

unDX4I

Four Input Dante® Wall Plate Interface



User Manual

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Revision 02_b



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614-00027

IMPORTANT SAFETY INSTRUCTIONS

The symbols below are internationally accepted symbols that warn of potential hazards with electrical products.



This symbol, wherever it appears, alerts you to the presence of un-insulated dangerous voltage inside the enclosure -- voltage that may be sufficient to constitute a risk of shock.



This symbol, wherever it appears, alerts you to important operating and maintenance instructions in the accompanying literature. Please read the manual.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Protect the power cord (Ethernet cable) from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
10. Only use attachments/accessories specified by Attero Tech
11. Unplug this apparatus during lightning storms.
12. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
13. If rack mounting, provide adequate ventilation. Equipment may be located above or below this apparatus but some equipment (like large power amplifiers) may cause an unacceptable amount of hum, or may generate too much heat and degrade the performance of this apparatus.



TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.

LIMITED FIVE YEAR WARRANTY

The equipment is warranted for five years from date of purchase from Attero Tech, LLC against defects in materials or workmanship. This warranty does not cover equipment which has been abused or damaged by careless handling or shipping. This warranty does not apply to used or demonstrator equipment. Should any defect develop, Attero Tech, LLC will, at our option, repair or replace any defective parts without charge for either parts or labor. If Attero Tech, LLC cannot correct the defect in the equipment, it will be replaced at no charge with a similar new item. Attero Tech, LLC will pay for the cost of returning your equipment to you. This warranty applies only to items returned to Attero Tech, LLC, shipping costs prepaid, within five years from the date of purchase. This Limited Warranty is governed by the laws of the State of Indiana. It states the entire liability of Attero Tech, LLC and the entire remedy of the purchaser for any breach of warranty as outlined above. NEITHER ATTERO TECH, LLC NOR ANYONE INVOLVED IN THE PRODUCTION OR DELIVERY OF THE EQUIPMENT SHALL BE LIABLE FOR ANY INDIRECT, SPECIAL, PUNITIVE, CONSEQUENTIAL, OR INCIDENTAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THIS EQUIPMENT EVEN IF ATTERO TECH, LLC HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT SHALL THE LIABILITY OF ATTERO TECH, LLC EXCEED THE PURCHASE PRICE OF ANY DEFECTIVE EQUIPMENT.

This warranty gives you specific legal rights. You may have additional legal rights which vary from state to state.



Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules and EN55022. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at their own expense



This symbol means the product must not be discarded as household waste, and should be delivered to an appropriate collection facility for recycling. Proper disposal and recycling helps protect natural resources, human health and the environment. For more information on disposal and recycling of this product, contact your local municipality, disposal service, or the business where you bought this product.

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1 – Overview

The unDX4I Dante™ Audio interface is a cost effective multi-IO wall box and is designed to fit into most dual gang US junction boxes. Its size and I/O density make it easy to put Dante connectivity wherever it's needed – near the audio source or destination – thereby eliminating costly and interference prone analog wiring.



Figure 1 - unDX4I Front View



Figure 2 - unDX4I Rear View

The unDX4I features four balanced mic/line XLR inputs with each input also supporting software controlled 48V phantom power. Additionally, the unDX4I is equipped with two balanced line outputs available on in-wall Phoenix connector for connection to an adjacently installed passive connector wall plate (sold separately). The outputs feature software controlled volume control on each channel. All inputs and outputs can be used simultaneously and all audio channels are available separately on the Dante network.

Connection to the Dante network is provided by a single Ethernet RJ45 connector on the back of the unit. The unDX4I is PoE-enabled which allows the unDX4I to be powered over its network cable from a suitable PoE source (IEEE 802.3af) eliminating the need for a local power supply. This is particularly useful as the unDX4I can then be mounted in remote location where access to a mains outlet would be limited or indeed, non-existent.

Audinate's Dante Controller or other 3rd party manufacturer's Dante routing software can be used to control the audio routing configuration of the device while the Attero Tech unIFY Control Panel application or supporting DSP partner software can be used to configure the device-specific features.

The unDX4I also supports control by third party systems allowing external configuration of its settings such as phantom power and input gain in real time. This device is also compatible with Dante Domain Manager. Further information on 3rd party control can be found later in this document in section 3.3.

1.1 – What's in the Box

The device comes supplied with the following:

- (1) unDX4I
- (1) 2-gang Decora cover plate cover w/mounting screws

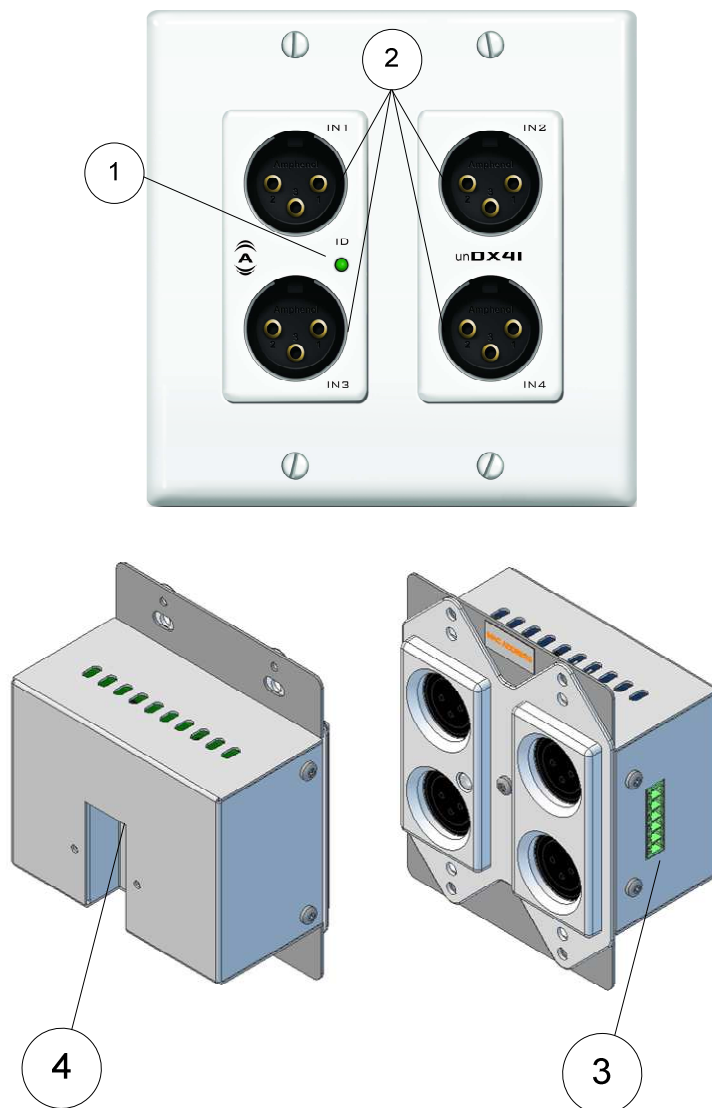
1.2 – Optional Extras

The following are available as options for the unDX4I and that may be ordered separately:

- unXP20 - Passive dual XLR male single gang Decora wall plate (Comes with triple gang decora cover plate).

™ Dante is a trademark of Audinate Pty. Ltd.

2 – Device Installation



1	Power/ ID LED
2	4 x Balanced audio inputs
3	2 x Balanced audio outputs
4	RJ-45 connector

***Note:** The unDX4I has a label on the front of the metal housing at the top that shows the device's MAC address. This is important for initial device identification as the last six digits make up part of the device's default network name that is shown when the device is detected by Dante Controller. The full MAC address is also given on the back of the unit.

2.1 - Mounting

It is recommended that the unit be secured to a flat surface with a screw through each mounting flange. Dimensions for mounting are shown in the Figure 3 below. Use a No. 6 screw of a type and size that is applicable to the surface to which the device will be attached.

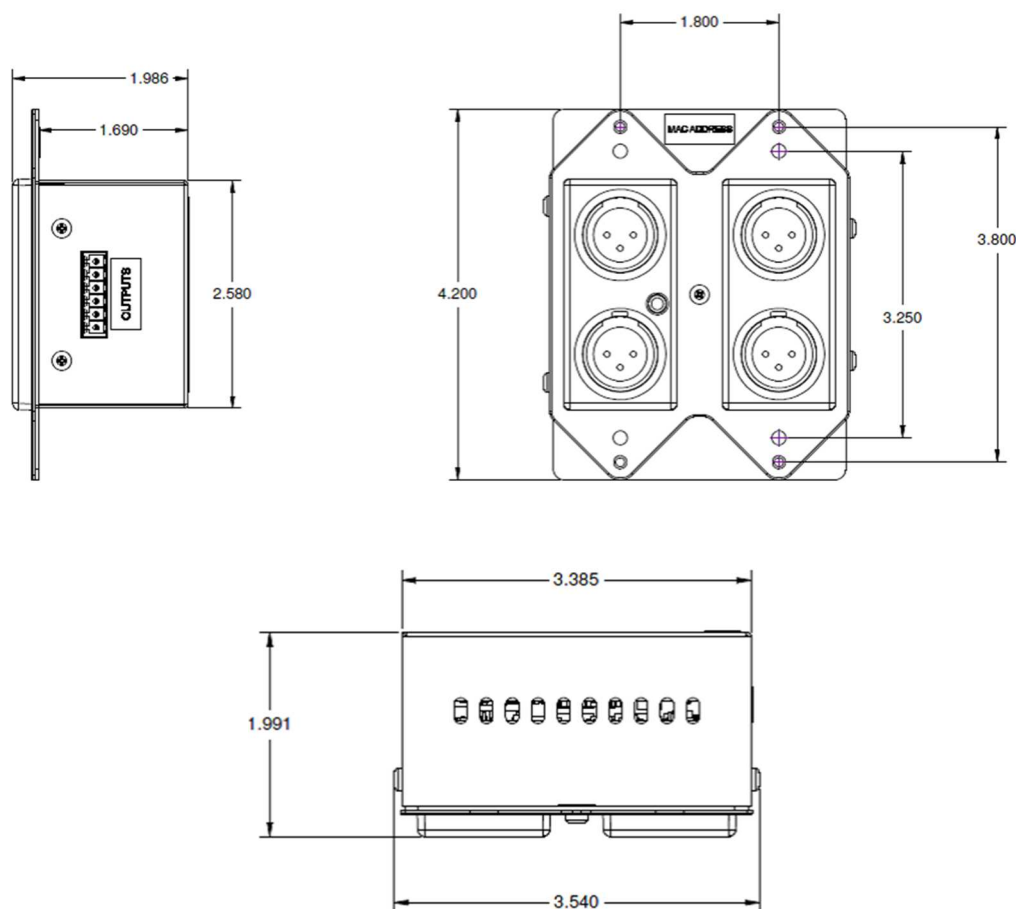


Figure 3 - Mounting Information

- Attach the PoE + Data Dante I/F port to a spare PoE-enabled port on a PoE switch using a CAT-5 cable. If a midspan injector is being used, connect a spare input port to the Dante network switch using a CAT-5 cable, and then connect the corresponding output port to the PoE + Data Dante I/F of the unDX4I.
- Attach any audio sources that will be used to the inputs. The inputs are balanced so be sure to check what output type the source to be connected uses in order to find how to connect it correctly (see Hardware Connections section).
- If the end user should need to change audio sources while the device is running, phantom power should be disabled before disconnecting and reconnecting the audio cabling. Ideally, the corresponding input should be muted as well in order to prevent undesirable and potentially damaging audio pops if the channel is currently active in the system.

***Note:** All Atterro Tech products are tested using UTP cabling and it is recommended that UTP cabling be used when installing them. STP cabling can be used for installation though care must be taken not introduce grounding issues into the system by doing so.

If all steps are performed correctly, the power LED on the front should be lit. There may also be some activity on the Dante I/F LED indicators. With no Dante network, both LEDs will remain off. If an active connection is made both LEDs will come on and if there is network activity, the yellow LED will then flash.

2.2 – Error Reporting

The unDX4I is equipped with error reporting features. Upon power up, the front panel LED will briefly light red and then change to green if the device boots successfully. If the LED remains on solid red, this indicates a device failure.

2.3 – Hardware Connections

The unDX4I and unDX4I-L accept unbalanced or balanced audio from source devices. Refer to the following diagrams and instructions for connecting different types of audio devices. Professional grade audio cabling is recommended to achieve the best audio performance throughout the system.

2.3.1 – Input from an Unbalanced Source

To connect a 2-wire unbalanced source to the unDX4I, connect the positive output of the unbalanced source to the positive input of the unDX4I. Connect both the source and unDX4I input grounds together, and short the negative input of the unDX4I to ground at the input of the unDX4I.

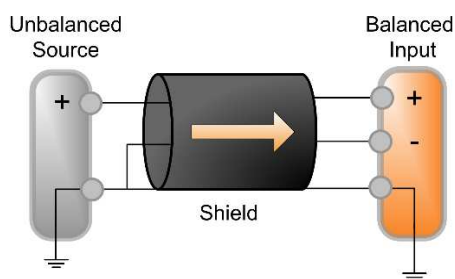


Figure 4 - 2-Wire Unbalanced Source Connection

To connect unbalanced sources with a 3-wire connection, short the negative conductor to the shield at the source connection.

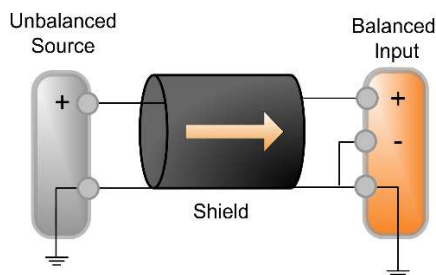


Figure 5 - 3-Wire Unbalanced Source Connection

2.3.2 – Input from a Balanced Source

To connect balanced sources to the unDX4I, connect positive output to positive input, negative output to negative input, and connect the grounds together through the cable shield.

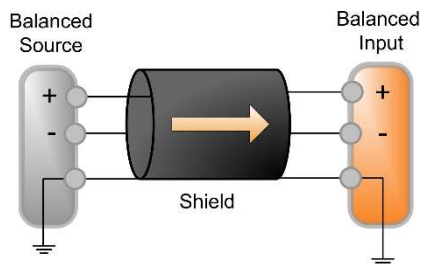
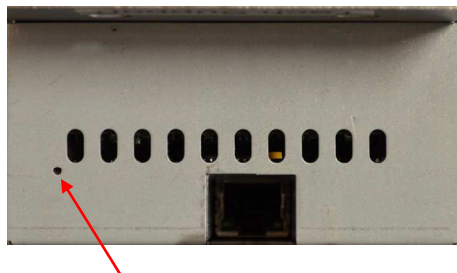


Figure 6 - Balanced Source Connection

2.4 – Factory Reset

The unDX4I has a factory reset option. Using it will reset all the devices parameters back to their factory defaults including all the Dante settings such as device name, channel names as well as the device settings such as input select. The devices IP address mode is also reset back to getting a dynamic IP.



Access to the factory reset button is through a small circular hole on the underside of the unit, next to the ventilation cutouts.

To use the factory reset, insert a small screwdriver or paperclip into the hole to activate the factory reset switch. There should be a noticeable “click” when it’s activated. Hold the switch in for 5 to 10 seconds then release. If the factory reset was successful, the unit will actually reset indicated by the power LED will turning red.

3 – Device Configuration

There are two parts of the device that require software to setup. First the audio routing, and second the configurable features of the device itself.

Certain 3rd party manufacturers provide audio routing functionality from within their own configuration application. Check the applications manual/help or contact the manufacturer in question to see if this is supported. If not supported by a 3rd party tool, the audio routing may be carried out using Audinate's Dante Controller. Dante Controller can be obtained from the Audinate website (www.Audinate.com) and is available for both Mac and PC. Instructions on how to use this application and about setting up routes on a Dante network can also be found on Audinate's website.

**Note: The unDX4I will be shown using a default device name of "unDX4I-#####" where "#####" is the last six characters of the devices MAC address.*

Configuration of the unDX4I specific features is carried out using the Attero Tech unIFY Control Panel application. This application is available from the Attero Tech website (<http://www.atterotech.com/products/unify-control-panel/>). It should be used to examine and modify the device specific features such as mic/line gain level, and phantom power settings.

3.1 – IP Address Setup

***** IMPORTANT *****

Failure to correctly configure IP addresses will not allow an unDX4I device to correctly authenticate in the unIFY Control Panel software and while it will show up in Dante Controller, the input and output channels won't be visible and routing of audio to and from the device will not be possible.

In order to configure an unDX4I, both to set up internal parameters and also setup audio routing, the PC will need to be able to communicate with the devices over the network. While all Dante devices will be discovered regardless of the IP address setup on the PC, communication can only occur if the PC and the device have compatible IP addresses.

By default, the unDX4I is set to get a dynamic IP address. As with all Dante devices, if the unDX4I does not find a DHCP server to retrieve an IP address from, it will give itself an local link address sometimes also known as an automatic private IP address (APIPA) instead. A local link IP address is always in the range 169.254.x.y.

To ensure communication, the PC can either be set to get a dynamic IP address, or be given a static IP address in the range 169.254.x.y y with a subnet mask of 255.255.0.0. The PC may require a restart if its IP address is changed for the change to take effect.

In some applications, IP addresses of devices may need to be set to something specific and that can be done once initial communication has been established. Bear in mind however that if a static IP address is assigned to a device and that static IP address is in a different range to the IP it was previously using to communicate with the PC, the PC will lose communication with the device until such time as the PC's IP address is also changed to an IP in range of the devices new IP address.

Further information on IP setup for an audio system using Dante can be found in the FAQ's on the Audinate website (<https://www.audinate.com/resources/faqs>).

3.2 – Software Control

The unDX4I is fully supported in from unIFY Control Panel v1.7.5 onwards and for a full description of the software and configuration features refer to the integrated help documentation within the unIFY Control Panel application.

3.3 – 3rd Party Control

The unDX4I supports 3rd party control, allowing external systems to manage the device's settings such as phantom power, mic/line gain options and control of presets.

Information on the commands each device supports as well as details of how to use the Direct UDP interface can be found in the unIFY 3rd party Software API document, available from the registered users section of the Attero Tech website (Go to www.atterotech.com and click on the “log-in” option).

There are two control interface types available. The first type is a Dante proprietary interface (-C) which is typically used by devices already that have built-in support for Attero Tech devices. The second type supports a 3rd party UDP interface (-U) and is available to anyone to use with any device capable of sending and receiving UDP messages.

3.4 – Command Interface Type

The type of command interface a specific device supports is defined by the Dante firmware it has been loaded with. There are two methods to determine which Dante firmware and thus which command interface that is:

- 1) unIFY Control Panel V2.0 or later: Right-clicking on the device in the device list, mouse over the “Device Info” option and then look for the “Control Type” option. A “-C” means the device is using the Dante Proprietary interface. A “-U” means the device is using the Direct UDP interface.
- 2) Dante Controller”: Double-click on the device in question in the routing grid to display the “Device View” form, select the “Status” tab and look for the “Firmware Version” parameters in the “Device Information” section.

Firmware Version	Control Interface
V1.0.0	Dante Proprietary (-C)
V2.0.0	Direct UDP (-U)

A devices initial control interface is chosen when ordering the unit. However, it can be easily changed though once the unit is in the field by updating the device's Dante firmware. Firmware updates can be done using the smart firmware update option within our unIFY Control Panel application (V2.3 and later). Both unIFY and .SFU file for updating a device can be obtained from the registered users section of the Attero Tech website (Go to www.atterotech.com and click on the log-in option).

3.5 – Using the Command Interface

In order to make use of the command interface, regardless of type, the unDX4I simply needs to be configured with an IP address that is compatible with the device doing the controlling. The control devices should then be able to converse with the unDX4I without any further configuration necessary.

4 – ARCHITECTS & ENGINEERING SPECIFICATION

4.1 – unDX4I A&E Specifications

The Dante interface unit shall provide four mic/line analog inputs on the rear panel via 3-pin depluggable connectors. Selectable gains of -18dB, -3dB, +25dB, and +40dB and a +48V phantom power option shall be provided via software for each input. The internal analog to digital signal conversion shall be performed at 24-bit resolution with a sampling frequency of 48kHz. The Dante interface unit shall receive power over the Ethernet cable from an IEEE 802.3af PoE compliant network switch or midspan injector.

The Dante interface unit shall be compatible with Attero Tech unIFY software and support control by a third party control system for flexible control and monitoring in system applications. The Dante interface shall be compliant with the RoHS directive. The Dante interface unit shall be Compliant with the EMI/EMC requirements for FCC and CE.

The Dante interface shall be DDM ready.

The Dante interface unit shall be the Attero Tech unDX4I.

4.2 – Device Specifications

Audio Inputs	
Input Type:	Four Balanced and RF filtered inputs on XLR
Gain:	-18dB, -3dB, +25dB and +40dB, software selectable
Input Impedance:	>1.8K Ohms at any gain
Maximum Input Levels:	+20dBu @ -18dB gain, +6dBu @ - 3 dB gain, -23dBu @ +25dB gain -38dBu @ +40dB gain
Phantom Power:	+48V, software selectable
Audio Input Performance	
EIN:	-115dBu
THD+N:	<0.02% @ 1kHz for all gain settings, input signal 3dB below maximum
Frequency Response:	20Hz – 20kHz, +/- 1dB (-18 and - 3 dB gain) 50Hz - 20kHz +/- 1dB (+25dB and +40dB gain)
Audio Outputs	
Output Type:	Two balanced line level with automatic muting on loss of Dante signal on 3-pin Depluggable Phoenix
Attenuation Range	Software controlled volume (0 to -60dB, 1dB increments)
Output Impedance	200 Ohms balanced
Maximum Output Levels:	+20dBu at 0dB attenuation
Audio Output Performance	
Dynamic Range:	100 dB
THD+N:	<0.01% @ 1kHz, input signal 3dB below maximum
Frequency Response	20Hz – 20kHz, +/- 1dB (-18dB and - 3dB gain) 50Hz - 20kHz +/- 1dB (+25 and +40 dB gain)

Dante Network	
Physical Level:	Standard Ethernet
Connector:	Single RJ-45
Cable Quality:	CAT-5e or better
Transmission Speed:	100 Mbps
Supported Sample Rates	44.1kHz 48kHz
Minimum Dante Network Latency	1ms
Power Requirements	
PoE	802.3af PoE PD compliant
Power Consumption	6.5W Max
Cable Quality:	CAT-5e or better
Physical Dimensions	
Width	3.54"
Height	4.2"
Depth	2"
Weight	1.7lbs
Product Compliance	
FCC CFR 47 Parts 15B ICES-003 CE (EN55022) RoHS REACH	

APPENDIX A – Reference Documents

The following table lists the relevant reference documents.

Document Title	Location
unIFY 3 rd Party Software API	Registered users area on website
Dante Firmware Update Quick Start	Registered users area on website