Model 371 Intercom Beltpack
Two Channels, Dante™ Technology

STUDIO TECHNOLOGIES INC.

Key Features

- Dante Audio-over-Ethernet technology

- Two independent talk and listen channels

- 4-pin male XLR headset connector

- Integrated call function

- Configurable operating parameters

- Power-over-Ethernet (PoE) powered

Introduction

The Model 371 Intercom Beltpack combines the features offered by broadcast-style 2-channel party-line (PL) intercom user devices with a single-channel listen output and a 4-pin male XLR headset interface connector. This output arrangement allows deployment in PL intercom applications where support for single-ear headsets is desired. These headsets, which utilize dynamic microphones, are widely used in theatrical, corporate, and industrial applications where it's important to have one ear remain open to ambient audio signals.

The Model 371 uses the advanced capabilities that Dante audio-over-Ethernet can provide. Over a standard IP network, multiple Model 371 units can be used in PL intercom applications with help from an external Dante-enabled audio matrix. Or, units can be used "point-to-point" or directly interfaced with ports on compatible matrix intercom systems. Only a single Power-over-Ethernet (PoE) connection is required for operation. Key user features can be easily configured including microphone preamplifier gain and talk button operation. Additional user features

include integrated sidetone, remote microphone off, and call alerting. This capability, along with the great audio quality provided by the digital audio signal path, offers a superior user experience.

Set up and configuration of the 2-channel Model 371 is simple. An etherCON® RJ45 jack 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. A broadcast or intercom-style headset with a dynamic microphone interfaces to the unit using a cable-mounted 4-pin female XLR connector. The connected headset can be either single- or dual-ear models but the Model 371 has only a single channel headphone audio output; the two listen audio channels are always combined and sent to the one audio output. Three DIP switches are used to establish the unit's operating parameters. Two "push-in/push-out" rotary level controls make it easy to set the headphone output volume as well as maintaining the desired settings. The Model 371's 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 371's two audio channels 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 TV, radio, and streaming broadcast events, corporate and government AV installations, and industrial facilities.

Dante Audio-over-Ethernet

Audio data is sent to and received from the Model 371 using the Dante audio-over-Ethernet media networking technology. As a Dante-compliant device, the Model 371's two output (Dante transmitter) and two input (Dante receiver) audio channels can be assigned to other devices (routed) 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 24 with a sampling rate of 48 kHz. Two bi-color LEDs provide an indication of the Dante connection status. The Dante Controller's identify command takes on a unique role with the Model 371. Not only will it cause the talk button LEDs to light in a unique highly visible sequence, it will also turn off any active talk channels.

Audio Quality

The Model 371's completely "pro" performance really bucks the reputation of "intercom audio." A low-noise, wide dynamic-range microphone preamplifier and associated voltage-controller-amplifier (VCA) dynamics controller (compressor) ensures that input audio quality is preserved while minimizing the chance of signal overload. The output of the microphone preamp and compressor is routed to an analog-to-digital conversion (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, routes 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 the Dante receiver channels and pass into the Model 371's processor. The sampling rate is 48 kHz with a bit depth of up to 24. Headphone level control, channel mixing (combining), and sidetone creation are performed in the digital domain. This provides flexibility, allows precise control, and keeps the three user level potentiometers (channel 1, channel 2, and sidetone) from having to directly handle analog audio signals. The two audio channels destined for the headphone output are sent to a high-performance 2-channel digital-to-analog converter and then on to a robust driver circuit. High signal levels can be provided to a variety of headsets, headphones, and earpieces.

Call Function

A call function allows Model 371 users to send and receive channel-specific visual alert signals. Pressing the dedicated call button on the top of a unit is all that's required to signal other users that attention is requested. Using 20 kHz tones, the call signals are sent within the audio channels ("in band") allowing interoperability between multiple Model 371 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 371 is its ability to be easily configured to the meet the needs of specific users and applications. Three DIP switches allow control of the microphone preamplifier gain and talk button operation. The gain of the microphone preamplifier can be selected from nominally 40 or 46 dB. This allows compatibility with dynamic microphones that are part of many industry-standard intercom and broadcast headsets. The two push-button switches that control the talk audio on/off status can be individually configured for push to talk or push to talk/tap to latch operation.

Ethernet Data and PoE

The Model 371 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 connector. 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 371'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 371's PoE interface reports to the power sourcing equipment (PSE) that it's a class 1 (very low power) device. If a PoE-enabled Ethernet port can't be provided by the associated Ethernet switch a low-cost PoE midspan power injector can be utilized.

Future Capabilities and Firmware Updating

The Model 371 was designed so 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.

To implement the Dante interface the Model 371 uses Audinate's Ultimo™ integrated circuit. The firmware in this integrated circuit can be updated via the Ethernet connection, helping to ensure that its capabilities remain up to date.

Model 371 Specifications

Audio Channels: 2 talk, 2 listen

Power Source:
Power-over-Ethernet (PoE): class 1 (very low power, ≤3.84 watts)

Network Audio Technology:
Type: Dante Audio-over-Ethernet
Bit Depth: up to 24
Sample Rate: 48 kHz
Number of Transmitter (Output) Channels: 2
Number of Receiver (Input) Channels: 2
Dante Audio Flows: 4; 2 transmitter, 2 receiver

Network Interface:
Type: twisted-pair Ethernet, Power-over-Ethernet (PoE) supported
Data Rate: 100 Mb/s (10 Mb/s Ethernet not supported)

Microphone Input:
Type: unbalanced, for use with dynamic microphones
Gain: 40 or 46 dB, selectable, ref. –60 dBu input to Dante output (–20 dBFS nominal)
Frequency Response: 50 Hz to 10 kHz, –3 dB
Distortion (THD+N): <0.02%
Dynamic Range: 75 dB

Compressor:
Threshold: 1 dB above nominal level (–19 dBFS)
Slope: 2:1
Status LED: compressor active

Headphone Output:
Type: single-channel (combination of audio input 1 and audio input 2)
Compatibility: intended for connection to headsets or earpieces with nominal impedance of 50 ohms or greater

Maximum Output Voltage: 3.8 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 Signal Support:
Method: 20 kHz, ±800 Hz, within audio channels
Call Send Level: –20 dBFS
Call Receive Level: –27 dBFS minimum

Connectors:
Headset: 4-pin male XLR (intended for interfacing with a cable-mounted 4-pin female XLR connector wired with pin 1 mic –/shield/screen; pin 2 mic +; pin 3 headphone –; and pin 4 headphone +)
Ethernet: Neutrik etherCON RJ45
USB: type A receptacle (located inside Model 371's enclosure and used only for firmware updates)

Dimensions (Overall):
3.6 inches wide (9.2 cm)
1.6 inches high (4.0 cm)
4.8 inches deep (12.6 cm)

Mounting: intended for portable applications; contains integral belt clip; optional mounting adapter kit allows Model 371 to be permanently mounted

Weight: 0.6 pounds (0.3 kg)

Specifications subject to change without notice.