EMX-HD-AUD

HDMI Audio Extractor w/ EDID Management

Extracts Digital and Analog Audio from HDMI input
Equalizes and Extends HDMI video signals to 50 ft
Learns and Emulates EDID
USB Port for EDID Read & Write
HDCP Compliant

1.0 Introduction

Thank you for purchasing the Hall Research EMX-HD-AUD. This versatile device can be used to extract the audio from HDMI, extend HDMI cable length, manage EDID (pass-thru or emulate), and re-clock both TMDS video and DDC data. The use of EMX-HD-AUD can often resolve system level HDMI signal-chain issues by acting as an intelligent intermediary.

The EMX-HD-AUD is powered from the HDMI source input and no additional power supply connection is needed for most applications. A USB power supply is included and may be used in case the HDMI source has limited power.

Use the EMX-HD-AUD wherever you want to diagnose or resolve HDMI issues. It can fix problems caused by incompatibility of components in the video signal chain, signal degradation due to long cables, or issues related to EDID.

Multi-color LED's on the unit indicate the mode of operation with regards to EDID routing, and also provide real-time status on the HDMI signal's video and audio. The audio outputs include stereo analog on a 3.5mm jack, Digital audio (2 or multi-channel SPDIF) on optical TOSLINK connector, and of course the audio that is embedded in the HDMI output stream. Each of the audio outputs can be independently muted. For example, you can remove the audio from the HDMI output. This would be desirable in many applications if the connected TV's audio were causing annoying echo due to processing delay.

The EMX-HD-AUD constructs an EDID table (capabilities list) for the connected source. This table either is copied verbatim from the connected display (sink) when in pass-thru mode, or substitutes an internal EDID data from on board memory. The internal EDID data can be learned from any connected display by using the buttons on the box, or uploaded to it from a PC via the USB port. Most importantly, the device maintains HDCP compliance regardless of the EDID routing mode, so HDCP protected content passes through the system with protection intact even when the EDID is emulated from internal memory.

The EMX-HD-AUD is HDMI 1.3 and 1.4 (deep-color and 3D) compatible, and automatically compensates for the signal degradation caused by long video cable runs of up to 50 ft (15 m) on its input and can drive HDMI cables on its output to 30 ft (10 m).

The package includes a universal power supply and a USB cable for connection to a PC. Free Windows™ PC software is available on the product's website that allows reading, saving, manipulating, and writing EDID tables to and from the unit. The software can also be used to control the operational modes and provides diagnostic tools such as indication of the HDMI input signal's video and audio characteristics.
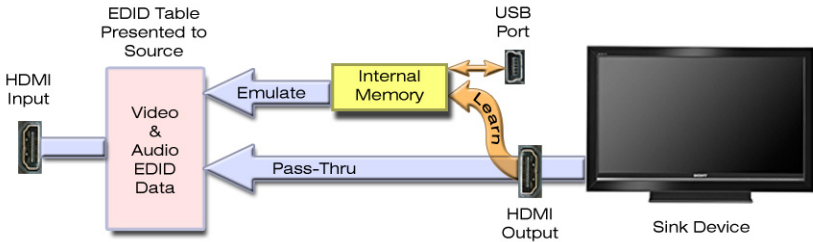
EDID Routing Modes

2.0 Features

❑ Extracts both analog and digital audio

❑ Pass-through EDID or Learn and emulate custom files

❑ Powered from HDMI input or external power (if required)

❑ Re-clocks HDMI and buffers DDC (resolves EDID and HDCP issues)

❑ Surge protects HDMI input and output

❑ Supports DVI, HDMI™, HDCP, CEC, Deep-Color, and 3D Video

❑ LED indicators for Mode and HDMI Video/Audio status

❑ Extract audio with or without a display

❑ Can mute audio outputs independently

❑ Can remove the audio from the HDMI output signal

❑ USB port for EDID management

❑ Free PC software to grab, manipulate or upload EDID data

❑ Locking HDMI Connectors (requires compatible cable for locking feature)

❑ Designed and made in USA

3.0 Installation

The EMX-HD-AUD connects between the video source and an optional display device.
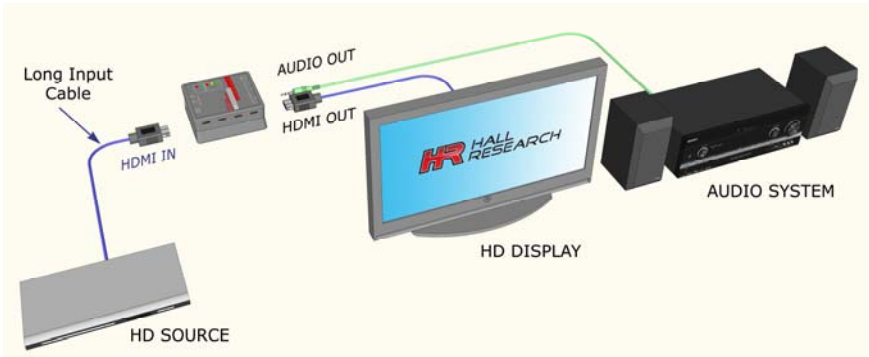
Connect the included power supply to the mini-USB connector on the video output end of the unit if needed.

Connect the HDMI or DVI video source to the EMX-HD-AUD video input.

Connect the EMX-HD-AUD video output to the display device (not required for operation).

Connect the EMX-HD-AUD 3.5mm audio output and/or TOSLINK optical output to the external sound system.

Though capable of driving long cables on its output, when used as an extender, it is best to place the EMX-HD-AUD at the far end of the long HDMI cable. In that way its automatic equalizer can clean the signal and open the TMDS "eye"
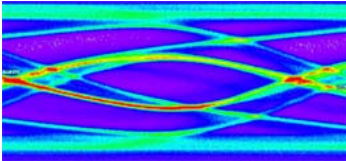
TMDS Signal at end of long Cable
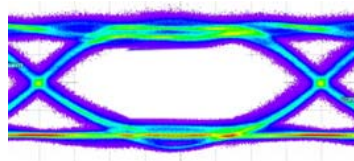
TMDS Signal after Equalization

The EMX-HD-AUD LEDs show the current device settings. Refer to the operations section for more information.

Model C-HDMI-L-x

(x = 1.5, 3, 6, 10, 15, 25, 35 or 50 ft)

Video Input End

Top View

Video Output End

4.0 Default EMULATION resolutions

The following lists the default resolutions of the EMX-HD-AUD. The user can overwrite the default EDID table but upon performing a Factory Default reset, these values are reset.

RESOLUTION	FREQUENCY	ASPECT RATIO	RESOLUTION	FREQUENCY	ASPECT RATIO
640x480	60, 67, 72, 75	(Aspect 4:3)	720x480i	59.94/60	(Aspect 4:3, 8:9)
800x600	56, 60, 72, 75	(Aspect 4:3)	720x480p	59.94/60	(Aspect 4:3, 8:9)
1024x768	60, 70, 75	(Aspect 4:3)	1280x720p	59.94/60	(Aspect 16:9, 1:1)
1280x720	**60**	**(Aspect 16:9)**	1920x1080i	59.94/60	(Aspect 16:9, 1:1)
1280x800	60	(Aspect 16:10)	1920x1080p	50, 59.94/60	(Aspect 16:9, 1:1)
1280x1024	60, 75, 85	(Aspect 5:4)			
1400x1050	60	(Aspect 4:3)			
1440x900	60	(Aspect 16:10)			
1600x1200	60	(Aspect 4:3)			
1680x1050	60	(Aspect 16:10)			
1920x1080	60	(Aspect 16:9)			
1920x1200	60	(Aspect 16:10)			

5.0 Power Requirements

This device requires 5 Volts DC which can come from the included power supply with a mini-USB connector or from Pin 18 (+5 V) of the HDMI connector.

To power the EMX-HD-AUD from the HDMI or DVI input power, the source must be able to supply a minimum of 100 mA (@ 5 vDC). Using a video source with insufficient power capabilities will result in erratic operation and loss of video.

6.0 Operation

o The EMX-HD-AUD buttons are recessed in the device to help prevent accidental changes to the device settings and may require the use of a pointed device to press the buttons!

VIDEO LEDS

- *EMULATE*
  - o All portions of the EDID pertaining to video are from internally stored memory.
- *PASS-THRU*
  - o All portions of the EDID pertaining to video are from the attached SINK.
- *Video input Status Indication*
  - o A slow blink (~1/sec) indicates NON-HDCP content; a fast blink (~2/sec) indicates HDCP content, no blinking indicates no video detected.

AUDIO LEDS

- *MULTI*
  - o Audio EDID includes 2-channel LPCM, as well as multi-channel DTS and DOLBY.
- *2 CH*
  - o Audio EDID includes 2-channel LPCM.
- *PASS-THRU*
  - o Audio EDID reported to the source is directly derived from the audio capabilities of attached SINK.
- *Video input Status Indication*
  - o If Audio is embedded on the input HDMI signal, either the MULTI or the 2CH LED positions will be blinking to indicate the type of Audio that is being received. Note that the Analog output is muted if the received HDMI audio is multi-channel.

LEARNING an EDID

- o Press and hold the VIDEO button for approximately 3~5 seconds until the EMULATE LED starts blinking
- o Release the button, the EMULATE LED will continue blinking while the unit reads the EDID from the connected output.
- o If the EDID reads successfully, ALL LED's will illuminate one at a time in a sequential pattern 5 times.
- o If the EDID was NOT successfully read, the PASS-THRU and EMULATE VIDEO LEDs will alternately flash 5 times to indicate the error. This usually indicates either a cable issue or the connected OUTPUT device has an invalid EDID.

SET FACTORY DEFAULTS

- o Press and hold BOTH the AUDIO and VIDEO buttons for approximately 3~5 seconds until BOTH the VIDEO EMULATE and AUDIO MULTI LED's start blinking together.
- o Release both buttons.
- o If the factory defaults were successfully restored, ALL LED's will illuminate one at a time in a circular pattern 5 times.

7.0 Free Windows Software GUI

The EMX-HD-AUD is controllable via a free Windows™ based GUI available on the Hall Research website http://www.hallresearch.com.

All of the device features, and more, are accessible from the GUI. EDID files can be exported and modified using 3rd party software and imported back into the EMX-HD-AUD. The device is also capable of writing custom EDID data back to compatible display devices.

The user guide for the Software GUI is only available on the website.
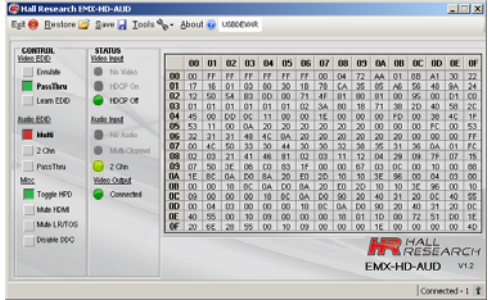
8.0 Troubleshooting

No LEDs illuminate .... *Check power supply*

Device will not remember settings or will not LEARN and EDID or the LEDs only momentarily FLASH when buttons are pushed

No Video .... *Verify cabling and check power supply.*
.... *Verify HDCP compliant display for HDCP content.*
.... *Verify GUI DDCcontrol is enabled.*

No Audio .... *Verify source audio and video formats*

If neither MULTI nor 2CH LED's are blinking, input may be DVI rather than HDMI video.

Ensure GUI 'MUTE' controls are set correctly and not MUTED.

The 3.5mm stereo audio is only active when the HDMI audio format is 2-channel LPCM.

EDID Not Learned Correctly ...... *Ensure VIDEO & AUDIO modes not changed*

When an EDID is learned, the EMX-HD-AUD is placed in Pass-Thru modes for both Video and Audio. In these modes, the EDID will remain un-touched and can be exported, if desired.

If either VIDEO or AUDIO modes are changed; the EDID will be mixed to have audio capabilities. The previous 'un-touched' EDID will no longer be available unless previously saved.

9.0 Returning unit for Repair

If you need to transport or ship your unit: Package it carefully. We recommend that you use the original container.

Before you ship the units back to Hall Research for repair or return, contact us to get a Return Authorization (RMA) number.

10.0 Specifications

Power Supply .... **(North American)**
5 vDC, 1 ADC
USB-A to mini-B cable
90-264 VAC, 47-63 HZ
CE/FCC/UL
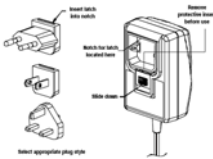
(Export)
5 vDC, 1.2 ADC
Integral mini-B cable
90-264 VAC, 47-63 HZ
CE/FCC/UL
Inter-changeable blades

Size .... 2.71″ (W) x 2.825″ (D) x 1.25″ (H)
(68.83 mm) x (71.76 mm) x (31.75 mm)
Weight ....1 Lb (0.453 kg)
Operating Temperature.. 32 to 104 DegF (0 to 40 DegC)
Storage Temperature ....-40 to 185 DegF (-40 to 85 DegC)
Humidity ....10 to 90% non-condensing
Cooling ....Convection
Enclosure type ....Black Plastic ABS-94VO, UL File #56070
Vibration ....ISTA 1A in carton (International Safe Transit Association)
Safety ....CE
EMI/EMC ....CE, FCC Class A
MTBF...90,000 hours
Warranty..2 years parts and labor
USB ....1.1 Full Speed
Support video formats...DVI 1.0
.... HDMI™ 1.4
....HDCP 1.0
....Analog RGBHV

11.0 Trademarks

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