Overview

The Gearbox™ 8VSB 8 Tuners/IP 52ch is a real time multichannel streamer, integrated RF receiver, and transcoder designed to receive SMPTE 310M (8VSB) signals and transform them into streams that are best suited for customers. It is designed to be scalable, easily adaptable, and field upgradable to meet the needs of cable operators who are very comfortable with embedded Linux® based appliances. It relies on an Intel® 16 Core CPU as an accelerator. We have also optimized the transcode engine for reliability, efficiency, and flexibility.

The Gearbox is an MPEG-2 to H.264 transcoder or transscalar. It receives multiple 8VSB transport streams, transcodes them to H.264 or optional H.265, and outputs them to an IP network. Resulting streams can be viewed with standard transport stream compatible set-top boxes, streaming video, smart phones, or software clients such as VLC or JW Player. The Gearbox 8VSB 8 Tuners/IP 52ch receives transport streams, demultiplexes the requested services and streams these services using UDP, RTP, RTMP, Adaptive, or HTTP via IP networks as either IP multicast or IP unicast streams. The system transcodes individual streams into H.264 format up to a maximum individual bitrate of 15 Mbps.

The Gearbox 8VSB 8 Tuners/IP 52ch selects all required PIDs and multiplexes the demultiplexed transport stream packets into IP packets.

The unit provides PID filtering of all unwanted traffic, increasing system performance and the number of channels which can be transmitted per unit.

Programs typically are forwarded (pushed) as transport stream packets via UDP or as RTP (real time protocol) payload (RFC 2250). Pushing can be either unicast or multicast. In addition to push, programs can be forwarded on request (pulled) using HTTP, HTTP Live, RTMP, DASH, etc.

Applications

- IPTV head end to feed CDN’s
- Telco TV ingest
- Hotels, Ships, Universities, Resorts feeds
- Streaming to designated VideoLAN VLC or similar clients, or to Roku®, Amino™, or other set-top boxes

Features

- Input: Simultaneously receives one to eight 8VSB inputs – terrestrial digital
- Based on embedded Linux®
- IP input (H.264, MPEG-2, or VC-1): UDP, RTP, RTSP, HTTP, HTTP Live, RTMP (pushed from Flash server)
- IP output protocols: UDP, RTP, RTMP (Open Flash), HTTP, with DLNA support
- Supports HLS (adaptive) and DASH for output to mobile devices
- Supports logo insertion, text overlay, and SCTE 35 compliant cue tone insertion ("ad markers") on outputs
- Performs AES-128 encryption
- Supports 50 HLS users natively. Optional built-in server
- Supports rotating key servers like Verimatrix® VCAS™
- Supports 1,000+ simultaneous HLS, DASH, and/or RTMP users.
- Supports NTSC or PAL
- Transcoding bit rates: .1 to 15 Mbps
- Creates simultaneous High, Medium, and Low bitrate streams
- Supports 1080i, 1080p, 720p, 576i, 480i, and 480p and any other broadcast or video format
- Simultaneous demodulation, transcoding, optional time delay, and optional multiplexing
- Transcodes up to 20 720p60 HD streams, or 13 1080i/p HD streams, or 52 SD streams from MPEG-2 to H.264, or vice-versa
- Optional H.265 transcodes are up to 5 720p HD streams, or 3 1080i/p HD streams, or 20 SD streams from MPEG-2 or H.264 to H.265, or vice-versa
- SNMP, REST, SOAP support for remote management and monitoring
- Support for Variable Bit Rate (VBR) encoding maximizes adaptive streaming video quality and bandwidth efficiency
- Tested to work with Atlas™, Wowza®, and Adobe® Flash® media servers
- Tested to work with Akamai, Tulix, Verizon, etc. CDN’s
- Tested compatible with major brands of IP devices including Amino™, Roku®, Telergy, Android™, and Apple iPad® and iPhone®
- Tested compatible with major brands of professional H.265, H.264, and MPEG-2 decoders and video servers
- Audio support: AAC, optional MP3, MPEG-1 Layer II, and/or optional “SurCode for Dolby Digital” AC-3
- Settings are remembered when power cycled
- Remote GUI includes some scheduling
- Redundant power supply and optional SFP ports

Supports 1,000 RTMP, DASH, and/or HLS Users Natively.


IP output protocols: UDP, RTP, RTMP (Open Flash), HTTP, with DLNA support

Transcodes up to 20 720p60 HD streams, or 13 1080i/p HD streams, or 20 SD streams from MPEG-2 or H.264, or vice-versa

Supports HLS (adaptive) and DASH for output to mobile devices

Optional multiplexing

Supports 50 HLS users natively. Optional built-in server

Supports HLS (adaptive) and DASH for output to mobile devices

Supports HLS (adaptive) and DASH for output to mobile devices

Optional H.265 transcodes are up to 5 720p HD streams, or 3 1080i/p HD streams, or 20 SD streams from MPEG-2 or H.264 to H.265, or vice-versa

SNMP, REST, SOAP support for remote management and monitoring

Support for Variable Bit Rate (VBR) encoding maximizes adaptive streaming video quality and bandwidth efficiency

Tested to work with Atlas™, Wowza®, and Adobe® Flash® media servers

Tested to work with Akamai, Tulix, Verizon, etc. CDN’s

Tested compatible with major brands of IP devices including Amino™, Roku®, Telergy, Android™, and Apple iPad® and iPhone®

Tested compatible with major brands of professional H.265, H.264, and MPEG-2 decoders and video servers

Audio support: AAC, optional MP3, MPEG-1 Layer II, and/or optional “SurCode for Dolby Digital” AC-3

Settings are remembered when power cycled

Remote GUI includes some scheduling

Redundant power supply and optional SFP ports

Supports 1,000 RTMP, DASH, and/or HLS Users Natively.


IP output protocols: UDP, RTP, RTMP (Open Flash), HTTP, with DLNA support

Transcodes up to 20 720p60 HD streams, or 13 1080i/p HD streams, or 20 SD streams from MPEG-2 or H.264, or vice-versa

Optional H.265 transcodes are up to 5 720p HD streams, or 3 1080i/p HD streams, or 20 SD streams from MPEG-2 or H.264 to H.265, or vice-versa

SNMP, REST, SOAP support for remote management and monitoring

Support for Variable Bit Rate (VBR) encoding maximizes adaptive streaming video quality and bandwidth efficiency

Tested to work with Atlas™, Wowza®, and Adobe® Flash® media servers

Tested to work with Akamai, Tulix, Verizon, etc. CDN’s

Tested compatible with major brands of IP devices including Amino™, Roku®, Telergy, Android™, and Apple iPad® and iPhone®

Tested compatible with major brands of professional H.265, H.264, and MPEG-2 decoders and video servers

Audio support: AAC, optional MP3, MPEG-1 Layer II, and/or optional “SurCode for Dolby Digital” AC-3

Settings are remembered when power cycled

Remote GUI includes some scheduling

Redundant power supply and optional SFP ports

Supports 1,000+ simultaneous HLS, DASH, and/or RTMP users.
**Inputs/Outputs**

8 8VSB inputs – 4 per port

Transcodes up to 52 SD streams, or 20 720p60 streams, or 13 1080i or 1080p HD streams from MPEG-2 to H.264, or vice-versa.

**Specifications**

**Supported Resolutions – Input and Output**

<table>
<thead>
<tr>
<th>Resolution</th>
<th>1920 x 1080</th>
<th>1280 x 720</th>
<th>720 x 576</th>
<th>640 x 480</th>
<th>480 x 480</th>
<th>480 x 320</th>
<th>320 x 240</th>
<th>qHD</th>
<th>H.264up</th>
</tr>
</thead>
<tbody>
<tr>
<td>1920 x 1080</td>
<td>720 x 480</td>
<td>704 x 480</td>
<td>640 x 480</td>
<td>480 x 480</td>
<td>480 x 320</td>
<td>320 x 240</td>
<td>200 mbps</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Also supports any custom resolution not listed here, including computer formats like 1280x1024, etc. Note: Lower resolution results in higher transcodes. H.265 output resolutions supported are 1080, 720, 576, 480. H.265 576/480 resolutions only have 4:3 aspect ratio.

**8VSB (SMPTE 310M) Input**

- **Modulation:** 8VSB (SMPTE 310M) – terrestrial digital
- **Inputs:** RF from antenna
- **Frequency range:** 54 to 860 MHz
- **Maximum raw throughput:** 200 mbps

**IP Input**


**IP Output**

- **Audio Output:** AAC, optional MP3, MPEG-1 Layer II, and/or optional “SurCode for Dolby Digital” AC-3
- **Ethernet:** Two GigE, optional 10 GigE
- **Output “wrappers”:** UDP, RTP, RTMP (Open Flash), HTTP, with DLNA support
- **Type:** IP-multicast, IP-unicast with “wrappers”
- **Bit Rates:** Multiple H.264 video streams at different bit rates (.1 to 15 mbps), resolutions, and protocols, wrappers, and containers
  - Optional H.265: H.265 average bit rate supported. No constant or variable.
- **Quality:** 8 bit encoding with 4:2:0 color sampling; optional 4:2:2
- **Video:** NTSC or PAL
- **Latency:** About 1.2 seconds (fixed)

**CPU and Operating System**

- **CPU:** Intel® Xeon® 16 Core
- **OS:** DVEO embedded Linux® on SSD

**Administration**

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

**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

**Ad Insertion**

- SCTE Ad Marker insertion via RS232, USB, IP, Contact closures

---

**GUI’s**

- Status Screen

**CDNs Tested With:**

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

**Options**

- Optional transcoding to H.265
- 4:2:2 10 bit encoding
- Optional DOZER™ Automated UDP Packet Recovery protocol, enabling error-free video delivery over UDP. DOZER ensures smooth MPEG-2, H.264, and optional H.265 delivery through DVEO patented algorithms for automated packet recovery and re-ordering of out-of-sequence packets.
- Optional built-in “Mini Atlas” server supports 1,000+ simultaneous HLS, DASH, and/or RTMP users

**Ordering Information**

Gearbox 8VSB 8 Tuners/IP 52ch

Other versions available: MF (Multifunction), ASI 2ch/ASI 2ch, ASI 4ch/ASI 4ch, 12 Port ASI/IP, IP/IP, QAM 8Ch/IP, ISDB-Tb 8 Tuners/IP, DVB-S-S2 8 Tuners/IP, DVB-T-T2 8 Tuners/IP

© 2019 Computer Modules, Inc. DVEO, Atlas, DOZER, and Gearbox are trademarks of Computer Modules, Inc. Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries. All other trademarks and registered trademarks are the properties of their respective owners. All rights reserved. Specifications are subject to change without notice. AAC licensed via Via Licensing.

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