PUV-3050RX-UA

UHD+ HDMI Over HDBaseT3 Receiver with Analogue Audio I/O & USB 2.0

/// **OPERATION MANUAL**

DISCLAIMERS

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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
RDV1	2021/12/06	Preliminary release
RDV1	27/10/2022	New IR/RS-232 Diagrams

CONTENTS

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1. INTRODUCTION

This 4K UHD[+] HDMI over HDBaseT receiver uses HDBaseT 3.0, the newest generation of HDBaseT technology, and 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 IR, RS-232, and USB 2.0. This receiver is ideal for use in any video extension scenario, especially when latency-free, uncompressed, high resolution video is critical, such as medical installations, live conferences, and education.

When used with its matched transmitter, 2 micro USB host connections are available (1 on the transmitter, 1 on the receiver) for connecting a single USB host (such as a laptop or PC) to devices on up to 4 USB 2.0 (Type-A) ports (2 on the transmitter, 2 on the receiver) forming a highly flexible KVM extension configuration.

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 Receiver with USB KVM

/// 2× 3-pin Terminal Block

/// 1× 8-pin Terminal Block

/// 1× Operation Manual

4. SYSTEM REQUIREMENTS

/// A compatible HDBaseT transmitter with PoH (PSE) support is required.

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

/// 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 input

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

▪ Supports Deep Colour input and output up to 12-bit

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

▪ Supports CEC bypass/extract

▪ 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 (PD), Bi-directional audio (analogue), and Control (bi-directional USB/IR/RS-232 pass-through)

▪ 2 USB 2.0 Type-A device ports and 1 Micro USB host port

▪ Selectable HDMI audio extraction/analogue audio bypass functionality when paired with a compatible transmitter

▪ Powered directly via PoH from the connected transmitter

# 6. OPERATION CONTROLS AND FUNCTIONS

6.1 Front Panel
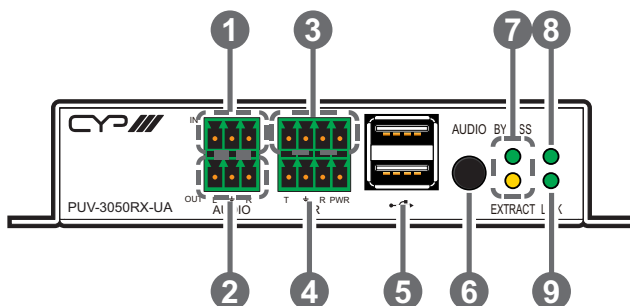
1 **AUDIO IN 3-pin Terminal Block:** Connect to the analogue audio output of a device such as a media player or game console using a 3-pin adapter cable. Audio is sent to the analogue audio output on the connected compatible receiver.

2 **AUDIO OUT 3-pin Terminal Block:** Connect to powered speakers or an amplifier for analogue audio output using a 3-pin adapter cable. Audio is sourced from the analogue audio input on the connected compatible receiver.

3 **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.

4 **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.

5 **USB 2.0 Ports (Type-A):** Connect directly to standard USB devices such as a mouse, keyboard, or flash drive to extend their USB functionality to the currently active Micro-USB host port.

6 **AUDIO Button:** Press this button to toggle the connected transmitter's analogue audio stream source between the analogue audio input (bypass) and the HDMI input's audio (extract).

Note: HDMI audio extraction is only available with LPCM 2.0 sources. This feature requires connection to a fully compatible transmitter.

7 **BYPASS & EXTRACT LEDs:** These LEDs will illuminate to indicate if the unit is in audio bypass or extract mode.

8 **POWER LED:** This LED will illuminate to indicate the unit is on and receiving power.

9 **LINK LED:** This LED will illuminate solidly when a live connection with a compatible transmitter is active.
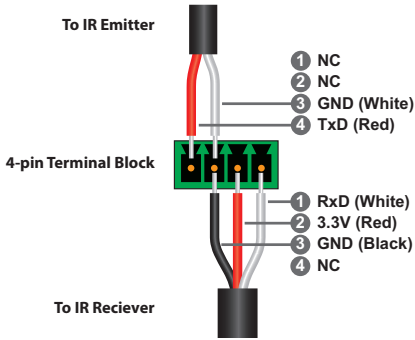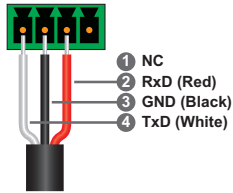
6.2 Rear Panel
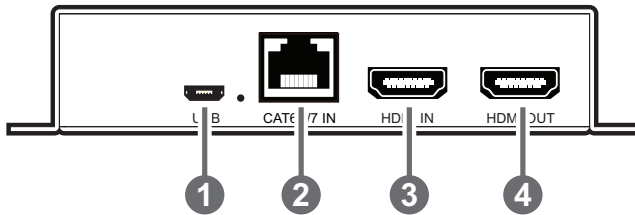
1 **USB 2.0 Port (Micro-B) & LED:** Connect directly to a standard USB host such as a PC or laptop to extend their USB functionality to all currently connected USB devices on both ends of the HDBaseT connection. The LED will illuminate solidly to indicate when the USB port is active.

Note: If USB hosts are connected to both the transmitter and receiver at the same time, only the most recently connected host will be active.

2 **CAT6A/7 IN Port:** Connect to a compatible HDBaseT transmitter with a single Cat.6A/7 cable for extension of all data signals. Power via PoH will also be supplied to this unit when connected to a compatible PSE transmitter.

Note: A compatible PoH (PSE) transmitter is REQUIRED to power this receiver.

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

Note: If this HDMI input is connected, its video will automatically be output over the local HDMI output, overriding any current HDBaseT video source.

4 **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

To IR Emitter

1 NC
2 NC
3 GND (White)
4 TxD (Red)

4-pin Terminal Block

1 RxD (White)
2 3.3V (Red)
3 GND (Black)
4 NC

To IR Reciever

6.4 Serial Pinout

1 NC
2 RxD (Red)
3 GND (Black)
4 TxD (White)

6.5 Audio Pinouts

Stereo Audio Input

3-pin Terminal Block

1 RIGHT
2 GND
3 LEFT

Stereo Audio Output

3-pin Terminal Block

1 RIGHT
2 GND
3 LEFT

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

TX

RX

IR Input & Output

USB

Cat 6A/7 Cable

USB

60°

1.5m

RS-232

HDMI Output

Keyboard & Mouse

60°

3m 7m 3m

Serial Controlled Device

HDTV
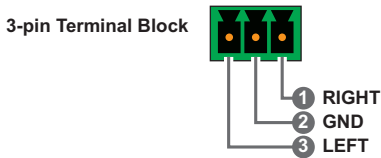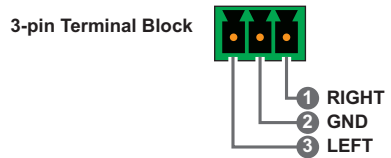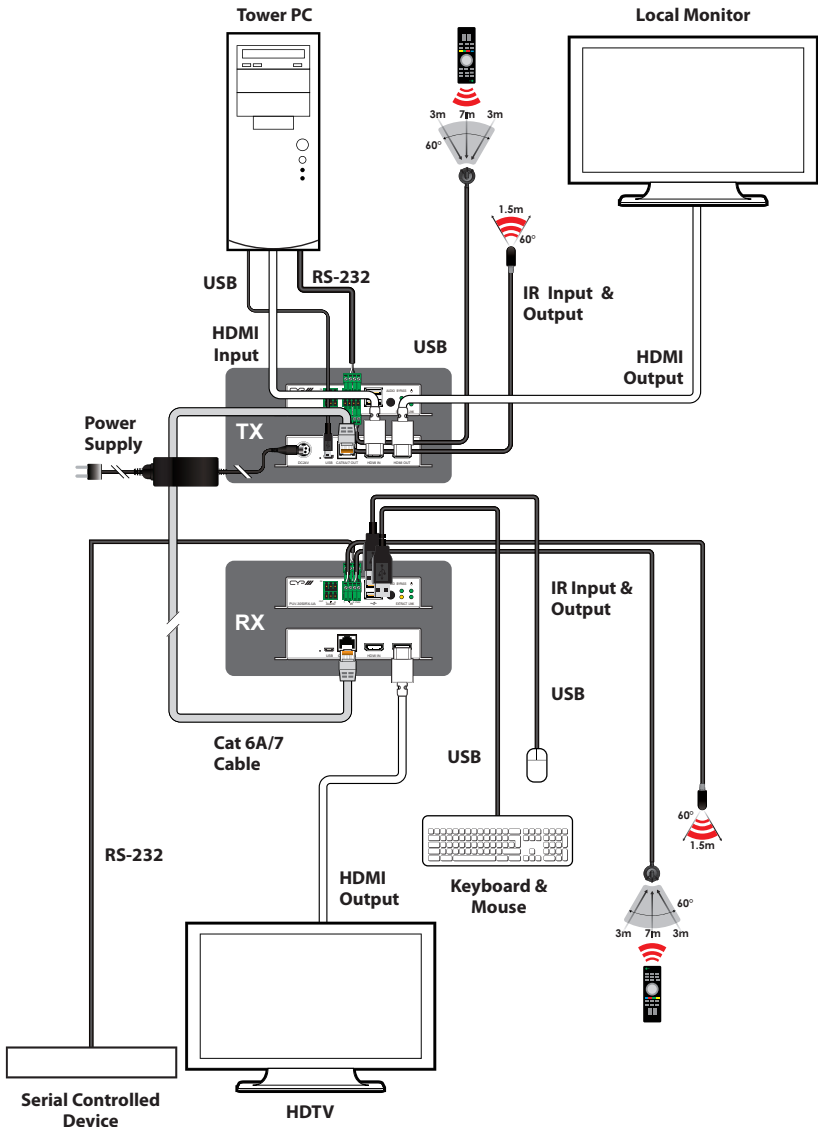
8. SPECIFICATIONS

8.1 Technical Specifications

HDMI Bandwidth	18Gbps
HDBaseT Bandwidth	18Gbps
Input Ports	1×HDBaseT (RJ-45)
	1×HDMI (Type-A)
	1×Analogue Stereo (3-pin Terminal Block)
Output Ports	1×HDMI (Type-A)
	1×Analogue Stereo (3-pin Terminal Block)
Pass-through Ports	1×IR In/Out (4-pin Terminal Block)
	1×RS-232 (4-pin Terminal Block)
	2×USB 2.0 (Type-A)
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	PoH (from Tx)
ESD Protection (HBM)	±8kV (Air Discharge)
	±4kV (Contact Discharge)
Dimensions (W×H×D)	128mm×25mm×108mm [Case Only]
	128mm×25mm×109.5mm [All Inclusive]
Weight	390g
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	14W

8.2 Video Specifications

Supported Resolutions (Hz)	Input		Output
	HDMI	HDBT	HDMI
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	HDBT	HDMI
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 & HDBaseT Input / HDMI 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

8.3.2 Analogue Audio

Analogue Input	
Max Audio Level	2Vrms
Impedance	10kΩ
Type	Unbalanced

Analogue Output	
Max Audio Level	2Vrms
THD+N	< −80dB@0dBFS 1kHz (A-wt)
SNR	> 80dB@0dBFS
Frequency Response	< ±0.5dB@20Hz~20kHz
Crosstalk	< −71dB@10kHz
Impedance	499Ω
Type	Unbalanced

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

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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-Minimized 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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