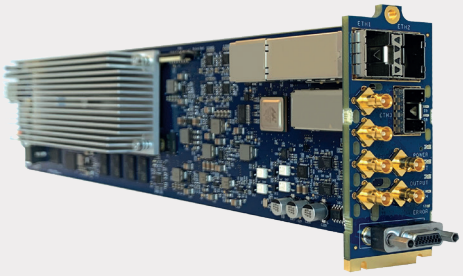
MGW Diamond+ OG

Multi-codec, Broadcast-grade 4K/Multi-channel HD openGear® Encoder Card



MGW Diamond+ OG is a broadcast-grade HEVC, H.264 and MPEG-2 IP encoder that is ideal for contribution or point-to-point streaming applications, and compatible with the openGear ecosystem for seamless integration. It features a powerful encoding engine with the ability to output up to 8 streams simultaneously.

MGW Diamond+ OG is available as an openGear card for easy integration within production studios, broadcast facilities or corporate server rooms.

MGW Diamond+ OG captures up to 4x 3G/HD/SD-SDI and streams up to eight live channels, each to two targets, addressing diverse applications within broadcast, sports, enterprise and federal markets. Featuring Ultra High Definition and High Dynamic range (HDR) support, MGW Diamond+ OG can capture and encode 4K60p HDR video from either its 4x3G-SDI or 12G-SDI inputs.

MGW Diamond+ OG reliably delivers broadcast-quality content over dedicated IP networks but also over lossy networks such as the Internet, thanks to its support of stream protection protocols.

Ultra Low Latency Streaming over WAN with SPRINT Protocol

Introducing the SPRINT Protocol by VITEC, the ultimate solution for achieving the best end-to-end latency when streaming over lossy networks. When combined with the MGW Ace Decoder, our technology delivers glass-to-glass latency as low as 100ms.

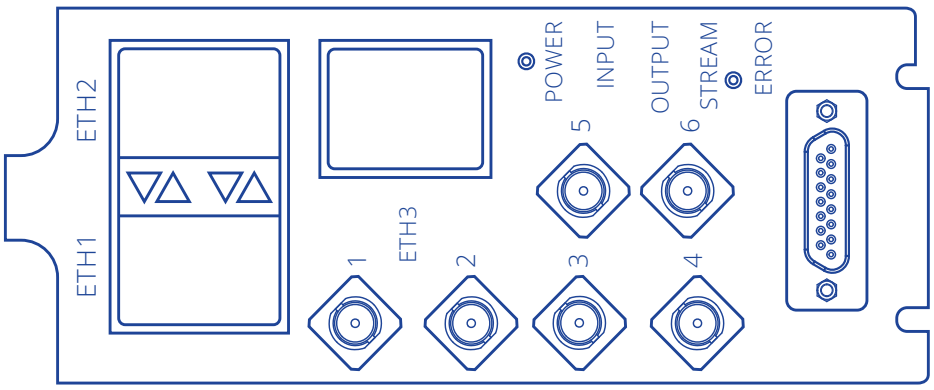
Features & Benefits

- HEVC/H.264 and MPEG-2 broadcast grade codec
- Up to 4K60p input and encoding support
- Support for 32 audio channels
- Large protocol support including UDP/RTP TS, Zixi™, RIST, SRT, SPRINT, and RTMP/RTMPS
- Live input preview for confidence monitoring
- Compatible with openGear ecosystem for seamless integration

Applications

- Broadcast Contribution over IP
- Site-to-site primary distribution
- Remote production over any network
- Remote/At Home production over the Internet/REMI
- IPTV distribution

Rear Panel Interfaces



Technical Specification

Video Inputs

- 4x SDI (HD-BNC)
- Supported standards:
  - 12G-SDI (SMPTE 2082-1) - SDI1 and SDI2
  - 4x3G-SDI (SMPTE 425-5 Level A/Two-Sample Interleave)
  - 3G/HD/SD-SDI (SMPTE 259M-C, SMPTE 292M, SMPTE 274M, SMPTE 296M, SMPTE 424M, 425M Level A only)
- Quad channel mode in 3G-SDI, HD-SDI, SD-SDI

Input Resolutions/Frame Rates

- 4096x2160p @ 60, 59.94, 50, 30, 29.97, 25, 24, 23.98 Hz (4K DCI)
- 3840x2160p @ 60, 59.94, 50, 30, 29.97, 25, 24, 23.98 Hz (UHD)
- 1920x1080p @ 60, 59.94, 50, 30, 29.97, 25, 24, 23.98 Hz
- 1920x1080i @ 60, 59.94, 50 Hz
- 1280x720p @ 60, 59.94, 50, 30, 29.97, 25 Hz
- 720x480/576i @ 60, 59.94, 50 Hz (NTSC, PAL, PAL-M)

Audio Inputs

- SDI Embedded audio
  - PCM stereo and mono (encoded as AAC-LC)
  - AC-3/E-AC-3 (compressed passthrough)

Video Output

- HEVC, H.264 or MPEG-2 IP video encoding (codec common to all channels)
- HEVC IP Video encoding of 8x independent channels (up to 8x 1080p30 or 4x 1080p60 or 1x 4K60p)
- H.264 IP Video encoding of 4x independent channels (up to 4x 1080p60 per channel or 1x 4K60p). Secondary channel is available as a copy of the primary encoding channel.
- MPEG-2 IP Video encoding of 4x independent channels (up to 1080p30 per channel)
- Dual target support for each encoded channel (up to 16 streams total in HEVC and H.264)

HEVC (H.265) MPEG-H HEVC (ISO/IEC 23008-2)

- Main/Main 10 and Main 4:2:2 - up to 4:2:2 10-bits
- Level up to Level 6.1, Main and High Tier
- Selectable GOP structure and size: I, IP, IBP, I(2)BP, I(3)BP, I(4)BP, I(5)BP, I(6)BP, I(7)BP, I(7)BB
- Bit Rate: 36Kbps to 100Mbps
- Frame type: Progressive and Interlaced
- Frame rate downsampling from 60/59.94/50 fps down to 30/29.97/25 fps
- Bit rate Regulation Modes: Constant (CBR), Variable (VBR)
- Output Resolutions: Configurable from FD1 up to 4096x2160p60
- Encoding latency less than 30ms (p60)

H.264 (MPEG-4 AVC Part 10) - ISO/IEC 14496-10 MPEG-4 AVC – Rec. ITU-T H.264

- Modes: Baseline Profile L3, Main Profile L3 and L4, High Profile L4 and L4.2
- Bit Rate: 64Kbps to 100Mbps
- Frame type: Progressive and Interlaced
- Frame rate downsampling from 60/59.94/50 fps down to 30/29.97/25 fps
- Selectable GOP structure and size: I, IP, IBP, IBBP
- Bit Rate Regulation Modes: Constant (CBR), Variable (VBR)
- Output Resolutions: Configurable from FD1 up to 4096x2160p50
- Encoding latency less than 30ms (p60)

MPEG-2 - ISO/IEC 13818 - Rec. ITU-T H.222.0

- Main and High profile (4:2:0 8-bit)
- Bit Rate: 64Kbps to 100Mbps
- Selectable GOP structure and size: I, IP, IBP, IBBP
- Frame type: Progressive and Interlaced
- Frame rate downsampling from 60/59.94/50 fps down to 30/29.97/25 fps
- Frame Rate: 1-60 fps
- Output Resolutions: Configurable from FD1 up to 1080p (max 1080p30/1080i59.94)

Audio Outputs

- Up to 8 audio services per channel
- Codec: PCM to MPEG-4 AAC-LC (ISO/IEC 14496-3)
  - Stereo and mono modes
  - Bit Rate: 32Kbps - 256Kbps in stereo, 16Kbps - 128Kbps in mono
  - Sampling Rate: 48 kHz
- Compressed audio passthrough (AC-3/E-AC-3)
  - AES3 Passthrough (SMPTE 302M)

Ancillary Data Support

- Timecode (SMPTE12M-2)
- High Dynamic Range (HDR):
  - HDR10 (SMPTE ST 2084/ITU-R BT.2100)
- Ad Signaling:
  - SCTE104 messages capture from SDI input (VANC)
  - Embedded as SCTE35 in MPEG-TS
- Closed captions:
  - CEA-708/CEA-608
  - Transport: ANSI/SCTE 128, ATSC A/72 (CC in user data)

Network Protocols

- UDP TS: MPEG Transport Stream over UDP
- RTP TS: MPEG Transport Stream over RTP
- Zixi Stream protection:
  - Zixi P2P and Broadcaster modes
  - Zixi ABR streaming (Adaptive Bitrate)
  - Zixi Low latency
- SRT (Caller, Listener and RendezVous)
- RIST (Simple and Main profiles)
- SPRINT
- RTMP & RTMPS (H.264)
- Unicast and Multicast (IGMPv3) streaming
- HTTPS, SSH, SAP
- NTP, PTP v1 & v2 (IEEE 1588-2002, IEEE 1588-2008)

Advanced Features

- Low latency mode in 4K/HD/SD streaming from SDI
- Hardware-based resolution and frame rate scaling
- Stream to one or more destinations (2 targets per encoding channel, up to 16 streams total)
- Latency monitoring when paired with MGW Ace Decoder
- Time-synchronized playback: synchronize the playback of multiple independent streams using MGW Ace Decoder
- On-the-fly bitrate change
- Fast boot time, less than 30 seconds

Network Interfaces

- Connected to internal OGX frame
- 2x SFP+ port (1Gb/s) for management and/or streaming
- DHCP/Static IP address, IPv6 stateless and IPv4

Management

- Secure web-based remote management interface (HTTPS), password-protected
- Custom SSL certificate loading capability
- Customizable notice and consent login banner
- Live video input preview for confidence monitoring
- Stream Transport protection statistics for easier configuration and enhanced quality of service
- Autostart mode recovers saved configuration after power cycle
- Remote firmware and software upgrade capability via command line or web GUI
- System and channel event logging
- Easy-to-use HTTPS Rest API for control and status monitoring from 3rd-party control software
- Status LEDs for power, network activity, temperature and fan errors, streaming and video source indications
- Debug tools (ping and traceroute) directly available in the web interface
- System discovery to retrieve MGW Diamond+ OG IP address on a network

Peripherals

- 1x Hardware system reset for factory reset or reboot

Environmental/Regulation

- Operating Temperatures: 0° C to +40° C (23° F to +104° F)
- Relative Humidity: 5% to 95% (non-condensing)
- EMC Standards: FCC part 15/ICES-003 Class A and CE
- Power: 25W (Typical), 30W (Max)
- Power Rating: 2.5A/12V
- MTBF: Ground - 43.88 years, Airborne Inhabited Cargo - 14.32 years (as per MIL-HDBK-217F, 20°C, operation time 100%)
- TAA-compliant

Physical

- Compatible with OGX and OG3 openGear frames
- Full Rear I/O Module (2 slots) for up to 10 cards within a 2RU openGear chassis

Ordering Information (P/N)

- 18554 - MGW Diamond+ OG - 4x HD or 1x4K channel - HEVC/H.264/MPEG-2 Encoder (Main and Rear I/O openGear modules)