LIGHTWARE
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Quick Start Guide

HDMI-TPX-TX209AU2K
HDMI-TPX-RX109AU2K

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-TX209AU2K and HDMI-TPX-RX109AU2K transmitter and receiver devices are based on SDVoE technology and allow users to extend HDMI 2.0 compliant video, audio and control signals from a single source to a single destination when they are directly connected. Moreover, these USB2.0 capable extenders also allow transparent and composite USB2.0 transmission in the opposite direction.

Beyond the benefits of sending high-resolution video and USB2.0 data over long distances, the extenders are also able to handle various connectivity standards, including a 1G user Ethernet channel over the 10G link, as well as command injection into RS-232.

The Gigabit Ethernet ports are also valuable additions, allowing users to connect Ethernet capable devices to the network directly through the TPX extenders. This is particularly useful for controlling external devices like projectors and displays.

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

Composite USB2.0 transmission adds the ability to connect remote USB-HID devices to a host computer through an extender pair. Transparent USB2.0, on the other hand, provides support for any type of USB2.0 devices like webcams, microphones, touch displays just to name a few.

Box Contents

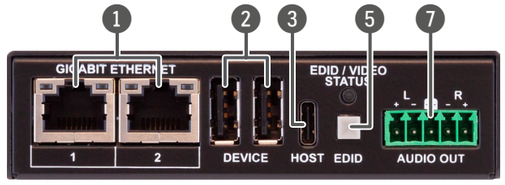
- HDMI-TPX-AU2K series device
- 48V DC adaptor with interchangeable plugs
- Phoenix Combicon 3-pole connector
- Phoenix Combicon 5-pole connector
- Safety and warranty info, Quick Start Guide

Compatible Devices

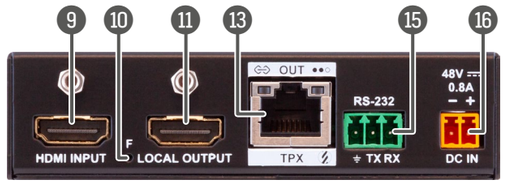
The product is compatible with all Lightware TPX series models and any third-party SDVoE AVX devices.

Front and Rear View - Transmitter (TX)

Front View

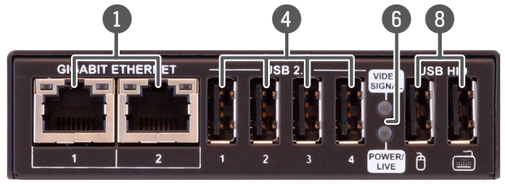


Rear View

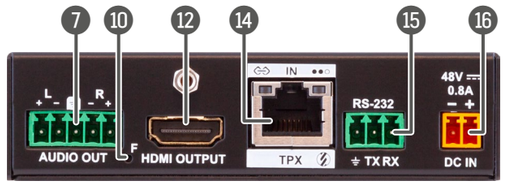


Front and Rear View - Receiver (RX)

Front View



Rear View



1. **Gigabit Ethernet ports** — 1GBase-T RJ45 connectors for user Ethernet purpose.
2. **Device USB-A connectors** — USB-A connectors with USB 2.0 support for various type of USB devices.
3. **Host USB-C connector** — USB-C connection between the transmitter and the host computer. The port receives **USB data only**, no AV signal transmission is accepted. It **supports USB 2.0** standard only.
4. **USB 2.0 connectors** — USB-A connectors with USB 2.0 support for various type of USB devices (e.g. webcam, microphone, external storage, etc). The signal is transmitted to the receiver over the optical link.
5. **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.
6. **Status LEDs** — The LEDs give immediate feedback about the current status of the extender. 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. **USB HID connectors** — USB K+M ports for HID-compatible devices (preferably keyboard and mouse).
9. **HDMI input** — HDMI input port with HDMI 2.0 support for the source device.
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. **HDMI output** — HDMI output port with HDMI 2.0 support for the sink device.
13. **TPX output port** — RJ45 connector for AVX output signal transmission. See more details about the connector in the *Power Supply Options* and the *Status LEDs* sections.
14. **TPX input port** — RJ45 connector for AVX input signal. See more details about the connector in the *Power Supply Options* and the *Status LEDs* sections.
15. **RS-232 port** — 3-pole Phoenix connector for bi-directional serial communication.
16. **48V DC input** — 48V DC input with 2-pole Phoenix connector.

Mounting Options

The following table summarizes the compatiblity of the HDMI-TPX-AU2K series devices with the mounting accessories offered by Lightware. The number in the brackets means how many same-size devices can be assembled to the mounting plate.

The following accessories can be ordered separately, please contact sales@lightware.com for the details.

 1U High Rack Shelf	 UD Mounting Kit	 UD Mounting Kit Double	 UD Mounting Plate F110
✔ (4x)	✔ (1x)	✔ (2x)	✔ (1x)

 UD Mounting Plate F120	 UD Mounting Pro P110	 UD Mounting Pro P140	 PRC-16-312 rackmount cage
✔ (2x)	✔ (1x)	✔ (2x)	✔ (16x)

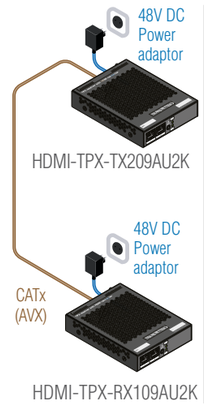
⚠ ***Using different (e.g. longer) screws may cause damage to the device.***

❗ *The extenders are quarter-rack sized.*

Power Supply Options

The HDMI-TPX-AU2K series devices fulfill the PoE PD+PSE (IEEE802.3af) standard and they can be powered in any of the following ways:

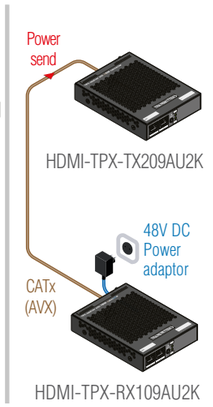
1. Local adaptor for both TX and RX



2. Local adaptor and remote power to RX



3. Local adaptor and remote power to TX



Status LEDs

EDID / VIDEO STATUS		Transmitter
off		Device is not powered.
blinking (green or yellow)		No video signal present on the HDMI input port.
on (green)		Stored 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.
POWER/LIVE		**Receiver**
off		Device is not powered.
blinking between 50% and 100% brightness (green)		Device is powered on and operational.
VIDEO SIGNAL		**Receiver**
off		No video signal present on the HDMI output port.
on (green)		Video signal is present on the HDMI output port.

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.

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.

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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
Supported power source	100-240 V AC; 50/60 Hz
Supplied power	48V DC, 0.8A
AC power plug	Interchangable (EU, UK, JP/US, AUS/NZ)
DC power plug	2-pole Phoenix connector
Power consumption (TX, without / with remote power)	18 W / 21 W
Power consumption (RX, without / with remote power)	22 W / 25 W
Heat dissipation (TX, without / with remote power)	61.4 BTU/h / 71.7 BTU/h
Heat dissipation (RX, without / with remote power)	75.1 BTU/h / 85.3 BTU/h

Enclosure

Rack mountable	yes, with mounting accessories
Enclosure material	1 mm steel
Dimensions (mm / inch)	100.4 W x 151.8 D x 26 H (3.95 W x 6 D x 1 H)
Weight	476 g (1.05 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

TPX input/output

Connector type	RJ45 female connector
Power over Ethernet	PoE PD+PSE (IEEE802.3af)
Data rate	10GBase-T
Compliance	SDVoE AVX
HDCP compliance	HDCP 2.3
Transferred signals	Video, Audio, RS-232, Infrared, 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

* 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.

Audio Ports

Analog audio output

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

USB Ports

USB-C port

Connector type	Type-C receptacle
Number of ports	1
USB compliance	USB 2.0

USB-A port

Connector type	Type-A receptacle
Number of ports (TX / RX)	2 / 6
USB compliance	USB 2.0
Power supplement of all ports (TX)	5V, 1.4A
Power supplement of all ports (RX)	5V, 1.7A (USB 2.0) / 5V, 0.3A (USB HID)
Max current supplement per USB-A port	1A

Control Ports

Ethernet port

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

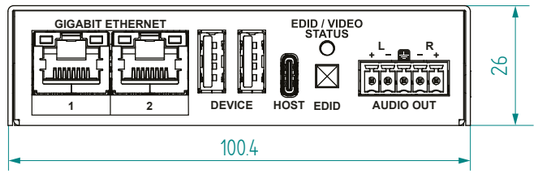
RS-232 serial port

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

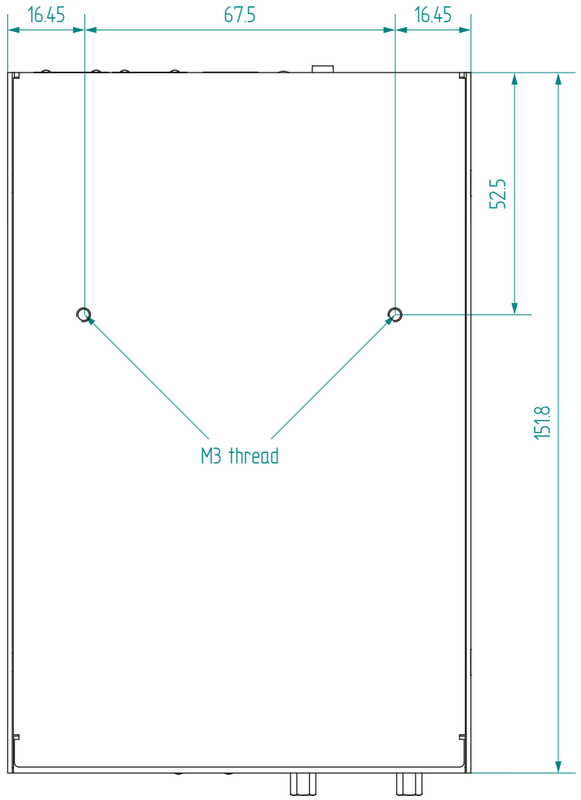
Mechanical Drawings

The following drawings present the physical dimensions of the HDMI-TPX-AU2K series extenders. Dimensions are in mm.

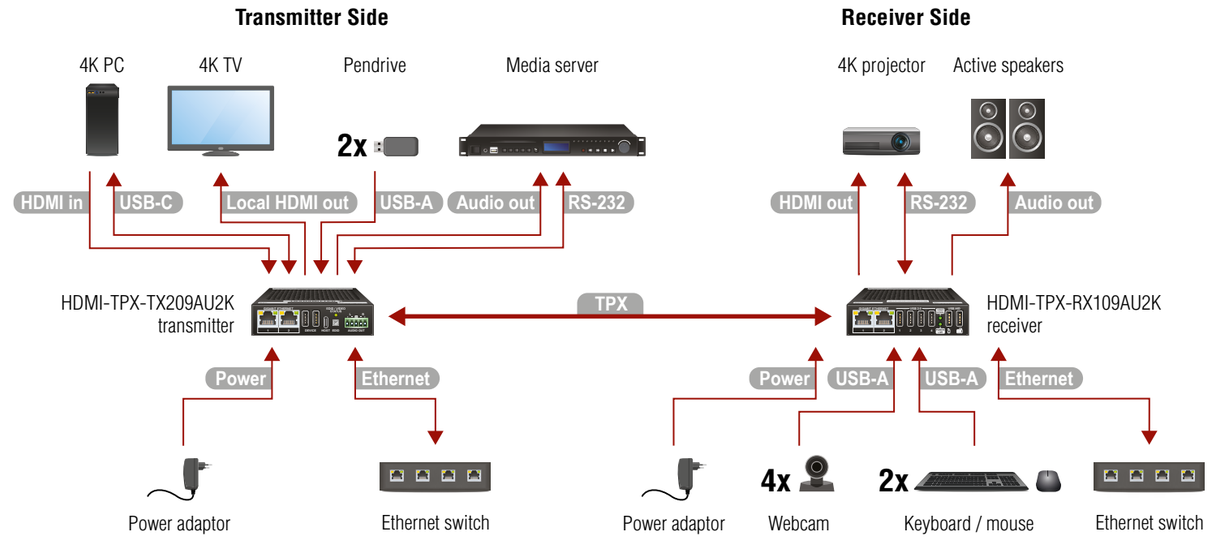
Front View



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.
USB-C	Connect the host PC to the Host port by an USB-C cable. The port supports USB 2.0 standard and receives USB data only, no AV transmission allows.
HDMI in	Connect the source (e.g. 4K PC) 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-A	Connect up to two USB 2.0 devices (e.g. pendrive/microphone/ webcam/etc) to the Device ports.
RS-232	Optionally for RS-232: connect a device (e.g. media player) to the RS-232 port.
Ethernet	Connect the device to a LAN network.
Power	Powering on the devices is recommended to do as the final step during the installation.

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 HDMI cables.
Audio out	Optionally for analog output: connect an audio device (e.g. active speakers) to the analog audio output port by an audio cable.
USB-A	USB 2.0 ports: connect up to four USB 2.0 devices (e.g. pendrive/ microphone/webcam/etc) to the receiver. USB HID ports: connect up to two USB HID devices to the receiver (preferably mouse and keyboard).
RS-232	Optionally for RS-232: connect a device (e.g. 4K projector) to the RS-232 port.
Ethernet	Connect the device to a LAN network.
Power	Powering on the devices is recommended to do as the final step during the installation.

⚠ User Ethernet is also transmitted over the TPX interface so be sure not to create a network loop!

Ventilation

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

Firmware Update

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.

USB Port Diagram

The following port diagram describes the USB signal routes of the devices.

