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Video Gateways

TVG450

JPEG 2000 Gateway

The TVG450 provides a best-in-class solution for transport of broadcast quality television signals over IP networks.

JPEG 2000 compression technology enables transport of SD, HDTV, Stereoscopic 3D and 3G-HDTV over IP/Gigabit Ethernet links.

The JPEG 2000 Gateway enables broadcasters to utilize cost-efficient IP links for high quality, low latency contribution. MXF/IP encapsulation ensures perfect synchronization of all video, audio and ancillary data.

TVG450 enables service providers to utilize visually lossless JPEG 2000 compression and IP/Ethernet technology to build cost effective managed video services on top of IP-MPLS, Metro Ethernet or SONET/SDH transport networks.

Nevion Video Gateways can be configured via an easy-to-use web interface, which also offers extensive built-in monitoring. Connection management can be performed via Connect, VideoIPath, or any 3rd party NMS.

Applications

- Professional broadcast contribution
- Live sports and event contribution
- Studio-to-studio media exchange
- Managed video services over IP

Key features

- Visually lossless JPEG 2000 4:2:2 10-bit compression
- Multi-channel JPEG 2000 encoding or decoding
- 4 SD or 2 HDTV or 1 3D/3G-HDTV channel per unit
- Bidirectional mode for simulatenous encoding and decoding of SD/HD (maximum 2 channels)
- Very low end-to-end latency
- MXF/IP encapsulation ensures perfect synchronization of video, audio channels and ancillary data.
- FEC for video over IP with no extra latency
- Hitless switching with IP diversity reception (SMPTE 2022-7)
- IP unicast, multicast and multiple unicast output
- Integrated frame store and reference sync on decoder
- Highly efficient error correction and concealment
- User-friendly web GUI for monitoring and control

R1718
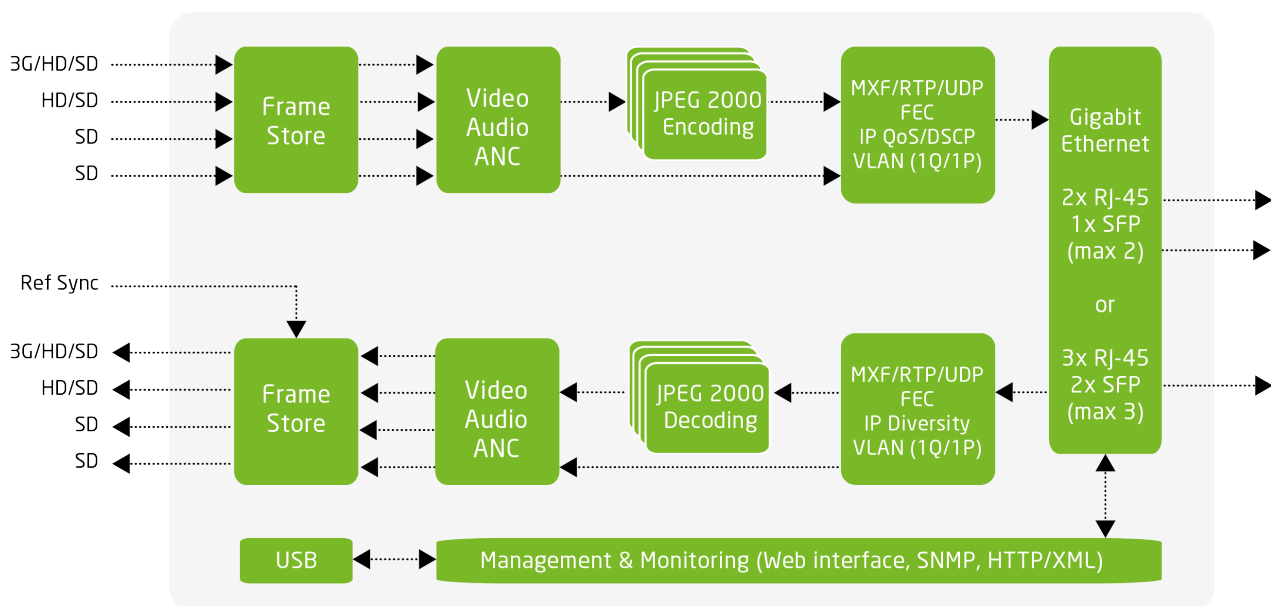
JPEG 2000 compression technology

Each frame/field is encoded with JPEG 2000 Part 1 image compression, with native 10-bit resolution and 4:2:2 YCbCr sampling. JPEG 2000 typically provides visually lossless video qualtiy at a compression ratio of 10:1.

Multi-channel encoding or decoding

The TVG450 has 3 operational modes; encoder, decoder or bidirectional mode. In encoder and decoder mode, the TVG450 supports up to 4 SD or 2 HD or 1 3D/3G SDI signal. It is also possible to combine SD and HD signals (maximum 1 HD and 2 SD). In the bidirectional mode, the TVG450 can simultaneously encode and decode 1 HD/SD signal (maximum 2 channels).

Transparent audio & ancillary data

The TVG450 supports transmission of up to 16 mono channels of embedded audio for SD/HD-SDI (32 for 3G-SDI). Handling of embedded audio, whether it's linear PCM or pre-compressed audio, is fully transparent. Similarly, handling of ancillary data such as closed captioning, teletext, active format description, time code and other metadata is also fully transparent.

MXF/IP encapsulation

MXF/IP encapsulation ensures perfect synchronization of video, multi-channel audio and associated ancillary data.

Robust transmission over IP

The TVG450 includes a number of features to ensure robust operation and graceful degradation in the presence of IP transport impairments; buffering for IP jitter compensation, packet reordering, FEC and highly efficient error concealment with built-in frame store.

Forward Error Correction (FEC)

FEC provides protection against intermittent and short burst packet loss, and does not require any additional latency.

Hitless switching with IP diversity

The TVG450 is equipped with dual GigE interfaces for transport over redundant IP network links, and supports multiple IP unicast/multicast outputs per encoder. On the decoding side, IP diversity reception , complaint with SMPTE 2022-7 (SIPS), enables hitless switching on packet loss or link failures.

Integrated frame store and refsync

The TVG450 decoder has a built-in frame store for locking the output SDI signal(s) to an external reference sync signal (black burst/tri-level sync)

Test image transmission

An encoder can be configured to transmit an internally generated test image at a configurable, constant bitrate to allow testing of network links prior to a live event.

TVG450 JPEG 2000 Gateway
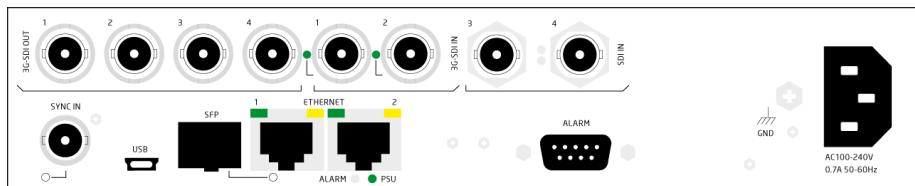
Video interfaces

Number of ports	2 x 3G/HD-SDI and 2 x SD-SDI input ports 2 x 3G/HD-SDI and 2 x SDI output ports
Connector	Female BNC (75 Ohm)
Reference sync input	Tri-level and Bi-level (black burst)

Video formats

SD-SDI (max 4 channels)	SMPTE-259-C 625i25, 525i29.97
HD-SDI (max 2 channels)	SMPTE-292 1280 x 720p: 50 / 59.94 / 60 Hz 1920 x 1080i: 25 / 29.97 /30 Hz 1920 x 1080p: 25 Hz
3G-SDI (max 1 channel)	SMPTE-424 1920 x 1080p: 50 / 59.94 / 60 Hz
Stereoscopic 3D HD-SDI	2x SMPTE-292
DVB-ASI (max 4 channels)	EN50083-9, 1-60 Mbps, 188 byte packets, SPTS/MPTS

Ethernet network interfaces

Number of ports	3 x Ethernet ports (default) 5x Ethernet ports (hardware option)
Connector type	2 x RJ-45, 1 x SFP (default - max 2 active) 3x RJ-45, 2 x SFP (hardware option - max 3 active)
Interface type	Gigabit Ethernet, 802.3ab (electrical), 802.3z (optical) Fast Ethernet (FE) IEEE 802.3u Ethernet IEEE 802.3i
Protocols	IP/UDP/RTP, ARP, IGMPv2/v3, Diffserv/TOS, 802.1Q (VLAN tagging), 802.1P (VLAN priority), HTTP/TCP

Video compression

Video compression	JPEG 2000 Part 1 (ISO/IEC 15444-1:2000)
Video format	YCbCr, 4:2:2, 10-bit per component
Number of channels	Up to 4 SD or 2 HDTV or 1 3D/3G-HDTV channel per unit Bidirectional mode for SD and HDTV (max 2 channels)
Encoding. bitrate	25 - 450 Mbit/s
Video encapsulation	MXF over RTP/UDP/IP
Forward error correction	FEC for MXF over IP (based on ST 2022 FEC)

Audio and ancillary data

Embedded audio	16 AES channels / 4 AES groups (user selectable), 24-bit, transparent for linear PCM and non-PCM audio
VBI (SD)	Time code (VITC), Video Index, World system teletext (WST), Closed captioning, Wide screen signaling (WSS), VPS, Transparent VBI lines (raw luma samples)
Ancillary data (HD)	Transparent for all VANC, such as Time code (SMPTE 12M), Closed captioning (SMPTE 334-1), Active format description (AFD, SMPTE 2016-3), Teletext and subtitling (OP-47)
Lip-sync (audio/video)	±1 video line

Control and management

Connector type	RJ-45 or SFP (see "IP/Ethernet network interfaces")
Interface type	10/100/1000Base-T Gigabit Ethernet (GE) IEEE 802.3i, 802.3u, 802.3ab, 802.3z
Features	Element control through HTTP/WEB interface, Control and monitoring through SNMP, TXP support (HTTP/XML)
In-band mgmt	Supported (configurable via web interface)
Protocols	HTTP, XML, SNMP v2c/v1
Alarm relay	9-pin D-SUB
Maintenance port	USB (Mini B)

Physical, power and environmental

Input voltage	Single/Dual AC PSU: 100-240V AC +/- 10% Single DC PSU: -48V DC
Power consumption	Single PSU: 35W max, Dual PSU: 45W max
Dimensions (single PSU)	1 RU, half-width 19", 210 x 300 x 44.5mm (WxDxH) Two units may be mounted in 19" 1 RU rack
Dimensions (dual PSU)	1 RU, full-width 19", 420 x 300 x 44.5mm (WxDxH)
Compliance	CE: 73/23/EEC (Low voltage equipment), CE: 89/336/EEC (Electromagnetic compatibility), CSA: designed for CSA approval, Safety: IEC60950 and EN60950, EMC:EN55022, EN55024, EN6100-3-2
Operating temperature	0˚C to 50˚C
Storage temperature	-20°C to +70°C
Relative humidity	5% to 95% (non condensing)

Product options

TVG450-3G-HD-SD-SDI-J2K-IP	TVG450 JPEG 2000 Gateway
TV-HW-OPT-AC	Single 110V/220V AC PSU
TV-HW-OPT-AC2	Dual 110V/220V AC PSU
TV-HW-OPT-DC	Single -48V DC PSU
TVG450-XGE	Additional GE data ports (HW option)
TVG450-ENC1	Encoder/Decoder, 1 SD
TVG450-ENC2	Encoder/Decoder, 1 HD or 2 SD
TVG450-ENC3	Encoder/Decoder, 1 HD + 1 SD or 3 SD or 1+1 HD Bidir.
TVG450-ENC4	Encoder/Decoder, 2 HD or 1 HD + 2 SD or 4 SD
TVG450-DEC2	Decoder only, 1 HD, or 2 SD
TVG450-DEC3	Decoder only, 1 HD + 1 SD, or 3 SD
TVG450-DEC4	Decoder only, 2 HD or 1 HD+2 SD or 4 SD
TVG450-3GENC	3G-SDI license for Encoding/Decoding
TVG450-3GDEC	3G-SDI license for Decoding
TVG450-S3D	Stereoscopic 3D license
TVG450-FEC	Forward Error Correction on IP input/output
TVG450-IDR	IP Diversity Reception (for hitless switching)
TVG450-SFP	Optical IP via SFP socket
TVG450-M2TS	ASI/MPEG-2 TS pass throughProgram information

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Video Gateways

Nevion Video Gateways are a line of compact, powerful and cost-effective products designed for real-time contribution and distribution of broadcast quality video over IP networks.

By taking advantage of the inherent flexibility of IP networking, the Video Gateways provide broadcasters and service providers with flexible, efficient and scalable solutions for high quality professional video transport. The Video Gateway portfolio includes the market leading Transport Stream Gateway - the TVG425 - and the industry's first combined SD/HD/3G/3D JPEG 2000 contribution solution - the TVG450

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