

 **LIGHTWARE**
UCX-4x3-TPN-
TX20 Universal
Transmitter
switchers



LIGHTWARE UCX-4x3-TPN-TX20 Universal Transmitter switchers User Guide

[Home](#) » [LIGHTWARE](#) » LIGHTWARE UCX-4x3-TPN-TX20 Universal Transmitter switchers User Guide 

Contents

- [1 LIGHTWARE UCX-4x3-TPN-TX20 Universal Transmitter switchers](#)
- [2 Specifications](#)
- [3 Product Usage Instructions](#)
- [4 FAQ](#)
- [5 Important Safety Instructions](#)
- [6 Introduction](#)
- [7 Box Contents](#)
- [8 Front Panel Status LEDs](#)
- [9 Connecting steps](#)
- [10 Audio Cable Wiring Guide](#)
- [11 CONTACT](#)
- [12 Documents / Resources](#)
 - [12.1 References](#)



LIGHTWARE UCX-4x3-TPN-TX20 Universal Transmitter switchers



Specifications

- **Model:** UCX-4x3-TPN-TX20
- **Power Input:** 24V DC
- **Video Input:** HDMI
- **Video Output:** HDMI
- **USB Ports:** 2 x USB-A, 2 x USB-C, 1 x Micro USB, 1 x USB-B
- **Network Requirements:** Managed network switches supporting 10Gbps (10GbE) line speed
- **Power Delivery:** Up to 100W over one USB-C port, 20W over the other USB-C port, or 60W over both ports

Product Usage Instructions

- The Video Input Status LED indicates the presence of a valid video signal on the corresponding port:

FAQ

- **Q:** What are the network requirements for the UCX-TPN series extenders?
- **A:** Managed network switches supporting 10Gbps (10GbE) line speed are required for optimal performance.
- **Q:** How much power can the UCX-4x3-TPN-TX20 provide over its USB-C ports?
- **A:** The device can charge a device with up to 100W over one USB-C port and up to 20W over the other USB-C port, or distribute 60W over both ports.

Important Safety Instructions

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

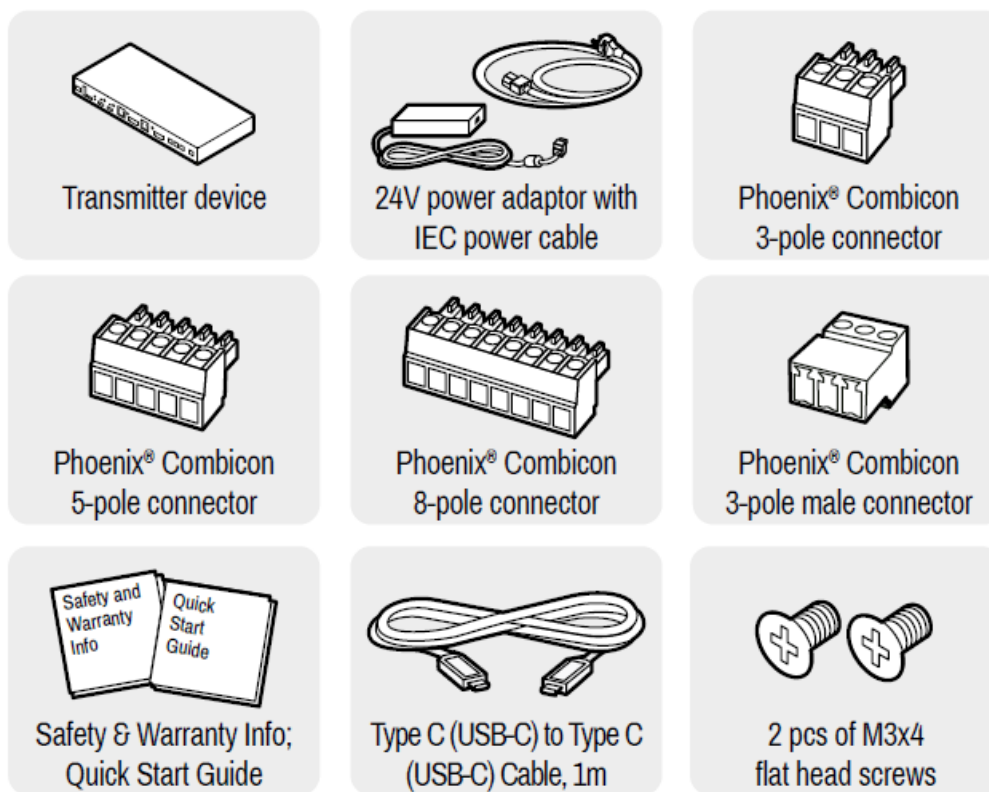
Introduction

- Lightware's universal Transmitter switchers exploit SDVoE technology and USB-C connectivity for a simplified extension of up to 100m of 4K video, audio, control signals and power from a single source to multiple destinations through 10G Ethernet networks, providing meeting participants with easy host switching, video resolution capabilities up to 4K@60Hz at 4:4:4, as well as comprehensive and secure Ethernet features.





- The Transmitters are featured with an audio de-embedding function via the 5-pole Phoenix® Combicon analog audio ports.
- Beyond the benefits of sending high-resolution video over long distances, the Transmitters are also capable of handling various connectivity standards, including bi-directional RS-232, GPIO and OCS as well.
- The Gigabit Ethernet port is also a valuable addition, allowing users to connect an additional device to the network directly through the TPN extender.

Box Contents



Front view (UCX-4×3-TPN-TX20)



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 functions.
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. **RX LED** Function will be implemented in a later release.
6. **USB-C ports** USB-C port for receiving video and audio signals, as well as USB data from the host device.
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. **Status LEDs** For the details, see the table on the right.
10. **HDMI input ports** HDMI input ports for receiving video and audio signals.
11. **Input 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.

Rearview (UCX-4×3-TPN-TX20)











1. **DC input** DC input for local powering. Connect the output to the 2-pole Phoenix connector. For more details, see the powering options on the next page.
2. **USB-A ports** Downstream ports for connecting USB peripherals (e.g. camera, keyboard, multitouch display).
3. **TPN output port** RJ45 connector for AVX output signal transmission. See more details about the connector in the Status LEDs section.
4. **HDMI output ports** HDMI output ports for sending video and audio signals to the receiver.
5. **Status LEDs** For more information, see the table on the right.
6. **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.
7. **RS-232 ports** 3-pole Phoenix® connectors for bi-directional RS-232 communication.
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.











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

UCX-2x1-TPN-TX20 has no HDMI output ports.



Front Panel 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. |
| VIDEO SIGNAL | | |
|  | 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. |

RJ45 Port LEDs

| TPN OUTPUT  | | |
|--|------------------|--|
|  | off | No connection is established between the transmitter and the receiver units. |
|  | on (green) | Connection is established with 10G / 5G / 2.5G bandwidth. |
| TPN OUTPUT  | | |
|  | off | No data transmission on the port. |
|  | blinking (green) | Data transmission is active. |
| GIGABIT ETHERNET - LEFT LED | | |
|  | on (green) | Connection is established with 100Mbps bandwidth. |
|  | blinking (green) | Data transmission is active. |
| GIGABIT ETHERNET - RIGHT LED | | |
|  | on (green) | Connection is established with 1Gbps bandwidth. |
|  | blinking (green) | Data transmission is active. |

Rear Panel LEDs

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

Powering options

- The UCX-4x3-TPN-TX20 is capable of charging a device with 100W over one USB-C port and another device with 20W over the other USB-C port, or charging with 60W over both ports.

Network Requirements

- The UCX-TPN 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

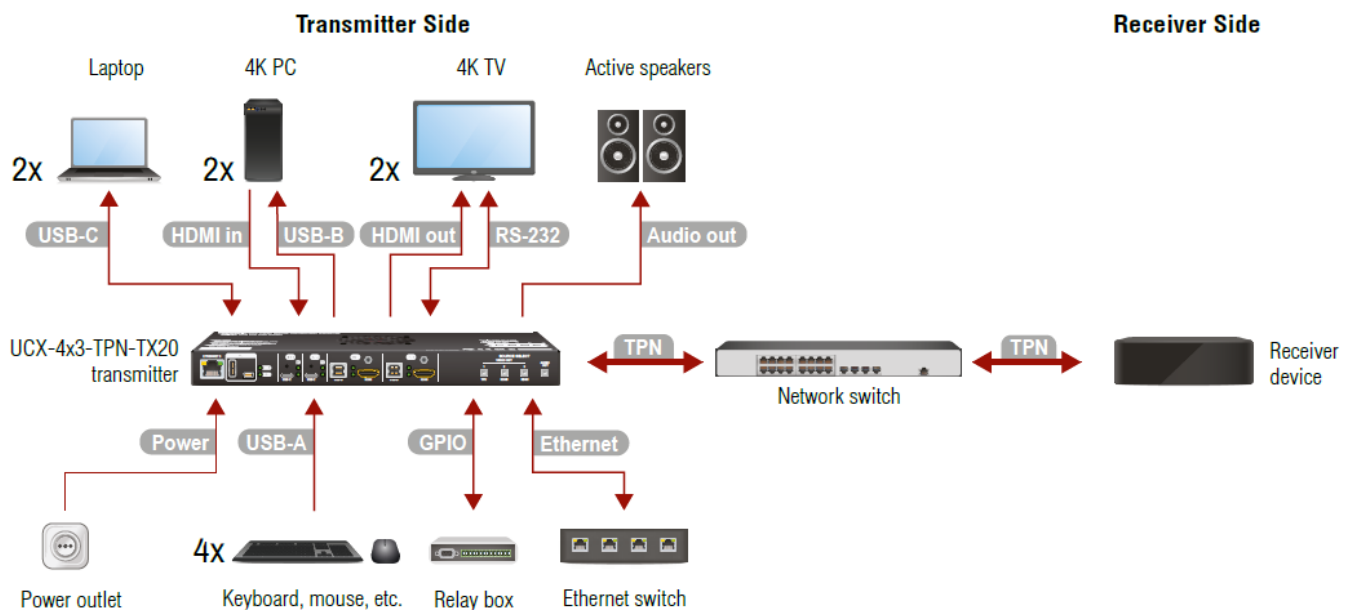
Ventilation

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

Factory default settings (UCX-4×3-TPN-TX20)

| | |
|-----------------------------------|--|
| IP address | Dynamic (DHCP is enabled) |
| Hostname | FlightAware-<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-C Power Limit | 60W / 60W |
| DP Alternate Mode Policy | Auto |
| Port Power Role | Dual Role |
| 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, HTTPS | Enabled |
| HTTP, HTTPS authentication | Disabled |
| LARA | Disabled |

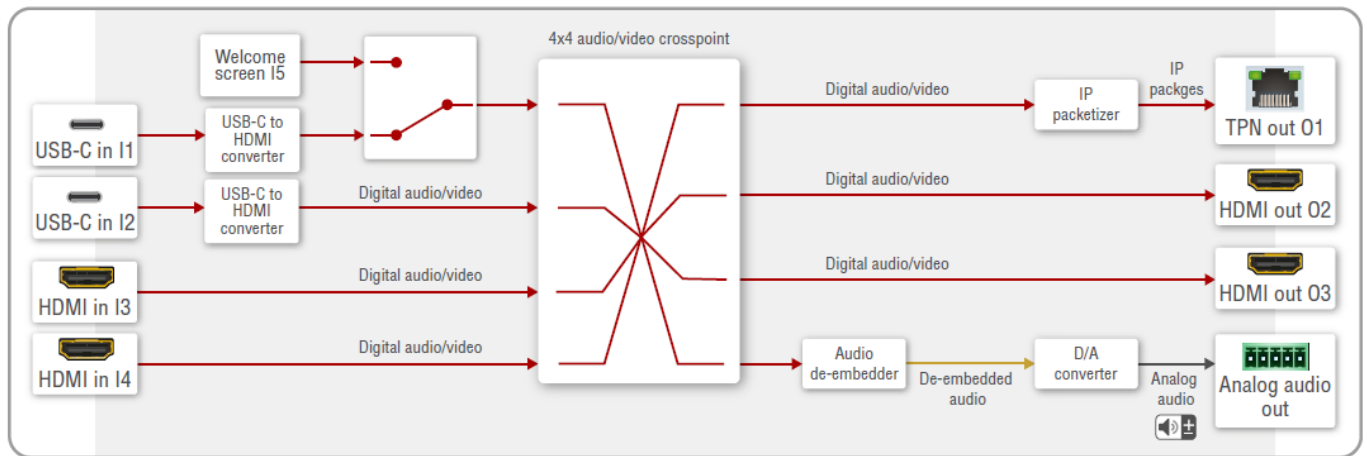
Connecting steps



| | |
|------------------|--|
| TPN | <p>Connect a CATx cable between the TPN output port of the transmitter and the RJ45 port of the 10G network switch.</p> <p>⚠ User Ethernet is also transmitted over the TPN interface, so be sure not to create a network loop.</p> |
| USB-C | <p>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.</p> |
| HDMI in | <p>Connect a source to the HDMI input port of the transmitter by a HDMI cable.</p> |
| USB-B | <p>Optionally connect the USB host.</p> |
| HDMI out | <p>Connect a sink to the HDMI input port of the transmitter by a HDMI cable.</p> |
| RS-232 | <p>Optionally for RS-232: connect a device to the RS-232 port.</p> |
| Audio out | <p>Optionally for analog output: connect an audio device to the analog audio output port by an audio cable.</p> |
| USB-A | <p>Optionally connect USB peripherals to the USB-A ports with USB cables.</p> |
| GPIO | <p>Optionally connect a controller/controlled device to the GPIO port.</p> |
| Ethernet | <p>Optionally connect the device to a LAN network.</p> <p>⚠ User Ethernet is also transmitted over the TPN interface, so be sure not to create a network loop.</p> |
| Power | <p>Powering on the devices is recommended to do as the final step during the installation. Please check the <i>Power Supply Options</i> section for the details.</p> |

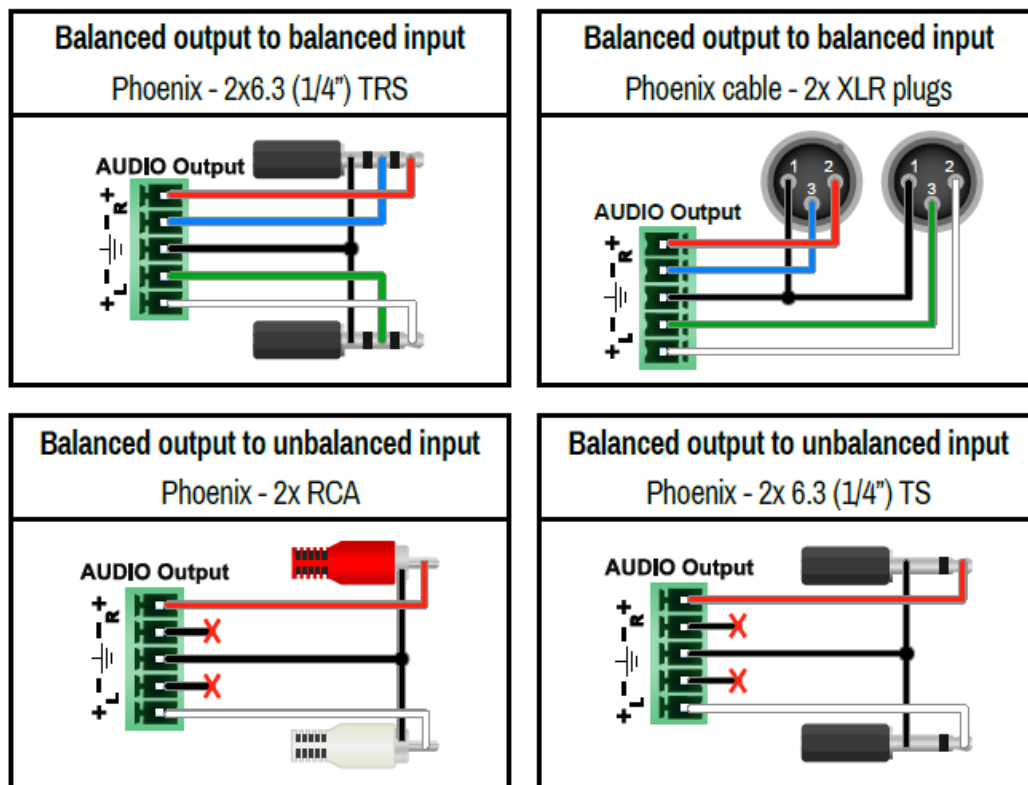
Only connect one of the devices to the LAN, to avoid creating a network loop!

Port diagram for video / audio (UCX-4x3-TPN-TX20)



Audio Cable Wiring Guide

- The UCX-TPN series devices are built with a 5-pole Phoenix® output connector.
- See a few examples below of the most common assembling cases.



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.

Minimum CAT Cable Requirement

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

Firmware Update

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



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 levels (Push-Pull). The direction of the pins can be input or output (adjustable). The signal levels are the following:

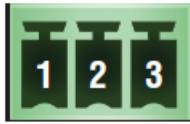


| | Input voltage (V) | Output voltage (V) | Max. current (mA) |
|-------------------------|--------------------------|---------------------------|--------------------------|
| Logic low level | 0 – 0.8 | 0 – 0.5 | 30 |
| Logic high level | 2 -5 | 4.5 – 5 | 18 |

- 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 4×0.22 mm² wires.
- 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:



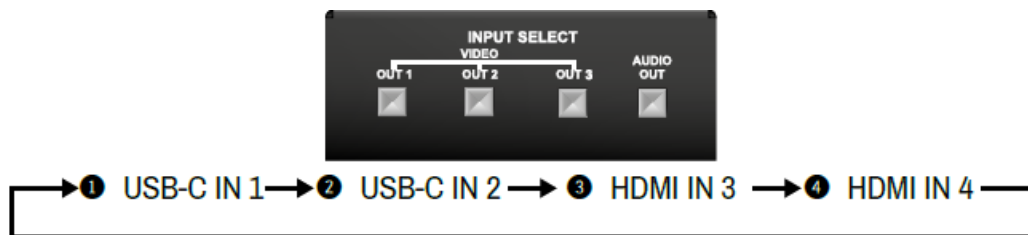
| | Output voltage (V) |
|------------------|--------------------|
| Logic low level | 3 – 15 |
| Logic high level | -15 – 3 |

- Plug pin assignment: 1: Ground, 2: TX data, 3: RX data

Button functionality – Video Source Selection

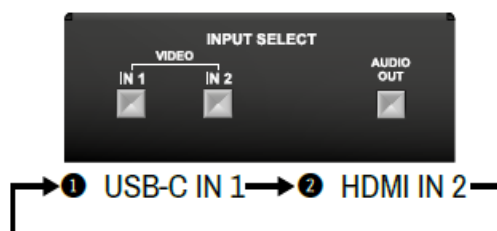
UCX-4×3-TPN-TX20

- Push the OUT1 button to set the video input to the TPN 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):



UCX-2×1-TPN-TX20

- Push the IN1 button to select the USB-C port as input for the TPN output port.
- Push the IN2 button to select the HDMI port as input for the TPN output port.
- Push the AUDIO OUT button to set the audio source of the analog audio output. The sequence is the following for the video switching:



CONTACT

Lightware Visual Engineering PLC.

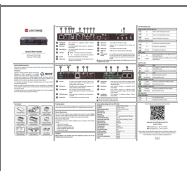
- Budapest, Hungary

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



©2024 Lightware Visual Engineering. All rights reserved. All trademarks mentioned are the property of their respective owners. Specifications are subject to change without notice. Further information on the device is available at www.lightware.com.

Documents / Resources

| | |
|--|--|
|  | <p>LIGHTWARE UCX-4x3-TPN-TX20 Universal Transmitter switchers [pdf] User Guide UCX-4x3-TPN-TX20, UCX-2x1-TPN-TX20, UCX-4x3-TPN-TX20 Universal Transmitter switchers, UCX-4x3-TPN-TX20, Universal Transmitter switchers, Transmitter switchers, switchers</p> |
|--|--|

References

- [User Manual](#)

Manuals+, Privacy Policy

This website is an independent publication and is neither affiliated with nor endorsed by any of the trademark owners. The "Bluetooth®" word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. The "Wi-Fi®" word mark and logos are registered trademarks owned by the Wi-Fi Alliance. Any use of these marks on this website does not imply any affiliation with or endorsement.