

# AX32 | DX32

## Audio Interface



Pristine Audio Converters  
with versatile I/O structure  
and Monitor Control

# DAD – Digital Audio Denmark

by NTP Technology

## Digital Audio Denmark

DAD – Digital Audio Denmark was founded in 1999 and has since 2008 been a brand owned by NTP Technology. The vision of DAD has always been to develop analogue-to-digital and digital-to-analogue conversion interfaces with the best possible sound quality. With the continuing development and improvement of digital pro audio applications in general, the developments by DAD have an increased focus on signal processing and digital integration to many platforms.

## Pristine A/D and D/A converter with superb sonic quality and versatile audio I/O structure

The DAD development team recognises that transparent A/D and D/A conversion is of the utmost importance to the sonic and artistic success of a sound production. It is essential in preserving the musical details of acoustic and electronic instruments so that the actual conversion process is inaudible.

The AX32 by DAD provides the highest possible audio quality. Its outstanding audio specification includes up to 128 dB dynamic range, a harmonic distortion below -120 dB, low jitter, high-precision clock circuitry, and a sonic quality which is true to the analogue sound.

One of the benefits of DAD being a part of NTP Technology is the access to the legacy of advanced audio routing, signal processing and digital I/O technology that have been a part of the NTP routing products for decades. By adding this technology to the DAD converter designs the most powerful combination of sophisticated conversion and router technology is possible. Once you have tried the AX32 by DAD, you will never settle for less.

## What are the units?

The DAD AX32 and DX32 products are based on the same implementation of conversion, routing, signal processing, I/O and control. The AX32 is a 2RU 19" rackmount unit with a modular section for installation of different I/O cards, and a general digital I/O and control section. The DX32 is a 1RU 19" rack mount unit, which is functionally identical to the AX32, but without the card slot option for insertion of the I/O cards.

## AX32 Analogue Mic/Line AD/DA/DD interface and router

AX32 is a light-weight and compact unit which can be configured with up to six 8-channel A/D or D/A cards providing for a total of up to 48 analogue input and output channels. The A/D card features an optional mic pre with astounding sound quality.

The AX32 base unit includes as standard a coax MADI interface and eight AES3 stereo I/O. The base unit can be upgraded with a further two MADI I/O and a Dante AoIP option.

Further option cards include a dual MADI I/O card and an AES3 card with 8 stereo pairs. The AX32 can be configured with up to 8 of these cards as alternatives to, or in combination with, the analogue cards.

Any input channel can be routed to any output channel and even to multiple outputs simultaneously thereby providing a flexible interface to any DAW and even to multiple DAWs simultaneously.

## DX32 Digital interface and router

The DX32 is a high capacity and compact digital audio bridge which provides fast and flexible connections between MADI, AES and Dante. Any input channel can be routed to any output channel and even to multiple outputs simultaneously making the DX32 the ideal choice for audio routing, digital format conversion and distribution.

In addition the DX32 includes PPM measurements on all input and output channels and can also be configured with the optional Pro | Mon monitor control.

## Major users of DAD audio converters include:

Abbey Road Studios | Acoustic Recordings |  
Alchemy Mastering | Bauer Studios | Benny  
Andersson's RMV Studio | Classic Sound |  
CMC Studios | Collegium Records | Danish  
Radio | Deutsches Filmorchester Babelsberg |  
DEX Mastering | DPA Microphones | Echopark  
Studios | Hana Music Montreux | Helsinki  
Music Centre | Lindberg lyd | McGill University |  
Moscow Music Conservatory | NDR Hamburg |  
NHK | Opéra de Dijon | Radio France  
Internationale | Royal Danish Opera House |  
Royal Opera House London | Sidney Opera  
House | SK Works | Slovak Philharmonic  
Orchestra | St Petersburg Philharmonic  
Orchestra | Stock Fish Records | Swedish  
Radio | Swineshead Productions | Telarc  
International | Ultimo Productions and the  
Warsaw National Philharmonic Orchestra



## Advanced signal routing and Dante / AES67 AoIP via IP Ethernet

The standard I/O configuration enables any analogue and digital interface input to be routed to one or more of the available analogue and digital output interfaces. The AX32 and DX32 are thus a combined analogue and digital I/O interface in combination with a powerful internal router which can manage 1,500 inputs and 1,500 outputs simultaneously. Furthermore, the optional Dante AoIP interface allows the AX32 and DX32 to interface with other Dante-enabled devices from more than 200 manufacturers.

## Monitor control and signal processing

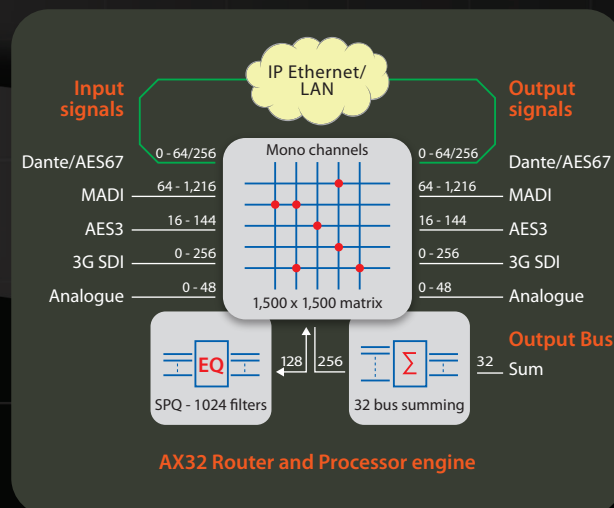
In addition to the signal routing functionality an optional 32 bit floating point processor engine is available providing a 32 bus summing system with 256 possible inputs and gain adjustment on all input and output channels. In addition, the SPQ speaker processor card is available as an option providing 1,024 filters and 128 channels of equalization and delay for speaker correction and bass management. With the supportive control functionality provided by the Pro | Mon software license for AX32 and DX32, the units can be turned into a power full Monitor Control system.

## Interfaces

The AX32 and DX32 provide a large number of I/O channels, where some are included as standard and others are options.

The following interfaces are always available on the unit:

- 1 MADI interfaces with 64 I/O channels
- 8 line AES3 interface with 16 I/O channels



As internal options for the units a 64 or 256 channel Dante AoIP interface as well as a dual MADI interface with 128 channels is available. Sync interfaces via word clock, AES11, Video, and all digital signal inputs. Sample rate can be set to internal or external. The sample rate can be set via all external devices.

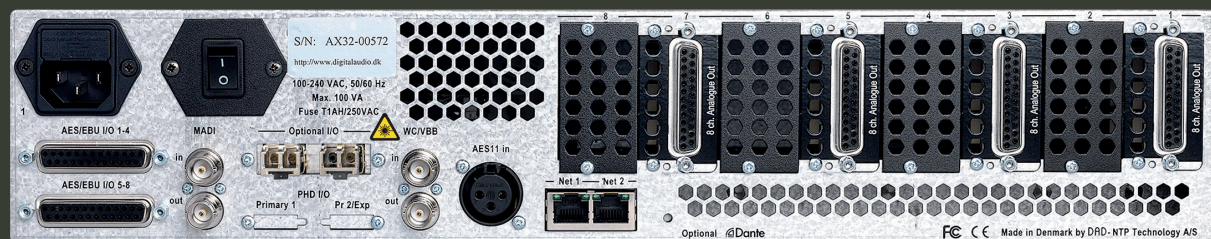
## I/O Cards

The AX32 has 8 slots for user configurable I/O cards. 3 different analogue and 3 different digital I/O cards are available. The slots can be configured with either 6 analogue card or 8 digital cards or a combination thereof.

The following I/O cards are available:

- 8 ch. Line pristine A/D card
- 8 ch. Mic/Line pristine A/D card
- 8 ch. pristine D/A card
- Dual SDI/HD/3G 2x16 ch. emb/deembed. card w. SRC
- 8 Line AES3 16 ch. I/O Card w. SRC
- Dual MADI 128 ch. I/O Card

## Rear panel AX32



## Rear panel DX32



# Technology

## Sample rates up to 384 kHz and DSD

DAD were the first to design converters that handle sample rates up to 384 kHz. The AX32 follows the track of the renowned AX24 with an enhanced performance on the standard sample rates and the high sample rates like 192 kHz, DXD, 384 kHz and the one bit DSD format.

## Dual 5 bit @ 6.14Mhz A/D conversion

The outstanding sound quality of the AX32 is achieved by an extreme attention to detail in every part of the circuit design. One of these details is the use of two parallel A/D converters per channel to increase the dynamic range.

Another very important detail is the use of the DAD ultimate high resolution conversion technology using the higher order 6.14Mhz 5 bit delta sigma modulator of the ADC chip. Rather than using the decimation filters built into the ADC chip, we feed the output from the modulator to a DSP featuring DAD designed and optimised decimation filters, allowing us to provide all sample rates in the highest possible quality.

## Accurate Mic-pres with relay gain system

The AX32 mic pre's have an outstanding performance with an equivalent input noise below -130 dB. A resistor-based gain step circuitry with relays ensures that no un-linear distortion is added to the sensitive microphone signal when amplified. Each 0.1 dB gain step is digitally compensated for an inter channel accuracy of 0.1 dB.

## 128 times oversampled D/A with DXD and true DSD

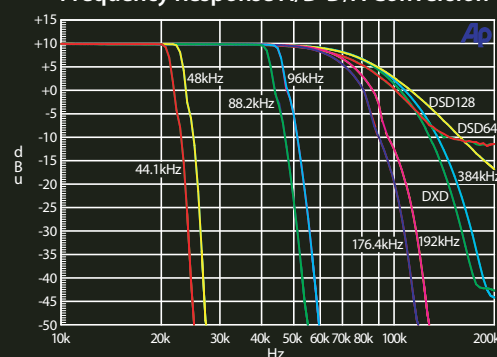
The D/A converter provides an ultimate natural conversion and relies on a high resolution design with 128 times oversampled output of the PCM sample rates, using DAD optimized reconstruction filters, as well as a true-DSD output provided by the same modulator and filter system. The analogue output level is adjusted by a level step circuitry using relays in combination with a digital gain circuitry and a mute system ensuring high dynamic range, and still no disturbing clicks when changing formats or powering down.

## Low latency routing and signal processing

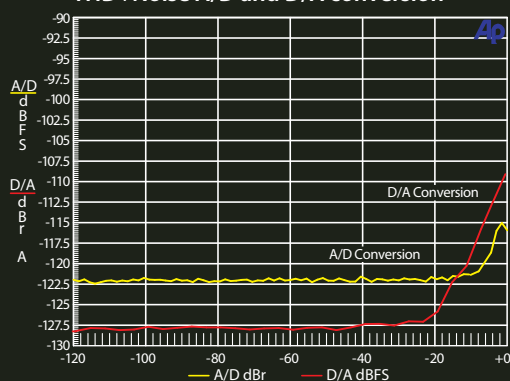
The AX32 and DX32 units are internally distributing all the I/O signals via a 1,500x1,500 I/O matrix, which also provides a channel based processing and a 32 bit floating point summing processor. The matrix provides fixed-latency asynchronous routing of all inputs to one or more outputs with a time stamp mechanism. This ensures a fixed latency of 5 audio samples from all digital inputs to all digital outputs. All the sample rates from 44.1 kHz to 384 kHz and DSD are supported. Due to the nature of the DSD format, no signal processing is however possible when operating in DSD mode.

## Specifications

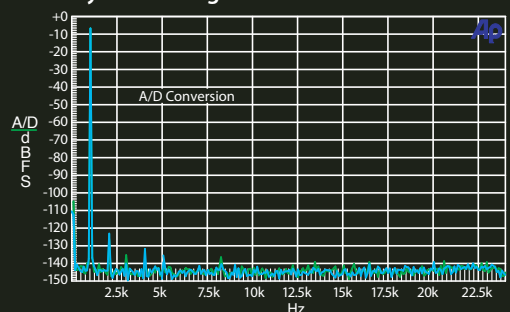
Frequency Response A/D-D/A Conversion



THD+Noise A/D and D/A conversion



Dynamic Range



- Dynamic range, ADC (A) > 123 dB
- THD + N, ADC (A) < -120 dB @ -6 dBFS
- Dynamic Range, DAC (A) > 128 dB
- THD + N, DAC (A) < -115 dB @ -6 dBFS
- Cross talk (A) < -120 dB
- Mic Equivalent noise (A) < -130 dB @ 100Ω
- Mic gain range - 18 to +70 dB
- Mic gain step accuracy < 0.25 dB
- Sample-rates 44.1 to 384kHz, DSD64, DSD128 (DoP)
- Clock accuracy < 2PPM via Digital PPL

# Control

## DADman control software

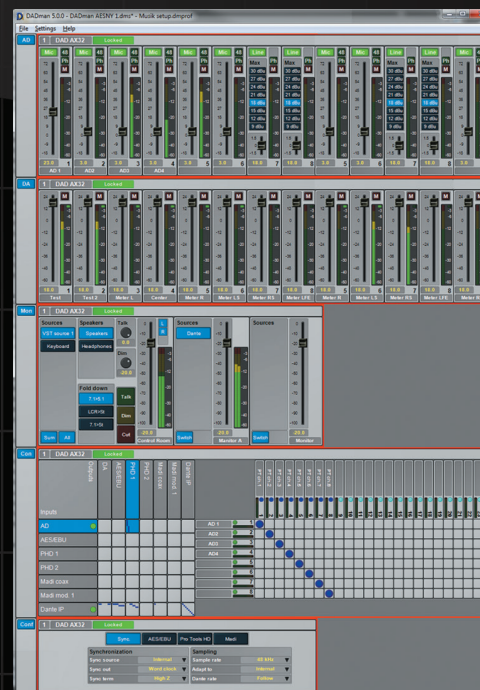
The AX32 and DX32 are controlled via a network connection using the DADman control software which is available for Microsoft Windows™ and Apple™ OS X. DADman provides a GUI oriented user interface for configuration and operation of the DAD interfaces. DADman can control multiple AX32s and DX32s simultaneously, and the units can also be controlled from multiple computers simultaneously.

## Eucon control protocol

The Avid™ Eucon™ control protocol is supported by DADman allowing the AX32 and DX32 to be controlled by a range of Avid Eucon-enabled control surfaces such as the S6, S3 and Dock. Currently the implementation provides control of the AX32 mic pre's and the Pro | Mon monitor control option.

## 3rd party hardware controllers

Control of AX32 and DX32 is supported by various hardware controllers. Apart from Avid Eucon-enabled control surfaces, other stand-alone controllers from 3rd party manufacturers are also available for direct control of the AX32 and DX32 functions.



## Monitor control via DADman and MOM for Immersive audio

The AX32 and DX32 provide a unique solution for easy and flexible monitor control and signal insert management using a variety of analogue and digital audio interfaces. Monitor control is made via the DADman software and can be configured for a variety of user defined I/O set-ups. The AX32 or DX32 processes the matrix settings, signal levels, summing and down-mix, as well as the speaker filters via the SPQ card for AX32. The AX32 and DX32 is a powerful monitor control system supporting all the immersive audio formats, which also can be managed via the MOM, the DAD Monitor Operating Module, for tactile control of the monitor functionality.



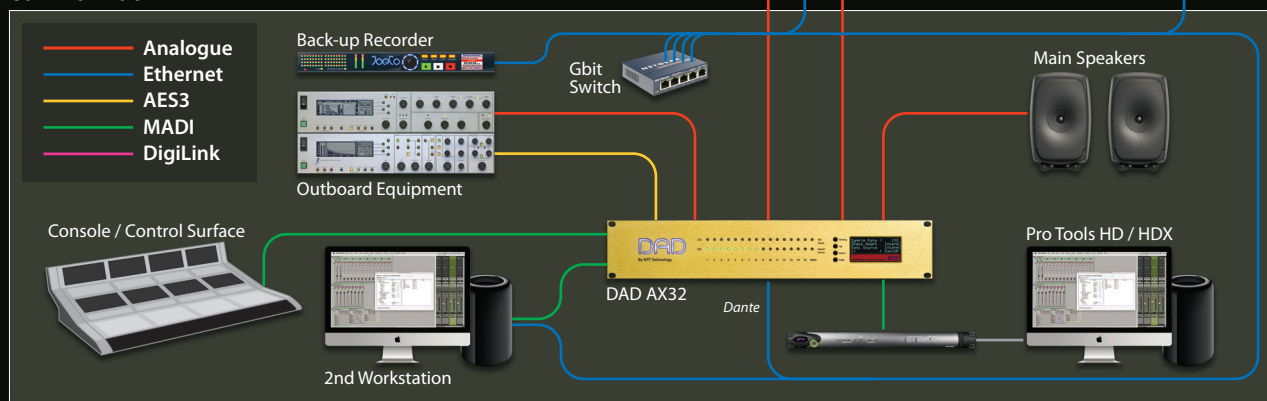


# Benefits

## Music Studio

The AX32 is the core AD/DA converter and signal concentrator for the recording micro-phones, one or more DAW's, a digital mixing desk, the outboard processors, the cue and talk-back signals and the studio speakers. The set-up provides ultimate flexibility and sound quality in the recording studio.

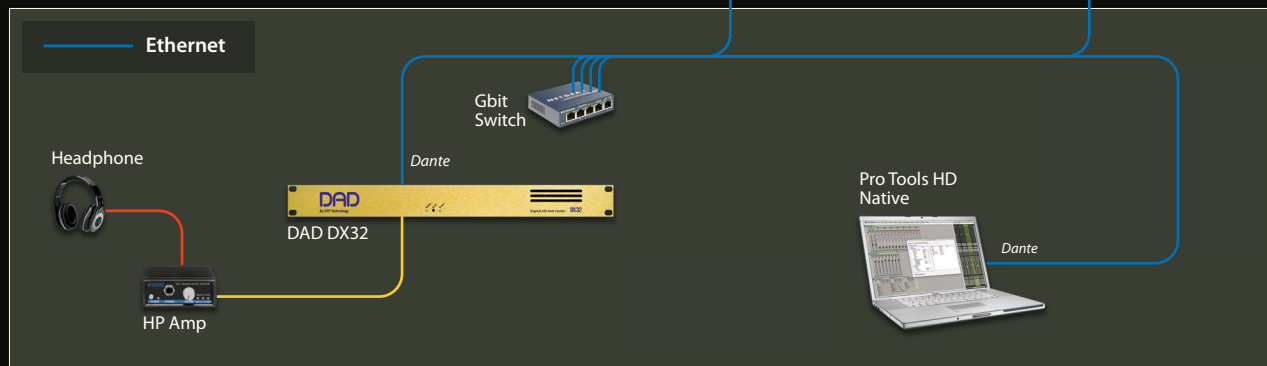
### CONTROL ROOM



## Location Recording

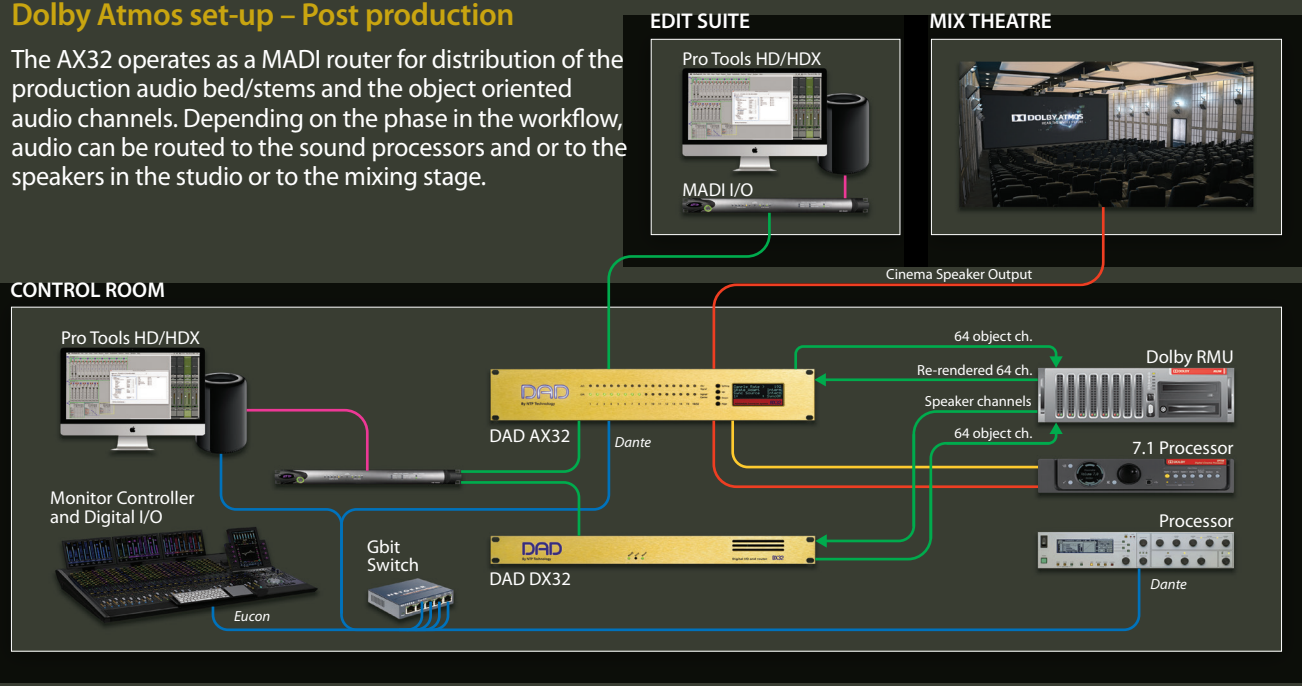
The AX32 in combination with DX32 makes a perfect light-weight and compact solution for solution multi-channel location recording. The AX32 with remote-controlled mic pre's is installed close to the performers and feeds the DX32 and even a FOH desk using Dante through a single network cable.

### CONTROL ROOM

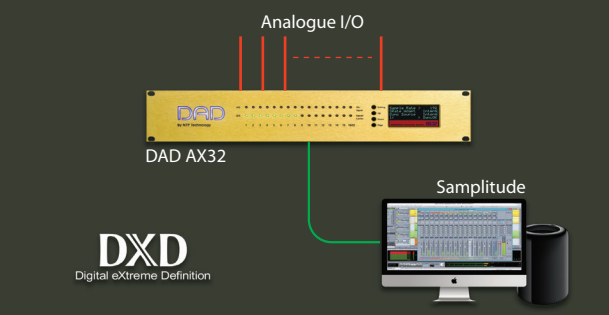


## Dolby Atmos set-up – Post production

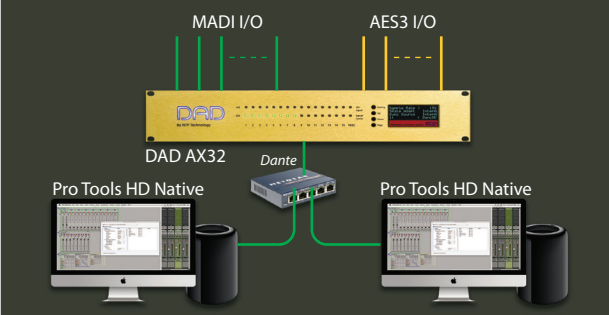
The AX32 operates as a MADi router for distribution of the production audio bed/stems and the object oriented audio channels. Depending on the phase in the workflow, audio can be routed to the sound processors and or to the speakers in the studio or to the mixing stage.



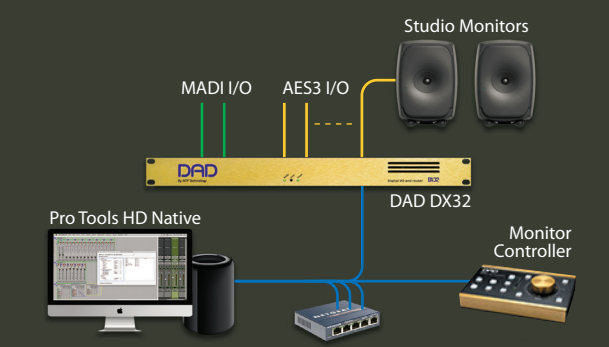
## Interface for MADi DAW



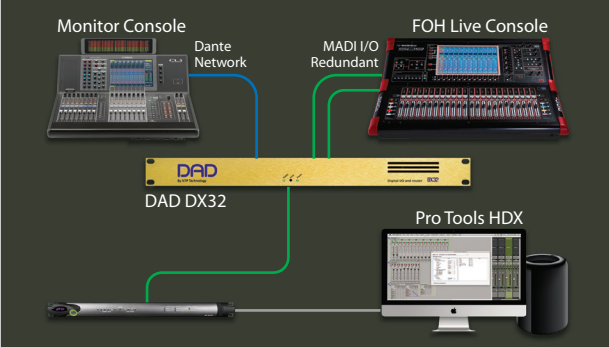
## Working with two Pro Tools systems



## Monitor control for digital I/O



## DX32 for live applications



# A masterful combination

## AX32 | Analogue Mic/Line AD/DA/DD matrix



## DX32 | Digital interface and matrix

METAlliance  
PRO PARTNER

DSD  
Direct Stream Digital

DXD  
Digital extreme Definition

EuCon

Dante™

**DAD**  
DIGITAL AUDIO DENMARK  
By NTP Technology

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