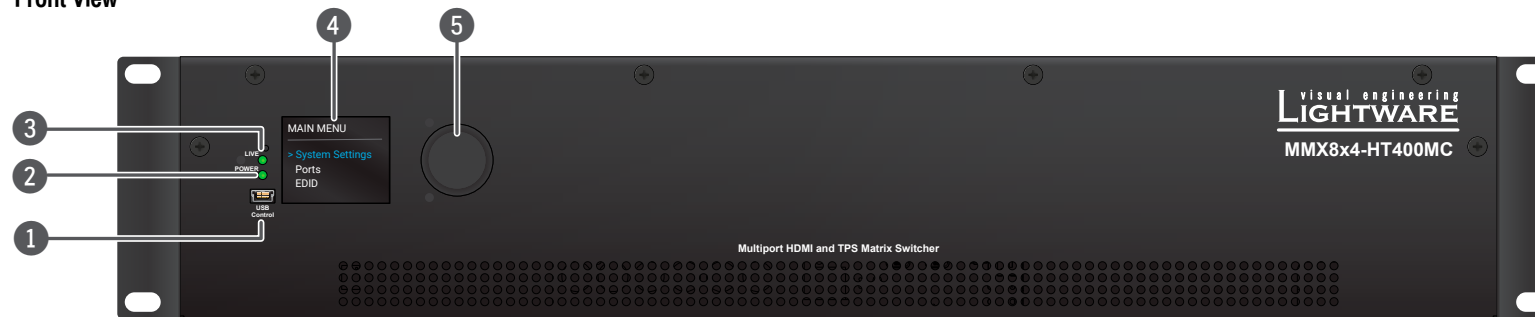




## Quick Start Guide

MMX8x4-HT400MC

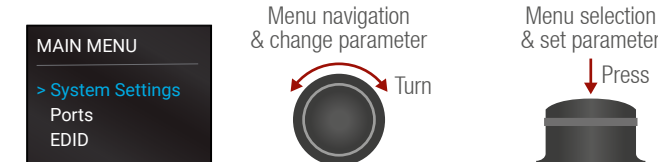
### Front View



- 1 **USB port** USB mini-B port for controlling the unit locally by Lightware Device Controller software.
- 2 **POWER LED** ● on Power LED indicates that the unit is powered on.
- 3 **LIVE LED** ☀ blinking slow The unit is on and operates properly. ☀ blinking fast The unit is in bootloader mode.
- 4 **LCD screen** Displays the front panel menu. Basic settings are available.
- 5 **Jog dial knob** Browse the menu by turning the knob, click on the desired item to check or change it.

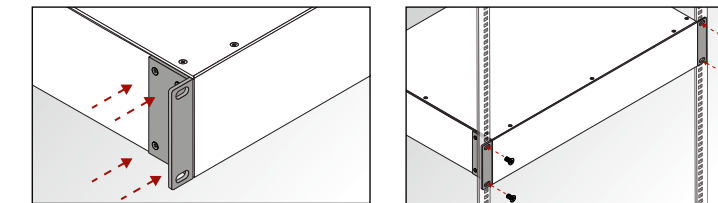
### LCD Menu and Navigation

The front panel has a color LCD showing the most important settings and parameters (E.g. network settings, port status, crosspoint state). The jog dial control knob can be used to navigate between the menu items or change the value of a parameter. The knob can be pressed to enter a menu or edit/set a parameter.



### Mounting Options - Standard Rack Installation

Two rack ears are supplied with the product, which are fixed on left and right side as shown in the picture. The default position allows mounting the device as a standard rack unit installation.

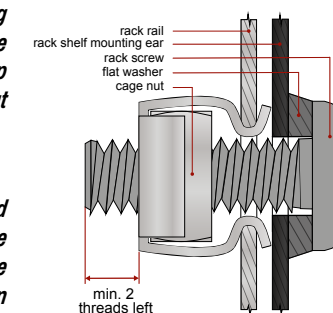


1 The matrix switcher is 2U-high and one-rack wide.

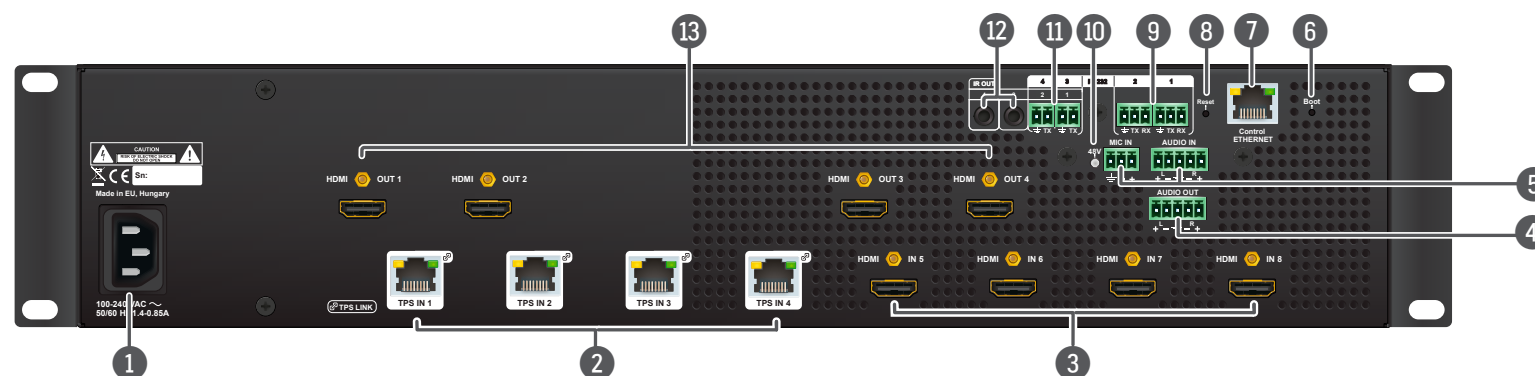
▲ Always use all the four screws for fixing the device ears to the rack rail. Choose properly sized screws for mounting. Keep minimum two threads left after the nut screw.

### Ventilation

▲ To ensure the correct ventilation and avoid overheating let enough free space around the appliance. Do not cover the appliance, let the ventilation holes free on both sides.



### Rear View



- 1 **AC connector** Standard IEC connector accepting 100-240 V, 50 or 60 Hz.
- 2 **TPS inputs** RJ45 connectors (4x) for incoming TPS signal; not PoE-compliant.
- 3 **HDMI inputs** HDMI input ports (4x) for sources.
- 4 **Audio output port** 5-pole Phoenix connector for balanced analog audio; the signal can be mixed from the de-embedded audio of the TPS/HDMI inputs or the microphone input or the line in. See details from the audio features on the next page.
- 5 **Audio input port** 3-pole Phoenix connector for microphone input and 5-pole Phoenix connector for balanced analog audio input.
- 6 **Boot button** Reset or power on the device while keep pushing the hidden button takes the matrix in bootloader mode.
- 7 **Ethernet port** RJ45 connector to control the matrix via LAN.
- 8 **Reset button** Reboots the matrix; the same as switching it off and on again.
- 9 **RS-232 ports** 3-pole Phoenix connectors (2x) for bi-directional RS-232 communication.
- 10 **48 V LED** ● on Phantom power turned on. ● off Phantom power turned off.
- 11 **Serial/ Infra ports** 2-pole Phoenix connectors (2x) for IR output or TTL output serial signal.
- 12 **Infra output ports** 3.5 mm TRS (Jack) connectors (2x) for infra signal transmission (both of them are outputs).
- 13 **HDMI output** HDMI output connectors (4x) for sink devices.

- 7 **Ethernet port** RJ45 connector to control the matrix via LAN.
- 8 **Reset button** Reboots the matrix; the same as switching it off and on again.
- 9 **RS-232 ports** 3-pole Phoenix connectors (2x) for bi-directional RS-232 communication.
- 10 **48 V LED** ● on Phantom power turned on. ● off Phantom power turned off.
- ▲ Turn off the phantom power before connecting the microphone!
- 11 **Serial/ Infra ports** 2-pole Phoenix connectors (2x) for IR output or TTL output serial signal.
- 12 **Infra output ports** 3.5 mm TRS (Jack) connectors (2x) for infra signal transmission (both of them are outputs).
- 13 **HDMI output** HDMI output connectors (4x) for sink devices.

### Serial Output Voltage Levels (TTL and RS-232)

	TTL*	RS-232
Logic low level	0 .. 0.25V	3 V .. 15 V
Logic high level	4.75 .. 5.0V	-15 V .. -3 V

\*Using a receiver with at least 1k impedance to any voltage between 0V and 5V to get the voltages.

### Important Safety Instructions

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

### Introduction

MMX8x4-HT400MC is a standalone matrix switcher specifically designed for conference room environments with eight video inputs (four HDMI and four TPS) and four HDMI video outputs. 4K / UHD (30Hz RGB 4:4:4 or 60Hz YCbCr 4:2:0), 3D capabilities and HDCP are fully supported. MMX8x4-HT400MC has a dedicated Special Audio Input block with input ports for microphone and line-in. The built-in sound mixer allows free mixing of the microphone or the line-in and the de-embedded audio from one of the input HDMI signals.

The MMX8x4-HT400MC matrix is compatible with any third-party HDBaseT™ device.

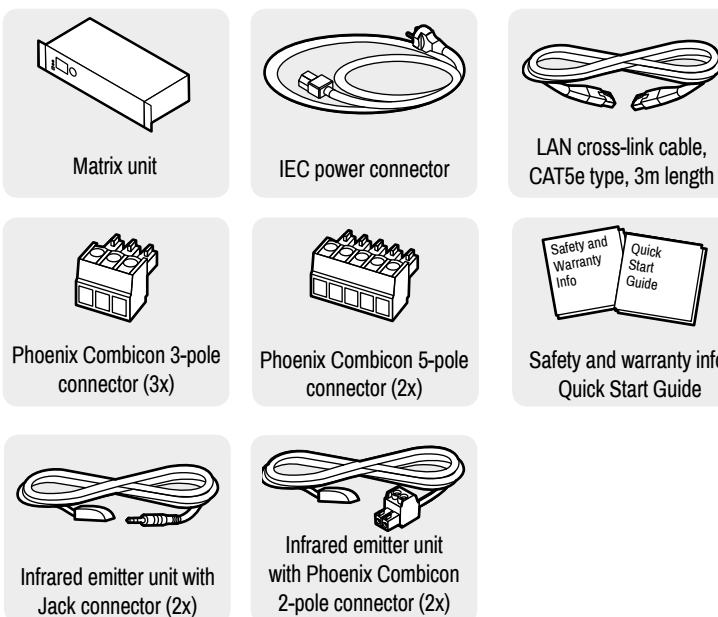


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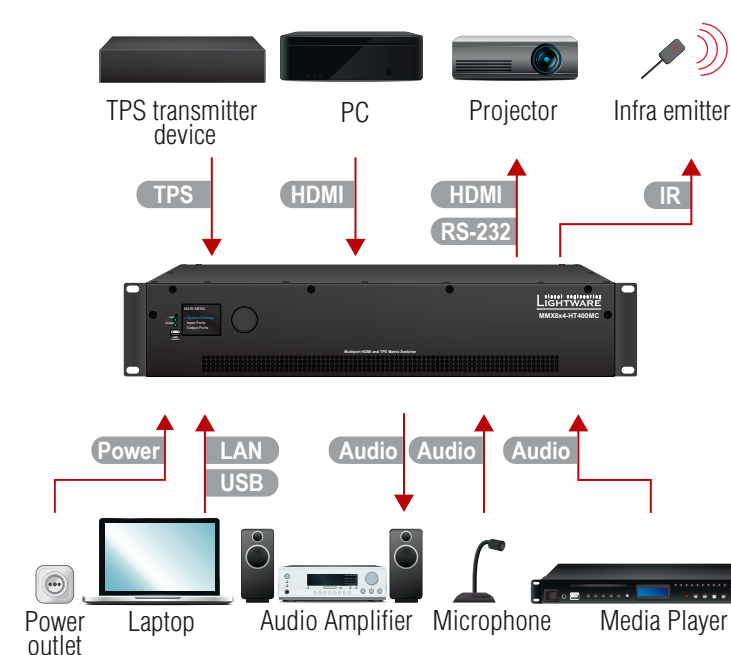
### Compatible Devices

The MMX8x4-HT400MC matrix is compatible with other Lightware TPS devices, matrix TPS and TPS2 boards, 25G boards, as well as third-party HDBaseT-extenders, but not compatible with the phased out TPS-90 extenders.

### Box Contents



### Connecting Steps



- TPS** Connect an HDBase-T™-compatible transmitter to TPS input port (not PoE-compliant).
- HDMI** Connect an HDMI source (e.g. PC) to the HDMI input port.
- HDMI** Connect an HDMI sink (e.g. projector) to the HDMI output port.
- RS-232** Optionally connect a serial device (e.g. projector) to the 3-pole Phoenix connector to transmit RS-232 commands.
- IR** Optionally connect the infra emitter to the infra output port (2-pole Phoenix or 1/8" Stereo Jack connector) to transmit infra signal.
- LAN** Optionally connect the UTP cable (straight or cross, both are supported) in order to control the matrix switcher via the Lightware Device Controller software.
- USB** Optionally connect the USB cable in order to control the matrix switcher via the Lightware Device Controller software.
- Audio** Optionally for analog output connect an audio device (e.g. audio amplifier) to the analog audio output port by an audio cable.
- Audio** See the **Installation Guide for Connecting a Microphone** section on the next page before connecting the microphone. Not proper setting can cause a damage.
- Audio** Optionally for audio input port: connect the audio source (e.g. media player) to the audio input port by an audio cable.
- Power** Connect the power cord to the AC power socket to the matrix unit.

1 Powering the device is recommended as the final step.

### Further Information

The document is valid with the following firmware version: 1.1.0  
The User's manual of this appliance is available on [www.lightware.com](http://www.lightware.com).  
See the [Downloads](#) section on the website of the product.

### Contact Us

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Doc. ver.: 1.2  
19200103

## Installation Guide for Connecting a Microphone

These settings can be done from a computer using the Lightware Device Controller (LDC) software. The application is available at [www.lightware.com](http://www.lightware.com), install it on a Windows PC or a Mac OS X and connect to the device via LAN, USB, or RS-232.

1. Before the connection, please set these properties below:

Port	Property	Value	Lightware Device Controller
Analog audio output (BAL.OUT)	Volume	-80dB and/or Mute	
	Volume	-80dB and/or Mute	
Microphone input (MIC IN)	<p><b>⚠ Skipping the volume or mute setting can cause serious damage in the speaker or the external sound system when phantom power is turned on!</b></p>		
	Phantom power	Turn off	
	<p><b>⚠ Always turn off the phantom power before connecting the microphone!</b></p>		

Port	Property	Value	Lightware Device Controller
Microphone input (MIC IN)	Input gain	-12dB	
	EQ (High, Hmid, Lmid, Low)	0	
	Panorama	0	

2. Connect the microphone.
- In case of **dynamic or wireless microphone**: skip this step and follow the instructions with step 3.
  - In case of **condenser microphone**: Switch on the phantom power. Keep pressed the +48V button more than 2 seconds to activate phantom power.

**⚠ Phantom power supplies the condenser microphone by 48V which is necessary for normal operation. Application of the phantom power can cause a damage if dynamic or wireless microphone is connected!**

**⚠ Always switch on the phantom power when the cabling and connecting are done. Do not disconnect the microphone when the phantom power is switched on!**

3. Set these properties below:

Port	Property	Value	Lightware Device Controller
Analog audio output (BAL.OUT)	Volume	0dB	
Microphone input (MIC IN)	Volume	0dB	

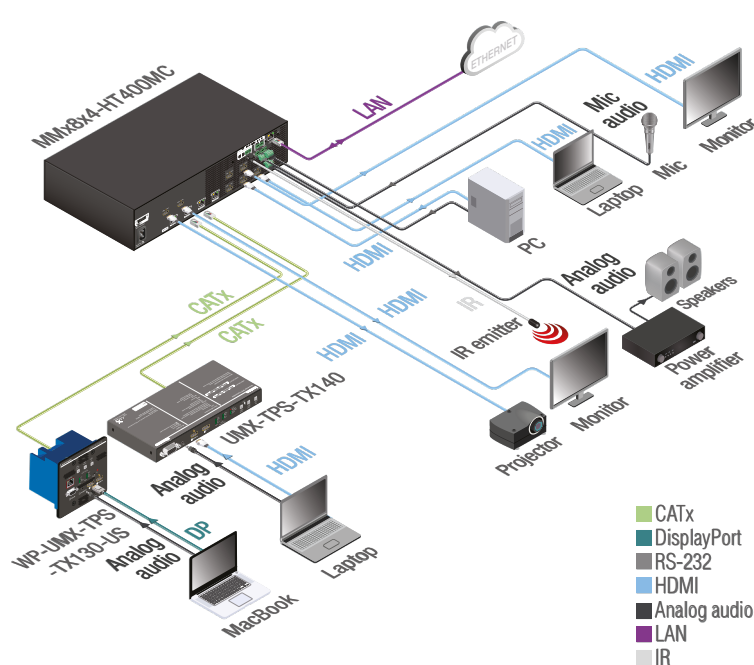
4. Talk to the microphone continuously. Increase the microphone input gain slowly and check the signal indicator chart. It gives a feedback about the optimal signal level.
- ⚠ Take care that peak led (PK!) never lights up!**

MIC input gain	MIC signal
	<ul style="list-style-type: none"> <li><span style="color: red;">●</span> PK!</li> <li><span style="color: yellow;">●</span> NOM.</li> <li><span style="color: green;">●</span> SIG.</li> </ul>

5. If the signal level is low, set the optimal volume both the microphone input and balanced output channel. Always check the signal indicator chart for the optimal level!
- ⚠ Take care that peak led (PK!) never lights up!**

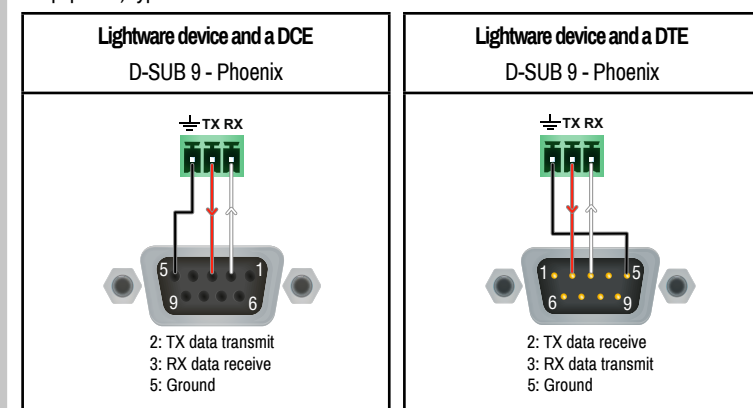
MIC input volume	Output volume

## Typical Application



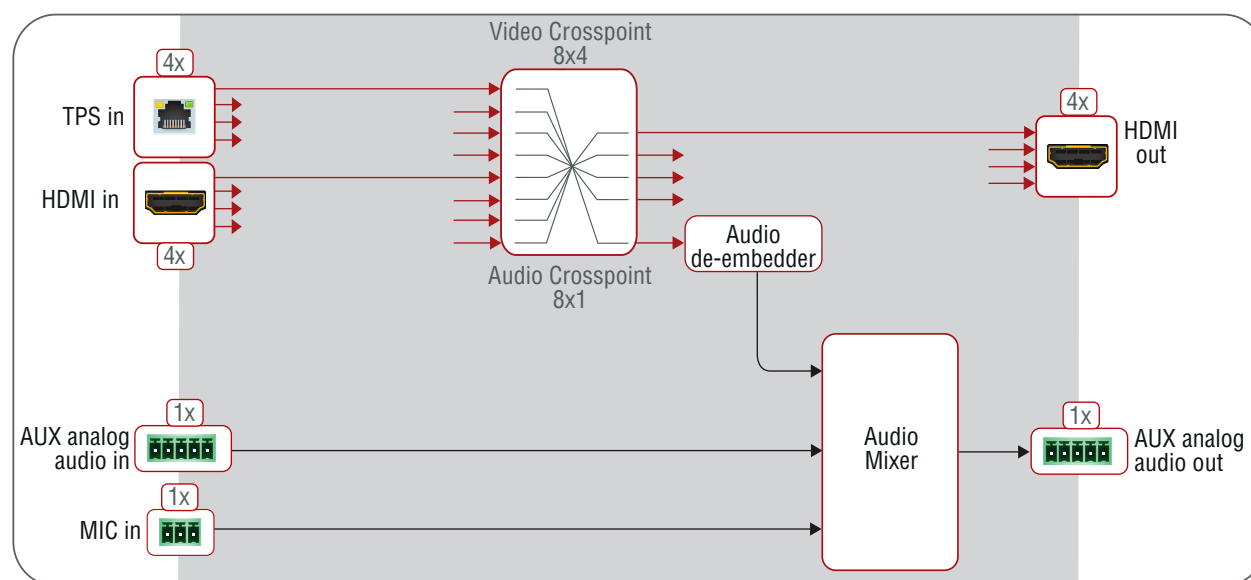
## Wiring Guide for RS-232 Data Transmission

MMX8x4 series matrix 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 **Cable Wiring Guide** on our website [www.lightware.com/support/guides-and-white-papers](http://www.lightware.com/support/guides-and-white-papers).

## Port Diagram



## Factory Default Settings

IP address	192.168.0.100
LW3 / LW2 port number	6107 / 10001
RS-232 port setting	57600 BAUD, 8, N, 1
Control protocol (RS-232)	LW2
Crosspoint setting	Input 1 on all outputs
I/O Ports	Unmuted, unlocked
TPS mode	Auto
HDCP enable (inputs)	Enable
HDCP mode (outputs)	Auto
Signal type	Auto
Emulated EDID	F47 - (Universal HDMI, all audio)
MIC input levels	Volume (dB): 0.00; Panorama (Balance): 0; Gain (dB): 0.00
Analog audio input levels	Volume (dB): 0.00; Balance: 0; Gain (dB): 0.00
Analog audio output levels	Volume (dB): 0.00; Balance: 0

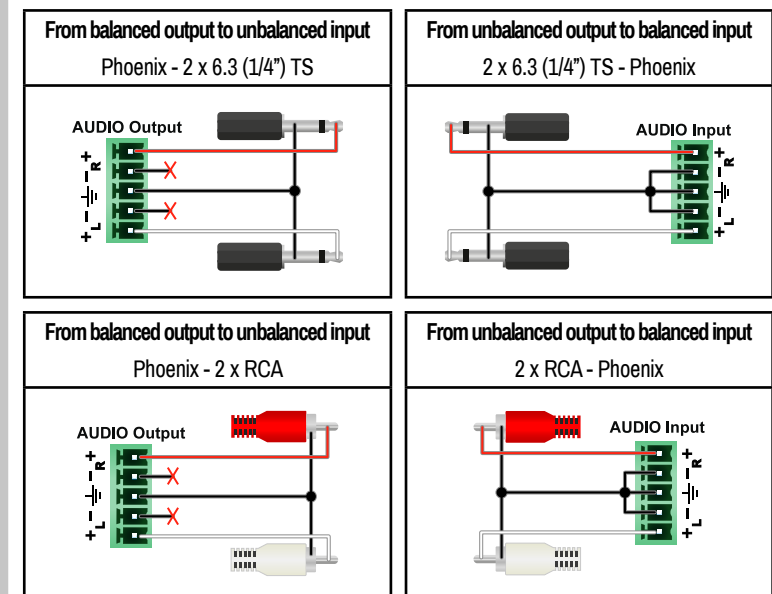
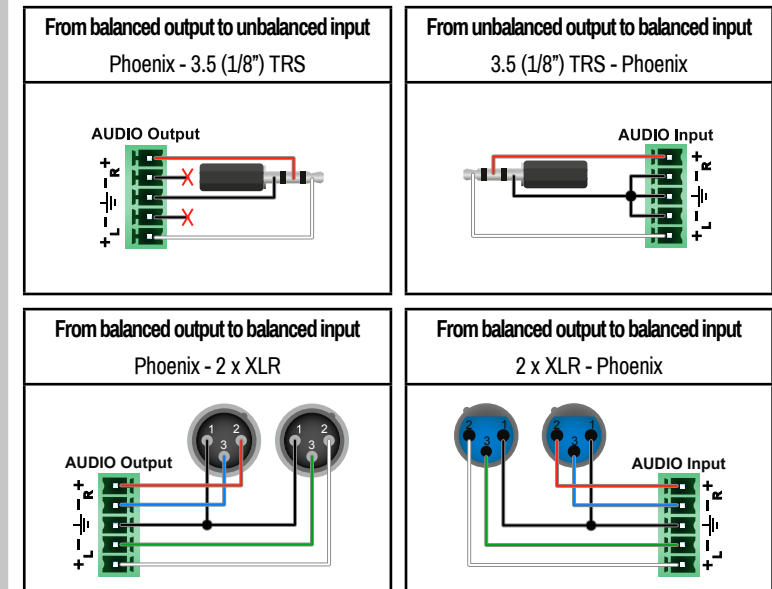
## Firmware Upgrade

Lightware Device Updater (LDU) is an easy and comfortable way to keep your device up-to-date. Establish the connection via Ethernet. Download and install LDU software from the company's website [www.lightware.com](http://www.lightware.com) where you can find the latest firmware package as well.

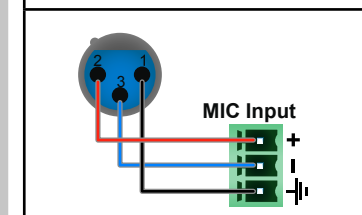


## Audio Cable Wiring Guide

MMX8x4 series matrix is built with 5-pole Phoenix input and output connectors. See below a few example of the most common assembling cases.



## From balanced input to balanced output 1 x XLR - Phoenix



**⚠ Always check the correct wiring of the microphone cable! Never apply phantom power with unbalanced cable, because it can cause a damage!**

Microphone cable should be shielded with 2x0,22mm conductor, max. 50m long.

For more information about audio cable wiring see the user's manual of the device or the Audio Cable Wiring Guide on our website [www.lightware.com](http://www.lightware.com).

## Pin Assignment of 2-pole IR Emitter Connector (1/8" TS)

Pin	Assignment
1 Tip	+5V
2 Ring	Signal (active low)
3 Sleeve	

## Maximum Extension Distances

To specify the accurate extension distances, please also check the documentation of the connected HDBaseT-compatible device.

Resolution	Pixel clock rate	Cable lengths (for 'C' Corporate models)		
		CAT5e AWG24	CAT7 AWG26	CAT7 AWG23
1024x768@60Hz	65 MHz	60 m	80 m	80 m
1280x720p@60Hz	73.8 MHz	60 m	80 m	80 m
1920x1080p@60Hz (24bpp)	148.5 MHz	60 m	80 m	80 m
1920x1200@60Hz	152.9 MHz	60 m	80 m	80 m
1600x1200@60Hz	162 MHz	60 m	80 m	80 m
1920x1080@60Hz (36bpp)	223 MHz	60 m	80 m	80 m
3840x2160@30Hz UHD	297 MHz	40 m	40 m	40 m
4096x2160@30Hz 4K	297 MHz	40 m	40 m	40 m

**⚠ CAT7 SFTP AWG23 cable is always recommended.**