



CPLUS-V2PE

**4K UHD+ HDMI to Dual HDMI Scaler
with Audio De-Embedding & Test Patterns**



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.

REVISION HISTORY

VERSION NO.	DATE (DD/MM/YY)	SUMMARY OF CHANGE
VR0	07/04/16	Preliminary release
VR1	02/06/16	Remove HDR from OSD
VS2	20/06/17	Updated text/diagrams



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1. INTRODUCTION

This HDMI to Dual HDMI Scaler with Audio De-Embedding & Test Patterns is designed to upscale 1080p signals into 4K UHD (18Gbps) or downscale 4K UHD (18Gbps) signals into 1080p with synchronized digital and analog audio output. A friendly and simple interface design allows the user to control the unit while viewing the OSD directly on the HDMI output. The input signal can be output to both HDMI outputs simultaneously with a different resolution on each or the unit can generate a test pattern at a preferred video resolution for easy on-site display testing and validation. This UHD Scaler is the best tool to use with your HD and UHD signals.

2. APPLICATIONS

- HDMI signal splitting
- On-site equipment testing
- Production testing
- R&D design and testing

3. PACKAGE CONTENTS

- 1×HDMI to Dual HDMI Scaler
- 1×5V/2.6A DC Power Adaptor
- 1×Operation Manual

4. SYSTEM REQUIREMENTS

- HDMI input 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.

Notes:

- *When displaying 4K HDR or equivalent signals, appropriate output displays and HDMI cables are required in order to obtain the best image quality. The use of "Premium High Speed HDMI" cables is highly recommended for 18Gbps HDMI signals.*

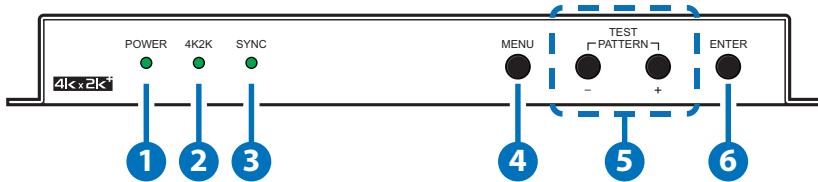
- *HDMI cable distance can be impacted by the materials and design of the cable used. The use of "Premium High Speed HDMI" cables is highly recommended for resolutions of 1080p or above.*

5. FEATURES

- 1 HDMI input and 2 HDMI outputs with 4K UHD (18Gbps) support and HDCP 2.2 compliance
- Supports HDCP 2.2 to HDCP1.4 conversion
- Compatible with DVI 1.0
- HDMI signal bypass on both outputs or upscales 1080p signals to 4K on output B and downscales 4K signals to 1080p on output A
- 4K UHD (4:4:4) to 4K UHD (4:2:0) conversion
- HDMI signal bypass, upscale and downscale
- Integrated EDID management
- Test pattern generation at selected resolutions for on-site display testing
- Supports High-Dynamic-Range (HDR) sources
- Supports HDR conversion from 4K@24/25/30Hz (4:4:4/4:2:2) 10 or 12-bit to 4K@24/25/30Hz (8-bit)
- Supports UHD resolutions up to 3840×2160@50/60Hz (4:4:4) & 4096×2160@50/60Hz (4:4:4)
- Supports data rates up to 18Gbps (600MHz) and Deep Color up to 1080p/16-bit
- Supports pass-through of HD audio formats including LPCM 2.0/5.1/7.1, Bitstream, and HD Bitstream
- OSD with instant I/O resolution display
- Digital to Analog (DAC) audio conversion
- Supports the Apple source compatibility mode option

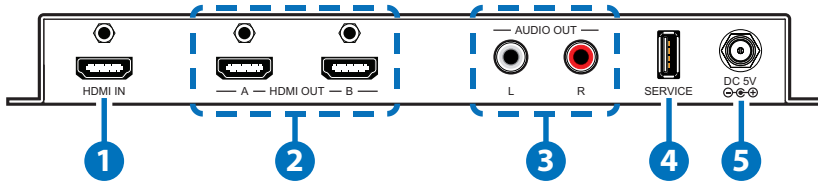
6. OPERATION CONTROLS AND FUNCTIONS

6.1 Front Panel



- 1 POWER:** This LED will illuminate when the unit is connected with a power supply.
- 2 4K2K:** This LED will illuminate when the input source contains a 4K UHD signal.
- 3 SYNC:** This LED will illuminate when the input source is sending signal.
- 4 MENU:** Press this button to enter into OSD menu. Once within the OSD press this button a second time to exit. Press and hold this button together with the “-” button for 3 seconds to reset the unit back to factory defaults.
- 5 DOWN & UP/TEST PATTERN:** When the OSD menu is in use, press these buttons to move within the menu. Outside of the OSD, press these buttons together to instantly set the output timing to 1280×720@60Hz and display test patterns on both outputs.
- 6 ENTER:** Press to confirm a selection or to go deeper into a menu item.

6.2 Rear Panel



- 1 **HDMI IN:** Connect to HDMI source equipment such as a media player, game console or set-top box.
- 2 **HDMI OUT A~B:** Connect to HDMI TVs, monitors or amplifiers for digital video and audio output. Each output can display a different resolution with a choice between the HDMI source or a test pattern.
- 3 **AUDIO OUT:** Connect to powered speakers or an amplifier for stereo analog audio output extracted from an HDMI source with LPCM 2.0 audio.
- 4 **SERVICE:** This slot is reserved for firmware update use only.
- 5 **DC 5V:** Plug the 5V DC power adapter into the unit and connect it to an AC wall outlet for power.

6.3 OSD Menu

6.3.1 Unit's OSD Menu

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
OUTPUT	OUTPUT A	INPUT 4K2K	PASS THROUGH
			DOWN 1080P
			FIX 4K2K (420)
			FIX 8 BITS
	OUTPUT B	INPUT 1080P	PASS THROUGH
			UP 4K2K
			UP 4K2K (420)
		INPUT 4K2K	PASS THROUGH
			FIX 4K2K (420)
			FIX 8 BITS
EDID	INT 4K (6G-2CH)		
	INT 4K (3G-2CH)		
	INT 4K (420-2CH)		
	INT 1080P (2CH)		
	EXT OUT A		
	EXT OUT B		
	EXT OUT A (2CH)		
	EXT OUT B (2CH)		
HDCP	HDCP SUPPORT		
	OFF		
	REFER TO SOURCE		
OSD	DISPLAY INFO.	ON	
		OFF	
	OSD TIME OUT	OFF	
		5 SEC.	
		10 SEC.	
		15 SEC.	

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
OSD (cont.)	OSD TIME OUT	20 SEC.	
		25 SEC.	
		30 SEC.	
		35 SEC.	
		40 SEC.	
TEST PATTERN A	MODE	OFF	
		ON	
		AUTO PATTERN	
		AUTO TIMING	
	PATTERN	WHITE COLOR	
		RED COLOR	
		GREEN COLOR	
		BLUE COLOR	
		MAGENTA COLOR	
		YELLOW COLOR	
		CYAN COLOR	
		COLOR BAR	
		RAMP	
		TOGGLE	
	RESOLUTION	720×480P@60	
		720×576P@50	
		1280×720P@50	
		1280×720P@60	
		1920×1080P@50	
		1920×1080P@60	
		3840×2160P@24	
		3840×2160P@25	
		3840×2160P@30	
		4096×2160P@24	

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
TEST PATTERN A (cont.)	RESOLUTION	4096×2160P@25	
		4096×2160P@30	
	HDCP	DISABLE	
		ENABLE	
	SWITCH TIME	10 SEC.	
		20 SEC.	
		30 SEC.	
		40 SEC.	
		50 SEC.	
		1 MIN.	
		2 MIN.	
		3 MIN.	
		5 MIN.	
	AUTO TIMING SELECT	720×480P@60	
		720×576P@50	
		1280×720P@50	
		1280×720P@60	
		1920×1080P@50	
		1920×1080P@60	
		3840×2160P@24	
		3840×2160P@25	
		3840×2160P@30	
		4096×2160P@24	
		4096×2160P@25	
		4096×2160P@30	
TEST PATTERN B	MODE	OFF	
		ON	
		AUTO PATTERN	
		AUTO TIMING	
	PATTERN	WHITE COLOR	

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
TEST PATTERN B (cont.)	PATTERN	RED COLOR	
		GREEN COLOR	
		BLUE COLOR	
		MAGENTA COLOR	
		YELLOW COLOR	
		CYAN COLOR	
		COLOR BAR	
		RAMP	
		TOGGLE	
	RESOLUTION	720×480P@60	
		720×576P@50	
		1280×720P@50	
		1280×720P@60	
		1920×1080P@50	
		1920×1080P@60	
		3840×2160P@24	
		3840×2160P@25	
		3840×2160P@30	
		4096×2160P@24	
		4096×2160P@25	
		4096×2160P@30	
		3840×2160P@50	
		3840×2160P@60	
		4096×2160P@50	
		4096×2160P@60	
	HDCP	DISABLE	
		ENABLE	
	SWITCH TIME	10 SEC.	
		20 SEC.	

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
TEST PATTERN B (cont.)	SWITCH TIME	30 SEC.	
		40 SEC.	
		50 SEC.	
		1 MIN.	
		2 MIN.	
		3 MIN.	
		5 MIN.	
	AUTO TIMING SELECT	720×480P@60	
		720×576P@50	
		1280×720P@50	
		1280×720P@60	
		1920×1080P@50	
		1920×1080P@60	
		3840×2160P@24	
		3840×2160P@25	
		3840×2160P@30	
		4096×2160P@24	
		4096×2160P@25	
		4096×2160P@30	
		3840×2160P@50	
		3840×2160P@60	
		4096×2160P@50	
		4096×2160P@60	
INFORMATION	RESOLUTION	INPUT	
		OUTPUT A	
		OUTPUT B	
	HDCP	OUTPUT A	
		OUTPUT B	
	FIRMWARE	VERSION	

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
FIRMWARE UPDATE			
FACTORY SETTING			

Note:

- Values in **Bold** are factory default settings.
- When input timing is non-VESA compliant the OSD may be disabled. To get into the OSD menu in this case, press the hot key combination to enter into test pattern mode and operate the OSD menu while the test pattern is displaying.

6.3.2 Conversion Rules

• DOWN 1080P

Input Resolution (Hz)		Output Resolution (Hz)
3840×2160p@24	→	1920×1080p@24
3840×2160p@25	→	1920×1080p@25
3840×2160p@30	→	1920×1080p@30
3840×2160p@50	→	1920×1080p@50
3840×2160p@60	→	1920×1080p@60
4096×2160p@24	→	1920×1080p@24
4096×2160p@25	→	1920×1080p@25
4096×2160p@30	→	1920×1080p@30
4096×2160p@50	→	1920×1080p@50
4096×2160p@60	→	1920×1080p@60

• UP 4K2K

Input Resolution (Hz)		Output Resolution (Hz)
1920×1080p@24	→	3840×2160p@24
1920×1080p@25	→	3840×2160p@25
1920×1080p@30	→	3840×2160p@30
1920×1080p@50	→	3840×2160p@50
1920×1080p@60	→	3840×2160p@60

• UP 4K2K (YUV420)

Input Resolution (Hz)		Output Resolution (Hz)
RGB 4:4:4 & YCbCr 4:4:4/4:2:2		YCbCr 4:2:0
1920×1080p@50	→	3840×2160p@50
1920×1080p@60	→	3840×2160p@60

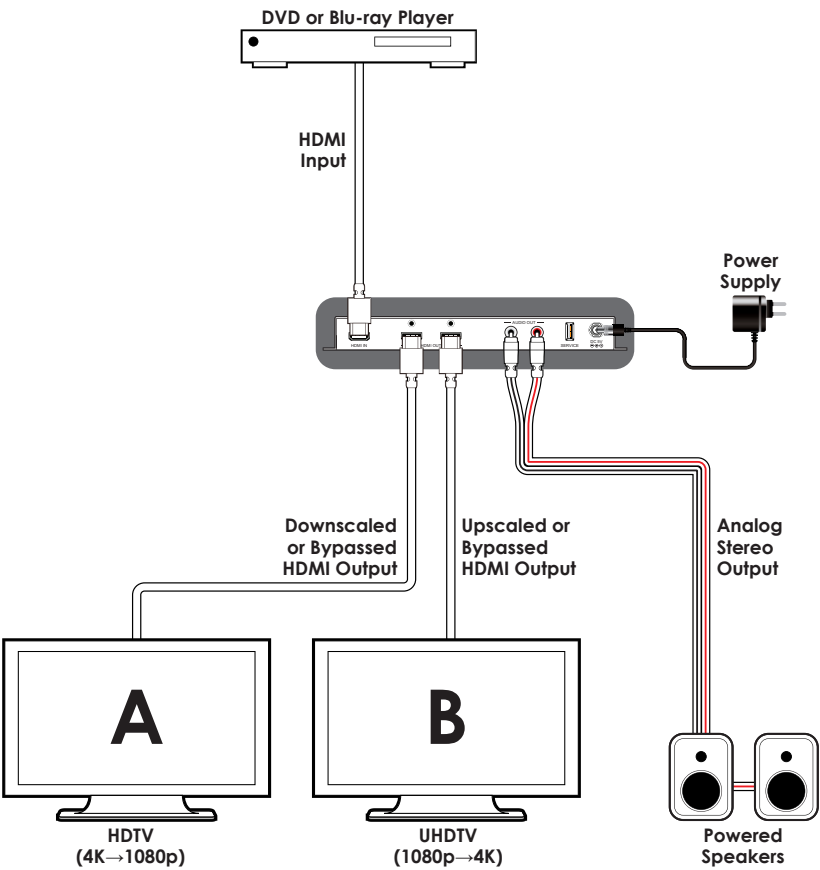
- **FIX 4K2K (YUV420)**

Input Resolution (Hz)		Output Resolution (Hz)
RGB 4:4:4 & YCbCr 4:4:4/4:2:2		YCbCr 4:2:0
3840×2160p@50	→	3840×2160p@50
3840×2160p@60	→	3840×2160p@60
4096×2160p@50	→	4096×2160p@50
4096×2160p@60	→	4096×2160p@60

- **FIX 8 BITS**

Input Resolution (Hz)		Output Resolution (Hz)
RGB 4:4:4 & YCbCr 4:4:4/4:2:2, 10/12/16-bit		RGB 4:4:4 & YCbCr 4:4:4/4:2:2, 8-bit
3840×2160p@24	→	3840×2160p@24
3840×2160p@25	→	3840×2160p@25
3840×2160p@30	→	3840×2160p@30
4096×2160p@24	→	4096×2160p@24
4096×2160p@25	→	4096×2160p@25
4096×2160p@30	→	4096×2160p@30
YCbCr 4:2:0, 10/12/16-bit		YCbCr 4:2:0, 8-bit
3840×2160p@50	→	3840×2160p@50
3840×2160p@60	→	3840×2160p@60
4096×2160p@50	→	4096×2160p@50
4096×2160p@60	→	4096×2160p@60

7. CONNECTION DIAGRAM



8. SPECIFICATIONS

8.1 Technical Specifications

Video Bandwidth	600MHz/18Gbps
Input Ports	1×HDMI
Output Ports	2×HDMI 2×RCA (Stereo Audio)
Supported Resolutions	480i@60Hz - 4K@60Hz (4:4:4, 8-bit) VGA@60Hz - WUXGA@60Hz (RB)
HDMI Cable Length	10m (1080p@60Hz, 12-bit) 5m (4K@60Hz, 4:4:4, 8-bit)
Power Supply	5V/2.6A DC (US/EU standards, CE/FCC/UL certified)
ESD Protection	Human Body Model: ±12kV (Air Discharge) ±8kV (Contact Discharge)
Dimensions	231.5mm×25mm×108mm (W×H×D) [Case Only] 231.5mm×25mm×117mm (W×H×D) [All Inclusive]
Weight	616g
Chassis Material	Metal
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	5.8W

8.2 Video Specifications

Supported Resolutions (Hz)	HDMI Input	HDMI Output
800×600@56/60/72/75/85	✓	✓
1024×768@60/70/75/85	✓	✓
1280×768@60/75	✓	✓
1280×800@60/75	✓	✓
1280×1024@60/75	✓	✓
1366×768@60	✓	✓
1400×1050@60/75	✓	✓
1440×900@60/75	✓	✓
1600×900@60	✓	✓
1600×1200@60	✓	✓
1680×1050@60	✓	✓
1920×1200@60	✓	✓
640×480i@60	✓	✓
640×480p@60	✓	✓
720×480p@60	✓	✓
720×576i@50	✓	✓
720×576p@50	✓	✓
1280×720p@50/60	✓	✓
1920×1080i@50/60	✓	✓
1920×1080p@24/25/30/50/60	✓	✓
3840×2160p@24/25/30/50/60	✓	✓
4096×2160p@24/25/30/50/60	✓	✓

8.3 Audio Specifications

Input Level/Freq.	Output Terminal	Output Level	THD+N	Frequency Response	SNR	Crosstalk
HDMI 0dBFS, 1kHz	L/R	2Vrms±10%	< 0.1%	±3dB	> 70dB	< -60dB

9. ACRONYMS

ACRONYM	COMPLETE TERM
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
LPCM	Linear Pulse-Code Modulation
OSD	On-Screen Display
UHD	Ultra-High-Definition
USB	Universal Serial Bus
VGA	Video Graphics Array (640×480@60Hz)
WUXGA	Wide Ultra Extended Graphics Array (1920×1200@60Hz)



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