unD3IO (discontinued)
2-in/2-out Dante Wallplate with Multi-IO Analog Connectivity

User Manual

Date 03/14/2018

Revision 05_b

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. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and third grounding prong. The wider blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by Attero Tech
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus.
13. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
14. Unplug this apparatus during lightning storms or when unused for long periods of time.
15. 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.
16. This apparatus shall be connected to a mains socket outlet with a protective earthing connection.
17. When permanently connected, on all-pole mains switch with a contact separation of at least 3mm in each pole shall be incorporated in the electrical installation of the building.
18. 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 of 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 his own expense.

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Contents

1 - Overview

The unD3IO 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 sink – thereby eliminating costly and interference prone analog wiring.

Figure 1 - unD3IO front view

The unD3IO features two Dante input and two Dante output channels. The analog I/O are configurable via software to support different connectivity configurations. The XLR connector provides balanced mic/line audio to Dante output channel 1. However, the second Dante output comes from one of three possible input mixes:
- o   A mono mix of the RCA jack inputs
- o   A mono-mix of the 3.5mm stereo jack inputs
- o   A combined mix of the RCA inputs and the stereo jack inputs

The user can select which mix they require through the control software.

The unD3IO has two output options. An XLR connector provides a balanced line output for analog output 1 only, and a 3.5mm stereo jack connector provides an unbalanced line level output for both analog output 1 and analog output 2. Both output connectors may be used simultaneously.

Connection to the Dante network is provided by a single Ethernet RJ45 connector on the back of the unit. The unD3IO is PoE-enabled which allows it to be powered over its network cable from a suitable PoE source (IEEE 802.3af-compliant) and eliminating the need for a local power supply. This is particularly useful as the unD3IO can then be mounted in remote locations 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 can be used to configure the device-specific features.

The unD3IO also supports control by third party systems allowing external configuration of its settings such as phantom power and input gain in real time. Further information on 3rd party control can be found later in this document in section 4.
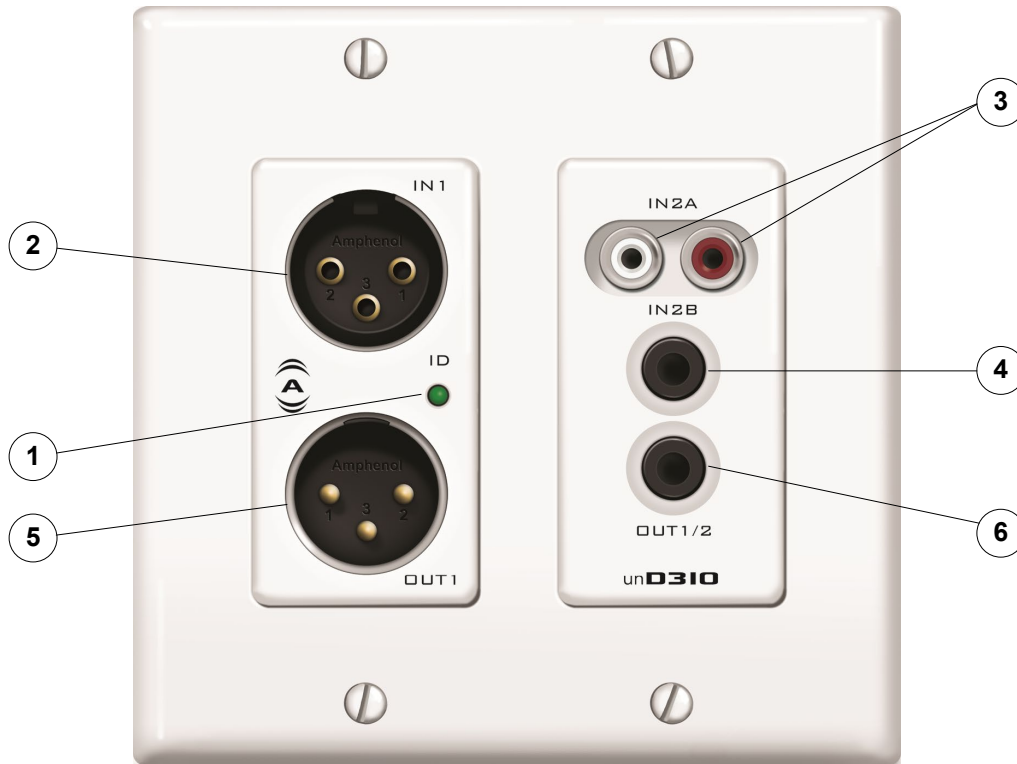
1.1– What's in the Box

The unD3IO comes supplied with the following
- o   unD3IO device
- o   Mounting kit
- o   Decora plate

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2 – Device Installation

1	Power/ ID LED
2	Balanced audio input (Input 1)
3	Unbalanced RCA Audio inputs (Input 2A)
4	Unbalanced stereo 3.5mm jack audio input (Input 2B)
5	Balanced audio output (Output 1)
6	Unbalanced stereo jack audio output (Output 1 & 2)

Note: *The unD3IO has a label on the front of the metal housing at the top that shows the last 6 digits of the MAC address. This is important for initial device identification as these digits make up part of the devices 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

A typical installation will involve mounting the wall plate into the wall using an "old-work" type bracket or a pre-mounted wall box. Before starting, make sure the wall box where the unD3IO is to be installed is pre-wired with a suitable cable back to a PoE enabled network switch or mid-span injector. If a mid-span injector is being used, the cable should be connected to the port that supplies both Ethernet and power (refer to the manual for the midspan injector if unsure which port is which).

Note: All Attero 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.

Attach the network cable from the switch/mid-span injector to the Dante I/F port of the Dante unD3IO. If the switch or mid-span injector is already running and PoE is enabled, the unit should power up and the green ID LED on the front of the device should turn on.

With the cable attached, carefully place the unD3IO into the wall box taking care to not trap the cabling. Once fully in place, secure with the screws provided. Once the unit is secured in the wall box, fit the Decora plate and secure it with the screws provided with it.

2.2 – Hardware Connections

The unD3IO accepts and drives either unbalanced or balanced audio 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.

2.2.1 – Balanced Source to Balanced Sink

To connect balanced sources to the unD3IO XLR input or connecting a balanced sink to the unD3IO XLR output, use a 2-core cable with a shield and connect positive output to positive input, and negative output to negative input using the cable cores, and connect output ground to input ground using the cables shield.
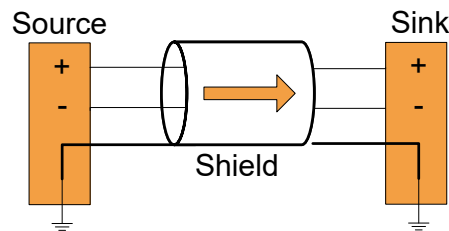

Figure 2 - Balanced Source to Balanced Sink Connection

2.2.2 – Unbalanced Source to Balanced Sink

Use the following if using a single core cable with shield to connect a 2-wire unbalanced source to XLR input on the unD3IO, or to connect an RCA or stereo jack unbalanced output signal from the unD3IO to a balanced input on another device. Connect the positive output of the unbalanced source to the positive input of the balanced sink. Connect both the source and sink input grounds together and short the negative input of the sink to ground at the input of the sink.
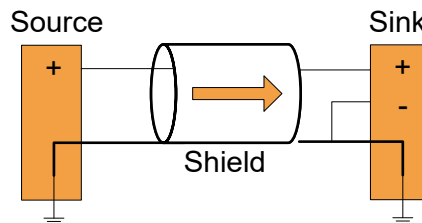

Figure 3 - 2-Wire Unbalanced Source to Unbalanced Sink Connection

For the same connections but using a 2-core + shield cable, connect the positive and grounds as before but this time, short the negative conductor to the shield at the source connection instead.
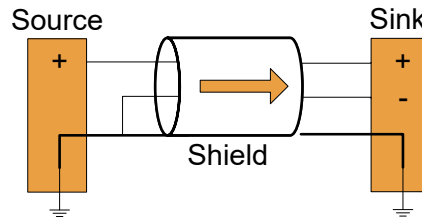

Figure 4 - 3-Wire Unbalanced Source to Balanced Sink Connection

2.2.3 – Balanced Source to Unbalanced Sink

Use the following if using a single core cable with shield to connect a balanced source to an RCA or stereo jack input on the unD3IO or to connect the XLR output from the unD3IO to an unbalanced input on another device. Connect the positive output of the balanced source to the positive input of the unbalanced sink. Connect both the source and sink input grounds together and short the negative input of the source to ground at the output of the source.
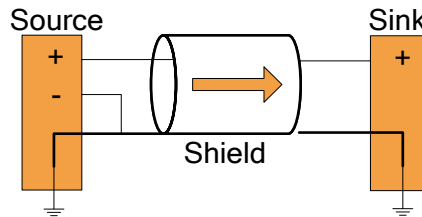

Figure 5 - 3-Wire Balanced Source to Unbalanced Sink Connection

For the same connections but using a 2-core + shield cable, connect the positive and grounds as before but instead, short the negative conductor to the shield at the sink end of the cable instead.

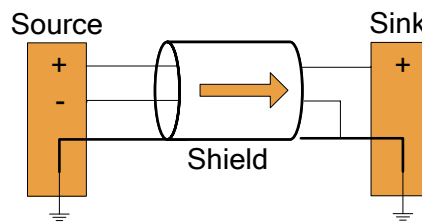**Figure 6 - 3-Wire Balanced Source to Unbalanced Sink Connection**

2.2.4 – Unbalanced Output to an Unbalanced Sink

To connect an unbalanced source to unD3IO RCA or stereo jack input, or connect the stereo jack output to an unbalanced sink, connect the positive output to the sink's positive input and connect the grounds together through the cable shield.
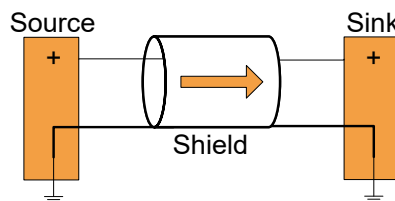

Figure 7 – Unbalanced Source to Unbalanced Sink Connection

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.

The audio routing should be carried out using any application that supports Dante audio routing. This could be from a 3rd party manufacturer or be Audinate's own Dante Controller. Dante Controller can be obtained from the Audinate website (www.Audinate.com). Instructions on how to use this software and about setting up routes on a Dante network can also be found on Audinate's website.

Note: When using Dante controller, the unD3IO will be shown using a default device name of unD3IO-###### where '######' is the last six characters of the devices MAC address.

Configuration of the unD3IO specific features is carried out using the Attero Tech uniFY Control Panel application. This application is available from the Attero Tech website (www.atterotech.com). It is used to initially configure the device and can examine and modify the device specific features such as mic/line gain settings, phantom power, and output boost options. The unD3IO features are supported in uniFY Control Panel V1.3 or later.

The unD3IO also supports 3rd party control systems by configuration with direct UDP messages. Further information on using this facility can be found in the uniFY 3rd Party Control – Software API document available from the Attero Tech website.

3.1 – IP Address Setup
** **IMPORTANT** **
Failure to correctly configure IP addresses will not allow an unD3IO 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 unD3IO will not be possible.
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In order to configure an unD3IO both to set up its internal parameters and also setup audio routing, the PC will need to be able to communicate with it 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, unD3IO is set to get a dynamic IP address. As with all Dante devices, if the unD3IO device does not find a DHCP server to retrieve an IP address from, it will give itself an automatic private IP address (APIPA) instead. An APIPA 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. The PC may require a restart for the changes to take affect.

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 Installation

After downloading the application, run the .exe and the first screen to appear will be the license agreement and options screen.

The software will install to a default location of c:\program Files (x86)\Attero Tech\unIFY Control Panel). Clicking the "Options" button allows the user to change the installation location if required though it's not necessary to change it.
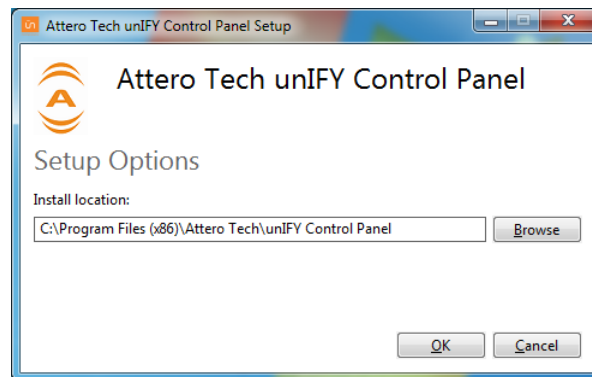

To select a new installation location, either type in a new path in the edit box, or click on the "Browse" button to browse the folder tree for the desired installation location. Once complete, click the OK button to return to the previous screen.

To continue the install, read the license agreement and check the "I agree…" check box. Doing so enables the "Install" button. Click the now enabled "Install" button to start the installation of the files.

On Windows Vista or later if the PC has the UAC enabled, a warning pop up will now appear saying the installer is about to make changes to your PC. This needs to be accepted for the installation to complete successfully.

The installer will show a progress screen and will now being transferring files to your PC.
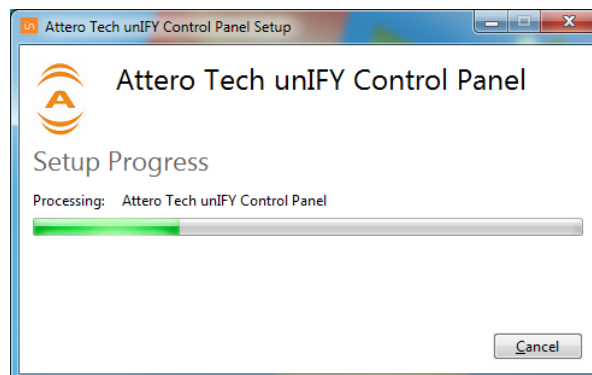
Once the files are transferred, the installer will show a completion message show whether the installation was successful or not.
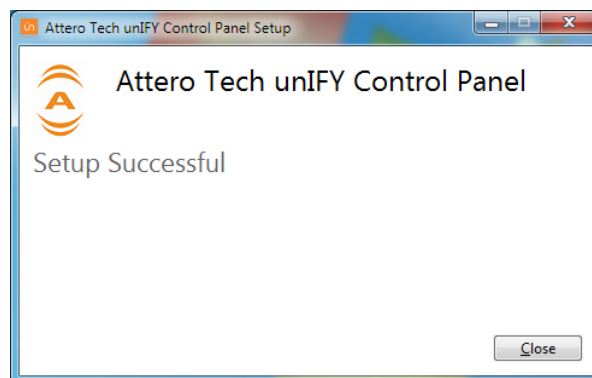
If the installation was unsuccessful for any reason, the final screen will show an error message.

Once the required software is installed, click on the unIFY Control Panel icon in the programs list under Attero Tech. This will start the application.
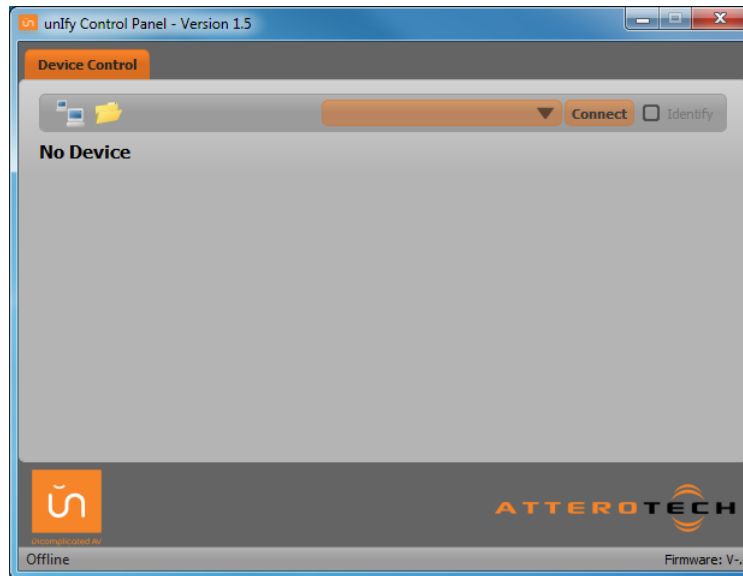

Figure 8 - Device Configuration window

3.3 – Selecting a Network Adapter

In order to connect to a device the application needs to know what network adapter it should use to contact devices.

Clicking on the networked PC icon [icon] will show a list of all possible adapters.

Note: Only network adapters that are deemed as being compatible with Dante will be shown in the list.

3.4 – Connecting to a Device

A few seconds after selecting the adapter, the device list should start to populate with detected devices. The detected devices are listed by their device name. Select the device to be configured from the drop down list and then click the "Connect" button. The application will then attempt to establish a connection with the device. If successful, the status bar will show "Connected" and the controls will become active and their values will update to show the current state of the device including channel names (shown for each input and output in a small grey window just below the main settings).

Note: The label below each set of channel controls show that channels name as displayed in Dante Controller. The channel name cannot currently be set from within the unIFY application. To change the channel names, use Dante Controller.

This connected device is now treated as the active device and any changes to the controls will be sent to this device alone.

3.5 – Device Identification

The device identification feature allows the user to see which device is physically being configured. When the Identify feature is active, the power LED on the active device will flash. The Identify check box shows the state of the device identify feature. If the box is checked, the feature is active on the active unit. If the check box is clear, the identify feature is inactive. To change the state of the feature, simply click in the Identify check box to toggle its state from off to on or on to off. The identify function will continue to operate until the function is turned off via the user interface or the device is powered down.

Note: The identify function of Dante Controller does not control the identify feature on the unD3IO. To identify a device use the unIFY Control Panel identify function instead.

3.6 – Device Controls
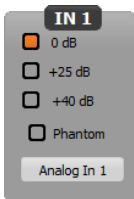
Each of the unD3IO inputs has different configurable options. The balanced input on the XLR (IN 1) has mic/line gain options, and the phantom power control. The unbalanced outputs are fed into IN2 and the user has an Input Select option to determine audio from which unbalanced connector is used.

The mic/line gain control gives the user three gain choices depending on the type of signal being provided to the input. For a line level signal, select the 0dB option. The remaining two options are for use if a microphone is to be connected directly to the input. If using a microphone as an input source, choose the gain value that best suits the microphones output signal.

The phantom power option is available for microphones that need it. The unD3IO provides 24V phantom power. Check the box to turn phantom power on. Uncheck the box to turn it off.

The input selection option (shown right) allows the user to select which of the unbalanced inputs are used as the second Dante output channel. Both RCA inputs are mixed by default to create input source A. The 3.5mm stereo jack stereo inputs are mixed together to produce stereo source B. The user can select which one of these sources the second input should be taken. The options are source A only, source B only, or a mix of both source A and source B.
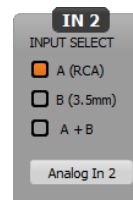
3.7 – Saving and Loading Settings

The unD3IO device settings can be saved or loaded by clicking on the ☐ icon to bring up the preset form.
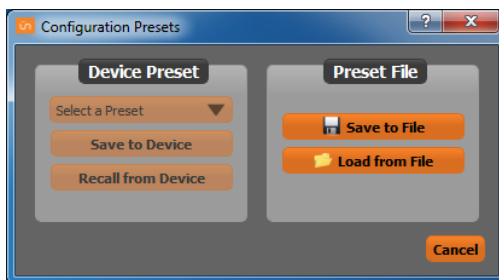
The unD3IO supports 10 internal presets with one of those presets used as the power-up default. It also supports saving settings to, and loading settings from, a file for transferring to another device or backup purposes.

3.7.1 – Internal Presets

Settings in a device can be saved to an internal preset which can then be recalled at a later date. There are 10 internal presets, one of which is the "Default" preset that is used to set device settings when the unD3IO is first powered on.

Select a preset to use by using the drop down in the Device Preset section. Once a preset has been selected, the current settings of the device can be saved to the selected preset by clicking the "Save to Device" button. Alternately, the settings from the selected preset can be loaded and used as the current settings by clicking the "Recall from Device" button.

Note: Loading a preset will overwrite all the current settings in the device with settings from the selected preset. The GUI will also update to show these new settings overwriting all of its settings also.

3.7.2 – Preset Files

To allow settings to be transferred to others devices or for use as a backup, the current settings can also be saved to a file or loaded from a file. When loading settings from a file, both the on-screen controls and the device settings will be modified to match the settings from the file. If the settings from the file need to be saved to a preset, then that will need to be done manually once the settings are loaded.

To save the current settings to a file, click the "Save to File" button and then enter an appropriate filename. To load settings from a file, click the "Load from File" button and select the appropriate file.

4 – 3ʳᵈ Party Control

The unD3IO supports 3ʳᵈ party control allowing external system to manage the unD3IO's settings such as phantom power, mic/line gain options and control of presets.

There are two control interface types available for the unD3IO. The first type is a Dante proprietary interface 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 and is available to anyone to use with any device capable of sending and receiving UDP messages.

Information on the commands the unD3IO supports as well as details of how to use the 3ʳᵈ party 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).

4.1 – Command Interface Type

The type of command interface a specific unD3IO 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) Run uniFY Control Panel V1.5.1 or later and connect to a device. The interface type is shown on the status bar at the bottom of the application window as the "Direct UDP" setting. A "No" means the device is using the Dante Proprietary interface. A "Yes" means the device is using the 3rd party UDP interface.

2) Using Dante Controller, look at the devices "Product Version" on the "Device Info" tab. Alternately, double-click on the device in question, select the "Status" tab and look for the "Product Version" parameter. In either case, if the product version is V1.x.x then the device is using the Dante Proprietary interface. If it's V2.0.0 or later, then the device is using the 3ʳᵈ party UDP control interface.

A device's command interface can be changed simply by updating the device's Dante firmware. Moreover, this can be done in the field in almost all cases. The tools and necessary firmware files for updating a device's command interface 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). The firmware files have an extension .DNT (otherwise known as "donut" files) and there is one for each command interface type. The firmware file with the lower of the two version numbers supports the Dante proprietary interface while the one with the higher version number supports the 3ʳᵈ Party UDP interface.

Note: While all devices support the Dante proprietary interface, some of the early unD3IO's may not support the 3ʳᵈ party UDP command interface. This is due to incompatible host processor firmware that the device may be using. Use the uniFY Control panel to connect to the device in question and, upon successful connection, the "Firmware Version" will be reported on the right hand side of the status bar at the bottom of the application window. If the firmware version reports V1.2 or later, the device will support the 3ʳᵈ Party UDP interface, and may updated in the field. If not, contact Attero Tech technical support for further assistance.

4.2 – Using the Command interface

In order to make use of the command interface, regardless of type, the unD3IO 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 unD3IO without any further configuration necessary.

5 – ARCHITECTS & ENGINEERS SPECIFICATION

The Dante interface unit shall provide one mic/line analog input on the front panel with a female XLR connector. Selectable gains of 0dB, +25dB, and +40dB, and +48V phantom power option shall be provided via software for the XLR input. The unit shall provide one line level balanced output with a male XLR connector. The unit will provide two RCA line level inputs and one 3.5mm TRS line level input, both internally summed to mono. The unit will provide a 3.5mm TRS line level output. 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 802.3af PoE compliant network switch. The Dante interface shall be wall mounted in a standard US dual gang junction box.

The Dante interface shall be compatible with Attero Tech Unify software 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 the Attero Tech unD3IO.

5.1 – Device Specifications

Audio Inputs (XLR):

Input Type:	Balanced and RF filtered 3-pin depluggable
Gain:	0dB, +25dB, +40dB, software selectable
Maximum Input Levels:	+12dBu @ 0dB gain -13dBu @ +25dB gain -28dBu @ +40dB gain
Phantom Power:	+48V, software selectable
Input Impedance:	>1.8K ohms at any gain setting

Audio Inputs (RCA, Jack):

Input Type:	Unbalanced RF filtered line level stereo, each summed to mono

Audio Outputs (XLR):

Output Type (XLR):	Balanced line level with automatic muting on loss of Dante signal
Output Gain	0dB
Maximum output level:	+12dBu

Audio Outputs (Jack):

Output Type (Jack):	Unbalanced line level with automatic muting on loss of Dante signal
Maximum output level:	+12dBu

Audio Performance:

Frequency Response:	+/- 1dB, 20Hz – 20kHz
EIN	-115dBu (+40dB gain)
Noise:	<-90dBu @ 0dB gain
System THD:	<0.01% at any gain, input signal 3dB below maximum

Dante Network:

Physical Level:	Standard Ethernet
Connector:	Single RJ-45
Cable Quality:	CAT-5
Transmission Speed:	100Mbps

Power Requirements	IEEE802.3af PoE
Power Consumption	Less than 3W
Dimensions	2.75"H x 3.60"W x 1.88"D
Operating Temperature:	0 ºC – 40 ºC
Compliance	FCC CFR 47 Parts 15B ICES-003 CE (EN55022) RoHS

APPENDIX A – Reference Documents

The following table lists the relevant reference documents.

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

Document Information

Document title:	unD3IO
Document file name:	unD3IO User Manual.doc
Revision number:	<05_a>
Issued by:	Attero Tech
Issue Date:	10/16/2017
Status:	Released

Revision History

Revision	Date	Author	Description of change
00_a	03/27/14	CNL	Initial Draft
00_b	05/22/14	CNL	Updates after review by Josh and Mike
01	05/22/14	CNL	Release version 01
01_a	08/28/14	CNL	Restructured Section 3 added details on device IP address setup Refreshed the screen shots to latest unIFY version (V1.5)
02	08/29/14	CNL	Release version 02
02_a	10/02/14	CNL	Updated device specification compliance text
03	10/02/14	CNL	Release Version 03
03_a	11/05/14	CNL	Added descriptions for the two different control interfaces
04	11/05/14	CNL	Release Version 04
04_a	11/14/14	CNL	Update device specs
05	11/14/14	CNL	Release Version 05
05_a	10/16/17	CNL	Bug #3475 – Update manual regarding UTP/STP cable
05_b	03/14/18	SGG	Warranty Updated