visual engineering
LIGHTWARE

Quick Start Guide

HDMI-TPX-TX106
HDMI-TPX-RX106
HDMI-TPX-TX107
HDMI-TPX-RX107

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-106 and HDMI-TPX-107 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 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 and command injection over IR (output only) as well.

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

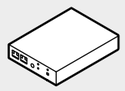
HDCP 2.3 and basic EDID management functionality are also among the features offered by these devices, such as their connectivity and easy integration into a wide range of AV operations and compatibility with 3rd party devices.

Compatible Devices

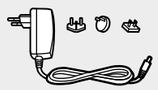
The product is compatible with all Lightware TPX series models and any third-party AVX devices.

AV EXTENDER

Box Contents



Transmitter / receiver device



12V DC adaptor with interchangeable plugs *

48V DC adaptor with interchangeable plugs **

Phoenix® Combicon 3-pole connector

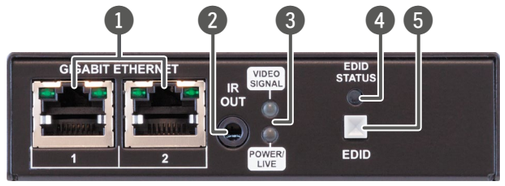
Safety & Warranty Info; Quick Start Guide

* Only for HDMI-TPX-TX106 and HDMI-TPX-RX106 units.

** Only for HDMI-TPX-TX107 and HDMI-TPX-RX107 units.

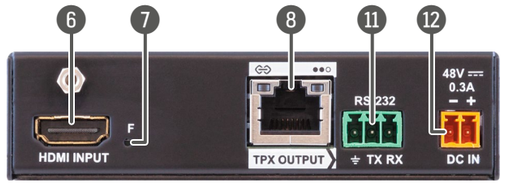
Front and Rear View - Transmitter (TX)

Front View



TX106 model is built with one, TX107 model is built with two Gigabit Ethernet connectors.

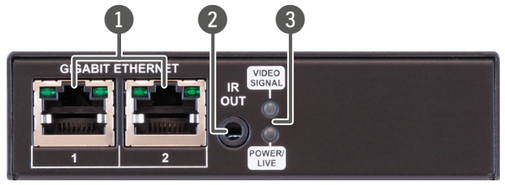
Rear View



TX106 model is built with 12V, TX107 model is built with 48V DC input connector.

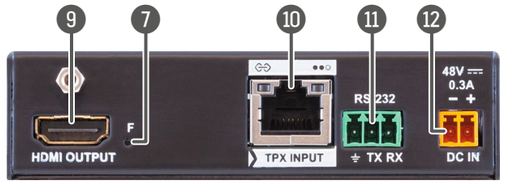
Front and Rear View - Receiver (RX)

Front View



RX106 model is built with 12V, RX107 model is built with 48V DC input connector.

Rear View



RX106 model is built with one, RX107 model is built with two Gigabit Ethernet connectors.

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 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 (yellow/green)	Connection is established with 100Mbps bandwith.	
blinking (yellow/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.	

1 **Gigabit Ethernet port** — 1GBase-T RJ45 connector 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 detials in the *Status LEDs* section on the right.

4 **EDID Status LED** — The LED gives immediate feedback about the current status of the EDID emulation. See the detials in the *Status LEDs* section on the right.

5 **EDID button** — Two EDID emulation modes can be selected with the 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.

6 **HDMI input** — HDMI input port with HDMI 2.0 support for source devices.

7 **Factory reset button** — Hidden button for setting the device to factory default values.

8 **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.

9 **HDMI output** — HDMI output port with HDMI 2.0 support for sink devices.

10 **TPX input** — RJ45 connector for AVX input signal. See more details about the connector in the *Power Supply Options* and the *Status LEDs* sections.

11 **RS-232 port** — 3-pole Phoenix connector for bi-directional serial communication.

12 **12V / 48V DC input** — DC input for local powering. Connector types by models:
- HDMI-TPX-106 series: 12V DC input with locking connector.

- HDMI-TPX-107 series: 48V DC input with 2-pole Phoenix connector.

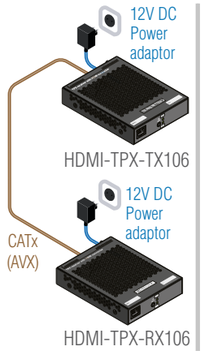
Power Supply Options

HDMI-TPX-106 series

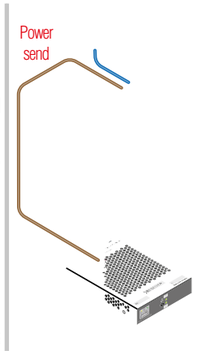
TPX106 series extenders are able to supply remote power to each other over the TPX connector.

The TPX106 series devices can be powered by 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

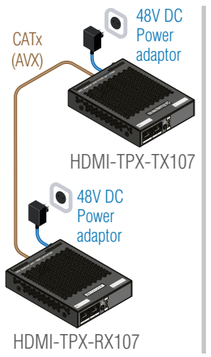
HDMI-TPX-107 series

TPX107 series extenders fulfill PoE PD standard which means TPX port can receive power over the Ethernet line.

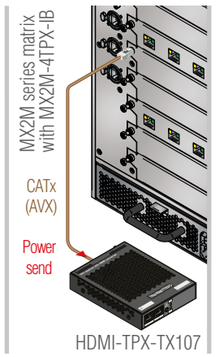
HDMI-TPX-107 series extenders are not able to send remote power to each other.

The TPX107 series devices can be powered by any of the following ways:

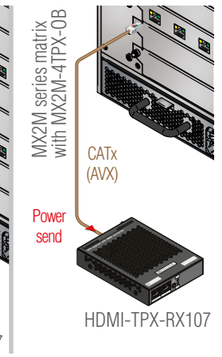
1. Local adaptor for both TX and RX



2. Remote power via matrix board to TX



3. Remote power via matrix board to RX



Further Information

The document is valid with the following firmware version: 1.0.0
The User's manual of this appliance is available on www.lightware.com.
See the Downloads section on the dedicated product page.

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Doc. ver.: 1.0
19200191

Specification

General

Compliance ..... CE
Electrical safety ..... IEC/EN 62368-1:2014
EMC (emission) ..... IEC/EN 55032:2015
EMC (immunity) ..... IEC/EN 55035:2017
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 (106 series) ..... Power adaptor / 12V remote powering
Power supply option (107 series) ..... Power adaptor / PoE PD
Supported power source ..... 100-240 V AC; 50/60 Hz
Power consumption (TPX106 series, without remote power) ..... 11 W
Power consumption (TPX106 series, with remote power) ..... 25 W
Power consumption (TPX107 series) ..... 11 W
Heat dissipation (TPX106 series, without remote power) ..... 37.5 BTU/h
Heat dissipation (TPX106 series, with remote power) ..... 85.3 BTU/h
Heat dissipation (TPX107 series) ..... 37.5 BTU/h

Power Adaptor (TPX106 series)

Supplied power ..... 12V DC, 3A
AC power plug ..... Interchangable (EU, UK, JP/US, AUS/NZ)
DC power plug ..... Locking DC connector (2.1/5.5 mm pin)

Power Adaptor (TPX107 series)

Supplied power ..... 48V DC, 0.3A
AC power plug ..... Interchangable (EU, UK, JP/US, AUS/NZ)
DC power plug ..... 2-pole Phoenix connector

Enclosure

Rack mountable ..... yes, with UD kit / UD kit double / 1U high rack shelf
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 ..... 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 connector
Power over Ethernet (TPX106 series) ..... 12V remote powering
Power over Ethernet (TPX107 series) ..... PoE PD (IEEE802.3af)
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 in case of the AV signal is above HDMI 1.4 standard.

Control Ports

Ethernet port

Connector type ..... RJ45 female connector
Number of connectors per unit (106 series / 107 series) ..... 1 / 2
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 setting ..... 57600 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)

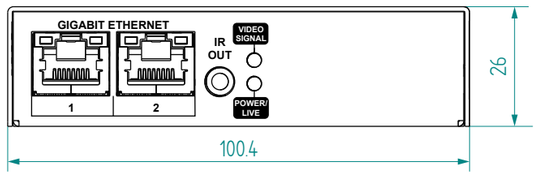
Firmware Upgrade

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.

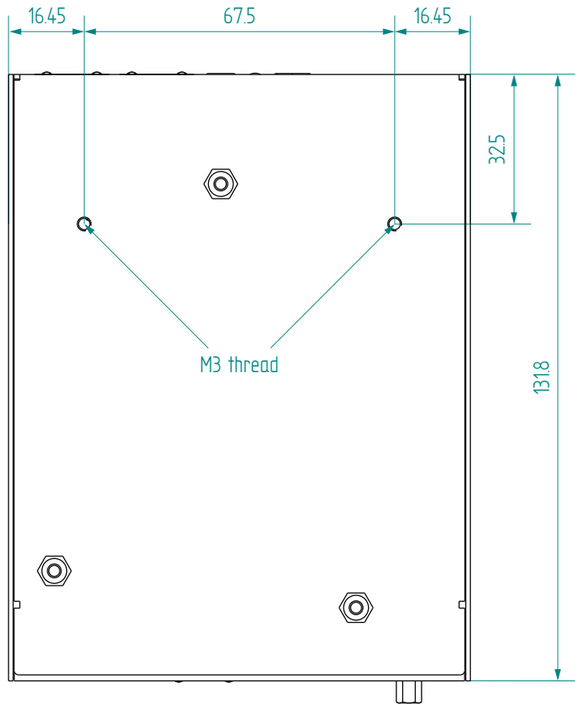
Mechanical Drawings

The following drawings present the physical dimensions of the HDMI-TPX-100 series extenders. Dimensions are in mm.

Front View



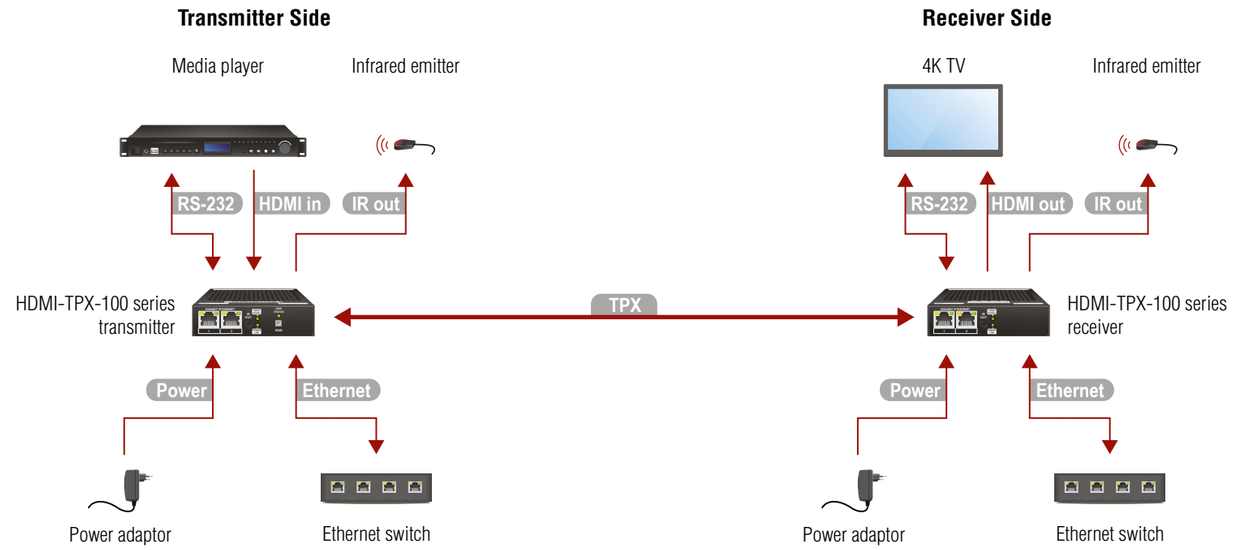
Bottom View



Ventilation

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

Connecting Steps



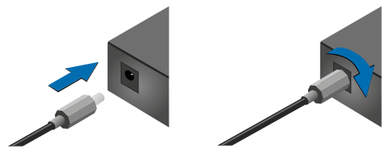
Transmitter Side	
TPX	Connect a CATx cable between the TPX output port of the transmitter and the TPX input port of the receiver.
HDMI in	Connect the source (e.g. media player) to the HDMI input port of the transmitter by a HDMI cable.
Ethernet	Connect the device to a LAN network.
IR out	Optionally for 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 sink (e.g. 4K TV) to the HDMI output port of the receiver by a HDMI 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 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.

Locking DC Plug

Twist 90° clockwise to lock.

ℹ *Only HDMI-TPX-106 series extenders are built with locking DC input connector*



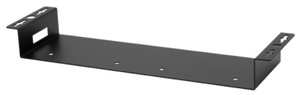
Minimum CAT Cable Requirement

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

Mounting Options

For the mounting of the devices Lightware supplies optional accessories for different usages. There are two kinds of mounting kits with a similar fixing method. The transmitter and the receiver have two mounting holes with inner thread on the bottom side. Fasten the device by the screws enclosed to the accessory.

Under-desk mounting kit



Under-desk double mounting kit

1U high rack shelf

The Under-desk and Under-desk double mounting kit makes it easy to mount a single device on any flat surface, e.g. furniture. 1U high rack shelf provides mounting holes for fastening two half-rack or four quarter-rack sized units. Pocket-sized devices can also be fastened on the shelf. To order mounting accessories, please contact sales@lightware.com.

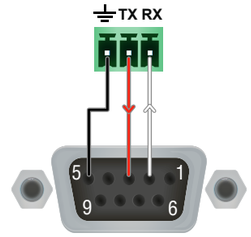
ℹ *The transmitter and the receiver units are quarter-rack sized.*

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

Wiring Guide for RS-232 Data Transmission

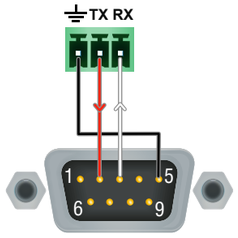
HDMI-TPX-100 series extenders are built with a 3-pole Phoenix connector. See the below examples of connecting to a DCE (Data Circuit-terminating Equipment) or a DTE (Data Terminal Equipment) type device:

Lightware device and a DCE
D-SUB 9 - Phoenix



2: TX data transmit
3: RX data receive
5: Ground

Lightware device and a DTE
D-SUB 9 - Phoenix



2: TX data receive
3: RX data transmit
5: Ground

For more information about the cable wiring see the user's manual of the device or the **Cable Wiring Guide** on our website www.lightware.com/support/guides-and-white-papers.