

# BROADCAST Routing AoIP

Bridge the Gap Between Any Format



AES67

MADI

AES3



3GSDI

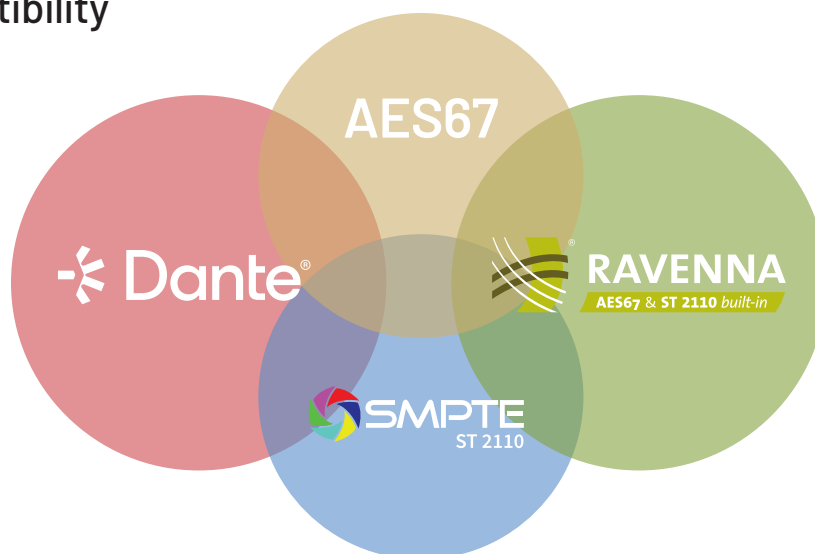
DADLink

ADAT

Routing – Monitoring – Format Conversion – Audio I/O

**DAD**  
DIGITAL AUDIO DENMARK

## Format Compatibility



## Major AoIP Formats for the Thunder|Core, Penta and AX32 Audio Interfaces

Dante, Ravenna, AES67 and ST 2110-30 audio connectivity is available for our renowned Thunder|Core, Penta and AX32 audio interfaces. Our networking capabilities ensure seamless compatibility within AoIP environments and versatile configurations with IP Ethernet Audio Formats into our product functionality.

Starting with DADman version 5.8.2 and corresponding firmware, all products support Dante with integrated AES67 and ST 2110-30 functionality. The Ravenna card with AES67 and ST 2110-30 functionality is available for the modular audio interfaces.

The Thunder|Core and Penta audio interfaces provide a variety of digital and analogue input and output options. All the signals are available in the large internal routing matrix which has a capacity of up-to 2,048 x 2,048 non-blocking connections. The number of channels depends on the actual input and output configuration of the audio interface.

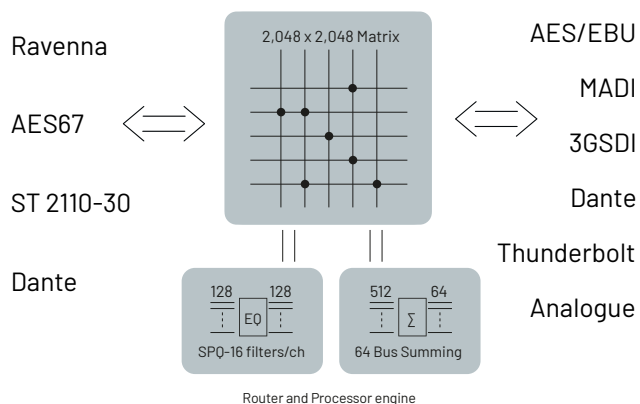
A 64 channel bus summing system is a part of the matrix, and provides via the Pro|Mon functionality unique and flexible summing and monitoring configurations that can be targeted for different workflows.

### Audio over IP Options

The Penta and AX32 audio interfaces have 64 input and output Dante channels in the basic configuration with a built-in Brooklyn 3 module and supports AES67 and unmanaged ST 2110-30.

The Thunder|Core interfaces have 256 input and output Dante channels in the basic configuration with a native Dante implementation and supports AES67 and managed ST 2110-30.

In addition, you can also install the optional Ravenna card and Dante card in Penta 720 and Penta 721s, AX32, AX64 and AX Center, where sample-rate conversion can be enabled, to get more connectivity and to bridge between different networks, synchronisation or sample rates. The Dante card has support for AES67 and managed ST 2110-30.



## Digital and Analog I/O

All our audio interfaces come with a variety of input and output connectivity where some formats are available in the basic configuration of the interface, and some are available via expansion with the optional cards. Audio routes seamlessly between AoIP, digital, and analogue ports with a fixed internal latency of just 7 samples, ensuring perfect phase alignment across all signals. Please refer to the [digitalaudio.dk](http://digitalaudio.dk) website for more details on each of our interfaces and card options.

## Routing and Format Conversion

You can install more AoIP options in one or more audio interfaces and establish routing between the various interfaces. In that way routing of a dynamic nature with a switch time of one sample can be made between fixed IP configurations, as well as format conversion between IP audio configurations on different networks and formats e.g. Ravenna <-> Dante. The routing for the Thunder|Core products is managed via the DADman software or via the Junior panel controlling the audio interface directly or for the Penta and AX32 products via DADman or the SW-P-08 control protocol.

## Monitoring

Monitoring of any on the signals in the audio interface can be managed via the Pro|Mon control functionality provided in DADman. Monitors can be configured in a flexible manner to fit any required audio format and channel configuration. Tactile control can be achieved via the MOM monitor controller.

## Format Compatibility and History

Pushing digital audio over ethernet and IP Layer 3 networks has been possible with various technologies over the last 25 years. Especially with the Dante technology invented by Audinate and the RAVENNA open solution for transmitting Audio over IP invented by ALC NetworkX, AoIP became widely adopted by many vendors. In 2013 Audio Engineering Society defined a standard for a common denominator for the AoIP audio format AES67 defining the audio transport layer which is compatible with Dante and Ravenna as well as other

proprietary formats like Livewire and Q-Lan. However, AES67 does not specify a discovery system. In 2017 SMPTE defines a suite of standards that describes how to send digital media over an IP network ST 2110-30 defines the transport of PCM audio based on AES67 with some constraints related to synchronization.

So, the Dante, Ravenna, AES67 and ST-2110-30 formats are certainly interoperable on the network level but need to be configured correct to be compatible. With all formats being available on our interfaces we can provide easy connectivity, routing, format conversion and monitoring for all the formats.

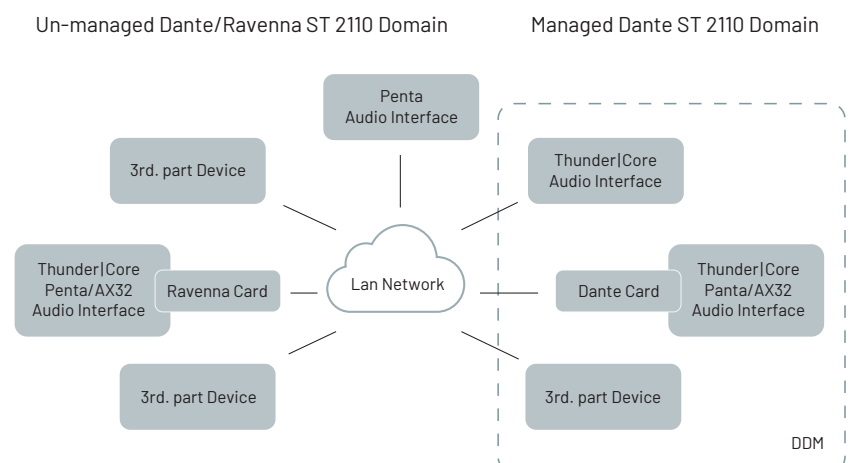
## Ravenna, AES67 and ST 2110-30

The Ravenna AoIP solution provides a system for audio connectivity on IP Ethernet including AES67 and ST-2110-30. Unmanaged configuration, audio patching and control can be done with the ANEMAN control software provided by Merging Technology or via other systems provided e.g. by Lawo.

## Dante, AES67 and ST 2110-30

The Dante AoIP solution provides a system for audio connectivity on IP Ethernet including AES67 and ST-2110-30. Unmanaged configuration, audio patching and control are done using the Dante Controller software provided by Audinate. Depending on the Dante implementation in the Audio Interface some functionally require management provided by the Dante Domain Manager Software (DDM)

*Overview of ST 2110-30 devices in unmanaged and managed mode.*



## Dante Support for ST 2110-30 & AES67:

### Feature Highlights

- Ability to set devices to ST 2110-30 mode and configure ST 2110-30 RTP and PTPv2 parameters
- Configure ST 2110-30 RTP flow parameters including configurable RTP payload ID, encoding, and latency. Configurable encoding and latency settings available for AES67
- Import third-party System description Data (SDP)
- Configure PTP clock settings in Dante Controller, including PTP DSCP values for AES67 and ST 2110-30. In unmanaged AES67 mode, new options include enabling/disabling PTPv1 multicast, setting PTPv2 Priority 1 and 2 values, and adjusting PTPv2 multicast TTL
- Expanded multicast address range support (224.0.0.0-239.255.255.255) for ST 2110-30 flows
- Support for ST 2110-30 A, B, C and AX, BX, and CX conformance levels, enabling 48 kHz with A, B and C profile and 96 kHz sample rate with AX profile aligned for AES67 mode 96 kHz support
- No support for NMOS

## Ravenna Support for ST 2110-30 & AES67:

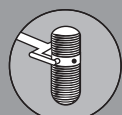
### Feature Highlights

- PTPv2 Master or Slave, IEEE-1588-2008 standard
- NMOS IS-04 and IS-05 support
- Discovery, Configuration and control via WebUI, NMOS, Ravenna, SAP, ANEMAN and JSON API
- High-performance audio-streaming over standard IP networks
- Full interoperability with AES67 and ST 2110-30 devices
- User-friendly web interface for swift configuration
- Support for ST 2110-30 A, B, C and AX, BX, and CX conformance levels, enabling 48 kHz sample rate with A, B and C profile and 96 kHz sample rate with AX, BX and CX profile

## Overview of managed and unmanaged configuration

| Product               | AoIP Technology                 | AES67         | ST 2110-30 | ST 2110-30 mode | Control and Configuration  |
|-----------------------|---------------------------------|---------------|------------|-----------------|----------------------------|
| Penta/AX32 series     | Dante Brooklyn II module 64 ch. | Yes           | Yes        | Managed         | Dante Controller + DDM     |
|                       | Dante Brooklyn 3 module 64 ch.  | Yes, extended | Yes        | Unmanaged       | Dante Controller           |
| Thunder   Core series | Dante Native 256 ch.            | Yes           | Yes        | Managed         | Dante Controller + DDM     |
| Ravenna Card          | Ravenna ZMAN 128 ch w. SRC      | Yes           | Yes        | Unmanaged       | Merging Anemann and others |
| Dante Card            | Dante Native 128 ch. w. SRC     | Yes           | Yes        | Managed         | Dante Controller + DDM     |

*Note that Penta and AX32 requires MOD-DANTE-BKII or MOD- DANTE-BK3 to be installed*



Broadcast Routing



[digitalaudio.dk/broadcast-routing](https://digitalaudio.dk/broadcast-routing)



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