User Guide

Matrix Switchers

DTP CrossPoint 84

Scaling Presentation Matrix Switchers with DTP Extension

Extron Electronics

INTERFACING, SWITCHING AND CONTROL

68-2349-01 Rev. C
07 15

Safety Instructions

Safety Instructions • English

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안전 지침 • 한국어

경고: 이 기호 ⚠ 가 제품에 사용될 경우, 제품의 인클로저 내에 있는 접지되지 않은 위험한 전류로 인해 사용자가 감전될 위험이 있음을 경고합니다.

주의: 이 기호 ⚠ 가 제품에 사용될 경우, 장비와 함께 제공된 책자에 나와 있는 주요 운영 및 유지보수(정비) 지침을 경고합니다.

안전 가이드라인, 규제 준수, EMI/EMF 호환성, 접근성, 그리고 관련 항목에 대한 자세한 내용은 Extron 웹 사이트(**www.extron.com**)의 Extron 안전 및 규제 준수 안내서, 68-290-01 조항을 참조하십시오.

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ATTENTION:

- The Twisted Pair Extension technology works with shielded twisted pair (STP) cables **only**. To ensure FCC Class A and CE compliance, STP cables and STP connectors are also required.
- La technologie extension paires torsadées fonctionne avec les câbles paires torsadées blindées (UTP) ou non blindées (STP) **uniquement**. Afin de s'assurer de la compatibilité entre FCC Classe A et CE, les câbles STP et les connecteurs STP sont nécessaires.

- For more information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics, see the "**Extron Safety and Regulatory Compliance Guide**" on the Extron website.
- Pour plus d'informations sur les directives de sécurité, les conformités de régulation, la compatibilité EMI/EMF, l'accessibilité, et les sujets en lien, consultez le « **Informations de sécurité et de conformité Extron** » sur le site internet d'Extron.

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Conventions Used in this Guide

Notifications

The following notifications are used in this guide:

ATTENTION:
- Risk of property damage.
- Risque de dommages matériels.

NOTE: A note draws attention to important information.

TIP: A tip provides a suggestion to make working with the application easier.

Software Commands

Commands are written in the fonts shown here:

```
^AR Merge Scene,,Op1 scene 1,1 ^B 51 ^W^C
[Ø1] R ØØØ4 ØØ3ØØ ØØ4ØØ ØØ8ØØ ØØ6ØØ [Ø2] 35 [17] [Ø3]
Esc X1 * X17 * X20 * X24 * X22 CE ←
```

NOTE: For commands and examples of computer or device responses mentioned in this guide, the character "**Ø**" is used for the number zero and "**O**" is the capital letter "**o**."

Computer responses and directory paths that do not have variables are written in the font shown here:

```
Reply from 2Ø8.132.18Ø.48: bytes=32 times=2ms TTL=32
C:\Program Files\Extron
```

Variables are written in slanted form as shown here:

```
ping xxx.xxx.xxx.xxx –t
SOH R Data STX Command ETB ETX
```

Selectable items, such as menu names, menu options, buttons, tabs, and field names are written in the font shown here:

From the **File** menu, select **New**.

Click the **OK** button.

Specifications Availability

Product specifications are available on the Extron website, **www.extron.com**.

Extron Glossary of Terms

A glossary of terms is available at **http://www.extron.com/technology/glossary.aspx**.

Contents

Introduction

About this Guide

This guide contains installation, configuration, and operating information for the Extron DTP CrossPoint Scaling Presentation Matrix Switchers with DTP Extension (see **figure 1** on the next page).

About the DTP CrossPoint 84 Matrix Switchers

The switchers distribute HDCP-compliant HDMI and Extron proprietary DTP video and audio signal types. A matrix switcher routes any input signal to any combination of outputs. It can route multiple input and output configurations simultaneously.

The DTP CrossPoint fixed matrix size switchers support a total of eight inputs: up to six HDMI and one or two inputs from Extron DTP transmitting devices. The matrix switchers provide up to four outputs: one or two HDMI and one or two scaled DTP outputs (see **DTP Input and Output Signals** on page 3).

The DTP CrossPoint Matrix Series consists of three 8-input by 4-output models, differentiated by their audio and control capabilities:

- **DTP CrossPoint 84**
- **DTP CrossPoint 84 IPCP SA** — Includes a stereo audio amplifier and a built-in Extron IPCP Pro 350 control processor
- **DTP CrossPoint 84 IPCP MA** — Includes a mono audio amplifier and a built-in Extron IPCP Pro 350 control processor

The switcher has RS-232 and infrared (IR) insertion ports on all DTP inputs and outputs that allow you to route bidirectional control signals to the connected devices.

The switchers provide four mono microphone (mic)/line level inputs that can be mixed with one or all audio outputs. Adjustable mic input audio gain and attenuation compensates for level differences among audio inputs. The DTP CrossPoint 84 also includes a built-in digital signal processor (DSP) that provides a wide variety of microphone pre-amplifier controls, mixers, filters, dynamics processors, and feedback supressors.

The mic/line inputs have a talkover feature that automatically reduces the program audio group when mic/line input is present. When the mic/line input is not present, the program audio group is restored to the set volume level. The mic talkover threshold is adjustable from 0 dB to -60 dB.

Each input and output is individually isolated and buffered; switching is accomplished with virtually no crosstalk or signal noise between channels. Audio that is switched through the DSP can either be linked with the video (audio follow) or independent of the video (audio breakaway). Embedded digital audio always follow the video.

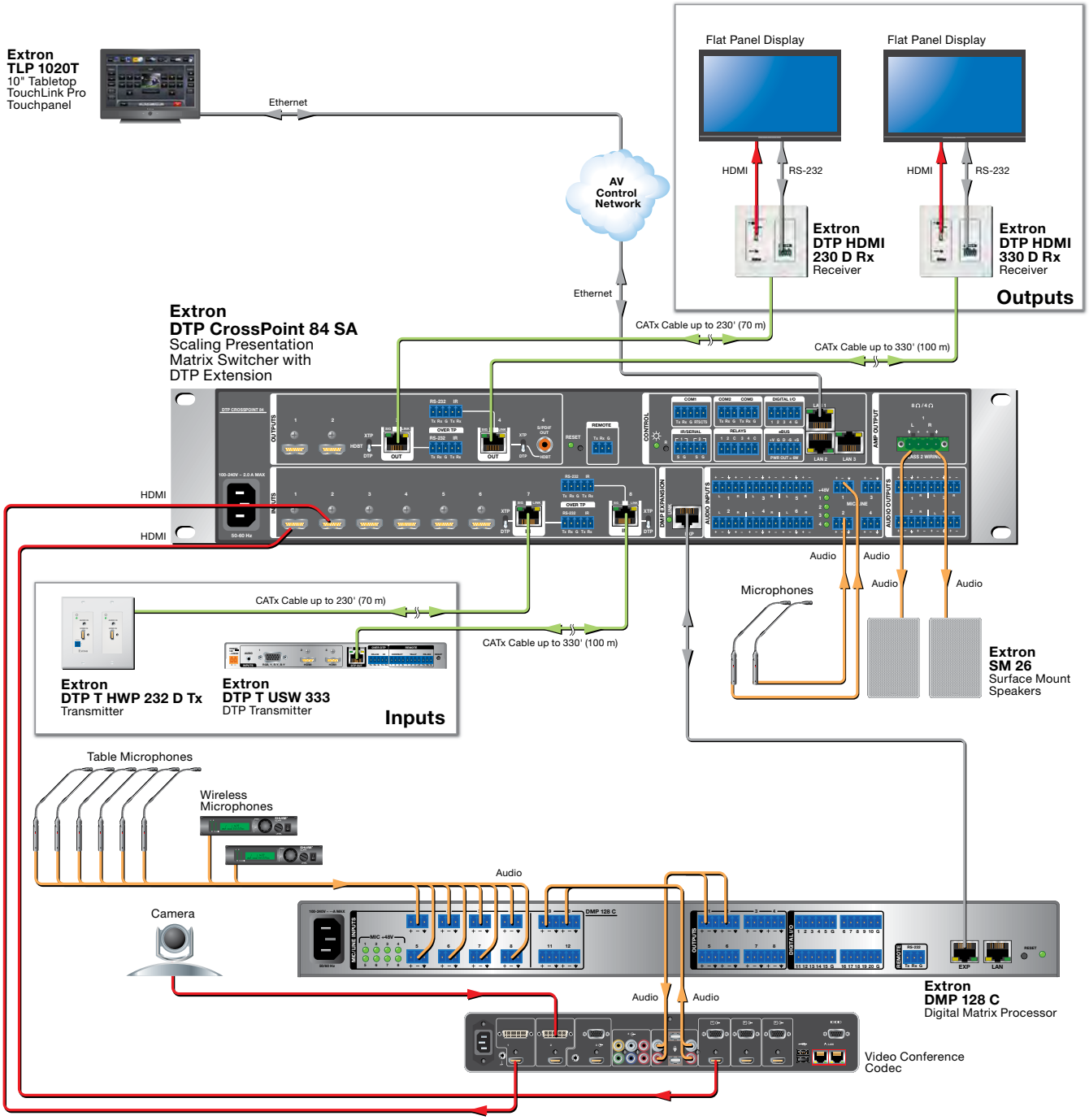


Figure 1. Typical DTP CrossPoint 84 IPCP Application

The switcher has a rear panel serial port and a front panel USB port for remote control and reporting. The IPCP models also feature the built-in Extron IPCP Pro 350 control processor, which has three rear panel local area network (LAN) Ethernet ports. The non-IPCP model has one Ethernet port. The matrix switcher is programmed with the Extron Simple Instruction Set (SIS), a set of basic ASCII code commands that provide simple control through a control system or PC without programming long, obscure strings of code. SIS commands can be entered via the RS-232 port, USB port, or the LAN ports.

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

The DTP CrossPoint can be operated by any of the following connected to either serial port or a LAN port:

- A control system
- A PC and any of the following:
  - The Extron SIS
  - The Extron Windows-based DSP Configurator program
  - The Extron Windows-based Product Configuration Software (PCS)
- An Extron MKP 2000 remote control panel
- An Extron MKP 3000 remote control panel
- (**RS-232 only**) An Extron MCP 1000 remote control panel and/or MKP 1000 remote keypad

Setup of the IPCP control processor, built into IPCP models, requires the Extron Global Configurator, which is available for download from the Extron Web site. The processor offers RS-232 and IR-based control, relays, and digital I/O controls that can control and monitor a variety of external devices, such as projectors and lights.

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

The switcher has an internal 100 VAC to 240 VAC, 50-60 Hz, 180 watts power supply that provides worldwide power compatibility.

DTP Input and Output Signals

The DTP inputs and outputs are proprietary signals that are created within any of the Extron DTP Extender systems and transmitted over a single shielded twisted pair (STP) cable.

The DTP CrossPoint accepts DTP inputs from transmitting devices such as the DTP T USW 333. Depending on the connected transmitting model, it generates the DTP signal from a variety of video and audio inputs, including HDMI, DVI, analog VGA, and embedded and analog audio. The DTP signal can also include bidirectional RS-232 and IR control signals from the connected transmitting and receiving devices or inserted locally, on the DTP CrossPoint switcher.

Depending on the transmitting or receiving device, the DTP inputs and outputs can travel up to 330 feet (100 meters) or 230 feet (70 meters) without a loss of signal integrity.

Definitions

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

- **Tie** — An input-to-output video and/or line audio 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, one or more sets of ties. The "configuration" also can include some or all of the signal processor settings that can be made in the DSP Configurator program.
- **Current configuration** — The configuration that is currently active in the switcher (also called configuration 0).
- **Preset** — A full or partial configuration (a subset of ties, sets of ties, or signal processor settings) with accompanying audio settings that has been stored.

NOTES:

- Presets can be created **only** by using the DSP Configurator program.
- When a preset is retrieved from memory, it becomes the current configuration.
- Up to 32 partial or presets can be stored in memory. Preset locations are assigned to the input buttons and output buttons. Up to 12 preset locations can be recalled from the front panel. Preset numbers larger than 12 are accessible under remote control.
- Presets can also be recalled using SIS commands, using the Product Configuration Software, or using the DSP Configurator program.
- When a preset consisting of full configurations is recalled, it completely overwrites the current configuration.
- When a preset consisting of one or more partial configurations is recalled, it overwrite only a portion of the current configuration, leaving other ties and settings unchanged.

Features

All-in-one 8x4 matrix switcher, scaler, and audio DSP —
The DTP CrossPoint 84 delivers all of the core functionality of a conventional AV system in a single enclosure, making it ideal for presentation environments that require multiple displays.

Audio power amplifier — The SA and MA models feature amplifiers for sound reinforcement.

Inputs —

- Six HDMI
- Two DTP twisted pair inputs on RJ-45
- Six stereo balanced or unbalanced audio inputs on captive screw
- Four mic/line audio inputs on captive screw

Outputs —

- Two HDMI
- Two independently scaled DTP twisted pair outputs on RJ-45
- One S/PDIF (Sony/Philips Digital Interface Format) digital audio output on an RCA connector
- Four variable audio outputs on captive screw connectors
- (**SA and MA models)** One variable amplified speaker output
  - **DTP CrossPoint 84 SA** — 5 mm, 4-pole captive screw connector
  - **DTP CrossPoint 84 MA** — 5 mm, 2-pole captive screw connector

Integrated DTP inputs and outputs — Support digital transmission of HDMI or DVI plus video, control, and audio up to 330 feet (100 meters) over a shielded twisted pair (STP) cable, providing high reliability and maximum performance on an easily installed cable infrastructure.

Supports 4K and UHD signals at all inputs and on both HDMI outputs — Incoming 4K and UHD signals are supported at all HDMI and DTP inputs, and can be passed only to the HDMI outputs.

Selectable scaled DTP output rates — From 640x480 to 1920x1200, including HDTV 1080p/60, and 2K (2048x1080). The output rate can be individually selected for each of the two scaled DTP outputs. Available output rates include computer-video up to 1920x1200, HDTV rates up to 1080p/60, and 2048x1080.

Compatible with DTP 230 Series and DTP 330 Series, plus XTP Matrix Switchers — Enables mixing and matching with desktop and wallplate transmitters and receivers, as well as other DTP-enabled products. The DTP CrossPoint 84 can also be integrated into an XTP System to provide connectivity between presentation spaces and a larger, facility-wide system.

DTP outputs are compatible with HDBaseT-enabled devices — The DTP outputs can be configured to send video and embedded audio signals to HDBaseT-enabled displays.

TP inputs and outputs are compatible with XTP matrix switcher I/O boards.

Compatible with shielded twisted pair cable — The DTP CrossPoint 84 fully supports a maximum transmission distance of 330 feet (100 meters) for all compatible resolutions when used with STP cable. Shielded twisted pair cabling with solid center conductor sizes of 24 AWG or better is recommended for optimal performance.

Extron XTP DTP 24 shielded twisted pair cable is strongly recommended for optimal performance

Remote powering of DTP transmitters and receivers — The DTP CrossPoint 84 can provide power to two DTP transmitters and two DTP receivers over the twisted pair connections, eliminating the need for separate power supplies at the remote units.

RS-232 insertion from the Ethernet control port — System level device control to all remote locations via a matrix switcher Ethernet port, providing comprehensive control of endpoints and attached devices without needing additional equipment.

Bidirectional RS-232 and IR insertion for AV device control — Bidirectional RS-232 control and IR signals can be transmitted alongside the video signal over DTP connections, allowing the remote device to be controlled without the need for additional cabling. Bidirectional control insertion eliminates the need for control system wiring to remote devices.

HDMI audio embedding — Two-channel audio signals can be embedded onto the HDMI and DTP outputs.

HDMI audio de-embedding — Embedded HDMI two-channel LPCM audio can be extracted for routing and further processing. Embedded multi-channel bitstream formats are routed with the video to the HDMI and DTP outputs.

Output volume control — The DTP CrossPoint 84 provides master volume control for the line level and amplified (SA and MA models) audio outputs, as well as a separate control for mic volume.

Audio input gain and attenuation — Gain or attenuation can be adjusted for each two-channel audio input to achieve optimal signal-to-noise ratio.

Audio breakaway — Provides the capability to break two-channel audio away from its corresponding video signal and route to the audio outputs, allowing the audio and video signals from one source to be switched to different destinations.

S/PDIF audio output — The DTP CrossPoint 84 includes an S/PDIF output for two-channel LPCM audio or encoded standard definition bitstream audio for Dolby or DTS multi-channel surround sound.

Integrated digital audio matrix processor with ProDSP 32/64-bit signal processing — The DTP CrossPoint 84 features 32/64-bit floating point audio DSP processing, which maintains very wide dynamic range and audio signal transparency, to simplify management of gain staging while reducing the possibility of DSP signal clipping.

Digital audio expansion port — An expansion port provides interfacing to an Extron DMP 128 processor for AEC and audio system scalability. The expansion port allows the DTP CrossPoint 84 and any DMP 128 ProDSP Digital Matrix Processor model to be linked together via a single shielded Category (CAT) 6 cable for 16x8 channel transport between devices. Expansion supports audio system scalability with expanded audio processing and signal routing capabilities. A 1 foot (0.3 meter) shielded CAT 6 cable is included with DMP 128 models.

Four mic/line inputs with 48 volt phantom power — Four mic or line level audio sources can be independently mixed with program audio. Selectable 48 volt phantom power allows the use of condenser microphones.

Mic ducking — Automatically reduces program audio when a microphone or other incoming audio signal is detected, replacing the need for a separate audio ducking processor.

Studio grade 24-bit/48 kHz analog-to-digital and digital-to-analog converters — Professional converters fully preserve the integrity of the original audio signal.

Fixed, low latency DSP processing — Input to output latency is a constant 4.5 ms within the DTP CrossPoint 84, regardless of the number of active channels or processes. Fixed, low latency processing keeps audio in sync with video, and prevents distractions to the presenter resulting from delayed live audio.

DSP Configurator Software — A powerful yet user-friendly PC-based software tool for managing all audio operations of the DTP CrossPoint 84. It enables complete setup and configuration of digital audio processing tools on the DSP platform, as well as routing and mixing.

Group masters — The DTP CrossPoint 84 provides the capability to consolidate gain or mute control throughout the system. Gain or mute controls can be selected and added to a group master, which can then be controlled by a single master fader or mute control. Up to 32 group masters can be created.

Soft limits provide optimal group master adjustment range — The group master volume range can be limited using soft limits to maintain optimal minimum and maximum levels when using external volume control. This prevents operators from over or under-adjusting levels when using Ethernet, USB, or RS-232 control. The DSP Configurator Software provides quick drag-and-drop adjustment of soft limits from the Group Controls screen.

32 DSP Configurator presets — Using the DSP Configurator Software, any or all parameters for DSP processing, levels, AV matrix switching ties, and audio matrix mixing can be saved as presets.

Flexible matrix design provides output, virtual, and expansion routing options — The DSP architecture of the DTP CrossPoint 84 employs an intuitive matrix design that offers substantial flexibility in routing, mixing, and processing audio input sources. An output matrix allows any of the four microphone inputs to be matrix mixed to any or all of the four stereo outputs of the AV switcher block. If desired, any of the microphone inputs or AV switcher outputs can first be directed into a virtual matrix, which routes the inputs to eight virtual buses, before being mixed back into the output matrix. Virtual buses allow inputs to be processed together as a group. The expansion matrix provides signal routing between the DTP CrossPoint 84 and a DMP 128 processor linked via the expansion port.

Building Blocks processor settings — A collection of pre-designed processor settings optimized for a specific type of input or output device, such as microphones and Extron speakers, with preset levels, filters, dynamics, and more. Flexible Building Blocks are available on each I/O strip and allow system designers to fully customize and save their own Building Blocks, further streamlining audio system design and integration.

(**SA and MA models) Energy efficient Class D stereo or mono amplifier**:

- **2 x 50 watts @ 4 ohms; 2 x 25 watts @ 8 ohms**
- **1 x 100 watts @ 70 volts** — The DTP CrossPoint 84 SA offers a stereo power amplifier with 50 watts per channel into 4 ohms and 25 watts per channel into 8 ohms, while the DTP CrossPoint 84 MA 70 offers a mono 70 volt power amplifier with 100 watts rms output. Both feature an Extron exclusive, highly efficient, advanced Class D amplifier design with CDRS - Class D Ripple Suppression, an Extron patented technology that provides a smooth, clean audio waveform and an improvement in signal fidelity over conventional Class D amplifier designs. CDRS eliminates the high frequency switching ripple characteristic of Class D amplifiers, a source of RF emissions which can interfere with sensitive AV equipment such as wireless microphones.

Supports HDMI specification — Includes data rates up to 10.2 Gbps, Deep Color up to 12-bit, 3D, and HD lossless audio formats.

HDCP compliant — Fully supports HDCP-encrypted sources, with selectable authorization for unencrypted content.

Key Minder continuously verifies HDCP compliance for quick, reliable switching — Key Minder authenticates and maintains continuous HDCP encryption between input and output devices to ensure quick and reliable switching in professional AV environments, while enabling simultaneous distribution of a single source signal to one or more displays.

EDID Minder — Automatically manages EDID communication between connected devices. EDID Minder ensures that all sources power up properly and reliably output content for display.

SpeedSwitch Technology — Provides exceptional switching speed for HDCP-encrypted content

HDCP authentication and signal presence confirmation — Provides real-time verification of HDCP status for each digital video input and output. This allows for simple, quick, and easy signal and HDCP verification through RS-232, USB, or Ethernet, providing valuable feedback to a system operator or helpdesk support staff.

HDCP Visual Confirmation — Provides a green signal when encrypted content is sent to a non-compliant display. A full-screen green signal is sent when HDCP-encrypted content is transmitted to a non-HDCP compliant display, providing immediate visual confirmation that protected content cannot be viewed on the display.

HDMI to DVI Interface Format Correction — Automatically enables or disables embedded audio and infoframes, and sets the correct color space for proper connection to HDMI and DVI displays.

QuickSwitch Front Panel Controller (QS-FPC) with tri-color backlit buttons — Provides a discrete button for each input and output, allowing for simple, intuitive operation. Buttons can be custom labeled for easy identification. The buttons illuminate red, green, or amber depending on function, for ease of use in low-light environments.

***View* I/O mode** — Users can easily view which inputs and outputs are actively connected.

Presets — Frequently used I/O configurations may be recalled either from the QuickSwitch Front Panel Controller, Ethernet, USB, or RS-232 serial control.

Output muting control — Provides the capability to mute one or all outputs at any time. This allows, for example, content to be viewed on a local monitor prior to appearing on the main presentation display.

Aspect ratio control — For the scaled DTP outputs, the aspect ratio of the video can be controlled by selecting a FILL mode, which provides a full screen output, or a FOLLOW mode, which preserves the original aspect ratio of the input signal.

Auto Input Memory — When activated for the scaled DTP outputs, the unit automatically stores size, position, and picture settings based on the incoming signal. When the same signal is detected again, these image settings are automatically recalled from memory.

Output Standby Mode — The unit can be set to automatically mute video and sync output to the display device when no active input signal is detected. This allows the projector or flat-panel display to automatically enter into standby mode to save energy and enhance lamp or panel life.

User presets — Memory presets are available for each input to store and recall optimized image settings.

Internal video test patterns for calibration and setup — The unit offers several test patterns for the scaled DTP outputs, to facilitate proper system setup and calibration of display devices.

Automatic input cable equalization, up to 100 feet (30 meters), at 1080p at 60 Hz, with 8-bit color when used with Extron HDMI Pro Series cable — Actively conditions incoming HDMI signals to compensate for signal loss when using long cables or source devices with poor HDMI signal output. 4K at 30 Hz, and 2560x1600 at 60 Hz resolutions are equalized to 50 feet (15 meters). Improves performance when using low quality cables.

Automatic HDMI output reclocking — Reshapes and restores timing of digital video signals at each HDMI output, eliminating high frequency jitter to ensure reliable transmission over long cables.

Remote power — Provides +5 VDC, 250 mA power on each HDMI output for powering external peripheral devices, such as the Extron DVI 104. Power provided via an HDMI output eliminates the need of a separate power supply for the connected peripheral device.

Front panel security lockout — Prevents unauthorized use in non-secure environments. In lockout mode, a special button combination is required to operate the matrix switcher from the front panel controller.

Ethernet monitoring and control — Enables control and proactive monitoring over a LAN, WAN, or the Internet. An intuitive Web interface is included for configuration of the unit.

Built-in web pages — Enables the use of a standard browser for device monitoring and configuration over an intuitive web interface.

RS-232 control port — Enables the use of serial commands for integration into a control system. Extron products use the SIS - Simple Instruction Set command protocol, a set of basic ASCII commands that allow for quick and easy programming.

Front panel USB configuration port — Enables easy configuration without having to access the rear panel.

RJ-45 signal and link LED indicators for DTP ports — Provides a means for validating signal flow and operation, allowing quick identification of connectivity issues.

Easy setup and commissioning with the Extron Product Configuration Software (PCS) — Conveniently configure multiple products using a single software application.

Rack-mountable 2U, full rack width metal enclosure

Includes LockIt HDMI cable lacing brackets

Internal universal power supply — The 100-240 VAC, 50/60 Hz, international power supply provides worldwide power compatibility.

Installation

Setup and Installation Checklist

Preparation

- ☐ Familiarize yourself with the DTP CrossPoint matrix switcher.
- ☐ Obtain IP setting information for the matrix switcher from the local network administrator (see the *IPCP Pro 350 Series User Guide* at **www.extron.com**).

Physical installation

- ☐ If desired, install the switcher in a rack (see **Mounting the Switcher** on page 149.
- ☐ Cable input and output devices (see **Video and TP Input and Output Connections and Switches** on page 12.
- ☐ If desired, connect computers or control systems to any of the remote control ports (a serial port [see **item S** on page 15], a USB port [see **item A** on page 21], and a LAN port [see **item R** on page 15]) on the switcher.
- ☐ Connect power (see **item U** on page 15).
- ☐ Test the switcher by creating a tie (**Example 1: Create a set of video and audio ties** on page 31).
- ☐ If desired, create and replace button labels (see **Removing and Installing Button Labels** on page 150).

Ancillary operations

- ☐ Install the Product Configuration Software and DSP Configurator software (see **Matrix Software** on page 72).

Rear Panel Cabling and Features

The non-IPCP, SA, and MA models have similar features, with differences in the control connections and Amplified Output block only. Figure 2 shows the rear panel of a composite DTP CrossPoint 84 model, featuring elements of different models. Figure 3 shows only the Amplified Output block portion of the DTP CrossPoint 84 IPCP MA rear panel.

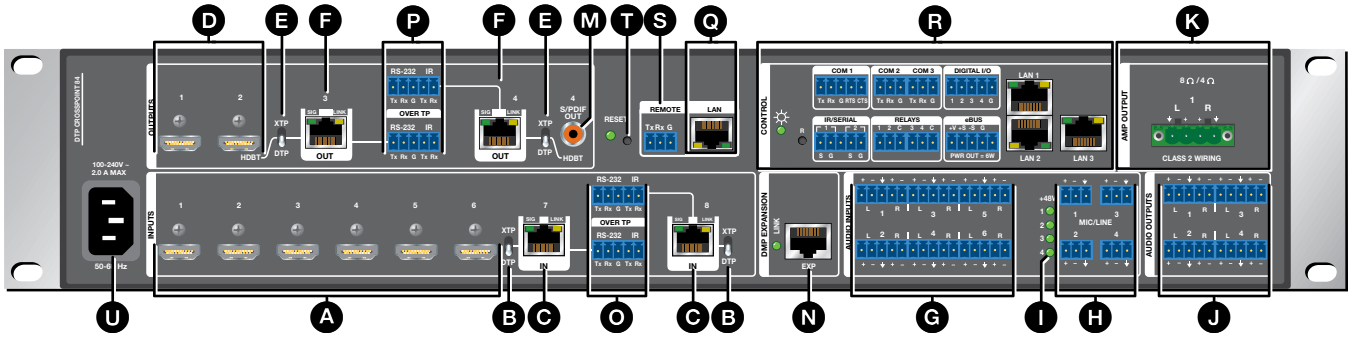


Figure 2. DTP CrossPoint 84 Matrix Switcher Rear Panel (showing non-IPCP LAN port, IPCP, and SA [Stereo Audio] Components)

NOTE: Figure 2 is a composite that shows features of all models. Actual models can have **either** item Q **or** item R, but not both. Models with R also have either item K or L (see figure 3).

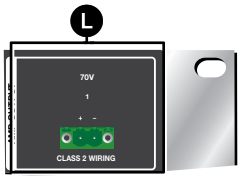


Figure 3. DTP CrossPoint 84 IPCP MA (Mono Audio) Amplified Output Block

ATTENTION:

- 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.
- Prenez des précautions contre les décharges électrostatiques (soyez électriquement relié à la terre) lorsque vous effectuez des connexions.
- Remove system power before making all connections.
- Débranchez l'alimentation du système avant de faire n'importe quelle connexion.

A **HDMI Inputs 1 through 6** (see page 12)
B **Input TP function switches** (see page 12)
C **TP Inputs 7 and 8** (see page 12)
D **HDMI Output 1 and 2** (see page 12)
E **Output TP function switches** (see page 13)
F **TP Outputs 3 and 4** (see page 13)
G **Audio Inputs 1 through 6** (see page 13)
H **Mic/Line Inputs 1 through 4** (see page 13)
I **+48 V (phantom power) LEDs** (see page 13)
J **Audio Outputs 1 through 4** (see page 14)
K **Amp Output 1** (SA model) (see page 14)
L **Amp Output 1** (MA model, see figure 3) (see page 14)
M **S/PDIF Output 4** (see page 14)
N **DMP Expansion Port and LED** (see page 14)
O **Over TP (Inputs 7 and 8) ports** (see page 14)
P **Over TP (Outputs 3 and 4) ports** (see page 14)
Q **LAN (Ethernet) port** (non-IPCP model) (see page 15)
R **IPCP Pro 350 control processor** (IPCP model, see page 15)
S **Remote port** (see page 15)
T **Switcher Reset button and LED** (see page 15)
U **Power connector** (see page 15)

Video and TP Input and Output Connections and Switches

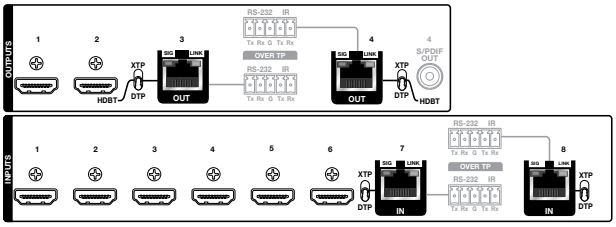


Figure 4. Video and TP Input and Output Connections and Switches

Ⓐ **HDMI Inputs 1 through 6** (see **figure 2** on the previous page)— Plug HDMI digital video sources into the matrix switcher via these HDMI connectors. These connectors can also accept DVI video with appropriate adapters. See **HDMI connectors** on page 16 for pin assignments and to use the LockIt HDMI Cable Lacing Bracket to secure the connector to the transmitter.

Ⓑ **Input TP function switches, inputs 7 and 8** (see **figure 2**) — These switches tailor the switcher to accept input 7 and 8 signals as follows:

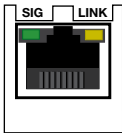
ATTENTION:

- Position this switch **BEFORE** connecting the appropriate device to the TP connector. Failure to comply can damage the endpoint.
- Positionnez le sélecteur **AVANT** de connecter l'appareil approprié au connecteur TP. Ne pas respecter cette procédure pourrait endommager le point de connexion.

XTP position — If the transmitting device is an XTP CrossPoint matrix switcher, set this switch to the XTP position. The TP input comes from an XTP CrossPoint matrix switcher and consists of HDMI with embedded audio plus RS-232 and IR.

DTP position — If the connected transmitting device is in the Extron DTP series, set this switch to the DTP position. The TP input comes from a DTP transmitting device and consists of HDMI with embedded audio, analog audio, RS-232 and IR, and remote power.

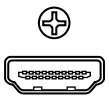
Ⓒ **TP Inputs 7 and 8** (see **figure 2**) — Connect STP cables between compatible Extron DTP transmitting devices or XTP matrix switchers and these RJ-45 connectors (see **TP connectors** on page 17 to wire the connector).



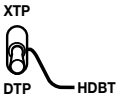
ATTENTION:

- Do not connect this port to a computer data or telecommunications network.
- Ne connectez pas ces port à des données informatiques ou à un réseau de télécommunications.

Ⓓ **HDMI Output 1 and 2** (see **figure 2**) — Connect HDMI cables between these ports and HDMI video displays. See **HDMI connectors** on page 16 for pin assignments and to use the LockIt HDMI Cable Lacing Bracket to secure the connector to the transmitter.



E **Output TP function switches, outputs 3 and 4** (see **figure 2** on page 11) — These switches tailor the output signals for output 3 and 4 as follows:



ATTENTION:

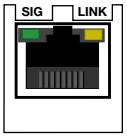
- Position this switch **BEFORE** connecting the appropriate device to the TP connector. Failure to comply can damage the endpoint.
- Positionnez le sélecteur **AVANT** de connecter l'appareil approprié au connecteur TP. Ne pas respecter cette procédure pourrait endommager le point de connexion.

XTP position — If the receiving device is an XTP CrossPoint matrix switcher, set these switches to the XTP position. The TP output is compatible with an XTP CrossPoint matrix switcher and consists of HDMI with embedded audio plus RS-232 and IR.

HDBT position — For HDBaseT-enabled receivers, set these switches to the HDBT position. The TP output is compatible with HDBaseT-enabled devices and consist of HDMI with embedded audio plus RS-232 and IR.

DTP position — If the connected receiving device is in the Extron DTP series, set these switches to the DTP position. TP output is compatible with a DTP receiving device and consists of HDMI with embedded audio, analog audio, RS-232 and IR, and remote power.

F **TP Outputs 3 and 4** (see **figure 2**) — Connect STP cables between these RJ-45 connectors and compatible Extron DTP receivers or XTP matrix switchers or HDBaseT-enabled devices (see **TP connectors** on page 17 to wire the connector).



ATTENTION:

- Do not connect this port to a computer data or telecommunications network.
- Ne connectez pas ces port à des données informatiques ou à un réseau de télécommunications.

Audio Input and Output Connections

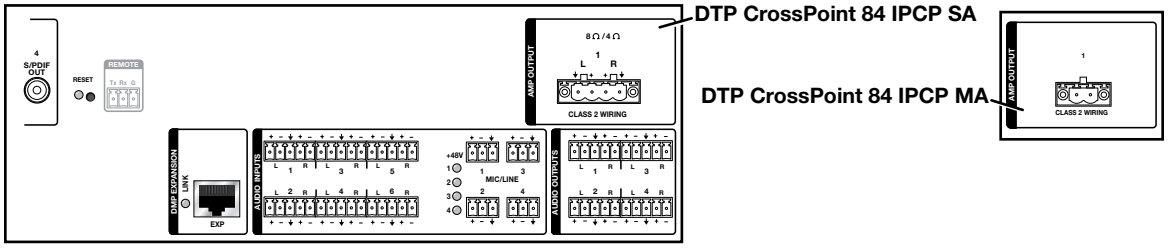
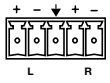


Figure 5. Audio Input and Output Connections and Indications

For inputs and outputs on captive screw connectors (**G**, **H**, and **J**) the connectors are included with the switcher, but you must supply the audio cable.

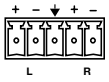
G **Audio Inputs 1 through 6** (see **figure 2** on page 11)— Connect balanced or unbalanced stereo audio inputs to these 5-pole, 3.5 mm captive screw connectors (see **Analog audio input connectors** on page 19 to wire the connectors).



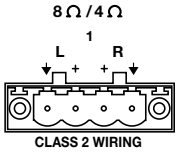
H **Mic/Line Inputs 1 through 4** (see **figure 2**) — Connect microphones or other mono audio inputs to these 3-pole, 3.5 mm captive screw connectors (see **Mic/ Line input connectors** on page 19 to wire the connectors).

I **+48 V (phantom power) LEDs** (see **figure 2**) — These LEDs light to indicate that +48 V phantom power is applied to the associated mic/line inputs.

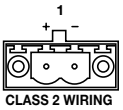
J **Audio Outputs 1 through 4** (see **figure 2** on page 11)— Connect audio devices such as an audio amplifier or powered speakers, to these 5-pole, 3.5 mm captive screw connectors. These connectors output unamplified, line level audio, whether it is tied from an analog input or de-embedded from an HDMI input (see **Analog audio output connectors** on page 20 to wire the connectors).



K **Amp Output 1** (stereo audio model, see **figure 2**) — Connect unpowered, 4-ohm or 8-ohm speakers to this 4-pole 5 mm captive screw connector to play the amplified stereo audio from output 1.



L **Amp Output 1** (mono audio model, see **figure 3** on page 11) — Connect unpowered speakers to this 2-pole captive screw connector to play the amplified mono audio from output 1.

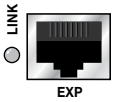


ATTENTION:

- Ensure the rated input voltage of the speakers matches the rated output voltage of the switcher.
- Assurez-vous que la tension nominale d'entrée des enceintes soit compatible avec la tension nominale de sortie du sélecteur

M **S/PDIF Output 4** (see **figure 2**) — Connect a compatible device to this RCA connector to receive digital audio signal stripped from the output 4 digital stream (see **S/PDIF output connector**, on page 21, to wire this connector).

N **DMP Expansion Port and LED** (see **figure 2**) —



Expansion port — Connect a CAT 6 cable between this port and the Expansion port on an optional Extron DMP 128 ProDSP Digital Matrix Processor. A shielded 1-foot cable is included with the DMP 128. Expansion supports audio system scalability with expanded audio processing and signal routing capabilities (see **Expansion Port Operation Within the DSP**, on page 128, for details on using this functionality). No setup is required; just connect the two devices.

Link LED — Lights to indicate that the port is connected to a compatible device.

Serial and IR Insertion Connections

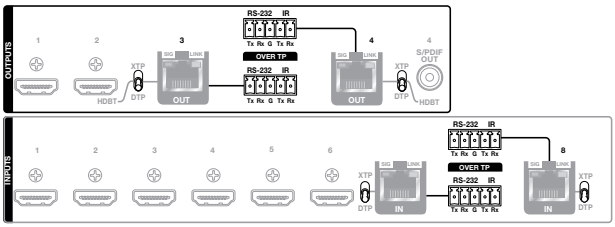
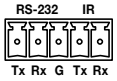
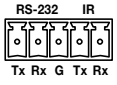


Figure 6. Serial and IR Insertion Connections

O **Over TP (Inputs 7 and 8) ports** (see **figure 2**)— If desired, connect serial RS-232 signals, modulated IR signals, or both to these 3.5 mm, 5-pole captive screw connectors to insert bidirectional RS-232 and IR communications onto the associated inputs (see **Serial and IR port connectors** on page 20 to wire the cables).



P **Over TP (Outputs 3 and 4) ports** (see **figure 2**) — If desired, connect serial RS-232 signals, modulated IR signals, or both to these 3.5 mm, 5-pole captive screw connectors to insert bidirectional RS-232 and IR communications onto the associated outputs (see **Serial and IR port connectors** on page 20 to wire the cables).



Control Connections

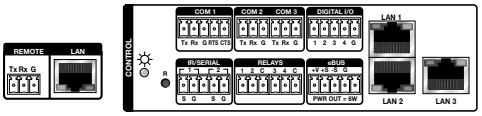


Figure 7. Control Connections

NOTE: Figure 7 shows features of all models. Actual models can have **either** a LAN port (item Q, below) **or** a control processor (item R), but not both.

S for ● numbers.

Q LAN port (non-IPCP model, see **figure 2** on page 11) — If desired, for IP control of the switcher, connect the matrix switcher to a PC or to an Ethernet LAN via this RJ-45 connector. See **TP connections** on page 17 to wire the connector. You can use a PC to control the networked switcher from anywhere in the world using any of the following methods:

- SIS commands (see **Using the Command and Response Tables** on page 56)
- The Extron Product Configuration Software (see **Product Configuration Software** on page 75)
- The DSP Configurator program (see **DSP Configurator Program** on page 80)
- Built-in HTML pages (see **HTML Operation** on page 133)

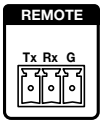
Act (yellow) LED — The Act LED indicates transmission of data packets on the RJ-45 connector. This LED should blink as the switcher communicates.

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

R IPCP Pro 350 control processor (IPCP models only, see **figure 2**) —The IPCP models include a built-in IPCP control processor that can control and monitor a variety of external devices. The IPCP offers RS-232 and IR-based control, relays, and digital I/O controls. Controllable devices can include:

- Projectors or other displays
- Source devices
- Switchers
- Lights
- Projector lifts
- Screen motors

See the *IPCP Pro 350 Series User Guide* at **www.extron.com** to make all connections and to configure and operate the IPCP control processor.

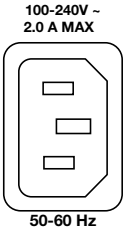


S Remote Port (see **figure 2**) — Plug a serial RS-232 device into the matrix switcher via this 3.5 mm, 3-pole captive screw connector for remote control of the switcher (see **Serial and IR port connectors** on page 20 to wire the connector).

Switcher Reset

T Switcher Reset button and LED (see **figure 2**) — The Reset button initiates four levels of reset of the matrix switcher. For the different reset levels, press and hold the button while the switcher is running or while you power up the switcher (see **Rear Panel Operations** on page 46 for details).

Power

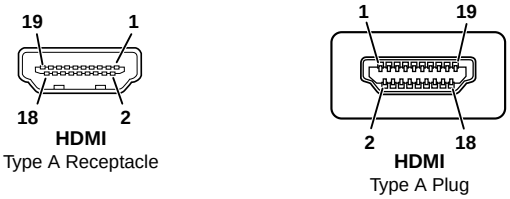


U Power connector (see **figure 2**) — Plug a standard IEC power cord into this connector to connect the switcher to a 100 VAC to 240 VAC, 50-60 Hz power source.

Detailed Pin Assignments, Wiring, and Sample Applications

HDMI connectors

Figure 8 defines the pinout for the HDMI protocol.



Pin	Signal	Pin	Signal	Pin	Signal
1	TMDS data 2+	7	TMDS data 0+	13	CEC control
2	TMDS data 2 shield	8	TMDS data 0 shield	14	Reserved (NC)
3	TMDS data 2-	9	TMDS data 0-	15	SCL
4	TMDS data 1+	10	TMDS clock+	16	SDA
5	TMDS data 1 shield	11	TMDS clock shield	17	DDC / CEC Ground
6	TMDS data 1-	12	TMDS clock-	18	+5 V power
				19	Hot plug detect

Figure 8. HDMI Connector

Use the LockIt Lacing Brackets, supplied with the switcher, to securely fasten HDMI cables to devices as follows (see figure 9):

1. Plug the HDMI cable into the panel connection.

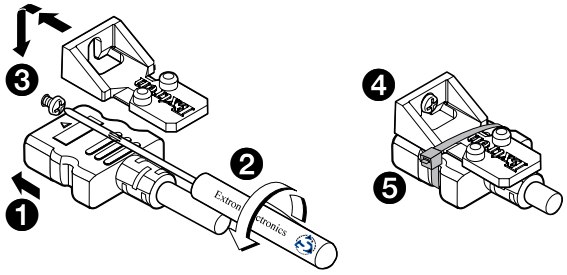


Figure 9. Installing the LockIt Lacing Bracket

2. Loosen the HDMI connection mounting screw from the panel enough to allow the LockIt lacing bracket to be placed over it. The screw does not have to be removed.
3. Place the LockIt lacing bracket on the screw and against the HDMI connector, then tighten the screw to secure the bracket.

ATTENTION:

- Do not overtighten the HDMI connector mounting screw. The shield to which it fastens is very thin and can easily be stripped.
- Ne serrez pas trop la vis de montage du connecteur HDMI. Le blindage auquel elle est attachée est très fin et peut facilement être dénudé.

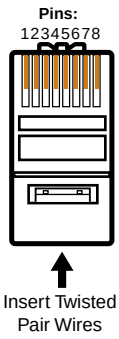
4. Loosely place the included tie wrap around the HDMI connector and the LockIt lacing bracket as shown.
5. While holding the connector securely against the lacing bracket, use pliers or similar tools to tighten the tie wrap, then remove any excess length.

TP connectors

All RJ-45 ports, whether TP input and output ports, the Expansion port, and the LAN (Ethernet) ports on the switcher or IPCP control processor use twisted pair cables. It is essential that the TP cables be the correct type and that they be properly terminated with the correct pinout. The TP cable can be terminated as a patch (straight-through) cable or a crossover cable and must be properly terminated for your application (see figure 10). All these cables are terminated with RJ-45 connectors. All TP cables are limited to a length of 330 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.



Straight-through Cable
DTP I/O Ports, Expansion Port, and LAN Ports

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

Crossover Cable
LAN Ports

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.

Figure 10. RJ-45 Connector and Pinout Tables

- **Patch (straight) cable** —
  - **TP input and output ports** — Shielded twisted pair (STP) for connection to Extron DTP transmitters and receivers, XTP matrix switchers, or HDBaseT-enabled devices.
  - **Expansion port** — STP for connection between the matrix switcher and a DMP 128. A shielded 1-foot cable is included with the DMP 128.
  - **LAN ports** — Unshielded twisted pair (UTP) or STP for connection of the LAN port to an Ethernet LAN or direct connection between the switcher and a computer.
- **Crossover cable** —
  - **LAN ports** — UTP or STP for direct connection between the DTP CrossPoint 84 matrix switcher and a connected computer.

LAN ports

The LAN ports require CAT 3, CAT 5e, or CAT 6a, crossover or patch cables.

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

- 10Base-T Ethernet requires CAT 3 UTP or STP cable at minimum.
- 100Base-T (max. 155 Mbps) or 1000Base-T Fast Ethernet require CAT 5e UTP or STP cable at minimum.

For ports on an IPCP module, see the *IPCP Pro 350 Series User Guide* at **www.extron.com** to make all network connections and to configure and operate the processor.

TP and Expansion ports

The TP input and output ports are compatible with Extron XTP DTP 24 SF/UTP cables, as well as CAT 5e, 6, 6a, and 7 shielded twisted pair (F/UTP, SF/UTP, and S/FTP) cable. The Expansion port requires CAT 5e, 6, 6a, or 7 shielded twisted pair cable.

For the TP ports only —

ATTENTION:

- Do not connect these ports to a computer data or telecommunications network.
- Ne connectez pas ces port à des données informatiques ou à un réseau de télécommunications.

- Do not use Extron UTP23SF-4 Enhanced Skew-Free AV UTP cable or STP201 cable to link the matrix switcher to Extron DTP or XTP products or HDBaseT-enabled devices.
- N'utilisez pas le câble AV Skew-Free UTP version améliorée UTP23SF d'Extron ou le câble STP201 pour relier la grille de commutation avec des produits XTP ou DTP d'Extron, ou des appareils équipés HDBaseT.

- To ensure FCC Class A and CE compliance, STP cables and STP connectors are required.
- Afin de s'assurer de la compatibilité entre FCC Classe A et CE, les câbles STP et les connecteurs STP sont nécessaires.

Extron recommends using the following practices to achieve full transmission distances up to 330 feet (100 m) and reduce transmission errors.

- Use the following Extron XTP DTP 24 cables and connectors for the best performance:
  - **XTP DTP 24/1000** Non-Plenum 1000' (305 m) spool 22-236-03
  - **XTP DTP 24P/1000** Plenum 1000' (305 m) spool 22-235-03
  - **XTP DTP 24 Plug** Package of 10 101-005-02
- If you not using XTP DTP 24 cable, Extron recommends, at a minimum, using 24 AWG, solid conductor, STP cable with a minimum bandwidth of 400 MHz.
- Terminate cables with shielded connectors to the TIA/EIA T 568 B standard only (patch cables, see **figure 10** on the previous page).
- Limit the use of more than two pass-through points, which may include patch points, punch down connectors, couplers, and power injectors. If these pass-through points are required, use CAT 6 or 6a shielded couplers and punch down connectors.

NOTE: When using cable in bundles or conduits, consider the following:

- Do not exceed 40% fill capacity in conduits.
- Do not comb the cable for the first 65 feet (20 meters), where cables are straightened, aligned, and secured in tight bundles.
- Loosely place cables and limit the use of tie wraps or hook and loop fasteners.
- Separate twisted pair cables from AC power cables.

Analog audio input connectors

See figure 11 to wire a connector for the appropriate input type. Connectors are included with the switcher, but you must supply the audio cable. Use the supplied tie-wrap to strap the cable to the extended tail of the connector.

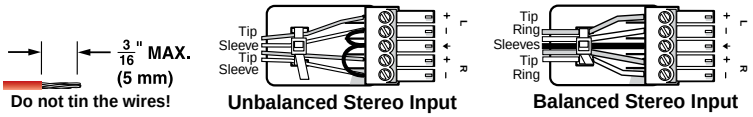
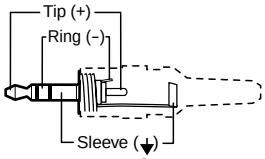


Figure 11. Captive Screw Connector Wiring for Audio Inputs

NOTES:

- The length of exposed wires is important. The ideal length is 3/16 inch (5 millimeters).
  - If the stripped section of wire is longer than 3/16 inch, the exposed wires may touch, causing a short circuit.
  - If the stripped section of wire is shorter than 3/16 inch, wires can be easily pulled out even if tightly fastened by the captive screws.
- Do not tin the power supply leads before installing them in the connector. Tinned wires are not as secure in the connector and could be pulled out.

An unbalanced stereo audio connector consists of a tip, ring, and sleeve. An unbalanced mono audio connector consists of a tip and sleeve. When you are making connections for the switcher from existing audio cables, see at right to identify the tip, ring, and sleeve parts of the connector. The ring, tip, and sleeve wires are also shown on the captive screw audio connector diagrams, figure 11, figure 12, and **figure 13** on the next page.



3.5 mm Stereo Plug Connector
(balanced)

Mic/Line input connectors

See figure 12 to wire a connector for mono audio input. Use the supplied tie-wrap to strap the audio cable to the extended tail of the connector.

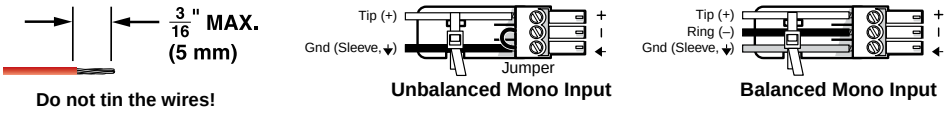


Figure 12. Captive Screw Connector Wiring for Mono Audio Inputs

NOTE: The length of exposed wires is important. The ideal length is 3/16 inch (5 mm) (see the audio input connector **NOTES** above for details).

Analog audio output connectors

Connect audio devices, such as an audio amplifier or powered speakers, to these 3.5 millimeter, 5-pole captive screw connectors. These connectors output the tied unamplified, line level audio (see figure 13 to wire an output connector). Use the supplied tie-wrap to strap the audio cable to the extended tail of the connector.

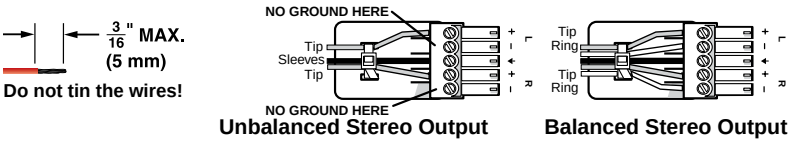


Figure 13. Captive Screw Connector Wiring for Audio Outputs

ATTENTION:

- For unbalanced audio, connect the sleeves to the ground contact. **DO NOT** connect the sleeves to the negative (-) contacts.
- Pour l'audio asymétrique, connectez les manchons au contact au sol. Ne **PAS** connecter les manchons aux contacts négatifs (–).

NOTES:

- The length of exposed wires is important. The ideal length is 3/16 inch (5 millimeter) (see the audio input connector **NOTES** on the previous page for details).
- The audio that is output on these connectors is converted from the tied embedded input signal or the analog audio input. This feature allows you to duplicate the outputs while eliminating the need for extra receivers.

By default, the audio ties follow the video ties. Audio breakaway, which can be activated via the front panel or under remote control **if**, in the DSP Configurator, the **`Output Signal Source`** is set to **`From DSP`** (see **Output signal processor chain, Volume controls** on page 100), allows you to select from any one of the audio input sources and route it separately from its corresponding video source (see **Example 3: Remove a tie from a set of ties** on page 33). You can also use an **SIS command** (see page 60) or the Product Configuration Software (see **Matrix Software** on page 72).

Serial and IR port connectors

Figure 14 shows how to wire the Over TP RS-232 and IR and Remote connectors.

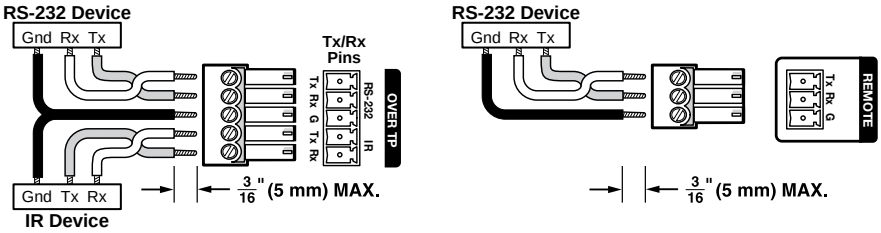
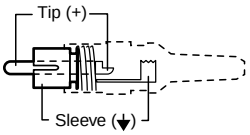


Figure 14. RS-232 and IR Connectors Wiring

NOTE: The length of exposed wires is important. The ideal length is 3/16 inch (5 millimeter) (see the audio input connector **NOTES** on the previous page for details).

S/PDIF output connector

Figure 15 shows the S/PDIF connector, a 75-ohm cable with a standard RCA connector.



RCA Connector

Figure 15. S/PDIF Connector

Front Panel Configuration Port

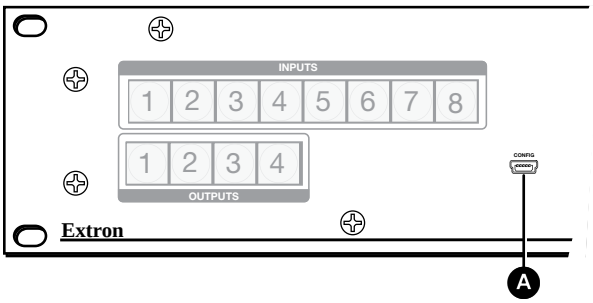


Figure 16. Front Panel Configuration Port

Ⓐ **Configuration port** — This USB mini-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.

Operation

This section describes the front panel operation of the DTP CrossPoint Matrix Switcher, including:

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

Front Panel Controls and Indicators

The front panel controls (see figure 17) are grouped into four sets. The input and output buttons, Ⓐ and Ⓑ, are grouped on the left side of the control panel. The control buttons and video and audio (I/O) selection buttons, Ⓒ through Ⓗ, are grouped in the center of the panel. The Volume controls (Ⓘ and Ⓙ) and the IPCP indications (IPCP models only, Ⓚ) are on the right side of the panel.

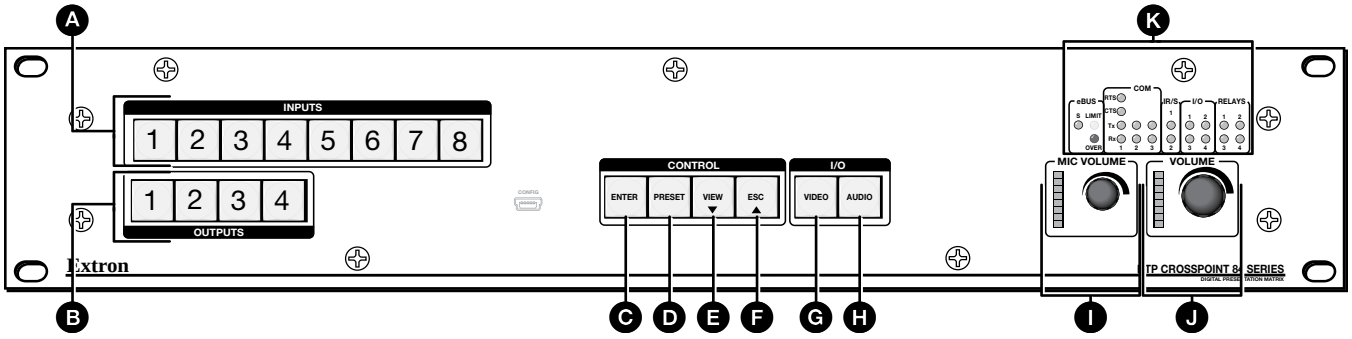


Figure 17. Front Panel, DTP CrossPoint 84 Switcher

Ⓐ **Input buttons** (see page 24)
Ⓑ **Output buttons** (see page 24)
Ⓒ **`Enter` button** (see page 25)
Ⓓ **`Preset` button** (see page 25)
Ⓔ **`View` button** (see page 25)
Ⓕ **`Esc` button** (see page 25)
Ⓖ **`Video` button** (see page 26)
Ⓗ **`Audio` button** (see page 26)
Ⓘ **`Mic Volume` (gain) knob and LEDs** (see page 27)
Ⓙ **`Volume` (gain) knob and LEDs** (see page 27)
Ⓚ **IPCP control processor LEDs** (IPCP model) (see page 27)

The illuminated buttons can be labeled with text, graphics, or both. The buttons can be set to provide amber background illumination all the time, or the background illumination can be turned off (see **Background Illumination** on page 43). The buttons blink or are lit at full intensity (depending on the operation) when selected.

Input and Output Buttons

NOTE: See **Front Panel Operations**, beginning on page 28 for detailed descriptions of the following operations.

Primary functions							
	Action	Select input or output for tie being created.					
	Indication	*Blink*: potential tie/untie. *Lit*: current tie *Amber*: video and audio tie *Green*: video only tie *Red*: audio only tie					
					 through		
Secondary functions							
Presets	Action	Select a preset in Preset mode.					
	Indication	*Lit*: A preset has been saved to this location.					
Output mutes	Action	**Outputs**: Press and hold to mute or unmute the output.					
	Indication	**Outputs** *blink*: Output is muted.					
Input audio configuration	Action 1		**Input 2 and Output 2** *blink*: Select config mode.				
	Action 2	**Inputs**: Select the input to configure.					
	Indication	**Inputs**: Indicate setting.					
Control insert configuration	Action 1				**Input 4 and Output 4** *blink*: Select config mode.		
	Action 2			**Output 3 and Output 4**: Select the output to configure.		**Input 7 and Input 8**: Select the input to configure.	
	Indication				**Inputs and outputs**: Indicate setting.		
Background illumination	Action	**Input 1 and Input 2**: Toggle between background illumination or buttons unlit.					

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

- ❑ Select and identify an input for creating ties or for audio level adjustment.
- • Select a preset.
- • (**Input 2**) With the Output 2 button, select input audio configuration mode.
- • Display input audio configuration.
- • (**Input 4)** With the Output 4 button, select control insert configuration mode.
- • (**Input 7 and Input 8 only**) Display control insert configuration for input.
- • (**Input 1 and Input 2 only**) Toggle background illumination of the buttons on and off.

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

- ❑ Select and identify an output for ties.
- • Select a preset.
- • Mute the output.
- • (**Output 2**) With the Input 2 button, select input audio configuration mode.
- • (**Output 4)** With the Input 4 button, select control insert configuration mode.
- • (**Output 3 and Output 4 only**) Display control insert configuration for output.

Control Buttons

NOTE: See **Front Panel Operations**, beginning on page 28 for detailed descriptions of the following operations.

Primary functions					
	Action	Save changes	Select Preset mode	Select View mode	Cancel or Escape
	Indication	*Blink*: Save needed	*Lit*: Recall preset	View mode selected	Blinks once
		ENTER	PRESET	VIEW ▼	ESC ▲
Secondary functions					
Input audio configuration	Indication			*Blink*: Input Audio Configuration Mode.	
Port configuration	Action 1:	Select Configuration mode.			
	Action 2:	Select 9600 baud	Select 19200 baud	Select 38400 baud	Select 115200 baud
	Indication	*Blink*: 9600 baud	*Blink*: 19200 baud	*Blink*: 38400 baud	*Blink*: 115200 baud
Front panel locks	Action 1:			Select Lock mode 1 or toggle between mode 2 and mode 1.	
	Action 2:		Select Lock mode 2 or toggle between mode 0 and mode 2.		

C **Enter button** — The **Enter** button has two primary functions (❑) and two secondary functions (•):

- ❑ Saves configuration or other changes that you make on the front panel. To create a simple configuration:
  - ❍ Specify video, audio, or both (see I/O buttons [**item G**] and [**item H**]).
  - ❍ Press the desired input button (**item A**).
  - ❍ Press the desired output button or buttons (**item B**).
  - ❍ Press the **Enter** button.
- ❑ Indicates that a potential tie or other change has been created but not saved.
- • With the **Preset**, **View**, and **Esc** buttons, selects Serial Port Configuration mode.
- • Selects 9600 baud for the rear panel Remote port in Serial Port Configuration mode and indicates the selection.

D **Preset button** — The **Preset** button has one primary function (❑) and three secondary functions (•):

- ❑ Activates *Recall* Preset mode to activate a previously-defined preset and indicates the selection.
- • With the **Enter**, **View**, and **Esc** buttons, selects Serial Port Configuration mode.
- • Selects 19200 baud for the rear panel Remote port in Serial Port Configuration mode and indicates the selection.
- • With the Vew and **Esc** buttons, selects front panel security Lock mode 2 or toggles between mode 0 (unlocked) and mode 2.

E **View (▼) button** — The **View** (▼) button has one primary function (❑) and five secondary functions (•):

- ❑ Select and indicate View-only mode, which displays the current configuration.

  NOTE: View-only mode also provides a way to mute and unmute the outputs.

- • With the **Esc** button, indicates Input Audio Configuration mode.
- • With the **Enter**, **Preset**, and **Esc** buttons, selects Serial Port Configuration mode.
- • Selects 38400 baud for the rear panel Remote port in Serial Port Configuration mode, and indicates the selection.
- • With the **Preset** button and **Esc** button, selects between front panel locks (Lock mode 2 and Lock mode 0).
- • With the **Esc** button, selects between front panel locks (Lock mode 2 and Lock mode 1).

F **Esc (▲) button** — The **Esc** (▲) button has one primary function (❑) and five secondary functions (•):

- ❑ Cancels operations or selections in progress and resets the front panel button indicators and blinks once to indicate that the escape function has been activated.
- • With the **View** button, indicates Input Audio Configuration mode.
- • With the **Enter**, **Preset**, and **View** buttons, selects Serial Port Configuration mode.
- • Selects 115200 baud for the rear panel Remote port in Serial Port Configuration mode and indicates the selection.
- • With the **Preset** button and **View** button, selects between front panel locks (Lock mode 2 and Lock mode 0).
- • With the **View** button, selects between front panel locks (Lock mode 2 and Lock mode 1).

I/O Buttons

NOTE: See **Front Panel Operations**, beginning on page 28 for detailed descriptions of the following operations.

Primary functions			
	Action	Select video	Select audio
	Indication	*Green*: selected	*Red*: selected
		VIDEO	AUDIO
Secondary functions			
Control insert configuration	Indication	*Blink*: Control Insert Configuration Mode.	
Resets	Action:	Perform a system reset.	

G **Video button** — The **Video** button has one primary function (❑) and two secondary functions (•):

- ❑ Selects and deselects video for a configuration that is being created or viewed and lights green to indicate that video is available for configuring or for viewing.
- • With the **Audio** button, indicates Control Insert Configuration mode.
- • With the **Audio** button, commands the front panel system reset.

H **Audio button** — The **Audio** button has one primary function (❑) and two secondary functions (•):

- ❑ Selects and deselects audio for a configuration that is being created or viewed and lights to indicate that audio is available for configuration or viewing.
- • With the **Video** button, indicates Control Insert Configuration mode.
- • With the **Video** button, commands the front panel system reset.

Volume Controls

NOTE: The following volume functions are in the default group masters configuration. Operation of these controls can be changed using the DSP Configurator software (see **Group masters**, on page 101).

If you change the group master configuration, the front panel controls adjust the new group masters that you create.

I **Mic Volume (gain) knob and LEDs** — Rotate the knob clockwise to increase the pre-mixer gain for all four microphone inputs. By default, this knob controls DSP group master 2.

J **Volume knob and LEDs** — Rotate the knob clockwise to increase the output 1 amplified volume. By default, this knob controls DSP group master 1.

For both Volume controls, the range is from 0 (-100 dB) to 100 (+12 dB). The default setting is 50 (-50 dB). As the volume increases or decreases, the LED bar ramps up and down to indicate the current volume range, as shown in table 1. As you increase and decrease the volume, the top LED that is lit blinks.

The sensitivity of the encoder (the amount [dB] of volume adjustment per step of rotation) varies depending on the current volume setting (see the last column in table 1).

Table 1. Volume Indication

Volume ranges for each LED (dB)	LEDs lit	Increment (dB per step of knob rotation)
-4 to 0	All 8 LEDs lit.	1
-9 to -5	Bottom 7 LEDs lit.	
-14 to -10	Bottom 6 LEDs lit.	
-19 to -15	Bottom 5 LEDs lit.	
-29 to -20	Bottom 4 LEDs lit.	2
-49 to -30	Bottom 3 LEDs lit.	4
-69 to -50	Bottom 2 LEDs lit.	
-99 to -70	Bottom LED lit.	5
-100	All LEDs off.	

Control Processor Indications

K **IPCP LEDs** —The DTP CrossPoint 84 IPCP includes a built-in IPCP control processor that can control and monitor a variety of external devices. The IPCP control processor display its operational status on the front panel. See the *IPCP Pro 350 Series User Guide* at **www.extron.com** to interpret the indications of the IPCP control processor.

Button Icons

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

Input and output labels can be created easily with the Extron Button-Label Generator software, which is shipped 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 18). See **Removing and Installing Button Labels**, on page 150, for details on using the labeling software, blank labels you can fill in yourself, and a procedure for removing and replacing the translucent covers.

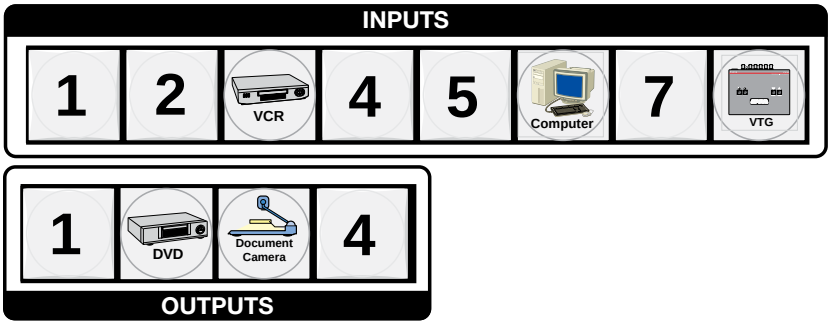


Figure 18. Sample Button Icons

Front Panel Operations

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

- **Creating ties, sets of ties, and configurations**
- **Changing a configuration**
- **Viewing ties, sets of ties, and configurations**
- **Recalling a preset**
- **Muting and unmuting outputs**
- **Configuring the audio inputs**
- **Configuring the TP insertion ports**
- **Reading and setting the Remote port baud rate**
- **Toggling background illumination on and off**
- **Locking and unlocking the front panel**
- **Performing a front panel reset**

Definitions

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

Tie — An input-to-output connection

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

NOTE: An output can never be tied to more than one input.

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

Full configuration — A configuration that includes the ties associated with all inputs and outputs and all associated DSP processors.

Partial configuration — A subset of ties, sets of ties, and DSP processors.

Current configuration — The configuration that is currently active (also called configuration 0)

Preset — One or more ties or sets of ties and signal processor settings that has been created and stored under RS-232 or Ethernet control. Up to 32 presets can be stored in memory. The first 12 preset locations are assigned to the input buttons and output buttons and can be recalled from the front panel. Preset numbers 12 through 32 can be recalled under RS-232 or Ethernet control only.

Preset locations are assigned to the input and output buttons. When a preset is retrieved from memory, it becomes either:

- The current configuration (if the preset includes a full configuration), overwriting all of the current configuration.
- Part of the current configuration (if the preset includes a partial configuration), overwriting a portion of the current configuration, leaving other ties and settings unchanged.

Power

Apply power by connecting the power cord between the switcher and an AC source. The switcher performs a self-test that blinks the front panel button indicators red, green, and amber and then turns them off. An error-free power-up self-test sequence leaves all input, output, and control buttons either unlit or showing background illumination and the **Video** button and the **Audio** button lit.

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

If an error occurs during the self-test, the switcher locks up and does not operate. If your switcher locks up on power-up, call the Extron S3 Sales and Technical Support Hotline. See **www.extron.com** for the phone number in your region of the world.

Front Panel Security Lockouts

In the procedural descriptions that follow, it is assumed that the switcher is in Lock mode 0 (fully unlocked). The following two Lock modes are also available:

- Lock mode 1 — All changes are locked from the front panel (except for setting Lock mode 2). Some functions can be viewed.
- Lock mode 2 — Advanced features are locked and can be viewed only. Basic functions are unlocked.

NOTE: The switcher is shipped from the factory in Lock mode 2. See **Setting the Front Panel Locks (Executive Modes)** on page 44 for a detailed list of basic and advanced functions and the procedure to set the various front panel locks.

Creating a Configuration

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

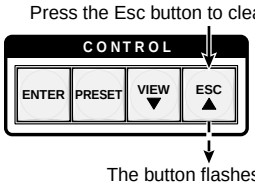
1. Press the **Esc** button to clear any input button indicators, output button indicators, or control button indicators that may be lit.
2. Press the **Video** button and **Audio** button as necessary to select video, audio, or both for configuration.
3. Select the desired input and one or more outputs by pressing the input and output buttons.
   - Input buttons and output buttons light or blink:
     - **Amber** to indicate video and audio ties
     - **Green** to indicate video only ties
     - **Red** to indicate audio only ties
   - To indicate potential ties, output buttons blink the appropriate color when an input is selected.
   - To indicate current ties, output buttons light steadily the appropriate color when an input is selected.
   - To clear unwanted outputs, press and release the associated lit output buttons. To indicate potential unties, output buttons blink the appropriate color when an output is deselected but not untied from the input.
4. Press and release the **Enter** button to accept the tie or to break an existing tie.
5. Repeat steps 1 through 4 to create or clear additional ties until the desired configuration is complete.

NOTES:

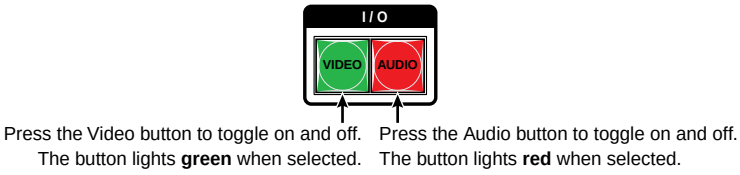
- Only one video input and one audio input can be tied to an output.
- If a tie is made between an input and an output, and the selected output was previously tied to another input, the older tie is broken in favor of the newer tie.
- If an input with no tie is selected, only the button for the selected input lights.
- When the **Video** button and the **Audio** button are lit, if an input with an audio tie but no video tie is selected, the button for the input and the button for the output light the appropriate color (amber, green, or red).
- As each input and output is selected, the associated output button blinks the appropriate color to indicate a tentative tie. Buttons for outputs that were already tied to the input light the appropriate color steadily. Outputs that are already tied can be left on, along with new blinking selections, or toggled off by pressing the associated output button.

Example 1: Create a set of video and audio ties

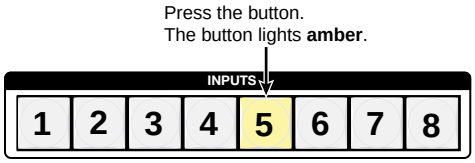
1. **Clear all selections**: Press and release the **Esc** button.



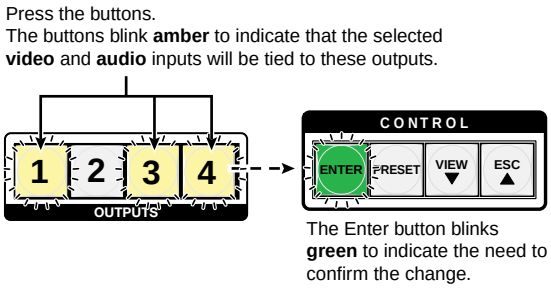
2. **Select video and audio for the tie**: If necessary, press and release the **Video** button and the **Audio** button to light both.



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

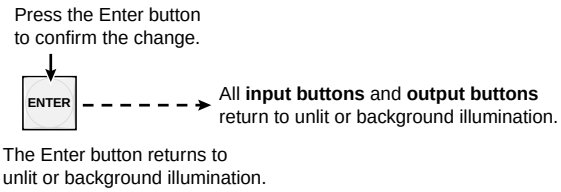


4. **Select the outputs**: Press and release the output 1, output 3, and output 4 buttons.



> **NOTE:** You can cancel the entire set of ties at this point by pressing and releasing the **Esc** button. The **Esc** button blinks once.

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



The current configuration (see figure 19) is now input 5 video and audio are tied to output 1, output 3, and output 4.

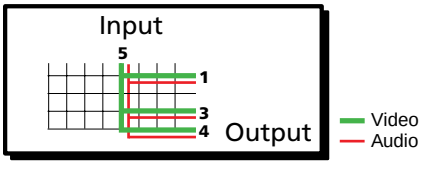


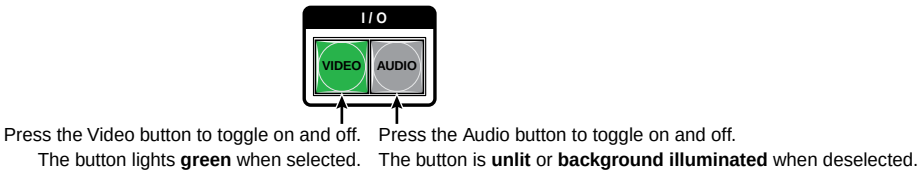
Figure 19. Final Configuration, Example 1

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

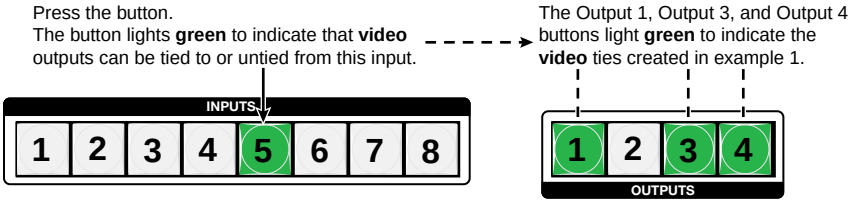
In the following example, a new video tie is added to the current configuration. The example shows the front panel indications that result from your actions.

NOTE: This example assumes that you have performed **example 1** on the previous page.

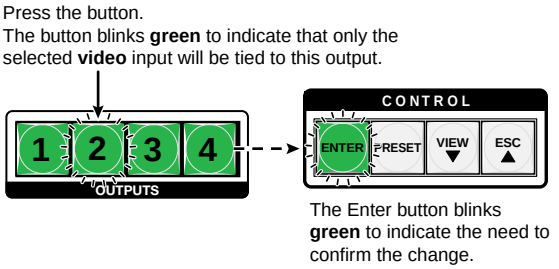
1. **Clear all selections**: Press and release the **Esc** button.
2. **Select video only for the tie**: Press and release the **Video** button and the **Audio** button as necessary to light **Video** only.



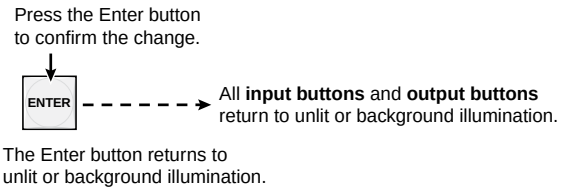
3. **Select an input**: Press and release the Input 5 button.



4. **Select the output**: Press and release the Output 2 button.



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



The current configuration (see figure 20) is now:

- **Video** — Input 5 video is tied to output 1, output 2, output 3, and output 4.
- **Audio** — Input 5 audio is tied to output 1, output 3, and output 4.

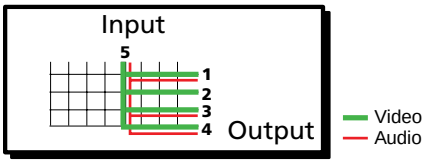


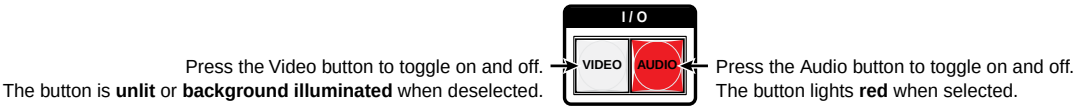
Figure 20. Final Configuration, Example 2

Example 3: Remove a tie from a set of ties

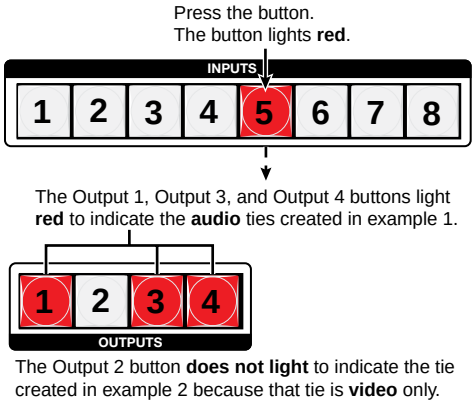
In the following example, an existing tie is removed from the current configuration. The example shows the front panel indications that result from your actions.

NOTE: This example assumes that you have performed **example 1** on page 31 and **example 2** on the previous page.

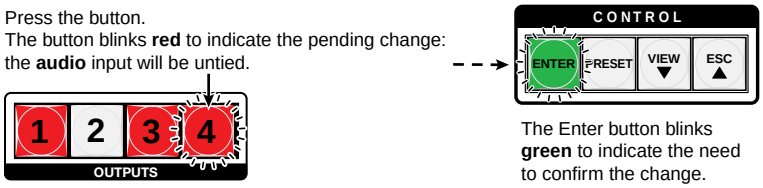
1. **Clear all selections**: Press and release the **Esc** button.
2. **Select audio only for the tie**: Press and release the **Video** button and the **Audio** button as necessary to light **Audio** only.



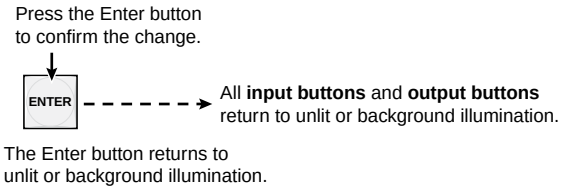
3. **Select an input**: Press and release the input 5 button.



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



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



The current configuration (see figure 21) is now:

- **Video** — Input 5 video is tied to output 1, output 2, output 3, and output 4.
- **Audio** — Input 5 audio is tied to output 1 and output 3.

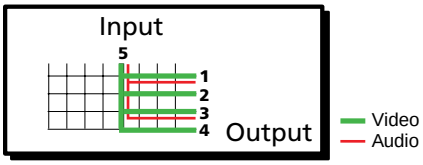


Figure 21. Final Configuration, Example 3

Viewing the 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 audio outputs (see **Muting and Unmuting Video and HDMI Audio Outputs** on page 38).

View the current configuration as follows:

1. Press the **Esc** button to clear any input button indications, output button indications, or control button indications that may be lit.
2. Press and release the **View** button. All of the buttons light for outputs that are **not** tied as follows:
   - **Amber** to indicate video and audio ties
   - **Green** to indicate video only ties
   - **Red** to indicate audio only ties

   If you press an output button for which there are no ties, the output buttons light for all outputs without ties.
3. Press the **Video** button, **Audio** button, or both to select video, audio, or both to view.
4. Select the desired input or outputs whose ties you wish to view by pressing the input and output buttons.

NOTES:

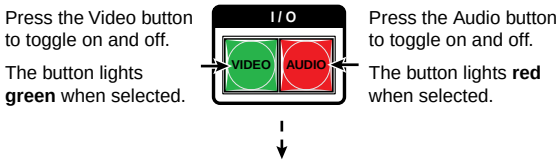
- To see all ties of the current configuration, press and release each input and output button, one at a time, with the **Video** button and the **Audio** button lit.
- When you view video and audio ties, the **Video** button is lit green and the **Audio** button is lit red. After you select an input or output, the output buttons light different colors to show where video and audio ties are not the same (audio is broken away). Amber indicates video and audio, green indicates video only, and red indicates audio only.
- After 30 seconds of front panel inactivity, View-only mode automatically deselects.

Example 4: Viewing video and audio, audio only, and video only ties

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

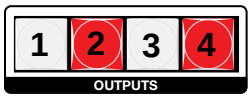
NOTE: This example assumes that you have performed **example 1** on page 31, **example 2** on page 32, and **example 3** on page 33.

1. **Clear all selections**: Press and release the **Esc** button.
2. **Select View-only mode**: Press and release the **View** button. The **View** button lights red.
3. **Select video and audio for viewing**: Press and release the **Video** button and the **Audio** button as necessary to light both.

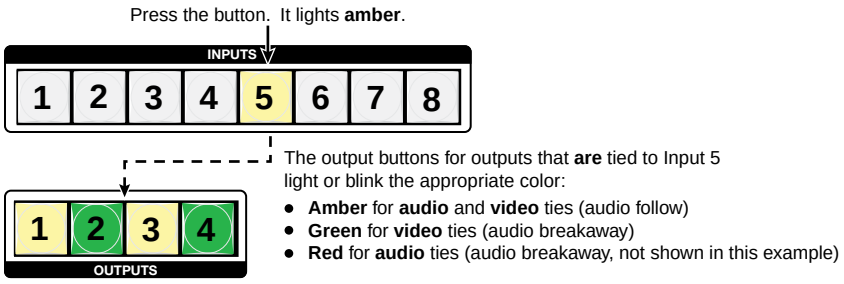


Until you select an input, the buttons for all untied outputs light the appropriate color:

- **Amber** if **no inputs** are tied (not shown in this example)
- **Green** if **no video inputs** are tied (only audio is tied)
- **Red** if **no audio** inputs are tied (only video is tied).



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

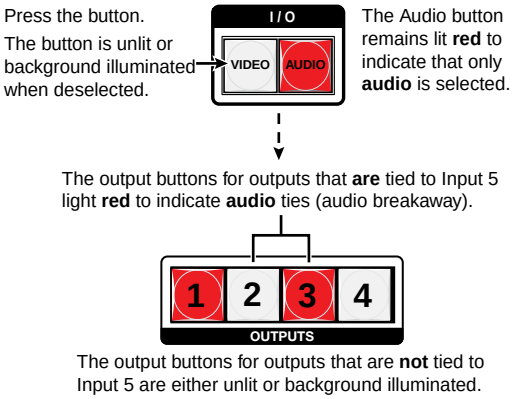


The output buttons for outputs that are **not** tied to Input 5 are either unlit or background illuminated.

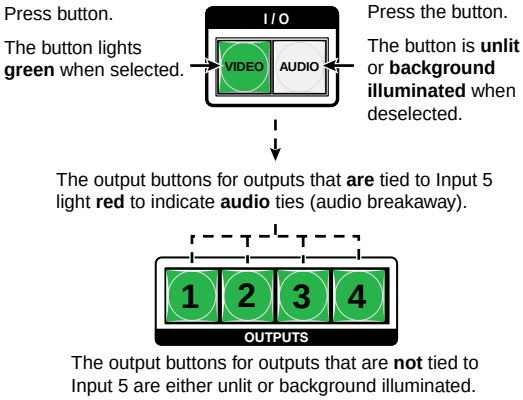
NOTE: You can also view a set of ties by selecting a tied output. Demonstrate this as follows:

- Note the number of a lit output button, and then press and release the output button for an untied (unlit or background illumination) output.
- Observe that all of the untied outputs light.
- Then press the output button that you noted previously.
- 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.

5. **Deselect video**: Press and release the **`Video`** button.

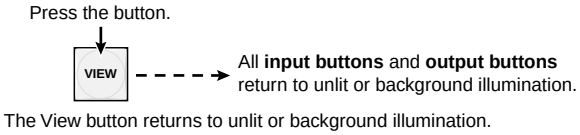


6. **Toggle audio off and video on:** Press and release the **`Video`** button and the **`Audio`** button.



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

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



Recalling Presets

A full or partial configuration, plus all signal processor settings can be saved as one of 32 presets. Presets are created via the DSP Configurator software **only** (see **Save a preset** on page 106). When a preset is retrieved from memory, it becomes either the current configuration or part of the current configuration, with all of the associated saved audio settings.

Presets 1 through 12 are assigned to the input buttons and output buttons and can be recalled from the front panel (see figure 22). Preset numbers 12 through 32 can be recalled via RS-232, USB, or Ethernet control only.

NOTES:

- Presets **cannot** be viewed from the front panel unless they are recalled as the current configuration.
- 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 all or part of the current configuration, which is lost unless it is also stored as a preset. The recalled preset overwrites current configuration ties in favor of the preset configuration ties.

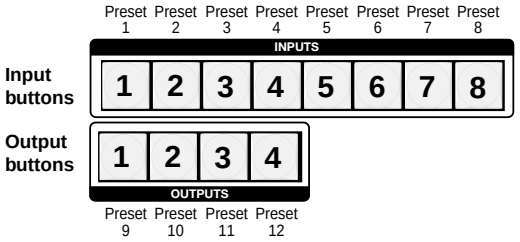
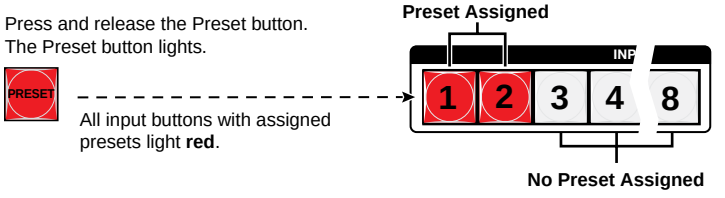


Figure 22. DTP CrossPoint 84 Preset Locations

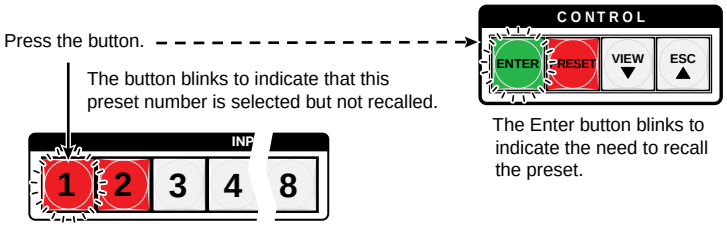
Example 5: Recalling a preset

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.

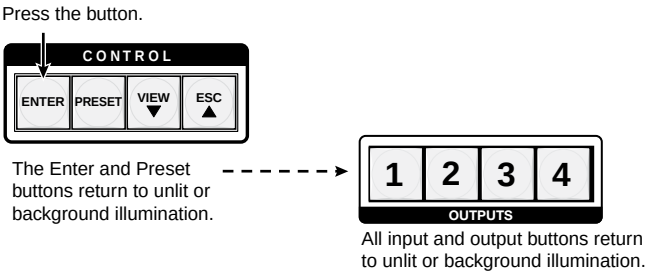
1. **Clear all selections**: Press and release the **`Esc`** button.
2. **Select Recall Preset mode**: Press and release the **`Preset`** button.



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



4. **Recall the preset**: 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** on page 35).



Muting and Unmuting Video and HDMI Audio Outputs

Individual outputs can be muted or unmuted as follows:

NOTES:

- Output mutes are protected when front panel Lock mode 2 is selected. You can view the status of the output (muted or unmuted) in Lock mode 2 but you cannot change it from the front panel (see **Setting the Front Panel Locks (Executive Modes)** on page 44).
- Audio mute silences the HDMI audio and S/PDIF audio only, not the analog or amplified audio.

1. Press the **Esc** button to clear any input button indications, output button indications, or control button indications that may be lit.
2. Press and release the **View** button.
3. Press the **Video** button and the **Audio** button to select video, HDMI audio, or both to mute or unmute.
4. One at a time, press and **hold** the buttons for the desired 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.
5. Press and release the **View** button to return to normal switcher operation.

NOTES:

- You can mute video and HDMI audio, video-only, or HDMI audio-only outputs. Pressing and releasing the **Video** button and the **Audio** button toggles each selection on and off.
- When you enter View-only mode, the output LEDs turn **on** for all outputs **without** ties.
- Mutes are saved to volatile memory. When power is removed and restored, all outputs are unmuted.

Example 6: Muting and unmuting an HDMI audio output

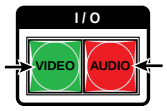
In the following example, a switcher output is muted and unmuted. The steps show the front panel indications that result from your action.

1. **Clear all selections**: Press and release the **Esc** button.
2. **Select View-only mode**: Press and release the **View** button. The **View** button lights red.
3. **Select both video and audio for viewing and muting**: If necessary, press and release the **Video** button and the **Audio** button.

> **NOTE:** This example assumes that you have performed **example 1** on page 31, **example 2** on page 32, and **example 3** on page 33.

Press the Video button to toggle on and off.

The button lights **green** when selected.

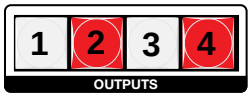


Press the Audio button to toggle on and off.

The button lights **red** when selected.

Until you select an input, the buttons for all untied outputs light the appropriate color:

- **Amber** if **no inputs** are tied (not shown in this example)
- **Green** if **no video inputs** are tied (only audio is tied)
- **Red** if **no audio** inputs are tied (only video is tied).

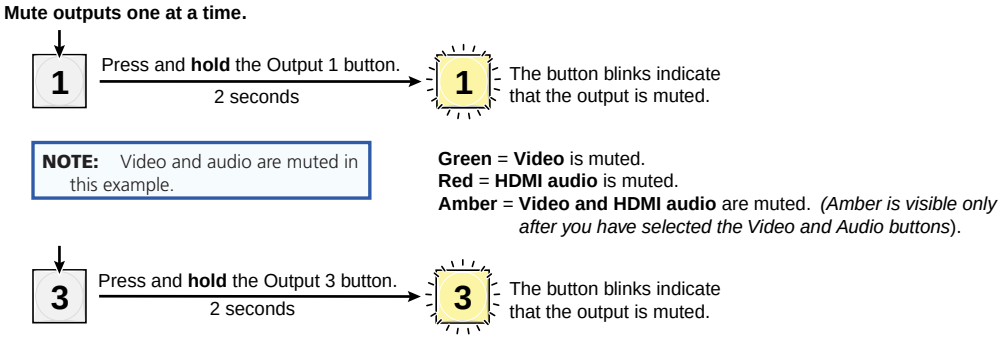


> **NOTE:** Output mutes are protected when front panel Lock mode 2 is selected. You can view the mutes in Lock mode 2 but you cannot change them from the front panel (see **Setting the Front Panel Locks (Executive Modes)** on page 44).
>
> If front panel Lock mode 2 is selected and you try to perform steps 4 and 5, the actions are ignored.

4. **Mute outputs**: One at a time*:*

   a. Press and **hold** the Output 1 button until the button begins to blink (approximately 2 seconds).

   b. Press and **hold** the Output 3 button until the button begins to blink (approximately 2 seconds).



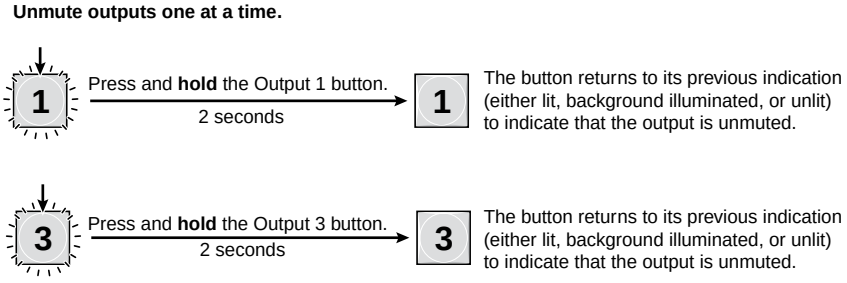
NOTES:

- If both video and audio are selected, the mute action toggles both the video and HDMI audio outputs. If either the video output or the HDMI audio output is already muted, the unmuted output is muted and the muted output is unmuted.
- If both video and audio are selected and only video is muted, the output button blinks between green and amber. If only audio is selected, the output button blinks between red and amber.

5. **Unmute outputs**: One at a time*:*

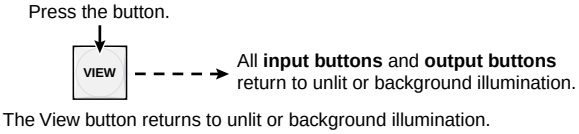
   a. Press and **hold** the Output 1 button until the button returns to its previous state (approximately 2 seconds). The output 1 video and audio signals are unmuted.

   b. Press and **hold** the Output 3 button until the button returns to its previous state (approximately 2 seconds). The output 3 video and audio signals are unmuted.



NOTE: If both video and audio are selected, the unmute action toggles both the video and HDMI audio outputs. If either the video output or the audio output is already unmuted, the muted output is unmuted and the unmuted output is muted.

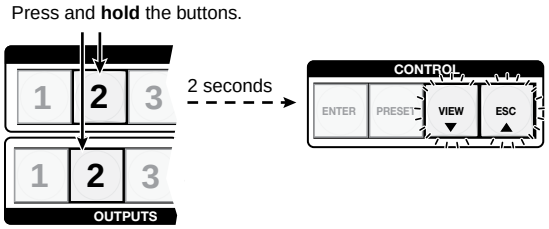
6. **Exit View-only mode**: Press and release the **`View`** button.



Configuring the Input Audio

The input audio can be configured to tie the digital audio input (on the HDMI or TP connector), the analog audio input (on the local connector), or to automatically select the input, with digital having priority. Configure the input audio as follows:

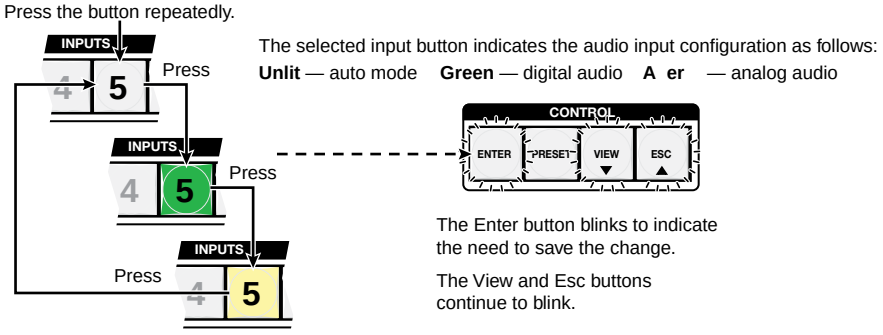
1. Press the **Esc** button to clear any input button indications, output button indications, or control button indications that may be lit.
2. **Select Input Audio Configuration mode**: Press and **hold** the Input 2 and Output 2 buttons simultaneously until the **View** and **Esc** button begin to blink (approximately 2 seconds).



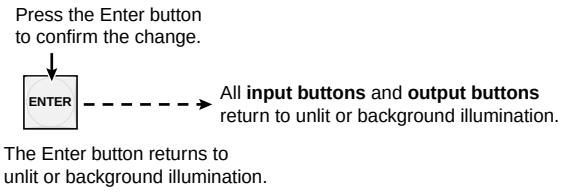
3. Release the input and output buttons.

> **NOTE:** The audio configuration is protected when front panel Lock mode 2 is selected. You can view the configuration in Lock mode 2 but you cannot change it from the front panel (see **Setting the Front Panel Locks (Executive Modes)** on page 44).
>
> If front panel Lock mode 2 is selected and you try to perform steps 4 and 5, the actions are ignored.

4. **Select the input and configure it**: Press and release an input button to select that input to configure. Repeatedly press the input, cycling through unlit, green, and amber indications, to select the configuration.



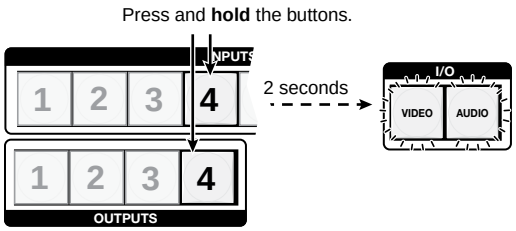
5. **Confirm the change**: Press and release the **Enter** button.



Configuring the TP Insertion Ports

The control insertion ports on TP inputs and outputs can be configured for Ethernet insertion or RS-232 pass-through. Configure the control insertion as follows:

1. Press the **Esc** button to clear any input button indications, output button indications, or control button indications that may be lit.
2. **Select Control Insert Configuration mode**: Press and **hold** the Input 4 and Output 4 buttons simultaneously until the **Video** and **Audio** button begin to blink (approximately 2 seconds).

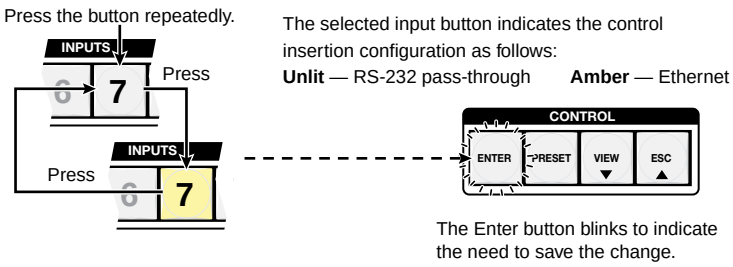


3. Release the input and output buttons.

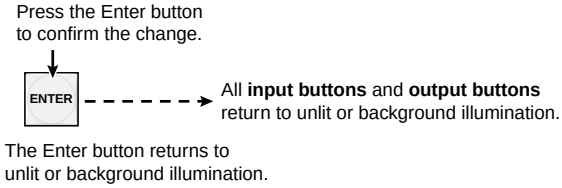
> **NOTE:** The TP insertion ports are protected when front panel Lock mode 2 is selected. You can view the port configurations in Lock mode 2 but you cannot change them from the front panel (see **Setting the Front Panel Locks (Executive Modes)** on page 44).
>
> If front panel Lock mode 2 is selected and you try to perform steps 4 and 5, the actions are ignored.

4. **Select the input or output and configure it**: Press and release either an input button or output button to select that input or output to configure. Repeatedly press the input or output, toggling between unlit and amber indications, to select the configuration.

> **NOTE:** Only TP inputs and outputs (inputs 7 and 8 and output 3 and 4) are valid selections. Other input buttons do not respond.



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

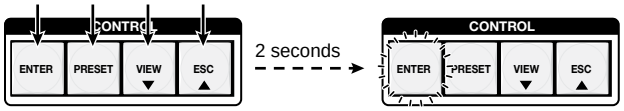


Selecting the Remote Port Baud Rate

The switcher can operate at the 9600, 19200, 38400, and 115200 baud rate. This variable can be viewed and changed from the front panel, as follows:

1. **Select Serial Port Configuration mode**: Simultaneously press and **hold all** Control buttons (**`Enter`**, **`Preset`**, **`View`**, and **`Esc`**).

Press and **hold** the buttons.



- All Control buttons light with one blinking.

The blinking Control button indicates the baud rate as follows:

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

2. Release the Control buttons.

NOTE: If front panel Lock mode 2 is selected and you try to perform step 3, the actions are ignored and the **`Enter`**, **`Video`**, and **`Audio`** buttons flash (see **Setting the Front Panel Locks (Executive Modes)** on page 44).

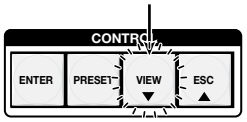
3. **Change the baud rate**: Press and release the button that relates to the desired value.

Press and release the button(s) to configure the port as follows:

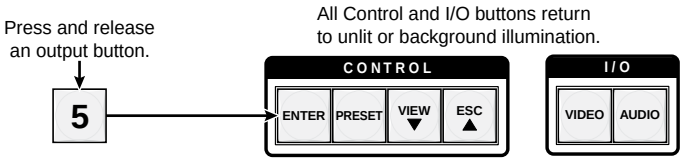
Enter — 9600	Preset — 19200
View — 38400	Esc — 115200

The selected button blinks and the others remain lit.

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



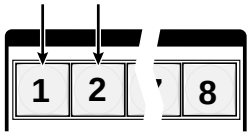
4. **Exit the Serial Port Configuration mode**: Press and release an output button.



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 (see figure 23).

Press and **hold** the buttons.



After the illumination status of the buttons change (after approximately 2 seconds), release the buttons.

Figure 23. Toggle Background Illumination on or off

Setting the Front Panel Locks (Executive Modes)

The matrix switcher has three levels of front panel security lock that limit the operation of the switcher from the front panel. The three levels are:

- **Lock mode 0** — The front panel is completely unlocked. All front panel functions are available.
- **Lock mode 1** — All changes are locked from the front panel (except for setting Lock mode 2). Some functions can be viewed.
- **Lock mode 2** — Basic functions are unlocked. Advanced features are locked and can be viewed only.

  Basic functions consist of:

  - Making ties
  - Saving and recalling presets
  - Changing Lock modes

  Advanced functions consist of:

  - Setting audio output mutes
  - Setting the rear panel remote port protocol and baud rate

NOTE: The switcher is shipped from the factory in Lock mode 2.

Selecting Lock mode 2 or toggling between mode 2 and mode 0

NOTE: If the switcher is in Lock mode 0 or mode 1, this procedure selects mode 2. The **Esc**, **Video**, and **Audio** buttons blink twice.

If the switcher is in Lock mode 2, this procedure selects mode 0 (unlocks the switcher). The **Video** and **Audio** buttons blink twice.

Toggle the lock on and off by pressing and holding the **Enter** button, the **Video** button, and the **Audio** button simultaneously for approximately 2 seconds (see figure 24).

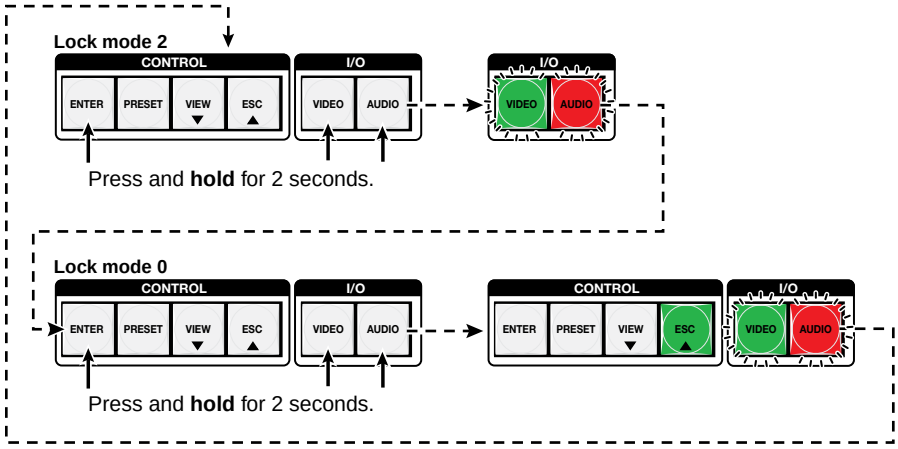


Figure 24. Toggle Front Panel Lock Between Mode 2 and Mode 0

Selecting Lock mode 2 or toggling between mode 2 and mode 1

NOTE: If the switcher is in Lock mode 0 or mode 1, this procedure selects mode 2.
If the switcher is in Lock mode 2, this procedure selects mode 1.

Toggle the lock on and off by pressing and holding the **Video** button and the **Audio** button simultaneously for approximately 2 seconds (see figure 25).

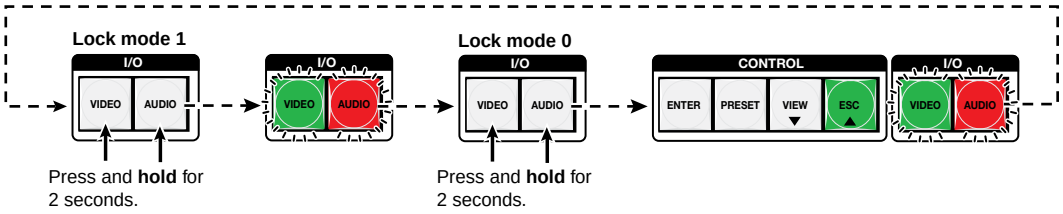


Figure 25. Toggle Front Panel Lock Between Mode 2 and Mode 1

Performing a System Reset from the Front Panel

The front panel reset is identical to issuing the Esc Z XXX ← SIS command defined on page 64. A system reset performs the following functions:

NOTES:

- System reset does not reset the Internet protocol (IP) settings or replace user-installed firmware.
- This function resets not only the switcher, but any connected endpoints.

- Clears all ties and presets
- Clears all mutes
- Disables all RS-232 output inserts
- Restores group masters 1 and 2 to their factory defaults (Mic volume and Volume)

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 (see figure 26).

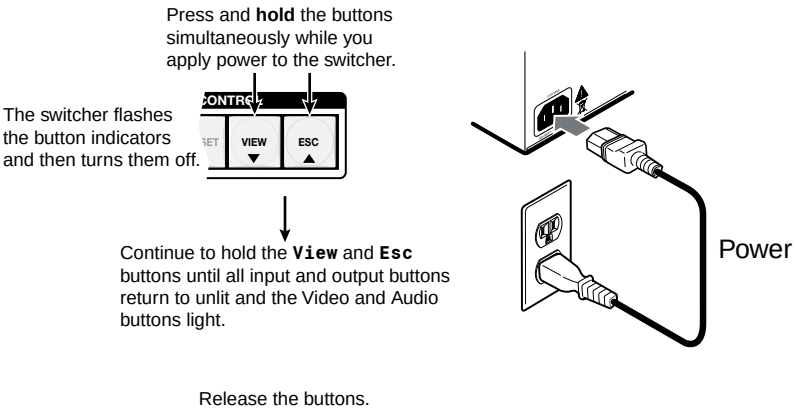


Figure 26. System Reset

NOTE: If background illumination was turned on before the reset, the I/O and control buttons are unlit after the reset. When you cycle power, background illumination returns to the condition that you previously selected.

Rear Panel Operations

The rear panel has a Reset button that initiates four levels of resets (numbered 1, 4, and 5 for the sake of comparison with other Extron IPL products). The Reset button is recessed, so use a small screwdriver, a pointed stylus, or a ballpoint pen.

See table 2, for a summary of the modes.

ATTENTION:

- Review the reset modes carefully. Using the wrong reset may result in unintended loss of flash memory programming, port reassignment, or a controller reboot.
- Étudier de près les différents modes de réinitialisation. Appliquer le mauvais mode de réinitialisation peut causer une perte inattendue de la programmation de la mémoire flash, une reconfiguration des ports ou une réinitialisation du contrôleur. (du processeur.)

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.

Table 2. Reset Mode Comparison and Summary

Mode	Activation	Result	Purpose and 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 **Updating the Firmware** on page 77 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 files and settings (such as drivers, adjustments, 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 ØQ SIS command (see page 65) 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.
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 and release Reset (<1 second) within 1 second. Nothing happens if the second momentary press does not occur 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 blinks four times in quick succession during the reset.	Mode 4 enables you to set IP address information using ARP and the MAC address.

Table 2. Reset Mode Comparison and Summary (continued)

Mode	Activation	Result	Purpose and Notes
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 and release Reset (<1 second) within 1 second. Nothing happens if the second momentary press does not occur 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 real time adjustments, including: clears all ties and presets, clears all HDMI mutes, disables all RS-232 output inserts, clears all audio settings. • Resets all IP options. • Removes/clears all files for the switcher. The reset LED blinks four 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.

Performing a Hard Reset (Reset 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 (see figure 27).

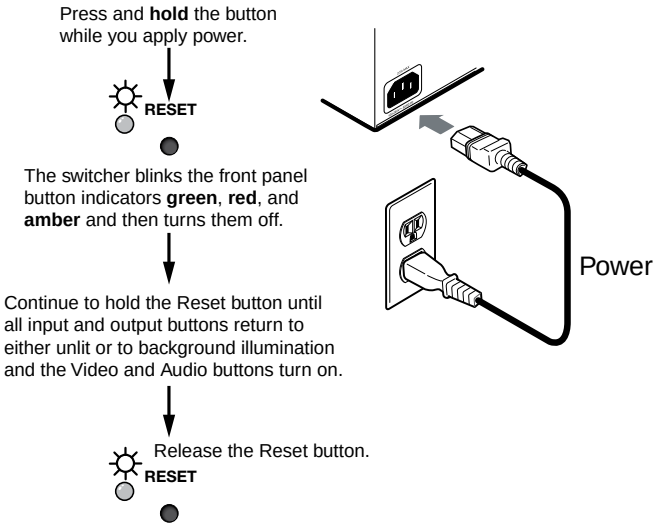


Figure 27. Hard Reset

Performing Soft System Resets (Resets 4 and 5)

Perform a soft reset of the switcher as follows:

1. Use a small screwdriver to press and **hold** the rear panel **Reset** button until the Reset LED and the front panel **Video** and **Audio** buttons blink the number of times for the desired reset: twice (IP settings reset) or three times (absolute reset) (see figure 28).

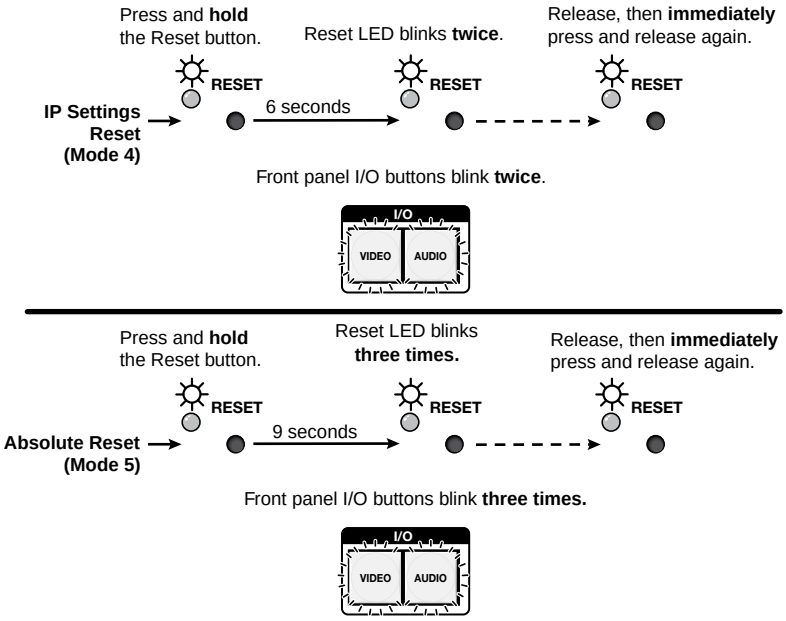


Figure 28. Soft System Resets

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

Troubleshooting

This section recommends what to do if you have problems operating the switcher.

1. Ensure that all devices are plugged in and powered on.
2. Check to see if one or more outputs are muted.
3. Ensure an active input is selected for output on the switcher.
4. Ensure that the proper signal format is supplied.
5. Check the cabling and make corrections as necessary.
6. Call the Extron S3 Sales and Technical Support Hotline if necessary. See **www.extron.com** for the phone number in your region of the world.

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 51** and use one for each preset configuration. Cross out all unused or inactive inputs and outputs. Use different colors for video and audio.

NOTE: All of the equipment in the following examples is connected through the appropriate transmitter or receiver.

Worksheet Example 1: System Equipment

Figure 29 shows a portion of a worksheet for a DTP CrossPoint 84 in a fictional organization with the system hardware annotated. Inputs 6 and 8 have no connection in this organization, so they are crossed out on the worksheet. Similarly, output 2 is crossed out.

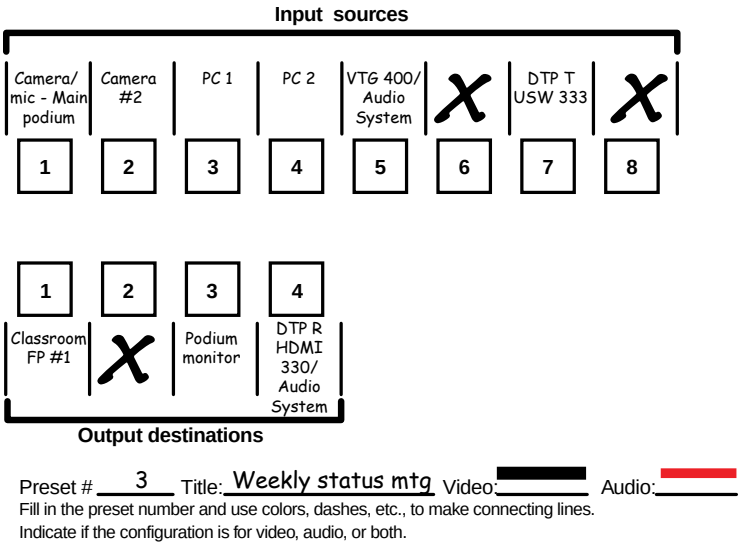


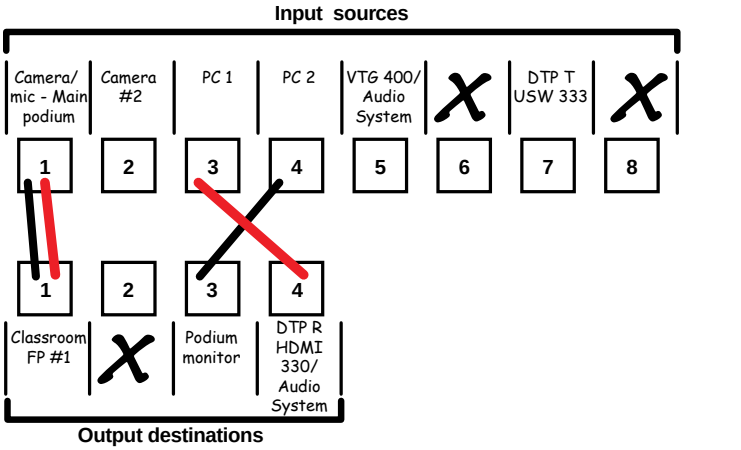
Figure 29. Worksheet Example 1: System Equipment

Inputs include cameras, PCs, an Extron VTG 400DVI, an audio system, and digital and analog inputs to an Extron DTP T USW 333 switcher. Output devices include monitors, projectors, a stereo, a VCR for recording presentations, and a DA.

The VTG 400DVI video test generator connected to input 5 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 can be used in a similar manner to check out the audio components.

Worksheet Example 2: Daily Configuration

Figure 30 continues from worksheet example 1 by showing the video and audio ties in the preset 1 configuration. Black lines shows video ties, red lines show the audio ties.



Preset # 3 Title: Weekly status mtg Video: Audio:
Fill in the preset number and use colors, dashes, etc., to make connecting lines.
Indicate if the configuration is for video, audio, or both.

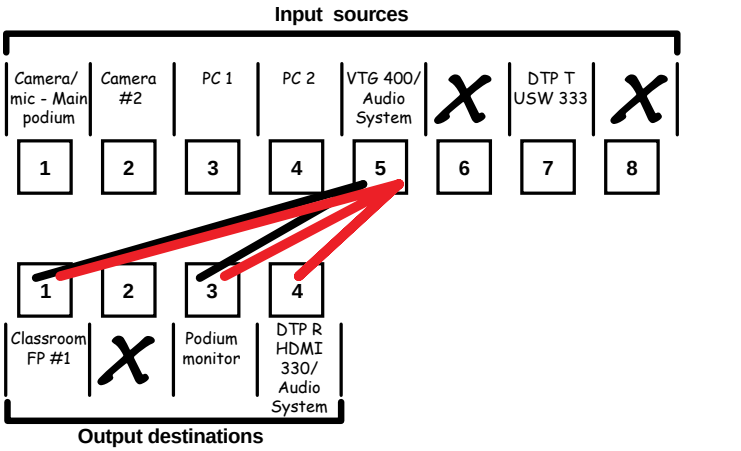
Figure 30. Worksheet Example 2: Daily Configuration

In this example:

- The presenter, from the podium camera (input 1), is displayed in the classroom (output 1).
- Her laptop computer presentation on (input 4) is displayed on the podium (output 3).
- Her microphone audio (input 1) is played in the classroom (output 1).
- Audio from another PC (input 3) is output to a local device via a DTP receiver (output 4).

Worksheet Example 3: Test Configuration

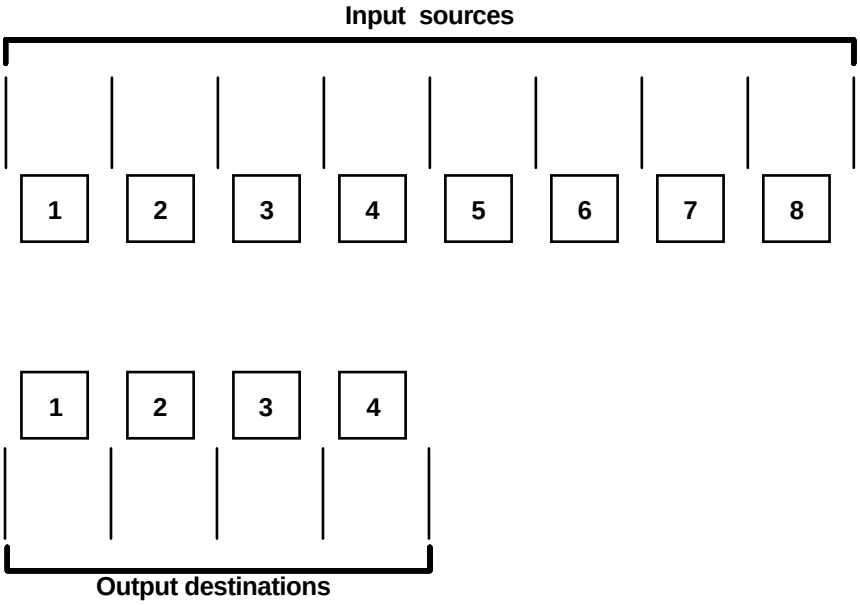
The AV system in our fictional organization needs to be fine tuned on a regular basis. Figure 31 shows a typical test configuration, with an Extron video test generator (input 5) generating a test pattern to all monitors (outputs 1, 3, and 4). Sound checks are run from a CD player (input 5) to all audio systems (outputs 1, 3, and 4).



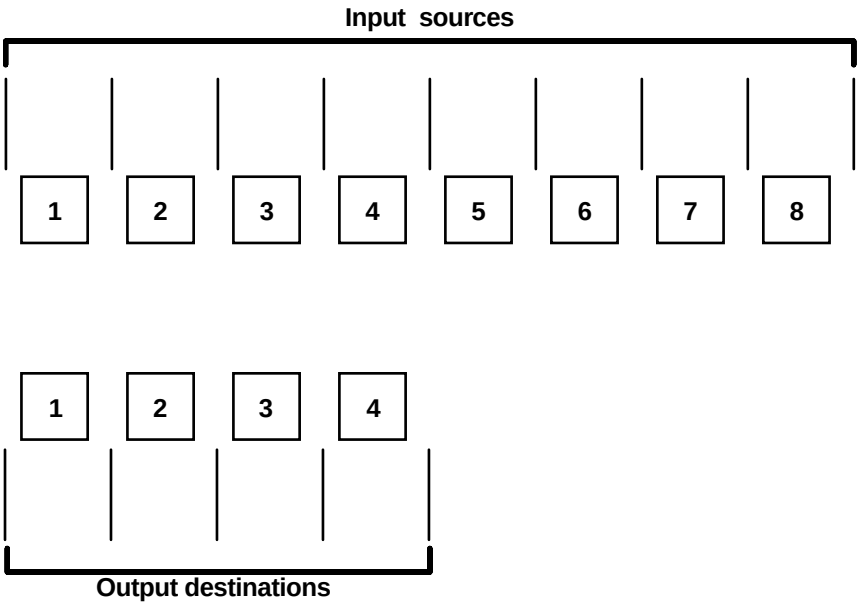
Preset # 4 Title: Test config Video: Audio:
Fill in the preset number and use colors, dashes, etc., to make connecting lines.
Indicate if the configuration is for video, audio, or both.

Figure 31. Worksheet Example 3: Test Configuration

Configuration Worksheets



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



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

Programming Guide

The DTP CrossPoint Matrix Switcher can be remotely controlled, monitored, or configured via:

- The Extron Product Configuration Software and DSP Configurator software (see **Matrix Software**, on page 72).
- Built-in HTML pages (see **HTML Operation**, on page 133)
- SIS commands (see below)

This section describes the operation of the DTP CrossPoint Matrix Switchers via SIS commands, including:

- **Host Control Ports**
- **Host-to-Switcher Instructions**
- **Switcher-Initiated Messages**
- **Switcher Error Responses**
- **Using the Command and Response Tables**
- **Special Characters**

NOTE: This section details the matrix-switcher-centric SIS commands. Additional commands are available for the DSP (see the **DSP SIS Commands** section, beginning on page 141.

Host Control Ports

The switcher has one serial port and a USB port. IPCP models have three Ethernet LAN ports and the non-IPCP model has one LAN port. Any of these ports can be 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 control of the switcher possible.

The rear panel Remote port and front panel Configuration port are independent of one another. A front panel Configuration port connection and a rear panel Remote port connection can be active at the same time.

Serial Port

The rear panel Remote port is an RS-232 serial port on a 3-pin captive screw connector (see **item** Ⓢ on page 15).

The default serial port protocol of the rear panel Remote port is:

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

See **Selecting the Remote Port Baud Rate** on page 43 to configure the rear panel Remote port from the front panel.

Extron recommends leaving the Remote port at 9600 baud.

USB Port

The front panel Configuration port (see **item A** on page 21) is a standard USB port. A USB cable, terminated on one end with a USB mini-B male connector, is available at any local electronics store.

Ethernet (LAN) Ports

The Ethernet cable can be terminated as a straight-through cable or a crossover cable and must be properly terminated for your application (see **item Q** [non-IPCP model] or **item R** [IPCP models] both on page 15).

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

Default IP addresses

To access the DTP CrossPoint switcher via the LAN port, you need the IP address for the unit, 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 for the DTP CrossPoint using the ping (ICMP) utility (for all control access information for the IPCP Pro 350, see the *IPCP Pro 350 Series User Guide* at **www.extron.com** for more details).

If the addresses have not been changed, the factory-specified defaults are:

	DTP CrossPoint 84	IPCP Pro 350
• **IP address**	192.168.254.254	192.168.254.250
• **Subnet mask**	255.255.0.0	255.255.255.0
• **Gateway address**	0.0.0.0	0.0.0.0

NOTE: For IPCP models:

- The values listed above are the same for all three LAN ports.
- The LAN ports give access to either the DTP CrossPoint or the built-in IPCP Pro 350 control processor.
- The unused ports function as a simple, multiport, unmanaged network switch so that you can connect additional devices to the same network.

Establishing a connection

Establish a network connection to a DTP CrossPoint switcher as follows:

1. Open a TCP socket to port 23 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 the name of the product, firmware version, part number, and the current date and time.

   NOTES:

   - 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 five minutes but the value can be changed (see the **Configure port timeout** SIS command on page 70).

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 DTP CrossPoint 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 device, the number of connections should stay low and unnecessary open sockets should be closed.

Using Verbose Mode

Telnet connections to a DTP CrossPoint 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 70).

Host-to-Switcher Instructions

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

Switcher-initiated Messages

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

The switcher does not expect a response from the host, but, for example, the host program might request a new status.

`(c) Copyright 20yy, Extron Electronics DTPCP84, Vx.xx, 60-nnnn-nn↵`
`{day, date, time}↵`

The switcher initiates the `Copyright` message on the Remote RS-232 port when it is first powered up and on a newly connected Internet protocol (IP) port. `Vx.xx` is the firmware version number and `60-nnnn-nn` is the switcher part number.

`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 tie creation has occurred.

`Rprnn↵`

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

`Amtnn*x↵`

The switcher initiates the `Amt` message when an output audio 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.

`GrpmDn*y↵`

The switcher initiates the `Grpm` message when a front panel Volume knob is adjusted. "*n*" is the control: `1` (Mic Volume) or `2` (Volume)."*y*" is the variable.

`Exen↵`

The switcher initiates the `Exe` message when the front panel security lockout (executive mode) is toggled on or off from the front panel. "*n*" is the executive mode: `0`, `1`, or `2`.

Switcher Error Responses

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

E01 — Invalid input channel number (out of range)
E10 — Invalid command
E11 — Invalid preset number (out of range)
E12 — Invalid output number (out of range)
E13 — Invalid value (out of range)
E14 — Invalid command for this configuration
E22 — Busy
E24 — Privileges violation (Users have access to all view and read commands [other than the administrator password], and can create ties, presets, and audio mutes)
E25 — Device not present
E26 — Maximum number of connections exceeded
E28 — Bad filename or file not found

Using the Command and Response Tables

The command and response tables begin on **page 60**. Symbols used in the table represent variables in the command and response fields. Command and response examples are shown throughout the table. The SIS commands are **not** case sensitive. The ASCII to HEX conversion table below is for use with the command and response table.

ASCII to Hex Conversion Table

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

Esc 1B CR 0D LF 0A

General Matrix Switcher Commands

Symbol definitions

↵ = Carriage return and line feed

← = Carriage return (no line feed)

| = Pipe (can be used interchangeably with the ← character)

• = space

Esc = Escape key

W = Can be used interchangeably with the Esc character

X1 = Input number	ØØ – Ø8 (ØØ = untied input, valid for tie commands only)		
X2 = Output number	ØØ – Ø4 (ØØ = untied output, valid for tie commands only)		
X3 = EDID value (resolution and rate)	See **table 3** on page 61.		
X4 = EDID filename	*nnnnn*.bin. Can include a full path name. File carries 128 or 256 bytes of data.		
X5 = Mute status enable or available	Ø = Disable (unmute)	1 = Enable (mute)	2 = Mute video and sync
X6 = Input audio source	Ø = Auto (see *Example 2* on **page 62**) 1 = HDMI (de-embedded digital audio) (**default**) 2 = Analog 2-channel audio		
X7 = Output audio source	Ø = Original HDMI audio	1 = Embed audio	2 = None
X8 = Detected input audio format	Ø = None 1 = 2-channel	2 = 3-channel or bitstream	
X9 = HDCP authorized device	Ø = Off 1 = On (**default**)		
X10 = HDCP output mode	Ø = Auto (follow the input) (**default**) 1 = On (always encrypt HDMI outputs) 2 = Follow input with continuous DVI trials 3 = Always encrypt HDMI outputs with continuous DVI trials		
X11 = HDCP status (for inputs)	Ø = No source device connected 1 = Source connected is HDCP-compliant	2 = Source connected is not HDCP-compliant	
X12 = HDCP status (for outputs)	Ø = No monitor connected 1 = Monitor connected but does not support HDCP 2 = Monitor connected, supports HDCP, but the video signal is not encrypted 3 = Monitor connected, supports HDCP, and the video signal is encrypted		
X13 = Video format	Ø = Auto (HDMI RGB Full to CEA sink or DVI to non-CEA sink) 1 = DVI (RGB 444, no audio, no InfoFrames) 2 = HDMI RGB Full (RGB 444, 000 - 255 audio, InfoFrames) 3 = HDMI RGB Limited (RGB 444, 016 - 255 audio, InfoFrames) 4 = HDMI YUV Full (RGB 444, 000 - 255 audio, InfoFrames) 5 = HDMI YUV Limited (RGB 444, 016 - 255 audio, InfoFrames) 6 = HDMI YUV Full (RGB 422, 000 - 255 audio, InfoFrames) 7 = HDMI YUV Limited (RGB 422, 016 - 255 audio, InfoFrames)		
X14 = Output video bit depth	Ø = Auto (**default**)	1 = 8-bit	
X15 = Video mute status	Ø = No mutes 1 = Video mute	2 = Video and sync	
X16 = Input signal status	Ø = No signal detected	1 = Sync detected	
X17 = TP and insertion input number	Ø7 or Ø8		
X18 = Switch position	Ø = DTP	1 = HDBT (output only)	2 = XTP
X19 = TP (scaled) and insertion output number	Ø3 or Ø4		
X20 = Name	12 characters maximum upper- and lower-case alphanumeric characters and _ / and spaces are valid.		

NOTE: The HTML language reserves certain characters for specific functions (see **Special Characters** on page 71).

X21 = Preset number	Ø1 – 32		
X22 = Lock mode	Ø = Mode 0	1 = Mode 1	2 = Mode 2 (**default**)
X23 = Scaler preset	ØØ1 – 128		
X24 = Firmware version number to second decimal place *(x.xx)*			

X25 = Verbose firmware version-description-upload date/time (see the **Query firmware version (verbose)** command on page 65).

X26 = Voltage
Positive or negative voltage and magnitude

X27 = Internal temperature
Degrees Celsius

X28 = Fan speed
RPM

X29 = Picture adjustments
ØØØ through 127 (Ø64 = **default**)

X30 = Position and size
±1Ø24Ø
Horizontal position specified from left,
Vertical position specified from top

X31 = Active pixels and active lines
Dependent on the input signal and selected scaling.

X32 = Aspect ratio fill or follow
1= fill (**default**)
2 = follow

X33 = Overscan percentage
Ø = 0% (**default**)
1 = 2.5%
2 = 5.0%

X34 = Test pattern
ØØ = Disable (**default**)
Ø1 = Crop
Ø2 = Alternating pixels
Ø3 = Crosshatch
Ø4 = Color bars
Ø5 = Grayscale
Ø6 = Blue mode

X35 = Duration
Ø = Output sync instantly disabled when no active video input is selected
ØØ1 through 5ØØ (seconds)
5Ø1 = Output sync never times out (**default**)

X36 = Screen saver status
Ø = Active input detected, timer is not running
1 = No active input, timer is running, output sync is still active
2 = No active input, timer is expired, output sync is disabled.

X37 = Scaler output resolution and rate

	Refresh rate (Hz)							
	23.98	**24**	**25**	**29.97**	**30**	**50**	**59.94**	**60**
640x480								11
800x600								14
1024x768								2Ø
1280x768								29
1280x800								32
1280x1024								35
1360x768								41
1366x768								47
1440x900								53
1400x1050								56
1600x900								58
1680x1050								6Ø
1600x1200								62
1920x1200								64
480p							65	66
576p						67		
720p			68	69	7Ø	71	72	**73***
1080i						74	75	76
1080p	77	78	79	8Ø	81	82	83	84
2048x1080 (2k)	85	86	87	88	89	9Ø	91	92

*** Default**

X38 = Captive screw or UART	**Ø** = Captive screw RS-232 insert (**default**) 1 = Ethernet RS-232 insert (UART)
X39 = Port number	Ø2 — Ø5 = UARTs 2 — 5 (DTP input and output ports) Ø2 = Input 7 Ø3 = Input 8 Ø4 = Output 3 Ø5 = Output 4
X40 = Baud rate	3ØØ*, 6ØØ*, 12ØØ*, 18ØØ*, 24ØØ*, 36ØØ*, 48ØØ*, 72ØØ*, 96ØØ, 144ØØ*, 192ØØ, 288ØØ*, 384ØØ, 576ØØ*, 1152ØØ (**default = 96ØØ**) * Valid for serial port insert commands only
X41 = Parity	**o**dd, **e**ven, **n**one, **m**ark, **s**pace (only the first letter required) (**n = default**)
X42 = Data bits	7, 8
X43 = Stop bits	1, 2
X44 = Port timeout interval (in 10-second increments)	1 (= 10 seconds) - 65ØØØ (**default** is **3Ø** = 300 seconds = 5 minutes)

NOTE: X39 through X44 are variables for the RS-232 inserts. These variables are repeated on page 70 as X51 through X55 and X58 for the rear panel Remote RS-232 port.

X45 = UART starting point	The starting point (X45) is the rear panel Remote RS-232 port. The next two positions (X45+1 and X45+2) are DTP inputs. The next two positions (X45+3 and X45+4) are DTP outputs. **Default values**: 2ØØØ = Rear panel Remote (RS-232) port 2ØØ1 and 2ØØ2 = Input 7 and input 8 2ØØ3 and 2ØØ4 = Output 3 and output 4

Command and Response Table for Matrix Switcher Commands

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Create Ties			
NOTES: • Commands can be entered back-to-back in a string, with no spaces. For example: `1*1!Ø2*Ø3%Ø2*Ø3$4*4!`. • The quick multiple tie and tie input to all output commands activate all I/O switches simultaneously. • The matrix switchers support 1- and 2-digit numeric entries (`1*1` or `Ø2*Ø2`).			
Tie input video and audio to output	X1*X2!	OutX2•InX1•All↵	Tie the input X1 video and audio to output X2.
Example:	1*3!	OutØ3•InØ1•All↵	Tie input 1 video and audio to output 3.
Tie input video only to output	X1*X2%	OutX2•InX1•Vid↵	Audio breakaway.
Example:	7*5%	OutØ5•InØ7•Vid↵	Tie input 7 video to output 5.
Tie input audio only to output	X1*X2$	OutX2•InX1•Aud↵	Audio breakaway.
Example:	8*4$	OutØ4•InØ8•Aud↵	Tie input 8 audio to output 4.
Untie input video and audio	Ø*X2!	OutX2•InØØ•All↵	Untie the video and audio input from output X2.
Quick multiple tie	Esc+QX1*X2!...X1*X2$←	Qik↵	
Example:	Esc+Q3*4!3*3%3*2$←	Qik↵	Tie input 3 video and audio to output 4, tie input 3 video to output 3, and tie input 3 audio to output 2.
Tie input to all outputs, video and audio	X1*!	InX1•All↵	
Example:	5*!	In Ø5•All↵	Tie input 5 video and audio to all outputs.
NOTE: `Ø*!` clears all ties.			
Tie input to all outputs, video only	X1*%	InX1•Vid↵	Audio breakaway.
Example:	1Ø*%	In1Ø•Vid↵	Tie input 10 video to all outputs.
Tie input to all outputs, audio only	X1*$	InX1•Aud↵	Audio breakaway.
Read ties			
Read video output tie	X2%	X1↵	Video input X1 is tied to output X2.
Read audio output tie	X2$	X1↵	Audio input X1 is tied to output X2.
EDID commands			
NOTES: • See **table 3**, on the next page for X3 values. • Leading zeroes are optional for the entry of the inputs (X1s) and EDID values (X3s). Leading zeroes are reported in the response. • For the Save (EscSX3EDID←) and Import (EscIX3,X4EDID←) commands, X3 is valid only in the range of 75 through 82.			
Assign EDID data to an input	EscAX1*X3EDID←	EdidAX1*X3↵	Assign an EDID value of X3 to input X1.
Example:	EscA7*36EDID←	EdidAØ7*Ø36↵	Assign an EDID value of 1024x768 at 60 Hz to input 7.
Assign EDID data to all inputs	EscAX3*EDID←	EdidAX3↵	Assign an EDID value of X3 to all inputs.
View EDID input assignment	EscAX1EDID←	X3↵	
Save output EDID to user assigned slot	EscSX3EDID←	EdidSX3↵	Save the output 1 EDID to location X3.
Example:	EscS75EDID←	EdidS75↵	Save the output 1 EDID to user location 1.
Import EDID to user slot	EscIX3,X4EDID←	EdidIX3↵	
Export EDID	EscEX3,X4EDID←	EdidEX3↵	

NOTE:
X1 = Input number — ØØ – Ø8 (ØØ = untied input)
X2 = Output number — ØØ – Ø4 (ØØ = untied output)
X3 = EDID value (resolution and rate) — See **table 3** on the next page.
X4 = EDID filename — *nnnnn*`.bin`. Can include a full path name. File carries 128 or 256 bytes of data.

Table 3. EDID Values

X3	Source or value	X3	Source or value	X3	Source or value	X3	Source or value
Assigned output values							
Ø1	Output 1	Ø2	Output 2	Ø3	Output 3	Ø4	Output 4
DVI – PC values							
Ø5	1024x768 @ 50 Hz	13	1280x1024 @ 50 Hz	21	1440x900 @ 50 Hz	29	1920x1080 @ 50 Hz
Ø6	1024x768 @ 60 Hz	14	1280x1024 @ 60 Hz	22	1440x900 @ 60 Hz	3Ø	1920x1080 @ 60 Hz
Ø7	1280x720 @ 50 Hz	15	1360x768 @ 50 Hz	23	1600x900 @ 50 Hz	31	1920x1200 @ 50 Hz
Ø8	1280x720 @ 60 Hz	16	1360x768 @ 60 Hz	24	1600x900 @ 60 Hz	32	1920x1200 @ 60 Hz
Ø9	1280x768 @ 50 Hz	17	1366x768 @ 50 Hz	25	1600x1200 @ 50 Hz	33	2048x1080 @ 50 Hz
1Ø	1280x768 @ 60 Hz	18	1366x768 @ 60 Hz	26	1600x1200 @ 60 Hz	34	2048x1080 @ 60 Hz
11	1280x800 @ 50 Hz	19	1400x1050 @ 50 Hz	27	1680x1050 @ 50 Hz		
12	1280x800 @ 60 Hz	2Ø	1400x1050 @ 60 Hz	28	1680x1050 @ 60 Hz		
HDMI – PC values, 2-channel Audio							
35	1024x768 @ 50 Hz	42	1280x1024 @ 60 Hz	49	1440x900 @ 50 Hz	56	1680x1050 @ 60 Hz
36	1024x768 @ 60 Hz	43	1360x768 @ 50 Hz	5Ø	1440x900 @ 60 Hz	57	1920x1200 @ 50 Hz
37	1280x768 @ 50 Hz	44	1360x768 @ 60 Hz	51	1600x900 @ 50 Hz	58	1920x1200 @ 60 Hz
38	1280x768 @ 60 Hz	45	1366x768 @ 50 Hz	52	1600x900 @ 60 Hz	59	2048x1080 @ 50 Hz
39	1280x800 @ 50 Hz	46	1366x768 @ 60 Hz	53	1600x1200 @ 50 Hz	6Ø	2048x1080 @ 60 Hz
4Ø	1280x800 @ 60 Hz	47	1400x1050 @ 50 Hz	54	1600x1200 @ 60 Hz		
41	1280x1024 @ 50 Hz	48	1400x1050 @ 60 Hz	55	1680x1050 @ 50 Hz		
HDMI HDTV							
61	480p @ 60 Hz 2-channel audio	65	720p @ 50 Hz multi-channel audio	69	1080i @ 50 Hz multi-channel audio	73	1080p @ 50 Hz multi-channel audio
62	576p @ 50 Hz 2-channel audio	66	720p @ 60 Hz multi-channel audio	7Ø	1080i @ 60 Hz multi-channel audio	74	1080p @ 60 Hz multi-channel audio
63	720p @ 50 Hz 2-channel audio	67	1080i @ 50 Hz 2-channel audio	71	1080p @ 50 Hz 2-channel audio		
64*	720p @ 60 Hz 2-channel audio	68	1080i @ 60 Hz 2-channel audio	72	1080p @ 60 Hz 2-channel audio		
User – Assigned EDIDs							
75	User assigned 1	77	User assigned 3	79	User assigned 5	81	User assigned 7
76	User assigned 2	78	User assigned 4	8Ø	User assigned 6	82	User assigned 8

***** Default value

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Video mutes			
Mute video only	X2*1B	VmtX2*1↵	Mute output X2 video (video off, sync on).
Mute video and sync	X2*2B	VmtX2*2↵	Mute output X2 video and sync.
Unmute video	X2*ØB	VmtX2*Ø↵	Unmute output X2 video (video on).
Read video mute	X2B	X5↵	
Global video mute	1*B	Vmt1↵	Mute all video outputs.
Global video and sync mute	2*B	Vmt2↵	Mute all video and sync outputs.
Global video unmute	Ø*B	VmtØ↵	Unmute all video outputs.
Audio routing selections			
NOTE: These commands select between the audio embedded in the digital video stream and the 2-channel analog audio.			
Input audio selection	EscIX1*X6AFMT←	AfmtIX1*X6↵	Use audio from the X6 source.
Example 1:	EscI1*2AFMT←	AfmtIØ2*1↵	Use analog audio from the analog audio port of input 1.
Example 2:	EscI1*ØAFMT←	AfmtIØ1*Ø↵	Auto (**Ø**): Digital audio takes priority over analog audio.
View input audio selection	EscIX1AFMT←	X6↵	
View all input audio selections	EscIAFMT←	X6[1] X6[2] X6[3] ... X6[8]↵	8 sequential audio input selections, starting from input 1.
Output audio HDMI select	EscOX2*X7AFMT←	AfmtOX2*X7↵	When audio is broken away from video, embed audio from the X7 source in the video output.
Example:	EscO3*ØAFMT←	AfmtOØ3*Ø↵	When audio is broken away from video, use the embedded audio from the input port when creating an audio breakaway tie to output 3.
View output audio breakaway selection	EscOX2AFMT←	X7↵	
View output audio breakaway selection, all outputs	EscOAFMT←	X7[1] X7[2] X7[3] X7[4]↵	4 sequential audio output selections, starting from output 1.
Audio input format			
View detected digital input audio format	Esc4Ø*X1STAT←	X8↵ 4ØStatX1*X8↵	Format detected on input X1 is X8. Verbose mode 2 or 3 response.
Input reports as an HDCP-authorized device			
HDCP authorized device on	EscEX1*1HDCP←	HdcpEX1*1↵	Set the input as an HDCP authorized device.
HDCP authorized device off	EscEX1*ØHDCP←	HdcpEX1*Ø↵	Set the input as not an HDCP authorized device.
View HDCP authorized status	EscEX1HDCP←	X9↵	Show HDCP authorized device status.
HDMI output settings			
Set output HDCP mode to auto	EscSX2*ØHDCP←	HdcpSX2*Ø↵	Set output X2 HDCP to auto.
Set output HDCP mode to follow (DVI)	EscSX2*2HDCP←	HdcpSX2*2↵	Set output X2 HDCP to auto (mode 2).
Set output HDCP mode to on	EscSX2*1HDCP←	HdcpSX2*1↵	Set output X2 HDCP to always encrypted.
Set output HDCP mode to on (DVI)	EscSX2*3HDCP←	HdcpSX2*3↵	Set output X2 HDCP to on (always encrypted) (mode 3).
View output HDCP mode	EscSX2HDCP←	X10↵	

NOTE:

X1 = Input number	Ø1 – Ø8		
X2 = Output number	Ø1 – Ø4		
X5 = Mute enable	Ø = Disable (unmute)	1 = Mute video	2 = Mute video and sync
X6 = Input audio source	Ø = Auto (see the *Example 2*, above)		
	1 = HDMI (de-embedded digital audio) (**default**)		2 = Analog 2-channel audio
X7 = Output audio source	Ø = Original HDMI audio	1 = Embed audio	2 = None
X8 = Detected input audio format	Ø = None	1 = 2-channel	2 = 3-channel or bitstream
X9 = HDCP authorized device	Ø = Off	1 = On (**default**)	
X10 = HDCP output mode	Ø = Auto (follow the input) (**default**)	2 = Follow input with continuous DVI trials	
	1 = On (always encrypt HDMI outputs)	3 = Always encrypt HDMI outputs, continuous DVI trials	

Command and Response Table for Matrix Switcher Commands (continued)

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
HDCP status			
View input HDCP status	Esc I X1 HDCP ←	X11 ↵	HdcpI X1 * X11 ↵ for verbose mode 2 and 3.
View HDCP status of all inputs	Esc IHDCP ←	X11[1] X11[2] X11[3] … X11[8] ↵	
View output HDCP status	Esc O X2 HDCP ←	X12 ↵	HdcpO X2 * X12 ↵ for verbose mode 2 and 3.
View HDCP status of all outputs	Esc OHDCP ←	X12[1] X12[2] X12[3] X12[4] ↵	
Output format			
Set output format	Esc X2 * X13 VTPO ←	Vtpo X2 * X13 ↵	
View output format	Esc X2 VTPO ←	X13 ↵	
Output video bit depth			
Set bit depth	Esc X2 * X14 BITD ←	Bitd X2 * X14 ↵	
View bit depth	Esc X2 BITD ←	X14 ↵	
View ties and mutes			
Read video output tie	X2 %	X1 ↵	Video input X1 is tied to output X2.
Example:	7%	Ø2 ↵	Input 2 video is tied to output 7.
Read audio output tie	X2 $	X1 ↵	Audio input X1 is tied to output X2.
Example:	3$	Ø6 ↵	Input 6 audio is tied to output 3.
View video output mutes	Esc VM ←	Mut X15[1] X15[2] X15[3] X15[4] ↵	Each X15 is the video mute status of an output: left = output 1, right = output 4).
NOTE: The "Mut" portion of the response appears only when the switcher is in *Verbose* mode 2 or 3.			
Input sync detection			
View all input connections	ØLS	Frq ØØ • X16[1] X16[2] … X16[8] ↵	Each X16 is the connection status of an input, starting from input 1.
NOTE: The "Frq ØØ •" portion of the response appears only when the switcher is in *Verbose* mode 2 or 3.			
Example:	ØLS	No input detected / Sync detected Response Status: Ø Ø Ø 1 1 1 Ø 1 ↵ Input: 1 2 3 4 5 6 7 8	
DTP/HDBaseT/XTP switch positions			
View input switch position	Esc I X17 HDBT ←	X18 ↵	HdbtI X17 * X18 ↵ for verbose mode 2 and 3.
View output switch position	Esc O X19 HDBT ←	X18 ↵	HdbtO X19 * X18 ↵ for verbose mode 2 and 3.

NOTE:

X1 = Input number	Ø1 – Ø8		
X2 = Output number	Ø1 – Ø4		
X11 = HDCP status (for inputs)	Ø = No source device connected	2 = Source connected is not HDCP-compliant	
	1 = Source connected is HDCP-compliant		
X12 = HDCP status (for outputs)	Ø = No monitor connected		
	1 = Monitor connected, does not support HDCP		
	2 = Monitor connected, supports HDCP ,the video signal is not encrypted		
	3 = Monitor connected, supports HDCP, the video signal is encrypted		
X13 = Video format	Ø = Auto (HDMI RGB Full to CEA sink or DVI to non-CEA sink)		
	1 = DVI (RGB 444, no audio, no InfoFrames)		
	2 = HDMI RGB Full (RGB 444, 000 - 255 audio, InfoFrames)		
	3 = HDMI RGB Limited (RGB 444, 016 - 255 audio, InfoFrames)		
	4 = HDMI YUV Full (RGB 444, 000 - 255 audio, InfoFrames)		
	5 = HDMI YUV Limited (RGB 444, 016 - 255 audio, InfoFrames)		
	6 = HDMI YUV Full (RGB 422, 000 - 255 audio, InfoFrames)		
	7 = HDMI YUV Limited (RGB 422, 016 - 255 audio, InfoFrames)		
X14 = Output video bit depth	Ø = Auto (default)	1 = 8-bit	
X15 = Video mute status	Ø = No mutes	1 = Video mute	2 = Video and sync
X16 = Input signal status	Ø = No signal detected	1 = Sync detected	
X17 = TP and insertion input number	Ø7 or Ø8		
X18 = Switch position	Ø = DTP	1 = HDBT (output only)	2 = XTP
X19 = TP (scaled) and insertion output number	Ø3 or Ø4		

Command and Response Table for Matrix Switcher Commands (continued)

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Names			
NOTE: The HTML language reserves certain characters for specific functions (see **Special Characters** on page 71).			
Write input name	Esc X1 , X20 NI ←	Nmi X1 , X20 ↵	
Example:	Esc 1 , Podium cam NI ←	NmiØ1 , Podium cam ↵	Name input 1 "Podium cam".
Read input name	Esc X1 NI ←	X20 ↵	
Write output name	Esc X2 , X20 NO ←	Nmo X2 , X20 ↵	
Example:	Esc 1 , Main PJ1 NO ←	NmoØ1 , Main PJ1 ↵	Name output 1 "Main PJ1".
Read output name	Esc X2 NO ←	X20 ↵	
Write EDID name	Esc E X3 * X20 UNAM ←	UnamE X3 * X20 ↵	
NOTE: For the Write, Clear, and Read EDID Name commands, X3 is valid only in the range of 75 through 82 (User EDID slots 1 through 8).			
Example:	Esc E75*Slot 1UNAM ←	UnamE75*Slot 1 ↵	Name EDID location 75 "Slot 1".
Clear EDID name	Esc E X3 *•UNAM ←	UnamE75*USER•*n* ↵	*n* = 1 through 8.
Read EDID name	Esc E X3 UNAM ←	X20 ↵	
Write scaler preset name	Esc 2* X23 , X20 PNAM ←	Pnam2* X23 , X20 ↵	
Example:	Esc 2*5 , preset 1PNAM ←	Pnam2*ØØ5 , preset 1 ↵	Name scaler preset 5 "preset 1".
Read scaler preset name	Esc 2* X23 PNAM ↵	X20 ↵	
Recall presets			
NOTES: • Create presets using the DSP Configurator program (see **Save a preset** on page 106). • If you try to recall a preset that is not saved, the matrix switcher responds with the error code E11.			
Recall a global preset	X21 .	Rpr X21 ↵	Command character is a period.
Example:	5.	RprØ5 ↵	Recall preset 5, (ties and audio settings).
Resets			
System reset (factory default)	Esc ZXXX ←	Zpx ↵	Clear all ties and presets, restore group masters 1 and 2.
Absolute reset, including IP settings	Esc ZQQQ ←	Zpq ↵	Similar to Esc ZXXX ←, plus clear the IP address to 192.168.254.254 and subnet mask to 255.255.000.000.
NOTE: The absolute reset (Esc ZQQQ ←) command resets not only the switcher, but any connected endpoints.			
Absolute reset, excluding IP settings	Esc ZY ←	Zpy ↵	Similar to Esc ZQQQ ←, but preserves IP address, subnet mask, gateway address, unit name, DHCP setting, and port mapping. Recommended after a firmware update.
Executive modes			
NOTE: See **Setting the Front Panel Locks (Executive Modes)** on page 44 for more information on the Lock modes.			
Lock all front panel functions	1X	Exe1 ↵	Enable Lock mode 1.
Lock advanced front panel functions	2X	Exe2 ↵	Enable Lock mode 2.
Unlock all front panel functions	ØX	ExeØ ↵	Enable Lock mode 0.
View lock status	X	X22 ↵	

NOTE:

X1 = Input number	Ø1 – Ø8		
X2 = Output number	Ø1 – Ø4		
X3 = EDID value (resolution and rate)	See **table 3** on page 61.		
X20 = Name	Up to 12 upper- and lower-case alphanumeric characters and _ / and spaces		
X21 = Preset number	Ø1 – 32		
X22 = Lock mode	Ø = Mode 0	1 = Mode 1	2 = Mode 2 (**default**)
X23 = Scaler preset	ØØ1 – 128		

Command and Response Table for Matrix Switcher Commands (continued)

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Information requests			
Information request	I	DTPCP84↵	
Request part number	N	60-*nnnn-nn*↵	See the Extron website for the part number.
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 controller firmware version	Q	X24↵	
Example:	Q	1.23↵	The factory-installed controller firmware version is 1.23 (sample value only).
Query controller firmware version (verbose)	ØQ	X24-X25-X25↵	Detailed status of the controller firmware and any firmware upgrade. The active firmware is marked by an asterisk (*). A caret (^) indicates 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			
Example:	Øq	See below	

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

1.23-1.00(1.06LX-DTPCP84 -Tue, Ø8 Apr 2014 ØØ:ØØ:ØØ UTC)-1.00*(1.06LX-DTPCP84 -Mon, 21 Apr 2014 16:39:21 UTC)↵

Ethernet protocol firmware; DTP CrossPoint firmware version; Updated firmware version

Request system status	S	StsØØ*X26•X27•X28•X28↵	
NOTE: The "StsØØ*" portion of the response appears only when the switcher is in *Verbose* mode 2 or 3.			
Response description: Power supply•Temperature Celsius•Fan 1 RPM•Fan 2 RPM↵			
Example:	S	12.25Ø•35.ØØØ•1976•2ØØ4↵	Temperature is 35.0 °C; Fan 2 rotating at 2004 RPM; Power supply at 12.25V
View and erase file directory			
NOTE: The response to the View File Directory command differs, depending on whether the command is sent via an RS-232 or Telnet connection or sent via a Web browser connection.			
View file directory RS-232 port and Telnet	EscDF↵	See below: *filename*1•*date*/*time*•*length*↵ *filename*2•*date*/*time*•*length*↵ • • • • *filenamen*•*date*/*time*•*length*↵ # *of*·Bytes·Left↵↵	List user-supplied files.
View file directory Web browser	EscDF↵	See below: Var•file•=•new•array•(); File•[1]•=•'*filename*1,*date*1,*filesize*1'; File•[2]•=•'*filename*3,*date*3,*filesize*3'; • • • • File•[*n*]•=•'*filenamen*,*daten*,*filesizen*'; File•[*n+1*]•=•# *of*•Bytes•Left	List user-supplied files.
Erase user-supplied web page/files	Esc*filename*EF↵	Del•*filename*↵	

NOTE:
- X24 = Firmware version number to second decimal place (*x.xx*)
- X25 = Verbose firmware version-description-upload date and time.
- X26 = Voltage — Positive or negative voltage and magnitude
- X27 = Internal temperature — Degrees Celsius
- X28 = Fan speed — RPM

Command and Response Table for Matrix Switcher Commands (continued)

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Scaler Output Commands			
Brightness			
Set a specific brightness value	Esc X19 * X29 BRIT ↵	Brit X19 * X29 ↵	Specify the brightness adjustment.
Increment brightness value	Esc X19 + BRIT ↵	Brit X19 * X29 ↵	Increase the brightness setting by one.
Decrement brightness value	Esc X19 – BRIT ↵	Brit X19 * X29 ↵	Decrease the brightness setting by one.
View the brightness value	Esc X19 BRIT ↵	X29 ↵	Show the brightness setting.
Contrast			
Set a specific contrast value	Esc X19 * X29 CONT ↵	Cont X19 * X29 ↵	Specify the contrast adjustment.
Increment contrast value	Esc X19 + CONT ↵	Cont X19 * X29 ↵	Increase the contrast setting by one.
Decrement contrast value	Esc X19 – CONT ↵	Cont X19 * X29 ↵	Decrease the contrast setting by one.
View the contrast value	Esc X19 CONT ↵	X29 ↵	Show the contrast setting.
Detail			
Set a specific detail value	Esc X19 * X29 HDET ↵	Hdet X19 * X29 ↵	Specify the detail adjustment.
Increment detail value	Esc X19 + HDET ↵	Hdet X19 * X29 ↵	Increase the detail setting by one.
Decrement detail value	Esc X19 – HDET ↵	Hdet X19 * X29 ↵	Decrease the detail setting by one.
View the detail value	Esc X19 HDET ↵	X29 ↵	Show the detail setting.
Horizontal shift			
Specify a value	Esc X19 * X30 HCTR ↵	Hctr X19 * X30 ↵	Set the horizontal location of first active pixel in output X19.
Increment value	Esc X19 + HCTR ↵	Hctr X19 * X30 ↵	Increment the value by one pixel (shift the image to the right).
Decrement value	Esc X19 – HCTR ↵	Hctr X19 * X30 ↵	Decrement the value by one pixel (shift the image to the left).
View	Esc X19 HCTR ↵	X30 ↵	Show the horizontal location of first active pixel in output X19.
Vertical shift			
Specify a value	Esc X19 * X30 VCTR ↵	Vctr X19 * X30 ↵	Set the vertical location of first active line in output X19.
Increment value	Esc X19 + VCTR ↵	Vctr X19 * X30 ↵	Increment the value by one line (shift up).
Decrement value	Esc X19 – VCTR ↵	Vctr X19 * X30 ↵	Decrease the value by one line (shift down).
View	Esc X19 VCTR ↵	X30 ↵	Show the vertical location of first active line in output X19.
Horizontal size (image)			
Specify a value	Esc X19 * X30 HSIZ ↵	Hsiz X19 * X30 ↵	Set the horizontal of output X19.
Increment value	Esc X19 + HSIZ ↵	Hsiz X19 * X30 ↵	Increment the value by one pixel (make one pixel wider).
Decrement value	Esc X19 – HSIZ ↵	Hsiz X19 * X30 ↵	Decrement the value by one pixel (make one pixel narrower).
View	Esc X19 HSIZ ↵	X30 ↵	Show the horizontal size of output X19.
Vertical size (image)			
Specify a value	Esc X19 * X30 VSIZ ↵	Vsiz X19 * X30 ↵	Set the vertical of output X19.
Increment value	Esc X19 + VSIZ ↵	Vsiz X19 * X30 ↵	Increment the value by one pixel (make one pixel taller).
Decrement value	Esc X19 – VSIZ ↵	Vsiz X19 * X30 ↵	Decrement the value by one pixel (make one pixel shorter).
View	Esc X19 VSIZ ↵	X30 ↵	Show the vertical size of output X19.

NOTE:

X19 = TP (scaled) and insertion output number	Ø3 or Ø4
X29 = Picture adjustments	ØØØ through 127 (Ø64 = default)
X30 = Position and size	±1Ø24Ø (Horizontal is specified from left, vertical from top)

Command and Response Table for Matrix Switcher Commands (continued)

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Compound image position and size			
Specify all size and position values	Esc X19 ,X30*X30*X30*X30XIMG↵		
		XimgX19,X30*X30*X30*X30↵	
Example:	Esc3,+Ø*+Ø*2ØØØ*1ØØØXIMG↵		
		Ximg3,+ØØØØØ*+ØØØØØ*Ø2ØØØ*Ø1ØØØ↵	
View all size and position values	Esc X19XIMG↵	X30*X30*X30*X30↵	
View active pixels and lines			
View active pixels	Esc X19APIX↵	ApixX19*X31↵	
NOTE: The "ApixX19*" portion of the response appears only when the switcher is in *Verbose* mode 2 or 3.			
View active lines	Esc X19ALIN↵	AlinX19*X31↵	
NOTE: The "AlinX19*" portion of the response appears only when the switcher is in *Verbose* mode 2 or 3.			
View defaults	EscVX19SPEC↵		Show active pixels, active lines, total pixels, and total lines.
		SpecVX19*X31*X31*X30*X30↵	
NOTE: The "SpecVX19*" portion of the response appears only when the switcher is in *Verbose* mode 2 or 3.			
Aspect ratio			
Set to fill	Esc X19*1ASPR↵	AsprX19*1↵	Always fill the output.
Set to follow	Esc X19*2ASPR↵	AsprX19*2↵	Follow the input aspect ratio.
View aspect ratio	Esc X19ASPR↵	X32↵	
Execute Auto-Image			
Execute Auto-Image	X19*A	ImgX19↵	
Overscan			
NOTE: The Overscan command applies to SMPTE input rates only (NTSC or PAL, 480p to 1080p, 50 Hz or 60 Hz).			
Set overscan value	Esc6*X33OSCN↵	Oscn6*X33↵	
Read overscan value	Esc6OSCN↵	X33↵	
Save and recall scaler presets			
NOTE: If you try to recall a scaler preset that is not saved, the matrix switcher responds with the error code E13.			
Save a scaler preset	2*X19*X23,	2SprX19*X23↵	Command character is a comma.
Recall a scaler preset	2*X19*X23.	2RprX19*X23↵	Command character is a period.
Example:	2*3*5.	2Rpr3*ØØ5↵	Recall preset 5, which becomes the current configuration.
Erase a scaler preset	EscX2*X23PRST↵	PrstX2*X23↵	
Show scaler preset availabilities	51#	PreIX5[1]X5[2]X5[3] ... X5[128]↵	Each X5 is the availability status of a scaler preset, starting from preset 1.
NOTE: The "PreI" portion of the response appears only when the switcher is in *Verbose* mode 2 or 3.			
Auto memories			
Enable auto memories	Esc X19*1AMEM↵	AmemX19*1↵	Set auto memories on. Previous settings for the incoming signal are recalled.
Disable auto memories	Esc X19*ØAMEM↵	AmemX19*Ø↵	Set auto memories off.
Show auto memory status	Esc X19AMEM↵	X5↵	Default = Ø.

NOTE:

X5 = Available or enable	Ø = Not available or disable	1 = Available or enable	
X19 = TP (scaled) and insertion output number	Ø3 or Ø4		
X23 = Scaler preset	ØØ1 – 128		
X29 = Picture adjustments	ØØØ through 127 (Ø64 = **default**)		
X30 = Position and size	±1Ø24Ø	Horizontal is specified from left, vertical from top	
X31 = Active pixels and active lines	Dependent on the input signal and selected scaling.		
X32 = Aspect ratio fill or follow	1= fill (**default**)	2 = follow	
X33 = Overscan percentage	Ø = 0% (**default**)	1 = 2.5%	2 = 5.0%

Command and Response Table for Matrix Switcher Commands (continued)

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Test pattern			
Enable a test pattern	Esc X19 *X34 TEST ←	Test X19 *X34 ↵	
Disable test patterns	Esc X19 *Ø TEST ←	Test X19 *Ø ↵	
View test pattern selection	Esc X19 TEST ←	X34 ↵	
Screen saver timeout and status			
Set screen saver to go black immediately	Esc T X19 *ØSSAV ←	SsavT X19 *ØØØ ↵	Disable sync whenever no input video is preset.
Set screen saver timeout duration	Esc T X19 *X35 SSAV ←	SsavT X19 *X35 ↵	Blank output X19 after X35 seconds.
Example:	Esc T3*3ØØSSAV ←	SsavT3*3ØØ ↵	Blank output 3 after 300 seconds (5 minutes).
Set screen saver to never go black	Esc T X19 *5Ø1SSAV ←	SsavT X19 *5Ø1 ↵	Do not blank output X19.
View screen saver timeout duration	Esc T X19 SSAV ←	X35 ↵	
View screen saver status	Esc S X19 SSAV ←	X36 ↵	
Scaler output rate			
Set scaler output rate	Esc X19 *X37 RATE ←	Rate X19 *X37 ↵	Set the scaler to output X37 on output X19.
Example:	Esc 3*73RATE ←	Rate3*73 ↵	Set the scaler to output 720p video at 60 Hz on output 3.
View scaler output rate	Esc X19 RATE ←	X37 ↵	
RS-232 Insertion Commands			
Captive screw and Ethernet serial port insertion enables			
Enable an input captive screw serial port insertion	Esc I X17 *ØLRPT ←	LrptI X17 *Ø ↵	Enable the captive screw serial port insert on input X17. This disables the Ethernet RS-232 insert.
Enable an input Ethernet serial port insertion	Esc I X17 *1LRPT ←	LrptI X17 *1 ↵	Enable the Ethernet serial port insert on input X17. This disables the captive screw serial port insert.
Set all RS-232 input insertions	Esc I X38 *LRPT ←	LrptI X38 ↵	
View input insertion	Esc I X17 LRPT ←	X38 ↵	
View all input insertions	Esc ILRPT ←	X38[7] X38[8] ↵	One X38 for both available inputs, starting at input 7.
Enable an output captive screw serial port insertion	Esc O X19 *ØLRPT ←	LrptO X19 *Ø ↵	Enable the captive screw serial port insert on output X19. This disables the Ethernet serial port insert.
Enable an output Ethernet serial port insertion	Esc O X19 *1LRPT ←	LrptO X19 *1 ↵	Enable the Ethernet serial port insert on output X19. This disables the captive screw serial port insert.
Set all RS-232 output insertions	Esc O X38 *LRPT ←	LrptO X38 ↵	
View RS-232 output insertion	Esc O X19 LRPT ←	X38 ↵	
View all output insertions	Esc OLRPT ←	X38[3] X38[4] ↵	One X38 for both available outputs, starting at output 3.

NOTE:

X17 = TP and insertion input number	Ø7 or Ø8	
X19 = TP (scaled) and insertion output number	Ø3 or Ø4	
X34 = Test pattern	ØØ = Disable (**default**)	
	Ø1 = Crop	Ø4 = Color bars
	Ø2 = Alternating pixels	Ø5 = Grayscale
	Ø3 = Crosshatch	Ø6 = Blue mode
X35 = Duration	Ø = Output sync instantly disabled when no active video input is selected	
	ØØ1 through 5ØØ (seconds)	
	5Ø1 = Output sync never times out (**default**)	
X36 = Screen saver status	Ø = Active input detected, timer is not running	
	1 = No active input, timer is running, output sync is still active	
	2 = No active input, timer is expired, output sync is disabled.	
X37 = Scaler output resolution and rate	See the **table** on page 58.	
X38 = Captive screw or UART	Ø = Captive screw RS-232 insert	1 = Ethernet RS-232 insert (UART) (**default**)

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Ethernet and serial port insert parameters			
Set serial port parameters	Esc X39 * X40 , X41 , X42 , X43 CP ←	Cpn X39 • Ccp X40 , X41 , X42 , X43 ↵	
Read serial port parameters	Esc X39 CP ←	X40 , X41 , X42 , X43 ↵	
Configure current port timeout	Esc Ø * X44 TC ←	PtiØ * X44 ↵	
Read current port timeout	Esc ØTC ←	X44 ↵	
Configure global IP port timeout	Esc 1 * X44 TC ←	Pti1 * X44 ↵	
Read global IP port timeout	Esc 1TC ←	X44 ↵	
Set UART start point	Esc X45 MD ←	Pmd X45 ↵	Sets the initial (lowest) port number for the range of numbers assigned to the serial port and UARTs.
Read UART start point	Esc MD ←	X45 ↵	

NOTE:

X39 = Port number
- Ø1 = Remote (RS-232) port
- Ø2 — Ø5 = UARTs 1 — 5 (DTP input and output ports)

X40 = Baud rate
- 3ØØ, 6ØØ, 12ØØ, 18ØØ, 24ØØ, 36ØØ, 48ØØ, 72ØØ, 96ØØ, 144ØØ, 192ØØ, 288ØØ, 384ØØ, 576ØØ, 1152ØØ (**default=96ØØ**)

X41 = Parity
- **o**dd, **e**ven, **n**one, **m**ark, **s**pace (only the first letter required) (**n = default**)

X42 = Data bits
- 7, 8

X43 = Stop bits
- 1, 2

X44 = Port timeout interval (in 10-second increments)
- 1 (= 10 seconds) - 65ØØØ (default is 3Ø = 300 seconds = 5 minutes)

X45 = UART starting point
- The starting point (X45) is the rear panel Remote RS-232 port.
- The next two positions (X45+1 and X45+2) are DTP inputs.
- The next two positions (X45+3 and X45+4) are DTP outputs.
- **Default values**:
  - 2ØØØ = Rear panel Remote (RS-232) port
  - 2ØØ1 and 2ØØ2 = Input 7 and input 8
  - 2ØØ3 and 2ØØ4 = Output 3 and output 4

Port Specific and Communications Protocol SIS Commands

Symbol definitions

X50 = Password — Up to 12 alphanumeric characters

NOTE: The HTML language reserves certain characters for specific functions (see **Special Characters** on the next page).

X51 = Port number — Ø1 = Remote (RS-232) port

X52 = Baud rate — 96ØØ (**default**), 19ØØ, 384ØØ, 1152ØØ

X53 = Parity — **o**dd, **e**ven, **n**one, **m**ark, **s**pace (only the first letter required) (**n = default**)

X54 = Data bits — 7, 8 (**default**)

X55 = Stop bits — 1 (**default**), 2

NOTE: X51 through X55 and X58 are variables for the rear panel Remote RS-232 port. These variables are repeated on page 59 as X39 through X44 for the RS-232 inserts.

X56 = Port type — Ø = RS-232 (**default**) 1 = RS-422 (not available on DTP CrossPoint)

X57 = Verbose mode — Ø = Clear or none (default for Telnet connection); 1 = Verbose mode (default for RS-232 or USB connection); 2 = Tagged responses for queries; 3 = Verbose mode and tagged for queries

NOTE: If tagged responses is enabled (modes 2 and 3), 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•X20↵).

X58 = Port timeout interval (in 10-second increments) — 1 (= 10 seconds) - 65ØØØ (default is 3Ø = 300 seconds = 5 minutes)

SIS Command and Response Table for Remote and Communications Protocol Commands

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)
Set administrator password	Esc X50 CA←	Ipa•X50↵
Read administrator password	Esc CA←	X50↵
Reset (clear) administrator password	Esc•CA←	Ipa•↵
Set user password	Esc X50 CU←	Ipu•X50↵
Read user password	Esc CU←	X50↵
Reset (clear) user password	Esc•CU←	Ipu•↵
Set serial port parameters	Esc X51 * X52 , X53 , X54 , X55 CP←	Cpn X51 •Ccp X52 , X53 , X54 , X55 ↵
Read serial port parameters	Esc X51 CP←	X52 , X53 , X54 , X55 ↵
Configure flow control	Esc X51 * Y86 , Y87 CF←	Cpn X51 •Cfl Y86 , Y87 ↵
Read flow control	Esc X51 CF←	Y86 , Y87 ↵
Configure receive timeout	Esc X51 * Y88 , Y89 CE←	Cpn X51 •Cce Y88 , Y89 , Y90 , Y91 ↵
NOTE: The configure command is sufficient as shown for most users, with the priority (Y90) and length or delimiter (Y91) omitted). The response in this case is "Cpn X51 •Cce Y88 , Y89 , Ø , ØØØØØL↵," with the default Y90 and Y91 values returned.		
Read receive timeout	Esc X51 CE←	Y88 , Y89 , Y90 , Y91 ↵
Set mode	Esc X51 * X56 CY←	Cpn X51 •Cty X56 ↵
Read mode	Esc X51 CY←	X56 ↵
Set verbose mode	Esc X57 CV←	Vrb X57 ↵
Read verbose mode	Esc CV←	X57 ↵
Configure current port timeout	Esc Ø * X58 TC←	PtiØ* X58 ↵
Read current port timeout	Esc ØTC←	X58 ↵
Configure global IP port timeout	Esc 1 * X58 TC←	Pti1* X58 ↵
Read global IP port timeout	Esc 1TC←	X58 ↵

NOTE: This section details the matrix-switcher-centric SIS commands. Additional commands are available for the DSP, see the **DSP SIS Commands section**, beginning on page 141.

IPCP Pro 350 Information

The DTP CrossPoint 84 IPCP models include a built-in IPCP Pro 350 control processor that supports the LAN ports and other functionality. See the *IPCP Pro 350 Series User Guide* at **www.extron.com**.

Special Characters

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

The switcher rejects the following characters:
{space (spaces **are** valid for use in names)} + ~ , @ = ‘ [ ] { } < > ’ “ semicolon (;) colon (:) | \ and ?.

Matrix Software

The DTP CrossPoint Matrix Switcher can be remotely controlled, monitored, or configured via:

- SIS commands (see **Programming Guide**, on page 52)
- Built-in HTML pages (see **HTML Operation**, on page 133)
- The following two Extron computer programs:
  - Product Configuration Software
  - DSP Configurator

This section details the two programs, both available on the Extron website. The section covers:

- **Software Operational Considerations and Installation**
- **Product Configuration Software**
- **DSP Configurator Program**
- **Optimizing the Audio**

The Windows-based DSP Configurator program and Extron Product Configuration Software (PCS) communicate with the switcher via the following ports:

- **Rear panel LAN ports** — Password-protected RJ-45 connections (see **Software Operation via Ethernet**, on the next page).
- **Front Panel Configuration port** — A non-password-protected USB mini-B port (see **Software Operation via USB Port**, on the next page).

Both programs are compatible with Windows 2000, Windows XP, and later.

The Product Configuration Software manages basic functions such as:

- Video and audio matrix (making ties)
- Video input and output configuration
- Scaler setup and picture controls
- EDID management
- Test patterns
- RS-232 insertion
- Line audio input level and output volume

The DSP Configurator software provides all of the tools and controls necessary for configuring and controlling the advanced audio mixing and processing functions available in the digital signal processor built into the switcher.

NOTE: The DSP Configurator has a software lock that protects the complex DSP audio adjustments, making them unavailable for selection in PCS. This protects the DSP settings against inadvertent changes made by the more basic PCS audio adjustment capabilities.

This software lock can be overridden, but Extron **STRONGLY** advises against doing so.

Software Operational Considerations and Installation

Software Operation via Ethernet

When the switcher is connected to an Ethernet WAN or LAN (see **item Q** [non-IPCP model] or **item R** [IPCP models] both on page 15), up to 200 users can be connected to locally or remotely operate it, using the DSP Configurator or Product Configuration Software.

Connection to the switcher via the Ethernet can be password protected. There are two levels of password protection:

- Administrators have full access to all matrix 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 available in the Product Configuration Software when the operator is logged on as a user.

Software Operation via a USB Port

The front panel Configuration port (see **item A** on page 21) and a standard USB cable, can be used for remote control of the switcher using the DSP Configurator or Product Configuration Software. The standard USB cable must be terminated on one end with a USB mini-B male connector.

Installing the Software

The PCS, version 2.0 or newer; DSP Configurator, version 2.0 or newer; and Firmware Loader are available on the Extron website. Download and install all programs as follows:

NOTE: Steps 1 through 6, starting below, are also used to download a firmware update package.

1. Visit the website **www.extron.com** and click the **`Download`** tab (see figure 32, ❶).

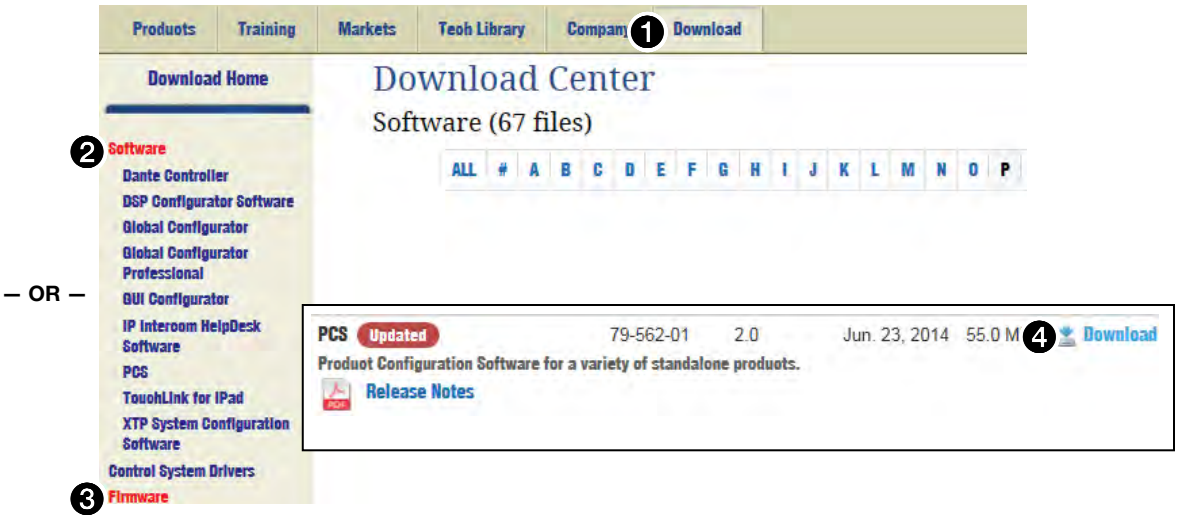


Figure 32. Downloading a Software or Firmware Package (PCS Shown)

2. Click either the **`Software`** (❷) or **`Firmware`** (❸) link as appropriate to the operation you are performing.

3. Click **Download** for the desired software or firmware to download (see **figure 32** on the previous page, ❹).

   TIP: Jump to the nearest page of downloads by clicking the desired filtering letter.

   The Download Center dialog box appears (see figure 33).

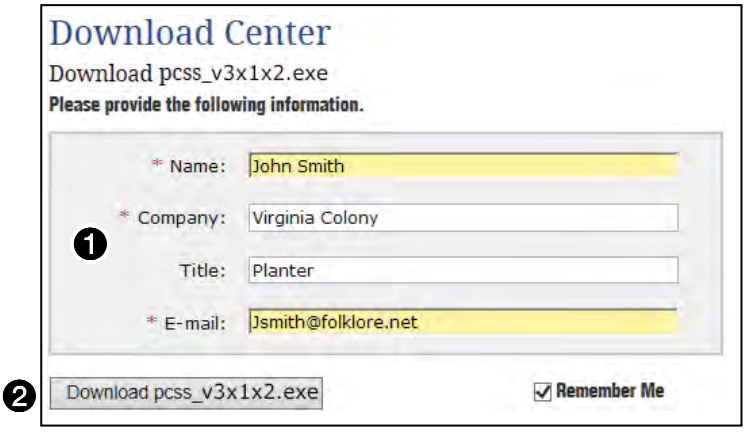


Figure 33. Download Center Dialog Box

4. Enter the requested personal information (see figure 33, ❶).

   TIP: Click **Remember Me** to eliminate step 4 in future downloads.

5. Click **Download** to copy the software or firmware to the computer (❷). The download warns you about downloads and asks you to confirm it (see figure 34).

Figure 34. Download Warning and Confirmation

   NOTE: Figure 34 may appear different or may not appear at all, depending on your web browser choice and its security settings.

6. Click **Run** to confirm that you want to run the installation (see figure 34, ❶).
7. **For a firmware download**, exit this procedure and return to **Updating the Firmware** in this Matrix Software section on page 77 or **Update the firmware** in the HTML Operation section on page 137.

8. Follow the on-screen instructions. The installation creates the necessary subfolders of `C:\Program Files` and the necessary groups. It places the appropriate icons into correct group folders and on the PC desktop:

NOTE: `C:\Program Files(x86)\` ... for 64-bit Windows OS.

Product Configuration Software —

- **Folder** — `C:\Program Files\Extron\ Extron PCS`
- **Group folder** —`Extron Electronics\Extron Product Configuration Software`
  - **`Check for Extron PCS Updates`**
  - **`Extron PCS Help`**
  - **`Extron Product Configuration Software`**
  - **`Uninstall Extron Product Configuration Software`**

DSP Configurator —

- **Folder** — `C:\Program Files\Extron\DSP_Configurator`
- **Group folder** —`Extron Electronics\DSP Configurator`
  - **`DSP Configurator Help`**
  - **`DSP Configurator`**
  - **`Uninstall DSP Configurator`**

Product Configuration Software

Starting the Program

Start the Extron Product Configuration Software by clicking the desktop icon or as follows:

1. Click **`Start > All Programs > Extron Electronics > Extron Product Configuration Software > Extron Product Configuration Software`**.

   The Product Configuration Software opens to the Device Discovery screen (see figure 35).

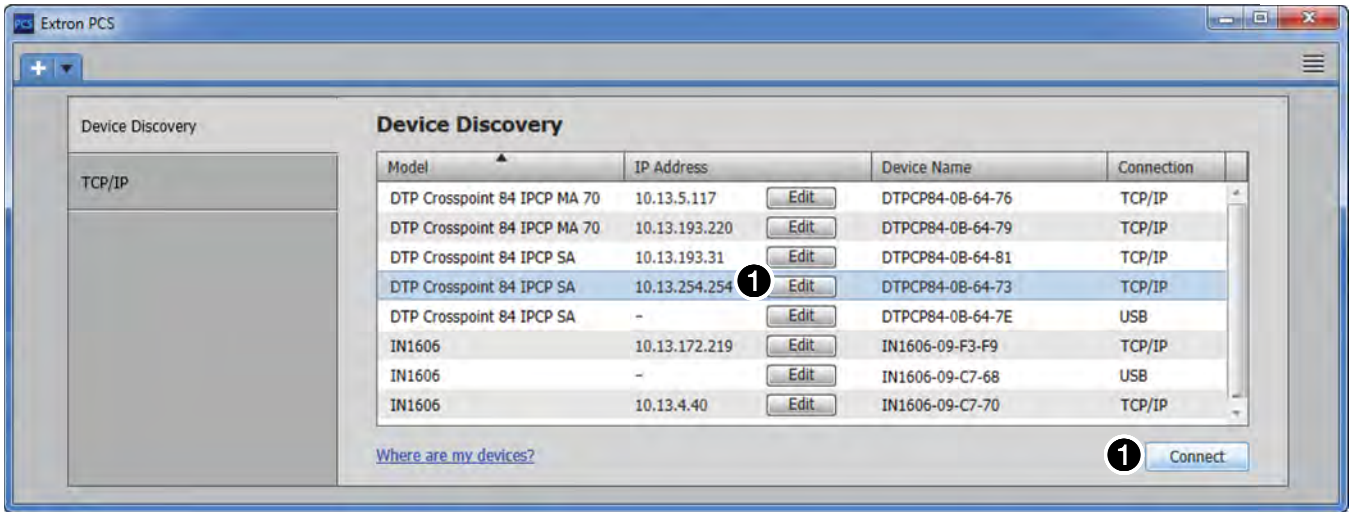


Figure 35. Device Discovery Screen

2. Select (click) your DTP CrossPoint and click **`Connect`** (see figure 35, ❶). The Product Configuration Software opens to the EDID Minder page (see **figure 36** on the next page).

   Operate the Product Configuration Software as described in the PCS Help.

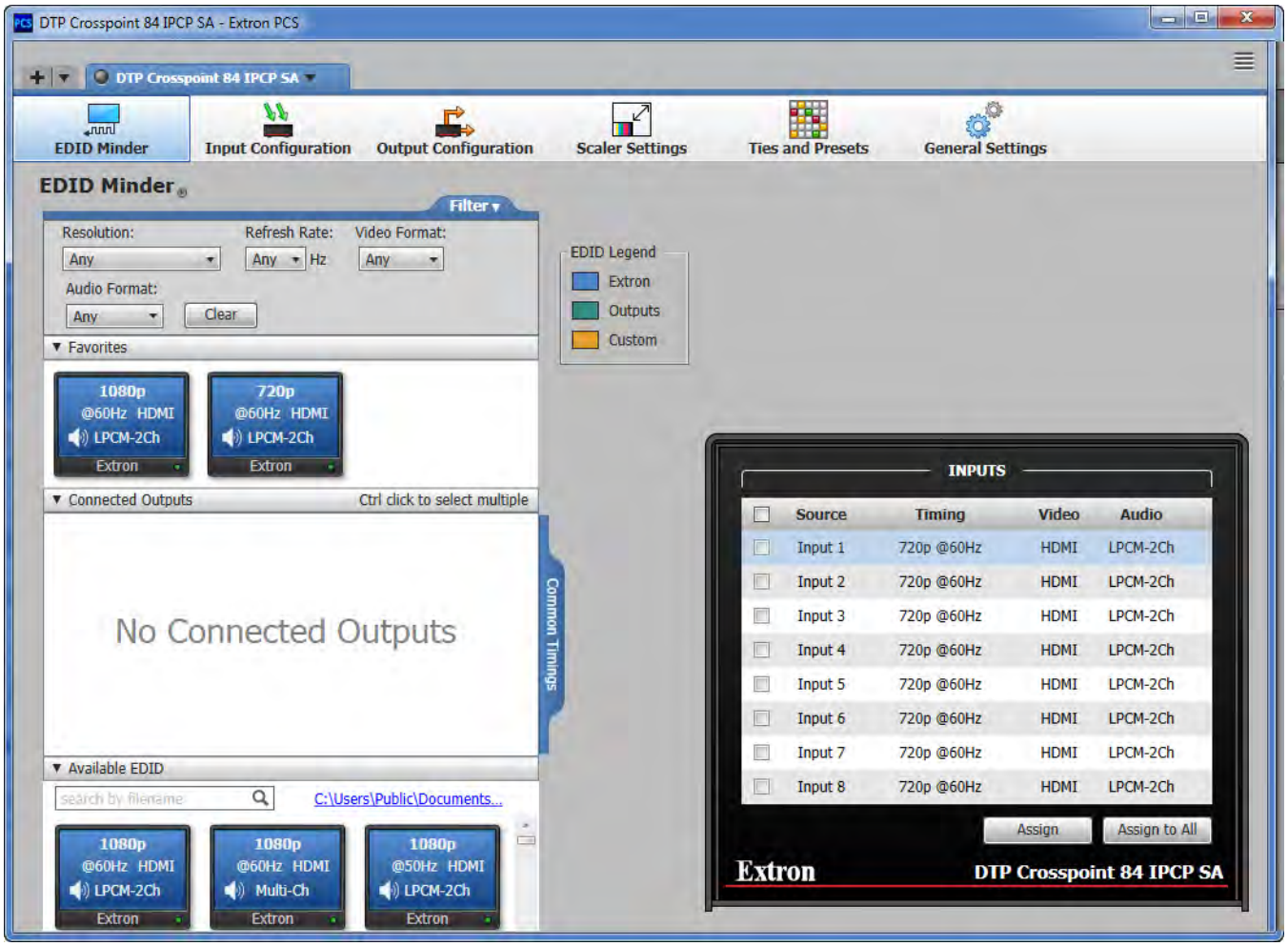
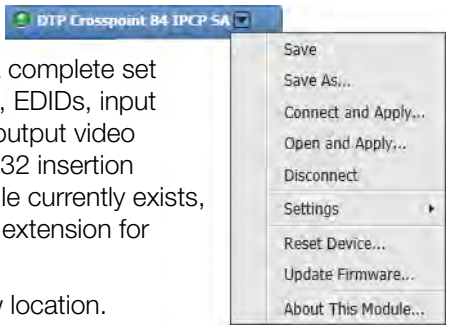


Figure 36. Product Configuration Software (DTP CrossPoint 84 Shown Connected)

Menu



- **Save** — Saves a configuration file consisting of a complete set of matrix switcher settings, including ties, presets, EDIDs, input video configurations, input audio configurations, output video configurations, output audio configurations, RS-232 insertion setting, and screen saver settings, to a file. If no file currently exists, the program prompts you for a file name. The file extension for these files is .extc.
- **Save As ...** — Saves a configuration file to a new location.
- **Connect and Apply** — Calls the Device Discovery screen where you can select a different or the same Extron device, connect to it, and open and apply a saved configuration file to it.

  NOTE: Connect and Apply is unavailable for selection when the Product Configuration Software is currently connected to a device.

- **Open and Apply** — Opens a saved configuration file and applies its settings to the connected device shown on the currently selected device tab.
- **Disconnect** — Disconnects the Product Configuration Software from the unit while leaving the program active.

- **`Settings`** — Allows you to view and set a wide assortment of hardware and communication settings. Select settings that can be changed:
  - Device name
  - Date and Time
  - Adminstrator and user passwords

    NOTE: An Administrator password must be assigned before a User password can be assigned.

  - RS-232 baud rate for the rear panel Remote port
  - TCP/IP settings (DHCP, IP address, subnet mask, gateway address, and DNS server)
- **`Reset Device ...`** — Opens a dialog box that allows you to initiate 3 levels of matrix switcher reset.
- **`Update Firmware ...`** — Disconnects the Product Configuration Software from the unit and calls the Firmware Loader utility in the background (see "Updating the Firmware").
- **`About This Module ...`** — Provides the version number of the software.

Updating the Firmware

The Product Configuration Software provides a way to replace the firmware that is coded on the control board of the switcher without taking the unit out of service.

NOTE: Upgrading the firmware does not overwrite the current configuration.

Update the unit firmware as follows:

1. Perform steps 1 through 6 of **Installing the Software**, on page 73, to download the firmware upgrade from the Extron website, **www.extron.com**.
2. Click **`Run`** in the `File Download` and `Security Warning` dialog boxes (see **figure 37**, ❶ 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.
3. Click **`Next`** (❷). The program extracts the firmware files and places them in a folder identified in the InstallShield Wizard window.

   ATTENTION:
   - The extension of the firmware file must be .eff or .efs. Opening a file with an incorrect extension may cause the device to stop functioning.
   - L'extension du fichier firmware doit être .eff ou .efs. Si un fichier est ouvert avec une mauvaise extension, l'appareil peut arrêter de fonctionner.

   NOTES:
   - **Note the folder to which the firmware file is saved**. When downloaded from the Extron website, the firmware is placed in a subfolder of:
     - **64-bit Windows OS**: `C:\Program Files (x86)\Extron\Firmware`.
     - **32-bit Windows OS**: `C:\Program Files\Extron\Firmware`.
   - The original factory-installed firmware is permanently available on the unit. If the attempted firmware upload fails, the unit reverts to the factory-installed firmware.
4. Click **`Finish`** to exit the program (❸).

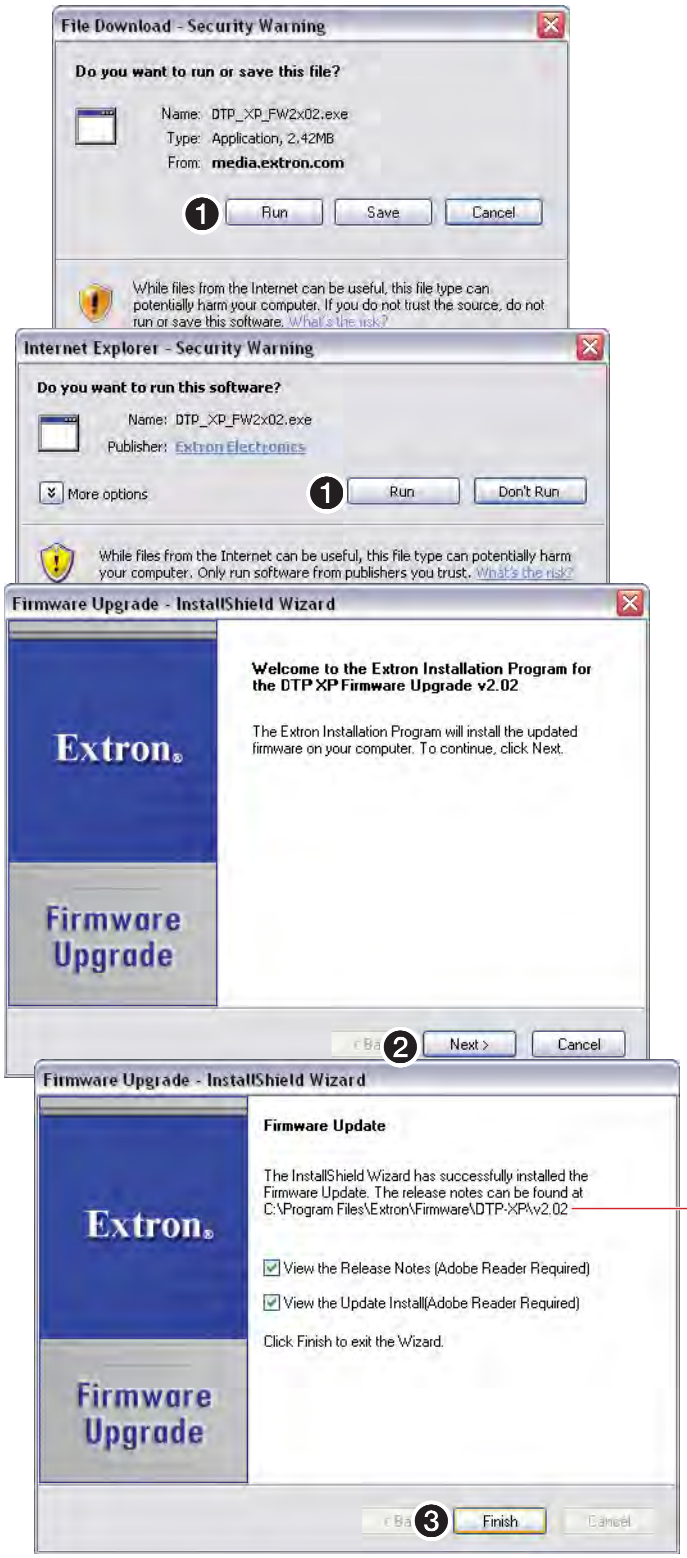


Figure 37. Extracting Firmware Upgrade Files

5. Connect the computer to the switcher rear panel LAN port (see **item Q** [non-IPCP model] or **item R** [IPCP models] both on page 15) or front panel Configuration port (see **item A** on page 21).
6. Start the Product Configuration Software and connect to the unit (see **Starting the Program**, steps 1, 2, 3, and 5, starting on page 75).

7. Click **Tools** > **Update firmware**. The software asks you to confirm that you want to continue the update (see figure 38).

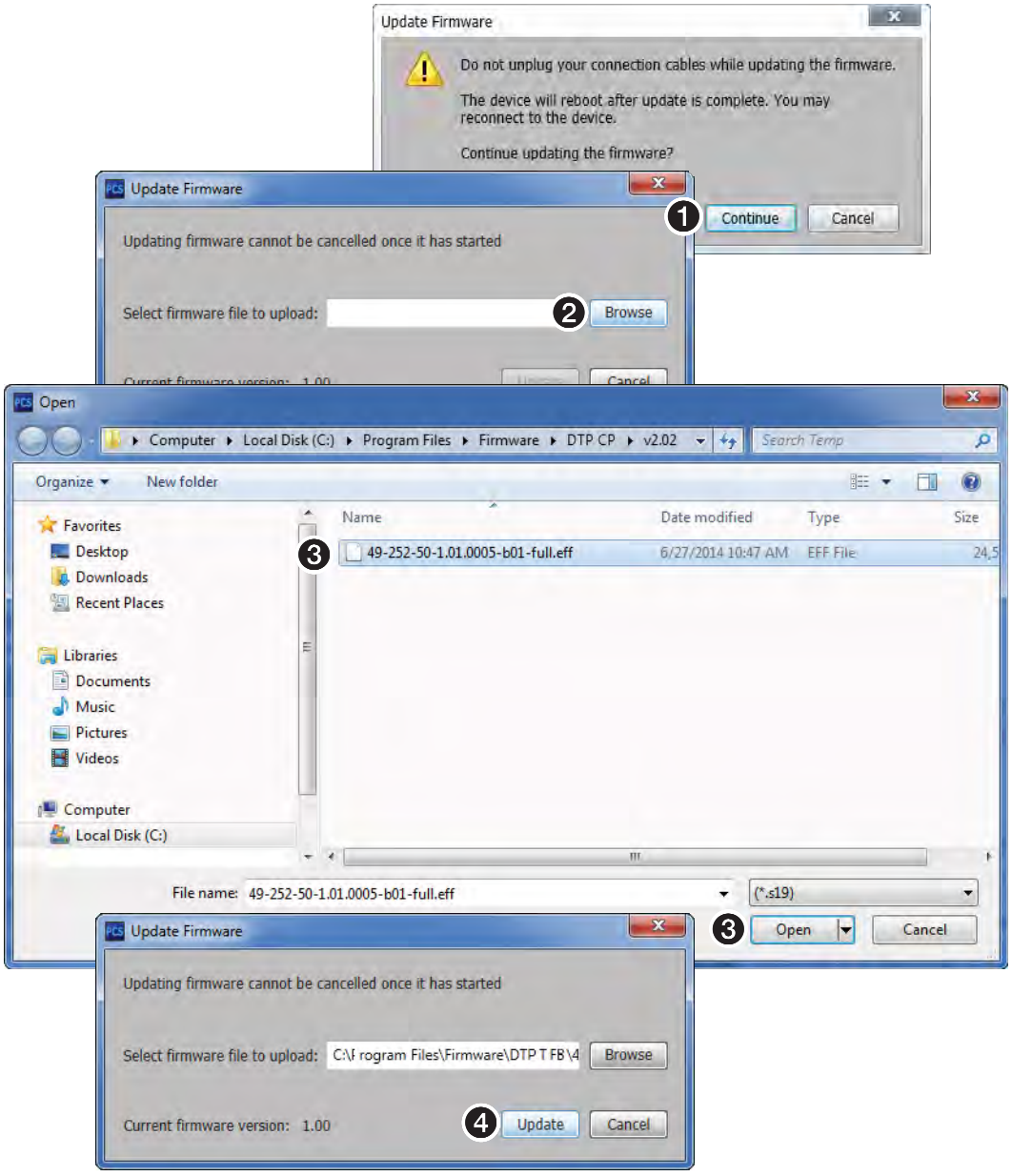
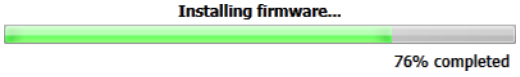


Figure 38. Updating Firmware

8. Click **Continue** (see figure 38, ❶). The Product Configuration Software disconnects itself from the unit and calls the Firmware Loader utility in the background. The Update Firmware dialog box appears.
9. Click **Browse** (❷). The **Open** dialog box opens.
10. Navigate to the folder where you saved the firmware upgrade file (see figure 38, above). Select the file and click **Open** (❸). The **Update Firmware** dialog box returns to the top.
11. Click **Update** to continue (❹).

    The Firmware Loader utility tests the connection, installs the update, and then verifies the firmware.



    At the conclusion of the process, the utility reports **Upload Complete**.

12. Click **Close**. The Product Configuration Software window returns to the front.
13. Click the ⊗ in the connection tab to completely disconnect the program from the unit and then reconnect the program as described in **Starting the Program**, beginning at step 3 on page 75.

DSP Configurator Program

The DSP Configurator can connect to the switcher via any rear panel LAN port or the front panel Configuration port. Use of the rear panel Remote (RS-232) port is **not** recommended.

Starting the Program

NOTE: Extron recommends connection via an Ethernet LAN port for the DSP Configurator program.

Start the DSP Configurator Program by clicking the desktop icon or as follows:

1. Click **Start > All Programs > Extron Electronics > DSP Configurator > DSP Configurator**. The DSP Configurator startup screen displays (see figure 39).

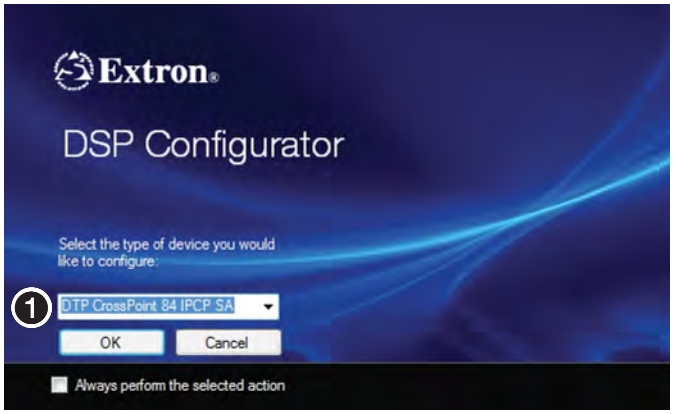
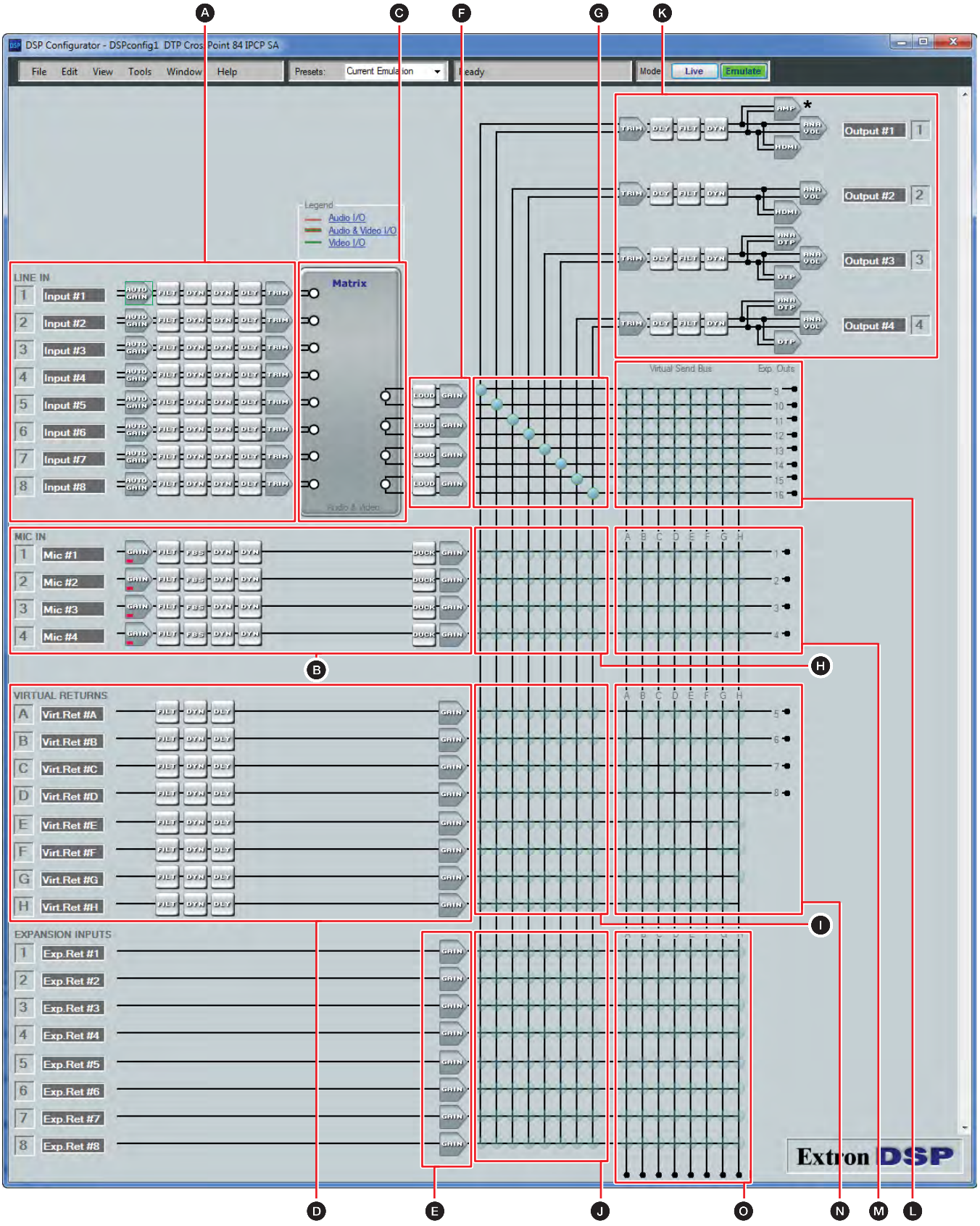


Figure 39. DSP Configurator Screen and DTP CrossPoint Selection

2. **If necessary**, select the DTP CrossPoint switcher in the drop-down box and click **OK** (see figure 39, ❶).

TIP: If you have only DTP CrossPoint switchers of the same model, click **Always perform the selected operation** to eliminate step 2 in future startups.

The DSP Configurator program starts in Emulate mode (see **figure 40** on the next page).



* This output 1 amplifier block is not present on non-IPCP models.

Figure 40. DSP Configurator (Stereo Audio) Program Window

Using the Program

In the DSP Configurator window in Emulate mode, you can tailor a variety of audio parameters and then transfer them to the DTP CrossPoint by going to LIve mode (connected to a DTP CrossPoint). You can also switch to LIve mode and then tailor the audio settings in real time, while listening to the audio output with a critical ear (see **Emulate mode vs. Live mode**, on page 107).

There are three possible DSP Configurator displays, shown below, with the following available switching functions:

- **Audio and video I/O page** — Make video and audio ties (audio follow) and audio adjustments
- **Audio-only I/O page** — Make audio only ties (audio breakaway) and audio adjustments
- **Video-only I/O page** — Make video only ties (video breakaway)

The DSP Configurator program always starts in the audio and video I/O page, as shown in **figure 40** on the previous page. The audio-only I/O page looks virtually identical. The video-only I/O page strips out all of the audio control blocks (see **Video-only I/O page and audio-only I/O page**, on page 105).

The DSP Configurator program window consists of a number of signal processor chains, an AV matrix block, a mic mixer block, and several other mixer blocks (see **figure 40**).

Ⓐ Line audio input signal processor chains

Ⓑ Mic input signal processor chains

Ⓒ AV matrix block

Ⓓ Virtual returns inputs processor chains

> **NOTE:** The virtual returns, along with the virtual sends, comprise the virtual bus, an internal bus for creating submixes. The virtual bus allows you to "loop" already-mixed audio to these processor chains for additional processing.
>
> See **figure 40**. Virtual sends A through H run down through the Ⓛ, Ⓜ, Ⓝ, and Ⓞ mixer blocks and exit the DSP. A through H reenter the DSP as virtual returns on Ⓓ.

Ⓔ Expansion port input signal processing chains

Ⓕ Post-matrix signal processor chain

Ⓖ Switcher-to-output mixer block

Ⓗ Mic-to-output mixer block

Ⓘ Virtual returns-to-output mixer block

Ⓙ Expansion inputs-to-output mixer block

Ⓚ Output signal processor chain

Ⓛ Switcher-to-virtual-send-bus mixer block

Ⓜ Mic-to-virtual-send-bus mixer block

Ⓝ Virtual returns-to-virtual-send-bus mixer block

Ⓞ Expansion inputs-to-virtual-send-bus mixer block

Audio signal processor chains and control blocks

Each of the six signal processing chains (Ⓐ, Ⓑ, Ⓓ, Ⓔ, Ⓕ, and Ⓚ) consists of one or a series of control blocks of two basic types that are specific to that chain: gain, trim, post-gain, and volume control blocks (collectively known as "gain blocks" – ▰) and processor blocks (▭). For example, the audio input 1 chain consists of a gain fader, a filter block, two dynamic blocks, a delay block, and a trim fader. Gain controls are always present (active) in the signal processor chain. Processor blocks, while always shown in the program window, must be individually activated ("inserted") as shown in figure 42.

Many gain blocks can be muted and process block controls can be bypassed. Mutes and bypasses are shown by a red indicator in the block.

Gain blocks — The parameters set by the gain blocks are always present in the signal chain. To access the actual fader control to view a value, make a change, or observe a live audio meter (Input Gain chain and Output Volume chain Gain and Trim blocks only), double-click the gain block icon (see figure 41). This action opens a dialog box, a new window that contains the fader for that control.

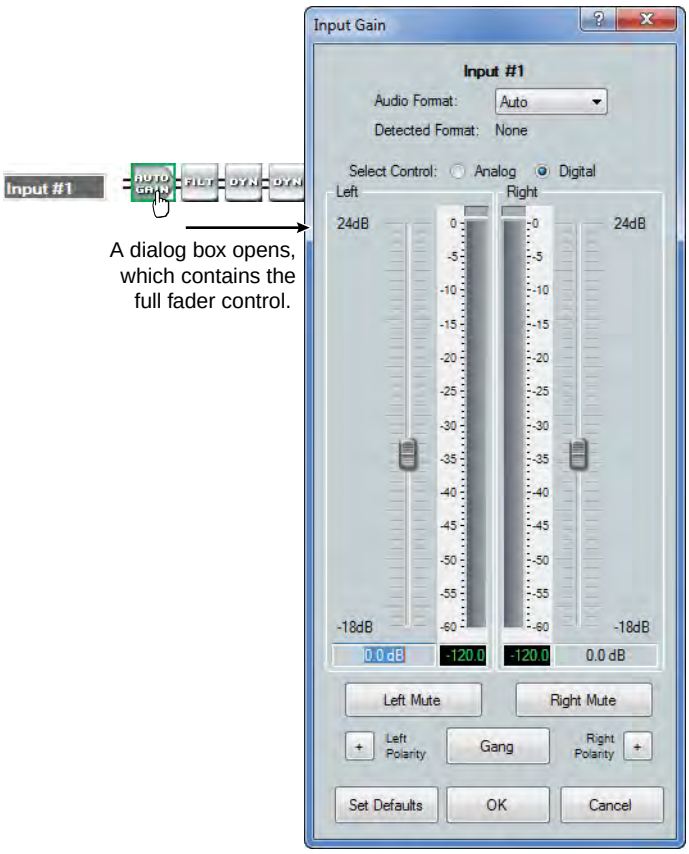


Figure 41. Accessing a Typical Gain Control Dialog Box

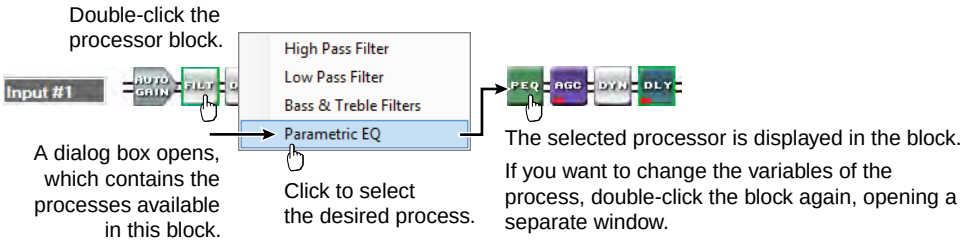


Figure 42. Selecting and Inserting a Typical Processor Block Dialog Box

Processor blocks — Each processor block control represents a menu of one or more possible processes (such as filters) that can be inserted into the audio stream. For blocks that provide more than one processor, only one processor can be selected. Each block can be inserted by a double-click or right-click >**Insert** and selecting the desired processor (see **figure 42** on the previous page). Once a block is inserted, the selected processor is displayed in the block and the block itself changes color.

Each processor has a set of associated parameters that define that processor (such as a frequency curve). Those parameters can be accessed and changed by double-clicking again on the now inserted process block. This action opens a customizable dialog box, a new window that contains parameters for the process (see figure 43).

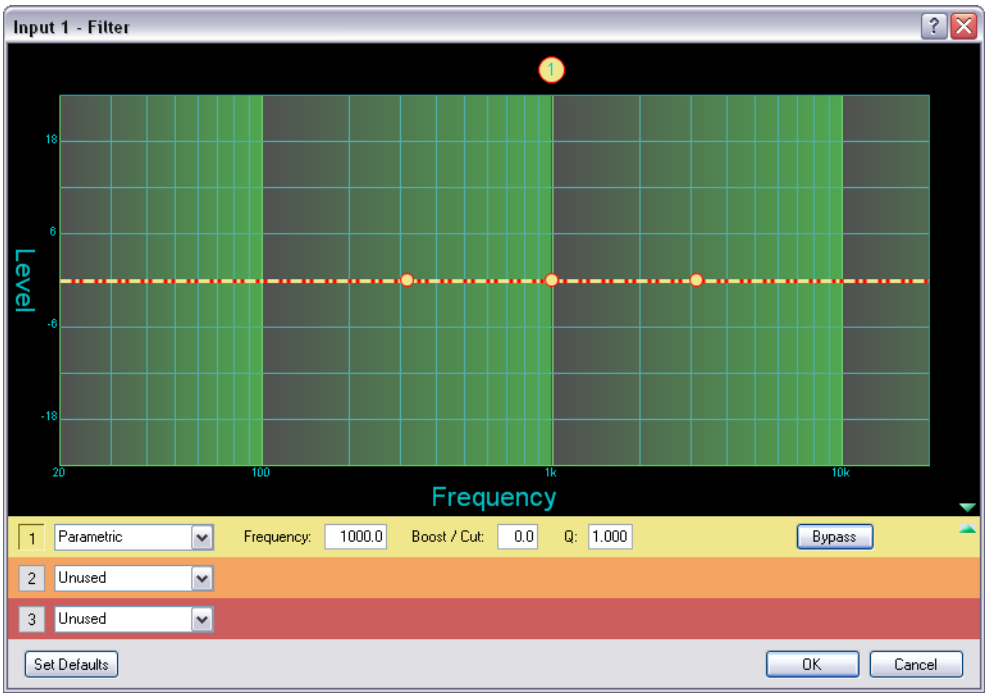


Figure 43. Sample Processor Dialog Box

NOTE: Figure 43 is a sample of one type of dialog box. The contents and appearance of each processor are unique to that processor.

- The **Set Defaults** button discards all custom settings and reload the factory defaults. 

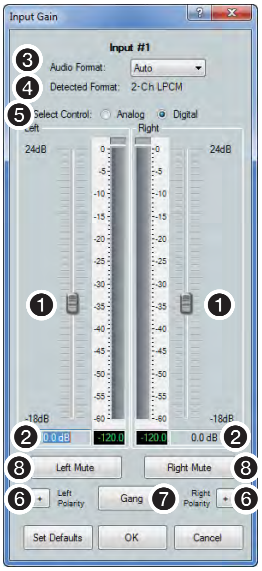
- The **Bypass** button temporarily suspends the processor without removing the processor block. 

By default, each processor block is automatically bypassed when inserted (the **Bypass** button in the processor dialog box is selected), although this can be changed for each processor block type (see **DSP Configurator Tools menu** on page 113 and the specific tabs for the processor types). When a processor is bypassed, a red indicator in the block turns on. 

The block can be removed from the audio stream by selecting it and depressing the keyboard <Delete> key or by right-clicking and selecting **Delete**.

Line audio input signal controls (see figure 40 on page 91, Ⓐ)

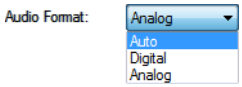
The program audio input signal processor chain makes adjustments to program audio material before it is tied to specific outputs.



`Gain` control block — The always-present gain control provides left and right controls to adjust the audio level of each input through a range of -18 dB to +24 dB to set input gain levels for optimal signal to noise ratio.

Click and drag the desired fader (❶) or click in the dB field (❷) and type a value. The meter value displayed in green shows the signal level in dBFS.

❸ **`Audio Format` drop-down box** — Use this control to select the audio format:



- **`Analog`** — Audio on the local audio input (captive screw) connector (see **item Ⓖ** on page 13) is processed within the DSP.
- **`Digital`** — Embedded audio on the HDMI or DTP input is handled as follows:
  - **LPCM format** — Audio is de-embedded and processed within the DSP.
  - **Any other format** — The original digital audio is not de-embedded and is not routed into the DSP. No audio is available on the analog audio output (captive screw) connector (see **item Ⓙ** on page 14).
- **`Auto`** — Audio is automatically selected between the digital and analog inputs, with the digital input having priority. When the **`Detected Format`** field (❹) displays either **`None`** or **`Multi-Channel`**, the analog input is automatically selected.

Based on the selection made in this box, when the dialog box is closed, the Gain block reports **`Auto Gain`**, **`Dig Gain`**, or **`Ang Gain`**.

❹ **`Detected Format:` field** — This field displays the detected digital audio format. The displayed format can be either:

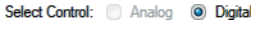
- **`None`** — No digital signal format is detected. This may be due to a source device being switched off or not connected. Some digital audio players may not output a detectable signal (or no digital audio clock) when paused or stopped.
  - Analog input audio passes through the DSP to any output when **`Audio Format`** (❸) is set to **`Analog`** or **`Auto`**.
  - Digital input audio is not passed to any output.
- **`2-Ch LPCM`** — The detected format is uncompressed digital audio, in stereo or 2-channel format. This does not include Dolby or DTS stereo formats, as these audio formats are encoded.
  - LPCM input audio passes through the DSP to any output when **`Audio Format`** (❸) is set to **`Digital`** or **`Auto`**.
  - Embedded LPCM input audio passes directly to an HDMI or DTP output, bypassing the DSP, if the **`Output Signal Source`** control in the Volume block of that output is set to **`Original`** (see item ❻ in **Output signal processor chain Volume controls** on page 100).
  - Analog input audio is not passed to any output.

- **Multi-Channel** — The detected format is any compressed or encoded digital audio format, such as Dolby or DTS multi-channel.
  - Multi-channel input audio does not pass through the DSP regardless of selected **Audio Format** (see item ❸ in **Line audio input signal controls** on the previous page). Gain, mute controls, and meters are disabled and unavailable for operation throughout the DSP.
  - Multi-channel input audio passes to an HDMI or DTP output, bypassing the DSP, if the **Output Signal Source** control in the Volume block of that output is set to **Original** (see item ❻ in **Output signal processor chain Volume controls** on page 100).
  - Analog input audio passes through the DSP to any output when **Audio Format** (❸) is set to **Analog** or **Auto**.

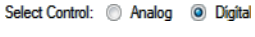
See item ❺ for interaction with the **Audio Format drop-down box.**

❺ **Select Control indications and radio buttons** (see the **Line audio input signal controls** drawing on the previous page) — These buttons indicate the audio, **Digital** or **Analog**, that is adjusted by this control block. This control reacts to the **Audio Format** (❸) control as follows:

- **Audio Format** (❸)**: Analog** — 

- **Audio Format** (❸)**: Digital** — 

- **Audio Format** (❸)**: Auto** — The software automatically selects the radio button dependent on the **Detected Format:** field (❹) display as follows:
  - **Detected Format** (❹)**: None** or **Multi-Channel** — 

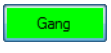
  - **Detected Format** (❹)**: LPCM** — 

You can manually select a radio button **only** when the **Audio Format drop-down box** (❸) is set to **Auto**. Select **Digital** or **Analog** to override the selected control.

NOTES:

- Setting the **analog gain** without a signal present may have a real-world application. For example, if you have a consumer audio component, a gain setting of 11.8 dB (consumer line level of -10dBV; pro line level of +4dBu; conversion factor from dBV to dBu = 11.8 dB) brings its line level up to pro line level (or you can see the suggested setting if you insert a building block for a consumer audio product [see **Signal Path Building Blocks** on page 121]).
- Setting the **digital gain** without a signal present is less likely. If you know the general level of your source material you can attempt this but Extron does not recommend doing so.

❻ **Polarity buttons** (see the **drawing**) — Select to flip the polarity of the audio connectors (+/tip and -/ring) to easily correct for miswired connectors. 

❼ **Gang button** (see the **drawing**) — Select to tie the fader and mute controls together. Ganged faders move together at relative levels to the top or bottom of their travel. If one fader reaches the limit of its travel first, it retains that position while the other fader continues to travel. When the ganged faders travel in the reverse direction, the fader that was at its limit reverts to its position relative to the other fader. 

❽ **Mute buttons** (see the **drawing**) — Select to separately mute and unmute the audio channels. If you mute both channels, audio is completely silent on that input. When one or both channels are muted, one or two red indicators in the block turn on. The mute controls are common to both digital and analog signals. 

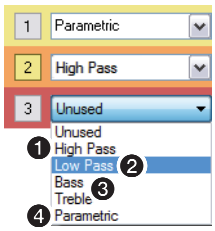
NOTE: When the left and right channels are ganged, either **Mute** button mutes and unmutes both channels.

`Filter` block — The filter processor block, when first inserted, provides one of four filter selections; additional filters can then be added. A filter attenuates (removes) or boosts a range of frequencies from an audio waveform, while passing other frequencies. Click the desired filter to select it.

NOTE: Selecting **`Bass & Treble Filter`** inserts two separate filters.

Additional filters, for a total of up to three filters, can then be added by double-clicking the processor block. Additionally, the frequency range of each filter can be changed in the dialog box, customized to the filter, that can be accessed by double-clicking the processor block.

To add a second or third filter to the filter block, select the desired filter in the 2 and 3 drop-down boxes in the dialog box.



The following filters are available:

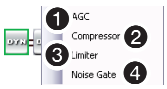
❶ **`High pass filter`** — A high pass filter passes a band of frequencies extending from a specified cutoff frequency (greater than zero) up toward the high end of the frequency spectrum. All frequencies above the specified cutoff frequency are allowed to pass, attenuating all frequencies below. The default cutoff is 100 Hz.

❷ **`Low pass filter`** — A low pass filter passes a band of frequencies extending from a specified cutoff frequency (less than infinite) down toward the low end of the frequency spectrum. All frequencies below the specified cutoff frequency are allowed to pass, attenuating all frequencies above. The default cutoff is 10 kHz

❸ **`Bass and treble filters`** — Also known as shelving or tone filters, the separate bass and treble filters give the ability to cut or boost gain evenly above or below a given frequency, with the end-band shape giving the visual appearance of a shelf. These filters are typically applied to program material, and are expressed as bass and treble control. The default bass frequency is 100 Hz and the treble default is 8 kHz.

❹ **`Parametric equalizer filter`** — A parametric equalizer is a variable equalizer that offers control of all parameters, including amplitude (boost or cut — the amount of gain (boost) or gain reduction (cut) that is applied at a given frequency), center frequency (frequency), and bandwidth (Q). This allows the user to control the amplitude of each band, shift the center frequency, and widen or narrow the affected area.

`Dynamics` blocks (2) — The two dynamics processor blocks, when inserted, each provide one of four dynamic processors. A dynamic processor alters the dynamic range of an audio signal, the difference between the loudest to the quietest portions of the signal above the noise floor of the system. Dynamic range can either be increased using an expander (noise gate) or reduced using a compressor. Click the desired dynamics processor to select it or to view a live audio meter as shown at right.



The parameters of each processor can be changed in the dialog box, customized to the processor, that can be accessed by double-clicking the processor block.

❶ **Automatic gain control (`AGC`)** — AGC adjusts the gain level based upon the strength of the incoming signal to achieve a more consistent volume. Above a set threshold, weaker signals receive more gain to reach a user-defined target level; stronger signals receive less gain or no gain at all.

A *window* range is also applied above and below the target level. When the signal reaches the window, gain control starts scaling in a linear fashion toward the target level to achieve smoother results.

The default threshold is -40 dB. The default target level is -10.0 dB. The default gain and window are 12.0 dB.

❷ **Compressor** (See the **Dynamics blocks** drawing on the previous page) — The compressor regulates the level of the input signal by reducing, or compressing, the dynamic range of the signal above a specified threshold. The input-level-to-output-level ratio of the signal determines the reduction in the dynamic range beyond the threshold setting. For example, with a ratio setting of 2:1, for every 2 dB of input the compressor outputs 1 dB of gain.

Compression is commonly used to keep mic levels within an acceptable range for maximum clarity. A compressor make softer sounds louder either by reducing the dynamic range and then raising the output level of the compressor (referred to as *make-up gain*), or by increasing the input signal and then preventing clipping by reducing the louder portions of the signal. This has the effect of making louder portions of a signal softer. Compression also can be used, similar to a limiter, to protect a system or a signal chain from overload.

The default threshold is -30 dB. The ratio is 2.0:1.

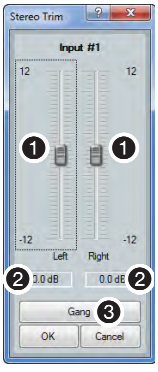
❸ **Limiter** (see the **drawing**) — The limiter regulates the level of the input signal by severely restricting its dynamic range above a specified threshold. The limiter prevents clipping and protects a system against component or speaker damage. The limiter is closely related to the compressor but applies a much higher compression ratio, in excess of 20:1 (often expressed as ∞:1) and with a high threshold setting (default is -10 dB, close to clipping). The ratio cannot be changed.

❹ **Noise gate** (see the **drawing**) — The noise gate is an expander, expanding the dynamic range of a signal below a specified threshold. To simplify, it makes soft signals softer, effectively removing background noise while allowing a stronger signal, above the threshold, to pass. Using a high ratio of 20:1, the expander closes the audio path below the threshold, eliminating background noise, opening the path above the threshold to allow signal to pass; hence the term *noise gate*.

The default threshold is -65 dB. The ratio is 20.0:1.

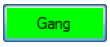
Delay block — The delay processor block, when inserted, provides a means to delay the audio signal to sync it to video. The processor can delay the audio using either time or distance in feet or meters between the video display and audio speakers, as a determiner. The default delay, when inserted, is at 100 ms using the time function. The settings of the delay block can be changed in the dialog box that can be accessed by double-clicking the processor block. When you select either **Feet** or **Meters**, you can also specify a temperature, in either degrees Fahrenheit or degrees Celsius The processor calculates the change in speed of sound for the specified temperature.

Trim control — The always-present trim control provides separate left and right input channel faders for fine adjustment with a gain range of -12 dB to +12 dB in 0.1 dB increments. The default setting is unity gain (0.0 dB).



Click and drag the desired fader (❶) or click in the dB field (❷) and type a value.

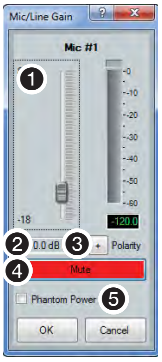
❸ **Gang button** — Select to tie the left and right fader controls together. Ganged faders move as described for the **item ❼** in "Gain control block", on page 87.



Mic/line input signal controls (see figure 40 on page 81, Ⓑ)

The mic/line input signal processor chain makes adjustments to microphone or line level audio material, such as a multimedia presentation, before it is mixed with program audio.

`Gain` control — The always-present gain control provides a single long-throw fader with a gain range of 0 dB to +80 dB, adjustable in 1 dB increments, with a level setting readout below the fader.



A gain range from 0 to +10 dB accommodates a line level signal, typically from a wireless microphone receiver with a line level output.

Above +10 dB, the input switches to a mic level input.

Click and drag the fader (❶) or click in the dB field (❷) and type a value. The meter value displayed in green shows the signal level in dBFS.

❸ **`Polarity` buttons** —Select to flip the polarity of the wires connected to the audio connectors (+/tip and -/ring) to easily correct for miswired connectors.

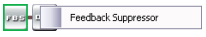
❹ **`Phantom` Power check box** — Click to toggle +48 VDC phantom power on and off, typically to power a condenser mic.

❺ **`Mute` button** — Select to silence and unmute the mic audio. If you mute the audio, it is completely silent on that input. When the audio is muted, a red indicator in the block turns on.

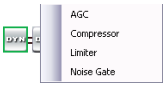
`Filter` block — The filter processor block, when first inserted, provides one of four filter selections; additional filters can be then be added. The available filters and adding additional filters are identical to as described for the Line audio **Filter block**, on page 87 (except that up to five filters total can be selected for this block).

NOTE: Selecting **`Bass & Treble Filter`** inserts two separate filters.

`Feedback` suppressor block — The feedback suppressor processor block, when inserted, detects feedback on a live microphone channel, and uses a set of fixed and dynamic filters to counteract the frequency peaks at the detected feedback frequencies. You may possibly achieve an additional 3 dB to 9 dB of mic gain where feedback would have otherwise prevented these levels.

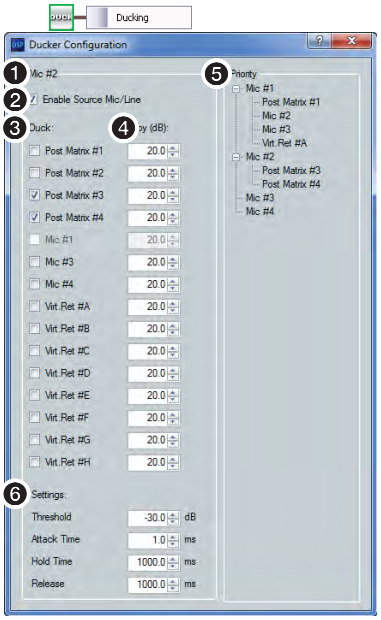


`Dynamics` blocks (2) — The two dynamics processor blocks, when inserted, each provide one of four dynamic processors. The available processors are identical to as described for the Line audio **Dynamics block**, on page 87.



`Delay` block — The delay processor block, when inserted, provides a means to delay the audio signal to sync it to video. The delay processor block is identical to as described for the Line audio **Delay block**, on page 88.

`Ducking` block — The ducking processor block, when inserted, provides a means to *duck*, or lower the level of one or more input signals (ducking targets, such as microphones, the program material, or audio input on the virtual bus) when a specified source must take precedence. The inserted ducking processor block ducks the targets when the processor detects a signal from the ducking source. Ducking lasts for the duration of the interrupting signal (plus hold and release time) and restores the original level of the ducked mic once the other signal has ceased. Ducking is useful when:



- Program material needs to be attenuated in order to more clearly hear the voice of the narrator.
- One microphone, such as one used by a master of ceremonies, needs to have priority over other mics, program material, or both.
- A paging mic needs to attenuate all other signals.

All four ducking processor blocks are controlled via a common dialog box that opens when you select to configure any of the ducking blocks. All empty ducking processor blocks have no ducking source or target settings by default.

In some cases, multiple levels of ducking may be required, enabling an input source to take precedence over all but one other input.

In the priority tree on the right side of the figure above, post-matrix 1, mic inputs 2 and 3, and virtual return A are set to duck when mic 1 has a signal above the ducking threshold. Mic 2 is set to duck post matrix 3 and 4. Since mic 1 has previously been set to duck mic 2, mic 1 is disabled to prevent contradictory priorities.

The inputs are arranged by their priority status. Mic 1 has all other ducked inputs under it; therefore, if a signal is detected, it triggers mics 2 through 4 to duck. If mic 2 detects a signal and there is no signal on mic 1, mic 2 triggers mics 3 and 4 to duck. However, if the mic 1 signal exceeds the threshold, it then ducks all inputs including mic 2.

NOTE: Ducking attenuation is not additive. When an input target is ducked, regardless of how far down the priority line it is, the maximum attenuation is that set for the individual input and virtual send in the "`by (dB):`" column near the center of the dialog box.

See **Ducker Priority Tutorial** on page 125 for a more detailed examination of priority.

❶ **Current source indicator** (see the drawing above) — Shows the input selected as the ducking source. Ducker settings affect the input channel shown here. When a ducker dialog is opened for a channel, the current source defaults to that channel. The current source can also be selected via the priority tree (see ❺, on the next page).

Mic #2

❷ **`Enable Source Mic/Line check box`** — When checked, ducking is enabled for the current source and the ducker processor block is lit. When cleared, ducking is disabled for the current source and the ducker processor block is unlit.

Enable Source Mic/Line

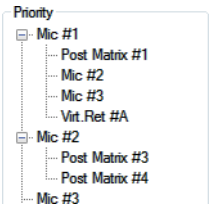
❸ **`Duck:` (targets)** — Shows all potential input targets. Only checked inputs are ducked. The current source is not available as a target (a source cannot duck itself). If the current source has been designated as a target of another input channel, that input channel is not available (a target cannot be the source).

Duck:
Post Matrix #1
Post Matrix #2
Post Matrix #3
Post Matrix #4
Mic #1

❹ **`by (dB):`** (See the **Ducking** block drawing on the previous page) — Individual attenuation settings for each duck target in dB. The default is 20.0 dB. If additional attenuation of a target is required, increase this value. The current source setting is not available.

The attenuation range is 80.0 to 0.0 dB in 0.1 dB increments.

❺ **`Priority`** (see the **drawing**) — Displays the hierarchy of ducking source to duck targets. Priority levels are displayed in tree fashion. Input channels that are targets being ducked by a source are shown as indented below the source. Any input channel displayed in the tree is an active link. Click an input channel to select that channel as the current source. The current source indicator (see ❶, on the previous page) reflects the selected input channel.



❻ **`Settings:`** (see the **drawing**) — Used to configure the parameter settings for the ducker source. When a ducker block is copied, these settings are transferred.

Threshold — Sets the input signal level, in dB, the ducking source must exceed before ducking begins. If ducking does not occur quickly enough to avoid loss of speech or program material from the ducking source, decrease this setting. If ducking occurs too soon, allowing background noise to trigger ducking, increase the setting.

The range is -60 to 0 dB in 1 dB increments. The default is -30 dB.

Attack Time — Adjusts the time to duck the targets once the threshold is exceeded.

The range is 0 to 3000 milliseconds in 1 millisecond increments. The default is 1 millisecond.

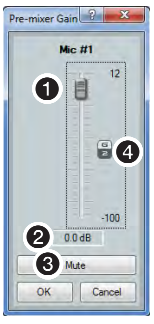
Hold Time — Determines the time, in milliseconds, after a ducking source signal drops below the threshold before ducking ceases.

The range is 0 to 10000 milliseconds in 1 millisecond increments. The default is 1000 milliseconds (1 second).

Release — Determines how long, in milliseconds, after the ducking source level is below the threshold and the hold time is met, the ducking targets take to restore signal levels.

The range is 10 to 10000 milliseconds in 1 millisecond increments. The default is 1000 milliseconds (1 second).

`Gain` control — The always-present gain control provides a single long-throw fader with a gain range of 12 dB to -100 dB, adjustable in 0.1 dB increments, with a level setting readout below the fader.



Click and drag the fader (❶) or click in the dB field (❷) and type a value. The meter value displayed in green shows the signal level in dBFS.

❸ **`Mute` button** — Select to mute and unmute the mic audio. If you mute the audio, it is completely silent on that input. When the audio is muted, a red indicator in the block turns on.

NOTES:

- The G2 indicator (❹) means that this fader is part of a group master (group 2 in this example) (see **Group masters**, on page 101 to create group masters).
- Multiple masters can be created for a fader, in which case the ❹ indicator is G#.
- By default, the front panel Mic Volume knob controls this fader.

AV matrix block (see figure 40 on page 81, C)

The AV matrix block (figure 44) displays the current tie configuration of either the program own emulation (Emulate mode) or the connected matrix switcher (Live mode) and provides a way to make or break ties.

- To create a tie, drag a line from an input node (○) to one or more output nodes.
- To tie an input to all outputs, right-click an input node and select **`Connect To All Outputs`**.
- The `Legend` panel identifies the type of tie: **`Video I/O`** (video breakaway), **`Video and Audio I/O`** (audio follow), or **`Audio Only`** (audio breakaway). Click the legend link to select the type of tie.
- To remove a tie, click an input or output node and press the keyboard <Delete> key or right-click an input or output node and select **`Delete All Connections`** (for an input node) or **`Delete Connection`** (for an output node).

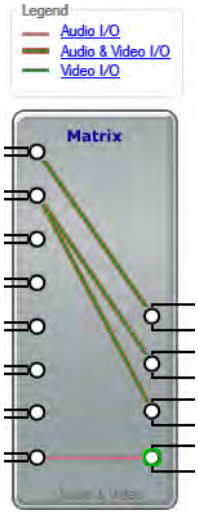


Figure 44. AV Matrix Block

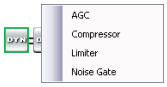
Virtual returns inputs controls (see figure 40, D)

The virtual returns input processor chain makes adjustments to inputs on the virtual bus from within the DTP CrossPoint switcher.

`Filter` block — The filter processor block, when first inserted, provides one of four filter selections; additional filters can be then be added. The available filters and adding additional filters are identical to as described for the Line audio **Filter block**, on page 87.

NOTE: Selecting **`Bass & Treble Filter`** inserts two separate filters.

`Dynamics` block — The dynamics processor block, when inserted, each provide one of four dynamic processors. The available processors are identical to as described for the Line audio **Dynamics block**, on page 87.



`Delay` block — The delay processor block, when inserted, provides a means to delay the audio signal to sync it to video. The delay processor block is identical to as described for the Line audio **Delay block**, on page 88.

`Gain` control (pre-mixer) — The always-present gain control provides a fader with a gain range of 12 dB to -100 dB, adjustable in 0.1 dB increments. The Gain block is identical to as described for the Mic/line inputs signals **Gain block**, on page 85.

Expansion port input signal gain control (see figure 40 on page 81, Ⓔ)

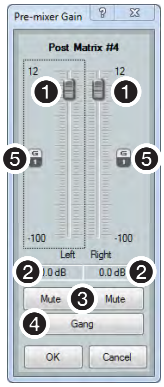
The always-present expansion port input pre-mixer gain control provides a fader with a gain range of 12 dB to -100 dB, adjustable in 0.1 dB increments. The Gain block is identical to as described for the Mic/line inputs signals **Gain block**, on page 85.

Post-matrix signal processor chain (see figure 40, Ⓕ)

The post-matrix signal processor chain makes adjustments to program audio material, after it is tied to a specific output but before it is mixed with microphone or other audio material.

`Loudness` block — The loudness processor block, when inserted, applies a filter compensation curve to the signal in an inverse relationship to the post-gain control setting and output volume control setting; the higher the post-gain or output volume setting, the less compensation is applied. For the relationship to the post-gain control, the left and right trims are represented by separate curves in the Loudness dialog. You can fine-tune the loudness compensation (see **Optimizing the Audio**, on page 129).

`Gain` (pre-mixer) **control block** — The always-present gain control provides left and right controls to adjust the audio level of each audio output from the AV switcher block through a range of -100 dB to +12 dB to ensure that there is no noticeable volume difference among sources.



Click and drag the desired fader (❶) or click in the dB field (❷) and type a value.

❸ **`Mute` buttons** — Select to separately silence and unmute the left and right audio channels. If you mute both channels, audio is completely silent on that output. When one or both channels are muted, one or two red indicators in the block turn on.

> **NOTE:** When the left and right channels are ganged, either **`Mute`** button mutes and unmutes both channels.

❹ **`Gang` button** — Select to tie the left and right fader controls together. Ganged faders move together at relative levels to the top or bottom of their travel. If one fader reaches the limit of its travel first, it retains that position while the other fader continues to travel. When the ganged faders travel in the reverse direction, the fader that was at its limit reverts to its position relative to the other fader.

> **NOTES:**
>
> - The G1 indicator (❺) means that this fader is part of a group master (group 1 in this example) (see **Group masters**, on page 101 to create group masters).
> - Multiple masters can be created for a fader, in which case the ❺ indicator is G#.
> - By default, the front panel Volume knob controls this fader.

Switcher-to-output mixer block (see figure 40 on page 81, G)

The switcher-to-output mixer block (see figure 45) sends audio from the AV matrix block to the output. It is an array of points where the output of the AV matrix can be mixed into the output of the DSP. The block provides a way to mute and unmute the output of the AV block onto the path to the physical audio connectors. The mix-points are unmuted by default. Unmuting effectively mixes the inputs into the audio outputs at the level set in the left and right mix controls.

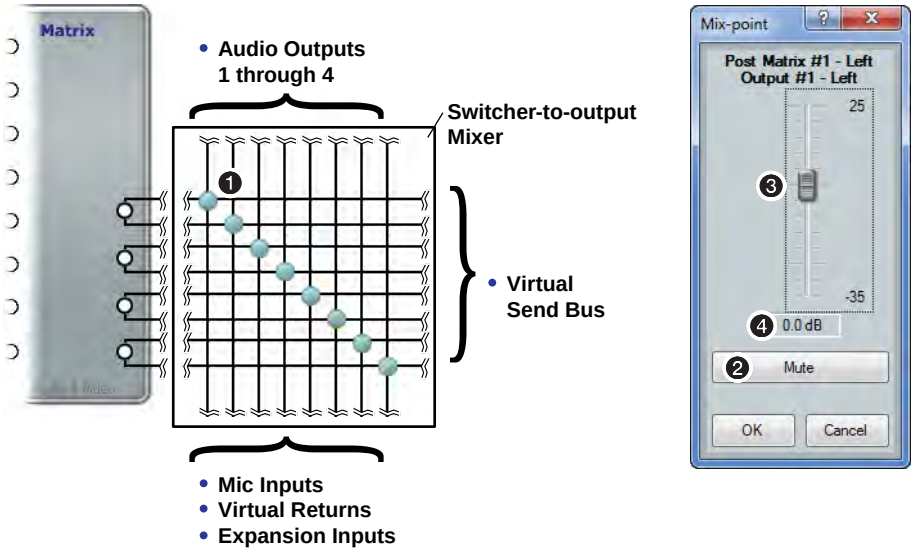


Figure 45. Switcher-to-output Mixer Block and Mix-point Dialog Box

To mute or unmute an input, double-click one of the mix-points (❶) to open a mix-point dialog box. Click the **Mute** button (❷) in the dialog box to unmute or mute the applicable input. The appearance of the mix-point indicates the input connection status as follows:

- Unmuted
- Muted

The mix-point dialog box features a fader control that provides a mix (level) adjustment with a gain range of -35 dB to +25 dB in 0.1 dB increments. Click and drag the fader (❸) or click in the dB field (❹) and type a value. The default setting is unity gain (0 dB).

TIP: If you have an audio signal is output on the virtual bus and looped around back to the virtual input, mute the audio output by the AV block in these mix-points to prevent the unprocessed signal from being output along with the processed audio.

Simplified mixer signal flow

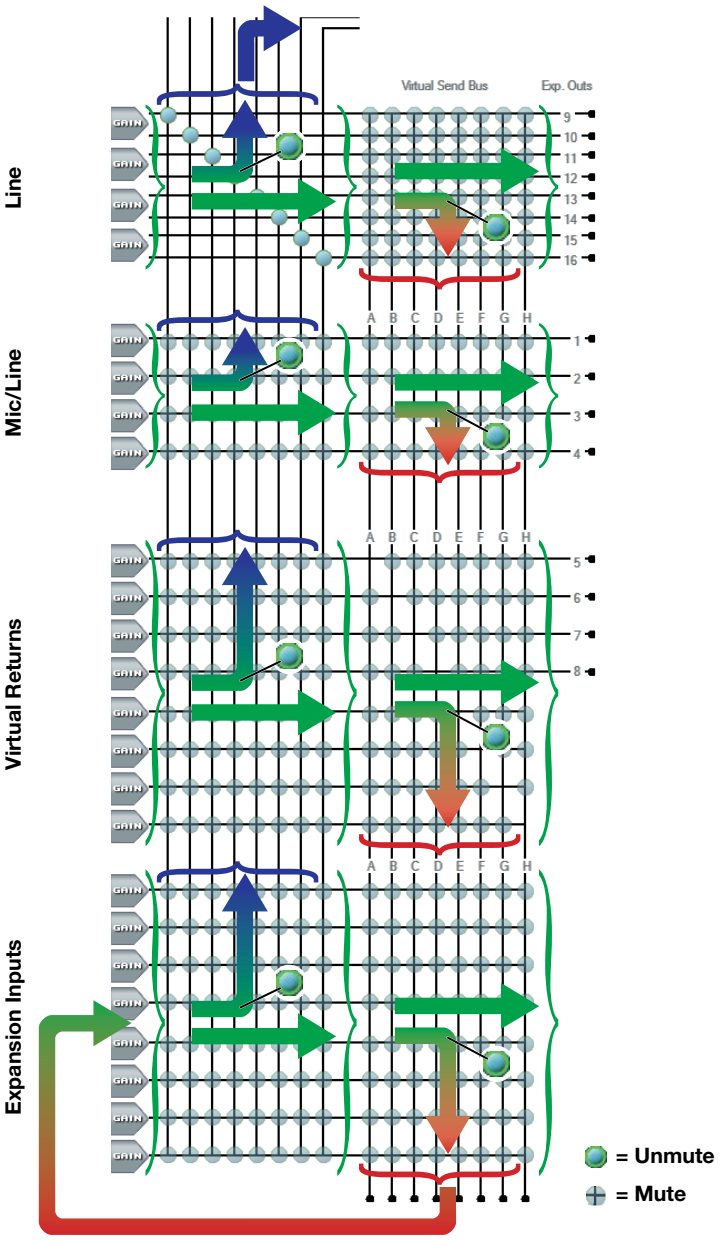


Figure 46. Simplified Mixer Signal Flow

- Mix-point mutes (indicated by ⊕ in figure 46, a graphic representation of the mixer) do not block the horizontal signal flow. Unless muted **before** the mixer, audio always flows from left to right through the mixer.
- Mix-point unmutes (●) redirect the audio vertically **without** disrupting the horizontal signal flow. In the first column of mix-points, audio is redirected up. In the second column, audio is redirected down.
- The virtual send bus does not exit the DSP, but is looped around for potential additional processing.
- In support of future DMP 128 applications, the Expansion bus outputs are not numbered intuitively in the signal flow diagram. Outputs 1 through 8 are below outputs 9 through 16.

Mic-to-output mixer block (see figure 40 on page 81, ❽)
Virtual returns-to-output mixer block (❾)
Expansion inputs-to-output mixer block (❿)

These three mixer blocks (see figure 47) are an array of points where mic, virtual bus, and expansion bus audio can be further mixed into the left and right channels of audio outputs 1 through 4. The block provides a way to unmute and mute the inputs from the mic/line input, virtual bus, or expansion bus signal processor chains. The mix-points are muted by default. Unmuting effectively mixes the inputs into the audio outputs at the level set in the mix controls.

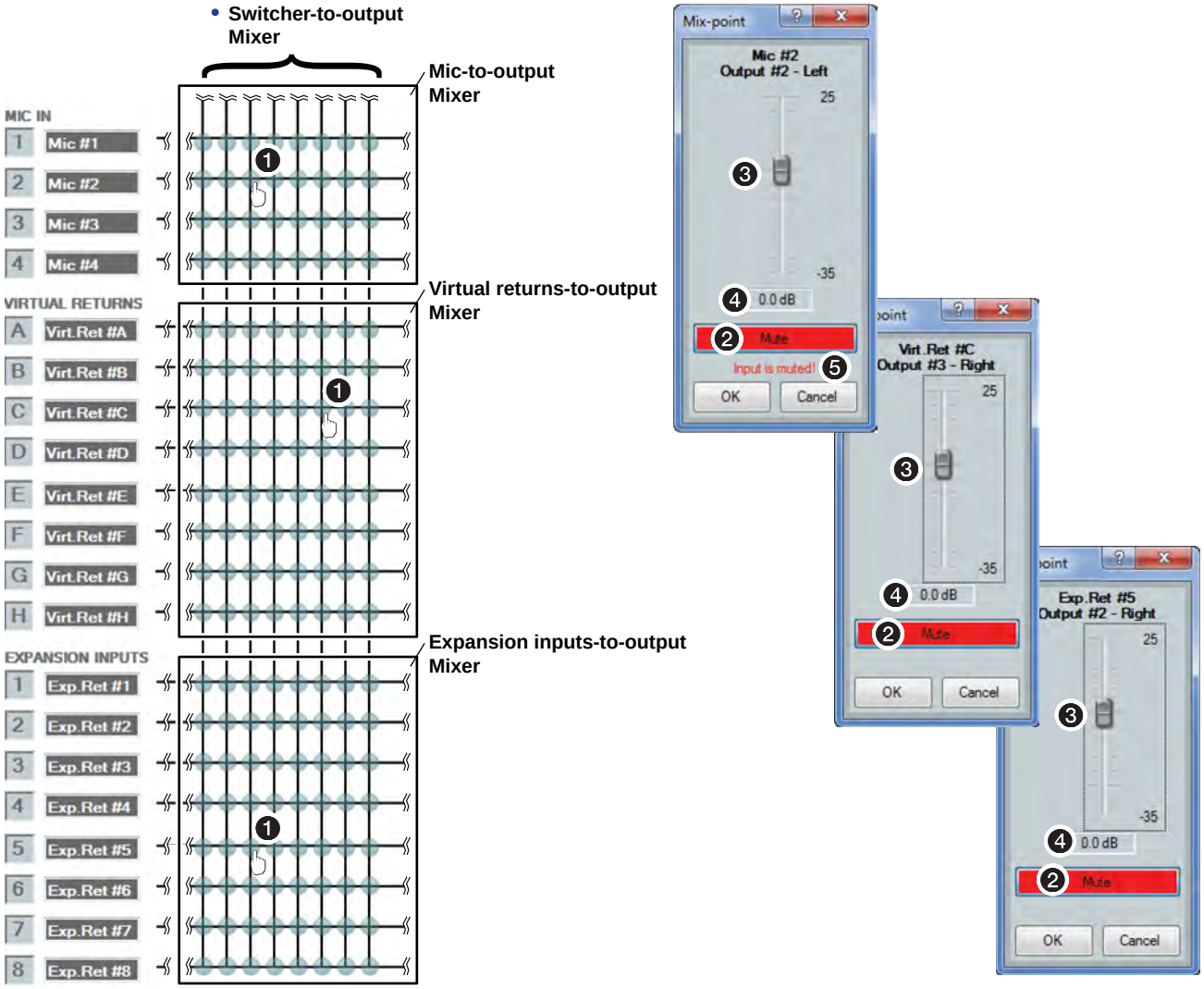


Figure 47. Output Mixer Blocks and Mix-point Dialog Boxes

To mute or unmute an input, double-click one of the mix-points (❶) to open a mixing dialog box. Click the **Mute** button (❷) in the dialog box to unmute or mute the applicable input.

The dialog boxes feature a fader control that provides a mix (level) adjustment with a gain range of -35 dB to +25 dB in 0.1 dB increments. Click and drag the fader (❸) or click in the **dB** field (❹) and type a value. The default setting is unity gain (0 dB).

NOTES:

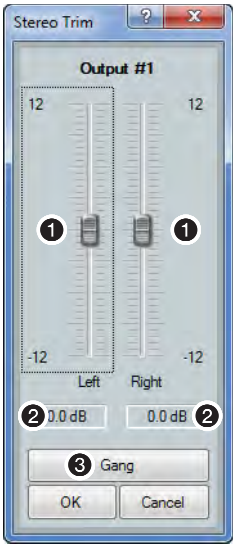
- Unlike from line inputs 1 through 4 (typically program audio), more than one mic, virtual return, or expansion port audio input can be mixed into a single audio output.
- The message **`Input is muted!`** in **figure 47** on the previous page (❺) indicates that **`Mute`** is selected in the mic/line input gain control block. This message can appear **ONLY** for mix-points in the mic-to-output mixer block.

Output signal processor chain (see figure 40 on page 81, ⓚ)

The output signal processor chain makes adjustments to mixed program and microphone audio, before it is output to the selected speakers or other audio devices.

NOTE: * This output 1 amplifier block is not present on non-IPCP models.

`Trim` control block — The always-present trim control provides left and right controls to adjust the audio level of each output through a range of -12 dB to +12 dB to ensure that there is no noticeable volume difference among sources.



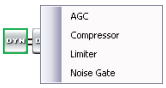
Click and drag the desired fader (❶) or click in the dB field (❷) and type a value. The meter value displayed in green shows the signal level in dBFS.

❸ **`Gang` button** — Select to tie the left and right fader controls together. Ganged faders move together at relative levels to the top or bottom of their travel. If one fader reaches the limit of its travel first, it retains that position while the other fader continues to travel. When the ganged faders travel in the reverse direction, the fader that was at its limit reverts to its position relative to the other fader.

`Delay` block — The delay processor block, when inserted, provides a means to delay the audio signal to sync it to video. The delay processor block is identical to as described for the Line audio **Delay block**, on page 88.

`Filter` block — The filter processor block, when first inserted, provides one of four filter selections; additional filters can be then be added. The available filters and adding additional filters are identical to as described for the Line audio **Filter block**, on page 87.

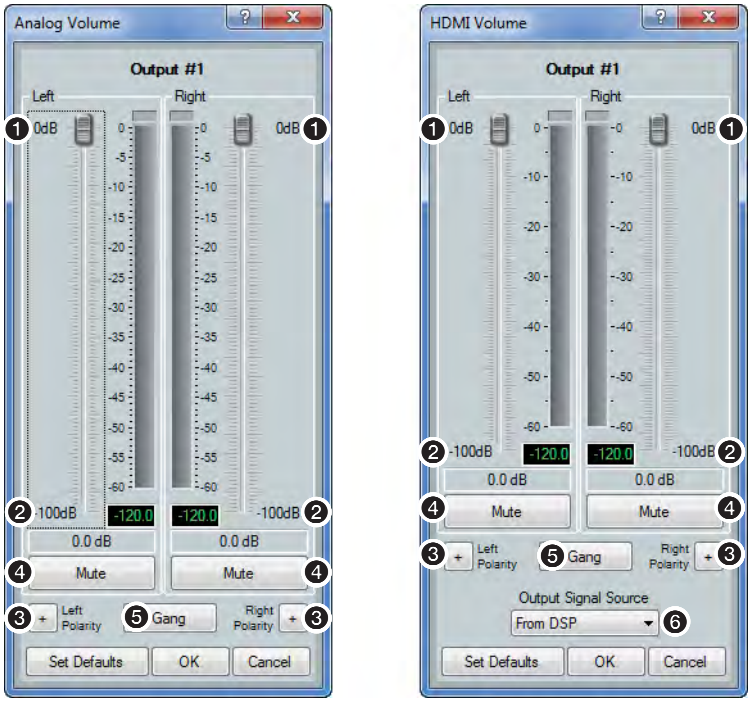
NOTE: Selecting **`Bass & Treble Filter`** inserts two separate filters.



`Dynamics` block — The dynamics processor block, when inserted, each provide one of four dynamic processors. The available processors are identical to as described for the Line audio **Dynamics block**, on page 87.

`Volume` controls — The always-present volume controls provide left and right controls to adjust the audio level of each output through a range of 0 dB (effectively muted) to +100 dB (full volume). There are three analog and two digital volume controls. They are similar, but for the **`Output Signal Source`** control. The analog and digital types apply to the outputs as shown below:

- Analog volume controls — All carry the same audio, assuming the same tied input, the same output source setting, and the same mix:
  - Amplifier (**`AMP`**) — Output 1 only (not present on non-IPCP models)
  - Analog volume (**`ANA VOL`**) — Output 1 through 4
  - Analog DTP (**`ANA DTP`**) — Output 3 and 4 only
- Digital volume controls — Both carry the same audio, assuming the same tied input, the same output source setting, and the same mix:
  - HDMI volume (**`HDMI`**) — Output 1 and 2
  - DTP (**`DTP`**) — Output 3 and 4 only.



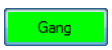
Analog Volume Control — Digital Volume Control

Figure 48. Analog and Digital Volume Controls

NOTE: For digital volume controls **only**, the **`Output Signal Source`** selection (❻ on the next page) affects the remaining controls in the block. If **`Original`** or **`No Audio`** is selected, all other controls in the block become unavailable for selection.

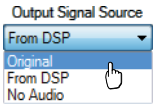
Click and drag the desired fader (❶) or click in the dB field (❷) and type a value. The meter value displayed in green shows the signal level in dBFS.

❸ **`Polarity` buttons** —Select to flip the polarity of the wires connected to the audio connectors (+/tip and -/ring) to easily correct for miswired connectors. 

❹ **`Gang` button** — Select to tie the left and right fader controls together. Ganged faders move together at relative levels to the top or bottom of their travel. If one fader reaches the limit of its travel first, it retains that position while the other fader continues to travel. When the ganged faders travel in the reverse direction, the fader that was at its limit reverts to its position relative to the other fader. 

❺ **`Mute` buttons** (see **figure 48** on the previous page) — Select to separately silence and unmute the left and right audio channels. If you mute both channels, audio is completely silent on that input. When one or both channels are muted, one or two red indicators in the block turn on.

❻ **`Output Signal Source` drop-down box** (see **figure 48**)— Use this control to select the audio source:



- **`Original`** — Audio embedded in the original digital (HDMI or DTP) input passes through the matrix switcher without being de-embedded and processed within the DSP. All other controls in the digital volume control become unavailable for selection, because audio is not processed within this block.
- **`From DSP`** — Audio is de-embedded and processed within the DSP.
- **`No Audio`** — Audio is muted (but no indication of the muting is shown other than the selection in this box). All other controls in the digital volume control become unavailable for selection, because audio is not processed within this block.

> **TIP:** If the **`Output Signal Source`** is set to **`Original`**, the digital audio embedded in the digital (HDMI or DTP) signal continues to be routed as part of the digital signal and is output with the video, *even for audio breakaway ties*.
>
> For video-only ties, select **`No Audio`** to prevent embedded audio from being routed with the video signal.

Switcher-to-virtual-send-bus mixer block (see figure 40 on page 81, L)
Mic-to-virtual-send-bus mixer block (M)
Virtual returns-to-virtual-send-bus mixer block (N)
Expansion inputs-to-virtual-send-bus mixer block (O)

These four mixer blocks (see figure 49) are an array of points where the switcher output, the mic, the virtual bus, and the expansion bus audio can be further mixed and routed for additional processing. The block provides a way to unmute and mute the inputs. The mix-points are muted by default. Unmuting effectively mixes the inputs into the audio outputs at the level set in the mix controls.

The function and indication of the mix-points and the dialog boxes are identical to as described for the **Mic-to-output mixer block**, on page 96.

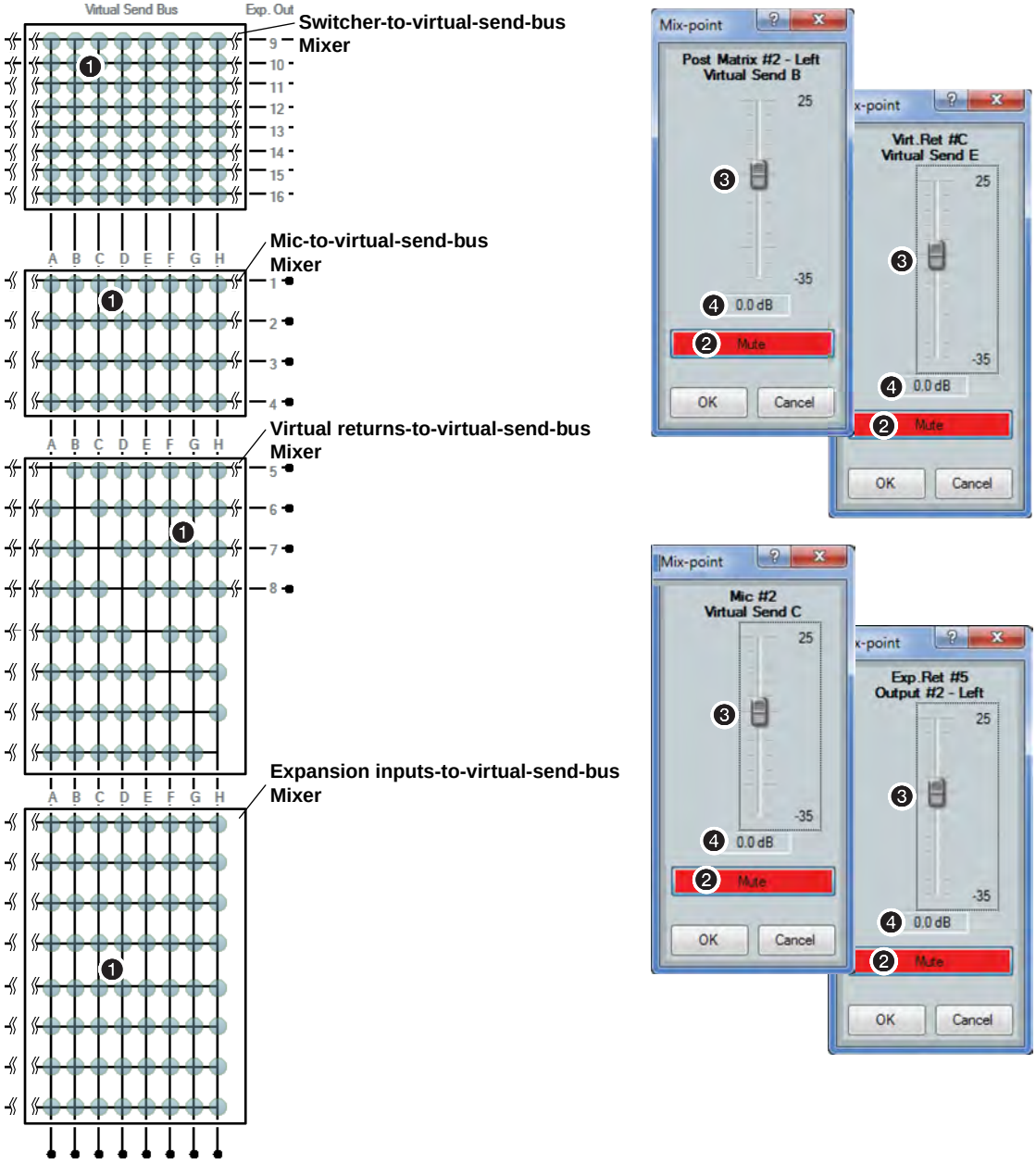


Figure 49. Virtual Send Bus and Expansion Bus Mixer Blocks and Mix-point Dialog Boxes

Group masters

Any of the gain, volume, trim, bass, and treble fader controls for one or more gain blocks can be grouped with other gain blocks of the same type (in the same location in the audio signal path but for different inputs or outputs) for single-fader control of the entire group (see figure 50) Mute controls within the blocks can also be grouped (see figure 51). Up to 32 groups can be created, each can include up to 16 group members.

NOTE: Stereo gain blocks have two, left and right, signal paths. Each path counts as a group member, limiting you to up to eight gain blocks total for a control group of stereo gain controls. In figure 50, the group 3 master consists of six members.

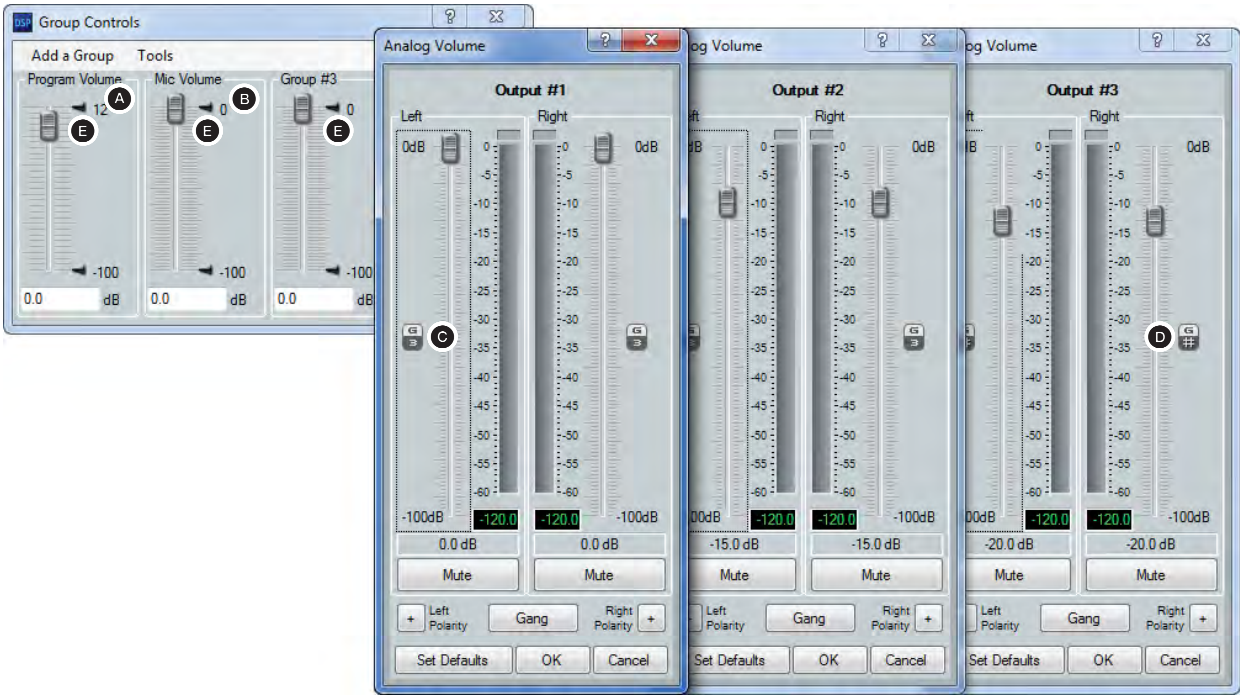


Figure 50. Sample Fader Group Master and Associated Gain Controls

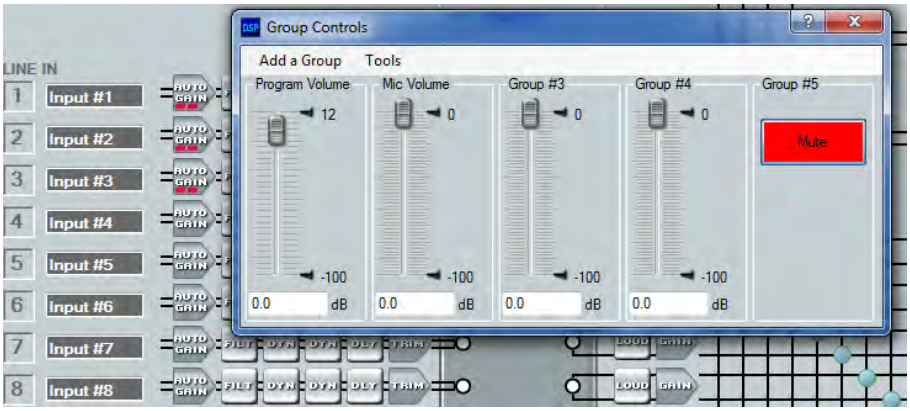


Figure 51. Sample Mute Group Master and Muted Inputs

As an example, assume that your system has several audio outputs dedicated to a single room. You want all outputs to receive the same audio input, but there are different audio dynamics in different parts of the room. Front row audience members need less mic audio mixed in, and you want to insert varying degrees of delay for different audience rows. The output 1 through output 3 analog volume controls can be grouped into a master that controls the volume throughout the room (see figure 50).

Each individual volume control in the group can be set for that output, but when you move the group fader, the faders for all three outputs move in tandem, retaining their relative levels.

NOTE: By default, group 1 (Ⓐ, in **figure 50** on the previous page) is configured as the Program Volume. Group 1 masters the **Pre-mixer Gain control block** (see page 93), and parallels the front panel Volume control. Group 2 (Ⓑ) is configured as the Mic Volume. It masters the **Mic/line Pre-mixer Gain control block** (see page 93), and parallels the front panel Mic volume control. These default groups can be overwritten if desired, but not deleted (see the **System reset** SIS command on page 64).

If you overwrite groups 1 and 2, the front panel controls adjust the group masters that you create in place of them.

An icon in the gain control indicates that that gain control is assigned to a group. In **figure 50**, the G 3 icon (Ⓒ) indicates group 3. The G # icon (Ⓓ) in the output 3 control indicates that that gain control is assigned to more than one group.

Grouped faders move together at relative levels to the top or bottom of their travel. If one fader reaches the limit of its travel first, it retains that position while the other faders continue to travel. When the grouped faders travel in the reverse direction, the fader that was at its limit reverts to its position relative to the other faders. No gain block level fader can be set beyond the upper or lower limits for that group fader, either the hard limits or the soft limits. Any gain fader in the group can be set to a level below the group fader.

Soft limits (, Ⓔ) are adjustable, letting you set the ceiling and floor for the group.

NOTE: If a block is muted, that block remains muted when the group mute is released.

TIP: Extron recommends that if you include a control in multiple groups, that you do so with care; overlapping group membership can quickly become unmanageable.

Configuring a group master

Configure a group as follows:

1. Click **`Tools`** > **`Configure Groups`** to open the Configure Groups dialog box.

   NOTE: Or, click **`View`** > **`Group Controls`** and then click **`Add a Group`**.

2. In the **`Select Group`** drop-down box, click a group to select it (see figure 52, ❶).

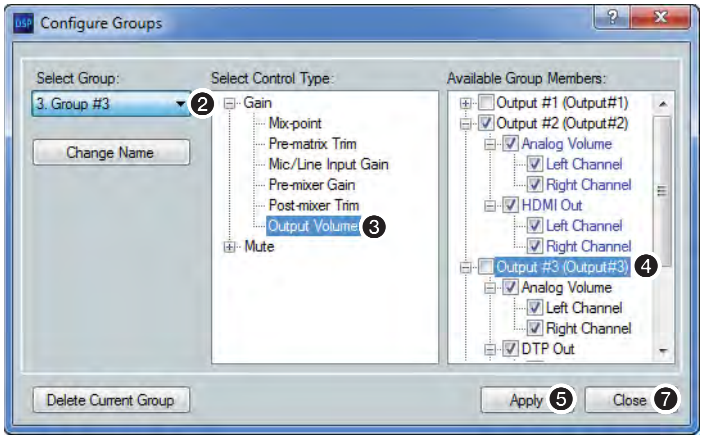


Figure 52. Configure Groups Dialog Box

NOTE: **`<empty>`** groups have no group members assigned. Numbered groups (such as **`Group #`**) or otherwise named groups have controls assigned that may be overwritten if you select them and continue.

3. In the **Select Control Type** field, click the **+** to expand the **Gain** or **Mute** tree and then select a control to assign it to the group.
4. In the **Available Group Members** field, click the desired check boxes to select or deselect those blocks as members of the group.

   Block trees with multiple potential group members automatically expand.

   Potential group members that are already assigned to a different group are displayed in blue text.
5. Click the **Apply** button to create or configure the group.
6. If desired, repeat steps 2 through 5 to create or configure other groups.
7. Click the **Close** button to exit the Configure Groups dialog box.

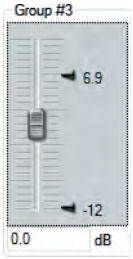
Deleting a group master

Delete a group as follows:

1. Click **Tools** > **Configure Groups** to open the Configure Groups dialog box.

   NOTE: Or, click **View** > **Group Controls** and then click **Add a Group**.
2. In the **Select Group** drop-down box, click a numbered group (such as **Group #3**) to select it (see **figure 52**, on the previous page).
3. Click **Delete Current Group**.
4. Click **Yes** in the Confirm Deletion dialog box.

Setting soft limits



Each gain type control provides upper and lower soft limits used to limit the range of the group master control. Soft limits (◄) prevent group controls from exceeding an upper limit or going below a lower limit. They are easily adjustable and provide the ability to set a ceiling and floor for the group. When a group master is created, the soft limits default to the hard limits (maximum and minimum) of that group of controls.

Soft limits can be defined using the mouse by clicking and dragging the Soft Limit icon. The resolution is 0.1 dB. For more precise setting, using the keyboard (see **Setting group master soft limits** on page 120).

Viewing and using a group master

Click **View** > **Group Controls** to open the Group Controls dialog box (see figure 53).

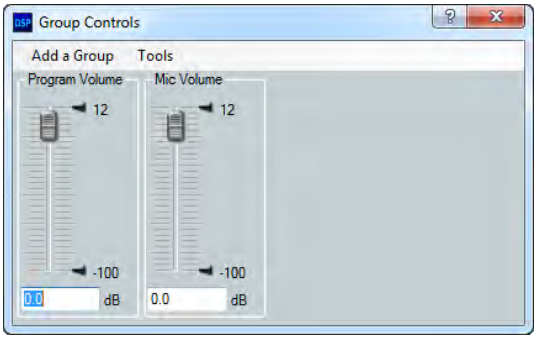


Figure 53. Group Controls Dialog Box

- Slide a group fader up and down to adjust all gain controls in the group.
- Click and drag a soft limit (◄) to set the ceiling or floor for the group.

NOTES:

- The soft limits cannot be dragged beyond the current setting of the group fader; the ceiling cannot be set below the fader and the floor cannot be set above the fader.
- None of the individual gain faders can be dragged below the floor or above the ceiling of the soft limits of the group.

- Click the **Mute** button in a mute group to mute or unmute all blocks in the group.

NOTE: If a block is muted, that block remains muted when the group mute is released.

- Click **Add a Group** to open the Configure Groups dialog box (see **Configuring a group master** and figure 52 on page 102).
- Click **Tools** > **Clear All Groups** in the Group Controls dialog box to delete all groups.
- Click **Tools** > **Increment/Decrement Simulator** in the Group Controls dialog box to open a dialog box (see figure 54) that lets you easily experiment with fine adjustments.

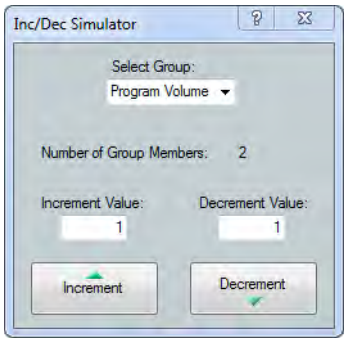


Figure 54. Increment/Decrement Simulator Dialog Box

NOTES:

- You must select a group before the other controls in the dialog box are active.
- The size of the increment can be changed from its default value of **1 dB** by typing a value in the **Increment Value** or **Decrement Value** field, to as fine as **Ø.1 dB**.

- Click **Tools** > **Group Details Report** in the Group Controls dialog box to create a text file that details all created groups (see figure 55).

```
GROUP DETAILS REPORT

Group #1 (Program Volume)
   Processor Type: Pre-mixer Gain
   Current Gain value: Ø dB
   Current Group Members:
      Output #1 (Output#1) Left Channel
      Output #1 (Output#1) Right Channel
Group #2 (Mic Volume)
   Processor Type: Pre-mixer Gain
   Current Gain value: Ø dB
   Current Group Members:
      Mic #1 (Input#9)
      Mic #2 (Input#10)
      Mic #3 (Input#11)
      Mic #4 (Input#12)
```

Figure 55. Sample Group Details Report

Video-only I/O page and audio-only I/O page

The video-only I/O page (see figure 56), selected by clicking **Video Only** in the legend field, clicking **View** > **Video I/O**, or pressing the keyboard <F4> key. Switching operations using the AV matrix block (see **AV matrix block (C)** on page 92) tie only video (video breakaway).

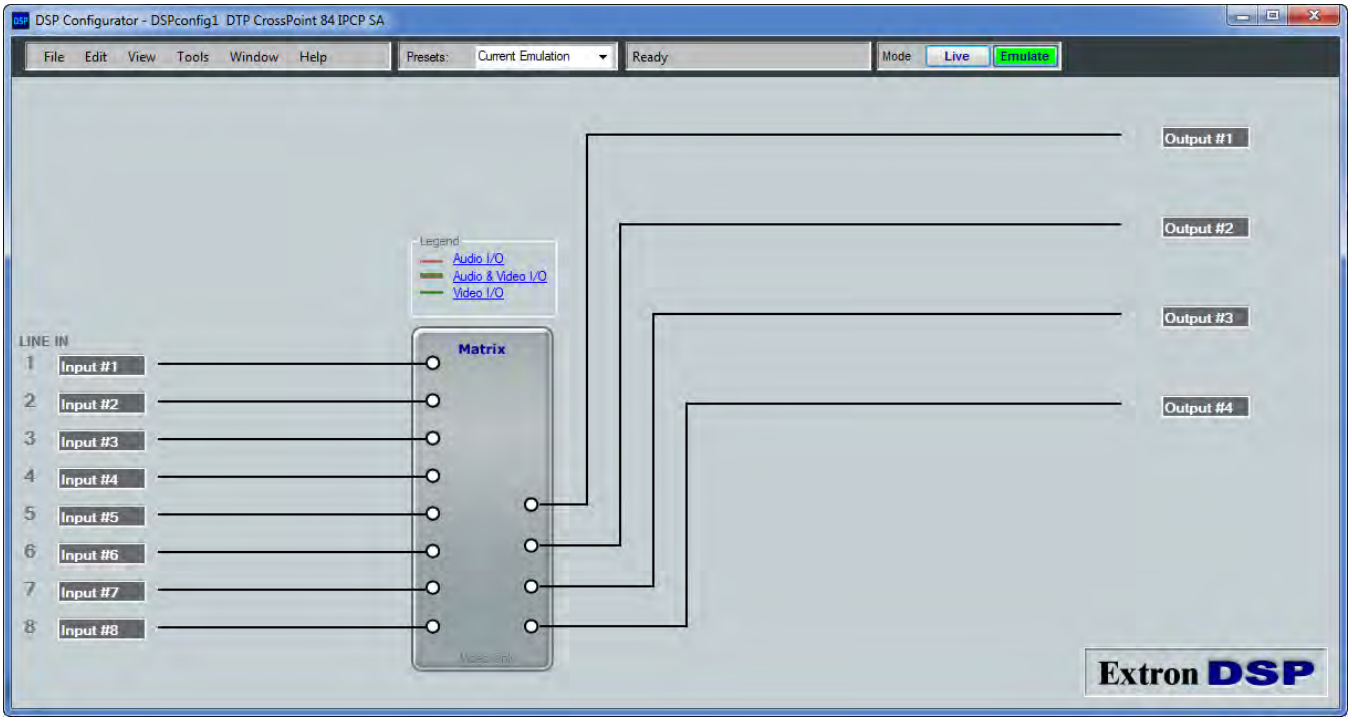


Figure 56. DSP Configurator Program Window, Video-only I/O Page

The audio-only I/O page, selected by clicking **Audio Only** in the legend field, clicking **View** > **Audio I/O**, or pressing the keyboard <F3> key. The appearance is identical to the video & audio I/O page (see **figure 40** on page 81), and the same audio control are available. Switching operations using the the AV matrix block (see **AV matrix block (C)** on page 92) tie only audio.

Presets

The DTP CrossPoint 84 can store up to 32 presets and can include both selected ties and selected audio signal processing settings made in the program. Presets, when recalled, overwrite only a portion of the current configuration, leaving other ties and settings unchanged, and are useful when only selected ties and/or settings, such as for a particular room, need to be changed.

Save a preset

Before you save a preset using the DSP Configurator program, you must select (mark) the desired ties and signal processor blocks. Save a preset as follows:

1. Mark the desired video and audio ties as desired:
   a. Click an output node (○). The node is marked by a green outline (◎).

      The output and the tied input are selected to be saved as a preset.
   b. Ctrl-click additional outputs as desired.

TIPS:

- If an input is tied to multiple outputs, and you want the entire set of ties saved as a preset, mark each output to save that tie.
- To mark multiple successive outputs (marking all outputs selects all ties), mark the uppermost output node as described in step 1a. Then, Shift-click an output node under it to mark all of the outputs between the two nodes.

2. Mark the desired mic mix-points:
   a. Click a mix-point (●). The point is marked by a green outline (◉).

      The mic/line input, the mixed output, and all mix settings are selected to be saved as a preset.
   b. Ctrl-click additional mix-points as desired.

TIPS:

- To mark the same mic/line input mix-point for a successive series of outputs, mark the leftmost or rightmost mix-point as described in step 2a. Then, Shift-click a mix-point to the left or right of it to mark each mix-point in the row (mix the mic/line input to each output).

- To mark the same output mix-point for a successive series of mic/line inputs, mark the uppermost mix-point as described in step 2a. Then, Shift-click a mix-point under it to mark each mix-point in the column (mix the output to each mic/line input).

3. Mark the desired gain and/or processor blocks:
   a. Click a processor block. The block is marked by a green outline (▣).

      The processor block and all of its settings is selected to be saved as a preset.
   b. Ctrl-click additional processor blocks as desired.

TIP: To mark multiple successive processor blocks in a chain, use right-click > **Mark Row**.

4. Save the preset:

   a. Click **Tools** > **Presets** > **Save Presets**.

      The Save a Preset dialog box appears.

   b. **As desired**, enter a specific preset number

   c. **As desired**, enter a preset name.

      NOTE: Unless you enter a specific number, name, or both, the DSP Configurator enters the next unused preset number and the name "`Preset {number}`.

   d. Click **OK**.

Recall a Preset

Recall a preset as follows:

1. Select the desired preset in the **Presets** drop-down box (see figure 57).

   The selected preset appears in the **Presets** drop-down box, marked processors appear indicated by green boxes, ties that will be loaded as part of the preset are shown by dashed lines, and ties that will be eliminated by the preset are indicated by the output node highlighted in green.

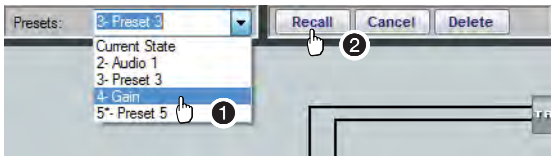


Figure 57. Recalling a Preset

NOTES:

- The **Recall**, **Cancel**, and **Delete** buttons appear when a preset is selected.
- An asterisk (*) in the drop-down box indicates that a preset that only exists in the switcher has not been saved to the configuration file of the DSP Configurator. The ties and settings of the preset are not in sync between the DSP Configurator program and the switcher.
- Presets marked with an asterisk should be recalled and then the current DSP Configurator settings saved. Click **File** > **Save** or **File** > **Save As**.
- It may take up to two seconds for the preset data to read-in in LIve mode.

2. Click **Recall** to load and make active the selected preset.

TIPS:

- Click **Cancel** to abandon the preset recall (but not deleting the preset) and return to the current configuration.
- Click **Delete** to permanently erase the preset..

Emulate mode vs. Live mode

The DSP Configurator program always starts in Emulate mode. In Emulate mode, you can perform all of the functions available in the DSP Configurator program, without connecting a switcher to the computer, and save all of the ties and settings to a configuration file on your PC. When you open the file via the DSP Configurator program, the program restores all ties and settings as the current configuration (emulated if in Emulate mode or live, in the switcher, if in LIve mode) and makes presets saved in the file available for recall.

Synchronizing: pull vs. push

When you switch to LIve mode, after making ties or setting processors in Emulate mode, you need to synchronize the switcher and the DSP Configurator program. You are given the opportunity to either:

- *Pull* data from the switcher and update the configuration of the DSP Configurator program.
- *Push* data from the DSP Configurator program to the switcher, overwriting ties, settings, and presets in the switcher.

You can also switch to LIve mode and then tailor the audio settings in real time, while listening to the audio output with a critical ear.

Selecting Live mode and pulling data

Switch from Emulate mode to LIve mode as follows:

NOTE: Extron recommends connection via an Ethernet LAN port for DSP Configurator.

1. Click the **Mode Live** button (see figure 58). The Connect to device window appears, with either the TCP/IP tab, the USB tab, or RS-232 tab active.

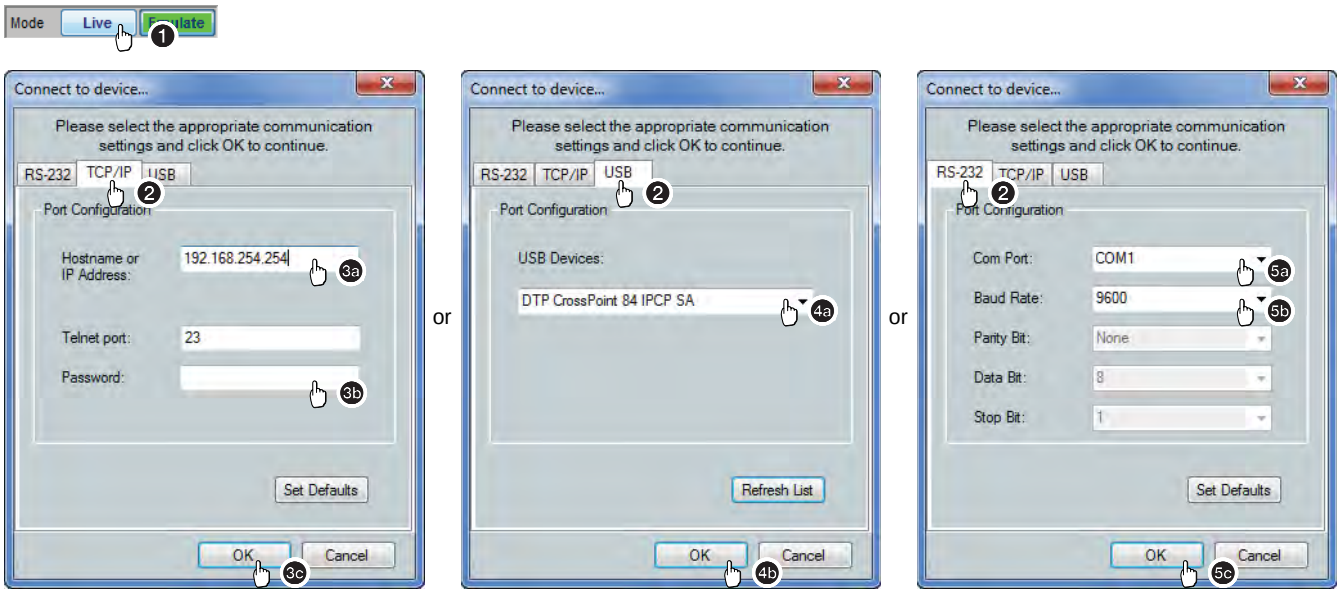


Figure 58. Selecting Live Mode

2. **If necessary** and as desired, click either the:
   - **TCP/IP tab** (for connection via the LAN port (preferred) — Proceed to step 3).
   - **USB tab** (for connection via the front panel Configuration port — Proceed to step 4).
   - **RS-232 tab** (for connection via the rear panel Remote port — Proceed to step 5).

3. **If you selected TCP/IP in step 2**:

   a. Observe the IP Address field in the IP Connection window. The field displays the last IP address entered.

      If the IP Address field is correct, proceed to step 3b.

      If the address is not correct, either click in the **IP Address** field and enter the IP address or click on the scroll down button (▾) to open a drop-down box 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 password.

   c. Click **OK**.

      The Synchronize with Device dialog box (see **figure 59**, on the next page) appears. Proceed to step 6.

4. **If you selected USB in step 2**:

   a. Click the **USB Devices** drop-down box and select the switcher.

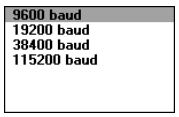
   b. Click **OK**.

      The Synchronize with Device dialog box (see **figure 59**) appears. Proceed to step 6.

5. **If you selected RS-232 in step 2**:

   a. Click the **Com Port** drop-down box and select the PC comm port that is connected to the rear panel RS-232 port of the switcher.

   b. Check the baud rate displayed in the comm port selection window. If you need to change the baud rate to match the rate of the switcher, click the **Baud Rate** drop-down box and select the desired baud rate. The default is **9600**.



   c. Click **OK**.

      The Synchronize with Device dialog box (see **figure 59**) appears. Proceed to step 6.

6. **If necessary** and as desired, click (see **figure 59**) either the:

   - **Pull** radio button (❶) (to configure the DSP Configurator program to match the switcher — proceed to step 8)
   - **Push** radio button (❷) (to configure the switcher to match the DSP Configurator program — proceed to step 7)

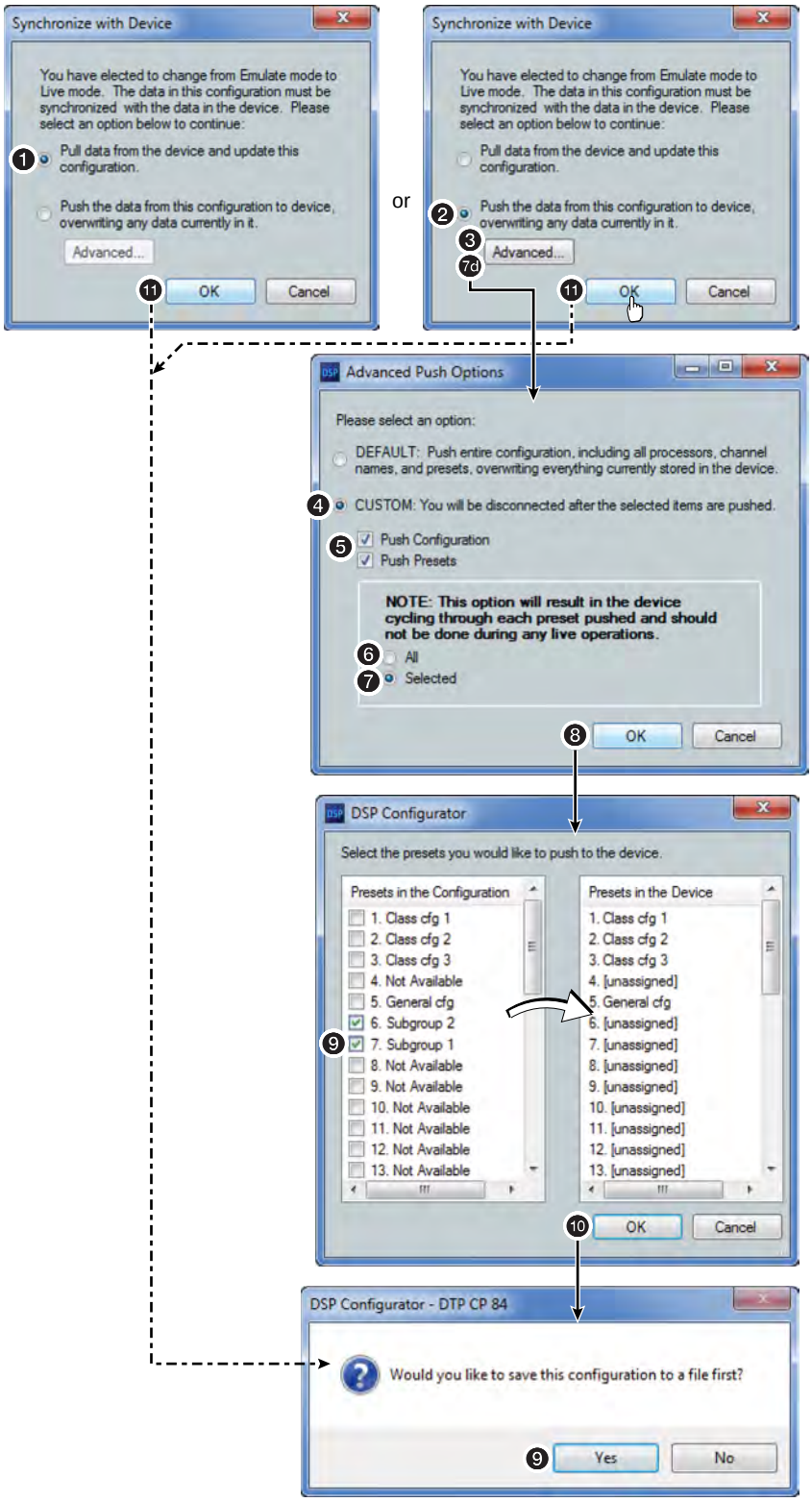


Figure 59. Selecting Live Mode, Continued

7. If you want to tailor the push to the switcher (push just the configuration, just the presets, or the configuration and selected presets), click the **Advanced** button (see figure 59 on the previous page, ❸) and proceed to step 7a.

   To push all of the DSP Configurator ties, gain and processor blocks, and presets to the switcher, proceed to step 8.

   a. Select the **Custom** radio button (❹).

   b. Select one or both check boxes as desired; **Push Configuration** and **Push Presets** (❺).

      NOTE: Configuration includes all ties, mic mixes, and gain and processor blocks. This selection does not include presets.

   c. If you selected **Push Presets** in step 7b, select either:

      Selected (❻) and **OK** (❽)— The **Select** dialog box opens. Proceed to step 7d.

      All (❼ and **OK** (❽), equivalent to a standard push) — The DSP Configurator program is connected live to the switcher, completing the mode selection. Ties, processors, and presets are pushed or pulled as selected.

   d. Select the desired presets to push by clicking the appropriate check boxes (❾).

   e. Click **OK** (❿). Proceed to step 9.

8. Click **OK** (⓫). The DSP Configurator program is connected live to the switcher, completing the mode selection. Ties, processors, and presets are pushed or pulled as selected.

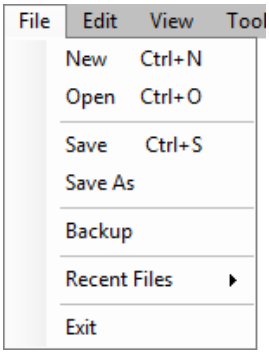
9. If you have created ties or made any changes to the DSP parameters (including gain and processor blocks) since the last time you saved to a file, the DSP Configurator prompts you to save the file. Click **Yes** or **No**, as desired,

   If a password was required and not entered or if an incorrect password was entered, the program prompts for the password.

DSP Configurator Windows Menus

DSP Configurator File menu

NOTE: **New**, **Open**, and **Recent Files** are unavailable in LIve mode.



New — Discards the current DSP configuration (after prompting to save any changes) and opens a blank configuration file with no inserted processors, saved presets, created ties, or mic mixes.

Open — Loads and activates a previously saved DSP configuration file.

Save — Saves all changes to the current DSP configuration file under the current file name. If the file has not previously been saved the program prompts for a file name.

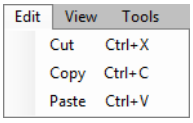
Save As — Saves all changes to the current DSP configuration file under a new file name.

Backup — Transfers all presets plus the current configuration to a DSP configuration file within the DSP Configurator program.

Recent Files — Opens a list of recently opened or saved DSP configuration files, making it easy to select one to open.

Exit — Closes the DSP Configurator Program.

DSP Configurator Edit menu



Cut — Copies all of the parameters of a selected processor block or set of selected blocks to the clipboard and removes the blocks from the processor stream.

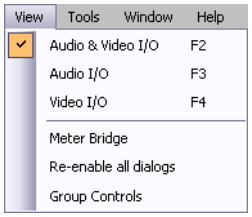
NOTES:

- Gain blocks are always present and cannot be **Cut**.
- Processor blocks are removed from the processor stream after a **Cut** and a subsequent **Paste** operation.
- Processor blocks and their parameters can be pasted only into another block of the same type. For example, the input 1 filter block and all of its parameters can be copied to the input 2 filter block but not to the input 1 delay block.

Copy — Copies all of the parameters of a selected processor block, gain block, or set of selected blocks to the clipboard.

Paste — Inserts processor blocks and their parameters from the clipboard into the DSP Configurator program at the location selected.

DSP Configurator View menu



Audio & Video I/O — Selects the audio and video I/O page for the DSP Configurator program (the default view).

Audio I/O — Selects the audio-only I/O page for the DSP Configurator program.

Video I/O — Selects the video-only I/O page for the DSP Configurator program.

Meter Bridge — Opens a Meters dialog box (see figure 60) with real-time meters that monitor the audio levels at each input and output.

NOTE: **Meter Bridge** is available in LIve mode only and only while connected via the LAN port of the switcher.

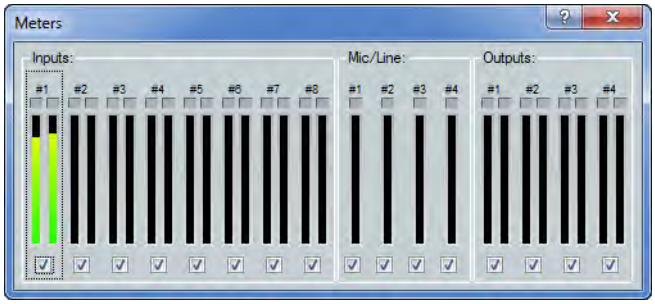
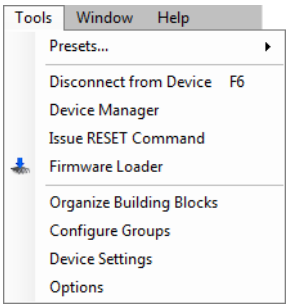


Figure 60. Meter Dialog Box

Re-enable all dialogs — Re-enables all dialog boxes, the pop-up windows that allow you to make changes to the parameters of a block.

Group Controls — Opens the the Group Controls dialog box (see **Viewing and using a group master** on page 104).

DSP Configurator Tools menu



Presets — Allows you to mark all items, save a preset, and clear marked items:

- **Mark All Ties** — Mark (select) all created ties to save as a preset.
- **Mark All Items** — Mark (select) all parts of the current configuration (excluding presets), including processors, created ties, and mic mixes to save as a preset.
- **Save Preset** — Save the currently marked processors, ties, and mic mixes as a preset.
- **Clear Marked Items** — Unmark (deselect) all parts of the current configuration (excluding presets), including processors, created ties, and mic mixes.

Connect to Device or **Disconnect from Device** (depending on Emulate or LIve mode) — Performs the same functions as the **Mode Emulate** and **Mode Live** buttons.

Device Manager — Opens the Device Manager dialog box, in which you can switch between devices that use the DSP Configurator and also add, clone (duplicate), or delete devices that use the DSP Configurator.

Issue RESET Command — Initializes and clears any or all of the following: ties, mic mixes, presets, audio configuration, processor blocks, and gain blocks. This reset is identical to the Esc**ZXXX**← SIS command (see page 64).

Firmware Loader — Calls the Firmware Loader program, which allows you to replace the switcher firmware without taking the switcher out of service. This is similar to the Product Configuration Software Update Firmware selection (see **Updating the Firmware**, on page 77).

Organize Building Blocks — Opens the Organize Building Blocks dialog box, in which you can save building blocks, move them within folders, or delete them (see **Organizing listed building blocks**, on page 122).

Configure Groups — Opens the Configure Groups dialog box (see **Configuring a group master** on page 102).

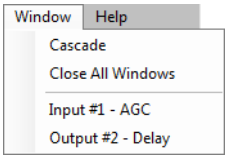
Device Setting — Opens a dialog box that provides a means to set the IP address and passwords of the unit and to set the baud rate for the serial port.

Options — Opens a tabbed dialog box that allows you to tailor the appearance and operation of the DSP Configurator program to your liking:

- **Appearance** — Change the color style of the program.
- **Complimentary Colors** — Set the primary and secondary colors in the filter blocks. Complimentary colors allows custom selection of colors used with the various graphs and dialog boxes. Graph colors change the row colors containing the information and descriptions of the graphs seen in the processor blocks.
- **Graph Colors** — Change the row colors containing the information and descriptions of the graphs seen in the processor blocks.
- **Preferences** — Contains options for selection of the devices to connect to, or to **Always ask** on startup. That selection can be changed using **Default Device**.

  If Show Meters is set to **True**, Dynamic Block Meters can be used to tailor the appearance of the dynamics meters to use the full meter to show input and gain reduction, or to show the level based on the output and gain reduction.
- **Processor Defaults** — Sets the default parameters for all processors. Also allows you to restore the factory defaults for these processors.

DSP Configurator Window menu



`Cascade` — Rearranges all open DSP Configurator program windows, including dialog boxes, in a cascading array.

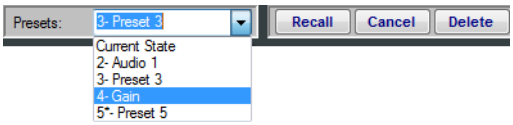
`Close All Windows` — Closes all open dialog boxes.

Individual windows — Brings the associated dialog box to the front of the desktop.

DSP Configurator Help selection

Opens the DSP Configurator program Help file.

DSP Configurator Presets drop-down box



Displays a list of up to 32 presets, which can include ties and audio settings. You can select a preset from the list to display it in the window and either activate it (Recall), abort the selection without
either recalling or deleting it (Cancel), or delete it (Delete) (see **Recall a preset** on page 107).

NOTES:

- The **`Recall`**, **`Cancel`**, and **`Delete`** buttons appear when a preset is selected.
- An asterisk (*) in the drop-down box indicates that a preset that only exists in the switcher has not been saved to the configuration file of the DSP Configurator. The ties and settings of the preset are not in sync between the DSP Configurator program and the switcher.

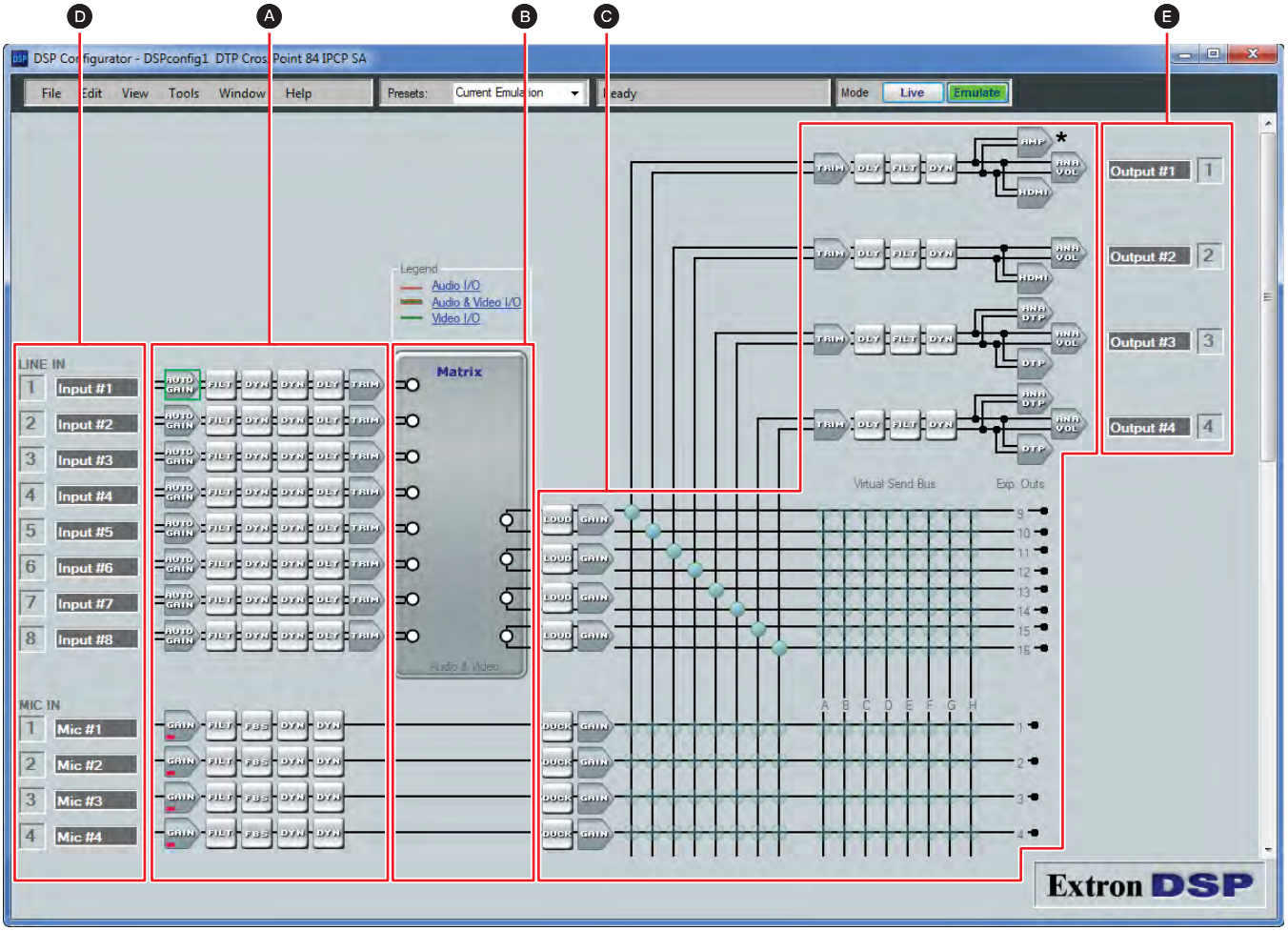
DSP Configurator Mode buttons

Allows you to select between LIve mode and Emulate mode (see **Emulate mode vs. Live mode**, on page 107, for more information).

Keyboard Navigation

The DSP Configurator program is fully navigable using the computer keyboard. Some keyboard navigation behavior matches Windows standards, while other behaviors are specific to the DSP Configurator program.

When the program is started, the cursor focus is in the upper left corner of the program audio input (line signal processor chain (A) on figure 61). The Input 1 Gain block is highlighted green [ ]).



***** This output 1 amplifier block is not present on non-IPCP models.

Figure 61. DSP Configurator Program Window

Standard Windows navigation

The keyboard keys navigate and function as follows:

- **<Tab> key** —

  Sequentially jump among major segments of the DSP Configurator program. From the audio input chains (A), sequential jumps are in the following order:

  - AV matrix block (B)
  - Output processor chains and mixers (C)

- **<Shift>-<Tab> key combination** —

  Reverses the direction of the <**Tab**> key function.

- **Arrow (←, →, ↑, and ↓) keys** —

  Navigate up, down, left, and right within any of the areas in the DSP Configurator.

  Jump from the audio input blocks (see **figure 61** on the previous page, Ⓐ) into the input name fields (Ⓓ).

  Jump from the output blocks (Ⓒ) into the output name fields (Ⓔ).

- **<Enter> Key** — Performs the same action as a mouse double-click. For example, opens the context menu from which a processor type may be selected or opens a dialog box when applicable. When an action button is highlighted, <**Enter**> executes the button action and toggles the button when applicable.

- **Control key** — The <**Ctrl**> key can be used in the following shortcuts.

  - **<Ctrl>-<X>** — Cut the selected elements.
  - **<Ctrl>-<C>** — Copy the selected elements.
  - **<Ctrl>-<V>** — Paste the selected elements.
  - **<Ctrl>-<E>** — Go to Emulate mode.
  - **<Ctrl>-<A>** — The first press of the Ctrl-A combination highlights all AV matrix block (Ⓑ) output nodes. The second press highlights all elements within the program.

- **<Alt> key** — The <**Alt**> key is used with specific letter keys to open and navigate task bar menus. When the <**Alt**> key is pressed and either held or released, the first letters in the menu titles (**F**ile, **E**dit, **V**iew, **T**ools, **W**indow, or **H**elp) become underlined. Press the underlined letter key to open that menu.

  Once a task bar menu is open, use the up and down arrow keys to move up and down in the menu or submenu, use the right key to open a submenu (if applicable), and use the <**Esc**> key to back out of an active menu or submenu.

DSP Configurator-unique navigation

Making ties

Video and audio ties can be made from the keyboard as follows:

1. Use arrows (←, →, ↑, and ↓) and <**Tab**> to navigate to the AV matrix block (B) input node (O) from which you will make the tie. The node is marked by a yellow outline (O).
2. Press and **hold** <**Shift**><**Tab**> while you press right arrow → to drag the potential tie (dashed line) to the corresponding output node (input 1 to output 1, 2 to 2, and so on).
3. Release <**Shift**>.
4. Press <**Enter**> to execute the tie.
5. **If desired to make additional ties from the same input**, press up arrow ↑ or down arrow ↓ (<**Shift**> is not required) to select another output to tie to the same input.
6. **If you made additional ties from the same input**, press <**Enter**> to execute the tie.
7. **If desired**, repeat steps 5 and 6 to tie additional outputs to the same input.
8. **If desired to make ties from a different input**, press left arrow ← once, and repeat steps 1 through 7.
9. Press <**Tab**> , <**Esc**> , right arrow → , or left arrow ← to exit the set ties operation.

Highlighting and marking items, cutting or copying, saving a preset

When an item within the program is selected, it is green highlighted. One or more highlighted items can be cut, copied, pasted, or saved as a preset. The cut, copy, and paste functions can be performed using the task bar menus (see **<Alt> key** on the previous page) or the shortcuts described on the previous page.

NOTE: When an item is cut, it is not removed from its original location until it has been pasted in its new location.

Highlight multiple elements for cut, copy, paste, or a preset as follows:

1. Use arrows (←, →, ↑, and ↓) to move to the first block to highlight.
2. **To highlight sequential blocks**:, press and hold <**Shift**> , then use arrows (←, →, ↑, and ↓) to navigate to and highlight additional elements.

   When you reach the last element you want highlighted, release <**Shift**>.
3. **To highlight non-sequential blocks**:
   a. Press and **hold** <**Ctrl**>, then use arrows (←, →, ↑, and ↓) to navigate to the next desired element
   b. Release <**Ctrl**>.
   c. **To highlight sequential blocks**, press and hold <**Shift**>, then use arrows (←, → , ↑, and ↓) to navigate to and highlight additional elements.
   d. **To move away from the highlighted block or set of sequential blocks**, press and hold <**Shift**>, then use arrows (←, →, ↑, or ↓) to move the highlighting box away from the last-highlighted element.

      NOTE: If you do not perform step 3c, the last selected element will not remain highlighted.

   e. Release <**Shift**>.
4. **To highlight another element or group of elements**, repeat steps 1 through 3.
5. **To cut or copy**, press the <**Ctrl**>-<**X**> or <**Ctrl**>-<**C**> combination.

6. **To save a preset**, press <**Alt**>, then <**T**>, then right arrow →, then down arrow ↓, then <**Enter**> (see figure 62).

   The Save a Preset dialog box appears.

   a. **As desired**, <**Tab**> to the **Preset Number** field and type a specific preset number.

   b. **As desired**, <**Tab**> to the **Preset Name** field and type a preset name.

   NOTE: Unless you enter a specific number, name, or both, DSP Configurator enters the next sequential unused preset number and the name **Preset** *number*.

   c. Press <**Tab**> to highlight the **OK** button and press <**Enter**>.

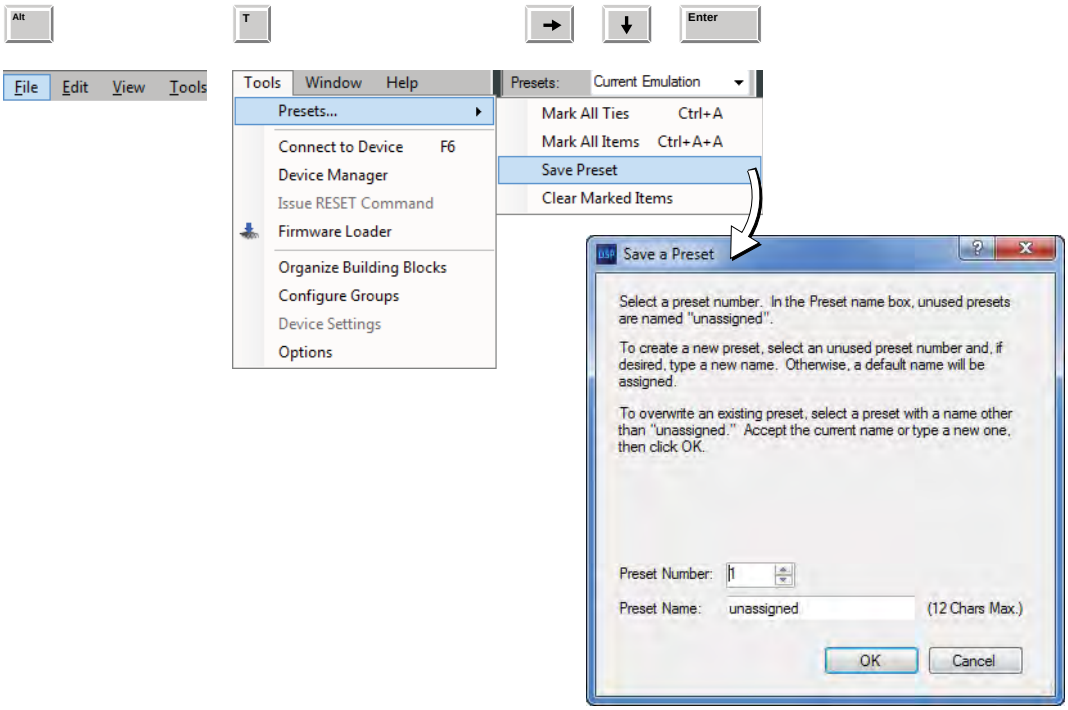


Figure 62. Saving a Preset Using Keyboard Navigation

Setting group master soft limits

- **<Shift> key in a combination moves the upper limit** —
  - **<Shift>-Up arrow or <Shift>-down arrow (Shift ↑ or Shift ↓)** — Moves the soft upper limit in 0.1 dB increments.
  - **<Shift>-<Page Up> or <Shift>-<Page Down>** — Moves the soft upper limit in 10 dB increments.
  - **<Shift>-<Home>** — Moves the soft upper limit to the upper default.
  - **<Shift>-<End>** — Moves the soft upper limit to the fader position.
- **<Ctrl> key in a combination moves the lower limit** —
  - **<Ctrl>-Up arrow or <Ctrl>-down arrow (Ctrl ↑ or Ctrl ↓)** — Moves the soft lower limit in 0.1 dB increments.
  - **<Ctrl>-<Page Up> or <Ctrl>-<Page Down>** — Moves the soft lower limit in 10 dB increments.
  - **<Ctrl>-<Home>** — Moves the soft lower limit to the fader position.
  - **<Ctrl>-<End>** — Moves the soft lower limit to the lower default.

Signal Path Building Blocks

All of the inputs and outputs that have name blocks (in figure 63) are discrete signal paths:

Visible in figure 63

- Line in
- Mic in
- Output

Not visible in figure 63

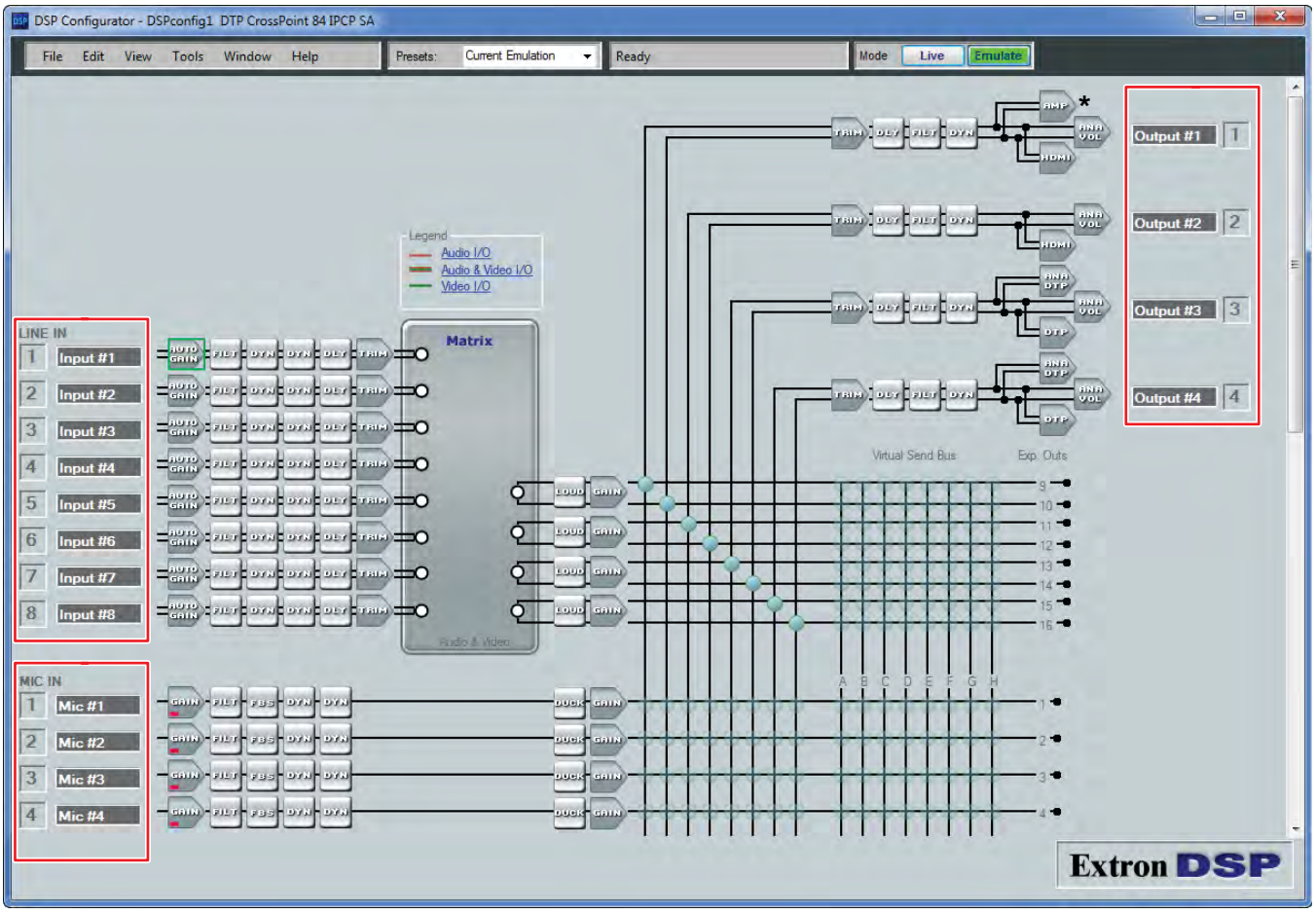
- Virtual returns in
- Expansion bus in

The input and output processor chains on these paths can be individually loaded with pre-configured modular templates called building blocks. These modules are designed for specific microphones, source devices, or speaker destinations, and can streamline the initial configuration. The modules are configurable and are more versatile than a global template.

The modular building blocks can be loaded to a selected input or output by a clicking on the signal path label bringing up the building block dialog box.

Different menus or dialogs are available according to the selected signal path.

The building blocks can be renamed and processor blocks further customized according to the requirements of the system.



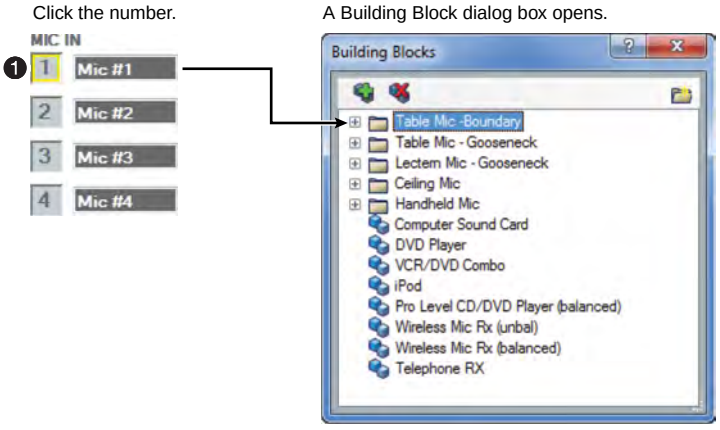
* This output 1 amplifier block is not present on non-IPCP models.

Figure 63. Building Blocks Availability

Selecting a building block

Select a hand-held microphone configuration as follows:

1. **Open the Building Blocks dialog box**: Click the Mic Input 1 number box (see ❶, below). The `Building Blocks` dialog box opens.

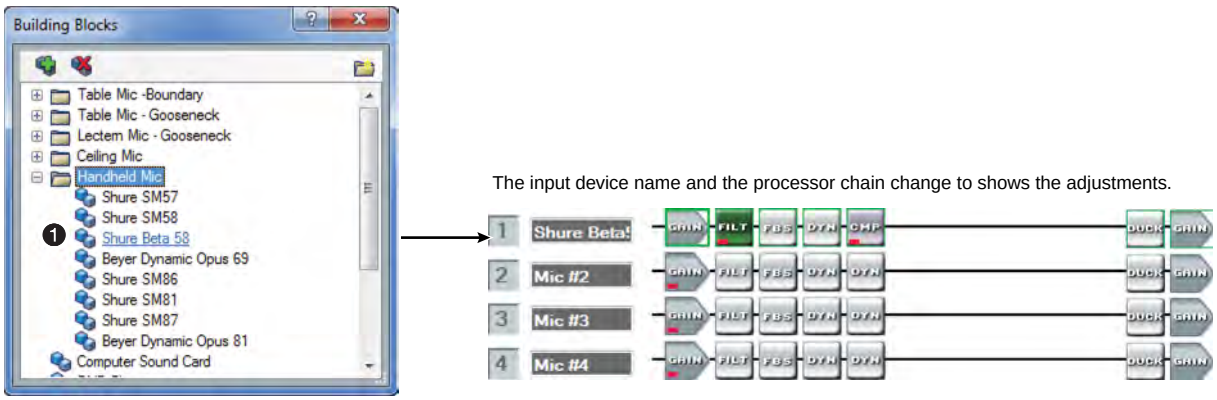


The modules in the box are dependent on the device type clicked.
In this example, mic modules are shown because a mic input was selected.

2. **Select the desired building block**: Click **`Shure Beta 58`** (see ❶, below). The input channel loads the pre-configured processor blocks, sets the gain, and renames the channel `Shure Beta 58`.

> **NOTE:** Common devices may be grouped in folders. If necessary, click a folder (**`Handheld mic`** in the example below) to open it and make the building blocks available for selection.

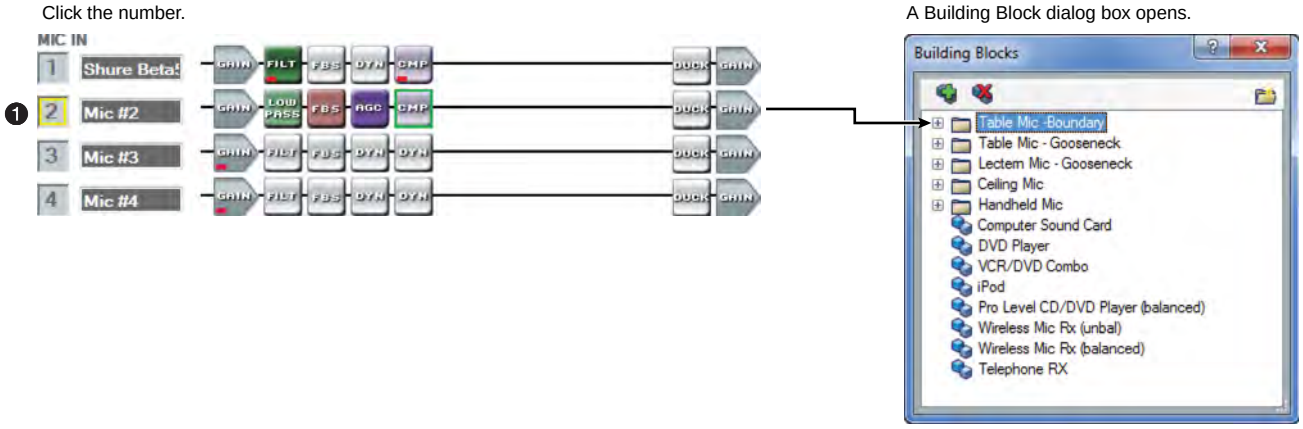
Click the desired input device.



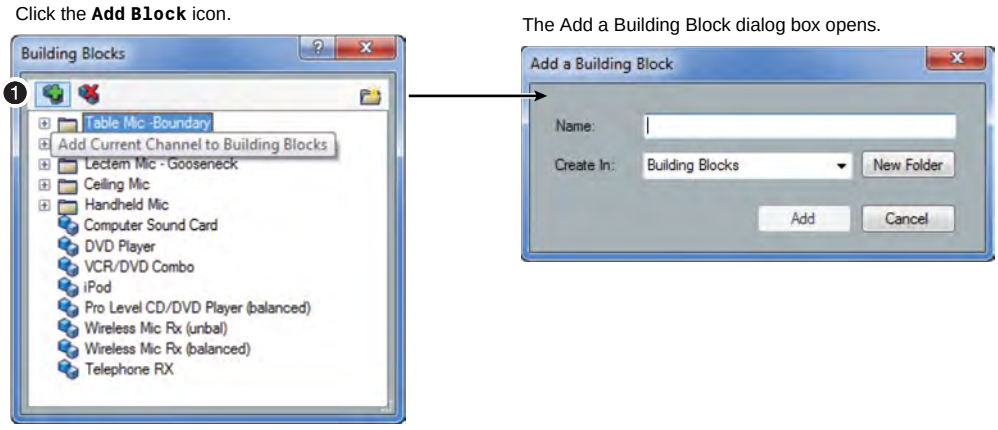
Adding a building block

Custom building blocks can be created if necessary, such as when a new mic is connected to an input. The signal path can be configured for that specific mic and then saved as a new building block as follows:

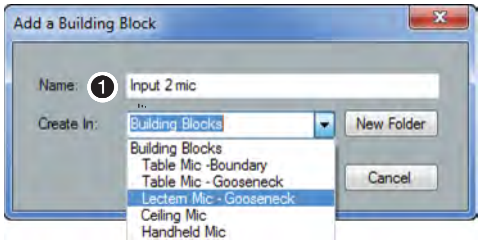
1. Modify the processing chain for an input or output. In this example, a custom mic configuration has been created for mic 2.
2. **Open the Building Blocks dialog box**: Click the Mic Input 2 number box (see ❶, below). The Building Blocks dialog box opens.



3. **Add a building block**: In the dialog box, select the **`Add Block`** icon (, see ❶, below).



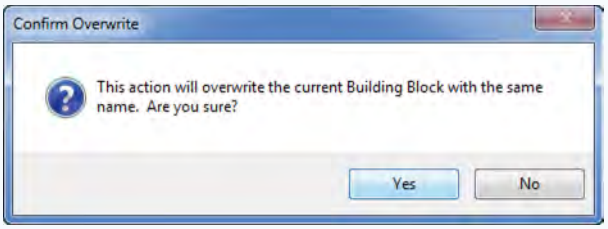
4. **Name the block**: In the **`Name`** field, type a name for the new building block (see ❶, below). If desired, select a folder for the block in the **`Create In`**: drop-down box.



NOTE: You can choose to overwrite an existing building block:

1. Type an existing name for the new configuration.

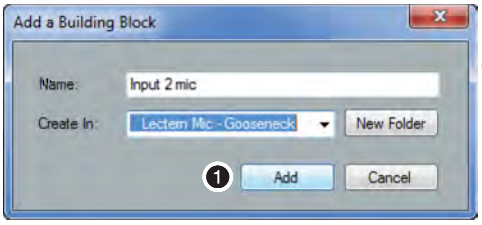
   The program prompts to warn that an existing configuration will be overwritten.



2. Click **Yes**.

5. Click **Add** (see ❶, below).

Click the **Add** button.



The dialog box closes.

The Name field changes to that of the new building block.

The new mic configuration is now a building block that can be used to quickly configure new devices.

Organizing building blocks

The Tools menu contains a utility that allows the building blocks to be organized or rearranged to suit an application. Individual blocks and folders can be moved or deleted and new folders can be created. Click **Tools** > **Organize Building Blocks**. The Organize Building Blocks dialog box opens (see figure 64).

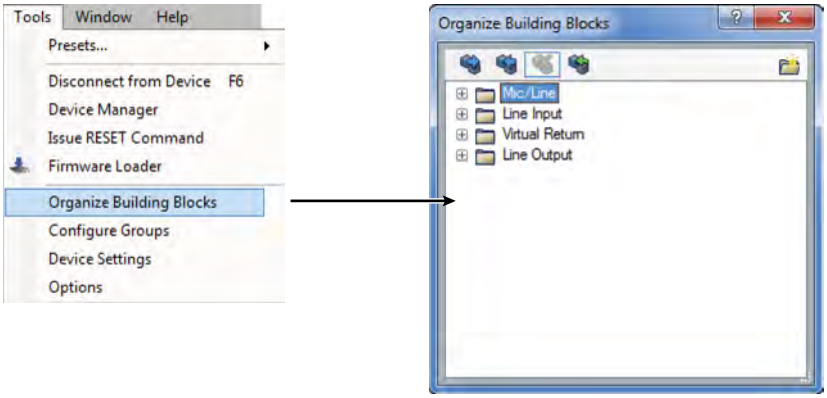


Figure 64. Starting the Organize Building Blocks Utility

The general categories of folders include the main inputs; mic/line, line, and virtual return; and line outputs.

This utility lets you organize listed building blocks. You can also import and export the building blocks file so that you can use your set of building blocks on other computers.

Organizing Listed Building Blocks

Building blocks can be organized within default folders or within new folders. You can move individual building blocks or a folder with all of its contents to a new location.

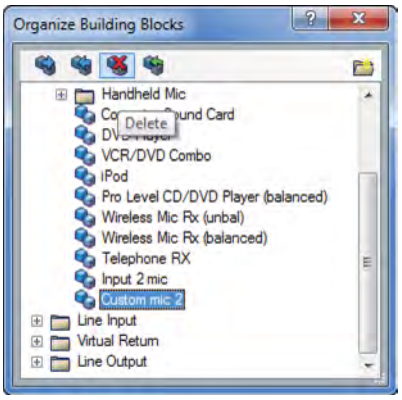
Create a new folder in the **Organize Building Blocks** dialog box by clicking the **New Folder** icon ( ) in the upper right corner. The folder appears within the currently selected group in the organizational tree.

To move a building block or a folder, click and drag the desired item to the new location.

Folders can be expanded to view the associated building blocks by clicking the **Plus** icon ( ) beside the folder name.

Deleting a building block or folder

TIP: If you inadvertently delete a needed default building block, you can restore it (see **Restore Default Building Blocks**, on the next page).



From within the **Organize Building Blocks** dialog box, delete a building block or folder by selecting (clicking) the block or folder from the list and clicking the **Delete** icon ( ).

Restore Default Building Blocks

If one of the default building blocks, those that were installed with DSP Configurator, has been deleted, it can be restored.

NOTE: User-defined building blocks cannot be restored.

From within the **Organize Building Blocks** dialog box, restore default building blocks by selecting (clicking) the **Restore Default Building Blocks** icon ( ). The default building blocks and original folders are restored to the list.

Importing or Exporting Building Blocks Files

You can import a building blocks file from another computer running DSP Configurator or export a file for use elsewhere. Building blocks files are saved with an XML file extension.

Import a building blocks file from within the Organize Building Blocks dialog box as follows:

1. Click the **Import Building Blocks File** icon ( ). The "**Import from**..." dialog box opens.
2. Browse to and select the desired building blocks file.
3. Click **Open**. The selected building blocks file is imported into the **Organize Building Blocks** dialog box.

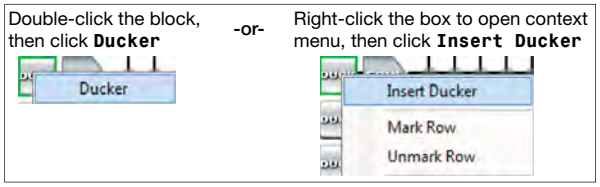
Export a building blocks file from within the Organize Building Blocks dialog box, as follows:

1. Click the **Export Building Blocks File** icon ( ). The "**Export to**..." dialog box opens.
2. Browse to the location where the file is to be saved.
3. In the **File Name** field, leave the current file name or enter a new file name.
4. Click **Save**.

Ducker Priority Tutorial

Insert a ducker using one of the methods at right.

Once inserted, double-click on the ducker block to open the **Ducker Configuration** dialog box. The **Enable Source Mic/Line** box is checked.



Set a ducking source

The first inserted mic ducks all selected targets.

1. Insert a ducking processor to mic 1.
2. Open the ducker configuration box and select the desired duck targets (see figure 65). In this example post-matrix 1 through 4 are the ducking targets.

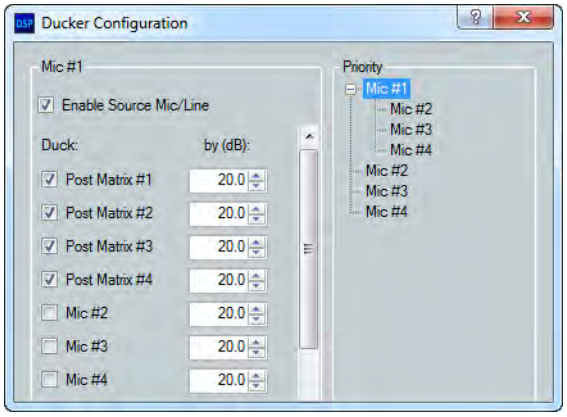


Figure 65. Set a Ducking Source

Any signal on mic 1 that exceeds the ducking threshold now ducks mics 2 through 4.

Set an additional ducking source

The ducking processor can also have an additional input duck other targets using the priority feature. The second input ducks its selected duck targets, and can also be ducked by the first ducking source.

1. Insert a ducking processor on the additional ducking source. In this example, mic 2 is the second ducking source (see figure 66).

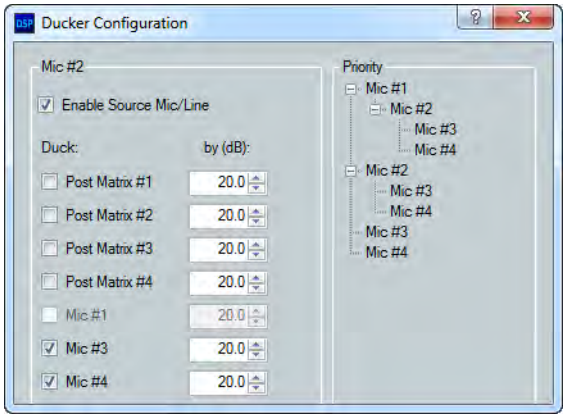


Figure 66. Set a Second Ducking Source

As was shown in **figure 65**, on the previous page, mic 1 is the first source. Since it was selected as a ducking target, mic 1 is not available as a target of mic 2.

2. Open the ducking dialog box for the input and select the desired duck targets. In this example mics 3 and 4 are the ducking targets of mic 2.

   Any signal on input #2 that exceeds the ducking threshold now ducks mics 3 and 4. The ducking targets can be changed at any time by double-clicking the mic 2 ducking processor block.

   Since mic 2 is a target of mic 1, if a signal on mic 1 exceeds the ducking threshold, mics 2 through 4 are still ducked regardless of whether the signal on mic 2 exceeds its ducking threshold.

NOTE: No input will be ducked more than the amount set in the applicable **by (dB):** field.

Expansion Port Operation Within the DSP

The expansion port (see **DMP Expansion Port and LED**, in the Installation section on page 14) allows a DTP CrossPoint matrix switcher and an Extron DMP 128 ProDSP Digital Matrix Processor to be connected together for bidirectional communications with 16 channels of output audio and 8 channels of input audio. Audio that is processed in one unit can be directly input to the other unit to harness its processing capabilities.

Expansion output channels

The DTP CrossPoint has 16 expansion output channels (see figure 67), comprised of:

- Mic inputs 1 through 4 (channels 1 through 4)
- Virtual returns A through D (channels 5 through 8)
- Line outputs 1 through 4, left and right (channels 9 through 16)

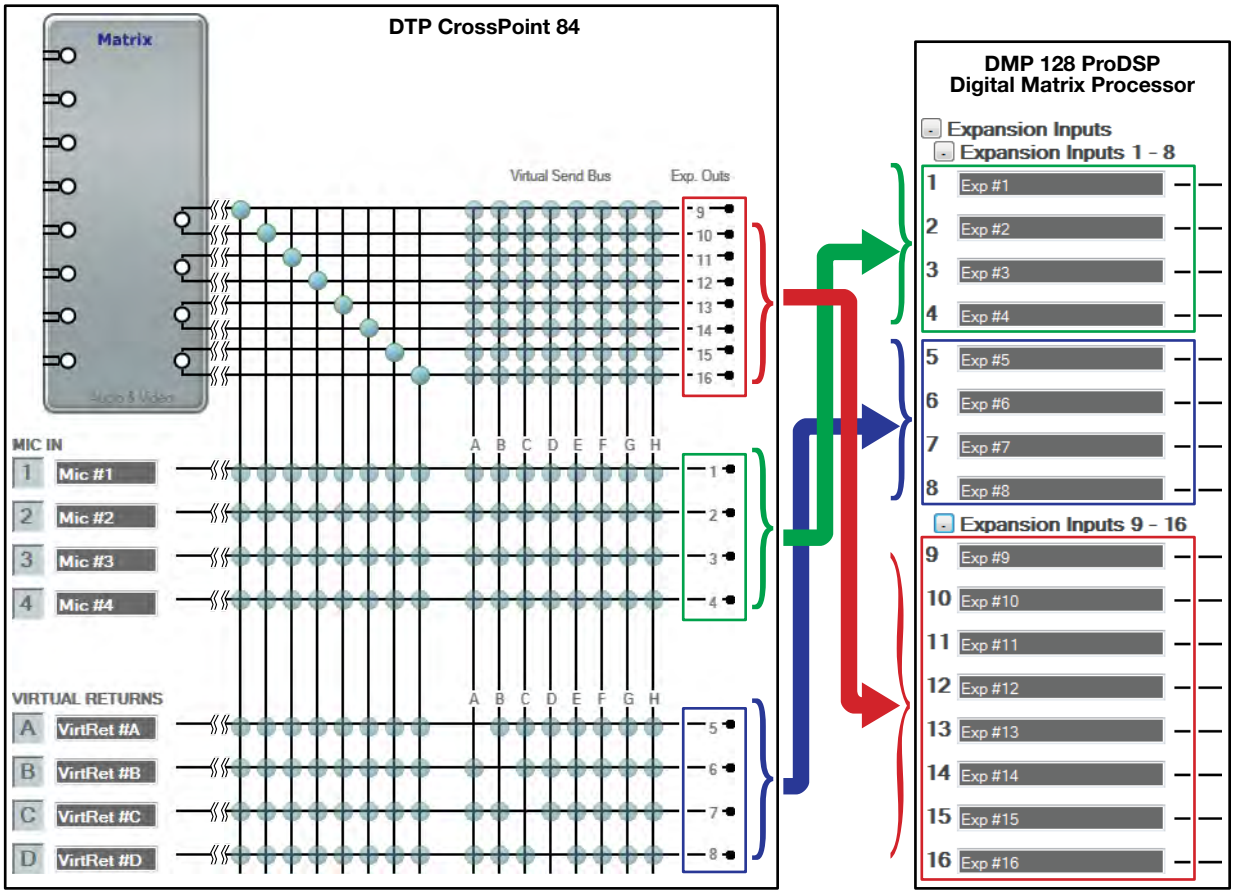


Figure 67. Expansion Output Channels

Expansion input channels

The DTP CrossPoint accepts 8 expansion input channels (see figure 68).

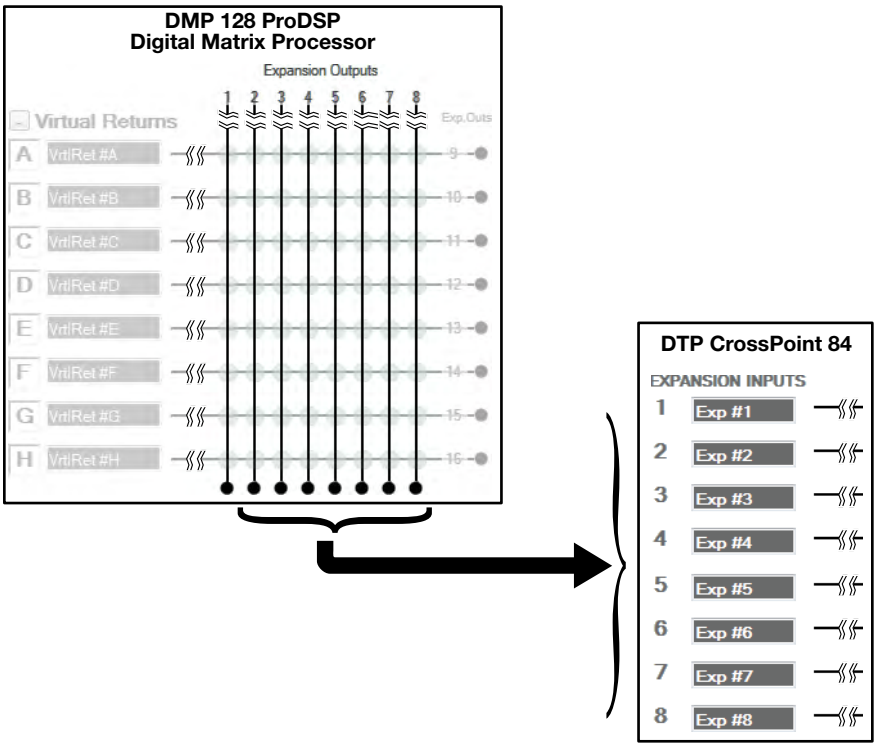


Figure 68. Expansion Input Channels

Connection

No special setup is required; just connect the two devices. By default, the DMP 128 is the primary unit and the DTP CrossPoint is always the secondary unit. If you have trouble connecting the matrix switcher and the DMP 128, check that the DMP 128 is set to be the primary device.

Optimizing the Audio

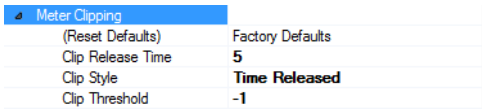
Program material that you are familiar with is preferable for the following procedures, otherwise, pink noise can be used.

TIP: The Extron VTG 300 or VTG 400 is recommended to provide the pink noise.

Input Clipping and Clipping Meters

Audio clipping is a form of distortion that occurs when the signal peaks (or excursions) exceed the limits of the circuit, cutting off the excursions of a signal. This condition gives audibly undesirable results. While it is difficult to clip the audio signal within the DSP audio signal chain, it is extremely important that the audio signal is not clipped before the input to the switcher. Once audio is clipped at the input, there is no remedy further down the signal chain. However, if audio clipping occurs at the output of the DSP that is not a result of clipping at the input, this can be addressed in the DSP audio signal chain.

Meters are available in the gain controls ( ) and in the dynamic processor blocks ( ) when the program is in Live mode and an audio signal is applied to the DSP. The meters in the DSP Configurator program indicate clipping at a user-definable level, with the default setting at -1 dB. At the -1 dB setting, the meter indicates clipping when it reaches -1 dBFS, or 1 dB below actual clipping. Setting the clipping meter below actual clipping provides a bit of a "safety net," letting you know to pull back on input gain before clipping actually occurs. You can increase or decrease this safety net by clicking **Tools** > **Options** > **Defaults** tab > **Meter Clipping** tab, and setting the **Clip Threshold** to a number between **0** (dB) and **-20**. When the clip threshold is set to **0**, clipping is indicated only when actual clipping occurs.



Meters within the DSP Configurator program are peak-type meters, referenced to "full scale," or 0 dBFS. For the DTP CrossPoint 84, 0 dBFS corresponds to 22 dBu, which is the maximum output level of the switcher.

Setting the Input and Output Gain Structure

Before calibrating loudness, set up the system gain structure.

1. Set the signal generator to output -10 dBFS or use recorded program material at -20 dBFS.
2. Set the input gain in the DSP Configurator so that the input meter reads -20 dBFS.

> **NOTE:** In step 3, if using a recorded source and the player has an output level setting control, ensure that the output of the player is set to its maximum, or 0 dB of attenuation.

3. For program material, set the input level to approximately -15 dBFS, with peaks at no more than -5 dBFS to -3 dBFS. This setting provides enough headroom to accommodate transients or unanticipated loud events in the program material in order to avoid possible clipping.
4. Tie the audio from the source to the speakers that will carry program material in the room to be calibrated.
5. With the output channel volume set to -20 dB, listen to the audio output while you set the external amplifier so that the source material plays at a volume level that is reasonably loud but tolerable. Verify that the amplifier is not clipping by observing the amplifier clip indicator.

Adjusting the Pre-matrix Trim

The pre-matrix trim control can be used to compensate for any level changes caused by signal processing before the trim control. Adding a compressor generally reduces the signal level, while a filter can either boost or cut the overall signal level.

> **NOTE:** This procedure is valid only if no processing is active in the output signal path, and if post-matrix trim value is set to 0 dB (unity gain). If you have processors inserted in the output signal path, open them and bypass them to temporarily remove them from the signal path.

1. After you have set the input gain, add any processors that you wish to use into the input signal chain.

> **TIP:** If you make changes to filter settings after you have set your dynamics processors, recheck the levels in your dynamics processors to make sure that they are still valid.

2. Open the line input gain dialog box, the output volume dialog box, and the pre-matrix trim dialog box.
3. Set output volume to 100%. If the audio is too loud or distracting, mute the output.
4. With program material (or pink noise) present at the input, adjust the pre-matrix trim so that the meter level in the output volume dialog box matches the meter level in the input gain dialog box. This maintains the audio at an optimal level in the input signal chain.

> **TIP:** This is a good baseline. If, after you've set up your microphone input gain and mix-point levels, output processing, and post-matrix trim levels, you find that you need more headroom to prevent clipping at the outputs, return to the pre-matrix trim controls and lower each trim by the same dB amount.
>
> You may also find that further minor adjustments to the pre-matrix Trim controls help to balance out the perceived audio levels of the different inputs.

Finalizing the Output Gain Structure

Adding a compressor generally reduces the signal level, while a filter may boost or cut the overall signal level. Loudness boosts the overall signal level, but mostly at lower volume settings (see **Calibrating Loudness** on page 132 for more information).

1. Add any processors that you wish to use into the output signal chain.

   After adding processors to the output signal chain, the output volume level may clip when set to or near 100%.

2. Set output volume to a level where clipping is eliminated.

NOTE: Mic levels also contribute to possible clipping at the outputs. They may need to be lowered at the mic mix-points to maintain the balance between program material (line inputs) and voice (mic).

TIP: Remember that the output volume control is essentially the same volume control that is accessible to a front panel operator. An operator may unknowingly change the volume back to a level where clipping occurs. You can reduce the chance of this inadvertent clipping by using the post-matrix trim control rather than the volume control (see **Adjusting the Post-matrix Trim** on the next page).

Setting the Mic Input and Mic Mix-point Levels

1. Double-click the mic mix-point to be set, opening the dialog box for that mix-point.
2. Unmute the mix-point (mixing in the mic signal). The default level is 0.0 dB, or unity gain.
3. Connect your chosen microphone to mixed mic/line input.
4. Open the mic input gain dialog box for the mixed mic.
5. If your mic requires phantom power, turn it on in the mic input dialog box.
6. Unmute the mic/line input.
7. While testing the mic, raise the mic gain fader until the mic is clearly audible.

   The gain level and the mic gain meter level reading vary at this point, but as a general guideline, the input gain level is approximately 40 dB to 50 dB and the meter averages approximately -20 dBFS.

TIP: Voice levels at microphone inputs can vary greatly, making audio optimization difficult for these inputs. Having the meters average around -20 dBFS gives enough headroom to accommodate sudden changes to voice levels. Further adjustment may be necessary.

Adjusting the Post-matrix Trim

Adjusting the post-matrix trim can be challenging. This section provides guidelines, but it may take some experimentation to set levels just right. For example, the output level can be controlled and kept below clipping using a compressor or limiter in the output dynamics block. However, adjusting the post-matrix trim affects how the compressor or limiter works.

1. Open the output volume dialog box and the post-matrix trim dialog box.
2. Set output volume to 100% (if the audio is too loud or distracting, mute the output).
3. With program material or pink noise present at the input, adjust the post-matrix trim until the meter level in the output volume dialog box is below clipping (or ideally, matches the level at the input gain meter). This maintains the audio at an optimal level in the output signal chain, and prevents clipping at the output.

Setting the Volume Control for an External Amplifier

The maximum output of the switcher is +22 dBu. Assume that you have a power amp with a maximum input level of +4 dBu when the input attenuator is fully open. If you want to control volume levels using the output volume controls of the switcher and at the same time ensure that clipping does not occur at the amplifier, you need to turn down the input attenuator of the power amp the equivalent of 18 dB (18 + 4 = 22 dB), which puts the input level of the amp at -14 dB (+4 minus 18 = -14). If you find that the amp setting (when the output volume controls of the DSP Configurator are at 100%) is too loud for the room, you can turn it down further. If the amp is not loud enough for the room, you will need a more powerful amplifier.

On the other hand, if you wish to control volume levels using the input attenuation control for the power amplifier, (using the same power amp max input level) you can set the output volume control of the DSP Configurator to -18 dB. This is another way that clip points of the two devices will be matched, ensuring that clipping will not occur.

However, Extron recommends using the output volume control of the matrix switcher for controlling output volume. If you are using loudness processing on the unit, it works only in conjunction with the output volume control.

Calibrating Loudness

The basic gain structure is now set up. From this point, loudness can be calibrated using an SPL meter, a critical ear, or a combination of the two.

Setting loudness using a meter

To calibrate loudness, use a sound pressure level meter set to “C” weighting.

1. Open the post-matrix loudness processor dialog box.
2. Bypass the loudness processor.
3. Place the meter in an average listening location.
4. Start your program material playback or generate pink noise.
5. Measure the SPL in the room.
6. In the loudness dialog box, adjust the fader until the value in the “SPL” readout box matches the reading on the SPL meter.

   NOTE: Calibration can be performed with the output channel volume set to any comfortable listening level, but a relatively loud volume that can be easily measured is preferred.

   Loudness is now calibrated.
7. Release the bypass of the loudness processor to hear the compensation.

Alternate method:

NOTE: This method works if 90 dB is an acceptable amplifier or volume limit for the room.

1. Set the Loudness Compensation fader in the loudness dialog box to its default (center) position and the output channel volume fader to 0 dB (100% volume).
2. Adjust the amplifier until the SPL meter reads 90 dB. Loudness is now calibrated.

Setting loudness "by ear"

When setting loudness by ear, it is also essential that the system gain structure be set up first.

1. Open the post-matrix loudness processor dialog box.
2. Bypass the loudness processor.
3. Place the meter in an average listening location.
4. Set the output volume fader to a relatively quiet listening level. Filter compensation from the loudness processor is most prominent at low listening levels. Set to the levels described earlier.
5. Set the Loudness Compensation fader in the loudness dialog box to its default (center) position.
6. Release the bypass on the loudness processor to hear the compensation.

   NOTE: You should hear a moderate enhancement to the program material with more accentuated bass frequencies (below 500 Hz) and more brightness in the high frequencies that carry harmonic content (above 7 kHz). You can toggle the loudness bypass on and off to compare the difference between loudness off and on.

7. To experiment with less loudness compensation, move the Loudness Compensation fader to the left, toward **Less**.

   For more loudness compensation, move the fader to the right, toward **More**.
8. Any adjustment you make to the Loudness Compensation fader carries through to all listening levels. Set the DSP Configurator output volume to a relatively loud listening level.
9. Toggle the loudness bypass on and off to compare the difference between loudness off and on. At a loud listening level, this difference should be minimal, or barely perceivable.

HTML Operation

The DTP CrossPoint Matrix Switcher can be remotely controlled via:

- SIS commands (see **Programming Guide**, beginning on page 52)
- The Extron Product Configuration Software and DSP Configurator software (see **Matrix Software**, on page 72).
- The built-in HMTL page (see below)

This section details using the built-in HTML page to perform a variety of tasks. Subjects includes:

- **Download the Startup Page and View Switcher Status**
- **Change the Communications Settings**
- **Update the Firmware**
- **Set Passwords**
- **Set the Clock**

The switcher can be monitored and configured through its LAN port, connected via a LAN or WAN, using a compatible web browser. The browser display has the appearance of a web page. This chapter describes the factory-installed HTML page, which is always available and cannot be erased or overwritten.

NOTES:

- For best results, Extron recommends the following browsers:
  - Microsoft Internet Explorer, version 8.0 or newer, **with compatibility mode off**
  - Mozilla Firefox, version 6 or newer
  - Google Chrome, version 9 or newer
  - Apple Safari, version 4 or newer
- If your Ethernet connection to the matrix switcher is unstable, try turning off the proxy server in your Web browser. In Microsoft Internet Explorer, click **`Tools`** > **`Internet Options`** > **`Connections`** > **`LAN Settings`**, uncheck the **`Use a proxy server...`** box, and then click **`OK`**.

Download the Startup Page and View Switcher Status

Access the switcher using HTML pages as follows:

1. Start the Web browser program.
2. Click in the **Address** field of the browser and highlight any existing text.
3. Enter the IP address of the switcher 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. Press <**Enter**>. The switcher checks to see if it is password protected.

   If the switcher is not password protected, it downloads the HTML page (see **figure 70** on the next page).

   If the switcher is password protected, the switcher downloads the Authentication Required dialog box (see figure 69).

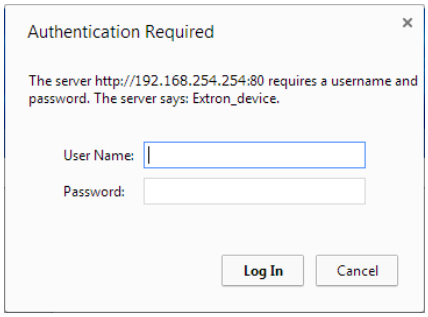


Figure 69. Authentication Required Dialog Box

NOTE: By default, the **User Name** is either **admin** or **user**, depending on the level of authentication requested.

5. Click in the **User Name** field and type in the appropriate name.

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

   The switcher downloads the factory-installed HTML page, (see figure 70).

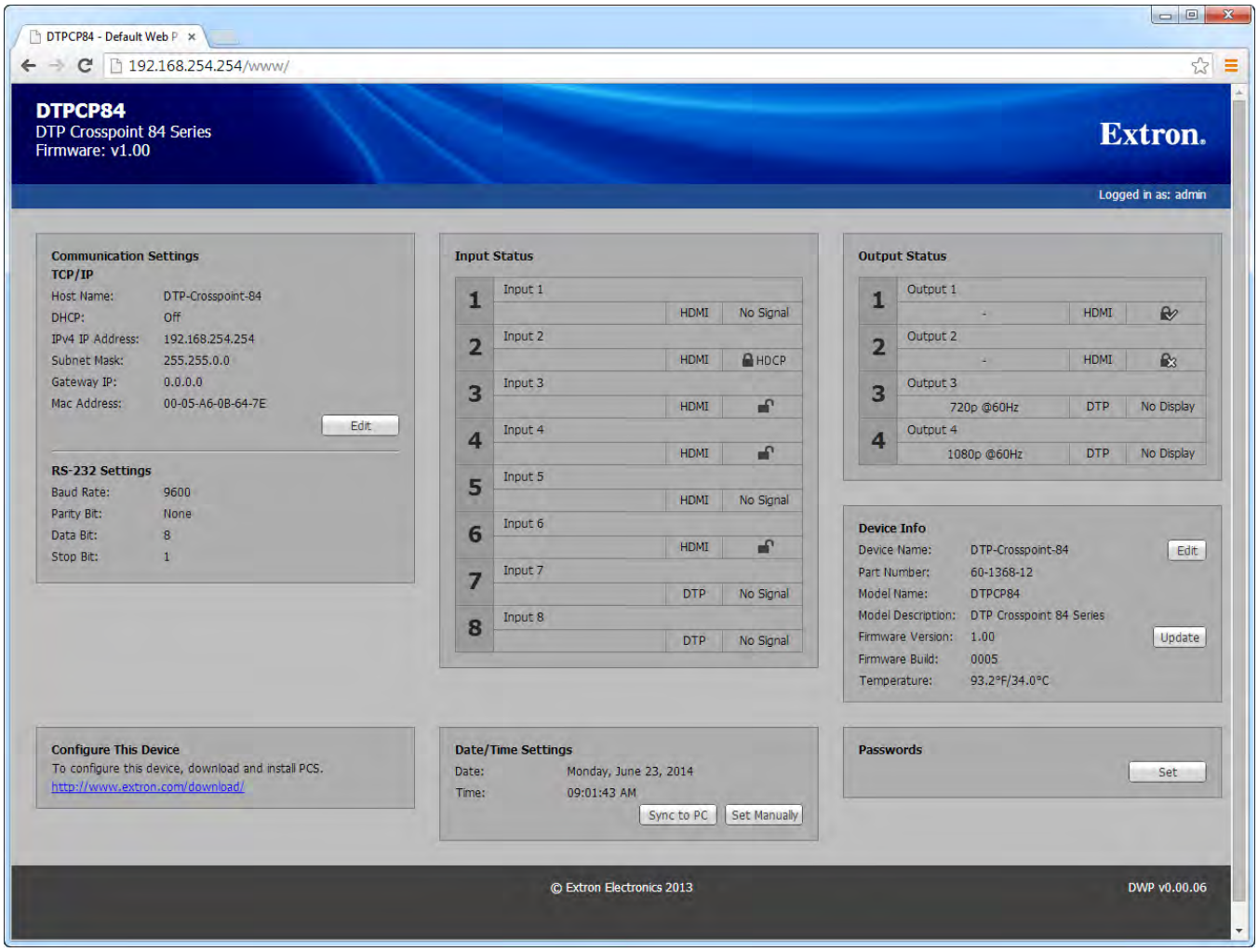


Figure 70. Built-in HTML Page

The input status panel displays the connection status of each input. The output status panel displays the selected resolution of scaler outputs 3 and 4. The various lock icons have the following meanings:

Input Status locked (HDCP) — The input is HDCP compliant.

Input Status unlocked — The input is not HDCP compliant.

Output Status locked-check — The connected display is HDCP compliant and an encrypted signal is routed to it.

Output Status locked-X — The connected display is HDCP compliant but currently not encrypted.

Change the Communications Settings

Click the **Edit** button in the Communications Settings panel (see figure 71, ❶) to open the Communications Settings dialog box. The dialog box provides a location for viewing and editing settings unique to the Ethernet interface. See the *IPCP Pro 350 Series User Guide* at **www.extron.com** for basic information about IP addresses.

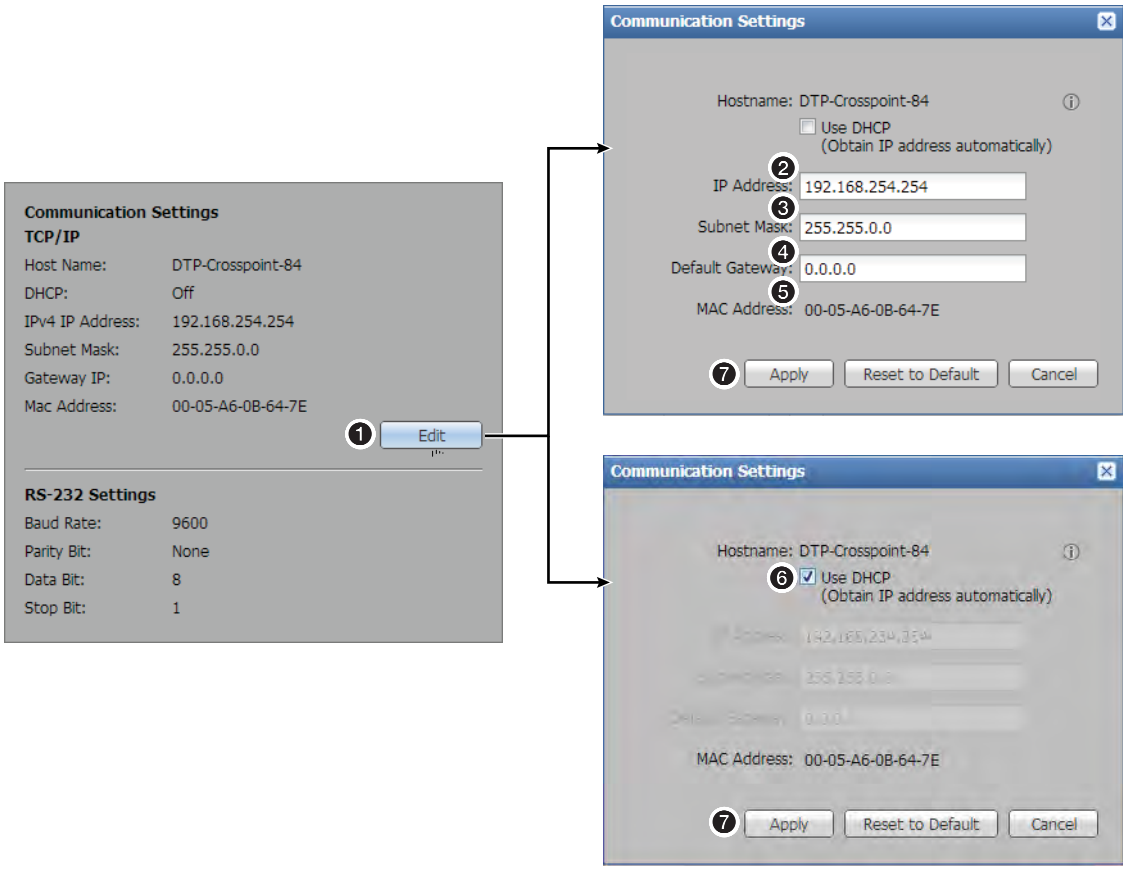


Figure 71. Communications Settings Dialog Box

Address Fields (DHCP Not Selected)

The **IP Address** field (❷) contains the IP address of the connected matrix switcher. This value is encoded in the flash memory in the switcher.

The **Subnet Mask** field (❸) is used to determine whether the matrix switcher is on the same subnet as the controlling PC when you are subnetting.

The **Default Gateway** field (❹) 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.

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 octet, are optional. Values of 256 and above are invalid. For more information on all of these fields, see the *IPCP Pro 350 Series User Guide* at **www.extron.com**.

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

The **MAC Address** (❺) is hardcoded in the matrix switcher and cannot be changed.

Edit any of these changeable fields as follows:

NOTE: The address fields cannot be edited when DHCP is selected.

1. Click in the desired field. The graphic cursor becomes a text cursor.
2. Edit the address or name as desired.
3. Press the <**Tab**> key on the keyboard or click in another field to exit the field.
4. Click the **Apply** button (see **figure 71**, on the previous page, ❼) to make the address change take affect.

Use DHCP Check box

The **Use DHCP** check box (❻) directs the matrix switcher to ignore any entered IP addresses and to obtain its IP address from a Dynamic Host Configuration Protocol (DHCP) server (if the network is DHCP capable). Contact the local system administrator to determine if this is the appropriate selection. Click the **Apply** button (❼) to make check box changes take affect.

Update the Firmware

Click the **Update** button in the Device Info panel (see figure 72) to open the Firmware Update dialog box. The dialog box provides a way to replace the firmware that is coded in the switcher without removing it from the system.

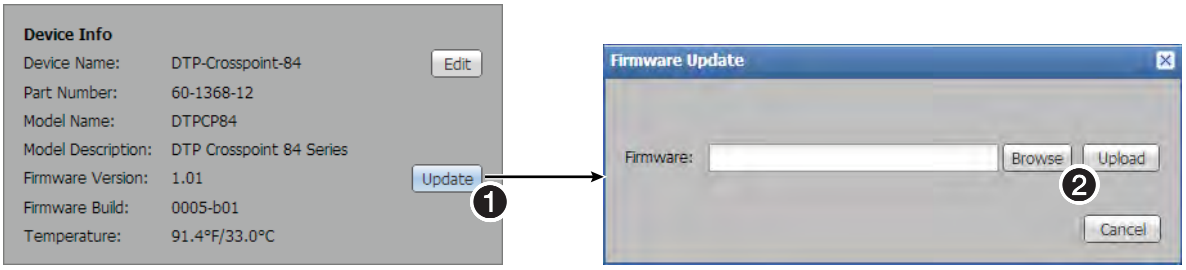


Figure 72. Firmware Update Dialog Box

Update the switcher firmware as follows:

1. Perform steps 1 through 6 of **Installing the Software**, on page 73, to download the firmware upgrade from the Extron website.
2. Connect the PC to the matrix switcher via any switcher LAN port.
3. Access the matrix switcher using HTML pages.
4. Click **Update** in the Device Info panel (see figure 72, ❶). The Firmware Upgrade dialog box opens.
5. Click **Browse** (❷). The Open dialog box opens (see **figure 73** on the next page).

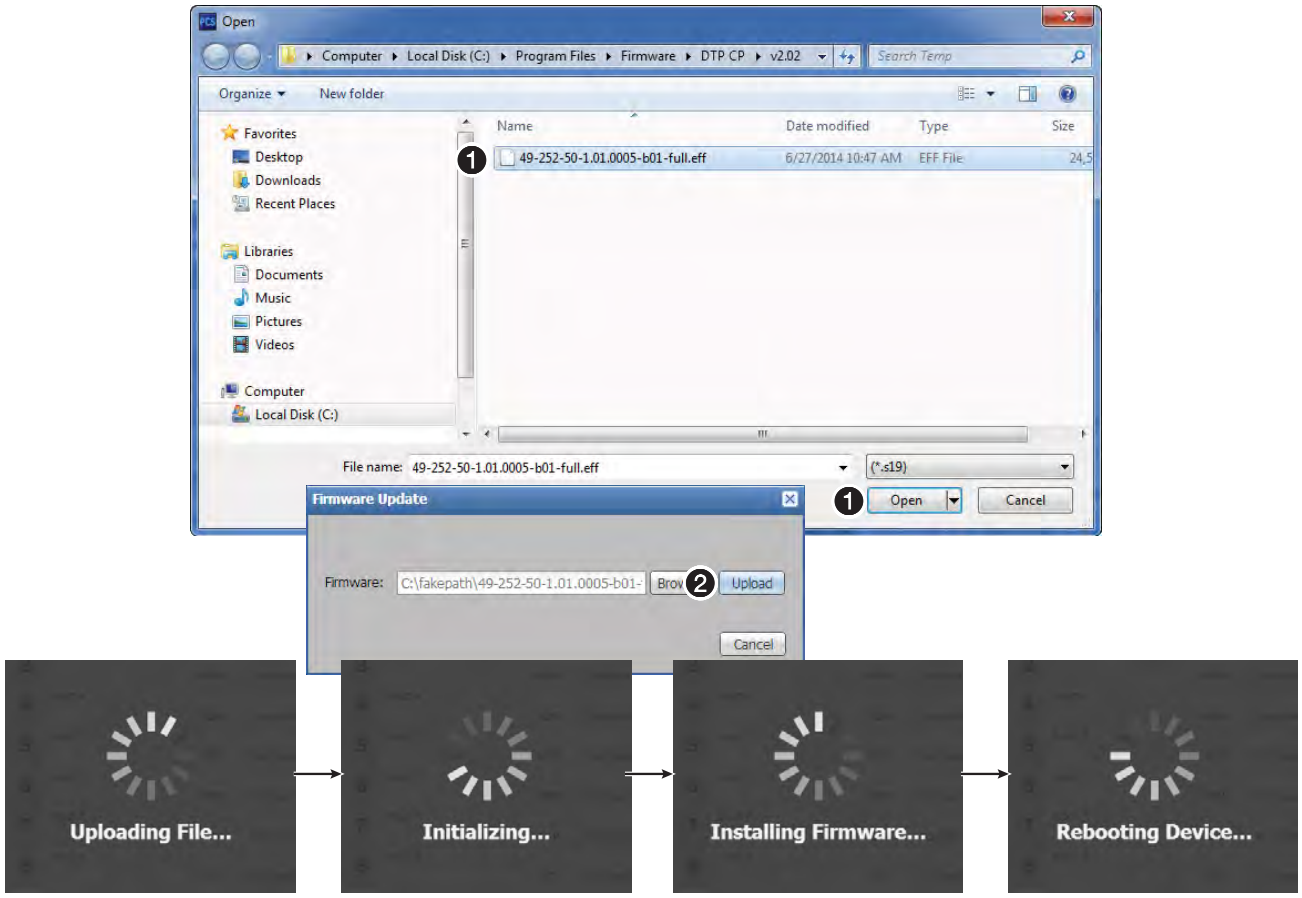


Figure 73. Updating Firmware

6. Navigate to the folder where you saved the firmware upgrade file. Select the file and click **`Open`** (see figure 73, ❶). The Firmware Update dialog box returns to the top.
7. Click **`Upload`** (❷). The switcher reports `Uploading`, `Initializing`, `Installing`, and `Rebooting`. this process may take 6 to 8 minutes. After the reboot is complete, the display returns to the default HTML page (see **figure 70** on page 135).

NOTE: If the default HTML page does not display after 10 minutes, close the web browser and reopen.

Set Passwords

Click **Set** in the Passwords panel (see figure 74, ❶) to open the Passwords dialog box.

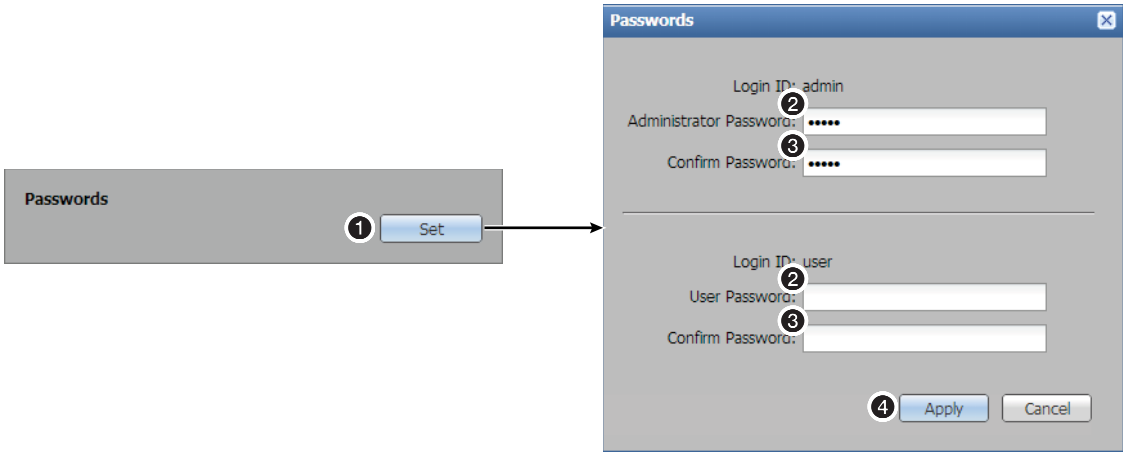


Figure 74. Passwords Dialog Box

The fields in the Passwords dialog box 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 (❷) and then again in the **Confirm Password** field (❸). Characters in these fields are masked by asterisks or dots (*****). If you do not want to password protect an access level, leave both fields blank. After entering the desired password in both fields, click the **Apply** button (❹).

NOTES:

- An administrator password must be created before a user password can be created.
- You cannot clear an existing password using this dialog box (see the **Reset (clear) administrator password** and **Reset (clear) User password** SIS commands, both on page 70).

Set the Clock

Sync to PC

The simplest way to set the switcher clock is to click **Sync to PC** in the Date/Time Settings panel (see figure 75). The switcher uploads the time and date information from the connected computer.

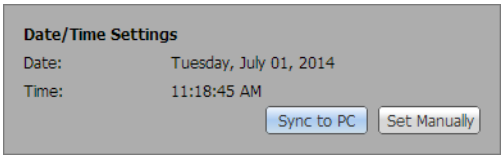


Figure 75. Date/Time Settings Panel — Sync to PC

Set Manually

The Date/Time Settings dialog box (see figure 76) provide a location for viewing and setting the time functions.

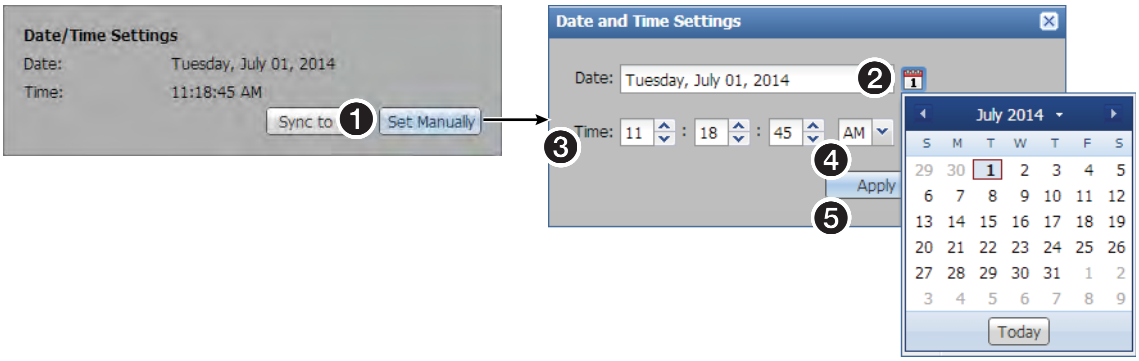


Figure 76. Date/Time Settings Dialog Box

Manually set the time as follows:

1. Click **Set Manually** on the the Date/Time Settings panel (see figure 76, ❶) to open the Date/Time Settings dialog box.
2. Click the **Calendar** icon (, ❷) and select the date in the pop-up calendar tool.
3. Use the keyboard to enter hours, minutes, and seconds or click the up or down buttons until the desired variable is displayed in the applicable fields (❸).
4. Select **AM** or **PM** in the AM/PM drop-down box (❹).
5. Click **Apply** (❺).

DSP SIS Commands

Command and Response Table for DSP SIS Commands

Many DSP functions; such as gain (which includes the mix-points), trim, mutes, and some group master functions; can be controlled using SIS commands. These commands follow the same general rules as basic SIS commands, but the variables (Xns) tend to be more complex. Also, a comprehensive understanding of the audio signal flow of the DSP is helpful to understanding these commands. Thumbnails of the controls are provided in the tables that follow for reference; the signal flow is described in detail in **DSP Configurator Program**, beginning on page in 80. The ● letters in the tables on on pages 144 through 148 refer to blocks of controls in the full DSP Configurator program window (see **figure 40** on page 81).

Symbol Definitions

↵ = Carriage return and line feed
← = Carriage return (no line feed)
| = Pipe (can be used interchangeably with the ← character)
• = space
Esc = Escape key
W = Can be used interchangeably with the Esc character

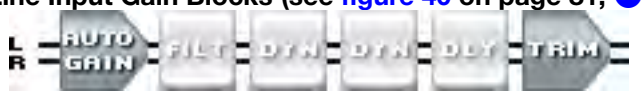
X60	= Object ID (gain control or mix-point)	See **table 4**, beginning on the next page.
X61	= Level value	-100.0 dB to +80.0 dB, in 0.1 dB increments. Example: **56** = 5.6 dB.

NOTE: The valid range of the X61 level for a specific control depends on the control addressed.

X62	= Mute and phantom power status	**Ø** = unmute (pass audio) or off **1** = mute or on
X63	= Group master group number	**Ø1** – 32
X64	= Group fader setting	dB value, in 0.1 dB increments. The valid range depends on the type of gain block
X65	= Group fader increment	dB value, in 0.1 dB increments, to raise or lower a group fader
X66	= Group fader soft limit	dB value, in 0.1 dB increments. X66 must be within the range for the gain block grouped in X63.
X67	= Group type	**6**= gain **12** = mute

Table 4. X60 Object ID Values

Line Input Gain Blocks (see figure 40 on page 81, A)



Input	Gain	Trim	Input	Gain	Trim
Input 1			**Input 5**		
Left	30000	30100	Left	30008	30108
Right	30001	30101	Right	30009	30109
Input 2			**Input 6**		
Left	30002	30102	Left	30010	30110
Right	30003	30103	Right	30011	30111
Input 3			**Input 7**		
Left	30004	30104	Left	30012	30112
Right	30005	30105	Right	30013	30113
Input 4			**Input 8**		
Left	30006	30106	Left	30014	30114
Right	30007	30107	Right	30015	30115

Mic Input Gain Blocks (B)

Input	Input Gain	Pre-mixer Gain	Input	Input Gain	Pre-mixer Gain
Input 1	40000	40100	**Input 3**	40002	40102
Input 2	40001	40101	**Input 4**	40003	40103

Table 4. X60 Object ID Values, continued

Post-matrix Gain Blocks (see figure 40 on page 81, F) 			
Output	**Gain**	**Output**	**Gain**
Output 1		**Output 3**	
Left	50000	Left	50004
Right	50001	Right	50005
Output 2		**Output 4**	
Left	50002	Left	50006
Right	50003	Right	50007

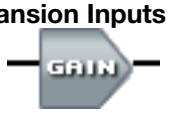
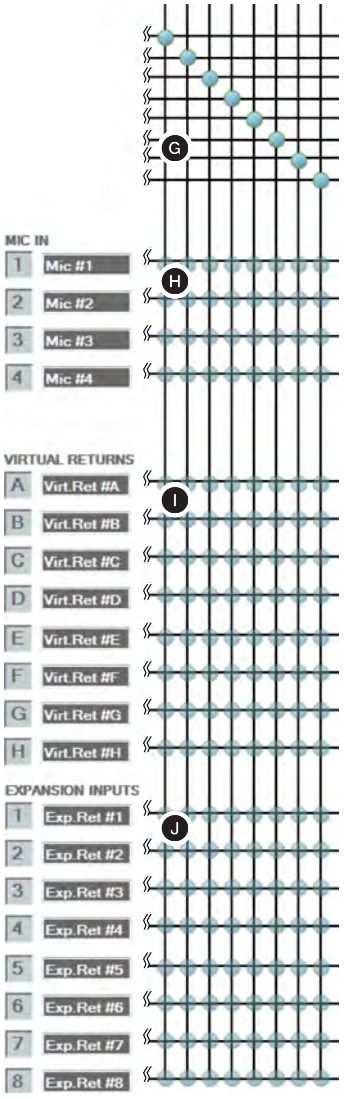
Virtual Returns and Expansion Inputs Gain Blocks (D and E) 			
Virtual Return	**Gain**	**Expansion Input**	**Gain**
Virtual Return A	50100	**Expansion Input 1**	50200
Virtual Return B	50101	**Expansion Input 2**	50201
Virtual Return C	50102	**Expansion Input 3**	50202
Virtual Return D	50103	**Expansion Input 4**	50203
Virtual Return E	50104	**Expansion Input 5**	50204
Virtual Return F	50105	**Expansion Input 6**	50205
Virtual Return G	50106	**Expansion Input 7**	50206
Virtual Return H	50107	**Expansion Input 8**	50207

Table 4. X60 Object ID Values, continued

Mixer blocks, part 1



Switcher-to-output mixer block (see figure 40 on page 81, G)								
	Out 1	Out 2	Out 3	Out 4	Out 5	Out 6	Out 7	Out 8
Output 1								
Left	20000							
Right		20101						
Output 2								
Left			20202					
Right				20303				
Output 3								
Left					20404			
Right						20505		
Output 4								
Left							20606	
Right								20707

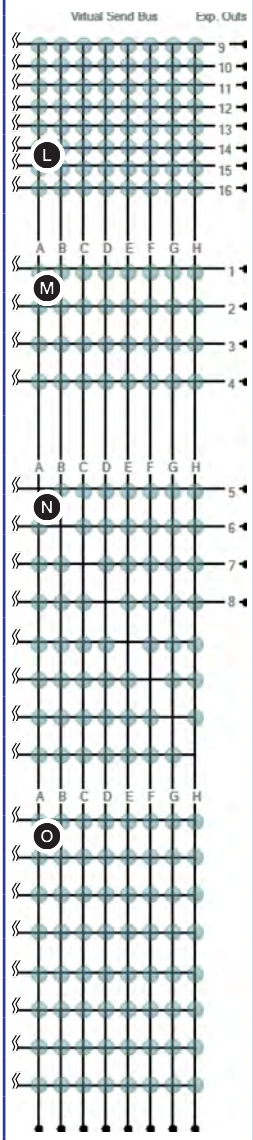
Mic-to-output mixer block (H)								
Mic in 1	20800	20801	20802	20803	20804	20805	20806	20807
Mic in 2	20900	20901	20902	20903	20904	20905	20906	20907
Mic in 3	21000	21001	21002	21003	21004	21005	21006	21007
Mic in 4	21100	21101	21102	21103	21104	21105	21106	21107

Virtual returns-to-output mixer block (I)								
V. rtn A	21200	21201	21202	21203	21204	21205	21206	21207
V. rtn B	21300	21301	21302	21303	21304	21305	21306	21307
V. rtn C	21400	21401	21402	21403	21404	21405	21406	21407
V. rtn D	21500	21501	21502	21503	21504	21505	21506	21507
V. rtn E	21600	21601	21602	21603	21604	21605	21606	21607
V. rtn F	21700	21701	21702	21703	21704	21705	21706	21707
V. rtn G	21800	21801	21802	21803	21804	21805	21806	21807
V. rtn H	21900	21901	21902	21903	21904	21905	21906	21907

Expansion inputs-to-output mixer block (J)								
Exp. in 1	22000	22001	22002	22003	22004	22005	22006	22007
Exp. in 2	22100	22101	22102	22103	22104	22105	22106	22107
Exp. in 3	22200	22201	22202	22203	22204	22205	22206	22207
Exp. in 4	22300	22301	22302	22303	22304	22305	22306	22307
Exp. in 5	22400	22401	22402	22403	22404	22405	22406	22407
Exp. in 6	22500	22501	22502	22503	22504	22505	22506	22507
Exp. in 7	22600	22601	22602	22603	22604	22605	22607	22607
Exp. in 8	22700	22701	22702	22703	22704	22705	22706	22707

Table 4. X60 Object ID Values, continued

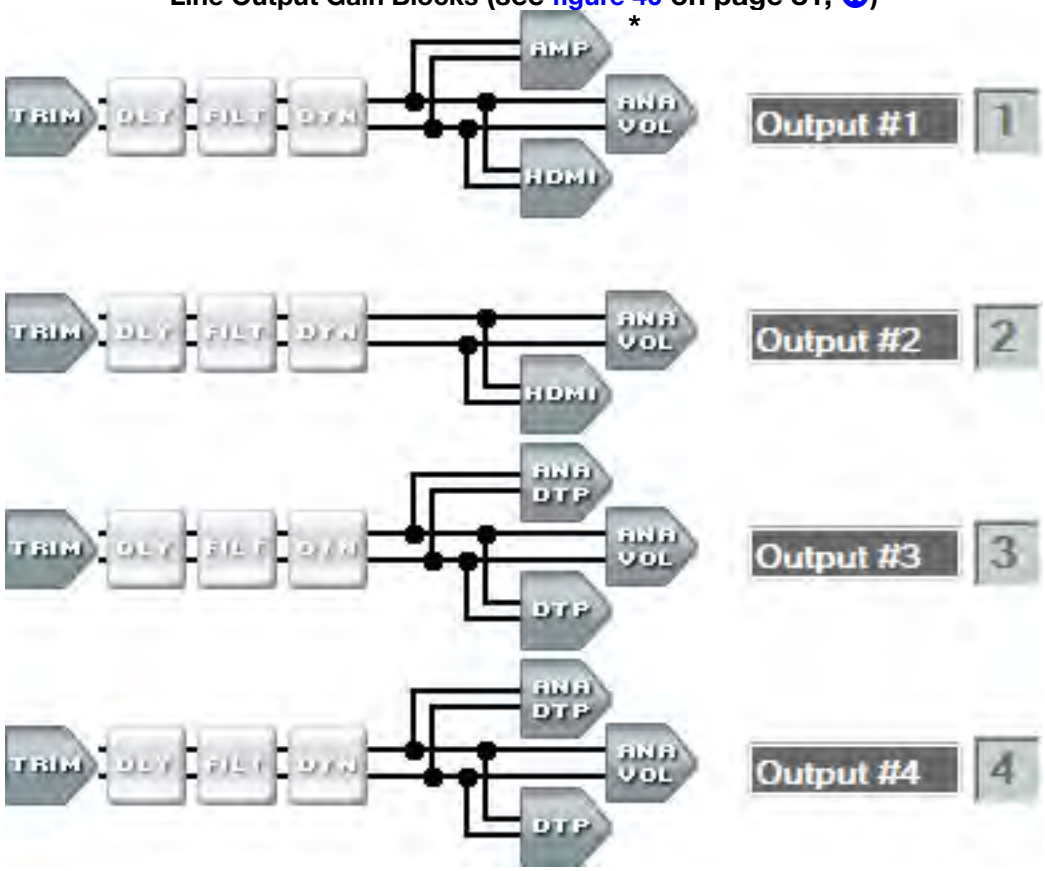
Mixer blocks, part 2



	V. Send A	V. Send B	V. Send C	V. Send D	V. Send E	V. Send F	V. Send G	V. Send H
Switcher-to-virtual-send-bus mixer block (see figure 40 on page 81, M)								
Output 1								
Left	20008	20009	20010	20011	20012	20013	20014	20015
Right	20108	20109	20110	20111	20112	20113	20114	20115
Output 2								
Left	20208	20209	20210	20211	20212	20213	20214	20215
Right	20308	20309	20310	20311	20312	20313	20314	20315
Output 3								
Left	20408	20409	20410	20411	20412	20413	20414	20415
Right	20508	20509	20510	20511	20512	20513	20514	20515
Output 4								
Left	20608	20609	20610	20611	20612	20613	20614	20615
Right	20708	20709	20710	20711	20712	20713	20714	20715
Mic-to-virtual-send-bus mixer block (M)								
Mic in 1	20808	20809	20810	20811	20812	20813	20814	20815
Mic in 2	20908	20909	20910	20911	20912	20913	20914	20915
Mic in 3	21008	21009	21010	21011	21012	21013	21014	21015
Mic in 4	21108	21109	21110	21111	21112	21113	21114	21115
Virtual returns-to-virtual-send-bus mixer block (N)								
V. rtn A		21209	21210	21211	21212	21213	21214	21215
V. rtn B	21308		21310	21311	21312	21313	21314	21315
V. rtn C	21408	21409		21411	21412	21413	21414	21415
V. rtn D	21508	21509	21510		21512	21513	21514	21515
V. rtn E	21608	21609	21610	21611		21613	21614	21615
V. rtn F	21708	21709	21710	21711	21712		21714	21715
V. rtn G	21808	21809	21810	21811	21812	21813		21815
V. rtn H	21908	21909	21910	21911	21912	21913	21914	
Expansion inputs-to-virtual-send-bus mixer block (O)								
Exp. in 1	22008	22009	22010	22011	22012	22013	22014	22015
Exp. in 2	22108	22109	22110	22111	22112	22113	22114	22115
Exp. in 3	22208	22209	22210	22211	22212	22213	22214	22215
Exp. in 4	22308	22309	22310	22311	22312	22313	22314	22315
Exp. in 5	22408	22409	22410	22411	22412	22413	22414	22415
Exp. in 6	22508	22509	22510	22511	22512	22513	22514	22515
Exp. in 7	22608	22609	22610	22611	22612	22613	22614	22615
Exp. in 8	22708	22709	22710	22711	22712	22713	22714	22715

Table 4. X60 Object ID Values, continued

Line Output Gain Blocks (see figure 40 on page 81, K)



* This output 1 amplifier block is not present on non-IPCP models.

Output	Trim	Output	Analog Volume	Digital Volume
Output 1		**Amp Output***		**HDMI**
Left	60100	60300	60000	60200
Right	60101	60301†	60001	60201
Output 2				**HDMI**
Left	60102		60002	60202
Right	60103		60003	60203
Output 3		**Analog DTP**		**Digital DTP**
Left	60104	60304	60004	60204
Right	60105	60305	60005	60205
Output 4		**Analog DTP**		**Digital DTP**
Left	60106	60306	60006	60206
Right	60107	60307	60007	60207

† Not used on MA (mono amplifier) model.

DSP SIS Commands

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Audio trim, gain, and mixing			
NOTES: • The command format is the same, regardless of the control or mix-point that is to be set; the acceptable adjustment range varies depending on the control or mix-point: • All X61 values are in 0.1 dB increments. Example: 56 = 5.6 dB. • The valid range of the level for a specific control depends on the control addressed: • The line audio input gain range is –18 dB to +24 dB (X61 = –180 to +240). • The mic input gain range is –18 dB to 80 dB (X61 = –180 to +800). • The line input trim and line output trim range is –12 to +12 dB (X61 = –120 to +120). • The mic pre-mixer gain, line out post-switcher gain, and pre-mixer gain range is –100 dB to +12 dB (X61 = –1000 to +120). • The mix-points (with their associated mixing controls) range is –35 dB to +25 dB (X61 = –350 to +250). • The line output gain range is –100 to 0 dB (X61 = –1000 to 0). • For attenuation, the negative sign (–) must be entered and is reported in the response. For gain, the positive sign (+) is optional and is not returned in the response.			
Set an analog DSP trim, gain, or mix-point	EscGX60*X61AU←	DsGX60*X61↵	Set object ID (X60) to a level of X61.
Example 1:	EscG300012*56AU←	DsG 300012*56↵	Set the input 7 left gain to a value of 5.6 dB.
Example 2:	EscG208000*–125AU←	DsG 208000*–125↵	Set the mic input 1 gain to a level of –12.5 dB.
Read an analog DSP trim or mix-point	EscGX60AU←	X61↵	Object ID X60 is set to a value of X61.
Example 1:	EscG500005AU←	105↵	Post-switcher output 4 right is set to +10.5 dB.
Example 2:	EscG603001AU←	–955↵	Output 1 amplified audio output is set to -95.5 dB. This response is not possible on an MA model switcher.
Set a digital DSP trim, gain, or mix-point	EscHX60*X61AU←	DsHX60*X61↵	Set object ID (X60) to a level of X61.
Example:	EscH60204*-780AU←	DsH 60204*-780↵	Set the output 3 left digital DTP gain to a value of –78 dB.
Read a digital DSP trim or mix-point	EscHX60AU←	X61↵	Object ID X60 is set to a value of X61.
Example:	EscH30103AU←	75↵	Line input 2 right trim is set to +7.5 dB.
Audio mute			
Audio mute	EscMX60*1AU←	DsMX60*1↵	Mute object ID X60.
Example:	EscM60006*1AU←	DsM 60006*1↵	Mute output 4, left, analog volume.
Audio unmute	EscMX60*0AU←	DsMX60*0↵	Unmute object ID X60.
Example:	EscM40000*0AU←	DsM 40000*0↵	Unmute mic input 1 gain (pass audio).
Read audio mute	EscMX60AU←	X62↵	X62: 0 = mute off, 1 = mute on.
Phantom power			
NOTE: The phantom power commands are valid only for the mic input gain object IDs (Y60s 40000 through 40003).			
Phantom power on	EscZX60*1AU←	DsZX60*1↵	Turn phantom power on for object ID X60.
Example:	EscZ40000*1AU←	DsZ 40000*1↵	Turn phantom power on for mic 1.
Phantom power off	EscZX60*0AU←	DsZX60*0↵	Turn phantom power off for object ID X60.
Read phantom power status	EscZX60AU←	X60*X62↵	X62: 0 = phantom power off. 1 = phantom power on.

NOTE: X60 = Object ID (gain control or mix-point) See table 4, beginning on page 143.
X61 = Level value (depends on control) -100.0 dB to +80.0 dB, in 0.1 dB increments. Example: 56 = 5.6 dB.
X62 = Mute and phantom power status 0 = unmute (pass audio) or off 1 = mute or on

Command and Response Table for DSP SIS Commands (continued)

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Group masters			
NOTES: • See **Group Masters**, on page 101, for more information about audio group masters. • A group must have assigned members for these commands to have an effect. • For X64, a positive (+) value is assumed unless a negative (-) value is specified. • If entering a X64 value outside the valid range for the group or outside the soft limits, the DTP CrossPoint responds with an invalid parameter (E13) error.			
Set a group fader control	EscDX63*X64GRPM↵	GrpmDX63*X64↵	Set the group fader to a value of X64.
Example:	Esc D2*-293GRPM↵	GrpmD2*-293↵	Set the group 2 fader control to -29.3 dB.
Raise a group fader control	EscDX63*X65+GRPM↵	GrpmDX63*X64↵	Increase the level of the X63 group fader by X65 dB.
Example:	Esc D2*3Ø+GRPM↵	GrpmD2*-263↵	Raise the group 2 fader 3 dB (from -29.3 dB to -26.3 dB, starting from the level set in the Set a group fader control example, above.
Lower a group fader control	EscDX63*X65-GRPM↵	GrpmDX63*X64↵	Decrease the level of the X63 group fader by X65 dB.
View the group fader control level	EscDX63GRPM↵	GrpmDX63*X64↵	In verbose modes 1 and 2, the response is simplified to X64↵.
Mute a group mute control	EscDX63*1GRPM↵	GrpmDX63*1↵	Mute all blocks in group X63.
Clear (unmute) a group mute control	EscDX63*ØGRPM↵	GrpmDX63*Ø↵	Umute all blocks in group X63.
View a group mute control	EscDX63GRPM↵	X62↵	
Set soft limits	EscLX63*X66upper*X66lowerGRPM↵	GrpmLX63*X66*X66↵	Set the groups soft limits to X66 and X66.
Example:	EscL2*+6Ø*-6ØGRPM↵	GrpmL2*6Ø*–6Ø↵	Set the upper soft limit for the group 2 fader to +6.0 dB and the lower limit to -6.0 dB.
View soft limits	EscLX63GRPM↵	GrpmLX63*X66*X66↵	In verbose modes 0 and 1, the response is simplified to X66*X66↵.
View group type	EscPX63GRPM↵	GrpmPX63*X67↵	Show the group type (X67) for group X63. In verbose modes 0 and 1, the response is simplified to X67↵.
View group members	EscOX63GRPM↵	GrpmOX63*X60[1]*X60[2]*...*X60[16]↵	X60 is the control or mix-point. In verbose modes 0 and 1, the response is simplified to X60[1]*X60[2]*...*X60[16]↵.

NOTE:		
	X60 = Object ID (gain control or mix-point)	See **table 4**, beginning on page 143.
	X63 = Group master group number	Ø1 – 32
	X64 = Group fader setting	dB value, in 0.1 dB increments. The valid range depends on the type of gain block
	X65 = Group fader increment	dB value, in 0.1 dB increments, to raise or lower a group fader
	X66 = Group fader soft limit	dB value, in 0.1 dB increments. X66 must be within the range for the gain block grouped in X63.
	X67 = Group type	6= gain 12 = mute

Reference Information

This section covers the following DTP CrossPoint matrix switcher procedures:

- **Mounting the Switcher**
- **Removing and Installing Button Labels**

ATTENTION:

- Installation and service must be performed by authorized personnel only.
- L'installation et l'entretien doivent être effectués par le personnel autorisé uniquement.

Mounting the Switcher

The DTP CrossPoint 84 is housed in a rack-mountable, 2U high metal enclosure with mounting flanges for standard 19-inch wide racks.

UL Guidelines

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

- **Elevated operating ambient temperature** — If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consider installing the equipment in an environment compatible with the maximum ambient temperature specified by Extron (Tma = +32 to +122 °F [0 to +50 °C]).
- **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.
- **Mechanical loading** — Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- **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.
- **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

If desired, rack mount the switcher as follows:

1. Insert the unit into the rack, aligning the mounting bracket holes with those in the rack (see figure 77).

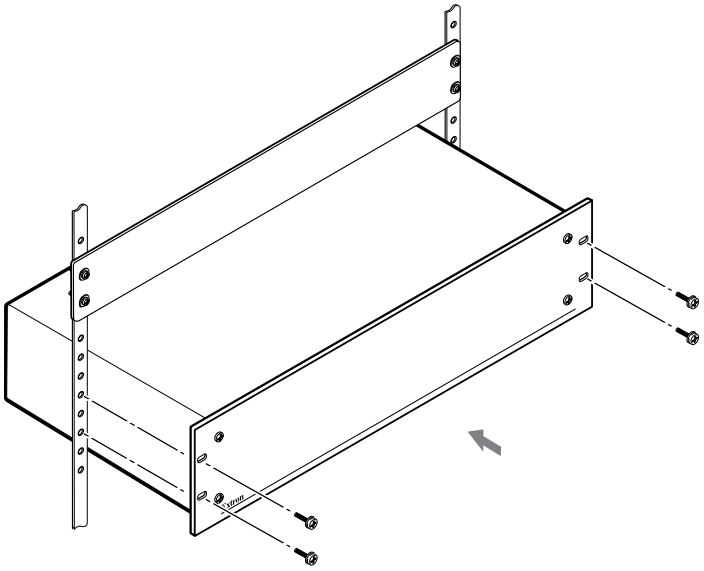


Figure 77. Installing the Switcher in a Rack

2. Secure the switcher to the rack using the supplied bolts.

Removing and Installing Button Labels

Making Labels Using the Button-Label Generator Program

The Button Label Generator software creates labels that you can place in the translucent covers of the input and output selection buttons. You can create labels with names, alphanumeric characters, or even color bitmaps for easy and intuitive input and output selection (see **Installing Labels in the Buttons** on page 152 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 under the **Download** tab (see figure 78, ❶). Click the **Software** link (❷), and download and install the program on your PC, using the procedure detailed in **Installing the Software** on page 73.

Figure 78. Location of Software on the Website

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: `C:\Program Files(x86)\` ... for 64-bit Windows OS.

Using the Button-Label Generator software

Start the Button-Label Generator program by clicking the desktop icon or as follows:

1. Click **Start** > **All Programs** > **Extron Electronics** > **Button Label Generator** > **Button Label Generator**. The Button-Label Generator window appears (see figure 79).

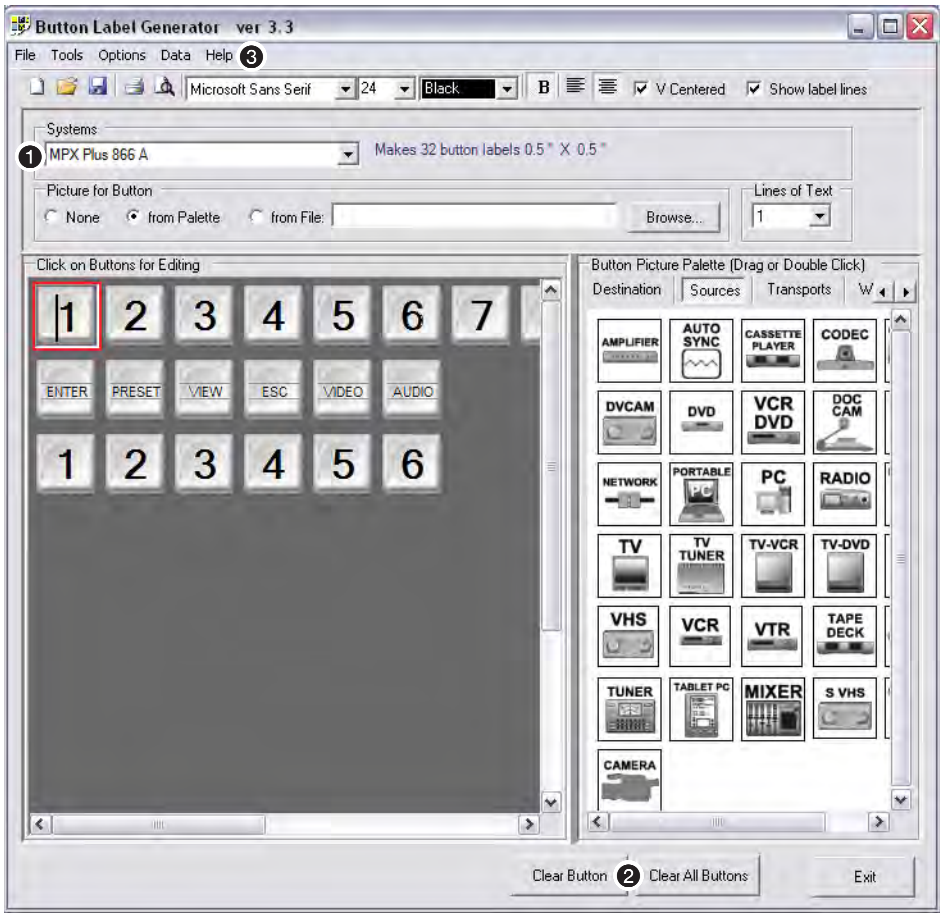


Figure 79. Extron Button-Label Generator Window

2. In the **Systems** drop-down box (figure 79, ❶), choose the **MPX Plus 866 A** option to match, as closely as possible, the button label size and quantities for your DTP CrossPoint switcher.
3. Using normal Windows controls, you can create and print labels that can be placed in the label windows on the front panel of the switcher.

> **NOTE:** For best results, print on transparent or translucent material.

4. Click the **Clear All Buttons** button (❷) 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 (❸).

Making Labels from Paper Templates

Figure 81 on the next page 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 windows of the input or output buttons.

Installing Labels in the Buttons

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 80).

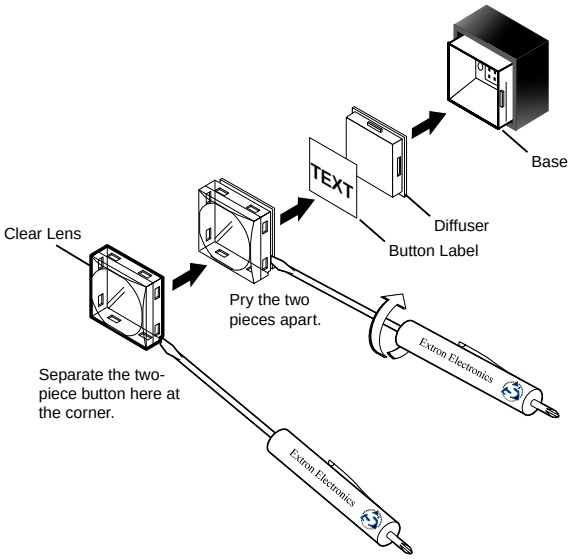


Figure 80. Illuminated Button Label Replacement

2. Locate the notch in the corner of one side of the clear button cap lens.
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 label insert from the transparent button cap lens.
5. Insert the replacement button label into the button cap. Check for correct label orientation.
6. Align the white diffuser plate with the cap (lens). 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.

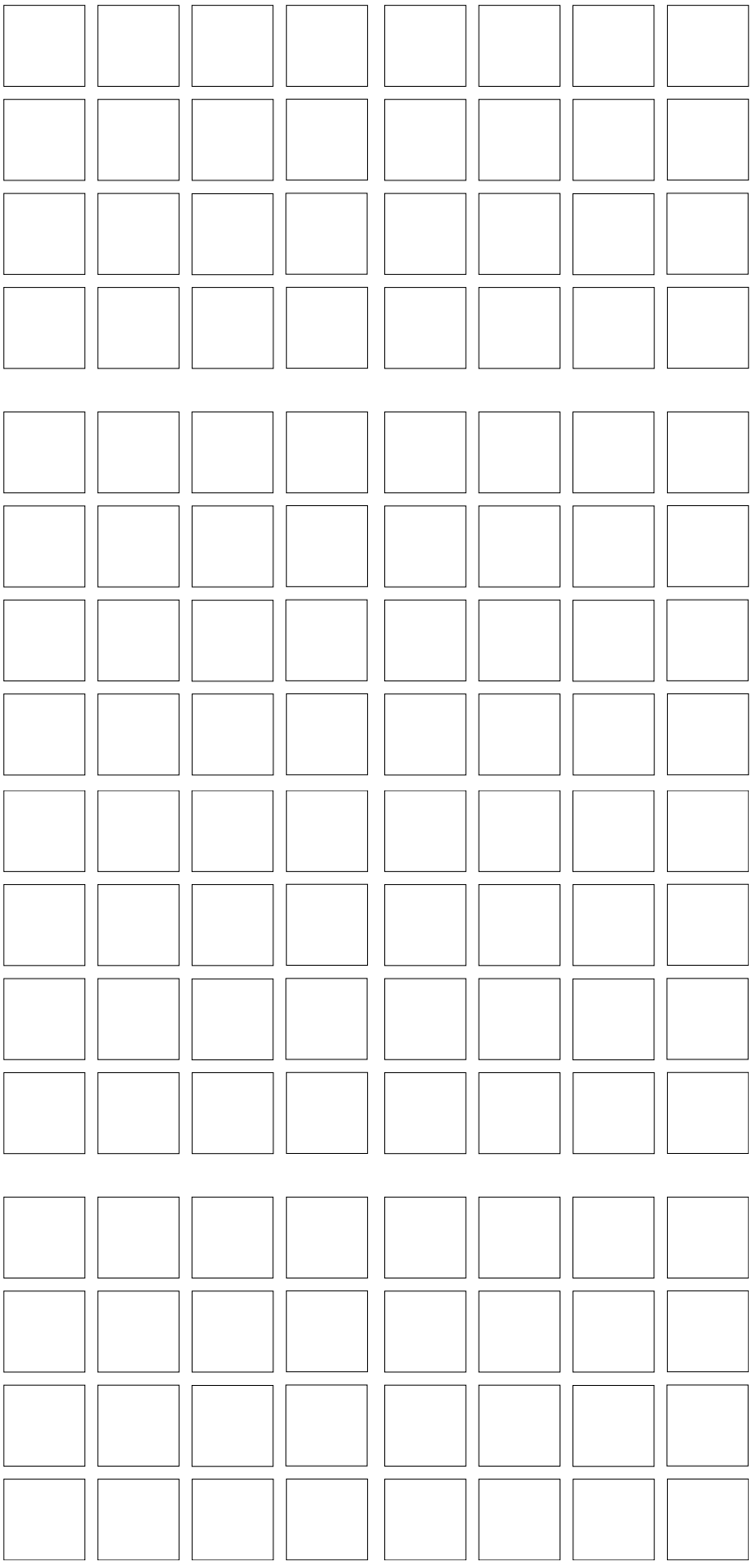


Figure 81. Button Label Blanks

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
1230 South Lewis Street
Anaheim, CA 92805
U.S.A.

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

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

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

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

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

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

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

USA: 714.491.1500 or 800.633.9876
Asia: 65.6383.4400
Europe: 31.33.453.4040
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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