



LIGHTWARE HDMI-TPS-RX220AK HDBaseT Compatible TPS Receiver with USB KVM User Guide

[Home](#) » [LIGHTWARE](#) » LIGHTWARE HDMI-TPS-RX220AK HDBaseT Compatible TPS Receiver with USB KVM User Guide 

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Contents

- [1 Important Safety Instructions](#)
- [2 Introduction](#)
- [3 Compatible Devices](#)
- [4 Box Contents](#)
 - [4.1 Status LEDs](#)
- [5 Connecting Steps](#)
- [6 Mounting](#)
- [7 Powering Options](#)
- [8 Wiring Guide for RS-232 Data Transmission](#)
- [9 TPS Receiver Concept](#)
- [10 Maximum Extension Distance](#)
- [11 Port Diagrams](#)
- [12 Typical Application Diagram](#)
 - [12.1 Front Panel Control](#)
- [13 Further Information](#)
- [14 Documents / Resources](#)
 - [14.1 References](#)
- [15 Related Posts](#)

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 Lightware HDMI-TPS-RX220AK receiver. The device offers seamless HDBaseT™ integration with additional Lightware product lines and developments, including TPS matrices and 25G boards. The device receives digital video at a resolution up to 4K, as well as audio and control up to 170 meters over a single CAT cable. Furthermore, the device utilizes control over USB KVM, and can be remotely powered over TPS link with PoE (IEEE 802.3af), a useful array of features to further simplify the operation for system integrators and users.

The product is compatible with any third-party HDBaseT™ devices.



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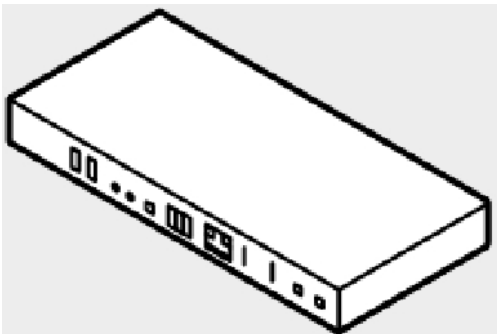
Compatible Devices

The receiver is 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.

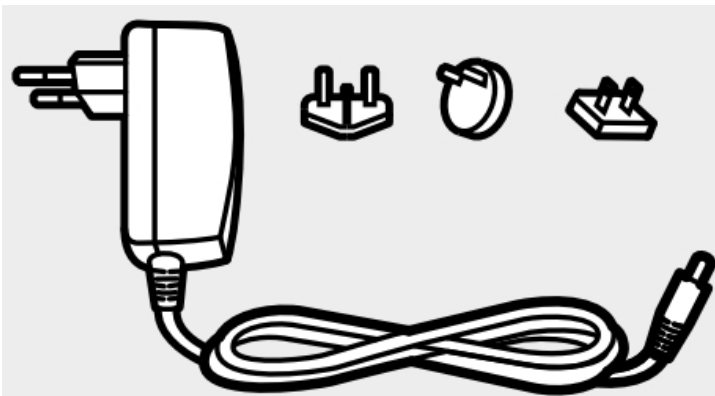
CyberData ***The receiver is PoE-compatible (Power over Ethernet, can be powered remotely via CATx cable) but the device can receive only power and cannot send power to other PoE-compatible devices.***

Box Contents

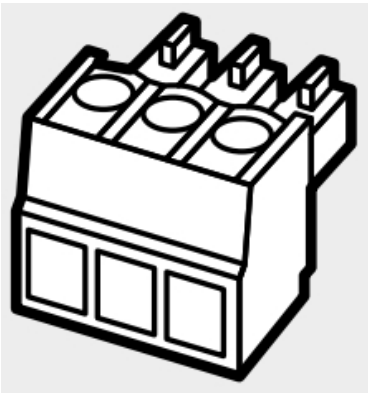
- Receiver unit



- 12V DC adaptor with interchangeable plugs



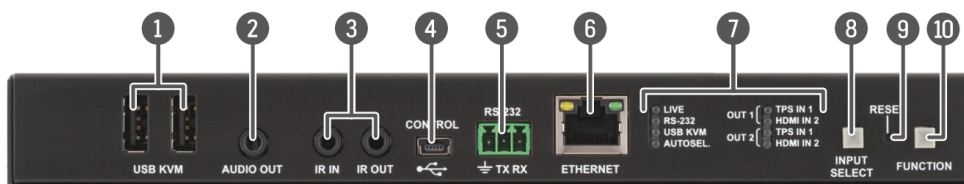
- Phoenix Combicon 3-pole connector



- Safety and warranty info, Quick Start Guide



Front View



1. USB A-type connectors

USB KVM ports for HID-compatible devices (preferably keyboard and mouse).

2. Analog audio output

TRS (3.5mm jack) connector for unbalanced analog audio output.

3. Infrared connectors

2 TRS (3.5mm jack) connectors for Infrared units (IR IN for the detector, IR OUT for the emitter)

4. USB-mini connector

USB interface for LDC connection to control and configure the device.

5. RS-232 connector

3-pole Phoenix connector for serial communication.

6. Ethernet connector

RJ45 connector for remote controlling and firmware upgrade purpose.

7. Status LEDs

LEDs give feedback about the current status of the device, interface ports and the AV crosspoint settings.

8. Input select button

Pushing the button selects video source for HDMI out 1 and 2 ports.

9. Reset button

Pushing the button reboots the unit.

10. Function button

Special functions are available with this button (bootload mode, DHCP settings, restore factory default settings, condition launching in Event Manager).



Infrared emitter and detector units are optionally available accessories.

Status LEDs

LIVE

- OFF: device is not powered.
- BLINKING (slow; 1 sec): device is powered and operational.
- BLINKING (fast; 0,5 sec): device is in bootload (firmware upgrade) mode.
- ON: device is powered but not operational.

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.

USB KVM

- OFF: USB is not enumerated.
- ON: USB is enumerated.

AUTOSEL. (AUTOSELECT)

- OFF: Autoselect function is not active.
- ON: Autoselect is enabled on any input.

Input Select LEDs

- OFF: Input is not selected.
- BLINKING: Input is selected but no signal is present.
- ON: Signal is present on the selected input.

Rear View



1. 12V DC input connector

12V DC input for local powering.

2. TPS input port

TPS input port for the compatible transmitter device (extender / matrix / board).

3. HDMI input port

HDMI input port for DVI or HDMI signal. Connect an HDMI cable between the receiver and the source device.

4. HDMI out 1 port

HDMI output 1 port for the sink device. The source of the port can be selected with the Input Select button.

Connect HDMI cables between the receiver and the sink devices.



5. HDMI out 2 port

HDMI output 2 port for the sink device. The source of the port can be selected with the Input Select button.

Connect HDMI cables between the receiver and the sink devices.

Rear Panel LEDs

• TPS Input LEDs

-  ON: remote power receiving (PoE) is active.
-  OFF: no TPS link between transmitter and receiver.
- BLINKING: device is in low power mode or in Ethernet fallback mode.
- ON: TPS link is active.

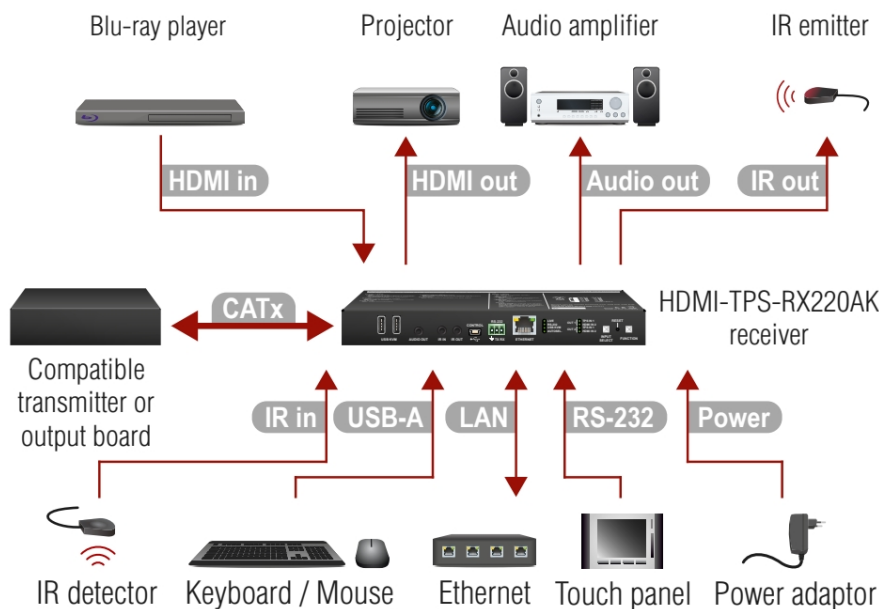
HDMI Input / Output – SIGNAL LED

- OFF: input or output signal is not present or muted.
- ON: signal is present.

HDMI Output – HDCP LED

- OFF: output signal is not HDCP-encrypted.
- BLINKING: non-HDCP capable device is connected, encrypted signal is replaced with red screen.
- ON: output signal is HDCP-encrypted.

Connecting Steps



- **CATx** Connect the receiver and the TPS transmitter/matrix output board by a CATx cable via the TPS connector.
- **HDMI in** Connect the receiver and the HDMI source device (e.g. Blu-ray player) by a HDMI cable via the HDMI input port.
- **HDMI out** Connect the sink devices (e.g. projector) to the HDMI output 1 and 2 ports by HDMI cables.
- **Audio out** Optionally for analog audio output: connect an audio device (e.g. audio amplifier) to the analog audio output port by an audio cable.
- **IR in** Optionally for Infrared extension:
- **IR out**
 - Connect the IR emitter to the IR OUT port of the receiver, and/or
 - Connect the IR detector to the IR IN port of the receiver.
- **USB-A** Optionally for USB HID extension: connect the USB HID devices to the receiver (preferably mouse and keyboard).
- **LAN** Optionally connect the receiver to a LAN in order to control the device.
- **RS-232** Optionally for RS-232 extension: connect a controller/controlled device (e.g. touch panel) to the RS-232 port.
- **Power** Connect the power adaptor to the DC input on the receiver first, then to the AC power socket.



See the available powering options of the receiver on the Powering Options section on the other side.

Mounting

To mount the receiver Lightware supplies optional accessories for different usage. There are two kinds of mounting kits with similar fixing method. The receiver 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



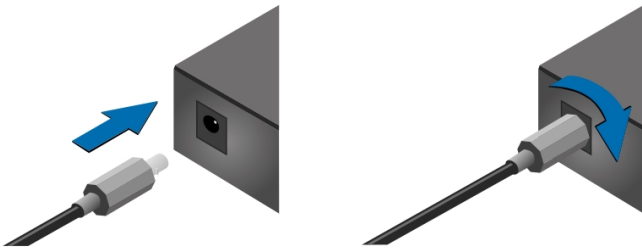
1U high rack shelf

The Under-desk double mounting kit makes easy to mount a single device on any flat surface, e.g. furniture. The 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 receiver is half-rack sized

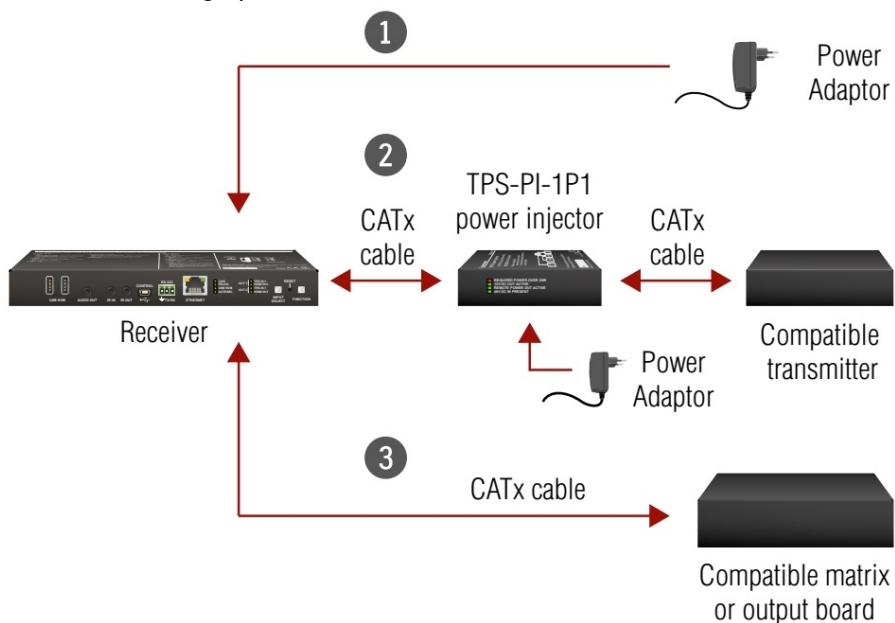
Locking DC Plug

Twist 90° clockwise to lock.



Powering Options

Power: Powering options



1. Using local PSU

Connect the power adaptor to the DC input on the receiver first, then to the AC power socket.

2. Using PoE with connecting a transmitter:

Connect the TPS IN (PoE) port of the receiver to the TPS+PoE output port of the TPS-PI-1P1 power injector by a CATx cable as well as connect the TPS output port of the transmitter to the TPS port of the TPS-PI-1P1 by a CATx cable.

3. Using PoE with connecting a matrix switcher or an output board

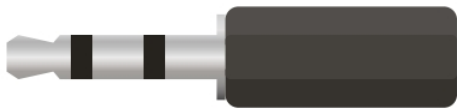
Connect the TPS IN (PoE) port of the receiver to the PoEcompatible TPS output port of the matrix or output board by a CATx cable.

i In case of connecting the receiver to an output board of the matrix always connect an external PSU to the board. For the detailed information please read the user's manual of the matrix.

i The Ethernet port does not support PoE. Only the TPS port support PoE function.

i If both remote and local power sources are connected, the remote power will be used.

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



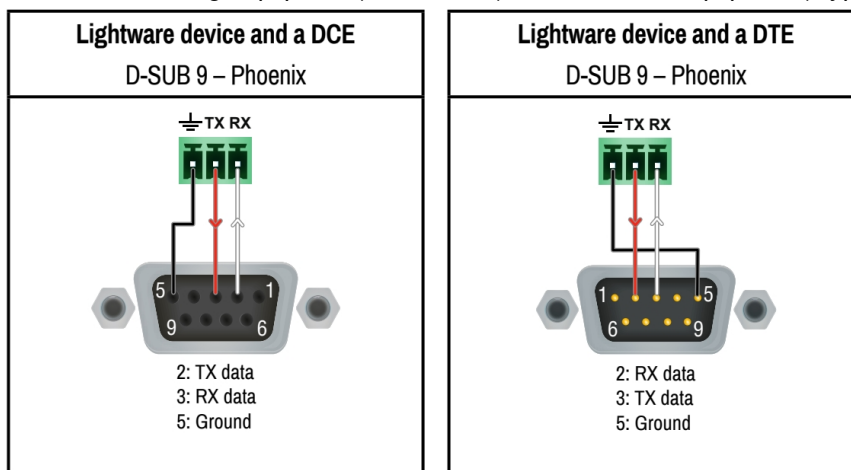
3 pole, 2 rings: IR receiver



2 pole, 1 ring: IR transmitter

Wiring Guide for RS-232 Data Transmission

The receiver is built with 3-pole Phoenix connector. See the examples below 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.

TPS Receiver Concept

HDMI-TPS-RX220AK is a multifunctional TPS receiver with audio de embedding function and USB KVM feature. The device receives audio/video, Ethernet, RS-232 and Infrared signals via the TPS input port and can be powered by another extender due to the PoE capability. The receiver can be controlled via USB, Ethernet, RS-232 or Infrared and is able to control thirdparty devices via the RS-232, Ethernet, Infrared and USB KVM.

Maximum Extension Distance

Resolution	Pixel clock rate	Cable lengths (Auto I Long reach TPS mode)		
		CAT5e AWG24	CAT7 AWG26	CAT7 AWG23
1024×768@60Hz	65 MHz	100 m / 130 m*	90 m / 120 m*	120 m / 170 m*
1280×720p@60Hz	73.8 MHz	100 m / 130 m*	90 m / 120 m*	120 m / 170 m*
1920×1080p@60Hz (24bpp)	148.5 MHz	100 m / 130 m*	90 m / 120 m*	120 m / 170 m*
1920×1200@60Hz	152.9 MHz	100 m / NA	90 m / NA	120 m / NA
1600×1200@60Hz	162 MHz	100 m / NA	90 m / NA	120 m / NA
1920×1080@60Hz (36bpp)	223 MHz	70 m I NA	70 m / NA	100 m / NA
3840×2160@30Hz UHD	297 MHz	70 m I NA	70 m / NA	100 m / NA
4096×2160@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

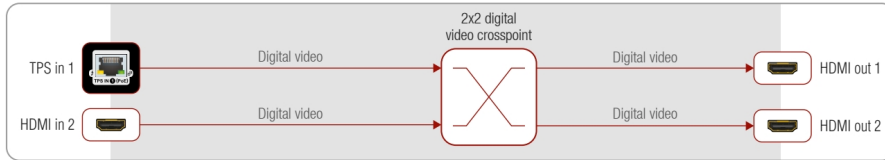
extension distances, please also check the documentation of the connected TPS device.



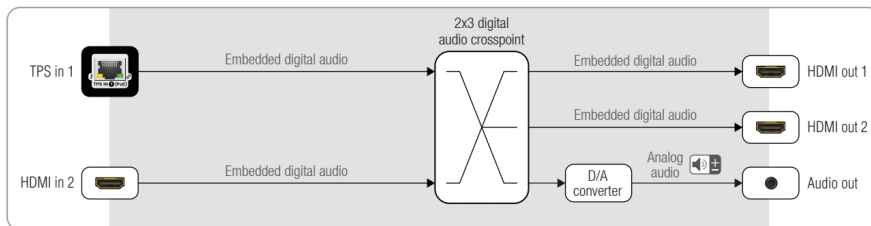
CAT7 SFTP AWG23 cable is always recommended.

Port Diagrams

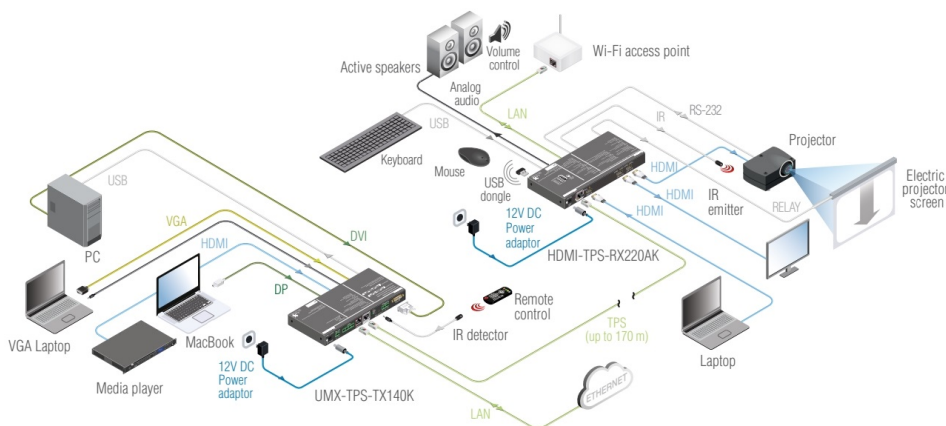
Video Port Diagram



Audio Port Diagram



Typical Application Diagram



Front Panel Control

Set dynamic IP address

1. Keep the Function 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. Restore Factory Default Settings
3. Keep the Function button pressed for 10 seconds; after 5 seconds front panel LEDs start to blink but keep the button pressed; the LEDs start to blink faster 5 seconds later.
4. Release the button, then press it 3 times quickly; the following factory default settings are restored:

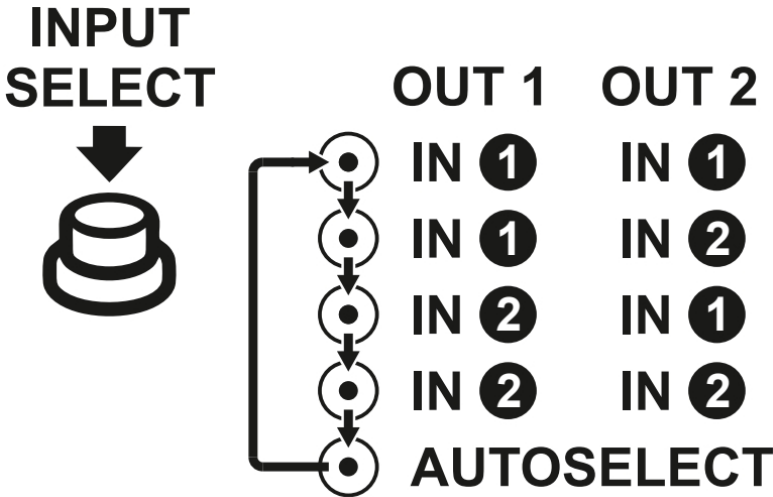
Network settings	
IP address (static)	192.168.0.100
Subnet mask	255.255.255.0
Static gateway	192.168 0.1
DHCP	Disabled
TCP/IP port nr. LW2 I LW3	10001 16107

Video crosspoint settings	
01 (HDMI out 1)	11 (TPS in 1)
02 (HDMI out 2)	12 (HDMI in 2)
Video port properties	
Autoselect	Disabled
Input TPS mode	Auto
Emulated EDID on the inputs	Factory #47: Universal HDMI PCM
Audio switcher setting	

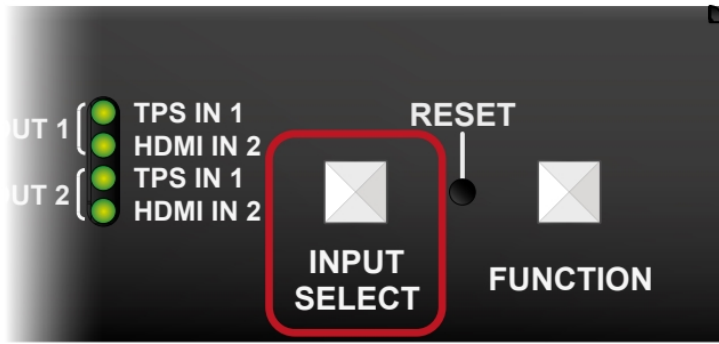
03 (Analog audio out)	11 (de-embedded audio stream of TPS in 1)
Analog audio output port properties	
Volume	0.00 dB (100%)
Balance	0 (center)
RS-232 settings	
RS-232 mode	Passthrough
Control protocol	LW2
Port setting	57600 BAUD, 8, N, 1
Command injection port (local/link)	800118002

Input Selection for the HDMI Output Ports

The source signal for the HDMI output ports can be selected by pushing the Input Select button. Five preprogrammed crosspoint states can be applied:

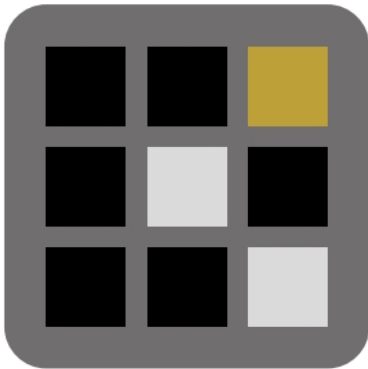


1x short press



Software Control – Using Lightware Device Controller (LDC)

The device can be controlled from a computer through the Ethernet, USB or RS-232 ports 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.



i The IP address of the unit is static (default): 192.168.0.100., DHCP is disabled.

Further Information

The User's manual of this appliance is available on www.lightware.com. See the Downloads section on the dedicated product page.

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Doc. ver.: 1.1

19200209

Documents / Resources

	LIGHTWARE HDMI-TPS-RX220AK HDBaseT Compatible TPS Receiver with USB KVM [pdf]] User Guide HDMI-TPS-RX220AK, HDBaseT Compatible TPS Receiver with USB KVM, HDMI-TPS-RX220 AK HDBaseT Compatible TPS Receiver with USB KVM
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References

-  [Lightware Visual Engineering](#)

Manuals+.