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User Guide

Matrix Switchers

DMS 1600
DMS 3600

Configurable Digital Video Matrix Switchers







Extron® Electronics
INTERFACING, SWITCHING AND CONTROL

68-1829-01 Rev. C
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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.

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.

Consignes de Sécurité • Français



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



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

Attention

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

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

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

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

Avertissement

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

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

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

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

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

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

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.

Vorsicht

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

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

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

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

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

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

Instrucciones de seguridad • Español



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



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

Precaucion

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

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

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

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

Advertencia

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

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

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

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

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

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

安全须知 • 中文



这个符号提示用户该设备用户手册中有重要的操作和维护说明。



这个符号警告用户该设备机壳内有暴露的危险电压，有触电危险。

注意

阅读说明书 • 用户使用该设备前必须阅读并理解所有安全和使用说明。

保存说明书 • 用户应保存安全说明书以备将来使用。

遵守警告 • 用户应遵守产品和用户指南上的所有安全和操作说明。

避免追加 • 不要使用该产品厂商没有推荐的工具或追加设备，以避免危险。

警告

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

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

电源线保护 • 妥善布线， 避免被踩踏，或重物挤压。

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

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

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

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FCC Class A Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

The Class A limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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

For more information on safety guidelines, regulatory compliances, EMI/EMF compliance, accessibility, and related topics, **click here**.

Notational Conventions Used in this Guide

TIP: A tip provides a suggestion to make setting up or working with the device easier.

NOTE: A note draws attention to important information.

CAUTION: A caution warns of things or actions that might damage the equipment.

WARNING: A warning warns of things or actions that might cause injury, death, or other severe consequences.

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Introduction

- About this Guide
- About the DMS Matrix Switchers
- Features

About this Guide

This guide contains installation, configuration, and operating information for the Extron® DMS 1600 Matrix Switcher and DMS 3600 Matrix Switcher (see figure 1). These customizable DVI matrix switchers support up to 16 (DMS 1600) or 36 (DMS 3600) inputs and outputs.

NOTE: In this manual, the term "DMS matrix switcher" refers to either switcher model unless otherwise specified.

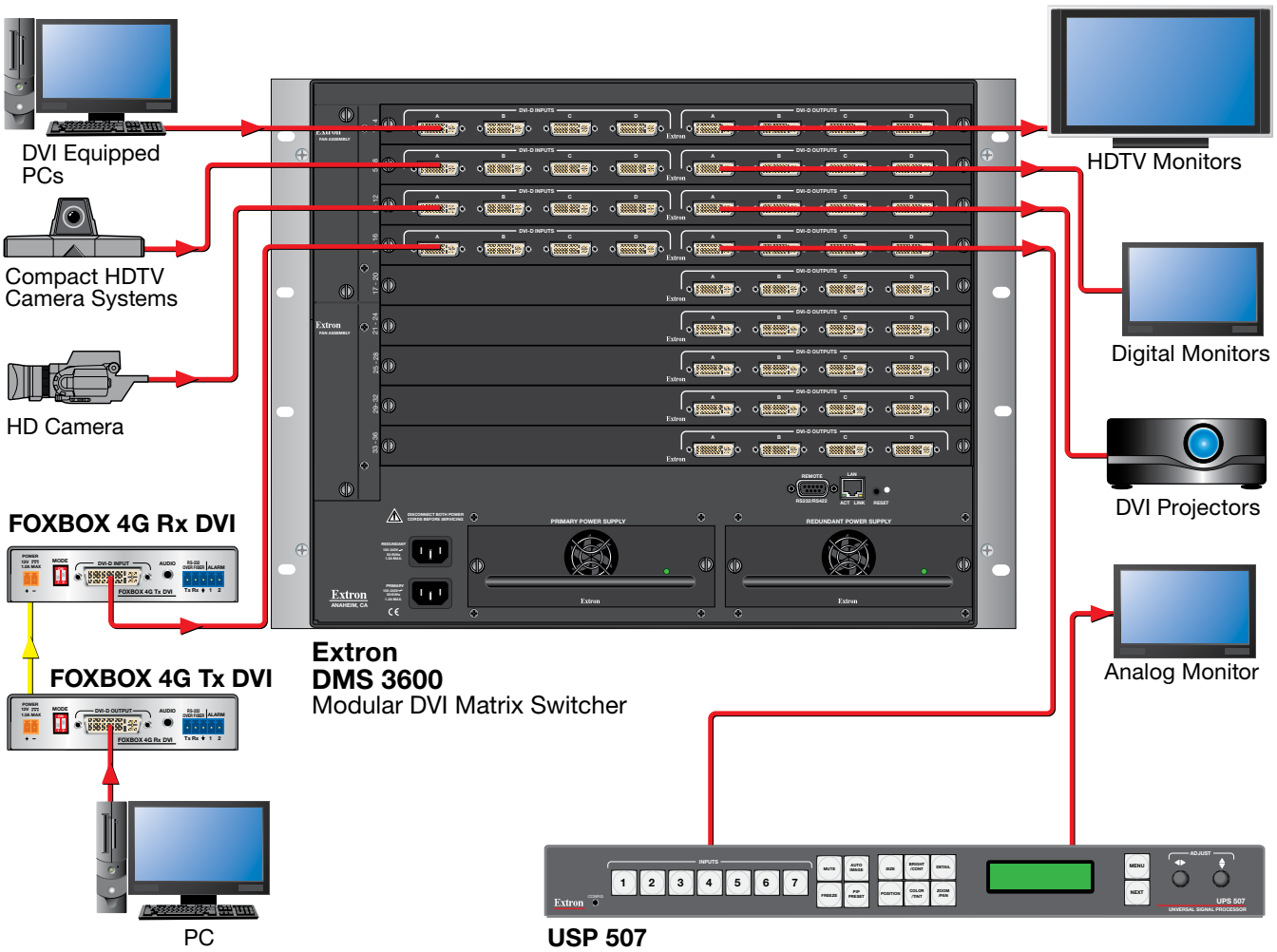


Figure 1. Typical DMS 3600 Application

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About the DMS Matrix Switchers

The DMS matrix switchers are configurable, modular matrix switchers that distribute a single link of DVI or HDMI (with suitable adapters) digital video. Each switcher is assembled from user-installed input and output (I/O) boards. There are three types of I/O boards available:

- 4x4 DVI input and output board
- 4 DVI input board
- 4 DVI output board

Each board supports up to four inputs, outputs, or both. The DMS 1600 can support up to four I/O boards of any of the above type. The DMS 3600 can support up to nine I/O boards.

By adding or removing I/O boards within certain rules that are detailed in **I/O Boards**, you can expand and contract the DMS 1600 and DMS 3600 from a 4-input by 4-output matrix to up to either:

- **DMS Matrix 1600 —** A 16-input by 16-output matrix
- **DMS Matrix 3600 —** A 36-input by 36-output matrix

The matrix switcher routes any input signal to any combination of outputs. The matrix switcher can route multiple input/output configurations simultaneously.

One or two internal, hot-swappable 100 VAC to 240 VAC, 50-60 Hz, 175-watt power supplies provide worldwide power compatibility and reliability.

The matrix switchers are single box solutions to complex digital video signal routing applications. Each input and output is individually isolated and buffered, and any input can be switched to any one or all outputs with virtually no crosstalk or signal noise between channels.

The matrix switchers can be remotely controlled via their rear panel Remote RS-232/RS-422 ports, their rear panel LAN port, and their front panel Configuration (USB) port using either the Extron Matrix Switchers Control Program or the Simple Instruction Set (SIS™). The icon-driven Extron software uses a graphical, drag-and-drop interface to make I/O configuration and other customization functions simple and convenient. The SIS is a set of basic ASCII code commands that provide simple control through a control system or PC.

The switcher can be operated remotely by any of the following connected to either a serial port 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/RS-422 only) an Extron MCP 1000 remote control panel
- (RS-232/RS-422 only) an Extron MKP 1000 remote keypad

The matrix switchers are housed in rack-mountable, 4U (DMS 1600) or 8U (DMS 3600) high metal enclosures with mounting flanges for standard 19-inch racks.

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Features

DVI video inputs and outputs — With DVI I/O boards, the switchers input and output DVI-D digital video signals on DVI-I connectors.

Automatic input board cable equalization — Typically equalizes greater than 100 feet (30 m) at 1.65 Gb/s of Extron DVID SL or equivalent high quality cable.

Automatic output board re-clocking — Restores the signal timing and shape allowing for increased transmission distances.

EDID Minder® — Lets you direct the monitor reference of the computer video source and what resolution to output.

Switching flexibility — The switcher provides individually buffered, independent matrix switched outputs.

- **Tie any input to any or all outputs.**
- **Quick multiple tie —** Multiple inputs can be switched to multiple outputs simultaneously. This allows all displays (outputs) to change from source to source at the same time.

Digital Sync Validation Processing (DSVP™) — In critical environments or unmanned, remote locations, it may be vital to know that sources are active and switching. The Extron DSVP feature confirms that input sources are active by scanning all sync inputs for active signals. DSVP provides instantaneous feedback via any of the remote control ports on the switcher.

E-mail notification — The DMS matrix switchers have a built-in SMTP client feature that send out e-mail notifications through an SMTP server. The e-mail notification function monitors a selected input. If the input loses or regains the sync signal, the switcher sends out an e-mail regarding the loss or restoration of the input signal to the e-mail recipients. The matrix switcher can send e-mails to up to 8 e-mail recipients.

Rooming — The switcher can be programmed to group multiple outputs to specific "rooms," allowing them to have their own presets.

Operational reliability — The DMS matrix switcher can support round-the-clock operation in mission-critical applications, using a combination of hot-swappable components and redundant power supplies.

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- **Field upgradable, hot-swappable modular design —** The architecture of the DMS matrix switcher allows you to repair, upgrade, reconfigure, or expand the matrix by simply installing a new I/O board or replacing a board of one type with one of another. Hot-swappable components let you replace any I/O board at any time without powering down the switcher.
- **Power redundancy —** Power redundancy, standard for the DMS 3600 and optional for the DMS 1600, ensures zero downtime and no loss of functionality through all but catastrophic power failure.
  - **Two AC power inputs —** Two inputs ensure the switcher operates through any power interruption short of a simultaneous loss of power from both power sources.
  - **Two power input circuits —** The two complete power circuits, from the plug, through the power supply, to the power insertion onto the power distribution plane, are separate and independent from each other (see figure 2).

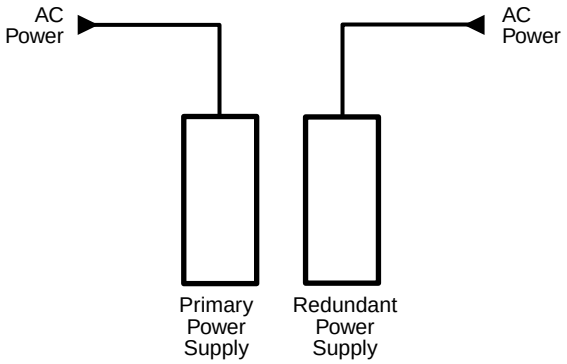


Figure 2. Redundant Power Supply Backs Up Primary Power Supply

  - **Two hot-swappable power supplies (standard for the DMS 3600 and optional for the DMS 1600) —** The 100 VAC to 240 VAC, 50-60 Hz power supplies of the matrix switchers provide worldwide power compatibility.
  - **Primary and redundant circuits —** The power supply circuitry is configured to automatically switch over. Should the primary power supply fail, the hot redundant power supply immediately assumes the load of the failed primary supply, meaning zero downtime and no loss of functionality.
  - **Ease of maintenance —** A failed power supply can be easily replaced from the rear at any time without powering down the matrix, and with no tools required.
  - **Power supply status LEDs —** Front panel and rear panel LEDs indicate the status of the primary and redundant power supplies.

Operational flexibility — Operations such as input/output selection and setting of presets can be performed using a variety of local and remote control mechanisms:

- **Front panel controller**
- **Matrix Switchers Control Program**
- **Simple Instruction Set (SIS)**
- **HTML pages**
- **Remote control panels and keypads (see the list on page 2)**

The serial ports allow remote control via a PC or a control system. The Ethernet link allows multiple remote links with two levels of password protection.

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Upgradeable firmware — The firmware that controls all switcher operation can be upgraded in the field via RS-232/RS-422 or Ethernet, without taking the switcher out of service. Firmware upgrades are available for download on the Extron website, **www.extron.com**, and can be installed using the Matrix Switchers Control Program or the built-in HTML pages.

Labeling — The included Button Label Generator 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 available as 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. The presets are available via front panel operation or serial port or Ethernet control.

Rack mountability — The DMS matrix switchers are housed in rack-mountable metal enclosures with mounting flanges for standard 19-inch racks.

Front panel security lockout modes (Executive mode) — If a matrix switcher is installed in an open area, where operation by unauthorized personnel may be a problem, a security lockout mode can be implemented. When the front panel is locked, a special button combination or SIS command is required to unlock the front panel controller and make the front panel fully operational.

I/O grouping — Allows the matrix switcher to be virtually divided into smaller subswitchers, making installation and control easier. I/O grouping limits the selection of inputs and outputs to members of the same group. I/O grouping allows specific outputs, such as those designated for a specific purpose, to be grouped together.

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Installation

This section describes the installation of the DMS 1600 and DMS 3600, including:

- **Setup and Installation Checklist**
- **Rear Panel Cabling and Features**
- **Front Panel Configuration Port**

Setup and Installation Checklist

Get ready

- ☐ Familiarize yourself with the DMS matrix switcher.
- ☐ Obtain IP setting information for the matrix switcher from the local network administrator (see "**Ethernet Connection**" on page 111).

Configure the matrix switcher

- ☐ Install the desired I/O boards (**page 103**).

Perform physical installation

- ☐ If desired, create (**page 85**) and replace (**page 109**) button labels.
- ☐ If desired, install the switcher in a rack (**page 102**).
- ☐ Cable input and output devices to the I/O boards (**page 9**).
- ☐ If desired, connect computers or control systems to any of the remote control ports (a serial port [**page 10**], a USB port [**page 13**], and a LAN port [**page 11**]) on the switcher.
- ☐ Connect power (**page 12**).
- ☐ Test the switcher by creating a tie (**page 22**).

Ancillary operations

- ☐ Install the Matrix Switchers Control Program (**page 62**).

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Rear Panel Cabling and Features

Figure 3 shows a DMS 1600. **Figure 4**, on the next page, shows a DMS 3600. The two models have similar features, but different-sized enclosures and a different arrangement of the features. The DMS 3600 has two fan assemblies.

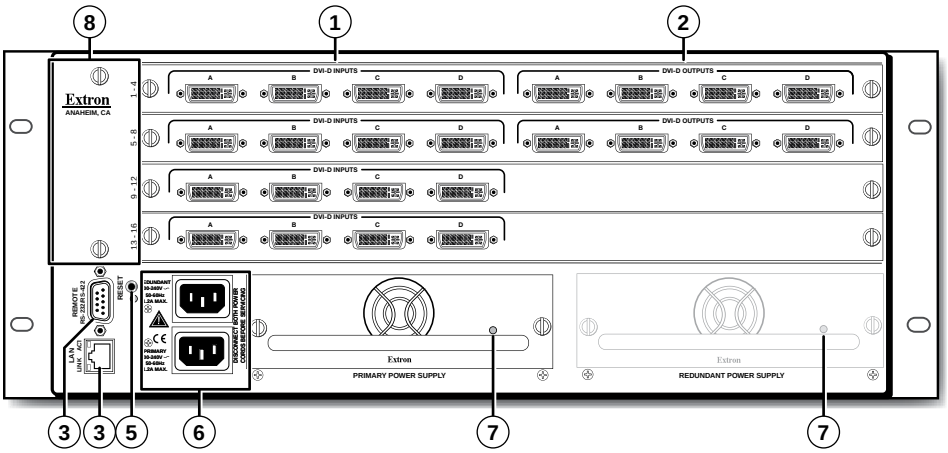


Figure 3. DMS 1600 Matrix Switcher Rear Panel

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

Remove system power before making all connections.

1. **DVI input connectors** (see **page 10**)
2. **DVI output connectors** (see **page 10**)
3. **Remote RS-232 / RS-422 port** (see **page 10**)
4. **LAN connection (Ethernet connector)** (see **page 11**)
5. **Reset button and LED** (see **page 12**)
6. **Power connectors** (see **page 12**)
7. **Power indicator LEDs** (see **page 12**)
8. **Cooling fan assemblies** (see "**Removing and Installing a Fan Module**")

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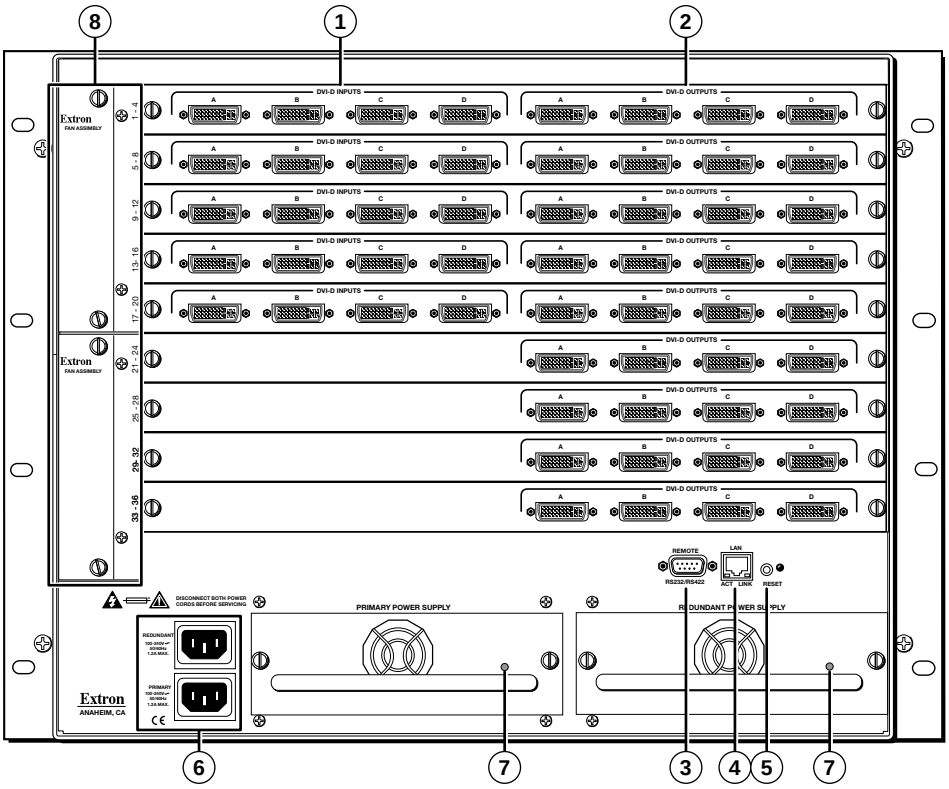


Figure 4. DMS 3600 Matrix Switcher Rear Panel

1. **DVI input connectors** (see **page 10**)
2. **DVI output connectors** (see **page 10**)
3. **Remote RS-232 / RS-422 port** (see **page 10**)
4. **LAN connection (Ethernet connector)** (see **page 11**)
5. **Reset button and LED** (see **page 12**)
6. **Power connectors** (see **page 12**)
7. **Power indicator LEDs** (see **page 12**)
8. **Cooling fan assemblies** (see "**Removing and Installing a Fan Module**")

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I/O Boards

Figure 5 shows a mix of boards. On the boards, the input and output DVI connectors on the I/O boards are identified as A through D. Each I/O board is identified by the input and output numbers supported by the board position (1 - 4, 5 - 8, and so on).

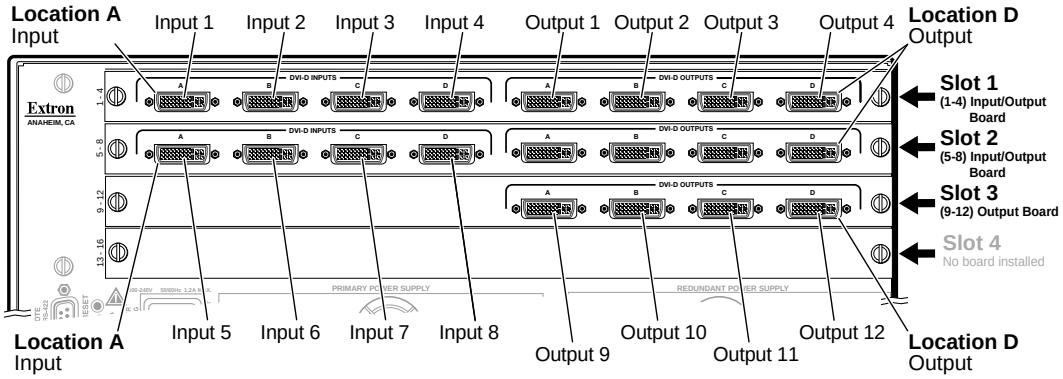


Figure 5. Arrangement of Inputs and Outputs on the I/O Boards

Slot	Inputs and outputs	Slot	Inputs and outputs
1	1 through 4	5*	17 through 20
2	5 through 8	6*	21 through 24
3	9 through 12	7*	25 through 28
4	13 through 16	8*	29 through 32
		9*	33 through 36

* DMS 3600 only

Locations A through D correspond to the input and output numbers identified by the board position numbers. (For example, the input and output numbers supported by the I/O board in location 5 - 8 are as follows: A = 5, B = 6, C = 7, and D = 8.) Inputs and outputs are grouped separately, with inputs A through D on the left and outputs A through D on the right.

There are certain rules for configuring the DMS matrix switcher for proper operation, as detailed below:

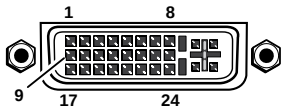
- The top slot (slot 1) **must** contain a 4x4 DVI input and output board.
- The next slot (slot 2) can contain any of the three board types (a 4x4 DVI input and output board, 4 DVI input board, or 4 DVI output board) or a blank panel.
- A 4x4 DVI input and output board can be followed (in the slot directly underneath it) by any of the board types.
- After you insert a 4 DVI input board or 4 DVI output board, all active boards underneath it **must** be the same type.
- If you install a blank panel, all slots under it **must** contain blank panels (you cannot skip a slot).

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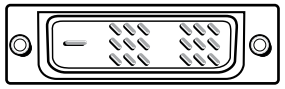
NOTE: Although the I/O boards use DVI-I connectors, the switchers handle only DVI-D (digital) video and the boards are labeled "DVI-D."

① **DVI-D Inputs connectors —** Connect DVI cables between these ports and the DVI output ports of the digital video sources. Figure 6 defines the pinout for the DVI protocol.

② **DVI-D Outputs connectors —** Connect DVI displays for the routed direct digital image. Figure 6 defines the pinout for the DVI protocol.



Female Connector


Male Connector

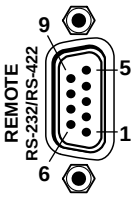
* CEC control on pin 8 is a proprietary usage, not the industry standard.

Pin	Signal	Pin	Signal	Pin	Signal
1	TMDS data 2–	9	TMDS data 1–	17	TMDS data 0–
2	TMDS data 2+	10	TMDS data 1+	18	TMDS data 0+
3	TMDS data 2 shield	11	TMDS data 1 shield	19	TMDS data 0 shield
4	Spare	12	Spare	20	Spare
5	Spare	13	Spare	21	Spare
6	DDC clock	14	+5 V power	22	TMDS clock Shield
7	DDC data	15	Ground (+5 V)	23	TMDS clock+
8	CEC control*	16	Hot Plug Detect	24	TMDS clock–

Figure 6. DVI Connectors

Remote Port

③ **Remote RS-232/RS-422 port —** Connect a host device, such as a computer, touch panel control, or RS-232 capable PDA to the switcher via this 9-pin D connector for serial RS-232/RS-422 control (see figure 7).



Pin	RS-232	Function	RS-422	Function
1	—	Not used	—	Not used
2	TX	Transmit data	TX–	Transmit data (–)
3	RX	Receive data	RX–	Receive data (–)
4	—	Not used	—	Not used
5	Gnd	Signal ground	Gnd	Signal ground
6	—	Not used	—	Not used
7	—	Not used	RX+	Receive data (+)
8	—	Not used	TX+	Transmit data (+)
9	—	Not used	—	Not used

Figure 7. Remote RS-232/RS-422 Port

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

NOTE: The switcher can support either the RS-232 or RS-422 serial communication protocol, and can operate at 9600, 19200, 38400, or 115200 baud rates.

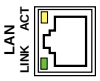
See "**Selecting the Rear Panel Remote Port Protocol and Baud Rate**" to configure the RS-232/RS-422 port from the front panel.

If desired, connect an MKP 2000 or MKP 3000 remote control panel to the rear panel Remote port on the switcher. Refer to the *MKP 2000 Remote Control Panel User Guide* or the *MKP 3000 User Guide* for details.

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Ethernet Connection

④ **LAN port —** If desired, for IP control of the system, 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 running the Extron Matrix Switchers Control Program or has downloaded HTML pages from the switcher.



Link LED indicator — The Link LED indicates that the switcher is properly connected to an Ethernet LAN. This LED should light steadily.

Act LED indicator — The Act LED indicates transmission of data packets on the RJ-45 connector. This LED should flicker as the switcher communicates.

Cabling

It is vital that your Ethernet cables be the correct cable type and that they be properly terminated with the correct pinout. Ethernet links use Category (CAT) 3, 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 of 328 feet (100 m).

NOTES:
- Do not use standard telephone cables. Telephone cables do not support Ethernet or Fast Ethernet.
- Do not stretch or bend cables. Transmission errors can occur.

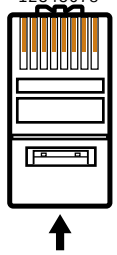
The cable used depends on your network speed. The switcher supports both 10 Mbps (10Base-T — Ethernet) and 100 Mbps (100Base-T — Fast Ethernet), half-duplex and full-duplex Ethernet connections.

- 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.

RJ-45 connector wiring

The Ethernet cable can be terminated as a straight-through cable or a crossover cable and must be properly terminated for your application (see figure 8).

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



Crossover Cable

Pin	End 1 Wire color	End 2 Wire color
1	White-green	White-orange
2	Green	Orange
3	White-orange	White-green
4	Blue	Blue
5	White-blue	White-blue
6	Orange	Green
7	White-brown	White-brown
8	Brown	Brown
	T568A	T568B

A cable that is wired as T568A at one end and T568B at the other (Tx and Rx pairs reversed) is a "crossover" cable.

Straight-through Cable

Pin	End 1 Wire color	End 2 Wire color
1	White-orange	White-orange
2	Orange	Orange
3	White-green	White-green
4	Blue	Blue
5	White-blue	White-blue
6	Green	Green
7	White-brown	White-brown
8	Brown	Brown
	T568B	T568B

A cable wired the same at both ends is called a "straight-through" cable, because no pin/pair assignments are swapped.

Figure 8. RJ-45 Connector and Pinout Tables

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Reset Button and LED



⑤ **Reset button —** The Reset button initiates four levels of reset of the matrix switcher. For four different reset levels, press and hold the button while the switcher is running or while you power up the switcher (see "**Rear Panel Operations**" for details).

Power

⑥ **Primary and Redundant AC power connectors —** Plug standard IEC power cords into these connectors to connect the switcher to 100 VAC to 240 VAC, 50-60 Hz power sources.

> **NOTE:** For the most reliable power, include a redundant power supply for your DMS 1600 system (the secondary power supply is standard for the DMS 3600) and connect the Redundant power cord to either an uninterruptible power source or to a power source that is completely independent from the primary power source.

⑦ **Primary and Redundant power supply indicator LEDs —**

Green — Indicates that the associated power supply is operating within normal tolerances.

Red — Indicates that the associated power supply is operating outside the normal tolerances or has failed (see "**Maintenance and Modifications**" to replace the power supply).

Fans

⑧ **Cooling fan or fans —** See "**Removing and Installing a Fan Module**."

Front Panel Configuration Port

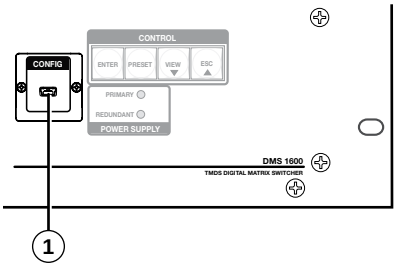


Figure 9. Front Panel Configuration (Config) Port

① **Configuration port —** This mini USB B port serves a similar 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.

> **NOTE:** A front panel Configuration port connection and a rear panel Remote port connection can both be active at the same time. If commands are sent simultaneously to both, the command that reaches the processor first is handled first.

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Operation

This section describes the front panel operation of the DMS 1600 and DMS 3600, including:

- **Front Panel Controls and Indicators**
- **Rear Panel Power Indicators**
- **Front Panel Operations**
- **Rear Panel Operations**
- **Troubleshooting**
- **Configuration Worksheets**

Front Panel Controls and Indicators

The front panel controls (see figure 10 and **figure 11** on the next page) are grouped into two sets. The input and output buttons are grouped on the left side of the control panel. The control buttons are grouped on the right side of the panel.

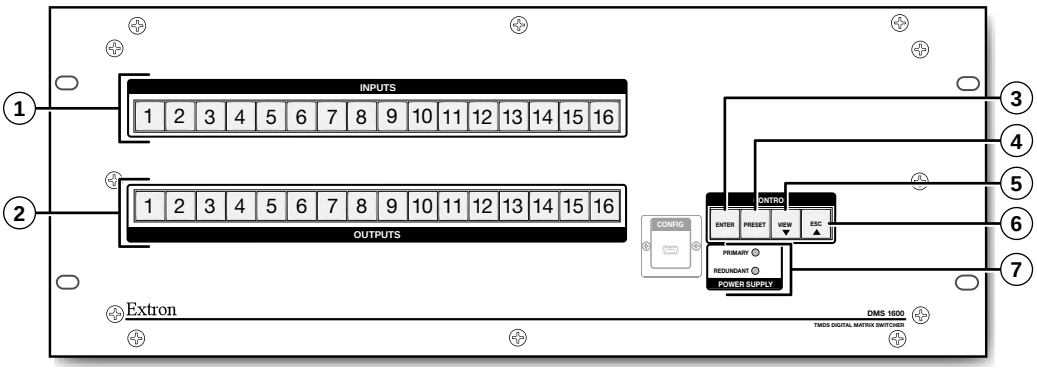


Figure 10. Front Panel, DMS 1600 Switcher

1. **Input buttons** (see **page 16**)
2. **Output buttons** (see **page 16**)
3. **Enter button** (see **page 17**)
4. **Preset button** (see **page 18**)
5. **View button** (see **page 18**)
6. **Esc button** (see **page 18**)
7. **Power indicators** (see **page 19**)

The illuminated pushbuttons can be labeled with either text or graphics. The buttons can be set to provide amber background illumination all the time or the background illumination can be turned off (see "**Background Illumination**"). The buttons blink or are lit at full intensity (depending on the operation) when selected.

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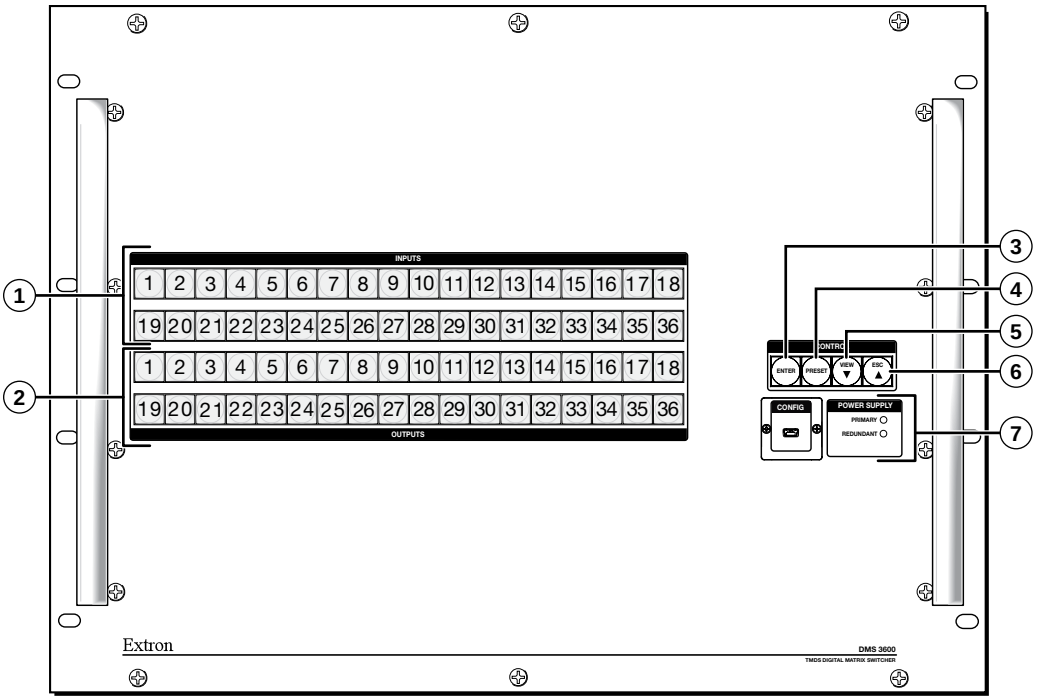


Figure 11. Front Panel, DMS 3600 Switcher

1. **Input buttons** (see page 16)
2. **Output buttons** (see page 16)
3. **Enter button** (see page 17)
4. **Preset button** (see page 18)
5. **View button** (see page 18)
6. **Esc button** (see page 18)
7. **Power indicators** (see page 19)

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Input and Output Buttons

Primary functions					
	Action	Select input or output for tie being created.			
	Indication	*Blink*: potential tie/untie. *Lit*: current tie			
	DMS 1600	1	2	3 through	15 and 16
	DMS 3600	1	2	3 through	17 and 18
		19 through 36			
Secondary functions					
I/O Grouping	Action 1	Input 1 and Output 1: Select *I/O Group* mode.			
	Action 2	Assign an input or output to the selected group.			
	Indication	*Lit*: Input or output is assigned to the selected group.			
Presets	Action	Select a preset in *Preset* mode.			
	Indication	*Lit*: A preset has already been saved to this location. *Blink*: Preset location is selected to be saved.			
Output mutes	Action	*Outputs*: Press and hold to mute the output.			
	Indication	*Outputs, blink*: Output is muted.			
Port configuration	Action 1			Inputs 15, 16 (17, 18): Select Configuration mode	
	Action 2			Input 15 (17): Select RS-232.	Input 16 (18): Select RS-422.
	Indication			*Blink*: selected	*Blink*: selected
Background illumination	Action	Input 1 and Input 2: Toggle between background illumination or buttons unlit.			

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① **Input buttons —** The input buttons have one primary function (❑) and five secondary functions (•):

❑ Select and identify an input.

- **(Input 1 only)** Press simultaneously with the Output 1 button to select *I/O Group* mode (see "**I/O Grouping**").
- Select a preset (see "**Using Presets**").
- **(Input 1 and Input 2 only)** Toggle background illumination of the buttons on and off (see "**Background Illumination**").
- **Input 15 and 16 (DMS 1600) or Input 17 and 18 (DMS 3600)** Select *Serial Port Selection and Configuration* mode (see "**Selecting the Rear Panel Remote Port Protocol and Baud Rate**").
- **Input 15 (DMS 1600) or Input 17 (DMS 3600) —** Select the RS-232 protocol for the RS-232/RS-422 port in *Serial Port Selection and Configuration* mode and indicate its selection (see "**Selecting the Rear Panel Remote Port Protocol and Baud Rate**").
- **Input 16 (DMS 1600) or Input 18 (DMS 3600) —** Select the RS-422 protocol for the RS-232/RS-422 port in *Serial Port Selection and Configuration* mode and indicate its selection (see "**Selecting the Rear Panel Remote Port Protocol and Baud Rate**").

② **Output buttons —** The output buttons have one primary function (❑) and three secondary functions (•):

❑ Select and identify output.

- (**Output 1 only**) Press simultaneously with the Input 1 button to select *I/O Group* mode (see "**I/O Grouping**").
- **(DMS 1600)** Select a preset (see "**Using Presets**").
- Mute the output (see "**Muting and Unmuting Outputs**").

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Control Buttons

Primary functions					
	Action	Save changes	Select Preset mode	Select View mode	Cancel/escape
	Indication	*Blink*: save needed	*Blink*: Save preset Lit: Recall preset	View mode selected	Flashes once
					
Secondary functions					
I/O Grouping	Action	Select group 1.	Select group 2.	Select group 3.	Select group 4.
	Indication	*Lit*: group selected.	*Lit*: group selected.	*Lit*: group selected.	*Lit*: group selected.
Port configuration	Action	Select 9600 baud.	Select 19200 baud.	Select 38400 baud.	Select 115200 baud.
	Indication	*Blink*: selected	*Blink*: selected	*Blink*: selected	*Blink*: selected
Front panel lock	Action	With Esc, toggle front panel lock on and off.			With Enter, toggle front panel lock on and off.
	Indication		Flash twice to indicated the front panel has been locked or unlocked.		

③ **Enter button —** The Enter button has three primary functions (❑) and three secondary functions (•):

❑ Saves configuration or preset changes that you make on the front panel. To create a simple configuration:

- Press the desired input button (①).
- Press the desired output buttons (②).
- Press the Enter button (③).

❑ Indicates that a potential tie has been created but not saved.

❑ Indicates that a global preset has been selected to be saved or recalled but that the preset action has not been accomplished.

- In the *I/O Group* mode, selects group 1 and indicates its selection (see "**I/O Grouping**").
- Selects 9600 baud for the RS-232/RS-422 port in *Serial Port Selection and Configuration* mode and indicate its selection (see "**Selecting the Rear Panel Remote Port Protocol and Baud Rate**").
- With the Esc button, toggles the front panel lock on and off (see "**Locking the Front Panel (Executive Mode)**").

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④ **Preset button —** The Preset button has 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.

- In the *I/O Group* mode, selects group 2 and indicates its selection (see "**I/O Grouping**").
- Selects 19200 baud for the RS-232/RS-422 port in *Serial Port Selection and Configuration* mode and indicates its selection (see "**Selecting the Rear Panel Remote Port Protocol and Baud Rate**").
- With the View button, indicates that the front panel lock has been toggled on or off (see "**Locking the Front Panel (Executive Mode)**").

⑤ **View button —** The View button has one primary function (❑) and four secondary functions (•):

❑ Selects and indicates *View-only* mode, which displays the current configuration.

> **NOTE:** View-only mode also provides a way to mute and unmute the outputs (see "**Muting and Unmuting Outputs**").

- In the *I/O Group* mode, selects group 3 and indicates its selection (see "**I/O Grouping**").
- With the Esc button, commands the front panel system reset (see "**Performing a System Reset from the Front Panel**").
- Selects 38400 baud for the RS-232/RS-422 port in *Serial Port Selection and Configuration* mode and indicates its selection (see "**Selecting the Rear Panel Remote Port Protocol and Baud Rate**").
- With the Preset button, indicates that the front panel lock has been toggled on or off (see "**Locking the Front Panel (Executive Mode)**").

⑥ **Esc button —** The Esc button has two primary functions (❑) and three secondary functions (•):

❑ Cancels operations or selections in progress and resets the front panel button indicators.

> **NOTE:** The Esc button does not reset the current configuration or any presets..

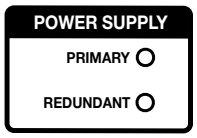
❑ Flashes once to indicate that the escape function has been activated.

- In the *I/O Group* mode, selects group 4 and indicates its selection (see "**I/O Grouping**").
- Selects 115200 baud for the RS-232/RS-422 port in *Serial Port Selection and Configuration* mode and indicates its selection (see "**Selecting the Rear Panel Remote Port Protocol and Baud Rate**").
- With the Enter button, toggles the front panel lock on or off (see "**Locking the Front Panel (Executive Mode)**").

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Power Indicators

⑦ **Primary and Redundant Power Supply LEDs —**



Green — Indicates that the associated power supply is operating within normal tolerances.

Red — Indicates that the associated power supply is operating outside the normal tolerances, has failed, or (**DMS 3600 only**) is not installed (see "**Maintenance and Modifications**" to replace the power supply).

Unlit (DMS 1600 Redundant LED) — No power supply is installed.

Button Labels

The numbered translucent covers on the input and output buttons can be removed and replaced to insert labels behind them.

Input and output labels can be created easily with the Extron Button Label Generator software, which ships with every Extron matrix switcher. Each input and output can be labeled with names, alphanumeric characters, or color bitmaps for easy and intuitive input and output selection (see figure 12) (see "**Matrix Software**" for details on using the labeling software, see "**Maintenance and Modifications**" for blank labels and a procedure for removing and replacing the translucent covers).

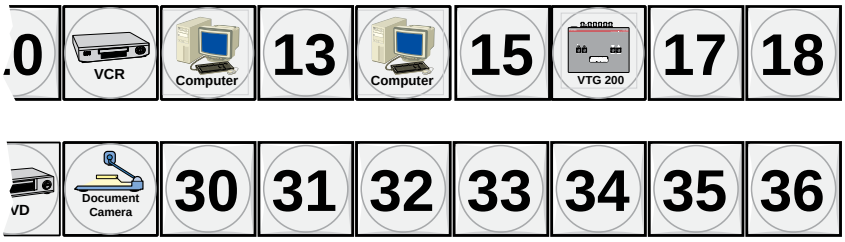


Figure 12. Sample Button Labels and Icons

Rear Panel Power Indicators

The two power supply modules (primary power supply and redundant power supply, see figure 13) each have a 2-color LED.

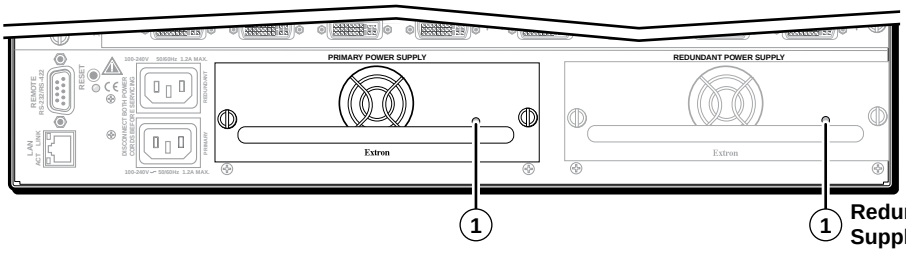


Figure 13. Rear Panel Power Supply Indicators

① **Primary and Redundant Power Supply LEDs —**

Green — Indicates that the associated power supply is operating within normal tolerances.

Red — Indicates that the associated power supply has failed (see "**Maintenance and Modifications**" to replace the power supply).

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Front Panel Operations

The following paragraphs detail the power-up process and provide sample procedures for the following actions:

- **Creating ties, sets of ties, and configurations**
- **Changing a configuration**
- **Viewing ties, sets of ties, and configurations**
- **Creating I/O groups**
- **Saving a preset**
- **Recalling a preset**
- **Muting and unmuting outputs**
- **Locking and unlocking the front panel**
- **Performing a front panel reset**
- **Toggling background illumination on and off**
- **Reading and setting the Remote RS-232/RS-422 port settings**

Definitions

The following terms, which apply to 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. When a preset is retrieved from memory, it becomes the **current configuration**. Presets can be saved and recalled from the front panel and any of the serial or LAN ports. For front panel operations, preset locations are assigned to the input buttons.
- **Room —** A subset of outputs that are logically related to each other, as determined by the operator. The switchers support up to 10 **rooms**, each of which can consist of from 1 to 16 outputs.
- **Room memory preset —** A **configuration** consisting of outputs in a single **room** that has been stored. When a room preset is retrieved from memory, it becomes the **current configuration**.

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Power

Apply power by connecting one or both power cords between the Primary and Redundant AC power connectors and the AC sources. The switcher performs a self-test that randomly flashes the front panel buttons; then flashes all buttons green, red, and amber; and then turns them either off or to background illumination. An error-free power up self-test sequence leaves all control buttons either unlit or showing background illumination.

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 fails to respond to commands or button pushes. If your switcher locks up on power-up, call the Extron S3 Sales & Technical Support Hotline (see the **rear cover** of this manual for the phone number in your region of the world).

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 front panel button indications that may be lit.
2. Select the desired input and one or more outputs by pressing the input and output buttons. Input buttons and output buttons light or blink green to indicate ties.
   - To indicate **potential ties**, output buttons **blink** when an input is selected.
   - To indicate **current ties**, output buttons **light steadily** when an input is selected.
   - To clear unwanted outputs, press and release the associated lit output buttons. To indicate **potential unties**, output buttons **blink** when an output is deselected but not untied from the input.
3. Press and release the Enter button to accept the tie.
4. Repeat steps **1** through **3** to create or delete additional ties until the desired configuration is complete.

NOTES:
- Only one input can be tied to an output.
- If a tie is made between an input and an output, and 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 the button for that input lights.
- As each input and output is selected, the associated output button blinks to indicate a tentative tie. Buttons for outputs 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.
- If you press the input button for an input that is I/O grouped (see I/O grouping), you cannot select the output button for an output in a different group. The associated input button remains lit.

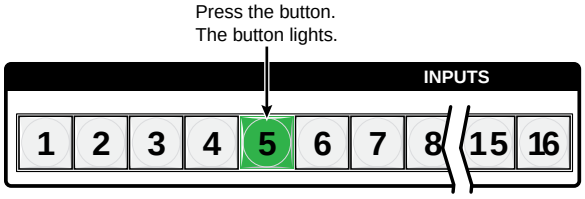
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Example 1: Creating a set of ties

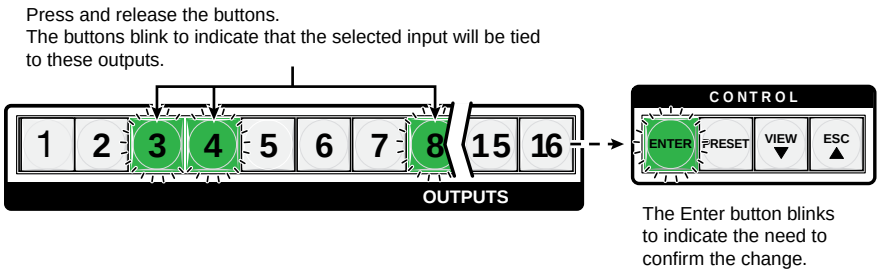
In the following example, input 5 is tied to outputs 3, 4, and 8. The steps show the front panel indications that result from your action.

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

1. **Clear all selections**: Press and release the Esc button. The button flashes once.
2. **Select an input**: Press and release the input 5 button.

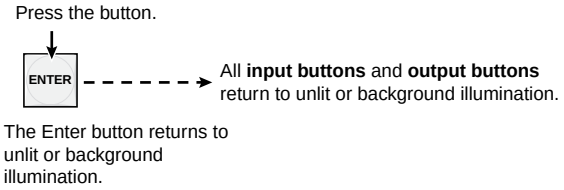


3. **Select the outputs**: Press and release the output 3, output 4, and output 8 buttons.

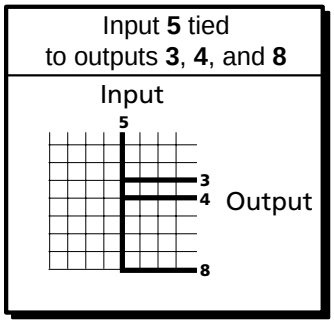


NOTE: You can cancel the entire set of ties at this point by pressing and releasing the Esc button. The Esc button flashes once and all selected input and output buttons return to unlit or background illumination.

4. **Confirm the change**: Press and release the Enter button.



The current configuration is now input 5 tied to output 3, output 4, and output 8.



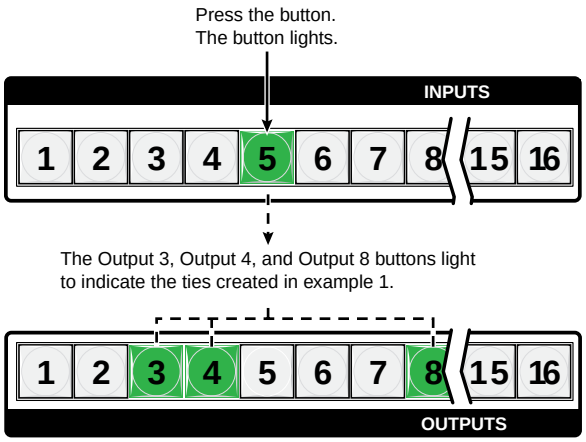
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Example 2: Adding a tie to a set of ties

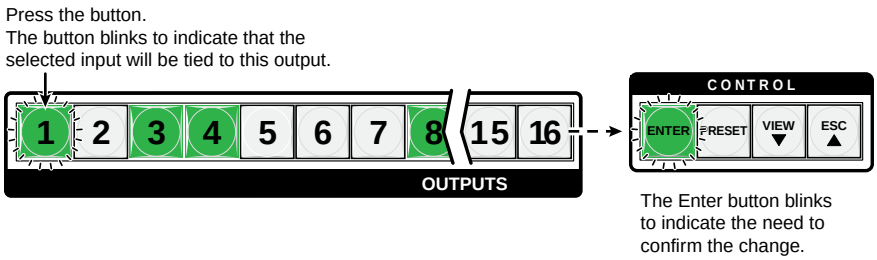
In the following example, a new tie is added to the current configuration. The steps show the front panel indications that result from your action.

NOTE: This example assumes that you have performed **example 1**.

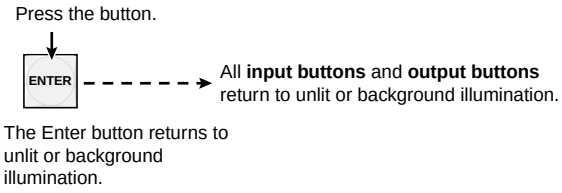
1. **Clear all selections**: Press and release the Esc button. The button flashes once.
2. **Select an input**: Press and release the input 5 button.



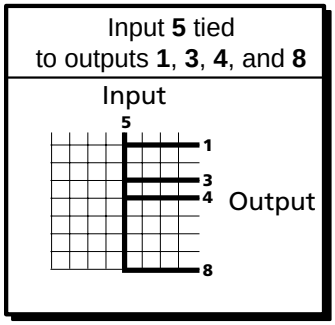
3. **Select the output**: Press and release the output 1 button.



4. **Confirm the change**: Press and release the Enter button.



The current configuration is now input 5 tied to output 1, output 3, output 4, and output 8.



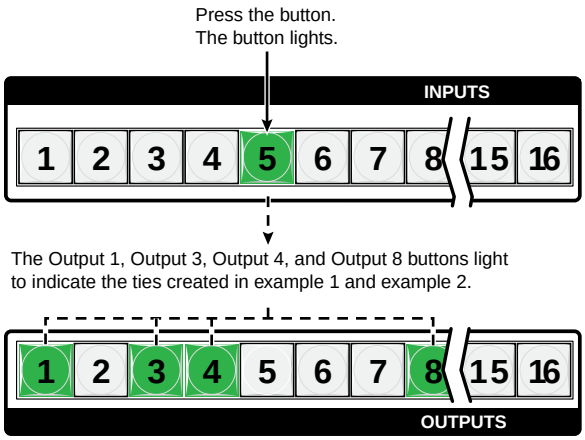
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Example 3: Removing a tie from a set of ties

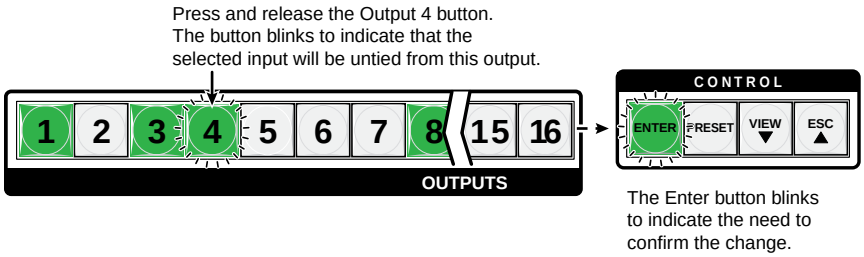
In the following example, an existing tie is removed from the current configuration. The steps show the front panel indications that result from your action.

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

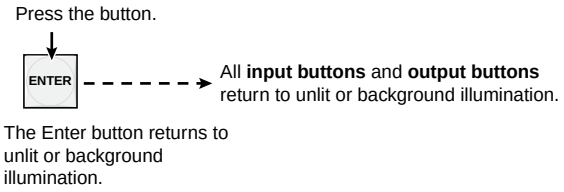
1. **Clear all selections**: Press and release the Esc button. The button flashes once.
2. **Select an input**: Press and release the input 5 button.



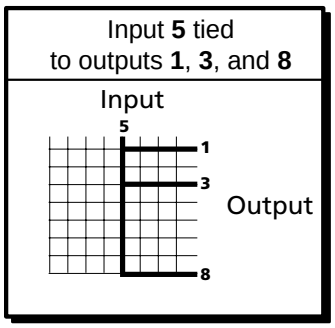
3. **Select the output**: Press and release the output 4 button.



4. **Confirm the change**: Press and release the Enter button.



The current configuration is now input 5 tied to output 1, output 3, and output 8.



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Viewing a Configuration

The current configuration can be viewed using the front panel buttons. The *View-only* mode prevents inadvertent changes to the current configuration. *View-only* mode also provides a way to mute outputs (see "**Muting and Unmuting Outputs**").

View the current configuration as follows:

1. Press the Esc button to clear any front panel button indications that may be lit.
2. Press and release the View button. All of the buttons light for outputs that are not tied.
3. Select the desired input or outputs whose ties you wish to view by pressing the input and output buttons.

   If you press an output button for which there are no ties, the output buttons light for all outputs without ties.

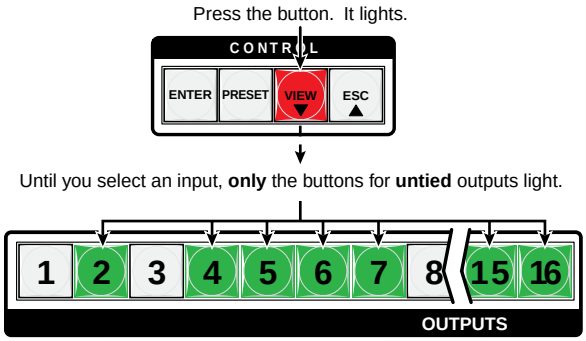
NOTES:
- To see all ties of the current configuration, press and release each input and output button, one at a time..
- After 30 seconds of front panel inactivity, *View-only* mode automatically ends.

Example 4: Viewing Ties

In the following example, the ties in the current configuration are viewed. The steps show the front panel indications that result from your action.

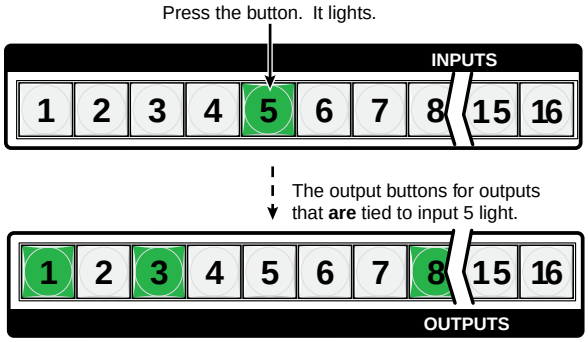
NOTE: This example assumes that you have performed **example 1**, **example 2**, and **example 3.**

1. **Clear all selections**: Press and release the Esc button. The button flashes once.
2. **Select *View-only* mode**: Press and release the View button.



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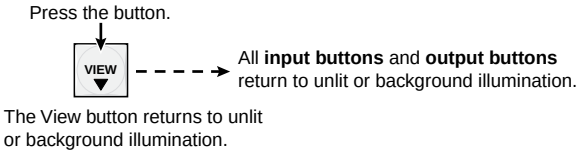
3. **Select an input**: Press and release the input 5 button.



NOTE: You can also view a set of ties by selecting a tied output. Demonstrate this as follows:

1. Note the number of a lit output button, and then press and release the output button for an untied (unlit or background illumination) output.
2. Observe that all of the untied outputs light.
3. Press the output button that you noted previously.
4. Observe that the selected output button, the tied input button (input 5), and the output buttons light for all of the outputs that are tied to the input.

4. **Exit *View-only* mode**: Press and release the View button to exit *View-only* mode.



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I/O Grouping

I/O grouping is a matrix switcher feature that allows you to subdivide the front panel controls of the matrix into up to four smaller functional subswitchers (see figure 14) and limit tie creation. The I/O group limitation applies to tie creation *from the front panel only*. Inputs and outputs can be assigned to one of four groups or not assigned to any group.

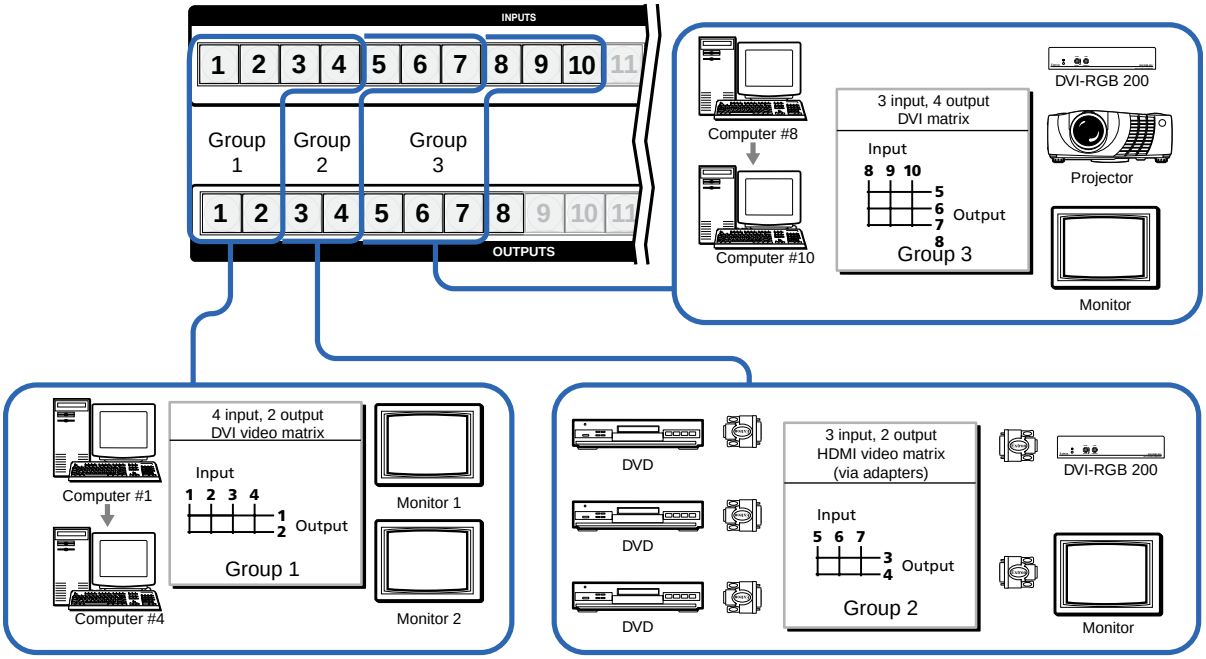


Figure 14. I/O Grouping

When you are creating ties on the front panel, inputs and outputs that are assigned to a group can be tied only to other outputs and inputs within the same group. For example, a front panel operator cannot tie an input that is assigned to group 1 to an output that is assigned to group 2. Ungrouped inputs and outputs can be switched to outputs and inputs in any group. Ties between groups (an input in group 1 tied to an output in group 2) *can* be created under RS-232/RS-422 or Ethernet control.

Suggested applications for the I/O grouping feature include:

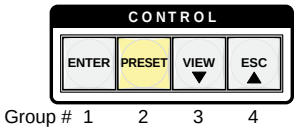
- Segregating sync-critical inputs and outputs
- Segregating specific video formats to prevent an input in one video format from being inadvertently applied to an output device that supports another video format
- Segregating input and output devices that are in separate rooms
- Isolating video from being displayed on specific output devices for operational security reasons

The I/O groups can be set up on the front panel or via the serial port, the USB port, or the LAN port and using either the **SIS commands** or the **Matrix Switchers Control Program**.

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Create I/O groups on the front panel as follows:

1. Press the Esc button to clear any front panel button indications that may be lit.
2. To enter *I/O Group* mode, press and **hold** the Input 1 and Output 1 buttons until the input and output buttons light to display the ungrouped inputs and outputs.
3. Press and release one of the Control buttons to select a group:
   - Press the Enter button to select group 1.
   - Press the Preset button to select group 2.
   - Press the View button to select group 3.
   - Press the Esc button to select group 4.



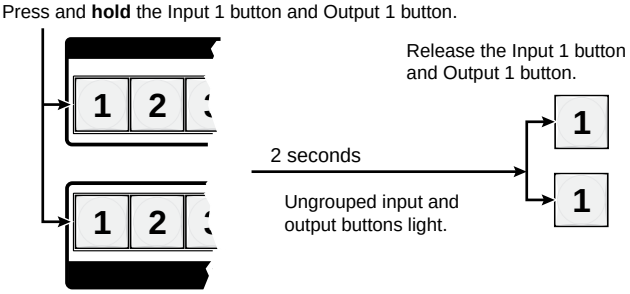
4. Select the desired inputs and outputs to assign to the group by pressing the input and output buttons.
5. Allow the *I/O Group* mode to time out after approximately 30 seconds.

NOTES:
- Ties between groups (an input in group 1 tied to an output in group 2) *can* be created under serial port, USB port, or Ethernet control.
- Ties that were created before I/O groups were created remain valid, even if they include inputs and outputs in different groups.
- Presets *can* be created under serial port, USB port, or Ethernet control that tie inputs and outputs across group boundaries. These presets are selectable from the front panel
- An input or output can be assigned to only one group. If you assign an input or output to a group and that input or output is already assigned to a different group, the older grouping is discarded in favor of the new grouping
- For I/O groups to have any function, at least two groups must be created.

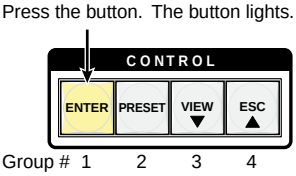
Example 5: Grouping inputs and outputs

In the following example, several switcher inputs and outputs are assigned to groups. The steps show the front panel indications that result from your action.

1. **Clear all selections**: Press and release the Esc button. The button flashes once.
2. **Select I/O Group mode**: Press and **hold** the Input 1 and Output 1 buttons simultaneously for approximately 2 seconds and then release the buttons.



3. **Select an I/O group**: Press and release the Enter button to select group 1.



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4. **Assign inputs and outputs**:

   a. **One at a time**, press and release the input 1 through 4 buttons.

   Press the buttons. The selected buttons light.

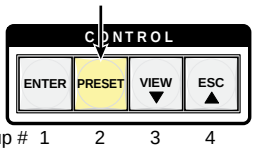
   b. **One at a time**, press and release the output 1 through 4 buttons.

   Press the buttons. The selected buttons light.

5. **Select an I/O group**: Press and release the Preset button to select group 2.

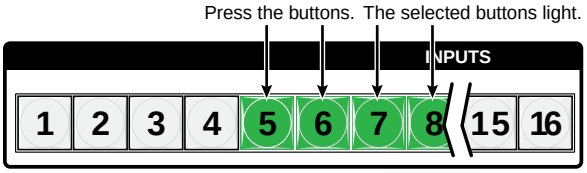
   Press the button. The button lights.

6. **Assign inputs and outputs**:

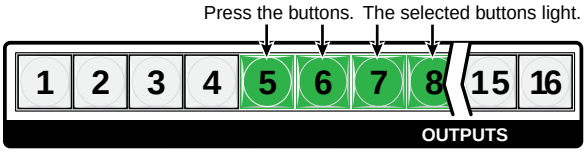
   a. **One at a time**, press and release the input 5 through 8 buttons.

   Press the buttons. The selected buttons light.

   b. **One at a time**, press and release the output 5 through 8 buttons.

   Press the buttons. The selected buttons light.

7. Do nothing for approximately 30 seconds. The switcher exits *I/O Group* mode.

   In this example:

   - Group 1 consists of inputs 1 through 4 and outputs 1 through 4.
   - Group 2 consists of inputs 5 through 8 and outputs 5 through 8.

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Using Presets

The current configuration (configuration 0) can be saved as a preset in any one of 32 preset memory addresses. Presets can be saved and recalled from the front panel.

- On the DMS 1600, the preset locations are assigned to all input and output buttons (see figure 15).
- On the DMS 3600, the preset locations are assigned to input buttons 1 through 32.

When a **preset** is retrieved from memory, it becomes the **current configuration**.

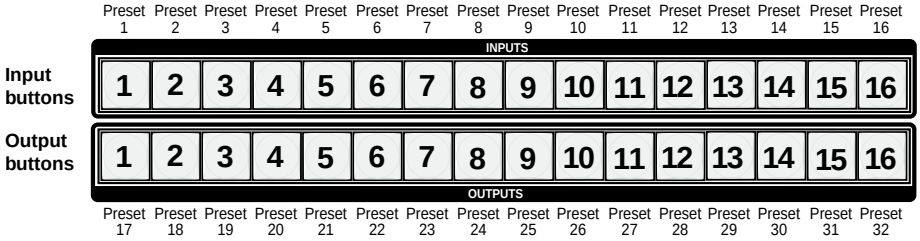


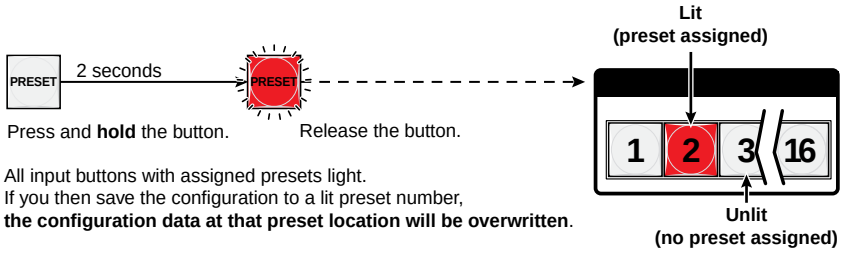
Figure 15. DMS 1600 Preset Locations

NOTES:
- Presets *cannot* be viewed from the front panel unless recalled as the current configuration. Presets can be viewed using the Extron **Matrix Switchers Control Program**.
- 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.

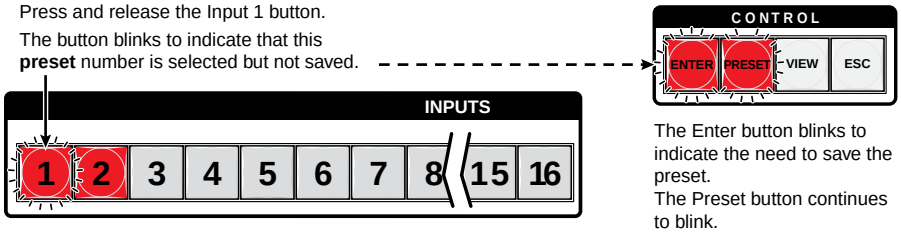
Example 6: Saving a preset

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. **Clear all selections**: Press and release the Esc button. The button flashes once.
2. **Select Save Preset mode**: Press and **hold** the Preset button for approximately 2 seconds until it blinks.

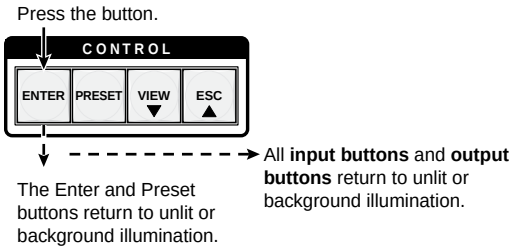


3. **Select the preset**: Press and release the input button for the desired preset.



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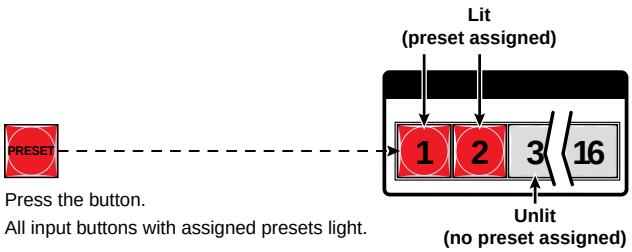
4. **Confirm the change**: Press and release the Enter button. The current configuration is now stored in the selected memory location.



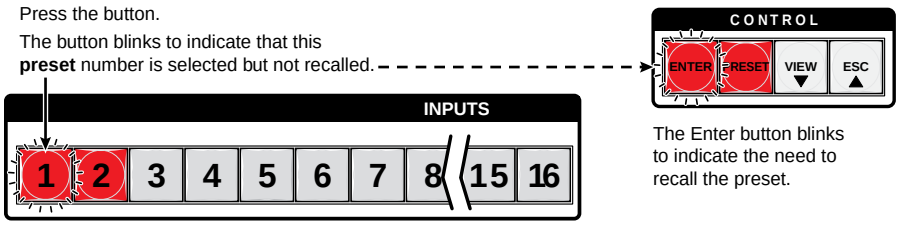
Example 7: Recalling a preset

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.

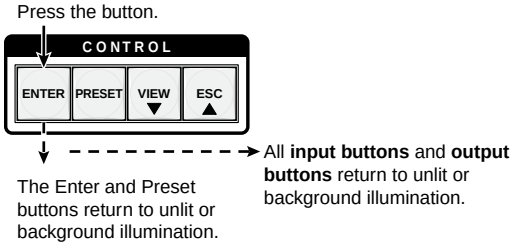
1. **Clear all selections**: Press and release the Esc button. The button flashes once.
2. **Select *Recall Preset* mode**: Press and release the Preset button.



3. **Select the preset**: Press and release the input button for the desired preset.



4. **Confirm the recall**: Press and release the Enter button. The configuration stored in the selected memory location is now the current configuration and can be viewed in the *View-only* mode (see **example 4**).



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Muting and Unmuting Outputs

Individual outputs can be muted or unmuted as follows:

1. Press the Esc button to clear any front panel button indications that may be on.
2. Press and release the View button.
3. One at a time, press and **hold** the button or buttons for the desired output or outputs for approximately 2 seconds. The output buttons for the selected outputs blink to indicate the mute or return to their previous state to indicate the unmute.
4. Press and release the View button to return to normal switcher operation.

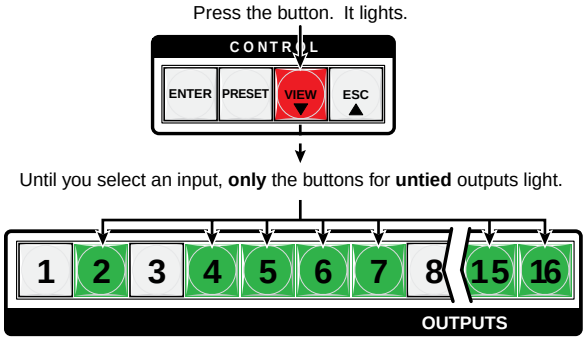
NOTES:
- When you enter View-only mode, the output buttons light for all outputs *without* ties.
- Mutes are saved to non-volatile memory. When power is removed and restored, the mute settings are retained.

Example 8: 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.

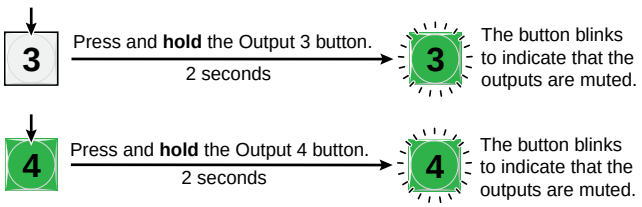
NOTE: This example assumes that you have performed **example 1**, **example 2**, and **example 3.**

1. **Clear all selections**: Press and release the Esc button. The button flashes once.
2. **Select *View-only* mode**: Press and release the View button. The View button lights.



3. **Mute the outputs**: **One at a time**, press and **hold** the Output 3 button and then the Output 4 button for approximately 2 seconds until each button begins to blink. The output 3 and output 4 signals are muted.

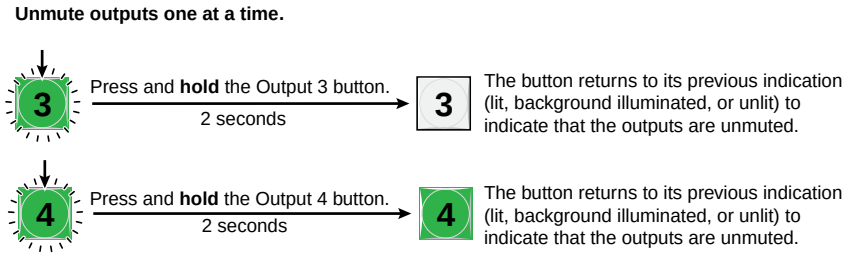
Mute outputs one at a time.



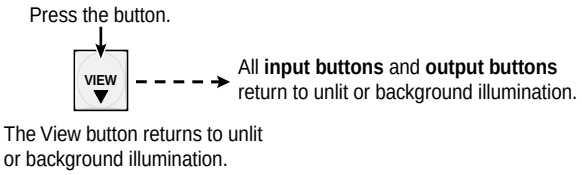
NOTE: When you push Input 3, it lights and Input 4 returns to unlit because of ties made in examples 1, 2, and 3.

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4. **Unmute the outputs**: **One at a time**, press and **hold** the Output 3 button and then the Output 4 buttons for approximately 2 seconds until each button lights steadily. The output 3 and output 4 signals are unmuted.



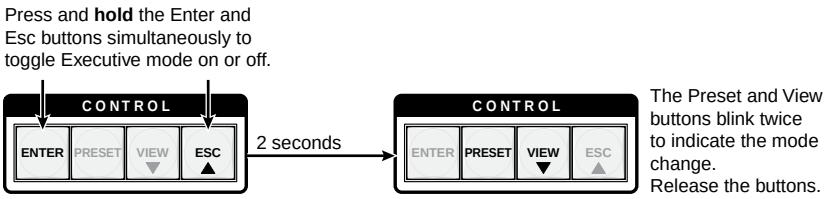
5. **Exit *View-only* mode**: Press and release the View button.



Locking the Front Panel (*Executive* Mode)

The front panel security lockout limits the operation of the switcher from the front panel. When the switcher is locked, all of the front panel functions are disabled except for the *View-Only* mode functions and deselecting the front panel *Lock* mode (see "**Viewing a Configuration**"). Other than in *View-Only* mode, if the user pushes a front panel button when the switcher is locked, the View and Preset buttons flash twice and return to their previous state.

To toggle the lock on and off, press and hold the Enter button and the Esc button simultaneously for approximately two seconds.



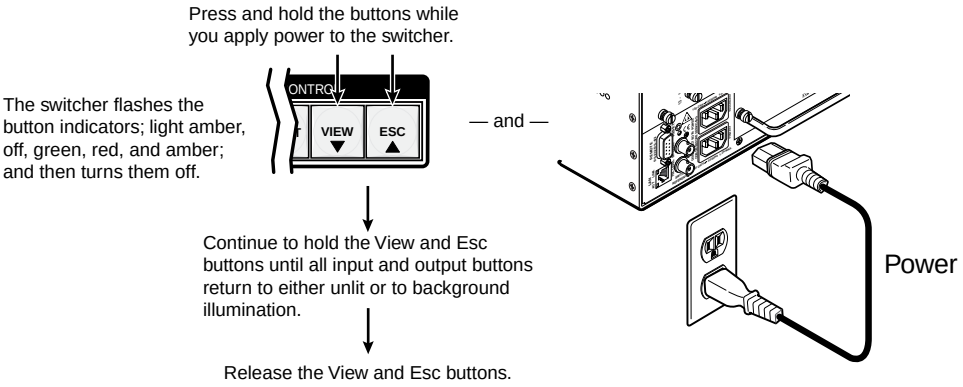
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Performing a System Reset from the Front Panel

The front panel reset is identical to the Esc Z X X X ← SIS command. A system reset clears all ties and presets, all output mutes, and resets all I/O grouping.

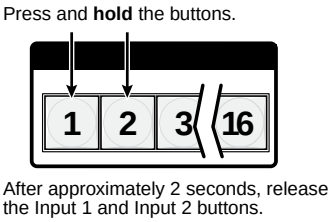
Reset the switcher to the factory default settings by pressing and holding the View button and Esc button simultaneously while you apply AC power to the switcher.

NOTES:
- For the reset to occur, you must apply power from an unpowered state. Applying the redundant power with primary power already applied does not reset the switcher.
- System reset does not reset the Internet protocol (IP) settings or replace user-installed firmware.



Background Illumination

The buttons on the front panel can be set to provide amber background illumination at all times or the background illumination can be turned off. To toggle the background illumination on or off, press and **hold** the Input 1 and Input 2 buttons simultaneously for approximately 2 seconds.



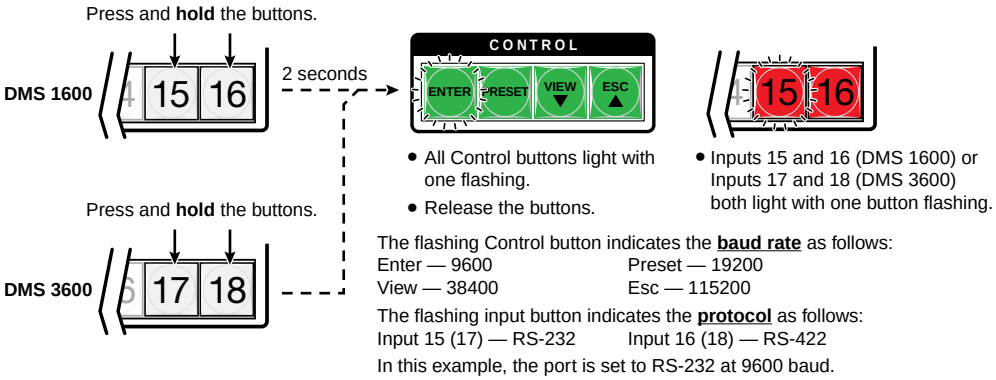
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Selecting the Rear Panel Remote Port Protocol and Baud Rate

The switcher can support either RS-232 or RS-422 serial communication protocol, and can operate at 9600, 19200, 38400, and 115200 baud rates. The settings of these variables can be viewed and changed from the front panel.

View and configure the serial communications settings of the switcher as follows:

1. **Select *Serial Port Selection and Configuration* mode**: Simultaneously press and **hold** the two top rightmost input buttons.



- All Control buttons light with one flashing.
- Release the buttons.
- Inputs 15 and 16 (DMS 1600) or Inputs 17 and 18 (DMS 3600) both light with one button flashing.

The flashing Control button indicates the **baud rate** as follows:
Enter — 9600 Preset — 19200
View — 38400 Esc — 115200

The flashing input button indicates the **protocol** as follows:
Input 15 (17) — RS-232 Input 16 (18) — RS-422

In this example, the port is set to RS-232 at 9600 baud.

2. Release the Input buttons.

3. **Change a value**: Press and release the button that relates to the desired value.

Press and release the button(s) to configure the port as follows:
Baud rate:
Enter — 9600 Preset — 19200
View — 38400 Esc — 115200

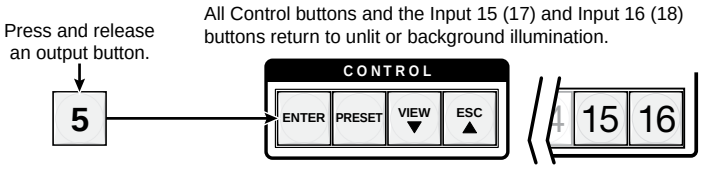
Serial protocol:
Input 15 (17) — RS-232 Input 16 (18) — RS-422

The selected buttons blink and the others remain lit.

In this example, the port is set to RS-422 at 38400 baud.



4. **Exit *Serial Port Selection and Configuration* mode**: Press and release any output button.



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Rear Panel Operations

The rear panel has a Reset button that initiates four levels of resets (identified as modes 1, 3, 4, and 5 for the sake of comparison with an Extron IPL product). The Reset button is recessed, so use a pointed stylus, ballpoint pen, or small screwdriver to access it.

For different reset levels, press and hold the button while the switcher is running or press and hold the button while you apply power to the switcher.

See the following table for a summary of the modes.

CAUTION: Review the reset modes carefully. Using the wrong reset mode may result in unintended loss of flash memory programming, port reassignment, or a controller reboot.

NOTE: The reset modes listed below close all open IP and Telnet connections and close all sockets. Also, the following modes are separate functions, not a continuation from Mode 1 to Mode 5.

Reset Mode Comparison/Summary

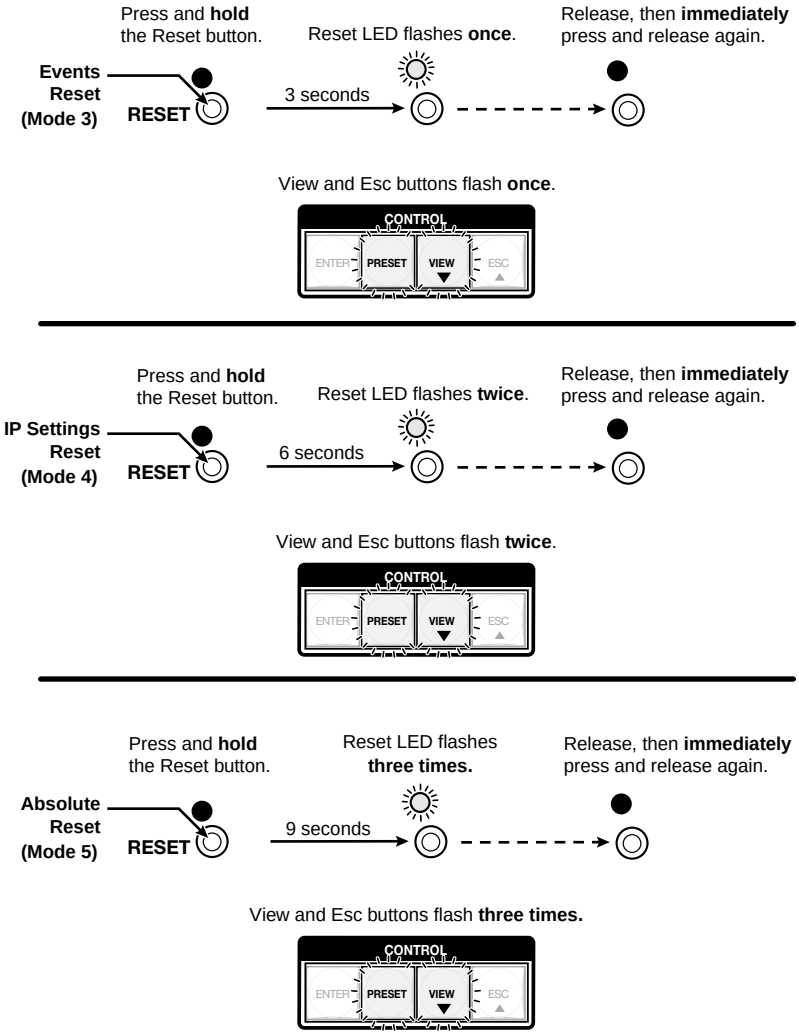
Mode	Activation	Result	Purpose/Notes
1	Hold down the recessed Reset button while applying power to the switcher. **NOTE:** After a mode 1 reset is performed, update the switcher firmware to the latest version. Do not operate the switcher firmware version that results from the mode 1 reset. If you want to use the factory default firmware, you must upload that version again (see "Matrix Software" for details on uploading firmware).	The switcher reverts to the factory default firmware. Event scripting will not start if the switcher is powered on in this mode. All user settings and files, such as the current configuration and IP settings, are maintained. **NOTE:** If you do not want to update firmware, or you performed a mode 1 reset by mistake, cycle power to the switcher to return to the firmware version that was running before the mode 1 reset. Use the 0Q SIS command to confirm that the factory default firmware is no longer running (look for the asterisk [*] following the version number.	Use mode 1 to revert to the factory default firmware version if incompatibility issues arise with user-loaded firmware.
3	Hold down the Reset button for about 3 seconds, until the Reset LED blinks once, then press Reset momentarily (<1 second) within 1 second.	**Mode 3** turns events on or off. During resetting, the Reset LED flashes 2 times if events are starting, 3 times if events are stopping.	Mode 3 is useful for troubleshooting.
4	Hold down the Reset button for about 6 seconds, until the Reset LED blinks twice (once at 3 seconds and again at 6 seconds). Then press Reset momentarily (<1 second) within 1 second.	**Mode 4**: • Enables ARP capability. • Sets the IP address to the factory default • Sets the subnet address to the factory default. • Sets the gateway address to the factory default. • Sets port mapping to the factory default. • Turns DHCP off. • Turn events off. The Reset LED flashes three times in quick succession during the reset.	Mode 4 enables you to set IP address information using ARP and the MAC address.
5	Hold down the Reset button for about 9 seconds, until the Reset LED blinks three times (once at 3 seconds, again at 6 seconds, and then again at 9 seconds). Then press Reset momentarily (<1 second) within 1 second.	**Mode 5** performs a complete reset to factory defaults (with the exception of the firmware): • Does everything mode 4 does. • Resets most settings including: clears all ties and presets clears all output mutes clears all I/O grouping • Resets all IP options. • Removes/clears all files for the switcher. The reset LED flashes three times in quick succession during the reset.	Mode 5 is useful if you want to start over with configuration and uploading or to replace events. Same as Esc ZQQQ ← SIS command.

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Performing Soft System Resets (Modes 3, 4, and 5)

Perform a soft reset of the switcher as follows:

1. Use an Extron Tweeker or other small screwdriver to press and **hold** the rear panel Reset button until the rear panel Reset LED and the front panel Preset and View buttons blink once (events reset), twice (IP settings reset), or three times (absolute reset).
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.



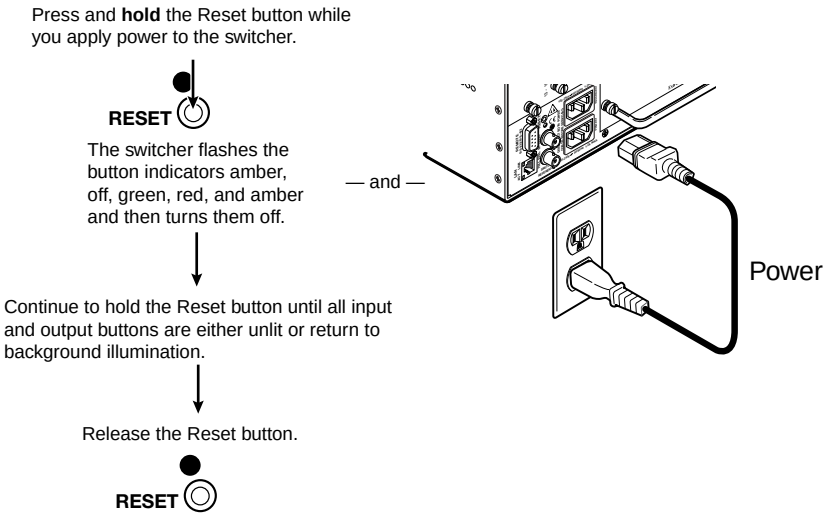
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Performing a Hard Reset (Mode 1)

The hard reset function restores the switcher to the base firmware that it was 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.



Troubleshooting

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

General Checks

- Ensure that all devices are plugged in and powered on. The switcher is receiving power if one of the front panel Power Supply LEDs is lit green.
- Check to see if one or more outputs are muted.
- Ensure an active input is selected for output on the switcher.
- Ensure that the proper signal format is supplied.
- Check the cabling and make corrections as necessary.
- Call the Extron S3 Sales & Technical Support Hotline if necessary (see the **rear cover** of this manual for the phone number in your region of the world).

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Digital Signal Guidelines

DVI and HDMI signals run at a very high frequency and are especially susceptible to bad video connections, too many adapters, or cables that are too long. To avoid the loss of an image or introduction of image jitter, follow these guidelines:

- The DVI cable on the input or output of the switcher should not exceed 50 feet (15.2 m).
- Use only cable designed for DVI signals.
- If the display exhibits a flashing black or blue screen, snow, or other distortion, a non-HDCP compliant display may be receiving an HDCP-encrypted signal.

  Check for an HDCP problem by ejecting the DVD from the player. If the display distortion stops and the DVD menu or screen saver image is clear, the problem is HDCP-related.

- The DMS 1600 and DMS 3600 work as described in point-to-point applications. Do not use any additional adapters, patch panels, or couplers with the input or output DVI or HDMI cables. Additional links in the signal chain can result in the reduction of signal integrity and overall cable length performance.

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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 43** and **page 44** and use one for each preset configuration. Cross out all unused or inactive inputs and outputs.

Worksheet Example 1: System Equipment

Figure 16 shows a worksheet for a switcher configured as a 12-input by 16-output matrix in a fictional organization with the system hardware annotated. Inputs 10 and 11 have no connections in this organization, so they have been crossed out on the worksheet. Inputs 13 through 16 do not exist on this model, so they are crossed out. Similarly, outputs 5, 7, 14, 15, and 16 are crossed out on the worksheet.

Inputs include PCs, cameras, DVD players, a VCR, and an Extron VTG 400DVI. Output devices include monitors, front and rear projectors, and a VCR for recording presentations.

The VTG 400DVI video test generator connected to input 12 enables a video test pattern to be sent to one, several, or all output devices for problem isolation or adjustment purposes. An audio test tape or CD could be used in a similar manner to check the audio components.

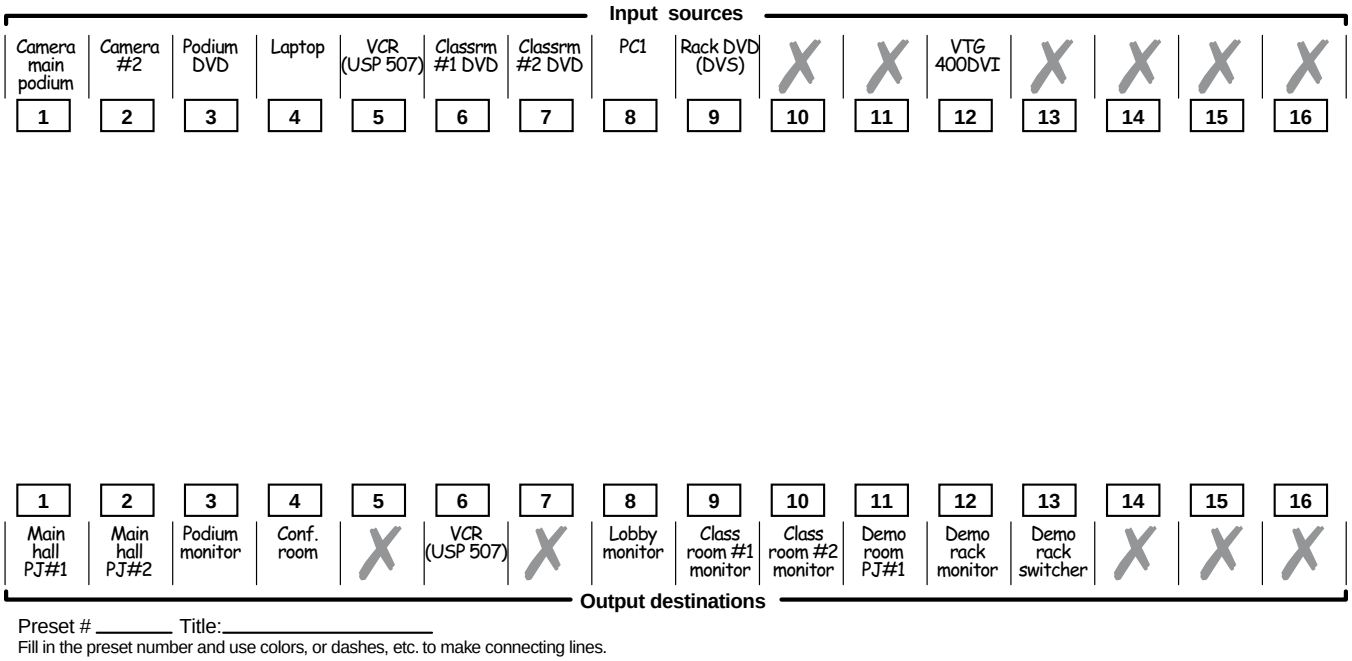


Figure 16. Worksheet Example 1: System Equipment

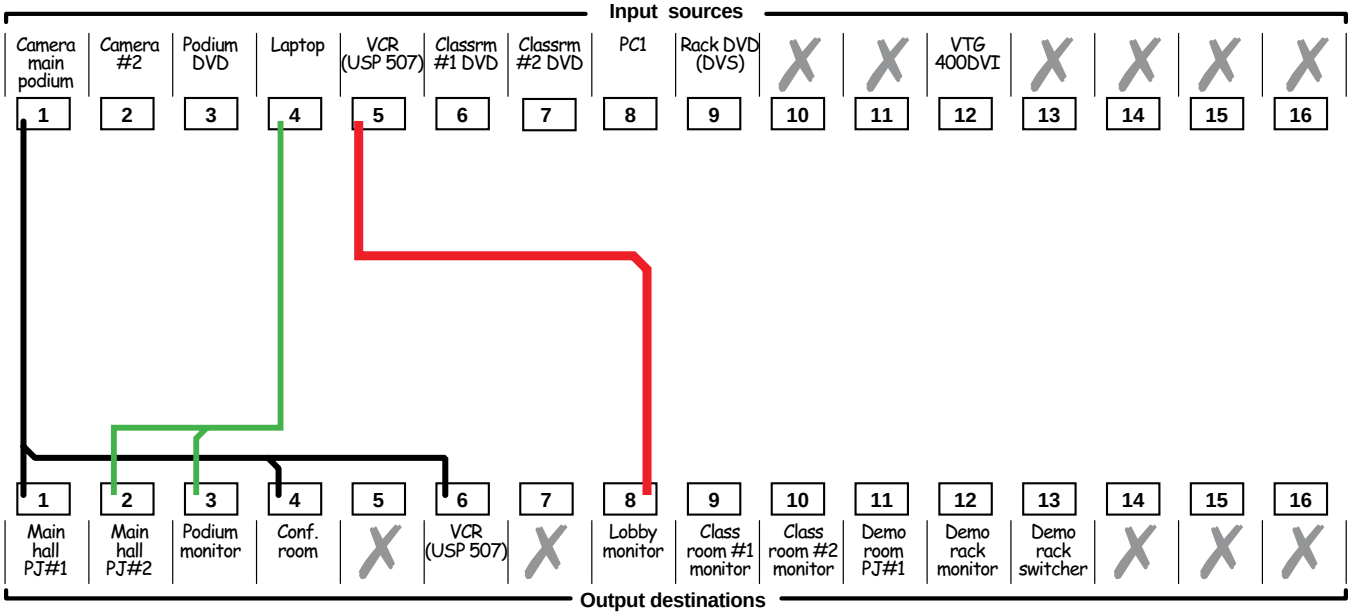
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Worksheet Example 2: Daily Configuration

Figure 17 continues from worksheet example 1 by showing the ties that make up the configuration of preset 1. Black lines show one configuration, green lines a second configuration, and red lines a third configuration.

In this example:

- The image of the presenter, from the main podium camera (input 1), is:
  - Displayed in the main hall (output 1)
  - Displayed in the conference room (output 4) to the overflow crowd
  - Tied to the VCR (output 6)
- The presenter has a presentation on her laptop computer (input 4) that is:
  - Displayed in the main hall (output 2)
  - Displayed locally on the podium (output 3)
- Video from the VCR (input 5) is played in the lobby (output 8)



Preset # _____ Title:_____

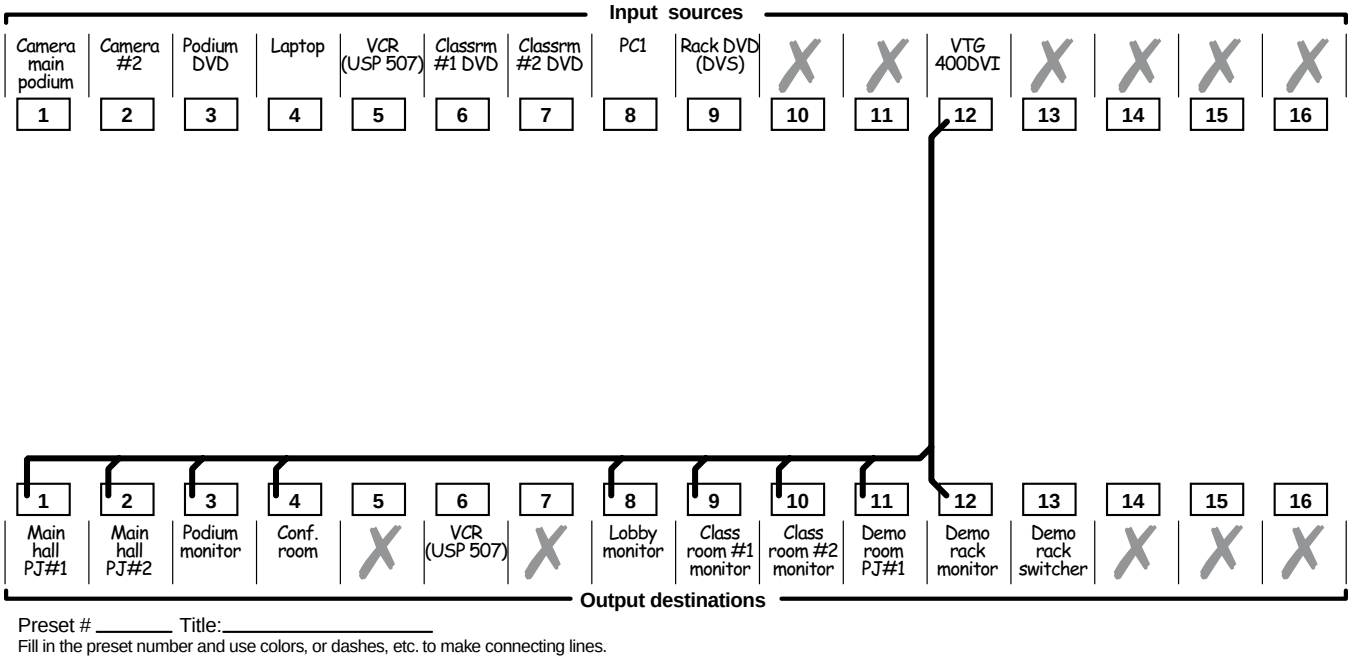
Fill in the preset number and use colors, or dashes, etc. to make connecting lines.

Figure 17. Worksheet Example 2: Daily Configuration

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Worksheet Example 3: Test Configuration

The video system in our fictional organization needs to be fine tuned on a regular basis. Figure 18 shows a typical test configuration, with an Extron video test generator (input 12) generating a test pattern to all projectors and monitors.

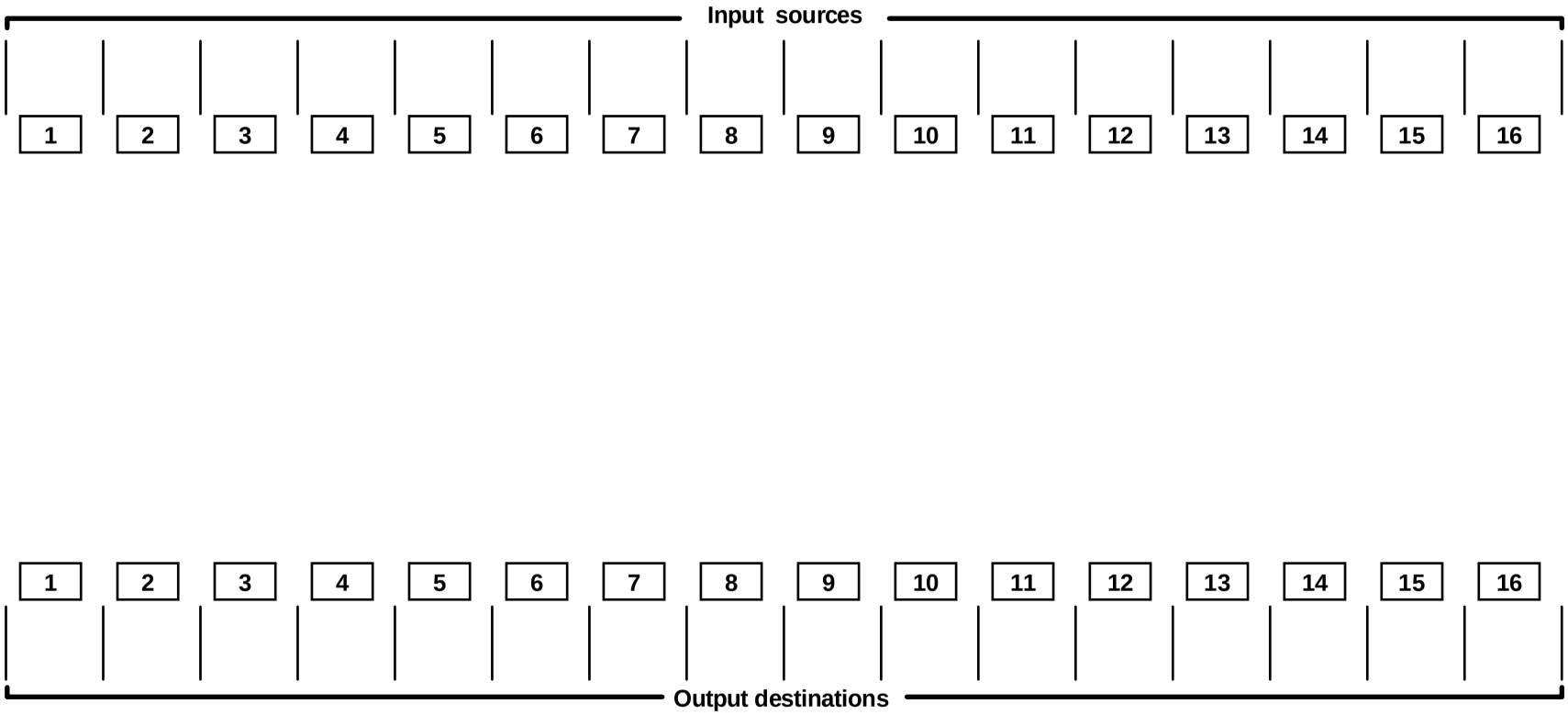


Preset # _____ Title:_____

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

Figure 18. Worksheet Example 3: Test Configuration

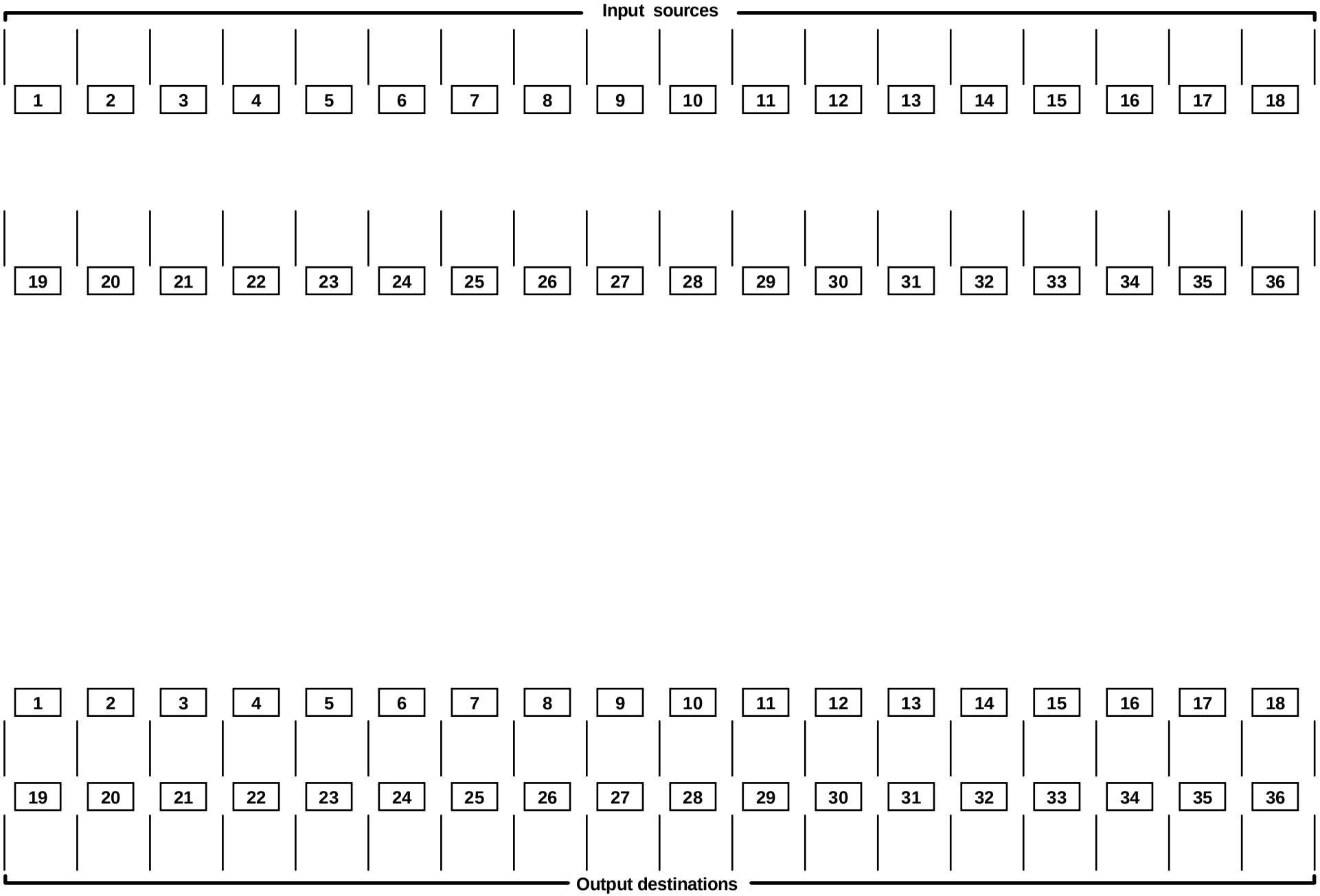
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Preset #

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

Blank Configuration Worksheet, DMS 1600



Preset #

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

Blank Configuration Worksheet, DMS 3600

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Programming Guide

This section describes SIS command control of the DMS 1600 and DMS 3600, including:

- **Local Control Ports**
- **Ethernet (LAN) Port**
- **Host-to-Switcher Instructions**
- **Switcher-Initiated Messages**
- **Switcher Error Responses**
- **Using the Command/Response Tables**

Local Control Ports

The switcher has two local ports that can be directly connected to a host device such as a computer running the Extron DataViewer utility or the HyperTerminal utility, or a control system. These ports make remote control of the switcher possible using a direct connection. The local ports are:

- The rear panel Remote (RS-232 or RS-422) port, a 9-pin D female connector
- The front panel Configuration port, a mini USB B port

NOTE: These two ports are independent of one another. A front panel Configuration port connection and a rear panel Remote port connection can both be active at the same time.

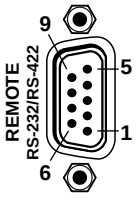
Rear Panel Remote Port

The default protocol for the 9-pin D female Remote port (see figure 19) is as follows:

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

The port can be configured to operate at the 9600, 19200, 38400, or 115200 baud rate.

NOTE: Extron recommends leaving this port at 9600 baud only.



Pin	RS-232	Function	RS-422	Function
1	—	Not used	—	Not used
2	TX	Transmit data	TX–	Transmit data (–)
3	RX	Receive data	RX–	Receive data (–)
4	—	Not used	—	Not used
5	Gnd	Signal ground	Gnd	Signal ground
6	—	Not used	—	Not used
7	—	Not used	RX+	Receive data (+)
8	—	Not used	TX+	Transmit data (+)
9	—	Not used	—	Not used

Figure 19. Remote Connector Pin Assignments

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Front Panel Configuration Port

A standard USB cable and the Extron DataViewer utility, version 2.0 or newer, can be used for connection to the Configuration port. The USB cable, available at any local electronics store, should be terminated on one end with a mini USB B male connector

NOTE: Before you use the DMS Configuration (USB) port for the first time, you need to install and activate the USB driver on your computer. The simplest way to do this is to install version 8.0 or newer of the Matrix Switchers Control Program and then run the Found New Hardware Wizard (see "**Installing the Software**" and "**Activating a USB Port for the First Time**").

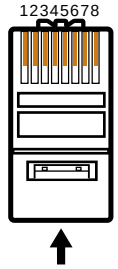
Ethernet (LAN) Port

The rear panel Ethernet connector on the switcher can be connected to an Ethernet LAN or WAN for SIS control of the switcher. Communications between the switcher and the controlling device is via Telnet (a TCP socket using port 23). The TCP port can be changed if necessary, via SIS. The SIS commands and the actions of the switcher are identical to the commands and actions the switcher has when communicating with it via RS-232.

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 (see figure 20).

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



Crossover Cable

Pin	End 1 Wire color	End 2 Wire color
1	White-green	White-orange
2	Green	Orange
3	White-orange	White-green
4	Blue	Blue
5	White-blue	White-blue
6	Orange	Green
7	White-brown	White-brown
8	Brown	Brown
	T568A	T568B

A cable that is wired as T568A at one end and T568B at the other (Tx and Rx pairs reversed) is a "crossover" cable.

Straight-through Cable

Pin	End 1 Wire color	End 2 Wire color
1	White-orange	White-orange
2	Orange	Orange
3	White-green	White-green
4	Blue	Blue
5	White-blue	White-blue
6	Green	Green
7	White-brown	White-brown
8	Brown	Brown
	T568B	T568B

A cable wired the same at both ends is called a "straight-through" cable, because no pin/pair assignments are swapped.

Figure 20. RJ-45 Ethernet Connector Pin Assignments

Default IP Addresses

To access the DMS matrix switcher via the LAN port, you 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, you can determine the actual numeric IP address using the ping utility (see "**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
- DHCP: off

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Establishing a Connection

Establish a network connection to a DMS matrix switcher as follows:

1. Open a TCP socket using the IP address of the switcher.

   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.

   The switcher responds with a copyright message including the date, the name of the product, firmware version, part number, and the current date/time.

   NOTE: If the switcher is not password-protected, the device is ready to accept SIS commands immediately after it sends the copyright message.

   If the switcher is password-protected, a `Password` prompt appears below the copyright message.

2. If the switcher is password protected, enter the appropriate administrator or user password.

   If the password is accepted, the switcher responds with `Login User` or `Login Administrator`.

   If the password is not accepted, the `Password` prompt reappears.

Connection Timeouts

The Ethernet link times out after a designated period of time of no communications. By default, this timeout value is set to 5 minutes but the value can be changed (see the **Configure port timeout** SIS commands on page 61).

NOTE: Extron recommends leaving the default timeout at 5 minutes and periodically issuing the Query (Q) command to keep the connection active. If there are long idle periods, Extron recommends disconnecting the socket and reopening the connection when another command must be sent.

Number of Connections

A DMS matrix switcher can have up to 200 simultaneous TCP connections, including all HTTP sockets and Telnet connections. When the connection limit is reached, the switcher accepts no new connections until some have been closed.
No error message or indication is given that the connection limit has been reached. To maximize performance of an IP Link device, the number of connections should be kept low and unnecessary open sockets should be closed.

Using Verbose Mode

Telnet connections to a DMS matrix switcher can be used to monitor for changes that occur on the switcher, such as front panel operations and SIS commands from other Telnet sockets or a serial port. For a Telnet session to receive change notices from the switcher, the Telnet session must be in verbose mode 1 or 3 (see the **Verbose mode** SIS command on page 61). In verbose mode 1 or 3, the Telnet socket reports changes in messages that resemble SIS command responses.

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Host-to-Switcher Instructions

SIS commands consist of one or more characters per field. No special characters are required to begin or end a command character sequence. When a command is valid, the unit executes the command and sends a response to the host device. All responses from the unit to the host end with a carriage return and a line feed (CR/LF = ↵), which signals the end of the response character string. A string is one or more characters.

Switcher-Initiated Messages

When the connection is via a serial port or the switcher is in verbose mode 2 or 3, and 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 2010, Extron Electronics, DMS 1600, V*x.xx*, 60-1091-01
{day, date, time}↵

— **or** —

(c) Copyright 2010, Extron Electronics, DMS 3600, V*x.xx*, 60-1092-01
{day, date, time}↵

The switcher issues the appropriate copyright message (above) when it is first powered on or when connection via Internet Protocol (IP) is established. V*x.xx* is the firmware version number.

NOTE: {Day, date, time} are reported only if the connection is via the LAN 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.

Spr*nn*↵

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

Rpr*nn*↵

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

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Vmt*nn**x↵

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

Exe*n*↵

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)
E21 — Invalid room number
E24 — Privilege violation (Ethernet)

Using the Command/Response Tables

Symbols (variables), defined on the next page, are used throughout the command/response tables. The symbols represent variables in the unit-initiated messages and the command/response table fields. Letters in the command field are not case-sensitive. The table below shows the hexadecimal equivalent of each ASCII character used in the command/response table.

Space →

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

Special Characters

The HTML language reserves certain characters for specific functions. Extron recommends against using these characters as part of preset names, the name of the switcher, passwords, or locally created file names.

Use of the following characters is not recommended:
{space} + ~ , @ = ' [ ] { } < > ' " semicolon (;) colon (:) | \ and ?.

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Command/Response Table for SIS Commands

Symbol definitions for command/response table

↵ = CR/LF (carriage return/line feed)
← = Carriage return (no line feed)
| = Pipe (can be used interchangeably with the ← character)
• = Space (hard) character
Esc = Escape key (hex 1B)
W = Can be used interchangeable with the Esc character

X1	= Input number (for tie)	00 – 16 (DMS 1600) or 36 (DMS 3600) (00 = untied)
X2	= Output	01 – 16 (DMS 1600) or 36 (DMS 3600)
X3	= Mute, front panel lock	0 = not muted/not locked, 1 = muted/locked
X4	= DDC value (EDID) (see the table on page 52)	
X5	= Input number	01 – 16 (DMS 1600) or 36 (DMS 3600)
X6	= Global preset number	00 through 32 (00 = current configuration)
X7	= Room number (for room presets)	01 through 10 (each can have up to 10 room presets [X9s] assigned)

NOTE: A room is a subset of operator selected outputs that relate to each other. The DMS matrix switcher supports up to 10 rooms, each of which can consist of from 1 to 16 outputs.

X8	= Name	Up to 12 characters for input and output names, global preset names, and room preset names 11 characters maximum for room names Upper-and lower-case alphanumeric characters are valid

NOTE: The following characters are invalid or not recommended in the name: ~ , @ = ‘ [ ] { } < > “ : | \ and ?.

X9	= Room preset number	01 through 10

NOTE: A room preset is a stored configuration with all of the outputs assigned to a single room. When a room preset is retrieved from memory, it becomes the current configuration.

X10	= Connection status	0 = no input connected 1 = input connected
X11	= Group number (for I/O grouping)	1 through 4 (or 0 = no group)
X12	= Number (quantity) of inputs	4, 8, 12, 16, 20, 24, 28, 32, 36
X13	= Number (quantity) of outputs	4, 8, 12, 16, 20, 24, 28, 32, 36
X14	= Board installed	0 = No board installed 1 = 4 inputs x 4 outputs 2 = 4 inputs x 0 outputs 3 = 0 inputs x 4 outputs
X15	= Part number	60-*nnnn*-01 (see “**Part Numbers**”)
X16	= Firmware version number to second decimal place (*x.xx*)	
X17	= Verbose firmware version-description-upload date/time	See the **Query controller firmware version (verbose)** command
X18	= Voltage	Positive or negative voltage and magnitude
X19	= Temperature	Degrees Fahrenheit
X20	= Fan speed	In revolutions per minute (RPM)
X21	= Power supply status	0 = not installed or failed 1 = installed and OK

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Command/Response Table for SIS Commands

Command	ASCII Command (Host to Unit)	Response (Unit to Host)	Additional Description
Create ties			
NOTES: • The matrix switchers support 1-, 2-, and 3-digit numeric entries (1, 02, or 003). • Commands can be entered back-to-back in a string, with no spaces. For example: 1*1!02*02&003*003%. • The **quick multiple tie** and **tie input to all output** commands activate all I/O switches simultaneously. • The **!** tie command, **&** tie command, and **%** tie command can be used interchangeably. • The **!** tie all command, **&** tie all command, and **%** tie all command can be used interchangeably.			
Tie input X1 to output X2	X1*X2!	OutX2•InX1•All↵	Tie input X1 to output X2.
Example:	1*3!	Out03•In01•All↵	Tie input 1 to output 3.
Tie input X1 to output X2	X1*X2&	OutX2•InX1•RGB↵	Tie input X1 to output X2.
Example (see note above):	10*4&	Out04•In10·RGB↵	Tie input 10 to output 4.
Tie input X1 to output X2	X1*X2%	OutX2•InX1•Vid↵	Tie input X1 to output X2.
Example (see note above):	7*5%	Out05•In07•Vid↵	Tie input 7 to output 5.
Quick multiple tie	Esc+QX1*X2!...X1*X2!←	Qik↵	**!**, **&**, and **%** ties are valid.
Example:	Esc+Q3*4!3*5%3*6!4*7!←	Qik↵	Tie input 3 to output 4, output 5, and output 6. Tie input 4 to output 7.
Tie input to all outputs	X1*!	InX1•All↵	Tie input X1 to all outputs.
Example:	5*!	In05•All↵	Tie input 5 to all outputs.
Tie input to all outputs	X1*&	InX1•RGB↵	Tie input X1 to all outputs.
Example:	8*&	In08•RGB↵	Tie input 8 to all outputs.
Tie input to all outputs	X1*%	InX1•Vid↵	Tie input X1 to all outputs.
Example:	10*%	In10•Vid↵	Tie input 10 to all outputs.
Read ties			
NOTE: The **!** read tie command, **&** read tie command, and **%** read tie command can be used interchangeably.			
Read tied input	X2!	X1↵	Input X1 is tied to output X2.
Read tied input, RGB output	X2&	X1↵	Input X1 is tied to output X2.
Read tied input, Vid output	X2%	X1↵	Input X1 is tied to output X2.
Channel mute commands			
Channel mute	X2*1B	VmtX2*1↵	Mute output X2.
Channel unmute	X2*0B	VmtX2*0↵	Unmute output X2.
Read channel mute status	X2B	X3↵	1 = mute on, 0 = mute off.
Global channel mute	1*B	Vmt1↵	Mute all outputs.
Global channel unmute	0*B	Vmt0↵	Unmute all outputs.

NOTE: X1 = Input number — 00 – 16 (36) (00 = untied)
X2 = Output number — 01 – 16 (36)
X3 = Mute status — 0 = not muted, 1 = muted

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Command/response Table for SIS Commands (continued)

Command	ASCII Command (Host to Unit)	Response (Unit to Host)	Additional Description

EDID commands

NOTES:
- EDID communicates video display information, including native resolution and vertical interval refresh rate requirements, to the input. The input device then outputs the optimal video format for the output (such as a display) based on the provided EDID data, ensuring proper video image quality. This communication takes place over the Display Data Channel (DDC).
- In the commands below, the EDID data can come from either an active output or be set to a specified value.

X4 *values*:

X4 value DMS model 1600	X4 value DMS model 3600	Source	X4 value DMS model 1600	X4 value DMS model 3600	Source	X4 value DMS model 1600	X4 value DMS model 3600	Source (outputs 35 and 36) or Resolution	X4 value DMS model 1600	X4 value DMS model 3600	Resolution
01	01	Output 1	N/A	18	Output 18	N/A	35	Output 35	32	52	1365x768 @ 75 Hz
02	02	Output 2	N/A	19	Output 19	N/A	36	Output 36	33	53	1366x768 @ 60 Hz
03	03	Output 3	N/A	20	Output 20	17	37	640x480 @ 60 Hz	34	54	1366x768 @ 75 Hz
04	04	Output 4	N/A	21	Output 21	18	38	640x480 @ 75 Hz	35	55	1400x1050 @ 60 Hz
05	05	Output 5	N/A	22	Output 22	19	39	800x600 @ 60 Hz	36	56	1600x1200 @ 60 Hz
06	06	Output 6	N/A	23	Output 23	20	40	800x600 @ 75 Hz	37	57	1920x1200 @ 60 Hz
07	07	Output 7	N/A	24	Output 24	21	41	852x480 @ 60 Hz	38	58	480p @ 60 Hz
08	08	Output 8	N/A	25	Output 25	22	42	852x480 @ 75 Hz	39	59	576p @ 50 Hz
09	09	Output 9	N/A	26	Output 26	**23***	**43***	**1024x768 @ 60 Hz**	40	60	720p @ 50 Hz
10	10	Output 10	N/A	27	Output 27	24	44	1024x768 @ 75 Hz	41	61	720p @ 60 Hz
11	11	Output 11	N/A	28	Output 28	25	45	1024x852 @ 60 Hz	42	62	1080p @ 60 Hz
12	12	Output 12	N/A	29	Output 29	26	46	1024x852 @ 75 Hz	43	63	1080i @ 60 Hz
13	13	Output 13	N/A	30	Output 30	27	47	1280x768 @ 60 Hz	44	64	1080p @ 50 Hz
14	14	Output 14	N/A	31	Output 31	28	48	1280x768 @ 75 Hz	45	65	1080p @ 60 Hz, stereo
15	15	Output 15	N/A	32	Output 32	29	49	1280x1024 @ 60 Hz	46 – 53	66 – 73	User defined
16	16	Output 16	N/A	33	Output 33	30	50	1280x1024 @ 75 Hz			
N/A	17	Output 17	N/A	34	Output 34	31	51	1365x768 @ 60 Hz			

*** Default resolution and refresh rate**

Assign EDID data to an input	Esc A X5 * X4 EDID ←	EdidA X5 * X4 ↵
Assign EDID data to all inputs	Esc A * X4 * EDID ←	EdidA0 * X4 ↵
Save output #1 EDID data to a user-defined space	Esc S * X4 EDID ←	EdidS X4 ↵
View EDID data assignment	Esc A * X5 EDID ←	X4 ↵

NOTE: X4 = DDC value (EDID) — See the table above. A value of 01 through 16 (36) sets the resolution and rate to match those of the specified output.

X5 = Input number — 01 – 16 (36)

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Command/response Table for SIS Commands (continued)

Command	ASCII Command (Host to Unit)	Response (Unit to Host)	Additional Description
Save, recall, and directly write presets			
NOTES: • If you try to recall a preset that is not saved (does not exist), the matrix switcher responds with the error code E11. • The following characters are invalid or not recommended in preset names: = - , " @ = [ ] { } " ; : | \ and ?. • If a room is not defined (does not exist in the switcher) and you try to save a room preset, the matrix switcher responds with error code E11. • A room can contain a maximum of 16 outputs. • An output can belong only to one room. • The maximum number of rooms (X7) is 10. • The default name (X8) is the room number with four trailing spaces: "Room•#X7••••."			
Save current configuration as a global preset	X6,	SprX6↵	Command character is a comma.
Example:	9,	Spr09↵	Save current configuration as preset 9.
Recall a global preset	X6.	RprX6↵	Command character is a period.
Example:	5.	Rpr05↵	Recall preset 5 to become the current configuration.
Direct write process for a global preset —			
NOTE: The **direct write of a global preset** should always be preceded by a **clear global preset ties** command of that same preset number, as shown below. In a directly-written preset, the input tied to each output (or no tied input) remains unchanged unless overwritten or cleared. If you do not *clear* the ties in 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 with the same number can unexpectedly become part of the newly-created preset.			
Clear all ties of a preset	Esc+X6P0*!←	SprX6↵	Clear all ties in preset X6.
Directly write a global preset	Esc+X6PX1*X2!X1*X2&X1*X2%...X1*X2!← SprX6↵		Enter as many ties as are valid for this configuration. The **! tie** command, **& tie** command, and **% tie** command are interchangeable.
Example:	Esc+27P0!←	Spr27↵	Clear all ties in preset 27.
	Esc+27P12*5!10*09%3*2!3*8&← Spr27↵		Brackets are shown to separate ties for clarity only. Create global preset 27, which ties input 12 to output 5, input 10 to output 9, input 3 to output 2, and input 3 to output 8.
Write room outputs	EscX7,X2¹,X2²,... X2ⁿMR←	MprX7,X2¹,X2²,...X2ⁿ↵	See notes above.
Example:	Esc8,3,04,5,6MR←	Mpr8,03,04,05,06↵	Outputs 3, 4, 5, and 6 are assigned to room 8.
Read room outputs	EscX7MR←	X8,X2¹,X2²,X2ⁿ↵	
Example:	Esc3MR←	Room·#03••••,01,02,08,09↵	Outputs 1, 2, 8, and 9 are assigned to room 3.
Save current configuration as a room preset	X7*X9,	RmmX7•SprX9↵	Command character is a comma.
Example:	3*9,	Rmm03•Spr09↵	Save current configuration as preset 9 for room 3.
Recall room preset	X7*X9.	RmmX7•RprX9↵	Command character is a period.
Directly write a room preset	Esc+X7*X9PX1*X2!X1*X2&X1*X2%...X1*X2!← RmmX7•SprX9↵		Enter as many ties as are valid for this configuration. The **! tie** command, **& tie** command, and **% tie** command are interchangeable.
Example:	Esc+7*3P12*7&11*5&4*15%6*6!← Rmm07•Spr03↵		Brackets are shown to separate ties for clarity only. Create preset 3 for room 7, which ties input 12 to output 7, input 11 to output 5, input 4 to output 15, and input 6 to output 6.

NOTE:	X1 = Input number (for tie)	00 – 16 (36) (00 = untied)
	X2 = Output number	01 – 16 (36)
	X6 = Global preset number	00 through 32 (00 = current configuration)
	X7 = Room number (for room presets)	01 through 10 (each can have up to 10 room presets [X9s] assigned)
	X9 = Room preset number	00 through 10 (00 = current configuration for room)
	X8 = Name	Up to 12 upper-and lower-case alphanumeric characters are valid

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Command/response Table for SIS Commands (continued)

Command	ASCII Command (Host to Unit)	Response (Unit to Host)	Additional Description
View ties, mutes, and presets			
NOTE: The **! read tie** command, **& read tie** command, and **% read tie** command can be used interchangeably.			
Read tied input	X2!	X1↵	Input X1 is tied to output X2.
Example:	1!	05↵	Input 5 is tied to output 1.
Read tied input, RGB output	X2&	X1↵	Input X1 is tied to output X2.
Example:	15&	27↵	Input 27 is tied to output 15.
Read tied input, Vid output	X2%	X1↵	Input X1 is tied to output X2.
Example:	7%	02↵	Input 2 is tied to output 7.
View status of all output mutes	EscVM←	X3¹X3²X3³ ... X3ⁿ↵	Each X3 response is the mute status of an output, starting from output 1. *n* is the highest-numbered output.
View global preset configuration	EscX6*X2*1VC←	X1ⁿ•X1ⁿ⁺¹•...X1ⁿ⁺¹⁵•Vid↵	Show the configuration of preset X6. Show the input tied to 16 consecutive outputs, starting from output X2.
Command description:	Preset # (X6)*starting output# (X2)*1VC		
Response description:	Input # (X1ⁿ) tied to output # (X2)•X1ⁿ⁺¹ tied to X2•X1ⁿ⁺² tied to X2• ... •X1ⁿ⁺¹⁵ tied to X2•*Vid*↵		
Example (***8x8 matrix***):	Esc23*1*1VC←	input 8 tied to output 4; input 2 tied to output 3; no tied input; outputs do not exist Response = tied input: 08•08•02•08•08•01•00•00•-•-•-•-•-•-•-•-•Vid↵ Output: 1 2 3 4 5 6 7 8 09 10 11 12 13 14 15 16	Each position shown in the response is an output: left = starting output number (1 in this example), right = starting output +15 (16 in this example). (Outputs 9 through 16 are not present on this matrix switcher.) The number in each position is the input tied to that output. In this example, for preset 23, video input 8 is tied to outputs 1, 2, 4, and 5; input 2 is tied to output 3; and input 1 is tied to output 6. No inputs are tied to outputs 7 and 8.
NOTE: EscX6*1*1VC← where X6 = 0 returns the current video configuration of the switcher.			
View room preset configuration	EscX7*X9*X2*1VC←	X1ⁿ•X1ⁿ⁺¹•...X1ⁿ⁺¹⁵•Vid↵	Show the configuration for room X7, preset X9. Show the input tied to 16 consecutive outputs, starting from output X2.
Command description:	Room # (X7)*room preset # (X9)*starting output# (X2)*1VC		
Response description:	Input # (X1ⁿ) tied to output # (X2)•X1ⁿ⁺¹ tied to X2•X1ⁿ⁺² tied to X2• ... •X1ⁿ⁺¹⁵ tied to X2•*Vid*↵		
DSVP			
List all connections	LS	X10¹X10²X10³ ... X10ⁿ↵	Each X10 response is the connection status of an input, starting from input 1. *n* is the highest-numbered input.
Example (**32x32 matrix**):	LS	no input detected; input detected Response Status: 0 0 0 1 1 1 0 . . . 0↵ Input: 1 2 3 4 5 6 7 32	

NOTE:	X1 = Input number (for tie)	00 – 16 (36) (00 = untied)
	X2 = Output number	01 – 16 (36)
	X3 = Mute status	0 = not muted 1 = muted
	X6 = Global preset number	00 through 32 (00 = current configuration)
	X7 = Room number (for room presets)	01 through 10 (each can have up to 10 room presets [X9s] assigned)
	X9 = Room preset number	01 through 10
	X10 = Connection status	0 = no input connected 1 = input connected

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Command/response Table for SIS Commands (continued)

Command	ASCII Command (Host to Unit)	Response (Unit to Host)	Additional Description
I/O Grouping			
NOTE: Each X11 position in the following I/O grouping commands must have an entry, 1, 2, 3, or 4 (or 0 [not grouped]).			
Write input grouping	Esc X11¹ X11² X11³ ... X11ⁿ I ←	Gri X11¹ X11² X11³ ... X11ⁿ ↵	Each X11 entry is the group number assigned to an input, starting from input 1. *n* is the highest-numbered input for your configuration.
*Example (**16 x 16 matrix**):*	Esc 40133000044 ... 4I ←	See below.	
	Input 1 in group 4; Input 2 not grouped; Input 16 in group 4 Response #s = group: Gri 4 0 1 3 3 0 0 0 0 4 0 0 0 4 4 4 ↵ Input: 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16		Input 1 – group 4, input 2 – group 0 (not grouped), ... input 16 – group 4.
Write output grouping	Esc X11¹ X11² X11³ ... X11ⁿ O ←	Gro X11¹ X11² X11³ ... X11ⁿ ↵	Each X11 entry is the group number assigned to an output, starting from output 1. *n* is the highest-numbered output for your configuration.
Read input grouping	Esc I ←	X11¹ X11² X11³ X11⁴ X11ⁿ ↵	Each X11 entry is the group number assigned to an input, starting from input 1. *n* is the highest-numbered input for your configuration.
*Example (**8 x 8 matrix**):*	Esc I ←	Input 1 in group 1; Input 8 not grouped Response = group: 1 1 1 3 3 0 0 0 ↵ Input: 01 02 03 04 05 06 07 08	
Read output grouping	Esc O ←	X11¹ X11² X11³ X11⁴ X11ⁿ ↵	Each X11 entry is the group number assigned to an output, starting from output 1. *n* is the highest-numbered output for your configuration.
Names			
NOTES: • Do not use leading spaces in preset name. • If a preset is unassigned, the X8 displays [unassigned]. • If a global preset is saved, but not yet named, the default name is Preset X6. • If a room preset is saved, but not yet named, the default name is Rm X7 Prst X9.			
Write global preset name	Esc X6 , X8 NG ←	Nmg X6 , X8 ↵	
Example:	Esc 1,Security 1NG ←	Nmg01,Security 1 ↵	Name global preset 1 "Security 1."
Read global preset name	Esc X6 NG ←	X8 ↵	
Example:	Esc 2NG ←	Security 2 ↵	Global preset 2 is named "Security 2."
Write room name	Esc X7 , X8 NR ←	Nmr X7 , X8 ↵	
Example:	Esc 1,Classrm 1NR ←	Nmr01,Classrm 1 ↵	Name room 1 "classrm 1."
Read room name	Esc X7 NR ←	X8 ↵	
Write room preset name	Esc X7 * X9 , X8 NP ←	Nmp X7 * X9 , X8 ↵	
Example:	Esc 1*3,Podium_DVDNP ←	Nmp01*03,Podium_DVD ↵	Name room 1, preset 3 "Podium_DVD."
Read room preset name	Esc X7 , X9 NP ←	X8 ↵	
Write input name	Esc X5 , X8 NI ←	Nmi X5 , X8 ↵	
Example:	Esc 1,Podium camNI ←	Nmi01,Podium cam ↵	Name input 1 "Podium cam."
Read input name	Esc X5 NI ←	X8 ↵	
Write output name	Esc X2 , X8 NO ←	Nmo X2 , X8 ↵	
Read output name	Esc X2 NO ←	X8 ↵	
Example:	Esc 1NO ←	Main PJ1 ↵	Output 1 is named "Main PJ1."

NOTE:		
	X5 = Input number	01 – 16 (36)
	X2 = Output number	01 – 16 (36)
	X11 = Group number (for I/O grouping)	1 through 4 (or 0 = no group)
	X6 = Global preset number	00 through 32 (00 = current configuration)
	X7 = Room number (for room presets)	01 through 10 (each can have up to 10 room presets [X9s] assigned)
	X9 = Room preset number	00 through 10 (00 = current configuration for room)
	X8 = Name	Up to 12 upper-and lower-case alphanumeric characters are valid

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Command/response Table for SIS Commands (continued)

Command	ASCII Command (Host to Unit)	Response (Unit to Host)	Additional Description
Front panel locks (*Executive* mode)			
Lock front panel	1X	Exe1↵	
Unlock front panel	0X	Exe0↵	
View lock status	X	X3↵	
Resets			
Reset all global presets	Esc ZG←	Zpg↵	Clear all global presets and their names.
Reset one global preset	Esc X6 ZG←	Zpg X6↵	Clear global preset X6.
Reset all mutes	Esc ZZ←	Zpz↵	Unmute all outputs.
Reset room map (outputs)	Esc ZR←	Zpr↵	Clear all room definitions.
Reset individual room	Esc X7 ZR←	Zpr X7↵	Delete room X7.
Reset individual room preset	Esc X7 * X9 ZP←	Zpp X7 * X9↵	Clear an individual room preset (X7*X9) and name.
Reset whole switcher	Esc ZXXX←	Zpx↵	Clear all ties and presets, rooms, and I/O names.
Reset settings and delete files	Esc ZY←	Zpy↵	Excludes IP settings to preserve communications. Recommended after a firmware update.
Absolute reset	Esc ZQQQ←	Zpq↵	Similar to **Reset whole switcher**, plus clear the IP address to 192.168.254.254 and subnet mask to 255.255.000.000.
Information requests			
Information request	I	V X12 X X13 • A X12 X X13 • S X14¹ X14² ... X14ⁿ↵	V X12 X X13 shows the number of available inputs and outputs for this configuration. A X12 X X13 has no meaning for this product. S X14¹ X14² ... X14ⁿ shows the board type installed in each slot. *n* is either 4 (DMS 1600) or 9 (DMS 3600).
Request part number	N	X15↵	See "**Part Numbers**."

NOTE: There are up to three separate sets of Extron firmware on which the switcher can report: the 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 firmware version	Q	X16↵	
Example:	Q	1.23↵	The factory installed firmware controller version is 1.23 (sample value only).
Query controller firmware version (verbose)	0Q	X16 - X17 - X17↵	Provide a detailed status of the Ethernet protocol firmware, the controller firmware, and an 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 firmware is not loaded.
Response description:	*Ethernet protocol firmware version–controller firmware version–updated firmware version*↵		
	0q	See below	

Description — * indicates the version running — Upload date and time

1.23-1.00(1.68-DMS1600••••-Wed, 24 Feb 2010 00:00:00 GMT)-1.00*(1.06-DMS1600••••-Mon, 27 Mar 2010 16:39:21 GMT)↵

Ethernet protocol firmware — DMS firmware version — Updated firmware version

NOTE:

X3 = Lock status	0 = not locked	1 = locked
X6 = Global preset number	00 through 32 (00 = current configuration)	
X7 = Room number (for room presets)	01 through 10 (each can have up to 10 room presets [X9s] assigned)	
X9 = Room preset number	00 through 10 (00 = current configuration for room)	
X12 = Number (quantity) of inputs	4, 8, 12, 16, 20, 24, 28, 32, 36	
X13 = Number (quantity) of outputs	4, 8, 12, 16, 20, 24, 28, 32, 36	
X14 = Board installed	X0 = No board installed	C2 = 4 inputs x 0 outputs
	C1 = 4 inputs x 4 outputs	C3 = 0 inputs x 4 outputs
X15 = Part number	60-nnnn-01 (see "**Part Numbers**")	
X16 = Firmware version number to second decimal place (x.xx)		
X17 = Verbose firmware version-description-upload date/time		

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Command/response Table for SIS Commands (continued)

Command	ASCII Command (Host to Unit)	Response (Unit to Host)	Additional Description
Information requests (continued)			
Request system status	S		
DMS 1600 response		X18•X18•X18•X18•X18•X18•X18•X19•X20•X20•X21•X21↵	
DMS 3600 response		X18•X18•X18•X18•X18•X18•X18•X19•X20•X20•X20•X20•X21•X21↵	
*Response description (**DMS 1600**):*			
+3.3V•+5V•+1.3V•+1.2V•+12V (system volts)•+12V (redundant PS)•+12V (Primary PS)•Temp•Fan 1 RPM•Fan 2 RPM•Pri PS•Red PS↵			
*Response description (**DMS 3600**):*			
+3.3V•+5V•+1.3V•+1.2V•+12V (system volts)•+12V (redundant PS)•+12V (Primary PS)•Temp•Fan 1 RPM•Fan 2 RPM•Fan 3 RPM•Fan 4 RPM• Pri PS•Red PS↵			
NOTE: The response to the View File Directory command differs, depending on whether the command is sent via an RS-232/RS-422 or Telnet connection or via a web browser connection.			
View file directory RS-232/RS-422 port and Telnet	Esc DF←	*filename*1,*date/time*,*length*↵ *filename*2,*date/time*,*length*↵ *filename*3,*date/time*,*length*↵ • • *filenamen*,*date/time*,*length*↵ # *of* Bytes•Left↵↵	List user-supplied files.
View file directory web browser	Esc DF←	Var file = new array (); File [1] = '*filename*1,*date*1,*filesize*1'; File [2] = '*filename*2,*date*2,*filesize*2'; File [3] = '*filename*3,*date*3,*filesize*3'; • • File [*n*] = '*filenamen*,*daten*,*filesizen*'; File [*n+1*] = # *of* Bytes•Left	List user-supplied files.
Erase a user-supplied web page or file	Esc *filename* EF←	Del*filename*↵	

NOTE:
X18 = Voltage (positive or negative voltage and magnitude)
X19 = Temperature Degrees Fahrenheit
X20 = Fan speed In revolutions per minute (RPM)
X21 = Power supply status 0 = not installed or failed 1 = installed and OK

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Command/Response Table for IP-Specific SIS Commands

Symbol Definitions for IP-specific SIS commands

X30 = Matrix name — (Up to 240 alphanumeric characters)

NOTE: The following characters are invalid or not recommended in the name: {space} ~ , @ = ` [ ] { } < > ‘ “ ; : | \ and ?.

X31 = Default name — DMS 1600 — DMS-1600 + last 3 pairs of MAC address
DMS 3600 — DMS-3600 + last 3 pairs of MAC address

X32 = Time and date (for 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 23
MM = minutes: 00 through 59
SS = seconds: 00 through 59

X33 = Time and date (for read) — In the format: Day,•DD•Mmm•YYYY•HH:MM:SS *where*:
Day = weekday: Mon through Sun
DD = date: 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

X34 = GMT offset — –12.0 through +14.0. Hours and minutes removed from GMT

X35 = Daylight Saving Time — 0 = Daylight Saving Time off/ignore
1 = Daylight Saving Time on (northern hemisphere)
2 = Daylight Saving Time on (Europe)
3 = Daylight Saving Time on (Brazil)

X36 = IP address — ###.###.###.###

X37 = Hardware (MAC) address — ##-##-##-##-##-##

X38 = Number of open connections — 0 – 255

X39 = Password — 12 alphanumeric characters

NOTE: The following characters are invalid or not recommended in passwords: {space} + ~ , @ = ` [ ] { } < > ‘ “ ; : | \ and ?.

X40 = Domain name — Standard domain name rules apply (for example: *xxx*.com)

NOTE: The following characters are invalid or not recommended in a domain name: {space} + ~ , = ` [ ] { } < > ‘ “ ; : | \ and ?.
The @ character is acceptable only as the lead-in to the domain name (such as @extron.com).

X41 = E-mail account — 65 - 72. 65 = e-mail recipient 1, 66 = 2, 67 = 3, ... 72 = recipient 8

X42 = E-mail address — Typical e-mail address format (for example: *nnnn@xxx.com)*

X43 = Notification selections, part 1 — I = inputs F = fans P = power supply

X44 = Notification selections, part 2

If **X43 = I, then**	**X44** = 00 (all inputs), or 01 through 16 (36) (input 1 through 16 [36])
If **X43 = F, then**	**X44** = 00 (all fans)
If **X43 = P, then**	**X44** = 00 (both power supplies).

X45 = Notify when? — 0 = no response 2 = fixed/restored 4 = suspend
1 = fail/missing 3 = both 1 & 2

X46 = DHCP — 0 =off, 1 = on

X47 = Port # — 00 (all ports), 01 (rear panel), 03 – 99

X48 = Baud rate — 9600, 19200, 38400, 115200

X49 = Parity — **o**dd, **e**ven, **n**one, **m**ark, **s**pace (Only the first letter required.)

X50 = Data bits — 7, 8

X51 = Stop bits — 1, 2

X52 = Port type — 0 = RS-232, 1 = RS-422

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X53 = Verbose mode

0 = clear/none (default for Telnet connection)
1 = verbose mode (default for RS-232/RS-422 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•X30↵).

X54 = Port timeout interval (in 10-sec. increments)

1 (= 10 seconds) – 65000 (default is 30 = 300 seconds = 5 minutes)

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Command/Response Table for IP-specific SIS Commands

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
IP setup commands			
Set matrix name	Esc X30 CN ←	Ipn•X30 ↵	Up to 240 alphanumeric characters.
Set matrix name to factory default	Esc•CN ←	Ipn•X31 ↵	"DMS-*nn*00" plus the last 3 pairs of the MAC address. *nn* is either "16" or "32."
Read matrix name	Esc CN ←	X30 ↵	
Set time and date	Esc X32 CT ←	Ipt X32 ↵	
Read time and date	Esc CT ←	X33 ↵	
Set GMT offset	Esc X34 CZ ←	Ipz X34 ↵	In the command, the divider between hours and minutes can be either a colon or a period. In the response divider is a colon.
Example:	Esc 8.0CZ ←	Ipz08:00 ↵	GMT +8:0 hours.
Set Daylight Saving Time	Esc X35 CX ←	Ipx X35 ↵	
Read Daylight Saving Time	Esc CX ←	X35 ↵	
Set IP address	Esc X36 CI ←	Ipi X36 ↵	
Read IP address	Esc CI ←	X36 ↵	
Read hardware (MAC) address	Esc CH ←	X37 ↵	
Read # of open connections	Esc CC ←	X38 ↵	
Set subnet mask	Esc X36 CS ←	Ips X36 ↵	
Read subnet mask	Esc CS ←	X36 ↵	
Set gateway address	Esc X36 CG ←	Ipg X36 ↵	
Read gateway address	Esc CG ←	X36 ↵	
Set administrator password	Esc X39 CA ←	Ipa•X39 ↵	
Read administrator password	Esc CA ←	X39 ↵	
Reset (clear) administrator password	Esc•CA ←	Ipa•↵	
Set user password	Esc X39 CU ←	Ipu•X39 ↵	
Read user password	Esc CU ←	X39 ↵	
Reset (clear) user password	Esc•CU ←	Ipu•↵	
Set mail server IP address, domain name, password	Esc X36 , X40 , X39 CM ←	Ipm X36 , X40 , X39 ↵	
Read mail server IP address, domain name, password	Esc CM ←	X36 , X40 , X39 ↵	
Set e-mail recipient	Esc X41 , X42 CR ←	Ipr X41 , X42 , ↵	This command sets the recipient. To receive e-mail notifications, you must then set the events that the switcher reports, using one or more separate Set e-mail events (EM) commands (see below).
Example:	Esc 72,Jsmith@folklore.netCR ←	Ipr72,Jsmith@folklore.net,↵	
Read e-mail recipient	Esc X41 CR ←	X42 , ↵	
Set e-mail events for recipient	Esc I X43 X41 , X44 , X45 EM ←	Ipe X43 , X41 , X44 , X45 ↵	You must first have set an e-mail recipient for the e-mail account number (X41), using the separate Set e-mail (CR) command (see above).
Example:	Esc I72,0,3EM ←	Ipe*72*0*3 ↵	E-mail account #72 (recipient #8) (Jsmith, as set by the preceding Set e-mail recipient command), will receive fail/missing and fixed/restore messages for all inputs.
Read e-mail events for recipients	Esc X43 X41 , X44 EM ←	X45 , X45 , X45 , … , X45 ↵	

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Command/Response Table for IP-specific SIS Commands (continued)

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
IP setup commands (continued)			
Set DHCP on or off	Esc X46 DH ←	Idh X46 ↵	X46: 0 = off, 1 = on
Read DHCP on/off status	Esc DH ←	X46 ↵	
Set serial port parameters	Esc X47 * X48 , X49 , X50 , X51 CP ←	Cpn X47 • Ccp X48 , X49 , X50 , X51 ↵	
Read serial port parameters	Esc X47 CP ←	X48 , X49 , X50 , X51 ↵	
Set serial port mode	Esc X47 * X52 CY ←	Cpn X47 • Cty X52 ↵	X52: 0 = RS-232, 1 = RS-422
Read serial port mode	Esc X47 CY ←	X52 ↵	
Set verbose mode	Esc X53 CV ←	Vrb X53 ↵	
Read verbose mode	Esc CV ←	X53 ↵	
Configure current port timeout	Esc 0 * X54 TC ←	Pti0 * X54 ↵	
View current port timeout	Esc 0TC ←	X54 ↵	
Configure global IP port timeout	Esc 1 * X54 TC ←	Pti1 * X54 ↵	
View global IP port timeout	Esc 1TC ←	X54 ↵	

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Matrix Software

This section describes using software to operate the DMS 1600 and DMS 3600, including:

- **Matrix Switchers Control Program**
- **Button Label Generator Program**

Matrix Switchers Control Program

The Extron Matrix Switchers Control Program communicates with the switcher via the Ethernet LAN port, the serial port, or the USB port to provide an easy way to set up ties and sets of ties. The program is compatible with Microsoft® Windows® 2000, Windows XP, Windows 7, and newer operating systems. Updates to the Matrix Switchers Control Program can be downloaded from the Extron website (**www.extron.com**).

Installing the Software

NOTE: To support the front panel Configuration (USB) port, you must use version 8.0 or newer of the Matrix Switchers Control Program.

The program is available on the Extron Software Products disc. Install the software as follows:

NOTE: For full functionality, install both of the following programs:

- Matrix Switchers Control Program
- Firmware Loader

1. Insert the disc into the drive. The Extron software DVD window (see figure 21) should open automatically.



Figure 21. Software DVD Window

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NOTE: If the window does not open automatically, run Launch.exe from the DVD.

2. Click the **Software** tab.



3. Scroll to the desired program and click **Install** (see figure 22).



Figure 22. Software Installation

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

NOTES:
- For Windows 7, the folder is `C:\Program Files (x86)\Extron\Matrix_Switchers`.
- The DMS matrix switcher can support remote control via any of the following three ports:
  - **Rear panel LAN port —** For IP control of the system via an Ethernet LAN, via this RJ-45 connector from anywhere in the world.
  - **Rear panel Remote RS-232/RS-422 port —** The port can be configured for either the RS-232 or RS-422 serial communication protocol and operate at the 9600, 19200, 38400, or 115200 baud rate (see the **serial port parameters SIS commands** on page 61 to configure the port).
  - **Front panel Configuration port —** A USB B port.

Software Operation via Ethernet

When a matrix switcher is connected to an Ethernet WAN or LAN, up to 200 users can operate it, locally or remotely, using the Matrix Switchers Control Program (see "**Ethernet Connection**" 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, 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 not selectable in the Matrix Switchers Control Program when the operator is logged on as a user.

The IP Settings/Options window (see **figure 28** on page 68) 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**" for more details).

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Using the Matrix Switcher Control Software

Many items found in the Matrix Switchers Control Program are also accessible via **front panel controls** and under **SIS control**. The Matrix Switcher Help Program provides information on settings and on how to use the control program, itself.

NOTE: The first time you connect to the Configuration (USB) port, the Found New Hardware Wizard appears (see figure 23) (see "**Activating a USB Port for the First Time**," below).

For other connections, proceed to "**Starting the program**" on the next page.



Figure 23. Found New Hardware Wizard

Activating a USB Port for the First Time

The first time you connect to the Configuration (USB) port, the Found New Hardware Wizard appears (see figure 23). Activate the connected USB port for your device as follows:

NOTE: If you have not installed the latest Matrix Switchers Control Program (version 8.0 or newer), click **Cancel** and install the program. Reconnect the switcher to the Configuration port.

1. Select the **`No, not this time`** radio button and click **`Next`**.
2. Select the **`Install the software automatically`** radio button and click **`Next`**. Follow the on-screen instructions. The wizard assigns the driver necessary to access the switcher to the connected Configuration (USB) port (this may take a few minutes).
3. Click **`Finish`** to exit the wizard.
4. Proceed to "**Starting the program**" on the next page or return to "**Programming Guide**."

NOTE: You may need to repeat these steps if you subsequently connect the switcher to a different USB port on the same computer.

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Starting the program

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

   The Comm Port Selection window (see figure 24) appears.

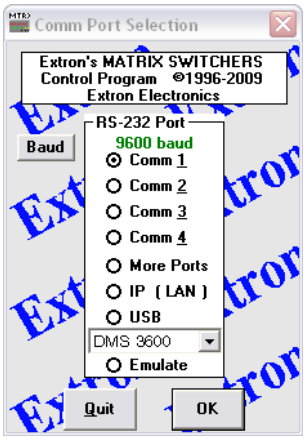
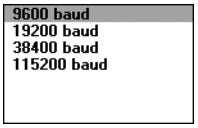


Figure 24. Comm Port Selection Window

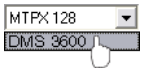
2. Choose either the comm port that is connected to the serial port of the switcher, **USB**, **IP [LAN]**, or **Emulate**.

   - **If you selected a comm port**, check the baud rate displayed in the Baud Rate field. If you need to change the baud rate, click the **Baud** button and double-click on the desired baud rate.

     Click **OK**. The Extron Matrix Switchers Control Program window (see **figure 26** and **figure 27**) appears, displaying the current configuration of the attached matrix. Proceed to "**Using the program**."

   - **If you selected USB**, select the DMS matrix switcher in the drop-down window and click **OK**. Proceed to "**Using the program**."

   - **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 83.

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3. **If you selected `IP [LAN]` in step 2**, the IP Connection window appears (see figure 25).

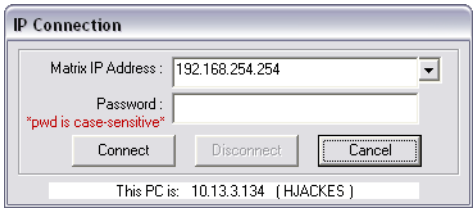


Figure 25. Address and Password Entry

   a. Examine the Matrix 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 with the administrator password, the program connects you to the matrix switcher with all of the administrator rights and privileges. The Extron Matrix Switchers Control Program window (see **figure 26** and **figure 27**) appears, displaying the current configuration of the attached matrix. Proceed to "**Using the program**."

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

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

Using the program

- To create a tie, click and 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 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.
- For quick display of information on a specific input or output device, position the pointer tool over that device in the control program window. The program opens a pop-up that details the connections to that device and the signal status (present or missing) input from or output to that device (see the inset box in **figure 27**).

> **HINT:** You can print a map of the current configuration by clicking **`File`** > **`Print Tie Map`**.

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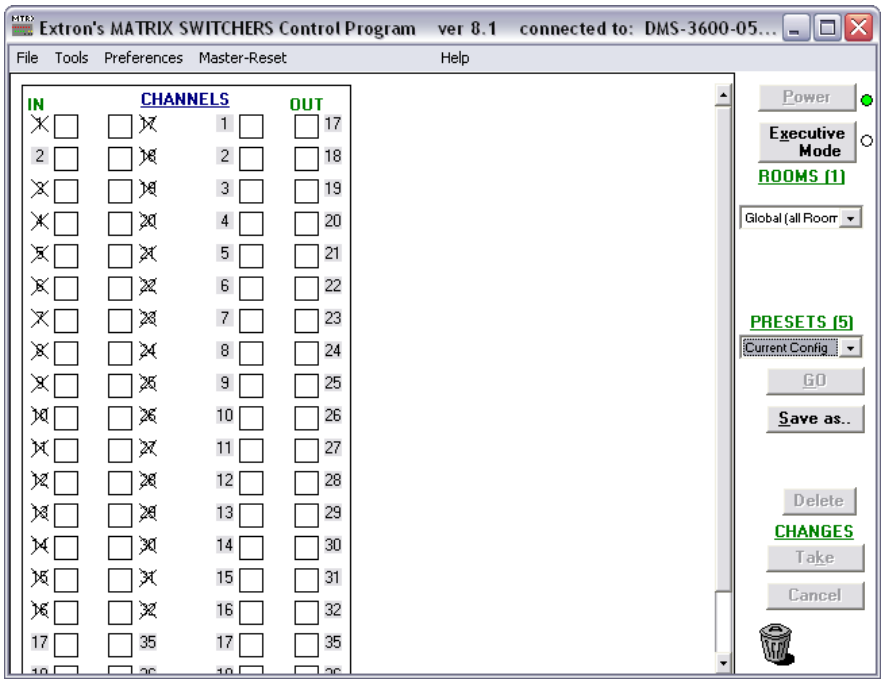


Figure 26. Extron Matrix Switchers Control Program Window

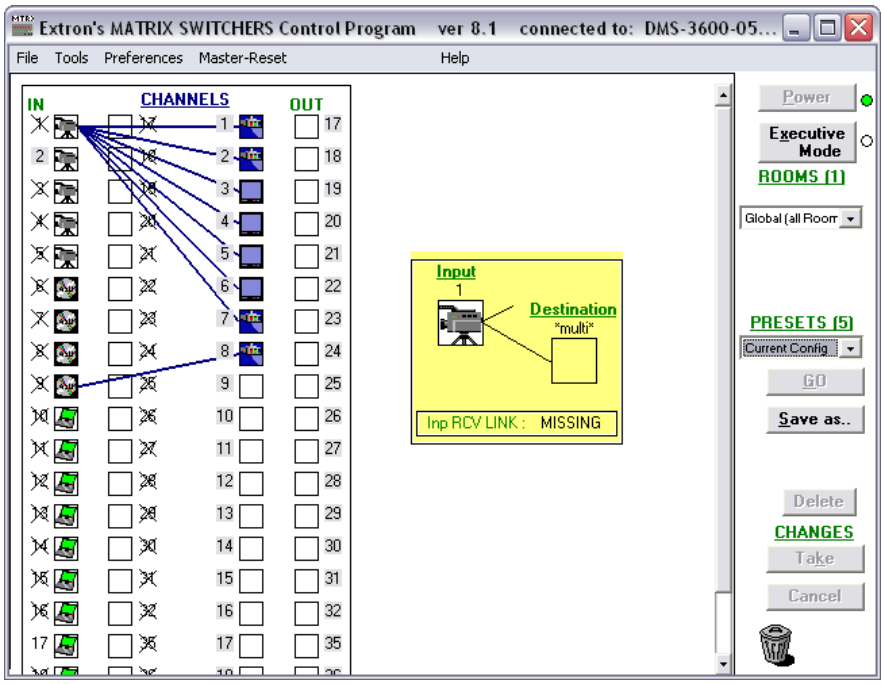


Figure 27. Sample Control Program Window, with Ties and Icons

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IP Settings/Options Window

The IP Settings/Options window (click **`Tools`** > **`IP options`**, see figure 28) provides a location for viewing and, if connected via either serial port or if logged on via the Ethernet port as an administrator, editing settings unique to the Ethernet interface (see "**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.

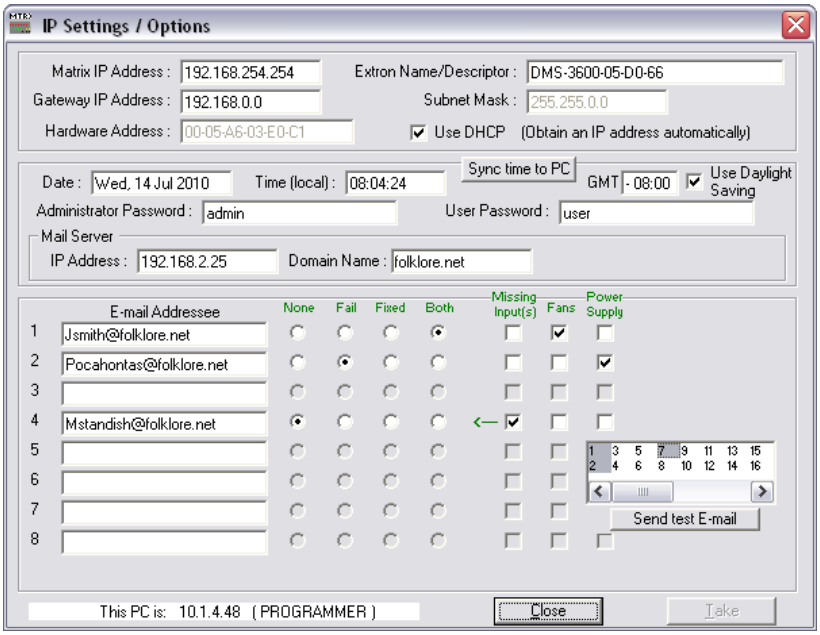


Figure 28. Control Program IP Setting/Options Window

NOTES:

- Editing variables in the IP Settings/Options window 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 or USB port and protecting the Ethernet access to this screen by assigning an administrator password to qualified and knowledgeable personnel only.
- When the control program is connected to the switcher via the RS-232 or USB port, 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.

Address and Name fields

The **`Matrix IP Address`** field contains the IP address of the connected matrix switcher.

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

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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 (see "**Subnetting — A Primer**").

The **Mail Server IP Address** field displays the IP address of the mail server that handles the e-mail for the facility in which the DMS matrix switcher is installed.

Valid addresses consist of four 1-, 2-, or 3-digit numeric subfields, properly called octets, 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 addresses are as follows, but if these conflict with other equipment at your installation, you can change the addresses to any valid value:

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

NOTE: The address fields are unavailable for editing when DHCP is selected.

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 or not recommended in the Extron Name/ Descriptor field:
{space} + ~ , @ = ‘ [ ] { } < > ’ “ ; : | \ and ?.

The **Mail Server Domain Name** field displays the domain name that the DMS matrix switcher uses to log on to the e-mail server. Standard domain conventions (such as *xxx*.com) apply.

NOTE: The following characters are invalid or not recommended in a domain name: {space} + ~ , = ‘ [ ] { } < > ’ “ ; : | \ and ?. The @ character is only acceptable as the lead-in to the domain name (such as @folklore.net).

Edit any of these fields as follows:

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

Hardware Address field

The hardware (MAC) address is hardcoded in the 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 using Dynamic Host Configuration Protocol (DHCP) (if the network is DHCP capable). Contact the local system administrator to determine whether to use DHCP.

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Date, Time (local), and GMT (offset) fields

The **Date** field displays the current date in the local zone.

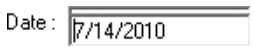
The **Time (local)** field displays the current time in the local time zone.

The **GMT** field displays the amount of time, in hours and minutes, that the local time varies from the GMT international time reference.

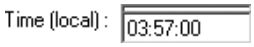
NOTE: Rather than using the following procedure, you can click the **Sync Time to PC** button to set the switcher to the internal time on your computer.

If desired, adjust any of these values as follows:

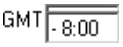
1. Click in the desired field. The field changes to an editable field appropriate to the value being changed and the graphic cursor becomes a text cursor.
   - The **Date** field becomes a set date field, with the date in the format (M)M/(D)D/YYYY. Leading zeroes are not shown.

   - The **Time (local)** field becomes a set time field, with the time in the format HH:MM:SS (00:00:00 to 23:59:59).

   - The **GMT** field becomes a set offset field, with the offset in the format ±HH:MM (–12:00 to +14:00).

2. Edit the field as desired to set the proper value. For time, remember to use 24-hour time. Leading zeroes are optional.
3. Press <Tab> 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.

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.

Use Daylight Saving checkbox

Click in the **Use Daylight Saving** checkbox to turn Daylight Saving Time on and off for North America. When Daylight Saving Time is turned on, the switcher automatically updates its internal clock between Standard Time and Daylight Saving Time in the spring and fall on the date that the time change occurs in North America. When Daylight Saving Time is turned off, the switcher does not adjust its time reference.

NOTE: For Daylight Saving Time in Europe and Brazil, see the **set Daylight Saving Time** SIS command.

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Administrator Password and User Password fields

The **Administrator Password** field displays the password required to log on to the matrix switcher via the Ethernet port with all of the administrator rights and privileges. 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 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, both password fields are masked with asterisks (**********) as a security measure.

NOTES:
- 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 either the serial port or USB port and protecting the Ethernet access to this screen by assigning an administrator password to qualified and knowledgeable personnel only.
- An administrator password must be created before a user password can be created.
- The following characters are invalid or not recommended in passwords: {space} + ~ , @ = ‘ [ ] { } < > ’ “ ; : | \ and ?.

Edit either password field as follows:

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

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E-mail Addressee fields

The eight **`E-mail Addressee`** fields permit the administrator to identify the e-mail addresses of the personnel to whom the matrix switcher e-mails notification of its failure and repair status. Figure 29 shows a typical e-mail from the switcher.

Miles Standish

From: DMS-3600-3-03-E0-C1@folklore.net
Sent: Wednesday, July 14, 2010 11:22 AM
To: Miles Standish
Subject: DMS-3600-3-03-E0-C1 - Fans restored.

Wed, 14 Jul 2010 11:21:48
Unit Name = DMS-3600-3-03-E0-C1
Unit IP Address = 192-168-254-254

Figure 29. Typical DMS Switcher E-mail

The radio buttons and check boxes associated with each address field (see figure 30) permit the administrator to specify e-mail requirements for each recipient.



Figure 30. E-mail Addressee Fields

Edit these fields and controls as follows:

1. Click in the desired **`E-mail Addressee`** field. The pointer tool becomes a text cursor.
2. Edit the e-mail address as desired. Standard e-mail address conventions apply (for example: *nnnnn@xxx*.com).
3. Press <Tab> on the keyboard or click in another field to exit the e-mail addressee field.
4. In the square check boxes associated with each addressee, select one or more options about which the addressee is to be e-mailed: **`Missing Input(s)`**, **`Fans`**, and **`Power Supply`**. In the floating box that contains the input numbers, select the inputs to be monitored.
5. In the round radio buttons associated with each addressee, select whether the addressee is to be e-mailed of failures, fixes, both, or not be notified.
   The **`None`** radio button is useful for temporarily removing personnel from the e-mail list when they are unavailable, such as on travel or vacation.
6. If desired, click on the **`Send test E-mail`** button to test the e-mail function.
7. Click on the **`Take`** button to make the e-mail address changes take effect.

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Updating Firmware

The firmware upgrade utility provides a way to replace the firmware that is coded on the control board in the switcher without taking the switcher out of service.

Update the switcher firmware as follows:

1. Visit the Extron website, **www.extron.com**, click the **Download** tab, and then click the **Firmware** link (see figure 31).

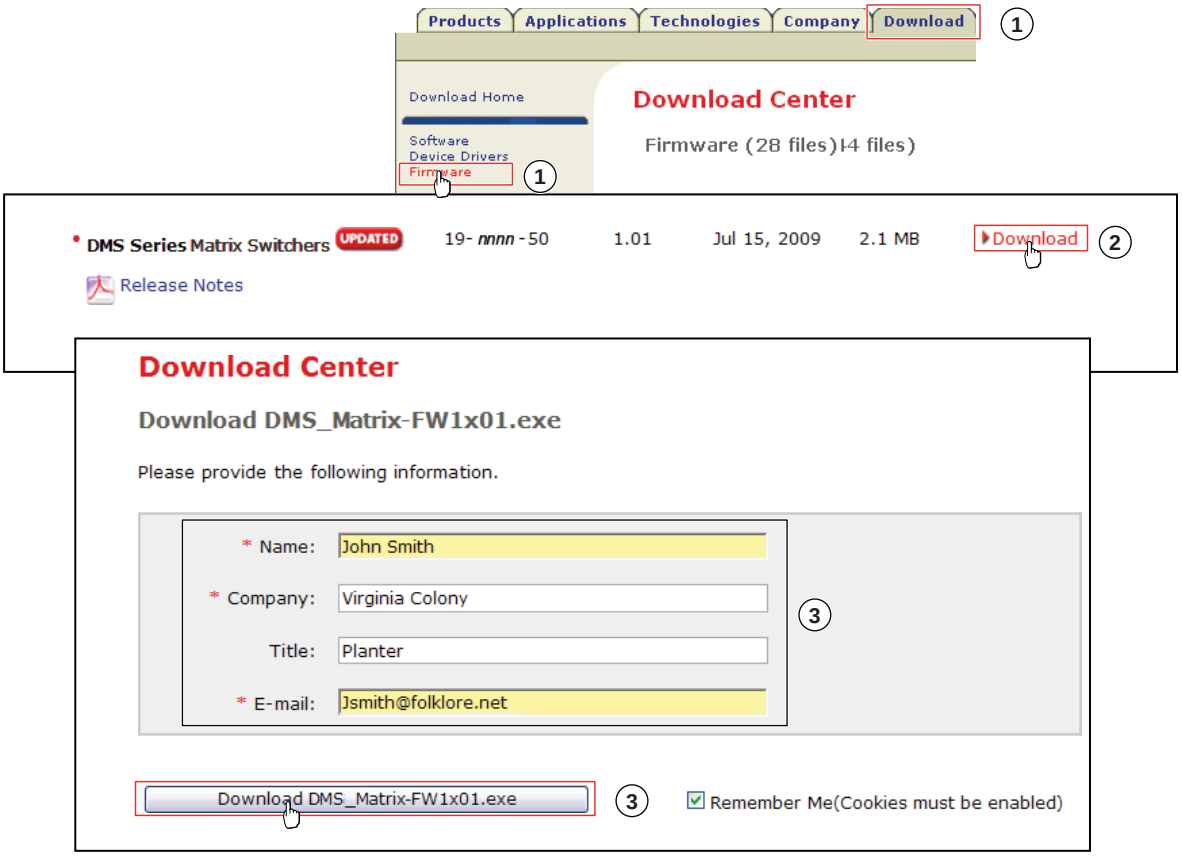


Figure 31. Location of Firmware Upgrade Files

2. Select the appropriate firmware file (such as DMS Series) to download and click **Download**.
3. Enter the requested personal information and then click **Download** to copy the firmware to your computer.
4. Click **Run** twice (see **figure 32** on the next page). The PC downloads the firmware update from the Extron website and starts the Extron Installation Program to extract the firmware file.
5. Click **Next**. The program extracts the firmware files and places them in a folder identified in the InstallShield Wizard window. Note the folder to which the firmware file is saved.
6. Click **Finish** to exit the program.

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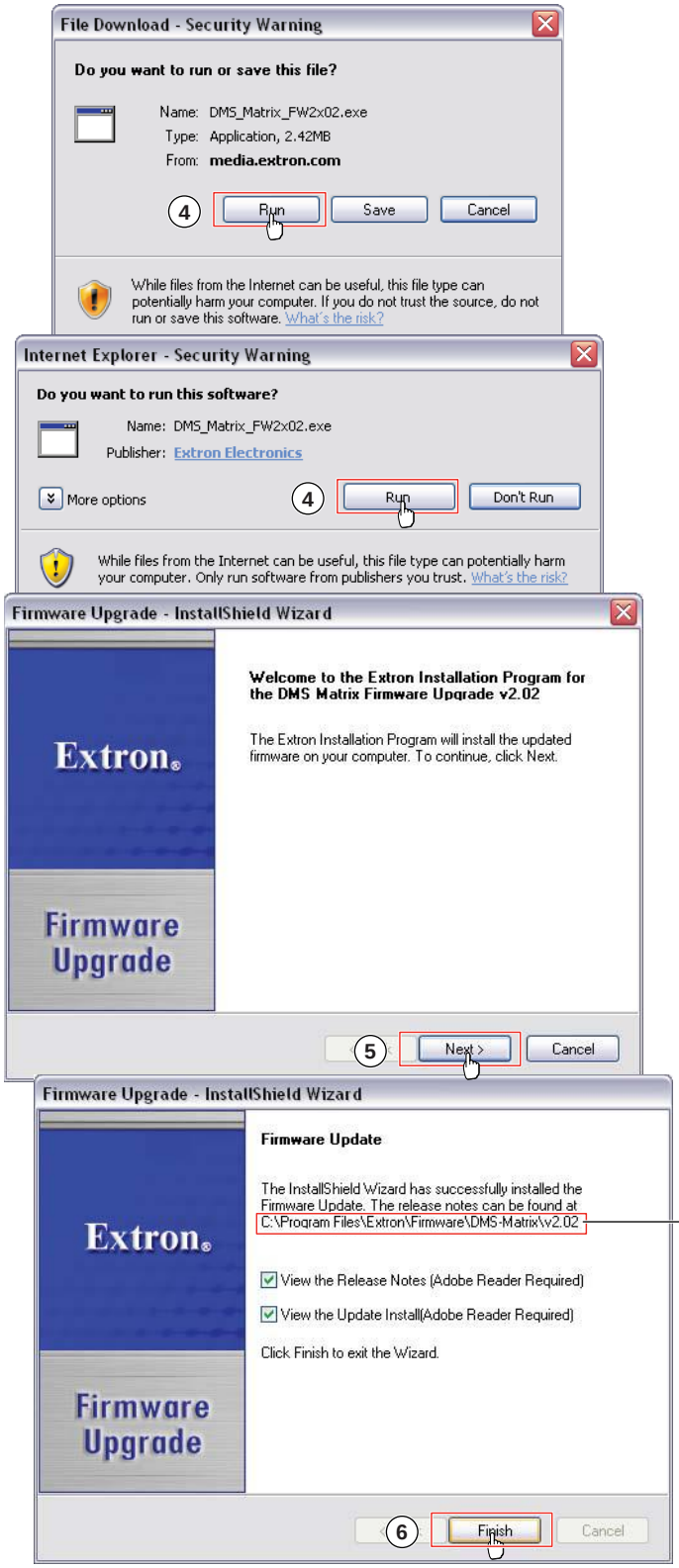


Figure 32. Downloading Firmware Upgrade Files

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7. Connect a computer running Windows to the serial port, USB port, or LAN port of the switcher (see "**Installation**" for more details).
8. Start the Matrix Switchers Control Program and connect to the matrix switcher (see "**Starting the program**," steps 1 through 4, starting on page 65).
9. Click **Tools** > **Update firmware**.

   If you are connected via the LAN port, the `Choose File to Upload` window appears (see figure 33) (see Ethernet-connected firmware upload below).

   If you are connected via either serial port, the `Firmware Loader` window appears (see figure 34 and "**Serial-port or USB-port-connected firmware upload**" on the next page).

Ethernet-connected firmware upload

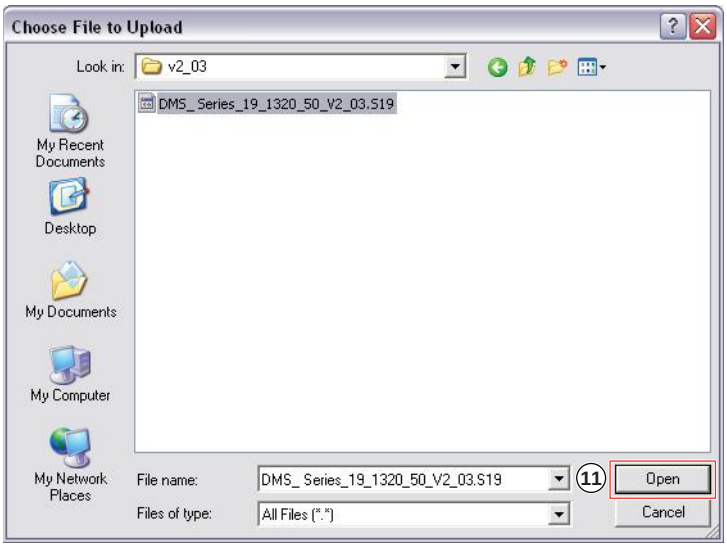


Figure 33. Select Files Window

10. Navigate to the folder where you saved the firmware upgrade file. Select the file.

NOTES:
- Valid firmware files must have the file extension `.S19`. Any other file extension is not a firmware upgrade.
- The original factory-installed firmware is permanently available on the DMS matrix switcher. If the attempted firmware upload fails for any reason, the switcher reverts to the factory-installed firmware.

11. Click the **Open** button. The software advises you that you are about to reprogram the firmware of the switcher. Click **OK** to continue.



A status window appears that advises that the upload is in progress. The firmware upload to the DMS matrix switcher may take a few minutes. When the status window closes and the front panel button indications on the switcher flash amber, green, red, and amber and then return to either off or to background illumination, the upload is complete.

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Serial-port- or USB-port-connected firmware upload

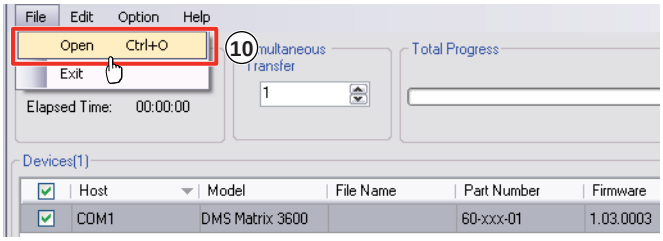


Figure 34. Extron Firmware Loader Window

10. Select the DMS matrix switcher and click **File** > **Open**. The Choose File to Upload screen appears (see figure 35).

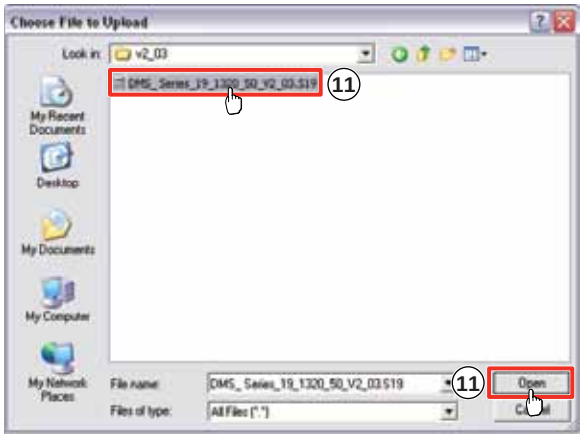


Figure 35. Choose Firmware File Window

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

CAUTION: The firmware file must have an .s19 extension. Other file types can cause the switcher to stop functioning until a reset is performed.

10. In the Firmware Loader window, click **Begin** (see figure 36).

The Total Progress and Progress status bars show the progress of the upload, which may take several minutes. Once the status bars have progressed from 0% to 100%, and Status is listed as Complete, the firmware loader utility resets the switcher.

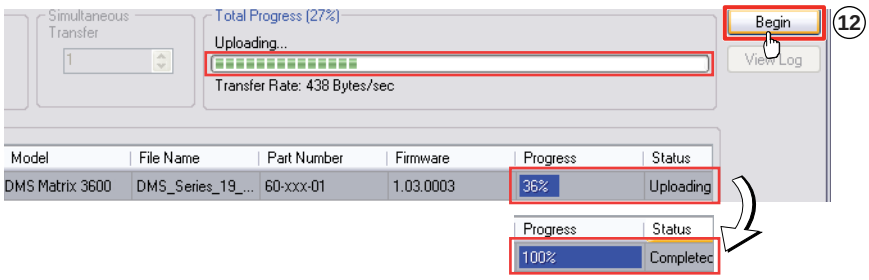


Figure 36. Firmware Loader Screen

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

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Uploading HTML Files

You can create customized HTML pages for the switcher to display. The HTML Files List window (see figure 37), accessible via the Tools menu, provides a way to view the contents of the file system and upload custom HTML pages to the 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 "**Updating Firmware**" in this chapter to replace the firmware).

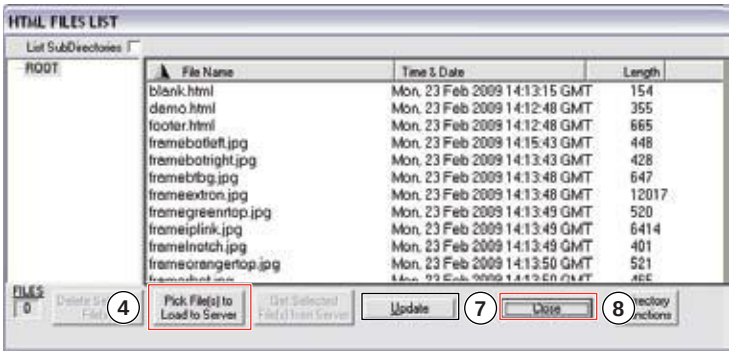


Figure 37. HTML Files List Window

NOTE: The files listed in figure 37 are shown for example only and may not be present on your switcher.

Upload HTML pages as follows:

NOTE: The following characters are invalid or not recommended in file names: {space} + ~ , @ = ‘ [ ] { } < > ’ “ ; : | \ and ?.

1. Connect the PC to the matrix switcher via the RS-232/RS-422 port, USB port, or Ethernet port on the switcher.
2. Start the Matrix Switchers Control Program and connect to the DMS matrix switcher (see "**Starting the program**," steps **1** through **4**, starting on page 65).
3. Click on **`Tools`** > **`HTML File Manager`**.
4. Click the **`Pick File(s) to Load to Server`** button. An `Open File` window appears.
5. Navigate to the folder where you saved the HTML file. Select the file.

   NOTES:
   - To select multiple files, hold the Ctrl key while you select the desired files.
   - If you want one of the HTML files that you created to be the default start-up page, name the file "index.html." The DMS matrix switcher automatically looks for that file name when you first connect to it using an Internet browser.

6. Click the **`Open`** button. The upload of files to the DMS matrix switcher may take a few minutes.
7. Click the **`Update`** button to confirm the upload.
8. Click the **`Close`** button to exit the HTML Files List window.

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Windows Buttons, Drop Boxes, and Trash Can

The buttons, drop boxes, and trash can on the right side of the Matrix Switchers Control Program window perform the following functions:



Power — Unavailable for DMS matrix switchers, 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. Click the button to cycle between locked (the indicator displays red) and unlocked (the indicator is white).

Rooms menu — Displays a list of up to 10 rooms. You can select a room from the list to display it in the window.

> **NOTE:** A ***Room*** is a subset of outputs that are logically related to each other, as determined by the operator. The DMS matrix switcher supports up to 10 rooms, each of which can consist of from 1 to 16 outputs.

Presets menu — Displays a list of up to 32 global presets and up to 100 room presets (10 rooms x 10 presets per room). You can select a preset from the list to display it and either activate it (**Go**) or delete it (**Delete**).

Presets – Go — Activates the selected preset as the current configuration.

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

Presets – Delete — Allows the current preset to be deleted.

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

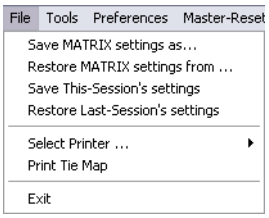
Changes – Cancel — Returns to the previous screen, undoing any changes you have made.

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

Windows Menus

> **NOTE:** Selections in the various drop-down menus in the following pages that are gray are unavailable for selection.

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 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 changes from the previous session the last time you exited the program, the ties from that session are also loaded.

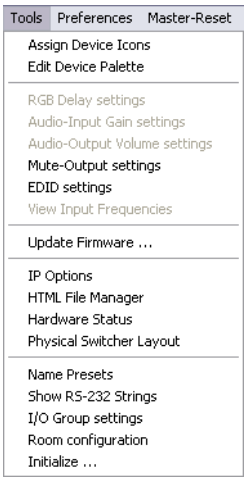
Select printer — Selects the target printer.

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

Exit — Closes the Matrix Switchers Control Program.

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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.

`Mute-Outputs settings` — Displays the Mute Adjust screen, from which you can mute each output.

`EDID settings` — Displays the EDID Configuration window (see figure 38), from which you can select a pre-programmed resolution and refresh rate for an input and save the output resolution of the monitor connected to output 1 to one of the user-defined locations.

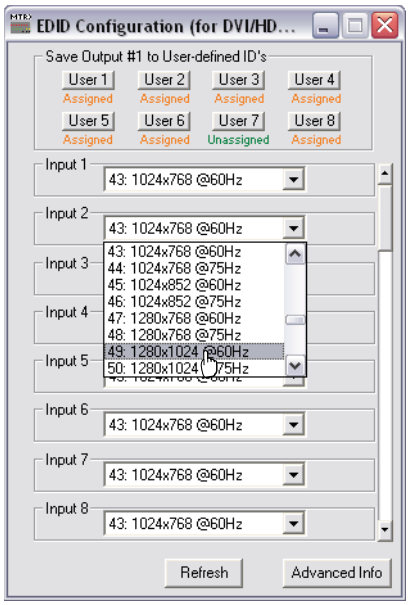


Figure 38. EDID Configuration Window

NOTES:
- EDID communicates video display information, including native resolution and vertical interval refresh rate requirements, to the input. The input device then outputs the optimal video format for the output (such as a display) based on the provided EDID data, ensuring proper video image quality. This communication takes place over the Display Data Channel (DDC).
- In the EDID Configuration window, the EDID data can come from either an active output or be set to a specified value.

`Update Firmware` — Allows you to replace the firmware that is coded on the control board in the switcher without taking the switcher out of service, opening the switcher enclosure, and replacing the firmware chip set (see "**Updating Firmware**" on page 73).

`IP Options` — Allows you to set IP options (see "**IP Settings/Options Window**" on page 68).

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`Hardware Status` — Provides an overall view of the status of the matrix switcher, including the power supply voltages, the temperature status, the Remote RS-232/RS-422 port configuration, and the installed and updated firmware status (see figure 39).

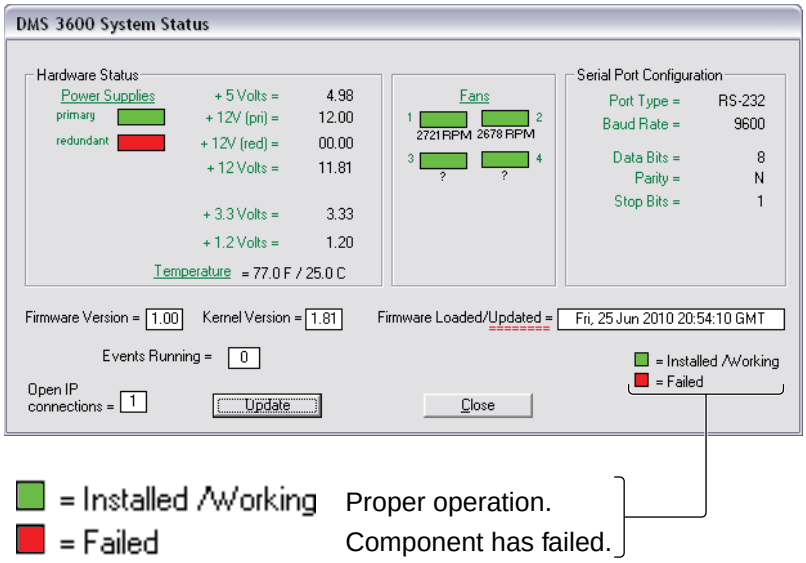


Figure 39. Status Window

`Physical Switcher Layout` — Opens the DMS Physical Configuration window (see figure 40), which displays the I/O board type installed in each slot. The In Channels or Out Channels field can be helpful in identifying a specific input or output. In figure 40, for example, output 29 is identified as slot 8, connector A (**8o01**).

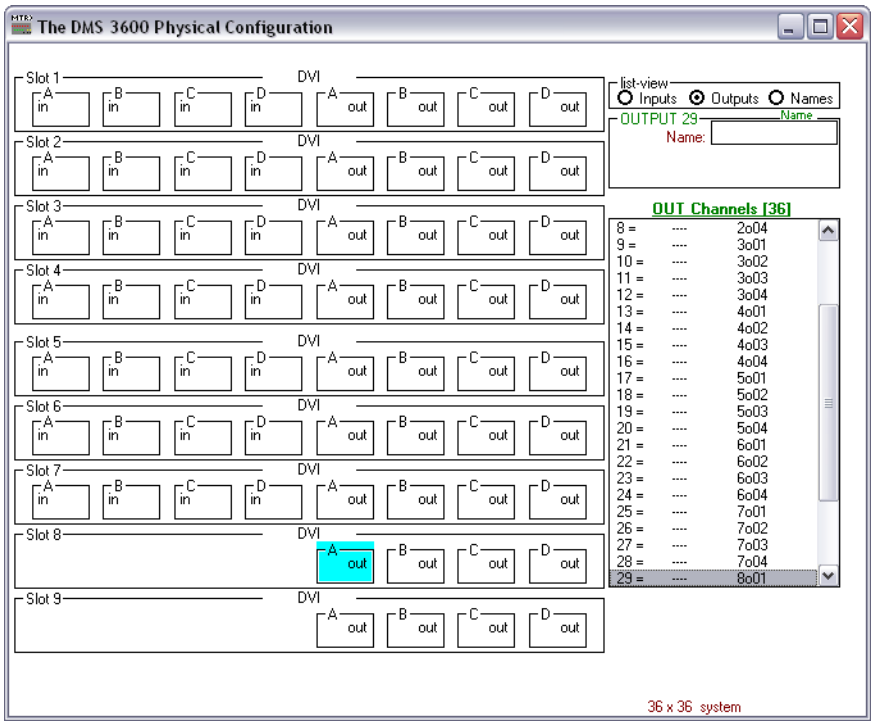


Figure 40. Physical Configuration Window

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

NOTES:
- Preset names are limited to 12 upper- and lower-case alphanumeric characters, space, and the _ and / characters.
- The following characters are invalid or not recommended 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 SIS programming.

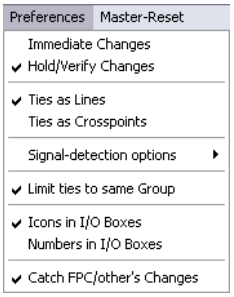
I/O group settings — Allows you to establish I/O groups.

Room configuration — Allows you to assign outputs to rooms or delete outputs from rooms.

NOTE: A Room is a subset of outputs that are logically related to each other, as determined by the operator. The DMS matrix switcher supports up to 10 rooms, each of which can consist of from 1 to 16 outputs.

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

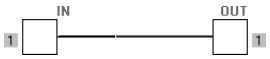
Preferences menu



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 (below).



Ties as Crosspoints — Displays ties as a matrix of inputs and outputs (see figure 41). Ties that have been made are indicated as amber or green boxes. Ties that will take effect when you click the **Take** button are indicated by +. Ties that will be broken when you click the **Take** button are indicated by –.

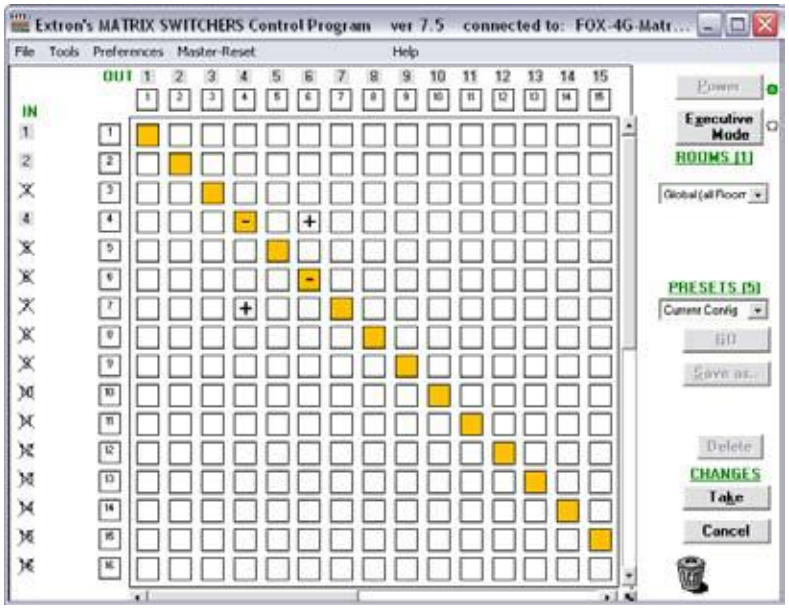


Figure 41. Ties Shown as Crosspoints

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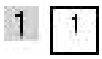
Signal-detection options — Allows you to set the signal presence feature as follows, to:

- Automatically refresh the display every 10 seconds.
- Update the display whenever you refresh the screen.
- Never sample and display the link status

Icons in I/O Boxes — Erases any numbers in the I/O boxes in the Control Program window (see **figure 27**). You can place icons in the boxes.



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.



Catch FPC/other's changes — When checked, sets the switcher to report all configuration and setting changes to the serial port or Ethernet connection that turned this selection on. These reports allow the Matrix Switchers Control Program to track the changes that occur in the configuration and settings of the switcher, whether commanded via the front panel, either serial port, or the Ethernet port.

Master-Reset selection



Master reset performs all of the following functions:

- Clears all ties
- Clears all presets
- Clears all output mutes
- Resets all I/O grouping

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

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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 Switchers 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 **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**.
5. Select **DMS** as the Matrix Model (see figure 42) and either **DMS 1600** or **DMS 3600** as the Default Size. Check the boards that are installed; and select the type, input/output (**4x4**), input only (**4x0**), or output only (**0x4**), for each board. Click **OK**.

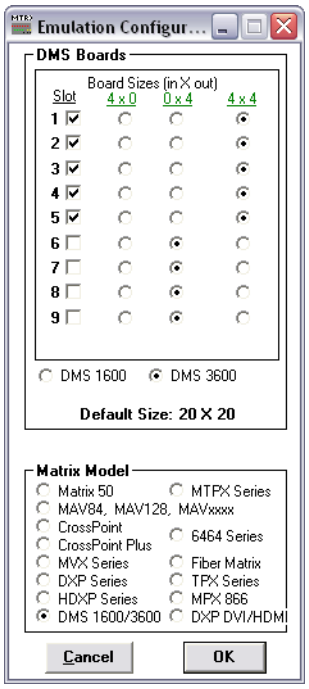


Figure 42. Emulation Mode Configuration

6. Continue using the program as described on **page 66**.

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 Switchers Control Program, click on the **Help** menu on the main screen.
- From within the Matrix Switchers Control Program, press the <F1> key.

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Button Label Generator Program

The Button Label Generator software creates labels that you can place in the translucent covers above and below 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 "**Maintenance and Modifications**" for the procedure for removing and replacing the translucent covers.

Installing the Button Label Generator Software

The Extron Button Label Generator is available on the Extron website, **www.extron.com**, under the Download tab. Click the **Software** link (see figure 43). Locate, download, and install the program.

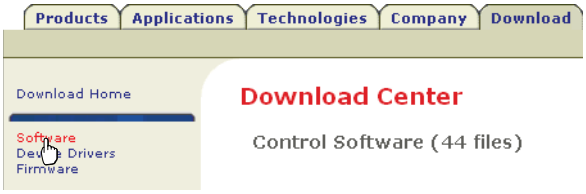


Figure 43. Location of Software on the Web Site

NOTE: The Button Label Generator software is also included on the Extron Software Products disc that accompanied the switcher.

By default, the Windows installation creates a `C:\Program Files\Extron\ButtonLabelGenerator` directory and places the Button Label Generator icon into a group or folder named "Extron Electronics."

NOTE: For Windows 7, the folder is `C:\Program Files (x86)\ButtonLabelGenerator`.

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Using the Button Label Generator Software

To run the Button Label Generator program, click **Start** > **Programs** > **Extron Electronics** > **Button Label Generator** > **Button Label Generator**. The Button Label Generator window appears (see figure 44).

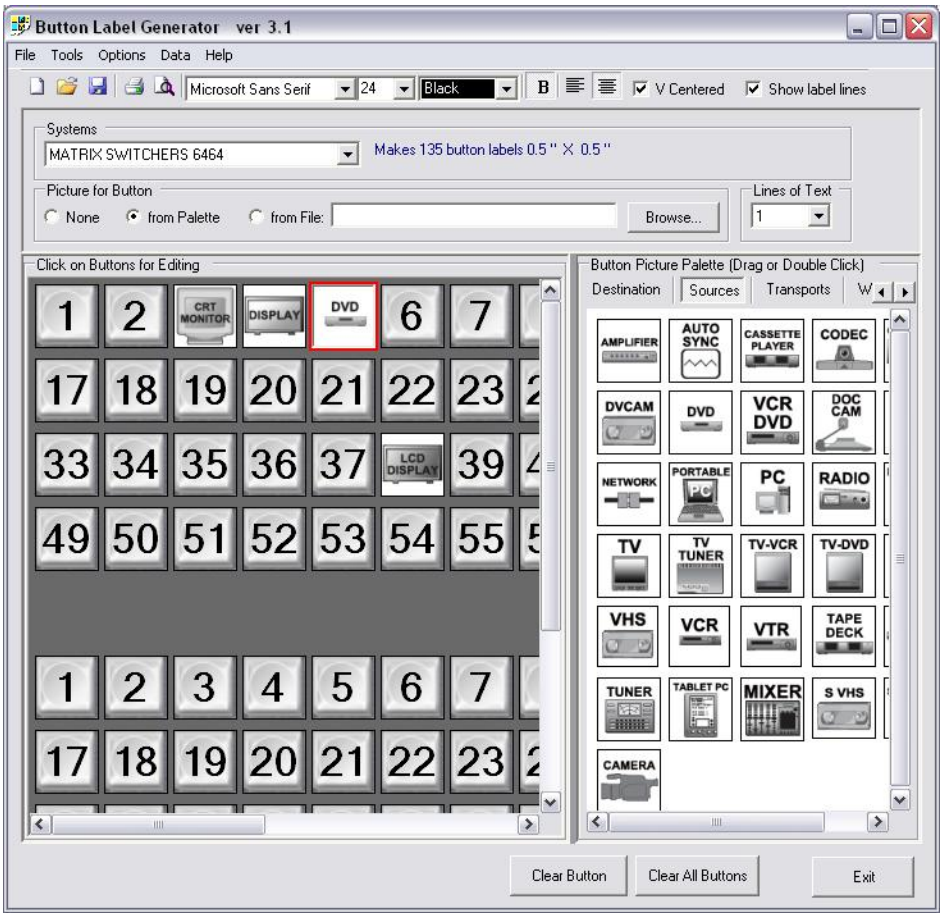


Figure 44. Button Label Generator Window

- In the Systems selection box:
  - Choose the **Matrix Switchers 1616** option to match the button label size and quantities for a DMS 1600 switcher.
  - Choose the **Matrix Switchers 6464** option to match the button label size and quantities for a DMS 3600 switcher.
- Using standard Windows controls, create and print labels that can be placed in the clear button caps on the front panel of the switcher.
- Click the **Clear All Buttons** button and create new labels as many times as necessary to make all of the button labels that you need.

To access the help program, click the **Help** menu.

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HTML Operation

This section describes the operation of the DMS 1600 and DMS 3600 via their embedded web pages, including:

- Opening the Embedded Web Pages
- Status Tab
- Configuration Tab
- File Management Tab
- Control Tab
- Special Characters

The switcher can be controlled and operated through its LAN port, connected via a LAN or WAN, using a web browser such as Microsoft Internet Explorer®. The display of the status or operation of the switcher 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 Internet Explorer, click **`Tools`** > **`Internet Options`** > **`Connections`** > **`LAN Settings`**, uncheck the **`Use a proxy server...`** box, and then click **`OK`**.

Opening the Embedded Web Pages

Access the switcher using HTML pages as follows:

1. Start the web browser program.
2. Click in the `Address` field of the browser.
3. Enter the matrix IP address in the `Address` field of the browser.

   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.

   NOTES:
   - The `Address field` of the browser should display the address in the following format: *xxx.xxx.xxx.xxx/{optional_file_name.html}*.
   - The following characters are invalid or are not recommended in file names: {space} + ~ , @ = ' [ ] { } < > ' " ; : | \ and ?.

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

   If the switcher is not password protected, it checks and downloads the HTML pages (proceed to step **7**).

   If the switcher is password protected, the switcher downloads the `Enter Network Password` page (see figure 45).



Figure 45. Enter Network Password Dialog Box

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 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`" (see figure 46), also known as the System Status page.

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Status Tab

System Status Page

The `System Status` page (see figure 46) provides an overall view of the status of the matrix switcher, including individual voltages and the serial port status (if applicable). 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.

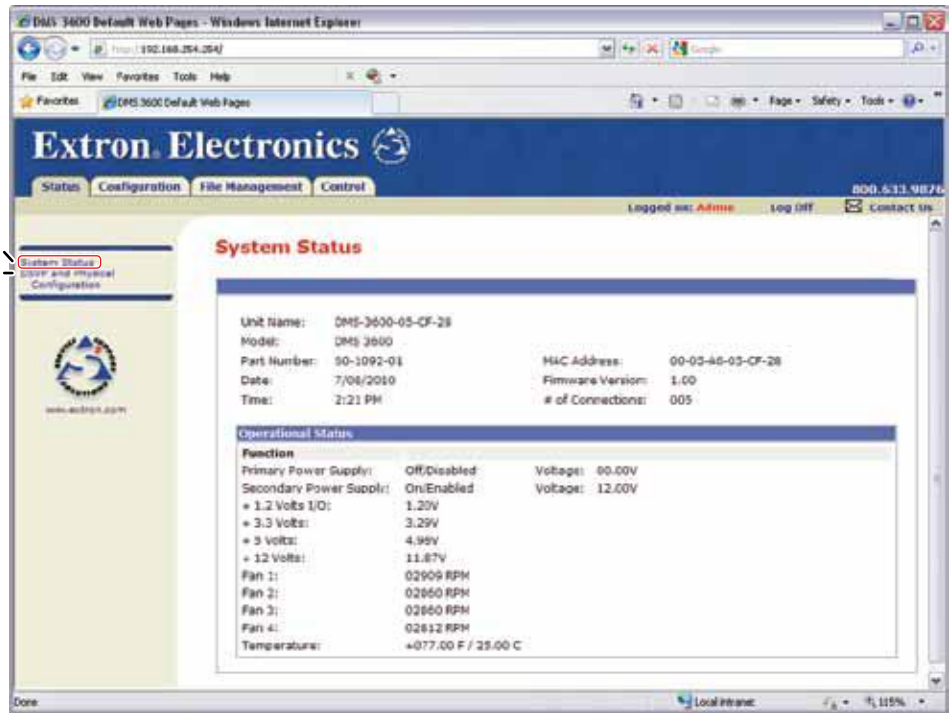


Figure 46. System Status Page

The `System Status` page periodically updates itself to reflect the latest status of the switcher components. If a variable changes, the display shows the change the next time it updates.

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DSVP and Physical Configuration Page

You can view the board type and signal status of each I/O board slot on the `DSVP and Physical Configuration` page (see figure 47). Click the **`DSVP and Physical Configuration`** link to the left of the `Status` page to download the `DSVP and Physical Configuration` page. The page updates itself every 30 seconds to show the latest board types and signal status.

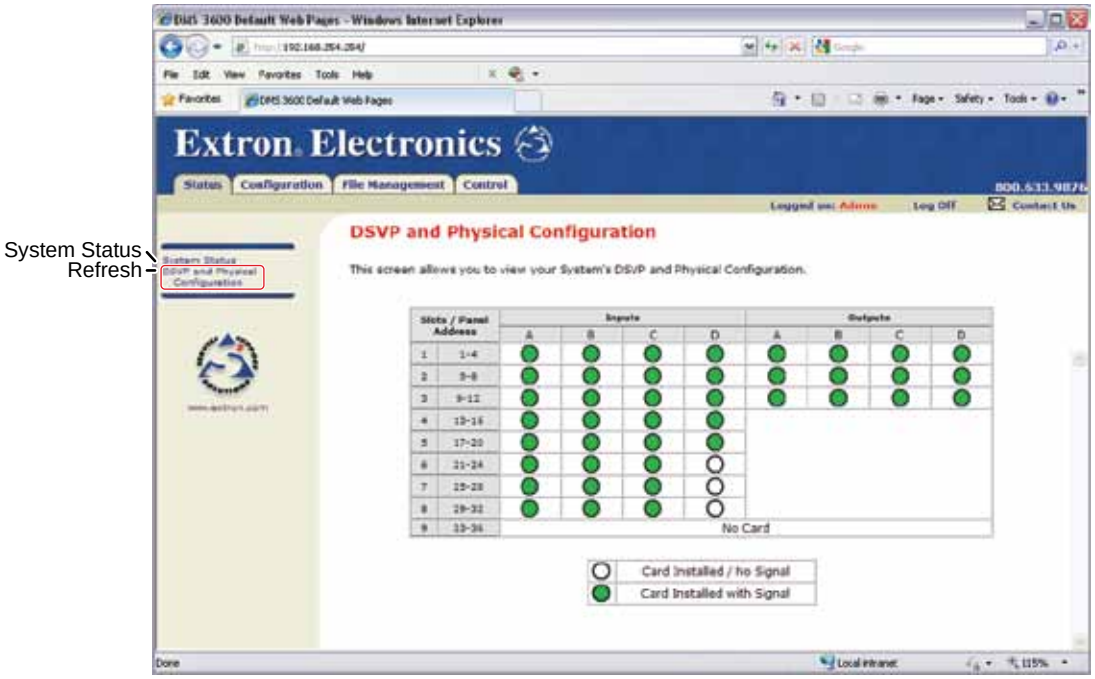


Figure 47. DSVP and Physical Configuration Page

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Configuration Tab

System Settings Page

The DMS matrix switcher downloads the **System Settings** page (see figure 48) when you click the **Configuration** tab. The screen consists of fields in which you can view and edit IP administration and system settings (see "**Ethernet Connection**" for basic information about IP addresses and subnetting.

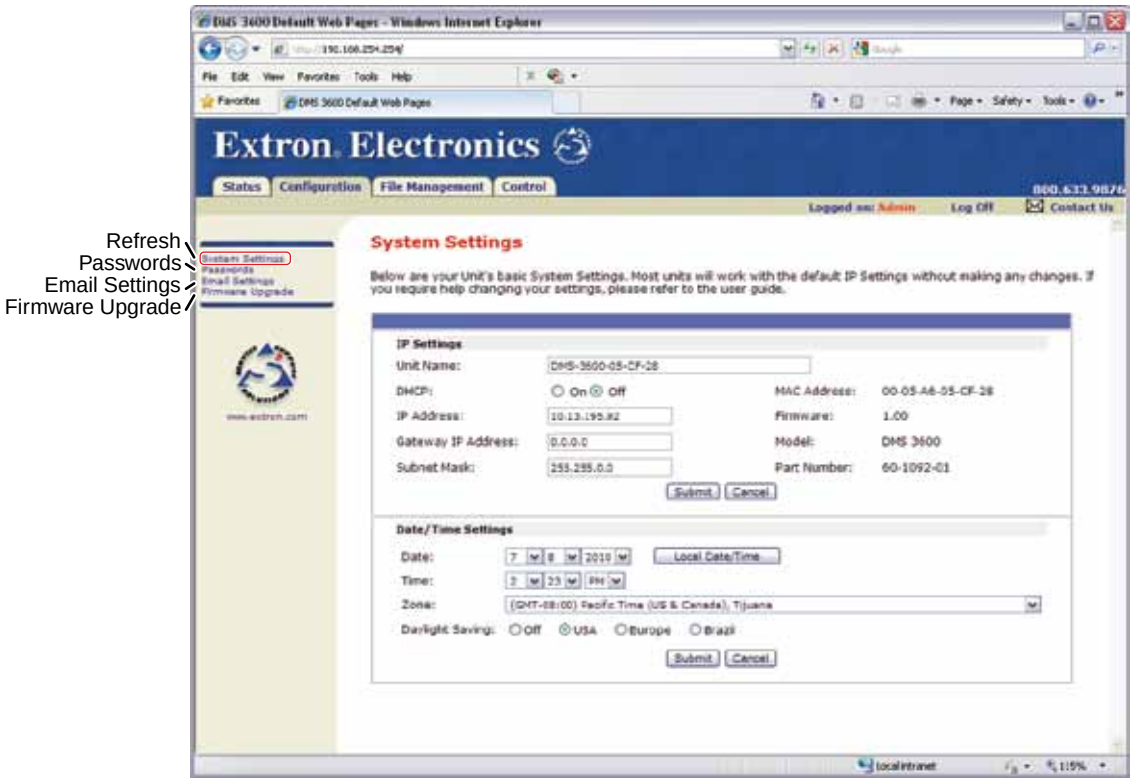


Figure 48. System Settings Page

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 output mutes, and view all settings with the exception of passwords.

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 IP Settings fields section.

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 or not recommend in the matrix name: + ~ , @ = ' [ ] { } < > ' " ; : | \ and ?.

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DHCP radio button

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 determine if DHCP is appropriate.

IP Address field

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

Standard IP protocol consists of addresses comprised of four 1-, 2-, or 3-digit numeric subfields, properly called octets, 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 conflicts with other equipment at your installation, 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. Standard IP protocol rules apply to the Gateway 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**."

MAC Address field

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

Firmware field

The Firmware field identifies the installed firmware version. This field is hardcoded in the switcher and cannot be changed without updating the firmware.

Model field

The Model field identifies the number of inputs and outputs. This field is hardcoded in the switcher and cannot be changed.

Part Number field

The Part Number field identifies the part number of your switcher. This field is hardcoded in the switcher and cannot be changed.

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Date/Time Settings fields

The **Date/Time Settings** fields (see figure 49) provide a location for viewing and setting the time functions.



Figure 49. Date/Time Settings Fields

To sync the clock in the switcher to the connected PC, simply click the **Local Date/Time** button and then click the **Submit** button.

NOTE: Use of the **Local Date/Time** button has no effect on the Zone and Daylight Savings functions.

For more complete control of the date and time settings, change the settings as follows:

1. Click the drop box for the desired variable. The adjustable variables are month, day, year, hours, minutes, AM/PM, and (time) zone. A drop-down scroll box appears (the year drop box is selected in figure 49).
2. Click and drag the slider or click the scroll up button or the 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).

   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, select the correct Daylight Saving radio button to turn on the daylight savings time feature for your region or nation.

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

6. Click the **Submit** button.

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Passwords Page

Access the Passwords page (see figure 50) by clicking the **Passwords** link on the System Settings page.

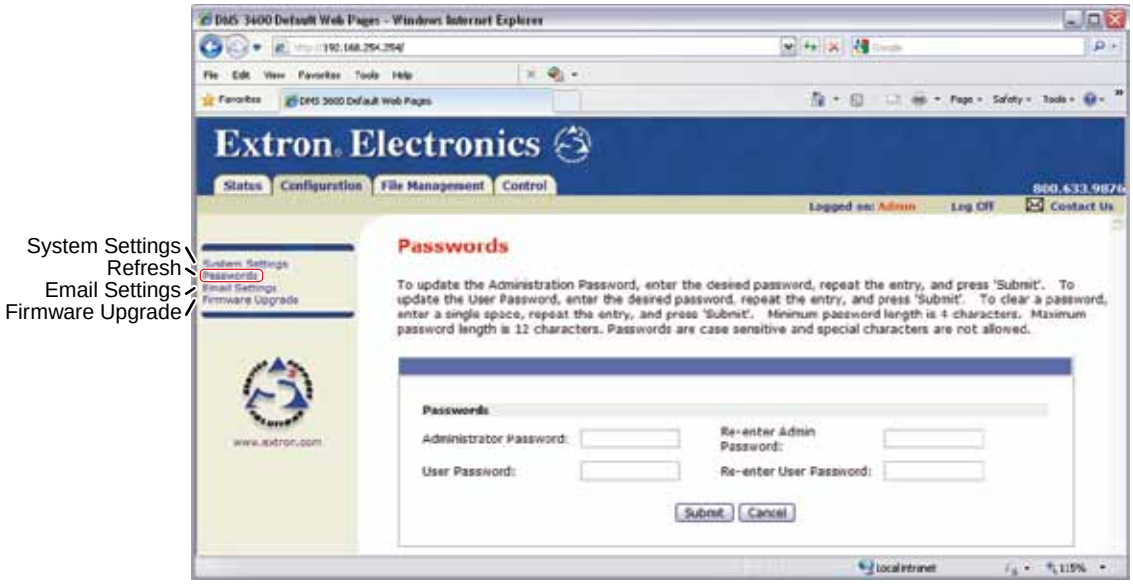


Figure 50. Passwords Page

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

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Email Settings Page

Reach the **Email Settings** page (see figure 51) by clicking the **Email Settings** link on the **System Settings** page. The **Email Settings** page has fields for setting up the e-mail notification capabilities of the switcher. For the e-mail settings and for each row of the e-mail notification settings, click the **Edit** button to make the fields available for editing. The button changes to **Save**. After editing the associated settings, click the **Save** button.

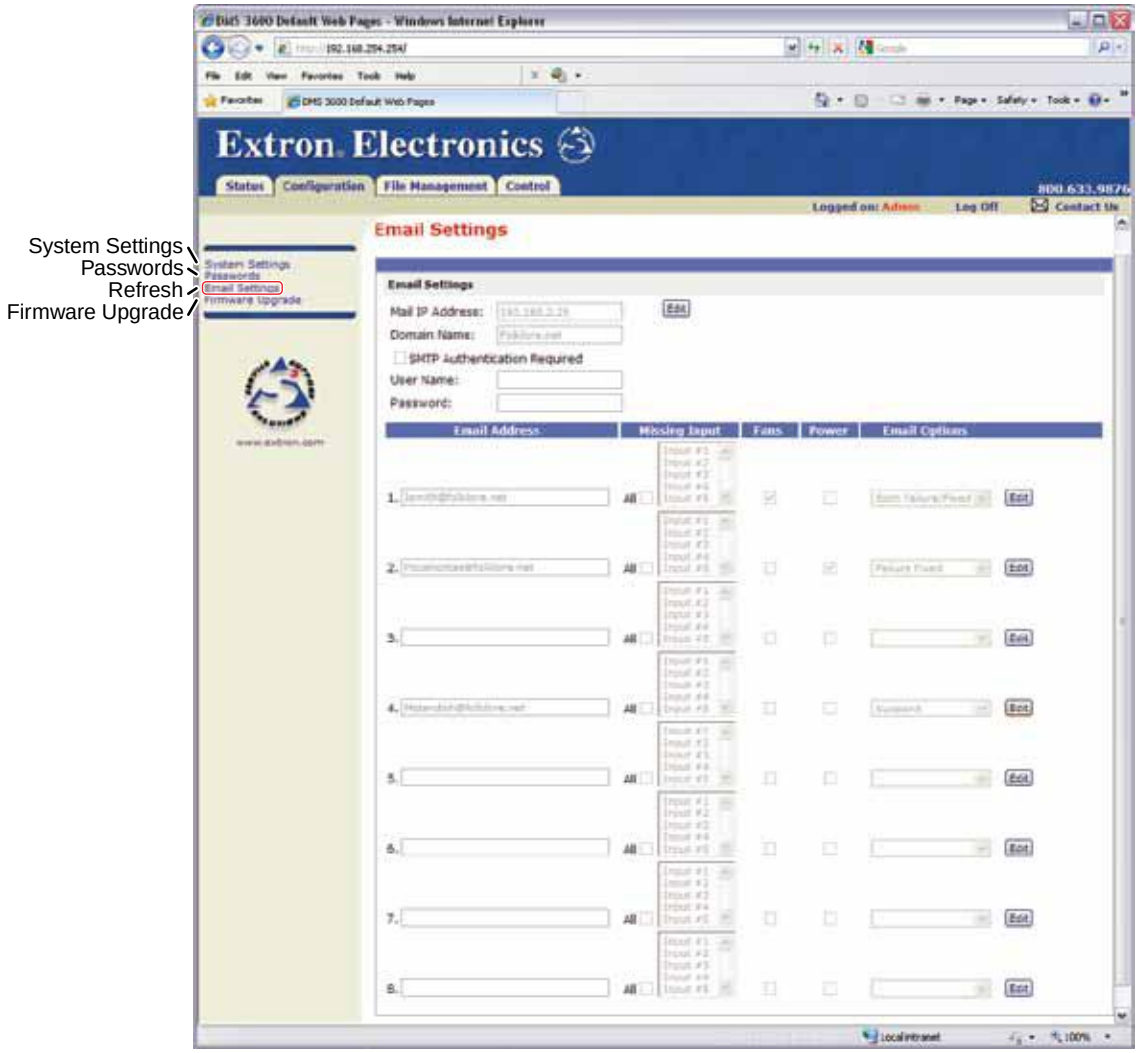


Figure 51. Email Settings Page

Mail IP Address field

The **Mail IP Address** field displays the IP address and the domain name of the e-mail server for the facility in which the DMS matrix switcher is installed. Standard IP protocol rules apply to the Mail IP address

Domain Name field

The **Domain Name** field displays the domain name that the DMS matrix switcher uses to log on to the e-mail server. Standard domain name conventions (for example: *xxx*.com) apply.

NOTE: The following characters are invalid or not recommended in a domain name: {space} @ + ~ , = ‘ [ ] { } < > ’ “ ; : | \ and ?.

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Email Address fields

The eight **Email Address** fields identify the e-mail addresses of the personnel to whom the DMS matrix switcher e-mails notification of its failure and repair status. Standard e-mail address conventions (*xxxxx@xxx*.com) apply.

The check boxes and drop boxes associated with each address field permit you to specify specific criteria under which the switcher will e-mail recipients. In the associated **Missing Input** drop boxes, select the inputs to monitor for presence or absence of a signal. Check the **Fans** and **Power** boxes to monitor the cooling and power supplies. In the associated **Email Options** drop box, select whether the recipient is to be e-mailed of failures, fixes, both, not notified, or to be removed from the e-mail list. The **Suspend** option is useful for temporarily removing personnel from the e-mail list when they are unavailable, such as on travel or vacation. Deleting an e-mail addressee and clicking the **Submit** button removes the recipient from e-mail notification completely.

Firmware Upgrade Page

The **Firmware Upgrade** page provides a way to replace the switcher firmware without taking the switcher out of service. Access the **Firmware Upgrade** page (see figure 52) by clicking the **Firmware Upgrade** link on the **System Settings** page.



Figure 52. 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 custom HTML pages, see "**File Management Page**."

1. Perform steps **1** through **6** of "**Updating Firmware**" in on page 73.

   NOTE: Note the folder to which the firmware file is saved.

2. Connect the PC to the DMS matrix switcher via the LAN port on the switcher.
3. Access the DMS matrix switcher using HTML pages.
4. Click the **Configuration** tab.

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5. Click the **Firmware Upgrade** link (see figure 53).

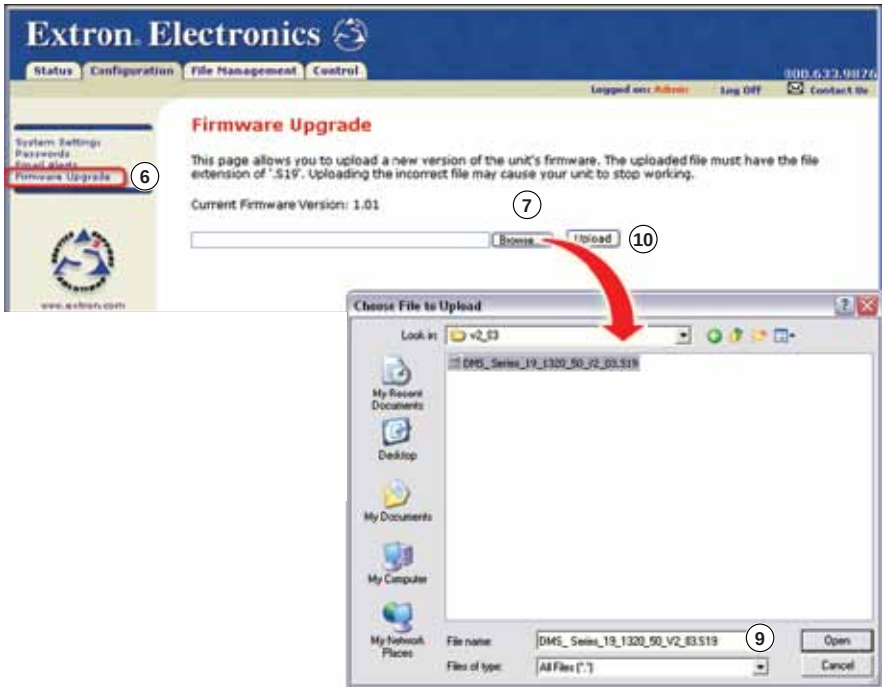


Figure 53. Firmware Upgrade

6. Click the **Browse** button. A **Choose File** window appears.
7. Navigate to the folder where you saved the firmware upgrade file. Select the file.

NOTES:
- Valid firmware files must have the file extension "**.S19**." Any other file extension is not a firmware upgrade.
- The original factory-installed firmware is permanently available on the DMS matrix switcher. If the attempted firmware upload fails for any reason, the switcher automatically reverts to the factory-installed firmware.

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

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File Management Tab

File Management Page

To delete files such as HTML pages from the switcher or to upload your own files to the switcher, click the **`File Management`** tab. The switcher downloads the `File Management` HTML page (see figure 54).



Figure 54. File Management Page

NOTE: The files listed in figure 54 are shown for example only and may not be present on your switcher.

To delete a file, click the **`Delete`** button associated with a file.

Upload your own files as follows:

NOTE: The following characters are invalid or not recommended in file names: {space} + ~ , @ = ‘ [ ] { } < > ’ “ ; : | \ and ?.

1. Click the **`Browse`** button.
2. Browse through your system and select the desired files.

   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 files that you selected appear in the list.

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Control Tab

Set and View Ties Page

You can create ties on the **Set and View Ties** page (see figure 55). Access the **Set and View Ties** page by clicking the **Control** tab.

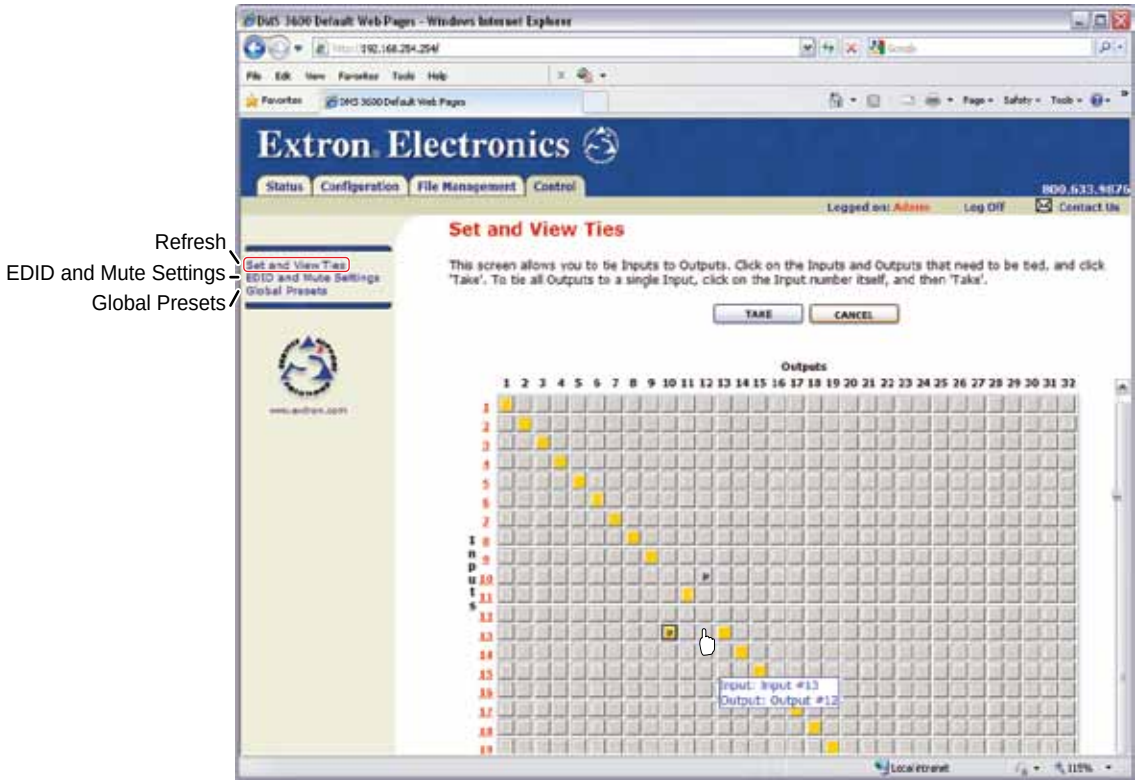


Figure 55. Set and View Ties Page

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

- The **amber** buttons indicate **ties**.
- The **gray** buttons indicate **no ties**.

Creating or deleting a tie

Make or break a tie as follows:

1. Move the mouse over the matrix of input and output selection buttons. Click a button to
   - Create a pending tie of the input and output associated with that button
   - Create a pending untie of the input and output associated with that button

   A "P" (for pending) appears in the button.

   NOTES:
   - Because of command length limitations in the browser, you can make a maximum of 30 connections with a single **Take** command (step **2**).
   - To tie an input to all outputs, click the input number for that input.

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

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EDID and Mute Settings Page

The **EDID and Mute Settings** page provides a way to set the EDID resolution and refresh rate for each input and to mute and unmute all or individual outputs. Access the **EDID and Mute Settings** page (see figure 56) by clicking the **EDID and Mute Settings** link on the **Set and View Ties** page.

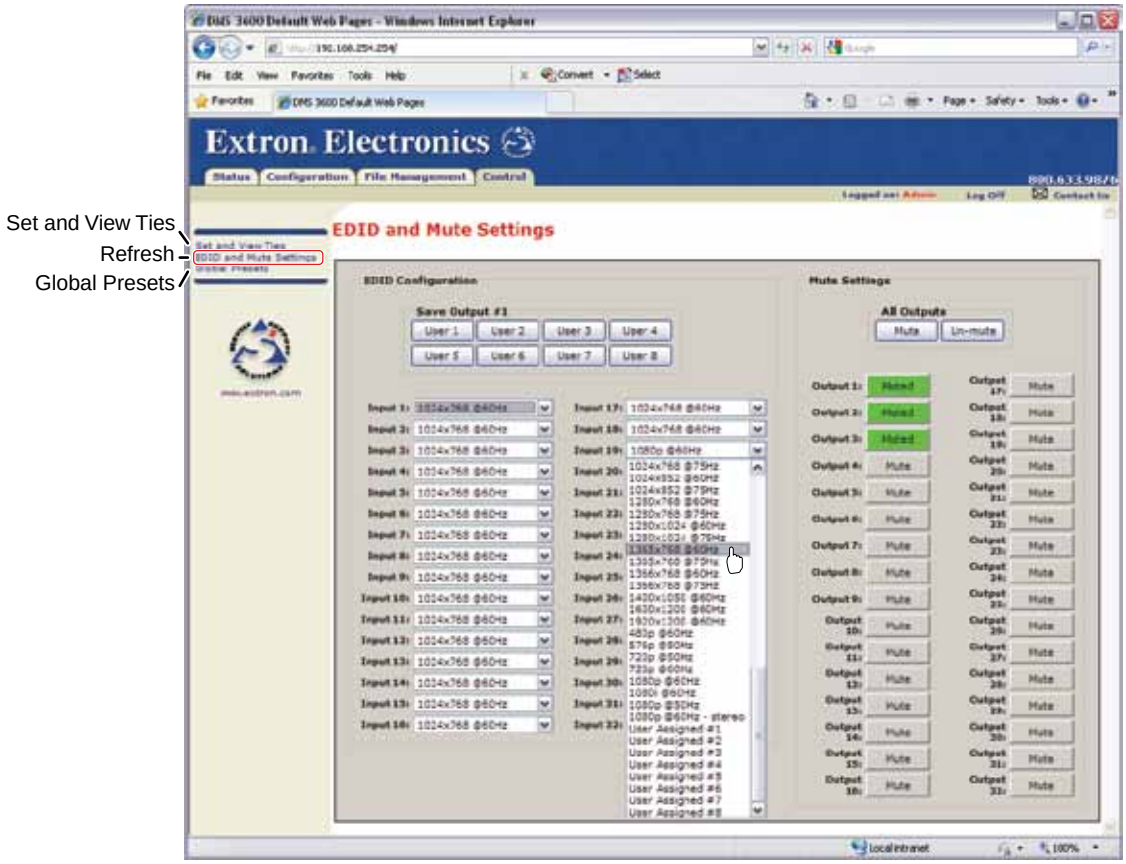


Figure 56. EDID and Mute Settings Page

NOTES:
- EDID communicates video display information, including native resolution and vertical interval refresh rate requirements, to the input. The input device then outputs the optimal video format for the output (such as a display) based on the provided EDID data, ensuring proper video image quality. This communication takes place over the Display Data Channel (DDC).
- On the EDID and Mute Settings page, the EDID data can come from either an active output or be set to a specified value.

Select the resolution and refresh rate for an output by using the drop-down box for that input.

Save the output resolution of the monitor connected to output 1 to one of the User Assigned locations by clicking the desired User button.

Toggle mute on and off for an output by clicking the **Mute** button for that output.

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Global Presets Page

You can save and recall global presets from the **Global Presets** page (see figure 57). Access the **Global Presets** page by clicking the **Global Presets** link on the left of the **Set and View Ties** page.



Figure 57. Global Presets Page

Saving 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.

NOTES:
- Preset names are limited to up to 12 upper- and lower-case alphanumeric characters.
- The following characters are invalid or not recommended in preset names:
  + ~ , @ = ‘ [ ] { } < > ’ “ ; : | \ and ?.

If you do not rename an unassigned button, the DMS matrix switcher names the preset as `Preset {the selected preset number}`, “`Preset 08`” for example.

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

4. Click the **Accept** button.

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Recalling a preset

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

Special Characters

The HTML language reserves certain characters for specific functions. Extron recommends against using these characters as part of preset names, its name, passwords, or locally created file names.

Use of the following characters is not recommended:
{space} + ~ , @ = ‘ [ ] { } < > ’ “ semicolon (;) colon (:) | \ and ?.

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Maintenance and Modifications

This section covers corrective maintenance and modifying the DMS matrix switchers, including:

- Mounting the Switcher
- Removing and Installing the I/O Board or Blank Panel
- Removing and Installing the Power Supply Module
- Removing and Installing a Fan Module
- Removing and Installing Button Labels

Mounting the Switcher

UL Guidelines

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

1. **Elevated operating ambient —** If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consider installing the equipment in an environment compatible with the maximum ambient temperature specified by the manufacturer [Tma = +32 to +122 °F (0 to +50 °C)].
2. **Reduced air flow —** Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
3. **Mechanical loading —** Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
4. **Circuit overloading —** Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
5. **Reliable earthing (grounding) —** Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (such as the use of power strips).

Mounting Instructions

The DMS 1600 is housed in a rack-mountable, 4U high metal enclosure with mounting flanges for standard 19-inch racks. The DMS 3600 is in an 8U high enclosure. 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.

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Removing and Installing the I/O Board or Blank Panel

NOTE: For proper cooling and air flow, boards or blank panels should be installed in all locations during normal switcher operations.

Figure 58 shows a mix of I/O boards. On the boards, the input and output DVI connectors on the I/O boards are identified as A through D. Each I/O board is identified by the input and output numbers supported by the board position (1 - 4, 5 - 8, and so on).

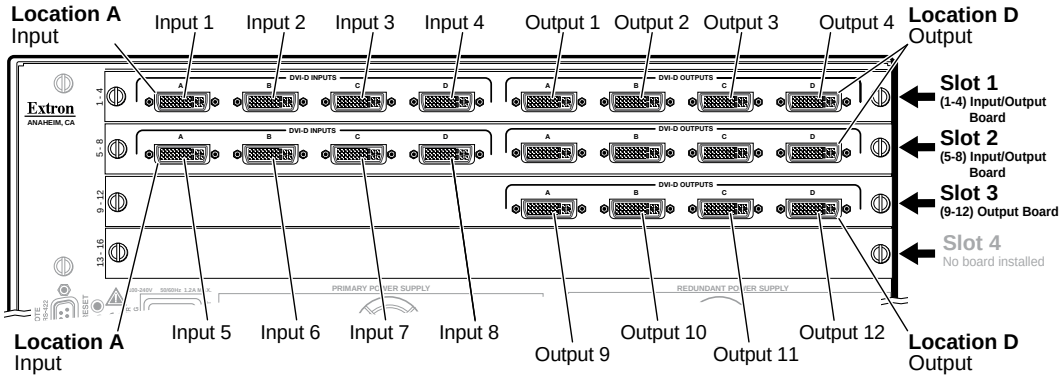


Figure 58. Arrangement of Inputs and Outputs on the I/O Boards

Slot	Inputs and outputs	Slot	Inputs and outputs
1	1 through 4	5*	17 through 20
2	5 through 8	6*	21 through 24
3	9 through 12	7*	25 through 28
4	13 through 16	8*	29 through 32
		9*	33 through 36

* DMS 3600 only

Locations A through D correspond to the input and output numbers identified by the board position numbers. (For example, the input and output numbers supported by the I/O board in location 5 - 8 are as follows: A = 5, B = 6, C = 7, and D = 8.) Inputs and outputs are grouped separately, with inputs A through D on the left and outputs A through D on the right.

There are certain rules for configuring the DMS matrix switcher for proper operation, as detailed below:

- The top slot (slot 1) **MUST** contain a 4x4 DVI input and output board.
- The next slot (slot 2) can contain any of the three board types (a 4x4 DVI input and output board, 4 DVI input board, or 4 DVI output board).
- A 4x4 DVI input and output board can be followed (in the slot directly underneath it) by any of the board types.
- After you insert a 4 DVI input board or 4 DVI output board, all active boards underneath it **MUST** be the same type.
- If you install a blank panel, all slots under it **MUST** contain blank panels (you cannot skip a slot).

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Removing the I/O Board or Blank Panel

Remove an input/output board, input board, output board, or blank panel as follows:

NOTE: The boards are hot-swappable. You do not need to power down the switcher to remove a board.

1. **For a board**, disconnect any connected cables.
2. Rotate the left and right knurled knobs to completely loosen the screws.
3. Gently pull on the screws to loosen the board or panel from the backplane.
4. Slide the board or panel out of the chassis (see figure 59).

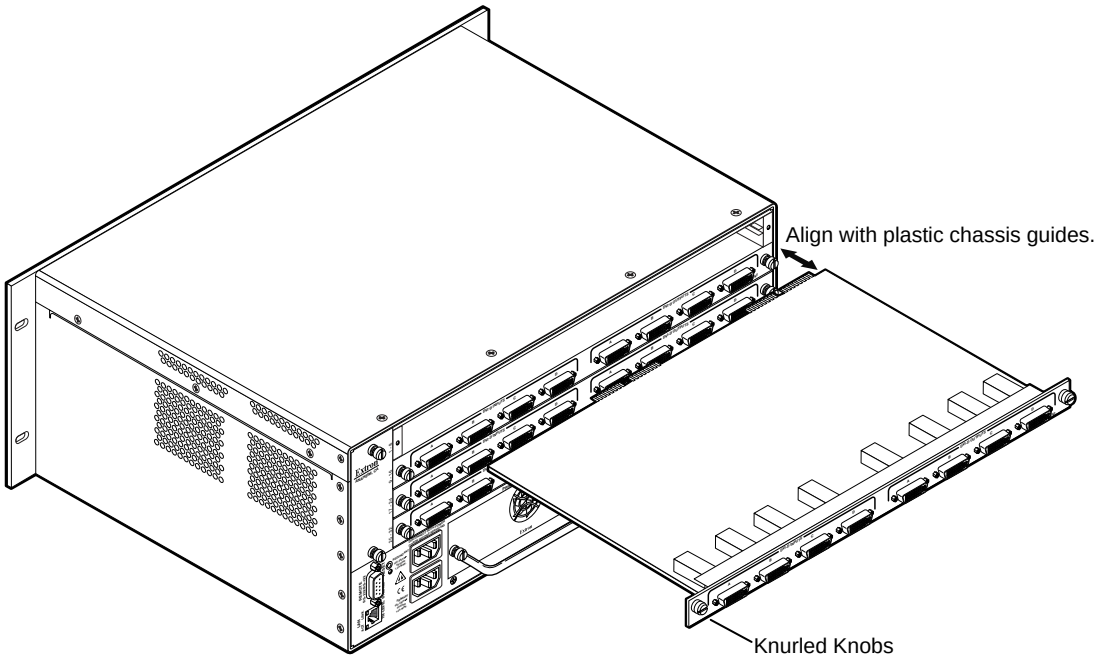


Figure 59. I/O Board Replacement

CAUTION: Do not touch the electronic components or the backplane or circuit board connectors without being electrically grounded. Handle circuit boards by their edges only. ESD can damage circuits, even if you cannot feel, see, or hear it.

5. Place the removed board on an antistatic surface or in an antistatic container.

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Installing the I/O Board or Blank Panel

NOTE: The boards are hot-swappable. You do not need to power down the switcher to remove a board.

Install an input/output board, input board, output board, or blank panel as follows:

CAUTION: Do not touch the electronic components or the backplane or circuit board connectors without being electrically grounded. Handle circuit boards by their edges only. ESD can damage circuits, even if you cannot feel, see, or hear it.

1. **For a board**, orient the board to be installed so that connector A is on the left and connector D is on the right as you face the rear of the switcher.
2. For a board, align the board with the left and right plastic chassis guides (see figure 59).
3. Gently slide the board or blank panel into the enclosure. **For a board**, slide the board toward the front panel until it meets resistance.
4. Gently seat the board or panel in the backplane.
5. Tighten the left and right screws with a screwdriver to lock the board or panel in place.

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Removing and Installing the Power Supply Module

CAUTION: The DMS matrix switchers use double pole/neutral fusing. Power must be disconnected before servicing internal components.

Removing the Power Supply Module

The two power supply modules (primary power supply and redundant power supply) are identical and hot-swappable. Each power supply module has a 2-color LED, visible on the rear panel, that indicates the status of the power supply outputs. If the LED is lit green, the power supply is operating normally. If the LED is lit red, the supply has failed and should be replaced at the earliest opportunity.

NOTES:
- The redundant power supply is an optional accessory for the DMS 1600. The redundant power supply is standard for the DMS 3600.
- The power supply modules are hot-swappable. Either power supply can be removed without powering down the switcher.

Remove a power supply module as follows:

1. Rotate the left and right knurled knobs to completely loosen the screws.
2. Gently pull on the handle to loosen the power supply from the backplane (see figure 60).
3. Slide the power supply out of the chassis.

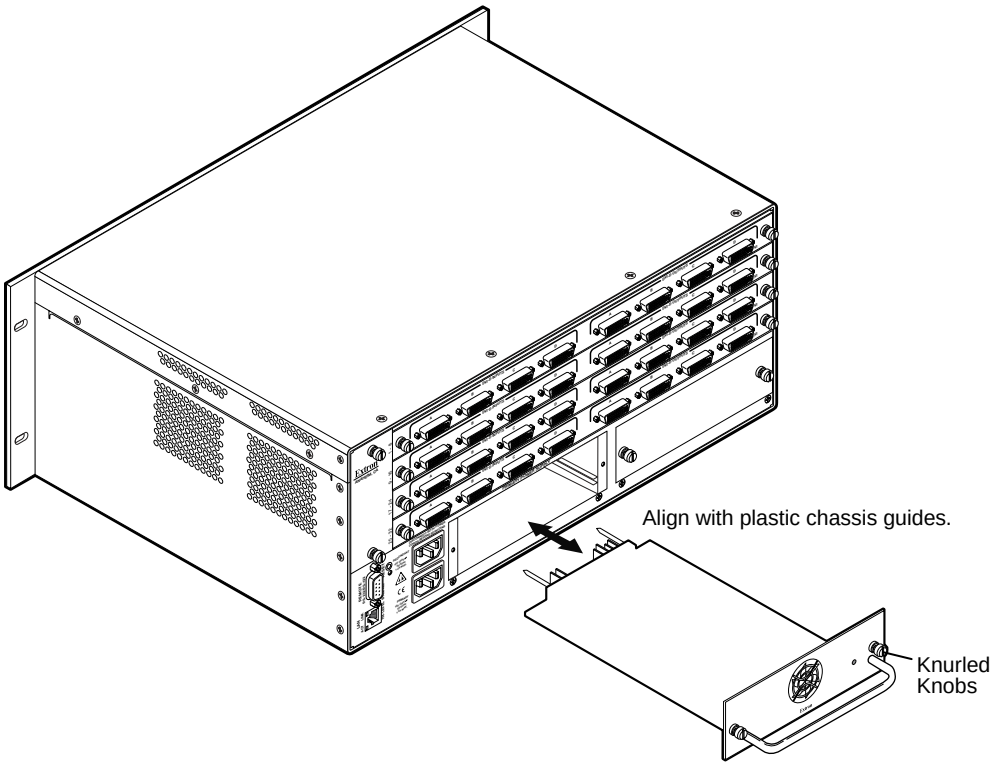


Figure 60. Power Supply Replacement

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Installing the Power Supply Module

NOTE: The power supply modules are hot-swappable. You do not need to power down the switcher to install a power supply.

Install a power supply module as follows:

1. Orient the power supply module to be installed with the LED to the right.
2. Align the flanges on the power supply module with the left and right plastic chassis guides (see figure 60).
3. Gently slide the power supply module into the enclosure until the power supply meets resistance.
4. Gently seat the power supply in the backplane.
5. Tighten the left and right screws with a screwdriver to lock the power supply in place.

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Removing and Installing a Fan Module

The DMS 1600 has a single fan module. The DMS 3600 has two identical fan modules. If a fan fails, it should be replaced at the earliest opportunity.

Removing a Fan Module

NOTE: The fan modules are hot-swappable and can be removed or installed without powering down the switcher.

1. Remove and retain the two screws that secure the row identification plate (identifying the rows of the adjacent DVI input and output connectors) to the fan. Retain the plate.
2. Rotate the top and bottom knurled knobs to completely loosen the captive screws (see figure 61).

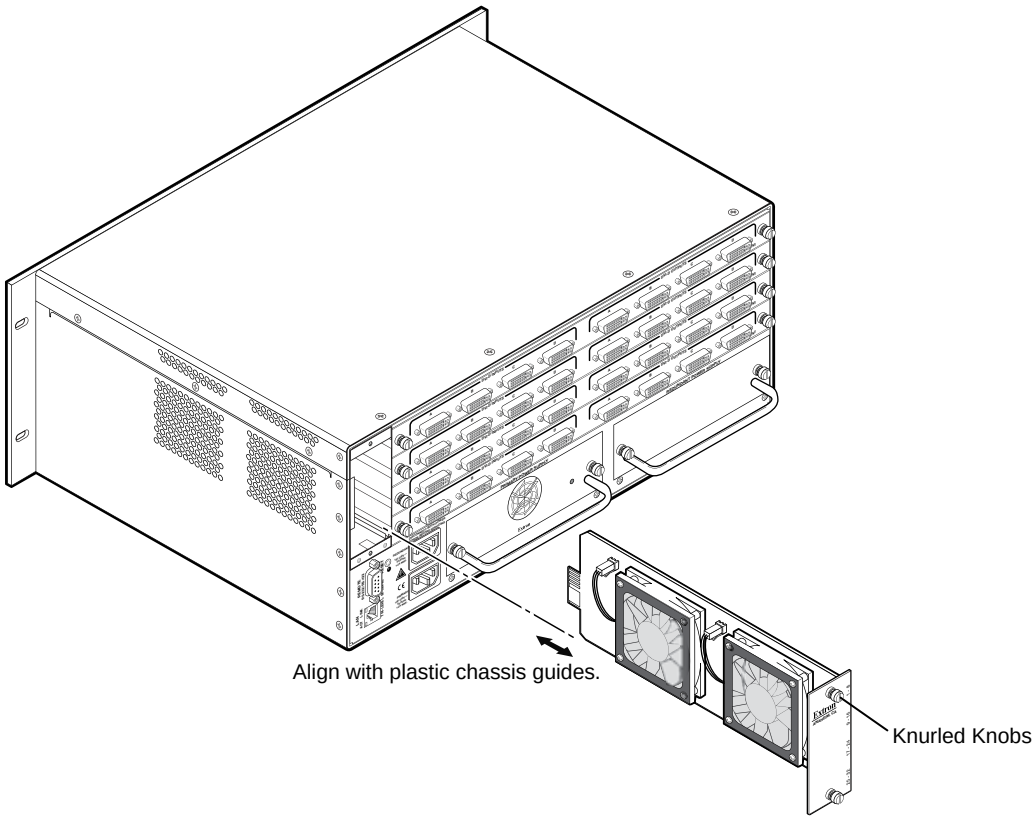


Figure 61. Fan Replacement

3. Gently pull on the screws to loosen the fan from the backplane.
4. Slide the fan out of the chassis.

Installing a Fan Module

1. Orient the fan to be installed so that the printing on the back of the panel is right-side up.
2. Align the flanges on the fan with the top and bottom plastic chassis guides (see figure 61).
3. Gently slide the fan into the enclosure until the fan meets resistance.
4. Gently seat the fan in the backplane.
5. Tighten the top and bottom screws with a screwdriver to lock the fan in place.
6. Secure the row identification plate to the fan.

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Removing and Installing Button Labels

Figure 63, on page 110 provides strips of blank button labels. If desired, copy them or cut them out, write button information in each button area as desired, and put them in the input or output button windows of the switcher. You can also create labels using the Button Label Generator software (see "Matrix Software").

Installing Labels in the Buttons of the Matrix Switcher

Install new labels in the front panel buttons as follows:

1. Remove the button from the matrix switcher; use a small, flat bladed screwdriver such as an Extron Tweeker to gently pry a button out from the front panel (see figure 62).

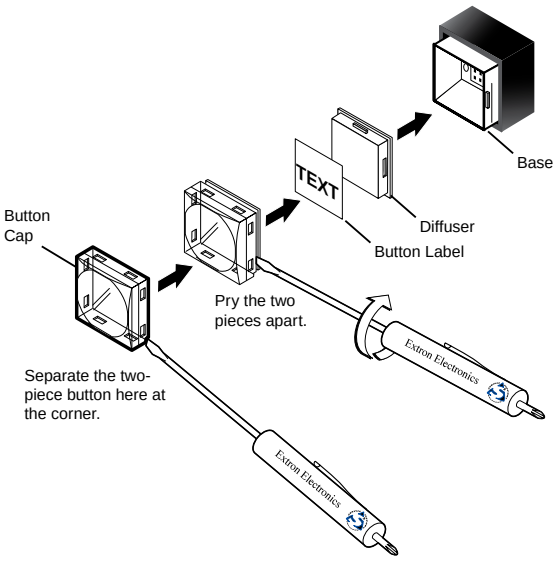


Figure 62. Illuminated Button Label Replacement

2. Locate the notch in the corner of one side of the clear button cap.
3. Separate the white backing (diffuser) from the clear button cap (lens); insert the blade of the small screwdriver into the corner notch and gently twist the blade.
4. Save the translucent, white diffuser, but remove the text/label insert from the transparent button cap.
5. Insert the replacement button label into the button cap. Check for correct label orientation.
6. Align the white diffuser plate with the cap. The bumps on the diffuser plate should be aligned (top and bottom) with the notches on the clear button cap. Firmly snap it into place.
7. Align the tabs on the base of the matrix switcher with the notches on the diffuser plate. Gently, but firmly, press the reassembled button into place in the front panel of the switcher.
8. Repeat steps **1** to **7** as needed to relabel other buttons.

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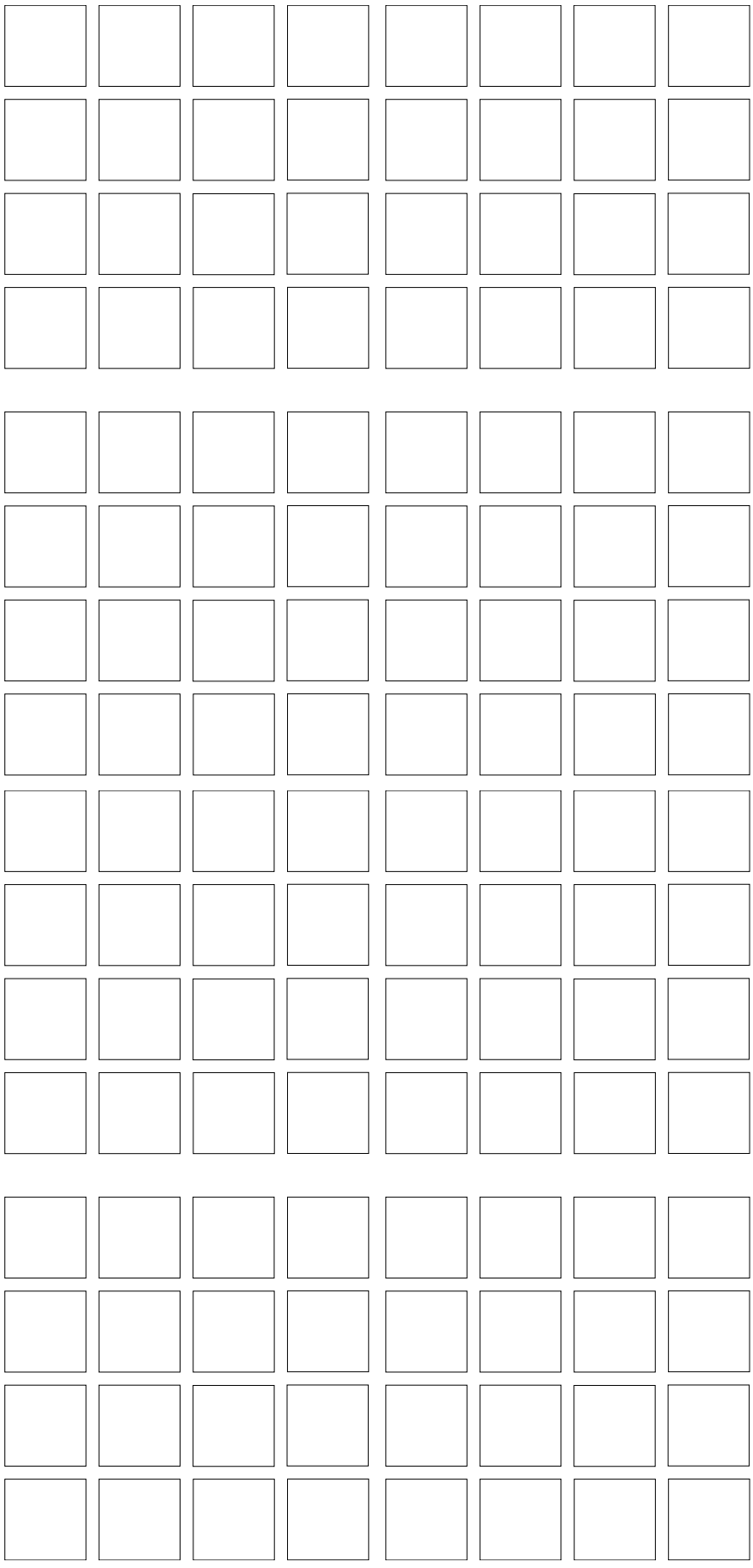


Figure 63. Button Label Blanks

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Ethernet Connection

This section provides a high level discussion of the Ethernet connection the switcher and a primer on the subject of subnetting. Topics that are covered, include:

- Ethernet Link
- Subnetting — A Primer

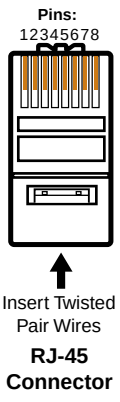
Ethernet Link

The rear panel Ethernet connector on the DMS matrix 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.

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 (see figure 64).

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



Crossover Cable

Pin	End 1 Wire color	End 2 Wire color
1	White-green	White-orange
2	Green	Orange
3	White-orange	White-green
4	Blue	Blue
5	White-blue	White-blue
6	Orange	Green
7	White-brown	White-brown
8	Brown	Brown
	T568A	T568B

A cable that is wired as T568A at one end and T568B at the other (Tx and Rx pairs reversed) is a "crossover" cable.

Straight-through Cable

Pin	End 1 Wire color	End 2 Wire color
1	White-orange	White-orange
2	Orange	Orange
3	White-green	White-green
4	Blue	Blue
5	White-blue	White-blue
6	Green	Green
7	White-brown	White-brown
8	Brown	Brown
	T568B	T568B

A cable wired the same at both ends is called a "straight-through" cable, because no pin/pair assignments are swapped.

Figure 64. RJ-45 Connector Pinout Tables

Default IP Address

To access the DMS matrix switcher via the LAN port, you need the IP address of the switcher. If the address has been changed to an address comprised of words and characters, 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 DMS matrix switcher.

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Pinging to Determine the Extron IP Address

The ping utility is available at the DOS prompt. Ping tests the Ethernet interface between the computer and the DMS matrix 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 the one shown in figure 65.

   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 65. Typical Ping Response

Pinging to Determine the 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 return display is similar to the ping response shown in figure 65, 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.

Configuring the DMS Matrix Switcher for Network use via the ARP Command

The ARP (address resolution protocol) command tells your computer to associate the MAC (media access control) address of the DMS matrix switcher with the assigned IP address. You must then use the ping utility to access the controller, at which point the IP address of the controller is reconfigured.

Use ARP to configure the IP address as follows:

1. Obtain a valid IP address for the DMS matrix switcher from your network administrator.
2. Obtain the MAC address (UID #) of the DMS matrix switcher from the label on its rear panel. The MAC address should have this format: 00-05-A6-xx-xx-xx.

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3. If the DMS matrix switcher has never been configured and is still set for factory defaults, proceed to step **4**. If not, perform a Mode 4 system reset and then proceed to step **4**. For detailed information on reset modes (see "**Performing Soft System Resets [Modes 3, 4, and 5])**."

   NOTE: The DMS matrix switcher must be configured with the factory default IP address (192.168.254.254) before the ARP command is executed, as described below.

4. At the PC, access the MS-DOS command prompt (see "**Pinging to determine the Extron IP address**," steps 1 through 3), then enter the `arp –s` command. Type in the desired new IP address for the unit (obtained in step **1**) and the MAC address of the unit (from the rear panel of the unit), for example
   `arp –s 10.13.197.7 00-05-A6-03-69-B0` and then press <Enter>.

   The computer returns the command prompt (`C:\`).

   After you issue the `arp -s` command, the controller changes to the new address and starts responding to the ping requests to the new address, as described in the next step.

   NOTE: You must ping the DMS matrix switcher for the IP address change to take place. The response should show the new IP address, as shown in figure 66.

5. Execute a ping command by entering ping followed by a space and the new IP address at the command prompt. For example:

   `ping 10.13.197.7`

```
C:\>ping 10.13.197.7

Pinging 10.13.197.7 with 32 bytes of data:

Reply from 10.13.197.7: bytes=32 time<10ms TTL=128
Reply from 10.13.197.7: bytes=32 time<10ms TTL=128
Reply from 10.13.197.7: bytes=32 time<10ms TTL=128
Reply from 10.13.197.7: bytes=32 time<10ms TTL=128

Ping statistics for 10.13.197.7:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

   Figure 66. Ping with New Address

   NOTE: You can reconnect using either Telnet or a web browser to verify that the update was successful.

6. After verifying that the IP address change was successful, enter and issue the arp –d command at the DOS prompt. For example:

   `arp –d 10.13.197.7` removes 10.13.197.7 from the ARP table

   or

   `arp –d*` removes all static IP addresses from the ARP table.

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Connecting as a Telnet Client

The Telnet utility is available from the DOS prompt. Telnet allows you to input SIS commands to the DMS matrix 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 **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 as shown in figure 67.

```
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 67. Telnet Window

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 DMS matrix switcher via Telnet.

Open

Connect to the DMS matrix 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 DMS matrix 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 matrix 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 matrix switcher switching capabilities and editing functions. Users can create ties, set mutes, and view all settings with the exception of passwords. By default, the DMS matrix 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 DMS matrix switcher.

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Escape character and Esc key

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

The Telnet Escape character is a key combination, the <Ctrl> key and the <]> key pressed simultaneously, which returns you to the Telnet prompt while leaving the connection to the DMS matrix switcher intact.

The Escape key is the <Esc> key on the computer keyboard.

Local echo

Once connected to the DMS matrix 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 responses of the switcher 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 DMS matrix switcher and need to access the Telnet prompt to turn local echo off, type the Escape character (<Ctrl>+<]>).

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 <Ctrl> 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>+<]>). 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 DMS matrix switcher, access the Telnet prompt by typing the Escape character (<Ctrl>+<]>).

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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 the DMS matrix switcher and the mail server gateway. To understand subnetting at the level required to install and operate the DMS matrix switcher, you must understand the concepts of a gateway, local and remote devices, IP addresses and octets, and subnet masks and octets.

Gateways

The DMS matrix switcher can communicate with the e-mail server that the switcher uses for e-mail notification 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 and e-mail values in the matrix switcher (see "**IP Settings/Options Window**" and "**Email Settings Page**"). When you are setting up the variables for e-mail notification, which may include subnetting, the matrix switcher is the local device and the e-mail 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) (see figure 68). 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.

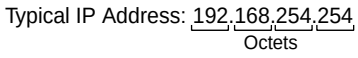


Figure 68. Typical IP Address

Subnet Masks and Octets

The subnet mask (see figure 69) 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.

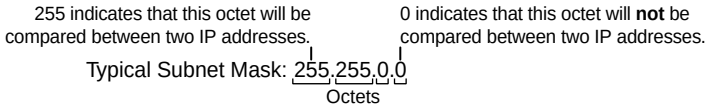


Figure 69. Typical Subnet Mask

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Determining Whether Devices are on the Same Subnet

To determine the subnet, the IP address of the local device is compared to the IP address of the remote device (see figure 70). The octets of each address 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 IP addresses of the local device and the remote device are unmasked.

  Unmasked octets are compared (indicated by ? in figure 70).

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

  Masked octets are not compared (indicated by X in figure 70)**.**

If the unmasked octets of the two IP addresses **match** (indicated by = in figure 70, example 1), the two addresses **are on the same subnet**.

If the two unmasked fields **do not match** (indicated by ≠ in figure 70, 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 70. Comparing the IP Addresses of the Local and Remote Devices

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Reference Information

This section discusses the specifications, part numbers, and accessories for the DMS 1600 and DMS 3600. Topics that are covered, include:

- **Specifications**
- **Part Numbers**

Specifications

Video — DMS DVI boards

Routing	
1600 Series	From 4 x 4 to 16 x 16 matrix, expandable by increments of 4 inputs and 4 outputs
3600 Series	From 4 x 4 to 36 x 36 matrix, expandable by increments of 4 inputs and 4 outputs
Gain	Unity
Resolution range	Up to 1080p (HDTV) or 1920x1200 (the highest resolution of the single link DVI standard) @ 48, 50, or 60 Hz
Signal type	Single-link DVI digital video signals are supported.
Digital video	RGB digital video (DVI and HDMI standards) or Y, Cr, Cb digital component video (HDMI), actively buffered (supports all single link DVI and HDMI [if using an optional adapter] standards from 640x480 @ 60 Hz to 1600x1200 @ 60 Hz computer video)

NOTE: The DMS DVI Series boards are not compatible with HDMI 1.3.

Digital audio	Not supported
Consumer Electronics Control (CEC)	Not supported
EDID and DDC	Supports Extended Display Identification Data (EDID) and Display Data Channel (DDC) data using DVI and HDMI standards. EDID and DDC signals are actively buffered.
HDCP	Not supported
HPD	Supports hot plug detection (HPD) of display as a pass-through signal.
Maximum data rate	4.95 Gbps (1.65 Gbps per color)
Maximum pixel clock	165 MHz
Standards	DVI 1.0
Switching speed	200 ns, max.

Video input — DMS 44 DVI and DMS 4i DVI input boards

Number/signal type	4 digital RGB single link DVI-D per input board
Connectors	4 female DVI-I (digital only) per input board
Equalization	Automatic
Input cable length	100' (30 m) at 1920x1200 @ 48, 50, or 60 Hz; or 1080p; 8 bit color

NOTE: The transmission distance varies depending on the signal resolution and on the type of cable, graphics card, and display used in the system.

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Video output— DMS 44 DVI and DMS 4o DVI output boards

Number/signal type ..... 4 digital RGB single link DVI-D per output board
Connectors ..... 4 female DVI-I (digital only) per output board
Re-clocking ..... Automatic
Output cable length ..... 50' (15.24 m) at 1920x1200 @ 48, 50, or 60 Hz; or 1080p
Peripheral device power ..... 250 mA per output

Control/remote — switcher host ports

Serial host control port ..... 1 bidirectional RS-232 or RS-422, rear panel 9-pin female D connector
Baud rate and protocol..... 9600 (default), 19200, 38400, 115200 baud, adjustable; 8 data bits, 1 stop bit, no parity
Serial control pin configurations
9-pin female D connector
RS-232..... 2 = Tx, 3 = Rx, 5 = GND
RS-422..... 2 = Tx-, 3 = Rx-, 5 = GND, 7 = Rx+, 8 = Tx+
USB control ports ..... 1 front panel female mini USB B
USB standards ..... USB 2.0, low speed
Ethernet control port..... 1 RJ-45 female
Ethernet data rate (for network communication)
10/100Base-T, half/full duplex with autodetect
Ethernet protocol ..... ARP, ICMP (ping), IP, TCP, DHCP, HTTP, SMTP, Telnet
Ethernet default settings ..... Link speed and duplex level = autodetected
IP address = 192.168.254.254
Subnet mask = 255.255.0.0
Default gateway = 0.0.0.0
DHCP = off
Web server..... Up to 200 simultaneous sessions
7.0 MB nonvolatile user memory
Program control ..... Extron control/configuration program for Windows®
Extron Simple Instruction Set™ (SIS™)
Microsoft® Internet Explorer® ver. 6 or higher, Telnet

General

Power: DMS 1600..... 1 or 2 (positive-negative), 100 VAC to 240 VAC, 50-60 Hz; internal, 175 watts each
*A redundant power supply is optional.

Power consumption: DMS 1600.....

Primary Power Supply Only		Primary and Redundant Supplies	
115 VAC, 60 Hz	240 VAC, 50 Hz	115 VAC, 60 Hz	240 VAC, 50 Hz
97 watts	93 watts	107 watts	103 watts

Measured fully loaded with (4) 4x4 I/O boards

Power: DMS 3600..... 2*(positive-negative), 100 VAC to 240 VAC, 50-60 Hz; internal, 400 watts each
*A redundant power supply is standard.

Power consumption: DMS 3600.....

Primary and Redundant Supplies	
115 VAC, 60 Hz	240 VAC, 50 Hz
212 watts	203 watts

Measured fully loaded with (9) 4x4 I/O boards

Power consumption: I/O boards.....

Per DMS Board		
Board	115 VAC, 60 Hz	240 VAC, 50 Hz
4x4 I/O	18 watts	17 watts
4 input	10 watts	10 watts
4 output	7 watts	6 watts

Temperature/humidity ..... Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, noncondensing
Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, noncondensing
Cooling..... Fan, right to left (as viewed from front panel)

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Thermal dissipation, full load: DMS 1600

Primary Power Supply Only		Primary and Redundant Supplies	
115 VAC, 60 Hz	240 VAC, 50 Hz	115 VAC, 60 Hz	240 VAC, 50 Hz
331.1 BTU/hr	317.4 BTU/hr	365.2 BTU/hr	351.5 BTU/hr

Measured fully loaded with (4) 4x4 I/O boards

Thermal dissipation, full load: DMS 3600

Primary and Redundant Supplies	
115 VAC, 60 Hz	240 VAC, 50 Hz
723.6 BTU/hr	692.8 BTU/hr

Measured fully loaded with (9) 4x4 I/O boards

Rack mount..... Yes
Enclosure type..... Metal
Enclosure dimensions
DMS 1600..... 7.0" H x 17.0" W x 12" D (4U high, full rack wide)
(17.8 cm H x 43.2 cm W x 30.5 cm D)
(Depth excludes connectors and buttons. Width excludes rack ears.)
DMS 3600..... 14.0" H x 17.0" W x 12.25" D (8U high, full rack wide)
(35.6 cm H x 43.1 cm W x 31.1 cm D)
(Depth excludes connectors and handles. Width excludes rack ears.)
Product weight with boards installed
DMS 1600
With primary power supply only
26.9 lbs (12.2 kg)
With both primary and redundant power supplies
27.9 lbs (12.6 kg)
DMS 3600..... 38.5 lbs (17.5 kg)
Shipping weight with boards installed
DMS 1600..... 32 lbs (15 kg)
DMS 3600..... 48 lbs (22 kg)
DIM weight, international
DMS 1600..... 32 lbs (15 kg)
Vibration..... ISTA 1A in carton (International Safe Transit Association)
Regulatory compliance
Safety..... CE, c-UL, UL
EMI/EMC..... CE, C-tick, FCC Class A, ICES, VCCI
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.

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Part Numbers

DMS Matrix Switcher Part Numbers

The matrix switcher is custom-built to your requirements. You need to specify the number and type of I/O boards desired when you order a unit. The following part numbers apply:

Matrix switcher part numbers	Part number
DMS 1600 Matrix Switcher enclosure	60-1091-01
DMS 3600 Matrix Switcher enclosure	60-1092-01
DMS DVI 44 I/O board	70-741-01
DMS DVI 4 input board	70-741-02
DMS DVI 4 output board	70-742-03
DMS blank panel	70-841-01
Power supply module	
DMS 1600 Switcher (1)	70-710-02
(DMS 3600) FOX 4G Matrix 7200 Switcher (2)*	70-704-01
Fan module	
(DMS 1600) FOX 4G Matrix 3200 Switcher (1)*	70-709-01
(DMS 3600) FOX 4G Matrix 7200 Switcher (2)*	70-814-01
IEC power cords (2)	
Rubber feet	
DMS Matrix Switcher Setup Guide	
Extron Software Products disc (Matrix Switchers Control Program and Button Label Generator)	

* FOX 4G Matrix switcher part, used for DMS

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Replacement/configuration Change Parts

The following parts can be ordered to change the size of the matrix or to replace components:

Part	Part number
Input and output boards	
DMS DVI 44 I/O board	70-741-01
DMS DVI 4 input board	70-741-02
DMS DVI 4 output board	70-742-03
Blank panel, 1 I/O board space	70-651-21
Power supply modules	
(DMS 1600) FOX 4G Matrix 3200 Switcher (1)*	70-710-02
(DMS 3600) FOX 4G Matrix 7200 Switcher (2)*	70-704-01
Fan modules	
(DMS 1600) FOX 4G Matrix 3200 Switcher (1)*	70-709-01
(DMS 3600) FOX 4G Matrix 7200 Switcher (2)*	70-814-01
Button cap and diffuser kit (set of 3 button cap assemblies)	70-352-01

* FOX 4G Matrix switcher part, used for DMS

Accessories

These items can be ordered separately:

Accessory	Part number
MKP 1000 remote keypad	
Black	60-239-02
White	60-239-03
WT (water-tight), black	60-239-52
WT (water-tight), white	60-239-53
MCP 1000M (master)	60-298-01
MKP 2000 X-Y remote control panel, black	60-682-02
MKP 3000, black	60-708-02

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Extron® Warranty

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

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

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

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

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

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

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

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

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

USA: (714) 491-1500 **Europe**: +31.33.453.4040
Asia: +65.6383.4400 **Japan**: +81.3.3511.7655

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

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

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

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