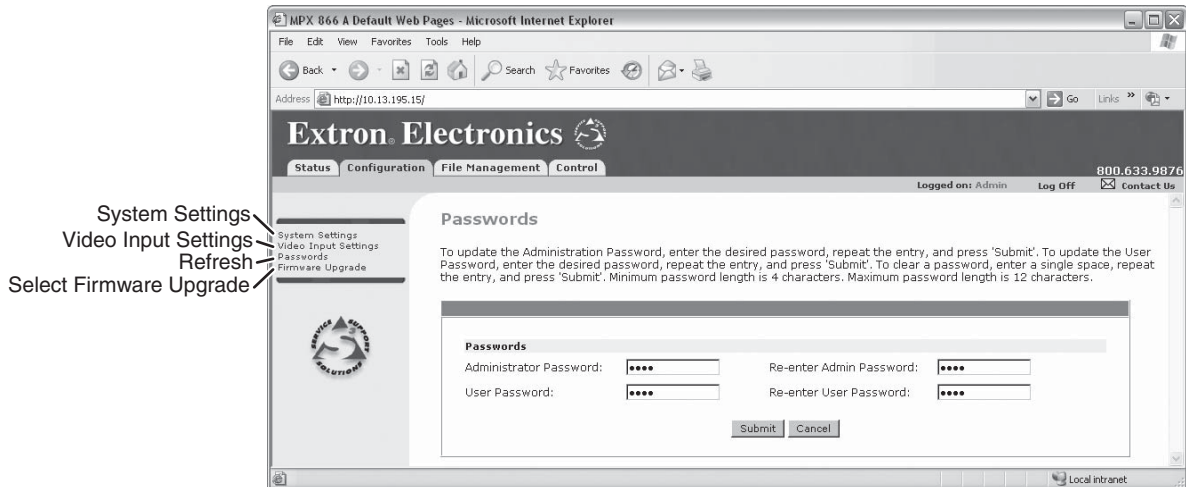


Figure 6-6 — Passwords page

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 (*****). 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.

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, enter a space in the Password and Re-enter Password fields and click the *Submit* button.

Firmware Upgrade Page

The Firmware Upgrade page 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. Access the Firmware Upgrade page (figure 6-7) by clicking the Firmware Upgrade link on the System Configuration page.

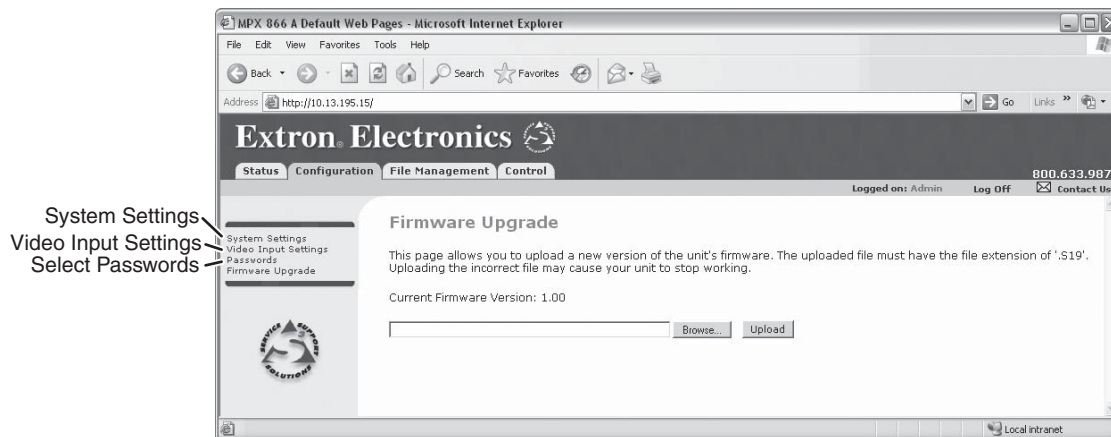


Figure 6-7 — Firmware Upgrade page

Update the switcher firmware as follows:

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 Page, on page 6-9.

1. Visit the Extron web site, www.extron.com, select the MPX product category, and select the latest firmware installation package (*.exe file) for the switcher and download it. Note the folder to which you save the firmware file.
2. Run the executable (*.exe) file to decompress the firmware file.
3. Connect the PC to the matrix switcher via the switcher's Ethernet port.
4. Access the matrix switcher using HTML pages.
5. Click the Configuration tab.
6. Click the Firmware Upgrade link.
7. Click the *Browse* button. An open file window appears.
8. Navigate to the folder where you saved the firmware upgrade file. Select the 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 matrix switcher. If the attempted firmware upload fails for any reason, the switcher automatically reverts to the factory-installed firmware.

9. Click the *Open* button.
10. Click the *Upload* button. The firmware upload to the switcher may take a few minutes.

File Management Page

To delete files such as HTML pages from the connected switcher or to upload your own files to the switcher, click the File Management tab. The switcher downloads the file management HTML page (figure 6-8).

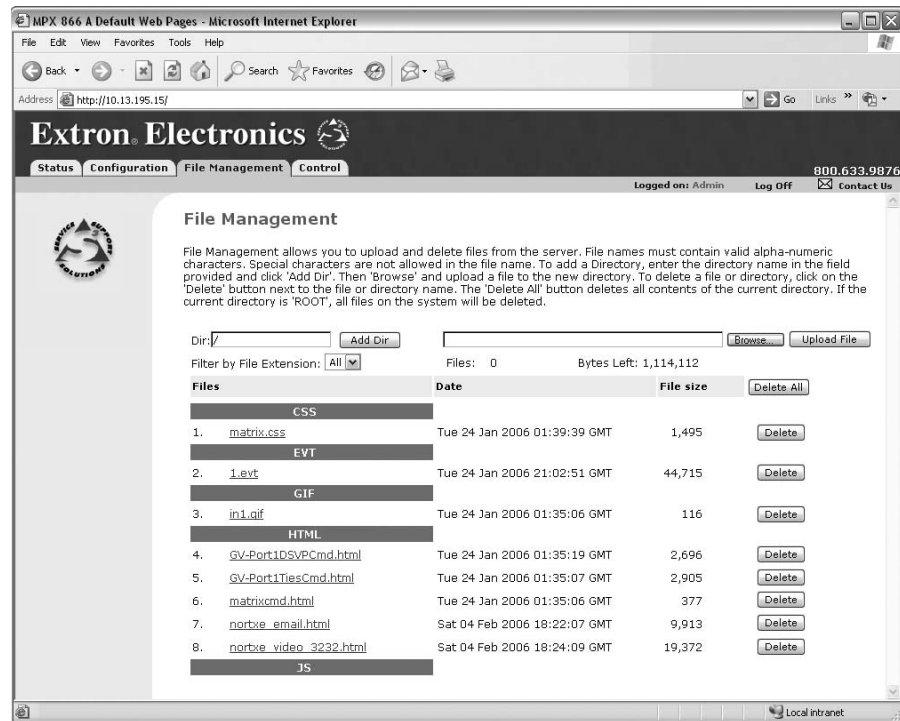


Figure 6-8 — File Management page

NOTE The files listed in figure 6-8 are shown for example only and may not be present on your switcher.

To delete a file, check the associated delete check box and click the *Delete Files* button.

Upload your own files as follows:

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

1. Click the *Browse* button.
2. Browse through your system and select the desired file(s).

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

3. Click the *Upload File* button. The file(s) that you selected appear in the list.

HTML Operation, cont'd

Set and View Ties Page

You can create ties on the Set and View Ties page (figure 6-9). Access the Set and View Ties page by clicking the *Control* tab.

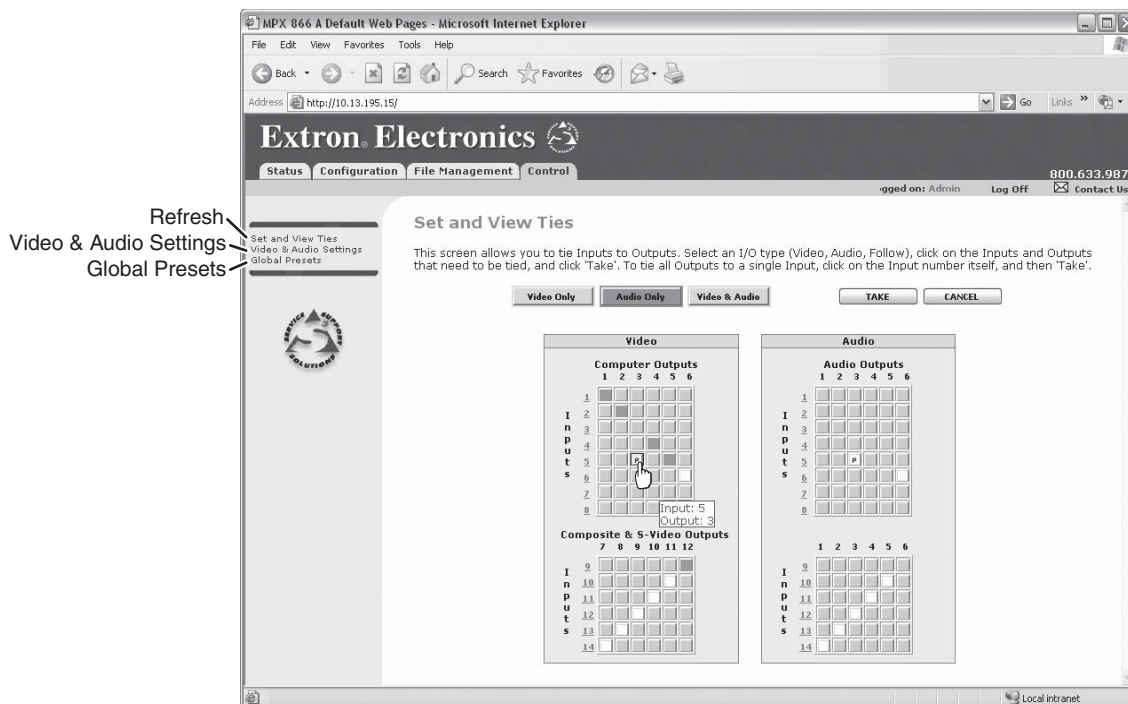


Figure 6-9 — Set and View Ties page

The page consists of a matrix of input (rows) and output (columns) selection buttons of four different colors:

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

- NOTE**
- Video ties can only be made *within* the following groups, *never between* the groups:
 - The computer video group (inputs 1 through 8 and outputs 1 through 6)
 - The low resolution video group (inputs 9 through 14 and outputs 7 through 12)
 - Audio ties can only be made to the computer video/audio subgroup (outputs 1 through 6).

-
- Video and audio ties between the low resolution video input subgroup (inputs 9 through 14) and the low resolution video output subgroup (outputs 7 through 12) are **always** made with the audio broken away. In such an operation, the switcher automatically ties the audio to an output in the computer video/audio outputs subgroup (**outputs 1 through 6**) as follows:
 - If the video is tied to output 7, the audio is tied to output 1.
 - If the video is tied to output 8, the audio is tied to output 2.
 - If the video is tied to output 9, the audio is tied to output 3.
 - If the video is tied to output 10, the audio is tied to output 4.
 - If the video is tied to output 11, the audio is tied to output 5.
 - If the video is tied to output 12, the audio is tied to output 6.

NOTE If you lose track of the input and output associated with a specific button, let the mouse pointer rest over a button for a moment. As shown on figure 6-9, a field pops up that identifies the input and output for that button.

Create 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 matrix of input and output selection buttons. Click a button to create a preliminary tie (if not tied) or preliminary untie (if tied) of the input and output associated with that button. A "P" (for pending) appears in the button.

NOTE If you lose track of the input and output associated with a specific button, let the mouse rest over one of the tie buttons for a moment. A field pops up (as shown on figure 6-9) that identifies the input and output for that button.

NOTE To tie an input to all outputs, click that input's input number.

3. Click the *Take* button to make the configuration changes or *Cancel* button to abandon the configuration changes.

HTML Operation, cont'd

RGB and Audio Settings page

The RGB and Audio Settings page provides a way to set the input audio gain and attenuation, set the output volume, and mute and unmute all video and audio outputs. Access the RGB and Audio Settings page (figure 6-10) by clicking the RGB & Audio Settings link on the Control page.

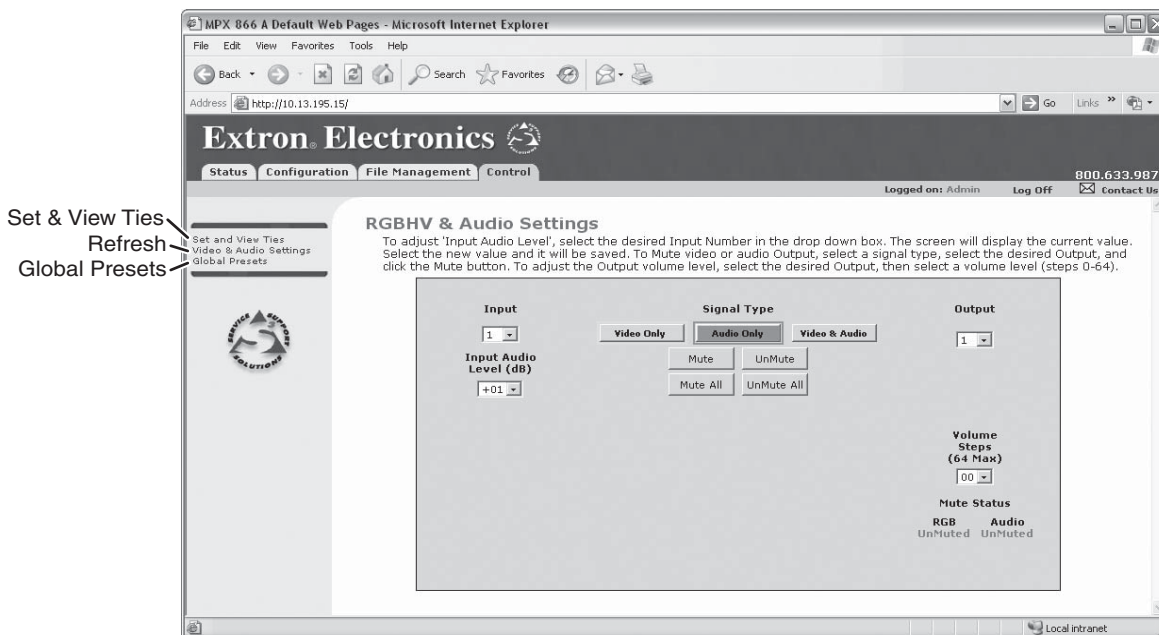


Figure 6-10 — RGB and Audio Settings page

Change the input gain and attenuation (audio models only)

Users can set each input's level of audio gain or attenuation (-18 dB to +24 dB) from the RGB and 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 6-11).

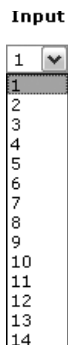


Figure 6-11 — Input selection drop box

-
- Click the desired input.
 - Click the Input Audio Level (dB) drop box. A drop down scroll box appears (figure 6-12).

**Input Audio
Level (dB)**

-01	▼
+11	▲
+10	
+09	
+08	
+07	
+06	
+05	
+04	
+03	
+02	
+01	
+00	
-01	
-02	
-03	
-04	
-05	
-06	
-07	
-08	
-09	
-10	
-11	
-12	
-13	
-14	
-15	
-16	
-17	
-18	▼

Figure 6-12 — Gain drop box

- Click and drag the slider or click the scroll up ▲ button or scroll down ▼ button until the desired audio level is visible.
- Click the desired gain or attenuation value.

HTML Operation, cont'd

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 the Output drop box. A drop down scroll box appears (figure 6-13).

Output

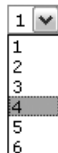


Figure 6-13 — Output selection drop box

2. Click the desired output.
3. Click the *Video*, *Audio*, or *Follow* 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.

Click the *Mute All* or *UnMute All* to mute or unmute all of the outputs.

Observe the Mute status indications on the page (figure 6-14). Unmuted is displayed in green and muted is displayed in red.

Mute Status

RGB	Audio
UnMuted	Muted

Figure 6-14 — Mute status indications

Change the output volume level

Users can set each output's volume level through a range of zero steps of attenuation (full attenuation, minimum volume) to 64 steps of attenuation (no attenuation, full volume) from the RGB and Audio Settings page.

Change an output's audio level setting as follows:

1. Click the output drop box. A drop down scroll box appears (figure 6-15).

Output

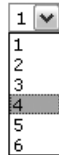


Figure 6-15 — Output selection drop box

2. Click the desired output.
3. Click the Volume Steps (64 Max) drop box. A drop down scroll box appears (figure 6-16).

**Volume
Steps
(64 Max)**

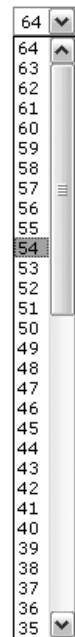


Figure 6-16 — Volume drop box

4. Click and drag the slider or click the scroll up  button or scroll down  button until the desired audio volume is visible.
5. Click the desired output volume step value.

NOTE The table on the next page defines the value of each audio volume step.

HTML Operation, cont'd

Audio volume adjustment settings

Number of steps	dB of attenuation	Output volume	Number of steps	dB of attenuation	Output volume	Number of steps	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%			

Global Presets Page

You can save and recall global presets from the Global presets page (figure 6-17). Access the Global presets page by clicking the *Global Presets* link on the left of the Control page.

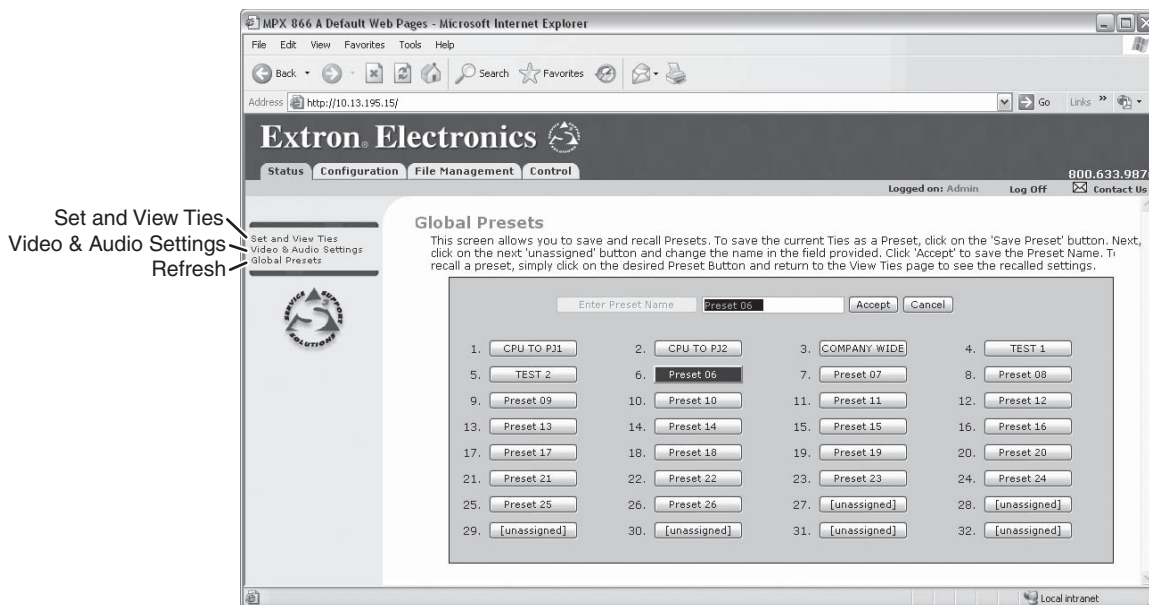


Figure 6-17 — Global Presets page

Save a preset

Save the current configuration (configuration 0) as a preset as follows:

1. Click the *Save Preset* button.
2. Select the desired preset by clicking on one of the presets listed. To create a new preset, click one of the *[unassigned]* buttons. Overwrite an existing preset by clicking an already existing preset.
3. If desired, type over the current name in the box adjacent to the *Save Preset* button.

NOTE Preset names are limited to 12 upper and lower case alphanumeric characters and the {space} _ : = and / characters.

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

If you do not rename an unassigned button, the matrix switcher automatically names the preset as Preset {next available number}.

If you do not rename an existing preset when it is overwritten, the matrix switcher retains the same name.

4. Click the *Accept* button.

Recall a preset

To recall a global preset to be the current configuration, click the button associated with the desired preset.

HTML Operation, cont'd

Special Characters

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

The switcher rejects the following characters:

{space} + ~ , @ = ' [] { } < > ' " semicolon (;) colon (:) | \ and ?.



MPX 866 A Media Presentation Matrix Switcher

Appendix A

Ethernet Connection

Ethernet Link

Subnetting — A Primer

Ethernet Connection

Ethernet Link

The rear panel Ethernet connector on the matrix switcher system can be connected to an Ethernet LAN or WAN. This connection makes SIS control of the switcher possible using a computer connected to the same LAN.

Ethernet connection

The Ethernet cable can be terminated as a straight-through cable or a crossover cable and must be properly terminated for your application (figure A-1).

- **Crossover cable** — Direct connection between the computer and the MPX.
- **Patch (straight-through) cable** — Connection of the switcher to an Ethernet LAN.

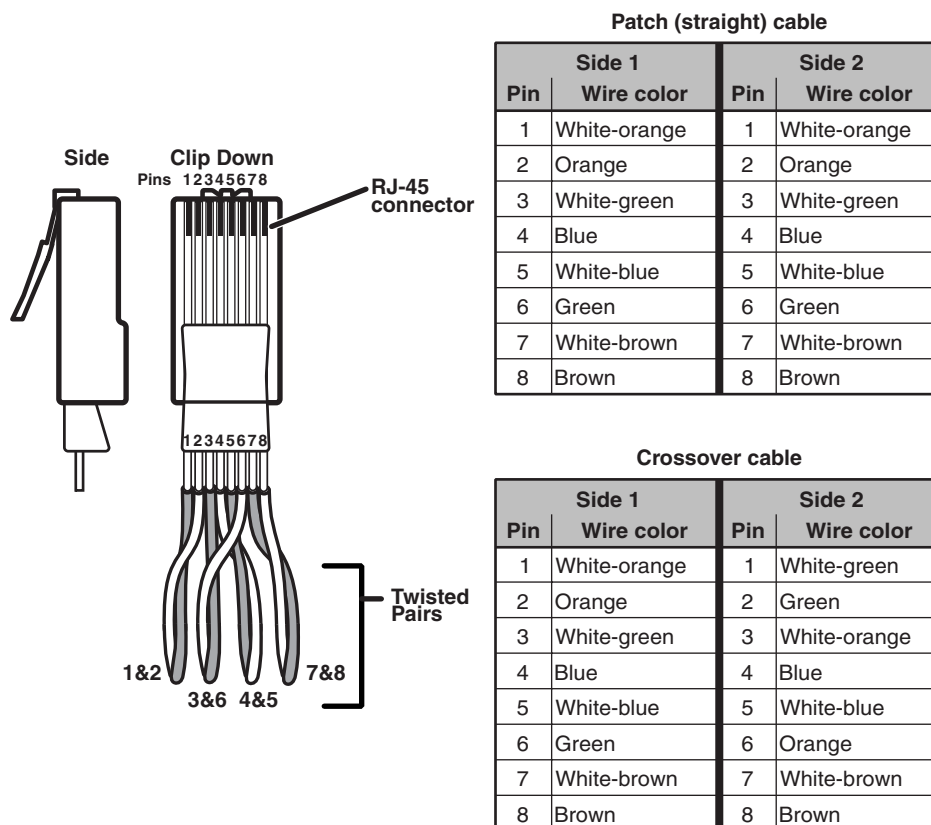


Figure A-1 — RJ-45 connector pinout tables

Default address

To access the switcher via the Ethernet port, you need the switcher's IP address. If the address has been changed to an address comprised of words and characters (an alias), you can determine the actual numeric IP address using the Ping utility. If the address has not been changed, the factory-specified default is 192.168.254.254.

Ping can also be used to test the Ethernet link to the switcher.

Pinging to determine Extron IP address

The Microsoft Ping utility is available at the DOS prompt. Ping tests the Ethernet interface between the computer and the switcher. Ping can also be used to determine the actual numeric IP address from an alias and to determine the web address.

Ping the switcher as follows:

1. On the Windows task bar, click on *Start > Run*.
2. At the Open prompt, type *command*.
3. Click the OK button.
4. At the DOS prompt, type *ping {IP address}* and then press [Enter]. The computer returns a display similar to figure A-2.

The line **Pinging ...** reports the actual numeric IP address, regardless of whether you entered the actual numeric IP address or an alias name.

```
C:\>ping 192.168.254.254

Pinging 192.168.254.254 with 32 bytes of data:

Reply from 192.168.254.254: bytes=32 time<10ms TTL=128
Reply from 192.168.254.254: bytes=32 time<10ms TTL=128
Reply from 192.168.254.254: bytes=32 time<10ms TTL=128
Reply from 192.168.254.254: bytes=32 time<10ms TTL=128

Ping statistics for 192.168.254.254:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Figure A-2 — Ping response

Pinging to determine Web IP address

The Ping utility has a modifier, *-a*, that directs the command to return the Web address rather than the numeric IP address.

At the DOS prompt, type *ping -a {IP address}* and then press [Enter]. The computer's return display is similar to the Ping response shown in figure A-2, except that when you specify the *-a* modifier, the line **Pinging mail...** reports the web IP address rather than the numeric IP address, regardless of whether you entered the actual numeric IP address or an alias name.

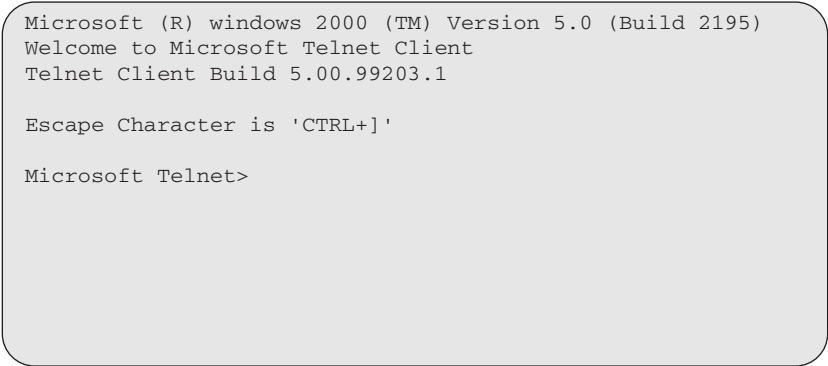
Ethernet Connection, cont'd

Connecting as a Telnet client

The Microsoft Telnet utility is available from the DOS prompt. Telnet allows you to input SIS commands to the switcher from the PC via the Ethernet link and the LAN.

Access the DOS prompt and start Telnet as follows:

1. On the Windows task bar, click on *Start > Run*.
2. At the Open prompt, type *command*.
3. Click the OK button.
4. At the DOS prompt, type *telnet* and then press [Enter]. The computer returns a display similar to figure A-3.



```
Microsoft (R) windows 2000 (TM) Version 5.0 (Build 2195)
Welcome to Microsoft Telnet Client
Telnet Client Build 5.00.99203.1

Escape Character is 'CTRL+]'

Microsoft Telnet>
```

Figure A-3 — Telnet screen

Telnet tips

It is not the intention of this manual to detail all of the operations and functionality of Telnet; however, some basic level of understanding is necessary for operating the switcher via Telnet.

Open

Connect to the switcher using the Open command. Once you are connected to the switcher, you can enter the SIS commands the same as you would if you were using the RS-232 link.

Connect to the switcher as follows:

1. At the Telnet prompt, type *open {IP address}* and then press [Enter].
If the switcher is not password protected, no further prompts are displayed until you break or disconnect the connection to the switcher.
If the switcher is password protected, Telnet displays the password prompt.
2. If necessary, at the password prompt, type *{password}* and then press [Enter].

Connection to the switcher via the Ethernet can be password protected. There are two levels of password protection: administrator and user. A person logged on as an administrator has full access to all MPX 866 A switching capabilities and editing functions. Users can select video and/or audio for output, select test patterns, set RGB and audio mutes, select a blue screen, and view all settings with the exception of passwords. By default, the switcher ships with both passwords set to {carriage return}.

Once you are logged in, the switcher returns either **Login Administrator** or **Login User**. No further prompts are displayed until you break or disconnect the connection to the switcher.

Escape character and Esc key

When Telnet is first started, the utility advises that the **Escape character** is 'Ctrl+I'. Many SIS commands include the keyboard **Esc** key. Consequently, some confusion may exist between the Escape character and the Escape key.

The Telnet Escape character is a key combination, the **Ctrl** key and the **I** key pressed simultaneously, that returns you to the Telnet prompt while leaving the connection to the switcher intact.

The Escape key is the **Esc** key on the computer keyboard.

Local echo

Once connected to the switcher, by default, Telnet does not display your keystrokes on the screen. SIS commands are typed in blindly and only the SIS responses are displayed on the screen. To command Telnet to show keystrokes, at the Telnet prompt, type *set local_echo* and then press [Enter] before you open the connection to the switcher.

With local echo turned on, keystrokes and the switcher's responses are displayed on the same line. For example: **1*1!In1 Out1 All**, where **1*1!** is the SIS command and **In1 Out1 All** is the response.

With local echo turned on, all keystrokes are displayed, even those that should be masked, such as the password entry. For example, when entering a password with local echo turned on, you see a display such as **a*d*m*i*n***, where **admin** is the keyed in password and ********* is the masked response.

You can turn off local echo by typing *unset local_echo* and then pressing [Enter] at the Telnet prompt. If you are connected to the switcher and need to access the Telnet prompt to turn local echo off, type the Escape character (**Ctrl+I**).

Set carriage return-line feed

Unless commanded otherwise, Telnet transmits a line feed character only (no carriage return) to the connected switcher when you press the **Enter** key. This is the correct setting for SIS communication with the switcher. The Telnet *set crlf* command forces Telnet to transmit carriage return and line feed characters when **Enter** is pressed, but if *crlf* is set, the SIS link with the switcher does not function properly.

Close

To close the link to the switcher, access the Telnet prompt by typing the Escape character (**Ctrl+I**). At the Telnet prompt, type *close* and then press [Enter].

Help

For Telnet command definitions, at the Telnet prompt, type *?* and then press [Enter].

Quit

Exit the Telnet utility by typing *quit* and then pressing [Enter] at the Telnet prompt. If you are connected to the switcher, access the Telnet prompt by typing the Escape character (**Ctrl+I**).

Ethernet Connection, cont'd

Subnetting — A Primer

It is not the purpose of this manual to describe TCP/IP protocol in detail. However, some understanding of TCP/IP subnetting (a subnet is a **subset** of a **network** — a set of IP devices that have portions of their IP addresses in common) is necessary in order to understand the interaction of and the mail server gateway. To understand subnetting at the level required to install and operate the switcher, you must understand the concepts of a gateway, local and remote devices, IP addresses and octets, and subnet masks and octets.

Gateways

The MPX 866 A switcher can communicate with the a controlling computer directly (if they are on the same subnet) or the communication can be routed via a gateway (a computer that provides a link between different subnets).

Local and remote devices

The local and remote devices are defined from the point of view of the function being described. In this manual, subnetting is an issue when you are using the controlling PC to set TCP/IP values in the switcher (see *IP Settings/Options window* in chapter 5, *Matrix Software*). When you are setting up the variables that may include subnetting, the matrix switcher is the local device and the remote server is the remote device.

IP addresses and octets

Valid IP addresses consist of four 1-, 2-, or 3-digit numeric subfields, properly called octets, separated by dots (periods) (figure A-4). Each octet can be numbered from 000 through 255. Leading zeroes, up to three digits total per octet, are optional. Values of 256 and above are invalid.

Typical IP Address: 192,168,254,254
Octets

Figure A-4 — IP address and octets

Subnet masks and octets

The subnet mask (figure A-5) is used to determine whether the local and remote devices are on the same subnet or different subnets. The subnet mask consists of four numeric octets separated by dots. Each octet can be numbered from 000 through 255. Leading zeroes, up to three digits total per octet, are optional. Each octet typically contains either 255 or 0. The octets determine whether or not the same octets of two IP addresses will be compared when determining if two devices are on the same subnet.

255 indicates that this octet will be compared between two IP addresses. 0 indicates that this octet will **not** be compared between two IP addresses.

Typical Subnet Mask: 255,255,0,0
Octets

Figure A-5 — Subnet mask and octets

Determining whether devices are on the same subnet

To determine the subnet, the local device's IP address is **compared** to the remote device's IP address (figure A-6). Each address's octets are **compared** or **not compared**, depending on the value in the related subnet mask octet.

- If a subnet mask octet contains the value 255, the related octets of the local device's address and the remote device's IP address are unmasked.

Unmasked octets are compared (indicated by ? in figure A-6).

- If the subnet mask octet contains the value 0, the related octets of the local device's and remote device's IP addresses are masked.

Masked octets are not compared (indicated by X in figure A-6).

If the unmasked octets of the two IP addresses **match** (indicated by = in figure A-6) (example 1), the two addresses **are on the same subnet**.

If the two unmasked fields **do not match** (indicated by ≠ in figure A-6) (example 2 and example 3), the addresses **are not on the same subnet**.

	Example 1	Example 2	Example 3
Local IP Address:	192.168.254.254	192.168.254.254	192.168.254.254
Subnet Mask:	255.255.0.0 (? ? X.X)	255.255.0.0 (? ? X.X)	255.255.0.0 (? ? X.X)
Remote IP Address:	192.168.2.25	190.190.2.25	192.190.2.25
Match?:	=.X.X — Match (Same subnet)	≠.X.X — No match (Different subnet)	≠.X.X — No match (Different subnet)

Figure A-6 — Comparing the IP addresses

Ethernet Connection, cont'd



MPX 866 A Media Presentation Matrix Switcher

Appendix B

Reference Information

Specifications

Part Numbers and Accessories

Button Labels

Reference Information

Specifications

Video

Routing

RGB/VGA 8 x 6 matrix

S-video/composite video. 6 x 6 matrix

Gain Unity

Bandwidth

RGB/VGA 300 MHz (-3 dB), fully loaded

S-video/composite video. 150 MHz (-3 dB), fully loaded

0 - 10 MHz: no more than +0.1 dB to -0.1 dB

0 - 30 MHz: no more than +0.1 dB to -0.5 dB

Differential phase error 1.0° at 3.58 MHz and 4.43 MHz

Differential gain error 1.0% at 3.58 MHz and 4.43 MHz

Crosstalk

RGB/VGA <-50 dB @ 10 MHz, <-30 dB @ 100 MHz

S-video/composite video. -50 dB @ 5 MHz

Switching speed 100 ms (max.)

Video input

Number/signal type

RGB/VGA 8 VGA-UXGA RGBHV, RGBS, RGsB, RsGsBs

S-video/composite video. Up to 4 S-video and 2 composite video

or

6 composite video

Connectors

RGB/VGA 8 female 15-pin HD

S-video/composite video. 4 x 2 female BNC for S-video or composite video (inputs 11 to 14) and
2 x 1 female BNC for composite video or genlock only (inputs 9 and 10)

Nominal level 1 Vp-p for Y of S-video and for composite video

0.7 Vp-p for RGB

0.3 Vp-p for C of S-video

Minimum/maximum levels

RGB/VGA Analog: 0.3 V to 1.5 Vp-p with no offset

S-video/composite video. Analog: 0.5 V to 2.0 Vp-p with no offset

Impedance 75 ohms

Horizontal frequency (RGB) 15 kHz to 145 kHz

Vertical frequency (RGB) 30 Hz to 170 Hz

Return loss

RGB/VGA <-40 dB @ 5 MHz

S-video/composite video <-30 dB @ 5 MHz

DC offset (max. allowable, S-video or composite video)

1.5 V

External sync (genlock, S-video or composite video)

0.3 V to 0.4 Vp-p

Video output

Number/signal type	
RGB/VGA	6 VGA-UXGA RGBHV, RGBS, RGsB, RsGsBs, (follows input type)
S-video/composite video.	2 S-video, 2 S-video or composite video, and 2 composite video
Connectors	
RGB/VGA	6 female 15-pin HD
S-video/composite video.	2 x 2 female BNC for S-video only (outputs 9 and 10) 2 x 2 female BNC for S-video or composite video pass-through (outputs 11 and 12) 2 x 1 female BNC for composite video only (outputs 7 and 8)
Nominal level	1 Vp-p for Y of S-video and for composite video 0.7 Vp-p for RGB 0.3 Vp-p for C of S-video
Minimum/maximum levels	
RGB/VGA	Analog: 0.3 V to 1.5 Vp-p with no offset (follows input)
S-video/composite video.	Analog: 0.0 V to 2.0 Vp-p with no offset
Impedance	75 ohms
Return loss	
RGB/VGA	-40 dB @ 5 MHz
S-video/composite video	-30 dB @ 5 MHz
DC offset	
S-video/composite video.	±5 mV with input at 0 offset
VGA.....	±10 mV with input at 0 offset
Switching type	
RGB/VGA	Triple-Action
S-video/composite video.	Vertical interval

Sync

Input type (VGA group)	RGBHV, RGBS, RGsB, RsGsBs
Output type (VGA group)	RGBHV, RGBS, RGsB, RsGsBs (follows input)
Genlock connector	1 BNC female (video input 9)
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 for RGBHV, RGBS
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 ns
Polarity.....	Positive or negative (follows input)

Reference Information, cont'd

Audio

Routing	14 x 6 stereo matrix
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	>85 dB, balanced, at maximum output (21 dBu) (unweighted)
Crosstalk	<-120 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)

NOTE Full attenuation is volume level 0, -98 dB. The default is -0 dB, volume level 64.

Audio input

Number/signal type	14 stereo, balanced/unbalanced
Connectors	(14) 3.5 mm captive screw connectors, 5 pole
Impedance	>25k ohms unbalanced, 50k 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 by RS-232, Ethernet, or front panel

NOTE 0 dBu = 0.775 Vrms, 0 dBV = 1 Vrms, 0 dBV $\approx$ 2 dBu

Audio output

Number/signal type	6 stereo, balanced/unbalanced
Connectors	(6) 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 host control port	(2) RS-232: 2 rear panel 3.5 mm captive screw connectors, 3 pole; 1 front panel 2.5 mm stereo mini jack (in parallel with the rear panel secondary port)
Baud rate and protocol.....	9600 baud; 8 data bits, 1 stop bit, no parity
Serial control pin configurations.	Captive screw connectors: 1 = TX, 2 = RX, 3 = GND Mini stereo jack: tip = TX, ring = RX, sleeve = GND
Ethernet host 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, SMTP
Default settings.....	Link speed and duplex level = autodetected IP address = 192.168.254.254 Subnet mask = 255.255.0.0 Gateway = 0.0.0.0 DHCP = off
Web server.....	Up to 200 simultaneous sessions 1 MB nonvolatile user memory
Program control.....	Extron's control/configuration program for Windows® Extron's Simple Instruction Set (SIS™) Microsoft® Internet Explorer ver. 6 or higher, Telnet

General

Power	100 VAC to 240 VAC, 50/60 Hz, 15 watts, internal, autoswitchable
Temperature/humidity	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing Operating: +32 to +104 °F (0 to +40 °C) / 10% to 90%, noncondensing
Rack mount	Yes
Enclosure type	Metal
Enclosure dimensions	3.5" H x 17.0" W x 9.4" D (2U high, full rack wide) 8.9 cm H x 43.2 cm W x 23.9 cm D (Depth excludes connectors. Width excludes rack ears.)
Product weight	15 lbs (6.8 kg)
Shipping weight	25 lbs (12 kg)
DIM weight	TBD
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.*

Reference Information, cont'd

Part Numbers and Accessories

MPX 866 A part numbers

Model	Part number
MPX 866 A Media Presentation Matrix Switcher	60-825-01
5-pole captive screw audio connectors (qty. 20)	10-703-12LF
3-pole captive screw serial connectors (qty. 2)	10-703-11LF
Matrix Switchers Control Program and Button Label Generator	
<i>MPX 866 A Media Presentation Matrix Switcher User's Manual</i>	

Optional accessories

These items can be ordered separately:

Adapters, power supplies, labels	Part number
MKP 1000 remote keypad	
Black	60-239-02
White	60-239-03
RAL9010 white	60-239-05
WT (water-tight)	60-239-51
MCP 1000M (master)	60-298-01
MCP 1000S (slave)	60-298-02
MKP 2000 matrix switcher X-Y remote control panel	
Black	60-682-02
White	60-682-03
RAL9010 white	60-682-05
MKP 3000	
Black	60-708-02
White	60-708-03
RAL9010 white	60-708-05

Cables

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

Bulk cable and termination tools

MHR mini high resolution cable	Part number
MHRVGA/500 non-plenum 5-conductor, 500' (150 m)	22-024-01
MHRVGA/1000 non-plenum 5-conductor, 1000' (300 m)	22-024-03
MHRVGAP/500 plenum 5-conductor, 500' (150 m)	22-131-02
MHRVGAP/1000 plenum 5-conductor, 1000' (300 m)	22-131-03
MHR-2/250 non-plenum 2-conductor, 250' (75m)	22-123-02
MHR-2/500 non-plenum 2-conductor, 500' (150 m)	22-123-03
MHR-2P/250 plenum 2-conductor, 250' (75m)	22-129-02
MHR-2P/500 plenum 2-conductor, 500' (150 m)	22-129-03

RG6 super high resolution cable	Part number
RG6/500 non-plenum 1-conductor, 500' (150 m)	22-098-02
RG6-1000 non-plenum 1-conductor, 1000' (300 m)	22-098-03
RG6P/500 plenum 1-conductor, 500' (150 m)	22-164-02
RG6P/1000 plenum 1-conductor, 1000' (300 m)	22-164-03

Termination tools and connectors	Part number
15-pin HD connectors, (VGA style), qty. 10	100-070-51
CTU 200 universal crimp tool	100-241-01
MHR universal crimp term. kit (100 MHR BNC connectors)	100-266-01
RG6 universal crimp term. kit (100 RG6 BNC connectors)	100-267-01
CTU 100 universal compression tool (BNC, F, RCA)	100-181-01
MHR BNC compression kit (100 MHR BNC connectors)	60-538-01
RG6 BNC compression kit (100 RG6 BNC connectors)	60-538-02

Terminated cable assemblies

VGA male-to-male cables	
VGA M-M MD, 3' to 100' (0.9 m to 30.4 m) (molded)	26-238- <i>nn</i>
VGA M-M BK, 3' to 100' (0.9 m to 30.4 m) (backshell)	26-238- <i>nn</i>
VGAP M-M MD, 3' to 25' (0.9 m to 7.6 m) (molded)	26-439- <i>nn</i>
VGAP M-M BK, 35' to 100' (10.6 m to 30.4 m) (backshell)	26-439- <i>nn</i>

VGA male-to-male with audio cables	Part number
VGA-A M-M MD, 3' to 100' (0.9 m to 30.4 m) (molded)	26-490- <i>nn</i>
VGA-A M-M BK, 3' to 100' (0.9 m to 30.4 m) (backshell)	26-490- <i>nn</i>
VGA-A 90° M-M MD, 3' to 12' (0.9 m to 3.6 m) (molded)	26-510- <i>nn</i>
VGA-A 90° M-M BK, 3' to 12' (0.9 m to 3.6 m) (backshell)	26-510- <i>nn</i>
VGA-A 90° Up M-M MD, 3' to 12' (0.9 m to 3.6 m) (molded)	26-510- <i>nn</i>
VGA-A 90° Up M-M BK 3' to 12' (0.9 m to 3.6 m) (backshell)	26-510- <i>nn</i>

Reference Information, cont'd

VGA male-to-female cables	Part number
VGA M-F MD, 3' to 100' (0.9 m to 30.4 m) (molded)	26-112- <i>nn</i>
VGA M-F BK, 3' to 100' (0.9 m to 30.4 m) (backshell)	26-112- <i>nn</i>
VGAP M-F MD, plenum 3' to 25' (0.9 m to 7.6 m) (molded)	26-438- <i>nn</i>
VGAP M-F BK, plenum 35' to 100' (10.6 m to 30.4 m) (backshell)	26-438- <i>nn</i>

VGA male-to-female with audio cables	Part number
VGA-A M-F MD, 3' to 50' (0.9 m to 15.2 m) (molded)	26-491- <i>nn</i>
VGA-A M-F BK, 3' to 50' (0.9 m to 15.2 m) (backshell)	26-491- <i>nn</i>
VGA-A 90° M-F MD, 3' to 12' (0.9 m to 3.6 m) (molded)	26-509- <i>nn</i>
VGA-A 90° M-F BK, 3' to 12' (0.9 m to 3.6 m) (backshell)	26-509- <i>nn</i>
VGA-A 90° Up M-F MD, 3' to 12' (0.9 m to 3.6 m) (molded)	26-509- <i>nn</i>
VGA-A 90° Up M-F BK 3' to 12' (0.9 m to 3.6 m) (backshell)	26-509- <i>nn</i>

S-video cables	Part number
MHR-2 SVM-M, 6' to 100' (1.8 m to 30.4 m)	26-316- <i>nn</i>
MHR-2P SVM-M, Plenum, 6' to 100' (0.9 m to 30.4 m))	26-522- <i>nn</i>

S-video/BNC adapters	Part number
SVHSF-BNCF, S-video female to BNC male, 1' to 6' (30 cm to 1.8 m)	26-541- <i>nn</i>
SVHSF-BNCF, S-video female to BNC female, 8" (20 cm)	26-541-01
SVHSM-BNCF, S-video male to BNC female, 1' to 6' (30 cm to 1.8 m)	26-353- <i>nn</i>
SVHSM-BNCF, S-video female to BNC female, , 8" (20 cm)	26-353-01

Composite video male-to-male cables	
RG6 BNC, 3' to 100' (0.9 m to 30.4 m)	26-383- <i>nn</i>

Button Labels

Figure B-1 provides 16-button strips of blank button labels. Feel free to photocopy them or cut them out of the manual, write button information in each button area as desired, and put them in the switcher's label window. Use scissors to trim the blank to the appropriate length.

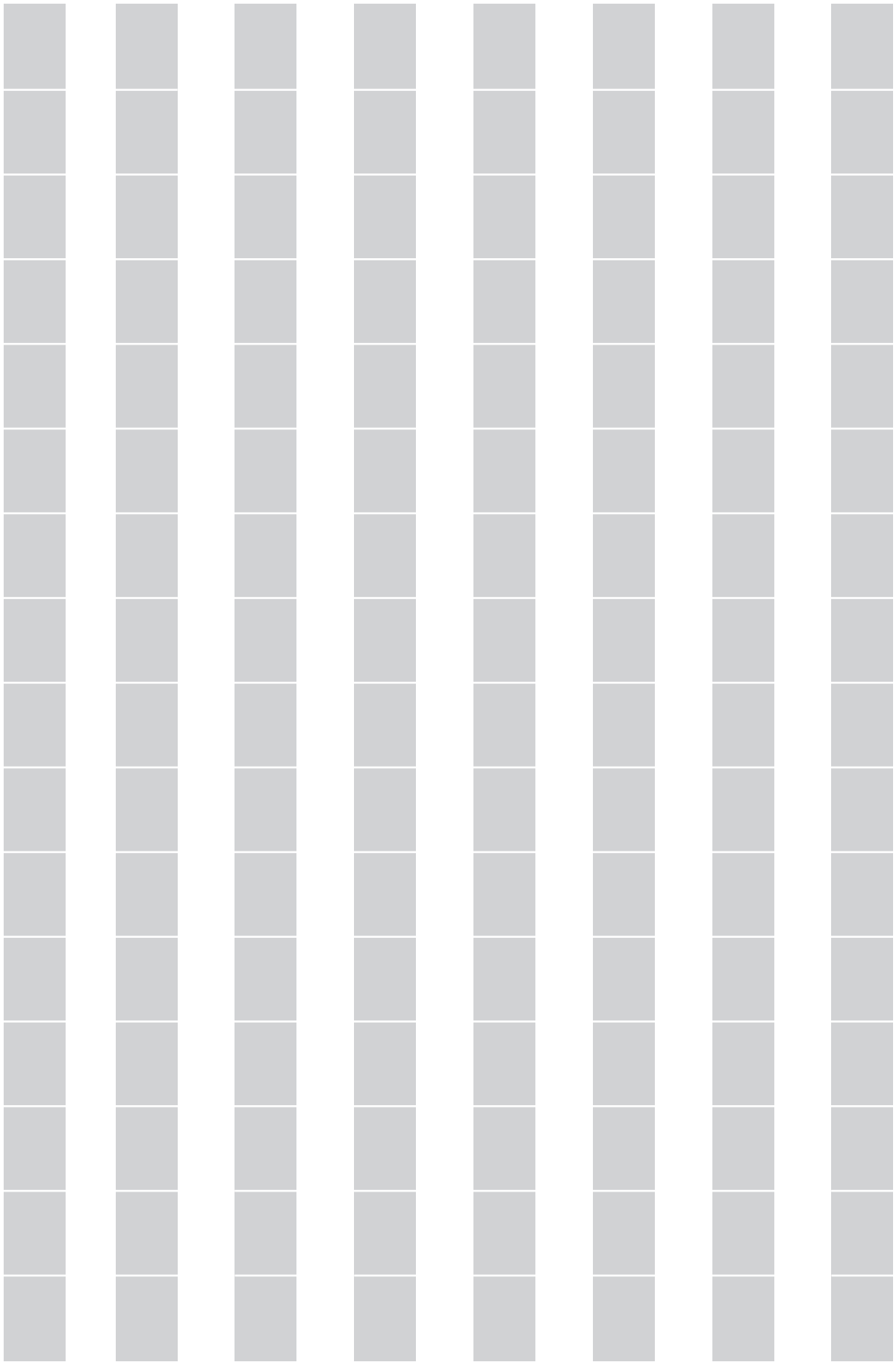


Figure B-1 — Button label blanks, 16-button strips

Reference Information, cont'd

FCC Class A Notice

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Note: This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance.

Extron's Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty 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.

**Extron Electronics, USA**

1230 South Lewis Street
Anaheim, CA 92805
USA
714.491.1500
Fax 714.491.1517

Extron Electronics, Europe

Beeldschermweg 6C
3821 AH Amersfoort
The Netherlands
+31.33.453.4040
Fax +31.33.453.4050

Extron Electronics, Asia

135 Joo Seng Road, #04-01
PM Industrial Building
Singapore 368363
+65.6383.4400
Fax +65.6383.4664

Extron Electronics, Japan

Kyodo Building
16 Ichibancho
Chiyoda-ku, Tokyo 102-0082 Japan
+81.3.3511.7655
Fax +81.3.3511.7656