Model 215A
Announcer's Console

User Guide
Issue 2, April 2023

This User Guide is applicable for serial numbers
M215A-00151 and later with Main Firmware version 1.00 and later
and STcontroller software application version 3.08.00 and later

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Revision History

Issue 2, April 2023:

- Corrections made to the 3-pin header connector details in Appendix B.

Issue 1, November 2022:

- Initial release.

Introduction

The Model 215A Announcer's Console is designed to serve as the audio control center for announcers, commentators, and production personnel. This tabletop unit supports applications utilizing the Dante® audio-over-Ethernet media networking technology. The Model 215A is suitable for numerous applications including on-air television sports broadcasting, stadium announcement, and corporate AV. Three pushbutton switches allow the user to control the main and talkback audio output channels. Ease of use, configuration flexibility, and sonic excellence are some of the unit's highlights.

The Model 215A is compatible with broadcast and audio system environments that use Dante technology. An Ethernet connection with Power-over-Ethernet (PoE) power is all that's required to make the unit part of a sophisticated, networked audio system. Add a microphone and pair of headphones (or a broadcast headset) and the installation is complete. Whether it's the on-air audio, the talkback audio, or the headphone cue feed, superior audio quality is always maintained. Using the STcontroller software application, a range of configuration choices allow the desired operating parameters to be easily selected. And while flexible to configure, the user is presented with an easy-to-understand set of controls and indicators.

User Controls and Status Indicators

Three pushbutton switches, four LED indicators, and three rotary controls provide the user with a clear, easy-to-use interface. One pushbutton switch controls the status of the Dante main transmitter (output) channel. This is the audio channel intended for on-air, announcement, or other primary uses. Two LEDs display the on/off status of the main output channel. Two additional pushbutton switches control the status of the Dante talkback transmitter (output) channels. These are the audio signals used to communicate with producers, directors, spotters, or other behind-the-scenes production personnel. A status LED is associated with each of the talkback pushbutton switches. The three pushbutton switches utilize gold-plated contacts for reliable long-term operation and include backlighting using white LEDs. Three rotary controls allow the user to adjust the content and level of the headphone output channels.

Microphone Input

A microphone signal is connected to the Model 215A by way of a standard 3-pin female XLR connector. The unit incorporates a high-performance microphone preamplifier which offers low-noise, low-distortion, and high-headroom amplification over a 19 to 64 dB range. The gain is adjustable in 3-dB steps. The microphone input is compatible with balanced dynamic or condenser microphones. Phantom

Figure 1. Model 215A Announcer's Console front and back views

power is provided and meets the worldwide P48 standard. A dual-color LED indicator serves as an optimization aid when setting the gain of the microphone preamplifier.

Output Channels and their Operation

By way of the Dante interface, the Model 215A provides a main transmitter (output) channel and two talkback transmitter (output) channels. The main output channel is designed to serve as the on-air, stadium announcement, or other primary audio feed. The talkback output channels are intended to provide production trucks, control rooms, or support personnel with a talent-originated cue signal.

In addition to the Dante main and talkback transmitter (output) channels, a fourth Dante transmitter (output) channel, called aux, is also provided. A configuration choice allows the aux channel to be selected for Hot Mic, Tally Tone, or Main Output with 18 kHz Tone operation.

When selected for Hot Mic, an un-switched audio output whose source is the microphone preamplifier is provided

on the Dante aux transmitter (output) channel. This "always active" audio signal could be utilized in an application where the Model 215A is being used in conjunction with an intercom system or audio console. Production personnel may need to monitor the talent audio signal no matter the status of the main or talkback functions.

When selected for Tally Tone operation, a 20 kHz sine wave signal is present on the Dante aux transmitter (output) channel whenever the main output function is active. This tone can be useful as a "trigger" signal for other connected devices that need to provide an indication whenever the Model 215A is actively providing an "on-air" audio signal. For example, a Studio Technologies' Model 391 Dante Alerting Unit can respond to the tally tone signal and provide an "on-air" indicator using its LED display. Alternatively, a Studio Technologies' Model 544D Interface unit could provide a contact closure whenever the tally tone output is active.

Main with 18 kHz Tone allows creation of a unique signal on the aux output. Whenever the Dante main output function is active the signal on the Dante aux transmitter (output) channel will be a combination of audio from the microphone preamplifier and an 18 kHz sine wave tone. This type of signal can be extremely useful in conjunction with REMI/At-Home applications.

A large part of the Model 215A's unique power is the ability to configure the operation of the main and talkback functions. To meet the needs of the many specific broadcast and production applications, a variety of pushbutton switch operating modes are available. The main pushbutton switch can be selected to operate from among five modes. In the Push to Mute mode, the pushbutton performs a momentary mute of the audio signal associated with the Dante main transmitter (output) channel. In this way, a "cough" pushbutton function is created, something typically required for television sports broadcasting. In the Push to Talk mode, the pushbutton switch provides a momentary active function for the Dante main transmitter (output) channel. This mode would be appropriate for an application such as stadium announcement. The Latching (alternate action) mode allows the pushbutton switch to enable or disable the audio signal associated with the Dante main transmitter (output) channel as desired. This is useful in radio broadcasting, announce-booth, or voice-over applications. The fourth mode, Push to Talk/Tap to Latch, provides a hybrid function, supporting both push to talk and tap to enable/tap to disable operation. This operation is similar to that found in many broadcast intercom system user stations. The fifth mode, Push to Mute/Tap to Latch, is a second hybrid function, supporting both push to mute and tap to enable/tap to disable operation.

The pushbutton switches associated with the talkback functions can be independently configured to operate from among three modes. One mode supports a push to talk function. This is typically used for on-air broadcast applications. The second mode provides a latching function. The third mode provides a push to talk/tap to latch function, a hybrid mode that is discussed previously. This mode can be especially useful when the Model 215A is used in production-support applications.

Overall Model 215A operation can be configured from among three modes. One mode is intended for on-air use while the other two can be useful for production applications. The Model 215A's On-Air mode is appropriate for on-air television, radio, and streaming broadcast applications. When on-air is selected the audio signal associated with the Dante main transmitter (output) channel will always mute when either or both the talkback functions are active. This prevents audio that's intended for production or support personnel from being sent out the on-air audio path.

For non-on-air applications, the Model 215A can be configured to operate in two production modes. These allow the Dante main transmitter (output) channel to be used as a third talkback channel, rather than always muting when a talkback function is active. By utilizing one of these production modes, the unit can be even more powerful when used in a live-event application, supporting personnel serving in roles such as sports-event spotter, musical director, or production assistant. In addition to changing how the Dante main transmitter (output) channel will respond to talkback pushbutton switch operation, one of the production modes also support using the headphone output for connection with a power amplifier or amplified loudspeakers. In this mode, the headphone output level will automatically be reduced (attenuated or dimmed) whenever one of the Dante main or talkback transmitter (output) channels is active. This can enhance intelligibility and help prevent acoustical feedback from occurring between loudspeakers and a Model 215A-related microphone.

Headphone Output

The Model 215A provides a number of configuration choices that relate to the unit's 2-channel (stereo) headphone output. These choices include the audio sources that are utilized and how the three rotary level control's function, if and when sidetone action will take place, the minimum headphone output level, and the overall headphone output gain range. Five headphone output audio source and routing modes are offered. These modes impact how the three rotary controls adjust the four Dante receiver (input) channels and the sidetone audio signals.

The first two modes support standard on-air applications and use Dante audio receiver (input) channels 1 and 2. In the broadcast world, these two signals are often referred to as talent cue or IFB audio. In live television applications they typically originate in production trailers or control rooms and provide one channel of program-with-interrupt audio and a second channel with program-only audio. The third, fourth, and fifth configuration modes allow all four of the Dante-provided audio sources to be utilized. These can be useful for more complex or specialized situations.

The three headphone level controls ("rotary pots") are provided for setting the "mix" of the selected audio input sources as well as adjusting the overall headphone output level. How these controls function depend on the selected headphone mode. The first mode can be used to support traditional on-air sports applications. In this mode, it would be typical to route (Dante subscribe) program-with-interrupt audio to the Dante receiver (input) channel 1 and program-only audio to the Dante receiver (input) channel 2. Rotary control A, located on the left side, is used to adjust the level of the program-with-interrupt audio signal that's routed to the left headphone output channel. Rotary control B, located in the center, is used to adjust the level of the program-only audio signal that's routed to the right headphone output channel. For use with dual-channel or stereo cue signals, another headphone output mode provides a stereo ("level/balance") mode. In this mode, rotary control A adjusts the level of both Dante receiver (input) channels 1 and 2, while rotary control B allows adjustment of the left/right level balance. In both of these modes, rotary control C, located on the right side, is used to adjust the level of the sidetone audio signal that can be sent to both the left and right headphone output channels.

When selected for the third headphone output mode rotary control A adjusts the level of Dante receiver (input) channel 1 as it is sent to the left headphone output channel and Dante receiver (input) channel 2 as it is sent to the right headphone output channel. Rotary control B provides the same function for Dante receiver (input) channels 3 and 4. Rotary control C adjusts the sidetone level.

The fourth headphone output mode offers another unique routing choice. Rotary control A adjusts the level of Dante receiver (input) channel 1 as it is sent only to the left headphone output channel. Rotary control B adjusts the level of Dante receiver (input) channel 2 as it is sent only to the right headphone channel. Rotary control C adjusts the level of Dante receiver (input) channels 3 and 4 as they are sent, respectively, to the left and right headphone output channels.

The fifth headphone output mode is similar to the fourth, with the exception that Dante receiver (input) channel 1 is sent to both the left and right headphone output channels; Dante receiver (input) channel 2 is sent to both the left and right headphone output channels.

The sidetone function allows audio from the output of the Model 215A's microphone preamplifier to be sent to the left and right headphone output channels. This can be useful, providing the user with an aural confirmation of the signal connected to the microphone input. This ability can be especially important when a "mix-minus" talent cue signal is provided for the user. For application flexibility the sidetone function can be configured from among four choices, specifying when it will be active in relation to the status of the main and talkback functions. It can also be disabled if desired.

To help minimize the chance of broadcast cues being missed, the action of the rotary level controls can be configured so that there's always a minimum headphone output level. Alternately, the rotary controls can be configured to fully mute when the controls are at their minimum (fully counterclockwise) position. When the rotary level control on the right side, labeled C, is configured for sidetone use it will always allow the sidetone signal to be fully muted.

The 2-channel (stereo) headphone output was designed to meet the needs of contemporary headphones and headsets. Specifically, the two output circuits act as voltage drivers rather than power drivers. In this configuration, they can provide high output levels with very low distortion and noise, along with minimal current consumption. With the Model 215A, all types of headphones, headsets, and earpieces can be directly connected.

A configuration feature allows the overall headphone output gain range to be selected. The low setting is appropriate for most applications where users need to listen at moderate levels. The high setting can be useful when monitoring at higher levels is warranted by an application.

Dante Audio-over-Ethernet

Audio data is sent to and from the Model 215A using the Dante audio-over-Ethernet media networking technology. For flexibility in meeting a variety of application and sonic requirements, bit depths of up to 24 and sample rates of 44.1 and 48 kHz are supported.

Audio transmitter (output) and receiver (input) channels on associated Dante-enabled devices can be routed (Dante subscribed) to the Model 215A using the Dante Controller software application. This makes selecting the way in which the Model 215A fits into an application a simple matter. For example, the Dante main transmitter (output) channel can be routed to the Dante receiver (input) channel of an audio console. The Dante talkback transmitter (output) audio output channels could be routed to Dante receiver (input)

inputs on a matrix intercom system. And the Dante aux transmitter (output) channel, configured for Hot Mic, could be routed directly to an amplified speaker for producer or director use. No special assignment or "multing" using cables or patch points is necessary to send a Dante transmitter (output) channel to Dante receiver (input) channels of multiple destinations – only a single mouse-click is required to reroute or assign a Dante audio signal.

On its input side, the Model 215A allows up to four headphone cue sources to be received from an audio console, matrix intercom system, or a variety of other Dante-enabled devices; the sources don't need to originate from the same device although there is a limit of two. In this way, program audio could be supplied by an audio console while program-with-interrupt audio could be supplied by a matrix intercom system.

Ethernet Data, PoE, and DC Power Source

The Model 215A connects to a 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 to meet the needs of harsh or high-reliability environments. The Model 215A's operating power can be provided by way of the Ethernet interface using the Power-over-Ethernet (PoE) standard. This allows fast and efficient interconnection with the associated data network. To support PoE power management, the Model 215A's PoE interface reports to the power sourcing equipment (PSE) that it's a class 2 (low power) device. (In PoE parlance the Model 215A is a standard PD (powered device).) The unit can also be powered using an external source of 12 volts DC. For redundancy, both power sources can be connected simultaneously. If both sources are connected, PoE will power the unit. Four LEDs, located on the back panel, display the status of the network connection, PoE power source, and Dante interface.

Configuration Flexibility

The Model 215A can be configured to meet the needs of specific applications and user preferences. All configuration tasks are performed using the STcontroller personal computer software application, available free of charge on the Studio Technologies' website. (Versions of STcontroller that are compatible with the Windows® and macOS® operating systems can be downloaded.) In the Model 215A there are no mechanical switch settings or button-press sequences required to configure how the unit functions. Selectable parameters include microphone preamplifier gain, P48 phantom power on/off, input channel routing and headphone output performance, sidetone operation,

pushbutton switch operation, and overall operating mode. Changes made to any of the configuration parameters become active immediately.

The gain of the microphone preamplifier can be selected in 3-dB steps over a 19 to 64 dB range. This allows the Model 215A to match the output sensitivity of a range of handheld and headset-associated microphones. A low-noise source of P48 phantom power can be enabled if required to support condenser microphones. The four Dante receiver (input) audio sources and the way in which they are assigned to the headphone output channels can be configured. This configuration includes how the three rotary controls (pots) function. These five unique choices allow almost any required headphone monitoring situation to be implemented. Whether for use in on-air sports, in stadium announcement applications, or as a production support tool, the Model 215A should be able to achieve the desired configuration. The integrated sidetone function can be configured to operate from among three choices. This allows audio associated with the output of the microphone preamplifier to be sent to the headphone output channels as required. Sidetone can be important as some applications may provide a "mix-minus" talent cue signal that doesn't include the user's own voice content. A configuration selection allows the operation of the main pushbutton switch and its associated function to be selected from among five choices. The talkback buttons can be configured from among three choices.

Customization

In the world of broadcast and production audio it's fair to say that applications vary widely. To this end, one or two additional XLR connectors can easily be mounted into the Model 215A's back panel. Multiple 3-position headers, located on the Model 215A's circuit board, provide technician access to microphone, headphone, pushbutton switch, and relay connections. Using a variety of optional factory-supplied connector and interface cable kits allows a Model 215A to be optimized to meet the needs of specific applications. For example, some applications may prefer to use a multi-pin XLR connector to interface with a headset. This can easily be accomplished by installing the appropriate 6- or 7-pin XLR connector kit and making a few simple connections. Other applications may benefit from having "mult" or "loop-through" connections, something easily incorporated into a Model 215A. External contact closures to activate the main and/or talkback functions can be interfaced using a 4-pin XLR connector kit.

Two general-purpose relay contacts are provided on the Model 215A's circuit board. Accessible using 3-pin header connectors, they allow specialized configurations to be created. Under software control, the form-A (normally open) solid-state relay contacts can be configured to follow the state of the main and talkback functions. Taking advantage

of the two locations provided for additional XLR connectors, a technician may easily implement a variety of functions such as a tally indication or audio muting during talkback.

Future Capabilities and Firmware Updating

The Model 215A was designed so that in the future its capabilities and performance can be easily enhanced. A USB type A receptacle, located on the unit's back panel, allows the operating firmware (embedded software) to be updated using a standard USB flash drive. The Model 215A uses Audinate's Ultimo™ integrated circuit for implementing Dante. The firmware within this integrated circuit can be updated via the Ethernet connection, helping to ensure that its capabilities remain up to date.

Getting Started

In this section, signal interconnections will be made using the connectors located on the back panel of the Model 215A. A microphone signal will be interfaced by way of a 3-pin XLR connector. A ¼-inch 3-conductor phone jack is provided for the headphone output. An Ethernet connection will be made using either a standard RJ45 patch cable or an etherCON protected RJ45 plug. This will typically supply power-over-Ethernet (PoE) along with data. A 4-pin XLR connector allows the connection of an external source of 12 volts DC.

System Components

Included in the shipping carton will be a Model 215A Announcer's Console and instructions on how to obtain an electronic copy of this guide. As a device that can be Power-over-Ethernet (PoE) powered, no external power source is provided. If the local-area-network (LAN) associated with the application won't provide PoE, an external source of 12 volts DC will need to be provided. An applicable power supply, the Studio Technologies' PS-DC-02, is available as an option.

Microphone Input

The Model 215A is compatible with balanced dynamic and condenser microphones. Depending on the application, the microphone may be part of a headset or be an independent handheld or stand-mounted model. The Model 215A's P48 microphone power source will support essentially all phantom-powered microphones. The quality of the Model 215A's microphone preamplifier and associated circuitry is such that applications may benefit from using "high-end" microphones.

Microphone interconnection is made by way of a 3-pin female XLR connector, located on the Model 215A's back panel. The mating connector (male) should be wired such that pin 2 is signal high (+ or hot), pin 3 is signal low (– or

cold), and pin 1 is shield. It's possible that an unbalanced microphone will also work correctly. In this case, the mating connector (male) should be wired so that XLR male pin 2 is signal high (+ or hot) and signal common/shield is connected to both XLR male pins 1 and 3.

As of the writing date of this guide, the Sennheiser HMD 26-II and HMD 27 headsets are popular for on-air sports broadcasting use. Fine products, they work very well with the Model 215A. Adding the suffix "-XQ" to the headsets' full part number specifies a 3-pin male XLR connector for the microphone and a ¼-inch 3-conductor plug for the stereo headphones. This configuration is very useful, allowing the headsets to work directly "out of the box" with the Model 215A. These two headset models from the HMD-series feature dynamic microphones and will function directly with the Model 215A. Units from the HME-series of headsets are NOT compatible with the Model 215A as they require an electret (unbalanced, low-voltage DC) power source. This is completely different from the P48 phantom power standard that the Model 215A supports.

Models from manufacturers such as AKG, beyerdynamic, DPA, Sennheiser, and Shure can perform very well in Model 215A applications. A headset that users have reported being satisfied with is the Audio-Technica BPHS1. Offered at a relatively low price point, it may be applicable for some applications.

Headphone Output

The Model 215A provides a 2-channel ("stereo") headphone output by way of a 3-conductor ¼-inch phone jack. Devices such as stereo headphones or "dual-ear" broadcast-style headsets can be directly connected using a 3-conductor ¼-inch plug. Following the usual convention, the left channel should be terminated on the tip lead, the right channel on the ring lead, and common on the sleeve lead.

It's also possible to use a monaural ("single-ear") headset or broadcast-type single earbud as long as sufficient care is taken. If a 3-conductor ¼-inch plug is used by the device it should be wired such that the tip lead is connected to the positive terminal of the transducer and the sleeve lead is connected to the negative or common lead of the transducer; the plug's ring lead should be left unconnected.

A single- or dual-ear monaural device that is terminated on a 2-conductor (tip and sleeve) ¼-inch plug can also be utilized. When a plug of this type is inserted into the Model 215A's headphone output connector (phone jack) the unit's right headphone output channel will be shorted. (This occurs since the ring lead of the connector would be directly shorted to the sleeve lead.) This can stress the Model 215A's right channel headphone output circuitry as well as drawing extra current from the output stage. To

prevent this unwanted condition the Headphone Output – Audio Sources and Routing should be set for Mode 4. Audio should then only be routed (subscribed) to the Dante receiver (input) channels associated with the left headphone output channels. This will prevent audio from being sent to the right headphone output channel. Refer to a later section for details on how to configure the headphone output.

Ethernet Connection

An Ethernet connection that supports 100BASE-TX is required for the Model 215A's Dante audio-over-Ethernet connectivity. A 10BASE-T connection is not sufficient for Model 215A operation. A 1000BASE-T (GigE) connection is not supported unless it can automatically "fall back" to 100BASE-TX operation. An Ethernet connection that supports Power-over-Ethernet (PoE) is recommended as it will provide both data and operating power for the Model 215A. For Ethernet switches that provide PoE (referred to as power sourcing equipment or PSE), the Model 215A will enumerate itself as a PoE class 2 device. If PoE is not available an external 12 volts DC power source can also be connected. A compatible power supply is not included with the Model 215A and must be purchased separately.

The 100 Mb/s twisted-pair Ethernet connection is made using a Neutrik etherCON protected RJ45 connector that is located on the back panel of the Model 215A. This allows connection using a cable-mounted etherCON plug or a standard RJ45 plug. The Model 215A's Ethernet interface supports auto MDI/MDI-X which ensures that a "reversing" or "crossover" data patch cable will not be required.

External 12 Volts DC Input

An external source of 12 volts DC can be connected to the Model 215A by way of the 4-pin male XLR connector, located on the back panel. While the requirement for the external source is nominally 12 volts, correct operation will take place over a range of 10 to 18 volts. The Model 215A's operating current is modest (less than 300 milliamperes at 12 volts) and the exact value is stated in the Specifications section. The DC source should be terminated to a 4-pin female XLR connector with pin 1 negative (–) and pin 4 positive (+). Purchased as an option, the PS-DC-02 power supply is available from Studio Technologies. Its AC mains input allows connection of 100-240 volts, 50/60 Hz and its output, terminated on a 4-pin XLR female connector, is 12 volts DC, 1.5 amperes maximum.

Redundant Power

As previously discussed, an Ethernet connection that provides Power-over-Ethernet (PoE) can serve as the Model 215A's power source. Alternately, an external 12 volts DC source can be connected. For redundancy, both PoE and the external 12 volts DC source can be connected at the same time. If both PoE and an external 12 volts DC source are connected, power will be drawn only from the PoE supply. If the PoE source becomes inoperative the 12 volts DC source will provide the Model 215A's power with no interruption in operation.

Pushbutton Labeling

The specific pushbutton switches used in the Model 215A were selected for several reasons. Foremost was the fact that they are highly reliable, including having gold-plated contacts for long life in less-than-ideal environments. The second reason was that applying customized labels to the underside of the pushbutton caps would be relatively simple. The labels, text printed on clear material, are placed under the clear caps on top of the white plastic diffuser material, essentially on the top of the pushbuttons.

From the factory, the pushbuttons are labeled, from left to right, COUGH, TALKBACK 1, and TALKBACK 2. These were selected to be appropriate for many on-air applications in English-speaking locations. It's expected that these may be changed to meet the specific needs of an application.

As a "head start" for some applications, a clear sheet printed with a number of commonly used pushbutton designations is included in the shipping carton. These were created at the factory using a standard personal computer graphics program and laser printed onto sheets of transparency film. The desired pushbutton labels can be cut out with a pair of scissors or an X-ACTO® (razor) knife following the printed guidelines that indicate the required size.

The clear lens on top of each pushbutton cap can be removed with a fingernail or small screwdriver. Be certain not to scratch the pushbutton if a screwdriver or other small tool is used. The clear label can be removed and replaced. The cap is then snapped back into the top of the housing using finger-pressure only. No tool is required to replace the cap.

If you need to make your own labels the process is quite simple. Use a personal computer to create the desired text. The finished label size should be 0.625-inches (15.8 mm) square. The completed artwork can then be printed on transparency film sheets using a laser or inkjet printer. These sheets are readily available from most office supply stores. A pair of scissors or an X-ACTO (razor) knife will complete the task.

Dante Configuration

For audio to correctly pass to and from the Model 215A requires, at a minimum, that several Dante-related parameters be configured. These configuration settings will be stored in non-volatile memory within the Model 215A's Dante network interface circuitry. Configuration will typically

be done with the Dante Controller software application which is available for download free of charge at audinate.com. Versions of Dante Controller are available to support Windows and macOS operating systems.

The Model 215A uses the Ultimo integrated circuit to implement the Dante architecture. This dictates which parameters can be configured and what choices are available. The Model 215A is compatible with AES67 and the Dante Domain Manager™ (DDM) software application. AES67 operation requires that a setting within Dante Controller be enabled. For DDM operation please refer to the specific DDM documentation for details on what Model 215A and related parameters may have to be configured.

Audio Routing

The Model 215A's four Dante transmitter (output) channels must be assigned to the desired Dante receiver (input) channels on associated equipment. This will route the main, talkback, and auxiliary transmitter (output) channels to the devices that will be "listening" to them. Within Dante Controller a "subscription" is the term used for routing a transmitter flow (a group of up to four output channels) to a receiver flow (a group of up to four input channels).

Using Dante Controller, the desired Dante transmitter (output) channels can be routed to the four Dante receiver (input) channels associated with the Model 215A. The exact number utilized will depend on the specific application. The configured headphone output audio sources and routing mode will determine how the Dante receiver (input) channels will be associated with the three level controls and the headphone output channels.

As previously mentioned, the Model 215A uses the Ultimo integrated circuit to implement its Dante functionality. The number of flows associated with this integrated circuit is four, two transmitter and two receiver; as such, the chance of a flow limitation is very possible. These flows can either be unicast, multicast, or a combination of the two. (Note that when operating in the AES67 mode the Dante transmitter (output) channels will function only in multicast; unicast is not supported.) If the Model 215A's Dante transmitter (output) channels need to be routed to more than two flows it's possible that an intermediary device with enhanced flow capability, such as the Studio Technologies' Model 5422A Dante Intercom Audio Engine, can be used to "repeat" the signals.

Unit and Channel Names

The Model 215A has a default Dante device name of **ST-M215A** and a unique suffix. The suffix identifies the specific Model 215A that is being configured. The Model 215A provides four Dante transmitter (output) channels with the default names of **Main**, **Talkback 1**, **Talkback 2**,

and **Aux**. The Model 215A has four Dante receiver (input) channels with default names of **Headphone Ch1**, **Headphone Ch2**, **Headphone Ch3**, and **Headphone Ch4**. Using Dante Controller, these names can be revised as appropriate for the specific application.

Device Configuration

The Model 215A supports audio sample rates of 44.1 and 48 kHz with no pull-up/down options available. For most professional audio applications, a sample rate of 48 kHz would be appropriate. The digital audio data is in the form of pulse-code modulation (PCM) samples. Encoding choices within Dante Controller are *PCM 16*, *PCM 24*, and *PCM 32*, but in most cases the default selection of PCM 24 would be appropriate. Clocking and Device Latency Parameters can be adjusted if required but the default values in Dante Controller are typically correct.

Network Configuration – Address

By default, the Model 215A's Dante IP address and related network parameters will be determined automatically using the DHCP or, if that's not available, link-local network protocols. If desired, Dante Controller allows the IP address and related network parameters to be manually set to a fixed (static) configuration. While this is a more-involved process than simply letting DHCP or link-local "do their thing," if fixed addressing is necessary then this capability is available. In this case, it's highly recommended that every unit be physically marked, e.g., directly using a permanent marker or "console tape," with its specific static IP address. If knowledge of a Model 215A's IP address has been misplaced there is no reset button or other method to easily restore the unit to a known (default) IP setting.

AES67 Configuration – AES67 Mode

Dante Controller allows a Model 215A to be configured for AES67 operation. This requires the AES67 Mode to be set for Enabled. By default, AES67 mode is set for Disabled.

Model 215A Clocking Source

While technically the Model 215A can serve as a Leader clock for a Dante network (as can all Dante-enabled devices), in virtually all cases the unit will be configured to receive its timing reference ("sync") from another device. As such, Dante Controller's check box for Preferred Leader associated with the Model 215A would typically not be enabled.

Model 215A Configuration

The STcontroller software application is used to configure the way in which the Model 215A functions. No DIP switch settings or other local actions are used to configure the unit. This makes it imperative that STcontroller be available for convenient use on a personal computer that's connected to the related LAN.

Changes made using STcontroller will be immediately reflected in the unit's operation; no Model 215A reboot is required. Each time a Model 215A configuration change is made the unit's main and talkback LEDs on the front panel will flash in a distinctive pattern. This provides a clear indication that a command from STcontroller has been received and acted upon.

Installing STcontroller

STcontroller is available free of charge on the Studio Technologies' website (studio-tech.com). Versions are available that are compatible with personal computers running selected versions of the Windows and macOS operating systems. If required, download and install STcontroller onto the designated personal computer. The network connection of this personal computer must be on the same local area network (LAN) and subnet as the Model 215A unit that is going to be configured. Immediately after starting STcontroller the application will locate all the Studio Technologies' devices that it can control. The one or more Model 215A units to be configured will appear in the device list. Use the Identify command to allow easy recognition of a specific Model 215A unit. Double-clicking on a device name will cause the associated configuration menu to appear. Review the current configuration and make any changes that are desired.

Menu Page

The following configuration selections are available in the STcontroller menu:
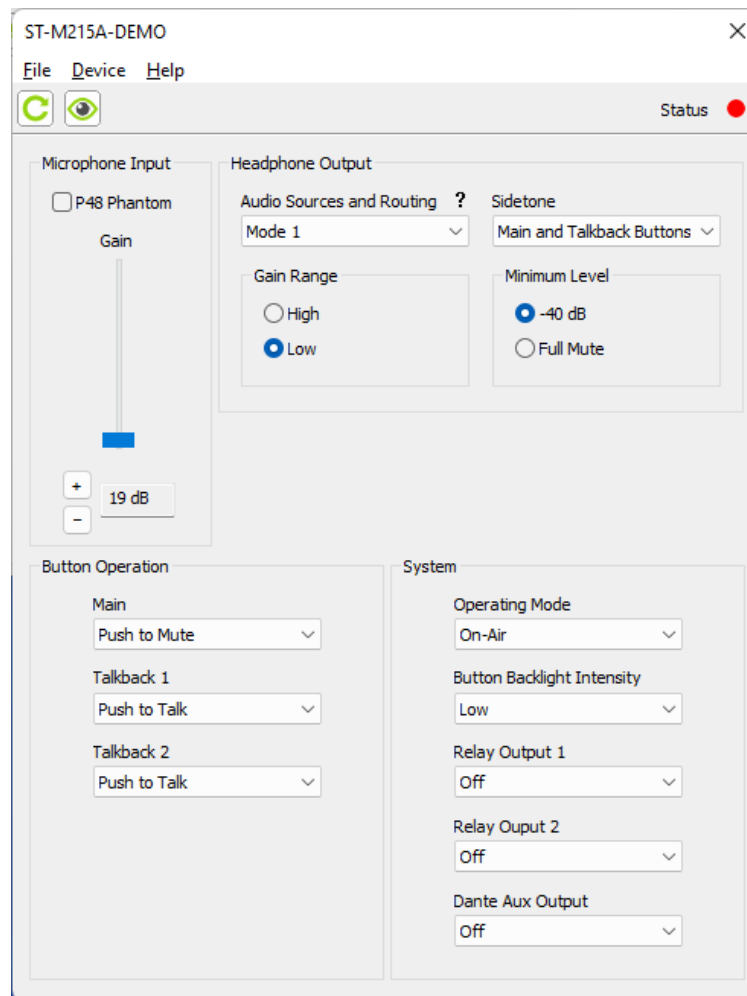
Microphone Input – P48 Phantom Power

Choices are *Off* and *On*.

STcontroller allows selection of the on/off status of the microphone input's P48 phantom power source. The on/off status is displayed by way of an LED, red in color, located on the back panel adjacent to the microphone input connector. Select the status of the P48 source to meet the needs of the connected microphone.

Microphone Input – Gain

Choices are 19 dB to 64 dB in 3-dB steps.

STcontroller is used to select the gain of the microphone preamplifier. There's no problem changing the gain setting while the unit is operating. Small audio clicks or pops might occur during gain transitions but this shouldn't be a major issue as long as associated monitor loudspeakers are temporarily attenuated or muted.

To select the correct amount of gain for an application will probably take some experimentation. The goal is to bring the microphone's signal up to the Dante reference level which Studio Technologies considers to be –20 dBFS (this is 20 dB below the digital maximum of 0 dBFS). Operating at this nominal signal level will help ensure that optimal audio performance is delivered to the destination device or devices.

There's no "perfect" gain setting that this guide can recommend. The two issues that impact the gain setting are the output sensitivity of the connected microphone and the acoustical output level of the microphone's user. With some headset microphones, such as that in a Sennheiser HMD 26 or HMD 27, selecting an initial gain setting of 43 or 46 dB would be appropriate. Users who speak loudly might need to have the gain reduced to 40 or even 37 dB; quiet users might need 49 or 52 dB of gain.

Observing the signal level on the device that's being "fed" (digitally supplied) by the Model 215A's Dante main transmitter (output) channel is a good means of checking the actual signal level as it relates to the configuration of the microphone preamplifier. Most devices have some method of providing an indication of the digital level, either in the form of a numerical value, physical or virtual "VU" meter, or LED-based display. The Studio Technologies' Model 5202 Dante to Phones and Line Output Interface would also be an excellent means of monitoring the Model 215A's output level. The Model 5202 provides a 2-channel LED level that is calibrated in dBFS.

A dual-color LED, located on the Model 215A's back panel adjacent to the microphone input connector, is provided as an aid when adjusting the gain of the microphone preamplifier. It provides a 3-step indication of the output level of the microphone preamplifier. It will light green when the signal level is –40 dBFS or greater, light in a mix of green and red when the signal level is –14 dBFS or greater, and light red only when the signal level is –4 dBFS or greater. When the gain of the microphone preamplifier is set optimally a signal at a normal level that's applied to the microphone input will cause the LED to light green with an occasional peak signal causing the LED to light both green and red at the same time. A more conservative gain setting would find that the LED would only light green. A gain setting that results in the LED ever lighting only red would be incorrect. The gain must be reduced or the audio quality would probably be severely compromised.

Headphone Output – Audio Sources and Routing

Choices are *Mode 1*, *Mode 2*, *Mode 3*, *Mode 4*, and *Mode 5*.

STcontroller allows selection from among five headphone audio source and routing modes. Each mode is distinct and careful selection will help optimize the Model 215A's operation for a range of applications.

Mode 1 – Ch1 L / Ch2 R / Sidetone LR: This mode is provided for on-air applications where two independent audio sources need to be routed separately to the two headphone output channels. Dante receiver (input) channel 1 will be routed to the left headphone output channel and level control A will adjust its level. Dante receiver (input) channel 2 will be routed to the right headphone output channel and level control B will adjust its level. Level control C will adjust the level of the sidetone audio as it is sent to both the left and right headphone output channels.

Mode 2 – Ch1 L Ch2 R / Balance LR / Sidetone LR: This mode is provided for stereo applications that could include live music events that are distributed via streaming audio or by way of an over-the-air broadcast. In these applications

it's typical to want the user to have a single control to simultaneously adjust the level of a stereo pair while a separate potentiometer is used to adjust the left/right level balance.

When set for Mode 2 Dante receiver (input) channel 1 will be routed to the left headphone output channel and Dante receiver (input) channel 2 will be routed to the right headphone output channel. Level control A will adjust the level of the input channels as they sent to both headphone output channels. Level control B will adjust the level balance between the left and right output channels. Level control C will adjust the level of the sidetone audio as it is sent to both the left and right headphone output channels.

Mode 3 – Ch1 L Ch2 R / Ch3 L Ch4 R / Sidetone LR: This mode can be useful in applications where two stereo signals need to be provided to the user on the left and right headphone output channels. In this mode, Dante receiver (input) channels 1 and 2 are routed, respectively, to the left and right channels of the headphone output. Level control A adjusts the level of this stereo pair. Dante receiver (input) channels 3 and 4 are also routed, respectively, to the left and right channels of the headphone output. Level control B adjusts the level of this stereo pair as it is sent to the headphone output channels. Level control C adjusts the level of the sidetone audio as it is sent to both the left and right headphone output channels.

Mode 4 – Ch1 L / Ch2 R / Ch3 L Ch4 R: This mode is very similar to Mode 1 except instead of providing sidetone another stereo pair can be routed to the left and right headphone output channels. Dante receiver (input) channel 1 is routed to the left channel of the headphone output. Level control A adjusts its level. Dante receiver (input) channel 2 is routed to the right headphone output channel and level control B adjusts its level. A stereo pair can enter the Model 215A by way of Dante receiver (input) channels 3 and 4. These signals, whose level is adjusted using the level control C, are sent, respectively, to the left and right channels of the headphone output.

Mode 5 – Ch1 LR / Ch2 LR / Ch3 L Ch4 R: This mode is a unique variation where two monaural signals can be routed to both the left and right headphone output channels while a stereo input source is routed, in stereo, to the headphone output channels. Dante receiver (input) channel 1 will be routed to both the left and right channels of the headphone output. Its level is adjusted by level control A. Dante receiver (input) channel 2 will also be routed to both the left and right channels of the headphone output. Its level will be adjusted using level control B. A stereo pair can enter the Model 215A by way of Dante receiver (input) channels 3 and 4. These signals will be sent, in stereo, to the left and right channels of the headphone output. Their level, as a pair, will be adjusted using level control C.

Headphone Output – Sidetone

Choices are *Off*, *Main Button*, *Talkback Buttons*, and *Main and Talkback Buttons*.

STcontroller allows the Model 215A's sidetone function to be configured as desired. Sidetone is audio from the output of the microphone preamplifier that is sent to the headphone output channels. This can be important, allowing the user to "hear" themselves for performance confirmation and comfort. Making a specific selection from among the four available modes will depend on the needs of the application. If a "full mix" is being provided to the Model 215A's Dante receiver (input) channels then locally provided sidetone won't be needed and the Off mode should be selected. The user will hear themselves by way of the audio signals that are arriving via the Dante receiver (input) channels. If "mix-minus" audio is being supplied to the Model 215A then selecting one of the headphone source and routing modes which enables sidetone (modes 1, 2, or 3) can be an important means of establishing user confidence. The selected sidetone mode will determine exactly when sidetone audio will be sent to the headphone output channels.

Off: In this mode, the sidetone function is not active.

Main Button: In this mode, the sidetone function will be active whenever the main button function is active and audio associated with the microphone preamplifier is present on the Dante main transmitter (output) channel.

Talkback Buttons: In this mode, the sidetone function will be active whenever either or both of the talkback buttons are active and audio associated with the microphone preamplifier is present on either or both of the Dante talkback transmitter (output) channels.

Main and Talkback Buttons: In this mode, the sidetone function will be active whenever one or more of the main or talkback buttons are active and audio associated with the microphone preamplifier is present on the Dante main or Dante talkback transmitter (output) channels.

Headphone Output – Gain Range

Choices are *High* and *Low*.

STcontroller is used to select the overall level of the headphone output channels. The default setting, *Low*, is designed so that users with typical audio input sources will be inclined to set the three rotary level controls at approximately 50% of their rotation. This would be appropriate for most applications. The *High* setting would be applicable in cases where an extreme headphone output level is required or the level of the audio input sources is lower than typical. Using the High setting in the former application is not recommended as hearing damage could result from exposure to high signal levels.

Headphone Output – Minimum Level

Choices are *–40 dB* or *Full Mute*.

STcontroller allows selection of the headphone output's minimum level. In the *–40 dB* setting the minimum headphone output level is approximately 40 dB below the maximum output level; the headphone output will never fully mute. This ensures that audio signals present on the selected Dante receiver (input) channels will always be present on the headphone output channels. In most on-air broadcast applications this is the appropriate setting, ensuring that some level of signal is always present.

When *Full Mute* is selected moving any level control to its fully counterclockwise position will cause its associated channel to fully mute. If a level control is set to serve as a balance control, moving it to either its fully counterclockwise or its fully clockwise position will cause the associated signal to mute. Selecting the Full Mute mode may be appropriate for applications where minimizing the chance of audio "leakage" into an active microphone is important. As an example, this setting could useful when the connected headset or headphones are at times placed on a desk or tabletop, adjacent to on-air talent.

Note that when level control C, located on the right side of the front panel, has been configured to control the sidetone level the configuration of the headphone output minimum level mode will not impact it. When level control C is used for sidetone, setting it to its fully counterclockwise position will always cause the sidetone output level to fully mute.

Button Operation – Main

Choices are *Push to Mute*, *Push to Talk*, *Latching*, *Push to Talk/Tap to Latch*, and *Push to Mute/Tap to Latch*.

STcontroller allows the operating mode of the main button to be configured. There are five choices available:

Push to Mute: If this mode is selected, the main button function will normally be active. The audio signal associated with the output of the microphone preamplifier will be routed to the Dante main transmitter (output) channel. Whenever the main button is pressed this audio signal will not be present on the Dante main transmitter (output) channel.

Push to Talk: If this mode is selected, the main button function will normally be inactive. The audio signal associated with the microphone preamplifier will not be present on the Dante main transmitter (output) channel. Whenever the main button is pressed the audio signal will become active on the Dante main transmitter (output) channel.

Latching: If this mode is selected, the main button's function will alternate between its active and inactive states whenever the main button is pressed. Upon Model 215A power up the function will be in its inactive state.

Push to Talk/Tap to Latch: This mode is a combination of the Push to Talk and Latching modes. It's similar to the way talk pushbutton switches function on user stations associated with broadcast or production intercom systems. If the main button is pressed and held the main button's function will be active. It will stay active until the main button is released. If the main button is momentarily "tapped" the main button's status will change, either from inactive-to-active or from active-to-inactive. Upon Model 215A power up the main button function will be in its inactive state.

Push to Mute/Tap to Latch: This mode is a combination of the Push to Mute and Latching modes. Whenever the main button is momentarily "tapped" the main button's status will change, either from active-to-inactive or inactive-to-active. The audio signal associated with the output of the microphone preamplifier will be routed to the Dante main transmitter (output) channel. Whenever the main button is pressed and held this audio signal will not be present on the Dante main transmitter (output) channel. It will stay in this condition until the main button is released. Upon Model 215A power up the main button function will be in its inactive state.

Button Operation – Talkback 1

Choices are *Push to Talk*, *Latching*, and *Push to Talk/ Tap to Latch*.

The manner in which talkback button 1 functions can be configured. There are three mode choices available.

Push to Talk: If this mode is selected, the talkback function will normally be inactive and the LED associated with the talkback button will not be lit. Whenever the talkback button is pressed the talkback function will become active and depending on the unit's configuration, the button's green or red LED will light.

Latching: If this mode is selected, the talkback function will alternate between the active and inactive states whenever the talkback button is pressed. Upon power up the talkback function will be in its inactive state and its button LED will not be lit.

Push to Talk/Tap to Latch: This mode is a combination of the Push to Talk and Latching modes. It's similar to the way talk pushbutton switches function on user stations associated with broadcast or production intercom systems. If the talkback button is pressed and held the talkback function will be active. It will stay active until the talkback button is released. If the talkback button is momentarily "tapped" the status of the talkback function will change, either from inactive-to-active or from active-to-inactive. Upon Model 215A power up the talkback button will be in its inactive state and its LED will not be lit.

Button Operation – Talkback 2

Choices are *Push to Talk*, *Latching*, and *Push to Talk/ Tap to Latch*.

The manner in which talkback button 2 functions can be configured. There are three mode choices available. How they function are identical to those that described for talkback button 1.

System – Operating Mode

Choices are *On-Air*, *Production*, and *Production with Dim*.

The operating mode configures the overall manner in which the Model 215A operates. Specifically, it determines how the Dante main transmitter (output) channel operates vis-à-vis the Dante talkback transmitter (output) channels and whether the headphone output level is reduced during talkback operation. Understanding how these three modes impact overall system operation will ensure that correct operation and maximum usability will occur.

On-Air: When selected to the On-Air mode, the audio signal on the Dante main transmitter (output) channel will mute whenever either or both of the Dante talkback transmitter (output) channels are active. The On-Air mode should be selected for all on-air broadcast applications when it's imperative that the audio signal on the Dante main transmitter (output) channel be muted whenever on-air talent uses either or both of the talkback functions to communicate with production personnel.

Production: When the system mode is set for Production, the audio signal on the Dante main transmitter (output) channel won't mute in response to either or both of the talkback functions being active. This mode allows the Dante main transmitter (output) channel to be used, for example, as an additional Dante talkback transmitter (output). In this way, the Dante main and Dante talkback transmitter (output) channels can be used independently, with neither impacting the other. This also allows the three pushbutton switches and their associated functions to be used simultaneously. When selected for the correct application, this mode can prove to be very useful. However, it's not appropriate for on-air use!

Production with Dim: This mode is identical to the Production mode with the exception that the headphone output will reduce in level ("dim") whenever the main or talkback functions are active. This mode was specifically provided to minimize the chance that acoustical feedback will occur in applications where the headphone output is connected to inputs on audio amplifiers or amplified speakers. In this mode, the level of the headphone output channels is reduced by 18 dB whenever a main or talkback function is active. This mode is not appropriate when headphones are going to be connected to the Model 215A!

System – Button Backlight Intensity

Choices are *High* and *Low*.

This configuration choice selects the intensity of the white LEDs that provide backlighting for the three pushbutton switches. *Low* is appropriate when the Model 215A is to be used in an environment where the ambient light level is low. *High* would be appropriate where other light sources in the physical area may make the main and talkback pushbuttons more difficult to identify. High may also be useful when identification markings have been inserted under the clear lens caps.

System – Relay Output 1

Choices are *Off*, *Main Button*, *Talkback 1 Button*, *Talkback 2 Button*, and *Main and Talkback Buttons*.

This configuration choice selects when relay output 1 will be enabled.

Off: When relay output 1 is configured for Off the contact associated with relay output 1 will never close (short). This setting would be appropriate when relay output 1 is not being utilized.

Main Button: When relay output 1 is configured for Main Button the contact associated with relay output 1 will close (short) whenever the main button function is active.

Talkback Button 1: When relay output 1 is configured for Talkback Button 1 the contact associated with relay output 1 will close (short) whenever the talkback button 1 function is active.

Talkback Button 2: When relay output 1 is configured for Talkback Button 2 the contact associated with relay output 1 will close (short) whenever the talkback button 2 function is active.

Main and Talkback Buttons: When relay output 1 is configured for Main and Talkback buttons the contact associated with relay output 1 will close (short) whenever the main or talkback button functions are active.

System – Relay Output 2

Choices are *Off*, *Main Button*, *Talkback 1 Button*, *Talkback 2 Button*, and *Main and Talkback Buttons*.

This configuration choice selects when relay output 2 will be enabled.

The exact functioning of the choices for relay output 2 is identical to those provided for relay output 1.

System – Dante Aux Output

Choices are *Off*, *Hot Mic*, *Tally Tone*, and *Main with 18 kHz Tone*.

The Dante aux transmitter (output) channel is available for special applications and is capable of providing a variety of audio signals. Each configuration choice has been carefully selected and may prove useful in sophisticated applications. If the Dante aux transmitter (output) channel is not going to be utilized then the *Off* mode choice should be selected.

When *Hot Mic* is selected audio associated with the output of the Model 215A's microphone preamplifier will always be present on the Dante aux transmitter (output) channel. The Hot Mic function can be very useful but has the potential for abuse. By the very nature of a hot mic function, no button press by the user can cause the audio signal on the Dante aux transmitter (output) channel to become inactive. Users must be aware that audio from the microphone preamplifier will always be present on this Dante transmitter (output) channel.

When *Tally Tone* is selected a 20 kHz sine wave signal at a level of −20 dBFS will be present on the Dante aux transmitter (output) channel whenever the main output function is active. This is provided as a control signal for use in REMI/At-Home or other specialized applications. A 20 kHz tone being present on the Dante aux transmitter (output) will serve as a tally signal indicating that audio can be present on the Dante main transmitter (output) channel.

Main with 18 kHz Tone is an interesting configuration choice. Whenever the Dante main transmitter (output) channel is active the signal on the Dante aux transmitter (output) channel will consist of a combination (sum or mix) of audio from the output of the microphone preamplifier and an 18 kHz sine wave tone. In this way, the Dante aux transmitter (output) can prove to be especially useful for REMI/At-Home applications. Other products from Studio Technologies, including the Model 5422A Dante Intercom Audio Engine and the Model 391 Dante Alerting Unit, can directly utilize this signal.

Operation

At this point, the microphone, headphone, Ethernet, and, if required, 12 volts DC power connections should have been made. The pushbutton labels may have been revised. The desired configuration should have been made using the STcontroller software application. The Dante transmitter (output) and Dante receiver (input) channels should have been routed (subscribed) using the Dante Controller software application. Normal operation of the Model 215A can now begin.

Initial Operation

The Model 215A will begin functioning a few seconds after its power source is connected. As previously discussed, the power source can be provided by Power-over-Ethernet (PoE) or an external source of 12 volts DC. If both are connected, the PoE source will power the unit. Should PoE subsequently no longer be available uninterrupted operation will continue using the external DC source.

Upon Model 215A power up most of the status and button backlight LEDs will activate in a test sequence. The PoE, USB, and SIG/PEAK LEDs, located on the back panel, will light one after another. On the unit's top surface, the two status LEDs and the backlight LED associated with the main pushbutton switch and the status and backlight LEDs associated with the two talkback pushbutton switches will momentarily light in sequence. Once that sequence has completed all the LEDs will begin to function normally.

The manner in which the LINK/ACT, SYS, and SYNC LEDs (all located below the etherCON connector) will light depends on characteristics related to the connected Ethernet signal and the configuration of the unit's Dante interface. This will be covered in detail in the next section.

After the power-up sequence has completed the Model 215A will begin normal operation. Depending on the selected configuration one status LED associated with the main pushbutton switch may be lit. The user is now presented with three pushbutton switches, four LEDs, and three rotary controls. These are simple to operate and understand, as will be described in later sections.

Ethernet, PoE, and Dante Status LEDs

Four status LEDs are located below the etherCON connector on the Model 215A's back panel. The LINK/ACT LED will light green whenever an active connection to a 100 Mb/s Ethernet network has been established. It will flash in response to data packet activity. The PoE LED will light green whenever Power-over-Ethernet (PoE) associated with the connected Ethernet signal is providing operating power to the Model 215A. The SYS and SYNC LEDs display the operating status of the Dante interface and associated network. The SYS LED will light red upon Model 215A power up to indicate that the Dante interface is not ready. After a short interval it will light green to indicate that it is ready to pass data with another Dante device. The SYNC LED will light red when the Model 215A is not synchronized with a Dante network. It will light solid green when the Model 215A is synchronized with a Dante network and an external clock source (timing reference) is being received. It will slowly light on and off green when the Model 215A is part of a Dante network and is serving as the Leader clock. (This will not be the normal situation for most applications but is

technically possible.) Note that up to 30 seconds may be required for the SYNC LED to reach its final state.

How to Identify a Specific Model 215A

The Dante Controller software application offers an identify command that can be used to help locate a specific Model 215A. When Identify is selected for a specific unit the button backlight LEDs will flash. In addition, the SYS and SYNC LEDs, located directly below the etherCON connector on the back panel, will slowly flash green. After a few seconds the identification patterns will cease and normal Model 215A operation will again take place.

Signal Present/Peak LED

A dual-color LED is located on the Model 215A's back panel, adjacent to the microphone input connector. It monitors the output of the microphone preamplifier, providing a 3-step signal level indication. The LED will light green when the signal level is –40 dBFS or greater. It will simultaneously light green and red, appearing orange, when the signal level is –14 dBFS or greater. The LED will light red when the signal level is –4 dBFS or greater. During normal operation this LED should light green and when signal peaks are present, will occasionally light both green and red. If the LED is lit constantly green and red at the same time the gain of the microphone preamplifier most likely should be reduced. The LED should never light red only as this would indicate a signal that's in danger of reaching 0 dBFS (digital "clipping"). This would indicate that the gain of the microphone preamplifier should be significantly reduced.

P48 Phantom Power LED

A red LED indicator is located on the back panel adjacent to the microphone input connector. Labeled P48, it will light whenever the P48 phantom power source is active and providing power to the microphone input

Pushbutton Switches and Status LEDs

Three pushbutton switches are used to control the audio signals on the main and talkback output channels. The way each operates depends on the selected configuration. Four LED indicators are located adjacent to the pushbuttons and reflect the status of the audio signals associated with the main and talkback output channels. The pushbuttons' clear lenses are backlit using white LEDs. The intensity (brightness) of these LEDs is configured from a choice of two values, low or high. The backlighting does not provide an indication of the associated pushbutton's status nor do they serve as a tally function, but rather allow the pushbutton's labeling and location to be visible in low-light conditions.

Main Button and LED Indicators

The pushbutton switch that is located on the left side, factory labeled as COUGH, functions according to the selected configuration. Two LED indicators, located directly above the pushbutton switch, are associated with the status of the audio signal on the Dante main transmitter (output) channel. The green LED, located on the right, is lit whenever the microphone audio signal is connected to the Dante main transmitter (output) channel. This could be considered as an "on-air" or "mic-active" indicator. If the Model 215A's system mode is configured to On-Air, the red LED, located on the left, will be lit when the audio signal associated with Dante main transmitter (output) channel is muted.

If the Model 215A is configured to operate in one of the production modes, the red LED will never light. This is to reflect the fact that the main pushbutton switch has now taken on a function similar to that of a talkback pushbutton switch. To clarify, when the Model 215A is set to either of the production modes, the red LED will never light; the green LED will light whenever microphone audio is connected to the Dante main (transmitter) output channel.

Main Button Modes

Depending on the selected configuration, there are five ways the main pushbutton switch can function:

Push to Mute: If this mode is selected, the audio signal associated with the Dante main transmitter (output) channel is normally active. The audio signal will mute whenever the pushbutton switch is pressed and held.

Push to Talk: If this mode is selected, the audio signal associated with the Dante main transmitter (output) channel is normally muted. The audio signal will become active whenever the pushbutton switch is pressed and held.

Latching: If this mode is selected, the audio signal associated with the Dante main transmitter (output) channel will alternate between its active and muted states whenever the pushbutton switch s pressed. Upon power up the audio signal will be in its muted state.

Push to Talk/Tap to Latch: This mode is a combination of the Push to Talk and Latching modes. It's similar to the way talk pushbuttons function on user stations associated with broadcast or production intercom systems. If the pushbutton is pressed and held the audio signal associated with the Dante main transmitter (output) channel will become active until the pushbutton switch is released. If the pushbutton switch is momentarily "tapped" the audio signal will change state. Upon Model 215A power up the audio signal will be in its muted state.

Push to Mute/Tap to Latch: This mode is a combination of the Push to Mute and Latching modes. Whenever the main button is momentarily "tapped" its status will alternate between active and muted. When the main button's function is active and the main button is pressed and held the audio signal will mute on the Dante main output channel. It will stay in this condition until the main button is released. Upon Model 215A power up the audio signal will be in its muted state.

Main Output vis-à-vis Talkback Activity

This short section applies only in the case where the Model 215A's system mode is configured for On-Air and the main pushbutton mode is set to Latching, Push to Talk/Tap to Latch, or Push to Mute/Tap to Latch.

Talkback activity will always cause the audio signal associated with the Dante main transmitter (output) channel to be placed in its muted state. If the audio signal was in the "latched-on" state when talkback activity began, once talkback activity ends that state will resume; the audio signal associated with the Dante main transmitter (output) channel will again be in its on ("latched") state.

Talkback Buttons and LED Indicators

The second pushbutton switch from the left, factory labeled TALKBACK 1, controls the audio signal associated with the Dante talkback transmitter (output) channel 1. The third pushbutton switch from the left, factory labeled TALKBACK 2, controls the audio signal associated with the Dante talkback transmitter (output) channel 2. The manner in which each talkback pushbutton switch functions depends on the way each has been configured. One LED indicator, green in color, is located directly above each talkback pushbutton switch. It will light whenever the microphone audio signal is connected to its associated Dante talkback transmitter (output) channel. If the Model 215A's system mode is selected for On-Air, whenever any of the talkback functions are active the audio signal associated with the Dante main transmitter (output) channel will be placed in its muted state. If the Model 215A is selected for either of the production modes, the status of the talkback pushbutton switches will not impact the status of the audio signal associated with the Dante main transmitter (output) channel.

Talkback Button Modes

The operation of the talkback pushbutton switch can be independently configured using the STcontroller software application. Depending on the selected configuration, there are three ways each talkback pushbutton switch can function:

Push to Talk: If this mode is selected, the audio signal associated with a Dante talkback transmitter (output) channel is normally muted. The audio signal will become active whenever its associated talkback pushbutton switch is pressed and held.

Latching: If this mode is selected, the audio signal associated with a Dante talkback transmitter (output) channel will alternate between its active and muted state whenever its associated talkback pushbutton is pressed. Upon Model 215A power up the Dante talkback transmitter (output) channels will be in their muted state.

Push to Talk/Tap to Latch: This mode is a combination of Push to Talk and Latching. If the pushbutton switch is pressed and held, the audio signal associated with its Dante talkback transmitter (output) channel will become active until that talkback pushbutton switch is released. If the talkback pushbutton switch is momentarily "tapped" the audio signal will change state. Upon Model 215A power up the talkback audio signals will always be in their muted state.

Headphone Output

Three rotary controls ("pots") are located on the Model 215A's front panel and are associated with the headphone output. The way these control's function will depend on the configuration of the Audio Sources and Routing parameter within the STcontroller software application. There are five modes available and each is unique. The overall level of the headphone output is established using the gain range configuration. Another configuration setting selects whether the headphone output channels will maintain a minimum output level or can be fully muted. The action of the sidetone function is also configured using STcontroller.

To understand exactly how the level controls on a specific Model 215A will function requires knowledge of how that unit has been configured. Please refer to the Configuration section for details. It may require a bit of study to fully understand how the controls will function. The author would like to be able to provide a simple explanation. But there are really five simple explanations, one for each configuration choice!

Each level control has a mechanical step (detent) that is located at the halfway (50%) position of its rotation range. This is intended to serve as an aid to Model 215A users. In an ideal installation, setting the controls to their detent position will result in a comfortable headphone output level. The user, in response to a changing operating environment, can then move the level controls to get more or less headphone level as desired. The detent position will always remain as a useful reference point. To achieve this condition, the audio level on the appropriate Dante receiver (input) channels will have to be calibrated as required. This is somewhat counterintuitive to the usual mentality of just providing the

user with whatever level comes up by default. Spending a few extra minutes "trimming" the levels of the audio channel can result in much happier, and more-productive, users.

One of the headphone output modes uses control B, located in the center of the unit, as a level balance function. In this case, the detent position will send approximately equal levels to both the left and right headphone output channels. This is as one would expect from a "stereo" balance control such as provided in consumer electronic equipment.

When the headphone minimum level configuration is set to –40 dB, turning a level control to its fully counterclockwise position will cause the level of its associated headphone output channel(s) to become 40 dB below maximum. This ensures that users will never be fully "isolated" from potentially important cue signals. In addition, when a control is set to provide a balance function, turning it to either its fully clockwise or fully counterclockwise position will cause the level on the applicable headphone output channel to be 40 dB below its maximum.

If the headphone minimum level configuration is set for Full Mute, turning a level control to its fully counterclockwise position will cause the level of the associated headphone output channel(s) to fully mute. In addition, when a control is configured to provide a balance function, rotating it to either its fully clockwise or fully counterclockwise position will cause the level of the applicable channel to fully mute.

The overall level of the headphone output can be configured as desired for specific applications. In the STcontroller configuration application this is referred to as the Gain Range. The default setting, low, is designed so that users will typically set the rotary controls at approximately 50% of rotation. The high setting would be applicable in cases where an extreme headphone output level is required or the source material that is provided on the Dante receiver (input) channels is lower than typical.

Sidetone Function Activity

The Model 215A's sidetone function is used to send post-microphone-preamplifier audio to the headphone output as a user confirmation signal. Whether or not the sidetone function can be active will depend on the configuration of the Headphone Output – Audio Sources and Routing parameter in the STcontroller software application. Three of the five available modes enable sidetone. If one of these three modes is selected, when sidetone audio will actually be sent to the headphone output will depend on the configuration of the Headphone Output – Sidetone parameter in the STcontroller application. The Sidetone parameter can be configured from among four choices. One disables sidetone. The other three allow sidetone audio to be active when the Dante main transmitter (output) channel is active,

to be active when one of the Dante talkback transmitter (output) channels is active, or to be active whenever a Dante main or Dante talkback transmitter (output) channel is active. Sidetone audio will always be sent to both the left and right headphone output channels.

USB Interface

A USB type A receptacle and associated status LED is located on the back panel of the Model 215A. It is labeled FIRMWARE UPDATE and is used only for updating the unit's operating firmware (embedded software). No audio data of any kind will pass through it. For details, please refer to the Technical Notes section.

Technical Notes

IP Address Assignment

By default, the Model 215A's Ethernet interface will attempt to obtain an IP address and associated network settings using DHCP (Dynamic Host Configuration Protocol). If a DHCP server is not detected, an IP address will be assigned using the link-local protocol. This protocol is known in the Microsoft® world as Automatic Private IP Addressing (APIPA). It is also sometimes referred to as auto-IP (PIPPA). Link-local will assign an IP address in the IPv4 range of 169.254.0.1 to 169.254.255.254. In this way, multiple Dante-enabled devices will be connected together and automatically function, whether or not a DHCP server is active on the LAN. Even two Dante-enabled devices that are directly interconnected using an RJ45 patch cord will correctly acquire IP addresses and be able to communicate and transport audio.

As previously discussed, using the Dante Controller software application, the Model 215A's IP address and related network parameters can be set for a fixed ("static") configuration. While this is more involved than letting DHCP or link-local "do their thing," if fixed addressing is necessary then that capability is available. In this case, it's highly recommended that each unit be physically marked, e.g., directly labeled using a permanent marker or "console tape," with its specific IP address. If knowledge of a Model 215A's IP address has been misplaced there is no reset button or other direct method to restore the unit to a default IP setting.

In the unfortunate event that a device's IP address is "lost," the Address Resolution Protocol (ARP) networking command can be used to "probe" devices on a network for this information. For example, within the Windows OS the **arp –a** command can be used to display a list of LAN information that includes MAC addresses and corresponding IP addresses. The simplest means of identifying an unknown IP address is to create a "mini" LAN with a personal computer connected directly to the Model 215A.

Then by using the appropriate ARP command the required "clues" can be obtained.

Optimizing Network Performance

For best Dante audio-over-Ethernet performance a network that supports VoIP QoS capability is recommended. This can be implemented on virtually all contemporary managed Ethernet switches. There are even specialized switches that are optimized for entertainment-associated applications. Refer to the Audinate website (audinate.com) for details on optimizing networks for Dante applications.

Travel Case

For portable applications it may be desirable to store and transport each Model 215A unit in a protective case. After much travel with prototype announcer's console units, Studio Technologies' personnel learned to appreciate the Pelican Model 1450 case. Purchased with the foam interior option, it does an excellent job of holding one Model 215A and an external 12 volts DC power supply. Some applications may benefit from selecting a larger case that would also hold a related headset, cables, etc. An even larger case could be selected that would hold multiple Model 215A units. Pelican sells their products through a dealer network, many of which can be located via a web search.

Additional Connectors Locations

Two spare connector locations are provided on the Model 215A's back panel. They are labeled A and B. From the factory they contain blank plates that can be readily removed and replaced with a variety of XLR-style connectors. The spare connector locations are specifically included so that a Model 215A can be customized to meet the many specific needs that arise in broadcast and related audio applications. Expected uses for these locations include adding a 6- or 7-pin XLR connector to allow direct connection of a broadcast-style headset. Other uses include creating a "loop through" or "mult" function for the microphone input and/or headphone output connections. A number of interface cable assemblies, along with some special-function kits, are available from Studio Technologies. Please refer to the company website (studio-tech.com) for details on what is available.

The spare connector locations are compatible with the Neutrik DL-series of connectors. For flexibility, XLR versions are available that provide from three to seven contacts. For example, a compatible 3-pin female connector would be Neutrik part number NC3FD-L-1. Another connector is the NC6FDS-L-1 which is often used to support headsets. This is a 6-pin female connector with the unique Switchcraft® 6-pin arrangement. Other connectors, such as the etherCON protected RJ45 and 3-conductor ¼-inch jack, can be also be installed. The 4-40 thread-pitch hardware that secures the blank plates to the Model 215A's back

panel are also intended to secure the installer-provided alternate connectors.

The Model 215A's enclosure must be disassembled prior to installing connectors in the spare locations. Four 6-32 button-head machine screws, two on the bottom front of the enclosure and two on the back panel, must be removed. A 5/64-inch hex driver is required. The cover can then be carefully separated from the chassis, remaining attached by means of a flexible cable assembly. This "flex-cable" assembly links the main printed circuit board assembly with the board assembly that contains the pushbutton switches and LED indicators. Ensure that the flex cable is not damaged while the Model 215A is being customized.

If connectors are added to the Model 215A's spare connector locations, adding labels to them can be helpful. For a great look it is recommended that Brother® P-Touch ¼-inch (6 mm) labels be created. Tape material that prints white text on a black background works out well for the Model 215A. The Brother label cassette number TX-3151, white on black, is appropriate for use with many of their printers.

3-Position Headers

In addition to the spare connector locations on the back panel, provision has been made to allow easy interconnection with the Model 215A's printed-circuit-board-mounted input and output connectors. This was accomplished by including several 3-position male header connectors on the Model 215A's circuit board. These headers, on 0.1-inch centers, are wired in parallel with some of the Model 215A's connectors. This "no solder" solution makes customizing a Model 215A a simple process. The headers, located on the Model 215A's main printed circuit board assembly, are Molex® part number 22-23-2031. They mate with Molex housing number 22-01-3037. To make the interconnection, separate crimp terminals are attached to three loose wires and then "snapped" into the appropriate housing. Molex part number 08-50-0114 specifies crimp terminals that are appropriate for 22-to-30-gauge wires. These terminals are available worldwide from sources such as Digi-Key (digikey.com).

To make the process of connecting to the Model 215A's headers a simple task, an interface cable kit, part number 31087, is available from Studio Technologies. Each kit includes five cable assemblies and a length of heat-shrinkable tubing. Each cable assembly consists of a mating connector with three color-coded wires attached. These wires, approximately 12 inches in length, allow convenient soldering to a connector selected to be installed in a spare location on the Model 215A's back panel. For reference, Studio Technologies selected gray as the wire color for pin 1, yellow as the wire color for pin 2, and blue as the wire color for pin 3.

Interface cable kit 31987 includes a length of heat-shrinkable tubing so that the connector terminals or "solder cups" can be insulated from each other. It will also provide some strain relief to the solder joints. Be certain to slip the desired length of tubing over the wire prior to soldering a connection! (If the writer had a dollar for every time where he forgot to put tubing on a wire (or slip on a connector shell) before making a solder connection...)

Most of the 3-position headers on the Model 215A's main circuit board assembly are located close to their related input or output connectors. Other headers provide access to functions such as the relays or the contact closure inputs. For details on the headers please refer to Appendix B.

Contact Closure Input Connections

Provision has been made on the Model 215A's main printed circuit board assembly to allow external switches or contact closures to control the status of the microphone audio signal as it is sent to the main and talkback output channels. Two 3-position headers provide access to the circuitry associated with those functions. Refer to Appendix B for connection details. The input circuitry for the three functions is "active low," with a 3.4 k ohm resistor connected to +3.3 volts DC to act as a pull up. A combination of resistors and capacitors provide ESD protection.

Relay Contacts

The Model 215A provides two normally open (not shorted) relay contacts for use in specialized applications. The action of each can be configured using the STcontroller software application. Some "head scratching" or "brainstorming" should lead to a number of interesting ways to take advantage of the relay contacts. Applications could include keying wireless transmitters, activating "on-air" lights, and muting loudspeaker systems. To utilize the relay contacts does require the talents of a qualified technician. This is because the Model 215A's enclosure must be disassembled and the desired wiring scheme implemented. For detailed information on interfacing with the relay contacts refer to Appendix B.

Pushbutton Backlighting

From the factory, white LEDs are installed within the three pushbutton housings. These LEDs provide illumination ("backlighting") of the pushbutton switches. This may prove useful for applications where adequate room lighting is not available. It's important to note that the pushbutton lighting does not provide a tally function; it is intended to illuminate the pushbutton's clear lens and associated labeling. The LED intensity does not change as its associated button is pressed.

The lamp socket in each of the pushbutton housings was originally designed to allow insertion of a pluggable T-1 bi-pin incandescent bulb. They are also compatible with the more modern leaded T-1 LEDs. At of the time of writing this guide, the specific LED used at the factory is the King-bright WP7104QWC/D. If backlighting is not desired, it's easy to remove the LED lamps. The mating socket in each pushbutton assembly is accessed by carefully removing the pushbutton's lens cap, graphic label, and frosted lens. Once this is done, carefully pull on the body of the LED and it will pull out of the socket. (A pair of needle-nose pliers or tweezers may be required to perform this task.)

If an LED needs to be replaced note that it is typically a polarized device. If upon insertion it does not light, simply remove the LED, rotate it 180 degrees, then re-insert it into the socket.

Application Firmware Update Procedure

It's possible that updated versions of the application firmware (embedded software) that is utilized by the Model 215A's microcontroller (MCU) integrated circuit will be released to add features or correct issues. Refer to the Studio Technologies' website for the latest application firmware file. The unit has the ability to load a revised file into its MCU's nonvolatile memory by way of a USB flash drive. The Model 215A implements a USB host function that directly supports connection of a standard USB flash drive. The Model 215A's MCU updates its application firmware using a file named **M215Av*XrXX*.stm** where the *X*s are decimal digits that represent the actual firmware version number.

The update process begins by preparing a USB flash drive. The flash drive doesn't have to be empty (blank) but must be in the personal-computer-standard FAT32 format. The USB interface in the Model 215A is compatible with USB 2.0-, USB 3.0-, and USB 3.1-compliant flash drives. Save the new application firmware file in the root directory of the flash drive with a name of **M215Av*XrXX*.stm** where the *XrXX* is the actual version number. Studio Technologies will supply the application firmware file inside of a .zip archive file. The name of the zip file will reflect the application file's version number and will contain two files. One file will be the actual application file and the other a readme (.txt) text file. It's recommended that the readme (.txt) file be reviewed as it will contain details about the associated application firmware. The application firmware file inside of the zip file will adhere to the required naming convention so that it can be directly copied to the flash drive. Once ready, the USB flash drive should be inserted into the USB host interface by way of the USB type A receptacle that is located on the Model 215A's back panel. The unit must then be power cycled; first powered off and then again powered on. At this point, the application file located in the root folder of the USB flash drive will automatically load. The precise steps required will be highlighted in the next paragraphs.

To install the firmware file, follow these steps:

1. Remove power from the Model 215A. This will entail removing the Ethernet connection if it is providing PoE power and/or removing the external source of 12 volts DC if that is being used.

2. Insert the prepared USB flash drive into the Model 215A's USB receptacle, located on the back panel of the unit.

3. Apply power to the Model 215A. Power can be provided by Power-over-Ethernet (PoE) associated with a connected Ethernet signal or can be from an external 12 volts DC source.

4. The Model 215A will run a "boot loader" program that will immediately load the new application (**M215Av*XrXX*.stm**) file. The loading process typically takes approximately 10 seconds. During this time period, the LED, located below the USB receptacle, will slowly flash green. Once the entire loading process is over, the Model 215A will restart using the newly loaded application firmware.

5. At this time, the Model 215A will be functioning with the newly loaded application firmware and the USB flash drive can be removed. But to be conservative, remove the PoE Ethernet connection or 12 volts DC power source first and then remove the USB flash drive. Re-connect the PoE Ethernet connection or the 12 volts DC power source to restart the unit.

6. Using STcontroller, confirm that the desired application firmware version has been correctly loaded.

Note that upon power being applied to the Model 215A, if a connected USB flash drive doesn't have the correct application file (**M215Av*XrXX*.stm**) in its root folder no harm will occur. Upon power up the LED, located below the USB receptacle on the back panel, will rapidly flash green for a few seconds to indicate this condition and then normal operation using the unit's existing application firmware will begin.

Ultimo Firmware Update

As previously discussed, the Model 215A implements its Dante connectivity using the Ultimo integrated circuit from Audinate. The STcontroller or Dante Controller software applications can be used to determine the version of Dante firmware (embedded software) that resides in this integrated circuit. The Dante firmware (embedded software) residing in the Ultimo can be updated by way of the Model

215A's Ethernet port. Performing this update process is easily accomplished using an automated method called Dante Updater that's included as part of the Dante Controller application. This application is available, free of charge, from the Audinate website (audinate.com). The latest Model 215A firmware file should be available as part of Audiante's product library database. The Dante file will also be available on the Studio Technologies' website with a name in the form of **M215Av*XrXrX*.dnt**. Being available on Audinate's database will allow the Dante Updater software application that is included with Dante Controller to automatically query and, if required, update the Model 215A's Dante interface.

Restoring Factory Defaults

A command within the STcontroller application will allow the Model 215A's configuration selection to be reset to their factory default values. From within STcontroller select the specific Model 215A unit for which you want to restore its defaults. Select the **Device** tab and then select the **Factory Defaults** feature. Then click on the **OK** box. Refer to Appendix A for a list of the Model 215A's factory default values.

Specifications

Power Sources:

Power-over-Ethernet (PoE): class 2 (low power, ≤6.49 watts) per IEEE 802.3af

DC Input: 10 to 18 volts DC, 290 mA maximum at 12 volts DC (can be powered by optional PS-DC-02)

Network Audio Technology:

Type: Dante audio-over-Ethernet

AES67-2018 Support: yes, on/off selectable

Dante Domain Manager (DDM) Support: yes

Bit Depth: up to 24

Sample Rates: 44.1 or 48 kHz

Pull Up/Down Support: none

Dante Transmitter (Output) Channels: 4 (Main, Talkback 1, Talkback 2, Aux)

Dante Receiver (Input) Channels: 4

Dante Audio Flows: 4; 2 transmitter, 2 receiver

Analog to Dante Equivalent: an analog input signal at a level of –36 dBu and microphone preamplifier gain configured for 40 dB will result in a Dante transmitter (output) level of –20 dBFS

Network Interface:

Type: 100BASE-TX, Fast Ethernet per IEEE® 802.3u (10BASE-T and 1000BASE-T (GigE) not supported)

Data Rate: 100 Mb/s (10 Mb/s and 1000 Mb/s Ethernet not supported)

Microphone Input:

Compatibility: dynamic or phantom-powered microphones

Type: balanced, capacitive coupled

Impedance: 3.7 k ohms, nominal

CMRR: >76 dB, 20 Hz to 20 kHz, 40 dB microphone preamplifier gain

Gain Range: 19 to 64 dB, adjustable in 3-dB steps

Frequency Response: 20 Hz to 20 kHz, +0/–1 dB, microphone input to Dante output

Distortion (THD+N): 0.004%, measured at 1 kHz, –36 dBu mic input, 40 dB microphone preamplifier gain

Dynamic Range: >109 dB, 40 dB microphone preamplifier gain, A-weighted

EIN: –123 dBu, 22 kHz bandwidth, 64 dB microphone preamplifier gain, 150 ohms source resistance

Phantom Power: P48 per IEC 61938 P48 standard, on/off selectable, 45 volts DC nominal

Headphone Output:

Type: 2-channel

Compatibility: intended for connection to stereo (dual-channel) or monaural (single-channel) headphones, headsets, or earpieces with nominal impedance of 50 ohms or greater

Maximum Output Voltage: 3.0 Vrms, 1 kHz, 150 ohm load

Frequency Response: 20 Hz to 20 kHz, ±1 dB

Distortion (THD+N): <0.025%, measured at 1 kHz, 0 dBu output

Dynamic Range: >109 dB, A-weighted

Tone:

Use: provides support for tone operated (TOX) IFB function on devices such as Studio Technologies' Model 5422A Dante Intercom Audio Engine

Type: sine wave

Frequency: 18 kHz ± 0.1 Hz

Level: –20 dBFS

Distortion: <0.01% THD+N

Remote Control Inputs: 3

Functions: mimics the action of the main and talkback button functions

Type: active low, 1 mA maximum, input pulled up to 3.3 volts DC via 3.4 k ohm resistors

Access: requires user-implemented connector scheme

Relay Contacts: 2

Functions: configurable, can follow status of the main, talkback, or main and talkback functions

Type: form A (normally open, not shorted), solid-state

Rating: 100 mA, 60 volts AC/DC, maximum

Contact Resistance: 16 ohms, maximum

Access: requires user-implemented connector scheme

Connectors:

Microphone Input: 3-pin female XLR

Headphone Output: ¼-inch 3-conductor jack

Ethernet: Neutrik NE8FBH etherCON RJ45 receptacle

DC Input: 4-pin male XLR (pin 1 negative, pin 4 positive)

USB: type A receptacle (used only for updating firmware)

Spare Connector Locations: 2

Allows Studio Technologies' option modules to be installed. Also compatible with Neutrik NC*D-L-1 connectors (*=3F, 3M, 5M, 6F, 6FS, etc.).

Configuration: requires Studio Technologies' STcontroller software application

Software Updating: USB flash drive for updating application firmware; Dante Updater application for updating Dante interface firmware

Environmental:

Operating Temperature: 0 to 50 degrees C (32 to 122 degrees F)

Storage Temperature: –30 to 70 degrees C (–22 to 158 degrees F)

Humidity: 25 to 85%, non-condensing

Altitude: not characterized

Dimensions (Overall):

5.6 inches wide (14.2 cm)
3.3 inches high (8.4 cm)
8.5 inches deep (21.6 cm)

Deployment: intended for tabletop applications

Weight: 2.7 pounds (1.2 kg)

Specifications and information contained in this User Guide subject to change without notice.

Appendix A: STcontroller Default Configuration Values

Microphone Input – P48 Phantom: Off (box not checked)

Microphone Input – Gain: 19 dB

Headphone Output – Audio Sources and Routing: Mode 1

Headphone Output – Sidetone: Main and Talkback Buttons

Headphone Output – Gain Range: Low

Headphone Output – Minimum Level: –40 dB

Button Operation – Main: Push to Mute

Button Operation – Talkback 1: Push to Talk

Button Operation – Talkback 2: Push to Talk

System – Operating Mode: On Air

System – Button Backlight Intensity: Low

System – Relay Output 1: Off

System – Relay Output 2: Off

System – Dante Aux Output: Off

Appendix B: 3-Pin Header Connector Details

The following list provides details on the 3-pin header connectors located on the Model 215A's printed circuit board. Shown are both reference numbers and associated functions.

P2: Microphone Input
Pin 1: Common
Pin 2: High (+)
Pin 3: Low (–)

P5: Headphone Output
Pin 1: Common
Pin 2: Left Channel (Tip)
Pin 3: Right Channel (Ring)

P6: DC Output
Pin 1: Common
Pin 2: 10-18 volts DC Out
Pin 3: Not Used

P7: Relay Contact 1
Pin 1: Common
Pin 2: Normally Open
Pin 3: Normally Open
Note: Pin 2 connects (closes or shorts) to Pin 3 when the configured function or functions active.

P8: Relay Contact 2
Pin 1: Common
Pin 2: Normally Open
Pin 3: Normally Open
Note: Pin 2 connects (closes or shorts) to Pin 3 when the configured function or functions active.

P10: Contact Closure Inputs – Main and Talkback 1
Pin 1: Common
Pin 2: Main Pushbutton Switch
Pin 3: Talkback 1 Pushbutton Switch

P11: Contact Closure Input – Talkback 2
Pin 1: Common
Pin 2: Not Used
Pin 3: Talkback 2 Pushbutton Switch