Model 372A Intercom Beltpack Featuring Dante® Technology

STUDIO TECHNOLOGIES INC.

Key Features

- Dante audio-over-Ethernet technology

- One talk and two listen channels

- Supports dynamic and electret microphones

- 5-pin female XLR headset connector

- 3.5 mm 4-conductor TRRS headset connector

- Call receive and display function

- Excellent audio quality

- Uses STcontroller for configuration

- AES67 and Dante Domain Manager™ (DDM) support

- Power-over-Ethernet (PoE) powered

Introduction

The Model 372A Intercom Beltpack is a highly compact user-worn device that combines a single channel of talk and two channels of listen. The unit begins with the features offered by traditional analog party-line (PL) intercom user devices and adds a range of new capabilities, along with the advanced performance and flexibility that Dante® audio-over-Ethernet provides. Over a standard IP network, multiple Model 372A and other compatible Studio Technologies' beltpack units can be used to create party-line intercom applications with help from an external Dante-enabled audio matrix such as the Studio Technologies' Model 5422 Dante Intercom Audio Engine. Alternately, Model 372A units can be used "point-to-point" or interfaced with Dante-compatible matrix intercom systems.

Having one talk and two listen channels may seem unconventional. But it can be ideal for many "real-world" applications. Often an intercom user is primarily listening and non-verbally responding to requests made by producers, directors, or stage managers. Typically, the Model 372A will be configured to be part of one talk-and-listen party-line intercom channel. During the time that an event is taking place the listen function will serve a much more important role; the talk function will rarely be utilized. However, the second listen channel will often be important. Typically, it will be designated as a program-listen or "show audio" channel. The two listen channels, along with the ability to receive and display call signals, allow the Model 372A to very effectively support production personnel in a compact and cost-effective manner.

Only a single Power-over-Ethernet (PoE) connection is required for operation. Key user features can be easily configured using the STcontroller software application. Configurable parameters include electret microphone powering, microphone preamplifier gain, talk button operation, and headphone channel assignment. Features include integrated sidetone, call signal receive display, and remote mic kill ("talk off"). The range of capabilities, along with the excellent audio quality provided by the digital audio signal path, offers a unique and powerful user experience.

Setting up and configuring a Model 372A is simple. An etherCON® RJ45 receptacle is used to interconnect with a standard twisted-pair Ethernet port associated with a local-area network (LAN). This connection provides both power and bidirectional digital audio. The Model 372A is compatible with both broadcast and "gaming" headsets.

A broadcast or intercom-style headset with a dynamic or electret (DC-powered) microphone can be interfaced with the Model 372A using a 5-pin XLR connector. The Model 372A also directly supports connection of earbuds or gaming headsets that utilize a 3.5 mm 4-conductor TRRS plug. These moderately priced devices, commonly associated with mobile phones or personal computers, are often of high-quality and may be preferred for some applications. With the Model 372A's moderate price and ability to support a broad range of headset devices the overall cost of deploying an intercom system can often meet budget goals.

The STcontroller software application is used to select the unit's operating parameters. The talk pushbutton switch can be configured for optimal operation. Two "push-in/push-out" ("pop-out") rotary controls make it easy to set and maintain the desired headphone output level. The Model 372A's compact enclosure is made from an aluminum alloy which offers both light weight and ruggedness. A stainless steel belt clip, located on the back of the unit, allows direct attachment to a user's clothing.

The audio quality of the Model 372A is excellent, with low distortion, low noise, and high headroom. Careful circuit design and rugged components ensure long, reliable operation. A wide range of applications can be supported, including education and commercial theater, sports and entertainment TV and radio events, streaming broadcasts, corporate and government AV, post production, and aerospace.

Dante Audio-over-Ethernet

Audio data is sent to and received from the Model 372A using the Dante audio-over-Ethernet media networking technology. As a Dante-compliant device, the Model 372A's one audio output (Dante transmitter) channel and two audio input (Dante receiver) channels can be interconnected (routed) with other devices using the Dante Controller software application. The Dante transmitter and receiver channels are limited to supporting four Dante flows, two in each direction. The digital audio's bit depth is up to 24 with a sampling rate of 48 kHz. The Model 372A is AES67 compatible and compliant with the Dante Domain Manager™ software application.

Two bi-color LEDs provide status indications of the Dante interface. The Dante Identify command takes on a unique role with the Model 372A. Not only will it cause the talk pushbutton's orange LED to light in a highly visible sequence, it will also turn off ("kill") the talk function if it is active.

Audio Quality

The Model 372A offers "pro" audio performance that is not found in typical party-line (PL) intercom beltpacks. A low-noise, wide dynamic-range microphone preamplifier and associated voltage-controlled-amplifier (VCA) dynamics controller (compressor) ensures that microphone audio quality is preserved while minimizing the chance of signal overload. DC power to support electret microphones can be enabled as required. The output of the microphone preamp and compressor is routed to an analog-to-digital converter (ADC) section that supports a sampling rate of 48 kHz with a bit depth of up to 24. The audio signal, now in the digital domain, travels through the processor and on to the Dante interface section where it is packetized and prepared for transport over Ethernet.

Audio input signals arrive via two Dante receiver channels. The supported sampling rate is 48 kHz with a bit depth of up to 24. The audio signals pass into the Model 372A's processor where channel routing, headphone level control, and sidetone creation are performed within the digital domain. This provides flexibility, allowing precise control of the audio signals and eliminating the need for the two rotary level controls from having to directly handle analog audio signals. The audio signals destined for the 2-channel headphone output are sent to a high-performance digital-to-analog converter and then on to robust driver circuitry. High signal levels can be provided to a variety of headsets.

Call Function Receive

A call receive function allows Model 372A users to be provided with a visual indication that a call signal is active. The orange LED within the pushbutton switch will first flash then light solid whenever a call signal is detected on either of the Dante receiver (input) channels. Using 20 kHz tones, the call signals are sent within the Dante audio channels ("in band") allowing interoperability between multiple Studio Technologies' beltpack units as well as being compatible with legacy party-line intercom systems. Call signals can be useful to indicate to users that they are needed "on headset" or should be actively listening to an intercom channel. The call function can also be used to provide real-time cues to production personnel during the running of live events.

Configuration Flexibility

A highlight of the Model 372A is its ability to be easily configured to meet the needs of specific users and applications. All configuration choices are made using the STcontroller software application that communicates with the Model 372A by way of an Ethernet network connection. Configurable parameters include microphone power and preamplifier gain, headphone monitoring, sidetone audio operation, and talk button operation.

The microphone input can be selected for compatibility with dynamic or electret (DC-powered) microphones. The gain of the microphone preamplifier can be selected from among five choices. These choices allow compatibility with the variety of microphones that are part of broadcast, intercom, and computer gaming headsets.

To support optimum user performance, the Model 372A's talk pushbutton switch can be configured from among three choices: Push to Talk, Latching, or Push to Talk/Tap to Latch. Two audio channels arrive via Dante receivers (inputs) and are destined for the 2-channel headphone output. Each input source can be independently routed to the left headphone channel,

right headphone channel, or both the left and right headphone channels. This flexibility allows a variety of listening environments to be created, including stereo, single-channel monaural, and dual-channel monaural.

Ethernet Data and PoE

The Model 372A connects to an Ethernet data network using a standard 100 Mb/s twisted-pair Ethernet interface. The physical interconnection is made by way of a Neutrik® etherCON RJ45 receptacle. While compatible with standard RJ45 plugs, etherCON allows a ruggedized and locking interconnection for harsh or high-reliability environments. An LED displays the status of the network connection.

The Model 372A's operating power is provided by way of the Ethernet interface using the 802.3af Power-over-Ethernet (PoE) standard. This allows fast and efficient interconnection with the associated data network. To support PoE power management, the Model 372A's PoE interface reports to the power sourcing equipment (PSE) that it's a class 1 (very low power) device.

Future Capabilities and Firmware Updating

The Model 372A was designed such that its capabilities and performance can be enhanced in the future. A USB connector, located on the unit's main circuit board (underneath the unit's cover), allows the application firmware (embedded software) to be updated using a USB flash drive.

The Model 372A uses Audinate's Ultimo™ integrated circuit to implement the Dante interface. The firmware in this integrated circuit can be updated via the Ethernet connection, helping to ensure that its capabilities remain up to date.

Model 372A Specifications

Power Source:
Power-over-Ethernet (PoE): class 1 (very low power, ≤3.84 watts) per IEEE® 802.3af

Network Audio Technology:
Type: Dante audio-over-Ethernet
AES67-2013 Support: yes
Dante Domain Manager (DDM) Support: yes
Bit Depth: up to 24
Sample Rate: 48 kHz
Number of Transmitter (Output) Channels: 1
Number of Receiver (Input) Channels: 2
Dante Audio Flows: 4; 2 transmitter, 2 receiver

Network Interface:
Type: 100BASE-TX, twisted-pair Ethernet, Power-over-Ethernet (PoE) supported
Data Rate: 100 Mb/s (10 Mb/s and 1000 Mb/s "GigE" Ethernet not supported)

Compatibility – Headset A: single- or dual-ear broadcast-style with dynamic or electret (low-voltage DC-powered) microphone: pin 1 mic common; pin 2 mic; pin 3 phones common; pin 4 phones left; pin 5 phones right

Compatibility – Headset B: CTIA™/AHJ configuration (typically uses electret powered mic): tip phones left; ring 1 phones right; ring 2 common; sleeve mic

Audio Channels: 1 talk, 2 listen

Microphone Input:
Compatibility: dynamic or electret (low-voltage DC-powered) microphones
Type: unbalanced
Electret Microphone Power: 3.3 volts DC via 2.00 k resistor, selectable on/off
Impedance: 1 k ohms, nominal, microphone power off; 690 ohms, nominal, microphone power on
Gain: 24, 30, 36, 42, or 48 dB, selectable, ref. –60 dBu input to Dante output (–20 dBFS nominal)
Frequency Response: 40 Hz to 20 kHz, –3 dB
Distortion (THD+N): <0.02% (at minimum gain)
Dynamic Range: 91 dB of dynamic range

Compressor:
Application: applies to Dante transmitter (output) channel and sidetone audio
Threshold: 2 dB above nominal level (–19 dBFS)
Slope: 2:1
Status LED: compressor active

Headphone Output:
Type: 2-channel
Compatibility: intended for connection to stereo (dual-channel) or monaural (single-channel) headsets with nominal impedance of 50 ohms or greater
Maximum Output Voltage: 2.8 Vrms, 1 kHz, 150 ohm load
Frequency Response: 20 Hz to 10 kHz, –3 dB
Distortion (THD+N): <0.002%
Dynamic Range: >100 dB

Call Receive Function:
Implementation: monitors both Dante receiver (input) channels for presence of call signals
Signaling Method: 20 kHz, ±800 Hz, within audio channels
Call Receive Level: –27 dBFS minimum

Connectors:
Headset A: 5-pin female XLR
Headset B: 4-conductor (TRRS) 3.5 mm jack, per Japanese standard JEITA/EIAJ RC-5325A
Ethernet: Neutrik NE8FBH etherCON RJ45 receptacle
USB: type A receptacle (located inside Model 372A's enclosure and used only for application firmware updates)

Configuration: requires Studio Technologies' STcontroller software application, version 2.01.00 and later

Environmental:
Operating Temperature: 0 to 50 degrees C (32 to 122 degrees F)
Storage Temperature: –40 to 70 degrees C (–40 to 158 degrees F)
Humidity: 0 to 95%, non-condensing
Altitude: not characterized

Dimensions (Overall):
3.1 inches wide (7.9 cm)
1.5 inches high (4.0 cm) without belt clip; 1.8 inches (4.6 cm) with belt clip
4.9 inches deep (12.5 cm)

Deployment: intended for portable applications; contains integral belt clip

Weight: 0.5 pounds (0.23 kg)

Specifications subject to change without notice.