



## EXC-4KP100-HDTUSB-KIT

18Gbps HDMI™ HDBaseT Extender with USB 2.0  
Over CAT5/6 (100m) KIT

### User Manual



# Thank you for purchasing this incredible product

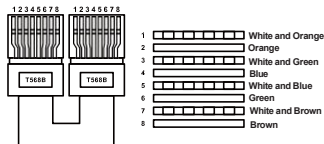
For best performance and safety, please read these instructions carefully before connecting and operating this product. Please keep this manual for future reference

## 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.

## Caution

The network cable connection method required for this product is a direct connection. DO NOT CROSS CONNECT.



Direct termination Method

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# 1. Introduction

This HDBaseT extender is built for high-performance, long-distance signal transmission. It carries HDMI™, IR, RS-232, USB 2.0 (supporting KVM) and control signals up to 100 m (328 ft) over a single CAT5e/6 cable. It supports video resolutions up to 4K@60Hz (4:4:4).

The system allows full control of the source or display from either end through CEC and bi-directional IR pass-through, simplifying setup and day-to-day use. EDID management (COPY TV/STD) ensures correct communication with different displays, and PoC powering either the transmitter or receiver, providing flexibility during installation.

This is ideal for video conferencing, multimedia distribution, KVM applications, and any project requiring dependable long-distance HDMI™ extension. It also supports the extension of USB 2.0 devices such as keyboards, mice, and other HID peripherals.

## 2. Features

- HDCP 2.3/2.2/1.x compliant
- Video bandwidth is up to 18Gbps
- Video resolution is up to 4K@60Hz (4:4:4), as specified in HDMI™ 2.0b
- The transmission distance is up to 100m/328ft via CAT5e/6 cable
- USB 2.0 signal transmission
- Support bi-directional IR, RS-232 control signal and CEC passthrough
- HDMI™ audio formats: LPCM, Dolby Digital/Plus/EX, Dolby True HD, Dolby Atmos, DTS, DTS-EX, DTS-96/24, DTS High Res, DTS-HD Master Audio, DTS:X
- Support audio de-embedding on the Receiver
- Advanced EDID management
- HDR, HDR10, HDR10+, Dolby Vision, HLG pass-through
- Bi-directional PoC (Power over Cable)

### 3. Package Contents

- ① 1× 18Gbps HDMI™ over HDBaseT Extender (Transmitter)
- ② 1× 18Gbps HDMI™ over HDBaseT Extender (Receiver)
- ③ 1× 24V/1A Locking Power Supply
- ④ 1× USB Cable (USB-A to USB-B)
- ⑤ 1× IR Blaster Cable (1.5m)
- ⑥ 1× IR Wideband Receiver Cable (1.5m)
- ⑦ 2× 3pin-3.5mm Phoenix Connector
- ⑧ 4× Mounting Ear
- ⑨ 8× Machine Screws (KM3\*6)
- ⑩ 1× User Manual

### 4. Specifications

| Technical                         |                                                                                                                           |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| HDMI™ Compliance                  | HDMI™ 2.0b                                                                                                                |
| HDCP Compliance                   | HDCP 2.3/2.2/1.x                                                                                                          |
| Video Bandwidth                   | 18Gbps                                                                                                                    |
| Video Resolution (Input & Output) | Up to 4K@60Hz (4:4:4)<br>* All available resolutions are shown as follow.                                                 |
| IR Level                          | 5Vp-p                                                                                                                     |
| IR Frequency                      | Wideband 20K-60KHz                                                                                                        |
| Color Space                       | RGB, YCbCr_4:4:4, YCbCr_4:2:2, YUV_4:2:0                                                                                  |
| Color Depth                       | 8/10/12-bit                                                                                                               |
| HDR                               | HDR, HDR10, HDR10+, Dolby Vision, HLG                                                                                     |
| CEC                               | Supported                                                                                                                 |
| HDMI™ Audio Format                | LPCM, Dolby Digital/Plus/EX, Dolby True HD, Dolby Atmos, DTS, DTS-EX, DTS-96/24, DTS High Res, DTS-HD Master Audio, DTS:X |
| Transmission Distance             | 100m/328ft for 4K@60Hz over CAT5e/6 cable                                                                                 |

|                       |                                                                                                                                                                                                                                                                                                  |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ESD Protection        | IEC 61000-4-2:<br>±8kV (Air-gap discharge) & ±4kV (Contact discharge)                                                                                                                                                                                                                            |
| <b>Connections</b>    |                                                                                                                                                                                                                                                                                                  |
| Transmitter           | Input: 1× IN [HDMI™ Type A, 19-pin female]<br>Output: 1× HDBT OUT [RJ45]<br>Control: 1× HOST [USB-B, 4-pin female]<br>1× IR IN [3.5mm audio jack]<br>1× IR OUT [3.5mm audio jack]<br>1× RS-232 [3pin-3.5mm phoenix connector]<br>1× SERVICE [USB-C]                                              |
| Receiver              | Input: 1× HDBT IN [RJ45]<br>Output: 1× OUT [HDMI™ Type A, 19-pin female]<br>1× AUDIO OUT [3.5mm audio jack]<br>Control: 4× USB 2.0 DEVICE [USB-A, 9-pin female]<br>1× IR IN [3.5mm audio jack]<br>1× IR OUT [3.5mm audio jack]<br>1× RS-232 [3pin-3.5mm phoenix connector]<br>1× SERVICE [USB-C] |
| <b>Mechanical</b>     |                                                                                                                                                                                                                                                                                                  |
| Housing               | Metal Enclosure                                                                                                                                                                                                                                                                                  |
| Color                 | Black                                                                                                                                                                                                                                                                                            |
| Dimensions            | Transmitter/Receiver: 157mm (W) × 88mm (D) × 20mm (H)                                                                                                                                                                                                                                            |
| Weight                | Transmitter: 371g; Receiver: 378g                                                                                                                                                                                                                                                                |
| Power Supply          | DC 24V/1A; Support bi-directional PoC function                                                                                                                                                                                                                                                   |
| Power Consumption     | (PoC) Transmitter: 28.32W; (PoC) Receiver: 25.68W                                                                                                                                                                                                                                                |
| Operating Temperature | 0°C ~ 40°C / 32°F ~ 104°F                                                                                                                                                                                                                                                                        |
| Storage Temperature   | -20°C ~ 60°C / -4°F ~ 140°F                                                                                                                                                                                                                                                                      |
| Operating Humidity    | 20%~80% (relative humidity, non-condensing)                                                                                                                                                                                                                                                      |
| Storage Humidity      | 10%~90% (relative humidity, non-condensing)                                                                                                                                                                                                                                                      |

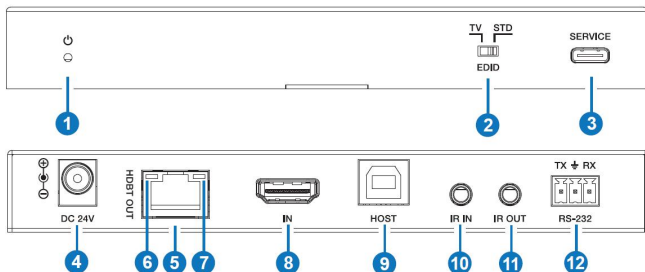
**\* All available input/output resolutions:**

640x480p60Hz, 800x600p60Hz, 1024x768p60Hz, 1280x1024p60Hz, 1360x768p60Hz,  
 1440x900p60Hz, 1440x1050p60Hz, 1600x1200p60Hz, 720x480i59.94Hz(480i59),  
 720x480p59.94Hz(480p59), 720x576i50Hz(576i50), 720x576p50Hz(576p50),

1280x720p50Hz(720p50), 1280x720p59.94Hz(720p59), 1280x720p60Hz(720p60), 1920x1080i50Hz(1080i50), 1920x1080i59.94Hz(1080i59), 1920x1080i60Hz(1080i60), 1920x1080p23.98Hz(1080p23), 1920x1080p24Hz(1080p24), 1920x1080p25Hz(1080p25), 1920x1080p29.97Hz(1080p29), 1920x1080p30Hz(1080p30), 1920x1080p50Hz(1080p50), 1920x1080p59.94Hz(1080p59), 1920x1080p60Hz(1080p60), 3840x2160p23.98Hz(2160p23), 3840x2160p24Hz(2160p24), 3840x2160p25Hz(2160p25), 3840x2160p29.97Hz(2160p29), 3840x2160p30Hz(2160p30), 3840x2160p50Hz(2160p50), 3840x2160p59.94Hz(2160p59), 3840x2160p60Hz(2160p60), 4096x2160p23.98Hz, 4096x2160p24Hz, 4096x2160p25Hz, 4096x2160p29.97Hz, 4096x2160p30Hz, 4096x2160p50Hz, 4096x2160p59.94Hz, 4096x2160p60Hz

## 5. Operation Controls and Functions

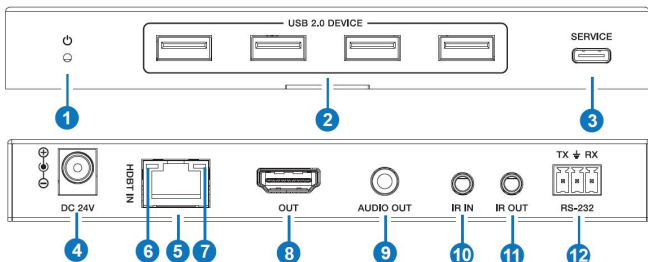
### 5.1 Transmitter Module



| No. | Name            | Function Description                                                                                                                          |
|-----|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | PWR LED         | The green LED is on when the Transmitter is powered on.                                                                                       |
| 2   | EDID DIP switch | Used for EDID settings.<br><b>TV</b> : Copy EDID from the connected display device on RX.<br><b>STD</b> : Standard EDID (4K60 4:4:4 SDR 2CH). |
| 3   | SERVICE         | USB-C port, used for firmware update.                                                                                                         |

| No. | Name                           | Function Description                                                                                                                                               |
|-----|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4   | DC 24V                         | DC 24V/1A power input port.<br><i>Note that the extender supports POC (Power over cable), only one module (TX or RX) requires the power supply</i>                 |
| 5   | HDBT OUT                       | HDBT output port, connected to the HDBT IN port on the Receiver with CAT cable.                                                                                    |
| 6   | Link Signal Indicator (Green)  | <ul style="list-style-type: none"> <li>On: Transmitter and Receiver are connected and linked.</li> <li>Off: Transmitter and Receiver are not connected.</li> </ul> |
| 7   | Data Signal Indicator (Yellow) | <ul style="list-style-type: none"> <li>On: HDMI signal with HDCP.</li> <li>Flashing: HDMI signal without HDCP.</li> <li>Off: No HDMI signal.</li> </ul>            |
| 8   | HDMI IN                        | HDMI signal input port, connected to source device with HDMI cable.                                                                                                |
| 9   | HOST                           | USB host port, connected to a PC.                                                                                                                                  |
| 10  | IR IN                          | Connects to IR receiver cable. The IR signal will be emit to the IR OUT port on the Receiver.                                                                      |
| 11  | IR OUT                         | Connects to IR blaster cable. The IR signal is from the IR IN port on the Receiver.                                                                                |
| 12  | RS-232                         | 3-pin phoenix connector, used for RS-232 command transmission between the Transmitter and Receiver.                                                                |

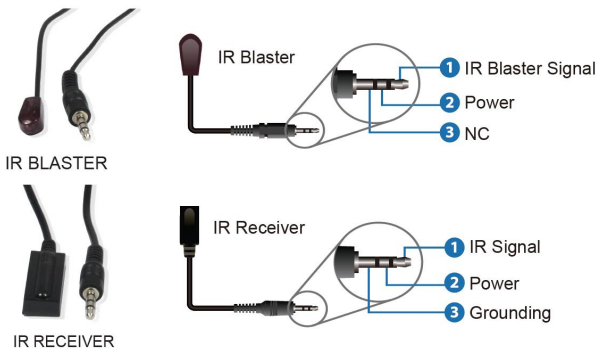
## 5.2 Receiver Module



| No. | Name                           | Function Description                                                                                                                                                                                                                                                                                                                                                                                         |
|-----|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | PWR LED                        | The green LED is on when the Receiver is powered on.                                                                                                                                                                                                                                                                                                                                                         |
| 2   | USB 2.0 DEVICE                 | <p>USB 2.0 type A ports, connected to USB 2.0 devices such as a USB camera, keyboard and mouse.</p> <p><b>Note:</b> If the left two ports are both connected, the power output of the two ports are limited to share 1A; If only one is connected, the power output of each port is 1A. If more power is required an external self powered USB hub can be used.</p> <p>The right two ports are the same.</p> |
| 3   | SERVICE                        | USB-C port, used for firmware update.                                                                                                                                                                                                                                                                                                                                                                        |
| 4   | DC 24V                         | <p>DC 24V/1A power input port.</p> <p><i>Note that the extender supports POC (Power over cable), only one module (TX or RX) requires the power supply.</i></p>                                                                                                                                                                                                                                               |
| 5   | HDBT IN                        | HDBT input port, connected to the HDBT OUT port of the Transmitter with CAT cable.                                                                                                                                                                                                                                                                                                                           |
| 6   | Link Signal Indicator (Green)  | <ul style="list-style-type: none"> <li>▪ On: Transmitter and Receiver are connected and linked.</li> <li>▪ Off: Transmitter and Receiver are not connected.</li> </ul>                                                                                                                                                                                                                                       |
| 7   | Data Signal Indicator (Yellow) | <ul style="list-style-type: none"> <li>▪ On: HDMI signal with HDCP.</li> <li>▪ Flashing: HDMI signal without HDCP.</li> <li>▪ Off: No HDMI signal.</li> </ul>                                                                                                                                                                                                                                                |
| 8   | HDMI OUT                       | HDMI signal output port, connected to display device such as TV or monitor with HDMI cable.                                                                                                                                                                                                                                                                                                                  |
| 9   | AUDIO OUT                      | Analog audio output port, connected to an audio device.                                                                                                                                                                                                                                                                                                                                                      |
| 10  | IR IN                          | Connects to IR receiver cable. The IR signal will be emit to the IR OUT port of the Transmitter.                                                                                                                                                                                                                                                                                                             |
| 11  | IR OUT                         | Connects to IR blaster cable. The IR signal is from the IR IN port of the Transmitter.                                                                                                                                                                                                                                                                                                                       |
| 12  | RS-232                         | 3-pin phoenix connector, used for RS-232 command transmission between the Transmitter and Receiver.                                                                                                                                                                                                                                                                                                          |

### 5.3 IR Pin Out

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

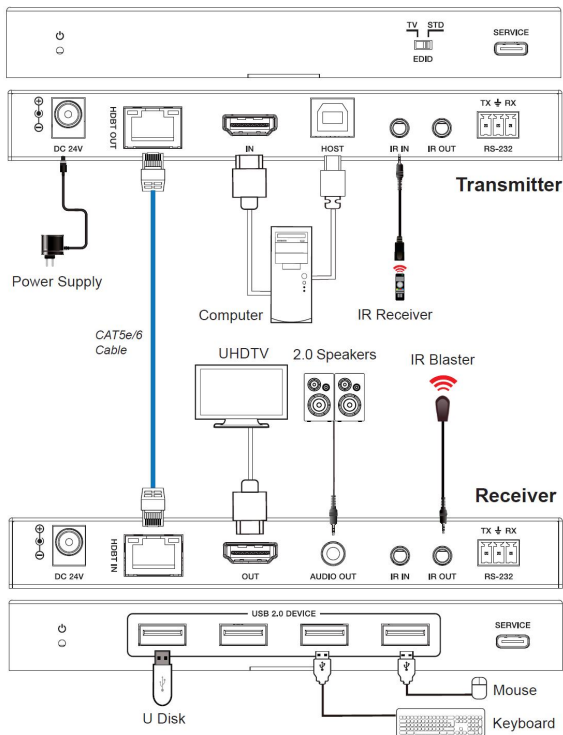


#### **Note:**

When the angle between the IR receiver and the remote control is  $45^\circ$ , the transmission distance is 0-5 meters;

When the angle between the IR receiver and the remote control is  $90^\circ$ , the transmission distance is 0-8 meters.

## 6. Application Example



**HDMI™**  
HIGH-DEFINITION MULTIMEDIA INTERFACE

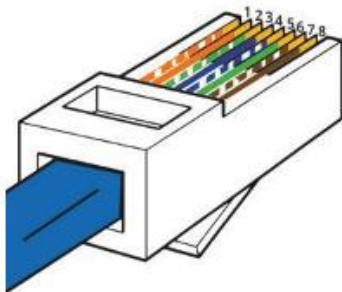
The terms HDMI, HDMI High-Definition Multimedia Interface, HDMI trade dress and the HDMI Logos are trademarks or registered trademarks of HDMI Licensing Administrator, Inc.

## 7. CAT Cable Termination Diagram

For 4K signal distribution we recommend a suitable CAT6UTP solid 23AWG cable which should be terminated properly with the correct RG45 connectors according to TIA568B termination standard shown below. CCA Cable bandwidth is too low and will cause problems over distance.

### RJ45 Pin-Out T568B

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



## 8. PhD Solutions Limited Warranty

### IMPORTANT INFORMATION – YOUR RIGHTS AND WARRANTY

This Limited Warranty gives you specific legal rights. You may also have additional rights that vary by jurisdiction. The disclaimers, exclusions, and limitations of liability in this Limited Warranty will not apply to the extent prohibited by applicable law. For a full description of your legal rights, refer to the laws applicable in your jurisdiction or consult a relevant consumer advisory service.

If your product does not function adequately due to defects in materials or workmanship, **PhD Solutions Limited** (the “Warrantor”) will, during the Warranty Period:

- Repair the product with new or refurbished parts. or
- Replace it with a new or refurbished product.

### 1. WARRANTY COVERAGE AND PERIOD

#### **PhD Solutions Limited**

Office 4106, Level 41

Mazaya Business Avenue AA1

Jumeirah Lakes Towers

Dubai 214745

United Arab Emirates

warrants to the owner of the enclosed product (“Product”) that it will be free from defects in materials and workmanship for a period of two (2) years from the date of delivery following the original purchase (the “Warranty Period”).

If the Product is professionally installed, the Warranty Period begins on the date the installer purchased the Product, not the system commissioning date. Please confirm this with your installer.

If the Product fails to conform to this Limited Warranty during the Warranty Period, PhD Solutions will, at its sole discretion:

- (a) Repair or replace any defective Product or component; or
- (b) Accept the return of the Product and refund the amount paid by the original purchaser

Repair or replacement may be carried out using new or refurbished products or components.

If the Product or any component is no longer available, PhD Solutions reserves the right to replace it with the closest equivalent product of similar function and performance, or a newer model with equivalent or improved functionality, at its sole discretion. This is your sole and exclusive remedy under this Limited Warranty.

Any Product repaired or replaced under this warranty will be covered for the longer of:

- Ninety (90) days from the date of delivery; or
- The remaining Warranty Period

This Limited Warranty is transferable, but the Warranty Period will not be extended or expanded for any transfer.

## **2. WARRANTY CONDITIONS AND CLAIM PROCESS**

To make a claim under this Limited Warranty, the Product owner must:

- (a) Notify PhD Solutions during the Warranty Period and provide a description of the fault
- (b) Comply with all return instructions provided by PhD Solutions
- (c) Return the Product at their own cost (unless prohibited by applicable law)

PhD Solutions will have no warranty obligations for returned Products deemed ineligible after inspection.

PhD Solutions will cover return shipping costs for valid claims. For ineligible Products, all shipping costs will be the responsibility of the owner.

## **3. WHAT THIS LIMITED WARRANTY DOES NOT COVER**

This warranty does not cover the following ("Ineligible Products"):

- Products marked as "sample" or sold "as is"

Products that have been subject to:

- (a) Modification, alteration, tampering, or unauthorised repair
- (b) Handling, installation, testing, or use not in accordance with PhD Solutions instructions
- (c) Abuse or misuse
- (d) Power surges, voltage fluctuations, or interruptions in electrical or telecommunications networks
- (e) Use of incorrect or poor-quality cabling, terminations, or accessories
- (f) Improper grounding or system design

**Electrostatic discharge (ESD) damage**, including:

- Improper handling without ESD protection
- Induced electrical discharge from environmental factors

**Acts of God**, including but not limited to:

- Lightning (including indirect ESD effects)
- Fire, flood, tornado, earthquake, or other natural events

This warranty does not cover consumables (including batteries) unless defective due to manufacturing faults, or software (even if supplied with the Product).

Use of unauthorised service providers may impair performance and invalidate this warranty.

PhD Solutions does not warrant that the Product will operate uninterrupted, error-free, or that it will process all data correctly in all scenarios.

#### **4. INSTALLER AND SYSTEM RESPONSIBILITY**

The installer and/or system integrator is responsible for:

- Correct system design and product selection
- Proper installation, configuration, and commissioning
- Ensuring compatibility between connected devices
- Following all cabling and grounding best practices

PhD Solutions shall not be liable for system performance issues resulting from incorrect installation or design.

#### **5. DISCLAIMER OF WARRANTIES**

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Total liability shall not exceed the amount paid for the Product by the original purchaser.

## **7. LIMITATION OF LIABILITY**

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All product information and services are provided “as is” and “as available” without guarantee of accuracy or reliability.

Use of the Product and related services is at your own risk. PhD Solutions shall not be liable for any damage to:

- HVAC systems
- Plumbing
- Property
- AV or IT systems
- Connected devices or peripherals
- Any other equipment or assets

Product information is provided for convenience and is not a substitute for direct system monitoring.

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Some jurisdictions do not allow limitations on implied warranties or exclusions of certain damages. In such cases, parts of this warranty may not apply.

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