

nexus

DIGITAL AUDIO ROUTING AND INTERCONNECT SYSTEM



NEXUS? An audio network? A router? An I/O matrix? None of these terms adequately describe what this system really is. So we need a new name: **NEXUS!**

NEXUS is not only simultaneously an audio network, router, and I/O matrix; it also offers audio format conversion, A/D and D/A converter systems, audio processing, data transmission, routing interfaces, multi-channel metering, power-amplifier control, communication options, logical functions, and much more ...

The fundamental principle is convincing: fibre-optical lines covering the entire studio complex transfer all audio and control data in the digital domain. So-called Base Devices are installed in studios, control rooms, machine rooms, and on stages. They provide all the required I/O resources in the appropriate formats via industry standard ports. A intuitive graphical control software application allows any inputs to be routed to the desired outputs - no matter where the I/O resources are physically located.

The NEXUS is **THE** versatile audio network and routing system. Use it as an I/O matrix for mixing consoles, studios and OB trucks. Use it in switching centres and for networking entire broadcasting complexes, also in sound reinforcement and other professional audio applications.

ANALOGUE AUDIO

The XAD+, and XDA+ 8-channel analogue line input and output boards use a special A/D and D/A converter technology designed and developed by Stage Tec. Thanks to this, the XAD+ and XDA+ offer exceptional dynamic ranges of 133 dB(A) and 131 dB(A), respectively.

The XMAD 4-channel 28-bit microphone-input converter board actually achieves a dynamic range of 150 dB. The microphone inputs can be used as line inputs without switching. Overloading the microphone inputs, analogue level adjustments and the need to preamp microphone levels are at last consigned to history.

DIGITAL AUDIO

Interface modules are available for converting audio and ancillary data to the internal NEXUS 24-bit TDM data format from a variety of digital formats. The modules can be equipped with sample-rate converters for interfacing with asynchronous devices.

NON-AUDIO

NEXUS routing and forwarding capabilities are equally applicable to many other types of signal. The system can generate and distribute various serial formats (RS 232, RS 422, RS 485, MIDI, DMX, LTC ...) and control signals for downstream devices (e.g. power-amplifiers, lighting and machine control).

SIGNAL CONVERSION

All audio modules read and write the internal 24-bit audio format of the time-division-multiplex bus system. Thus, audio inputs of any type can be routed to any appropriate NEXUS output (e.g. analogue inputs to digital outputs, or Y2 inputs to AES/EBU outputs). With NEXUS, format conversion - usually a complex and expensive business - ceases to be an issue.

SIGNAL PROCESSING

Signal distribution does not require signal processing modules. However, a NEXUS DSP can be routed to wherever signal processing is needed - virtually anywhere in the system, providing all necessary controls for EQ, delay, dynamics, faders, etc.

The processing modules are controlled from the NEXUS user interface.

OPERATION

NEXUS is operated via a graphical user interface (GUI) running on a PC and/or from CANTUS and AURUS consoles. The NEXUS control software provides intuitive access to, and control of, all system components. All settings can be stored, and presets can be easily recalled.

NETWORKING

NEXUS offers almost limitless cost-efficient connectivity via optical fibre cables. Distances of up to 100 kilometres (more than 60 miles) can be spanned without losing audio-quality or system sync.

COMPONENTS

NEXUS Base Devices are 19" mainframes available in a flexible range of heights (3, 6, 9, 12, or 15 units). All inputs and outputs are made available on 3-U plug-in boards.



RELIABILITY

Secure operation is a core NEXUS feature. Systems can be configured with a high level of redundancy and every Base Device includes a dedicated controller module. The concept of "distributed intelligence" prevents total failure in case of malfunctions. Defects are immediately highlighted by the graphical alert system. Single modules can be replaced during operation without clicks or other malfunctions (hot-swap capability). Every board is available to the system within a few seconds after installation.

REFERENCES

Several hundred NEXUS systems of various sizes with more than a thousand Base Devices have already been installed worldwide - for example, in radio broadcast, OB trucks, theatres, exhibition halls, film studios, government buildings, and for live applications. There are also numerous AURUS, CANTUS, and CINETRA installations where NEXUS systems are used as I/O interfaces, audio networks and/or routing systems.

NEXUS users include: 20TH CENTURY FOX, VATIKAN RADIO, VARIOUS GERMAN TV BROADCASTERS (ZDF, RTL, SAT1, N-TV, DEUTSCHE WELLE, MDR, BR, SWR, RBB) RAI, BBC, NBC, CBS, CANAL+, DRESDEN SEMPER OPERA, VIENNA STATE OPERA, GERMAN T-COM AG, ATHENS OLYMPIC STADIUM, SPACE CENTER II (French Guyana), GERMAN REICHSTAG BERLIN, ST. MORITZ SKIING WORLD CUP 2003, and many more.

NEXUS!

NEXUS is the ONE routing and transmission system for digital audio with a distributed modular structure that ensures brilliant sound, comprehensive and easy control, and optimum reliability.

APPLICATIONS

- In radio and TV broadcasting: switching centres, full broadcast-centre networking, studio routing matrices, transmission
- In recording and post-production studios: routing matrix for mixing consoles and studios, complete wiring of studio complexes, A/D, D/A, and format conversion
- In theatres, concert halls, convention centres, exhibition grounds: interconnection of recording studios, stages, sound-reinforcement facilities, and other areas, venue and building networking



GENERAL AUDIO SPECIFICATIONS

- Sample rates: 44.1, 48, 88.2, 96 kHz (software-controlled)
- Analogue full-scale level: 0 dBFS = 0...22/24 dBu analogue (globally selectable)

DIGITAL AUDIO INPUTS AND OUTPUTS

XER MODULE

- Formats: AES/EBU and S/PDIF (XLR, Cinch(phono), TOSLINK, BNC, RJ45)
- Sample-rate converters (standard)
- Officially certified by Dolby® for Dolby E signal transmission*
- Supports legacy mode

XET MODULE

- Formats: AES/EBU and S/PDIF (XLR, Cinch(phono), TOSLINK, BNC, RJ45)
- Sample-rate converters (option)
- Officially certified by Dolby® for Dolby E signal transmission*
- Supports legacy mode

XAF MODULE

- Formats: Alesis ADAT via TOSLINK
- Output-signal re-quantizing to 16 or 20 bits with dithering and noise shaping

XSF MODULE

- Formats: Sony SDIF-2

XMF MODULE

- Formats: MADI with BNC and optical ports
- Officially certified by Dolby® for Dolby E signal transmission*
- Supports legacy mode

XTF MODULE

- Formats: Tascam TDIF DB-25
- Output-signal re-quantizing to 16 or 20 bits with dithering and noise shaping

XYF MODULE

- Formats: Yamaha Y2 (MEL2)
- Output-signal re-quantizing to 16 or 20 bits with dithering and noise shaping

XSDI MODULE

- Audio embedder/de-embedder for SMPTE-259M video (SDI)
- Officially certified by Dolby® for Dolby E signal transmission*
- Output-signal re-quantizing to 16 or 20 bits with dithering and noise shaping

LINE INPUTS (XAD+ MODULE)

- Port type: transformer-balanced, floating
- A/D converters: 24-bit, TrueMatch
- Dynamic range: 133 dB(A) (typ.) @ 24 dBu
- THD&N: 0.001% @ 24 dBu (typ.)

LINE OUTPUTS (XDA+ MODULE)

- Port type: transformer-balanced, floating
- D/A converters: 24-bit Delta-Sigma
- Dynamic range: 131 dB(A) @ 24 dBu (typ.)

MICROPHONE INPUTS (XMAD MODULE)

- Port type: transformer-balanced, floating
- A/D converters: 28-bit, TrueMatch
- Input level: 22 dBu balanced (max.)
- Input impedance: 10 kilohm
- Makeup Gain: 0...70 dB, click-free adjustment in 1-dB steps
- Dynamic range: > 152.5 dB(A) @ 200 ohm input impedance
- THD&N: < 0.003% @ 22 dBu
- Configuration: 48-V phantom power, subsonic filter, amplifier, phase inversion

NON-AUDIO

XCI MODULE

- Operating surface interface for controlling the NEXUS
- Supported protocols: RS 232 DCE, RS 232 DTE, RS 422 AES 15, RS 422 SMPTE/EBU, MIDI, Stage Tec protocol, Ethernet port

XRI MODULE

- Signalling and remote-start distribution

XTI MODULE

- Level conversion between different formats
- Transmits RS 232, RS 422, RS 485, MIDI, DMX, LTC

AUDIO PROCESSING

XDSP MODULE

- Formats: extended 40-bit floating-point format
- Signal processors: parametric EQ, gain control, delay
- Limiter, compressor, summing, and various signal-processor modules available on request

XFAD MODULE

- 8-in-8 summing for autonomous controlled crossfades
- Full NEXUS integration; operation via graphical user interface

* Dolby and the double-D symbol are registered trademarks of Dolby Laboratories.

BASE DEVICE

Base Devices are designed and constructed as 19" mainframes for NEXUS modules featuring as standard the time-division-multiplex bus system (backplane), controller boards, and power-supply units. Optional redundant power-supply units are available on request. Interface boards are supplied to client specification.

CONFIGURATION

- 19" mainframe (flightcase or mounting rack on request)
- 1 to 3 front-panel rows (3 U each)
- Up to 2 extra rows without backplanes
- 1 XCPU controller board
- 1 backplane power-supply unit (min.)
- Redundant power-supply units (optional)
- I/O boards as requested

SLOTS

- 20 free single width (20.32mm) slots per front-panel row
- 60 slots (max.)

BUS SYSTEM

- Time-division-multiplexed audio data bus
- 256 dynamically assigned time-slots per Base Device
- 24-bit audio plus ancillary data according to AES-3
- System size: up to 4095 inputs and 4095 outputs

OPERATING VOLTAGES

- Power supply: 90 to 264 VAC
- Line frequency: 47 to 63 Hz
- Power consumption: 100 W (max.) for each Base Device

DIMENSIONS

- Height: 132.5 to 665.9 mm/5.22 to 26.22" (3/6/9/12/15U)
- Width: approx. 482.6 mm/19"
- Depth: approx. 470 mm/18.50" (without handles, ports), (from 2006: approx. 440mm/17.32")

SYSTEM MODULES

The XCPU central controller module and the power-supply units are mandatory components of NEXUS Base Devices. In addition, XFOC fibre-optic interface boards must be implemented for networking multiple Base Devices.

XCPU CONTROLLER BOARD MODULE

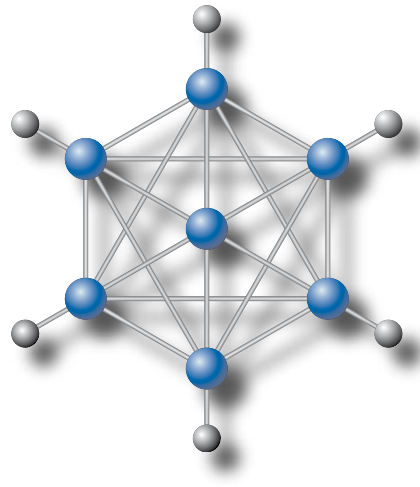
- Central Base Device controller board, controls and monitors Base Device and routing
- Control-computer interface
- Global signal and noise generator
- Wordclock I/O
- Level metering

XFOC FIBRE-OPTIC INTERFACE BOARD MODULE

- Intercommunication between Base Devices
- 2 ports supporting 128 audio channels each
- Spans distances of up to 100 kilometers/> 62 miles
- Transmission of complete control data
- Sync-information transmission
- Redundant operation supported

XPSU POWER-SUPPLY UNIT

- Wide-range units supplying all components; no fans
- Multiple units and/or redundant units per Base Device supported
- Space-saving backplane installation
- Output power: 100 W each



Ne|xus (Latin) n. [,neks's]
- (inter)connection, link,
interweavement

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