



User Manual



**KVM + HDMI + Analog Audio + USB over CAT5e/6 LAN
Extender 200 meters**

H-HDMI-KVM-Tx/Rx

A Note from Thor Broadcast about this Manual

Intended Audience

This user manual has been written to help people who must use, integrate and to install the product. Some chapters require some prior electronics knowledge, especially in broadcast technologies and standards.

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1. INTRODUCTION

An **H-HDMI-KVM-Tx/Rx** HDMI extender, includes the transmitter and receiver set + power supplies, is used over RJ45 to expand the transmission of HDMI, analog audio signals, and USB over CAT cables. It can be used in many applications, including KVM (keyboard, video, mouse) connections between PCs and monitors, extending up to 200 meters (approximately 600 feet) over Twisted Pair LAN RJ45 CAT5e/6 cables or through switches. This setup allows for both point-to-point and point-to-multipoint configurations.

This **H-HDMI-KVM-Tx/Rx** (HDMI + KVM + 1 forward 3.5 audio + 1 reverse IR signal) set transmits HDMI audio and video signals up to 200 meters via CAT5e/6 cable. The Tx/Rx supports the TCP/IP network protocol, enabling transmission from one transmitter to multiple receivers through Ethernet switches.

It transmits HDMI signals and also features a local loop-out for live viewing. Additionally, it includes IR infrared return transmission, independent audio transmission, and remote control IR of the signal source.

The device also incorporates EDID data and built-in audio, enhancing the HDMI extender's compatibility over Ethernet.

It offers excellent transmission distance for copper with HD 1080p60, facilitating low-cost, easy installation using existing CAT LAN lines in any application.

The system is widely used in information systems, security monitoring, video conferencing systems, HD teaching systems, LCD splicing, LED fusion, and more.

2. FEATURES

1. Matrix and Switcher for up to 1x256 (**N TO 1 is not supported**) applications.
2. Extends 4K 30P, 1080 60P HDMI signal up to 180m (600ft) over a single Cat5E cable, 100M Ethernet.
3. Use conventional Ethernet Switch for extension and distribution, and can be cascaded by the Ethernet switches for longer distance.
4. Supports IR (20KHz~60KHz) extension.
5. Supports Stereo Audio over IP, independent to HDMI extension.
6. Supports USB (Keyboard, Mouse) extension over IP and KVM switch function by button selection.
7. Supports EDID pass-through and Transmitter resolution pass-through, including most popular 16:9, 16:10, 4:3 resolution and timing (Support list please refer to appendix).
8. Supports Graphic / Video mode selection and the latency is between 0.06-0.10 seconds.
9. Power supply is 5V2A with TYPE-C port.
10. The shell is made of aluminum alloy with fixed holes for easy installation.

Note: N TO N mode means that multiple TXs are connected to multiple RXs through the Ethernet switch.

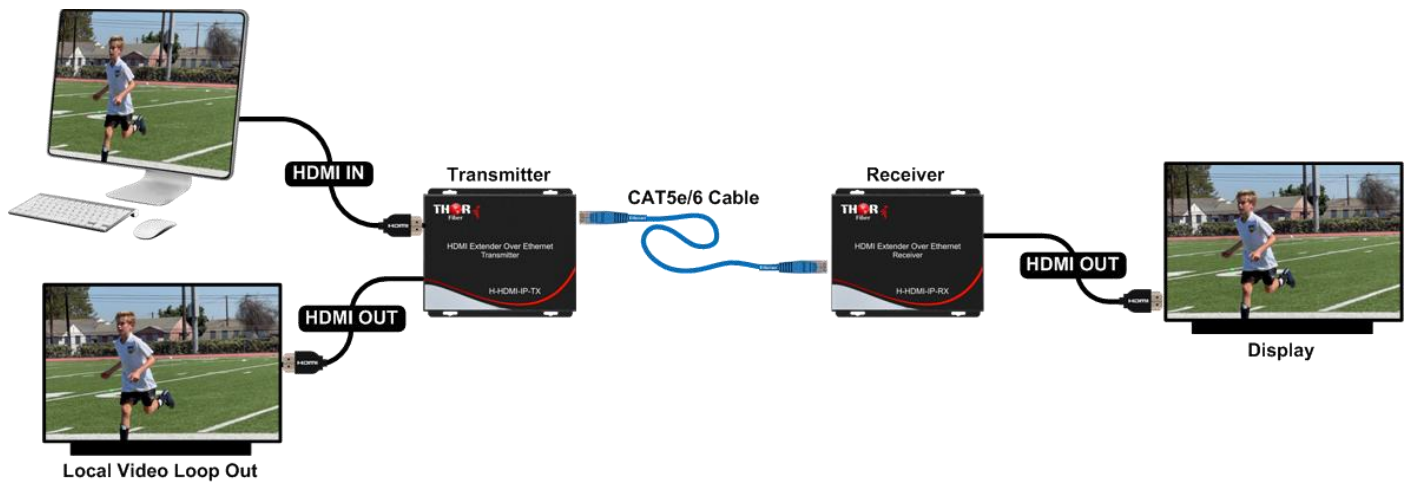
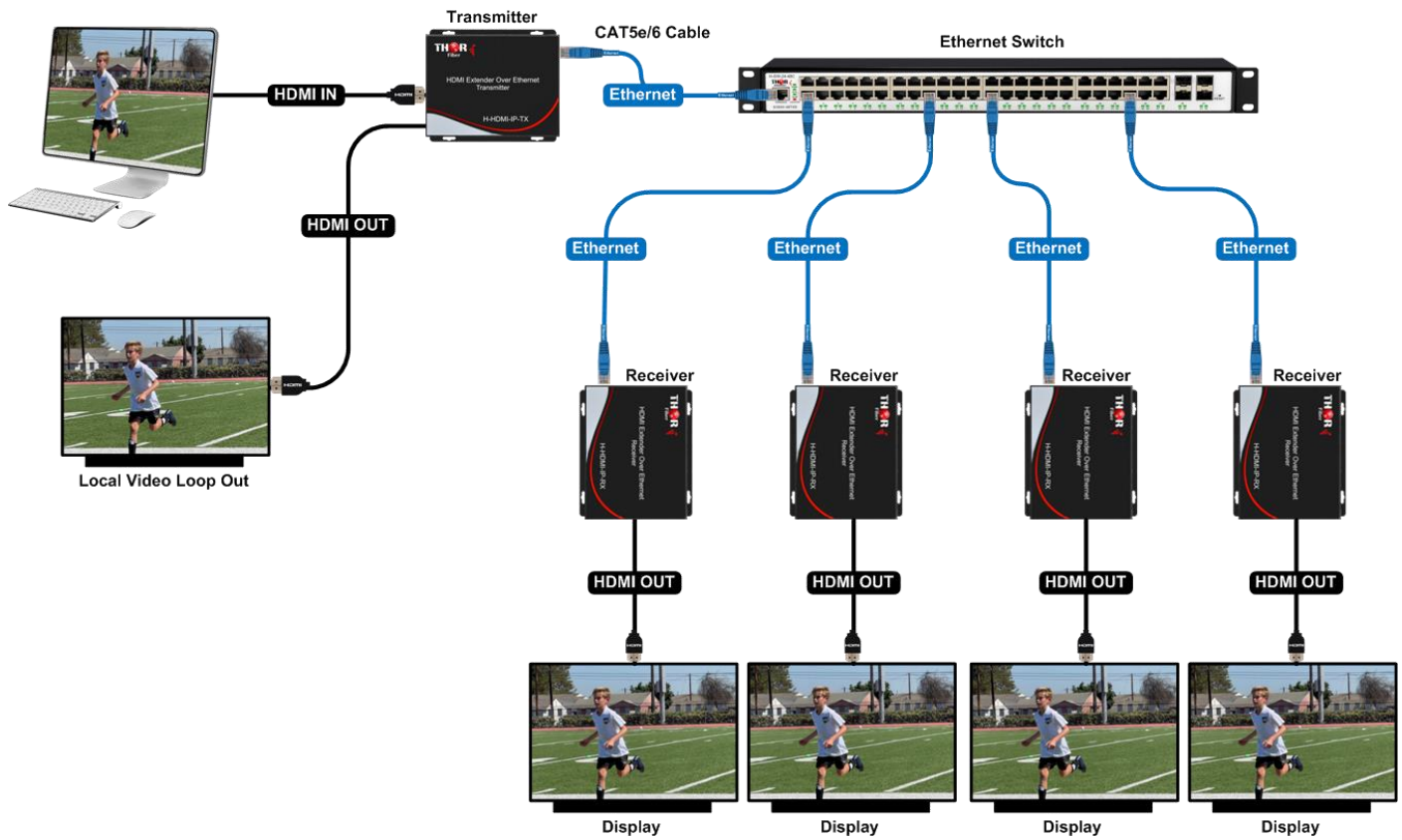
Turn to SP and press the ID to pair the IDs. The indicator light of the same group should be the same and different from that of other groups **Note: USB KVM supports only mouse and keyboard.**

Other USB devices are not supported.

3. SPECIFICATION

Video index	
Video version	HDMI 1.3 (full-digital)
HDCP protocol	1.2
Maximum pixel clock	148.5MHZ
Resolution	720 (1440) x 480i @ 59.94/60Hz 720 (1440) x 576i @ 50Hz 720 x 480p @ 59.94/60Hz 720 x 576p @ 50Hz 1280 x 720p @ 59.94/60Hz 1280 x 720p @ 50Hz 1920 x 1080i @ 59.94/60Hz 1920 x 1080i @ 50Hz 1920 x 1080p @ 23.98/24Hz 1920 x 1080p @ 59.94/60Hz 1920 x 1080p @ 50Hz
Effective cable length	Less than 10m
Physical interface	The HDMI-A interface
KVM(USB) index	
Version	1.1
Tx physical interface	USB female type A
Rx physical interface	USB female type A
Audio index	
Sampling frequency	32k, 44.1k, 48k, 64k, 88.2k, 96k, 176.4k, 192kHz
Sampling depth	24bit
Dynamic bandwidth	96db
Total harmonic distortion(THD)	-88db
Signal to noise ratio(SNR)	96db
Audio input / output impedance	600Ω
Signal level	VPP 3.3V
Physical interface	3.5mm stereo audio socket
Signal type	Analog stereo channel
IR index	
Infrared interface	Standard 3.5mm interface
Infrared frequency	Standard with 20-60KHz
Signal type	Digital signal
Infrared transmission direction	Reverse transmission
Other indexes	
Operating temperature	-20°C ~70°C
Storage temperature	-40°C ~85°C
Product size	104*104*28mm
Product net weight (Pair)	0.35/kg
Product weight (including outer packaging)	0.6/kg
Product outer packaging dimensions	275*220*55mm
Power supply	5V 1A
Power dissipation	≤2.5W

6. INSTALLATION



4K Parameter Table

Support list of display input		4K Model
TX HDMI input and RX HDMI output		1.11534.0
TX HDMI input	RX HDMI output	HDMI loopback output
640x480 60Hz	800x600 60Hz	640x480 60Hz
800x600 60Hz	800x600 60Hz	800x600 60Hz
1024x768 60Hz	1024x768 60Hz	1024x768 60Hz
1280x720 60Hz	1280x720 60Hz	1280x720 60Hz
1280x720 50Hz	1280x720 60Hz	1280x720 50Hz
1280x768 60Hz	1280x768 60Hz	1280x768 60Hz
1280x800 60Hz	1280x800 60Hz	1280x800 60Hz
1280x960 60Hz	1280x960 60Hz	1280x960 60Hz
1280x1024 60Hz	1280x1024 60Hz	1280x1024 60Hz
1360x768 60Hz	1920x1080 60Hz	1360x768 60Hz
1400x1050 60Hz	1400x1050 60Hz	1400x1050 60Hz
1440x900 60Hz	1440x900 60Hz	1440x900 60Hz
1920x1200 60Hz	1920x1200 60Hz	1920x1200 60Hz
1600x1200 60Hz	1600x1200 60Hz	1600x1200 60Hz
1680x1050 60Hz	1680x1050 60Hz	1680x1050 60Hz
1920x1080 60Hz	1920x1080 60Hz	1920x1080 60Hz
1920x1080i 60Hz	1920x1080 60Hz	1920x1080i 60Hz
1920x1080 50Hz	1920x1080 60Hz	1920x1080 50Hz
1920x1080i 50Hz	1920x1080 60Hz	1920x1080i 50Hz
3840x2160 60Hz	3840x2160 30Hz	3840x2160 60Hz
4096x2160 60Hz	4096x2160 30Hz	4096x2160 60Hz

1080P Parameter

Support list of display input		1080P Model
TX HDMI input and RX HDMI output		1.11194.0
TX HDMI input	RX HDMI output	HDMI loopback output
640x480 60Hz	800x600 60Hz	800x600 60Hz
800x600 60Hz	800x600 60Hz	800x600 60Hz
1024x768 60Hz	1024x768 60Hz	1024x768 60Hz
1280x720 60Hz	1280x720 60Hz	1280x720 60Hz
1280x720 50Hz	1280x720 60Hz	1280x720 60Hz
1280x768 60Hz	1280x768 60Hz	1280x768 60Hz
1280x800 60Hz	1280x800 60Hz	1280x800 60Hz
1280x960 60Hz	1280x960 60Hz	1280x960 60Hz
1280x1024 60Hz	1280x1024 60Hz	1280x1024 60Hz
1360x768 60Hz	1920x1080 60Hz	1920x1080 60Hz
1400x1050 60Hz	1400x1050 60Hz	1400x1050 60Hz
1440x900 60Hz	1440x900 60Hz	1440x900 60Hz
1920x1200 60Hz	1920x1200 60Hz	1920x1200 60Hz
1600x1200 60Hz	1600x1200 60Hz	1600x1200 60Hz
1680x1050 60Hz	1680x1050 60Hz	1680x1050 60Hz
1920x1080 60Hz	1920x1080 60Hz	1920x1080 60Hz
1920x1080i 60Hz	1920x1080 60Hz	1920x1080 60Hz
1920x1080 50Hz	1920x1080 60Hz	1920x1080 60Hz
1920x1080i 50Hz	1920x1080 60Hz	1920x1080 60Hz

**TO REDUCE THE RISK OF ELECTRICAL SHOCK,
DO NOT REMOVE COVER FROM THIS UNIT.
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.**

WARNING: TO PREVENT SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE



CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN

5. SAFETY INSTRUCTIONS

1. Read all safety and operating instructions before you operate the modulator
2. Retain all safety and operating instructions for future reference
3. Heed all warnings on the modulator and in the safety and operating instructions
4. Follow all installation, operating and use instructions.
5. Unplug the modulator from the AC power outlet before cleaning. Use only a damp cloth for cleaning the exterior of the modulator
6. Do not use accessories or attachments not recommended by us, as they may cause hazards, and will void the warranty
7. Do not operate the modulator in high humidity areas, or expose it to water or moisture.
8. Do not place the modulator on an unstable cart, bracket or table. The modulator may fall, causing serious personal injury and damage to the modulator. Install the modulator only in a mounting rack designed for 19" rack-mounted equipment.
9. Do not block or cover slots and openings in the modulator. These are provided for ventilation and protection from overheating. Never place the modulator near or over a radiator or heat register.
10. We strongly recommend using an outlet that contains surge suppression or ground fault protection. For added protection during a lightning storm, or when the modulator is left unattended for long periods of time, unplug it from the wall outlet or PDU and disconnect the lines between the modulator and its source. This will prevent damage caused by lightning or power line surges.
11. Do not overload wall outlets or extension cords, as this can result in a risk of fire or electrical shock.
12. Never insert objects of any kind into the modulator through openings as the objects may touch dangerous voltage and will void the warranty. Refer all servicing to authorized service personnel.
13. Unplug the modulator from the wall outlet or PDU and refer servicing to authorized service personnel whenever the following occurs:
 - The power supply cord or plug is damaged
 - Liquid has been spilled into or objects have fallen into modulator
 - The modulator has been exposed to rain or water
 - The modulator has been dropped or the chassis has been damaged
 - The modulator exhibits a distinct change in performance
14. When replacement parts are required, ensure that the service technician uses replacement parts specified by Thor. Unauthorized substitutions may damage the modulator or cause electrical shock or fire and will void the warranty.

5.1 Unpacking and Handling:

A full **H-HDMI-KVM-Tx/Rx** is shipped with all equipment assembled, wired, factory tested, and then packaged in an appropriate shipping container.

5.2 Mechanical Inspection

Inspect the front and rear of the equipment for shipping damage. Make sure the equipment is clean, and no wire, cable, or connectors are broken, damaged or loose.

5.3 Precautions

Avoid heat buildup

Ensure easy access to rack wiring

Facilitate servicing and maintenance

Avoid direct heating or air conditioning

Make sure rack supports are sufficiently installed to support racks

Beware of dripping water onto equipment from leaky roofs, waveguide roof entries and cold-water pipe condensation

5.4 Damage in Shipment

Should any damage be discovered after unpacking the unit, immediately file a claim with the carrier. A full report of the damage shall be made, and a copy forwarded to the Seller