User Guide

Matrix Switchers

HDXP Plus Series

Matrix Switchers

Extron Electronics

INTERFACING, SWITCHING AND CONTROL

68-1200-01 Rev. B
10 13

Safety Instructions

Safety Instructions • English

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ATTENTION: This symbol, ⚠, when used on the product, is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

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ATTENTION : Ce pictogramme, ⚠, lorsqu'il est utilisé sur le produit, signale à l'utilisateur des instructions d'utilisation ou de maintenance importantes qui se trouvent dans la documentation fournie avec le matériel.

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Chinese Simplified（简体中文）

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注 意: ⚠ 产 品 上 的 这 个 标 志 意 在 提 示 用 户 设 备 随 附 的 用 户 手 册 中 有 重要的操作和维护(维修) 说明。

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Korean

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Conventions Used in this Guide

Notifications

The following notifications are used in this guide:

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

ATTENTION: Attention indicates a situation that may damage or destroy the product or associated equipment.

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 * X23 * X21 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**.

Contents

Introduction

This section gives an overview of the Extron HDXP Plus Series Matrix Switchers, describes significant features of the series, and provides application diagrams.

About this Guide

This user guide contains installation, configuration, and operating information for the HDXP matrix switchers, including the HDXP 1616, HDXP 3216, and HDXP 3232 models.

The terms “HDXP,” “switcher,” and “HDXP switcher” are used in this guide to refer to all three HDXP models.

About the HDXP Plus Series Matrix Switchers

The Extron HDXP Plus Series are multi-rate digital matrix switchers that distribute any serial digital interface (SDI) or high definition serial digital interface (HD-SDI) input to any combination of SDI and HD-SDI outputs. The HDXP matrix switchers can route multiple input and output configurations simultaneously. They can route all SMPTE and ITU standard serial digital video signals up to 2.97 gigabits per second (Gbps), including dual-link HD-SDI digital video signals and high resolution signals from computer-video graphics cards equipped with HD-SDI outputs. Three matrix sizes are available:

- HDXP 1616 (16 inputs by 17 outputs)
- HDXP 3216 (32 inputs by 17 outputs)
- HDXP 3232 (32 inputs by 33 outputs)

The HDXP inputs can equalize incoming signals on up to 330 feet (100 meters) of high-quality cable, such as the Extron RG-6 Super High Resolution (SHR) coaxial cable. The outputs can reclock and drive all digital signals up to 330 feet (100 meters) on RG-6 cable.

The HDXP Plus series switchers conform to SMPTE and ITU-R BT specifications and support data rates of 19 megabits per second (Mbps) through 1.485 Gbps.

The zero-skew design of the HDXP ensures that dual-link HD-SDI signals are switched with no timing errors. The inputs adapt to the incoming signal rate, while the output is reclocked to the rate of the signal routed to it. The output reclocking can be disabled on a per-output basis (in bypass mode), or it can be set to a fixed rate. For each input, the HDXP can report if a signal is available or missing; and for each output, it can report the signal frequency.

Inputs and outputs can be grouped together to form up to four functional sub-switchers, based on data rate, video format, location, and so on. This facilitates installation and front panel control.

The HDXP can operate in two switching modes, selectable via front panel buttons:

- **Matrix switching mode (mode 1):** Any input may be switched to any output.
- **Preview selection mode (mode 2):** Any single input may be selected and previewed.

Each HDXP switcher has the rear panel Remote RS232/RS422 port, the front panel Config RS-232 port, and the LAN port for remote control and configuration. The switcher can be controlled via the front panel, the Extron Simple Instruction Set (SIS) commands, the HDXP web pages, and the Extron Windows-based control software via the RS-232 or RS-422 link, or an Ethernet connection.

The HDXP 1616 and 3216 models are housed in rack-mountable, 2U (3.5 inches) high, full rack wide metal enclosures. The HDXP 3232 has a 3U (5.25") high, full rack wide metal enclosure, also rack mountable. Each model has an internal 100 VAC to 240 VAC, 50-60 Hz, 80 watt power supply that provides worldwide power compatibility.

Features

- **Inputs** — 16 or 32 SDI and HD-SDI video inputs on female BNC connectors
- **Outputs** — 17 or 33 SDI and HD-SDI video outputs (including one preview output) on female BNC connectors
- **Serial digital data rates from 19 Mbps to 1.485 Gbps** — The HDXP switchers can switch signals conforming to all serial digital and high definition serial digital video transmission standards. They support carriage of embedded audio, ancillary data, and the ID information of the data stream.
- **Input cable equalization** — Each input signal is automatically equalized. Typically, a 1.485 Gbps input signal is equalized for distances of 330 feet (100 meters) on high quality cable such as Extron RG-6/SHR coaxial cable.
- **SDI-SMPTE 259M and HD-SDI-SMTPE 292M compliance** — Automatically adapts to SMPTE and ITU digital video standards for HD-SDI and SDI. Complies with SMPTE 259M, ITU-R BT.601, SMPTE 292M, ITU-R BT.1120, and SMPTE 372M standards.
- **Automatic rate selection** — The HDXP automatically detects and locks onto the incoming data signal. It accepts the following SMPTE data rates:
  - **SDI (SMPTE 259M and ITU-R BT .601)** — 143 Mbps, 177 Mbps, 270 Mbps, and 360 Mbps
  - **SDI (SMPTE 344M)** — 540 Mbps
  - **HD-SDI (SMPTE 292M and ITU-R BT .1120)** — 1.485 Gbps
  - **HD-SDI (Dual link) (No Preview function)** — 2.97 Gbps (1.485 Gbps x 2, using two inputs and outputs)
- **Digital Sync Validation Processing (DSVP)** — In critical environments or unmanned, remote locations, it may be vital to know that sources are active and switching. Extron DSVP verifies that input sources are active by scanning all inputs and outputs for active sync signals. It then provides feedback regarding the available input signal and the output signal rate. This information can be displayed via the RS-232 and RS-422 interfaces, Ethernet, and the Windows-based control software.
- **Video Genlock (HDXP 3232 only)** — Allows for vertical interval switching, and enables smooth, seamless transitions when switching between synchronous video sources. Separate bi-level (SDI) and tri-level (HD-SDI) references are provided on two additional BNC connectors.

- **Input-output (I/O) grouping** — Allows the matrix to be virtually divided into smaller sub-switchers, making installation and control easier. I/O grouping allows specific outputs, such as those designated for a specific purpose, to be grouped together.
- **Output reclocking** — Each output has a reclocker, which detects the rate of the digital input signal stream and re-times the output signal to match it. This enables the signal to travel farther through the cable. All digital signals are reclocked unless this feature is disabled via remote control (bypass mode).

  The following options are available for the output reclockers:

  - They can automatically reclock the output to the incoming signal rate if it is one of the eight standard SDI and HD-SDI rates. This is the default setting.
  - They can be set to a specific rate via SIS commands, the web pages, or the Windows-based control software.

    TIP: This option is recommended if the signal will always be input at the same rate. Setting to one rate ensures that time will not be lost while the reclockers detect and re-time to the signal rate.

  - They can be bypassed for non-standard signal rates (bypass mode).
- **Input signal preview** — A separate output is provided for previewing any input without tying up one of the matrix outputs.
- **Channel to channel isolation** — Provides a high level of isolation between channels and very low electromagnetic emissions to minimize signal leakage.
- **Buffered input and output** — Each input and output is individually buffered to provide maximum performance and eliminate nearly all crosstalk.
- **Viewing input or output mode** — Allows you to see which individual inputs and outputs are actively connected.
- **Global memory presets** — You can store up to 32 configurations in memory as global presets. Preset locations are assigned to the input buttons and (where necessary) output buttons. Up to 16 or 32 presets (depending on the number of inputs and outputs) can be selected from the front panel for either saving or retrieving. When a preset is retrieved from memory, it becomes the current configuration.
- **Rooms** — Each switcher can be programmed to group multiple outputs to specific "rooms," allowing them to have their own presets. This can be done via SIS commands or the Windows-based control software.
- **Room Presets** — 100 room presets, each consisting of up to 16 outputs in a single room, enable room configurations to be set up and stored. When a room preset is recalled, it becomes the current room configuration.
- **Switching flexibility** — Outputs are individually buffered and independently matrix switched, enabling you to do the following:

  - Tie any input to any or all outputs.
  - Switch multiple inputs to multiple outputs simultaneously. This allows all displays (outputs) to change from source to source at the same time.
- **RS-232 and RS-422 connections** — An RS-232/RS-422 control port on the rear panel connects the HDXP switcher to a computer running a control system (such as the IP Link Global Configurator), the Windows-based control software, and the SIS command set.

  In addition, the HDXP 3232 has a 2.5 mm TRS configuration port on the front panel, which provides an RS-232 connection only.

- **Front panel security lockout (executive mode)** — If a matrix switcher is installed in an open area, where operation by unauthorized personnel may be a problem, this security lockout feature can be implemented. When the front panel is locked, a special button combination, SIS command, or selection from the Windows-based control software screens is required to unlock the front panel controller before it can be operated.
- **Operational flexibility** — Operations such as input and output selection and setting of presets can be performed via the front panel, Ethernet, or the serial ports. The RS-232 and RS-422 link allows remote control via a PC or control system. The Ethernet link allows a remote connection with two levels of password protection.
  - **Front Panel Control** — The QuickSwitch Front Panel Controller (QS-FPC) provides a discrete button for each input and each output. An input or output can be selected or switched by a single press of its front panel button. The front panel buttons are large, positive touch, illuminated pushbuttons that can be labeled with text or graphics.
  - **Windows-based control program** — The Extron Windows-based control software program provides a versatile range of operational options with its graphical interface and drag-and-drop or point-and-click operation. This program also has an emulation mode that lets you create a switcher configuration file at the home office and then download it for use by the switcher on site. This program can be accessed via either an RS-232 or RS-422, or an IP connection.
  - **Simple Instruction Set (SIS)** — The Telnet, RS-232, and RS-422 remote control protocol uses SIS commands for easy programming and operation.
  - **IP (Ethernet) control** — Allows the switcher to be controlled through an Ethernet local area network (LAN) or wide area network (WAN) using standard IP internet protocols. The HDXP web pages, accessed via Ethernet, provide an alternative method to control and configure the switchers.
  - **Remote control panels and keypads** — The HDXP switchers are remote controllable via the optional X-Y switching control MKP 2000 or MKP 3000 keypads, connected to the switcher via Ethernet or the RS232/RS422 port. The remote control devices are easy to use and provide tactile buttons for quick selection. Each MKP can be used to select a different input, output, or preset.
- **Button labeling** — Labels for the three-colored front panel buttons may be created with any Brother P-Touch labeler or with the Extron label software, which is shipped with every Extron matrix switcher. Each input and output can be labeled with a name, alphanumeric characters, or a color bitmap for easy, intuitive input and output selection.
- **E-mail notification** — The built-in SMTP client feature sends out e-mail notifications to specified addresses when a monitored input loses its signal, or when the switcher is powered on. Up to eight e-mail recipients are allowed.
- **Rack mounting** — The HDXP switchers, which have integrated front panel mounting brackets, can be mounted in any conventional 19" wide rack.
- **Power supply** — The 100 VAC to 240 VAC internal power supply provides worldwide power compatibility.
- **Upgradable firmware** — The firmware that controls all switcher operations can be upgraded in the field via RS-232, RS-422, or Ethernet, without taking the switcher out of service, opening the switcher enclosure, and replacing the firmware chip. Firmware upgrades are available for download on the Extron website, www.extron.com and they can be installed using the Windows-based control program, SIS commands, or the web pages.

Application Diagrams

The following diagrams show examples of HDXP applications.

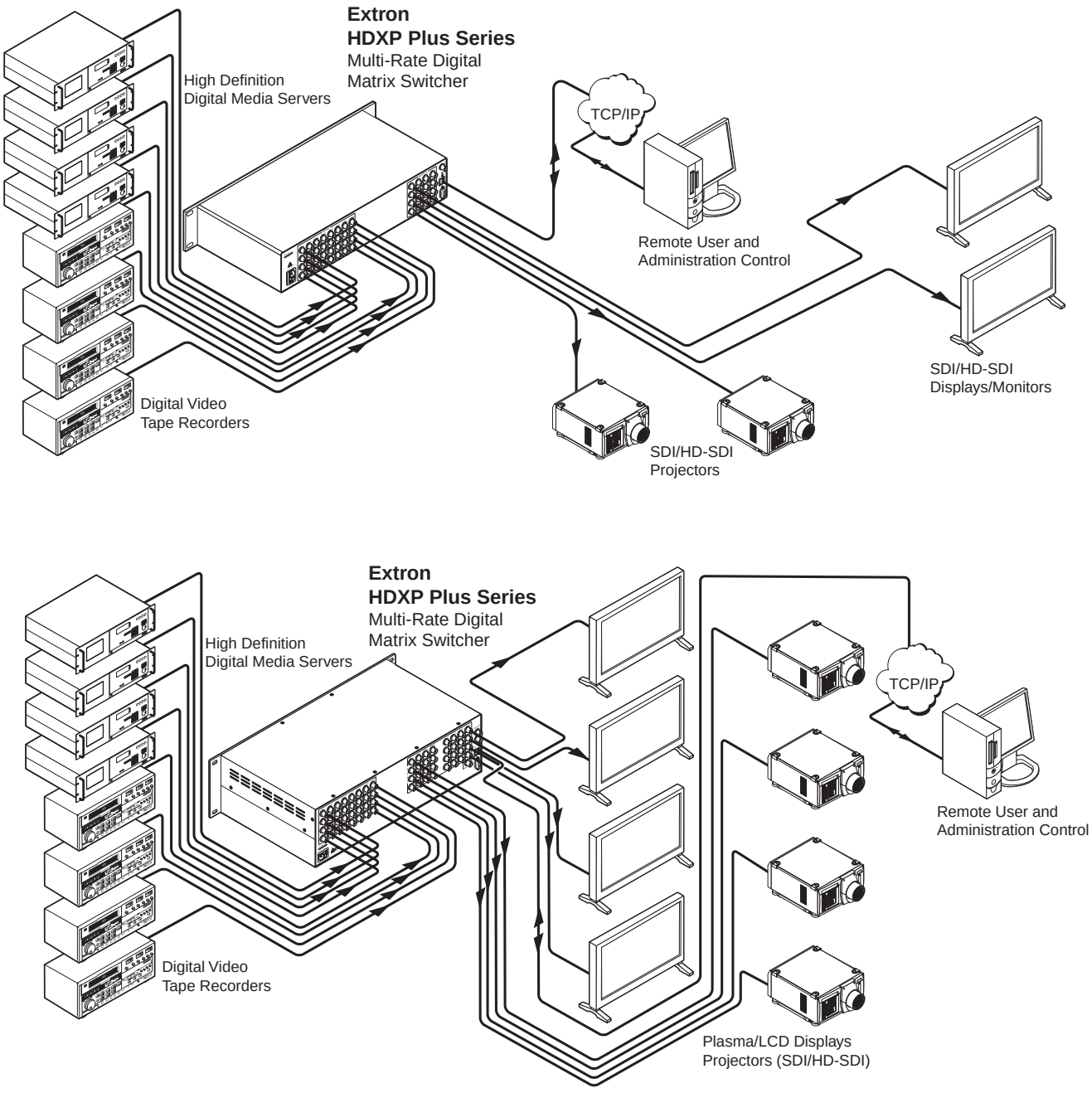


Figure 1. Application Diagrams for HDXP Plus

Installation

This section describes the rear panels of the HDXP switchers and provides instructions for cabling and mounting. Topics include:

- **Rear Panels and Cabling**
- **Connections**

Rear Panels and Cabling

Most of the HDXP connectors are on the rear panel. Figures 2, 3, and **4** show the rear panels of the HDXP 1616, 3216, and 3232 switchers.

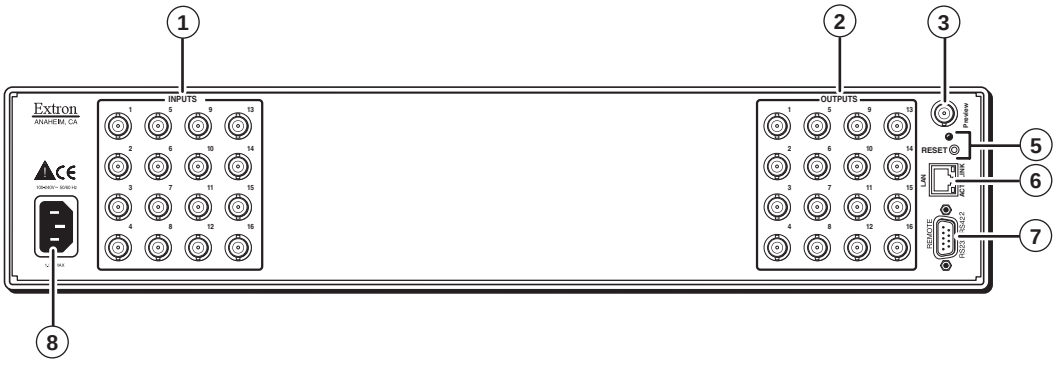


Figure 2. HDXP 1616 Rear Panel

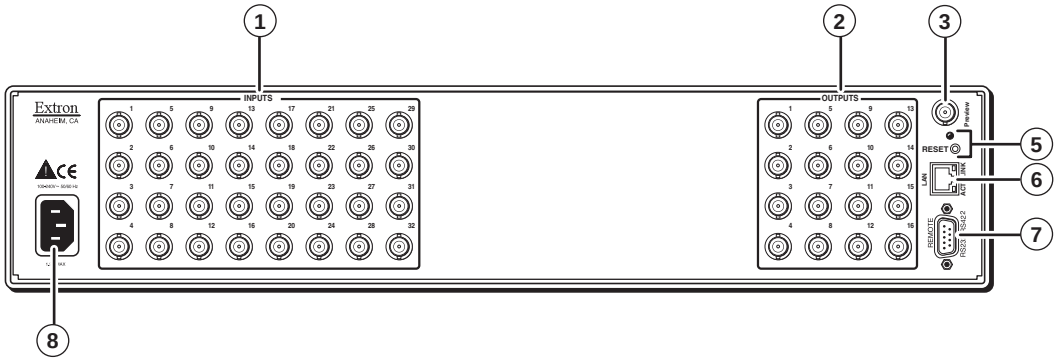


Figure 3. HDXP 3216 Rear Panel

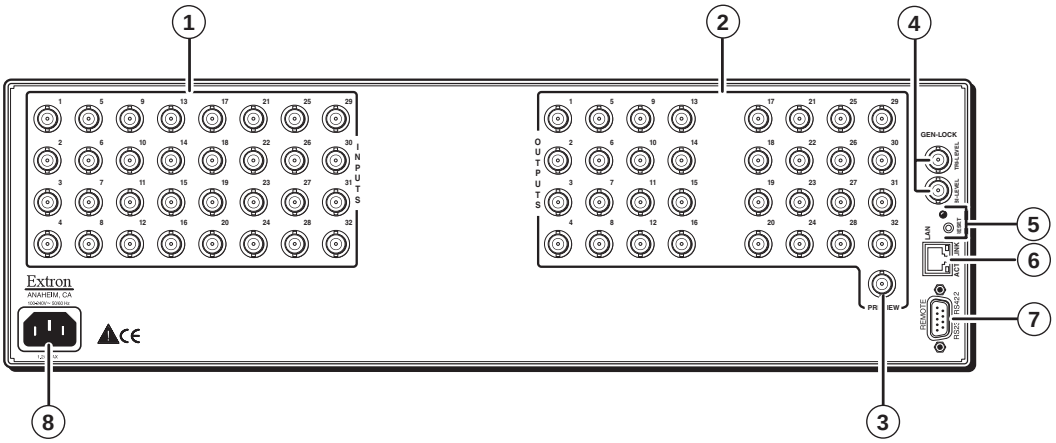


Figure 4. HDXP 3232 Rear Panel

Connections

WARNING: Risk of Electric Shock. Remove power from the system before making any connections.

ATTENTION: Use Electrostatic discharge precautions (be electrically grounded) when making connections. Electrostatic discharge (ESD) can damage equipment, although you may not feel, see, or hear it.

Video Connections

NOTE: The switchers do not alter the video signal in any way. The signal that is output by the switcher is in the same format as the input signal.

1. **Video inputs** — Connect serial digital input sources to these female BNC connectors.

2. **Video outputs** — Connect serial digital video output devices to these female BNC connectors.

3. **Preview output** — Connect a digital display device to this female BNC connector to enable you to preview a selected input when the switcher is in preview mode.

External Sync Connections (HDXP 3232 only)

④ **External sync connectors for bi-level and tri-level** — Connect an external sync signal to this BNC connector to genlock the video signal in broadcast or other sync-critical applications.

The HDXP switchers switch between inputs during the vertical interval period, resulting in glitch-free video switching when the input devices are also using the same sync timing. The HDXP can use an external signal to synchronize switching during the vertical interval. Without this external sync locking feature, switching between inputs could result in a brief rolling (sync loss) or a brief change in the picture size.

Figure 5 shows a basic external sync configuration. The Bi-level or Tri-level sync connector receives the timing signal. A **T** connector attached to the cable allows the signal to be passed on to another video device, if required. Terminate the **T** connector if desired.

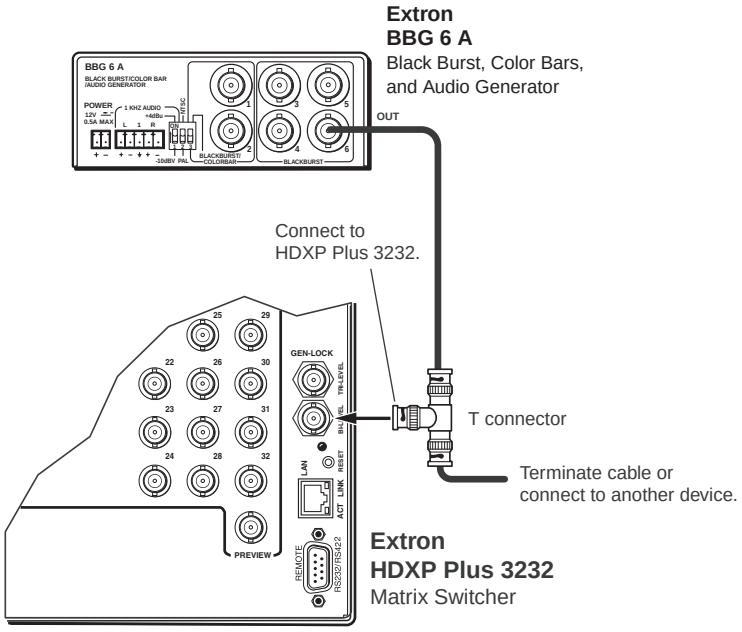


Figure 5. Simple HDXP 3232 External Sync Connection Example

Figure 6 shows a configuration in which the timing source passes through three video cameras and a video scan converter before connecting to the switcher. This type of camera can synchronize with the external timing source for video editing applications.

NOTE: I/O grouping is used to set the inputs associated with each reference input. Input group 1 is associated with the tri-level signal and input group 2 is associated with the bi-level signal.

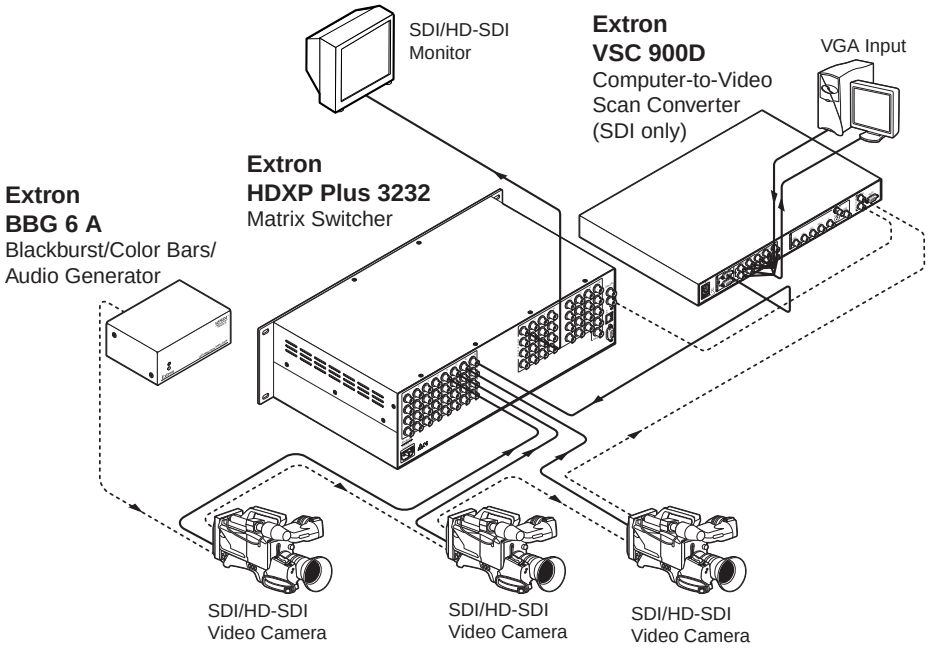


Figure 6. Multiple Device Example of an HDXP 3232 External Sync

If no external sync timing source is connected, switching occurs immediately.

Reset Button

⑤ **Reset button** — This recessed button initiates three levels of reset on the matrix switcher. To initiate the different levels of reset, use a pointed object such as a stylus or a small screwdriver to press and hold the Reset button while the switcher is running or while you are powering it up (see **Resetting** on page 37 for details).

- **Events (mode 3) reset** — Hold the Reset button until the Reset LED blinks once (approximately 3 seconds), then release it and press it again momentarily to toggle events monitoring on and off.
- **IP settings (mode 4) reset** — Hold the Reset button until the Reset LED blinks twice (approximately 6 seconds), then release it and press it again to reset the switcher IP functions.

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

  Absolute (mode 5) reset — Hold the Reset button until the Reset LED blinks three times (approximately 9 seconds), then release it and press it again to restore the switcher to the default factory settings.
- **Hard reset** — Hold the Reset button while powering up the switcher to restore the switcher to the default factory settings and factory installed firmware version.

  NOTE: This type of reset does not clear the current configuration.

Ethernet Connection

⑥ **LAN port** — If desired, connect the HDXP switcher to a PC or to an Ethernet LAN via this RJ-45 connector. Use a PC to control the networked switcher with SIS commands (see the **Remote Configuration and Control** section, beginning on page 45), the windows-based control program (see the **Matrix Software** section, beginning on page 67), or the HTML pages (see the **HTML Configuration and Control** section, beginning on page 96).

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

Cabling and RJ-45 connector wiring

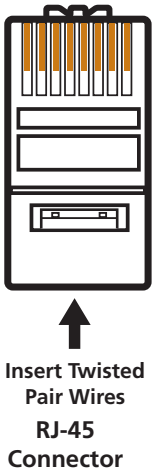
It is vital that you use the correct Ethernet cables, and that they be properly terminated with the correct pinout. Ethernet links use Category (CAT) 5e or CAT 6, unshielded twisted pair (UTP) or shielded twisted pair (STP) cables, terminated with RJ-45 connectors. Ethernet cables are limited to a length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

NOTES:

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

The Ethernet cable must be properly terminated for your application as either a crossover or a straight-through cable.

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



Crossover Cable

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

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

Straight-through Cable

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

A cable that is wired the same at both ends is called a "straight-through" cable because no pin or pair assignments are swapped. Both ends of the cable can be T568B (as shown) or T568A (not shown).

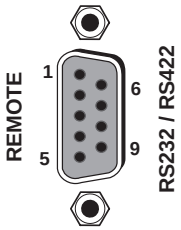
Figure 7. RJ-45 Connector and Pinout Tables

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

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

RS-232 and RS-422 Remote Connections

⑦ **Remote RS232/RS422 connector** — Connect a host device, such as a computer, touch panel control, or RS-232 capable PDA to the switcher via this 9-pin D connector for serial RS-232 or RS-422 control.



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

Figure 8. Remote RS232/RS422 Connector

See the **Remote Configuration and Control** section beginning on page 45 for definitions of the SIS commands (serial commands to control the switcher via this connector) and the **Matrix Software** section beginning on page 67 for details on how to install and use the control software.

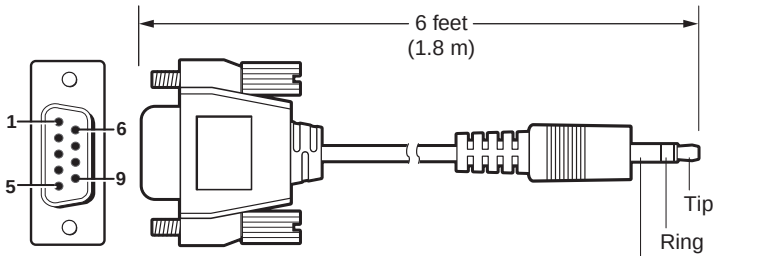
NOTE: The switcher can support either an RS-232 or RS-422 serial communication protocol, and operate at 9600, 19200, 38400, or 115200 baud rates (see **Selecting the RS-232 or RS-422 Protocol and Baud Rate** on page 36 to configure the RS232/RS422 port from the front panel).

If desired, connect an MKP 2000 or MKP 3000 remote control panel to the switcher Remote RS232/RS422 connector (see the *MKP 2000 Remote Control Panel User's Manual* and the *MKP 3000 User's Manual* for details).

RS-232 Config connector (front panel) — On the HDXP 3232 only, an additional RS-232 port is located on the front panel. A host device can be connected to this port for serial RS-232 control only. Protocol for the port is:

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

The optional 2.5 mm cable can be used to connect the HDXP to your computer. Figure 9 shows the pin assignments for this cable.



9-pin D	Connection	TRS Plug
Pin 2	Computer Rx line	Tip
Pin 3	Computer Tx line	Ring
Pin 5	Computer signal ground	Sleeve

Figure 9. 2.5 mm Connector Cable for the Configuration Port (HDXP 3232 Only)

See the **Remote Configuration and Control** section, beginning on page 45, and the **Matrix Software** section beginning on page 67 for details about using SIS commands and the control software to configure the HDXP.

Power

⑧ **AC power connector** — Plug a standard IEC power cord into this connector to connect the switcher to a 100 VAC to 240 VAC, 50 or 60 Hz power source.

Operation

This section describes the HDXP front panel controls and the procedures for configuring and operating the HDXP switchers. Topics include:

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

Front Panel Controls and Indicators

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

These illuminated push buttons can be labeled with text and graphics. You can set the buttons to have amber background illumination all the time, or you can turn off the background illumination (see **Setting the Button Background Illumination** on page 35). The buttons blink or light steadily (depending on the operation) when pressed.

You can re-label the input and output buttons by removing their numbered translucent covers and inserting new labels behind the covers. An alternative set of labels is provided and you can also create your own labels using the Extron Button Label Generator software (also provided). See **Creating Button Labels** on page 92 for the procedure.

Definitions

The following terms, which apply to Extron matrix switchers, are used in this guide:

- **Tie** — An input-to-output connection.
- **Set of ties** — An input tied to two or more outputs. (An output can never be tied to more than one input.)
- **Configuration** — One or more ties or one or more sets of ties.
- **Current configuration** — The configuration that is currently active in the switcher (also called configuration 0).
- **Global memory preset** — A configuration that has been stored. Up to 32 global memory presets can be stored in memory. Preset locations are assigned to the input buttons and (where necessary) output buttons. All models have 32 presets available from the front panel and under RS-232, RS-422, or Ethernet control.

  When a **preset** is retrieved from memory, it becomes the **current configuration**.
- **Room** — A subset of outputs that are logically related to each other, as determined by the operator. The switchers support up to 10 rooms, each of which can consist of from 1 to 16 outputs.
- **Room memory preset** — A configuration consisting of outputs in a single room that has been stored. When a room preset is retrieved from memory, it becomes the current configuration for the outputs assigned to that room only (none of the other outputs are affected).

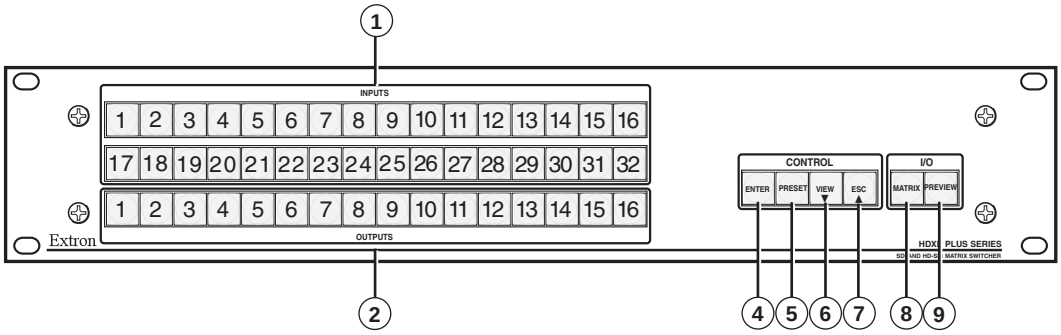


Figure 10. HDXP 1616 and HDXP 3216 Front Panel

NOTE: On the HDXP 1616, which has only 16 input connectors, the input buttons in the second row (buttons 17 through 32) can be used only for preset selection.

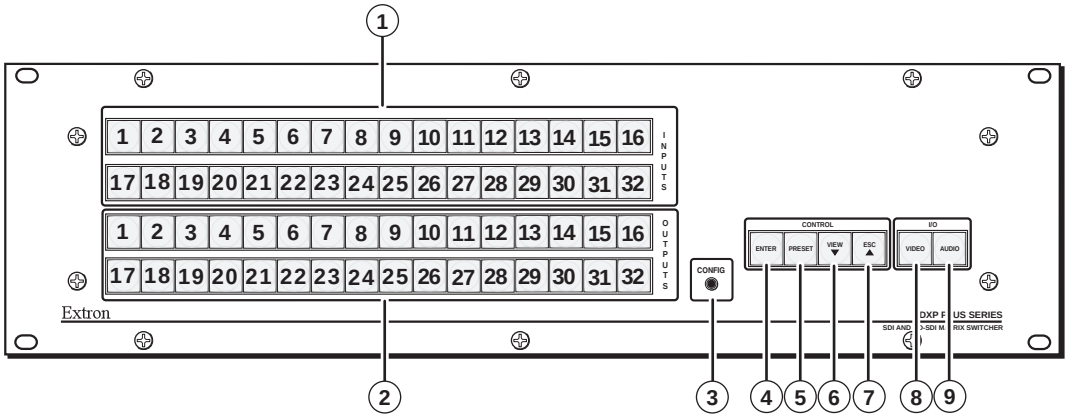


Figure 11. HDXP 3232 Front Panel

Input and Output Buttons

(1) **Input buttons** — The input buttons have two primary functions (❑) and three secondary functions (•):

- ❑ Select an input.
- ❑ Identify the selected input.
- • **Input 1 only:** With the Output 1 button, place the switcher in I/O grouping mode (see **I/O Grouping** on page 26).
- • Select a global preset (see **Saving and Recalling Presets** on page 29).
- • **Inputs 1 and 2 only:** Activate or deactivate button background illumination (see **Setting the Button Background Illumination** on page 35).

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

- ❑ Select outputs.
- ❑ Identify the selected outputs.
- • **Output 1 only:** With the Input 1 button, place the switcher in I/O grouping mode (see **I/O Grouping**).
- • Mute or unmute an output (see **Muting and Unmuting Outputs** on page 33).

Configuration Port (HDXP 3232 Only)

③ **Config port (HDXP 3232 only)** — This RS-232 port is an alternative to the RS232/RS422 connector on the HDXP rear panel (see **Rear Panels and Cabling** on page 6 for a description). This port (RS-232 only) can be used for system configuration and control via SIS commands or the Windows-based control software. For information on connecting to this port, see **RS-232 and RS-422 Remote Connections** on page 11.

Control Buttons

④ **Enter button** — The Enter button has three primary functions (❑) and five secondary (•) functions:

- ❑ Saves changes that you make on the front panel. To create a simple configuration:
  - **a.** Specify a Matrix connection (see **I/O Buttons** on page 16 [⑧ and ⑨]).
  - **b.** Press the desired input button (①).
  - **c.** Press the desired output buttons (②).
  - **d.** Press the Enter button.
- ❑ Indicates that a potential tie has been created but not saved.
- ❑ Indicates that a global preset has been selected to be saved or recalled but that the preset action has not been accomplished.
- • In I/O Grouping mode, selects group 1 (see **I/O Grouping** on page 26).
- • In I/O grouping mode, indicates that group 1 is selected (see **I/O Grouping**).
- • Selects the RS-232 or RS-422 protocol and baud rate (see **Selecting the RS-232 or RS-422 Protocol and Baud Rate** on page 36).

⑤ **Preset button** — The Preset button has two primary functions (❑) and five secondary (•) functions:

- ❑ Places the switcher in preset saving mode to save a configuration as a preset, and in preset recalling mode to activate a previously-defined preset.
- ❑ Blinks when preset saving mode is active, and lights steadily when preset recalling mode is active.
- • In I/O grouping mode, selects group 2 (see **I/O Grouping**).
- • In I/O grouping mode, indicates that group 2 is selected (see **I/O Grouping**).
- • Selects the RS-232 or RS-422 protocol and baud rate (see **Selecting the RS-232 or RS-422 Protocol and Baud Rate**).

⑥ **View ▼ button** — The View ▼ button has two primary functions (❑) and eight secondary (•) functions:

❑ Places the switcher in view-only mode to display the current configuration.

> **NOTE:** View-only mode also provides a way to mute and unmute outputs (see **Muting and Unmuting Outputs**) on page 33).

❑ Indicates that the HDXP is in view-Only mode.

- In I/O grouping mode, selects group 3 (see **I/O Grouping** on page 26).
- In I/O grouping mode, indicates that group 3 is selected (see **I/O Grouping**).
- Selects the RS-232 or RS-422 protocol and baud rate (see **Selecting the RS-232 or RS-422 Protocol and Baud Rate** on page 36).

⑦ **Esc ▲ button** — The Esc ▲ button has two primary functions (❑) and five secondary (•) functions:

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

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

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

- In I/O grouping mode, selects group 4 (see **I/O Grouping**).
- In I/O grouping mode, indicates that group 4 is selected (see **I/O Grouping**).
- Selects the RS-232 or RS-422 protocol and baud rate (see **Selecting the RS-232 or RS-422 Protocol and Baud Rate**).

I/O Buttons

You must select the input-output connection mode when you are creating or viewing a configuration. This is done with the Matrix (⑧) and Preview (⑲) buttons.

⑧ **Matrix button** — The Matrix button has two primary functions (❑) and four secondary functions (•):

❑ Places the HDXP in Matrix switching mode, enabling any input to be switched to any output.

❑ Lights green to indicate that the HDXP is in matrix switching mode, and that any input can be selected for switching to any output.

- With the Preview button, toggles the front panel lock on or off (see **Locking the Front Panel (Executive Mode)** on page 35).
- With the Preview button, initiates the front panel system reset (see **Resetting using front panel buttons** on page 38).
- Selects RS-232 for the rear panel RS232/RS422 port, when the HDXP is in Serial Port Configuration mode (see **Selecting the RS-232 or RS-422 Protocol and Baud Rate** on page 36).
- Flashes to indicate that the Remote RS232/RS422 port is set to the RS-232 protocol when the switcher is in Serial Port Configuration mode (see **Selecting the RS-232 or RS-422 Protocol and Baud Rate**).

⑨ **Preview button** — The Preview button has two primary functions (❑) and three secondary functions (•):

- ❑ Places the HDXP in Preview switching mode, enabling selection of one input to preview.
- ❑ Lights to indicate that the HDXP is in preview mode, and that only one input can be selected to be viewed.
- • With the Matrix button, toggles the front panel lock on or off (see **Locking Out the Front Panel [Executive mode]**).
- • With the Matrix button, initiates the front panel system reset (see **Resetting using front panel buttons**).
- • Selects RS-422 for the rear panel RS232/RS422 port when the switcher is in Serial Port Configuration mode (see **Selecting the RS-232 or RS-422 Protocol and Baud Rate**).
- • Flashes to indicate that the RS232/RS422 port is set to the RS-422 protocol when the HDXP is in Serial Port Configuration mode (see **Selecting the RS-232 or RS-422 Protocol and Baud Rate**).

Operations

The following sections detail the powering up process and provide procedures for operations that can be performed from the front or rear panel.

Powering On

Apply power by connecting the power cord to an AC source. The switcher performs a self-test that flashes the front panel button indicators red, green, and amber and then turns them off (the order of button LED colors may vary by model). An error-free power-up self-test sequence leaves all input, output, and control buttons either unlit or showing background illumination. The lit or unlit status of the Matrix and Preview buttons is the same as it was when the switcher was powered off.

The current configuration and all presets are saved in 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 HDXP locks up and does not operate. If your switcher locks up on power-up, call the **Extron S3 Support Hotline**.

Creating a Configuration

A configuration consists of one or more inputs, each tied to a set of outputs. To set up a configuration, you must place the HDXP in matrix switching mode, which enables you to switch any input to any output.

NOTE: While an input can be tied to multiple outputs, an output can be tied to only one input.

This section contains the steps to follow to create or change a configuration. The following subsections contain some examples of configurations that can be created on the HDXP, and instructions on setting them up. The illustrations show the HDXP 3216; however, the procedures apply to all HDXP models.

1. Press the Esc ▲ button to clear any pending changes or input, output, or control button indicators that may be lit.
2. Press the Matrix button in the I/O section. The Matrix button lights green (the Preview button remains unlit).

3. Select an input by pressing its button. The input button you pressed lights green.

   NOTE: If your selected input already has outputs tied to it, the buttons of the tied outputs also light green (steadily) when you press the input button.

4. Press the button for each output that you want to tie to the selected input.
   - The output buttons blink green when pressed, indicating **potential ties**.
   - The Enter button also blinks green.

   NOTE: Outputs that are already tied can remain tied (buttons lit), along with your new blinking selections; or you can untie them by pressing their associated output buttons, which start to blink also.

5. Press Enter to establish the tie. The input, output, and Enter buttons become unlit.
6. Repeat steps 3 through 5 to create additional ties until the desired configuration is complete.

NOTES:
- Only one input can be tied to an output. If you tie an input to an output that is already tied to another input, the older tie is broken in favor of the newer tie.
- If you press the input button for an I/O grouped input and then try to select an output in a different group, the associated output button cannot be selected, and the selected input button remains lit (see **I/O Grouping** on page 26).

Example 1: Creating a set of ties

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

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

1. Press and release the Esc ▲ button.

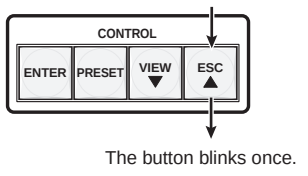


Figure 12. Clearing All Selections

2. If necessary, place the HDXP in matrix switching mode by pressing and releasing the Matrix button. The button lights steadily green.

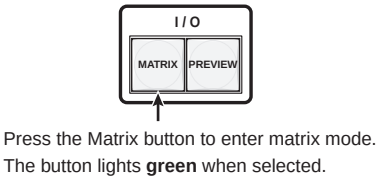


Figure 13. Selecting Matrix Mode

3. Press and release the Input 5 button.

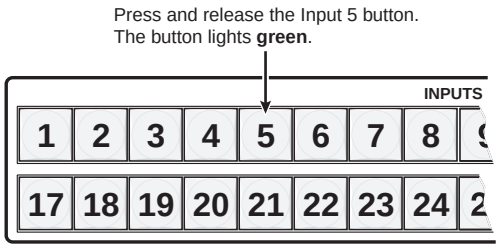


Figure 14. Selecting Input 5

4. Press and release the Output 3, Output 4, and Output 8 buttons.

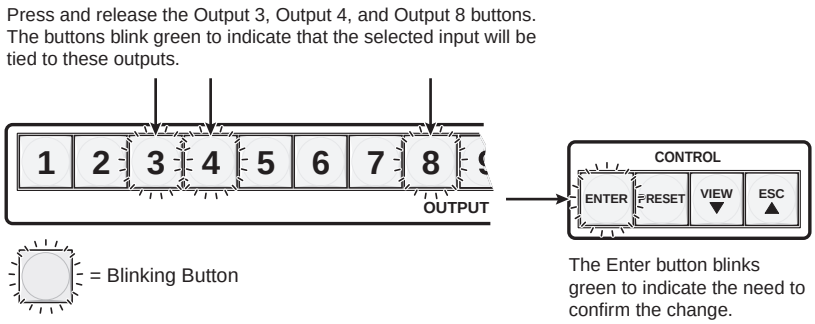


Figure 15. Selecting the Outputs

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

5. Press and release the Enter button.

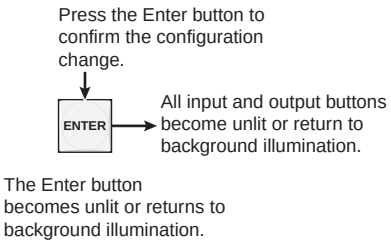


Figure 16. Confirming the Tie

The configuration now is:

Input 5 tied to output 3, output 4, and output 8

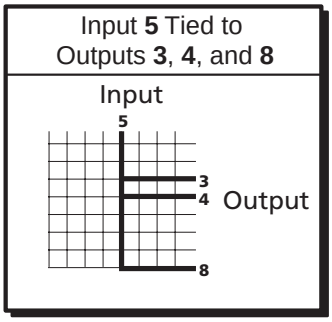


Figure 17. Example 1, Final Configuration

Example 2: Adding a tie to a set of ties

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

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

1. Press and release the Esc ▲ button.

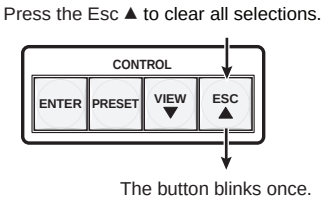


Figure 18. Clearing All Selections

2. If necessary, place the HDXP in matrix switching mode by pressing and releasing the Matrix button. The button lights steadily green.

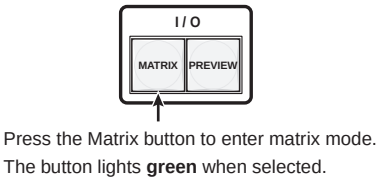


Figure 19. Selecting Matrix Mode

3. Press and release the Input 5 button.

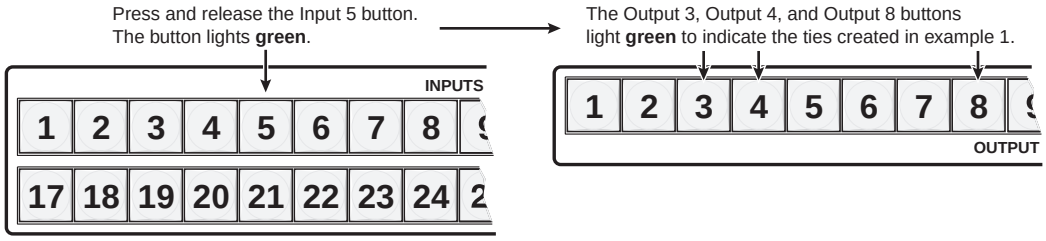


Figure 20. Selecting an Input with Ties

4. Press and release the output 1 button.

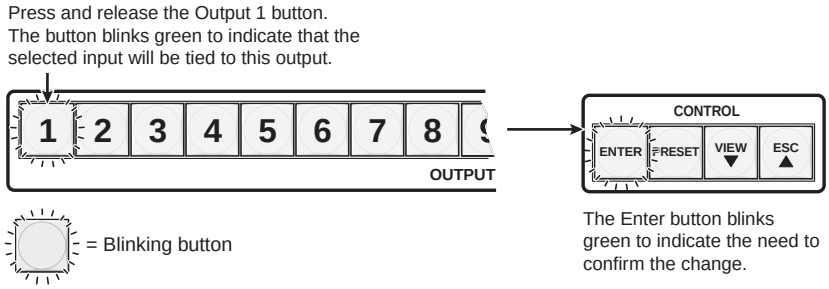


Figure 21. Selecting an Additional Output

5. Press and release the Enter button.

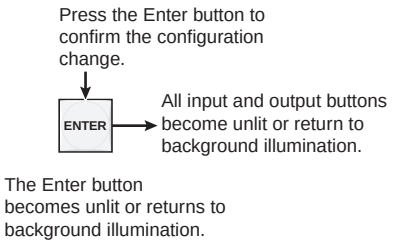


Figure 22. Confirming the Tie

The configuration now is:

Input 5 tied to output 1, output 3, output 4, and output 8

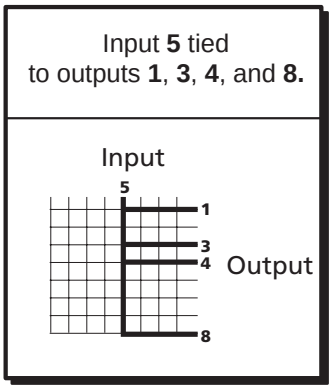


Figure 23. Example 2, Final Configuration

Breaking ties

To undo an existing I/O tie:

1. Press the Matrix button. The button lights green.
2. Press the input button whose tie you want to dissolve. The input button and its tied output buttons light green.
3. Press one of the lit output buttons. The button you pressed, and the Enter button, start to blink.
4. Press the Enter button. The input, output, and Enter buttons become unlit, and the tie is broken.

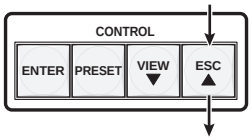
Example 3: Removing a tie from a set of ties

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

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

1. Press and release the Esc ▲ button.

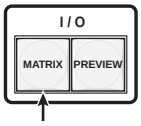
Press the Esc ▲ to clear all selections.



The button blinks once.

Figure 24. Clearing All Selections

2. If necessary, place the HDXP in matrix switching mode by pressing and releasing the Matrix button. The button lights steadily green.



Press the Matrix button to enter matrix mode.
The button lights **green** when selected.

Figure 25. Selecting Matrix Mode

3. Press and release the input 5 button.

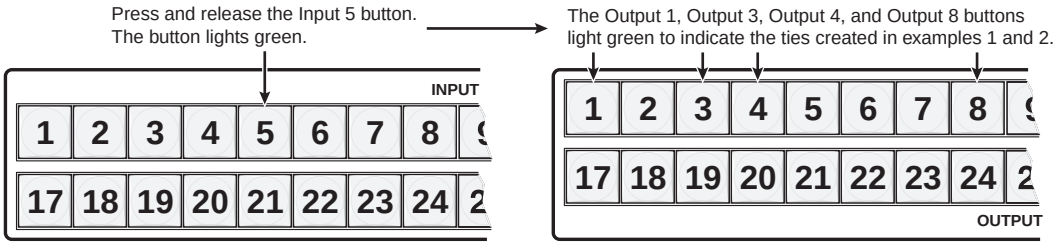


Figure 26. Selecting an Input

4. Press and release the Output 4 button.

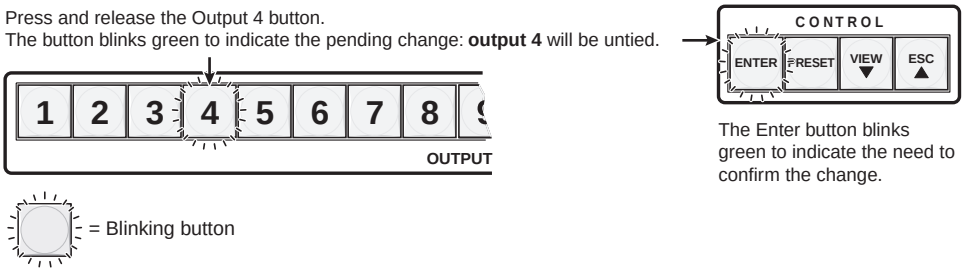


Figure 27. Deselecting the Output

5. Press and release the Enter button.

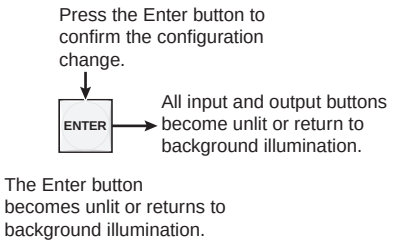


Figure 28. Confirming the Tie Removal

The configuration now is:

Input 5 tied to output 1, output 3, and output 8 (see figure 29).

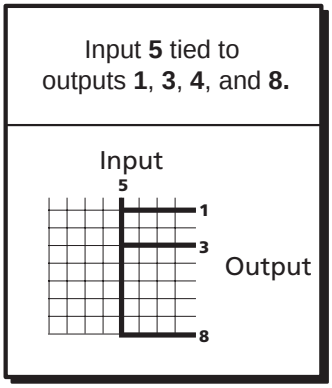


Figure 29. Example 3, Final Configuration

Previewing an Input

You can preview any input by switching it to the preview output when the HDXP is in preview mode. To preview an input:

1. Press the Esc ▲ button to clear any input, output, or control button indicators that may be lit.
2. Press the Preview button in the I/O section. The Preview button lights red (the Matrix button is unlit).

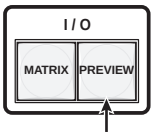


Figure 30. Selecting Preview Mode

NOTE: If an input has already been selected in preview mode, its button also lights red when you press Preview.

3. Press the button for the input that you want to preview. The input button lights **red** when pressed, and the selected input is tied to the Preview output.

NOTE: Preview selection mode times out and returns to matrix mode after 30 seconds of non-use.

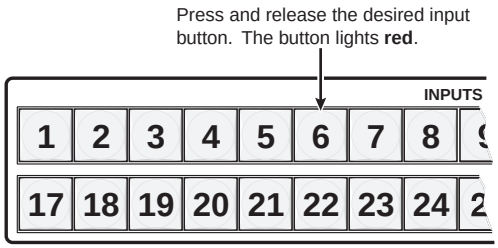


Figure 31. Selecting an Input to Preview

NOTE: Only one input at a time can be previewed. If another input button was lit when you pressed Preview, it becomes unlit.

4. Repeat steps 2 and 3 if you want to preview another input.

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 outputs (see **Muting and Unmuting Outputs** on page 33).

NOTE: You cannot view configurations while the HDXP is in preview mode. When you place it in view-only mode, the HDXP also switches to Matrix mode. If you want to return the HDXP to preview mode, you must press the Preview button again.

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 on.

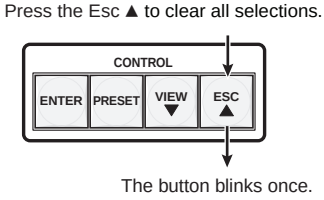


Figure 32. Clearing All Selections

2. Press and release the View ▼ button.

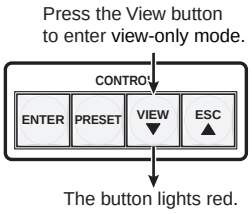


Figure 33. Entering View-only Mode

- The View ▼ button lights red.
- The Matrix button lights green.
- All of the buttons for outputs that are **not** tied light green.

3. Select the input or output whose ties you wish to view by pressing its input or output button.

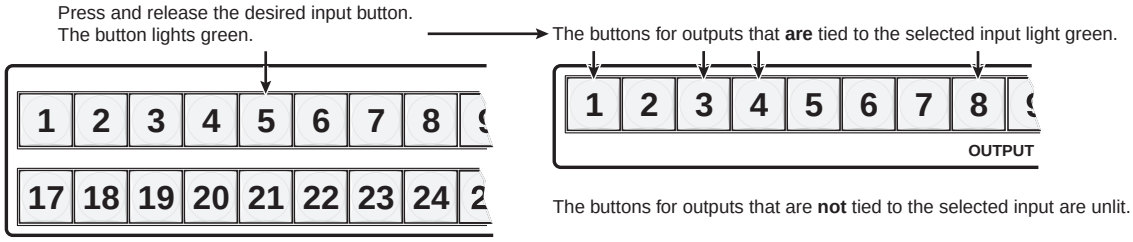


Figure 34. Selecting an Input to View in View-only Mode

- When you press the button for an input or an output that has ties, the buttons for all the inputs and outputs tied to it light green.
- When an output button for which there are no ties is pressed, the buttons also light for all other outputs without ties.

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

4. To exit view-only mode, press View ▼ again; or wait for the View ▼ button to turn off (approximately 30 seconds).

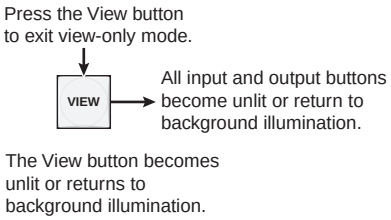


Figure 35. Exiting View-only Mode

I/O Grouping

I/O grouping is a matrix switcher feature that allows you to subdivide the front panel control of the matrix into four smaller functional sub-switchers and limit tie creation **from the front panel only**. Inputs and outputs can be assigned to one of four groups or not assigned to any group.

Inputs and outputs that are assigned to a group can be tied only to other outputs and inputs within the same group when you are creating ties on the front panel. For example, you cannot tie an input that is assigned to group 1 to an output that is assigned to group 2. Ungrouped inputs and outputs can be switched to outputs and inputs in any group. Ties between groups (for example, an input in group 1 tied to an output in group 2) **can** be created via SIS commands, the Matrix Switcher Control Program, or Ethernet control.

You can set up the I/O groups by the following methods:

- Front panel buttons and menus (see **Creating I/O groups** on page 27)
- SIS commands via RS-232, RS-422, or Ethernet control (see the **Remote Configuration and Control** section beginning on page 45)
- The Matrix Switcher Control Program via Telnet/RS-232/RS-422 or IP control (see the **Matrix Software** section beginning on page 67)

HDXP 3232 only: Outputs assigned to I/O group 1 reference the bi-level genlock sync signal for vertical interval switching; outputs assigned to I/O group 2 reference the tri-level genlock sync signal.

Figure 36 gives an example of input-output grouping of SDI and HD-SDI devices on an HDXP 3232.

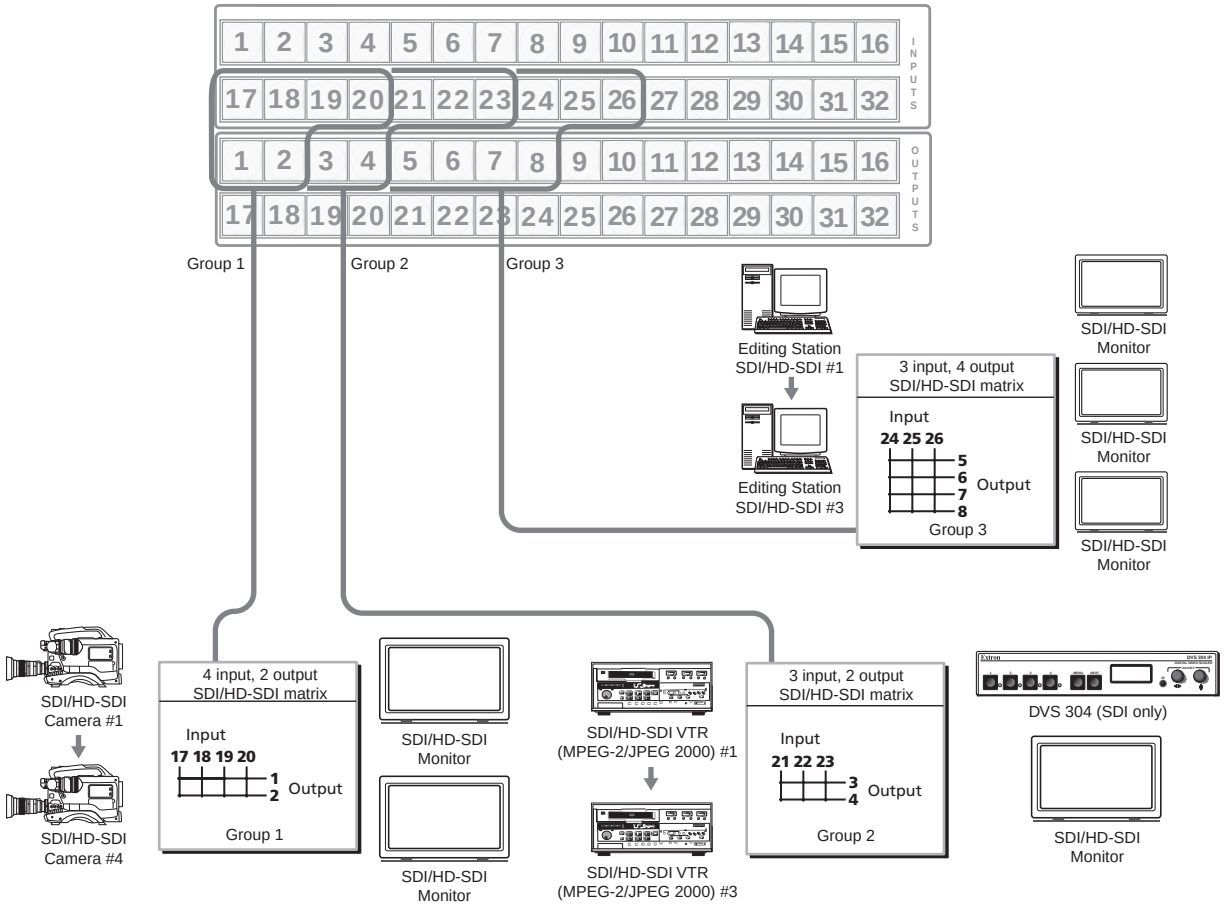


Figure 36. I/O Grouping of Incompatible Video Formats

Suggested applications for the I/O grouping feature include:

- Segregating specific video formats to prevent an input in one video format from being inadvertently applied to an output device that supports another video format (see figure 37).
- Segregating input and output devices that are in separate rooms.
- Isolating video from being displayed on specific output devices for operational security reasons.

NOTES:

- Presets can be created under RS-232, RS-422, or Ethernet control to tie inputs and outputs across group boundaries. These presets **are** selectable from the front panel.
- An input or output can be assigned to only one group. If you assign an input or output to a group, and that input or output is already assigned to a different group, the older grouping is replaced by the new grouping.
- For I/O groups to have any function, at least two groups must be created.

Creating I/O groups

Follow these steps to create I/O groups using the front panel:

NOTE: The illustrations in this section show the HDXP 3216. However, the procedure applies to all three HDXP models.

1. Press the Esc ▲ button to clear any input buttons, output buttons, or control buttons that may be lit. The Esc ▲ button blinks once, then turns off.

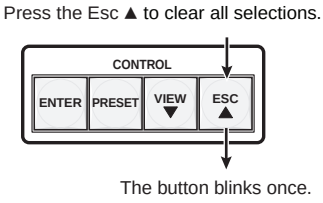


Figure 37. Clearing All Selections

2. To enter I/O grouping mode, press and **hold** the Input 1 and Output 1 buttons simultaneously, until the buttons for all the ungrouped inputs and outputs light green (approximately 3 seconds). If no groups have been formed, **all** the input and output buttons light.

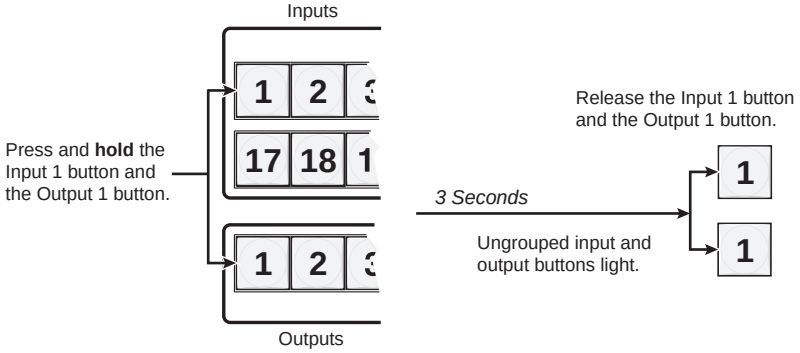


Figure 38. Selecting I/O Group Mode

3. Press and release one of the Control buttons to select a group number:
   - Press the Enter button to select group 1.
   - Press the Preset button to select group 2.
   - Press the View ▼ button to select group 3.
   - Press the Esc ▲ button to select group 4.

   In the figure 39 example, group 1 is being selected.

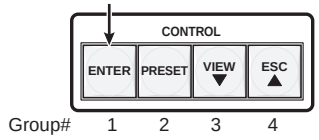


Figure 39. Selecting an I/O Group Number

4. Select the desired inputs and outputs to assign to the group by pressing their input and output buttons. In the example below, inputs and outputs 1 through 4 are being selected.

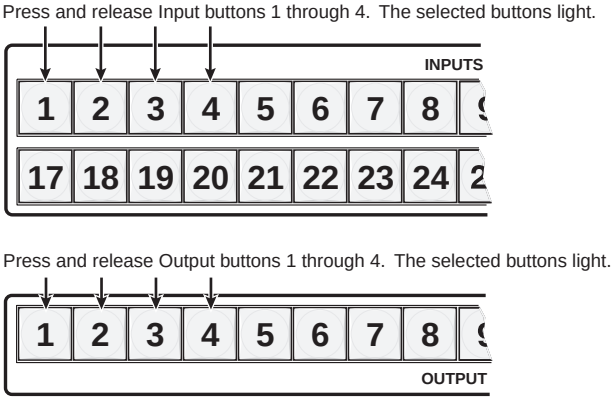


Figure 40. Assigning Inputs and Outputs to a Group

5. In order for an input group to be functional, you must create more than one group. Repeat steps 3 and 4 to create a second input group.
6. If you want to create more I/O groups, repeat steps 3 and 4 again.
7. When finished grouping, press and release the Matrix and Preview buttons to exit the I/O grouping mode.

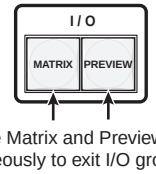


Figure 41. Exiting I/O Grouping Mode

Alternatively, you can allow the mode to time out by waiting approximately 30 seconds.

Viewing I/O groups

To see the groupings that have been created:

1. Press and hold the Input 1 and Output 1 buttons until all ungrouped buttons light green (approximately 3 seconds).
2. Press the Control button for the group number you want to view (Enter = group 1, Preset = group 2, View ▼ = group 3, and Esc ▲ = group 4). The buttons for all inputs and outputs in that group light green.
3. To view another group, repeat step 2.
4. When finished viewing groups, wait 30 seconds for grouping mode to time out, or press the Matrix and Preview buttons simultaneously.

Saving and Recalling Presets

The current configuration (configuration 0) can be saved as a preset in any one of 32 preset memory addresses. Preset locations are assigned to the input buttons and (where necessary) output buttons. Up to 32 presets can be selected from the front panel to be either saved or recalled. When a **preset** is recalled from memory via the front panel, it becomes the **current configuration**.

NOTES:

- Presets cannot be viewed from the front panel unless recalled as the current configuration. Presets that are not the current configuration **can** be viewed using the Matrix Switcher Control Program (see the **Matrix Software** section beginning on page 67 for more details).

  The current configuration and all other presets are stored in non-volatile memory. When power is removed and restored, the current configuration remains active and all presets are retained.
- When a preset is recalled, it replaces the current configuration, which is lost unless it is also stored as a preset. The recalled preset overwrites all of the current configuration ties in favor of its own ties.
- Figure 42 shows the presets associated with the input and output buttons on each HDXP model. (On the HDXP 1616, which has only 16 input connectors, input buttons 17 through 32 are used for presets, but not for input selection.)

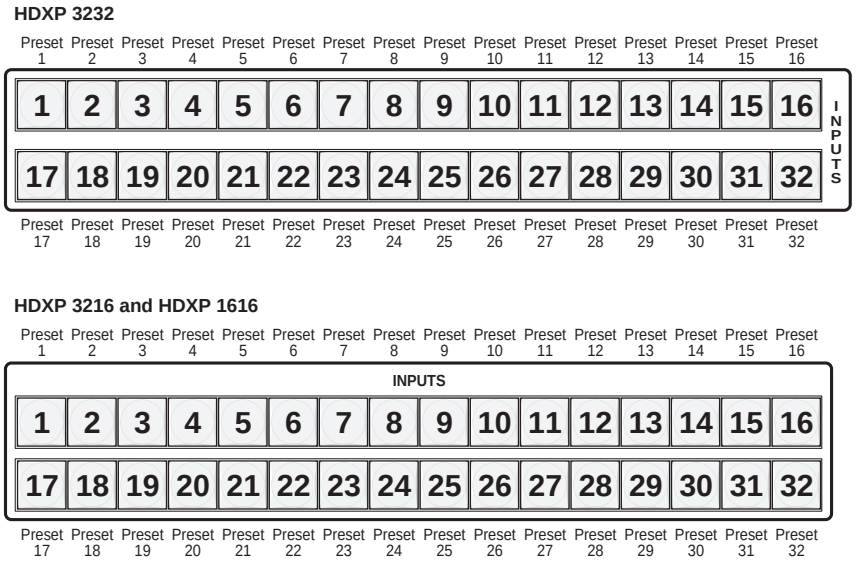


Figure 42. Preset Locations on the HDXP 3232, 3216, and 1616

Saving a preset

Follow these steps to save the current configuration (set of ties) as a preset. The steps show the front panel indications that result from your action.

NOTE: The illustrations for this procedure show the HDXP 3216. However, the information applies to all HDXP models.

1. Press and release the Esc ▲ button.

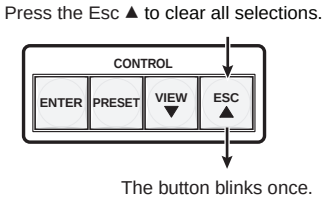


Figure 43. Clearing All Selections

2. Press and **hold** the Preset button for approximately 2 seconds, until it blinks.

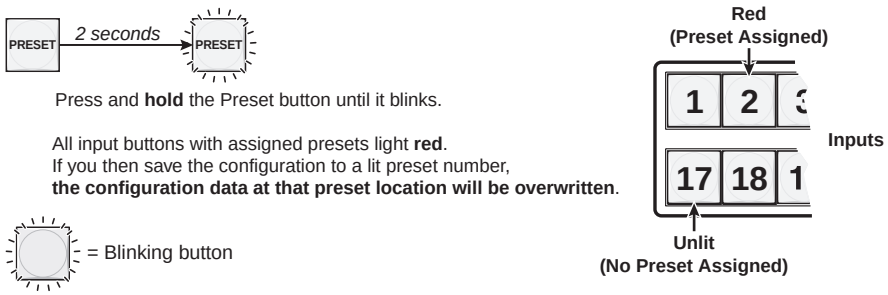


Figure 44. Entering Save Preset Mode

In this illustration, preset 2 has already been assigned; therefore, the Input 2 button lights red when preset mode is entered.

3. Press and release the input or output button for the desired preset number.

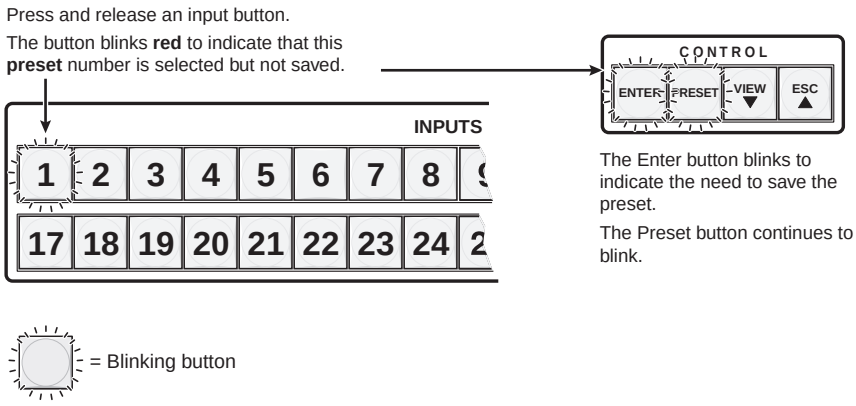


Figure 45. Selecting the Preset Number

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

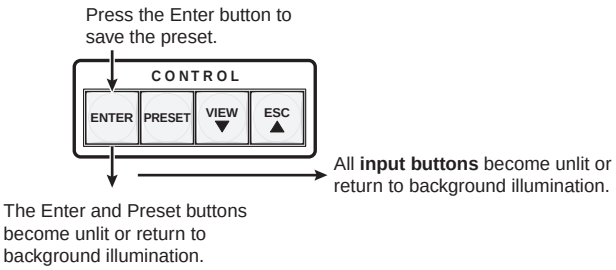


Figure 46. Press the Enter Button

Recalling a preset

Follow these steps to recall a preset (set of ties) to be the current configuration. The steps below show the front panel indications that result from your action.

NOTE: The illustrations for this procedure show the HDXP 3216. However, the information applies to all HDXP models.

1. Press and release the Esc ▲ button.

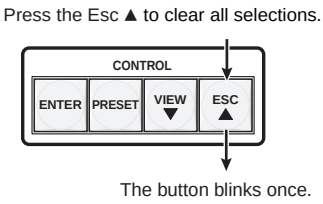


Figure 47. Clear All Selections

2. Press and release the Preset button.

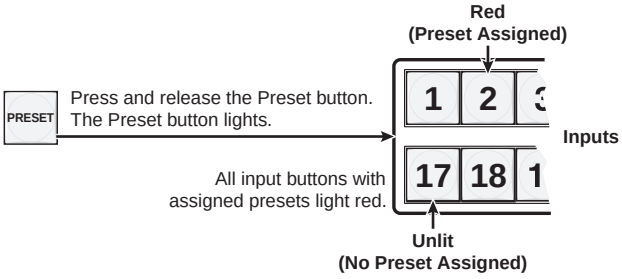


Figure 48. Entering Recall Preset Mode

In the example in figure 48, the Input 2 button lights red, because a preset has been assigned to it. Input button 17 does not light, because no preset has been assigned to it.

3. Press and release the input or output button for the desired preset. In figure 49, preset 1 (Input button 1) is selected.

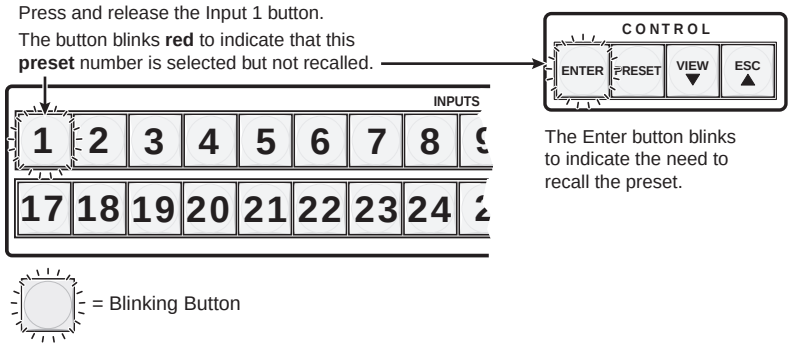


Figure 49. Select the Preset

4. Press and release the Enter button (see figure 50). The configuration stored in selected memory location is now the current configuration and can be viewed in view-only mode (see **Viewing the Configuration** on page 24).

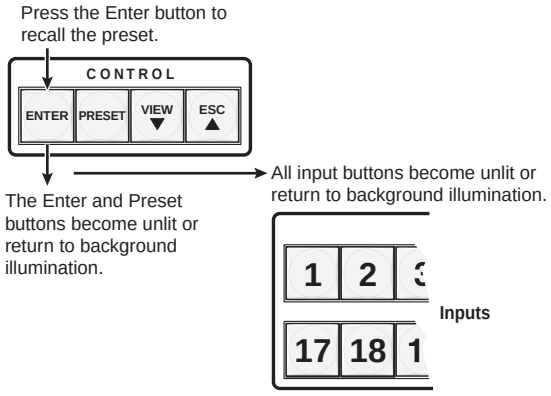


Figure 50. Pressing Enter to Recall the Preset

5. Press and release the View ▼ button to return the HDXP to normal switcher operation.

Muting and Unmuting Outputs

You can mute and unmute the outputs on the HDXP using the front panel. (You can also mute and unmute them via SIS commands, the Windows-based control software, and the web pages.)

NOTE: Mutings are saved to memory. When power is removed and restored, the mute settings are retained.

Muting an output

Follow these steps to mute an output:

1. Press the Esc ▲ button to clear any input button indications, output button indications, or control button indications that may be on.

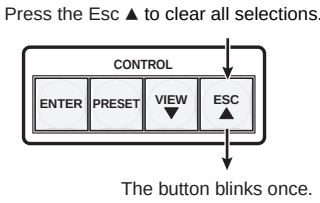


Figure 51. Clearing All Selections

2. Press and release the View ▼ button to enter view-only mode. The View ▼ button lights red, and all untied output buttons light green.

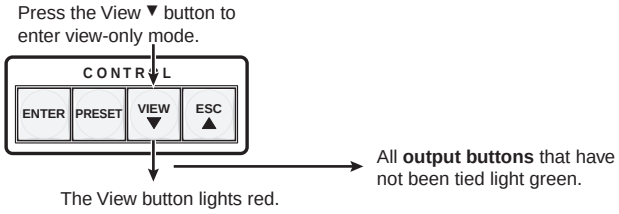


Figure 52. Entering View-only Mode

3. Press and **hold** the button for the desired output until the output button starts to blink (approximately 2 seconds). This indicates that the output is muted.
4. Repeat step **3** for each output that you want to mute.

   In the following illustration, outputs 3 and 4 are muted.

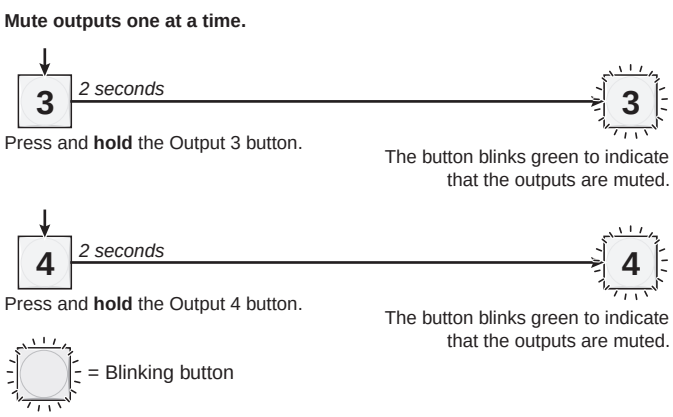


Figure 53. Muting the Outputs

NOTE: The front panel times out after 30 seconds, and the View ▼ and the blinking output buttons become unlit or return to background lighting. If you want to mute another output after a timeout, you must press the View ▼ button again (repeat steps 2 and 3).

5. When finished muting, press and release the View ▼ button to exit view-only mode, or wait for the front panel to time out (approximately 30 seconds).

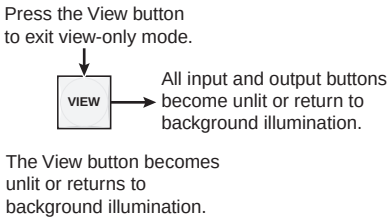


Figure 54. Exiting View-only Mode

Unmuting an output

1. Press and release the View ▼ button to enter view-only mode. The View ▼ button lights red, and the buttons for any muted inputs begin blinking green.
2. **One at a time**, press and **hold** the button for each output that you want to unmute until the button lights steadily (approximately 2 seconds).

   In the following illustration, outputs 3 and 4 are unmuted.

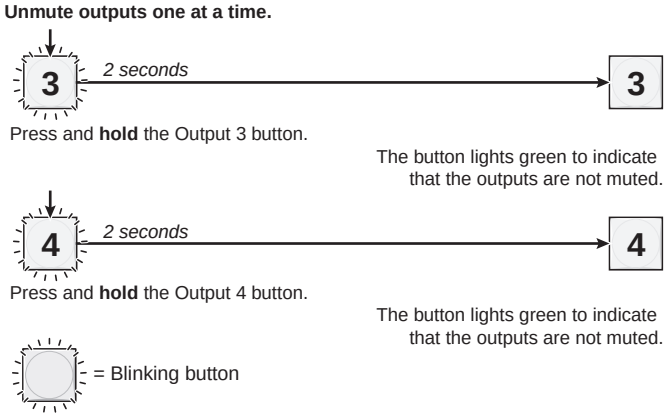


Figure 55. Unmuting the Outputs

3. Press the View ▼ button to exit view-only mode, or wait for the front panel to time out after approximately 30 seconds.

Locking the Front Panel (Executive Mode)

The front panel security lockout (executive mode) limits the operation of the HDXP from the front panel. When the switcher is locked, all of the front panel functions are disabled except for the view-only mode functions (see **Viewing the Configuration** on page 24) and front panel lock mode selection.

To toggle executive mode on and off, press and hold the Matrix and Preview buttons until the two buttons blink twice (approximately 3 seconds).

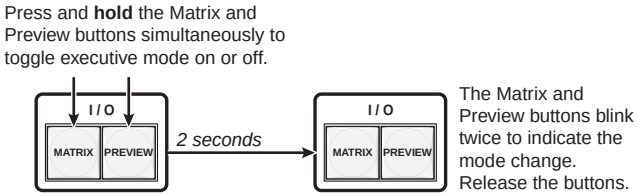


Figure 56. Toggling Front Panel Lock On and Off

If you press a front panel button when the switcher is locked, the Matrix and Preview buttons flash twice, then return to their previous state.

NOTE: This does not occur in view-only mode or when you press the two I/O buttons to enter or exit executive mode.

Setting the Button Background Illumination

You can set the buttons on the front panel to have amber background illumination at all times, or you can turn the background illumination off.

To toggle the background illumination on or off, press and **hold** the Input 1 and Input 2 buttons until the button background changes (approximately 2 seconds).

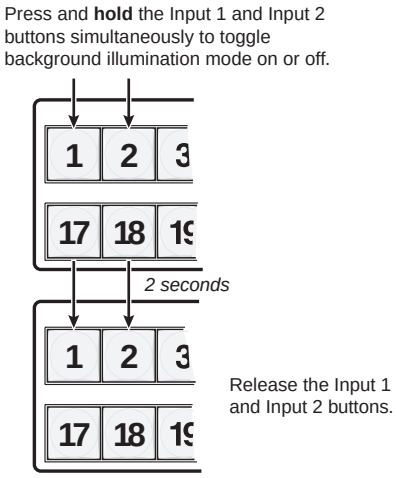


Figure 57. Toggling Background Illumination On or Off

Selecting the RS-232 or RS-422 Protocol and Baud Rate

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

NOTE: This information applies to only the rear panel Remote RS232/RS422 port. The front panel Config port is RS-232 only; RS-422 cannot be selected for it.

View and configure the serial communications settings as follows:

1. To enter serial port configuration mode, simultaneously press and **hold all** Control buttons (Enter, Preset, View ▼, and Esc ▲) until all buttons light (approximately 2 seconds).

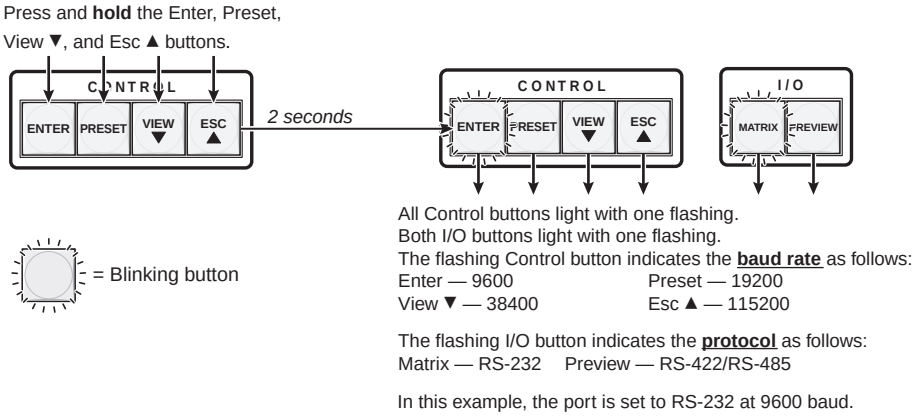


Figure 58. Enabling Serial Port Configuration Mode

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

Baud rate:

- **Enter** selects 9600 baud.
- **Preset** selects 19200.
- **View ▼** selects 38400 baud.
- **Esc ▲** selects 115200 baud.

Protocol:

- **Matrix** selects RS-232
- **Preview** selects RS-422.

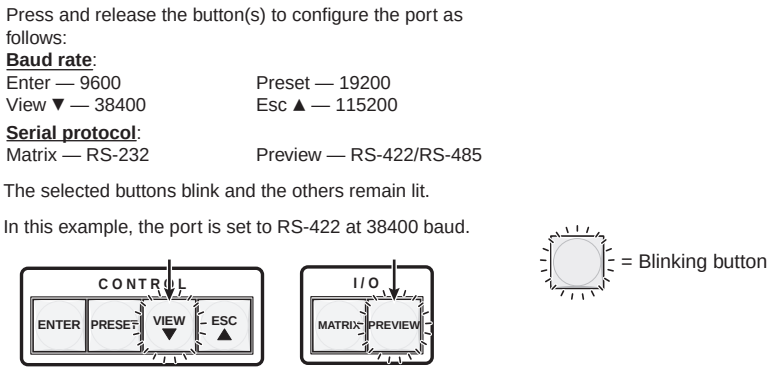


Figure 59. Selecting RS-232 or RS-422 and the Baud Rate

4. Press and release an input or output button to exit the serial port configuration mode.

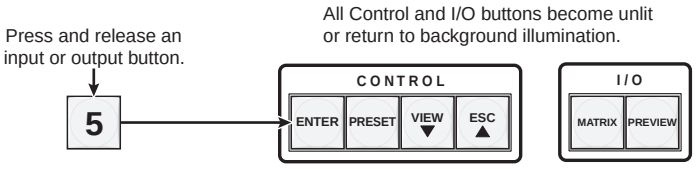


Figure 60. Exiting Serial Port Configuration Mode

Resetting

There are several methods by which you can reset the HDXP, and some of these methods allow for four levels of resetting. The following reset methods are available on the HDXP:

- Front panel buttons
- Rear panel reset button
- SIS commands
- Windows-based control software

The front panel and rear panel reset methods are discussed in this section. For information about resetting via SIS commands, see the **Remote Configuration and Control** section beginning on page 45. For information about using the Windows-based software to reset, see the **Matrix Software** section beginning on page 67.

Resetting using front panel buttons

The front panel (system) reset is identical to the Esc ZXXX ← SIS command, which returns the HDXP to its factory-set defaults (see the **Remote Configuration and Control** section). A system reset clears all ties, presets, and output muting, and resets all I/O grouping.

To reset the switcher to the factory default settings, press and **hold** the Matrix and Preview buttons **while** you apply AC power to the switcher.

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

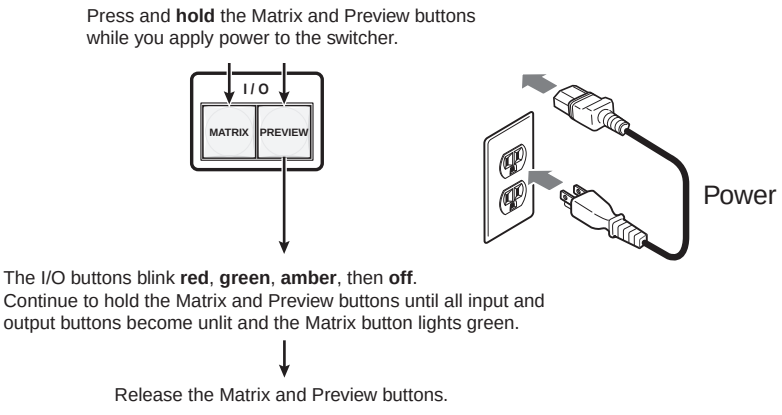


Figure 61. Resetting the System from the Front Panel

Resetting using the rear panel Reset button

The rear panel has a Reset button that initiates four levels of matrix switcher resets. This button is recessed; it can be accessed with a pointed stylus, ballpoint pen, or an Extron Tweeker (a small screwdriver provided with the unit). While the switcher is running or while you are applying power to it, press and hold in the button for the number of seconds required for the desired reset level.

The table below provides a summary of the rear panel reset modes.

Reset Modes Summary

Mode	Activation	Result	Purpose
1	Hold in the Reset button while applying power to the switcher.	Restores the factory-installed firmware. It does **not** clear the current configuration.	Mode 1 can be used to remove a version of firmware if incompatibility issues arise.
3	Hold in the Reset button until the Reset LED blinks once (after approximately 3 seconds); then within 1 second press Reset momentarily (for less than 1 second).	Turns events (such as on and off. During resetting, the Reset LED blinks two times if events are starting or three times if events are stopping.	Mode 3 is useful for troubleshooting.
4	Hold in the Reset button until the Reset LED blinks twice (once after approximately 3 seconds and again after 6 seconds); then within 1 second press Reset momentarily (for less than 1 second).	• Enables ARP capability. • Sets the IP address, subnet address, and gateway address to the factory defaults. • 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. It does not replace any user-installed firmware.

5	Hold in the Reset button until the Reset LED blinks three times (once after approximately 3 seconds, again after 6 seconds, and then again after 9 seconds); then within 1 second press Reset momentarily (for less than 1 second).	Performs a complete reset to factory defaults (with the exception of the firmware), which includes:
		• Everything mode 4 does
		• Reset of almost all real time adjustments:
		  • Clears all ties, presets, audio or RS-232 mutes, and I/O grouping.
		  • Resets all IP options.
		  • Removes or clears all switcher files.
		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 and also to replace events.

	NOTE: Mode 5 reset clears most adjustments. To save these settings, use the Matrix Switchers Control Program and select **`Save MATRIX settings as...`** from the **`File`** menu before you perform this reset (see the Matrix Switcher Control Program help file for more information).		

Soft system resets

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

- **Events (mode 3) reset** — This function toggles the monitoring of events on or off (if events monitoring was on, this function turns it off; if monitoring was on, the HDXP turns it off).
- **IP settings (mode 4) reset** — The IP settings reset performs the following functions:
  - Enables Arp program capability.
  - Resets the IP address to the factory default (192.168.254.254).
  - Resets the subnet mask to the factory default (255.255.0.0).
  - Resets the gateway address to its factory default (0.0.0.0).
  - Resets port mapping to the factory default (port 80).
  - Turns DHCP off.
  - Turns events off.

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

- **Absolute (mode 5) reset** — Absolute reset restores the switcher to the default factory conditions. This function is identical to the Esc ZQQQ ← SIS command (see the **Resets** commands on page 60).

To perform a soft reset of the HDXP from the rear panel:

1. Press and **hold in** the Reset button until the front panel Matrix and Preview buttons and the back panel Reset LED blink once (for events reset), twice (for system reset), or three times (for absolute reset).

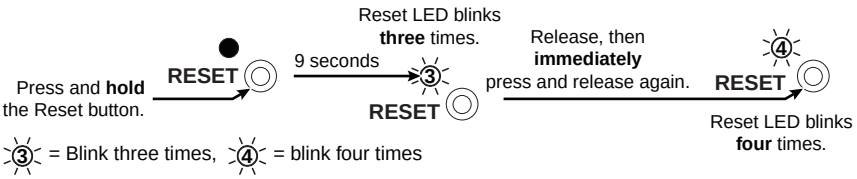


Figure 62. Whole Switcher and Absolute Resets

2. Release the Reset button, then immediately press and release the Reset button again. No reset is performed if the second momentary press does not occur within 1 second.

Hard reset

The hard reset function restores the HDXP to the base firmware with which it was shipped. After a hard reset, events do not automatically start, but user settings and files are restored.

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

To perform a hard reset:

1. If necessary, turn off power to the switcher.
2. Press and **hold in** the Reset button on the rear panel **while** you apply AC power to the switcher.

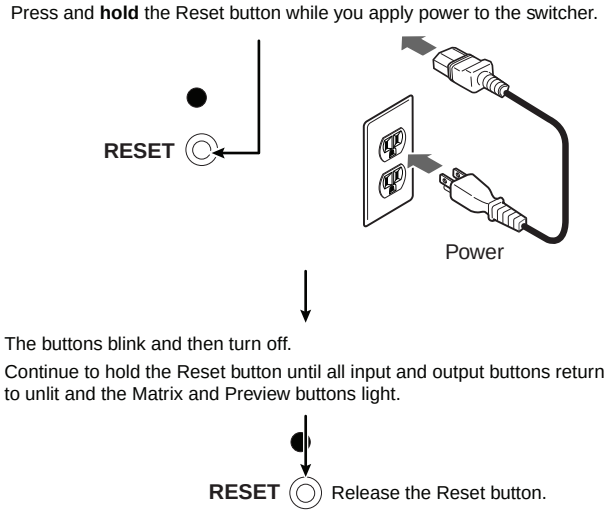


Figure 63. Hard Reset

Troubleshooting

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

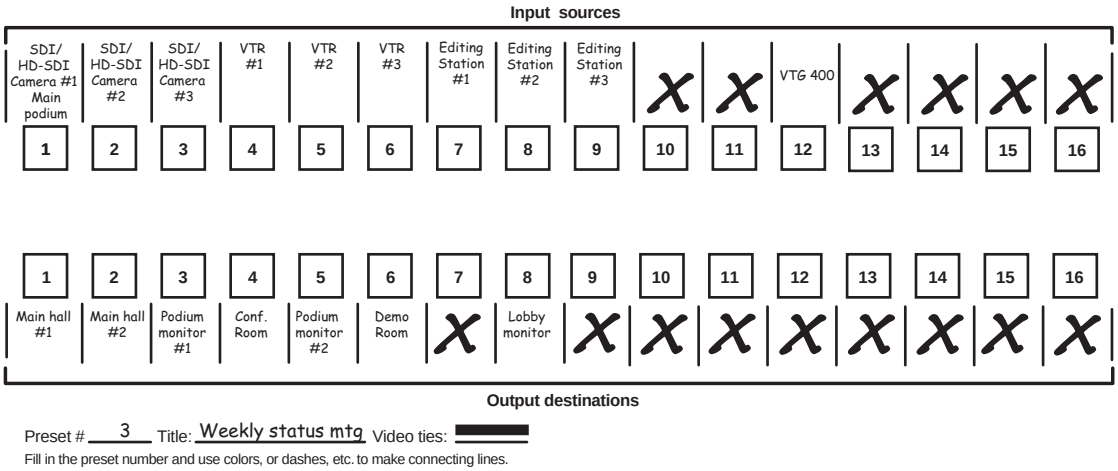
1. Ensure that all devices are plugged in and powered on. The switcher is receiving power if the back panel Reset/Power LED is lit green.
2. Check to see if one or more outputs are muted.
3. Ensure an active input is selected for output on the switcher.
4. Ensure that the proper signal format is supplied.
5. Check the cabling and make corrections as necessary.
6. Terminate unused inputs and outputs with 75-ohm BNC connectors.
7. Call the Extron **S3 Support Hotline** if necessary.

Configuration Worksheets

Rather than trying to remember the configuration for each preset, use worksheets to record this information. Make copies of the blank worksheet at the end of this section, and use one for each preset configuration. Cross out all unused or inactive inputs and outputs. The worksheet is generic for all models of HDXP. Disregard or cross out boxes for inputs and outputs that your switcher does not have.

Worksheet Example 1: System Equipment

Figure 64 shows a worksheet for an HDXP in a fictional organization with the system hardware annotated. Inputs 10, 11, and 13 – 16 have no connection in this organization, so they have been crossed out on the worksheet.



Preset # 3 Title: Weekly status mtg Video ties:

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

Figure 64. Worksheet Example 1: System Equipment

Inputs include VTRs, editing stations, SDI/HD-SDI cameras, and an Extron VTG 400. Output devices include various SDI/HD-SDI monitors.

The VTG 400 video test generator connected to input 12 enables a video test pattern to be sent to one, several, or all output devices for problem isolation or adjustment purposes.

Worksheet Example 2: Daily Configuration

Figure 65 continues from worksheet example 1 by showing the video ties that make up the configuration of preset 1. A solid ink line shows video ties.

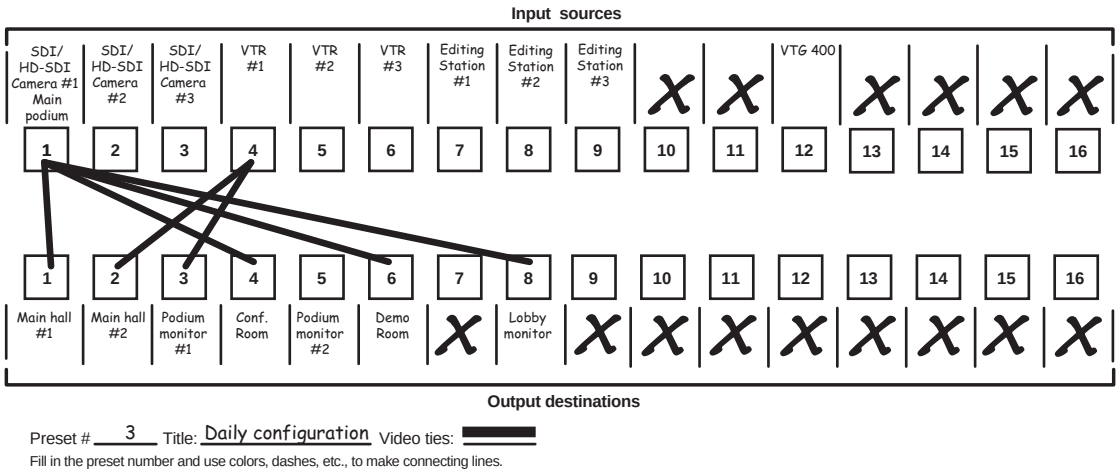


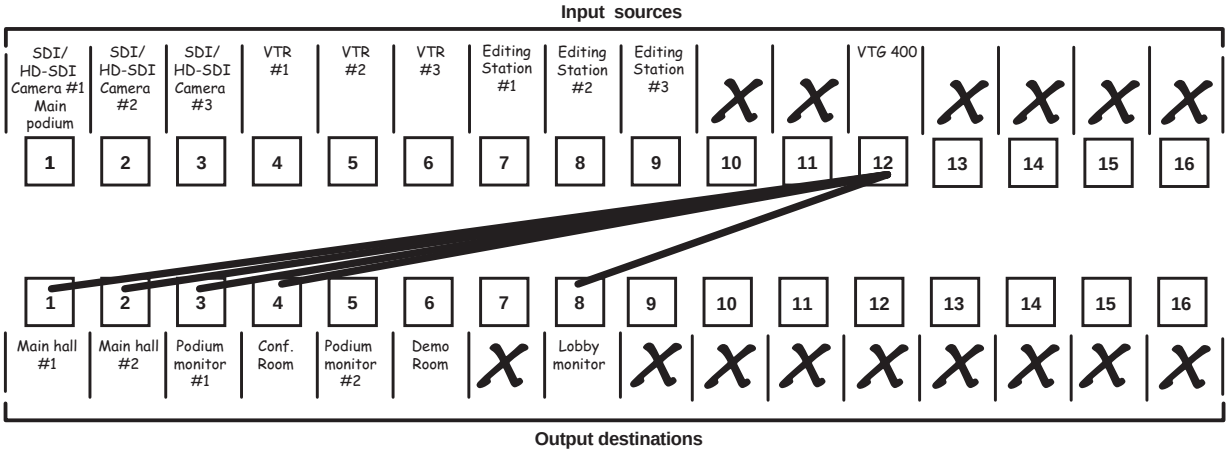
Figure 65. Worksheet Example 2: Daily Configuration

In this example:

- The image of the presenter, from the main podium camera (input 1), is:
  - Displayed in the main hall (output 1)
  - Displayed in the conference room (output 4) to the overflow crowd
  - Displayed in the lobby (output 8)
  - Displayed in the Demo Room (output 6)
- The presenter has a presentation stored in the VTR (input 4) that is:
  - Displayed in the main hall (output 2)
  - Displayed locally on the #2 podium (output 3).

Worksheet Example 3: Test Configuration

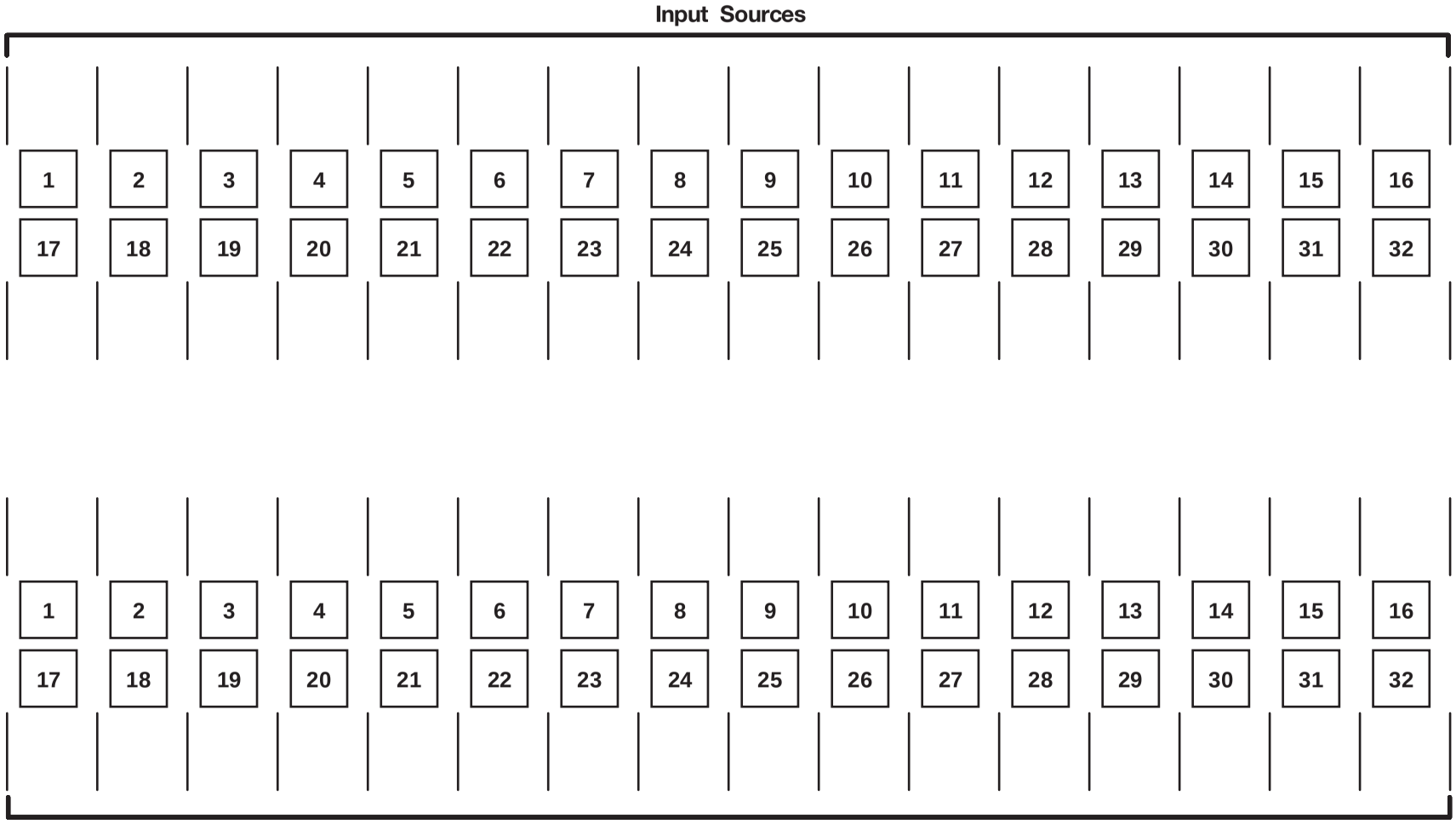
The AV system in our fictional organization needs to be fine tuned on a regular basis. Figure 66 shows a typical test configuration, with an Extron video test generator (input 12) generating a test pattern to all monitors (outputs 1, 2, 3, 4, and 8).



Preset # 3 Title: System test Video ties:

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

Figure 66. Worksheet Example 3: Test Configuration



Preset # _____ Title:_____

Fill in the preset number and use colors, or dashes, etc. to make connecting lines. Disregard or cross out the input and output boxes that do not apply to your switcher.

HDXP Configuration Worksheet

Remote Configuration and Control

This section describes the serial connections through which the Extron Simple Instruction Set (SIS) commands can be issued. It also lists the commands that are available for controlling and configuring the HDXP switchers. Topics include:

- **Serial Ports**
- **Ethernet Port**
- **Host-to-Switcher Instructions**
- **Switcher-Initiated Messages**
- **Switcher Error Responses**
- **Using the Command and Response Table for SIS Commands**
- **Command and Response Table for SIS Commands**

Serial Ports

The HDXP can support either RS-232 or RS-422 serial communication protocol and can operate at 9600, 19200, 38400, or 115200 baud rates (see **Selecting the RS-232 and RS-422 Protocol and Baud Rate** on page 36 to set the baud rate for your switcher).

The HDXP has two ports for serial control, both of which enable use of SIS commands and the Matrix Switcher Control Program. The default protocol for these ports is:

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

The HDXP serial ports can be connected to the serial port of a host device such as a computer running the Extron DataViewer utility, an RS-232 capable PDA, or a control system. This connection makes software control of the switcher possible.

- **Rear Panel RS232/RS422 port:** The rear panel 9-pin D female connector labeled Remote RS232/RS422 can be connected to the serial port of a host device for RS-232 or RS-422 control of the HDXP. For the pin assignments for this port, see **RS-232 and RS-422 Remote Connections** on page 11.
- **Front Panel RS-232 Port (HDXP 3232 Plus only):** The front panel TRS connector labeled Config can be connected to a host device for RS-232 control only.

  The optional 2.5 mm cable can be ordered separately and used to connect the HDXP 3232 Plus to the host serial port. For connection information for this cable, see **RS-232 Config connector (front panel)** on page 11.

Ethernet Port

The rear panel Ethernet connector on the switcher can be connected to an Ethernet LAN or WAN. Communication between the switcher and the controlling device can be via Extron DataViewer or Telnet (a TCP socket using port 23). The Telnet port can be changed, if necessary, via SIS (for information on connecting via Telnet, see **Connecting as a Telnet Client** on page 115).

The Ethernet connection makes SIS control of the switcher possible using a computer connected to the same LAN or WAN. The SIS commands and behavior of the product are identical to the commands and behavior the product exhibits when you are communicating with it via a serial port.

Ethernet Cable

The Ethernet cable must be properly terminated for your application as either a straight-through cable or a crossover cable (for pin assignments for these cables, see **Ethernet Connection** on page 10).

Default IP Addresses

To access the HDXP switcher via the Ethernet port, obtain the IP address of the switcher (and the subnet mask and gateway address if needed) from your network administrator. If the IP address has been changed to an address comprised of words and characters, you can determine the actual numeric IP address using the ping (ICMP) utility (see **Setting an IP Address** on page 113 for more details). If the addresses have not been changed, the factory-specified defaults are:

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

Establishing an Ethernet Connection

Establish a network connection to an HDXP switcher as follows:

1. Open a TCP connection to port 23, using the IP address of the switcher. A variety of methods are available for making this connection, including Telnet or utilities such as Extron DataViewer.

   The switcher responds with a copyright message that includes the date, 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.

3. If the password is accepted, the switcher responds with `Login User` or `Login Administrator`.
4. If the password is not accepted, the `Password` prompt reappears.

Number of Connections

An HDXP switcher can have up to 200 simultaneous TCP connections, including all http 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, keep the number of connections low and close unnecessary sockets.

Verbose Mode

The connection to an HDXP switcher can be used to monitor for changes that occur on the switcher, such as front panel operations and SIS commands from other connections or a serial port. To receive change notices from the switcher, you must enable verbose mode 1 or 3 (see **Verbose Mode Commands** on page 66). In verbose mode 1 or 3, changes are reported in messages that resemble SIS command responses.

Host-to-Switcher Instructions

The HDXP accepts SIS (Simple Instruction Set) commands through the RS-232/RS-422 and Ethernet ports. 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).

With an RS-232 or RS-422 connection:

`(c) Copyright 20nn, Extron Electronics HDXP Plus Series, Vn.nn, 60-nnn-01`↵

With an Internet connection:

`(c) Copyright 20nn, Extron Electronics HDXP Plus Series, Vn.nn, 60-nnn-01`↵

`Ddd, DD Mmm YYYY HH:MM:SS`↵

The switcher initiates the copyright message when it is first powered on or when connection via Internet protocol (IP) is established. `Vn.nn` is the firmware version number, `60-nnn-01` is the HDXP model part number, and `20nn` is the copyright year.

↵ `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.

NOTE: The Password prompt dialog box is redisplayed if an incorrect password is entered.

↵ Login Administrator ↵

↵ Login User ↵

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

Qik ↵

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

Spr*nn* ↵

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

Vmt*nn* **x* ↵

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

Exe*n* ↵

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

Switcher Error Responses

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

E01 — Invalid input channel number (too large)
E10 — Invalid command
E11 — Invalid preset number (too large)
E12 — Invalid output number or port number
E13 — Invalid value (out of range)
E14 — Command not available for this configuration
E17 — Timeout (caused only by direct write of global presets)
E21 — Invalid room number
E22 — Busy
E24 — Privilege violation (Ethernet and Extron software only)
E25 — Device not present
E26 — Maximum number of connections exceeded
E27 — Invalid event number
E28 — Bad file name or file not found

NOTE: User privileges extend to all view and read commands except reading the administrator password. Users can also create ties, creating and recall presets, and mute outputs.

Using the Command and Response Table for SIS Commands

The **command and response table** begins on page 54. Lowercase letters are acceptable in the command field except where indicated. The table below shows the hexadecimal equivalent of each ASCII character used in the command and response table.

Space →

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

Figure 67. ASCII to Hexadecimal Conversion

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

Symbol Definitions

↵ = Carriage return and line feed

← = Carriage return (no line feed)

| = Pipe character (alternative for carriage return, no line feed)

• = Space

Esc = <Escape> key

W = Alternative for <Escape> key

NOTE: Input and output numbers in commands can be entered as 1-digit, 2-digit, or 3-digit numbers. All input and output numbers are reported as 2-digit numbers in the response.

$^{24, 27, 28}$ = E24, E27, and E28 error codes. These superscripts indicate the error message displayed if the command is entered incorrectly or with invalid parameters (see **Switcher Error Responses** on page 48).

X1 = Input number
HDXP 1616: **1** – **16**
HDXP 3216 and 3232: **1** – **32**

X2 = Input number (for tie)
HDXP 1616: **Ø** – **16**
HDXP 3216 and 3232: **Ø** – **32**

NOTE: Input **Ø** = muted input

X3 = Output number
HDXP 1616 and 3216: **Ø1** – **17**
HDXP 3232: **Ø1** – **33**

X5 = Output reclocking rate

ØØ = Auto (default)	**Ø3** = 177 (component PAL)	**Ø6** = 540
Ø1 = Bypass	**Ø4** = 270	**Ø7** = 1485
Ø2 = 143 (component NTSC)	**Ø5** = 360	**Ø8** = 2970

X6 = Total inputs in the matrix

X7 = Total outputs in the matrix

X8 = Room number (for room presets): Ø – 1Ø. (Each room can have up to ten presets assigned.)

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

X9 = On and off status (executive mode or power supply)
Ø = off or disabled
1 = on or enabled

X10 = Group number (for I/O grouping): Ø – 4 (Ø = no group)

X11 = Global preset number: Ø – 32 (Ø = current configuration)

X12 = Room preset number: Ø – 1Ø (Ø = current configuration for the room)

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

X14 = Output mute status
Ø = Unmuted
1 = Muted

X15 = Output rate: *nnn.nn*
---- = bypass mode
ØØØØ = no connection (rate mismatch)
nnnn = actual rate

X16 = Dirty RAM status
1 = RAM needs to be saved to Flash memory.
Ø = RAM has been saved to Flash memory (safe to power off or reset).

X17 = Time in tens of milliseconds to wait for characters coming into a serial port before terminating the connection.
Default is 1Ø = 100 ms; maximum is 32,767.

X18 = Time in tens of milliseconds to wait between characters coming into a serial port before terminating the connection.
Default is 2 = 20 ms; maximum is 32,767 ms.

X19 = Firmware version number to second decimal place (*n.nn*)

X20 = Verbose firmware version: version – description – upload date and time.

X21 = Signal status
Ø = No signal at input
1 = Signal at input

X22 = Temperature (degrees Fahrenheit)

X23 = Name

- 12 characters maximum for global and room preset names
- 11 characters maximum for room names

Valid characters are:
Upper- and lowercase letters (a – z, A – Z)
Numerals Ø – 9
Spaces
Special characters: " + _ : = / and {space}

X25 = Matrix name (up to 240 characters)

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

X26 = GMT date and time (read) in the format
Www, • *DD* • *Mmm* • *YYYY* • *HH:MM:SS*
Www = name of the day of the week (Mon through Sun)
DD = day of the month (Ø1 through 31)
Mmm = Name of the month (Jan through Dec)
YYYY = year (2Ø*nn*)
HH = hour (ØØ through 24)
MM = minutes (ØØ through 59)
SS = seconds (ØØ through 59)
• = space

X27 = IP address (*nnn.nnn.nnn.nnn*). Leading zeros in each of the four fields are optional.

X28 = E-mail event number: 1 – 64

X29 = Default name (Factory default name consisting of model name plus the last three character pairs of MAC address)
Example: HDXP-Plus-Serie-ØØ-2E-C7

X30 = Password (12 characters maximum)

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

X31 = Connection security level
Ø = anonymous
1 – 1Ø = Extended security levels 1 through 10
11 = User level
12 = Administrator level
The response is returned as two digits with a leading zero if needed.

X32 = *E-mail user name* (e-mail name for the HDXP) (240 characters maximum)

X33 = E-mail address: Acceptable e-mail address format (for example, *xxxxx@xxx.com*)

X34 = Hardware (MAC) address (*nn-nn-nn-nn*)
The media access code (MAC) or hardware address is an identification code for the unit, consisting of six pairs of alphanumeric characters. This address cannot be changed.

X35 = Number of open connections (Ø – 255)

X37 = GMT date (*MM*/*DD*/*YY* • *HH:MM:SS*)

X38 = Mail domain name (Standard domain name conventions apply.
Example: extron.com)

X39 = GMT offset (-12.Ø through +14.Ø hours and minutes removed from Greenwich Mean Time)

X40 = Daylight Savings time
Ø = Daylight savings time off or ignored
1 = Daylight savings time on (used in the northern hemisphere [USA] and parts of Europe and Brazil)

X41 = E-mail account number (65 through 72)

X42 = Notify when?
Ø = No response
1 = Fail or missing
2 = Fixed and restored
3 = Both 1 and 2

X43 = Notification selections
HDXP 3216 and 3232: Ø1 – 32 = Inputs 1 through 32
HDXP 1616: Ø1 – 16 = Inputs 1 through 16
Power supply: 98

X44 = Notify status for reading (16-digit number). For each digit,
Ø = Do not notify
1 = Notify

X45 = DHCP status
Ø = Off
1 = On

X46 = Telnet port number
Ø1 = Remote RS232/RS422 port on rear panel
Ø2 = Config port on front panel

> **NOTE:** The port number is represented as two ASCII characters (2 bytes). For example, Port 02 is represented as 3Ø 32 in hexadecimal.

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

X48 = Parity (odd, even, none, mark, or space). Only the first letter is required.

X49 = Data bits (7 or 8)

X50 = Stop bits (1 or 2)

X51 = Port type
0 = RS-232
1 = RS-422

X52 = Flow control (Hardware, Software, or None). Only the first letter is required.

X53 = Data pacing (0000 – 1000 milliseconds between bytes). Default is 0 ms.

X55 = Command data section

> **NOTE:** For web encoding only: Data is directed to the specified port and must be encoded if it is not alphanumeric. Since data can include either command terminator, it must be encoded as follows when used within the data section:
>
> - Space (hex 20) should be encoded as %2Ø (hex 25 32 30)
> - Plus sign (hex 2B) should be encoded as %2B (hex 25 32 42)

X56 = Parameter to set the Length of a message to receive or the Delimiter value.
# = Byte count or a single ASCII character in decimal.

X57 = IP address converted into a single 32-bit number. **Example:** 10.13.0.254 becomes (10*256*256*256) + (13*256*256) + (0*256) + 254, which becomes 167,772,16Ø + 851,968 + 254, which equals 168,624,382.

X58 = Subnet mask (###.###.###.###). Leading zeros in each of the four fields are optional. Default is 255.255.Ø.Ø.

X59 = Gateway IP address (*nnn.nnn.nnn.nnn*). Leading zeros in each of the four fields are optional.

X60 = Event number (Ø – 99)

X61 = Event buffer
Ø = Receive
1 = User
2 = NVRAM

X62 = Event buffer offset (0 to maximum buffer size)

X63 = Event data size
b = bit
B = byte (8 bits)
S = short (16 bits)
L = long (32 bits)

> **NOTE:** This parameter is case sensitive.

X64 = Event data to write

X65 = Number of bytes to read

X66 = Event status field:

event_type
event_state
event_paused
error_status
RcvBuff_startptr
RcvBuff_endptr
UsrBuff_startptr
UsrBuff_endptr

X67 = ASCII digits representing the numeric value of the data element read from the event buffer. (Leading zeros are suppressed.)

X68 = Parameter to set either the Length of the message to receive or a Delimiter value
L = byte count (min = Ø, max = 32767, and default = ØL [0 byte count])
D = decimal value for the ASCII character (min = Ø, max = ØØ255, and default = ØØØØØL)

This value is placed **before** the parameter; for example, 3 byte length = 3L, and the ASCII 0A delimiter is 1ØD. The response contains leading zeros.

NOTE: This parameter is case sensitive; you must use uppercase D and L.

X69 = Priority status for receiving timeouts.
Ø = use Send data string command parameters
1 = use Configure receive timeout command parameters
Default = Ø.

X70 = Verbose mode and tagged response status. In verbose mode, system responses to entries made via other connections are displayed. Tagged responses include the command entered as well as the response of the unit to it.
Ø = neither verbose mode nor tagged responses enabled (default for IP connection)
1 = verbose mode enabled; no tagged responses (default for serial connection)
2 = tagged responses enabled; verbose mode not enabled
3 = both verbose mode and tagged responses enabled

Command and Response Table for SIS Commands

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Create Ties			
NOTES: • Commands can be entered back-to-back in a string, with no spaces between commands. **Example:** 1*1!Ø2*Ø2&ØØ3*ØØ3%4*8& • The Quick multiple tie and Tie input to all outputs commands activate all I/O switches simultaneously. • The HDXP switchers support 1-, 2-, and 3-digit numeric entries (1*1!, Ø2*Ø2&, or ØØ3*ØØ3%). • The & tie command for RGB, the % command for video, and the ! command for all types of ties can be used interchangeably. • To **untie** an output from all inputs, enter a tie command in which X2 (the input) = Ø.			
Tie an input to an output	X2 * X3! X2 * X3 & X2 * X3 %	Out X3 •In X2 • All ↵ Out X3 •In X2 • RGB ↵ Out X3 •In X2 • Vid ↵	Tie input X2 to output X3. ! = all signal types & = RGB % = composite or S-video (See the second bullet point in the notes above.)
Example:	1*3!	Out3 • In1 • All ↵	Tie input 1 to output 3 (any type).
Quick multiple tie	Esc + Q X2 * X3 %...X2 * X3 ! ←	Qik ↵	Tie multiple inputs (X2) to multiple outputs (X3) with a single command.
Example:	Esc + Q3 * 4 % 3 * 5 % 3*6! ←	Qik ↵	Tie input 3 video to output 4, tie input 3 video to output 5, and tie input 3 to output 6.
Tie an input to all outputs	X2 *! X2 * & X2 * %	In X2 • All ↵ In X2 • RGB ↵ In X2 • Vid ↵	Tie input X2 to all outputs. ! = all signal types & = RGB % = composite or S-video (See the second bullet point in the notes above.)
Example:	5 * &	In5 • RGB ↵	Tie input 5 RGB to all outputs.
Mute Commands			
Video mute	X3 * 1B	Vmt X3*1 ↵	Mute output X3 video (video off).
Video unmute	X3 * ØB	Vmt X3 * Ø ↵	Unmute output X3 video (video on).
View individual mute status	X3 B	X14 ↵	View mute status X14 for video output X3.

NOTE:		
	X2 = Input number (for ties)	Ø – maximum number of inputs for your model (Ø = untied)
	X3 = Output number	1 – maximum number of outputs for your model
	X14 = Mute status for individual output	Ø = unmuted, 1 = muted

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Mute Commands (continued)			
Global video mute	1* B	Vmt1 ↵	Mute all video outputs.
NOTE: To mute outputs, you can also use the Input Ø command: Ø * X2 !, where input X2 is set to Ø.			
Global video unmute	Ø * B	VmtØ ↵	Unmute video for all outputs.
View all mutes	Esc VM ←	X14 X14...X14*n* ↵	Each X14 response is the mute status of an output, starting from output 1. *n* = the maximum number of outputs for this model.
		Mut X14 X14...X14*n* ↵	Verbose mode 2 or 3
Example: HDXP 1616	Esc VM ←	MutØ1ØØØ1ØØØØØØØ1ØØ ↵	Outputs 2, 6, and 14 are muted. All other outputs are unmuted.
NOTE: The Mut portion of the response appears only when the switcher is in verbose mode 2 or 3 (see **Verbose Mode Commands** on page 66).			
Save, Recall, and Directly Write Global and Room Presets			
NOTES: • If you try to recall a global preset that is not saved, the matrix switcher responds with an E11 error code . • If you try to save a room preset to a room that has not been defined, the HDXP responds with an E21 code. • The following characters are invalid or not recommended in preset names: + ~ , ` @ = [ ] { } ‘ ’ “ ” ; : | \ and ?			
Save the current ties as a global preset	X11,	Spr X11 ↵	Save the current configuration as preset X11. The command character is a comma.
Example:	9,	Spr Ø9 ↵	Save current ties as preset 9.
Recall a global preset	X11.	Rpr X11 ↵	Recall global preset X11 as the current configuration. The command character is a period.
Example:	5.	RprØ5 ↵	Recall preset 5.
Clear a global preset	Esc + X11 PO*! ←	Spr X11 ↵	Clear all ties in preset X11.
Example:	Esc + 27PØ*! ←	Spr27 ↵	Clear all ties in preset 27.
Save the current ties as a room preset	X8 * X12,	Rmm X8 • Spr X12 ↵	Save the current configuration as preset X12 for room X8. The command character is a comma.
Example:	3 * 9,	RmmØ3 • SprØ9 ↵	Save current ties as preset 9 for room 3.
Recall a room preset	X8 * X12.	Rmm X8 • Rpr X12 ↵	Recall preset X12 to room X8. Command character is a period.

NOTE:			
X8	=	Room number (for room presets)	1 – 1Ø. Each room can have up to 10 room presets (X12) assigned.
X12	=	Room preset number	1 – 1Ø. Each room (X8) can have up to 10 presets assigned.
X11	=	Global preset number	ØØ – 32. ØØ = current configuration
X14	=	Video mute status	For each output: Ø = no mutes, 1 = video mute

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Save, Recall, and Directly Write Global and Room Presets (continued)			
Directly write global presets	Esc + X11 P X2 * X3 ! . . . X2 * X3 ! ←	Spr X11 ↵	Tie input X2 to output X3 for as many ties as are desired and save all ties to preset X11. (The ! (tie all), % (tie video), and & (tie RGB) commands can all be used.)
Example:	Esc+27P12*5!10*Ø9!3*2!3*8!←	Spr 27 ↵	Brackets are shown to separate ties for clarity only. Create global preset 27, which ties input 12 to output 5, input 10 to video output 9, and input 3 to video outputs 6 and 8.
NOTE: The direct write of a global preset should always be preceded by a **clear global preset ties** command of that same preset number, as shown below. In a directly-written preset, the tied input for each output position (or no tied input) remains unchanged unless overwritten or cleared. If you do not clear the ties in a global preset number before you directly write a global preset to that number, ties that are part of the previous version of the specified preset with the same number can become part of the newly-created preset.			
Directly write room presets	Esc + X8 * X12 P X2 * X3 ! X2 * X3 % X2 * X3 . . . X2 * X3 & ←	Rmm X8 • Spr X12 ↵	Enter as many ties as are valid for this model. All tie types (&, %, and !) can be used.
Example:	Esc+7*3P12*7!11*5!4*5!6*6!←	RmmØ7 • SprØ3 ↵	Brackets are shown to separate ties for clarity only. Create preset 3 for room 7, which ties video input 1 to output 7, video input 3 to output 5, RGB input 4 to output 5, and input 6 to output 6.
NOTES: • A room can contain up to 16 outputs. • An output can belong to only one room. • The maximum number of rooms is 10. Each room can have up to 10 presets assigned to it. • If no room name is assigned (see the **Names** commands on page 59), the default name is "Room # X6 • X3, • X3, • X3."			
View Ties and Presets			
NOTE: The & view tie command for RGB and the % view tie command for video can be used interchangeably on the matrix switchers.			
View output tie	X3 ! X3 & X3 %	X2 ↵	View input X2 to which output X3 is tied. ! = all signal types & = RGB % = composite or S-video
Example:	3%	6 ↵	Output 3 is tied to input 6 composite video.
NOTE: For all HDXP models, the recommended starting output number for this command is 1.			

NOTE:

X2	=	Input number (for ties)	Ø – maximum number of inputs for your model (Ø = untied)
X3	=	Output number	1 – maximum number of outputs for your model
X8	=	Room number (for room presets)	1 – 1Ø. Each room can have up to 10 room presets (X12) assigned.
X11	=	Global preset number	ØØ – 32. ØØ = current configuration
X12	=	Room preset number	1 – 1Ø. Each room (X8) can have up to 10 presets assigned.

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
View Ties and Presets (continued)			
View global video preset	Esc X11 * X3 *1VC←	X2 • X2 •...• X2 • Vid ↵	Show preset X11 video configuration. Show the input (X2) tied to 16 sequential outputs, starting with output X3.
NOTES: • For HDXP 1616 and HDXP 3216, the starting output number is 1. • To view the current video configuration, enter Esc Ø* X3 * 1VC ← .			
Example: HDXP 3232	Esc 4 * 17 * 1VC ←	See below.	
		Input 24 tied to output 19 / No tied input / Input 8 tied to output 29 Response = tied input: Ø8•Ø8•24•Ø8•Ø8•29•29•ØØ•Ø8•Ø1•Ø1•Ø1•Ø8•Ø8•Ø8•Ø8•Vid ↵ Output: 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32	Each position shown in the response is an output. The first position on the left is the starting output and the last position (first position on the right) is the starting output number plus 15 (16 on the HDXP 1616 and 3216). The number in each position is the input tied to that output. In this example (preset 4) input 1 is tied to outputs 26 through 28. Input 8 is tied to outputs 17, 18, 20,21, 25, and 29 through 32. Input 24 is tied to output 19 and input 29 is tied to outputs 22 and 23. No input is tied to output 24.
View video room preset	Esc X8 * X12 * X3 *1VC ←	X2 • X2 •...• X2 • Vid ↵	Show room X8, preset X12 video configuration. Show the input (X2) tied to 16 sequential outputs assigned to room X8, starting from output X3.
NOTE: For the HDXP 1616 and 3216, the starting output number is 1.			
List Digital Sync Validation Processing (DSVP)			
List available input signals	ØLS	X21 X21 X21...X21*n* ↵	Each X21 response indicates presence or absence of horizontal and vertical sync on an input, starting from input 1. *n* is the maximum number of inputs on your model. For X21: Ø = no signal 1 = signal present
Example: HDXP 3232	ØLS	ØØØØØØ1ØØØØØØØØØ1ØØØØØØØØ1ØØØØ1Ø ↵	Inputs 7, 17, 26, and 31 have signals.
List individual signal status	X2 LS	X21 ↵	Show signal status X21 for input X2.

NOTE:			
X2	=	Input number (for ties)	Ø – maximum number of inputs for your model (Ø = untied)
X3	=	Output number	1 – maximum number of outputs for your model
X8	=	Room number (for room presets)	1 – 1Ø. Each room can have up to 10 room presets (X12) assigned.
X11	=	Global preset number	ØØ – 32. ØØ = current configuration
X12	=	Room preset number	1 – 1Ø. Each room (X8) can have up to 10 presets assigned.
X21	=	Signal status, DVSP	1 = signal present at input, Ø = no signal at input

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Output Reclocking			
Set the output reclocker	X3 * X5 =	Rte X3 * X5 ↵	Set the reclocking rate for output X3 to X5.
View the reclocker status	X3 =	X5 ↵	Show current reclocking rate X5 for output X3.
		Rte X3 * X5 ↵	Verbose mode 2 or 3
Example:	8 * Ø7 =	Rte Ø8 * Ø7 ↵	The reclocking rate for output 8 is 1485.
I/O Grouping			
NOTE: All input and output positions must contain a group number or Ø. For example, for the HDXP 3216 or 3232, you must enter 32 group numbers between Esc and I or between Esc and O. If you do not want to group a particular input or output, enter Ø in its position.			
Write input grouping	Esc X10 X10...X10*n* I ←	Gri X10 X10 ...X10*n* ↵	Each X10 entry is the group number assigned to an input position, starting from input 1. *n* = the maximum number of inputs for this model.
Example: HDXP 3232 or HDXP 3216	Esc 4Ø1...3I←	See below.	Input 1 – group 4 input 2 – group Ø (ungrouped) ... input 32 – group 3
	Input 1 in group 4 Input 2 not grouped / Input 32 in group 3 Response #s = group: Grl 4 Ø 1 3 3 Ø Ø Ø Ø 4 4 4 4 1 1 2 2 1 2 2 3 3 3 3 2 1 2 2 3 3 3 3 ↵ Input: 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32		
Write output grouping	Esc X10 X10...X10*n* O ←	Gro X10 X10 ...X10*n* ↵	Each X10 entry is the group number assigned to an output position, starting from output 1. *n* = the maximum number of outputs for this model.
Read input grouping	Esc I ←	X10 X10...X10*n* ↵	Each X10 entry is the group number assigned to an input position, starting from input 1. *n* = the maximum number of inputs for this model.
Example: HDXP 1616	Esc I ←	Input 1 in group 1 / Input 9 not grouped / Input 16 in group 2 Response = group: 1 1 1 3 3 Ø Ø Ø Ø 4 4 4 4 1 1 2 ↵ Input: 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16	
Read output grouping	Esc O ←	X10 X10...X10*n* ↵	Each X10 entry is the group number assigned to an output position, starting at output 1. *n* = the maximum number of outputs for this model.

NOTE:

X3	= Output number	1 – maximum number of outputs for your model
X5	= Output reclocking rate	ØØ = auto (default), Ø1 = bypass, Ø2 = 143 (component NTSC) Ø3 = 177 (component PAL), Ø4 = 270, Ø5 = 360, Ø6 = 540, Ø7 = 1485, Ø8 = 2970
X10	= Group number for I/O grouping	Ø – 4. Ø = not grouped.

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Rooms			
Write room outputs	Esc X8,X3,...X3n MR ←	Mpr X8,X3,...X3n ↵	Assign outputs X3 through X3n to room X8.
NOTES: • The maximum number of outputs per room is 16. • The maximum number of rooms is 10. • An output can be assigned to only one room.			
Read room outputs	Esc X8 MR ←	*Name*,X3,...X3n ↵	Show outputs X3 through X3n assigned to room X8.
Example:	Esc 3MR ←	Class1,Ø1,Ø2,Ø8,Ø9 ↵	Outputs 1, 2, 8, and 9 are assigned to room 3, which is named "Class1."
Names			
Write global preset name	Esc X11,X23 NG ←	Nmg X11,X23 ↵	Assign global preset X11 the name X23.
Example:	Esc 1,Security 1NG ←	NmgØ1,Security1 ↵	Name global preset 1 Security 1.
Read global preset name	Esc X11 NG ←	X23 ↵	View the name (X23) assigned to global preset number X11.
Example:	Esc 2NG ←	Security 2 ↵	Show the name (Security 2) of global preset 2.
Write room name	Esc X12,X23 NR←	Nmr X12,X23 ↵	Assign room preset X12 the name X23.
Example:	Esc 1,Classrm 1NR ←	NmrØ1,Classrm1 ↵	Name room 1 Classrm 1.
Read room name	Esc X12 NR ←	X23 ↵	
Write room preset name	Esc X12 * X8,X23 NP←	NmpX12 * X8,X23 ↵	
Example:	Esc1*3,Podium_DVDNP ←	NmpØ1*3,Podium_DVD ↵	Name room 1, preset 3 Podium_DVD.
Read room preset name	Esc X12,X8 NP ←	X13 ↵	
NOTES: • Do not use leading spaces in preset names. • If a preset is unassigned, X23 is [unassigned]. • If a global preset is saved, but not yet named, the default name is Preset X11. • If a room preset is saved, but not yet named, the default name is Rm X12 Prst X8.			
Write input name	Esc X1,X23 NI ←	Nmi X1,X23 ↵	Assign name X23 to input X1.
Example:	Esc 1,Podium camNI ←	Nmi1,Podium cam ↵	Name Input 1 Podium cam.
Read input name	Esc X1 NI←	X23 ↵	View the name of input X1.
Write output name	Esc X3,X23 NO ←	Nmo X3,X23 ↵	Assign name X23 to output X3.
Example:	Esc 1,Main PJ1NO ←	Nmo1,Main PJ1 ↵	Name output 1 Main PJ1.
Read output name	Esc X3 NO ←	X23 ↵	View the name of output X3.

NOTE:

X1	=	Input number (for ties)
X3	=	Output number
X8	=	Room number (for room presets)
X11	=	Global preset number
X12	=	Room preset number
X23	=	Name (for room, room presets, and global presets)

Ø – maximum number of inputs for your model (Ø = untied)
1 – maximum number of outputs for your model
1 – 1Ø. Each room can have up to 10 room presets (X12) assigned.
ØØ – 32. ØØ = current configuration
1 – 1Ø. Each room (X8) can have up to 10 presets assigned.
12 characters maximum for preset names
11 characters maximum for room names
Valid characters are a–z, A–Z, Ø–9, " _ : and {space}.

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Lock (Executive) Modes			
Lock all front panel functions	1X	Exe1 ↵	Enable lock mode 1.
Unlock all front panel functions	ØX	ExeØ ↵	Enable lock mode 0.
View lock status	X	X9 ↵	View lock mode status X9.
Resets			
Reset global presets and names	Esc ZG ←	Zpg ↵	Clear all global presets and their names.
Reset an individual global preset	Esc X11 ZG←	Zpg X11 ↵	Clear global preset X11.
Reset all mutes	Esc ZZ ←	Zpz ↵	Unmute all outputs.
Reset room map	Esc ZR ←	Zpr ↵	Clear all room definitions.
Reset individual room	Esc X8 ZR ←	Zpr X8 ↵	Clear all presets for room X8.
Reset all room presets and names	Esc ZP ←	Zpp ↵	Clear all room presets and room names.
Reset individual room preset and name	Esc X12 * X8 ZP ←	Zpp X12 * X8 ↵	Clear room preset X12 and name for room X8.
Reset whole switcher	Esc ZXXX ←	Zpx ↵	Clear all ties and presets.
Reset flash memory	Esc ZFFF ←	Zpf ↵	Reset flash memory (reset user-supplied files).
Absolute system reset	Esc ZQQQ ←	Zpq ↵	Clear all ties and presets and reset the HDXP to factory defaults. Reset the IP address to 192.168.254.254 and the subnet mask to 255.255.000.000.
Information Requests			
Information request	I	V X6 x X7 • A X6 x X7 ↵	V X6 x X7 is the number of video inputs by the number of video outputs. A X6 x X7 is the number of audio inputs and outputs. Because the HDXP does not have audio, this part of the response is always A00x00.
Example: HDXP 3216	I	V32x17 • A00x00 ↵	The matrix consists of 32 video inputs and 17 video outputs. (It has no audio inputs or outputs.)
Request product name	1I	HDXP Plus Series	
Request model description	2I	SDI and HD-SDI Matrix Switcher	
Request system memory usage	3I	*n* bytes used out of *n* kBytes	Show amount of memory used and total memory available for operations.
Request user memory usage	4I	*n* bytes used out of *n* kBytes	Show amount of user memory used and total available.

NOTE:

X6 = Total inputs in matrix	Number of inputs on this switcher	
X7 = Total outputs in matrix	Number of outputs on this switcher	
X8 = Room number (for room presets)	1 – 10. Each room can have up to 10 room presets (X12) assigned.	
X9 = Lock mode status	Ø = lock mode disabled (front panel is unlocked), 1 = lock mode enabled (front panel is locked)	
X11 = Global preset number	ØØ – 32. ØØ = current configuration	
X12 = Room preset number	1 – 10. Each room (X8) can have up to 10 presets assigned.	

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Information Requests (continued)			
Request part number	N	60-*nnn*-01↵	Show the HDXP part number: HDXP 3232 = 60-797-01 HDXP 3216 = 60-790-01 HDXP 1616 = 60-876-01
Query controller firmware version	Q	X19 ↵	View firmware version X19 to the second decimal place.
Example:	Q	1.23 ↵	The factory-installed controller firmware version is 1.23.
Query controller firmware version (verbose mode)	0Q	X19 X20 X19 X20 ↵	Provide a detailed status of the Ethernet protocol firmware, the HDXP firmware, and any firmware upgrade. The firmware that is currently running is marked by an asterisk (*). A caret (^) indicates that the firmware has a bad checksum or an invalid load. ?.?? indicates that firmware is not loaded.
Response format: *Ethernet protocol firmware version – firmware version – updated firmware version*			
Example:	0q	(See below.)	

Response:

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

n.nn – 1.00(1.50-SDI Series – Wed, 04 Jan 2006 23:11:29 GMT) – 1.00*(1.57-SDI Series – Fri, 19 Apr 2013 20:02:35 GMT) ↵

Meaningless data for this switcher model — HDXP 3216 firmware version — Updated firmware version

NOTE: There are up to three separate sets of Extron firmware on which the HDXP can report: the HDXP Plus Series control 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**.

Request system status	S	X22 ↵	Display power supply voltages and internal temperature X22.
Example:	S	3.29 5.15 91.40 ↵	3.29 and 5.51 are the power supply voltages. 91.4 (°F) is the unit internal temperature.
View File Directory Commands			

NOTE: The response to the View File Directory command differs depending on whether the command is sent via an RS-232, RS-422, or Telnet connection, or via a web browser connection.

View file directory RS232/RS422 port and Telnet	Esc DF ↵	*filename1*,*date*/*time*,*length* ↵ *filename2*,*date*/*time*,*length* ↵ *filename3*,*date*/*time*,*length* ↵ ... *filenamen*,*date*/*time*,*length* ↵	List user-supplied files that have been uploaded to the root (\) directory and any subdirectories, followed by the number of bytes of space left in the entire directory.
		{*space remaining*} bytes • left ↵ ↵	

NOTE:	X19 = Firmware version	Firmware version number to second decimal place.
	X20 = Firmware version, verbose mode	*Version – description – date and time of upload*
	X22 = Power supply voltages and temperature	*Voltage • voltage • internal temperature*

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Information Requests (continued)			
View File Directory Commands (continued)			
View file directory web browser	Esc DF ←	Var file = new array (); File [1] = '*filename1*,*date1*,*filesize1*'; File [2] = '*filename2*,*date2*,*filesize2*'; File [3] = '*filename3*,*date3*,*filesize3*'; ... File [*n*] = 'filename*n*,date*n*,filesize*n*'; File [*n*+1] = {*space remaining*} bytes • left	List user-loaded files.
Erase user-supplied web pages or files	Esc *filename*EF ←	Del • *filename* ↵	
IP Setup Commands			
Set matrix name	Esc X25 CN ←	Ipn • X25 ↵	Change the switcher name to X25.
NOTE: The following characters are invalid or not recommended in the matrix name: ~ , ` @ = [ ] { } ' " ; : | \ and ?			
Read matrix name	Esc CN ←	X25↵	View switcher name X25.
Reset matrix name to factory default	Esc • CN ←	Ipn • X29↵	Reset the name of the HDXP to factory default X29.
Example:	Esc • CN ←	Ipn • HDXP-Plus-Series-ØØ-2E-C7 ↵	
Set time and date	Esc X37 CT ←	Ipt X37 ↵	Set the HDXP time and date to X37.
Read time and date	Esc CT ←	X26 ↵	View HDXP day, date, and time X26.
Example:	Esc CT ←	Mon, Ø8 May 2Ø13 19:Ø1:17 ↵	
Set GMT offset	Esc X39 CZ ←	Ipz X39 ↵	Set the Greenwich Mean Time (GMT) offset value (X39) for the location of the HDXP.
Example:	Esc 5.3ØCZ ←	Ipz+Ø5:3Ø ↵	
Read GMT offset	Esc CZ ←	X39 ↵	View GMT offset X39 for the HDXP.
Set Daylight Saving Time	Esc X40 CX ←	Ipx X40 ↵	Enable or disable daylight saving time (X40).
Read Daylight Saving Time	Esc CX ←	X40 ↵	View the DST status on the HDXP.

NOTE: X25 =	Matrix switcher name	Name of the matrix switcher, up to 24 alphanumeric characters or hyphens (-). The last character **cannot** be a hyphen.
X26 =	HDXP time and date (for viewing)	Day, date, and time in the format *Www*, *DD*/Mmm/*YYYY* HH:MM:SS. *Www* = day of week (Mon – Sat), *Mmm* = month (Jan – Dec), *DD* = day of month (Ø1 – 31), YYYY = year (2Ø*nn*), HH = hour (ØØ – 24), MM = minutes (ØØ – 59), SS = seconds (ØØ – 59)
X29 =	Factory default switcher name	Consists of a combination of the model name and the last three pairs of the switcher MAC address.
X37 =	HDXP time and date (for setting)	Time and date in the format *MM*/*DD*/*YY HH*:*MM*:*SS*
X39 =	Greenwich Mean Time (GMT) offset	GMT offset (-12.00 to +14.0 hours) represents the time difference in hours and minutes (± *hh.mm* relative to Greenwich, England). The plus sign and leading zero are optional.
X40 =	Daylight saving time (DST) status	Ø = off, 1 = off. Daylight saving time (DST) is a 1-hour offset that is observed in the USA and parts of Europe and Brazil.

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
IP Setup Commands (continued)			
Set DHCP on or off	Esc X45 DH ←	Idh X45 ↵	Set DHCP on or off (X45).
Read DHCP status	Esc DH ←	X45 ↵	View DHCP status X45.
Set IP address	Esc CI X27 CI ←	Ipi X27 ↵	Set IP address X27.
Read IP address	Esc CI ←	X27 ↵	View the HDXP IP address.
Read hardware (MAC) address	Esc CH ←	X34 ↵	View media access code (MAC) address X34 for your unit.
Set subnet mask	Esc X58 CS ←	Ips X58 ↵	Set subnet mask X58 for the HDXP.
Read subnet mask	Esc CS←	X58 ↵	View the subnet mask.
Set gateway IP address	Esc X59 CG ←	Ipg X59 ↵	Set gateway IP address X59 for the HDXP.
Read gateway IP address	Esc CG ←	X59 ↵	View the gateway address.
Set administrator password	Esc X30 CA ←	Ipa • X30 ↵	Set administrator password X30 for the HDXP.
Read administrator password	Esc CA ←	X30 ↵	View current administrator password.
Reset (clear) administrator password	Esc • CA←	Ipa • ↵	Remove all administrator and user passwords.
Set user password	Esc X30 CU ←	Ipu • X30 ↵	Set user password X30 for the HDXP.
NOTE: An administrator password must be in place before a user password can be set.			
Read user password	Esc CU ←	X30 ↵	View the user password.
Reset (clear) user password	Esc • CU ←	Ipu • ↵	Clear the user password only.
Bidirectional Serial Port Commands			
Configure port parameters[24]	Esc X46*X47 X48,X49,X50 CP ←	Cpn X46 • Ccp X47,X48,X49,X50 ↵	Set baud rate X47, parity X48, Data bits X49, and stop bits X50 for the IP connection for port X46.
Read port parameters	Esc X46 CP ←	X47,X48,X49,X50 ↵	View the parameters of port X46.
Set serial port mode	Esc X46 * X51 CY ←	Cpn X46 • Cty X51 ↵	Set the serial communication type X51 for serial port X46.
Read serial port mode	Esc X46 CY ←	X51 ↵	View mode X51 of port X46.

NOTE:

X27 =	IP address	Format *nnn.nnn.nnn.nnn*. Leading zeros in each field are optional.
X30 =	Password	Administrator or user password can be 4 to 12 alphanumeric characters. Spaces and special characters or symbols are not allowed. The password is case-sensitive.
X34 =	MAC address	Format *nn-nn-nn-nn-nn-nn*.
X45 =	DHCP status	Ø = off, 1 = on. Default is Ø.
X46 =	Serial port number	Ø1 = RS232/RS422 port on rear panel, Ø2 = front panel Config port
X47 =	Baud rate	9600, 19200, 384000, or 115200
X48 =	Parity	odd, even, none, mark, or space (only first letter required)
X49 =	Data bits	1 or 2
X50 =	Stop bits	7 or 8
X51 =	Serial port type	Ø = RS-232, 1 = RS-422
X58 =	Subnet mask	Format *nnn.nnn.nnn.nnn*. Leading zeros in each field are optional.
X59 =	Gateway IP address	Format *nnn.nnn.nnn.nnn*. Leading zeros in each field are optional.

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
IP Setup Commands (continued)			
Bidirectional Serial Port (continued)			
Configure flow control[24]	Esc X46 * X52,X53 CF ←	Cpn X46 • Cfl X52,X53 ↵	Set flow control X52 and data pacing rate X53 for port X46.
View flow control	Esc X46 CF ←	X52,X53 ↵	View data rate X53 for flow control X52 for port X46.
Configure receive timeout[24]	Esc X46 * X17 * X18 * X69 * X68 CE ←	Cpn X46 • Cce X17,X18 ↵	Set receive timeout parameters for port X46: • Timeout after X17 ms for arriving characters • Timeout after X18 ms between characters • Message length or delimiter value X68. • Receive priority status X69.
View receive timeout	Esc X46 CE ←	X17,X18,X69,X68 ↵	View the receive timeout parameters.
Send data string (web encoding only)	Esc X46 * X17 * X18 * X56 RS ← X55	*Response to command*	Send command data X55 to port X46.

NOTE: The X17*X18 X56 sequence is optional. If X17 and X18 are not specified, the default values are used.

NOTE:

X17 = Receive timeout	Time in tens of ms to wait for characters to arrive at the serial port before terminating the connection. Default = 1Ø (100 ms). Maximum = 32,767.
X18 = Interval between characters	Time in tens of ms to wait between characters coming into the serial port before terminating the connection. Default = 2 (20 ms). Maximum = 32,767.
X46 = Serial port number	Ø1 = RS232/RS422 port on rear panel, Ø2 = front panel Config port
X52 = Flow control	H = hardware, S = software, N = none
X53 = Data pacing	Number of milliseconds between bytes (ØØØØ – 1ØØØ). Default is Ø.
X55 = Command data (for web encoding)	Data is directed to the specified port and must be encoded as follows if it is not alphanumeric: • Space (hex 20) should be encoded as %2Ø (hex 25 32 30) • Plus sign (hex 2B) should be encoded as %2B (hex 25 32 42)
X56 = Command length or delimiter	Parameter to set either the length of the message to be received or a delimiter value. Parameter is case-sensitive—it must be **uppercase**. # is the byte count for L **or** a single ASCII character in decimal format for D. #L = length of the command to be received: Ø through 32767. The default is Ø. **Example:** A 3-byte length = 3L. #D = delimiter value: Ø through ØØ255. The default is the byte count.
X68 = Message length or delimiter	Parameter to set either the length of the message to be received or a delimiter value. Parameter is case-sensitive—it must be **uppercase**. L = length in bytes. Min = Ø, max = 32767. Default is ØL (Ø bytes). D = decimal value for ASCII character (delimiter). Min = Ø, max = ØØ255. Default is ØØØØØL. Value precedes parameter; for example, 3-byte length = 3L.
X69 = Priority status for receive timeouts	Ø = Use Send data string command parameters. 1 = Use configure receive timeout command parameters. Default is Ø.

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
IP Setup Commands (continued)			
E-mail commands			
Read connection security level	Esc CK ←	X31 ↵	View security level X31 of the current connection.
Set mail server IP address and domain name	Esc X27,X38 CM ←	Ipm X27,X38 ↵	Set the e-mail domain name for IP address X27 with domain name X38 (for example, extron.com).
Read mail server IP address, domain name, and password	Esc CM ←	X27,X38,X30 ↵	Show mail server IP address X27, e-mail domain name X38, and password X30.
Set e-mail recipient	Esc X41,X33 CR ←	Ipr X33 ↵	Set the recipient of e-mail. For the recipient to receive e-mail notifications, you must then set the events that the HDXP reports, using one or more separate Set e-mail events (EM) commands (see example below).
Example:	Esc 72,JSmith@folklore.netCR ←	IprJSmith@folklore.net,↵	E-mail account #72, JSmith, will receive e-mail messages on occasions specified by the Set e-mail events for recipient command.
View e-mail recipient	Esc X41 CR ←	X33 ↵	Show e-mail recipient address X33 for e-mail account X41.
Set e-mail events for recipient	Esc X41,X42,X43,X43...X43 EM ←	Ipe X41 ↵	Send e-mail notifications X42 for input or power supply X43 to e-mail account number X41.
Example:	Esc I72,Ø,3EM ←	IpeI72*Ø*33333333 ↵	E-mail account #72 (recipient 8), JSmith, will receive Fail or missing and Fixed and restored messages for all inputs.

NOTE: Before entering this command, you must first set a recipient for e-mail account X41 using the Set e-mail recipient (CR) command.

NOTE:

X27 =	IP address	Format *nnn.nnn.nnn.nnn*. Leading zeros in each field are optional.
X30 =	Password	Administrator or user password can be 4 to 12 alphanumeric characters. Spaces and special characters or symbols are not allowed. The password is case-sensitive.
X31 =	Connection security level	Ø = anonymous, 1 – 1Ø = extended security levels 1 through 10, 11 = user, 12 = administrator The response is returned as 2 digits with a leading zero.
X33 =	E-mail address	Typical e-mail address format; for example, *nnnnn@xxx.com*
X38 =	E-mail domain name	E-mail domain name (Standard domain name conventions apply.)
X41 =	E-mail account number	65 – 72
X42 =	Notification type	Ø = no response, 1 = fail or missing, 2 = fixed or restored, 3 = 1 and 2.
X43 =	Notification selections	**HDXP 3216 and 3232:** Ø1 – 32 = inputs 1 through 32 **HDXP 1616:** Ø1 – 16 = inputs 1 through 16 **Power supply:** 98

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
IP Setup Commands (continued)			
E-mail Commands (continued)			
Read e-mail events for recipient	Esc X41 EM ←	X42,X44 ↵	View notification status X44 for e-mail account X41.
Example: ***HDXP 1616***	Esc 72EM ←	See below.	
		Notify failed and fixed / E-mail input 8 status / Ignore input 16 Response: 3,1,1,Ø,Ø,Ø,Ø,Ø,1,Ø,Ø,Ø,Ø,Ø,Ø,Ø,1 ↵ Input: 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 Power Supply	E-mail account #72 will receive Fail or missing and Fixed or restored messages for input signals 1, 2, and 8, and power supply.
Send e-mail (event)	Esc X28 SM ←	Eml X28 ↵	Send event e-mail X28.
Verbose Mode Commands			
Set verbose mode[24]	Esc X70 CV ←	Vrb X70 ↵	Enable or disable verbose mode, tagged responses, or both.
NOTE: The HDXP can send out unsolicited information (such as a notice of a change in input or some other setting). This is called a verbose (wordy) relationship between the switcher and a connected device. For a direct RS-232 or RS-422 connection, the HDXP is set for verbose mode by default. When the HDXP is connected via Ethernet, verbose mode is disabled by default in order to reduce the amount of communication traffic on the network. If you want to use verbose mode with a switcher connected via Ethernet, you must set this mode to On each time you reconnect to the HDXP.			
Read verbose mode	Esc CV ←	X70 ↵	Show verbose mode and tagged response status X70.
RAM Status Commands			
View dirty RAM status	Esc FF ←	X16 ↵	Show RAM status X16:
Commit RAM to flash memory	Esc 1FF ←	Nvr X16 ↵	Response is delivered when the process is complete.

NOTE:

X16 =	Dirty ram status	Ø = RAM needs to be saved to flash memory. 1 = RAM has been saved to flash memory and it is safe to power of or reset.
X28 =	E-mail event number	1 – 64
X41 =	E-mail account number	65 – 72
X42 =	Notification type	Ø = no response, 1 = fail or missing, 2 = fixed or restored, 3 = 1 and 2.
X44 =	Notification status (viewing)	16- or 32-digit number, in which each input is represented by a digit. In this number: Ø = Do not notify or no input exists, 1 = notify.
X70 =	Verbose mode status	Ø = neither verbose mode nor tagged responses enabled (default for IP connection) 1 = verbose mode enabled, tagged responses disabled (default for serial connection) 2 = tagged responses enabled, verbose mode not enabled 3 = both verbose mode and tagged responses enabled

Matrix Software

This section describes the procedures for using the software products provided for the HDXP switchers.

- **Matrix Software Control Program**
- **Creating Button Labels**

The following software programs accompany the HDXP 3232, 3216, and 1616 switchers:

- The Windows-based Extron Matrix Switcher Control Program, which communicates with the switcher via the RS232/RS422 port and the Ethernet port, provides an easy way to set up ties and sets of ties.
- The Extron Button-Label Generator allows you to design and print labels for the HDXP front panel buttons.

Both programs are compatible with Windows 95/98, Windows NT, Windows ME, Windows 2000, Windows XP, and Windows 7. Updates to these programs can be downloaded from **www.extron.com**.

Matrix Switchers Control Program

The Windows-based Matrix Switchers Control Program is provided at no cost at **www.extron.com**. To use the Matrix software you must download it from the Extron website and install it on your computer hard drive

Downloading the Matrix Software Control Program

From the Extron website, you can download the Matrix Switchers Control Program as well as updates to it as they become available. To access the software on the web:

1. Open the Extron web page and select the **Download** tab.
2. On the Download Center screen, click the **Software** link in the left panel or the **Software** icon in the main panel (see **figure 68** on the next page).

Figure 68. Software Links on the Download Page

3. On the next page, click the **M** link of the alphabet at the center or the bottom of the page.
4. Scroll to locate the Matrix Switchers software, then click the **Download** link to the right.

Figure 69. Download Link for the Matrix Switcher Control Program

5. On the next screen, fill in the requested information, then click the **Download MATRIX_SW_*vnxn*.exe** button.
6. On the security confirmation window that appears at the bottom of the screen (Windows 7) or the center (Windows XP), click **Run** to download the installer file.

NOTE: If you want to save the installation file to your computer hard drive to run later, click **Save**. On the Save As window that opens, save the installer file to the desired location on your computer. When you are ready to install the software, double-click on the **pcss_*vnxnxn*.exe** icon, click **Run** on the download screen that opens, and restart this procedure at step 7.

7. If a second security prompt window opens, click **Run** again to start the installation process.
8. Follow the instructions on the InstallShield Wizard screens to complete the software program installation.

   By default, the software installation creates a `C:\Program Files\Extron\Matrix Software` or `C:\Program Files (x86)\Extron\Matrix Software` directory and places two files (MATRIX Switcher+ Control Program [MTRX.exe] and MATRIX Switcher+ Help [MTRX.hlp]) in it. If there is not already an Extron folder in your Program Files folder, the installation program creates it as well.

NOTES:

- The program controls most Extron matrix switchers, but its operation is limited to the features and configuration of your HDXP.
- The HDXP switcher can support either RS-232 or RS-422 serial communication protocol from the rear panel Remote RS232/RS422 connector, and RS-232 from the front panel Config connector. The HDXP operates at 9600, 19200, 38400, or 115200 baud rates. See **Selecting the RS-232 or RS-422 Protocol and Baud Rate** on page 36 to configure the Remote RS232/RS422 and Config ports from the front panel.

Software Operation Via Ethernet

When an HDXP switcher is connected to an Ethernet WAN or LAN, any number of users can operate it, locally or remotely, using the Matrix Switcher Control Program (see **Ethernet Connection** on page 10 for information on connecting to the network via Ethernet).

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

Ethernet protocol settings

The IP Settings/Options screen (see **figure 78** on page 75) provides a location for viewing. If connected via the RS-232, RS-422, or Ethernet and you are logged on as an administrator, editing settings unique to the Ethernet interface (see **IP Setup** on page 75 for more details).

Special Characters

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

The following characters are invalid or not recommended: *space* (spaces **can** be used in names) + ~ , @ = [ ] { } < > ' " ; (semicolon) : (colon) | \ and ?

Using the Software

Many items in the Windows-based Matrix Switcher Control Program are also accessible via front panel controls (see the **Operation** section beginning on page 13), under SIS control (see the **Remote Configuration and Control** section beginning on page 45), and via the web pages (see the **HTML Configuration and Control** section beginning on page 96). The Matrix Switcher Control Program help file provides information on settings and on how to use the control program itself.

1. To run the Matrix Switcher Control Program, click the **Matrix Switcher + Control Pgm** icon (shown at right) in the Extron Electronics group or folder on your **Start** menu.

   You can access this icon from your **Start** menu by selecting the following:

   Start > **All Programs** > **Extron Electronics** > **Matrix Switchers** > **Matrix Switcher + Control Program**

   The Comm Port Selection window opens (see figure 70).

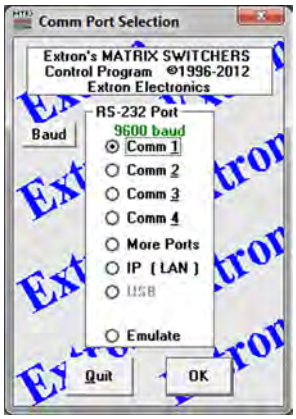


Figure 70. Comm Port Selection Window

2. Choose the comm port that is connected to the HDXP RS232/RS422 port, or select **IP [LAN]** or **Emulate**.

   - **If you selected a Comm port**:

     a. Check the baud rate displayed in the Comm Port Selection window. If you need to change the baud rate, click the **Baud** button to display the baud rate pop-up list (after you click it, the **Baud** button changes to **OK**).

     b. Double-click on the desired baud rate (available selections are **9600**, **19200**, **38400**, and **115200**; the default is **9600**).

c. Click **OK** and proceed to step 4.

Figure 71. Baud Rate Pop-up List

- **If you selected `IP [LAN]`**, click **OK** and proceed to step 3.
- **If you selected `Emulate`**, click **OK** and see **Using Emulation Mode** on page 89.

3. **If you selected `IP [LAN]` in step 2**, the IP Connection window opens.

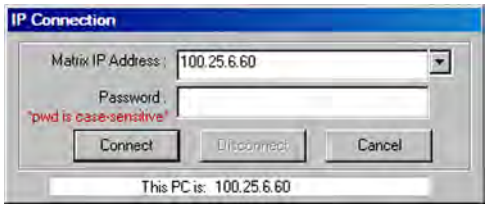


Figure 72. Address and Password Entry for IP Connection

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

- **If the IP address is correct**, proceed to step 3b.
- **If the address is not correct**, either click in the **`Extron IP Address`** field and enter the IP address or click the scroll down button (▾). Select from among the recently used addresses, then proceed to step 3b.

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

b. If your HDXP is password protected, click in the **`Password`** field and enter the appropriate administrator or user password.

c. Click **`Connect`**.

- If you logged on using the administrator password, the Windows program connects you to the HDXP switcher with all of the administrator rights and privileges.
- If you logged on with the user password, the Matrix program connects you to the HDXP switcher with only user capabilities.
- If an incorrect password is entered, the program beeps and returns to the password entry display.

4. The Extron Matrix Switcher Control Program window opens. The window displays the current configuration of the attached matrix, with numbered boxes representing the video inputs and outputs.

NOTE: Figures 73 and 74 show the HDXP 3232, which has 32 inputs and 32 outputs. The window for the HDXP 3216 has 32 input boxes and 16 output boxes, while the HDXP 1616 window has 16 input boxes and 16 output boxes.

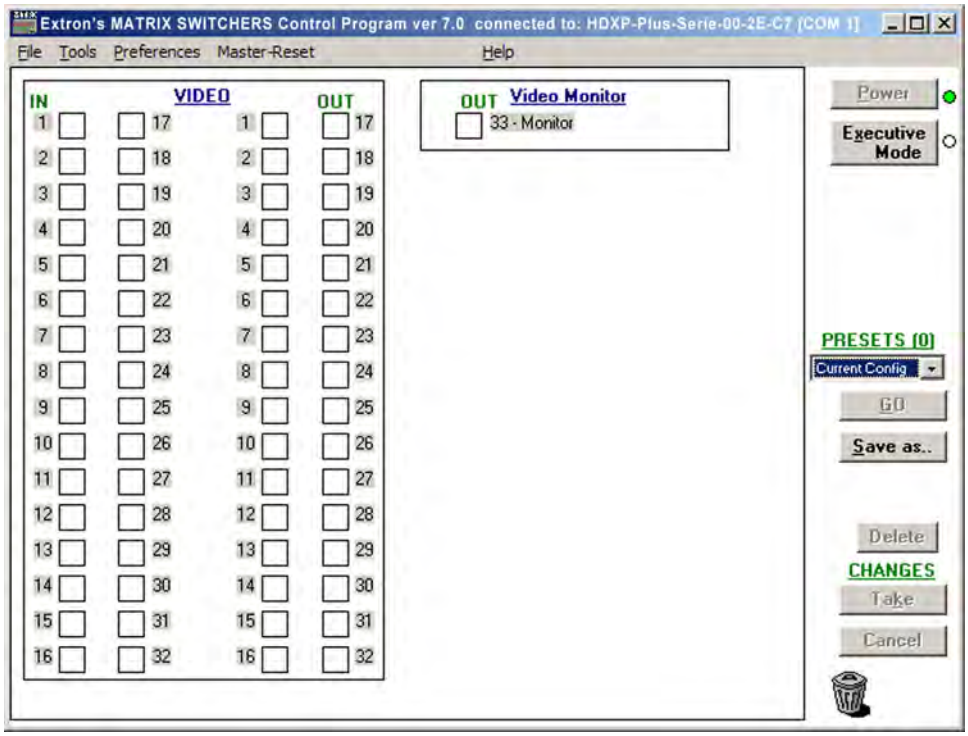


Figure 73. Extron Matrix Switcher Control Program Window (No Ties)

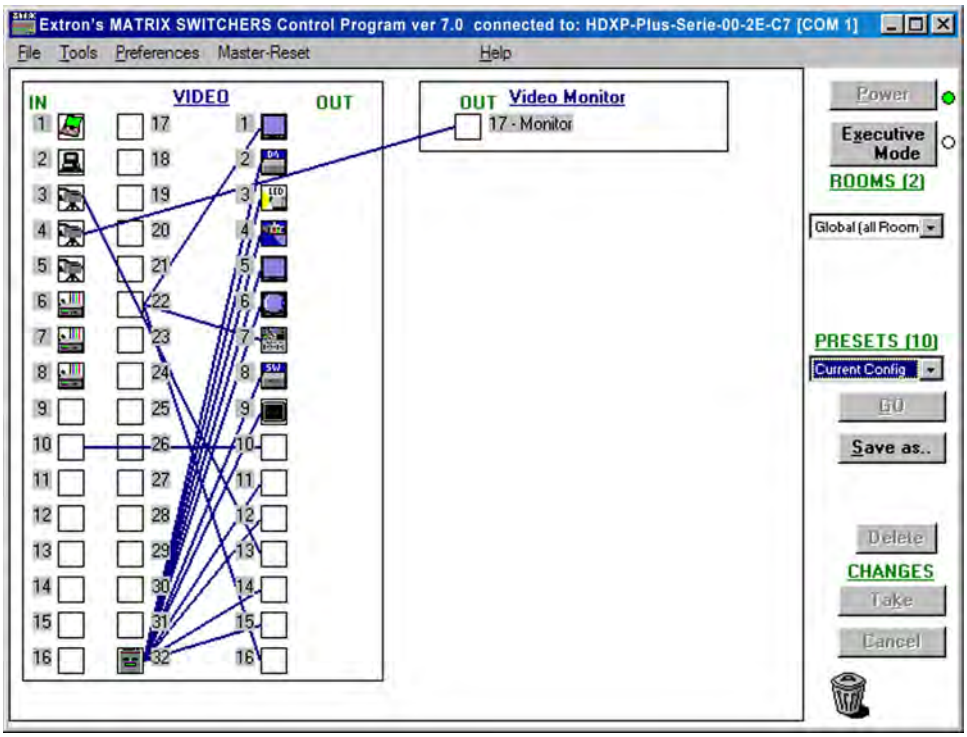


Figure 74. Sample Matrix Window with Ties and Rooms

Setting up the Matrix window

On the Matrix window, the inputs and outputs are represented by boxes. You can make the control program easier to use by assigning device icons that represent your connected devices to each input and output box.

1. Click on an input or an output box. The Input Devices or Output Devices window opens, containing icons representing devices that can be connected to a switcher.

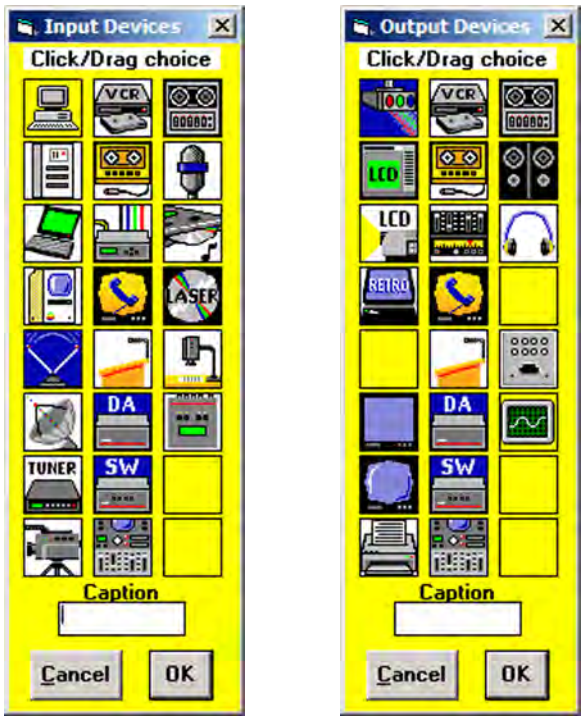


Figure 75. Input Devices and Output Devices Icon Windows

2. Click and drag an icon from the devices screen to an input or output box on the Matrix window. Repeat for additional devices as desired.
3. In the **`Caption`** field, enter a caption for the device, if desired; for example, **`Laptop`**. This caption appears in the descriptive window that pops up when you pass the cursor over an input or output box containing an icon.

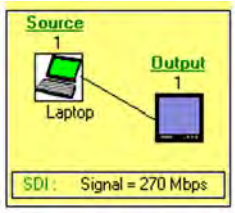


Figure 76. Pop-up Window for Input 1 Containing a Caption

4. When finished assigning icons, click **OK** to close the device window.

   To change an icon in an input or output box, drag the new icon to the box. It replaces the previous one.

   To remove the icon from a box and leave the box empty, drag an empty square to the box.

   Alternatively, you can display the input and output numbers in the boxes instead of icons. To do this, select **`Numbers in I/O Boxes`** from the **`Preferences`** drop-down menu.

Managing Ties

On the Matrix window, you can create, dissolve, and view input-to-output ties as follows:

- **To create a tie**, click and drag from an input box to an output box.
  - **If `Hold/Verify Changes` has been selected from the `Preferences` menu**:

    A broken line appears, connecting the two boxes. (If you want to undo the preliminary tie at this point, click the **`Cancel`** button. The broken line disappears.) Click **`Take`** to confirm the tie. The broken line becomes solid.
  - **If `Immediate Changes` has been selected from the `Preferences` menu:**

    The tie is made immediately (no **`Cancel`** button is displayed).
- **To remove a tie**, drag the output box to its tied input box or to the trash can.
  - **If `Hold/Verify Changes` has been selected from the `Preferences` menu**:

    The tie line becomes broken. If you want to reinstate the tie at this point, click **`Cancel`**. The broken line becomes solid again. Click **`Take`**. The broken tie line disappears.
  - **If `Immediate` Changes has been selected from the `Preferences` menu:**

    The tie is undone immediately.
- **To view information on a specific input or output device**, position the cursor over that device in the Matrix window. A pop-up window opens, showing the input and output numbers, names (if captions were specified), details on the connections to that device, and the frequency of the video signal being sent to or from it.

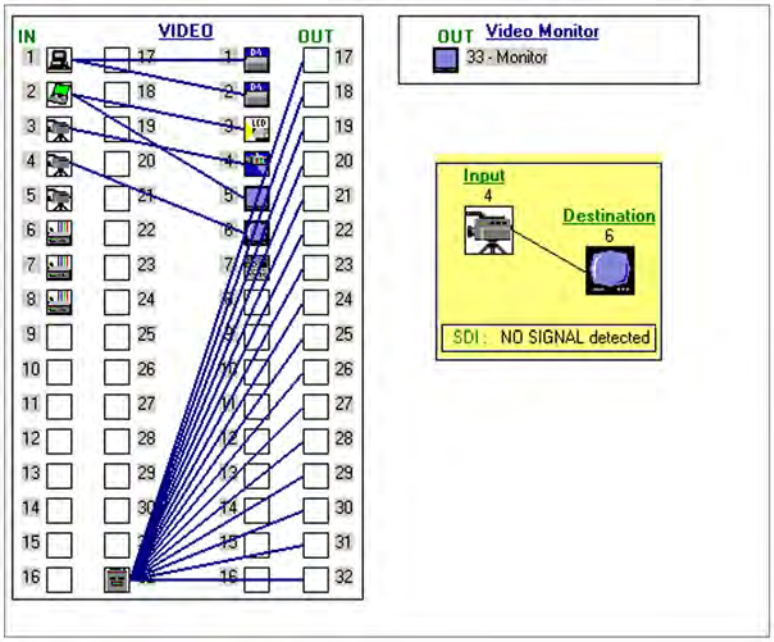


Figure 77. Matrix Window Section with Pop-up Information on Input 4

IP Setup

The IP Settings/Options window (see figure 78) lets you view and, if connected via the RS-232 or RS-422 link or if you are logged on via the Ethernet port as an administrator, editing settings unique to the Ethernet interface. None of the fields on this screen can be edited while you are logged on as a user. To display the IP Settings/Options window, select **IP Options** from the **Tools** drop-down menu.

Figure 78. IP Setting/Options Window

NOTES:

- Editing the following fields on the IP Settings/Options screen while connected via the Ethernet port can immediately disconnect your computer from the switcher:
  - **IP Address**
  - **Gateway IP Address**
  - **Subnet Mask**
  - **Use DHCP**
  - **Administration Password**

  Extron recommends editing the settings on this screen using the RS-232 or RS-422 link and protecting the Ethernet access to this screen by assigning an administrator password to qualified and knowledgeable personnel only.
- When the control program is connected to the HDXP via the RS-232 or RS-422 link, the **Administrator Password** and **User Password** fields are not masked. If a password has been inadvertently changed to an unknown value, you can look up and, if desired, change a password in this window without knowing the current password.

See **Setting an IP Address** on page 113 for basic information about IP addresses.

Setting the matrix IP address

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

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

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

Edit the address field as follows:

1. Click in the **Matrix IP Address** field. The graphic cursor becomes a text cursor.
2. Make any desired changes to the address.
3. Press the <Tab> key on the keyboard or click in another field to exit the **Matrix IP Address** field.
4. Click the **Take** button to make the address change take effect.

NOTE: Editing the **IP Address** field while connected via Ethernet can immediately disconnect your from the HDXP. It is recommended that you connect via RS-232 or RS-422 to edit this field.

Setting the Extron name or descriptor

The **Extron Name/Descriptor** field contains the name used as the "from" information when the HDXP switcher e-mails notification of its failed or repaired status. The default name or descriptor shown in this field is a portion of your product name, followed by the last six characters of the unit MAC address (for example, `HDXP-Plus-Serie-Ø5-A6-2D`).

This descriptor can be changed to any valid name, up to 24 alphanumeric characters including forward slash (/) and hyphen (-).

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

Edit the Extron Name/Descriptor field as follows:

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

Setting the gateway IP address

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

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

Edit this field as follows:

1. Click in the **Gateway IP Address** field. The graphic cursor becomes a text cursor.
2. Make any desired changes to the address.
3. Press the <Tab> key on the keyboard or click in another field to exit the **Gateway IP Address** field.
4. Click the **Take** button to make the address change take effect.

NOTE: Editing the **Gateway IP Address** field while connected via Ethernet can immediately disconnect your from the HDXP. It is recommended that you connect via RS-232 or RS-422 to edit this field.

Setting the subnet mask

The **Subnet Mask** field is used to determine whether the HDXP is on the same subnet as the controlling PC or the mail server when you are subnetting. The subnet mask has the same format as the Matrix IP and Gateway addresses (*nnn.nnn.nnn.nnn*).

For more information, see **Subnetting, a Primer** on page 117.

Edit this field as follows:

1. Click in the **Subnet Mask** field. The graphic cursor becomes a text cursor.
2. Make any desired changes to the mask.
3. Press the <Tab> key on the keyboard or click in another field to exit the **Subnet Mask** field.
4. Click the **Take** button to make the changes to the mask take effect.

NOTE: Editing the **Subnet Mask** field while connected via Ethernet can immediately disconnect your computer from the HDXP. It is recommended that you connect via RS-232 or RS-422 to edit this field.

Hardware Address field

The hardware (MAC) address consists of six pairs of alphanumeric characters in the format *xx-xx-xx-xx-xx-xx*. The MAC address is hard coded in the HDXP switcher and cannot be changed.

Enabling and disabling DHCP

Selecting the **Use DHCP** check box directs the HDXP 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 for information about DHCP on your system.

NOTE: Selecting or deselecting this check box while connected via Ethernet can immediately disconnect your computer from the HDXP. It is recommended that you connect via RS-232 or RS-422 to edit this field.

Setting the date

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

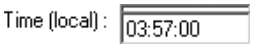
1. Click in the **Date** field. A date editing field appears, displaying the date in the format *(M)M/(D)D/YYYY*, as shown at right. Leading zeros are not used. The graphic cursor becomes a text cursor in the date editing field.

2. Edit the field as desired to set the proper date. Leading zeros are optional.
3. Press the <Tab> key on the keyboard or click in another field to exit the set date field.
4. Click the **Take** button to make the date change take effect.

Setting the local time

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

1. Click in the **Time (local)** field. A time editing field appears with the date in the format *HH:MM:SS* (*ØØ:ØØ:ØØ to 23:59:59*), as shown at right. The graphic cursor becomes a text cursor in the time editing field.



2. Edit the field as desired to set the proper time. Remember to use 24-hour time. Leading zeros are optional.
3. Press the <Tab> key or click in another field to exit the **Time (local)** field.
4. Click the **Take** button to make the time change take effect.

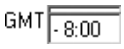
Sync Time to PC button

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

Setting the offset from GMT

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

1. Click in the **GMT** field. An offset editing field appears with the offset in the format ±*HH*:*MM* (–12:ØØ to +14:ØØ), as shown at right. The graphic cursor becomes a text cursor in the set offset field.



2. Edit the field as desired to set the proper offset. Leading zeros are optional. Some time zones are on the half-hour (30 minutes).
3. Press the <Tab> key or click in another field to exit the **GMT** field.
4. Click the **Take** button to make the offset change take effect.

Enabling daylight savings time

When daylight savings time is enabled, the switcher updates its internal clock between daylight savings time and standard time in the spring and fall on the date that the time change occurs in your location. When daylight savings time is turned off, the switcher does not adjust its time reference.

Select the **Use Daylight Savings** check box to enable daylight savings time.

Setting the administrator password

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

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

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

Editing the **Administrator Password** field while connected via Ethernet can immediately disconnect your from the HDXP. It is recommended that you connect via RS-232 or RS-422 to edit this field.

Edit this field as follows:

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

Setting the user password

The **User Password** field displays the password required to log on to the HDXP switcher via the Ethernet port as a user, **without** all administrator rights and privileges. Passwords are case sensitive and are limited to 12 uppercase and lowercase alphanumeric characters.

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

NOTES:

- An administrator password must be created before a user password can be created.
- The following characters are invalid or not recommended in passwords:
  + ~ , @ = ` [] {} < > ' " ; : | \ ? and {space}.

Edit this field as follows:

1. Click in the **User Password** field. The graphic cursor becomes a text cursor.
2. Make any desired changes to the case-sensitive user password.
3. Press the <Tab> key on the keyboard or click in another field to exit the **User Password** field.
4. Click the **Take** button to make the password change take effect.

Setting the mail server IP address

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

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

Edit this field as follows:

1. In the mail server section, click in the **IP address** field. The graphic cursor becomes a text cursor.
2. Make any desired changes to the mail server IP address.
3. Press the <Tab> key or click in another field to exit the **IP address** field.
4. Click the **Take** button to make the address change take effect.

Setting the mail server domain name

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

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

Edit this field as follows:

1. In the Mail Server section, click in the **Domain Name** field. The graphic cursor becomes a text cursor.
2. Edit the name as desired.
3. Press the <Tab> key on the keyboard or click in another field to exit the **Domain Name** field.
4. Click the **Take** button to make the name change take effect.

Entering e-mail addressee information

The eight **E-mail Addressee** fields permit the administrator to identify the e-mail addresses of the personnel to whom the HDXP switcher e-mails notification of its failure and repair status. Figure 79 shows a typical e-mail from the switcher.

HDXP-Plus-Serie-00-61-D7 - Power Supply Fixed
HDXP-Plus-Serie-00-61-D7@folklore.com
To: Charley Adams
Thu. 11 May 2006 13.02.37
Unit Name = HDXP-Plus-Serie-00-61-D7
Unit IP Address = 100.25.112.9

Figure 79. Typical HDXP E-mail

The radio buttons and check boxes associated with each address field permit the administrator to specify specific e-mail requirements for each recipient.

Edit these fields and controls as follows:

1. Click in the desired **E-mail Addressee** field. The graphic cursor becomes a text cursor.
2. Edit the e-mail address as desired. Standard e-mail address conventions (such as *nnnnn@xxx*.com) apply.

3. Press the <Tab> key on the keyboard or click in another field to exit the e-mail addressee field.
4. Use the check boxes associated with each addressee to select the options about which the addressee will be e-mailed: missing inputs or power supply.
5. When you select either a radio button or a check box for an addressee, the floating box that contains the input numbers is displayed on the Input Settings/Options screen. Select the inputs that need monitoring by clicking on their numbers in this box. Selected input numbers are displayed in white on a blue field. To deselect an input number, click on it again.

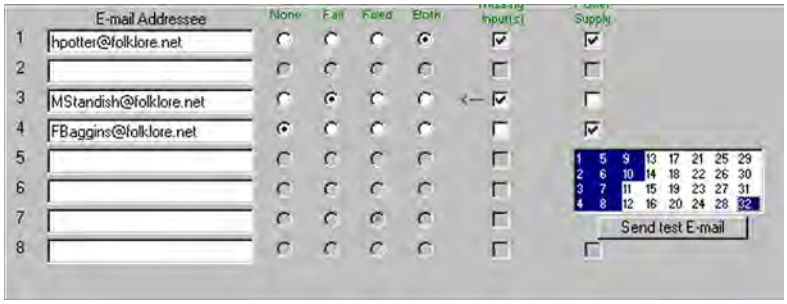


Figure 80. Selecting Inputs to Monitor

6. Use the round radio buttons associated with each addressee to select whether the addressee will be e-mailed about failures, fixes, both, or not be notified. The **None** radio button is useful for temporarily removing personnel from the e-mail list when they are unavailable, such as traveling or on vacation.
7. If desired, click the **Send test E-mail** button to test the e-mail function.
8. Click the **Take** button to make the e-mail address changes take effect.

Updating the Firmware

The firmware upgrade utility provides a way to replace the firmware that is coded on the HDXP control board without needing to take the switcher out of service, open its enclosure, and replace the firmware chip.

Update the HDXP firmware as follows:

NOTE: The update firmware utility is for replacing the firmware that controls all switcher operation. This is **not** the page to insert your own HTML pages (see **Uploading HTML Files** on page 83 to insert custom HTML pages).

1. Visit the Extron website, **www.extron.com** and download the latest firmware file to your computer.

   a. On the Extron web page, select the **Download** tab.
   b. On the Download Center page, click the **Firmware** link on the left sidebar menu or the Firmware icon (shown at right).
   c. Scroll to locate the name of your HDXP switcher and click its **Download** link.
   d. On the next screen, fill in the required information, then click the **Download HDXPplusFW*nxn*.exe** button.
   e. On the Open File - Security Warning window, click **Save**.
   f. On the Save As window, browse to the folder where you want to save the firmware file, and click **Save**. The firmware installation file is placed on your hard drive.

2. Start the Matrix Switcher Control Program and connect to the HDXP switcher (see steps 1 through 4 under **Using the Software** on page 70 for the procedure).

> **NOTE:** The Ethernet connection is much faster than the RS-232 or RS-422 connection. Extron recommends using the Ethernet connection rather than the serial port for firmware uploads.

3. From the **Tools** menu, select **Update Firmware...**. The Select files to Upload to Extron Server window opens.
4. Navigate to the folder where you saved the firmware file. Select the file.

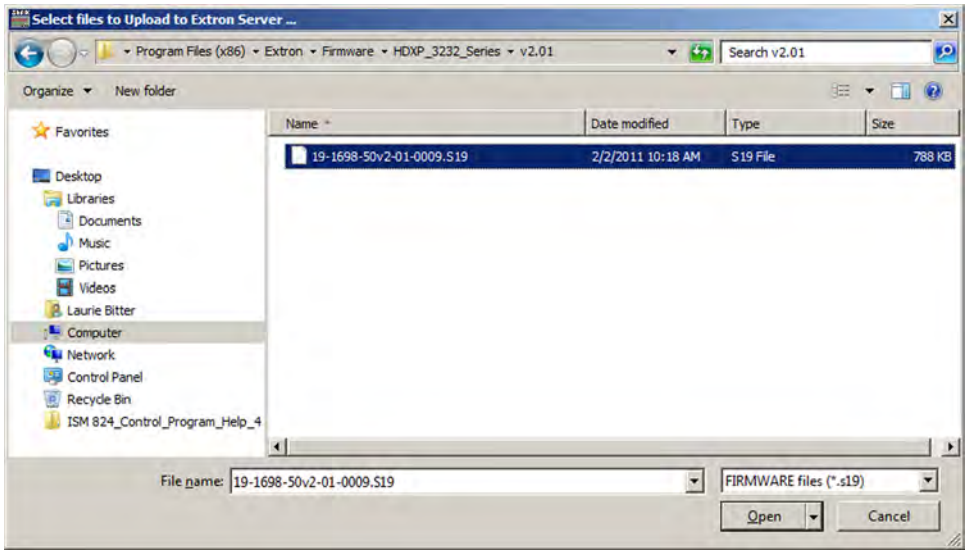


Figure 81. Select Files to Upload to Extron Server Window with Firmware File Selected

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

5. Click **Open**. A confirmation prompt window opens, reminding you that loading the selected .S19 file will reprogram the device firmware.
6. Click **OK** to continue with the upload. A status window, which shows the progress of the upload, appears. The firmware upload to the HDXP switcher may take a few minutes.

7. When the upload is complete, another prompt window appears, informing you that the new firmware upgrade will cause the HDXP to reset, which will terminate the connection with your computer and close the control software. Click **OK**.

   If you want to continue using the Matrix Switcher Control Program, you must restart it.

Uploading HTML Files

You can create customized HTML pages for the HDXP to display. The HTML Files List window (shown below) provides a way to view the contents of the HDXP file system and to upload custom HTML pages to the switcher.

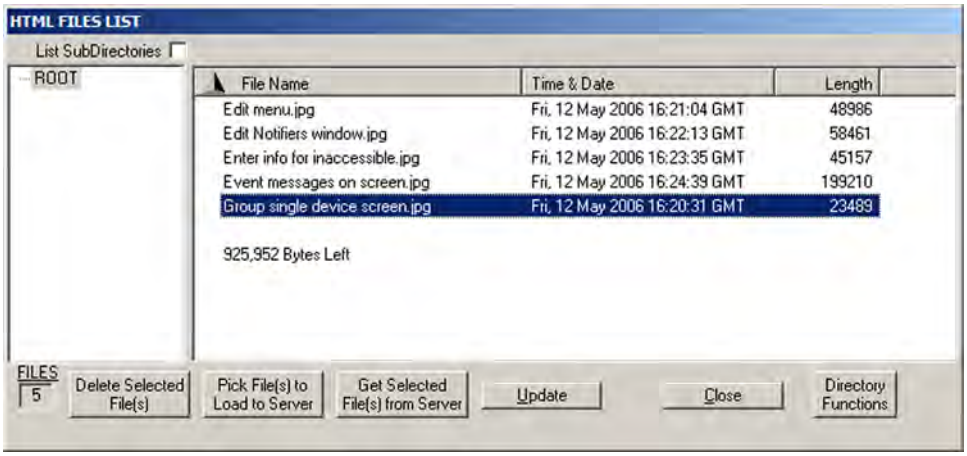


Figure 82. HTML Files List Window

Upload HTML pages as follows:

NOTES:

- The files listed in figure 82 are shown for example only and may not be present on your switcher.
- The HTML Files List window is for inserting your own HTML pages. This is **not** the window to replace the firmware that controls all switcher operation (see **Updating the Firmware** on page 81 to replace the firmware).
- The following characters are invalid in file names:
  `+ ~ , @ = ` [] {} < > ' " ; : | \ ?` and {space}.

1. Connect the PC to the HDXP via the RS232/RS422 port or Ethernet port.
2. Start the Matrix Switcher Control Program and connect to the HDXP switcher (see steps 1 through 4 under **Using the Software** on page 70 for the procedure).
3. From the **Tools** menu, select **HTML File Manager**. The HTML Files List window opens.
4. Click the **Pick Files to Load to Server** button. The Select files window opens.
5. Navigate to the folder where you saved the HTML files. Select the files.

   NOTES:

   - To select multiple files, hold the <Ctrl> key while you click on the desired files.
   - If you want one of the HTML files that you created to be the default start-up page, name the file “index.html”. The HDXP switcher looks for that file name when you first connect to it using an Internet browser.

6. Click the **Open** button. The file uploading process may take a few minutes.
7. Click the **Update** button to confirm the upload.
8. Click the **Close** button to exit the HTML Files List window.

Windows Buttons, Menus, and Trash Can

The buttons, drop-down menus, and trash can icon on the right side of the program window perform the following functions:

- **Power** — This button is unavailable for HDXP switchers, because the HDXP cannot be powered on and off via software.
- **Executive mode** — Allows you to lock out front panel operations, except for the view-only mode functions.
- **Room menu** — Displays a list of up to 10 rooms. From this list you can select a room to display in the window.

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

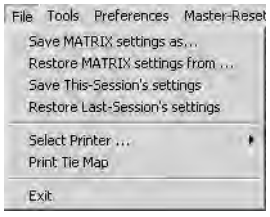
- **Presets menu** — Displays a list of up to 32 global presets and up to 100 room presets (10 rooms with 10 presets per room). From this list you can select a preset to display in the window. You can either activate the selected preset by clicking **Go** or delete it by clicking **Delete**.
- **Go** — Activates the selected preset as the current configuration.
- **Save as** — Allows the current set of ties to be saved as a preset. Enter the preset number when prompted to do so.
- **Delete** — Removes the selected preset.
- **Take** — Allows you to save to file any changes made to the displayed configuration.
- **Cancel** — Returns to the previous screen, undoing any changes you have made.
- **Trash can** — Drag and drop from an input or output button to the trash can to undo all ties associated with that input or output.

Windows Menus

The menu bar on the Matrix window contains the following pull-down menus.

File menu

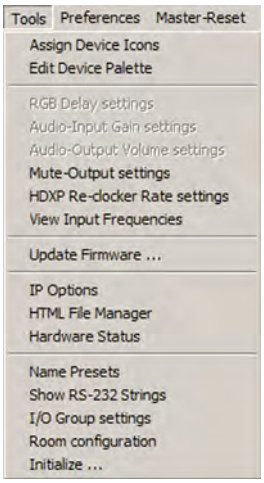
The **File** menu contains the following options:



- **Save MATRIX settings as** — Saves a complete set of up to 132 presets (32 global and 100 room presets), plus the last active setting (preset #0), to a file. Saved settings include assigned icons and icon captions.
- **Restore MATRIX settings from** — Loads and activates a previously saved settings file.
- **Save This-Session's settings** — Performs the same function as **Save MATRIX settings as**, but you are not able to specify a file name to which it will be saved.
- **Restore Last-session's settings** — Loads the icons and icon captions that were saved during the last session. If you saved the changes to the settings from the previous session the last time you exited the program, the ties from that session are loaded.
- **Select Printer** — Selects the target printer that will be used to print tie maps.
- **Print Tie Map** — Prints the tie set that is displayed on the screen.
- **Exit** — Closes the Matrix Switcher Control Program.

Tools menu

The **Tools** menu contains the following options. (Grayed out options are unavailable on your switcher.)



- **Assign Device Icons** — Displays the complete set of input and output device icons. You can drag any of these icons to the input and output boxes.
- **Edit Device Palette** — Allows you to add your own device icon graphics.
- **Mute-Output settings** — Displays the Channel Mute Settings window. On this screen, use the slider bar to select an output to mute, then select the **Video** check box in the Mute section. To mute all outputs at once, select the **All** check box.

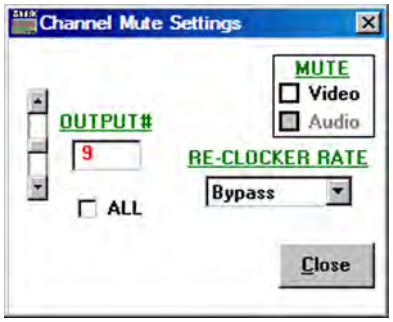


Figure 83. Channel Mute Settings Window

- **HDXP Reclocker Rate settings** — Opens the Channel Mute Settings window, on which you can use the **Reclocker Rate** menu to select a rate at which outputs will be reclocked to put them in sync with input signals.
- **View Input Frequencies** — (DSVP) Displays the input horizontal and vertical frequencies for each input.
- **Update Firmware** — Allows you to replace the firmware that is coded on the switcher control board without needing to take the HDXP out of service, open the switcher enclosure, and replace the firmware chip set (see **Updating the Firmware** on page 81).
- **IP Options** — Allows you to set options for the IP connection (see **IP Setup** on page 75).
- **HTML File Manager** — Displays a list of HTML files installed on the switcher and allows you to upload custom files from a connected PC to the switcher (see **Uploading HTML Files** on page 83).

- **`Hardware status`** — Opens the HDXP Plus System Status window, which provides an overall view of the status of the matrix switcher, including the primary and secondary power supply status and the individual voltages, the internal temperature, the Remote RS232/RS422 port configuration, the number of IP connections, and the installed and updated firmware status (see figure 84).

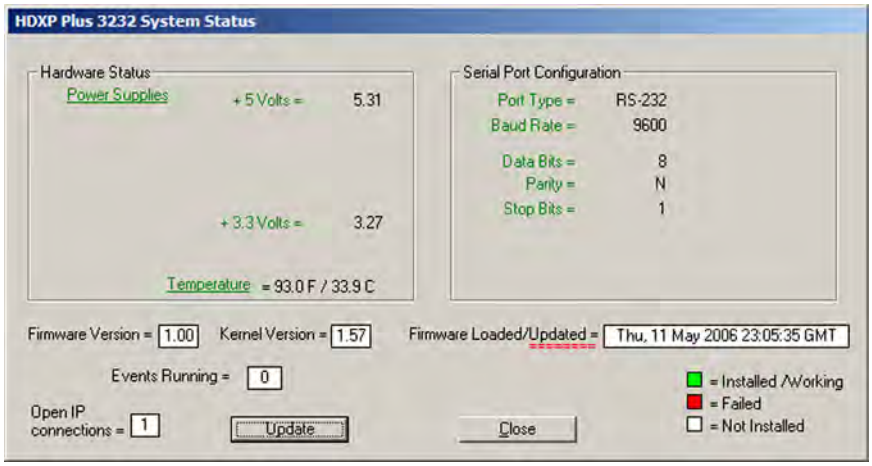
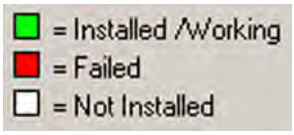


Figure 84. Status Window

The following status color coding applies to the text in the Hardware Status and Serial Port Configuration sections:

- **Green** — Proper operation
- **Red** — Component has failed.
- **White** — Components are not installed.



NOTE: The HDXP switchers are not available in custom configurations. Each model has all available monitored components, such as power supplies, installed. If you see the white "not installed" indication, the "not installed" component may have become disconnected during shipment or rough handling.

- **`Name Presets`** — Opens the Names for Presets window, which allows you to assign a name to each of the 32 global presets and 100 room presets. Select a preset from the list and enter a name for it in the text box at the top of the screen. Click **`Take`** to confirm the name.

NOTES:

- Preset names are limited to 12 upper- and lowercase alphanumeric characters, {space}, and the `_ : =` and `/` characters.
- The following characters are invalid or not recommended in preset names: `+ ~ , @ = ` ` [ ] { } < > ' " ; : | \` and `?.`

- **`Show RS-232 strings`** — Displays the ASCII commands that are used by the current configuration. You can refer to these for SIS programming (see the **Remote Configuration and Control** section beginning on page 45 for information on entering SIS commands).

- **`I/O Group settings`** — Opens the Input/Output Groups window, which allows you to establish input and output groups. Drag two or more of the small boxes representing inputs and outputs to one of the input or output Group boxes. Repeat as desired. Click **`Take`** to establish the groups.

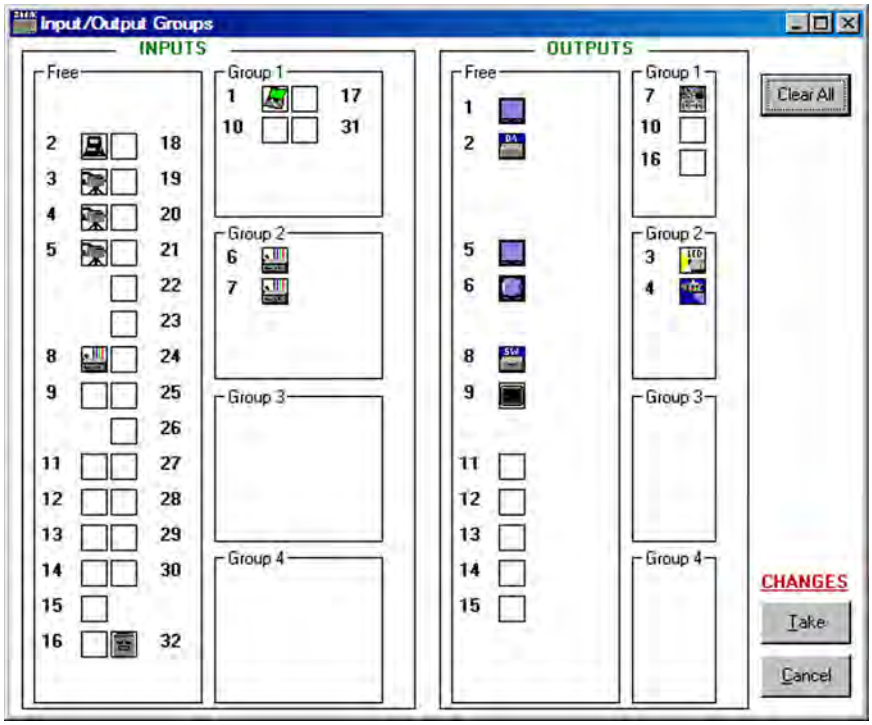


Figure 85. Input/Output Groups Window

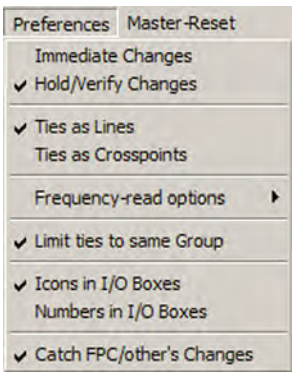
- **`Room configuration`** — Allows you to assign outputs to rooms or delete outputs from rooms. Drag one or more of the small boxes representing outputs to one of the Room boxes. Repeat as desired to form additional rooms. Click **`Take`** to establish the rooms.

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

- **`Initialize`** — Displays a window on which you can select, initialize, and clear any or all of the following: ties, presets, groups, preset names, icon names, and icons.

Preferences menu

The **`Preferences`** menu contains the following options:



- **`Immediate changes`** — Causes the configuration changes you make to take effect immediately, without the need to click a Take button. When you select this option, the **`Take`** and **`Cancel`** buttons are removed from the Matrix window.
- **`Hold/Verify Changes`** — Delays implementation of configuration changes until the **`Take`** button is pressed.

- **`Ties as Lines`** — Displays ties as lines.

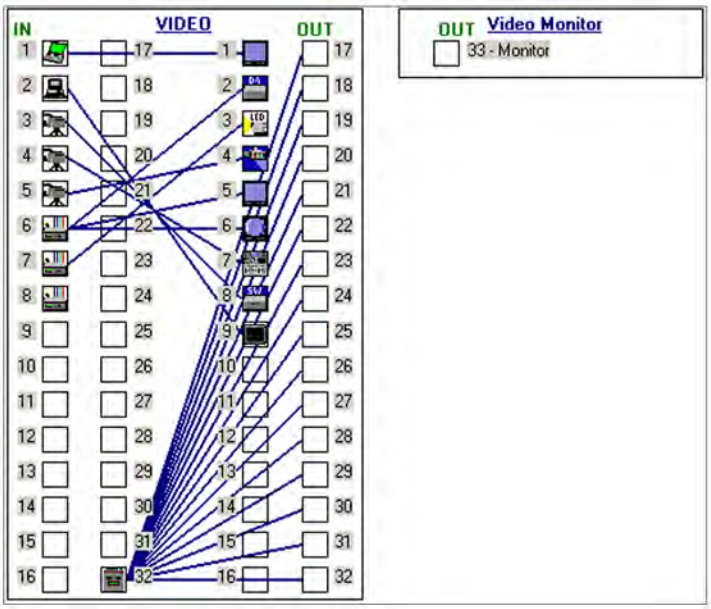


Figure 86. Ties Shown as Lines

- **`Ties as Crosspoints`** — Displays ties as a matrix of inputs and outputs. Ties that have been made are indicated as amber boxes. Ties that will take effect when you click the **`Take`** button are indicated by a plus sign (**+**) in the crosspoint box. Ties that will be broken when you click the **`Take`** button are indicated by a minus sign (**–**).

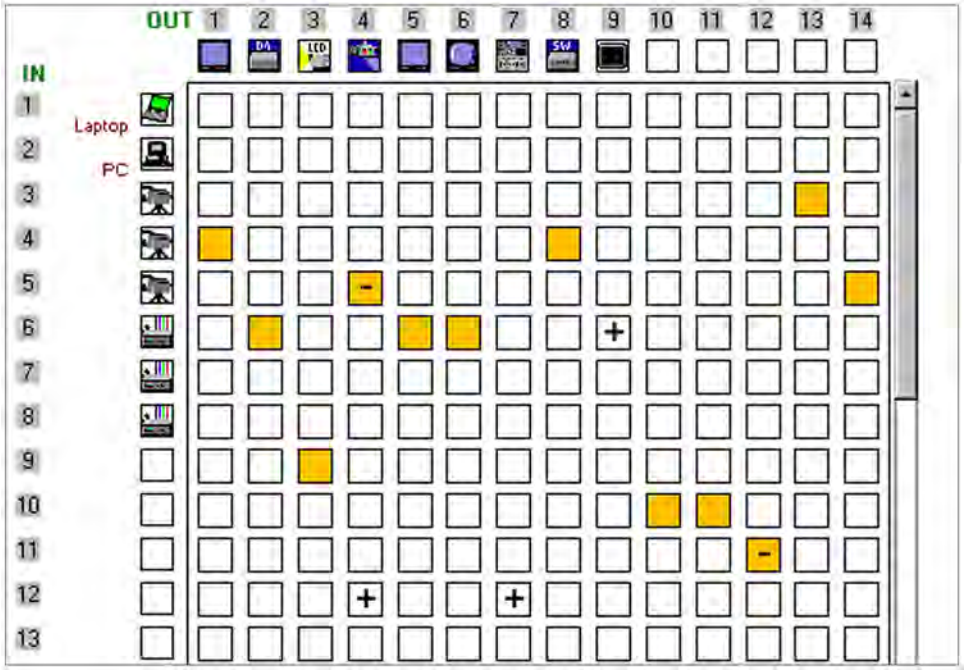
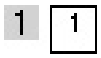


Figure 87. Ties Shown as Crosspoints

- **Frequency-read options** — Provides a submenu that allows you to set the input signal detection (DSVP) feature to do one of the following:
  - Automatically refresh the display (set this option to **Automatically every 10 seconds**).
  - Sample the sync and update the display whenever you make a configuration change (set this option to **On Demand or by Refresh**).
  - Never sample and display the sync or no sync status (set this option to **None**).
- **Limit ties to same group** — Allows you to create ties only between inputs and outputs that are in the same group (similar to front panel operation).
- **Icons in I/O boxes** — Displays icons that you place in the I/O boxes in the Matrix window (see **figure 86** on the previous page).

- **Numbers in I/O boxes** — Displays the input and output numbers in the I/O boxes in the Matrix window (see the **figure 87** on the previous page). You are not able to place icons in the boxes when this option is selected.



- **Catch FPC/other's Changes** — When checked, sets the switcher to report all configuration and setting changes to the Remote RS-232/RS-422 or Ethernet connection that enabled this selection. These reports allow the Matrix Switcher Control Program to track the changes that occur in the switcher configuration and settings, whether commanded via the front panel, the RS232/RS422 port, or the Ethernet port.

Master-Reset selection

Master-Reset clears all ties and presets, all output mutes, and all I/O grouping.

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

Using Emulation Mode

Emulation mode allows you to set up the software without attaching the switcher to the computer. In emulation mode, you can emulate any matrix switcher that is supported by the Matrix Switcher Control Program; you are not limited to the HDXP.

To use emulation mode, do the following:

1. Double-click the **MATRIX Switchers + Control Program** icon in the Extron Electronics group or folder.
2. On the Comm Port Selection window, select **Emulate**, and click **OK**.

3. From the Initialize Emulated Matrix Settings From window, select an emulation file (.mtx extension), and click **Open**.

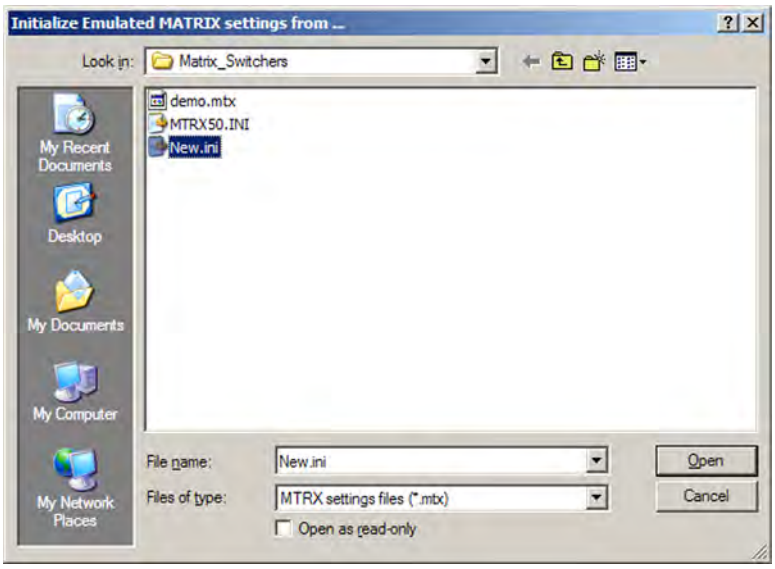


Figure 88. Selecting an Emulation File

NOTE: Selecting the Demo.mtx file provides a sample of a completed matrix setup. Selecting the New.ini file or clicking **Cancel** provides a blank setup to get you started.

4. On the Save Emulated Matrix Settings window, enter a file name under which you want to save any changes to the file, and click **Save**.

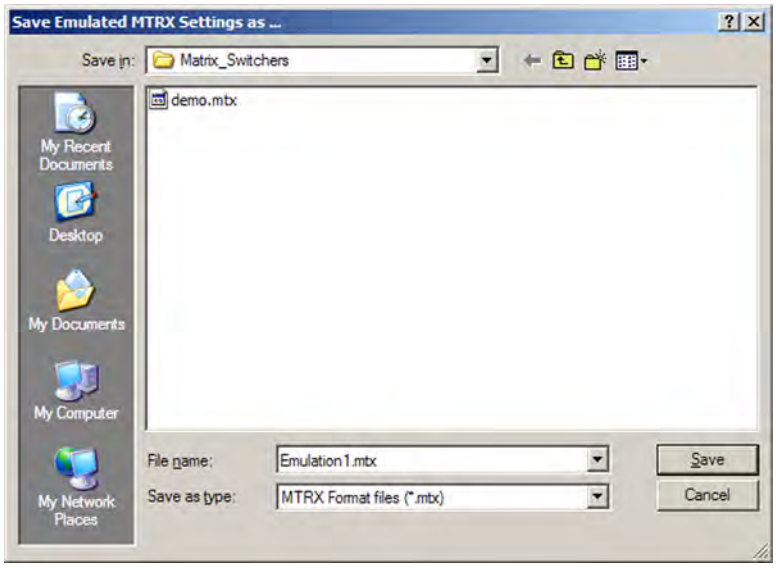


Figure 89. Saving a New Emulation File

5. On the Emulation Configuration window, select the number of video boards that your model has and the matrix switcher model you are configuring, and click **OK**.

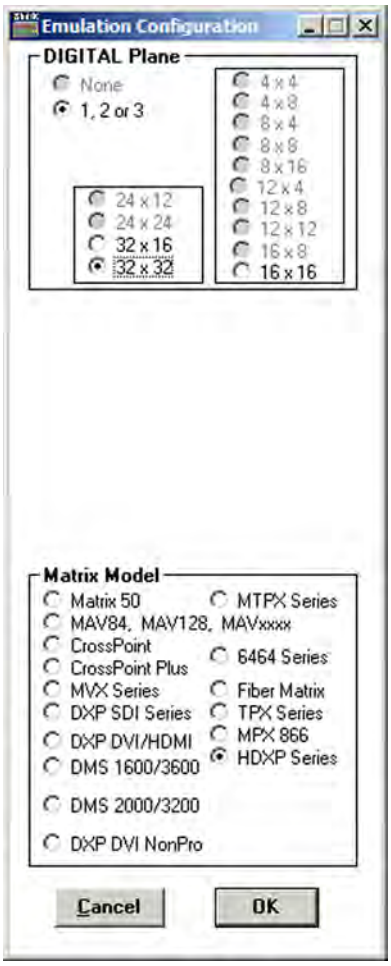


Figure 90. Emulation Configuration Window

6. Continue using the program as described in **Using the Software** on page 70.

Using the Matrix Switcher Help System

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

- From the Extron Electronics program folder or **Start** menu group, select the **MATRIX Switcher + Help** icon (shown at right).
- Within the Matrix Switcher Control Program, select **Contents** from the **Help** menu on the Matrix window.
- From within the Matrix Switcher Control Program, press the <F1> key.

Creating Button Labels

The button caps are pre-labeled for your convenience by default. However, you can replace the labels of the input and output buttons with the included additional printed button labels or with labels that you create and print yourself. You can temporarily remove the numbered translucent covers on the input and output buttons to insert different labels behind the covers.

Page 95 contains **blank button labels**. If desired, photocopy them or cut them out of the guide, write button information in each button area as desired, and insert them in the switcher input or output button caps. You can also create labels using the Button Label Generator software.

Button Icons

The Extron Button-Label Generator software is provided with every Extron matrix switcher. Each input and output button can be labeled with names, alphanumeric characters, or color bitmaps for easy and intuitive input and output selection. See **Blank Button Labels** on page 95 for blank labels and **Using the Button Label Generator** for the procedure for removing and replacing the translucent covers.

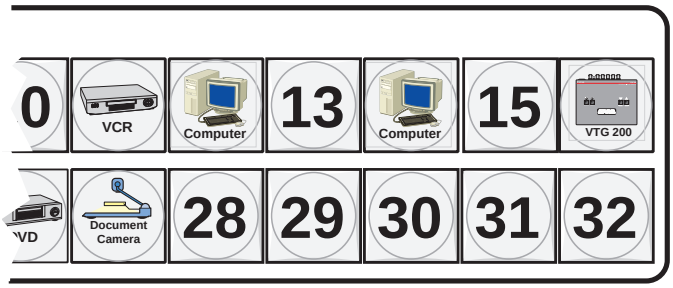


Figure 91. Example of Button Labels on an HDXP Front Panel Section

Using the Button Label Generator

The Button Label Generator software creates labels for the HDXP input and output buttons. You can create labels with names, alphanumeric characters, icons, and even colored bitmaps for easy and intuitive input and output selection. See **Replacing Button Labels** on page 94 for procedures for removing and replacing the button covers and changing the labels.

The program is contained on the same DVD as the Matrix Switcher Control Program, and is installed automatically when you install the control software. By default, the software installation creates a directory for the program at `C:\Program Files` [or `Program Files (x86)` for Windows 7, 32-bit]`\Extron\ButtonLabelGenerator`. The **`Button Label Generator`** icon is placed in the Extron Electronics group or folder.

1. To run the label creation program, double-click on the **Button Label Generator** icon (shown at right) in the Extron Electronics group or folder. The Button Label Generator window opens.

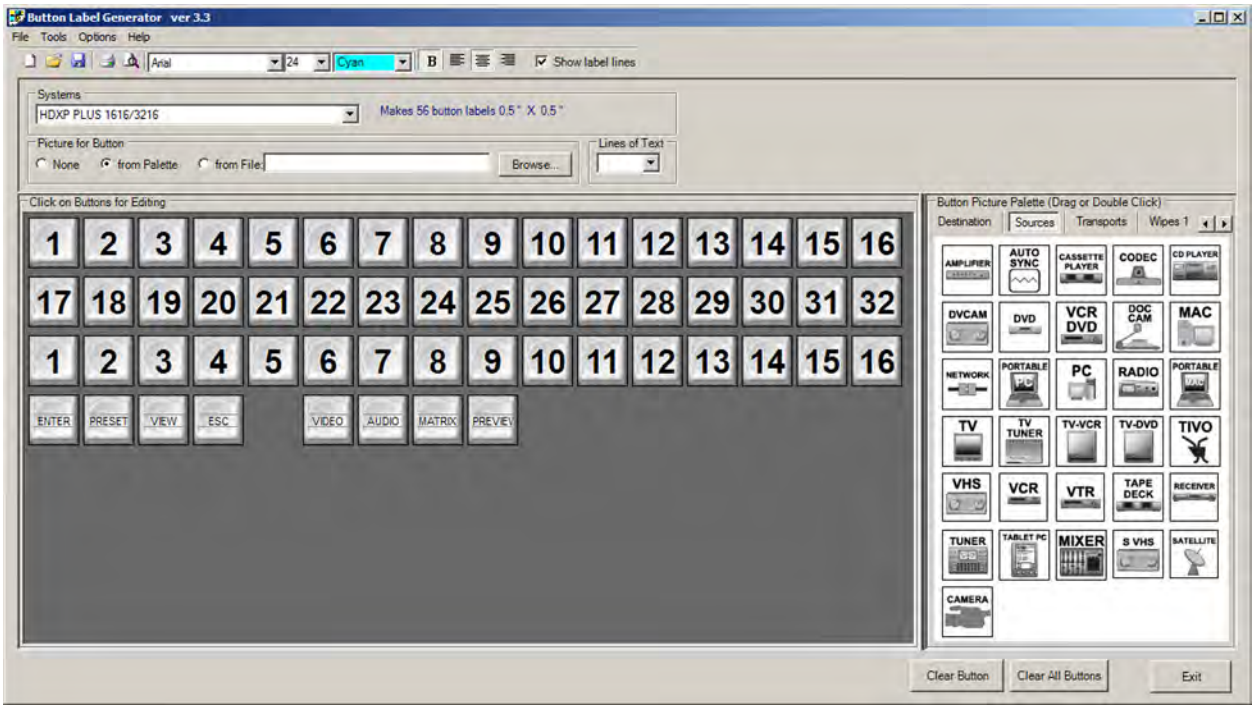


Figure 92. Button Label Generator Window

2. From the **Systems** menu, select **HDXP Plus 1616/1632** or **HDXP Plus 3232** for the layout of your model (although you can select any option from this menu). You can also select **Customize Button Layouts** from the **Tools** menu to open the Customize button layout window, on which you can create your own layout.
3. Click on the button representation that you want to edit. A red box surrounds the selected button.
4. Edit the selected button by using any of the tools provided on the Button Label Generator window. Some of the edits you can make are:
   - Enter text and select the font, text size, and text color from the drop-down menus on the tool bar.
   - Select an icon from the **Button Picture Palette** and drag it to a button.
   - Place a bitmap image from your computer on a selected button.

   To remove all the text or the image from a selected button, click **Clear Button**. To remove the text and images from all the buttons, click **Clear All Buttons**.

   To access the Button Label Generator help, select **Use Help** from the **Help** menu.
5. After creating the labels, print them by selecting **Print** from the **File** pull-down menu in the upper-left corner of the Button Label Generator window. To save the button label set as an .xml file on your computer, select **Save As** from the **File** menu and enter a name for the label file.

Replacing Button Labels

The button assembly consists of a clear lens cap, the button label, and a white diffuser. Remove the button assembly from the HDXP as follows:

1. Remove the button assembly by inserting a small, flat-bladed screwdriver, such as an Extron Tweeker, between the button base and the diffuser to gently pry the button assembly off the button plunger, as shown in figure 93.
2. Locate the small corner notch on the clear lens cap, and slide the screwdriver between the lens cap and the diffuser (see ② in figure 93).
3. Using a rotating motion of the screwdriver, carefully pry the two pieces apart (see ③ in figure 93).
4. Lift out the transparent square label that you want to replace, being careful not to damage the circuits beneath it. You may need to use the small screwdriver to gently pry the label out.
5. Insert one of the new labels you created in before starting into the clear button cap, align the white backing plate with the cap, and firmly snap it into place.
6. Gently, but firmly, press the reassembled button into place on the HDXP front panel.
7. Repeat steps 1 through 6 as needed to relabel other buttons.

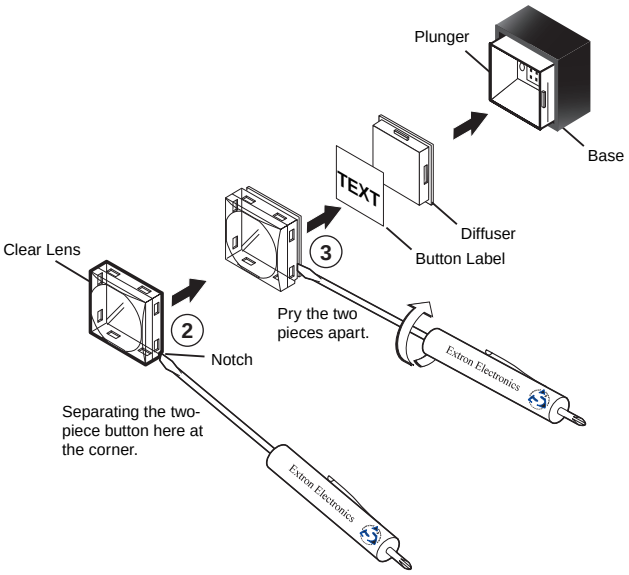
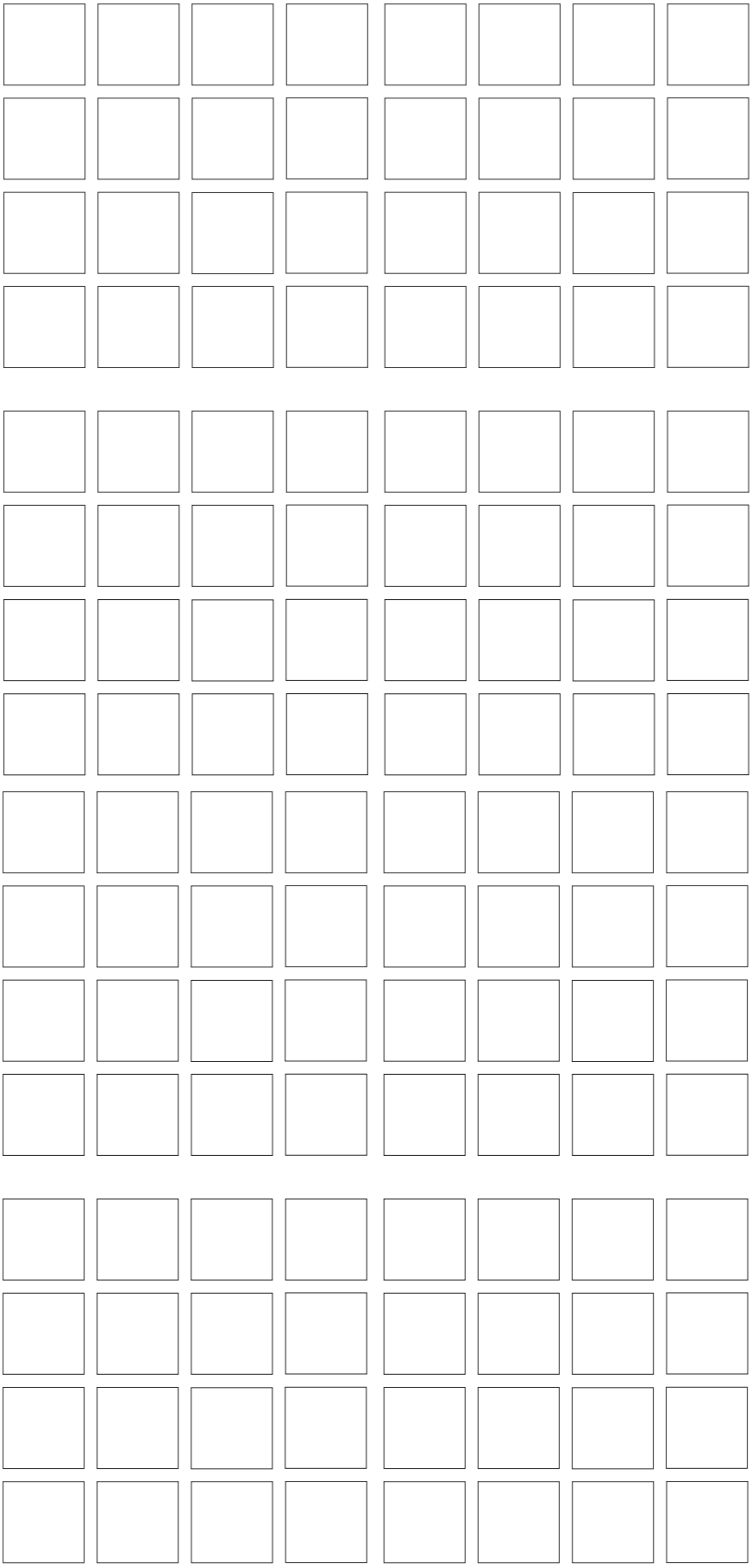


Figure 93. Replacing a Button Label

Blank Button Labels



HTML Configuration and Control

This section provides procedures for accessing and using the HDXP embedded web pages. Topics include:

NOTE: If your Ethernet connection to the matrix switcher is unstable, try turning off the proxy server in your web browser. To do this in Microsoft Internet Explore, click **Tools** > **Internet Options** > **Connections** > **LAN Settings**, and clear the **Use a proxy server...** check box. Click **OK**.

Accessing the Web Pages

Access the HTML pages as follows:

1. Start the web browser program.
2. Click in the browser **Address** field.
3. Enter your HDXP IP address in the browser **Address** field.

   NOTE: If the local system administrators have not changed the value, enter the factory default `192.168.254.254` in this field.

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

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

5. Press the keyboard <Enter> key. The switcher checks to see if it is password protected.
   - If the switcher is not password protected, the System Status web page is displayed.
   - If the HDXP is password protected, the network password dialog box is displayed.

Figure 94. Example of a Network Password Dialog Box

6. In the **Password** field, enter the appropriate administrator or user password. If desired, select the check box to have the system input your password the next time you enter your HDXP IP address. Click **OK**.

> **NOTE:** A User Name entry is not required.

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

- Does the address include a specific file name, such as `10.13.156.10/`*`file_name`*`.html`? **If so**, the switcher downloads that HTML page.
- Is there a file in the HDXP memory that is named "index.html"? **If so**, the switcher downloads "index.html" as the default startup page.
- **If neither of the above conditions is true**, the switcher downloads the factory-installed default startup page, "nortxe_index.html", also known as the System Status page.

Special Characters

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

The following characters are invalid or not recommended:
`+ ~ , @ = ` [ ] { } < > ' " ;` (semicolon) `:` (colon) `| \ ?` and *space*.

System Status Page

The System Status page (see figure 95) provides an overall view of the status of the matrix switcher, including individual voltages and serial port status (if applicable). The System Status page is the default page that the switcher downloads when you connect to the switcher. Access the System Status page from other pages by clicking the **Status** tab.

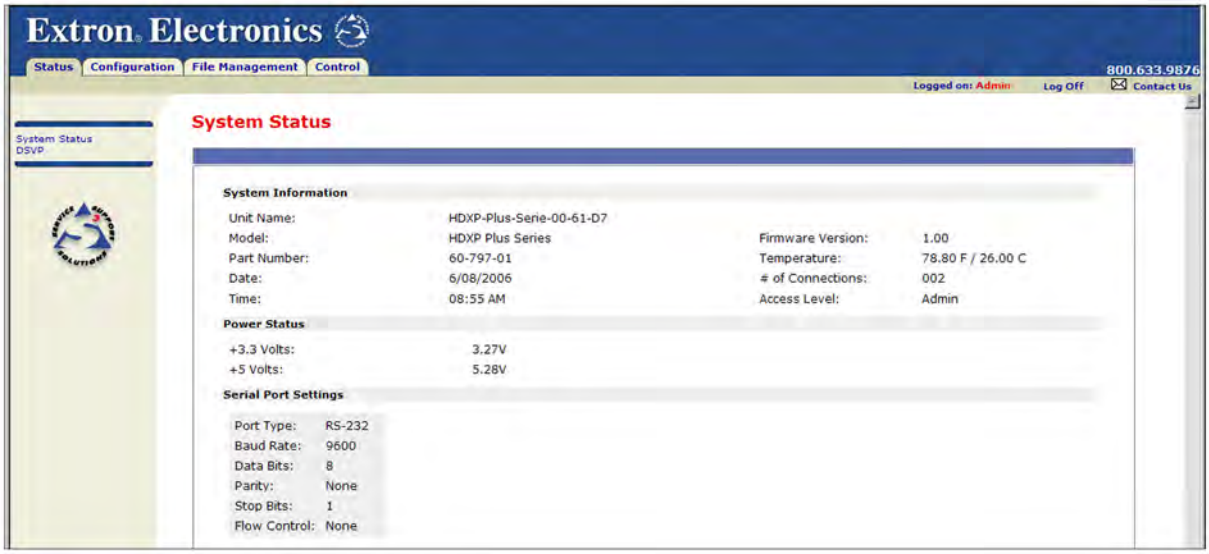


Figure 95. System Status Page

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

DSVP Page

You can view a snapshot-in-time of the input frequencies of connected inputs on the Digital Sync Validation Processing (DSVP) page. Click the **DSVP** link on the left panel of the System Status page to display the DSVP page.

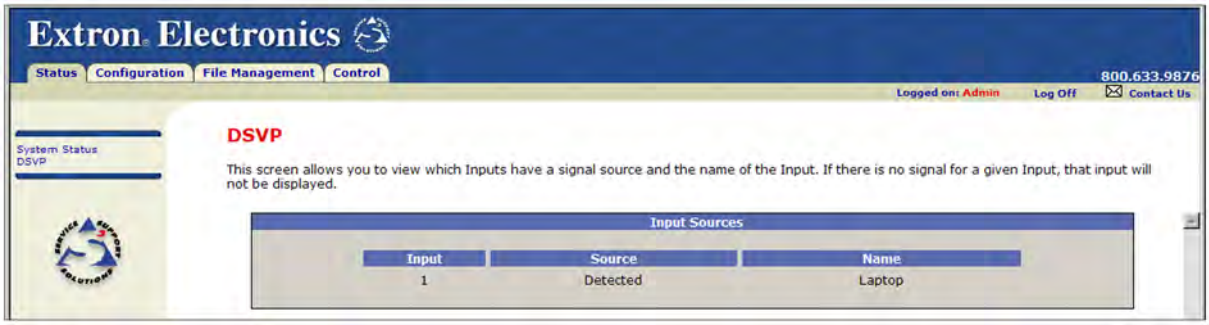


Figure 96. DSVP Page

System Settings Page

The HDXP switcher displays the System Settings page (shown in figure 97) when you click the **Configuration** tab. The screen consists of fields in which you can view and edit IP administration and system settings. The Email Settings and Passwords pages can be accessed by clicking the appropriate link on the sidebar menu (see **Setting an IP Address** on page 113 for basic information about IP addresses and subnetting).

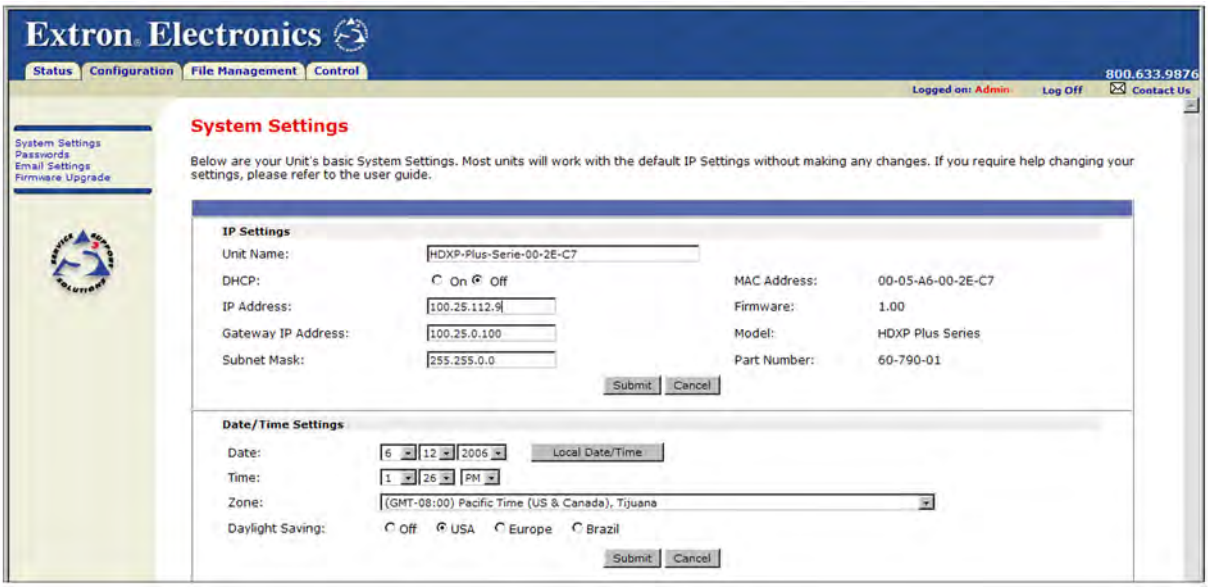


Figure 97. System Settings (Configuration)

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

- The Ethernet connection to the switcher, either entering SIS commands (see the **Remote Configuration and Control** section beginning on page 45) or using the Extron Matrix Switcher Control Program (see the **Matrix Software** section beginning on page 67) is password-protected.
- Connection via the RS232/RS422 port is not password-protected.

IP Settings Fields

The IP Settings fields provide a location for viewing and editing settings unique to the Ethernet interface. After editing any of the settings on this page, click the **Submit** button at the bottom of the IP Settings section.

Unit Name field

The **Unit Name** field contains the name used as the "from" information when the HDXP e-mails notification of its failed or repaired status. You can change this name field to any valid name, up to 24 alphanumeric characters.

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

DHCP radio buttons

The **DHCP On** radio button directs the switcher to ignore any entered IP addresses and to obtain its IP address from a Dynamic Host Configuration Protocol (DHCP) server (if the network is DHCP capable).

The **DHCP Off** radio button turns DHCP off. Contact the local system administrator to for the setting of this control.

IP Address field

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

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

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

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

Gateway IP Address field

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

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

Subnet Mask field

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

MAC Address field

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

Date/Time Settings Fields

The Date/Time Settings section provides a location for viewing and setting the time functions.

Figure 98. Date/Time Settings Section

Change the date and time settings as follows:

1. Click the drop-down menu for the desired variable. The adjustable variables are month, day, year, hours, minutes, am or pm, and (time) zone (the **Month** drop-down menu is displayed in figure 98).
2. Click and drag the slider or click the **Scroll Up** button or **Scroll Down** button until the desired variable is visible.
3. Click on the desired variable.

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

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

4. Repeat steps 1 through 3 for other variables that need to be changed.
5. Select the appropriate **Daylight Saving** radio button. To turn off daylight savings time, select **Off**.

   NOTE: When daylight savings time is enabled, the switcher updates its internal clock between Standard Time and Daylight Savings Time in the spring and fall on the date that the time change occurs in the United States of America and parts of Europe and Brazil. When daylight savings time is turned off, the switcher does not adjust its time reference.

6. Click the **Submit** button at the bottom of the Date/Time Settings section to implement your selections.

Passwords Page

Access the Passwords page by clicking the **Passwords** link on the sidebar menu on System Settings page.

Figure 99. Passwords Page

The fields on the Passwords page are for entering and verifying administrator and user passwords. Passwords are case sensitive and are limited to 12 upper- and lowercase alphanumeric characters. Each password must be entered twice — once in the **Password** field and then again in the **Re-enter Password** field to the right. Characters in these fields are masked by four bullets (••••). If you do not want to password-protect an access level, leave the **Password** and the **Re-Enter Password** fields blank. After entering the desired password in both fields, click the **Submit** button at the bottom of the page.

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

To clear an existing password so that no password is required, delete the bullets in the **Password** and **Re-enter Password** fields and enter a space in each field, then click the **Submit** button at the bottom of the page.

Email Settings Page

Access the Email Settings page by clicking the **Email Settings** link on the sidebar menu on the System Configuration page. The Email Settings page has fields for setting up the HDXP e-mail notification capabilities.

For the e-mail settings and for each row of the e-mail notification settings, click the **Edit** button at the right of the field to make the field available for editing. The button changes to **Save**. After editing the settings associated with the **Edit/Save** button, click the **Save** button.

Figure 100. Email Settings Page (Upper Portion)

Mail IP Address field

The **Mail IP Address** field displays the IP address and the domain name of the mail server that handles the e-mail for the facility in which the HDXP switcher is installed.

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

Domain Name field

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

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

SMTP Authorization Required fields

Selecting the **SMTP Authorization Required** check box sets the HDXP to require SMTP authorization before accepting any e-mail. To set up this authorization requirement, follow these steps:

1. To enable the SMTP authorization fields, click the **Edit** button at the right of the **Mail IP Address** field. The **Edit** button changes to **Save**.
2. Select the **SMTP Authorization Required** check box, located below the **Domain Name** field. This enables the **User Name** and **Password** fields below the check box.
3. In the **User Name** and **Password** fields, enter a user name and a password that senders must enter in order for the HDXP to accept their e-mail messages.

   For the User name, you can use any combination of letters, numerals, spaces, and symbols **except** the comma (**,**) and the single and double quotation marks (' and "). For the password, you can use all characters except the comma. The user name and password can each be from 1 to 30 characters.

   NOTE: You must specify **both** a user name and a password.

4. Click the **Save** button next to the **Mail IP Address** field to save your user name and password.

To remove SMTP authorization, click **Edit**, deselect the SMTP Authorization Required check box, then click **Save**.

Email address fields

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

The check boxes and drop-down menus associated with each address field let you specify specific criteria under which the HDXP will e-mail the recipients.

- In the **Missing Input** drop-down menu to the left of the address, select the inputs to monitor for presence or absence of a signal.
- Select the **Power** check box to monitor the power supplies.
- In the associated **E-Mail Options** drop box, select whether the recipient is to be e-mailed of failures, fixes, both, not notified, or to be removed from the e-mail list.

Figure 101. Email Options Menu on the Email Settings Page

The **Suspend** option is useful for temporarily removing personnel from the e-mail list when they are unavailable, such as traveling or vacation. Deleting an e-mail addressee and clicking the **Save** button removes the recipient from e-mail notification completely.

Firmware Upgrade Page

The Firmware Upgrade page provides a way to replace the firmware that is coded on the HDXP control board without needing to take the switcher out of service. Access the Firmware Upgrade page by clicking the **Firmware Upgrade** link on the System Settings page.

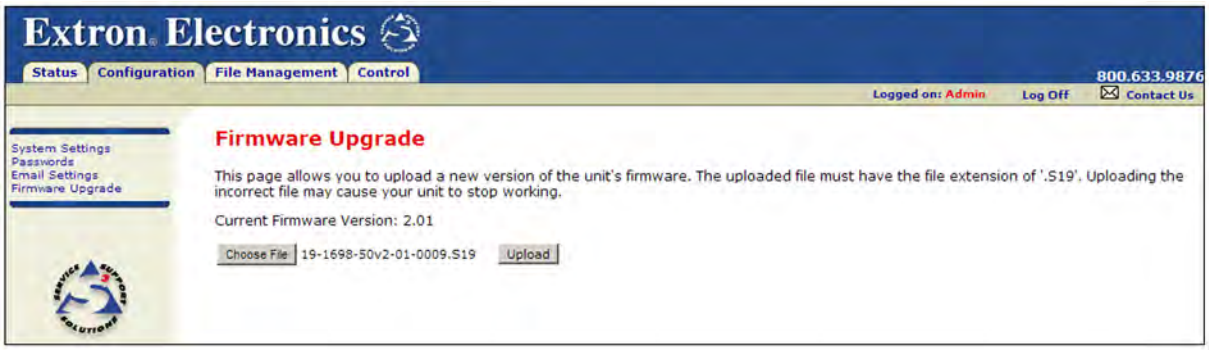


Figure 102. Firmware Upgrade Page

NOTE: The Firmware Upgrade page is **only** for replacing the firmware that controls all switcher operation. To insert your own HTML pages, see **Using the File Management Page** on page 107.

Update the HDXP firmware as follows:

1. Go to the Extron website, **www.extron.com**, and download the latest firmware file to your computer.
   a. On the Extron web page, select the **Download** tab.
   b. On the Download Center page, click the **Firmware** link on the left sidebar menu.
   c. Scroll to locate the name of your HDXP switcher and click its **Download** link.
   d. On the next screen, fill in the required information, then click the **Download *product name_firmware version*.exe** button.
   e. On the File Download - Security Warning window, click **Save**.
   f. On the Save As window, browse to the folder where you want to save the firmware file, and click **Save**. The firmware installation file is placed on your hard drive.
2. Access the HDXP web pages.
3. Select the **Configuration** tab.
4. On the Configuration page, click the **Firmware Upgrade** link on the left sidebar menu.
5. Click the **Choose File** button. An Open window is displayed.

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

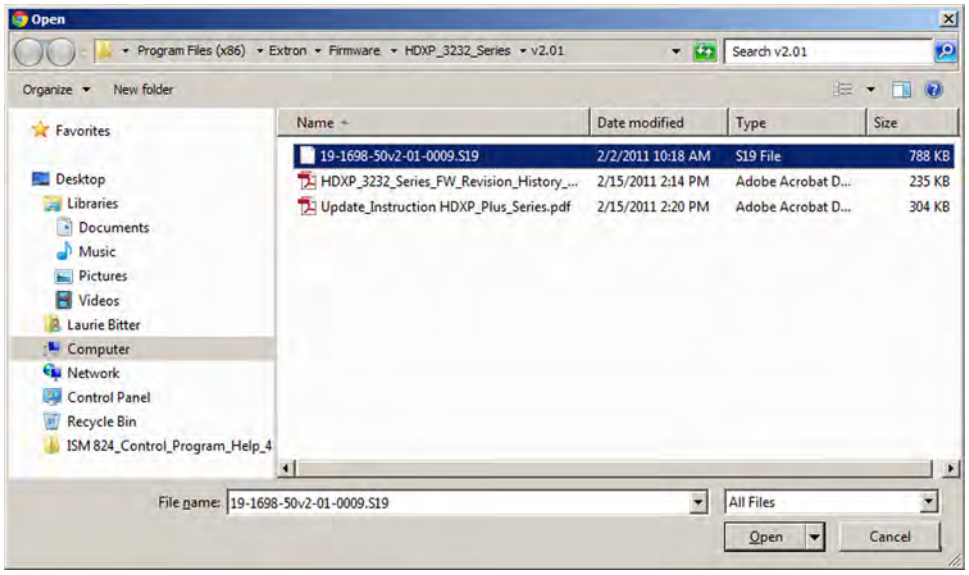


Figure 103. Open Window with an HDXP Firmware File Selected

NOTES:

- Valid firmware files must have the file extension **.S19**. A file with any other extension is **not** a firmware upgrade.
- The original factory-installed firmware is permanently available on the HDXP switcher. If the attempted firmware upload fails for any reason, the HDXP reverts to the factory-installed firmware.

7. Click **`Open`**.
8. On the Firmware Upgrade page, click the **`Upload`** button.

   While the firmware is uploading, the Upload button changes to **`Uploading...`** . When the uploading process is complete, the button changes back to **`Upload`**. The uploading may take a few minutes.

When the firmware upload is complete, the new version number is displayed on the Firmware Upgrade and System Status screens.

Using the File Management Page

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

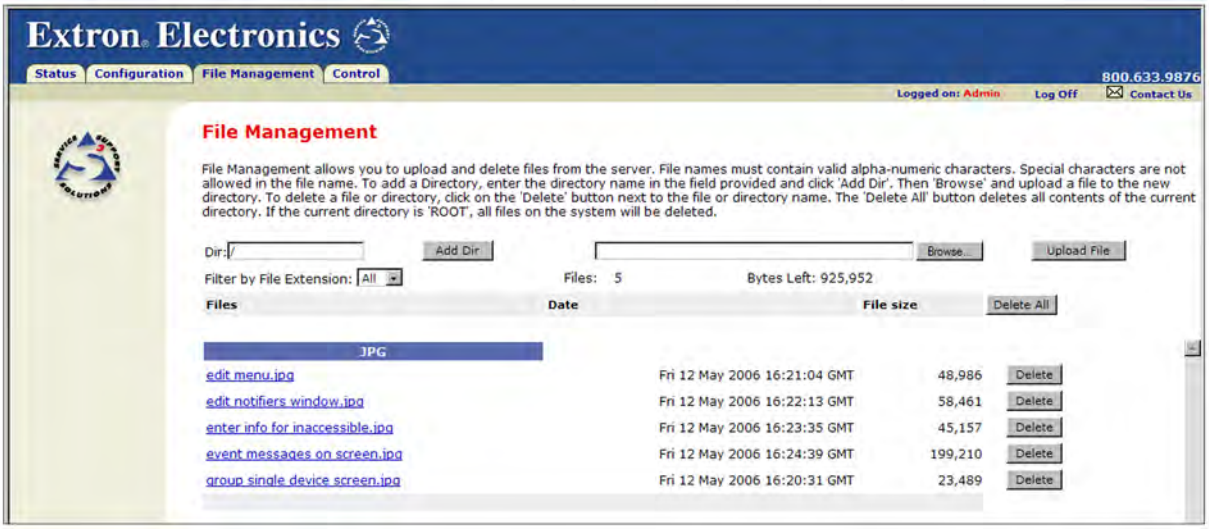


Figure 104. File Management Page

NOTE: The files listed in figure 104 are shown for example only and may not be present on your switcher.

Uploading Files

Files to be uploaded to the HDXP must contain only valid alphanumeric characters and underscores.

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

To upload files from the server, follow these steps:

1. Click the **Browse** button to the right of the file name field.
2. Browse to locate the file that you want to upload, and open it. The file name and directory path are displayed in the file name field on the File Management screen.
3. Click the **Upload File** button. The selected file name appears in the Files column on the File Management screen. Files are listed separately under headings of their extensions.

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

Adding a Directory

To add a directory or folder to the HDXP file system, follow these steps:

1. Enter the directory name in the **Dir:** field, following the slash (/).
2. Click the **Add** button.
3. With the directory name displayed, perform the uploading files procedure described in the previous section to add a file to the directory. The directory name appears at the top of the Files column, preceded by a slash.

To add more files to the directory, click the directory name to open it, then use the **Uploading Files** procedure on the previous page. To exit the directory, click **(root)** or **(back)**.

Other File Management Activities

You can also perform the following tasks on the File Management screen:

- **Open a file** — Click on the name of the file in the Files column.
- **Delete a file** — Click the **Delete** button at the right end of the line that contains the file you want to remove.
- **Delete all files** — Click the **Delete All** button.
- **Display files by file extension** — The **Filter by File Extension** menu lists the extensions of the files that have been uploaded to the HDXP. This menu lets you choose to display only files with the extension you select. Select **All** to display all uploaded files.

Set and View Ties Page

You can create ties on the Set and View Ties page (see figure 105). Access the Set and View Ties page by selecting the **Control** tab.

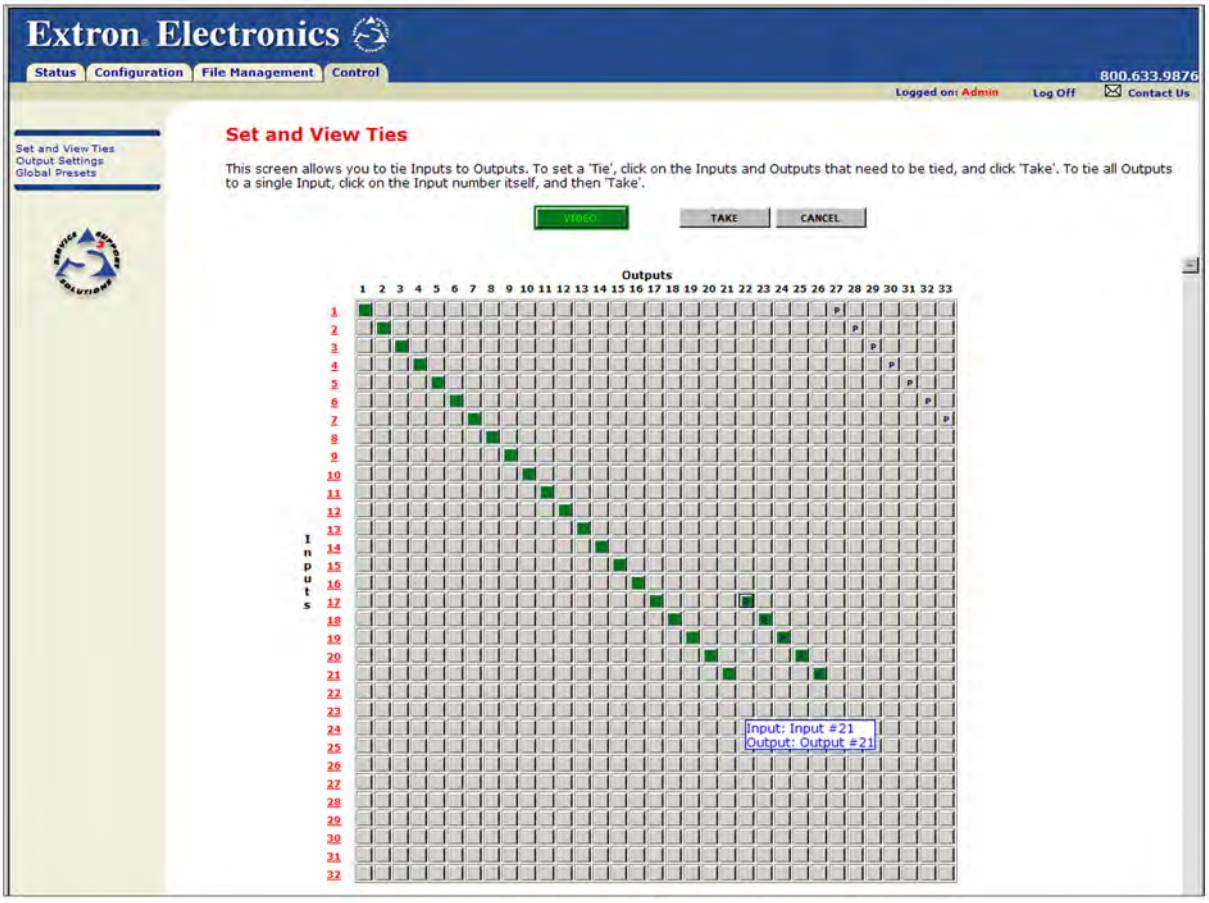


Figure 105. Set and View Ties Page

The Set and View Ties page consists of a matrix of input (rows) and output (columns) selection buttons.

Creating a Tie

Select and switch an input as follows:

1. Move the mouse over the matrix of input and output selection buttons. Click a button to create a preliminary tie of the input and output associated with that button (if they are not already tied) or a preliminary untie (if the input and output are tied). A P (for preliminary) appears on the button.

   NOTES:

   - If you lose track of the input and output associated with a specific button, let the mouse rest over one of the tie buttons for a moment. A field pops up (see figure 105) that identifies the input and output for that button.
   - To tie an input to all outputs, click the input number, located at the left of the matrix.

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

Output Settings Page

The Output Settings page allows you to mute or unmute and to change the reclocker rate of the outputs on your unit.

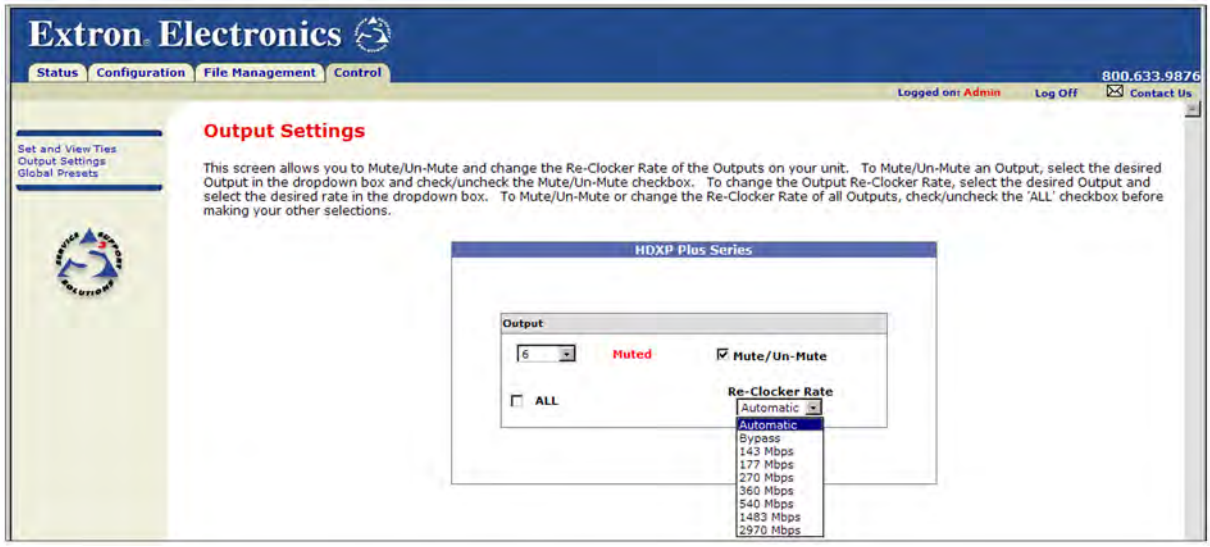


Figure 106. Output Settings Page

Muting and unmuting the output

To mute or unmute an output, do the following:

1. To select an individual output to mute or unmute, select an output number from the **Output** drop-down menu.
2. Select or clear the **Mute/Un-Mute** check box. The word **Muted** appears in red next to the output selection menu.

Changing the output reclocker rate

To change the output reclocker rate, do the following:

1. Select the desired output from the drop-down menu.
2. From the Reclocker Rate drop-down menu, select the desired rate.
   - Select **Automatic** if you want the reclocker to automatically adapt the output to the input signal.
   - To disable the reclocker for the selected output, select **Bypass**.

To mute, unmute, or change the reclocker rate of all the outputs, select or clear the **ALL** check box.

Global Presets Page

You can save and recall global presets from the Global Presets page. Access the Global Presets page by clicking the **Global Presets** link on the left panel of the Control page.

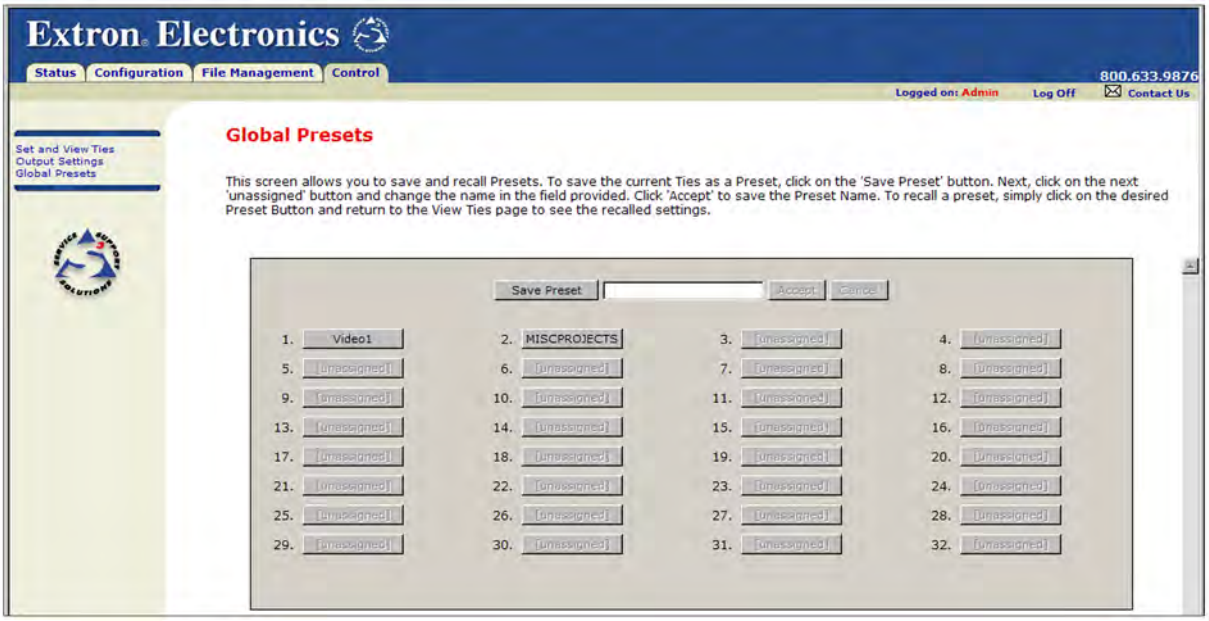


Figure 107. Global Presets Page

Saving a preset

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

1. Click the **Save Preset** button. It changes to **Select Preset...**.
2. Select the desired preset by clicking one of the preset buttons.
   - To create a new preset, click one of the [unassigned] buttons.
   - To overwrite an existing preset, click its button.
3. Enter a name for the preset in the text field.

NOTES:

- Preset names are limited to 12 characters. Valid characters are Ø – 9, a – z, A – Z, and special characters _ : = / and *space*.
- The following characters are invalid or not recommended in preset names: + ~ , @ = ‘ [ ] { } < > ' " ; : | \ and ?.

4. Click the **Accept** button.
   - If you do not rename an unassigned button, the HDXP names the preset as Preset *nn* (*nn* is the next available number).
   - If you do not rename an existing preset when it is overwritten, the HDXP retains the same name.

Recalling a preset

To recall a global preset to be the current configuration, click the button for the desired preset on the Global Presets page.

Reference Information

This section provides reference information on the HDXP Plus products. Topics include:

Mounting the Switcher

The HDXP matrix switchers are housed in rack-mountable metal enclosures with mounting flanges for standard 19-inch racks. If desired, rack mount the HDXP switcher as follows:

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

Figure 108 shows a diagram of an HDXP 1616 or 3216 being mounted to a standard 19-inch rack.

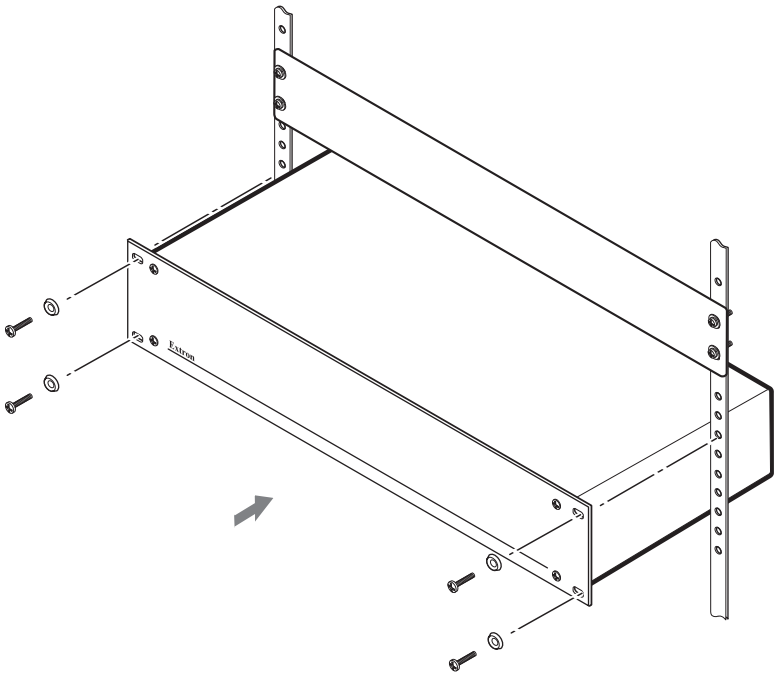


Figure 108. Rack Mounting the HDXP

Setting an IP Address

What is an IP Address?

An IP address is a 32-bit binary number that is used to identify each device on an Ethernet network. This number is usually represented by four decimal numbers (called "octets"), each in the range of 0 through 255 and separated by dots; for example, 198.123.34.240. This is called "dotted decimal notation."

An IP address is divided into two parts:

- Network identifier
- Host identifier

Each address on a given network must have the same network identifier value but have a unique host identifier. As a result, there are different classes of addresses that define the range of valid addresses and the parts of the address that are used for the network and host identifiers.

The most common IP address classes are:

Class Name	Valid Address Range	Identifier Arrangement
Class A	0.0.0.1 to 127.255.255.254	*NNN.HHH.HHH.HHH*
Class B	128.0.0.1 to 191.255.255.254	*NNN.NNN.HHH.HHH*
Class C	192.0.0.1 to 223.255.255.254	*NNN.NNN.NNN.HHH*

NNN refers to the network identifier and *HHH* refers to the host identifier.

Choosing IP Addresses

If the computer and the HDXP are directly connected or connected via their own independent network, follow the guidelines below for choosing the IP addresses.

However, if you intend to connect your computer and switcher to an existing network, you need to advise the network administrator and ask the administrator to allocate suitable IP addresses.

On an independent network, it is generally recommended that you use the Class C format (from 192.0.0.1 to 223.255.255.254).

There are two rules for choosing IP addresses:

- Network identifier must be the same for each IP address
- Host identifier must be unique for each address.

Applying these rules to Class C addresses, the first three decimal values of your IP address must all be the same while the last value is used to uniquely identify each device.

The following is an example of a **valid** Class C addressing scheme:

Device	IP Address
Matrix Switcher Control Software computer	208.132.180.41
HDXP Plus switcher	208.132.180.42

NOTE: The host identifiers (41 and 42 in the above example) do not need to be sequential or in any particular order. However, it is recommended that you group the numbers for simplicity.

The following is an example of an **invalid** Class C addressing scheme:

Device	IP Address
Matrix Switcher Control Software computer	208.132.180.41
HDXP Plus switcher	192.157.180.42

NOTE: The above addresses are invalid because the network identifier for each address is not the same even though each IP address is unique.

You can perform a test from your computer to check that a device at a particular address is responding correctly or to determine its address (see **Pinging for the IP Address**).

Subnet Mask

The subnet mask is another 32-bit binary number that is used to "mask" certain bits of the IP address. This provides a method of extending the number of network options for a given IP address. It works by allowing part of the host identifier to be used as a subnet identifier.

It is important that you set the correct value for the subnet mask. The basic values depend on the class of IP address being used.

Class Name	Subnet Mask
Class A	255.0.0.0
Class B	255.255.0.0
Class C	255.255.255.0

See **Subnetting, a Primer** on page 117 for more information.

Pinging for the IP Address

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

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

Ping to determine Extron IP address

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

Ping the switcher as follows:

1. From the Windows **Start** menu, select **Run...**. The Run window opens.
2. In the **Open** text field, enter `cmd`.
3. Click **OK**. A command window opens.

4. At the command prompt, enter `ping` *`IP address`*. The computer returns a display similar to figure 109.

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

```
C:\>ping 192.168.254.254

Pinging 192.168.254.254 with 32 bytes of data:

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

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

Figure 109. Ping Response

Ping to determine web IP address

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

At the prompt, enter `ping -a` *`IP address`*. The display that the computer returns is similar to the `Ping` response shown in figure 109, except that when you specify the `-a` modifier, the line `Pinging mail...` reports the web IP address instead of the numeric IP address, regardless of whether you entered the actual numeric IP address or an alias name.

Connecting as a Telnet Client

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

Starting Telnet

Access the command prompt and start Telnet as follows:

1. From the **`Start`** menu, select **`Run...`**. The Run window opens.
2. In the **`Open`** text field, enter `cmd`.
3. Click **`OK`**. A command window opens.
4. At the prompt, enter `telnet`. The computer returns a display similar to figure 110.

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

Escape Character is 'CTRL+]'

Microsoft Telnet>
```

Figure 110. Telnet Screen

Operating using Telnet

This guide does not detail all of the operations and functionality of Telnet. However, some basic level of understanding is necessary for operating the HDXP switcher via Telnet.

Connecting to the HDXP (Open command)

You connect to the HDXP Plus switcher using the `Open` command. After your computer is connected to the switcher, you can enter the SIS commands the same as you would if you were using the RS-232 or RS-422 link.

1. At the Telnet prompt, enter `open IP address`.
   - **If the switcher is not password-protected**, no further prompts are displayed until you disconnect from the HDXP switcher.
   - **If the switcher is password-protected**, Telnet displays the password prompt.
2. If necessary, enter the password at the password prompt.

   Connection to the switcher via the Ethernet can be password protected. There are two levels of password protection: administrator and user.
   - A person logged on as an administrator has full access to all HDXP switching capabilities and editing functions.
   - Users can select test patterns, mute or unmute the output, select a blue screen, and view all settings with the exception of passwords. By default, the switcher is delivered with both passwords set to "carriage return."

   When you are logged in, the switcher returns either `Login Administrator` or `Login User`. No further prompts are displayed until you disconnect from the HDXP switcher.

Escape character and <Esc> key

Many SIS commands include the keyboard <Esc> key. Consequently, some confusion may exist between the `Escape` character and the <Esc> key.

When Telnet is first started, the utility advises that the `Escape character is` "`Ctrl+]`." This means that the Telnet `Escape` character is a key combination: the <Ctrl> key and the <]> key pressed simultaneously. Pressing these keys displays the Telnet prompt while leaving the connection to the HDXP switcher intact.

Local echo

Once your computer is connected to the HDXP switcher, by default Telnet does not display your keystrokes on the screen. SIS commands are entered blindly, and only the SIS responses are displayed on the screen. To command Telnet to show all keystrokes, enter `set local_echo` at the Telnet prompt before you open the connection to the switcher.

With local echo turned on, keystrokes and the switcher responses are displayed on the same line.

Example: `1*1!In1 Out1 All`,

where `1*1!` is the SIS command and `In1 Out1 All` is the response.

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

Local echo can be turned off by entering `unset local_echo` at the Telnet prompt. If your computer is connected to the HDXP switcher, and you need to access the Telnet prompt to turn local echo off, enter the `Escape` sequence (<Ctrl +]>).

Setting carriage return-line feed

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

Closing the link to the switcher

To close the link to the switcher, access the `Telnet` prompt by entering the escape sequence (<Ctrl +]>). At the `Telnet` prompt, enter `close`.

Help

For Telnet command definitions, enter `?` at the Telnet prompt.

Exiting Telnet (Quit command)

Exit the Telnet utility by entering `quit` at the Telnet prompt. If you are connected to the HDXP switcher, access the Telnet prompt by entering the Escape sequence (<Ctrl +]>).

Subnetting, a Primer

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

Gateways

The HDXP switcher can communicate with the e-mail server that it uses for e-mail notification directly (if they are on the same subnet), or the communication can be routed via a gateway (a computer that provides a link between different subnets).

Local and remote devices

The local and remote devices are defined from the point of view of the function being described. In this guide, subnetting is an issue when you are using the controlling computer to set TCP/IP and e-mail values in the HDXP switcher (see **IP Setup** on page 75 and **Email Settings Page** on page 103). When you are setting up the variables for e-mail notification, the matrix switcher is the local device and the e-mail server is the remote device.

IP addresses and octets

Valid IP addresses consist of four 1-, 2-, or 3-digit numeric sub-fields, called “octets,” which are separated by dots (periods) (see figure 111). Each octet can be numbered from 000 through 255. Leading zeros, up to three digits total per octet, are optional. Values of 256 and above are invalid.

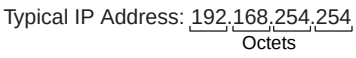


Figure 111. IP Address and Octets

Subnet masks and octets

The subnet mask (see figure 112) is used to determine whether the local and remote devices are on the same subnet or different subnets. The subnet mask consists of four numeric octets separated by dots. Each octet can be numbered from 000 through 255. Leading zeros, up to three digits total per octet, are optional. Each octet typically contains either 255 or 0. The octets determine whether or not the same octets of two IP addresses will be compared when determining if two devices are on the same subnet.

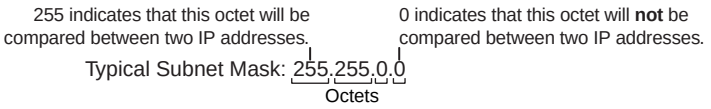


Figure 112. Subnet Mask and Octets

Determining whether devices are on the same subnet

To determine the subnet, the local device IP address is compared to the remote device IP address (see figure 113). The octets of each address are compared or not, depending on the value in the related subnet mask octet.

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

  Unmasked octets are compared (indicated by ? in figure 113).

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

  Masked octets are not compared (indicated by *n* in figure 113).

If the unmasked octets of the two IP addresses **match** (indicated by = in example 1 of figure 113), the two addresses **are on the same subnet**.

If the two unmasked fields **do not match** (indicated by an unequal sign [≠] in figure 113, examples 2 and 3), the addresses **are not on the same subnet**.

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

Figure 113. Comparing the IP Addresses

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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Extron Middle East
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