



# CH-506TX & RX CH-506TXL & RXL

HDMI/IR/RS-232 over Single CAT5e/CAT6 Extender



**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
VR0	2011/12/12	Preliminary Release
VS1	2012/04/26	Updated format, diagrams and statements
VS2	2012/07/26	IR cable updated
VR3	2012/09/28	Add Lite Version
VR4	2014/01/10	HDMI I/O Cable Distance
VR5	2014/03/13	IR cable quantity
VR6	2015/04/28	Support Resolution
VR7	2019/07/25	Update Format and Cable Distance
VR8	2020/02/21	Revise typo of light to lite and correct the video bandwidth on specification of page 7



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## 1. INTRODUCTION

The HDMI with RS-232 over Single CAT5e/6/7 transmitter and receiver set can send uncompressed audio/video over a single run of CAT5e/6/7 cable up to 100m at 1080p and 70m at 4K\* and has the added benefit of control through the built-in RS-232 and IR ports.

\*Lite version can run up to 70m at 1080p and 40m at 4K

## 2. APPLICATIONS

- 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 & IR over Single CAT5e/CAT6 Transmitter
- 1×HDMI & IR over Single CAT5e/CAT6 Receiver
- 1×IR Blaster
- 1×IR Extender
- 2×3.5mm Phone Jack to RS-232 Cable
- 2×5V/2.6A DC Power Adaptor
- Operation Manual

## 4. SYSTEM REQUIREMENTS

Input HDMI source equipment such as DVD/Blu-ray players and HDMI equipped output display (TVs or monitors).



## 5. FEATURES

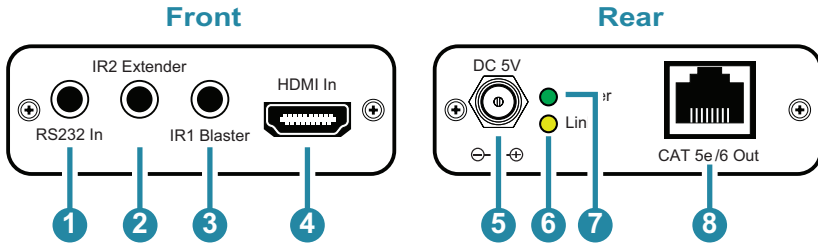
- HDMI 1.x and DVI 1.0 compliant
- HDCP compliant
- Supports HDMI 3D and 4K x 2K features
- Supports HDCP repeater and CEC function
- Supports distance up to 100m/328ft at 1080p and 70m/229ft at 4K through CAT5e/6/7 cable\*
- HDMI input resolutions up to 4K@60Hz (YUV 4:2:0, 8-bit) or 4K@30Hz (YUV 4:4:4, 8-bit)
- Supports pass-through of audio formats including LPCM 2.0/5.1/7.1, and Bitstream over HDMI
- 3Play convergence: HDMI & Control (IR & RS-232)
- Installation friendly

*Note: This system was tested with CAT6/23AWG cable. Results may vary with cables of different specifications.*

*\*Lite version CAT5e/6/7 cable up to 70m/229ft at 1080p and 40m/131ft at 4K*

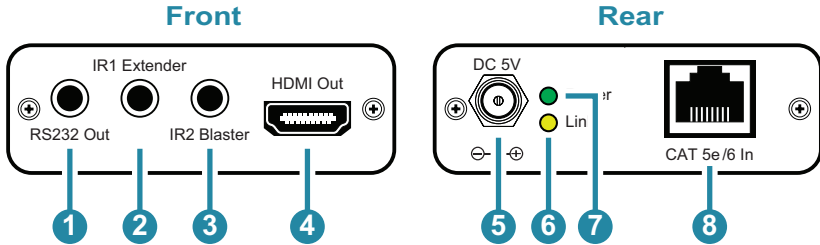
## 6. OPERATION CONTROLS AND FUNCTIONS

### 6.1 Transmitter Front and Rear Panels



- 1 **RS-232 In:** Connect to a PC/laptop or RS-232 enabled device (with supplied 3.5 mm phone jack to D-Sub 9 pin adaptor) for the transmission of RS-232 commands.
- 2 **IR2 Extender:** Connect to the supplied IR extender cable for IR signal reception. Ensure that remote controller being used is within the direct line-of-sight of the IR extender.
- 3 **IR1 Blaster:** Connect to the supplied IR blaster cable for IR signal transmission. Place the IR blaster in direct line-of-sight of the equipment to be controlled.
- 4 **HDMI In:** Connect to HDMI source equipment such as a DVD or Blu-ray player.
- 5 **DC 5V:** Plug the 5V DC power supply into the unit and connect the adaptor to an AC outlet.
- 6 **Link:** The yellow LED will illuminate when both the input and output CAT5e/6/7 signals are connected.
- 7 **Power:** This green LED will illuminate when the device is connected to a power supply.
- 8 **CAT5e/6 Out:** Connect to the receiver unit with a single CAT5e/6/7 cable for transmission of all data signals.

## 6.2 Receiver Front and Rear Panels



- 1 **RS-232 Out:** Connect to the device that is to be controlled (with the supplied 3.5mm phone jack to D-Sub 9-pin adaptor) by RS-232 commands.
- 2 **IR1 Extender:** Connect to the supplied IR extender cable for IR signal reception. Ensure that remote being used is within the direct line-of-sight of the IR extender.
- 3 **IR2 Blaster:** Connect to the supplied IR blaster cable for IR signal transmission. Place the IR blaster in direct line of sight of the equipment to be controlled.
- 4 **HDMI Out:** Connect to a HDMI equipped TV/monitor for display of the HDMI input source signal.
- 5 **DC 5V:** Plug the 5V DC power supply into the unit and connect the adaptor to an AC outlet.
- 6 **Link:** The yellow LED will illuminate when both the input and output CAT5e/6/7 signals are connected.
- 7 **Power:** This green LED will illuminate when the device is connected to a power supply.
- 8 **CAT5e/6 In:** Connect to the transmitter unit with a Single CAT5e/6/7 cable for transmission of all data signals.

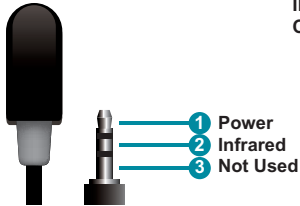


### 6.3 D-Sub 9-Pin Definitions

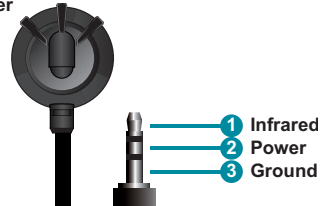
PIN	DEFINE TX/RX
1	N/C
2	TxD/RxD
3	RxD/TxD
4	N/C
5	GND
6	N/C
7	N/C
8	N/C
9	N/C

### 6.4 IR Cable Pin Assignment

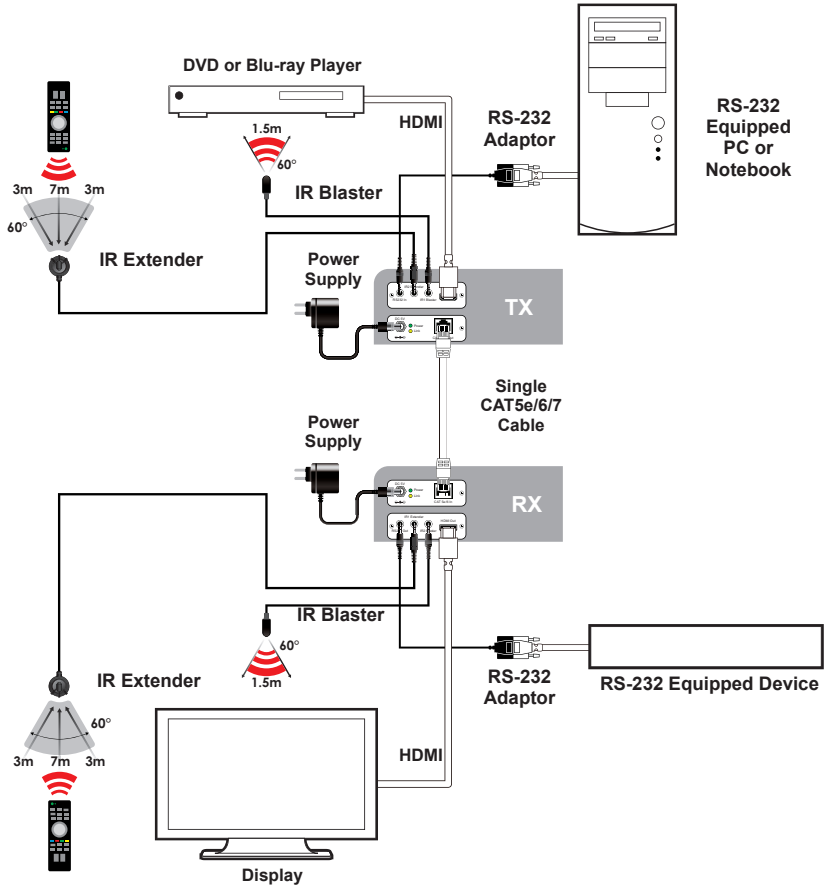
IR Blaster Cable



IR Extender Cable



## 7. CONNECTION DIAGRAM



## 8. SPECIFICATIONS

<b>HDMI Bandwidth</b>	10.2Gbps
<b>HDBaseT Bandwidth</b>	10.2Gbps
<b>Transmitter</b>	
<b>Input Ports</b>	1×HDMI, 1×IR Extender, 1×RS-232
<b>Output Ports</b>	1×CAT5e/6/7, 1×IR Blaster
<b>Receiver</b>	
<b>Input Ports</b>	1×CAT5e/6/7, 1×IR Extender
<b>Output Ports</b>	1×HDMI, 1×RS-232, 1×IR Blaster
<b>IR Frequency</b>	30 - 50kHz (30 - 60kHz under ideal conditions)
<b>Baud Rate</b>	up to 115200/sec
<b>Power Supply</b>	5V / 2.6A DC (US/EU standards, CE/FCC/ UL certified)
<b>ESD Protection</b>	Human-body Model: ±8 kV (air-gap discharge) ±4 kV (contact discharge)w
<b>IR Frequency</b>	30~50 kHz
<b>Dimensions</b>	71 mm (W)×79 mm (D)×23 mm (H)
<b>Weight</b>	240g (TX), 245g (RX)
<b>Chassis Material</b>	Aluminum
<b>Silkscreen Color</b>	Black
<b>Operating Temperature</b>	0 °C~40 °C/32 °F~104 °F
<b>Storage Temperature</b>	-20 °C ~ 60 °C/-4 °F~140 °F
<b>Relative Humidity</b>	20~90% RH (non-condensing)
<b>Power Consumption</b>	3W (TX), 6W (RX)

## 8.1 Cable Specifications

Cable Length	1080p		4K30	4K60
	8-bit	12-bit	8-bit (4:4:4)	8-bit (4:2:0)
<b>High Speed HDMI Cable</b>				
<b>HDMI Input</b>	15m	10m	5m	5m
<b>HDMI Output</b>	15m	10m	5m	5m
<b>Ethernet Cable</b>				
<b>Cat.5e/6/7</b>	100m		70m	
<b>Cat.5e/6</b>	60m*		35m*	
<b>Cat.6a/7</b>	70m*		40m*	

\*For Lite version

- **1080p (FHD Video)**

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

- **4K30 (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

## 9. ACRONYMS

ACRONYM	COMPLETE TERM
<b>CAT5e</b>	Category 5 Cable
<b>CAT6</b>	Category 6 Cable
<b>CEC</b>	Consumer Electronics Control
<b>DVI</b>	Digital Visual Interface
<b>HDCP</b>	High-bandwidth Digital content protection
<b>HDMI</b>	High Definition Multimedia Interface
<b>IR</b>	Infrared





