



LIGHTWARE SW4-TPS-TX240 HDBaseT Transmitter User Guide

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Transmitter User Guide*



Quick Start Guide

SW4-TPS-TX240
SW4-TPS-TX240-Plus

Important Safety Instructions

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

Introduction

Thank you for choosing Light ware SW4-TPS-TX240 transmitter. The product has HDBaseT™ integration with additional Light ware developments. The device transmits DP / HDMI / DVI digital video signal up to 4K resolution, audio and control up to 170 m distance over a single CAT cable (DP signal is converted to HDMI).

Compatible Devices



The transmitters are compatible with other Light ware 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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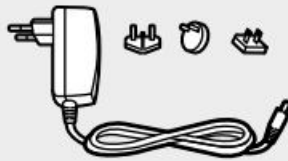
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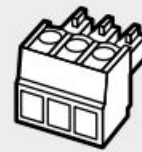
Box Contents



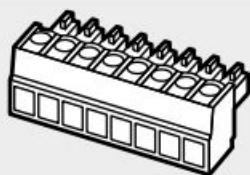
Transmitter unit



12V DC power adaptor
with interchangeable plugs



Phoenix combicon
3-pole connector



Phoenix combicon
8-pole connector



Safety and warranty info,
Quick Start Guide

Front View



- | | | |
|----------|---------------------------|--|
| 1 | Autoselect LED | LED gives feedback about the current Autoselect status. |
| 2 | HDCP LED | LED gives feedback about the HDCP status of the output signal. |
| 3 | DisplayPort Input | Input for DisplayPort audio/video signal. The applied cable shall not be more, than 30 m (at 2.7 Gbps data speed). |
| 4 | HDMI Inputs | HDMI connectors for DVI video or HDMI video and audio. |
| 5 | DVI-D input | DVI-I connector for DVI-D video and audio. |
| 6 | Audio input | 3.5 mm Jack connector for asymmetric analog audio signal. |
| 7 | Video/Audio Select | Selecting a video/audio input manually. |
| 8 | Reset Button | Pushing the button reboots the unit. |
| 9 | Show me Button | Special functions are available with this button (e.g. enable DHCP or restore factory default settings). |

Front Panel LEDs

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).

When Autos elect is enabled and video signal is not present at all, video LEDs blink.

HDCP LED

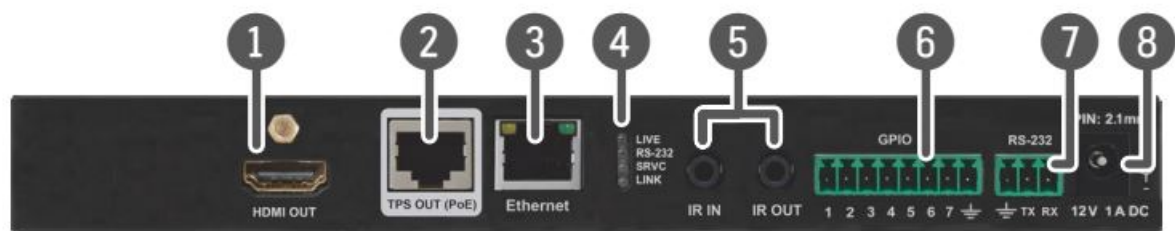
- OFF: video output signal is not encrypted with HDCP.
- ON: video output signal is encrypted with HDCP.

Auto select 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 a valid signal is detected.

Rear View



1	HDMI output	Local HDMI output with the same A/V content as the TPS output.
2	TPS output	Locking RJ45 connector for HDBaseT™ signal transmission.
3	Ethernet	Locking RJ45 connector for Ethernet communication.
4	Status LEDs	The LEDs give feedback about the actual state of the device.
5	IR in and out	2 TRS (3.5mm jack) connectors for Infrared units (IR IN for the detector, IR OUT for the emitter).
6	GPIO port	8-pole Phoenix connector for configurable general purpose input/output ports.
7	RS-232 port	3-pole Phoenix connector for RS-232 serial port.
8	12V DC input connector	12V DC input for local powering.

Rear Panel LEDs

LIVE

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

RS-232 LED

- 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

Reserved for future developments.

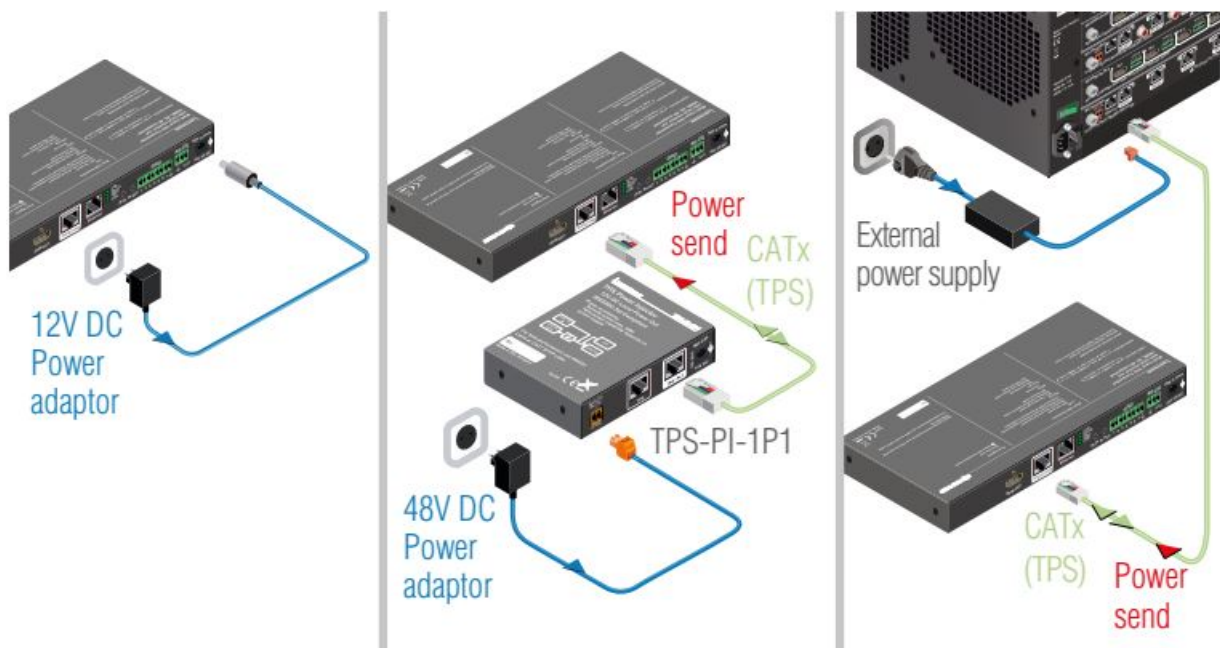
LINK

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

Power Supply Options

The transmitter can be powered:

- Locally with the supplied 12V DC adaptor or Light ware's rack mountable PSU,
- Remotely by a PoE-compatible power injector, like Light ware's TPS-PI-1P1,
- Powering by a matrix board over the TPS (CATx) cable. Connect the external PSU to the output board.



SW4-TPS-TX240 transmitter is PoE-compatible and can receive power over the TPS line. The TPS-TX/RX95 extenders are not PoE-compatible, thus, they are not able to send/receive power to/from the SW4-TPS-TW240 transmitter.

Mounting

To mount the device Light ware 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

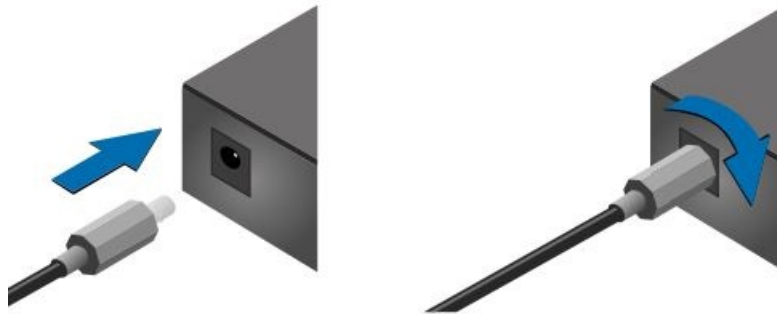
The Under-desk double mounting kit makes it easy to mount a single device on any flat surface, e.g. furniture. The 1U high rack shelf provides mounting holes for fastening two halftrack or four quarter-rack sized units. Pocket-sized devices can also be fastened on the shelf.

To order mounting accessories please contact sales@lightware.com.

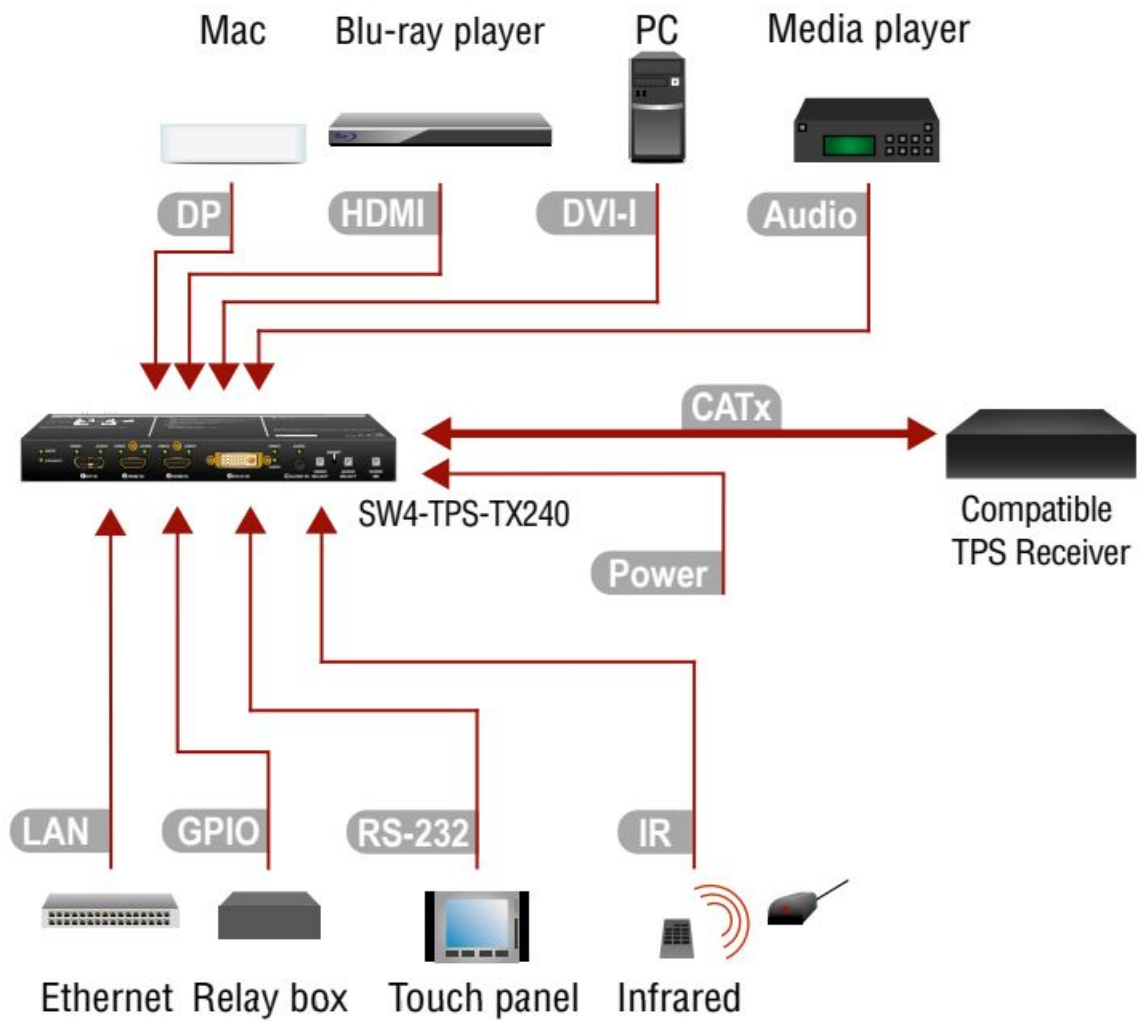
Using different (e.g. longer) screws may cause damage to the device.
The transmitter is half-rack sized.

Locking DC plug

Twist 90° clockwise to lock.



Connecting Steps

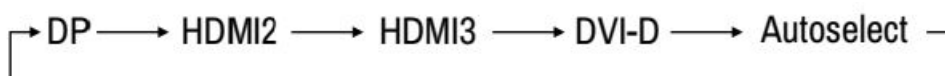


CATx	Connect the TPS output port to the receiver (or the Matrix input board) by a CATx cable via the TPS output port .
DP HDMI DVI-I	Connect the transmitter and the sources using the inputs and VGA / DisplayPort / HDMI / DVI-I / cables.
Audio	Optionally for audio extension: connect the audio source (e.g. 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 RS-232 port of the transmitter.
IR	Optionally for Infrared extension: <ul style="list-style-type: none"> ▪ Connect the IR emitter to the IR OUT port of the transmitter, and/or ▪ Connect the IR detector to the IR IN port of the transmitter.
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.

i *Infrared emitter and detector units are optionally available accessories.*

Video/Audio Input Selection

Desired video/audio input can be selected by the Video/Audio select buttons on the front panel. The input can also be selected by using LDC (Lightware Device Controller), sending a protocol command or using Autoselect. The selection order of the Video inputs is the following:



Front panel Button Functions

- Video input switching: Press the Video select.
- Audio input switching: Press the Audio select.
- Lock/unlock buttons: Press the Audio select and the Show me together.

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.

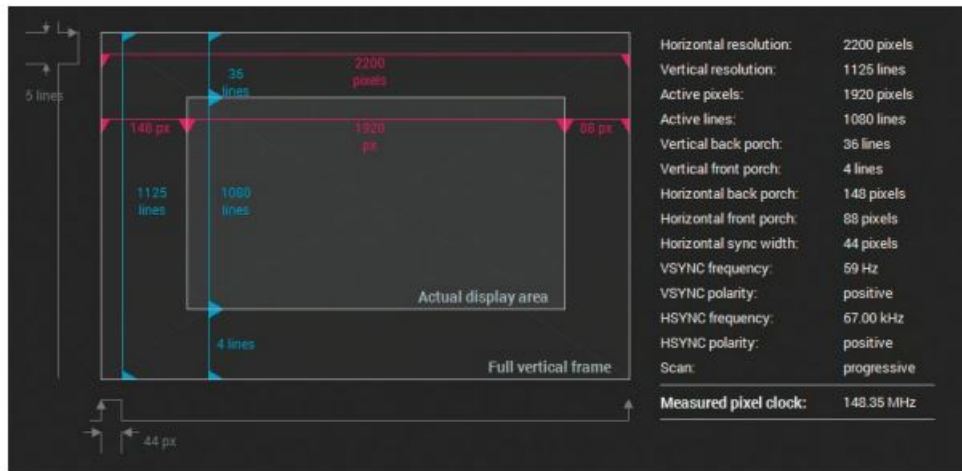
Software Control Using Lightware Device Controller (LDC)



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 following:

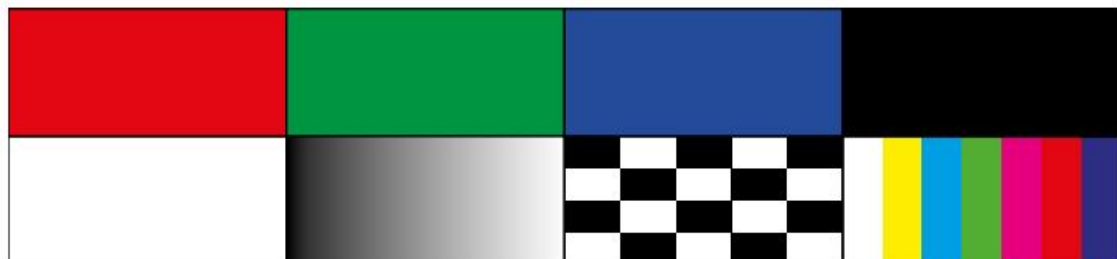
Frame Detector

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



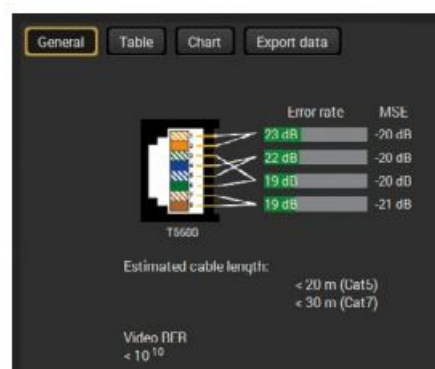
Test Pattern Generator

The output ports can send a special image towards the sink devices for testing purposes. The settings of the test pattern are available via LDC, see the available patterns below:

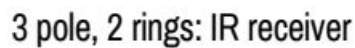
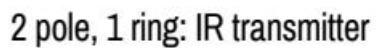


TPS Cable Diagnostics

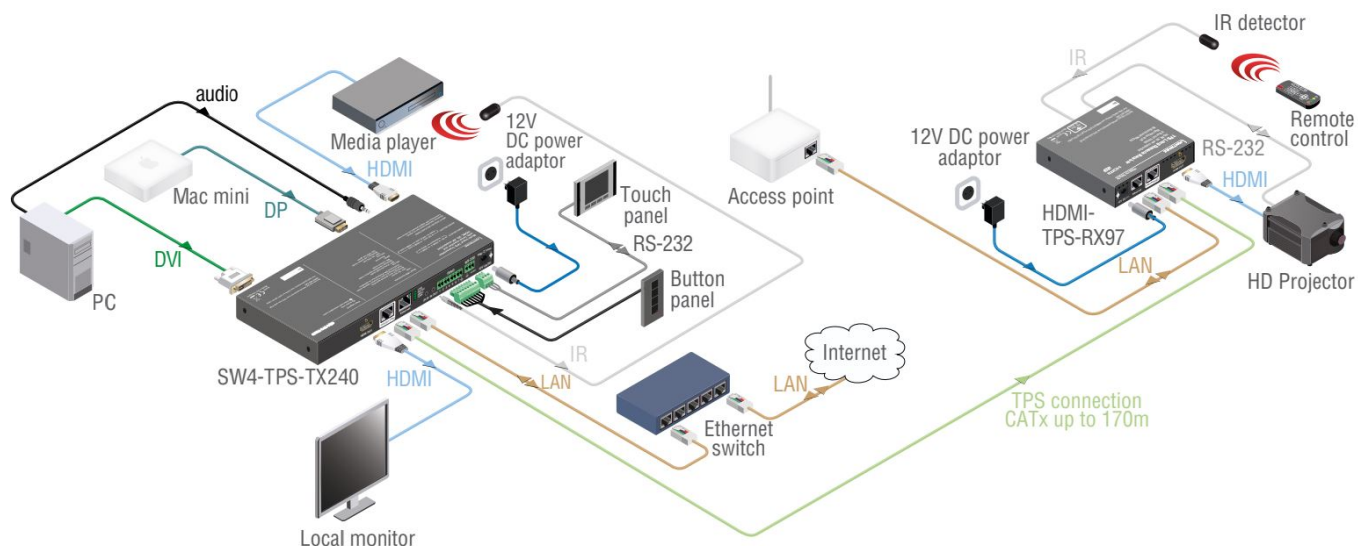
The estimated cable length and the quality of the link are measured periodically and the diagnostic window shows the values in real-time. If the green bars hit the first line in the middle they turn into red. It means the number of the errors – during the extension – is higher than recommended. The link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



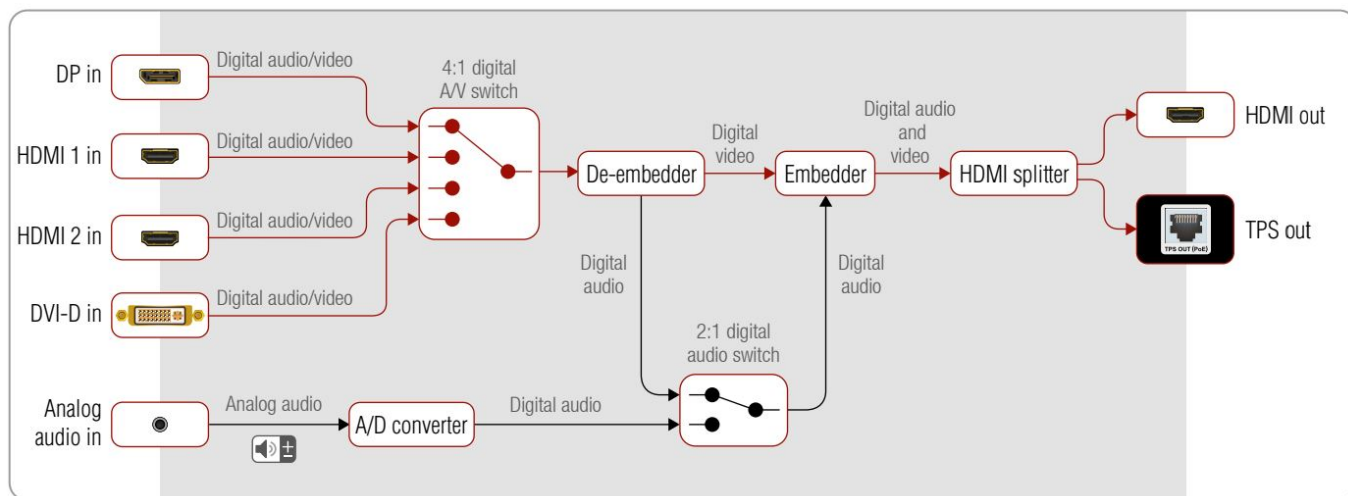
Types of IR Connectors (1/8" TRS / TS)



Typical Application



Port Diagram



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)	DisplayPort input
Autoselect	Disabled
Output TPS mode	Auto
Emulated EDID	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
GPIO output level	High
GPIO direction	Input

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.

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 check the documentation of the connected HDBaseT Compatible device as well.

CAT7 SFTP AWG23 cable is always recommended.

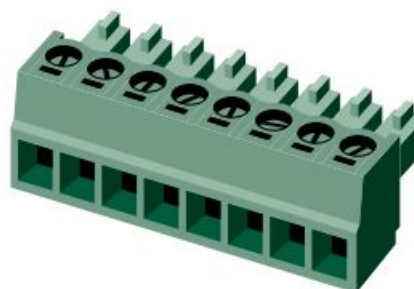
GPIO – General Purpose Input/Output Ports

The seven GPIO pins of the transmitter 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

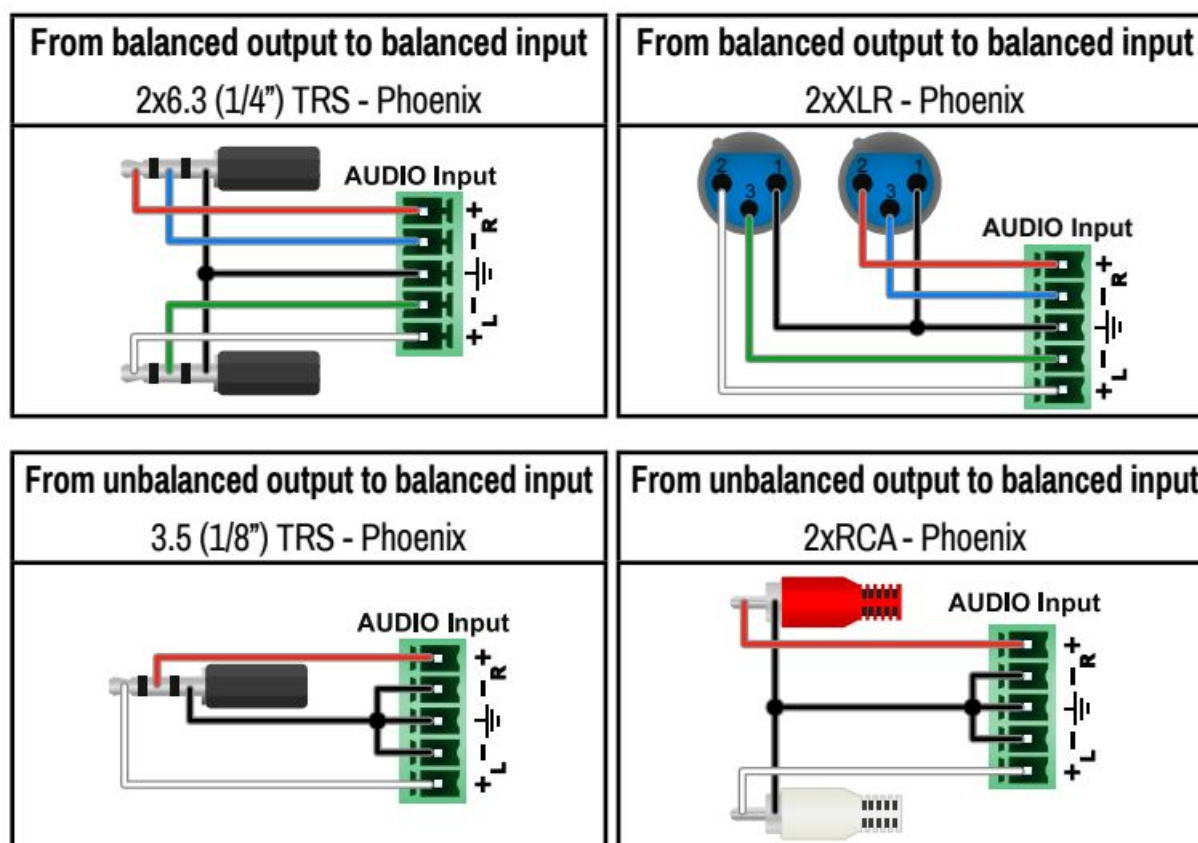
Pin nr.	Signal
1	Configurable
2	
3	
4	
5	
6	
7	
Ground	



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

Audio Cable Wiring Guide

SW4-TPS-TX240 transmitter is built with 5-pole Phoenix input connector. See below a few example of the most common assembling cases.

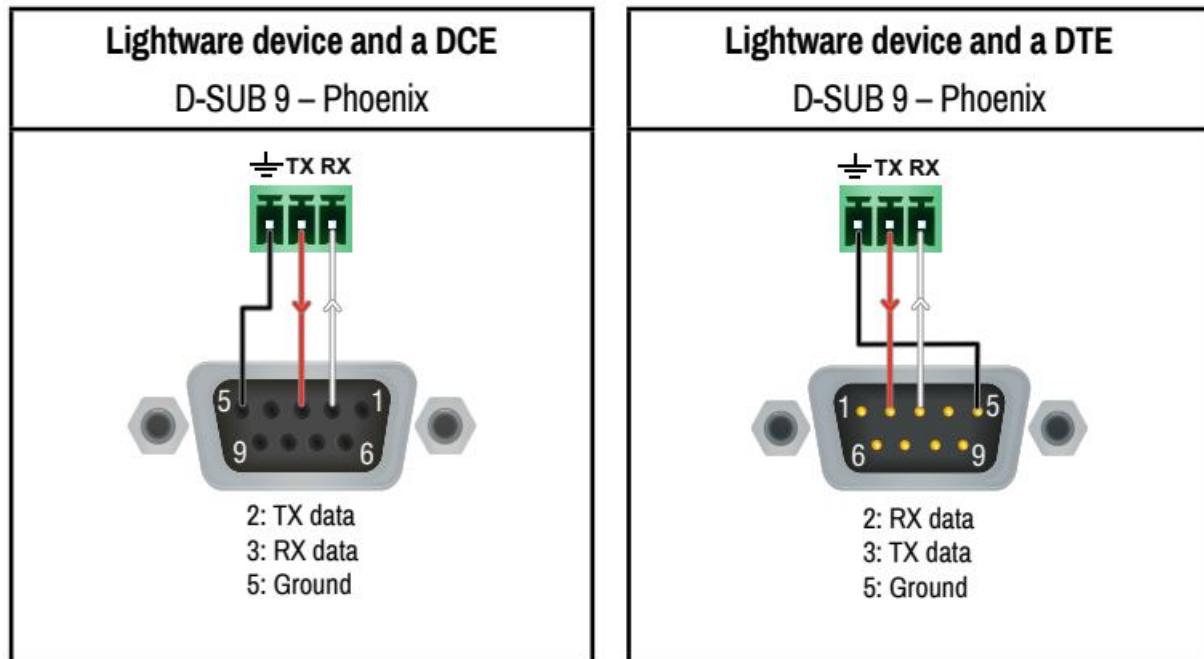


For more information about audio cable wiring see the user's manual of the device or the Wiring Guide on our

website www.lightware.com.

Wiring Guide for RS-232 Data Transmission

The device is 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:



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.

Further information

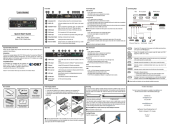
The User's manual of this appliance is available at www.lightware.com.

See the Downloads section on the dedicated product page.

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Documents / Resources

	LIGHTWARE SW4-TPS-TX240 HDBaseT Transmitter [pdf] User Guide SW4-TPS-TX240, SW4-TPS-TX240-Plus, HDBaseT Transmitter, SW4-TPS-TX240 HDBaseT Transmitter
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References

-  [Lightware Visual Engineering](#)
-  [Guides and White Papers](#)

