

User Manual

TPUH610S

18G HDMI Extender with Audio Breakout



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Version: TPUH610S_2019V1.3

Statement

Thanks for choosing this product, please read this user manual carefully before using this product. The functions described in this version are updated till May, 2019. In the constant effort to improve our product, we reserve the right to make functions or parameters changes without notice or obligation.

Safety Precaution

- Do not dismantle the housing or modify the module to avoid electrical shock or burn.
- Using supplies not meeting the products' specifications may cause damage, deterioration or malfunction.
- Do not expose the unit to rain, moisture or install this product near water.
- Install the device in a place with fine ventilation.
- Do not twist or pull by force ends of the optical cable. It can cause malfunction.
- Do not use liquid or aerosol cleaners to clean this unit.
- Always unplug the power to the device before cleaning.
- Unplug the power when not used for a long period of time.
- Refer all servicing to qualified service personnel.

After-sales Service

We provide limited warranty for the product within three years.

Packing List

- 1x TPUH610ST Transmitter
- 2x TX Mounting Ears with 4 Screws
- 4x TX Plastic Cushions
- 1x 3-pin Terminal Block
- 1x Power Adapter (24V DC 1.25A)
- 1x TPUH610SR Receiver
- 2x RX Mounting Ears with 4 Screws
- 4x RX Plastic Cushions
- 1x RS232 Cable (3-pin to DB9)
- 1x User Manual

Note: Please contact your distributor immediately if any damage or defect in the components is found.

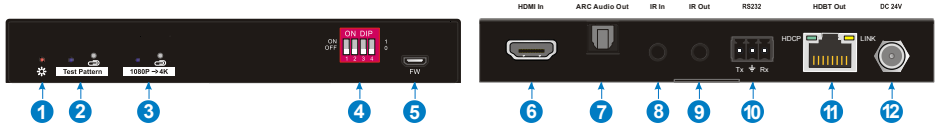
Product Introduction

Thanks for choosing the TPUH610S HDMI 2.0 Extender, which consists of a transmitter and a receiver. It can extend 4K video to distance up to 131 feet (40 meters) and 1080P video to distances up to 230 feet (70 meters) over a single CATx cable. It supports audio de-embedded and ARC. It also supports bidirectional IR and RS232 pass-through to control source or display device remotely. PoC feature allows the transmitter and the receiver can be powered from each other and only one power adapter is needed in system. Besides passing EDID information from the display, there are multiple built-in EDID settings can be selected by the 4-pin DIP switch on the front panel of transmitter. Moreover, the extender supports convenient firmware upgrade through Micro-USB port.

Features

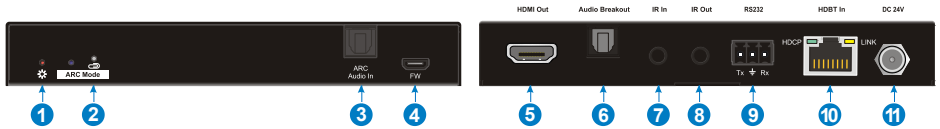
- Supports HDMI 2.0 and the HDMI video resolution up to 4K@60Hz 4:4:4 HDR.
- HDMI input supports HDCP 2.2 and the output support HDCP Active or HDCP Passive mode.
- Extends 4K signals to distances up to 131 feet (40 meters) and 1080P signals to distances up to 230 feet (70 meters) over a single CATx cable.
- Supports video resolution up-scaling, the 1080P input can be automatically upgraded to 4K output.
- SPDIF out on receiver for source audio de-embedding.
- 18Gbps high bandwidth.
- Advanced EDID management: multiple built-in EDID settings can be selected.
- Test pattern provides a built-in 4K/1080P image for troubleshooting.
- Bidirectional IR, RS232 and 24V PoC.
- Supports ARC.
- Supports CEC pass-through.
- Provides LEDs to indicate the current operating status.
- Firmware upgrade by Micro-USB port.

Transmitter Panel Description



- ① **Power LED:** The LED illuminates red when power is applied.
- ② **Test Pattern:** Press the button with paper clip or other sharp tool to enable the test pattern, and the left LED illuminates blue, the product generates an image of 1080P/60Hz color bar to output; Press this button again, the left LED blinks blue at an interval of 500ms, the product generates an image of 4K/60Hz 4:4:4 color bar to output. Press and hold this button for three seconds again can exit the Test Pattern mode.
- ③ **1080P → 4K:** Press and hold the button at least three seconds with paper clip or other sharp tool to enable 1080P to 4K up-scaling, and then the left LED illuminates blue. Press and hold it again to exit.
- ④ **EDID:** 4-pin DIP switch for EDID setting and HDCP mode selection. Please refer to the **EDID Management** for more details.
- ⑤ **FW:** Micro-USB port for firmware upgrade and user-defined EDID upload.
- ⑥ **HDMI In:** Type-A female HDMI input port to connect a HDMI source.
- ⑦ **ARC Audio Out:** Toslink connector to connect speaker or amplifier for ARC audio output.
- ⑧ **IR In:** 3.5mm jack to connect the IR receiver for IR pass-through.
- ⑨ **IR Out:** 3.5mm jack to connect the IR emitter for IR pass-through.
- ⑩ **RS232:** 3-pin terminal block to connect the RS232 control device (e.g. PC) or a third-party device to be controlled.
- ⑪ **HDBT Out:** RJ45 port to connect the HDBT input port of receiver by CATx Ethernet cable. The LINK LED illuminates orange when there is a valid HDBaseT link between the transmitter and the receiver. The HDCP LED illuminates green when the video contains HDCP content.
- ⑫ **DC 24V:** DC connector for the power adapter connection.

Receiver Panel Description



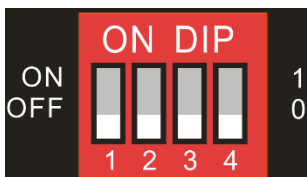
- ① **Power LED:** The LED illuminates red when power is applied.
- ② **ARC Mode:** Press the button with paper clip or other sharp tool to enable the ARC mode, and then the left LED illuminates blue. Press it again to exit the ARC mode and the LED is off.
- ③ **ARC Audio In:** Toslink connector to connect ARC audio source device (e.g.TV).
- ④ **FW:** Micro-USB port for firmware upgrade.
- ⑤ **HDMI Out:** Type-A female HDMI output port to connect HDMI display (e.g.TV).
- ⑥ **Audio Breakout:** If the ARC mode is OFF, the Toslink connector is connected to speaker or amplifier for HDMI source audio de-embedding. Note that if the ARC mode is ON, this port has no audio output.
- ⑦ **IR In:** 3.5mm jack to connect the IR receiver for IR pass-through.
- ⑧ **IR Out:** 3.5mm jack to connect the IR emitter for IR pass-through.
- ⑨ **RS232:** 3-pin terminal block to connect the RS232 control device (e.g. PC) or a third-party device to be controlled.
- ⑩ **HDBT In:** RJ45 port to connect the HDBT output port of transmitter by CATx Ethernet cable. The LINK LED illuminates orange when there is a valid HDBaseT link between the transmitter and the receiver. The HDCP LED illuminates green when the video contains HDCP content.
- ⑪ **DC 24V:** DC connector for the power adapter connection.

DIP Switch Operation

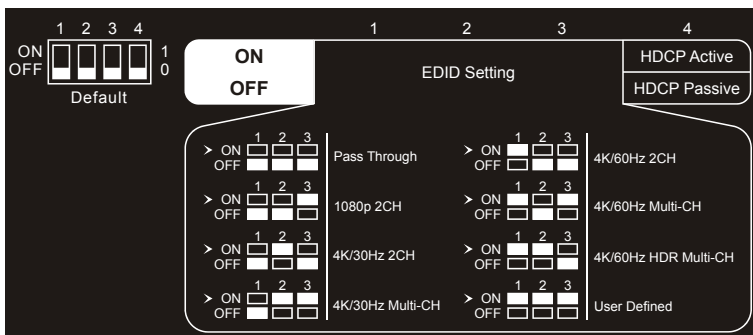
EDID Management

The Extended Display Identification Data (EDID) is used by the source device to match its video resolution with the connected display. By default, the source device obtains its EDID from the first connected display. Meanwhile, since the displays with different capabilities are connected to the extender, the DIP switch on the front panel of transmitter can be used to set the EDID to a fixed value to ensure the compatibility in video resolution.

The switch represents “0” when in the lower (**OFF**) position, and it represents “1” while putting the switch in the upper (**ON**) position.



Switch 1~3 are used for EDID setting. The DIP switch status and its corresponding setting are shown at the back of the product.



Switch Status	Video Resolution	Audio Format
000	Pass Through	
001	1080P	2CH
010	3840x2160@30Hz	2CH
011	3840x2160@30Hz	Multi-CH
100	3840x2160@60Hz	2CH
101	3840x2160@60Hz	Multi-CH
110	3840x2160@60Hz HDR	Multi-CH (Supports PCM 2CH, PCM5.1, Dolby)

		Digital 5.1,DTS 2CH)
111	User-defined EDID (Upload the EDID by Micro-USB port)	

Note:

- *2CH: Supports LPCM 2CH.*
- *Multi-CH: Supports LPCM 8CH, Dolby TrueHD, DTS-HD , Dolby Digital5.1, DTS 5.1, Dolby Digital Plus.*

● **User-defined EDID Setting**

Except directly invoking the built-in EDID, the specific EDID can be customized by following the below operation process.

- 1) Rename the user-defined EDID according the following format.

EC_xx_xxxxx_xxxx_xxx.bin

- EC: Fixed value
- xx: EDID ID. It is "15".
- xxxxx: Video resolution.
- xxx: Refresh rate.
- xxx: Audio format.

Example: EC_15_3840x2160_60Hz_Dolby.bin

- 2) Connect the **FW** port of transmitter to the PC with USB cable, and then power on the transmitter, the PC will automatically detect a virtual disk named of "BOOTDISK".
- 3) Double-click to open the disk, a file named of "READY.TXT" will be showed.
- 4) Copy the user-defined EDID (such as **EC_15_3840x2160_60Hz_Dolby.bin**) to the "BOOTDISK" disk.
- 5) Reopen the disk to check the filename "READY.TXT" whether automatically becomes "SUCCESS.TXT", if yes, the user-defined EDID was imported into the transmitter and saved as its corresponding EDID ID successfully.
- 6) Remove the USB cable, and then reboot the transmitter.
- 7) Now the new EDID can be invoked by setting the DIP switch status to "111".

HDCP Mode

Put the switch **4** on the “**ON**” position to select **HDCP Active** mode, or on the “**OFF**” position for **HDCP Passive** mode.

Switch Status	Mode	HDCP
OFF (0)	Passive (Default)	Automatically follows the HDCP version of source device.
ON (1)	Active	<ul style="list-style-type: none"> If the input video has HDCP content, the HDCP version of HDMI output is HDCP 1.4 for broader video solution. If the input video has no HDCP content, the HDMI output has no HDCP too.

ARC Mode

The front panel of receiver provides a buttons to enable or disable ARC mode, as below figure shows:



Press the button with paper clip or other sharp tool to enable the ARC mode, and then the left LED illuminates blue. Press it again to exit the ARC mode and the LED is off.

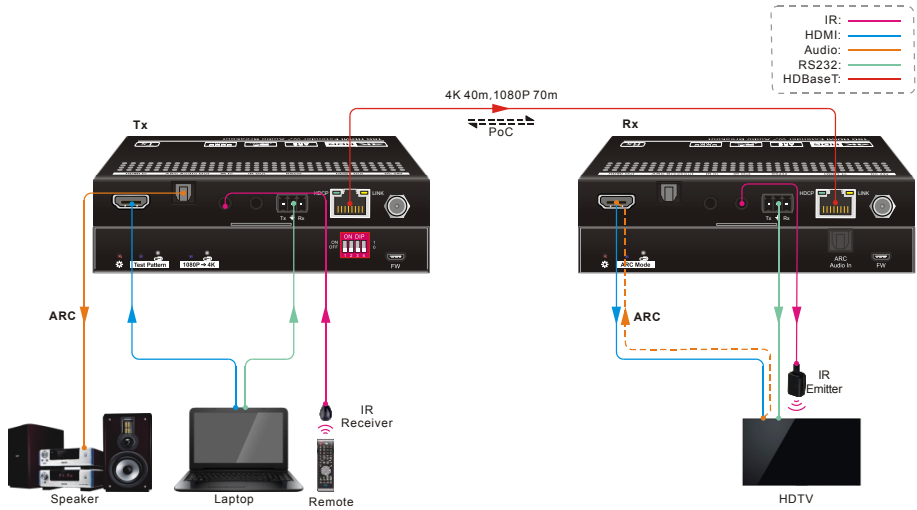
ARC Mode	Display (e.g.TV)	Audio Transmission Path
ON	ARC is supported.	The TV audio is transmitted from the TV back to the receiver via HDMI cable, and then it will be output by the ARC Audio Out port of transmitter.
	ARC is not supported.	Connect the TV to the ARC Audio In port of receiver with an audio cable. The TV audio is transmitted from the TV back to the receiver via the audio cable, and then it will be output by the ARC Audio Out port of transmitter. <i>Note that if the ARC mode is ON, the Audio Breakout port of receiver has no audio output.</i>
OFF	/	The TV audio can't be back to the ARC Audio Out port of transmitter. The Audio Breakout port of receiver is connected to speaker or

amplifier for HDMI source audio de-embedding.

System Connection

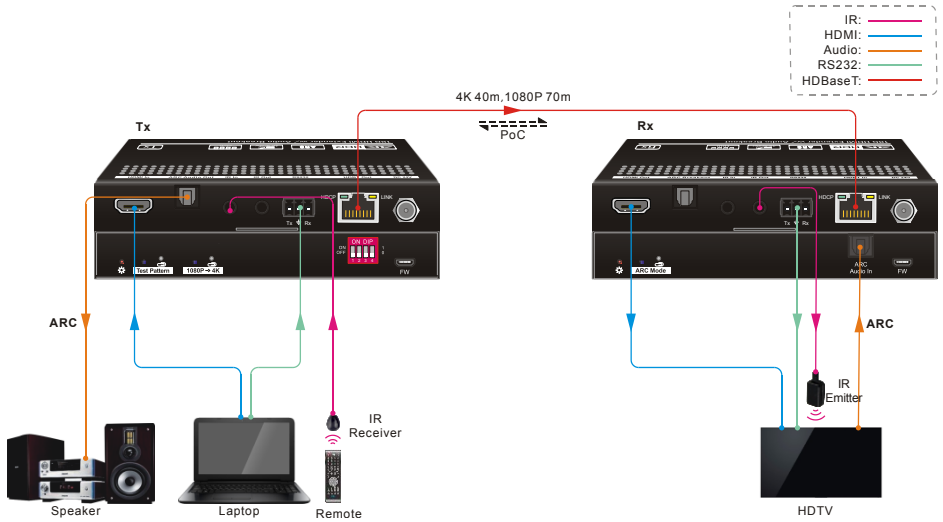
The following diagram illustrates the typical input and output connections of the extender:

- 1) The ARC mode of receiver is **ON**, and the display device (e.g. HDTV) supports ARC. The TV audio is transmitted from the TV back to the receiver via HDMI cable, and then it will be output by the **ARC Audio Out** port of transmitter.



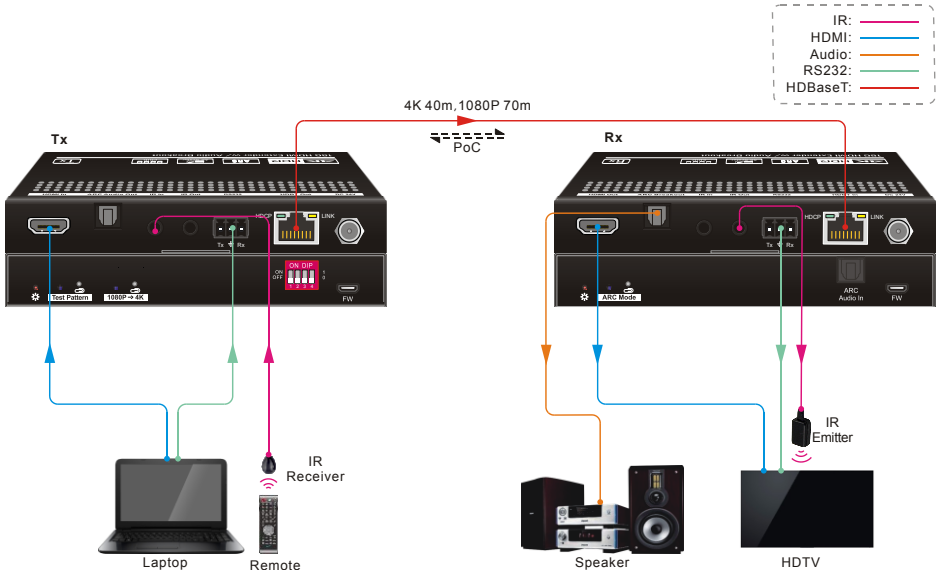
Note: The STP cable is recommended to be used to ensure optimal machine performance in ARC mode.

- 2) The ARC mode of receiver is **ON**, but the display device (e.g. HDTV) doesn't support ARC. The TV audio is transmitted from the TV back to the receiver via the audio cable, and then it will be output by the **ARC Audio Out** port of transmitter.



Note: The STP cable is recommended to be used to ensure optimal machine performance in ARC mode.

- 3) The ARC mode of receiver is **OFF**. The TV audio can't be back to the **ARC Audio Out** port of transmitter. The **Audio Breakout** port of receiver is connected to speaker or amplifier for HDMI source audio de-embedding.



Technical Specification

	Transmitter	Receiver
Video		
Input	(1) HDMI	(1) HDBT
Input Connector	(1) Type-A female HDMI	(1) RJ45
Input Resolution	Up to 4Kx2K@60Hz 4:4:4 8bit HDR10	Up to 4Kx2K@60Hz 4:2:0
Output	(1) HDBT Out	(1) HDMI
Output Connector	(1) RJ45	(1) Type-A female HDMI
Output Resolution	Up to 4Kx2K@60Hz 4:2:0	Up to 4Kx2K@60Hz 4:4:4 8bit HDR10
Audio		
Input	-	(1) ARC Audio In
Input Connector	-	(1) Toslink Connector
Output	(1) ARC Audio Out	(1) Audio Breakout
Output Connector	(1) Toslink connector	(1) Toslink connector
Audio Format	Supports PCM, Dolby Digital, Dolby True-HD, DTS and DTS-HD.	
Frequency Response	20Hz – 20KHz, ± 3 dB	
Max Output Level	2.0Vrms \pm 0.5dB. 2V = 16dB headroom above -10dBV (316mV) nominal consumer line level signal	
THD+N	< 0.05% (-80dB), 20Hz – 20KHz bandwidth, 1KHz sine at 0dBFS level (or max level)	
SNR	> 85dB, 20Hz-20 kHz bandwidth	
Crosstalk Isolation	> 70dB, 10KHz sine at 0dBFS level (or max level before clipping)	
L-R Level Deviation	< 0.3dB, 1KHz sine at 0dBFS level (or max level before clipping)	
Frequency Response Deviation	< \pm 0.5dB 20Hz - 20KHz	
Output Load Capability	1K Ω and higher (Supports 10x paralleled 10K Ω loads)	
Stereo Channel Separation	>70dB@1KHz	
Control		
Control Part	(1) Test Pattern button, (1)1080P \rightarrow 4K button, (1) EDID 4-pin DIP switch, (1) FW, (1) IR In, (1) IR Out, (1) RS232	(1) ARC Mode button, (1) FW, (1) IR In, (1) IR Out, (1) RS232
Control Connector	(1) Micro-USB port, (2) 3.5mm jacks, (1) 3-pin terminal block	(1) Micro-USB port, (2) 3.5mm jacks, (1) 3-pin terminal block

General	
Bandwidth	18Gbps
HDMI Standard	2.0
HDCP Version	2.2, 1.4 compliant
CEC	Pass-through
Bidirectional PoC	Supported
HDMI 2.0 Cable Length	4K@60Hz 4:4:4 ≤ 5m, 4K@60Hz 4:2:0 ≤ 15m, 1080P ≤ 20m
Transmission Standard	HDBaseT
Transmission Distance	1080P@60Hz ≤ 230 feet (70 meters), 4K@60Hz ≤ 131 feet (40 meters)
Operation Temperature	-5~ +55℃
Storage Temperature	-25 ~ +70℃
Relative Humidity	10%-90%
Power Supply	Input:100V~240V AC; Output:24V DC 1.25A
Power Consumption	12W (Max)
Dimension (W*H*D)	TX/RX: 140mm x 19.5mm x 84mm
Net Weight	TX:275g, RX:290g

Note: Please adopt high-qualified HDMI cable fully compliant with HDMI 2.0 for reliable transmission and connection.