



# CPLUS-2H1HLR

UHD+ 2x1 HDMI Video Wall Rotation



Operation Manual

**HDMI®**  
HIGH-DEFINITION MULTIMEDIA INTERFACE

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## SAFETY PRECAUTIONS

Please read all instructions before attempting to unpack, install or operate this equipment and before connecting the power supply. Please keep the following in mind as you unpack and install this equipment:

- Always follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.
- Never spill liquid of any kind on or into this product.
- Never push an object of any kind into this product through any openings or empty slots in the unit, as you may damage parts inside the unit.
- Do not attach the power supply cabling to building surfaces.
- Use only the supplied power supply unit (PSU). Do not use the PSU if it is damaged.
- Do not allow anything to rest on the power cabling or allow any weight to be placed upon it or any person walk on it.
- To protect the unit from overheating, do not block any vents or openings in the unit housing that provide ventilation and allow for sufficient space for air to circulate around the unit.
- Please completely disconnect the power when the unit is not in use to avoid wasting electricity.

## VERSION HISTORY

REV.	DATE	SUMMARY OF CHANGE
<b>RDV1</b>	2020/09/04	Preliminary release
<b>RDV2</b>	2020/12/14	Add Phase 2 features: Chroma key, Cropping
<b>RDV3</b>	2020/12/28	Added Default and Preset Update to software



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## 1. INTRODUCTION

This UHD<sup>+</sup> 2×1 HDMI Video Wall Rotation processor is capable of scaling and rotating the selected input source to nearly any angle and size desired. It's the ideal solution for presenting sources across the unique video display arrangements often found in commercial displays, control rooms, or classrooms. HDMI input and output resolutions up to 4K@60Hz with 2 channel LPCM audio is supported. In Warping mode the output is locked to 4K, but video latency is only 1 to 2 frames and the unit is capable of scaling and rotating the source, with an accuracy of 1°, as required. In Scaling mode, the unit can scale to a wide selection of output resolutions, up to 4K@60Hz, with independent PiP windows, outlines and video mirror effects.

By combining multiple units with an HDMI splitter or matrix it is possible to create fantastically varied arrangements of rotated displays for large video wall applications. This is perfect for creating distinct and eye-catching advertising or promotional displays limited only by your imagination.

Configuring these large video walls is made simple by use of our Video Wall PC application, allowing the user to visually lay out and configure the entire video wall at one time in a graphical WYSIWYG user interface. A number of common video wall arrangement presets are included with the software by default to make it possible to get started quickly. Control of the unit is accomplished via front panel controls with an OSD menu, Telnet, RS-232 or the Video Wall PC software.

## 2. APPLICATIONS

- Public Commercial Displays
- Demo Room Displays
- Hotel Lobby Information Displays
- Live Public Events

## 3. PACKAGE CONTENTS

- 1× UHD<sup>+</sup> 2×1 HDMI Video Wall Rotation
- 1× 24V/2.7A DC Power Adapter
- 1× Shockproof Feet (Set of 4)
- 1× Operation Manual

## 4. SYSTEM REQUIREMENTS

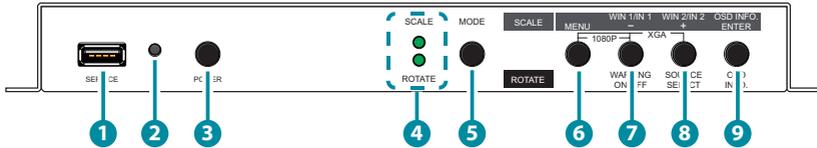
- HDMI source equipment such as media players, video game consoles or set-top boxes.
- HDMI receiving equipment such as an HDTV, monitor or audio amplifier.

## 5. FEATURES

- HDMI 2.0 and DVI 1.0 compliant (with the use of an HDMI-DVI adapter)
- HDCP 1.x and 2.2 compliant
- 2 HDMI inputs and 1 HDMI output
- Supports up to 4K UHD<sup>+</sup> (18Gbps, 4K@50/60Hz 4:4:4, 8-bit) video input and output
- Only 1 to 2 frames of video latency
- Supports horizontal/vertical video warping with zooming in/out and 360 degree display rotation in 1° increments (Warping mode)
- Supports up to two simultaneous, freely scalable, PiP windows in multi-windowing modes (Scaling mode)
- Seamless switching (no loss of sync to display) when switching sources with optional crossfade transition (Scaling mode)
- Each window can have a border with a selectable color (Scaling mode)
- Per-input video cropping and chroma key overlay (Scaling mode)
- Wide variety of video adjustments, including: contrast, brightness, hue, sharpness, aspect ratio
- Supports the ability to store a multi-window or warping arrangement as a preset that can be recalled later
- Independent audio source selection and routing in all modes
- Uploadable and freely positionable graphic logo support
- Per-input EDID management with internal or external EDID options
- Control of the unit is accomplished by use of front panel buttons with OSD menu, Telnet, RS-232 or dedicated Video Wall PC software

## 6. OPERATION CONTROLS AND FUNCTIONS

### 6.1 Front Panel



**1 SERVICE Port:** This port is reserved for firmware update and user EDID/logo upload use only.

**2 POWER LED:** This LED will illuminate green to indicate the unit is on and receiving power. When the unit is in stand-by mode the LED will illuminate red.

**3 POWER Button:** Press this button to power the unit on or place it into stand-by mode.

*Note: Ethernet and RS-232 remain active when the unit is in stand-by mode.*

**4 SCALE & ROTATE LEDs:** One of these LEDs will illuminate to indicate the unit's current operational mode.

**5 MODE Button:** Press this button to toggle between Scaling mode (Scale) and Warping mode (Rotate).

**6 MENU Button:** Press to enter the OSD menu, or to back out from menu items.

*Note: When in Scaling mode, pressing "MENU" and "+" together will reset the output resolution to XGA (1024×768@60Hz). Pressing "MENU" and "-" together will reset the output resolution to 1080p@60Hz.*

**7 WIN 1/IN 1 & - (MINUS) & WARPING ON/OFF Button:**

- **Menu Operation:** When in a menu, press to move down or adjust selections within OSD menus.
- **Scaling Mode:** Press to switch window 1's source in multi-windowing modes or to select input 1 in Switcher mode.
- **Warping Mode:** Press to enable or disable warping functionality.

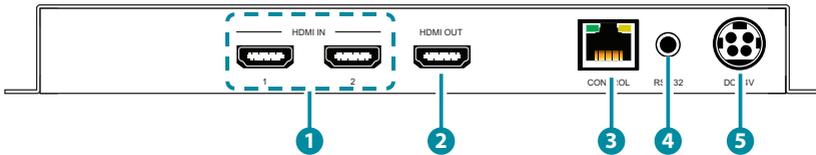
**8 WIN 2/IN 2 & + (PLUS) & SOURCE SELECT Button:**

- **Menu Operation:** When in a menu, press to move up or adjust selections within OSD menus.
- **Scaling Mode:** Press to switch window 2's source in multi-windowing modes or to select input 2 in Switcher mode.
- **Warping Mode:** Press to select the input source.

## 9 OSD INFO & ENTER Button:

- **Menu Operation:** When in a menu, press to confirm a selection within the OSD or to go deeper into a menu item.
- **Scaling/Warping Mode:** Press to display information about the unit on the OSD including details about video, audio and Ethernet.

## 6.2 Rear Panel

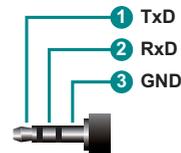


- 1 **HDMI IN 1~2 Ports:** Connect to HDMI source equipment such as media players, game consoles, or set-top boxes.
- 2 **HDMI OUT Port:** Connect to an HDMI TV, monitor, or amplifier for digital video and audio output.
- 3 **CONTROL Port:** Connect directly, or through a network switch, to your PC/laptop to control the unit via the control software or Telnet.
- 4 **RS-232 Port:** Connect directly to a PC, laptop, or other serial control device with a 3.5mm adapter cable to send RS-232 commands to control the unit or control it via the control software.
- 5 **DC 24V Port:** Plug the 24V DC power adapter into this port and connect it to an AC wall outlet for power.

## 6.3 RS-232 Pinout and Defaults

Serial Port Default Settings	
Baud Rate	19200
Data Bits	8
Parity Bits	None
Stop Bits	1
Flow Control	None

3.5mm to DE-9 Adapter Cable



## 6.4 OSD Menu

All functions of this unit can be controlled by using the OSD (On Screen Display) which is activated by pressing the MENU button on the front of the unit. Use the + (PLUS), - (MINUS), and ENTER buttons to navigate the OSD menu. Press the MENU button to back out from any menu item and then press it again to close the menu.

<b>MAIN MENU</b>
<b>Video Mode</b>
<b>Window/Warping Layout</b>
<b>Chroma Key</b>
<b>Window Cropping</b>
<b>Picture</b>
<b>Audio</b>
<b>Input EDID</b>
<b>HDCP Mode</b>
<b>Output Resolution</b>
<b>OSD Settings</b>
<b>Logo Settings</b>
<b>Ethernet</b>
<b>Preset</b>
<b>Setup</b>
<b>Information</b>

The individual functions of the OSD will be introduced in the following section. Items marked in **BOLD** are the factory default settings.

VIDEO MODE	
2ND LEVEL	3RD LEVEL
Display Func	<b>SCALING</b>
	Warping
<b>Scaling Mode</b>	
Video Mode	Switcher
	<b>PIP</b>
	PoP
	Preset 1
	Preset 2
	Preset 3
	Preset 4
Transition (Switcher Only)	<b>OFF</b>
	Cross Fade
Out Source (Switcher Only)	<b>IN 1</b>
	In 2
Win 1 Source (Pip/PoP/Preset)	<b>IN 1</b>
	In 2
Win 2 Source (Pip/PoP/Preset)	In 1
	<b>IN 2</b>
<b>Warping Mode</b>	
Warping Preset	<b>WARPING</b>
	Preset 1
	Preset 2
	Preset 3
	Preset 4
Output Source	<b>IN 1</b>
	In 2
Warping On/Off	On
	<b>OFF</b>

VIDEO MODE	
2ND LEVEL	3RD LEVEL
Fixed Angle	0~359 (0)

- 1) **Display Func:** Set the unit's overall operation mode to either Scaling mode or Warping mode.  
*Note: Each mode's video settings are independent of each other and some functions are only available in a single mode.*
- 2) **Video Mode:** Select the preferred operation mode of the unit while in Scaling mode.  
*Note: Selecting Switcher mode will restrict the output to a single full screen window. All other modes may have up to 2 windows. All changes made to the video/audio output configuration are automatically saved to the currently selected preset.*
- 3) **Transition:** Enable or disable the use of a cross fade transition when changing sources in Scaling mode's Switcher mode.
- 4) **Out Source:** Select the source for the HDMI output while in Scaling mode's Switcher mode.
- 5) **WIN 1/2 Source:** Select the source for the specified window when in multi-windowing modes (PiP, PoP, Preset 1~4).
- 6) **Warping Preset:** Select the warping preset to configure.  
*Note: All changes made to the video/audio output configuration are automatically saved to the currently selected preset.*
- 7) **Output Source:** Select the source for the HDMI output while in Warping mode.
- 8) **Warping On/Off:** Enable or disable warping functionality for the video output. Enabling warping allows for the creation of video walls.  
*Note: Certain features, such as Fixed angle are only available when warping is disabled.*
- 9) **Fixed Angle:** Allows for the full screen source to be rotated to the specified angle.  
*Note: Changing this setting will automatically disable warping mode.*

<b>WINDOW LAYOUT (Scaling Mode Only)</b>	
<b>2ND LEVEL</b>	<b>3RD LEVEL</b>
Input Select (Switcher Only)	<b>IN 1</b>
	In 2
Window Select (Pip/PoP/Preset)	<b>WIN 1</b>
	Win 2
Window On/Off	<b>ON</b>
	Off
Position X	0~Max H Resolution
Position Y	0~Max V Resolution
Size Width	0~Max H Resolution
Size Height	0~Max V Resolution
Priority	1~2 ( <b>2</b> )
Aspect Ratio	<b>FULL</b>
	16:9
	16:10
	4:3
	Best Fit
	User (Pip/PoP/Preset only)
	Center (Rotation only)
Mirror	On
	<b>OFF</b>
Rotation (Switcher Only)	On
	<b>OFF</b>
Border On/Off	On
	<b>OFF</b>

WINDOW LAYOUT (Scaling Mode Only)	
2ND LEVEL	3RD LEVEL
Border Color	Black
	Red
	<b>GREEN</b>
	Blue
	Yellow
	Magenta
	Cyan
	White
	Dark Red
	Dark Green
	Dark Blue
	Dark Yellow
	Dark Magenta
	Dark Cyan
	Gray
Window Reset	<b>NO</b>
	Yes

- 1) **Input Select:** Select the input to modify.  
*Note: Only available in Switcher mode. All settings are individually saved, per-input.*
- 2) **Window Select:** Select the window to modify.  
*Note: Only available in multi-windowing modes. All settings are individually saved, per-window/per-mode.*
- 3) **Window On/Off:** Enable or disable the currently selected window.  
*Note: Only available in multi-windowing modes.*
- 4) **Position X/Y:** Set the X and Y coordinate position of the upper left corner of the currently selected window.  
*Note: Only available in multi-windowing modes.*

- 5) **Size Width/Height:** Set the horizontal and vertical size of the currently selected window.  
*Note: Only available in multi-windowing modes.*
- 6) **Priority:** Select the layer priority of the currently selected window. Priority 1 is at the front and priority 2 is at the back.  
*Note: Only available in multi-windowing modes.*
- 7) **Aspect Ratio:** Select a fixed aspect ratio for the currently selected window. The aspect ratio will be based on the window's current height. Selecting the "Full" aspect ratio will return the window to the current mode's default size and shape for that window. Selecting "Best Fit" will automatically set the ratio based on the window's current source resolution. Selecting "Center" will fit the rotated source completely within the display while maintaining the original aspect ratio.  
*Note: The "Custom" aspect ratio is not available in the Switch preset. The "Center" aspect ratio is only available when rotation is active and the input/output resolutions are not both 4K.*
- 8) **Mirror:** Selecting "On" will flip the currently selected window horizontally.  
*Note: Only available in the Switch preset when rotation is disabled.*
- 9) **Rotation:** Selecting "On" will rotate the output 90 degrees counterclockwise and stretch it to fill the display.  
*Note: Only available in the Switch preset. Rotation is not available if cropping is enabled.*
- 10) **Border On/Off:** Enables or disable the color border around the currently selected window.
- 11) **Border Color:** Select the color to use for the border of the currently selected window.
- 12) **Window Reset:** Reset the current window to its default settings based on the currently selected mode.

WARPING LAYOUT (Warping Mode Only)	
2ND LEVEL	3RD LEVEL
Warping Select	[Currently selected preset]
Keep Aspect Ratio	<b>ON</b>
	Off
Warping Left	-1767~3687 <b>(960)</b>

WARPING LAYOUT (Warping Mode Only)	
2ND LEVEL	3RD LEVEL
Warping Top	-972~2007 <b>(540)</b>
Warping Width	1536~3840 <b>(1920)</b>
Warping Height	864~2160 <b>(1080)</b>
Warping Angle	0~359 <b>(45)</b>
Warping Bezel L	0~255 <b>(0)</b>
Warping Bezel R	0~255 <b>(0)</b>
Warping Bezel T	0~255 <b>(0)</b>
Warping Bezel B	0~255 <b>(0)</b>
4C Top Left	[Current X/Y coordinates of each corner of the warped crop within the selected source]
4C Top Right	
4C Bom Left	
4C Bom Right	
Warping Reset	<b>NO</b>
	Yes

- 1) **Warping Select:** Displays which warping preset is currently active.
- 2) **Keep Aspect Ratio:** Enables or disables forcing the current aspect ratio to be maintained when the display is resized by changing the warping width or height.
- 3) **Warping Left/Top:** Sets the pixel position of the top/left corner of the pre-rotated display within the currently selected source.

*Note: If the Warping Angle value is changed, this value will not change and will continue to match the location of the display prior to rotation in order to simplify manual positioning. Due to the complexities of rotational warping, the unit performs the additional calculations to generate the true locations of each corner of the display, as shown by the “4C” values, so that unintended distortion can be avoided.*

- 4) **Warping Width/Height:** Sets the horizontal and vertical size of the display, within the currently selected source, in pixels.
- 5) **Warping Angle:** Sets the rotation angle of the display in degrees.
- 6) **Warping Bezel L/R/T/B:** Sets the left, right, top, and bottom bezel measurements of the display in units relative to the size of the display.

- 7) **4C Top Left/Top Right/Bom Left/Bom Right:** Displays the computed X/Y pixel coordinates for each of the 4 corners of the display, within the current source.
- 8) **Warping Reset:** Reset all warping output settings to their defaults.

CHROMA KEY (Scaling Mode Only)	
2ND LEVEL	3RD LEVEL
Chroma Key	On
	<b>OFF</b>
User Select	<b>USER 1</b>
	User 2
	User 3
	User 4
	White
	Yellow
	Cyan
	Green
	Magenta
	Red
	Blue
	Black
Red Max	0~255 <b>(255)</b>
Red Min	0~255 <b>(0)</b>
Green Max	0~255 <b>(255)</b>
Green Min	0~255 <b>(0)</b>
Blue Max	0~255 <b>(255)</b>
Blue Min	0~255 <b>(0)</b>

- 1) **Chroma Key:** Enable or disable the chroma key function. When enabled, input 1 becomes the top layer which has the keying values applied to it while input 2 is the bottom layer.

*Note: Only available when in Scaling mode with Switcher mode active.*

- 2) **User Select:** Select the keying preset to apply when the chroma key function is enabled.

*Note: Only presets User 1~4 can be manually adjusted. All other presets are fixed value combinations.*

- 3) **Red Max/Min:** Set the maximum and minimum values for the chroma key's red component.
- 4) **Green Max/Min:** Set the maximum and minimum values for the chroma key's green component.
- 5) **Blue Max/Min:** Set the maximum and minimum values for the chroma key's blue component.

WINDOW CROPPING (Scaling Mode Only)	
2ND LEVEL	3RD LEVEL
In1/Win1 Cropping Enable	On
	<b>OFF</b>
In1/Win1 Cropping H-Start	0~3840 <b>(320)</b>
In1/Win1 Cropping H-Width	0~3840 <b>(1280)</b>
In1/Win1 Cropping V-Start	0~2160 <b>(180)</b>
In1/Win1 Cropping V-Height	0~2160 <b>(720)</b>
In1/Win1 Cropping Reset	<b>NO</b>
	Yes
In2/Win2 Cropping Enable	On
	<b>OFF</b>
In2/Win2 Cropping H-Start	0~3840 <b>(320)</b>
In2/Win2 Cropping H-Width	0~3840 <b>(1280)</b>
In2/Win2 Cropping V-Start	0~2160 <b>(180)</b>
In2/Win2 Cropping V-Height	0~2160 <b>(720)</b>
In2/Win2 Cropping Reset	<b>NO</b>
	Yes

- 1) **In1/Win1 Cropping Enable:** Enable or disable cropping for input 1 (Switcher mode) or window 1 (PiP/PoP/Preset modes).  
*Note: Cropping settings are stored independently for every mode/preset.*
- 2) **In1/Win1 Cropping H-Start/H-Width:** Set the horizontal starting pixel and relative horizontal width for the video content to display.  
*Note: Values are applied to the native resolution of the incoming source being cropped, not the scaled output resolution or window size.*
- 3) **In1/Win1 Cropping V-Start/V-Height:** Set the vertical starting pixel and relative vertical height for the video content to display.  
*Note: Values are applied to the native resolution of the incoming source being cropped, not the scaled output resolution or window size.*
- 4) **In1/Win1 Cropping Reset:** Reset all cropping settings for the current mode/input/window to their factory defaults.
- 5) **In2/Win2 Cropping Enable:** Enable or disable cropping for input 2 (Switcher mode) or window 2 (PiP/PoP/Preset modes).  
*Note: Cropping settings are stored independently for every mode/preset.*
- 6) **In2/Win2 Cropping H-Start/H-Width:** Set the horizontal starting pixel and relative horizontal width for the video content to display.  
*Note: Values are applied to the native resolution of the incoming source being cropped, not the scaled output resolution or window size.*
- 7) **In2/Win2 Cropping V-Start/V-Height:** Set the vertical starting pixel and relative vertical height for the video content to display.  
*Note: Values are applied to the native resolution of the incoming source being cropped, not the scaled output resolution or window size.*
- 8) **In2/Win2 Cropping Reset:** Reset all cropping settings for the current mode/input/window to their factory defaults.

PICTURE (Scaling Mode Only)	
2ND LEVEL	3RD LEVEL
Input Select	<b>IN 1</b>
	In 2
Contrast	0~100 ( <b>75</b> )
Brightness	0~100 ( <b>50</b> )
Saturation	0~100 ( <b>50</b> )
Hue	0~100 ( <b>50</b> )
Sharpness H	0~20 ( <b>10</b> )
Sharpness V	0~20 ( <b>10</b> )
Reset	<b>NO</b>
	Yes

- 1) **Input Select:** Select the input to modify.
- 2) **Contrast:** Set the overall contrast of the currently selected input.
- 3) **Brightness:** Set the overall brightness of the currently selected input.
- 4) **Saturation:** Set the overall saturation of the currently selected input.
- 5) **Hue:** Set the hue shift of the currently selected input.
- 6) **Sharpness H/V:** Set the amount of sharpness processing to apply to the currently selected input.
- 7) **Reset:** Reset the current input to its default settings.

AUDIO	
2ND LEVEL	3RD LEVEL
OUT Source (Switcher/Warping)	<b>WINDOW</b>
	In 1
	In 2
OUT Source (PiP/PoP/Preset)	<b>WIN 1</b>
	Win 2
	In 1
	In 2
OUT Mute	On
	<b>OFF</b>
Audio Port Name	[Current Port Name]

- 1) **OUT Source:** Select which input or window's audio to output.
- 2) **OUT Mute:** Enable or disable muting the audio output.
- 3) **Audio Port Name:** Display the currently set name for the audio output.

INPUT EDID	
2ND LEVEL	3RD LEVEL
EDID Mode	<b>ALL</b>
	Independent
All EDID	<b>1080P60 2CH</b>
	4Kp30 2CH
	4Kp60 2CH
	Sink OUT
	User 1
	User 2
	User 3
User 4	
IN 1 EDID	[Same as All EDID]

INPUT EDID	
2ND LEVEL	3RD LEVEL
IN 2 EDID	[Same as All EDID]
User 1 Update	<b>NO</b>
	Yes
User 2 Update	<b>NO</b>
	Yes
User 3 Update	<b>NO</b>
	Yes
User 4 Update	<b>NO</b>
	Yes
User 1 EDID Name	[Current User EDID Names]
User 2 EDID Name	
User 3 EDID Name	
User 4 EDID Name	

- 1) **EDID Mode:** Select how to assign EDIDs to the unit’s inputs. Selecting “Independent” allows for a different EDID to be assigned to each input, selecting “All” allows for a single EDID to be assigned to all inputs.
- 2) **All EDID:** Select the EDID to assign to all inputs.  
*Note: Only available in the “All” EDID Mode.*
- 3) **In 1~2 EDID:** Select the EDID to assign to the specified input.  
*Note: Only available in the “Independent” EDID Mode.*
- 4) **User 1~4 Update:** To update any of the unit’s 4 User EDIDs via USB, select “Yes” next to the appropriate User EDID and then insert a USB stick containing the new EDID into the Service port. The upload will occur immediately.  
*Note: The USB stick must contain, in the root directory, a compatible and properly named (EDID\_USER\_\*.BIN) EDID file.*
- 5) **User 1~4 EDID Name:** Display the currently set names for each User EDID.

HDCP MODE	
2ND LEVEL	3RD LEVEL
In 1	HDCP Support Off
	Refer to Source
	<b>REFER TO DISPLAY</b>
In 2	HDCP Support Off
	Refer to Source
	<b>REFER TO DISPLAY</b>
-HDCP Status-	
Out	[Current HDCP Status]
Win 1	
Win 2	

- 1) **In 1~2:** Select the HDCP behavior for each input.
  - **HDCP Support Off:** Completely disables support for HDCP on that input.
  - **Refer to Source:** Makes the input port support the same HDCP version as required by the connected source.
  - **Refer to Display:** Makes the input support the HDCP version of the currently connected displays.
- 2) **HDCP Status:** Displays the current HDCP status of both sources and the output.
 

*Note: In warping mode, only the output's HDCP state is displayed.*

OUTPUT RESOLUTION	
2ND LEVEL	
640×480p59	1920×1080p25
480p60	1920×1080p30
576p50	1920×1080p50
800×600p60	<b>1920×1080P60</b>
848×480p60	1920×1200rb
1024×768p60	2048×1152rb
1280×720p50	3840×2160p24 *
1280×720p60	3840×2160p25 *
1280×768p60	3840×2160p30 *
1280×800p60	4k p24 (DCI)
1280×960p60	4k p25 (DCI)
1280×1024p60	4k p30 (DCI)
1360×768p60	4k p50 (DCI)
1366×768p60	4k p59 (DCI)
1400×1050p60	4k p60 (DCI)
1440×900p60	3840×2160p50 *
1600×900p60rb	3840×2160p59
1600×1200p60	3840×2160p60 *
1680×1050p60	Native OUT
1920×1080p24	

1) **Output Resolution:** Select the preferred video output resolution.

*Note: In Warping mode, only the resolutions marked with an asterisk (\*) are available.*

OSD SETTINGS	
2ND LEVEL	3RD LEVEL
Menu Position	<b>TOP LEFT</b>
	Top Right
	Bottom Right
	Bottom Left
Menu Timeout	5~60 ( <b>10</b> )
	Off
Info. Timeout	5~60 ( <b>5</b> )
	Off
Info. Display	<b>ON</b>
	Off
Transparency	0~10 ( <b>0</b> )
Background	Black
	<b>GRAY</b>
	Blue

- 1) **Menu Position:** Set the position of the OSD menu on the output.
- 2) **Menu Timeout:** Set the length of time, in seconds, that the OSD menu will continue to be displayed if there is no user input, or disable the timeout completely.
- 3) **Info. Timeout:** Set the length of time, in seconds, that the informational OSD will be displayed after a signal or source change, or disable the timeout completely.
- 4) **Info. Display:** Enable or disable the informational OSD.
- 5) **Transparency:** Set the transparency level of the background of the OSD menu.
- 6) **Background:** Set the color for the background of the OSD menu.

LOGO SETTINGS	
2ND LEVEL	3RD LEVEL
Logo On/Off	On
	<b>OFF</b>
Position X	0~100 <b>(10)</b>
Position Y	0~100 <b>(10)</b>
Load Default	<b>NO</b>
	Yes
Logo Update	<b>NO</b>
	Yes

- 1) **Logo On/Off:** Enable or disable displaying the logo graphic.
- 2) **Position X/Y:** Sets the position of the logo's upper left corner, within the output. The position values are a relative percentage of the available output resolution.

*Note: When Warping mode is active the logo will remain aligned with the physical display and will not be rotated or scaled with the source video.*

- 3) **Load Default:** Selecting yes will reset the logo and install a default test image.

*Note: The reset process can take a few moments. Progress information will be displayed on the OSD while the default logo is being installed. The unit will automatically reboot when it is finished.*

- 4) **Logo Update:** To upload a graphic logo via USB, select "Yes" and then insert a USB stick containing the new logo graphic file (8-bit \*.bmp format, 960×540 max resolution) into the Service port. The upload will occur immediately.

*Note: The USB stick must contain, in the root directory, a compatible and properly named (LOGO\_USER\_\*.BMP) graphic file.*

ETHERNET	
2ND LEVEL	3RD LEVEL
IP Mode	<b>STATIC</b>
	DHCP
-Static IP Config-	
IP Address	X.X.X.X ( <b>192.168.1.50</b> )
Subnet Mask	X.X.X.X ( <b>255.255.255.0</b> )
Gateway	X.X.X.X ( <b>192.168.1.254</b> )
-Link Status-	
IP Mode	[Current IP Mode]
IP Address	[Current Network Info]
Subnet Mask	
Gateway	
MAC Addr.	[Unit's MAC Address]

- 1) **IP Mode:** Set the unit's IP address mode to Static or DHCP.
- 2) **Static IP Config:** When the unit is in Static IP mode the IP address, netmask and gateway addresses may be manually set here. Changes will occur immediately.  
*Note: Only editable in Static IP mode.*
- 3) **Link Status:** Displays the unit's current IP configuration and the unit's MAC address.

PRESET	
2ND LEVEL	3RD LEVEL
Save	<b>PRESET 1</b>
	Preset 2
	Preset 3
	Preset 4
Recall	<b>PRESET 1</b>
	Preset 2
	Preset 3
	Preset 4

- 1) **Save Preset 1~4:** Select a preset and then press the “ENTER” button to store the unit’s current video window configuration to the currently selected preset.
- 2) **Recall Preset 1~4:** Select a preset and then press the “ENTER” button to activate the currently selected preset.

SETUP	
2ND LEVEL	3RD LEVEL
Auto Sync Off	<b>ALWAYS ON</b>
	5 sec
	10 sec
	15 sec
	30 sec
	1 min
	1.5 min
	2 min
	2.5 min
	3 min
	5 min
	10 min
Auto Source (Switcher mode only)	On
	<b>OFF</b>
Telnet TimeOut	<b>OFF</b>
	1~10 mins
Firmware Update	<b>NO</b>
	Yes
User EDID Reset	<b>NO</b>
	Yes
Factory Reset	<b>NO</b>
	Yes

- 1) **Auto Sync Off:** Set the amount of time to continue outputting sync with a black screen if there are no live sources and no operations have been executed on the unit. Setting this to “Always On” forces the unit to always output sync.
- 2) **Auto Source:** Enable or disable input source auto switching.  
*Note: Only available in the Scaling mode’s Switcher mode.*

- 3) **Telnet TimeOut:** Set the length of time to wait for activity over a Telnet connection before automatically disconnecting the session.
- 4) **Firmware Update:** To update the firmware via USB, select “Yes” and then insert a USB stick containing the new firmware into the Service port. The upload will occur immediately.

*Note: The USB stick must contain, in the root directory, a compatible and properly named (\*.bin) firmware file.*

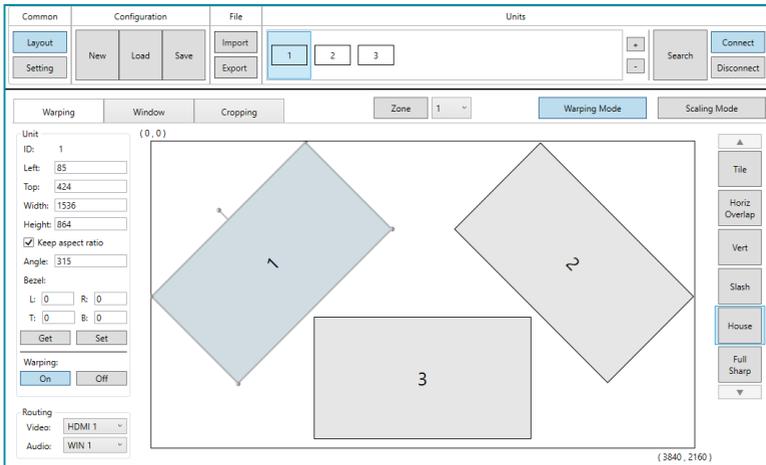
- 5) **User EDID Reset:** Select “Yes” to reset the unit’s User EDIDs to their factory default states.
- 6) **Factory Reset:** Select “Yes” to reset the unit to its factory default state. After the reset is complete, the unit will reboot automatically.

INFORMATION	
2ND LEVEL	3RD LEVEL
In 1	[Current Input Resolutions]
In 2	
Out	[Current Output Resolution]
Video Mode	[Current Mode]
Sink Native	[Native resolution as reported by EDID]
Firmware	[Current Firmware Versions]

- 1) **Information:** Shows the currently detected details for both inputs and the output as well as listing the status of a few critical system settings and relevant firmware versions.

## 6.5 Video Wall Control Software

The Video Wall Control software provides complete control over this Video Wall Rotation processor via Ethernet or RS-232. This software can scan the local network, as well as any RS-232 connections on the PC, for controllable units to add to the current video wall grouping. Multiple video wall configurations can be stored in the software for quick local recall, or the configurations can be exported as a file for use in other video wall deployments.



In addition to video wall design, creation, and positioning, this software can also be used to configure the Scaling mode of the unit which includes seamless switching, dual-window output as well as per-input cropping.

### 6.5.1 Software Operation

Please obtain the “Video Wall Control” software from your authorized dealer and save it in a directory where you can easily find it.

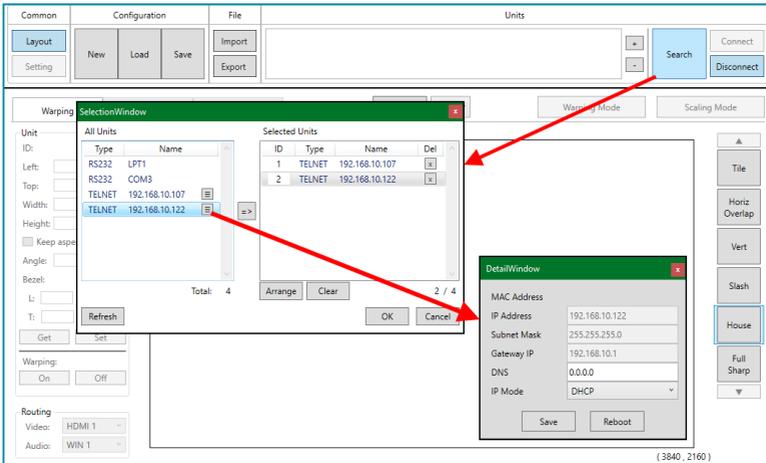
Ensure that all the units you wish to control have been powered on and that they are all connected to the same network as your laptop/PC. Start the software by double clicking on the \*.exe file to start the Video Wall Control software.

By default, when the software starts, the layout will be empty. Dummy displays may be added to/removed from the layout using the “+”/“-” buttons in the “Units” section if there are no live units available for control and the user wishes to visualize different display arrangements. To add physical units to the layout, perform a “Search”.

*Note: This software is only compatible with PCs running Windows 7 or later operating systems.*

## 6.5.2 Video Wall Unit Search

By clicking on the “Search” button at the top-right corner of the window, all Video Wall Rotation Processors that are located on the local network or are directly connected via RS-232 can automatically discovered. Each detected unit can then be added to the current video wall layout and assigned a unique ID number.

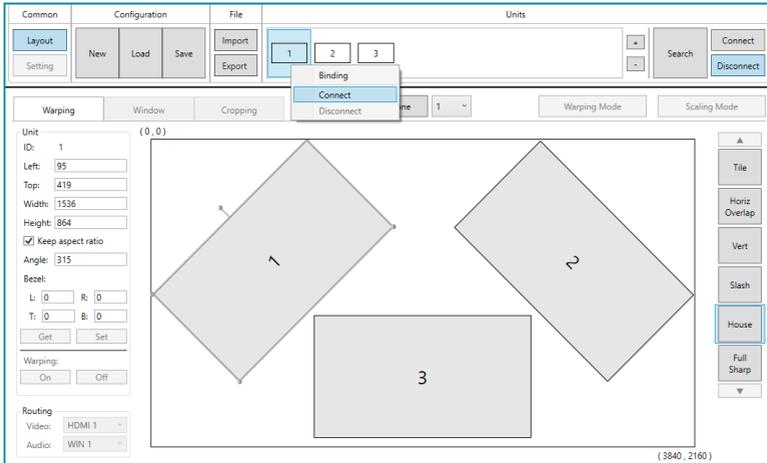


- 1) Search Button:** Click on the “Search” button to open the Unit Selection Window. All detected units on the local network as well as all available local serial ports will be listed in the “All Units” section. After all units have been selected and arranged, click on the “OK” button to add them to the layout.

*Note: Units connected via RS-232 can't be directly detected, so all available serial ports will be listed, even if they do not currently have a connected unit.*

- All Units List:** All detected units on the local network as well as all available local serial ports are listed here. All detected units are identified by their IP address. If additional units are added to the network after the window is opened, click “Refresh” to detect them. Selecting a Unit (or serial port) and then clicking the right arrow button (➤) will place them in the Selected Units window in the order they are added. The Ethernet details of each detected unit may also be changed by clicking on the associated details icon (🔍).
- Selected Units:** All selected units will appear here with an ID number indicating their order to be added to the layout. If you wish to re-order the units, type new ID numbers next to each unit and click “Arrange”. To remove an individual unit from the list, click the “X” next to its name. To remove all units, click the “Clear” button.

After all desired displays have been added to the layout, each display must be connected to so that they may be controlled. If some displays that need to be a part of the layout are not currently available for connection, dummy monitors may be added in their place by pressing the “+” button. Displays that are no longer a part of the layout may also be disconnected, or removed completely. Each display can be connected or disconnected individually, or as a group.



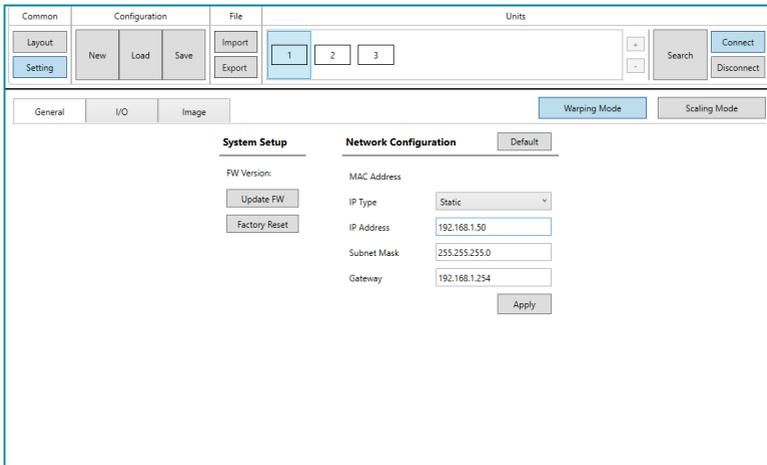
- 2) **Connect Button:** Clicking the “Connect” button will activate the software’s connection to all currently selected units, allowing control and configuration of those units. To connect a display to only a single unit, right click on the display’s number and select “Connect” from the dropdown menu.
- 3) **Disconnect Button:** If you want to ensure that no additional settings are sent to the units, click the “Disconnect” button and all selected units will be disconnected from the software. To disconnect a single unit from a display, right click on the display’s number and select “Disconnect” from the dropdown menu.  
*Note: Disconnected units will still be shown in the layout, but the “Get”, “Set”, and “Setting” functions will not be available.*
- 4) **+/- Buttons:** To add dummy units (displays with no physical unit currently connected) to a layout, click the “+” button. To completely remove both real and dummy units from a layout, select the unit to remove and then click the “-” button.
- 5) **Binding:** To change the unit assigned to display, right click on the display’s number and select “Binding”. This will open up a window where you can select a new unit to assign to the display.

### 6.5.3 Basic Unit Settings & Configuration

The basic configuration and settings for each connected unit can be set by selecting the unit to configure from the “Units” section and then clicking on the “Setting” button in the upper-left “Common” section of the window. The operational mode of the unit (Warping mode or Scaling mode) may be set here, as well as the Ethernet, I/O, and mode-specific image features. To exit the setting configuration tabs and return to the layout mode, click on the “Layout” button in the upper-left “Common” section of the window.

*Note: Some configuration options are not available in both modes.*

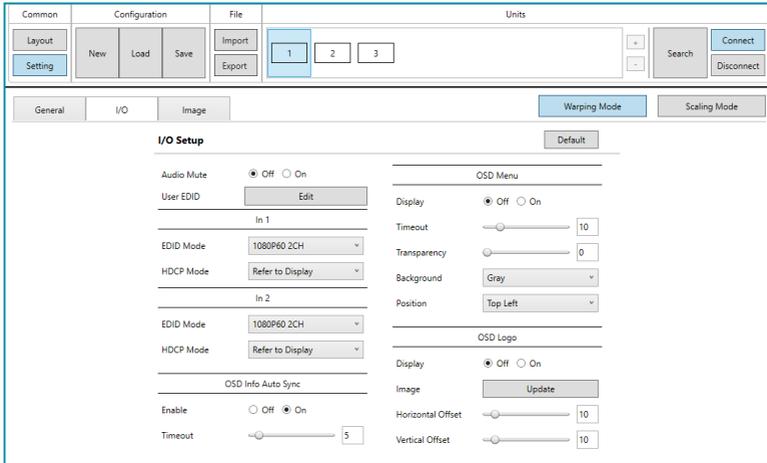
The “General” tab provides control over the network configuration, and provides a way to initiate a firmware update or perform a factory reset. This tab provides the same options in both operational modes.



- 1) **System Setup:** Displays the current firmware version and provides options to update the firmware or perform a factory reset on the unit.
  - **Update FW Button:** Provides a way to update the unit’s firmware. Insert a USB thumb drive, with a valid firmware file (\*.bin format) in the root directory, into the unit’s USB service port then click the “Update FW” button. After the update is complete the unit will automatically reboot.
  - **Factory Reset Button:** Selecting this will reset the unit’s settings back to their factory defaults.
- 2) **Network Configuration:** The IP address, netmask and gateway can be set manually, or DHCP can be enabled for automatic IP configuration if your local network supports it. Click on “Apply” to confirm and activate any changes made to these settings. To return these settings to their factory defaults, click on the “Default” button.

## 6.5.4 I/O Configuration

The “I/O” tab provides control over basic input and output functions such as audio mute, EDID selection, HDCP behavior, OSD display management, and the custom logo overlay. To return these settings to their factory defaults, click on the “Default” button. Changes made to these settings will occur immediately.



- 1) **Audio Mute:** Enables or disables muting the audio output.
- 2) **User EDID:** To upload a custom User EDID, insert a USB thumb drive, with a valid EDID file named “EDID\_USER\_\*.BIN” in the root directory, into the unit’s USB service port then click the “Update” button.
- 3) **In 1~2 EDID Mode:** Select the preferred EDID for the unit to use for each input from the dropdown menu (1080P60 2CH, 4KP30 2CH, 4KP60 2CH, User 1~4, and Sink).
- 4) **In 1~2 HDCP Mode:** Select the HDCP behavior for each input.
  - **Support Off:** Completely disables support for HDCP on that input.
  - **Refer to Source:** Makes the input port support the same HDCP version as required by the connected source.
  - **Refer to Display:** Makes the input support the HDCP version of the currently connected displays.
- 5) **OSD Info Auto Sync Enable:** Enable or disable the informational OSD.
- 6) **OSD Info Auto Sync Timeout:** Set the length of time, in seconds, that the informational OSD will be displayed after a signal or source change, or disable the timeout completely.

- 7) **OSD Menu Display:** Selecting “On” will force the OSD menu to appear on screen.
- 8) **OSD Menu Timeout:** Set the length of time, in seconds, that the OSD menu will continue to be displayed, if there is no user input. Setting this to 0 will disable the timeout completely.
- 9) **OSD Menu Transparency:** Set the transparency level of the background of the OSD menu with a range from 0 (opaque) to 10 (mostly transparent).
- 10) **OSD Menu Background:** Set the color of the background of the OSD menu. Available choices are: Black, Gray, and Blue.
- 11) **OSD Menu Position:** Use the dropdown to set the position of the OSD menu on the output. Available choices are: Top Left, Top Right, Bottom Right, and Bottom Left.
- 12) **OSD Logo Display:** Enables or disables the custom logo overlay feature.

*Note: Enabling OSD Info will automatically disable the Logo Display and enabling the Logo Display will automatically disable OSD Info.*

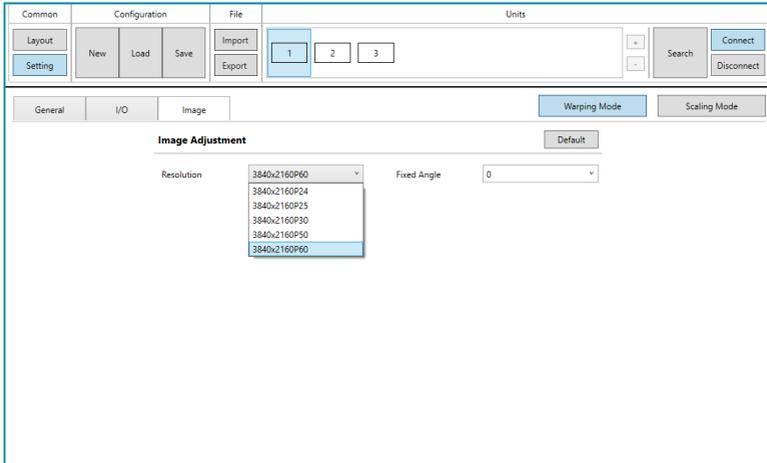
- 13) **OSD Logo Image Update:** To upload a custom overlay image, insert a USB thumb drive, with a valid graphics file (8-bit \*.bmp format, 960×540 max resolution) named “LOGO\_USER\_\*.BMP” in the root directory, into the unit’s USB service port then click the “Update” button.

*Note: The upload process can take a while, depending on the size of the logo. Progress information will be displayed on the OSD while the logo is being installed. The unit will automatically reboot when it is finished.*

- 14) **OSD Logo Horizontal/Vertical Offset:** Sets the position of the logo’s upper left corner, within the output. The position values are a relative percentage of the available output resolution.

## 6.5.5 Warping Mode Image Configuration

The “Image” tab in Warping mode provides control over the output resolution as well as the Fixed Angle rotation feature. To return these settings to their factory defaults, click on the “Default” button. Changes made to these settings will occur immediately.

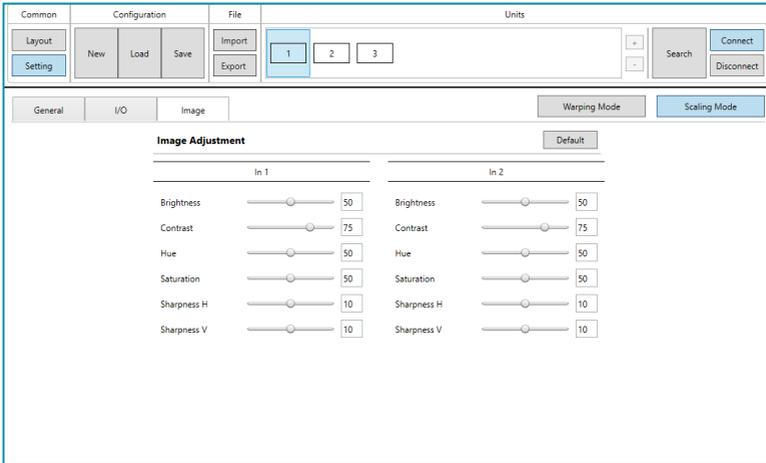


- 1) **Resolution:** Selects the output resolution to use in Warping mode.  
*Note: In Warping mode, only 4K output resolutions are available.*
- 2) **Fixed Angle:** Allows setting a fixed rotation angle, set in 1° increments, for a the full screen output when in Warping mode if warping has been turned off. Select the pre-set rotation angle from the dropdown menu or manually type in the preferred angle to use.  
*Note: Setting a Fixed Angle will automatically disable warping on this unit.*

## 6.5.6 Scaling Mode Image Configuration

The “Image” tab in Scaling mode provides control over the video color and quality settings for each input on the unit. To return these settings to their factory defaults, click on the “Default” button. Changes made to these settings will occur immediately.

*Note: Control over the output resolution is provided within the Scaling tab in the Layout window.*



- 1) **In 1~2 Brightness:** This slider provides control over the overall brightness of the associated source video.
- 2) **In 1~2 Contrast:** This slider provides control over the overall contrast of the associated source video.
- 3) **In 1~2 Hue:** This slider provides control over the hue shift of the associated source video.
- 4) **In 1~2 Saturation:** This slider provides control over the overall saturation of the associated source video.
- 5) **In 1~2 Sharpness H/V:** These sliders provide control over the amount of sharpness processing to apply to the associated source video.

*Note: Horizontal and vertical processing is independently controlled, providing finer control over the image quality.*

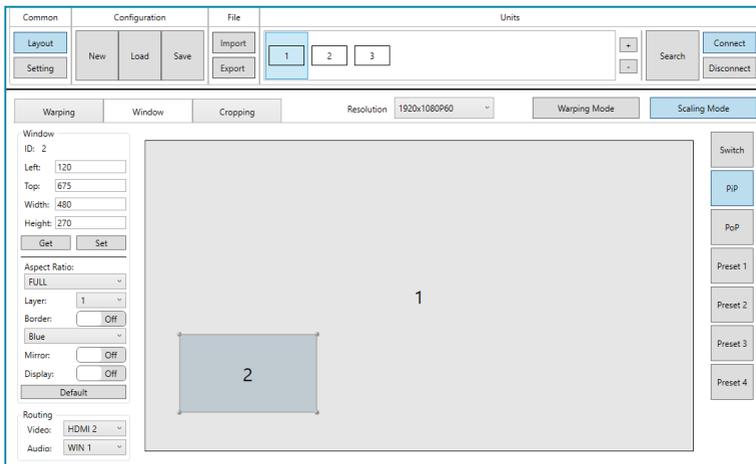
## 6.5.7 Scaling Mode Layouts

The position, size, cropping values, and other settings of up to 2 windows on the selected unit can be configured in the Layout window's Window and Cropping tabs when in Scaling Mode. If you are currently in the Setting window, clicking on the "Layout" button in the upper-left "Common" section of the window will switch back to the Layout screen. If the unit is not currently in Scaling mode, clicking on the "Scaling Mode" button on the upper right side of the Layout window will force the unit to change modes.

*Note: The unit must be in Scaling mode for these tabs to be populated and controllable.*

### 6.5.7.1 Window Tab

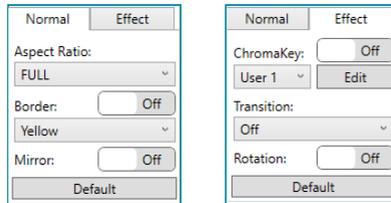
The "Window" tab provides control over the various multi-windowing features of Scaling Mode. The outline of the layout window represents the currently selected output resolution and each window must be positioned within this space. Each window contains an ID number and, when selected, that window's size, position, and other settings will listed in the left hand column. On the right side is a column containing all available Scaling Mode presets which may be recalled instantly by clicking on them.



- 1) Resolution:** Use the dropdown at the top of the tab to select the preferred output resolution for the unit. The change will occur immediately.

*Note: After changing resolutions, windows will automatically adjust to maintain their proportional sizes.*

- 2) **Warping Mode/Scaling Mode:** Press either of these buttons at the top of the tab to switch the unit's operational mode between Warping mode and Scaling mode. The change will occur immediately.
- 3) **Preset Column:** This column on the right side of the tab contains all available Scaling Mode presets. Most presets are dual-window modes, however selecting the "Switch" preset will limit the output to a single, full screen, window that cannot be resized and the central options available on the left side of the tab will split into the "Normal" and "Effect" sub-tabs shown below which add chroma key and transition controls. After selecting a new preset, the change will occur immediately. Presets 1~4 are user presets and can be customized. Right-click on a user preset and select "Update" to assign the current window arrangement and routing to that preset.



- 4) **Window Information and Details:** This section displays all of the relevant position and dimension details of the selected window.
 

*Note: Only one unit's details will be displayed if multiple units are currently selected.*

  - **ID:** Displays the ID number of the currently selected window.
  - **Left/Top:** Sets the X and Y coordinate position of the upper left corner of the currently selected window. Click on the "Set" button, after making changes, to make them active.
  - **Width/Height:** Set the horizontal and vertical size of the currently selected window. Click on the "Set" button, after making changes, to make them active.

*Note: Left/Top/Width/Height are not adjustable in the Switch preset.*
- 5) **Get:** Click this button to download the unit's current window settings into the software.
- 6) **Set:** Click this button to save all current window settings to the active preset.
- 7) **Aspect Ratio:** Use the dropdown to select a fixed aspect ratio for the currently selected window or input. Available options are: Full, 16:9,

16:10, 4:3, Keep, Center, and Custom. In multi-windowing modes the aspect ratio will be based on the window's current height. Selecting the "Full" aspect ratio will return the window to the current mode's default size and shape for that window. Selecting "Keep" will automatically set the ratio based on the window's current source resolution. The change will occur immediately.

*Note: The "Custom" aspect ratio is not available in the Switch preset. The "Center" aspect ratio is only available when rotation is active and the input/output resolutions are not both 4K.*

- 8) Layer:** Select the layer priority of the currently selected window. Priority 1 is at the front and priority 2 is at the back. The change will occur immediately.

*Note: Not available in the Switch preset.*

- 9) Border:** Clicking this switch enables or disables a colored border around the currently selected window or input. Use the dropdown to select the color to use for the border of the currently selected window/input. The change will occur immediately.

- 10) Mirror:** Turning this switch on will flip the currently selected window/input horizontally. The change will occur immediately.

*Note: Only available in the Switch preset when rotation is disabled.*

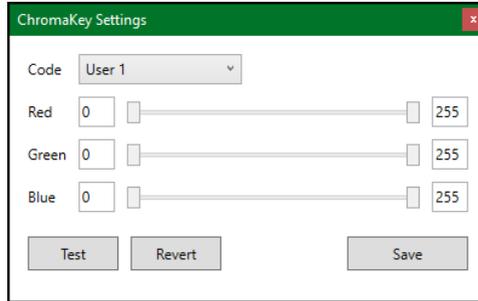
- 11) Display:** Clicking this switch enables or disables the currently selected window. The change will occur immediately.

*Note: Not available in the Switch preset.*

- 12) Default:** Click this button to return the section's settings to their factory default values.

- 13) ChromaKey:** Click the switch to enable or disable the chroma key function. When enabled, input 1 becomes the top layer which has the keying values applied to it while input 2 is the bottom layer. Use the dropdown to select the chroma key preset to use. These changes will occur immediately. Click on the "Edit" button to open the ChromaKey Settings window to view, test, or modify, a chroma key preset.

*Note: Only available in the Switch preset. If audio routing is set to WIN 1 or WIN 2, audio will come from the bottom layer.*

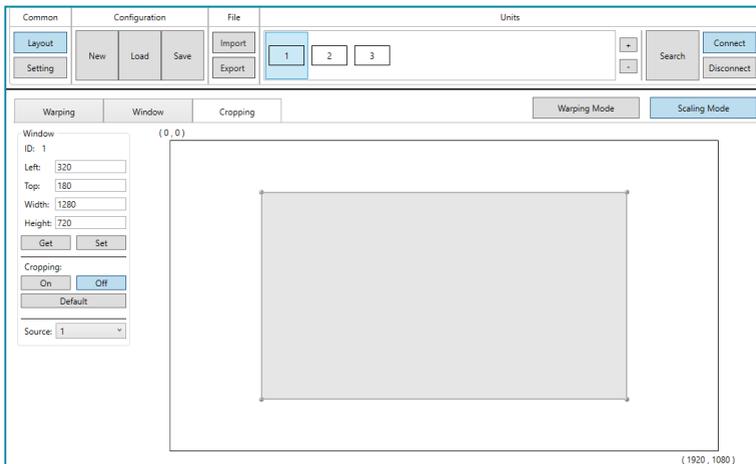


- **Code:** Use the dropdown to select the chroma key preset to use/edit.  
*Note: Only presets User 1~4 can be edited.*
  - **Red/Green/Blue:** Set the maximum and minimum values for the chroma key's red, green, and blue components.
  - **Test:** Click on this button to test your new chroma key values without saving them.
  - **Revert:** Click on this button, after making changes to the red/green/blue ranges, to revert them all to their currently saved values.
  - **Save:** Once you are satisfied with your customized chroma key values, click this button to save it to the current user preset.
- 14) **Transition:** Use the dropdown to enable or disable the use of a cross fade transition when changing sources.  
*Note: Only available in the Switch preset.*
- 15) **Rotation:** Selecting "On" will rotate the output 90 degrees counterclockwise and stretch it to fill the display. When rotation is active, the "Center" aspect ratio option becomes available, which will force the rotated image to display letterboxed while maintaining the source's original aspect ratio.  
*Note: Only available in the Switch preset. Rotation is not available if cropping is enabled.*
- 16) **Video Routing:** Use the dropdown to select the video source for the current window. The change will occur immediately.
- 17) **Audio Routing:** Use the dropdown to select which input or window's audio to output. The change will occur immediately.

### 6.5.7.2 Cropping Tab

The “Cropping” tab provides control over the amount of video cropping, if any, to apply to each window, in multi-windowing modes, or each input when using the “Switch” preset. A visual representation of the crop section is displayed in the main window and can be manually adjusted by clicking and dragging any corner. Alternatively, for more accurate crop settings, exact values may be typed into the appropriate spaces on the left. Once you are satisfied with the crop settings, clicking on the “Set” button will save them to the current preset. Cropping values are applied to the native resolution of the incoming source being cropped, not the scaled output resolution or window size.

*Note: The unit must be in Scaling mode for this tab to be populated and controllable.*



- 1) **ID:** Displays the currently selected input/window.
- 2) **Left/Width:** Set the horizontal starting pixel and relative horizontal width for the video content to display.  
*Note: Values are applied to the native resolution of the incoming source being cropped, not the scaled output resolution or window size.*
- 3) **Top/Height:** Set the vertical starting pixel and relative vertical height for the video content to display.  
*Note: Values are applied to the native resolution of the incoming source being cropped, not the scaled output resolution or window size.*

- 4) **Get:** Click this button to download the cropping settings for the current window into the software.
- 5) **Set:** Click this button to save the current input/window's cropping settings to the active preset.

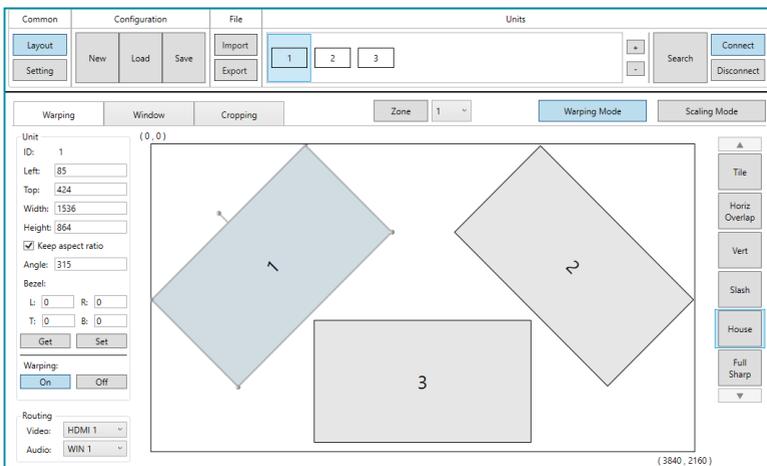
*Note: Cropping settings are stored independently for every mode/preset.*

- 6) **Cropping On/Off:** Enable or disable cropping for the current input (Switcher) or window (PiP/PoP/Preset). The change will occur and be saved to the current preset immediately.
- 7) **Default:** Click this button to return the cropping settings to their factory default values.
- 8) **Source:** Use the dropdown to select which input/window's cropping values to edit.

## 6.5.8 Warping Mode Layouts

The position, size and angle of the display connected to each unit is set in the Layout window's Warping tab when in Warping Mode. If you are currently in the Setting window, clicking on the "Layout" button in the upper-left "Common" section of the window will switch back to the Layout screen. If the unit is not currently in Warping mode, clicking on the "Warping Mode" button on the upper right side of the Layout window will force the unit to change modes. The warping effect can be manually turned on and off using the "Warping On/Off" buttons in the bottom left section of the Warping tab.

*Note: The unit must be in Warping mode for this tab to be populated and controllable.*



The outline of the warping layout window represents the source video at a resolution of 3840×2160 pixels and each display should be positioned within this space. It is possible for a display to extend beyond the edge of the source, if desired, but the area outside the source's boundary will be filled with black. Each display contains a number which matches the ID number of the unit that is connected to it and the size/position of each display (listed to the left) is measured in pixels relative to its size/position within the layout space. Pre-defined layouts do not include bezel compensation.

*Note: The pixel size of individual displays MUST be between 1536×864 and 3840×2160. Display sizes set outside this range will automatically be adjusted when the "Set" button is pressed.*

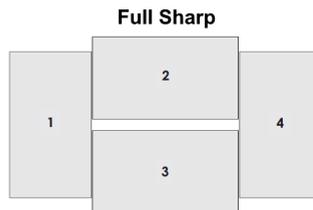
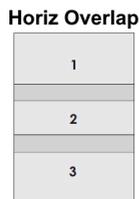
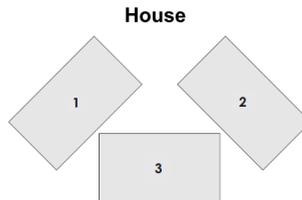
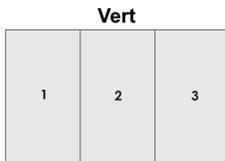
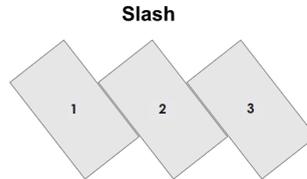
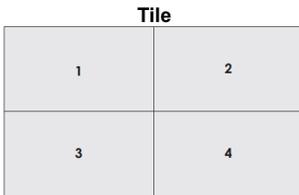
### 6.5.8.1 Pre-Defined Video Wall Layouts

This control software provides a number of common, pre-defined, video wall configurations which can be selected and easily applied to any connected units as a starting point for configuring a video wall. All pre-defined configurations are designed around video walls containing 3 to 4 displays.

- 1) Selecting Pre-Defined Layouts:** Select any of the provided predefined layouts from the right-hand scroll bar. After selecting a new layout, you must confirm that you wish to leave the current layout.

*Note: It is not possible to save changes to the pre-defined layouts. Switching to a new layout will remove any changes made to the current layout.*

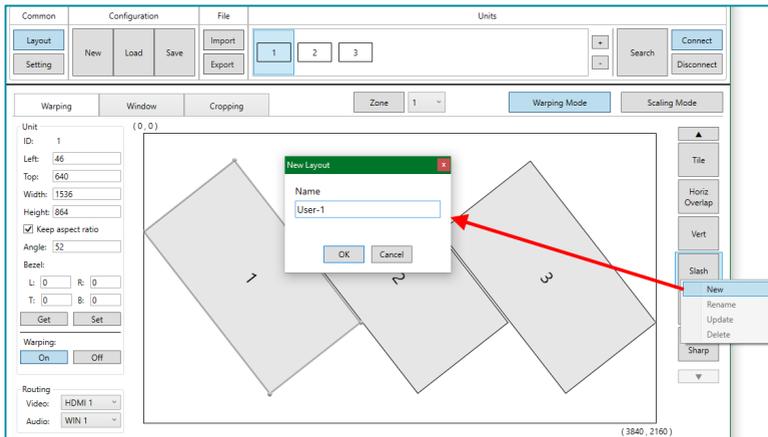
#### ■ Available Pre-Defined Layouts



After confirming the preferred layout, select all of the units involved in the video wall from the “Unit” section at the top of the window and then click on the “Set” button in the bottom-right corner of the window to upload the new layout configuration to all selected units. After clicking “Set”, the units will take a few seconds to fully update with the new configuration.

### 6.5.8.2 Customized Video Wall Layouts

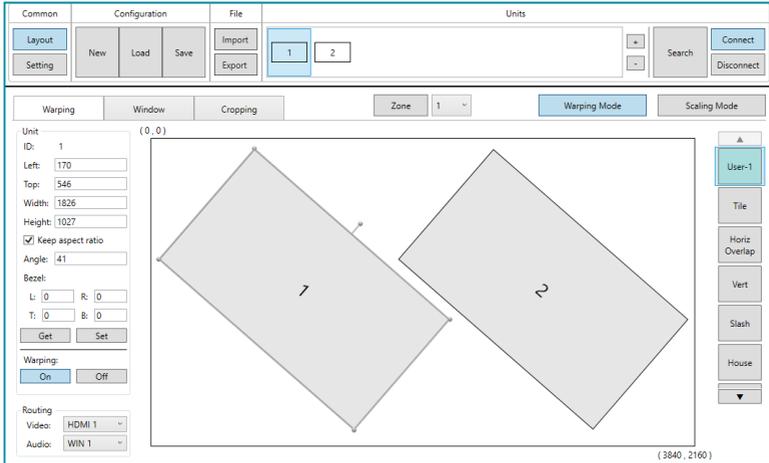
This control software provides a number of common, pre-defined, video wall configurations, however in most cases a customized layout will be needed. Custom layouts are created by selecting a layout to use as a basis, and then right-clicking on the layout's selection button and selecting "New" from the dropdown. You then provide a name for the new layout and click "OK" to generate it. Custom layouts are always located at the top of the list to make them easy to find.



The Unit information area on the left shows all of the relevant details of the currently selected display. You may freely reposition or resize any of the displays by simply clicking on them and dragging them around the layout space, or by typing numbers directly into the Unit information area. If bezel measurements are to be used, the display width/height measurement should be the total measurement of the screen plus the bezel. After arranging the layout to approximately match the arrangement of the real displays, select all of the units involved in the video wall from the "Unit" section at the top of the window and then click on the "Set" button in the Unit information section to upload the new layout configuration to all selected units. After clicking "Set", the units will take a few seconds to fully update with the new configuration. In most cases it will take multiple adjustment and tweaking passes to perfectly match the physical layout.

It is recommended to periodically save the modifications that have been made to the current layout by right clicking on the custom layout on the right and selecting "Update". This will save the changes to that layout, so that they are not lost if you close the software, or change to another layout.

*Note: Making changes to a layout and then switching to a new layout without updating the layout will cause those changes to be lost.*



- 1) **Unit Information and Details:** This section displays all of the relevant position, dimension, and orientation details of the selected unit/display. These changes will occur immediately.

*Note: Only the most recently selected unit's details will be displayed if multiple units are currently selected.*

- **ID:** The ID number of the currently selected unit/display.
- **Left/Top/Width/Height:** Displays the current values for the pixel position of the top/left corner of the un-rotated display as well as the current width and height in pixels. After changing any of these values, press the enter key to commit the change to the layout.

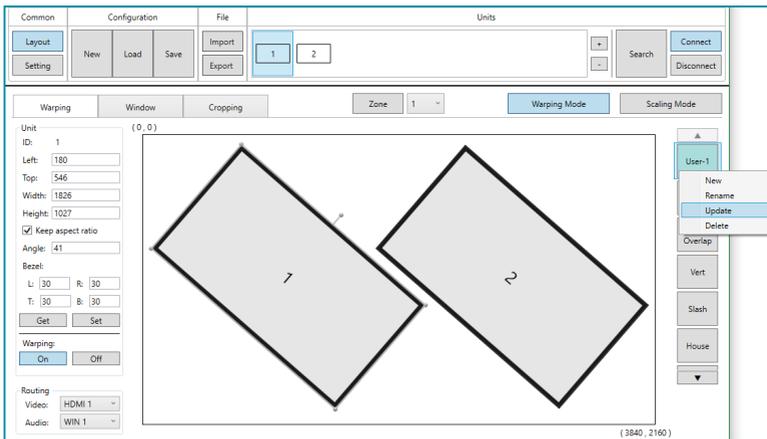
*Note: If the bezel values are set to 0, the height and width values should only be the measurement of the video panel within the display. However, if bezel values are being used, these dimensions represent the size of the entire physical display (including the bezel).*

- **Keep Aspect Ratio:** Enables or disables forcing the current aspect ratio to be maintained when the display is resized either by typing a new value, or by mouse-dragging a corner of the display in the layout.
- **Angle:** Displays the current rotation angle of the selected display in degrees. After changing this value, press the enter key to commit the change to the layout.

- **Bezel L/R/T/B:** Displays the current bezel measurements, in pixels, for the selected display and allows for their modification. The bezel is represented in the layout by a darkened rectangle around the viewable portion of the display. After changing this value, press the enter key to commit the change to the layout.

*Note: Bezel measurements are optional. Bezel values subtract from the entered horizontal and vertical measurements of the display and reduce the size of the viewable portion of the display in the layout window.*

- 2) **Get Button:** Downloads the current layout settings from all selected units into the software.
- 3) **Set Button:** Uploads the current layout to all selected units.
- 4) **Warping On/Off Buttons:** Enables or disables warping on the currently selected unit(s). When warping is disabled, the complete source video will display normally, filling the display.
- 5) **Routing Video/Audio:** Use the dropdowns to select the video and audio source for the current video wall.

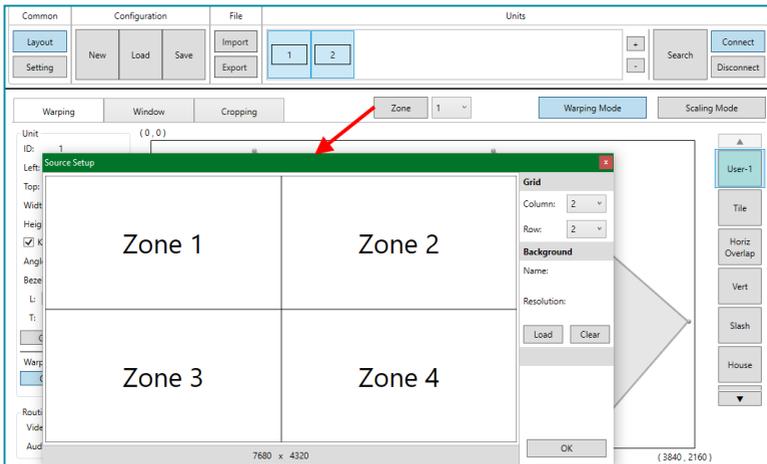


- 6) **Custom Layout Selection Right-Click Menu:** Right clicking on any custom layout button brings up a menu of functions that can be performed on that layout.
  - **New:** Opens the “New Layout” window and allows for the creation of a new custom layout based on the current layout.
  - **Rename:** Brings up a window allowing for the selected layout to be renamed.
  - **Update:** Updates the selected layout with the data in the currently live layout tab.
  - **Delete:** Deletes the selected custom layout.

### 6.5.8.3 Multi-Zone Video Wall Layouts

Though this unit's input is limited to a maximum resolution of 4K, it is possible to generate large, flexible, video walls from larger sources by using a 4K+ capable video wall splitter product with each output of the video wall splitter generating a 4K, or lower, block of video which is then further distributed to each zone's group of Video Wall Rotation products.

*Note: It is not possible for a display to be used in more than one zone at a time, or to cross zone borders.*



The Zone feature makes managing, and visualizing, this special arrangement of displays easier. Simply click on the “Zone” button to launch the Zone Source Setup window. Select the number of horizontal and vertical zones needed. The total output resolution of all zones together is displayed at the bottom of the window. For example, a 2x2 zone arrangement would effectively be an 8K (7680x4320) video wall. A static graphic image may also be uploaded to help make visualizing the zone configuration easier. Click “OK” to accept the new zone configuration and return to the main layout window. To arrange the displays used in a specific zone, select the zone from the dropdown and then add the displays that belong to that zone (via the “Search” function or the “+” button).

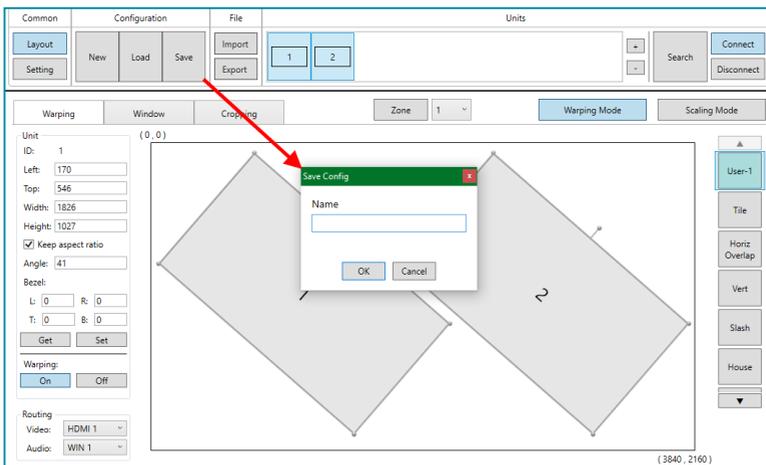
- 1) **Zone Button:** Click this to launch the Zone Source Setup window.
- 2) **Zone Selection:** Use this dropdown to select the zone display layout to view or modify.
- 3) **Zone Grid Column:** Sets the number of zones, horizontally, within the full layout.

- 4) **Zone Grid Row:** Sets the number of zones, vertically, within the full layout.
- 5) **Background Load:** Click this button to load a graphic image to use as a background for the video wall(s) to help visualize the effect of the whole layout on the source video.
- 6) **Background Clear:** Click this button to remove the background image.

### 6.5.9 Configuration Export/Import

The Configuration and File sections of the main window provide ways to save/load populated layout configurations as well as to export/import configurations/layouts to a file on your local PC. A saved layout configuration includes unit connection information as well as display orientation.

- 1) **Configuration:** This section provides a way to load, save, or clear populated layout configurations.



- **New Button:** Completely clears all displays from the currently viewed layout edit window.

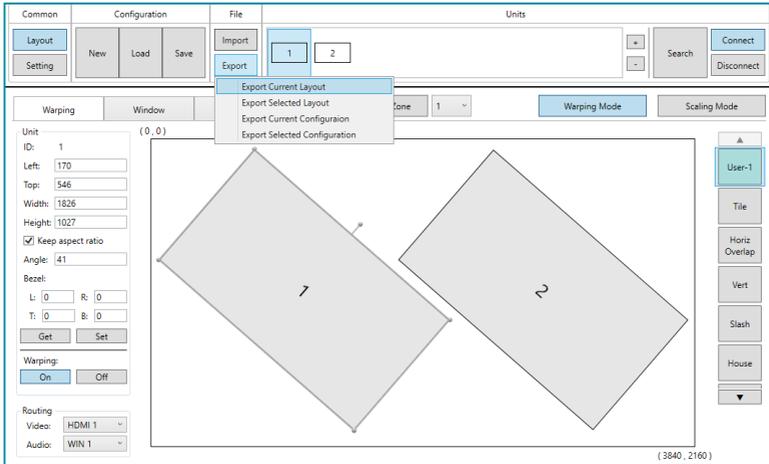
*Note: Only displays and their unit connection details are cleared. Layouts saved to the right-side selection bar are unaffected.*

- **Load Button:** Load a previously saved layout configuration.
- **Save Button:** Save the currently viewed layout, including unit connection information as well as display orientation.

*Note: Using the same name as a previously saved configuration will overwrite it.*

- 2) **File:** This section provides a way to export saved layouts and configurations to a file on the local PC, or to import previously saved layouts and configurations.

*Note: Exported configurations and layouts are stored as protected \*.zip files and cannot be opened for direct editing.*



- **Import Button:** Click this button to import a saved layout or configuration from a file (\*.zip format) located on the local PC.
- **Export Button:** Click this button to open the export dropdown.
  - **Export Current Layout:** Exports the currently viewed layout to a file on the local PC.
  - **Export Selected Layout:** Select a layout, from all available custom user layouts, to save it to a file on the local PC.
  - **Export Current Configuration:** Exports the current layout's configuration to a file on the local PC.
  - **Export Selected Configuration:** Select a configuration, from all available stored configurations, to save it to a file on the local PC.

## 6.6 Telnet Control

Before attempting to use Telnet control, please ensure that both the unit and the PC are connected to the same active networks.

Start your preferred Telnet/Console client, or use the built in client provided by most modern computer operating systems. After starting the client, connect by using the current IP address of the unit and port 23 (if the communication port number used by the unit has not been changed previously). This will connect us to the unit we wish to control and commands may now be entered directly.

*Note 1: If the IP address of the unit is changed then the IP address required for Telnet access will also change accordingly.*

*Note 2: The default IP address is 192.168.1.50 and the default communication port is 23.*

## 6.7 Serial and Telnet Commands

COMMAND
Description and Parameters
<b>help</b> ↵ Show the full command list.
<b>help N1</b> ↵ Show details about the specified command. <b>N1</b> = {Command}
<b>?</b> ↵ Show the full command list.
<b>? N1</b> ↵ Show details about the specified command. <b>N1</b> = {Command}
<b>get fw ver</b> ↵ Show the unit's current firmware version.

COMMAND					
Description and Parameters					
<b>get mac addr</b> ↵	Show the unit's MAC address.				
<b>get model name</b> ↵	Show the unit's model name.				
<b>get model type</b> ↵	Show the unit's product type.				
<b>set feedback broadcast N1</b> ↵	<p>Enable or disable the broadcast of console command feedback.</p> <p>Available values for <b>N1</b>:</p> <table> <tr> <td>ON</td> <td>[Enabled]</td> </tr> <tr> <td>OFF</td> <td>[Disabled]</td> </tr> </table>	ON	[Enabled]	OFF	[Disabled]
ON	[Enabled]				
OFF	[Disabled]				
<b>get feedback broadcast</b> ↵	Show the current console command feedback broadcast state.				
<b>get user config</b> ↵	List the unit's current configuration information.				
<b>set power N1</b> ↵	<p>Set the unit's power state.</p> <p>Available values for <b>N1</b>:</p> <table> <tr> <td>ON</td> <td>[Power on]</td> </tr> <tr> <td>OFF</td> <td>[Standby mode]</td> </tr> </table>	ON	[Power on]	OFF	[Standby mode]
ON	[Power on]				
OFF	[Standby mode]				
<b>get power</b> ↵	Show the unit's current power state.				
<b>set ip mode N1</b> ↵	<p>Set the IP address assignment mode.</p> <p>Available values for <b>N1</b>:</p> <table> <tr> <td>STATIC</td> <td>[Static IP mode]</td> </tr> <tr> <td>DHCP</td> <td>[DHCP mode]</td> </tr> </table>	STATIC	[Static IP mode]	DHCP	[DHCP mode]
STATIC	[Static IP mode]				
DHCP	[DHCP mode]				
<b>get ip mode</b> ↵	Show the current IP address assignment mode.				

COMMAND	
Description and Parameters	
<b>get ipconfig</b> ↵	Show the unit's current IP configuration information.
<b>get ipaddr</b> ↵	Show the unit's current IP address.
<b>get netmask</b> ↵	Show the unit's current netmask.
<b>get gateway</b> ↵	Show the unit's current gateway address.
<b>set static ipaddr N1</b> ↵	Set the unit's static IP address. <b>N1</b> = X.X.X.X [X = 0~255, IP address]
<b>get static ipaddr</b> ↵	Show the unit's static IP address.
<b>set static netmask N1</b> ↵	Set the unit's static netmask. <b>N1</b> = X.X.X.X [X = 0~255, Netmask]
<b>get static netmask</b> ↵	Show the unit's static netmask.
<b>set static gateway N1</b> ↵	Set the unit's static gateway address. <b>N1</b> = X.X.X.X [X = 0~255, Gateway address]
<b>get static gateway</b> ↵	Show the unit's static gateway address.
<b>set device operation mode N1</b> ↵	Set the unit's operation mode to scaling or warping. Available values for <b>N1</b> : 1 [Scaling mode] 2 [Warping mode]

COMMAND	
Description and Parameters	
<b>get device operation mode</b> ↵	
Show the unit's current operation mode.	
<b>set warping layout mode N1</b> ↵	
Set the Warping mode's active preset.	
Available values for <b>N1</b> :	
1	[Warping]
2	[Preset 1]
3	[Preset 2]
4	[Preset 3]
5	[Preset 4]
<b>get warping layout mode</b> ↵	
Show the current Warping mode preset.	
<b>set window layout mode N1</b> ↵	
Set the Scaling mode's active preset.	
Available values for <b>N1</b> :	
0	[Switcher]
1	[PiP]
2	[PoP]
4	[Preset 1]
5	[Preset 2]
6	[Preset 3]
7	[Preset 4]
<b>get window layout mode</b> ↵	
Show the current Scaling mode preset.	
<b>set window N1 route N2</b> ↵	
Set the input to route to the specified window in multi-windowing presets.	
<b>N1</b> = 1~2	[Window number]
<b>N2</b> = 1~2	[HDMI input number]

COMMAND	
Description and Parameters	
<b>get window N1 route</b> ↵	
Show the input currently routed to the specified window.	
<b>N1</b> = 1~2	[Window number]
<b>set out A route N1</b> ↵	
Route the specified input to the HDMI output in the single-window Switcher preset.	
<b>N1</b> = 1~2	[HDMI input number]
<b>get out A route</b> ↵	
Show the current input routed to the HDMI output in the single-window Switcher preset.	
<b>set window N1 mute N2</b> ↵	
Enable or disable the specified window's video mute function.	
<b>N1</b> = 1~2	[Window number]
Available values for <b>N2</b> :	
0	[Disabled]
1	[Enabled]
<b>get window N1 mute</b> ↵	
Show the current video mute settings for the specified window.	
<b>set window N1 hposition N2</b> ↵	
Set the horizontal position of the specified window.	
<b>N1</b> = 1~2	[Window number]
<b>N2</b> = 0~{Max H Res}	[Horizontal position in pixels]
<b>get window N1 hposition</b> ↵	
Show the current horizontal position of the specified window.	
<b>N1</b> = 1~2	[Window number]

COMMAND	
Description and Parameters	
<b>set window N1 vposition N2</b>	↵↵
Set the vertical position of the specified window.	
<b>N1</b> = 1~2	[Window number]
<b>N2</b> = 0~{Max V Res}	[Vertical position in pixels]
<b>get window N1 vposition</b>	↵↵
Show the current vertical position of the specified window.	
<b>N1</b> = 1~2	[Window number]
<b>set window N1 hsize N2</b>	↵↵
Set the horizontal size of the specified window.	
<b>N1</b> = 1~2	[Window number]
<b>N2</b> = 0~{Max H Res}	[Horizontal size in pixels]
<b>get window N1 hsize</b>	↵↵
Show the current horizontal size of the specified window.	
<b>N1</b> = 1~2	[Window number]
<b>set window N1 vsize N2</b>	↵↵
Set the vertical size of the specified window on custom mode.	
<b>N1</b> = 1~2	[Window number]
<b>N2</b> = 0~{Max V Res}	[Vertical size in pixels]
<b>get window N1 vsize</b>	↵↵
Show the current vertical size of the specified window.	
<b>N1</b> = 1~2	[Window number]
<b>set window N1 priority N2</b>	↵↵
Set the layer priority of the specified window.	
<b>N1</b> = 1~2	[Window number]
<b>N2</b> = 1~2	[Layer priority. 1 is front, 2 is back]

COMMAND	
Description and Parameters	
<b>get window N1 priority</b> ↵	
Show the current priority of the specified window.	
<b>N1</b> = 1~2	[Window number]
<b>set window N1 aspect ratio N2</b> ↵	
Set the aspect ratio of the video shown on the specified window.	
<b>N1</b> = 1~2	[Window number]
Available values for <b>N2</b> :	
1	[Full]
2	[16:9]
3	[16:10]
4	[4:3]
5	[Best fit]
6	[User]
7	[Center]
<b>get window N1 aspect ratio</b> ↵	
Show the currently set aspect ratio for the video shown on the specified window.	
<b>N1</b> = 1~2	[Window number]
<b>get window aspect ratio list</b> ↵	
List all available window aspect ratio options.	
<b>set window N1 mirror N2</b> ↵	
Enable or disable mirror mode on the specified window.	
<b>N1</b> = 1~2	[Window number]
Available values for <b>N2</b> :	
ON	[Enabled]
OFF	[Disabled]
<b>get window N1 mirror</b> ↵	
Show the current mirror mode setting of the specified window.	
<b>N1</b> = 1~2	[Window number]

COMMAND	
Description and Parameters	
<b>set window N1 border mode N2</b> ↵	
Enable or disable the specified window's border function.	
<b>N1</b> = 1~2	[Window number]
Available values for <b>N2</b> :	
ON	[Enabled]
OFF	[Disabled]
<b>get window N1 border mode</b> ↵	
Show the current state of the specified window's border function.	
<b>N1</b> = 1~2	[Window number]
<b>set window N1 border color N2</b> ↵	
Set the border color of the specified window.	
<b>N1</b> = 1~2	[Window number]
Available values for <b>N2</b> :	
1	[Black]
2	[Red]
3	[Green]
4	[Blue]
5	[Yellow]
6	[Magenta]
7	[Cyan]
8	[White]
9	[Dark Red]
10	[Dark Green]
11	[Dark Blue]
12	[Dark Yellow]
13	[Dark Magenta]
14	[Dark Cyan]
15	[Gray]
<b>get window N1 border color</b> ↵	
Show the current border color of the specified window.	
<b>N1</b> = 1~2	[Window number]

COMMAND	
Description and Parameters	
<b>set window N1 default</b> ↵	
Reset the specified window's, settings to their factory defaults.	
<b>N1</b> = 1~2	[Window number]
<b>set in N1 rotation mode N2</b>	
Enable or disable rotation mode for the specified input.	
<b>N1</b> = 1~2	[HDMI input number]
Available values for <b>N2</b> :	
ON	[Enabled]
OFF	[Disabled]
<b>get in N1 rotation mode</b> ↵	
Show the current rotation state of the specified input.	
<b>N1</b> = 1~2	[HDMI input number]
<b>set transition mode N1</b> ↵	
Set the transition mode to use, if any, when switching sources in Switcher mode.	
Available values for <b>N1</b> :	
0	[No transition (Cut)]
1	[Cross fade]
<b>get transition mode</b> ↵	
Show the current transition mode used when switching sources in Switcher mode.	
<b>set chroma key mode N1</b> ↵	
Enable or disable the unit's chroma key mode.	
Available values for <b>N1</b> :	
ON	[Enabled]
OFF	[Disabled]
<b>get chroma key mode</b> ↵	
Show the current state of the unit's chroma mode.	

**COMMAND****Description and Parameters****set chroma key rgb codes N1**↵

Set the chroma key value preset to use when chroma key is enabled.

Available values for **N1**:

1	[User 1]
2	[User 2]
3	[User 3]
4	[User 4]
5	[White]
6	[Yellow]
7	[Cyan]
8	[Green]
9	[Magenta]
10	[Red]
11	[Blue]
12	[Black]

**get chroma key rgb codes**↵

Show the currently selected chroma key preset.

**set chroma key user N1 r max N2**↵

Set the maximum value for the red component of the specified chroma key user preset.

Available values for **N1**:

1	[User 1]
2	[User 2]
3	[User 3]
4	[User 4]

**N2** = 0~255 [Red maximum value]

*Note: Only the User 1~4 presets can be adjusted. All other presets contain fixed values to simplify quick chroma key setup.*

## COMMAND

### Description and Parameters

#### **get chroma key user N1 r max**↵

Show the current maximum value for the red component of the specified chroma key preset.

Available values for **N1**:

1	[User 1]
2	[User 2]
3	[User 3]
4	[User 4]
5	[White]
6	[Yellow]
7	[Cyan]
8	[Green]
9	[Magenta]
10	[Red]
11	[Blue]
12	[Black]

#### **set chroma key user N1 r min N2**↵

Set the minimum value for the red component of the specified chroma key user preset.

Available values for **N1**:

1	[User 1]
2	[User 2]
3	[User 3]
4	[User 4]

**N2** = 0~255 [Red minimum value]

*Note: Only the User 1~4 presets can be adjusted. All other presets contain fixed values to simplify quick chroma key setup.*

**COMMAND****Description and Parameters****get chroma key user N1 r min**↵

Show the current minimum value for the red component of the specified chroma key preset.

Available values for **N1**:

1	[User 1]
2	[User 2]
3	[User 3]
4	[User 4]
5	[White]
6	[Yellow]
7	[Cyan]
8	[Green]
9	[Magenta]
10	[Red]
11	[Blue]
12	[Black]

**set chroma key user N1 g max N2**↵

Set the maximum value for the green component of the specified chroma key user preset.

Available values for **N1**:

1	[User 1]
2	[User 2]
3	[User 3]
4	[User 4]

**N2** = 0~255 [Green maximum value]

*Note: Only the User 1~4 presets can be adjusted. All other presets contain fixed values to simplify quick chroma key setup.*

**COMMAND****Description and Parameters****get chroma key user N1 g max**↵

Show the current maximum value for the green component of the specified chroma key preset.

Available values for **N1**:

1	[User 1]
2	[User 2]
3	[User 3]
4	[User 4]
5	[White]
6	[Yellow]
7	[Cyan]
8	[Green]
9	[Magenta]
10	[Red]
11	[Blue]
12	[Black]

**set chroma key user N1 g min N2**↵

Set the minimum value for the green component of the specified chroma key user preset.

Available values for **N1**:

1	[User 1]
2	[User 2]
3	[User 3]
4	[User 4]

**N2** = 0~255 [Green minimum value]

*Note: Only the User 1~4 presets can be adjusted. All other presets contain fixed values to simplify quick chroma key setup.*

**COMMAND****Description and Parameters****get chroma key user N1 g min**↵

Show the current minimum value for the green component of the specified chroma key preset.

Available values for **N1**:

1	[User 1]
2	[User 2]
3	[User 3]
4	[User 4]
5	[White]
6	[Yellow]
7	[Cyan]
8	[Green]
9	[Magenta]
10	[Red]
11	[Blue]
12	[Black]

**set chroma key user N1 b max N2**↵

Set the maximum value for the blue component of the specified chroma key user preset.

Available values for **N1**:

1	[User 1]
2	[User 2]
3	[User 3]
4	[User 4]

**N2** = 0~255 [Blue maximum value]

*Note: Only the User 1~4 presets can be adjusted. All other presets contain fixed values to simplify quick chroma key setup.*

## COMMAND

### Description and Parameters

#### get chroma key user N1 b max↵

Show the current maximum value for the blue component of the specified chroma key preset.

Available values for **N1**:

1	[User 1]
2	[User 2]
3	[User 3]
4	[User 4]
5	[White]
6	[Yellow]
7	[Cyan]
8	[Green]
9	[Magenta]
10	[Red]
11	[Blue]
12	[Black]

#### set chroma key user N1 b min N2↵

Set the minimum value for the blue component of the specified chroma key user preset.

Available values for **N1**:

1	[User 1]
2	[User 2]
3	[User 3]
4	[User 4]

**N2** = 0~255 [Blue minimum value]

*Note: Only the User 1~4 presets can be adjusted. All other presets contain fixed values to simplify quick chroma key setup.*

COMMAND	
Description and Parameters	
<b>get chroma key user N1 b min</b> ↵	
Show the current minimum value for the blue component of the specified chroma key preset.	
Available values for <b>N1</b> :	
1	[User 1]
2	[User 2]
3	[User 3]
4	[User 4]
5	[White]
6	[Yellow]
7	[Cyan]
8	[Green]
9	[Magenta]
10	[Red]
11	[Blue]
12	[Black]
<b>set cropping in N1 mode N2</b> ↵	
Enable or disable cropping for the specified input when in Switcher mode.	
<b>N1</b> = 1~2	[HDMI input number]
Available values for <b>N2</b> :	
ON	[Cropping enabled]
OFF	[Cropping disabled]
<b>get cropping in N1 mode</b> ↵	
Show the current cropping state of the specified input when in Switcher mode.	
<b>N1</b> = 1~2	[HDMI input number]
<b>set cropping in N1 h start N2</b> ↵	
Set the specified input's horizontal starting pixel value to use when cropping is enabled.	
<b>N1</b> = 1~2	[HDMI input number]
<b>N2</b> = 0~3840	[Horizontal pixel position]

COMMAND	
Description and Parameters	
<b>get cropping in N1 h start</b> ↵	
Show the specified input's current horizontal starting pixel value used when cropping is enabled.	
<b>N1</b> = 1~2	[HDMI input number]
<b>set cropping in N1 v start N2</b> ↵	
Set the specified input's vertical starting pixel value to use when cropping is enabled.	
<b>N1</b> = 1~2	[HDMI input number]
<b>N2</b> = 0~2160	[Vertical pixel position]
<b>get cropping in N1 v start</b> ↵	
Show the specified input's current vertical starting pixel value used when cropping is enabled.	
<b>N1</b> = 1~2	[HDMI input number]
<b>set cropping in N1 width N2</b> ↵	
Set the specified input's horizontal width value to use when cropping is enabled.	
<b>N1</b> = 1~2	[HDMI input number]
<b>N2</b> = 0~3840	[Horizontal pixel width]
<b>get cropping in N1 width</b> ↵	
Show the specified input's current horizontal width value used when cropping is enabled.	
<b>N1</b> = 1~2	[HDMI input number]
<b>set cropping in N1 height N2</b> ↵	
Set the specified input's vertical height value to use when cropping is enabled.	
<b>N1</b> = 1~2	[HDMI input number]
<b>N2</b> = 0~2160	[Vertical pixel height]

COMMAND	
Description and Parameters	
<b>get cropping in N1 height</b> ↵	
Show the specified input's current vertical height starting pixel value used when cropping is enabled.	
<b>N1</b> = 1~2	[HDMI input number]
<b>set cropping in N1 default</b> ↵	
Reset the specified input's video cropping settings to the factory defaults.	
<b>N1</b> = 1~2	[HDMI input number]
<b>set cropping window N1 mode N2</b> ↵	
Enable or disable cropping for the specified window's source when in PiP, PoP, or Preset modes.	
<b>N1</b> = 1~2	[Window number]
Available values for <b>N2</b> :	
ON	[Cropping enabled]
OFF	[Cropping disabled]
<b>get cropping window N1 mode</b> ↵	
Show the current cropping state of the specified window.	
<b>N1</b> = 1~2	[Window number]
<b>set cropping window N1 h start N2</b> ↵	
Set the specified window's horizontal starting pixel value to use when cropping is enabled.	
<b>N1</b> = 1~2	[Window number]
<b>N2</b> = 0~3840	[Horizontal pixel position]
<b>get cropping window N1 h start</b> ↵	
Show the specified window's current horizontal starting pixel value used when cropping is enabled.	
<b>N1</b> = 1~2	[Window number]

COMMAND	
Description and Parameters	
<b>set cropping window N1 v start N2↵</b>	
Set the specified window's vertical starting pixel value to use when cropping is enabled.	
<b>N1</b> = 1~2	[Window number]
<b>N2</b> = 0~2160	[Vertical pixel position]
<b>get cropping window N1 v start↵</b>	
Show the specified window's current vertical starting pixel value used when cropping is enabled.	
<b>N1</b> = 1~2	[Window number]
<b>set cropping window N1 width N2↵</b>	
Set the specified window's horizontal width value to use when cropping is enabled.	
<b>N1</b> = 1~2	[Window number]
<b>N2</b> = 0~3840	[Horizontal pixel width]
<b>get cropping window N1 width↵</b>	
Show the specified window's current horizontal width value used when cropping is enabled.	
<b>N1</b> = 1~2	[Window number]
<b>set cropping window N1 height N2↵</b>	
Set the specified window's vertical height value to use when cropping is enabled.	
<b>N1</b> = 1~2	[Window number]
<b>N2</b> = 0~2160	[Vertical pixel height]
<b>get cropping window N1 height↵</b>	
Show the specified input's current vertical height value used when cropping is enabled.	
<b>N1</b> = 1~2	[Window number]

COMMAND	
Description and Parameters	
<b>set cropping window N1 default</b> ↵	
Reset the specified window's video cropping settings to the factory defaults.	
<b>N1</b> = 1~2	[Window number]
<b>set in N1 contrast N2</b> ↵	
Set the contrast level of the specified input.	
<b>N1</b> = 1~2	[HDMI input number]
<b>N2</b> = 0~100	[Contrast level]
<b>get in N1 contrast</b> ↵	
Show the current contrast level of the specified input.	
<b>N1</b> = 1~2	[HDMI input number]
<b>set in N1 brightness N2</b> ↵	
Set the brightness level of the specified input.	
<b>N1</b> = 1~2	[HDMI input number]
<b>N2</b> = 0~100	[Brightness level]
<b>get in N1 brightness</b> ↵	
Show the current brightness level of the specified input.	
<b>N1</b> = 1~2	[HDMI input number]
<b>set in N1 saturation N2</b> ↵	
Set the saturation level of the specified input.	
<b>N1</b> = 1~2	[HDMI input number]
<b>N2</b> = 0~100	[Saturation level]
<b>get in N1 saturation</b> ↵	
Show the current saturation level of the specified input.	
<b>N1</b> = 1~2	[HDMI input number]

COMMAND	
Description and Parameters	
<b>set in N1 hue N2↵</b>	<p>Set the hue value of the specified input.</p> <p><b>N1</b> = 1~2 [HDMI input number]  <b>N2</b> = 0~100 [Hue value]</p>
<b>get in N1 hue↵</b>	<p>Show the current hue value of the specified input.</p> <p><b>N1</b> = 1~2 [HDMI input number]</p>
<b>set in N1 h sharpness N2↵</b>	<p>Set the horizontal sharpness level for the specified input video source.</p> <p><b>N1</b> = 1~2 [HDMI input number]  <b>N2</b> = 0~20 [Horizontal sharpness level]</p>
<b>get in N1 h sharpness↵</b>	<p>Show the current horizontal sharpness level for the specified input video source.</p> <p><b>N1</b> = 1~2 [HDMI input number]</p>
<b>set in N1 v sharpness N2↵</b>	<p>Set the vertical sharpness level for the specified input video source.</p> <p><b>N1</b> = 1~2 [HDMI input number]  <b>N2</b> = 0~20 [Vertical sharpness level]</p>
<b>get in N1 v sharpness↵</b>	<p>Show the current vertical sharpness level for the specified input video source.</p> <p><b>N1</b> = 1~2 [HDMI input number]</p>
<b>set in N1 picture default↵</b>	<p>Reset the specified input's picture settings to the factory defaults.</p> <p><b>N1</b> = 1~2 [HDMI input number]</p>

COMMAND	
Description and Parameters	
<b>set audio out A mute N1</b> ↵	
Enable or disable muting the HDMI audio output.	
Available values for <b>N1</b> :	
ON	[Audio muted]
OFF	[Mute disabled]
<b>get audio out A mute</b> ↵	
Show the current mute state of the HDMI output.	
<b>set audio out A route N1</b> ↵	
Route the specified audio source to the HDMI output.	
<b>N1</b> = 1~2	[HDMI input number]
<b>get audio out A route</b> ↵	
Show the current audio source routed to the HDMI output.	
<b>set audio out A name N2</b> ↵	
Set the name for the HDMI output's audio.	
<b>N1</b> = {Name}	[Audio output name, 16 chars max]
<b>get audio out A name</b> ↵	
Show the current name for the HDMI output's audio.	
<b>set all in edid mode N1</b> ↵	
Select the EDID management mode to use (All or Independent) for all inputs.	
Available values for <b>N1</b> :	
1	[All mode]
2	[Independent mode]
<b>get all in edid mode</b> ↵	
Show the current EDID management mode used by all inputs.	

COMMAND	
Description and Parameters	
<b>set all in edid N1</b> ↵	
Set the EDID to use when the “All” EDID mode is active.	
Available values for <b>N1</b> :	
0	[1080p60 2-channel]
1	[4K30 2-channel]
2	[4K60 2-channel]
3	[Sink out]
4	[User 1]
5	[User 2]
6	[User 3]
7	[User 4]
<b>get all in edid</b> ↵	
Show the current EDID used by the “All” EDID mode.	
<b>set in N1 edid N2</b> ↵	
Set the EDID to use on the specified input in the “Independent” EDID mode.	
<b>N1</b> = 1~2	[HDMI input number]
Available values for <b>N2</b> :	
0	[1080p60 2-channel]
1	[4K30 2-channel]
2	[4K60 2-channel]
3	[Sink out]
4	[User 1]
5	[User 2]
6	[User 3]
7	[User 4]
<b>get in N1 edid</b> ↵	
Show the EDID currently being used on the specified input in the “Independent” EDID mode.	
<b>N1</b> = 1~2	[HDMI input number]

COMMAND	
Description and Parameters	
<b>set user N1 edid update</b> ↵	
<p>Trigger the unit's EDID upload mode for the specified User EDID slot. After activating this, insert a USB stick containing the new EDID into the unit's Service port.</p>	
<b>N1</b> = 1~4	[User EDID number]
<b>set in N1 hdcp mode N2</b> ↵	
<p>Set the HDCP behavior of the specified input.</p>	
<b>N1</b> = 1~2	[HDMI input number]
<p>Available values for <b>N2</b>:</p>	
0	[HDCP support disabled]
1	[Refer to source]
2	[Refer to display]
<b>get in N1 hdcp mode</b> ↵	
<p>Show the current HDCP behavior used by the specified input.</p>	
<b>N1</b> = 1~2	[HDMI input number]
<b>set out A timing N1</b> ↵	
<p>Set the output resolution to use for the HDMI output.</p>	
<p>Available values for <b>N1</b>:</p>	
0	[640x480p59]
1	[480p60]
2	[576p50]
3	[800x600p60]
4	[848x480p60]
5	[1024x768p60]
6	[1280x720p50]
7	[1280x720p60]
8	[1280x768p60]
9	[1280x800P60]
10	[1280x960p60]
11	[1280x1024p60]
12	[1360x768P60]
13	[1366x768p60]
14	[1400x1050p60]
15	[1440x900p60]

COMMAND	
Description and Parameters	
16	[1600x900p60rb]
17	[1600x1200p60]
18	[1680x1050p60]
19	[1920x1080p24]
20	[1920x1080p25]
21	[1920x1080p30]
22	[1920x1080p50]
23	[1920x1080p60]
24	[1920x1200rb]
25	[2048x1152rb]
26	[3840x2160p24 *]
27	[3840x2160p25 *]
28	[3840x2160p30 *]
29	[4K p24 (DCI)]
30	[4K p25 (DCI)]
31	[4K p30 (DCI)]
32	[4K p50 (DCI)]
33	[4K p59 (DCI)]
34	[4K p60 (DCI)]
35	[3840x2160p50 *]
36	[3840x2160p59 *]
37	[3840x2160p60 *]
38	[Native OUT A]
<p><i>Note: In Warping mode, only the resolutions marked with an asterisk(*) are available.</i></p>	
<p><b>get out A timing</b>↵</p> <p>Show the current resolution used by the HDMI output.</p>	
<p><b>set out A osd logo display N1</b>↵</p> <p>Enable or disable the graphical logo overlay on the HDMI output.</p> <p>Available values for <b>N1</b>:</p> <p>ON [Logo enabled]</p> <p>OFF [Logo disabled]</p>	
<p><b>get out A osd logo display</b>↵</p> <p>Show the current state of the graphical logo overlay on the HDMI output.</p>	

COMMAND									
Description and Parameters									
<b>set out A osd logo hposition N1</b>	<p>Set the horizontal position of the graphical logo overlay on the HDMI output.</p> <p><b>N1</b> = 0~100 [Horizontal logo position]</p>								
<b>get out A osd logo hposition</b>	<p>Show the current horizontal position of the graphical logo overlay on the HDMI output.</p>								
<b>set out A osd logo vposition N1</b>	<p>Set the vertical position of the graphical logo overlay on the HDMI output.</p> <p><b>N1</b> = 0~100 [Vertical logo position]</p>								
<b>get out A osd logo vposition</b>	<p>Show the current vertical position of the graphical logo overlay on the HDMI output.</p>								
<b>set out osd logo default</b>	<p>Reset the unit's OSD logo to the factory default.</p>								
<b>set system usb osd logo update</b>	<p>Trigger the unit's OSD Logo upload mode. After activating this, insert a USB stick containing the new OSD Logo into the unit's Service port.</p>								
<b>set out A osd banner location N1</b>	<p>Set the OSD banner location on the HDMI output.</p> <p>Available values for <b>N1</b>:</p> <table> <tr> <td>0</td> <td>[Top left]</td> </tr> <tr> <td>1</td> <td>[Top right]</td> </tr> <tr> <td>2</td> <td>[Bottom right]</td> </tr> <tr> <td>3</td> <td>[Bottom left]</td> </tr> </table>	0	[Top left]	1	[Top right]	2	[Bottom right]	3	[Bottom left]
0	[Top left]								
1	[Top right]								
2	[Bottom right]								
3	[Bottom left]								
<b>get out A osd banner location</b>	<p>Show the current OSD banner location on the HDMI output.</p>								

COMMAND							
Description and Parameters							
<b>set out A osd info display N1</b> ↵	<p>Enable or disable the Info OSD.</p> <p>Available values for <b>N1</b>:</p> <table> <tr> <td>ON</td> <td>[Info OSD enabled]</td> </tr> <tr> <td>OFF</td> <td>[Info OSD disabled]</td> </tr> </table>	ON	[Info OSD enabled]	OFF	[Info OSD disabled]		
ON	[Info OSD enabled]						
OFF	[Info OSD disabled]						
<b>get out A osd info display</b> ↵	<p>Show the current Info OSD setting's state.</p>						
<b>set out A osd info timeout N1</b> ↵	<p>Set the OSD info's timeout value (in seconds).</p> <p>Available values for <b>N1</b>:</p> <table> <tr> <td>0</td> <td>[No timeout]</td> </tr> <tr> <td>5~60</td> <td>[Timeout in seconds]</td> </tr> </table>	0	[No timeout]	5~60	[Timeout in seconds]		
0	[No timeout]						
5~60	[Timeout in seconds]						
<b>get out A osd info timeout</b> ↵	<p>Show the current OSD info's timeout value.</p>						
<b>set out A osd timeout N1</b> ↵	<p>Set the OSD menu's timeout value (in seconds).</p> <p>Available values for <b>N1</b>:</p> <table> <tr> <td>0</td> <td>[No timeout]</td> </tr> <tr> <td>5~60</td> <td>[Timeout in seconds]</td> </tr> </table>	0	[No timeout]	5~60	[Timeout in seconds]		
0	[No timeout]						
5~60	[Timeout in seconds]						
<b>get out A osd timeout</b> ↵	<p>Show the current OSD menu's timeout value.</p>						
<b>set out A osd background color N1</b> ↵	<p>Set the color of the background of the OSD menu.</p> <p>Available values for <b>N1</b>:</p> <table> <tr> <td>BLACK</td> <td>[Black background]</td> </tr> <tr> <td>GRAY</td> <td>[Gray background]</td> </tr> <tr> <td>BLUE</td> <td>[Blue background]</td> </tr> </table>	BLACK	[Black background]	GRAY	[Gray background]	BLUE	[Blue background]
BLACK	[Black background]						
GRAY	[Gray background]						
BLUE	[Blue background]						
<b>get out A osd background color</b> ↵	<p>Show the current color of the background of the OSD menu.</p>						

COMMAND	
Description and Parameters	
<b>set out A osd transparency N1</b> ←	
Set the transparency level of the background of the OSD menu.	
Available values for <b>N1</b> :	
0	[No transparency]
1~10	[Transparency level]
<b>get out A osd transparency</b> ←	
Show the current transparency level of the OSD menu's background.	
<b>set out A osd N1</b> ←	
Display or turn off the OSD menu.	
Available values for <b>N1</b> :	
ON	[OSD menu on]
OFF	[OSD menu off]
<b>get out A osd</b> ←	
Show the current OSD menu state.	
<b>set current route to preset N1</b> ←	
Save all current routing assignments to the specified preset.	
<b>N1 = 1~4</b>	[Preset number]
<b>set route preset N1</b> ←	
Activate the routing assignments saved in the specified preset.	
<b>N1 = 1~4</b>	[Preset number]

COMMAND																									
Description and Parameters																									
<b>set out A auto sync off N1</b> ↵	<p>Enable or disable the Auto Sync Off function on the HDMI output and set the timeout length.</p> <p>Available values for <b>N1</b>:</p> <table> <tr><td>0</td><td>[Always on]</td></tr> <tr><td>1</td><td>[5 seconds]</td></tr> <tr><td>2</td><td>[10 seconds]</td></tr> <tr><td>3</td><td>[15 seconds]</td></tr> <tr><td>4</td><td>[30 seconds]</td></tr> <tr><td>5</td><td>[1 minute]</td></tr> <tr><td>6</td><td>[1.5 minutes]</td></tr> <tr><td>7</td><td>[2 minutes]</td></tr> <tr><td>8</td><td>[2.5 minutes]</td></tr> <tr><td>9</td><td>[3 minutes]</td></tr> <tr><td>10</td><td>[5 minutes]</td></tr> <tr><td>11</td><td>[10 minutes]</td></tr> </table>	0	[Always on]	1	[5 seconds]	2	[10 seconds]	3	[15 seconds]	4	[30 seconds]	5	[1 minute]	6	[1.5 minutes]	7	[2 minutes]	8	[2.5 minutes]	9	[3 minutes]	10	[5 minutes]	11	[10 minutes]
0	[Always on]																								
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5	[1 minute]																								
6	[1.5 minutes]																								
7	[2 minutes]																								
8	[2.5 minutes]																								
9	[3 minutes]																								
10	[5 minutes]																								
11	[10 minutes]																								
<b>get out A auto sync off</b> ↵	<p>Show the current Auto Sync Off timeout setting for the HDMI output.</p>																								
<b>set system usb fw update</b> ↵	<p>Trigger the unit's firmware upload mode. After activating this, insert a USB stick containing the new firmware into the unit's Service port.</p>																								
<b>set factory user edid default</b> ↵	<p>Restore the unit's uploaded User EDIDs to their factory defaults.</p>																								
<b>set factory default</b> ↵	<p>Restore the unit's settings except network, uploaded EDIDs, and presets to their factory defaults.</p>																								
<b>set device operation mode N1</b> ↵	<p>Set the unit's operation mode to scaling or warping.</p> <p>Available values for <b>N1</b>:</p> <table> <tr><td>1</td><td>[Scaling mode]</td></tr> <tr><td>2</td><td>[Warping mode]</td></tr> </table>	1	[Scaling mode]	2	[Warping mode]																				
1	[Scaling mode]																								
2	[Warping mode]																								
<b>get device operation mode</b> ↵	<p>Show the unit's current operation mode.</p>																								

COMMAND	
Description and Parameters	
<b>set warping mode N1</b> ↵	
<p>Enable or disable the warping function when the operational mode is set to “warping”.</p> <p>Available values for <b>N1</b>:</p> <p>ON [Warping functionality enabled]  OFF [Warping functionality disabled]</p>	
<b>get warping mode</b> ↵	
<p>Show the current state of the unit’s warping mode.</p>	
<b>set rotate angle N1</b> ↵	
<p>Set the rotation angle of the video output when warping is disabled.</p> <p><b>N1</b> = 0~359 [Non-warped rotation angle]</p>	
<b>get rotate angle</b> ↵	
<p>Show the current rotation angle applied when warping is disabled.</p>	
<b>set warping keep aspect ratio N1</b> ↵	
<p>Enable or disable keeping the source’s aspect ratio when warping is enabled and adjusting width/height values.</p> <p>Available values for <b>N1</b>:</p> <p>ON [Maintain current aspect ratio]  OFF [Free resizing allowed]</p>	
<b>get warping keep aspect ratio</b> ↵	
<p>Show the current warping aspect ratio mode applied to a warped output.</p>	
<b>set warping in 1 v start N1</b> ↵	
<p>Set the display’s vertical starting pixel within the source video when warping is enabled.</p> <p><b>N1</b> = 0~2160 [Vertical starting pixel]</p> <p><i>Note: Position is based on an un-rotated display. This setting is the same as used in the OSD menu and control software.</i></p>	
<b>get warping in 1 v start</b> ↵	
<p>Show the current vertical starting pixel value.</p>	

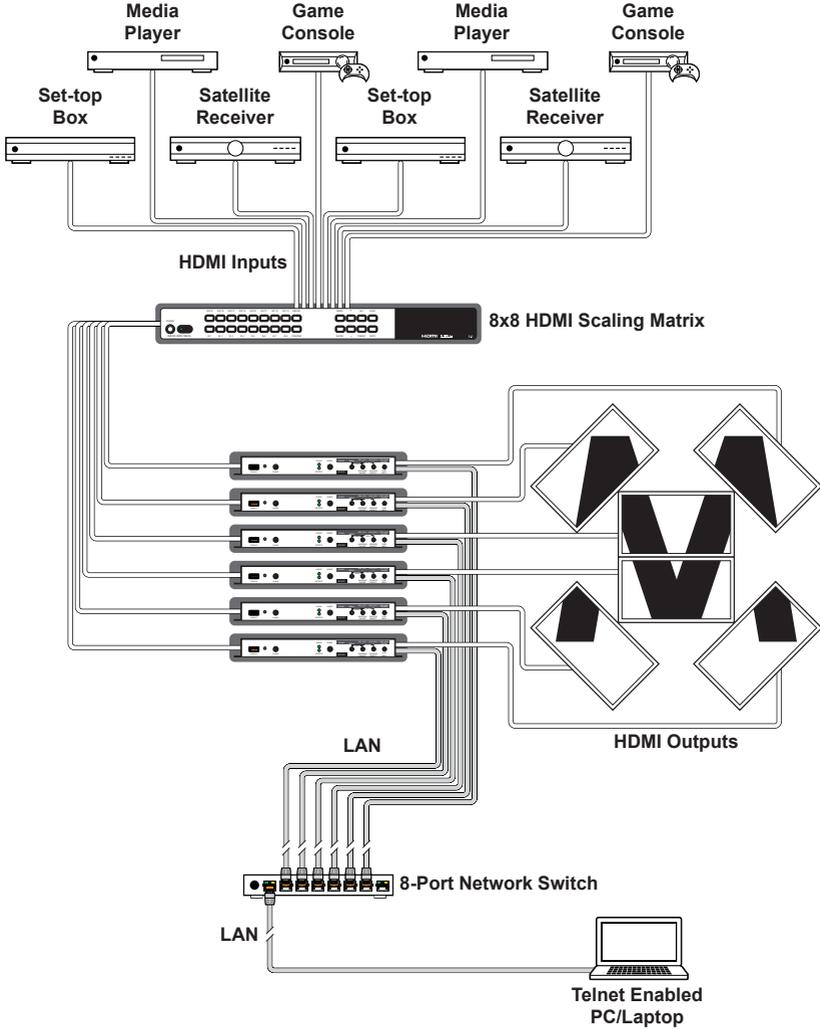
COMMAND	
Description and Parameters	
<b>set warping in 1 h start N1</b> ↵	
Set the display's horizontal starting pixel within the source video when warping is enabled.	
<b>N1</b> = 0~3840	[Horizontal starting pixel]
<i>Note: Position is based on an un-rotated display. This setting is the same as used in the OSD menu and control software.</i>	
<b>get warping in 1 h start</b> ↵	
Show the current horizontal starting pixel value.	
<b>set warping in 1 width N1</b> ↵	
Set the display's relative width within the video source when warping is enabled.	
<b>N1</b> = 1536~3840	[Display width in pixels]
<b>get warping in 1 width</b> ↵	
Show the current display width value.	
<b>set warping in 1 height N1</b> ↵	
Set the display's relative height within the video source when warping is enabled.	
<b>N1</b> = 864~2160	[Display height in pixels]
<b>get warping in 1 height</b> ↵	
Show the current display height value.	
<b>set warping angle N1</b> ↵	
Set the warping angle to apply to the unit's output when warping is enabled.	
<b>N1</b> = 0~359	[Warping rotation angle]
<b>get warping angle</b> ↵	
Show the current warping angle applied to the warped output.	
<b>set video wall top bezel N1</b> ↵	
Set the display's top bezel compensation value.	
<b>N1</b> = 0~255	[Top bezel]

COMMAND	
Description and Parameters	
<b>get video wall top bezel</b> ↵	Show the display's current top bezel compensation value.
<b>set video wall bottom bezel N1</b> ↵	Set the display's bottom bezel compensation value. N1 = 0~255 [Bottom bezel]
<b>get video wall bottom bezel</b> ↵	Show the display's current bottom bezel compensation value.
<b>set video wall left bezel N1</b> ↵	Set the display's left bezel compensation value. N1 = 0~255 [Left bezel]
<b>get video wall left bezel</b> ↵	Show the display's current left bezel compensation value.
<b>set video wall right bezel N1</b> ↵	Set the display's right bezel compensation value. N1 = 0~255 [Right bezel]
<b>get video wall right bezel</b> ↵	Show the display's current right bezel compensation value.
<b>get warping in 1 top left corner</b> ↵	Show the current top left corner coordinates used from within the input video when warping is enabled.
<b>get warping in 1 top right corner</b> ↵	Show the current top right corner coordinates used from within the input video when warping is enabled.
<b>get warping in 1 bottom left corner</b> ↵	Show the current bottom left corner coordinates used from within the input video when warping is enabled.

COMMAND
Description and Parameters
<b>get warping in 1 bottom right corner↵</b> Show the current bottom right corner coordinates used from within the input video when warping is enabled.
<b>get warping out A top left corner↵</b> Show the current top left corner coordinates within the video output when warping is enabled.
<b>get warping out A top right corner↵</b> Show the current top right coordinates within the video output when warping is enabled.
<b>get warping out A bottom left corner↵</b> Show the current bottom left coordinates within the video output when warping is enabled.
<b>get warping out A bottom right corner↵</b> Show the current bottom right coordinates within the video output when warping is enabled.

*Note: Commands will not be executed unless followed by a carriage return. Commands are not case-sensitive.*

## 7. CONNECTION DIAGRAM



## 8. SPECIFICATIONS

### 8.1 Technical Specifications

<b>HDMI Bandwidth</b>	18Gbps
<b>Input Ports</b>	2×HDMI (Type-A)
<b>Output Ports</b>	1×HDMI (Type-A)
<b>Control Ports</b>	1×RS-232 (3.5mm) 1×IP Control (RJ-45)
<b>Service Port</b>	1×USB 2.0 (Type-A)
<b>Baud Rate</b>	19200
<b>Power Supply</b>	24V/2.7A DC (US/EU standards, CE/FCC/UL certified)
<b>ESD Protection (HBM)</b>	±8kV (Air Discharge) ±4kV (Contact Discharge)
<b>Dimensions (W×H×D)</b>	231.5mm×25mm×158mm [Case Only] 231.5mm×25mm×161mm [All Inclusive]
<b>Weight</b>	945g
<b>Chassis Material</b>	Metal (Steel)
<b>Chassis Color</b>	Black
<b>Operating Temperature</b>	0°C – 40°C/32°F – 104°F
<b>Storage Temperature</b>	-20°C – 60°C/-4°F – 140°F
<b>Relative Humidity</b>	20 – 90% RH (Non-condensing)
<b>Power Consumption</b>	23W

## 8.2 Video Specifications

Supported Resolutions (Hz)	Input	Scaling Output	Warping Output
	HDMI	HDMI	HDMI
720×400p@70/85	✓	×	×
640×480p@60/72/75/85	✓	59.94	×
720×480i@60	✓	×	×
720×480p@60	✓	✓	×
720×576i@50	✓	×	×
720×576p@50	✓	✓	×
800×600p@56/60/72/75/85	✓	60	×
848×480p@60	✓	✓	×
1024×768p@60/70/75/85	✓	60	×
1152×864p@75	✓	×	×
1280×720p@50/60	✓	✓	×
1280×768p@60/75/85	✓	60	×
1280×800p@60/75/85	✓	60	×
1280×960p@60/85	✓	60	×
1280×1024p@60/75/85	✓	60	×
1360×768p@60	✓	✓	×
1366×768p@60	✓	✓	×
1400×1050p@60	✓	✓	×
1440×900p@60/75	✓	60	×
1600×900p@60RB	✓	✓	×
1600×1200p@60	✓	✓	×
1680×1050p@60	✓	✓	×
1920×1080i@50/60	✓	×	×
1920×1080p@24/25/30	✓	✓	×
1920×1080p@50/60	✓	✓	×
1920×1200p@60RB	✓	✓	×

Supported Resolutions (Hz)	Input	Scaling Output	Warping Output
	HDMI	HDMI	HDMI
2560×1440p@60RB	✓	×	×
2560×1600p@60RB	✓	×	×
2048×1080p@24/25/30	✓	×	×
2048×1080p@50/60	✓	×	×
2048×1152p@60RB	✓	✓	×
3840×2160p@24/25/30	✓	✓	✓
3840×2160p@50/60 (4:2:0)	✓	×	×
3840×2160p@24, HDR10	×	×	×
3840×2160p@50/60 (4:2:0), HDR10	×	×	×
3840×2160p@50/60	✓	✓	✓
4096×2160p@24/25/30	✓	✓	×
4096×2160p@50/60 (4:2:0)	✓	✓	×
4096×2160p@24, HDR10	×	×	×
4096×2160p@50/60 (4:2:0), HDR10	×	×	×
4096×2160p@50/60	✓	✓	×

## 8.3 Audio Specifications

### 8.3.1 Digital Audio

HDMI Input / Output	
LPCM	
Max Channels	2 Channels
Sampling Rate (kHz)	48
Bitstream	
Supported Formats	None

## 8.4 Cable Specifications

Cable Length	1080p		4K30	4K60
	8-bit	12-bit	(4:4:4) 8-bit	(4:4:4) 8-bit
High Speed HDMI Cable				
HDMI Input	15m	10m	5m	3m
HDMI Output	15m	10m	5m	3m

### Bandwidth Category Examples:

- **1080p (FHD Video)**
  - Up to 1080p@60Hz, 12-bit color
  - Data rates lower than 5.3Gbps or below 225MHz TMDS clock
- **4K30 (4K UHD Video)**
  - 4K@24/25/30Hz & 4K@50/60Hz (4:2:0), 8-bit color
  - Data rates higher than 5.3Gbps or above 225MHz TMDS clock but below 10.2Gbps
- **4K60 (4K UHD+ Video)**
  - 4K@50/60Hz (4:4:4, 8-bit)
  - 4K@50/60Hz (4:2:0, 10-bit HDR)
  - Data rates higher than 10.2Gbps

## 9. ACRONYMS

ACRONYM	COMPLETE TERM
<b>DHCP</b>	Dynamic Host Configuration Protocol
<b>DVI</b>	Digital Visual Interface
<b>EDID</b>	Extended Display Identification Data
<b>GbE</b>	Gigabit Ethernet
<b>Gbps</b>	Gigabits per second
<b>GUI</b>	Graphical User Interface
<b>HDCP</b>	High-bandwidth Digital Content Protection
<b>HDMI</b>	High-Definition Multimedia Interface
<b>HDR</b>	High Dynamic Range
<b>IP</b>	Internet Protocol
<b>kHz</b>	Kilohertz
<b>LAN</b>	Local Area Network
<b>LED</b>	Light-Emitting Diode
<b>LPCM</b>	Linear Pulse-Code Modulation
<b>MAC</b>	Media Access Control
<b>MHz</b>	Megahertz
<b>OSD</b>	On-Screen Display
<b>PiP</b>	Picture in Picture
<b>PoP</b>	Picture outside of Picture
<b>TCP</b>	Transmission Control Protocol
<b>TMDs</b>	Transition-Minimized Differential Signaling
<b>4K UHD</b>	4K Ultra-High-Definition (10.2Gbps max)
<b>4K UHD<sup>+</sup></b>	4K Ultra-High-Definition (18Gbps max)
<b>USB</b>	Universal Serial Bus
<b>XGA</b>	Extended Graphics Array



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