



CSC-6012TX & CSC-6012RX

4K UHD+ HDMI over HDBaseT
Scaling Transmitter and Receiver



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 (DD/MM/YY)	SUMMARY OF CHANGE
RDV1	30/08/16	Preliminary release
VS1	20/06/17	Updated text/diagrams



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1. INTRODUCTION

Transmitter

This HDMI to HDMI/HDBaseT Scaling Transmitter 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 1080p@60Hz, if necessary, in order to fit within HDBaseT bandwidth limitations. Simple 18Gbps HDMI test patterns are also available to be output. Control of remote devices is possible via bi-directional RS-232 or IR as well as via 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.

Receiver

This HDBaseT to Dual HDMI Scaling Receiver can receive uncompressed audio/video along with control, Ethernet, and extra audio data over a single run of Cat.5e/6/7 cable up to 100m. While the HDBaseT input is limited to a maximum of 4K@60Hz (4:2:0, 8-bit), this unit can automatically convert or scale the input to output at 4K@60Hz (4:4:4, 8-bit) depending on the detected capability of the connected display. Simple 18Gbps HDMI test patterns are also available to be output for easy testing of local equipment. Control of remote devices is possible via bi-directional RS-232 or IR as well as via a LAN connection. Digital OAR (Optical Audio Return) support at 48kHz and a balanced analog audio output provides users with additional audio flexibility. The 48V PoH design can receive power from the connected Transmitter (PSE), eliminating the need for a local power supply, however power via 5V power supply is also supported if needed.

2. 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

3. PACKAGE CONTENTS

Transmitter

- 1×HDMI over HDBaseT Scaling Transmitter
- 1×IR Blaster Cable
- 1×IR Extender Cable
- 1×Terminal Block (3-pin)
- 1×Terminal Block (5-pin)
- 1×Power Cord
- 1×24V/2.7A DC Power Adaptor
- 1×Operation Manual

Receiver

- 1×HDMI over HDBaseT Scaling Receiver
- 1×IR Blaster Cable
- 1×IR Extender Cable
- 1×Terminal Block (3-pin)
- 1×Terminal Block (5-pin)
- 1×5V/3A DC Power Adaptor
- 1×Operation Manual

4. SYSTEM REQUIREMENTS

- HDMI source equipment such as media players, video game consoles or set-top boxes.
- HDMI receiving equipment such as HDTVs, monitors or audio amplifiers.
- Transmitter requires a compatible HDBaseT™ receiver with 48V PoH support. An HDBaseT™ receiver equipped with Optical Audio Return (OAR) channel support are strongly recommended.
- Receiver requires a compatible HDBaseT™ transmitter as a video source. An HDBaseT™ transmitter equipped with Optical Audio Return (OAR) channel support and 48V PoH is strongly recommended.

Notes:

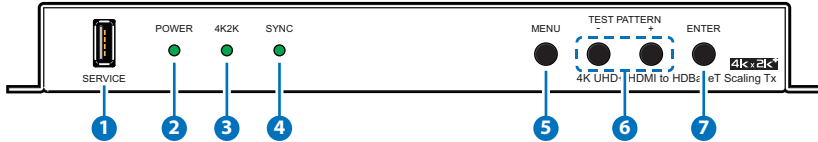
- *When displaying 4K HDR, or an equivalent signal, an appropriate display is required in order to obtain the best image.*
- *HDMI cable distance can be impacted by the materials and design of the cable used. The use of "Premium High Speed HDMI" cables is highly recommended.*

5. FEATURES

- Supports the HDBaseT 1.0 specification
- HDBaseT 5Play™ convergence: High-Definition (HD) Video and Audio, 100BaseT Ethernet, 48V PoH, and Control (Bi-directional IR/RS-232 pass-through)
- Supports UHD resolutions up to 3840×2160@50/60Hz (YUV 4:4:4) & 4096×2160@50/60Hz (YUV 4:4:4)
- Supports pass-through of all standard digital audio: LPCM 2.0/5.1/7.1, Bitstream & HD Bitstream
- Supports RS-232 baud rates from 110~115200bps
- 10/100 Ethernet network support
- Fully compliant with HDMI 1.4, and compatible with HDMI 2.0 (4K@60Hz, YUV 4:2:0)
- HDMI with 18Gbps (600MHz) 4K support and HDCP 2.2 compliant
- Supports Deep Color up to 1080p/12-bit
- Supports DVI to HDMI conversion
- Supports signal bypass on HDMI output (on the Transmitter)
- Transmitter can upscale 1080p signals to 4K over HDBaseT output or downscale 4K signal to 1080p (same framerate is maintained)
- Receiver supports signal bypass on both outputs or output B can upscale 1080p signals to 4K and output A can downscale a 4K signal to 1080p (same framerate is maintained)
- Supports 4K UHD (4:4:4) to 4K UHD (4:2:0) conversion
- Supports OAR (Optical Audio Return) and DAC balanced audio conversion
- Test pattern generation at select resolutions for on-site display testing
- Integrated EDID management
- OSD with instant I/O resolution display

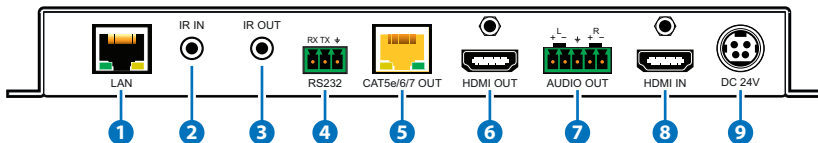
6. OPERATION CONTROLS AND FUNCTIONS

6.1 Transmitter's 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 DOWN & UP/TEST PATTERN:** When the OSD menu is in use, press these buttons to move within the menu. Outside of the OSD, press these buttons together to instantly set the output timing to 1280×720@60Hz and display a test pattern on both outputs.
- 7 ENTER:** Press to confirm a selection or to go deeper into a menu item.

6.2 Transmitter's Rear Panel

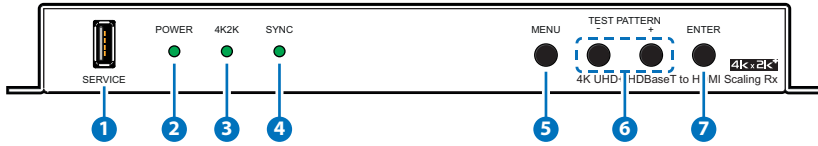


- 1 LAN:** Connect to an Ethernet supporting device or to your local network as appropriate. The yellow LED will illuminate to indicate a successful LAN connection between the Transmitter and Receiver, however, if the yellow LED blinks irregularly it indicates a data link error. The green LED will illuminate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

speed is 100Mbit/s.

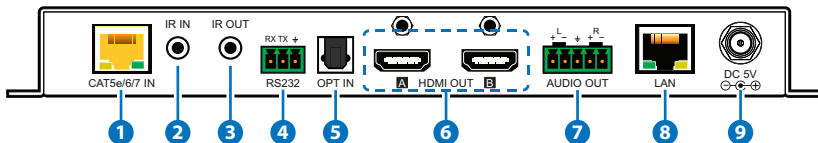
- 2 **IR IN:** Connect to the provided IR Extender to extend the IR control range of remotely located devices. Ensure that the remote being used is within direct line-of-sight of the IR Extender.
- 3 **IR OUT:** Connect to the provided IR Blaster to transmit IR signals to devices within direct line-of-sight 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 a compatible 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. 48V PoH will be provided to compatible Receivers only.
- 6 **HDMI OUT:** 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. (Follows balanced audio specifications.)
- 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.

6.3 Receiver's 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. Once within the OSD press this button a second time to exit. Press and hold this button together with the "-" button for 3 seconds to reset the unit back to factory defaults.
- 6 DOWN & UP/TEST PATTERN:** When the OSD menu is in use, press these buttons to move within the menu. Outside of the OSD, press these buttons together to instantly set the output timing to 1280×720@60Hz and display a test pattern on both outputs.
- 7 ENTER:** Press to confirm a selection or to go deeper into a menu item.

6.4 Receiver's Rear Panel

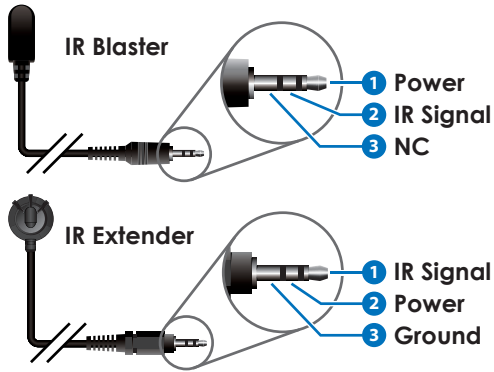


- 1 CAT5e/6/7 IN:** Connect to a compatible Transmitter unit with a single Cat.5e/6/7 cable for transmission of all data signals. The yellow LED will illuminate to indicate a successful data connection between the Transmitter and Receiver. The green LED will illuminate to indicate when PoH is active.
- 2 IR IN:** Connect to the provided IR Extender to extend the IR control

range of remotely located devices. Ensure that the remote being used is within 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 the device you wish to control via a 3-pin adapter cable to receive RS-232 commands from the Transmitter. For sending commands to the Transmitter side, depending on your equipment's pinout, the Tx and Rx pins might need to be reversed.
- 5 **OPT. IN:** Connect to the optical audio output of a device such as a media player or game console using an appropriate optical cable. The audio will be sent back to the Transmitter via the OAR (Optical Audio Return) feature.
- 6 **HDMI OUT A~B:** Connect to HDMI TVs, monitors or amplifiers for digital video and audio output. The selected output resolution can be different for each HDMI port. 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 source with LPCM 2.0 audio. (Follows balanced audio specifications.)
- 8 **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.
- 9 **DC 5V:** Plug the 5V DC power adapter into the unit and connect it to an AC wall outlet for power. (Not required if the unit is being powered by a 48V PoH Transmitter.)

6.5 IR Cable Pin Assignment



6.6 OSD Menu

6.6.1 Transmitter's OSD Menu

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
OUTPUT	OUTPUT HDBaseT	INPUT 4K2K	DOWN 1080P
			FIX 4K2K
			AUTO
	OUTPUT HDMI	INPUT 1080P	PASS THROUGH
			UP 4K2K
			UP 4K2K (YUV420)
		INPUT 4K2K	PASS THROUGH
			FIX 4K2K (YUV420)
			FIX 8 BITS
AUDIO	AUDIO SOURCE	HDMI	
		OAR	
EDID	INTERNAL 4K (6G-2CH)		
	INTERNAL 4K (3G-2CH)		
	INTERNAL 4K (420-2CH)		
	INT 1080P (2CH)		
	EXTERNAL HDBaseT		
	EXTERNAL HDMI		
	EXTERNAL HDBaseT (2CH)		
	EXTERNAL HDMI (2CH)		
HDCP	HDCP SUPPORT OFF		
	REFER TO SOURCE		

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
HDCP (cont.)	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	720×480P@60	
		720×576P@50	
		1280×720P@50	

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
TEST PATTERN HDBaseT (cont.)	RESOLUTION	1280×720P@60	
		1920×1080P@50	
		1920×1080P@60	
		3840×2160P@24	
		3840×2160P@25	
		3840×2160P@30	
		4096×2160P@24	
		4096×2160P@25	
		4096×2160P@30	
	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	720×480P@60	
		720×576P@50	
		1280×720P@50	
		1280×720P@60	
		1920×1080P@50	
		1920×1080P@60	
		3840×2160P@24	
		3840×2160P@25	
		3840×2160P@30	
		4096×2160P@24	

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
TEST PATTERN HDBaseT (cont.)	AUTO TIMING SELECT	4096×2160P@25	
		4096×2160P@30	
TEST PATTERN HDMI	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	720×480P@60	
		720×576P@50	
		1280×720P@50	
		1280×720P@60	
		1920×1080P@50	
		1920×1080P@60	
		3840×2160P@24	
		3840×2160P@25	
		3840×2160P@30	
		4096×2160P@24	
		4096×2160P@25	
		4096×2160P@30	
		3840×2160P@50	

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
TEST PATTERN HDMI (cont.)	RESOLUTION	3840×2160P@60	
		4096×2160P@50	
		4096×2160P@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	720×480P@60	
		720×576P@50	
		1280×720P@50	
		1280×720P@60	
		1920×1080P@50	
		1920×1080P@60	
		3840×2160P@24	
		3840×2160P@25	
		3840×2160P@30	
		4096×2160P@24	
		4096×2160P@25	
		4096×2160P@30	
		3840×2160P@50	
		3840×2160P@60	
		4096×2160P@50	
		4096×2160P@60	

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
INFORMATION	RESOLUTION	INPUT	
		HDBaseT OUTPUT	
		HDMI OUTPUT	
	HDCP	HDBaseT OUTPUT	
		HDMI OUTPUT	
	FIRMWARE	SYSTEM VERSION	
		VALENS VERSION	
FIRMWARE UPDATE			
FACTORY SETTING			

Note:

- Values in **Bold** are factory default settings.
- When input timing is non-VESA compliant the OSD may be disabled. To get into the OSD menu in this case, press the hot key combination to enter into test pattern mode and operate the OSD menu while the test pattern is displaying.

6.6.2 Receiver's OSD Menu

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
OUTPUT	OUTPUT A	INPUT 4K2K	PASS THROUGH
			DOWN 1080P
			FIX 4K2K (RGB444)
			FIX 4K2K (YUV444)
			AUTO
	OUTPUT B	INPUT 1080P	PASS THROUGH
			UP 4K2K
			UP 4K2K (YUV420)
		INPUT 4K2K	PASS THROUGH
			FIX 4K2K (RGB444)
			FIX 4K2K (YUV444)
			4K2K COLOR AUTO FIX
EDID	INTERNAL 4K (3G-2CH)		
	INTERNAL 4K (420-2CH)		
	INTERNAL 1080P (2CH)		
	EXTERNAL OUT A		
	EXTERNAL OUT B		
	EXTERNAL OUT A (2CH)		
	EXTERNAL OUT B (2CH)		
HDCP	HDCP SUPPORT OFF		
	REFER TO SOURCE		
	REFER TO DISPLAY		
OSD	DISPLAY INFO.	ON	

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
OSD (cont.)	DISPLAY INFO.	OFF	
	OSD TIME OUT	OFF	
		5 SEC.	
		10 SEC.	
		15 SEC.	
		20 SEC.	
		25 SEC.	
		30 SEC.	
		35 SEC.	
		40 SEC.	
TEST PATTERN A	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	720×480P@60	
		720×576P@50	
		1280×720P@50	
		1280×720P@60	
		1920×1080P@50	

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
TEST PATTERN A (cont.)	RESOLUTION	1920×1080P@60	
		3840×2160P@24	
		3840×2160P@25	
		3840×2160P@30	
		4096×2160P@24	
		4096×2160P@25	
		4096×2160P@30	
	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	720×480P@60	
		720×576P@50	
		1280×720P@50	
		1280×720P@60	
		1920×1080P@50	
		1920×1080P@60	
		3840×2160P@24	
		3840×2160P@25	
		3840×2160P@30	
		4096×2160P@24	
		4096×2160P@25	
		4096×2160P@30	

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
TEST PATTERN B (cont.)	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	720×480P@60	
		720×576P@50	
		1280×720P@50	
		1280×720P@60	
		1920×1080P@50	
		1920×1080P@60	
		3840×2160P@24	
		3840×2160P@25	
		3840×2160P@30	
		4096×2160P@24	
		4096×2160P@25	
		4096×2160P@30	
		3840×2160P@50	
		3840×2160P@60	
		4096×2160P@50	

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
TEST PATTERN B (cont.)	RESOLUTION	4096×2160P@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	720×480P@60	
		720×576P@50	
		1280×720P@50	
		1280×720P@60	
		1920×1080P@50	
		1920×1080P@60	
		3840×2160P@24	
		3840×2160P@25	
		3840×2160P@30	
		4096×2160P@24	
		4096×2160P@25	
		4096×2160P@30	
		3840×2160P@50	
		3840×2160P@60	
		4096×2160P@50	
		4096×2160P@60	
INFORMATION	RESOLUTION	INPUT	
		OUTPUT A	

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
INFORMATION (cont.)	RESOLUTION	OUTPUT B	
	HDCP	OUTPUT A	
		OUTPUT B	
	FIRMWARE	SYSTEM VERSION	
		VALENS VERSION	
FIRMWARE UPDATE			
FACTORY SETTING			

Note:

- Values in **Bold** are factory default settings.
- When input timing is non-VESA compliant the OSD may be disabled. To get into the OSD menu in this case, press the hot key combination to enter into test pattern mode and operate the OSD menu while the test pattern is displaying.

6.6.3 Common Conversion Rules

- **DOWN 1080P**

Input Resolution (Hz)		Output Resolution (Hz)
3840×2160p@24	→	1920×1080p@24
3840×2160p@25	→	1920×1080p@25
3840×2160p@30	→	1920×1080p@30
3840×2160p@50	→	1920×1080p@50
3840×2160p@60	→	1920×1080p@60
4096×2160p@24	→	1920×1080p@24
4096×2160p@25	→	1920×1080p@25
4096×2160p@30	→	1920×1080p@30
4096×2160p@50	→	1920×1080p@50
4096×2160p@60	→	1920×1080p@60

- **UP 4K2K**

Input Resolution (Hz)		Output Resolution (Hz)
1920×1080p@24	→	3840×2160p@24
1920×1080p@25	→	3840×2160p@25
1920×1080p@30	→	3840×2160p@30
1920×1080p@50	→	3840×2160p@50
1920×1080p@60	→	3840×2160p@60

- **UP 4K2K (YUV420)**

Input Resolution (Hz)		Output Resolution (Hz)
RGB 4:4:4 & YCbCr 4:4:4/4:2:2		YCbCr 4:2:0
1920×1080p@50	→	3840×2160p@50
1920×1080p@60	→	3840×2160p@60

6.6.4 Transmitter's Conversion Rules

- **FIX 4K2K**

Input Resolution (Hz)	Output Resolution (Hz)
RGB 4:4:4 & YCbCr 4:4:4/4:2:2, 8/10/12/16-bit	RGB 4:4:4 & YCbCr 4:4:4/4:2:2, 8-bit
3840×2160p@24	→ 3840×2160p@24
3840×2160p@25	→ 3840×2160p@25
3840×2160p@30	→ 3840×2160p@30
4096×2160p@24	→ 4096×2160p@24
4096×2160p@25	→ 4096×2160p@25
4096×2160p@30	→ 4096×2160p@30
RGB 4:4:4 & YCbCr 4:4:4/4:2:2/4:2:0, 8/10/12/16-bit	YCbCr 4:2:0, 8-bit
3840×2160p@50	→ 3840×2160p@50
3840×2160p@60	→ 3840×2160p@60
4096×2160p@50	→ 4096×2160p@50
4096×2160p@60	→ 4096×2160p@60

- **FIX 4K2K (YUV420)**

Input Resolution (Hz)	Output Resolution (Hz)
RGB 4:4:4 & YCbCr 4:4:4/4:2:2	YCbCr 4:2:0
3840×2160p@50	→ 3840×2160p@50
3840×2160p@60	→ 3840×2160p@60
4096×2160p@50	→ 4096×2160p@50
4096×2160p@60	→ 4096×2160p@60

- **FIX 8 BITS**

Input Resolution (Hz)		Output Resolution (Hz)
RGB 4:4:4 & YCbCr 4:4:4/4:2:2, 10/12/16-bit		RGB 4:4:4 & YCbCr 4:4:4/4:2:2, 8-bit
3840×2160p@24	→	3840×2160p@24
3840×2160p@25	→	3840×2160p@25
3840×2160p@30	→	3840×2160p@30
4096×2160p@24	→	4096×2160p@24
4096×2160p@25	→	4096×2160p@25
4096×2160p@30	→	4096×2160p@30
YCbCr 4:2:0, 10/12/16-bit		YCbCr 4:2:0, 8-bit
3840×2160p@50	→	3840×2160p@50
3840×2160p@60	→	3840×2160p@60
4096×2160p@50	→	4096×2160p@50
4096×2160p@60	→	4096×2160p@60

- **AUTO**

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

6.6.5 Receiver's Conversion Rules

- **FIX 4K2K (RGB444)**

Input Resolution (Hz)	Output Resolution (Hz)
RGB 4:4:4 & YCbCr 4:4:4/4:2:2	RGB 4:4:4
3840×2160p@24	→ 3840×2160p@24
3840×2160p@25	→ 3840×2160p@25
3840×2160p@30	→ 3840×2160p@30
4096×2160p@24	→ 4096×2160p@24
4096×2160p@25	→ 4096×2160p@25
4096×2160p@30	→ 4096×2160p@30
RGB 4:4:4 & YCbCr 4:4:4/4:2:2/4:2:0	RGB 4:4:4
3840×2160p@50	→ 3840×2160p@50
3840×2160p@60	→ 3840×2160p@60
4096×2160p@50	→ 4096×2160p@50
4096×2160p@60	→ 4096×2160p@60

- **FIX 4K2K (YUV444)**

Input Resolution (Hz)	Output Resolution (Hz)
RGB 4:4:4 & YCbCr 4:4:4/4:2:2	YCbCr 4:4:4
3840×2160p@24	→ 3840×2160p@24
3840×2160p@25	→ 3840×2160p@25
3840×2160p@30	→ 3840×2160p@30
4096×2160p@24	→ 4096×2160p@24
4096×2160p@25	→ 4096×2160p@25
4096×2160p@30	→ 4096×2160p@30
RGB 4:4:4 & YCbCr 4:4:4/4:2:2/4:2:0	YCbCr 4:4:4
3840×2160p@50	→ 3840×2160p@50
3840×2160p@60	→ 3840×2160p@60
4096×2160p@50	→ 4096×2160p@50
4096×2160p@60	→ 4096×2160p@60

- **AUTO**

If the input is RGB and the output supports RGB.

Input Resolution (Hz)	Output Resolution (Hz)
RGB 4:4:4	RGB 4:4:4
3840×2160p@24	→ 3840×2160p@24
3840×2160p@25	→ 3840×2160p@25
3840×2160p@30	→ 3840×2160p@30
3840×2160p@50	→ 3840×2160p@50
3840×2160p@60	→ 3840×2160p@60
4096×2160p@24	→ 4096×2160p@24
4096×2160p@25	→ 4096×2160p@25
4096×2160p@30	→ 4096×2160p@30
4096×2160p@50	→ 4096×2160p@50
4096×2160p@60	→ 4096×2160p@60

If the input is YUV 4:4:4, and the output can support it, then the output will be YUV 4:4:4. If the input is YUV 4:4:4, and the output can't support it, then the output will be converted to RGB 4:4:4.

Input Resolution (Hz)	Output Resolution (Hz)
YCbCr 4:4:4	RGB 4:4:4 & YCbCr 4:4:4
3840×2160p@24	→ 3840×2160p@24
3840×2160p@25	→ 3840×2160p@25
3840×2160p@30	→ 3840×2160p@30
3840×2160p@50	→ 3840×2160p@50
3840×2160p@60	→ 3840×2160p@60
4096×2160p@24	→ 4096×2160p@24
4096×2160p@25	→ 4096×2160p@25
4096×2160p@30	→ 4096×2160p@30
4096×2160p@50	→ 4096×2160p@50
4096×2160p@60	→ 4096×2160p@60

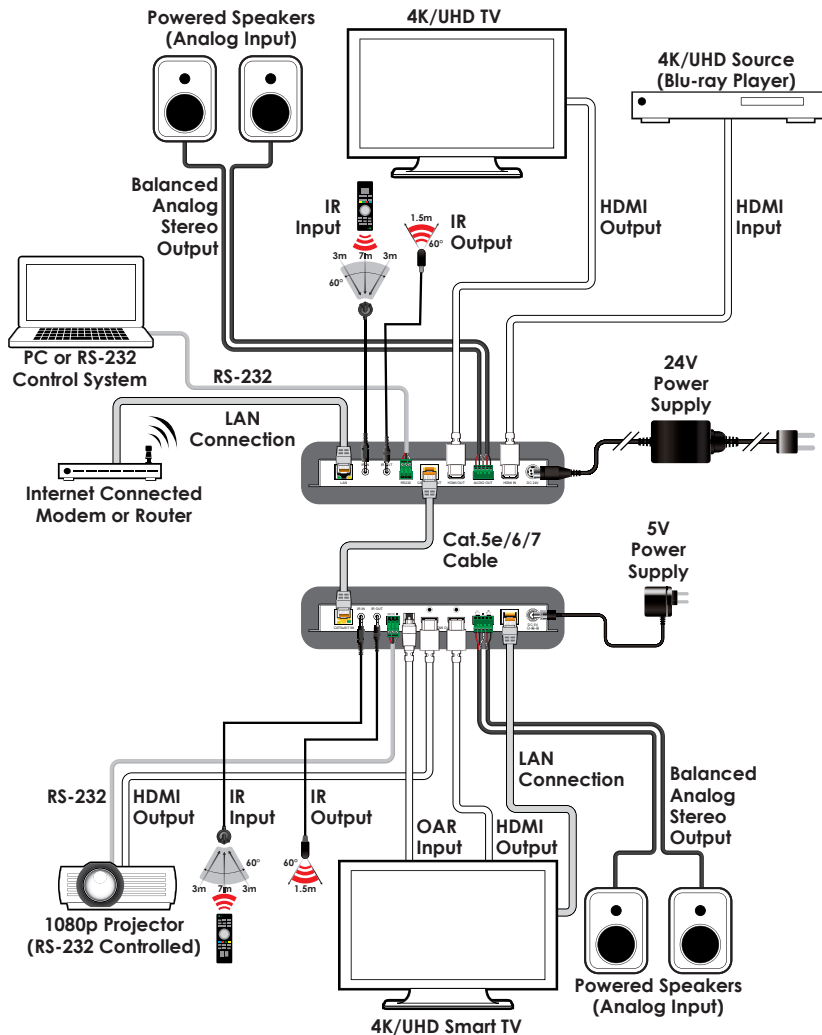
If the input is YUV 4:2:2, and the output can support it, then the output will be YUV 4:2:2. If the output does not support YUV 4:2:2 but does support YUV 4:4:4, then the output will be YUV 4:4:4. If the output does not support YUV 4:2:2 or 4:4:4, then the output will be RGB.

Input Resolution (Hz)	Output Resolution (Hz)
YCbCr 4:2:2	RGB 4:4:4 & YCbCr 4:4:4/4:2:2
3840×2160p@24	→ 3840×2160p@24
3840×2160p@25	→ 3840×2160p@25
3840×2160p@30	→ 3840×2160p@30
3840×2160p@50	→ 3840×2160p@50
3840×2160p@60	→ 3840×2160p@60
4096×2160p@24	→ 4096×2160p@24
4096×2160p@25	→ 4096×2160p@25
4096×2160p@30	→ 4096×2160p@30
4096×2160p@50	→ 4096×2160p@50
4096×2160p@60	→ 4096×2160p@60

If the input is YUV 4:2:0, and the output is not 18Gbps capable, then the output will be YUV 4:2:0. If the output is 18Gbps capable and supports YUV 4:4:4, then the output will be YUV 4:4:4. If the output is 18Gbps capable, but does not support YUV 4:4:4, then the output will be RGB.

Input Resolution (Hz)	Output Resolution (Hz)
YCbCr 4:2:0	RGB 4:4:4 & YCbCr 4:4:4/4:2:0
3840×2160p@50	→ 3840×2160p@50
3840×2160p@60	→ 3840×2160p@60
4096×2160p@50	→ 4096×2160p@50
4096×2160p@60	→ 4096×2160p@60

7. CONNECTION DIAGRAM



8. SPECIFICATIONS

8.1 Technical Specifications

Transmitter

Video Bandwidth	HDMI: 600MHz/18Gbps HDBaseT: 340MHz/10.2Gbps
Input Ports	1×HDMI
Output Ports	1×HDMI, 1×Cat.5e/6/7 1×Balanced Stereo Audio (5-pin Terminal Block)
Control Interfaces	1×IR Blaster (3.5mm) 1×IR Extender (3.5mm) 1×RS-232 (3-pin Terminal Block) 1×LAN (RJ45)
HDMI Cable Length	10m (1080p@60Hz, 12-bit) 5m (4K@60Hz, 4:4:4, 8-bit)
IR Frequency	30 - 50kHz (30 - 60kHz under ideal conditions)
Baud Rate	Up to 115200bps
Power Supply	24V/2.7A DC (US/EU standards, CE/FCC/UL certified)
ESD Protection	Human Body Model: ±12kV (Air Discharge) ±8kV (Contact Discharge)
Dimensions	231.5mm×25mm×108mm (W×H×D) [Case Only] 231.5mm×25mm×117mm (W×H×D) [All Inclusive]
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 (Non-condensing)
Power Consumption	20.28W
Receiver	
Video Bandwidth	HDMI: 600MHz/18Gbps HDBaseT: 340MHz/10.2Gbps
Input Ports	1×Cat.5e/6/7 1×S/PDIF Audio (TOSLINK)
Output Ports	2×HDMI 1×Balanced Stereo Audio (5-pin Terminal Block)
Control Interfaces	1×IR Blaster (3.5mm) 1×IR Extender (3.5mm) 1×RS-232 (3-pin Terminal Block) 1×LAN (RJ45)
HDMI Cable Length	10m (1080p@60Hz, 12-bit) 5m (4K@60Hz, 4:4:4, 8-bit)
IR Frequency	30 - 50kHz (30 - 60kHz under ideal conditions)
Baud Rate	Up to 115200bps
Power Supply	5V/3A DC (US/EU standards, CE/FCC/UL certified)
ESD Protection	Human Body Model: ±12kV (Air Discharge) ±8kV (Contact Discharge)
Dimensions	231.5mm×25mm×108mm (W×H×D) [Case Only] 231.5mm×25mm×117mm (W×H×D) [All Inclusive]
Weight	670g



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 (Non-condensing)
Power Consumption	13.86W

8.2 Video Specifications

Supported Resolutions (Hz)	HDMI Input	HDMI Output
640×480@60	✓	✓
800×600@56/60/72/75/85	✓	✓
1024×768@60/70/75/85	✓	✓
1280×768@60/75	✓	✓
1280×800@60/75	✓	✓
1280×1024@60/75	✓	✓
1366×768@60	✓	✓
1400×1050@60/75	✓	✓
1440×900@60/75	✓	✓
1600×900@60	✓	✓
1600×1200@60	✓	✓
1680×1050@60	✓	✓
1920×1200@60	✓	✓
720×480i@60	✓	✓
720×480p@60	✓	✓
720×576i@50	✓	✓
720×576p@50	✓	✓
1280×720p@50/60	✓	✓
1920×1080i@50/60	✓	✓

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

8.3 Audio Specifications

Input Level/Freq.	Output Terminal	Output Level	THD+N	Frequency Response	SNR	Crosstalk
HDMI 0dBFS, 1kHz	Balanced L/R	4Vrms±10%	< 0.1%	±3dB	> 70dB	< -60dB
Optical 0dBFS, 1kHz	Balanced L/R	4Vrms±10%	< 0.1%	±3dB	> 70dB	< -60dB

8.4 Cable Specifications

Cable Type	Cable Length	Supported Video Format
Cat.5e/6/6a/7	100 meters	Full HD video: - Up to 1080p@60Hz, 12-bit color - Data rates lower than 5.3Gbps or below 225MHz TMDS clock
Cat.5e/6/6a/7	70 meters	Ultra HD video: 4K@24/25/30Hz & 4K@50/60Hz (YUV 4:2:0), 8-bit color - Data rates higher than 5.3Gbps or above 225MHz TMDS clock

8.5 HDBaseT Features

Features	Transmitter	Receiver
Audio/Video	✓	✓
Control (IR & RS-232)	✓	✓
Power Source Equipment (PSE)	✓	
Powered Device (PD)		
LAN	✓	✓

9. ACRONYMS

ACRONYM	COMPLETE TERM
Cat.5e	Category 5 (enhanced) Cable
Cat.6	Category 6 Cable
Cat.7	Category 7 Cable
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
IR	Infrared
LAN	Local Area Network
LPCM	Linear Pulse-Code Modulation
OAR	Optical Audio Return
OSD	On-Screen Display
PD	Powered Device
PoH	Power over HDBaseT
PSE	Power Sourcing Equipment
S/PDIF	Sony/Philips Digital Interface Format
UHD	Ultra-High-Definition
USB	Universal Serial Bus
VGA	Video Graphics Array (640×480@60Hz)
WUXGA	Wide Ultra Extended Graphics Array (1920×1200@60Hz)



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