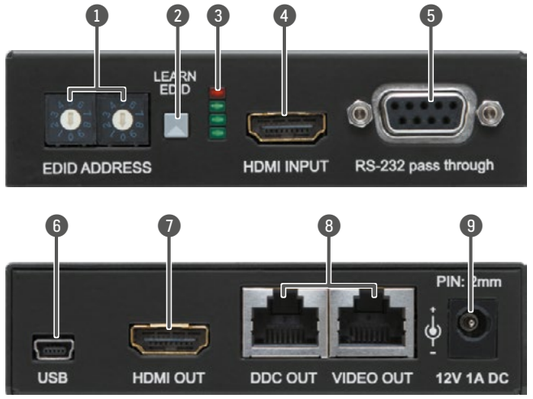
visual engineering
LIGHTWARE

Quick Start Guide

DVI-HDCP-TP-TX50, -TX100R
DVI-HDCP-TP-RX50, -RX100R
HDMI-TP-TX50, -TX100R, -TX200R
HDMI-TP-RX50R, -RX100R, -RX100RA, -RX200R

Front and rear views - Transmitter



For lower resolutions, with a maximum pixel clock frequency of 165 MHz and if RS-232 transmission and remote power is not necessary, one CAT cable is enough - connected to VIDEO OUT.

Legend - Transmitter

1	**EDID rotary switches**	The rotary switches select one of the EDID memory addresses.
2	**Learn button**	Stores the EDID of the display device attached to the output in the selected memory address, or toggle LED functions.
3	**Status LEDs**	The LEDs give feedback about the state of units and video signal.
4	**HDMI input**	Connect one HDMI cable between the HDMI source and the transmitter unit.
5	**RS-232 port**	9-pole D-sub female connector. Connect a serial cable between the transmitter unit and the desired serial device.
6	**USB port**	USB interface for firmware upgrade and LDC connection.
7	**HDMI output**	Connect one HDMI cable between the local display device and the transmitter unit.
8	**CATx outputs**	Connect one or two CATx cables between the transmitter and the receiver (or Lightware Hybrid Matrix equipped with twisted pair input cards).
9	**DC 12V input**	Connect the output of the supplied 12V DC power adaptor or use Lightware's rack mountable power supply unit.

Status LEDs

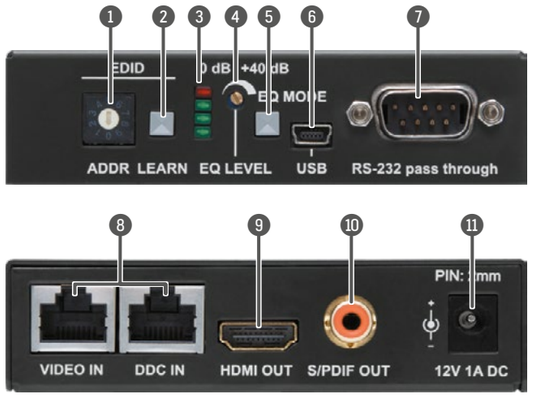
	RX100RA, RX200R and RX200R	
	ON	**BLINKING**
LED1	HDCP-encrypted content	Selected EDID is invalid
LED2	HDMI signal is present	Selected EDID is valid
LED3	Signal detected	Hotplug detected on HDMI OUT(1)
LED4	RX: Auto EQ mode is ON TX: Source connected	RX100: - RX200: Hotplug detected on OUT2 TX200: Hotplug detected on CATx

LED1
LED2
LED3
LED4

	RX100R		TX100R	
	ON	**BLINKING**	**ON**	**BLINKING**
LED1	Manual cable EQ is ON	Firmware main version	Selected EDID is invalid	EDID learn failure
LED2	Auto cable EQ is ON	Firmware sub version	Selected EDID is valid	EDID learn success
LED3	Signal detected	-	Hotplug detected	-
LED4	Hotplug detected	-	Source connected	-

LED functions (ON/BLINKING) can be toggled by pressing the LEARN button.

Front and rear views - Receiver



The extenders do not have networking capabilities. Do not connect the RJ45 ports of the extenders to a Local Area Network device or a PC. Doing so may damage the unit!

Legend - Receiver

1	**EDID rotary switch**	The rotary switch selects one of the EDID memory addresses.
2	**Learn button**	Stores the EDID of the display device attached to the output in the selected memory address, or toggle LED functions.
3	**Status LEDs**	The LEDs give feedback about the state of units and video signal.
4	**EQ level adjust**	The potentiometer can be used to precisely set the right amount of equalization in manual EQ mode.
5	**EQ mode selector button**	Toggles between automatic and manual EQ mode. The EQ mode status LEDs indicate which mode is currently active.
6	**USB port**	USB interface for firmware upgrade and LDC connection.
7	**RS-232 port**	9-pole D-sub male connector. Connect a serial cable between the transmitter unit and the desired serial device.
8	**CATx input**	Connect one or two CATx cable(s) between the trasmitter and the receiver (or Lightware Hybrid Matrix equipped with twisted pair output cards).
9	**HDMI output**	Connect one HDMI cable between the local display device and the transmitter unit.
10	**S/PDIF output**	Standard RCA receptacle for digital coaxial audio output.
11	**DC 12V input**	Connect the output of the supplied 12V DC power adaptor or use Lightware's rack mountable power supply unit.

Maximum twisted pair distances

Resolution	Pixel clk freq. (MHz)	RX/TX50 series			RX/TX100-200 series		
		Cat5e UTP	Cat6 FTP	Cat7 S/FTP	Cat5e UTP	Cat6 FTP	Cat7 S/FTP
640x480	25.2	60 m	75 m	85 m	65 m	75 m	80 m
800x600	40.0	60 m	65 m	75 m	65 m	70 m	75 m
1024x768	65.0	55 m	65 m	75 m	60 m	65 m	75 m
1280x720p	74.4	55 m	65 m	75 m	60 m	65 m	75 m
1920x1080i	74.4	50 m	65 m	75 m	60 m	65 m	75 m
1280x1024	108.2	50 m	65 m	70 m	50 m	65 m	70 m
1400x1050	122.1	45 m	65 m	70 m	40 m	65 m	70 m
1920x1080p	149.1	30 m	55 m	65 m	30 m	60 m	65 m
1920x1200p	153.4	30 m	55 m	65 m	20 m	60 m	65 m
1600x1200	162.4	30 m	45 m	55 m	NR*	55 m	65 m
1920x1080p 30 bit	186.3	20 m	25 m	35 m	NR*	50 m	60 m
1920x1080p 36 bit	223.6	10 m	15 m	20 m	NR*	20 m	20 m

* NR: Not recommended.

The vertical frequency for all resolutions is 60 Hz.

Important safety instructions

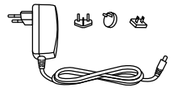
Please read and keep the information in the attached safety instructions supplied with the product before start using the device.

Introduction

The Lightware HDMI- and DVI-HDCP-TP series extenders can transmit HDMI or DVI-D signals over two CATx cables. They fully support HDMI 1.3a signals with or without HDCP encryption. Most of the models support RS-232 transmission and HDMI-TP-RX100RA de-embeds digital audio from the HDMI stream and outputs via its S/PDIF connector.

Box contents

Extender unit



12V DC power adaptor with interchangeable plugs

Additional jumper (red) for remote power settings

Safety and warranty info, Quick Start Guide

Powering on (only on RX/TX100-200 series)

1. After the system is complete, firstly connect the adaptor to the extenders then to the socket.
2. At first the extenders display the firmware version using the the upper two LEDs. The following example shows this process for a firmware version of 1.2.4:
   - RED blinks once, short pause.
   - GREEN blinks two times, short pause.
   - GREEN blinks four times.
3. The attached source(s) and monitor(s) can be powered on.

If none of the LEDs light up upon power-up, the unit is most likely damaged and further use is not advised. Please contact support@lightware.eu.

Adjusting the input equalization (only on RX100-200 series)

The amplitude of high frequency signals decreases after they pass through long distances in copper cables. To counter-act this phenomenon, the receiver amplifies the signal while maximizing the amplitude at a certain level. Two equalization modes are available: automatic and manual. The mode can be toggled by pressing the EQ MODE button.

It is always advised to use the automatic mode and only adjust the equalization manually if the auto mode does not give a good result.

Serial Port (only on RX/TX100-200 series)

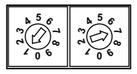
A serial device can be connected to the RS-232 port to use the serial data pass-through function of the RX-TX pairs. This option is useful e.g. to connect touch panel control devices.

EDID memory (valid for TX100 and TX200R devices)

- Address #00: copy of the last attached monitor's EDID from local HDMI/DVI OUT.
- Address #01..#49: factory preset EDIDs suporting various embedded audio formats.
- Address #51..#99: user programmable EDID memory.

Selecting and EDID

1. Turn the EDID ADDRESS rotary switches to the desired position. Use a flat head screwdriver to change the address. The left switch sets the tens value, the right switch gives the ones value of the EDID.



Avoid the use of keys, coins, knives and other sharp objects.

2. The EDID Status LEDs provide feedback in SECONDARY (BLINKING) mode.
3. Now the selected EDID is reported at the HDMI/DVI INPUT.

Learning EDID

1. To see EDID status, check if the Status LEDs are in SECONDARY (BLINKING) mode.
2. Turn the EDID ADDRESS rotary switches to the desired position (addresses #51..#69).
3. Connect the sink device to the HDMI/DVI OUT.
4. Press and hold the LEARN button for approximately 2 seconds.
5. The EDID Status LEDs provide feedback in SECONDARY (BLINKING) mode:
   - Red blinking: the learn process failed from DDC OUT.
   - Green blinking: the learn process was successful from DDC OUT.

RX100R, RX100RA and RX200R devices contains EDID management feature with lower possibilites but the process is the same as above described.

Remote powering

Please check the DC power settings in TP extenders before they are switched on. In the case of wrong jumper setting devices may be damaged!

Power source can be set by jumper for local supply with plug-in adapter, or for remote supply through TP CATx cable. The extenders are able to receive and/or send power.

When the remote power feature is used, check the settings both ends of the TP line.

Never send power towards Lightware Matrix IO cards from TP extender units.

'12V DC POWER ADAPTOR' is the default setting of the jumper. If no jumper is placed on the pins, the extender cannot be powered on.

Jumper configurations

Setting on the RX	Setting on the TX / Output Board
only local adaptor	only local adaptor
local adaptor + remote send	only remote receive from RX
only remote receive from TX	local adaptor + remote send
only local adaptor	PWR 12V DC not connected to OB
only remote receive from OB	PWR 12V DC connected to OB

Further information

The Product brief and further information is available at www.lightware.eu.
See the Downloads section on the website of the product.

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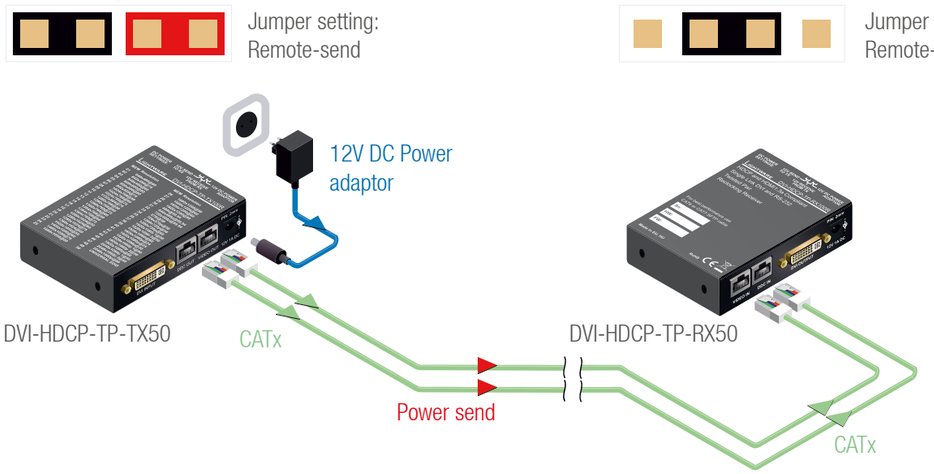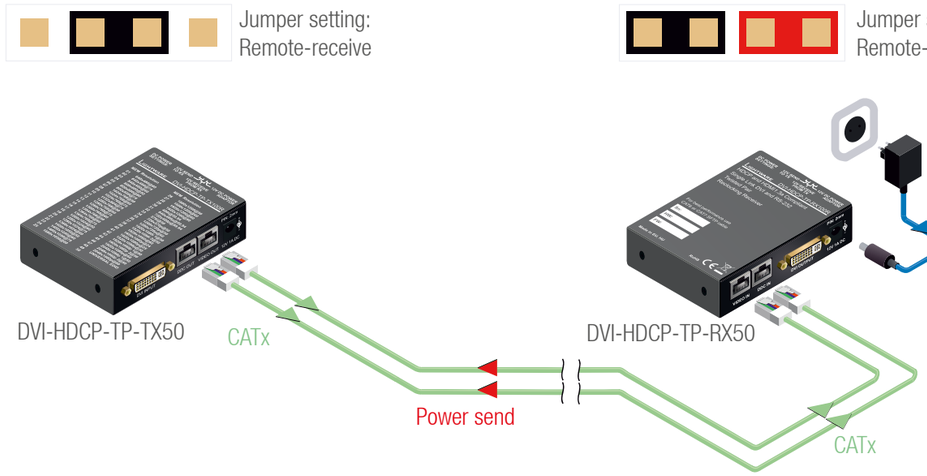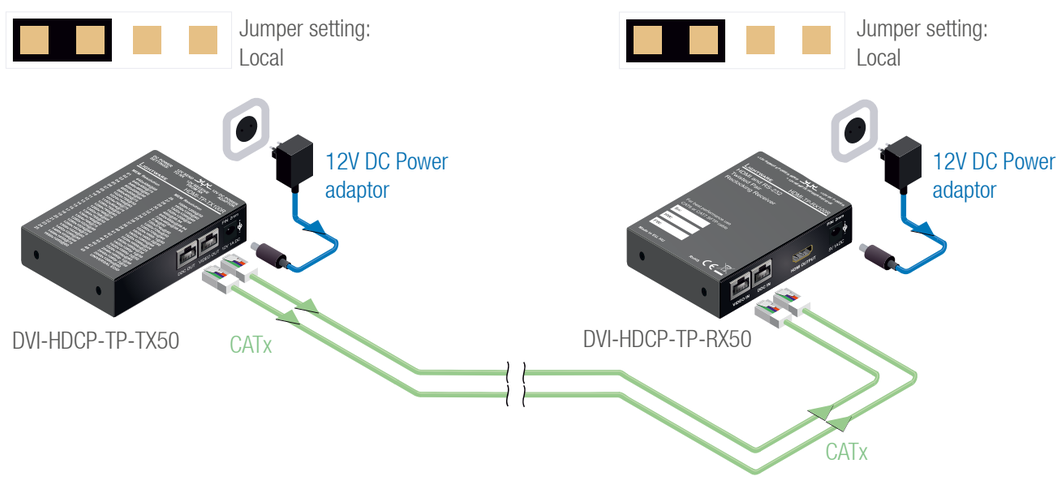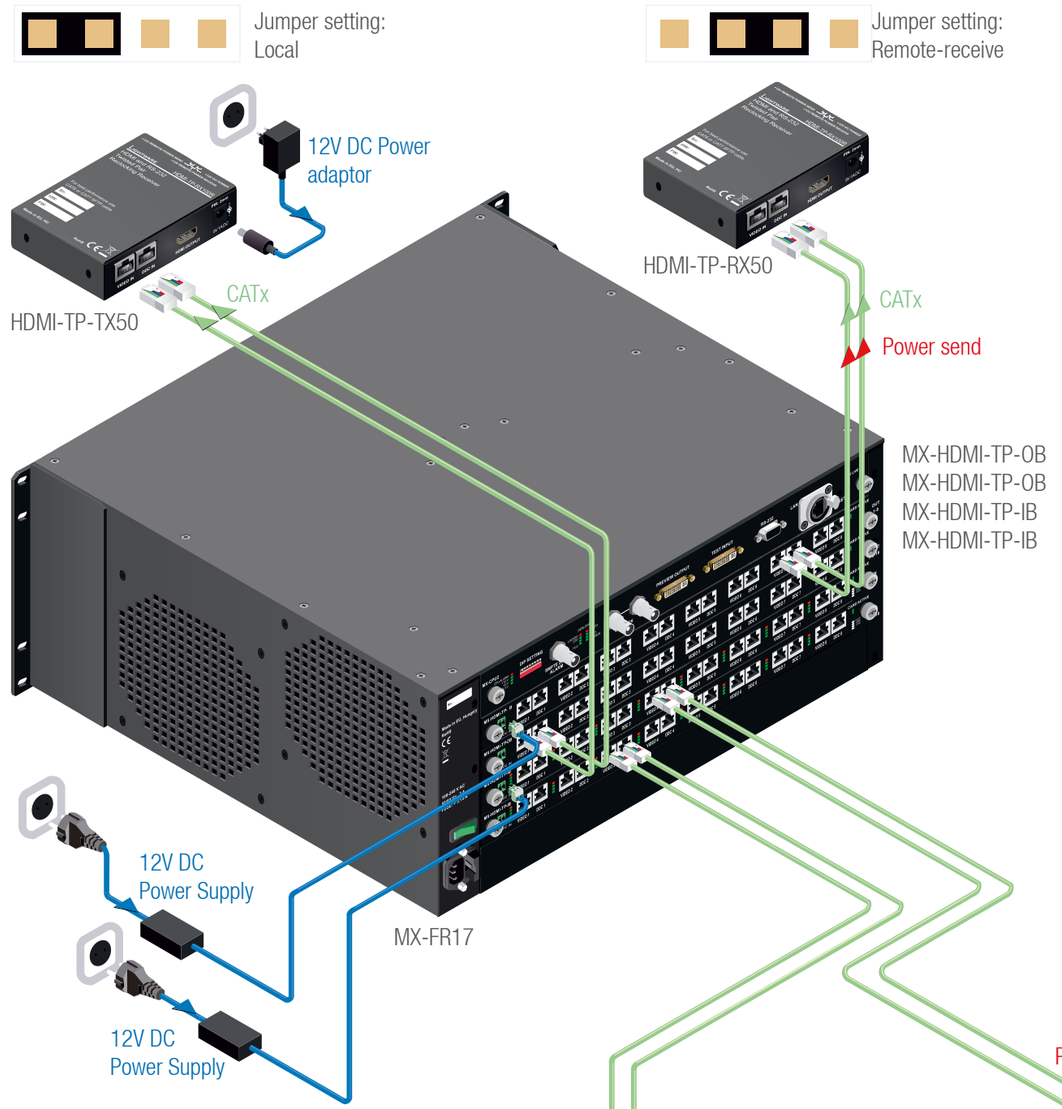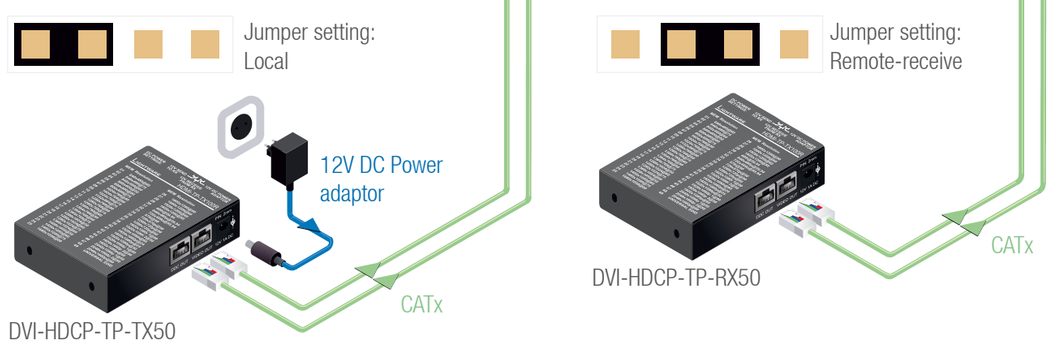
Remote power options