



AU-11PRO

Full 4K HDMI Audio Embedder/De-embedder with ARC

OPERATION MANUAL

HDMI[®]
HIGH-DEFINITION MULTIMEDIA INTERFACE

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Version 1.1

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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.
- Please completely disconnect the power when the unit is not in use to avoid wasting electricity.

VERSION HISTORY

REV.	DATE	SUMMARY OF CHANGE
RDV1	2022/12/29	Preliminary release

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1. INTRODUCTION

This UHD⁺ Audio Extractor & Inserter can take the selected audio from an HDMI, ARC (from HDMI Output 1), optical, or analog source and output it simultaneously over the unit's HDMI, optical, and analog outputs. This allows the user to convert an audio source using high quality ADC/DAC processing for use with powered speakers or an AV receiver that otherwise would not be able to support the original format. The HDMI input and mirrored HDMI output ports support resolutions up to 4K@60Hz (4:4:4, 8-bit) and advanced video content such as HDR (High Dynamic Range), 10-bit color is also supported. The built-in EDID management controls allow the user to select from multiple pre-configured EDIDs, including the option for a custom user uploaded EDID.

2. APPLICATIONS

- /// Classroom and Lecture Hall Presentations
- /// Showrooms and Demo Rooms
- /// Hotel Lobby Information Displays
- /// Public Commercial Displays

3. PACKAGE CONTENTS

- /// 1× UHD⁺ Audio Extractor & Inserter
- /// 1× 5V/3A DC Power Adapter
- /// 1× Shockproof Feet (Set of 4)
- /// 1× Operation Manual

4. SYSTEM REQUIREMENTS

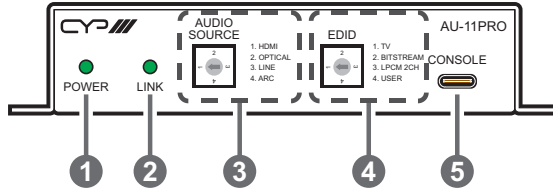
- /// HDMI source equipment such as media players, video game consoles, or set-top boxes.
- /// HDMI receiving equipment such as HDTVs, monitors, or audio amplifiers.
- /// Analog audio receiving equipment such as an audio amplifier or powered speakers.
- /// The use of Premium High Speed HDMI cables is highly recommended.

5. FEATURES

- /// HDMI 2.0 and DVI 1.0 compliant
 - /// HDCP 1.x and 2.2 compliant
 - /// 1 HDMI input and 2 mirrored HDMI outputs
 - /// Supports up to 4K UHD⁺ (18Gbps, 4K@50/60Hz 4:4:4, 8-bit) video input and output
 - /// Supports pass-through of 10/12-bit HDR sources
 - /// HDMI supports pass-through of multiple audio formats including LPCM (up to 8 channels), Bitstream and HD Bitstream
 - /// Freely selectable audio extraction source
- Note: Optical output is limited to LPCM 2.0 and standard Bitstream sources.
Analog audio output is limited to LPCM 2.0 sources.*
- /// Provides EDID management with EDID bypass, 2 pre-made EDIDs, and a user modifiable EDID
 - /// Controllable via front panel selector dials and RS-232 style control via a Virtual COM port over USB-C

6. OPERATION CONTROLS AND FUNCTIONS

6.1 Front Panel



- 1 POWER LED:** This LED will illuminate to indicate the unit is on and receiving power.
- 2 LINK LED:** 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.
- 3 AUDIO SOURCE Dial:** This dial selects the audio source to be embedded in the HDMI output signals as well as output over the optical and analog outputs.

Note: The ARC source can only come from HDMI output 1 and requires a connected TV with ARC support enabled.

- 4 EDID Dial:** This dial selects the EDID to provide to the HDMI input. The available options are:

- **TV:** Copies the EDID from the display currently connected to output 1 and passes it to the input.

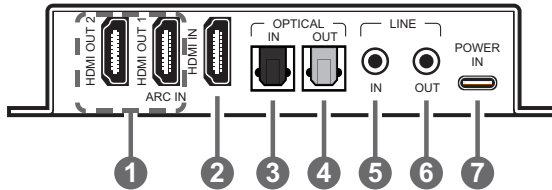
Note: If the connected outputs are a mixture of HDMI and DVI displays, the EDID's color space will be set to RGB for compatibility reasons.

- **BITSTREAM:** This pre-defined EDID has a native resolution of 1080p@60Hz with support for LPCM 2.0 and Bitstream formats.
- **LPCM 2CH:** This pre-defined EDID has a native resolution of 1080p@60Hz with only support for the LPCM 2.0 format.
- **USER:** Uses the currently stored user EDID.

Note: The user EDID can be modified via direct entry using a serial command.

- 5 **CONSOLE USB-C Port:** This slot is for EDID management, control and firmware update use. Connect directly to your PC/laptop using a standard USB-C cable and send serial commands (via virtual COM port).

6.2 Rear Panel



- 1 **HDMI OUT 1~2 Ports:** Connect to HDMI TVs, monitors, or amplifiers for digital video and audio output.
Note: Only HDMI Output 1 supports ARC audio input.
- 2 **HDMI IN Port:** Connect to HDMI source equipment such as a media player, game console, or set-top box. DVI sources are supported with the use of an HDMI to DVI adapter.
- 3 **OPTICAL IN Port:** Connect to the optical audio output of a device such as a media player or game console using an appropriate optical cable.
- 4 **OPTICAL OUT Port:** Connect to powered speakers or an amplifier for digital audio output using an appropriate optical cable.
Note: Supported extracted audio from the HDMI input is limited to LPCM 2.0 and standard Bitstream sources.
- 5 **LINE IN Port:** Connect to the analog stereo output of a device such as an audio player or PC.
- 6 **LINE OUT Port:** Connect to powered speakers, headphones, or an amplifier for analog stereo audio output.
Note: Supported extracted audio from the HDMI or optical inputs is limited to LPCM 2.0 sources.
- 7 **POWER IN USB-C Port:** Plug the USB-C 5V DC power adapter into this port and connect it to an AC wall outlet for power.

6.3 Serial Defaults (via USB-C)

Serial Port Default Settings	
Baud Rate	19200
Data Bits	8
Parity Bits	None
Stop Bits	1
Flow Control	None

6.4 Serial Commands (via USB-C)

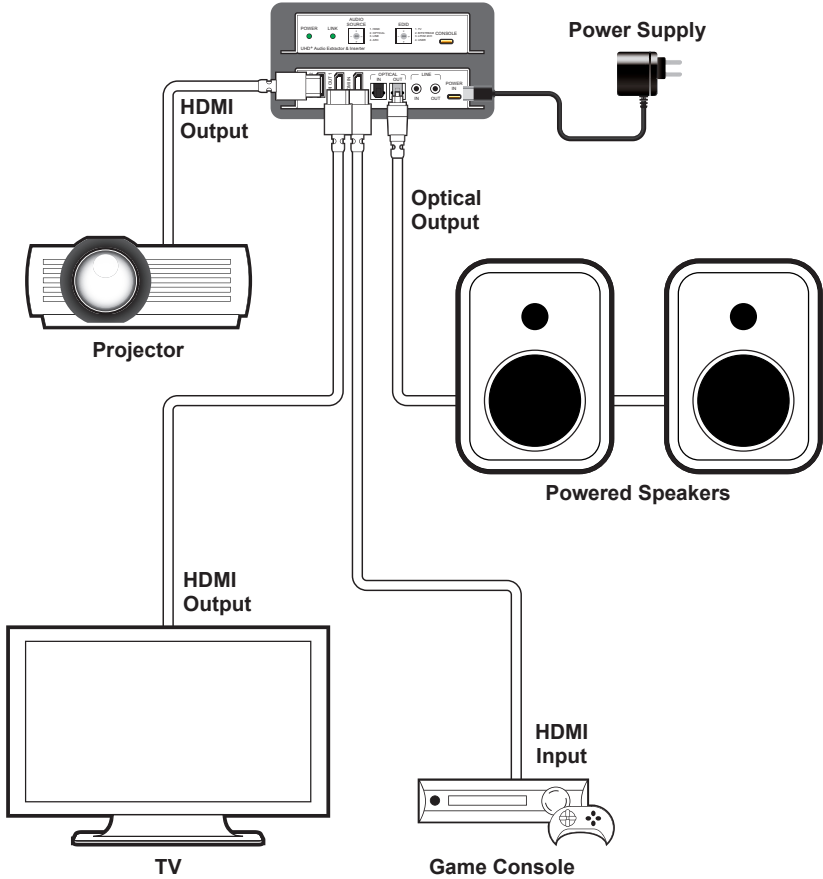
COMMAND	
Description and Parameters	
help ↵	Show all available commands.
help N1 ↵	Show details about the specified command. N1 = {Command}
? ↵	Show all available commands.
? N1 ↵	Show details about the specified command. N1 = {Command}
get fw ver ↵	Show the unit's current firmware version.
get model name ↵	Show the unit's model name.
get model type ↵	Show the unit's model type.
get command ver ↵	Show the unit's command protocol version.
set factory default ↵	Reset the unit to its factory defaults.

COMMAND												
Description and Parameters												
<p>set feedback broadcast N1 ↵</p> <p>Enable or disable the broadcast of console command feedback.</p> <p>Available values for N1:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">ON</td> <td>[Enable]</td> </tr> <tr> <td>OFF</td> <td>[Disable]</td> </tr> </table>	ON	[Enable]	OFF	[Disable]								
ON	[Enable]											
OFF	[Disable]											
<p>get feedback broadcast ↵</p> <p>Show the current console command feedback broadcast state.</p>												
<p>set system reboot ↵</p> <p>Reboot the unit.</p>												
<p>set uart 1 reset ↵</p> <p>Reset the unit's virtual COM port settings to the factory defaults.</p>												
<p>set uart 1 baudrate N1 ↵</p> <p>Set the baud rate of the virtual COM port.</p> <p>Available values for N1:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">4800</td> <td>[4800 baud]</td> </tr> <tr> <td>9600</td> <td>[9600 baud]</td> </tr> <tr> <td>19200</td> <td>[19200 baud]</td> </tr> <tr> <td>38400</td> <td>[38400 baud]</td> </tr> <tr> <td>57600</td> <td>[57600 baud]</td> </tr> <tr> <td>115200</td> <td>[115200 baud]</td> </tr> </table> <p><i>Note: Changing this value will terminate the current console connection and require reconnecting at the new baud rate.</i></p>	4800	[4800 baud]	9600	[9600 baud]	19200	[19200 baud]	38400	[38400 baud]	57600	[57600 baud]	115200	[115200 baud]
4800	[4800 baud]											
9600	[9600 baud]											
19200	[19200 baud]											
38400	[38400 baud]											
57600	[57600 baud]											
115200	[115200 baud]											
<p>get uart 1 baudrate ↵</p> <p>Show the current baud rate of the virtual COM port.</p>												
<p>get audio in type list ↵</p> <p>List all available audio input sources.</p>												

COMMAND	
Description and Parameters	
get audio out A route ↵	Show the current audio source routed to the HDMI/Optical/Line outputs.
get in 1 edid ↵	Show the currently selected EDID used on the HDMI input.
set user 1 edid data N1 ↵	Upload a new EDID (in hex format) for use as the specified User EDID. N1 = {EDID data} [Comma delimited hex pairs]
get user 1 edid data ↵	Show the current contents of the specified User EDID as hex data.
get sink N1 edid data ↵	Show the EDID from the display connected to the HDMI output as hex data. N1 = A~B [HDMI output port]
get internal N1 edid data ↵	Show the specified Internal EDID as hex data. Available values for N1 : 1 [LPCM 2CH EDID] 2 [Bitstream EDID]

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

7. CONNECTION DIAGRAM



8. SPECIFICATIONS

8.1 Technical Specifications

HDMI Bandwidth	18Gbps
Input Ports	1×HDMI (Type-A) 1×Digital Audio (TOSLINK) 1×Analog Stereo Audio (3.5mm)
Output Ports	2×HDMI (Type-A) 1×Digital Audio (TOSLINK) 1×Analog Stereo Audio (3.5mm)
Control Port	1×USB 3.0 (Type-C)
Service Port	1×USB 3.0 (Type-C)
Baud Rate	19200
Power Supply	5V/3A DC (US/EU standards, CE/FCC/UL certified)
ESD Protection (HBM)	±8kV (Air Discharge) ±4kV (Contact Discharge)
Dimensions (W×H×D)	128mm×75mm×25mm [Case Only] 128mm×79mm×25mm [All Inclusive]
Weight	264g
Chassis Material	Metal (Aluminum)
Chassis 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	3.5W

8.2 Video Specifications

Supported Resolutions (Hz)	Input	Output
	HDMI	HDMI
720×400p@70/85	✓	✓
640×480p@60/72/75/85	✓	✓
720×480i@60	✓	✓
720×480p@60	✓	✓
720×576i@50	✓	✓
720×576p@50	✓	✓
800×600p@56/60/72/75/85	✓	✓
848×480p@60	✓	✓
1024×768p@60/70/75/85	✓	✓
1152×864p@75	✓	✓
1280×720p@50/60	✓	✓
1280×768p@60/75/85	✓	✓
1280×800p@60/75/85	✓	✓
1280×960p@60/85	✓	✓
1280×1024p@60/75/85	✓	✓
1360×768p@60	✓	✓
1366×768p@60	✓	✓
1400×1050p@60	✓	✓
1440×900p@60/75	✓	✓
1600×900p@60RB	✓	✓
1600×1200p@60	✓	✓
1680×1050p@60	✓	✓
1920×1080i@50/60	✓	✓
1920×1080p@24/25/30	✓	✓

Supported Resolutions (Hz)	Input	Output
	HDMI	HDMI
1920×1080p@50/60	✓	✓
1920×1200p@60RB	✓	✓
2560×1440p@60RB	✓	✓
2560×1600p@60RB	✓	✓
2048×1080p@24/25/30	✓	✓
2048×1080p@50/60	✓	✓
3840×2160p@24/25/30	✓	✓
3840×2160p@50/60 (4:2:0)	✓	✓
3840×2160p@24, HDR10	✓	✓
3840×2160p@50/60 (4:2:0), HDR10	✓	✓
3840×2160p@50/60	✓	✓
4096×2160p@24/25/30	✓	✓
4096×2160p@50/60 (4:2:0)	✓	✓
4096×2160p@24, HDR10	✓	✓
4096×2160p@50/60 (4:2:0), HDR10	✓	✓
4096×2160p@50/60	✓	✓

8.3 Audio Specifications

8.3.1 Digital Audio

HDMI Input / Output	
LPCM	
Max Channels	8 Channels
Sampling Rate (kHz)	32, 44.1, 48, 88.2, 96, 176.4, 192
Bitstream	
Supported Formats	Standard & High-Definition

S/PDIF Input / Output	
LPCM	
Max Channels	2 Channels
Sampling Rate (kHz)	32, 44.1, 48, 88.2, 96, 176.4, 192
Bitstream	
Supported Formats	Standard

8.3.2 Analog Audio

Analog Input	
Max Audio Level	2Vrms
Impedance	20k Ω
Type	Unbalanced

Analog Output	
Max Audio Level	2Vrms
THD+N	< -75dB@0dBFS 1kHz (A-wt)
SNR	> 105dB@0dBFS
Frequency Response	< ± 1 dB@20Hz~20kHz
Crosstalk	< -80dB@10kHz
Impedance	470 Ω
Type	Unbalanced

8.4 Cable Specifications

Cable Length	HD	FHD	4K UHD	4K UHD ⁺	8K UHD
High Speed HDMI Cable					
HDMI Input	15m	10m	5m	3m	×
HDMI Output	15m	10m	5m	3m	×

Bandwidth Category Examples:

- **HD Video**
 - 720p@60Hz
 - HDMI transmission rates lower than 3Gbps
 - HD-SDI (SMPTE 292M, 1.485Gbps)
- **FHD Video**
 - 1080p@60Hz
 - HDMI transmission rates between 3Gbps and 5.3Gbps
 - 3G-SDI (SMPTE 424M, 2.970Gbps)
- **4K UHD Video**
 - 4K@24/25/30Hz (8-bit color) & 4K@50/60Hz (4:2:0, 8-bit color)
 - HDMI transmission rates between 5.3Gbps and 10.2Gbps
 - 6G-SDI (SMPTE ST 2081, 6Gbps)
- **4K UHD⁺ Video**
 - 1080p@120Hz (10/12-bit HDR)
 - 4K@50/60Hz (4:4:4, 8-bit) & 4K@50/60Hz (4:2:0, 10/12-bit HDR)
 - HDMI transmission rates between 10.2Gbps and 18Gbps
 - 12G-SDI (SMPTE ST 2082, 12Gbps)
- **8K UHD Video**
 - 4K@120Hz (10/12-bit HDR)
 - 8K@24/25/30Hz (10/12-bit HDR) & 8K@50/60Hz (4:2:0, 8-bit color)
 - HDMI transmission rates between 18Gbps and 48Gbps
 - 24G-SDI (SMPTE ST 2083, 24Gbps)

9. ACRONYMS

ACRONYM	COMPLETE TERM
4K UHD	4K Ultra-High-Definition (10.2Gbps max)
4K UHD⁺	4K Ultra-High-Definition (18Gbps max)
8K UHD	8K Ultra-High-Definition (48Gbps max, without DSC)
8K UHD⁺	8K Ultra-High-Definition (48Gbps max, with DSC)
ADC	Analog-to-Digital Converter
ARC	Audio Return Channel
CEC	Consumer Electronics Control
DAC	Digital-to-Analog Converter
dB	Decibel
DVI	Digital Visual Interface
EDID	Extended Display Identification Data
Gbps	Gigabits per second
HDCP	High-bandwidth Digital Content Protection
HDMI	High-Definition Multimedia Interface
HDR	High Dynamic Range
kHz	Kilohertz
LED	Light-Emitting Diode
LPCM	Linear Pulse-Code Modulation
MHz	Megahertz
S/PDIF	Sony/Philips Digital Interface Format
SNR	Signal-to-Noise Ratio
THD+N	Total Harmonic Distortion plus Noise
TMDS	Transition-Minimized Differential Signaling
USB	Universal Serial Bus
Ω	Ohm



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RDV1