Model 342 Intercom Station

Key Features

- Dante audio-over-Ethernet technology

- Two talk and two listen channels

- Supports dynamic and electret microphones

- 5-pin female XLR headset connector

- 3.5 mm 4-conductor (TRRS) CTIA-compliant 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 342 Intercom Station is a compact, desktop device that supports two channels of talk and 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 342 Intercom Station units and other compatible Studio Technologies' products can be used to create party-line intercom applications with help from an external Dante-enabled audio matrix such as the Studio Technologies' Model 5421 or Model 5422A Dante Intercom Audio Engines. Alternatively, Model 342 units can be used "point-to-point" or interfaced with Dante-compatible matrix intercom systems.

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 power, microphone preamplifier gain, talk button operation, status LED action and intensity, sidetone operation, and headphone channel assignment. Hardware features include dual-channel (stereo) headphone output, dual headset connectors, integrated sidetone, call signal receive display, and remote mic kill ("talk off"). The range of capabilities, along with the excellent audio quality supported by the digital audio path, offers a unique and powerful user experience.

Setting up and configuring a Model 342 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 unit is compatible with both broadcast and "gaming" headsets. A "professional" broadcast or intercom-style headset with a dynamic or electret (DC-powered) microphone can be interfaced with a Model 342 using a 5-pin XLR connector. The Model 342 also directly supports connection of earbuds or gaming headsets that utilize a 3.5 mm 4-conductor (TRRS) CTIA-compliant plug. These moderately priced devices, commonly associated with mobile phones or personal computers, are often of high quality and may be the preferred headset for some applications. With the Model 342's moderate price and ability to support a broad range of headsets, the overall cost of deploying a high-performance intercom system can often meet budget goals.

The STcontroller software application is used to select the Model 342's operating parameters. Versions are available, free of charge, that support the Windows® and macOS® operating systems. The two LED-illuminated talk pushbutton switches can be independently 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 342's

compact enclosure is made from steel which offers both stability and ruggedness.

The audio quality of the Model 342 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, house-of-worship, corporate and government AV, post production, and aerospace.

Dante Audio-over-Ethernet

Audio data is sent to and received from the Model 342 using the Dante audio-over-Ethernet media networking technology. As a Dante-compliant device, the Model 342's two Dante transmitter (output) and two Dante receiver (input) channels will be routed (subscribed) with other devices using the Dante Controller software application. The digital audio's bit depth is up to 24 with a sampling rate of 48 kHz. The Model 342 is AES67-compliant and is compatible with the Dante Domain Manager™ (DDM) software application.

Dual-color LEDs provide status indications of the Dante interface. The Dante Identify command can take on a unique role with the Model 342. Not only can it cause the two talk pushbutton switches to light orange in a highly visible sequence, it can be configured to turn off ("kill") the talk functions if either or both are active.

Audio Quality

The Model 342 offers "pro" audio performance that is not found in typical party-line (PL) intercom devices. 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 (input) channels. The supported sampling rate is 48 kHz with a bit depth of up to 24. The audio signals pass into the Model 342'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 Receive Function

A call receive function allows Model 342 users to be provided with a visual indication that a call signal is active on a Dante receiver (input) channels. The cadence of the visual indication can be configured to meet an application's needs. 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 342 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 342 by way of an Ethernet network connection. Configurable parameters include microphone power and preamplifier gain, headphone monitoring, sidetone operation, call receive cadence, 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 342's two talk pushbutton switches can be independently configured from among four choices: Push to Talk, Latching, Push to Talk/Tap to Latch, or Disabled. Two audio channels arrive via Dante receiver (input) channels 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, dual-channel monaural, and single-channel monaural.

Ethernet Data and PoE

The Model 342 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, located on the unit's back panel, displays the status of the network connection.

The Model 342'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 an

associated data network. To support PoE power management, the Model 342'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 342 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 standard USB flash drive. The Model 342 uses the UltimoX2™ integrated circuit from Audinate to implement its 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 342 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, selectable on/off
Dante Domain Manager (DDM) Support: yes
Bit Depth: up to 24
Sample Rate: 48 kHz
Pull-Up//Down Support: no
Dante Transmitter (Output) Channels: 2
Dante Receiver (Input) Channels: 2
Dante Audio Flows: 4; 2 transmitter, 2 receiver

Network Interface:
Type: 100BASE-TX, Fast Ethernet per IEEE 802.3u (10BASE-T and 1000BASE-T (GigE) not support)
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: 1 dB above nominal level (–19 dBFS)
Slope: 2:1
Status LED: lights when 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 jack
USB: type A receptacle (located in side Model 342's enclosure and used only for application firmware updates)

Configuration: uses Studio Technologies' STcontroller personal computer application

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: 5 to 95%, non-condensing
Altitude: not characterized

Dimensions (Overall):
4.3 inches wide (10.9 cm)
2.1 inches high (5.4 cm)
5.1 inches deep (13.0 cm)

Weight: 1.1 pounds (0.50 kg)

Deployment: intended for tabletop applications

Specifications and information subject to change without notice.