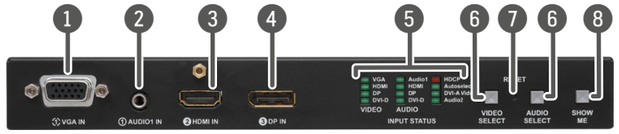
visual engineering
LIGHTWARE

Quick Start Guide

UMX-TPS-TX120
UMX-TPS-TX130
UMX-TPS-TX140
UMX-TPS-TX140-Plus

Front View Legend (UMX-TPS-TX140)



1	**VGA Input**	Input for an analog video source. Using a VGA cable where all the pins are wired (DDC channel) is highly recommended.
2	**Audio Input**	3.5 mm Jack connector for unbalanced analog audio signal.
3	**HDMI Input**	Input for a digital video source. Applied cable shall not be more, than 30 m (at 1080p) and 15 m (at 4K).
4	**DisplayPort Input****	Input for digital video source (only on TX140 models). Applied cable shall not be more, than 30 m (at 2.7 Gbps data speed).
5	**Status LEDs**	The LEDs give feedback about the state of the unit, the video and audio signals. See the attached list for details.
6	**Video/Audio Select**	Selecting a video/audio input manually.
7	**Reset Button**	The same as disconnecting the device from the power source and reconnecting it again.
8	**Show me Button**	Special functions are available with this button (e.g. enable DHCP or restore factory default settings).

Front Panel LEDs (UMX-TPS-TX-140)

Video Sources

- OFF: video source is not selected.
- BLINKING: video source is selected but not active.
- ON: video source is selected and active.

Audio Sources

- OFF: audio source is not selected.
- BLINKING: audio source is selected but not active.
- ON (with short pause): audio source is selected and the port is active but not embedded to the output video stream (DVI output mode).
- ON (continuously): audio source is selected, the port is active and the audio is embedded to the output video stream (HDMI output mode).

HDCP LED

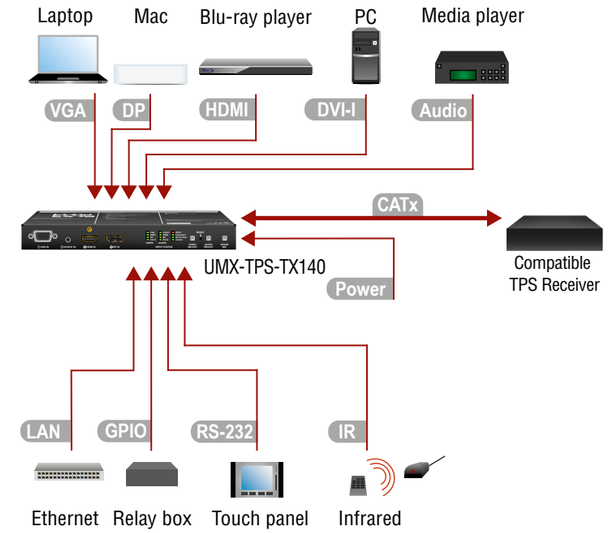
- OFF: video output signal is not encrypted with HDCP.
- ON: video output signal is encrypted with HDCP.

Autoselect LED

- OFF: autoselect is disabled.
- BLINKING: autoselect is enabled; searching for signal (video LEDs also blink).
- ON: autoselect is enabled; active video signal is found (the LED of selected video also lights).

A port is active if there is a valid signal on it.

Connecting Steps



CATx	Connect the TPS output port to the **TPS+PoE** output port of the TPS-PI-1P1 by a CATx cable. Connect the receiver (or the Matrix input board) to the power injector by a CATx cable via the **TPS** port.
VGA DP HDMI DVI-I	Connect the transmitter and the sources using the inputs and VGA / DisplayPort / HDMI / DVI-I / cables.
Audio	Optionally for audio extension: connect the audio source (e.g. media player) to the audio input port by an audio cable.
LAN	Optionally connect the transmitter to a LAN in order to control the device.
GPIO	Optionally connect a controller/controlled device (e.g. relay box) to the GPIO port.
RS-232	Optionally connect a serial device to the transmitter's RS-232 port.
IR	Optionally for Infrared extension: ▪ Connect the IR emitter to the IR OUT port of the switcher, and/or ▪ Connect the IR detector to the IR IN port of the switcher.
Power	Powering on the devices is recommended to do as the final step during the installation. Please see the **Power Supply Options** section for the details.

Important Safety Instructions

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

Introduction

Lightware's UMX-TPS-TX100 devices transmit universal video at a resolution up to 4K, audio and control up to 170 m distance over a single CAT cable. The products have HDBaseT™ integration with additional Lightware developments. The transmitter was designed for digital and analog video and audio signals e.g. DVI, VGA, HDMI1.4 and DP 1.1 with analog stereo audio from local inputs or embedded 7.1 HBR audio and to handle HDCP encryption.

The UMX-TPS-TX140-Plus model offers advanced control features: 100 available event slots; support RS-232 protocol for communication and control of third party devices like VC codec - this allows the Cisco Room Kit login on RS-232–USB connection; support to receive CEC commands for control of displays and Lightware Event Manager to automate room actions; support to send CEC commands on HDMI ports for control of other devices; support true Infrared messages using HEX codes to control TVs, media players and other devices with IR emitters.

Compatible Devices

The transmitters are compatible with other Lightware TPS devices, matrix TPS and TPS2 boards, 25G boards, as well as third-party HDBaseT™ extenders, displays, but not compatible with the phased out TPS-90 extenders.

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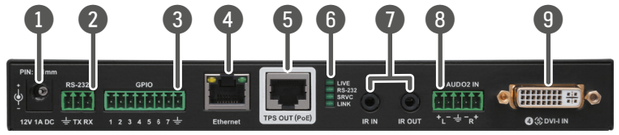
Rear View Legend (UMX-TPS-TX140)



1	**12V DC Input connector**	12V DC input for local powering.
2	**RS-232 connector**	3-pole Phoenix connector for RS-232 serial port.
3	**GPIO***	8-pole Phoenix connector for configurable general purpose input/output ports.
4	**Ethernet**	Locking RJ45 connector for Ethernet communication.
5	**TPS Output Port**	Locking RJ45 connector for HDBaseT™ signal transmission. Connect a twisted pair cable between the transmitter and the receiver.
6	**Status LEDs**	The LEDs give feedback about the actual state of the device.
7	**IR Input/Output**	2 TRS (3.5mm jack) connectors for Infrared units (IR IN for the detector, IR OUT for the emitter).
8	**Audio Input****	5-pole Phoenix connector for unbalanced analog audio signal.
9	**DVI-I Input***	DVI-D or DVI-A signal input port.

Rear Panel LEDs

LIVE

- OFF: the device is not powered.
- BLINKING (slow): the device is powered and operational.
- BLINKING (fast): the device is in bootload mode.
- ON: the device is powered but no operation.

RS-232

- OFF: RS-232 ports (Local and Link) are in Pass-through mode.
- BLINKING: Command Injection mode is active.
- ON: RS-232 ports (Local and Link) are in Control mode.

SRVC

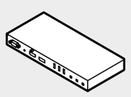
- ON: Test pattern is the selected and active input source.

LINK

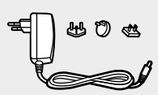
- OFF: no TPS link between transmitter and receiver.
- BLINKING (slow): low power mode is active.
- BLINKING (fast): Ethernet fallback mode is active.
- ON: TPS link is established, HDBaseT or Long reach mode is active.

* Only on UMX-TPS-TX130, UMX-TPS-TX140, and UMX-TPS-TX140-Plus
** Only on UMX-TPS-TX140 and UMX-TPS-TX140-Plus

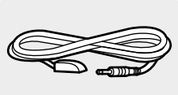
Box Contents



Transmitter unit



12V DC power adaptor with interchangeable plugs

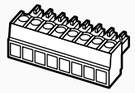


Infrared transmitter unit

Phoenix combicon 3-pole connector

Safety and warranty info, Quick Start Guide

Phoenix combicon 5-pole connector*



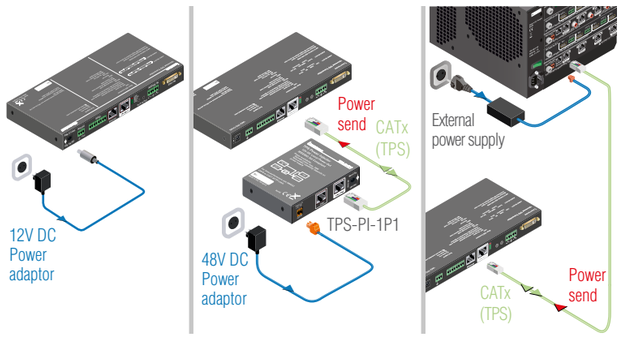
Phoenix combicon 8-pole connector**

* Only for UMX-TPS-TX140 and UMX-TPS-TX140-Plus
** Only for UMX-TPS-TX130, UMX-TPS-TX140, and UMX-TPS-TX140-Plus

Power Supply Options

The transmitters can be powered:

- Locally with the supplied 12V DC adaptor or Lightware's rack mountable PSU, or
- Remotely by a PoE-compatible power injector, like Lightware's TPS-PI-1P1.
- Powering by a matrix board over the TPS (CATx) cable. Output board needs to be powered by an external PSU.



UMX-TPS-TX100 transmitters are PoE-compatible and can receive power over the TPS line. The TPS-TX/RX95 extenders are not PoE-compatible thus not able to send/receive power to/from the UMX-TPS-TX100 transmitters.

Mounting

To mount the device Lightware supplies optional accessories for different usage. There are two kinds of mounting kits with similar fixing method. The transmitter has two mounting holes with inner thread on the bottom side. Fasten the device by the screws enclosed with the accessory.

Under-desk double mounting kit

1U high rack shelf

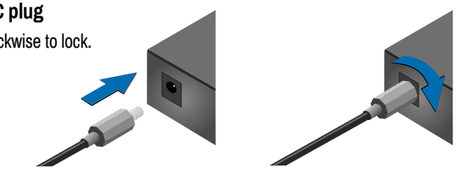
The Under-desk double mounting kit makes it easy to mount a single device on any flat surface, e.g. furniture. 1U high rack shelf provides mounting holes for fastening two half-rack or four quarter-rack sized units. Pocket-sized devices can also be fastened on the shelf. To order mounting accessories please contact sales@lightware.com.

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

The transmitter is half-rack sized.

Locking DC plug

Twist 90° clockwise to lock.



Further information

The document is valid with the following firmware version: 1.3.0
The User's manual of this appliance is available on www.lightware.com.
See the Downloads section on the dedicated product page.

Contact us

sales@lightware.com
+36 1 255 3800

support@lightware.com
+36 1 255 3810

Lightware Visual Engineering LLC.

Peterdy 15, Budapest H-1071, Hungary

Doc. ver.: 2.3
19200131

Front Panel Button Functions

Lock/Unlock Buttons

Press the AUDIO SELECT and the SHOW ME together.

Video Input Selection

The desired video input can be selected by the VIDEO SELECT button on the front panel. The selection order of the inputs depend on the model as follows:

- TX120 models:
  VGA → HDMI → Autoselect
- TX130 models:
  VGA → HDMI → DVI-D → DVI-A → Autoselect
- TX140 / TX140-Plus models:
  VGA → HDMI → DP → DVI-A → DVI-D → Autoselect

The input can be also selected by using LDC (Lightware Device Controller), sending a protocol command, or using Autoselect.

Audio Input Selection

The desired audio input can be selected by the Audio select button on the front panel. The selection order of the inputs depend on the model. The input can be also selected by using LDC (Lightware Device Controller), sending a protocol command, or using Autoselect.

ℹ *If 4K video is selected to the output, analog audio cannot be embedded to the video stream due to the capabilities of the video IC, thus the original audio stream will be transmitted.*

Cross Audio-embedding

The video and audio inputs can be combined with limitations. Below table contains the allowed connections:

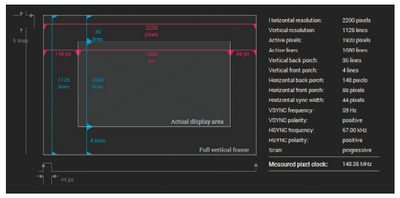
		Audio source		
		HDMI	DP	Analog Audio Input
Video source	HDMI	✔	-	✔
	DP	-	✔	✔
	VGA	-	-	✔

Software Control – Using Lightware Device Controller (LDC)

The device can be controlled from a computer through the Ethernet port using Lightware Device Controller. Please download the application from www.lightware.com, install on a Windows PC or a macOS and connect to the device via the Ethernet port. LDC software contains many useful built-in tools which can be used for signal analysis like the followings:

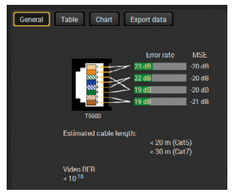
Frame Detector

Lightware's Frame Detector function works like an input signal analyzer and makes possible to determine the exact video format that is sent by the source, thus helps to identify many problems (e.g. timing parameter difference).



TPS Cable Diagnostics

The estimated cable length and the quality of the link are measured periodically and the diagnostic window shows the values in real-time. If the green bars hit the first line in the middle they turn into red. It means the number of the errors – during the extension – is higher than the recommended one. The link might be alive but recovering of the received data is not guaranteed.

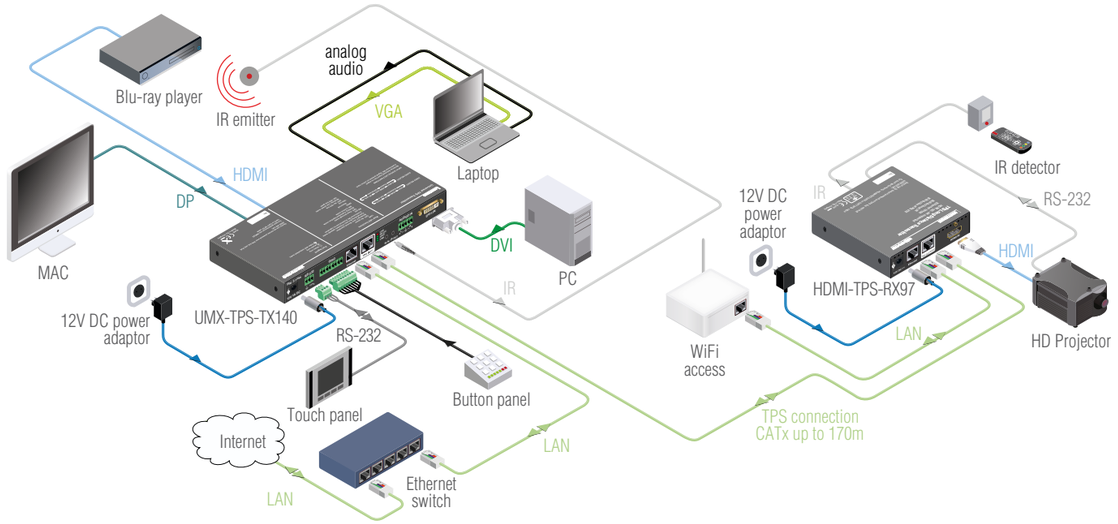


Types of IR connectors (1/8" TRS / TS)

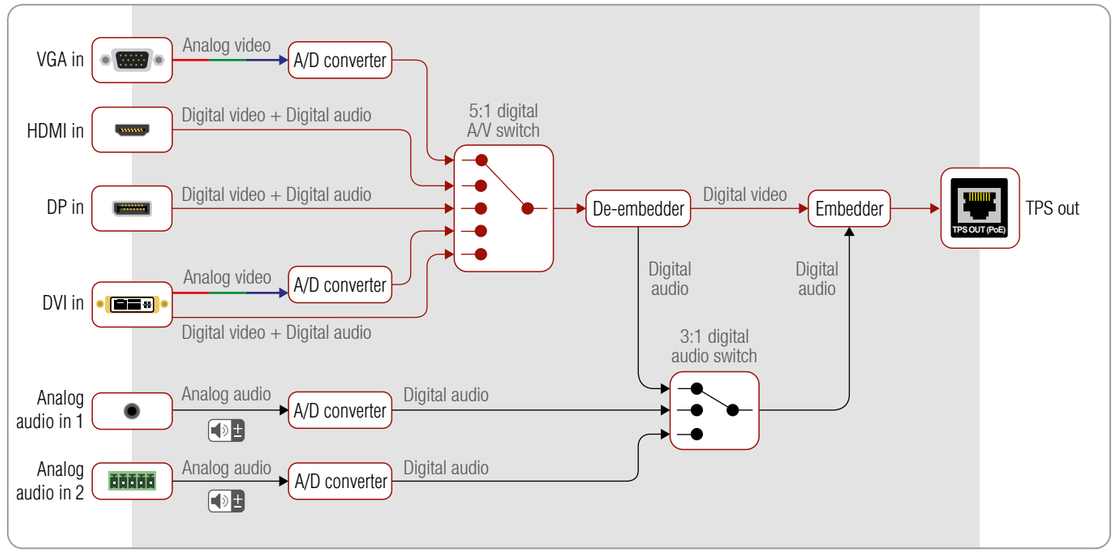
2 pole, 1 ring: IR transmitter

3 pole, 2 rings: IR receiver

Typical Application



Port Diagram (of TX140 models)



Restore Factory Default Settings

1. Keep the **Show me button** pressed for 10 seconds; after 5 seconds front panel LEDs start to blink but keep the buttons pressed; the LEDs start to blink faster 5 seconds later.
2. **Release the button**, then press it 3 times quickly; factory default settings are restored:

IP address (fix)	192.168.0.100
Subnet mask	255.255.255.0
Static gateway	192.168.0.1
DHCP	disabled
TCP/IP port nr. LW2 / LW3	10001 / 6107
Crosspoint setting (Audio / Video)	Audio 1 (Audio) / VGA input
Autoselect	disabled
Output TPS mode	Auto
Emulated EDID	Analog ports: F89
	Digital ports: dynamic
RS-232 mode	Pass-through
RS-232 control protocol	LW2
RS-232 port setting	57600 BAUD, 8, N, 1
Command injection port (local / link)	8001 / 8002

Setting a Dynamic IP Address

1. Keep the Show me button pressed for 5 seconds; all front panel LEDs start to blink.
2. Release the button, then press it 3 times quickly. DHCP is now enabled.

Maximum Extension Distances

Resolution	Pixel clock rate	Cable lengths (Auto / Long reach TPS mode)		
		CAT5e AWG24	CAT7 AWG26	CAT7 AWG23
1024x768@60Hz	65 MHz	100 m / 130 m*	90 m / 120 m*	120 m / 170 m*
1280x720p@60Hz	73.8 MHz	100 m / 130 m*	90 m / 120 m*	120 m / 170 m*
1920x1080p@60Hz (24bpp)	148.5 MHz	100 m / 130 m*	90 m / 120 m*	120 m / 170 m*
1920x1200@60Hz	152.9 MHz	100 m / NA	90 m / NA	120 m / NA
1600x1200@60Hz	162 MHz	100 m / NA	90 m / NA	120 m / NA
1920x1080@60Hz (36bpp)	223 MHz	70 m / NA	70 m / NA	100 m / NA
3840x2160@30Hz UHD **	297 MHz	70 m / NA	70 m / NA	100 m / NA
4096x2160@30Hz 4K **	297 MHz	70 m / NA	70 m / NA	100 m / NA

* Long reach TPS mode supports pixel clock frequencies up to 148.5 MHz.

** If 4K video is selected to the output, analog audio cannot be embedded to the video stream due to the capabilities of the video IC, thus the original audio stream is transmitted.

Above values are valid when the transmitter is powered by a local adaptor; distances may decrease depending on the powering mode (local or remote) and cable quality. To specify the accurate extension distances, please also check the documentation of the connected HDBaseT-compatible device.

ℹ *CAT7 SFTP AWG23 cable is always recommended.*

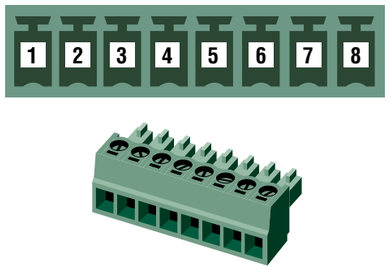
GPIO - General Purpose Input/Output Ports

The device has seven GPIO pins which 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)
Logical low level	0 - 0.8	0 - 0.5	30
Logical high level	2 -5	4.5 - 5	18

GPIO connector and plug pin assignment

Pin nr.	Signal
1	Configurable
2	
3	
4	
5	
6	
7	
Ground	

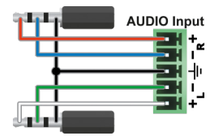


ℹ *The total available current of the controller is 180 mA.*

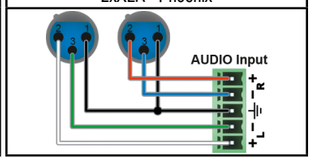
Audio Cable Wiring Guide

UMX-TPS-TX140 / TX140-Plus transmitters are built with 5-pole Phoenix input connector. See below a few example of the most common assembling cases.

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

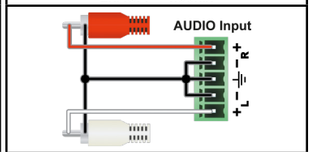


From balanced output to balanced input
2xXLR - Phoenix



From unbalanced output to balanced input
3.5 (1/8") TRS - Phoenix

From unbalanced output to balanced input
2xRCA - Phoenix

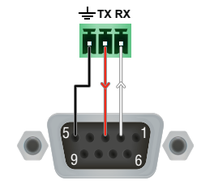


For more information about audio cable wiring see the user's manual of the device or the **Wiring Guide** on our website www.lightware.com/support/guides-and-white-papers.

Wiring Guide for RS-232 Data Transmission

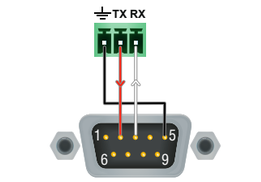
UMX-TPS-TX100 transmitters are built with 3-pole Phoenix connector. See the below examples of connecting to a DCE (Data Circuit-terminating Equipment) or a DTE (Data Terminal Equipment) type device:

Lightware device and a DCE
D-SUB 9 – Phoenix



2: TX data transmit
3: RX data receive
5: Ground

Lightware device and a DTE
D-SUB 9 – Phoenix



2: TX data receive
3: RX data transmit
5: Ground

For more information about the cable wiring see the user's manual of the device or the **Cable Wiring Guide** on our website www.lightware.com/support/guides-and-white-papers.