

unD32 BoB

32 Channel Dante Break Out Box



User Manual

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1 – Overview

The unD32 is a 32 channel Dante break out box (BoB) and comes in a 19-inch 1RU rack mountable chassis. Its 32 analog output channels are fully balanced with grounding and shielding per AES48-2005 standards. Each output has the following features:

- Rear panel connectors using a 3 pin Phoenix style connector receptacle with a pin pitch of 3.81 mm (150mils)
- Capable of a maximum output level of +20dBu before clipping
- Individually adjustable volume over a 60dB range using the unD32 internal volume controls
- Individual mute facility
- AES67 support (Product Version 2.0 onwards)

In addition to the volume and mute controls per channel, there is also a master volume and master mute. All the volume and mute controls can be accessed by using Atterotech's unIFY Control Panel software.

The unD32 includes front panel controls which consist of a 16x2 backlit character display and a 6 button keypad. These can be used to both view the assign audio flows of each of the 32 balanced outputs and control the output volume of each channel directly on the unit itself.



Figure 1 – unD32 Front



Figure 2 – unD32 Rear

The unD32 features both primary and secondary Gigabit Dante network connections as well as a third “local” Gigabit port. All three of these network interfaces are available via separate 8P8C modular connector receptacles (RJ-45) on the rear panel of the unit. The three ports allow the unD32 to be run in single network “Switch” mode or in dual network “Redundancy” mode.

The unit is powered using an external universal 24V DC power supply (100VAC - 240VAC, 50Hz - 60Hz). The specific part number used to order the unD32 determines what style of mains connector the supplied power cord comes with.

1.1 – What’s in the Box?

The unD32 comes supplied with the following:

- unD32 unit (710-00149-01)
- 24V DC Power Supply
- AC Power Cord (mains connector type determined by part number used to order the unD32)
- 32 Phoenix-style connector plugs (RIA 31369103)

1.2 - unD32 Unit Block Diagram

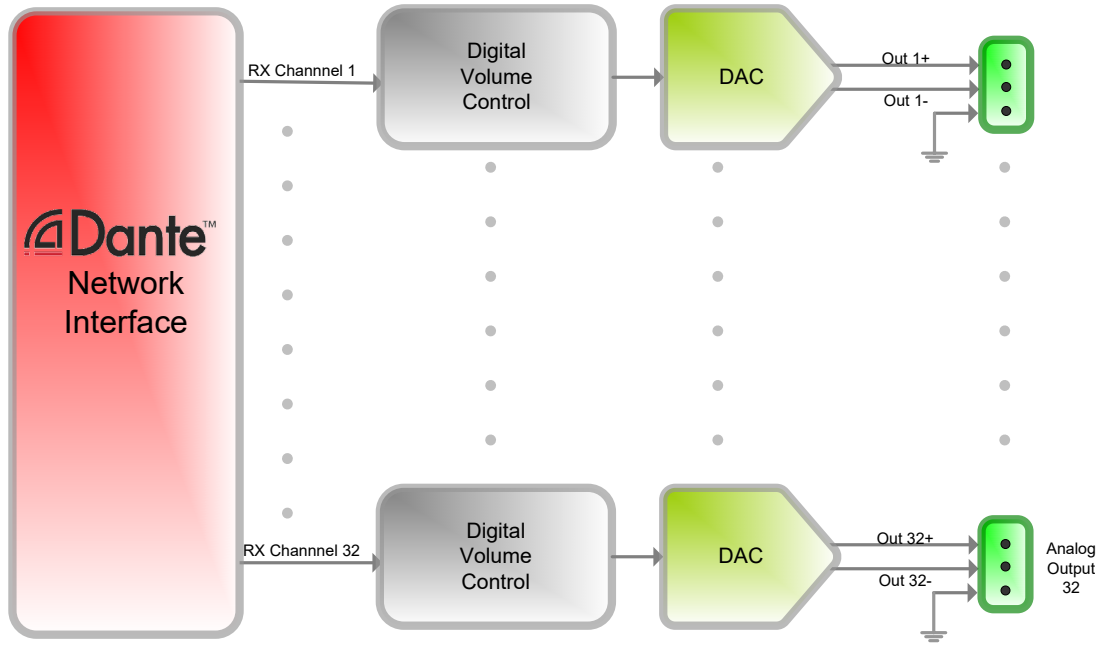


Figure 3 - unD32 Block Diagram

2 – Installation

The unD32 comes ready to be mounted into a standard 1RU rack. The rack mount tabs are built in to the front panel of the unit (rack screws are not supplied).

2.1 – Power Connection

Attach the provided power supply to power connector on the back of the unD32. The use the provided AC power cable to connect the power supply to standard AC outlet. There is no “on” switch so the unit will power up as soon as the power connection is made.

**Note: It is recommended to attach the power supply to the unD32 first, then connect the power cord to the power supply and finally, plug the cable into the AC outlet.*

2.2 – Network Connections

There are two configurations for network connectivity. Each is listed below. Select the configuration that best fits the intended application.

**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.*

2.2.1 – Single Network Connection

This type of network connection is probably the most common and uses a single Ethernet cable connecting the unD32 to the Ethernet switch that is providing the Dante network to the area of the facility where the unD32 is installed. The Ethernet cable can be plugged into any of the three ports on the unD32.

**Note: This is the default configuration and the unD32 should require no configuration changes to work in this mode. However, if problems occur when using this type of network topology, make sure the unD32 is configured for switch mode (refer to Dante Controller User’s Guide for information on how to do this).*

The unused ports of the unD32 may be used to connect other devices to the Dante network if required. However, as the unD32 acts as a switch, devices connected in this must count the unD32 as a switch hop.

2.2.2 – Redundant Network Connection

This type of network connection relies on the Dante network in the area of the facility where the unD32 is to be installed being provided by two completely separate networks. This type of network topology provides redundancy through duplication to each of the devices units connected to the network. To use the unD32 in such a system, connect the primary port to a switch on the primary network and then connect the secondary port to a switch on the secondary network. When using this type of network topology please make sure the unD32 is configured for redundant mode (refer to Dante Controller User’s Guide for information on how to do this).

**Note: It is recommended before using redundancy mode that the Audinate documentation on redundancy be reviewed to ensure the full implication of its use on both the network design and the system design are understood. Problems will result when redundancy mode is enabled on the unD32 if the audio networks are not designed and setup correctly to work in this manner.*

In this mode, the local port can be used as a control port as it can access the device regardless of whether the unD32 is operating on its primary or secondary interface (only one of which will be active for audio transfers at any one time).

2.3 – Audio Connections

The unD32 unit comes shipped with thirty two Phoenix-style, screw connectors pre-installed into the thirty two audio output connector ports.

===== ***** WARNING ***** =====
Outputs on the unD32 can be damaged if they are connected to inputs on other devices that have a phantom power option that is enabled or becomes enabled.

To avoid this, it is recommended that wherever possible outputs on the unD32 be connected to line-only inputs that do not have a phantom power option. If that is not possible, and when modifying installation wiring schemes of a system, care needs to be taken when enabling phantom power on a system where there is potential for phantom power becoming applied to an unD32 output.

=====

2.3.1 – Balanced Destination

To connect a balanced input on a destination device to an unD32 output, connect the positive and negative connections of both the unD32 output and the destination devices input respectively. Use the shield of the cable to connect the two GND pins together. If the cable does not have a shield, use a free internal core instead.

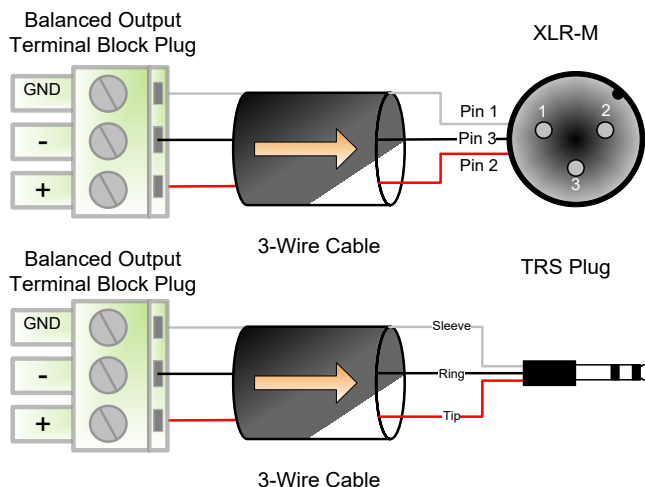


Figure 4 - unD32 Output to Balanced Destination

2.3.2 - Single Ended Destination

To connect a 2-wire unbalanced input to an unD32 output, connect the positive input of the destination device to the positive output of the unD32. Connect the GNDs together through the cable shield. If the cable does not have a shield, use a free core instead. Leave the unD32 negative output floating.

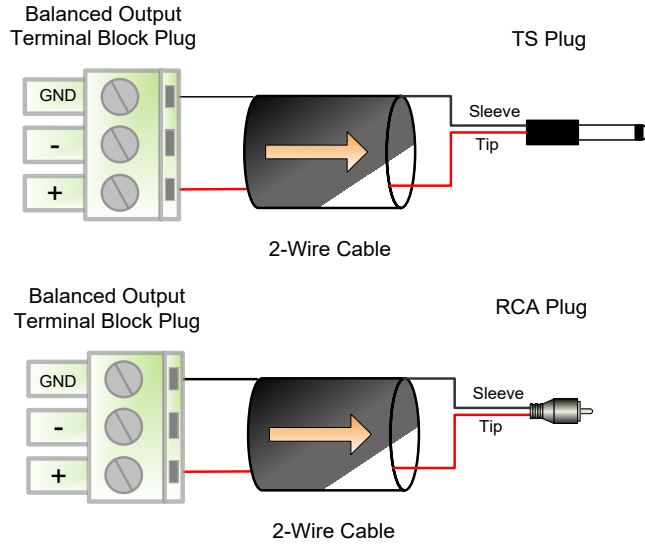


Figure 5 - unD32 Output to Single Ended Destination

3 – Front Panel Operation

The front panel allows the user to:

- View which of the available Dante audio channels is mapped to each of the unD32 audio outputs
- Adjust the signal level of each analog audio output from 0dBFS down to -60dBFS
- Mute an output.

3.1 – Front Panel

The front panel contains a 16-character by 2-line LCD screen and a six button keypad. A depiction of the front panel is shown in Figure 6.

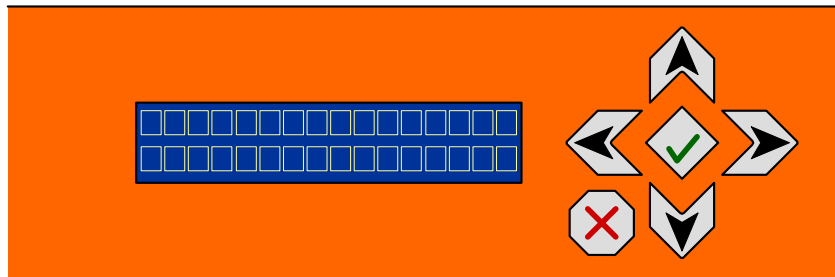


Figure 6 – unD32 Keypad & LCD

The six button keypad allows the user to traverse the various control screens. Four keys provide the ability to move the cursor Up, Down, Left, and Right. The key in the center with a check mark is the Enter key. The key marked with a red “X” at the bottom left is the Cancel Key.

3.2 – Cursor

The LCD will always display a cursor during operation of the unD32. The cursor is shown as a blinking block at the first character of a field. The cursor indicates the field that is currently selected. The cursor will initially be in the first character of the unD32 Output Channel field in the Channel Select screen.

3.3 – Transition between Screens

Each channel has two screens associated with it: the Channel Select screen and the Volume Select screen. These screens are described in subsequent sections of this user’s manual.

A single press of either the Up or Down button will cause the screen to transition to the Volume Select screen for the current channel. Another press of the Up or Down button will cause the screen to transition to the Channel Select screen for the next higher or next lower Output Channel respectively.

**Note: The channel number wraps from 32 to 1 in the Up direction and 1 to 32 in the down direction.*

3.4 – Channel View Screen

The Channel View screen provides the user a method to view which audio channel on the audio network is assigned for each individual output. This is also the initial screen the unD32 will show after power up. Figure 7 below shows a representation of it.



Figure 7 – Channel Select Screen

The top line shows the selected channel number (1 – 32) and name of the audio stream that the selected channel is currently receiving from the audio network. The channel number is always shown as two digits so channels less than 10 will have a preceding '0'. Only the first 10 characters of the stream name will be visible. If no assignment has been made, "- NONE -" is shown in this field.

**Note: Unlike Dante, AES67 channels are not required to be named and so name information is not available to receiving devices. On the unD32, if a channel is received from an AES67 stream, the unD32 will simply show "AES67".*

The bottom line shows the signal level of the selected audio channel. The level meter provides an approximate analog output level and is displayed as an extending horizontal bar. If no bar is shown, the output level is -40dBu or below, while a bar that extends up to the right-hand edge of the screen represents +20dBu full scale output and possibly clipping.

3.5 – Volume Select Screen

The Volume Select screen provides the user a method to trim the output levels of the unD32 from the front panel and the figure below shows a representative of it.

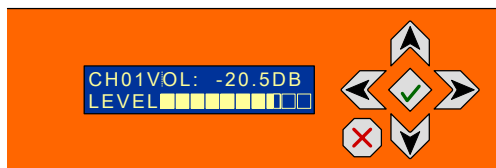


Figure 8 – Volume Select Screen

The top line on the Volume Select screen shows the channel number that is currently selected and the current volume level.

The bottom line shows the signal level of the selected audio channel. The level meter provides an approximate analog output level and is displayed as an extending horizontal bar. If no bar is shown, the output level is -40dBu or below while a full bar up to the right edge of the screen represents +20dBu full scale output or clipping.

While in the Volume Select menu, pressing the Right/Left button will cause the cursor to move between the first position of the Channel Volume and the Volume Select fields. To change the volume on an unD32 Output Channel, the cursor should be moved to the first position of the Volume Select field.

Once in the Volume Select field, the Up and Down buttons will raise or lower the volume setting respectively. The Up/Down buttons can be held down for greater than a half a second and the function will be auto-incremented to enable fast changes of the volume. The volume can be adjusted between 0dBFS and -60dBFS. One press of the down button when the volume setting is at -60dB will cause the channel to be muted and show "MUTE" on the display.

To transition back to the Channel Menu, the cursor needs to be moved to the first character of the Channel Volume field.

3.6 – LCD Sleep

After five minutes of inactivity, the LCD will go into “Sleep” mode where the backlight for the LCD and buttons is turned off. Sleep mode only affects the backlight and all other unD32 operations including audio transfers will continue as normal. Pushing any button will cause the LCD to “wake up” and the LCD and button backlights to illuminate again.

**Note: While changes to settings using the front panel are active immediately, they are only saved to non-volatile memory when the LCD goes to “sleep”. If changes have been made to the unD32 settings using the front panel and the unit is then powered down before the LCD has gone to “sleep”, any changes will be lost.*

4 – Device Configuration

There are two parts of the device that can be configured using a GUI: audio routing and device specific parameters such as master volume, master mute and channel volumes and mutes.

The audio routing is carried out using Audinate’s Dante Controller. This application is 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 their website.

**Note: When using Dante controller, the unD32 will be shown using a default device name of unD32-##### where ‘#####’ is the last six characters of the devices MAC address.*

4.1 – unIFY Control Panel Notes

The unIFY Control Panel software provides users with a simple tool to monitor and configure Atterotech devices. It detects connected devices on the configured network automatically showing them in a device list. Once a device is discovered, unIFY can present further details about the device.

Configuration of the unD32 specific features is carried out using the Atterotech unIFY Control Panel application (V3.0 or later). This application is available through the Atterotech customer portal (<https://portal.atterotech.com/home/>). It can be used to examine and modify the device specific features such as individual channel volume and mute settings as well as master volume and master mute.

Note:* The unD32 settings are volatile and parameter changes will be lost if the unit is reset or power cycled. However, unIFY Control Panel can be used to save presets and change the power-on defaults to prevent loss of settings. This is a manual process and is not automatic. See **4.1.8 Preset Configuration and the unIFY Control Panel manual for steps to save.

4.1.1 – Master Mute On/Off

Clicking the “Master Mute” when in the off state activates the mute function on all 32 outputs simultaneously. Conversely, click the “Master Mute” button when in the on state deactivates the master mute. Individual mute states are maintained when these functions are used.

4.1.2 – Master Volume

Use the master volume to set the maximum overall level on all outputs. It adds no gain, just merely attenuates each output by the indicated value. A value of 0dB would mean no attenuation.

4.1.3 – UDP Request/Response ports

Sets the port number used to send and receive UDP control message through to control the unD32. The request port is port commands are sent to on the unD32. The response port is which port the D32 sends any responses to commands back to.

4.1.4– Pre/Post Metering

The unD32 has two modes of metering. Switching between these modes can be come any time using the appropriate radio buttons. The pre- metering mode shows the levels of the audio signals received directly from the Dante flows prior to any adjustments the D32 may make. Post- meters show the levels sent to the local outputs after all audio adjustments the unD32 may

4.1.5 – Dante RX Channel Name

The Dante RX channel name is shown just below the channel number for each channel and represents the Dante receive channel name as it appears on the Dante network for each analog output channel. The box is small so the entire name may not be displayed. To see the full name, hover over the name and a pop-up hint will appear showing the entire name.

**Note: This field is non-editable. To edit the channel names, use the device list view control or use Dante Controller.*

4.1.6– Channel Mute

Each output has its own mute. The state of the button indicates its state with dark grey meaning the mute is inactive and orange indicating the mute is active. Click the button to change the mute state.

4.1.7 – Channel Volume

Each output has its own volume control. The slider is just to the left of the channel meter and is adjustable from a minimum of -60dB to a maximum of 0dB. To adjust the volume, click on the slider and drag it either up or down. Alternately, click in the text box below the slider and type in the desired level.

4.1.8 Preset Configuration

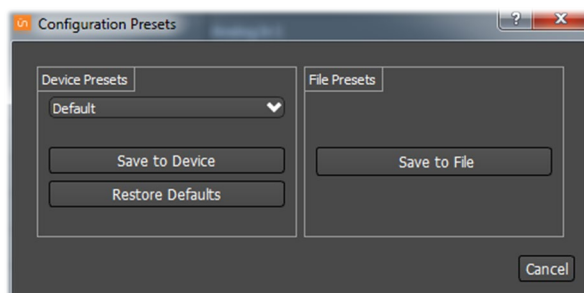
Most devices feature preset capabilities for recalling a previously saved set of settings either from a file on the PC or from non-volatile memory on the target device. When a device is selected for configuration, if the device supports presets, a “Save Presets” button and “Load Presets” button will be added to the toolbar.



4.1.8.1 Save Presets

When the “Save Presets” button is pressed, the “Configuration Presets” dialog will open in save mode.

**Note: If the parameter lock is active, the device preset side will be greyed out as the parameter lock prevents any change to device settings. This lock must be removed before a preset can be saved to the device. This may require the Dante lock be removed first, if that is also active.*



4.1.8.2 – Save: Device Presets

Current settings can be saved to a preset in non-volatile memory on the selected device. Use the dropdown list to select which preset the current settings will be stored to, then click the “Save to Device” button. On all Attero Tech devices, preset 0 is used to store the power-on defaults.

The power-on defaults can be reset back to factory settings with the “Restore Defaults” button.

***WARNING: Use this with care!**

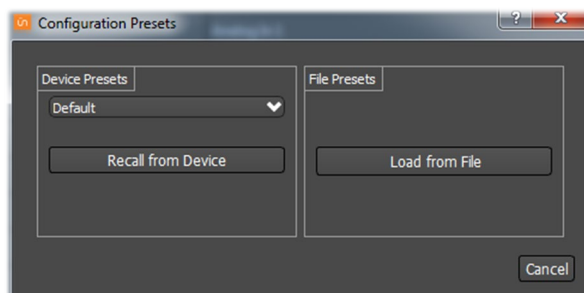
4.1.8.3 – Save: File Presets

Current settings can also be stored off to a file. The file created can be used to apply the same settings to multiple devices (see Multiple Device Preset Load feature in the unIFY Control Panel manual). It can also be stored off as a back-and recalled later if needed.

4.1.8.4 – Load Presets

When the “Load Presets” button is pressed, the “Configuration Presets” dialog will open in “Load” mode.

**Note: If the parameter lock is active, loading a preset will not be possible as configuration changes are blocked. A warning will instead pop up warning the user that the parameter lock is active. This lock must be removed before a preset can be loaded. This may require the Dante lock be removed first, if that is also active.*



4.1.8.5 – Recall – Device Presets

Update the current settings from a previously stored preset in non-volatile memory on the device. Use the dropdown list to select the desired preset, then click the “Recall from Device” button.

4.1.8.6 – Recall – File Presets

Use the “Load from File” button to update the current device settings from a file which was previously saved using the “Save Preset to File” feature.

4.2– Third party Control

The unD32 allows direct access to its master and channel volume and mute settings. This is achieved by the control system sending system formatted UDP messages to a specific port of the unD32. The port to send this information to and the port to which the response is sent is set using the Command Port and Response Port values. To alter the port used, simply change the values in the respective fields and click the “Configure” button to apply the values to the unit.

Further information on the protocol and the precise message format that the UDP messages use can be found in the unIFY Software API document.

4.3 – Troubleshooting

Device not showing up in unIFY D32 Control Panel

- 1) PC not connected to Dante network (must use a wired connection).
- 2) If the PC has a firewall, ensure that it’s configured to allow the unIFY Control Panel as access to the network.

Audio not being heard

- 1) Audio not routed to correct output or not routed to the unD32at all
- 2) Master volume set too low
- 3) Master mute active
- 4) Channel volume set too low
- 5) Channel mute active

The metering data is transferred across the network using multicast packets. However there are situations which will cause the application to not receive these packets. If the application is not getting metering data, try the following.

- 1) Ensure any firewall is configured to allow the unIFY Control Panel as access to the network. If the unD32 Control Panel software still does not work correctly, try disabling the firewall temporary while you use the application.
- 2) If Windows 7, enable “Reliable Multicast Protocol”.

**Note: This is enabled on the interface (network card) for the Dante audio, if your system has multiple network interfaces.*

See the following link for instructions: <http://www.itechtalk.com/thread11886.html>

- 3) Check that the device and the PC’s network card both have an IP address and they are both in the same network range.

5 – Device Specifications

5.1 – Architects and Engineering Spec

The Dante Break Out Interface shall have 32 balanced analog output channels. Each channel shall be capable of being driven from a unique Dante audio flow or a channel from an AES67 stream, such that a maximum of 32 different audio signals can be output simultaneously. The unit shall have a 16x2 character LED display and 6 buttons on the front panel which allow all parameters of the unit to be adjusted and monitored. All parameter changes will be non-volatile and self-restoring in the event of AC power interruption. The unit's display shall show Dante flow name for Dante audio or "AES67" for AES67 audio, volume setting in dB, and relative output level for each channel. The unit shall accept worldwide voltages from 100 - 240VAC, 50Hz/60Hz and have active PFC (power factor correction). The unit shall be compliant with FCC Part 15, CE, and UL requirements. Analog output grounding and shielding shall be compliant with AES48-2005 guidelines. The unit shall be the Attero Tech unD32 BoB.

5.2 – Device Specifications

Output Type:	Balanced with automatic muting upon loss of Dante signal
Output Impedance:	200 ohms balanced, 100 ohms unbalanced (i.e. either "+" or "-" output with respect to ground)
Output Noise:	< -90dBu @ 0dB gain
Dynamic Range:	> 110dB
Maximum Output Level:	+20dBu
System THD:	< 0.05% at any gain, input signal 3dB below maximum
Output Channels:	32
Audio Network	Dante / AES67 (44.1 kHz / 48 kHz support)
Network Ports	3
Power Consumption:	20 W maximum at 100V-240VAC
Operating Temperature	0°C - 40°C
Certifications:	FCC Part 15 Class A, CE, UL. Compliant with AES48-2005 Grounding/EMI Guidelines
Dimensions:	1.75" H x 19" W x 6" D
Weight	5 lbs

APPENDIX A – Reference Documents

The following table lists the relevant reference documents.

Document Title	Revision
unIFY Software API manual	V1.0