

2160p 4:4:4/60 In-line HDMI Scaler with 7.1 Audio Downmixing and eARC



User Manual

VER 1.0

Thank you for purchasing this product

For optimum performance and safety, please read these instructions carefully before connecting, operating or adjusting this product. Please keep this manual for future reference.

Surge protection device recommended

This product contains sensitive electrical components that may be damaged by electrical spikes, surges, electric shock, lightning strikes, etc. Use of surge protection systems is highly recommended in order to protect and extend the life of your equipment.

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1. Introduction

This product is an audio and video processor, which can extract HDMI audio signal (IIS or S/PDIF), decode Dolby Digital, Dolby Digital Plus, Dolby TrueHD, DTS, DTS-HD Master Audio, and then output 2.0CH LPCM audio. It also can process (Sound Channel Superposition) LPCM (up to 7.1CH) audio, and then output the audio as stereo (LPCM 2.0) over HDMI OUTPUT 2 (Audio only), digital (optical and coaxial) or RCA (analog) audio port. The product supports ARC/eARC function. The ARC/eARC audio returned from TV can be output through digital and analog audio ports after being processed, or be directly embedded into HDMI and output by the HDMI OUTPUT 2 port. Traditional AVR audio input ports cannot support high-bandwidth audio formats, so that embedding audio into HDMI can provide users with complete high-quality audio. HDMI OUTPUT 1 port supports video resolution up to 4K@60Hz 4:4:4. The output can be Bypass or Downscale to adapt to different display devices.

2. Features

- ☆ HDMI 2.0 and HDCP 2.2 / 1.4 compliant
- ☆ Support 18Gbps video bandwidth
- ☆ HDMI input supports video resolution up to 4K@60Hz 4:4:4
- ☆ Support HDR, HLG and Dolby Vision
- ☆ Support two HDMI OUTPUT ports to output at the same time:
 - HDMI OUTPUT 1 supports 4K Downscale to 1080p
 - HDMI OUTPUT 2 is the audio output port, which can provide high-bandwidth and high-quality audio for traditional AVRs
- ☆ The audio of HDMI OUTPUT 1 supports Bypass or 2CH Downmix switching
- ☆ Support ARC/eARC function: the ARC/eARC audio extracted from TV can be transmitted to any AVR input through the HDMI audio output.
- ☆ When the resolution of HDMI OUTPUT 1 is downscaled from 4K to 2K, the corresponding HDCP will switch from 2.2 to 1.4

- ☆ Support up to Dolby TrueHD and DTS-HD Master audio Downmix processing, with 2CH audio output through coaxial, fiber optical and stereo audio ports
- ☆ Support HDMI port, analog audio port, digital audio port (coaxial and fiber optical) to output audio at the same time
- ☆ The analog audio port only supports 2CH Downmix audio output
- ☆ Audio extraction can be realized without connecting any HDMI receiver devices when there is HDMI signal input
- ☆ Input audio format supports up to 24bit 192KHz
- ☆ Output audio can be controlled through API commands, including the volume increase/decrease and mute/unmute commands
- ☆ Advanced EDID management: manage the communication between the EDID and the signal source through the EDID of display or internal storage
- ☆ With LED indicators to indicate the power, status and audio formats
- ☆ 8-position DIP switch can control downscaling, downmixing, ARC/eARC function, HDMI audio embedding and EDID management. If all 8 DIP switches are in the “off” position, the whole system should be controlled by API commands

3. Package Contents

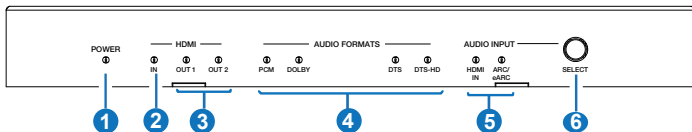
- ① 1 x 2160p 4:4:4/60 In-line HDMI Scaler
- ② 1 x 3pin-3.5mm Phoenix Connector (male)
- ③ 2 x Mounting Ears
- ④ 4 x Machine Screws (KM3*4)
- ⑤ 1 x 12V/1A Locking Power Adapter
- ⑥ 1 x User Manual

4. Specifications

Technical	
HDMI Compliance	HDMI 2.0
HDCP Compliance	HDCP 2.2 / 1.4
Video Bandwidth	18 Gbps
Video Resolution	480P60~4K2K@60Hz 4:4:4
Color Space	RGB, YCbCr 4:4:4 / 4:2:2 / 4:2:0
Color Depth	8/10/12-bit
Audio Formats	HDMI: LPCM, Dolby Digital, Dolby Digital Plus, Dolby TrueHD, DTS, DTS-HD Master Coaxial / Toslink: PCM 32KHz/44.1KHz/48KHz/88.2KHz/96KHz/176.4KHz/192KHz, Dolby 5.1, DTS-ES 6.1, DD+ TrueHD, DTS-HD L/R analog: PCM 32KHz/44.1KHz/48KHz/88.2KHz/96KHz/176.4KHz/192KHz
HDR	Support HDR 10, HLD and Dolby vision
ESD Protection	Human-body Model: ±8kV (Air-gap discharge), ±4kV (Contact discharge)
Connection	
Input	1 x HDMI IN [Type A, 19-pin female]
Output	2 x HDMI OUTPUT [Type A, 19-pin female] 1 x COAXIAL AUDIO OUT [RCA] 1 x TOSLINK AUDIO OUT [S/PDIF] 1 x L/R AUDIO OUT [RCA red & white]
Control	1 x RS-232 [3pin-3.81mm phoenix connector]
Mechanical	
Housing	Metal Enclosure
Color	Black
Dimensions	214mm(W) × 117mm(D) × 25mm(H)
Weight	605g
Power Supply	DC 12V/1A
Power Consumption	4W (Max)
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)

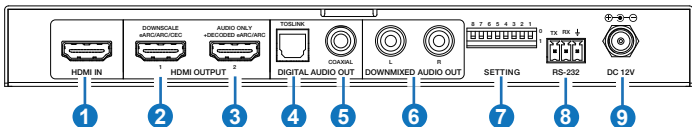
5. Operation Controls and Functions

5.1 Front Panel



No.	Name	Function Description
1	POWER LED	Red LED will be on when the product is powered on.
2	HDMI IN LED	HDMI signal input indicator. Blue LED will be on when there is HDMI signal input.
3	HDMI OUT 1/2 LED	HDMI signal output indicators. The corresponding blue OUT 1/2 LED will be on when the HDMI OUTPUT 1/2 port is connected to display device.
4	PCM/DOLBY/DTS/DTS-HD LED	Audio formats indicator. When PCM/DOLBY/DTS/DTS-HD is decoding, the corresponding LED will be on.
5	AUDIO INPUT LED	Audio source indicator. When the HDMI extracting audio or ARC/eARC audio is selected as the input audio, the corresponding LED will be on.
6	SELECT Button	Press this button to select the HDMI extracting audio or ARC/eARC audio as the input audio.

5.2 Rear Panel



No.	Name	Function Description
1	HDMI IN	HDMI signal input port, connect to HDMI source device such as DVD, PS4 or Set-top Box with HDMI cable.
2	HDMI OUTPUT 1	HDMI video signal output port, connected to TV with ARC/eARC function with HDMI cable.

No.	Name	Function Description
3	HDMI OUTPUT 2	HDMI audio signal output port, connected to audio amplifier with HDMI cable.
4	TOSLINK	Fiber optical audio output port.
5	COAX	Coaxial audio output port.
6	L/R	Analog audio output port.
7	SETTING DIP switch	8-position DIP switch, which can control downscaling, downmixing, ARC/eARC function, HDMI audio embedding and EDID management. Please refer to the following "8-position DIP Switch Function List" for details.
8	RS-232	3-pin phoenix connector, connected to a PC or control system for RS-232 command control.
9	DC 12V	DC 12V power supply port.

8-position DIP Switch Function List

Function	DIP Switch Position								Setting	
	8	7	6	5	4	3	2	1		
HDMI Output 1 Scaling									0	Auto Downscale
									1	Force Downscale
HDMI Output 1 Audio									0	Bypass
									1	Downmix 2ch
S/PDIF Audio Output									0	Bypass (max 5.1ch)
									1	Downmix 2ch
EDID Management	0	0	0	0						1080p/60 2ch PCM (default)
	1	0	0	0						1080p/60 5.1ch Dolby/DTS
	0	1	0	0						1080p/60 7.1ch Dolby/DTS HD
	1	1	0	0						1080i/60 2ch PCM
	0	0	1	0						1080i/60 5.1ch Dolby/DTS
	1	0	1	0						1080i/60 7.1ch Dolby/DTS HD
	0	1	1	0						2160p/60 4:2:0 HDR 2ch PCM
	1	1	1	0						2160p/60 4:2:0 HDR 5.1ch Dolby/DTS
	0	0	0	1						2160p/60 4:2:0 HDR 7.1ch Dolby/DTS HD
	1	0	0	1						2160p/60 4:4:4 Static HDR 2ch PCM
	0	1	0	1						2160p/60 4:4:4 Static HDR 5.1ch Dolby/DTS
	1	1	0	1						2160p/60 4:4:4 Static HDR 7.1ch Dolby/DTS HD
	0	0	1	1						DVI 1280x1024 60Hz No Audio
	1	0	1	1						Copy EDID from HDMI Output 1
	0	1	1	1						Copy EDID from HDMI Output 2
1	1	1	1						API Managed EDID	

Dip Switch: 1=On (Down) | 0=Off (Up)

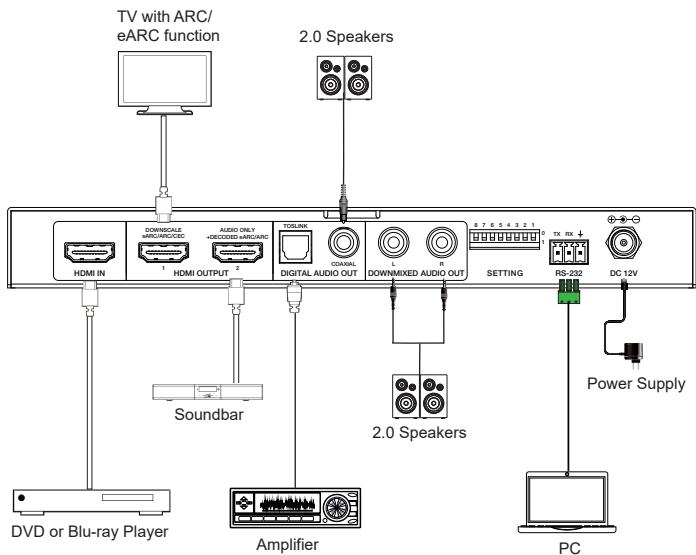
6. RS-232 Command

The product also supports RS-232 command control. Connect the RS-232 port of the product to a PC with a 3-pin phoenix connector cable. Then, open a Serial Command tool on PC to send ASCII commands to control the product. The ASCII command list about the product is shown as below.

ASCII Commands	
Serial port protocol. Baud rate: 57600 (default); Data bits: 8bit; Stop bits:1; Check bit: 0	
x - Parameter 1; y - Parameter 2; ! - Delimiter	
Command Code	Function Description
System Information Command	
?	Print Help Information
HELP	Print Help Information
STATUS	Print System Status And Port Status
System Control Command	
RESET	Reset System To Default Setting (Should Type "Yes" To Confirm, "No" To Discard)
Video Output Control Command	
OUT DSM xx	Set Video Output mode xx=[00...01] 00:FORCE 01:AUTO
Input And Output Port Control Command	
EDID CP yy	Set Input:xx EDID Copy From Output:yy yy=[01...02]: Select One OUTPUT Port
EDID DF zz	Set Input:xx EDID To Default EDID:zz zz=00: HDMI 1080p@60Hz, Audio 2CH PCM zz=01: HDMI 1080p@60Hz, Audio 5.1CH DTS/DOLBY zz=02: HDMI 1080p@60Hz, Audio 7.1CH DTS/DOLBY/HD zz=03: HDMI 1080i@60Hz, Audio 2CH PCM zz=04: HDMI 1080i@60Hz, Audio 5.1CH DTS/DOLBY zz=05: HDMI 1080i@60Hz, Audio 7.1CH DTS/DOLBY/HD zz=06: HDMI 4K@60Hz 4:2:0, Audio 2CH PCM zz=07: HDMI 4K@60Hz 4:2:0, Audio 5.1CH DTS/DOLBY zz=08: HDMI 4K@60Hz 4:2:0, Audio 7.1CH DTS/DOLBY/HD zz=09: HDMI 4K@60Hz 4:4:4, Audio 2CH PCM zz=10: HDMI 4K@60Hz 4:4:4, Audio 5.1CH DTS/DOLBY zz=11: HDMI 4K@60Hz 4:4:4, Audio 7.1CH DTS/DOLBY/HD zz=12: DVI 1280x1024@60Hz, Audio None

Command Code	Function Description
Audio Output Control Command	
AUD RX aa	Audio Input Selection aa=[01:HDMI 02:ARC/EARC]
AUD TX yy BYP	Set Output yy Audio Bypass yy=[01...02] 01:HDMI1 02:SPDIF/OPTICAL
AUD TX yy DMX	Set Output yy Audio Downmix yy=[01...02] 01:HDMI1 02:SPDIF/OPTICAL
MUTE TX yy ON	Set Output yy Audio Mute ON yy=[00:ALL 01:HDMI1 02:HDMI2 03:OPTICAL 04:SPDIF 05:L/R]
MUTE TX yy OFF	Set Output yy Audio Mute OFF yy=[00:ALL 01:HDMI1 02:HDMI2 03:OPTICAL 04:SPDIF 05:L/R]
VOL xx	Set Downmix Audio Volume xx=[00...100]: Volume Value xx=+: Volume Increase xx=-: Volume Decrease
VOL BSTR xx yy	Set Downmix Audio BASS/TREBLE Volume xx=[00:BASS 01:TREBLE] yy=[00...30]: Volume Value yy=+: Volume Increase yy=-: Volume Decrease

7. Application Example



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HIGH-DEFINITION MULTIMEDIA INTERFACE

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