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Haivision

Makito



Compact, High Performance, High Definition H.264 Encoder & Decoder

Highest Performance HD H.264 Encoder/Decoder The Makito™ HD H.264 encoder and decoder support up to 1080p60 resolution and an incredible end-to-end latency of 70 milliseconds. Available with SDI (SDI, HD-SDI, 3G-SDI, Composite, S-Video) or DVI (DVI, XGA, Component), the Makito encoder addresses video over IP H.264 encoding anywhere on a resolution/bandwidth scale from CIF as low as 150 kbps to full HD at 15 Mbps. As a perfect mate to the Makito encoder, the Makito decoder supports up to 3G-SDI and HDMI.

Power Features Makito encoders can output a variety of stream types (Unicast/Multicast TS, RTSP, RTMP) and multiple bitrates (MBR) to various destinations concurrently, which allows integrators to serve desktops, mobile devices, set-top boxes, signage players, recorders, and streaming servers. The Makito also includes powerful media features such as snapshots, logo application, and Selective Mute™ to enable complete control and identification of sources and destinations directly from the encoder. The Makito is ideal for multi-channel enterprise IPTV delivery, for HD signage deployments, and for mass HD distribution/record environments such as schools, medical facilities, stadiums, auditoriums, professional training, and simulation environments.

Ultra-Compact Encoding For remote installations or headends, the Makito offers highly flexible configurations. Available as an ultra compact appliance for single channel requirements, or within a 1RU (6 blades) or 4RU (21 blades) chassis for high-density encoding/decoding challenges, the Makito uses 1/5 of the rack space with 1/10 the power, and delivers 2x the resolution of typical 1RU encoders.

Features	Benefits
70 Millisecond End-to-End Latency	Supports mission-critical and advanced communication challenges
1080p60 Resolution	Highest quality HD
DVI/XGA Input	Stream computer displays up to 1920 x 1080
High Density	Reduce rack space with 6 1080p60 encoders per 1RU
End-to-End Secure Video	Deliver protected multicast without copy risk
Selective Mute	Disable viewing audiences with notice
Multi-Bitrate (MBR) Streaming	Stream directly to desktops, mobile devices, and set-top boxes
Multi-Streaming	Stream to multiple systems/audiences simultaneously
Snapshots	Grab full resolution images before encoding
Logo Application	Identify streams and burn in graphics
Complete Product Range	Industry-proven product family including encoders, decoders and DVB-IP gateways
Talkback Audio Decoding	Enable bi-directional audio from InStream players
Metadata Support	Insert synchronized KLV into the MPEG stream from IP, embedded, or serial data sources

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TechSpecs

Makito

MAKITO DVI ENCODER

Video Inputs:
- Y, Pb, Pr / RGBHV component analog
- Y, Cb, Cr / DVI component digital

Video Resolutions:
- 1920x1080p 60/59.94/50/30/29.97/25/24/23.98 Hz *
- 1920x1080i 60/59.94/50 Hz
- 1280x720p 60/59.94/50/30/29.97/25 Hz
- 720x480/576i 60/59.94/50 Hz
- 720x480/576p 60/59.54/50 Hz
- (interlaced shown in fields per second)

Computer Resolutions:

1400x1050 60 Hz *	1024x768 85/75/60 Hz
1280x1024 75/60 Hz *	800x600 85/75/60 Hz
1280x768 85/75/60 Hz	640x480 85/75/60 Hz

Audio Inputs/Outputs:
- Available through terminal block connector:
  - Balanced stereo analog audio
  - Unbalanced stereo analog audio
  - Talkback (single mono channel)

MAKITO SDI ENCODER & MAKITO DECODER

Video Inputs (encoder only):
- S-Video
- Composite (NTSC/PAL/PAL-M)
- SD-SDI / SMPTE 259M-C
- HD-SDI / SMPTE 292M & 296M
- 3G-SDI / SMPTE 274M & 424M (Level A Only) & 425M *

Video Outputs (decoder only):
- HDMI
- SD-SDI / SMPTE 259M-C
- HD-SDI / SMPTE 292M & 296M
- 3G-SDI / SMPTE 274M & 424M (Level A Only) & 425M

Video Resolutions:
- 1920x1080p 60/59.94/50/30/24/23.98/29.97/25 Hz *
- 1920x1080i 60/59.94/50 Hz
- 1280x720p 60/59.94/50/30/29.97/25 Hz
- 720x480/576i 60/59.94/50 Hz
- (interlaced shown in fields per second)

Audio Inputs/Outputs:
- Available through terminal block connector:
  - Balanced stereo analog audio
  - Unbalanced stereo analog audio
  - Talkback (single mono channel)
- Embedded Audio
  - SD-SDI SMPTE 272M
  - HD-SDI SMPTE 299M
  - HDMI (Decoder only)

ADVANCED FEATURES
- Multi-Bitrate (MBR) Streaming
- SD De-interlacing
- Built-in Downscaling
- EIA-608-B/NTSC Line 21 Closed Captioning
- EIA-708-B/SDI Closed Captioning
- Forward Error Correction (FEC)
- AES Encryption 128-bit or 256-bit
- Logo Overlay
- Selective Mute
- SD Aspect Ratio Configuration
- SD AFD and WSS (SDI only)
- Color Space Conversion (DVI only)
- Talkback (encoder only)

VIDEO ENCODING/DECODING

Compression Standard:
- H.264 (MPEG-4 AVC part 10)
- ISO/IEC 14496-10
- Main Profile
- Level 4.2 and lower intermediate levels
- I, IP framing
- Configurable Group of Picture (GOP) size
- Configurable frame rate
- Deblocking Filter

Bit Rates:
- SD/HD from 150 kbps to 15 Mbps

Rate Control:
- CBR/VBR

Latency (encoder only):
- Less than 55ms

AUDIO ENCODING/DECODING

Compression Standard:
- MPEG-2 AAC-LC ISO/IEC 13818-7
- MPEG-4 AAC-LC ISO/IEC 14496-3

Audio Channels:
- 2 per video channel

Bit Rates:
- From 32 to 448 kbps per audio pair

Frequency Response:
- From 20 Hz to 22 kHz

METADATA (OPTIONAL)
- CoT to KLV conversion
- KLV or CoT over serial RS-232/422
- KLV or CoT over UDP
- KLV over SDI
- SMPTE 336M compliant
- MISB 0601.5 compliant
- MISB 0604.2 compliant
- Asynchronous & synchronous modes as per MISB 0604.2
- High precision timecode insertion as per MISB 0604.2

MANAGEMENT INTERFACES

Standard:
- RS-232 (optional for x-290E-DVI)
- RJ45 to RS-232 (DB-9 Management Cable Req'd.)

Management:
- HTTPS (web browser)
- Command line over SSH/Telnet/RS-232
- SFTP (Secure FTP)
- SCP (Secure Copy)
- SNMP v3

* Not applicable to S/B-290E-X-M Makito models

SINGLE BLADE APPLIANCE

Dimensions:
- 24mm H x 149mm W x 202mm D (0.92"H x 5.85"W x 8.0"D)

Weight:
- 2.5 lbs.

Power:
- 5VDC, 13W (each blade),
- 100-240VAC 15W external locking power supply

Temperature:
- Operating: -20º to 50ºC (-4º to 122ºF)
- Non-operating: -40º to 50ºC (-40º to 122ºF)

IP NETWORK INTERFACES

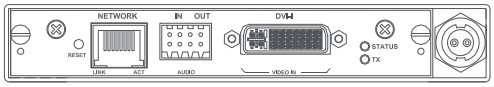
Standard:
- Ethernet 10/100/1000 Base-T, auto-detect, Half/Full-duplex

Connector:
- RJ45

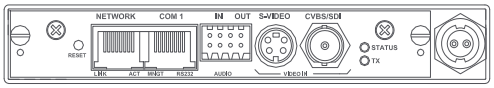
Networking Protocols:
- Unicast streaming
- Multicast streaming (IGMP v3)
- Multiple unicast streaming
- MPEG transport stream over UDP / RTP
- Direct RTP - H.264 over RTP (RFC 3984)
- RTP / RTCP (RFC 3550)
- RTMP
- Static IP/DHCP
- QuickTime RTSP (RFC 3640) (Progressive resolutions only)
- SAP (RFC 2974)

CERTIFICATIONS
- JITC: MISP 5.5 (Makito v2.0.0-32 only)
- Common Criteria NDPP 1.1 (Makito v2.1.1-3 only)

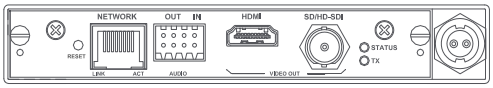
MULTI-BLADE CHASSIS OPTIONS
6 blade chassis (F-MB6X-RAC, F-MB6X-DC, F-MB6X-MED)
21 blade chassis (F-MB21B-R)
See MB6/MB21 for specification details



Makito DVI Encoder



Makito SDI Encoder



Makito Decoder

Makito Product Portfolio & Ordering Information **

Makito SDI Encoder	S/B-290E-HDSDI	Makito Encoder Appliance (S) or Blade (B) – 1080p H.264 IP Video Encoder supporting 3G/HD/SD-SDI, Composite, S-Video
Makito SDI Encoder	S/B-290E-SDI-M	Makito Encoder Appliance (S) or Blade (B) – 720p/1080i H.264 IP Video Encoder supporting HD/SD-SDI, Composite, S-Video
Makito DVI Encoder	S/B-290E-DVI	Makito Encoder Appliance (S) or Blade (B) – 1080p H.264 IP Video Encoder supporting DVI-I, XGA, and Component
Makito DVI Encoder	S/B-290E-DVI-M	Makito Encoder Appliance (S) or Blade (B) – 720p/1080i H.264 IP Video Encoder supporting DVI-I, XGA, and Component
Makito Decoder	S/B-290D-HD	Makito Decoder Appliance (S) or Blade (B) – HD H.264 IP Video Decoder supporting 3G/HD/SD-SDI and HDMI
6 Slot Chassis	F-MB6X-RAC/MED/DC	6 slot 1RU rack mount chassis for Makito, Makito X, Barracuda, and Torpedo blades
21 Slot Chassis	F-MB21B-R	21 slot 4RU rack mount chassis for Makito, Makito X, Barracuda, and Torpedo blades

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