



## CPLUS-VHH

4K UHD+ HDMI Enhancer with 5V Power Injection



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
RDV1	2019/04/29	Preliminary release



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## 1. INTRODUCTION

This 4K UHD HDMI to HDMI Enhancer with 5V Power Injection is an advanced solution for HDMI signal extension and cascading. This unit is designed to enhance and stabilize high-bandwidth HDMI signals for cleaner transmission over long distances using multiple HDMI cables without the need for external power. 4K signals may be extended over distances up to 5M per cable segment with support for cascading up to 4 times. This unit is powered by the 5V that accompanies standard HDMI signals, however in situations where additional 5V power is required (such as when cascading) it can be added with the simple connection of an external USB power source.

This repeater complies with the advanced HDCP 2.2 and HDMI 2.0 standards, as well as supporting the legacy HDCP 1.x and HDMI 1.x standards. 4K UHD video sources, up to and including 4K@60Hz (4:4:4, 8-bit) as well as 10/12-bit sources with HDR are fully supported. Up to 8 channel LPCM digital audio as well as Bitstream and HD Bitstream audio formats are supported as well. All functionality is automatic, requiring no external controls.

## 2. APPLICATIONS

- HDMI Signal Extension
- HDMI Cable Cascading
- Adding 5V Support to Legacy HDMI Sources

## 3. PACKAGE CONTENTS

- 1× 4K UHD+ HDMI Enhancer
- 1× Operation Manual

## 4. SYSTEM REQUIREMENTS

- HDMI source equipment such as a media player, video game console, PC, or set-top box
- HDMI receiving equipment such as an HDTV, monitor, or audio amplifier
- The use of Premium High Speed HDMI cables is highly recommended

## 5. FEATURES

- HDMI input and output supports 18Gbps 4K UHD with HDR signals
- HDCP 1.x and 2.2 compliant
- Supports UHD resolutions up to 4096×2160@60Hz (4:4:4, 8-bit)
- Supports 12-bit Deep Color up to 1080p@60Hz
- Supports pass-through of audio formats including LPCM (Up to 8 channels), Bitstream, and HD Bitstream
- Supports CEC and ARC bypass
- Retiming capability allows for clean regenerated signals for transmission.
- Supports external 5V power injection via Micro-USB power supply (Optional)
- Supports up to 4 layers of cascading (5 cable segments)

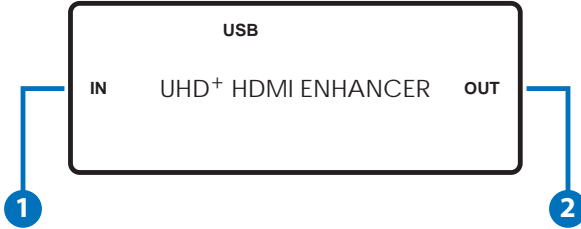
*Note: It is strongly suggested to use power injection on the first and last unit when cascading.*

- Compact design

*Note: High quality 24AWG HDMI cable was used to verify cable distance and cascading support limits. Different cable qualities can result in different cable distance and cascading performance.*

## 6. OPERATION CONTROLS AND FUNCTIONS

### 6.1 Front Panel

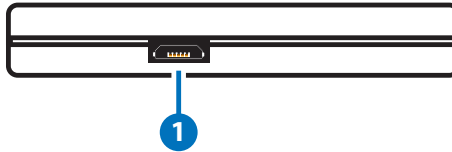


- 1 HDMI IN Port:** Connect to HDMI source equipment such as a media player, game console, or set-top box.

*Note: This unit is directly powered by the 5V included with standard HDMI signals. In some rare cases, an HDMI source may not provide enough power. In those cases, external power must be provided via the Micro-USB port.*

- 2 HDMI OUT Port:** Connect to HDMI TVs, monitors, or amplifiers for digital video and audio output.

### 6.2 Side Panel

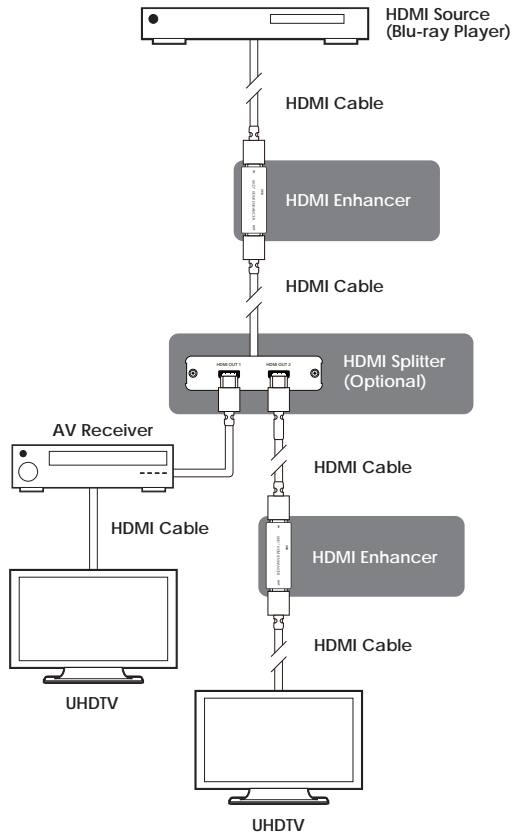


- 1 USB Port:** Plug a 5V Micro-USB power supply into this port to inject additional 5V power into the HDMI signal. (Optional)

*Note: It is strongly suggested to use power injection on the first and last unit when cascading.*



## 7. CONNECTION DIAGRAM





## 8. SPECIFICATIONS

### 8.1 Technical Specifications

<b>HDMI Bandwidth</b>	18Gbps
<b>Input Ports</b>	1×HDMI (Type-A)
<b>Output Ports</b>	1×HDMI (Type-A)
<b>Voltage Injection Port</b>	1×USB 2.0 (Micro-B)
<b>ESD Protection (HBM)</b>	±8kV (Air Discharge) ±4kV (Contact Discharge)
<b>Dimensions (W×H×D)</b>	65mm×10mm×24mm [All Inclusive]
<b>Weight</b>	15g
<b>Chassis Material</b>	Plastic
<b>Chassis Color</b>	Black
<b>Operating Temperature</b>	0°C – 40°C/32°F – 104°F
<b>Storage Temperature</b>	-20°C – 60°C/-4°F – 140°F
<b>Relative Humidity</b>	20 – 90% RH (Non-condensing)
<b>Power Consumption</b>	0.75W

## 8.2 Video Specifications

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

Supported Resolutions (Hz)	Input	Output
	HDMI	HDMI
1920×1200p@60RB	✓	✓
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	✓	✓
4096×2160p@24/25/30	✓	✓
4096×2160p@50/60 (4:2:0)	✓	✓
4096×2160p@24, HDR10	✓	✓
4096×2160p@50/60 (4:2:0), HDR10	✓	✓
4096×2160p@50/60	✓	✓

## 8.3 Audio Specifications

### 8.3.1 Digital Audio

HDMI Input / Output	
LPCM	
Max Channels	8 Channels
Sampling Rate (kHz)	32, 44.1, 48, 88.2, 96, 176.4, 192
Bitstream	
Supported Formats	Standard & High-Definition

## 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	
HDMI Output	15m	10m	5m	

### 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 (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 (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
ARC	Audio Return Channel
AV	Audio/Video
AVR	Audio/Video Receiver or Recorder
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
LPCM	Linear Pulse-Code Modulation
PC	Personal Computer
UHD	Ultra-High-Definition (10.2Gbps)
UHD+	Ultra-High-Definition Plus (18Gbps)
UHDTV	Ultra-High-Definition Television
USB	Universal Serial Bus
VGA	Video Graphics Array
WUXGA (RB)	Widescreen Ultra Extended Graphics Array (Reduced Blanking)
XGA	Extended Graphics Array





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