

4K2K
HDCP2.2

SY-300H-4K22

HDMI to HDMI Scaler with Audio Embedding & De-Embedding

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	SUMMARY OF CHANGE
v1.00	25/09/2018	First release

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1. INTRODUCTION

This compact yet versatile HDMI to HDMI UHD Scaler accepts and outputs a wide range of resolutions up to 4K@60Hz (4:4:4, 8-bit) with simultaneous audio embedding and de-embedding of digital (HDMI or optical) or analog audio. Integrated EDID and HDCP management options allow for control over the way connected sources and displays detect the unit. The scaled HDMI output is powered by a high quality single-pass scaling engine with the ability to adjust the image with a number of fine tuning options including: contrast, brightness, hue, saturation, sharpness, noise reduction, and RGB levels. 3-D motion adaptive de-interlacing and frame rate conversion is supported as well.

The HDMI input and output supports passing up to LPCM 7.1 digital audio as well as Bitstream and HD Bitstream audio formats. Audio embedding and de-embedding is also available with the included digital optical and analog stereo audio inputs and outputs (LPCM 2.0 only). Shortcut keys are provided to quickly change the output resolution to 1080p@60Hz or XGA when needed for quick connection to a display or for troubleshooting purposes.

This is an ideal device to integrate previously incompatible sources and displays in your boardroom, classroom, or home. This unit is controlled via a comprehensive On-Screen Display (OSD) menu that provides the user with easy access to all settings.

2. APPLICATIONS

- Entertainment Rooms & Home Theaters
- Showrooms & Demo Rooms
- Lecture Hall Presentations
- Public Commercial Displays
- AV Equipment and Control Rooms

3. PACKAGE CONTENTS

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

4. SYSTEM REQUIREMENTS

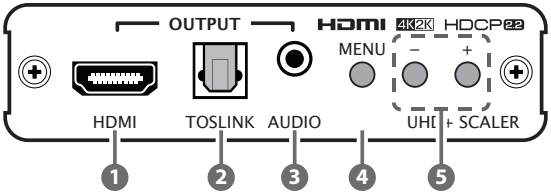
- HDMI input source equipment such as a media player, video game console or set-top box.
- HDMI receiving equipment such as an HDTV, monitor or audio amplifier.
- The use of "Premium High Speed HDMI" cables is highly recommended.

5. FEATURES

- HDMI input and output with 18Gbps (600MHz) 4K UHD support
- DVI 1.0 compliant with the use of an HDMI-DVI adaptor
- HDCP 2.2 and HDCP 1.x compliant
- 1 HDMI input and 1 HDMI output
- 1 Digital Optical Audio (TOSLINK) and 1 Analog Stereo Audio input
- 1 Digital Optical Audio (TOSLINK) and 1 Analog Stereo Audio output
- HDMI input supports resolutions up to 4096×2160p@60Hz (4:4:4, 8-bit)
- Scaled HDMI output supports resolutions from 640×480@60Hz up to 4096×2160p@60Hz (4:4:4, 8-bit)
- Supports pass-through of many audio formats including LPCM 2.0/5.1/7.1, Bitstream, and HD Bitstream via HDMI
- Supports audio embedding and de-embedding via digital optical and analog stereo audio inputs and outputs (LPCM 2.0 only)
- Supports frame rate conversion, 3-D motion adaptive de-interlacing, and 3:2/2:2 pull-down detection and recovery
- Supports output adjustments to contrast, brightness, hue, saturation, sharpness, RGB levels and aspect ratio
- Integrated EDID and HDCP management
- Controllable via front panel buttons with comprehensive OSD

6. OPERATION CONTROLS AND FUNCTIONS

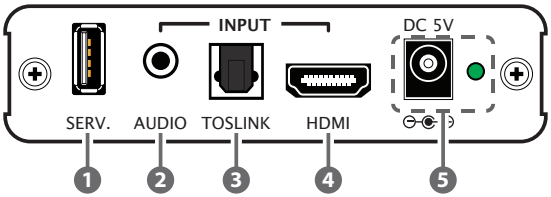
6.1 Front Panel



1. **HDMI OUTPUT:** Connect to an HDMI TV, monitor or amplifier for digital video and audio output.
2. **TOSLINK INPUT:** Connect to powered speakers or an amplifier for digital audio output using an appropriate optical cable.
3. **AUDIO INPUT:** Connect to powered speakers or an amplifier for stereo analog audio output.
4. **MENU:** Press to enter the OSD menu, to confirm a selection within the OSD or to go deeper into a menu item. To back out from menu items or exit the menu, select the "Exit" option.
5. **– & +:** Press to move up and down or adjust selections within OSD menus.

   Note: Pressing "MENU" and "+" together will reset the output resolution to XGA (1024×768@60Hz). Pressing "MENU" and "–" together will reset the output resolution to 1080p@60Hz. Pressing and holding the "–" button while powering the unit on will perform a factory reset.

6.2 Rear Panel



1. **SERV.:** This port is reserved for firmware update use only.
2. **AUDIO INPUT:** Connect to the stereo analog output of a device such as an audio player or PC.
3. **TOSLINK INPUT :** Connect to the optical audio output of a device such as a media player or game console using an appropriate optical cable.
4. **HDMI INPUT:** Connect to HDMI source equipment such as a media player, game console or set-top box.
5. **DC 5V & LED:** Plug the 5V DC power adapter into this port and connect it to an AC wall outlet for power. The LED will illuminate to indicate the unit is on and receiving power.

6.3 OSD Menu

All functions of this unit can be controlled by using the OSD (On Screen Display) which is activated by pressing the MENU button on the front of the unit. Use the + (Plus), – (Minus), and MENU buttons to navigate the OSD menu. Select the "EXIT" option to back out from any menu item and then select it again to close the menu.

MAIN MENU
Video
Picture
Audio
OSD
EDID
Reset
FW Update
Information
Exit

The individual functions of the OSD will be introduced in the following section. Items marked in **BOLD** are the factory default settings.

VIDEO		
2ND LEVEL	3RD LEVEL	4TH LEVEL
Output	640×480 60	
	800×600 60	
	1024×768 60	
	1280×768 60	
	1280×800 60	
	1280×1024 60	
	1360×768 60	
	1400×1050 60	
	1440×900 60	
	1600×1200 60	

VIDEO		
2ND LEVEL	3RD LEVEL	4TH LEVEL
Output (cont.)	1680×1050 60	
	1920×1200 60 RB	
	2560×1600 60	
	1920×1080 60	
	1280×720 60	
	2048×1080 50	
	2048×1080 60	
	2560×1440 60 RB	
	720×480P 60	
	1280×720P 60	
	1920×1080P 60	
	720×576P 50	
	1280×720P 50	
	1920×1080P 50	
	1920×1080P 24	
	1920×1080P 25	
	1920×1080P 30	
	2560×1080P 50	
	2560×1080P 60	
	3840×2160P 24	
	3840×2160P 25	
	3840×2160P 30	
	3840×2160P 50	
	3840×2160P 60	
	4096×2160P 24	
	4096×2160P 25	
	4096×2160P 30	
	4096×2160P 50	
	4096×2160P 60	
	Native	

VIDEO		
2ND LEVEL	**3RD LEVEL**	**4TH LEVEL**
Aspect	Over Scan	
	FULL	
	Best Fit	
	Pan Scan	
	Letter Box	
	Under 2	
	Under 1	
	Follow In	
	Zoom Mode	
Zoom Mode Ratio	60~180 **(100)**	
HDCP	Off	
	Refer to Source	
	REFER TO DISPLAY	
No Signal Color	**BLACK**	
	White	
	Blue	
	Red	
	Green	
Blank	**OFF**	
	On	
Freeze	**OFF**	
	On	
Auto Sync Off	**OFF**	
	30s	
	60s	
	3 Min	
Auto Sync Off	5 Min	
	10 Min	
Output Setting	Bypass Enable	**OFF**
		On

VIDEO		
2ND LEVEL	**3RD LEVEL**	**4TH LEVEL**
Output Setting (cont.)	Output 4K(6G) YUV420	**OFF**
		On
	EXIT	
Exit		

1) **Output:** Selects the output resolution to use. Selecting "Native" will make the unit automatically select an output resolution based on the detected EDID of the connected display.
2) **Aspect:** Selects the aspect ratio to use when outputting the source. "Full" stretches the source to fill the output resolution, regardless of the original aspect ratio, while "Best Fit" will always attempt to retain the original source's correct aspect ratio by adding black bars if necessary. "Follow In" centers the source on the screen, without any scaling (1:1 pixel reproduction). Selecting "Zoom Mode" activates the free-scaling zoom mode which allows for a zoom/shrink level to be manually selected using the "Zoom Mode Ratio" setting.

   Note: Some video noise might be present when using the "Follow In" mode if the selected output resolution is 4096×2160@60Hz and the source is at, or above, 1680×1050 but below 3840×2160.
3) **Zoom Mode Ratio:** Sets the percentage amount to zoom or shrink the image when "Zoom Mode" is active.
4) **HDCP:** Selects the HDCP logic to use with the HDMI input. Setting this to "Off" will completely disable HDCP support on that input.
5) **No Signal Color:** Selects the free run color to use when no live input source is detected.
6) **Blank:** Allows for the output video and audio to be blanked/ muted.
7) **Freeze:** Allows for the output video to be frozen. While the output is frozen, audio output will also be muted.
8) **Auto Sync Off:** Sets the amount of time to continue outputting sync with the free run color if there is no live source and no operations have been executed on the unit. Setting this to "OFF" forces the unit to always output sync.
9) **Output Setting:** Allows for configuring the following special video signal handing functions.
   - **Bypass Enable:** Enables or disables source bypass mode.

When this is enabled, the video signal will be passed without modification.

- **Output 4K(6G) YUV420:** Enables or disables the 4K@50/60 4:4:4 to 4K@50/60 4:2:0 color space conversion function.

Note: Enabling Bypass mode will grey-out/disable the following Video Menu sections: Aspect, Zoom Mode Ratio, Freeze, Blank, and the entire Picture Menu section.

PICTURE	
2ND LEVEL	**3RD LEVEL**
Color Gain R	0~1023 **(512)**
Color Gain G	0~1023 **(512)**
Color Gain B	0~1023 **(512)**
Color Offset R	0~1023 **(512)**
Color Offset G	0~1023 **(512)**
Color Offset B	0~1023 **(512)**
Brightness	0~60 **(30)**
Contrast	0~60 **(30)**
Hue	0~60 **(30)**
Saturation	0~60 **(30)**
Sharpness	0~63 **(0)**
NR	**OFF**
	Low
	Middle
	High
	Auto
Reset Picture	
Exit	

1) **Color Gain R/G/B:** These controls provide control over the red, green, and blue color gain level of the scaled output.
2) **Color Offset R/G/B:** These controls provide control over the red,

green, and blue color offset level of the scaled output.

3) **Brightness:** Provides control over the overall brightness of the scaled output image.
4) **Contrast:** Provides control over the overall contrast of the scaled output image.
5) **Hue:** Provides control over the hue shift of the scaled output image.
6) **Saturation:** Provides control over the color saturation level of the scaled output image.
7) **Sharpness:** Provides control over the amount of sharpness processing to apply to the scaled output image.
8) **NR:** Provides control over the aggressiveness of the digital noise reduction processing when applied to the scaled output image. Selecting "Off" disables all noise reduction processing.
9) **Reset Picture:** Selecting this will reset all picture settings back to their factory defaults.

AUDIO	
2ND LEVEL	**3RD LEVEL**
Source	**AUTO**
	TOSLINK
	Analog
Volume	0~100 **(80)**
HDMI Mute	**OFF**
	On
TOSLINK Mute	**OFF**
	On
Analog Mute	**OFF**
	On
Reset Audio	
Exit	

1) **Source:** Provides control over the selection of the audio source to output. In "Auto" mode, if no audio source is detected the audio input

will automatically switch to the analog input.

Note: If "Auto" is selected, and there is no video source, the analog audio will be heard while the free run color is displayed.

2) **Volume:** Provides control over the audio source's volume level.

   Note: HDMI to HDMI audio is bypass only and the volume can not be adjusted.

3) **HDMI Mute:** Mutes or unmutes the HDMI output's audio.
4) **TOSLINK Mute:** Mutes or unmutes the TOSLINK output's audio.
5) **Analog Mute:** Mutes or unmutes the analog output's audio.
6) **Reset Audio:** Selecting this will reset all audio settings back to their factory defaults.

OSD	
2ND LEVEL	**3RD LEVEL**
H Position	0~60 **(30)**
V Position	0~60 **(30)**
Timer	**OFF**
	5s
	10s
	15s
	20s
	25s
	30s
	35s
	40s
Timer	45s
	50s
	55s
	60s
Transparent	0~50 **(50)**

OSD	
2ND LEVEL	**3RD LEVEL**
Display	Off
	On
	5S
	10s
Reset OSD	
Exit	

1) **H Position:** Set the horizontal position of the OSD menu.
2) **V Position:** Set the vertical position of the OSD menu.
3) **Timer:** Set the length of time to wait before automatically turning off the OSD menu if there is no user interaction. The timer may also be disabled.
4) **Transparent:** Set the transparency level of the OSD menu. A setting of 50 is completely opaque.
5) **Display:** Enable or disable the information display and set the length of time for the information display to be visible after a source or resolution change.
6) **Reset OSD:** Selecting this will reset all OSD settings back to their factory defaults.

EDID	
2ND LEVEL	**3RD LEVEL**
HDMI EDID	**FHD 2CH**
	FHD MCh
	UHD 2Ch
	UHD MCh
	UHD+ 2Ch
	UHD+ MCh
	Output
	Auto Output
Exit	

1) **HDMI EDID:** Select the EDID to use with the HDMI input. Selecting "Output" will copy and use the current sink's EDID but will not re-copy the EDID if the sink is changed. Selecting "Auto Output" will automatically copy and use the EDID from the current sink every time a new sink is connected.

RESET	
2ND LEVEL	**3RD LEVEL**
Reset All	
Exit	

1) **Reset All:** Selecting this will reset the unit's settings back to their factory defaults.

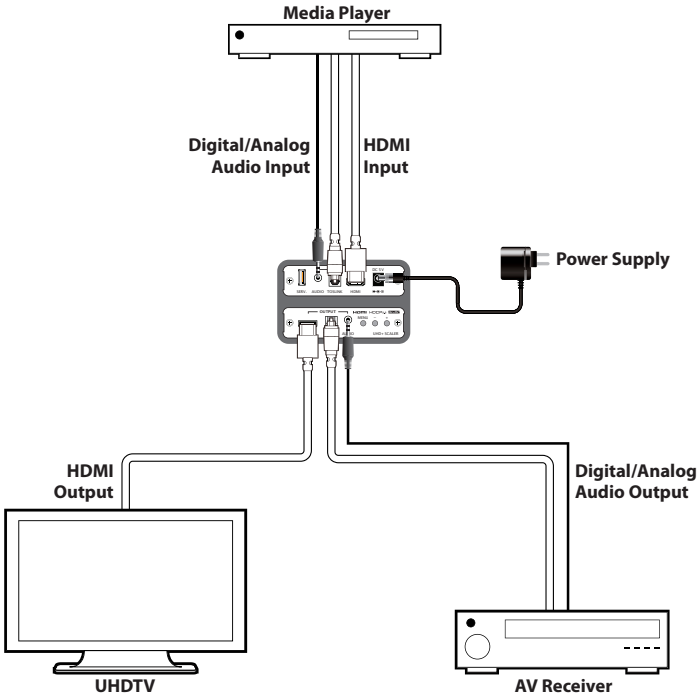
FW UPDATE	
2ND LEVEL	**3RD LEVEL**
Update From USB	
Exit	

1) **Update from USB:** Provides a way to update the unit's firmware. Insert a USB thumb drive, with a valid firmware file (*.bin format) in the root directory, into the unit's USB service port then select this option. After the update is complete the unit will automatically reboot.

INFORMATION	
2ND LEVEL	**3RD LEVEL**
Input Format	[Current Status Details]
Input Color	
Input Resolution	
Input HDCP	
Output Format	
Output Color	
Output Resolution	
Output HDCP	
Sink HDCP	
Version	

1) **Information:** This screen displays information about the unit's current state, input and output status, as well as the current firmware version.

7. CONNECTION DIAGRAM



8. SPECIFICATIONS

8.1 Technical Specifications

HDMI Bandwidth	600MHz/18Gbps
Input Ports	1×HDMI 1×Stereo (3.5mm) 1×S/PDIF (TOSLINK)
Output Ports	1×HDMI 1×Stereo (3.5mm) 1×S/PDIF (TOSLINK)
Power Supply	5V/2.6A DC (US/EU standards, CE/FCC/UL certified)
ESD Protection	Human Body Model: ±8kV (Air Discharge) ±4kV (Contact Discharge)
Dimensions	102mm×25mm×147mm (W×H×D) [Case Only] 102mm×25mm×155.75mm (W×H×D) [All Inclusive]
Weight	350g
Chassis Material	Aluminum
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	11W

8.2 Video Specifications

Supported PC Resolution (Hz)	HDMI Input	HDMI Output
640×480@60/72/75/85	✓	60Hz
800×600@56/60/72/75/85	✓	60Hz
1024×768@60/70/75/85	✓	60Hz
1280×720@50/60	✓	60Hz
1280×768@60/75/85	✓	60Hz
1280×800@60/60 (RB)	✓	60Hz
1280×1024@60	✓	✓
1360×768@60	✓	✓
1400×1050@60/60 (RB)	✓	60Hz
1440×900@60/60 (RB)	✓	60Hz
1600×1200@60	✓	✓
1680×1050@60/60 (RB)	✓	60Hz
1920×1080@60	✓	✓
1920×1200@60 (RB)	✓	✓
2560×1600@60	✓	✓
2048×1080@50	✓	✓
2048×1080@60	✓	✓
2560×1440@60 (RB)	✓	✓

Supported TV Resolution (Hz)	HDMI Input	HDMI Output
720×480i@60	✓	×
720×480p@60	✓	✓
720×576i@50	✓	×
720×576p@50	✓	✓
1280×720p@50/60	✓	✓

Supported TV Resolution (Hz)	HDMI Input	HDMI Output
1920×1080i@50/60	✓	×
1920×1080p@24/25/30/50/60	✓	✓
2560×1080p@50/60	✓	✓
3840×2160p@24/25/30/50/60	✓	✓
4096×2160p@24/25/30/50/60	✓	✓

8.3 Audio Specifications

Analog Input	
Max Audio Level	2Vrms
Impedance	499kΩ
Type	Unbalanced

Analog Output	
Max Audio Level	2Vrms
THD+N	< –80dB@0dBFS 1kHz (A-wt)
SNR	> 70dB@0dBFS
Frequency Response	< ±3dB@20Hz~20kHz
Crosstalk	< –70dB@10kHz
Impedance	499Ω
Type	Unbalanced

Digital (S/PDIF) Input	
Sampling Rate (kHz)	32, 44.1, 48, 82, 88.2, 96, 176.4, 192

Digital (S/PDIF) Output	
Sampling Rate (kHz)	48

8.4 Cable Specifications

	1080p		4K
HDMI Cable Length	**8-bit**	**12-bit**	**8-bit**
Input	15m	10m	3m
Output	15m	10m	3m

9. ACRONYMS

ACRONYM	COMPLETE TERM
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
OSD	On-Screen Display
PC	Personal Computer
S/PDIF	Sony/Philips Digital Interface Format
SNR	Signal-to-Noise Ratio
THD+N	Total Harmonic Distortion plus Noise
UHD	Ultra-High-Definition
UHDTV	Ultra-High-Definition Television
USB	Universal Serial Bus

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