HDBaseT Receiver 70m User Guide

Model CM-BT10-RX70

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Contact information For contact information, see www.clarecontrols.com.

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

The CM-BT10-RX70 HDBaseT receiver is designed to work in conjunction with the CM-BT10-TX70 HDBaseT transmitter or an HDBaseT matrix switch, such as the CM-MT4410-BT-70. HDMI signals are input into the transmitter or switch, and HDBaseT technology is used to transmit the signals to the receiver up to 230 ft. (70 m) via a Cat5e/Cat6 cable. The receiver then outputs the HDMI signal.

Bi-directional IR and RS232 are also transmitted across the Cat5e/Cat6 cable. The receiver supports CEC, bi-directional RS232 and IR control, and PoC (Power over Cable), which can be used to power the receiver via the Cat5e/Cat6 cable. This eliminates the need for power at the receiver end.

Features

- Supports full HD: Delivers high-resolution image (1080p at 60 Hz, 3D, 4K*2K)
- Maximum transmission distance is 230 ft. (70 m) over single a CAT5e/CAT6 cable
- High bandwidth: 10.2 Gbps
- HDTV compatible: Uses HDMI 1.4 and is HDCP-compliant
- Support PoC and CEC
- Communicates with the display to transmit EDID and Hot Plug Detect (HPD) signals constantly via the CAT5e/Cat6 cable
- Uses HDBaseT technology for extended capability and reliability
- Bi-directional RS232/IR control
- LED indicators show working status to aid in troubleshooting
- Wall or table mount aluminum enclosure
- External power supply (100~240 VAC, 50/60 Hz)

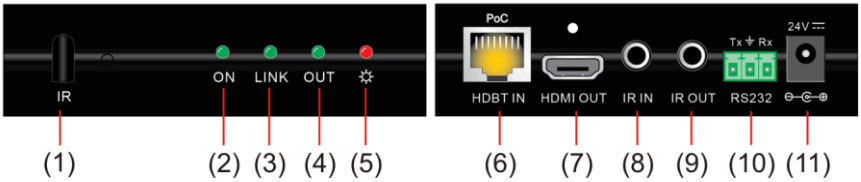
Package contents

- 1 x CM-BT10-RX70 HDbaseT receiver
- 2 x detachable mounting ears
- 4 x screws
- 4 x rubber feet
- 1 x IR emitter
- 1 x IR receiver
- 1 x RS232 cables (DB9 female to 3-pin connector)
- 1 x user manual

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

Product appearance

Figure 1: The HDBaseT receiver



(1) IR	IR receiver.
(2) ON	Working status indicator. When the CM-BT10-RX70 is on and working properly, the green LED blinks.
(3) LINK	HDBaseT link status indicator, green LED. Remains illuminated when there is a connection.
(4) OUT	The LED remains illuminated when connected with devices that support HDCP and HDCP handshake is working normally. If the devices do not support HDCP, this green LED blinks.
(5) POWER LED	The red LED illuminates and stays illuminated when power is connected.
(6)HDBT IN	Connects via single Cat5e/Cat6 cable to the HDBaseT port in the CM-BT10-TX70 transmitter or the CM-MT4410-BT-70 matrix switch.
(7) HDMI OUT:	Connect to the HDMI display device.
(8) IR IN:	Connects to an IR receiver. The IR signal received from this port is transmitted via HDBaseT to the transmitter unit for use at the source location. **Note:** When an IR receiver connects to this port, the front IR port (1) is unavailable.
(9) IR OUT:	IR signals received by the CM-BT10-TX70 or CM-MT4410-BT-70 and sent via HDBaseT to the CM-BT10-RX70 are available for IR emitter use from this port.
(10) RS232:	RS232 connector. Supports bi-directional RS232 communication.
(11) 24V DC:	Connects to the power supply. Not required when using PoC supplied by the CM-BT10-TX70 or CM-MT4410-BT-70.

System connection

Usage precautions

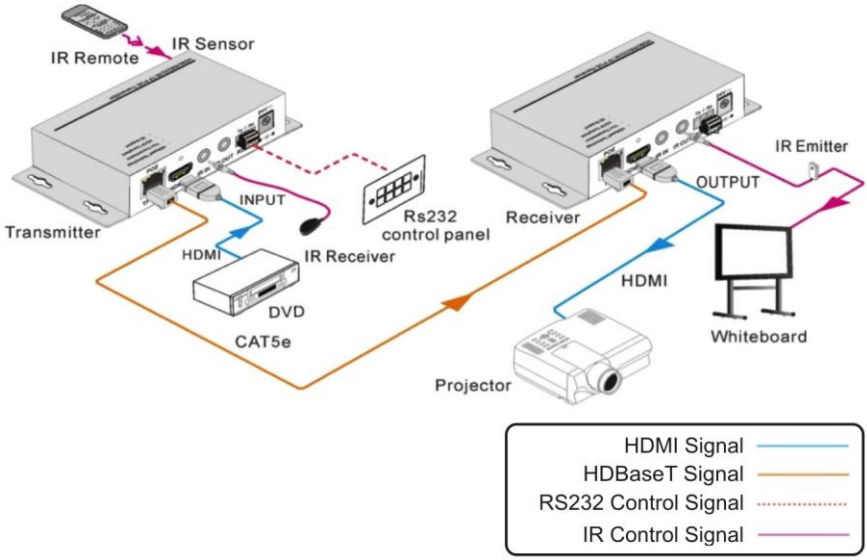
- System should be installed in a clean environment and have proper temperature and humidity controls.
- All of the power switches, plugs, sockets, and power cords should be insulated for safety.
- All devices should be connected before powering on.
- The Cat5e/Cat6 terminations for HDBaseT devices should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

Application examples

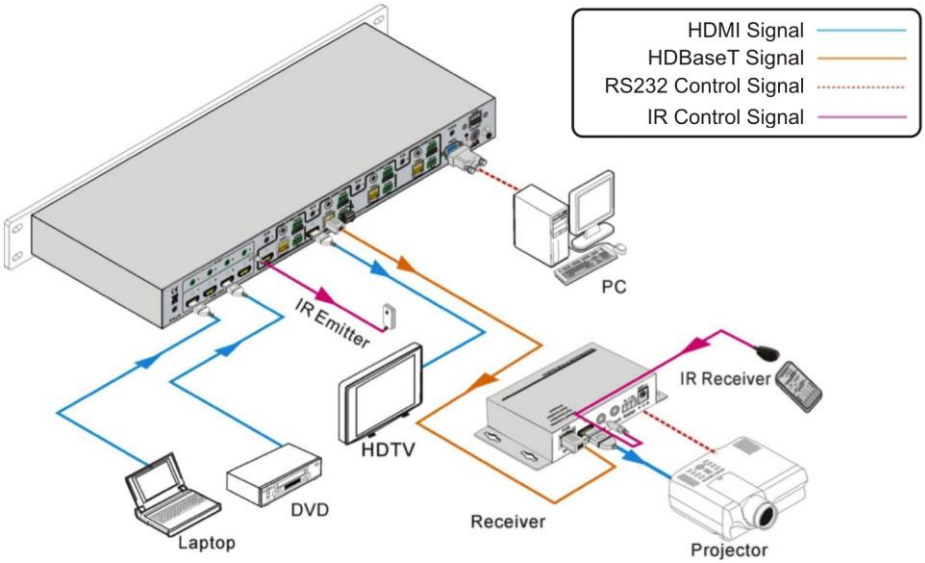
The CM-BT10-RX70 HDBaseT receiver works in conjunction with the CM-BT10-TX70 HDBaseT transmitter or an HDBaseT matrix switch, such as the CM-MT4410-BT-70. By transmitting signals across reliable Cat5e/Cat6 cables, the video signal may be used at far greater distances from the source device than would be capable with traditional HDMI cables. Additionally, control signals can be sent bi-directionally across the same Cat5e/Cat6 cable. The following figures show you some application examples for use of the CM-BT10-RX70 receiver.

Note: When using a control system, such as Clare Controls, Crestron, or URC to transmit IR control to the receiver via HDBaseT, a 3.5mm female mono to 3.5mm male stereo adapter cable must be used. The female mono end connects to the control system; the male stereo end connects to CM-BT10-TX70 or CM-MT4410-BT-70.

Example 1: CM-BT10-TXRX70 - HDBaseT Extender Set



Example 2: CM-MT4410-BT-70 with CM-BT10-RX70



Connection procedure

To connect the HDBaseT Extender Set 70m

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 or switch 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 CM-BT10-TX70, the CM-MT4410-BT-70, or the CM-BT10-RX70.
    b. When using a powered IR receiver, connect via a 3.5 mm stereo plug to the IR RX on either the CM-BT10-TX70 or the CM-BT10-RX70.
    c. When using a control system to send IR signal, you must use a 3.5 mm female mono to 3.5 mm male stereo cable adapter (included with the matrix switch). Use a standard 3.5 mm male mono connector from the control system to the female side of the adapter cable. Plug the 3.5 mm male stereo side of the adapter into the IR RX port on either the CM-BT10-TX70 or the CM-MT4410-BT-70.
5. When using the bi-directional RS232 control, an adapter cable is included for conversion from the 3-pin connector to a DB9 connector.

    Note: Only pins 2,3, and 5 are used on the DB9 (Rx, TX, Gnd).

Application

The CM-BT10-RX70 receiver 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. It can be used in both residential and commercial applications when centrally locating the source equipment and displaying HD video in remote locations. The CM-BT10-RX70 must be used in conjunction with a CM-BT10-TX70 transmitter or an HDBaseT matrix switch (such as the CM-MT4410-BT-70), allowing the sharing of source content across multiple displays.

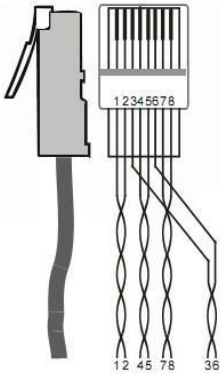
Note: When using a control system, such as Clare Controls, Crestron, or other system, the 3.5 mm female mono to 3.5 mm male stereo adapter cable (included) must be used. The female mono end connects to the control system; the male stereo end connects to CM-BT10-TX70.

Twisted pair cable connection

The Cat5e/Cat6 terminations for HDBaseT devices should be a straight thru TIA/EIA T568B standard, as shown below.

Table 1: T568B cable standards

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

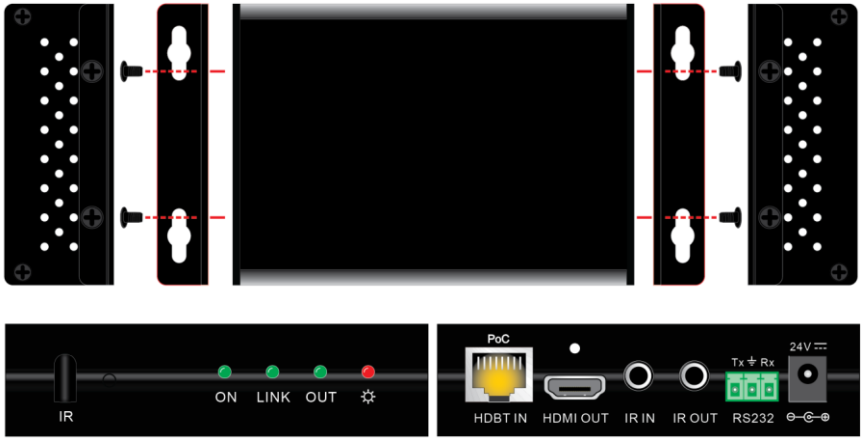
Note: RJ45 EZ connectors should not be used at any time.

Specifications

Input	
Input signal	1 IR, 1 RJ-45 and 1 RS232
Input connector	3.5 mm mini jack, RJ-45, 3p captive screw connector
Video signal	HDMI 1.4
Audio	Digital audio, transmit through HDMI audio
Output	
Output	1 HDMI, 1 IR, 1 RS232
Output connector	HDMI female, 3.5 mm mini jack, 3p captive screw connector
Video signal	HDMI 1.4
Transmission mode	HDBaseT
General	
Resolution range	800 x 600 to 1920 x 1200, 1080p, 3D, 4K*2K
Transmission distance	Maximum distance 230 ft. (70 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 1.4 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: 100~240 VAC, 50/60 Hz, Output: 24 VDC, 1.25A
Power consumption	9.6 W
Case dimension (W × H × D)	4.3 × 1.1 × 3.0 in. (11.0 × 2.8 × 7.7 cm)
Net weight	1.1 lb. (0.5 Kg)

Note: All nominal levels are at ±10%.

Panel drawings



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 Cat5e/Cat6 patch cable can be used for testing to ensure that the devices are all compatible and working properly.
- 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.
    - If the static becomes stronger or picture quality becomes worse when connecting the video connectors, this may be due to improper external grounding. Check the rack's grounding.
    - IR signal problems.
        - When using a control system, such as Clare Controls, Crestron, or other system, a 3.5 mm female mono to 3.5 mm male stereo adapter cable must be used. Connect the female mono end to the control system. Connect the male stereo end to the CM-BT10-TX70 or CM-4410-BT-70.

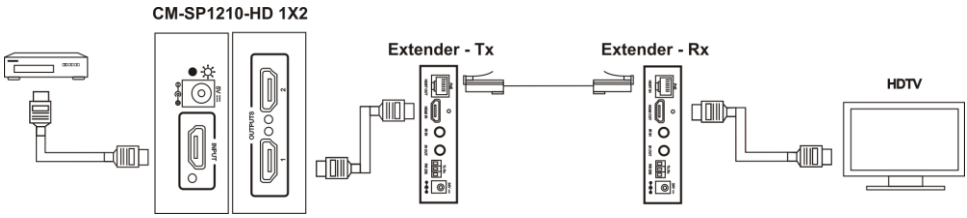
NOTICE: The following products do not work with HDBaseT extender sets.

Affected Products

- Cisco Explorer 4742HDC and 8642HDC DVR cable boxes
- Cisco RNG150 and RNG200 DVR cable boxes
- Cisco 164X HDC boxes
- Scientific Atlanta 8240 and 8300HDC cable boxes provided by Time Warner Cable or Comcast/Xfinity
- Samsung BD-ES6000 Blu-ray player
- Motorola DCX3200M P2
- Motorola RNG-series boxes

Corrective Action

To allow the HDBaseT to work with these products, insert a Clare Controls CM-SP1210-HD HDMI 1x2 Splitter between the device and the HDBaseT extender.



If you experience additional problems, please call Customer Support at 941.404.1072.

Safety operation

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

- Ensure the supply voltage is in the correct range of 100~240 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 CM-BT10-RX70 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 of time.
- 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.