

Messenger Rackmount Decoder

HD/SD MPEG-2 4:2:0 Decoder (MRD-420)

COBHAM

The most important thing we build is trust.



Features

- SMPTE 310/ASI Transport Stream Inputs & Outputs
- Three modes of PID selection: Priority Tuning, PID Locking, Auto-acquire.
- Decodes MPEG-2 HD & SD (4:2:0)
- Genlock Capability
- Dual (mirrored) HD-SDI Video Outputs Plus Component [Y,Pb,Pr /RGB]
- Provides either Cropped or Letterbox display conversion from received 16x9 video
- Digital Audio Outputs of Raw (AC-3) or two channel decoded PCM Audio Embedding (up to four pairs) into HD-SDI outputs
- Balanced Analog Audio Outputs (Left & Right) for each audio decoder
- Passes Dolby AC-3 as received in transport stream to either Embedded audio pair or Digital Output
- Down-mixes Dolby AC-3 material to a 2-channel PCM audio pair.
- Front Panel Controls Indicators and Alarms
- Remote Client (for both Windows & Linux) for control and monitoring of unit
- Password Protection for System-change ability
- 19 inch rack mountable, occupies 1 Rack-unit in height.
- Ethernet Port Connectivity (10/100 Mbps)

The MRD 420 is a One Rack-Unit (1-RU) HD/SD MPEG-2 4:2:0 decoder. It decodes MPEG transport streams with video of MP@HL or MP@ML and 4:2:0 color sampling. The unit accepts MPEG I video, MPEG 2 video, and un-encrypted Digicypher Video. Audio elementary streams of MPEG I, Layer 1 and Layer 2, Dolby AC-3, and Digicypher Audio are decoded.

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MPEG Transport Stream Tuning

The decoder can be set to tune both video and audio by three ways: Auto, PID locking, Priority.

In *Auto* mode the unit will self acquire the first MPEG program in the transport stream and the first audio PID listed in the PMT for that Program. For multiple program streams (MPTS), the program number can be selected. Within the selected MPEG program, each of the two audio processors can have an audio PID from that program selected.

In *PID locking* mode the MRD 420 can be set to select video (and PCR) from a specific PID, and select audio for the 1st and 2nd audio processor from specific setting. This setting can be set manually using numeric PID values. In this mode the MRD 420 will only decode video or audio that has been manually set.

In *Priority* mode two different MPEG program and Audio PID index scenarios (priorities) can be set.

Unit Status

The MRD 420 has two LED status lights. One LED is for Input, which is green when the selected input is OK (present and valid for transport stream interfaces, and meets settable criteria). The second LED lights when Error conditions occur.

Serial Transport Stream I/O (SMPTE 310/DVB-ASI)

The Serial Transport Stream I/O card has one input jack and one output jack. The user must select whether the card is to be used in the 310M mode or the ASI mode. For ASI the bitrate for the transport stream must be between 1.5 Mb/s and 60 Mb/s. For SMPTE 310M the bitrate for the transport stream must be 19.392658 Mbps. The input mode setting also affects the output mode.

Video Output (2-HDSDI, 1-Component [Y,Pb,Pr /RGB])

The video output card provides two isolated but mirrored HD-SDI, SMPTE 292M compatible serial digital video outputs and one analog Y,Pb,Pr or RGBHV Component output. One high density DB-15 female plug serves for both the Y,Pb,Pr or RGBHV outputs. Selections in the Front Panel menu or the Remote Client determine the available output.

Audio from two processors on a Decoder Board can be embedded into the HD-SDI serial digital signal in the Horizontal Ancillary Space (HANC). Two types of processed audio can be embedded, raw compressed digital and two-channel decoded PCM linear encoded AES/EBU. Closed Caption data NTSC (608B) and DTVCC (708B) can be embedded into the Vertical Ancillary Space (VANC) of the Luma portion starting at line 12.

Audio Output

The audio output card provides both digital and analog audio outputs, each from two audio processors at the same time. There are two digital audio output jacks; one for each audio processor. The audio processor for each jack can be individually set to any audio PID in the audio decoder setup section. Each digital audio output can be set to RAW or PCM. In RAW the compressed audio for the selected PID is passed through to the digital output. Typically this setting (raw) is used to pass through the Dolby AC-3 compressed digital signal. When the digital audio output is set to PCM, two-channel PCM linear coded AES/EBU audio is output to the digital audio jack for each audio processor (1 or 2) decoded from the selected audio PID. There is a DB-15 high density male connector which provides balanced analog outputs for each audio processor. The audio processor is self sensing of the type of compressed audio in the transport stream.

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Rear Panel

Specifications:

General System

Embedded control:	IXP425
Operating System:	Linux
Display Type:	VFD (Vacuum Fluorescent Display)
Display Configuration:	4 lines x 20 characters
Keypad:	Mechanical switches overlay
Front panel Lockout:	Password control, up to 10 alpha-numeric characters (no punctuations or spaces allowed)

Remote Operation/Update Interface

Type:	Ethernet, 10/100 BaseT
Rear panel indicators:	Link (LED, Green), Activity (LED, Yellow)
Connector:	RJ45

Serial Remote operation interface

Type:	RS232
Protocol:	115, 8, N, 1
Connector:	9 pin D-sub, male

Front Panel Indicators .

Input LED:	Green indicates valid input on selected input, Off indicates no valid signal on the selected input
Error LED:	Red indicates error is occurring OFF indicates no errors detected
Error Parameters:	Input: TEI bit, Level and MER limit flags Decoder: No PAT, DSYNC error

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Power	Limitations:	System: Fan failure, Over-temp Input and Error conditions are subject to system configuration and user settings
	AC Input:	100 - 120/ 200 – 240 VAC
	Power:	Maximum – 200 W
	Frequency:	47 – 63 Hz
	Line cord:	Detachable, 3-prong
	Cooling:	Forced air, front intake, rear exhaust
	Temperature monitor:	Fan failure, internal temp sensor

General	Operating Temperature:	15 to 35 degrees C
	Operating Humidity:	<95% Non-Condensing
	Size:	Height = 1U, Width = 19., Depth = 19. 19 in. rack mountable, removable ears
	Weight:	10lbs. (base unit)
	Warm-up Time:	15 minutes minimum
	Pollution Degree:	2
	Installation Category:	II

Compliance/Certifications

CSA/UL C22.2 No 60950-1-03, FCC part 15 Class B
CE: CENELEC EN61010-1, CENELEC EN 61326

MPEG Decoder (Video, 2 Audio)

General

Compatibility Standard:	MPEG-2 compatible MP@HL , MP@ML 4:2:0
Bit streams Accepted:	MPEG-1 video per ISO/IEC 11172-2 MPEG-2 video per ISO/IEC 13818-2 PES packets per ISO/IEC 13818-1
TS Bit Rate:	1.5 Mbps to 60 Mbps

Video Decoder

Format @ Frame rate:	1080i @ 30 Hz, 29.97 Hz, 25 Hz 720P @ 60 Hz, 59.94 Hz, 50 Hz 480P @ 60 Hz, 59.94 Hz, 50 Hz 480i @ 29.97 Hz
Scalability:	Input/Output format fully selectable
Display modes supported:	Letterbox, Cropped, (selectable)
Aspect Ratio:	16 x 9, 4 x 3 (selectable - format dependant)

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Audio Decoder

Decoder Capabilities:	AC-3 MPEG-1, layers I and II MPEG-2, layer II, All pass-through compatible
Output formats:	IEC-60958 (uncompressed) IEC-61937 (compressed) PCM Down mix
MPEG-2 PES Formats:	MPEG-2, MPEG-1, AC-3, linear PCM
Audio Source:	Selected Audio Services 1-4
PCM Down mix (selectable):	L/R (Stereo), Lt/Rt (Surround), Mono1, Mono2
Modes (selectable):	User defined, Monitor, Transmission
AV Lip-sync:	Includes control for audio PTS and PCR tracing.
Genlock capability:	HD – Adjustment of pixels and lines. Max number dependent on video mode SD – Adjustment of Color burst phase, pixels, and lines.
Genlock Reference:	480i @ 29.97, Ref NTSC “black and burst” 1080i @ 29.97 fps Ref NTSC “black and burst” or 1080i tri-level sync @ 29.97 fps 1080i @ 30 fps – Ref 1080i tri-level sync @ 30 fps 1080i @ 50 fps – Ref 1080i tri-level sync @ 50fps 720p @ 50 fps – Ref 720p tri-level sync @ 50 fps 720p @ 59.94 fps–Ref 720 tri-level sync @ 59.94 fps 720p @ 60 fps – Ref 720 tri-level sync @ 60 fps

Note: AC-3 is a registered trademark of Dolby Laboratories.

Serial Transport Stream I/O (SMPTE 310M/DVB-ASI)

General

Configuration:	ASI or 310M, selectable (Not simultaneously)
Connector:	BNC (2), female
Impedance:	75 Ohms

ASI Serial TS Input/Output

# of ASI Inputs:	1
# of ASI Outputs:	1 (non loop-through)
Standard:	EN50083-9 (V2:3/98) DVB ASI
Data Bit Rate:	270 Mbps
Max TS Rate Supported:	60 Mbps

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310M Serial TS Input/Output

# of 310M Inputs:	1
# of 310M Outputs:	1 (non loop-through)
Standard:	SMPTE 310M
Data Bit Rate:	19.39 Mbps, synchronous

Video Output General

Output connectors:	Qty 2 -HD-SDI, Qty 1 - Analog Video
Output formats supported:	1920 x 1080 Interlaced 1280 x 720 Progressive 720 x 480 Progressive 720 x 480 Interlaced
Frame rates:	60/30, 59.94/29.97, 25 Hz (selectable) (1080i, 720P, 480P) (progressive/interlaced)
Aspect Ratio:	16 x 9 (fixed: 1080i, 720P) 16 x 9, 4 x 3 (selectable: 480P)
Display Modes (selectable): SD: Letterbox, Cropped	HD: Letterbox, Cropped, Full

HD-SDI (High Definition Serial Digital Interface)

Standard:	SMPTE 292M
Data Bit Rate:	1.485 Gbps
# of Serial Outputs:	2
Connector:	BNC (x2), female
Impedance:	75 Ohms, +/- 10%
Return loss:	>=15 dB,
# of Video formats supported:	2
Video format standards:	SMPTE274M (1080i, 29.97 Hz) SMPTE296M (720P, 59.94 Hz)
Embedded audio format:	SMPTE299M
Sample rates supported:	32, 44.1, 48 KHz
Sample rate out:	48 KHz
# embedded audio ch pairs:	4 (2 complete audio groups)
Audio types supported:	AC3, MPEG2 layer 1 and 2, or PCM
Embedded audio control:	Selectable, .type./disable (each pair independently controlled)
Audio type standard:	Compressed (IEC 60958) Uncompressed (IEC 61937)
Closed Captions:	Embedded - EIA-708B Enable/Disable, selectable

Analog Video (15-pin High Density Dsub)

Video format standards:	SMPTE274M (1080I)
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	SMPTE296M (720P) SMPTE253M (480P, 480I) (reference: EIA 770.2 and 770.3)
# of Analog outputs:	1 (shared: RGBHV and YPbPr)
Connector:	High Density 15-pin Dsub, female
Impedance:	75 Ohms, +/- 10%
Return Loss:	>20 dB, 30 KHz – 30 MHz
Frequency Response:	Y = 30 KHz – 30 MHz, +/-0.2 dB ripple Pb,Pr = 30 KHz – 15 MHz, +/-0.2 dB
H/V Sync:	4 Vpp into 1 MOhm, negative polarity

Audio Output General

Audio Source:	Selected Audio Services 1-4
# of Services:	2
PCM Down mix (selectable):	L/R, Lt/Rt, Mono1, Mono2 (selectable)
Modes:	User defined, Monitor, Transmission

Digital Audio Out

Digital Output format: Type (selectable):	SPDIF/AES3id (S/PDIF connector is BNC) Raw (native, AC3, MPEG, etc.), PCM (uncompressed Ch1 and 2), IEC 60958-3 AC-3 (consumer), MPEG - 1/2, layers 1 and 2 AES3id (IEC 60958-4/61937), Ch1/2 (professional)
Standard:	
Connector:	S/PDIF connector is BNC BNC (2), female
Impedance:	75 Ohms

Analog Audio Out

Output Type:	Balanced, 2 channel pairs (+/-, L/R)
Source:	Same as selected Digital PCM above
Conditions:	Load = 600 ohms, -20 dBFS encoded TS source
Amplitude:	4 dBu (1.74 Vpp/1.23 Vrms) +/-5%
Max Output:	27 dBu
THD+N:	<0.01%
Crosstalk:	<-85 dB
Frequency Response:	20 Hz to 20 KHz < +/-0.1 dBu
Connector:	High density 15-pin D-sub, male
Impedance:	600 Ohms nominal