GEARBOX265™ 3Ch HD-SDI/IP

Broadcast Grade, Real Time, 3 RU, Quick Starting, Standards Compliant, Embedded Linux® Based, Remotely Manageable, Three HD-SDI Input HEVC Encoder with Multiprotocol, Multiwrapper IP Output.

Features Real Time Encoding of Content from Three Cameras or Video Servers Equipped with SDI, HDMI, or HD-SDI Outputs. Outputs Three HD or 20 SD H.265 Transport Streams with Any Resolution including 1080p, 720p, 576i, or 480i. Designed for Streaming HEVC Compressed Video to CDNs, Servers, ISPs, and End Users who Need HLS or UDP Transport Streams.

Overview

H.265 HEVC is the widely anticipated codec that is designed to replace H.264 as the mainstay of the IP video delivery industry. Just like H.264, it is being developed via international collaboration by major corporations, academia, and individuals. It is now in its finalization phase and by all reports works well.

DVEO has kept up with H.265 development since its inception and it is hereby offering this pioneering three HD-SDI input 1080 resolution TS encoder.

As you would expect, the Gearbox265 3Ch HD-SDI/IP is surrounded by the proven DVEO encoder support tools. The underlying encoder engine is optimized to output HD or SD or a combination of both.

Applications

- Transmission of 3 each 1080p HD over IP
- Transmission of 20 SD TS streams out
- Repurposing SDI or HD-SDI Video Feeds for lowest bit rate
- Live or Multiscreen Content Distribution
- Military and Telco Compatibility Testing
- Testing and demonstrating HEVC
- H.265 HEVC benchmarking

Features

- Input format can be SDI or HD-SDI
- Outputs: IP transport streams (H.265) via GigE port (RJ45) or optionally 10 GigE ports
- IP output protocols: UDP, RTP, HLS
- SDI and/or HD-SDI video loop through for monitoring
- Encodes up to three 1080p HD streams, or creates up to 20 SD streams
- Supports HLS (adaptive) for output to mobile devices
- Supports rotating key servers like Verimatrix® VCAS™
- Performs AES-128 encryption
- OPTION: Supports Streaming from local hard drive
- Supports NTSC or PAL
- Supports PAL TO NTSC conversion
- Supports HEVC main profile
- Encoding bit rates: .1 to 15 Mbps
- IP output supports 1080p, 720p, 576i, 480i, and other formats
- Supports HDTV input formats SMPTE-274M/SMPTE-296M-2001, ITU-R BT.656
- SNMP, REST, SOAP support for remote management and monitoring
- Support for Variable Bit Rate (VBR) encoding maximizes adaptive streaming video quality and bandwidth efficiency
- Expects embedded SDI audio
- Audio Output: AAC, MPEG-1 Layer II, optional MP3, and/or optional “SurCode for Dolby Digital” AC-3
- Settings are remembered when power cycled
- Based on embedded Linux® running on tiny Flash Memory Module
- Remote GUI includes some scheduling
- Redundant power supply
- Excellent H.265 benchmarks
- Option: DELL servers with 16 core CPU's and dual redundant power supplies

Computer Modules, Inc.
11409 West Bernardo Court
San Diego, CA 92127
Tel: 858-613-1818   Fax: 858-613-1815
www.dveo.com
Sample of GUIs

Status Screen

Network Setup

Scheduled SDI Input Setup

IP Output Setup

Input/Outputs Example

Throughput

1. If you have twenty Mbps bandwidth Internet then you can only stream twenty one Mbps streams.

Service Control GUI
### Specifications

#### SDI, HD-SDI Input
- **Inputs:** Three SDI (SMPTE 259M), HD-SDI (SMPTE 292M) inputs
- **Audio Input:** SDI Embedded
- **CC/Teletext:** Supports closed captioning and Teletext with overlay

#### SDI, HD-SDI Loop Through
- **Loop Through:** SDI/HD-SDI loop through for input monitoring

#### IP Output
- **Outputs:** Three HD streams, or 20 SD streams, or one HD stream and 10 SD streams
- **Audio Output:** AAC, MPEG-1 Layer II, optional MP3, and/or optional “SurCode for Dolby Digital” AC-3
- **Ethernet:** Two 10 GigE ports
- **Output “wrappers”:** UDP, RTP, HLS
- **Type:** IP-multicast, IP-unicast with “wrappers”
- **Bit Rates:** 1080i or p @3.5 mbps, 720@2 mbps, 576/480@1 mbps
- **H.265 average bit rate only**
- **Quality:** 8 bit encoding with 4:2:0 color sampling
- **Video:** NTSC or PAL

#### Administration
- **Access:** Web interface, SSH (Secure command line interface)
- **SNMP:** Monitoring and alerts
- **Scheduling:** On, Off support for timeslots

#### CPU and Operating System
- **CPU:** Intel® Dual 16 Core processor
- **OS:** DVEO embedded Linux® on SSD

#### Physical & Power
- **Size --** 3 RU high: 19 x 5.25 x 25.2 inches (W x H x D)
- **Power Supply:** 3U 760W – Redundant
- **Temperature Range:** Operating: 0°C ~ +50°C on Full Load Storage & Shipping: -20°C ~ +70°C
- **Non-operating Humidity:** 5% to 95% non-condensing
- **Weight:** 39 lbs. (17.69 kg)
- **Conformities:** UL, BSMI, CSA, FCC, CE, RoHS

#### Security
- **Ports security scanned to MIL requirements prior to shipment**

### Ports Utilized

<table>
<thead>
<tr>
<th>Protocol</th>
<th>TCP Ports</th>
<th>UDP Ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTTP</td>
<td>80, 8000, 8001, 8080, 1-65535 (out)</td>
<td></td>
</tr>
<tr>
<td>HTTPS</td>
<td>443</td>
<td></td>
</tr>
<tr>
<td>RTMP</td>
<td>1935</td>
<td></td>
</tr>
<tr>
<td>RTP</td>
<td>6970-6999, 16384-32767</td>
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</tbody>
</table>

### Supported Resolutions

#### Supported Resolutions – Input and Output

<table>
<thead>
<tr>
<th>Resolutions - Input and Output</th>
<th>1920 x 1080</th>
<th>1280 x 720</th>
<th>720 x 576</th>
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</thead>
<tbody>
<tr>
<td>720 x 480</td>
<td>480 x 480</td>
<td>320 x 240</td>
<td></td>
</tr>
<tr>
<td>704 x 480</td>
<td>480 x 320</td>
<td></td>
<td></td>
</tr>
<tr>
<td>640 x 480</td>
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Also supports many custom resolutions not listed here.

- **Note:** Lower resolution results in higher transcodes.
- **Note:** Supports PAL TO NTSC conversion.
- **Note:** Supports closed captioning. Does not support 608 closed captioning for SDI input. Only 708 is supported.
- **Note:** Does not support closed captioning for optional HDMI inputs.
- H.265 output resolutions supported are 1080, 720, 576, 480.
- H.265 576/480 resolutions only have 4:3 aspect ratio.

### CDNs Tested With

1. Akamai*
2. Limelight
3. Tata
4. Octoshape
5. CDNetworks
6. Internap
7. Highwinds
8. Verizon*
9. Ustream*
10. Mirror Image
11. Tulix*
12. More to come!

*Certified

### Options

- Optional DOZERTM Automated UDP Packet Recovery protocol, enabling error-free video delivery over public internet. DOZER is DVEO's patented algorithms for automated packet recovery and re-ordering of out-of-sequence packets.

### Ordering Information

Gearbox265 3Ch HD-SDI/IP

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