HALL RESEARCH

USER'S MANUAL

SC-HD-2A

HDMI Scaler & Audio Embedder / Extractor

Scale HDMI or DVI video
Embed Digital or Analog Audio into HDMI output
Extract (De-embed) Digital and Analog Audio from HDMI input

UMA1246 Rev n/c

CUSTOMER SUPPORT INFORMATION

Order toll-free in the U.S. 800-959-6439
FREE technical support, Call **714-641-6607** or fax **714-641-6698**
Mail order: **Hall Research**, 1163 Warner Ave. Tustin, CA 92780
Web site: www.hallresearch.com E-mail: info@hallresearch.com

TRADEMARKS USED IN THIS MANUAL

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FCC RADIO FREQUENCY INTERFERENCE STATEMENT

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation

Contents

1. Introduction

1.1 General

Thank you for purchasing Hall Research's SC-HD-2A. This unit can convert and scale DVI or HDMI video in to various output resolutions. Video can be manipulated is several ways. For example, the output can be horizontally flipped (mirrored along x-axis), or hue, saturation, and other salient parameters of video can be manipulated. The mirroring feature is useful for teleprompter and rear projection systems.

The unit takes advantage of the HDMI signal's ability to embed audio with video. For convenience, both stereo analog and optical digital audio inputs and outputs are provided. The audio from the input HDMI signal can be extracted (de-embedded) and output on both digital as well as stereo analog signal. The audio embedded in the HDMI output can be selected from 3 sources: HDMI input, analog L/R input, or digital optical input.

The SC-HD-2A has the ability to output a wide range of resolutions regardless of the input timing and resolution. The output resolution can automatically match the native resolution of the display connected to its output (based on the EDID setting of the display), or it can be specified by the user.

The SC-HD-2A features an OSD menu for configuration, picture setup, system information and other advanced options. The compact and sturdy enclosure features integrated mounting brackets.

1.2 Features

- Any PC or HDTV video signal can be scaled up or down to any other PC or HDTV resolution
- Analog and digital audio inputs and outputs
- Embeds audio to HDMI from analog or digital audio source
- Horizontal mirroring (x-axis flip)
- Advanced scaling for real-time frame rate capture & conversion
- Selectable audio delay up to 150ms (for lip sync)
- OSD adjustment of contrast, brightness, color, size, sampling clock, phase, position, audio source and delay
- HDMI, HDCP, and DVI Compliant
- Supports 50/60Hz frame rate conversion
- Quick Select button combinations for setting output resolution

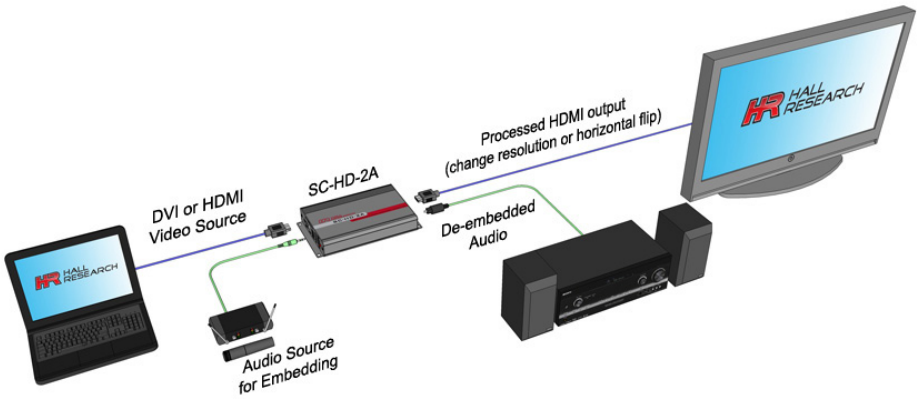
2. Installation

2.1 Connections

The SC-HD-2A accepts HDMI or DVI inputs and outputs. Video cables are not provided, and for use with DVI equipment, adapter or HDMI to DVI cable would be required.

The unit accepts audio input signal from TOSLink (optical) or analog (L/R) that can be embedded it on HDMI output. The Audio signal that is in the HDMI output is also extracted (de embedded) and available simultaneously as TOSLink (optical) or analog (L/R).

2.2 Connection Block Diagram



2.3 Package Contents

(1) Model SC-HD-2A
(1) 5V DC Universal Power Supply (Do Not Substitute)
(1) 3.5mm to (2) RCA Audio Cable
(1) User's Manual

3. Configuration & Operation

3.1 Inputs and Outputs

3.2 OSD Menu

Pressing the Menu button will bring up the OSD menu controls on the screen. Use the up and down arrows to your desired item, then press MENU to select and enter into sub menu. Select EXIT from a submenu to go back to the main menu or from the main menu to exit the OSD.

Top Menu	Sub-Menu	Value
PICTURE SETTING	CONTRAST	0 to 100% (DEFAULT=43)
	BRIGHTNESS	0 to 100% (DEFAULT=54)
	EXIT	
FINETUNE	HUE	0 to 100% (DEFAULT=55)
	SATURATION	0 to 100% (DEFAULT=37)
	SHARPNESS	0 to 100% (DEFAULT=18)
	NR	OFF/LOW/MIDDLE/HIGH (Default = OFF)
	EXIT	
COLOR SETTING	RED	0 to 100% (DEFAULT=48)
	GREEN	0 to 100% (DEFAULT=48)
	BLUE	0 to 100% (DEFAULT=52)
	EXIT	
OUTPUT SETTING	SIZE	FULL, OVERSCAN, UNDERSCAN, LETTERBOX, PANSCAN (DEFAULT=FULL)
	RESOLUTION	NATIVE* , 640x480, 800x600, 1024x768, 1280x800, 1440x900, 1280x1024, 1400x1050, 1600x900, 1600x1200, 1680x1050, 1920x1200, 480p, 576p, 720p50, 720p60, 1080i50, 1080i60, 1080p50, 1080p60 (DEFAULT= NATIVE)
	MIRROR	OFF or ON (DEFAULT = OFF)
	TIMING SHIFT	OFF or ON (DEFAULT = OFF)
	EXIT	
AUDIO SETTING	DELAY	OFF/40ms/110ms/150ms (DEFAULT = OFF)
	INPUT	EMBEDDED/ ANALOG / OPTICAL (DEFAULT = EMBEDDED)
	SOUND	ON or MUTE (DEFAULT = ON)
	EXIT	

OSD SETTING	H-POSITION	0 to 100 (DEFAULT=10)
	V-POSITION	0 to 100 (DEFAULT=90)
	TIMER	0 to 100 (DEFAULT=10)
	BACKGROUND	0 to 100 (DEFAULT=63)
	DISPLAY	INFO/ON/OFF (DEFAULT = OFF)
FACTORY RESET		Reset unit parameters to default state
INFORMATION		SOURCE (Input Interface) INPUT (Input Resolution) OUTPUT (Output Resolution) VERSION (Firmware Version) MODEL SC-HD-2A
EXIT		EXIT OSD

* The NATIVE output setting causes the scaler to select an output resolution that matches the native resolution of the connected display. In this mode, if the native resolution of the connected display is not a supported output format of the SC-HD-2A, then the scaler will output a 720p signal.

3.3 Setting the Output Resolution

3.3.1 Obtaining an image on the screen

As shipped from the factory, or after a factory default reset, the output resolution is set to“NATIVE”. This means that upon power up the device will read the EDID of your display and output a compatible resolution resulting in a picture. However, if the output is set at a resolution not supported by the connected TV, then you may not get a picture. This is a problem since settings are done via on-screen display (OSD) menus.

To allow the user to get an image on the screen, two preset button combinations are available on the front panel with very common resolutions, one of which should produce an image.

1. If the display is HDTV (with an HDMI connection); then a resolution of 720p should result in an image.
2. If the display is PC compatible (DVI), then XGA (1024x768) should produce an image.

Once you have an image, you can call up the OSD menu to make further changes as necessary.

Setting Resolution using **Quick Select** buttons
*At any time, press the **UP ARROW** ↑ and **MENU** buttons together to directly set the output resolution to 1024x768 @ 60 Hz.* *Press the **MENU** and **DOWN ARROW** ↓ together to set the output resolution to 720P @ 60 Hz.*

3.3.2 Recalling Factory Defaults

Factory defaults may be recalled via (2) methods:

1. Press the MENU button to display the OSD. Using the ↓↑ arrows buttons, move to highlight the 'FACTORY RESET' option and press the **MENU** button. The unit will reset all parameters to the factory defaults. The output resolution will be set at 'NATIVE', which should result in a picture being displayed. The actual resolution of the display monitor in this mode is dependant on the monitor and not the SC-HD-2A.

2. Press and hold the **UP ARROW** ↑ and **DOWN ARROW** ↓ button simultaneously for 3 seconds. This causes all parameters to revert to factory defaults.

3.3.3 Setting the output resolution

Press the **MENU** button to open the OSD and use the arrow buttons (↑↓) to select the OUTPUT option. Press the **MENU** button.

Use arrows to scroll thru the available resolutions listed. See Section 6 below for a list of all available resolutions.

Default output resolution after a factory reset of the SC-HD-2A is "Native".

4. Troubleshooting

There are no field serviceable parts or circuits in the device. If you think the device is malfunctioning (or you have no picture output), please try to use the methods described in Section 3.3 to obtain a picture first.

4.1 Contacting Hall Research

If you determine that your SC-HD-2A is malfunctioning, do not attempt to repair the unit. Instead, contact Hall Research Technical Support at 714-641-6607. To return the unit to Hall Research you must first get a Return Authorization (RMA) number. Package the unit carefully, if returning. We recommend that you use the original container.

5. Specifications

Video Bandwidth	225 MHz/6.75 Gbps
Input Ports	1 x HDMI, 1 x 3.5mm audio, 1 x Optical , 1 x USB (Service only)
Output Ports	1 x HDMI, 1 x Optical, 1 x 3.5mm audio
Power Supply	5 VDC @ 2.6A DC (US/EU Standard, CE/FCC/UL Certified)
Output Resolution	Up to 1080p & WUXGA@60
Audio Sample Rate	Up to 48 kHz / Optical & HDMI
Mounting	Brackets at each end with screw holes provided for rack or wall mounting
Dimensions	6.5” (165.1mm) D x 4” (102mm) W x 1” (25.4mm) H
Weight	Shipping: 2.85 lbs (1.29 kg) Product: 0.74 lbs (0.34 kg) each
Chassis Material	Aluminum
Operating Temperature	+32 to +104 °F (0 to 40 °C) 20%~90%, non-condensing
Power Consumption	5.5W
ESD Protection	Human Body model: ±8 kV (air-gap discharge) ±6 kV (contact discharge)
MTBF	90,000 estimated

Notice

Use only regulated 5v DC supply (center positive) as supplied with the unit. Use of any other voltage will cause damage to the unit and void warranty.

6. Supported Input and Output Resolutions

Resolutions & Refresh Rate	Supported @ Input		Available @ Output	
	PC	SD/HD	PC	SD/HD
640x480 (VGA) @60/72/75/85	☑		☑@60	
800x600 (SVGA)@56/60/72/75/85			☑@60	
1024x768 (XGA)@60/70/75/85	☑		☑@60	
1280x800 (WXGA)@60	☑		☑@60	
1440x900 (WXGA+)@60	☑		☑@60	
1600X900@60	☑		☑@60	
1280x1024 (SXGA)@60/75/85	☑		☑@60	
1400x1050 (SXGA+)@60	☑		☑@60	
1600x1200 (UXGA)@60	☑		☑@60	
1680x1050 (WSXGA)@50/60	☑		☑@60	
1920x1200 (WUXGA)@60	☑		☑@60	
480I		☑		
576I		☑		
480P		☑		☑@60
576P		☑		☑@50
720p@50/60		☑		☑@50/60
1080i@50/60		☑		☑@60
1080p@50/60		☑		☑@50/60

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