



# LIGHTWARE DA2HDMI-4K-Plus Distribution Amplifier User Guide

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Quick Start Guide  
DA2HDMI-4K-Plus  
DA2HDMI-4K-Plus-A



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## Important Safety Instructions

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

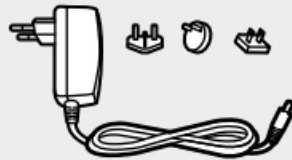
### Introduction

DA2HDMI-4K-Plus-A is a multifunctional distribution amplifier with built-in Advanced 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.

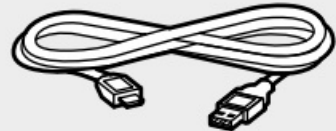
## Box Contents



Distribution Amplifier



5V DC Power Adaptor  
with Interchangeable Plugs



USB Cable



Phoenix Combicon  
5-pole connector

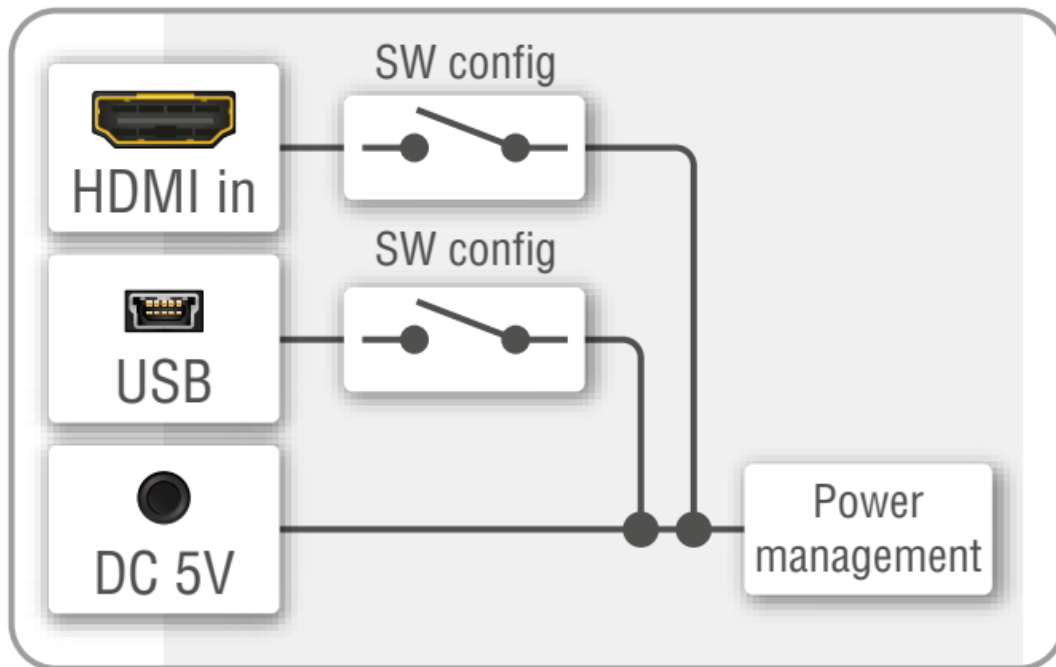


Safety and Warranty info,  
Quick Start Guide

## Powering Options

The device can be powered in 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.



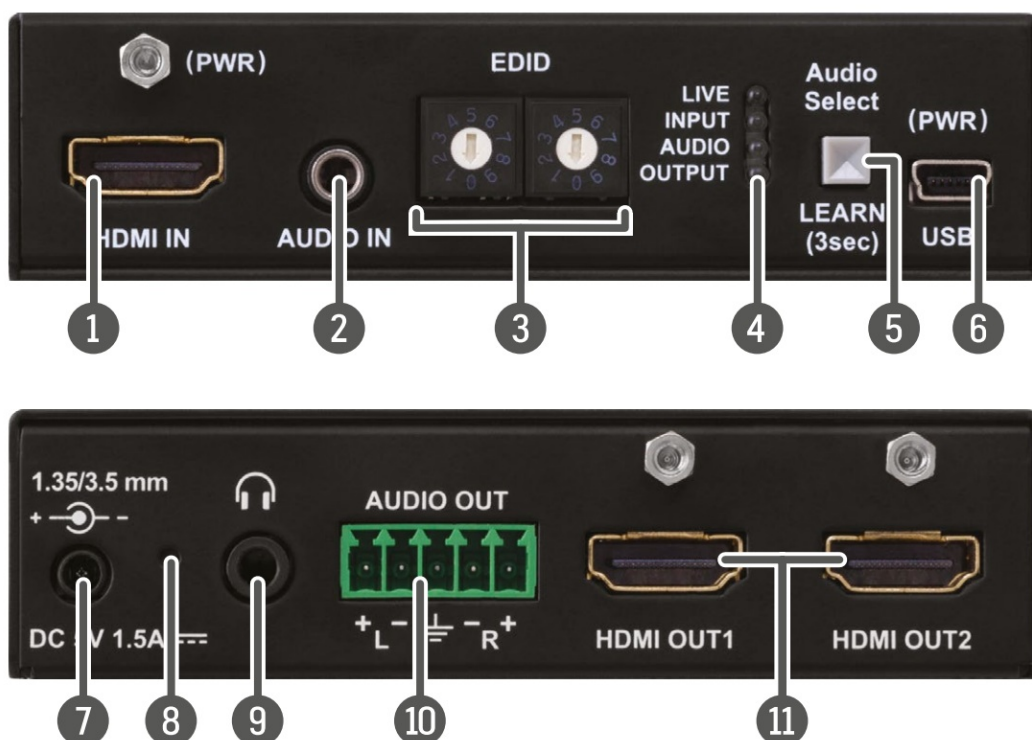
**i** Make sure that the port is able to supply 5V 500 mA current.

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.

## Front and Rear Views



**i** Only the DA2HDMI-4K-Plus-A model is built with analog audio connectors.

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

## Legend

1	HDMI Input	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	Audio Input	3.5 mm jack connector for asymmetric analog audio signal.
3	Rotary Switches	Selecting one of the EDID memory addresses.
4	Status LEDs	The LEDs display information about the signal states.
5	Learn Button (Audio Select)	Store the EDID of the sink on HDMI OUT1, start the device in Bootload mode, or toggle between the audio sources.
6	USB Control	USB mini-B type connector to access special settings, perform a firmware update and supply the unit with power.
7	DC Input	Input for the supplied power adaptor.
8	Hidden Button	Button for restarting the unit.
9	Phones	3.5mm jack output connector, which is the same as the Analog Audio Output (Phoenix).
10	Audio Output	5-pole Phoenix connector for balanced analog audio; the signal is de-embedded from the HDMI outputs.
11	HDMI Outputs (mirrored)	Identical video output ports. Connect an HDMI cable between the sink and the unit.

## Front Panel LEDs

LIVE 

- BLINKING (slow): the device is powered properly and operational.
- BLINKING (fast): the device is in Bootload mode.
- 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 (blue): analog audio input is selected to be embedded in the video stream.
- ON (red): HDMI, multichannel / compressed audio signal is detected.
- ON (purple): HDMI, PCM 2 channel audio signal is detected.
- BLINKING: autoselect is enabled.
- OFF: no audio is transmitted.

OUTPUT   

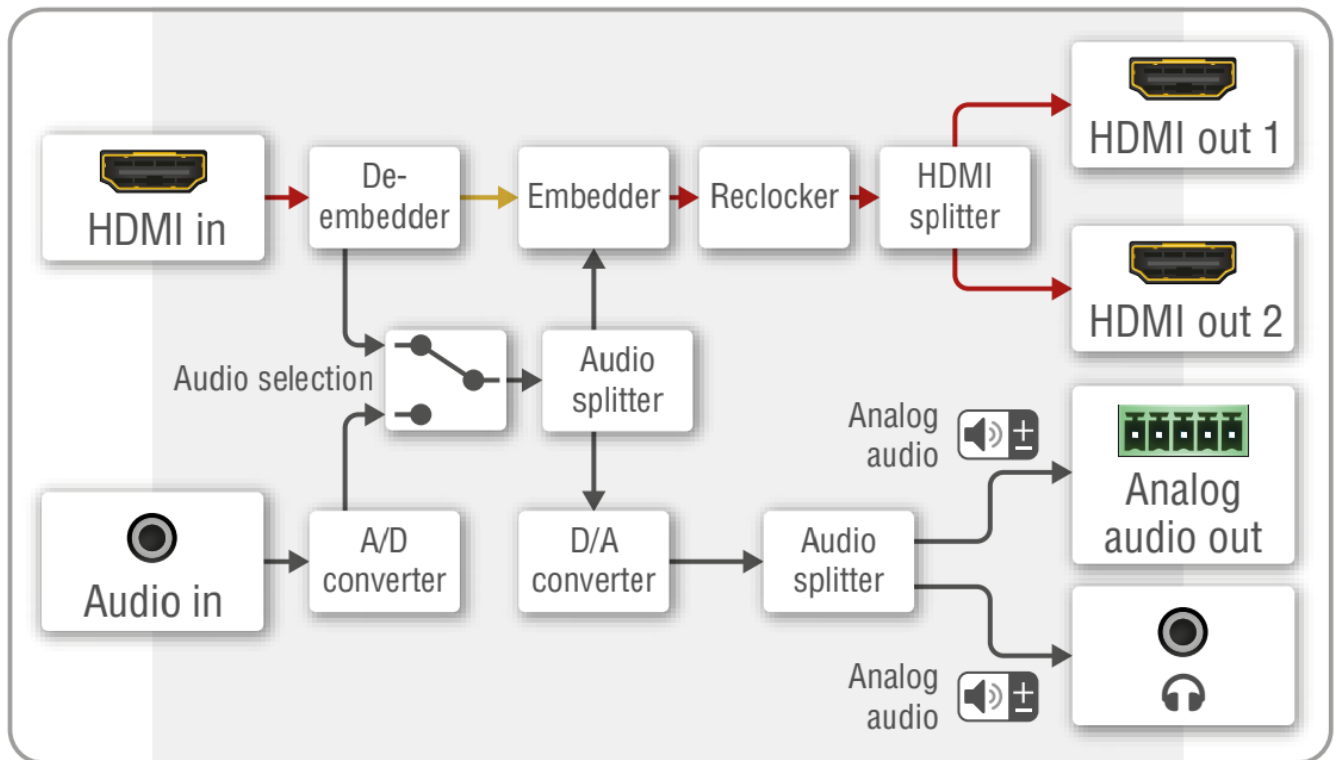
- ON (orange): hotplug detected on HDMI OUT1.
- ON (yellow): hotplug detected on HDMI OUT2.
- ON (green): hotplug detected on HDMI OUT 1 and HDMI OUT 2.

## Installation



1. Connect the desired source to the HDMI input port.
2. Optionally connect an audio source to the Audio input port.
3. Connect one or two sink device(s) to the HDMI output port(s).
4. Optionally connect an audio device (e.g. amplifier) to the Phoenix Audio output port.
5. Optionally connect a headphone to the 3.5 mm Jack Audio output port.
6. Optionally connect a laptop or PC to the USB port and run the LDC software.
7. First connect the power cord of the supplied adaptor to the DC input, then to the AC power socket.

## Port Diagram



### Audio Selection (only on the Plus-A variant)

Press the Audio select (LEARN) button to toggle the audio options.

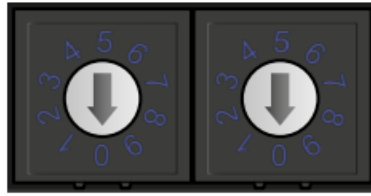


The device is able to select an audio source automatically: activate the Autoselect mode by the Audio select button. In this case the Analog input port has higher priority: if the Autoselect mode is active and a 3.5mm Jack plug is connected to the Audio input port, it will be embedded into the HDMI stream.

## 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 dark for a second, then provides feedback:
  - f* BLINKING (green): EDID learning is successful, the EDID is stored.
  - f* BLINKING (red): EDID learning is failed.
4. The LED turns dark for a second, then shows the state(s) of the connected sink(s).

**i** Please note that the EDIDs stored in the User EDID memory are deleted when the factory default settings are restored.

### **Further EDID Options**

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

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

### **EDID Memory Structure**

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

ID	Resolution	ID	Resolution	ID	Resolution	ID	Resolution
0	Copy HDMI1	14	640x480p59	28	1920x1080i50_2	42	3440x1440p24
1	640x480p60	15	720x480p59	29	1920x1080i60	43	3440x1440p30
2	800x600p60	16	720x576p50	30	1920x1080i60	44	2560x1600p60
3	1024x768p60	17	1280x720p50	31	1920x1080p24	45	2560x2048p50
4	1280x768p50	18	1280x720p60	32	1920x1080p30	46	3840x2160p24
5	1280x768p60	19	1024x768p60	33	1920x1080p50	47	3840x2160p30
6	1280x1024p50	20	1366x768p60	34	1920x1080p60	48	3840x2160p60
7	1280x1024p60	21	1280x800p60	35	1920x1080p60	49	4096x2160p24
8	1600x1200p50	22	1440x900p60	36	2048x1080p60	50	4096x2160p30
9	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

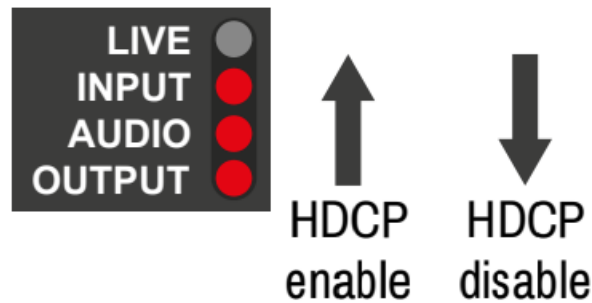
ID	Description	ID	Description
56	Universal DVI	60	Universal 1-IDMI 4K PCM AUDIO
57	Universal 1-IDMI PCM AUDIO	61	Universal 1-IDMI 4K ALL AUDIO
58	Universal HDMI ALL AUDIO	62-98	User EDIDs
59	Universal HDMI DC ALL AUDIO	99	Copy 1-1DMI2

### 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 display if the HDCP state is changed:



- HDCP is enabled: LEDs are dark and light up sequentially.
- HDCP is disabled: LEDs light up and turn dark sequentially.

### 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 on [www.lightware.com](http://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 by default. The input and output port settings are available separately for the video and audio signals. Beside this, 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. every 2 seconds.

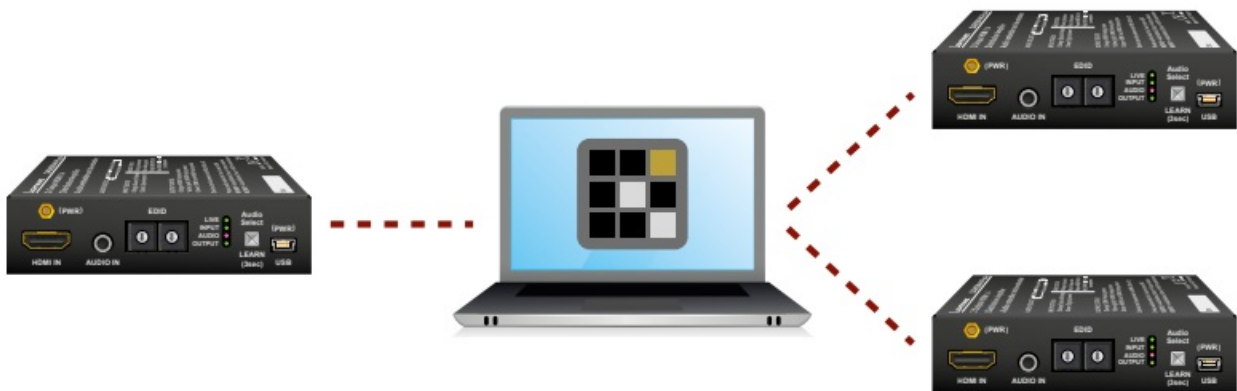
## EDID Management

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.

**i** 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 that needs to be configured and upload (restore) your configuration file.

## Restoring the Factory Default Settings

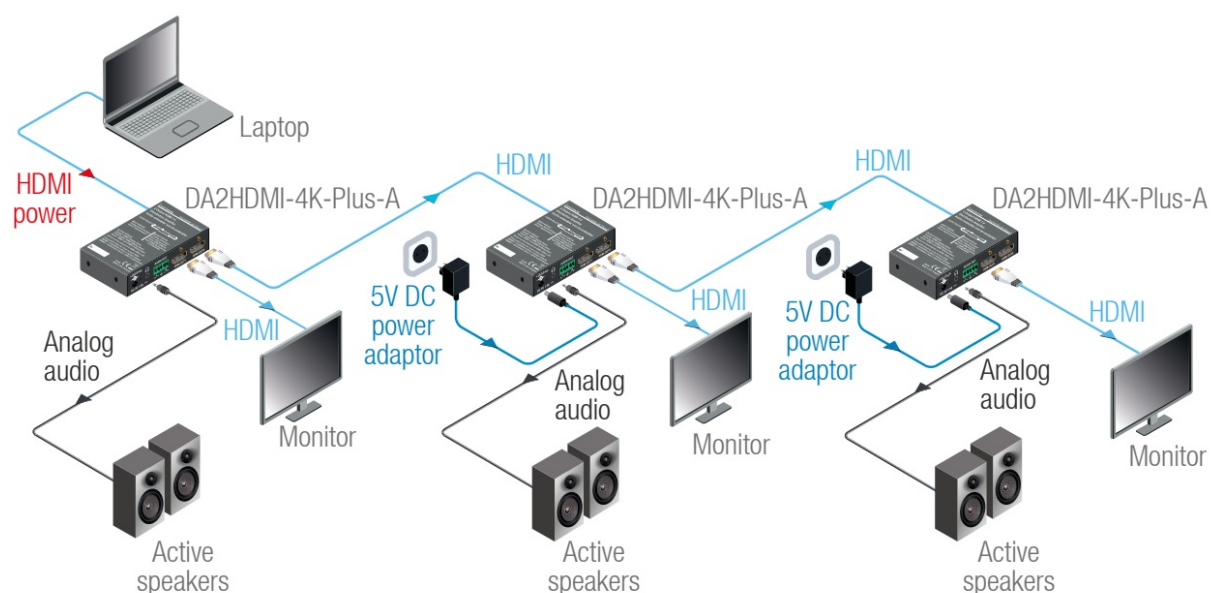
The settings and parameters can be set to factory default as follows:

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

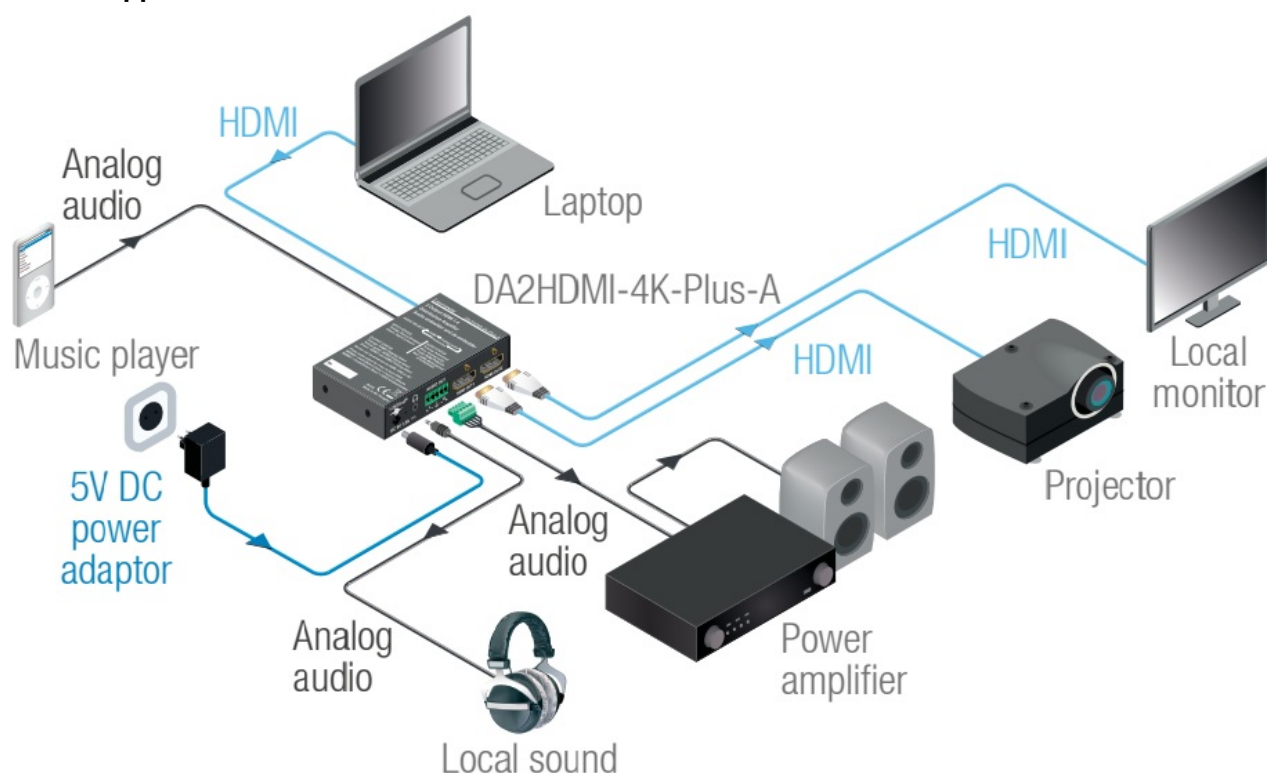
HDCP (input port)	enabled
HDCP (output port)	auto
HDMI mode (output port)	auto
HDMI output pod (audio signal)	unmuted
Autoselect	enabled
Test pattern generator	off
User EDID memory	cleared

## Typical Application Diagrams

### Daisy Chain System



### Standalone Application



# Specifications

## General

Compliance .....	CE, UKCA
Electrical safety .....	EN 62368-1:2020
EMC (Emission) .....	EN 55032:2.015+A1:2020
EMC (Immunity) .....	EN 55035:2017+A11:2020
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 options .....	External power adaptor / USB port / HDMI input port
Power adaptor .....	Input 100-240 V AC 50/60 Hz, Output 5V DC, 3 A
Power consumption .....	1.8 W
Heat dissipation .....	6.1 BTU/h

## Power adaptor

Supported power source .....	100-240 V AC; 50/60 Hz
Supplied power .....	5V DC, 1.5 A
AC power plug .....	Interchangeable (EU, UK, JP/US, AUS/NZ)
DC power plug .....	DC connector (2.5/5.5 mm pin)

## Enclosure

Rack mountable .....	Yes
Enclosure material .....	1 mm steel
Dimensions in mm .....	100.4 W x 67.6 D x 26 H
Dimensions in inch .....	4 W x 2.7 D x 1 H
Weight .....	250 g / 0.55 lbs

## Video Input

Connector type .....	19-pole HDMI Type A receptacle
AV standards .....	DVI 1.0, HDMI 1.4
HDCP compliance .....	HDCP 1.4
Color space .....	RGB, YCbCr
Video delay .....	0 frame
Supported resolutions at 8 bits/color * .....	up to 4096×2160@30Hz (4:4:4)
.....	up to 4096×2160@60Hz (4:2:0)
Reclocking .....	Pixel Accurate Reclocking
3D support .....	yes
Audio formats .....	8 channel PCM / Dolby TrueHD, DTS-HD Master Audio 7.1
Input cable equalization .....	Yes, +12dB fixed
Cable length (input port) .....	max 20 m (4Kp30) or 30 m (1080p60)

## Video Outputs

Connector type .....	19-pole HDMI Type A receptacle
AV standards .....	DVI 1.0, HDMI 1.4
HDCP compliance .....	HDCP 1.4
Color space .....	RGB, YCbCr
Video delay .....	0 frame
Supported resolutions at 8 bits/color * .....	up to 4096×2160@30Hz (4:4:4)
.....	up to 4096×2160@60Hz (4:2:0)
Audio formats .....	8 channel PCM / Dolby TrueHD, DTS-HD Master Audio 7.1
Control over CEC .....	HDMI out 1: no CEC control; HDMI out 2: transparent

\* All standard VESA, CEA and other custom resolutions up to 300MHz (HDMI1.4) are supported.

## Audio Ports

### Analog audio input

Connector type .....	3.5 mm TRS (1/8" jack)
Audio formats .....	2-channel PCM
Sampling frequency .....	48 kHz

Maximum input level..... +0 dBu, 0.77 Vrms, 2.19 Vpp  
Signal transmission .....Balanced / unbalanced signal  
Volume ..... -95 – 0 dB  
Balance ..... 0 – 100 (50 = center)  
Gain ..... 0 dB – +6 dB

#### **Analog audio output**

Connector type ..... 5-pole Phoenix connector  
Audio formats ..... 2-channel PCM  
Sampling frequency..... 48 kHz  
Signal transmission .....Balanced / unbalanced signal  
Volume ..... -57 – +6 dB  
Balance ..... 0 – 100 (50 = center)  
Nominal Differential Output Level @ 0 dB Gain ..... +4 dBu  
Nominal Differential Output Level @ 3 dB Gain ..... +7 dBu

#### **EDID Management**

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

#### **Control Port**

Connector type ..... USB mini-B receptacle  
USB compliance..... USB 2.0

### **Firmware Update – Using Lightware Device Updater (LDU) Preparation**

The following are necessary to perform a firmware update:



- Lightware Device Updater software – available on [www.lightware.com](http://www.lightware.com),
- Firmware package of the device (LFP file) – please contact [support@lightware.com](mailto:support@lightware.com).
- Power adaptor to supply the device.

### **Performing the Update**

**i** The device must be supplied with the power adaptor when the firmware is updated.  
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.

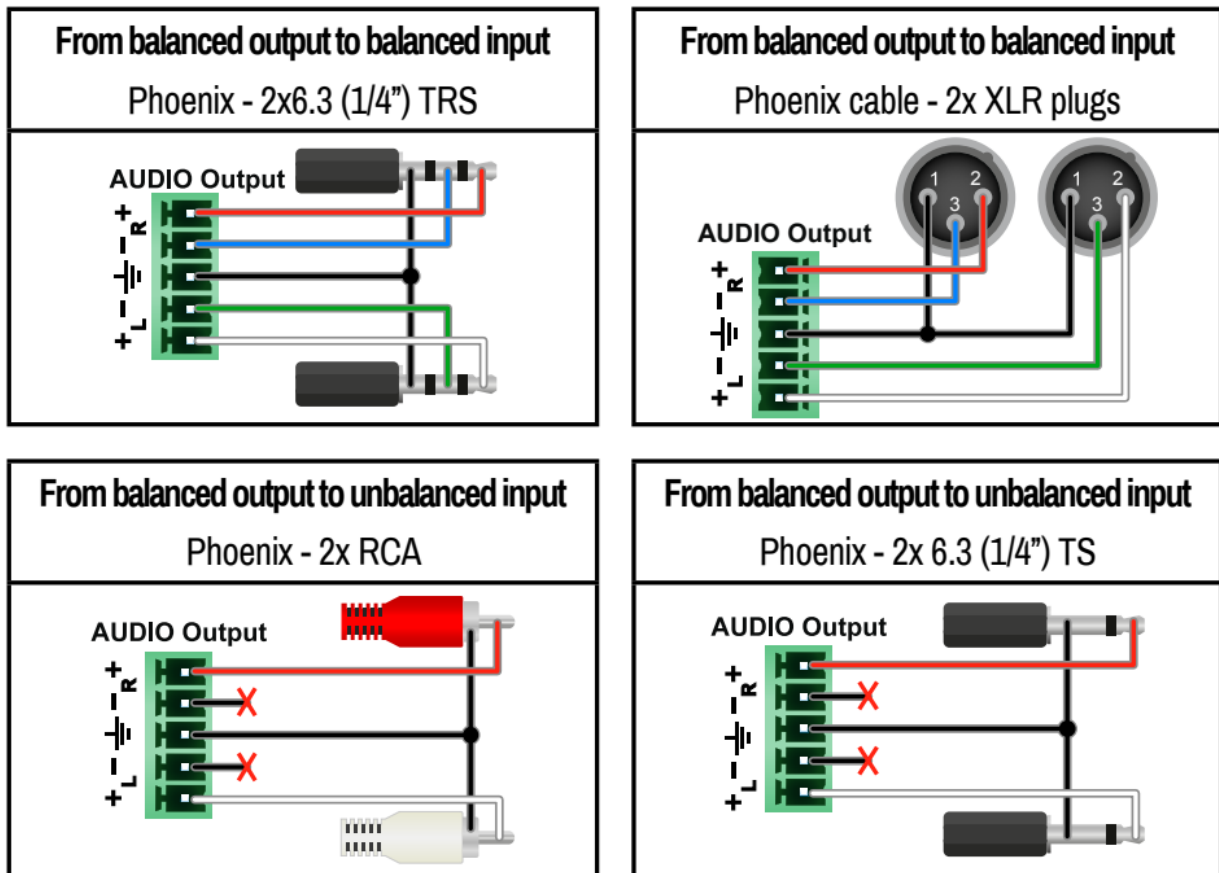
### **Starting the Unit in Bootload Mode**

If the usual firmware update 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 bootloader mode. The LIVE LED blinks fast.

## Audio Cable Wiring Guide

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



For more information about the audio cable wiring, see the Cable Wiring Guide on our website [www.lightware.com](http://www.lightware.com).

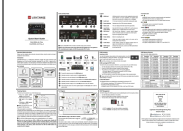


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## Documents / Resources



[LIGHTWARE DA2HDMI-4K-Plus Distribution Amplifier](#) [pdf] User Guide  
DA2HDMI-4K-Plus Distribution Amplifier, DA2HDMI-4K-Plus, Distribution Amplifier, Amplifier

## References

-  [Lightware Visual Engineering](#)
- [User Manual](#)

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