CPLUS-V4H2HPIP

UHD+ 4×2 HDMI Matrix with PiP

Operation Manual

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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
RDV1	2019/11/22	Preliminary release
RDV2	2020/06/15	Added 3840x2400@60rb output support
RDV3	2020/12/28	Added phase 2 features (keying, rotation, auto multi-window, boot logos)

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1. INTRODUCTION

This 4 by 2 HDMI Matrix with PiP is a high performance HDMI switch with integrated scaling and multi-windowing technology which can connect up to four 4K UHD+ HDMI sources to up to two 4K UHD+ HDMI displays and freely switch between them. It is an ideal solution for monitoring or displaying multiple sources simultaneously for use in control rooms, conference rooms or classrooms. Video resolutions up to 4K@60Hz and LPCM audio up to 7.1 channels at 192kHz are supported and this unit is fully compatible with the HDCP 1.x and 2.2 standards.

Any of 4 different HDMI sources may be displayed individually, full screen, with seamless switching in Matrix mode, or they can be displayed using a variety of multi-window modes including standard views like PiP (Picture in Picture) and PoP (Picture outside of Picture) as well as fully customizable quad-window modes. Support for chroma keying, with some limitations, is also provided. Control of input/window routing, position and sizing is easy using the front panel controls with OSD menu as well as by WebGUI, RS-232, and Telnet.

2. APPLICATIONS

- Entertainment Room & Home Theater
- Show Room & Demo Room
- Lecture Room & Hall Presentation
- Public Commercial Display

3. PACKAGE CONTENTS

- 1× UHD+ 4×2 HDMI Matrix with PiP
- 1× 24V/2.7A DC Power Adapter
- 1× Rackmount Ears (Set of 2)
- 1× Shockproof Feet (Set of 4)
- 1× Operation Manual

4. SYSTEM REQUIREMENTS

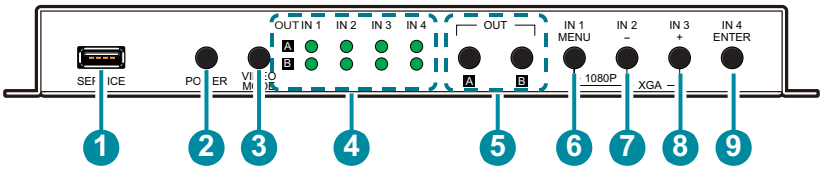
- HDMI source equipment such as media players, video game consoles or set-top boxes.
- HDMI receiving equipment such as HDTVs, monitors or audio amplifiers.

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
- 4 HDMI inputs and 2 HDMI outputs
- Supports up to 4K UHD^{+} (18Gbps, 4K@50/60Hz 4:4:4, 8-bit) video input and output
- Seamless switching (no loss of sync to display) when switching sources in Matrix mode
- Supports up to four simultaneous, freely scalable, windows in multi-windowing modes
- Supports the ability to store a multi-window arrangement as a preset that can be recalled later
- Auto-window mode that will automatically change the number of visible windows based on the number of live sources
- Independent audio source selection and routing in all modes
- Inputs 1 & 2 support pass-through of many audio formats including 8 channel LPCM, Bitstream, and HD Bitstream (Inputs 3 & 4 are limited to 2 channel LPCM only)
- Chroma key mode (between input 1 & 2 only)
- 90 degree counterclockwise rotation support (matrix mode only)
- Each window can have a border with a selectable color
- Uploadable and freely positionable graphic logo support
- Uploadable boot screen logo support
- Intuitive and easy adjustment of window size, position and settings in multi-window modes via the WebGUI
- Per-input EDID management with internal or external EDID options
- Controllable via front panel buttons, WebGUI, Telnet, and RS-232

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 & Button:** Press this button to power the unit on (green LED) or place it into stand-by mode (red LED).

   Note: Ethernet and RS-232 remain active when the unit is in stand-by mode.
3. **VIDEO MODE Button:** Press this button to sequentially switch the unit's operational mode between Matrix, PiP, PoP, Quad, and Auto.
4. **OUT A~B/IN 1~4 LED Array:** In Matrix mode, these LED's indicate the currently selected sources (IN 1~4) routed to each of the two outputs (OUT A~B). When the unit is in a multi-windowing mode (PiP/PoP/Quad/ Preset) all LEDs will be illuminated simultaneously.

   Note: When source selection is active the associated output's LED(s) will blink.
5. **OUT A/B Buttons:** In Matrix mode, either of these buttons to activate/ deactivate discrete source selection for the associated output. In multi-windowing modes (PiP/PoP/Quad/Preset) either button will activate/ deactivate sequential source selection for the 4 windows.

   Note: These buttons only activate/deactivate the ability to change sources. Actual source selection is accomplished using the IN 1~4 buttons.
6. **IN 1/MENU Button:** When not in source selection mode, press to enter the OSD menu, or to back out from menu items. When source selection is active, pressing this button will either select input 1 (Matrix mode) or sequentially switch through all 4 inputs for window 1 (PiP/PoP/Quad/ Preset modes).

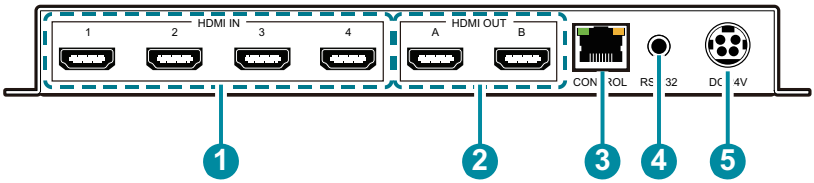
Note: Pressing "MENU" and "+" together will reset the output resolution to XGA (1024×768@60Hz). Pressing "MENU" and "-" together will reset the output resolution to 1080p@60Hz.

7. **IN 2/- (MINUS) Button:** When not in source selection mode, press to move down or adjust selections within OSD menus. When source selection is active, pressing this button will either select input 2 (Matrix mode) or sequentially switch through all 4 inputs for window 2 (PiP/PoP/Quad/Preset modes).

8. **IN 3/+ (PLUS) Button:** When not in source selection mode, press to move up or adjust selections within OSD menus. When source selection is active, pressing this button will either select input 3 (Matrix mode) or sequentially switch through all 4 inputs for window 3 (PiP/PoP/Quad/Preset modes).

9. **IN 4/ENTER Button:** When not in source selection mode, press to confirm a selection within the OSD or to go deeper into a menu item. When source selection is active, pressing this button will either select input 4 (Matrix mode) or sequentially switch through all 4 inputs for window 4 (PiP/PoP/Quad/Preset modes).

6.2 Rear Panel



1. **HDMI IN 1~4 Ports:** Connect to HDMI source equipment such as media players, game consoles, or set-top boxes.

   Note: Audio support on inputs 3~4 is limited to 2 channel LPCM.

2. **HDMI OUT A~B Ports:** Connect to HDMI TVs, monitors, or amplifiers 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 Telnet/WebGUI.

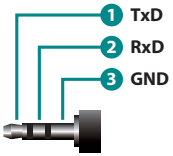
4. **RS-232 Port:** Connect directly to a PC, laptop, or other serial control device with a 3.5mm adapter cable to send RS-232 commands to control the unit.

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.

MAIN MENU
Video Mode
Window Layout
Picture
Audio
Input EDID
HDCP Mode
Output Resolution
OSD Settings
Logo Settings
Ethernet
Preset
Setup
Information

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**
Video Mode	Matrix
	PiP
	PoP
	QUAD
	Auto
	Preset 1
	Preset 2
	Preset 3
	Preset 4
PiP/PoP/Quad/Preset Mode	
WIN 1 Source	In 1~4 **[1]**
WIN 2 Source	In 1~4 **[2]**
WIN 3 Source	In 1~4 **[3]**
WIN 4 Source	In 1~4 **[4]**
Auto Mode	
Auto Layout 2	**SIDE BY SIDE**
	Big Small
	Big Small 2
Matrix Mode	
Fade In Out	On
	OFF
OUT A Source	In 1~4 **[1]**
OUT B Source	In 1~4 **[2]**

1) **Video Mode:** Select the preferred operation mode of the unit.

   Note: Selecting some modes will limit available features.

2) **WIN 1/2/3/4 Source:** Select the source for the specified window in multi-windowing modes (PiP, PoP, Quad).

3) **Auto Layout 2:** Select the preferred window arrangement to use in Auto mode when there are only 2 live sources.

4) **Fade In/Out:** Enable or disable crossfading between sources in Matrix mode.

5) **OUT A/B Source:** Select the source for the specified HDMI output when in Matrix mode.

Window Layout (Matrix Mode)	
2ND LEVEL	**3RD LEVEL**
Input Select	In 1~4 **[1]**
Aspect Ratio	**FULL**
	16:9
	16:10
	4:3
	Best Fit
Mirror	**NO**
	Yes
Rotate	On
	OFF
Border On/Off	On
	OFF
Border Color	Black
	Red
	GREEN
	Blue
	Yellow
	Magenta
	Cyan
	White
	Dark Red
	Dark Green
	Dark Blue
	Dark Yellow
	Dark Magenta

Window Layout (Matrix Mode)	
2ND LEVEL	3RD LEVEL
	Dark Cyan
	Gray
Window Reset	**NO**
	Yes

1) **Input Select:** Select the input to modify.

   Note: All settings are individually saved, per-input.

2) **Aspect Ratio:** Select a fixed aspect ratio for the currently selected window. Selecting the “Full” aspect ratio will stretch the source to fill the output, regardless of original aspect. Selecting “Best Fit” will automatically set the ratio based on the window’s current source resolution.

3) **Mirror:** Selecting “On” will flip the currently selected input horizontally.

4) **Rotate:** Enable or disable rotating the input counterclockwise by 90 degrees.

   Note: When rotation is active the output is forced to full screen and the mirror and border settings are disabled. When the output resolution is set to 4K, only input 1 can be rotated.

5) **Border On/Off:** Enables or disable the color border around the currently selected input.

6) **Border Color:** Select the color to use for the border of the currently selected input.

7) **Window Reset:** Reset the current input to its default settings.

Window Layout (PiP/PoP/Quad/Preset Modes)	
2ND LEVEL	3RD LEVEL
Window Select	Win 1~4 **[1]**
Window On/Off	**ON**
	Off
Position X	0~Max H resolution
Position Y	0~Max V resolution
Size Width	1~Max H resolution
Size Height	1~Max V resolution

Window Layout (PiP/PoP/Quad/Preset Modes)	
2ND LEVEL	**3RD LEVEL**
Priority	1~4 **[4]**
Aspect Ratio	**FULL**
	16:9
	16:10
	4:3
	Best Fit
	User
Mirror	**NO**
	Yes
Border On/Off	On
	OFF
Border Color	Black
	Red
	GREEN
	Blue
	Yellow
	Magenta
	Cyan
	White
	Dark Red
	Dark Green
	Dark Blue
	Dark Yellow
	Dark Magenta
	Dark Cyan
	Gray
Window Reset	**NO**
	Yes

1) **Window Select:** Select the window to modify.

   Note: All settings are individually saved, per-window/per-mode.

2) **Window On/Off:** Enable or disable the currently selected window.

3) **Position X/Y:** Set the X and Y coordinate position of the upper left corner of the currently selected window.

4) **Size Width/Height:** Set the horizontal and vertical size of the currently selected window.

5) **Priority:** Select the layer priority of the currently selected window. Priority 1 is at the front and priority 4 is at the back.

6) **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.

7) **Mirror:** Selecting "On" will flip the currently selected window horizontally.

8) **Border On/Off:** Enables or disable the color border around the currently selected window.

9) **Border Color:** Select the color to use for the border of the currently selected window.

10) **Window Reset:** Reset the current window to its default settings based on the currently selected mode.

Chroma Key (Matrix Mode Only)	
2ND LEVEL	**3RD LEVEL**
Chromakey	On
	OFF
User Select	**USER 1**
	User 2
	User 3
	User 4
	White
	Yellow
	Cyan
	Green
	Magenta
	Red
	Blue
	Black
Red Max	0~255 **[255]**
Red Min	0~255 **[0]**
Green Max	0~255 **[255]**
Green Min	0~255 **[0]**
Blue Max	0~255 **[255]**
Blue Min	0~255 **[0]**

1) **Chromakey:** Enable or disable Chroma Key mode. When enabled, Input 1 will always be the background layer and input 2 will always be the foreground layer to which the key is applied.

   Note: When Chroma Key is active the aspect ratio is forced to full screen and the border feature is disabled.

2) **User Select:** Select the keying preset to use when chroma key is active. There are 4 user editable presets and 8 fixed presets.

3) **Red/Green/Blue Max/Min:** Set the keying range (the color range within input 2's video to make transparent) to use for the currently selected User Key Preset by setting the maximum and minimum values for red, green, and blue.

Note: If a fixed preset is currently selected, the values will be displayed, but cannot be modified.

Picture	
2ND LEVEL	**3RD LEVEL**
Input Select	**IN 1**
	In 2
	In 3
	In 4
Contrast	0~100 **[75]**
Brightness	0~100 **[50]**
Saturation	0~100 **[50]**
Hue	0~100 **[50]**
Sharpness H	0~10 **[10]**
Sharpness V	0~10 **[10]**
Reset	**NO**
	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 (Matrix Mode)	
2ND LEVEL	**3RD LEVEL**
OUT A Source	**WINDOW**
	In 1
	In 2
	In 3
	In 4
OUT A Mute	On
	OFF
OUT B Source	**WINDOW**
	In 1
	In 2
	In 3
	In 4
OUT B Mute	On
	OFF

1) **OUT A Source:** Select the audio source to pair with video output A.
2) **OUT A Mute:** Enable or disable muting audio output A.
3) **OUT B Source:** Select the audio source to pair with video output B.
4) **OUT B Mute:** Enable or disable muting audio output B.

Audio (PiP/PoP/Quad/Auto/Preset Modes)	
2ND LEVEL	**3RD LEVEL**
OUT A Source	**WIN 1**
	Win 2
	Win 3
	Win 4
	In 1
	In 2
	In 3
	In 4
OUT A Mute	On
	OFF
OUT B Source	**WIN 1**
	Win 2
	Win 3
	Win 4
	In 1
	In 2
	In 3
	In 4
OUT B Mute	On
	OFF

1) **OUT A Source:** Select the audio source to pair with video output A.
2) **OUT A Mute:** Enable or disable muting audio output A.
3) **OUT B Source:** Select the audio source to pair with video output B.
4) **OUT B Mute:** Enable or disable muting audio output B.

Input EDID	
2ND LEVEL	**3RD LEVEL**
EDID Mode	**ALL**
	Appoint
All EDID	**FHD 2CH**
	4KUHD 2CH
	4KUHD+ 2CH
	Sink OUT A
	Sink OUT B
	User 1
	User 2
	User 3
	User 4
IN 1 EDID	Same as [All EDID]
IN 2 EDID	Same as [All EDID]
IN 3 EDID	Same as [All EDID]
IN 4 EDID	Same as [All EDID]
User 1 Update	**NO**
	Yes
User 2 Update	**NO**
	Yes
User 3 Update	**NO**
	Yes
User 4 Update	**NO**
	Yes

1) **EDID Mode:** Select how to assign EDIDs to the unit's inputs. Selecting "Appoint" 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 1~4 EDID:** Select the EDID to assign to the specified input.

   Note: Only available in the "Appoint" EDID Mode.

4) **User 1~4 EDID:** 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.

HDCP Mode	
2ND LEVEL	**3RD LEVEL**
In 1~4	HDCP Support Off
	Refer to Source
	REFER TO DISPLAY
OUT A	[Current HDCP status display]
OUT B	
Win 1	
Win 2	
Win 3	
Win 4	

1) **In 1~4:** 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 all sources and outputs.

Output Resolution	
2ND LEVEL	
640×480p59	1920×1080p30
480p60	1920×1080p50
576p50	**1920×1080P60**
800×600p60	1920×1200RB
848×480p60	2048×1152RB
1024×768p60	3840×2160p24
1280×720p50	3840×2160p25
1280×720p60	3840×2160p30
1280×768p60	4K p24 (DCI)
1280×800p60	4K p25 (DCI)
1280×960p60	4K p30 (DCI)
1280×1024p60	4K p50 (DCI)
1360×768p60	4K p59 (DCI)
1366×768p60	4K p60 (DCI)
1400×1050p60	3840×2160p50
1440×900p60	3840×2160p59
1600×900p60RB	3840×2160p60
1600×1200p60	3840×2400p60RB
1680×1050p60	Native OUT A
1920×1080p24	Native OUT B
1920×1080p25	

1) **Output Resolution:** Select the preferred video output resolution.
   Note: Both outputs always share the same resolution selection.

OSD Settings	
2ND LEVEL	**3RD LEVEL**
Menu Position	**TOP LEFT**
	Top Right
	Bottom Right
	Bottom Left
Menu Timeout	Off
	5~60 **[10]**
Info. Timeout	Off
	5~60 **[5]**
Info. Display	**ON**
	Off
Transparency	**OFF**
	1~10
Background	Black
	GRAY
	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 of the background of the OSD menu.

Logo Settings	
2ND LEVEL	**3RD LEVEL**
Logo On/Off	On
	OFF
Position X	0~100 **[10]**
Position Y	0~100 **[10]**
Load Default	**NO**
	Yes
Logo Update	**NO**
	Yes
Boot Logo On/Off	**ON**
	Off
Boot 4K Source	**DEFAULT**
	User
Boot 1080P Source	**DEFAULT**
	User
Boot VGA Source	**DEFAULT**
	User
User 4K Update	**NO**
	Yes
User 1080P Update	**NO**
	Yes
User VGA Update	**NO**
	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.
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.

5) **Boot Logo On/Off:** Enable or disable displaying a graphic image during boot up.

6) **Boot 4K Source:** Select whether to display the default graphic image during boot, or the user uploaded graphic when the output resolution is set to 4K or above.

7) **Boot 1080P Source:** Select whether to display the default graphic image during boot, or the user uploaded graphic when the output resolution is between 1080p and VGA.

8) **Boot VGA Source:** Select whether to display the default graphic image during boot, or the user uploaded graphic when the output resolution is less than VGA.

9) **User 4K Update:** To upload a 4K boot graphic via USB, select “Yes” and then insert a USB stick containing the new boot graphic file (8-bit *.BMP format, 3840×2160 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_BOOT_4K_*.BMP) graphic file.

10) **User 1080P Update:** To upload a 1080p boot graphic via USB, select “Yes” and then insert a USB stick containing the new boot graphic file (8-bit *.BMP format, 1920×1080 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_BOOT_1080P_*.BMP) graphic file.

11) **User VGA Update:** To upload a VGA boot graphic via USB, select “Yes” and then insert a USB stick containing the new boot graphic file (8-bit *.BMP format, 640×480 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_BOOT_VGA_*.BMP) graphic file.

Ethernet	
2ND LEVEL	**3RD LEVEL**
IP Mode	**STATIC**
	DHCP
Static IP Config	
IP Address	X.X.X.X **[192.168.1.50]**
Subnet Mask	X.X.X.X **[255.255.255.0]**
Gateway	X.X.X.X **[192.168.1.254]**
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	**PRESET 1**
	Preset 2
	Preset 3
	Preset 4
Recall	**PRESET 1**
	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	**ALWAYS ON**
	5 sec.
	10 sec.
	15 sec.
	30 sec.
	1 min.
	1.5 min.
	2 min.
	2.5 min.
	3 min.
	5 min.
	10 min.

Setup	
2ND LEVEL	**3RD LEVEL**
Firmware Update	**NO**
	Yes
User EDID Reset	**NO**
	Yes
Factory Reset	**NO**
	Yes
User Boot Logo Clear	**NO**
	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) **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.*
3) **User EDID Reset:** Select “Yes” to reset the unit’s User EDIDs to their factory default states.
4) **Factory Reset:** Select “Yes” to reset the unit to its factory default state. After the reset is complete, the unit will reboot automatically.
5) **User Boot Logo Clear:** Select “Yes” to remove all user uploaded boot graphics.

Information	
2ND LEVEL	**3RD LEVEL**
IN 1	[Current Input Resolutions]
IN 2	
IN 3	
IN 4	
OUT	[Current Output Resolution]
Video Mode	[Current Mode]
Sink A Native	[Native resolutions as reported by EDID]
Sink B Native	
Firmware	[Current Firmware Versions]
RX3/RX4 Firmware	

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

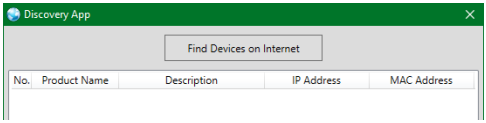
6.5 WebGUI Control

- **Device Discovery**

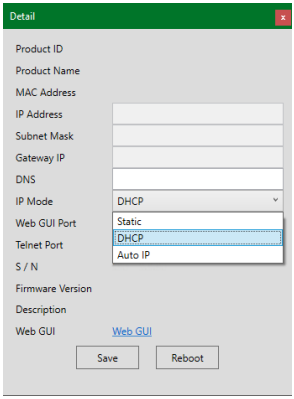
Please obtain the “Device Discovery” software from your authorized dealer and save it in a directory where you can easily find it.

Connect the unit and your PC/Laptop to the same active network and execute the “Device Discovery” software. Click on “Find Devices on Internet” and a list of devices connected to the local network will show up indicating their current IP address.

Note: The unit’s default IP address is 192.168.1.50.



By clicking on one of the listed devices you will be presented with the network details of that particular device.

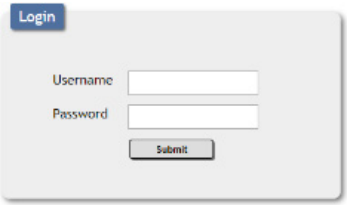


1) **IP Mode:** If you choose, you can alter the static IP network settings for the device, or switch the unit into DHCP mode to automatically obtain proper network settings from a local DHCP server. To switch to DHCP mode, please select DHCP from the IP mode drop-down, then click “Save” followed by “Reboot”.
2) **WebGUI Hotkey:** Once you are satisfied with the network settings, you may use them to connect via Telnet or WebGUI. The network information window provides a convenient link to launch the WebGUI directly.

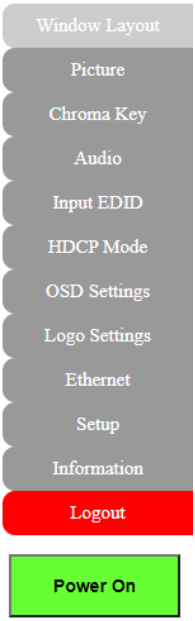
- **WebGUI Overview**

After connecting to the WebGUI's address in a web browser, the login screen will appear. Please enter the appropriate user name and password then click "Submit" to log in.

Note: The default user name and password is "admin".



On the left side of the browser you will see the following menu tabs where all primary functions of the unit are controllable via the built in WebGUI. The individual functions will be introduced in the following sections.



Clicking the red "Logout" tab will automatically log the currently connected user out of the WebGUI and return to login page. Clicking on the "Power" button will toggle the unit's current power state between on (green) and stand-by (red).

6.5.1 Upper Tab Windows

This upper section of the web interface is visible on every tab and provides control over the unit's operational mode, source selection, and output resolution as well as containing basic information about the currently connected source and display devices.

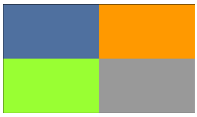
1) **Source:** This section displays the currently detected resolution for the sources connected to each input.
2) **Display:**
   - **Resolution:** Use the dropdown to select the preferred output resolution for the unit.

     Note: Both outputs will always share the same output resolution, even in Matrix mode.
   - **Sink A/B Native:** Displays the native resolution of both connected displays as reported by their respective EDIDs.
3) **Video Mode:**
   - **Video Mode:** Use the dropdown to select the unit's operational mode. Available options are: Matrix, PiP, PoP, Quad, Auto, and Presets 1~4.
     - **Matrix Mode:** Full screen video with the ability to select sources independently for each output. Seamless switching with optional crossfade is supported. This is the only mode that can support chroma key.

       Note: When Chroma Key is active, both outputs will show the same video.
     - **PiP Mode:** This is a quad-windowing preset mode. By default it is in a PiP (Picture in Picture) configuration but it can be manually adjusted by the user.

     - **PoP Mode:** This is a quad-windowing preset mode. By default it is in a PoP (Picture outside Picture) configuration but it can be manually adjusted by the user.

- **Quad Mode:** This is a quad-windowing preset mode. By default it is in an equal 4 window configuration but it can be manually adjusted by the user.



- **Auto Mode:** This is a multi-windowing mode that automatically selects the number of visible windows (up to 4) based on the number of currently detected live inputs. The configuration to use when only 2 sources have been detected is set using the “Auto 2-Layout Select” dropdown.
- **Preset Modes:** These are 4 additional quad-windowing presets that can be manually adjusted by the user.

  Note: Switching between video modes will cause the output to briefly go to black, but audio output will not be affected if the selected audio source is the same in both modes.

- **Win 1~4:** Select the video source to use in each window of a multi-window mode (PiP/PoP/Quad/Preset).

  Note: Only available when a multi-window mode is active.

- **Out A~B:** Select the video source for each output in Matrix mode.

  Note: Only available when Matrix mode is active.

- **Fade:** Enable or disable crossfading between sources in Matrix mode.

  Note: Only available when Matrix mode is active.

- **Auto 2-Layout Select:** Select the preferred window arrangement to use in Auto mode when there are only 2 live sources. Available options are:

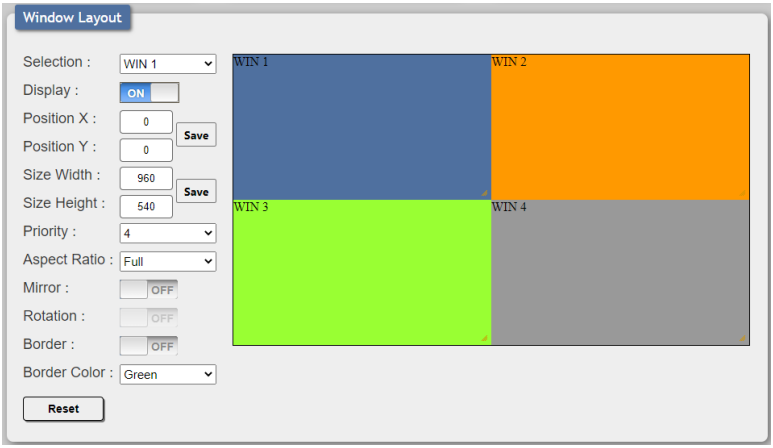
Side by Side **Big Small** **Big Small 2**

Note: Only available when Auto mode is active.

6.5.2 Window Layout Tab

This tab provides control over the position, size, aspect, priority, and other settings of each window in multi-viewer modes. A graphical representation of the layout is also provided. When the unit is in the Matrix or Auto modes, only a limited selection of controls are available.

Note: Only the information from the currently selected window/input is displayed. A window's position and size cannot exceed the current output resolution.



1) **Selection:** In multi-windowing modes, use the dropdown to select the window to modify. In Matrix mode select the input to modify.

   Note: Changes made while a "Preset" video mode is selected will automatically be applied and saved to that preset.

2) **Display:** Enable or disable the currently selected window.

   Note: Not available in Matrix or Auto modes.

3) **Position X/Y:** Set the X and Y coordinate position of the upper left corner of the currently selected window. Click on the "Save" button, after making changes, to make them active.

   Note: Not available in Matrix or Auto modes.

4) **Size Width/Height:** Set the horizontal and vertical size of the currently selected window. Click on the "Save" button, after making changes, to make them active.

   Note: Not available in Matrix or Auto modes.

5) **Priority:** Select the layer priority of the currently selected window. Priority 1 is at the front and priority 4 is at the back.

   Note: Not available in Matrix or Auto modes.

6) **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, Best Fit, and User. 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 "Best Fit" will automatically set the ratio based on the window's current source resolution.

   Note: The "User" aspect ratio is not available in Matrix mode. Not available in Auto mode.

7) **Mirror:** Turning this switch on will flip the currently selected window/input horizontally.

   Note: Not available in Auto mode.

8) **Rotation:** Enable or disable rotating the output image counterclockwise by 90 degrees.

   Note: Only available in Matrix mode. When the output resolution is set to 4K, only input 1 can be rotated.

8) **Border:** This switch enables or disables the color border around the currently selected window or input.

   Note: Not available in Auto mode.

9) **Border Color:** Use the dropdown to select the color to use for the border of the currently selected window/input. Available colors are: Black, red, green, blue, yellow, magenta, cyan, white, dark red, dark green, dark blue, dark yellow, dark magenta, dark cyan, gray.

   Note: Not available in Auto mode or when Chroma Key is enabled.

10) **Reset:** Reset the current window/input to its default settings based on the currently selected mode.

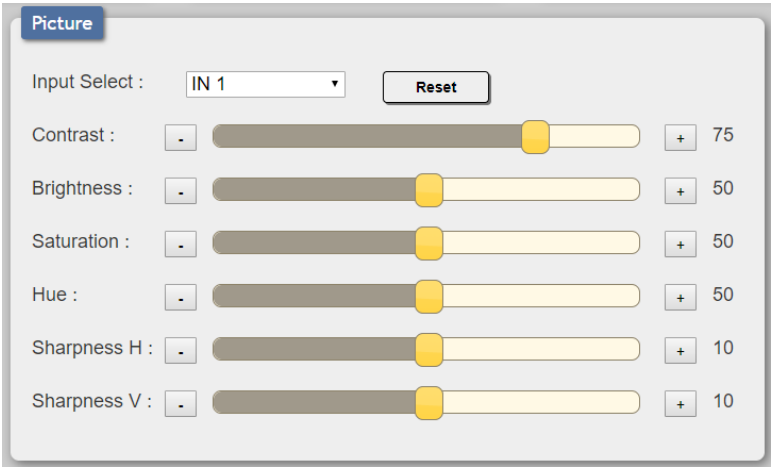
11) **Visual Layout Window:** When in a multi-windowing mode, individual windows may be selected, moved and resized simply by clicking and dragging on them in the layout window. To select a window, click on it and the information will be displayed on the left. Click and drag the center of a window to reposition it. Click and drag the bottom right corner of a window to manually resize it. The results of a change will be displayed on the outputs as soon as the mouse button has been released.

    Note: Window positioning and size can not be adjusted in Auto mode. Not available in Matrix mode.

6.5.3 Picture Tab

This tab provides controls over each input's contrast, brightness, saturation, hue, and sharpness levels.

Note: All picture settings are per-input and are mode-independent.



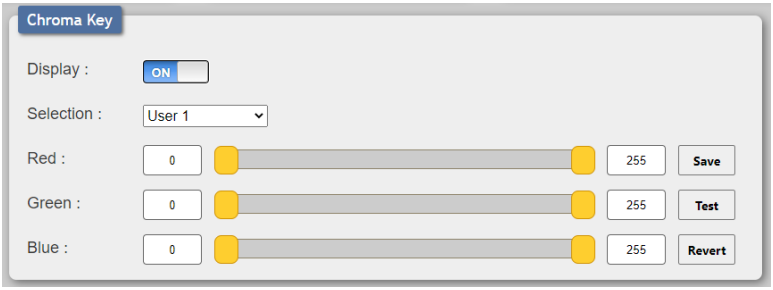
1) **Input Select:** Use the dropdown to select the input to modify.
2) **Reset:** Reset the current input to its default settings.
3) **Contrast:** This slider provides control over the overall contrast of the currently selected source video.
4) **Brightness:** This slider provides control over the overall brightness of the currently selected source video.
5) **Saturation:** This slider provides control over the overall saturation of the currently selected source video.
6) **Hue:** This slider provides control over the hue shift of the currently selected source video.
7) **Sharpness H/V:** These sliders provide control over the amount of sharpness processing to apply to the currently selected source video.

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

6.5.4 Chroma Key Tab

This tab provides control over the chroma key functions of the unit. A number of pre-designed standard key ranges are provided as well as slots to save up to 4 user-created key ranges. Keying values and ranges are set using the full RGB color space (0~255).

Note: Only available in Matrix mode.



1) **Display:** Enable or disable Chroma Key mode. When enabled, Input 1 will always be the background layer and input 2 will always be the foreground layer to which the key is applied.

   Note: When Chroma Key is active the aspect ratio is forced to full screen and the border feature is disabled.

2) **Selection:** Use the dropdown to select the keying preset to use when chroma key is active. There are 4 user editable presets and 8 fixed presets.

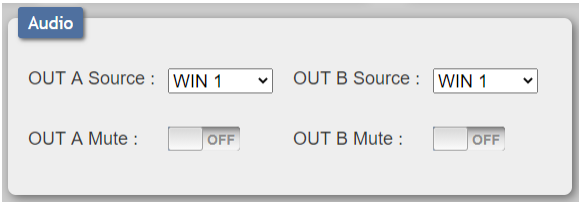
3) **Red/Green/Blue:** Set the keying range (the color range within input 2's video to make transparent) to use for the currently selected User Key Preset by setting the maximum and minimum values for red, green, and blue. Click the "Save" button to store the current keying color ranges to the selected User Preset. Click the "Test" button see the effect of changes made to the keying ranges without saving them. Press the "Revert" button to return all ranges to the values saved in the current User Preset.

   Note: If a fixed preset is currently selected, the values will be displayed, but cannot be modified.

6.5.5 Audio Tab

This tab provides control over the audio output behavior of the unit, including routing selection and muting.

Note: Due to Matrix mode only supporting a single "window", changing modes between a multi-windowing mode and Matrix mode when an audio source is set to windows 2~4 will result in the source reverting to window 1.



1) **OUT A Source:** Use the dropdown to choose the audio source to pair with video output A.
   - **IN 1~4:** Always use the audio from the specified input.
   - **WIN 1~4:** Always use audio from the source currently displayed in the specified window.

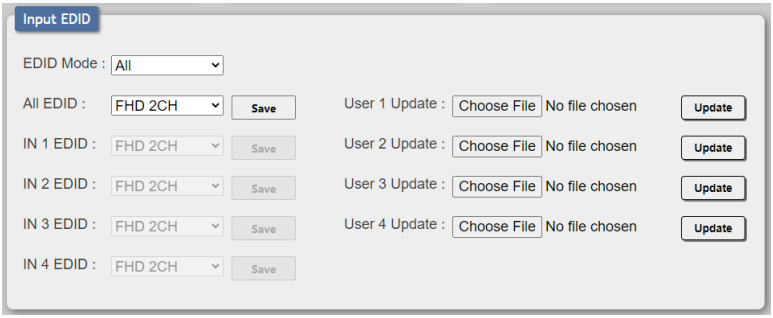
     Note: WIN 2~4 is not available as a source in Matrix mode.
2) **OUT B Source:** Use the dropdown to choose the audio source to pair with video output A.
   - **IN 1~4:** Always use the audio from the specified input.
   - **WIN 1~4:** Always use audio from the source currently displayed in the specified window.

     Note: WIN 2~4 is not available as a source in Matrix mode.
3) **OUT A Mute:** Click the switch to toggle between muted and unmuted audio on output A.
4) **OUT B Mute:** Click the switch to toggle between muted and unmuted audio on output A.

6.5.6 Input EDID Tab

This unit provides the option of three standard EDIDs, two sink sourced EDIDs and four user uploaded EDIDs that can be assigned to all inputs at the same time, or to each input independently.

Note: In most cases, assigning a new EDID to an input will cause the affected input to briefly blink out while the source adapts to the new information.



1) **EDID Mode:** Use the dropdown to 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 "All" EDID Mode.
3) **IN 1~4 EDID:** Select the EDID to assign to the specified input.

   Note: Only available in "Appoint" EDID Mode.

This unit provides the following 3 default EDIDs:

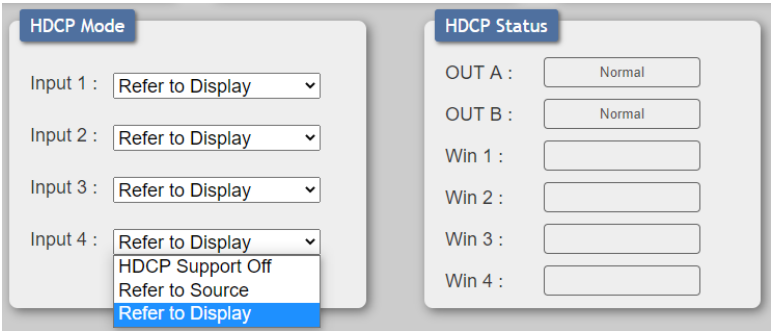
Unit's default EDIDs	
FHD 2CH	1920×1080p@60Hz (4.95Gbps) & 8-bit color, LPCM 2.0
4K UHD 2CH	3840×2160p@30Hz (10.2Gbps) & Deep Color (8/10/12-bit), LPCM 2.0
4K UHD+ 2CH	3840×2160p@60Hz (18Gbps) & Deep Color (8/10/12-bit), LPCM 2.0

Note: In some rare cases it is possible for custom or external EDIDs to cause compatibility issues with certain sources. If this happens, it is recommended to switch to one of the 3 default EDIDs for maximum compatibility.

4) **User 1~4 Update:** To update any of the unit's 4 User EDIDs, click the "Choose File" button to open the file selection window and then select the EDID file (*.bin format) located on your local PC. After selecting the file, click the "Update" button to begin the EDID upload process.

6.5.7 HDCP Mode Tab

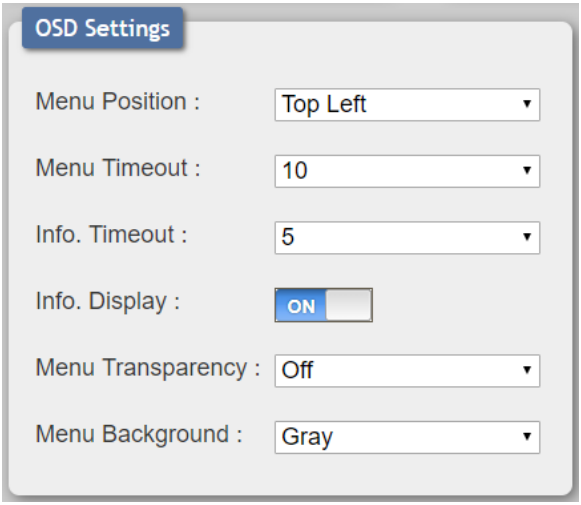
This tab provides control over the HDCP settings for all inputs.



1) **HDCP Mode Input 1~4:** Use the dropdown to 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.

6.5.8 OSD Settings Tab

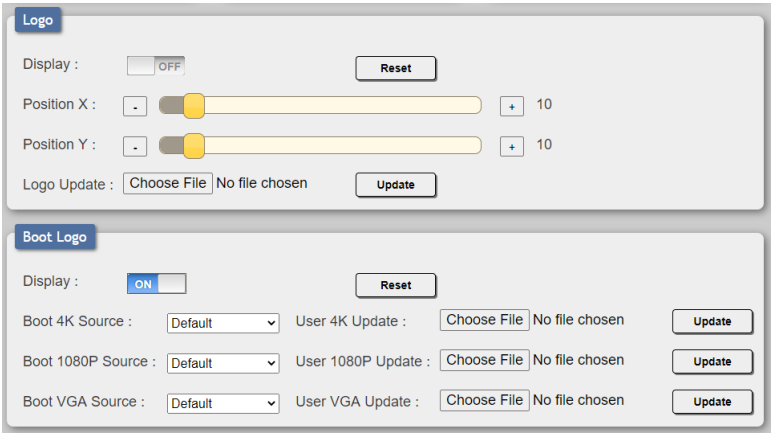
This tab provides control over the behavior of the OSD menu and informational display.



1) **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.
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) **Menu Transparency:** Set the transparency level of the background of the OSD menu with a range from Off (opaque) to 10 (mostly transparent).
6) **Menu background:** Set the color of the background of the OSD menu. Available choices are: Gray, Black, and Blue.

6.5.9 Logo Settings Tab

This tab provides control over the user uploaded logo graphic. Controls include positioning, an uploading a new logo directly from the WebGUI and an option to reset the logo to a built in default image that can be used for testing.



1) **Logo:**
   - **Display:** Enable or disable displaying the logo graphic.
   - **Reset:** Resets the logo and installs 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.
   - **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.
   - **Logo Update:** To upload a graphic logo, please click the "Choose File" button to open the file selection window and then select the graphic logo file (8-bit *.bmp format, 960×540 max resolution) located on your local PC. After selecting the file, click the "Update" button to upload the logo to the unit.

     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.

2) **Boot Logo:**

- **Display:** Enable or disable displaying the logo graphic.
- **Reset:** Removes all user uploaded boot logo images.
- **Boot 4K Source:** Select whether to display the default graphic image during boot, or the user uploaded graphic when the output resolution is set to 4K or above.
- **Boot 1080P Source:** Select whether to display the default graphic image during boot, or the user uploaded graphic when the output resolution is between 1080p and VGA.
- **Boot VGA Source:** Select whether to display the default graphic image during boot, or the user uploaded graphic when the output resolution is less than VGA.
- **User 4K Update:** To upload a 4K boot graphic, please click the "Choose File" button to open the file selection window and then select the graphic file (8-bit *.BMP format, 3840×2160 resolution) located on your local PC. After selecting the file, click the "Update" button to upload the logo to the unit.

  Note: Upload progress information will be displayed on the OSD while the boot logo is being installed.
- **User 1080P Update:** To upload a 1080p boot graphic, please click the "Choose File" button to open the file selection window and then select the graphic file (8-bit *.BMP format, 1920×1080 resolution) located on your local PC. After selecting the file, click the "Update" button to upload the logo to the unit.

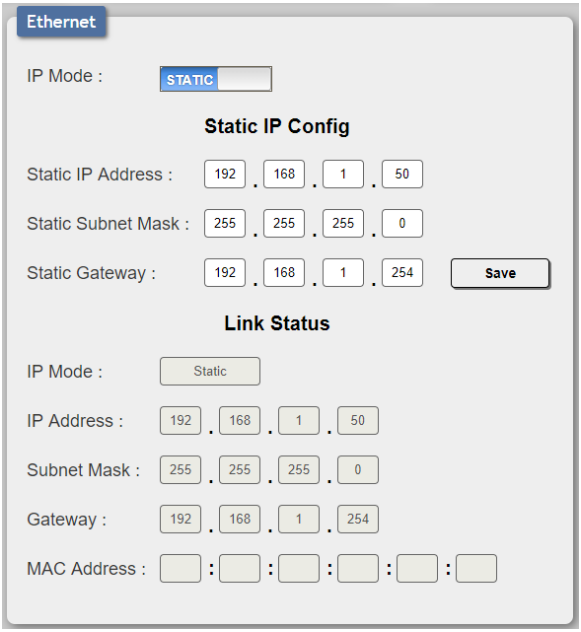
  Note: Upload progress information will be displayed on the OSD while the boot logo is being installed.
- **User VGA Update:** To upload a VGA boot graphic, please click the "Choose File" button to open the file selection window and then select the graphic file (8-bit *.BMP format, 640×480 resolution) located on your local PC. After selecting the file, click the "Update" button to upload the logo to the unit.

  Note: Upload progress information will be displayed on the OSD while the boot logo is being installed.

6.5.10 Ethernet Tab

This tab provides controls to change the network settings for the unit. You can manually set the IP address, netmask and gateway address in “Static IP” mode, or you can obtain an IP address automatically by enabling DHCP.

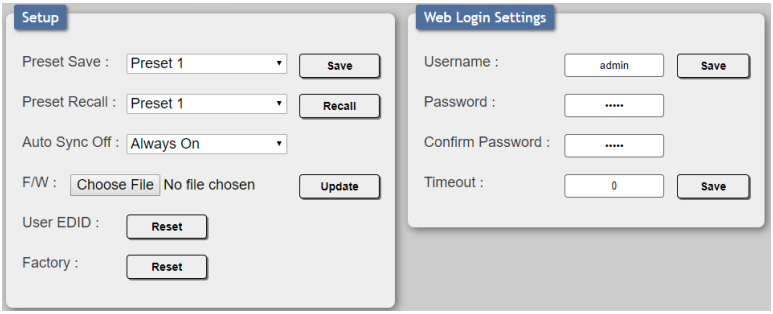
Note: The unit’s default Static IP address is 192.168.1.50. If the IP address is changed then the IP address required for WebGUI/Telnet access will also change accordingly.



1) **IP Mode:** Click this button to toggle between the Static IP and DHCP modes. In DHCP mode, the unit will attempt to automatically obtain its IP configuration details from a local DHCP server. In Static mode the unit will use the manually assigned IP configuration information.
2) **Static IP Config:** When the unit is in Static IP mode the IP address, netmask and gateway addresses may be manually set here. Click “Save” to apply and use the newly entered address.
3) **Link Status:** Displays the unit’s current IP configuration and the unit’s MAC address.

6.5.11 Setup Tab

Provides a way to update firmware and reset various sections within the unit. Control over the unit's Auto Sync Off feature, storing/recalling presets as well as configuring the WebGUI login settings is also provided here.



1) **Preset Save:** Select a preset from the dropdown list and then click the "Save" button to store the unit's current video window configuration to the currently selected preset.
2) **Preset Recall:** Select a preset from the dropdown list and then click the "Recall" button to activate the currently selected preset.

   Note: this can also be achieved by selecting a Preset from the Video Mode dropdown at the top of the WebGUI.
3) **Auto Sync Off:** Sets 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.
4) **Firmware Update:** To update the unit's firmware, click the "Choose File" button to open the file selection window and then select the firmware update file (*.bin format) located on your local PC. After selecting the file, click the "Upgrade" button to begin the firmware update process. After the upgrade is complete, the unit will reboot automatically.
5) **User EDID Reset:** Press this button to reset the unit's User EDIDs to their factory default states.
6) **Factory Reset:** Press this button to reset the unit to its factory default state. After the reset is complete, the unit will reboot automatically.

7) **Web Login Settings:** WebGUI login settings can be set here.

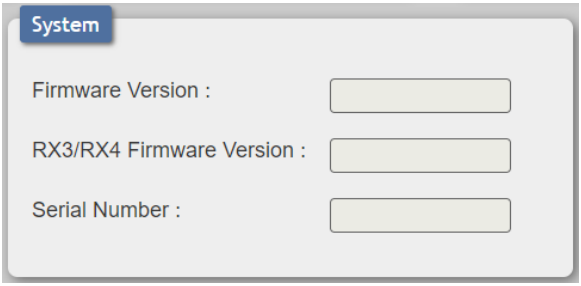
- **Username/Password:** To change the login username and password, enter the new information in the spaces provided and press “Save”.

  Note: The default user name and password is “admin”.

- **Timeout:** Set the length of time to wait, in minutes, before logging out a user due to inactivity. Setting this to “0” disables the timeout.

6.5.12 System Tab

This tab displays the unit’s serial number as well as the current firmware versions.



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
help↵ Show the full command list.
help N1↵ Show details about the specified command. **N1** = {Command}
?↵ Show the full command list.
? N1↵ Show details about the specified command. **N1** = {Command}
get fw ver↵ Show the unit's current firmware version.

COMMAND Description and Parameters
get command ver↵ Show the unit's current command version.
get mac addr↵ Show the unit's MAC address.
get model name↵ Show the unit's model name.
get model type↵ Show the unit's product type.
set nickname N1↵ Set the unit's nickname. **N1** = {Name} [Unit nickname]
get nickname↵ Show the unit's current nickname.
get user config↵ List the unit's current configuration information.
set feedback broadcast N1↵ Enable or disable the broadcast of console command feedback. Available values for **N1**: ON [Enabled] OFF [Disabled]
get feedback broadcast↵ Show the current console command feedback broadcast state.
set power N1↵ Set the unit's power state. Available values for **N1**: ON [Power on] OFF [Power off (standby mode)]

COMMAND Description and Parameters
get power↵ Show the unit's current power state.
set system reboot Reboot the unit.
set ip mode N1↵ Set the IP address assignment mode. Available values for **N1**: STATIC [Static IP mode] DHCP [DHCP mode]
get ip mode↵ Show the current IP address assignment mode.
get ipconfig↵ Show the unit's current IP configuration information.
get ipaddr↵ Show the unit's current IP address.
get netmask↵ Show the unit's current netmask.
get gateway↵ Show the unit's current gateway address.
set static ipaddr N1↵ Set the unit's static IP address. **N1** = X.X.X.X [X = 0~255, IP address]
get static ipaddr↵ Show the unit's static IP address.
set static netmask N1↵ Set the unit's static IP address. **N1** = X.X.X.X [X = 0~255, Netmask]

COMMAND Description and Parameters
get static netmask↵ Show the unit's static netmask.
set static gateway N1↵ Set the unit's static IP address. **N1** = X.X.X.X [X = 0~255, Gateway address]
get static gateway↵ Show the unit's static gateway address.
set webgui username N1↵ Set the WebGUI login username. **N1** = {Username} [16 characters max]
get webgui username↵ Show the current WebGUI login username
set webgui password N1↵ Set the WebGUI login password. **N1** = {Password} [16 characters max]
get webgui password↵ Show the current WebGUI login password.
set webgui login timeout N1↵ Set the WebGUI inactivity timeout value. **N1** = 0~240 [Minutes]
get webgui login timeout↵ Show the current WebGUI inactivity timeout value.
set telnet login N1↵ Enable or disable allowing Telnet logins. Available values for **N1**: ON [Enabled] OFF [Disabled]

COMMAND Description and Parameters
get telnet login↵ Show the current state of Telnet login allowance.
set telnet username N1↵ Set the Telnet login username. **N1** = {Username} [16 characters max]
get telnet username↵ Show the current Telnet login username.
set telnet password N1↵ Set the Telnet login password. **N1** = {Password} [16 characters max]
get telnet password↵ Show the unit's Telnet access port.
set window layout mode N1↵ Set the window layout mode. Available values for **N1**: 0 [Matrix mode] 1 [PiP mode] 2 [PoP mode] 3 [Quad mode] 4 [Auto mode] 5 [Preset 1] 6 [Preset 2] 7 [Preset 3] 8 [Preset 4]
get window layout mode↵ Show the window current layout mode.

COMMAND Description and Parameters
set window N1 route N2↵ Set the input to route to the specified window. **N1** = 1~4 [Window number] **N2** = 1~4 [Input port] *Note: Valid in multi-windowing modes only.*
get window N1 route↵ Show the input currently routed to the specified window. **N1** = 1~4 [Window number] *Note: Valid in multi-windowing modes only.*
set out N1 route N2↵ Route the specified input to the specified output. **N1** = A~B [Output port] **N2** = 1~4 [Input port] *Note: Valid in matrix mode only.*
get out N1 route↵ Show the current input routed to the specified output. **N1** = A~B [Output port] *Note: Valid in matrix mode only.*
set window N1 mute N2↵ Enable or disable the specified window. **N1** = 1~4 [Window number] Available values for **N2**: ON [Enabled] OFF [Disabled] *Note: Valid in multi-windowing modes only.*

COMMAND Description and Parameters
get window N1 mute↵ Show the visibility status of the specified window, **N1** = 1~4 [Window number] *Note: Valid in multi-windowing modes only.*
set window N1 hposition N2↵ Set the horizontal position of the specified window. **N1** = 1~4 [Window number] **N2** = 0~{Max res} [Horizontal size] *Note: Valid in multi-windowing modes only.*
get window N1 hposition↵ Show the current horizontal position of the specified window. **N1** = 1~4 [Window number] *Note: Valid in multi-windowing modes only.*
set window N1 vposition N2↵ Set the vertical position of the specified window. **N1** = 1~4 [Window number] **N2** = 0~{Max res} [Vertical size] *Note: Valid in multi-windowing modes only.*
get window N1 vposition↵ Show the current vertical position of the specified window. **N1** = 1~4 [Window number] *Note: Valid in multi-windowing modes only.*
set window N1 hsize N2↵ Set the horizontal size of the specified window. **N1** = 1~4 [Window number] **N2** = 1~{Max res} [Horizontal size] *Note: Valid in multi-windowing modes only.*

COMMAND Description and Parameters
get window N1 hsize↵ Show the current horizontal size of the specified window. **N1** = 1~4 [Window number] *Note: Valid in multi-windowing modes only.*
set window N1 vsize N2↵ Set the vertical size of the specified window. **N1** = 1~4 [Window number] **N2** = 1~{Max res} [Vertical size] *Note: Valid in multi-windowing modes only.*
get window N1 vsize↵ Show the current vertical size of the specified window. **N1** = 1~4 [Window number] *Note: Valid in multi-windowing modes only.*
set window N1 priority N2↵ Set the priority of the specified window. **N1** = 1~4 [Window number] **N2** = 1~4 [Priority] *Note: Valid in multi-windowing modes only.*
get window N1 priority↵ Show the current priority of the specified window. **N1** = 1~4 [Window number] *Note: Valid in multi-windowing modes only.*

COMMAND Description and Parameters
set window N1 aspect ratio N2↵ Set the aspect of the specified window. **N1** = 1~4 [Window number] Available values for **N2**: 1 [Full] 2 [16:9] 3 [16:10] 4 [4:3] 5 [Best Fit] 6 [User]
get window N1 aspect ratio↵ Show the current aspect of the specified window. **N1** = 1~4 [Window number]
set window N1 mirror N2↵ Set the mirror mode of the specified window. **N1** = 1~4 [Window number] Available values for **N2**: ON [Enabled] OFF [Disabled]
get window N1 mirror↵ Show the current mirror mode of the specified window. **N1** = 1~4 [Window number]
set window N1 border mode N2↵ Set the border mode of the specified window. **N1** = 1~4 [Window number] Available values for **N2**: ON [Enabled] OFF [Disabled]

COMMAND Description and Parameters
get window N1 border mode↵ Show the current border mode of the specified window. **N1** = 1~4 [Window number]
set window N1 border color N2↵ Set the border color of the specified window. **N1** = 1~4 [Window number] Available values for **N2**: 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]
get window N1 border color↵ Show the current border color of the specified window. **N1** = 1~4 [Window number]
set window N1 default↵ Reset the settings of the specified window **N1** = 1~4 [Window number]

COMMAND Description and Parameters
set in N1 rotation mode N2↵ Enable or disable 90 degree rotation for the specified input. **N1** = 1~4 [Input port] Available values for **N2**: ON [Rotation enabled] OFF [Rotation disabled]
get in N1 rotation mode↵ Show the current rotation state of the specified input. **N1** = 1~4 [Input port]
set chroma key mode N1↵ Enable or disable chroma key mode. Available values for **N1**: ON [Chroma key mode enabled] OFF [Chroma key mode disabled]
get chroma key mode↵ Show the current chroma key state.
set chroma key rgb codes N1↵ Set the RGB key range 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]

COMMAND Description and Parameters
get chroma key rgb codes↵ Show the currently selected chroma key RGB key range preset.
set chroma key user N1 r max N2↵ Set the maximum red keying value for the specified user preset. **N1** = 1~4 [User key preset number] **N2** = 1~255 [Red key max value]
get chroma key user N1 r max↵ Show the current maximum red keying value saved in the specified user preset. **N1** = 1~4 [User key preset number]
set chroma key user N1 r min N2↵ Set the minimum red keying value for the specified user preset. **N1** = 1~4 [User key preset number] **N2** = 0~254 [Red key minimum value]
get chroma key user N1 r min↵ Show the current minimum red keying value saved in the specified user preset. **N1** = 1~4 [User key preset number]
set chroma key user N1 g max N2↵ Set the maximum green keying value for the specified user preset. **N1** = 1~4 [User key preset number] **N2** = 1~255 [Green key max value]
get chroma key user N1 g max↵ Show the current maximum green keying value saved in the specified user preset. **N1** = 1~4 [User key preset number]

COMMAND Description and Parameters
set chroma key user N1 g min N2↵ Set the minimum green keying value for the specified user preset. **N1** = 1~4 [User key preset number] **N2** = 0~254 [Green key minimum value]
get chroma key user N1 g min↵ Show the current minimum green keying value saved in the specified user preset. **N1** = 1~4 [User key preset number]
set chroma key user N1 b max N2↵ Set the maximum blue keying value for the specified user preset. **N1** = 1~4 [User key preset number] **N2** = 1~255 [Blue key max value]
get chroma key user N1 b max↵ Show the current maximum blue keying value saved in the specified user preset. **N1** = 1~4 [User key preset number]
set chroma key user N1 b min N2↵ Set the minimum blue keying value for the specified user preset. **N1** = 1~4 [User key preset number] **N2** = 0~254 [Blue key minimum value]
get chroma key user N1 b min↵ Show the current minimum blue keying value saved in the specified user preset. **N1** = 1~4 [User key preset number]
set in N1 contrast N2↵ Set the contrast level of the specified input. **N1** = 1~4 [Input port] **N2** = 0~100 [Contrast level]

COMMAND Description and Parameters
get in N1 contrast↵ Show the current contrast level of the specified input. **N1** = 1~4 [Input port]
set in N1 brightness N2↵ Set the brightness level of the specified input. **N1** = 1~4 [Input port] **N2** = 0~100 [Brightness level]
get in N1 brightness↵ Show the current brightness level of the specified input. **N1** = 1~4 [Input port]
set in N1 saturation N2↵ Set the saturation level of the specified input. **N1** = 1~4 [Input port] **N2** = 0~100 [Saturation level]
get in N1 saturation↵ Show the current saturation level of the specified input. **N1** = 1~4 [Input port]
set in N1 hue N2↵ Set the hue value of the specified input. **N1** = 1~4 [Input port] **N2** = 0~100 [Hue value]
get in N1 hue↵ Show the current hue value of the specified input. **N1** = 1~4 [Input port]

COMMAND Description and Parameters
set in N1 h sharpness N2↵ Set the horizontal sharpness level of the specified input. **N1** = 1~4 [Input port] **N2** = 0~20 [Horizontal sharpness level]
get in N1 h sharpness↵ Show the current horizontal sharpness level of the specified input. **N1** = 1~4 [Input port]
set in N1 v sharpness N2↵ Set the vertical sharpness level of the specified input. **N1** = 1~4 [Input port] **N2** = 0~20 [Vertical sharpness level]
get in N1 v sharpness↵ Show the current vertical sharpness level of the specified input. **N1** = 1~4 [Input port]
set in N1 picture default↵ Restore the picture settings to their factory default settings. **N1** = 1~4 [Input port]
set audio out N1 mute N2↵ Enable or disable muting the specified audio output. **N1** = A~B [Output port] Available values for **N2**: ON [Mute] OFF [Unmute]
get audio out N1 mute↵ Show the current mute state of the specified output. **N1** = A~B [Output port]

COMMAND Description and Parameters
set transition mode N1↵ Set the transition mode to use when switching sources in matrix mode. Available values for **N1**: 0 [Cut transition] 1 [Crossfade transition]
get transition mode↵ Show the current transition mode used when switching sources in matrix mode.
set audio out N1 route N2↵ Route the specified audio source to the specified audio output. **N1** = A~B [Output port] Available values for **N2**: 1 [Input 1] 2 [Input 2] 3 [Input 3] 4 [Input 4] 5 [Window 1] 6 [Window 2] 7 [Window 3] 8 [Window 4]
get audio out N1 route↵ Show the current audio source routed to the specified audio output. **N1** = A~B [Output port]
set all in edid mode N1↵ Select the EDID management mode to use (All or Appoint) for all inputs. Available values for **N1**: ON [All mode] OFF [Appoint mode]
get all in edid mode↵ Show the current EDID management mode used by all inputs.

COMMAND Description and Parameters
set all in edid N1↵ Set the EDID to use when the “All” EDID mode is active. Available values for **N1**: 1 [1080p@60Hz, 2 channel audio] 2 [4K@30Hz, 2 channel audio] 3 [4K@60Hz, 2 channel audio] 7 [User 1] 8 [User 2] 9 [User 3] 10 [User 4] 15 [Sink A] 16 [Sink B]
get all in edid↵ Show the current EDID used by the “All” EDID mode.
set in N1 edid N2↵ Set the EDID to use on the specified input in “Appoint” mode. **N1** = 1~4 [Input port] Available values for **N2**: 1 [1080p@60Hz, 2 channel audio] 2 [4K@30Hz, 2 channel audio] 3 [4K@60Hz, 2 channel audio] 7 [User 1] 8 [User 2] 9 [User 3] 10 [User 4] 15 [Sink A] 16 [Sink B]
get in N1 edid↵ Show the EDID currently being used on the specified input. **N1** = 1~4 [Input port]
set user N1 edid update↵ Upload a new EDID for use as the specified User EDID. **N1** = 1~4 [User EDID number]

COMMAND Description and Parameters
set in N1 hdcp mode N2↵ Set the HDCP behavior of the specified input. **N1** = 1~4 [Input port] Available values for **N2**: 0 [HDCP support disabled] 1 [Refer to source] 2 [Refer to display]
get in N1 hdcp mode↵ Show the current HDCP behavior used by the specified input. **N1** = 1~4 [Input port]
get in N1 hdcp status↵ Show the current HDCP status of the specified input. **N1** = 1~4 [Input port]
get out N1 hdcp status↵ Show the current HDCP status of the specified output. **N1** = A~B [Output port]
get out N1 hdcp ability↵ Show the HDCP compliance level of the display device connected to the specified output. **N1** = A~B [Output port]
get in N1 hdcp ability↵ Show the HDCP compliance level of the source connected to the specified input. **N1** = 1~4 [Input port]

COMMAND	
Description and Parameters	
set out A timing N1↵	
Set the output resolution to use for both outputs.	
Available values for **N1**:	
0	[640×480p59]
1	[480p60]
2	[576p50]
3	[800×600p60]
4	[848×480p60]
5	[1024×768p60]
6	[1280×720p50]
7	[1280×720p60]
8	[1280×768p60]
9	[1280×800p60]
10	[1280×960p60]
11	[1280×1024p60]
12	[1360×768p60]
13	[1366×768p60]
14	[1400×1050p60]
15	[1440×900p60]
16	[1600×900p60rb]
17	[1600×1200p60]
18	[1680×1050p60]
19	[1920×1080p24]
20	[1920×1080p25]
21	[1920×1080p30]
22	[1920×1080p50]
23	[1920×1080p60]
24	[1920×1200p60rb]
25	[2048×1152p60rb]
26	[3840×2160p24]
27	[3840×2160p25]
28	[3840×2160p30]
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	[3840×2160p50]

COMMAND	
Description and Parameters	
36	[3840×2160p59]
37	[3840×2160p60]
38	[3840×2400p60rb]
39	[Native OUT A]
40	[Native OUT B]
get out A timing↵	
Show the current resolution used by both outputs.	
set out A osd banner location N1↵	
Set the OSD menu location.	
Available values for **N1**:	
0	[Top Left]
1	[Top Right]
2	[Bottom Right]
3	[Bottom Left]
get out A osd banner location↵	
Show the current OSD menu location.	
set out A osd timeout N1↵	
Set the OSD menu's timeout value (in seconds).	
Available values for **N1**:	
0	[Disabled]
5~60	[Timeout in seconds]
get out A osd timeout↵	
Show the current OSD menu's timeout value.	
set out A osd info display N1↵	
Enable or disable the info OSD.	
Available values for **N1**:	
ON	[Enabled]
OFF	[Disabled]
get out A osd info display↵	
Show the current info OSD state.	

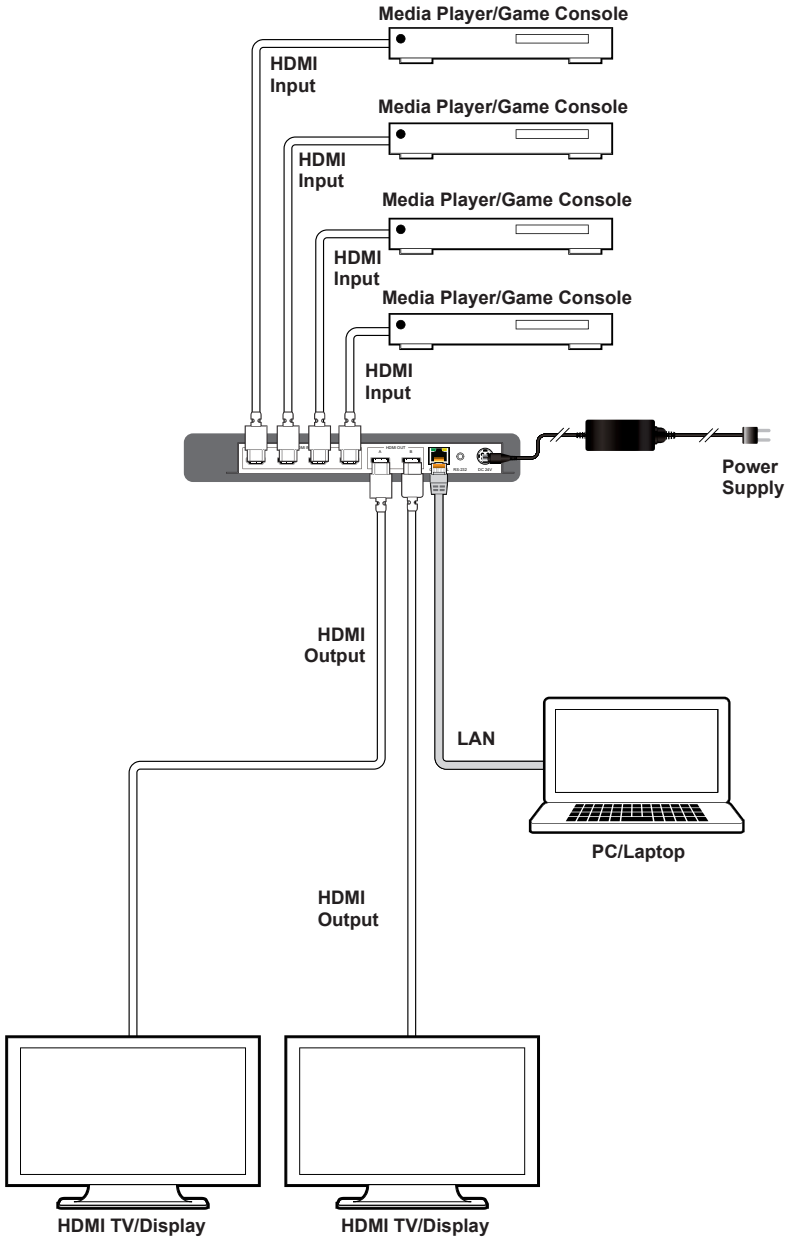
COMMAND Description and Parameters
set out A osd info timeout N1↵ Set the OSD info's timeout value (in seconds). Available values for **N1**: 0 [Disabled] 5~60 [Timeout in seconds]
get out A osd info timeout↵ Show the current OSD info's timeout value.
set out A osd transparency level N1↵ Set the transparency level of the OSD. **N1** = 0~10 [Transparency level]
get out A osd transparency level↵ Show the OSD's current transparency level.
set out A osd background color N1↵ Set the color of the background of the OSD banner. Available values for **N1**: BLACK [Black background] GRAY [Gray background] BLUE [Blue background]
get out A osd background color↵ Show the current color of the background of the OSD banner on the specified output.
set out A osd logo display N1↵ Enable or disable the graphical logo overlay. Available values for **N1**: ON [Enabled] OFF [Disabled]
get out A osd logo display↵ Show the current state of the graphical logo overlay.

COMMAND Description and Parameters
set out A osd logo hposition N1↵ Set the horizontal position of the graphical logo overlay. **N1** = 0~100 [Horizontal position]
get out A osd logo hposition↵ Show the current horizontal position of the graphical logo overlay.
set out A osd logo vposition N1↵ Set the vertical position of the graphical logo overlay. **N1** = 0~100 [Vertical position]
get out A osd logo vposition↵ Show the current vertical position of the graphical logo overlay.
set osd logo default↵ Resets the logo and installs a default test image.
set system usb osd logo update↵ Initiates the logo update process via USB.
set current route to preset N1↵ Saves the unit's current route settings to the specified preset. **N1** = 1~4 [Preset number]
set route preset N1↵ Activates the routing assignments saved in the specified preset. **N1** = 1~4 [Preset number]

COMMAND Description and Parameters
set out A auto sync off N1↵ Enable or disable the Auto Sync Off function and set the timeout length. Available values for **N1**: 0 [Always on] 1 [5 seconds] 2 [10 seconds] 3 [15 seconds] 4 [30 seconds] 5 [1 minutes] 6 [1.5 minutes] 7 [2 minutes] 8 [2.5 minutes] 9 [3 minutes] 10 [5 minutes] 11 [10 minutes]
get out A auto sync off↵ Show the current Auto Sync Off settings.
set system usb fw update↵ Initiates the firmware update process via USB.
get update filename↵ Show the unit's update firmware filename.
set factory user edid default↵ Restore the unit's User EDIDs to their factory default settings.
set factory default↵ Restore the unit's settings, except for User EDIDs, to the their factory default settings.

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

HDMI Bandwidth	18Gbps
Input Ports	4×HDMI (Type-A)
Output Ports	2×HDMI (Type-A)
Control Ports	1×RS-232 (3.5mm) 1×IP Control (RJ-45)
Service Port	1×USB 2.0 (Type-A)
Baud Rate	19200
Power Supply	24V/2.7A DC (US/EU standards, CE/FCC/UL certified)
ESD Protection (HBM)	±8kV (Air Discharge) ±4kV (Contact Discharge)
Dimensions (W×H×D)	231.5mm×25mm×158mm [Case Only] 231.5mm×25mm×161mm [All Inclusive]
Weight	968g
Chassis Material	Metal (Steel)
Chassis Color	Black
Operating Temperature	0˚C – 40˚C/32˚F – 104˚F
Storage Temperature	-20˚C – 60˚C/-4˚F – 140˚F
Relative Humidity	20 – 90% RH (Non-condensing)
Power Consumption	15.3W

8.2 Video Specifications

Supported Resolutions (Hz)	Input	Output
	HDMI	HDMI
720×400p@70/85	✓	×
640×480p@60/72/75/85	✓	59Hz
720×480i@60	✓	×
720×480p@60	✓	✓
720×576i@50	✓	×
720×576p@50	✓	✓
800×600p@56/60/72/75/85	✓	60Hz
848×480p@60	✓	×
1024×768p@60/70/75/85	✓	60Hz
1152×864p@75	✓	×
1280×720p@50/60	✓	✓
1280×768p@60/75/85	✓	60Hz
1280×800p@60/75/85	✓	60Hz
1280×960p@60/85	✓	60Hz
1280×1024p@60/75/85	✓	60Hz
1360×768p@60	✓	✓
1366×768p@60	✓	✓
1400×1050p@60	✓	✓
1440×900p@60/75	✓	60Hz
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	Output
	HDMI	HDMI
2560×1440p@60RB	✓	×
2560×1600p@60RB	✓	×
2048×1080p@24/25/30	✓	×
2048×1080p@50/60	✓	×
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	✓	✓
3840×2400@60RB	×	✓
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 Inputs 1~2/ All Outputs	
LPCM	
Max Channels	8 Channels
Sampling Rate (kHz)	32, 44.1, 48, 88.2, 96, 176.4, 192
Bitstream	
Supported Formats	Standard & High-Definition
HDMI Inputs 3~4	
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
ASCII	American Standard Code for Information Interchange
CLI	Command-Line Interface
DHCP	Dynamic Host Configuration Protocol
DVI	Digital Visual Interface
EDID	Extended Display Identification Data
Gbps	Gigabits per second
GUI	Graphical User Interface
HDCP	High-bandwidth Digital Content Protection
HDMI	High-Definition Multimedia Interface
HDTV	High-Definition Television
IP	Internet Protocol
kHz	Kilohertz
LAN	Local Area Network
LED	Light-Emitting Diode
LPCM	Linear Pulse-Code Modulation
MAC	Media Access Control
MHz	Megahertz
OSD	On-Screen Display
PiP	Picture in Picture
PoP	Picture outside of Picture
RGB	Red, Green, Blue
TCP	Transmission Control Protocol
TMDS	Transition-Minimized Differential Signaling
4K UHD	4K Ultra-High-Definition (10.2Gbps max)
4K UHD+	4K Ultra-High-Definition (18Gbps max)
UHDTV	Ultra-High-Definition Television
USB	Universal Serial Bus
VGA	Video Graphics Array

ACRONYM	COMPLETE TERM
WUXGA (RB)	Widescreen Ultra Extended Graphics Array (Reduced Blanking)
XGA	Extended Graphics Array

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