LIGHTWARE
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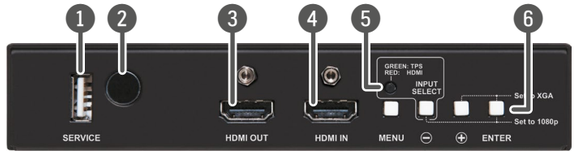
Quick Start Guide

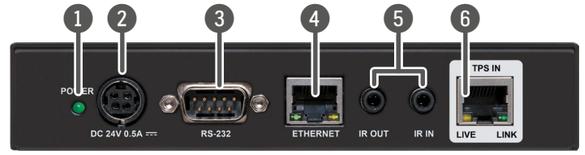
HDMI-TPS-RX120-HDSR

Front View



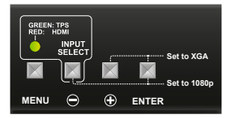
1	**USB Port**	The port is used to perform a firmware upgrade only.
2	**IR Sensor**	Receiving the IR signals from the supplied remote controller.
3	**HDMI Output**	Connect an HDMI cable between the receiver and the display device.
4	**HDMI Input**	Connect an HDMI cable between the HDMI source and the receiver unit.
5	**Input LED**	Green: TPS input is switched to the output. Red: HDMI input is switched to the output.
6	**Front Panel Buttons**	The buttons can be used for OSD menu navigation and fast output format change (see the details below).

Rear View



1	**Power LED**	If the LED lights, the device is powered and ready to use.
2	**DC 24V Input**	24V DC input for local power supply.
3	**RS-232 Port**	Local RS-232 port for bidirectional serial data communication; see the **RS-232 Communication** section.
4	**Ethernet**	The Ethernet data is passed through the device between the Ethernet and the TPS port.
5	**IR Ports**	IR input/output connectors (3.5 mm Jack).
6	**TPS Input**	TPS input port for connecting a compatible device.

Front Panel Buttons



MENU Button

- Displaying/hiding the OSD menu (HDMI output).

⊖ Button

- Moving left in the main menu, moving up in a submenu, or decreasing the value of a parameter.
- Toggle the input ports: when the OSD is not displayed, the other input can be selected.

⊕ Button

- Moving right in the main menu, moving down in a submenu, or increasing the value of a parameter.

Enter Button

- Selecting a menu/submenu item, or saving the value of a parameter.

Button Combinations

- ⊖ and Enter: changing the output resolution to 1920x1080p60 (Full HD) immediately.
- ⊕ and Enter: changing the output resolution to 1024x768p60 (XGA) immediately.

Important Safety Instructions

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

Introduction

HDMI-TPS-RX120-HDSR is a TPS receiver with a local HDMI input and a built-in HD video scaler. Conversion between common formats and frame rates are supported. One common resolution can be used across a system independently of the connected displays requirement, which improves general performance.

The connected display receives continuous HDMI signal thanks to the scaler, thus eliminating annoying warnings and longer interruptions when switching the input signal.

Compatible Devices

The receiver is compatible with other Lightware TPS devices, TPS and TPS2 output boards, as well as third-party HDBaseT-extenders, displays, but not compatible with the phased out TPS-90 extenders.

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

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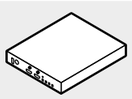
Box Contents



Receiver unit

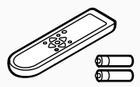
External Power Supply Unit (24V / 2.7A)

IEC power cable

Safety and Warranty info, Quick Start Guide

Optional Accessory

The following accessory can be purchased separately:

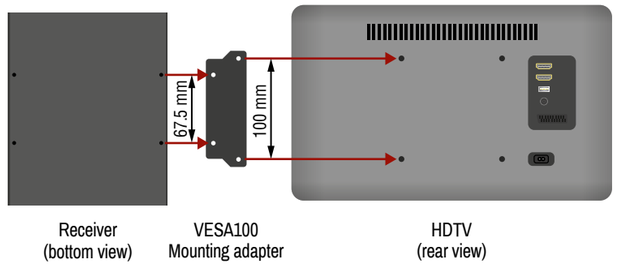


Remote Control unit with AAA battery (2x)

⚠ ***Batteries shall not be exposed to excessive heat such as sunshine, fire or the like.***

Mounting Options

The receiver can be mounted by the optional VESA100 Mounting adapter (please contact sales@lightware.com). See the below example about the application:

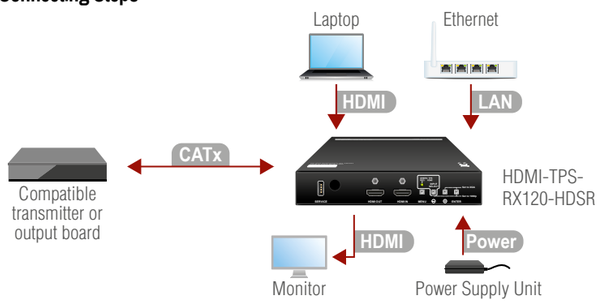


Receiver (bottom view) | VESA100 Mounting adapter | HDTV (rear view)

Two mounting holes can be found at the bottom of the receiver at each side, the Mounting adapter can be fixed as indicated. The other two holes of the plate can be fixed to a VESA-mounting compatible device (e.g. rear panel of an HDTV).

ℹ *The VESA100 Mounting adapter can be used to fix the receiver e.g. under the desk.*

Connecting Steps



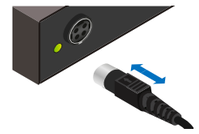
CATx	Connect a CATx cable between the receiver and a compatible transmitter or output board.
HDMI	Connect a monitor to the HDMI output port.
HDMI	Optionally connect a HDMI source (e.g. laptop) to the HDMI input port.
LAN	Optionally connect the receiver to an Ethernet switch by a CATx cable.
Power	Connect the attached PSU to the receiver and then to the power socket.

Powering Options

⚠ ***The receiver cannot be powered remotely, always use the supplied power adaptor. Warranty is void if damage occurs due to use of a different power source.***

Locking DC Connector

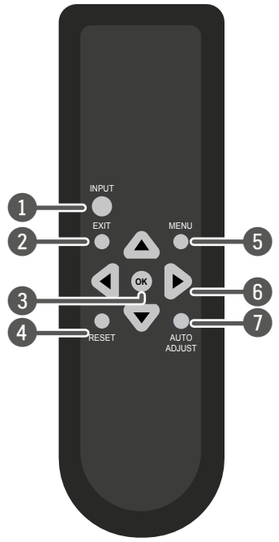
The DC connector has a small latch which helps to avoid an unwanted power disconnection – push the plug until it stops. Be careful when disconnecting the DC plug from the connector, do not pull it by grabbing the cable, always grab the movable plastic angular housing as indicated in the figure.



Bi-directional Pass-through Data Lines

The direction of the video extension is fixed from the transmitter side towards to the receiver but the pass-through data lines are bi-directional. Thus, RS-232, IR, Ethernet source and sink devices can be connected either to the TX or to the RX and the signal is transmitted to the other extender.

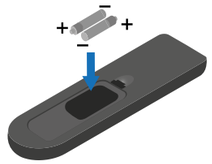
Remote Control Unit (Optional Accessory)



1	Input selector
2	Exit from the current menu/parameter
3	OK button to save the actual setting
4	Reserved
5	Displaying the OSD menu
6	Menu navigation buttons
7	Reserved

Installing the AAA Batteries

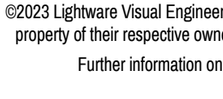
Pay attention to the polarity of the batteries as shown in the figure.



About the IR Extension

The IR input and output ports receives/sends baseband IR signal, no modulation/demodulation is done. These ports are suitable for wired IR connections mostly.

IR Port Pinout (Applicable Plugs)



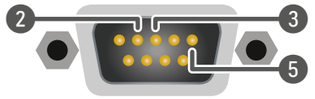
	IR Input	IR Output
1	IR signal	Power
2	Power	IR signal
3	Ground	Ground

⚠ ***The IR Transmitter and Receiver units supplied with other Lightware devices cannot be connected to the receiver directly.***

RS-232 Communication

The serial data coming from the TPS line is passed through to the RS-232 port and vice versa. If the incoming command is known by the receiver, it will be processed. Please note that in such cases the response from the receiver will be sent to the sender only. E.g. if a command is sent from the local RS-232 port, the response would not be sent over the TPS line but appear only at the local RS-232 port.

RS-232 Port Pinout



2	Tx data
3	Rx data
5	Ground

TAKE CARE OF ME

I AM THE ONE AND ONLY USER DOCUMENT FOR THIS PRODUCT

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support@lightware.com +36 1 255 3810

Further information on the device is available at www.lightware.com.

Doc. ver.: 1.4

19210101

RS-232 Commands

Below listed commands can be used to query or control the receiver. The commands can be sent via the local RS-232 port or via the TPS line. Please check the serial port settings which are fixed in the device:

Baud rate: 9600; **data bit**: 8 bits; **parity**: none; **stop bit**: 1

ℹ *Connect a cross-link serial cable between the receiver and a computer.*

Protocol Description

- The commands must be followed by Carriage return and Line feed (<CR><LF>).
- The parameters can be **queried (read)** by the **'R'** letter in each case.
- The parameters can be **set** by the **'S'** letter.
- The commands are **not** case-sensitive.
- The ● symbol means the space character in below examples.

Querying a Parameter

	Format		Example
Command	R●<command><CR><LF>	→	R OUTPUT
Response	<command>=<current_setting><CR><LF>	←	OUTPUT=12

Setting a Parameter

	Format		Example
Command	S●<command>●<new_setting><CR><LF>	→	S OUTPUT 8
Response	<command>=<new_setting><CR><LF>	←	OUTPUT=8

Querying the Status of the Current Settings

	Format		Example
Command	R●STATUS<CR><LF>	→	R STATUS
Response	ST<status_parameters>	←	ST2x122000002xx

Explanation

Response	Parameter	Description
2	[SOURCE]	TPS input is selected
x	reserved	
12	[OUTPUT]	output resolution is 1600x1200p60
2	[ASPECT]	image aspect is 'best fit'
0	[AUDIO DELAY]	no audio delay
0	[AUDIO MUTE]	audio is unmuted
0	[KEY LOCK]	front panel buttons are unlocked
0	[EDID TYPE]	current EDID does not support audio
0	[HSYNC SHIFT]	H sync shift is off
2	[INFO DISPLAY]	input info is always displayed (OSD)
x	reserved	
x	reserved	

ℹ *The response values are single Bytes except in the case of the [OUTPUT] which is always a double Byte, eg. '12'.*

List of RS-232 Commands

ℹ *The underlined values mean the default settings.*

Selecting the Input

SOURCE <set>	**1** = HDMI	**2** = TPS

Setting the Output Resolution (RGB, YUV)

OUTPUT <set>	**0** = native **1** = 640x480@60 **2** = 800x600@60 **3** = 1024x768@60 **5** = 1360x768@60 **6** = 1280x720@60 **7** = 1280x800@60 **8** = 1280x1024@60	**9** = 1440x900@60 **10** = 1400x1050@60 **11** = 1680x1050@60 **12** = 1600x1200@60 **13** = 1920x1080@60 **16** = 1920x1200@60 **17** = 720x480p60 **18** = 1280x720p60	**19** = 1920x1080p60 **20** = 1920x1080p60 **22** = 720x576p50 **23** = 1280x720p50 **24** = 1920x1080p50 **25** = 1920x1080i50

ℹ *The preferred resolution of the last attached sink will be the default when connected.*

Setting the Aspect Ratio of the Output Signal

ASPECT <set>	**1** = stretch/full **2** = best fit	**3** = fit width **4** = fit height	**5** = 14:9 **6** = 1 to 1 and center

Setting the Audio Delay

AUDIO DELAY <set>	**0** = off **1** = 40 ms	**2** = 110 ms **3** = 150 ms

Muting the Audio

AUDIO MUTE <set>	**0** = unmuted	**1** = muted

Hsync Shifting (for Compatibility Reasons)

HSYNC SHIFT <set>	**0** = off	**1** = on

Locking the Front Panel Buttons

KEY LOCK <set>	**0** = unlocked	**1** = locked

ℹ *When the keys are locked the RS-232 commands can be used only for querying the parameters. Modification is not possible, only the 'S KEY LOCK 1' setting command is accepted.*

Querying the Type of the Current EDID

EDID TYPE <set>	**1** = stereo LPCM	**2** = multichannel

Querying the Type of the Device (for LW2 Protocol Compatibility)

{i}	response: (I:HDMI-TPS-RX120-HDSR)

Setting the Visibility of the Input Port Status Info (OSD, Top Left Corner)

INFO DISPLAY <set>	**0** = off	**1** = 5 sec	**2** = always on

Querying the Current Firmware Version

FW	note: R/S prefix is not necessary

Reloading the Factory Default Values

S RESET 1

Firmware Upgrade

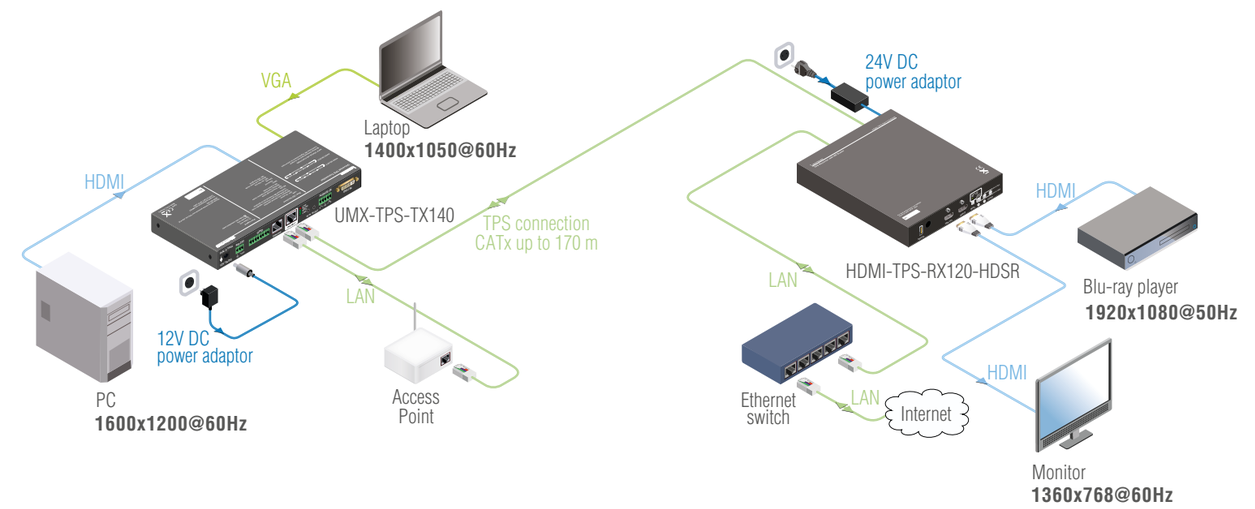
To have the latest firmware running in your device, please do the followings:

1. Contact Lightware Support to get the latest firmware file.
2. Copy the firmware file to an USB flash drive. Make sure that the file system is FAT/FAT32 and the name of the firmware file is **MSTFLASH_FILE_CH_521RX.bin**.
3. Disconnect the power supply unit from the receiver.
4. Insert the pen drive into the **USB service** port of the receiver.
5. Press the **Menu** button and keep it pressed.
6. Connect the power supply to the receiver. The device is powered on, the upgrade is started while the front panel **Input LED** lights in red; release the **Menu** button.
7. After cca. 30 seconds later the process is finished the front panel **Input LED** is blinking in green/red and the **Power LED** also blinks.
8. Unplug the power supply remove the USB pen drive and reconnect the PSU again.

Factory Default Settings

Selected input	TPS input port
Output size	Best fit
Audio	unmuted, 40 ms delay
Front panel buttons (key lock)	unlocked
Input port status info display (OSD)	off
Emulated EDID type at the input port	audio supported (stereo LPCM)
RS-232 port setting (device control)	9600 BAUD, 8, N, 1

Typical Application



Supported Resolutions (HDMI Input Port)

640x480**p**60/72/75	720x576**i**50	1600x1200**p**60
800x600**p**56/60/72/75	1024x768**p**60/70/75	1680x1050**p**60 *
720x480**p**60	1280x720**p**50/60	1920x1080**p**50/60
720x480**i**60	1280x800**p**60	1920x1080**i**50/60
720x576**p**50	1280x1024**p**60/75	1920x1200**p**60

* with reduced blanking

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

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

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.*

Error Responses

When undefined value is sent (e.g. S SOURCE 9) the response will be ERROR. Unknown and insufficient commands are not processed, response is not sent.

The Handling of the Batteries

Use only standard batteries. Do not use new and used batteries together. This may cause a battery to break or leak and may cause fire, injury, or contamination (damage). When replacing the batteries, insert them with right polarity. Otherwise, the battery may become damaged or it may cause fire, personal injury or damage due to leakage of the internal liquid. The batteries (and rechargeable batteries) are not ordinary refuse and must be returned for recycling purposes. The customer is responsible for returning the used or rechargeable batteries for recycling. Be careful that children do not place the batteries in their mouths when removed from the remote control. Place the battery in a location that children or infants cannot reach.

Correct Disposal of Batteries in this Product

This marking on the battery indicates that the batteries in this product should not be disposed of with other household waste at the end of their working life. Where marked, the chemical symbols Hg, Cd or Pb indicate that the battery contains mercury, cadmium or lead above the reference levels in EC Directive 2006/66. If batteries are not properly disposed of, these substances can cause harm to human health or the environment. To protect natural resources and to promote material reuse, please separate batteries from other types of waste and recycle them through your local, free battery return system.

Software Control – Using Lightware Device Controller

The device can be controlled from a computer using the Lightware Device Controller (LDC) software. The application is available at www.lightware.com (Product Families / Software menu). Install the software it on a Windows PC or a Mac OS X and connect to the device as follows.

Connecting via the RS-232 Port

1. Connect a computer to the RS-232 port of the receiver by a **cross-link serial cable**.
2. Launch the **LDC** software and select the **Serial Devices** tab.
3. Press the **Query** button of the given COM port, select the device and press the **Connect** button.

Connecting via the TPS Line to an MX-FR Matrix Switcher (TPS Output Board)

1. Connect the receiver to an MX-FR matrix with TPS output port.
2. Connect the matrix to a LAN and connect a computer to the same LAN.
3. Start the LDC software and connect to the matrix listed at Ethernet Devices tab.
4. Open the **Port properties** panel of the given TPS output port and press the **Open remote device settings** button at the bottom of the window.

Specifications

General

Compliance	CE, UKCA
EMC (Emission)	EN 55032:2015+A1:2020
EMC (Immunity)	EN 55035:2017+A11:2020
Electrical safety	EN 62368-1:2020
RoHS	EN 63000:2018
Warranty	3 years
Operating temperature	0° to +50°C (+32° to +122°F)
Operating humidity	10% to 90%, non-condensing
Cooling	passive

Power

Power supply option	power adaptor
Power consumption	12W
Heat dissipation	41 BTU/h

Power adaptor

Supported power source	100-240 V AC; 50/60 Hz
Supplied power	24V DC, 2.7A
Power over TPS	no

Enclosure

Enclosure material	1 mm steel
Dimensions in mm	190.5 W x 191.7 D x 30 H
Dimensions in inch	7.5 W x 7.6 D x 1.2 H
Weight	985 g

TPS Input (HDBaseT™-compatible)

Connector type	RJ45
Ethernet pass-through	yes
RS-232 pass-through	yes
IR pass-through	yes

Video Input and Output

Connector types	19-pole HDMI Type A receptacle
A/V standards	DVI 1.0, HDMI 1.3
HDCP compliant	yes
Color space	RGB, YCbCr
Deep color support (output)	converted to 8 bit / color
Supported resolutions	up to 1920x1200@60Hz, 1920x1080@60Hz
EDID support	two built-in EDIDs (stereo / AC3 support)
Cable length (HDMI input port)	max. 30 m
Video latency	2-3 frames (=33..50 ms @ 60Hz)