Model 374 Intercom Beltpack
Four Channels, Dante™ Technology

STUDIO TECHNOLOGIES INC.

Key Features

- Dante™ Audio-over-Ethernet technology
- Four independent talk and listen channels
- Excellent audio quality
- Configurable button operating modes
- Flexible audio-to-phones routing
- Power-over-Ethernet (PoE) powered

Introduction

The Model 374 Intercom Beltpack starts with the features offered by traditional broadcast party-line (PL) intercom user devices and adds a range of new features along with the advanced performance and capabilities that Dante audio-over-Ethernet provides. With four independent talk and listen channels the Model 374 bridges the gap between typical single- and dual-channel party-line devices and permanently installed multi-channel intercom panels. Imagine the possibilities—four channels of high-quality party-line intercom in a compact, user-worn package.

Over a standard IP network, multiple Model 374 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 preamplifier gain, independent talk button operation, and individual-channel headphone signal routing. User features include integrated sidetone, remote talk channel turn off ("mic kill"), and monitor only modes. This capability, along with the great audio quality provided by the digital audio signal path, offers a unique and powerful user experience.

Set up and configuration of the Model 374 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 stereo or monaural headset with a dynamic microphone interfaces with the unit using a 5-pin XLR connector. DIP switches and software-based configuration are used to establish the unit's operating parameters. Four "push-in/push-out" rotary level controls make it easy to set and maintain the desired headphone output. The Model 374'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 374's four 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 sports and entertainment TV and radio events, streaming broadcasts, corporate and government AV installations, and post-production facilities.

Dante Audio-over-Ethernet

Audio data is sent to and received from the Model 374 using the Dante audio-over-Ethernet media networking technology. As a Dante-compliant device, the Model 374's four output (Dante transmitter) and four input (Dante receiver) audio

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 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 374. 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 374's completely "pro" performance is counter to the less-than-stellar reputation of typical intercom audio. A low-noise, wide dynamic-range microphone preamplifier and associated voltage-controller-amplifier (VCA) dynamics controller ("limiter") ensures that mic input audio quality is preserved while minimizing the chance of signal overload. The output of the microphone preamp and limiter is routed to an analog-to-digital converter (ADC) section that supports a sampling rate of 48 kHz with a bit depth of 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 four Dante receiver channels and pass into the Model 374's processor. The sampling rate is 48 kHz with a bit depth of up to 24. Channel routing, headphone level control, and sidetone creation are performed within the digital domain. This provides flexibility, allows precise control, and keeps the five level potentiometers (channels 1-4 and sidetone) 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, headphones, and earpieces.

Configuration Flexibility

A highlight of the Model 374 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 a button backlight mode. A software-based

configuration mode allows optimizing talk button operation and the routing of the audio inputs to the headphone output channels.

The gain of the microphone preamplifier can be selected from among four choices. This allows compatibility with the dynamic microphones that are part of the many industry-standard broadcast and intercom headsets. A button backlight mode can be enabled to ensure that an LED associated with each of the four talk buttons will always be lit. This is provided for applications where there is little or no ambient lighting available to assist in identifying button locations.

A highly unique Model 374 feature is the ability to individually configure the way in which the four pushbutton switches function; four choices are available. For standard intercom beltpack operation either push to talk or push to talk/tap to latch operation can be selected. For situations where only monitoring of an intercom channel is desired a talk disable mode is available. And for advanced monitoring-only situations a mode can be selected such that a button will serve in an audio on/off role.

Four audio channels arrive via Dante and are destined for the 2-channel headphone output. Each input can be independently routed to the left and right, left-only, or right-only 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 374 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 374'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 374'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 374 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 374 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 374 Specifications

Audio Channels: 4 talk, 4 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: 4
Number of Receiver (Input) Channels: 4
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)

Mic Input:
Type: unbalanced, for use with dynamic microphones
Gain: 34, 40, 43, 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 Outputs:
Compatibility: intended for connection to mono or stereo 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

Connectors:
Headset: 5-pin female XLR
Ethernet: Neutrik etherCON RJ45
USB: type A receptacle (located inside Model 374'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 374 to be permanently mounted

Weight: 0.6 pounds (0.3 kg)

Specifications subject to change without notice.

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