HDBaseT Extender Set 100m User Guide

Model CM-BT10-TXRX100

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Content

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Installation in accordance with this manual, applicable codes, and the instructions of the authority having jurisdiction is mandatory.

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Introduction

HDBaseT Extender Set 100M is an HDMI/IR/RS-232 twisted pair extender that includes one HDMI transmitter and one HDMI receiver. It is a professional 1×1 extender, with a single CAT5e cable. The input HDMI signal can be transmitted long-distances, and the control signal (IR & RS-232) is capable of working bi-directionally. The HDBaseT Extender can also support PoC, and with its Ethernet ports, it also supports Internet access for use in a LAN.

Features

- HDBaseT technology
- High bandwidth: 10.2 Gbps
- Supports CEC
- Supports 3D
- Supports PoC
- HDMI/IR/RS-232 signal transmitted over single CAT5e/CAT6 twist pair
- Maximum transmission distance is up to 100 meters for all supported signals
- Supports Ethernet expanding
- HDTV-compatible, uses HDMI 1.4a and is HDCP-2.2 compliant
- Support 4K × 2K at 30 Hz, 1080P, 1080i, 720P, 576P, 576i, 480P, and 480i
- High-quality output video signal with 24bit/36bit deep color
- Bi-directional RS-232 control
- Bi-directional IR control
- LED indicators show work status
- Wall- or table-mount aluminum enclosure, PT case design

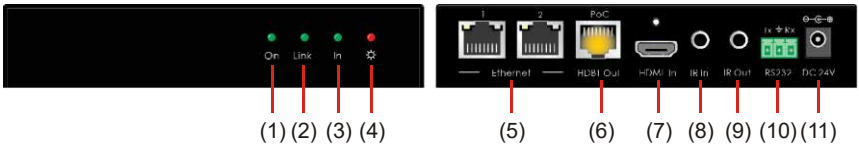
Package contents

- 1x Tx100 transmitter
- 1x Rx100 receiver
- 4x mounting ears (separated from the transmitter and the receiver)
- 1x power adapter (24 VDC, 3 A)
- 1x power supply plug adapter kit
- 2x RS-232 cable
- 8x screws (3 × 6mm)
- 1x user manual

Notes: Ensure all the accessories are included. If not, contact your dealer.

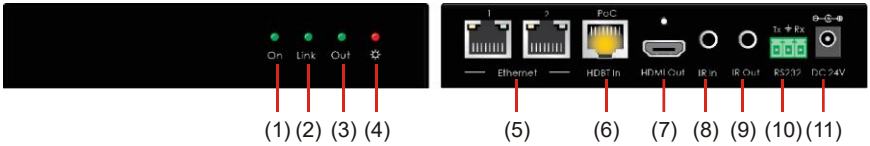
Product appearance

Figure 1: The Tx100 transmitter



(1) ON	Working status indicator of this device. When the transmitter is on and working properly, the green LED blinks.
(2) LINK	HDBaseT link status indicator, green LED. It remains illuminated when the device has a connection.
(3) IN	The LED remains illuminated when connected to a device that supports HDCP and is working normally. The LED blinks when the device does not support HDCP.
(4) POWER LED	The red LED illuminates and stays on when power is connected.
(5) ETHERNET	Built-in Ethernet connectivity. Connect any of the Ethernet ports found on the transmitter or receiver for Internet access and to feed your IP-enabled devices. You can also connect to an existing LAN to integrate all IP-enabled devices connected to the Extender Set. When properly connected, the yellow LED indicators blink and the green indicators remain illuminated.
(6) HDBT OUT	Connects to the HDBaseT port on the receiver via a single Cat5e/Cat6 cable.
(7) HDMI IN	Connects to the HDMI source device.
(8) IR IN	Infrared signal input. Collects infrared signals to be sent via HDBaseT to the receiver (Rx) IR OUT.
(9) IR OUT	Infrared signal input. Outputs infrared signals received from the receiver (Rx) via HDBaseT.
(10) RS-232	RS-232 connector. Supports bi-directional RS-232 communication.
(11) 24 VDC	Connects to the power supply. (Not necessary if the receiver connects with a power adapter.)

Figure 2: The Rx100 receiver



(1) ON	Working status indicator of this device. When the receiver is on and working properly, the green LED blinks.
(2) LINK	HDBaseT link status indicator, green LED. It remains illuminated when the device has a connection.
(3) OUT	The LED remains illuminated when connected to a device that supports HDCP and is working normally. The LED blinks when the device does not support HDCP.
(4) POWER LED	The red LED illuminates and stays on when power is connected.
(5) ETHERNET	Built-in Ethernet connectivity. Connect any of the Ethernet ports found on the transmitter or receiver for Internet access and to feed your IP-enabled devices. You can also connect to an existing LAN to integrate all IP-enabled devices connected to the Extender Set. When properly connected, the yellow LED indicators blink and the green indicators remain illuminated.
(6) HDBT IN	Connects to the HDBaseT port on the receiver via a single Cat5e/Cat6 cable.
(7) HDMI OUT	Connect to the HDMI display device.
(8) IR IN	Infrared signal input. Collects infrared signals to be sent via HDBaseT to the transmitter (Tx) IR OUT.
(9) IR OUT	Infrared signal input. Outputs infrared signals received from the transmitter (Tx) via HDBaseT.
(10) RS-232	RS-232 connector. Supports bi-directional RS-232 communication.
(11) 24 VDC	Connects to the power supply.

Twisted pair cable connection

The Cat5e/Cat6 terminations for HDBaseT devices should be a straight thru TIA/EIA T568B standard. TIA/EIA T568A standard is **not** recommended.

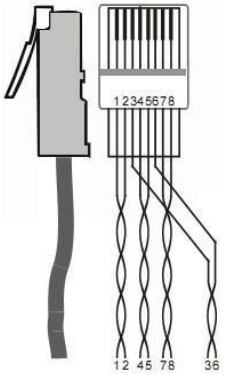
Table 1: T568A and T568B cable standards

TIA/EIA T568A	
Pin	**Cable color**
1	green white
2	green
3	orange white
4	blue
5	blue white
6	orange
7	brown white
8	brown

1st Ground	4-5
2nd Ground	3-6
3rd Group	1-2
4th Group	7-8

TIA/EIA T568B	
Pin	**Cable color**
1	orange white
2	orange
3	green white
4	blue
5	blue white
6	green
7	brown white
8	brown

1st Ground	4-5
2nd Ground	1-2
3rd Group	3-6
4th Group	7-8



Note: RJ45 EZ connectors should not be used at any time.

System connection

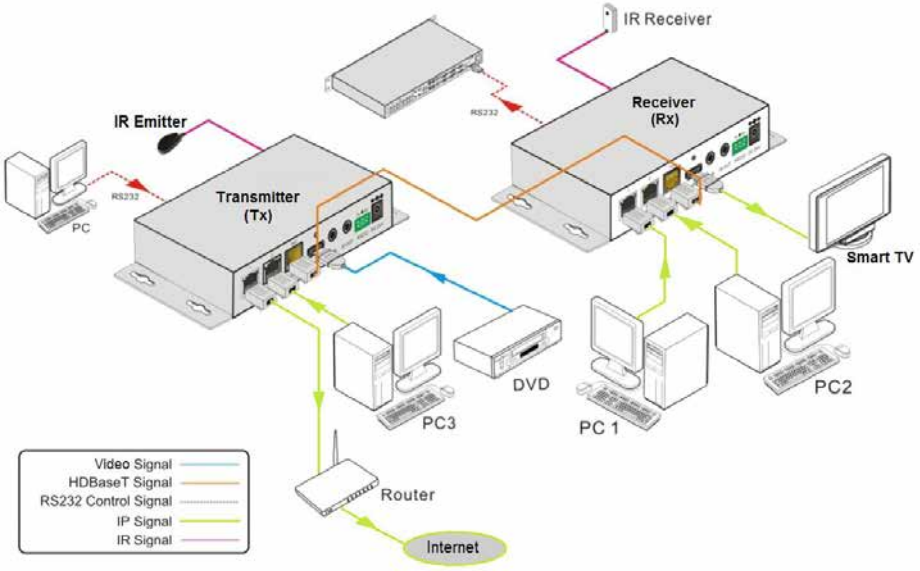
Usage precautions

- System should be installed in a clean environment and have proper temperature and humidity controls.
- All of the power switches, plugs, sockets, and power cords should be insulated for safety.
- All devices should be connected before powering on.
- The Cat5e/Cat6 terminations for HDBaseT devices should be a straight-thru TIA/EIA T568B standard.

Application examples

The Rx100 receiver works in conjunction with the Tx100 transmitter or an HDBaseT matrix switch, such as Clare Controls' 4x4 Matrix Switch. By transmitting signals across reliable Cat5e/Cat6 cables, the video signal can be used at far greater distances from the source device than would be capable with traditional HDMI cables. Additionally, control signals can be sent bi-directionally across the same Cat5e/Cat6 cable. The following system diagram shows you a sample application for the HDBaseT Extender and/or the Rx100 receiver.

Figure 3: System diagram



Connection procedure

To connect the HDBaseT Extender Set 100m:

1. Connect HDMI from the source (such as Blu-ray DVD) to the HDMI IN port of the transmitter using an HDMI cable.
2. Connect the HDBT OUT port of the transmitter to the HDBT IN port of the receiver with a single CAT5e/CAT6 cable using TIA/EIA T568B terminations at each end.
3. Connect the HDMI OUT port of the receiver to an HDMI in port on the display using an HDMI cable.
4. When using the bi-directional IR control, do the following:
   a. Connect the IR emitter at either end to the IR TX port on either the transmitter or the receiver.
   b. When using a powered IR receiver, connect via a 3.5 mm stereo plug to the IR RX on either the transmitter or the receiver.
5. When set as a LAN, use one of the four ETHERNET ports for Internet access. You can then connect the remaining ports to computers.

6. Connect the RS-232 port of the computer and the RS-232 port of transmitter or receiver using a RS-232 cable. You can use any one, as the RS-232 signal can be transmitted bi-directionally.
7. Connect the 24 VDC power adapter. The adapter can supply enough power for all its PoC functions.

Application

The HDBaseT Extender Set 100M is useful in any scenario when an HDMI signal (along with control signals) must be transmitted reliably across greater distances than is practical using traditional HDMI cables. The set may be used in both residential and commercial applications when centrally locating the source equipment and displaying HD video in remote locations. The HDBaseT Extender Set 100M can also be used in conjunction with an HDBaseT matrix switch to allow the sharing of source content across multiple displays.

Note: When connecting your HDBaseT Extender Set 100M to a TV cable box that transmits HDMI 1.2, you must use an HDMI 1x2 Splitter (p/n CM-SP1210-HD) between the TV cable box and the extender set receiver. The HDMI 1x2 Splitter converts the HDMI 1.2 signal coming from the cable box to a compliant signal (HDMI 1.3, 1.4).

Specifications

	Transmitter (Tx100)	Receiver (Rx100)
Input		
Input signal	1 HDMI, 1 IR and 1 RS-232	1 IR, 1 RJ-45 and 1 RS-232
Input connector	1 HDMI female 1 3.5 mm mini jack for IR in 1 3P captive connector	1 3.5 mm mini jack for IR in 1 RJ-45 1 3P captive connector
Video signal	HDMI 1.4a	HDMI 1.4a
Audio	Digital audio, transmits through HDMI audio	Digital audio, transmits through HDMI audio
Output		
Output	1 HDBaseT, 1 IR out, 1 RS-232	1 HDMI, 1 IR out, 1 RS-232
Output connector	1 RJ-45 1 3.5 mm mini jack for IR out 1 3P captive connector	1 HDMI female 1 3.5 mm mini jack for IR out 1 3P captive connector
Video signal	HDMI 1.4a	HDMI 1.4a
Transmission mode	HDBaseT	HDBaseT
Ethernet port		
Connector	2 RJ45	2 RJ45
Ethernet transmission speed	Adaptive 10M/100M (max.), full duplex or half duplex.	
General		
Resolution range	800 × 600 to 1920 × 1200, 1080p, 3D, 4K × 2K at 30 Hz	
Transmission distance	Maximum distance 328 ft. (100 m)	
Gain	0 dB to 10 dB at 100 MHz	
Differential phase error	±10° at 135 MHz at 100 m	
SNR	>70 dB at 100 MHz at 100 m	
Bandwidth	10.2 Gbps	
Return lost	＜-30 dB at 5 KHz	
THD	＜0.005% at 1 KHz	
HDMI standard	Support HDMI 1.4a and HDCP	
Min. to max. level	＜0.3 to 1.45 Vp-p	
Impedance	75Ω	
Temperature	-4 to +158ºF (-20 to +70ºC)	
Humidity	10% to 90%	

Power supply	Input: 100 to 240 VAC, 50/60 Hz, Output: 24 VDC, 1.25 A
Power consumption	10 W
Net weight	1.8 lb. (0.8 Kg)

Note: All nominal levels are at ±10%.

Dimensions

Figure 4: Transmitter dimensions

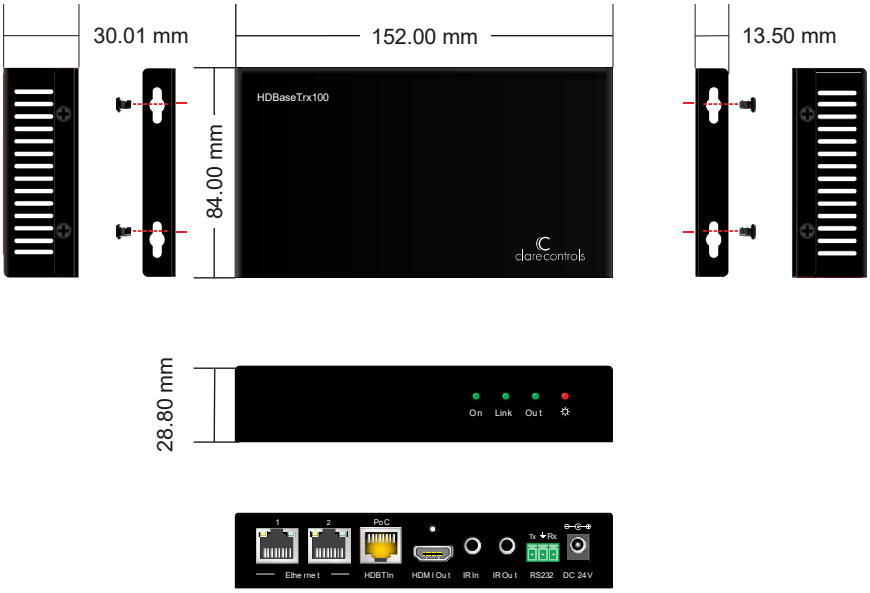
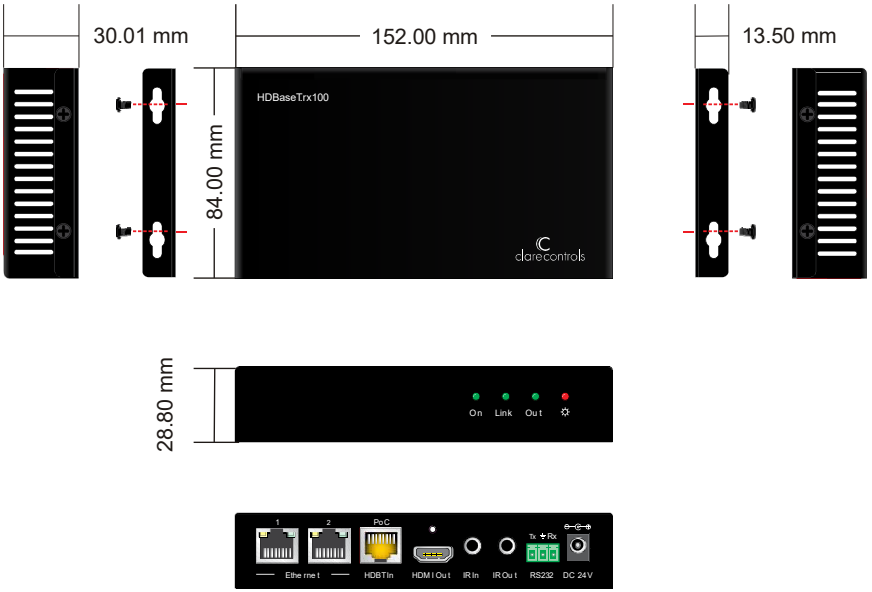


Figure 5: Receiver dimensions



Troubleshooting and maintenance

- No image on display:
  - Ensure that the display device has been set to the correct input.
  - Ensure that the HDMI cables used for both the source/transmitter and the receiver/display are properly connected and are working. Test the HDMI cables directly from a source to display and ensure their operation.
  - Ensure that the Cat5e/Cat6 cable has not been damaged and that it has been terminated correctly with T568B on both ends. A temporary length of Cat5e/Cat6 can be used for testing to ensure that the devices are all compatible and working properly.
  - Ensure proper grounding of the power supply.
  - Known issues with HDMI 1.2 source devices. Certain cable television STB's are known to have issues with HDBaseT transmission. This is due to their older compatibility (HDMI 1.2). Please contact Clare Controls Customer Support for a solution to these issues.
- Color loss or poor picture quality:
  - Ensure that the HDMI cables used for both the source and transmitter and the receiver and display are properly connected and are of good quality. Test the HDMI cables directly from a source to display and ensure their picture quality.
  - Ensure proper grounding of the power supply.
  - If the static becomes stronger or picture quality becomes worse when connecting the video connectors, this may be due to improper grounding. Check the grounding and make sure all the components are properly grounded to a common ground. Improper grounding may cause damage to the receiver.
- IR signal problems:
  - When using a control system such as Clare Controls, Crestron, or URC, the 3.5 mm male mono to 3.5 mm male stereo adapter cable (included) must be used. Connect the male mono end to the control system. Connect the male stereo end to the CM-BT10-TX100.

Safety operation

To guarantee the reliable operation of the equipment and personal safety, please follow the procedures listed below.

- The system must be grounded properly. Do not use two blades plugs. Ensure the supply voltage is in the correct range of 100 to 240 VAC, 50/60 Hz.
- Do not locate the device in a place that is abnormally hot or cold or does not have proper temperature control and ventilation.
- The HDBaseT Extender Set generates heat when operating. Its environment should be well ventilated to prevent damage caused by overheating.
- Disconnect power in humid weather, or when left unused for long periods.
- Before making or removing any connections to the device, ensure that the power supply has been disconnected.
- Do not attempt to open the enclosure of the equipment. Do not attempt any repairs. There are no user-serviceable parts inside. Any attempt to open the equipment will result in a complete void of any warranty and may result in serious injury or death.
- Do not splash any chemical substances or liquids on or around the equipment.

After-sales service

- If there appears to be problems when using the device(s), refer to the “Troubleshooting and maintenance” section in this manual.
- You can contact Customer Support at http://support.clarecontrols.com. Please be ready to provide the following information.
    - Product model number, version and serial number.
    - Detailed description of the trouble issues.
    - Description of all connections and third-party equipment being used.
- If, during the warranty period, the unit cannot be repaired, a suitable replacement will be issued. Replacement units will be comparable to the original. However, due to potential design changes over time, replacement units may not be identical to the unit replaced.

Warranty information

Clare Controls offers a three (3) year limited warranty on original Clare Controls components, from the date of shipment from Clare Controls. To view complete limited warranty details, including limitations and exclusions, www.clarecontrols.com/warranty.

Scan the code to view product warranty details.