



# MGP 641 xi Series

## Multi-Graphic Processors



## User Guide Signal Processors

## 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](http://www.extron.com).

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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 estas están incluidas en la documentación proporcionada con el equipo.

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### Instructions de sécurité • Français

**⚠ AVERTISSEMENT :** Ce pictogramme, , lorsqu'il est utilisé sur le produit, signale à l'utilisateur la présence à l'intérieur du boîtier du produit d'une tension électrique dangereuse susceptible de provoquer un choc électrique.

**⚠ 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 l'équipement.

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](http://www.extron.com).

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**⚠ 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.

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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](http://www.extron.com).

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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](http://www.extron.com).

### Инструкция по технике безопасности • Русский

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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](http://www.extron.com), номер по каталогу - 68-290-01.

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**⚠ 注意:** 产品上的这个标志意在提示用户，设备随附的用户手册中有重要的操作和维护(维修)说明。

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](http://www.extron.com)，参见 Extron 安全规范指南，产品编号 68-290-01。

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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](http://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。

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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](http://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.

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

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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.

### ATTENTION:

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

### NOTES:

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

**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 *italics* 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](http://www.extron.com).

### Extron Glossary of Terms

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



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# Introduction

This section provides an overview of the MGP 641 xi Series Multi-Graphic Processors, including information about the following:

- [About this Guide](#)
- [About the MGP 641 xi Series Multi-Graphic Processors](#)
- [Features](#)
- [Application Diagrams](#)

## About this Guide

This guide discusses how to install, configure, and operate the Extron MGP 641 xi Series processors. Throughout the guide, the terms “MGP,” “MGP 641 xi Series” and “processor” are used interchangeably to refer to any of the products.

## About the MGP 641 xi Series Multi-Graphic Processors

The Extron MGP 641 xi Series are multi-window video signal processors that display multiple video sources on a single screen in picture-in-picture or picture-by-picture format. The following models are available:

- MGP 641 xi
- MGP 641 xi SDI
- MGP 641 xi 5K
- MGP 641 xi 5K SDI

The MGP 641 xi and MGP 641 xi SDI support input and output signals up to 4096 x 2160 @ 60 Hz. The MGP 641 xi 5K and the MGP 641 5K SDI support signals up to 5120 x 2880 @ 30 Hz as well as 4096 x 2160 @ 60 Hz.

The HDCP 2.3-compliant processors include four HDMI 2.0 inputs and an additional HDMI background input for presenting live, non-scaled content behind source windows. All models also feature one HDMI output and one buffered DTP3 output. In addition, the MGP 641 xi Series SDI models have four 12G-SDI inputs that are configurable to be used instead of the HDMI inputs. Each input is dedicated to one window. On the front panel, all models have one USB-C configuration port.

The MGP 641 xi Series feature dedicated connectivity for each of the four windows, HDCP 1.4 and 2.3 support, logo and background image support, logo and video keying, and ultra-high resolution support up to 4096 x 2160 (5K models support up to 5120 x 2880). HDMI and DTP 4K @ 60 Hz outputs deliver duplicate signals to local and remote displays. Fully customizable window layouts and window transition effects enhance presentation of the source content. Source and output rotation enable use with portrait displays, and audio de-embedding simplifies integration. Configurations can be saved as presets and recalled as needed.

**NOTE:** The two 5K models do not support image rotation.

The MGP 641 xi Series can be controlled and configured using the front panel controls, Simple Instruction Set™ (SIS™) commands, the internal web page, and the Videowall Configuration Software (VCS).

The MGP 641 xi Series processors can be controlled and configured remotely using front panel buttons and knobs, the Extron Simple Instruction Set (SIS) commands via the RS-232, USB, or Ethernet LAN connections, the MGP 641 xi Series embedded web pages, and the Videowall Configuration Software (VCS) via an Ethernet LAN or USB. The VCS program is available at [www.extron.com](http://www.extron.com). For information on using VCS, see the *VCS Help File*, also on the Extron website.

## Features — All Models

- **Display up to four source windows on a single canvas with a live or static background** — Simplifies system design by reducing the need for multiple displays.
- **Supports 4K/60 signals on all inputs and outputs** — Supports HDMI input and output signals up to 4096x2160 at 60 Hz with 4:4:4 color sampling. The MGP 641 xi SDI also supports 12G-SDI input signals up to 4096x2160 at 60 Hz with 4:2:2 color sampling.
- **Live annotation capabilities with Extron LinkLicense®** — Optional LinkLicense for MGP 641 xi Annotation allows a presenter to draw and point in real-time over live video and graphics presentations.
- **Four HDMI inputs**
- **DTP3 output is compatible with HDBaseT™-enabled devices** — The DTP3 output can be configured to send video and embedded audio signals, plus bidirectional RS-232 to an HDBaseT-enabled display.
- **HDMI background input** — A dedicated non-scaled input accepts live content or images from an HDMI source for display behind the source windows.
- **Supported HDMI 2.0 specification features include data rates up to 18 Gbps, Deep Color up to 12-bit, and HD lossless audio formats**
- **Advanced Extron Vector™ 4K scaling engine** — The Vector 4K scaling engine is specifically designed for critical-quality 4K imagery, with best-in-class image upscaling and downscaling.
- **USB-A ports** — Supports USB peripherals for manipulating window size and position, accessing Annotation OSD menu, and storing captured screen images. Each USB port supports data rates up to 5 Gbps.
- **Capture, store, and recall images using a USB flash drive** — An image can be captured as a snapshot of the live video output, including annotations, and saved to internal memory or a removable USB flash drive.
- **Multiple window transition effects** — Windows can be transitioned into and out of the preset using dissolve and cut effects, resulting in smooth, professional presentations.
- **Integrated DTP3 extension supports transmission of uncompressed 4K/60 and 5K video up to 330 feet (100 meters) over a shielded CAT 6A cable**
- **Compatible with DTP3 and DTP®-enabled products, plus XTP II CrossPoint® matrix switchers** — Enables mixing and matching with desktop and wallplate receivers, as well as other DTP3 and DTP-enabled products to meet application requirements. It is not compatible with DTP2 products. The MGP 641 xi Series processor can be integrated with XTP® and XTP II CrossPoint matrix switchers to provide connectivity between presentation spaces and a larger, facility-wide system.
- **HDCP 2.3 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.
- **HDCP Visual Confirmation** — When HDCP encrypted content is transmitted to a non-HDCP compliant display, a green window is sent to the display for immediate visual confirmation that protected content cannot be viewed on that display.
- **Key Minder® continuously verifies HDCP compliance for quick, reliable switching** — Key Minder authenticates and maintains continuous HDCP encryption between input and output devices to ensure quick and reliable switching in professional AV environments, while enabling simultaneous distribution of a single source signal to two or more displays.
- **EDID Minder® automatically manages EDID communication between connected devices** — EDID Minder ensures that all sources reliably output content at power up.
- **Supports custom EDID and output resolutions** — User-defined output resolutions up to a 600 MHz pixel clock can be supported by uploading custom EDID files or capturing EDID from a display or other destination device.
- **Custom output resolutions** — Maximizes compatibility with evolving display technology, non-standard displays, and direct-view LED systems.

- **Logo image keying and display** — A logo graphic can be positioned and keyed over live video. Graphics files in BMP, JPG, PNG, or TIFF format may be uploaded to the unit. Full-screen images can also be displayed to eliminate loss of video between presentations. Up to 32 logo images can be stored on the processor.
- **Video keying** — Title information or other content from an input source can be keyed over the Program image.
- **Cascade multiple MGP 641 xi 5K processors for additional windows** — Up to four MGP 641 xi Series units can be linked via the HDMI background input to allow presentation of up to 16 windows on a single display.
- **Fully customizable window layouts** — Up to four windows can be sized, positioned, and overlapped anywhere on the single digital canvas, with additional adjustments for zoom and priority.
- **Output rotation** — The duplicate HDMI and DTP3 output signals can be rotated 90 degrees, accommodating displays arranged in portrait or landscape orientations.
- **Dynamic input detection** — Instead of conventional lookup tables, Vector 4K technology analyzes incoming digital video signal parameters for precise signal detection, conversion, and scaling. This capability facilitates fast, flexible detection of both standard and custom resolutions.
- **Auto-layout mode** — Automatically configures the window layout to a full screen, a side-by-side, a pyramid, or a quad-split arrangement, based on which inputs have an active signal.
- **Seamless presentation of signals sourced from upstream devices** — Signals sourced from an upstream switcher can be transitioned using cut to black, fade to black, seamless cut, or seamless fade for clean, professional-looking presentations.
- **Image freeze control** — Any window can be frozen via the front panel, RS-232, or Ethernet control.
- **Window mute control** — Any window can be added or removed via the front panel, RS-232, or Ethernet control.
- **Customizable window borders** — Borders provide easy identification of displayed content. The Window Border options include semi-transparent borders and text labels with adjustable size, color, and location.
- **128 window configuration presets** — A total of 128 default window presets are available and customizable to allow quick saving and recall of size, positioning, priority, and border style for each window.
- **Window preset effects** — Transitions between presets can be set to Cut or Animated. The Animated effect dynamically resizes and repositions the four windows to the locations determined by a new preset. Duration is adjustable.
- **Screen Saver Mode** — Can be set to automatically mute video and sync output to the display device when there are no active connections or logos displayed. The connected display automatically enters standby mode to conserve energy, reducing costs and increasing panel life.
- **Customizable on-screen clock** — A clock in a digital time format can be presented anywhere on screen, with user-definable size, color, and time/date formatting.
- **Stereo audio de-embedding** — Embedded HDMI two-channel PCM audio can be extended over the DTP3 output or extracted as balanced or unbalanced stereo audio to the analog outputs.
- **Aspect ratio control** — The aspect ratio of the image in a window can be controlled by selecting a FILL mode that provides a full-window display or a FOLLOW mode, which preserves the original aspect ratio of the input signal.
- **Front panel controls with LCD display** — Back lit front panel buttons and an LCD menu system with navigation controls ensure simplified operation and provide quick access to configuration settings.
- **Front panel USB-C® configuration port** — Enables easy system configuration without having to access the rear panel.
- **Easy-to-use configuration and control software** — Extron Videowall Configuration Software - VCS reduces configuration and preset programming time with a task-oriented, intuitive interface.
- **Built-in Web pages** — Enables the use of a standard browser for device monitoring and troubleshooting over an intuitive Web interface.

- **Internal video test patterns and pink noise generator for calibration and setup**
- **Ethernet monitoring and control** — Enables control and proactive monitoring over a LAN or WAN.
- **Adjust window size and position with a USB touch screen display or mouse** — Local USB control using the connected USB touch screen display or mouse.
- **RS-232 control port** — Facilitates the use of serial commands for integration into a control system. Extron products use the SIS™ protocol, a set of basic ASCII commands that allow for quick and easy programming.
- **Front panel security lockout** — Locks out front panel functions; all functions remain available through Ethernet, USB, or RS-232 control.
- **Rack-mountable 1U, full rack width metal enclosure**
- **Includes LockIt® cable lacing brackets** — Securely fastens HDMI or USB-C® cables to a device, eliminating risk of disconnection.
- **Internal Extron Everlast™ power supply** — Provides worldwide power compatibility, with high demonstrated reliability and low power consumption for reduced operating cost.
- **Extron Everlast power supply is covered by a 7-year parts and labor warranty**

### **MGP 641 5K Models Only**

- **Support 5K signals on all HDMI inputs and outputs** — Supports HDMI input and output signals up to 5120 x 2880 @ 30 Hz, with 4:4:4 color sampling.

### **MGP 641 SDI Models Only**

- **Four 12G-SDI and four HDMI inputs**
- **Automatically adapt to SMPTE and ITU digital video standards for SDI signals up to a 12G-SDI data rate SDI only** — MGP 641 xi SDI and MGP 641 xi 5K SDI models both provide SDI inputs that support 12G, 6G, 3G, HD, and SD-SDI signals up to 4096x2160 at 60 Hz with 4:2:2 color sampling.

# Application Diagrams

## MGP 641 xi Application Diagram

Figure 1 shows an example of how devices can be connected to the MGP 641 xi.

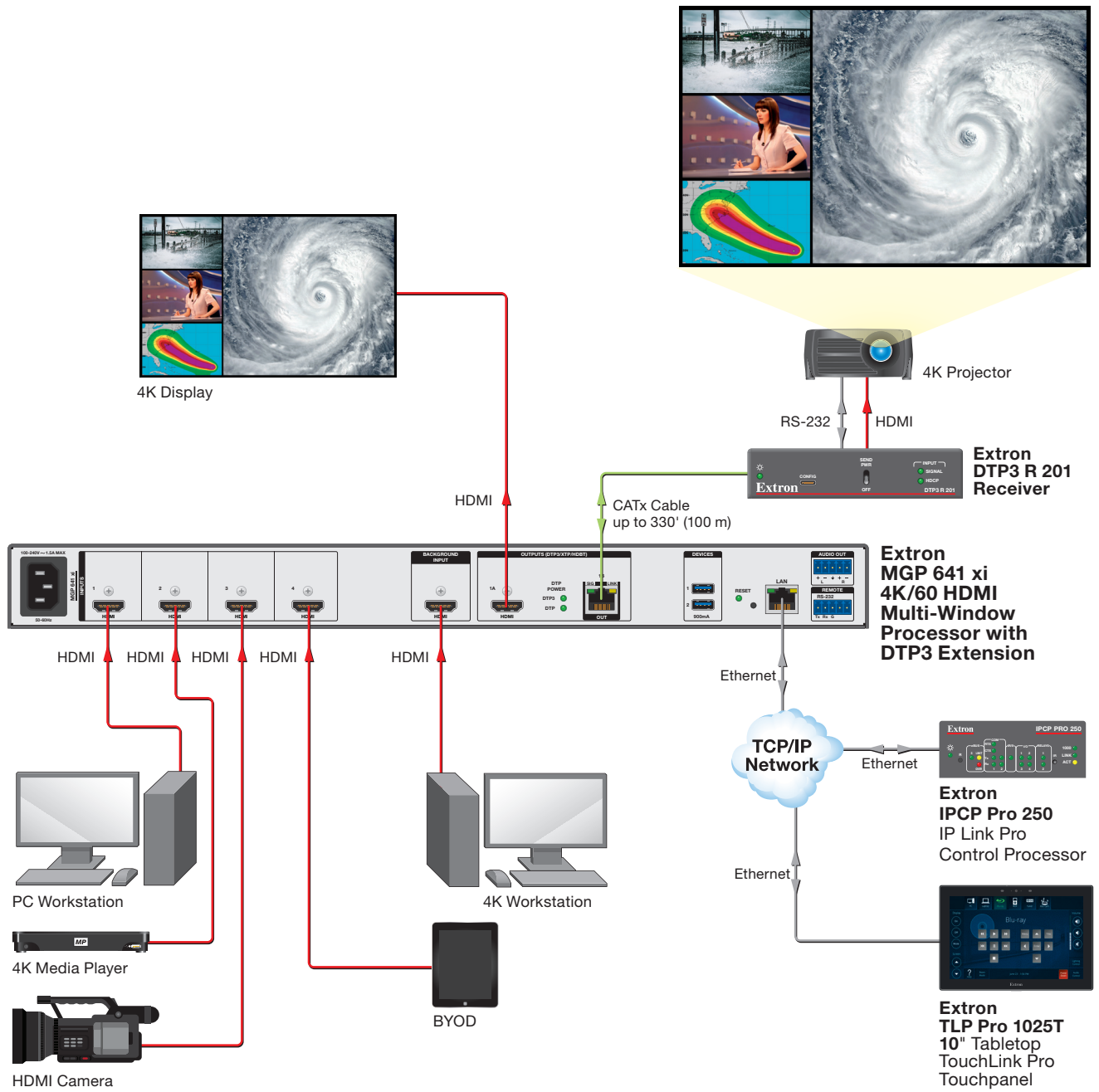
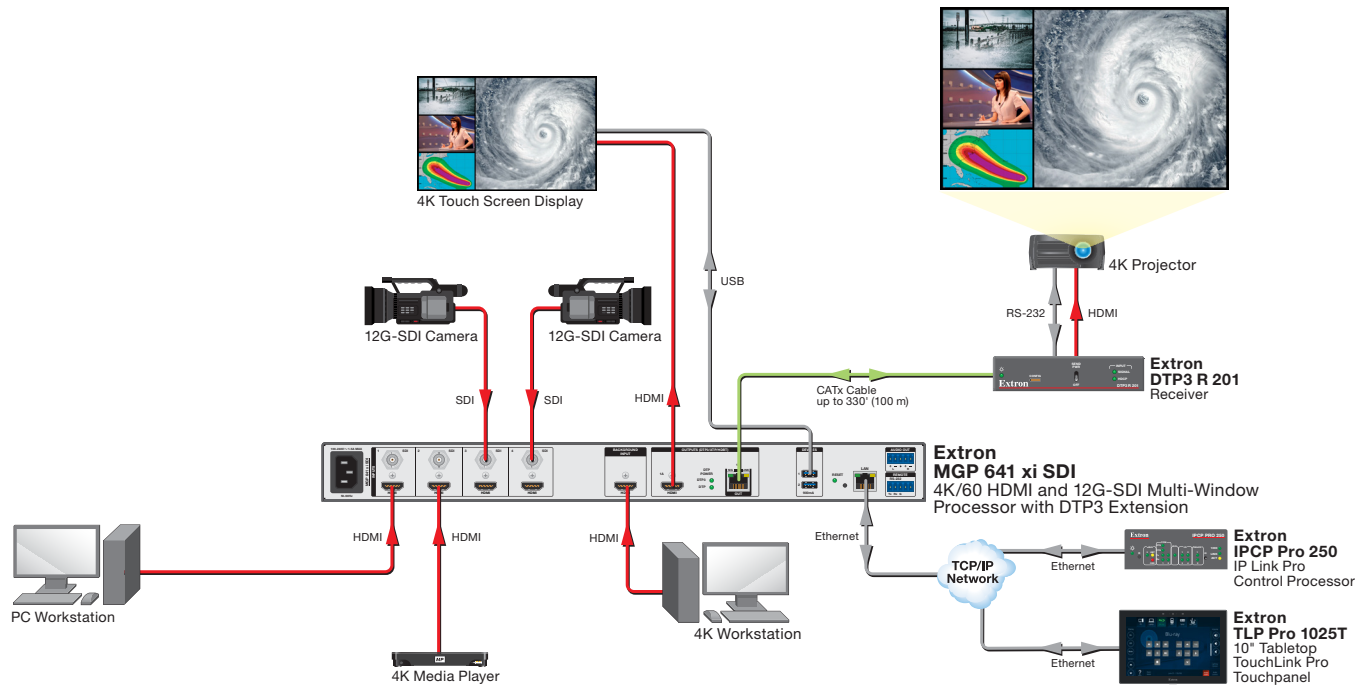


Figure 1. Connection Diagram Example for MGP 641 xi

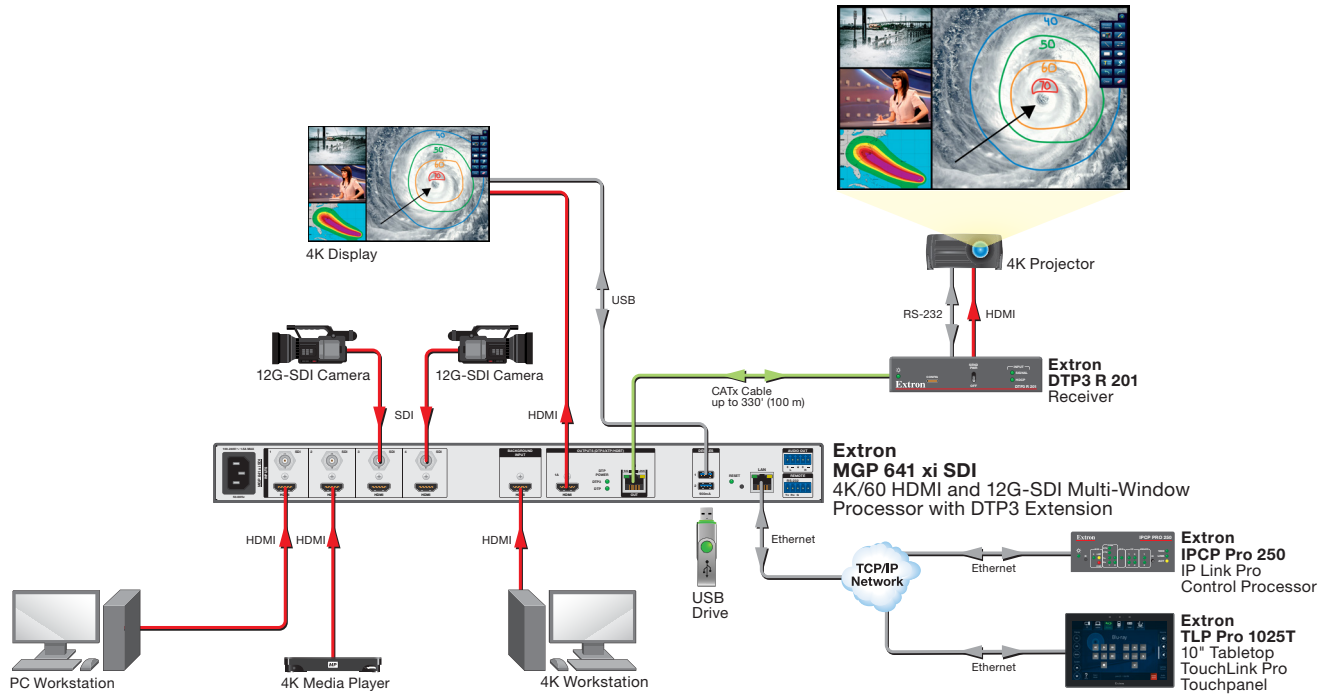
## MGP 641 xi SDI Application Diagrams

Figure 2 shows a connection diagram for an MGP 641 xi SDI without annotation.



**Figure 2. Connection Diagram Example for MGP 641 xi SDI (without Annotation)**

Figure 3 shows a connection diagram for an MGP 641 xi SDI with annotation on the displays.



**Figure 3. Connection Diagram Example for MGP 641 xi SDI with Annotation**

## MGP 641 xi 5K SDI

Figure 4 shows a connection diagram for an MGP 641 xi 5K SDI with annotation on the displays.

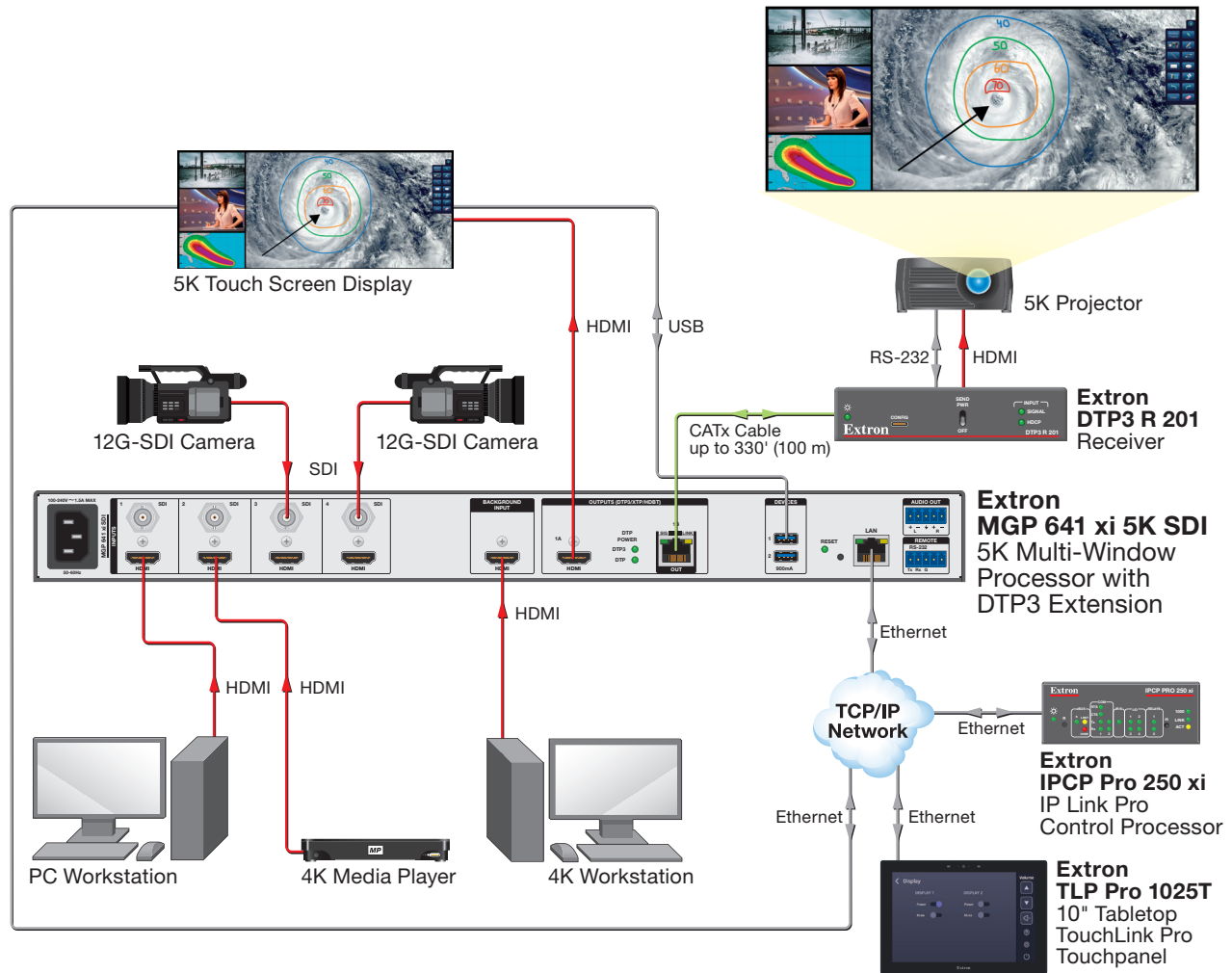


Figure 4. Connection Diagram Example for MGP 641 xi 5K SDI

## Ultra-high Resolution Support

All the MGP 641 xi Series processors support resolutions up to 4096 x 2160 at 60 Hz on their inputs and outputs. The maximum raster dimensions are 4096 x 2400.

In addition, the MGP 641 xi 5K models support the following resolutions:

- 5120 x 1080 @ 30 Hz and 60 Hz
- 5120 x 1440 @ 30 Hz and 60 Hz
- 5120 x 2160 @ 30 Hz
- 5120 x 2560 @ 30 Hz
- 5120 x 2880 @ 30 Hz

If the output rate is set to 3840 x 2160 or 4096 x 2160 @ 50 Hz, 59.94 Hz, or 60 Hz, the twisted pair outputs are active only if connected to a DTP3 receiver.

## DTP and DTP3 Support

The MGP 641 xi Series use DTP3 extension technology on the DTP output and support DTP and DTP3 receivers.

- **DTP receivers** — The units are compatible with all products that contain DTP inputs.
  - **Transmission distance of 330 feet (100 meters)** — Requires the connected receiver to be 330 feet (100 meters) capable. Data rates up to 10.2 Gbps are supported at this distance.
  - **Transmission distance of 230 feet (70 meters)** — Requires the connected receiver to be 230 feet (70 meters) capable. Data rates up to 6.75 Gbps are supported at this distance. Data rates above 6.75 Gbps, up to 10.2 Gbps are supported at 130 feet (40 meters).
- **DTP3 receivers** — The units are compatible with all products that contain DTP3 inputs. Data rates up to 18 Gbps are supported at 330 feet (100 meters).

## Audio

Digital audio from any of the four windows or the background input can be de-embedded or passed through as embedded digital audio. Multi-channel bitstream formats can be passed to the HDMI and DTP3 outputs. Also, embedded two-channel PCM audio can be extended over the DTP3 output or extracted as balanced or unbalanced stereo audio to the analog outputs.

A single embedded multi-channel or 2-channel audio signal on an HDMI or SDI input is passed through to be embedded on the local HDMI output and the DTP HDMI signal. If the selected audio source is 2-ch LPCM (HDMI) or AES (SDI), it is also made available on a local 5-pole captive screw connector and as over DTP analog audio. If the audio source is multi-channel, the local analog connection and the over DTP audio signals are muted.

| Source Signal             | Local HDMI | Local Analog | DTP HDMI  | Over DTP Analog Audio |
|---------------------------|------------|--------------|-----------|-----------------------|
| 2-ch LPCM                 | Available  | Available    | Available | Available             |
| Multi-ch LPCM (HDMI)      | Available  | Muted        | Available | Muted                 |
| Multi-Ch bitstream (HDMI) | Available  | Muted        | Available | Muted                 |
| 2-ch AES (SDI)            | Available  | Available    | Available | Available             |
| Multi-ch AES (SDI)        | Available  | Available    | Available | Available             |
| Multi-ch bitstream (SDI)  | Muted      | Muted        | Muted     | Muted                 |

**Supported digital sampling frequencies include:**

192 kHz    96 kHz    88.2 kHz    76.4 kHz    48 kHz    44.1 kHz    32 kHz

See the [Audio Configuration](#) commands starting on page 62 for instructions on selecting channels and audio pairs.

### SDI Embedded Audio (xi SDI Model Only)

For the SDI inputs, specific audio channels can be selected to be heard on the analog and HDMI outputs via SIS commands (see [AES Audio Pair or Channel Selection](#) on page 63) and VCS (see the VCS Help File). The 16 channels are divided into four groups, each consisting of two channel pairs (four channels).

#### NOTES:

- Bitstream audio formats on the SDI inputs are not supported as de-embedded or pass through audio.
- The default source selection is window 1, but all audio outputs are muted by default to ensure audio is not passed through without being configured.

See [Audio Configuration](#) for information on the channels contained within each group.

# Installation

This section describes the installation procedures for the MGP 641 xi Series Multi-Graphic Processors and the connectors on the rear panels. Topics include:

- [Installation Overview](#)
- [Rear Panel Features and Connections](#)
- [Installing the LockIt HDMI Cable Lacing Brackets](#)
- [Twisted Pair Recommendations for DTP, XTP, and HDBT Communication](#)
- [RS-232 Signal Insertion](#)

## Installation Overview

The MGP processor can be connected to up to four input devices simultaneously, and up to two output devices. Follow these steps to install the MGP 641 xi Series:

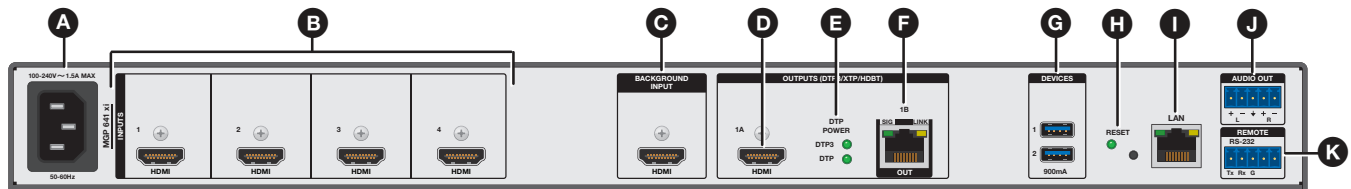
1. Mount the MGP to a rack using the pre-installed side mounting brackets (see [Mounting the MGP 641 xi Series Processor](#) starting on page 98). The MGP 641 xi Series has a 1U high, full rack wide enclosure.  
  
Alternatively, attach the four provided rubber feet to the bottom of the MGP and place the unit in the desired location.
2. Connect HDMI or DVI (with an appropriate adapter) sources to the HDMI input connectors (inputs 1 through 4), or  
  
Connect SDI sources to the SDI input connectors (SDI models only) (see [figure 5, B](#) on page 10).
3. If desired, connect a source to the HDMI live background connector ([C](#)). The MGP windows are displayed in front of this unscaled background video source.

**NOTE:** You must set the output resolution to match that of the background source, or the background video is not displayed. The refresh rates do **not** need to match.

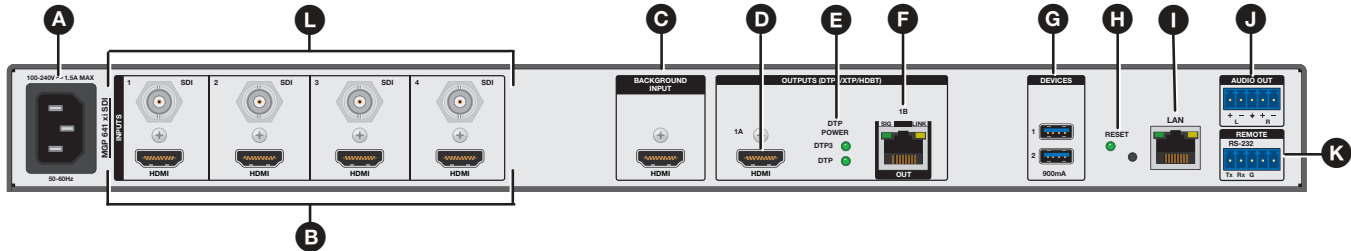
4. Make the following output connections as needed:
  - Connect an HDMI, or DVI with an appropriate adapter, display to the HDMI output 1A connector ([D](#)).
  - Connect a DTP endpoint, XTP matrix switcher, or HDBaseT compatible receiver to the buffered DTP/XTP/HDBT output connector 1B ([F](#)). For cable wiring and recommendations, see [Twisted Pair Recommendations for DTP, XTP, and HDBT Communication](#) on page 13.
5. Connect a balanced or unbalanced analog audio output device (such as a DSP device or an amplifier) to the 5-pole captive screw AUDIO OUT connector ([J](#)) for 2-Ch audio from the selected input. This connector is configurable via VCS (see the VCS Help File) or SIS (see [Audio Output Format commands](#) on page 62) as two discrete mono outputs or as one stereo output.
6. If the MGP is to be connected to a computer or to a host controller for remote control, connect an RS-232 cable from the host to the 5-pole REMOTE RS-232 rear panel connector ([K](#)) or to the front panel USB-C CONFIG port (see [figure 10, A](#) on page 16). The default protocol for the RS-232 port is 9600 baud, 1 stop bit, no parity, and 8 data bits, with no flow control.  
  
Alternatively, connect an RJ-45 network cable to the rear panel LAN port for remote configuration and control.
7. Connect power to the MGP by plugging a standard IEC power cord (provided) from a 100 to 240 VAC, 50-60 Hz power source into the power receptacle (see [figure 5, A](#)).
8. Apply power to all other devices.

# Rear Panel Features and Connections

## MGP 641 xi and MGP 641 xi 5K Rear Panel



## MGP 641 xi SDI and MGP 641 xi 5K SDI Rear Panel



- A** AC power connector
- B** HDMI inputs (inputs 1 through 4)
- C** HDMI live BACKGROUND INPUT
- D** HDMI output (output 1A)
- E** DTP remote power LEDs
- F** DTP/XTP/HDBT output
- G** USB Devices connectors
- H** RESET button and LED
- I** LAN connector
- J** Analog audio output connector
- K** REMOTE RS-232 connector
- L** SDI inputs (inputs 1 through 4)

Figure 5. Rear Panels

- A AC power connector** — Connect the included power cord from this male IEC connector to a 100–250 VAC, 50–60 Hz power source.
- B HDMI inputs (inputs 1 through 4)** — Connect HDMI (or DVI with an appropriate adapter) sources to these four HDMI connectors, using the Lock-It brackets to secure the connectors in place (see [Installing the LockIt HDMI Cable Lacing Brackets](#) on page 13). These inputs feed directly to the windows with the same numbers. The windows support pixel clocks up to 600 MHz (see [Ultra-high Resolution Support](#) on page 7 for details).
- C HDMI live BACKGROUND INPUT** — Connect an HDMI or DVI (with an appropriate adapter) input source to this HDMI connector in order to display the video source live as a background on the output screen. The background HDMI source is displayed behind the four MGP 641 xi Series windows and any auxiliary content. This input is not scaled.
- D HDMI output (output 1A)** — Plug an HDMI (or DVI with an appropriate adapter) output device into this HDMI connector, using a Lock-It brackets to secure the connector in place (see [Installing the LockIt HDMI Cable Lacing Brackets](#)). The HDMI output port supports resolutions up to 4K @ 60 Hz.
- E DTP remote power LEDs** — These green LEDs light to indicate when either DTP3 or DTP remote power is being provided to a receiver via the DTP output.

**NOTE:** Remote power is not available when the DTP Out port is set to XTP or HDBT.

- F DTP/XTP/HDBT output (output 1B)** — (See [figure 5](#) on page 10) This connector and the HDMI output connector (1A) are mirrored, meaning that they display the same image.

Connect a DTP or DTP3 receiver, an XTP matrix switcher, or an HDBaseT compatible receiver to this RJ-45 twisted pair Out connector. For cable wiring and recommendations, see [Twisted Pair Recommendations for DTP, XTP, and HDBT Communication](#) on page 13.

- This is a buffered DTP3 output that can support resolutions up to 600 MHz pixel clocks at distances up to 330 feet (100 meters).
- This output also allows for remote powering of DTP and DTP3 receivers, as well as over-DTP analog audio which matches the 5-pole analog audio output of the MGP.

#### ATTENTION:

- Do not connect this port to a computer or telecommunications network.
- Ne connectez pas ce port à des données informatiques ou à un réseau de télécommunications.
- DTP remote power is intended for indoor use only. No part of the network that uses DTP remote power should be routed outdoors.
- L'alimentation DTP à distance est exclusivement réservée à un usage en intérieur. Un réseau utilisant une alimentation à distance ne peut pas être routé en extérieur.

| Signal Support                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DTP Mode                                                                                                                                                                                                                                                                                                          | XTP Matrix and HDBaseT Mode                                                                                                                                                                                                                   |
| <ul style="list-style-type: none"> <li>• HDCP-compliant digital video</li> <li>• Embedded audio into the TMDS output or analog audio</li> <li>• Ethernet insertion of RS-232 control signals (see <a href="#">RS-232 and IR Signal Insertion</a> on page 14)</li> <li>• Remote power to a DTP receiver</li> </ul> | <ul style="list-style-type: none"> <li>• HDCP-compliant digital video</li> <li>• Embedded audio into the TMDS output</li> <li>• Ethernet insertion of RS-232 control signals (see <a href="#">RS-232 and IR Signal Insertion</a>).</li> </ul> |

**NOTE:** RS-232 communication can also be sent to the far end of the twisted pair connection, but it must be done through RS-232 insertion via Ethernet. A control signal applied to an MGP 641 xi Series LAN port can be routed to the RS-232 port of any connected twisted pair device (see [Connecting for Ethernet to RS-232 Insertion](#) on page 14).

- G USB Devices connectors** — Connect USB touchpanels or human interface devices (HIDs) to these USB 3.0, 900 mA connectors to enable annotation on the four windows.

- H RESET button and LED** — Pressing the recessed **RESET** button causes various settings to be reset to the factory defaults (see [Resetting](#) on page 38 for more information).

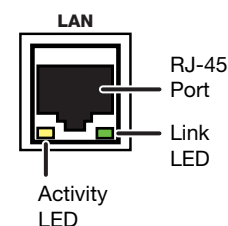
The green RESET LED, located to the upper-left of the reset button, blinks a varying number of times to indicate which reset mode has been entered.

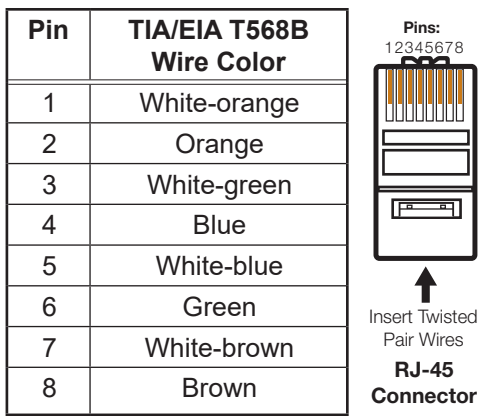
- I LAN connector** — Plug an RJ-45 network cable into this connector to connect the unit to a network (via a switch, hub, or router) or to a single computer.

- **Activity LED** — This yellow LED blinks to indicate network activity.
- **Link LED** — This green LED lights to indicate a good network connection.

Use a straight-through cable to connect to a network, or a crossover cable to connect directly to a computer.

- For 10BaseT (10 Mbps) networks, use a CAT 3 or better cable.
- For 100BaseT (maximum 155 Mbps) networks, use a CAT 5 cable.





**Figure 6. Wiring the LAN Connector**

If desired, configure the LAN port by using SIS commands (see the LAN port setup commands, beginning with [Set IP address](#) on page 52) or by using the Comm Settings menu on the front panel (see [Comm Settings Menu](#) on page 36). The LAN port default settings are:

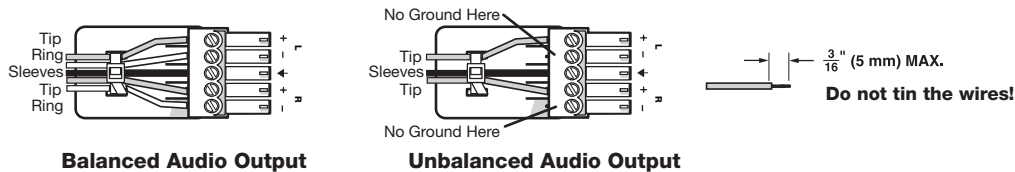
**IP address:** 192.168.254.254

**Gateway IP address:** 0.0.0.0

**Subnet mask:** 255.255.255.0

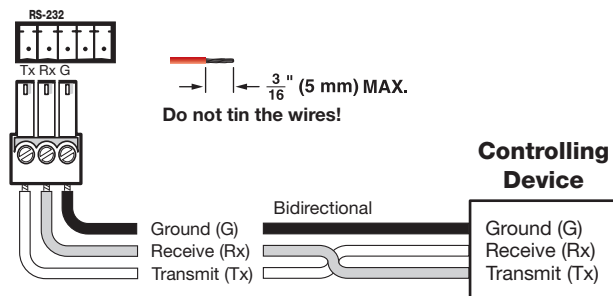
**DHCP:** off

- J Analog audio output connector** (see [figure 5](#) on page 10) — Connect audio output devices to this 5-pole captive screw connector to pass 2-channel or multi-channel embedded audio to the HDMI or DTP output. Wire the connector for line level, balanced or unbalanced, analog stereo (see [figure 7](#)).



**Figure 7. Audio Output Connector Wiring**

- K REMOTE RS-232 connector** — Plug a computer or other RS-232 host device into the three left-most pins (Tx, Rx, and G) of this 5-pole captive screw connector.



**Figure 8. RS-232 Connection**

- L SDI inputs (inputs 1 through 4) (SDI models only)** — Connect SDI sources to these four SDI connectors, which feed directly to the windows with the same numbers. These connectors support 12G, 6G, 3G, HD, and SD-SDI signals.

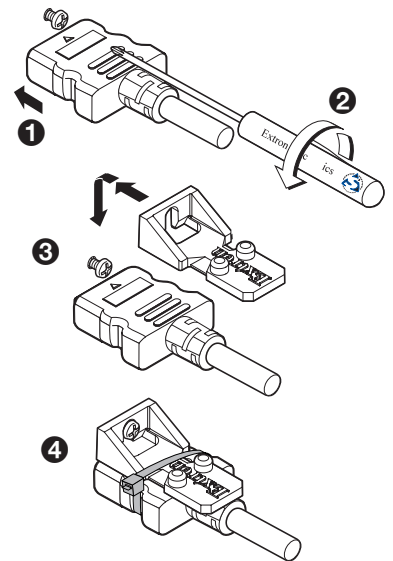
## Installing the LockIt HDMI Cable Lacing Brackets

The Extron LockIt lacing brackets make it possible to simply and universally secure a standard HDMI cable to most HDMI devices.

**NOTE:** The HDMI device must have an HDMI connection mounting screw for this bracket to be used.

To securely fasten an HDMI cable to a device:

1. Plug the HDMI cable into the panel connection.
2. Loosen the HDMI connection mounting screw from the panel enough to allow the LockIt lacing bracket to be placed over it. The screw does not have to be removed.
3. Place the LockIt lacing bracket on the screw and against the HDMI connector, then tighten the screw to secure it.
4. Loosely place the included tie wrap around the HDMI connector and the LockIt lacing bracket as shown.
5. While holding the connector securely against the lacing bracket, tighten the tie wrap, then remove any excess length.



### ATTENTION:

- Do not overtighten the HDMI connection mounting screw. The shield to which it is fastened 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.

## Twisted Pair Recommendations for DTP, XTP, and HDBT Communication

The MGP 641 xi Series is compatible with shielded twisted pair (F/UTP, SF/UTP, and S/FTP) cable DTP, XTP, or HDBaseT communication.

### ATTENTION:

- Do not use Extron UTP23SF-4 Enhanced Skew-Free AV UTP cable or STP201 cable to link the device with DTP transmitters or receivers.
- N'utilisez pas le câble AV Skew-Free UTP version améliorée UTP23SF d'Extron ou le câble STP201 pour relier le appareil avec les émetteurs ou les récepteurs DTP.

Extron recommends using the following practices to achieve full transmission distances and reduce transmission errors.

- Use the following Extron XTP DTP 24 SF/UTP cables and connectors for the best performance:
  - **XTP DTP 24/1000** Non-Plenum 1000' (305 m) spool
  - **XTP DTP 24P/1000** Plenum 1000' (305 m) spool
  - **XTP DTP 24 Plug** Package of 10
- If not using XTP DTP 24 cable, at a minimum, Extron recommends 24 AWG, solid conductor, STP cable with a minimum bandwidth of 400 MHz.
- Terminate cables with shielded connectors to the TIA/EIA-T568B standard.
- Limit the use of more than two pass-through points, which may include patch points, punch down connectors, couplers, and power injectors. If these pass-through points are required, use shielded couplers and punch down connectors.

**NOTES:** When using shielded twisted pair cable in bundles or conduits, consider the following:

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

## RS-232 Signal Insertion

The twisted pair output port allows you to insert RS-232 control signals onto the same cable that carries video and audio to extend them to the over TP port on a connected endpoint (see [figure 9](#) on page 15).

A control signal applied to an MGP 641 xi Series LAN port can be routed to the RS-232 port of the connected twisted pair device. The RS-232 inputs and outputs inserted via Ethernet can support up to a 115 K baud rate.

When connected to an Ethernet LAN, the MGP can be accessed from a computer running a standard Internet browser. Connect the MGP to a computer, control device, router, or switch (see [figure 6](#) on page 12 to wire the crossover cable).

The default IP address of the MGP 641 xi Series is 192.168.254.254, the default subnet mask is 255.255.255.0, and the default gateway address is 0.0.0.0.

### Connecting for Ethernet to RS-232 Insertion

[Figure 9](#) shows a connection example of an Ethernet to RS-232 insertion, in which an Extron IPCP Pro control processor provides control of a display via the MGP 641 xi Series. Configure this type of insertion as follows:

1. Connect a twisted pair cable from the control processor to the MGP 641 xi Series LAN port, directly or via a network.
2. If necessary to match the device to be controlled, use VCS (see the VCS Help File) or SIS commands (see the [Serial Port Configuration commands](#) on page 74) to configure the RS-232 port protocol (baud rate, parity, data bits, and stop bits).
3. Connect the TP cable from the MGP 641 xi Series DTP Out connector to the input of the DTP endpoint (receiver).
4. Connect a serial cable from the DTP receiver to the device to be controlled.

## Port number

For Ethernet to RS-232 insertion, the insertion port number must be stated from a specific universal asynchronous receiver-transmitter (UART) start point. This number is entered as the IP port number when you establish communication with the insertion port. The output insertion port number is automatically assigned as 2001 and cannot be changed.

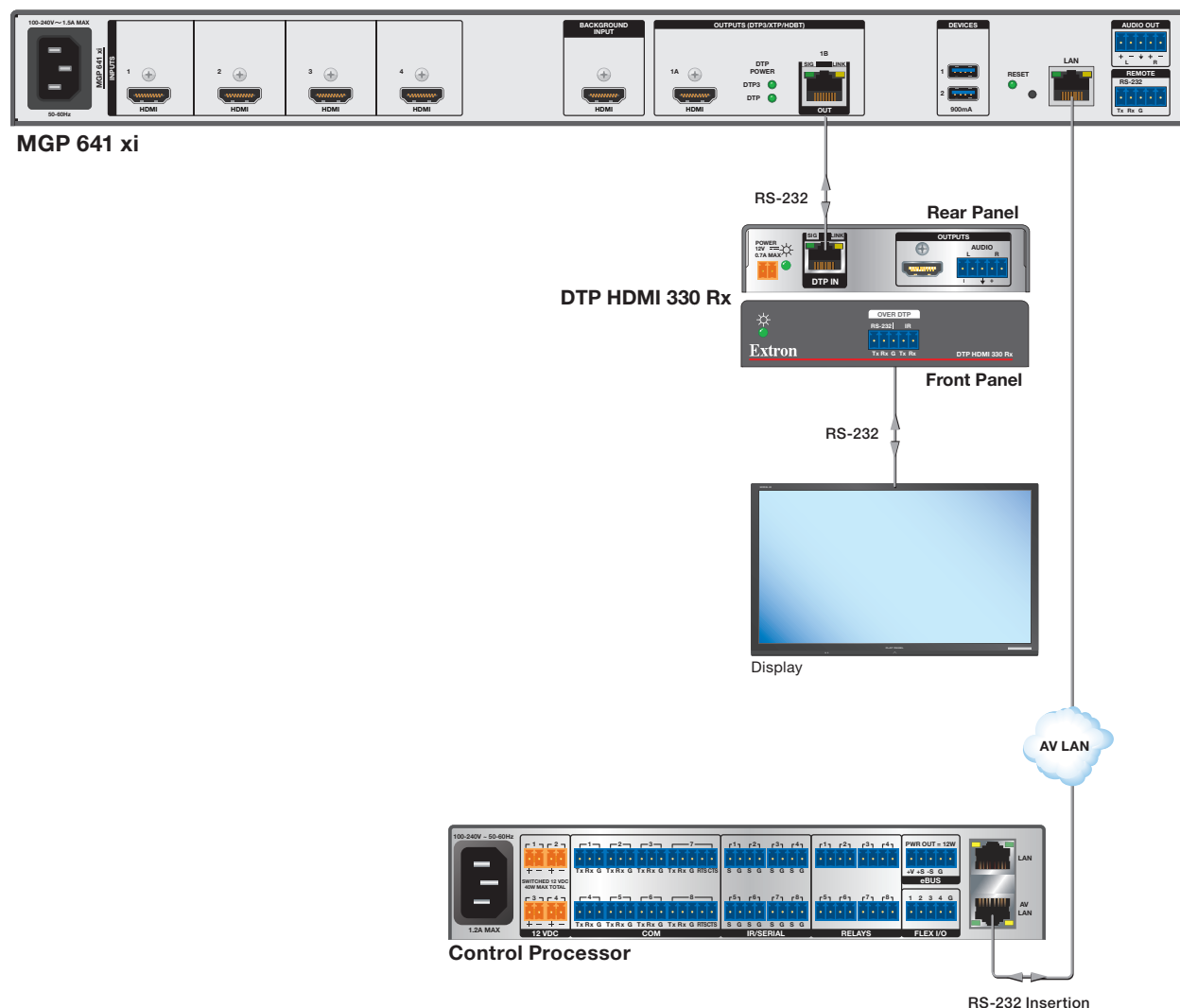


Figure 9. Typical Ethernet to RS-232 Insertion to an Endpoint

# Operation

This section describes setup and operating procedures for the MGP 641 xi Series available from the front panel. The following topics are discussed:

- [Front Panel Features](#)
- [Power-up and Default Cycle](#)
- [Selecting a Window and Input](#)
- [Muting and Freezing a Window](#)
- [Presets](#)
- [Menus, Configuration, and Adjustments](#)
- [Additional Functions](#)

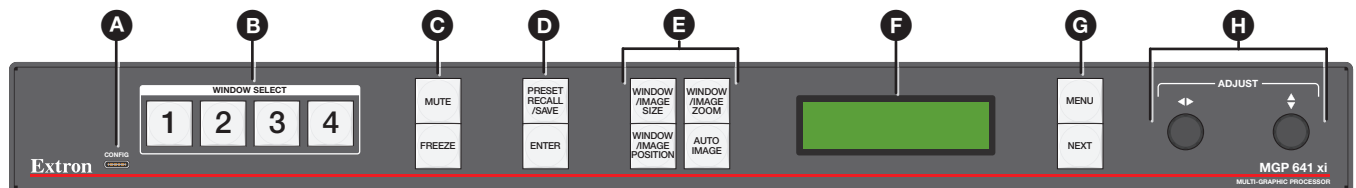
You can set up and operate the MGP 641 xi Series using:

- The front panel controls
- A computer or any other device that can send and receive communications through the remote RS-232 port or the LAN port. Settings can be adjusted through the host computer using SIS commands or VCS.
- A computer or other device using an Ethernet connection and IP protocol (Telnet, SSH, or a web browser).

For details on setup and control, see [Remote Configuration and Control](#) starting on page 43. For web page control, see the [HTML Configuration and Control](#) starting on page 87. For configuration and control via VCS, see the *VCS Help File*.

## Front Panel Features

The front panels of all models are identical except for the product name in the lower-right corner.



- |                                                               |                                                  |
|---------------------------------------------------------------|--------------------------------------------------|
| <b>A</b> USB CONFIG port                                      | <b>E</b> <a href="#">Picture Control buttons</a> |
| <b>B</b> Window and input selection buttons                   | <b>F</b> <a href="#">LCD screen</a>              |
| <b>C</b> MUTE and FREEZE buttons                              | <b>G</b> <a href="#">Menu navigation buttons</a> |
| <b>D</b> <a href="#">PRESET SAVE/RECALL and ENTER buttons</a> | <b>H</b> <a href="#">ADJUST knobs</a>            |

Figure 10. MGP 641 xi Series Front Panel

- A** **USB CONFIG port** — Connect a host device to this USB C port for device configuration, control, file transfer, and firmware upgrades.
- B** **Window and input selection buttons** — Press one of these buttons to select windows 1 through 4 for configuration. The selected button lights amber.
- C** **MUTE and FREEZE buttons** —
  - **MUTE** — Press this button to mute the selected window. The button lights amber when the mute is enabled. To unmute, press the lit **MUTE** button again.
  - **FREEZE** — Press this button to freeze the selected window. The button lights amber when freeze is enabled. To unfreeze the window, press the lit **FREEZE** button again.

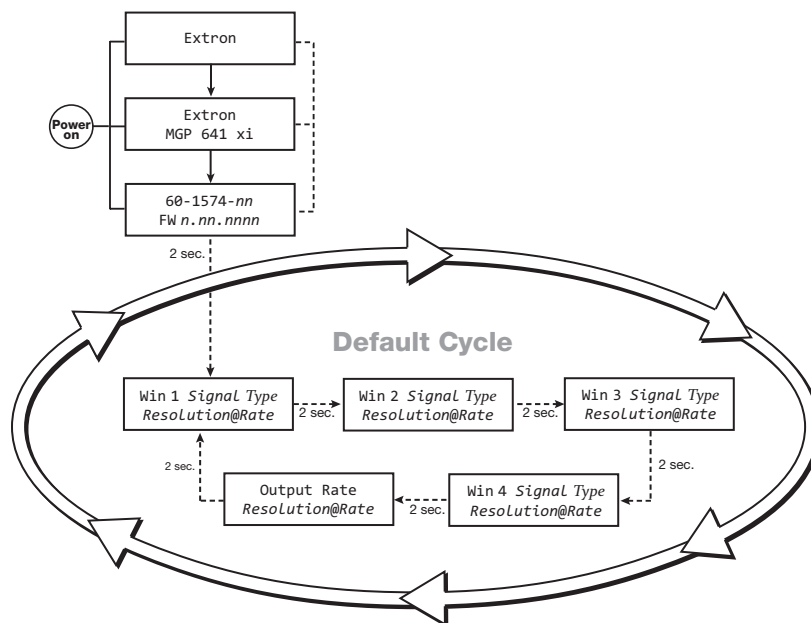
- D PRESET RECALL/SAVE and ENTER buttons** (see [figure 10](#) on page 16) — In combination, these buttons save the current settings to a window preset or recall a stored preset (up to 128). Press **PRESET RECALL/SAVE**, then rotate the **ADJUST** knobs to select a window preset to recall. Press **ENTER** to complete the action.  
Press and hold **PRESET RECALL/SAVE** to save a window preset.
- E Picture control buttons** — Press these buttons to adjust the size, position, and zoom, or to perform an auto-image adjustment on the selected window.
  - Press **WINDOW/IMAGE SIZE**, **WINDOW/IMAGE POSITION**, or **WINDOW/IMAGE ZOOM** once to select the window (the button lights amber) or twice to select the image within the window (the button lights green).  
Use the horizontal (◀▶) and vertical (⬆⬇) **ADJUST** knobs to adjust the settings shown on the left and right sides of the LCD screen, respectively.
  - Press **AUTO-IMAGE** to perform an Auto Image adjustment on the selected input window. Press it again to confirm the adjustment.
- F LCD screen** — Displays the configuration menus, messages, and your selections.
- G Menu navigation buttons** — Press **MENU** to step through the menus on the LCD screen. From each menu, press **NEXT** to step through its submenus.
- H ADJUST knobs** — Turn the horizontal (◀▶) and vertical (⬆⬇) **ADJUST** knobs to scroll through submenu options and preset memory slots, and to adjust picture controls.

## Power-up and Default Cycle

When the MGP 641 xi Series first powers up, the LCD screen displays an initial sequence of three screens:

1. Extron
2. MGP 641 [xi or xi SDI]
3. 60-*nnnn*-*nn* (product part number)  
FW *n.nn.nnnn* (firmware version)

The initial sequence is followed by the default cycle of screens showing the current input type for each window and the output resolution and refresh rate. These messages continue to cycle on the LCD screen when the menu system is not in use. Figure 11 shows a flow diagram of the order in which these screens are repeated.



**Figure 11. Default Cycle Example**

**NOTE:** From any menu or submenu, the MGP saves all adjustment settings and times out to the default screens after 30 seconds of inactivity.

## Selecting a Window and Input

The MGP 641 xi Series has four windows in which to display sources. To select a window is to select its associated input, or logo if assigned.

### Window Select Buttons

The four **WINDOW SELECT** buttons let you select which window is affected by the **MUTE**, **FREEZE**, and **PICTURE CONTROL** buttons, as well as the menu selections on the LCD screen.



When you select a picture control, the window whose button was previously selected is affected (see [Picture Controls](#) on page 21 for information on the available controls).

To select a window, press its **WINDOW SELECT** button, which lights. To deselect a window, press any other **WINDOW SELECT** button. Only one window can be selected at a time.

## Muting and Freezing a Window

### Mute

The **MUTE** button is located to the right of the **WINDOW SELECT** buttons on the front panel (see [figure 10](#) on page 16). To mute a window (remove the window from being displayed on the output):

1. Select the desired **WINDOW SELECT** button.
2. Press **MUTE**. The button lights amber and remains lit while the input is muted.

To unmute the window, press **MUTE** again.

When a window is muted or unmuted, the currently selected transition effect (cut or fade), if any, is employed as the window on the display closes or opens (see [Window Configuration Menu](#) on page 29 for information on transition effects).

You can also mute and unmute the windows using VCS (see the *VCS Help File*) or SIS commands (see the [Window Mute](#) commands on page 54).

If the unit loses power, the mute status is maintained and the output of the MGP appears as it did when power was lost.

If a window is muted and the source to that window is changed or removed, the window remains muted until manually frozen.



### Freeze

The front panel **FREEZE** button is located below the **MUTE** button (see [figure 10](#)). Press **FREEZE** to freeze the image in the selected window. When the window is frozen, this button lights amber and remains lit while Freeze is enabled. To unfreeze the image, press **FREEZE** again. The button LED turns off.

You can also freeze the windows using VCS (see the *VCS Help File*) or SIS commands (see the [Freeze commands](#) on page 54).

If the unit loses power, the freeze function is disabled when power is restored. If an image is frozen and the source to that window is changed or removed, the image remains frozen until manually unfrozen.

# Presets

A preset is a set of window (input) parameters that you create and save as a preset in MGP memory. You can recall a saved preset and implement its settings at any time. A preset enables you to save time by applying a group of settings to the MGP 641 xi Series simultaneously.

## Window Presets

The MGP 641 xi Series provides 128 slots for window presets that save information for all the windows. Use the **PRESET RECALL/SAVE** and **ENTER** buttons on the front panel to save and recall presets. Window presets can also be saved, recalled, and named using VCS (see the *VCS Help File*) or SIS commands via RS-232 (SIS only), USB, or Ethernet connection (see the [Presets Commands](#) starting on page 60).



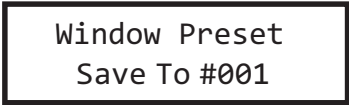
The table below shows the settings that are saved in a window preset.

| Window Settings                                                                                                                                                                                                                                          | Global Settings                                                                                                                                                                                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>Window size and position</li><li>Image size and position in the window</li><li>Window mute status</li><li>Active window border style</li><li>Window priority</li><li>Window source (HDMI or logo preset)</li></ul> | <ul style="list-style-type: none"><li>Background source</li><li>Background logo preset number (if used)</li><li>Foreground logo preset number (if used)</li><li>User defined color (if used)</li></ul> |

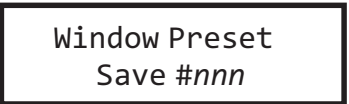
## Saving a window preset

To save a window preset using the front panel buttons:

1. Press and hold the **PRESET RECALL/SAVE** button until the message shown at right appears (approximately 2 seconds). The **PRESET RECALL/SAVE** button lights green.
2. Rotate either **ADJUST** knob to select one of the 128 available window preset slots.
3. Press the **ENTER** button, located below the **PRESET RECALL/SAVE** button, to save the current window settings in the selected preset location.



The LCD screen shows a message indicating that the preset is being saved to the selected memory location, followed by a message that the preset has been saved (see the images at right).



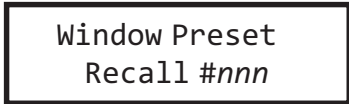
If you want to exit the preset dialog without saving any changes, press the **MENU** button or wait until the **PRESET RECALL/SAVE** button turns off (about 30 seconds).



## Recalling a window preset

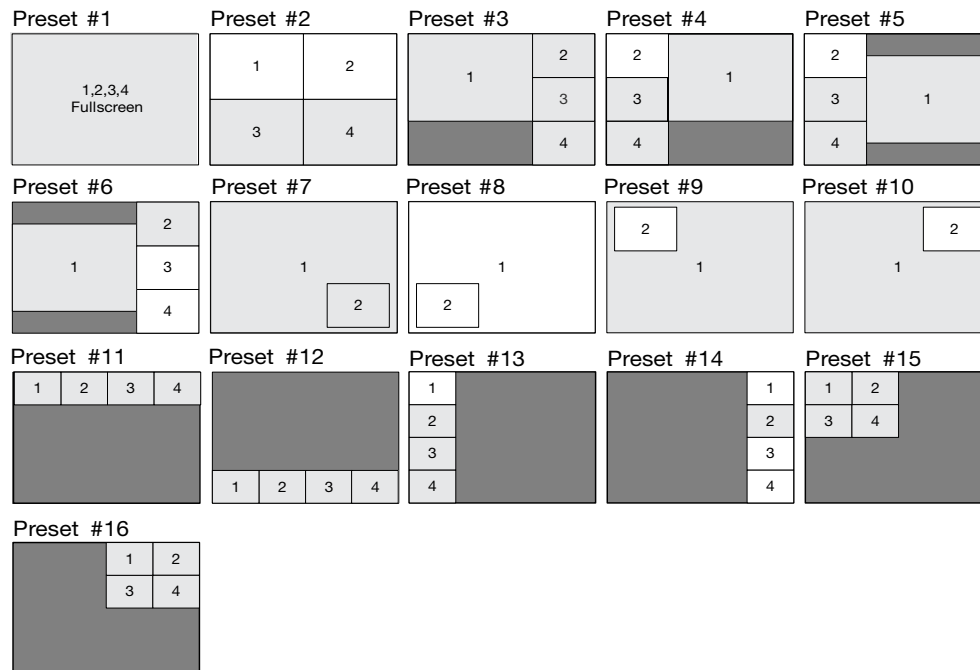
To recall a window preset using the front panel buttons:

1. Press and release the **PRESET RECALL/SAVE** button. The button lights amber and the LCD screen displays the message shown at right.
2. Use either **ADJUST** knob to select a window preset number to recall.
3. Press the **ENTER** button to recall the selected preset selected. The LCD screen shows a message indicating that the preset was recalled (see the image at right). Recalled presets apply to both outputs.



## Default window presets

Figure 12 shows the 16 different factory default preset window configurations for the MGP 641 xi Series. These presets can be used for any output rate, and do not have border styles associated with them (see the [Presets Commands](#) on page 60). By default, the 16 presets are repeated to fill all 128 preset locations.



**Figure 12. Factory Default Window Preset Configurations**

## Input Presets

The MGP 641 xi Series has 128 input preset slots that are global, containing all of the settings for an input when the MGP is used with an upstream matrix switcher. Input presets allow a matrix switcher with multiple types of video inputs to be connected to the MGP to expand the number of input video sources.

Each input should be switched into the MGP, configured (size, position, and preset name), then saved as a preset for recall by the control system when that input is sent from the switcher to any of the four MGP inputs.

Input presets can be saved and recalled using VCS (see the *VCS Help File*) or by SIS commands (see the [Input Presets commands](#) on page 61).

The following settings are contained in the input presets:

- Input type
- Input name
- Image position
- Image size
- Window size (for reference)

Image size and position are saved based on the percentage of the window filled, so the preset can be used for the input in any window size. Therefore, the preset can be saved from any window and the saved size and position is scaled proportionally when recalled in another window.

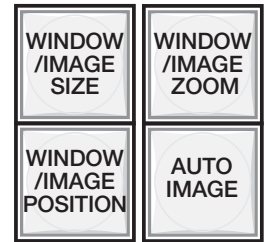
When an input preset is recalled to a window, it fills the window based on the sizing and positioning that the preset had at the time that it was saved. For example, if a video source had been zoomed into when it was saved as a full screen window, it is still displayed zoomed in if it is recalled to a smaller window.

Since all inputs are digital, input presets can be saved based on one input rate and recalled to a different input rate. This enables presets to be used to set aspect ratio or for other quick sizing shortcuts.

## Picture Controls

The MGP 641 xi Series processors have four picture control buttons located on the front panel to the left of the **PRESET RECALL/SAVE** and **ENTER** buttons. Use these buttons to adjust horizontal and vertical size, horizontal and vertical position, Auto Image, and magnified focus (zoom).

**NOTE:** Picture controls are window-dependent. The values must be set separately for each window.



- Pressing a picture control button once displays the picture control for the selected window on the LCD screen. While the control is displayed, pressing any of the other window buttons displays the picture control settings for that window.
- For the **WINDOW/IMAGE SIZE**, **WINDOW/IMAGE POSITION**, and **WINDOW/IMAGE ZOOM** buttons, press the button repeatedly to switch between window settings and image settings.

The selected window displays a blinking blue border, whether or not a border is enabled for that window.

### Adjusting the Picture Controls

Use the picture controls buttons to make adjustments to an input window or perform an Auto-Image. When you select one of these buttons, the button for the most recently selected window lights, indicating that the window is being adjusted.

#### Adjusting window and image picture controls for position, size, or zoom

- Press the **WINDOW SELECT** button for the window (input) to adjust.
- Press the button for the desired picture control: **WINDOW/IMAGE SIZE** (sizing), **WINDOW/IMAGE POSITION** (moving and centering), **WINDOW/IMAGE ZOOM** (magnification), and **Auto-Image**. The controls are displayed on the LCD screen.
- Rotate the horizontal **ADJUST** (◀▶) or vertical **ADJUST** (⬆⬇⬇⬆) knob to select a level from the available range.
- Repeat steps 1 through 3 for each window or image adjustment to be made for the selected input.

#### Performing Auto-Image

- Press the **WINDOW SELECT** button for the window to adjust.
- Press the **AUTO IMAGE** button. The button blinks green, and the message shown at right appears on the LCD screen.
- Press **AUTO IMAGE** again to initiate the Auto Image. When the process is complete, the **AUTO IMAGE** button turns off. A message appears briefly on the LCD screen (see the image at right), then the screen returns to the default cycle.

Auto Image Win *n*  
Press Auto = Go

Auto Image Win *n*  
Complete!

## Picture Controls Summary

The following table summarizes the functions of the picture control buttons and how to make adjustments.

| Button                       | Display                                                                   | Function                                                                                                                                        | Range                                                                                                                                                                                                                                                                                                       | ADJUST Knob                                                                                             |
|------------------------------|---------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| WINDOW/<br>IMAGE<br>SIZE     | Size: Window 1<br>H=960 V=540                                             | Enlarge or shrink window <i>n</i> .                                                                                                             | <b>Min:</b> 1/16 of output rate<br><b>Max:</b> 2 times output rate                                                                                                                                                                                                                                          | <b>For H (width):</b><br>Horizontal ◀▶ ADJUST knob<br><b>For V (height):</b><br>Vertical ⬆⬇ ADJUST knob |
|                              | (Press button twice.)<br>Size: Image 1<br>H=960 V=540                     | Enlarge or shrink the image of input <i>nn</i> within the window.                                                                               | <b>Min:</b> 1/16 of output rate<br><b>Max:</b> 2 times output rate                                                                                                                                                                                                                                          |                                                                                                         |
| WINDOW/<br>IMAGE<br>POSITION | Center: Window 1<br>H=+0 V=+0                                             | Position the upper-left corner of window <i>n</i> on the display in relation to the display center.                                             | <b>Default:</b> 0000 ± output rate                                                                                                                                                                                                                                                                          | <b>For H:</b> Horizontal ◀▶ ADJUST knob<br><b>For V:</b><br>Vertical ⬆⬇ ADJUST knob                     |
|                              | (Press button twice.)<br>Center: Image 1<br>H=0 V=0                       | Position the upper-left corner of the image of input <i>nn</i> within the window in relation to the window center.                              | <b>Default:</b> 0000 ± output rate                                                                                                                                                                                                                                                                          |                                                                                                         |
| WINDOW/<br>IMAGE<br>ZOOM     | Zoom: Window 1<br>H=960 V=540                                             | Increase or decrease the size of the selected window while keeping the aspect ratio constant.                                                   | <b>Min:</b> 1/16 of output rate<br><b>Max:</b> 2 times output rate                                                                                                                                                                                                                                          | <b>For H:</b><br>Horizontal ◀▶ ADJUST knob<br><b>For V:</b><br>Vertical ⬆⬇ ADJUST knob                  |
|                              | (Press button twice.)<br>Zoom: Image 1<br>H=960 V=540                     | Increase or decrease the size of the image of input <i>n</i> in the selected window while keeping the aspect ratio constant.                    | <b>Min:</b> 1/16 of output rate<br><b>Max:</b> 2 times output rate                                                                                                                                                                                                                                          |                                                                                                         |
| AUTO<br>IMAGE                | Auto Image Win 1<br>Press Auto = Go                                       | Performs an Auto Image adjustment to the currently selected window. Size and position are reset to defaults for the input aspect ratio setting. | <b>Fill:</b> Horizontal and vertical image position return to 0, 0, and the image size is set to match the current window size.<br><b>Follow:</b> Horizontal and vertical image position and size are set to maintain the native aspect ratio for the input rate with respect to the window being affected. |                                                                                                         |
|                              | (Press button again.)<br>When completed:<br>Auto Image Win 1<br>Complete! |                                                                                                                                                 |                                                                                                                                                                                                                                                                                                             |                                                                                                         |

## Menus, Configuration, and Adjustments

The MGP 641 xi Series menus enable configuration of the processor. The names of the menu, submenus, and options are displayed on the LCD screen on the front panel. The menu navigation buttons (**MENU** and **NEXT**) are located to the right of the LCD screen (see figure 13). Press these buttons to cycle through the available menu and submenu options.

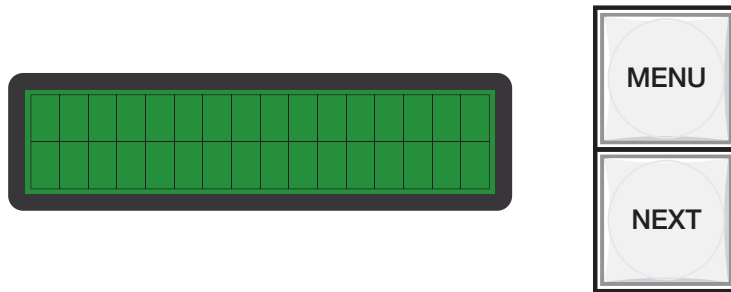


Figure 13. LCD Screen with MENU and NEXT Buttons

### Menu System Overview

The MGP 641 xi Series menu system consists of a main menu with seven options (menus). Each of these seven menus has a set of submenus, which enable you to make desired adjustments (see the Main Menu Flow diagram in [figure 14](#) on page 24).

### Using the menus

Access the different levels of menus by pressing the **MENU** and **NEXT** buttons and turning the **ADJUST** knobs as follows:

1. **Main menu access** — To access the main menu, press the **MENU** button. The first main menu option (Input Configuration) is displayed on the screen.
2. **Main menu options (menus)** — Repeatedly pressing the **MENU** button cycles through the main menu options. Press the **MENU** button until the desired menu is displayed.
3. **Submenu options** — When the desired main menu item that you want to configure is displayed on the LCD screen, press the **NEXT** button to cycle through the submenu options of the displayed menu.
4. **Adjustments** — With a desired submenu option displayed, rotate the horizontal (◀▶) and vertical (⬆⬇) **ADJUST** knobs clockwise or counterclockwise to display and select the parameters available for the option.
5. **Implementation** — To save and implement the adjustments you have selected, do one of the following:
  - Press **NEXT** to display another submenu option to adjust.
  - Press **MENU** repeatedly until the EXIT menu screen appears, then press **NEXT**.
  - Do nothing more, and wait until the LCD screen returns to the default cycle (approximately 30 seconds).

Your adjustments remain in effect until you change them or reset the unit to factory defaults (see [Resetting](#) starting on page 38).

**NOTE:** The menus time out and the default cycle displays after 30 seconds of inactivity. Any selections made with the **ADJUST** knobs prior to time-out are saved and remain in effect.

```

graph TD
    PO((Power On)) --> E1[Extron]
    E1 -.->|2 sec.| E2["Extron  
MGP 641 xi [SDI]"]
    E2 -.->|2 sec.| E3["60-1574-nn  
FW n.nn.nnnn"]
    E3 -.->|2 sec.| DC((Default Cycle))
    DC --> IC[Input Configuration]
    IC -.->|30 sec.| DC
    IC -- MENU --> OC[Output Configuration]
    OC -.->|30 sec.| DC
    OC -- MENU --> WC[Window Configuration]
    WC -.->|30 sec.| DC
    WC -- MENU --> IWC[Image/Window Configuration]
    IWC -.->|30 sec.| DC
    IWC -- MENU --> AC[Advanced Configuration]
    AC -.->|30 sec.| DC
    AC -- MENU --> VCS[View Comm Settings]
    VCS -.->|30 sec.| DC
    VCS -- MENU --> ECS[Edit Comm Settings]
    ECS -.->|30 sec.| DC
    ECS -- MENU --> EM[Exit Menu  
Press NEXT]
    EM -.->|30 sec.| DC
    EM -- NEXT --> DC
    EM -- MENU --> IC
    VCS -- Hold 3 sec. --> ECS
  
```

The flowchart illustrates the boot and configuration sequence for the Extron MGP 641 xi [SDI]. It begins with a 'Power On' event, leading to the 'Extron' logo, then to the model name 'Extron MGP 641 xi [SDI]' (2 sec.), and the firmware version '60-1574-nn FW n.nn.nnnn' (2 sec.). This sequence leads to the 'Default Cycle' (2 sec.), which initiates the configuration menu. The menu consists of several options: 'Input Configuration', 'Output Configuration', 'Window Configuration', 'Image/Window Configuration', 'Advanced Configuration', 'View Comm Settings', 'Edit Comm Settings', and 'Exit Menu Press NEXT'. Each option has a 30-second timeout before returning to the 'Default Cycle'. The 'Exit Menu Press NEXT' option also has a 30-second timeout and a 'NEXT' button to return to the 'Default Cycle'. The 'View Comm Settings' option has a 'Hold 3 sec.' button to enter the 'Edit Comm Settings' menu, which also has a 30-second timeout and a 'MENU' button to return to 'View Comm Settings'. The 'Exit Menu Press NEXT' option has a 'MENU' button to return to the 'Input Configuration' menu.

**NOTE:** From any menu or submenu, the MGP saves all adjustment settings and times out to the default screens after 30 seconds of inactivity.

## Input Configuration Menu

The Input Configuration menu allows you to configure settings for the HDMI input associated with the selected window. The input being configured is determined by the window number currently selected on the front panel.

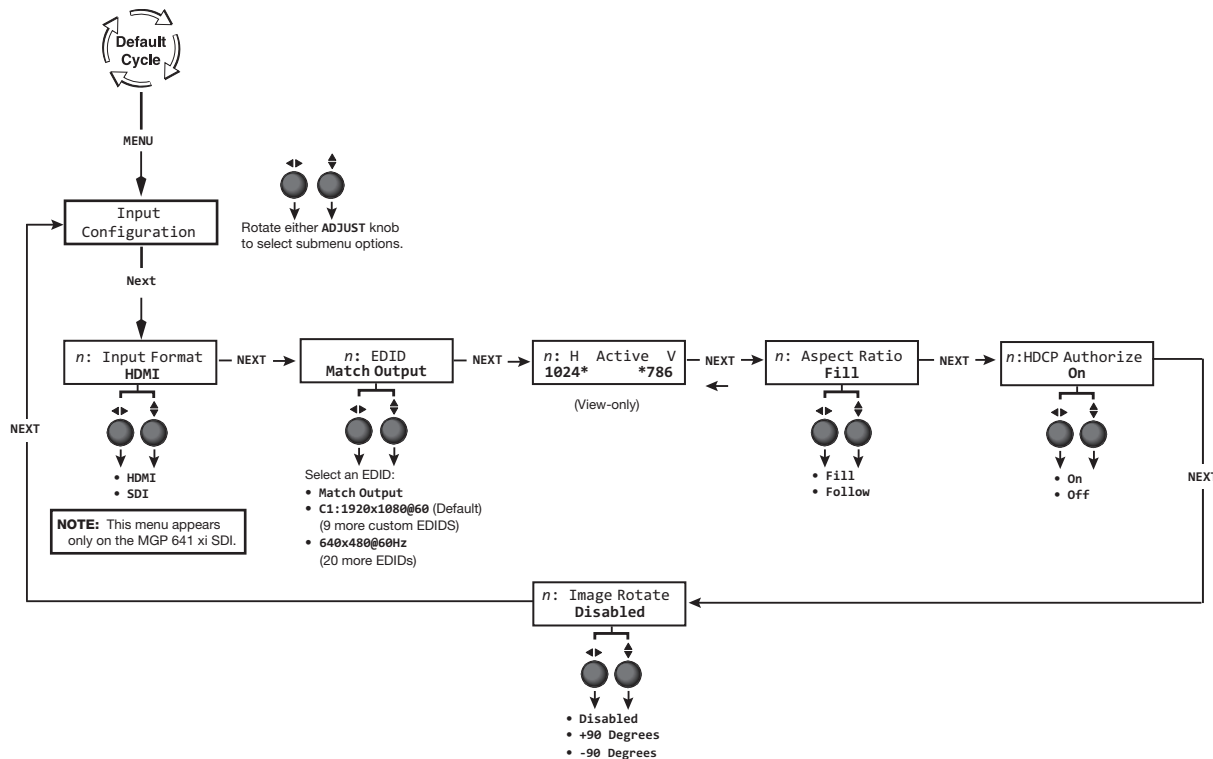


Figure 15. Input Configuration Menu Flow

### Input Configuration submenu options

- **Input format** — Rotate either **ADJUST** knob to select the HDMI (default) or SDI input format.

**NOTE:** This menu is available only on the MGP 641 xi SDI.

- **EDID** — Rotate either **ADJUST** knob to select an EDID for the current input from a list of 20 factory-supplied EDIDs, or select **Match Output** (default) to use the current output resolution and refresh rate.  
In addition, 10 custom EDID slots are provided. These EDIDs can be captured from a connected display device or uploaded via SIS or VCS. The 10 custom, user-defined output rates default to 1080p @ 60 Hz when no custom EDID is captured or uploaded. (See [Output resolutions and EDID emulation](#) on page 47 for a list of the available EDIDs.)
- **Active** — This view-only screen shows the active pixels (H) and lines (V) of the detected input signal on the currently selected window.
- **Aspect Ratio** — Select the aspect ratio of the image relative to the window in which it is displayed. The options are:
  - **Fill** — Each input signal fills its entire window (default).
  - **Follow** — Each input signal is displayed with its native aspect ratio.
- **HDCP Authorize** — Select **On** (default) or **Off**. This option lets you disable HDCP communication on discrete inputs.

For source devices that require encryption, select **On** to enable HDCP authorization. This setting is useful for devices such as Mac computers, iPhones, iPads, and some Windows sources that always encrypt their output, regardless of whether they are displaying HDCP content, if the downstream sink is capable of HDCP. By not allowing HDCP signals on an input, the MGP can pass most content from these sources as a non-encrypted signal to analog and digital video outputs.

When HDCP authorization is disabled, the window displaying an encrypted source does not display content that requires HDCP. Instead, the window displays either a black screen or a warning message generated by the source.

**NOTE:** All windows must not be displaying HDCP content for the MGP output to not be encrypted.

- **Image Rotate** — This option enables you to rotate the individual inputs 90 degrees clockwise or counterclockwise, allowing for support of either portrait inputs on a standard landscape oriented output or landscape sources on a portrait oriented output. Image rotation is available for all MGP resolutions and rates.

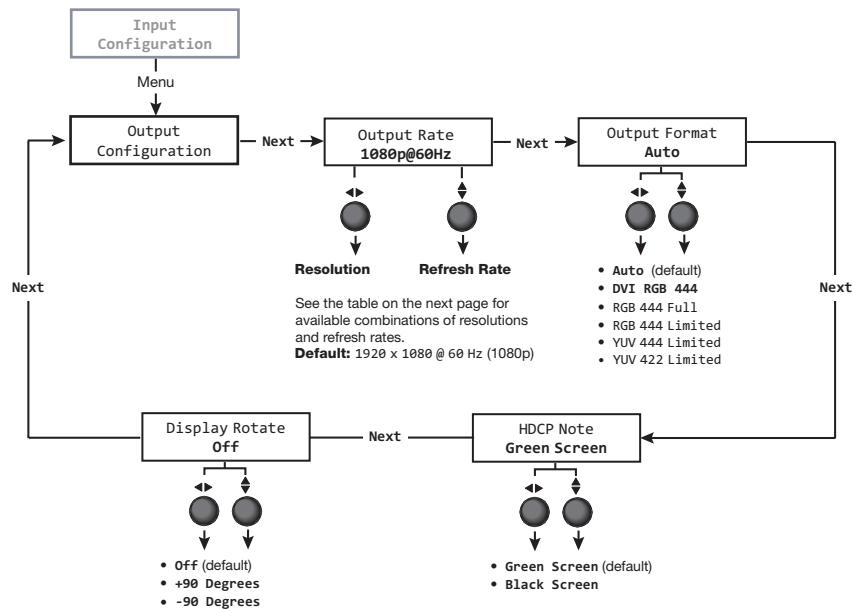
**NOTE:** Image rotation is available only on windows 2 and 4. If the selected window is 1 or 3, the screen shows Not Available for this option.

Rotation selections include:

- **Disabled** (default)
- **+ 90 degrees** (90° clockwise)
- **- 90 degrees** (90° counterclockwise)

## Output Configuration Menu

The Output Configuration menu allows you to set output resolution and refresh rate, output signal type, and sync polarity. The following flow diagram shows the Output Configuration submenus and the adjustments that can be made from them.



**Figure 16. Output Configuration Menu Flow**

- **Output Rate** — While this option is displayed, rotate the horizontal **ADJUST** (◀▶) knob to select one of the available resolutions, or rotate the vertical **ADJUST** (⬆⬇) knob to select one of the refresh rates. The resolutions and refresh rates are shown in the [Resolution and Refresh Rates](#) table on page 27.

|                                    | Resolution and Refresh Rates |       |       |          |       |       |          |       |
|------------------------------------|------------------------------|-------|-------|----------|-------|-------|----------|-------|
|                                    | 23.98 Hz                     | 24 Hz | 25 Hz | 29.97 Hz | 30 Hz | 50 Hz | 59.94 Hz | 60 Hz |
| 640 x 480                          |                              |       |       |          |       |       |          | X     |
| 800 x 600                          |                              |       |       |          |       |       |          | X     |
| 852 x 480                          |                              |       |       |          |       |       |          | X     |
| 1024 x 768                         |                              |       |       |          |       |       |          | X     |
| 1280 x 768                         |                              |       |       |          |       |       |          | X     |
| 1280 x 800                         |                              |       |       |          |       |       |          | X     |
| 1280 x 1024                        |                              |       |       |          |       |       |          | X     |
| 1360 x 768                         |                              |       |       |          |       |       |          | X     |
| 1366 x 768                         |                              |       |       |          |       |       |          | X     |
| 1440 x 900                         |                              |       |       |          |       |       |          | X     |
| 1400 x 1050                        |                              |       |       |          |       |       |          | X     |
| 1600 x 900                         |                              |       |       |          |       |       |          | X     |
| 1680 x 1050                        |                              |       |       |          |       |       |          | X     |
| 1600 x 1200                        |                              |       |       |          |       |       |          | X     |
| 1920 x 1200                        |                              |       |       |          |       |       |          | X     |
| 480p                               |                              |       |       |          |       |       | X        | X     |
| 576p                               |                              |       |       |          |       | X     |          |       |
| 720p                               |                              |       | X     | X        | X     | X     | X        | X     |
| 1080i                              |                              |       |       |          |       | X     | X        | X     |
| 1080p                              | X                            | X     | X     | X        | X     | X     | X        | X*    |
| 2048 x 1080                        | X                            | X     | X     | X        | X     | X     | X        | X     |
| 2048 x 1200                        |                              |       |       |          |       |       |          | X     |
| 2048 x 1536                        |                              |       |       |          |       |       |          | X     |
| 2560 x 1080                        |                              |       |       |          |       |       |          | X     |
| 2560 x 1440                        |                              |       |       |          |       |       |          | X     |
| 2560 x 1600                        |                              |       |       |          |       |       |          | X     |
| 3840 x 2160                        | X                            | X     | X     | X        | X     | X     | X        | X     |
| 4096 x 2160***                     | X                            | X     | X     | X        | X     | X     | X        | X     |
| 5180 x 1080***                     |                              |       |       |          | X     |       |          | X     |
| 5180 x 1440***                     |                              |       |       |          | X     |       |          | X     |
| 5180 x 2160***                     |                              |       |       |          | X     |       |          |       |
| 5180 x 2560***                     |                              |       |       |          | X     |       |          |       |
| 5180 x 2880***                     |                              |       |       |          | X     |       |          |       |
| Custom EDID or output rate #1 - 10 |                              |       |       |          |       |       |          |       |

\*Default

\*\*\*Not available as an EDID, only as an output rate option

By default, the resolution provided in the EDID is the last selected factory rate. To manually set the resolution information provided in the EDID data, see [Output resolutions and EDID emulation](#) on page 47.

**NOTES:**

- If the output rate is set to 3840x2160 or 4096x2160 at 50 Hz, 59.94 Hz, or 60 Hz, the twisted pair outputs are active only if connected to a DTP3 receiver or an XTP matrix switcher with an XTP II CP 4i board installed.
- When an HDMI background is used, the MGP output must be set to the same resolution as the HDMI background source. It is not necessary to set the refresh rate to match the background because this is done automatically.

If the selected output resolution is different from that of the HDMI background, the display shows a black screen or blue screen (depending on the selected screen saver setting) as the background. (See the [Advanced Configuration Menu](#) on page 32 to enable the background input.)

- **Output Format** — Rotate either **ADJUST** knob to select the digital format of the HDMI output 1A and twisted pair output 1B. If Auto (the default) is selected, the MGP uses the EDID from the connected sink device to determine the output format.

Available signal types are:

- **Auto** (default)
- **DVI RGB 444**
- **RGB 444 Full**
- **RGB 444 Limited**
- **YUV 444 Limited**
- **YUV 422 Limited**

- **HDCP Note** — Rotate either **ADJUST** knob to select what is displayed on the HDMI output when any of the four windows or the background input contains HDCP-protected content and the output is a non-HDCP sink. Options are:

- **Green Screen** (default)
- **Black Screen**

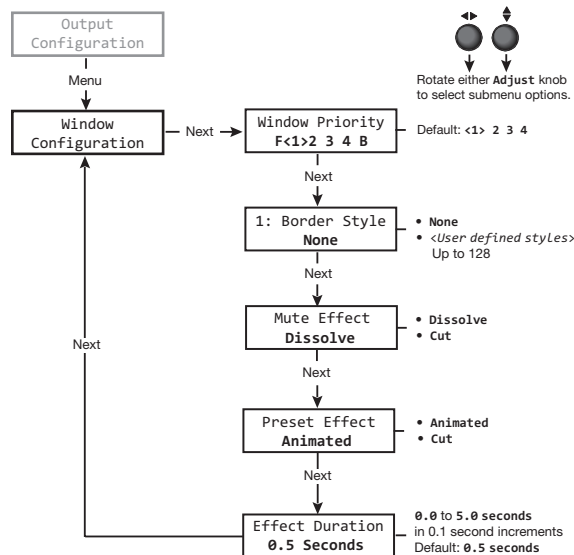
- **Display Rotate** — This option enables you to rotate the output 90 degrees clockwise or counterclockwise, allowing for support of either portrait inputs on a standard landscape oriented output or landscape sources on a portrait oriented output. Output rotation is available for all MGP resolutions and rates.

Rotation selections include:

- **Off** (default)
- **+ 90 degrees** (90° clockwise)
- **- 90 degrees** (90° counterclockwise)

## Window Configuration Menu

The Window Configuration menu allows you to set window front and back priority, add user-defined borders to the windows, select the window transition effect to use when muting (closing) and unmuting (displaying) a window, select the transition effect to use when recalling a window preset, and specify the duration of the selected mute and preset effects.



**Figure 17. Window Configuration Menu Flow**

The Window Configuration submenu contains the following options:

- **Window Priority** — This option enables you to set how the windows overlap one another or “stack” on the display. For example, by default the window with priority 1 is displayed in front of all the other windows. If the top priority window is sized to fill the screen, the other windows are not visible.  
  
By default, the Window Priority LCD screen displays the numbers of the windows in order, from left to right, with window 1 having first priority (shown with angle brackets).  
  
To change the priority of a window:
  1. From the Window Configuration screen, press **NEXT** once to display the Window Priority screen.
  2. Rotate the vertical **ADJUST** (↕) knob to move the angle brackets to the window whose priority level you want to change.
  3. Rotate the horizontal **ADJUST** (↔) knob to move the bracketed window number to the desired priority position. For example, if you want window 2 to display in front of all the other windows (priority 1), move <2> all the way to the left, following the letter F on the LCD screen.
  4. Repeat steps 1 and 2 as desired for each additional window whose priority you want to change.
- **Border Style** — Use this submenu to select border presets for the windows. The window border presets can be created and saved only in VCS (see the VCS Help File). However, you can use the front panel controls to select (recall) presets that have already been defined.  
  
To select a border preset to recall:
  - a. From the Window Configuration screen, press **NEXT** twice to display the Window Border Style screen.
  - b. Rotate either **ADJUST** knob to scroll through the numbers of the user-defined presets until the desired one is displayed.

You can also select **None** (the default), which specifies no border. If no presets have been defined, this is the only option on this submenu.

- **Mute Effect** — Use this submenu to select a transition effect for the MGP to use when muting and unmuting windows. To select a transition effect:
  - a. From the Window Configuration screen, press **NEXT** three times to display the Mute Effect screen.
  - b. Rotate either **ADJUST** knob to select a mute effect. Options are:
    - **Cut** — The windows are instantly muted to a black screen.
    - **Dissolve** (default) — A dissolve causes the window to fade gradually to black.
- **Preset Effect** — Use this submenu to select a transition effect for the MGP to use when recalling window presets. To select a transition effect:
  - a. From the Window Configuration screen, press **NEXT** four times to display the Preset Effect screen.
  - b. Rotate either **ADJUST** knob to select a preset transition effect. Options are:
    - **Cut** — The windows instantly change to the new size and location on the display defined by the recalled preset.
    - **Animated** (default) — The windows move and resize dynamically on screen to the location and size defined by the recalled preset. The display shows the four windows stretching or shrinking as well as moving to the new location at a smooth rate according to the effect duration.
- **Effect Duration** — Use this submenu to set the amount of time the MGP takes to complete a mute or preset transition effect. Select from durations of 0.0 to 5.0 seconds, in 0.1 second increments. (Effect duration is not available with the cut effect.) To set an effect duration:
  - a. Press the **NEXT** button five times, until Effect Duration is displayed.
  - b. Rotate either the horizontal (◀▶) or the vertical (⬆⬇) **ADJUST** knob to select an effect duration.

## Image/Logo Configuration Menu

This menu lets you recall and display images or logos that have been preassigned via SIS commands (see [Image, Logo, and Clock Configuration](#) starting on page 64) or via VCS (see the *VCS Help File*). The MGP supports BMP, JPG, PNG, and TIFF image file formats. You can configure images using VCS.

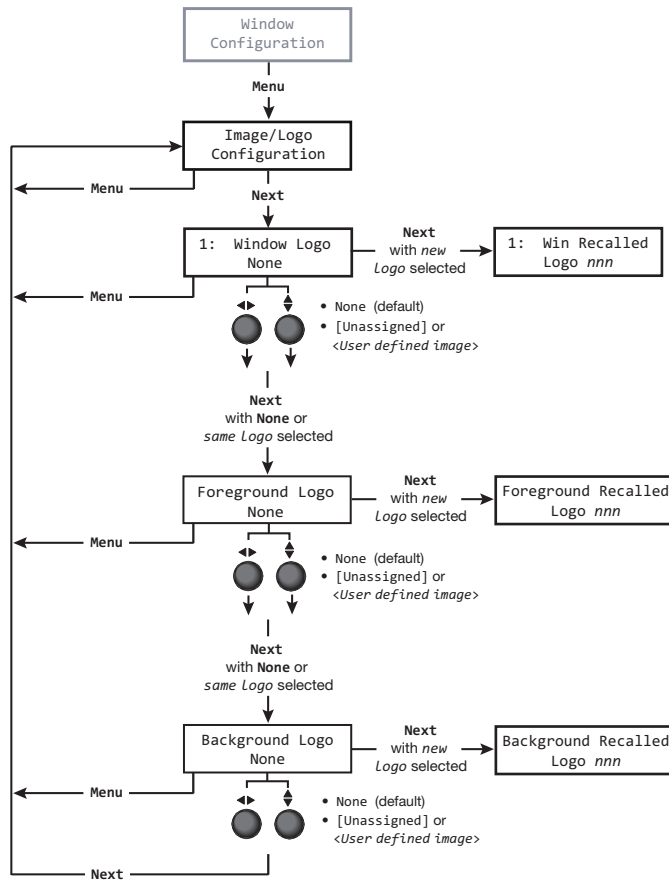


Figure 18. Image/Logo Configuration Menu Flow

## Recalling logo presets

To display an image in the foreground, background, or at a desired location on a window, you can recall a previously configured logo preset.

To recall an image:

1. From the **Image/Logo Configuration** menu, press **NEXT** repeatedly until the desired image type is displayed on the LCD screen. Available selections are:

- **Window Logo** — Displays an image scaled to fit the selected window (any size or proportion) to which it is recalled, while obeying the aspect ratio setting for the window. This image replaces the active video in the window.

**NOTE:** All image keying parameters configured via VCS as part of the logo preset are applied to the image when it is scaled in a window (see the *VCS Help File* to configure logos).

- **Foreground Logo** — Displays an unscaled image in front of any other window content. Using VCS, you can position the foreground logo anywhere on the screen and apply a logo key effect to it if desired (see the *VCS Help File*). When a foreground logo in the selected window is changed or muted, it cuts to the new logo image.
- **Background Logo** — Displays an unscaled, static background image. Recalled background images are always centered regardless of whether they are smaller or larger than the output raster.

2. Rotate either **ADJUST** knob to scroll through the numbers of the user-defined logo presets until the desired one is displayed, or:
  - If no presets have been defined, the only option (other than **None**) is [**unassigned**].
  - Select **None** to display **no** images in the selected position (foreground, background, or in the window). Selecting **None**, then pressing **NEXT** removes the current logo image from the selected position.
3. Press **NEXT**. Depending on your selection in step 2, the following appears on the LCD screen:
  - If **None** or the same logo is selected, the LCD screen displays the next item on the Image/Configuration menu (or returns to the Image/Configuration menu screen).
  - If a new logo was selected, one of the following screens appears:
    - {Window number}: Win Recalled  
Logo nnn
    - Foregnd Recalled  
Logo nnn
    - Backgnd Recalled  
Logo nnn

Press **NEXT** again to move to the next Image/Logo Configuration menu item.

## Advanced Configuration Menu

Use the Advanced Configuration menu to set features that are not intended to be changed frequently. You can also view the internal temperature of the unit.

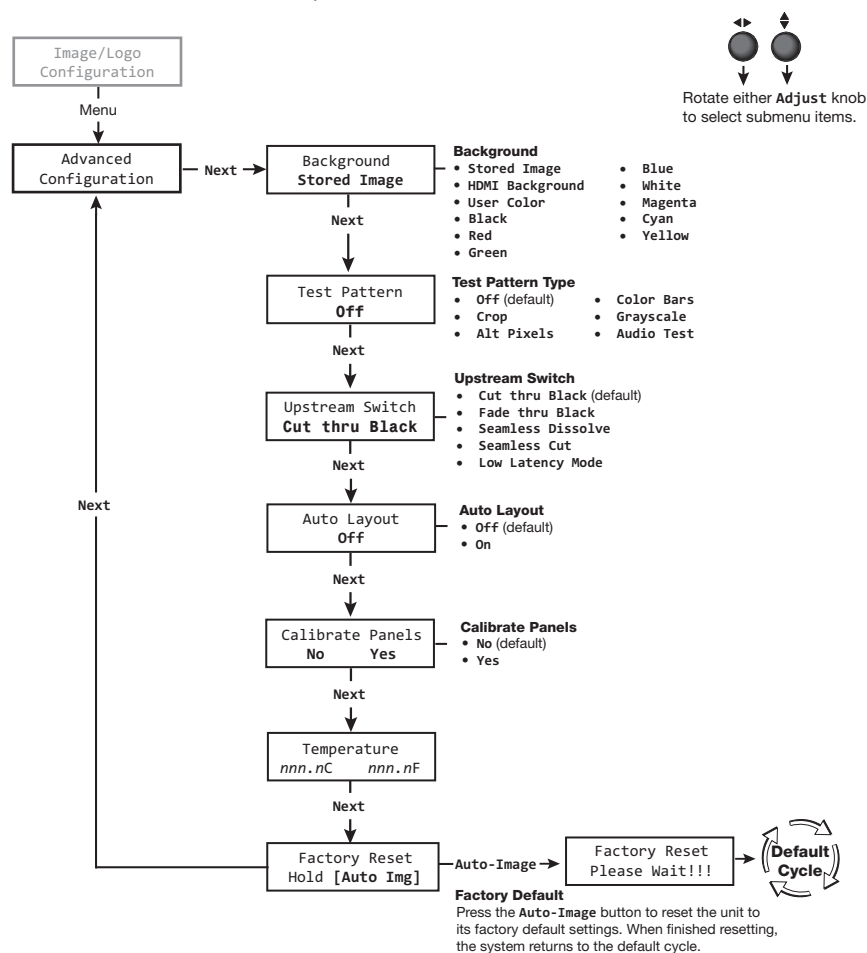


Figure 19. Advanced Configuration Menu Flow

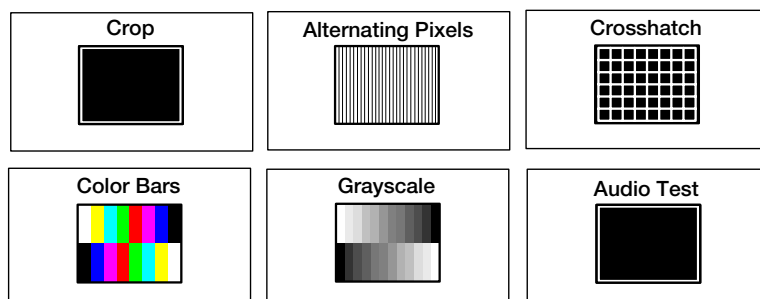
The Advanced Configuration menu contains the following submenus:

- **Background** — Rotate either **ADJUST** knob to select a background color for the output screen. Options are:
  - **Stored Image** — The saved background that was most recently recalled. Select this option if you want to return to the recalled background after having changed to a different background color.
  - **HDMI Background** — Displays the unscaled image from the live background input as the background on the screen. When this option is selected, the MGP changes the live background refresh **rate** (not the resolution) to match that of the output.

**NOTES:**

- The live background input does not support the 1080i resolution.
- If you select this background, you must set the output **resolution** to that of the HDMI background input (the refresh rate is changed automatically). Otherwise, the background is black or blue, depending on the screen saver setting.

- **Test Pattern** — Several test patterns are available via this submenu to adjust the display device for color, convergence, focus, resolution, contrast, grayscale, and aspect ratio. The available pattern selections are:
  - **Off** (default)
  - **Crop**
  - **Alt Pixels**
  - **Crosshatch**
  - **Color Bars**
  - **Grayscale**
  - **Audio Test**



**Figure 20. Test Patterns Available for the MGP 641 xi Series**

**NOTES:**

- By default all test patterns include a single pixel wide crop pattern line.
- The Audio Test pattern displays a crop pattern and also outputs pink noise at 48 kHz, 24 bit.
- Test pattern selections persist through a power cycle.

- **Upstream Switch** — Enables selection of a transition effect to be used when the signal from an upstream matrix switcher is lost and when it is restored. All fade switch effects have a duration of 0.5 seconds. Available effects are:
  - **Cut thru Black** — The video in the window immediately mutes to black when the signal is lost and cuts to the new signal when it is restored (default).
  - **Fade thru Black** — The window freezes the last solid frame before the signal was lost and fades the image to black. The window fades in the new signal when it is restored.
  - **Seamless Cut** — The window freezes the last solid frame before the signal was lost and seamlessly cuts to the new signal when it is restored. If no signal is applied for 8 seconds, the image within the window cuts to black.

- **Seamless Dissolve** — The window freezes the last solid frame before the signal was lost and performs a seamless dissolve to the new signal when it is applied. If no signal is applied for 8 seconds, the image within the window fades to black.
- **Low Latency Mode** — The window attempts to display the new signal as quickly as possible. Two frames of video delay are also removed from the video processing logic of the MGP, which may introduce video artifacts during the switch transition.
- **Auto Layout mode** — Enables or disables Auto Layout mode. This mode automatically configures the window layout to full screen, side by side, pyramid, or quad arrangement (see figure 21), based on which windows have an active signal or logo preset. When a signal is newly detected or removed, the MGP rearranges the windows accordingly using the defined window preset effect.



**Figure 21. Auto Layout Mode Window Configurations**

The layouts in figure 21 are not part of the 128 available window presets and the combination of windows being displayed is not fixed. For example, layout B can include windows 1 and 2, 1 and 3, 1 and 4, 2 and 3, 2 and 4, or 3 and 4. The same applies to layouts C and D.

If no signal is present and Auto Layout is enabled, all windows are muted and the screen saver is displayed.

While the MGP is in Auto Layout mode, the front panel remains unlocked and any desired changes can be made. However, these changes can be overwritten once the status on any of the four inputs changes.

- **Calibrate Panels** — Lets you calibrate any connected touchpanel. (Calibration can also be performed via VCS (see the *VCS Help File*).

To calibrate a touchpanel using the front panel:

1. Select **Yes** from the Calibrate Panels menu. If a touchpanel is connected, the screen shown at right appears in the LCD panel.

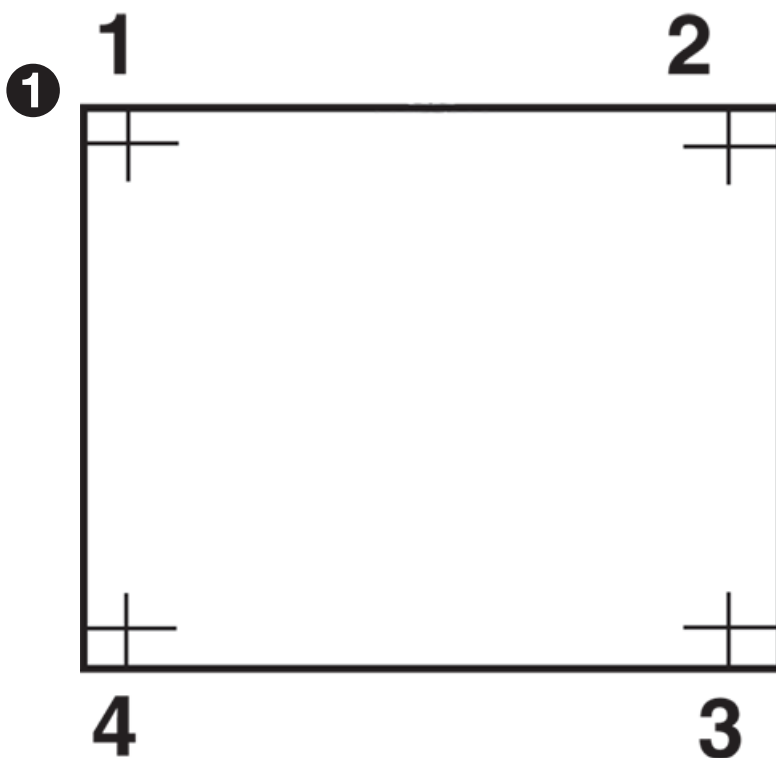
If no touchpanel is attached, the screen at right is displayed. After 5 seconds, the default cycle resumes.

2. On the touchpanel screen, tap the crosshair that appears in the upper-left corner (see [figure 22](#), ❶ on page 35).

Tap + To Set  
Next = Exit

Calibrate Panels  
No panels

**NOTE:** If not tapped, the crosshair disappears after 15 seconds.



**Figure 22. Calibration Crosshairs on Touchpanel Screen**

The crosshair disappears (turns white), and another crosshair appears in the top right corner (2 in figure 22).

3. Tap each crosshair as it appears. The order the crosshairs are displayed in the screen corners is:
  1. Top left
  2. Top right
  3. Bottom right
  4. Bottom left

After the fourth crosshair has been tapped, the MGP saves the calibration data. If another touchpanel is connected, the Calibration screen displays crosshair 1 for the next screen. Repeat steps 1 through 3 for each successive touchpanel.

- **Internal Temperature screen** — Displays the current internal temperature of the unit temperature in degrees Fahrenheit and Celsius. This is an information-only screen and no adjustments can be made to it.
- **Factory Reset** — Resets the unit to its factory default values (removing any user-specified values) while retaining all network settings. From this screen, press the **Auto-Image** button to initiate the reset. When the reset is complete, the LCD screen displays the default cycle.

**NOTE:** The equivalent SIS command is `[Esc] ZXXX ←`. This command does **not** affect the current password, including the initial factory-set serial number.

For other reset methods, see [Resetting](#) starting on page 38.

## Comm Settings Menu

Use the Comm Settings menu to view and edit the serial communication port configuration and the MGP 641 xi Series IP addresses. This menu consists of two levels: View Comm Settings and Edit Comm Settings (Edit Comm Settings is accessed through View Comm Settings).

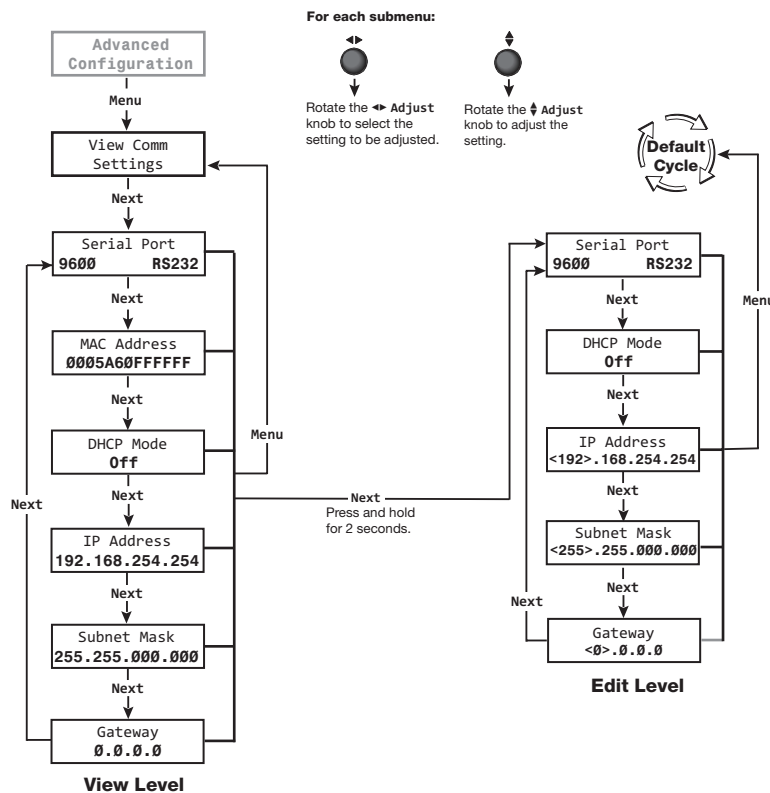


Figure 23. View and Edit Comm Settings Menu Flow

### Viewing serial port and IP settings

When you first reach the Comm Settings menu, the View Comm Settings level is displayed. At this level, all screens that are cycled through by pressing **NEXT** show the current settings. The **ADJUST** knobs are disabled, and no changes can be made via the LCD screen.

To view the serial port and IP settings:

1. From the View Comm Settings menu, press **NEXT** repeatedly to cycle through the screens displaying the current settings for the serial port, MAC address, DHCP mode, IP address, gateway address, and subnet mask.
2. Press **MENU** to return to the View Comm Settings screen.

## Editing serial port and IP settings

To make changes to the serial port configuration, IP address, DHCP mode, gateway address, and subnet mask, access the **Edit Comm Settings** menu, then rotate the **ADJUST** knobs as described below.

**NOTE:** The MAC address has no screen in this mode because it cannot be edited.

1. With any **View Comm Settings** menu view-level screen displayed, press the **NEXT** button and hold it until the Serial Port screen appears (approximately 3 seconds).
2. Press **NEXT** repeatedly to cycle through the edit level screens.
3. To enter or change information on each screen:
  - Serial Port — Rotate the horizontal **ADJUST** knob (◀▶) to select the baud rate (the default is **9600**).
  - DHCP Mode — Rotate either **ADJUST** knob to select **On** or **Off**.
  - IP Address, Subnet Mask, and Gateway — Rotate the horizontal **ADJUST** knob (◀▶) to move the angle brackets to the desired octet. Rotate the vertical **ADJUST** knob (⬆⬇⬇⬆) to adjust the number. Repeat as needed.
4. When finished editing the settings for the selected item, either press **NEXT** to display the next item, or press **MENU** to exit the **Edit Comm Settings** menu and go to the default cycle.

**NOTE:** DHCP must be set to **Off** before you can edit the IP addresses.

## Additional Functions

### HDCP Authorization

The HDCP Authorized function allows the MGP 641 xi Series HDMI inputs to be able to report as an HDCP authorized sink or a non-HDCP authorized sink (display) device to a source device. This is especially useful for sources that encrypt their output even if the source material does not require HDCP encryption, which would then prevent content from being displayed on non-HDCP compliant displays.

For example, if you wanted to show a non-HDCP protected presentation from a PC using the HDMI output of the PC, there is a chance that the PC may encrypt the HDMI, because it can see that the MGP HDMI input supports HDCP authorization. If you were going to send only the HDMI output of the MGP to a display (sink) that supported HDCP, there would be no problem. However, if you wanted to use the MGP analog output to an analog sink, the green HDCP notification screen would be displayed, due to the source unnecessarily enabling encryption on its HDMI output.

Disabling HDCP authorization on one of the MGP HDMI inputs ensures that the PC with non-HDCP protected content determines that the signal path does not support HDCP, and therefore does not encrypt its output. With HDCP authorization disabled on the MGP input, you are able to view your non-HDCP protected content from the video output of the MGP. With HDCP authorization enabled on an input, if HDCP protected content is selected on the source, the source either simply mutes its video output to black, or displays a warning message.

HDCP authorization is available also via SIS commands (see the [HDCP Authorization commands](#) on page 52 or via VCS (see the *VCS Help File*).

# Locking the Front Panel (Executive Mode)

To prevent access by unauthorized users or accidental changes to the MGP 641 settings, some of the front panel controls can be locked using executive mode (the rear panel RS-232, front panel Config, and the LAN ports remain unlocked).

The following lock modes are available via SIS commands (see [Front Panel Lock Mode \(Executive Mode\)](#) on page 67) and VCS (see the *VCS Help File*). Only mode 2 is available from the front panel.

- **Mode 0 (default)** — All front panel locks are disabled, allowing access to all front panel functions.
- **Mode 1** — All front panel buttons and knobs are disabled.
- **Mode 2** — Limited front panel controls are available, including **MUTE**, **FREEZE**, **AUTO IMAGE**, and **PRESET RECALL/SAVE** buttons.

**NOTE:** This is the only mode that can be enabled via the front panel.

Executive mode 2 can be enabled or disabled from the front panel when the system is in the default cycle. To turn lock mode on, press the **MENU** and **NEXT** buttons simultaneously, and hold them until the message shown at right appears on the LCD screen (approximately 2 seconds).

EXEC MODE 2  
ENABLED

To disable front panel lock mode 2, press and hold the **MENU** and **NEXT** buttons until the message shown at right appears in the LCD window (approximately 2 seconds).

EXEC MODE  
DISABLED

# Resetting

Resetting the unit causes various settings to revert to factory defaults. There are three reset modes that are initiated by pressing the **RESET** button on the rear panel. This button is recessed, and can be pressed by a pointed stylus, ballpoint pen, or small screwdriver such as the Extron Tweeker (provided). The [Reset Mode Summary table](#) on page 39 summarizes the reset modes.

## ATTENTION:

- Review the reset modes carefully (see the table on the next page). Using the wrong reset mode may result in unintended loss of flash memory programming, port reassignment, or processor 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 processeur.

## Reset Mode Summary table

| Reset Mode Summary                                         |                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mode                                                       | Use This Mode to...                                                                                                                                                                                                                      | Activation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Result                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Use Factory Firmware Settings<br>(Run Universal Boot Code) | <p>Temporarily boot up the unit running only the universal boot code, then install the desired firmware.</p> <p>Use this in the event that a firmware update has failed or if incompatibility issues arise with user-loaded firmware</p> | <p>To start the Run Universal Boot Code reset mode and replace firmware:</p> <ol style="list-style-type: none"> <li>1. Press and hold in the recessed <b>Reset</b> button while applying power to the unit. Hold the button in until the Reset LED blinks twice, then release the button. The controller enters factory firmware mode, and the LED blinks rapidly.</li> <li>2. Upload new firmware to the unit as desired (see <a href="#">Updating the Firmware</a> on page 100 for details).</li> </ol> <div> <b>NOTE:</b> Do not continue to operate the control processor using only the boot code. The unit requires a full firmware package in order to be fully operational. If you want to use the firmware version with which the unit shipped, you must upload that version again (see the <i>Global Configurator Help File</i> or <i>Toolbelt Help File</i> for instructions). </div> | <p>The control processor firmware is replaced.</p> <p>If the unit is powered on in Run Universal Boot Code mode, event scripts and systems do not start. All user files and settings such as drivers, adjustments, and IP settings are maintained.</p> <div> <b>NOTE:</b> To return the unit to the firmware version that was running prior to the reset, cycle power to the unit. </div>                                                                                             |
| Reset to Factory Defaults                                  | Start over with configuration and uploading                                                                                                                                                                                              | <p>To reset the unit to all factory default settings:</p> <ol style="list-style-type: none"> <li>1. Hold down the <b>Reset</b> button for about 9 seconds until the Reset LED blinks once at 3 seconds, twice at 6 seconds, and three times at 9 seconds.</li> <li>2. Release and momentarily press and release the <b>Reset</b> button (for &lt;1 second) within 1 second*.</li> </ol> <p>*Nothing happens if the momentary press does not occur within 1 second.</p>                                                                                                                                                                                                                                                                                                                                                                                                                           | <p>Reset to Factory Defaults mode performs a complete reset to factory defaults (except the firmware).</p> <ul style="list-style-type: none"> <li>• Does everything Reset All IP Settings mode does.</li> <li>• Removes all user-loaded files and configurations from the controller:</li> <li>• Clears driver-port associations (IR, serial, Ethernet) and port configurations.</li> <li>• Removes button configurations.</li> <li>• Removes schedules, settings, macros.</li> </ul> |

| Reset Mode Summary    |                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mode                  | Use This Mode to...                                                                     | Activation                                                                                                                                                                                                                                                                                                                                                                                                                                | Result                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Reset All IP Settings | Reset IP settings and port maps to factory defaults without affecting user-loaded files | <p>To reset all IP settings:</p> <ol style="list-style-type: none"> <li>1. Hold down the <b>Reset</b> button for about 6 seconds until the Reset LED blinks once at 3 seconds, then twice at 6 seconds.</li> <li>2. Release and momentarily press and release the <b>Reset</b> button (for &lt;1 second) within 1 second*.</li> </ol> <p>*Nothing happens if the momentary press does not occur within 1 second.</p>                      | <p>Resets All IP Settings mode:</p> <ul style="list-style-type: none"> <li>• Sets the IP address back to factory default (192.168.254.250)</li> <li>• Sets the subnet back to factory default (255.255.255.0)</li> <li>• Sets the default gateway address to the factory default (0.0.0.0)</li> <li>• Sets domain and host names to factory default.</li> <li>• Sets port mapping back to factory default.</li> <li>• Turns DHCP off.</li> <li>• Turns events off (user-created schedules, macros).</li> <li>• Stops any running program.</li> </ul>                                                        |
| Start or Stop Program | Toggle stop or start program                                                            | <p>To stop or start a program:</p> <ol style="list-style-type: none"> <li>1. Hold down the <b>Reset</b> button for about 3 seconds, until the Reset LED blinks once.</li> <li>2. Release and press the <b>Reset</b> button momentarily (for &lt;1 second) within 1 second*.</li> </ol> <p>*Nothing happens if the momentary press does not occur within 1 second.</p>                                                                     | <ul style="list-style-type: none"> <li>• The LED blinks two times if the program is starting.</li> <li>• The LED blinks three times if the program is stopping.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Project Recovery      | Recover project configuration and program files if passwords have been lost             | <p>To start the Project Recovery mode and recover a project:</p> <p>Press the front panel <b>Reset</b> button three times within 1 second. The Reset LED blinks for 30 seconds, while the device is in project recovery mode. After the Reset LED stops blinking and remains lit, the device returns to the previous state with no settings changed. Use this mode to recover project or program files if a product password is lost.</p> | <p>Project Recovery mode stops regular operation and allows a connection to be made to the unit via software without requiring password entry so that project files can be retrieved and saved.</p> <p>During project recovery mode, events are stopped, and so is communication with AV devices.</p> <p>While the control processor is in this mode, use the software to recover project files.</p> <p>Upon exiting project recovery mode:</p> <ul style="list-style-type: none"> <li>• The unit returns to its pre-recovery mode state and settings.</li> <li>• The Reset LED lights steadily.</li> </ul> |

| Reset Mode Summary     |                                   |                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                           |
|------------------------|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mode                   | Use This Mode to...               | Activation                                                                                                                                                                                                                                                                                                  | Result                                                                                                                                                                                    |
| Enable or Disable DHCP | Enable or disable the DHCP client | To enable or disable the DHCP client for the LAN port:<br><br>Press and release the <b>Reset</b> button five times consecutively.<br><br><b>Do not press</b> the button within 3 seconds following the fifth press.                                                                                         | <ul style="list-style-type: none"> <li>The Reset LED blinks six times if the DHCP client is enabled.</li> <li>The Reset LED blinks three times if the DHCP client is disabled.</li> </ul> |
|                        |                                   | <b>NOTES:</b> <ul style="list-style-type: none"> <li>By default, DHCP is off and the unit uses a static IP address.</li> <li>When DHCP is disabled, the unit uses the factory default IP address, which is 192.168.254.250, or the previously stored static IP address if it was not at default.</li> </ul> |                                                                                                                                                                                           |

## On-screen Annotation

The MGP 641 xi Series support annotation features that allow you to draw or point on 4K video and computer sources using a touchpanel or mouse. Annotation is available via VCS (see the *VCS Help File*) and SIS commands (see the [Annotation Commands](#) starting on page 70).

The onscreen annotation menu can be customized to include any combination of presets and annotation tools using VCS.

To display the on-screen annotation menu, click the small button in the top or bottom right corner of the screen.

**NOTE:** LinkLicense must be installed for the annotation features to be available.

## LinkLicense

### Loading LinkLicenses

Extron Toolbelt or VCS can be used to load LinkLicenses onto the MGP 641 xi and MGP xi SDI models. See the *VCS Help File* or the *Toolbelt Help File* to load LinkLicense to the computer.

When a LinkLicense is loaded onto the unit, you can identify what LinkLicense has been loaded by looking at the status in VCS.

## On-screen Annotation Functions

The annotation buttons become visible when the mouse is moved or a connected touchpanel screen is tapped to start the controls.

The following OSD button functions are available on the MGP 641 xi and MGP xi SDI (see the *VCS Help File* for the MGP xi Series:

- **Pointer** — The cursor becomes an extra large arrow filled with the currently selected color. This is used to bring attention to specific areas of the image.
- **Freehand** — Enables freehand drawing on the screen.
- **Line** — Draws a straight line between two points.
- **Arrow** — Draws a straight line with an arrow at one end.
- **Rectangle** — Creates a rectangle with its edges parallel to the raster.
- **Ellipse** — Creates an ellipse or circle.
- **Size Select** — Selects the line weight for to all drawing functions.

- **Eraser** — Erases any annotations created onscreen.
- **Color** — Opens the color selection window which has 16 colors available.
- **Fill** — Fills in all rectangle and ellipse objects that have been created.
- **Undo** — Undoes each step that was required to create the previous object. Up to 15 steps can be undone for an item.
- **Redo** — If within the 15 steps of the undo states, advances you to recreate the annotation most recently undone.
- **Clear** — Clears the screen of all annotation.
- **Window Preset** — Opens the window preset selection window, from which up to 8 window presets can be assigned on the Window Preset window for instant preset recall using a touch monitor or mouse.

For detailed information on using these annotation functions, see the *VCS Help File* or the [Annotation Commands](#) starting on page 70.

# Remote Configuration and Control

The MGP 641 xi Series can be configured and controlled via Extron Simple Instruction Set (SIS) commands when connected to a host computer or other device (such as a control system). Attach the host device to the rear panel RS-232 connector or LAN connector, or to the front panel USB port. The default protocol for the RS-232 connection is 9600 baud, 8 data bits, 1 stop bit, no parity, and no flow control. This section describes SIS communication and control. Topics in this section include:

- [Host and Processor Communication](#)
- [SIS Overview](#)
- [Command and Response Table for MGP 641 xi Series SIS Commands](#)
- [Command and Response Table for IP SIS Commands](#)
- [Videowall Configuration Software \(VCS\) Program](#)

## Host and Processor Communication

SIS commands consist of one or more characters per field. No special characters are required to begin or end a command sequence. When the MGP determines that a command is valid, it executes the command and sends a response to the host device. All responses from the MGP 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).

### Connecting the MGP to the host

Use one of the following methods to establish communication between the host and the MGP:

- **RS-232** — Connect the unit to the host via the rear panel Remote RS-232 connector. To enter SIS commands, use a communication utility such as Extron DataViewer, available at [www.extron.com](http://www.extron.com).
- **Ethernet** — Ensure the unit is connected to the host via the rear panel LAN port. To enter SIS commands, use a secure communication utility that supports Secure Shell (SSH). Enter the MGP IP address where requested and use **22023** as the port number.
- **Ethernet over USB** — Connect the host to the front panel USB Config port. To enter SIS commands, use a secure communication utility that supports Secure Shell (SSH). Enter **203.0.113.22** for the IP address where requested and **22023** as the port number.

#### To log in to the MGP via Ethernet or Ethernet over USB:

- **User name** = admin
- **Password** = {unit serial number} if the unit is new, extron if the unit has had an absolute system reset.

**NOTE:** Performing a unit factory reset (entering a ZQQQ [\[Absolute system reset\]](#) SIS command or a [Use Factory Firmware Settings](#) reset via the rear panel **Reset** button) changes the serial number password to extron.

### Initial Power Up Messages

The copyright message is displayed upon connecting to the unit via SSH, TCP/IP, or Telnet or after a power cycle via RS-232.

`↵ (c) Copyright YYYY, Extron Electronics, MGP 641 xi [SDI], Vn.nn, 60-1574-nn↵`  
`Ddd, DD MMM YYYY HH:MM:SS ↵` (day, date, and time as in Wed, 07 Oct 2020 11:27:33)

- YYYY is the year.
- Vn.nn is the firmware version number.

## Password Messages

If the MGP 641 xi Series is protected by a password, the following password message prompts you for the password to access the MGP features.

←Password←

The prompt requires a password, followed by a carriage return. The prompt is repeated if the correct password is not entered.

- **For initial setup** — The factory-configured passwords for all accounts on the MGP have been set to the device serial number. Passwords are case-sensitive.  
This means that, for initial setup, you must enter the serial number of your unit at the password prompt (the serial number can be found on a label on the rear panel). This password allows administrator level access.  
If the correct password is entered, access is granted and the command prompt is displayed. If the password is incorrect, the ←Password← prompt reappears.
- **After initial access** — You can keep the serial number password or change it. You can also set administrator and user level passwords (see [Passwords](#) on page 80).

**NOTE:** Performing a unit factory reset (entering an `[Esc]ZQQQ←` [[Absolute system reset](#)] SIS command or a [Use Factory Firmware Settings](#) reset via the rear panel **RESET** button) converts the serial number password to extron.

When you enter the new password correctly, the unit responds with one of the following, depending on the password entered:

- ←Login Administrator←
- ←Login User←

(If the password is **not** accepted, the Password prompt reappears.)

The Login Administrator response represents administrator level access, while the Login User response represents user level access. If the passwords are the same for both administrator and user, the unit defaults to administrator privileges.

If the unit is **not** password-protected, it is ready to accept SIS commands immediately after it sends the copyright message.

## Processor-initiated Messages

When certain local events occur, such as a change in the input or output HDCP status, the MGP responds by sending a message to the host. No response is required from the host. The following messages may be sent:

- Reconfig `[X1]←` A change in the input frequency was detected for input `[X1]`.
- HplgO`[X2]←` A hot plug event was detected on output `[X2]`.
- HdcpI `[X1]*[X44]←` A change was detected in the HDCP status (`[X44]`) of input `[X1]`.
- HdcpO `[X2]*[X45]←` A change was detected in the HDCP status (`[X45]`) of output `[X2]`.
- IN00•`[X61]*...*[X61]←` This message appears when a sync change (detected or removed) occurs on any input. `[X61]` is the video signal status for each input. For `[X61]`, 0 = no input signal detected, 1 = input signal detected.

# Error Responses

When the MGP 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.

- E01 — Invalid input number

E10 — Invalid command

E11 — Invalid preset number

E12 — Invalid port or output number

E13 — Invalid parameter

E14 — Not valid for this configuration

E17 — Invalid command for signal type
- E22 — Busy

E24 — Privilege violation

E25 — Device not present

E26 — Maximum number of connections exceeded

E28 — Bad filename or file not found

E33 — Bad file type or size

# SIS Overview

## Using the Command and Response Tables

The [Command and Response Table for MGP 641 xi Series SIS Commands](#) starting on page 52 lists the commands that the processor recognizes as valid, the responses that are returned to the host, a description of the command function or the results of executing the command, and examples of commands in ASCII (Telnet).

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

Figure 24. ASCII to Hexadecimal Character Conversion Table

## Symbol Definitions

- ↵

= Carriage return with line feed (hex 0D 0A)
- ↵ or |

= Carriage return (no line feed) (hex 0D)

For web browser commands, use the pipe character (|) instead of the soft return (↵).
- = Space character
- Esc or W

= <Escape> key (hex 1B)
- 24

= Error code response from the unit if a command is entered incorrectly (linked to Error Responses).

## MGP 641 xi Series command definitions

- X1** = Input (window) selection  
Response is two digits, padded with a zero.  
0 = All windows  
1 = Window 1  
2 = Window 2  
3 = Window 3  
4 = Window 4  
98 = Foreground (logo commands only)  
99 = Background (valid only for EDID, HDCP authorization, HDCP status, audio, and information request commands)
- X2** = Output number  
1 = HDMI output  
2 = TP output  
3 = Analog audio output — local 5-pole captive screw and remote DTP analog audio (valid only for audio mute commands)  
99 = All outputs
- X3** = Input video type  
1 = HDMI or DVI  
2 = SDI (auto detect)
- X8** = Active pixels  
Response is four digits, padded with zeros.
- X9** = Active lines  
Response is four digits, padded with zeros.
- X10** = On or off, enable or disable  
0 = Off or disable  
1 = On or enable
- X12** = Internal temperature in degrees Celsius  
Response is two digits, padded with a zero.
- X13** = Horizontal and vertical frequencies  
Response is three digits with one decimal place and padded with zeros. Example: 075.3
- X14** = Text label or name — Up to 32 characters.  
  - **Cannot** contain , \* |.
  - The first character must be a **letter**.
  - The last character **cannot** be a hyphen.
  - No distinction is made between uppercase and lowercase letters.

## Default names:

- Unsaved locations = *[unassigned]*
- Saved window preset = Window Preset *nnn*  
Example: Window Preset 005.
- Saved input preset = Input Preset *nnn*  
Example: Input Preset 012
- Saved logo = Logo *nn*. Example: Logo 05
- Input name = Input *n*. Example: Input 4

Saving a blank or a single space repopulates with the default name.

- X15** = Picture adjustment — 0 to 127  
Default = 64  
Response is three digits, padded with zeros.
- X16** = Horizontal and vertical shift (center or position)  
  - Range for image and windows: -32768 to +32768
  - Range for logo and clock: -4096 to +4096
- Limits are  $\pm$  the output resolution.  
Response is five digits, padded with zeros and preceded by + or -.
- X17** = Horizontal and vertical size range for image and window: 10 to 32768  
Minimum = 1/16 the size of the active output area.  
Maximum = 2x the size of the active output area.  
Response is five digits, padded with zeros.
- X18** = Detected input format  
0 = no signal  
1 = HDMI  
2 = DVI  
3 = SDI (MGP 641 xi SDI only)  
4 = HD-SDI (MGP 641 xi SDI only)  
5 = 3G-SDI (MGP 641 xi SDI only)  
6 = 6G-SDI (MGP 641 xi SDI only)  
7 = 12G-SDI (MGP 641 xi SDI only)  
8 = Unknown (MGP 641 xi SDI only)

- X21** = Output resolution and EDID emulation  
Response is two digits, padded with a zero.

See [Output resolutions and EDID emulation](#) on page 47.

## Output resolutions and EDID emulation — X21

|                                                                |     |
|----------------------------------------------------------------|-----|
| Automatic (EDID matches current processor output resolution)** | 0** |
| Output A HDMI (EDID export only)                               | 1   |
| Output B DTP3 (EDID export only)                               | 2   |

| Resolution                            | 23.98 Hz | 24 Hz | 25 Hz | 29.97 Hz | 30 Hz | 50 Hz | 59.94 Hz | 60 Hz |
|---------------------------------------|----------|-------|-------|----------|-------|-------|----------|-------|
| 640x480                               |          |       |       |          |       |       |          | 10    |
| 800x600                               |          |       |       |          |       |       |          | 11    |
| 1024x768                              |          |       |       |          |       |       |          | 12    |
| 1280x768                              |          |       |       |          |       |       |          | 13    |
| 1280x800                              |          |       |       |          |       |       |          | 14    |
| 1280x1024                             |          |       |       |          |       |       |          | 15    |
| 1360x768                              |          |       |       |          |       |       |          | 16    |
| 1366x768                              |          |       |       |          |       |       |          | 17    |
| 1440x900                              |          |       |       |          |       |       |          | 18    |
| 1400x1050                             |          |       |       |          |       |       |          | 19    |
| 1600x900                              |          |       |       |          |       |       |          | 20    |
| 1680x1050                             |          |       |       |          |       |       |          | 21    |
| 1600x1200                             |          |       |       |          |       |       |          | 22    |
| 1920x1200                             |          |       |       |          |       |       |          | 23    |
| 480p                                  |          |       |       |          |       |       | 24       | 25    |
| 576p                                  |          |       |       |          |       | 26    |          |       |
| 720p                                  |          |       | 29    | 30       | 31    | 32    | 33       | 34    |
| 1080i                                 |          |       |       |          |       | 35    | 36       | 37    |
| 1080p                                 | 38       | 39    | 40    | 41       | 42    | 43    | 44       | 45*   |
| 2048x1080 (2K)                        | 46       | 47    | 48    | 49       | 50    | 51    | 52       | 53    |
| 2048x1200                             |          |       |       |          |       |       |          | 54    |
| 2048x1536                             |          |       |       |          |       |       |          | 55    |
| 2560x1080                             |          |       |       |          |       |       |          | 56    |
| 2560x1440                             |          |       |       |          |       |       |          | 57    |
| 2560x1600                             |          |       |       |          |       |       |          | 58    |
| 3840x2160                             | 59       | 60    | 61    | 62       | 63    | 64    | 65       | 66    |
| 4096x2160***                          | 69       | 70    | 71    | 73       | 73    | 74    | 75       | 76    |
| 5120x1080***                          |          |       |       |          | 79    |       |          | 80    |
| 5120x1440***                          |          |       |       |          | 81    |       |          | 82    |
| 5120x2160***                          |          |       |       |          | 83    |       |          |       |
| 5120x2560***                          |          |       |       |          | 85    |       |          |       |
| 5120x2880***                          |          |       |       |          | 87    |       |          |       |
| Custom EDID/Output rates 1 through 10 | 201-210  |       |       |          |       |       |          |       |

\*Default output resolution

\*\*Default EDID

\*\*\*Not available as an EDID, only as an output rate option

- X22** = Test patterns  
 0 = off (default)  
 1 = Crop  
 2 = Alternating Pixels  
 3 = Crosshatch  
 4 = Colorbars  
 5 = Grayscale  
 6 = Audio Test
- Displays Crop pattern with on-screen text Audio Test.
  - Outputs pink noise at 48 KHz, 24 bit, stereo.

**X25** = Window preset — 1 - 128  
 Response is three digits, padded with zeros.

**X26** = Input preset — 1 - 128  
 Response is three digits, padded with zeros.

**X27** = Logo or image assignments — 1 - 32

**X28** = Output sync timeout — Number of seconds before output sync times out.  
 1 - 500 seconds, in 1-second increments  
 0 = Output sync is instantly disabled with no active video on any of the inputs.  
 501 = Output sync never times out (default).  
 Response is three digits, padded with zeros.

**X29** = Front panel lock (executive mode) status  
 0 = Unlocked (default)  
 1 = All front panel controls locked  
 2 = Partial front panel lock: window preset recall, mute, freeze, and auto image buttons are available.

**NOTE:** Front panel lockout does **not** include RS-232, USB, and Ethernet control.

**X39** = Aspect ratio setting  
 1 = Fill — Each input rate fills the entire window (default).  
 2 = Follow — Each input rate is displayed with its native aspect ratio.

**X40** = Screen saver mode  
 1 = Disabled (default)  
 2 = Blue screen

**X42** = Window (video output) mute  
 0 = Unmute (default)  
 1 = Mute video to black screen  
 2 = Mute video and sync (for output mute only).

**X44** = HDCP input status  
 0 = No source device detected  
 1 = Source detected but no HDCP present  
 2 = Source detected with HDCP

**X45** = HDCP output status  
 0 = No sink device detected  
 1 = Sink detected but no HDCP present  
 2 = Sink detected with HDCP

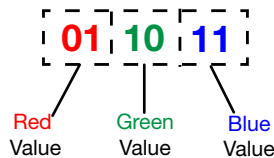
**X46** = HDCP output mode  
 0 = Off — Disable all HDCP authentication and encryption attempts.  
 1 = Follow input (with a maximum of 10 seconds of authentication trials, default).  
 2 = Encrypt output (with a maximum of 10 seconds of authentication trials).  
 3 = Follow input (with continuous trials).  
 4 = Encrypt output (with continuous trials).

**X47** = HDCP notification mode  
 0 = Black screen — Notification disabled (mute output)  
 1 = Green screen (default)

**X48** = Digital output format  
 0 = Auto — HDMI RGB Full to a CEA sink, or DVI to a non-CEA sink (default)  
 1 = DVI — RGB 444, 0-255, no audio packet or InfoFrames.  
 2 = HDMI RGB Full — RGB 444, 0-255, audio packet, InfoFrames  
 3 = HDMI RGB Limited — RGB 444, 16-235, audio packet, InfoFrames  
 5 = HDMI YUV 444 Limited — YUV 444, 16-235, audio packet, InfoFrames  
 7 = HDMI YUV 422 Limited — YUV 422, 16-235, audio packet, InfoFrames

**X50** = Annotation type  
 0 = Eraser  
 1 = Pointer  
 2 = Freehand  
 4 = Vector line  
 5 = Arrow line (The arrow appears at the endpoint of the vector.)  
 6 = Ellipse  
 7 = Rectangle

**X53** = Line color (6-bit RGB color, 64 total colors)  
**Binary format:**



Examples:  
 000000 = Black  
 010000 = Dark red (33%)  
 100000 = Medium red (66%)  
 110000 = Bright Red (100%)  
 001100 = Bright green  
 000011 = Bright blue (default)  
 111111 = White  
 010101 = Dark gray (33%)

**X54** = Line weight or eraser size  
 1-63 pixels wide. Default is 8.

**X55** = Cursor timeout  
 1-500 seconds. Default is 10 seconds.  
 0 = Cursor time out is disabled.

- X57** = Annotation location  
Eight-digit number with first four digits being the X coordinate and the last four the Y coordinate.  
Limits = 1000,1000. Fixed for any output rate.  
*Example:*  
(0,0) = 00000000 = top left  
(500,500) = 05000500 = screen center.
- X58** = OSD menu timeout  
0 = Menu never times out (OSD timeout is disabled).  
1-500 in 1 second increments (default = 10 seconds)  
501 = Sync never times out.
- X61** = Video signal status  
0 = Video or TMDS signal not detected  
1 = Video or TMDS signal detected
- X63** = Screen saver status  
0 = Active input detected, timer not running  
1 = No active input, timer running, output sync still active  
2 = No active input, timer expired, output sync disabled
- X69** = Image or display rotation  
0 = Disabled (default)  
1 = 90 degrees clockwise (the LCD panel displays +90 degrees)  
2 = 90 degrees counterclockwise (the LCD panel displays -90 degrees)
- X70** = Effect variable  
0 = Transparency (not available for background color)  
1 = Red of RGB key or background color  
2 = Green of RGB key or background color  
3 = Blue of RGB key or background color  
4 = Level key (not available for background color)
- X71** = Effect level setting — 0 - 255
- X72** = Window preset effect  
0 = Cut — The windows instantly cut to the new location and size defined by the recalled preset.  
1 = Animated — The windows move and resize dynamically on screen to the location and size defined by the recalled preset.
- X73** = Effect duration — 00 - 50 in 0.1-second increments  
Default = 05 = 0.5 seconds.
- X74** = Logo or video key effect  
0 = Disabled (default)  
1 = Transparency  
2 = RGB key  
3 = Level key
- X75** = Background options  
0 = Black (default)  
1 = Red  
2 = Green  
3 = Blue  
4 = White  
5 = Magenta  
6 = Cyan  
7 = Yellow  
8 = User defined color  
9 = User defined image  
10 = Live background input
- X76** = Window border style presets — 0 - 128  
0 = No border  
Response is three digits, padded with zeros.
- X77** = Upstream switch effect (video signal change within a window)  
0 = Cut — Immediately switch to black on loss or change of signal (default).  
1 = Fade — Freeze last frame on loss or change of sync and fade to black.  
2 = Seamless fade — Freeze last frame on loss or change of sync and seamlessly dissolve to new signal when it is locked.  
3 = Seamless cut — Freeze last frame on loss or change of sync and seamlessly cut to new signal when it is locked.  
4 = Low latency mode — The MGP attempts to display the new signal as quickly as possible. Also removes two frames of video delay from the video processing logic and may introduce video artifacts during the switch.
- X78** = Window mute effect  
0 = Cut  
1 = Dissolve
- X79** = Twisted pair format  
0 = DTP (default)  
1 = XTP  
2 = HDBaseT
- X80** = DTP remote power  
0 = No remote power (default)  
1 = DTP (non-DTP3), 12 VDC  
2 = DTP3, 48 VDC
- X81** = Audio output format  
1 = Dual mono  
2 = Stereo (default)
- X82** = Audio input format  
0 = None (muted). Configures input EDID with no audio support.  
2 = LPCM-2Ch — Configures input EDID for LPCM-2Ch support. Passes all digital audio input signals to the HDMI outputs. If LPCM-2Ch audio is present, it is also de-embedded to the 5-pole captive screw analog output (default).  
3 = Multi-Ch — Configures input EDID for Multi-Ch support. Passes all digital audio input signals to the HDMI outputs. If LPCM-2Ch audio is present it is also de-embedded to the 5-pole captive screw analog output.

**X83** = Configuration file type.

**NOTE:** Configuration files are stored on directory/nortxe-backup, created on the unit when the configuration is saved.

0 = IP config file (ip.cfg)

2 = Unit-specific parameters file (box.cfg)

**X84** = User name for image capture

**X86** = AES audio channel or pair number

**X87** = AES audio channel group number (see [AES Audio Group Selection](#) on page 1 for a list of channels and pairs contained in each group)  
1 - 4 (default is 1)

**X99** = Video output bit depth

0 = Auto — 10-bit to sinks with deep color support (interface and rate permitting), 8-bit to all others

1 = Force 8-bit

### IP, RS-232, and Query Command Definitions

**X101** = Port number

1 = RS-232 port (3-pole captive screw)

2 = UART on DTP output

**X103** = Greenwich Mean Time (GMT) offset value

(-12:00-14:00) in hours and minutes (*hh:mm*)

**X106** = Service (network path of server)

**X107** = Mount point (network shares)

**X108** = Username (network shares)

**X109** = Password (network shares)

**X110** = Options (network shares)

**X111** = Firmware version number (listed to two decimal places)

**X112** = Boolean for Extron share (network shares)

**X113** = Local date and time format - **set**:

*MMM/DD/YY-HH:MM:SS*

Example: 06/21/20-10:54:12

Local date and time format - **view**:

*Ddd, DD Mmm YYYY HH:MM:SS*

Example: Fri, 26 Sep 2008 18:19:33

**X114** = IP address (*nnn.nnn.nnn.nnn*). Leading zeros in each of the four fields are optional in setting values and are suppressed in returned values.

**X115** = Boolean for reconnect (network shares)

**X118** = Hardware (MAC) address (*xx-xx-xx-xx-xx-xx*)

**X119** = Subnet mask (*nnn.nnn.nnn.nnn*). Leading zeros are optional in setting values in each of the four fields, and are suppressed in returned values.

**X122** = Verbose response mode

0 = Clear/none (default for Telnet connections).

1 = Verbose mode is on (enabled) (default for RS-232 connections).

2 = Verbose mode is off, tagged responses are sent for queries (tagged responses are enabled).

3 = Verbose mode is on (enabled) and tagged responses are enabled and sent for queries.

If tagged responses are enabled, all read or view commands return the constant string plus the data. For example:

Command: **[Esc]** CN←

Response: Ipn • **X14** ←

**NOTE:** In verbose response mode, the MGP responds with more information than it usually would. For example, the MGP can send out a notice of a change in some setting without receiving a query via your PC. That change could have been a result of an internal process (a script execution), a selection made using a touchpanel or keypad, a change made using GV or a web page, or input from a connected sensor or switch.

That is an example of a verbose (wordy) relationship between the MGP and a connected device. Verbose mode creates more network traffic than usual, which can slow down network performance.

|                      | Verbose Responses                                                                                                                                                                   | Tagged Responses                                                                                                                                                              |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      | Receive unsolicited responses (messages) for all actions initiated via any source (touchpanel, port input, internal web page changes, or commands) instead of only for SIS commands | Receive tagged responses to read or view commands (Responses to SIS commands are always tagged. Turning tagged responses on adds tags to the responses to SIS read requests.) |
| <b>X122</b><br>Value |                                                                                                                                                                                     |                                                                                                                                                                               |
| 0                    |                                                                                                                                                                                     |                                                                                                                                                                               |
| 1                    | ✓                                                                                                                                                                                   |                                                                                                                                                                               |
| 2                    |                                                                                                                                                                                     | ✓                                                                                                                                                                             |
| 3                    | ✓                                                                                                                                                                                   | ✓                                                                                                                                                                             |

See the [Set verbose mode](#) command (**[Esc]** CV←) on page 68 in the “Command and Response Table for IP Commands” for a brief explanation of what this communication mode is and what it does.

**X125** = Baud rate — 9600, 19200, 38400, or 115200

**X126** = Parity (only the first letter is needed):  
O[dd], E[ven], N[one], S[pace]

**X127** = Data bits — 7 or 8

**X128** = Stop bits — 1 or 2

**X132** = Password — view  
The system responds with four asterisks (\*\*\*\*) if a password exists, and with an empty space if none exists (instead of with an actual password).

**X133** = Password — set

- Length is 1-128 characters.
- All human-readable characters are allowed except |.
- The password cannot be a single space.
- Passwords are case-sensitive.
- A user password cannot be assigned if no administrator password exists. An E14 error code is returned.
- If the admin password is cleared, the user password is cleared as well.

**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 extron.

**X149** = Default name — A combination of the model name and the last three character pairs of the unit MAC address.  
Example: MGP-641-00-02-3D)

**X152** = Connection security level  
0 = Not logged in  
1 = User  
2 = Administrator

**X169** = Time zone code —The code is an acronym for the time zone (2-6 letters) (see the [List all time zones](#) command on page 74 to view a list of available time zones).

**X170** = Time zone description — The UTC equivalent for a particular time zone as well as a general description of the geographical area. The description is formatted as {*UTC offset*} : {*Location name*}.

**X171** = Network Time Protocol (NTP) setting  
0 = Enabled  
1 = Disabled  
2 = Synced

**X172** = Number of Ethernet port connections

**X199** = Prefix representing subnet mask bits (subnet mask value in CISG commands).  
Default = /16, which represents the default subnet mask, 255.255.0.0.

Example: 255.255.240.0 is represented as /20.

## Command and Response Table for MGP 641 xi Series SIS Commands

| Command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ASCII<br>(Host to Processor)              | Response<br>(Processor to Host)                                             | Description                                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-----------------------------------------------------------------------------|----------------------------------------------------------------|
| <b>Input Configuration</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                           |                                                                             |                                                                |
| <b>Input Video Type</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                           |                                                                             |                                                                |
| Set video type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>[X1]*[X3]</b> \                        | Ityp <b>[X1]*[X3]</b> ↵                                                     | Set input <b>[X1]</b> to video format <b>[X3]</b> .            |
| View video type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>[X1]</b> \                             | <b>[X3]</b> ↵                                                               | View video format of input <b>[X1]</b> .                       |
| <b>Detected Input Video Format</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                           |                                                                             |                                                                |
| View detected input format                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>[X1]*</b> \                            | <b>[X18]</b> ↵<br><i>Verbose modes 2 and 3:</i><br>Ityp <b>[X1]*[X18]</b> ↵ | View video format <b>[X18]</b> detected on input <b>[X1]</b> . |
| <b>Input EDID</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                           |                                                                             |                                                                |
| Specify an EDID value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>[Esc]A[X1]*[X21]</b> EDID↵             | EdidA <b>[X1]*[X21]</b> ↵                                                   | Assign EDID <b>[X21]</b> to input <b>[X1]</b> .                |
| View assigned EDID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>[Esc]A[X1]</b> EDID↵                   | <b>[X21]</b> ↵                                                              | View EDID <b>[X21]</b> for input <b>[X1]</b> .                 |
| Save the output EDID to a custom slot                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>[Esc]S[X2]*[X21]</b> EDID↵             | EdidS <b>[X2]*[X21]</b> ↵                                                   | Save the EDID of output <b>[X2]</b> to <b>[X21]</b> .          |
| <b>NOTE:</b> For the Save command, <b>[X21]</b> can be 201 - 210 only.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                           |                                                                             |                                                                |
| Export EDID file                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>[Esc]E[X21],&lt;filename&gt;</b> EDID↵ | EdidE <b>[X21]</b> ↵                                                        | Export EDID <b>[X21]</b> to <b>&lt;filename&gt;</b> .          |
| Import EDID file                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>[Esc]I[X21],&lt;filename&gt;</b> EDID↵ | EdidI <b>[X21]</b> ↵                                                        | Import EDID <b>[X21]</b> from <b>&lt;filename&gt;</b> .        |
| <b>NOTES:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                           |                                                                             |                                                                |
| <ul style="list-style-type: none"> <li>For the Import EDID command, <b>[X21]</b> can be 201 - 210.</li> <li><b>&lt;Filename&gt;</b> can optionally be a full path name. The EDID file format is 128 or 256 bytes of binary data with a <b>.bin</b> extension.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                           |                                                                             |                                                                |
| <b>HDCP Authorization</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                           |                                                                             |                                                                |
| Enable HDCP authorization                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>[Esc]E[X1]*1</b> HDCP↵                 | HdcpE <b>[X1]*1</b> ↵                                                       | Enable HDCP authorization for input <b>[X1]</b> (default).     |
| Disable HDCP authorization                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>[Esc]E[X1]*0</b> HDCP↵                 | HdcpE <b>[X1]*0</b> ↵                                                       | Disable HDCP authorization for input <b>[X1]</b> .             |
| <b>KEY:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                           |                                                                             |                                                                |
| <div> <div> <b>[X1]</b> = Input (window) selection           <br/><br/> <b>[X2]</b> = Output number           <br/><br/> <b>[X3]</b> = Input video type           <br/><br/> <b>[X18]</b> = Detected input format           <br/> <b>[X21]</b> = Output resolution and EDID emulation         </div> <div>           0 = All windows           <br/>1 = Window 1, 2 = Window 2, 3 = Window 3, 4 = Window 4           <br/>99 = Background (valid only for EDID, HDCP authorization, HDCP status, audio, and information request commands)           <br/><br/>           1 = HDMI output           <br/>2 = TP output           <br/>3 = Analog audio output — local 5-pole captive screw and remote DTP analog audio (valid only for audio mute commands)           <br/>99 = All outputs           <br/><br/>           1 = HDMI or DVI           <br/>2 = SDI (auto detect)           <br/><br/>           0 = no signal, 1 = HDMI, 2 = DVI           <br/>Response is two digits, padded with a zero.           <br/>See <a href="#">Output resolutions and EDID emulation</a> on page 47.         </div> </div> |                                           |                                                                             |                                                                |

| Command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ASCII<br>(Host to Processor) | Response<br>(Processor to Host)                                              | Description                                                                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| <b>Input Configuration (continued)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                              |                                                                              |                                                                                         |
| <b>HDCP Authorization (continued)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                              |                                                                              |                                                                                         |
| View HDCP authorization status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>[Esc]E[X1]HDCP</b> ←      | <b>[X10]</b> ←                                                               | View HDCP authorization status <b>[X10]</b> .                                           |
| <b>Input Aspect Ratio</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                              |                                                                              |                                                                                         |
| Set for fill                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>[Esc][X1]*1ASPR</b> ←     | <b>Aspr[X1]*1</b> ←                                                          | Set input <b>[X1]</b> to always fill the entire window (default).                       |
| Set to follow                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>[Esc][X1]*2ASPR</b> ←     | <b>Aspr[X1]*2</b> ←                                                          | Set input <b>[X1]</b> to maintain its current native aspect ratio.                      |
| View aspect setting                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>[Esc][X1]ASPR</b> ←       | <b>[X39]</b> ←                                                               | View current aspect ratio setting <b>[X39]</b> for input <b>[X1]</b> .                  |
| <b>Input Name</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                              |                                                                              |                                                                                         |
| Write input name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>[Esc][X1],[X14]NI</b> ←   | <b>Nmi[X1],[X14]</b> ←                                                       | Set name <b>[X14]</b> for input <b>[X1]</b> .                                           |
| <b>NOTE:</b> To reset an input name to the default, enter a single space for <b>[X14]</b> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                              |                                                                              |                                                                                         |
| View input name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>[Esc][X1]NI</b> ←         | <b>[X14]</b> ←                                                               | View name <b>[X14]</b> of input <b>[X1]</b> .                                           |
| <b>Auto-Image</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                              |                                                                              |                                                                                         |
| Execute                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>[X1]*0A</b>               | <b>Img[X1]*0</b> ←                                                           | Execute an Auto-Image for the current input (follows the current aspect ratio setting). |
| Execute and fill                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>[X1]*1A</b>               | <b>Img[X1]*1</b> ←                                                           | Execute an Auto-Image and fill the window.                                              |
| Execute and follow                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>[X1]*2A</b>               | <b>Img[X1]*2</b> ←                                                           | Execute an Auto-Image and maintain the aspect ratio of the current input.               |
| <b>Active Pixels and Lines</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                              |                                                                              |                                                                                         |
| View active pixels                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>[Esc][X1]APIX</b> ←       | <b>[X8]</b> ←<br><i>In verbose modes 2 and 3:</i><br><b>Apix [X1]*[X8]</b> ← | View active pixels <b>[X8]</b> for input <b>[X1]</b> .                                  |
| View active lines                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>[Esc][X1]ALIN</b> ←       | <b>[X9]</b> ←<br><i>In verbose modes 2 and 3:</i><br><b>Alin[X1]*[X9]</b> ←  | View active lines <b>[X9]</b> for input <b>[X1]</b> .                                   |
| <b>KEY:</b> <div> <div> <b>[X1]</b> = Input (window) selection           <div> <b>0</b> = All windows<br/> <b>1</b> = Window 1, <b>2</b> = Window 2, <b>3</b> = Window 3, <b>4</b> = Window 4<br/> <b>99</b> = Background (valid only for EDID, HDCP authorization, HDCP status, audio, and information request commands)           </div> </div> <div> <b>[X8]</b> = Active pixels<br/> <b>[X9]</b> = Active lines<br/> <b>[X10]</b> = On or Off status<br/> <b>[X14]</b> = Input name           <div> <b>0</b> = Off or disabled, <b>1</b> = On or enabled (default)<br/>           Text label or name — Up to 32 characters.           <ul style="list-style-type: none"> <li><b>Cannot</b> contain , *  .</li> <li>The first character must be a <b>letter</b>.</li> <li>The last character <b>cannot</b> be a hyphen.</li> <li>Names are not case-sensitive.</li> <li>Default input name: Input <i>n</i> (example: Input 4).<br/>Setting to a single space repopulates with the default name.</li> </ul> </div> </div> <div> <b>[X39]</b> = Aspect ratio setting           <div> <b>1</b> = Fill: Each input rate fills the entire window (default).<br/> <b>2</b> = Follow: Each input rate displays with its native aspect ratio.           </div> </div> </div> |                              |                                                                              |                                                                                         |

| Command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ASCII<br>(Host to Processor) | Response<br>(Processor to Host) | Description                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|---------------------------------|--------------------------------------------------------|
| <b>Input Configuration (continued)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                              |                                 |                                                        |
| <b>Input Image Rotation (Inputs 2 and 4, MGP 641 xi and MGP 641 xi SDI only)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                              |                                 |                                                        |
| <b>NOTE:</b> Input image rotation is not available on the 5K models.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                              |                                 |                                                        |
| Set rotation direction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | [Esc] I[X1]*[X69] ROTA ←     | RotaI[X1]*[X69] ←               | Set the direction of rotation for input [X1] to [X69]. |
| View rotation direction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | [Esc] I[X1] ROTA ←           | [X69] ←                         | View rotation direction [X69] for input [X1].          |
| <b>Picture Adjustments</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                              |                                 |                                                        |
| <b>Window Mute</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                              |                                 |                                                        |
| Mute window                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | [X1]*1B                      | Vmt[X1]*1 ←                     | Mute (blank) window (input) [X1].                      |
| Unmute window                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | [X1]*0B                      | Vmt[X1]*0 ←                     | Unmute (display) window [X1].                          |
| View mute status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | [X1]B                        | [X42] ←                         | View mute status [X42] for window [X1].                |
| <b>Output Mute</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                              |                                 |                                                        |
| Mute output to black                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 99*1B                        | Vmt99*1 ←                       | Mute the output to black.                              |
| Mute output and sync                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 99*2B                        | Vmt99*2 ←                       | Mute the output and disable the sync.                  |
| Unmute output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 99*0B                        | Vmt99*0 ←                       | Unmute output. Window mute status persists.            |
| View output mute status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 99B                          | [X42] ←                         | View output mute status [X42].                         |
| <b>NOTE:</b> Window mute status is not affected by the output mute setting.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                              |                                 |                                                        |
| <b>Window Priority</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                              |                                 |                                                        |
| Set priority                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | [X1]*[X1]*[X1]*[X1]~         | Pri[X1]*[X1]*[X1]*[X1] ←        | Set the priority of the windows to the order entered.  |
| View priority                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ~                            | [X1]*[X1]*[X1]*[X1] ←           | Display the priorities of the windows.                 |
| <b>Freeze</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                              |                                 |                                                        |
| Enable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | [X1]*1F                      | Frz[X1]*1 ←                     | Freeze window [X1].                                    |
| Disable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | [X1]*0F                      | Frz[X1]*0 ←                     | Unfreeze window [X1].                                  |
| View                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | [X1]F                        | [X10] ←                         | Show the freeze status of window [X1].                 |
| <b>KEY:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                              |                                 |                                                        |
| <div> <div> [X1] = Input (window) selection </div> <div> 0 = All windows<br/> 1 = Window 1, 2 = Window 2, 3 = Window 3, 4 = Window 4<br/> 99 = Background (valid only for EDID, HDCP authorization, HDCP status, audio, and information request commands) </div> </div> <div> <div> [X10] = On or Off status </div> <div> 0 = Off or disabled<br/> 1 = On or enabled </div> </div> <div> <div> [X42] = Window (video output) mute </div> <div> 0 = Unmute (default)<br/> 1 = Mute video to black screen<br/> 2 = Mute video and sync (for output mute only). </div> </div> <div> <div> [X69] = Image or display rotation </div> <div> 0 = Disabled (default)<br/> 1 = 90 degrees clockwise (the LCD panel displays +90 degrees)<br/> 2 = 90 degrees counterclockwise (the LCD panel displays -90 degrees) </div> </div> |                              |                                 |                                                        |

| Command                                                                                                                                                                                                                                                                                                                                                                                                                                          | ASCII<br>(Host to Processor)         | Response<br>(Processor to Host) | Description                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|---------------------------------|----------------------------------------------------------------------------------|
| <b>Picture Adjustments (continued)</b>                                                                                                                                                                                                                                                                                                                                                                                                           |                                      |                                 |                                                                                  |
| <b>Horizontal Shift (Window)</b>                                                                                                                                                                                                                                                                                                                                                                                                                 |                                      |                                 |                                                                                  |
| Set a specific horizontal shift value for the window                                                                                                                                                                                                                                                                                                                                                                                             | <code>[Esc] W [X1]*[X16]HCTR←</code> | <code>Hctr W [X1]*[X16]←</code> | Set the horizontal centering of window <code>[X1]</code> to <code>[X16]</code> . |
| Increment horizontal window shift                                                                                                                                                                                                                                                                                                                                                                                                                | <code>[Esc] W [X1] + HCTR←</code>    | <code>Hctr W [X1]*[X16]←</code> | Shift window <code>[X1]</code> <b>right</b> .                                    |
| Decrement horizontal window shift                                                                                                                                                                                                                                                                                                                                                                                                                | <code>[Esc] W [X1] - HCTR←</code>    | <code>Hctr W [X1]*[X16]←</code> | Shift window <code>[X1]</code> <b>left</b> .                                     |
| View horizontal window shift amount                                                                                                                                                                                                                                                                                                                                                                                                              | <code>[Esc] W [X1]HCTR←</code>       | <code>[X16]←</code>             | View the amount of horizontal window shift ( <code>[X16]</code> ).               |
| <b>Vertical Shift (Window)</b>                                                                                                                                                                                                                                                                                                                                                                                                                   |                                      |                                 |                                                                                  |
| Set a specific vertical shift value for the window                                                                                                                                                                                                                                                                                                                                                                                               | <code>[Esc] W [X1]*[X16]VCTR←</code> | <code>Vctr W [X1]*[X16]←</code> | Set the vertical centering of window <code>[X1]</code> to <code>[X16]</code> .   |
| Increment vertical window shift                                                                                                                                                                                                                                                                                                                                                                                                                  | <code>[Esc] W [X1] + VCTR←</code>    | <code>Vctr W [X1]*[X16]←</code> | Shift window <code>[X1]</code> <b>down</b> .                                     |
| Decrement vertical window shift                                                                                                                                                                                                                                                                                                                                                                                                                  | <code>[Esc] W [X1] - VCTR←</code>    | <code>Vctr W [X1]*[X16]←</code> | Shift window <code>[X1]</code> <b>up</b> .                                       |
| View vertical window shift amount                                                                                                                                                                                                                                                                                                                                                                                                                | <code>[Esc] W [X1]VCTR←</code>       | <code>[X16]←</code>             | View the amount of vertical window shift ( <code>[X16]</code> ).                 |
| <b>Horizontal Size (Window)</b>                                                                                                                                                                                                                                                                                                                                                                                                                  |                                      |                                 |                                                                                  |
| Set a specific value                                                                                                                                                                                                                                                                                                                                                                                                                             | <code>[Esc] W [X1]*[X17]HSIZ←</code> | <code>Hsiz W [X1]*[X17]←</code> | Set the width of window <code>[X1]</code> to <code>[X17]</code> .                |
| Increase the horizontal size of the window                                                                                                                                                                                                                                                                                                                                                                                                       | <code>[Esc] W [X1] + HSIZ←</code>    | <code>Hsiz W [X1]*[X17]←</code> | Widen the window.                                                                |
| Decrease the horizontal size of the window                                                                                                                                                                                                                                                                                                                                                                                                       | <code>[Esc] W [X1] - HSIZ←</code>    | <code>Hsiz W [X1]*[X17]←</code> | Narrow the window.                                                               |
| View the horizontal size of the window                                                                                                                                                                                                                                                                                                                                                                                                           | <code>[Esc] W [X1]HSIZ←</code>       | <code>[X17]←</code>             | View the width ( <code>[X17]</code> ) of the window.                             |
| <b>Vertical Size (Window)</b>                                                                                                                                                                                                                                                                                                                                                                                                                    |                                      |                                 |                                                                                  |
| Set a specific value for the vertical size of the window                                                                                                                                                                                                                                                                                                                                                                                         | <code>[Esc] W [X1]*[X17]VSIZ←</code> | <code>Vsiz W [X1]*[X17]←</code> | Set the height of window <code>[X1]</code> to <code>[X17]</code> .               |
| Increase the vertical size of window                                                                                                                                                                                                                                                                                                                                                                                                             | <code>[Esc] W [X1] + VSIZ←</code>    | <code>Vsiz W [X1]*[X17]←</code> | Increase the height of the window.                                               |
| Decrease vertical size of the window                                                                                                                                                                                                                                                                                                                                                                                                             | <code>[Esc] W [X1] - VSIZ←</code>    | <code>Vsiz W [X1]*[X17]←</code> | Decrease the height of the window.                                               |
| View the vertical size of the window                                                                                                                                                                                                                                                                                                                                                                                                             | <code>[Esc] W [X1]VSIZ←</code>       | <code>[X17]←</code>             | View the height ( <code>[X17]</code> ) of the window.                            |
| <b>KEY:</b> <div> <div> <div><code>[X1]</code> = Window (input) number</div> <div><code>[X16]</code> = Horizontal and vertical shift (center or position)</div> </div> <div> <div>0 = All windows</div> <div>1 = Window 1, 2 = Window 2, 3 = Window 3, 4 = Window 4</div> <div>-32768 to +32768</div> <div>Limits are ± the output resolution.</div> <div>Response is five digits, padded with zeros and preceded by + or -.</div> </div> </div> |                                      |                                 |                                                                                  |
| <b>NOTES:</b> <ul style="list-style-type: none"> <li>For horizontal shift: A negative (–) number shifts the window to the <b>left</b>. A positive (+) number shifts it to the <b>right</b>.</li> <li>For vertical shift: A negative (–) number shifts the window <b>up</b>. A positive (+) number shifts it <b>down</b>.</li> </ul>                                                                                                              |                                      |                                 |                                                                                  |
| <div> <div><code>[X17]</code> = Horizontal and vertical size (width and height)</div> <div> 10 to 32768<br/> Minimum = 1/16 the size of the active output area.<br/> Maximum = 2x size of the active output area.<br/> Response is five digits, padded with zeros. </div> </div>                                                                                                                                                                 |                                      |                                 |                                                                                  |

| Command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ASCII<br>(Host to Processor)          | Response<br>(Processor to Host) | Description                                                                                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------|-----------------------------------------------------------------------------------------------|
| <b>Picture Adjustments (continued)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                       |                                 |                                                                                               |
| <b>Horizontal Shift (Image)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                       |                                 |                                                                                               |
| Set a specific horizontal shift value for the image                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <code>[Esc] I [X1]*[X16]HCTR ←</code> | <code>Hctr I [X1]*[X16]↵</code> | Set the horizontal centering of the image in window <code>[X1]</code> to <code>[X16]</code> . |
| Increment the horizontal image shift                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <code>[Esc] I [X1] + HCTR ←</code>    | <code>Hctr I [X1]*[X16]↵</code> | Shift the image in window <code>[X1]</code> <b>right</b> .                                    |
| Decrement the horizontal image shift                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <code>[Esc] I [X1] - HCTR ←</code>    | <code>Hctr I [X1]*[X16]↵</code> | Shift the image in window <code>[X1]</code> <b>left</b> .                                     |
| View the horizontal image shift amount                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <code>[Esc] I [X1]HCTR ←</code>       | <code>[X16]↵</code>             | View the amount of horizontal image shift ( <code>[X16]</code> ).                             |
| <b>Vertical Shift (Image)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                       |                                 |                                                                                               |
| Set a specific vertical shift value for the image                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <code>[Esc] I [X1]*[X16]VCTR ←</code> | <code>Vctr I [X1]*[X16]↵</code> | Set the vertical centering of the image in window <code>[X1]</code> to <code>[X16]</code> .   |
| Increment the vertical image shift                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <code>[Esc] I [X1] + VCTR ←</code>    | <code>Vctr I [X1]*[X16]↵</code> | Shift the image in window <code>[X1]</code> <b>down</b> .                                     |
| Decrement the vertical image shift                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <code>[Esc] I [X1] - VCTR ←</code>    | <code>Vctr I [X1]*[X16]↵</code> | Shift the image in window <code>[X1]</code> <b>up</b> .                                       |
| View the vertical image shift amount                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <code>[Esc] I [X1]VCTR ←</code>       | <code>[X16]↵</code>             | View the amount of vertical image shift ( <code>[X16]</code> ).                               |
| <b>Horizontal Size (Image)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                       |                                 |                                                                                               |
| Set a specific horizontal size value for the image                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <code>[Esc] I [X1]*[X17]HSIZ ←</code> | <code>Hsiz I [X1]*[X17]↵</code> | Set the width of the image in window <code>[X1]</code> to <code>[X17]</code> .                |
| Increase the horizontal size of the image                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <code>[Esc] I [X1] + HSIZ ←</code>    | <code>Hsiz I [X1]*[X17]↵</code> | Widen the image in window <code>[X1]</code> .                                                 |
| Decrease the horizontal size of the image                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <code>[Esc] I [X1] - HSIZ ←</code>    | <code>Hsiz I [X1]*[X17]↵</code> | Narrow the image in window <code>[X1]</code> .                                                |
| View the horizontal size of the image                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <code>[Esc] I [X1]HSIZ ←</code>       | <code>[X17]↵</code>             | View the width ( <code>[X17]</code> ) of the image in window <code>[X1]</code> .              |
| <b>Vertical Size (Image)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                       |                                 |                                                                                               |
| Set a specific value for the vertical size of the image                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <code>[Esc] I [X1]*[X17]VSIZ ←</code> | <code>Vsiz I [X1]*[X17]↵</code> | Set the height of the image in window <code>[X1]</code> to <code>[X17]</code> .               |
| Increase the vertical size of the image                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <code>[Esc] I [X1] + VSIZ ←</code>    | <code>Vsiz I [X1]*[X17]↵</code> | Increase the height of the image in window <code>[X1]</code> .                                |
| Decrease the vertical size of the image                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <code>[Esc] I [X1] - VSIZ ←</code>    | <code>Vsiz I [X1]*[X17]↵</code> | Decrease the height of the image in window <code>[X1]</code> .                                |
| View the vertical size of image                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <code>[Esc] I [X1]VSIZ ←</code>       | <code>[X17]↵</code>             | View the height ( <code>[X17]</code> ) of the image in window <code>[X1]</code> .             |
| <b>KEY:</b> <div> <div> <code>[X1]</code> = Window (input) number <code>[X16]</code> = Horizontal and vertical shift (center or position) </div> <div> <math>\emptyset</math> = All windows<br/> 1 = Window 1, 2 = Window 2, 3 = Window 3, 4 = Window 4<br/> -32768 to +32768<br/> <math>\emptyset</math> = 2048. Limits are <math>\pm</math> the output resolution.<br/> Response is five digits, padded with zeros and preceded by + or -. </div> </div> <div> <b>NOTE:</b> <ul style="list-style-type: none"> <li>For horizontal image shift: A negative (–) number shifts the image to the <b>left</b> within the window. A positive (+) number shifts it to the <b>right</b>.</li> <li>For vertical image shift: A negative (–) number shifts the image <b>up</b> within the window. A positive (+) number shifts it <b>down</b>.</li> </ul> </div> <div> <code>[X17]</code> = Horizontal and vertical size (width and height) <div> 10 to 32768<br/> Minimum = 1/16 the size of the active output area.<br/> Maximum = 2x size of the active output area.<br/> Response is five digits, padded with zeros. </div> </div> |                                       |                                 |                                                                                               |

| Command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ASCII<br>(Host to Processor)                           | Response<br>(Processor to Host)                  | Description                                                                                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Picture Adjustments (continued)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                        |                                                  |                                                                                                                                                                                                                                                                                       |
| <b>Compound Window Size and Position</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                        |                                                  |                                                                                                                                                                                                                                                                                       |
| Set window size and position                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <code>[Esc] [X1], [X16]*[X16]*[X17]*[X17] XWIN←</code> | <code>Xwin [X1], [X16]*[X16]*[X17]*[X17]←</code> | For window [X1], set the position (horizontal and vertical) to [X16] and the size (width and height) to [X17].                                                                                                                                                                        |
| <b>NOTE:</b> The variables must be entered in the following order: horizontal position ([X16]), vertical position ([X16]), horizontal size ([X17]), vertical size ([X17]).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                        |                                                  |                                                                                                                                                                                                                                                                                       |
| View window size and position                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <code>[Esc] [X1] XWIN←</code>                          | <code>[X16]*[X16]*[X17]*[X17]←</code>            | View the position and size of window [X1].                                                                                                                                                                                                                                            |
| <b>Compound Image Size and Position</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                        |                                                  |                                                                                                                                                                                                                                                                                       |
| Set image size and position                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <code>[Esc] [X1], [X16]*[X16]*[X17]*[X17] XIMG←</code> | <code>Ximg [X1], [X16]*[X16]*[X17]*[X17]←</code> | For the image in window [X1], set the position (horizontal and vertical) to [X16] and the size (width and height) to [X17].<br>[X1] = 0-4. 0 = all windows.<br>For [X17]: Minimum = 1/16 the size of the active input area.<br>Maximum = double the active output area for 200% zoom. |
| <b>NOTE:</b> The variables must be entered in the following order: horizontal position ([X16]), vertical position ([X16]), horizontal size ([X17]), vertical size ([X17]).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                        |                                                  |                                                                                                                                                                                                                                                                                       |
| View image size and position                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <code>[Esc] [X1] XIMG←</code>                          | <code>[X16]*[X16]*[X17]*[X17]←</code>            | View the position ([X16]) and size ([X17]) of the image in window [X1].                                                                                                                                                                                                               |
| <b>KEY:</b> <div> <div> [X1] = Window (input) number </div> <div> 0 = All windows<br/> 1 = Window 1, 2 = Window 2, 3 = Window 3, 4 = Window 4 </div> </div> <div> <div> [X16] = Horizontal and vertical shift (center or position) </div> <div> -32768 to +32768<br/> Limits are ± the output resolution.<br/> Response is five digits, padded with zeros and preceded by + or -. </div> </div> <div> <b>NOTE:</b> <ul style="list-style-type: none"> <li>For horizontal shift: A negative (–) number shifts the window to the <b>left</b>. A positive (+) number shifts it to the <b>right</b>.</li> <li>For vertical shift: A negative (–) number shifts the window <b>up</b>. A positive (+) number shifts it <b>down</b>.</li> </ul> </div> <div> <div> [X17] = Horizontal and vertical size (width and height) </div> <div> 10 to 32768<br/> Minimum = 1/16 the size of the active output area.<br/> Maximum = 2x size of the active output area.<br/> Response is five digits, padded with zeros. </div> </div> |                                                        |                                                  |                                                                                                                                                                                                                                                                                       |

| Command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ASCII<br>(Host to Processor)                     | Response<br>(Processor to Host)     | Description                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------------------------------------|------------------------------------------------------------------------------|
| <b>Output Configuration</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                  |                                     |                                                                              |
| <b>Output Rate</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                  |                                     |                                                                              |
| Set output rate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>[Esc]</b> <b>[X21]</b> RATE ←                 | Rate <b>[X21]</b> ↵                 | Select the output resolution and refresh rate ( <b>[X21]</b> ).              |
| View output rate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>[Esc]</b> RATE ←                              | <b>[X21]</b> ↵                      | View the selected output rate.                                               |
| <b>HDMI Output Format</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                  |                                     |                                                                              |
| Set output format                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>[Esc]</b> 1 * <b>[X48]</b> VTPO ←             | Vtpo1 * <b>[X48]</b> ↵              | Set the colorspace and format for the HDMI and DTP outputs to <b>[X48]</b> . |
| View format setting                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>[Esc]</b> 1 VTPO ←                            | <b>[X48]</b> ↵                      | View the current colorspace and format for the output.                       |
| View auto output format                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>[Esc]</b> 1 * VTPO ←                          | <b>[X48]</b> ↵                      | View the output format when <b>[X48]</b> is set to 0 (Auto).                 |
| <b>HDCP Output Mode</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                  |                                     |                                                                              |
| Set HDCP mode                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>[Esc]</b> S <b>[X2]</b> * <b>[X46]</b> HDCP ← | Hdcp S <b>[X2]</b> * <b>[X46]</b> ↵ | Set the HDCP mode for output <b>[X2]</b> to <b>[X46]</b> .                   |
| View HDCP mode                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>[Esc]</b> S <b>[X2]</b> HDCP ←                | <b>[X46]</b> ↵                      | View the HDCP mode for output <b>[X2]</b> .                                  |
| <b>Display Rotation</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                  |                                     |                                                                              |
| Set display direction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>[Esc]</b> 0 <b>[X69]</b> ROTA ←               | Rota 0 <b>[X69]</b> ↵               | Set the rotation of the display screen to <b>[X69]</b> .                     |
| View display rotation setting                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>[Esc]</b> 0 ROTA ←                            | <b>[X69]</b> ↵                      | View current output rotation status <b>[X69]</b> .                           |
| <b>KEY:</b> <div> <div> <b>[X2]</b> = Output number </div> <div> <b>[X21]</b> = Output resolution and EDID emulation </div> <div> <b>[X46]</b> = HDCP output mode </div> <div> <b>[X48]</b> = HDMI output format </div> <div> <b>[X69]</b> = Input or display rotation </div> </div> <div> 1 = HDMI output, 2 = TP output, 3 = Analog audio output (valid only for audio mute and audio format commands)<br/> 99 = All outputs<br/> Response is two digits, padded with a zero.<br/> See <a href="#">Output resolutions and EDID emulation</a> on page 47<br/> 0 = Off — Disable all HDCP authentication and encryption attempts.<br/> 1 = Follow input (with a maximum of 10 seconds of authentication trials, default).<br/> 2 = Encrypt output (with a maximum of 10 seconds of authentication trials).<br/> 3 = Follow input (with continuous trials).<br/> 4 = Encrypt output (with continuous trials).<br/> 0 = Auto — HDMI RGB Full to a CEA sink, or DVI to a non-CEA sink (default)<br/> 1 = DVI — RGB 444, 0-255, no audio packet or InfoFrames.<br/> 2 = HDMI RGB Full — RGB 444, 0-255, audio packet, InfoFrames<br/> 3 = HDMI RGB Limited — RGB 444, 16-235, audio packet, InfoFrames<br/> 5 = HDMI YUV 444 Limited — YUV 444, 16-235, audio packet, InfoFrames<br/> 7 = HDMI YUV 422 Limited — YUV 422, 16-235, audio packet, InfoFrames<br/> 0 = Disabled (default)<br/> 1 = 90 degrees clockwise (the LCD panel displays +90 degrees)<br/> 2 = 90 degrees counterclockwise (the LCD panel displays -90 degrees) </div> |                                                  |                                     |                                                                              |

| Command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ASCII<br>(Host to Processor)     | Response<br>(Processor to Host)                     | Description                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-----------------------------------------------------|-------------------------------------------------------------------------------------------|
| <b>Output Configuration (continued)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                  |                                                     |                                                                                           |
| <b>Screen Saver</b><br>(The action takes place when there is no active video or defined logo graphic in any of the windows or the background.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                  |                                                     |                                                                                           |
| Set mode                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>[Esc] M [X40] S SAV ←</b>     | Ssav M [X40] ↵                                      | Set the screen saver mode to [X40].                                                       |
| View mode                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>[Esc] M S SAV ←</b>           | [X40] ↵                                             | View current screen saver mode [X40] for the output.                                      |
| Set screen saver duration before output sync timeout                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>[Esc] T [X28] S SAV ←</b>     | Ssav T [X28] ↵                                      | Set the screen saver timeout duration to [X28] seconds.<br>Default = 501 seconds = never. |
| View screen saver duration before output sync timeout                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>[Esc] T S SAV ←</b>           | [X28] ↵                                             | View screen saver timeout duration [X28].                                                 |
| View screen saver status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>[Esc] S S SAV ←</b>           | [X63] ↵<br>Verbose modes 2 and 3:<br>Ssav S [X63] ↵ | View screen saver status [X63].                                                           |
| <b>Window Configuration</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                  |                                                     |                                                                                           |
| <b>Window Border Style</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                  |                                                     |                                                                                           |
| Set border style                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>[Esc] B [X1]*[X76] WNDW ←</b> | Wdw B [X1]*[X76] ↵                                  | Set the window border style to [X76].                                                     |
| View setting                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>[Esc] B [X1] WNDW ←</b>       | [X76] ↵                                             | View border style setting [X76].                                                          |
| <b>KEY:</b> <div> <div> [X1] = Window (input) number </div> <div> [X28] = Output sync timeout (number of seconds before output sync times out) </div> <div> [X40] = Screen saver mode </div> <div> [X63] = Screen saver status </div> <div> [X76] = Window border style </div> <div> 0 = All windows<br/> 1 = Window 1, 2 = Window 2, 3 = Window 3, 4 = Window 4<br/> 1 - 500 seconds, in 1-second increments<br/> 0 = Output sync is instantly disabled with no active video on any of the inputs.<br/> 501 = Output sync never times out.<br/> 1 = Black screen (default)<br/> 2 = Blue screen<br/> 0 = Active input detected, timer not running<br/> 1 = No active input, timer running, output sync still active<br/> 2 = No active input, timer expired, output sync disabled<br/> Window border style presets — 0 - 128<br/> 0 = No border<br/> Response is three digits, padded with zeros. </div> </div> |                                  |                                                     |                                                                                           |

| Command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | ASCII<br>(Host to Processor)           | Response<br>(Processor to Host)                                                    | Description                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------|
| <b>Window Configuration (continued)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                        |                                                                                    |                                                |
| <b>Video Key Effect Selection</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                        |                                                                                    |                                                |
| Disable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <code>[Esc][X1]*0 VKEF</code>          | <code>Vkef[X1]*0</code>                                                            | Disable key effect for window [X1].            |
| Transparency                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <code>[Esc][X1]*1 VKEF</code>          | <code>Vkef[X1]*1</code>                                                            | Enable transparency for window [X1].           |
| RGB Key                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <code>[Esc][X1]*2 VKEF</code>          | <code>Vkef[X1]*2</code>                                                            | Enable RGB key for window [X1].                |
| Level Key                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <code>[Esc][X1]*3 VKEF</code>          | <code>Vkef[X1]*3</code>                                                            | Enable Level key for window [X1].              |
| View setting                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <code>[Esc][X1] VKEF</code>            | <code>[X74]</code><br><i>Verbose modes 2 and 3:</i><br><code>Vkef[X1]*[X74]</code> | View current key effect [X74] for window [X1]. |
| <b>Video Key Effect Level</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                        |                                                                                    |                                                |
| Set specific value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <code>[Esc][X1]*[X70]*[X71]VKEY</code> | <code>Vkey[X1]*[X70]*[X71]</code>                                                  | Set the key level for [X70] to [X71].          |
| View level setting                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <code>[Esc][X1]*[X70]VKEY</code>       | <code>[X71]</code>                                                                 | View the current setting for [X70].            |
| <b>KEY:</b> <div> <div> [X1] = Window (input) number<br/><br/> [X70] = Effect variable<br/><br/> [X71] = Effect level setting<br/> [X74] = Video key effect </div> <div> 0 = All windows<br/> 1 = Window 1, 2 = Window 2, 3 = Window 3, 4 = Window 4<br/><br/> 0 = Transparency (not available for background)<br/> 1 = Red of RGB key or background color<br/> 2 = Green of RGB key or background color<br/> 3 = Blue of RGB key or background color<br/> 4 = Level key (not available for background color)<br/><br/> 0 - 255<br/> 0 = Disabled (default)      2 = RGB key<br/> 1 = Transparency              3 = Level key </div> </div> |                                        |                                                                                    |                                                |
| <b>Presets Commands</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                        |                                                                                    |                                                |
| <b>Save and Recall Window Presets</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                        |                                                                                    |                                                |
| Recall preset                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <code>1*[X25].</code>                  | <code>1Rpr[X25]</code>                                                             | Recall window preset [X25].                    |
| Save preset                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <code>1*[X25],</code>                  | <code>1Spr[X25]</code>                                                             | Save the current layout to preset [X25].       |
| View last recalled preset                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <code>[Esc] L1 PRST</code>             | <code>[X25]</code><br><i>Verbose modes 2 and 3:</i><br><code>Prst L 1*[X25]</code> | View last recalled window preset [X25].        |
| Delete preset                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <code>[Esc][X1]*[X25] PRST</code>      | <code>Prst X 1*[X25]</code>                                                        | Reset window preset [X25] to default values.   |
| <b>Window Preset Name</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                        |                                                                                    |                                                |
| Write preset name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <code>[Esc]1*[X25],[X14] PNAM</code>   | <code>Pnam1*[X25],[X14]</code>                                                     | Set name [X14] for window preset [X25].        |
| <b>NOTE:</b> To restore a window preset name to the default (Window Preset <i>nnn</i> ), enter a single space for [X14].                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                        |                                                                                    |                                                |
| View preset name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <code>[Esc]1*[X25] PNAM</code>         | <code>[X14]</code>                                                                 | View window preset name [X14].                 |
| <b>KEY:</b> <div> <div> [X14] = Window preset name<br/><br/> [X25] = Window preset number </div> <div> <ul style="list-style-type: none"> <li>Can have up to 32 characters.</li> <li>Cannot contain , *  .</li> <li>The first character must be a letter.</li> <li>The last character cannot be a hyphen.</li> <li>Not case-sensitive.</li> </ul> 1 - 128<br/> Response is three digits, padded with zeros. </div> </div>                                                                                                                                                                                                                   |                                        |                                                                                    |                                                |

| Command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ASCII<br>(Host to Processor) | Response<br>(Processor to Host) | Description                                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|---------------------------------|------------------------------------------------------------------------|
| <b>Presets (continued)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                              |                                 |                                                                        |
| <b>Window Preset Effect</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                              |                                 |                                                                        |
| Cut                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | [Esc]0 WPEF ←                | Wpef0 ←                         | Set the window preset effect to cut.                                   |
| Animated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | [Esc]1 WPEF ←                | Wpef1 ←                         | Set the window preset effect to animated (default).                    |
| View effect setting                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | [Esc] WPEF ←                 | [X72] ←                         | View window preset effect setting [X72].                               |
| <b>Window Mute Effect</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                              |                                 |                                                                        |
| Cut                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | [Esc]0 WMEF ←                | Wmef0 ←                         | Set the window mute effect to cut.                                     |
| Dissolve                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | [Esc]1 WMEF ←                | Wmef1 ←                         | Set the window mute effect to dissolve (default).                      |
| View mute effect setting                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | [Esc] WMEF ←                 | [X78] ←                         | View window preset effect setting [X78].                               |
| <b>Effect Duration — Window Mute and Window Preset Effects</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                              |                                 |                                                                        |
| Set effect duration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | [Esc][X73] EDUR ←            | Edur[X73] ←                     | Set the duration of the current effect preset or mute effect to [X73]. |
| View effect duration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | [Esc] EDUR ←                 | [X73] ←                         | View duration [X73] of the current effect.                             |
| <b>KEY:</b> <div> <div> [X72] = Window preset effect </div> <div> 0 = Cut — The windows instantly cut to the new location and size defined by the recalled preset.<br/> 1 = Animated — The windows move and resize dynamically on screen to the location and size defined by the recalled preset. </div> <div> [X73] = Window effect duration </div> <div> 00 – 50 in 0.1-second increments. Default = 05 = 0.5 seconds. </div> <div> [X78] = Window mute effect </div> <div> 0 = Cut, 1 = Dissolve </div> </div>                                                  |                              |                                 |                                                                        |
| <b>Input Presets</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                              |                                 |                                                                        |
| Recall input preset                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2*[X1]*[X26].                | 2Rpr [X1]*[X26] ←               | Recall input preset [X26] to window [X1].                              |
| Save input preset                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 2*[X1]*[X26],                | 2Spr[X1]*[X26] ←                | Save the input settings for window [X1] to input preset [X26].         |
| Delete input preset                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | [Esc] X2*[X26] PRST ←        | PrstX2*[X26] ←                  | Clear input preset [X26] and set it to [unassigned].                   |
| <b>Input Preset Naming</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                              |                                 |                                                                        |
| Write input preset name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | [Esc]2*[X26],[X14] PNAM ←    | Pnam2*[X26],[X14] ←             | Set name [X14] for input preset [X26].                                 |
| View input preset name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | [Esc]2*[X26] PNAM ←          | [X14] ←                         | View input preset name [X14].                                          |
| <b>NOTE:</b> To restore an input preset name to the default (Input Preset <i>nnn</i> ), enter a single space for [X14].                                                                                                                                                                                                                                                                                                                                                                                                                                            |                              |                                 |                                                                        |
| <b>Auto Layout Mode</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                              |                                 |                                                                        |
| Disable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | [Esc]0 AUSW ←                | Ausw 0 ←                        | Disable auto window layout mode (default).                             |
| Enable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | [Esc]1 AUSW ←                | Ausw 1 ←                        | Enable auto window layout mode.                                        |
| View layout mode status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | [Esc]AUSW ←                  | [X10] ←                         | View auto layout status [X10].                                         |
| <b>KEY:</b> <div> <div> [X1] = Window (input) number </div> <div> 0 = All windows, 1 = Window 1, 2 = Window 2, 3 = Window 3, 4 = Window 4 </div> <div> [X14] = Input preset name </div> <div> <ul style="list-style-type: none"> <li>Can have up to 32 characters.</li> <li>Cannot contain , *  .</li> <li>The first character must be a letter.</li> <li>The last character cannot be a hyphen.</li> <li>Not case-sensitive.</li> </ul> </div> <div> [X26] = Input preset number </div> <div> 1 - 128. Response is three digits, padded with zeros. </div> </div> |                              |                                 |                                                                        |

| Command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ASCII<br>(Host to Processor) | Response<br>(Processor to Host)                                                 | Description                                                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|---------------------------------------------------------------------------------|----------------------------------------------------------------|
| <b>Audio Configuration</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                              |                                                                                 |                                                                |
| <b>Audio Input Switching</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                              |                                                                                 |                                                                |
| Select audio source                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | [X1]\$                       | In[X1]•Aud↵                                                                     | Select the audio from input [X1].                              |
| View selected audio input                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | \$                           | [X1]↵                                                                           | View currently selected audio input.                           |
| <b>Audio Mute — Digital and Analog</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                              |                                                                                 |                                                                |
| <b>NOTES:</b> <ul style="list-style-type: none"> <li>The mute setting persists after a power cycle.</li> <li>Global audio mute is enabled by default.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                              |                                                                                 |                                                                |
| Enable global audio mute                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1Z                           | Amt1↵                                                                           | Mute all audio outputs.                                        |
| Disable global audio mute                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0Z                           | Amt0↵                                                                           | Unmute all audio outputs.                                      |
| Enable or disable discrete audio mutes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | [X2]*[X10]Z                  | Amt[X2]*[X10]↵                                                                  | Set the mute status of audio output [X2] to [X10].             |
| View discrete audio mute                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | [X2]*Z                       | [X10]↵                                                                          | View mute status [X10] of audio output [X2].                   |
| View global mute status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Z                            | [X10]•[X10]•[X10]↵<br><i>In verbose modes 2 and 3:</i><br>Amt[X10]•[X10]•[X10]↵ | View audio mute status [X10] of HDMI, DTP, and analog outputs. |
| <b>Audio Input Format</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                              |                                                                                 |                                                                |
| Set none                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | [Esc] I [X1]*0 AFMT↵         | Afmt I [X1]*0↵                                                                  | Mute all audio for input [X1].                                 |
| Set LPCM-2Ch digital                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | [Esc] I [X1]*2 AFMT↵         | Afmt I [X1]*2↵                                                                  | Select 2Ch digital audio for input [X1].                       |
| Set Multi-Ch digital                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | [Esc] I [X1]*3 AFMT↵         | Afmt I [X1]*3↵                                                                  | Select multi-Ch digital audio for input [X1].                  |
| View format                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | [Esc] I [X1] AFMT↵           | [X82]↵                                                                          | View audio input format [X82] for input [X1].                  |
| <b>Audio Output Format</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                              |                                                                                 |                                                                |
| Set format                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | [Esc] O 1*[X81]AFMT↵         | Afmt O 1*[X81]↵                                                                 | Set the format for the audio output to [X81].                  |
| View format                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | [Esc] O 1 AFMT↵              | [X81]↵                                                                          | View audio output format [X81].                                |
| <b>KEY:</b> <div> <div> [X1] = Window (input) number<br/><br/> [X2] = Output number<br/><br/> [X10] = On or off status<br/> [X81] = Audio output format<br/> [X82] = Audio input format </div> <div> 0 = All windows, 1 = Window 1, 2 = Window 2, 3 = Window 3, 4 = Window 4<br/> 99 = Background (valid only for EDID, HDCP authorization, HDCP status, audio, and information request commands)<br/><br/> 1 = HDMI output, 2 = TP output, 3 = Analog audio output (valid only for audio mute commands), 99 = All outputs<br/><br/> 0 = Off or disabled, 1 = On or enabled<br/><br/> 1 = Dual mono, 2 = Stereo (default)<br/><br/> 0 = None (muted). Configures input EDID with no audio support.<br/> 2 = LPCM-2Ch — Configures input EDID for LPCM-2Ch support. Passes all digital audio input signals to the HDMI outputs.<br/> 3 = Multi-Ch — Configures input EDID for Multi-Ch support. Passes all digital audio input signals to the HDMI outputs.<br/> See the <a href="#">Audio input format symbol definition</a> ([X82]) on page 49 for more information. </div> </div> |                              |                                                                                 |                                                                |

| Command                                  | ASCII<br>(Host to Processor) | Response<br>(Processor to Host)                                         | Description                                                |
|------------------------------------------|------------------------------|-------------------------------------------------------------------------|------------------------------------------------------------|
| Audio Configuration (continued)          |                              |                                                                         |                                                            |
| AES Audio Pair or Channel Selection      |                              |                                                                         |                                                            |
| Select pair or channel                   | [Esc][X1]*[X86]AESCL←        | Aesc[X1]*[X86]↵                                                         | Select pair or channel [X86] for input [X1] to be decoded. |
| View pair or channel                     | [Esc][X1]AESCL←              | [X86]↵                                                                  | View decoded pair or channel [X86] for input [X1].         |
| AES Audio Group Selection                |                              |                                                                         |                                                            |
| Group                                    | SDI Embedded Audio           | HDMI Audio Signal                                                       |                                                            |
| 1                                        | Pair 1 — Channel 1           | L — Left Speaker                                                        |                                                            |
|                                          | Pair 1 — Channel 2           | R — Right Speaker                                                       |                                                            |
|                                          | Pair 2 — Channel 1           | LFE — Low frequency extension                                           |                                                            |
|                                          | Pair 2 — Channel 2           | C — Center                                                              |                                                            |
| 2                                        | Pair 1 — Channel 1           | LS — Left surround                                                      |                                                            |
|                                          | Pair 1 — Channel 2           | RS — Right surround                                                     |                                                            |
|                                          | Pair 2 — Channel 1           | SBL — Surround back left                                                |                                                            |
|                                          | Pair 2 — Channel 2           | SBR — Surround back right                                               |                                                            |
| 3                                        | Pair 1 — Channel 1           | Reserved for future use                                                 |                                                            |
|                                          | Pair 1 — Channel 2           | Reserved for future use                                                 |                                                            |
|                                          | Pair 2 — Channel 1           | Reserved for future use                                                 |                                                            |
|                                          | Pair 2 — Channel 2           | Reserved for future use                                                 |                                                            |
| 4                                        | Pair 1 — Channel 1           | Reserved for future use                                                 |                                                            |
|                                          | Pair 1 — Channel 2           | Reserved for future use                                                 |                                                            |
|                                          | Pair 2 — Channel 1           | Reserved for future use                                                 |                                                            |
|                                          | Pair 2 — Channel 2           | Reserved for future use                                                 |                                                            |
| Select group                             | [Esc][X1]*[X87]AESGL←        | Aesg[X1]*[X87]↵                                                         | Select group [X87] for input [X1] to be decoded.           |
| View group                               | [Esc][X1]AESGL←              | [X87]↵                                                                  | View decoded group [X87].                                  |
| KEY:                                     |                              |                                                                         |                                                            |
| [X1] = Window number                     |                              | 0 = All windows, 1 = Window 1, 2 = Window 2, 3 = Window 3, 4 = Window 4 |                                                            |
| [X86] = AES audio channel or pair number |                              |                                                                         |                                                            |
| [X87] = AES channel or pair group number |                              | 1 - 4. (Default is 1.)                                                  |                                                            |

| Command                                                                                                                    | ASCII<br>(Host to Processor)           | Response<br>(Processor to Host)                                                                                                                                                                                                                      | Description                                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Image, Logo, and Clock Configuration</b>                                                                                |                                        |                                                                                                                                                                                                                                                      |                                                                                                                                               |
| <b>Logo and Image Configuration</b>                                                                                        |                                        |                                                                                                                                                                                                                                                      |                                                                                                                                               |
| Select image file                                                                                                          | <code>[Esc]A[X27],filenameLOGO←</code> | <code>LogoA[X27],filename←</code>                                                                                                                                                                                                                    | Assign logo <i>filename</i> to logo preset slot <i>X27</i> .                                                                                  |
| <b>NOTE:</b> The image or logo file must be present in the Graphics directory. BMP, JPG, PNG, and TIFF images are allowed. |                                        |                                                                                                                                                                                                                                                      |                                                                                                                                               |
| Clear logo assignment                                                                                                      | <code>[Esc]X 3*[X27]PRST←</code>       | <code>Prst X 3*[X27]←</code>                                                                                                                                                                                                                         | Clear logo <i>X27</i> slot and set the logo name to [unassigned].                                                                             |
| Query logo availability                                                                                                    | <code>[Esc]Q LOGO←</code>              | <code>{32 characters}←</code><br><i>In verbose modes 2 and 3:</i><br><code>LogoQ 00*{32 characters}←</code>                                                                                                                                          | View status (saved or empty) of all logo and screen saver slots. Each character in the response represents a logo slot: 1 = saved, 0 = empty. |
| <b>NOTE:</b> The first 32 digits indicate the logo image slots.                                                            |                                        |                                                                                                                                                                                                                                                      |                                                                                                                                               |
| <b>Logo Name</b>                                                                                                           |                                        |                                                                                                                                                                                                                                                      |                                                                                                                                               |
| Write logo name                                                                                                            | <code>[Esc]L [X27],[X14] UNAM←</code>  | <code>UnamL[X27],[X14]←</code>                                                                                                                                                                                                                       | Set name <i>X14</i> for logo <i>X27</i> .                                                                                                     |
| <b>NOTE:</b> To restore a logo name to the default (Logo <i>nn</i> ), enter a single space for <i>X14</i> .                |                                        |                                                                                                                                                                                                                                                      |                                                                                                                                               |
| View logo name                                                                                                             | <code>[Esc]L [X27] UNAM←</code>        | <code>[X14]←</code>                                                                                                                                                                                                                                  | View name <i>X14</i> of logo <i>X27</i> .                                                                                                     |
| <b>Logo, Image, or Background Recall</b>                                                                                   |                                        |                                                                                                                                                                                                                                                      |                                                                                                                                               |
| Recall to window                                                                                                           | <code>[Esc]F[X1]*[X27] LOGO←</code>    | <code>LogoE[X1]*[X27]←</code>                                                                                                                                                                                                                        | Recall logo <i>X27</i> to be displayed in window <i>X1</i> .                                                                                  |
| Recall to foreground                                                                                                       | <code>[Esc]E 98*[X27]LOGO←</code>      | <code>LogoE 98*[X27]←</code>                                                                                                                                                                                                                         | Recall logo <i>X27</i> to be displayed in the foreground of the window.                                                                       |
| Recall to background                                                                                                       | <code>[Esc]E 99*[X27]LOGO←</code>      | <code>LogoE 99*[X27]←</code>                                                                                                                                                                                                                         | Recall logo <i>X27</i> to be displayed in the background of the window.                                                                       |
| Disable window image                                                                                                       | <code>[Esc]F[X1]*0 LOGO←</code>        | <code>LogoE [X1]*0←</code>                                                                                                                                                                                                                           | Remove the image from window <i>X1</i> and display live video.                                                                                |
| Disable foreground image                                                                                                   | <code>[Esc]E 98*0 LOGO←</code>         | <code>LogoE 98*0←</code>                                                                                                                                                                                                                             | Remove the logo image from the foreground.                                                                                                    |
| Disable background image                                                                                                   | <code>[Esc]E 99*0 LOGO←</code>         | <code>LogoE 99*0←</code>                                                                                                                                                                                                                             | Remove the logo image from the background.                                                                                                    |
| View window image                                                                                                          | <code>[Esc]F[X1] LOGO←</code>          | <code>[X27]←</code>                                                                                                                                                                                                                                  | View the logo or image currently displayed in window <i>X1</i> .                                                                              |
| View foreground image                                                                                                      | <code>[Esc]E 98 LOGO←</code>           | <code>[X27]←</code>                                                                                                                                                                                                                                  | View the logo or image currently displayed in the foreground.                                                                                 |
| View background image                                                                                                      | <code>[Esc]E 99 LOGO←</code>           | <code>[X27]←</code>                                                                                                                                                                                                                                  | View the logo or image currently displayed in the background.                                                                                 |
| <b>KEY:</b>                                                                                                                |                                        |                                                                                                                                                                                                                                                      |                                                                                                                                               |
| <i>X1</i> = Window number                                                                                                  |                                        | 0 = All windows, 1 = Window 1, 2 = Window 2, 3 = Window 3, 4 = Window 4                                                                                                                                                                              |                                                                                                                                               |
|                                                                                                                            |                                        | 98 = Foreground (logo commands only)                                                                                                                                                                                                                 |                                                                                                                                               |
|                                                                                                                            |                                        | 99 = Background (valid for only EDID, HDCP authorization, HDCP status, audio, and information request commands)                                                                                                                                      |                                                                                                                                               |
| <i>X14</i> = Logo or image name                                                                                            |                                        | <ul style="list-style-type: none"> <li>• Can have up to 32 characters.</li> <li>• Cannot contain , *  .</li> <li>• The first character must be a letter.</li> <li>• The last character cannot be a hyphen.</li> <li>• Not case-sensitive.</li> </ul> |                                                                                                                                               |
| <i>X27</i> = Logo or image slot number                                                                                     |                                        | 1 - 32. Response is three digits, padded with zeros.<br>0 = No image                                                                                                                                                                                 |                                                                                                                                               |

| Command                                                                                                                                                                                                                                                                                                                                                                                                                                     | ASCII<br>(Host to Processor)        | Response<br>(Processor to Host)                                | Description                                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|----------------------------------------------------------------|------------------------------------------------------------------------|
| <b>Image, Logo, and Clock Configuration (continued)</b>                                                                                                                                                                                                                                                                                                                                                                                     |                                     |                                                                |                                                                        |
| <b>Background Settings</b>                                                                                                                                                                                                                                                                                                                                                                                                                  |                                     |                                                                |                                                                        |
| Set background source                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>[Esc]S[X75] BSET ←</b>           | BsetS[X75]↵                                                    | Set the background color or source to [X75].                           |
| View background source                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>[Esc]S BSET ←</b>                | [X75]↵                                                         | View background source [X75].                                          |
| Set user defined color                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>[Esc]C[X70]*[X71] BSET ←</b>     | BsetC[X70]*[X71]↵                                              | Select background color effect [X70] and set the color level to [X71]. |
| View user defined color setting                                                                                                                                                                                                                                                                                                                                                                                                             | <b>[Esc]C[X70] BSET ←</b>           | [X71]↵                                                         | View level setting [X71] for background color effect [X70].            |
| <b>KEY:</b><br><br>[X70] = Background color effect variable<br>[X71] = Color effect level setting<br>[X75] = Background options<br><br>1 = Red of background color<br>2 = Green of background color<br>3 = Blue of background color<br><br>0 - 255<br><br>0 = Black (default), 1 = Red, 2 = Green, 3 = Blue, 4 = White,<br>5 = Magenta, 6 = Cyan, 7 = Yellow, 8 = User defined color,<br>9 = User defined image, 10 = Live background input |                                     |                                                                |                                                                        |
| <b>Logo Key Effect</b>                                                                                                                                                                                                                                                                                                                                                                                                                      |                                     |                                                                |                                                                        |
| Disabled                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>[Esc][X27]*0 LKEF ←</b>          | Lkef[X27]*0↵                                                   | Disable key effect for logo [X27].                                     |
| Transparency                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>[Esc][X27]*1 LKEF ←</b>          | Lkef[X27]*1↵                                                   | Enable transparency key for logo [X27].                                |
| RGB key                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>[Esc][X27]*2 LKEF ←</b>          | Lkef[X27]*2↵                                                   | Enable RGB key for logo [X27].                                         |
| Level key                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>[Esc][X27]*3 LKEF ←</b>          | Lkef[X27]*3↵                                                   | Enable level key for logo [X27].                                       |
| View key setting                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>[Esc][X27] LKEF ←</b>            | [X74]↵<br><i>In verbose modes 2 and 3:</i><br>Lkef[X27]*[X74]↵ | View key setting [X74] for logo [X27].                                 |
| Set logo key effect level                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>[Esc][X27]*[X70]*[X71]LKEY ←</b> | Lkey[X27]*[X70]*[X71]↵                                         | Set level for key effect [X70] to [X71] for logo [X27].                |
| View key effect level setting                                                                                                                                                                                                                                                                                                                                                                                                               | <b>[Esc][X27]*[X70]LKEY ←</b>       | [X71]↵                                                         | View current level setting [X71] for key effect [X70] for logo [X27].  |
| <b>KEY:</b><br><br>[X27] = Logo or image assignment<br>[X70] = Logo effect variable<br><br>[X71] = Logo effect level setting<br>[X74] = Logo key effect<br><br>1 - 32, 101 = No signal image<br>0 = Transparency<br>1 = Red of RGB key<br>2 = Green of RGB key<br>3 = Blue of RGB key<br>4 = Level key<br><br>0 - 255<br><br>0 = Disabled (default), 1 = Transparency, 2 = RGB key,<br>3 = Level key                                        |                                     |                                                                |                                                                        |

| Command                                                                                                                                                                                                                                                                                                                                                                          | ASCII<br>(Host to Processor)             | Response<br>(Processor to Host)                  | Description                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|--------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Image, Logo, and Clock Configuration (continued)</b>                                                                                                                                                                                                                                                                                                                          |                                          |                                                  |                                                                                       |
| <b>Horizontal Shift (Logo)</b>                                                                                                                                                                                                                                                                                                                                                   |                                          |                                                  |                                                                                       |
| Set a specific horizontal shift value for the foreground logo                                                                                                                                                                                                                                                                                                                    | <b>[Esc]</b> L <b>[X27]*[X16]</b> HCTR ← | Hctr L <b>[X27]*[X16]</b> ↵                      | Set the horizontal centering of the foreground logo <b>[X27]</b> to <b>[X16]</b> .    |
| Increment the horizontal foreground logo shift                                                                                                                                                                                                                                                                                                                                   | <b>[Esc]</b> L <b>[X27] +</b> HCTR ←     | Hctr L <b>[X27]*[X16]</b> ↵                      | Shift foreground logo <b>[X27]</b> <b>right</b> .                                     |
| Decrement the horizontal foreground logo shift                                                                                                                                                                                                                                                                                                                                   | <b>[Esc]</b> L <b>[X27] -</b> HCTR ←     | Hctr L <b>[X27]*[X16]</b> ↵                      | Shift foreground logo <b>[X27]</b> <b>left</b> .                                      |
| View horizontal centering of the logo                                                                                                                                                                                                                                                                                                                                            | <b>[Esc]</b> L <b>[X27]</b> HCTR ←       | <b>[X16]</b> ↵                                   | View amount of horizontal shift ( <b>[X16]</b> ) for foreground logo <b>[X27]</b> .   |
| <b>Vertical Shift (Logo)</b>                                                                                                                                                                                                                                                                                                                                                     |                                          |                                                  |                                                                                       |
| Set a specific vertical shift value for the foreground logo                                                                                                                                                                                                                                                                                                                      | <b>[Esc]</b> L <b>[X27]*[X16]</b> VCTR ← | Vctr L <b>[X27]*[X16]</b> ↵                      | Set the vertical centering of foreground logo <b>[X27]</b> to <b>[X16]</b> .          |
| Increment vertical image shift                                                                                                                                                                                                                                                                                                                                                   | <b>[Esc]</b> L <b>[X27] +</b> VCTR ←     | Vctr L <b>[X27]*[X16]</b> ↵                      | Shift foreground logo <b>[X27]</b> <b>down</b> .                                      |
| Decrement vertical image shift                                                                                                                                                                                                                                                                                                                                                   | <b>[Esc]</b> L <b>[X27] -</b> VCTR ←     | Vctr L <b>[X27]*[X16]</b> ↵                      | Shift foreground logo <b>[X27]</b> <b>up</b> .                                        |
| View vertical image shift amount                                                                                                                                                                                                                                                                                                                                                 | <b>[Esc]</b> L <b>[X27]</b> VCTR ←       | <b>[X16]</b> ↵                                   | View the amount of vertical shift ( <b>[X16]</b> ) for foreground logo <b>[X27]</b> . |
| <b>On-screen Clock and Date</b>                                                                                                                                                                                                                                                                                                                                                  |                                          |                                                  |                                                                                       |
| Enable on-screen clock                                                                                                                                                                                                                                                                                                                                                           | <b>[Esc]</b> 1 TIME ←                    | Time1 ↵                                          | Display the time on the video output.                                                 |
| Disable on-screen clock                                                                                                                                                                                                                                                                                                                                                          | <b>[Esc]</b> 0 TIME ←                    | Time0 ↵                                          | Remove the time from the video output.                                                |
| View the time setting                                                                                                                                                                                                                                                                                                                                                            | <b>[Esc]</b> TIME ←                      | <b>[X10]</b> ↵                                   | View the time On or Off status.                                                       |
| <b>Horizontal Shift (Clock)</b>                                                                                                                                                                                                                                                                                                                                                  |                                          |                                                  |                                                                                       |
| Set a specific horizontal shift value for the on-screen clock                                                                                                                                                                                                                                                                                                                    | <b>[Esc]</b> K <b>[X16]</b> HCTR ←       | Hctr K <b>[X16]</b> ↵                            | Set the horizontal centering of the on-screen clock to <b>[X16]</b> .                 |
| Increment the horizontal shift of the on-screen clock                                                                                                                                                                                                                                                                                                                            | <b>[Esc]</b> K <b>+</b> HCTR ←           | Hctr K <b>[X16]</b> ↵                            | Shift the on-screen clock <b>right</b> .                                              |
| Decrement the horizontal shift of the on-screen clock                                                                                                                                                                                                                                                                                                                            | <b>[Esc]</b> K <b>-</b> HCTR ←           | Hctr K <b>[X16]</b> ↵                            | Shift the on-screen clock <b>left</b> .                                               |
| View horizontal centering of the on-screen clock                                                                                                                                                                                                                                                                                                                                 | <b>[Esc]</b> K HCTR ←                    | <b>[X16]</b> ↵                                   | View amount of horizontal shift ( <b>[X16]</b> ) for the on-screen clock.             |
| <b>Vertical Shift (Clock)</b>                                                                                                                                                                                                                                                                                                                                                    |                                          |                                                  |                                                                                       |
| Set a specific vertical shift value for the on-screen clock                                                                                                                                                                                                                                                                                                                      | <b>[Esc]</b> K <b>[X16]</b> VCTR ←       | Vctr K <b>[X16]</b> ↵                            | Set the vertical centering of the on-screen clock to <b>[X16]</b> .                   |
| Increment the vertical shift of the on-screen clock                                                                                                                                                                                                                                                                                                                              | <b>[Esc]</b> K <b>+</b> VCTR ←           | Vctr K <b>[X16]</b> ↵                            | Shift the on-screen clock <b>down</b> .                                               |
| Decrement vertical foreground logo shift                                                                                                                                                                                                                                                                                                                                         | <b>[Esc]</b> K <b>-</b> VCTR ←           | Vctr K <b>[X16]</b> ↵                            | Shift the on-screen clock <b>up</b> .                                                 |
| View vertical centering of the on-screen clock                                                                                                                                                                                                                                                                                                                                   | <b>[Esc]</b> K VCTR ←                    | <b>[X16]</b> ↵                                   | View the amount of vertical shift ( <b>[X16]</b> ) for the on-screen clock.           |
| <b>KEY:</b><br><div> <div> <b>[X27]</b> = Logo or image assignment<br/> <b>[X16]</b> = Horizontal and vertical shift (center or position) </div> <div> 1 - 32, 101 = No signal image<br/> Range for logo and clock: -4096 to +4096<br/> Limits are ± the output resolution.<br/> Response is five digits, padded with zeros and preceded by + or -. </div> </div>                |                                          |                                                  |                                                                                       |
| <b>NOTE:</b> <ul style="list-style-type: none"> <li>For horizontal image shift: A negative (–) number shifts the image to the <b>left</b> within the window. A positive (+) number shifts it to the <b>right</b>.</li> <li>For vertical image shift: A negative (–) number shifts the image <b>up</b> within the window. A positive (+) number shifts it <b>down</b>.</li> </ul> |                                          |                                                  |                                                                                       |
| <b>[X10]</b> = On or off status                                                                                                                                                                                                                                                                                                                                                  |                                          | 0 = Off or disabled (default), 1 = On or enabled |                                                                                       |

| Command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ASCII<br>(Host to Processor) | Response<br>(Processor to Host)                         | Description                                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|---------------------------------------------------------|--------------------------------------------|
| <b>Advanced Configuration</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                              |                                                         |                                            |
| <b>Test Pattern</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                              |                                                         |                                            |
| Set test pattern                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>[Esc][X22]</b> Test ←     | Test[X22]↵                                              | Select test pattern [X22].                 |
| View test pattern                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>[Esc]</b> Test ←          | [X22]↵                                                  | View selected test pattern [X22].          |
| <b>Upstream Video Switch Effect</b> (Occurs when an input frequency is changed within a window.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                              |                                                         |                                            |
| Select effect                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>[Esc]</b> U1*[X77]SWEF ←  | SweF U1*[X77]↵                                          | Set the upstream switch effect to [X77].   |
| View upstream switch effect                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>[Esc]</b> U1 SWEF ←       | [X77]↵                                                  | View switch effect selection [X77].        |
| <b>Front Panel Lock Mode (Executive Mode)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                              |                                                         |                                            |
| Enable lock mode 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1X                           | Exe1↵                                                   | Lock the entire front panel.               |
| Enable lock mode 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2X                           | Exe2↵                                                   | Allow limited front panel access.          |
| Disable front panel lock                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0X                           | Exe0↵                                                   | Unlock the entire front panel.             |
| View lock mode                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | X                            | [X29]↵<br><i>In verbose modes 2 and 3:</i><br>Exe[X29]↵ | View current front panel lock mode [X29].  |
| <b>HDCP Notification (Green Screen)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                              |                                                         |                                            |
| Set the notification mode                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>[Esc]</b> N1*[X47] HDCP ← | Hdcp N1*[X47]↵                                          | Set the HDCP notification to [X47].        |
| View HDCP notification                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>[Esc]</b> N1 HDCP ←       | [X47]↵                                                  | View current HDCP notification type [X47]. |
| <b>KEY:</b> <div> <div> [X22] = Test patterns 0 = off (default), 1 = Crop, 2 = Alternating Pixels, 3 = Crosshatch, 4 = Colorbars, 5 = Grayscale, 6 = Audio Test <ul style="list-style-type: none"> <li>Displays Crop pattern with on-screen text Audio Test.</li> <li>Outputs pink noise at 48 KHz, 24 bit, stereo.</li> </ul> </div> <div> [X29] = Front panel lock (executive mode) status 0 = Unlocked (default) 1 = All front panel controls locked 2 = Partial front panel lock: window preset recall, mute, freeze, and auto image buttons are available. </div> </div> |                              |                                                         |                                            |
| <b>NOTE:</b> Front panel lockout does <b>not</b> include RS-232, USB, and Ethernet control.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                              |                                                         |                                            |
| [X47] = HDCP notification mode 0 = Black screen — Notification disabled (mute output) 1 = Green screen(default) Affects the window, but not the entire output.                                                                                                                                                                                                                                                                                                                                                                                                                |                              |                                                         |                                            |
| [X77] = Upstream video switch effect (video signal change within a window) 0 = Cut — Immediately switch to black on loss or change of signal (default). 1 = Fade — Freeze last frame on loss or change of sync and fade to black. 2 = Seamless fade — Freeze last frame on loss or change of sync and seamlessly dissolve to new signal when it is locked. 3 = Seamless cut — Freeze last frame on loss or change of sync and seamlessly cut to new signal when it is locked. 4 = Low latency mode — Display the new signal as quickly as possible.                           |                              |                                                         |                                            |

| Command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ASCII<br>(Host to Processor) | Response<br>(Processor to Host)                                                                                                                                                                                       | Description                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| <b>Advanced Configuration (continued)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                              |                                                                                                                                                                                                                       |                                              |
| <b>HDCP Status</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                              |                                                                                                                                                                                                                       |                                              |
| Query input HDCP status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>[Esc] I [X1] HDCP ←</b>   | <b>[X44] ←</b><br><i>In verbose modes 2 and 3:</i><br>Hdcp I [X1]*[X44] ←                                                                                                                                             | View HDCP status [X44] of input [X1].        |
| Query output HDCP status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>[Esc] O [X2] HDCP ←</b>   | <b>[X45] ←</b><br><i>In verbose modes 2 and 3:</i><br>Hdcp O [X2]*[X45] ←                                                                                                                                             | View HDCP status [X45] of output [X2].       |
| Query HDCP status for all inputs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>[Esc] I HDCP ←</b>        | <b>[X44], [X44], [X44], [X44], [X44] ←</b><br><br><i>In verbose modes 2 and 3:</i><br>Hdcp I [X44], [X44], [X44], [X44], [X44] ←                                                                                      | View HDCP status [X44] of all inputs.        |
| Query HDCP status for all outputs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>[Esc] O HDCP ←</b>        | <b>[X45], [X45] ←</b><br><i>In verbose modes 2 and 3:</i><br>Hdcp O [X45], [X45] ←                                                                                                                                    | View HDCP status [X45] of all outputs.       |
| <b>Video Signal Presence</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                              |                                                                                                                                                                                                                       |                                              |
| View video input signal presence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>[Esc] 0 LS ←</b>          | <b>[X61]*[X61]*[X61]*[X61]*[X61] ←</b><br><i>In verbose modes 2 and 3:</i> ([X61]).<br>In00•[X61]*[X61]*[X61]*[X61]*[X61] ←<br>Response format for the [X61]s:<br><i>Input1*Input2*Input3*Input4*Background Input</i> | View signal presence for all inputs ([X61]). |
| <b>Twisted Pair Protocol</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                              |                                                                                                                                                                                                                       |                                              |
| DTP/XTP/HDBT format                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>[Esc] O 2*[X79]HDBT ←</b> | <b>Hdbt 0 2*[X79] ←</b>                                                                                                                                                                                               | Set protocol [X79] for the TP output.        |
| View the TP setting                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>[Esc] O 2 HDBT ←</b>      | <b>[X79] ←</b>                                                                                                                                                                                                        | View protocol [X79] for the TP output.       |
| <b>KEY:</b> <div> <div> [X1] = Input number [X44] = HDCP input status [X45] = HDCP output status [X61] = Video signal status [X79] = Twisted pair format </div> <div> 0 = All windows, 1 = Window 1, 2 = Window 2, 3 = Window 3, 4 = Window 4<br/> 0 = No source device detected<br/> 1 = Source detected but no HDCP present<br/> 2 = Source detected with HDCP<br/> Response format:<br/> <i>Input1, Input2, Input3, Input4, Background Input</i><br/> 0 = No sink device detected<br/> 1 = Sink detected but no HDCP present<br/> 2 = Sink detected with HDCP<br/> Response format: <i>Output1, Output2</i><br/> 0 = Video or TMDS signal not detected<br/> 1 = Video or TMDS signal detected<br/> Response format:<br/> <i>Input1*Input2*Input3*Input4*Background Input</i><br/> 0 = DTP (default), 1 = XTP, 2 = HDBaseT </div> </div> |                              |                                                                                                                                                                                                                       |                                              |

| Command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ASCII<br>(Host to Processor)                                             | Response<br>(Processor to Host)                                     | Description                                                                                                                                                                                                                                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Advanced Configuration (continued)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                          |                                                                     |                                                                                                                                                                                                                                                                                                                       |
| <b>DTP Remote Power</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                          |                                                                     |                                                                                                                                                                                                                                                                                                                       |
| <b>ATTENTION:</b> <ul style="list-style-type: none"> <li>Ensure that the correct remote DTP power setting is used. Sending DTP3 power to a DTP (series 1) endpoint can result in hardware damage. Enable DTP3 power only to a compatible DTP3 endpoint.</li> <li>Assurez-vous de bien régler l'alimentation DTP à distance. L'envoi d'une alimentation DTP3 à un point de connexion DTP (ancienne gamme) peut provoquer des dommages matériels. Assurez une alimentation DTP3 uniquement vers un point de connexion DTP3 compatible</li> </ul> |                                                                          |                                                                     |                                                                                                                                                                                                                                                                                                                       |
| <b>NOTE:</b> This setting is available only when HDBT is set to DTP. Remote power state for HDBT/XTP mode is forced to 0 (off). Attempts to change the power setting while the unit is not in DTP mode returns an E14 (Not valid for current configuration) error message.                                                                                                                                                                                                                                                                     |                                                                          |                                                                     |                                                                                                                                                                                                                                                                                                                       |
| Set DTP output remote power                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <code>[Esc]O 2*[x80] RPWR ←</code>                                       | <code>Rpwr 0 2*[x80] ↵</code>                                       | Set the remote power on the TP output to [x80].                                                                                                                                                                                                                                                                       |
| View remote power setting                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <code>[Esc]O 2 RPWR ←</code>                                             | <code>[x80] ↵</code>                                                | View remote power setting [x80].                                                                                                                                                                                                                                                                                      |
| <b>KEY:</b> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div>[x80] = DTP remote power</div> <div>           0 = No remote power (default)<br/>           1 = DTP (non-DTP3), 12 VDC<br/>           2 = DTP3, 48 VDC         </div> </div>                                                                                                                                                                                                                                                                   |                                                                          |                                                                     |                                                                                                                                                                                                                                                                                                                       |
| <b>Image Capture</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                          |                                                                     |                                                                                                                                                                                                                                                                                                                       |
| Save image to file                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <code>[Esc]0*/Graphics/filename MF ←</code>                              | <code>Ims0*/Graphics/filename ↵</code>                              | Save what is currently displayed on the screen to the <i>Graphics</i> folder with the designated <i>filename</i> and file format defined by the <i>filename</i> extension.                                                                                                                                            |
| <b>NOTE:</b> If no <i>filename</i> is provided, the image is captured as a .png file, and the filename is a time stamp in the following format: YYYYMMDD_HHMMSS.png.                                                                                                                                                                                                                                                                                                                                                                           |                                                                          |                                                                     |                                                                                                                                                                                                                                                                                                                       |
| Save image to network                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <code>[Esc]0*/shares/&lt;network path&gt;/directory/filename MF ←</code> | <code>Ims0*/shares/&lt;network path&gt;/directory/filename ↵</code> | Save what is currently displayed on the screen to <network path> with the designated <i>filename</i> and file format defined by the <i>filename</i> extension. The credentials (user name and password) used to capture to this network folder are from the Network Folder Capture Settings (see the commands below). |
| <b>NOTE:</b> <network path> must be defined using VCS and proper username and password credentials must be provided. Subdirectories under the <network path> can be defined, but must be enabled by the network permissions.                                                                                                                                                                                                                                                                                                                   |                                                                          |                                                                     |                                                                                                                                                                                                                                                                                                                       |

| Command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ASCII<br>(Host to Processor)                  | Response<br>(Processor to Host)            | Description                                                                                                                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Image Capture (continued)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                               |                                            |                                                                                                                                                                                                           |
| Save image to USB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <code>[Esc]2*/directory/filename MF←</code>   | <code>Ims2*/directory/filename←</code>     | Save what is currently displayed on the screen to the <i>images</i> folder on the connected USB flash drive with the designated <i>filename</i> and file format defined by the <i>filename</i> extension. |
| <b>NOTE:</b> Only one USB flash drive can be connected at a time. If multiple drives are connected, only the first drive that is found receives the captured image.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                               |                                            |                                                                                                                                                                                                           |
| Quick capture                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <code>[Esc]lms0*/graphics/temp.bmp MF←</code> | <code>[Esc]lms0*/graphics/temp.bmp←</code> | Create a temp.bmp file ready for the image Quick Capture software to download.                                                                                                                            |
| <b>NOTE:</b> The unit does not send out a tagged response until capture of the image to the designated location is complete.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                               |                                            |                                                                                                                                                                                                           |
| <b>Annotation</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                               |                                            |                                                                                                                                                                                                           |
| <b>Annotation Type</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                               |                                            |                                                                                                                                                                                                           |
| Set annotation type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <code>[Esc][X50]DRAW←</code>                  | <code>Draw [X50]←</code>                   | Select annotation type <code>[X50]</code> .                                                                                                                                                               |
| View current annotation type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <code>[Esc]DRAW←</code>                       | <code>[X50]←</code>                        | View the current annotation type.                                                                                                                                                                         |
| <b>Annotation Color</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                               |                                            |                                                                                                                                                                                                           |
| <b>NOTE:</b> The color setting applies to all annotation types.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                               |                                            |                                                                                                                                                                                                           |
| Set color                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <code>[Esc]1*[X53]ACOL←</code>                | <code>Aco1 1*[X53]←</code>                 | Select color <code>[X53]</code> for annotation on USB device.                                                                                                                                             |
| View color                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <code>[Esc]1ACOL←</code>                      | <code>[X53]←</code>                        | View current color setting for USB device.                                                                                                                                                                |
| <b>KEY:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                               |                                            |                                                                                                                                                                                                           |
| <div> <div> <div><code>[X50]</code> = Annotation type</div> <div><code>[X53]</code> = Annotation color</div> </div> <div> <p>0 = Eraser, 1 = Pointer, 2 = Freehand, 4 = Vector line,<br/> 5 = Arrow line (The arrow appears at the endpoint of the vector.),<br/> 6 = Ellipse, 7 = Rectangle<br/> Line color (6-bit RGB color, 64 total colors)</p> <p><b>Binary format:</b></p> <div> <div>01</div> <div>10</div> <div>11</div> </div> <div> <div>Red</div> <div>Green</div> <div>Blue</div> </div> <div> <div>Value</div> <div>Value</div> <div>Value</div> </div> </div> <p><b>Examples:</b><br/> 000000 = Black, 010000 = Dark red (33%),<br/> 100000 = Medium red (66%), 110000 = Bright Red (100%),<br/> 001100 = Bright green, 000011 = Bright blue (default),<br/> 111111 = White, 010101 = Dark gray (33%)</p> </div> |                                               |                                            |                                                                                                                                                                                                           |

| Command                                                                                                                                                                                                                                                                                                                              | ASCII<br>(Host to Processor) | Response<br>(Processor to Host) | Description                                                                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|---------------------------------|----------------------------------------------------------------------------|
| <b>Annotation — LinkLicense units only (continued)</b>                                                                                                                                                                                                                                                                               |                              |                                 |                                                                            |
| <b>Annotation Object Fill</b>                                                                                                                                                                                                                                                                                                        |                              |                                 |                                                                            |
| <b>NOTE:</b> The fill setting applies to rectangles and ellipses drawn after the setting has been modified.                                                                                                                                                                                                                          |                              |                                 |                                                                            |
| Enable object fill                                                                                                                                                                                                                                                                                                                   | <b>[Esc]1 FILL ←</b>         | Fill 1↵                         | Enable fill for subsequent objects drawn.                                  |
| Disable object fill                                                                                                                                                                                                                                                                                                                  | <b>[Esc]0 FILL ←</b>         | Fill 0↵                         | Disable fill for subsequent objects drawn.                                 |
| View object fill                                                                                                                                                                                                                                                                                                                     | <b>[Esc] FILL ←</b>          | <b>[X10]↵</b>                   | View the object fill setting.                                              |
| <b>Line Configuration</b>                                                                                                                                                                                                                                                                                                            |                              |                                 |                                                                            |
| Set line weight                                                                                                                                                                                                                                                                                                                      | <b>[Esc][X54]LNWT ←</b>      | Lnwt[X54]↵                      | Set the line weight to [X54] pixels.                                       |
| View line weight                                                                                                                                                                                                                                                                                                                     | <b>[Esc]LNWT ←</b>           | <b>[X54]↵</b>                   | View the current line weight setting.                                      |
| <b>Eraser Size</b>                                                                                                                                                                                                                                                                                                                   |                              |                                 |                                                                            |
| Set eraser size                                                                                                                                                                                                                                                                                                                      | <b>[Esc][X54]ERSR ←</b>      | Ersr[X54]↵                      | Set the eraser width to [X54] pixels.                                      |
| View eraser size                                                                                                                                                                                                                                                                                                                     | <b>[Esc]ERSR ←</b>           | <b>[X54]↵</b>                   | View the current eraser width.                                             |
| <b>Annotation Edit Functions</b>                                                                                                                                                                                                                                                                                                     |                              |                                 |                                                                            |
| Clear all annotations                                                                                                                                                                                                                                                                                                                | <b>[Esc]0EDIT ←</b>          | Edit0↵                          | Clear all annotations on the output. This cannot be undone.                |
| Undo last annotation                                                                                                                                                                                                                                                                                                                 | <b>[Esc]1EDIT ←</b>          | Edit1↵                          | Undo the most recent annotation. The last seven states are held in memory. |
| Redo annotation                                                                                                                                                                                                                                                                                                                      | <b>[Esc]2EDIT ←</b>          | Edit2↵                          | Place the previously removed annotation back on the output.                |
| <b>Cursor Timeout</b>                                                                                                                                                                                                                                                                                                                |                              |                                 |                                                                            |
| <b>NOTE:</b> Setting the timeout to zero disables the menu timeout.                                                                                                                                                                                                                                                                  |                              |                                 |                                                                            |
| Set cursor timeout                                                                                                                                                                                                                                                                                                                   | <b>[Esc][X55]CDUR ←</b>      | Cdur[X55]↵                      | Set the cursor duration to [X55] seconds.                                  |
| View cursor timeout                                                                                                                                                                                                                                                                                                                  | <b>[Esc]CDUR ←</b>           | <b>[X55]↵</b>                   | View the timeout setting.                                                  |
| <b>Panel Calibration Mode</b>                                                                                                                                                                                                                                                                                                        |                              |                                 |                                                                            |
| Enter calibration mode                                                                                                                                                                                                                                                                                                               | <b>[Esc]1 PCAL ←</b>         | Pcal 1↵                         | Set the touchpanel to calibration mode.                                    |
| Exit calibration mode                                                                                                                                                                                                                                                                                                                | <b>[Esc]0 PCAL ←</b>         | Pcal 0↵                         | Exit touchpanel calibration mode.                                          |
| View calibration mode                                                                                                                                                                                                                                                                                                                | <b>[Esc]PCAL ←</b>           | <b>[X10]↵</b>                   | View the current touchpanel calibration mode setting.                      |
| <b>KEY:</b><br><div> <div>[X10] = Enable or disable object fill</div> <div>0 = Disabled, 1 = Enabled</div> <div>[X54] = Line weight or eraser size</div> <div>1-63 pixels. Default is 8.</div> <div>[X55] = Cursor timeout</div> <div>1-500 seconds. Default is 10 seconds.</div> <div>0 = Cursor time out is disabled.</div> </div> |                              |                                 |                                                                            |
| <b>OSD Menu Configuration — LinkLicense units only</b>                                                                                                                                                                                                                                                                               |                              |                                 |                                                                            |
| <b>Menu Timeout</b>                                                                                                                                                                                                                                                                                                                  |                              |                                 |                                                                            |
| <b>NOTE:</b> Setting the timeout to zero disables the cursor timeout.                                                                                                                                                                                                                                                                |                              |                                 |                                                                            |
| Set menu timeout                                                                                                                                                                                                                                                                                                                     | <b>[Esc][X58]MDUR ←</b>      | Mdur [X58]↵                     | Sets the OSD menu display duration to [X58] seconds.                       |
| View menu timeout                                                                                                                                                                                                                                                                                                                    | <b>[Esc]MDUR ←</b>           | <b>[X58]↵</b>                   | View OSD menu timeout.                                                     |
| <b>Menu Graphics</b>                                                                                                                                                                                                                                                                                                                 |                              |                                 |                                                                            |
| Load default OSD                                                                                                                                                                                                                                                                                                                     | <b>[Esc]0MLOD ←</b>          | Mlod00↵                         | Load the factory default images from the firmware.                         |
| Load user-defined OSD                                                                                                                                                                                                                                                                                                                | <b>[Esc]1MLOD ←</b>          | Mlod01↵                         | Check the file system for custom OSD images and reload them.               |
| <b>NOTE:</b> User-defined graphics must be loaded into the OSD folder.                                                                                                                                                                                                                                                               |                              |                                 |                                                                            |
| <b>KEY:</b><br><div> <div>[X58] = OSD menu timeout</div> <div>0 = Menu never times out (OSD timeout is disabled).</div> <div>1-500 in 1-second increments (default = 10 seconds)</div> <div>501 = Sync never times out.</div> </div>                                                                                                 |                              |                                 |                                                                            |

| Command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ASCII<br>(Host to Processor) | Response<br>(Processor to Host)                                                                                                      | Description                                                                                                                                                                                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>General Information Requests</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                              |                                                                                                                                      |                                                                                                                                                                                             |
| See also <a href="#">Information Requests</a> on page 76, in the Command and Response Table for IP SIS Commands.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                              |                                                                                                                                      |                                                                                                                                                                                             |
| General Information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | [X1]*I                       | Vid[X1]•Typ[X3]•Blk[X42]•Hrt[X13]•Vrt[X13]↵<br><i>In verbose modes 2 and 3:</i><br>Inf00•Vid[X1]•Typ[X3]•Blk[X42]•Hrt[X13]•Vrt[X13]↵ | View the selected window and input number ([X1]), input type ([X3]), mute status ([X42]), horizontal frequency ([X13]), and vertical frequency ([X13]).                                     |
| Internal temperature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | [Esc]20 STAT↵                | [X12]↵<br><i>In verbose modes 2 and 3:</i><br>Stat 20•[X12]↵                                                                         | View the internal temperature ([X12]) of the unit in degrees Celsius.                                                                                                                       |
| <b>KEY:</b> <div> <div> [X1] = Window (input) number<br/> [X3] = Input type<br/> [X12] = Internal temperature in degrees Celsius<br/> [X13] = Horizontal and vertical frequencies<br/> [X42] = Video mute<br/> [X80] = DTP remote power </div> <div> 1 = Window 1, 2 = Window 2, 3 = Window 3, 4 = Window 4<br/> 1 = HDMI or DVI, 2 = SDI<br/> Response is two digits, padded with a zero.<br/> Response is three digits with one decimal place and padded with zeros. Example: 075.3<br/> 0 = Unmute (default), 1 = Mute video to black screen<br/> 2 = Mute video and sync (for output mute only).<br/> 0 = No remote power (default), 1 = DTP (non-DTP3) /12 VDC,<br/> 2 = DTP3/48 VDC </div> </div> |                              |                                                                                                                                      |                                                                                                                                                                                             |
| <b>Backup and Restore Configuration</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                              |                                                                                                                                      |                                                                                                                                                                                             |
| Save unit configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | [Esc]1*[X83]XF↵              | Cfg 1*[X83]XF↵                                                                                                                       | Back up the current unit configuration to the file system.                                                                                                                                  |
| Restore unit configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | [Esc]0*[X83]XF↵              | Cfg 0*[X83]XF↵                                                                                                                       | Restore the saved configuration to the unit.                                                                                                                                                |
| <b>KEY:</b> <div> [X83] = Configuration file type </div> <div> 0 = IP config file (ip.cfg)<br/> 2 = Unit-specific parameters file (box.cfg) </div> <div> <b>NOTE:</b> Configuration files are stored on directory/nortxe-backup, which is created on the unit when the configuration is saved. </div>                                                                                                                                                                                                                                                                                                                                                                                                   |                              |                                                                                                                                      |                                                                                                                                                                                             |
| <b>Resets</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                              |                                                                                                                                      |                                                                                                                                                                                             |
| <b>Erase Files and Directories</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                              |                                                                                                                                      |                                                                                                                                                                                             |
| Erase a user-supplied file                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | [Esc]filename EF↵            | Del•filename↵                                                                                                                        | Delete user file <i>filename</i> from the unit.                                                                                                                                             |
| Erase current directory and its files                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | [Esc]/EF↵                    | Dd1↵                                                                                                                                 | Delete the current directory and all files in it from the unit.                                                                                                                             |
| Erase current directory and its subdirectories                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | [Esc]//EF↵                   | Dd1↵                                                                                                                                 | Delete the current directory, all its subdirectories, and all files in the subdirectories from the unit.                                                                                    |
| <b>Reset the Unit</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                              |                                                                                                                                      |                                                                                                                                                                                             |
| Erase flash memory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | [Esc]ZFFF↵                   | Zpf↵                                                                                                                                 | Delete the flash memory files from the user space on the unit. This includes backup and restore files, software configuration tools, image captures, user-supplied HTML files, and so on.   |
| Reset all device settings to factory default                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | [Esc]ZXXX↵                   | Zpx↵                                                                                                                                 | Reset product-specific settings, including verbose mode, to factory defaults.<br><b>Excludes</b> IP settings such as IP address, subnet mask, unit name, and gateway address and passwords. |

| Command                                                                                                                                                                                                                                                              | ASCII<br>(Host to Processor) | Response<br>(Processor to Host) | Description                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Resets (continued)</b>                                                                                                                                                                                                                                            |                              |                                 |                                                                                                                                                                                                                                                                                             |
| <b>Reset the Unit (continued)</b>                                                                                                                                                                                                                                    |                              |                                 |                                                                                                                                                                                                                                                                                             |
| Absolute system reset                                                                                                                                                                                                                                                | <b>Esc</b> ZQQQ←             | Zpq↵                            | Reset all device settings except the firmware version to factory defaults. The device password is reset to extron.                                                                                                                                                                          |
| Absolute system reset,<br>retaining IP                                                                                                                                                                                                                               | <b>Esc</b> ZY←               | Zpy↵                            | Reset all device settings except IP settings such as IP address, DHCP setting, global port timeout, and port mapping (telnet, web, and direct access) to preserve communication with the device (recommended after a firmware update). The serial port settings revert to factory defaults. |
| Restart network                                                                                                                                                                                                                                                      | <b>Esc</b> 2B00T←            | Boot2↵                          |                                                                                                                                                                                                                                                                                             |
| <b>NOTE:</b> This command is required after any changes are made to the IP address, subnet mask, DHCP, or gateway, unless the changes are made via a CISC command (see <a href="#">Set Multiple IP Parameters with a Single Command (CISC Commands)</a> on page 78). |                              |                                 |                                                                                                                                                                                                                                                                                             |

## Command and Response Table for IP SIS Commands

| Command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ASCII<br>(Host to Processor)                            | Response<br>(Processor to Host)                                                     | Additional Description                                                                                               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| <b>Serial Port Configuration — RS-232 Insertion over Ethernet</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                         |                                                                                     |                                                                                                                      |
| <b>NOTE:</b> These commands are available only when the TP mode is set to DTP on the input or output.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                         |                                                                                     |                                                                                                                      |
| Configure port parameters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <code>[Esc][X101]*[X125],[X126],[X127],[X128]CP←</code> | <code>Cpn[X101]•Ccp[X125],[X126],[X127],[X128]←</code>                              | Set the Remote RS-232 or DTP UART port [X101] parameters.                                                            |
| View serial port parameters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <code>[Esc][X101]CP←</code>                             | <code>[X125],[X126],[X127],[X128]←</code>                                           | View parameters of port [X101].                                                                                      |
| <b>KEY:</b> <div> <div>[X101] = Port number</div> <div>[X125] = Baud rate</div> <div>[X126] = Parity</div> <div>[X127] = Data bits</div> <div>[X128] = Stop bits</div> <div>1 = Remote RS-232 port (3-pole captive screw)</div> <div>2 = UART on DTP output</div> <div>9600 (default), 19200, 38400, or 115200</div> <div>Only the first letter is needed: O[dd], E[ven], N[one], S[pace]</div> <div>7 or 8 (default)</div> <div>1 (default) or 2</div> </div>                                                                                                                                                                                                                                                                                                       |                                                         |                                                                                     |                                                                                                                      |
| <b>Time, Date, and Time Zone Configuration</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                         |                                                                                     |                                                                                                                      |
| <b>Time Zone</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                         |                                                                                     |                                                                                                                      |
| List all time zones                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <code>[Esc]*TZON←</code>                                | <code>[X169]*[X170]←</code><br>...<br><code>[X169]*[X170]←</code>                   | View a list of available time zones ([X169]) and their descriptions ([X170]).                                        |
| Set time zone <sup>24</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <code>[Esc][X169]*TZON←</code>                          | <code>Tzon•[X169]*[X170]←</code>                                                    | Set time zone for the unit. The response is the time zone code ([X169]) and description ([X170]).                    |
| <b>NOTE:</b> Use the List all time zones command to determine the desired time zone code.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                         |                                                                                     |                                                                                                                      |
| View current time zone                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <code>[Esc]TZON←</code>                                 | <code>[X169]*[X170]←</code>                                                         | View the set time zone [X169] followed by zone description [X170].                                                   |
| View GMT offset                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <code>[Esc]CZ←</code>                                   | <code>[X103]←</code><br><i>In verbose modes 2 and 3:</i><br><code>Ipz[X103]←</code> | View Greenwich Mean Time (GMT) offset value [X103] for the MGP location (-12:00–14:00) in hours and minutes (hh:mm). |
| <b>KEY:</b> <div> <div>[X103] = Greenwich Mean Time (GMT) offset value</div> <div>[X169] = Time zone code</div> <div>[X170] = Time zone description</div> <div>GMT offset (-12.00 to +14.00) represents the time difference in hours and minutes (± hh:mm relative to Greenwich, England). The plus sign and leading zero are optional.</div> <div>The code is an acronym for the time zone (2-6 letters) (enter the List all time zones command to view a list of available time zones).</div> <div>The list of time zones is provided in the order of UTC offset.</div> <div>The UTC equivalent for a particular time zone as well as a general description of the geographical area. The description is formatted as {UTC offset} : {Location name}.</div> </div> |                                                         |                                                                                     |                                                                                                                      |

| Command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | ASCII<br>(Host to Processor)         | Response<br>(Processor to Host) | Additional Description                                                                                                                                                                                                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Time, Date, and Time Zone Configuration (continued)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                      |                                 |                                                                                                                                                                                                                                  |
| <b>Time and Date</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                      |                                 |                                                                                                                                                                                                                                  |
| Set time and date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>[Esc]</b> <b>[X113]</b> CT←       | Ipt• <b>[X113]</b> ↵            | <b>[X113]</b> is the local date and time. The set format is<br><i>MM/DD/YYHH:MM:SS</i> .<br>(The hours, minutes, and seconds can also be separated by periods.)<br><i>Examples:</i><br>11/13/06-10:54:00 or<br>11/13/06-10.54.00 |
| View time and date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>[Esc]</b> CT←                     | <b>[X113]</b> ↵                 | View date and time <b>[X113]</b> . The read format is:<br><i>Www, DD Mmm YYYY HH:MM:SS</i><br>(Www = day of the week). <i>Example:</i><br>Tue, 18 Nov 2006 18:19:33.                                                             |
| <b>Network Time Protocol (NTP)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                      |                                 |                                                                                                                                                                                                                                  |
| <b>NTP Enable</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                      |                                 |                                                                                                                                                                                                                                  |
| Enable, disable, or sync NTP to set the time <sup>24</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>[Esc]</b> <b>[X171]</b> NTEN←     | Nten <b>[X171]</b> ↵            | Set NTP status to <b>[X171]</b> .                                                                                                                                                                                                |
| View NTP status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>[Esc]</b> NTEN←                   | <b>[X171]</b> ↵                 | View NTP status <b>[X171]</b> .                                                                                                                                                                                                  |
| <b>NTP Server IP or Name</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                      |                                 |                                                                                                                                                                                                                                  |
| Set NTP IP address <sup>24</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>[Esc]</b> <b>[X114]</b> NTIP←     | Ntip <b>[X114]</b> ↵            | Set NTP server IP address <b>[X114]</b> .                                                                                                                                                                                        |
| Set NTP IP address to default <sup>24</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>[Esc]</b> •NTIP←                  | Ntip↵                           | Set the NTP IP address to an <b>empty string</b> (default).                                                                                                                                                                      |
| View NTP IP address                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>[Esc]</b> NTIP←                   | <b>[X114]</b> ↵                 | View the current NTP IP address.                                                                                                                                                                                                 |
| <b>NTP Port Selection</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                      |                                 |                                                                                                                                                                                                                                  |
| Set NTP port map <sup>24</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>[Esc]</b> N{port number}<br>PMAP← | PmapN {port number}↵            | Set the NTP port number.                                                                                                                                                                                                         |
| Reset NTP port map to default <sup>24</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>[Esc]</b> N123PMAP←               | PmapN00123↵                     | Reset the NTP port number to 00123, the default.                                                                                                                                                                                 |
| Disable the NTP port                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>[Esc]</b> N 0 123PMAP←            | PmapN00000↵                     | Disable the NTP port (set the port number to 00000).                                                                                                                                                                             |
| View NTP port mapping                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>[Esc]</b> N PMAP←                 | {port number}↵                  | View the number of the current NTP port.                                                                                                                                                                                         |
| <b>KEY:</b> <div> <div> <b>[X113]</b> = Local date and time </div> <div> <b>[X114]</b> = IP address </div> <div> <b>[X171]</b> = Network Time Protocol (NTP) setting </div> <div> <b>Set format:</b><br/> <i>MMM/DD/YY-HH:MM:SS</i><br/> Example: 06/21/20-10:54:12<br/> <b>View format:</b><br/> <i>Ddd, DD Mmm YYYY HH:MM:SS</i><br/> Example: Fri, 26 Sep 2008 18:19:33<br/> Format <i>nnn.nnn.nnn.nnn</i>). Leading zeros in each of the four fields are optional in setting values and are suppressed in returned values.<br/> Default: Empty string (enter a single space)<br/> 0 = Enabled, 1 = Disabled, 2 = Sync now </div> </div> |                                      |                                 |                                                                                                                                                                                                                                  |



| Command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ASCII<br>(Host to Processor)                                                                                                                                                 | Response<br>(Processor to Host)                         | Additional Description                                      |                   |                                                                                                                                                                              |                           |                                            |                               |                   |                    |                                                  |                          |                                                                                                                               |                               |                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------------------------|-------------------------------|-------------------|--------------------|--------------------------------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------|------------------------------------------------|
| IP Configuration (continued)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                              |                                                         |                                                             |                   |                                                                                                                                                                              |                           |                                            |                               |                   |                    |                                                  |                          |                                                                                                                               |                               |                                                |
| <b>NOTES:</b> <ul style="list-style-type: none"><li>Changes made to any TCP/IP settings do not take effect until the reboot network command (<b>Esc</b>2B00T↵) is issued.</li><li>IP address setup commands that are followed by <sup>24</sup> require administrator permission to enter. Attempts to issue them without administrator status result in an E24 (privilege violation) error message.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                              |                                                         |                                                             |                   |                                                                                                                                                                              |                           |                                            |                               |                   |                    |                                                  |                          |                                                                                                                               |                               |                                                |
| Set IP address <sup>24</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Esc</b> X114CI↵                                                                                                                                                           | Ipi • X114↵                                             | Set the IP address to X114.                                 |                   |                                                                                                                                                                              |                           |                                            |                               |                   |                    |                                                  |                          |                                                                                                                               |                               |                                                |
| View IP address                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Esc</b> CI↵                                                                                                                                                               | X114↵                                                   | View the current IP address.                                |                   |                                                                                                                                                                              |                           |                                            |                               |                   |                    |                                                  |                          |                                                                                                                               |                               |                                                |
| Set subnet mask <sup>24</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Esc</b> X119CS↵                                                                                                                                                           | Ips • X119↵                                             | Set the subnet mask to X119.                                |                   |                                                                                                                                                                              |                           |                                            |                               |                   |                    |                                                  |                          |                                                                                                                               |                               |                                                |
| View subnet mask                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Esc</b> CS↵                                                                                                                                                               | X119↵                                                   | View the subnet mask setting.                               |                   |                                                                                                                                                                              |                           |                                            |                               |                   |                    |                                                  |                          |                                                                                                                               |                               |                                                |
| Set gateway IP address <sup>24</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Esc</b> X114CG↵                                                                                                                                                           | Ipg • X114↵                                             | Set the gateway IP address to X114.                         |                   |                                                                                                                                                                              |                           |                                            |                               |                   |                    |                                                  |                          |                                                                                                                               |                               |                                                |
| View gateway IP address                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Esc</b> CG↵                                                                                                                                                               | X114↵                                                   | View the gateway IP address.                                |                   |                                                                                                                                                                              |                           |                                            |                               |                   |                    |                                                  |                          |                                                                                                                               |                               |                                                |
| View MAC address<br>(View-only)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Esc</b> CH↵                                                                                                                                                               | X118↵<br><i>In verbose modes 2 and 3:</i><br>Iph•X118↵  | View unit Media Access Code (MAC) address X118 of the unit. |                   |                                                                                                                                                                              |                           |                                            |                               |                   |                    |                                                  |                          |                                                                                                                               |                               |                                                |
| Reboot networking                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Esc</b> 2B00T↵                                                                                                                                                            | Boot2↵                                                  | Restart the network after IP setting or DHCP changes.       |                   |                                                                                                                                                                              |                           |                                            |                               |                   |                    |                                                  |                          |                                                                                                                               |                               |                                                |
| Set unit name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Esc</b> X112CN↵                                                                                                                                                           | Ipn • X112↵                                             | Assign a name for the unit.                                 |                   |                                                                                                                                                                              |                           |                                            |                               |                   |                    |                                                  |                          |                                                                                                                               |                               |                                                |
| Set unit name to factory default                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Esc</b> •CN↵                                                                                                                                                              | Ipn • X149↵                                             | Reset the unit name to its factory default name (X149).     |                   |                                                                                                                                                                              |                           |                                            |                               |                   |                    |                                                  |                          |                                                                                                                               |                               |                                                |
| View unit name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Esc</b> CN↵                                                                                                                                                               | X112↵                                                   | View current unit name X112.                                |                   |                                                                                                                                                                              |                           |                                            |                               |                   |                    |                                                  |                          |                                                                                                                               |                               |                                                |
| View session security level                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>Esc</b> CK↵                                                                                                                                                               | X152↵<br><i>In verbose modes 2 and 3:</i><br>Pvl X15@ J | View security level X152 of the current connection.         |                   |                                                                                                                                                                              |                           |                                            |                               |                   |                    |                                                  |                          |                                                                                                                               |                               |                                                |
| <b>KEY:</b> <table><tr><td>X114 = IP address</td><td>Format <i>nnn.nnn.nnn.nnn</i> (192.168.254.254 = default)<br/>Leading zeros in each of the four octets are optional in setting values, and are suppressed in returned values.</td></tr><tr><td>X114 = Gateway IP address</td><td><i>nnn.nnn.nnn.nnn</i> (0.0.0.0 = default)</td></tr><tr><td>X118 = Hardware (MAC) address</td><td>00-05-A6-xx-xx-xx</td></tr><tr><td>X119 = Subnet mask</td><td><i>nnn.nnn.nnn.nnn</i> (255.255.255.0 = default)</td></tr><tr><td>X149 = Default unit name</td><td>A combination of the model name and the last three character pairs of the unit MAC address. <i>Example:</i> MGP-641-00-02-3D)</td></tr><tr><td>X152 = Session security level</td><td>0 = Not logged in, 1 = User, 2 = Administrator</td></tr></table> |                                                                                                                                                                              |                                                         |                                                             | X114 = IP address | Format <i>nnn.nnn.nnn.nnn</i> (192.168.254.254 = default)<br>Leading zeros in each of the four octets are optional in setting values, and are suppressed in returned values. | X114 = Gateway IP address | <i>nnn.nnn.nnn.nnn</i> (0.0.0.0 = default) | X118 = Hardware (MAC) address | 00-05-A6-xx-xx-xx | X119 = Subnet mask | <i>nnn.nnn.nnn.nnn</i> (255.255.255.0 = default) | X149 = Default unit name | A combination of the model name and the last three character pairs of the unit MAC address. <i>Example:</i> MGP-641-00-02-3D) | X152 = Session security level | 0 = Not logged in, 1 = User, 2 = Administrator |
| X114 = IP address                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Format <i>nnn.nnn.nnn.nnn</i> (192.168.254.254 = default)<br>Leading zeros in each of the four octets are optional in setting values, and are suppressed in returned values. |                                                         |                                                             |                   |                                                                                                                                                                              |                           |                                            |                               |                   |                    |                                                  |                          |                                                                                                                               |                               |                                                |
| X114 = Gateway IP address                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <i>nnn.nnn.nnn.nnn</i> (0.0.0.0 = default)                                                                                                                                   |                                                         |                                                             |                   |                                                                                                                                                                              |                           |                                            |                               |                   |                    |                                                  |                          |                                                                                                                               |                               |                                                |
| X118 = Hardware (MAC) address                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 00-05-A6-xx-xx-xx                                                                                                                                                            |                                                         |                                                             |                   |                                                                                                                                                                              |                           |                                            |                               |                   |                    |                                                  |                          |                                                                                                                               |                               |                                                |
| X119 = Subnet mask                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <i>nnn.nnn.nnn.nnn</i> (255.255.255.0 = default)                                                                                                                             |                                                         |                                                             |                   |                                                                                                                                                                              |                           |                                            |                               |                   |                    |                                                  |                          |                                                                                                                               |                               |                                                |
| X149 = Default unit name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | A combination of the model name and the last three character pairs of the unit MAC address. <i>Example:</i> MGP-641-00-02-3D)                                                |                                                         |                                                             |                   |                                                                                                                                                                              |                           |                                            |                               |                   |                    |                                                  |                          |                                                                                                                               |                               |                                                |
| X152 = Session security level                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 0 = Not logged in, 1 = User, 2 = Administrator                                                                                                                               |                                                         |                                                             |                   |                                                                                                                                                                              |                           |                                            |                               |                   |                    |                                                  |                          |                                                                                                                               |                               |                                                |



| Command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ASCII<br>(Host to Processor)                 | Response<br>(Processor to Host)   | Additional Description                                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IP Configuration (continued)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                              |                                   |                                                                                                                                             |
| <b>NOTES:</b> <ul style="list-style-type: none"> <li>Changes made to any TCP/IP settings do not take effect until the reboot network command (<b>Esc</b>2B00T←) is issued.</li> <li>IP address setup commands that are followed by <sup>24</sup> require Administrator permission to enter. Attempts to issue them without Administrator status result in an E24 (privilege violation) error message.</li> </ul>                                                                                                                                     |                                              |                                   |                                                                                                                                             |
| <b>Ethernet Port Configuration (continued)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                              |                                   |                                                                                                                                             |
| Set web port map <sup>24</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Esc</b> W {port number}<br>PMAP←          | Pmap W {port number}←             | Set the web port number.                                                                                                                    |
| Reset web port map                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Esc</b> W 80 PMAP←                        | Pmap W 00080←                     | Set the web port number to 80 (default).                                                                                                    |
| Disable web port                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Esc</b> W 0 PMAP←                         | Pmap W 00000←                     | Disable the web port.                                                                                                                       |
| View web port mapping <sup>24</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Esc</b> W PMAP←                           | {port number}←                    | View the currently set web port.                                                                                                            |
| Set Telnet port map <sup>24</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>Esc</b> Z {port number}<br>PMAP←          | Pmap Z {port number}←             | Set the Telnet port number.                                                                                                                 |
| <b>NOTE:</b> Telnet port 23 is disabled by default.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                              |                                   |                                                                                                                                             |
| Reset Telnet port map                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Esc</b> Z 23 PMAP←                        | Pmap Z 00023←                     | Set the Telnet port number to 23 (default).                                                                                                 |
| Disable Telnet port                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Esc</b> Z 0 PMAP←                         | Pmap Z 00000←                     | Disable the Telnet port.                                                                                                                    |
| View Telnet port mapping <sup>24</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Esc</b> Z PMAP←                           | {port number}←                    | View the current Telnet port.                                                                                                               |
| <b>SIS-over-SSH</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                              |                                   |                                                                                                                                             |
| <b>NOTES:</b> <ul style="list-style-type: none"> <li>The echo setting must match the type of SSH client used. With echo <b>enabled</b> (default), characters that are typed into the client window are echoed in the window along with the SIS response, and are also sent to the server.</li> <li>With echo <b>disabled</b>, the characters are not echoed but are simply sent to the server.</li> <li>The echo setting applies only to current (not global) connection.</li> <li>Control systems should turn echo off after connecting.</li> </ul> |                                              |                                   |                                                                                                                                             |
| Enable echo (default)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Esc</b> 1ECHO←                            | Echo 1←                           | Echo on: All data sent is echoed back to the sender, followed by the response. Extra carriage returns may also be received when echo is on. |
| Disable echo                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>Esc</b> 0ECHO←                            | Echo 0←                           | Echo off: only the response is sent to the sender.                                                                                          |
| View echo status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Esc</b> ECHO←                             | <b>X10</b> ←                      | View the echo setting                                                                                                                       |
| Set SIS-over-SSH port map <sup>24</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Esc</b> B <b>X76</b> *{port number} PMAP← | PmapB• <b>X76</b> *{port number}← | Set the SIS-over-SSH port                                                                                                                   |
| Reset SIS-over-SSH port map <sup>24</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Esc</b> B <b>X76</b> *22023 PMAP←         | PmapB• <b>X76</b> *22023←         | Reset the SSH port to the default 22023.                                                                                                    |
| Disable SIS-over-SSH port <sup>24</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Esc</b> B <b>X76</b> *0 PMAP←             | PmapB• <b>X76</b> *00000←         | Disable the SIS-over-SSH port.                                                                                                              |
| View the SIS-over-SSH port <sup>24</sup> mapping                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Esc</b> B <b>X76</b> PMAP←                | {port number}←                    | View the current SIS-over-SSH port mapping.                                                                                                 |
| <b>KEY:</b> <div> <b>X10</b> = Echo status           <span style="margin-left: 100px;">0 = disabled, 1 = enabled (default)</span> </div> <div> <b>X76</b> = Network interface card (NIC) number           <span style="margin-left: 100px;">1-3</span> </div>                                                                                                                                                                                                                                                                                        |                                              |                                   |                                                                                                                                             |

| Command                                                                                                                                                                                                                                                                                                                                                                                                                | ASCII<br>(Host to Processor)                                                                                                                                                                                         | Response<br>(Processor to Host)                                                                                         | Additional Description                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| <b>Passwords</b>                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                      |                                                                                                                         |                                                         |
| <b>NOTE:</b> The initial passwords set at the factory are the serial number of the unit. However, if the unit is reset (via the ZQQQ SIS command or the rear panel <b>Reset</b> button), this password reverts to extron.                                                                                                                                                                                              |                                                                                                                                                                                                                      |                                                                                                                         |                                                         |
| Set administrator password <sup>24</sup>                                                                                                                                                                                                                                                                                                                                                                               | <code>[Esc][X133]CA←</code>                                                                                                                                                                                          | <code>Ipa•[X133]↵</code>                                                                                                | Set the administrator password to <code>[X133]</code> . |
| View administrator password                                                                                                                                                                                                                                                                                                                                                                                            | <code>[Esc]CA←</code>                                                                                                                                                                                                | <code>****↵</code> or <code>↵</code><br><i>In verbose modes 2 and 3:</i><br><code>Ipa•****↵</code> or <code>Ipa↵</code> | View the administrator password.                        |
| Reset administrator password <sup>24</sup>                                                                                                                                                                                                                                                                                                                                                                             | <code>[Esc]•CA←</code>                                                                                                                                                                                               | <code>Ipa•↵</code>                                                                                                      | Reset the administrator password to extron.             |
| Set user password <sup>14,24</sup>                                                                                                                                                                                                                                                                                                                                                                                     | <code>[Esc][X133]CU←</code>                                                                                                                                                                                          | <code>Ipu•[X133]↵</code>                                                                                                | Set the user password.                                  |
| View user password                                                                                                                                                                                                                                                                                                                                                                                                     | <code>[Esc]CU←</code>                                                                                                                                                                                                | <code>****↵</code> or <code>↵</code><br><i>In verbose modes 2 and 3:</i><br><code>Ipu•****↵</code> or <code>Ipu↵</code> | View the user password.                                 |
| Reset user password <sup>24</sup>                                                                                                                                                                                                                                                                                                                                                                                      | <code>[Esc]•CU←</code>                                                                                                                                                                                               | <code>Ipu•↵</code>                                                                                                      | Reset the user password to extron.                      |
| <b>KEY:</b><br><code>[X133]</code> = Password <ul style="list-style-type: none"> <li>Length is 1-128 characters.</li> <li>All human-readable characters are permitted except  .</li> <li>The password cannot be a single space.</li> <li>Passwords are case-sensitive.</li> </ul>                                                                                                                                      |                                                                                                                                                                                                                      |                                                                                                                         |                                                         |
| <b>NOTE:</b> If there is a valid password, the response is <code>****↵</code> . If there is no password, the response is <code>↵</code> .                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                      |                                                                                                                         |                                                         |
| <b>Network Shares</b>                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                      |                                                                                                                         |                                                         |
| Add a network share                                                                                                                                                                                                                                                                                                                                                                                                    | <code>[Esc]A{"service":"[X106]",<br/> "mountpoint":"[X107]",<br/> "username":"[X108]",<br/> "password":"[X109]",<br/> "options":"[X110]",<br/> "extron_share":"[X112]",<br/> "reconnect":"[X115]}"<br/> XNAS←</code> | Xnas<parameters & status in JSON format>↵                                                                               | Add or mount a network share.                           |
| <i>Example response:</i> XnasA{"username":"user1", "password":"****", "options":"ro", ...}↵                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                      |                                                                                                                         |                                                         |
| Unmount (remove) a share                                                                                                                                                                                                                                                                                                                                                                                               | <code>[Esc]X*[X107]XNAS←</code>                                                                                                                                                                                      | <code>XnasX*[X107]↵</code>                                                                                              |                                                         |
| Unmount (remove) all shares                                                                                                                                                                                                                                                                                                                                                                                            | <code>[Esc]X*0XNAS←</code>                                                                                                                                                                                           | <code>XnasX*0↵</code>                                                                                                   |                                                         |
| <b>KEY:</b><br><code>[X106]</code> = Service (network path of server)<br><code>[X107]</code> = Mount point (network shares)<br><code>[X108]</code> = Username (network shares)<br><code>[X109]</code> = Password (network shares)<br><code>[X110]</code> = Options (network shares)<br><code>[X112]</code> = Boolean for Extron share (network shares)<br><code>[X115]</code> = Boolean for reconnect (network shares) |                                                                                                                                                                                                                      |                                                                                                                         |                                                         |

| Command                           | ASCII<br>(Host to Processor)                                                                                                                                                                                               | Response<br>(Processor to Host)                                                                                                           | Additional Description |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| <b>Network Shares (continued)</b> |                                                                                                                                                                                                                            |                                                                                                                                           |                        |
| View all mounted shares           | <code>[Esc]GXNAS ←</code>                                                                                                                                                                                                  | <code>[List of shares in JSON format] ↵</code><br><i>In verbose modes 2 and 3:</i><br><code>XnasG[List of shares in JSON format] ↵</code> |                        |
| Example:                          | <pre>[{"options": "", "username": "", "password": "", "type": "nfs", "service": "10.0.0.0://home/bob/Videos", "mountpoint": "10.0.0.0", "extron_share": false, "status": "unavailable", "reconnect": true}, {...}] ↵</pre> |                                                                                                                                           |                        |

## Videowall Configuration Software (VCS) Program

The Extron VCS program is a PC-based program for the MGP 641 xi Series that provides a convenient way to configure the processor. System configuration is broken down into logical tasks, including output and wall configuration, source setup, window preset design, and EDID Minder. Online and offline editing allows creation and configuration of systems with or without an MGP connected.

Window presets are created by dragging and dropping sources onto a virtual representation of the videowall. Offline configuration allows for videowall configuration files to be created when the MGP is temporarily unavailable.

### Downloading VCS from the Website

To use the Videowall Configuration Software, download the latest version of the program from the Extron web page and install it on the PC that is to be connected to the MGP, as described in the following sections. You can also download updates to VCS as they become available. To access the software:

1. On the Extron website, hover the mouse pointer over the **Download** tab (see figure 25, ❶), then move the pointer to the **Software** link (❷) in the Downloads column and click it.

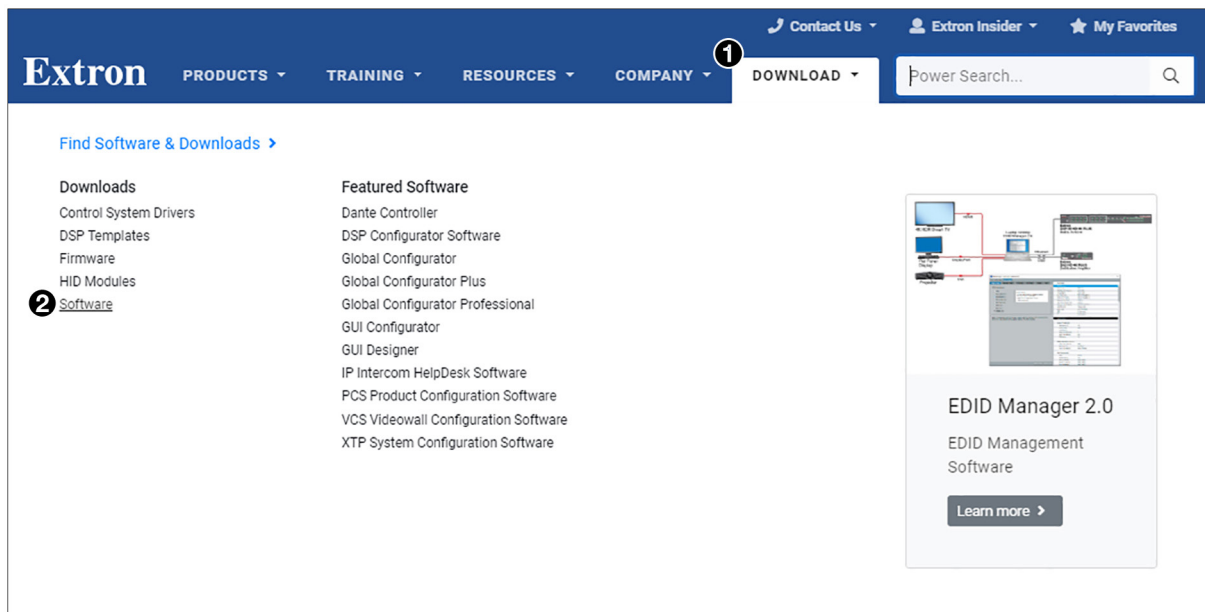
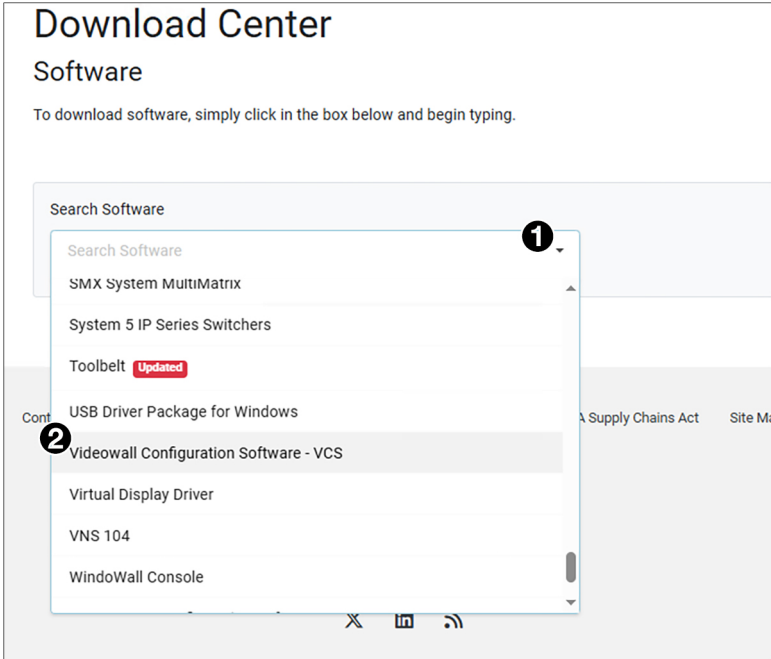


Figure 25. Software Link on the Download Page

2. On the Download Center screen, click on the down arrow in the **Search Software** box to see a list of the downloadable software (see figure 26, ❶). If you need an Extron Insider ID number to access this box, see your Extron representative.



**Figure 26. VCS Links on Download Center Page**

3. From the drop-down list, select Videowall Configuration Software - VCS (❷).
4. On the Videowall Configuration Software - VCS Download Center screen, click the link to the active VCS version (see figure 27, ❶). After a few seconds, a link to the VCS installer file in your Downloads folder appears.

## Videowall Configuration Software - VCS

Videowall Configuration Software

Extron VCS – Videowall Configuration Software is a universal application for configuring Extron 4K videowall processors. With this intuitive, time-saving software, Extron videowall products are configured using a common interface. System configuration is broken down into logical tasks, such as wall configuration, source setup, preset design, and EDID Minder for simplified integration. Online and offline editing allows creation and configuration of systems with or without an attached Quantum Ultra processor. Familiar editing controls streamline layering, aligning, and sizing of source windows. Live and Preview modes provide the option for immediate or controlled wall response to edits. With an intuitive workflow and familiar interface, VCS provides efficient configuration of any Extron 4K videowall processor.

VCS is a PC-based software application supporting Ethernet communication. Settings and preset changes within the software are automatically synchronized and stored on the videowall processor, allowing direct connection and control of the hardware using SIS commands. System maintenance is simplified with integrated connection status indicators and Quantum Ultra firmware update controls.

Active

| Version                           | Release Date | Release Notes                 |
|-----------------------------------|--------------|-------------------------------|
| ❶ 1.16.0 <a href="#">Download</a> | Jul. 8, 2024 | <a href="#">Release Notes</a> |

Summary

- Added Feature – IN4FOX3 and OUT4FOX3 boards – The IN4FOX3 and OUT4FOX3 boards are now shipping and supported by the firmware and VCS software.
- Added Feature – Quantum Ultra – Custom user accounts – An administrator can now define up to 50 total accounts for a project. User name, password, and account type are all editable.
- Added Feature – Quantum Ultra – Canvas permissions per user – Each user account in a project can now be granted or denied access to a canvas by an administrator.
- Added Feature – Quantum Ultra – Input source restrictions per canvas – Each canvas can have the source list reduced to display a subset of inputs only needed for that canvas.

Send Feedback

**Figure 27. VCS Download Center Screen**

- Click the link to locate the installer file, then follow the instructions on the screen to complete the VCS installation.

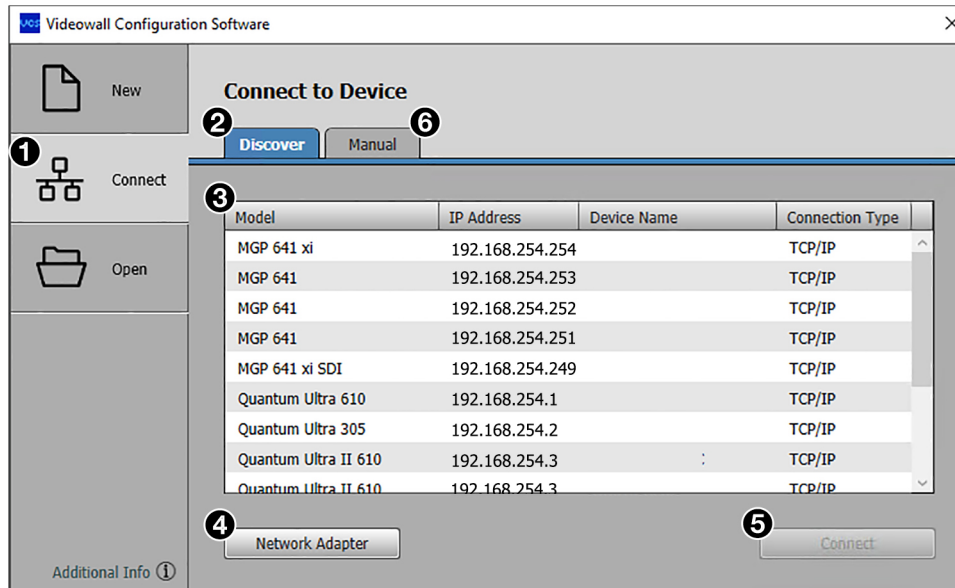
## Starting the Configuration Program

To start using the VCS program:

- Open the software program either by double-clicking the **VCS** icon (shown at right) if one was placed on your desktop during installation, or by clicking **Start > All Programs > Extron > Videowall Configuration Software**.

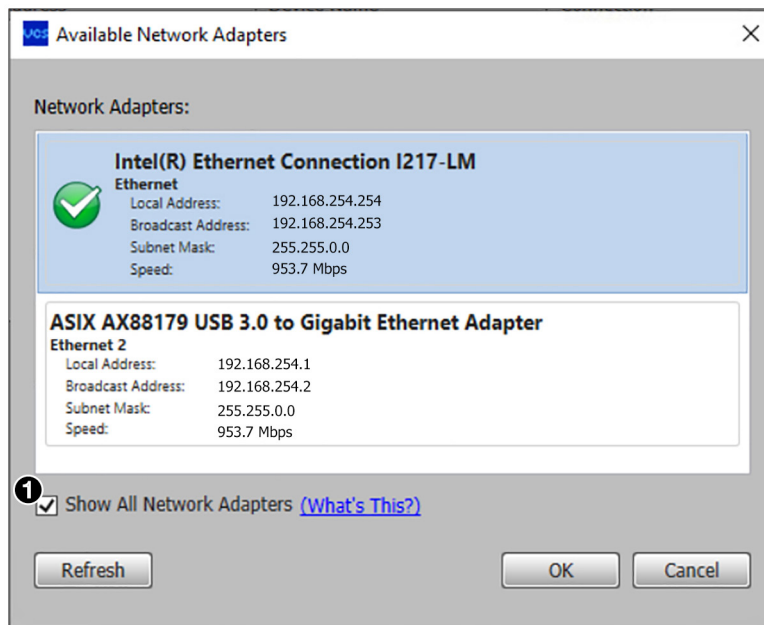


VCS opens with the Start screen for the MGP 641 xi Series. The **Connect** side tab (see figure 29, ①) is selected, and the Connect to Device panel on the Discover tab (②) is displayed. (The **New** and **Open** side tabs are not used by the MGP.)



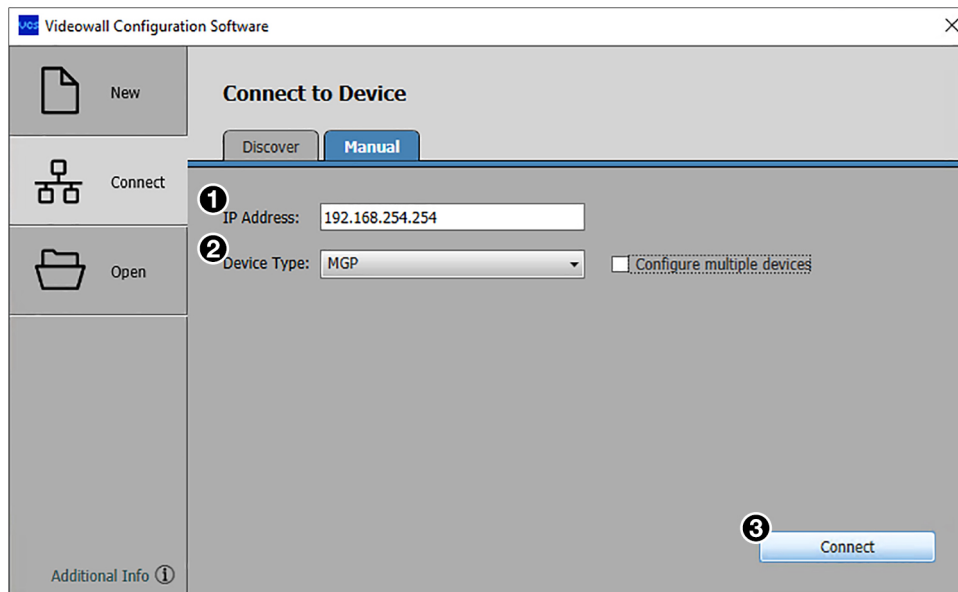
**Figure 28. Start Screen**

- In the Connect to Device panel (③), click on the MGP 641 xi to which you want to connect.
  - If necessary, click the **Network Adapter** button (④) to select an adapter to enable you to view more devices on the network.
    - On the Network Adapter screen, select the desired network adapter to use to connect to the MGP.
    - If no network adapters appear on the screen, select the **Show All Network Adapters** checkbox (see figure 29, ① on the next page).



**Figure 29. Network Adapter Screen**

- c. Click **OK** to confirm your selection. the Network Adapter screen closes.
- If the desired MGP does not appear in the Connect to Device panel:
  - a. Click the **Manual** tab (see [figure 28](#), [6](#) on page 83). The Manually Add Device window opens.



**Figure 30. Manually Add Device Window**

- b. In the **IP Address** field, enter the address of the MGP to be connected (see figure 30, [1](#)).
- c. Ensure that MGP is selected from the Device Type drop-down list ([2](#)).

**NOTE:** A unit added this way is **not** shown in the Select Devices to Add panel.

- Click the **Connect** button (see [figure 30](#), ③ on page 84) to connect to the device.  
The login screen opens.

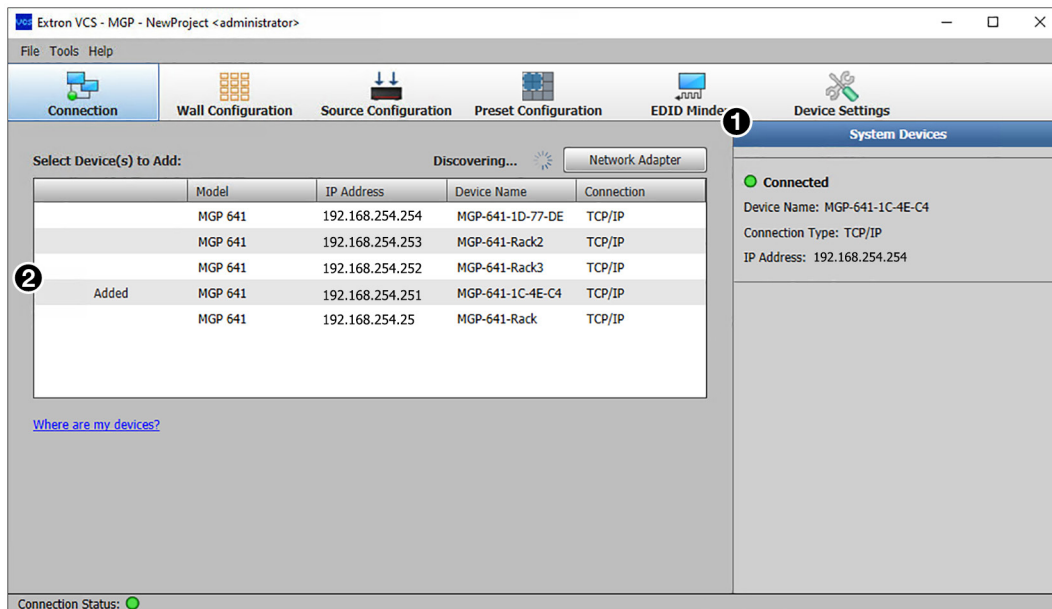


**Figure 31. VCS Login Screen**

- On the login screen:
  - In the **Username** field, enter the user name for the MGP. By default, this is admin.
  - In the **Password** field, enter the password for the MGP. By default, this is the serial number of the MGP (see the note below).

**NOTE:** The factory configured passwords for all accounts on this device are initially set to the device serial number. In the event of a complete system reset, the passwords convert to the default, which is extron.

- The main window appears, displaying the Connection screen with the selected device information and connection status displayed in the right (System Devices) panel (see [figure 32](#), ①). The designation Added (②) appears in front of the selected MGP in the Select Device(s) to Add panel.



**Figure 32. Connection Screen**

## Configuring multiple devices

To create a configuration with more than one MGP 641 xi Series processor, use the Manual tab of the Connect to Device screen to add devices to the configuration. A configuration can contain up to four devices (see the *VCS Help File* to add devices to a configuration).

**NOTE:** It is not possible to add devices to an existing configuration from the Select Device(s) to Add screen. You must create a new configuration manually.

For detailed instructions on using VCS to configure the videowall, see the *VCS Help File*.

# HTML Configuration and Control

The MGP 641 xi Series features an internal web server, displayed as a web page. This page allows you to monitor and adjust certain settings of the MGP via a LAN connection. Use a web browser to view the pages on a PC connected to the MGP LAN port.

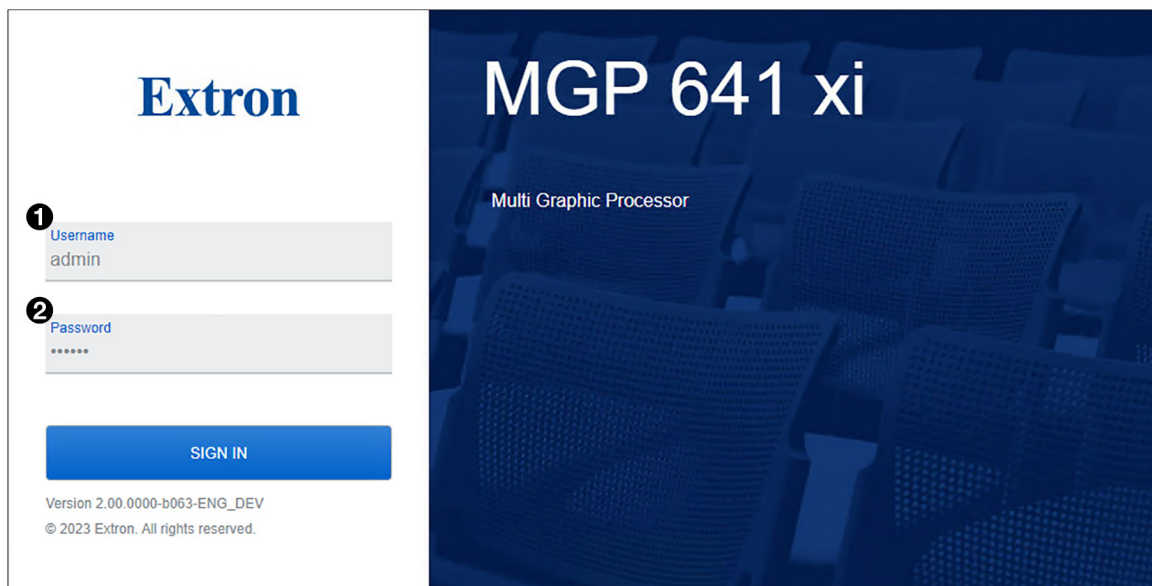
**NOTE:** The internal web page does not support compatibility mode in Microsoft® Internet Explorer®. Extron recommends using Microsoft Edge®, Mozilla® Firefox®, or Google Chrome™.

This section gives an overview of the internal web page, which is always available and cannot be erased or overwritten. Topics in this section include:

- [Accessing the Web Page](#)
- [Web Page Components](#)

## Accessing the Web Page

1. Connect the MGP to a LAN using the rear panel RJ-45 LAN connector (see [figure 5](#), ❶, on page 7).
2. Open a web browser on a connected PC.
3. Enter the IP address of the device in the browser **Address** field.
4. To access the web page via Ethernet over USB, enter **203.0.113.22** for the IP address.
5. Press the <Enter> key on the keyboard. The Sign in window opens (see figure 33).
6. In the **Username** field (see figure 33, ❶), enter admin or user (optional).



**Figure 33. Example of a Network Password Dialog Box**

7. Enter the password if one is assigned.

**NOTE:** The 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, these passwords are reset to extron.

To change the password, see [Passwords panel](#) on page 92.

8. Click the **Sign In** button (see figure 33, ❷).

# Web Page Components

The web page opens with the Device Utilities screen (figure 34 shows an example of an MGP 641 xi 5K web page):

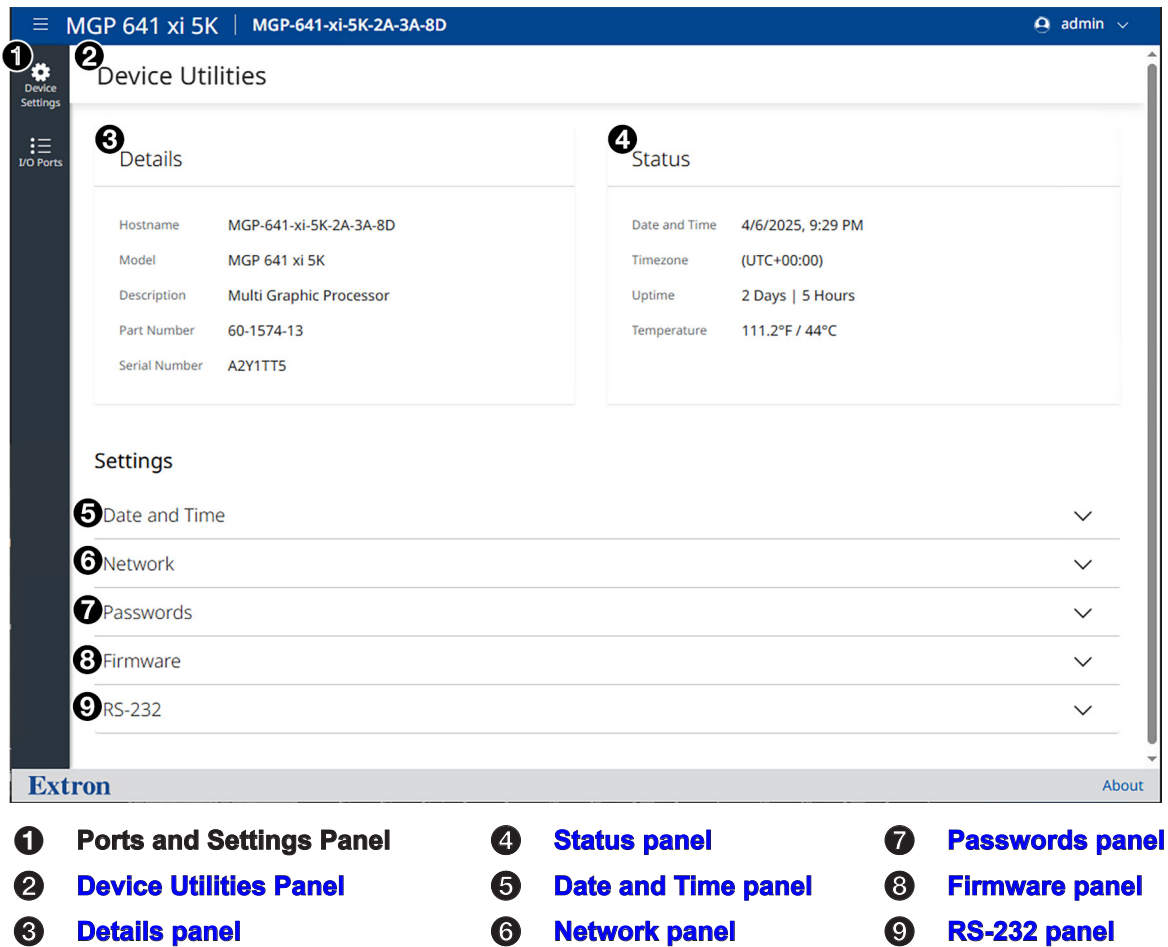


Figure 34. Internal Web Page

## Ports and Settings Panel

The Ports and Settings panel (see figure 34, **1**), contains icons you can click to display the following screens:

- **Device Utilities** — Displays the Details panel (**3**), containing general unit information, the Status panel (**4**), providing date and time and other unit status information, and the Settings panel, which provides access to the configurable system settings (**5** through **9**).
- **I/O Ports** — Provides information on all input and output ports on the unit (see [I/O Ports](#) on page 96 for details).

## Device Utilities Panel

The Device Utilities panel (see [figure 34](#), ② on page 88) contains the following items. To access any of the five Settings drop-down panels, click the down arrow to the right of its name to expand it. To collapse a settings panel when finished editing it, click the up arrow to the right of its name.

### Details panel

This view-only panel contains the following information about the unit (③):

- The unit name (Hostname)
- Product description (Multi Graphic Processor)
- Model (MGP 641 xi, MGP 641 xi SDI, MGP 641 xi 5K, or MGP 641 xi 5K SDI)
- Part number (60-1574-11 [MGP 641 xi], 60-1574-12 [MGP 641 xi SDI], 60-1574-13 [MGP 641 xi 5K], or 60-1574-14 [MGP 641 xi 5K SDI])
- Unit serial number

### Status panel

This view-only panel contains the following unit status information (④):

- The current date and time (These settings can be configured via the Date and Time panel, see Date and Time settings.)
- The time zone in which the unit is operating (This setting can be configured via the Date and Time panel, see Date and Time settings.)
- The unit internal temperature in Fahrenheit and Celsius
- Uptime — The amount of days and hours the unit has been running

### Date and Time panel

The following settings are available via the Date and Time panel:

#### *Syncing the date and time on the MGP to the PC*

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

Click the **SYNC TO PC** button (see [figure 35](#), ①). (Clicking the **EDIT** button first is optional.) When the sync is completed, the current date and time appear in the **Date | Time** field, followed by a green check mark (②).

The screenshot shows a web interface titled "Date and Time". Below the title is a section "Set Date & Time" with a "Manual" option selected. Under "Manual", there is a "Date | Time" field displaying "04/21/23 11:36 AM" followed by a green checkmark (②). At the bottom, there are two buttons: "EDIT" (③) and "SYNC TO PC" (①). The "SYNC TO PC" button is highlighted in blue.

Figure 35. Syncing MGP Date and Time to the PC

## Editing the date, time, and time zone manually

To set the date, time, or time zone manually:

1. In the Date and Time panel, click the **EDIT** button (see [figure 35](#), ③ on page 89).

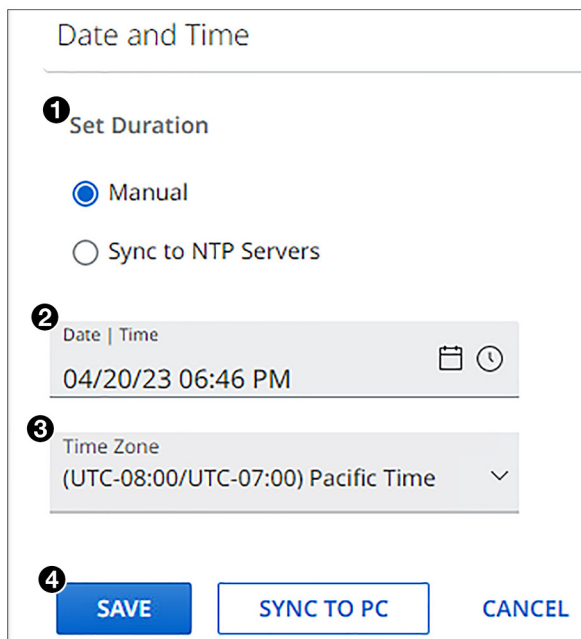


Figure 36. Date and Time Editing Panel

2. Under Set Duration, select **Manual**.
3. On the Date and Time editing panel, set the time, date, and time zone as desired:
  - **Date and Time** — In the **Date | Time** field (1), either click on the hour and minute text fields and type in the time, or click the **Datepicker** (see figure 37, ①) or **Timepicker** (②) icon to display the following panels:

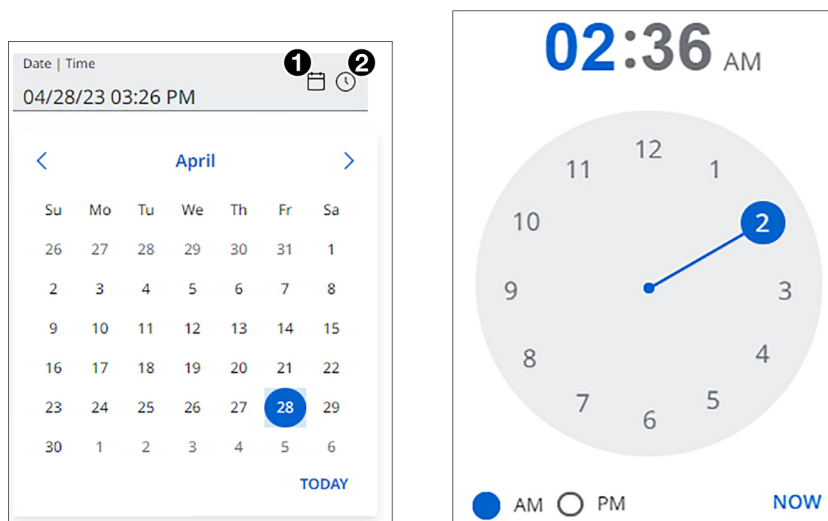


Figure 37. Datepicker and Timepicker Screens

- **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 for the MGP from the drop-down menu (see [figure 36](#), ③ on page 90).
4. When finished entering settings, click **SAVE** (④) to confirm them, or **CANCEL** to close the dialog box without implementing the settings.

## Syncing to NTP servers

To set the date, time, and time zone by syncing the MGP with a network server:

**Figure 38. Syncing the MGP 641 xi to Network Servers**

1. Select the **Sync to NTP Servers** radio button.
2. If desired, select the time zone for the MGP from the Time Zone drop-down list (see [figure 38](#), ②).
3. Enter the IP addresses of up to three network servers from which the MGP can obtain the date and time (③).
4. Click **SAVE** (④).

When syncing to NTP servers is enabled, the MGP syncs to the server at the address entered in the NTP Server #1 space. If it fails to connect to server #1, it tries server #2, then server #3.

## Network panel

In the Network panel you can set the hostname, IP address, subnet mask, and gateway address for your MGP, and turn DHCP on and off. You can also view the MAC address of the unit. To set the IP addresses:

1. Click the down arrow at the right of the **Network** field to view the network settings.

The screenshot shows the 'Network' configuration window. At the top is a title bar with 'Network' and a close button. Below are several fields: 'Device Name / Hostname' with the value 'MGP-641-xi' (callout 1), a 'DHCP' toggle switch currently in the 'Off' position (callout 2), 'IP Address' with '192.168.254.254' (callout 3), 'Subnet Mask' with '255.255.255.0' (callout 4), 'Default Gateway' with '0.0.0.0' (callout 5), and 'DNS Server' with '0.0.0.0' (callout 6). At the bottom, the 'MAC Address' is displayed as '00-05-A6-25-C4-6B'. At the very bottom are 'SAVE' and 'CANCEL' buttons (callout 7).

**Figure 39. Edit Network Settings Screen**

2. Edit the network settings as desired:
  - **Device Name / Hostname** — Enter a name for the unit (see figure 39, ❶).
  - **DHCP** — Click the **DHCP** button (❷) 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 (❸)**, **Subnet Mask (❹)**, **Default Gateway address (❺)**, **DNS Server (❻)** — To set any of these addresses, click in the desired field and enter the address.
3. When finished editing, click **SAVE** (❷) 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.

## Passwords panel

### NOTES:

- The 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, these passwords are reset to the default password, which is extron.
- If the device is reset via [Use Factory Firmware Settings](#), the admin and user passwords are both reset to extron (see [Resetting](#) on page 38).

To set admin and optional user passwords on the MGP, click the down arrow to the right of Passwords to display the settings.

**NOTE:** The following rules apply to passwords:

- Length is 1-128 characters.
- All human-readable characters are permitted except |.
- A default administrator password (admin) is preassigned.
- The administrator password can be changed, but it cannot be removed. A user password can be deleted by entering a single space as the password.

### ***Assigning an administrator password***

1. In the Passwords panel, click **EDIT**. The password settings are displayed.

**Figure 40. Passwords Panel**

2. In the Admin Password field (see figure 40, ①), enter the new administrator password. The password appears as masked characters. To see the actual characters, select the **Show Password** checkbox.
3. In the Confirm Admin Password field (②), reenter the password from the Admin Password field.
4. Click the blue **CREATE** button (③). (You may need to click this button again to make it available.)  
The MGP 641 xi web page closes and the login page is displayed.
5. Enter the username (the default is **Admin**) and the new password to access the MGP 641 xi web page.

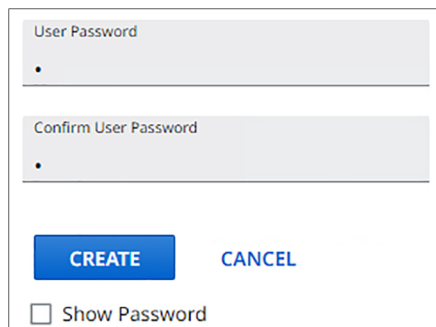
### ***Assigning a user password (optional)***

1. To assign a user password, click **EDIT** (④) in the User Password panel.
2. Repeat steps 2 through 4 in the User panel.

### ***Resetting an assigned admin password to default***

1. In the Admin Password field, enter a single space.
2. Enter a single space in the Confirm Admin Password field.
3. Click **Create**. The password is reset to the default password, which is extron.

### To remove a user password:



The screenshot shows a web interface for removing a user password. It features two input fields: 'User Password' and 'Confirm User Password'. Both fields contain a single bullet point, representing a space character. Below the fields are two buttons: 'CREATE' (highlighted in blue) and 'CANCEL'. At the bottom, there is a checkbox labeled 'Show Password' which is currently unchecked.

**Figure 41. Removing a User Password**

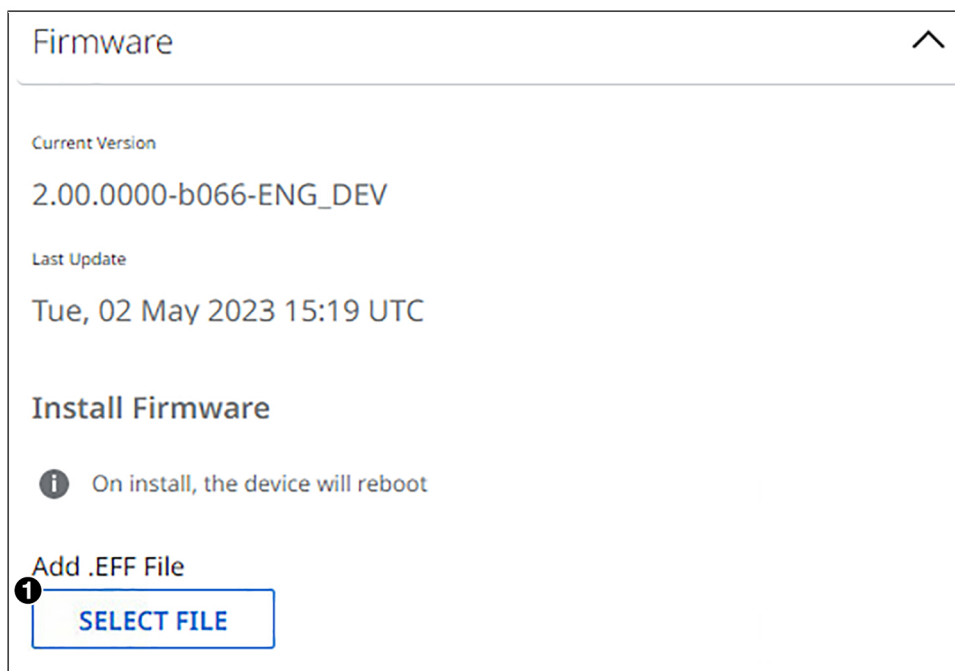
1. In the **User Password** field, enter a single space.
2. Enter a single space in the **Confirm User Password** field.
3. Click **SAVE**. The password is deleted.

### Firmware panel

The **Firmware** panel displays the current firmware version and the date it was last updated. You can update the firmware on your MGP from this panel (firmware files can be downloaded from [www.extron.com](http://www.extron.com), see [Downloading the Firmware](#) on page 101).

To update firmware:

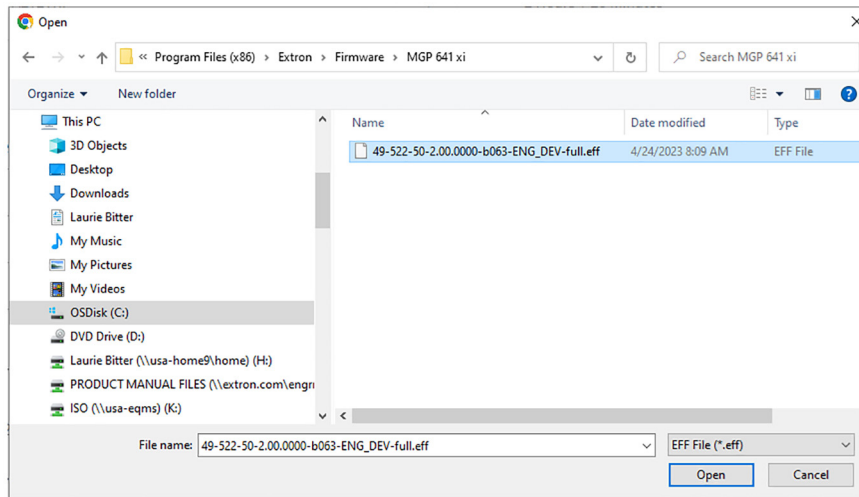
1. In the **Firmware** panel, click the **Select File** button (see figure 42, **1**).



The screenshot shows the 'Firmware' panel. At the top, the title 'Firmware' is displayed with an upward arrow icon. Below the title, the 'Current Version' is shown as '2.00.0000-b066-ENG\_DEV'. The 'Last Update' is shown as 'Tue, 02 May 2023 15:19 UTC'. Under the heading 'Install Firmware', there is an information icon and the text 'On install, the device will reboot'. At the bottom, there is a section labeled 'Add .EFF File' with a blue button labeled 'SELECT FILE' circled in red with a '1' next to it.

**Figure 42. SELECT FILE Button on the Firmware Panel**

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).

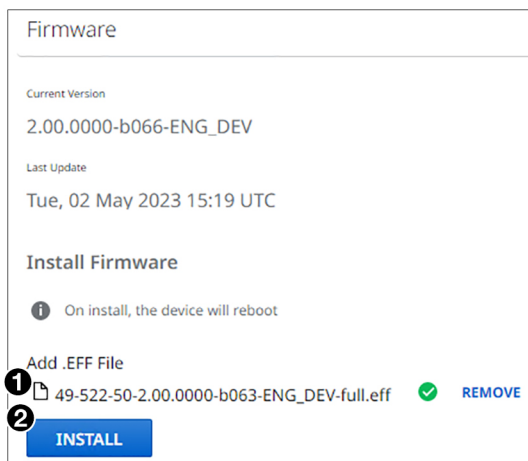


**Figure 43. Open Window for MGP 641 xi Firmware**

**ATTENTION:**

- Valid firmware files must have an .eff file extension. A file with any other extension is not a firmware upgrade for this device and could cause the unit to stop functioning.
- Les fichiers firmware valides doivent contenir l'extension fichier .eff. Un fichier avec n'importe quelle autre extension n'est pas une mise à jour de firmware pour cet appareil et l'appareil pourrait arrêter de fonctionner.

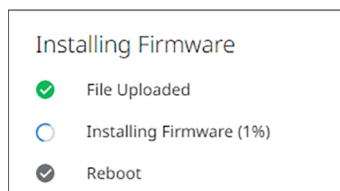
3. Double-click the firmware file name. The Open window closes, and the firmware file name appears in the Update Firmware panel on the web page (see figure 44, ❶).



**Figure 44. Firmware Update Dialog Box with a Firmware File Selected**

- Click **Install** (2) to begin uploading the firmware. (If you want to cancel the update, click the X button in the upper-right corner of the Update Firmware panel.)

The Installing Firmware window opens, containing three indicators that show the progress of the update: File Uploading, Installing Firmware, and Rebooting (see figure 45).



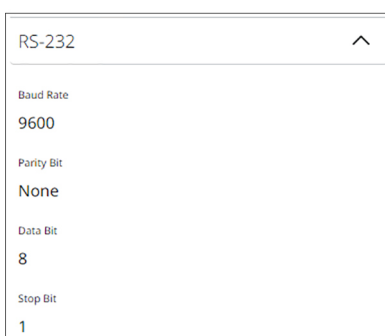
**Figure 45. Firmware Update Progress Window**

**NOTE:** While the firmware is uploading and rebooting, do not press any front panel buttons or make any selections on the web pages.

When the update is complete, the unit restarts, and the login web page is displayed. After you log in, the new firmware filename appears under Current Version in the Firmware panel of the web page.

## RS-232 panel

The view-only RS-232 panel (see figure 46) displays the RS-232 protocol for the MGP 641 xi Series serial port (see figure 5, K on page 10).



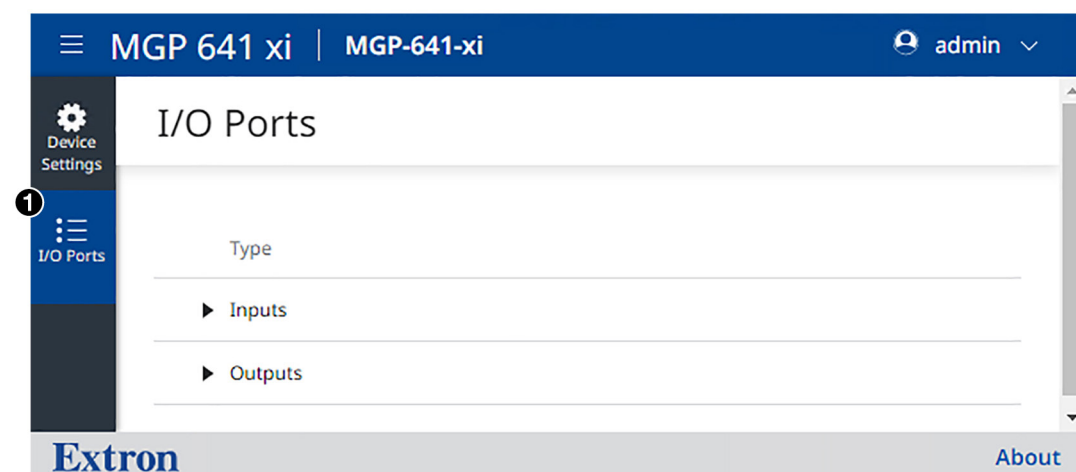
The defaults are:

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

**Figure 46. RS-232 Panel**

## I/O Ports

The I/O Ports screen contains two read-only drop-down panels on which to view information on the MGP input and output ports. To view this screen, click the **I/O Ports** button in the left panel (see figure 47, 1).



**Figure 47. I/O Ports Screen**

## Inputs panel

To expand the Inputs panel, click the arrow to the left of Inputs (see figure 48, ❶). The panel displays the input number, HDCP status, signal format, and resolution and refresh rate of the four video inputs and the live background input.

| Type            |                                                                                   |        |                           |
|-----------------|-----------------------------------------------------------------------------------|--------|---------------------------|
| ❶ ▼ Inputs      |                                                                                   |        |                           |
|                 | HDCP Status                                                                       | Format | Resolution & Refresh Rate |
| Video Input 1   |  | HDMI   | 3840x2160 @ 59.94 Hz      |
| Video Input 2   |  | HDMI   | 3840x2160 @ 60 Hz         |
| Video Input 3   |  | HDMI   | 3840x2160 @ 60 Hz         |
| Video Input 4   |  | HDMI   | 3840x2160 @ 60 Hz         |
| Live Background | No Signal                                                                         | HDMI   | 0x0 @ 0 Hz                |
| ▶ Outputs       |                                                                                   |        |                           |

**Figure 48. Inputs Panel**

The following indicators may appear in the HDCP Status column for a connected input:

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

When finished viewing the input information, click the **Inputs** arrow again to collapse the panel.

## Outputs Panel

To expand the Outputs panel, click the arrow to the left of Outputs (see figure 49, ❶). The Outputs panel displays the HDCP status, signal format (HDMI, DTP, or DVI) and resolution and refresh rate of the two outputs.

| ❶ ▼ Outputs |                                                                                     |        |                           |
|-------------|-------------------------------------------------------------------------------------|--------|---------------------------|
|             | HDCP Status                                                                         | Format | Resolution & Refresh Rate |
| Output 1A   |  | DVI    | 1080p @ 60Hz              |
| Output 1B   |  | DTP    | 1080p @ 60Hz              |

**Figure 49. Outputs Panel**

The following status symbols may be displayed for the outputs:

| Symbol                                                                              | Definition                                         |
|-------------------------------------------------------------------------------------|----------------------------------------------------|
|  | The display is HDCP compliant (follows input).     |
|  | The display is not HDCP compliant (follows input). |
| No Display                                                                          | No display is connected.                           |

# Reference Information

This section provides reference information on the MGP Products. Topics include:

- [Best Practices for Cleaning Your Extron Products](#)
- [Mounting the MGP 641 xi Series Processor](#)
- [Updating the Firmware](#)

## Best Practices for Cleaning Your Extron Products

Depending on the device, application, and location, there may be times when it becomes necessary to clean your Extron product. Frequently touched devices, such as touchscreens and button panels, require regular cleaning to ensure their surfaces remain sanitary. Plastic surfaces and cosmetic finishes can be damaged by long term exposure to chemicals. Therefore, Extron recommends the following guidelines when cleaning our products.

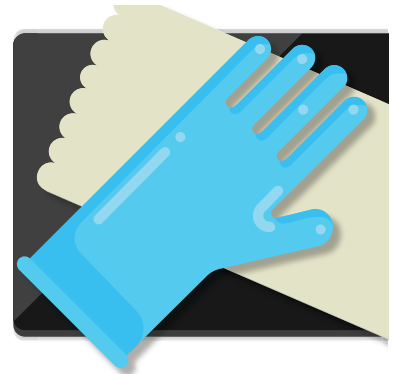
All Extron products can be safely cleaned with:

- 70% concentration or higher Isopropyl Alcohol
- Disinfectant cleaners that:
  - Are non-ammonium based (for example, contains no ammonium chloride).
  - Contain 2% or less sodium hypochlorite (for example, 2% bleach, 98% water).

Regardless of the device, it is important to follow these general guidelines when cleaning:

1. If possible, unplug the device.
2. Spray the cleaner on a lint-free cloth until the cloth is damp.
3. Do not spray the cleaner directly onto the product.
4. Gently clean the product surface using the cloth.

Your health and safety are an Extron priority. Keeping devices clean, especially those in high-traffic environments and high-use applications, is a crucial step in minimizing the spread of infections. Please contact Extron if you have any questions about the guidelines outlined in this section or if you have a question about cleaning a specific Extron product.



## Mounting the MGP 641 xi Series Processor

### Tabletop Use

Four self-adhesive rubber feet are included with the MGP 641 xi Series. For tabletop use, attach one foot to each corner of the bottom side of the unit and place the unit in the desired location.

## Rack Mounting

The MGP 641 xi Series can be mounted to a standard 19-inch rack shelf. Mounting kits are available at [www.extron.com](http://www.extron.com). To mount the unit, see the instructions provided with the kit.

### UL guidelines for rack mounting

The following Underwriters Laboratories (UL) guidelines pertain to the safe installation of the MGP 641 xi Series in a rack.

#### CAUTION:

- **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 temperature. Therefore, install the equipment in an environment compatible with the maximum ambient temperature (TMA = +122 °F, +50 °C) specified by Extron.
- **Reduced air flow** — Install the equipment in a rack so that the amount of air flow required for safe operation of the equipment is not compromised.
- **Mechanical loading** — When mounting the equipment in the rack, ensure that uneven mechanical loading does not cause a hazardous condition.
- **Circuit overloading** — When connecting the equipment to the supply circuit, consider 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 (for example, use of power strips).

### Consignes UL pour le Montage en Rack

Les consignes UL (« Underwriters Laboratories ») suivantes concernent l'installation en rack d'un boîtier MGP 641 xi Series :

#### ATTENTION :

- **Température ambiante élevée** — En cas d'installation de l'équipement dans un rack fermé ou composé de plusieurs unités, la température du rack peut être supérieure à la température ambiante. Par conséquent, il est préférable d'installer l'équipement dans un environnement qui respecte la température ambiante maximale (Tma) spécifiée par Extron.
- **Réduction du flux d'air** — Si l'équipement est installé dans un rack, veillez à ce que le flux d'air nécessaire pour un fonctionnement sécurisé de l'équipement soit respecté.
- **Charge mécanique** — Installez l'équipement en rack de manière à éviter toute situation dangereuse causée par le déséquilibre de la charge mécanique.
- **Surcharge électrique** — Lorsque vous connectez l'équipement au circuit d'alimentation, observez la connexion de l'équipement et étudiez les effets possibles d'une surcharge du circuit sur les protections contre les surintensités et les conducteurs d'alimentation. Consultez à cet égard les indications de la plaque d'identification de l'équipement.
- **Mise à la terre** — Assurez-vous que l'équipement est correctement mis à la terre. Accordez une attention particulière aux connexions électriques autres que les connexions directes au circuit de dérivation (ex. : les multiprises).

## Updating the Firmware

Updates to the Extron MGP 641 xi Series Multi-Graphic Processor firmware are made available periodically via the Extron website. If the need arises, you can replace the MGP main firmware via an IP connection without opening the unit.

### Determining the Firmware Version

There are three ways to check which version of firmware the MGP is using: view the front panel LCD window during power-on, the Firmware panel of the MGP 641 xi Series embedded web page, or the Device Settings tab in VCS.

#### Using the LCD display at Power-on

Watch the LCD window as you connect the MGP 641 xi Series to a power source. The third introductory screen (see figure 50, ❶) contains device part number and the firmware version and build.

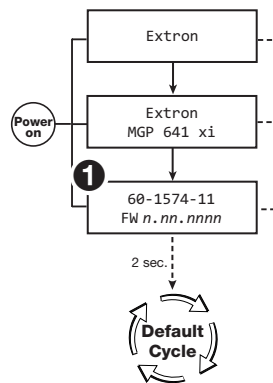


Figure 50. Displaying the Firmware Version at Power-up

#### Using the web page

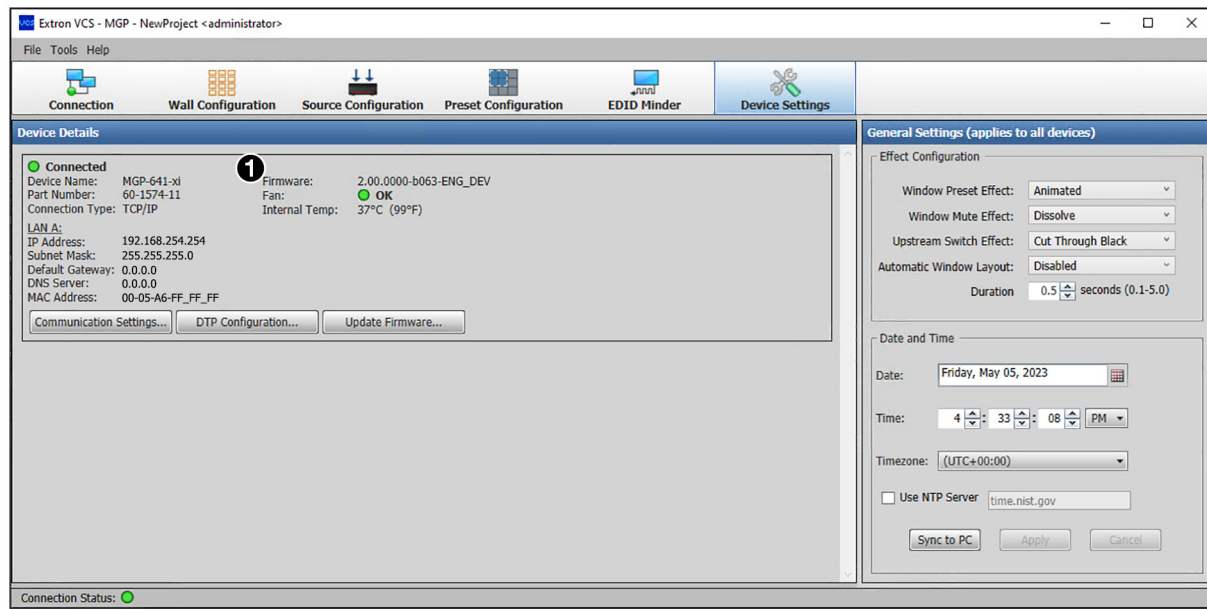
The MGP 641 xi Series comes from the factory with a default embedded web page. The Firmware panel displays the firmware version of your unit, as well as an **Update** button which enables you to update the firmware on your MGP (see [Firmware panel](#) on page 94).

#### Using the configuration software

To view the firmware version number from VCS:

1. Open the VCS program on your computer (see [Videowall Configuration Software \(VCS\) Program](#) starting on page 81 to obtain and open VCS).

- On the VCS screen, select the **Device Settings** tab (see figure 51, ❶).



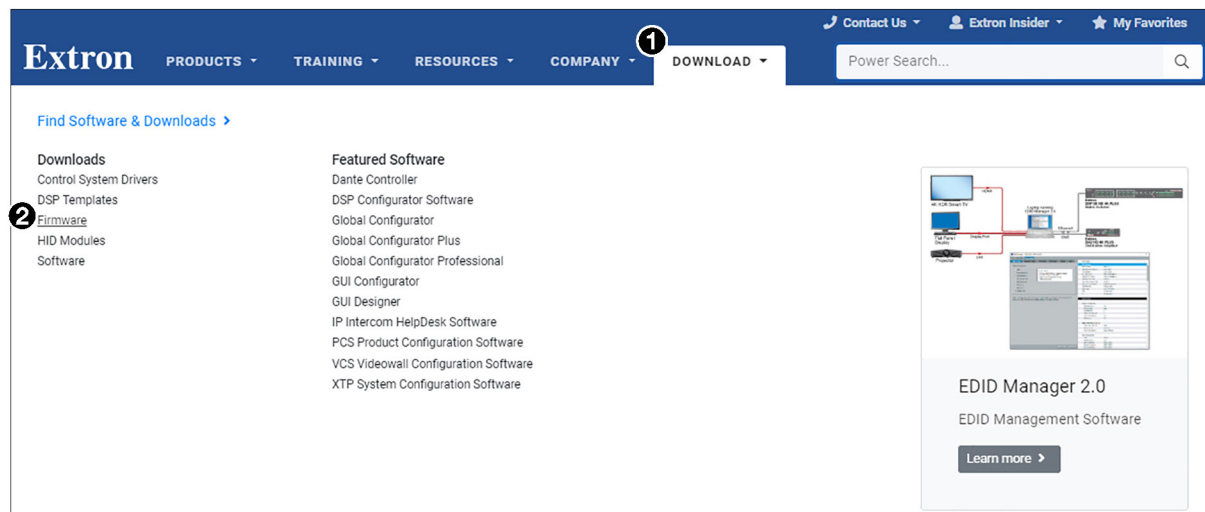
**Figure 51. Firmware Version on Device Settings Screen**

- On the Device Settings screen, locate **Firmware** (❷) in the last column of information. The current firmware version and build are displayed (see the *VCS Help File* to update firmware using VCS).

## Downloading the Firmware

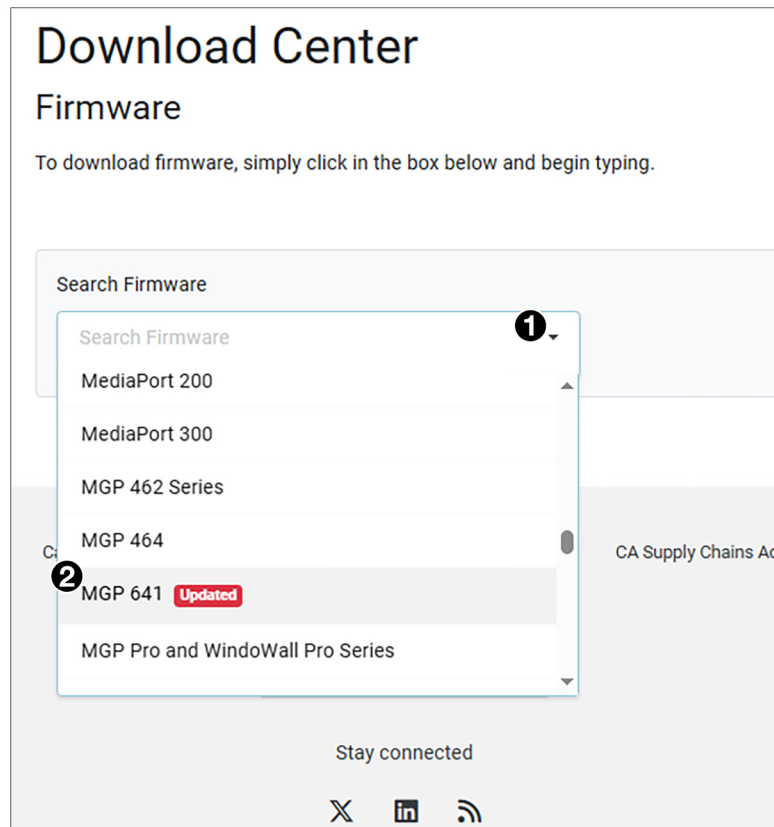
To obtain the latest version of MGP 641 xi Series firmware file and install it on your computer:

- On the Extron website, hover the mouse pointer over the **Download** tab (see figure 52, ❶), then move the pointer to the **Software** link (❷) in the Downloads column and click it.



**Figure 52. Downloading Firmware from the Extron Website**

2. On the Download Center screen, click on the down arrow in the **Search Software** box to see a list of the downloadable software (see figure 53, ①). If you need an Extron Insider ID number to access this box, see your Extron representative.



**Figure 53. VCS Links on Download Center Page**

3. From the drop-down list, select **MGP 641** (②) .
4. On the MGP 641 firmware Download Center screen, click the link to the active firmware version. After a few seconds, a link to the firmware installer file in your Downloads folder appears.
5. Click the link to the installer file, then follow the instructions on the screens to install the firmware.

## Uploading the Firmware to the MGP 641 xi Series

After you have installed the new firmware on your computer, you must upload it to the MGP. Firmware uploads can be performed via the MGP 641 xi Series internal web page (see [Firmware panel](#) on page 94) or the VCS program (see the *VCS Help File*).

**ATTENTION:** Valid firmware files must have the file extension .eff. A file with any other extension is not a firmware upgrade for this device and could cause the MGP to stop functioning.

The computer and the MGP must both be connected to an Ethernet network in order to update the main firmware. It is recommended that you always perform firmware upgrades via an IP connection.

**NOTE:** Check the [Extron website](#) for firmware-related documents, instructions, patch files, and new firmware files before loading new firmware into the unit.

# **Extron Warranty**



Extron warrants its powered products against defects in materials and workmanship for a period of three years from the date of invoice. In the event of malfunction during the warranty period, Extron will repair or replace a product to whatever extent it shall deem necessary to restore the product to proper operating condition.

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 non-Extron authorized modification to the product. 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.

## **Powered Warranty Exception**

**Everlast™ Power Supplies** — Extron warrants Everlast power supplies against any defects in materials and workmanship for a period of seven years from the date of invoice. In the event of a malfunction during the warranty period, Extron will repair or replace the power supply to its original operating condition. Extron engineers will examine the returned product and determine whether the Everlast Power Supply Warranty or Powered Product Warranty applies.

**Speakers** — Extron warrants Flat Field®, SoundField®, SpeedMount®, Column Array, and System INTEGRATOR® speakers against any defects in materials and workmanship for a period of five years from the date of invoice.

**Touchscreens** — Extron warrants touchscreen display and overlay components against any defects in materials and workmanship for a period of one year from the date of invoice.

**Annotator 300** — Extron warrants the Annotator 300 against any defects in materials and workmanship for a period of five years from the date of invoice.

## **Non-Powered Warranty Exception**

**Cable Cubby, Hideaway Surface Access Enclosures and Retractors** — Extron warrants Cable Cubby cable access enclosures, HSA Hideaway Surface Access enclosures, and Retractor cable retraction modules for a period of three years from the date of invoice.

**Active Cables and Active Adapters** — Extron warrants active cables and active adapter cables for a period of three years from the date of invoice.

**Cable Termination Tools and Dies** — Extron warrants cable termination tools for a period of three years from the date of invoice, excluding the die.

## **Return Information**

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.

**NOTE:** To assure the highest level of service, a return authorization number must be obtained from Extron before products are returned for service. Products must be shipped to Extron, prepaid along with proof of purchase **only** after obtaining a Return Authorization (RA) number from the Extron Customer Support department.

Please contact Extron to receive an RA (Return Authorization) number:

**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 and Middle East:** 971.4.299.1800

**Worldwide Headquarters: Extron USA West, 1025 E. Ball Road, Anaheim, CA 92805, 800.633.9876**