



HDCP2.2

4KHDR

# SY-HDVGA-4K22

PC/HDMI to HDMI 4K Scaler with Audio

**OPERATION MANUAL**



## 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
VR0	04/07/16	Preliminary release
VR1	23/09/16	Supported resolution
VS2	14/11/16	Updated text/diagrams

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## 1. INTRODUCTION

The SY-HDVGA-4K22 is a compact and versatile scaler with HDMI and VGA inputs, scaling to the HDMI output. With its wide range of input resolution support and full 4K@60Hz (4:4:4) output it's ideal for presenting content to the latest full UHD displays.

The unit also features analogue stereo and digital optical audio inputs and outputs for integrating into any wider audio systems. Its OSD allows user to adjust contrast, brightness, hue, saturation, sharpness, RGB (colour tone) level and aspect ratio size. Auto sync, auto input detection and HDMI EDID management complete the units simple yet comprehensive OSD menu system.

## 2. APPLICATIONS

- Home Theater with 4K@60Hz HDMI media player and VGA home PC with output to a 4K@60Hz TV
- Boardroom presenter connection point with auto-switching to new presenters and output to a large 4K display
- Lecture Hall, Showroom or Classroom signal display
- Displaying analog PC/HD contents on an HDMI display with audio

## 3. PACKAGE CONTENTS

- 1×HDMI/VGA to HDMI Scaler
- 1×5V/2.6A Power Adaptor
- 1×Operation Manual

## 4. SYSTEM REQUIREMENTS

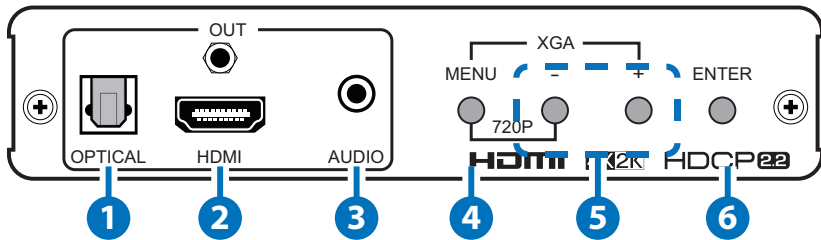
- HDMI or VGA source equipment such as media players, video game consoles, set-top boxes, PCs or laptops
- HDMI receiving equipment such as HDTVs, monitors or audio amplifiers
- The use of "Premium High Speed HDMI" cables is highly recommended

## 5. FEATURES

- HDMI 2.0 with 4K@60Hz (4:2:0 and 4:4:4) support, DVI 1.0 compliant
- HDCP 2.2 compliant
- Supports PC input resolutions from VGA~WUXGA and HD input resolutions from 480i~1080p@60Hz
- Supports HDMI input resolutions from 480i~4K@60Hz (4:4:4, 8-bit)
- Supports HDMI output resolutions from 640×480@60Hz up to 4096×2160@60Hz (4:4:4, 8-bit)
- Analog YUV input is supported with the use of a 15-pin to 3-RCA adapter
- 50/60Hz frame rate conversion
- 3-D motion adaptive de-interlacing and 3:2/2:2 pull-down detection and recovery
- Can automatically detect and output the preferred resolution and refresh rate reported by the EDID of the connected display (NATIVE output mode)
- EDID management options including multiple pre-defined EDIDs and EDID pass-through
- Comprehensive output picture adjustments (contrast, brightness, hue, saturation, sharpness, RGB (color tone) level and aspect ratio size)
- Supports LPCM 2.0 digital/analog audio input and LPCM 2.0 digital/analog output. The audio source is selected via the OSD and output simultaneously over the HDMI, optical and phone jack connections
- Supports firmware updates via USB

## 6. OPERATION CONTROLS AND FUNCTIONS

### 6.1 Front Panel



**1 OPTICAL OUT:** Connect to powered speakers or an amplifier for digital audio output using an appropriate optical cable. Supports LPCM 2.0 audio only. Bitstream formats will be muted.

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

*Note: When outputting 4K@60Hz HDMI signals, a compatible 4K@60Hz display is required. The use of "Premium High Speed HDMI" cables is highly recommended.*

**3 AUDIO OUT:** Connect to powered speakers or an amplifier for stereo analog audio output. Supports LPCM 2.0 audio only. Bitstream formats will be muted.

**4 MENU:** Press to enter the OSD menu, or to back out from menu items.

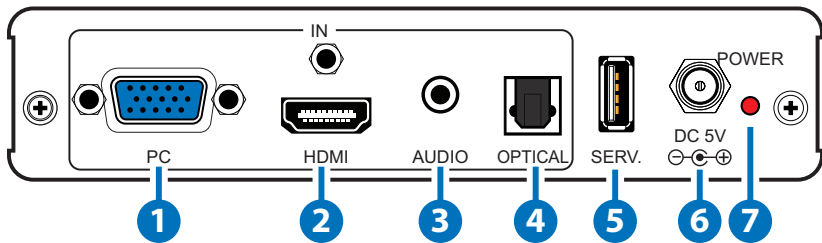
*Note: Pressing "MENU" and "+" together will reset the output resolution to XGA (1024x768@60Hz). Pressing "Menu" and "-" together will reset the output resolution to 720p@60Hz.*

**5 -/+:** Press to move up and down or adjust selections within menus. When not in the OSD press "-" to adjust the analog audio output volume (with on screen level indicator). Press "+" to activate the Auto Adjust function for VGA sources.

**6 ENTER:** Press to confirm a selection or to go deeper into a menu item within the OSD. When not in the OSD this button switches between the 2 inputs.

*Note: Pressing "ENTER", "+" and "-" together will perform a factory reset on the unit.*

## 6.2 Rear Panel



- 1 PC IN:** Connect to VGA source equipment such as a PC or laptop. YUV sources, such as DVD players, are also supported with the use of a 15-pin to 3-RCA adapter.
- 2 HDMI IN:** Connect to HDMI source equipment such as a media player, game console or set-top box. DVI sources are also supported with the use of an HDMI to DVI adapter.  
*Note: When outputting 4K@60Hz HDMI signals, a compatible 4K@60Hz display is required. The use of "Premium High Speed HDMI" cables is highly recommended.*
- 3 AUDIO IN:** Connect to the stereo analog output of a device such as a CD player or PC.
- 4 OPTICAL IN:** Connect to the optical audio output of a device such as a media player or game console using an appropriate optical cable.
- 5 SERVICE:** This slot is reserved for firmware update use only.
- 6 DC 5V:** Plug the 5V DC power adapter into the unit and connect it to an AC wall outlet for power.
- 7 POWER LED:** This LED will illuminate to indicate the unit is on and receiving power.



## 6.3 OSD Menu

MAIN MENU	SUB MENU	PARAMETER	DEFAULT
PICTURE	CONTRAST	0~100	50
	BRIGHTNESS	0~100	50
	EXIT		
FINETUNE [HDMI/YPbPr source only]	HUE	0~100	50
	SATURATION	0~100	50
	SHARPNESS	0~100	50
	NR	OFF	OFF
		LOW	
		MIDDLE	
HIGH			
EXIT			
FINETUNE [PC source only]	PHASE	0~100	
	CLOCK	0~100	
	H-POSITION	0~100	
	V-POSITION	0~100	
	EXIT		
COLOR	RED	0~100	50
	GREEN	0~100	50
	BLUE	0~100	50
	EXIT		
OUTPUT	SOURCE	PC/YPbPr	HDMI
		HDMI	
	RESOLUTION*	640×480@60	NATIVE
		800×600@60	
		1024×768@60	
		1280×768@60	
		1360×768@60	
		1280×800@60	

MAIN MENU	SUB MENU	PARAMETER	DEFAULT
<b>OUTPUT (Cont.)</b>	RESOLUTION (Cont.)	1280×1024@60	NATIVE
		1440×900@60	
		1400×1050@60	
		1680×1050@60	
		1600×1200@60	
		1920×1200@60 (RB)	
		480P@60	
		576P@50	
		720P@50	
		720P@60	
		1080P@50	
		1080P@60	
		4K2K@24	
		4K2K@25	
		4K2K@30	
		4K2K@50	
		4K2K@60	
		4K2K@50 (4:2:0)	
		4K2K@60 (4:2:0)	
	NATIVE		
	UHD BYPASS	BYPASS	SCALER
		SCALER	
	SIZE*	FULL	BEST FIT
		OVER SCAN	
		UNDER SCAN	
		LETTER BOX	
		PAN SCAN	
		BEST FIT	
	EXIT		

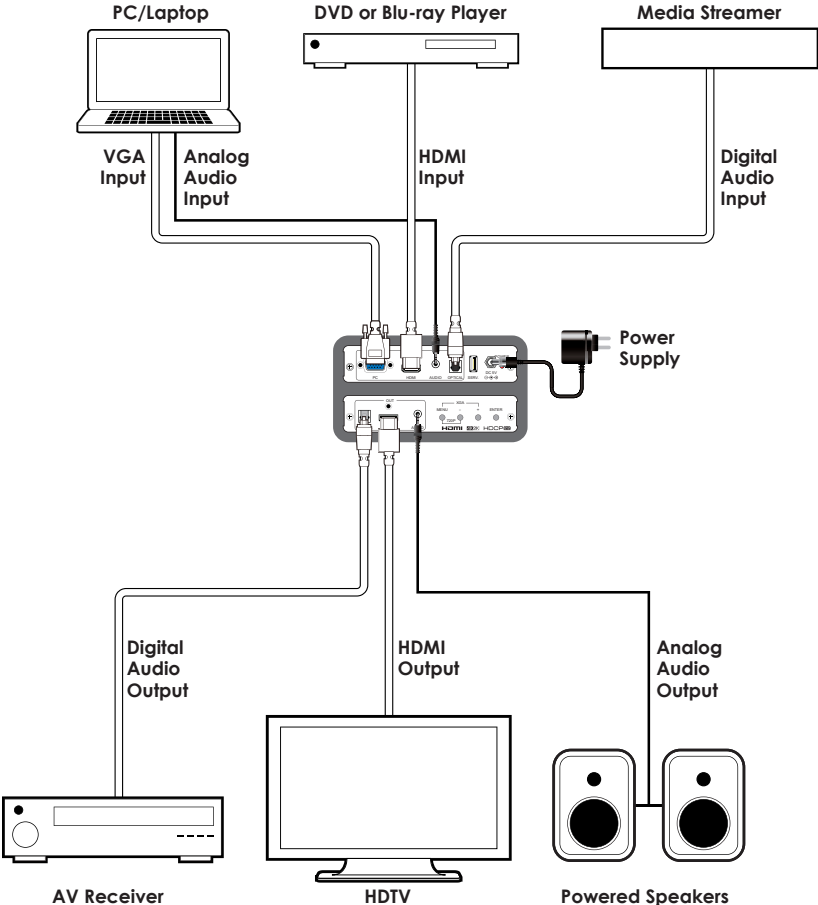
MAIN MENU	SUB MENU	PARAMETER	DEFAULT	
<b>AUDIO</b>	HDMI INPUT	AUTOMATIC	<i>AUTOMATIC</i>	
		EMBEDDED		
		ANALOG		
		OPTICAL		
	PC INPUT	ANALOG	<i>ANALOG</i>	
		OPTICAL		
	VOLUME [Analog audio only]	0~100	<i>100 [=2Vrms]</i>	
EXIT				
<b>OSD</b>	TIMER	OFF	<i>10</i>	
		5~100		
	DISPLAY	INFO	<i>INFO</i>	
		ON		
		OFF		
	EXIT			
	<b>EDID MANAGE</b> [HDMI source only]	EDID COPY	DEF. 1080P	<i>DEF. 1080P</i>
DEF. 4K2K (6G)				
DEF. 4K2K				
DEF. 4K2K (3G)				
OUTPUT				
EXIT				
<b>ADVANCED</b>		AUTO SYNC	OFF	<i>OFF</i>
	FAST [≈ 10sec.]			
	SLOW [≈ 120sec.]			
	AUTO INPUT	OFF	<i>AUTO SWITCH</i>	
		AUTO SWITCH		
	HDCP ON INPUT	OFF	<i>ON</i>	
		ON		

MAIN MENU	SUB MENU	PARAMETER	DEFAULT
<b>ADVANCED (Cont.)</b>	AUTO ADJUST	OFF	OFF
		ON	
	EXIT		
<b>FACTORY</b>	RESET	NO	NO
		YES	
	EXIT		

Note:

- When outputting a 4K resolution with the same refresh rate as the 4K source (or when bypass mode is enabled) the OSD items marked with an asterisk (\*) will be disabled.
- When a new output resolution is selected the output will immediately change and you will be asked to confirm that you can view the new resolution by pressing "Enter". If "Enter" is not pressed within 30 seconds the output will return to the previous resolution automatically.

# 7. CONNECTION DIAGRAM



## 8. SPECIFICATIONS

### 8.1 Technical Specifications

<b>Video Bandwidth</b>	600MHz/18Gbps
<b>Input Ports</b>	1×HDMI, 1×VGA [15-pin D-sub], 1×Optical Audio, 1×3.5mm Audio
<b>Output Ports</b>	1×HDMI, 1×Optical Audio, 1×3.5mm Audio
<b>Supported Resolutions</b>	408i@60Hz - 4K@60Hz (4:4:4, 8-bit) VGA@60Hz - WUXGA@60Hz (RB)
<b>Cable Length</b>	10m (1080p@60Hz, 12-bit) 5m (4K@60Hz, 4:4:4, 8-bit)
<b>Power Supply</b>	5V/2.6A DC (US/EU standards, CE/FCC/UL certified)
<b>ESD Protection</b>	Human Body Model: ±8KV (Air Discharge), ±4KV (Contact Discharge)
<b>Dimensions</b>	145mm×30mm×192mm (W×H×D) [Case Only] 145mm×30mm×201.2mm (W×H×D) [All Inclusive]
<b>Weight</b>	578g
<b>Chassis Material</b>	Aluminum
<b>Silkscreen 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 (No-condensing)
<b>Power Consumption</b>	8.47W

## 8.2 Video Specifications

### 8.2.1 Supported Resolutions

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

TV Resolution (Hz)	HDMI Input	YPbPr Input	HDMI Output
480i/576i	✓	✓	
480p/576p	✓	✓	✓
720p@50/60	✓	✓	✓
1080i@50/60	✓	✓	
1080p@24/25/30	✓	✓	
1080p@50/60	✓	✓	✓
3840×2160@24/25/30	✓		✓
3840×2160@50/60	✓		✓
4096×2160@24/25/30	✓		Bypass only
4096×2160@50/60	✓		

## 8.2.2 Scaled Resolutions

Input Resolution	Output Resolution	UHD BYPASS			
		SCALER		BYPASS	
		Bypass Path	Scaler Path	Bypass Path	Scaler Path
<b>Non-4K Timing</b>	<b>Any Timing</b>		✓		✓
<b>4K but not 24Hz</b>	<b>4K@24Hz</b>		✓	N/A	N/A
<b>4K but not 25Hz</b>	<b>4K@25Hz</b>		✓	N/A	N/A
<b>4K but not 30Hz</b>	<b>4K@30Hz</b>		✓	N/A	N/A
<b>4K but not 50Hz</b>	<b>4K@50Hz</b>	Note	✓	N/A	N/A
<b>4K but not 60Hz</b>	<b>4K@60Hz</b>	Note	✓	N/A	N/A
<b>4K but not 50Hz</b>	<b>4K@50Hz (4:2:0)</b>	Note	✓	N/A	N/A
<b>4K but not 60Hz</b>	<b>4K@60Hz (4:2:0)</b>	Note	✓	N/A	N/A
<b>4K@24Hz</b>	<b>4K@24Hz</b>	✓		✓	
<b>4K@25Hz</b>	<b>4K@25Hz</b>	✓		✓	
<b>4K@30Hz</b>	<b>4K@30Hz</b>	✓		✓	
<b>4K@50Hz</b>	<b>4K@50Hz</b>	✓		✓	
<b>4K@60Hz</b>	<b>4K@60Hz</b>	✓		✓	
<b>4K@50Hz (4:2:0)</b>	<b>4K@50Hz (4:2:0)</b>	✓		✓	
<b>4K@60Hz (4:2:0)</b>	<b>4K@60Hz (4:2:0)</b>	✓		✓	

Note: If a 4K input source and the selected 4K output resolution share the same timing (e.g. 3840×2160@60Hz input to 3840×2160@60Hz output) but use different color sub-sampling (4:4:4 to 4:2:0) the unit will convert the color and use the "Bypass path" for the output.



### 8.3 Audio Specifications

Formats	HDMI	Optical	Analog
LPCM 2.0	✓	✓	✓
LCPM 5.1	✓		
LPCM 7.1	✓		
Bitstream	✓		
HD Bitstream	✓		

Sampling Rates (kHz)	HDMI	Optical
32	✓	✓
44.1	✓	✓
48	✓	✓
88.2	✓	
96	✓	
176.4	✓	
192	✓	

Input		Output				
Level	Frequency Range	Level	THD+N	Frequency Response	SNR	Crosstalk
<b>Digital Audio</b>		<b>Digital Audio</b>				
0dB	1kHz	0dB~-1dB	<0.01%	±1dB	>80dB	<-80dB
<b>Analog Audio</b>		<b>Digital Audio</b>				
1Vrms	1kHz	0dB~-1.5dB	<0.1%	±3dB	>70dB	<-60dB
<b>Digital Audio</b>		<b>Analog Audio</b>				
0dB	1kHz	0.5Vrms±10%	<0.1%	±3dB	>80dB	<-60dB
<b>Analog Audio</b>		<b>Analog Audio</b>				
1Vrms	1kHz	0.5Vrms±10%	<0.1%	±3dB	>70dB	<-60dB

## 9. ACRONYMS

ACRONYM	COMPLETE TERM
<b>dB</b>	Decibel
<b>EDID</b>	Extended Display Identification Data
<b>HDCP</b>	High-bandwidth Digital Content Protection
<b>HDMI</b>	High-Definition Multimedia Interface
<b>LPCM</b>	Linear Pulse-Code Modulation
<b>SNR</b>	Signal-to-Noise Ratio
<b>THD+H</b>	Total Harmonic Distortion plus Noise
<b>UHD</b>	Ultra-High-Definition
<b>VGA</b>	Video Graphics Array
<b>XGA</b>	Extended Graphics Array
<b>WUXGA</b>	Wide Ultra Extended Graphics Array





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VS2