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ARCHITECTURAL AND ENGINEERING SPECIFICATION

Taurus UCX-4x3-TPX-TX20

4x3 USB Type-C and HDMI Matrix Switcher Transmitter with USB2.0 host switch, Ethernet, and room control/automation capability.

FUNCTIONAL OVERVIEW

The device shall be a compact USB-C and HDMI transmitter switcher designed for integration into BYOM environments. It shall provide seamless video, audio, USB2.0, and control signal extension over a single CAT6A cable, up to 100 meters using Lightware's TPX (SDVoE-based) technology. The matrix transmitter shall support four selectable local inputs: two USB-C and two HDMI, with either automatic or manual input switching. Configuration and monitoring shall be possible through the Web GUI - the Lightware Device Controller (LDC)*, via the Lightware Advanced Room Automation (LARA) or with the Lightware Advanced Room Automation Wizard (LARA Wizard).

*(LDC is available built in, or in a desktop version)

VIDEO

The matrix transmitter shall:

- support HDMI 2.0 signal formats.
- have two HDMI 2.0 and two USB-C (DisplayPort Alternate Mode) input ports, two HDMI 2.0 outputs and one TPX extender port (with 10G bandwidth)
- provide independent switching of its own four video input signals, or any additional hosts connected on the receiver input side.
- support video content and all standard resolutions and frequencies as specified under HDMI up to 1920x1200 50/60Hz, or 4096x2160 60Hz (UHD, 4K). 3840x2160 resolution is supported with a default Lightware EDID.
- be compatible with a 120Hz 3D video signal.
- support HDCP 1.4 and 2.2 content protection standards and provide per-port HDCP authentication diagnostics via the Web GUI (LDC) or via the LW3 protocol.
- allow HDCP to be enabled or disabled on both HDMI and USB-C inputs and provide real-time status indicators for each HDCP handshake.
- feature pixel accurate reclocking technology to restore signal integrity, by eliminating jitter and preserving original timing and color data.
- support EDID management for customizable EDID tables.
- provide the ability to import and export EDID and preset files from/to a PC, and store at least 100 EDID resolutions.
- allow users to create custom EDID resolutions.

- allow custom image file (jpg or bmp) uploading, and using this file later as a selectable welcome screen source. The maximum image size is 4MB, the preferred resolution is 1280x720.

USB-C / USB / HOST SWITCHING

The USB-C ports shall:

- provide full high-speed USB2.0 USB connectivity to the devices connected to the USB-A ports of the matrix transmitter.
- provide full high-speed USB2.0 USB connectivity to the devices connected to the four local USB-A ports of the matrix and the remote USB-A ports of the receiver.
- be able to distribute 120W power in total (in case of two connected devices up to 60W, or up to 100 W when a single device is connected)
- provide Ethernet connectivity to the internal processor (to control the matrix transmitter) to the receiver Ethernet ports, and to the local Ethernet connectors (RJ45) via the internal switch

The matrix transmitter shall:

- allow flexible assignment of USB peripherals to the active host, with support for both automatic and manual switching modes. Host switching shall not interrupt USB data transmission, and the system shall ensure full compatibility with standard USB bulk transfer protocols.
- have four high-speed USB ports for connected devices (like USB camera, mic, speaker, keyboard, mouse, solid state drive) with output power of at least 1A each.
- switch these USB devices to any of its own four host devices, or any additional inputs on the receiver side via USB-C and USB-B ports.

AUDIO

The matrix transmitter shall:

- have a balanced analog audio output port for stereo audio de-embedding from any of the active video sources.
- support the following signal formats: 7.1 HDMI embedded audio, Dolby TrueHD, and DTS-HD Master Audio 7.1 formats.
- provide adjustable volume on the analog output port.

POWER

The matrix transmitter shall:

- deliver up to 30W of remote power to compatible Lightware TPX receivers via Power over Ethernet Plus (PoE+, IEEE 802.3at) over a single Cat6A cable
- be powered by an external 160W power supply with an IEC C14 mains inlet, supporting 100–240 VAC at 50/60 Hz.

ETHERNET

The matrix transmitter shall:

- have an integrated Gigabit Ethernet Switch.
- have at least three RJ45-type Ethernet connectors (up to 1 Gbps speed).

SECURITY

The matrix transmitter shall:

- be able to support 802.1x authentication.
- allow VLAN tagging for logical network separation.
- be capable of network separation between corporate network and user network.
- support port-level Ethernet control, including enable/disable functions.
- be able to support different pre-defined VLAN presets.
- be able to update the firmware of its connecting receiver device.
- support HTTPS and secure WebSocket (WSS) protocols to enable encrypted web interface access and WebSocket-based control and monitoring.
- include Lightware Crypto Core with FIPS 140-2 validated cryptographic functions (in LCC variants).
- support secure REST API access with username and password authentication.
- allow selective USB port 5V power control for security and reset functions.
- negotiate USB port roles via USB-C Power Delivery protocol to prevent unauthorized device connections.
- include physical security lockout for front panel buttons.
- require a multi-step procedure for factory reset to avoid unauthorized erasure.
- remote service port disablement to reduce exposed attack surfaces.

CONTROL

The matrix transmitter shall:

- support Lightware Advanced Room Automation (LARA), a built-in room automation tool enabling event-based control without the need for external processors.
- include an integrated crosspoint routing engine, capable of independently switching video, audio, USB, and control signals between multiple inputs and outputs.
- be able to process the occupancy sensor input port from the receiver.
- provide two bi-directional RS-232 and at least six GPIO connections as well as Ethernet and USB ports for control.

- be able to send predefined TCP commands to attached compatible devices.
- be able to recognize predefined incoming RS232/TCP commands as a condition and execute switching, sending RS232/TCP or CEC command sequences on reception.
- be able to recognize input video signal changes as a condition and execute switching, and send RS232/TCP or CEC command sequences on change.
- provide one USB-A and one USB mini-B port for service functions.
- provide front panel LED indicators for power status / video signal presence / Ethernet link activity, and physical buttons for source selection. Rear panel indicators shall include Ethernet link activity and TPX connection status.
- support Consumer Electronics Control (CEC) functionality over all HDMI outputs, including via the TPX extension link to connected receivers.
- allow CEC commands to be sent manually or automatically based on signal presence, USB connection, or mode change.
- support bulk device configuration and management through the LDC software. This capability shall enable managing multiple UCX-TPX series devices concurrently, ensuring consistent configuration across rooms, zones, or entire deployments.
- support a secure and documented REST API for integration with third-party control and automation systems. The API shall use JSON over HTTPS to provide IP-based access for configuration and real-time control of key system functions.
- provide access to a Web GUI (LDC), allowing configuration of event conditions and actions without programming skills, while also supporting custom JavaScript coding for advanced control requirements.
- provide a browser-based Touch Panel interface for the users to access room control functions.

GENERAL

The matrix transmitter shall:

- have full paper / green packaging.
- be housed in a compact metal enclosure measuring 271 mm (W) x 140.3 mm (D) x 26 mm (H)
- be mountable under tables or inside furniture (the UD Mounting Plate kits are sold separately)
- be mountable in racks (1U rack shelves are sold separately)
- have a fan cooler, which is adjusted based on the device temperature.
- comply with CE, FCC Class A, UKCA, RoHS
- have a warranty of 3 years.
- be compatible with the following UCX-TPX receivers:

  - HDMI-UCX-TPX-RX107
  - UCX-3x3-TPX-RX20
- be compatible with the following TPX receivers:
  - HDMI-TPX-RX106
  - HDMI-TPX-RX107
  - HDMI-TPX-RX107D
  - HDMI-TPX-RX107A-SR
  - HDMI-TPX-RX107AU2K-SR
  - HDMI-TPX-RX109AU2K
  - HDMI-TPX-RX109DU2K
  - HDMI-TPX-RX209AK
- be packaged together with the following equipment:
  - 24V power adaptor with IEC power cable
  - 2 pcs. Phoenix® Combicon 3-male Connector
  - Phoenix® Combicon 5-pole Connector
  - Phoenix® Combicon 8-pole Connector
  - Safety and Warranty Info, Quick Start Guide
  - Type C (USB-C) to Type C (USB-C) Cable, 1m
  - 2 pcs. of M3x4 flat head screw

Document revision history

Document	Release Date	Changes	Checked by
Rev. 1.0	2 Dec 2024	Initial version	Tamás Takács
Rev 1.1	29 May 2025	Minor updates	Bence Varga
Rev.1.2	1 July 2025	Major update	Márk Hilóczki
Rev.1.3	2 March 2026	Minor updates	Bence Varga