HDBaseT 100m Extender Set User Guide

Model HDBaseT CM-BT20-TXRX100

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Other trade names used in this document may be trademarks or registered trademarks of the manufacturers or vendors of the respective products.

Manufacturer Clare Controls, LLC.
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Contact information For contact information, see www.clarecontrols.com.

FCC compliance This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC compliance **Class A:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his or her own expense.

FCC compliance

Class B: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

There is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

EU compliance

CE

Complete additional sections according to the governing laws and standards for the intended marketplace.

EU directives

1999/5/EC (R&TTE directive): Hereby, Clare Controls, Llc. declares that this device is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

2002/96/EC (WEEE directive): Products marked with this symbol cannot be disposed of as unsorted municipal waste in the European Union. For proper recycling, return this product to your local supplier upon the purchase of equivalent new equipment, or dispose of it at designated collection points. For more information see: www.recyclethis.info.

2006/66/EC (battery directive): This product contains a battery that cannot be disposed of as unsorted municipal waste in the European Union. See the product documentation for specific battery information. The battery is marked with this symbol, which may include lettering to indicate cadmium (Cd), lead (Pb), or mercury (Hg). For proper recycling, return the battery to your supplier or to a designated collection point. For more information, see: www.recyclethis.info.

Content

Safety precautions

Read all instructions carefully before using the device. Save this manual for future reference. To guarantee equipment reliability and personal safety, please follow the procedures listed below.

- Unpack the equipment carefully. Save the original box and packing material for future shipping.
- Follow basic safety precautions to reduce the risk of fire, electrical shock, and injury to persons.
- Only qualified professionals should service this product. Do not open or modify the device; it may result in electrical shock or burn. 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.
- Only use parts that meet the device's specifications. If you use parts that do not match, it may cause damage to the device.
- Do not expose this device to rain, moisture, chemicals (including aerosol cleaners), or any form of liquid to avoid fire or shock damage. If exposure occurs, unplug the device immediately.
- Do not disrupt the device's cables or power source.
- Do not twist or use force to pull the optical cable, this can cause damage or malfunction in the device.
- Do not leave this device plugged in and unused for long periods.
- Do not burn or mix this device with general household waste. Treat the device as electrical waste.
- 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, 50/60Hz.
- Do not place the device in a place that is abnormally hot/cold or does not have proper temperature control and ventilation.
- The HDBaseT CM-BT20-TXRX100 generates heat when operating. The environment should be well ventilated to prevent damage caused by overheating.
- Before cleaning or making/removing connections to the device, ensure that the power supply has been disconnected.

Caution: The HDBaseT CM-BT20-TXRX100 must be used as a pair. Do not use the RX separately or in combination with HDBaseT switches, as using it may cause damage to the unit.

Limitation of liability

To the maximum extent permitted by applicable law, in no event will Clare Controls, LLC. be liable for any lost profits or business opportunities, loss of use, business interruption, loss of data, or any other indirect, special, incidental, or consequential damages under any theory of liability, whether based in contract, tort, negligence, product liability, or otherwise. Because some jurisdictions do not allow the exclusion or limitation of liability for consequential or incidental damages the preceding limitation may not apply to you. In any event the total liability of Clare Controls, LLC. shall not exceed the purchase price of the product. The foregoing limitation will apply to the maximum extent permitted by applicable law, regardless of whether Clare Controls, LLC. has been advised of the possibility of such damages and regardless of whether any remedy fails of its essential purpose.

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

While every precaution has been taken during the preparation of this manual to ensure the accuracy of its contents, Clare Controls, LLC. assumes no responsibility for errors or omissions.

Introduction

The extender set (p/n CM-BT20-TXRX100) consists of a transmitter and receiver pair. HDMI signals are input into the transmitter and HDBaseT technology is used to transmit the signals to the receiver up to 100m (328 ft.) via a Cat5e/Cat6 cable. The receiver then outputs the HDMI signal.

Features

- Ultra-thin design
- Delivers high-resolution images (4Kx2K at 60 Hz)
- Maximum transmission distance is 100m for 1080p and 70m for 4kx2k
- Maximum extension distance is up to 100m for Ethernet
- High bandwidth: 10.2 Gbps
- HDCP-2.2 compliant
- Supports IR/RS232 pass-through
- Uses HDBaseT technology for extended capability and reliability
- Bi-directional IR
- PoH (Power over HDBaseT)
- LED indicators show working status to aid in troubleshooting
- Wall or table mount steel enclosure

Package contents

- 1 x CM-BT20-TX100
- 1 x CM-BT20-RX100
- 4 x detachable mounting brackets
- 8 x rubber feet
- 4 x screws
- 1 x power supply (24 VDC)
- 4 x power plug adapters
- 1 x quick start guide
- 1 x IR emitter
- 1 x IR adapter cable
- 2 x RS232 cables

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

Product appearance

Figure 1: The HDBaseT CM-BT20-TX100 transmitter

(1) LINK	The HDBT Link status indicator. It illuminates when the CM-BT20-TX100 and RX100 are linked and communicating and blinks when there is an error in the link.
(2) HDCP	The HDCP compliant indicator. • Illuminates when the output signal is HDCP • Blinks when the output signal is not HDCP • Extinguishes when there is no output
(3) Power LED	Illuminates when the device is receiving power.
(4) RS232	RS232 connector.
(5) IR IN	Connects to a 12v IR receiver, or the provided adapter cable. The IR signal received from this port will be transmitted via HDBaseT to the transmitter unit for use at the source location.
(6) IR OUT	IR signals received by receiver and sent via HDBaseT to the transmitter are available for emitter use from this port.
(7) HDMI IN	Connect to the HDMI source device.
(8) HDBT OUT	Connects via a single Cat5e/Cat6 cable to the HDBaseT port on the receiver and supports bi-directional PoH.
(9) Ethernet	100M Ethernet interface, one of these 2 ports is used for internet access, and the other is connected to a computer. When properly connected, the LED indicators on the corresponding ports blink.
(10) Ethernet	
(11) 24VDC	Connects to the power supply.

Figure 2: The HDBaseT CM-BT20-RX100 transmitter

(1) LINK	The HDBT Link status indicator. It illuminates when the CM-BT20-TX100 and RX100 are linked and communicating and blinks when there is an error in the link.
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(4) RS232	RS232 connector.
(5) IR IN	Connects to a 12v IR receiver, or the provided adapter cable. The IR signal received from this port will be transmitted via HDBaseT to the transmitter unit for use at the source location.
(6) IR OUT	IR signals received by receiver and sent via HDBaseT to the transmitter are available for emitter use from this port.
(7) HDMI OUT	Connect to the receiving HDMI devices.
(8) HDBT IN	Connects via a single Cat5e/Cat6 cable to the HDBaseT port on the transmitter and supports bi-directional PoH.
(9) Ethernet	100M Ethernet interface, one of these 2 ports is used for internet access, and the other is connected to a computer. When properly connected, the LED indicators on the corresponding ports blink.
(10) Ethernet	
(11) 24VDC	Connects to the power supply.

System connection

Usage precautions

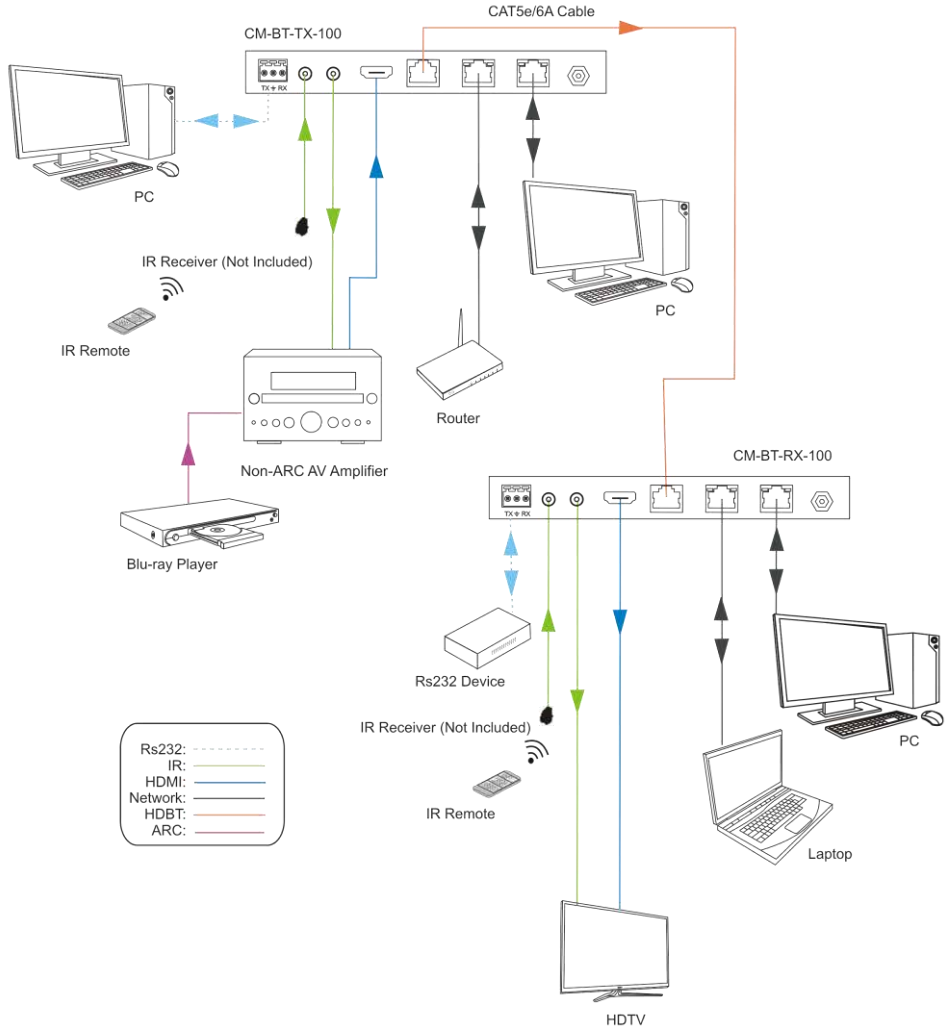
- The system should be installed in a clean environment and have proper temperature and humidity controls.
- All of the power switches, plugs, sockets, and power cords should be insulated for safety.
- All devices should be connected before powering on.
- The Cat5e/Cat6 terminations for HDBaseT devices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

Application examples

The HDBaseT CM-BT20-RX100 receiver works in conjunction with the HDBaseT CM-BT20-TX100 transmitter. 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 figures show you some application examples for the HDBaseT CM-BT20-TX100 and RX100.

Note: When using a control system, such as Clare Controls, Crestron, or URC, the 3.5mm male mono to 3.5mm male stereo adapter cable (included) must be used. The male mono end connects to the control system; the male stereo end connects to HDBaseT CM-BT20-TX100 IR IN.

Figure 3: System connection



Connection procedure

To connect the HDBaseT Compact Extender Set 100m:

1. Connect HDMI from the source (such as Blu-ray player) to the HDMI IN port of the transmitter using an HDMI cable.
2. Connect the HDBT OUT port of the HDBaseT CM-BT20-TX100 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 HDBaseT CM-BT20-RX100 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 the HDBaseT CM-BT20-TX100 or RX100.
    b. When using a powered IR receiver, connect via a 3.5mm stereo plug to the IR RX on either the HDBaseT CM-BT20-TX100 or RX100.
5. Connect one of the four available Ethernet ports to the internet, and then the other ports can be connected to computers to establish a LAN.
6. Connect the RS232 port of the computer and the RS232 port on either the CM-BT20-TX100 or RX100 using an RS232 cable.
7. Connect the 24VDC power adapter to the power port on the HDBaseT CM-BT20-TX100 transmitter. The HDBaseT CM-BT20-RX100 receiver is powered through PoC.

Application

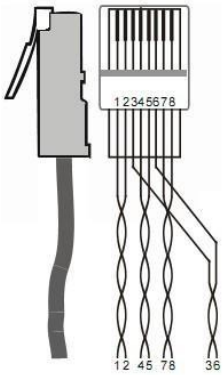
The HDBaseT CM-BT20-TXRX100 extender pair is useful in any scenario when an HDMI signal (along with control signals) must be transmitted reliably across greater distances than is practical using traditional HDMI cables. They may be used in both residential and commercial applications when centrally locating the source equipment and displaying HD video in remote locations.

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: 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



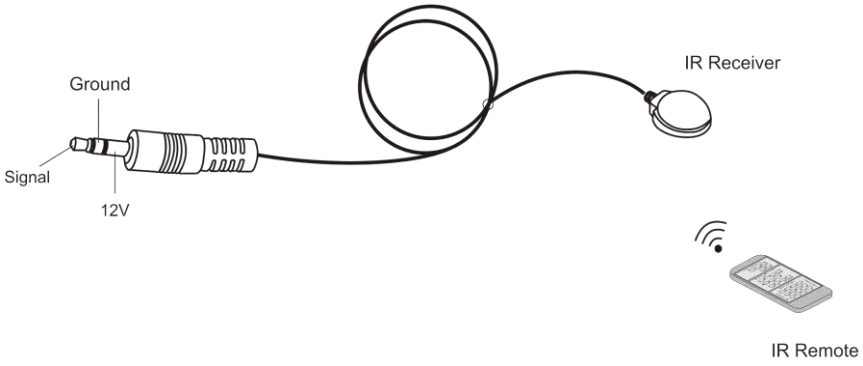
1st Ground	4-5
2nd Ground	1-2
3rd Group	3-6
4th Group	7-8

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

IR IN pinout

The following figure displays the IR IN pinout for the CM-BT20-TXRX100.

Figure 4: CM-BT20-TXRX100 IN pinout



Specifications

	HDBaseT CM-BT20-TX100 transmitter	HDBaseT CM-BT20-RX100 receiver
Input		
Input signal	1 HDMI and 1 IR	1 RJ45 and 1 IR
Input connector	HDMI female and 3.5mm mini jack	3.5mm mini jack and RJ-45
Video signal	HDMI1.4	HDMI1.4
Audio	Digital audio, transmit through HDMI audio	Digital audio, transmit through HDMI audio
Output		
Output	1 RJ45, 1 RS232, and 1 IR	1 HDMI, 1 RS232, and 1 IR
Output connector	3.5mm mini jack and RJ45	HDMI female and 3.5mm mini jack
Ethernet Port		
Connector	2 RJ45 with dual color indicator	2 RJ45 with dual color indicator
Ethernet Transmission Speed	Adaptive 10m/100m, full or half duplex	
General		
Transmission Mode	HDBaseT	
Resolution	800×600 at 60Hz, 1024×768 at Hz, 1280×720 at 60Hz, 1280×1024 at 60Hz, 1366×768 at 60Hz, 1600×1200 at 60Hz, 1920×1080at 60Hz, 1920×1200 at 60Hz, 3D, 4K×2K	
Transmission Distance	1080p ≤ 100m 4k×2k ≤ 70m	
Bandwidth	10.2 Gbps	
HDMI standard	Support HDMI 1.4 and HDCP2.2	
Impedance	75 Ω	
Temperature	32 to 122ºF (0 to 50ºC)	
Humidity	10 to 90%	
Power supply	Input: 100VAC~240VAC, 50/60Hz Output: 24VDC	
Power consumption	10 W	
Case dimension (W × H × D)	45.98 × .64 × 4.09 in. (152 × 16.2 × 104mm)	45.98 × .64 × 4.09 in. (152 × 16.2 × 104mm)
Net weight	.53 lb. (0.24kg)	.53 lb. (0.24kg)

Note: All nominal levels are at ±10%.

Panel drawings

Figure 5: HDBaseT CM-BT20-TX100 transmitter

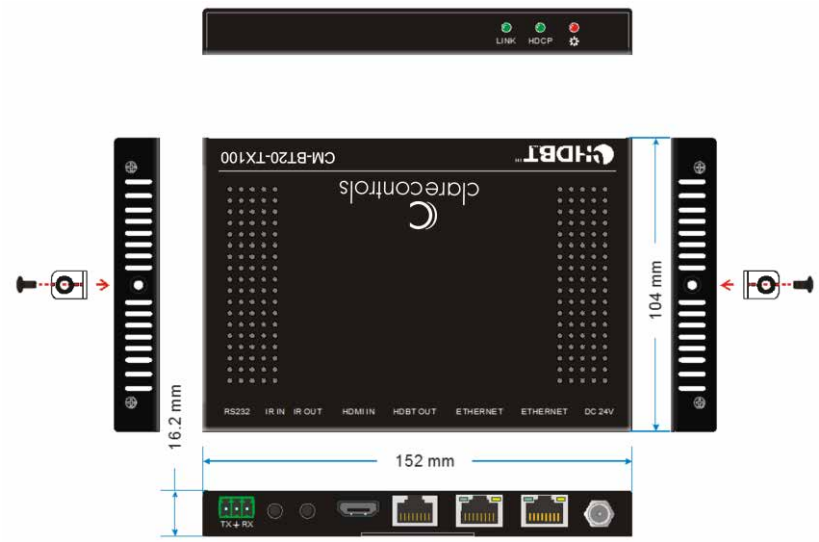
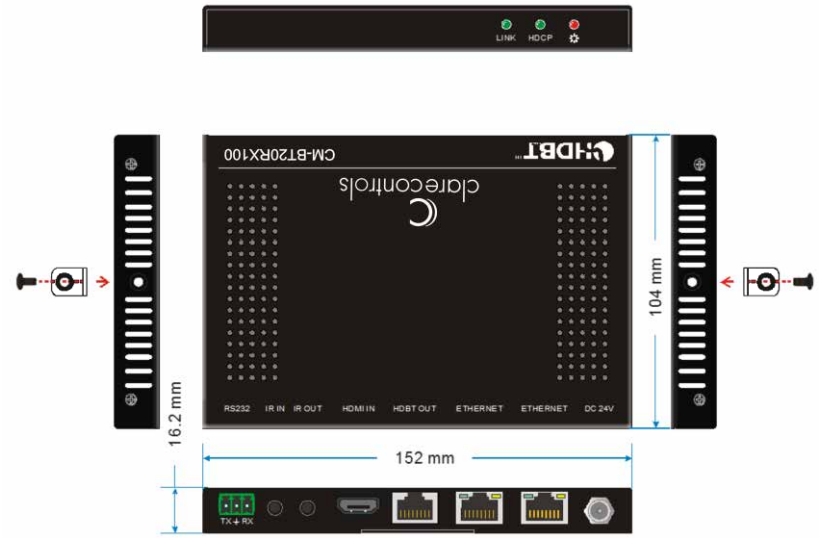


Figure 6: HDBaseT CM-BT20-RX100 receiver



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 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 all devices are compatible and working properly.

Color loss or poor picture quality

- Ensure that the HDMI cables used for both the source, transmitter, the receiver, and display are properly connected and are of good quality. Test the HDMI cables directly from a source to display and ensure picture quality.

Cannot control the device using RS23

- Ensure that the RS232 communication parameters are set correctly.

Cannot recognize the device connected to the Ethernet port

- Change the IP address of the extender or extended device.

After-sales service

If there appears to a problem when using the device(s), refer to the “Troubleshooting and maintenance” section in this manual. Return shipping costs are not covered by this warranty.

- 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
    - A detailed description of the trouble issues
    - A description of all connections and third-party equipment in use
- A valid invoice of purchase via an authorized dealer shall be required for any warranty coverage.

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.