NEXIS

HAD04

4K UHD+ HDMI Audio Extractor (LPCM 2.0)



HDMI®
HIGH-DEFINITION MULTIMEDIA INTERFACE

Operation Manual

DISCLAIMERS

The information in this manual has been carefully checked and is believed to be accurate. NEXIS assumes no responsibility for any infringements of patents or other rights of third parties which may result from its use.

NEXIS assumes no responsibility for any inaccuracies that may be contained in this document. NEXIS also makes no commitment to update or to keep current the information contained in this document.

NEXIS reserves the right to make improvements to this document and/or product at any time and without notice.

COPYRIGHT NOTICE

No part of this document may be reproduced, transmitted, transcribed, stored in a retrieval system, or any of its part translated into any language or computer file, in any form or by any means—electronic, mechanical, magnetic, optical, chemical, manual, or otherwise—without express written permission and consent from NEXIS.

© Copyright 2018 by NEXIS.

All Rights Reserved.

TRADEMARK ACKNOWLEDGMENTS

All products or service names mentioned in this document may be trademarks of the companies with which they are associated.

SAFETY PRECAUTIONS

Please read all instructions before attempting to unpack, install or operate this equipment and before connecting the power supply.

Please keep the following in mind as you unpack and install this equipment:

- Always follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.
- Never spill liquid of any kind on or into this product.
- Never push an object of any kind into this product through any openings or empty slots in the unit, as you may damage parts inside the unit.
- Do not attach the power supply cabling to building surfaces.
- Use only the supplied power supply unit (PSU). Do not use the PSU if it is damaged.
- Do not allow anything to rest on the power cabling or allow any weight to be placed upon it or any person walk on it.
- To protect the unit from overheating, do not block any vents or openings in the unit housing that provide ventilation and allow for sufficient space for air to circulate around the unit.

REVISION HISTORY

VERSION NO.	DATE	SUMMARY OF CHANGE
RDV1	24/11/16	Preliminary release
VS1	12/02/18	Final technical review

CONTENTS

1. Introduction.....1
2. Applications.....1
3. Package Contents 1
4. System Requirements.....2
5. Features.....2
6. Operation Controls and Functions.....3
6.1 Front Panel 3
6.2 Rear Panel..... 4
6.3 Virtual COM Port Control 4
6.4 EDID Commander..... 6
6.4.1 EDID Controller Tab..... 6
6.4.2 EDID Creator Tab 7
6.4.3 System Tab..... 8
7. Connection Diagram 9
8. Specifications 10
8.1 Technical Specifications 10
8.2 Video Specifications..... 11
8.3 Audio Specifications..... 12
9. Acronyms.....13

1. INTRODUCTION

This HDMI Audio Extractor can extract up to 2 channels of LPCM audio or 5.1 channels of Bitstream audio from an HDMI source, allowing the user to convert high quality HDMI audio into more convenient analog (LPCM 2.0 sources only) or optical signals for use with powered speakers or non-HDMI AV receivers.

Both the input and output HDMI ports support 4K UHD resolutions up to 4K@60Hz (4:4:4, 8-bit) and are capable of providing high quality audio and video performance. This unit supports passthrough of HD and standard Bitstream formats as well as LPCM 7.1 with audio sampling rates up to 192kHz. Built-in EDID management support allows the user select from multiple EDIDs and, with the use of optional PC software, to upload, download, or edit EDID files.

2. APPLICATIONS

- Audio extraction for use with non-HDMI AV receivers or powered speaker systems
- AV system integration and home theater installation
- Supporting HDMI sources on DVI displays with analog or external speaker systems
- HDMI/DVI EDID management

3. PACKAGE CONTENTS

- 1×HDMI Audio Extractor (LPCM 2.0)
- 1×5V/2.6A DC Power Adapter
- 1×Operation Manual

4. SYSTEM REQUIREMENTS

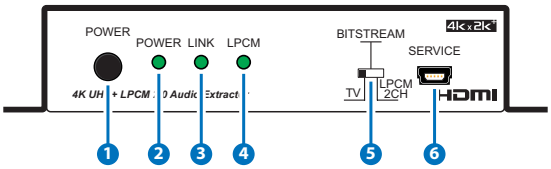
- HDMI source equipment such as a media player, video game console or set-top box.
- HDMI receiving equipment such as an HDTV, monitor or audio amplifier.
- Analog audio receiving equipment such as an audio amplifier or powered speakers.
- The use of "Premium High Speed HDMI" cables is highly recommended.

5. FEATURES

- HDMI input and output with 18Gbps (600MHz) 4K UHD support
- DVI 1.0 compatible with the use of an HDMI-DVI adaptor
- HDCP 1.4 and 2.2 compliant
- Supports HD resolutions up to 3840×2160@60 Hz (4:4:4, 8-bit) & 4096×2160@60 Hz (4:4:4, 8-bit)
- Supports 48-bit Deep Color up to 1080p@60Hz
- Supports passthrough of LPCM 7.1, Bitstream and HD Bitstream audio formats over HDMI
- Analog audio extraction supports LPCM 2.0 sources
- Optical S/PDIF audio extraction supports LPCM 2.0 & Bitstream formats
- Supports HDMI and S/PDIF audio sampling rates up to 192kHz
- Provides EDID management with EDID bypass and 2 user modifiable EDIDs
- PC based EDID management tool support
- Supports RS-232 style control via a Virtual COM port over USB

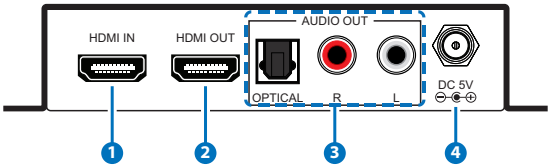
6. OPERATION CONTROLS AND FUNCTIONS

6.1 Front Panel



1. **POWER:** Press this button to power the unit on or off.
2. **POWER:** This LED will be lit when the unit is receiving power.
   Note: Press and hold the Power button for 3 seconds (until the LEDs begin flashing) to perform a factory reset.
3. **LINK:** This LED will illuminate to indicate that a live source has been detected on the input port. When no source is detected the LED will remain off.
4. **LPCM:** This LED will illuminate when LPCM audio has been detected on the HDMI input.
5. **TV/BITSTREAM/LPCM 2CH:** This switch selects the EDID that is provided to the input. The "TV" setting passes the EDID from the connected display without modification. "Bitstream" is the User 1 EDID and by default has a native resolution of 1080p@60Hz with support for LPCM 2.0 and Bitstream formats. "LPCM 2CH" is the User 2 EDID and by default has a native resolution of 1080p@60Hz and limits the audio support to LPCM 2CH. The two User EDIDs can be modified using the PC software.
6. **SERVICE:** This slot is for EDID management, control and firmware update use. Connect directly to your PC/laptop using a standard Mini-USB cable to connect using the PC software or to send commands (via virtual COM port).

6.2 Rear Panel



1. **HDMI IN:** Connect to HDMI source equipment such as a media player, game console or set-top box.
2. **HDMI OUT:** Connect to an HDMI TV, monitor or amplifier for digital video and audio output (LPCM up to 7.1, Bitstream, HD Bitstream).
3. **OPTICAL OUT:** Connect to powered speakers or an amplifier for digital audio output using an appropriate optical cable (LPCM 2.0 and Bitstream only).

   L/R OUT: Connect to powered speakers or an amplifier for stereo analog audio output (LPCM 2.0 only).
4. **DC 5V:** Plug the 5V DC power adapter into the unit and connect it to an AC wall outlet for power.

6.3 Virtual COM Port Control

COM PORT SETTINGS	
Baud rate	115200
Data bits	8
Parity	None
Stop bits	1
Flow control	None

COMMAND	DESCRIPTION & PARAMETERS
?	Show the full command list.
HELP	Show the full command list.
P1	Power the unit on.
P0	Power the unit off (Stand-by mode).
P?	Show the current power state.
SOURCEDET	Show the current input source detection state.
SINKINFO	Show information about the currently connected display.
HDCPIN N1	Set the HDCP handling mode for the HDMI input. Available values for **N1**: 1 [Follow Input] 2 [Follow Output] 3 [Apple Mode]
HDCPIN ?	Show the current HDCP handling mode.
ECHO N1	Set the console text echo mode behavior. Available values for **N1**: 0 [Text echoing is off] 1 [Text echoing is on]
ECHO ?	Show the current text echoing mode.
FADEFAULT	Reset the unit to the factory defaults.
VER	Show the unit's current firmware version.
REBOOT	Reboot the unit.

Note: Commands will not be executed unless followed by a carriage return. Commands are not case-sensitive.

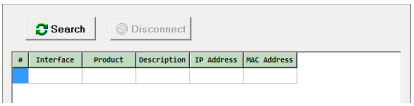
6.4 EDID Commander

(1) This unit uses an EDID Management application which allows the user to copy the EDID from an attached display, edit an existing EDID file stored on the PC or create a basic EDID from scratch. The EDID can then be uploaded to the unit for use.

(2) Please obtain the EDID Management software from your authorized dealer and save it in a directory where you can easily find it.

(3) Before connecting the unit to your PC, please install the appropriate Virtual COM Port Driver depending on your Windows version. Next, install the EDID Management software.

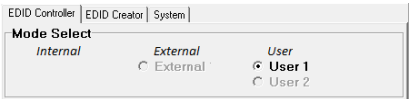
(4) After the installation has successfully completed, an icon for it will appear on the windows desktop. Launch the software by double-clicking on the icon and the EDID Management device detection window will open up on your screen.



(5) After launching the software, power the unit on and then connect it to the PC/laptop using a USB cable. Click on the "Search" button and any detected units will be displayed in the list. Clicking on a detected unit will open the EDID Commander window.

6.4.1 EDID Controller Tab

- **Mode Select:** The currently selected EDID is displayed here.



- The "User 1" EDID corresponds to the "Bitstream" setting on the front of the unit. The "User 2" EDID corresponds to the "LPCM 2CH" setting on the front of the unit. Both of these EDIDs are user-replaceable.
- To return them to their original values, please perform a factory reset on the unit.

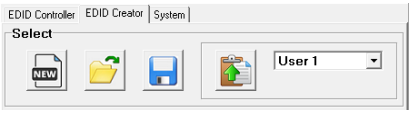
- **Save/Upload/Analysis:** EDIDs may be saved to a PC, uploaded from a PC or analyzed.



  - **Save:** Any EDID from the unit or the connected HDMI display can be saved to your PC as a *.bin file by selecting the EDID source from the drop down menu and then clicking the "Save" icon.
  - **Upload:** Previously saved EDID files (*.bin format) can be re-uploaded into the unit by selecting the User EDID to replace from the dropdown and then clicking the "Upload" icon. Before accepting the upload, the software will check and verify that the EDID's header and checksum values are acceptable.
  - **Analysis:** To analyze any EDID stored within the unit, select the EDID to view from the dropdown and click on the "Analysis" icon.

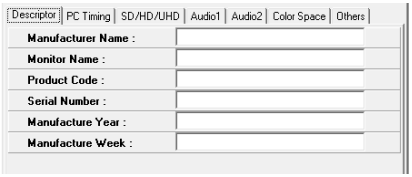
6.4.2 EDID Creator Tab

- **Select:** Click on the EDID Creator tab to begin designing a new EDID from scratch (select the "New" icon), to modify an existing EDID stored on the PC as a .bin file (select the "Load" icon) or to edit an EDID copied from the unit via the EDID Analyzer's edit option.



  - Selecting "New" will automatically populate the various EDID fields with basic information that can be easily edited to match the user's preferences.
  - Clicking on the "Load" icon will open a file load window and after the *.bin file has been selected and loaded the EDID fields will be populated with the information from that file. The same will happen when the EDID is copied from the EDID Analyzer window.

- **Edit:** The following tabs provide access to a wide range of EDID information which can be edited:

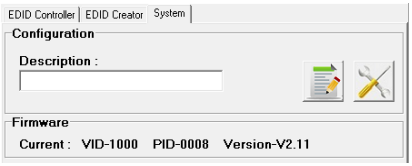


  - **Descriptor:** This tab allows for the editing of various description and information fields within the EDID file such as Manufacturer Name, Monitor Name, etc.
  - **PC Timing & SD/HD/UHD**: These tabs allow for the selection of the resolutions and refresh rates that the EDID will report as supported.
  - **Audio1 & Audio2:** These tabs allow for the selection of which audio formats, audio frequencies, channels and speaker locations are supported.
  - **Color Space**: This tab allows for the selection of which color formats and bit depths are supported, including BT.2020 and HDR support options.
  - **Others:** This tab contains options for supporting 3D and defining the CEC Address.

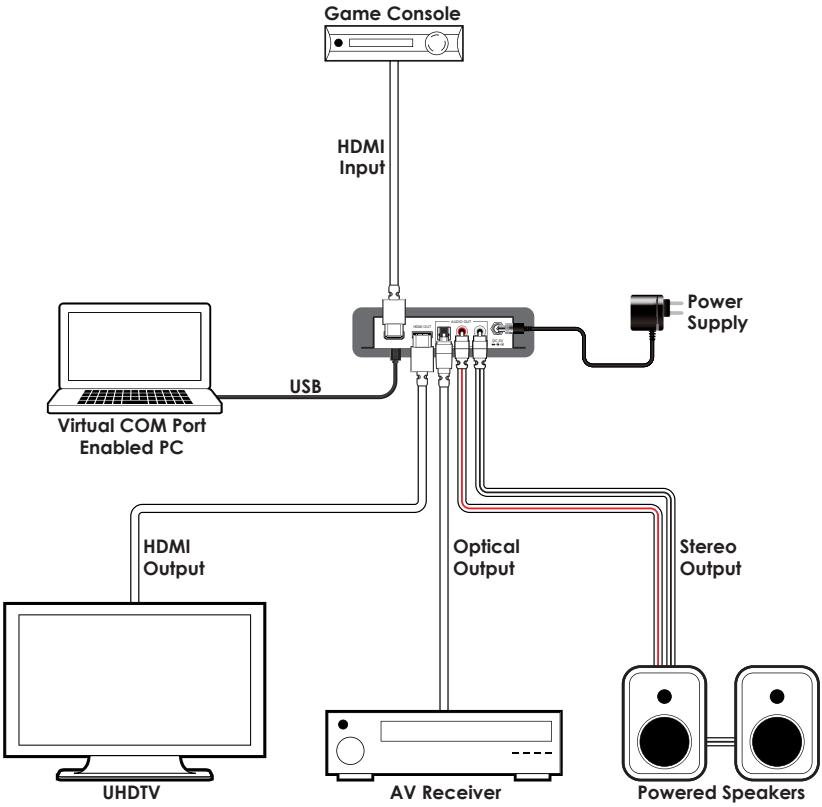
Once the user is finished editing or creating an EDID it can be saved to a *.bin file locally or uploaded directly to the unit using the "Save" and "Upload" icons respectively.

6.4.3 System Tab

- **Configuration & Firmware:** Select the System tab to edit the unit's description (select the "Rename" icon), to reset the unit to factory defaults (select the "Reset" icon) and to view the unit's current hardware and firmware version information.



7. CONNECTION DIAGRAM



8. SPECIFICATIONS

8.1 Technical Specifications

HDMI Bandwidth	600MHz/18Gbps
Input Port	1×HDMI
Output Ports	1×HDMI 1×Optical (S/PDIF) 2×RCA (Stereo)
Control Interface	1×USB Mini-B
HDMI Cable Length	10m (1080p@60Hz, 12-bit) 3m (4K@60Hz, 4:4:4, 8-bit)
Baud Rate	Up to 115200bps
Power Supply	5V/2.6A DC (US/EU standards, CE/FCC/UL certified)
ESD Protection	Human Body Model: ±8kV (Air Discharge) ±4kV (Contact Discharge)
Dimensions	128mm×25mm×108mm (W×H×D) [Case Only] 128mm×25mm×118mm (W×H×D) [All Inclusive]
Weight	358g
Chassis Material	Metal
Silkscreen Color	Black
Operating Temperature	0˚C - 40˚C/32˚F - 104˚F
Storage Temperature	−20˚C - 60˚C/−4˚F - 140˚F
Relative Humidity	20 - 90% RH (Non-condensing)
Power Consumption	3.91W

8.2 Video Specifications

Standard Resolution Support		Input	Output
640×480	60, 72, 75, 85	✓	✓
800×600	56, 60, 72, 75, 85	✓	✓
1024×768	60, 70, 75, 85	✓	✓
1280×720	50, 60	✓	✓
1280×768	60, 75, 85	✓	✓
1280×800	60	✓	✓
1280×1024	60	✓	✓
1360×768	60	✓	✓
1600×1200	60	✓	✓
1920×1200	60 (RB)	✓	✓
720×480p	60	✓	✓
720×576p	50	✓	✓
1280×720p	60	✓	✓
1920×1080i	50, 60	✓	✓
1920×1080p	24, 25, 30, 50, 60	✓	✓
3840×2160p (YUV 4:2:0)	50, 60	✓	✓
4096×2160p (YUV 4:2:0)	50, 60	✓	✓
3840×2160p	24, 25, 30, 50, 60	✓	✓
4096×2160p	24, 25, 30, 50, 60	✓	✓

8.3 Audio Specifications

Input/Output Audio Analysis:

Measurement	Input Connector
	HDMI
Level	0dBFs
Frequency	1kHz

Measurement	Output Connector		
	HDMI	Optical	Analog
Output Level	0~−1dB		2Vrms±10%
THD+N	<0.01%		<0.01%
Frequency Response	±1dBFS		±1dBFS
SNR	>80dB		>80dB
Crosstalk	<−80dB		<−80dB

Audio Sampling Rates:

HDMI	32, 44.1, 48, 88.2, 96, 176.4, 192kHz (Passthrough)
S/PDIF	

9. ACRONYMS

ACRONYM	COMPLETE TERM
3D	Three-Dimensional
ARC	Audio Return Channel
CEC	Consumer Electronics Control
COM	Communication
DAC	Digital-to-Analog Converter
DVI	Digital Visual Interface
EDID	Extended Display Identification Data
HD	High-Definition
HDCP	High-bandwidth Digital Content Protection
HDMI	High-Definition Multimedia Interface
HDR	High Dynamic Range
LED	Light-Emitting Diode
LPCM	Linear Pulse-Code Modulation
PC	Personal Computer
S/PDIF	Sony/Philips Digital Interface Format
SD	Standard-Definition
UHD	Ultra-High-Definition
USB	Universal Serial Bus