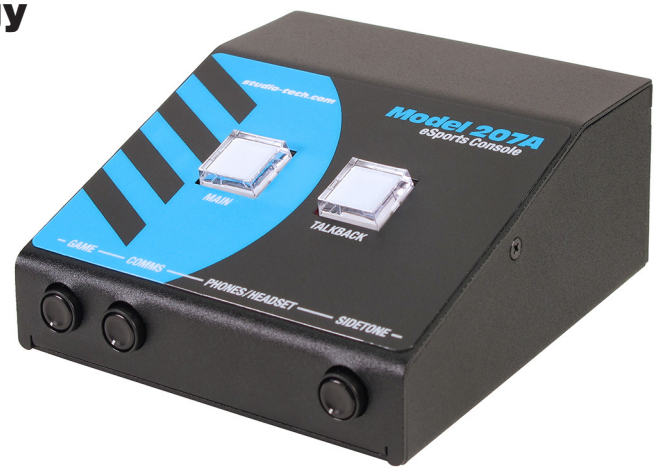
# Model 207A eSports Console
## Featuring Dante® Technology

STUDIO TECHNOLOGIES INC.





### Key Features

- Dante audio-over-Ethernet technology
- Supports headsets with 5-pin XLR and 3.5 mm TRRS CTIA connectors
- Independent stereo earbud and headset headphone outputs
- Integrated masking noise source
- Unbalanced stereo line-input for compatibility with computer audio
- Main, talkback, and two computer audio output channels
- Compact unit supports one on-air location
- Excellent audio performance
- Uses STcontroller for configuration
- Power-over-Ethernet (PoE) powered

### Introduction

The Model 207A eSports Console offers a unique combination of analog and digital audio resources specifically intended to support eSports-related live event, entertainment, and streaming broadcast applications. The unit is housed in a compact, steel enclosure that's intended for table-top use. Its compact size also makes it ideal for use in space-constrained locations. Color-configurable LED lights cast a distinctive "underglow" from the bottom of the enclosure. The Model 207A supports Dante® audio-over-Ethernet digital media technology with AES67 compatibility for integration into contemporary applications. The unit is extremely simple to deploy, is "pro" quality throughout, and provides an intuitive user experience. The Model 207A's audio quality is excellent, with low distortion, low noise, and ample headroom. Careful circuit design and rugged components ensure long, reliable operation.

The Model 207A integrates directly into both Dante audio-over-Ethernet and standard analog audio environments. With just a Power-over-Ethernet (PoE) connection, a broadcast or "gaming" headset, and a connection to a stereo line-level audio source, a complete player position can be created. If support for audio masking is desired, a set of stereo earbuds can also be connected.

An extensive set of parameters allows the Model 207A's functions to be tailored to meet the needs of a range of user and application requirements. These operating features are configured using the STcontroller software application. Available free of charge, STcontroller is a fast and simple means of confirming and revising the unit's operating parameters.

### Applications

The Model 207A on its own can provide an "all-Dante" solution for one eSports game player location. The unit's small size makes it ideal for live applications where the allotted physical space for personnel is very limited. Four Dante receiver (input) channels supply the user with their talent cue (IFB) and audio masking signals. Should the cue signal be "mix-minus" an integrated sidetone function can provide the user with a microphone confidence signal.

Separate 2-channel (stereo) headphone outputs can simultaneously drive both headsets and earbuds. Some applications may utilize "masking" audio which would typically be sent to the headphone output. For masking, the Model 207A includes an integral noise source that can be selected. Alternately, an external Dante input source can be used. Full-program or mix-minus audio would normally would be sent to earbuds by way

of the phones output. The phones audio sources would typically arrive in the Model 207A by way of Dante receiver (input) channels. For user confirmation, sidetone audio can be sent to either the headset or the earbud output.

Two Dante audio output channels are associated with a connected headset's microphone, one designated as main and the other as talkback. Two additional Dante outputs have signal sources derived from the Model 207A's stereo line input. These two audio channels, typically provided by an analog output of a personal computer, can also be routed to the headset or earbud outputs. The four Dante transmitter (output) channels are routed via an associated local area network (LAN) to inputs on Dante-compatible devices. Two pushbutton switches, main and talkback, provide the user with direct control over their microphone audio routing. For virtually "click-free" performance, Model 207A audio switching is performed within the digital domain. Three rotary controls allow the user to create their own headphone audio mix.

## Setup and Operation

Set up, configuration, and operation of the Model 207A is simple. An etherCON® RJ45 jack is used to interconnect with a standard twisted-pair Ethernet port provided by a PoE-enabled network switch. This connection supports both power and bidirectional digital audio.

A dual-channel (dual-ear or "stereo") broadcast headset can be directly connected to the unit's 5-pin female XLR connector. Alternately, a 4-conductor (TRRS) 3.5 mm jack allows direct connection of a gaming-style headset. For each headset type, the microphone input is compatible with dynamic or electret microphones. The integrated low-voltage DC source provides power support for electret microphones. A separate 2-channel (stereo) phones output is provided on a 3-conductor (TRS) 3.5 mm jack. In most applications, users will plug earbuds in this jack.

A 3-conductor (TRS) 3.5 mm jack supports connection of a computer's analog line-level audio output. The Model 207A takes this computer audio source and makes it part of the Dante audio network by first converting it to digital and then outputting it by way of two Dante transmitter (output) channels. The audio from the stereo line input can also be configured to be part of the sidetone confirmation signal that is sent to the headset and phones (earbud) outputs.

The STcontroller software application is used to configure the wide range of Model 207A operating parameters. This allows the unit's performance to be optimized to meet the needs of specific applications.

The user is presented with two pushbutton switches and three push-in/push-out rotary level potentiometers. This makes it easy to control the status of the main and talkback outputs as well as adjusting the signals that are sent to the headset and earbud output channels.

## Ethernet Data and PoE

The Model 207A connects to a local area network (LAN) by way of a standard 100 Mb/s twisted-pair Ethernet interface. The physical 100BASE-TX Ethernet interconnection is made by way of a Neutrik® etherCON RJ45 jack. While compatible with standard RJ45 plugs, this etherCON CAT5-compatible jack allows a ruggedized and locking interconnection for harsh or high-reliability environments.

The Model 207A's operating power is provided by way of the Ethernet interface using the 802.3af Power-over-Ethernet (PoE) standard. This allows fast and efficient interconnection with the associated data network. To support power management, the Model 207A's PoE interface enumerates (reports) to the power sourcing equipment (PSE) that it's a class 2 (low power) device.

## Dante Audio-over-Ethernet

Audio data is sent to and received from the Model 207A using the Dante audio-over-Ethernet media networking technology. As a Dante-compliant device, the Model 207A's four Dante transmitter (output) channels and four Dante receiver (input) channels can be assigned (routed or "subscribed") to other devices using the Dante Controller software application. The Dante transmitter (output) and receiver (input) channels are limited to supporting four Dante flows, two in each direction. The digital audio's bit depth is up to 32 with a sampling rate of 48 kHz. Two bi-color LEDs provide an indication of the Dante connection status. An additional LED displays the status of the associated Ethernet connection.

The Model 207A is compatible with the AES67 interoperability standard. In addition, the unit is compatible with the Dante Domain Manager™ (DDM) software application.

## Audio Quality

The Model 207A's audio performance is completely "pro." A low-noise, wide dynamic-range microphone preamplifier and associated voltage-controlled-amplifier (VCA) dynamics controller (compressor) ensures the headset's microphone audio quality is preserved while minimizing the chance of signal overload. The output of the microphone preamp/compressor circuit is routed to an analog-to-digital conversion (ADC) section that supports a sampling rate of 48 kHz and a bit depth of up to 32. The audio signal, now in the digital domain, routes through a 32-bit microprocessor and on to the Dante interface section where it is packetized and prepared for transport over Ethernet.

Audio signals arrive via four Dante receiver (input) channels and pass into the Model 207A's microprocessor integrated circuit. The supported sampling rate is 48 kHz with a bit depth of up to 32. Channel routing, headphone audio sources and level control, and sidetone creation are performed within the digital domain. This provides flexibility, allowing precise control and keeping the three level potentiometers from having to directly handle analog audio signals. The audio channels destined for the headset and phones (earbud) outputs are sent to high-performance digital-to-analog converters and then on to robust driver circuitry. High signal levels can be independently provided to the connected headset and earbuds.

## Configuration Flexibility

The Model 207A can be configured to meet the needs of specific applications and user preferences. All configuration choices are performed using the STcontroller software application. Selectable parameters include microphone preamplifier gain, microphone power source on/off, button operation, headset and phones (earbud) source selection, sidetone operation, and overall unit operation. In addition, the intensity of the user LED indicators can be configured as desired. The gain of the microphone preamplifier can be selected from among five choices. This allows the Model 207A to match the output sensitivity of a range of headset-associated microphones. A source of low-voltage DC power can be enabled if required to support electret microphones.

The main and talkback pushbutton switches can be individually configured. The main button can be selected to operate from among six modes while the talkback button can be selected from among four. These choices allow the Model 207A's operation to be tailored to meet the specific needs of many applications. As an example, for an on-air application the main button might need to be configured to provide a push to mute (cough) function. The microphone signal routed to the Dante main transmitter (output) channel would remain active unless a game player needs to momentarily disable it. The talkback button would most likely be set to the push to talk mode as its use would be intermittent.

The audio sources and the way in which they are assigned to the headset and phones output channels and front-panel rotary controls can be configured from among many choices. Each choice is unique, allowing almost any required monitoring situation to be implemented.

There's even an integral noise source that can be routed to the headset output channels. A separate configuration choice allows this noise source to be sent to the headset output at a fixed (non-changeable) level; its audio level would not be impacted by the rotary controls. This capability is included specifically to support gaming applications where a masking audio signal needs to be sent to each player's headset, helping to minimize the chance that venue audio will reach an eSports player.

The integrated sidetone function allows audio associated with the microphone input to be sent to the phones (earbud) and/or the headset output. This is important as different applications may provide either a "full mix" or a "mix-minus" talent cue signal. If a full mix cue signal is provided then sidetone audio will not be needed and the function can be disabled. In the case where a mix-minus signal is present, providing the user with sidetone can be an important means of confirming the signal that's coming from the connected microphone.

Three system modes select the overall way in which the Model 207A functions. The on-air mode is optimized for applications where strict separation between on-air and production audio channels is required. Other applications will benefit from the two available production modes.

## Future Capabilities and Firmware Updating

The Model 207A was designed so that its capabilities and performance can be enhanced in the future. A USB receptacle, located on the unit's main circuit board (underneath the unit's cover), allows the application firmware (embedded software) to be updated using a USB flash drive.

The Model 207A uses an Audinate UltimoX4™ integrated circuit to implement its Dante interface. The firmware in this integrated circuit can be updated via the Ethernet connection, helping to ensure that its capabilities remain up to date.

## Model 207A Specifications

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

**Network Interface:**
Type: 100BASE-TX, Fast Ethernet per IEEE 802.3u (10BASE-T and 1000BASE-T (GigE) not supported)
Power-over-Ethernet (PoE): Per IEEE 802.3af
Data Rate: 100 Mb/s (10 Mb/s and 1000 Mb/s (GigE) Ethernet not supported)

**General Network Audio:**
Type: Dante audio-over-Ethernet
AES67-2018 Support: yes, selectable on/off
Dante Domain Manager (DDM) Support: yes
Bit Depth: 16, 24, or 32
Sample Rate: 48 kHz
Dante Receiver (Input) Channels: 4
Nominal Level: –20 dBFS
Dante Receiver Audio Flows: 2
Dante Transmitter (Output) Channels: 4
Nominal Level: –20 dBFS
Dante Transmitter Audio Flows: 2

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

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

**Microphone Input:**
Compatibility: dynamic or electret (low-voltage DC-powered) microphones
Type: unbalanced
Electret Microphone Power: 5 volts DC via 2.21 k resistor, selectable on/off
Impedance: 1 k ohms, nominal, microphone power off; 690 ohms, nominal, microphone power on
Gain: 24, 30, 36, 42, 48 dB, selectable
Frequency Response: 50 Hz to 20 kHz, +0/–2 dB
Distortion (THD+N): <0.07%, measured at –20 dBFS, 22 Hz to 22 kHz bandwidth, 36 dB of gain
Dynamic Range: >96 dB, A-weighted, 24 dB gain

**Compressor:**
Application: applies to Dante main and talkback transmitter (output) channels and sidetone audio
Threshold: 2 dB above nominal level (–18 dBFS)
Slope: 2:1
Status LED: compressor active

**Headset Headphone Output:**
Type: 2-channel (stereo)
Compatibility: intended for connection to stereo (dual-channel) or monaural (single-channel) headsets with a nominal impedance of 50 ohms or greater
Maximum Output Voltage: 3.8 Vrms, 1 kHz, 150 ohm load
Frequency Response: 20 Hz to 20 kHz, –2 dB
Distortion (THD+N): <0.002%
Dynamic Range: >100 dB

**Headphone Output:**
Type: 2-channel (stereo)
Compatibility: intended for connection to stereo earbuds with a nominal impedance of 50 ohms or greater
Maximum Output Voltage: 3.8 Vrms, 1 kHz, 150 ohms load
Frequency Response: 20 Hz to 20 kHz, –2 dB
Distortion (THD+N): <0.002%
Dynamic Range: >100 dB

**Stereo Line Input:**
Type: stereo (2-channel), analog, unbalanced
Impedance: 10 k ohms, nominal
Nominal Level: –16 dBu (–18 dBV) (0.13 Vrms)
Gain: –3, 0, 3, 6, 9, or 12 dB, selectable
Frequency Response: 20 Hz to 20 kHz, +0/ –0.7 dB
Distortion (THD+N): <0.008%, measured at 0 dB gain
Dynamic Range: >105 dB, A-weighted

**Connectors:**
Headset A: 5-pin female XLR
Headset B: 4-conductor (TRRS) 3.5 mm jack, per Japanese standard JEITA/EIAJ RC-5325A
Headphone Output: 3-conductor (TRS) 3.5 mm jack, per Japanese standard JIS C 6560
Stereo Line Input: 3-conductor (TRS) 3.5 mm jack, per Japanese standard JIS C 6560
Ethernet: Neutrik NE8FBH etherCON RJ45 jack (compatible with standard RJ45 plug or etherCON CAT5-compatible plug)
USB: type A receptacle (located inside Model 207A's enclosure and used only for updating firmware)

**Configuration:** requires Studio Technologies' STcontroller software application

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

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

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

**Weight:** 1.2 pounds (0.55 kg)

**Deployment:** intended for tabletop applications

Specifications and information subject to change without notice.

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