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Connectivity Company

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CHE-HDBTW242K

Pro AV/IT HDBaseT™ 4K Dual Gang with HDMI/USB-C and USB,
Audio Wall Plate Extender Kit up to 230ft



User Manual

Version: V1.0.0



Important Safety Instructions



1. Do not expose this apparatus to rain, moisture, dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on the apparatus.



6. Clean this apparatus only with a dry cloth.



2. Do not install or place this unit in a bookcase, built-in cabinet or in another confined space. Ensure the unit is well ventilated.



7. Unplug this apparatus during lightning storms or when unused for long periods of time.



3. To prevent risk of electric shock or fire hazard due to overheating, do not obstruct the unit's ventilation openings with newspapers, tablecloths, curtains, and similar items.



8. Protect the power cord from being walked on or pinched particularly at plugs.



4. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.



9. Only use attachments / accessories specified by the manufacturer.



5. Do not place sources of naked flames, such as lighted candles, on the unit.



10. Refer all servicing to qualified service personnel.

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Introduction

Comprehensive's CHE-HDBTWP242K is a 3x1 wall-plate extender that features HDMI and USB-C AV inputs with USB 2.0 connectivity. The USB 2.0 connectivity is ideal for connecting devices such as webcams, Interactive panels, external drives, mice & keyboards. Supports video resolution up to 4K@60Hz 4:2:0. The transmitter is remotely powered by the receiver by PoH that can be extended up to 230ft over Cat5e/Cat6.

This kit is ideal for situations where USB must be extended alongside HDMI for display interactivity for items such as interactive whiteboards or projectors.

Features

- 1x USB-C and 2x HDMI inputs, support automatic/manual switching.
- Via a Cat 6/6a/7 cable, transmits 4K@60Hz (YUV 4:2:0 color sub-sampling) and 1080P@60Hz signal up to 100m
- Via a Cat 5e cable, transmits 4K@60Hz (YUV 4:2:0 color sub-sampling) signal up to 100m and 1080P@60Hz signal up to 90m
- High-speed USB 2.0, pass through over HDBaseT up to 100m
- Provides four USB Device ports with high power, for supporting higherpower USB devices connected
- One-way analog audio pass-through from transmitter to receiver
- Supports audio de-embedding from the HDMI output
- PoH capable – transmitter can be powered by connected receiver
- Supports firmware upgrade

Package Contents

For transmitter:

- 1 x Transmitter
- 1 x Wall Plate Plastic Panel (2-Gang US, with Screws)
- 1 x USB B to A Cable
- 1 x Phoenix Male Connector (3.5mm, 4 Pins)
- 4 x Mounting Screws

For receiver:

- 1 x Receiver
- 1 x DC 12V Power Adapter with US Pins
- 1 x Phoenix Male Connector (3.5mm, 3 Pins)
- 2 x Mounting Brackets (with Screws)

Specifications

Transmitter

Technical	
Video Input	2 x HDMI; 1 x USB-C
Input Video Signal	HDMI (4K@60Hz YUV 4:2:0, HDCP 2.2), USB-C DP Alt mode
Video Output	1 x HDBT OUT (RJ-45)
Output Video Signal	HDBT 2.0
Input/Output Resolutions Supported	HDMI: VESA: 800x600 ⁸ , 1024x768 ⁸ , 1280x768 ⁸ , 1280x800 ⁸ , 1360x768 ⁸ , 1366x768 ⁸ , 1440x900 ⁸ , 1600x900 ⁸ , 1600x1200 ⁸ , 1680x1050 ⁸ , 1920x1200 ⁸ SMPTE: 1280x720P ^{1,2,3,4,5,6,7,8} , 1920x1080I ^{6,8} , 1920x1080P ^{1,2,3,4,5,6,7,8} , 3840x2160 ^{2,3,5,6,8} , 4096x2160 ^{2,3,5,6,8} USB-C: Same as above

Technical	
	1 = at 23.98 Hz, 2 = at 24 Hz, 3 = at 25 Hz, 4 = at 29.97 Hz, 5 = at 30 Hz, 6 = at 50 Hz, 7 = at 59.94 Hz, 8 = 60 Hz Note: 4096x2160/3840x2160@50Hz/60Hz is based on chroma sub-sampling 4:2:0 8-bit only.
Audio Input	1 x HDMI; 1 x USB-C; 1 x Audio In (Unbalanced stereo 3.5mm)
Audio Format	<ul style="list-style-type: none"> • HDMI/USB-C: Supports multi-channel audio formats, including PCM 2.0/5.1/7.1, Dolby TrueHD, Dolby Atmos, DTS-HD Master Audio and DTS:X • Audio In: Stereo
USB Pass-through	USB 2.0
USB Port Type	USB-B
Maximum Pixel Clock	340MHz
Maximum Data Rate	10.2Gbps
Control Method	Auto switching, front panel buttons, API commands

General	
Operating Temperature	0°C to 45°C (32°F to 113°F)
Storage Temperature	-20°C to 70°C (-4°F to 158°F)
Humidity	10% to 90%, non-condensing
ESD Protection	Human-body Model: ±8kV (Air-gap discharge)/ ±4kV (Contact discharge)
Power Supply	PoH, powered by receiver; or local power supply through the 12V phoenix connector
Power Consumption (Max)	7.8W
Device Dimension (W x H x D)	89mm x 38.4mm x 105.6mm/3.5" x 1.51" x 4.16"
Product Weight	0.3kg/0.66lb

Receiver

Technical	
Video Input	1 x HDBT IN (RJ-45)
Input Video Signal	HDBT 2.0
Video Output	1 x HDMI OUT
Output Video Signal	HDMI (4K@60Hz YUV 4:2:0), HDCP 2.2
Input/Output Resolutions Supported	<p>VESA: 800x600⁸, 1024x768⁸, 1024x768⁸, 1280x768⁸, 1280x800⁸, 1360x768⁸, 1366x768⁸, 1440x900⁸, 1600x900⁸, 1600x1200⁸, 1680x1050⁸, 1920x1200⁸</p> <p>SMPT: 1280x720P^{1,2,3,4,5,6,7,8}, 1920x1080I^{6,8}, 1920x1080P^{1,2,3,4,5,6,7,8}, 3840x2160^{2,3,5,6,8}, 4096x2160^{2,3,5,6,8}</p> <p>1 = at 23.98 Hz, 2 = at 24 Hz, 3 = at 25 Hz, 4 = at 29.97 Hz, 5 = at 30 Hz, 6 = at 50 Hz, 7 = at 59.94 Hz, 8 = at 60 Hz</p> <p>Note: 4096x2160/3840x2160@50Hz/60Hz is based on chroma sub-sampling 4:2:0 8-bit only.</p>
Input Video Level	0.5~1.0V p-p
Maximum Pixel Clock	340MHz
Audio Format	<ul style="list-style-type: none"> • HDMI Out: Supports multi-channel audio formats, including PCM 2.0/5.1/7.1, Dolby TrueHD, Dolby Atmos, DTS-HD Master Audio and DTS:X • Audio Out: Stereo

General	
Operating Temperature	0°C to 45°C (32°F to 113°F)
Storage Temperature	-20°C to 70°C (-4°F to 158°F)
Humidity	10% to 90%, non-condensing
ESD Protection	Human-body Model: ±8kV (Air-gap discharge)/ ±4kV (Contact discharge)
Power Supply	DC 12V 3A
Power Consumption (Max)	8W (without USB)
Device Dimension (W x H x D)	210mm x 25mm x 90.2mm/8.27" x 0.98" x 3.55"
Product Weight	0.46kg/1.01lbs

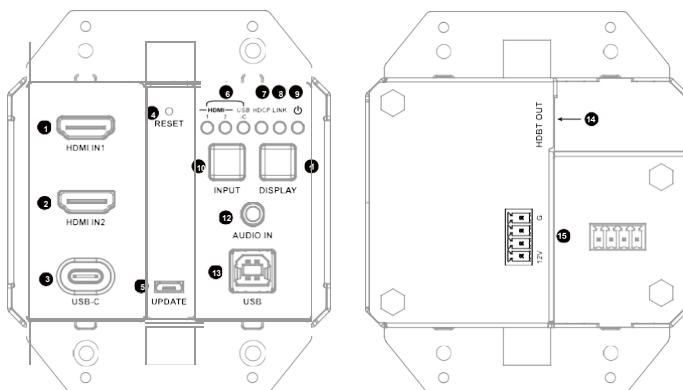
Transmission Distance

Note: Straight-through category cable wired to T568B standard is recommended.

Cable Type	Range	Supported Video
Cat 5e	100m/330ft	1080P@60Hz, 36bpp
	90m/197ft	1080P@60Hz, 48bpp
Cat 6/6a/7	100m/330ft	4K@30Hz, 4:4:4 24bpp 4K@60Hz, 4:2:0 24bpp

Panel Description

Transmitter

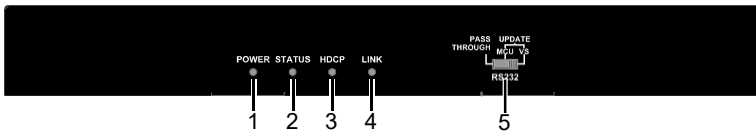


ID	Name	Description
1&2	HDMI IN (1~2)	Connect to HDMI sources.
3	USB-C	USB-C port: USB 3.1 Gen1 (5Gbps). Connect to a USB-C source for source input or connect to a control device for firmware upgrade.
4	RESET	Use this button to reset device. When the transmitter is powered on, use a pointed stylus to hold down this button for five or more seconds and then release, the transmitter will reboot and restore to its factory defaults.
5	UPDATE	Micro USB port for updating firmware (MCU and USB-C chip) or controlling the transmitter through API commands.
6	Input Selection LEDs	<ul style="list-style-type: none"> LED On: Corresponding input channel is selected. LED Off: Corresponding input channel is not selected.

ID	Name	Description
7	HDCP LED	<ul style="list-style-type: none"> • On: HDCP-protected content is being transmitted. • Blinking: Non-HDCP protected content is being transmitted. • Off: No content is being transmitted.
8	LINK LED	<ul style="list-style-type: none"> • On: HDBT link is normal. • Off/Blinking: No HDBT link or link error.
9	Power LED	<ul style="list-style-type: none"> • On: The transmitter is powered on. • Off: The transmitter is powered off.
10	INPUT	Input selection button.
11	DISPLAY	Display On/Off button. <ul style="list-style-type: none"> • Display On: Short press to turn on the display device. • Display Off: Press and hold for at least 3 seconds to turn off the display device.
12	AUDIO IN	Pass-through audio input. Connect to an audio source.
13	USB HOST	USB-B input. Connect to a USB host device.
14	HDBT OUT	HDBaseT Output. Connect to an HDBT receiver.
15	POWER Input	Pins 12V and G are used for local DC 12V input.

Receiver

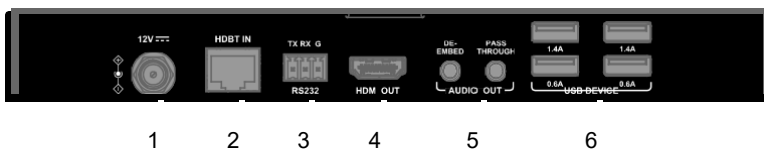
Front Panel



ID	Name	Description
1	POWER LED	<ul style="list-style-type: none"> • On: The device is powered on. • Off: The device is powered off.
2	STATUS LED	<ul style="list-style-type: none"> • Blinking: The device is working properly. • Off: The device is not working properly.
3	HDCP LED	<ul style="list-style-type: none"> • On: HDCP protected content is being transmitted. • Blinking: Non-HDCP protected content is being transmitted. • Off: No content is being transmitted.
4	LINK LED	<ul style="list-style-type: none"> • On: HDBT link is normal.

ID	Name	Description
		<ul style="list-style-type: none"> • Blinking/Off: Link error or no link.
5	RS232	<p>RS232 DIP Switch for settings of RS232 function.</p> <ul style="list-style-type: none"> • Pass-through (default setting): For controlling the transmitter for input selection. • MCU: For MCU firmware update. • VS: For VS firmware update. <p>Note: Transmitter and receiver must be updated individually.</p>

Rear Panel



ID	Name	Description
1	DC 12V	DC 12V power input; connect to the power adapter provided. With PoH function, the transmitter can be powered by the receiver.
2	HDBT IN	Connect to HDBT OUT of the transmitter via a Cat x cable.
3	RS232	For upgrading firmware or controlling the transmitter for input selection.
4	HDMI OUT	Connect to an HDMI display.
5	AUDIO OUT	<p>Unbalanced stereo audio output.</p> <ul style="list-style-type: none"> • De-embed: For audio de-embedding from the HDMI output. • Pass-through: For audio pass-through from Audio In port on the transmitter to this port.
6	USB DEVICE	<p>Connect to USB devices (e.g. keyboard, mouse, USB camera, USB flash drive, etc.).</p> <p>Note: USB ports support USB 2.0 standard with a maximum of 1.4A for the top two ports and 0.6A on the bottom two ports. Before connecting a USB 3.0 device, ensure it is compatible with USB 2.0.</p>

Installation and Wiring

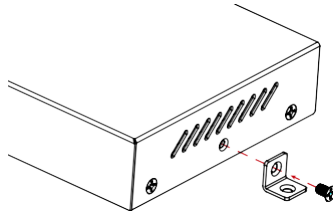
Installation

Note:

- Before installation, ensure the device is disconnected from the power source.
- The height of installation should not exceed 2 meters from the ground.

Steps to install the receiver in a suitable location:

1. Attach the installation bracket to the enclosure using the screws provided in the package separately.
2. The bracket is attached to the enclosure as shown.



3. Repeat steps 1-2 for the other side of the unit.
4. Attach the brackets to the surface you want to hold the unit against using the screws (provided by others).

Wiring

Warnings:

- Before wiring, disconnect the power from all devices.
- During wiring, connect and disconnect the cables gently.

Steps for device wiring:

1. Connect HDBT

- Connect HDBT OUT of the transmitter to HDBT IN of the receiver via a Cat 5e/6/7 cable.
2. Connect an HDMI display and audio receivers (e.g. earphone, speaker) respectively to the receiver.
 3. Connect the provided power adapter to the receiver. With PoH support, it is able to send power to the transmitter; no additional power adapter is required at the transmitter.
 4. Connect the video sources to the transmitter.
 5. Select a desired video source through automatic or manual switching function.
 6. Connect for KVM control:
Connect a host PC to USB-B port of the transmitter, and USB devices (e.g. USB camera, keyboard, and mouse) to USB DEVICE ports of the receiver to realize remote KVM control.
 7. Connect for additional control option:
Device Control: Connect a control PC to Micro USB port of the transmitter or to RS232 port of the receiver to control the transmitter via API commands. For more information, see Device Control section.

Automatic Switching

The transmitter offers automatic switching function.

The automatic switching function follows the **Last-In-First-Out** rule. For example, if a new active source is connected, the transmitter will automatically switch to this source. If the source selected is removed, the transmitter will automatically switch to the source with top priority (default priority: USB-C > HDMI 1 > HDMI 2).

If you want the display to play video from a specific video source:

1. Disconnect the cable from your desired video source, and then connect it again.
2. Use the Input Selection button on the front panel or API commands to select your desired video source.

Note: The automatic switching function can detect the input signal with 5V only. If the selected source in standby mode provides a continuous 5V power output, this function will not work, i.e. the transmitter will not switch the input to other active sources. In this case, please turn off the selected source in standby mode or remove it from the transmitter.

Device Control

Advanced users can control the transmitter via API commands through UPDATE port on transmitter or RS232 port on receiver: connect a control PC or control system to the UPDATE port of the transmitter (see Figure 1) or the RS232 port of the receiver (see Figure 2). API command for device control is available in the separate document. A professional RS232 serial interface software (e.g. Serial Assist) may be needed as well.

Before sending the API command to control the transmitter, ensure the transmitter, control PC and/or receiver are configured correctly.

Parameters	Value
Baud Rate	115200 bps
Data bits	8 bits
Parity	None
Stop bits	1 bit
Flow control	None

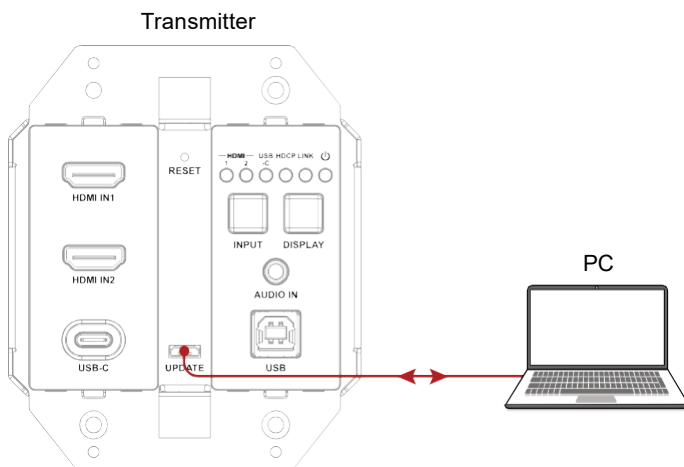


Figure 1- Control the Transmitter through UPDATE port

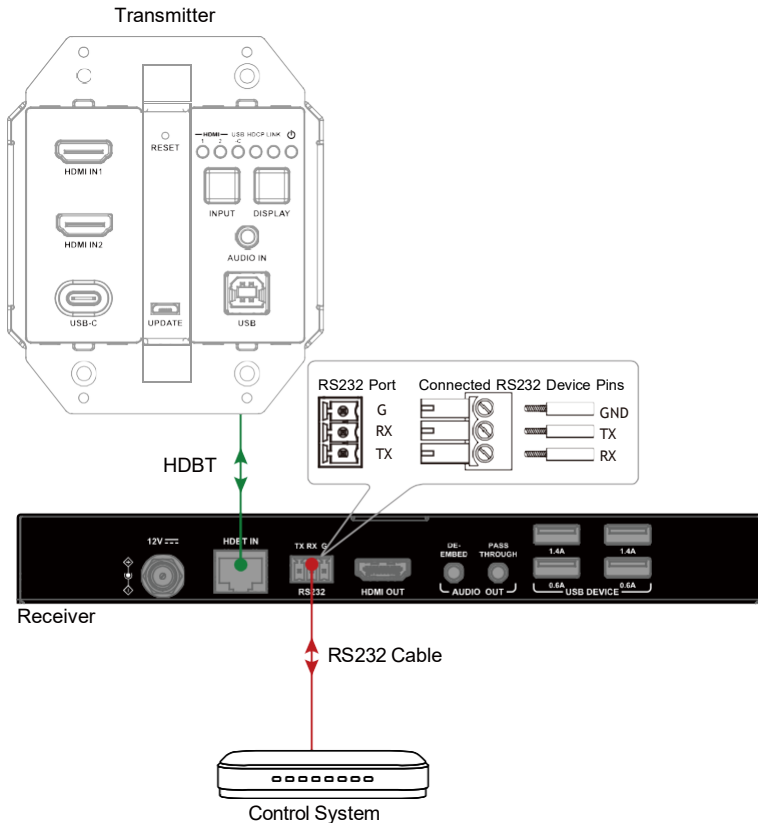


Figure 2- Control the Transmitter through RS232 port of the Receiver.



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