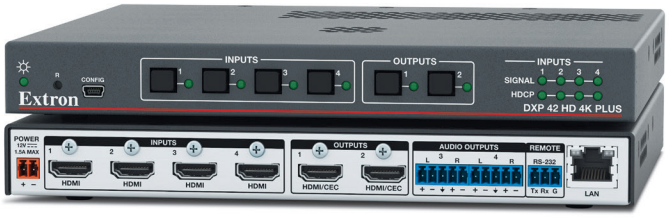
User Guide

Matrix Switchers

DXP HD 4K PLUS Series

4K HDMI Switchers



Extron

68-2939-01 Rev. F
03 20

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.

For information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics, see the Extron Safety and Regulatory Compliance Guide, part number 68-290-01, on the Extron website, **www.extron.com**.

Sicherheitsanweisungen • Deutsch

WARNUNG: Dieses Symbol ⚠ auf dem Produkt soll den Benutzer darauf aufmerksam machen, dass im Inneren des Gehäuses dieses Produktes gefährliche Spannungen herrschen, die nicht isoliert sind und die einen elektrischen Schlag verursachen können.

VORSICHT: Dieses Symbol ⚠ auf dem Produkt soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.

Weitere Informationen über die Sicherheitsrichtlinien, Produkthandhabung, EMI/EMF-Kompatibilität, Zugänglichkeit und verwandte Themen finden Sie in den Extron-Richtlinien für Sicherheit und Handhabung (Artikelnummer 68-290-01) auf der Extron-Website, **www.extron.com**.

Instrucciones de seguridad • Español

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ATENCIÓN: Este símbolo, ⚠, cuando se utiliza en el producto, avisa al usuario de la presencia de importantes instrucciones de uso y mantenimiento recogidas en la documentación proporcionada con el equipo.

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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

AVVERTENZA: Il simbolo, ⚠, se usato sul prodotto, serve ad avvertire l'utente della presenza di tensione non isolata pericolosa all'interno del contenitore del prodotto che può costituire un rischio di scosse elettriche.

ATTENTZIONE: 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.

Per informazioni su parametri di sicurezza, conformità alle normative, compatibilità EMI/EMF, accessibilità e argomenti simili, fare riferimento alla Guida alla conformità normativa e di sicurezza di Extron, cod. articolo 68-290-01, sul sito web di Extron, **www.extron.com**.

Instrukcje bezpieczeństwa • Polska

OSTRZEŻENIE: Ten symbol, ⚠, gdy używany na produkt, ma na celu poinformować użytkownika o obecności izolowanego i niebezpiecznego napięcia wewnątrz obudowy produktu, który może stanowić zagrożenie porażenia prądem elektrycznym.

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

Informacji na temat wytycznych w sprawie bezpieczeństwa, regulacji wzajemnej zgodności, zgodność EMI/EMF, dostępności i Tematy pokrewne, zobacz Extron bezpieczeństwa i regulacyjnego zgodności przewodnik, część numer 68-290-01, na stronie internetowej Extron, **www.extron.com**.

Инструкция по технике безопасности • Русский

ПРЕДУПРЕЖДЕНИЕ: Данный символ, ⚠, если указан на продукте, предупреждает пользователя о наличии неизолированного опасного напряжения внутри корпуса продукта, которое может привести к поражению электрическим током.

ВНИМАНИЕ: Данный символ, ⚠, если указан на продукте, предупреждает пользователя о наличии важных инструкций по эксплуатации и обслуживанию в руководстве, прилагаемом к данному оборудованию.

Для получения информации о правилах техники безопасности, соблюдении нормативных требований, электромагнитной совместимости (ЭМП/ЭДС), возможности доступа и других вопросах см. руководство по безопасности и соблюдению нормативных требований Extron на сайте Extron: , **www.extron.com**, номер по каталогу - 68-290-01.

安全说明 • 简体中文

警告: ⚠产品上的这个标志意在警告用户该产品机壳内有暴露的危险 电压，有触电危险。

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。

关于我们产品的安全指南、遵循的规范、EMI/EMF 的兼容性、无障碍使用的特性等相关内容，敬请访问 Extron 网站 , **www.extron.com**，参见 Extron 安全规范指南，产品编号 68-290-01。

安全記事 • 繁體中文

警告: ⚠ 若產品上使用此符號，是為了提醒使用者，產品機殼內存在著可能會導致觸電之風險的未絕緣危險電壓。

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有關安全性指導方針、法規遵守、EMI/EMF 相容性、存取範圍和相關主題的詳細資訊，請瀏覽 Extron 網站:**www.extron.com**，然後參閱《Extron 安全性與法規遵守手冊》，準則編號 68-290-01。

安全上のご注意 • 日本語

警告: この記号⚠が製品上に表示されている場合は、筐体内に絶縁されていない高電圧が流れ、感電の危険があることを示しています。

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安全上のご注意、法規厳守、EMI/EMF適合性、その他の関連項目については、エクストロンのウェブサイト **www.extron.com** より『Extron Safety and Regulatory Compliance Guide』(P/N 68-290-01) をご覧ください。

안전 지침 • 한국어

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

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

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FCC Class A Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. The Class A limits provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference. This interference must be corrected at the expense of the user.

NOTE: 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.

VCCI-A Notice

この装置は、クラスＡ情報技術装置です。この装置を家庭環境で使用すると、電波妨害を引き起こすことがあります。その場合には使用者が適切な対策を講ずるよう要求されることがあります。
ＶＣＣＩ－Ａ

Battery Notice

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.

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,,0p1 scene 1,1 ^B 51 ^W^C.0
[01] R 0004 00300 00400 00800 00600 [02] 35 [17] [03]
Esc X1 * X17 * X20 * X23 * X21 CE ←
```

NOTE: For commands and examples of computer or device responses used in this guide, the character "0" is 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 208.132.180.48: bytes=32 times=2ms TTL=32
C:\Program Files\Extron
```

Variables are written in slanted form as shown here:

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

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

From the **File** menu, select **New**.
Click the **OK** button.

Specifications Availability

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

Extron Glossary of Terms

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

Contents

Introduction

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

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 42 HD 4K PLUS** — 4 inputs by 2 outputs with 2 audio outputs
- **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 (DXP 44, 84, and 88 only)** — 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 (DXP 44, 84, and 88 only)** — 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 transmissions**
- **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 (DXP 44, 84, and 88 only)** — 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 (DXP 44, 84, and 88 only)** — The DXP HD 4K PLUS 44, 84, and 88 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 (DXP 44, 84, and 88 only)** — 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 (DXP 44, 84, and 88 only)** — 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 50). (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 EDID from output 1
10	Output 2	N/A	Automatically populated with sink EDID from output 2
11	Output 3	N/A	Automatically populated with sink EDID from output 3
12	Output 4	N/A	Automatically populated with sink EDID from output 4
13	Output 5	N/A	Automatically populated with sink EDID from output 5
14	Output 6	N/A	Automatically populated with sink EDID from output 6
15	Output 7	N/A	Automatically populated with sink EDID from output 7
16	Output 8	N/A	Automatically populated with sink EDID from output 8

DXP 44 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 EDID from output 1
6	Output 2	N/A	Automatically populated with sink EDID from output 2
7	Output 3	N/A	Automatically populated with sink EDID from output 3
8	Output 4	N/A	Automatically populated with sink EDID from output 4

DXP 42 HD 4K PLUS (4 x 2)

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 EDID from output 1
6	Output 2	N/A	Automatically populated with sink EDID from output 2

Application Diagrams

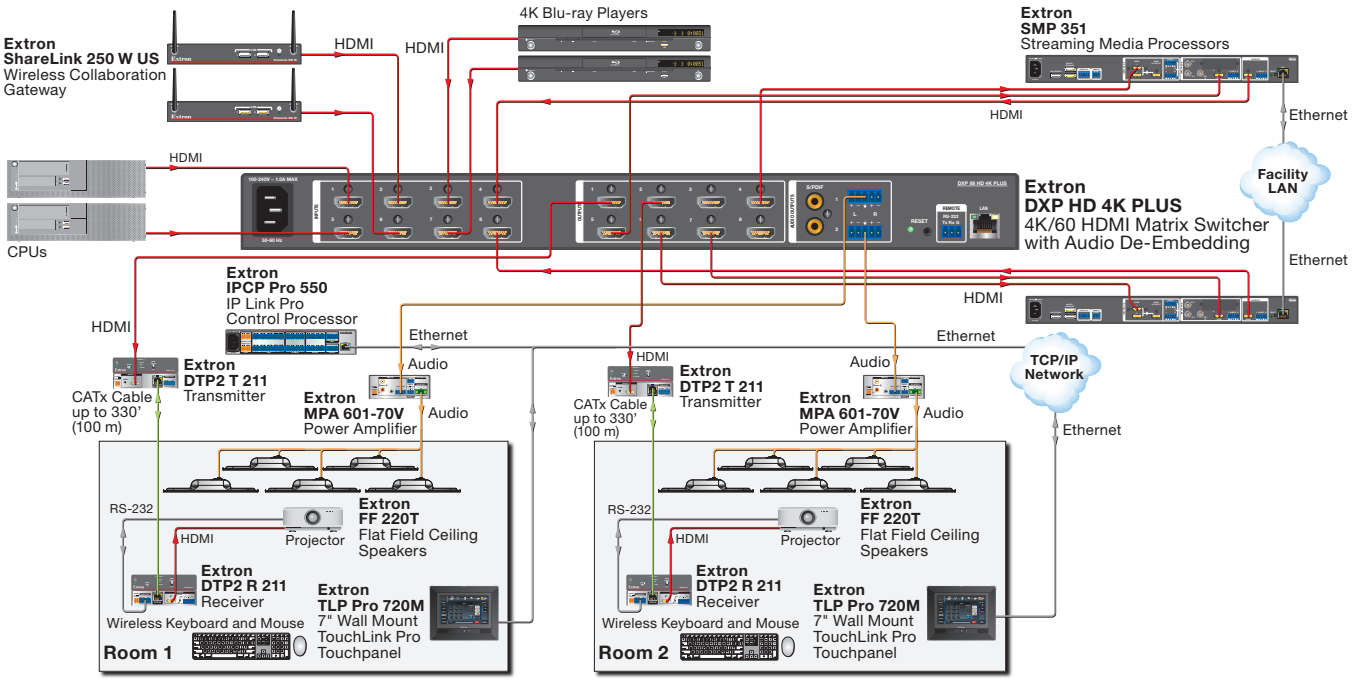


Figure 1. **Application Diagram for a DXP 88 HD 4K PLUS**

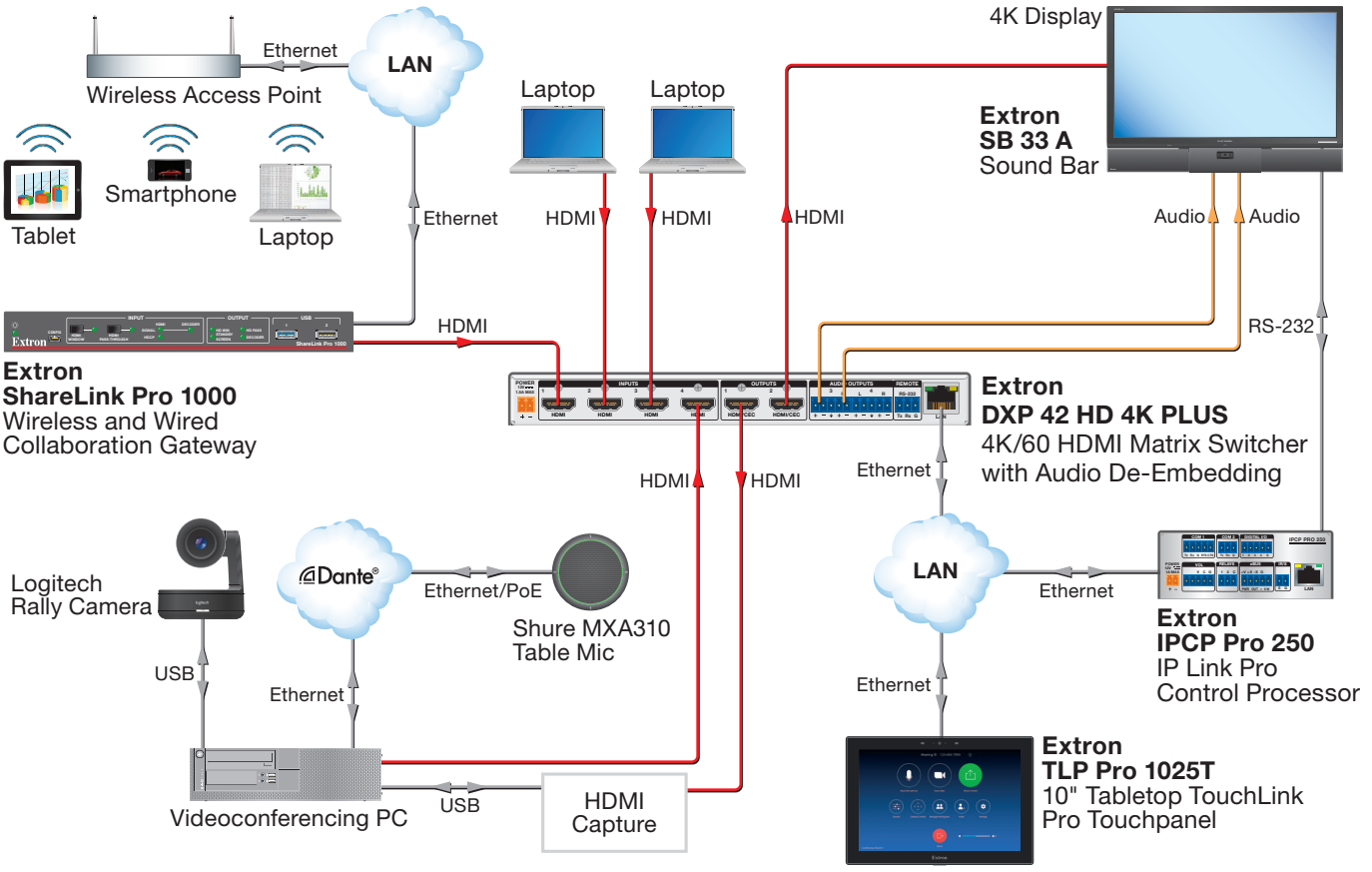


Figure 2. **Application Diagram for a DXP 42 HD 4K PLUS**

Installation

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

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

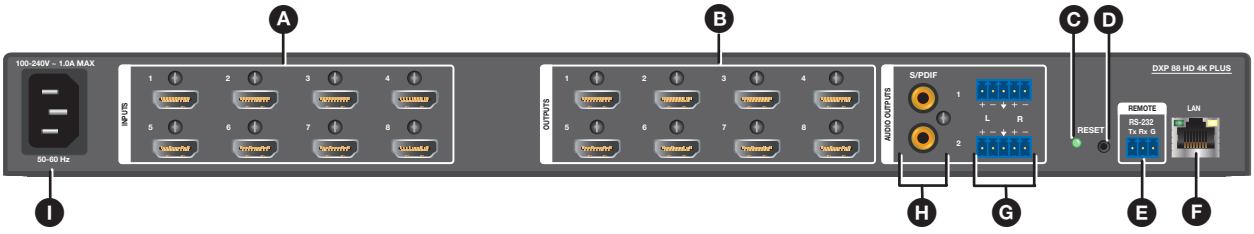
Rear Panels

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.

DXP 44, 84, and 88 Rear Panel



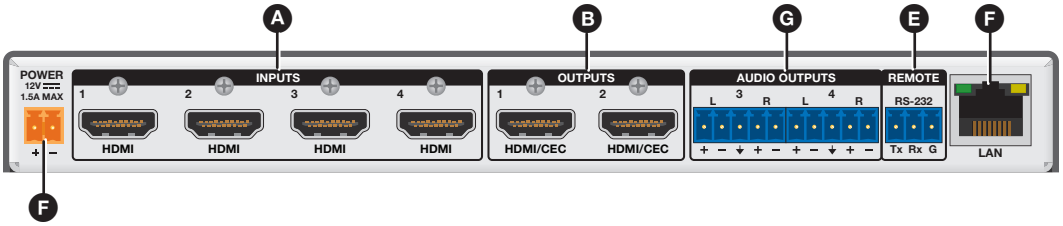
- A **Input connectors**
- B **Output connectors**
- C **Reset LED**
- D **Reset button**
- E **Remote RS-232 port**
- F **LAN port**
- G **Analog audio outputs**
- H **S/PDIF audio outputs**
- I **AC power connector**

Figure 3. DXP 88 HD 4K Plus Rear Panel

NOTE: Figure 3 shows a DXP 88 HD 4K PLUS. The rear panels of the DXP 44 and DXP 84 models are identical to it 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

DXP 42 Rear Panel



Ⓐ **Input connectors**
Ⓑ **Output connectors**
Ⓔ **Remote RS-232 port**
Ⓕ **LAN port**
Ⓖ **Analog audio outputs**
Ⓘ **Power connector**

Figure 4. DXP 42 HD 4K Rear Panel

Rear Panel Features

Ⓐ **Input connectors** — Connect HDMI source devices (or DVI sources with the appropriate adapters) to these female 19-pin type A HDMI input connectors (see **figure 3**, Ⓐ, on the previous page, or figure 4, Ⓐ).

LockIt cable lacing brackets, one for each HDMI input and output connector, are provided with the DXP. 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 13.

Ⓑ **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**).

Ⓒ **Reset LED** — (DXP 44, 84, and 88 only) This green LED remains lit while the DXP has power. While the **Reset** button (Ⓓ) 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 32 for more information).

NOTE: The factory configured passwords for all accounts on this device have been set to the device serial number.

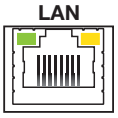
Performing a unit factory reset (entering an Esc **ZQQQ ← SIS command** or a **reset mode 5** via the rear panel **Reset** button) removes the serial number passwords, leaving the unit with no password.

Ⓓ **Reset button** — (DXP 44, 84, and 88 only) 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**).

Ⓔ **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 12 for more information).

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 (see **figure 3**, **E**, on page 7, or **figure 4**, **E**, on the previous page). 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 10).



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

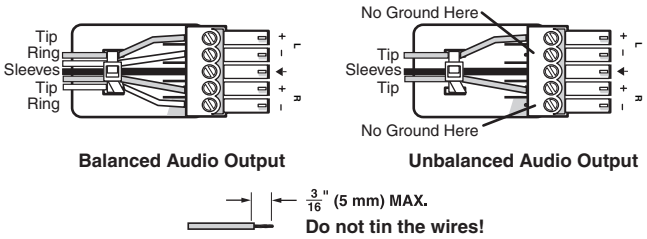


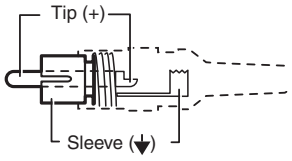
Figure 5. Wiring the Captive Screw Analog Audio Output Connectors

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 (Sony/Philips Digital Interface Format) digital audio outputs (DXP 44, 84, and 88 only) — 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, and **figure 3**, H, on page 7). 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 Power connector —

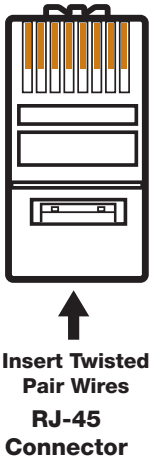
- **DXP 44, 84, and 88** — Connect a standard IEC power cord (provided) to this IEC connector (see **figure 3**, I, on page 7) and to an AC source.
- **DXP 42** — Connect 12 V, 1.5 A power supply (provided) to the rear panel 2-pole captive screw connector (see **figure 4**, I, on page 8).

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 6** on the next page). 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, as this can cause transmission errors.



Crossover Cable

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

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

Straight-through Cable

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

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

Figure 6. 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 7.

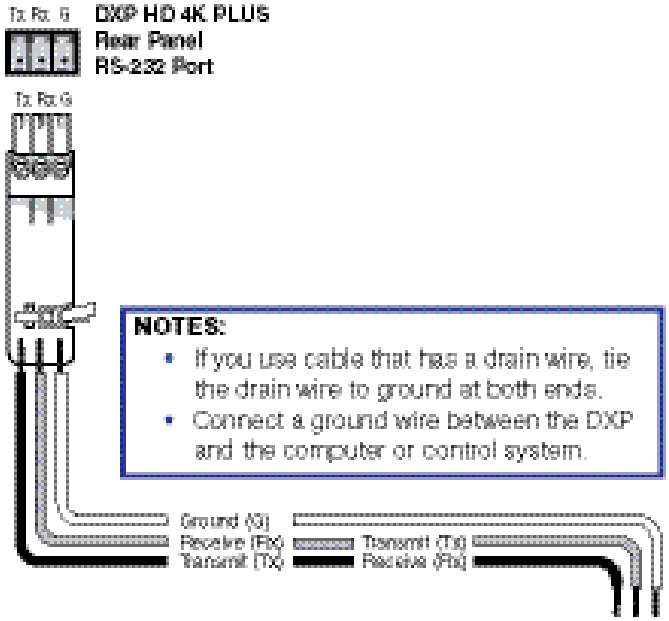


Figure 7. Wiring the Remote RS-232 Connector

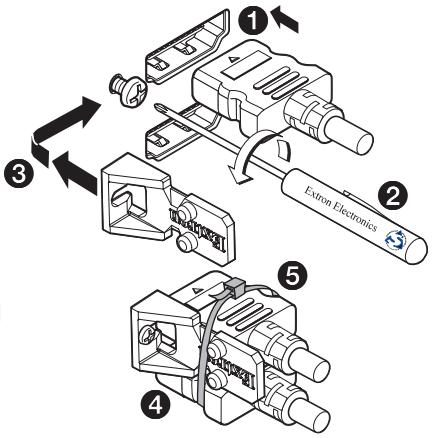
See **SIS Configuration and Control** starting on page 39, for definitions of the SIS commands, and **Configuration Software** starting on page 79, for details on how to install and use the control software.

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.

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 (❶).
2. Loosen the HDMI connection mounting screw from the panel enough to allow the LockIt lacing bracket to be placed over it (❷).
3. Place the LockIt lacing bracket onto the screw and slide it up against the HDMI connectors. Tighten the screw to secure the bracket (❸).

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 (❹).
5. While holding the connector securely against the lacing bracket, tighten the tie wrap, then remove any excess length (❺).

Operation

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

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** — (DXP 44, 84, and 88 only) 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** — (DXP 44, 84, and 88 only) 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** — (DXP 44, 84, and 88 only) 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

All DXP HD 4K PLUS switchers have input and output buttons. At the right of each button is an 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 panels also contain HDCP and signal status LEDs, which indicate the encryption status and signal presence for each input.

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

- **DXP 44, 84, and 88** — The buttons on the DXP 44, 84, and 88 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. The button LEDs are bicolor and light green if video has been selected for the associated input or red if audio has been selected.

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

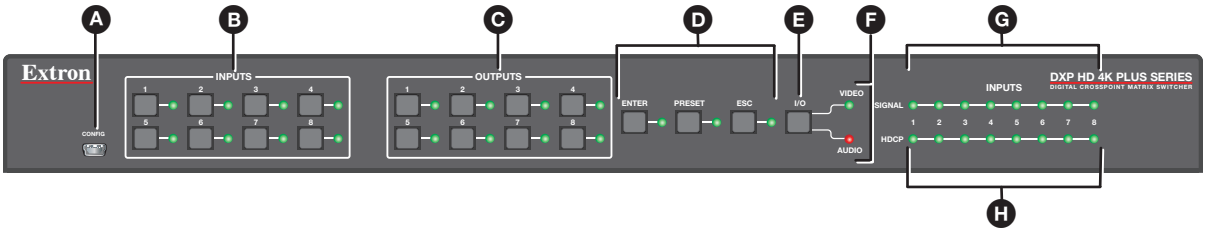
  NOTE: Although the DXP 44 and 84 both have eight input and eight output buttons, not all these buttons are functional for making ties:

  - **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 25).
  - **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.

  When the DXP 44, 84, or 88 switcher is in power-save mode 1 or 2 (see the **Power Save Mode** on page 57), all front-panel indicators are unlit with the exception of the I/O Video LED, which blinks continuously.

- **DXP 42** — The DXP 42 front panel has four input buttons and two output buttons. To the right of each button is a green LED that lights when the button is pressed. After approximately 5 seconds, the LED turns off. If a button is pressed for an input with ties to another input, the buttons for all tied inputs light as well.

DXP 44, 84, and 88 Front Panel

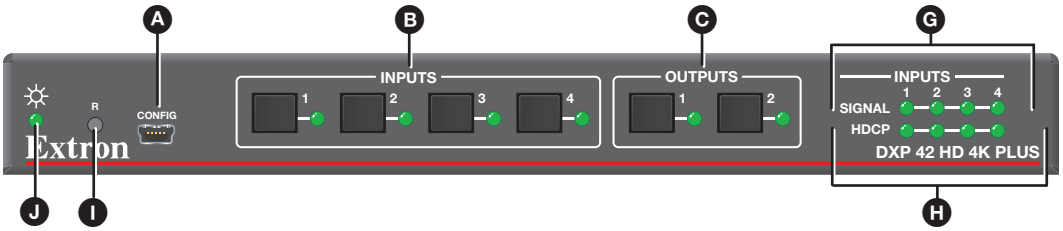


- A Config port
- B Input buttons
- C Output buttons
- D Control buttons
- E I/O button
- F Audio and Video LEDs
- G Signal LEDs
- H HDCP LEDs

Figure 8. DXP HD 4K PLUS 88 Series Front Panel

Figure 8 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.

DXP 42 Front Panel



- **A** Config port
- **B** Input buttons
- **C** Output buttons
- **G** Signal LEDs
- **H** HDCP LEDs
- **I** Reset button
- **J** Reset LED

Figure 9. DXP 42 HD 4K PLUS Front Panel

Front Panel Features

A Config port (see **figure 8** on the previous page) — 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:

DXP 44, 84, and 88

- **Primary:**
  - Select an input.
  - Identify the selected input.
- **Secondary:** Save and recall presets (see **Saving and Recalling Presets** on page 25).

DXP 42

- **Primary:** Select an input.
- **Secondary:** View ties.

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

DXP 44, 84, and 88

- **Primary:**
  - Select outputs.
  - Identify the selected outputs.

- **Secondary:**
  - Save and recall presets (see **Saving and Recalling Presets** on page 25).
  - Mute video and audio output (see **Muting and Unmuting Outputs from the Front Panel** on page 87).
  - De-embed HDMI audio signals from the input.

DXP 42

- **Primary:** Select an output.
- **Secondary:** View ties.

D **Control buttons** — (DXP 44, 84, and 88 only) 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** — (DXP 44, 84, and 88 only) 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** — (DXP 44, 84, and 88 only) The **Esc** button does the following:

  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** (see **figure 8** on page 15) — (DXP 44, 84, and 88 only) 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 28).
  - 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 32).

F **Audio and Video LEDs** — (DXP 44, 84, and 88 only) 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 30).

G **Signal LEDs** — All models have a green Signal LED for each input. Each LED lights when a signal (TMDS clock activity) is present on the input.

H **HDCP LEDs** — All models have a green HDCP LED for each input, which lights if the source connected to that input is HDCP encrypted.

I **Reset LED** — (DXP 42 only) This green LED remains lit while the DXP has power (see **figure 9**, **I**, on page 16). While the **Reset** button (**J**) 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 32 for more information).

NOTE: The factory configured passwords for all accounts on this device have been set to the device serial number.

Performing a unit factory reset (entering an Esc **ZQQQ** ← SIS command or a **mode 5 reset** via the rear panel **Reset** button) removes the serial number passwords, leaving the unit with no password.

J **Reset button** — (DXP 42 only) This recessed button initiates four levels (modes) of reset on the DXP switcher (see **figure 9**, **J**, on page 16). 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** on page 32).

Powering On

Apply power as follows:

- **DXP 44, 84, and 88** — Connect the provided IEC power cord to the rear panel IEC connector (**figure 3**, **I**, on page 7) and to an AC source.
- **DXP 42** — Connect the provided 12 V, 1.5 A power supply to the rear panel 2-pole captive screw connector (see **figure 4**, **I**, on page 8).

Self-test

When power is applied to the DXP, the switcher performs a self-test as follows:

- **DXP 44, 84, and 88** — 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).
- **DXP 42** — All the front panel button LEDs blink. After the power up sequence is completed, the button LEDs turn off. The Signal and HDCP LEDs light according to the current state of each input.

Front Panel Functions — DXP 44, 84, and 88

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.

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:

1. Press the **Esc** button to clear any input, output, or control indicators that may be lit.
2. 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).
3. 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.
4. Press and release the **Enter** button to accept the tie or to break an existing tie.
5. Repeat steps 1 through 4 to create or clear additional ties until the desired configuration is complete.

NOTES:
- Only one 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 — DXP 44, 84, and 88

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 30).

To tie an input to an output:

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

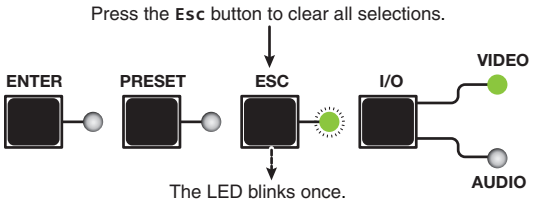


Figure 10. Press the Esc button

2. 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.

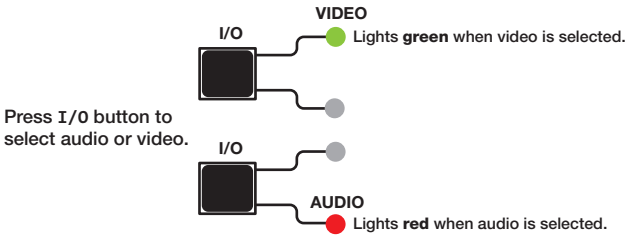


Figure 11. Selecting Audio or Video using the I/O Button

3. Press the desired input button.

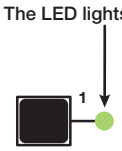


Figure 12. Selecting an Input for the Tie

4. 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.

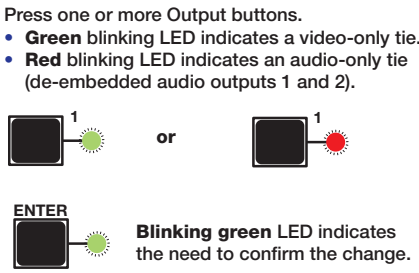


Figure 13. Selecting an Output for the Tie

5. 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 14).

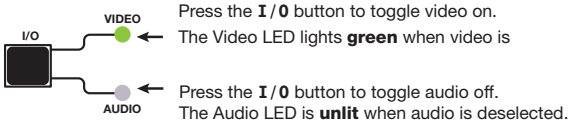


Figure 14. Selecting Video Only

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 15).

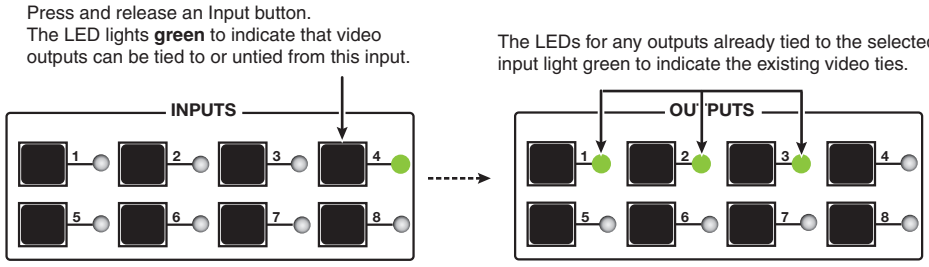


Figure 15. Selecting an Input with Ties (Video)

   - **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 16) 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.

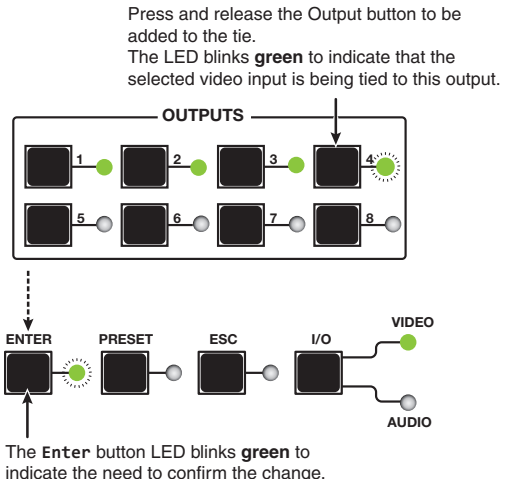


Figure 16. Selecting an Additional Output (Video)

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**).

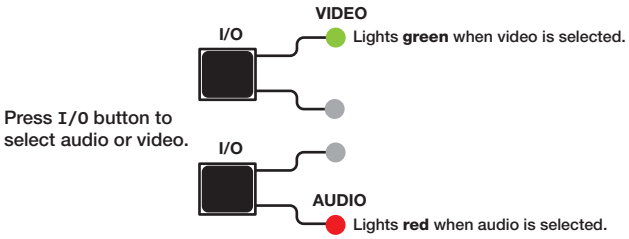


Figure 17. Selecting Audio or Video using the I/O Button

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

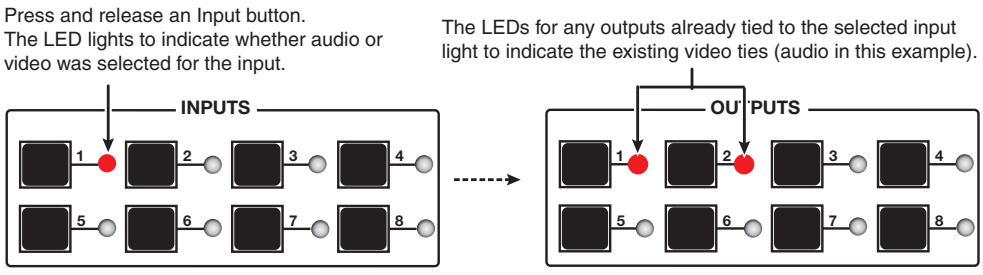


Figure 18. Selecting an Input

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.

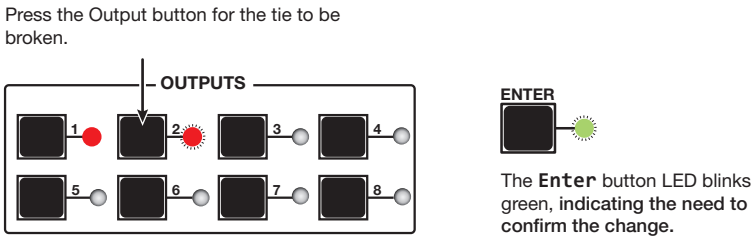


Figure 19. Selecting the Output to Untie

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 — DXP 44, 84, and 88

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 87).

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).

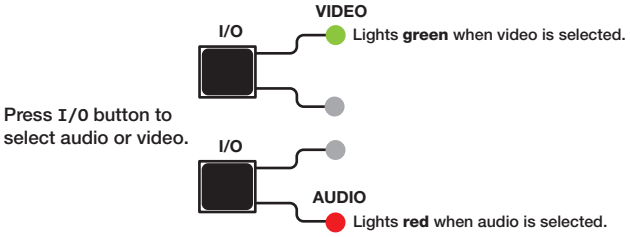


Figure 20. Selecting the Type of Ties to View

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.

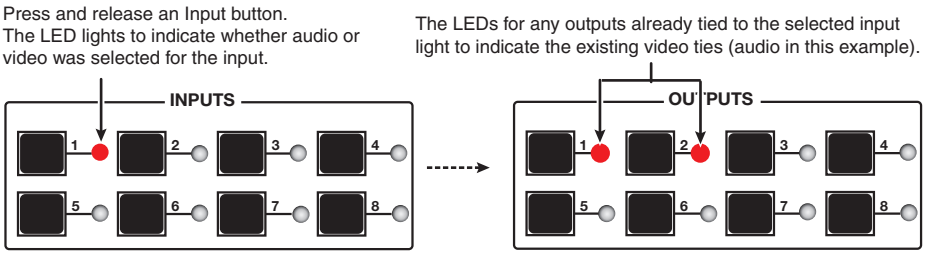


Figure 21. Viewing Audio Ties

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 **Configuration Software** starting on page 79, 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.

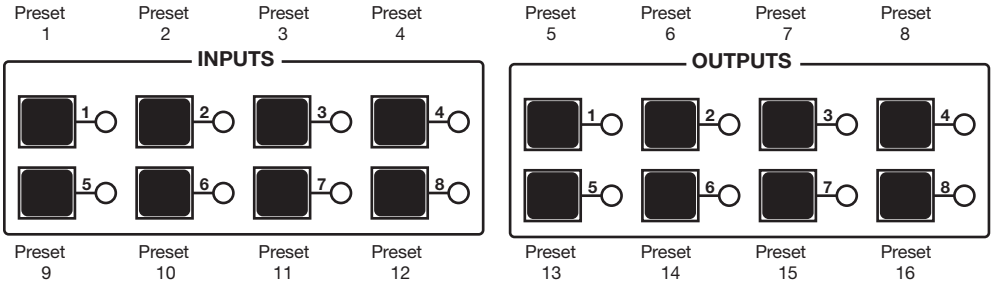


Figure 22. Preset Locations

NOTE: Before attempting to save or recall a preset, ensure that the unit is **not** in **Power save mode 2** (see page 30).

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.

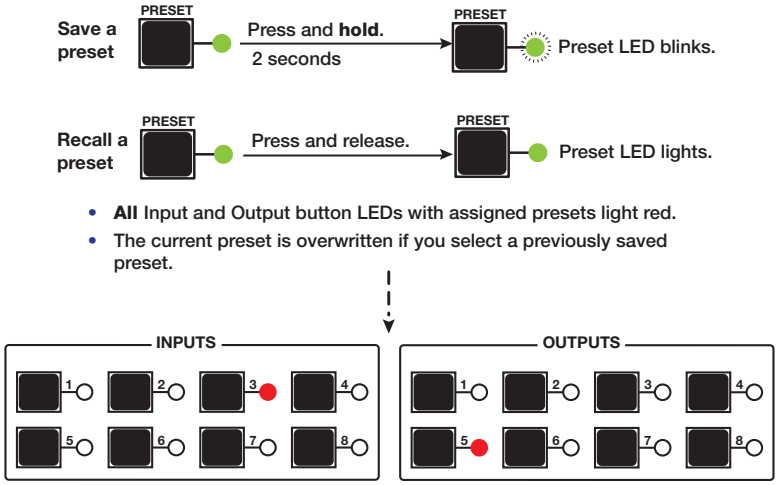


Figure 23. Saving or Recalling a Preset (DXP 44, 84, and 88)

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.

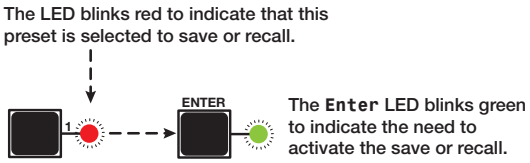


Figure 24. Pressing an Input or Output Button to Select a Preset

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 28).
- 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** (see page 30).

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).

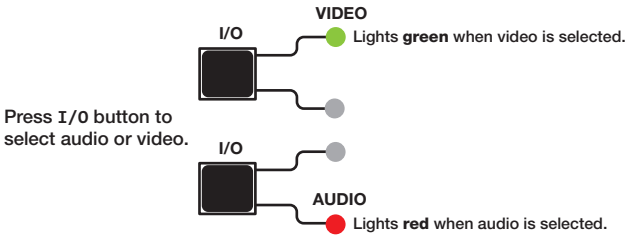


Figure 25. Selecting Audio or Video to Mute

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.

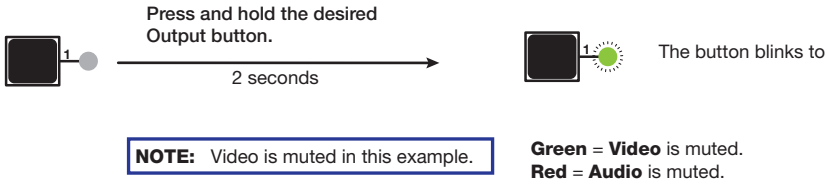


Figure 26. Muting an Output

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**.

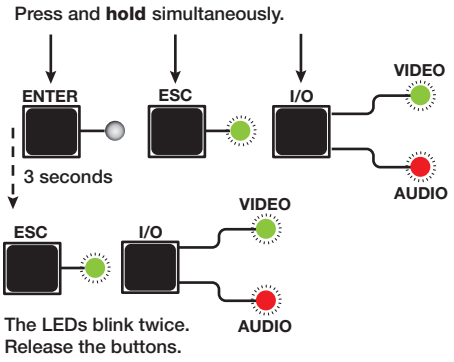


Figure 27. Switching between Front Panel Lock Modes 0 and 2

Selecting front panel lock mode 2 or toggling between lock modes 2 and 1

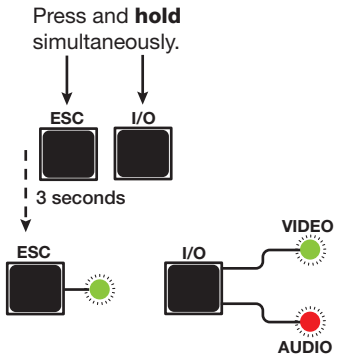
NOTES:

- 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 (see figure 28).



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

Release the buttons.

Figure 28. 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 Front Panel Lock Mode 2 or Toggling between Lock Modes 2 and 0** on page 28).

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 57). 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 0 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).

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 **0** 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.

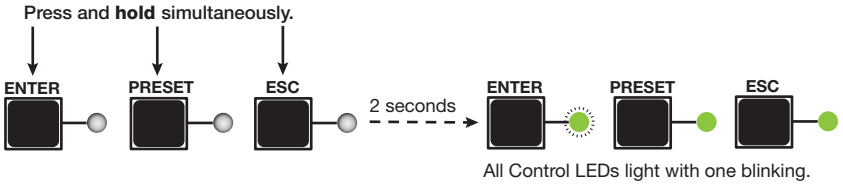


Figure 29. RS-232 Baud Rate Display

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.

Front Panel Functions — DXP 42

Creating Ties

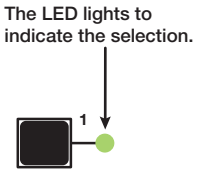
Ties can be made using the front panel buttons, SIS commands, or PCS. You can tie an input to one or more outputs.

NOTES:

- Audio ties can be made only with de-embedded audio.
- Audio ties cannot be made using the front panel buttons. However, they can be created using PCS or SIS commands.
- 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).

To make ties:

1. Press an input button on the front panel (see the illustration at right). The LED next to it lights.
   - If the selected input is already tied to one or more outputs, the tied output LEDs light.
   - If you press the tied output button, the output is disconnected (untied) from the input.



2. Within 5 seconds, press the output button or buttons to which the input is to be tied. All selected output LEDs light, then turn off after 5 seconds. Figure 30 shows a tie between input 1 and output 1.

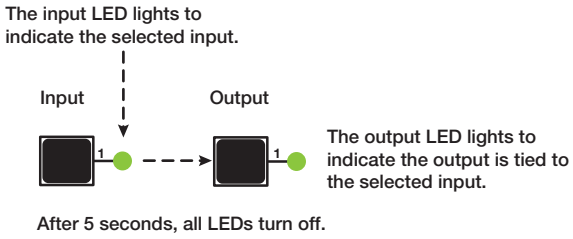


Figure 30. Tying Input 1 to Output 1

NOTE: If no output is selected within 5 seconds, the input LED turns off and no tie is made to the input.

To break existing ties:

1. Press the button for the input to be untied. The LEDs for the tied outputs light.
2. Press the output button to be untied. The output button LED turns off, indicating that the tie is broken.

Viewing Ties — DXP 42

- **To view ties to an input:** Press the desired input button. The button LEDs light for all outputs that are tied to that input.

  Figure 31 shows a tie between input 1 and output 1. Pressing the input 1 button causes its LED to light. The output 1 button LED also lights, indicating that a tie exists between input 1 and output 1.

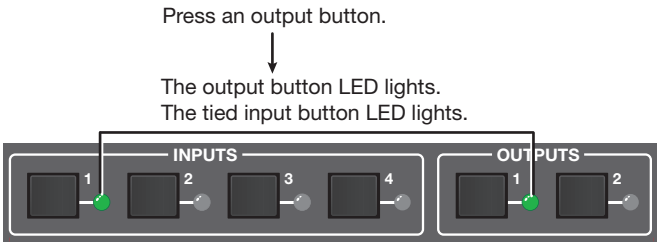


Figure 31. Viewing Ties to an Input

- **To view ties to an output:** Press the desired output button. The LED for the selected output button lights. In addition, the button LEDs for the tied input and for all outputs tied to that input light.

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 — DXP 44, 84, and 88 only** (see "Resetting the System Using the Front Panel Buttons."
- **Front panel (DXP 42) or rear panel (DXP 44, 84, 88) recessed Reset button** (see **Resetting Using the Front or Rear Panel Reset Button** on page 33)
- **SIS commands** (see the **Reset Commands** on page 57)
- **PCS** (see the *DXP HD 4K PLUS Series Help File)*

NOTE: Entering the Esc ZQQQ ← SIS command or performing a mode 5 reset via the rear panel **Reset** button (see the **Reset Modes Summary** on page 34) removes the current passwords (whether user-set or the factory-set serial number), leaving the unit with no password.

Resetting Using the Front Panel Buttons — DXP 44, 84, and 88 only

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 button reset is identical to the Esc ZXXX← SIS command (see the **Reset Commands**).

To reset the switcher to the factory default settings (see figure 32):

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.

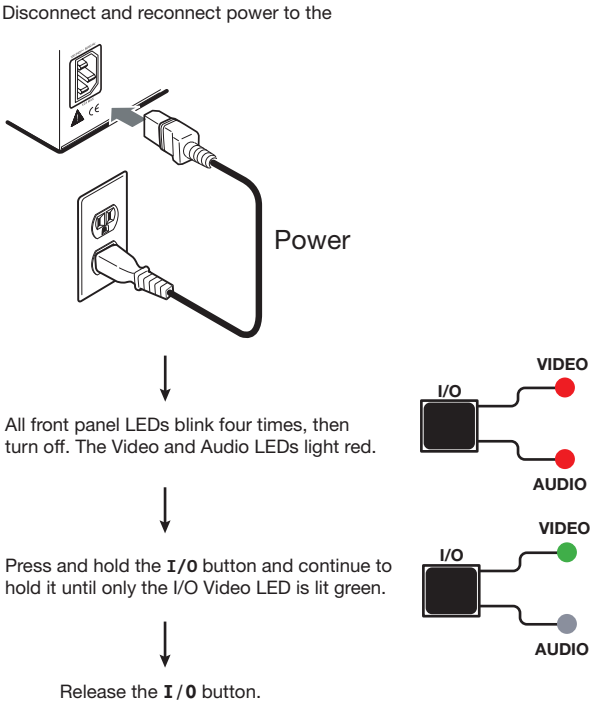


Figure 32. System Reset via Front Panel Buttons

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

Resetting Using the Front or Rear Panel Reset Button

The recessed **Reset** button (see **figure 3, D**, on page 7, or **figure 9, J**, on page 16) 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 Series. If you attempt to initiate it, the Power and Reset LED blinks 3 times but no reset is performed.

Reset Modes Summary

Mode	Activation	Result	Purpose/Notes
1	Hold in the recessed **Reset** button while applying power to the switcher.	• Restores the factory-installed firmware for a single power cycle. • 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 with user-loaded firmware.
4	Hold in the **Reset** button until the Power and 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).	• 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. The Reset LED blinks four times in quick succession during the reset.	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 Power and Reset LED blinks three times (once after approximately 3 seconds, again after 6 seconds, and then again after 9 seconds); then within 1 second press Reset momentarily (for less than 1 second).	Performs a complete reset to factory defaults (with the exception of the firmware), which includes:
		• Everything mode 4 does
		• Reset of all real time adjustments:
		  • Clears all ties, presets, and audio or RS-232 mutes.
		  • Resets all IP options.
		  • Removes or clears all switcher files.
		The reset LED blinks four times in quick succession during the reset.
			Mode 5 is useful if you want to start over with configuration and uploading and also to replace events.
			This reset, equivalent to the Esc ZQQQ ← SIS command, also removes the initial serial number passwords and sets them to no password.

NOTES:

- **For modes 3, 4, and 5:** Nothing happens if the momentary press does not occur within 1 second of pressing the **Reset** button.
- The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is no password.

To perform a hardware reset of the switcher (mode 1):

1. Use a stylus or small Philips screwdriver to press and **hold** the **Reset** button until:
   - **DXP 44, 84, and 88** (see figure 33): The front panel **Video** and **Audio** buttons blink twice (for a system reset) or three times (for an absolute reset).

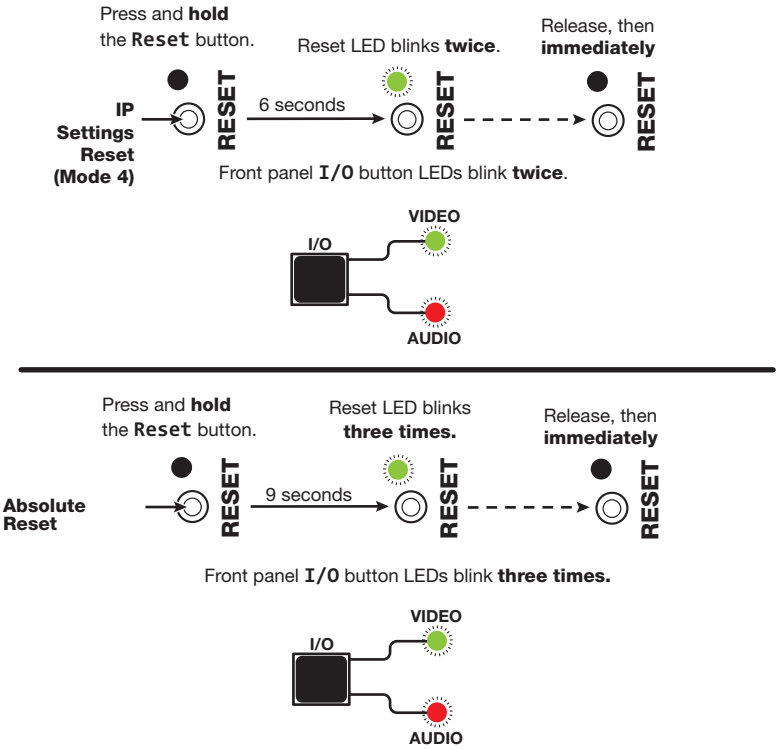


Figure 33. Soft Resets (Modes 4 and 5) on DXP 44, 84, and 88

   - **DXP 42:** The Reset/Power LED on the front panel (see **figure 9**, **J**) blinks twice (for a system reset) or three times (for an **Absolute system reset**).
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.

Troubleshooting

The following are recommendations (listed in the order they should be attempted) 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 **Worksheet Form** on page 38, 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 34 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.

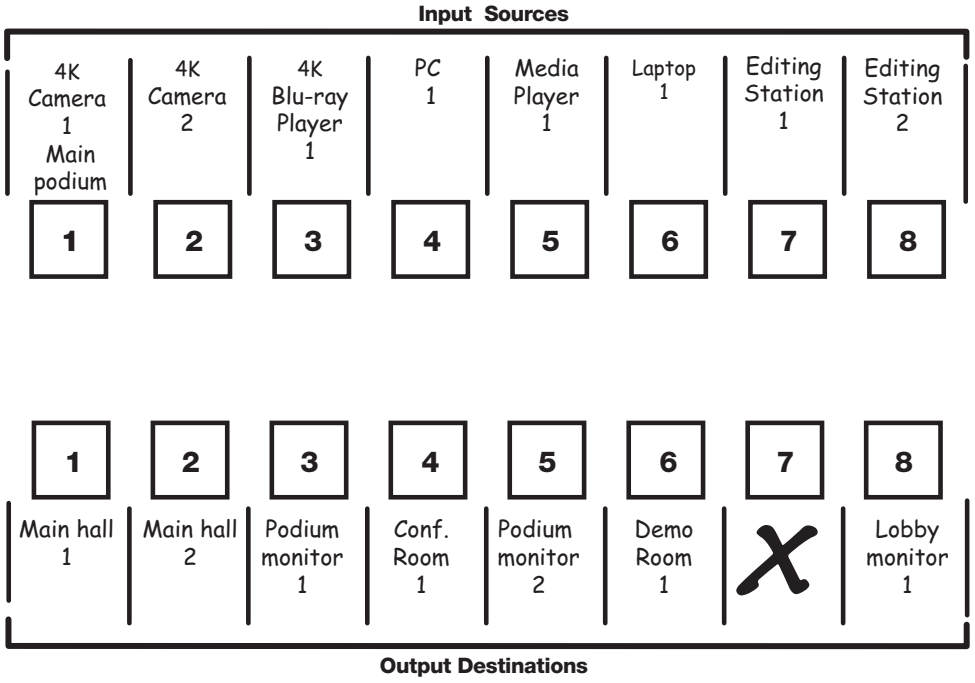


Figure 34. Worksheet Example 1: System Equipment

Inputs include media players, a PC, a laptop, editing stations, and 4K cameras. Output devices include various 4K monitors.

Worksheet Example 2: Daily Configuration

Figure 35 continues from worksheet example 1 by showing the video ties that make up the configuration of preset 1. A solid ink line shows video ties.

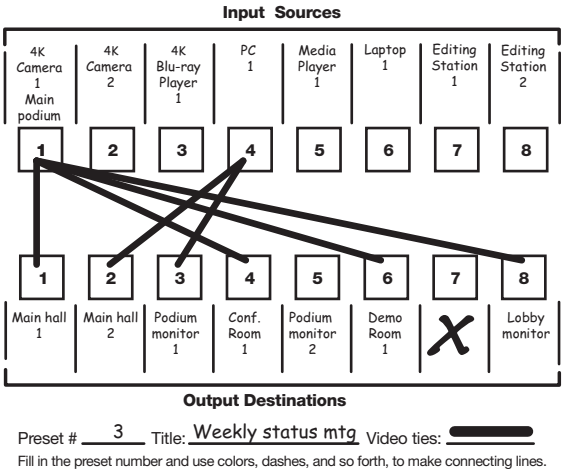


Figure 35. Worksheet Example 2: Daily Configuration

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 36 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).

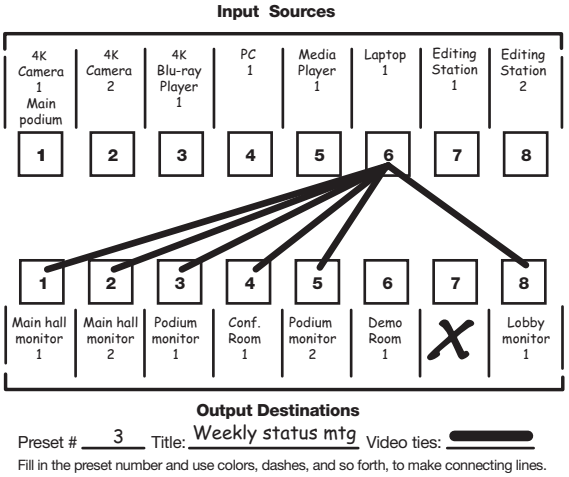
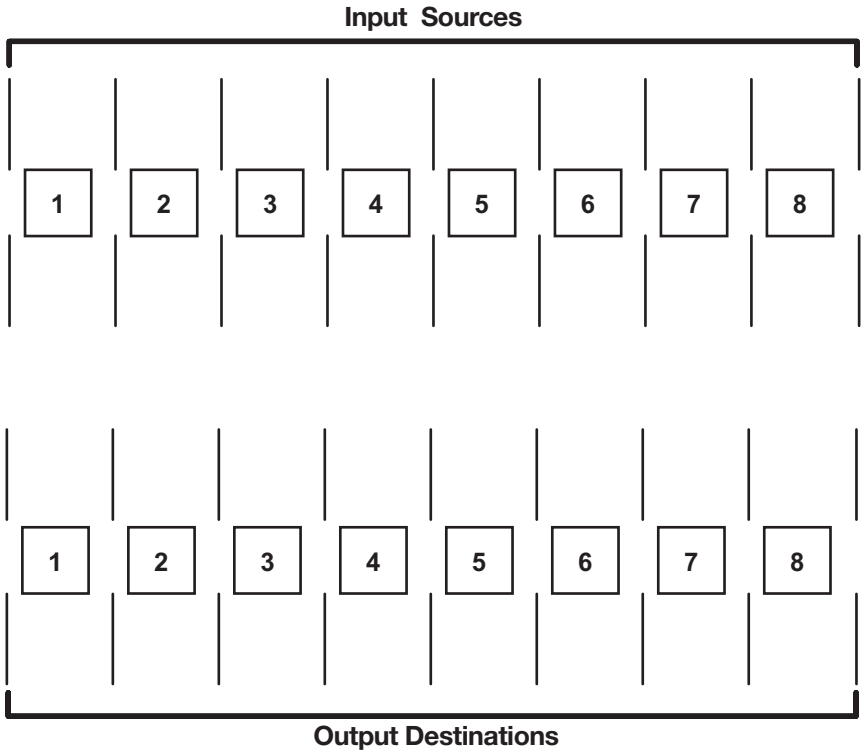


Figure 36. Worksheet Example 3: Test Configuration

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 - DXP 44, 84, 88**
- **Command and Response Table for SIS Commands - DXP 42**

Connection Methods

Attach the host device to one of the following connectors:

- Remote RS-232 connector (see **figure 3** or **figure 4**, **E**, on pages 8 and 9)
- LAN connector (**F**)
- USB connector (see **figure 8** or **figure 9**, **A**, on pages 15 and 16)

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-nnnn-nn↵`
`Ddd, DD Mmm YYYY HH:MM:SS↵`

20nn is the year.
DXP *nn* HD 4K Plus is the model name.
V*n.nn* is the firmware version number.
60-*nnnn-nn* is the model part number.
(Day, date, and time as in Mon, 17 Feb 2020 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.

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

  NOTES:

  - The factory configured passwords for all accounts on these devices have been set to the **device serial number**. Passwords are case sensitive.
  - Performing a unit factory reset (entering an Esc **ZQQQ** ← SIS command or a **mode 5 reset** via the rear panel **Reset** button) removes the serial number passwords, leaving the unit with no password.

- Qik↵

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

- RprX17↵

  The switcher initiates the Rpr message when a memory preset is recalled from the front panel. X17 is the preset number.

- SprX17↵

  The switcher initiates the Spr message when a memory preset is saved from the front panel. X17 is the preset number.

- VmtX2*X12↵

  The switcher initiates the Vmt message when a video output mute is toggled on or off from the front panel. X2 is the output number. X12 is the video mute status (0 = off, 1 = on).

- AmtX2*X13↵

  The switcher initiates the Amt message when an audio output mute is toggled on or off from the front panel. X2 is the output number. X13 is the mute status (0 = off, 1 = on).

- ExeX20↵

  The switcher initiates the Exe message when the Front Panel Lockout mode is toggled on or off from the front panel. X20 is the lock mode (0 = off, 1 = view only, 2 = basic mode only)

- HplgOX2 ↵

  The switcher initiates the HplgO message when a hot plug event is detected on an output (for example, if the display is disconnected from the unit). X2 is the output number.

- Reconfig↵

  The switcher sends this response upon any change of input frequency on the currently selected input or inputs.

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

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 **Port timeout** on page 60 to change this value).

NOTE: Extron recommends periodically issuing query commands (see **Information Requests** starting on page 58) 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 Tables**, starting on page 48, list the commands that the switchers recognize 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.

Space →

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

Figure 37. 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** starting on page 58). In verbose mode 1 or 3, changes are reported in messages that resemble SIS command responses.

Symbol Definitions

•	=	Space	
↵	=	Carriage return with line feed	
← or |	=	Carriage return with no line feed	
Esc or W	=	Escape key	
24	=	Superscripts indicate the error message displayed if the command is entered incorrectly or with invalid parameters (see **Error Responses** on page 41).	
X1	=	Input number	0 = untie (for ties If applicable) 1 through <*maximum number of inputs*>
X2	=	Output number	1 through <*maximum number of outputs*>: DXP 42: 1 or 2 DXP 44 and 84: 1-4 DXP 88: 1-8 0 = untie (for ties if applicable)
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 — DXP 42	0 = auto (default) 1 = DVI RGB 4:4:4 Full 2 = HDMI RGB 4:4:4 Full 3 = HDMI RGB 4:4:4 Limited 4 = HDMI YUV 4:4:4 Full 5 = HDMI YUV 4:4:4 Limited 6 = HDMI YUV 4:2:2 Full 7 = HDMI YUV 4:2:2 Limited
		Output format — DXP 88, 84, and 44	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	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 and analog audio, and S/PDIF mute
X14	=	Output mute	0 = 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 00 in dB (00 = default)
X16	=	Output volume	0 to 100 percent in approximately 1.28 dB intervals (100 = default)

NOTE: If X16 exceeds the acceptable volume range specified in the **Output Volume commands** on page 53, 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	0 = unlock the front panel 1 = mode 1 (complete front panel lockout) 2 = mode 2 (tie configuration and preset management only, default)
X21	=	HDCP notification — screen background color	0 = black screen 1 = green screen (default)
X22	=	Signal status	0 = no signal detected 1 = input signal detected

X23	=	Verbose mode	0 = None (default for LAN connection) 1 = Verbose mode (default for RS-232 and USB connection) 2 = Tagged responses to queries 3 = Verbose mode and tagged responses

NOTES:

- In **verbose response** mode, the DXP returns unsolicited responses for value and setting changes that may result from a signal change, or a setting adjustment made via another interface.

  Example: The DXP can send out a notice of a change in some setting without receiving a query via a PC or a control system. That change could have been a result of an internal process or a selection made via the PCS program. This is a verbose (wordy) relationship between the controller and a connected device.

- If **tagged responses** are enabled, all "view" commands return the command string plus the data, the same as in responses for setting a value.

  For example:
  Command: X1*\
  Response: Vtyp X1 * X3 ↵ (tagged) or X3 ↵ (untagged)

X24	=	Power save mode	0 = normal operation (default) 1 = limited functionality — disable all functions except IP, USB, and RS-232, and reduce fan speed. **To return to mode 0:** 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 0PSAV←. **To return to mode 0:** Enter the Esc 0PSAV← command or open PCS.
X25	=	Firmware version	*n.nn*
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	*nnn.nnn.nnn.nnn* (192.168.254.254 = default)

X31	=	Subnet mask	*nnn.nnn.nnn.nnn* (255.255.0.0 = default)
X32	=	Gateway address	*nnn.nnn.nnn.nnn* (0.0.0.0 = default)
X33	=	MAC address	00-05-A6-*xx-xx-xx*
X34	=	Open connections	0-<*maximum number of open connections*>
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 *MM/DD/YY•HH:mm:SS* *MM* = month: 01 (January) to 12 (December) *DD* = day: 01 to 31 (depending on the month) *YY* = year: 00 to 99 (last two digits) *HH* = hour: 00 to 23 *mm* = minute: 00 to 59 *SS* = second: 00 to 59
X38	=	Date and time (view only)	In the format *DAY,•DD•MMM•YYYY•HH:mm:SS* *DAY* =day of the week: Mon to Sun *DD* = date: 01 to 31 (depending on the month) *MMM* = month: 01 to 12 *YYYY* = year: 2000 to 2099 *HH* = hour: 00 to 23 *mm* = minute: 00 to 59 *SS* = second: 00 to 59
X39	=	GMT offset	-12:00 to +14:00
X40	=	Time zone	Time zone code (see the **View available time zones command** on page 61 to view a list of available time zones). The code is followed by an * in the response.
X41	=	Time zone description	In the format (UTC X39)•*<Description>* 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

NOTES:

- The pipe (|) character is invalid for passwords.
- The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords revert to the default, which is no password.

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	**O**dd, **E**ven, **N**one (default), **M**ark, **S**pace Enter only the first letter.

X48	=	Data bits	7, 8 (default)
X49	=	Stop bits	1 (default), 2
X50	=	EDID record	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 slot (See **EDID tables for DXP HD 4K PLUS** starting on page 4.)	Default — 1080p @ 60 Hz DXP 42 — 01-04 = input slot, manually populated via PCS 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. Default = EXN_HDMI_1080p60_2Ch.bin
X54	=	MKP mode	Volume steps: 1 = Set DXP to normal operation, 1-100 steps (default). 2 = Set DXP to MKP volume control range, 1-64 steps.

NOTES:

- Entering the Esc ZQQQ← or Esc ZXXX← system reset command resets the MKP mode to the factory default (mode 1).
- Affects all analog and S/PDIF audio outputs.

X55	=	Subnet mask for CISG command	A 2-digit code with optional leading zero.

Command and Response Table for SIS Commands — DXP 44, 84, 88

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 video input with embedded audio to an HDMI output (analog or S/PDIF) with the extracted audio.
NOTE: All HDMI source signals switch with embedded audio.			
Example: Breaking a tie	0*2!	Out2 In0 All	Untie an HDMI video input with embedded audio from the HDMI output.
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 (audio output 2 only)	X1*X2$	Out X2 • In X1 • Aud ↵	Tie or untie an HDMI audio input to an analog audio and S/PDIF output (audio output 2 only).
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 an 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).
Example (DXP 88 HD 4K PLUS)	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.

KEY:

X1 = Input number
0 = untie (for ties If applicable)
1 through <*maximum number of inputs*>

X2 = Output number
0 = untie (for ties if applicable)
HDMI output, 1 through <*maximum number of outputs*>:
DXP 42 — 1 or 2, DXP 44 and 84 — 1-4, DXP 88 — 1-8

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Input and Output Tie Commands (continued)			
View Ties			
View HDMI and audio output tie	X2!	X1↵ OutX2•InX1•All↵	View input tied to an HDMI and audio output. *Verbose modes 2 and 3*
View HDMI output tie	X2% or X2&	X1↵ OutX2•InX1•Vid↵	View input tied to an HDMI output. *Verbose modes 2 and 3*
View audio output tie	X2$	X1↵ OutX2•InX1•Aud↵	View input tied to an audio output. *Verbose modes 2 and 3*
Input Configuration Commands			
Input Name			
Set input name	EscX1,X4NI←	NmiX1,X4↵	Set the name of an input.
View input name	EscX1NI←	X4↵ NmiX1,X4↵	View name of an input. *Verbose modes 2 and 3*
HDCP Authorized Device			
Set HDCP Authorized device setting	EscEX1*X6HDCP←	HdcpEX1*X6↵	Set the HDCP Authorized device setting for an input.
View HDCP Authorized device setting	EscEX1HDCP←	X6↵ HdcpEX1*X6↵	View the HDCP Authorized device setting for an input. *Verbose modes 2 and 3*
Input HDCP Status			
View input HDCP status	EscIX1HDCP←	X7↵ HdcpIX1*X7↵	View the HDCP status on an input. *Verbose modes 2 and 3*
View all input HDCP status	EscIHDCP←	$X7^1X7^2...X7^n$↵ HdcpI00*$X7^1X7^2...X7^n$↵	View the HDCP status for all inputs. ^{n} = the maximum number of inputs *Verbose modes 2 and 3*

KEY:

X1 = Input number	1 through <*maximum number of inputs*>
X2 = Output number	0 = untie (for ties if applicable) HDMI output, 1 through <*maximum number of outputs*>: DXP 42 — 1 or 2, DXP 44 and 84 — 1-4, DXP 88 — 1-8
X4 = Name	Up to 16 alphanumeric characters
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

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
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. *Verbose modes 2 and 3*
View EDID native resolution	Esc N X1 EDID↵	X51↵ EdidN X51↵	View the EDID native resolution and refresh X51 from input slot X1. *Verbose modes 2 and 3*
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.

KEY:

X1 = Input number	1 through <*maximum number of outputs*>
X50 = EDID record	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 slot	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. **NOTE:** See **EDID tables for DXP HD 4K PLUS** starting 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			
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. *Verbose modes 2 and 3*
Output Format			
Set output format	Esc X2 * X8 VTPO ←	Vtpo X2 * X8 ↵	Set format X8 of output X2.
View output format	Esc X2 VTPO ←	X8 ↵ Vtpo X2 * X8 ↵	View the format of an output. *Verbose modes 2 and 3*
Output HDCP Mode			
Set output HDCP mode to Auto	Esc S X2 *0HDCP ←	HdcpS X2 *0 ↵	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. *Verbose modes 2 and 3*
Output HDCP Status			
View output HDCP status	Esc O X2 HDCP ←	X11 ↵ HdcpO X2 * X11 ↵	View the HDCP status of an output. *Verbose mode 2 and 3*
View all outputs HDCP status	Esc OHDCP ←	X11[1] X11[2] ... X11[n] ↵ HdcpO00* X11[1] X11[2] ... X11[n] ↵	View the HDCP status of all outputs. *n* = maximum number of outputs *Verbose modes 2 and 3*

KEY:

X2 = Output number	HDMI output, 1 through <*maximum number of outputs*>: DXP 42 — 1 or 2, DXP 44 and 84 — 1-4, DXP 88 — 1-8
X4 = Name	16 alphanumeric characters
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)
X10 = Output HDCP mode	0 = auto (follow the input, default) 1 = on (always encrypt HDMI outputs)
X11 = Output HDCP status	0 = 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

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Output Configuration Commands (continued)			
HDMI Video Mutes			
Set HDMI video mute	X2*X12B	VmtX2*X12↵	Set mute of an output.
NOTE: This command mutes both the HDMI video and the embedded audio.			
View HDMI video mute status	X2B	X12↵ VmtX2*X12↵	View the mute setting of an output. *Verbose modes 2 and 3*
Set HDMI video mute to all outputs	X12*B	VmtX12↵	Set mute of all outputs.
View all output mutes	EscVM←	X14[1]X14[2]...X14[n]↵ MutX14[1]X14[2]...X14[n]↵	View the mute status of all outputs. *n* = maximum number of outputs. *Verbose modes 2 and 3*
Output 5 V Pulse			
Pulse 5 V on HDMI output	EscPX2HPLG←	HplgPX2↵	Momentarily toggle the HDMI 5 V off and on to simulate an output X2 hot plug event.

KEY:

X2 = Output number	HDMI output, 1 through <*maximum number of outputs*>: DXP 42 — 1 or 2, DXP 44 and 84 — 1-4, DXP 88 — 1-8
X10 = HDCP mode	0 = auto (follow the input, default) 1 = on (always encrypt HDMI outputs)
X12 = Video mute	0 = unmute, 1 = video mute, 2 = video and sync mute
X14 = Output mute	0 = 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*-X15G	InX1•AudX15↵	Set the attenuation level of input X1 to X15.
Decrease attenuation	X1+G	InX1•AudX15↵	Increase the attenuation level of an input by 1 dB.
Increase attenuation	X1-G	InX1•AudX15↵	Decrease the attenuation level of an input by 1 dB.
View attenuation	X1G	X15↵	View the attenuation level of an input.
Output Volume (Analog Audio and S/PDIF Outputs Only)			
Set volume	X2*X16V	OutX2•VolX16↵	Set the volume level of an output.
Increase volume	X2+V	OutX2•VolX16↵	Increase the volume level of an output by 1.28 dB.
Decrease volume	X2-V	OutX2•VolX16↵	Decrease volume level of output X2 by 1.28 dB.
View volume level	X2V	X16↵	View the volume level of an output.
		OutX2•VolX16↵	*Verbose modes 2 and 3*
Audio Mute			
NOTE: For outputs **1–2**, X13 = 0–7. For outputs **3-8**, X13 = 0–1.			
Set audio mute	X2*X13Z	AmtX2*X13↵	Set the mute status of an output.
View audio mute status	X2Z	X13↵	View mute status of output X2.
Set audio mute to all	X3*Z	AmtX3↵	Mute or unmute all outputs.

KEY:

X1 = Input number — 1 through <*maximum number of inputs*>

X2 = Output number — HDMI output, 1 through <*maximum number of outputs*>: DXP 42 — 1 or 2, DXP 44 and 84 — 1-4, DXP 88 — 1-8

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 1.28 dB intervals (100 = default)

0 to 64 percent in MKP mode (see the **MKP Mode for Volume Control** on page 63).

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

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Preset Commands			
Global Presets			
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 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.

KEY:

X1 = Input number	1 through <*maximum number of inputs*>
X2 = Output number	HDMI output, 1 through <*maximum number of outputs*>: DXP 42 — 1 or 2, DXP 44 and 84 — 1-4, DXP 88 — 1-8
X4 = Name	16 alphanumeric characters ([unassigned] for presets not saved)
X17 = Global preset number	1-16. X17 can be 0 for viewing current ties only.

NOTE: [n] = maximum number of outputs.

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[n] MR ←	Mpr X18 , X2[1] , ... X2[n] ↵	Set outputs to a room. n = desired number of outputs within the maximum number.
Example	Esc 7,3,4,7 MR ←	Mpr7,3,4,7 ↵	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. *Verbose modes 2 and 3*
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 48 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.

KEY:

X1 = Input number	1 through <*maximum number of inputs*>.
X2 = Output number	HDMI output, 1 through <*maximum number of outputs*>: DXP 42 — 1 or 2, DXP 44 and 84 — 1-4, DXP 88 — 1-8
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 ↵ Nmp X18 * X19 , X4 ↵	View a room preset name. *Verbose modes 2 and 3*
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	0LS	X22[1] X22[2] ... X22[n] ↵ Frq00 ● X22[1] X22[2] ... X22[n] ↵	View the signal presence status of all inputs. [n] = maximum number of inputs. *Verbose modes 2 and 3*

KEY:

X1 = Input number	1 through <*maximum number of inputs*>.
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
X20 = Front Panel Lockout mode	0 = unlock the front panel 1 = mode 1 (complete front panel lockout) 2 = mode 2 (tie configuration and preset management only, default)
X22 = Video signal status	0 = No signal detected 1 = Input signal detected

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Device Commands			
Reset Commands			
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.
NOTE: Entering this command or performing a mode 5 reset via the rear panel **Reset** button (see **Reset Modes Summary** on page 34) removes the current passwords (whether user-set or the factory-set serial number), leaving the unit with no password.			
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.
Reboot network	Esc 2BOOT←	Boot2↵	Restart the network after IP setting or DHCP changes.
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 X24PSAV←	PsavX24↵	Set the power save mode to X24.
NOTE: The switcher returns to normal mode (X24 = 0) when you use the front panel, issue the Esc 0PSAV← command, connect via PCS, or cycle power.			
Set power save mode 2	Esc 2PSAV←	Psav2↵	
NOTE: The switcher returns to normal mode (X24 = 0) only when you issue the Esc 0PSAV← command, connect via PCS, or cycle power.			
Set power save mode 0	Esc 0PSAV←	Psav0↵	Set to normal operation (default).
View power save mode	Esc PSAV←	X24↵	

KEY:

X24 = Power save mode

0 = normal operation (default)
1 = limited functionality — Turn off all functions except IP, USB, and RS-232 ports, and slow fan speed.
To return to mode 0: 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 0PSAV←.
To return to mode 0: Enter Esc 0PSAV← (only method).

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Device Commands (continued)			
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.
Information Requests			
General information	I	V X1 X X2 • A X1 X X5↵	View the number of inputs and outputs for video and audio connectors on the device.
		Info00*V X1 X X2 • A X1 X X5↵	*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 firmware and build version	*Q	*n.nn.nnnn*↵	View the firmware version and build number.

KEY:

X1 = Input number	1 through <*maximum number of inputs*>.
X2 = Output number	HDMI output, 1 through <*maximum number of outputs*>: DXP 42 — 1 or 2, DXP 44 and 84 — 1-4, DXP 88 — 1-8
X5 = Analog audio and S/PDIF output number	1 or 2
X23 = Verbose mode	0 = 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
X25 = Firmware version	*n.nn*

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Information Requests (continued)			
View detailed firmware version information	`0Q`	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):

- `*` = 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 matrix status	`S`	X27•X28•X29↵	View the power supply voltage, temperature, and fan speed status.
		`Sts00*`X27•X28•X29↵	*Verbose modes 2 and 3*
View power supply status	`1S`	X27↵	View the power supply voltage.
		`Sts01*`X27↵	*Verbose modes 2 and 3*
View temperature	`2S`	X28↵	View the internal temperature.
		`Sts02*`X28↵	*Verbose modes 2 and 3*
View fan speed	`3S`	X29↵	View the internal fan speed.
		`Sts03*`X29↵	*Verbose modes 2 and 3*

KEY:

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
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.
View MAC address	Esc CH←	X33↵ Iph•X33↵	00-05-A6-*xx-xx-xx* *Verbose modes 2 and 3*
View number of open connections	Esc CC←	X34↵ Icc X34↵	View the number of open connections. *Verbose modes 2 and 3*
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.

KEY:

X3 = Enable or disable	0 = disable, 1 = enable
X30 = IP address	*nnn.nnn.nnn.nnn* (192.168.254.254 = default)
X31 = Subnet mask	*nnn.nnn.nnn.nnn* (255.255.0.0 = default)
X32 = Gateway address	*nnn.nnn.nnn.nnn* (0.0.0.0 = default)
X33 = MAC address	00-05-A6-*xx-xx-xx*
X34 = Open connections	0-<*maximum number of open connections*>
X35 = Port timeout	1 to 65000 in 10-second intervals (30 = default).

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
IP Control Port Commands (continued)			
Device Name			
Set device name[24]	Esc X36 CN ←	Ipn • X36 ↵	Set the device name.
NOTES: • 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.
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*

KEY:

X36 = Device name	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.
X37 = Date and time	In the format *MM/DD/YY•HH:mm:SS* *MM* = month: 01 (January) to 12 (December) *DD* = day: 01 to 31 (depending on the month) *YY* = year: 00 to 99 (last two digits) *HH* = hour: 00 to 23, *mm* = minute: 00 to 59, *SS* = second: 00 to 59
X38 = Date and time (view only)	In the format *DAY,•DD•MMM•YYYY•HH:mm:SS* *DAY* =day of the week: Mon to Sun *DD* = date: 01 to 31 (depending on the month) *MMM* = month: 01 to 12 *YYYY* = year: 2000 to 2099 *HH* = hour: 00 to 23, *mm* = minute: 00 to 59, *SS* = 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 (UTC X39) •*<Description>*. This is the UTC equivalent for a time zone as well as a description of the geographical area.

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
IP Control Port Commands (continued)			
Passwords			
NOTES: • The factory configured passwords for all accounts on this device have been set to the device serial number. If the unit is reset to factory settings, these passwords are set to no password. • 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.
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 ↵.
KEY: X42 = Password		0 to 128 characters	

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Serial Port Configuration			
Set serial port parameters	Esc X45*X46,X47,X48,X49CP←		
		CpnX45•CcpX46,X47,X48,X49↵	
			Set the baud rate, parity, data bits, and stop bits for serial port X45.
View port parameters	Esc X45CP←	X46,X47,X48,X49↵	
MKP Mode for Volume Control			
Set the MKP mode	Esc X54SVOL←	SvolX54↵	Set the number of volume steps (MKP mode) to X54.
View the MKP mode	Esc SVOL←	X54↵	View the current MKP mode setting.

KEY:

X45 = 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
X54 = MKP mode	Volume steps: 1 = Set DXP to normal operation, 1-100 steps (default). 2 = Set DXP to MKP volume control range, 1-64 steps.

NOTES:

- Entering the Esc ZQQQ← or Esc ZXXX← system reset command resets the MKP mode to the factory default (mode 1).
- Affects all analog and S/PDIF audio outputs.

Command and Response Table for SIS Commands — DXP 42

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Input and Output Tie Commands			
Individual Ties			
Tie HDMI input to HDMI video and audio outputs	X1*X2!	OutX2•InX1•All↵	Tie or untie an HDMI video input with embedded audio to an HDMI output (analog or S/PDIF) with the extracted audio.
NOTE: All HDMI source signals switch with embedded audio.			
Example: Breaking a tie	0*2!	Out2 In0 All	Untie an HDMI video input with embedded audio from the HDMI output.
View HDMI and audio output tie	X2!	X1↵ OutX2•InX1•All↵	View input tied to an HDMI and audio output. *Verbose modes 2 and 3*
Ties from an Input to All Outputs			
Tie HDMI input to all HDMI and audio outputs	X1*!	InX1•All↵	Tie an HDMI input to all HDMI and audio outputs.

KEY:

X1 = Input number — 1 through 4; 0 = untie (for ties If applicable)

X2 = Output number — 1 through 4; 0 = untie (for ties if applicable)

HDCP Authorized Device			
Set HDCP authorization for an input	Esc EX1*X6HDCP←	HdcpEX1*X6↵	Set HDCP authorization X6 for input X1.
View HDCP authorization setting for an input	Esc EX1HDCP←	X6↵ HdcpEX1*X6↵	View the HDCP authorization setting for input X1. *Verbose modes 2 and 3*
Set HDCP authorization for all inputs	Esc EX6*HDCP←	HdcpE*X6↵	Set HDCP authorization for all inputs.
View HDCP authorization for all inputs	Esc EHDCP←	X6•X6•X6•X6↵ HdcpEX6•X6•X6•X6↵	View HDCP authorization settings for all inputs. *Verbose modes 2 and 3*

KEY:

X6 = HDCP Authorized device — 0 = block HDCP encryption; 1 = allow HDCP encryption (default)

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Input and Output Tie Commands (continued)			
Input HDCP Status			
View input HDCP status	Esc I X1 HDCP ←	X7 ↵ HdcpI X1 * X7 ↵	View the HDCP status on an input. *Verbose modes 2 and 3*
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 *Verbose modes 2 and 3*

KEY:

X7 = Input HDCP status

0 = no source detected
1 = source is HDCP compliant
2 = source is not HDCP compliant

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. *Verbose modes 2 and 3*
EDID Commands			
View EDID in Hex	Esc R X1 EDID ↵	X50 ↵ EdidR X50 ↵	View the EDID X50 in Hex from input slot X1. *Verbose modes 2 and 3*
Import EDID to user slot	Esc I X52 , X53 EDID ↵	Esc I X52 ↵	Import EDID table X52 from X53.
Export EDID in binary format	Esc E X52 , X53 EDID ↵	Esc E X52 ↵	Export EDID table X52 to X53.

NOTE: See **EDID Minder** on page 3 for information on available EDID.

KEY:

X1 = Input number — 1 through 4

X50 = EDID record — 128 or 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 slot — Default — 1080p @ 60 Hz

NOTE: See **EDID tables for DXP HD 4K PLUS** starting 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 extension is .bin and carries 128 or 256 bytes of binary data.

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
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. *Verbose modes 2 and 3*
Output Format			
Set output format	Esc X2 * X8 VTPO ←	Vtpo X2 * X8 ↵	Set format X8 of output X2.
View output format	Esc X2 VTPO ←	X8 ↵ Vtpo X2 * X8 ↵	View the format of an output. *Verbose modes 2 and 3*
Output HDCP Mode			
Set output HDCP mode to Auto	Esc S X2 *0HDCP ←	HdcpS X2 *0 ↵	Set output X2 HDCP mode 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. *Verbose modes 2 and 3*
Output HDCP Status			
View output HDCP status	Esc O X2 HDCP ←	X11 ↵ HdcpO X2 * X11 ↵	View the HDCP status of an output. *Verbose mode 2 and 3*
View all outputs HDCP status	Esc OHDCP ←	X11[1] X11[2] X11[3] X11[4] ↵ *Verbose modes 2 and 3*: HdcpO00* X11[1] X11[2] X11[3] X11[4] ↵	View the HDCP status of all outputs.

KEY:

X2 = Output number — HDMI output, 1 through <*maximum number of outputs*>: DXP 42 — 1 or 2, DXP 44 and 84 — 1-4, DXP 88 — 1-8

X4 = Output name — 16 alphanumeric characters

X8 = Output format
- 0 = auto (default)
- 1 = DVI RGB 4:4:4 Full
- 2 = HDMI RGB 4:4:4 Full
- 3 = HDMI RGB 4:4:4 Limited
- 4 = HDMI YUV 4:4:4 Full
- 5 = HDMI YUV 4:4:4 Limited
- 6 = HDMI YUV 4:2:2 Full
- 7 = HDMI YUV 4:2:2 Limited

X10 = HDCP mode
- 0 = auto (follow the input, default)
- 1 = on (always encrypt HDMI outputs)

X11 = Output HDCP status
- 0 = 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

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Output Configuration Commands (continued)			
Video Color Bit Depth			
Set video color bit depth for an output	Esc X2 * X9 BITD ←	Bitd X2 * X9 ↵	Set the color bit depth for output X2 to X9.
View color bit depth for an output	Esc X2 BITD ←	X9 ↵	View the bit depth for output X2.
View color bit depth for all outputs	Esc BITD ←	X9[1] • X9[2] ↵	View color bit depth X9 for all outputs.
Signal Status			
View signal status for all inputs and outputs	Esc OLS ←	X22[1] • X22[2] • X22[3] • X22[4] * X22[1] • X22[2] ↵ Sig X22[1] • X22[2] • X22[3] • X22[4] * X22[1] • X22[2] ↵	View signal status X22 of all inputs and outputs.
HDCP Notification			
Set HDCP notification	Esc N X21 HDCP ←	HdcpN X21 ↵	Set the HDCP notification screen color to X21.
View HDCP notification	Esc N HDCP ←	X21 ↵	View the HDCP notification screen color.

KEY:

X1 = Input number	HDMI input, 1 through <*maximum number of inputs*>:
X2 = Output number	HDMI output, 1 through <*maximum number of outputs*>: DXP 42 — 1 or 2, DXP 44 and 84 — 1-4, DXP 88 — 1-8
X3 = Hot plug status	0 = disable, 1 = enable
X9 = Color bit depth	16 alphanumeric characters
X21 = HDCP notification screen	0 = black screen, 1 = green screen (default)
X22 = Signal status	0 = no signal present, 1 = signal present

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Video Output Mute			
Mute video to black on an output	X2*1B	Vmt X2*1↵	Mute video on output X2. Displays a black screen.
Mute video and sync on an output	X2*2B	Vmt X2*2↵	Mute video and sync on output X2.
Unmute video and sync on an output	X2*0B	Vmt X2*0↵	Unmute the video and sync on output X2.
View video mute status for an output	X2*B	X12↵ Vmt X2*X12↵	View the mute setting of output X2. *Verbose modes 2 and 3*
Mute all video to black	1B	Vmt1↵	Mute video (black screen) on all outputs.
Mute all video and sync	2B	Vmt2↵	Mute the video and sync on all outputs.
Unmute all video and sync	0B	Vmt0↵	Unmute video and sync on all outputs.
View all video output mutes	B	X12[1] X12[2]↵ Mut X12[1] X12[2]↵	View the video mute status of all outputs. *Verbose modes 2 and 3*

KEY:

X2 = Output number	HDMI output, 1 through <*maximum number of outputs*>: DXP 42 — 1 or 2, DXP 44 and 84 — 1-4, DXP 88 — 1-8
X9 = Color bit depth	16 alphanumeric characters
X12 = Video mute	0 = unmute, 1 = video mute, 2 = video and sync mute
X21 = HDCP notification screen	0 = black screen, 1 = green screen (default)
X22 = Signal status	0 = no signal present, 1 = signal present

Audio Configuration Commands

Audio Output Mute

NOTE: Audio mute commands affect both HDMI and analog audio (depending on the output from which it is de-embedded.

Set audio mute of an output	X2*X13Z	Amt X2*X13↵	Set audio mute X13 on output X2.
Unmute audio of an output	X2*0Z	Amt X2*0↵	Unmute the audio on output X2.
View audio mute status of an output	X2*Z	X13↵	View audio mute status of output X2.

KEY:

X2 = Output number	Audio output, 1 through <*maximum number of outputs*>: DXP 42 — 3 or 4, DXP 44, 84, and 88 — 1 or 2
X13 = Audio mute	0 = unmute (default), 1 = HDMI audio mute, 2 = analog audio mute, 3 = HDMI and analog audio mute

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Audio Configuration Commands (continued)			
Audio Output Mute (continued)			
NOTE: Audio mute commands affect both HDMI and analog audio (depending on the output from which it is de-embedded.			
Audio mute all (outputs 1 and 2)	X13Z	Amt X13 ↵	Mute the audio on outputs 1 and 2.
Audio unmute all (outputs 1 and 2)	0Z	Amt 0 ↵	Unmute the audio on all outputs.
View all audio mute status (outputs 1 and 2)	Z	X13[1]•X13[2] ↵	View the audio mute status of outputs 1 and 2.
		Amt X13[1]•X13[2] ↵	*Verbose modes 2 and 3*
Audio Output Volume Level (Analog Only)			
NOTE: Output volume control is for analog output only. Embedded digital audio on HDMI is not affected.			
Set volume of an output	X2V	Vol X16 ↵	Set the volume level of output X2 to X16. Response shows three decimal places.
Increase volume	X2+V	Vol X2*X16 ↵	Increase the volume level of output X2 to X16.
Decrease volume	X2-V	Out X2•Vol X16 ↵	Decrease volume level of output X2 to X16.
View volume level	X2V	X16 ↵	View the volume level of output X2.
		Out X2•Vol X16 ↵	*Verbose modes 2 and 3*

KEY:

X2 = Output number	Audio output, 1 through <*maximum number of outputs*>: DXP 42 — 3 or 4, DXP 44, 84, and 88 — 1 or 2
X13 = Audio mute	0 = unmute (default), 1 = HDMI audio mute, 2 = analog audio mute, 3 = HDMI and analog audio mute
X16 = Output volume level	0 to 100 percent in approximately 1.28 dB intervals (100 = default)

NOTE: If X16 exceeds the acceptable volume range specified in the analog output volume level commands, above, an E13 error message is returned.

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Front Panel Lockout Mode (Executive Mode)			
Set Front Panel Lockout mode	X20X	ExeX20↵	Set the accessibility to front panel operation.
View Front Panel Lockout mode	X	X20↵	View the accessibility level for front panel operation.
Device Commands			
Verbose Mode			
Set verbose mode	EscX23CV←	VrbX23↵	Enable or disable verbose mode and tagged responses, where additional information is provided in response to a query.
View verbose mode	EscCV←	X23↵	View the verbose mode.
Device Name			
Set device name[24]	EscX36CN←	Ipn•X36↵	Set the DXP unit name.

NOTES:

- 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.

Set device name to default	Esc•CN←	Ipn•DXP_42_HD_4K_PLUS	Set the DXP unit name to DXP_42_HD_4K_PLUS
View device name	EscCN←	X36↵	View the current device name.

KEY:

X20 = Front Panel Lockout mode
- 0 = unlock the front panel
- 1 = mode 1 (complete front panel lockout)
- 2 = mode 2 (tie configuration and preset management only, default)

X23 = Verbose mode
- 0 = 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

See the **Verbose mode command description** on page 45 for more information.

X36 = Device name
Maximum 24 alphanumeric characters or hyphens. The first character must be alpha. The last character cannot be a hyphen. No blank or space characters are permitted.

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Device Commands (continued)			
Reset Commands			
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.
NOTE: Entering this command or performing a mode 5 reset via the rear panel **Reset** button (see the **Reset Modes Summary** on page 34) removes the current passwords (whether user-set or the factory-set serial number), leaving the unit with no password.			
IP system reset	Esc 1ZQQQ←	Zpq1↵	Resets IP settings such as IP address, subnet mask, gateway IP address, unit name, DHCP setting and port mapping (telnet, web, or direct access) to factory defaults, and restarts the network.
NOTE: This command includes the 2BOOT← command so a separate 2BOOT← command is not required. The Zpq1↵ response is followed by Reconfig↵ and Boot2↵ responses.			
Reset all device settings and delete files[24]	Esc ZY←	Zpy↵	Reset all device settings, excluding IP settings.
Information Requests			
General information	I	V X1 X X2 ● A X1 X X5 ↵ *Verbose modes 2 and 3:* Info00*V X1 X X2 ● A X1 X X5 ↵	View the number of inputs and outputs for video and audio connectors.
NOTE: V X1 X X2 is the video matrix size. A X1 X X5 is the audio matrix size.			

KEY:

X1 = Input number	1 through 4
X2 = Output number	HDMI output, 1 through <*maximum number of outputs*>: DXP 42 — 1 or 2, DXP 44 and 84 — 1-4, DXP 88 — 1-8
X5 = Analog audio output number	1 through 4

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Information Requests (continued)			
View model name	1I	DXP•42•HD•4K•Plus↵ *Verbose modes 2 and 3:* Inf01*DXP•42•HD•4K•Plus•Series↵	View the name of the DXP model.
View model description	2I	DXP•42•HD•4K•Plus•Series↵ *Verbose modes 2 and 3:* Inf02*DXP•42•HD•4K•Plus•Series↵	View a brief description of the DXP model.
View part number	N	60-1678-01	View the DXP 42 part number.
View firmware version	Q	X25↵	View current firmware version X25.
View firmware and build version	*Q	X25.*nnnn*↵	View the firmware version and build number.

KEY:

X25 = Firmware version — *n.nn*

The firmware build number is X25.*nnnn*, where *nnnn* is the build number.

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 X30 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.

KEY:

X3 = Enable or disable — 0 = Disable DHCP mode (default), 1 = Enable DHCP mode

X30 = IP address — *nnn.nnn.nnn.nnn* (192.168.254.254 = default)

X31 = Subnet mask — *nnn.nnn.nnn.nnn* (255.255.0.0 = default)

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
IP Control Port Commands (continued)			
IP Setup			
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.
View MAC address	Esc CH ←	X33 ↵ Iph•X33 ↵	00-05-A6-*xx-xx-xx* *Verbose modes 2 and 3*
View number of open connections	Esc CC ←	X34 ↵ Icc X34 ↵	View the number of open connections. *Verbose modes 2 and 3*
Set DNS server address	Esc X30 DI ←	Ipd•X30 ↵	Set the IP address of the DNS server.
View DNS server address	Esc DI ←	X30 ↵	View the DNS server address. *Verbose modes 2 and 3*

KEY:

X3 = Enable or disable	0 = Disable DHCP mode (default), 1 = Enable DHCP mode
X30 = IP address	*nnn.nnn.nnn.nnn* (192.168.254.254 = default)
X32 = Gateway address	*nnn.nnn.nnn.nnn* (0.0.0.0 = default)
X33 = MAC address	00-05-A6-*xx-xx-xx*
X34 = Open connections	0-<*maximum number of open connections*>

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.

KEY:

X37 = Date and time	In the format *MM*/*DD*/*YY*•*HH*:*mm*:*SS* *MM* = month: 01 (January) to 12 (December) *DD* = day: 01 to 31 (depending on the month) *YY* = year: 00 to 99 (last two digits) *HH* = hour: 00 to 23, *mm* = minute: 00 to 59, *SS* = second: 00 to 59
X38 = Date and time (view only)	In the format *DAY*,•*DD*•*MMM*•*YYYY*•*HH*:*mm*:*SS* *DAY* =day of the week: Mon to Sun *DD* = date: 01 to 31 (depending on the month) *MMM* = month: 01 to 12 *YYYY* = year: 2000 to 2099 *HH* = hour: 00 to 23, *mm* = minute: 00 to 59, *SS* = second: 00 to 59

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
IP Control Port Commands (continued)			
Passwords			
NOTES: • The factory configured passwords for all accounts on this device have been set to the device serial number. If the unit is reset to factory settings, these passwords are set to no password. • 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.
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 ↵.
KEY: X42 = Password	0 to 128 characters		

CEC SIS Commands

CEC Symbol Definitions

X101 = CEC mode
- 0 = Disable CEC operations for this port (default)
- 2 = Enable insertion (unidirectional)
- 4 = Enable insertion and publish received CEC messages (bidirectional) (recommended)

X102 = CEC status
- 0 = CEC mode 0 disabled
- 2 = CEC mode 2 enabled but no device detected (unidirectional)
- 3 = CEC mode 2 enabled and device detected (unidirectional)
- 4 = CEC mode 4 enabled but no device detected (bidirectional)
- 5 = CEC mode 4 enabled and device detected (bidirectional)

X103 = Source logical address (our pseudo): 0 through 15
(-1 = Not found or port not enabled)

X104 = Destination logical address (theirs): 0 through 15
(-1 = not found or port not enabled)

CEC Logical Addresses

Address	Device
0	TV
1	Recording Device 1
2	Recording Device 2
3	Tuner 1
4	Playback Device 1
5	Audio System
6	Tuner 2
7	Tuner 3
8	Playback Device 2
9	Recording Device 3
10	Tuner 4
11	Playback Device 3
12	Reserved
13	Reserved
14	Free Use
15	Unregistered (as initiator address) Broadcast (as destination address)

X105 = CEC command: Predefined actions as strings within double quotes. For example: *"PwrOn"*, *"PwrOff"*, or "*ShowMe*"

X106 = Send result
- 0 = Failed (NAK [not acknowledged])
- 1 = Success (ACK [acknowledged]) of entire message
- 2 = Unable to send

X107 = CEC physical address — 4 hexadecimal digits (*Example*: %32%00)

X108 = CEC device presence:
0-F = Device address
X = Missing
— = CEC port is off

X109 = CEC data — User selected elements (0 through 15) in the form of a percent sign followed by two hex digits.
Example: %2A%07%FF

X110 = CEC address byte — In the form of percent sign followed by two hex digits
Example: %E0 = Extron output (14) to TV (0)

Command and Response Table for CEC SIS Commands

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
Enable or Disable CEC Commands			
Enable or disable one output CEC	Esc O X2 * X101 CCEC ←	CcecO X2 * X101 ↵	
Enable or disable all outputs CEC	Esc O X101 * CCEC ←	CcecO X101 ↵	
View output CEC status	Esc O X2 CCEC ←	X102 * X103 * X104 ↵ CcecO X2 * X102 * X103 * X104 ↵	*Verbose mode 2 and 3.*
Send CEC Commands			
Default Discovered Target Logical Address			
Send CEC data to Output (downstream sink)	Esc O X2 * X105 DCEC ← or Esc O X2 * X109 DCEC ←	DcecO X2 * X110 X109 * X106 ↵	For Send CEC commands, X105 and X109 can be used interchangeably. However, the response is always a hex representation (X109), for example, %2A%07%FF.
Broadcast to All Devices			
Send CEC data to Output (downstream sink)	Esc O X2 * 15 * X105 DCEC ← or Esc O X2 * 15 * X109 DCEC ←	DcecO X2 * X110 X109 * X106 ↵	

NOTE: Attempting to send a CEC command to an output that is disabled returns an E14 error.

KEY:

X2 = 1 through <*maximum number of outputs*>: DXP 42 — 1 or 2, DXP 44 and 84 — 1-4, DXP 88 — 1-8

X101 = CEC mode
- 0 = Disable CEC operations for this IO port (default).
- 2 = Enable insertion (unidirectional).
- 4 = Enable insertion and publish received CEC messages (bidirectional).

X102 = CEC status
- 0 = CEC mode 0 disabled
- 2 = CEC mode 2 enabled but no device detected (unidirectional)
- 3 = CEC mode 2 enabled and device detected (unidirectional)
- 4 = CEC mode 4 enabled but no device detected (bidirectional)
- 5 = CEC mode 4 enabled and device detected (bidirectional)

X103 = Source logical address (our pseudo) (see **CEC Logical Addresses** on page 75)
0 through 15, -1 = not found or port not enabled

X104 = Destination logical address (theirs) (see the **CEC Logical Addresses** table)
0 through 15, -1 = not found or port not enabled (see the **CEC Logical Addresses** table)

X105 = CEC command
Predefined actions as strings within double quotes: "PwrOn", "PwrOff", or "ShowMe"

X106 = Send result
0 = Failed (NAK) device not detected, 1 = Success (ACK) device detected, 2 = Unable to send

X109 = CEC data
User selected elements (0 to 15) in the form of percent sign followed by 2 hex digits
Example: %2A%07%FF

X110 = CEC address byte, in the form of a percent sign followed by two hex digits
Example: %E0 = Extron output (14) to TV (0)

Command	ASCII Command (Host to Switcher)	Response (Switcher to Host)	Additional Description
CEC Usage Examples			
Unidirectional Mode — No CEC received data messages (including answers to queries) desired			
Set mode	Esc O2*2CCEC←	CcecO2*2↵	Power on TV on output 2.
Send data	Esc O2*"PwrOn"DCEC← or Esc O2*%04DCEC←	DcecO2*%E0%04*1↵	
Bidirectional Mode — CEC received data messages desired			
Set mode	Esc O3*4CCEC←	CcecO3*4↵	Switch TV on output 3 to our signal (HDMI 2 on TV).
Send data	Esc O3*"ShowMe"DCEC← or Esc O3*15*%82%20%00DCEC←	DcecO3*%EF%82%20%00*1↵	
Examples of possible unsolicited messages	Ceco3*%0F%32%65%6E%67*1↵ Ceco3*%0E*1↵		TV broadcast command to set the menu language to English ("eng"). TV pings us to confirm we are still there.
NOTE: Asynchronous received data messages from CEC in bidirectional mode (4) format: Ceco X2*X110X109*X106↵			
Other CEC Commands			
List CEC device presence	Esc LQCEC←	*X108...X108↵ QcecL**X108 ... X108↵	*Output 1 ... output *n* *Verbose modes 2 and 3*
Rediscover device on output	Esc O X2 QCEC←	QcecO X2 *1↵ QcecO X2 *0*X106↵ ... QcecO X2 *13*X106↵	
Report physical address of output port	Esc O X2 PCEC←	X107↵ PcecO X2*X107↵	For 1000 (usually first HDMI input on TV) *Example:* %10%00 *Verbose modes 2 and 3*

KEY:

X2 = HDMI output —1 through <*maximum number of outputs*>:
DXP 42 — 1 or 2, DXP 44 and 84 — 1-4, DXP 88 — 1-8

X106 = Send result
0 = Failed (NAK) device not detected, 1 = Success (ACK) device detected, 2 = Unable to send

X107 = CEC physical address: 4 hexadecimal digits (*Example:* %10%00 for 1000)

X108 = CEC device presence
0-F = Device address, X = Missing, – = CEC port is off

X109 = CEC data
User selected elements (0 to 15) in the form of percent sign followed by two hex digits
Example: %2A%07%FF

X110 = CEC address byte, in the form of a percent sign followed by two hex digits
Example: %E0 = Extron output (14) to TV (0)

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

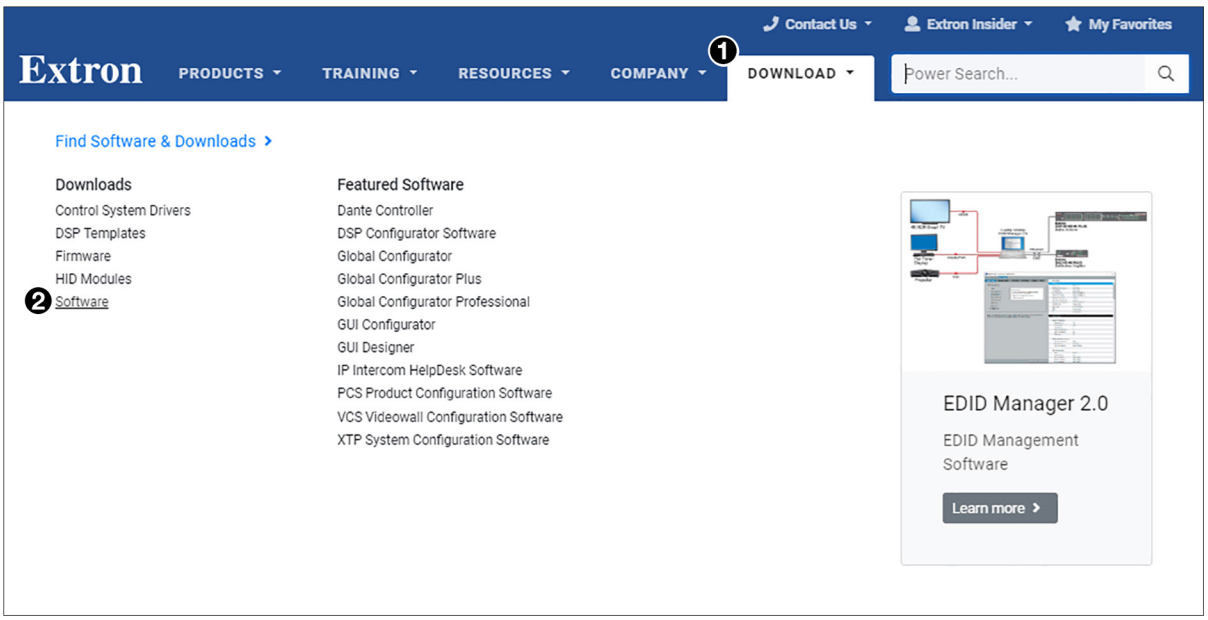


Figure 38. Download Center Page on the Extron Website

1. On the Extron website, select the **Download** tab (see **figure 38**, ❶, on the previous page).
2. Move the pointer to the **Software** link (❷) in the Downloads column and click it.

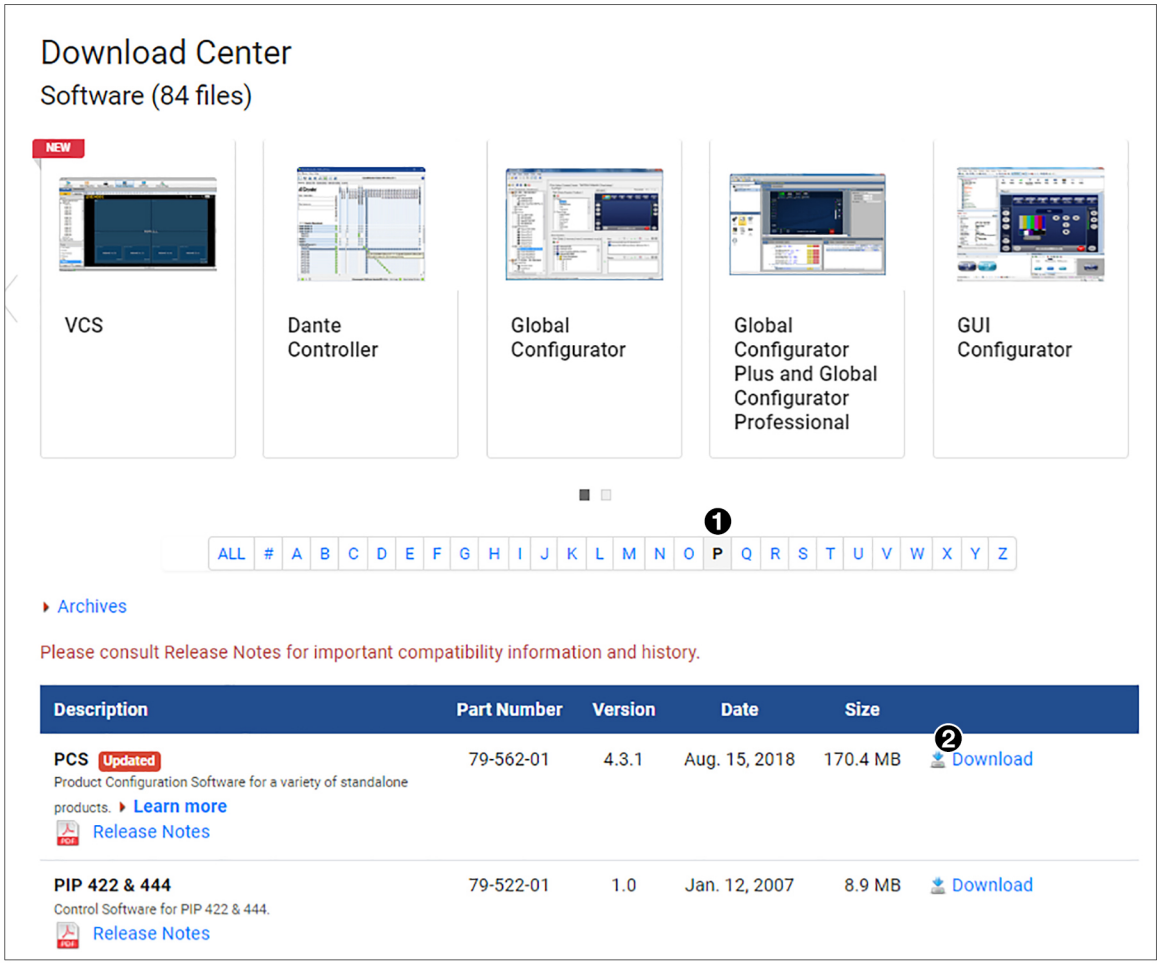


Figure 39. PCS Download Link

3. On the Download Center Software page, click the **P** link (see figure 39, ❶).
4. If necessary, scroll to locate PCS from the list of available software programs and click the **Download** link to the right of the name (❷).
5. On the login page that appears next, fill in the required information to log in to **www.extron.com** (if you need an ID number, see your Extron representative).
6. Follow the instructions on the subsequent screens to complete the software program installation. By default, the configuration program files are stored on your computer at: C:\Program Files (x86) \ Extron \ Extron PCS.

   If there is not already an Extron folder in your Program Files (x86) folder, the installation program creates it as well.

PCS Product Page

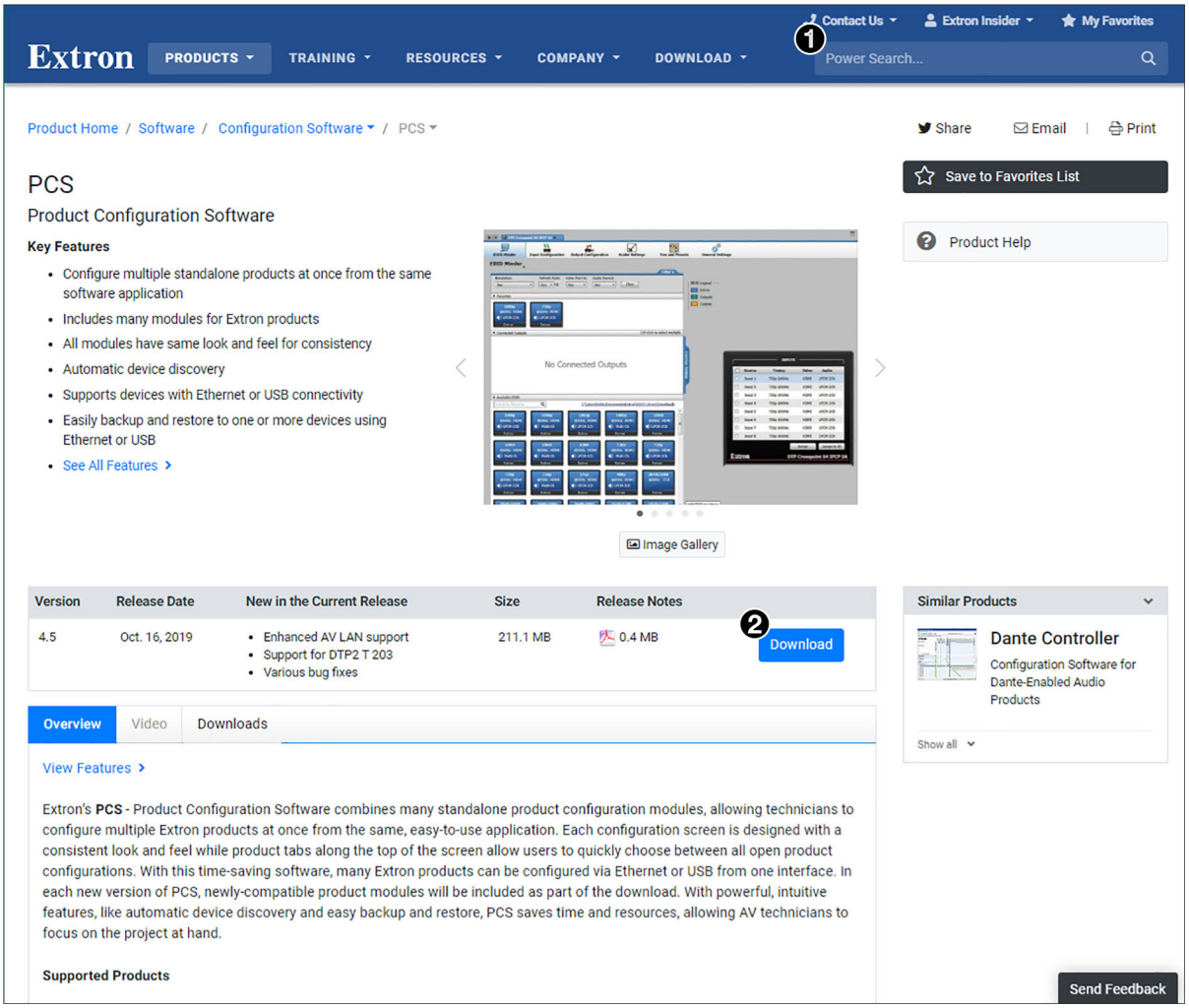


Figure 40. PCS Product Page

1. In the **Power Search** field (see figure 40, ❶), 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 (❷).
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.

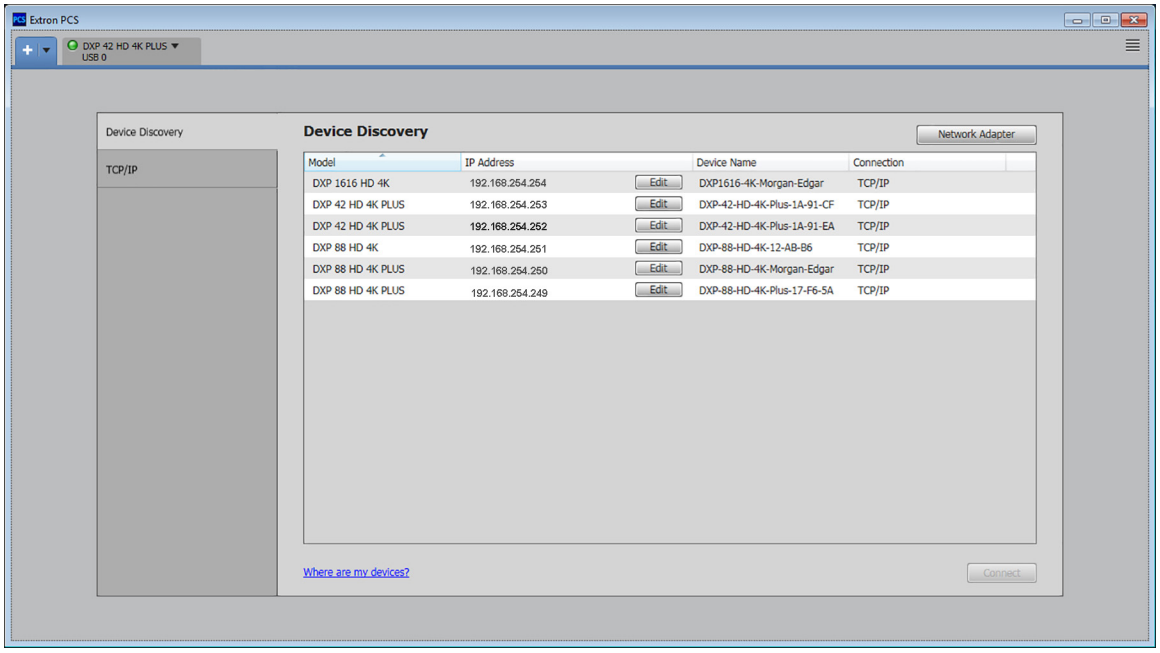


Figure 41. PCS Window

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.

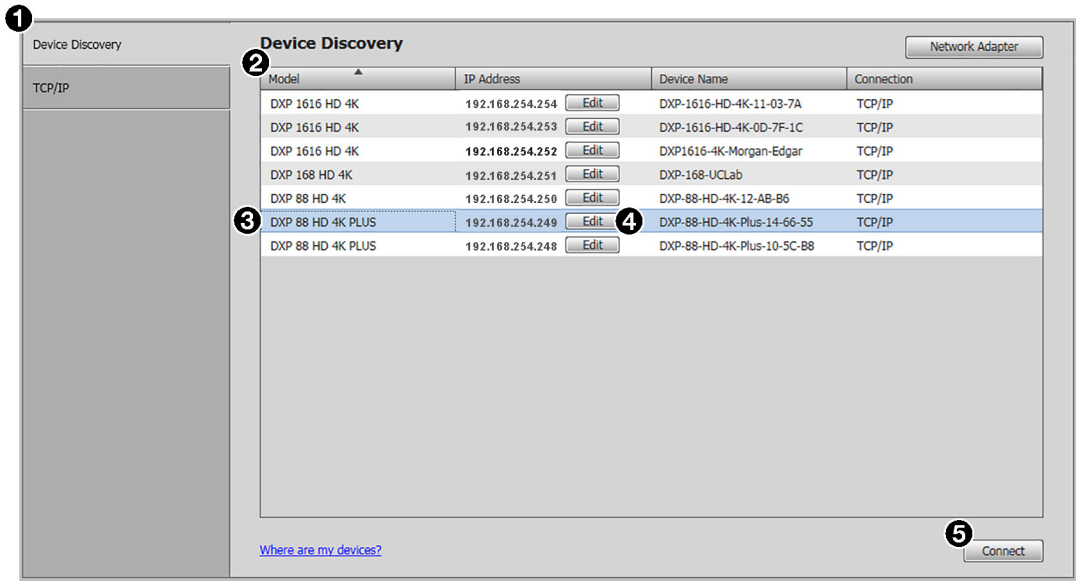


Figure 42. Device Discovery Panel

To sort the list of available devices:

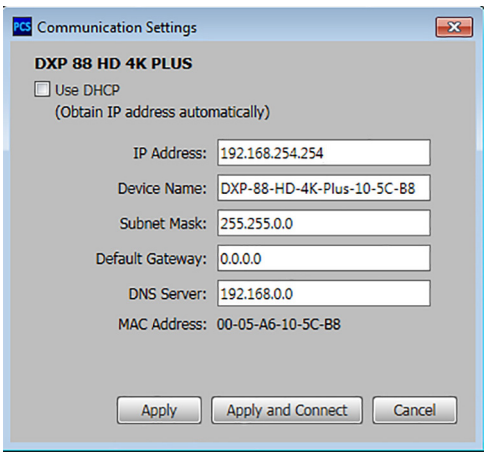
1. Click the **Device Discovery** tab (see figure 42, ❶).
2. Click the desired column heading (❷) to sort the category in ascending or descending order.

To connect to a device:

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

To edit communication settings from the Device Discovery panel:

1. Click the **Device Discovery** tab (❶).
2. Click the **Edit** button of the desired device (❹). The **Communication Settings** dialog box opens.
3. Enter the IP information (see **Communication Settings Panel** on page 89 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 43. TCP/IP Panel

1. Click the **TCP/IP** tab (see figure 43, ❶).
2. In the **IP Address** field (❷), enter the IP address of the desired device.
3. If required, enter the device password in the **Password** field (❸). Select the **Show Characters** checkbox (see ❺) to display the password characters.

   NOTES:

   - The factory-configured passwords for all accounts on this device are initially set to the device serial number. Passwords are case-sensitive.
   - Performing a unit factory reset (entering an Esc **ZQQQ← SIS command** or a **mode 5 reset** on page 34 via the rear panel **Reset** button) removes the serial number passwords, leaving the unit with no password.

4. In the **Telnet Port** field (❹), enter the Telnet port of the desired device.
5. Click the **Connect** button (❻). 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.

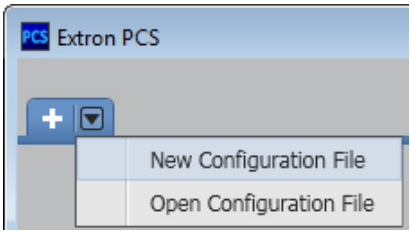


Figure 44. Configuration File Drop-Down Menu

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

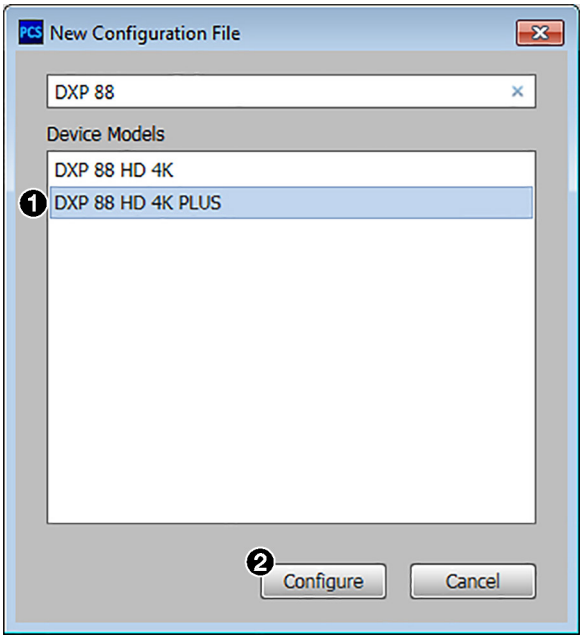


Figure 45. New Configuration File Dialog Box (DXP 88 HD 4K PLUS Selected)

2. Select the desired device model from the Device Models list (see figure 45, ❶).
3. Click the **Configure** button (❷). 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.

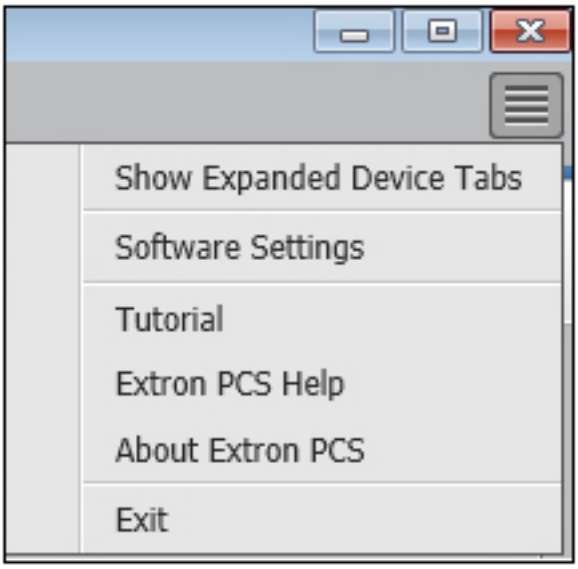


Figure 46. Software Menu

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 82) or open an offline device tab (see **Offline Device Preview** on page 85). From the **`Device`** menu, click **`[product] Help`**. The actual option displays the name of the connected device.

NOTE: The DXP 42 **`Device`** menu does not contain the **`Commissioning Report`** option.

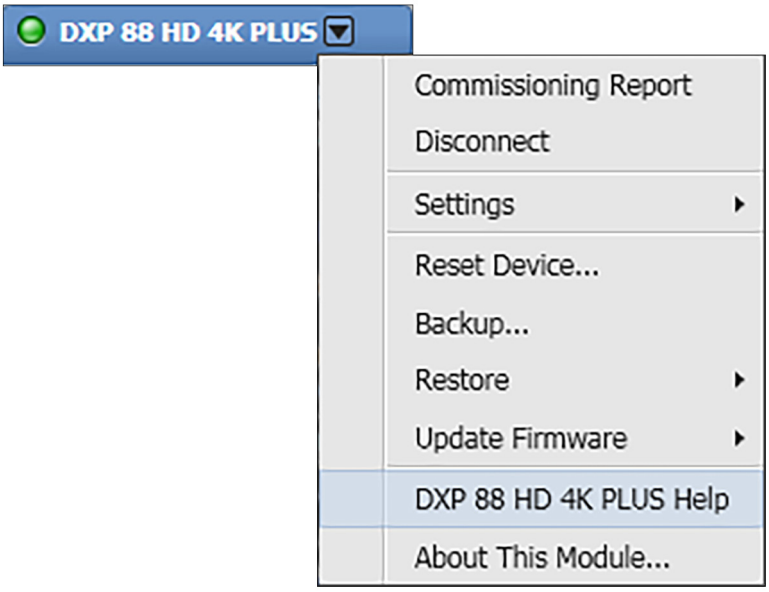


Figure 47. Device Menu

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 - DXP 44, 84, 88**
- **Web Page Components - DXP 42**

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** starting on page 39) or PCS (see **Configuration Software** starting on page 79, 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 10).
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.

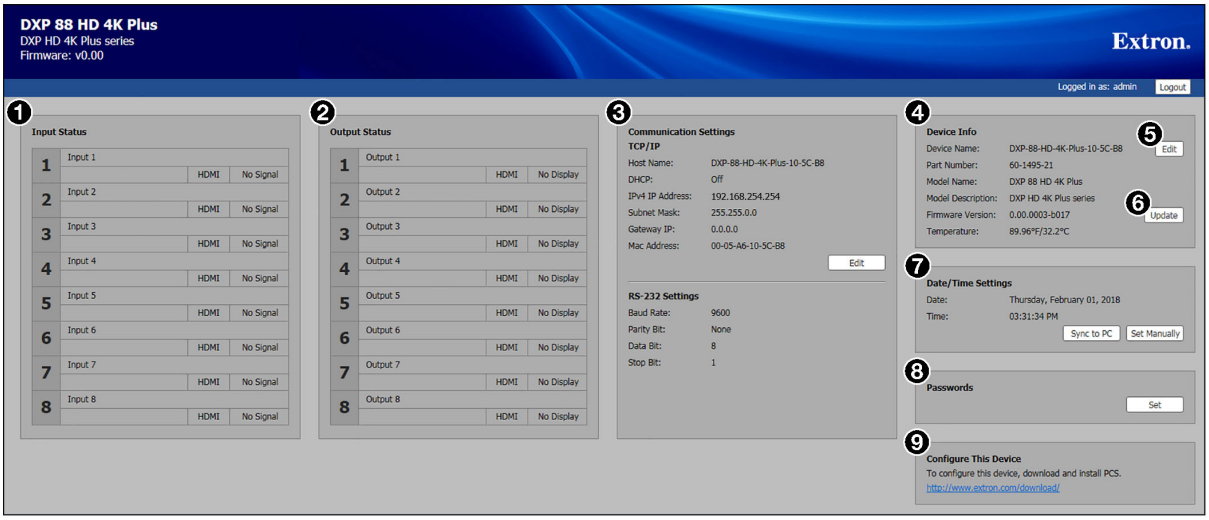
   NOTE: The default IP address is 192.168.254.254.

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.

     NOTE: The factory configured passwords for all accounts on this device have been set to the device serial number. If the unit is reset to factory settings (**mode 5 reset** or Esc **ZQQQ ← SIS command**), these passwords are set to no password. Passwords are case-sensitive.

6. Click the **`OK`** button.

Web Page Components — DXP 44, 84, 88



❶ **Input Status Panel**
❷ **Output Status Panel**
❸ **Communication Settings Panel**
❹ **Device Info Panel**
❺ **Date/Time Settings Panel**
❻ **Passwords Panel**
❼ **Configure This Device Panel**

Figure 48. Internal Web Page — DXP 88

NOTE: Figure 48 shows a DXP 88 web page. The web pages for the DXP 44 and 84 are identical except for the number of inputs and outputs.

Input Status Panel

The `Input Status` panel (see figure 48, ❶) 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
HDCP	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 48**, ❷, 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: • 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 (❸) 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.

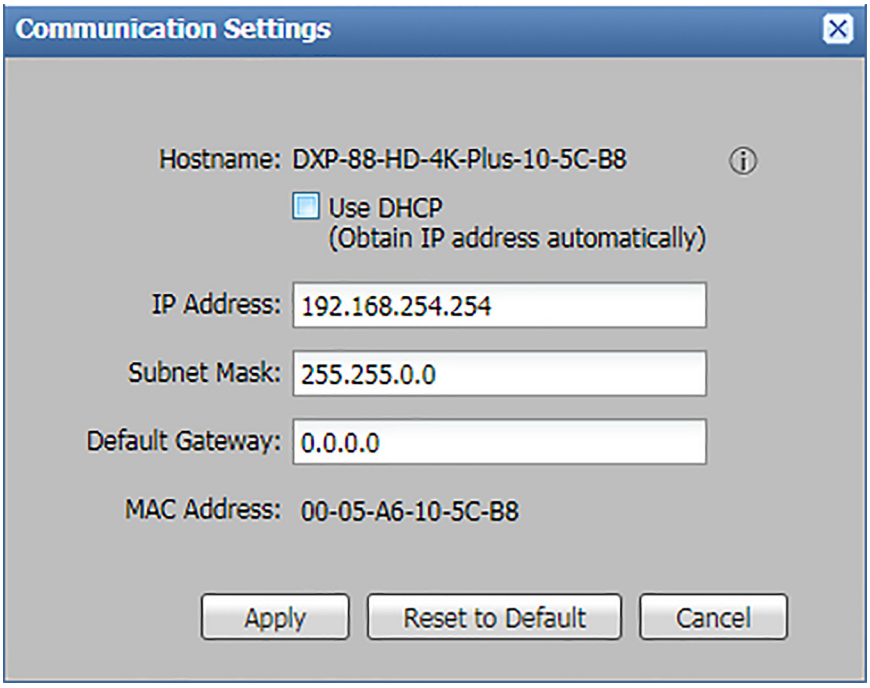


Figure 49. Communication Settings Dialog Box

NOTE: The hostname is generated from the device name. To change it, see **Setting the device name** on page 90.

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`.

NOTE: If the password is still set to the factory configured device serial number, the password is reset to no password.

To cancel pending changes:

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

Device Info Panel

The Device Info panel (see figure 48, 4, on page 87) 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.

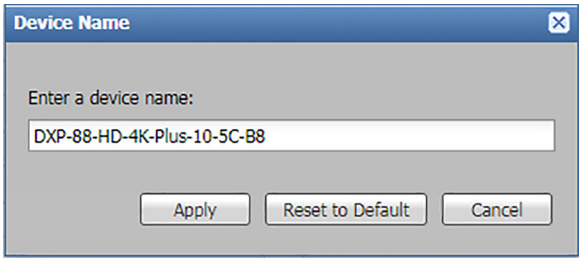


Figure 50. Device Name Dialog Box

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 51. 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

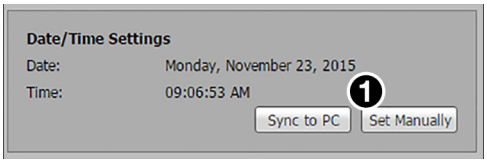
The Date/Time Settings panel (see **figure 48**, ❺, on page 87) displays the date and time on the device and provides options to set the device date and time automatically or manually.

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 ❶ in the figure at right). The Date and Time Settings dialog box opens.



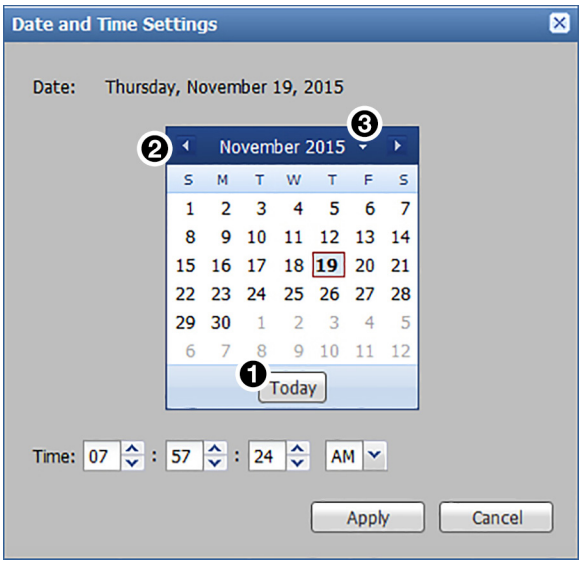


Figure 52. Date and Time Settings Dialog Box

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 52, ❶).
   - Select the date from the calendar by doing either of the following:
     - Click the left and right arrow buttons in the calendar heading (❷).
     - Click the drop-down menu next to the calendar month and year (❸), 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 48**, ❻ on page 87) 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.)

NOTE: The factory configured passwords for all accounts on this device have been set to the device serial number. If the unit is reset to factory settings (see **mode 5 reset** on page 34 or **Esc ZQQQ ← SIS command** [see page 57]), these passwords are set to no password.

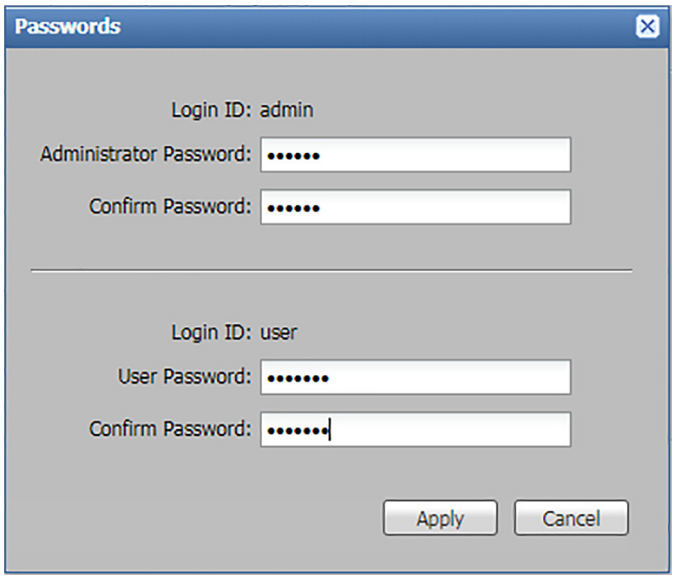


Figure 53. Passwords Dialog Box

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.

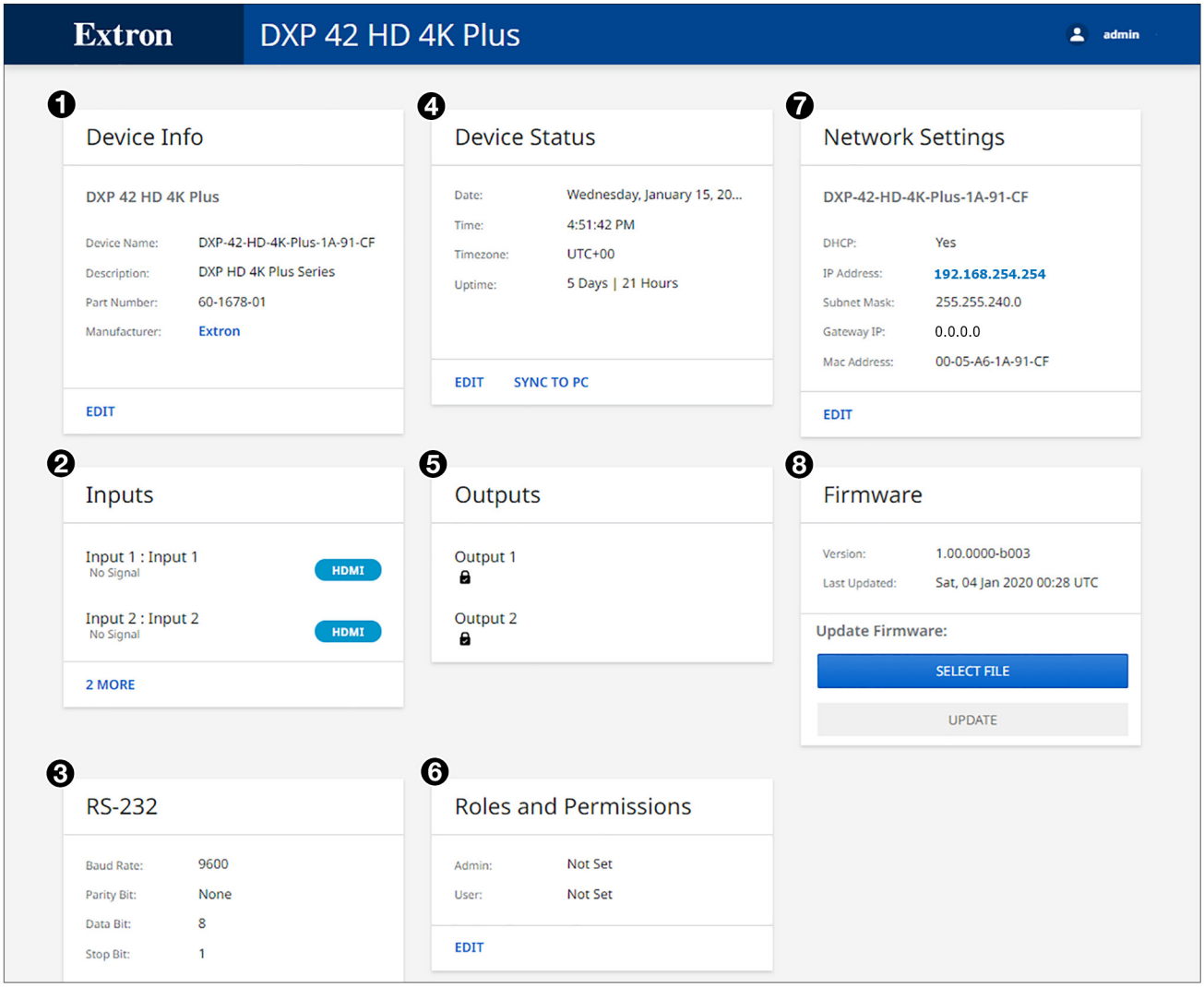
To cancel pending changes:

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

Configure This Device Panel

This panel (see **figure 48**, ❼, on page 87) 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.

Web Page Components — DXP 42



1. Device Info panel
2. Inputs panel
3. RS-232 panel
4. Device Status panel
5. Outputs panel
6. Roles and Permissions panel
7. Network Settings panel
8. Firmware panel

Figure 54. Internal Web Page — DXP 42

Device Info Panel

The **Device Info** panel (see **figure 54**, ❶, on the previous page) displays device name, brief product description, and part number, with the option to edit the device name. The panel also contains an **Extron** link which opens **www.extron.com** in a new window.

Setting the device name

To edit the device name (TCP/IP hostname), click the **Edit** button in the lower-left corner of the **Device Info** panel. The **Device Info Settings** dialog box opens.

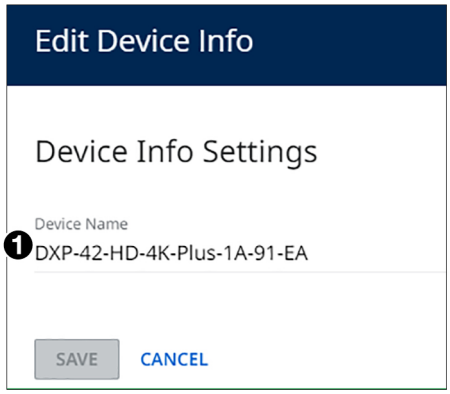


Figure 55. Device Info Settings Dialog Box

To change the name:

1. Click on the default name in the **Device Name** field (see figure 55, ❶). A cursor appears. (The default name is the model name followed by *-xx-xx-xx*, where *xx-xx-xx* are the last six characters of the unit MAC address.)
2. Enter a name for the DXP 42.
3. Click **Save** to apply the new name and close the dialog box, or click **Cancel** to close the dialog box without renaming the device.

Inputs Panel

The **Inputs** panel (see **figure 54**, ❷) displays the name and signal type of the active input signal as well as its HDCP status.

The following HDCP status indicators may be displayed for the inputs:

Symbol	Definition
HDCP	The signal is HDCP encrypted.
	The signal is not encrypted.
No Signal	There is no signal detected.

To view the status and type of all inputs, click the link (named **2 More**) in the lower-left corner of the **Inputs** panel to view the **Inputs** dialog box (see **figure 56** on the next page for an example).

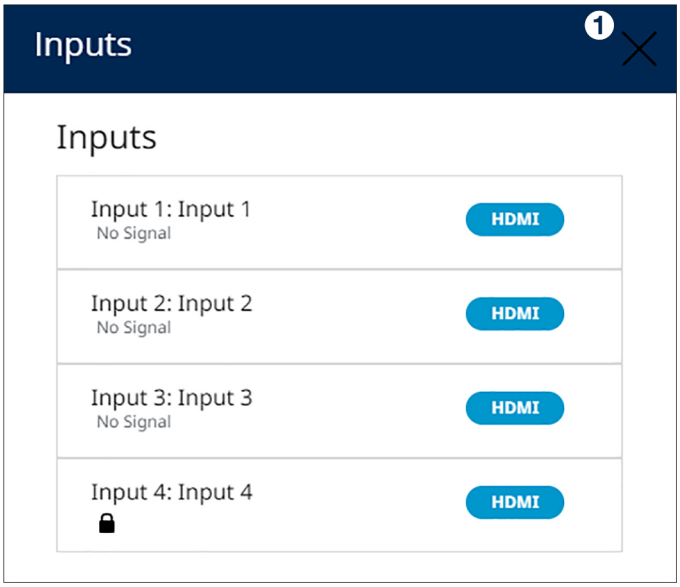


Figure 56. Inputs Dialog Box

When finished viewing the input information, click the **X** in the upper-right corner of the dialog box (see figure 56, ❶) to close it.

RS-232 Panel

The view-only RS-232 panel (see **figure 54**, ❸, on page 93) displays the RS-232 protocol for the DXP serial port. The defaults are:

- Baud rate — `9600`
- Parity Bit — `N` (none)
- Data bits — `8`
- Stop bits — `1`

Device Status Panel

The `Device Status` panel (❹) displays the current date, time, time zone, the amount of time the device has been running (`Uptime`), and internal temperature in degrees Celsius.

Syncing the DXP 42 to the PC

To set the DXP 42 date and time to match that of your computer:

Click **`Sync to PC`** at the bottom of the `Device Status` panel. When the sync is completed, the message shown in figure 57 appears in the upper-right corner of the screen.

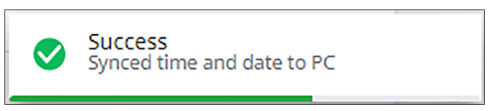


Figure 57. Sync to PC Success Message

Editing the date, time, and time zone

1. Click the **Edit** link in the lower-left corner of the panel. The Edit Device Status dialog box opens.

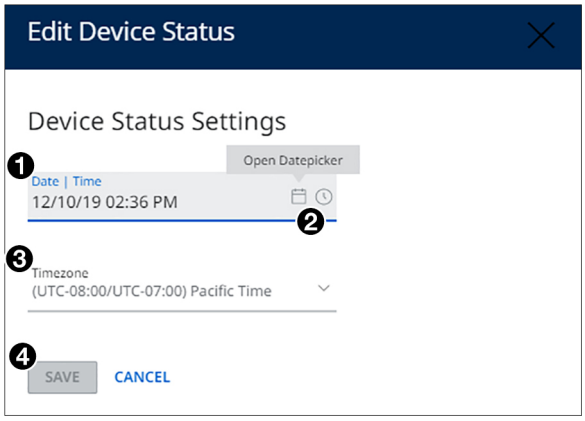


Figure 58. Edit Device Status Panel for Date and Time Setting

2. Set the time, date, and time zone as desired:

   - **Date and Time** — In the **Date | Time** field (see figure 58, ❶, either click on the hour and minute text fields and type in the time, or click the **Datepicker** or **Timepicker** icons (❷) to display the following panels:

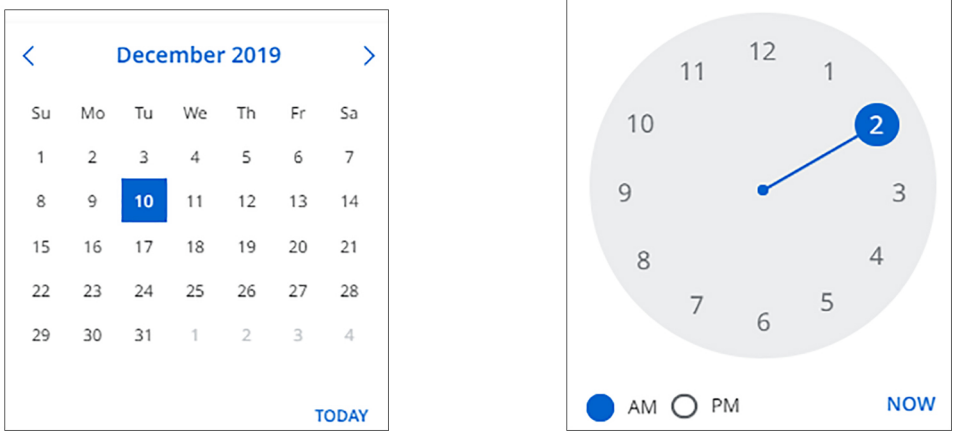


Figure 59. Datepicker and Timepicker Screens

   - **Date** — On the **Datepicker** screen, either select the desired date from the calendar (current month only) or click **TODAY** to display the current date in the **Date | Time** field. To select a different month, click the right and left arrows at the top of the screen to display the desired month and year.
   - **Time** — On the **Timepicker** screen, click on the hour or minutes above the clock, then click on the desired number on the clock. To display the current time in the **Date | Time** field, click **NOW**. Select the **AM** or **PM** radio button.
   - **Time Zone** — In the **Timezone** field, select the desired time zone from the drop-down menu (❸).

3. When finished entering settings, click **Save** (❹) to confirm them, or **Cancel** to close the dialog box without implementing the settings.

Outputs Panel

The Outputs panel (see figure 54, ❺, on page 93) displays the resolution and refresh rate of the outputs, their signal type (HDMI or DVI), and the HDCP status of all connected outputs.

The following status symbols may be displayed for connected outputs:

Symbol	Definition
	The display is HDCP compliant.
	The display is not HDCP compliant.
No Display	No display is connected.

Roles and Permissions Panel

In this panel (❻) you can set and remove administrator and user passwords.

NOTE: The following rules apply to passwords:

- Length is 1-128 characters.
- All human-readable characters are permitted except |.
- The password cannot be a single space unless you are removing the password entirely.
- Passwords are case-sensitive.
- A user password cannot be assigned if no administrator password exists.
- If the Admin password is cleared, the user password is cleared as well.

Setting a password

NOTE: The initial factory configured passwords for all accounts on this device have been set to the device serial number. Passwords are case sensitive. In the event of an absolute system reset, the passwords are reset to no password.

The web password is administrator level. Passwords are case sensitive.

To assign new administrator and user passwords:

1. In the Roles and Permissions panel, click **Edit**. The Role and Permission Settings dialog box opens
2. In the Admin panel, click the **Change Admin Password** link and enter the new administrator password in the field below (see figure 60, ❶, on the next page).
3. Click in the **Confirm Admin Password** field (❷) and repeat the password from the **Change Admin Password** field.

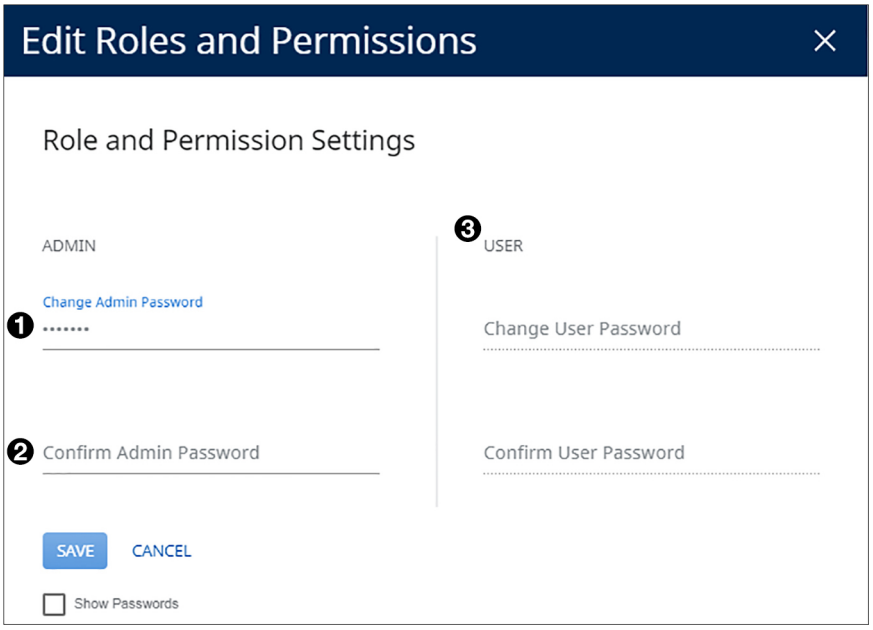


Figure 60. Passwords Dialog Box with Administrator Password Entered

4. If you want to assign a user password, repeat steps 2 and 3 in the `User` panel (see figure 60, ❸).
5. When finished, click **`Save`** to set the passwords. To close the window without saving a password, click **`Cancel`** or the **`X`** in the upper-right corner.

To remove an assigned password:

1. In the **`Change Admin Password`** or **`Change User Password`** field, enter a single space.
2. Enter a single space in the appropriate **`Confirm Password`** field.
3. Click **`Save`**.

Network Settings Panel

In the `Network Settings` panel (see **figure 54**, ❼, on page 93), you can set the IP address, subnet mask, and gateway address for your DXP, and turn DHCP on and off. You can also view the MAC address of the unit. To set the IP addresses:

1. Click **`Edit`** in the lower-left corner of the `Network Settings` panel. The `EDIT Network Settings` screen opens.

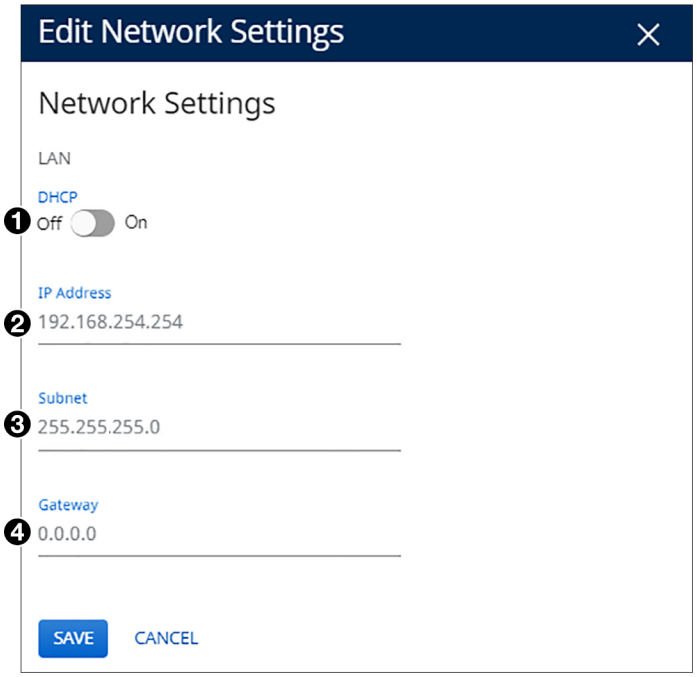


Figure 61. Edit Network Settings Screen

2. Edit the network settings as desired:
   - **DHCP** — Click the **`DHCP`** button (see figure 61, ❶) to toggle DHCP on and off. When DHCP is enabled (**`On`**), the unit configures its IP address and other network settings from the DHCP server. The default is **`Off`**.
   - **IP Address, (❷), Subnet mask (❸), and Gateway address (❹)** — To set any of these addresses, click in the desired field and enter the address.
3. When finished editing, click **Save** to confirm your changes or **`Cancel`** to close the window without making changes. You can also close the window by clicking the **`X`** in the upper-right corner of the screen.

NOTE: If DHCP is being enabled, the web page attempts to redirect and connect to the unit via the unit name (TCP/IP hostname). If a static IP address is being set, the web page attempts to connect to the new IP address.

Firmware Panel

The **Firmware** panel (see **figure 54**, ❽, on page 93) displays the current firmware version and the date it was last updated. You can also update the firmware on your DXP from this panel (firmware files can be downloaded from **www.extron.com**, see **Downloading Updated Firmware** starting on page 103).

To update the firmware on your DXP:

1. In the **Firmware** panel, click the **Select File** button.
2. In the **Open** dialog box, browse to locate the new firmware file on your computer (by default the file is stored at **C:\Program Files (x86)\Extron\Firmware** after being downloaded from the Extron web page).

   NOTE: Firmware files for DXP HD 4K PLUS series have a .eff extension. Do not attempt to load any other file types.

3. Double-click the firmware file name. The **Open** window closes, and the selected firmware file name appears in the **Update Firmware** panel on the web page (see figure 62, ❶).

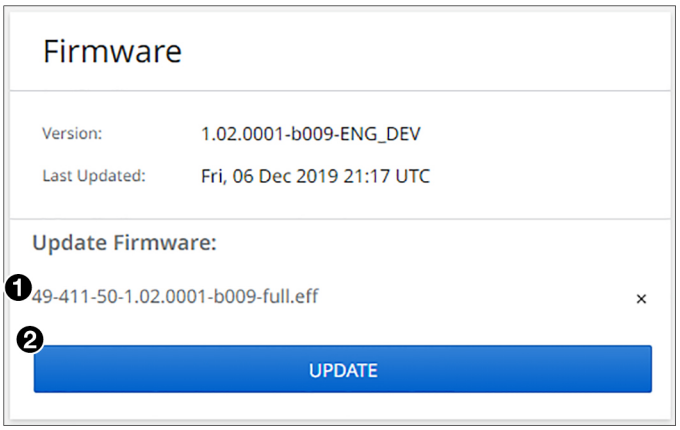


Figure 62. Firmware Update Dialog Box with a Firmware File Selected

4. Click **Update** to begin (❷). (If you want to cancel the update, click the **X** button in the upper-right corner of the **Update Firmware** panel.)

   During the updating process, a window appears in the middle of the screen, showing the progress of the update: Uploading, **Initializing**, **Writing to Flash**, and **Rebooting** (see figure 63).

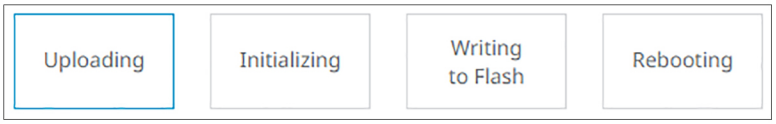


Figure 63. Firmware Update Progress Window

When the update is completed, the progress window closes and the message **Firmware Upload Complete** appears near the top of the screen. The new firmware filename appears beside **Version** in the **Firmware** panel of the web page.

Reference Information

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

Mounting the Switcher

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

Mounting Procedures

- **DXP 44, 84, and 88** — Using the included brackets or an optional 19-inch rack shelf kit (available at **www.extron.com**), mount the unit to the rack, following the instructions provided with the mounting kit.
- **DXP 42** — Using an optional rack shelf kit, back-of-the-rack mounting kit, or under-desk mounting kit such as the Extron MBU 125, mount the unit to the rack or furniture, following the instructions provided with the mounting kit.

Downloading Updated Firmware

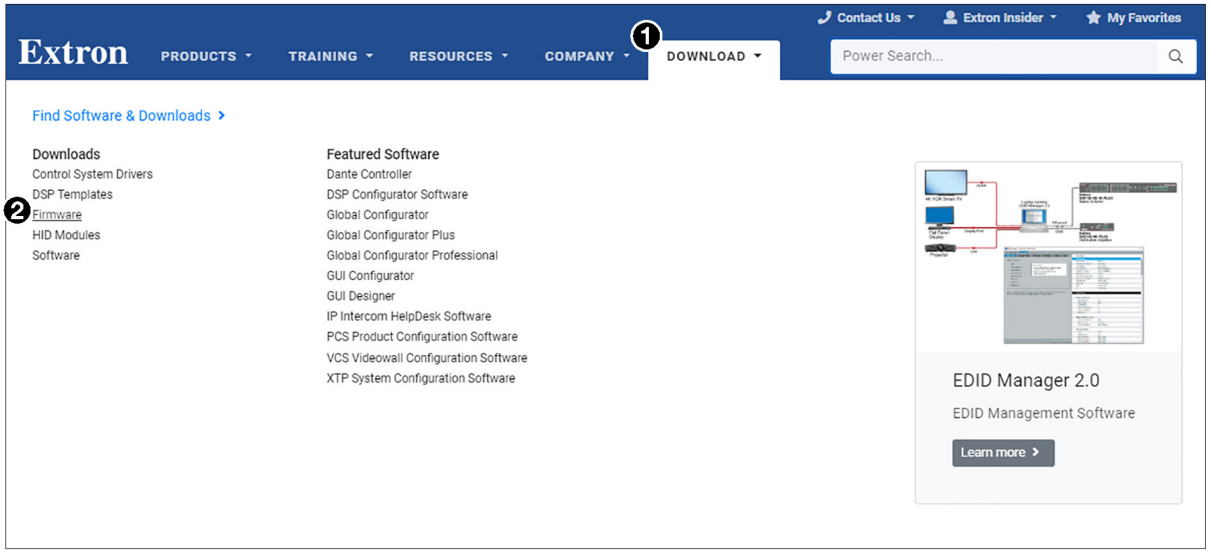


Figure 64. Downloading Firmware from the Extron Website

1. On the **www.extron.com**, click the **Download** tab (see figure 64, ❶).
2. Move the pointer to the **Firmware** link (❷) in the **Downloads** column and click it.
3. On the **Download Center** screen, click the **D** link (see figure 65, ❶).

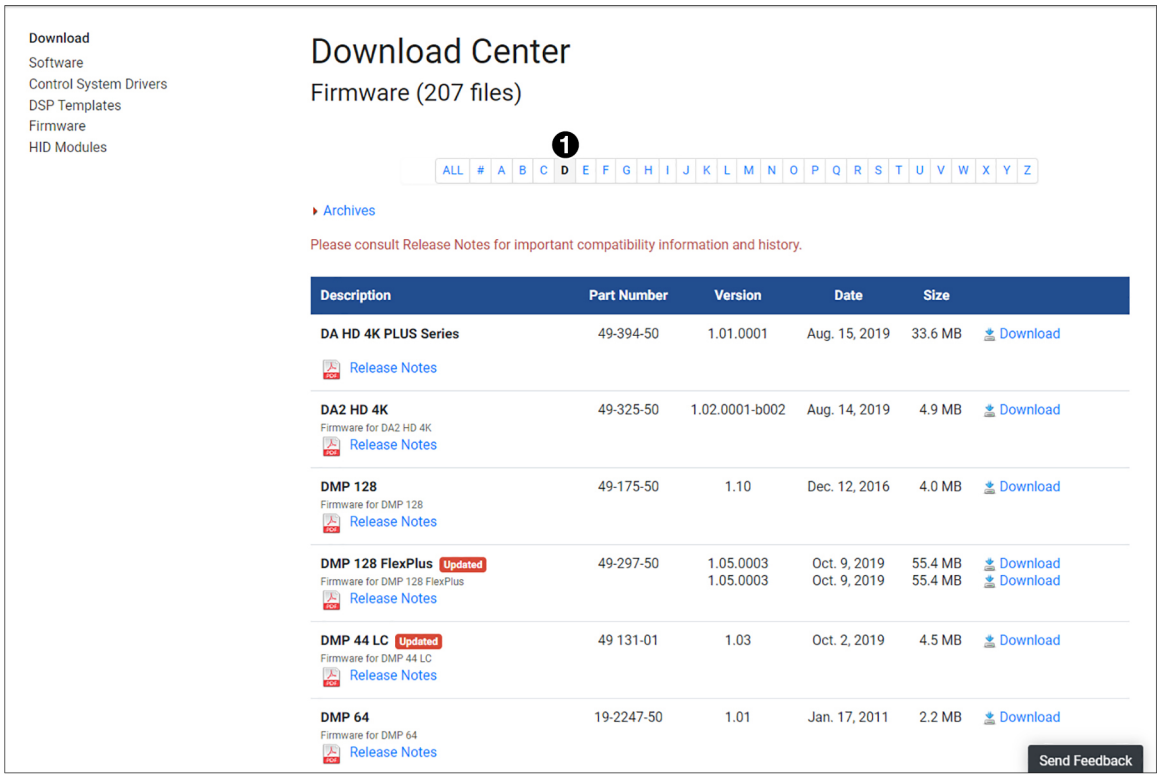


Figure 65. D Link on Firmware Download Center Page

4. If necessary, scroll to locate your device: DXP HD 4K PLUS Matrix Series.
5. Ensure the available firmware version is a later version than the current one on your device.

   NOTE: The firmware release notes provide details about the changes between different firmware versions. The file can be downloaded from the same page as the firmware.

6. Click the **Download** link to the right of your DXP device (see figure 66, ❶).

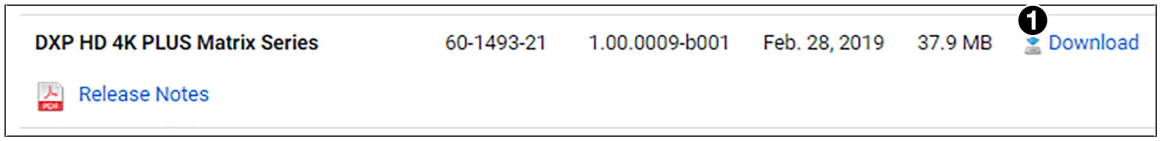


Figure 66. Firmware Download Link for DXP HD 4K PLUS

7. On the login page that appears next, fill in the required information to log in to **www.extron.com** (if you need an ID number, see your Extron representative).
8. Follow the instructions on the subsequent screens to complete the software program installation. By default, the configuration program files are stored on your computer at `C:\Program Files(x86)\Extron\Firmware\DXP HD 4K PLUS`

   If there is not already an Extron folder in your Program Files x86 folder, the installation program creates it as well.

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 109 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 `command`.
3. Click **OK**. A command window opens.
4. At the command prompt, enter `ping` *`IP address`*. The computer returns a display similar to figure 67.

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

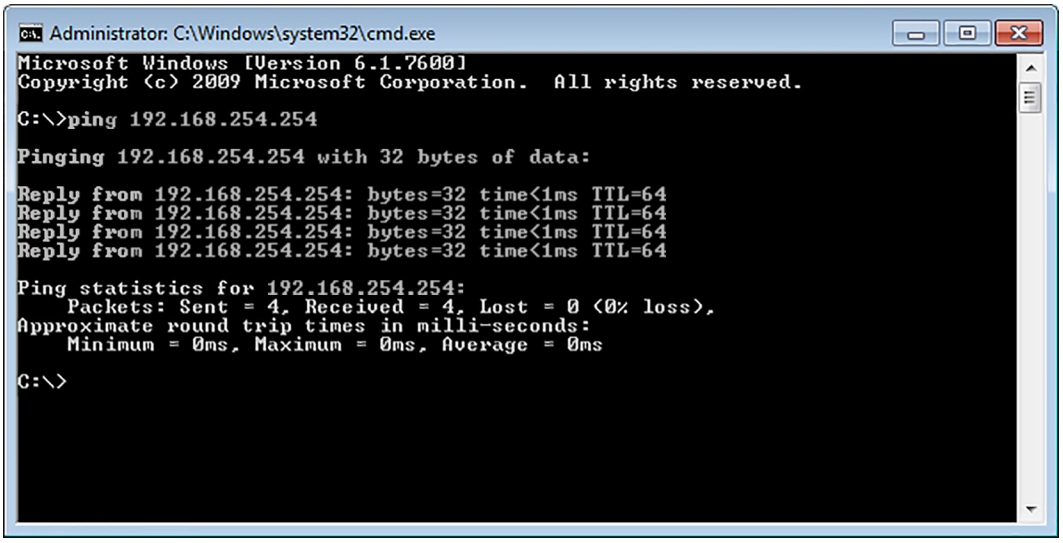


Figure 67. Ping Response

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 68.

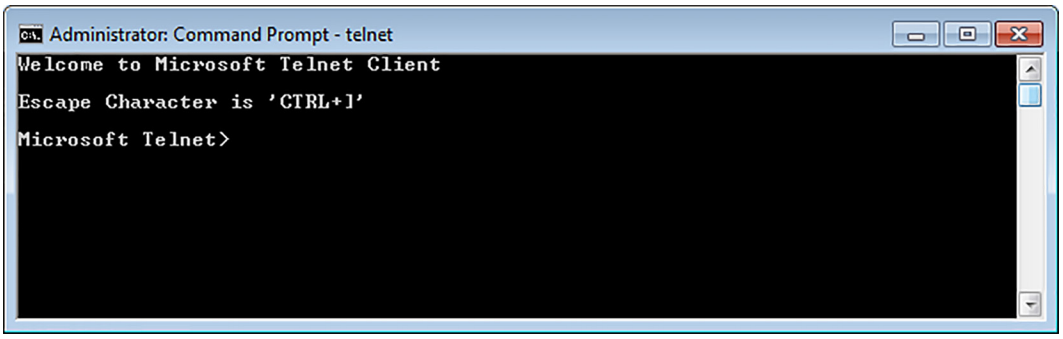


Figure 68. Telnet Screen

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.

   NOTE: The factory configured passwords for all accounts on this device have been set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is no password.
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+]`." This means that the Telnet `Escape` character is a key combination: the <**Ctrl**> key and the <**]**> key pressed simultaneously. Pressing these keys displays the Telnet prompt while leaving the connection to the 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 +]>).

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 **sub**set of a **net**work — a set of IP devices that have portions of their IP addresses in common. It is not the purpose of this manual to describe TCP/IP protocol in detail. However, some understanding of TCP/IP subnetting is necessary in order to understand the interaction of the 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 69). Each octet can be numbered from 000 through 255. Leading zeros, up to three digits total per octet, are optional. Values of 256 and above are invalid.

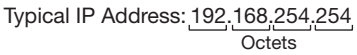


Figure 69. IP Address and Octets

Subnet masks and octets

The subnet mask (see figure 70) 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.

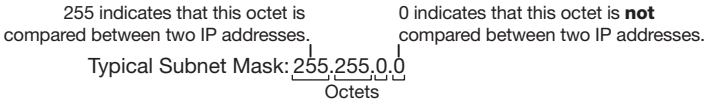


Figure 70. Subnet Mask and Octets

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 71). 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 71).

- 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 71).

If the unmasked octets of the two IP addresses **match** (indicated by **=** in example 1 of figure 71), the two addresses **are on the same subnet**.

If the two unmasked fields **do not match** (indicated by an unequal sign in figure 71, 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 71. 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.

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

Europe:
Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

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

Africa:
Extron South Africa
South Tower
160 Jan Smuts Avenue
Rosebank 2196, South Africa

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

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

USA: 714.491.1500 or 800.633.9876 **Asia**: 65.6383.4400
Europe: 31.33.453.4040 or 800.3987.6673 **Japan**: 81.3.3511.7655
Africa: 27.11.447.6162 **Middle East**: 971.4.299.1800

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.