4K UHD
HDCP 2.2
HDBT

PUV-3000TX
UHD+ HDMI over HDBaseT 3.0 Transmitter
(18Gbps, 4K@60Hz 4:4:4, 8-bit)

/// **OPERATION MANUAL**

HDMI®

HIGH-DEFINITION MULTIMEDIA INTERFACE

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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.
- Please completely disconnect the power when the unit is not in use to avoid wasting electricity.

VERSION HISTORY

REV.	DATE	SUMMARY OF CHANGE
v1.00	2021/11/04	Preliminary release

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1. INTRODUCTION

This 4K UHD[+] HDMI over HDBaseT transmitter uses HDBaseT 3.0, the newest generation of HDBaseT technology, and when combined with a compatible receiver is the perfect solution for extending full bandwidth (18Gbps) HDMI 2.0, 4K@60Hz (4:4:4, 8-bit) video with HD audio via a single run of Cat.6A/7 cable over distances of up to 40 meters. Multiple control and data signals may also be transmitted along with the audio and video, including bi-directional IR and RS-232.

This transmitter is ideal for use in any video extension scenario, but it excels when latency-free, uncompressed, high resolution video is critical, such as medical installations, live conferences, and education.

2. APPLICATIONS

/// Household entertainment sharing and control

/// Lecture hall/classroom display and control

/// Meeting room presentation and control

3. PACKAGE CONTENTS

/// 1× UHD[+] HDMI over HDBaseT Transmitter

/// 1× 24V/2.7A DC Power Adapter

/// 1× 8-pin Terminal Block

/// 1× Operation Manual

4. SYSTEM REQUIREMENTS

/// HDMI source equipment such a media player, video game console, or set-top box.

/// HDMI receiving equipment such as an HDTV, monitor, or audio amplifier.

/// A compatible HDBaseT receiver with PoH (PD) support is recommended.

/// The use of Premium High Speed HDMI cables, and industry standard Cat.6A or Cat.7 Ethernet cable is highly recommended.

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5. FEATURES

- HDMI 2.0 and DVI 1.0 compatible

- HDCP 2.2 and HDCP 1.x compliant

- HDBaseT 3.0 compliant (Backwards compatible with HDBaseT 2.0/1.0)

- 1 HDMI input, 1 HDMI output, and 1 HDBaseT output

- Supports up to 4K UHD[+] (18Gbps, 4K@60Hz 4:4:4, 8-bit) video input and output over both HDMI and HDBaseT

- Supports Deep input and output up to 12-bit

- Supports 10-bit and 12-bit HDR (High Dynamic Range) input/output

- Supports CEC bypass

- HDBaseT extends video, audio and data over a single Cat.6A/7 cable and can reach distances up to 40m/131ft

- HDBaseT feature support: HD Video and Audio, PoH (PSE), and Control (bi-directional IR/RS-232 pass-through)

- HDMI output functions as a local monitor

- Supplies PoH to the connected receiver

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6. OPERATION CONTROLS AND FUNCTIONS

6.1 Front Panel
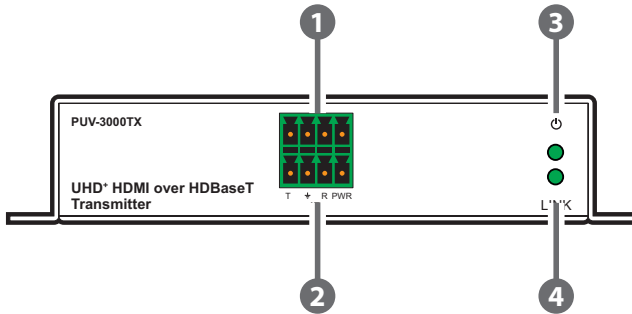
① RS-232 4-pin Terminal Block: Connect to a PC, laptop, or serial controllable device with a 4-pin adapter cable for the extension of RS-232 signals between both ends of the HDBaseT connection.

② IR 4-pin Terminal Block (In/Out): Connect to both an IR Blaster and Extender using a 4-pin Y-adapter cable to transmit and receive IR control signals and extend them to devices connected to the other end of the HDBaseT connection.

③ Power LED: This LED will illuminate to indicate the unit is on and receiving power.

④ LINK LED: This LED will illuminate solidly when a live connection with a compatible receiver is active.

6.2 Rear Panel
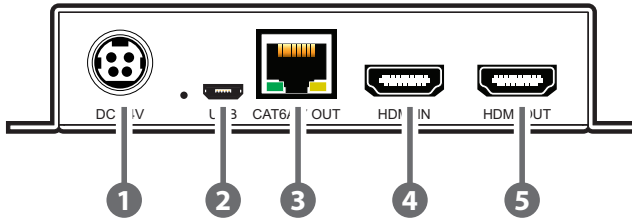
1 **DC 24V Port:** Plug the 24V DC power adapter into this port and connect it to an AC wall outlet for power.

2 **USB Port (Micro-B):** This port is reserved for firmware update use only.

3 **CAT6A/7 OUT Port:** Connect to a compatible HDBaseT receiver with a single Cat.6A/7 cable for extension of all data signals. PoH will also be supplied to a connected compatible PD receiver.

Note: The PoH function is designed for powering compatible receiver units only. Non-PoH receivers will need their own power supply. Receivers from other brands may not be compatible.

4 **HDMI IN Port:** Connect to HDMI source equipment such as a media player, game console, or set-top box.

5 **HDMI OUT port:** Connect to an HDMI TV, monitor, or amplifier for digital video and audio output.

6.3 IR Cable Pinouts

IR Blaster + IR Extender

4-pin Terminal Block

1. 3.3V
2. RxD
3. GND
4. TxD
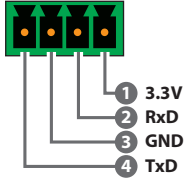
6.4 Serial Pinout

4-pin Terminal Block

1. NC
2. GND
3. RxD
4. TxD

7. CONNECTION DIAGRAM

Tower PC

Local Monitor

3m 7m 3m

60°

1.5m
60°

USB   **RS-232**

IR Input & Output

HDMI Input   **USB**

HDMI Output

Power Supply

IR Input & Output

Cat 6A/7 Cable

RS-232

60°
1.5m

60°

3m 7m 3m

HDMI Output

Serial Controlled Device   **Smart TV**
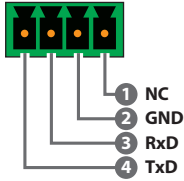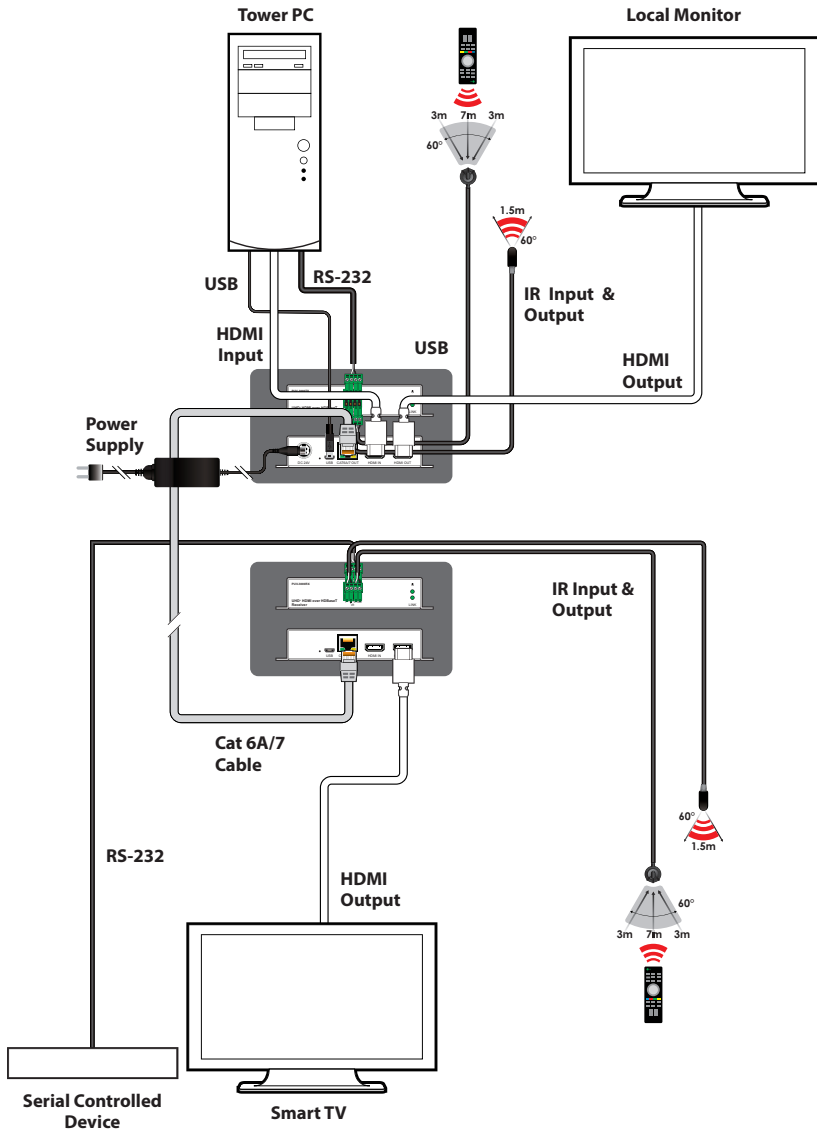
8. SPECIFICATIONS

8.1 Technical Specifications

HDMI Bandwidth	18Gbps
HDBaseT Bandwidth	18Gbps
Input Ports	1×HDMI (Type-A)
Output Ports	1×HDBaseT (RJ-45) 1×HDMI (Type-A)
Pass-through Ports	1×IR In/Out (4-pin Terminal Block) 1×RS-232 (4-pin Terminal Block)
Pass-through/Service Port	1×USB 2.0 (Micro-B)
IR Frequency	30 ~ 50kHz (30 ~ 60kHz under ideal conditions)
Baud Rate	Up to 115200
Power Supply	24V/2.7A DC (US/EU standards, CE/FCC/UL certified)
ESD Protection (HBM)	±8kV (Air Discharge) ±4kV (Contact Discharge)
Dimensions (W×H×D)	128mm×25mm×108mm [Case Only] 128mm×25mm×112.5mm [All Inclusive]
Weight	400g
Chassis Material	Metal (Steel)
Chassis Colour	Black
Operating Temperature	0˚C – 50˚C/32˚F – 122˚F
Storage Temperature	-20˚C – 60˚C/-4˚F – 140˚F
Relative Humidity	20 – 90% RH (Non-condensing)
Power Consumption	12W

8.2 Video Specifications

Supported Resolutions (Hz)	Input HDMI	Output HDMI	Output HDBT
720×400p@70/85	✓	✓	✓
640×480p@60/72/75/85	✓	✓	✓
720×480i@60	✓	✓	✓
720×480p@60	✓	✓	✓
720×576i@50	✓	✓	✓
720×576p@50	✓	✓	✓
800×600p@56/60/72/75/85	✓	✓	✓
848×480p@60	✓	✓	✓
1024×768p@60/70/75/85	✓	✓	✓
1152×864p@75	✓	✓	✓
1280×720p@50/60	✓	✓	✓
1280×768p@60/75/85	✓	✓	✓
1280×800p@60/75/85	✓	✓	✓
1280×960p@60/85	✓	✓	✓
1280×1024p@60/75/85	✓	✓	✓
1360×768p@60	✓	✓	✓
1366×768p@60	✓	✓	✓
1400×1050p@60	✓	✓	✓
1440×900p@60/75	✓	✓	✓
1600×900p@60RB	✓	✓	✓
1600×1200p@60	✓	✓	✓
1680×1050p@60	✓	✓	✓
1920×1080i@50/60	✓	✓	✓

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Supported Resolutions (Hz)	Input	Output	
	HDMI	HDMI	HDBT
1920×1080p@24/25/30	✓	✓	✓
1920×1080p@50/60	✓	✓	✓
1920×1200p@60RB	✓	✓	✓
2560×1440p@60RB	✓	✓	✓
2560×1600p@60RB	✓	✓	✓
2048×1080p@24/25/30	✓	✓	✓
2048×1080p@50/60	✓	✓	✓
3840×2160p@24/25/30	✓	✓	✓
3840×2160p@50/60 (4:2:0)	✓	✓	✓
3840×2160p@24, HDR10	✓	✓	✓
3840×2160p@50/60 (4:2:0), HDR10	✓	✓	✓
3840×2160p@50/60	✓	✓	✓
4096×2160p@24/25/30	✓	✓	✓
4096×2160p@50/60 (4:2:0)	✓	✓	✓
4096×2160p@24, HDR10	✓	✓	✓
4096×2160p@50/60 (4:2:0), HDR10	✓	✓	✓
4096×2160p@50/60	✓	✓	✓

8.3 Audio Specifications

8.3.1 Digital Audio

HDMI Input / Output & HDBaseT Output	
LPCM	
Max Channels	8 Channels
Sampling Rate (kHz)	32, 44.1, 48, 88.2, 96, 176.4, 192
Bitstream	
Supported Formats	Standard & High-Definition

8.4 Cable Specifications

	1080p		4K30	4K60
			(4:4:4)	**(4:4:4)**
Cable Length	**8-bit**	**12-bit**	**8-bit**	**8-bit**
High Speed HDMI Cable				
HDMI Input	10m	10m	5m	3m
HDMI Output	10m	10m	5m	3m
Ethernet Cable				
Cat.5e/6	40m			
Cat.6A/7	100m			

Bandwidth Category Examples:

1080p (FHD Video)

- Up to 1080p@60Hz, 12-bit colour
- Data rates lower than 5.3Gbps or below 225MHz TMDS clock

4K30 (4K UHD Video)

- 4K@24/25/30Hz & 4K@50/60Hz (4:2:0), 8-bit colour
- Data rates higher than 5.3Gbps or above 225MHz TMDS clock but below 10.2Gbps

4K60 (4K UHD+ Video)

- 4K@50/60Hz (4:4:4, 8-bit)
- 4K@50/60Hz (4:2:0, 10-bit HDR)
- Data rates higher than 10.2Gbps

8.5 HDBaseT Features

HDBaseT Feature Set	Transmitter
Video & Audio Extension	Supported
LAN Extension	Unsupported
Send power to Receiver	Supported (PoH)
Accept power from Receiver	Unsupported
IR Extension	Supported
RS-232 Extension	Supported
USB 2.0 Extension	Unsupported

9. ACRONYMS

ACRONYM	COMPLETE TERM
4K UHD	4K Ultra-High-Definition (10.2Gbps max)
4K UHD⁺	4K Ultra-High-Definition (18Gbps max)
AVoIP	Audio/Video over IP
Cat.5e	Enhanced Category 5 cable
Cat.6	Category 6 cable
Cat.6A	Augmented Category 6 cable
Cat.7	Category 7 cable
DVI	Digital Visual Interface
EDID	Extended Display Identification Data
GbE	Gigabit Ethernet
Gbps	Gigabits per second
HDBT	HDBaseT
HDCP	High-bandwidth Digital Content Protection
HDMI	High-Definition Multimedia Interface
HDR	High Dynamic Range
IR	Infrared
kHz	Kilohertz
LED	Light-Emitting Diode
LPCM	Linear Pulse-Code Modulation
MHz	Megahertz
PD	Powered Device
PoH	Power over HDBaseT
PSE	Power Sourcing Equipment
TMDS	Transition-Minimised Differential Signaling

ACRONYM	COMPLETE TERM
USB	Universal Serial Bus
VGA	Video Graphics Array
WUXGA (RB)	Widescreen Ultra Extended Graphics Array (Reduced Blanking)
XGA	Extended Graphics Array