LWR LIGHTWARE
INNOVATIVE, RELIABLE, MADE IN EUROPE.

Quick Start Guide

UCX-3x3-TPX-RX20

Front View
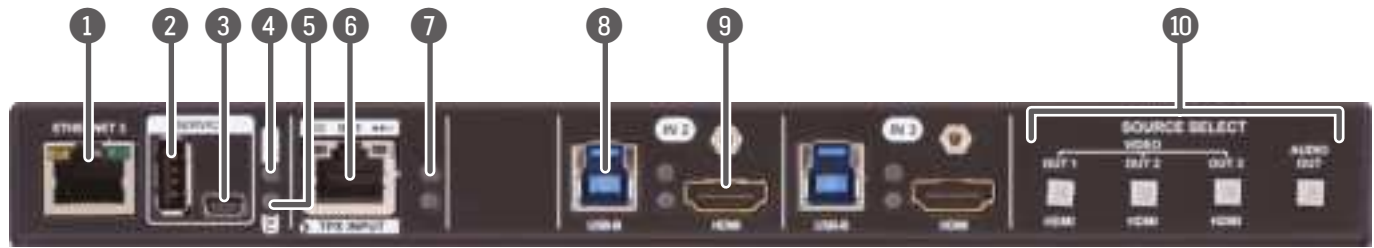
|		
1	**Configurable Ethernet port**	RJ45 connector for configurable 1GBase-T Ethernet communication.
2	**USB-A port**	The SERVICE-labelled USB-A connector is designed for service funtions.
3	**Micro USB port**	The SERVICE-labelled USB mini-B port is designed for service functions.
4	**LIVE LED**	blinking — The device is powered on and operational. / off — The device is not powered or out of operation.
5	**TX LED**	Function will be implemented in a later release.
6	**TPX Input Port**	RJ45 connector for AVX input signal transmission. See more details in the Status LEDs section.
7	**Status LEDs**	For the details, see the table on the right.
8	**USB-B ports**	Upstream ports for connecting USB host devices (e.g. computer).
9	**HDMI input ports**	HDMI input port for receiving video and audio signals.
10	**Source selection buttons**	For more details on the button functionality, see the table on the other side. When the LEDs blink green three times after pressing the button, they show that the front panel lock is enabled.

⚠ *Always use the supplied power supply. Warranty void if damage occurs due to use of a different power source.*

Important Safety Instructions

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

Introduction

Lightware's UCX Matrix Switcher receiver is part of a transmitter-receiver configuration that provides the same functionality as the UCX product range in terms of signal management and connectivity. Such functionality includes video resolution up 4K@60Hz 4:4:4 through the USB-C and HDMI inputs, easy USB host switching, and advanced security features. At the same time, the bundle overcomes the limitations imposed by the USB and HDMI cables and allows for the extension of video, audio, and control signals in one direction and the USB 2.0 and control data and in the other up to a transmission distance of 100m.

Highlighted Features

- Single CAT connectivity between TX and RX devices, up to 100m, transferring video, audio, USB 2.0, Ethernet, OCS and serial signals
- Local HDMI 2.0 and USB 3.1 Gen1 connectivity for Room PC and other room equipment
- CEC at the HDMI outputs
- Multiple USB connectivity for any type of USB device
- Supports 4K UHD @60Hz RGB 4:4:4, up to 18Gbps
- Independent USB Host switching layer for multiple USB hosts, up to 8 devices (4x at the TX, 4x at the RX)
- Room device control via Ethernet (TCP/IP), serial, GPIO or OCS
- Multiple Ethernet network configurations fitting various corporate network topologies and IT security standards (e.g. 802.1x compliance)


Rear View

1	**DC input**	DC input for local powering. Connect the output to the 2-pole Phoenix connector.
2	**USB-A ports**	Downstream ports for connecting USB peripherals (e.g. camera, keyboard, multitouch display).
3	**HDMI output ports**	HDMI output ports for sending video and audio signals to the sink.
4	**Status LEDs**	For more information, see the table on the right.
5	**Analog Audio output port**	Audio output port (5-pole Phoenix®) for balanced analog audio output signal. The signal is de-embedded from the selected video signal.
6	**RS-232 ports**	3-pole Phoenix® connectors for bi-directional RS-232 communication.
7	**OCS port**	3-pole Phoenix® connector (male) for connecting an occupancy sensor. The port provides 24V output voltage (50mA).
8	**GPIO port**	8-pole Phoenix® connector for configurable general purpose. Max. input/output voltage is 5V, see the details on the next page.
9	**Configurable Ethernet ports**	RJ45 connectors for configurable 1GBase-T Ethernet communication.

ℹ *The overall power supply of the USB-A connectors is beyond 1.5A, which makes it possible to supply devices with higher voltage requirements.*

Box Contents
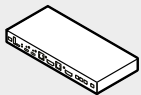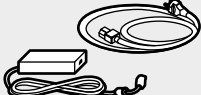
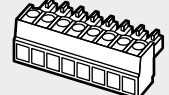|		
Receiver device	12V DC adaptor with interchageable plugs	Safety & Warranty Info; Quick Start Guide
Phoenix® Combicon 3-pole connector	Phoenix® Combicon 5-pole connector	Phoenix® Combicon 8-pole connector
Phoenix® Combicon 3-pole male connector	2 pcs of M3x4 fl at head screws	

Button functionality - Video Source Selection

Push the **OUT1** button to set the video input to the HDMI OUT1 port.

Push the **OUT2** button to set the video input to the HDMI OUT2 port.

Push the **OUT3** button to set the video input to the HDMI OUT3 port.

Push the **AUDIO OUT** button to set the audio source of the analog audio output.The sequence is the following (both for the video and audio switching):

❶ TPX IN 1 → ❷ HDMI IN 2 → ❸ HDMI IN 3
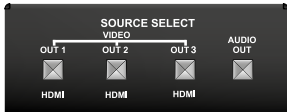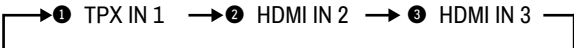
Ventilation

⚠ *Pay attention to the ventilation holes when designing the system. The ventilation holes on the top of the device must not be covered.*

Status LEDs

Video Input Status LED (the upper one)		
on	There is a valid video signal on this port.
off	There is no valid video signal on this port.
blink once	The port is selected by a button press.

USB Status LED (the lower one)		
on	The USB Host is connected and selected.
off	No USB Host or deselected port.
blink once	Port selected by a button press.

Rear Panel LEDs

Video Output Status		Transmitter
on	The video signal is present.	
off	The signal is not present or muted.	

TPX INPUT 🔗		
off	No connection is established between the transmitter and the receiver units.
on (green)	Connection is established with 10G / 5G / 2.5G bandwidth.

TPX INPUT ●●○		
off	No data transmission on the port.
blinking (green)	Data transmission is active.

GIGABIT ETHERNET - LEFT LED		
on (green)	Connection is established with 100Mbps bandwith.
blinking (green)	Data transmission is active.

GIGABIT ETHERNET - RIGHT LED		
on (green)	Connection is established with 1Gbps bandwith.
blinking (green)	Data transmission is active.

Factory default settings

IP address	Dynamic (DHCP is enabled)
Hostname	lightware-<serialno>
Video Crosspoint setting	I1 on O1, I2 on O2, I3 on O3
HDCP mode (in)	HDCP 2.2
HDCP mode (out)	Auto
Signal type	Auto
Emulated EDID	F47 - (Universal HDMI with PCM audio)
Audio Crosspoint setting	I1 on O4
Analog audio output levels	Volume (dB): 0.00; Balance: 0 (center)
Video Autoselect	Disabled
USB Autoselect	Follow video O1
D1-D4 Power 5V Mode	Auto
RS-232 port setting	9600 BAUD, 8, N, 1
RS-232 serial over IP	Enabled
HTTP and HTTPS	Enabled
HTTP and HTTPS authentication	Disabled
LARA	Disabled

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

Lightware Visual Engineering PLC.

Budapest, Hungary

✉ sales@lightware.com 📞 +36 1 255 3800
✉ support@lightware.com 📞 +36 1 255 3810

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

Doc. ver.: 1.0
19210128

Port diagram for video / audio

- Welcome screen I5
- TPX in I1 — Digital audio/video
- HDMI in I2 — Digital audio/video
- HDMI in I3 — Digital audio/video
- 3x4 audio/video crosspoint
- Digital audio/video → HDMI out O1
- Digital audio/video → HDMI out O2
- Digital audio/video → HDMI out O3
- Audio de-embedder → De-embedded audio → D/A converter → Analog audio → Analog audio out

Connecting steps

Transmitter Side

- Laptop 2x — USB-C
- 4K PC 2x — HDMI in, USB-B
- 4K TV 2x — HDMI out, RS-232
- Active speakers — Audio out

UCX-4x3-TPX-TX20 transmitter

TPX

- Power → Power outlet
- USB-A → 4x Keyboard, mouse, etc.
- GPIO → Relay box
- Ethernet → Ethernet switch

Receiver Side

- 4K projector — HDMI out, RS-232
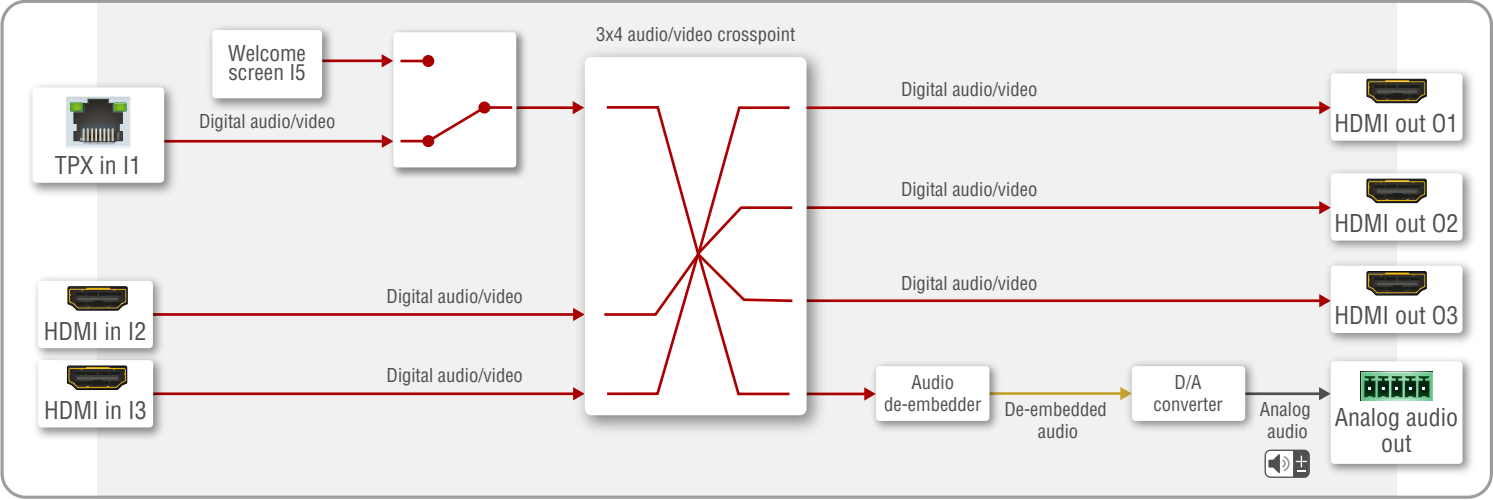- Room PC 2x — HDMI in, USB-B
- Audio amplifier — Audio out

UCX-3x3-TPX-RX20 receiver

- Power → Power outlet
- GPIO → Relay box
- OCS → OCS sensor
- USB-A → 4x Webcam
- Ethernet → Ethernet switch

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 a USB-C source to the USB-C input port. The applied cable shall be certified for Displayport Alternate mode HBR2 (4x5.4Gbps) applications.
HDMI in	Connect a source to the HDMI input port of the transmitter by a HDMI cable.
USB-B	Optionally connect the USB host.
HDMI out	Connect a sink to the HDMI input port of the transmitter by a HDMI cable.
RS-232	Optionally for RS-232: connect a device to the RS-232 port.
Audio out	Optionally for analog output: connect an audio device to the analog audio output port by an audio cable.
USB-A	Optionally connect USB peripherals to the USB-A ports with USB cables.
GPIO	Optionally connect a controller/controlled device to the GPIO port.
Ethernet	Optionally 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 sink to the HDMI output port of the receiver by a HDMI cable.
RS-232	Optionally for RS-232: connect a device to the RS-232 port.
HDMI in	Connect a source to the HDMI input port of the transmitter by a HDMI cable.
USB-B	Optionally connect the USB host.
Audio out	Optionally for analog output: connect an audio device to the analog audio output port by an audio cable.
GPIO	Optionally connect a controller/controlled device to the GPIO port.
OCS	Optionally connect an occupancy sensor to the OCS port.
USB-A	Optionally connect USB peripherals to the USB-A ports with USB cables.
Ethernet	Optionally connect the device to a LAN network.
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.

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

Audio Cable Wiring Guide

The Taurus UCX-TPX series is built with a 5-pole Phoenix output connector. See a few examples below of the most common assembling cases.

Balanced output to balanced input
Phoenix - 2x6.3 (1/4") TRS

Balanced output to balanced input
Phoenix cable - 2x XLR plugs

Balanced output to unbalanced input
Phoenix - 2x RCA

Balanced output to unbalanced input
Phoenix - 2x 6.3 (1/4") TS

⚠ *We highly recommend using CAT6a AWG24 Screened and Foiled Twisted Pair (SFTP) cables for the TPX connection, as lower grade cables may be vulnerable to interference that causes signal quality issues.*

GPIO (General Purpose Input/Output Ports)

The device has seven GPIO pins that operate at TTL digital signal levels and can be set to high or low level (Push-Pull). The direction of the pins can be input or output (adjustable). The signal levels are the following:

	Input voltage (V)	Output voltage (V)	Max. current (mA)
Logic low level	0 - 0.8	0 - 0.5	30
Logic high level	2 -5	4.5 - 5	18

Plug pin assignment **1-6**: Configurable, **7**: 5V (max. 500 mA); **8**: Ground

The recommended cable for the connectors is the AWG24 (0.2 mm² diameter) or the generally used 'alarm cable' with 4x0.22 mm² wires.

ℹ *The maximum total current for the six GPIO pins is 180 mA, the max. supported input/output voltage is 5V.*

RS-232

The switcher provides a 3-pole Phoenix connector for bi-directional serial communication. The signal levels are the following:

	Output voltage (V)
Logic low level	3 - 15
Logic high level	-15 - 3

Plug pin assignment: **1**: Ground, **2**: TX data, **3**: RX data
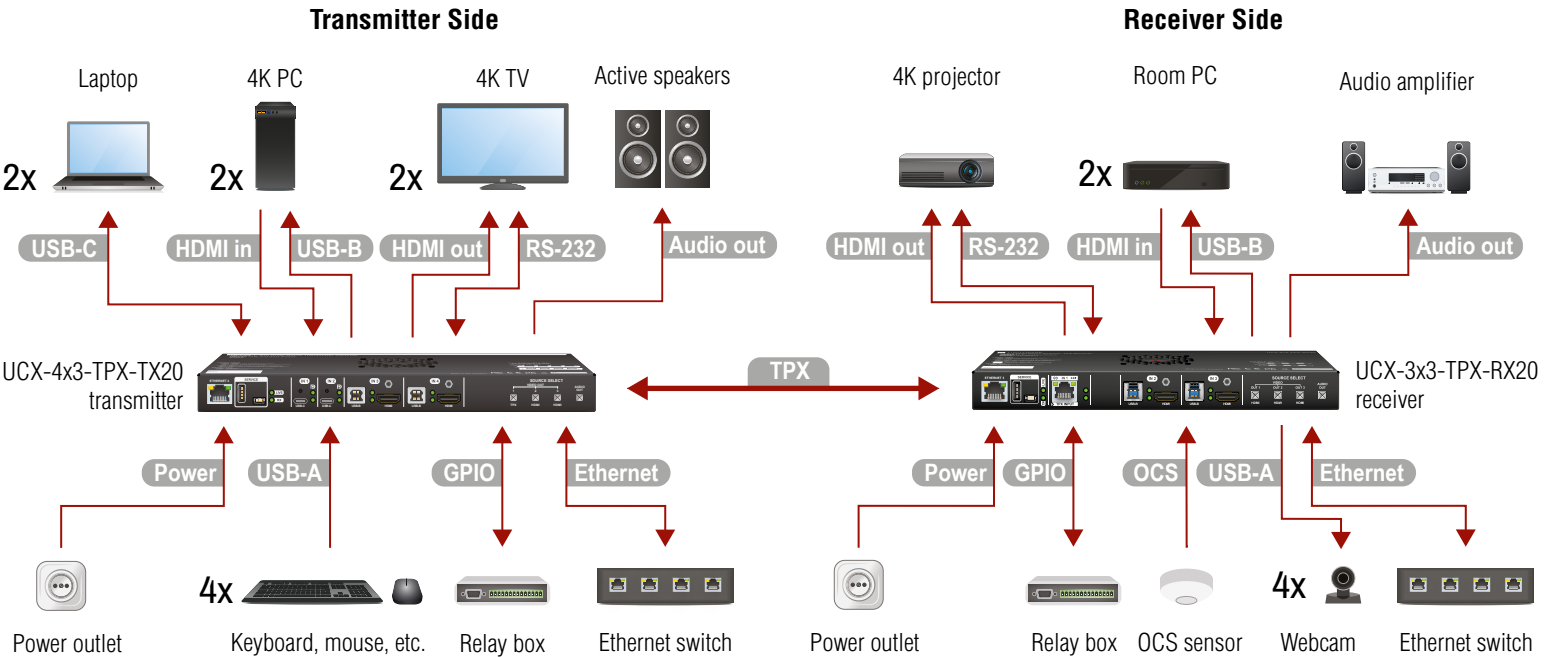
OCS (Occupancy) Sensor

The switcher is supplied with a 3-pole Phoenix connector (male), which is for connecting an OCS sensor.

Plug pin assignment: **1**: Configurable; **2**: 24V (max. 50 mA); **3**: Ground

The signal levels for the **Pin 1**	Input voltage (V)	Max. current (mA)
Logic low level	0 - 0.8	30
Logic high level	2 -5	18

⚠ *The occupancy sensor connector and the GPIO port are not compatible with each other because of the voltage level difference, please do not connect them directly.*