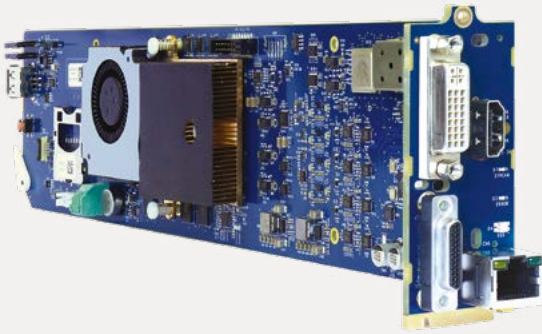


# MGW Diamond-Hx Encoder

4K & Multi-Channel SD/HD HDMI Encoder



MGW Diamond-Hx OG is an openGear 4K HEVC video encoder card that is ideal for IPTV distribution or Direct-to-Web applications. It features a powerful encoding engine with the ability to deliver up to four streams simultaneously. MGW Diamond-Hx OG is available as an openGear card for easy integration with production studios, broadcast facilities or enterprise server room environments.

MGW Diamond-Hx OG captures up to 2x 4K/UHD/HD/SD sources from HDMI, DVI-I or RGBHV inputs and streams up to 4 live channels, addressing diverse applications in enterprise, broadcast and sports markets. With support for Ultra High Definition (UHD) and High Dynamic Range (Roadmap), MGW Diamond delivers exceptional 4K60p picture quality taking advantage of a richer color gamut than other standard HD/4K encoders.

Ready for Direct-to-Web applications, MGW Diamond-Hx OG can capture HDMI feeds and publish to Content Delivery Network servers (CDN such as YouTube™, Akamai™, Facebook™) for large scale distribution. Featuring advanced transport protocol protection with Zixi, SRT, RIST and Pro-MPEG, as well as AES encryption, video feeds can be reliably and securely delivered over the internet for broadcast quality contribution.

Available as two flavours, MGW Diamond-H1 OG capture video from 1x HDMI and 1x DVI-I or RGBHV inputs while MGW Diamond-H2 OG can captures 2x HDMI inputs.

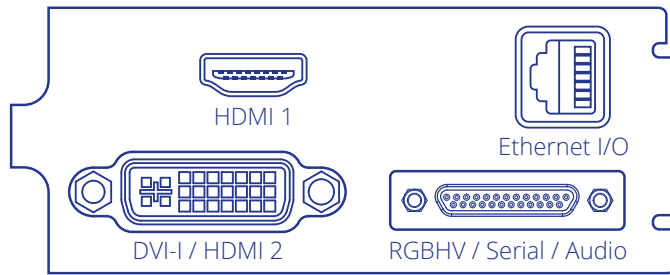
## Features & Benefits

- Low latency streaming from 2x HDMI, DVI-I or RGBHV sources simultaneously
- Ultra High Definition (4K)
- Encoder available as 2x HDMI inputs or 1xHDMI and 1x DVI/RGBHV inputs
- Up to 4 output streams
- Next-generation HEVC(H.265) compression support to reduce network bandwidth utilization by up to 50% compared to H.264
- Stream protection for reliable video/audio and metadata transmission (Zixi, SRT, RIST and Pro-MPEG)

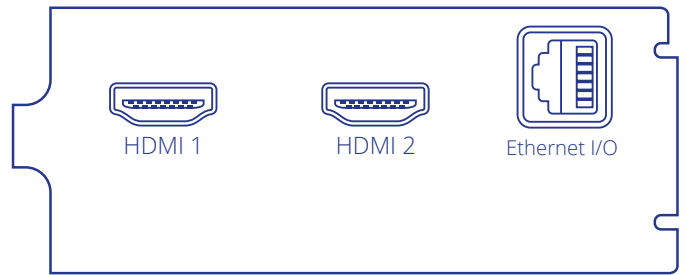
## Applications

- Multi-site and Multi-channel IP Video contribution
- IPTV Distribution from analog/digital video sources
- Direct-to-Web from HDMI sources
- Streaming video to desktop/laptop, TV and mobile devices over bandwidth-constrained pipes
- Distribution of TV content / PC screen on an organizational network

## Rear Panel Interfaces



MGW Diamond-H1 OG



MGW Diamond-H2 OG

## Technical Specification

### Video Inputs

- MGW Diamond-H1 OG
  - HDMI (Type A connector)
  - DVI-I (Female connector): DVI-A and DVI-D/HDMI
  - RGBHV
  - Supported standards: HDMI 2.0, from SD up to 4K60p
- MGW Diamond-H2 OG
  - 2x HDMI (Type A connector)
  - Supported standards: HDMI 2.0, from SD up to 4K60p

### Input Resolutions / Frame Rates

- 4096x2160p @ 60, 59.94, 50, 30, 29.97, 25, 24, 23.98 Hz (4K DCI) - HDMI1
- 3840x2160p @ 60, 59.94, 50, 30, 29.97, 25, 24, 23.98 Hz (UHD) - HDMI1
- 2048x1080p @ 60, 59.94, 50, 30, 29.97, 25, 24, 23.98 Hz (2K) - HDMI1
- 1920x1080p @ 60, 59.94, 50, 30, 29.97, 25, 24, 23.98 Hz
- 1920x1080i @ 60, 59.94, 50 Hz (HDMI, DVI-D)
- 1280x720p @ 60, 59.94, 50, 30, 29.97, 25 Hz
- 720x480/576i @ 60, 59.94, 50 Hz (HDMI, DVI-D)

### Graphical resolutions

- 1600x1200p @ 60, 50 Hz
- 1400x1050p @ 60, 50 Hz
- 1440x900p @ 60, 50 Hz
- 1366x768p @ 60, 50 Hz
- 1280x1024p @ 60, 50 Hz
- 1280x800p @ 60, 50 Hz
- 1280x768p @ 60, 50 Hz
- 1024x768p @ 60, 50 Hz
- 800x600p @ 60, 50 Hz

### Audio Inputs

- HDMI Embedded audio (Stereo and Mono)
- 2x Analog unbalanced audio (Stereo and Mono)

### Video Output

- Simultaneous HEVC and H.264 IP Video encoding of 2x independent channels (up to 1080p60 per channel)
- Up to 4 output streams with independent resolution (downscaling), frame rate and bitrate
- Up to 1x 4K60p output stream

### 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 5.2, Main and High Tier
- Selectable GOP structure and size: I, IP, IBP, IBBP, I(3)BP
- Bit Rate: 36Kbps to 80Mbps
- Frame Rate: 1-60 fps. Configurable frame rate from 60 down to 1fps.
- Bit Rate Regulation Modes: Constant (CBR), Variable (VBR)
- Output Resolutions: Configurable from CIF up to 3840x2160p60
- Encoding latency less than 30ms

### 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 80Mbps
- Selectable GOP structure and size: I, IP, IBP, IBBP, I(3)BP, I(4)BP
- Frame Rate: 1-60 fps. Configurable framerate from 60 down to 1fps.
- Bit Rate Regulation Modes: Constant (CBR), Variable (VBR)
- Output Resolutions: Configurable from CIF up to 3840x2160p60
- Encoding latency less than 30ms

## Audio Output

- Up to x32 audio encoding channels
- Codec: MPEG-4 AAC-LC (ISO/IEC 14496-3) and AAC-ELD
- Stereo and Mono modes
- Bit Rate: 32Kbps - 256Kbps in Stereo, 16Kbps - 128Kbps in Mono
- Sampling Rate: 16 kHz - 48 kHz

## Ancillary Data Support

- High Dynamic Range (HDR) - HDMI (Roadmap):
  - HDR10 (SMPTE ST 2084/ITU-R BT.2100)
  - HLG (ITU-R BT.2100) from SDI (SMPTE ST 2108)

## Network Protocols

- UDP TS: MPEG Transport Stream over UDP
- RTP TS: MPEG Transport Stream over RTP
- RTP ES (RTSP): Elementary stream over RTP
- Zixi™ Stream protection
  - Zixi P2P and Broadcaster modes
  - Zixi ABR streaming (Adaptive Bitrate)
  - Zixi Low Latency
- RTP TS with ProMPEG Forward Error Correction (SMPTE 2022)
- SRT Caller, Listener and RendezVous with FEC support
  - SRT Listener multi-destination
  - Stream ID / tagging for easier streaming port management
- RIST Main and Simple profile
- RTMP & RTMPS (H.264)
- Unicast and Multicast (IGMPv3) streaming
- HTTPS, SSH, SAP
- NTP, PTP v1 & v2 (IEEE 1588-2002, IEEE 1588-2008)

## Encryption

- Real-time AES encryption for video, audio and metadata.
- 128- and 256-bit encryption key support.
- Interoperability with AES compliant systems such as VITEC EZ TV and FITIS distribution platforms

## Management

- Secure Web based remote management interface (HTTPS), password protected
- Custom SSL certificate loading capability
- Customizable Notice and Consent login banner
- Zixi / SRT streaming 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
- Recovery or initialization of Ethernet settings over USB thumb drive
- System Discovery to retrieve MGW Diamond-Hx OG IP address on a network
- SSH/Telnet interface for management (status and control)

## Network Interfaces

- 1x Gigabit Ethernet port for streaming and/or management (10/100/1000 Base-T, Auto Detect, Half/Full Duplex) shared within openGear chassis
- 1x Gigabit Ethernet over RJ45 for streaming and/or management (Rear I/O board)
- DHCP / Static IP address, IPv4 and IPv6 support
- IEEE 802.1X - Extensible Authentication Protocol (EAP-MD5 and EAP-TLS)

## Peripherals

- 1x USB 2.0 port for easy configuration of system settings
- 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: 14W (Typical), 15W (Max)
- TAA Compliant

## Physical

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

## Advanced Features

- Multi-channel Low latency HD/SD streaming from HDMI, DVI-I or RGBHV sources with metadata
- Hardware based resolution and frame rate scaling
- Highly flexible hardware-based resolution scaling (11 configurations) and frame rate sampling (1 to 60fps)
- Zixi, SRT and ProMPEG FEC error correction / packet recovery
- Time-synchronized playback: synchronize the playback of multiple independent streams using with MGW Ace Decoder
- On-the-fly bitrate change and Zixi ABR streaming for auto adaptive bitrate based on network conditions (HEVC/H.264)
- Latency monitoring when paired with MGW Ace Decoder
- Fast boot time, less than 20 seconds
- ONVIF Discovery support - Limitations apply

## Ordering Information

17928 - MGW Diamond-H1 OG - HDMI / DVI - 2x HD or 1x4K channel  
(Main and Rear I/O openGear modules)

18282 - MGW Diamond-H1 OG - TS - HDMI / DVI - 2x HD or 1x4K channel  
(Main and Rear I/O openGear modules)

18553 - MGW Diamond-H2 OG - HDMI - 2x HD or 1x4K channel  
(Main and Rear I/O openGear modules)

18283 - MGW Diamond-H2 OG - TS - HDMI - 2x HD or 1x4K channel  
(Main and Rear I/O openGear modules)

17667 - MGW Diamond-H1 OG Breakout cable  
(RGBHV input, 2x unbalanced Analog Audio In.  
1x Talkback Analog Audio output and Serial/RS232)