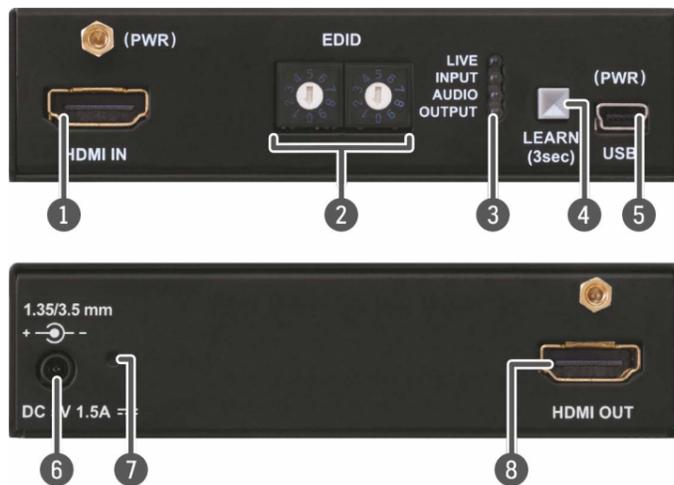**visual engineering**
# LIGHTWARE

# Quick Start Guide
## HDMI-4K Manager

## Front and rear view

⚠ *Never use a third-party power supply but the supplied one or use Lightware's rack-mountable power supply unit with the appropriate DC-DC cable.*

## Legend

| | | |
|---|---|---|
| 1 | HDMI in | HDMI input port for sources and for supplying the device with power (depends on source capabilities). The applied cable shall not be more than 20 m (4Kp30) or 30 m (1080p60). |
| 2 | EDID rotary switches | The rotary switches select one of the EDID memory addresses. |
| 3 | Status LEDs | The LEDs display information about the signal states. |
| 4 | Learn button | Store the EDID of the sink on HDMI OUT or start the device on bootload mode. |
| 5 | USB control | USB mini-B type connector to access special settings, perform a firmware upgrade and supply the unit with power. |
| 6 | DC in | Input for the supplied power adaptor. |
| 7 | Hidden button | Button for resetting the device. |
| 8 | HDMI output | Connect an HDMI cable between the sink and the unit. |

## Front panel LEDs

### LIVE 🟢
- BLINKING: the device is powered properly and operational.
- ON: shows the malfunction of the CPU; please restart the device.

### INPUT 🟠🟢
- ON (orange): source is connected (5V detected).
- ON (green): signal is present.

### AUDIO 🔴🟣
- ON (red): HDMI, multichannel / compressed audio signal is detected.
- ON (purple): HDMI, PCM 2 channel audio signal is detected.
- OFF: no audio is transmitted.

### OUTPUT 🟢
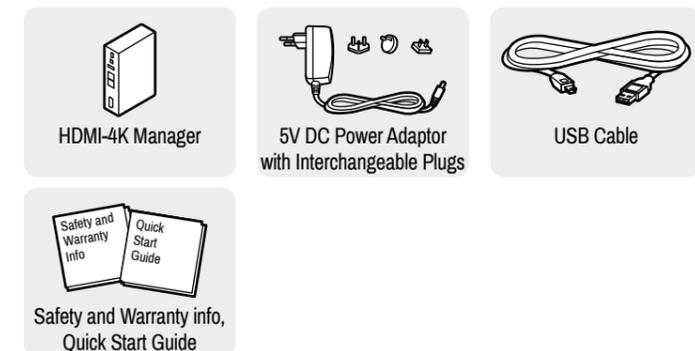- ON (green): hotplug detected on HDMI OUT.

## Important safety instructions

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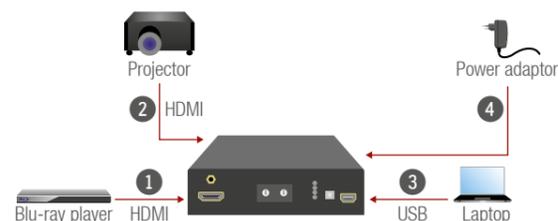
## Introduction

HDMI-4K Manager is a multifunctional interface with built-in EDID Management and Pixel Accurate Reclocking, supporting DVI and HDMI 1.4 signals with or without HDCP encryption. The output signal is reclocked and stabilized using Lightware Pixel Accurate Reclocking technology to remove jitter caused by long cables or poor quality sources.

## Box contents

HDMI-4K Manager | 5V DC Power Adaptor with Interchangeable Plugs | USB Cable

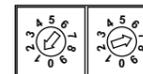Safety and Warranty info; Quick Start Guide

## Installation

1. Connect the desired source to the **HDMI input** port.
2. Connect a sink device to the **HDMI output** port.
3. Optionally connect a laptop or PC to the **USB** port and run LDC software.
4. Connect firstly the power cord of the supplied adaptor to the **DC input**, then secondly to the AC power socket.

## EDID emulation

### Selecting an EDID

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.

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

### EDID learning (OUTPUT LED)

The EDID of the sink connected to HDMI OUT 1 can be stored in the user EDID memory:

1. Turn the EDID rotary switches to the desired position (between #62 - #98).
2. Press the LEARN button and keep it pressed for three seconds.
3. The OUTPUT LED turns to dark for a second then provides feedback:
   - BLINKING (green): EDID learning is successful, the EDID is stored.
   - BLINKING (red): EDID learning is failed.
4. The LED turns to dark for a second, then shows the state(s) of the connected sink(s).

### Further EDID options

The following functions are available when connecting to the device by LDC:

- EDID learning or importing an EDID.
- Exporting an EDID and saving it as a file.
- Creating a custom EDID by using the EDID Editor or the Easy EDID Creator.
- Deleting an EDID (from the user memory).
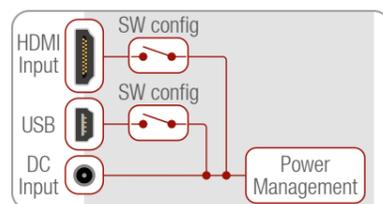
## EDID memory structure

**01-11:** DVI EDIDs; **12-55:** HDMI EDIDs

| ID | Resolution | ID | Resolution | ID | Resolution | ID | Resolution |
|---|---|---|---|---|---|---|---|
| 00 | Copy HDMI1 | 14 | 640x480p59 | 28 | 1920x1080i50_2 | 42 | 3440x1440p24 |
| 01 | 640x480p60 | 15 | 720x480p59 | 29 | 1920x1080i60 | 43 | 3440x1440p30 |
| 02 | 800x600p60 | 16 | 720x576p50 | 30 | 1920x1080i60 | 44 | 2560x1600p60 |
| 03 | 1024x768p60 | 17 | 1280x720p50 | 31 | 1920x1080p24 | 45 | 2560x2048p50 |
| 04 | 1280x768p50 | 18 | 1280x720p60 | 32 | 1920x1080p30 | 46 | 3840x2160p24 |
| 05 | 1280x768p60 | 19 | 1024x768p60 | 33 | 1920x1080p50 | 47 | 3840x2160p30 |
| 06 | 1280x1024p50 | 20 | 1366x768p60 | 34 | 1920x1080p60 | 48 | 3840x2160p60 |
| 07 | 1280x1024p60 | 21 | 1280x800p60 | 35 | 1920x1080p60 | 49 | 4096x2160p24 |
| 08 | 1600x1200p50 | 22 | 1440x900p60 | 36 | 2048x1080p60 | 50 | 4096x2160p30 |
| 09 | 1600x1200p60 | 23 | 1600x900p60 | 37 | 2560x1080p60 | 51 | 4096x2160p60 |
| 10 | 1920x1200p50 | 24 | 1280x1024p50 | 38 | 1600x1200p50 | 52 | 3840x2400p24 |
| 11 | 1920x1200p60 | 25 | 1280x1024p60 | 39 | 1600x1200p60 | 53 | 3840x2400p30 |
| 12 | 1440x480i60 | 26 | 1440x1080p60 | 40 | 1920x1200p60 | 54 | 720p60_3D |
| 13 | 1440x576i50 | 27 | 1920x1080i50_1 | 41 | 2560x1440p60 | 55 | 1080p60_3D |

| ID | Description | ID | Description |
|---|---|---|---|
| 56 | Universal DVI | 60 | Universal HDMI 4K PCM AUDIO |
| 57 | Universal HDMI PCM AUDIO | 61 | Universal HDMI 4K ALL AUDIO |
| 58 | Universal HDMI ALL AUDIO | 62-98 | User EDIDs |
| 59 | Universal HDMI DC ALL AUDIO | 99 | Copy HDMI2 |

## Powering Options

The device can be powered by any of the following ways:

- Using the supplied **power adaptor** (recommended).
- Connect the device to a proper **USB port** by the supplied cable.
- Connecting an **HDMI source** to the HDMI input port.

ℹ *Make sure that the port is able to supply 5V 500 mA current.*

If the power adaptor is connected, it will supply the device independently from the HDMI/USB ports. If the adaptor is disconnected from the DC input connector the device tries to use a different power source (HDMI or USB) if it is enabled and connected. (If the adaptor is unplugged from the AC socket but the DC plug is still connected, the device will be switched off and cannot be changed to another power source. Unplug the DC cable from the device to be powered by USB or HDMI.)
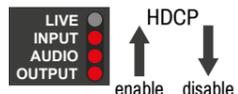
ℹ *The USB and HDMI powering modes can be enabled/disabled via LDC software.*

⚠ *If you are not sure that your USB or HDMI port has enough power, disable the powering over USB and HDMI by Lightware Device Controller software. If the supplied power over USB or HDMI is not enough the device will switch off. In the case of any strange behavior of the device, please disconnect the USB and HDMI cables and connect the 5V DC adaptor.*

## HDCP management

The HDCP setting of the HDMI input port can be enabled/disabled on the front panel as follows:

1. Turn the EDID rotary switches to '01' position.
2. Press the LEARN button and keep it pressed for three seconds.
3. The lower three LEDs give displays if the HDCP state is changed:
   - **Output→Audio→Input** LEDs are dark and light up sequentially: HDCP is **enabled**.
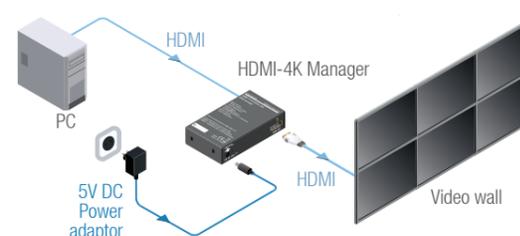   - **Input→Audio→Output** LEDs light and get dark sequentially: HDCP is **disabled**.

## Restoring the factory default settings

The settings and parameters can be set to factory default as follows:

1. Set the rotary switches to '00' position.
2. Press and keep pressed the LEARN button for three seconds. When the lower three LEDs blink, release the button. The following settings and parameters are restored:

| | |
|---|---|
| HDCP (input port) | enabled |
| HDCP (output port) | auto |
| HDMI mode (output port) | auto |
| HDMI output port (audio signal) | unmuted |
| Test pattern generator | off |

## Typical application diagram

## Further information

The document is valid with the following firmware version: 1.0.0
The Product brief and further information are available on www.lightware.com. See the Downloads section on the dedicated product page.

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Doc. ver.: 1.2
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## Specifications

### General

Compliance ................................................................................................................... CE

Safety.................................................................................................EN 62368-1:2014

EMI / EMC ........................................................................................ EN 55024 / EN 55032

Cooling ................................................................................................................ passive

### Power

Power supply ................................... external power adaptor / HDMI input port / USB port

Power adaptor ...................................... Input 100-240 V AC 50/60 Hz, Output 5V DC, 3 A

Power consumption ............................................................................................. 1.8 W (max)

### Digital video signal

HDMI connector .............................................................. 19-pole HDMI Type A receptacle

Supported signals ................................................................................ DVI 1.0, HDMI 1.4

Signal standard ....................... DVI and HDMI standard which supports embedded audio

Supported resolutions .................... up to 4K / UHD (30Hz RGB 4:4:4, 60Hz YCbCr 4:2:0)

3D support.......................................................................................................... yes

HDCP compliant.................................................................................................... yes

Control over CEC ....................................................................................... yes, transparent

Reclocking ..................................................................... Pixel Accurate Reclocking

Cable length (input port).......................................... max 20 m (4Kp30) or 30 m (1080p60)

### EDID management

EDID emulation ..................................................................................................... yes

EDID memory.................................................... 61 factory presets, 37 user-programmable

### Control

USB port ............................................................................................. USB mini-B receptacle

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## Software control – Using Lightware Device Controller (LDC)

The device can be controlled from a computer using the Lightware Device Controller software. The application is available at www.lightware.com (Support / Downloads section), install it on a Windows PC or a MacOS and connect to the device.

### Connecting by the USB port

Connect the supplied USB cable between the device and the computer and start the LDC. The device is displayed under the **USB devices** section; select it then press **Connect**.

### Crosspoint menu

When LDC connects to the device, the Crosspoint menu is shown as default. The input and output port settings are available separately for the video and audio signals. Besides, the following tools are available:

### Frame detector

The ports can show detailed information about the signal like blanking intervals and active video resolution. This feature is a good troubleshooter if compatibility problems occur during system installation.



## 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:
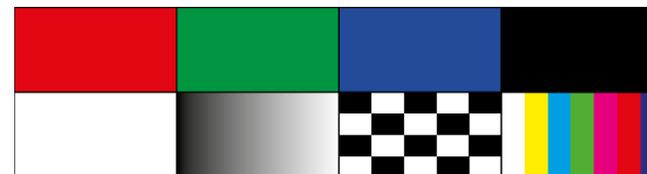
### Mode
- **On:** the test pattern is always sent to the output port.
- **Off:** the test pattern generator is off.
- **No signal:** the test pattern generator is switched on if video signal is not detected.

### Clock source
- 480p / 576p / Original video signal: the clock frequency of the test pattern.

### Pattern
- Red / Green / Blue / Black / White / Ramp / Chess / Bar / Cycle. Cycle setting means all the patterns are changed sequentially approx. in every 2 seconds.



## EDID management

Advanced EDID Management can be accessed by selecting the EDID menu. The software allows to create, modify, delete, import, or export EDIDs. Please note that the factory presets cannot be modified.

❶ *EDID emulation is available only by the EDID rotary switches on the device.*

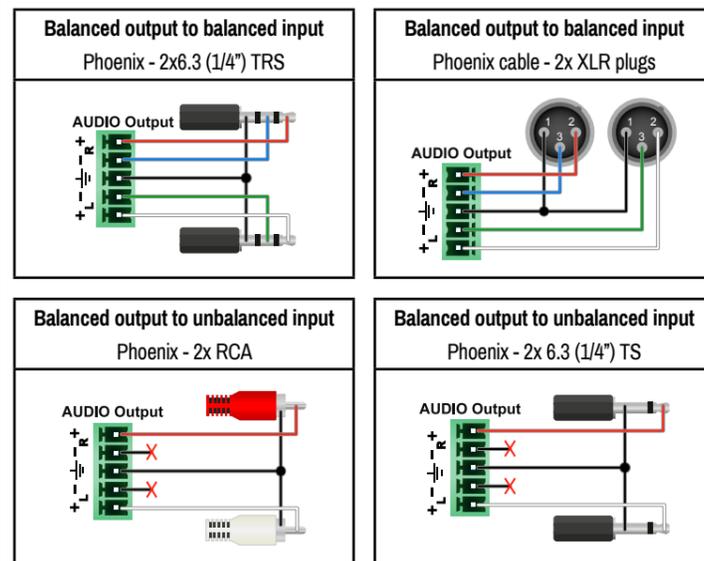### Backup and restore (Configuration cloning)

This simple method eliminates the need to repeatedly configure certain devices to have identical (non-factory) settings. If the devices are installed in the same type of system multiple times then it is enough to set up only one device to fit the user's needs and then copy those settings to the others, thus saving time and resources. Installing multiple devices with the same customized configuration settings can be done in a few easy steps:

1. Configure one device with all your desired settings with the LDC software.
2. Backup the full configuration file to your computer.
3. If needed, make some modifications to the configuration file using a text editor.
4. Connect to the other device which has to be configured and upload (restore) your configuration file.

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## Audio Cable Wiring Guide

The device is built with 5-pole Phoenix connector so we would like to help users assembling their own audio cables. See the most common cases below.

**Balanced output to balanced input**
Phoenix - 2x6.3 (1/4") TRS



**Balanced output to balanced input**
Phoenix cable - 2x XLR plugs



**Balanced output to unbalanced input**
Phoenix - 2x RCA



**Balanced output to unbalanced input**
Phoenix - 2x 6.3 (1/4") TS



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.

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## Firmware upgrade – Using Lightware Device Updater (LDU)

### Preparation

The following are necessary to perform a firmware upgrade:
- Lightware Device Updater software - available on www.lightware.com,
- Firmware package of the device (LFP file) - please contact support@lightware.com.
- Power adaptor to supply the device.

### Performing the Upgrade

❶ *The device must be supplied with the power adaptor when the firmware is upgraded. Supplying the device over USB or HDMI is not recommended for this process.*

1. Connect a PC/laptop to the USB port of the device by the supplied USB cable.
2. Start the LDU software and follow the instructions shown on the screen.

### Starting the unit in bootload mode

If the usual firmware upgrade cannot be performed for any reason, try the following:

1. Press the LEARN button and keep it pressed.
2. Press and release the hidden button.
3. Release the LEARN button. The device is restarted in bootload mode.