

# HA5 HDMI To HD-SDI/SDI Video and Audio Converter

## User Manual



**HDMI**™  
HIGH DEFINITION MULTIMEDIA INTERFACE

**AJA**  
VIDEO SYSTEMS

May 13, 2008

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This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Changes or modifications not expressly approved by AJA Video can effect emission compliance and could void the user's authority to operate this equipment.

## Contacting Support

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To contact AJA Video for sales or support, use any of the following methods:

443 Crown Point Circle, Grass Valley, CA. 95945 USA

Telephone: 800.251.4224 or 530.274.2048

Fax: 530.274.9442 Web: <http://www.aja.com>

Support Email: [support@aja.com](mailto:support@aja.com)

Sales Email: [sales@aja.com](mailto:sales@aja.com)

When calling for support, have all information at hand prior to calling.

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## Introduction

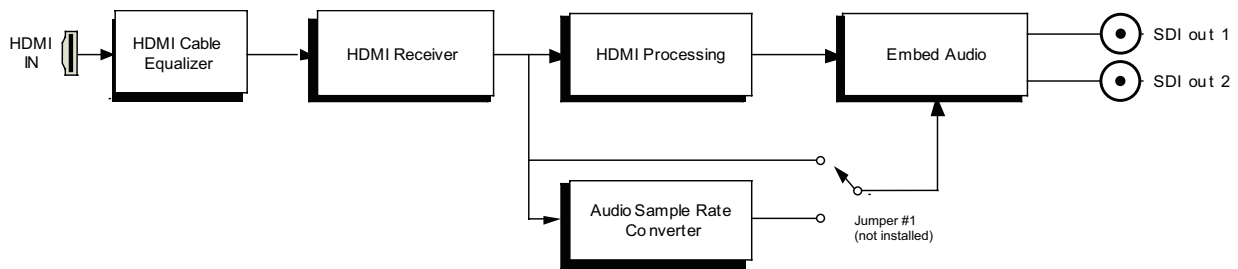
The HA5 converts HDMI to SDI or HD-SDI. Up to eight channels of HDMI audio are embedded into the SDI/HD-SDI output allowing a convenient single cable audio/video connection. The HA5 provides two SDI/HD-SDI outputs and supports long HDMI cables on the input. The HA5 is useful for connecting HDMI cameras and other sources to SDI/HD-SDI capture cards and equipment.

## Features

- HDMI to SDI/HD-SDI
- Full 10-bit Conversion
- Full HDMI support including embedded audio
- Equalized HDMI input supports long HDMI cables up to 40m
- PLL clock filtering for low jitter SDI/HD-SDI outputs
- Lock LED shows type of input source: SD (green) or HD (red)
- HDMI cable supplied
- Uses 5V power (supply sold separately)

**Note:** The HA5 will not pass HDMI video with HDCP copy protection.

## Block Diagram



*HA5 Converter, Simplified Block Diagram*

## Audio

HA5 converter supports 8 audio channels (4 stereo pairs) at 24-bit/48 KHz which it dis-embeds from HDMI and embeds into SDI. For proper embedding, audio must be synchronous to video. However, if audio is not synchronous with video or the sample rate is not 48 KHz, then jumper #1 must be installed. Having jumper #1 installed forces an onboard Sample Rate Converter to convert audio to 24-bit/48 KHz and then synchronize it with input video before embedding. In this scenario only channels 1/2 are embedded—the other 6 channels are muted.

## I/O Connections



### *HA5 Converter*

## User Controls

An internal jumper block (J2) with 3 jumpers provides controls for SDI output range and SDI audio. The Color Space is automatically detected to be either YCbCr, which is passed to SDI unmodified, or RGB—which can be a narrow or wide range before output to SDI. Each setting is described in the table below.

### Internal Jumper

Jumper #1	Jumper #2	Jumper #3
Installed (default) = 2 channels (1/2) of audio with Sample Rate Conversion to 48 KHz	Installed (default) = Wide RGB in (0-1023) to YCbCr out (64-940)	Installed (default) = Auxiliary (not used)
Removed = 8 channels of audio at 48 KHz	Removed = Narrow RGB in (64-940) to YCbCr out (64-940)	

To access this jumper, remove the four phillips screws securing the back side of the HA5 case. Once the case cover is removed, locate the jumper block. Jumper positions 1 through 3 are clearly marked on the circuit board.

## Installation

Typically, HA5 installation consists of the following steps:

1. Ensure the HA5 is disconnected from power.
2. Connect equipment to the converter BNCs and HDMI input connector.
3. Apply +5VDC power to the converter (AJA power supply model DWP or DWP-U).

## Specifications

Item	Specification
Input	HDMI with embedded audio
Input Formats	525i, 625i 1080p23.98/24/25/29.97/30 1080i 50/59.94/60 720p 50/59.94/60
Outputs	SMPTE-259/292/296, SDI/HD-SDI, 2 x BNC
HDCP	Content not supported
Size	4.6" x 2.4" x 1" (117 x 61 x 25 MM.)
Power	+5 VDC regulated, 4 watts, Requires Power Supply (AJA power supply model DWP or DWP-U recommended)

