**Features**

- **Inputs:** Simultaneously receives one to 16 DVB-T or DVB-T2 inputs – terrestrial digital
- **Supports multiple PLP**
- **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) for output to mobile devices**
- **Supports logo insertion, text overlay, and SCTE 35 compliant cue tone insertion ("ad markers") on outputs**
- **Supports rotating key servers like Verimatrix® VCAS™**
- **Performs AES-128 encryption**
- **Supports 50 HLS users natively. Optional built-in server 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, and encapsulation**
- **Transcodes up to 40 720p60 HD streams, or 26 1080i/p HD streams, or 104 SD streams from MPEG-2 to H.264, or vice-versa**
- **Optional H.265 transcodes are up to 10 720p HD streams, or 6 1080i/p HD streams, or 40 SD streams from MPEG-2 to 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®, Telyery, 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**
- **Based on embedded Linux®**
- **Remote GUI includes some scheduling**
- **Redundant power supply**

The **Gearbox™ II T+T2 16 Tuners/IP 104ch** is a real time multichannel streamer, integrated RF receiver, and transcoder designed to receive DVB-T and DVB-T2 signals and transform them into IP streams that are optimized for streaming. It is designed to be scalable, easily adaptable, and field upgradeable to meet the needs of streaming service users who are very comfortable with embedded Linux® based appliances. It relies on an Intel® Dual 16 Core CPU for encoding. We have optimized the encoder to obtain Telco grade reliability.

The Gearbox II is an MPEG-2 to H.264 transcoder or transcoder. It receives multiple DVB-T or DVB-T2 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 II T+T2 16 Tuners/IP 104ch 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.

Depending on the configuration, it forwards selected programs via IP datacasting; PAT, PMT, video PID, audio PID(s) and PCR information are transmitted. Gearbox II T+T2 16 Tuners/IP 104ch 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 Unicasting, Multicasting, Streaming**
- **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**

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**Overview**

The Gearbox™ II T+T2 16 Tuners/IP 104ch is a real time multichannel streamer, integrated RF receiver, and transcoder designed to receive DVB-T and DVB-T2 signals and transform them into IP streams that are optimized for streaming. It is designed to be scalable, easily adaptable, and field upgradeable to meet the needs of streaming service users who are very comfortable with embedded Linux® based appliances. It relies on an Intel® Dual 16 Core CPU for encoding. We have optimized the encoder to obtain Telco grade reliability.

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**Inputs/Outputs**

DVB-T/T2 Inputs – 4 per port

<table>
<thead>
<tr>
<th>DVB-T/T2 Inputs</th>
<th>IP In or Out</th>
<th>PS 1</th>
<th>PS 2</th>
</tr>
</thead>
</table>

Transcodes up to 104 SD streams, or 40 720p60 streams, or 26 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>DVB-T</th>
<th>DVB-T2</th>
<th>H.264up</th>
</tr>
</thead>
<tbody>
<tr>
<td>1920 x 1080</td>
<td>720 x 480</td>
<td>480 x 480</td>
<td>qHD</td>
</tr>
<tr>
<td>1280 x 720</td>
<td>704 x 480</td>
<td>480 x 320</td>
<td>H.264up</td>
</tr>
<tr>
<td>720 x 576</td>
<td>640 x 480</td>
<td>320 x 240</td>
<td>H.264up</td>
</tr>
</tbody>
</table>

Also supports any custom resolution not listed here, including computer formats like 1280 x 1024, etc. Note: Lower resolution results in higher transcodes.

Supports PAL TO NTSC conversion but not NTSC to PAL. Supports closed captioning. H.265 output resolutions supported are 1080, 720, 576, 480. H.265 576/480 resolutions only have 4:3 aspect ratio.

**DVB-T or DVB-T2 Input**

- **Modulation:** DVB-T or DVB-T2 (up to 16 inputs) – 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 10 GigE ports
- **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 or 10 bit encoding with 4:2:0 color sampling; optional 4:2:2
- **Video:** NTSC or PAL
- **Latency:** About 1.2 seconds (fixed)

**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) 48.26 x 13.34 x 64 cm (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**

**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 II T+T2 16 Tuners/IP 104ch

Other versions available: MF (Multifunction), IP/ASI, IP/IP, ASI/ASI, 12 Port ASI/IP, QAM 16 Tuners/IP 104ch, 2-16 Port HD-SDI/IP, 8VSB 16 Tuners/IP 104ch, DVB-S-S2 16 Tuners/IP, DVB-S-S2 8 Tuners+DEC/IR/IP, ISDB-Tb 16 Tuners/IP

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