



Model 5330 Flex-Use Dante® Audio Interface

Key Features

- Dante audio-over-Ethernet technology
- Four analog line inputs to Dante outputs
- Four Dante inputs to balanced line-level outputs
- Monitoring with meters, headphone and line outputs
- Excellent audio quality
- DDM and AES67 support
- 100-240 V, 50/60 Hz mains powered
- Standard connectors, lightweight, 1U rack mounting

Introduction

The Model 5330 Flex-Use Dante Audio Interface provides a simple yet high-performance means of interfacing analog signals with applications that utilize Dante® audio-over-Ethernet media networking technology. Four line-level analog sources can be connected to the unit and then, after conversion to digital, output by way of four output (transmitter) channels associated with the Dante interface. Four signals that arrive by way of Dante can be converted to analog and then output as balanced line-level signals. A monitor section allows the input and output signals to be selectively observed using meters, a headphone output, and a line-level output.

The Model 5330 is a fully professional product that offers the audio quality, features, and reliability required by 24-hour commercial applications. Four inputs, two on the front panel and two on the back, allow simple interfacing with a variety of unbalanced and balanced line-level analog sources. The 2-channel (stereo) input on the front panel is optimized for use with portable electronics that provide “-10” unbalanced audio sources. Using a rotary control, users can adjust the sensitivity of the input circuitry to match the level of the source. Two additional inputs are provided on the back panel and meet the requirements of professional audio equipment. They are differential (balanced) with

a nominal level of +4 dBu and plenty of signal-handling “headroom.” The four input signals are converted to 24-bit digital audio and then transported out of the unit via the Dante interface.

Four digital audio channels enter the Model 5330 via its Dante interface. These general-purpose audio channels are then converted from the digital domain to the analog domain. Four 3-pin male XLR connectors, located on the unit’s back panel, provide balanced +4 dBu nominal line-level analog outputs. An auxiliary output, also located on the back panel, provides a fifth “professional-quality” output. Pushbutton switches, located on the front panel, allow the user to select the source for the auxiliary output from among the four Dante input (receiver) channels.

The monitor section allows the user to select any audio input or output signal for visual and aural observation. Two 8-segment LEDs meters, calibrated in dBFS, allow precise monitoring of signal levels as they exist in the digital domain. A 2-channel (stereo) headphone output allows connection of headphones or ear buds that use either 3.5 mm or ¼-inch jacks. A separate line-level analog monitor output allows connection to inputs on amplified speakers or power amplifiers. Two rotary controls allow individual adjustment of the headphone and monitor outputs.





An Ethernet connection is all that's required to make the Model 5330 part of a sophisticated networked audio system. Dante audio-over-Ethernet has found wide acceptance as an audio "backbone" due to its ease of use, interoperability, excellent audio quality, and wide adoption by a large number of equipment manufacturers.

The Model 5330 can serve as an "edge" device for a Dante network implementation, providing high-performance input, output, and monitor resources for various applications. The unit is an excellent general-purpose "tool" to help expand Dante capabilities for facilities and applications that were initially implemented to support signals in the analog domain.

The Model 5330 is "universal" mains powered, requiring 100 to 240 volts, 50/60 Hz for operation. Standard connectors are used for interfacing with the audio input and output channels, Ethernet interface, and AC mains input. The unit's enclosure mounts in one space (1U) of a standard 19-inch rack enclosure and weighs less than four pounds (2 Kg).

Dante Audio-over-Ethernet

Digital audio data associated with the Model 5330 is interfaced with a local area network (LAN) using Dante audio-over-Ethernet media networking technology. The unit is compatible with the Dante Domain Manager™ (DDM) software application and is compliant with AES67 digital audio signals.

A major benefit of using Dante is its ability to use any standard Ethernet network implementation, including cabling and switches, to directly transport professional audio signals. The Model 5330 supports digital audio signals with sample rates of 44.1 and 48 kHz and a bit depth of up to 24. These sample rates were selected for optimal support of broadcast, production, industrial, commercial, and consumer applications. Status LEDs provide a real-time indication of LAN and Dante performance.

The signals associated with the Model 5330's four analog input channels are converted to digital and then routed to transmitter (output) channels on the unit's Dante interface. Four Dante transmitter (output) channels from an associated Dante-enabled device can be assigned to the Model 5330's input (receiver) channels using the Dante Controller application. These input signals are converted into analog and then sent to the output circuitry.

Applications

The Model 5330 is a general-purpose analog input, analog output and monitoring device intended for use in a variety of audio and audio-with-picture applications where Dante technology is utilized. It's applicable anywhere that line-level analog inputs and outputs need to be converted to and from Dante while audio quality is maintained. The term "Flex-Use" comes from the flexibility that the unit's range of simple but carefully-implemented resources can provide. It's suitable for demanding on-air broadcast and live-event applications that require both excellent audio performance and reliable operation. It can also be a perfect complement for academic, industrial, or corporate audio-visual facilities where a variety of analog input and output devices must be supported.

The rack-mounted unit is appropriate for installation in fixed locations, serving the needs of systems associated with stadium, worship, education, commercial, and government facilities. Its lightweight enclosure also makes it suitable for mobile and field uses. The Model 5330 features an optimized set of controls and indicators that makes it simple and intuitive to use. With the unit's metering and monitoring resources it's easy for users to obtain optimal performance. And by providing standard connectors for all inputs and outputs, along with universal AC mains powering, installation and setup can be completed in only a short period of time.

Four Analog Inputs

The Model 5330's four inputs allow connection to a range of unbalanced and balanced analog audio sources. Inputs 1 and 2 have a nominal level of -10 dBu and are intended for use with unbalanced sources associated with personal electronic devices such as phones, tablet and notebook computers. For easy access a 3.5 mm 3-conductor (stereo) jack is provided on the front panel. A rotary level control, located adjacent to the input jack, allows adjustment of the input sensitivity to match a wide range of audio sources. This allows the audio quality to easily be optimized. Inputs 3 and 4 are electronically balanced with a nominal level of $+4$ dBu. They use two 3-pin female XLR connectors which are located on the unit's back panel. They are intended for connection to professional audio sources such as audio consoles, wireless microphone receivers, and video playback equipment.

The four inputs are capacitor-coupled and ESD (static) protected to provide reliable operation in a variety of demanding applications. Extensive filtering minimizes the chance that radio frequency (RF) energy will cause interference. Low-noise, low-distortion, and wide dynamic-range circuitry ensures that audio quality is preserved. Four bi-color signal present/peak LEDs provide a simple means of observing input activity. The analog input audio is routed to high-performance analog-to-digital conversion (ADC) integrated circuits that support sampling rates of 44.1 and 48 kHz with a bit depth of up to 24. The audio signals, now in the digital domain, are connected to the Dante interface where the data is packetized and prepared for transport over Ethernet. The Dante Controller software application will typically be used to assign the Model 5330's four output (transmitter) channels to inputs (receiver) channels on designated Dante equipment.

Five Analog Outputs

The Model 5330 provides five analog line-level outputs, four main and one auxiliary. The unit's four Dante input (receiver) channels serve as the audio sources for the five outputs. The Dante Controller software application can be used to route (subscribe) Dante sources (transmitters) to the Model 5330's four Dante inputs (receivers). The unit's four Dante input (receiver) channels are "mapped" one-to-one with the four main output

channels. Four bi-color LEDs provide a signal present/peak indication of level of the four Dante input (receiver) channels. The audio source for the auxiliary output is selected by the user from among the four Dante input (receiver) channels. Two pushbutton switches and four LEDs, located on the front panel, allow for simple source selection.

The Model 5330's five outputs have a nominal signal level of $+4$ dBu and a maximum output level of $+24$ dBu. The outputs are electronically balanced, capacitor-coupled, and ESD (static) protected. They are compatible with virtually all balanced and unbalanced loads with an impedance of 2 k ohms or greater. High-quality components, including the important digital-to-analog converter (DAC) integrated circuits, are used to provide low-distortion, low-noise, and sonically-excellent performance. Robust circuitry provides protection from damage should a moderate DC voltage be accidentally connected, something especially useful in applications where powered party-line (PL) or talent-cueing (IFB) circuits may be present.

Monitoring

A flexible yet easy-to-use monitor section offers the ability to listen to and visually observe the level of the four input and four output audio signals. Two pushbutton switches allow a user to select which audio source or sources are to be monitored over headphones and/or loudspeakers. A configuration choice allows monitoring of either a single audio channel or a pair of audio channels. This mode choice can be valuable when monitoring monaural (single-channel) and stereo (dual-channel) signals. Two 8-segment LED meters display the level of the source or sources that are selected for monitoring. The meters are calibrated in dBFS, directly reflecting the digital signal levels of the Dante output (transmitter) and input (receiver) channels.

A 2-channel (stereo) headphone output allows support for stereo headphone or ear buds. For convenience both 3.5 mm and $\frac{1}{4}$ -inch 3-conductor (stereo) phone jacks are provided. In addition, a separate 2-channel (stereo) monitor output allows interfacing with inputs on amplified loudspeakers or a power amplifier associated with monitor loudspeakers. Two rotary controls allow the levels of the headphone and monitor outputs to be independently adjusted.

Simple Installation

The Model 5330 is housed in a lightweight aluminum enclosure and mounts in one space (1U) of a standard 19-inch rack enclosure. The unit uses standard connectors to allow fast and convenient interconnections. This includes 3-conductor male and female XLR connectors, 3.5 mm and ¼-inch jacks, and an IEC C14 receptacle for mains power. The unit connects to a local area network (LAN) using a standard RJ45 receptacle and supports 100 Mb/s twisted-pair Ethernet. Four LEDs on the back panel display the status of the Ethernet connection and Dante interface. The Model 5330 requires 100-240 volts, 50/60 Hz mains power for operation.

Specifications

Network Audio Technology:

Type: Dante audio-over-Ethernet

AES67-2013 Support: yes

Dante Domain Manager (DDM) Support: yes

Bit Depth: up to 24

Sample Rates: 44.1 and 48 kHz

Number of Transmitter (Output) Channels: 4

Number of Receiver (Input) Channels: 4

Dante Audio Flows: 4; 2 transmitter, 2 receiver

Network Interface:

Type: twisted-pair Ethernet

Data Rate: 100 Mb/s (10 Mb/s not supported; 1000 Mb/s "GigE"

Ethernet not supported unless falls back to 100 Mb/s)

Inputs 1 and 2:

Compatibility: unbalanced line-level sources

Type: analog, unbalanced, capacitor coupled

Impedance: 10 k ohms, nominal

Nominal Level: -10 dBu, adjustable with input level control

Maximum Level: depends on setting of the input level control

Dynamic Range: >116 dB, 0 dB gain, A-weighted

Distortion (THD+N): <0.001% (-101 dB) at -1 dBFS, 40 dB gain, 22 kHz bandwidth

Frequency Response: +0.0/-0.5 dB, 22 Hz to 22 kHz

Status LEDs: 2, displays signal present/peak

Inputs 3 and 4:

Compatibility: balanced or unbalanced line-level sources

Type: analog, electronically balanced, capacitor coupled

Impedance: 20 k ohms, nominal

Nominal Level: +4 dBu (results in Dante output level of -20 dBFS)

Maximum Level: +24 dBu (results in Dante output level of 0 dBFS)

Dynamic Range: >116 dB, 0 dB gain, A-weighted

Distortion (THD+N): <0.001% (-101 dB) at -1 dBFS, 40 dB gain, 22 kHz bandwidth

Frequency Response: +0.0/-0.5 dB, 22 Hz to 22 kHz

Status LEDs: 2, displays signal present/peak

Main, Auxiliary, and Monitor Outputs:

Type: analog, electronically balanced, capacitor coupled, intended to drive balanced or unbalanced loads of 2 k ohms or greater

Source Impedance: 200 ohms

Nominal Level - Main and Auxiliary: +4 dBu, reference -20 dBFS on Dante input

Nominal Level - Monitor: 0 dBu, reference -20 dBFS on Dante input

Maximum Level: +24 dBu with 0 dBFS on Dante input

Future Capabilities and Firmware Updating

The Model 5330 was designed so that its performance and capabilities can be enhanced in the future. A USB receptacle, accessible on the unit's back panel, allows the application firmware (embedded software) to be updated using a USB flash drive. To implement its Dante interface the Model 5330 uses one of Audinate's 4-in/4-out Ultimo™ integrated circuit. The firmware in this integrated circuit can be updated via the unit's Ethernet connection, helping to ensure that its Dante capabilities remain up to date.

Dynamic Range: >119 dB, A-weighted

Distortion (THD+N): 0.0012% (-99 dB), measured at -1 dBFS, 22 kHz bandwidth

Frequency Response: ±0.1 dB, 20 Hz to 20 kHz

Status LEDs: 4, displays signal present/peak

Audio Monitor:

Source: inputs 1-4 or main outputs 1-4, selectable as monaural or stereo

Level Meters: 2, 8-segment LED

Headphone Output:

Type: stereo (dual-channel)

Compatibility: intended for connection to stereo headphones with nominal impedance of 100 ohms or greater

Maximum Output Voltage: 4.9 volts RMS, 1 kHz, 150 ohm load

Frequency Response: +0/-1.4 dB, 20 Hz to 20 kHz

Distortion (THD+N): 0.005%

Dynamic Range: >100 dB

Connectors:

Inputs 1 and 2: 3-conductor 3.5 mm jack

Inputs 3 and 4: 3-pin female XLR

Main, Auxiliary, and Monitor Outputs: 3-pin male XLR

Headphone Output: 3-conductor 3.5 mm jack and 3-conductor ¼-inch jack

Ethernet: RJ45 receptacle

USB: type A receptacle (used only for application firmware updates)

AC Mains: 3-blade, IEC 320 C14-compatible (mates with IEC 320 C13)

Power Source:

AC Mains: 100 to 240 volts, +10/-15%, 50/60 Hz, 15 watt maximum

Dimensions - Overall:

19.0 inches wide (48.3 cm)

1.72 inches high (4.4 cm)

7.8 inches deep (19.8 cm); 8.2 inches (20.8 cm) overall

Mounting: one space (1U) in a standard 19-inch rack

Weight: 3.3 pounds (1.5kg)

Specifications subject to change without notice.

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