Quick Start Guide

TPN-CTU-X50

Important Safety Instructions

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

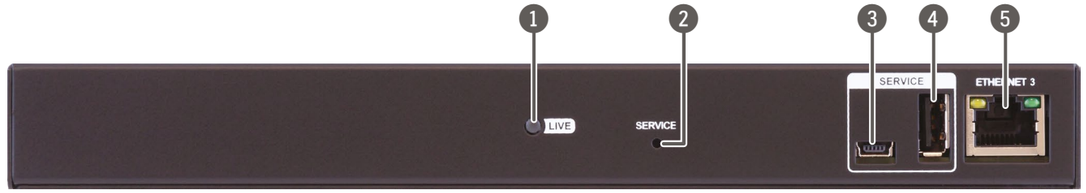
Introduction

TPN-CTU-X50 is a Control Unit (CU) for Lightware's TPN AV Over IP product line. With this control unit and an off-the-shelf 10G Ethernet switch installed as a crosspoint in the system, a virtual matrix can be created for TPN devices connected to the IP network as input and output endpoints.

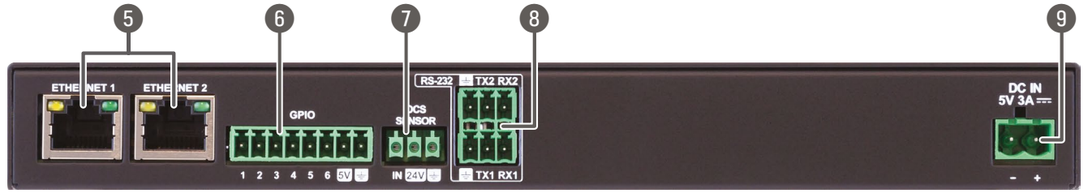
TPN-CTU-X50 is designed to manage small TPN systems with at most 50 TPN endpoints. Technically, the TPN-CTU-X50 runs an SDVoE Control Server instance. It is this SDVoE Control Server instance through which the TPN endpoints (and consequently, the virtual matrix) can be reached and configured using the open SDVoE API. Thanks to this architecture, any third-party controller interface device that supports the SDVoE API can be used for managing the virtual matrix.

The controller also features Lightware Advanced Room Automation (LARA) with a LARA TPN driver. This driver offers various methods and functions for interfering with the TPN system without the need to use the SDVoE API. With an ever-growing feature set, the driver offers an easy way for crosspoint switching and performing basic setup tasks like assigning EDID to and adjusting HDCP capabilities of the TPN transmitters. To ease system setup and operation, the driver also offers a graphical user interface for the integrator to perform setup tasks. Moreover, it includes an easily customizable user interface for crosspoint switching. With subsequent releases, more features are to be added.

Front View



Rear View



1 **LIVE LED** — The LED gives immediate feedback about the current status of the CTU.

	Off	Device is not powered.
	blinking (green)	Device is powered on and operational.

2 **Service button** — Hidden button for setting the device to factory default values.

3 **USB mini-B port** — Reserved for service functions.

4 **USB-A port** — Reserved for future development.

5 **Configurable Ethernet ports** — RJ45 connectors for configurable 100Base-T Ethernet communication.

Left LED (Link/Act)

	off	No connection is established.
	on (yellow)	Connection is established successfully.
	blinking (yellow)	TX or RX activity is in progress.

Right LED (Speed)

	off	Connection is speed is 10Mbps.
	on (green)	Connection is speed is 100Mbps.

6 **GPIO** — 8-pole Phoenix connector for configurable general purpose. Max. input/ output voltage is 5V.

⚠ ***The port is NOT compatible with the OCS connector.***

7 **OCS sensor connector** — 3-pole Phoenix connector (male) for connecting an occupancy sensor. The port provides 24V output voltage (50mA).

⚠ ***The port is NOT compatible with the GPIO connector.***

8 **RS-232 connectors** — 2 pcs 3-pole Phoenix connectors for bi-directional RS-232 communication.

9 **5V DC input** — 5V DC input connector for local powering.

TPN / OPTN Matrix Concept

The TPN and OPTN AV system is a video over IP solution based on audio/video signal extenders. The SFP+ module is swappable and can be singlemode or multimode. The TPN / OPTN matrix is Ethernet-based, using 10 GbE signal bandwidth and IPv4 protocols, it can be controlled by the TPN control box (CTU) using 1GbE Ethernet or RS-232 connections.

The TPN / OPTN matrix allows to build an AV network with up to 50 endpoint installation. This mode requires 10 GbE network with Layer 3 (L3) switch and the TPN-CTU-X50 control unit connected to the network.

⚠ ***The Control Unit does not transmit video signal.***

Factory Default Settings

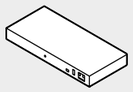
The settings can be restored by the front panel hidden button:

1. Prepare a thin and long tool (e.g. a pen, toothpick, piece of wire, etc).
2. Make sure the device is powered on and operational.
3. Press and keep pressed the hidden **SERVICE button** using the tool **for 10 seconds**. After 10 seconds the LEDs start blinking faster.
4. The LEDs get dark, the device restores the factory default settings and reboots.

The factory default values are the following:

Network	
IP address	Dynamic (DHCP is enabled)
Hostname	lightware-<serial_number>
HTTP, HTTPS	Enabled
HTTP, HTTPS authentication	Disabled
RS-232	
RS-232 port setting	9600 BAUD, 8, N, 1
RS-232 serial over IP	Enabled

Box Contents

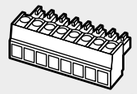


TPN Control Box

5V DC power adaptor with interchangeable plugs

Phoenix Combicon® 3-pole flat connector (2x)

Phoenix Combicon® 3-pole male connector



Phoenix Combicon® 8-pole connector

M3x6 flat head screw for mounting (2x)

Safety and warranty info, Quick Start Guide

Mounting Options

The following table summarizes the compatiblity of the TPN-CTU-X50 with the mounting accessories offered by Lightware. The number in the brackets means how many same-size devices can be assembled to the mounting plate.

The following accessories can be ordered separately, please contact sales@lightware.com for the details.

			
1U High Rack Shelf	**UD Mounting Kit Double**	**UD Mounting Plate F100**	**UD Mounting Plate F120**
✔ (2x)	✔ (1x)	✔ (1x)	✔ (2x)

		
UD Mounting Pro P110	**UD Mounting Pro P140**	**UD Mounting Pro P210**
✔ (1x)	✔ (2x)	✔ (2x)

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

ℹ *The device is half-rack sized.*

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

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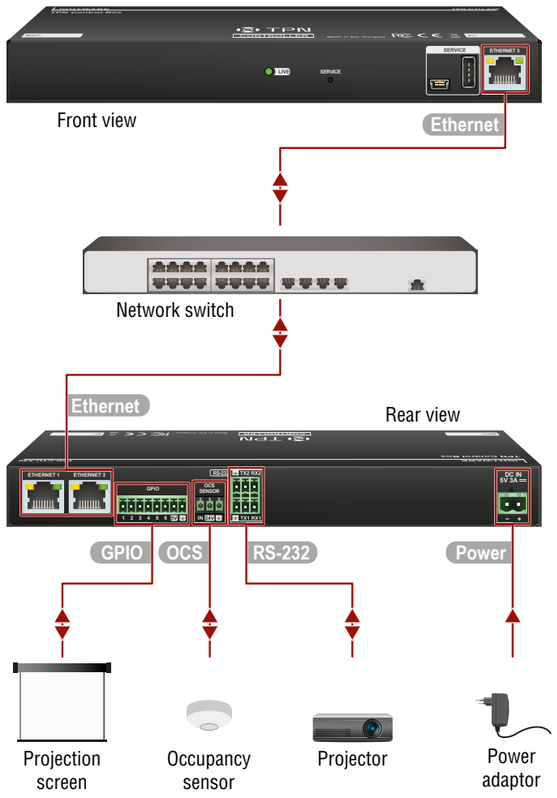
Connections



Ethernet	Connect the Control Unit and the network switch (where the endpoints are also connected to the network) by a CATx cable via one of the Ethernet ports to control and manage the AV matrix. ⚠ ***When connecting the device to the network(s), be sure not to create a network loop.***
RS-232	Optionally connect a controller/controlled device (e.g. projector) to the RS-232 port.
GPIO	Optionally connect a device (e.g. projection screen) to the GPIO port.
OCS	Optionally connect an occupancy sensor to the OCS port.
Power	Connect the external power supply to the AC power socket and then to the control unit.

ℹ *Powering the device is recommended as the final step.*

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).

Connector Pin Assingment

Pin nr.	Function
1-6	configurable
7	5V (max. 500mA)
8	ground

Signal Levels

	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.*

OCS (Occupancy) Sensor

The device is supplied with a 3-pole Phoenix® male connector for connecting an OCS sensor.

Connector Pin Assignment

Pin nr.	Function
1	input with logic low/high level
2	24V (max 50mA)
3	ground

Signal Levels

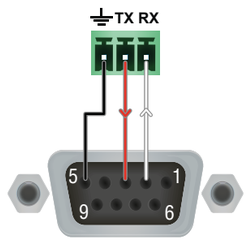
The signal levels for the **Pin 1**	Input voltage (V)	Max. current (mA)
Logic low level	0 - 0.8	30
Logic high level	2 -5	18

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

Wiring Guide for RS-232 Data Transmission

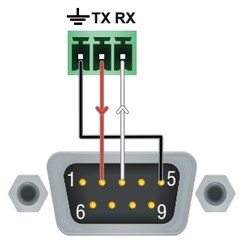
TPN-CTU-X50 supplied with 3-pole Phoenix connectors. See the examples of connecting to a DCE (Data Circuit-terminating Equipment) or a DTE (Data Terminal Equipment) type device:

Lightware device and a DCE
D-SUB 9 - Phoenix



2: TX data
3: RX data
5: Ground

Lightware device and a DTE
D-SUB 9 - Phoenix



2: TX data
3: RX data
5: Ground

For more information about the cable wiring see the user's manual of the device or **Cable Wiring Guide** on our website www.lightware.com.