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.

<table>
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<th>Product Features</th>
<th>Product Benefits</th>
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<tr>
<td>70 Millisecond End-to-End Latency</td>
<td>Supports mission-critical and advanced communication challenges</td>
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<tr>
<td>1080p60 Resolution</td>
<td>Highest quality HD</td>
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<td>DVI/XGA Input</td>
<td>Stream computer displays up to 1920 x 1080</td>
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<td>High Density</td>
<td>Reduce rack space with 6 1080p60 encoders per 1RU</td>
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<td>End-to-End Secure Video</td>
<td>Deliver protected multicast without copy risk</td>
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<td>Selective Mute</td>
<td>Disable viewing audiences with notice</td>
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<td>Multi-Bitrate (MBR) Streaming</td>
<td>Stream directly to desktops, mobile devices, and set-top boxes</td>
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<td>Multi-Streaming</td>
<td>Stream to multiple systems/audiences simultaneously</td>
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<td>Snapshots</td>
<td>Grab full resolution images before encoding</td>
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<tr>
<td>Logo Application</td>
<td>Identify streams and burn in graphics</td>
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<tr>
<td>Complete Product Range</td>
<td>Industry-proven product family including encoders, decoders and DVB-IP gateways</td>
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<td>TalkBack™ Audio Decoding</td>
<td>Enable bi-directional audio from InStream players</td>
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<td>Metadata Support</td>
<td>Insert synchronized KLV into the MPEG stream from IP, embedded, or serial data sources</td>
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MAKITO DVI ENCODER
Video Inputs:
Y, Pb, Pr / RGB/4 component analog
Y, Cr, Cr / DVI component digital
Video Resolutions:
1920x1080p 60/59.94/50/29.97/25 Hz
1280x720p 60/59.94/50/29.97/25 Hz
720x480/576 60/59.94/50/29.97/25 Hz
Audio Inputs:
Available through terminal block connector:
Balanced stereo analog audio
Unbalanced stereo analog audio

MAKITO SDI ENCODER & MAKITO DECODER
Video Inputs (encoder only):
S-Video
Composite (NTSC/PAL/PAL-M)
SD-SDI / SMPTE 295M-C
HD-SDI / SMPTE 292M & 296M
3G-SDI / SMPTE 274M & 424M & 425M
Video Outputs (decoder only):
HDMI
SD-SDI / SMPTE 256M-C
HD-SDI / SMPTE 252M & 296M
3G-SDI / SMPTE 274M & 424M & 425M
Video Resolutions:
1920x1080p 60/59.94/50/29.97/25 Hz
1280x720p 60/59.94/50/29.97/25 Hz
720x480/576 60/59.94/50/29.97/25 Hz
Audio Inputs/Outputs:
Available through terminal block connector:
Balanced stereo analog audio
Unbalanced stereo analog audio

ADVANCED FEATURES
Multi-Birate (MBR) Streaming
SD De-interlacing
Built-in Downsampling
EIA-608/808/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)

Audio 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, P, B frames
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 (encode 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 0604.2 compliant
Asynchronous & synchronous modes as per MISB 0604.2

Management Interfaces
Standard:
RS-232 (optional for x-290E-DVI)
JTAG to RS-232 (DB-9 Management Cable Req’d.)
Management:
HTTPS (web browser)
Command line over SSH/Telnet/RS-232
QuickTime RTSP (RFC 3640)

Certifications
Common Criteria NDPP 1.1 (Makito v2.1.1-3 only)

Chassis Options
6 blade chassis (F-MB6X-RAC, F-MB6X-DC, F-MB6X-MED)
21 blade chassis (F-MB21B-R)
See Datasheet for specification details

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