

Owner's Manual

HDBaseT HDMI Over Cat5e/6/6a Extenders

Models:

BHDBT-K-E3SI-ER, BHDBT-K-E3SI-LR, BHDBT-K-E3SPI-L,
BHDBT-K-PI, BHDBT-K-PI-LR, BHDBT-K-SPI

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Package Contents

	BHDBT-K-E3SI-LR	BHDBT-K-E3SI-LR	BHDBT-K-E3SPL-L	BHDBT-K-PI	BHDBT-K-PI-LR	BHDBT-K-SPI
External Power Supply (1 or 2)	2	2	1	1	1	1
International AC Adapter*	N	N	N	Y	Y	N
IR-In Cables	1	1	1	1	1	1
IR-Out Cables	1	1	1	1	1	1
Mounting Hardware	Y	Y	Y	Y	Y	Y
Owner's Manual	Y	Y	Y	Y	Y	Y

* Includes NEMA 5-15P (North America), CEE 7/16 Schuko (Europe), BS 1363 (UK) and AS/NZS 3112 (Australia) plugs.

Product Features

Note: This section lists features for all HDBaseT models referenced in this manual. See the HDBaseT Features Chart below to determine which features your model supports.

- Supports Ultra High Definition (UHD) 4k x 2k video resolutions up to 3840 x 2160, and High Definition (HD) video resolutions up to 1920 x 1080 (1080p)
- Extends HDMI audio/video, Ethernet, RS-232 Serial and IR Control signals over a single Cat5/6/6a cable
- Power over Ethernet (PoE) powers the receiver unit over Cat5/6/6a cable, eliminating the need for an external power supply at the receiver
- Ethernet models feature three 10/100 Ethernet ports on both the transmitter unit and the receiver unit for communication between devices and access to online content
- Extends a full duplex RS-232 serial signal, such as from a touchscreen monitor; baud rates up to 115 Kbps are supported
- IR Control lets you use your HDMI source's remote control in the same location as your extended monitor, or your monitor's remote control in the same location as your source; uses a 39 kHz IR frequency
- Plug-and-play; no software or drivers are required

HDBaseT Features Chart

	BHDBT-K-E3SI-ER	BHDBT-K-E3SI-LR	BHDBT-K-E3SPI-L	BHDBT-K-PI	BHDBT-K-PI-LR	BHDBT-K-SPI
HDMI Audio/Video	Y	Y	Y	Y	Y	Y
10/100 Ethernet	Y	Y	Y	N	N	N
RS-232 Serial	Y	Y	Y	N	N	Y
IR Remote Control	Y	Y	Y	Y	Y	Y
Power over Ethernet (PoE)	N	N	Y	Y	Y	Y

Maximum Distance and Video Resolution

Model	4K Max Distance – Cat6a	4K Max Distance – Cat5e/6	1080p Max Distance – Cat6a	1080p Max Distance – Cat5e/6
BHDBT-K-E3SI-ER	N/A	N/A	500 ft. (150 m)*	500 ft. (150 m)*
BHDBT-K-E3SI-LR	328 ft. (100 m)	230 ft. (70 m)	328 ft. (100 m)	328 ft. (100 m)
BHDBT-K-E3SPI-L	328 ft. (100 m)	230 ft. (70 m)	328 ft. (100 m)	328 ft. (100 m)
BHDBT-K-PI	130 ft. (40 m)	115 ft. (35 m)	230 ft. (70 m)	200 ft. (60 m)
BHDBT-K-PI-LR	328 ft. (100 m)	230 ft. (70 m)	328 ft. (100 m)	328 ft. (100 m)
BHDBT-K-SPI	130 ft. (40 m)	115 ft. (35 m)	230 ft. (70 m)	200 ft. (60 m)

* When using the BHDBT-K-E3SI-ER to extend a 1080p (60 Hz) signal at the maximum distance of 500 ft., the color depth of the source must be set to 8-bit.

Optional Accessories

- N001-Series Cat5e Patch Cables
- N022-01K-GY Cat5e 24 AWG Solid Wire Bulk Cable – 1,000 ft. (305 m)
- N202-Series Cat6 24 AWG Solid Wire Patch Cables
- N222-01K-BL Cat6 24 AWG Solid Wire Bulk Cable – 1,000 ft. (305 m)
- N261-Series Cat6a UTP Snagless Patch Cables
- N262-Series Cat6a STP Snagless Patch Cables
- P569-XXX-LOCK High-speed HDMI Cables with Ethernet and Locking Connectors

Mounting Instructions

The HDBaseT HDMI Over Cat5e/6/6a Extender products come with mounting hardware that allows them to be mounted in a variety of ways. The following images show the different ways the included mounting brackets can be attached for different mounting methods.

Note: The images below show a B126-1A1 unit, but mounting is the same for the HDBaseT extender products.

Wall-Mount



19" Rack-Mount



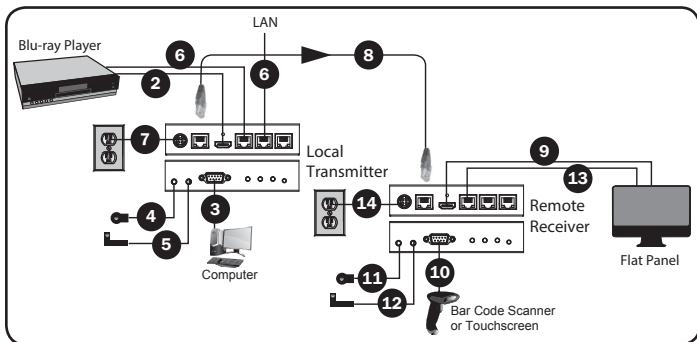
Pole Mount



Installation

Notes:

1. See the *Maximum Distance and Video Resolution* table on page 4 for information on your model's maximum supported distances and resolutions.
2. Test to make sure the entire installation works properly before pulling cables through ceilings/walls.
3. To achieve maximum distance and performance, use 24 AWG solid wire Cat5e/6 or 23 AWG solid wire Cat6a cable. Using stranded wire cable or cable with a gauge (AWG) size higher than that recommended will result in a shorter extension distance. Higher gauge cabling such as 26 AWG has a more limited transmission capability than lower-gauge cabling. All Tripp Lite N202-Series Cat6 cables are made with 24 AWG solid wire cabling. Extended lengths of 23 AWG solid wire Cat6a cable are available from Tripp Lite as a custom order.
4. When using a 28 AWG HDMI cable and displaying video resolutions higher than 1080p, the HDMI cables connecting the source and the monitor must not exceed 6 feet. When using a 24 AWG HDMI cable, you must not exceed a 16-foot length. For best results, use Tripp Lite's P569-XXX-LOCK series high-speed HDMI cables with Ethernet and locking connectors.
5. The transmitter and receiver included in each kit are compatible with each other only. You cannot mix and match transmitters and receivers from different kits. For example, a BHDDBT-K-PI transmitter will not work with a BHDDBT-K-PI-LR receiver.
6. Each kit includes one set of IR-IN and IR-OUT cables. It is up to the user to determine whether the cables will be used to extend an IR signal from the transmitter side to the receiver side, or the receiver side to the transmitter side. In most installations, the cables will be used to control the HDMI source (e.g. Blu-ray™ player) from the same location as the monitor connected to the receiver.
7. The diagram below shows a BHDDBT-K-E3SPI-LR installation. See the HDBaseT Features Chart on page 3 of this manual for the features your product supports.



Installation

1. Make sure the HDMI and RS-232 serial source is powered off.
2. Connect the HDMI source to the HDMI input port on the local transmitter unit.
3. Connect RS-232 serial DB9 cable (not included) to the RS-232 port on the local transmitter unit, then connect to computer.*
4. If you are using a remote control on the transmitter side of the installation to control a device on the receiver side (such as a TV), connect the IR-IN cable (with red 3.5 mm connector) to the IR-IN port on the local transmitter unit.
Note: *The IR-IN unit accepts a signal from a remote control and sends it to a device that is controlled on the other end of the installation. Position the IR-IN unit in an unobstructed area that can easily accept a remote control signal.*
5. If you are using a remote control on the receiver side of the installation to control a device on the transmitter side (such as a Blu-ray player), connect the IR-OUT cable (with green 3.5 mm connector) to the IR-OUT port on the local transmitter unit.
Note: *The IR-OUT unit receives the signal from the remote control on the other end of the installation and sends it to the device being controlled. Locate the IR-OUT unit in an area close to the remote-controlled device (e.g., Blu-ray player, TV).*
6. Connect the three 10/100 Ethernet ports on the transmitter unit to your devices (e.g., Blu-ray player, cable box, etc.) and/or a LAN.*
7. Connect the external power supply to the local transmitter unit and plug it into a Tripp Lite Surge Protector, Uninterruptible Power Supply (UPS) or Power Distribution Unit (PDU).
8. Connect the RJ45 output port on the local transmitter unit to the RJ45 input port on the remote receiver unit using Cat5e/6/6a cable.
9. Connect the HDMI monitor to the HDMI output port on the remote receiver unit.
10. Connect the RS-232 serial DB9 male cable to the RS-232 port on the remote receiver unit, then connect the RS-232 device.*
11. If you are using a remote control on the receiver side of the installation to control a device on the transmitter side (such as a Blu-ray player), connect the IR-IN cable (with red 3.5 mm connector) to the IR-IN port on the remote receiver unit.
Note: *The IR-IN unit accepts a signal from a remote control and sends it to a device controlled on the other end of the installation. Position the IR-IN unit in an unobstructed area that can easily accept a remote control signal.*

* See the HDBaseT Features Chart on page 3 of this manual for the features your product supports.

Installation

12. If you are using a remote control on the transmitter side of the installation to control a device on the receiver side (such as a TV), connect the IR-OUT cable (with green 3.5 mm connector) to the IR-OUT port on the remote receiver unit.
Note: *The IR-OUT unit receives the signal from the remote control on the other end of the installation and sends it to the device being controlled. Locate the IR-OUT unit in an area close to the remote-controlled device (e.g. Blu-ray player, TV).*
13. Connect the three 10/100 Ethernet ports on the receiver unit to your devices (e.g. monitor, etc.) and/or a LAN.*
14. Connect the external power supply to the remote receiver unit and plug it into a Tripp Lite Surge Protector, Uninterruptible Power Supply (UPS) or Power Distribution Unit (PDU). Models that support PoE will not require power at the receiver.*
15. Turn on the power to the HDMI source and RS-232 serial source.

* See the *HDBaseT Features Chart* on page 3 of this manual for the features your product supports.

Troubleshooting

If you are unable to obtain an acceptable image after following these installation instructions, try the following troubleshooting tips:

- 1. Are the external power supplies that came with the product connected and plugged into a working power source?** For the product to function properly, it must be connected to and receiving power from the external power supply.
- 2. Was the power to the connected devices turned off prior to installation?** If not, restart them.
- 3. What resolution are you trying to reach?** Make sure that the desired resolution is supported by your model's maximum distance and resolution specifications as listed in the Product Features section of this manual. The shorter the extension distance, the higher the resolution you will be able to obtain. If you are not able to get an acceptable image, try lowering your computer's video resolution or adjusting the refresh rate.
- 4. What type of cabling are you using?** Inferior cabling can result in poor performance, so it is important to use cables that support the video resolution you are trying to obtain. To achieve maximum distance and resolution, 24 AWG solid wire Cat5e/6 cable or 23 AWG solid wire Cat6a cable must be used. Tripp Lite's N202-Series Cat6 cables are made with 24 AWG solid wire, as are the N022-01K-GY (Cat5e) and N222-01K-GY bulk cables. Extended lengths of 23 AWG solid wire Cat6a cable is available from Tripp Lite as a custom order. The HDMI cables you are using must also support the video resolution you are trying to obtain. Inexpensive, low quality HDMI cables may not support the maximum resolution. When using a 28 AWG HDMI cable and displaying video resolutions higher than 1080p, the HDMI cables connecting the source and the monitor must not exceed 6 feet. When using a 24 AWG HDMI cable, you must not exceed a 16-foot length. For best results, use Tripp Lite's P569-XXX-LOCK series high-speed HDMI cables with Ethernet and locking connectors.
- 5. Test your cables to ensure they are working properly.** For example, connect your HDMI cables between a source and a monitor that you know works to see if the cable is functioning. For Cat5e/6 cable, connect it between a computer and a network to verify that it establishes a network connection.
- 6. Do you have any patch panels or other devices between the transmitter, repeater, and receiver units?** Tripp Lite's HDBaseT HDMI over Cat5e/6/6a extender products are designed to be connected directly from the transmitter to the transceiver and/or receiver with UTP cable. The more connection points that are between the source and the remote monitor, the more likely it will be that signal degradation will occur, causing poor performance. If you have a patch panel or other device in-between, it should be removed from the installation.

Troubleshooting

- 7. Check your cabling for any damages that may have occurred during installation.** If a cable connector is loosened from being pulled through ceilings/walls or the cable jacket is damaged causing the wiring to be exposed, you will not be able to achieve maximum performance.
- 8. Are the transmitter and/or receiver located in an area that exposes them to higher temperatures?** If the product overheats, it will not function properly.

Warranty and Product Registration

1-Year Limited Warranty

TRIPP LITE warrants its products to be free from defects in materials and workmanship for a period of one (1) year from the date of initial purchase. TRIPP LITE's obligation under this warranty is limited to repairing or replacing (at its sole option) any such defective products. To obtain service under this warranty, you must obtain a Returned Material Authorization (RMA) number from

TRIPP LITE or an authorized TRIPP LITE service center. Products must be returned to TRIPP LITE or an authorized TRIPP LITE service center with transportation charges prepaid and must be accompanied by a brief description of the problem encountered and proof of date and place of purchase. This warranty does not apply to equipment which has been damaged by accident, negligence or misapplication or has been altered or modified in any way.

EXCEPT AS PROVIDED HEREIN, TRIPP LITE MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Some states do not permit limitation or exclusion of implied warranties; therefore, the aforesaid limitation(s) or exclusion(s) may not apply to the purchaser.

EXCEPT AS PROVIDED ABOVE, IN NO EVENT WILL TRIPP LITE BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OF THIS PRODUCT, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE. Specifically, TRIPP LITE is not liable for any costs, such as lost profits or revenue, loss of equipment, loss of use of equipment, loss of software, loss of data, costs of substitutes, claims by third parties, or otherwise.

PRODUCT REGISTRATION

Visit www.tripp-lite.com/warranty today to register your new Tripp Lite product. You'll be automatically entered into a drawing for a chance to win a FREE Tripp Lite product!*

* No purchase necessary. Void where prohibited. Some restrictions apply. See website for details.

Regulatory Compliance

FCC Notice, Class B

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.

Note: 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. However, 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.

Any changes or modifications to this equipment not expressly approved by Tripp Lite could void the user's authority to operate this equipment.

WEEE Compliance Information for Tripp Lite Customers and Recyclers (European Union)



Under the Waste Electrical and Electronic Equipment (WEEE) Directive and implementing regulations, when customers buy new electrical and electronic equipment from Tripp Lite they are entitled to:

- Send old equipment for recycling on a one-for-one, like-for-like basis (this varies depending on the country)
- Send the new equipment back for recycling when this ultimately becomes waste

WARNING

Use of this equipment in life support applications where failure of this equipment can reasonably be expected to cause the failure of the life support equipment or to significantly affect its safety or effectiveness is not recommended.

Tripp Lite has a policy of continuous improvement. Product specifications are subject to change without notice.



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