



CH-519TXL & CH-519RXL

HDMI over CAT5e/6/7 Extender with IR/RS-232



Operation Manual



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
RDV1	2014/07/14	Preliminary release
RDV2	2021/01/29	Update to new format

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1. INTRODUCTION

This HDMI over single Cat.5e/6/7 transmitter and receiver set is a great solution for extending uncompressed HD audio and video as well as control via a single run of Cat.5e/6/7 cable over distances of up to 70 meters. Multiple data and control interfaces are provided, including IR and RS-232 connections.

This extender set 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. Both the transmitter and receiver are powered locally and require no manual controls for setup or operation.

2. APPLICATIONS

- Home 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 CAT5e/6/7 Transmitter with IR/RS-232
- 1× HDMI over CAT5e/6/7 Receiver with IR/RS-232
- 2× 5V/2.6A DC Power Adapter
- 1× Operation Manual

4. SYSTEM REQUIREMENTS

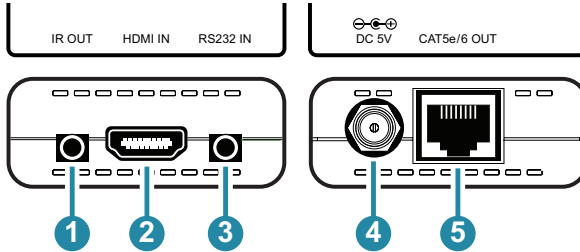
- HDMI source equipment such as media players, video game consoles or set-top boxes.
- HDMI receiving equipment such as HDTVs, monitors or audio amplifiers.
- The use of Premium High Speed HDMI cables, and industry standard Cat.6, Cat.6A, or Cat.7 Ethernet cable is highly recommended.

5. FEATURES

- HDMI 2.0 and DVI 1.0 compatible
- HDCP 2.2 and HDCP 1.x compliant
- 1 HDMI input (transmitter) and 1 HDMI output (receiver)
- Supports input/output resolutions up to 4K@60Hz (4:2:0, 8-bit)
- Supports Deep Color input and output up to 12-bit
- HDBaseT extends video, audio, and data over a single Cat.5e/6/7 cable and can reach distances up to 40m/131ft at 4K when using Cat.6A/7
- HDBaseT feature support: HD Video and Audio, and Control (bi-directional IR/RS-232 pass-through)
- Supports CEC bypass
- Supports pass-through of many audio formats including LPCM (up to 8 channels), Bitstream, and HD Bitstream

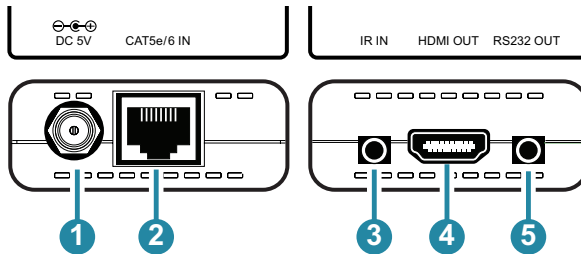
6. OPERATION CONTROLS AND FUNCTIONS

6.1 Transmitter Front & Rear Panels



- 1 IR OUT Port:** Connect to an 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.
- 2 HDMI IN Port:** Connect to HDMI source equipment such as a media player, game console, or set-top box. DVI sources are supported with the use of an HDMI to DVI adapter.
- 3 RS232 IN Port:** Connect to a PC, laptop, or serial controllable device with a 3.5mm adapter cable for the extension of RS-232 signals between both ends of the HDBaseT connection.
- 4 DC 5V Port:** Plug the 5V DC power adapter into this port and connect it to an AC wall outlet for power.
- 5 CAT5e/6 OUT Port:** Connect to a compatible HDBaseT receiver with a single Cat.5e/6/7 cable for transmission of all data signals.

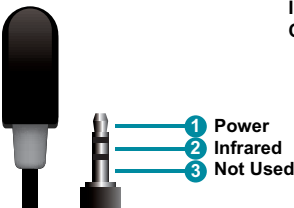
6.2 Receiver Front & Rear Panels



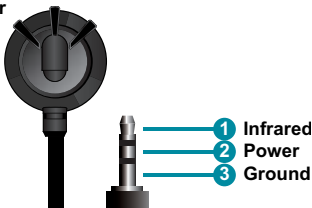
- ❶ **DC 5V Port:** Plug the 5V DC power adapter into this port and connect it to an AC wall outlet for power.
- ❷ **CAT5e/6 IN Port:** Connect to a compatible HDBaseT transmitter with a single Cat.5e/6/7 cable for reception of all data signals.
- ❸ **IR IN Port:** Connect to an IR Extender to receive local IR control signals and extend them to 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.
- ❹ **HDMI OUT Port:** Connect to an HDMI TV, monitor, or amplifier for digital video and audio output.
- ❺ **RS232 OUT Port:** Connect to a PC, laptop, or serial controllable device with a 3.5mm adapter cable for the extension of RS-232 signals between both ends of the HDBaseT connection.

6.3 IR Cable Pinouts

**IR Blaster
Cable**

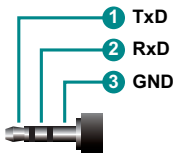


**IR Extender
Cable**

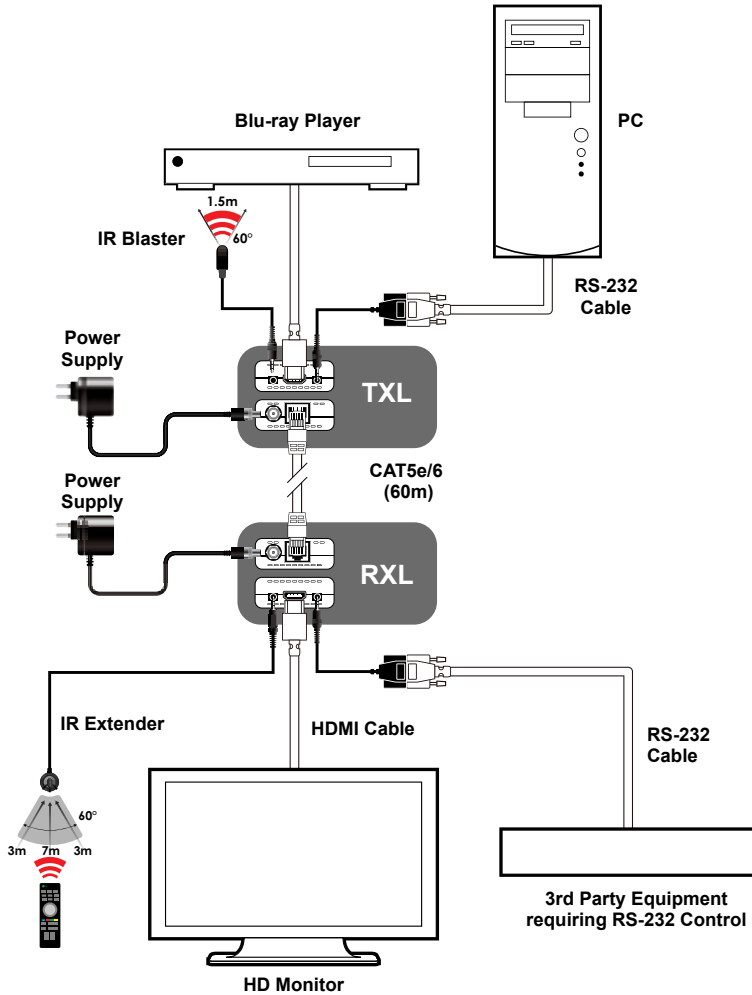


6.4 RS-232 Pinout

**3.5mm to DE-9
Adapter Cable**



7. CONNECTION DIAGRAM



8. SPECIFICATIONS

8.1 Technical Specifications

Transmitter

HDMI Bandwidth	18Gbps
HDBaseT Bandwidth	10.2Gbps
Input Ports	1×HDMI (Type-A)
Output Ports	1×HDBaseT (RJ-45)
Pass-through Ports	1×IR Extender (3.5mm) 1×IR Blaster (3.5mm) 1×RS-232 (3.5mm)
IR Frequency	30~50kHz (30 ~ 60kHz under ideal conditions)
Baud Rate	Up to 115200
Power Supply	5V/2.6A DC (US/EU standards, CE/FCC/UL certified)
ESD Protection (HBM)	±8kV (Air Discharge) ±4kV (Contact Discharge)
Dimensions (W×H×D)	55mm×22.5mm×75.5mm [Case Only] 55mm×22.5mm×82.2mm [All Inclusive]
Weight	60g
Chassis Material	Plastic
Chassis 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	2.6W

Receiver

HDMI Bandwidth	18Gbps
HDBaseT Bandwidth	10.2Gbps
Input Ports	1×HDBaseT (RJ-45)
Output Ports	1×HDMI (Type-A)
Pass-through Ports	1×IR Extender (3.5mm) 1×IR Blaster (3.5mm) 1×RS-232 (3.5mm)
IR Frequency	30~50kHz (30 ~ 60kHz under ideal conditions)
Baud Rate	Up to 115200
Power Supply	5V/2.6A DC (US/EU standards, CE/FCC/UL certified)
ESD Protection (HBM)	±8kV (Air Discharge) ±4kV (Contact Discharge)
Dimensions (W×H×D)	55mm×22.5mm×75.5mm [Case Only] 55mm×22.5mm×82.2mm [All Inclusive]
Weight	66g
Chassis Material	Plastic
Chassis 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	5.06W

8.2 Video Specifications

Supported Resolutions (Hz)	Input		Output	
	HDMI	HDBT	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	✓	✓	✓	✓
1920×1080p@24/25/30	✓	✓	✓	✓

Supported Resolutions (Hz)	Input		Output	
	HDMI	HDBT	HDMI	HDBT
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	
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	6m	6m	5m	×
HDMI Output	6m	6m	5m	×
Ethernet Cable				
Cat.5e/6	60m		35m	×
Cat.6a/7	70m		40m	×

Bandwidth Category Examples:

- **1080p (FHD Video)**
 - Up to 1080p@60Hz, 12-bit color
 - 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 color
 - 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	Unsupported
Accept power from Receiver	Unsupported
IR Extension	Supported
RS-232 Extension	Supported
USB 2.0 Extension	Unsupported

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

9. ACRONYMS

ACRONYM	COMPLETE TERM
Cat.5e	Enhanced Category 5 cable
Cat.6	Category 6 cable
Cat.6A	Augmented Category 6 cable
Cat.7	Category 7 cable
CEC	Consumer Electronics Control
DVI	Digital Visual Interface
EDID	Extended Display Identification Data
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
THD+N	Total Harmonic Distortion plus Noise
TMDs	Transition-Minimized Differential Signaling
4K UHD	4K Ultra-High-Definition (10.2Gbps max)
4K UHD+	4K Ultra-High-Definition (18Gbps max)
UHD TV	Ultra-High-Definition Television
VGA	Video Graphics Array
WUXGA (RB)	Widescreen Ultra Extended Graphics Array (Reduced Blanking)
XGA	Extended Graphics Array



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