



CH-1529RXV

4K UHD+ HDMI over HDBaseT Receiver
with HDR & OAR



Operation Manual

DISCLAIMERS

The information in this manual has been carefully checked and is believed to be accurate. Cypress Technology assumes no responsibility for any infringements of patents or other rights of third parties which may result from its use.

Cypress Technology assumes no responsibility for any inaccuracies that may be contained in this document. Cypress also makes no commitment to update or to keep current the information contained in this document.

Cypress Technology reserves the right to make improvements to this document and/or product at any time and without notice.

COPYRIGHT NOTICE

No part of this document may be reproduced, transmitted, transcribed, stored in a retrieval system, or any of its part translated into any language or computer file, in any form or by any means—electronic, mechanical, magnetic, optical, chemical, manual, or otherwise—without express written permission and consent from Cypress Technology.

© Copyright 2018 by Cypress Technology.

All Rights Reserved.

TRADEMARK ACKNOWLEDGMENTS

All products or service names mentioned in this document may be trademarks of the companies with which they are associated.





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.

REVISION HISTORY

| VERSION NO. | DATE | SUMMARY OF CHANGE |
|-------------|----------|---------------------------|
| RDV1 | 02/05/18 | Preliminary release |
| VS1 | 10/05/18 | Final technical review |
| VS2 | 21/05/18 | Updated section 6.1 & 6.5 |



CONTENTS

| | |
|--|-----------|
| 1. Introduction | 1 |
| 2. Applications | 1 |
| 3. Package Contents | 2 |
| 4. System Requirements | 2 |
| 5. Features | 2 |
| 6. Operation Controls and Functions | 3 |
| 6.1 Front Panel | 3 |
| 6.2 Rear Panel..... | 4 |
| 6.3 IR Cable Pinouts | 5 |
| 6.4 RS-232 Control | 5 |
| 6.5 RS-232 Commands..... | 6 |
| 7. Connection Diagram | 7 |
| 8. Specifications | 8 |
| 8.1 Technical Specifications | 8 |
| 8.2 Video Specifications | 9 |
| 8.3 Audio Specifications | 10 |
| 8.4 Cable Specifications | 11 |
| 8.5 HDBaseT Features..... | 11 |
| 9. Acronyms | 12 |





1. INTRODUCTION

This HDMI over single Cat.5e/6/7 Receiver is a great solution for extending HD audio and video as well as Ethernet and control via a single run of Cat.5e/6/7 cable over distances of up to 100 meters. Multiple data and control interfaces are provided, including IR, RS-232 and LAN connections. This Receiver complies with the advanced HDCP 2.2 and HDMI 2.0 standards, as well as supporting the legacy HDCP 1.x and HDMI 1.x standards. Despite HDBaseT's 10.Gbps bandwidth limitation, 4K UHD HDMI video sources, up to and including 4K@60Hz (4:4:4, 8-bit) as well as 10/12-bit sources with HDR, are able to be processed and extended by the use of AVLC (Adaptive Visually Lossless Compression) when connected to a compatible AVLC Transmitter.

Beyond video, data, and control this unit also contains useful audio features. The Optical Audio Return (OAR) feature supports transmitting optical audio back to a compatible Transmitter for local playback. Rounding out the feature set is automatic TMDS re-clocking support. This Receiver (PD) is powered by 48V PoH (Power over HDBaseT) from a compatible Transmitter (PSE), allowing for flexibility within different installation scenarios.

2. APPLICATIONS

- 48V PoH from Transmitter (PSE) to Receiver (PD)
- Household entertainment sharing and control
- Lecture room display and control
- Showroom display and control
- Meeting room presentation and control
- Classroom display and control

3. PACKAGE CONTENTS

- 1×HDMI over HDBaseT Receiver with HDR & OAR
- 1×3.5mm to IR Extender Cable
- 1×Rackmount Ears (Set of 2)
- 1×Operation Manual

4. SYSTEM REQUIREMENTS

- HDMI receiving equipment such as an HDTV, monitor or audio amplifier.
- A compatible HDBaseT Transmitter (PSE) with 48V PoH support is required.
- The use of industry standard Cat.6, Cat.6a or Cat.7 cable is highly recommended.
- The use of "Premium High Speed HDMI" cables is highly recommended.

5. FEATURES

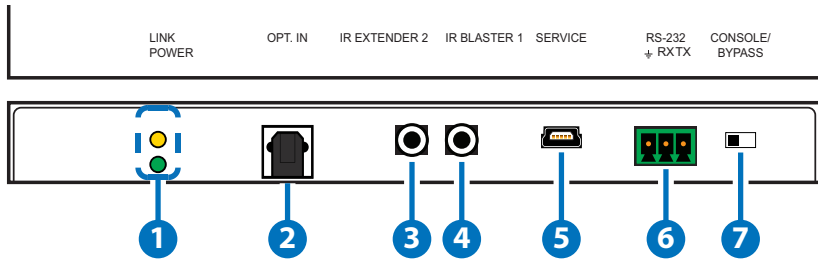
- HDMI with HDR, 3D & 4K@60Hz support, DVI 1.0 compatible
- HDCP 2.2 and HDCP 1.x compliant
- Supports up to 4K UHD (18Gbps, 4K@50/60Hz 4:4:4, 8-bit) video input and output
- Supports Deep Color input and output up to 12-bit
- Supports 10-bit and 12-bit HDR (High Dynamic Range) input/output
- Supports CEC bypass
- Simultaneous reception of uncompressed video, audio and data over a single Cat.5e/6/7 cable up to 100m/328ft at 1080p60 and 70m/230ft at 4K
- HDBaseT feature support: HD Video and Audio, 100BaseT Ethernet, 48V PoH, and Control (bidirectional IR/RS-232 pass-through)
- Support for compatible AVLC (Adaptive Visually Lossless Compression) Transmitters, allowing for the output of HDMI sources that were originally beyond 10.2Gbps (340MHz) and up to 18Gbps (600MHz) with no loss of visual quality



- Supports the Optical Audio Return (OAR) function to transmit optical audio from the Receiver to a compatible Transmitter
- Performs TMDS re-clocking and signal re-generation for improved signal integrity
- Ultra-thin wall plate design (16mm thickness) for convenient installation
- Powered by standard 48V PoH from Transmitter (PSE) to Receiver (PD) (compatible Transmitters only)

6. OPERATION CONTROLS AND FUNCTIONS

6.1 Front Panel



- 1 POWER LED:** This LED will illuminate to indicate the unit is on and receiving power.
LINK LED: This LED will illuminate solidly when a live connection with a compatible Transmitter is active.
- 2 OPT. IN:** Connect to the optical audio output of a device such as a media player or game console using an appropriate optical cable. Audio is sent to the Optical Audio Return output on a connected compatible Transmitter.
- 3 IR EXTENDER 2:** Connect to an IR Extender to extend the IR control range of devices connected to the other end of the HDBaseT connection. Ensure that the remote being used is within direct line-of-sight of the IR Extender.
- 4 IR BLASTER 1:** Connect to the provided IR Blaster to transmit IR signals from the other end of the HDBaseT connection to devices within direct line-of-sight of the IR Blaster.

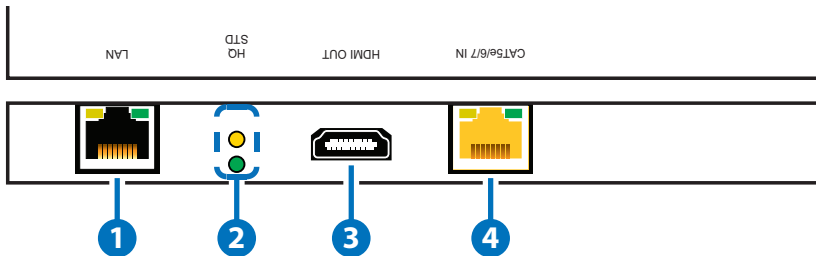
- 5 **SERVICE:** This USB port is reserved for firmware update.
- 6 **RS-232:** Connect to a PC, laptop or other serial control device with a 3-pin adapter cable for the extension of RS-232 signals to the Transmitter in "Bypass" mode, or for control this unit when in "Console" mode.

Note: Depending on the controlled device connected to the Transmitter side, the Tx and Rx pins might need to be reversed.

- 7 **CONSOLE/BYPASS:** This switch controls the operational mode of the RS-232 port. When set to "Bypass", RS-232 signals will be passed to the connected Transmitter. When set to "Console" the RS-232 port may be used to send commands directly to the Receiver.

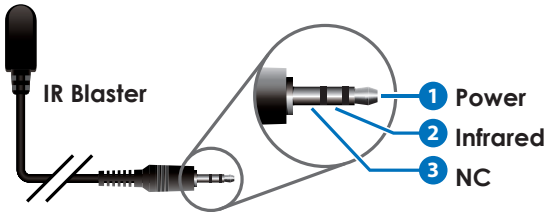
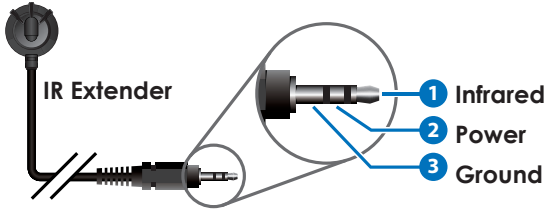
Note: RS-232 bypass requires both the Transmitter and Receiver to be set to "Bypass" mode.

6.2 Rear Panel



- 1 **LAN:** Connect to an Ethernet supporting device or to your local network, as appropriate, to extend the network to both ends of the HDBaseT connection.
- 2 **HQ & STD LEDs:** These LEDs illuminate to indicate which AVLC mode will be used when AVLC is required. The lower green LED indicates that AVLC will use HQ (High Quality) mode. The upper yellow LED indicates that AVLC will use STD (Standard) mode.
- 3 **HDMI OUT:** Connect to an HDMI TV, monitor or amplifier for digital video and audio output.
- 4 **CAT5e/6/7 IN:** Connect to a compatible, 48V PoH supplying, HDBaseT Transmitter with a single Cat.5e/6/7 cable for transmission of all data signals as well as to power the unit.

6.3 IR Cable Pinouts



6.4 RS-232 Control

| Terminal Block | |
|----------------|------------|
| Pin | Definition |
| 1 | GND |
| 2 | Rx |
| 3 | Tx |

| Controlling PC | |
|----------------|------------|
| Pin | Definition |
| 1 | |
| 2 | Rx |
| 3 | Tx |
| 4 | |
| 5 | GND |
| 6 | |
| 7 | |
| 8 | |
| 9 | |

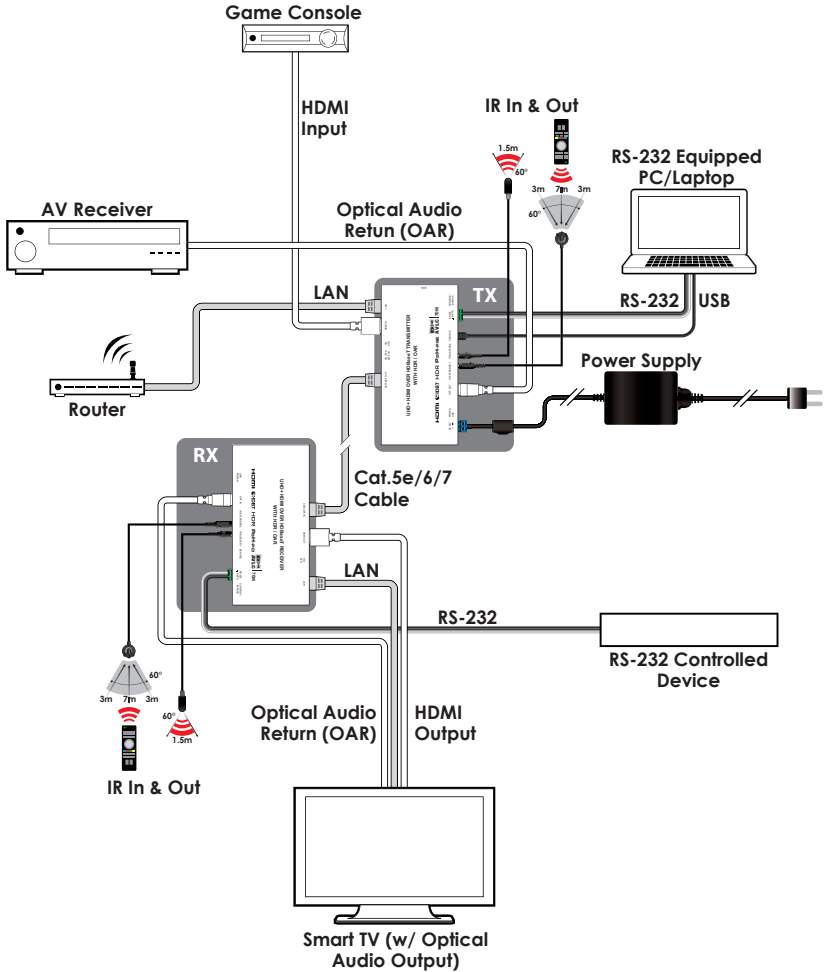
| Serial Port Settings | |
|----------------------|-------|
| Baud Rate | 19200 |
| Data Bits | 8 |
| Parity Bit | None |
| Stop Bits | 1 |
| Flow Control | None |

6.5 RS-232 Commands

| COMMAND | |
|---------------------------------------|---|
| Description and Parameters | |
| HELP↵ | Show the full command list. |
| ?↵ | Show the full command list. |
| GET MODEL NAME↵ | Show the unit's model name. |
| GET MODEL TYPE↵ | Show the unit's model type. |
| GET POWER↵ | Show the power state of the unit. |
| SET SYSTEM REBOOT↵ | Reboot the unit. |
| GET IN 1 SYNC STATUS↵ | Show the current input sync state. |
| GET OUT A SYNC STATUS↵ | Show the current output sync state. |
| GET TRANSCEIVER COMPRESS RATE↵ | Show the current AVLC compression mode. |

Note: Commands will not be executed unless followed by a carriage return. Commands are not case-sensitive.

7. CONNECTION DIAGRAM



8. SPECIFICATIONS

8.1 Technical Specifications

| | |
|----------------------------------|--|
| HDMI Bandwidth | 600MHz/18Gbps |
| HDBaseT Bandwidth | 340MHz/10.2Gbps |
| Input Ports | 1×HDBaseT (RJ45) 1×S/PDIF (TOSLINK) |
| Output Port | 1×HDMI |
| Pass-through Ports | 1×IR Extender (3.5mm) 1×IR Blaster (3.5mm) 1×LAN (RJ45) |
| Pass-through/Control Port | 1×RS-232 (3-pin Terminal Block) |
| IR Frequency | 30–50kHz (30–60kHz under ideal conditions) |
| Baud Rate | Up to 115200bps |
| Power Supply | 48V PoH (US/EU standards, CE/FCC/UL certified) |
| ESD Protection | Human Body Model: ±8kV (Air Discharge) ±4kV (Contact Discharge) |
| Dimensions | 163mm×16mm×78mm (W×H×D) [Case Only] 183mm×16mm×81mm (W×H×D) [All Inclusive] |
| Weight | 200g |
| Chassis Material | Aluminum |
| 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 | 7W |



8.2 Video Specifications

| Supported PC Resolutions (Hz) | | HDBaseT Input | HDMI Output |
|-------------------------------|--------------------|---------------|-------------|
| 640×480 | 60, 72, 75, 85 | ✓ | ✓ |
| 720×400 | 70, 85 | ✓ | ✓ |
| 800×600 | 56, 60, 72, 75, 85 | ✓ | ✓ |
| 1024×768 | 60, 70, 75, 85 | ✓ | ✓ |
| 1152×864 | 75 | ✓ | ✓ |
| 1280×720 | 50, 60 | ✓ | ✓ |
| 1280×768 | 60, 75, 85 | ✓ | ✓ |
| 1280×800 | 60, 60 (RB) | ✓ | ✓ |
| 1280×960 | 60 | ✓ | ✓ |
| 1280×1024 | 60 | ✓ | ✓ |
| 1360×768 | 60 | ✓ | ✓ |
| 1366×768 | 60 | ✓ | ✓ |
| 1400×1050 | 60, 60 (RB) | ✓ | ✓ |
| 1440×900 | 60, 60 (RB) | ✓ | ✓ |
| 1600×900 | 60 | ✓ | ✓ |
| 1600×1200 | 60 | ✓ | ✓ |
| 1680×1050 | 60, 60 (RB) | ✓ | ✓ |
| 1920×1080 | 60 | ✓ | ✓ |
| 1920×1200 | 60, 60 (RB) | ✓ | ✓ |

| Supported TV Resolutions (Hz) | | HDBaseT Input | HDMI Output |
|-------------------------------|-----------------------------|---------------|-------------|
| 720×480i | 59.94, 60 | ✓ | ✓ |
| 720×576i | 50 | ✓ | ✓ |
| 720×480p | 59.94, 60 | ✓ | ✓ |
| 720×576p | 50 | ✓ | ✓ |
| 1280×720p | 50, 59.94, 60 | ✓ | ✓ |
| 1920×1080i | 50, 59.94, 60 | ✓ | ✓ |
| 1920×1080p | 50, 59.94, 60 | ✓ | ✓ |
| 1920×1080p | 23.97, 24, 25, 29.97, 30 | ✓ | ✓ |
| 3840×2160p | 24, 25, 30 | ✓ | ✓ |
| 4096×2160p | 24, 25, 30 | ✓ | ✓ |
| 3840×2160p (YUV 4:2:0) | 50, 60 | ✓ | ✓ |
| 3840×2160p | 24, 25, 30 (10, 12-bit HDR) | ✓ (AVLC) | ✓ |
| 3840×2160p (YUV 4:2:0) | 50, 60 (10, 12-bit HDR) | ✓ (AVLC) | ✓ |
| 3840×2160p | 50, 60 | ✓ (AVLC) | ✓ |

8.3 Audio Specifications

| Digital (S/PDIF) Input | |
|----------------------------|------------------------------------|
| Sampling Rate (kHz) | 32, 44.1, 48, 88.2, 96, 176.4, 192 |



8.4 Cable Specifications

| HDMI Cable Length | 1080p | | 4K |
|-------------------|-------|--------|-------|
| | 8-bit | 12-bit | 8-bit |
| Output | 10m | 10m | 5m |

| Cat. Cable Length | 1080p | 4K |
|-------------------|-------|------|
| Cat.5e | 100m | 70m |
| Cat.6 | 100m | 70m |
| Cat.7 | 100m | 100m |

- **Full HD Video (1080p)**
 - Up to 1080p@60Hz, 12-bit color
 - Data rates lower than 5.3Gbps or below 225MHz TMDS clock
- **Ultra HD Video (4K)**
 - 4K@24/25/30Hz & 4K@50/60Hz (YUV 4:2:0), 8-bit color
 - 4K@50/60Hz (4:4:4, 8-bit) with AVLC active
 - Data rates higher than 5.3Gbps or above 225MHz TMDS clock

8.5 HDBaseT Features

| HDBaseT Feature | Supported |
|-------------------------------|-----------|
| Video & Audio | ✓ |
| IR Pass-through | ✓ |
| RS-232 Pass-through | ✓ |
| Accept power from Transmitter | ✓ |
| Send power to Transmitter | × |
| LAN Pass-through | ✓ |

9. ACRONYMS

| ACRONYM | COMPLETE TERM |
|---------------|---|
| AVLC | Adaptive Visually Lossless Compression |
| Cat.5e | Category 5 (enhanced) cable |
| Cat.6 | Category 6 cable |
| Cat.7 | Category 7 cable |
| CEC | Consumer Electronics Control |
| 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 |
| PC | Personal Computer |
| PD | Powered Device |
| PoH | Power over HDBaseT |
| PSE | Power Sourcing Equipment |
| S/PDIF | Sony/Philips Digital Interface Format |
| UHD | Ultra-High-Definition |
| UHDTV | Ultra-High-Definition Television |
| USB | Universal Serial Bus |



CYPRESS TECHNOLOGY CO., LTD.

www.cypress.com.tw