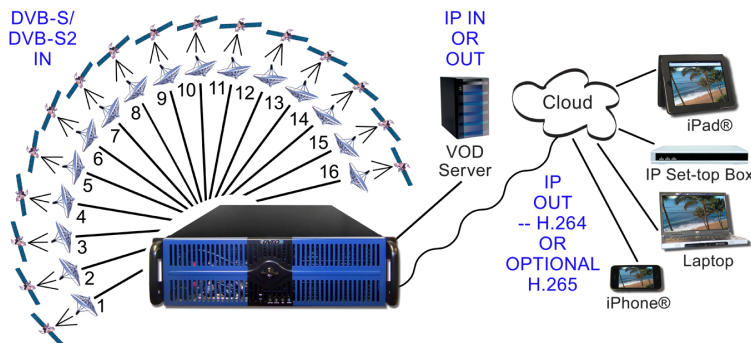# GEARBOX II™ DVB-S-S2 16 Tuners/IP (80ch)

Broadcast Quality, Up to 16 Channels, Real Time, Standard or High Definition (up to 1080p), Integrated DVB-S and DVB-S2 RF Receiver, and MPEG-2 to H.264 or Optional H.265 Transcoder, Scaler, and Streamer. Based on Embedded Linux®, it Boots Quickly from Flash Drive and Remembers all Settings. Easy to Use GUI Allows Full Config of Each Stream and via SNMP can Report its Status to Remote Network Operations. Will Transcode and Process Multiple Streams up to CPU Limitations. Typical Dedicated Transcodes are up to 80 SD Streams, or 20 1080i/p Streams, or 30 720p60 Streams. Supports RTMP, HTTP, and Live Streaming and Works with Atlas™, Wowza®, and Adobe® Flash® Servers. Supports 50 Simultaneous HLS Users. With Optional Atlas™ Add-on, Supports 1,000 RTMP, DASH, and/or HLS Users Natively.

Features

- Supports HLS (adaptive) for output to mobile devices
- Input: DVB-S or DVB-S2 – Simultaneously receives transport streams from up to 16 satellite transponders. Option for decryption available.
- 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 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.
- Transcoding bit rates: .1 Kbps 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 30 720p60 HD streams, or 20 1080i/p HD streams, or 80 SD streams from MPEG-2 to H.264, or vice-versa
- Optional H.265 transcodes are up to 8 720p HD streams, or 4 1080i/p HD streams, or 32 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, Edgecast, etc. CDN's
- Tested compatible with major brands of IP devices including Dune HD™, 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, Ogg Vorbis, MPEG-1 Layer II, optional MP3, and/or optional "SurCode for Dolby Digital" AC-3
- Settings are remembered when power cycled
- Options for DVB-T2, HD-SDI, ASI, 8VSB, and QAM inputs
- Remote GUI includes some scheduling
- Redundant power supply

Overview

The Gearbox II™ DVB-S-S2 16 Tuners/IP (80ch) is a real time multichannel integrated RF receiver and transcoder designed to receive up to sixteen simultaneous satellite 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 14 Core CPU for encoding. We have optimized the encoder to obtain Telco grade reliability.

The Gearbox II DVB-S-S2 16 Tuners/IP (80ch) is an MPEG-2 to H.264 transcoder or transcaler. It receives multiple satellite services, 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 system receives transport streams, demultiplexes the requested channels and streams these channels 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 DVB-S-S2 16 Tuners/IP (80ch) 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, Cruise Lines, Universities, Resorts feeds
- Streaming to designated VideoLAN VLC or similar clients, or to Roku®, Amino™, or other set-top boxes
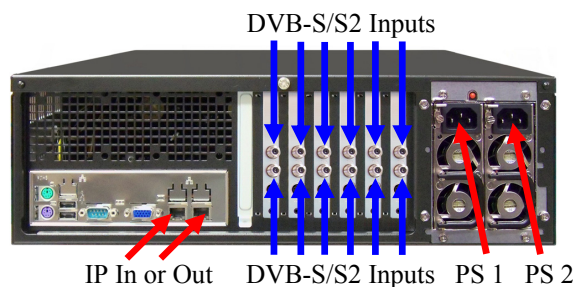

Computer Modules, Inc.
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Inputs/Outputs

DVB-S/S2 Inputs

IP In or Out   DVB-S/S2 Inputs   PS 1   PS 2
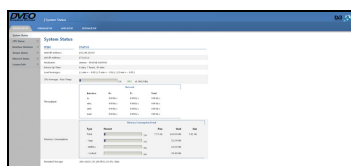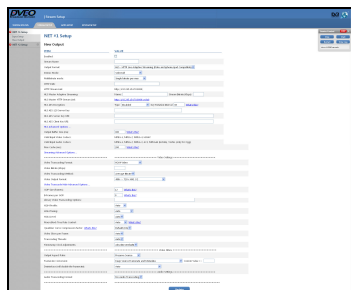
Transcodes up to 80 SD streams, or 30 720p60 streams, or 20 1080i or 1080p HD streams from MPEG-2 to H.264, or vice-versa.

GUI's

Status Screen

IP Output Setup

CDNs Tested With:

1. Akamai
2. Limelight
3. BitGravity
4. Octoshape
5. CDNetworks
6. Internap
7. Highwinds
8. Edgecast
9. Ustream
10. Mirror Image
11. Tulix
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 II DVB-S-S2 16 Tuners/IP (80ch)

Other inputs available: Decrypted DVB-S2, DVB-T+T2, 8VSB, QAM, ASI, IP, HD-SDI, and ISDB-Tb

Specifications

Supported Resolutions – Input and Output

1920 x 1080	720 x 480	480 x 480	qHD
1280 x 720	704 x 480	480 x 320	H.264up
720 x 576	640 x 480	320 x 240	

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-S/S2 Input (Free to Air – Option for Decryption Available)

Modulation:	QPSK (DVB-S), 8PSK (DVB-S2), 16APSK (DVB-S2)
Inputs:	16 Inputs – L-Band, K-Band, Ku Band, etc.
Symbol rate:	1 to 45 MS/s
Frequency range:	950 to 2150 MHz, 70 to 1002 MHz
LNB control:	22 kHz, power H/V
Spectral inversion:	ON/OFF/AUTO
Maximum raw throughput:	400 mbps

IP Input

IP Input protocols, "wrappers":	UDP, RTP, RTSP, HTTP, HTTP Live (HLS), RTMP (pushed from Flash server)

IP Output

Audio Output:	AAC, Ogg Vorbis, MPEG-1 Layer II, optional MP3, 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, MPEG-2, and/or optional H.265 video streams at different bit rates (.1 to 15 mbps)
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 14 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

Port scanned to MIL requirements prior to shipment

Ad Insertion

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

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