



Media Gateways

NX4600

Media Gateway

The NX4600 is Nevision's latest generation media transport and compression platform, offering simultaneous H.264/AVC encoding and decoding in a compact 1RU form factor.

The NX4600 is an H.264/AVC encoder, decoder and TS media gateway all built into one.

Up to four baseband SDI video signals can be encoded using H.264/AVC or MPEG-2 compression and transported over ASI and IP. The possibility to combine encoding, decoding and TS over IP transport in the same unit increases flexibility in deployment of new services and gives a very tight and compact offering for outside broadcast production applications (sports, news and other live events) and managed media services.

The Media Gateway includes Nevision's trademark advanced protection mechanisms that enable real-time transport of professional media over IP networks with extremely high availability. The NX4600 offers built-in aggregation of TS over IP streams on one or multiple GbE ports.

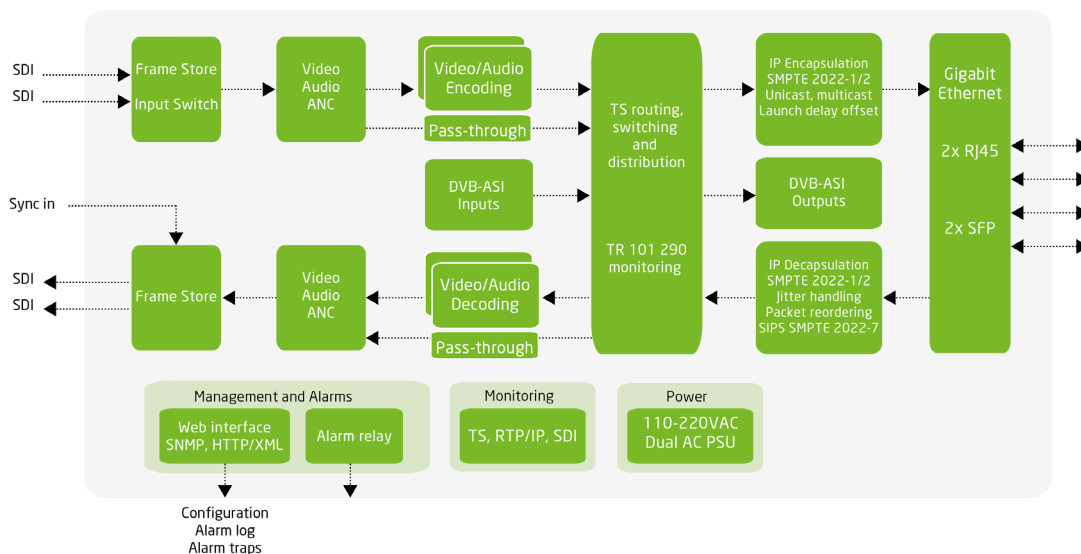
It's our goal to offer products that are reliable and easy to use. Therefore, the NX4600 offers an intuitive and dynamic web interface that offers built-in monitoring which helps anticipate and correct any issues with input signals or networks should they arise.

Applications

- Professional broadcast contribution
- Outside broadcast live sports & event contribution
- Studio-to-studio media exchange
- Managed media services over ASI or IP

Key features

- Multi-channel H.264/AVC encoder and/or decoder
- Support for SD, HD and 3G-SDI with multi-link synchronization (for slow motion applications)
- Best in class video quality with 4:2:2 10-bit H.264/AVC compression up to 80 Mbit/s per channel
- 16-channel audio compression or pass-through with full audio routing matrix built-in
- Integrated frame synchronizer on decoder
- Supports FEC, SIPS / SMPTE 2022-7 and Launch Delay Offset (LDO) IP protection mechanism
- BISS-1 de/scrambling
- Built-in TS monitoring (ETSI TR 101 290 Priority 1) of encoder output and decoder input, with option for Pri 2 and Pri 3 monitoring including PCR validation
- Thumbnails for input/output confidence monitoring
- Software license approach ensures easy and future-proof upgrade path
- User-friendly web GUI for monitoring & control



Flexible compression & transport

The NX4600 Media Gateway provides advanced processing, compression and networking capabilities. There are four (4) expansion slots for ASI or H.264/AVC codec modules, which gives a high level of flexibility in terms of deploying encoding and decoding capabilities in a small form factor.

The NX4600 is capable of doing TSolP adaptation, alarm-based TS redundancy switching and IP aggregation adding another layer of functionality.

Software licensed codec

The NX4600 can be deployed with up to 4 codec modules per unit, each of which can be software licensed for encoding or decoding. In fact, a codec module can be licensed for both feature sets, so that it can adapt to changing requirements in different broadcast productions.

H.264/AVC encoding & decoding

Video is encoded using H.264/AVC with native 10-bit resolution and 4:2:2 chroma sampling, up to Hi422P profile and 80 Mbit/s video elementary stream bitrate. Typical bandwidth usage for HD range from 10 Mbit/s to 50 Mbit/s depending on content and quality requirements and expectations. The encoder has built-in SDI input switching. The decoder has a built-in frame synchronizer with analog/digital sync inputs.

Transparent audio/data handling

The NX4600 supports transmission of 8 stereo pairs of embedded audio with a full audio routing matrix built-in. Handling of audio, whether it's linear PCM or pre-compressed audio, is fully transparent when using SMPTE 302 audio pass-through.

For applications where bandwidth is limited, options for audio compression are available, either using MPEG-1 Layer 2 (MPEG audio) or MPEG-4 AAC-LC. Line-by-line transparent ancillary data transport is supported using SMPTE 2038.

Protection and reliability

H.264/AVC encoding and decoding can be combined with Forward Error Correction (FEC), Seamless IP Protection Switching (SIPS) compliant to SMPTE 2022-7, as well as Launch Delay Offset (LDO).

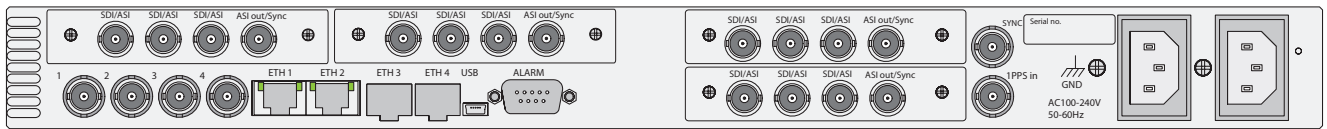
Content protection with BISS-1 scrambling and descrambling.

Seamless IP protection switching

Transmitting the same RTP/IP stream across dual, fully diverse network links enables receivers/decoders to utilize SMPTE 2022-7 Seamless IP Protection Switching (SIPS), which gives error-free transport even in case of severe packet loss or link outages as long as a packet arrives on either of the two network links.

Launch Delay Offset (LDO)

Encoders can send multiple IP output streams (unicast and/or multicast). With the LDO license option, an RTP stream copy can be transmitted after a configurable delay on the sender, thereby enabling SIPS-based seamless switching and error free transport on single-ended network links that may suffer from short outages (e.g. 50 ms outages).



NX4600 Media Server

Expansion slots	Up to 4 codec modules
Ethernet ports	2 x 100/1000Base-T, RJ-45 2 x 1000Base-X / 10GBase-R SFP+
Interface type	Gigabit Ethernet, 802.3ab (electrical), 802.3z (optical), Fast Ethernet (FE) 802.3u
Protocols	IPv4, DSCP/TOS, ICMP, ARP, IGMPv2/3, Pv6, ICMPv6 ND, MLDv1/v2, 802.1Q (VLAN tag), 802.1P (VLAN priority), HTTP/HTTPS, FTP/FTPS, Telnet/SSH, SNMP v2c, TCP, UDP, RTP, SNTp
Control features	Configuration and monitoring via dynamic rich web user interface. HTTP/XML, HTTP RESTful API or SNMP. Secure communication protocols Out-of-band or in-band access. Local user authentication. Extensive alarm management. Searchable log with 100,000 entries. Integrated in Nevision VideoPath.
TS input/output	MPEG TS in RTP/UDP/IP (ST2022-1/2) Four (4) integrated ASI ports configurable as input or output. DVB-ASI ETSI EN 50083-9 (Annex B), 188/204 B/pkt Female BNC connectors (75 Ohm)
Sync input	1 x Analog bi-level (black burst) or tri-level Female BNC connector (75 Ohm) 1 x 1PPS (1 pulse per second) Female BNC connector (50 Ohm) Timing & sync distribution in chassis
Alarm relay	9-pin D-SUB
Maintenance port	USB (Mini B)
Front panel display	Basic setup, device status & information
Front panel LEDs	Power on (Green), Alarm status (Clear on OK, Red on critical alarm)
Physical dimensions	1RU 19" rack-mount chassis WxDxH = 448 x 424 x 43 mm
Weight	7.5 kg (max. including accelerators)
Rack installation	Install in clean and dust free environment. Optional external fan filters available on request. Rack rails are required for mounting in mobile production trucks and flight cases.
Power configuration	Dual load-sharing AC power supplies
Input Voltage	100-240V AC +/- 10%, 50/60 Hz
Power consumption	Up to 300W (max. including codec modules)
Cooling	Temperature-controlled fans
Airflow	Front to rear side
Operating temp.	0°C to 50°C
Storage temp.	-20°C to 70°C
Relative humidity	5% to 95% (non-condensing)
Compliance Safety	Europe: IEC 60950-1:2005 / EN 60950-1:2006 (2nd Edition) incl. Amd 1:2009 and Amd 2:2013 USA: UL Std. No. 60950-1 (2nd edition) incl. AM 1:2011 and AM 2:2014 Canada: CAN/CSA.C22.2 No. 60950-1-07 incl. Amd 1 (2011) and Amd 2 (2014)
Compliance EMC	Europe: EN 55032:2012, EN 61000-3-2:2014, EN 61000-3-3:2013, EN 55103-2:2009 USA: FCC CFR 47 Part 15B Canada: ICES-003, Issue 6:2016

Video input/output interfaces

SD-SDI	SMPT E ST 259-C 625i/25, 525i/29.97
HD-SDI	SMPT E ST 292/ST 296/ST 274 1280 x 720p: 50/59.94 1920 x 1080i: 25/29.97
3G-SDI	SMPT E 424 (Level A/B)/ST 274 1920 x 1080p: 50/59.94
DVB-ASI	ETSI EN 50083-9, Annex B, 188 bytes/pkt

Video compression

Video codec	MPEG-4 AVC (ISO/IEC 14496-10), ITU H.264
Profile@Level	SD: MP@L3.2, HP@L3.2, Hi10P@L3.2, Hi422P@L3.2, HD: MP@L4.1, HP@L4.1, Hi10P@L4.1, Hi422P@L4.1
Chroma sampling	4:2:0, 4:2:2
Bit depth	8-bit, 10-bit
Bitrates supported	256 Kbps to 80 Mbps
Video codec	MPEG-2 (ISO/IEC 13818-2), ITU H.262
Profile@Level	SD: MP@ML, MP@HL, HP@ML, HP@HL HD: MP@HL, HP@HL H422P@HL
Chroma sampling	4:2:0, 4:2:2
Bit depth	8-bit
Bitrates supported	512 Kbps to 80 Mbps
Latency modes	Encoding: 150 ms or 650 ms Decoding: 100 ms or 300 ms

Audio and ancillary data formats

Audio formats	SD - SMPTE 272 and HD - SMPTE 299M 8 x AES3 stereo channel pairs
Audio pass-through	AES3 pass-through (SMPTE 302) 16/20/24-bit
Audio compression	MPEG-1 Layer II: 64 Kbps - 384 Kbps (2.0) AAC-LC: 32 Kbps - 384 Kbps (2.0) AAC-LC: 96 Kbps - 640 Kbps (5.1)
Sampling supported	48 KHz at 20 or 24 bit per sample
Channels	Stereo 2.0, dual mono, 5.1
Audio/video sync	±2 ms
Ancillary data	Generic ANC data transport (SMPTE 2038) Closed captioning, AFD, WSS, Time Code, Teletext (OP-47)

MPEG-2 Transport Stream

TDVB-ASI	ETSI EN 50083-9, Annex B, 188 bytes/pkt
TS over IP	SMPT E 2022-2 RTP/UDP/IP (CBR)
Input TS bitrate	Decoder: 2.5 Mbps to 213 Mbps (SPTS/MPTS)
Output TS bitrate	Encoder: 2.5 Mbps to 128 Mbps (SPTS)
Program information	Encoder output: PAT, PMT, SDT, NIT

Media Gateways

IP transport and protection

Protocols	RTP, UDP, IP, ICMP, ARP, IGMPv2/v3, Diffserv/TOS, 802.1Q (VLAN tag), 802.1P (VLAN priority), RIP-2
FEC	Compliant to SMPTE 2022-1/2
Extended FEC	Support for extended matrix size (L*D < 960, max sum 244, e.g. 240 x 4)
SMPTE ST 2022-7	Seamless IP protection Switching (SIPS) SMPTE ST 2022-7:2013
LDO	Launch delay offset for network redundancy using single path and SMPTE 2022-7 (SIPS)
Integrated frame store and reasync for robust operation	
IP jitter compensation for robust operation in the presence of IP transport impairments	
Test image transmission on sync loss for link preservation	

Content protection

BISS-1	Scrambling up to 80 Mbps per encoder. Descrambling up to 100Mbps aggregated TS bandwidth per NX4600 appliance
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Monitoring

ETSI TR 101 290 Priority 1 alarms (option for Pri 2 and 3)	
Thumbnails for confidence monitoring	
Detailed alarm log with 100,000 entries	

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