

DXP HD 4K PLUS Series

4K HDMI Switchers



Extron

Safety Instructions

Safety Instructions • English

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

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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Instructions de sécurité • Français

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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.

Pour en savoir plus sur les règles de sécurité, la conformité à la réglementation, la compatibilité EMI/EMF, l'accessibilité, et autres sujets connexes, lisez les informations de sécurité et de conformité Extron, réf. 68-290-01, sur le site Extron, www.extron.com.

Istruzioni di sicurezza • Italiano

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ATTENZIONE: Il simbolo, , se usato sul prodotto, serve ad avvertire l'utente della presenza di importanti istruzioni di funzionamento e manutenzione nella documentazione fornita con l'apparecchio.

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Instrukcje bezpieczeństwa • Polska

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UWAGI: Ten symbol, , gdy używany na produkt, jest przeznaczony do ostrzegania użytkownika ważne operacyjne oraz instrukcje konserwacji (obsługi) w literaturze, wyposażone w sprzęt.

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Инструкция по технике безопасности • Русский

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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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안전 지침 · 한국어

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NOTES: For more information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics, see the "[Extron Safety and Regulatory Compliance Guide](#)" on the Extron website.

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This product contains a battery. **Do not open the unit to replace the battery.** If the battery needs replacing, return the entire unit to Extron (for the correct address, see the Extron Warranty section on the last page of this guide).

CAUTION: Risk of explosion. Do not replace the battery with an incorrect type. Dispose of used batteries according to the instructions.

ATTENTION : Risque d'explosion. Ne pas remplacer la pile par le mauvais type de pile. Débarrassez-vous des piles usagées selon le mode d'emploi.

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VCCI-A

Conventions Used in this Guide

Notifications

The following notifications are used in this guide:

WARNING: Potential risk of severe injury or death.

AVERTISSEMENT : Risque potentiel de blessure grave ou de mort.

CAUTION: Risk of minor personal injury.

ATTENTION : Risque de blessure mineure.

ATTENTION:

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

NOTE: A note draws attention to important information.

Software Commands

Commands are written in the fonts shown here:

```
^AR Merge Scene,,Øp1 scene 1,1 ^B 51 ^W^C.Ø  
[Ø1] RØØØ4ØØ3ØØØØ4ØØØØ8ØØØØ6ØØ [Ø2] 35 [Ø7] [Ø3]  
Esc X1 * X17 * X20 * X23 * X21 CE ←
```

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

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

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

Variables are written in slanted form as shown here:

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

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

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

Click the **OK** button.

Specifications Availability

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

Extron Glossary of Terms

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



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Introduction

This section gives an overview of the Extron DXP HD 4K PLUS matrix switchers, describes significant features of the series, and provides application diagrams. Topics in this section include:

- [About this Guide](#)
- [About the DXP HD 4K PLUS Series Matrix Switchers](#)
- [Features](#)
- [EDID Minder](#)
- [Application Diagram](#)

About this Guide

This guide contains installation, configuration, and operating information for the DXP HD 4K PLUS Series matrix switchers. In this guide, the terms “DXP,” “switcher,” and “DXP matrix switcher” are used interchangeably to refer to any or all DXP HD 4K PLUS Series models.

About the DXP HD 4K PLUS Series Matrix Switchers

The DXP HD 4K PLUS Series are high performance HDMI matrix switchers for computer and video resolutions up to 4K @ 60 Hz. They support HDMI 2.0b specifications, including data rates up to 18 Gbps, HDR Deep Color up to 12-bit, 3D, and HD lossless audio formats. These switchers are HDCP 2.2 compliant and incorporate Extron technologies including SpeedSwitch, EDID Minder, and Key Minder. HDMI input equalization and output regeneration ensure reliable system operation. Digital audio can be de-embedded from any input and assigned to digital or analog stereo outputs. The following models are available in fixed matrix sizes:

- **DXP 44 HD 4K PLUS** — 4 inputs by 4 outputs with 2 audio outputs
- **DXP 84 HD 4K PLUS** — 8 inputs by 4 outputs with 2 audio outputs
- **DXP 88 HD 4K PLUS** — 8 inputs by 8 outputs with 2 audio outputs

The DXP HD 4K PLUS Series are designed for use with computers equipped with 4K graphics cards, media players and similar signal sources, and 4K native resolution displays. With a maximum data rate of 18 Gbps, the switchers support computer and video resolutions up to 4096x2160 @ 60 Hz with 8-bit color in 4:4:4 color space.

To maintain signal integrity, these switchers feature automatic cable equalization on inputs and output reclocking to reshape and restore timing of the video signal at each HDMI output. These features combined with Extron Pro Series High Speed HDMI Cables allow longer 4K signal runs, reducing the need for additional signal conditioning equipment by compensating for weak source signals or signal loss on long cable runs. Additionally, +5 VDC, 250 mA power is available on the outputs for peripheral devices.

Features

- **Supports computer and video resolutions up to and including 4K**, including 1080p @ 60 Hz Deep Color.
- **Supports HDMI 2.0b specification features**, including data rates up to 18 Gbps, Deep Color up to 12-bit, 3D, and HD lossless audio formats.
- **HDMI audio de-embedding with digital S/PDIF (Sony/Philips Digital Interface) and analog stereo audio outputs** — The DXP HD 4K PLUS Series can extract embedded HDMI two-channel LPCM audio to S/PDIF digital and analog audio outputs. It can also extract Dolby® or DTS® encoded bitstream audio to the S/PDIF outputs. The matrix switchers feature multiple sets of S/PDIF and analog outputs, supporting audio assignment from any HDMI input source.
- **S/PDIF audio output** — The DXP HD 4K PLUS Series includes two S/PDIF outputs for 2-channel LPCM audio or encoded standard definition bitstream audio for Dolby or DTS multi-channel surround sound.
- **HDCP 2.2 compliant** — Ensures display of content-protected media and interoperability with other HDCP-compliant devices.
- **User-selectable HDCP authorization** — Allows individual inputs to appear HDCP compliant or non-HDCP compliant to the connected source, which is beneficial if the source automatically encrypts all content when connected to an HDCP-compliant device. Protected material is not passed in non-HDCP mode.
- **SpeedSwitch Technology** provides high switching speed for HDCP-encrypted content.
- **Key Minder continuously verifies HDCP compliance for quick, reliable switching** — Key Minder authenticates and maintains continuous HDCP encryption between input and output devices to ensure quick and reliable switching in professional AV environments, while enabling simultaneous distribution of a single source to one or more displays.
- **HDCP authentication and signal presence LED indicators** — Front panel LED indicators for signal presence and HDCP authentication provide real time feedback and monitoring of key performance parameters.
- **EDID Minder automatically manages EDID communication between connected devices** — EDID Minder ensures that all sources power up properly and reliably output content for display (available through Product Configuration Software [PCS]).
- **Support for High Dynamic Range video (HDR)** — Enables greater contrast range and wider color gamut by providing the necessary video bandwidth, color depth, and metadata interchange capability for HDR video.
- **Supports DDC transmission** — DDC channels are actively buffered, allowing continuous communication between source and display.
- **HDMI to DVI Interface Format Correction** — Automatically reformats HDMI source signals for output to a connected DVI display.
- **Automatic input cable equalization** — Equalizes inputs to support signals up to 4K resolution at greater distances.
- **Automatic output reclocking** — Reshapes and restores timing of HDMI signals at each output, enabling transmission over long HDMI cables.
- **Provides +5 VDC, 250 mA power on the HDMI outputs** for external peripheral devices
- **Global presets** — Up to 16 frequently used I/O configurations can be saved and recalled using the front panel buttons, Ethernet, USB, or serial control. This time-saving feature allows I/O configurations to be set up and stored in memory for future use.

- **Rooming** — All models can be programmed to group selected outputs into specific “rooms,” each with its own set of unique presets. Each room can support up to 8 outputs. A total of 10 rooms, with 10 presets per room, are available.
- **QS-FPC QuickSwitch Front Panel Controller** — Discrete buttons for each input and output allow for simple, intuitive operation.
- **View I/O mode** — Discrete LEDs for each input button allow easy viewing of actively connected inputs and outputs for ease in troubleshooting.
- **Output volume control** — Provides the capability to mute one or all outputs at any time. This allows, for example, content to be viewed on a local monitor prior to appearing on the main presentation display.
- **Audio breakaway** — Provides the capability to break an analog audio signal on output 2 away from its corresponding video signal and route it to the audio outputs, allowing the analog audio channels to be operated as a separate switcher.
- **Ethernet monitoring and control** — Can be monitored, managed, or controlled over a LAN, WAN, or the Internet using standard TCP/IP protocols.
- **RS-232 control port** — The matrix switcher can be integrated into a control system. Extron products use the SIS (Simple Instruction Set) command protocol, a set of basic ASCII code commands that allow for quick and easy programming.
- **Product Configuration Software (PCS)** — The Extron PCS program provides a means of configuring multiple products using a single software application.
- **Front panel USB configuration port** — Enables setup, configuration, and firmware updating without having to access the rear panel.
- **Front panel security lockout (executive mode)** — Prevents unauthorized use in non-secure environments.
- **Rack-mountable full rack width metal enclosure, 1U high**
- **Includes Lockit HDMI cable lacing brackets** — Secure HDMI cables to the HDMI connectors.
- **Power save mode** — The unit can be placed in a low power standby state to conserve energy when not in use.
- **Highly reliable, energy-efficient internal universal power supply** — Provides worldwide power compatibility, with high demonstrated reliability and low power consumption for reduced operating costs.

EDID Minder

EDID Minder ensures that each source connected to an input sees the EDID of a display, even when that source is not selected for a display.

Depending on the selected EDID mode, the DXP can store the EDID of the connected display automatically (default), or you can manually select a factory EDID file from a pre-determined list. This EDID file is written to a file located at each selected input within the supported video group. All inputs support unique EDID emulation, HDCP, and HDCP Authorization enabling or disabling.

Managing EDID

You can manage EDID files using PCS (see the *DXP HD 4K PLUS Series Help* file). You can also select and import EDID files using SIS commands (see the [EDID Commands](#) on page 44). (EDID cannot be managed via the front panel.)

Factory Loaded EDID

The factory loaded EDID stored on the unit are taken from the Extron EDID Standards Folder, which is created on the DXP by PCS. You can choose an EDID file from the folder link via PCS or SIS commands. The HDMI inputs support digital Extron EDID files that are 2 blocks or 256 bytes. The second block contains audio information. The HDMI EDID support 2-channel PCM audio. The default Extron factory EDID file 1080p @ 60 Hz.

Assigned Output EDID

The DXP has four or eight memory slots, depending on the model, for the EDID of the display connected to the output of the matrix switcher.

The unit automatically saves EDID information from the HDMI outputs whenever an output is connected. The EDID information is saved until a new display or device is detected, and the new EDID information overwrites the previous one. The EDID of each output is saved and made available to any input slot. Assigned output EDIDs can be directly assigned to any input via PCS.

EDID tables for DXP HD 4K PLUS

DXP 88 HD 4K PLUS (8 x 8) and DXP 84 HD 4K PLUS (8 x 4)

SIS Variable X52	EDID Memory Slot	Default EDID File	Details
1	Input 1 (store)	EXN_HDMI_1080p60_2Ch.bin	Manually populated via PCS
2	Input 2 (store)	EXN_HDMI_1080p60_2Ch.bin	Manually populated via PCS
3	Input 3 (store)	EXN_HDMI_1080p60_2Ch.bin	Manually populated via PCS
4	Input 4 (store)	EXN_HDMI_1080p60_2Ch.bin	Manually populated via PCS
5	Input 5 (store)	EXN_HDMI_1080p60_2Ch.bin	Manually populated via PCS
6	Input 6 (store)	EXN_HDMI_1080p60_2Ch.bin	Manually populated via PCS
7	Input 7 (store)	EXN_HDMI_1080p60_2Ch.bin	Manually populated via PCS
8	Input 8 (store)	EXN_HDMI_1080p60_2Ch.bin	Manually populated via PCS
9	Output 1	N/A	Automatically populated with sink from output 1
10	Output 2	N/A	Automatically populated with sink from output 2
11	Output 3	N/A	Automatically populated with sink from output 3
12	Output 4	N/A	Automatically populated with sink from output 4
13	Output 5	N/A	Automatically populated with sink from output 5
14	Output 6	N/A	Automatically populated with sink from output 6
15	Output 7	N/A	Automatically populated with sink from output 7
16	Output 8	N/A	Automatically populated with sink from output 8

DXP 4 HD 4K PLUS (4 x 4)

SIS Variable X52	EDID Memory Slot	Default EDID File	Details
1	Input 1 (store)	EXN_HDMI_1080p60_2Ch.bin	Manually populated via PCS
2	Input 2 (store)	EXN_HDMI_1080p60_2Ch.bin	Manually populated via PCS
3	Input 3 (store)	EXN_HDMI_1080p60_2Ch.bin	Manually populated via PCS
4	Input 4 (store)	EXN_HDMI_1080p60_2Ch.bin	Manually populated via PCS
5	Output 1	N/A	Automatically populated with sink from output 1
6	Output 2	N/A	Automatically populated with sink from output 2
7	Output 3	N/A	Automatically populated with sink from output 3
8	Output 4	N/A	Automatically populated with sink from output 4

Application Diagram

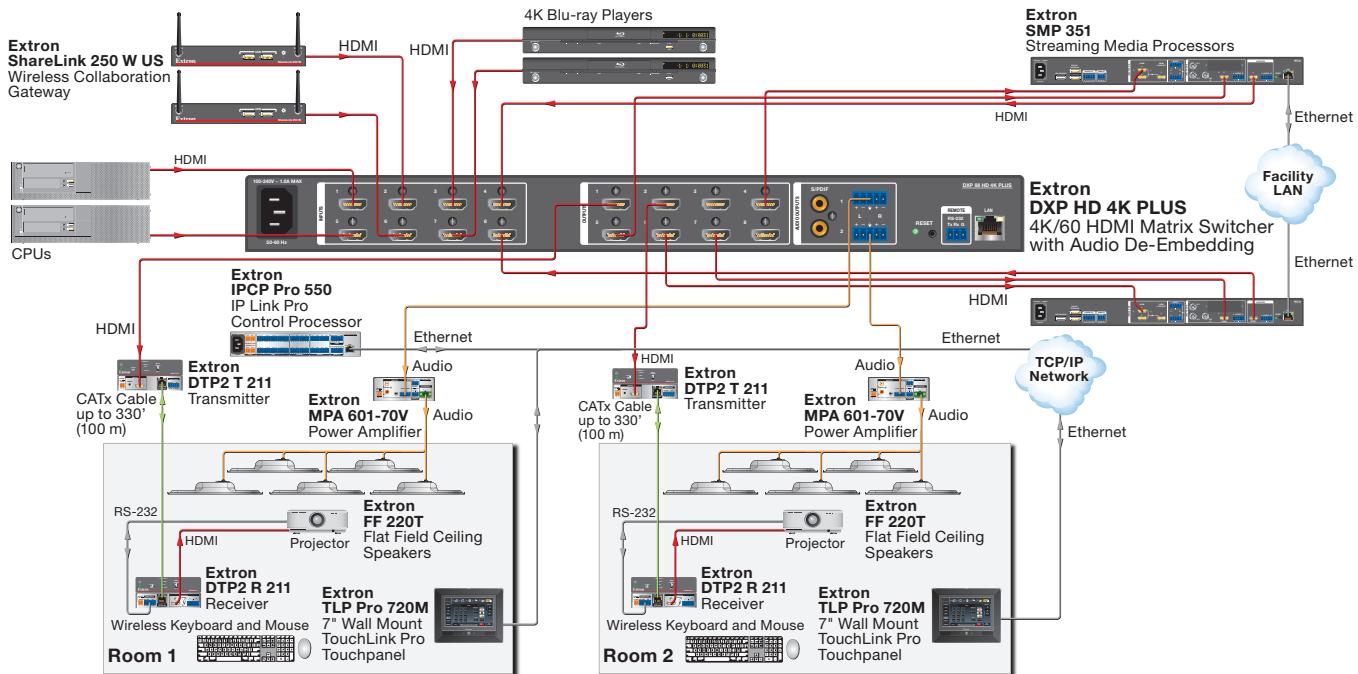


Figure 1. Application Diagram for a DXP 88 HD 4K PLUS

Installation

This section describes the rear panels of the DXP HD 4K PLUS switchers and provides instructions for cabling. It covers the following topics:

- **Rear Panel**
- **Connecting to the LAN Port**
- **Connecting to the Remote RS-232 Port**
- **Securing the HDMI Connectors Using the LockIt HDMI Cable Lacing Bracket**

Rear Panel

Most of the connectors are on the rear panels of the DXP HD 4K PLUS switchers.

WARNING: Remove power from the system before making any connections.

AVERTISSEMENT : Couper l'alimentation avant de faire l'installation électrique.

ATTENTION:

- Use electrostatic discharge precautions (be electrically grounded) when making connections. Electrostatic discharge can damage equipment, although you may not feel, see, or hear it.
- Prenez des précautions contre les décharges électrostatiques (soyez électriquement relié à la terre) lorsque vous effectuez des connexions. Les décharges électrostatiques peuvent endommager l'équipement, même si vous ne pouvez pas le sentir, le voir ou l'entendre.

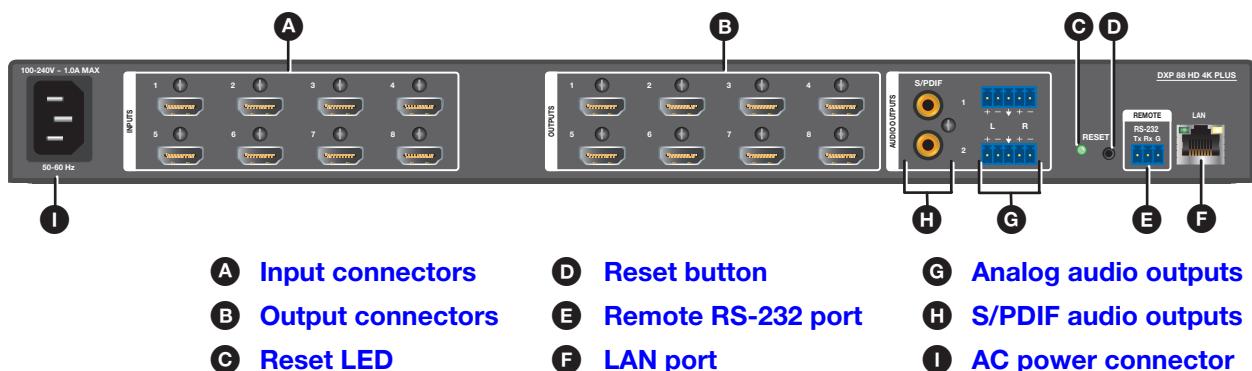


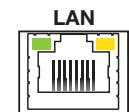
Figure 2. DXP 88 HD 4K Plus Rear Panel

NOTE: Figure 2 shows a DXP 88 HD 4K PLUS. The rear panels of the DXP 44 and DXP 84 models are identical to this model except for the number of inputs and outputs:

- **DXP 44 HD 4K PLUS** — 4 inputs and 4 outputs
- **DXP 84 HD 4K PLUS** — 8 inputs and 4 outputs
- **DXP 88 HD 4K PLUS** — 8 inputs and 8 outputs

- A** **Input connectors** — Connect HDMI source devices (or DVI sources with the appropriate adapters) to these female 19-pin type A HDMI input connectors. LockIt cable lacing brackets, one for each HDMI input and output connector, are provided with the DXP HD 4K PLUS. These brackets can be used to secure the HDMI cables to the DXP connectors to reduce stress on the HDMI connectors and prevent signal loss due to loose cable connections.
- For information on attaching the LockIt brackets, see [Securing the HDMI Connectors Using the LockIt HDMI Cable Lacing Bracket](#) on page 11.
- B** **Output connectors** — Connect HDMI output devices (or DVI devices with the appropriate adapters) to these female 19-pin type A HDMI output connectors for buffered video output (see [Securing the HDMI Connectors Using the LockIt HDMI Cable Lacing Bracket](#)).
- C** **Reset LED** — This green LED remains lit while the DXP has power. While the **Reset** button (**D**) is being pressed and held, this LED blinks every 3 seconds to indicate the level of reset that is initiated if the button is released at that point (see [Resetting](#) on page 27 for more information).
- D** **Reset button** — This recessed button initiates four levels (modes) of reset on the DXP switcher. To initiate the different reset levels, use a pointed object such as a small Philips screwdriver or a stylus to press and hold the button while the switcher is running or while it is being powered up (see [Resetting](#)).
- E** **Remote RS-232 port** — Connect a host device, such as a computer or touchpanel control, to the switcher via this 3-pole 3.5 mm captive screw connector for serial RS-232 control (see [Connecting to the Remote RS-232 Port](#) on page 10). Connect the 9-pin connector end of the RS-232 cable to the serial port of your computer or control system.
- F** **LAN port** — Connect the DXP switcher to a computer, a network switch, or a control system via this RJ-45 connector. You can use a computer to configure and control the networked switcher with SIS commands, the PCS configuration software, or the HTML page that is embedded on the switcher (see [Connecting to the LAN port](#) on page 9).

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



The default Ethernet settings are:

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

G Analog audio outputs — Connect powered speakers, an amplifier, or other audio output device to these 5-pole 3.5 mm captive screw connectors for 2-channel stereo analog audio output. These connectors can de-embed LPCM audio that was routed from any DXP HDMI input and convert it to a stereo analog signal.

NOTE: Analog output 1 and S/PDIF output 1 are always connected to the video input tied to them. Analog and S/PDIF output 2 can be broken away (switched separately from the video).

Figure 3 shows how to wire these connectors. Use the supplied tie-wrap to strap the audio cable to the extended tail of the connector.

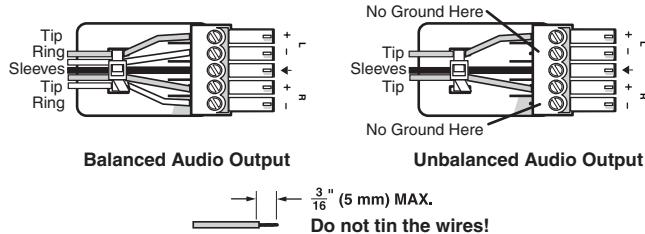


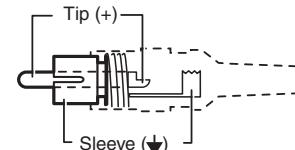
Figure 3. Wiring the Captive Screw Analog Audio Output Connectors

ATTENTION:

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

NOTE: The length of exposed wires is important. The ideal length is 3/16 inch (5 mm).

H S/PDIF digital audio outputs (Sony/Philips Digital Interface Format) — Use 75 ohm digital audio cables to connect audio signal processors (such as the Extron SSP 7.1 Surround Sound Processor) or other compatible devices to these female RCA connectors (see the illustration at right). The connected processor then converts digital signals from these ports to analog for encoded standard definition bitstream audio for Dolby or DTS multi-channel surround sound.



NOTES:

- When the input audio is a high bit rate (HBR) audio stream, mute these outputs.
- S/PDIF output 1 and analog output 1 are always connected to the video input tied to them. S/PDIF and analog output 2 can be broken away (untied).

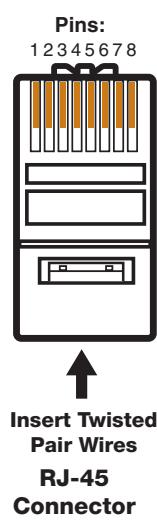
I AC power connector — Plug a standard IEC power cord (provided) into this connector to connect the switcher to a 100 VAC to 240 VAC, 50-60 Hz power source.

Connecting to the LAN Port

When connecting a computer to the DXP LAN port, it is essential that you use the correct Ethernet cables, and that they be properly terminated with the correct pinout (see figure 4). Ethernet links use Category (CAT) 3, 5e, or 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 the cables; this can cause transmission errors.



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 4. RJ-45 Connector and Pinout Tables

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

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

The Ethernet cable 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 DXP switcher
- **Patch (straight-through) cable** — Connection of the DXP to a network via a network switch

Connecting to the Remote RS-232 Port

The DXP HD 4K PLUS switchers have a rear panel Remote serial port through which they can be configured via SIS commands (serial commands that control the switcher through this connector).

Wire the 3.5 mm captive screw Remote RS-232 connector as shown in figure 5.

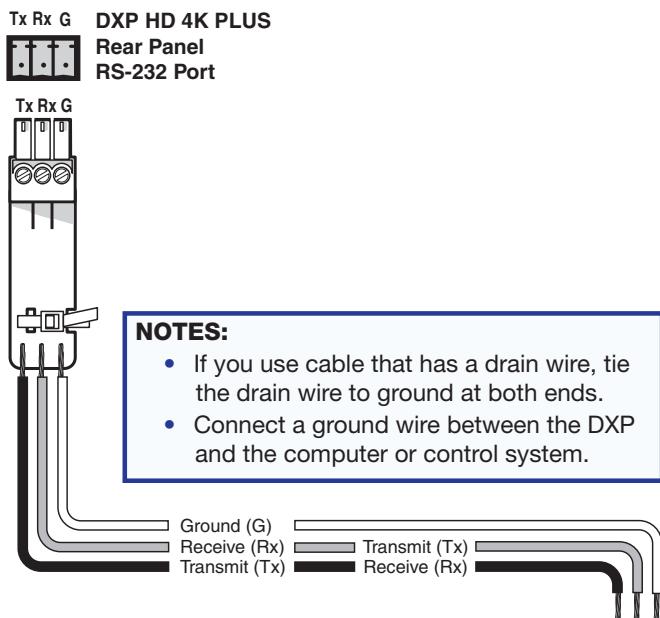


Figure 5. Wiring the Remote RS-232 Connector

See [SIS Configuration and Control](#), starting on page 35, for definitions of the SIS commands and [Configuration Software](#), starting on page 57, for details on how to install and use the control software.

NOTES:

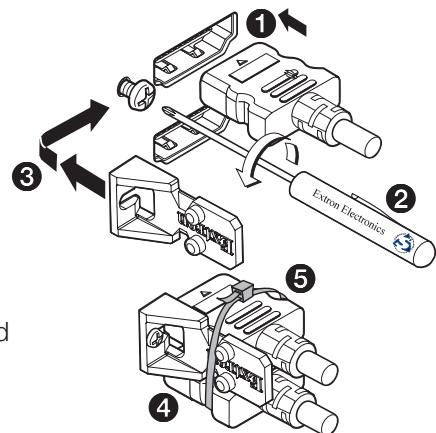
- The switcher operates at 300 to 115200 baud. The default is 9600.
- See [Selecting the Remote RS-232 Port Baud Rate](#) on page 30 to configure this port using the front panel buttons.

If desired, you can connect an MKP 2000 or MKP 3000 remote control panel to this port. See the user guide of either product for details.

Securing the HDMI Connectors Using the LockIt HDMI Cable Lacing Bracket

After connecting an input or output device to an HDMI connector, secure the connector in place with the provided LockIt bracket (see the illustration at right):

1. Plug one or both HDMI cables into the panel connection (1).
2. Loosen the HDMI connection mounting screw from the panel enough to allow the LockIt lacing bracket to be placed over it (2).
3. Place the LockIt lacing bracket onto the screw and slide it up against the HDMI connectors. Tighten the screw to secure the bracket (3).



ATTENTION:

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

4. Loosely place the included tie wrap around the HDMI connectors and the bracket (4).
5. While holding the connector securely against the lacing bracket, tighten the tie wrap, then remove any excess length (5).

Operation

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

- [Definitions](#)
- [Front Panel Controls and Indicators](#)
- [Powering On](#)
- [Creating or Changing a Configuration](#)
- [Viewing a Configuration](#)
- [Saving and Recalling Presets](#)
- [Muting and Unmuting Outputs from the Front Panel](#)
- [Locking and Unlocking the Front Panel \(Executive Modes\)](#)
- [Power Save Modes](#)
- [Resetting](#)
- [Selecting the Remote RS-232 Port Baud Rate](#)
- [Troubleshooting](#)
- [Configuration Worksheets](#)

Definitions

The following terms, which apply to Extron digital 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 sets of ties
- **Current configuration** — The configuration that is currently active in the switcher (also called configuration 0)
- **EDID (Extended Display Identification Data)** — Resolution, refresh rate, pixel clock, and audio channel configuration information for a display device. This information is stored in memory at system power-up and each time a new display device is connected. The EDID is then made available to be assigned to any input. This feature is available only through PCS (see the DXP HD 4K PLUS Series help file).
- **Global preset** — A configuration that has been stored, consisting of a complete map of all input and output connections. When a preset is retrieved from memory, it becomes the **current configuration**. The DXP HD 4K PLUS can store up to 16 global presets in memory.

- **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 1 to 16 outputs. Each room can have up to 10 presets.
- **Room preset** — A configuration consisting of outputs in a single room that has been stored. When a room preset is recalled from memory, it becomes the current configuration for the outputs assigned to that room only (none of the other outputs are affected). Room presets can be saved and recalled only via SIS commands or the PCS software.

Front Panel Controls and Indicators

NOTE: When the switcher is in either power-save mode (see [Power Save Mode SIS commands](#) on page 51), all front-panel indicators are unlit with the exception of the I/O Video LED, which blinks continuously.

The buttons on the DXP HD 4K PLUS front panels are grouped into two sets, with the input and output buttons located on the left side of the control panel and the Control and I/O buttons on the right.

Each DXP model has eight input buttons and output buttons, regardless of how many rear panel input and output connectors it actually has.

NOTE: Although the DXP 44 and 84 both have eight input and eight output buttons, not all these buttons are functional for making ties:

- **DXP HD 4K PLUS 44** — Only input and output buttons 1 through 4 are functional, except for creating and recalling presets (see [Saving and Recalling Presets](#) on page 22).
- **DXP HD 4K PLUS 84** — All input buttons are enabled, but only output buttons 1 through 4 are functional, except for creating and recalling presets.

At the right of each button is a bicolor LED that lights to indicate the button status or current function. Depending on the operation, the button LEDs blink or light steadily when pressed.

The front panel buttons have multiple functions, which are classified as primary and secondary.

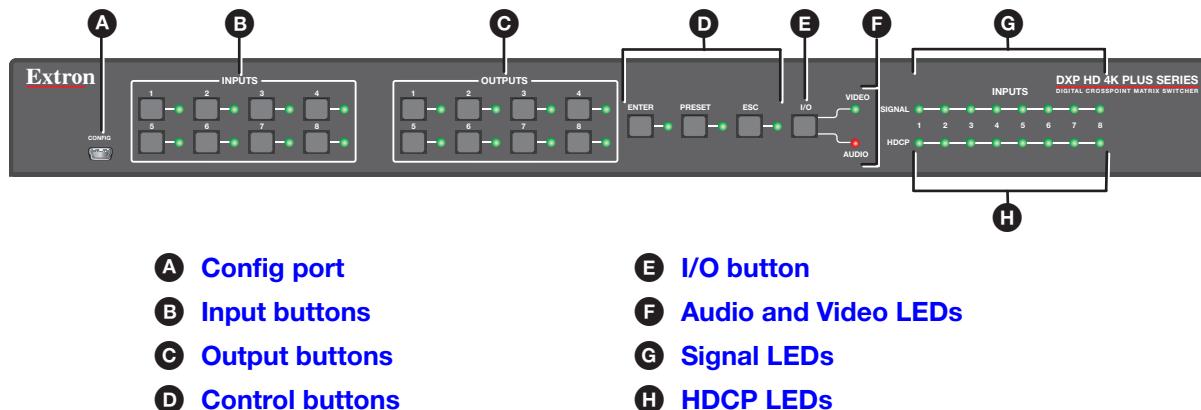


Figure 6. DXP HD 4K PLUS 88 Series Front Panel

Figure 6 shows a DXP 88 HD 4K front panel. The DXP 44 and 84 front panels are identical to this one except for the product names.

A Config port — This USB mini-B port serves a similar communications function to the rear panel Remote port, but is easier to access than the rear port after the matrix switcher has been installed and cabled. Use a USB type A to mini-B cable to connect this port to a USB connector on the computer to enable SIS commands to be sent from the computer, connection to the PCS configuration software, and uploading firmware.

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

B Input buttons — The input buttons have the following functions:

Primary:

- Select an input.
- Identify the selected input.

Secondary:

- Save and recall presets (see [Saving and Recalling Presets](#) on page 22).

C Output buttons — The output buttons have the following functions:

Primary:

- Select outputs.
- Identify the selected outputs.

Secondary:

- Save and recall presets (see [Saving and Recalling Presets](#)).
- Mute video and audio output (see [Muting and Unmuting Outputs from the Front Panel](#) on page 23).
- De-embed HDMI audio signals from the input.

D Control buttons — The three Control buttons have the following functions:

- **Enter button** — The **Enter** button has the following functions:

Primary:

- Save changes made on the front panel.
- Indicate that a potential tie has been created but not saved.
- Indicate that a preset has been selected to be saved or recalled but the preset action has not been completed.

Secondary:

- Select 9600 baud rate for the Remote RS-232 port.
- Set the front panel lock mode (executive mode).
- In conjunction with the **Preset** and **Esc** buttons, place the switcher in serial port configuration mode.
- Indicate that the Remote RS-232 port is set to 9600 baud in serial port configuration mode (blinking).

- **Preset button** — The **Preset** button has the following functions:

Primary:

- Place the switcher in preset saving mode to save a configuration as a preset, and in preset recalling mode to activate a previously-defined preset.
- Indicate when preset saving mode is active (blinks) and when preset recalling mode is active (lights steadily).

Secondary:

- Select the 19200 baud rate for the Remote RS-232 port.
- In conjunction with the **Enter** and **Esc** buttons, place the switcher in serial port configuration mode.
- Indicate that the Remote RS-232 port is set to 19200 baud in serial port configuration mode (blinking).

- **Esc button** — The **Esc** button has the following functions:

Primary:

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

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

- Indicate that the escape function has been activated (blinks once).

Secondary:

- Select the 115200 baud rate for the Remote RS-232.
- With the **Enter** and **I/O** buttons, set the front panel lock mode.
- With the **Enter** and **Preset** buttons, place the switcher in serial port configuration mode.
- Select 115200 baud for the Remote RS-232 port in serial port configuration mode (see **Selecting the Remote RS-232 Port Baud Rate** on page 30).
- Indicate that the Remote RS-232 port is set to 115200 baud in serial port configuration mode.

- E I/O button** — For this button, selecting **Video** routes HDMI signals from any of the inputs to any of the HDMI outputs, while selecting **Audio** routes the de-embedded audio from any of the HDMI inputs to any of the S/PDIF and analog audio outputs.

The **I/O** button has two LEDs to its right: a green Video LED and a red Audio LED. Press this button to toggle between video (green LED lights) and audio (the red LED lights) for the selected input or output.

NOTE: The I/O Video LED blinks to indicate that the unit is in power save mode.

The **I/O** button has the following functions:

Primary:

- Select the signal type, audio or video, for the input or output.
- Select audio or video for the configuration that is being viewed.

Secondary:

- With the **Enter** and **Esc** buttons, select between front panel lock modes 2 and 0 (see **Locking and Unlocking the Front Panel (Executive Modes)** on page 25).
- View the video or audio mute status of the selected input or output.
- Initiate system reset from the front panel (see **Resetting the System from the Front Panel** on page 27).

F Audio and Video LEDs — These two LEDs are located to the right of the **I/O** button and light to indicate whether the selected input or output is audio or video. The Video LED lights green when the **I/O** button is pressed to toggle to video. The Audio LED lights red when audio is selected.

The I/O Video LED also blinks while the DXP is in power save mode 1 or 2 (see **Power Save Modes** on page 26).

G Signal LEDs — The DXP HD 4K PLUS has a green Signal LED for each input. Each LED lights when a signal (TMDS clock activity) is present on the input.

H HDCP LEDs — The DXP HD 4K PLUS has a green HDCP LED for each input, which lights if the source connected to that input is HDCP encrypted.

Powering On

Apply power by connecting the provided IEC power cord to the rear panel IEC connector and to an AC source. The switcher performs a self-test as follows:

The front panel input, output, and **I/O** button LEDs blink red, then green, while the control button LEDs blink green. All LEDs turn off except the I/O LEDs, which light steadily red for several seconds. The I/O LEDs remain lit red while a self-test is performed, during which the green Input Signal and HDCP LEDs also light in order in a clockwise circling pattern. If error-free, the self-test ends with only one of the I/O LEDs lit, reflecting the previous selection of audio or video. If an error occurs during the self-test, the DXP locks up and does not operate. If this occurs, call the **Extron S3 Sales & Technical Support Hotline** (see the last page of this guide for contact information in your area).

The current configuration, EDID information, and all presets are saved in memory. When power is applied, the most recent configuration is retrieved. The previous presets remain intact. The switcher powers up in full power mode (neither power save mode enabled).

Creating or Changing a Configuration

A configuration consists of one or more inputs, each tied to a set of one or more outputs.

- A **tie** is an input-to-output connection.
- A **set of ties** is an input tied to two or more outputs. (An output can never be tied to more than one input.)
- A **configuration** is one or more ties, one or more sets of ties, or a combination.

NOTE: If power save mode 2 is enabled (all front panel functions are disabled except for mode 1 selection), you cannot use the front panel to make ties.

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 DXP, and instructions for setting them up. To create or change a configuration:

- Press the **Esc** button to clear any input, output, or control indicators that may be lit.
- Select to configure video or audio by repeatedly pressing the **I/O** button until the desired LED is lit (green LED for video or red for audio).

- Select the desired input and outputs by pressing the input and output buttons.

- The input LEDs light one of the following colors:
 - Green** — Video only ties
 - Red** — Audio only ties
- The output LEDs light or blink one of the following colors:
 - Green** — Video only ties
 - Red** — Audio only ties (output 2 only)

NOTES:

- To indicate **potential ties**, output LEDs **blink** in the appropriate color when an input is selected.
- To indicate **current ties**, output LEDs **light steadily** in the appropriate color when an input is selected.

- To clear unwanted outputs, press and release the associated output buttons whose LEDs are lit. To indicate **potential unties**, output LEDs **blink** the appropriate color when an output is deselected (muted) but not untied from the input.

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

NOTES:

- Only one input can be tied to any 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 an input with no tie is selected, only the LED for the selected input lights (no output LEDs light).
- As each input and output is selected, the associated output LED blinks the appropriate color to indicate a tentative tie. LEDs for outputs that were already tied to the input light the appropriate color steadily. Outputs that are already tied can be left on, along with new blinking selections, or toggled off by pressing the associated output button.

Creating Ties

NOTES:

- Audio ties are made only with de-embedded audio.
- Before beginning to create ties, ensure the unit is **not** in power save mode 2 (see **Power Save Modes** on page 26).

To tie an input to an output:

- Press and release the **Esc** button to clear any input button, output button, or control button indicators whose LEDs might be lit.

Press the **Esc** button to clear all selections.

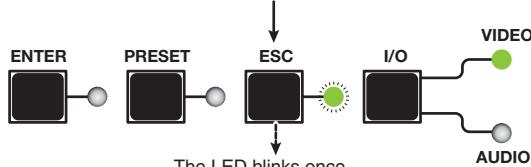


Figure 7. Press the Esc button

- Select video or audio by pressing the **I/O** button until the desired LED lights (green for video or red for audio).

NOTE: You cannot select both audio and video for a tie at the same time. You must repeat the tie process for each type of tie (audio and video) that you want to create for the desired input and output.

For example, first create a video tie between an input and output, then create an audio tie for the same input and output.

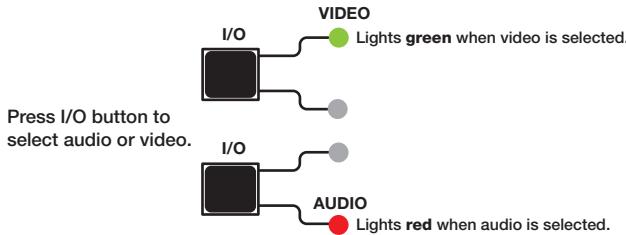


Figure 8. Selecting Audio or Video using the I/O Button

- Press the desired input button.

The LED lights to indicate the selection.

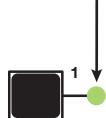


Figure 9. Selecting an Input for the Tie

- Press the output buttons to which the input is being tied. Each selected output LED blinks green for a video tie or red for an audio tie. The Enter LED also blinks to indicate that a tie has been initiated.

Press one or more Output buttons.

- Green blinking LED indicates a video-only tie.
- Red blinking LED indicates an audio-only tie (de-embedded audio outputs 1 and 2).

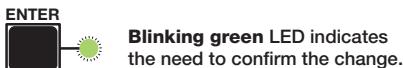


Figure 10. Selecting an Output for the Tie

- Press the **Enter** button. All button LEDs turn off.

Adding a Tie to a Set of Ties

To add a new tie to a configuration:

1. Press and release the **Esc** button.
2. **To select only video for the tie**, press and release the **I/O** button to toggle video on. The Video LED lights green when video is enabled. Deselect audio by pressing the **I/O** button until the Audio LED is unlit (see figure 11).

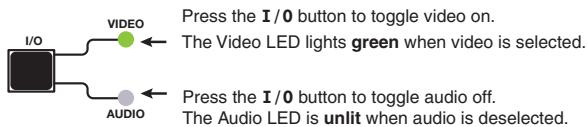


Figure 11. Selecting Video Only

To select only audio for the tie, press and release the **I/O** button to toggle audio on. The Audio LED lights red when audio is enabled. Deselect video by pressing the **I/O** button until the Video LED is unlit.

3. Press and release the desired input button.
 - **If only video is selected**, its LED lights green to indicate that video outputs can be tied to or untied from this input. Output button LEDs for any outputs already tied to the selected input light green also (see figure 12).

Press and release an Input button.
The LED lights green to indicate that video outputs can be tied to or untied from this input.

The LEDs for any outputs already tied to the selected input light green to indicate the existing video ties.

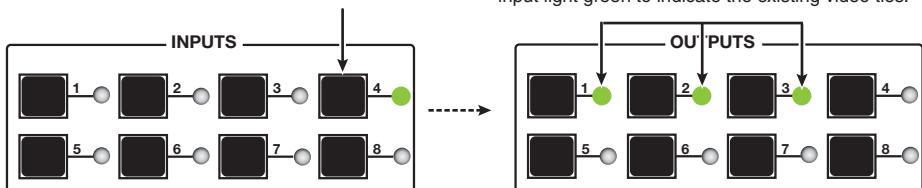


Figure 12. Selecting an Input with Ties (Video)

- **If only audio is selected**, the LED for the selected input button lights red to indicate that audio outputs (output 2 only) can be tied to or untied from this input.
4. Press and release the button for the output to be added to the tie. The LED for the selected output button blinks green (for video only, see figure 13) or red (for audio only) to indicate that the selected input is being tied to this output.

In addition, the **Enter** button LED blinks green.

Press and release the Output button to be added to the tie.
The LED blinks green to indicate that the selected video input is being tied to this output.

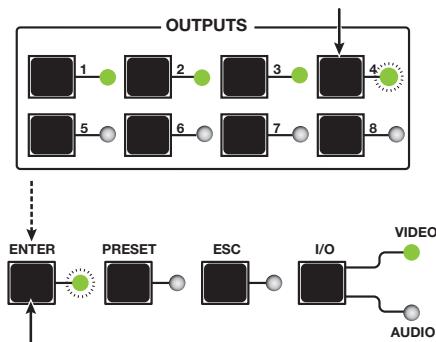


Figure 13. Selecting an Additional Output (Video)

5. Press the **Enter** button to confirm the tie. All button LEDs become unlit.

Removing a Tie from a Set of Ties

To undo an existing I/O tie:

1. Press and release the **Esc** button to clear any previous selections.
2. Press the **I/O** button repeatedly to select the type of tie you want to break (green for **Video**, red for **Audio**).

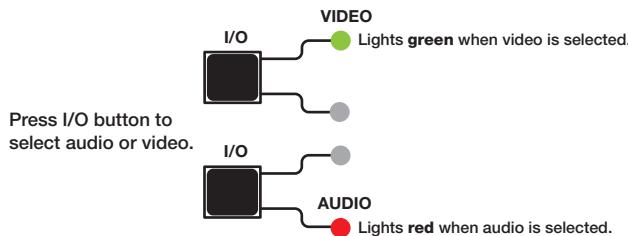


Figure 14. Selecting Audio or Video using the I/O Button

3. Press the input button whose tie you want to break. The input button LED and its tied output button LEDs light red (audio) or green (video), depending on your selection in step 2 and on the types of ties the selected input currently has.

Figure 15 shows an example of selecting an audio-only tie to break.

Press and release an Input button.
The LED lights to indicate whether audio or video was selected for the input.

The LEDs for any outputs already tied to the selected input light to indicate the existing video ties (audio in this example).

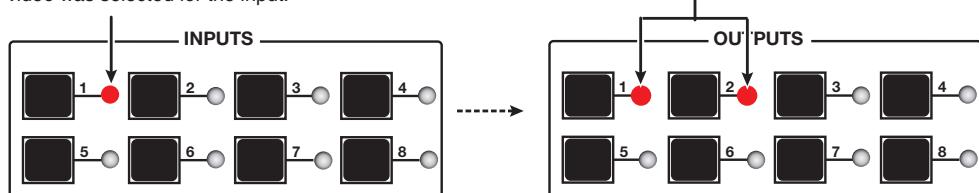


Figure 15. Selecting an Input

4. Press the desired output button whose LED is lit. The selected output button LED and the **Enter** button LED start to blink, indicating a change is pending.

Press the Output button for the tie to be broken.
The LED starts to blink.



The **Enter** button LED blinks green, indicating the need to confirm the change.

Figure 16. Selecting the Output to Untie

5. Press the **Enter** button. The selected input and output LEDs and the **Enter** button become unlit, and the tie is broken.

Viewing a Configuration

The mode lets you view the current set of video and audio ties using the front panel buttons. This mode prevents inadvertent changes to the current configuration and also provides a way to mute outputs (see **Muting and Unmuting Outputs from the Front Panel** on page 23).

View the current configuration for the DXP 44, 84, or 88 as follows:

1. Press the **Esc** button to clear any remaining input, output, or control button selections.
2. Select video or audio by pressing the **I/O** button until the desired LED lights (green for video or red for audio).

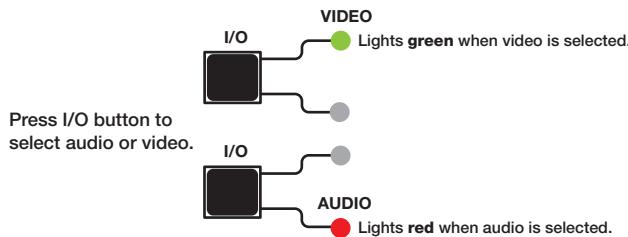


Figure 17. Selecting the Type of Ties to View

3. Select the desired input or outputs whose ties you wish to view by pressing the input and output buttons.
 - **View ties by selecting an input** — Press an input button. All button LEDs light for the outputs that are tied to the selected input.

Press and release an Input button.
The LED lights to indicate whether audio or video was selected for the input.

The LEDs for any outputs already tied to the selected input light to indicate the existing video ties (audio in this example).

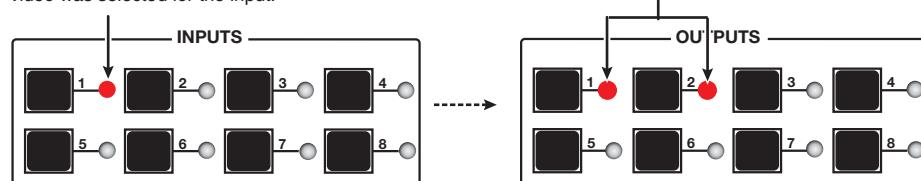


Figure 18. Viewing Audio Ties

NOTES:

- Only outputs 1 and 2 can have audio ties.
- If you press an output button while an input is selected for viewing, the output LED blinks to indicate a pending tie. Press **Esc** to cancel the tie or **Enter** to add the tie to the selected input.

- **View ties by selecting an output** — Press an output button. The LED for the tied input and all of the output button LEDs light for outputs that are also tied to the same input.
- **View all ties in a configuration** — Press and release each input and output button, one at a time. The output LEDs light as follows:
 - **Green** — Video-only ties
 - **Red** — Audio-only ties (outputs 1 and 2 only)

Saving and Recalling Presets

A preset is a complete map of all input and output connections. The current configuration (0) can be saved as a preset in any one of 16 preset memory slots. Preset locations are assigned to the input buttons and (where necessary) output buttons, and each switcher has as many presets available from the front panel as it has input and output buttons. In addition, all presets can be saved and recalled from the PCS software and by SIS commands. When a preset is retrieved from memory, it becomes the **current configuration**.

NOTES:

- Presets cannot be viewed from the front panel unless recalled as the current configuration. Presets *can* be viewed using the PCS configuration program (see the **Configuration Software** section, beginning on page 57, for more details).
- The current configuration and all presets are stored in non-volatile memory. When power is removed and restored, the current configuration is still active and all presets are retained.
- When a preset is recalled, it replaces the current configuration, which is lost unless it is also stored as a preset. The recalled preset overwrites all of the current configuration ties in favor of the preset ties.

- Inputs 1 through 4 correspond to global presets 1 through 4.
- Outputs 1 through 4 correspond to presets 5 through 8.
- Inputs 5 through 8 correspond to presets 9 through 12.
- Outputs 5 through 8 correspond to presets 13 through 16.

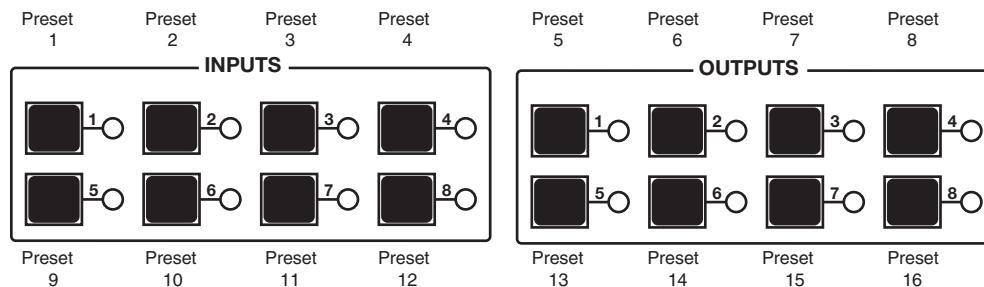


Figure 19. Preset Locations

NOTE: Before attempting to save or recall a preset, ensure that the unit is **not** in **power save mode 2**.

To save and recall a preset:

1. Press the **Esc** button to clear any previous selections. The Esc LED blinks green once.
 2. To save a preset, press and hold the **Preset** button until the Preset LED starts blinking.
- To recall a preset, press and **release** the **Preset** button.

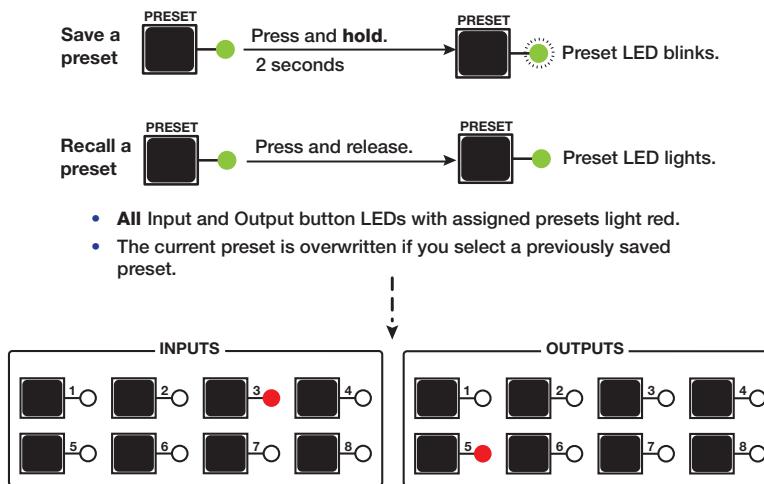


Figure 20. Saving or Recalling a Preset (DXP 44, 84, and 88)

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

NOTE: All input and output buttons can be used for presets, even if they do not represent actual inputs or outputs on the DXP.

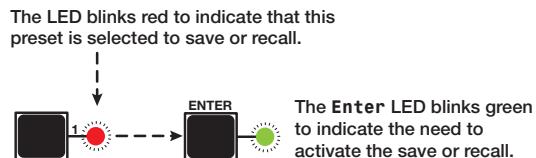


Figure 21. Pressing an Input or Output Button to Select a Preset

4. Press the **Enter** button to confirm.

Muting and Unmuting Outputs from the Front Panel

NOTES:

- You can mute video and audio, video-only, or audio-only outputs. Pressing and releasing the **Video** button and the **Audio** button toggles each selection on and off.
- When the DXP enters view-only mode, the output LEDs light for all outputs without ties.
- When power is removed and restored, muted outputs are unmuted.
- Mutes are protected when front panel lock mode 2 is selected. You can view the status of the output (muted or unmuted) in lock mode 2 but you cannot change it from the front panel (see **Locking and Unlocking the Front Panel (Executive Modes)** on page 25).
- To enable changes to the mute settings, set the lock mode to 0 and ensure that the unit is **not** in **power save mode 2**.

To mute and unmute outputs:

1. Press **Esc** to clear any leftover button selections or incomplete ties.
2. Select video or audio by pressing the **I/O** button until the desired LED lights (green for video or red for audio).

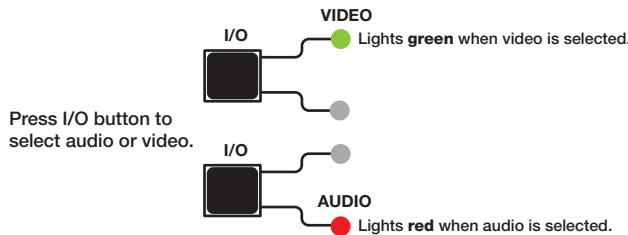


Figure 22. Selecting Audio or Video to Mute

3. Press the button for the output to be muted, and hold it until its LED begins to blink (approximately 2 seconds). The LED continues to blink until the output is unmuted.

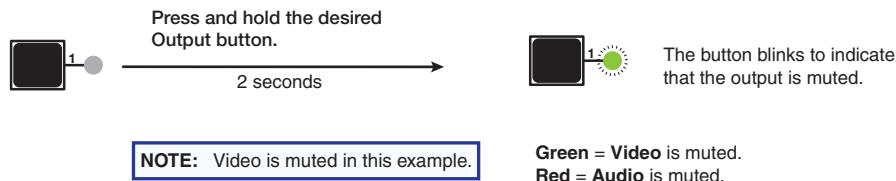


Figure 23. Muting an Output

To unmute an output, press and hold the desired output button until its LED stops blinking (approximately 2 seconds).

NOTE: If you want to mute an output, but accidentally press an input button prior to pressing and holding the desired output, this voids the output muting process and activates the tie process.

Viewing the Mute Status

To check the mute status of an output:

1. Press the **Esc** button to clear any previous selections.
2. Select video or audio by pressing the **I/O** button until the desired LED lights (green for video or red for audio).
3. Press the button for the output to be viewed.
 - If the selected output is muted, the button LED blinks red (audio) or green (video), depending on your viewing selection in step 2.
 - If the selected output is not muted, the LED for its button lights steadily.
4. If desired, press the **I/O** button again to view the mute status of the other signal type. For example, after viewing the audio mute status of an output and before it times out, press the **I/O** button again to view the video status of the same output.
5. To exit the view mode, press **Esc** or wait for the indicators to time out.

Locking and Unlocking the Front Panel (Executive Modes)

The matrix switchers have three levels of front panel security lock that limit the operation of the switcher from the front panel:

- **Lock mode 0** — The front panel is completely unlocked. All front panel functions are available.

NOTE: Opening PCS sets the lock mode to 0.

- **Lock mode 1** — All changes are locked from the front panel (except for setting lock mode 2). Some functions can be viewed. When the DXP enters mode 1, the **Video** and **Audio** LEDs blink twice.
- **Lock mode 2** — Basic functions are unlocked. Advanced features, except for switching to lock mode 1, are locked and can only be viewed. When the DXP enters mode 2, the **Esc**, **Video**, and **Audio** LEDs blink twice. This is the default mode.

Basic functions include:

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

Advanced functions include:

- Setting video and audio output mutes
- Setting the rear panel Remote RS 232 port protocol and baud rate

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

Selecting Front Panel Lock Mode 2 or Toggling between Lock Modes 2 and 0

NOTES:

- If the switcher is in lock mode 0 or 1, this procedure selects mode 2.
- If the switcher is in lock mode 2, this procedure selects mode 0 (unlocks the switcher).

Toggle the front panel lock on and off by pressing and holding the **Enter**, **I/O**, and **Esc** buttons simultaneously until the following LEDs blink twice (approximately 3 seconds).

- The Esc, Video, and Audio LEDs blink twice if the DXP is now in lock mode **2**.
- The Video and Audio LEDs blink twice if the DXP is now in lock mode **0**.

Press and **hold** simultaneously.

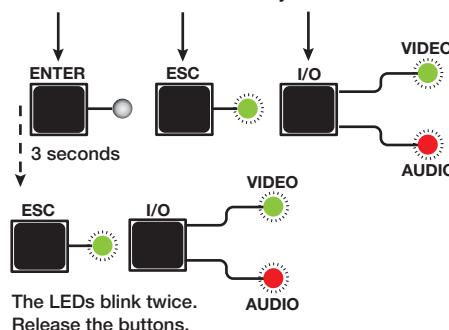


Figure 24. Switching between Front Panel Lock Modes 0 and 2

Selecting Front Panel Lock Mode 2 or Toggling between Lock Modes 2 and 1

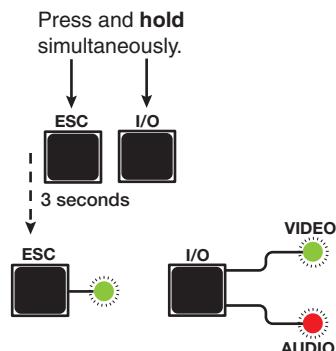
NOTES:

- If the switcher is in lock mode 1, this procedure selects mode 2.
- If the switcher is in lock mode 2, this selects mode 1 (locks all switcher functions except selecting mode 2).

Toggle the lock on and off by pressing and holding the **Esc** and **I/O** buttons until the following LEDs blink twice (approximately 3 seconds).

- The **Esc**, **Video**, and **Audio** LEDs blink twice if the DXP is now in lock mode **2**.
- The **Video** and **Audio** LEDs blink twice if the DXP is now in lock mode **1**.

NOTE: To switch from lock mode 1 (front panel is completely locked) to lock mode 0 (front panel is unlocked), you must first switch to mode 2, then from mode 2 to mode 0.



The **Esc**, **Video**, and **Audio** LEDs
blink twice.

Release the buttons.

Figure 25. Toggling between Lock Modes 1 and 2

Switching from Lock Mode 1 to Lock Mode 0

If the switcher is in lock mode 1, you cannot change it directly to lock mode 0 (completely unlocked). You must first place the switcher in lock mode 2, then **toggle it to mode 0** (see [Selecting Lock Mode 2 or Toggling Between Mode 2 and Mode 0](#) on page 25).

Power Save Modes

When the DXP is in a power saving mode, it remains in a standby state until activated by a front panel button press, an SIS command, or opening PCS. Power save modes are selectable only by SIS commands (see the [Power Save Mode](#) SIS commands on page 51). Three modes are available:

- **0** — Normal (full power) operation (default)
- **1** — Disables all functions except RS-232, USB, and IP control and slows the speed of the cooling fans. This mode is cancelled if a power cycle occurs, any front panel buttons are pressed, PCS is opened, or any SIS commands are sent via RS-232, USB, or Ethernet.
- **2** — Locks the front panel and disables all functions except RS-232, USB, PCS, and IP control, and slows the speed of the cooling fans. This mode can be cancelled only by entering the SIS command **[Esc] Ø PSAV←** or by opening PCS.

NOTE: While the DXP is in this mode, you cannot create ties, mute an output, set the RS-232 baud rate, or save or recall a preset. Before attempting any of these procedures, ensure that the unit is **not** in power save mode 2 (the Video LED for the **I/O** button blinks green continuously and no other front panel buttons respond).

Resetting

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

- **Front panel buttons** (see [Resetting the System from the Front Panel](#))
- **Rear panel Reset button** (see [Resetting Using the Rear Panel Reset Button](#) on the next page)
- **SIS commands** (see the [Reset Mode commands](#) in the Command and Response Table for SIS Commands, page 51)
- **PCS** (see the program help file)

Resetting the System from the Front Panel

A system reset (also known as a “hard reset”) does the following:

- Clears all ties and presets.
- Clears all video and audio setup and mutes.

NOTE: The system reset does **not** reset the internet protocol (IP) settings, replace user-installed firmware, or reset the unit name to the factory default.

The front panel reset is identical to the `Esc ZXXX←` SIS command (see the [Reset mode commands](#)).

To reset the switcher to the factory default settings (see [figure 26](#) on the next page):

1. Disconnect power from the DXP, then immediately reconnect it. All front panel LEDs blink four times, then turn off, leaving the I/O LEDs lit red.
2. Immediately press and continue to hold the **I/O** button while the front panel LEDs do the following:
 - a. The Input Signal and HDCP LEDs blink in order in a clockwise, circling pattern.
 - b. All front panel LEDs blink three times, then turn off.
 - c. The I/O Video LED lights green.

Disconnect and reconnect power to the switcher.

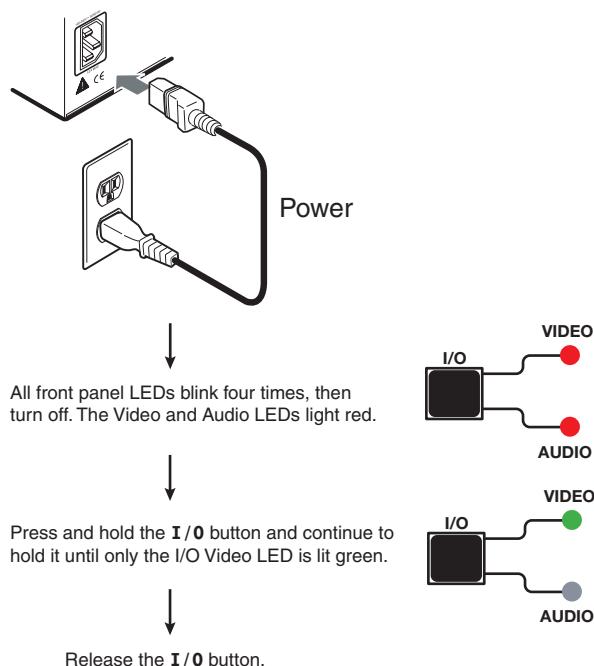


Figure 26. System Reset, DXP 88 Series

- When only the Video LED is lit steadily green, release the **I/O** button.

Resetting Using the Rear Panel Reset Button

The rear panel has a recessed **Reset** button (see **figure 2, D**, on page 6) that initiates various levels of soft resets, which restore various tiers of switcher settings to their defaults. For different reset levels, press and hold the button while the switcher is running or press and hold the button while you apply power to the switcher. Use a pointed stylus, ballpoint pen, or small screwdriver to press the button.

The **table** on the next page provides a summary of the reset modes.

ATTENTION:

- Review the reset modes in the **table on the next page** carefully. Using the wrong reset mode could result in unintended loss of flash memory programming, port reassignment, or a switcher reboot.
- Analysez minutieusement les différents modes de réinitialisation voir **tableau page suivante**. Appliquer le mauvais mode de réinitialisation peut causer une perte inattendue de la programmation de la mémoire flash, une reconfiguration des ports ou une réinitialisation du sélecteur.

NOTES:

- The reset modes listed in the table close all open IP and Telnet connections and all sockets.
- The modes described in the table are separate functions, not a continuation from mode 1 to mode 5.
- There is no reset mode 2 for DXP HD 4K PLUS.
- Because DXP HD 4K PLUS switchers do not support events, reset mode 3 is also unavailable. If you attempt to initiate it, the Reset LED blinks 3 times but no reset is performed.

Reset Modes Summary for DXP HD 4K PLUS Series

Mode	Activation	Result	Purpose/Notes
1	Hold in the recessed Reset button while applying power to the switcher.	<ul style="list-style-type: none"> Restores the factory-installed firmware for a single power cycle. Event scripts do not start. Maintains all user files and settings (drivers, audio adjustments, IP settings, and so on) are maintained. It does not clear the current configuration. 	Use mode 1 to revert to the factory firmware if incompatibility issues arise.
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).	<ul style="list-style-type: none"> Sets the IP address, subnet address, and gateway address to the factory defaults. Sets port mapping to the factory default. Turns DHCP off. Turn event scripts off. <p>The Reset LED blinks four times in quick succession during the reset.</p>	Mode 4 resets all IP settings to factory defaults. 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: <ul style="list-style-type: none"> Everything mode 4 does Reset of all real time adjustments: <ul style="list-style-type: none"> Clears all ties, presets, and audio or RS-232 mutes. Resets all IP options. Removes or clears all switcher files. <p>The reset LED blinks four times in quick succession during the reset.</p>	Mode 5 is useful if you want to start over with configuration and uploading and also to replace events. Equivalent to SIS command [Esc]ZQQQ← .

To perform a hardware reset of the switcher:

1. Use a stylus or small Philips screwdriver to press and **hold** the rear panel **Reset** button until the front panel **Video** and **Audio** buttons blink twice (for a system reset) or three times (for an absolute reset).

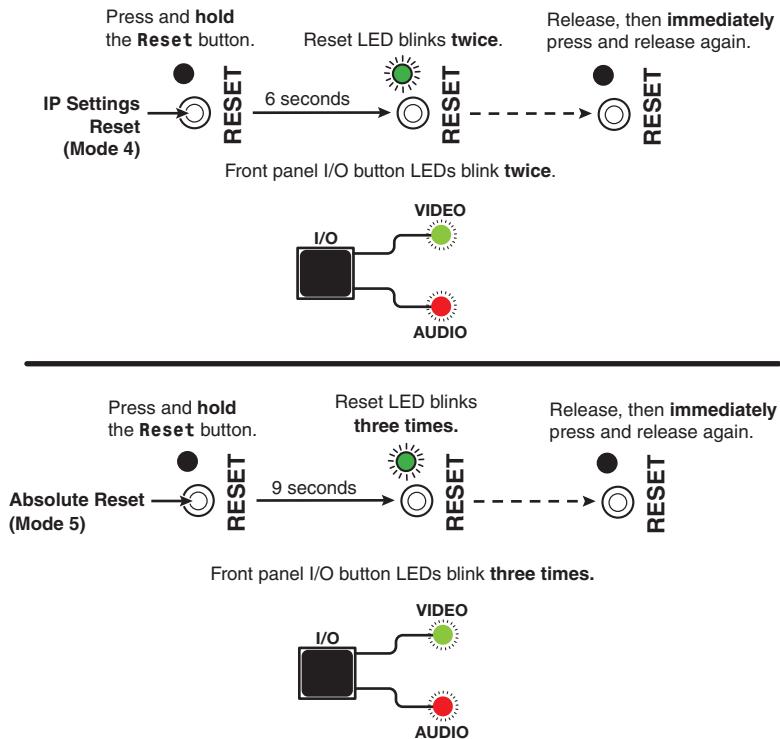


Figure 27. Soft Resets (Modes 4 and 5)

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

Selecting the Remote RS-232 Port Baud Rate

NOTES:

- The serial port settings are protected when front panel lock mode 2 is selected. You can view the settings in lock mode 2 but you cannot change them from the front panel.
- To enable changes to the baud rate settings, set the lock mode to **Ø** and ensure that the unit is **not** in **power save mode 2**.

To view and configure the serial communications settings for the switcher from the front panel:

1. Simultaneously press and **hold** all Control buttons: **Enter**, **Preset**, and **Esc**. Hold these buttons until **all** of the following button LEDs light (approximately 2 seconds): **Enter**, **Preset**, **Esc**. The LED representing the current baud rate blinks.
2. Release the Control buttons.
3. Press the appropriate Control button to select the desired baud rate:
 - **Enter** = 9600
 - **Preset** = 19200
 - **Esc** = 115200

The selected Control button LED blinks.

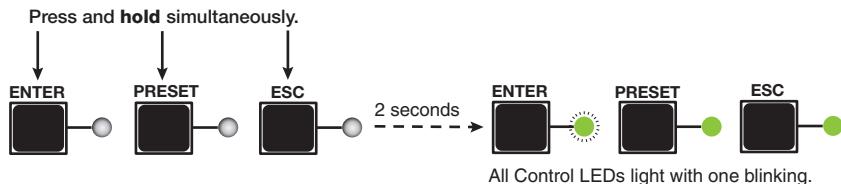


Figure 28. RS-232 Baud Rate Display

4. Press and release an output button to exit the Serial Port Configuration mode.

To change a value, press and release the Control button that relates to the desired value. The LEDs for the selected buttons blink and the other LEDs remain lit.

Troubleshooting

The following are recommendations for actions to take 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 Reset/Power LED is lit.
2. Check to see if one or more outputs are muted.
3. Ensure that an active input is selected for output on the switcher.
4. Ensure that the proper signal format is supplied.
5. Check the cabling and make corrections as necessary.
6. Call the [Extron S3 Sales & Technical Support Hotline](#) if necessary.

Configuration Worksheets

Instead of trying to remember the configuration for each preset, use worksheets to record this information. Make copies of the [blank worksheet](#) on page 34, and use one sheet for each preset configuration. Cross out all unused or inactive inputs and outputs. The worksheet is generic for all models of DXP. Disregard or cross out boxes for inputs and outputs that your switcher does not have.

Worksheet Example 1: System Equipment

Figure 29 shows a worksheet for a DXP in a fictional organization with the system hardware annotated. Output 7 has no connection in this organization, so it has been crossed out on the worksheet.

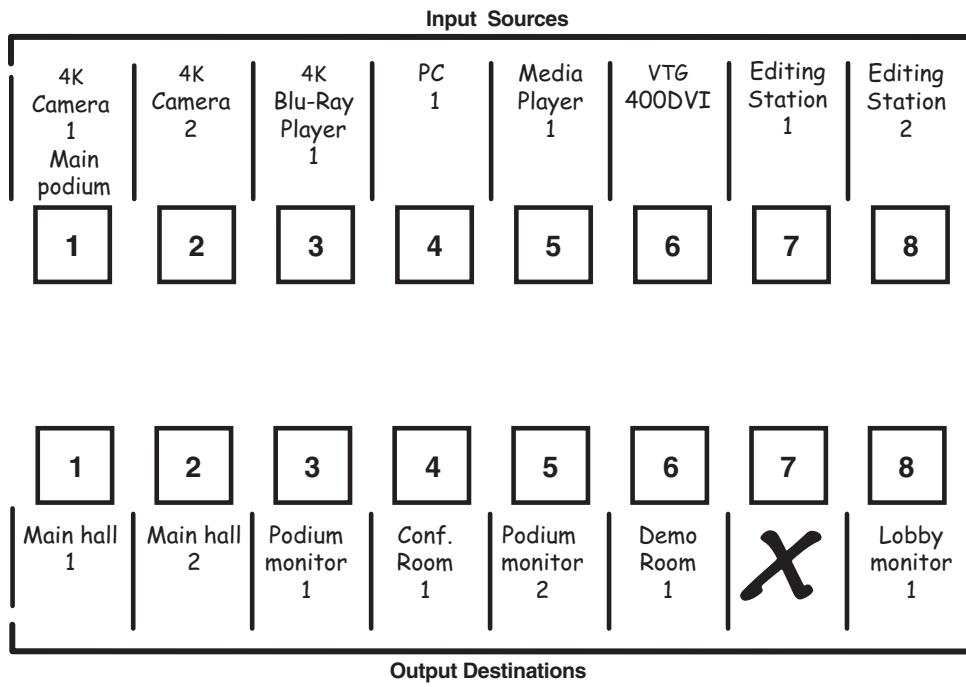


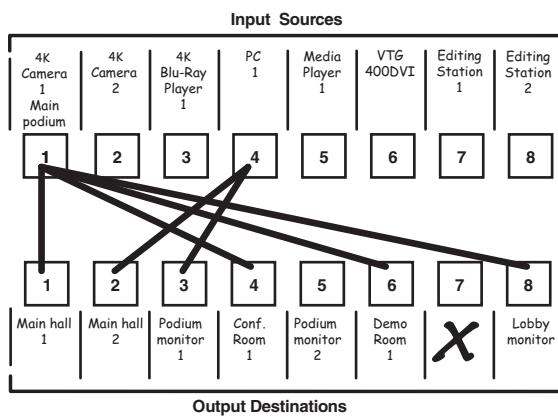
Figure 29. Worksheet Example 1: System Equipment

Inputs include media players, PCs, editing stations, 4K cameras, and an Extron VTG 400DVI. Output devices include various 4K monitors.

The VTG 400DVI video test generator connected to input 6 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 30 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.



Preset # 3 Title: Weekly status mtg Video ties:

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

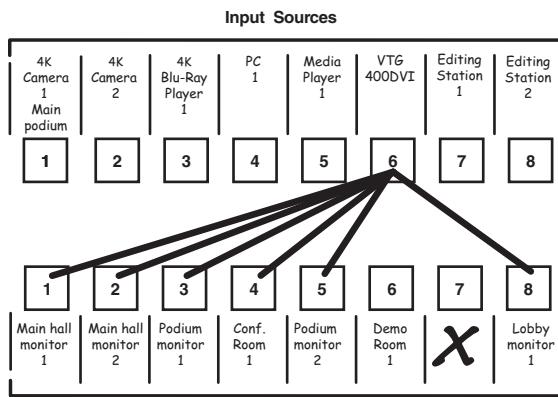
Figure 30. Worksheet Example 2: Daily Configuration

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 Demo Room (output 6)
 - Displayed in the lobby (output 8)
- The presenter has a presentation stored on PC 1 (input 4) that is:
 - Displayed in the main hall (output 2)
 - Displayed locally on podium 1 (output 3)

Worksheet Example 3: Test Configuration

The AV system in our fictional organization needs to be fine tuned on a regular basis. Figure 31 shows a typical test configuration, with an Extron video test generator (input 6) generating a test pattern to all monitors (outputs 1, 2, 3, 4, 8).

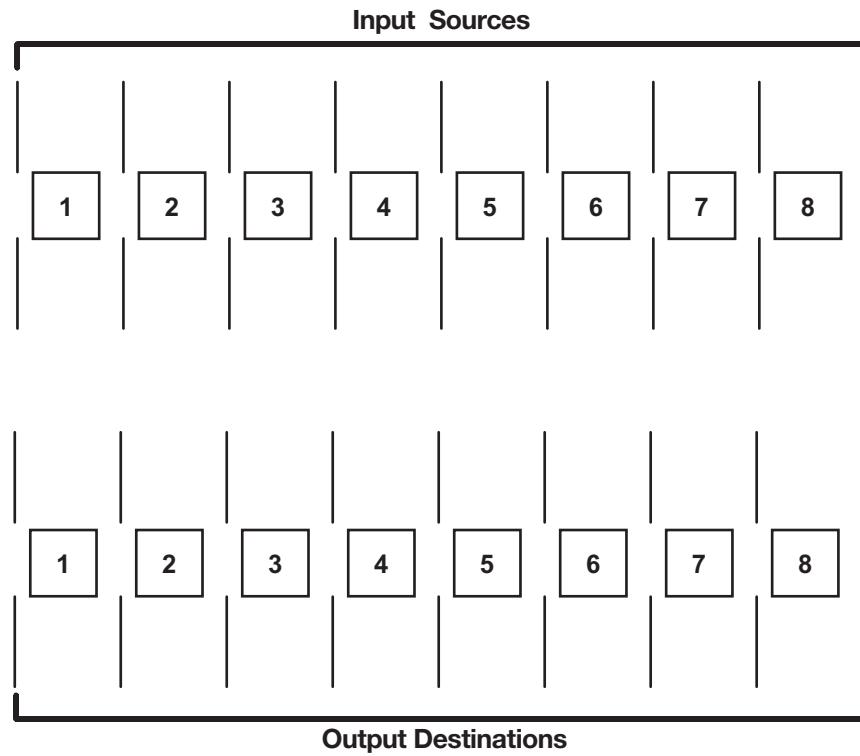


Preset # 3 Title: Weekly status mtg Video ties:

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

Figure 31. Worksheet Example 3: Test Configuration

Worksheet Form



Preset # _____ Title:_____

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

DXP HD 4K PLUS Configuration Worksheet

SIS Configuration and Control

The DXP HD 4K PLUS Series can be configured and controlled with Extron Simple Instruction Set commands. This section describes the communication between a connected host computer or other control device (such as a control system) and the device. Topics include:

- [Connection Methods](#)
- [Host and Matrix Switcher Communication](#)
- [SIS Overview](#)
- [Command and Response Table for SIS Commands](#)

Connection Methods

Attach the host device to one of the following connectors:

- Remote RS-232 connector (see [figure 2](#), **E**, on page 6)
- LAN connector (see [figure 2](#), **F**)
- USB connector (see [figure 6](#), **A**, on page 13)

Commands can be entered using a Telnet application such as the Extron DataViewer, available at www.extron.com (see the *DataViewer Help* file for more details).

Host and Matrix Switcher Communication

SIS commands consist of one or more characters per field. No special characters are required to begin or end a command sequence. Commands can be entered back-to-back in a string with no spaces. When the switcher determines that a command is valid, it executes the command and sends a response to the host device. All responses from the switcher to the host end with a carriage return and a line feed (CR/LF = ↵), indicating the end of the response character string (one or more characters).

Copyright Information

The copyright message is displayed upon connecting to a switcher via TCP/IP or Telnet or after a power cycle via RS-232, and depends on the matrix switcher model.

(c) Copyright 20nn, Extron Electronics, DXP nn HD 4K Plus, Vn.nn, 60-1495-nn↵
Ddd, DD Mmm YYYY HH:MM:SS↵

20nn is the year.

DXP nn HD 4K Plus is the model name.

Vn.nn is the firmware version number.

60-1495-nn is the model part number.

(Day, date, and time as in Mon, 12 Feb 2018 11:27:33)

Device-Initiated Messages

When a local event such as a front panel selection or adjustment takes place, the matrix switcher responds by sending a message to the host. No response is required from the host. Example switcher-initiated messages are listed here.

- **←>Password:**

The **←Password:** prompt requires a password (administrator level or user level) followed by a carriage return. If the correct password is entered, the unit responds with **←Login Administrator←** or **←Login User←**, depending on the password entered. If passwords are the same for both administrator and user, the switcher defaults to administrator privileges.

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

- **Qik←**

The switcher initiates the **Qik** message when a front panel switching operation occurs.

- **Rprnn←**

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

- **Sprnn←**

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

- **nnVmtx←**

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. *x* is the mute status (\emptyset = off, 1 = on).

- **nnAmtx←**

The switcher initiates the **Amt** message when an audio output mute is toggled on or off from the front panel. *nn* is the output number. *x* is the mute status (\emptyset = off, 1 = on).

- **Exen←**

The switcher initiates the **Exe** message when the Front Panel Lockout mode is toggled on or off from the front panel. *n* is the mode (\emptyset = off, 1 = view only, 2 = basic mode only)

- **HplgOnn←**

The switcher initiates the **Hplg0** message when a hot plug event is detected on an output. *nn* is the output number.

Error Responses

When the switcher receives a valid command, it executes the command and sends a response to the host device. If the unit is unable to execute the command, it returns an error response to the host.

Error codes

E01 — Invalid input number	E21 — Invalid room number
E10 — Invalid command	E22 — Busy
E11 — Invalid preset number	E24 — Privilege violation
E12 — Invalid output number	E25 — Device not present
E13 — Invalid parameter	E26 — Maximum number of connections exceeded
E14 — Not valid for this configuration	E27 — Invalid event number
E17 — Invalid command for signal type	E28 — Bad filename or file not found
E18 — System or command timed out	

Error response references

These references in the command and response tables note particular error responses to that command. For example:

²⁴ = Commands that give an E24 (privilege violation) error if not administrator level

Connection Timeouts

An Ethernet link disconnects after a designated period of no communications. By default, this timeout duration is 5 minutes (see the **Port Timeout** commands on page 54 to change this value).

NOTE: Extron recommends periodically issuing query commands (see the **Information Requests** commands, beginning on page 52) to keep the connection active. If there are long idle periods, Extron recommends disconnecting and reopening the connection when another command must be sent.

Number of Connections

A DXP HD 4K PLUS Series 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 ones.

SIS Overview

Using the Command and Response Table

The **Command and Response Table** beginning on page 43 lists the commands that the switcher recognizes as valid, the responses that are returned to the host, a description of the command function or the results of executing the command, and examples of commands in ASCII.

NOTE: Upper- and lowercase text can be used interchangeably unless otherwise stated.

ASCII to Hex Conversion Table											
Space →	20	!	21	“	22	#	23	\$	24	%	25
(28)	29	*	2A	+	2B	,	2C	-	2D
Ø	30	1	31	2	32	3	33	4	34	5	35
8	38	9	39	:	3A	;	3B	<	3C	=	3D
@	40	A	41	B	42	C	43	D	44	E	45
H	48	I	49	J	4A	K	4B	L	4C	M	4D
P	50	Q	51	R	52	S	53	T	54	U	55
X	58	Y	59	Z	5A	[5B	\	5C]	5D
`	60	a	61	b	62	c	63	d	64	e	65
h	68	i	69	j	6A	k	6B	l	6C	m	6D
p	70	q	71	r	72	s	73	t	74	u	75
x	78	y	79	z	7A	{	7B		7C	}	7D
										~	7E
										DEL	7F

Figure 32. ASCII to Hexadecimal Character Conversion Table

Verbose Mode

The connection to a DXP switcher can be used to monitor for changes that occur on the switcher, such as front panel operations and SIS commands from a TCP/IP connection or the RS-232 serial port. To receive change notices from the switcher, you must enable verbose mode 1 or 3 (see the **Verbose Mode** commands on page 51). In verbose mode 1 or 3, changes are reported in messages that resemble SIS command responses.

Symbol Definitions

•	=	Space
◀	=	Carriage return with line feed
◀	=	Carriage return with no line feed
or		
[Esc]	=	Escape key
or W		
24	=	Superscripts indicate the error message displayed if the command is entered incorrectly or with invalid parameters (see Error Responses on page 37).
[X1]	=	Input number 0 = untie (for ties if applicable) 1 - <maximum number of inputs>
[X2]	=	Output number 0 = untie (for ties if applicable) 1 - <maximum number of outputs>
[X3]	=	Enable or disable 0 = disable 1 = enable
[X4]	=	Name 16 alphanumeric characters (12 characters for room names)

NOTE: The pipe (|) character cannot be used in names. All other characters, including symbols and spaces, are permitted.

[X5]	=	Analog audio and S/PDIF output number 1 or 2
[X6]	=	HDCP Authorized device 0 = block HDCP encryption 1 = allow HDCP encryption (default)
[X7]	=	Input HDCP status 0 = no source detected 1 = source is HDCP compliant 2 = source is not HDCP compliant
[X8]	=	Output format 0 = pass-through (default) 1 = RGB (color quantization follows input) 2 = YUV 444 (color quantization follows input) 3 = YUV 422 (color quantization follows input)
[X9]	=	Color bit depth 0 = auto (default) 1 = 8-bit
[X10]	=	HDCP mode 0 = auto (follow the input, default) 1 = on (always encrypt HDMI outputs)
[X11]	=	Output HDCP status 0 = no sink is detected 1 = sink is connected, but does not support HDCP 2 = sink is connected, supports HDCP, but is currently not encrypted 3 = sink is connected, supports all HDCP versions, and is currently encrypted
[X12]	=	Video mute 0 = unmute 1 = video mute 2 = video and sync mute

X13	=	Audio mute	Ø = unmute 1 = HDMI audio mute 2 = Analog audio mute 3 = HDMI and analog audio mute 4 = S/PDIF mute 5 = HDMI audio and S/PDIF mute 6 = Analog audio and S/PDIF mute 7 = HDMI and analog audio, and S/PDIF mute
X14	=	Output mute	Ø = unmute 1 = video mute (one or more outputs) 2 = audio mute (one or more outputs) 3 = video and audio mute (one or more outputs)
X15	=	Input attenuation	-20 to ØØ in dB (ØØ = default)
X16	=	Output volume	0 to 100 percent in approximately 1 dB intervals (100 = default)

NOTE: If **X16** exceeds the acceptable volume range specified in the **analog output volume setting (V) commands**, an E13 error message is returned.

X17	=	Global preset number	1 - 16
X18	=	Room number	1 - 10
X19	=	Room preset number	1 - 10
X20	=	Front Panel Lockout mode	Ø = unlock the front panel 1 = mode 1 (complete front panel lockout) 2 = mode 2 (tie configuration and preset management only, default)
X22	=	Signal status	Ø = no signal detected 1 = input signal detected
X23	=	Verbose mode	Ø = clear or none (default for Telnet connections) 1 = verbose mode (default for RS-232 and USB connections) 2 = tagged responses for queries 3 = verbose mode and tagged queries
X24	=	Power save mode	Ø = normal operation (default) 1 = limited functionality — disable all functions except IP, USB, and RS-232, and reduce fan speed. To return to mode Ø: Press a front panel button, issue an SIS command, cycle power, or open PCS. 2 = limited functionality — disable all functions except IP, USB, and RS-232 ports, and reduce fan speed. Front panel is non-responsive. Responds only to SIS viewing commands and [Esc] ØPSAV← . To return to mode Ø: Enter the [Esc] ØPSAV← command or open PCS.
X25	=	Firmware version	<i>n.nn</i>
X26	=	Verbose firmware version	[version]-[description]-[upload date and time]
X27	=	Power supply	In voltage

X28	= Temperature	In degrees Celsius
X29	= Fan	In RPM
X30	= IP address	<i>nnn.nnn.nnn.nnn</i> (192.168.254.254 = default)
X31	= Subnet mask	<i>nnn.nnn.nnn.nnn</i> (255.255.0.0 = default)
X32	= Gateway address	<i>nnn.nnn.nnn.nnn</i> (0.0.0.0 = default)
X33	= MAC address	<i>00-05-A6-xx-xx-xx</i>
X34	= Open connections	<i>0-<maximum number of open connections></i>
X35	= Port timeout	1 to 65000 in 10-second intervals (30 = default)
X36	= Device name	Maximum 63 alphanumeric characters or hyphens. The first character must be an alpha character. The last character cannot be a hyphen. No blank or space characters are permitted. Uppercase and lowercase letters are interchangeable.
X37	= Date and time	In the format <i>MM/DD/YY•HH:mm:ss</i> <i>MM</i> = month: 01 (January) to 12 (December) <i>DD</i> = day: 01 to 31 (depending on the month) <i>YY</i> = year: 00 to 99 (last two digits) <i>HH</i> = hour: 00 to 23 <i>mm</i> = minute: 00 to 59 <i>SS</i> = second: 00 to 59
X38	= Date and time (view only)	In the format <i>DAY, •DD•MMM•YYYY•HH:mm:ss</i> <i>DAY</i> = day of the week: Mon to Sun <i>DD</i> = date: 01 to 31 (depending on the month) <i>MMM</i> = month: 01 to 12 <i>YYYY</i> = year: 2000 to 2099 <i>HH</i> = hour: 00 to 23 <i>mm</i> = minute: 00 to 59 <i>SS</i> = second: 00 to 59 <i>-12:00</i> to <i>+14:00</i>
X39	= GMT offset	
X40	= Time zone	Time zone code (see the View time zone command on page 55 to view a list of available time zones). The code is followed by an * in the response.
X41	= Time zone description	In the format <i>(UTCX39)•<Description></i> This is the UTC equivalent for a particular time zone as well as a general description of the geographical area.
X42	= Password	128 characters maximum
NOTE: The pipe () character is invalid for passwords.		
X43	= Filename	Can carry a full path name. EDID file format is .bin, carrying 128 or 256 bytes of binary data.
X45	= Serial port number	01 – 99
X46	= Baud rate	9600 (default), 19200, 38400, 115200
X47	= Parity	Odd, Even, None (default), Mark, Space Enter only the first letter.
X48	= Data bits	7, 8 (default)

X49	= Stop bits	1 (default), 2
X50	= EDID file data block	256 bytes of binary data in Hex
X51	= EDID resolution and rate	Native resolution and refresh rate from current EDID input assignment, translated from Hex
X52	= EDID reference file for DDC data	Default — 1080p @ 60 Hz DXP 44 — 01-04 = input slot, 05-08 = automatically populated with sink EDID from the output. DXP 84 — 01-08 = input slot, 09-12 = automatically populated with sink EDID from the output. DXP 88 — 01-08 = input slot, 09-16 = automatically populated with sink EDID from the output.
X53	= EDID filename	Name and path of the EDID file (can be a full path name). The EDID file format is .bin, carrying 128 or 256 bytes of binary data.
X54	= MKP mode	Volume steps: 1 = Set to normal operation (default), 1-64 steps. 2 = Set MKP volume control to 1-100 steps.

NOTE: Entering the **[Esc] ZQQQ←** or **[Esc] ZXXX←** system reset command resets the MKP mode to the factory default (mode 1).

Command and Response Table for SIS Commands

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Input and Output Tie Commands			
Individual Ties			
Tie HDMI input to HDMI and audio outputs	[X1]*[X2]!	Out[X2]•In[X1]•All←	Tie or untie an HDMI input to HDMI and audio output.
<i>Example: Breaking a tie</i>	Ø*4!	Out4 InØ All	Untie output 4 from all video and audio inputs (tie to input 0).
Tie HDMI input to HDMI output	[X1]*[X2]% or [X1]*[X2]&	Out[X2]•In[X1]•Vid←	Tie or untie an HDMI input to an HDMI output.
Tie HDMI audio input to audio only output	[X1]*[X2]\$	Out[X2]•In[X1]•Aud←	Tie or untie an HDMI audio input to an analog audio and S/PDIF output.
Ties from an Input to All Outputs			
Tie HDMI input to all HDMI and audio outputs	[X1]*!	In[X1]•All←	Tie an HDMI input to all HDMI and audio outputs.
Tie HDMI input to all HDMI outputs	[X1]*% or [X1]*&	In[X1]•Vid←	Tie an HDMI input to all HDMI outputs.
Tie HDMI audio input to all audio only outputs (audio output 2 only)	[X1]*\$	In[X1]•Aud←	Tie HDMI audio input to all analog audio and S/PDIF outputs (audio output 2 only).
Quick Tie			
Multiple ties	[Esc]+Q[X1]*[X2]...[X1]*[X2]! ← (& can be substituted for %.)	Qik←	Make multiple ties in one command entry (applies to HDMI and audio outputs).
<i>Example (DXP 88 HD 4K PLUS)</i>	[Esc]+Q3*4%6*1\$3*2! ← (& can be substituted for %.)	Qik←	Tie HDMI input 3 to HDMI output 4, HDMI audio input 6 to analog audio output 1, and HDMI input 3 to HDMI and analog audio output 2.
View Ties			
View HDMI and audio output tie	[X2]!	[X1]←	View input tied to an HDMI and audio output.
		Out[X2]•In[X1]•All←	Verbose modes 2 and 3
View HDMI output tie	[X2]% or [X2]&	[X1]←	View input tied to an HDMI output.
		Out[X2]•In[X1]•Vid←	Verbose modes 2 and 3
View audio output tie	[X2]\$	[X1]←	View input tied to an audio output.
		Out[X2]•In[X1]•Aud←	Verbose modes 2 and 3

NOTES:

[X1] = Input number

Ø = untie (for ties if applicable)

1 through <maximum number of inputs>

[X2] = Output number

Ø = untie (for ties if applicable)

1 through <maximum number of outputs>

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Input Configuration Commands			
Input Name			
Set input name	[Esc][X1],[X4]NI←	Nmi[X1],[X4]←	Set the name of an input.
View input name	[Esc][X1]NI←	[X4]← Nmi[X1],[X4]←	View name of an input. <i>Verbose modes 2 and 3</i>
HDCP Authorized Device			
Set HDCP Authorized device setting	[Esc]E[X1]*[X6]HDCP←	HdcpE[X1]*[X6]←	Set the HDCP Authorized device setting for an input.
View HDCP Authorized device setting	[Esc]E[X1]HDCP←	[X6]← HdcpE[X1]*[X6]←	View the HDCP Authorized device setting for an input. <i>Verbose modes 2 and 3</i>
Input HDCP Status			
View input HDCP status	[Esc]I[X1]HDCP←	[X7]← HdcpI[X1]*[X7]←	View the HDCP status on an input. <i>Verbose modes 2 and 3</i>
View all input HDCP status	[Esc]IHDCP←	[X7] ¹ [X7] ² ...[X7] ⁿ ← HdcpI00*[X7] ¹ [X7] ² ...[X7] ⁿ ←	View the HDCP status for all inputs. ⁿ = the maximum number of inputs <i>Verbose modes 2 and 3</i>
EDID Commands			
NOTE: See EDID Minder on page 3 for information on available EDID.			
View EDID in Hex	[Esc]R[X1]EDID←	[X50]← EdidR[X50]←	View the EDID [X50] in Hex from input slot [X1]. <i>Verbose modes 2 and 3</i>
View EDID native resolution	[Esc]N[X1]EDID←	[X51]← EdidN[X51]←	View the EDID native resolution and refresh [X51] from input slot [X1]. <i>Verbose modes 2 and 3</i>
NOTES:			
[X1]	= Input number	1 through <maximum number of inputs>	
[X4]	= Name	Up to 16 alphanumeric characters	
[X6]	= HDCP Authorized device	Ø = block HDCP encryption 1 = allow HDCP encryption (default)	
[X7]	= Input HDCP status	Ø = no source detected 1 = source is HDCP compliant 2 = source is not HDCP compliant	
[X50]	= EDID file data block	256 bytes of binary data in Hex	
[X51]	= EDID resolution and rate	Native resolution and refresh rate from current EDID input assignment, translated from Hex	

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
EDID Commands (continued)			
Import EDID	[Esc]I[X52], [X53]EDID←	[Esc]I[X52]←	Import EDID table [X52] from [X53].
Export EDID	[Esc]E[X52], [X53]EDID←	[Esc]E[X52]←	Export EDID table [X52] to [X53].
Output Configuration Commands			
Output Name			
Set output name	[Esc][X2],[X4]NO←	Nmo[X2],[X4]←	Set the name of an output.
View output name	[Esc][X2]NO←	X4← Nmo[X2],[X4]←	View the name of an output. <i>Verbose modes 2 and 3</i>
Output Format			
Set output format	[Esc][X2]*[X8]VTP0←	Vtpo[X2]*[X8]←	Set format [X8] of output [X2].
View output format	[Esc][X2]VTP0←	X8← Vtpo[X2]*[X8]←	View the format of an output. <i>Verbose modes 2 and 3</i>
HDCP Mode			
Set output HDCP mode to Auto	[Esc]S[X2]*ØHDCP←	Hdcps[X2]*Ø←	Set output [X2] HDCP to Auto.
Set output HDCP mode to On	[Esc]S[X2]*1HDCP←	Hdcps[X2]*1←	Set output [X2] HDCP to always encrypted.
View HDCP mode	[Esc]S[X2]HDCP←	X10← Hdcps[X2]*X10←	View the HDCP mode. <i>Verbose modes 2 and 3</i>

NOTES:

[X2] = Output number

1 through <maximum number of outputs>

[X4] = Name

16 alphanumeric characters

[X8] = Output format

Ø = pass-through (default)

1 = RGB (color quantization follows input)

2 = YUV 444 (color quantization follows input)

3 = YUV 422 (color quantization follows input)

[X10] = HDCP mode

Ø = auto (follow the input, default)

1 = on (always encrypt HDMI outputs)

[X52] = EDID reference file for DDC data

Default — 1080p @ 60 Hz

DXP 44 — Ø1-Ø4 = input slot, Ø5-Ø8 = automatically populated with sink EDID from the output.

DXP 84 — Ø1-Ø8 = input slot, Ø9-12 = automatically populated with sink EDID from the output.

DXP 88 — Ø1-Ø8 = input slot, Ø9-16 = automatically populated with sink EDID from the output.

NOTE: See **EDID tables for DXP HD 4K PLUS** on page 4 for lists of the available EDID.

[X53] = EDID filename

EDID file name and path (can be a full path name). EDID file format is .bin carrying 128 or 256 bytes of binary data.

Command	ASCII Command (Host to Switcher)	Response Switcher to Host)	Additional Description
Output Configuration Commands (continued)			
Output HDCP Status			
View output HDCP status	[Esc]0[X2]HDCP←	[X11]← Hdcp0[X2]*[X11]←	View the HDCP status of an output. <i>Verbose mode 2 and 3</i>
View all outputs HDCP status	[Esc]0HDCP←	[X11] ¹ [X11] ² ...[X11] ⁿ ← Hdcp000*[X11] ¹ [X11] ² ...[X11] ⁿ ←	View the HDCP status of all outputs. ⁿ = maximum number of outputs <i>Verbose modes 2 and 3</i>
HDMI Video Mutes			
Set HDMI video mute	[X2]*[X12]B	Vmt[X2]*[X12]←	Set mute of an output.
NOTE: This command mutes both the HDMI video and the embedded audio.			
View HDMI video mute status	[X2]B	[X12]← Vmt[X2]*[X12]←	View the mute setting of an output. <i>Verbose modes 2 and 3</i>
Set HDMI video mute to all outputs	[X12]*B	Vmt[X12]←	Set mute of all outputs.
View all output mutes	[Esc]VM←	[X14] ¹ [X14] ² ...[X14] ⁿ ← Mut[X14] ¹ [X14] ² ...[X14] ⁿ ←	View the mute status of all outputs. ⁿ = maximum number of outputs. <i>Verbose modes 2 and 3</i>
NOTES:			
[X1]	= Input number	1 through <maximum number of inputs>	
[X2]	= Output number	1 through <maximum number of outputs>	
[X11]	= Output HDCP status	Ø = no sink connected 1 = sink connected but does not support HDCP 2 = sink connected and supports HDCP, but currently not encrypted 3 = sink connected, supports HDCP, and is currently encrypted	
[X12]	= Video mute	Ø = unmute 1 = video mute 2 = video and sync mute	
[X14]	= Output mute	Ø = no mutes 1 = video mute (one or more outputs) 2 = audio mute (one or more outputs) 3 = video and audio mute (one or more outputs)	

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Audio Configuration Commands			
Input Attenuation			
Set attenuation	[X1]*-[X15]G	In[X1]●Aud[X15]◀	Set the attenuation level of input [X1] to [X15].
Decrease attenuation	[X1]+G	In[X1]●Aud[X15]◀	Increase the attenuation level of an input by 1 dB.
Increase attenuation	[X1]-G	In[X1]●Aud[X15]◀	Decrease the attenuation level of an input by 1 dB.
View attenuation	[X1]G	[X15]◀	View the attenuation level of an input.
Output Volume (Analog Audio and S/PDIF Outputs Only)			
Set volume	[X2]*[X16]V	Out[X2]●Vol[X16]◀	Set the volume level of an output.
Increase volume	[X2]+V	Out[X2]●Vol[X16]◀	Increase the volume level of an output by 1 dB.
Decrease volume	[X2]-V	Out[X2]●Vol[X16]◀	Decrease volume level of output [X2] by 1 dB.
View volume level	[X2]V	[X16]◀ Out[X2]●Vol[X16]◀	View the volume level of an output. <i>Verbose modes 2 and 3</i>
Audio Mute			
NOTE: For outputs 1-2, [X13] = 0-7. For outputs 3-8, [X13] = 0-1.			
Set audio mute	[X2]*[X13]Z	Amt[X2]*[X13]◀	Set the mute status of an output.
View audio mute status	[X2]Z	[X13]◀	View mute status of output [X2].
Set audio mute to all	[X3]*Z	Amt[X3]◀	Mute or unmute all outputs.
NOTES:			
[X1]	= Input number	1 through <maximum number of inputs>	
[X2]	= Output number	1 through <maximum number of outputs>	
[X3]	= Enable or disable	0 = disable (unmute) 1 = enable (mute)	
[X13]	= Audio mute	0 = unmute 1 = HDMI audio mute 2 = analog audio mute 3 = HDMI and analog audio mute	4 = S/PDIF mute 5 = HDMI audio and S/PDIF mute 6 = analog audio and S/PDIF mute 7 = HDMI audio, analog audio, and S/PDIF mute
[X15]	= Input attenuation	-20 to 00 in dB (00 = default)	
[X16]	= Output volume	0 to 100 percent in approximately 1 dB intervals (100 = default)	
		0 to 64 percent in MKP mode (see the MKP Mode commands on page 56).	
NOTE: If [X16] exceeds the acceptable volume range specified in the analog output volume setting commands , an E13 error message is returned.			

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Preset Commands			
Global Presets			
NOTE: " = maximum number of outputs.			
Save global preset	[X17] ,	Spr[X17]←	Save the current configuration to a global preset.
Recall global preset	[X17] .	Rpr[X17]←	Apply a global preset configuration.
Directly write global preset	[Esc]+[X17]P[X1]*[X2]%... [X1]*[X2]% ←	Spr[X17]←	Save a specified configuration to a global preset in one command entry.
NOTE: Before using the direct write of a global preset, always clear that global preset (see [Esc][X17]ZG ←, 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 preset number before directly writing another preset to it, ties that are part of the previous version may become part of the new preset.			
View global HDMI preset	[Esc][X17]*01*1VC ←	[X1]¹●[X1]²●...[X1]¹⁶●Vid ←	View the inputs tied to each output for a global preset.
		Vgp[X17]*Out01●[X1]¹●...[X1]^{2 or 4}●... - -¹⁶●Vid ←	Verbose modes 2 and 3:
View global audio preset	[Esc][X17]*01*2VC ←	[X1]¹●...[X1]^{2 or 4}●... - -¹⁶●Aud ←	View the inputs tied to each audio-only output for a global preset. - - = output is not applicable.
		Vgp[X17]*Out01●[X1]¹●...[X1]^{2 or 4}●... - -¹⁶●Aud ←	Verbose modes 2 and 3:
Set global preset name	[Esc][X17],[X4]NG ←	Nmg[X17],[X4] ←	Set a global preset name.
View global preset name	[Esc][X17]NG ←	[X4] ←	View a global preset name.
		Nmg[X17],[X4] ←	Verbose modes 2 and 3
Reset all global presets	[Esc]ZG ←	Zpg ←	Clear all global presets.
Reset individual preset	[Esc][X17]ZG ←	Zpg[X17] ←	Clear an individual global preset.

NOTES:

[X1] = Input number

1 through <maximum number of inputs>

[X2] = Output number

1 through <maximum number of outputs>

[X4] = Name

16 alphanumeric characters ([unassigned] for presets that have not been saved)

[X17] = Global preset number

1 - 16. **[X17]** can be Ø for viewing current ties only.

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Preset Commands (continued)			
Rooms			
Set room outputs	[Esc] [X18], [X2]¹, [X2]²... [X2]ⁿMR ←	Mpr [X18], [X2] ¹ , ... [X2] ⁿ ←	Set outputs to a room. ⁿ = desired number of outputs within the maximum number.
Example	[Esc] 7, 3, 4, 7MR	Mpr 7, 3, 4, 7 ←	Assign outputs 3, 4, and 7 to room 7.
View room outputs	[Esc] [X18]MR ←	[X2] ¹ , ... [X2] ⁿ ←	View the outputs of a room.
Set room name	[Esc] [X18], [X4]NR ←	Nmr [X18], [X4] ←	Set a room name.
View room name	[Esc] [X18]NR ←	[X4] ← Nmr [X18], [X4] ←	View a room name. <i>Verbose modes 2 and 3</i>
Reset room map	[Esc] ZR ←	Zpr ←	Clear all room and output configurations.
Reset individual room	[Esc] [X18]ZR ←	Zpr [X18] ←	Clear a room output configuration.
Room Presets			
NOTE: ⁿ = maximum number of outputs.			
Save room preset	[X18]*[X19],	Rmm [X18]•Spr [X19] ←	Save the current configuration to a room preset.
Recall room preset	[X18]*[X19].	Rmm [X18]•Rpr [X19] ←	Apply a room preset configuration.
Directly write room preset	[Esc]+[X18]*[X19]P[X1]*[X2]%...[X1]*[X2]%- Rmm [X18]•Spr [X19] ←		Save a specified configuration in one command entry (see Input and Output Tie Commands on page 43 for independent tie commands).
View room HDMI preset	[Esc] [X18]*[X19]*01*1VC← [X1]¹•[X1]²•...[X1]ⁿ•Vid←		View the inputs tied to each output of a room preset.

NOTES:

[X1] = Input number 1 through <maximum number of inputs>.

[X2] = Output number 1 through <maximum number of outputs>

[X4] = Name 16 alphanumeric characters ([unassigned] for presets that have not been saved)

[X18] = Room number 1 through 10

[X19] = Room preset number 1 through 10

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Preset Commands (continued)			
Room Presets (continued)			
View room audio preset	[Esc] [X18]*[X19]*01*2VC ←	[X1] ¹ •[X1] ² •... - - [X1] ⁿ •Aud	
			View the inputs tied to each audio output of a room preset. - - = output is not applicable.
Set room preset name	[Esc] [X18]*[X19], [X4] NP	Nmp[X18]*[X19], [X4]	Define a room preset name.
View room preset name	[Esc] [X18]*[X19] NP	[X4]	View a room preset name. <i>Verbose modes 2 and 3</i>
		Nmp[X18]*[X19], [X4]	
Reset all room presets	[Esc] ZP	Zpp	Clear all room preset configurations.
Reset individual room preset	[Esc] [X18]*[X19]ZP	Zpp[X18]*[X19]	Clear a room preset.
Advanced Configuration Commands			
Front Panel Lockout Mode (Executive Mode)			
Set Front Panel Lockout mode	[X20] X	Exe[X20]	Set the accessibility to front panel operation.
View Front Panel Lockout mode	X	[X20]	View the accessibility level for front panel operation.
Video Signal Presence			
View video signal presence status	ØLS	[X22] ¹ [X22] ² ...[X22] ⁿ	View the signal presence status of all inputs. ⁿ = maximum number of inputs.
		FreqØØ•[X22] ¹ [X22] ² ... [X22] ⁿ	<i>Verbose modes 2 and 3</i>

NOTES:

[X1] = Input number

[X4] = Name

[X18] = Room number

[X19] = Room preset number

[X20] = Front Panel Lockout mode

[X22] = Video signal status

1 through <maximum number of inputs>.

16 alphanumeric characters ([unassigned] for presets that have not been saved)

1 through 10

1 through 10

Ø = unlock the front panel

1 = mode 1 (complete front panel lockout)

2 = mode 2 (tie configuration and preset management only, default)

Ø = No signal detected

1 = Input signal detected

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Device Commands			
Verbose Mode			
Set verbose mode	[Esc] X23 CV ←	Vrb X23 ←	Enable or disable verbose mode and tagged responses, where additional information is provided in response to a query.
View verbose mode	[Esc] CV ←	X23 ←	View the verbose mode.
Reset Mode			
Reset flash memory ²⁴	[Esc] ZFFF ←	Zpf ←	Clear the flash memory.
Reset all device settings to factory default ²⁴	[Esc] ZXXX ←	Zpx ←	Reset all device settings to factory default except unit name.
Absolute system reset ²⁴	[Esc] ZQQQ ←	Zpq ←	Reset all device settings, including DHCP (off) and IP settings. The default IP address after reset is 192.168.254.254.
Reset all device settings and delete files ²⁴	[Esc] ZY ←	Zpy ←	Reset all device settings, excluding IP settings.
Reset mutes	[Esc] ZZ ←	Zpz ←	Unmute all muted outputs.
Power Save Mode			
NOTE: In power save modes 1 and 2 (X24 = 1 or 2), the cooling fans slow to save power.			
Set power save mode	[Esc] X24 PSAV ←	Psav X24 ←	Set the power save mode to X24 .
NOTE: The switcher returns to normal mode (X24 = Ø) when you use the front panel, issue the [Esc] ØPSAV ← command, connect via PCS, or cycle power.			
Set power save mode 2	[Esc] 2PSAV ←	Psav2 ←	
NOTE: The switcher returns to normal mode (X24 = Ø) only when you issue the [Esc] ØPSAV ← command, connect via PCS, or cycle power.			
Set power save mode 0	[Esc] ØPSAV ←	PsavØ ←	Set to normal operation (default).
View power save mode	[Esc] PSAV ←	X24 ←	
NOTES:			
X23 = Verbose mode	Ø = clear or none (default for Telnet connections) 1 = verbose mode (default for RS-232 and USB connections) 2 = tagged responses for queries 3 = verbose mode and tagged queries Ø = normal operation (default)		
X24 = Power save mode	1 = limited functionality — Turn off all functions except IP, USB, and RS-232 ports, and slow fan speed. To return to mode Ø: Press a front panel button, issue an SIS command, or cycle power.		
	2 = limited functionality — Turn off all functions except IP, USB, and RS-232 ports and slow fan speed. Front panel is non-responsive. The unit responds only to SIS viewing commands and [Esc] ØPSAV ←.		
	To return to mode Ø: Enter [Esc] ØPSAV ← (only method).		

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Information Requests			
General information	I	V[X1]X[X2]•A[X1]X[X5]← Info00*V[X1]X[X2]•A[X1]X[X5]←	View the number of inputs and outputs for video and audio connectors on the device. Verbose modes 2 and 3
NOTE: V[X1] X[X2] is the video matrix size. A[X1] X[X5] is the audio matrix size.			
View firmware version	Q	X25←	View the current firmware version.
View full firmware version	*Q	n.nn.nnnn←	View the firmware version and build number.
View detailed firmware version information	ØQ	X25 - X26 ¹ - X26 ² ←	View the boot loader, factory, and current user firmware versions. X25 = boot loader version X26 ¹ = factory base firmware X26 ² = updated firmware
NOTE: For X26, the following symbols may appear after the version number (see the example below): <ul style="list-style-type: none"> * = The firmware version is the current or active version. ? . ?? = Only the factory firmware version is loaded. This replaces the updated firmware version. ^ = The default factory firmware version is loaded instead of the listed version due to a mode 1 reset. ! = The current firmware version is corrupted. 			
Example response:			
version number	kernel version	upload date and time	indicator model description
1.00-1.00.0000-b001(1.81LX-DXP-HD		-Thu, 01 Jan 2015 00:01 UTC)	-1.00.0000-b004*(1.91LX-DXP-HD -Mon, 16 Nov 2015 10:26 UTC)←
boot loader version	factory base firmware version		updated firmware version
View part number	N	<part number>←	View the device part number.
View matrix status	S	X27•X28•X29← Sts00*X27•X28•X29←	View the power supply voltage, temperature, and fan speed status. Verbose modes 2 and 3
NOTES:			
X25	= Firmware version	n.nn	
X26	= Verbose firmware version	[version]([kernel]-[description]-[upload date and time])	
X27	= Power supply	In volts	
X28	= Temperature	In degrees Celsius	
X29	= Fan	In RPM	

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Information Requests (continued)			
View power supply status	1S	X27← Sts01*X27←	View the power supply voltage. <i>Verbose modes 2 and 3</i>
View temperature	2S	X28← Sts02*X28←	View the internal temperature. <i>Verbose modes 2 and 3</i>
View fan speed	3S	X29← Sts03*X29←	View the internal fan speed. <i>Verbose modes 2 and 3</i>
IP Control Port Commands			
IP Setup			
Set DHCP mode ²⁴	[Esc] X3 DH ←	Idh[X3]←	Enable or disable DHCP.
View DHCP mode	[Esc] DH ←	X3←	View the DHCP mode setting.
Set IP address ²⁴	[Esc] X28 CI ←	Ipi•X30←	Set the IP address.
View IP address	[Esc] CI ←	X30←	View the current IP address.
Set subnet mask ²⁴	[Esc] X31 CS ←	Ips•X31←	Set the subnet mask.
View subnet mask	[Esc] CS ←	X31←	View the subnet mask setting.
Set gateway IP address ²⁴	[Esc] X32 CG ←	Ipg•X32←	Set the gateway IP address.
View gateway IP address	[Esc] CG ←	X32←	View the gateway IP address setting.
View MAC address	[Esc] CH ←	X33← Iph•X33←	00-05-A6-xx-xx-xx <i>Verbose modes 2 and 3</i>
View number of open connections	[Esc] CC ←	X34← Icc[X34]←	View the number of open connections. <i>Verbose modes 2 and 3</i>
Reboot network	[Esc] 2B00T ←	Boot2←	Restart the network after IP setting or DHCP changes.

NOTES:

[X3] = Enable or disable	Ø = disable 1 = enable
[X27] = Power supply	In volts
[X28] = Temperature	In degrees Celsius
[X29] = Fan	In RPM
[X30] = IP address	nnn.nnn.nnn.nnn (192.168.254.254 = default)
[X31] = Subnet mask	nnn.nnn.nnn.nnn (255.255.Ø.Ø = default)
[X32] = Gateway address	nnn.nnn.nnn.nnn (Ø.Ø.Ø.Ø = default)
[X33] = MAC address	00-05-A6-xx-xx-xx
[X34] = Open connections	Ø-<maximum number of open connections>

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
IP Control Port Commands (continued)			
Port Timeout			
Set current port timeout	[Esc] 0*[X35]TC←	Pti0*[X35]←	Set the duration of inactivity required to automatically terminate a connection on the current port.
View current port timeout	[Esc] 0TC←	[X35]← Pti0*[X35]←	View the duration of inactivity required to automatically terminate a connection on the current port.
Set global IP port timeout	[Esc] 1*[X35]TC←	Pti1*[X35]←	Set the initial timeout value for any connection.
View global IP port timeout	[Esc] 1TC←	[X35]← Pti1*[X35]←	View the initial timeout value for any connection.
Device Name			
Set device name ²⁴	[Esc][X36]CN←	Ipn●[X36]←	Set the device name.
NOTES:			
<ul style="list-style-type: none"> The first character must be a letter. The last character must not be a hyphen. No blank or space characters are permitted. Uppercase and lowercase letters are interchangeable. To set the device name to the factory default, enter a space for the device name. The default name is a combination of the model name and the last three character pairs of the MAC address. 			
View device name	[Esc]CN←	[X36]←	View the current device name.
NOTES:			
<p>[X35] = Port timeout [X36] = Device name</p> <p>1 to 65000 in 10-second intervals (30 = default). Maximum 63 alphanumeric characters or hyphens. The first character must be alpha. The last character cannot be a hyphen. No blank or space characters are permitted.</p>			

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
IP Control Port Commands (continued)			
Date and time			
Set date and time	[Esc] [X37] CT ←	Ipt[X37]←	Set the date and time.
View date and time	[Esc] CT ←	[X38]←	View the date and time.
View GMT offset	[Esc] CZ ←	[X39]←	View the GMT offset.
View available time zones	[Esc] *TZON ←	<Multiple [X40]*[X41]←> ←→ occurs at the end of the list.	View a list of available time zones.
Set time zone	[Esc] [X40]*TZON ←	Tzon●[X40]*[X41]←	Set the time zone.
NOTE: Use the View available time zones command for available values for [X40].			
View time zone	[Esc] TZON ←	[X40]*[X41]← Tzon●[X40]*[X41]←	View the set time zone. Verbose modes 2 and 3
Passwords			
NOTES:			
<ul style="list-style-type: none"> • Passwords are case-sensitive. • The pipe () character is invalid for passwords. • A password cannot be a single space. 			
Set administrator password	[Esc] [X42] CA ←	Ipa●[X42]←	Set the administrator password.
Clear administrator password	[Esc]●CA ←	Ipa●←	Reset or clear the administrator password.
NOTES:			
[X37] = Date and time	In the format <i>MM/DD/YY●HH:mm:ss</i> <i>MM</i> = month: 01 (January) to 12 (December) <i>DD</i> = day: 01 to 31 (depending on the month) <i>YY</i> = year: 00 to 99 (last two digits) <i>HH</i> = hour: 00 to 23 <i>mm</i> = minute: 00 to 59 <i>SS</i> = second: 00 to 59		
[X38] = Date and time (view only)	In the format <i>DAY,●DD●MMM●YYYY●HH:mm:ss</i> <i>DAY</i> = day of the week: Mon to Sun <i>DD</i> = date: 01 to 31 (depending on the month) <i>MMM</i> = month: 01 to 12 <i>YYYY</i> = year: 2000 to 2099 <i>HH</i> = hour: 00 to 23 <i>mm</i> = minute: 00 to 59 <i>SS</i> = second: 00 to 59		
[X39] = GMT offset	-12:00 to +14:00		
[X40] = Time zone	Time zone code (use the Read time zones command to determine the available time zones). The code is followed by an * in the response.		
[X41] = Time zone description	In the format <i>(UTC[X39])●<Description></i> . This is the UTC equivalent for a time zone as well as a general description of the geographical area.		
[X42] = Password	0 to 128 characters		

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
IP Control Port Commands (continued)			
Passwords (continued)			
View administrator password	[Esc] CA←	*****← or ←	View the administrator password. If there is a valid password, the response is *****←. If there is no password, the response is ←.
Set user password	[Esc] X42 CU←	Ipu●X42←	Set the user password.
Clear user password	[Esc] ●CU←	Ipu●←	Reset or clear the user password.
View user password	[Esc] CU←	*****← or ←	View the user password. If there is a valid password, the response is *****←. If there is no password, the response is ←.
Serial port configuration			
Set serial port parameters	[Esc] X45* [X46], [X47], [X48], [X49] CP←	Cpn[X45]●Ccp[X46], [X47], [X48], [X49]←	Set the baud rate, parity, data bits, and stop bits for serial port X45 .
View port parameters	[Esc] X45 CP←	[X46], [X47], [X48], [X49]←	
MKP Mode for Volume Control			
Set the MKP mode	[Esc] X54 SVOL←	SvolX54←	Set the number of volume steps (MKP mode) to X54 .
View the MKP mode	[Esc] SVOL←	Svol←	View the current MKP mode setting.
NOTES:			
X42	= Password	0 to 128 characters	
X45	= Port number	01 – 99	
X46	= Baud rate	9600 (default), 19200, 38400, 115200	
X47	= Parity	Odd, Even, None (default), Mark, Space	
X48	= Data bits	Enter only the first letter.	
X49	= Stop bits	7, 8 (default)	
X54	= MKP mode	1 (default), 2	
		Volume steps: 1 = Set to normal operation (default), 1-64 steps. 2 = Set MKP volume control to 1-100 steps.	
NOTE: Entering the [Esc] ZQQQ← or [Esc] ZXXX← system reset command resets the MKP mode to the factory default (mode 1).			

Configuration Software

The Extron Product Configuration Software (PCS) offers another way to control the switchers via USB or TCP/IP connection. The graphical interface includes many of the same functions as those on the device front panel and through SIS commands.

This section describes the software installation and communication. For detailed information about configuring the device with PCS, see the *DXP HD 4K PLUS Series Help* file. Topics in this section include:

- **Software Installation**
- **Software Connection**
- **Help File Access**

PCS is compatible with most Microsoft® Windows operating systems. The software is available at www.extron.com.

Software Installation

To download PCS from the Extron website, locate it on the Download Center page or go to the PCS product page.

Software Download Center Page

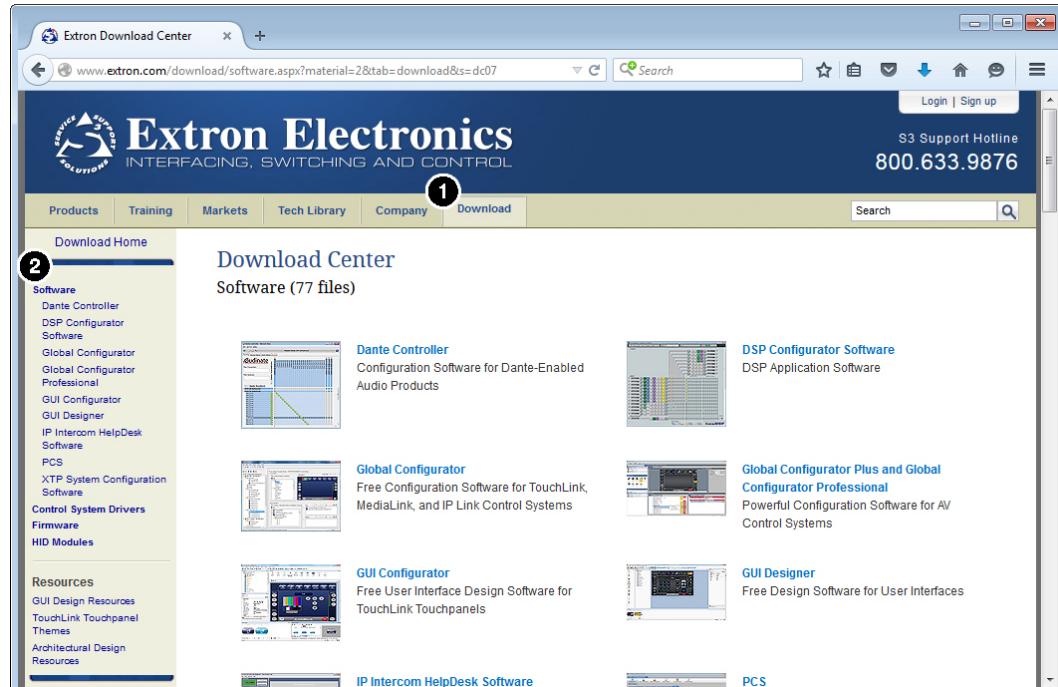


Figure 33. Download Center Page on the Extron Website

1. On the Extron website, select the **Download** tab (see **figure 33**, ① on the previous page).
2. From the left sidebar, click the **Software** link (②).

TIP: If PCS is featured in the left sidebar, click the **PCS** link to go directly to the PCS product page (see **PCS Product Page** on the next page).

Description	Part Number	Version	Date	Size	
PCS Updated Product Configuration Software for a variety of standalone products.	79-562-01	3.1.1	Mar. 11, 2015	75.5 MB	Download

Figure 34. PCS Download Link

3. Click the **P** link (see figure 34, ①).
4. Locate PCS from the list of available software programs and click the **Download** link (②) to the right of the name.
5. Submit any required information to start the download. Note where the file is saved.
6. Open the executable (.exe) file from the save location.
7. Follow the instructions that appear on the screen. By default, the installation creates a directory in the Program Files or Program Files (x86) folder.

PCS Product Page

The screenshot shows a web browser displaying the Extron Configuration Software product page for PCS. The page has a blue header with the Extron Electronics logo and navigation links for Products, Training, Markets, Tech Library, Company, Download, Login, and Sign up. A search bar is at the top right. The main content area shows the 'PCS' product details. It includes a 'Key Features' section with a bulleted list, a screenshot of the software interface showing a grid of icons and a list of outputs, and a table with version information. A 'Download' button is highlighted with a circled number 2.

VERSION	RELEASE DATE	KEY FEATURES ADDED IN THE CURRENT RELEASE	SIZE	RELEASE NOTES
3.1.1	Nov. 13, 2014	<ul style="list-style-type: none">Support for DSC 3G-3G ASupport for DSC DP-HD AMass Restore for select Ethernet-enabled	74.4 MB	0.6 MB Download

Figure 35. PCS Product Page

1. In the Search field (see figure 35, ①), type PCS. A drop-down menu of selected search results appears under the field.
2. Press <Enter> on the keyboard or select **PCS** from the drop-down menu.
3. Click the **Download** button (②).
4. Submit any required information to start the download. Note where the file is saved.
5. Open the executable (.exe) file from the save location.
6. Follow the instructions that appear on the screen. By default, the installation creates a directory in the Program Files or Program (x86) folder.

Software Connection

Open PCS from the Start menu or desktop shortcut. The Extron PCS window opens with the Device Discovery panel open. Connect to the switcher using the Device Discovery panel or the TCP/IP panel.

NOTE: Connecting to PCS returns the switcher to normal operation from power save modes 1 and 2.

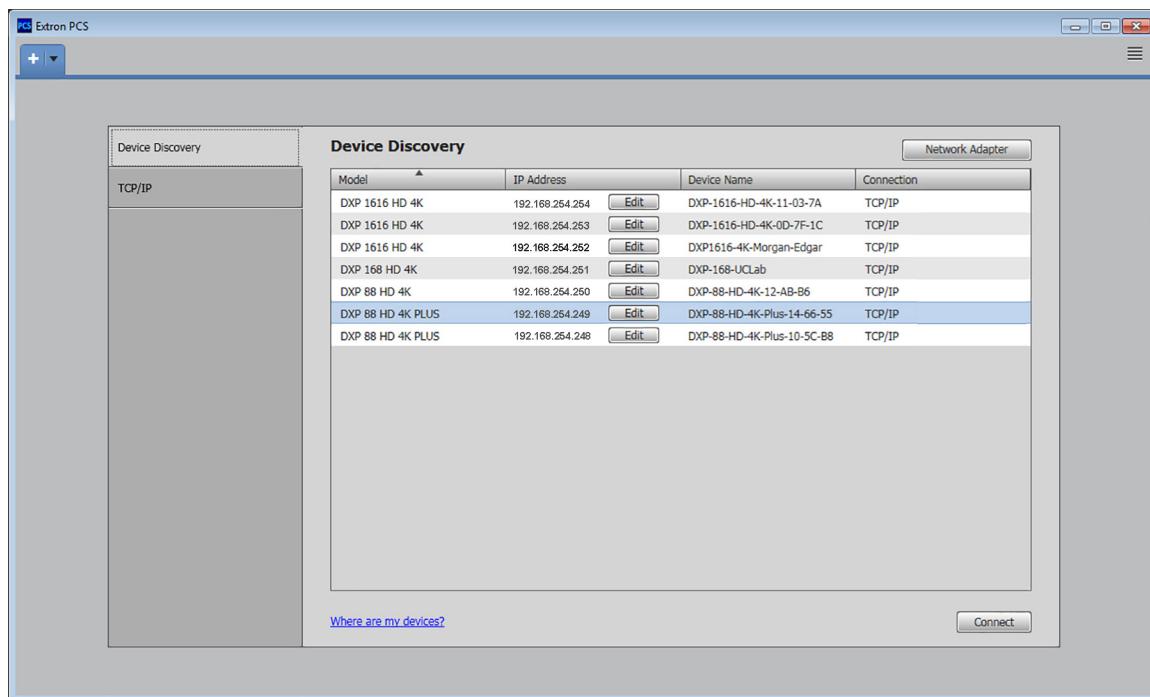


Figure 36. PCS Window

Offline device configuration is not supported with the DXP HD 4K PLUS Series, but the configuration screens and panels can still be viewed.

NOTES:

- PCS versions prior to 2.0 do not have the Device Discovery feature. If possible, update the PCS version from the [Extron website](#). If that is not possible, connect to the switcher by choosing the connection method and submitting the required information in the current PCS version.
- Verify that the current version of PCS supports the desired device by reviewing the software Release Notes, also available on the Extron website.

Device Discovery Panel

The Device Discovery panel displays accessible Extron devices connected directly to the PC or to a LAN or WAN. Devices are identified and sorted by model, IP address, device name, or connection method.

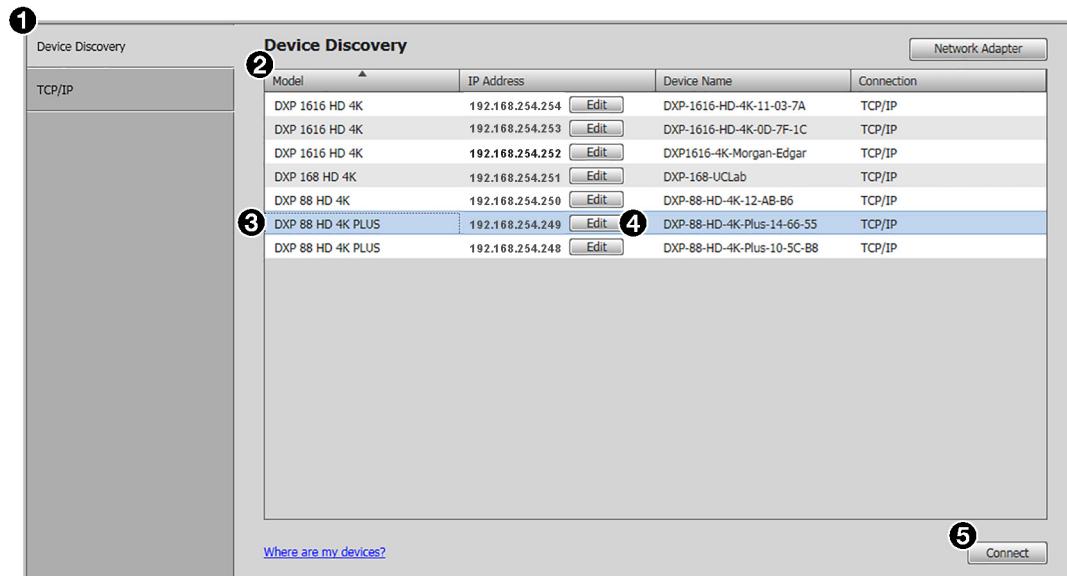


Figure 37. Device Discovery Panel

To sort the list of available devices:

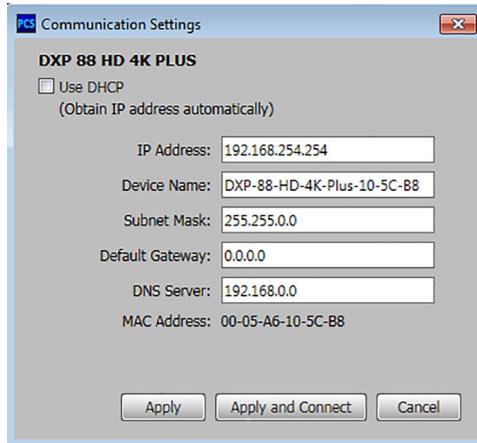
1. Click the **Device Discovery** tab (see figure 37, ①).
2. Click the desired column heading (②) to sort the category in ascending or descending order.

To connect to a device:

1. Click the **Device Discovery** tab (①).
2. Select the desired device (③).
3. Click the **Connect** button (⑤). A new device configuration tab opens.

To edit communication settings from the Device Discovery panel:

1. Click the **Device Discovery** tab (①).
2. Click the **Edit** button of the desired device (④). The **Communication Settings** dialog box opens.
3. Enter the IP information (see **Communication Settings Panel** on page 67 for configuration details).
4. Finalize the settings in one of the following ways:
 - Click the **Apply** button to accept the changes and return to the **Device Discovery** panel.
 - Click the **Apply and Connect** button to accept the changes and connect to the selected device. A new device configuration tab opens.
 - Click the **Cancel** button to cancel any pending changes and return to the **Device Discovery** panel.



TCP/IP Panel

The TCP / IP panel connects PCS to a specific device through Ethernet.



Figure 38. TCP/IP Panel

1. Click the **TCP / IP** tab (see figure 38, ①).
2. In the **IP Address** field (②), enter the IP address of the desired device.
3. If required, enter the device password in the **Password** field (③).

NOTE: Select the **Show Characters** checkbox (see ⑤) to display the password characters.

4. In the **Telnet Port** field (④), enter the Telnet port of the desired device.
5. Click the **Connect** button (⑥). A new device tab opens.

Offline Device Preview

Opening a new device tab for an offline device displays the interface and configuration options for the chosen model without connecting to it. However, settings cannot be changed.

To open a switcher device tab:

1. In the **Start-up** drop-down menu, select **New Configuration File**. The New Configuration File dialog box opens.

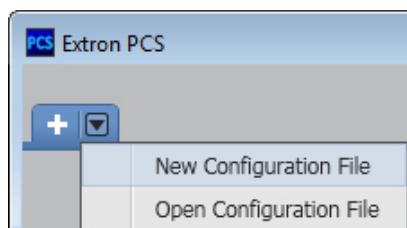


Figure 39. Configuration File Drop-Down Menu

NOTE: The **Open Configuration File** option is not available for the DXP HD 4K PLUS Series.

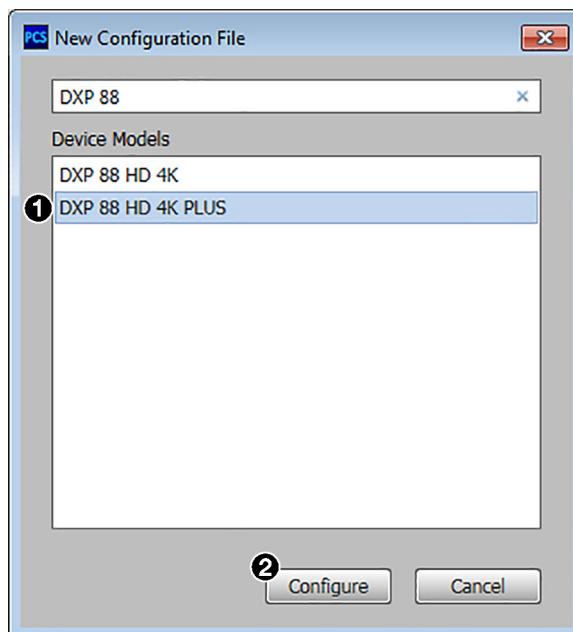


Figure 40. New Configuration File Dialog Box (DXP 88 HD 4K PLUS Selected)

2. Select the desired device model from the Device Models list (see figure 40, ①).
3. Click the **Configure** button (②). A new offline device configuration tab opens.

Help File Access

PCS contains two help files: one for PCS and one for the connected switcher.

The *Product Configuration Software Help* file contains information about PCS and how to use it. To access the help file, click **Extron PCS Help** from the **Software** menu in the top right corner.

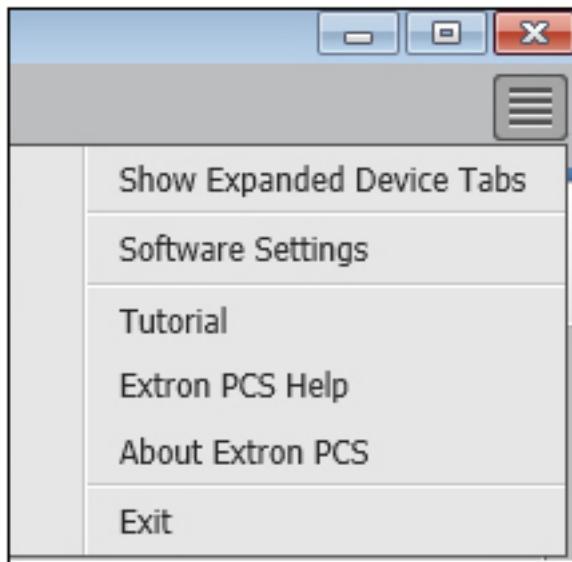


Figure 41. Software Menu

The *DXP HD 4K PLUS Series Help* file contains information about configuring the connected switcher. To access the help file, either connect to a device (see **Software Connection** on page 60) or open an offline device tab (see **Offline Device Preview** on the previous page). From the **Device** menu, click **[product] Help**. The actual option displays the name of the connected device.

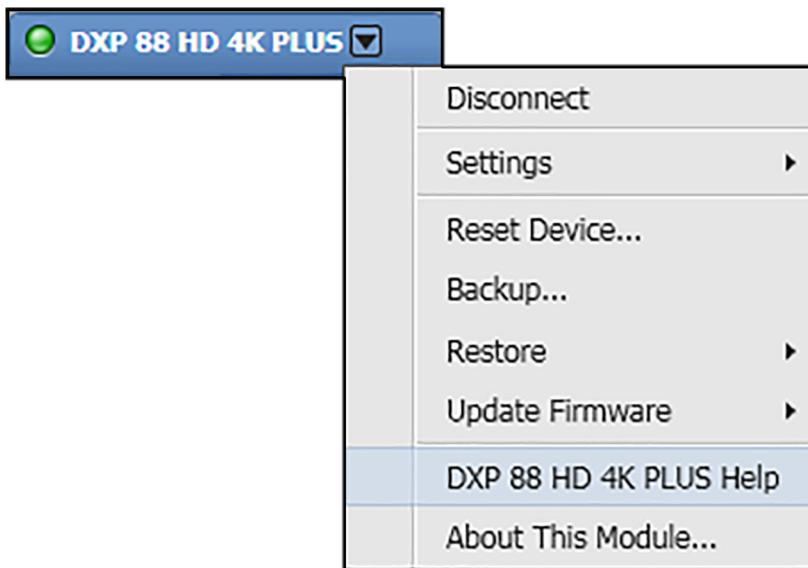


Figure 42. Device Menu

Internal Web Page

This section provides procedures for accessing and using the DXP HD 4K PLUS internal web page. Topics in this section include:

- [Web Page Access](#)
- [Web Page Components](#)

The internal web page displays information about the device and provides basic configuration options. For more detailed configuration options, use SIS commands (see [SIS Configuration and Control](#), beginning on page 35) or PCS (see [Configuration Software](#), beginning on page 57, and the DXP HD 4K PLUS PCS help file).

Web Page Access

To access the internal web page:

1. Connect the switcher to a LAN or WAN using the rear panel LAN connector (see [Connecting to the LAN Port](#) on page 9).
2. On a connected PC, open a web browser.

NOTES:

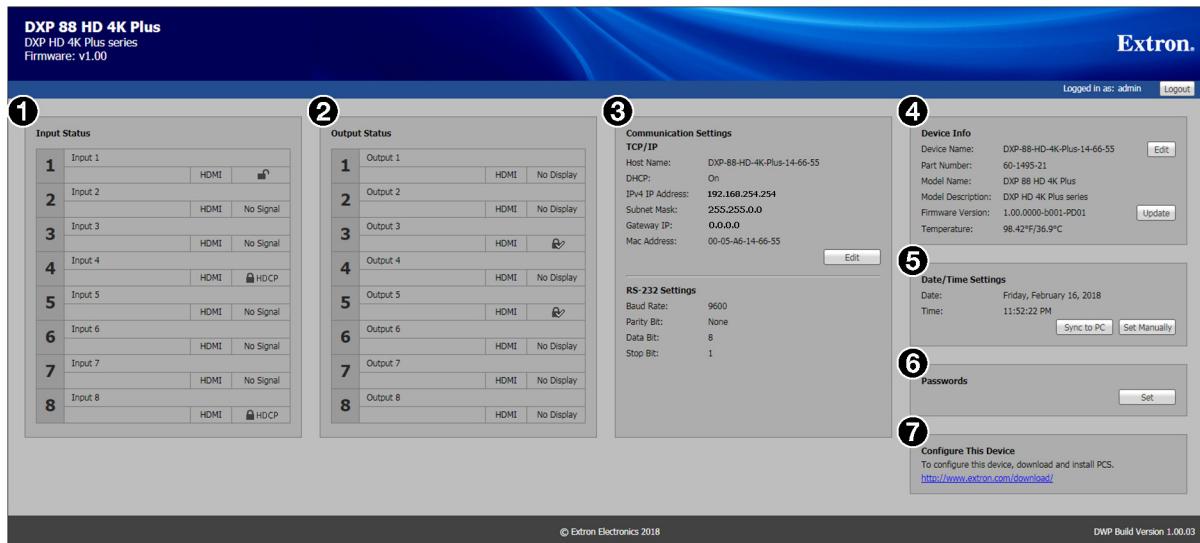
- The internal web page does not support compatibility mode in Microsoft Internet Explorer®.
- If the Ethernet connection to the switcher is unstable, try turning off the proxy server in the web browser.

3. Enter the IP address of the device in the browser **Address** field.

NOTE: The default IP address is 192.168.254.254.

4. Press the <Enter> key on the keyboard.
5. The switcher checks if the device is password-protected and performs one of the following:
 - If the device is not password-protected, the web page opens.
 - If the device is password-protected, enter a user name (**user** or **admin**) in the **User Name** field and the password in the **Password** field when prompted.
6. Click the **OK** button.

Web Page Components



- | | | |
|---|---|--|
| ① Input Status Panel
② Output Status Panel
③ Communication Settings Panel | ④ Device Info Panel
⑤ Date/Time Settings Panel | ⑥ Passwords Panel
⑦ Configure This Device Panel |
|---|---|--|

Figure 43. Internal Web Page

Input Status Panel

The Input Status panel (see figure 43, ①) displays information about the connected inputs. The number of inputs displayed depends on the number of inputs available on the DXP HD 4K PLUS Series model.

Each input is identified by number in the left column. For each input, the following information is displayed:

- **Input name** — Displays the name of the input.
- **Signal type** — Displays the signal type of the input.
- **HDCP encryption** — Displays the HDCP encryption status of the input (see the table below for symbol definitions).

Symbol	Definition
	The signal is HDCP encrypted.
	The signal is not encrypted.
—	Unable to determine the HDCP status.
No Signal	There is no signal detected.

Output Status Panel

The Output Status panel (see [figure 43, 2](#), on the previous page) displays information about the connected outputs. The number of outputs displayed depends on the number of outputs available on the DXP HD 4K Series model. Each output is identified by a number in the left column. For each output, the following information is displayed:

Output name — Displays the name of the output.

Output format — Displays the format of the output.

HDCP compliance — Displays the HDCP compliance status of each output (see the table below for symbol definitions).

Symbol	Definition
	The display is HDCP compliant. Either: <ul style="list-style-type: none">• The display is connected and supports HDCP but is not currently encrypted, or• The display is connected, supports HDCP, and is currently encrypted.
	The display is not HDCP compliant.
-	Unable to determine the HDCP status.
No Display	There is no display detected.

Communication Settings Panel

The Communication Settings panel (see [figure 43, 3](#)) enables you to configure TCP/IP settings and displays RS-232 settings (the RS-232 settings cannot be edited).

To configure the TCP/IP settings, click the **Edit** button in the Communication Settings panel. The Communication Settings dialog box opens.

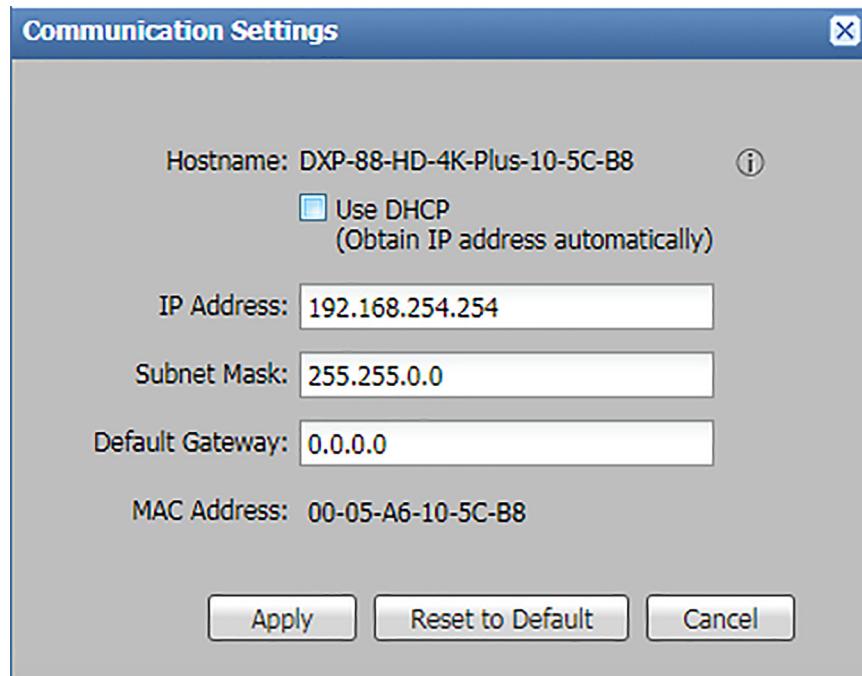


Figure 44. Communication Settings Dialog Box

NOTE: The hostname is generated from the device name. To change it, see [Setting the device name](#) on the next page.

To obtain an IP address automatically:

1. Select the **Use DHCP** checkbox.
2. Click the **Apply** button. The dialog box closes.

To set a static IP address:

1. Ensure the **Use DHCP** checkbox is not selected.
2. In the **IP Address** field, enter an IP address.
3. In the **Subnet Mask** field, enter the subnet mask if required.
4. In the **Default Gateway** field, enter the default gateway if required.
5. Click the **Apply** button. The dialog box closes.

To reset all communication settings to the default values:

Click the **Reset to Default** button. The following settings are reset:

- DHCP is disabled.
- The IP address is set to 192.168.254.254.
- The subnet mask is set to 255.255.0.0.
- The default gateway is set to 0.0.0.0.

To cancel pending changes:

Click the **Cancel** button. The dialog box closes.

Device Info Panel

The Device Info panel (see [figure 43, ④](#) on page 66) displays information about the device with options to edit the device name and update firmware.

Setting the device name

To edit the device name or hostname, click the **Edit** button in the Device Info panel. The Device Name dialog box opens.

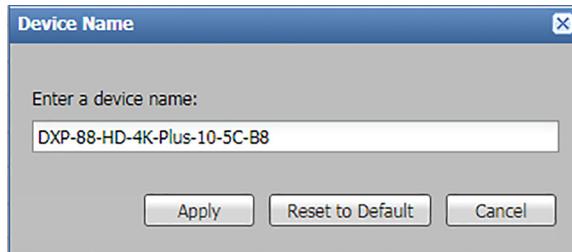


Figure 45. Device Name Dialog Box

To change the name:

1. In the **Enter a Device Name** field, enter a name for the DXP.
2. Click the **Apply** button. The dialog box closes.

To reset the name to the default value:

1. Click the **Reset to Default** button.
2. Click the **Apply** button. The dialog box closes.

To cancel pending changes:

Click the **Cancel** button. The dialog box closes.

Updating firmware

NOTE: If necessary, download firmware updates from www.extron.com.

To update the firmware, click the **Update** button in the Device Info panel. The Firmware Update dialog box opens.



Figure 46. Firmware Update Dialog Box

To update the firmware:

1. Click the **Browse** button. The **File Upload** dialog box opens.
2. Navigate to the location of the firmware file. Valid firmware files have an .eff extension.
3. Select the file and click the **Open** button. The **File Upload** dialog box closes.
4. Click the **Upload** button. The **Firmware Update** dialog box closes.

While the firmware is being updated, status messages are displayed, indicating when the firmware is uploading, initializing, then installing. The DXP reboots, then displays a message indicating that the firmware update is complete.

To cancel pending changes:

Click the **Cancel** button. The dialog box closes.

Date/Time Settings Panel

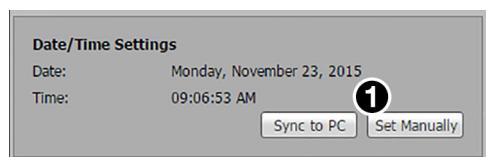
The Date/Time Settings panel (see [figure 43, 5](#), on page 66) displays the date and time on the device and provides options to set the device date and time automatically or manually.

Updating date and time automatically

This method sets the device date and time to the same date and time of the PC. To do this, click the **Sync to PC** button in the Date/Time Settings panel.

Updating date and time manually

With this method, each value of the date and time must be set. To edit the date and time manually, click the **Set Manually** button in the Date/Time Settings panel (see **1** in the figure at right). The Date and Time Settings dialog box opens.



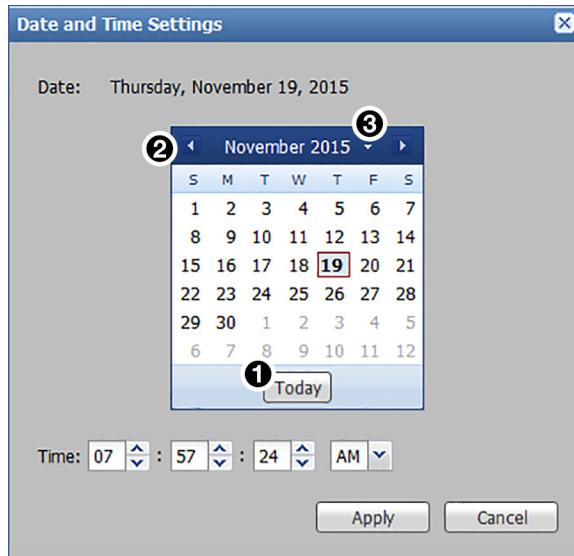


Figure 47. Date and Time Settings Dialog Box

To set the date and time:

1. Set the date by one of the following methods:
 - Click the **Today** button to set the date to the current date on the PC (see figure 47, ①).
 - Select the date from the calendar by doing either of the following:
 - Click the left and right arrow buttons in the calendar heading (②).
 - Click the drop-down menu next to the calendar month and year (③), and select the desired month and year. Click the **OK** button to accept the selected settings or the **Cancel** button to cancel pending selections.
2. To set the time, click the up and down arrow buttons for each field to set the hours, minutes, seconds, and AM or PM as desired. Alternatively, enter the desired value in each field.
3. Click the **Apply** button. The dialog box closes and the new values are applied.

To cancel pending changes:

Click the **Cancel** button. The dialog box closes.

Passwords Panel

The Passwords panel (see [figure 43, 6](#) on page 66) provides an option to set administrator or user passwords. To assign passwords, click the **Set** button in the Passwords panel. The Passwords dialog box opens. (By default, both passwords are set to a carriage return.)

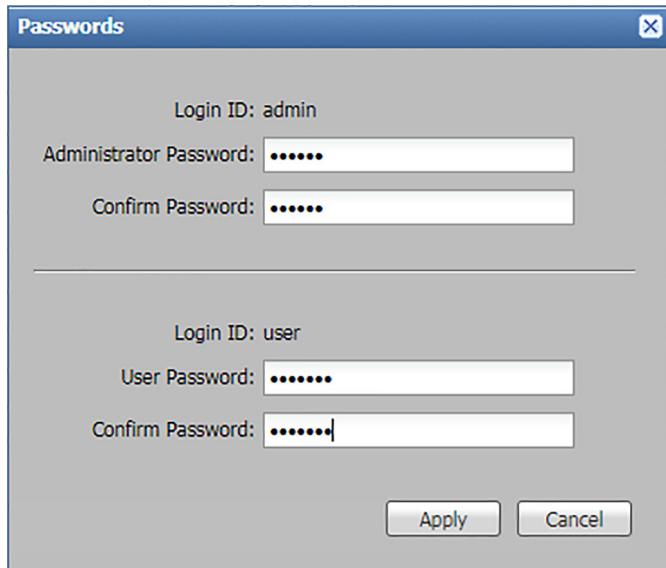


Figure 48. Passwords Dialog Box

To assign an administrator password:

1. In the **Administrator Password** field, enter the new password.
2. In the **Confirm Password** field directly under the **Administrator Password** field, enter the same password from the field above.
3. Click the **Apply** button. The dialog box closes.

To assign a user password:

1. Ensure an administrator password is assigned.
2. In the **User Password** field, enter the new password.
3. In the **Confirm Password** field directly under the **User Password** field, enter the same password from the field above.
4. Click the **Apply** button. The dialog box closes.

To remove a password:

1. In either the **Administrator Password** or **User Password** field, delete any existing password, leaving the field blank.
2. In the corresponding **Confirm Password** field, press the <Space> key on the keyboard.
3. Click the **Apply** button. The dialog box closes.

To cancel pending changes:

Click the **Cancel** button. The dialog box closes.

Configure This Device Panel

This panel (see [figure 43, 7](#), on page 66) contains a link to the Download page on the Extron website. From this page you can download and install the PCS configuration program. This software enables you to configure the input and output, set audio connections, manage EDID files, and so on.

Reference Information

This section provides reference information on the DXP HD 4K PLUS Series. The following topics are discussed:

- **Mounting the Switcher**
- **Network Setup**

Mounting the Switcher

The DXP HD 4K PLUS series switchers can be placed on a table top (with the four provided rubber feet attached) or mounted to a standard 19-inch rack.

UL Guidelines for Rack Mounting

The following Underwriters Laboratories (UL) guidelines pertain to the installation of the DXP into a rack:

- **Elevated operating ambient temperature** — If the equipment is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consider installing the equipment in an environment compatible with the maximum ambient temperature (T_{ma}) specified by Extron.
- **Reduced air flow** — Install the equipment in the rack so that the amount of air flow required for safe operation of the equipment is not compromised.
- **Mechanical loading** — Mount the equipment in the rack so that uneven mechanical loading does not create a hazardous condition.
- **Circuit overloading** — When connecting the equipment to the supply circuit, consider the connection of the equipment to the supply circuit and the effect that circuit overloading might have on overcurrent protection and supply wiring. Consider equipment nameplate ratings when addressing this concern.
- **Reliable earthing (grounding)** — Maintain reliable grounding of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (such as the use of power strips).

Rack Mounting Procedures

Using a 19-inch rack shelf kit (available at www.extron.com), mount the unit to the rack, following the instructions provided with the mounting kit.

Network Setup

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 DXP 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	192.168.180.41
DXP HD 4K PLUS switcher	192.168.180.42

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	168.192.180.41
DXP HD 4K PLUS switcher	192.168.180.42

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 77, for more information.)

Pinging for the IP Address

To access the DXP 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 DXP switcher.

Ping to determine Extron IP address

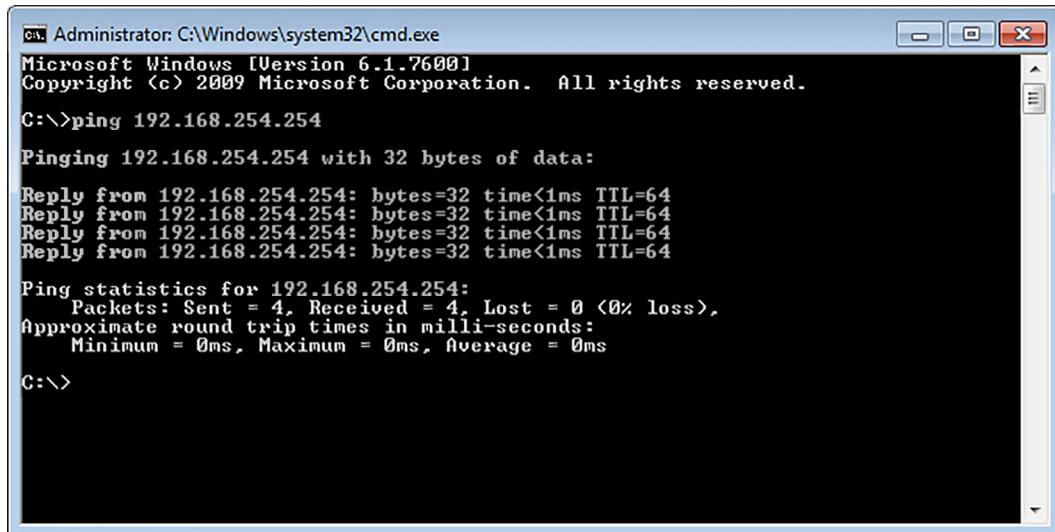
The Ping utility is available at the command prompt. Ping tests the Ethernet interface between the computer and the DXP switcher. Ping can also be used to determine the actual numeric IP address from an alias and to determine the web address.

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 49.

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



```
Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7600]
Copyright <c> 2009 Microsoft Corporation. All rights reserved.

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<1ms TTL=64

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

C:>
```

Figure 49. Ping Response

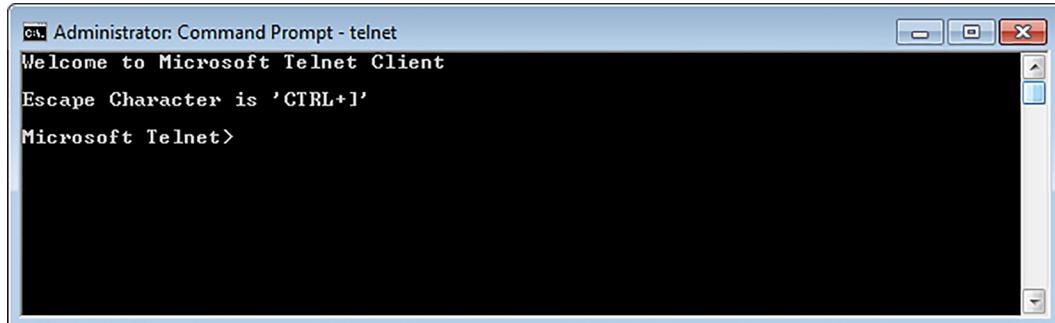
Connecting as a Telnet Client

The Telnet utility is available from the command prompt (you may need to install the Telnet client on your PC first). Telnet allows you to input SIS commands to the DXP switcher from the PC via the Ethernet link and the LAN.

Starting Telnet

Access the command prompt and start Telnet as follows:

1. On the **Start** menu, enter **telnet** in the **Search** field.
2. Click **OK**. The computer returns a display similar to figure 50.



```
Administrator: Command Prompt - telnet
Welcome to Microsoft Telnet Client
Escape Character is 'CTRL+J'
Microsoft Telnet>
```

Figure 50. Telnet Screen

Operating using Telnet

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

Connecting to the DXP (Open command)

Connect to the DXP 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 link.

Connect to the DXP as follows:

- 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 DXP 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 DXP 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 DXP 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+J”**. This means that the Telnet **Escape character** is a key combination: the <Ctrl> key and the <J> key pressed simultaneously. Pressing these keys displays the Telnet prompt while leaving the connection to the DXP switcher intact.

Local echo

Once your computer is connected to the DXP 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 DXP switcher, and you need to access the Telnet prompt to turn local echo off, enter the **Escape** sequence (<Ctrl + J>).

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 DXP switcher, access the Telnet prompt by entering the Escape sequence (<Ctrl +]>).

Subnetting, a Primer

A subnet is a subset of a network — 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 DXP switcher and the mail server gateway. To understand subnetting at the level required to install and operate the DXP switcher, you must understand the concepts of a gateway, local and remote devices, IP addresses and octets, and subnet masks and octets.

Gateways

The DXP 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).

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 (see figure 51). 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.

Typical IP Address: 192.168.254.254
Octets

Figure 51. IP Address and Octets

Subnet masks and octets

The subnet mask (see figure 52) 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 should be compared when determining if two devices are on the same subnet.

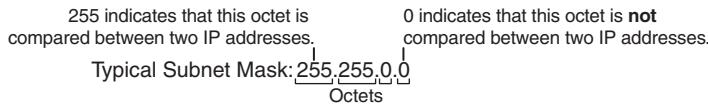


Figure 52. Subnet Mask and Octets

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 53). 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 53).

- 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 53).

If the unmasked octets of the two IP addresses **match** (indicated by = in example 1 of figure 53), the two addresses **are on the same subnet**.

If the two unmasked fields **do not match** (indicated by an unequal sign in figure 53, 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 53. 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.

Europe and Africa:

Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

Asia:

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

Japan:

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

China:

Extron China
686 Ronghua Road
Songjiang District
Shanghai 201611
China

Middle East:

Extron Middle East
Dubai Airport Free Zone
F13, 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 begins 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.