

HDMI to HDBaseT Scaler with Audio Output - ID# 15461



Operation Manual

Introduction

This HDMI to HDBaseT Scaler can send uncompressed audio/video along with control, Ethernet, and extra audio data over a single run of Cat.5e/6/7 cable up to 100m. Both the HDMI input and local HDMI output support video signals up to 4K@60Hz (4:4:4, 8-bit). For transmission over the HDBaseT output the signal can be converted to 4K@60Hz (4:2:0, 8-bit) or 1080p60, if necessary, in order to fit within HDBaseT bandwidth limitations. Simple 6G HDMI test patterns are also available to be output. Control of remote devices is possible via bi-directional RS-232, IR ports as well as a LAN connection. A balanced analog audio output provides users with additional audio flexibility. The 48V PoH design can power the connected Receiver (PD), eliminating the need for an extra power supply while the Transmitter itself is powered through the local 24V power supply.

Features

- Supports the HDBaseT 2.0 specification
- Supports 4K video over a single Cat.7 cable up to 100m/328ft and Cat.5e/6 cable up to 70m/295ft
- HDBaseT 5Play™ convergence: High-Definition (HD) Video and Audio, 100BaseT Ethernet, PoH and Control (Bi-directional IR/RS-232 pass-through)
- Fully compliant with HDMI 1.4, and compatible with HDMI 2.0 (4K@60Hz, YUV 4:2:0)
- HDMI with 6G 4K support and HDCP 2.2 compliant
- Supports DVI to HDMI conversion
- Support signal bypass on HDMI output
- Upscales 1080p signals to 4K over HDBaseT output or downscales 4K signal to 1080p (same framerate is maintained)
- 4K UHD(4:4:4) to 4K UHD(4:2:0) conversion
- Test pattern generation at select resolutions for on-site display testing
- Integrated EDID management
- Supports data rates up to 6Gbps (600MHz) and Deep Color up to 1080p, 48-bit
- Supports UHD resolutions including: 3840x2160@24/25/30Hz, 3840x2160@50/60Hz (4:4:4) & 4096x2160@24/25/30Hz, 4096x2160@50/60Hz (4:4:4)
- Supports LPCM 2.0/5.1/7.1, Dolby Digital 5.1, DTS 5.1, Dolby Digital Plus, Dolby TrueHD, Dolby Atmos and DTS-HD Master Audio (Bypass)
- Supports OAR (Optical Audio Return) and DAC audio balance conversion
- OSD with instant I/O resolution display
- 10/100 Ethernet network support
- Supports RS-232 baud rates from 110~115200bps

Note: When displaying 4K HDR, or an equivalent signal, an appropriate

display and HDMI cable quality are required in order to obtain the best image. The use of “Premium High Speed HDMI” cables is highly recommended.

Applications

- Live events needing dual output formats and signal extension
- Hotel ballroom with extension and audio breakout
- Long distance extension with no local power available at the Rx side
- On-site equipment testing

System Requirements

- HDMI source equipment such as media players, video game consoles or set-top boxes.
- Compatible HDBaseT™ receivers with 48v PoH support are required. HDBaseT™ receivers equipped with Optical Audio Return (OAR) channel support are strongly recommended

Operating Functions and Controls

Front Panel



1. SERVICE:

This slot is reserved for firmware update use only.

2. POWER:

This LED will illuminate to indicate the unit is on and receiving power.

3. 4K2K:

This LED will illuminate to indicate the input source contains a 4K UHD signal.

4. SYNC:

This LED will illuminate when a live input source is detected.

5. MENU:

Press to enter the OSD menu, or to back out from menu items. Press and hold this button together with the “-” button for 3 seconds to reset the unit back to factory defaults.

6. TEST PATTERN +/-:

Outside of the OSD, press these buttons to select a pattern to instantly display on the outputs. Press and hold both these buttons simultaneously to instantly switch the test pattern output timing to

1280x720@60Hz. Within the OSD menu, press to move up and down or adjust selections within menus.

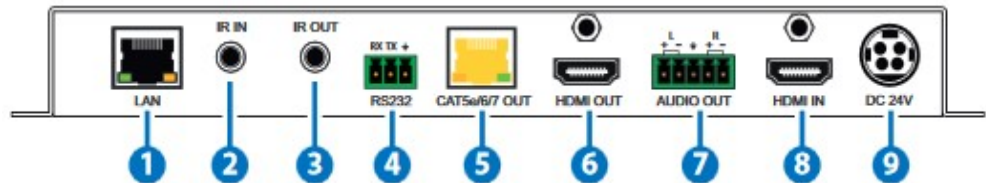
7. ENTER:

Press to confirm a selection or to go deeper into a menu item.

Note:

Press and hold the ENTER and MENU buttons for 3 seconds to enter into firmware update mode. The LEDs will illuminate in sequence from left to right to indicate the unit is in update mode. Plug a USB thumb drive containing the updated firmware in the root directory into the SERVICE port. The LEDs will turn off to indicate the update process is proceeding. If the update procedure is completed successfully all LEDs will illuminate together. If the update fails then no LEDs will illuminate. The unit will automatically reboot after approximately 10 seconds. After completing the upgrade process please verify the firmware version with in the OSD menu under "INFORMATION."

Rear Panel



1. LAN:

Connect to an Ethernet supporting device or to your local network as appropriate. The yellow LED will illuminate to indicate a successful LAN connection between the Transmitter and Receiver, however, if the yellow LED blinks irregularly it indicates a data link error. The green LED will illuminate when the connected Ethernet speed is 100Mbit/s.

2. IR IN:

Connect to the supplied IR Extender cable for IR signal reception. Ensure that remote being used is within the direct line-of-sight of the IR Extender.

3. IR OUT:

Connect to the provided IR Blaster to transmit IR signals to devices within direct line-of-sight of the IR Blaster.

4. RS-232:

Connect to a PC, laptop or other serial control device with a 3-pin adapter cable for the extension of RS-232 signals to the Receiver. For receiving commands from the Receiver side, depending on your equipment's pinout, the Tx and Rx pins might need to be reversed.

5. CAT5e/6/7 OUT:

Connect to the Receiver unit with a single Cat.5e/6/7 cable for transmission of all data signals. The output resolution can be different

from the resolution selected for the HDMI output. A test pattern can also be displayed.

6. HDMI OUT:

Connect to HDMI TVs, monitors or amplifiers for digital video and audio output. Connect to HDMI TVs, monitors or amplifiers for digital video and audio output. The output resolution can be different from the resolution selected for the HDBaseT output. A test pattern can also be displayed.

7. AUDIO OUT:

Connect to powered speakers, an audio amplifier, mixer, or DSP for balanced stereo analog output extracted from an HDMI or OAR source with LPCM 2.0 audio. (balance audio spec.)

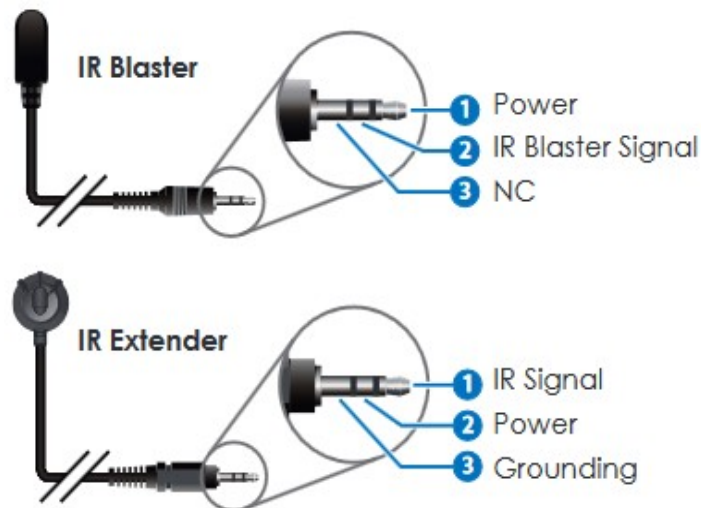
8. HDMI IN:

Connect to HDMI source equipment such as a media player, game console or set-top box.

9. DC 24V:

Plug the 24V DC power adapter into the unit and connect it to an AC wall outlet for power.

IR Cable Pin Assignments



OSD Menu

1 st Level	2 nd Level	3 rd Level	4 th Level	
OUTPUT	OUTPUT HDBaseT	INPUT 4K2K	DOWN 1080P* ₄	
			FIX 4K2K* ₅	
			AUTO* ₆	
	OUTPUT HDMI	INPUT 1080P	INPUT 4K2K	PASS THROUGH
				UP 4K2K* ₁
				UP 4K2K(YUV420)* ₂
INPUT 4K2K		PASS THROUGH		
		FIX 4K2K(YUV420)* ₃		
		FIX 8 BITS		
AUDIO	AUDIO SOURCE	HDMI		
		OAR		
EDID	INTERNAL 4K(6G-2CH)	YES/NO		
	INTERNAL 4K(3G-2CH)	YES/NO		
	INTERNAL 4K(420-2CH)	YES/NO		
	INT 1080P(2CH)	YES/NO		
	EXTERNAL HDBaseT	YES/NO		
	EXTERNAL HDMI	YES/NO		
	EXTERNAL HDBaseT (2CH)	YES/NO		
	EXTERNAL HDMI (2CH)	YES/NO		
HDCP	HDCP SUPPORT OFF			
	REFER TO SOURCE			
	REFER TO DISPLAY			
OSD	DISPLAY INFO.	ON		

		OFF	
	OSD TIME OUT	OFF	
		5 SEC.	
		10 SEC.	
		15 SEC.	
		20 SEC.	
		25 SEC.	
		30 SEC.	
		35 SEC.	
		40 SEC.	
TEST PATTERN HDBaseT		MODE	OFF
	ON		
	AUTO PATTERN		
	AUTO TIMING		
	PATTERN	WHITE COLOR	
		RED COLOR	
		GREEN COLOR	
		BLUE COLOR	
		MAGENTA COLOR	
		YELLOW COLOR	
		CYAN COLOR	
		COLOR BAR	
		RAMP	
		TOGGLE	
		RESOLUTION	720X480P@ 60
	720X576P@		

		50	
		1280X720P @50	
		1280X720P @60	
		1920X1080P @50	
		1920X1080P @60	
		3840X2160P @24	
		3840X2160P @25	
		3840X2160P @30	
		4096X2160P @24	
		4096X2160P @25	
		4096X2160P @30	
		3840X2160P @50	
		3840X2160P @60	
		4096X2160P @50	
		4096X2160P @60	
	HDCP	DISABLE	
		ENABLE	
	SWITCH TIME	10 SEC.	
		20 SEC.	
		30 SEC.	
		40 SEC.	
		50 SEC.	
		1 MIN.	

		2 MIN.	
		3 MIN.	
		5 MIN.	
TEST PATTERN HDMI	AUTO TIMING SELECT	720X480P@ 60	YES/NO
		720X576P@ 50	YES/NO
		1280X720P @50	YES/NO
		1280X720P @60	YES/NO
		1920X1080P @50	YES/NO
		1920X1080P @60	YES/NO
		3840X2160P @24	YES/NO
		3840X2160P @25	YES/NO
		3840X2160P @30	YES/NO
		4096X2160P @24	YES/NO
		4096X2160P @25	YES/NO
		4096X2160P @30	YES/NO
		MODE	OFF
	ON		
	AUTO PATTERN		
	AUTO TIMING		
	PATTERN	WHITE COLOR	
		RED COLOR	
		GREEN COLOR	

		BLUE COLOR	
		MAGENTA COLOR	
		YELLOW COLOR	
		CYAN COLOR	
		COLOR BAR	
		RAMP	
		TOGGLE	
	RESOLUTION	720X480P@ 60	
		720X576P@ 50	
		1280X720P @50	
		1280X720P @60	
		1920X1080P @50	
		1920X1080P @60	
		3840X2160P @24	
		3840X2160P @25	
		3840X2160P @30	
		4096X2160P @24	
		4096X2160P @25	
		4096X2160P @30	
		3840X2160P @60	

		4096X2160P @50	
		4096X2160P @60	
	HDCP	DISABLE	
		ENABLE	
	SWITCH TIME	10 SEC.	
		20 SEC.	
		30 SEC.	
		40 SEC.	
		50 SEC.	
		1 MIN.	
		2 MIN.	
		3 MIN.	
		5 MIN.	
	AUTO TIMING SELECT	720X480P@ 60	YES/NO
		720X576P@ 50	YES/NO
		1280X720P @50	YES/NO
		1280X720P @60	YES/NO
		1920X1080P @50	YES/NO
		1920X1080P @60	YES/NO
		NEXT PAGE	
		3840X2160P @24	YES/NO
		3840X2160P @25	YES/NO
		3840X2160P @30	YES/NO
		4096X2160P @24	YES/NO

		4096X2160P @25	YES/NO
		4096X2160P @30	YES/NO
		3840X2160P @50	YES/NO
		3840X2160P @60	YES/NO
		4096X2160P @50	YES/NO
		4096X2160P @60	YES/NO
		PREVIOUS PAGE	
INFORMATION	RESOLUTION	INPUT	XXX
		HDBaseT OUTPUT	XXX
		HDMI OUTPUT	XXX
	HDCP	HDBaseT OUTPUT	DISABLE/ENABL E
		HDMI OUTPUT	DISABLE/ENABL E
	FIRMWARE	SYSTEM VERSION	VX.XX
			VALENS VERSION VX.XX.XX.X
FIRMWARE UPDATE	NO		
	YES		
FACTORY SETTING	NO		
	YES		

***1 UP 4K2K**

1920x1080p@24Hz → 3840x2160@24Hz

1920x1080p@25Hz → 3840x2160@25Hz

1920x1080p@30Hz → 3840x2160@30Hz

1920x1080p@50Hz → 3840x2160@50Hz

1920x1080p@60Hz → 3840x2160@60Hz

***2 UP 4K2K (YUV420)**

Input → Output

1920x1080p@50Hz(RGB,YCbCr4:4:4,YCbCr 4:2:2) →
3840x2160@50Hz(YCbCr420)
1920x1080p@60(RGB, YCbCr4:4:4,YCbCr 4:2:2) →
3840x2160@60(YCbCr4:2:0)

***3 FIX 4K2K (YUV420)**

Input → Output
3840x2160@50Hz(RGB, YCbCr4:4:4, YCbCr4:2:2) →
3840x2160@50Hz(YCbCr4:2:0)
3840x2160@60Hz(RGB, YCbCr444,YCbCr 4:2:2) →
3840x2160@60Hz(YCbCr4:2:0)
4096x2160@50Hz(RGB, YCbCr444, YCbCr4:2:2) →
4096x2160@50Hz(YCbCr420)
4096x2160@60Hz(RGB, YCbCr444, YCbCr4:2:2) →
4096x2160@60Hz(YCbCr4:2:0)

***4 DOWN 1080P**

Input → Output
3840x2160@24Hz → 1920x1080p@24Hz
3840x2160@25Hz → 1920x1080p@25Hz
3840x2160@30Hz → 1920x1080p@30Hz
3840x2160@50Hz → 1920x1080p@50Hz
3840x2160@60Hz → 1920x1080p@60Hz
4096x2160@24Hz → 1920x1080p@24Hz
4096x2160@25Hz → 1920x1080p@25Hz
4096x2160@30Hz → 1920x1080p@30Hz
4096x2160@50Hz → 1920x1080p@50Hz
4096x2160@60Hz → 1920x1080p@60Hz

***5 FIX 4K2K**

Input → Output
3840x2160@24Hz(RGB, YCbCr4:4:4, YCbCr4:2:2/8~16-bit) →
3840x2160@24Hz(RGB, YCbCr4:4:4, YCbCr4:2:2/8-bit) →
3840x2160@25Hz(RGB, YCbCr4:4:4, YCbCr4:2:2/8~16-bit) →
3840x2160@25Hz(RGB, YCbCr4:4:4, YCbCr4:2:2/8-bit) →
3840x2160@30Hz(RGB, YCbCr4:4:4, YCbCr4:2:2/8~16-bit) →
3840x2160@30Hz(RGB, YCbCr4:4:4, YCbCr4:2:2/8-bit) →
4096x2160@24Hz(RGB, YCbCr4:4:4, YCbCr4:2:2/8~16-bit) →
4096x2160@24Hz(RGB, YCbCr4:4:4, YCbCr4:2:2/8-bit) →
4096x2160@25Hz(RGB, YCbCr4:4:4, YCbCr4:2:2/8~16-bit) →
4096x2160@25Hz(RGB, YCbCr4:4:4, YCbCr4:2:2/8-bit) →
4096x2160@30Hz(RGB, YCbCr4:4:4, YCbCr4:2:2/8~16-bit) →
4096x2160@30Hz(RGB, YCbCr4:4:4, YCbCr4:2:2/8-bit) →
3840x2160@50Hz(RGB, YCbCr4:4:4, YCbCr4:2:2, YCbCr4:2:0/8~16-bit) →
3840x2160@50Hz(YCbCr4:2:0/8bit) →
3840x2160@60Hz(RGB, YCbCr4:4:4, YCbCr4:2:2, YCbCr4:2:0/8~16-bit) →
3840x2160@60Hz(YCbCr4:2:0/8bit) →
4096x2160@50Hz(RGB, YCbCr4:4:4, YCbCr4:2:2, YCbCr4:2:0/8~16-bit) →
4096x2160@50Hz(YCbCr4:2:0/8bit) →
4096x2160@60Hz(RGB, YCbCr4:4:4, YCbCr4:2:2, YCbCr4:2:0/8~16-bit) →
4096x2160@60Hz(YCbCr4:2:0/8bit) →

***6 AUTO**

Defaults to Fix "4K2K" mode, however, if the connected sink does not support 4K, then the signal will be down scaled to 1080p.

Default settings are in bold font

Note: When input timing is non-VESA compliant the OSD may be disabled.

To get into the OSD menu in this case, please press the hot key combination to enter into test pattern mode and operate the OSD menu while the test pattern is displaying.

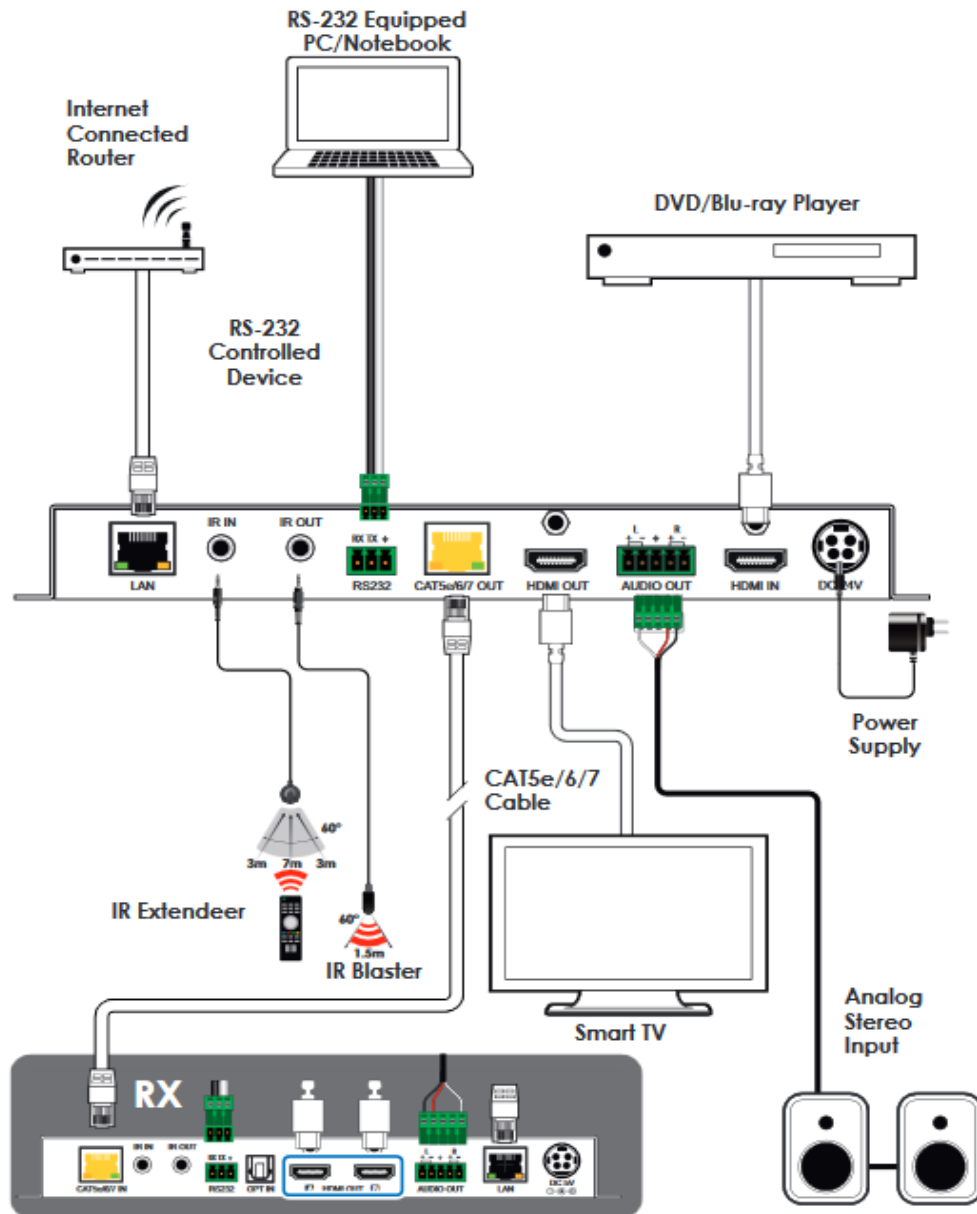
Specifications

Input Video Bandwidth	600MHz/18G
Output Video Bandwidth	340MHz/10.2Gbps - HDBaseT 600MHz/18Gbps - HDMI
Input Ports	1 x HDMI, 1 x IR 1 x LAN, 1 x RS-232, 1 x IR, 1 x USB (Service),
Output ports	1 x Cat.5e/6/7, 1, 1 x HDMI 1 x IR, 1 x L/R (Balanced Audio)
IR Frequency	20~60kHz
Baud Rate	Up to 115200 bps
Power Supply	24VDC/2.7A (US/EU standards, CE/FCC/UL certified)
ESD Protection	Human Body model: ± 8kV (air-gap discharge) ± 4kV (contact discharge)
Dimensions	231.5mm×25mm x 108mm (W×H×D)
Weight	648g
Chassis Material	Metal
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 (no condensation)
Power Consumption	20.28w

Note:

HDMI cable distance can be impacted by the materials and design of the cable used. The use of "Premium High Speed HDMI" cables is highly recommended.

Connection Diagram



Video Supports Specification

DVI and HDMI Supported (Hz)	Input	Output
640x480p@60	√	√
720x576i@50	√	√
720x576p@50	√	√
800x600@56/60/72/75/85	√	√
1024x768@60/70/75/85	√	√
1280x720p@50/60	√	√
1280x768@60/75	√	√
1280x800@60/75	√	√
1280x1024@60/75	√	√
1366x768@60	√	√
1400x1050@60/75	√	√
1440x900@60/75	√	√
1600x900@60	√	√
1600x1200@60	√	√
1680x1050@60	√	√
1920x1080i@50/60	√	√
1920x1080p@24/25/30/50/60	√	√
1920x1200@60	√	√
3840x2160@24/25/30/50/60	√	√
4096x2160@24/25/30/50/60	√	√

Audio Specification

Input Level/ Freq	Output Terminal	Output Level	THD+N	Frequency Response	SNR	Crosstalk
HDMI 0dBFS 1KHz	HDMI	0dB~-1dB	<0.01 %	±1dB	>80dB	<-80dB
	L/R	Vrms±10% 4Vrms±10%	<0.1%	±3dB	>70dB	<-60dB
OAR 0dBFs	L/R	Vrms±10% 4Vrms±10%	<0.1%	±3dB	>70dB	<-60dB