

# MD8000 – JPEG2000 Encoder/Decoder Video Module

## JPEG2000 Encoder/Decoder Video Module

The MD8000-JPEG video module can perform either as an encoder or decoder using JPEG2000 compression, a wavelet-based compression technique.

### KEY FUNCTIONS:

- Dual Purpose SD-SDI or HD-SDI JPEG2000 Transmit or Receive
- Supports Uncompressed HD or SDI Direct Encapsulation
- Accepts DVB-ASI Burst and Byte Mode
- Hitless Switch Protection

### KEY FEATURES:

- High Quality, User-Selectable Compression Rates for SD-SDI and HD-SDI
- Very low video/audio latency, less than 2 ms
- Uncompressed Audio Transmission up to 8 Channels AES and Ancillary Data
- Built-in video generator and ID generator
- Forward Error Correction (FEC)
- 75 ohm BNC connectors for inputs (Encoder version) and outputs (Decoder version)
- Available in standard JPEG2000 and SMPTE 2022 compatible versions (ARP/GARP, Layer 3)
- Operates over IP, SONET/SDH, or Metropolitan Ethernet networks
- Fully transparent

Delivering extremely high quality HD-SDI or SD-SDI video signal transport with compression, the MD8000-JPEG video module can perform either as an encoder or decoder using JPEG2000 compression, a wavelet-based compression technique. The JPEG2000 is ISO/IEC 15444-1, Annex A. compliant and uses YCrCb 4:2:2 chroma subsampling and 10 bit JPEG2000 Part 1 video coding. In addition to video, the JPEG2000 encoder can pass up to 16 uncompressed embedded audio channels along with the V-Ancillary data, time code, and audio control. JPEG2000 9/7 irreversible compression may be used for both HD-SDI and SD-SDI video signals and is visually lossless.

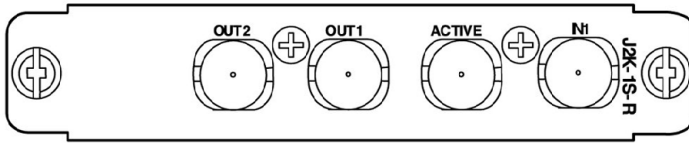
Hitless Protection Switching can be enabled for any of the signals transported by the MD8000-JPEG module. This technology uses two identical output streams routed over separate paths to a single destination, where any errors on one stream can be avoided by immediately switching to the other stream. Forward Error Correction and Lossless/Hitless path protection switching are also provided for extremely robust signal transport.

HD video formats include 1080i and 720p (SMPTE 292M) and SD video formats include 625i and 525i (SMPTE 259M). The JPEG2000 video module is available in two different versions, a standard JPEG2000 version and a JPEG2000 2022 version which is compliant with the SMPTE 2022 standard.

A video generator (useful in circuit turn-up, testing, and troubleshooting) and an ID generator are built into the JPEG2000 encoder module.

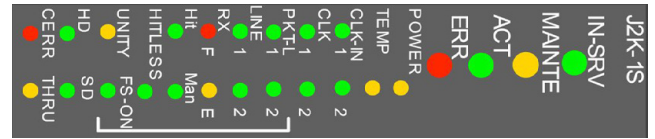
### APPLICATIONS:

- Carrier Class Media Delivery Networks
- High Performance Studio Interconnects
- Flawless Contribution Video-Transport
- Integrated Live, Recorded and File-Based Communications
- Studio-to-Studio Transfers



NAME	TYPE	DESCRIPTION
IN	BNC (75 Ohm)	HD-SDI Input to TX
ACTIVE	BNC (75 Ohm)	HD-SDI Active Loop out TX
OUT 1/2	BNC (75 Ohm)	HD-SDI Output from RX

Rear Board Connectors



NAME	CONDITION TO ILLUMINATE
IN-SRV	● Status Monitored
MAINT	● Under Maintenance
ACT	● Normal Operation
ERR	● Board Failure Detected
POWER	● Board Power Voltage Low (Warning)
TEMP	● Board Temperature High (Warning)
CLK-IN1/2 <sup>2</sup>	● BB Sync signal present. Receiving from: 1: SWCNT #1, 2: SWCNT #2
CLK1/2 <sup>2</sup>	● BB Sync signal present. Using signal from: 1: SWCNT #1, 2: SWCNT #2
PKT-L1/2 <sup>1</sup>	● Input stream of the selected channel 1: Packet input from Line 1 2: Packet input from Line 2
LINE1/2 <sup>1</sup>	● SWCNT for the selected channel 1: SWCNT #1; 2: SWCNT #2
RX-F/E <sup>1</sup>	● RX-F: Uncorrectable Error Detected ● RX-E: Correctable Error Detected
Hit/Man <sup>1</sup>	● Hit: Hitless Switching mode ● Man: Manual Switching mode
Hitless <sup>1</sup>	● Hitless Switching can be enabled
UNITY <sup>1,2</sup>	● H-Phase/V-Phase are set to standard values
FS-ON <sup>1,2</sup>	● FS function enables
HD/SD	● HD: Video input is HD-SDI ● SD: Video input is SD-SDI
CERR	● JPEG2000 Codec Error Detected
THRU	● Uncompressed Video Transport Mode
ENC <sup>3</sup>	Board is working as an Encoder
DEC <sup>3</sup>	Board is working as a Decoder

1. Always OFF for Encoder

2. Currently not supported

3. Board can work as an Encoder or Decoder  
depending on the file downloaded

## ORDERING INFORMATION

Front Panel LEDs

MODEL	ORDER NUMBER	ORDER CODE
SD/HD JPEG2000 Video Encoder w/ uncompressed passthrough of SD/HD, DVB-ASI	MD801015	JPEG2K-ENC-1Sch-F-E
SD/HD JPEG2000 Video Decoder w/ uncompressed passthrough of SD/HD, DVB-ASI	MD801016	JPEG2K-DEC-1Sch-F-E
SD/HD JPEG2000 Video Encoder w/ 2022-5/6 electrical I/O, ARP/GARP (Layer 3)	MD801031	J2K-ENC-1Sch-F-E(2022)
SD/HD JPEG2000 Video Decoder w/ 2022-5/6 electrical I/O, ARP/GARP (Layer 3)	MD801032	J2K-DEC-1Sch-F-E(2022)
SD/HD JPEG2000 Video Encoder w/ 2022-5/6 electrical and optical I/O, ARP/GARP (Layer 3)	MD801033	J2K-ENC-1Sch-F-O(2022)
SD/HD JPEG2000 Video Decoder w/ 2022-5/6 electrical and optical I/O, ARP/GARP (Layer 3)	MD801034	J2K-DEC-1Sch-F-O(2022)

### FUNCTIONAL SPECIFICATIONS:

Input Signal	HD-SDI	Format	1080i (50 Hz, 59.94 Hz, 60 Hz) 720p (50 Hz, 59.94 Hz, 60 Hz); SMPTE 292M	
	SD-SDI	Format	625i (50 Hz), 525i (59.94 Hz); SMPTE 259M	
	Connectors	Input, Active Output	1x BNC	
		Output, Active Loop	1x BNC	
Input	HD-SDI	Return Loss	15 dB or more (5 MHz - 270 MHz)	
		Maximum Cable Length	200m SD-SDI, 100m DVB-ASI (at 5C-2V coax cable)	
	SD-SDI	Impedance	75 Ohm, unbalanced	
		Return Loss	15 dB or more (5 MHz - 270 MHz)	
		Maximum Cable Length	200m SD-SDI, 100m DVB-ASI (at 5C-2V coax cable)	
Output Active	HD-SDI	Signal Amplitude	800 mVp-p ± 10% (75 ohm Load)	
		Rise Time	Less than 270 ps (at 20% – 80% Amplitude)	
		Fall Time	270 ps (at 20% – 80% Amplitude)	
		Impedance	75 ohm, unbalanced	
		Return Loss	15 dB or more (5 MHz – 742.5 MHz) 10 dB or more (742.5 MHz – 1.485 GHz)	
		DC offset	0.0 V ± 0.5 V	
		Jitter	Timing: 1 UI or less, Alignment: 0.2 UI or less	
		SD-SDI	Signal Amplitude	800 mVp-p ± 10% (75 ohm Load)
	Rise Time		0.4 – 1.5 ns (at 20% – 80% Amplitude)	
	Fall Time		0.4 – 1.5 ns (at 20% – 80% Amplitude)	
	ABS (Rise-Fall)		0.5 ns or less	
	Time Difference		Less than 0.5 ns	
	Impedance		75 ohm, unbalanced	
	Return Loss		15 dB or more (5 MHz – 270 MHz)	
	DC offset		0.0 V ± 0.5 V	
	Jitter		Timing: 0.2 UI or less, Alignment: 0.2 UI or less	
	Compression		Code Stream	ISO/IEC 15444-1 Annex A
			Video Format	YCrCb 4:2:2, 10 bit JPEG2000 Part 1
		HDTV/SDTV	JPEG2000 9/7 Irreversible	
V-ancillary		Pass-thru from 9-20 lines		
Selectable AES Audio		2, 4, 6, 8 (HD-SDI) / 1, 2, 3, 4 (SD-SDI)		
Audio/Video Delay		Less than 2 ms		
Power Consumption			18 watts	