# HDMI 2.1 40Gbps HDBT Extender Kit, 90m

# User Manual

## 500516

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# 1. Safety Precautions

To ensure the best performance from the product, please read all instructions carefully before using the device. Save this manual for future reference.

- Follow basic safety precautions to reduce the risk of fire, electrical shock, and injury.
- Do not dismantle the housing or modify the module. It may result in electrical shock or burns.
- Do not open or remove the housing of the device as you may be exposed to dangerous voltage or other hazards.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture and do not install this product near water. Keep the product away from liquids.
- Spillage into the housing may result in fire, electrical shock, or equipment damage. If an object or liquid falls or spills on the housing, unplug the module immediately.
- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.
- Using supplies or parts not meeting the product specifications may cause damage, deterioration or malfunction.
- Refer all servicing to qualified service personnel.
- Install the device in a place with adequate ventilation to avoid damage caused by overheat.
- Unplug the power when left unused for a long period of time.
- Information on disposal of devices: do not burn or mix with general household waste, please treat them as normal electrical waste.

## 2. Introduction

The HDMI 2.1 40Gbps HDBT Extender Kit, 90m (model: 500516) enables HDMI 2.1 connectivity at data rates up to 40Gbps & extends HDMI 8K up to 90m (295ft), HDMI 4K up to 120m (394ft) and 1080p up to 150m (492ft) over standard Cat6 UTP cable. Transmitter features with HDMI input, bidirectional IR, analog audio de-embedding and RS-232 pass-through. Receiver features with HDMI output, bidirectional IR, analog audio de-embedding and RS-232 pass-through. The device also supports 24V Bidirectional PoC.

The HDMI 2.1 40Gbps HDBT Extender Kit, 90m supports advanced functionalities like VRR, FVA, ALLM, HDR10, HDR10+, HLG and Dolby Vision. All audio format are supported.

## 3. Features

- Video bandwidth up to 40Gbps FRL and 18Gbps TMDS
- Supports all industry standard video resolution
- HDMI re-clocking on the HDBT receiver is helpful to solve HDMI and HDCP compatibility and handshaking issues
- Supports bidirectional IR, RS232 and CEC pass-through
- Supports VRR, FVA and ALLM
- Supports HDR10, HDR10+, HLG and Dolby Vision pass-through
- Supports bidirectional PoC (Power over Cable)
- Both the transmitter and receiver support analog audio de-embedding
- Simple plug and play installation

## 4. Package Contents

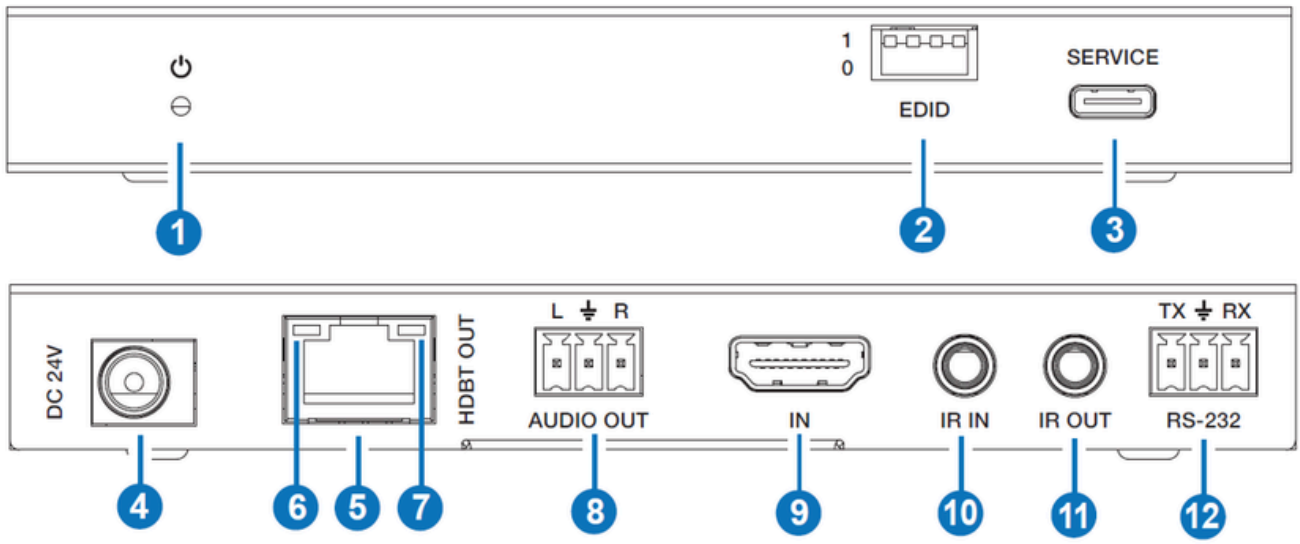
- One (1) HDMI 2.1 40Gbps HDBT Extender (Transmitter)
- One (1) HDMI 2.1 40Gbps HDBT Extender (Receiver)
- One (1) IR Blaster Cable (1.5m)
- One (1) Wideband Receiver Cable (1.5m)
- Four (4) 3pin-3.5mm Phoenix Connector
- One (1) 24V/1A Locking Power Supply
- Four (4) Mounting Ear
- Eight (8) Machine Screw (KM3*4)
- One (1) User manual (available via download)

# 5. Specifications

| | |
|---|---|
| **Technical** | |
| **Protocol Compliance** | HDMI 2.1 and HDCP 2.3 |
| **Transmission Rate** | Up to 40Gbps FRL and 18Gbps TMDS |
| **Video Resolution** | Up to 8K/30Hz (4:4:4) |
| **Transmission Distance** | 8K/30 up to 90m/295ft, 4K/60 up to 120m/394ft and<br>1080p up to 150m/492ft over CAT6 (F/FTP) cable |
| **IR Frequency** | Wideband 20KHz to 60KHz |
| **Color Space** | RGB, YCbCr 4:4:4, YCbCr 4:2:2 and YCbCr 4:2:0 |
| **Color Depth** | 8, 10, 12 bit |
| **HDR Standard** | HDR, HDR10, HDR10+, HLG and Dolby Vision |
| **HDMI Audio Format** | LPCM up to 7.1 channels, Dolby up to Dolby Atmos and DTS up to DTS:X |
| **Connection** | |
| **Transmitter** | Input: 1 × HDMI Input [HDMI Type A, 19-pin female]<br>Output: 1 × HDBT Output [RJ45, 8-pin female]<br>Control: 1 × IR Input [3.5mm stereo mini jack]<br>1 × IR Output [3.5mm stereo mini jack]<br>1 × RS232 [3pin-3.5mm Phoenix Connector]<br>1 × USB-C Service [USB-C female]<br>1 × EDID [4-pos DIP Switches] |
| **Receiver** | Input: 1 × HDBT Input [RJ45, 8-pin female]<br>Output: 1 × HDMI Output [HDMI type A, 19-pin female]<br>Control 1 × IR Input [3.5mm stereo mini jack]<br>1 × IR Output [3.5mm stereo mini jack]<br>1 × RS232 [3pin-3.5m phoenix connector]<br>1 × Service [USB-C female] |
| **Mechanical** | |
| **Housing** | Metal Enclosure |
| **Color** | Black |
| **Dimensions** | Transmitter/Receiver: 140mm [W] × 65mm [D] × 18mm [H] |
| **Weight** | Transmitter/Receiver: 240g |
| **Power Supply** | Input: 100~240VAC 50/60Hz<br>Output: 24VDC/1A |
| **Power Consumption** | Transmitter: 11.28W, Receiver: 10.8W |
| **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) |
| **Generic Specification** | |
| **Warranty** | 2 years |
| **Order Information** | 500516 HDMI 2.1 40Gbps HDBT Extender Kit, 90m (UPC: 627699005163) |

# 6. Operation Controls and Functions

## 6.1 Transmitter Panel

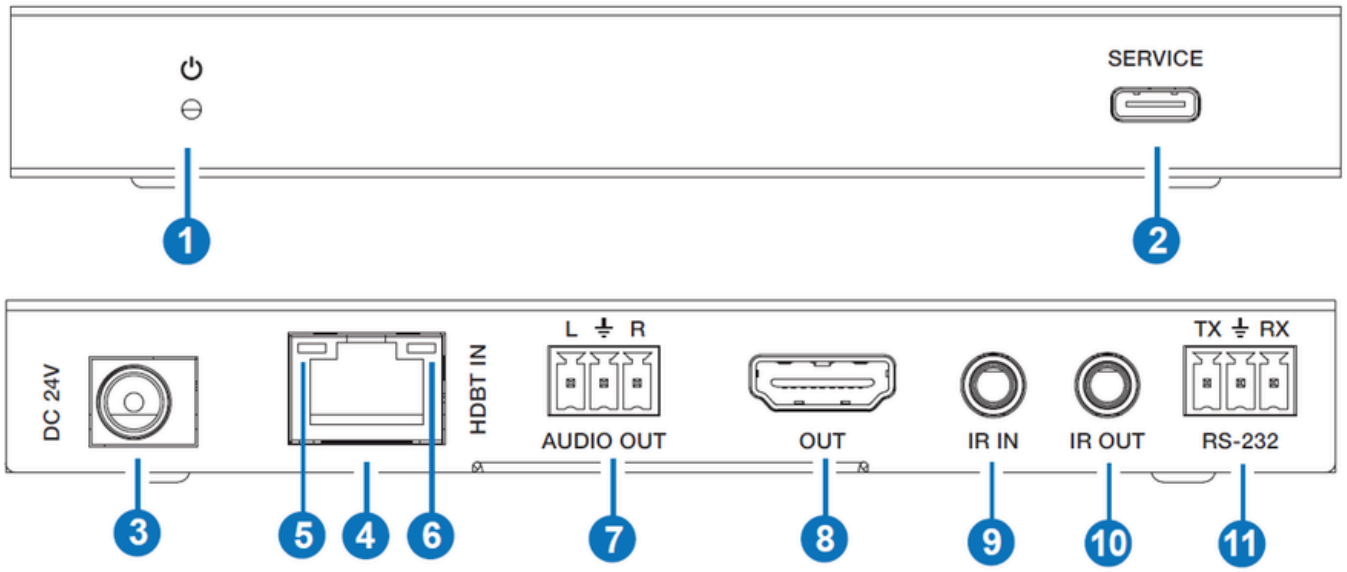



| No | Name | Description |
|---|---|---|
| 1 | PWR LED | The green LED is on when the Transmitter is powered on. |
| 2 | EDID DIP Switch | Used for EDID setting. (* EDID setting list is shown as follow.) |
| 3 | Service | USB-C port, used to debug serial and update firmware. |
| 4 | 24VDC | 24VDC/1A power input port.<br>Note that the extender supports POC function, it means that either Transmitter or Receiveris connected to 24VDC/1A power supply, the other doesn't need power supply. |
| 5 | HDBT Out | HDBT output port, connected to the HDBT IN port of the Receiver with CAT6 cable. |
| 6 | Link Signal Indicator (Green) | ▪ On: Transmitter and Receiver are connected and linked.<br>▪ Off: Transmitter and Receiver are not connected. |
| 7 | Data Signal Indicator (Yellow) | ▪ On: HDMI signal with HDCP.<br>▪ Flashing: HDMI signal without HDCP.<br>▪ Off: No HDMI signal. |
| 8 | AUDIO OUT (L/R) | Analog audio output port, supporting unbalanced audio output with a maximum support of 1Vrms.<br>Unbalanced connection method: L+, ⏚ , R+ |
| 9 | HDMI IN | HDMI signal input port, connected to source device with HDMI cable. |
| 10 | IR IN | Connects to IR receiver cable. The IR signal will be emit to the IR OUT port of the Receiver. |
| 11 | IR OUT | Connects to IR blaster cable. The IR signal is from the IR IN port of the Receiver. |
| 12 | RS-232 | 3-pin phoenix connector, connected to a PC or control system for RS-232 command transmission. |

* **EDID Setting List**:

[DIP]=1111: Copy RX HDMI OUT port sink EDID
[DIP]=1110: 8K30(444)_HDR, 7.0CH
[DIP]=1101: 8K30(444)_HDR, 2.0CH
[DIP]=1100: 4K120(444)_HDR, 7.1CH
[DIP]=1011: 4K120(444)_HDR, 2.0CH
[DIP]=1010: 4K120(420)_HDR, 7.1CH
[DIP]=1001: 4K120(420)_HDR, 2.0CH
[DIP]=1000: 5K60(444)_HDR, 7.1CH
[DIP]=0111: 5K60(444)_HDR, 2.0CH
[DIP]=0110: 4K60(444)_HDR, 7.1CH
[DIP]=0101: 4K60(444)_HDR, 2.0CH
[DIP]=0100: 4K30(444)_HDR, 7.1CH
[DIP]=0011: 4K30(444)_HDR, 2.0CH
[DIP]=0010: 1920x1200_SDR, 2.0CH
[DIP]=0001: 1080P60_SDR, 7.1CH
[DIP]=0000: 1080P60_SDR, 2.0CH

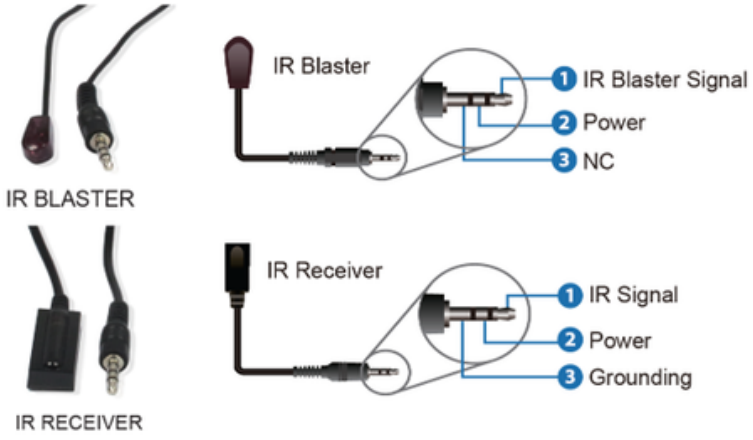
## 6.2 Receiver Panel



| No | Name | Description |
|---|---|---|
| 1 | PWR LED | The green LED is on when the Receiver is powered on. |
| 2 | Service | USB-C port, used to debug serialand update firmware. |
| 3 | 24VDC | 24VDC/1A power input port.<br>Note that the extender supports POC function, it means that either Transmitter or Receiveris connected to 24VDC/1A power supply, the other doesn't need power supply. |
| 4 | HDBT IN | HDBT input port, connected to the HDBT OUT port of the Transmitter with CAT6 cable. |
| 5 | Link Signal Indicator (Green) | ▪ On: Transmitter and Receiver are connected and linked.<br>▪ Off: Transmitter and Receiver are not connected. |
| 6 | Data Signal Indicator (Yellow) | ▪ On: HDMI signal with HDCP.<br>▪ Flashing: HDMI signal without HDCP.<br>▪ Off: No HDMI signal. |
| 7 | AUDIO OUT (L/R) | Analog audio output port, supporting unbalanced audio output with a maximum support of 1Vrms.<br>Unbalanced connection method: L+, ⏚ , R+ |
| 8 | HDMI OUT | HDMI signal output port, connected to display device such as TV or monitor with HDMI cable. |
| 9 | IR IN | Connects to IR receiver cable. The IR signal will be emit to the IR OUT port of the Transmitter. |
| 10 | IR OUT | Connects to IR blaster cable. The IR signal is from the IR IN port of the Transmitter. |
| 11 | RS-232 | 3-pin phoenix connector, connected to a PC or control system for RS-232 command transmission. |

## 6.3 IR Pin Definition

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




Note;
When the angle between the IR receiver and the remote control is ±45 °, the transmission distance is 0-5 meters;
When the angle between the IR receiver and the remote control is ±90 °, the transmission distance is 0-8 meters.

# 7. Application Example