LIGHTWARE
INNOVATIVE, RELIABLE, MADE IN EUROPE.



Quick Start Guide

HDMI-OPTN-TX100A
HDMI-OPTN-RX100A
HDMI-OPTN-TX200AU2K
HDMI-OPTN-RX100AU2K

Important Safety Instructions

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

CLASS 1
LASER PRODUCT

The extenders are Class 1 laser products.

Introduction

The HDMI-OPTN series transmitter and receiver devices are fiber extenders based on SDVoE technology and allow users to extend HDMI 2.0 compliant video, audio and control signals from a single source to multiple destinations through a fiber optical link.

Beyond the benefits of sending high-resolution video and USB2.0 data to a distance of up to 10km via fiber, 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.

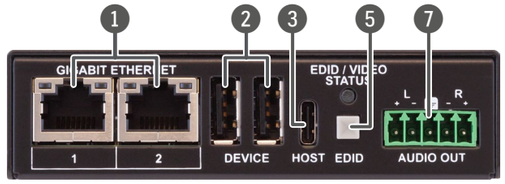
The Gigabit Ethernet ports are also valuable additions, allowing users to connect Ethernet capable devices to the network directly through the OPTX extenders. This is particularly useful for controlling external devices like projectors and displays.

HDCP 2.3 and basic EDID management functionality are also among the features offered by these devices, such as 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 various types of USB2.0 devices like webcams, microphones, touch displays just to name a few.

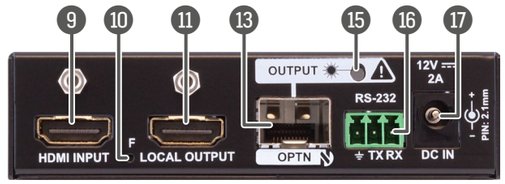
Front and Rear View - Transmitter (TX)

Front View



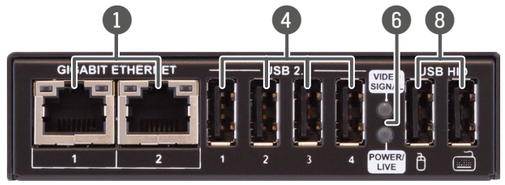
HDMI-OPTX-TX200AU2K variant can be seen on the picture. TX100A model is not built with USB-A and USB-C connectors.

Rear View



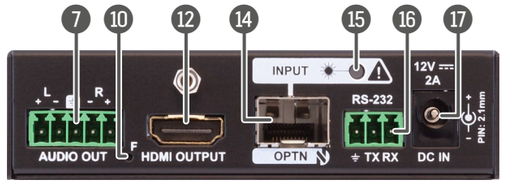
Front and Rear View - Receiver (RX)

Front View



HDMI-OPTX-RX100AU2K variant can be seen on the picture. RX100A model is not built with USB-A connectors.

Rear View

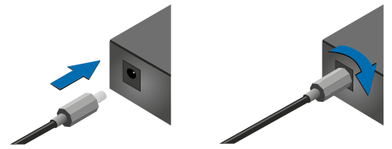


1. **Gigabit Ethernet ports** — 1GBase-T RJ45 connectors for user Ethernet purpose.
2. **Device USB-A connectors** — USB-A connectors with USB 2.0 support for various type of USB devices.
3. **Host USB-C connector** — USB-C connection between the transmitter and the host computer. The port receives **USB 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: Stored 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. **SFP+ port slot for OPTN output connection** — Optical output port slot for a 10 GbE SFP+ module or a DAC cable. Port can be used for either singlemode or multimode optical connection.
14. **SFP+ port slot for OPTN input connection** — Optical input port slot for a 10 GbE SFP+ module or a DAC cable. Port can be used for either singlemode or multimode optical connection.
15. **OPTN input/output link LED** — The LED gives immediate feedback about the current status of the extender. See the details in the *Status LEDs* section.
16. **RS-232 port** — 3-pole Phoenix connector for bi-directional serial communication.
17. **12V DC input** — 12V DC input with locking connector for local powering.

Locking DC Plug

Twist 90° clockwise to lock.



Ventilation

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

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



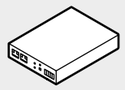
UD Mounting Pro P140

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.

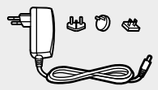
Using different (e.g. longer) screws may cause damage to the device.

The extenders are quarter-rack sized.

Box Contents



HDMI-OPTN series device



12V DC adaptor with interchangeable plugs



Phoenix Combicon 3-pole connector

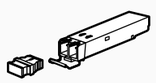


Phoenix Combicon 5-pole connector



Safety and warranty info, Quick Start Guide

Optional Accessories



10G SFP+ transceiver module

10GbE singlemode/multimode SFP+ modules can be ordered together and even separately. For the details, please contact sales@lightware.com.

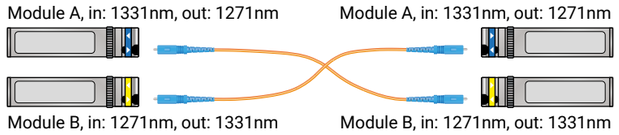
Status LEDs

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.

OPTN INPUT / OUTPUT LINK LED		Transmitter / Receiver
off		Device is not powered or SFP+ transceiver module is not installed.
on (red)		Device might emit laser radiation.
on (green)		Optical link established.

Cabling of the BiDi SFP+ Modules

In case of using bidirectional (BiDi) SFP+ modules in the HDMI-OPTN devices, please check the **wavelength** of the INPUT and OUTPUT modules. If the wavelengths are different, the cabling might be also different and the modules shall be connected **across**.



The User's Manual is also available via the QR code below:

Lightware Visual Engineering PLC.

Budapest, Hungary

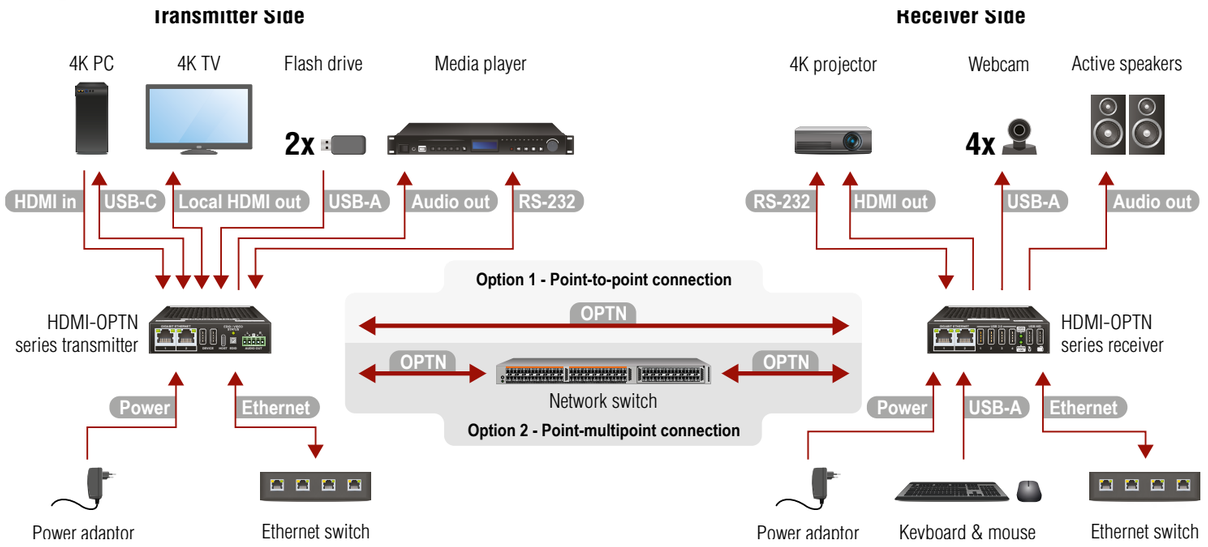
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Further information on the device is available at www.lightware.com.

Doc. ver.: 1.0
19210127

Connecting Steps



Transmitter Side

OPTN

Option 1 - Point-multipoint connection - Connect singlemode or multimode (depends on the installed SFP+ modules) fiber optical cables or DAC cables between the OPTN output port of the transmitter and the SFP+ port of the 10G network switch.

Option 2 - Point-to-point connection - Connect singlemode or multimode (depends on the installed SFP+ modules) fiber optical cables or DAC cables between the OPTN output port of the transmitter and the OPTN input port of the receiver. In this case, the extender operates as a OPTX device.

⚠ ***User Ethernet is also transmitted over the OPTN interface, so be sure not to create a network loop.***

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.

❗ *The port is available in the TX200AU2K model only.*

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.

❗ *The port is available in the TX200AU2K model only.*

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.

❗ *The ports are available in the TX200AU2K model only.*

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.

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

Receiver Side

OPTN

Option 1 - Point-multipoint connection - Connect singlemode or multimode (depends on the installed SFP+ modules) fiber optical cables or DAC cables between the OPTN input port of the receiver and the SFP+ port of the 10G network switch.

Option 2 - Point-to-point connection - Connect singlemode or multimode (depends on the installed SFP+ modules) fiber optical cables or DAC cables between the OPTN input port of the receiver and the OPTN output port of the transmitter. In this case, the extender operates as a OPTX device.

⚠ ***User Ethernet is also transmitted over the OPTN interface, so be sure not to create a network loop.***

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. 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).

❗ *The ports are available in the RX100AU2K model only.*

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.

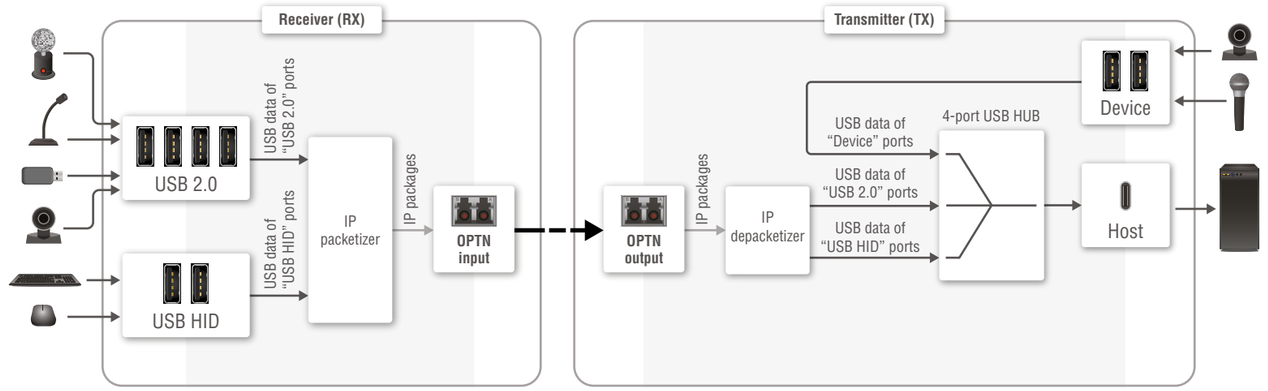
Power

Powering on the devices is recommended to do as the final step during the installation.

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

Port Diagram

The following port diagram describes the USB signal routes of the HDMI-OPTN-TX200AU2K and the HDMI-OPTN-RX100AU2K models.



Network Requirements

The HDMI-OPTN series extenders require managed network switches that support **10Gbps** (10GbE) line speed. BlueRiver technology transmits uncompressed or lightly compressed video of up to 4K along with other AV signals such as audio and control signals.

Network Switch Requirements

The following are the Layer 2 multicast configurations that are required on all the network switches:

- IGMP version 2 supported
- IGMP version 2 snooping enabled
- Filter/Drop unregistered multicast traffic
- Disable unregistered multicast flooding
- Enable fast leave support

Applied Ports

Protocol	Port Number	Description
TCP	6970	Used for communications between control software and BlueRiver Control Server.

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.