

# 48Gbps 2x4 HDMI™ Splitter



## 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, lighting 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 2x4 splitter features 2 HDMI inputs switching and distributing to 4 HDMI outputs synchronously, with video resolution up to 8K@60 4:2:0 12bit. Each output port supports 8K->4K/2K downscaling and HDR to SDR conversion independently. Audio de-embedding is supported to digital optical audio and balanced/unbalanced analog audio with gain adjustment. Auto or manual input switching and EDID management are also included. Built-in HDMI signal generator can easily diagnose the connection status of the external HDMI devices or cables. This product also can be controlled by front panel buttons, IR remote and API commands.

## 2. Features

- ☆ HDCP 2.3 compliant
- ☆ Support 48Gbps video bandwidth
- ☆ Support resolution up to 8K@60Hz 4:2:0 12bit, 8K@30Hz 4:4:4 12bit, 4K@120Hz 4:4:4 12bit, as specified in HDMI 2.1
- ☆ Support HDR, HDR10, HDR10+, Dolby Vision, ALLM/VRR pass-through
- ☆ Support 8K->4K/2K downscaling on each output for legacy display
- ☆ Support HDR to SDR conversion on each output for legacy display
- ☆ Support digital or analog audio de-embedding, and analog audio outputs with gain control
- ☆ Support auto switching and manual switching
- ☆ Support input switching via front panel buttons, IR remote, API commands
- ☆ Built-in equalizer, retiming and driver
- ☆ Advanced EDID management
- ☆ Controlled by front panel buttons, IR remote and API commands.

## 3. Package Contents

- |                                   |  |
|-----------------------------------|--|
| ① 1× 48Gbps 2x4 HDMI Splitter     | ② 1× 12V/1A Multinational Locking Power Supply |
| ③ 1× IR Remote                    | ④ 1× IR Wideband Receiver (1.5m)               |
| ⑤ 1× 3pin-3.5mm Phoenix Connector | ⑥ 1× 5pin-3.5mm Phoenix Connector              |
| ⑦ 2× Mounting Ear                 | ⑧ 4× Machine Screw (KM3*6)                     |
| ⑨ 1× User Manual                  |  |

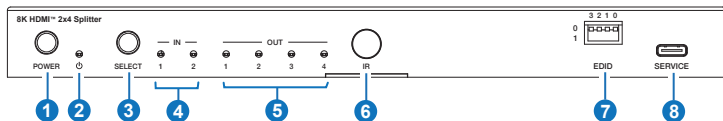
## 4. Specifications

Technical		
HDMI Compliance	HDMI 2.1	
HDCP Compliance	HDCP 2.3	
Video Bandwidth	48Gbps	
Video Resolution	Up to 8K@60Hz 4:2:0 12bit, 8K@30Hz 4:4:4 12bit, 4K@120Hz 4:4:4 12bit	
Color Depth	8/10/12-bit	
Color Space	RGB, YCbCr_4:4:4, YCbCr_4:2:2, YCbCr_4:2:0	
HDR	HDR, HDR10, HDR10+, Dolby Vision, HLG	
Audio Formats	<b>HDMI input/output:</b> LPCM, Dolby Digital/Plus/EX, Dolby True HD, Dolby Atmos, DTS, DTS-EX, DTS-96/24, DTS High Res, DTS-HD Master Audio, DSD <b>Audio de-embedding output:</b> Optical: Up to LPCM/Dolby/DTS 5.1CH L/R Out: LPCM 2CH	
Audio Parameters	Output Impedance	300 Ohm
	Output Level (Maximum)	8.2dBu(2Vrms) @balanced audio 2.2dBu(1Vrms) @unbalanced audio
	Frequency Response	(+0.5dB, -1dB) 20Hz to 20KHz
	Audio Output Sync Delay	0 to 2.2ms
	Audio S/N Ratio	99dB@2Vrms, 1KHz, A-weighted
	Audio THD+N	<0.2%@0dBV, 1KHz
IR Level	12Vp-p	
IR Frequency	Wideband 20K-60KHz	
Transmission Distance	3m/9.8ft over HDMI cable	
ESD Protection	IEC 61000-4-2: ±8kV (Air-gap discharge) & ±4kV (Contact discharge)	
Connection		
Input	2× IN [HDMI type A, 19-pin female]	
Output	4× OUT [HDMI type A, 19-pin female] 1× OPTICAL [S/PDIF] 1× L/R [5pin-3.5mm phoenix connector]	
Control	1× RS-232 [3pin-3.5mm phoenix connector] 1× IR CTL [3.5mm stereo mini-jack] 1× SERVICE [USB type C, upgrade port]	

Mechanical	
Housing	Metal Enclosure
Color	Black
Dimensions	220mm [W] × 110mm [D] × 21.5mm [H]
Weight	620g
Power Supply	DC 12V/1A
Power Consumption	6.24W (Max)
Operation Temperature	0°C ~ 40°C / 32°F ~ 104°F
Storage Temperature	-20°C ~ 60°C / -4°F ~ 140°F
Operating Humidity	20%~80% relative humidity, non-condensing
Storage Humidity	10%~90% relative humidity, non-condensing

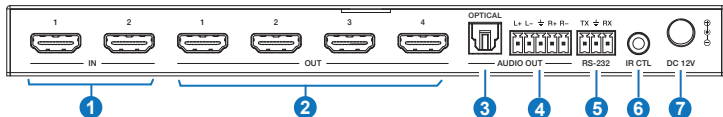
## 5. Operation Controls and Functions

### Front Panel



No.	Name	Function Description
1	POWER button	Press to power on; Press and hold to enter standby mode.
2	POWER LED	When the device is powered on, the power LED is green; When the device is standby, the power LED is red.
3	SELECT button	Press to select input source IN 1/IN 2 circularly.
4	IN LED (1~2)	When the IN 1/IN 2 port is selected as an input channel, the corresponding green LED will be on.
5	OUT LED (1~4)	When the OUT 1/2/3/4 port is connected to an active display device, the corresponding green LED will be on.
6	IR	IR signal receiving window.
7	EDID DIP switch	Use the DIP switch to set EDID. *EDID list is as follow.
8	SERVICE	USB-C port, used for firmware update.

## Rear Panel



No.	Name	Function Description
1	IN (1~2)	HDMI signal input ports, connected to source devices such as PC or PS5 with HDMI cable.
2	OUT (1~4)	HDMI signal output ports, connected to display devices such as TV or Monitor with HDMI cable.
3	OPTICAL (AUDIO OUT)	Digital audio output port, connected to an audio device.
4	L/R (AUDIO OUT)	Analog audio output port, supporting balanced audio output (with a maximum support of 2Vrms) and unbalanced audio output (with a maximum support of 1Vrms). Balanced connection method: L+, L-, R+, R- Unbalanced connection method: L+, R+
5	RS-232	RS-232 serial port, connected to a PC or control system for API command control.
6	IR CTL	12V IR input port, connected with the IR receiver cable.
7	DC 12V	DC 12V/1A power input port.

### \* EDID Setting List:

DIP\_0000: EDID pass-through (Copy from Sink 1) (default)

DIP\_0001: HDMI 1080p@60Hz, Audio 2CH PCM

DIP\_0010: HDMI 1080p@60Hz, Audio 5.1CH DTS/DOLBY

DIP\_0011: HDMI 4K@60Hz 4:4:4, 8-bit, Audio 2ch PCM

DIP\_0100: HDMI 4K@60Hz 4:4:4, 8-bit, Audio 5.1CH DTS/DOLBY

DIP\_0101: HDMI 4K@120Hz 4:4:4, 10-bit HDR/DV, Audio 2ch PCM

DIP\_0110: HDMI 4K@120Hz 4:4:4, 10-bit HDR/DV, Audio 5.1CH DTS/DOLBY

DIP\_0111: HDMI 4K@120Hz 4:4:4, 12-bit HDR/DV, Audio 2ch PCM

DIP\_1000: HDMI 4K@120Hz 4:4:4, 12-bit HDR/DV, Audio 5.1CH DTS/DOLBY

(Continued)

DIP\_1001: HDMI 8K@60Hz 4:2:0, 10-bit HDR/DV, Audio 2ch PCM

DIP\_1010: HDMI 8K@60Hz 4:2:0, 10-bit HDR/DV, Audio 5.1CH DTS/DOLBY

DIP\_1011: HDMI 8K@60Hz 4:2:0, 12-bit HDR/DV, Audio 2ch PCM

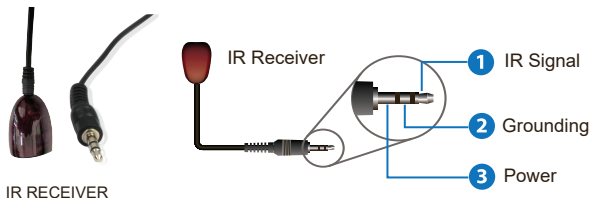
DIP\_1100: HDMI 8K@60Hz 4:2:0, 12-bit HDR/DV, Audio 5.1CH DTS/DOLBY

DIP\_1101: HDMI 8K@60Hz 4:2:0, 12-bit HDR/DV, Audio 2ch PCM- Inc VRR/DSC

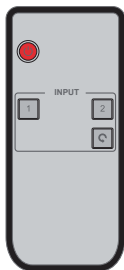
DIP\_1110: HDMI 8K@60Hz 4:2:0, 12-bit HDR/DV, Audio 5.1CH DTS/DOLBY- Inc VRR/DSC

DIP\_1111: EDID Software if possible or HDMI 1080p@60Hz, Audio 2ch PCM

## 6. IR Pin Definition




## 7. IR Remote



 : Power on the product or set it to standby mode.

**1/2** : Press 1/2 button to select HDMI signal source IN 1/2.

 : Press this button to cyclically switch HDMI signal source IN 1/2.

## 8. API Commands

The product supports API commands control. Connect the SERVICE or RS-232 port of the product to a PC, then open a Serial Command tool on PC to send API commands to control the product. The API commands list is shown below.

ASCII Commands				
1. Service port (USB-C virtual RS-232) communication protocol (Internal debug) Baud rate: 115200 (fixed), Data bit: 8, Stop bit: 1, Parity bit: none The end mark of command is "<CR><LF>"				
2. Phoenix RS-232 port communication protocol (Connect to control system) Baud rate: 4800~115200 (configurable), Data bit: 8, Stop bit: 1, Parity bit: none The end mark of command is "<CR><LF>"				
Commands	Function	Example	Feedback	Default
?	Get the list of all commands	?		
help	Get the list of all commands	help		
get fw version	Get firmware version	get fw version	1.0.0	
set power on/off	Set device power on/off	set power on set power off	Power on... System Initializing... Initialization Finished! FW: 1.0.0 Power off...	
get power	Get device power status	get power	Power on	
set reboot	Reboot the device	set reboot	Reboot... System Initializing... Initialization Finished! FW: 1.0.0	
set reset	Reset to factory defaults	set reset	Sure to RESET to default settings? Type "Yes" after next prompt to confirm...	
get status	Get system status	get status	Please refer to the note at the end of the list.	
set IR on/off	Set IR on/off	set IR on set IR off	Set IR on Set IR off	on
get IR	Get IR on/off status	get IR	IR on	

Commands	Function	Example	Feedback	Default
set key on/off	Set front panel key on/off	set key on set key off	Set key on Set key off	on
get key	Get front panel key on/off status	get key	Key on	
set baud x	Set RS-232 baud rate to x bps x=1: 4800 x=2: 9600 x=3: 19200 x=4: 38400 x=5: 57600 x=6: 115200	set baud 6	Set baud rate 115200	115200
get baud	Get RS-232 baud rate	get baud	Baud rate 115200	
set input x	Set input video (x=0~2) x=0: Off x=1~2: HDMI input 1~2	set input 1	Set input HDMI 1	1
get input	Get input port	get input	Input HDMI 1	
get hdmi5v	Get input HDMI 5V	get hdmi5v	HDMI 1: 5V HDMI 2: none	
set autoswitch x	Set auto-switching on/off (HDMI 5V detection) x=On, Off	set autoswitch on	Set autoswitch on	on
get autoswitch	Get auto-switching status	get autoswitch	Autoswitch on	
set output x downscale y	Set output (x=0~4) downscaling mode (y=0~2) x=0: all outputs x=1~4: HDMI output 1~4 y=0: Automatically according to display's capability y=1: Bypass video y=2: Force 1080p	set output 0 downscale 0	Set all outputs downscale auto	0
get output x downscale	Get output (x=0~4) downscaling mode	get output 0 downscale	HDMI output 1 downscale auto HDMI output 2 downscale auto HDMI output 3 downscale auto HDMI output 4 downscale auto	

Commands	Function	Example	Feedback	Default
set output x display y	Set output (x=0~4) display mode (y=0~3) x=0: all outputs x=1~4: HDMI output 1~4 y=0: Off (disable TMDS output) y=1: Input video y=2: AVMUTE y=3: Internal pattern	set output 0 display 2	Set all outputs display internal pattern	1
get output x display	Get output (x=0~4) display mode	get output 0 display	HDMI output 1 display internal pattern HDMI output 2 display internal pattern HDMI output 3 display internal pattern HDMI output 4 display internal pattern	
set output x HDCP y	Set output (x=0~4) HDCP mode (y=0~4) x=0: all outputs x=1~4: HDMI output 1~4 y=0: Reserved y=1: Follow sink y=2: Follow source y=3: Force HDCP 1.4 y=4: Force HDCP 2.2	set output 0 HDCP 1	Set all outputs HDCP follow sink	1
get output x HDCP	Get output (x=0~4) HDCP mode	get output 0 HDCP	HDMI output 1 HDCP follow sink HDMI output 2 HDCP follow sink HDMI output 3 HDCP follow sink HDMI output 4 HDCP follow sink	
get generator	Get internal signal generator output resolution and pattern	get generator	Generator 8K30Hz color bar	
set analog mute x	Set analog audio mute on/off x=On, Off	set analog mute on	Set analog mute on	off
get analog mute	Get analog audio mute status	get analog mute	off	
set analog gain x	Set analog audio gain (x=0dB ~ -79dB)	set analog gain -79dB	Set analog gain -79dB	0dB

Commands	Function	Example	Feedback	Default
get analog gain	Get analog audio gain value	get analog gain	Analog gain -79dB	
set generator x y	Set internal signal generator resolution (x=1~15) pattern (y=1~13) x=01: 8K30Hz x=02: 4K120Hz x=03: 4K100Hz x=04: 5K60Hz x=05: 5K50Hz x=06: 5K30Hz x=07: 5K25Hz x=08: 5K24Hz x=09: 4K60Hz x=10: 4K50Hz x=11: 4K25Hz x=12: 4K24Hz x=13: 1080P60Hz x=14: 480P60Hz x=15: 576P50Hz y=01: Color bar y=02: Checkboard y=03: Strip y=04: Red y=05: Green y=06: Blue y=07: White y=08: Ramp y=09: Red ramp y=10: Green ramp y=11: Blue ramp y=12: PRBS y=13: Black	set generator 1 1	Set generator 8K30Hz color bar	
set edid x to y	Set input ports (x=0~2) to EDID (y=0~32) x=0: all inputs x=1~2: HDMI input 1~2 y=00: HDMI 1080p@60Hz, Audio 2CH PCM (default) y=01: HDMI 1080p@60Hz, Audio 5.1CH DTS/DOLBY y=02: HDMI 1080p@60Hz, Audio 7.1CH DTS/DOLBY/HD	set edid 0 to 0	Set all inputs EDID to SDF_00: HDMI 1080p@60Hz, Audio 2CH PCM (default)	0

Commands	Function	Example	Feedback	Default
set edid x to y	(Continued) y=03: HDMI 4K@60Hz 4:4:4, 8-bit, Audio 2ch PCM y=04: HDMI 4K@60Hz 4:4:4, 8-bit, Audio 5.1CH DTS/DOLBY y=05: HDMI 4K@60Hz 4:4:4, 8-bit, Audio 7.1CH DTS/DOLBY/HD y=06: HDMI 4K@120Hz 4:4:4, 8-bit, Audio 2ch PCM y=07: HDMI 4K@120Hz 4:4:4, 8-bit, Audio 5.1CH DTS/DOLBY y=08: HDMI 4K@120Hz 4:4:4, 8-bit, Audio 7.1CH DTS/DOLBY/HD y=09: HDMI 4K@120Hz 4:4:4, 10-bit HDR/DV, Audio 2ch PCM y=10: HDMI 4K@120Hz 4:4:4, 10-bit HDR/DV, Audio 5.1CH DTS/DOLBY y=11: HDMI 4K@120Hz 4:4:4, 10-bit HDR/DV, Audio 7.1CH DTS/DOLBY/HD y=12: HDMI 4K@120Hz 4:4:4, 12-bit HDR/DV, Audio 2ch PCM y=13: HDMI 4K@120Hz 4:4:4, 12-bit HDR/DV, Audio 5.1CH DTS/DOLBY y=14: HDMI 4K@120Hz 4:4:4, 12-bit HDR/DV, Audio 7.1CH DTS/DOLBY/HD y=15: HDMI 4K@120Hz 4:4:4, 12-bit HDR/DV, Audio 2ch PCM - Inc VRR/DSC y=16: HDMI 4K@120Hz 4:4:4, 12-bit HDR/DV, Audio 5.1CH DTS/DOLBY - Inc VRR/DSC y=17: HDMI 4K@120Hz 4:4:4, 12-bit HDR/DV, Audio 7.1CH DTS/DOLBY/HD - Inc VRR/DSC y=18: HDMI 8K@60Hz 4:2:0, 10-bit HDR/DV, Audio 2ch PCM y=19: HDMI 8K@60Hz 4:2:0, 10-bit HDR/DV, Audio 5.1CH DTS/DOLBY y=20: HDMI 8K@60Hz 4:2:0, 10-bit HDR/DV, Audio 7.1CH DTS/DOLBY/HD y=21: HDMI 8K@60Hz 4:2:0, 12-bit HDR/DV, Audio 2ch PCM	set edid 0 to 0	Set all inputs EDID to SDF_00: HDMI 1080p@60Hz, Audio 2CH PCM (default)	0

Commands	Function	Example	Feedback	Default
	(Continued) y=22: HDMI 8K@60Hz 4:2:0, 12-bit HDR/DV, Audio 5.1CH DTS/DOLBY y=23: HDMI 8K@60Hz 4:2:0, 12-bit HDR/DV, Audio 7.1CH DTS/DOLBY/HD y=24: HDMI 8K@60Hz 4:2:0, 12-bit HDR/DV, Audio 2ch PCM - Inc VRR/DSC y=25: HDMI 8K@60Hz 4:2:0, 12-bit HDR/DV, Audio 5.1CH DTS/DOLBY - Inc VRR/DSC y=26: HDMI 8K@60Hz 4:2:0, 12-bit HDR/DV, Audio 7.1CH DTS/DOLBY/HD - Inc VRR/DSC y=27: DVI 1920x1080@60Hz, Audio None y=28: DVI 1920x1200@60Hz, Audio None y=29: HDMI 1920x1200@60Hz, Audio 2ch PCM y=30: User EDID 1 y=31: User EDID 2 y=32: EDID pass-through (Copy from Sink 1)			
get edid x	Get input ports EDID x=0: all inputs x=1~2: HDMI input 1~2	get edid 0	HDMI input 1 EDID SDF_00: HDMI 1080p@60Hz, Audio 2CH PCM (default) HDMI input 2 EDID SDF_00: HDMI 1080p@60Hz, Audio 2CH PCM (default)	
get edid data x	Get input ports EDID data x=0: all inputs x=1~2: HDMI input 1~2	get edid data 0	HDMI input 1 EDID <00 FF FF FF....> HDMI input 2 EDID <00 FF FF FF....>	
set user edid x <y>	Set user defined EDID (x=1~2) x=1: User Defined 1 x=2: User Defined 2 y = 00 FF FF FF ..... (y is 256 bytes EDID data)	set user edid 1 <00 FF FF FF....>	User defined 1 EDID is loaded successfully	

Commands	Function	Example	Feedback	Default
get user edid x	Get user defined EDID (x=1~2) x=1: User Defined 1 x=2: User Defined 2	get user edid 1	User defined 1 EDID <00 FF FF FF....>	

**Note:** The feedback of the command of "get status" is as follow. (The middle line ends with <LF><CR> and the last line ends with <CR><LF>.)

```

=====
Status Info 8K 2x4 Splitter
FW 1.0.0

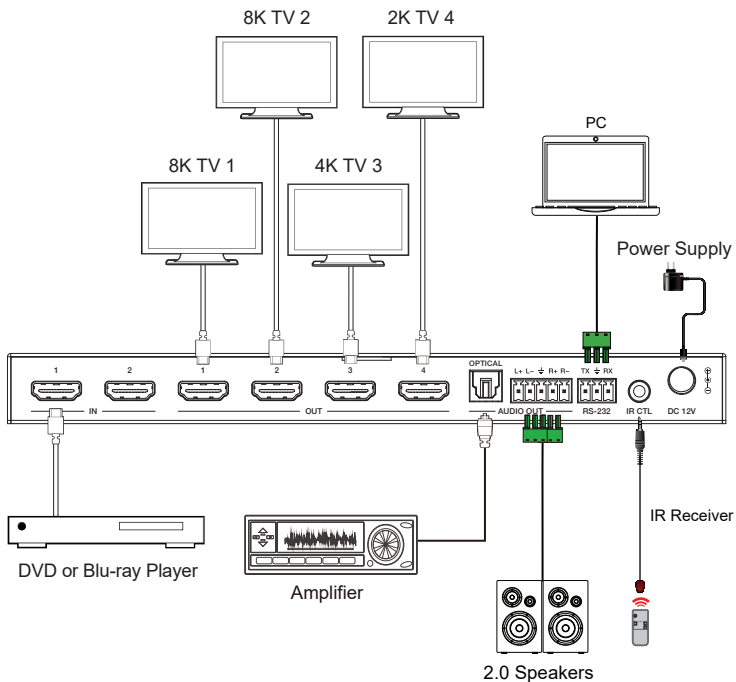
Power   Key      IR      Baud    Autoswitch
On      On       On      115200  On

Input   Cable      EDID
01      Connected  DIP_0000:EDID pass-through
02      Connected  DIP_0000:EDID pass-through

Output  FromIn  Cable      Resolution    ColorSpace  ColorDepth  Scaler  HDCP
01     01     Connected  3840x2160p60Hz  YUV 4:2:0  12bit      Off    Sink
02     01     Connected  1920x1080p60Hz  YUV 4:4:4  8bit       On     Sink
03     AVMUTE Connected  3840x2160p60Hz  YUV 4:2:0  12bit      Off    Sink
04     Pattern Connected  7680x4320p30Hz  RGB 4:4:4  8bit       Off    Sink
=====

```

## 9. Application Example



**HDMI**<sup>™</sup>  
HIGH-DEFINITION MULTIMEDIA INTERFACE

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