CSC-104

4K UHD+ 4×2 HDMI Matrixing Scaler

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
VS1	2018/07/26	Final technical review

CONTENTS

1. INTRODUCTION

This Scaler is a new and powerful 4K scaling solution. The maximum resolution supported is 4096×2160@50/60Hz (4:4:4, 8-bit) for all HDMI inputs and outputs. The scaled HDMI output is powered by a high quality single-pass scaling engine with the ability to adjust the image with a number of fine tuning options including: contrast, brightness, hue, saturation, sharpness, noise reduction, and RGB levels. 3-D motion adaptive de-interlacing and frame rate conversion is supported as well.

Additionally this unit brings a new level of ease of integration when employed in conference centers, classrooms and other public venues. The auto source detection and switching feature is designed to switch to the most recently connected source automatically and to switch to another live input if the current one becomes disconnected. The dedicated bypass output can send the selected source, without modification, to the connected display or, if desired, color space correction or down-conversion to 1080p can be applied to the signal.

The HDMI inputs and outputs support passing uncompressed digital audio up to LPCM 7.1 as well as Bitstream and HD Bitstream audio formats. Shortcut keys are provided to quickly change the output resolution to 1080p@60Hz or XGA when needed for quick connection to a display or for troubleshooting purposes. This unit is controlled via comprehensive front panel controls (with OSD), RS-232, and IR remote providing the user with easy access to all settings.

2. APPLICATIONS

- Entertainment Rooms & Home Theaters
- Showrooms & Demo Rooms
- Lecture Hall Presentations
- Public Commercial Displays
- AV Equipment and Control Rooms

3. PACKAGE CONTENTS

- 1×4 by 2 HDMI Matrixing Scaler
- 1×5V/3A DC Power Adapter
- 1×Remote Control (CR-182)

- 1×3-pin Terminal Block to 9-pin D-sub Adapter Cable
- 1×Shockproof Feet (Set of 4)
- 1×Operation Manual

4. SYSTEM REQUIREMENTS

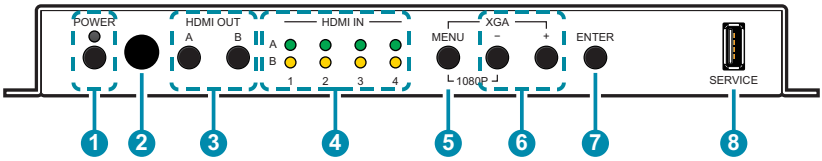
- HDMI source equipment such as media players, video game consoles or set-top boxes.
- HDMI receiving equipment such as HDTVs, monitors or audio amplifiers.
- The use of “Premium High Speed HDMI” cables is highly recommended.

5. FEATURES

- HDMI with HDR, 3D & 4K@60Hz support, DVI 1.0 compatible
- HDCP 2.2 and HDCP 1.x compliant
- 4 HDMI input and 2 HDMI output matrix
- Advanced single-pass 4K scaling engine
- Supports up to 4K UHD (18Gbps, 4096×2160@50/60Hz 4:4:4, 8-bit) video input
- Scaled and bypass HDMI outputs support video up to 4K UHD (18Gbps, 4096×2160@50/60Hz 4:4:4, 8-bit)
- HDMI inputs support Deep Color up to 16-bit at 1080p and 10/12-bit HDR (High Dynamic Range) up to 4K
- Bypass HDMI output supports Deep Color up to 16-bit at 1080p and 10/12-bit HDR (High Dynamic Range) up to 4K
- Supports pass-through of many audio formats including LPCM 2.0/5.1/7.1, Bitstream, and HD Bitstream
- Scaled output supports adjustments to contrast, brightness, hue, saturation, sharpness, RGB levels ,and aspect ratio
- Advanced EDID and HDCP management
- Auto input scan and auto switch functionality
- Quick output resolution switching via hot keys
- Controllable via front-panel buttons with OSD, RS-232 or IR remote

6. OPERATION CONTROLS AND FUNCTIONS

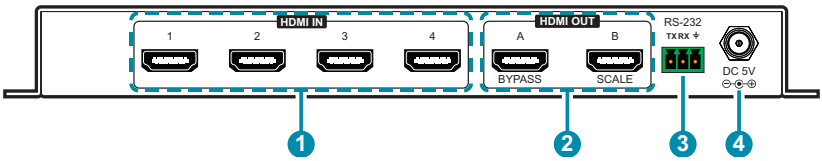
6.1 Front Panel



1. **POWER BUTTON & LED:** Press this button to power on the unit (green LED) or place it into stand-by mode (red LED).
2. **IR RECEIVER WINDOW:** Accepts IR signals from the included IR remote for control of this unit only.
3. **HDMI OUT A~B BUTTONS:** Press these buttons to sequentially switch through the available inputs for each output.
4. **HDMI IN 1~4 LEDS:** These LEDs will illuminate to indicate which source is currently selected for each output.
5. **MENU BUTTON:** Press to enter the OSD menu, or to back out from menu items.

   Note: Press and hold the "MENU" button while connecting the power supply to reset all settings to the factory defaults. 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.
6. **+ (PLUS) & – (MINUS) BUTTONS:** Press to move up and down or adjust selections within OSD menus.
7. **ENTER BUTTON:** Press to confirm a selection within the OSD or to go deeper into a menu item.
8. **SERVICE PORT:** This slot is reserved for firmware update use only.

6.2 Rear Panel

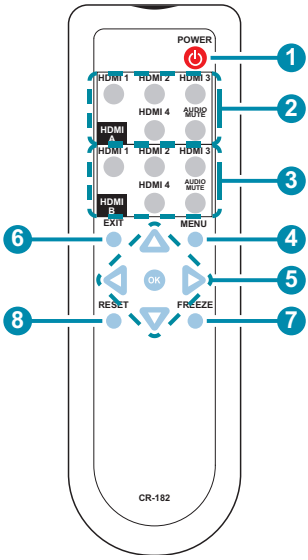


1. **HDMI IN 1~4 PORTS:** Connect to HDMI source equipment such as media players, game consoles or set-top boxes.
2. **HDMI OUT A~B PORTS:** Connect to HDMI TVs, monitors or amplifiers for digital video and audio output.

   BYPASS (A): This port can output any selected source without modification. Basic display compatibility functions are also supported, including 4K to 1080p scaling, and color space conversion.

   SCALE (B): All output from this port will be scaled to the user selected resolution, from 640×480@60Hz up to 4K@60Hz, with support for aspect ratio, zoom, and color adjustments.
4. **RS-232 PORT:** Connect directly to a PC, laptop or other serial control device with a 3-pin adapter cable to send RS-232 commands to control the unit.
5. **DC 5V PORT:** Plug the 5V DC power adapter into the unit and connect it to an AC wall outlet for power.

6.3 Remote Control



1. **POWER BUTTON:** Press this button to power on the unit or place it into stand-by mode.
2. **HDMI A SOURCE 1~4 BUTTONS:** Press any of these buttons to immediately switch Output A to the corresponding input.

   HDMI A MUTE BUTTON: Press this button to mute or unmute the audio on Output A.
3. **HDMI B SOURCE 1~4 BUTTONS:** Press any of these buttons to immediately switch Output B to the corresponding input.

   HDMI B AUDIO MUTE BUTTON: Press this button to mute or unmute the audio on Output B.
4. **MENU BUTTON:** Press to enter the OSD menu, or to back out from menu items.
5. **ARROW BUTTONS:** Press the arrow buttons to move up and down or adjust selections within OSD menus.

   OK BUTTON: Press the OK button to confirm a selection within the OSD or to go deeper into a menu item.
6. **EXIT BUTTON:** Press to immediately exit the OSD menu.
7. **FREEZE BUTTON:** Press this button to freeze or unfreeze the video on Output B.
8. **RESET BUTTON:** Press this button reset the unit's settings back to their factory defaults.

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
Picture
Audio
OSD
EDID
Reset
FW Update
Information

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

VIDEO		
2ND LEVEL	**3RD LEVEL**	**4TH LEVEL**
Video	**HDMI1**	
	HDMI2	
	HDMI3	
	HDMI4	
Output	640×480 60	
	800×600 60	
	1024×768 60	
	1280×768 60	
	1280×800 60	
	1280×1024 60	
	1360×768 60	

VIDEO		
2ND LEVEL	**3RD LEVEL**	**4TH LEVEL**
Output	1400×1050 60	
	1440×900 60	
	1600×1200 60	
	1680×1050 60	
	1920×1200 60 RB	
	2560×1600 60	
	1920×1080 60	
	1280×720 60	
	2048×1080 50	
	2048×1080 60	
	2560×1440 60 RB	
	720×480p 60	
	1280×720p 60	
	1920×1080P 60	
	720×576p 50	
	1280×720p 50	
	1920×1080p 50	
	1920×1080p 24	
	1920×1080p 25	
	1920×1080p 30	
	2560×1080p 50	
	2560×1080p 60	
	3840×2160p 24	
	3840×2160p 25	
	3840×2160p 30	
	3840×2160p 50	
	3840×2160p 60	
	4096×2160p 24	

VIDEO		
2ND LEVEL	**3RD LEVEL**	**4TH LEVEL**
Output	4096×2160p 25	
	4096×2160p 30	
	4096×2160p 50	
	4096×2160p 60	
	Native	
Aspect	Over Scan	
	FULL	
	Best Fit	
	Pan Scan	
	Letter Box	
	Under 2	
	Under 1	
	Follow In	
	Zoom Mode	
Zoom Mode Ratio	60~180 **(100)**	
HDMI1 HDCP	Support Off	
	Refer to Source	
	REFER TO DISPLAY	
HDMI2 HDCP	[Same as HDMI1 HDCP]	
HDMI3 HDCP		
HDMI4 HDCP		
No Signal Color	**BLACK**	
	White	
	Blue	
	Red	
	Green	
Blank	On	
	OFF	

VIDEO		
2ND LEVEL	**3RD LEVEL**	**4TH LEVEL**
Freeze	On	
	OFF	
Auto Setup	Auto Sync Off	**OFF**
		30s
		60s
		3Min
		5Min
		10Min
	Auto Scan	**OFF**
		On
		From Last
		From HDMI1
		From HDMI2
		From HDMI3
		From HDMI4
	Auto Switch	**OFF**
		On
Bypass Output	Video	**HDMI1**
		HDMI2
		HDMI3
		HDMI4
	4K down to 1080p	**OFF**
		RGB
		YUV444
		Follow In
	4K 6G YUV420	**OFF**
		On
	Bypass Color	**FOLLOW IN**

VIDEO		
2ND LEVEL	3RD LEVEL	4TH LEVEL
Bypass Output	Bypass Color	RGB
		YUV444
		YUV422

1) **Video (Output B only):** Selects the HDMI input to route to the scaled output (Output B) for display.
2) **Output (Output B only):** Selects the output resolution to use on the scaled output. Selecting “Native” will make the unit automatically select an output resolution based on the detected EDID of the connected display.
3) **Aspect (Output B only):** Selects the aspect ratio to use when outputting a source on the scaled output. “Full” stretches the source to fill the output resolution, regardless of the original aspect ratio, while “Best Fit” will always attempt to retain the original source’s correct aspect ratio by adding black bars if necessary. “Follow In” centers the source on the screen, without any scaling (1:1 pixel reproduction). Selecting “Zoom Mode” activates the free-scaling zoom mode which allows for a zoom/shrink level to be manually selected using the “Zoom Mode Ratio” setting.

   Note: Some video noise might be present when using the “Follow In” mode if the selected output resolution is 4096×2160@60Hz and the source is at, or above, 1680×1050 but below 3840×2160.
4) **Zoom Mode Ratio (Output B only):** Sets the percentage amount to zoom or shrink the image when the “Zoom Mode” aspect option is active.
5) **HDMI1~4 HDCP:** Selects the HDCP logic to use with the specified HDMI input. Setting this to “Support Off” will completely disable HDCP support on that input.
6) **No Signal Color:** Selects the free run color to use when no live input source is detected.
7) **Blank (Output B only):** Allows for the video and audio on the scaled output to be blanked/muted.

8) **Freeze (Output B only):** Allows for the video on the scaled output to be frozen. While the output is frozen, audio output will also be muted.

9) **Auto Setup:** Provides control over the behavior of the automated video source handling of the unit.

   - **Auto Sync Off:** Sets the amount of time to continue outputting sync with the free run color if there is no live source and no operations have been executed on the unit. Setting this to "OFF" forces the unit to always output sync.
   - **Auto Scan:** Enable or disable the auto scan on source loss feature. Selecting a specific input will force the search to begin with that input.
   - **Auto Switch:** Enable or disable automatically switching to any newly detected source.

10) **Bypass Output:** Provides control over the source and behavior of the bypass output (Output A).

   - **Video:** Select the HDMI input to route to the bypass output (Output A) for display.
   - **4K down to 1080p:** Enables or disables the 4K to 1080p scaling function. When enabled, any 4K source routed to Output A will be automatically scaled to 1080p using the selected color space.

     Note: Sources scaled in this way will always keep their original frame rate. For example, 4K@24Hz will be scaled to 1080p@24Hz.
   - **4K 6G YUV420:** Enables or disables the 4K@50/60 4:4:4 to 4K@50/60 4:2:0 color subsampling conversion function.

     Note: The "4K down to 1080p" option will override this setting, if it is enabled at the same time.
   - **Bypass Color:** Selects the preferred color space format to use on Output A. Selecting "Follow In" will keep the selected source's original format.

     Note: The "4K down to 1080p" and "4K 6G YUV420" options will override this setting, if they are enabled at the same time.

PICTURE (OUTPUT B ONLY)	
2ND LEVEL	**3RD LEVEL**
Color Gain R	0~1023 **(512)**
Color Gain G	0~1023 **(512)**
Color Gain B	0~1023 **(512)**

PICTURE (OUTPUT B ONLY)	
2ND LEVEL	**3RD LEVEL**
Color Offset R	0~1023 **(512)**
Color Offset G	0~1023 **(512)**
Color Offset B	0~1023 **(512)**
Brightness	0~60 **(30)**
Contrast	0~60 **(30)**
Hue	0~60 **(30)**
Saturation	0~60 **(30)**
Sharpness	0~63 **(0)**
NR	**OFF**
	Low
	Middle
	High
	Auto
Reset Picture	

1) **Color Gain R/G/B:** These controls provide control over the red, green, and blue color gain level of the scaled output.
2) **Color Offset R/G/B:** These controls provide control over the red, green, and blue color offset level of the scaled output.
3) **Brightness:** Provides control over the overall brightness of the scaled output image.
4) **Contrast:** Provides control over the overall contrast of the scaled output image.
5) **Hue:** Provides control over the hue shift of the scaled output image.
6) **Saturation:** Provides control over the color saturation level of the scaled output image.
7) **Sharpness:** Provides control over the amount of sharpness processing to apply to the scaled output image.
8) **NR:** Provides control over the aggressiveness of the digital noise reduction processing when applied to the scaled output image. Selecting “Off” disables all noise reduction processing.

9) **Reset Picture:** Selecting this will reset all picture settings back to their factory defaults.

Note: Settings from the "Picture" OSD menu are only applied to the scaled output (Output B).

AUDIO	
2ND LEVEL	**3RD LEVEL**
Scaler Out Mute	On
	OFF
Bypass Out Mute	On
	OFF
Reset Audio	

1) **Scaler Out Mute:** Mutes or unmutes HDMI Output B's audio.
2) **Bypass Out Mute:** Mutes or unmutes HDMI Output A's audio.
3) **Reset Audio:** Selecting this will reset all audio settings back to their factory defaults.

OSD	
2ND LEVEL	**3RD LEVEL**
H Position	0~60 **(30)**
V Position	0~60 **(30)**
Timer	Off
	5S
	10s
	15s
	20s
	25s
	30s
Timer	35s
	40s
	45s
	50s

OSD	
2ND LEVEL	**3RD LEVEL**
	55s
	60s
Transparent	0~50 **(50)**
Display	Off
	On
	5S
	10s
Reset OSD	

1) **H Position:** Set the horizontal position of the OSD menu.
2) **V Position:** Set the vertical position of the OSD menu.
3) **Timer:** Set the length of time to wait before automatically turning off the OSD menu if there is no user interaction. The timer may also be disabled.
4) **Transparent:** Set the transparency level of the OSD menu. A setting of 50 is completely opaque.
5) **Display:** Enable or disable the information display and set the length of time for the information display to be visible after a source or resolution change.
6) **Reset OSD:** Selecting this will reset all OSD settings back to their factory defaults.

EDID	
2ND LEVEL	**3RD LEVEL**
HDMI1 EDID	**FHD 2CH**
	FHD MCh
	UHD 2Ch
HDMI1 EDID	UHD MCh
	UHD^{+} 2Ch
	UHD^{+} MCh
	User 1
	User 2

EDID	
2ND LEVEL	3RD LEVEL
	User 3
	User 4
	Output A
	Auto Output A
	Output B
	Auto Output B
HDMI2 EDID	[Same as HDMI1 EDID]
HDMI3 EDID	
HDMI4 EDID	
HDMI ALL EDID	

1) **HDMI1~4 EDID:** Select the EDID to use with the specified HDMI input.
2) **HDMI ALL EDID:** Select an EDID to assign to all HDMI inputs.

   Note: Selecting "Output A" or "Output B" will copy and use the EDID from that output's current sink but will not re-copy the EDID if the sink is changed. Selecting "Auto Output A" or "Auto Output B" will automatically copy and use the EDID from that output every time a new sink is connected.

RESET	
2ND LEVEL	3RD LEVEL
Reset All	

1) **Reset All:** Selecting this will reset the unit's settings back to their factory defaults.

FW UPDATE	
2ND LEVEL	3RD LEVEL
Update from USB	

1) **Update from USB:** 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 select this option. After the update is complete the unit will automatically reboot.

INFORMATION	
2ND LEVEL	**3RD LEVEL**
SCALER OUT	
Video	[Current Status Details]
Input	
Output	
Output HDCP	
Source HDCP	
Sink HDCP	
BYPASS OUT	
Video	[Current Status Details]
Input	
Output	
Output HDCP	
Source HDCP	
Sink HDCP	
Version	[Firmware Version]

1) **Information:** This screen displays information about the unit's current state, input and output status, as well as the current firmware version.

6.5 RS-232 Control

Unit	
Pin	**Definition**
1	TxD
2	RxD
3	GND

Controlling PC	
Pin	**Definition**
1	NC
2	RxD
3	TxD
4	NC
5	GND
6	NC
7	NC
8	NC
9	NC

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

6.6 RS-232 Commands

COMMAND
Description and Parameters
HELP↵
Show the full command list.
?↵
Show the full command list.
SET FACTORY DEFAULT↵
Reset the unit to the factory defaults.
SET FACTORY OUT ROUTE DEFAULT↵
Reset the unit's routing to the factory defaults.
SET SYSTEM REBOOT↵
Reboot the unit.

COMMAND Description and Parameters
SET OUT N1 ROUTE N2↵ Route Input **N2** to Output **N1**. **N1** = A ~ B [Output port] **N2** = 1 ~ 4 [Input port]
GET OUT N1 ROUTE↵ Show the current routing for Output **N1**. **N1** = A ~ B [Output port]
SET ALL OUT ROUTE N1↵ Route Input **N1** to all Outputs. **N1** = 1 ~ 4 [Input port]
GET ALL OUT ROUTE↵ Show the current routing for all Outputs.
SET OUT A 4K2K DOWNSCALE MODE N1↵ Enable/disable the 4K to 1080p downscale mode used by Output A (Bypass) and set the color space to use when enabled. Available values for **N1**: 0 [Off] 1 [On, RGB 4:4:4] 2 [On, YUV 4:4:4] 3 [On, Follow Input]
GET OUT A 4K2K DOWNSCALE MODE↵ Show the current 4K to 1080p downscale mode state.
GET IN N1 TIMING↵ Show the current video timing details of the signal on Input **N1**. **N1** = 1 ~ 4 [Input port] *Note: Only currently routed inputs can show information.*
GET IN TYPE LIST↵ List the port type of all inputs on the unit.

COMMAND
Description and Parameters
GET OUT TYPE LIST↵ List the port type of all outputs on the unit.
GET IN PORT NUMBER↵ Show the number of input ports on the unit.
GET OUT PORT NUMBER↵ Show the number of output ports on the unit.
SET OUT B TIMING N1↵ Set the scaled output resolution for Output B. Available values for **N1**: 0 [Native] 1 [640×480@60Hz] 2 [800×600@60Hz] 3 [1024×768@60Hz] 4 [1280×768@60Hz] 5 [1280×800@60Hz] 6 [1280×1024@60Hz] 7 [1360×768@60Hz] 8 [1400×1050@60Hz] 9 [1440×900@60Hz] 10 [1600×1200@60Hz] 11 [1680×1050@60Hz] 12 [1920×1200@60Hz RB] 13 [2560×1600@60Hz] 14 [1920×1080@60Hz] 15 [1280×720@60Hz] 16 [2048×1080@50Hz] 17 [2048×1080@60Hz] 18 [2560×1440@60Hz RB] 19 [720×480p@60Hz] 20 [1280×720p@60Hz]

COMMAND	
Description and Parameters	
21	[1920×1080p@60Hz]
22	[720×576p@50Hz]
23	[1280×720p@50Hz]
24	[1920×1080p@50Hz]
25	[1920×1080p@24Hz]
26	[1920×1080p@25Hz]
27	[1920×1080p@30Hz]
28	[2560×1080p@50Hz]
29	[2560×1080p@60Hz]
30	[3840×2160p@24Hz]
31	[3840×2160p@25Hz]
32	[3840×2160p@30Hz]
33	[3840×2160p@50Hz]
34	[3840×2160p@60Hz]
35	[4096×2160p@24Hz]
36	[4096×2160p@25Hz]
37	[4096×2160p@30Hz]
38	[4096×2160p@50Hz]
39	[4096×2160p@60Hz]
GET OUT B TIMING↵	
Show the currently selected scaling resolution number for Output B.	
GET OUT N1 TIMING STRING↵	
Show the current output timing details for Output **N1**.	
N1 = A ~ B	[Output port]
GET OUT N1 SYNC STATUS↵	
Show the current sync state of Output **N1**.	
N1 = A ~ B	[Output port]
GET OUT TIMING LIST↵	
List all available scaled output resolutions.	

COMMAND Description and Parameters
SET OUT B CONTRAST N1↵ Set Output B's contrast level. **N1** = 0 ~ 60 [Contrast]
GET OUT B CONTRAST↵ Show Output B's current contrast level.
SET OUT B BRIGHTNESS N1↵ Set Output B's brightness level. **N1** = 0 ~ 60 [Brightness]
GET OUT B BRIGHTNESS↵ Show Output B's current brightness level.
SET OUT B SATURATION N1↵ Set Output B's color saturation level. **N1** = 0 ~ 60 [Saturation]
GET OUT B SATURATION↵ Show Output B's current color saturation level.
SET OUT B HUE N1↵ Set Output B's hue adjustment value. **N1** = 0 ~ 60 [Hue]
GET OUT B HUE↵ Show Output B's current hue adjustment value.
SET OUT B SHARPNESS N1↵ Set Output B's sharpness level. **N1** = 0 ~ 63 [Sharpness]
GET OUT B SHARPNESS↵ Show Output B's current sharpness level.

COMMAND	
Description and Parameters	
SET OUT B NR N1↵	
Set the amount of noise reduction to apply to Output B's source.	
Available values for **N1**:	
0	[Off]
1	[Low]
2	[Middle]
3	[High]
4	[Auto]
GET OUT B NR↵	
Show Output B's current noise reduction setting.	
SET OUT B R GAIN N1↵	
Set Output B's red gain level.	
N1 = 0 ~ 1023	[Red gain]
GET OUT B R GAIN↵	
Show Output B's current red gain level.	
SET OUT B G GAIN N1↵	
Set Output B's green gain level.	
N1 = 0 ~ 1023	[Green gain]
GET OUT B G GAIN↵	
Show Output B's current green gain level.	
SET OUT B B GAIN N1↵	
Set Output B's blue gain level.	
N1 = 0 ~ 1023	[Blue gain]
GET OUT B B GAIN↵	
Show Output B's current blue gain level.	

COMMAND
Description and Parameters
SET OUT B ASPECT RATIO N1↵ Set Output B's aspect ratio. Available values for **N1**: 0 [Overscan] 1 [Full] 2 [Best fit] 3 [Pan scan] 4 [Letterbox] 5 [Underscan 2] 6 [Underscan 1] 7 [Follow input] 8 [Zoom mode]
GET OUT B ASPECT RATIO↵ Show the current aspect ratio setting for Output B.
GET OUT ASPECT RATIO LIST↵ List all available aspect ratios.
SET OUT ALL AUTO SYNC OFF N1↵ Enable or disable the Auto Sync Off function and set the timeout length. Available values for **N1**: 0 [Off] 1 [On, 30 seconds] 2 [On, 60 seconds] 3 [On, 3 minutes] 4 [On, 5 minutes] 5 [On, 10 minutes]
GET OUT ALL AUTO SYNC OFF↵ Show the current Auto Sync Off setting.

COMMAND
Description and Parameters
SET AUDIO OUT N1 MUTE N2↵ Enable or disable audio mute on Output **N1**. **N1** = A ~ B [Output port] Available values for **N2**: OFF [Mute off] ON [Mute on]
GET AUDIO OUT N1 MUTE↵ Show the current mute state of Output **N1**. **N1** = A ~ B [Output port]
SET ALL AUDIO OUT MUTE N1↵ Enable or disable audio mute on all outputs. Available values for **N1**: OFF [Mute off] ON [Mute on]
GET ALL AUDIO OUT MUTE↵ Show the current audio mute state of all outputs.
GET AUDIO OUT TYPE LIST↵ List the unit's audio types for each output port.
SET IN N1 HDCP MODE N2↵ Set the HDCP handling method to use with input **N1**. **N1** = 1 ~ 4 [Input port] Available values for **N2**: 0 [Support off] 1 [Refer to source] 2 [Refer to display]
GET IN N1 HDCP MODE↵ Show the HDCP handling method currently used by input **N1**. **N1** = 1 ~ 4 [Input port]

COMMAND	
Description and Parameters	
GET IN N1 HDCP STATUS↵	
Show the current HDCP status of Input **N1**.	
N1 = 1 ~ 4	[Input port]
Available HDCP status types:	
0	[Unsupported]
1	[HDCP 1.4]
2	[HDCP 2.2]
3	[Unknown]
GET OUT N1 HDCP STATUS↵	
Show the current HDCP support level on Output **N1**.	
N1 = A ~ B	[Output port]
Available HDCP support types:	
0	[No support]
1	[HDCP 1.4]
2	[HDCP 2.2]
GET OUT N1 HDCP ABILITY↵	
Show the HDCP support level reported by the display on Output **N1**.	
N1 = A ~ B	[Output port]
Available HDCP support types:	
0	[No support]
1	[HDCP 1.4]
2	[HDCP 2.2]

COMMAND Description and Parameters
SET IN N1 EDID N2↵ Set the EDID for Input **N1** to EDID **N2**. **N1** = 1 ~ 4 [Input port] Available values for **N2**: 1 [FHD 2CH] 2 [FHD MCH] 3 [UHD 2CH] 4 [UHD MCH] 5 [UHD+ 2CH] 6 [UHD+ MCH] 7 [User EDID 1] 8 [User EDID 2] 9 [User EDID 3] 10 [User EDID 4] 11 [Output A] 12 [Auto Output A] 13 [Output B] 14 [Auto Output B]
GET IN N1 EDID↵ Show the EDID assigned to Input **N1**. **N1** = 1 ~ 4 [Input port]
GET IN EDID LIST↵ List all available EDIDs.
SET USER N1 EDID DATA N2↵ Set User EDID **N1**'s data in ASCII HEX. **N1** = 1 ~ 4 [User EDID] **N2** = {Hex pairs} [EDID data]

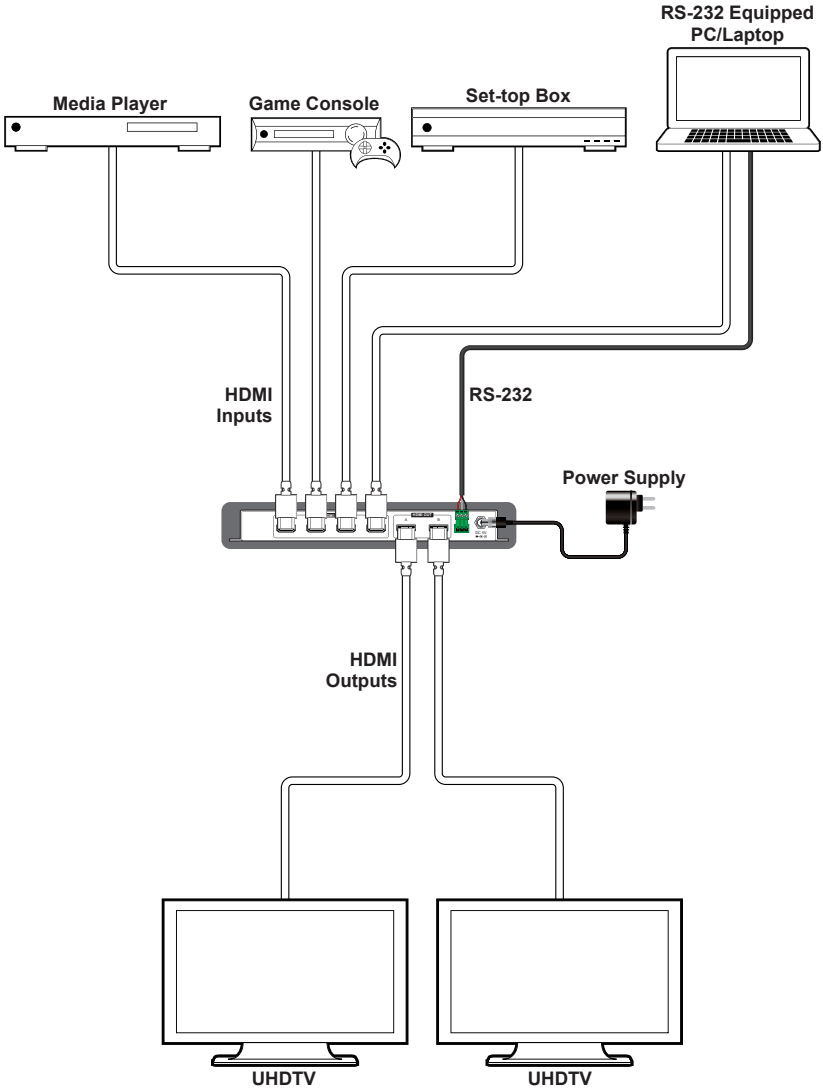
COMMAND	
Description and Parameters	
GET USER N1 EDID DATA↵	
List User EDID **N1**'s EDID data in ASCII HEX.	
N1 = 1 ~ 4	[User EDID]
GET INTERNAL N1 EDID DATA↵	
List Internal EDID **N1**'s data in ASCII HEX.	
N1 = 1 ~ 6	[Internal EDID]
GET SINK N1 EDID DATA↵	
List Output **N1**'s sink's EDID data in ASCII HEX.	
N1 = A ~ B	[Output port]
GET IN N1 EDID DATA↵	
List Input **N1**'s assigned EDID's data in ASCII HEX.	
N1 = 1 ~ 4	[Input port]
SET ALL IN EDID N1↵	
Set the EDID for all inputs to EDID **N1**.	
Available values for **N1**:	
1	[FHD 2CH]
2	[FHD MCH]
3	[UHD 2CH]
4	[UHD MCH]
5	[UHD$^+$ 2CH]
6	[UHD$^+$ MCH]
7	[User EDID 1]
8	[User EDID 2]
9	[User EDID 3]
10	[User EDID 4]
11	[Output A]
12	[Auto Output A]
13	[Output B]
14	[Auto Output B]

COMMAND
Description and Parameters
GET ALL IN EDID LIST↵ List the EDIDs assigned to all inputs.
SET OUT ALL OSD TIMEOUT N1↵ Set the OSD display timeout length, or disable the timeout. Available values for **N1**: 0 [No timeout] 1 [5 seconds] 2 [10 seconds] 3 [15 seconds] 4 [20 seconds] 5 [25 seconds] 6 [30 seconds] 7 [35 seconds] 8 [40 seconds] 9 [45 seconds] 10 [50 seconds] 11 [55 seconds] 12 [60 seconds]
GET OUT ALL OSD TIMEOUT↵ Show the current OSD timeout state.
SET OUT ALL OSD INFO N1↵ Set the OSD Info Display timeout length, or disable the OSD Info display. Available values for **N1**: 0 [Disabled] 1 [Always on] 2 [5 seconds] 3 [10 seconds]
GET OUT ALL OSD INFO↵ Show the current OSD Info Display setting.

COMMAND Description and Parameters
SET OUT ALL OSD HPOSITION N1↵ Set the horizontal position of the OSD. **N1** = 0 ~ 60 [Horizontal position]
GET OUT ALL OSD HPOSITION↵ Show the current horizontal position of the OSD.
SET OUT ALL OSD VPOSITION N1↵ Set the vertical position of the OSD. **N1** = 0 ~ 60 [Vertical position]
GET OUT ALL OSD VPOSITION↵ Show the current vertical position of the OSD.
SET OUT ALL OSD TRANSPARENCY N1↵ Set the transparency level for the OSD. **N1** = 0 ~ 50 [Transparency]
GET OUT ALL OSD TRANSPARENCY↵ Show the current OSD transparency value.

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	600MHz/18Gbps
Input Ports	4×HDMI
Output Ports	2×HDMI
Control Port	1×RS-232 (Terminal Block)
Other Port	1×Service (USB Type-A)
IR Frequency	30–50kHz (30–60kHz under ideal conditions)
Baud Rate	19200bps
Power Supply	5V/3A DC (US/EU standards, CE/FCC/UL certified)
ESD Protection	Human Body Model: ±8kV (Air Discharge) ±4kV (Contact Discharge)
Dimensions	231.5mm×25mm×108mm (W×H×D) [Case Only] 231.5mm×25mm×120mm (W×H×D) [All Inclusive]
Weight	700g
Chassis Material	Metal (Steel)
Silkscreen 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	12.8W

8.2 Video Specifications

Supported Resolutions (Hz)	Input	Output	
	HDMI	Bypass HDMI	Scaled HDMI
720×400@85	✓	✓	×
720×480i@60	✓	✓	×
720×480p@60	✓	✓	✓
640×480@60/72/75/85	✓	✓	60Hz
720×576i@50	✓	✓	×
720×576p@50	✓	✓	✓
800×600@56/60/72/75/85	✓	✓	60Hz
1280×720@50/60	✓	✓	✓
1024×768@60/70/75/85	✓	✓	60Hz
1280×768@60/75	✓	✓	60Hz
1360×768@60	✓	✓	✓
1366×768@60	✓	✓	✓
1280×800@60	✓	✓	✓
1152×864@75	✓	✓	×
1440×900@60	✓	✓	✓
1280×960@60	✓	✓	×
1280×1024@60	✓	✓	✓
1400×1050@60	✓	✓	✓
1680×1050@60/60 (RB)	✓	✓	✓
1920×1080i@50/60	✓	✓	×
1920×1080p@24/25/30/50/60	✓	✓	✓
1600×1200@60	✓	✓	✓
1920×1200@60 (RB)	✓	✓	✓
2560×1600@60 (RB)	✓	✓	✓

Supported Resolutions (Hz)	Input	Output	
	HDMI	Bypass HDMI	Scaled HDMI
2560×1440@60 (RB)	✓	✓	✓
3840×2160@24/25/30	✓	✓	✓
3840×2160@50/60 (4:4:4)	✓	✓	✓
3840×2160@50/60 (4:2:0)	✓	✓	×
4096×2160@24/25/30	✓	✓	✓
4096×2160@50/60 (4:4:4)	✓	✓	✓
4096×2160@50/60 (4:2:0)	✓	✓	×

8.3 Cable Specifications

HDMI Cable Length	1080p		4K30	4K60
	8-bit	12-bit	8-bit	8-bit
Input	15m	10m	5m	3m
Output	15m	10m	5m	3m

9. ACRONYMS

ACRONYM	COMPLETE TERM
ASCII	American Standard Code for Information Interchange
CEC	Consumer Electronics Control
DVI	Digital Visual Interface
EDID	Extended Display Identification Data
HD	High-Definition
HDCP	High-bandwidth Digital Content Protection
HDMI	High-Definition Multimedia Interface
HDR	High Dynamic Range
HDTV	High-Definition Television
IR	Infrared
LED	Light-Emitting Diode
LPCM	Linear Pulse-Code Modulation
OSD	On-Screen Display
PC	Personal Computer
UHD	Ultra-High-Definition
UHDTV	Ultra-High-Definition Television
USB	Universal Serial Bus
VGA	Video Graphics Array
XGA	Extended Graphics Array
WUXGA (RB)	Widescreen Ultra Extended Graphics Array (Reduced Blanking)

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