



HDMI Video Scaler, 4K/60

User Manual

500438-V2



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1. Safety Precautions

To ensure the best performance from the product, please read all instructions carefully before using the device. Save this manual for future reference.

- Follow basic safety precautions to reduce the risk of fire, electrical shock, and injury.
- Do not dismantle the housing or modify the module. It may result in electrical shock or burns.
- Do not open or remove the housing of the device as you may be exposed to dangerous voltage or other hazards.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture and do not install this product near water. Keep the product away from liquids.
- Spillage into the housing may result in fire, electrical shock, or equipment damage. If an object or liquid falls or spills on the housing, unplug the module immediately.
- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.
- Using supplies or parts not meeting the product specifications may cause damage, deterioration or malfunction.
- Refer all servicing to qualified service personnel.
- Install the device in a place with adequate ventilation to avoid damage caused by overheat.
- Unplug the power when left unused for a long period of time.
- Information on disposal of devices: do not burn or mix with general household waste, please treat them as normal electrical waste.

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2. Introduction

The HDMI Video Scaler, 4K/60 (500438-V2) allows one (1) HDMI source to be distributed to one (1) HDMI display. The scaler supports video sources up to 4K/60 Hz, 12 bit color and HD audio. The scaler is able to upscale up to 4K/60Hz and downscale to 1024x768/60Hz. It can extract audio signals from HDMI source to digital optical and analog stereo L/R audio outputs. In addition, it supports 10bits HDR (High Dynamic Range) access and HDMI high resolution pass-through digital audio formats, such as LPCM 2CH, Dolby TrueHD, Dolby Digital Plus, Dolby Atmos and DTS-HD Master audio, with audio sampling rate up to 192KHz. The product supports HDCP 2.2 and HDCP 1.X and can be controlled via front panel buttons and RS-232 commands.

3. Features

- HDMI 2.0b, HDCP 2.2 and HDCP 1.x compliant
- 18Gbps uncompressed bandwidth
- Input and output resolution support up to 4K/60 4:4:4
- Support LPCM, AC3, DD+, DTS, DTS-HD, up to 7.1 audio channel
- Audio de-embedding via analog and optical fiber audio ports
- Advanced EDID management
- Control via front panel buttons, RS-232 commands
- Compact design for easy and flexible installation

4. Package Contents

- One (1) HDMI Video Scaler, 4K/60
- One (1) 3pin-3.81mm Phoenix Connector (male)
- Two (2) Mounting Ears
- Four (4) Machine Screws (KM3*4)
- One (1) 12V/1A Locking Power Supply
- One (1) Power Changeover Plug (UK Standard)
- One (1) Power Changeover Plug (US Standard)
- One (1) Power Changeover Plug (EU Standard)
- One (1) User manual (available via download)

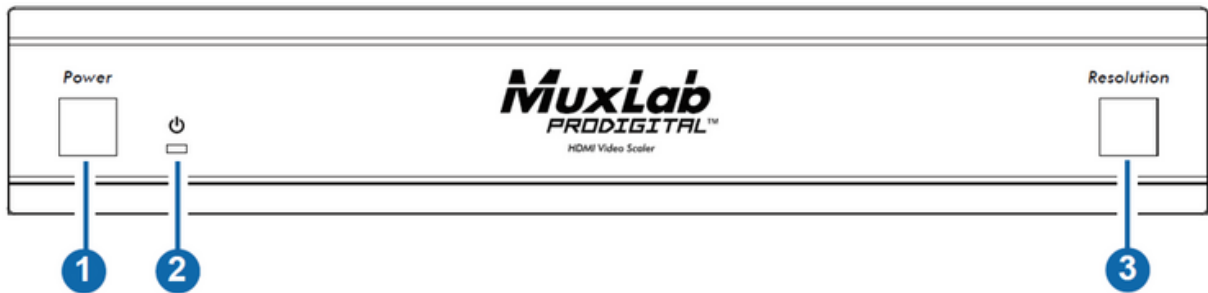
Notes: Confirm that the product and accessories are all included. If not, please contact the supplier from which you purchased the unit.

5. Specifications

Technical	
HDMI Compliance	HDMI 2.0b
HDCP Compliance	HDCP 2.2/1.x
Video Bandwidth	18Gbps
Video Resolution	Up to 4K/60 4:4:4
Color Space	RGB, YCbCr4:4:4, YCbCr 4:2:2, YCbCr 4:2:0
Color Depth	8/10/12bit
Audio Formats	HDMI: LPCM, Dolby TrueHD, Dolby Dig Plus, Dolby Atmos, DTS-HD Master audio Analog audio [3.5mm L/R]: PCM2.0 SPDIF (OPTICAL): Dolby Digital, DTS 5.1, PCM2.0 Note: It does not support HBR audio
ESD Protection	Human body model — ±8kV (Air-gap discharge) & ±4kV (Contact discharge)
Connection	
Input Ports	1 x HDMI Input [Type A, 19-pin female]
Output Ports	1 x HDMI Output [Type A, 19-pin female] 1 x Left/Right Output [RCA] 1 x Optical Output [S/PDIF]
Control Ports	1 x RS232 [3pin-3.81mm phoenix connector]
Mechanical	
Housing	Metal Enclosure
Color	Black
Dimensions (WxDxH)	175mm[W] x 100mm[D] x 30mm[H]
Weight	488g
Power Supply	Input: AC 100 - 240V 50/60Hz Output: DC 12V/1A (US/EU standard, CE/FCC/UL certified)
Power Consumption	3.48W (Max)
Operation Temperature	32 - 104°F / 0 - 40°C
Storage temperature	-4 - 140°F / -20 - 60°C
Relative Humidity	20 - 90% RH (no condensation)
Warranty	2 years
Order Information	500438-V2 HDMI Video Scaler, 4K/60 (UPC: 627699014387)

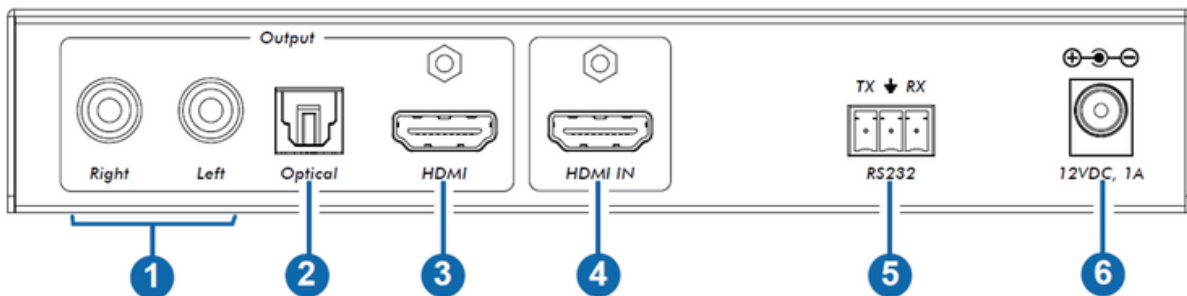
6. Operation Controls and Functions

6.1 Front Panel



No	Name	Function Description
1	Power Button	<ul style="list-style-type: none"> Short press this button to power on the device. Long press this button for 1 second to enter the standby mode.
2	Power LED	The Power LED will light in green when the product is powered on, and red when the product is on standby.
3	Resolution Button	Output resolution switching button. <ul style="list-style-type: none"> Short press the Resolution button to circularly switch the output resolution of the HDMI OUTPUT port (Please refer to the output resolution list of "8. Video & Audio"). Long press the Resolution button for 3 seconds to switch the output resolution to 720P/50Hz.

6.2 Rear Panel



No	Name	Function Description
1	Right/Left Output	PCM2.0 analog audio output ports.
2	Optical Output	Optical fiber digital audio output port.
3	HDMI Output Port	HDMI signal output port, connected to HDMI display device such as TV or Monitor with HDMI cable.
4	HDMI IN Port	HDMI signal input port, connected to HDMI source device such as DVD or Set-top box with HDMI cable
5	RS232 Port	3-pin phoenix connector, connected to a PC or control system for serial port upgrade or RS-232 command control.
6	12VDC, 1A	DC 12V/1A power input port.

7. EDID Settings

The User can select the following EDID modes via RS-232 commands.

No	EDID Mode	No	EDID Mode
1	4K60-2.0CH	11	1680x1050-2.0CH
2	4K60-5.1CH	12	1600x1200-2.0CH
3	4K60-7.1CH	13	1440x900-2.0CH
4	4K30-2.0CH	14	1360x768-2.0CH
5	4K30-5.1CH	15	1280x1024-2.0CH
6	4K30-7.1CH	16	1024x768-2.0CH
7	1080P-2.0CH	17	720P-2.0CH
8	1080P-5.1CH	18	AUTO
9	1080P-7.1CH	19	USER1
10	1920x1200-2.0CH		

8. Video & Audio

The video scaler supports multiple resolution video input up to 3840x2160/60, and supports multiple audio formats such as LPCM, AC3, DD+, DTS, DTS- HD, up to 7.1 channel pass through function via HDMI cable.

The User can control the volume of audio in LPCM format.

The video scaler supports the following video output resolutions via a powerful scaling engine.

No	Output Resolution	No	Output Resolution
1	4096x2160p 60Hz	9	1920x1080p 50Hz
2	4096x2160p 50Hz	10	1360x768p 60Hz
3	3840x2160p 60Hz	11	1280x800p 60Hz
4	3840x2160p 50Hz	12	1280x720p 60Hz
5	3840x2160p 30Hz	13	1280x720p 50Hz
6	3840x2160p 25Hz	14	1024x768 60Hz
7	1920x1200p 60Hz RB	15	AUTO
8	1920x1080p 60Hz		

9. 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 below.

ASCII Commands				
Serial port protocol. Baud rate: 115200 (default); Data bits: 8bit; Stop bits:1; Check bit: 0				
x - Parameter 1; y - Parameter 2; ! - Delimiter				
Command Code	Function Description	Example	Feedback	Default
System Setting				
help!	List all commands	help!		
r fw version!	Get Firmware version	r fw version!	MCU FW version x.xx.xx SCALER FW version x.xx.xx	
power z!	Power on/off the device,z=0~1 (z=0 power off, z=1 power on)	power 1!	Power on System Initializing... Initialization Finished! MCU FW version x.xx.xx SCALER FW version x.xx.xx	
r power!	Get current power state	r power!	power on/power off	
reboot!	Reboot the device	reboot!	Reboot... System Initializing... Initialization Finished! MCU FW version x.xx.xx SCALER FW version x.xx.xx	
reset!	Reset to factory defaults	reset!	Reset to factory defaults System Initializing... Initialization Finished! MCU FW version x.xx.xx SCALER FW version x.xx.xx	

Command Code	Function Description	Example	Feedback	Default
Output Setting				
s output res x!	Set Output Resolution (x=1~15) 1. 4096x2160p60, 2. 4096x2160p50, 3. 3840x2160p60, 4. 3840x2160p50, 5. 3840x2160p30, 6. 3840x2160p25, 7. 1920x1200p60RB, 8. 1920x1080p60, 9. 1920x1080p50, 10. 1360x768p60, 11. 1280x800p60, 12. 1280x720p60, 13. 1280x720p50, 14. 1024x768p60, 15. AUTO.	s output res 3!	out resolution: 3840x2160p60	3840x2160p 60
r output res!	Get output resolution	r output res!	out resolution: 3840x2160p60	
s output hdcp x!	set output hdcp (x=1~3) 1. HDCP 1.4 2. HDCP 2.2 3. HDCP OFF	s output hdcp 2!	output HDCP: HDCP 1.4	HDCP 1.4
r output hdcp!	Get output hdcp status.	r output hdcp!	output HDCP: HDCP 1.4	
s output vka x!	Set output video keep active pattern. (x=1~2) 1. black screen 2. blue screen	s output vka 1!	output VKA pattern: black screen	black screen
r output vka!	Get output video keep active pattern.	r output vka!	output VKA pattern: black screen	
s output itc x!	Set output video mode (x=1~2) 1: video mode 2: pc mode	s output itc 1!	output ITC: video mode	video mode
r output itc!	Get output video mode	r output itc!	output ITC: video mode	

Command Code	Function Description	Example	Feedback	Default
EDID Setting				
s input EDID x!	Set HDMI input EDID mode (x=1~19) 1. 4K2K60_444, Stereo Audio 2.0 2. 4K2K60_444, Dolby/DTS 5.1 3. 4K2K60_444, HD Audio 7.1 4. 4K2K30_444, Stereo Audio 2.0 5. 4K2K30_444, Dolby/DTS 5.1 6. 4K2K30_444, HD Audio 7.1 7. 1080P, Stereo Audio 2.0 8. 1080P, Dolby/DTS 5.1 9. 1080P, HD Audio 7.1 10. 1920x1200, Stereo Audio 2.0 11. 1680x1050, Stereo Audio 2.0 12. 1600x1200, Stereo Audio 2.0 13. 1440x900, Stereo Audio 2.0 14. 1360x768, Stereo Audio 2.0 15. 1280x1024, Stereo Audio 2.0 16. 1024x768, Stereo Audio 2.0 17. 720p, Stereo Audio 2.0 18. copy from HDMI out 19. USER1	s input EDID 1!	input EDID: 4K2K60_444, Stereo Audio 2.0	4K2K60_444, Stereo Audio 2.0
r input EDID!	Get input EDID mode	r input EDID!	input EDID: 4K2K60_444, Stereo Audio 2.0	
s edid user1 00 FF FF ...!	Set user1 EDID data	s edid user1 00 FF FF FF FF ...!	user1 EDID data: 0 0 FF FF FF FF FF FF FF 00	
r edid user1!	Get user1 EDID data	r edid user1!	user1 EDID data: 00 FF FF FF FF FF FF FF 00	
Audio Setting				
s output audio vol+!	Increase output audio volume	s output audio vol+!	output audio volume: 50	
s output audio vol-!	Decrease output audio volume	s output audio vol-!	output audio volume: 50	
s output audio vol x!	Set output audio volume value (x=0~100)	s output audio vol 30!	output audio volume: 30	100
r output audio vol!	Get output audio volume	r output audio vol!	output audio volume: 30	
s output audio mute x!	Set output audio mute on/off (x=0~1) 0. mute off 1. mute on	s output audio mute 0!	output audio mute: off	off
r output audio mute!	Get output audio mute on/off	r output audio mute!	output audio mute: off	

Command Code	Function Description	Example	Feedback	Default
Border Setting				
s border x!	Set the border mode of the specified window. (x=0~1) 0. off 1. on	s border 1!	border on	off
r border!	Get the border mode of windows	r border!	border on	
s border color y!	Set the border color of the window. (x=1~9) 1. BLACK 2. RED 3. GREEN 4. BLUE 5. YELLOW 6. MEGENTA 7. CYAN 8. WHITE 9. GRAY	s border color 1!	border color: BLACK	YELLOW
r border color!	Get the border color of windows	r border color!	border color: BLACK	

10. Application Diagram

