HD10MD3 HDTV
HD to SDI Down Converter

User Manual

AJA VIDEO SYSTEMS INC

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Introduction

The AJA HD10MD3 is a miniature digital downconverter for converting HD-SDI video to standard definition SDI and analog component composite video. The HD10MD3 uses a full 10-bit data path and a multi-point interpolation to produce excellent quality down-converted video. In addition, the HD10MD3 converts either 23.98/24Hz 1080p23.98sf or 1080p24sf to a 59.94 Hz output video using the standard 3:2 pulidown technique. The output can be formatted for either 4:3 or 16:9 standard definition monitors. For 4:3 monitors, the output can be formatted for either the Letterbox or Crop modes. Four channel AES embedded audio is passed to the SDI output. The HD1OMD3 is also dual-rate in that SDI inputs pass to the SDI and analog outputs.

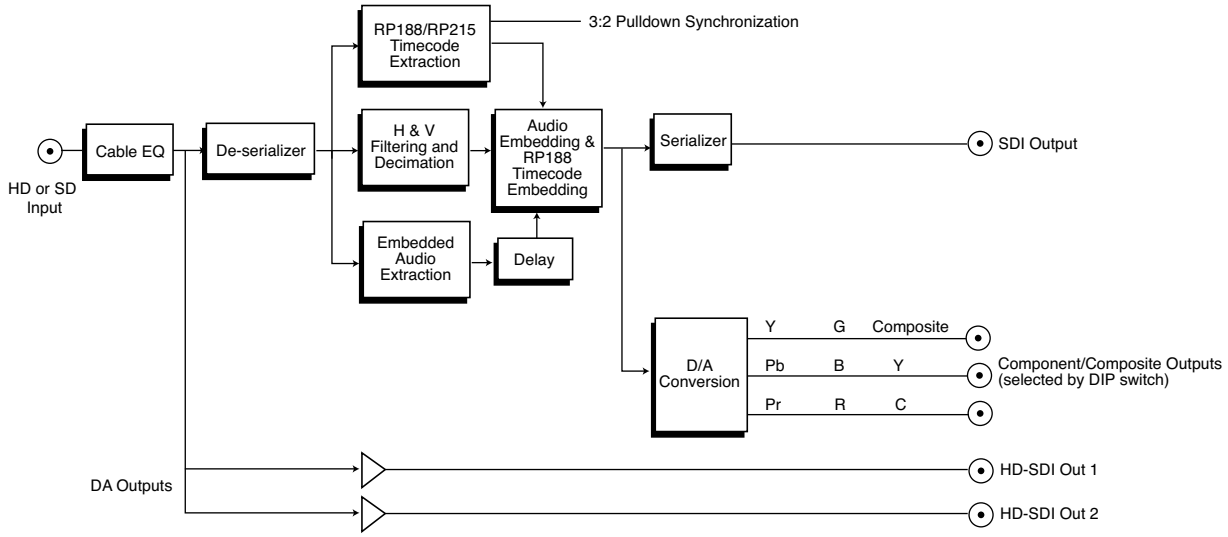
Features

- Broadcast-Quality HD to SD down conversion
- Multi-Standard
- Dual-rate HD-SDI/SDI input
- HD-SDI/SDI outputs
- HD-SDI input: SMPTE 292/296 HD-SDI digital video
- HD-SDI outputs: Equalized and buffered copy of input
- SDI output: SMPTE 259 SDI digital video
- Analog outputs: Component or Composite video (10 bit)
- Input formats:1080i 50, 59.94, 60 Hz
  1080psf: 23.98, 24, 25, 29.97, 30
  1080p: 23.9B, 24, 25, 29.97, 30
  1035i: 59.94, 60 Hz
  720p: 50, 59.94, 60 Hz
- External Dipswitch Configuration
- Power: 5-18V unregulated

Note:

The HD10MD3 automatically switches to PAL anytime the input is 1080i 50, 1080psf 25 or 1080p25. All other frames rates have an NTSC output: 60, 59.94, 30, 29.97, 24 and 23.98.

Block Diagram



HD10MD3 HD to SDI Down Converter, Block Diagram

I/O Connections

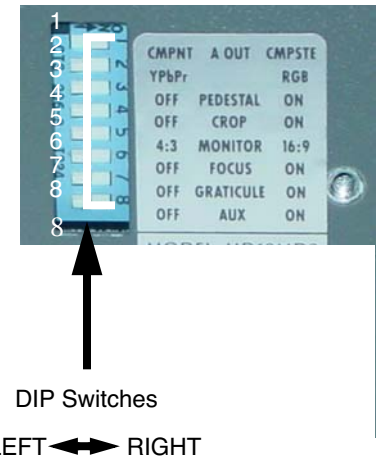
HD10MD3, Side View

User Controls

The user interface for the HD10MD3 is an 8-switch DIP accessible through a cut-out in the bottom of the unit. Use the DIP switches to configure outputs, pedestal, blanking, and enable or disable noise reduction.

The exact function of each DIP switch and what it controls is described on the following pages.

A jumper accessible by removing the DIP-switch side of the case (requires removal of 4 screws) allows you to select further options described later.



Switch 1—Selects Component or Composite Video on 3 Output BNCs

LEFT	RIGHT
Selects Component output	Selects composite video output

Switch 2—Selects Type of Component Video on 3 Output BNCs

:

LEFT	RIGHT
Selects YPbPr	Selects RGB

Switch 3—Turns Pedestal OFF/ON. In YPbPr Mode, use BETA Levels

:

LEFT	RIGHT
Pedestal Off	Pedestal On. This setting also changes analog output to BETA levels when in YPbPr mode

Switch 4—Format Crop Letterbox OFF/ON

:

LEFT	RIGHT
No crop	Crop On—if S5 switch *MONITOR* is set to 4:3 position

Switch 5—Selects Monitor Output to 4:3 or 16:9

:

LEFT	RIGHT
Selects 4:3	Selects 16:9

Switch 6—Turns Focus ON/OFF

LEFT	RIGHT
Turn Focus OFF	Turn Focus ON; zoom to center 720 x 486 image

Switch 7—Turn 4:3 Graticule ON/OFF

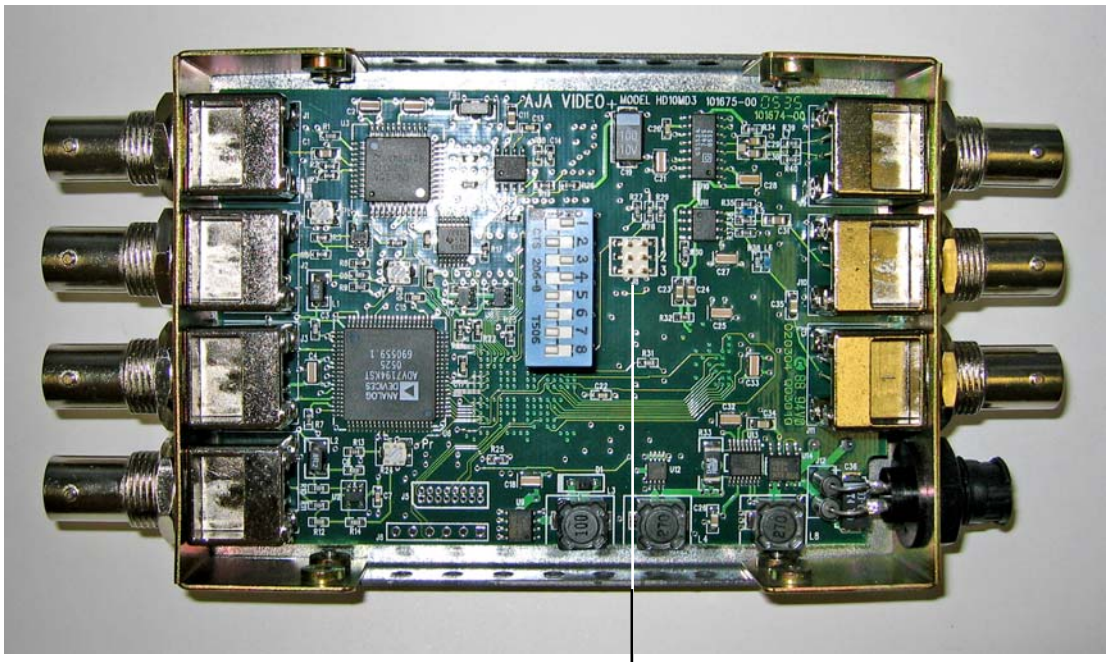
:

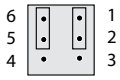
LEFT	RIGHT
Turn Graticule OFF	Turn Graticule ON (4:3 safe area)

Note: Switch 8 has no function.

Jumper Settings

Jumper J8 is located next to the DIP Switch. To access it, remove the back of the HD10MD3 case by first removing the 4 phillips screws that secure it. The meaning of the jumper settings is described in the illustration below:





Jumper
J8

Jumper Between Pins 1 and 2:
ON = RP215 is used to synchronize 3:2 pulldown sequence
OFF = RP188 is used.
In both cases the "A Frame" is synchronized to frame with timecode "xx:00"

Jumper Between Pins 5 and 6:
ON = Output start of vertical blanking lines up with input start of vertical blanking
OFF = Output start of vertical sync lines up with input start of vertical sync (per RP168)

Output Selection Matrix For Output 3 BNCs

The following table shows the combinations of DIP switch settings required to configure the three BNCs below the SDI Output BNC.

Output Format	DIP Switch #1	DIP Switch #2	DIP Switch #3
1 Composite and 1 Y/C (Pedestal)	RIGHT—CMPSTE	N/A	RIGHT
1 Composite and 1 Y/C (no pedestal)	RIGHT—CMPSTE	N/A	LEFT
RGB	LEFT—CMPNT	RIGHT—RGB	LEFT
RGB with pedestal	LEFT—CMPNT	RIGHT—RGB	RIGHT
SMPTE component (BETA625)/ EBU-N10	LEFT—CMPNT	LEFT—YPbPr/	LEFT
BETA 525 component	LEFT—CMPNT	LEFT—YPbPr/	RIGHT

Installation

Typically, HD10MD3 installation consists of the following:

1. disconnect +5VDC from the convertor
2. configure the DIP switch for the desired equipment configuration and video formats
3. connect video equipment to the convertor BNCs
4. apply +5VDC power to the converter (AJA power supply model DWP)

Specifications

Item	Specification
Formats	1080i 50/59.94/60Hz 1080p/psf 23.98/24/25/29.97/30 Hz 720p 23.98/24/25/29.97/30/50/60Hz (Automatic Configuration)
Inputs	HD-SDI or SDI SMPTE 259/292/296, 10-bit, BNC
Outputs	SDI, SMPTE 259M, 10-bit, BNC YPbPr - SMPTE, EBU-N10, Betacam RGB, NTSC, PAL, YC (S-Video), 10-bit 3 x BNC
Down Conversion	Multi-point interpolation. 10-bit processing. 3:2 conversion for 23.96/24p/psf inputs
Frequency Response	Y +0, -.5db to 30 MHz C +/- .25db to 15 MHz

Item	Specification
User Controls	*ExternalDipswitch:* Output Video Format 4:3/16:9 MonitorSelect Letterbox/Crop Pedestal (Output) 4:3 Safe-Zone Graticule Overlay
Size	5.8" x 3.1" x 1 (147 x 79 x 25mm)
Power	5-18V, 5 watts. Requires power supply.