



HD-VX Video ISR Module



By Light's HD-VX integrates Haivision's Makito X HEVC video encoder and Klas Telecom's award winning Voyager 8 deployable communications system to deliver a modular, mobile, and flexible ISR solution. The HD-VX can operate inside the Voyager 8 chassis or in stand alone mode.



ORDERING INFORMATION

Part Number	Description
BYL-HD-VX-1000	Voyager 8 module solution for the Makito X HEVC single channel 3G/HD/SD-SDI encoder
BYL-HD-VX-2000	Voyager 8 module solution for the Makito X HEVC dual channel 3G/HD/SD-SDI encoder

Specification

Physical Specifications

- 7.875" L x 7.375" W x 2.0" H
- (200 x 187 x 51 mm)
- 3.625 lbs / 1.64 kg

Electrical Specifications

- 12 VDC Input for operation in Klas Telecom Voyager 8 Chassis
- 25W power consumption

Construction

- Integrated aluminum chassis
- Forced Air Cooled, 5 VDC Fans

Operating Temperature range

- Operating -0 to 40C (32° to 104°F)
- Non-Operating -40 to 50C (32° to 104°F)

Makito X HEVC Key Features

HEVC + H.264 Makito X HEVC can reduce bandwidth requirements by 50%, while maintaining video quality when compared to H.264 encoders. The Makito X HEVC differs from competing HEVC encoders by combining the existing four engine H.264 architecture found in the Makito X while adding a dedicated HEVC encoding engine to the appliance.

KLV / STANAG Metadata for ISR Applications

Makito X HEVC encoder is ideal for full-motion video (FMV) applications requiring STANAG and MISP compliant Key-Length-Value (KLV) metadata. Capable of aggregating metadata from many sensors and sources, the Makito X HEVC fuels downstream networks, exploitation systems, and viewers, with frame accurate synchronization. The Makito X HEVC is designed for ISR applications where uplink network bandwidth is limited and costly. Improvements in compression efficiency increase image quality and positively impact mission intelligence.



Compact, High Performance HEVC + H.264 Encoder

Makito X HEVC video encoder transports secure, high quality, live HEVC/H.265 and AVC/H.264 video over any network at extremely low bit rates. Offering the award-winning features of the Makito X encoding platform but now with an additional HEVC encoding engine*, Makito X HEVC is the ideal encoder for broadcasters and defense organizations for live, interactive and bandwidth constrained backhaul and distribution applications. The Makito X HEVC offers unparalleled performance compared to other HEVC encoders, while keeping a standard based approach allowing for compatibility with third party HEVC decoders, Haivision transcoders, the Haivision Media Gateway and many HEVC players/viewers in the industry.

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Compact Hardware Appliance The Makito X HEVC is a compact, lightweight appliance with a highly efficient hardware architecture. The Makito X HEVC is excellent for space constrained applications or in remote contribution workflows. The Makito X HEVC is also available in blade format, compatible with Haivision's MB6 (1RU) and MB21 (4RU) chassis, making it a great fit for server rooms and headends. In addition, the Makito X HEVC is fully compatible with existing Makito X workflows, allowing for a simple HEVC upgrade path.

Reduce OPEX for Broadcast Workflows Haivision's SRT network protocol features packet loss recovery, encryption, real time end-to-end network statistics, options to easily manage firewall traversal and more, for the highest quality live video over any network. HEVC reduces Operating Expenses (OPEX) in your broadcast workflows by reducing bandwidth requirements. Further OPEX savings are possible by leveraging SRT to transmit video streams over less expensive connections such as the public internet.

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Features

Benefits

HEVC encoding	Reduce bandwidth requirements by up to 50% compared to H.264
Multiple HD encoding engines	Up to 4 H.264 encoding cores and 2 HEVC encoding cores to deliver HD streams
Size, Weight and Power	Compact, low power appliance or blade format for flexible and efficient deployment
SRT (Secure Reliable Transport)	AES encrypted, packet re-transmission, resilient live video transport over public or managed internet connections and firewall traversal
Advanced Metadata Support	Insert CoT and KLV into the MPEG stream from a variety of input sources
Multiple destinations per stream	Target different systems, networks, users, and platforms individually

MAKITO X HEVC SPECIFICATIONS

MAKITO X HEVC SDI ENCODER

Video Inputs (single or dual input encoder only)

Composite	NTSC/PAL/PAL-M
SD-SDI	SMPTE 259M-C
HD-SDI	SMPTE 292M
	SMPTE 274M
	SMPTE 296M
3G-SDI	SMPTE 424M (Level A Only)
	SMPTE 425M

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
 (interlaced shown in fields per second)

Audio Inputs/Outputs:
 Available through a locking mini-DIN-8 connector:
 Balanced stereo analog audio
 Unbalanced stereo analog audio
 Talkback
 Embedded Audio
 SD-SDI SMPTE 272M
 HD/3G-SDI SMPTE 299M

VIDEO ENCODING

Compression Standard:
 H.264 (MPEG-4 AVC part 10)
 ISO/IEC 14496-10
 H.265/HEVC
 ISO/IEC 23008-2
 Baseline, Main, and High Profiles (H.264)
 Up to Level 4.2 and lower intermediate levels
 I, IP, IBBP framing (H.264)
 IP framing (HEVC)
 Configurable Group of Picture (GOP) size
 Configurable frame rate
 Deblocking filter
 Region of interest coding (H.264)
 Up to Level 4.2 (1080p60) (H.264)
 Main Profile (HEVC)
 Up to Level 4 (1080p60) (HEVC)

Video Outputs:
 Up to 2x1080p60 H.264
 1x1080p60 HEVC
H.264 Bit Rates:
 SD/HD from 32 kbps to 25 Mbps
Rate Control:
 CBR/VBR
H.264 Latency (encoder only):
 Less than 55ms
HEVC Latency (encoder only):
 Less than 45ms

AUDIO ENCODING

Compression Standard:
 MPEG-2 AAC-LC ISO/IEC 13818-7
 MPEG-4 AAC-LC ISO/IEC 14496-3
Audio Channels:
 2 analog audio per blade
 16 embedded audio per blade (SDI)
 2 embedded audio per blade (DVI)
Bit Rates:
 From 56 to 320 kbps per audio pair
Frequency Response:
 From 20 Hz to 22 kHz

METADATA (OPTIONAL)

Input Metadata:
 KLV or CoT over serial RS-232
 KLV or CoT over IP
 KLV over HD-SDI
Metadata (Processing):
 CoT to KLV conversion
 CoT Relay
 Insertion and KLV edits
 KLV pass-through
 CC 608/708 pass-through
 SMPTE 336M compliant
 MISB 0601.10 compliant

IP NETWORK INTERFACES

Standard:
 Ethernet 10/100/1000 Base-T, auto-detect, Half/Full-duplex
 Unicast streaming
 Multicast streaming (IGMP v3)
 Multiple unicast streaming
H.264 Protocols:
 MPEG Transport Stream
 RTMP
 Secure Reliable Transport (SRT)
 Direct-RTP (RFC 3984)
HEVC Protocols:
 MPEG Transport Stream
 Secure Reliable Transport (SRT)

MANAGEMENT INTERFACES

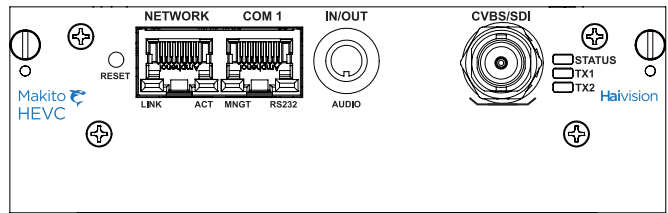
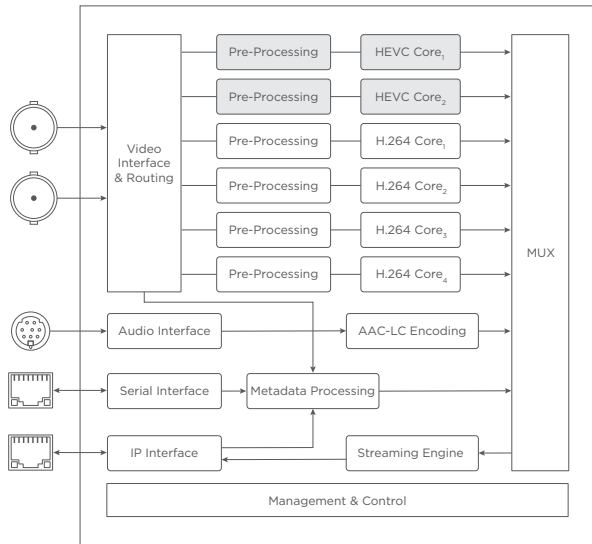
Standard:
 RS-232
 RJ45 to RS-232 (DB-9 Management Cable Req'd.)
 Ethernet
Management:
 HTTPS (web browser)
 Command line over SSH/Telnet/RS-232
 SFTP/TFTP/SCP
 SNMP v3

SINGLE BLADE APPLIANCE

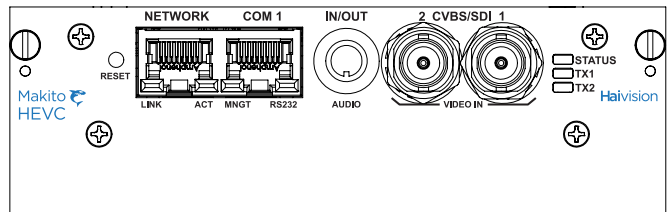
Dimensions:
 41mm H x 143mm W x 220mm D (1.7" H x 5.7" W x 8.7" D)
Weight:
 3 lbs (1.36 Kg)
Power:
 12VDC, 25W (each double-height blade)
 100-240VAC 30W external locking power supply
Temperature:
 Operating: 0° to 40°C (32° to 104°F)
 Non-operating: -40° to 50°C (-40° to 122°F)

MULTI-BLADE CHASSIS OPTIONS

6 blade chassis (F-MB6X-RAC, F-MB6X-DC, F-MB6X-MED)
 up to 3 HEVC blades
 21 blade chassis (F-MB21B-R)
 up to 10 HEVC blades



Makito X HEVC (Single SDI)



Makito X HEVC (Dual SDI)

Makito X Product Portfolio & Ordering Information **

Makito X HEVC Single SDI S/B-292E-SDI1-HEVC Makito X HEVC single channel 3G/HD/SD-SDI or composite encoder appliance (S) or blade (B)
Makito X HEVC Dual SDI S/B-292E-SDI2-HEVC Makito X HEVC dual channel 3G/HD/SD-SDI or composite encoder appliance (S) or blade (B)

** For complete pricing and ordering, contact us at sales@haivision.com or your certified Haivision reseller.