Model 5205
Mic/Line to Dante™ Interface

User Guide

Issue 2, August 2017

This User Guide is applicable for serial numbers
M5205-00151 and later with application firmware 2.1 and later
and Dante firmware 2.2 (Ultimo 3.10.4.1) and later

Copyright © 2017 by Studio Technologies, Inc., all rights reserved
www.studio-tech.com

50280-0817, Issue 2

This page intentionally left blank.

Table of Contents

Revision History..... 4
Introduction..... 5
Getting Started 7
Connections..... 8
Dante Configuration..... 9
Operation..... 9
Technical Notes 12
Specifications 16

Revision History

Issue 2, August 2017:

1. Documents that the unit now supports the STcontroller software application.

Issue 1, August 2015:

1. Initial release.

Introduction

The Model 5205 Mic/Line to Dante Interface is a general-purpose audio device that supports applications utilizing the Dante™ Audio-over-Ethernet media networking technology. Two analog microphone or line-level audio signals can be connected to the Model 5205. They are amplified as required and then converted to digital audio channels on an associated Dante connection. With the inherent interoperability of Dante, the Model 5205 can be used with other Studio Technologies Dante-enabled products or a multitude of devices from many other manufacturers.

Microphone or line-level balanced analog audio signals are connected using two 3-pin XLR connectors. The gain of the associated preamplifier circuitry can be selected for 0, 20, 30, 40, 50, or 60 dB. P48 phantom power is provided to support condenser microphones. LEDs display the status of the gain and phantom power functions. Multi-step LED meters provide confirmation of the level of the two Dante transmitter (output) audio channels.

The gain of the preamplifiers and on/off status of the P48 phantom power sources can be selected locally using the pushbutton switches. They can also be monitored and selected remotely using the STcontroller application.

The audio quality of the Model 5205's two audio channels is excellent, with low distortion, low noise, and high headroom. Careful circuit design and rugged components ensure long, reliable operation. A wide range of applications can be supported, including TV, radio, and streaming broadcast events, corporate and government AV installations, and post-production facilities.

The Model 5205 requires an Ethernet connection to supply both the data interface as well as Power-over-Ethernet (PoE) power. This requires an Ethernet connection from a PoE-enabled Ethernet switch. Alternately, the Model 5205 can be powered by an external midspan PoE power injector.

Applications

The Model 5205 is perfect for use in conjunction with a variety of fixed and portable audio applications where one or two analog audio signals need to join a Dante "network." The unit's high-performance audio circuitry allows virtually any source to be handled correctly. Essentially all



Figure 1. Model 5205 Mic/Line to Dante Interface front and rear views

condenser, dynamic, or ribbon microphones are compatible, as are most balanced and unbalanced analog line-level sources. The simple user controls, along with an extensive set of status indicators, help to ensure optimum performance is maintained. With the unit's compact size and PoE powering, it's simple to deploy multiple units to integrate a distributed set of sources into a Dante application. For permanent applications there's no reason why a Model 5205 can't reside within an equipment rack or be mounted, using optional brackets, underneath a table or on-air studio set. In a conference room setting the unit can be permanently connected to a PoE-enabled Ethernet port, ready to accept a signal source from various user-provided devices.

Mic/Line Inputs

Two microphone or line-level analog audio signals can be connected to the Model 5205's 3-pin female XLR connectors. The preamplifier gain of each channel can be independently adjusted from among six settings: 0 (line), 20, 30, 40, 50, or 60 dB. To support condenser microphones P48 phantom power can be independently selected as required for each channel. LEDs are provided to display the configuration of the gain and P48 phantom power functions.

Six pushbutton switches, located on the Model 5205's front panel, allow local selection of the preamplifier gain and P48 phantom power on/off status. The STcontroller application allows personal computer users to both view and change the gain of the preamplifiers and the on/off status of the P48 phantom power sources.

Audio Quality

The Model 5205's audio performance is very good. The low-noise, wide dynamic-range preamplifier circuitry ensures that input audio quality is preserved. The outputs of the preamplifiers are routed to high-performance analog-to-digital conversion (ADC) sections that support sampling rate of 44.1, 48, 88.2, and 96 kHz with a bit depth of 24. A precision voltage-reference integrated circuit supports the ADC circuitry in performing accurate signal conversion. The audio signals, now in the digital domain, are connected to the Dante interface section where they are packetized and prepared for transport over Ethernet. The P48 phantom power source is extremely low noise, providing microphone power while causing little signal degradation. This is important for demanding applications.

The mic/line inputs were carefully designed for use in permanent, as well as portable and field, applications. Extensive filtering minimizes the chance that radio frequency (RF) energy will interfere with the audio input signals. Other components were included to specifically address ESD ("static") situations, helping to ensure long-term reliable operation.

Metering

Two 8-step LED meters provide a real-time level indication of the two Dante transmitter (output) channels. Scaled in dBFS (decibels referenced to full scale digital) the meters offer a direct view of the audio signal levels as they are transported via Dante in the digital domain. This is important as optimal audio performance requires transporting signals at their proper levels — without an accurate indication this can be difficult to achieve.

Ethernet Data and PoE

The Model 5205 connects to an Ethernet data network using a standard 100 Mb/s twisted-pair Ethernet interface. The physical interconnection is made by way of a Neutrik® etherCON RJ45 connector. While compatible with standard RJ45 plugs, etherCON allows a ruggedized and locking interconnection for harsh or high-reliability environments. An LED displays the status of the network connection.

The Model 5205's operating power is provided by way of the Ethernet interface using the 802.3af Power-over-Ethernet (PoE) standard. This allows fast and efficient interconnection with the associated data network. To support PoE power management, the Model 5205's PoE interface reports to the power sourcing equipment (PSE) that it's a class 2 (low power) device. An LED is provided to indicate when power is being supplied to the Model 5205. If a PoE-enabled Ethernet port can't be provided by the associated Ethernet switch a low-cost PoE midspan power injector can be utilized.

Dante Audio-over-Ethernet

Audio data is sent from the Model 5205 using the Dante Audio-over-Ethernet media networking technology. As a Dante-compliant device, the Model 5205's two transmit audio channels can be assigned to other devices using the Dante Controller software application. The bit depth is 24 and sample rates of 44.1, 48, 88.2, and 96 kHz are supported. Two bi-color LEDs provide an indication of the Dante connection status.

Future Capabilities and Firmware Updating

The Model 5205 was designed so that its capabilities and performance can be enhanced in the future. A USB connector, located on the unit's back panel, allows the application firmware (embedded software) to be updated using a USB flash drive.

To implement the Dante interface the Model 5205 uses Audinate's Ultimo™ integrated circuit. The firmware in this integrated circuit can be updated via the Ethernet connection, helping to ensure that its capabilities remain up to date.

Getting Started

What's Included

Included in the shipping carton are a Model 5205 Interface and a printed copy of this guide. As a device that is Power-over-Ethernet (PoE) powered, no external power source is provided. Should a PoE midspan power injector be required it must be purchased separately.

Mounting Options

There is no provision for directly mounting one or more Model 5205 units in an equipment rack. However, the overall height of the unit was carefully selected so that it could be placed without interference on a single space (1U) rack shelf. The Model 5205's enclosure width allows up to four units to be placed side-by-side on a 1U shelf that's mounted in a standard 19-inch equipment rack. Hook-and-loop ("Velcro") tape can be used to secure the Model 5205 units to the shelf.

A set of mounting brackets is available to allow a Model 5205 to be attached to the underside of a desk, table, broadcast set, or other flat surface. Contact Studio Technologies for details.

Connections

In this section signal interconnections will be made using the connectors located on the back panel of the Model 5205. An Ethernet data connection with Power-over-Ethernet (PoE) capability will be made using either a standard RJ45 patch cable or an etherCON protected RJ45 plug. Microphone or line-level signal sources will be connected using two cable-mounted 3-pin male XLR connectors.

Ethernet Connection

A 100BASE-TX Ethernet connection that supports Power-over-Ethernet (PoE) is required for Model 5205 operation. This one connection will provide both the Ethernet data interface and power for the Model 5205's circuitry. A 10BASE-T connection is not sufficient and a 1000BASE-T ("GigE") connection is not supported unless it can automatically "fall back" to 100BASE-TX operation. For PoE-supporting Ethernet switch power management the Model 5205 will enumerate itself as a PoE class 2 device.

The Ethernet connection is made by way of a Neutrik etherCON protected RJ45 connector that is located on the back panel of the Model 5205. This allows connection by way of a cable-mounted etherCON plug or a standard RJ45 plug. The Model 5205's Ethernet interface supports auto MDI/MDI-X so that most cabling implementations will be correctly supported without requiring a "cross-over" or "reversing" cable.

Ethernet Port without PoE

As previously discussed in this guide, the Model 5205 was designed such that the Ethernet connection will provide both data and Power-over-Ethernet (PoE) power. There may be situations where the associated Ethernet switch does not provide PoE power. In these cases an external PoE midspan power injector can be used. As long as the midspan power injector is 802.3af-compatible it should function correctly. Midspan units are available from a variety of sources, including Studio Technologies.

Mic/Line Inputs

The two mic/line inputs are intended for connection with balanced microphone or line-level analog audio signal sources. Typically these sources will be associated with professional audio equipment such as dynamic, condenser, or ribbon microphones, audio consoles, video storage and playback systems, wireless microphone receivers, and audio testing equipment.

The Model 5205 provides two 3-pin female XLR connectors for interfacing analog audio signals with the mic/line inputs. For balanced signals pin 2 should be connected to signal + (high) and pin 3 should be signal – (low). Pin 1 should be connected to the shield of the interconnecting cable.

Unbalanced signals can also be connected. In most cases signal + (high) should be connected to pin 2 and common/shield should be connected to both pins 1 and 3

of the 3-pin male XLR mating connector. If this connection arrangement results in hum or noise it may be effective to try connecting signal + (high) to pin 2 and signal common/shield only to pin 3.

Dante Configuration

Several Model 5205's Dante-related parameters can be configured. These configuration settings will be stored in non-volatile memory within the Model 5205's circuitry. Configuration will typically be done with the Dante Controller software application which is available for download free of charge at www.audinate.com. Versions of Dante Controller are available to support Windows® and OS X® operating systems. The Model 5205 uses the Ultimo 2-input/2-output integrated circuit to implement the Dante architecture. However, only the two transmitter (output) channels are utilized. This dictates which parameters can be configured and what choices are available.

The two transmitter channels associated with the Model 5205's Dante interface must be assigned to the desired receiver channels. Within Dante Controller a "subscription" is the term used for routing a transmitter flow (a group of output channels) to a receiver flow (a group of input channels). The number of transmitter flows associated with an Ultimo integrated circuit is limited to two. These can either be unicast, multicast, or a combination of the two.

The Model 5205 will support audio sample rates of 44.1, 48, 88.2, and 96 kHz with a limited selection of pull-up/pull-down values. The Model 5205 can serve as the clock master for a Dante network but in most cases it will be configured to "sync" to another device.

The Model 5205 has a default Dante device name of **ST-M5205** and a unique suffix. The suffix identifies the specific Model 5205 that is being configured. The suffix's actual alpha and numeric characters relate to the MAC address of the Ultimo integrated circuit. The two Dante transmitter channels have default names of **Ch1** and **Ch2**. Using Dante Controller the default device name and channel names can be revised as appropriate for the specific application.

Operation

At this point an Ethernet connection with Power-over-Ethernet (PoE) capability should have been made. Alternately, a midspan power injector, in "series" with the Ethernet connection, should have been put into place. The Model 5205's Dante configuration settings should have been selected using the Dante Controller software application. At a minimum the two Dante transmitter channels should have been routed to receiver channels on an associated device. Analog signal sources should have been connection to the two mic/line inputs. Normal Model 5205 operation can now begin.

Initial Operation

The Model 5205 will begin to function as soon as a Power-over-Ethernet (PoE) power source is connected. However, full operation may take 20 seconds or longer to begin. Upon initial power up the four status LEDs located on the back panel will begin to light. The USB LED on the back panel and the P48, gain, and meter LEDs

on the front panel will light in a test sequence. After the LEDs complete their test sequence one LED associated with the level meter for channel 1 and one LED associated with the level meter for channel 2 will briefly light to indicate the version number of the unit's application firmware (embedded software). (Understanding how to "read" the application firmware number will be discussed in detail later in this guide.) Once the entire sequence has completed and the Dante connection has been established full operation will begin.

Ethernet, PoE, and Dante Status LEDs

Four status LEDs are located below the etherCON connector on the Model 5205's back panel. The PoE LED will light green to indicate that Power-over-Ethernet (PoE) power associated with the connected Ethernet signal is providing operating power for the Model 5205. 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 Ethernet data packet activity. The SYS and SYNC LEDs display the operating status of the Dante interface and associated network. The SYS LED will light red upon Model 5205 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 5205 is not synchronized with a Dante network. It will light solid green when the Model 5205 is synchronized with a Dante network and an external clock source (timing reference) is being received. It will slowly flash green when the Model 5205 is part of a Dante network and is serving as a clock master.

How to Identify a Specific Model 5205

The Dante Controller software application offers an identify command that can be used to help locate a specific Model 5205. When identify is selected for a specific unit its meter LEDs will light in a unique pattern. 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 LED identification patterns will cease and normal Model 5205 level meter and Dante status LED operation will again take place.

Level Meters

Two 8-step LED meters display the level of the two Dante transmitter (output) channels. The meter steps are calibrated in dBFS which indicates the number of dB below the maximum possible digital signal level. The maximum level, 0 dBFS, is the digital audio reference level equal to "full scale." Full scale refers to the maximum level possible for a sine wave before "digital clipping." In typical applications a signal with a nominal (normal) level of –20 dBFS would be desirable. The five meter steps that have a threshold of –20 dBFS and less light with the color green. The steps that light at –15 and –10 dBFS are yellow in color and indicate "hot" or above average signal levels. The top step lights red in color when a signal level is –5 dBFS or greater, indicating that a potentially "clipped" (distorted due to excessive level) signal is present.

Mic/Line Inputs

Two 3-pin female XLR connectors are provided to interface analog audio signals with the Model 5205's mic/line inputs.

Balanced and unbalanced signals with a wide range of nominal levels can be successfully connected.

As expected, a signal connected to the channel 1 input connector is associated with Dante transmitter (output) channel 1. A signal connected to the channel 2 mic/line input connector is associated with Dante transmitter (output) channel 2.

Preamplifier Gain Selection

Two pushbutton switches are associated with each mic/line input and are used to locally adjust the gain of the preamplifier circuitry. In the 0 dB (line) position the Model 5205 will provide no (unity) gain. In this specific case a connected analog signal that has a level of precisely 0 dBu will result in a Dante digital audio level of –20 dBFS. (That corresponds to 20 dB less than the maximum possible level.) Five other settings allow a gain of 20 to 60 dB, in 10-dB steps, to be selected.

Select the preamplifier gain such that normal input signals will cause the five green LEDs to light. Peak signals can cause the yellow LEDs to light on occasion. But the yellow LEDs should never be continuously lit. The red LED should never light, except possibly in the case of an extreme peak. The red LED lighting on a regular basis indicates that the signal level is at risk of reaching digital 0 (0 dBFS) which is destructive to audio quality.

When changing from the 0 dB to the 20 dB gain setting, or vice-versa, a slight mechanical click or “tick” sound may be heard coming from within the Model 5205’s enclosure. This is caused by the changing state of an electro-mechanical relay that places a 20 dB attenuator network in to or out of the signal path.

Note that due to a technical consideration the exact gain values are slightly different from the nominal values that are indicated on the front panel graphics and in most of the text provided in this guide. As such, there can be up to a 1-dB difference, high or low, at some gain settings. This will typically have no impact on the performance or use of the Model 5205. But laboratory or other precision testing of the Model 5205 will show these apparent anomalies. Refer to the Specifications section of this guide for the exact values.

P48 Phantom Power

To support microphones that require external power, the Model 5205 can provide a source of P48 phantom power. Press the P48 button associated with the desired channel to locally change the on/off status of the P48 phantom power source. The P48 LED, blue in color, will light when P48 phantom power is being provided to the associated mic/line input connector. For maximum flexibility P48 phantom power is available in all six of the preamplifier gain settings, including 0 dB (line). While P48 phantom power would not typically be needed in the 0 dB (line) setting it’s still available for special applications. This can include use with high-sensitivity microphones being used in environments with high-SPL audio levels.

Remote Configuration of Gain and P48 Phantom Power

Using the STcontroller application allows personal computer users to view and adjust the Model 5205’s preamplifier gain and P48 phantom power on/off status. The application is available for download on the Studio Technologies website (www.studio-tech.com). Its initial release is compatible with the

Windows® operating system. Changes made using the application will be displayed in real-time on the Model 5205's LED indicators. Changes made to the preamplifier gain and P48 on/off status using the Model 5205's local pushbutton switches will be displayed in STcontroller.

Button Lock-Out

There may be situations where it's desirable for the preamplifier gain and P48 phantom power on/off configurations to be maintained without the risk that an unauthorized user will press one of the buttons and cause an unwanted change to be made. A button lock-out function is included to minimize the chance that this will occur. Using the function is very simple: simultaneously press and hold both P48 buttons for approximately 2 seconds until the two P48 LEDs flash. This will indicate that a change has been made to the button lock-out status.

When the button lock-out function is enabled the six pushbuttons will no longer allow any local preamplifier gain or P48 configuration changes to be made. During operation, if the buttons are "locked" pressing a P48, gain up, or gain down button will cause both P48 LEDs to flash three times but no change will occur. Only by changing the status of the lock-out function, by pressing and holding both P48 buttons, will local changes to the gain or P48 on/off status be allowed.

Remote monitoring and control using the STcontroller application will continue to function normally, even if the buttons are in their locked-out state.

Configuration Storage

The selected configuration of the preamplifier gain and P48 on/off status, as well as the button lock-out status, will be stored in nonvolatile memory within the Model 5205. This allows the settings to be "remembered" during periods when the Model 5205 is not being provided with power. Upon the unit being powered up the stored settings will again be used.

USB Interface

A USB type A connector and associated status LED is located on the back panel of the Model 5205. This data interface is used only for updating the unit's application firmware. No audio data of any kind will pass through it. For details please refer to the Technical Notes section of this guide.

Technical Notes

IP Address Assignment

By default the Model 5205's Ethernet interface will attempt to obtain an IP address and associated 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 can 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.

Using the Dante Controller software application the Model 5205'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. But in this case it's highly recommended that each unit be physically marked, e.g., directly using a permanent marker or "console tape," with its specific IP address. If knowledge of a Model 5205's IP address has been misplaced there is no reset button or other 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, in 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 5205. Then by using the appropriate ARP command the required "clues" can be obtained.

For best Dante audio-over-Ethernet performance a network that supports VoIP QoS capability is recommended. This can typically 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 (www.audinate.com) for details on optimizing networks for Dante applications.

Application Firmware Version Display

As part of the Model 5205's power-up sequence the unit's application firmware version number is displayed. This is useful when working with factory personnel on application support and troubleshooting. The eight LEDs associated with the channel 1 level meters are used to display the major version number with a range of 1 through 8. The eight LEDs associated with the channel 2 level meters are used to display the minor version number which ranges from 1 through 8. Refer to Figure 2 for a detailed view of the LEDs and the corresponding application firmware version numbering scheme.

Application Firmware Update Procedure

It's possible that updated versions of the application firmware (embedded software) that is utilized by the Model 5205'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 the MCU's nonvolatile memory by way of a USB interface. The Model 5205 implements a USB host function that directly supports connection of a USB flash drive. The Model 5205's MCU updates its firmware using a file named **m5205.bin**.

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. Save the new firmware file in the root directory with a name of **m5205.bin**. Studio Technologies will supply the

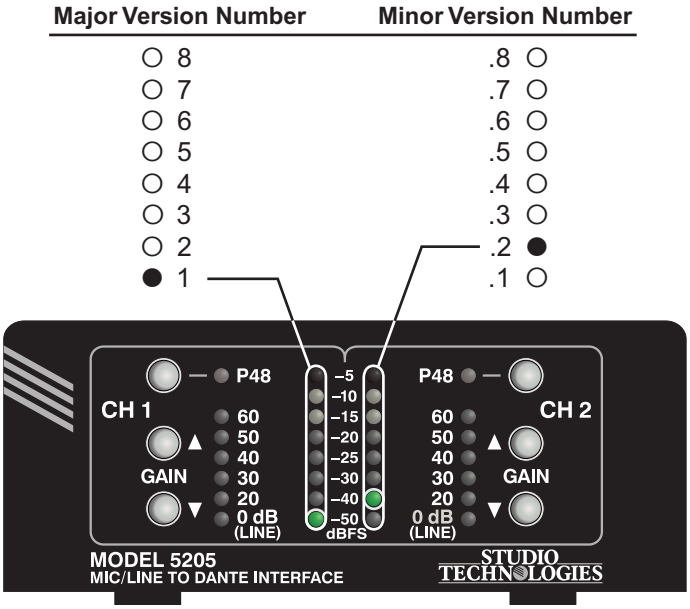


Figure 2. Detail of front panel showing the level meter LEDs that display the application firmware version. In this example, the application firmware version shown is 1.2.

application firmware file inside a .zip archive file. While the firmware file inside of the zip file will adhere to the naming convention required by the Model 5205, the name of the zip file itself will include the file's version number. For example, a file named **m5205v1r2MCU.zip** would indicate that version 1.2 of the application firmware (**m5205.bin**) is contained within this zip file. Once the USB flash drive is inserted into the USB interface, the unit powered off and again powered on, the file will automatically load. The precise steps required will be highlighted in the next paragraphs of this guide. After the firmware has been updated the two LED level meters should be used to confirm that the desired application firmware version has been successfully installed.

To install the application firmware file follow these steps:

1. Remove power from the Model 5205. This will entail removing the Ethernet connection that is providing PoE power.
2. Ensure that nothing is present in the USB port. Then again apply power to the unit and "read" the currently loaded application firmware version during the power-up sequence using the two level meters. (Refer to the Application Firmware Version Display paragraph earlier in this section.) Record the version number for later reference.
3. Remove power from the Model 5205.
4. Insert the prepared USB flash drive into the Model 5205's USB port, located on the back panel of the unit.
5. Apply power to the Model 5205. Power is provided by Power-over-Ethernet (PoE) associated with the connected Ethernet signal.

6. The Model 5205 will run a “boot loader” program that will immediately load the new application firmware file (**m5205.bin**). This process takes only a few seconds. During this time period the LED located below the USB connector will flash slowly on and off green. Once the entire loading process is over, taking approximately 10 seconds, the Model 5205 will restart using the newly-loaded application firmware.
7. At this time the Model 5205 is functioning with the newly-loaded application firmware and the USB flash drive can be removed. But to be conservative, remove power first and then remove the USB flash drive.
8. Apply power to the Model 5205 and “read” the application firmware version number by observing the two level meters. Ensure that this is the desired version and that it’s different from that noted in step 2. Note that upon power being applied to the Model 5205 if the USB flash drive doesn’t have the correct file (**m5205.bin**) in the root folder no harm will occur. Upon power up the USB LED will flash on and off rapidly 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 in this guide, the Model 5205 implements Dante connectivity using the 2-input/2-output Ultimo integrated circuit from Audinate. The Dante Controller software application can be used to determine the version of the firmware (embedded software) residing in the Ultimo “chip.” This firmware can be updated by way of the Model 5205’s Ethernet connection. The latest Dante firmware file is available on the Studio Technologies website. The Dante Firmware Update Manager application is used to install the firmware. This program is also available for download on the Studio Technologies website.

Specifications

Network Audio Technology:

Type: Dante Audio-over-Ethernet

Bit Depth: 24

Sample Rates: 44.1, 48, 88.2, and 96 kHz

Number of Dante Transmitter (Output) Channels: 2

Dante Audio Flows: 2 transmitter

Analog to Digital Equivalence: a +4 dBu input with 0 dB gain selected results in a Dante digital output level of –20 dBFS

Network Interface:

Type: twisted-pair Ethernet with Power-over-Ethernet (PoE)

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

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

General Audio Parameters:

Frequency Response (48 kHz Sample Rate): +0.0/–0.5 dB, 20 Hz to 22 kHz

Frequency Response (96 kHz Sample Rate): +0.0/–0.5 dB, 20 Hz to 40 kHz

Distortion (THD+N): 0.001% (–100 dB) at –1 dBFS, 40 dB gain, 22 kHz bandwidth

Dynamic Range: >114 dB, 0 dB gain, A-weighted

EIN: –123 dBu, 22 kHz bandwidth, 60 dB gain, 150 ohm source resistance

IMD (SMPTE): <0.002%, 60 Hz/7 kHz, 4:1, –20 dBFS

Mic/Line Inputs: 2

Type: electronically balanced

Input Impedance: 3.7 k ohms

CMRR: >75 dB, 20 Hz to 22 kHz, 40 dB gain

Gain, Nominal (Button Selected): 0 (line), 20, 30, 40, 50, and 60 dB

Gain, Actual (Button Selected): 0 (line), 19, 31, 40, 49, and 61 dB

Gain (Remote Control Selected): 0 dB (line), 10 dB, 19-70 dB in 3-dB steps

Compatibility: dynamic, ribbon, or phantom-powered mics

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

Remote Configuration Capability: preamplifier gain and P48 phantom power on/off status (uses STcontroller application)

Meters: 2

Function: displays level of Dante transmitter (output) signals

Type: 8-segment LED, modified VU ballistics

Connectors:

Mic/Line Inputs: 3-pin female XLR

Ethernet: Neutrik etherCON RJ45

USB: type A receptacle

Dimensions (Overall):

4.2 inches wide (10.7 cm)
1.7 inches high (4.3 cm)
5.1 inches deep (13.0 cm)

Mounting Option: bracket kit

Weight: 0.8 pounds (0.35 kg)

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