

# HIDAV®

## HDMI Audio & Video Single CAT5/RJ45 Extender Kit

User Manual

(HD-C5S4)



**[Must be used with Solid CAT5e or CAT6 Cable]**

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Rev.1108

Full HD  
1080

WUXGA  
1920  
x  
1200

x.v.Color  
HDCP™  
HIGH-DEFINITION CONTENT PROTECTION

7.1 CH  
AUDIO  
CAT-5e/6/7  
SINGLE  
PATENTED



Made in Taiwan



## Safety and Notice

The **HD-C5S4 HDMI Audio & Video Single CAT5/RJ45 Extender Kit** has been tested for conformance to safety regulations and requirements, and has been certified for international use. However, like all electronic equipments, the **HD-C5S4** should be used with care. Please read and follow the safety instructions to protect yourself from possible injury and to minimize the risk of damage to the unit.

- Follow all instructions and warnings marked on this unit.
- Do not attempt to service this unit yourself, except where explained in this manual.
- Provide proper ventilation and air circulation and do not use near water.
- Keep objects that might damage the device and assure that the placement of this unit is on a stable surface.
- Use only the power adapter and power cords and connection cables designed for this unit.
- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.

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# INTRODUCTION

The HD-C5S4 HDMI Audio & Video Single CAT5/RJ45 Extender Kit boosts up your video/audio transmission distance up to 60m (200ft) in HDTV 1080i format, 40m (130ft) in HDTV 1080p format, and 20m (65ft) in HDTV 1080p with 36-bit color depth. HD-C5S4 also supports the most advanced 3D video format complaint with HDMI and therefore guarantees the highest 3D video compatibility on the market. With only one cost effective Cat.5/5e/6 cable, users can readily extend HDTV sources from DVD players, Blu-ray Disc player, PS3, PC, and any other kinds of sources compliant with TMDS to distant display monitors including HDMI or DVI enabled TV sets or LCD PC monitors. With the advanced design for the latest HDMI technology, deep color video, DTS-HD Master Audio or Dolby TrueHD audio, and HDCP supports and compatibility are all further insured. This flexibility makes HDCP compliant DVD players or PS3 transmit utmost high quality video and audio with a greater distance at the minimal cost, when integrating several components apart. In addition, HD-C5S4 is also equipped with bi-directional IR pass-through path. This bonus feature allows users to boost IR control distance up to 100m (330 ft) and makes IR control possible through only single Cat.5/5e/6 cable including HDMI signals.

The HD-C5S4 includes two units: transmitting unit of HD-C5S4 and receiving unit of HD-C5S4. The transmitting unit is used to capture the input HDMI / DVI signals with IR control packets and carry the signals via one cost effective Cat.5/5e/6 cable. The receiving unit is responsible for equalizing the transmitted HDMI signal and reconstructing IR signals. The transmission distance between the sending and receiving units can be up to 60m (200ft) at HD 720p or 1080i; or 40m (130ft) at Full HD 1080p. With an 8-level equalization rotary control on the receiving unit, users can adjust the equalization strength to the received HDMI signals accordingly, and therefore optimize the transmission distance between source and destination.

## Features

- Support HDMI Deep Color & full 3D
- Extend the transmission up to 60m (200ft) from the HDMI source at HD 1080i or 720p 24-bit
- Extend the transmission up to 40m (130ft) from the HDMI source at Full HD 1080p 24-bit
- Extend the transmission up to 20m (65ft) from the HDMI source at Full HD 1080p 36-bit
- HDCP 1.1 compliant
- Minimize the cable skew by adjustable 8-level equalization control
- Pure unaltered uncompressed 7.1ch digital HDMI over Cat.5/5e/6 cable transmission
- DTS-HD Master Audio and Dolby TrueHD high bit rate audio support
- Allows cascading
- Wall mounting housing design for easy and robust installation
- Perfectly integrated with other HDMI over Cat.X series products



*The claimed transmission distance here is subject to the grade of installed cable(s), source device and display.*

*For over CAT.X transmission, the cable(s) has to be solid, not stranded. Any keystone jack along the transmission path will kill the transmission performance significantly!*

# Specifications & Package Contents

Model Name		HD-C5S4	
<b>Technical</b>			
Role of usage	Transmitter [TX]		Receiver [RX]
HDMI compliance	Yes		
HDCP compliance	Yes		
Video bandwidth	Single-link 225MHz [6.75Gbps]		
Video support	480i / 480p / 720p / 1080i / 1080p60		
HDMI over UTP transmission [24-bit]	Full HD (1080p)-40m (130ft) [CAT5e] / 50m (165ft) [CAT6] HD (720p/1080i)-50m (165ft) [CAT5e] / 60m (200ft) [CAT6]		
Audio support	Surround sound (up to 7.1ch) or stereo digital audio		
Signal Equalization	8-level digital control at RX		
Input TMDS signal	1.2 Volts [peak-to-peak]		
Input DDC signal	5 Volts [peak-to-peak, TTL]		
ESD protection	[1] Human body model — ±19kV [air-gap discharge] & ±12kV [contact discharge] [2] Core chipset — ±8kV		
PCB stack-up	4-layer board [impedance control — differential 100Ω; single 50Ω]		
Input	1x HDMI	1x RJ45	
Output	1x RJ45	1x HDMI	
HDMI source control	Controllable via IR pass-through from RX to TX with IR extenders		
HDMI connector	Type A [19-pin female]		
RJ45 connector	WE/SS 8P8C with 2 LED indicators		
Rotary control switch	EDID Mode	Signal level	
<b>Mechanical</b>			
Housing	Metal enclosure		
DIMENSIONS [L x W x H]	Model	91x 60 x 24mm [3.6" x 2.4" x 0.9"]	
	Package	270 x 175 x 80mm [10.6" x 6.9" x 3.1"]	
Weight	Model	198g [7oz]	194g [6.8oz]
	Package	780g [1.7 lbs]	
Fixedness	Wall-mounting case with screws		
Power supply	5V 2A DC		
Power consumption	3 Watts		
Operation temperature	0~40°C [32~104°F]		
Storage temperature	-20~60°C [-4~140°F]		
Relative humidity	20~90% RH [no condensation]		
<b>Package Contents</b>	1x HD-C5S4 [TX & RX] 2x DC 5V 2A wall wart 1x User Manual		

# PANEL DESCRIPTION

## Input Panel — HD-C5S4 Transmitter (TX)

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- MODE:**
- 0 - EDID Full-HD(1080p@60) - 24bit 2D video & 7.1ch audio
  - 1 - EDID Full-HD(1080p@60) - 24bit 2D video & 2ch audio
  - 2 - EDID Full-HD(1080p@60) - 36bit 2D video & 7.1ch audio
  - 3 - EDID Full-HD(1080p@60) - 36bit 2D video & 2ch audio
  - 4 - EDID HD(1080p@30)(1080i@60)(720p@60) - 24bit 2D video & 7.1ch audio
  - 5 - EDID HD(1080p@30)(1080i@60)(720p@60) - 24bit 2D video & 2ch audio
  - 6 - EDID Full-HD(1080p@60) - 36bit 3D video & 2ch audio
  - 7 - EDID learning mode

**HDMI IN:** Connects to a HDMI source with a HDMI male-male cable

## Output Panel — HD-C5S4 Transmitter (TX)

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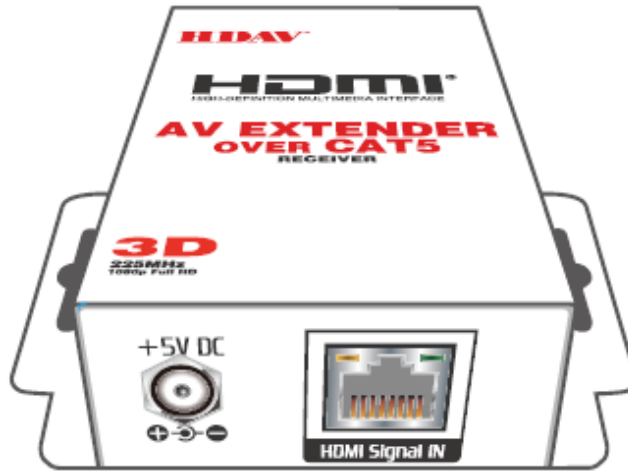


**+5V DC:** Connect to 5V DC power supply.

**HDMI Signal OUT:** Plug in a Cat-5/5e/6 cable that needs to be linked to the transmitting unit of HD-C5S4.

## Input Panel — HD-C5S4 Receiver (RX)

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**+5V DC:** Connect to 5V DC power supply.

**HDMI Signal IN:** Plug in a Cat-5/5e/6 cable that needs to be linked to the receiving unit of HD-C5S4.

## Output Panel — HD-C5S4 Receiver (RX)

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**Signal Level:** Adjust the 8-level equalization control to the received HDMI signals. The HDMI signal level varies from 0 (strongest) to 7 (weakest) for respective transmission length from longest possible range to short distance. Please adjust the signal level from 7 to 0 and stop turning the rotary switch whenever the audio/video is playing normally. Inappropriate signal level setting may cause overpowering issue that would shorten the product life significantly!

**HDMI OUT:** Connect to a HDMI display with a HDMI male-male cable.

# HARDWARE INSTALLATION

1. Connect a HDMI or DVI source (such as a Blu-ray Disc player) to the transmitting unit of HD-C5S4.
2. Connect a HDMI or DVI display (such as a LCD TV) to the receiving unit of HD-C5S4.
3. Connect IR Blaster/Receiver to both TX and RX units.
4. Connect a Cat-5/5e/6 cable between the transmitting and receiving units.
5. Make sure this Cat-5/5e/6 cable is tightly connected and not loose.
6. Plug in 5V DC power supply unit to the power jack of the receiving unit of HD-C5S4.
7. Plug in 5V DC power supply unit to the power jack of the transmitting unit of HD-C5S4.
8. If you see flickering or blinking image on the display, please adjust the rotary control switch to improve the cable skew. 0 stands for the strongest HDMI signal level for longest possible transmission length while 7 stands for the weakest HDMI signal level for short transmission length. Please adjust the signal level from 7 to 0 and stop turning the rotary switch whenever the audio/video is playing normally. Inappropriate signal level setting may cause overpowering issue that would shorten the product life significantly!

# EDID LEARNING

1. Turn off transmitting unit of HD-C5S4 and disconnect the Cat.5/5e/6 between transmitting and receiving units.
2. Connect the HDMI display to "**HDMI IN**" on the transmitting unit with a HDMI cable.
3. Set "**MODE**" on the transmitting unit at 7.
4. Turn on the transmitting unit.
5. The LED on the RJ45 of transmitting unit will dim and light again, which indicates the EDID learning procedure is complete.
6. Unplug the HDMI cable from the display and follow the instruction in [Hardware Installation] to set up the HD-C5S4 and enjoy the experience.

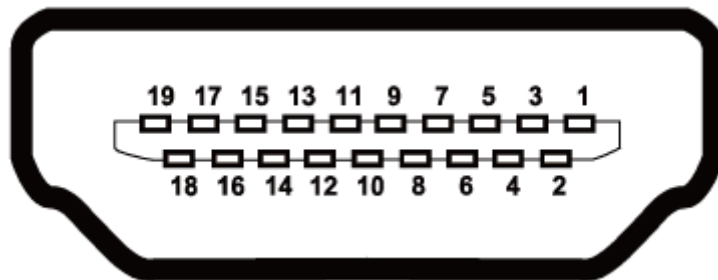
# CONNECTION DIAGRAM





# PIN DEFINITION

## HDMI

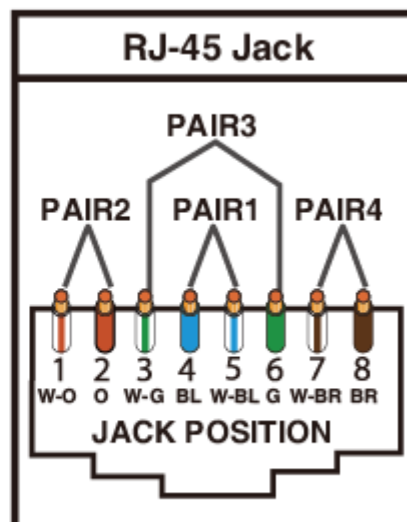


Type A (Receptacle) HDMI

Pin 1	TMDS Data2+	Pin 11	TMDS Clock Shield
Pin 2	TMDS Data2 Shield	Pin 12	TMDS Clock-
Pin 3	TMDS Data2-	Pin 13	NC
Pin 4	TMDS Data1+	Pin 14	Reserved (N.C. on device)
Pin 5	TMDS Data1 Shield	Pin 15	SCL
Pin 6	TMDS Data1-	Pin 16	SDA
Pin 7	TMDS Data0+	Pin 17	DDC/CEC Ground
Pin 8	TMDS Data0 Shield	Pin 18	+5V Power
Pin 9	TMDS Data0-	Pin 19	Hot Plug Detect
Pin 10	TMDS Clock+		

## CAT5 [RJ45]

Data Link TIA/EIA-568-B		
PIN	Color	Function
1	W-O	TX0-
2	O	TX0+
3	W-G	TX1-
4	BL	TX2-
5	W-BL	TX2+
6	G	TX1+
7	W-BR	TXC-
8	BR	TXC+



# NOTICE

1. When adjusting the signal level on the receiver unit, please dial the rotary control switch from 7 to 0 and stop turning the rotary switch whenever the audio/video is playing normally. Inappropriate signal level setting may cause overpowering issue that would shorten the product life significantly!
2. If the DVI or HDMI device requires the EDID information, please use EDID Reader/Writer to retrieve and provide DVI or HDMI display EDID information.
3. All HDMI over CAT5 transmission distances are measured using Belden 1583A CAT5e 125MHz UTP cable and ASTRODESIGN Video Signal Generator VG-859C & VG-870B.
4. The transmission length is largely affected by the type of Cat-5/5e/6 cables, the type of HDMI sources, and the type of HDMI display. The testing result shows solid UTP cables (usually in the form of 300m [1,000ft] bulk cables) can transmit a lot longer signals than stranded UTP cables (usually in the form of fixed length patch cords). Shielded STP cables are better suited than unshielded UTP cables. A solid UTP Cat-5e cable shows longer transmission range than stranded STP Cat-6 cable. For long extension applications, solid UTP/STP cables are the only viable choice.
5. EIA/TIA-568-B termination (T568B) for Cat-5/5e/6 cables is recommended for better performance.
6. To reduce the interference among the unshielded twisted pairs of wires in Cat-5/5e/6 cable, one can use shielded STP cables to improve EMI problems, which is worsen in long transmission.
7. Because the quality of the CAT5/6 cables has the major effect on how long the transmission limit can achieve and how good is the received picture quality, the actual transmission range is subject to one's choice of Cat-5/5e/6 cables. For desired resolutions greater than 1080i or 1280x1024, a Cat-6 cable is recommended.
8. If your HDMI display has multiple HDMI inputs, it is found that the first HDMI input [HDMI input #1] generally can produce better transmission performance among all HDMI inputs.



## Performance Guide for VGA over RJ-45 /CAT5 Cable Transmission

Performance rating		Type of category cable		
Wiring	Shielding	CAT5	CAT5e	CAT6
Solid	Unshielded (UTP)	★ ★ ★	★ ★ ★ ★	★ ★ ★ ★ ★
	Shielded (STP)	★ ★ ★	★ ★ ★	★ ★ ★ ★
Stranded	Unshielded (UTP)	★	★ ★	★ ★
	Shielded (STP)	★	★	★ ★
<b>Termination</b>		Please use <b>EIA/TIA-568-B</b> termination ( <b>T568B</b> ) at any time		