



## SP-4K1H1C150-KIT

18Gbps HDMI over HDBaseT Extender-Splitter with  
Bi-direction IR (150m)



User Manual

VER1.0

# Thank you for purchasing this incredible product

For best performance and safety, please read these instructions carefully before connecting and operating this product. Please keep this manual for future reference.

## Surge protection device recommended

This product contains sensitive electrical components that may be damaged by electrical spikes, power surges, electrostatic discharge (ESD), lightning strikes or transients. The use of surge protection systems is highly recommended in order to protect and extend the life of your equipment.

## Safety and performance Notice

Only use the power supply supplied with the unit, or a PhD Solutions supplied replacement. Do not disassemble any of the equipment. This will void the manufacturer's warranty.

## Table of Contents

1. Introduction.....	1
2. Features.....	1
3. Package Contents.....	2
4. Specifications.....	2
5. Operation Controls and Functions.....	4
5.1 Transmitter Module.....	4
5.2 Receiver Module.....	5
5.3 IR Pinout.....	6
6. Application Diagram.....	8
7. CAT Cable Termination Diagram.....	9

## 1. Introduction

Using the latest low latency Display Stream Compression (DSC), the 18Gbps HDMI Extender-Splitter can extend high-definition video and audio signals, RS-232 and bi-directional IR up to 492ft / 150 meters over a single CAT cable. It supports resolutions of up to 4K2K@60Hz 4:4:4, 18Gbps and HDCP 2.2. An HDMI loop output port will split the HDMI Input to a local Display. It also supports de-embedded audio for L/R audio output and PoC. The extender is equipped with two-way IR pass-through which allows for source and display control.

Utilizing DSC the extender splitter supports HDR10+, HLG and Dolby vision with the best light weight visually lossless compression.

This extender-splitter kit offers the most convenient solution for HDMI extension via a single Cat5e/6 with long distance capability and is the perfect solution for any application.

## 2. Features

- HDCP 2.2 / HDCP 1.4 and DVI 1.0 compliant
- Support 18Gbps 12-bit video bandwidth with DSC
- The maximum extended transmission distance via a single Cat5e/6 cable:  
394ft / 120 meters for 4K2K60 4:4:4;  
492ft / 150 meters for 1080P
- One HDMI loop output on the transmitter
- De-embedded 3.5mm audio output on receiver for sources set to PCM audio (No down mixing)
- With bi-directional IR, RS-232 and CEC pass-through
- HDR, HDR10+, Dolby Vision and HLG supported
- 24VPoC (Power over Cable) on one end
- Compact design for easy and flexible installation

### 3. Package Contents

Qty	Item
1	18Gbps HDMI over HDBaseT Extender (Transmitter)
1	18Gbps HDMI over HDBaseT Extender (Receiver)
1	IR Blaster cable (1.5 meters)
1	20~60KHz IR Receiver cable (1.5 meters)
4	Mounting Ears
2	3-pin Phoenix connector
1	24V/1A Locking Power adapter
1	User Manual

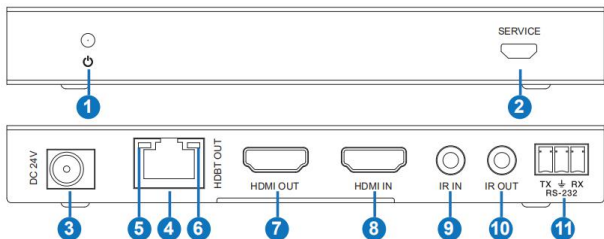
### 4. Specifications

Technical	
HDCP Compliance	HDCP 2.2 / HDCP 1.4
Video Bandwidth	18Gbps
Video Resolution	4K2K 50/60Hz 4:4:4 4K2K 50/60Hz 4:2:2 4K2K 50/60Hz 4:2:0 4K2K 30Hz 4:4:4 1080p, 1080i, 720p, 720i, 480p, 480i All HDMI 3D TV formats All PC resolutions including 1920 x 1200
Color Space	RGB / YCbCr 4:4:4, YCbCr 4:2:2, YCbCr 4:2:0
Color Depth	8/10/12-bit (1080P60Hz, 4K30Hz, 4K60Hz YCbCr 4:2:2/4:2:0) 8-bit (4K60Hz 4:4:4 )
HDMI Audio Formats	LPCM 2.0/2.1/5.1/6.1/7.1, Dolby Digital, Dolby TrueHD, Dolby Digital Plus(DD+), DTS-ES, DTS HD Master, DTS HD-HRA, DTS-X, Dolby Atmos
L/R Audio Formats	PCM 2.0
ESD Protection	Human body model — ±8kV (Air-gap discharge) & ±4kV (Contact discharge)

<b>Connection</b>			
Transmitter	Inputs: 1x HDMI Type A [19-pin female] Outputs: 1x HDMI Type A [19-pin female] 1x HDBT OUT [RJ45, 8-pin female] Control: 1x IR IN [3.5mm Stereo Mini-jack] 1x IR OUT [3.5mm Stereo Mini-jack] 1x RS-232 [Phoenix jack] 1x SERVICE [Mini-USB, Update port]		
Receiver	Inputs: 1x HDBT IN [RJ45, 8-pin female] Outputs: 1x HDMI Type A [19-pin female] 1x AUDIO OUT [3.5mm Stereo Mini-jack] Control: 1x IR IN [3.5mm Stereo Mini-jack] 1x IR OUT [3.5mm Stereo Mini-jack] 1x RS-232 [Phoenix jack] 1x SERVICE [Mini-USB, Update port]		
<b>Mechanical</b>			
Housing	Metal Enclosure		
Color	Black		
Dimensions	Transmitter / Receiver: 140mm [W] x 65mm [D] x 18mm [H]		
Weight	Transmitter: 160g, Receiver: 155g		
Power Supply	Input: AC 100 - 240V 50/60Hz Output: DC 24V/1A (Locking connector)		
Power Consumption	9.36 W		
Operating Temperature	32 - 104°F / 0 - 40°C		
Storage Temperature	-4 - 140°F / -20 - 60°C		
Relative Humidity	20 - 90% RH (no condensation)		
<b>Resolution / Distance</b>			
4K2K	394ft / 120M		
1080P	492ft / 150M		
<b>Resolution / Cable Length</b>	<b>4K60 - Feet / Meters</b>	<b>4K30 - Feet / Meters</b>	<b>1080P60 - Feet / Meters</b>
HDMI IN / OUT	16ft / 5M	32ft / 10M	50ft / 15M
The use of "Premium High Speed HDMI" cable is highly recommended.			

## 5. Operation Controls and Functions

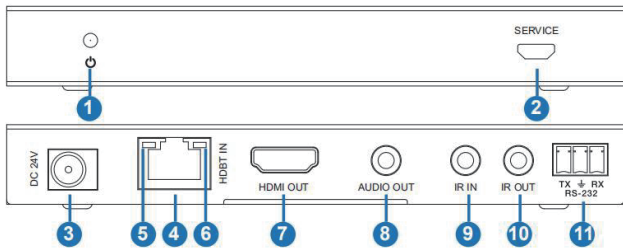
### 5.1 Transmitter Module



No.	Name	Function Description
1	Power LED	Red LED indicates that the transmitter is powered on.
2	SERVICE port	Firmware update port.
3	DC 24V	DC 24V/1A power supply input port. <i>Note that the extender supports PoC function, it means that either transmitter or receiver is powered by the 24V/1A power adapter, <b>Power required on one side only</b></i>
4	HDBT OUT	RJ45 connector for connecting the HDBT IN port of receiver with a CAT 5e/6 cable. Terminated 568B Configuration
5	Connection Signal Indicator lamp	<ul style="list-style-type: none"><li>▪ Illuminating: Transmitter and Receiver connection status is good.</li><li>▪ Flashing: Transmitter and Receiver are connection status is poor.</li><li>▪ Dark: Transmitter and Receiver are not connected.</li></ul>
6	Data Signal Indicator lamp	<ul style="list-style-type: none"><li>▪ Illuminating: HDMI signal with HDCP.</li><li>▪ Flashing: HDMI signal without HDCP.</li><li>▪ Dark: No HDMI signal.</li></ul>
7	HDMI OUT	HDMI loop output for display.
8	HDMI IN	HDMI source input.
9	IR IN	IR input port for receiving the signal of an IR remote.
10	IR OUT	IR output port for control of source device. This IR output signal is from the IR IN port of receiver.

11	RS-232	3-pin Phoenix connector for RS-232 command transmission. The RS-232 command will be passed through from transmitter to receiver or from receiver to transmitter.
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## 5.2 Receiver Module



No.	Name	Function Description
1	Power LED	Red LED indicates that the receiver is powered on.
2	SERVICE port	Firmware update port.
3	DC 24V	DC 24V/1A power supply input port. <i>Note that the extender supports PoC function, it means that either transmitter or receiver is powered by the 24V/1A power adapter, <b>Power required on one side only</b></i>
4	HDBT IN	RJ45 connector for connecting the HDBT OUT port of transmitter with a CAT 5e/6 cable. Terminated 568B Configuration
5	Connection Signal Indicator lamp	<ul style="list-style-type: none"> <li>▪ Illuminating: Transmitter and Receiver connection status is good.</li> <li>▪ Flashing: Transmitter and Receiver connection Status is poor.</li> <li>▪ Dark: Transmitter and Receiver are not connected.</li> </ul>
6	Data Signal Indicator	<ul style="list-style-type: none"> <li>▪ Illuminating: HDMI signal with HDCP.</li> <li>▪ Flashing: HDMI signal without HDCP.</li> <li>▪ Dark: No HDMI signal.</li> </ul>
7	HDMI OUT	HDMI output for display.
8	AUDIO OUT	3.5mm stereo connector for analog audio output.

9	IR IN	IR input port for receiving the signal of IR remote.
10	IR OUT	IR output port for control of display device. This IR output signal is from the IR IN port of transmitter.
11	RS-232	3-pin Phoenix connector for RS-232 command transmission. The RS-232 command will pass-through from transmitter to receiver or from receiver to transmitter.

### 5.3 IR Pinout

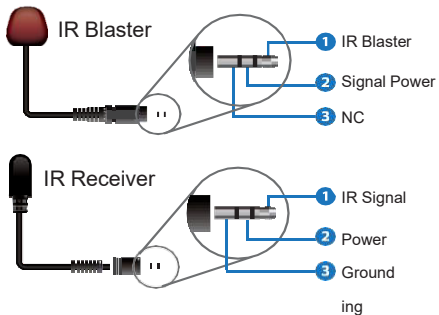
IR Receiver and Blaster pin's definition is as below:



IR RECEIVER

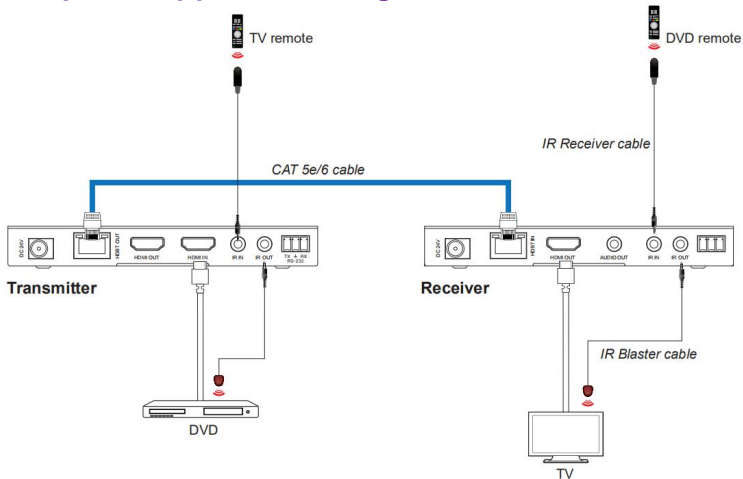


IR BLASTER



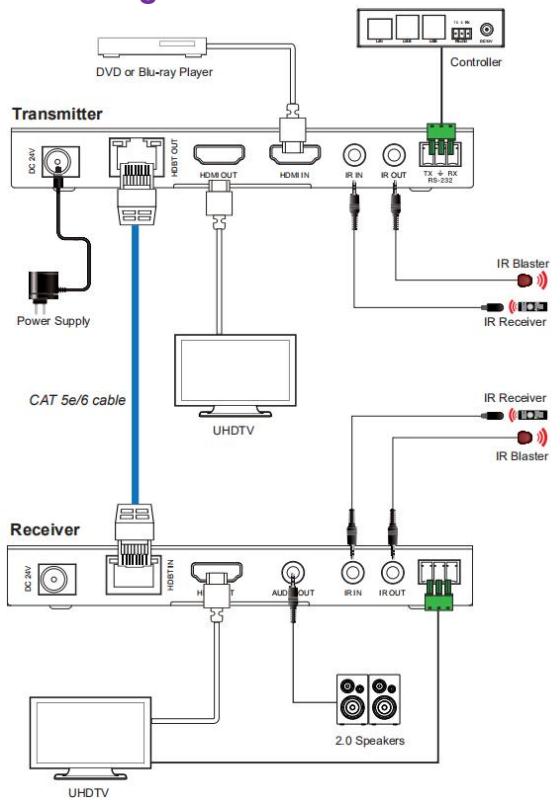


## IR system Application Diagram.



*Note: when the angle between the IR receiver and the remote control is  $\pm 45^\circ$  the transmission distance is 0-5 meters; when the angle between the IR receiver and the remote control is  $\pm 90^\circ$  the transmission distance is 0-8 meters.*

## 6. Application Diagram

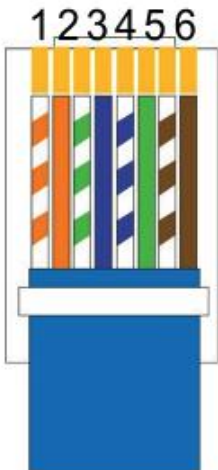
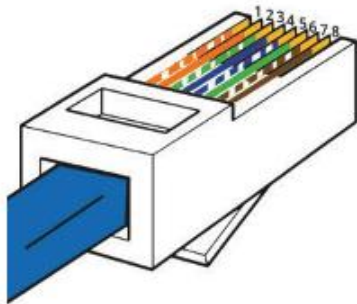


## 7. CAT Cable Termination Diagram

For 4K signal distribution we recommend a decent CAT6UTP solid 23AWG cable which should be terminated properly with the correct RG45 connectors according to TIA568B termination standard shown below.

### RJ45 Pin-Out T568B

- |                       |                      |
|-----------------------|----------------------|
| <b>1.White Orange</b> | <b>5.White Blue</b>  |
| <b>2.Orange</b>       | <b>6.Green</b>       |
| <b>3.White Green</b>  | <b>7.White Brown</b> |
| <b>4.Blue</b>         | <b>8.Brown</b>       |



## 8. PhD Solutions Product Warranty

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- Replace it with a new or refurbished product.

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