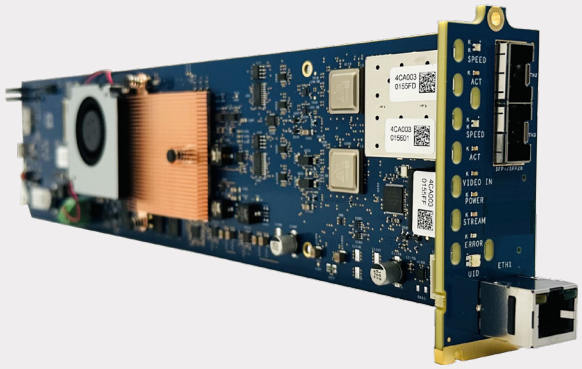
Diamond-IP OG Encoder

4K and Multi-Channel SD/HD HEVC Encoder



Diamond-IP OG is a quad-channel HD or one channel 4K HEVC video encoder available as an openGear card. It features SMPTE ST 2110 capture and a powerful encoding engine with the ability to output up to eight streams simultaneously.

Diamond-IP OG is available as an OpenGear card for easy integration in high availability applications where power redundancy, density and capability to easily commute video content is a must. It delivers exceptional video quality and ensures seamless interoperability with SMPTE ST 2110 standards for uncompressed video over high-speed fiber IP networks.

Diamond-IP OG captures a single 4K or up to 4 HD SMPTE ST 2110 input feeds and streams live up to 8 output channels, addressing diverse applications within News & Media as well as enterprise and broadcast markets.

Featuring SMPTE ST 2110 capture (uncompressed and JPEG-XS video essence), NMOS integration with third-party video sources and seamless stream protection through 2022-7 standards.

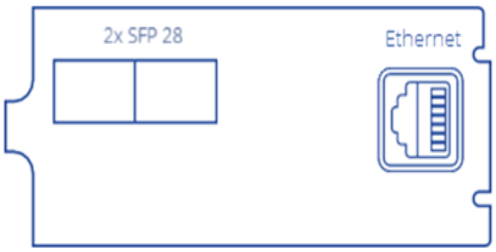
Features & Benefits

- Low-latency streaming from SMPTE ST 2110 sources
- SMPTE ST 2022-7 : 4Kp60 Hitless redundancy capture over dual 25G interfaces
- NMOS Stream Discovery and Registration
- Up to 8x 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/or Multi-channel IP Video contribution
- Dense IPTV distribution with up to 40x HD or 10x 4K channels in a 2RU chasssis (openGear card)
- High Availability Streaming SMPTE ST 2022-7 Seamless Protection Switching

Rear Panel Interfaces



Technical Specification

Video Inputs

- Uncompressed video (SMPTE ST 2110-20)
  - Up to 1x 4Kp60 or 4x 1080p60
  - 4:2:2 10-bit
- JPEG-XS Compressed Video (SMPTE ST 2110-22)
- Audio capture (SMPTE ST 2110-30)
  - 16x PCM Digital Stereo Audio
- Closed caption (SMPTE ST 2110-40)
- System Timing Definition (SMPTE ST 2110-10)
- PTP sync
- NMOS support
  - IS-04 – Discovery and registration
  - IS-05 – Connection management

Input Resolutions/frame rates

- 4096x2160p @ 60, 59.94, 50, 30, 29.97, 25 Hz (4K DCI)
- 3840x2160p @ 60, 59.94, 50, 30, 29.97, 25 Hz (UHD)
- 2048x1080p @ 60, 59.94, 50, 30, 29.97, 25 Hz
- 1920x1080p @ 60, 59.94, 50, 30, 29.97, 25, 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)

Video Output

- Simultaneous HEVC and H.264 IP Video encoding of 4x independent channels (up to 1080p60 per channel)
- Up to 8x output streams with independent resolution (downscaling), frame rate and bit rate
- Up to 1x 4Kp60 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, I(4)BP
- Bit rate: 36Kbps to 80Mbps
  - Regulation modes: Constant (CBR), Variable (VBR)
- Frame rate: 1-60 fps. Configurable frame rate from 60 down to 1fps.
- Output resolutions: Configurable from CIF up to 3840x2160p60
- Encoding latency less than 55ms

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
- Selectable GOP structure and size:
  I, IP, IBP, IBBP, I(3)BP, I(4)BP
- Bit rate: 64Kbps to 80Mbps
  - Regulation modes: Constant (CBR), Variable (VBR)
- Frame rate: 1-60 fps. Configurable frame rate from 60 down to 1fps.
- Output resolutions: Configurable from CIF up to 3840x2160p60
- Encoding latency less than 55ms

Audio Output

- Up to 32x audio encoding mono channels
- Codec: 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

Ancillary Data Support

- Timecode (SMPTE12M-2)
- Closed captions:
  - CEA-708/CEA-608
  - Transport: ANSI/SCTE 128, ATSC A/72
    [CC in HEVC user data]

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 Bit Rate)
  - Zixi Low latency
- RTP TS with ProMPEG Forward Error Correction (SMPTE ST 2022-1)
- SRT Caller, Listener and RendezVous
- RIST Main and Simple profile
- RTMP & RTMPS (H.264)
- SPRINT
- Unicast and Multicast (IGMPv3) streaming
- HTTPS, SSH
- 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 Avedia (ArtioCreate Portals/Signs) IPTV & Digital Signage Platforms

Network Interfaces

- 2x 25 Gbps or 2x 10 Gbps network interfaces for SMPTE ST 2110 capture over SFP28 or SFP+
- 1x Gigabit Ethernet port for streaming and/or management shared within OG chassis
- 1x Gigabit Ethernet over RJ45 for streaming and/or management (Rear I/O board)
- DHCP/Static IP address, IPv4 and IPv6 support

Advanced Features

- Multi-channel low-latency HD/SD streaming with metadata
- Hardware-based resolution and frame-rate scaling
- Highly flexible hardware-based resolution scaling and frame -rate sampling (1 to 60fps)
- Zixi, SRT, RIST, SPRINT and ProMPEG FEC error correction/ packet recovery
- Time-synchronized playback: synchronize the playback of multiple independent streams when paired with an MGW Ace Decoder
- On-the-fly bit rate change and Zixi ABR streaming for auto-adaptive bit rate based on network conditions (HEVC/H.264)
- Latency monitoring when paired with an MGW Ace Decoder
- Fast boot time

Environmental/Regulation

- Operating Temperatures: 0º C to +40º C (32º F to +104º F)
- Relative Humidity: 5% to 95% (non-condensing)
- EMC Standards: FCC part 15/ICES-003 Class A and CE
- Power: 12VDC, 20W (Typical), 26W (Max)
- TAA-compliant

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 HTTPS Rest API or web-GUI
- System and channel event logging
- Easy-to-use HTTPS Rest API for control and status monitoring from third-party control software
- Status LEDs for power, network activity, temperature, streaming and video source indications
- Recovery or initialization of Ethernet settings over USB memory stick
- mDNS discovery to retrieve encoder IP address on a network
- SSH interface for management (status and control)

Peripherals

- 1x Hardware system reset for factory reset or reboot
- 1x UID LED for quick and clear unit identification

Physical

- Compatible with VITEC Diamond C10 and Diamond C1, chassis and OG-X openGear frames
- Full Rear I/O Module (2 slots) for up to 10 cards within a 2RU openGear chassis

Ordering Information (P/N)

- 19553 - Diamond-IP OG - Encoder - HEVC - 4x HD or 1x 4K
- 19445 - Diamond-IP OG - Encoder - HEVC - TS - 4x HD or 1x 4K
- 19720 - Diamond-IP OG - License - JPEG-XS Input

*TS models have a streamlined feature set for local network streaming application; contact your VITEC representative for details