

## The Power of Nuendo.

channels – with Dolby Digital® and DTS® encoding options.

### System Scalability

Host-based technology allows Nuendo to make use of whatever resources are available, instead of being tied to a particular hardware configuration. Use a laptop or desktop computer; select Mac or Windows operating systems; choose the platform that will best suit your needs. When it comes to what hardware to use, that's easy too: Nuendo supports the ASIO standard audio driver format, giving you literally hundreds of choices from a multitude of developers. A Device Setup dialog lets you configure video and audio drivers, external control surfaces



(such as the Houston), and many other useful parameters, or simply add new functionality to Nuendo as it becomes available.

### Nuendo Features

- Types of Tracks: Audio Tracks, Group Channels, Video Track, MIDI Tracks, Mix Automation Tracks, Marker Track, Tempo and Time Signature Track
- Up to 200 audio channels of simultaneous playback
- Up to 64 group channels with same access to audio effects and EQ as normal audio tracks
- Recording of multiple channels of audio simultaneously 16, 24, & 32-bit float audio files, up to 384kHz sampling!
- Record AIFF, WAVE and Broadcast WAVE files
- Import AES31, AIFF, AIFC, WAVE, Broadcast WAVE, MPEG, MP2, MP3, REX, SD2 up to 384 kHz sample rate (depending on format)
- Import Open TL and Premiere Generic Edit Decision Lists
- CD audio grabbing
- 8 internal auxiliary effects buses
- 4 inline effects inserts for each audio channel
- Master effects bus allowing for up to eight simultaneous chained multi-channel effects
- Access to internal effect plug-ins or external effects patched via the audio hardware
- Realtime and offline support for VST and DirectX plug-ins
- Reverb, Echo/Delay, Compression/Dynamics, Chorus, Flanging, Modulated Filter Effects, Equalizers and Apogee UV-22 dithering algorithm built in
- Automated mixing of all parameters
- Plug-in-based surround panning
- Surround mixing: Freely configurable speaker arrangement with presets for most common formats; formats can be user-defined up to eight channels
- Optional Dolby Digital and DTS encoding
- Mix automation tracks for each audio track, group channel and for plug-ins
- Viewing of multiple mixing parameters simultaneously
- Offline mixdown to a mono, stereo or multichannel file
- Sample Editor (non-destructive sample mapping)
- Integrated processes: Acoustic Stamp, Crossfades, Envelope, Fade In/Out, Gain Change, Noise Gate, Normalize, Phase Reverse, Time Stretch and Pitch Shift with MPEX algorithm, Remove DC Offset, Reverse, Silence, Stereo Flip
- Non-destructive, editable fades and crossfades
- Global and per track auto-fades and auto-crossfades with user definable fade times for smooth transitions
- Audio Process History with the ability to modify, remove or replace former processes
- Analysis: Statistics, FFT-based spectral analyzer
- Pull-up and Pull-down supported via external hardware
- Fast locate and sync lock up
- Scrubbing of individual tracks forwards and backwards
- Tempo-lock option allows events to maintain their relative bar/measure and beat position across tempo changes
- A/B selection for 4-point cuts
- Timeline Formats: Timecode, Film Formats, Seconds, Samples, Bars/Measures and Beats
- Synchronization: Sample Clock Sync, 9-Pin, MTC, MIDI Clock, Sample-accurate sync with ASIO 2.0
- Real-time waveform drawing with different styles
- Plug-in information windows for listing and managing VST and DirectX plug-ins
- ReWire support for devices like Propellerheads' Reason, Rebirth 338, etc
- Display of multiple time formats
- Loop recording and playback for all tracks
- Networking support via standard networking protocols
- Playback of AVI, QuickTime and MPEG movies, video playback synchronized to audio
- Video Track with thumbnail preview
- Video playback with QuickTime, DirectShow or Video for Windows
- OMF import and export with media file references or media included. Video information can be converted to markers
- Markers can be accessed via the Marker Window, Marker Track, from the numerical keypad, or from a remote control such as Steinberg Houston, JL Cooper MCS-3000 and CS-10, Roland MCR-8, Yamaha 01V, Cm Automation Motormix, Radical SAC-2K
- Multiple remotes of the same kind supported
- MIDI support including "piano roll" editor, Controller Editing and Quantize
- Support for Virtual Studio Instruments
- mLAN (IEEE1394) support for multichannel audio transfer.
- Audio extraction and replacement in video files
- Cubase Song File import, MIDI File import and export
- Mixdown to MP3, RealAudio G2, AIFF, and WAVE (also Windows Media Audio & Real Audio V5 on PC, SD2 on Mac)
- The Audio Pool keeps your media accessible and organized
- The Pool is not attached to a particular project file and can be used for creating sound FX and sample libraries
- Browser view allows all data (events, automation, etc.) to be edited numerically
- Cue sheet printing, track sheet printing
- Enhanced editing operations and tools (range- or object-based selection, Nudging, Scrub Tool, etc)
- Unlimited undo/redo
- Options to lock events in size, fade-length, position, etc
- Two 9-pin connections with track arming, automated machine recognition and autoedit for audio layback
- LTB support for MIDI devices like Steinberg's Midex 8
- Edit Mode functionality for post production: Video picture "sticks" to the moved audio
- VST SystemLink for sample-accurate linking of multiple computers, irrespective of platform

## Specifications

AD-16		DA-16	
Inputs:	16 analog inputs, balanced; Word Clock	Inputs:	16 channels of AES/EBU, TDIF and ADAT (inc S/MUX) Word Clock
Outputs:	Four TosLink interfaces, 2 x 8 ch channels in ADAT mode and 4 x 4 for S/MUX; Optional AES/EBU & TDIF cards; Word Clock	Outputs:	16 analog outputs, balanced, -10 dBV to +28dBu
Resolution:	24-bit	Resolution:	24-bit, Delta-Sigma conversion
Sample Rates:	44.1, 48, 88.2, 96 kHz ±10%	Sample Rates:	32-106 kHz
Relative THD+N (S/(N+D)):	-105 dB @ 1kHz, -0.5 dBFS output	Relative THD+N (S/(N+D)):	-104 dB @ 1kHz, -0.5 dBFS input
Dynamic Range, -60 dB:	-117 dB A-weighted	Dynamic Range, -60 dB:	-116dB A-weighted
Passband Ripple:	0.001 dB	Passband Ripple:	0.0002 dB
Stopband Attenuation:	110 dB	Stopband Attenuation:	115 dB
Interchannel Crosstalk:	≤ -120 dB	Interchannel Crosstalk:	≤ -125 dB
Frequency Response:	10 Hz-20 kHz, ±0.025 dB	Frequency Response:	10 Hz-20 kHz;
Input Levels, maximum:	24 dBu, 18 dBu and 4 dBV	Gain: ±0.15 dB; Phase: << 1.0°	
Clock Jitter:	<22 pSec (ext WC input)	Wide and Narrow Lock indicators, sample rate indicators.	
Functionality:	Lock and sample rate indicators. Signal present and "over" indicators per channel. Internal clock (four sample rates) and External (word clock) input. Soft Limit and UV22HR buttons. Power switch & indicator. Rear panel reference level multi-turn trim pots (one per channel).	Signal present indicator per channel	
Connectors:	1 IEC power connector chassis male 4 Toslink optical transmitters for ADAT-S/MUX output 2 BNC for Word Clock input & output 2 DB25-B for analog input, Tascam standard pinout Option cards: 1 DB25-B for AES/EBU, 2 DB25-B for TDIF digital outputs 1U (1.75 in) high, 19 in rack-mount	Connectors:	1 IEC power connector chassis male 1 DB25-B for AES-EBU input. 2 DB25-B for TDIF input 4 Toslink optical receivers for ADAT-S/MUX input 1 BNC for Wordclock input 2 DB25-B for analog output, Tascam standard pinout 1U (1.75 in) high, 19 in rack-mount
Case:	1U (1.75 in) high, 19 in rack-mount	Case:	1U (1.75 in) high, 19 in rack-mount
Power Supply:	Switch-mode	Power Supply:	Linear power supply, Toroidal transformer
Input Voltage Range:	100-240 Volt AC 50-60 Hz	Input Voltage Range:	100-240 Volt AC (switched) 50-60 Hz
Power consumption:	~25W	Power consumption:	~25W



Rear panels. Above: AD-16; below: DA-16.



### Nuendo

#### Computer Hardware, PC:

Minimum requirement:  
Pentium II 233 MHz, 128 MB RAM  
Parallel port required

Recommended System:  
Dual PIII / Athlon 1 GHz or faster,  
256 MB RAM

Operating System, PC:  
Windows 98 SE, 2000, XP

Audio Hardware, PC:  
Supports ASIO 2 spec for high-end multi-channel audio cards  
Supports Windows MME spec for standard sound cards

#### Computer Hardware, Mac:

Minimum requirement:  
PowerMac G3, 128 MB RAM  
USB port required

Recommended System:  
PowerMac G4, 256 MB RAM  
MacOS 9.1 or higher;  
MacOS X 10.1.4 or higher

Operating System, Mac:  
Supports ASIO 2 spec for high-end multi-channel audio cards  
Supports Sound Manager

#### Audio Hardware, Mac:

At last. The ultimate pro-audio combination.

# NativeTools™ by Apogee

powered by **NUENDO**

For Windows or Macintosh computers



## NativeTools Studio Edition.

The Sound of Apogee.  
The Power of Nuendo.  
Together in one box.



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Created by Richard Elen

## The Sound of Apogee.

### AD16 24/96

Apogee's AD-16 is a 16-channel, 24-bit A/D converter, operating at sample rates up to 96 kHz. Its powerful multi-channel configuration integrates perfectly with the Nuendo DAW, and it is ideal for surround applications. The system offers ADAT optical outputs and optional AES/EBU or TDIF, for compatibility with many digital audio systems. The unit syncs to word clock or its own internal high-stability clock. Word Clock output is also provided.

Optical outputs on the AD-16 support the Sonorus S/MUX specification for sample-splitting of high sample-rate audio data into multiple ADAT-style optical interfaces. Additional light-pipe outputs are provided to deliver up to 96 kHz digital audio from all 16 channels in

this mode: ideal for the 96/52 PCI card supplied with NativeTools.

An expansion port allows the addition of optional TDIF or AES/EBU daughter cards.

LEDs indicate signal status on each channel, with the intensity modulated by the signal level to give an "analog-like" display. A second LED per channel indicates "overs", and may be user-configured. The balanced analog inputs are organized into two groups of eight channels on 25-pin D connectors.

Apogee's industry-standard word-length reduction system, UV22HR, is included for reducing the word length from the converter's native 24 bits to 16-bit for CD mastering, Internet audio, etc, or 20-bit for DVD-Video and other applications. UV22HR retains virtually all the



## AD-16 & DA-16: 16 channels of Apogee at 24/96.



high-resolution detail without creating artifacts.

Apogee's unique SoftLimit system maximizes digital output level without overs. These features are easily activated with a pair of buttons, and may be optionally applied to channels 1-8, 9-16 or all.

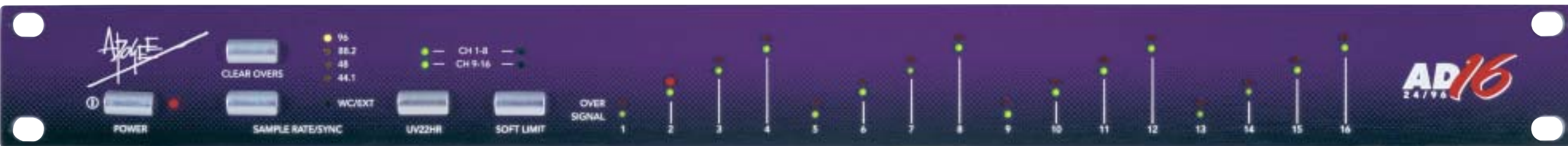
An elegant and effective user interface characterizes the AD-16, including a power switch, sample rate/sync selector, clear "overs" button, and two buttons for Soft Limit and UV22HR respectively. Rear panel DIP switches select regular ADAT versus S/MUX mode, "over" settings, UV22HR output resolution, infinite hold for the over indicators, and set the sample rate to 1x or 2x Word Clock.

The AD-16 closely matches its companion, the DA-16 16-channel D/A, in appearance.

Without compromise, these products make superior conversion more accessible, and more available for a wider range of creative applications. Both are ideal companions for the Nuendo DAW software that forms a vital part of the NativeTools system.

### AD-16 Features

- 16 channels of Apogee A/D in a compact 1U package - perfect for tracking, surround or multitrack transfer
- ADAT+S/MUX and optional TDIF or AES interfaces to connect to Nuendo and other DAWs and MDMs
- Full 24-bit A/D conversion for maximum quality
- UV22HR retains detail at 16- & 20-bit resolutions
- Sample rates up to 96 kHz - ideal for DVD-Audio and other high-density formats
- Soft Limit minimizes the chance of overs and maximizes digital output for the hottest recordings
- Adjustable "over" definition: 1-4 successive FS samples
- Locks to 1x or 2x the external Word Clock sample rate
- Multi-turn pots for level calibration



### DA16 24/96 INTELLIDAC

Designed to interface seamlessly with the Nuendo DAW part of the NativeTools package, Apogee's DA-16 "IntelliDAC" offers 16 channels of Apogee quality in a compact, convenient 1U package, handling 24-bit D/A conversion at sample rates up to 96 kHz.

Digital inputs to the DA-16 may be derived from AES/EBU, ADAT optical or TDIF sources, and the unit can sync to word clock or a specified input. ADAT and TDIF inputs are organized into two groups of eight, and channels 1-8 and 9-16 can have different sources. In addition, the light-pipe inputs accept the Sonorus S/MUX protocol for sample-splitting high-resolution signals into optical interfaces -

the protocol used by the 96/52 PCI card supplied with NativeTools - allowing access to all 16 channels. Input sample rates are detected automatically, and a two-level "Lock" indicator shows "wide" (up to ±150 degrees) and "narrow" (±5 degrees) lock. LEDs indicate signal status on each channel, whose intensity is modulated by the signal level to give an "analog-like" display. The balanced analog outputs are supplied in groups of eight channels on 25-pin D connectors.

"IntelliDAC", the DA-16's subtitle, relates to the converter's unique "intelligent" two-stage re-clocking system. A fast-responding "read" clock, with a wide locking range, fills a dedicated FIFO buffer, while an ultra-low-jitter "write" clock writes the data out of the buffer, and clocks the converters.



A significant advantage of this configuration is that both incoming clock and data are de-jittered.

As a result, the system is more insensitive to phase errors between synchronous digital sources. Errors up to ±150 degrees can be corrected, substantially reducing the chances of glitching, and enabling the D/A converter to offer superior performance even with extremely unstable input signals.

A calibration mode is also included, allowing quick and easy adjustment of the reference level for each channel.

The DA-16 is a powerful and audibly

superior solution for both multichannel/surround monitoring and analog mixing in the NativeTools environment, completing the record/replay chain with the ultimate in conversion quality.

### DA-16 Features

- Unique dual-clocking system locks to almost anything, removing jitter from both clock and data
- Two-level panel indicator gives instant lock status
- ADAT with S/MUX, plus TDIF & AES/EBU interfaces for interconnection with the NativeTools Nuendo 96/52 card and the vast majority of other systems
- 16 channels in a 1U form-factor - ideal for accurate surround monitoring or analog mixing
- Sample rates up to 96 kHz meet the high-resolution needs of the modern studio
- Simple level calibration for perfect interfacing with other studio equipment
- Superior Apogee audio performance where it counts



## Nuendo: The Premier Audio Production System.

Before the advent of today's super-computer-power PCs, early digital audio workstations (DAWs) relied on expensive, proprietary hardware with dedicated DSP chips. But today, computers are much more powerful - and much more affordable, making them ideal platforms for a high-power DAW solution.

For more than a decade, Steinberg Media Technologies has been the leader in native, host-based DAW systems. Building on that experience, Steinberg has created Nuendo: the ultimate audio production tool.

Instead of requiring dedicated DSP hardware and locking you into an expensive proprietary environment, Nuendo uses the power of your computer's CPU to deliver awesome performance, scalability, and above all, flexibility. With simple, expandable hardware interfacing that uses industry standard interfaces, not expensive proprietary ones.



### Flexible by Design

Flexibility is the key to Nuendo's superiority for digital audio recording, editing and mixing. Configure Nuendo to work the way you want with user-definable Key Commands and Views. Import almost any audio file. Choose the operating system that best suits your needs: Macintosh® OS 9 or X, Windows® 98, 2000 or XP. And Nuendo benefits from the added power and flexibility of multiple processors - allowing configurations far in advance of current hardware-based DAWs. Enhance Nuendo almost indefinitely with an enormous range of VST plug-ins: even connect multiple machines and platforms together with sample-accurate VST SystemLink.

### What Is Nuendo?

Nuendo offers a 200+ track recording facility, complete with a 200+ channel audio mixer including everything you need for fully professional recording, editing and automated mixing - and that's just the beginning. In film scoring, post-production, music recording, TV and radio, or video games, Nuendo has the tools to get the job done easier, faster, and for a fraction of the cost you'd expect. Nuendo won't limit your creative output, delivering support for mono, stereo, or any surround format up to eight discrete

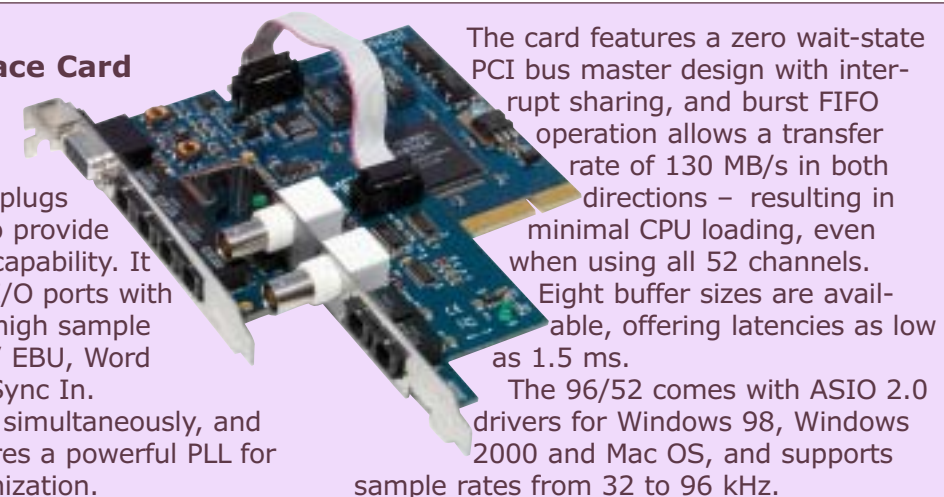


Because Nuendo is a host-based, native system, it is able to grow with your needs, adapting itself to the latest computer technology. Unlike proprietary hardware solutions, that limit future possibilities, Nuendo delivers the tools you need to keep pace with innovation and with your own requirements.

### Nuendo 96/52 PCI Audio Interface Card

The Nuendo 96/52 card, included in the NativeTools package, plugs into your computer to provide extensive digital I/O capability. It features three ADAT I/O ports with S/MUX capability for high sample rates, S/PDIF or AES/EBU, Word Clock I/O and ADAT Sync In.

All I/O is available simultaneously, and the ADAT input features a powerful PLL for perfect audio synchronization.



The card features a zero wait-state PCI bus master design with interrupt sharing, and burst FIFO operation allows a transfer rate of 130 MB/s in both directions - resulting in minimal CPU loading, even when using all 52 channels. Eight buffer sizes are available, offering latencies as low as 1.5 ms. The 96/52 comes with ASIO 2.0 drivers for Windows 98, Windows 2000 and Mac OS, and supports sample rates from 32 to 96 kHz.