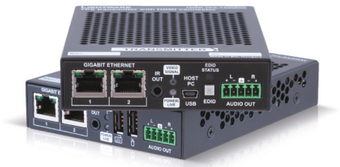
visual engineering
LIGHTWARE



Quick Start Guide

HDMI-TPX-TX209AK
HDMI-TPX-RX209AK

Important Safety Instructions

Please read the supplied safety instruction document before using the product and keep it available for future reference.

Introduction

The HDMI-TPX-209 series extenders with AVX technology are Lightware's future-proof development and a natural progression from the widely popular HDMI-TPS-TX/RX97 series, allowing users to extend HDMI 2.0 signals up to 4K60 4:4:4 video resolution through a single CATx cable over distances of up to 100 meters.

Beyond the benefits of sending high-resolution video over long distances, the extenders are also capable of handling various connectivity standards, including bi-directional RS-232, USB K+M extension and command injection over IR (output only) as well.

Audio signal de-embedding function is available via analog audio for HDMI-TPX-209AK series extenders.

The Gigabit Ethernet port is also a valuable addition, allowing users to connect an additional device to the network directly through the TPX extender.

HDCP 2.3 and basic EDID management functionality are also among the features offered by these devices, such as their connectivity and easy integration into a wide range of AV operations and compatibility with 3rd party devices.

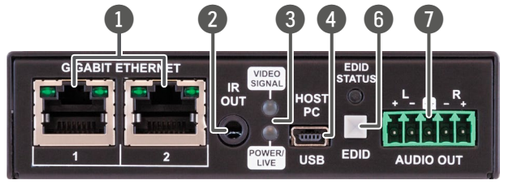
Compatible Devices

The product is compatible with all Lightware TPX series models and any third-party AVX devices.

AV EXTENDER

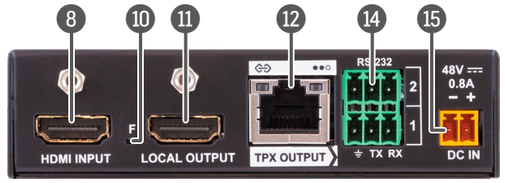
Front and Rear View - Transmitter (TX)

Front View



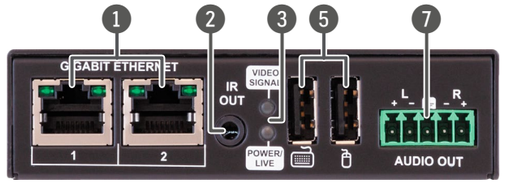
TX209AK model is built with a 5-pole Phoenix® connector for analog audio output.

Rear View



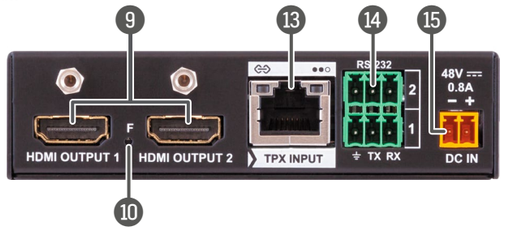
Front and Rear View - Receiver (RX)

Front View



TX209AK model is built with a 5-pole Phoenix® connector for analog audio output.

Rear View



1. **Gigabit Ethernet ports** — 1GBase-T RJ45 connectors for user Ethernet purpose.
2. **IR out** — TRS (3.5mm jack) output connector for an Infrared emitter unit.
3. **Status LEDs** — The LEDs give immediate feedback about the current status of the extender. See the details in the *Status LEDs* section.
4. **USB mini B-type connector** — USB connection to host (computer) unit via USB mini-B connector.
5. **USB A-type connectors** — USB K+M ports for HID-compatible devices (preferably keyboard and mouse).
6. **EDID button and Status LED** — Two EDID emulation modes can be selected with the EDID button: Learned and Transparent.
   - **Short press**: switch between transparent and stored user EDID.
   - **Long press**: learn and store EDID from the output of the receiver.

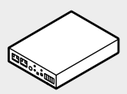
   The EDID Status LED gives immediate feedback about the current status of the EDID emulation. See the details in the *Status LEDs* section.
7. **Audio output** — 5-pole Phoenix connector for de-embedding the HDMI audio, which can be transmitted as a 2-channel balanced analog audio signal.
8. **HDMI input** — HDMI input port with HDMI 2.0 support for source devices.
9. **HDMI outputs** — HDMI output ports with HDMI 2.0 support for sink devices. The transmitted signals are mirrored on both ports.
10. **Factory reset button** — Hidden button for setting the device to factory default values.
11. **Local output** — Local HDMI output with the same AV content as the HDMI input.
12. **TPX output** — RJ45 connector for AVX output signal transmission. See more details about the connector in the *Power Supply Options* and the *Status LEDs* sections.
13. **TPX input** — RJ45 connector for AVX input signal. See more details about the connector in the *Power Supply Options* and the *Status LEDs* sections.
14. **RS-232 ports** — 3-pole Phoenix connectors for bi-directional serial communication.
15. **48V DC input** — 2-pole Phoenix DC input for local powering.

Status LEDs

POWER/LIVE		Transmitter / Receiver
off		Device is not powered.
blinking between 50% and 100% brightness (green)		Device is powered on and operational.
VIDEO SIGNAL		**Transmitter / Receiver**
off		No video signal detected on the HDMI input (TX) or HDMI output (RX) port.
on (green)		Video signal is detected on the HDMI input (TX) or HDMI output (RX) port.
EDID STATUS		**Transmitter**
on (green)		Learned EDID is emulated on the HDMI input port.
on (yellow)		Transparent EDID is emulated on the HDMI input port.
blinking (red)		Error occured during the EDID emulation. It may be caused by: ▪ EDID emulation cannot be set correctly. ▪ Device cannot apply transparent EDID emulation.

TPX INPUT/OUTPUT	⇔	Transmitter / Receiver
off		No connection is established between the transmitter and the receiver units.
on (green)		Connection is established with 10G / 5G / 2.5G bandwith.
blinking (yellow)		Link training is in progress.
TPX INPUT/OUTPUT	●●○	**Transmitter / Receiver**
off		No data transmission on the port.
blinking (green)		Data transmission is active.
GIGABIT ETHERNET - LEFT LED		**Transmitter / Receiver**
on (green)		Connection is established with 100Mbps bandwith.
blinking (green)		Data transmission is active.
GIGABIT ETHERNET - RIGHT LED		**Transmitter / Receiver**
on (green)		Connection is established with 1Gbps bandwith.
blinking (green)		Data transmission is active.

Box Contents



Transmitter / receiver device

48V DC adaptor with interchangeable plugs

Phoenix® Combicon 3-pole connector (2x)

Phoenix® Combicon 5-pole connector

Safety & Warranty Info; Quick Start Guide

Mounting Options

For the mounting of the devices Lightware supplies optional accessories for different usages. The device has two mounting holes with inner thread on the bottom side. Fasten the device by the screws enclosed to the accessory.

UD Mounting Plate F110

UD Mounting Plate F120

UD Mounting Pro P140

The UD Mounting Plate F110 makes it easy to mount a single device on any flat surface, e.g. furniture. The UD Mounting Plate F120 and UD Mounting Pro P140 provide the same for one half-rack or two quarter-rack sized units. Pocket-sized devices can also be fastened to them. The UD Mounting Pro P140 makes easy and quick changing of the extenders under the desk available. To order mounting accessories, please contact sales@lightware.com.

Using different (e.g. longer) screws may cause damage to the device.

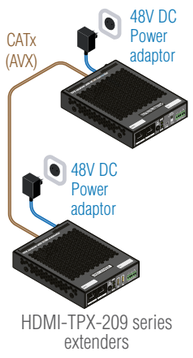
The extenders are quarter-rack sized.

Power Supply Options

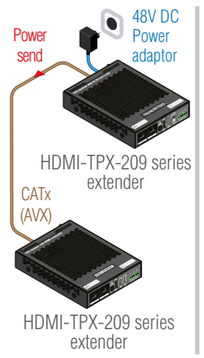
TPX209 series extenders are able to supply remote power to each other over the TPX connector.

The TPX209 series devices can be powered in any of the following ways:

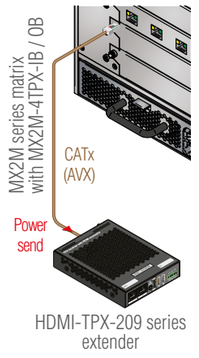
1. Local adaptor for both TX and RX



2. Local adaptor and remote power to TX / RX



3. Remote power via matrix board to TX / RX



TAKE CARE OF ME

I AM THE ONE AND ONLY USER DOCUMENT FOR THIS PRODUCT

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Further information on the device is available at www.lightware.com.

Doc. ver.: 1.2

19210104

Specification

General

Compliance ..... CE, UKCA
EMC (Emission) ..... EN 55032:2015+A1:2020
EMC (Immunity) ..... EN 55035:2017+A11:2020
Electrical safety ..... EN 62368-1:2020
RoHS ..... EN 63000:2018
Warranty ..... 3 years
Operating temperature ..... 0° to +50°C (+32° to +122°F)
Operating humidity ..... 10% to 90%, non-condensing
Cooling ..... passive

Power

Power supply option ..... Power adaptor / PoE PD + PoE PSE
Supported power source ..... 100-240 V AC; 50/60 Hz
Power consumption (without remote power) ..... 11 W
Power consumption (with remote power) ..... 22 W
Heat dissipation (without remote power) ..... 37.5 BTU/h
Heat dissipation (with remote power) ..... 75 BTU/h

Power Adaptor

Supplied power ..... 48V DC, 0.8A
AC power plug ..... Interchangable (EU, UK, JP/US, AUS/NZ)
DC power plug ..... 2-pole Phoenix connector

Enclosure

Rack mountable ..... yes, with mounting accessories
Enclosure material ..... 1 mm steel
Dimensions (mm / inch) ..... 100.4 W x 131.9 D x 26 H (3.95 W x 5.19 D x 1 H)
Weight ..... 482 g (1.06 lbs)

Video Ports

HDMI input/output

Connector type ..... 19-pole HDMI Type A receptacle
AV standard ..... DVI 1.0, HDMI 2.0
HDCP compliance ..... HDCP 2.3
Color space ..... RGB, YCbCr
Supported resolutions at 8 bits/color * ..... up to 4096x2160@60Hz (4:4:4)
Audio formats ..... 8-channel PCM, Dolby TrueHD, DTS-HD Master Audio 7.1
CEC support ..... transparent

TPX input/output

Connector type ..... RJ45 connector

Power over Ethernet ..... PoE PD + PoE PSE (IEEE802.3af)
Data rate 10GBase-T
Compliance ..... SDVoE AVX
HDCP compliance ..... HDCP 2.3
Transferred signals ..... Video, Audio, RS-232, Infrared, USB K+M, Ethernet
Color space ..... RGB, YCbCr
Video latency (TPX output) ..... 0 frame (five lines/ under 8ms)
Compression ratio (TPX output) ..... 1.4 to 1 **
Supported resolutions at 8 bits/color * ..... up to 4096x2160@60Hz (4:4:4)
Audio formats ..... 8-channel PCM, Dolby TrueHD, DTS-HD Master Audio 7.1

Audio Ports

Analog audio output

Connector type ..... 5-pole Phoenix connector
Audio formats ..... 2-channel PCM
Sampling frequency ..... 48 kHz
Signal transmission ..... Balanced signal

* All standard VESA, CEA and other custom resolutions up to 600MHz (HDMI2.0) are supported.

** Compression is applied only if the AV signal is above HDMI 1.4 standard.

Control Ports

Ethernet port

Connector type ..... RJ45 female connector
Ethernet data rate ..... 1GBase-T, full duplex with autodetect
Power over Ethernet (PoE) ..... Not supported

RS-232 serial port

Connector type ..... 3-pole Phoenix connector
Default settings ..... 9600 BAUD, 8N1

Infrared output port

Connector type ..... 3.5mm TRS (approx. 1/8" jack)
Output signal ..... Modulated (38kHz)
Operation mode ..... Command injection (only with 3rd-party software)

USB port (Transmitters)

Connector type ..... USB mini-B type
USB compliance ..... USB 2.0
Device class ..... HID

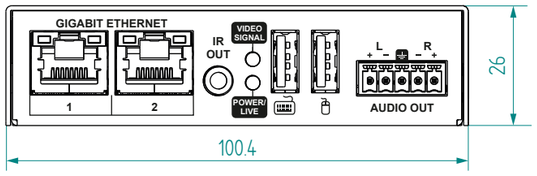
USB port (Receivers)

Connector type ..... USB A-type receptacle
USB compliance ..... USB 2.0
Device class ..... HID

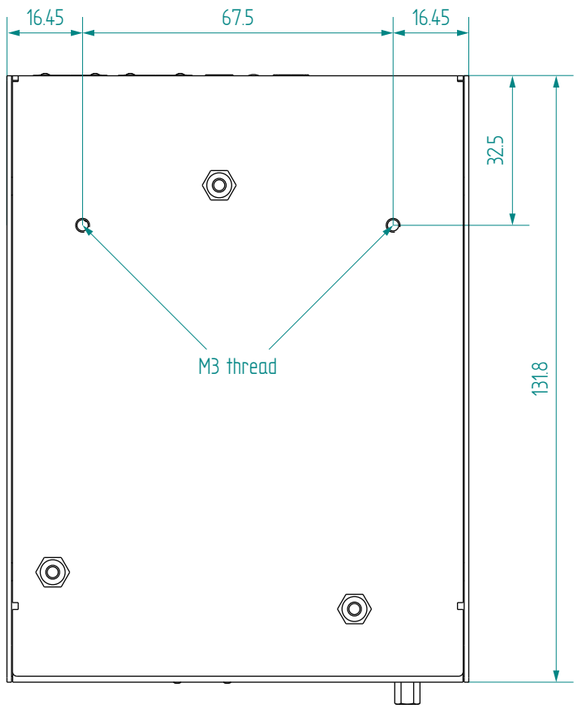
Mechanical Drawings

The following drawings present the physical dimensions of the HDMI-TPX-209 series extenders. Dimensions are in mm.

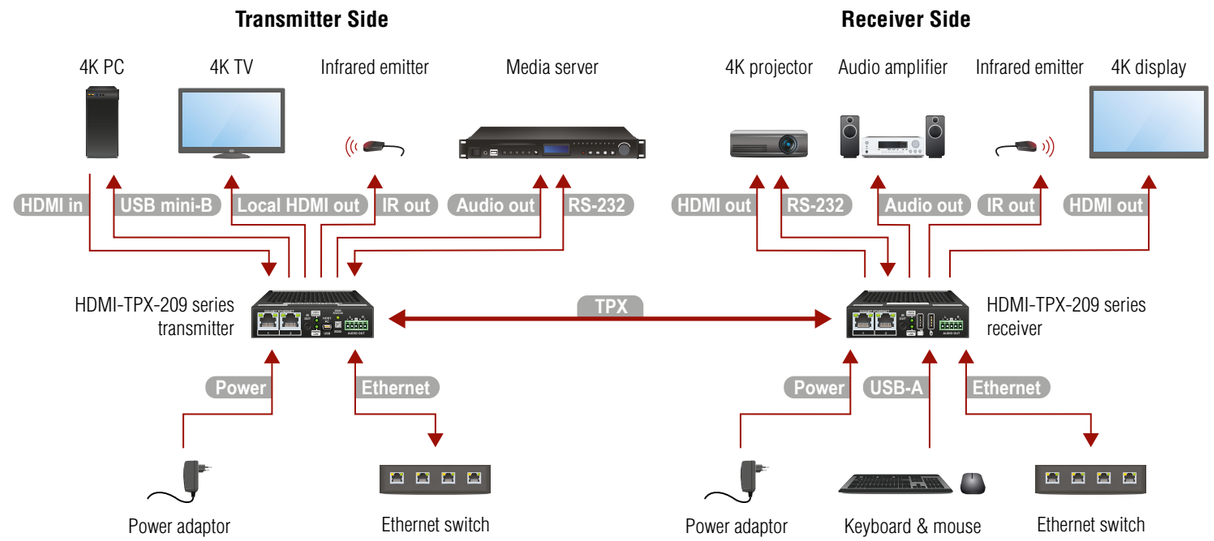
Front View



Bottom View



Connecting Steps



Transmitter Side	
TPX	Connect a CATx cable between the TPX output port of the transmitter and the TPX input port of the receiver.
HDMI in	Connect the source (e.g. media player) to the HDMI input port of the transmitter by a HDMI cable.
Local HDMI out	Connect the local sink devices (e.g. 4K TV) to the Local output port by an HDMI cable. The output port is local loopback port in this case: the same stream received on the input port is transmitted forward.
Audio out	Optionally for analog output: connect an audio device (e.g. media server) to the analog audio output port by an audio cable.
USB mini-B	Optionally for USB HID extension: connect the transmitter to the computer by an USB mini-B cable.
Ethernet	Connect the device to a LAN network.
IR out	Optionally for Infrared extension: connect an IR emitter to the IR OUT port of the transmitter.
RS-232	Optionally for RS-232: connect a device (e.g. media player) to the RS-232 port.
Power	Powering on the devices is recommended to do as the final step during the installation. Please check the *Power Supply Options* section for the details.

Receiver Side	
TPX	Connect a CATx cable between the TPX output port of the transmitter and the TPX input port of the receiver.
HDMI out	Connect the sinks (e.g. 4K display and 4K projector) to the HDMI output ports of the receiver by the HDMI cables.
Audio out	Optionally for analog output: connect an audio device (e.g. audio amplifier) to the analog audio output port by an audio cable.
USB-A	Optionally for USB HID extension: connect the USB HID devices to the transmitter (preferably mouse and keyboard).
Ethernet	Connect the device to a LAN network.
IR out	Optionally for Infrared extension: connect an IR emitter to the IR OUT port of the receiver.
RS-232	Optionally for RS-232: connect a device (e.g. 4K TV) to the RS-232 port.
Power	Powering on the devices is recommended to do as the final step during the installation. Please check the *Power Supply Options* section for the details.

Minimum CAT Cable Requirement

Lightware highly recommends using **CAT6a AWG24** or higher category 10G Ethernet cables for the TPX (AVX) connection between the transmitter and the receiver. Usage of e.g. AWG28 Ethernet cables may reduce the extension distance significantly.

Firmware Upgrade

Lightware Device Updater (LDU2) is an easy and comfortable way to keep your device up to date. Establish the connection via **Gigabit Ethernet** port. Download and install LDU2 software from the company's website, www.lightware.com, where you can find the latest firmware package as well.

Ventilation

⚠ ***Pay attention to the ventilation holes when designing the system. Top and side ventilation holes must not be covered.***