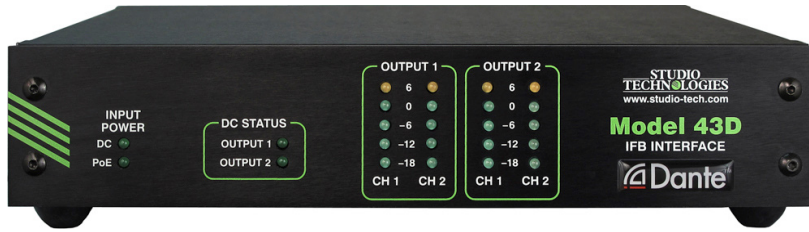




# Model 43D

## IFB INTERFACE



### Key Features:

- Dante™ Audio-over-Ethernet technology
- Powered 2-channel IFB outputs
- Line-level IFB outputs
- Excellent audio quality
- PoE and 12 Vdc powering
- Table-top, portable, or optional rack-mount use

### Overview

The Model 43D IFB Interface provides broadcast-standard powered and non-powered analog audio IFB outputs from audio signals that are being transported using the Dante™ Audio-over-Ethernet media networking technology. IFB, also known as “interruptible foldback” or talent cueing, is a method commonly used for on-air talent and related personnel to receive one-way (listen-only) audio signals associated with live-event broadcasts. Especially important in sports and entertainment events, IFB plays a crucial role in virtually all broadcast applications that require people to stay “in the know.” Dante has found wide acceptance as an audio “backbone” due to its ease of use, high performance, strong interoperability, and wide adoption by a large number of equipment manufacturers. The Model 43D is a specialized “tool” that helps to extend Dante’s capabilities into the important but specialized world of broadcast and production IFB.

Dante Audio-over-Ethernet technology is used to transport the four audio channels that are associated with two, 2-channel IFB outputs from their source to the Model 43D. Each of the Model 43D’s two powered IFB outputs supply operating power and two audio channels to groups of listen-only user devices. Two line-level analog outputs are also provided for general-purpose use. The Model 43D is compatible with the latest broadcast and audio equipment that uses Dante technology. An Ethernet connection is all that’s required to make the Model 43D part of a sophisticated, networked audio system.

A Model 43D utilizes four digital audio input channels typically provided by Dante-enabled devices such as matrix intercom systems, DSP processors, broadcast routers, and audio consoles. The powered IFB outputs allow direct connection with listen-only user beltpacks such as the popular Model 32A from Studio Technologies. The line-level IFB outputs are provided for connection with a variety of devices that use analog interfacing. Careful attention to circuit design and component selection ensures that excellent audio quality is maintained. Audio level meters provide confirmation of system performance during setup and operation. The Model 43D can be powered by Power-over-Ethernet (PoE) or an external source of 12 volts DC.

Standard connectors are used for the powered IFB outputs, line-level IFB outputs, Ethernet, and DC power interconnections. The Model 43D’s enclosure has a “1/2-rack” 1U form factor and weighs less than two pounds, making it well suited for use in portable applications. Alternately, using one of the optional rack-mount front panels, one or two Model 43D units can be mounted in a single space (1U) of a standard 19-inch rack enclosure.

### Dante Audio-over-Ethernet

Audio data is sent to the Model 43D using the Dante Audio-over-Ethernet media networking technology. Audio signals with a sample rate of 44.1 or 48 kHz and a bit depth of up to 24 are supported. Four transmitter (output) channels on associated Dante-enabled source devices can be assigned to the Model 43D’s receiver (input) channels using the Dante Controller application. This makes it simple to select the way in which a Model 43D fits into a specific application.

### Applications

The Model 43D was designed to add broadcast-standard 2-channel IFB functionality to Dante-enabled broadcast and related applications. Combining the networked audio capability of Dante with traditional analog powered (“wet”) and non-powered (“dry” or line-level) IFB outputs allows traditional and effective cueing methods to be maintained.

The Model 43D can be used in applications where IFB (talent cueing) channels are created in matrix intercom systems and become part of a Dante Audio-over-Ethernet network deployment. Output ports on matrix intercom systems that directly

support Dante, such as the RTS ADAM® with OMNEO®, can be routed to the Model 43D's Dante receiver (input) channels. The Model 43D's circuitry will then convert these signals into standard analog IFB audio outputs. In this way adding IFB support for RTS + OMNEO infrastructures is a simple task. Other matrix intercom and broadcast router systems also directly support Dante. The Model 43D can also be used with matrix intercom systems that don't support Dante. An external analog-to-Dante interface can be used to convert analog intercom output ports to Dante channels. For example, the Studio Technologies Model 44D Audio Interface does an excellent job of converting line-level analog signals to Dante digital audio channels. Once in the digital domain, these Dante channels can be interconnected with the Model 43D's audio input channels.

In applications where on-air talent uses headsets with two earphones (stereo or "dual muff") two unique audio channels are typically part of the provided IFB signal source. Generally one channel is configured in a matrix intercom system as "interrupt" while the other channel is configured as "program." (In U.S. applications the former signal is assigned to the left ear and the latter signal to the right ear.) An alternate term often used for the "interrupt" channel is "program-with-interrupt." This may be more descriptive as the function is actually a program source that gets interrupted with talkback audio. The "program" channel is typically a continuous source of program audio. An alternate term is "program-only." The source of interrupt audio is typically a producer or director who provides real-time information to the on-air talent.

In other applications, talent will use a single-ear headset, "ear bud," or in-ear monitor, keeping the other ear accessible to ambient audio. This is frequently done in electronic news gathering (ENG) or sports-broadcast applications where live interviews take place. An audio source with program-with-interrupt is provided; no program audio source is utilized.

## Powered IFB Outputs

The Model 43D provides two, 2-channel powered analog IFB outputs that are designed to directly support connection of listen-only user devices such as the Models 32A, 33A, or 34 from Studio Technologies. Each powered IFB output provides both DC and two channels of unbalanced audio. Two 3-pin male XLR connectors, located on the Model 43D's back panel, are used to interface with the listen-only user devices. Following broadcast-industry conventions, pin 1 is the common connection, pin 2 has 28 volts DC with channel 1 audio superimposed on it, and pin 3 has channel 2 audio. Each power



source supplies a maximum current of 120 milliamperes. The power supply outputs are monitored for over-current and short-circuit conditions. Under firmware (embedded software) control the outputs will automatically cycle off and on to help prevent damage to the circuitry and connected equipment.

## Line-Level IFB Outputs

In addition to the two, 2-channel powered IFB outputs, the Model 43D also provides two channels of analog line-level IFB. The audio sources for the line-level outputs is the same as used for channels 1 and 2 of powered IFB output 2. The line-level outputs are intended to allow interconnection with externally-powered listen-only user devices, inputs on wireless IFB systems, or analog inputs on consoles or related audio devices. The line-level IFB outputs have a nominal level of -10 dBu and are transformer- and capacitor-coupled, helping to ensure successful interconnection with virtually any line-level analog input.

## Pro Audio Quality

The Model 43D's audio circuitry was designed in the spirit of professional audio equipment rather than that found in typical IFB or talent cueing gear. High-performance components are used throughout, providing low-distortion, low-noise, and high headroom. The Model 43D's powered IFB output sources offer a unique level of performance; their ability to deliver power while maintaining audio quality is simply excellent.

## Audio Meters and Status LEDs

The Model 43D provides four 5-segment LED meters. The meters, located on the front panel, display the level of the audio signals associated with the two, 2-channel IFB outputs. At the time of installation and setup the meters are invaluable in helping to confirm correct operation. During normal operation the meters offer direct confirmation of the unit's audio signal levels, helping to ensure that optimal audio quality is maintained. Additional LED indicators are provided on the front panel, offering status indications of the incoming power and two IFB power sources.

## Ethernet Data, PoE, and DC Power Source

The Model 43D 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 for harsh or high-reliability environments. The Model 43D'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 43D's PoE interface reports to the power sourcing equipment (PSE) that it is a class 3 (mid power) device. The unit can also be powered using an external source of 12 volts DC. Four LEDs on the back panel display the status of the network connection, Dante interface, and PoE power source.

## Simple Installation

The Model 43D uses standard connectors to allow fast and convenient interconnections. An Ethernet signal is connected using a Neutrik etherCON RJ45. If Power-over-Ethernet (PoE) is available operation will commence immediately. An external 12 volt DC power source can also be connected by

way of a 4-pin XLR. Powered IFB and line-line IFB outputs are made using 3-pin male XLR connectors. The Model 43D is housed in a rugged yet lightweight aluminum enclosure that is designed to be "field tough." It can be used as a standalone portable unit, supporting what's known in the broadcast world as "throw-down" applications. Rack-mount options are also available allowing one or two units to be mounted in one space (1U) of a standard 19-inch rack enclosure.

## Future Capabilities and Firmware Updating

The Model 43D was designed so that its capabilities can be enhanced in the future. A USB connector, located on the Model 43D's back panel, allows the application firmware (embedded software) to be updated using a USB flash drive. To implement the Dante interface the Model 43D uses Audinate's Ultimo™ integrated circuit. The firmware in this integrated circuit can be updated via the unit's Ethernet connection, helping to ensure that its capabilities remain up to date.

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## Specifications

### Power Sources:

Power-over-Ethernet (PoE): class 3 (mid power, ≤12.95 watts) per IEEE 802.3af  
External: 10 to 18 volts DC, 1.0 amp maximum at 12 volts DC

### Network Audio Technology:

Type: Dante Audio-over-Ethernet  
Bit Depth: up to 24  
Sample Rates: 44.1, 48 kHz  
Number of Receiver (Input) Channels: 4  
Dante Audio Flows: 2 receiver

### Network Interface:

Type: twisted-pair Ethernet, Power-over-Ethernet (PoE) supported  
Data Rate: 100 Mb/s (10 Mb/s Ethernet not supported)

### Powered IFB Outputs: 2

Type: 2-channel analog powered IFB, unbalanced (pin 1 common; pin 2 DC with channel 1 audio; pin 3 channel 2 audio)  
Compatibility: 2-channel listen-only IFB user devices such as those offered by Studio Technologies  
Power Source: 28 volts DC, 120 mA maximum, nominal  
Analog Audio Level: -10 dBu, nominal, +4 dBu maximum, pins 2 and 3  
Frequency Response: ±1 dB, 20 Hz-20 kHz  
Distortion (THD+N): <0.02%, measured at 1 kHz, pins 2 and 3  
Signal-to-Noise Ratio: >85 dB, A-weighted, measured at 1 kHz, pins 2 and 3

### Line-Level IFB Outputs: 2

Type: transformer-coupled, capacitor isolated  
Nominal Level: -10 dBu  
Maximum Level: +10 dBu into 2 k ohms  
Frequency Response: -1 dB @ 20 Hz, -1.3 dB @ 20 kHz  
Distortion: <0.04%, measured at 1 kHz  
Signal-to-Noise Ratio: >87 dB, A-weighted, measured at 1 kHz

### Meters: 4

Function: displays level of IFB output audio channels  
Type: 5-segment LED, modified VU ballistics

### Connectors:

Powered and Line-Level IFB Outputs: 3-pin male XLR  
Ethernet: Neutrik etherCON RJ45  
External DC: 4-pin male XLR  
USB: type A receptacle

### Dimensions - Overall:

8.7 inches wide (22.1 cm)  
1.72 inches high (4.4 cm)  
8.3 inches deep (21.1 cm)

**Mounting Options:** single-unit, dual-unit, and combination-unit rack-mount front panels; uses one space (1U) in a standard 19-inch rack

**Weight:** 1.8 pounds (0.80 kg); rack-mount front panels add 0.2 pounds (0.09 kg)

Specifications subject to change without notice.

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