HBX-S, HBX-R

HDMI Extender over HDBaseT With Ultra-HD AV, IR, RS232 Control, and Ethernet over a single Cat6 Cable

Instructions for Use

Rev. 1.0 — October 16, 2026



FCC NOTICE

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference even if it causes undesired operation.

This equipment has been designed 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 it is not installed and used in accordance with the instruction manual, it 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 own expense.

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INTRODUCTION

Part Number	Function
HBX	HDMI + RS-232 + IR + Ethernet Extender Kit ** Includes Sender and Receiver*
HBX-S	HDMI + RS-232 + IR + Ethernet Sender
HBX-R	HDMI + RS-232 + IR + Ethernet Receiver

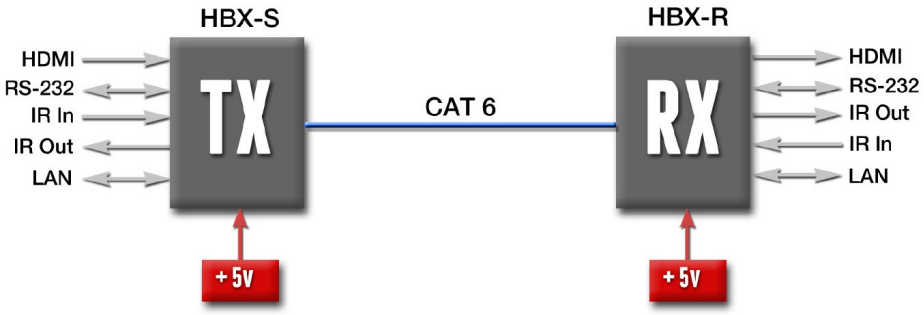
The HBX HDMI extender kit is comprised of a compact Sender (HBX-S) and corresponding Receiver (HBX-R).

The kit is used to extend HDMI, RS-232, IR, and Ethernet (100BaseT) up to 100 meters (328 feet) using a single Cat6 cable.

The extender supports all PC and HDTV Resolutions to 4K @ 30 Hz 4:4:4 or 4K @ 60 Hz 4:2:0.

The IR extension preserves the modulation (carrier) frequency and provides compatibility to most standards. It supports modulation range from 30 KHz to 60 KHz.

The Sender and the Receiver each include a universal 5v power supply. IR emitter and IR detector cables are included.



This Configuration is available as a Kit
Kit part number: HBX

Typical Connection Diagram

Features

- Fully Compliant with HDBaseT standard
- Supports virtually all HDMI and DVI resolutions including 4K UHD
- Extends, Video, Audio, RS-232, IR, and Ethernet
- Supports extension to 100 m (330 ft)
- Fully isolates grounds between TX and RX sides
- Compact, Rugged, Reliable, and Economical
- Plug and play, no configuration needed
- Receiver can be powered via PoC from senders that provide PoC such as HSM-44-BX Matrix Switch with HDBaseT outputs

PACKAGE CONTENTS

The Sender and Receiver each contain

- (x1) HBX-S/R
- (x1) Wideband IR Emitter
- (x1) Wideband IR Detector
- (x1) 5VDC locking power adapter with international AC plug kit
- (x1) User's Manual
- (x1) Phoenix Connector

INSTALLATION

- Connect a Cat6 cable (UTP or STP) between the sender and receiver. Please see the note below about cable requirements.
- Plug the provided 5v DC power supply to the Sender and Receiver. The HBX-R Receiver does not need power supply when connected to specific HDBaseT sources such as Hall Research HSM-44-BX Matrix Switch.
- Connect HDMI inputs and outputs
- Connect IR, RS-232, and Ethernet cables as required

Twisted-Pair Cable Requirements for HDBaseT

Three factors should be considered when deciding on the type of Category cable to be used: video resolution, distance, and the possibility of interfering sources (such as bundling multiple cables) that can affect signal integrity.

23-gauge, Shielded CAT6 cable is recommended for most applications

Cable	Use
Cat5e UTP	Use for 1080p video to 90meters or 4K video to 50 meters (in absence of interfering sources)
Cat6 UTP	OK for 1080p video to 100meters or 4K video to 70 meters (in absence of interfering sources)
Cat6 STP	OK for 1080p video to 100meters or 4K video to 70 meters (in presence of interfering sources such as Alien Crosstalk from other Cat6 cables that are adjacent in a bundle)
Cat6A/Cat7	Required for 4K video to 100 meters

CONNECTOR AND INDICATOR FUNCTIONS

HBX-S



Connector	Function
DC 5V	Power input. Please use the supplied 5V, 2A power supply.
HDMI IN	Connect to a video source to the Sender. The HBX series supports all HDMI resolutions up to UHD 4K30 4:4:4 or 4K60 4:2:0.
LAN	Used to extend an existing Ethernet connection between HBX-S and HBX-R. The extension operates at typical 100BaseT speeds. **Do not confuse the LAN Port with the HDBaseT (UTP) port!**
RS232	Use the supplied 3-pin screw connector to extend RS-232 serial control signals. All baud rates up to 115,200 are supported.
UTP	This is the **HDBaseT** signal output. The port is the link between Sender and Receiver. If STP (shielded Twisted Pair) cable is used, it is important to ensure the RJ45 connector on both ends of the cable have the required metal shroud and that the cable shield/drain wire is electrically connected to the metal shroud.
Link LED	Indicates HDBaseT link is established between the ends
Video LED	Indicates Video is being extended. the Video LED will blink if non-HDCP video is present, or light solid when HDCP video is present.
IR I/O	Infra-red signals can be extended through the HBX-S/R in either direction. Simply plug included IR DETECTOR into the IR IN port, or an IR BLASTER/EMITTER cable into the IR OUT port.



HBX-R



Functions are analogous to the HBX-S as described above. The HBX-R can get power using PoC (power over cable 9~24vDC) from compatible Senders such as HSM-44-BX. However, HBX-S does not provide PoC.

TROUBLESHOOTING

If you are experiencing problems getting the Extender to work properly, please use the following troubleshooting suggestions.

- Check the state of “Video” and “Link” LEDs next to HDBaseT UTP Connector.
- Make sure that the UTP or STP cable meets requirements. Use a shorter cable to test if cable length is the issue.
- You must make sure the video output source is not exceeding video resolution supported by the extender. For example 4K at 60 Hz refresh rate with 4:4:4 chroma sampling is not supported. You may have to set the video resolution of your source to 4K at 30 Hz 4:4:4, or 4K at 60 Hz 4:2:0 max.
- If the problem is in DDC channel, due to your source operating at high DDC clock rate or if the source does not support clock stretching, you may need to connect an additional buffer such as the HD-AUD to your source.

Contacting Hall Research

If you determine that your Extender is malfunctioning, do not attempt to repair the unit instead, contact Hall Research Technical Support at +1 (408) 962-0515 or support@atlona.com (Monday – Friday, 8:00 a.m. – 6:00 p.m. CST). To return the unit to Hall Research you must first get a Return Authorization (RMA) number. Package the unit carefully, if returning. We recommend that you use the original container.

SPECIFICATIONS

Specification	HBX-S, HBX-R
Video	
Standards	DVI (single link) and HDMI (compliant with HDMI 1.4 video specifications including 12 bit color depth, 3D video and 4K support)
Signal type	TMDS
Resolutions	DVI signal VGA (640x480) thru WUXGA (1920x1200) HDTV signal 480i through 1080p Digital Cinema 4K30 4:4:4 or 4K60 4:2:0 (4096x2160) up to 60 m
Audio	
Formats	All HDMI Embedded Audio including: LPCM 7.1CH, Dolby TrueHD and DTS-HD Master Audio (32-192 kHz sample rate)
Other Signals	
DDC	Pass-Thru DDC for reading EDID directly from remotely connected LCD and HDCP handshake
CEC	Pass-Thru DDC for Consumer Electronics Control compatible devices
RS232	Bidirectional (full-duplex) any baud rate up to 115,200
Ethernet	100BaseT Ethernet LAN
IR	Extended in both directions. Carrier modulation range from 30 kHz to 60 kHz
General	
Power Supply	100 VAC to 240 VAC, 50-60 Hz, external; 5 VDC, 2 A, regulated
Power	Sender & Receiver: 10 watts maximum
Temp/humidity	Storage: -40 to +158 °F (-40 to +70 °C) / 10% to 90%, non-condensing Operating: +32 to +122 °F (0 to +50 °C) / 10% to 90%, non-condensing
Cooling	Convection
Mounting	End plates with hole for surface mounting
Enclosure type	Metal (Aluminum ends, Aluminum Extrusion)
Dimensions	1.0" H x 3.9" W x 3.9" D (25mm H x 100mm W x 100mm D) Depth excludes connectors
Product weight	Sender 9.3 oz (0.58 lb or 264 g) Receiver 10 oz (0.63 lb or 284 g) Kit (shipping) 37 oz (2.3 lb or 1050 g) includes: sender, receiver, universal power supply, manual, and packaging

Specification	HBX-S, HBX-R
MTBF	90,000 hours (Calculated Estimate)
Warranty	3 years parts and labor
Certifications	
Safety	CE
EMI/EMC	CE, FCC Class A
Certifications	CE, FCC, RoHS

Specifications are subject to change without notice

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Sales, Marketing & Customer Support

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