



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 | 04/11/2021 | Preliminary release |
| v1.01 | 03/05/2022 | Corrections to cable distance/cover image |
| v1.02 | 05/05/2022 | Corrections to image/silkscreen |
| v1.03 | 27/10/2022 | New IR/RS-232 Diagrams |

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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

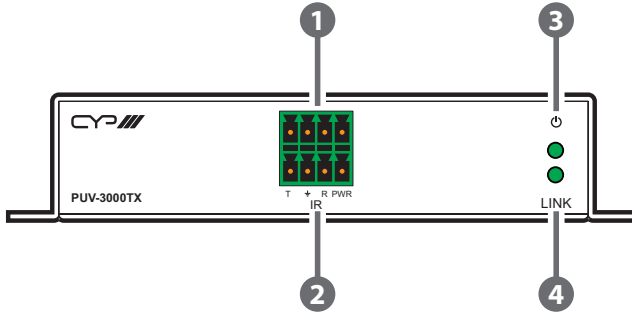
- /// HDMI source equipment such as a media player, video game console, or set-top box.
- /// HDMI receiving equipment such as an HDTV, monitor, or audio amplifier.
- /// A compatible HDBaseT receiver with PoH (PD) support is recommended.
- /// The use of Premium High Speed HDMI cables, and industry standard Cat.6A or Cat.7 Ethernet cable is highly recommended.

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

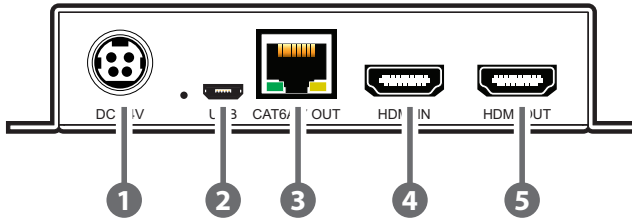
6. OPERATION CONTROLS AND FUNCTIONS

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



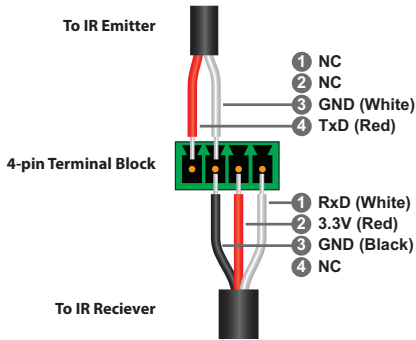
- 1 DC 24V Port:** Plug the 24V DC power adapter into this port and connect it to an AC wall outlet for power.
- 2 USB Port (Micro-B):** This port is reserved for firmware update use only.
- 3 CAT6A/7 OUT Port:** Connect to a compatible HDBaseT receiver with a single Cat.6A/7 cable for extension of all 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.

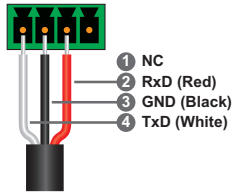
- 4 HDMI IN Port:** Connect to HDMI source equipment such as a media player, game console, or set-top box.
- 5 HDMI OUT port:** Connect to an HDMI TV, monitor, or amplifier for digital video and audio output.

6.3 IR Cable Pinouts

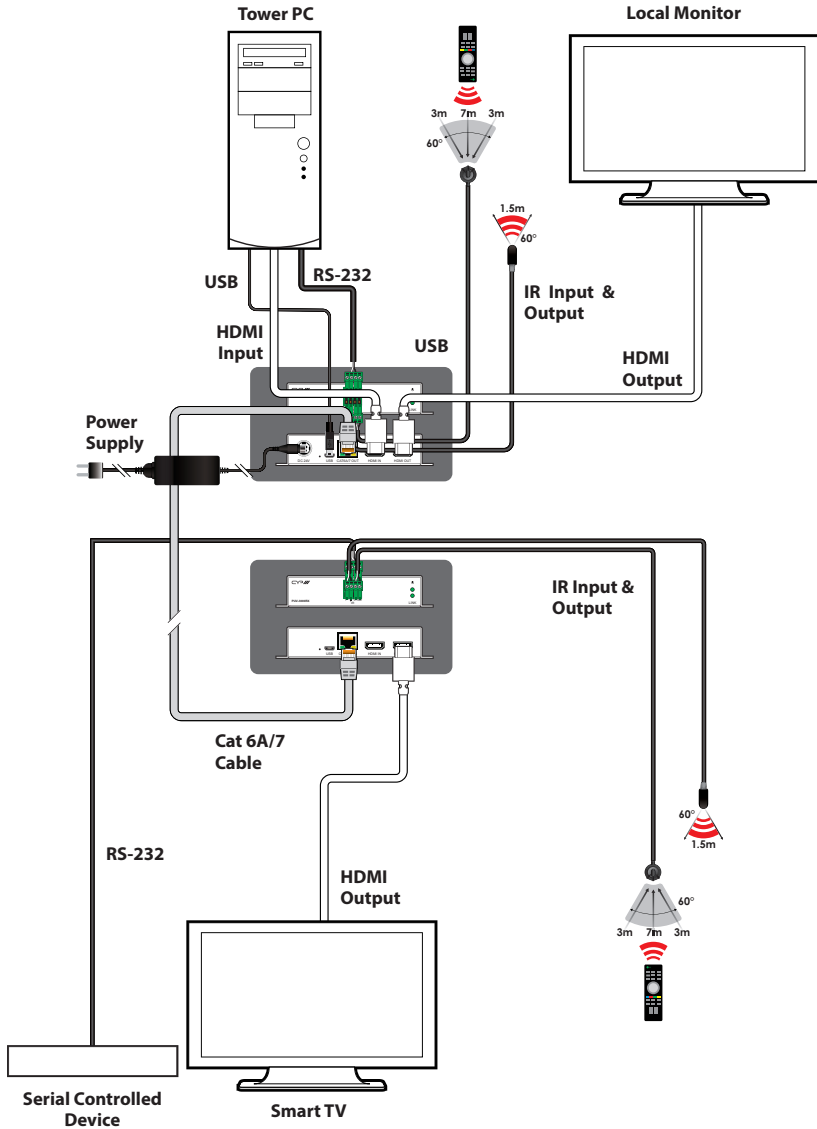
IR Blaster + IR Extender



6.4 Serial Pinout



7. CONNECTION DIAGRAM



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 | Output | |
|----------------------------|-------|--------|------|
| | HDMI | HDMI | 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 | ✓ | ✓ | ✓ |

| 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

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

**Results with Cat 5e/6 will vary*

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 |



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