



NX4600

## H.264/AVC Media Gateway

**The NX4600 Media Gateway is NeviON's latest generation H.264/AVC compression platform, offering simultaneous encoding and decoding in a compact 1RU form factor.**

The NX4600 Media Gateway is an encoder, decoder and media edge adapter that takes up to four baseband SDI video signals, compresses them using H.264/AVC or MPEG-2, and aggregates and transmits the streams over IP/Ethernet. It is also possible to combine encoding and decoding in the same 1RU unit, which increases flexibility and gives a very tight and compact offering for outside broadcast production applications (sports, news and other live events) and managed media services.

NX4600 includes NeviON's trademark advanced protection mechanisms that enable real-time transport of professional media over IP networks, as well as built-in monitoring that helps anticipate and correct any issues with the network or transport should they arise.

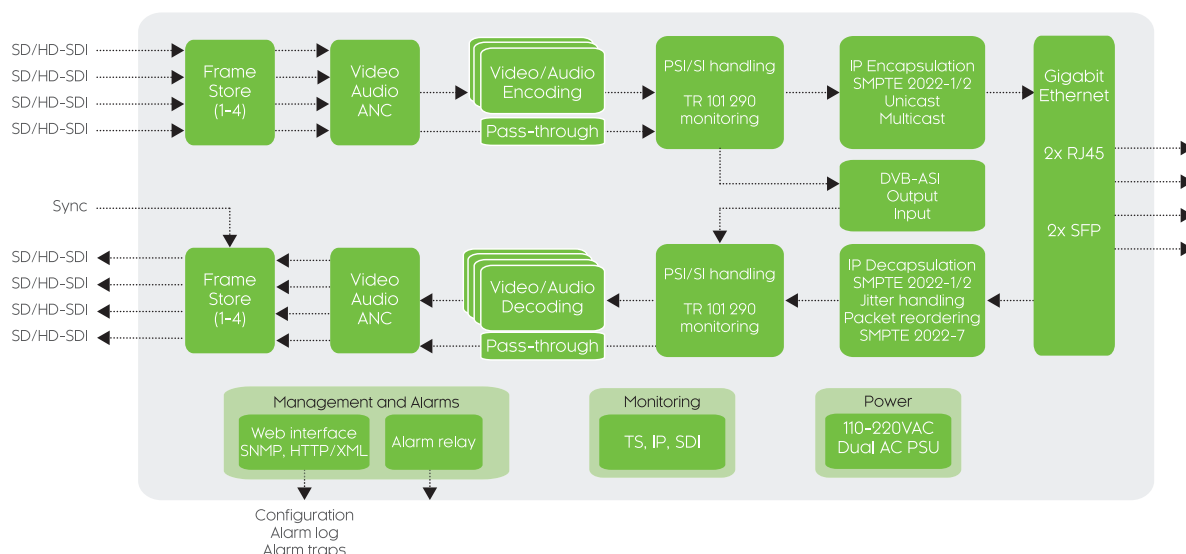
NeviON Gateways can be configured via an easy-to-use web interface, which also offers extensive built-in monitoring. Supervision and connection management can be performed via NeviON's VideoPath or any 3rd party Network Management System.

### Applications

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

### Key features

- Multi-channel H.264/AVC codec with IP & ASI interfaces
- Combine up to 4 channels of encoding and/or decoding in the same 1RU unit
- Software license approach ensures easy upgrade path
- Best in class video quality with 4:2:2 10-bit processing
- H.264/AVC compression up to 80 Mbit/s (Hi422P L.4.1)
- 16-channel audio compression or pass-through
- Built-in TS monitoring (ETSI TR 101 290 Priority 1)
- Standards-compliant IP transport - SMPTE 2022-1/2
- Seamless IP protection switching (SMPTE 2022-7)
- Integrated frame store and reference sync on decoder
- Highly efficient error correction and concealment
- User-friendly web GUI for monitoring and control



## Flexible compression and transport

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

## 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 compression technology

Video is encoded using H.264/AVC compression with native 10-bit resolution and 4:2:2 YCbCr sampling. Bandwidth usage can range from <10 Mbit/s up to 80 Mbit/s, depending on quality and latency requirements.

## Transparent audio handling

The NX4600 supports transmission of up to 16 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 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.

## Built-in aggregation for IP transport

The NX4600 is equipped with dual GigE electrical and optical interfaces for IP connectivity. All codec modules can use the same GigE ports for TS over IP input and output, thereby reducing the number of ports needed on the network access (top-of-rack) switches.

## Robust transmission over IP

The NX4600 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.

## Integrated frame store and reframe

The H.264/AVC decoder has a built-in frame store for locking the output SDI signal(s) to an external reference sync signal (black burst sync).

## Seamless IP protection switching

The NX4600 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, Seamless IP Protection Switching (SIPS) enables error-free transport even in the case of severe packet loss or link failures on any of the two network links.



## Codec modules (1-4 per chassis)

Number of channels	1 Encoder or 1 Decoder (software licenses required)
Number of ports	3 x HD-SDI/SD-SDI/ 1x DVB-ASI or SYNC input
Connector	Female BNC (75 Ohm)
Sync input format	Analog bi-level (black burst)

## Video formats

SD-SDI	SMPTE-259-C 625i25, 525i29.97
HD-SDI	SMPTE-292 720p50, 720p59.94, 1080i25, 1080i29.97
DVB-ASI	EN50083-9, up to 128 Mbps, 188 byte TS packets

## Video compression

Video codec Profile@Level	MPEG-4 AVC (ISO/IEC 14496-10), ITU H.264 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 subsampling	4:2:0, 4:2:2
Bit depth	8-bit, 10-bit
Video bitrate range	256 Kbps to 80 Mbps
Video codec Profile@Level	MPEG-2 (ISO/IEC 13818-2), ITU H.262 SD: MP@ML, MP@HL, HP@ML, HP@HL HD: MP@HL, HP@HL H422P@HL
Chroma subsampling	4:2:0, 4:2:2
Bit depth	8-bit
Video encoding bitrates	512 Kbps to 80 Mbps

## Audio and ancillary data formats

Audio formats	SD - SMPTE 272 and HD - SMPTE 299M 8 x AES3 stereo channel pairs
Ancillary data	Closed captioning, VITC, AFD

## Audio compression

Audio passthrough	AES3 passthrough (SMPTE 302) -16/20/24 bits
Audio codec support	MPEG-1 Layer II (ISO/IEC 11172-3) AAC-LC (ISO/IEC 13818-7/14496-3)
Sampling rate	48 KHz
Bit resolution	20, 24 bit
Channels	Stereo 2.0, dual mono, 5.1
Audio encoding bitrates	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)
Lip-sync (audio/video)	±2 ms

## MPEG-2 Transport Stream

TS monitoring	ETSI TR 101 290 Priority 1 alarms
ASI interface	DVB-ASI, ETSI EN 50083-9, Annex B
TS bitrate generated	2.5 Mbps to 128 Mbps
TS over IP encapsulation	SMPTE ST 2022-2:2007
Forward Error Correction	SMPTE ST 2022-1:2007
IP protection switching	SMPTE ST 2022-7:2013

## Ethernet network interfaces

Number of ports	4 x Gigabit Ethernet ports
Connector type	2 x 100/1000Base-T, RJ45, 2 x 1000Base-X SFP
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

## Control and management

Interface type	Single or dual Ethernet ports (RJ45 or SFP). For specifications refer to "Ethernet network interfaces".
Features	Device configuration through HTTP/WEB interface, control and monitoring through SNMP, HTTP/XML
In-band management	Supported (configurable via web interface)
Protocols	HTTP, XML, SNMP v2c
Alarm relay	9-pin D-SUB
Maintenance port	USB (Mini B)

## Front panel LED indicators

Power	Power on (Green)
Alarm	Alarm status (Clear on OK, Red on critical alarm)

## Physical and environmental characteristics

Physical dimensions	1RU 19" rack-mount chassis WxDxH = 420 x 400 x 44.5mm
Power configuration	Single or dual load-sharing power supplies
Input voltage	100-240V AC +/- 10%, 50/60 Hz,
Power consumption	225W max
Cooling	Temperature-controlled fans
Airflow	Front to back/side
Operating temperature	0°C to 50°C
Storage temperature	-20°C to 70°C
Relative humidity	5% to 95% (non condensing)
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

# NX4600 H.264/AVC Media Gateway

## NX4600 Media Gateway - hardware

NX4600-HW-M4-AC NX4600 Media Gateway base unit (1RU) that can hold up to four (4) field-installable modules. 4x GigE ports (2x 100/1000 Base-T, 2x 1000-BaseX SFP), 4 ASI I/O ports. Built-in ETSI TR 101 290 Priority 1 monitoring. Single 110V/220V AC PSU.

NX4600-HW-M4-AC2 NX4600 Media Gateway base unit (1RU) that can hold up to four (4) field-installable modules. 4x GigE ports (2x 100/1000 Base-T, 2x 1000-BaseX SFP), 4 ASI I/O ports. Built-in ETSI TR 101 290 Priority 1 monitoring. Dual load-sharing 110V/220V AC PSUs.

## NX4600 Media Gateway - software licenses

NX4600-SW-FEC License option enabling Forward Error Correction on IP input/output according to SMPTE 2022-1/2. Licensed per unit.

NX4600-SW-SIPS License option enabling Seamless IP Protection Switching (SIPS) for RTP/IP transport over dual diverse network links according to SMPTE 2022-7. Licensed per unit.

NX4600-SW-AMMX1 License option enabling advanced TS monitoring according to ETSI TR 101 290 Priority 2 alarms (e.g. PCR accuracy/overall jitter) and Pri 3 DVB-SI and ATSC A/78. Note that Priority 1 alarms is always included in base unit. Licensed per transport stream.

## H.264/AVC and MPEG-2 encoder/decoder - hardware

NX-HW-CODEC-M+ Single channel H.264/AVC, MPEG-2 encoder/decoder module for NX4600-HW-M4. Additional licenses required for encoding/decoding. 3 SDI/ASI interfaces (75 Ohm BNC), 1 sync input (BB).

## H.264/AVC and MPEG-2 encoder/decoder - software licenses

NX-SW-ENC-AVC-BASE License option for NX-HW-CODEC enabling H.264/AVC SD 4:2:0 8-bit encoding, MIL2/AAC-LC/SMPTE 302 audio transport (8 pairs)

NX-SW-ENC-AVC-HD License option for NX-HW-CODEC enabling HD encoding for H.264/AVC (requires NX-SW-ENC-AVC-BASE)

NX-SW-ENC-AVC-422 License option for NX-HW-CODEC enabling 4:2:2 encoding for H.264/AVC (requires NX-SW-ENC-AVC-BASE)

NX-SW-ENC-AVC-10B License option for NX-HW-CODEC enabling 10-bit encoding for H.264/AVC (requires NX-SW-ENC-AVC-422)

NX-SW-ENC-MPEG2-BASE License option for NX-HW-CODEC enabling MPEG-2 SD 4:2:0/4:2:2 8-bit encoding, MIL2/AAC-LC/SMPTE 302 audio transport (8 pairs)

NX-SW-ENC-MPEG2-HD License option for NX-HW-CODEC enabling HD encoding for MPEG-2 (requires NX-SW-ENC-MPEG2-BASE)

NX-SW-DEC-AVC-BASE License option for NX-HW-CODEC enabling H.264/AVC SD 4:2:0 8-bit decoding, MIL2/AAC-LC/SMPTE 302 audio transport (8 pairs)

NX-SW-DEC-AVC-HD License option for NX-HW-CODEC enabling HD decoding for H.264/AVC (requires NX-SW-ENC-AVC-BASE)

NX-SW-DEC-AVC-422 License option for NX-HW-CODEC enabling 4:2:2 decoding for H.264/AVC (requires NX-SW-ENC-AVC-BASE)

NX-SW-DEC-AVC-10B License option for NX-HW-CODEC enabling 10-bit decoding for H.264/AVC (requires NX-SW-ENC-AVC-422)

NX-SW-DEC-MPEG2-BASE License option for NX-HW-CODEC enabling MPEG-2 SD 4:2:0/4:2:2 8-bit decoding, MIL2/AAC-LC/SMPTE 302 audio transport (8 pairs)

NX-SW-DEC-MPEG2-HD License option for NX-HW-CODEC enabling HD decoding for MPEG-2 (requires NX-SW-ENC-MPEG2-BASE)

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