



The **army knife** for audio



## Technical User Manual



## IMPRINT

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## 1. INTRODUCTION

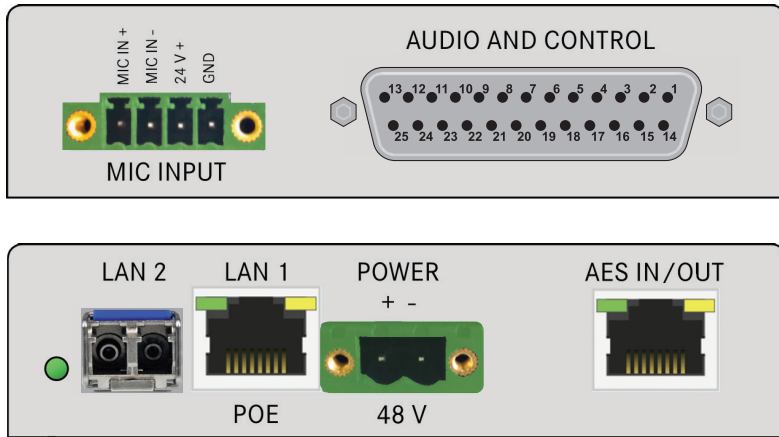
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Thank you for choosing tm stagetec systems's DIO device, DIO stands for Dante™ Input Output. We created the DIO as the army knife for audio, with an impressive range of tools and converters. It boasts a 2 port Ethernet switch (1x 1Gb Copper and 1x SFP cage - allowing for various fibre or copper connections), Dante™ audio, AES Input and Output, Mic Input, Line Input, Line Output, Headphone Output with external volume control and 2 x GPIO. The DIO is powered by PoE (Power over Ethernet) or runs via an external PSU. Redundancy is provided between both power sources.

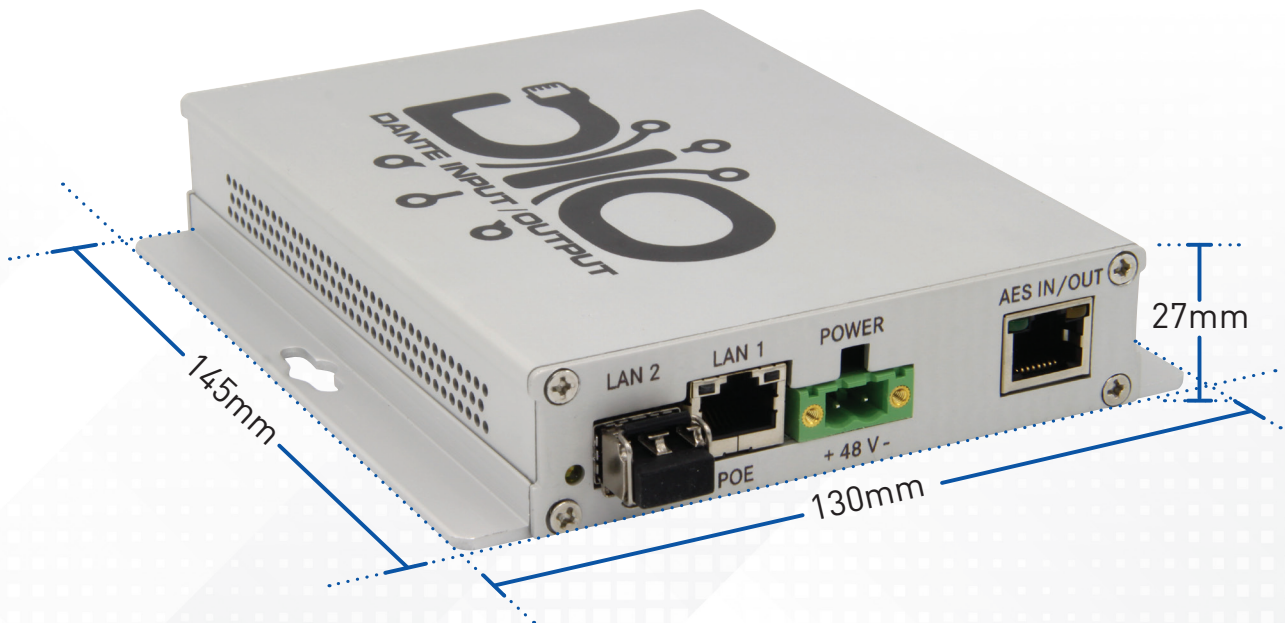
Please read this manual before attempting to operate your new device to ensure reliable operation for years to come. For any additional questions that are not addressed in this document, feel free to contact tm stagetec systems directly.

## 2. PRODUCT DESCRIPTION

### Interfaces



### Dimensions



## 2.1 ANALOGUE AUDIO

	Balanced Inputs	Balanced Outputs	Headphone Amplifier
Connection Type	D25 Connector	25 Connector	D25 Connector
Channel	- 2 x Balanced, - Max input level +24dBu	- 2 x Balanced, - Max output level+24dBu	- 2 channel, - 15vpp 220Ohm load - 8vpp 500hm Load - short circuit protected
Sample Rate	48kHz (24bit)	48kHz (24bit)	N/A
Dynamic Range	> 95dB (A weighted)	> 97dB (A weighted)	> 97dB (A weighted)
THD	- < -83dB 1kHz +18dBu input - -6dBFS output	- < -86dB 1kHz -6dBFS - 18dBu output	< -85dB 1kHz -6dBFS
Frequency Response	20Hz -20kHz	20Hz -20kHz	20Hz -20kHz
Channel Gain Control	+6dB to -12dB in 0.5db increments	+20dB to -57dB in 0.5db increments	N/A
Soft Clipper	N/A	N/A	0.1 to 10, in 0.1 increments
External Volume Control	N/A	N/A	Channel and gain range selectable

Input (Microphone)	
Connection Type	Phoenix Connector
Input Gain Block	Phoenix Connector
Dynamic Range	> 95dB (A weighted) unity gain , -112 dBu EIN150ohm reference -50dBu input level
Frequency Response	20Hz - 20kHz
THD	< -80dB 1khz 0dBu input , -3dBFS output
Attack	TC 6ms to 2000ms
Release	TC 24ms to 786430ms
Hold	2ms to 87491ms
Noise Gate Threshold	30 to -77db relFS
Phantom Power	+48v selectable
External DC output	+24v 40ma

## 2.2 DIGITAL AUDIO

	Input	Output
Connection Type	RJ45	RJ45
Sample Rate	48 kHz (32bit)	48 kHz (32bit)
Modes	Transparent / Non Transparent	N/A
Redundancy	2 x Buffered inputs (via Dante)	N/A

### Message Player (Option)

Wav, MP3 Message player triggered by GPIO or UDP protocol.

### GPIO

Inputs 2 x Opto Inputs - Max 5mA Sink

Outputs 2 x Outputs, bis 200V, max. 150mA

2 x Isolated Outputs - 200V Max 150mA

## 2.3 ETHERNET AND POWER

Ethernet	
Switchports	2
Port 1	1 Gbit Copper (POE IN)
Port 2	1 G bit Copper or Fibre (SFP Cage)
DANTE™ Configuration	8 x 8

Power	
External*	12-48 Volts
Power Over Ethernet *	POE Switch benötigt / required
Power	10 Watt / Watts

\*Redundancy power is provided between both inputs.



## 3. SETTING UP

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### 3.1 WHAT'S IN THE BOX

Start by removing the DIO from its shipping carton and check it for possible damage. Also check whether all accessories have been supplied.

Please be careful while unpacking as sharp edges may cause injuries.

The shipping carton contains:

- DIO
- Power Supply
- Owner's manual

If anything appears to be missing, please contact tm stagetec systems.

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### 3.2 INSTALLING

Install the DIO in the designated area. The casing has two mounting holes in the side which will allow you to screw or bolt it in wherever you wish. Please be aware that the chosen installation location should be a dry area that is not subjected to extreme heat and has suitable ventilation.

Never remove the outer casing of the DIO under any circumstance. Doing so may compromise electrical safety and mechanical protection. Be aware that any modification to the unit will void warranty.

## SETTING UP

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### 3.3 WIRING

#### Powering the device

Please use the supplied power supply to power the device by connecting the phoenix connector to the power input of the DIO. Be sure to follow all local safety regulations regarding power connections.

Alternatively, if you have a switch with POE (Power Over Ethernet) capabilities you may connect an ethernet cable from the switch to Lan Port 1 on the DIO to power it.

#### Sockets/Interfaces

Now you are ready to establish all required connections. The following sockets are provided:

- RJ45 ethernet connection (POE enabled)
- AES In/Out (RJ45)
- SFP cage for fibre or copper SFP
- 4 pin phoenix connector microphone input
- D25 connector (female)

## 4. DEVICE SETUP

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Configuration of the DIO is performed via a web browser individually for each device. Please read the following page for information on how to configure the device.

### Software

- Web browser – Internet Explorer 8 or later
- iOS – from 6.1.3 or later
- Safari – from 6.0.3 or later
- Firefox

If anything appears to be missing, please contact tm stagetec systems.

To commission a DIO you may use two methods to login.

1. Power up the DIO and connect it to a computer via ethernet or fibre. Check the default name from the label on the DIO i.e. "DIOB-xxxxx". In a web browser, go to address "http://DIO-B-XXXXXX.local" To login to the webpage, the default password is "password".

2. The Audinate Dante Controller software application is required, which can be downloaded from the Audinate website.

[www.audinate.com/support/softwaredownload/DanteController](http://www.audinate.com/support/softwaredownload/DanteController)

The software detects all devices in the network automatically, and shows the name as well as individual IP addresses for each device. These are required in order to configure the DIO via a web browser.

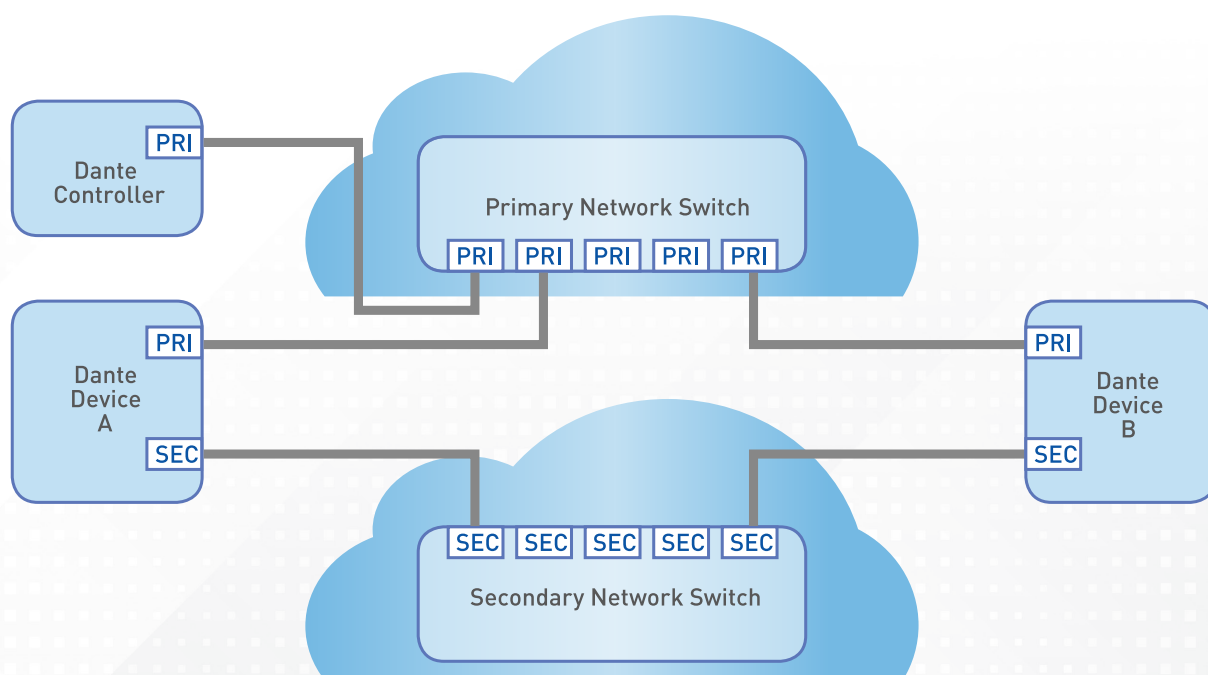
Changes that have been applied by using Dante Controller will only be valid until restarting the device. In order to change the settings permanently you should use the web service to apply changes and save them or at least save them in the web server after changing in Dante Controller. Otherwise the device will fall back to the last saved setting after rebooting. This applies to e.g. crosspoints, device names, channel names.

## DEVICE SETUP

### Please note:

DANTE™ allows you to build a redundant audio network between devices. This feature has to be activated on the respective devices (if available). If you decide to use a redundant audio network there are special requirements to consider:

- The device which does the configuration must be the part of the primary network.
- Both networks must have the same link speed. If the primary network offers a transmission speed of one gigabit per sec, this must also be available on the redundant network in order to facilitate automatic switchover in case of failure.
- If a device is not to be connected with redundant links, it should be used exclusively in the primary network.



## DEVICE SETUP

---

The configuration program is a Web browser-based configuration interface. You will be guided step-by-step through the configuration which offers the following options:

### **Status**

Status information

### **System**

System configurations

### **Outputs**

Configuration of OUTPUTS

### **Dante Metering**

Metering of Dante receivers and transmitters

### **Save Configuration**

Storing the configurations

### **Download Configuration**

Downloading the configurations

### **Restore Configuration**

Restoring configurations

### **Factory Reset**

Restore the device to its default settings

### **Reboot**

Reboot the device

### **Logout**

A configuration session remains active for 30 minutes. To prevent abuse, please logout after completing the configuration.

# DEVICE SETUP

## Connecting to the DIO

- 1 To configure a DIO, open your Web Browser and type the DIO's unique IP address into the address bar. Confirm with the Enter key. The status page of the DIO will appear with an option to login on the left hand side of the screen.
- 2 Click the login option. When the password prompt appears enter the password. By default, the password is "password".

1

**DIO-B**

- Status
- Login

**STATUS**

**DEVICE INFO**

Device Name	ipad
Dante Redundancy	Switched
Dante Preferred Master Clock	OFF
Dante Domain	ADHOC
Dante Domain State	DISCONNECTED
Uptime	0 days, 17 hours, 8 minutes
Temperature	42.75 °C

**VERSIONS**

Dante Model ID	51
Dante Software	4.00.008.002
Dante Firmware	4.00.002.007
Device Software	1.03.025
FPGA Firmware	2.02.003
Hardware	1.01.000
Options	NONE
SMA XML Configuration	2.06.000

**SWITCH INFO**

Status

LAN 1: 1G PRI  
LAN 2: NO SFP MODULE PRI

**DANTE NETWORK PRIMARY**

Clock State	SLAVE
Tx util Kbps	2794
Rx util Kbps	18
DHCP active	DHCP
IP Address	192.168.12.56
Mask	255.255.255.0
Gateway	192.168.12.254
DNS Suffix	stagetec.com.au
DNS Server	192.168.10.1
MAC Address	00:1D:C1:0D:9A:C0

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Login

2


**DIO-B**

- Status
- Login

Login

ENTER PASSWORD

Ok Cancel

 A configuration session remains active for 30 minutes. To prevent abuse, please logout after completing the configuration.

### Overview on the configuration program

**DIO-B**

- 🏠 Status
- ⚙️ System
- 📶 Inputs >
- 🔊 Outputs >
- 📶 Dante Metering >
- 🔧 GPIO
- 💾 Save Config
- 📄 Download Config
- 🔄 Restore Config
- ⚠️ Factory Reset
- 🔄 Reboot
- 🔒 Logout

**STATUS**

**DEVICE INFO**


<b>Device Name</b>	ipad
<b>Dante Redundancy</b>	Switched
<b>Dante Preferred Master Clock</b>	OFF
<b>Dante Domain</b>	ADHOC
<b>Dante Domain State</b>	DISCONNECTED
<b>Uptime</b>	0 days, 17 hours, 4 minutes
<b>Temperature</b>	42.75 °C

**VERSIONS**


<b>Dante Model ID</b>	51
<b>Dante Software</b>	4.00.008.002
<b>Dante Firmware</b>	4.00.002.007
<b>Device Software</b>	1.03.025
<b>FPGA Firmware</b>	2.02.003
<b>Hardware</b>	1.01.000
<b>Options</b>	NONE
<b>SMA XML Configuration</b>	2.06.000

**SWITCH INFO**

Status



LAN 1  
1G  
PRI



LAN 2  
NO SFP  
MODULE  
PRI

**DANTE NETWORK PRIMARY**

<b>Clock State</b>	SLAVE
<b>Tx util Kbps</b>	2802
<b>Rx util Kbps</b>	52
<b>DHCP active</b>	DHCP
<b>IP Address</b>	192.168.12.56
<b>Mask</b>	255.255.255.0
<b>Gateway</b>	192.168.12.254
<b>DNS Suffix</b>	stagetec.com.au
<b>DNS Server</b>	192.168.10.1
<b>MAC Address</b>	00:1D:C1:0D:9A:C0

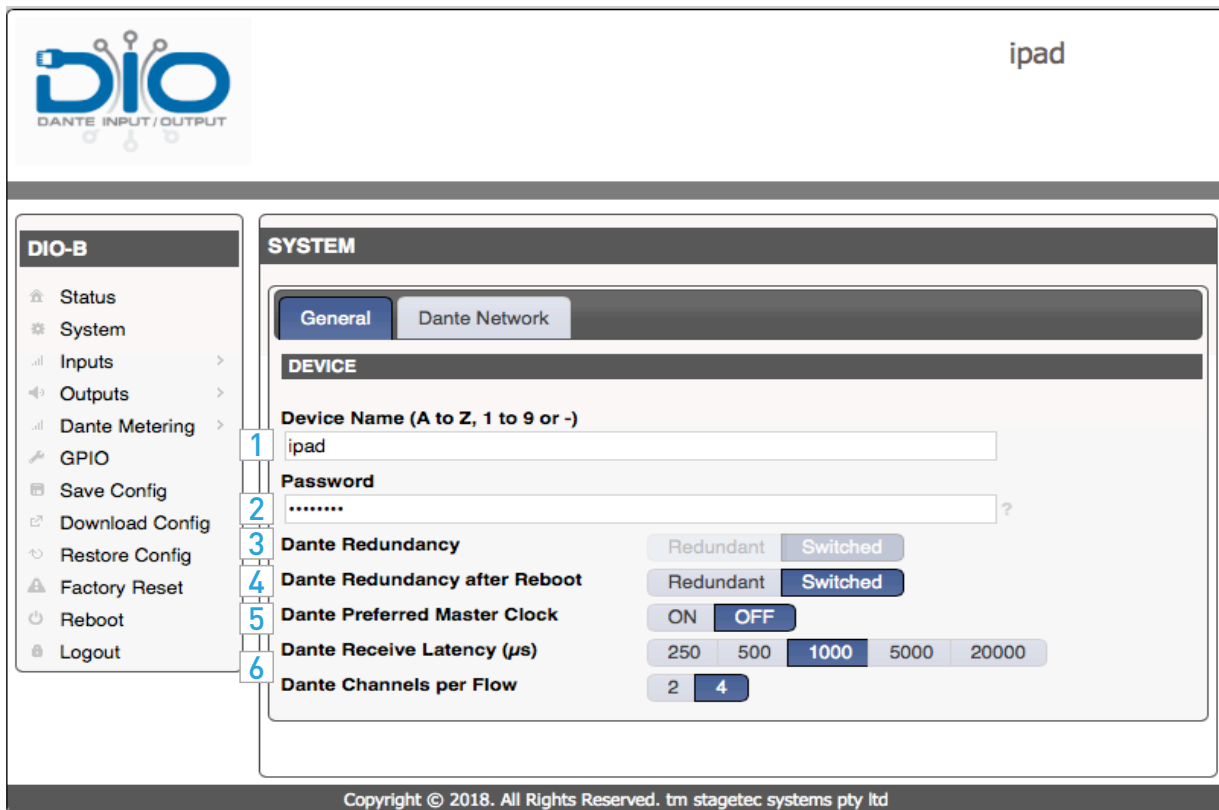
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**DIO-B**

- 🏠 Status
- ⚙️ System
- 📶 Inputs >
- 🔊 Outputs >
- 📶 Dante Metering >
- 🔧 GPIO
- 💾 Save Config
- 📄 Download Config
- 🔄 Restore Config
- ⚠️ Factory Reset
- 🔄 Reboot
- 🔒 Logout



Individual settings are only applied when the system is restarted after saving.



Under the menu item **SYSTEM General** you can configure following settings:

- 1 The name of the device can be edited in this window
- 2 The password can be changed
- 3 This shows the status of the device's redundancy. Please use the option below to change the status.
- 4 Change the desired status after reboot of device.

If set to Redundant LAN port 2 is used as the link to the redundant network, isolated by VLAN.

If set to Switched both LAN interfaces have the same functions and are linked directly to the internal switch.

- 5 Determines clock master. Here the DIO can be defined as the master clock. If there is no clock master defined, or several, the device with the smallest MAC address becomes the clock master.
- 6 This determines the latency settings.



Individual settings are only applied when the system is restarted after saving.



**SYSTEM Dante Network**

**SYSTEM**

General **Dante Network**

**DANTE NETWORK PRIMARY**

<b>Clock State</b>	SLAVE
<b>Tx util Kbps</b>	2794
<b>Rx util Kbps</b>	19
<b>DHCP Active</b>	<input type="radio"/> OFF <input checked="" type="radio"/> ON <span style="border: 1px solid black; padding: 2px;">1</span>
<b>DHCP after Reboot</b>	<input type="radio"/> OFF <input checked="" type="radio"/> ON <span style="border: 1px solid black; padding: 2px;">2</span>
<b>IP Address</b>	<input type="text" value="192.168.12.56"/>
<b>Mask</b>	<input type="text" value="255.255.255.0"/>
<b>Gateway</b>	<input type="text" value="192.168.12.254"/>
<b>DNS Server</b>	<input type="text" value="192.168.10.1"/>
<b>DNS Suffix</b>	stagetec.com.au
<b>MAC Address</b>	00:1D:C1:0D:9A:C0

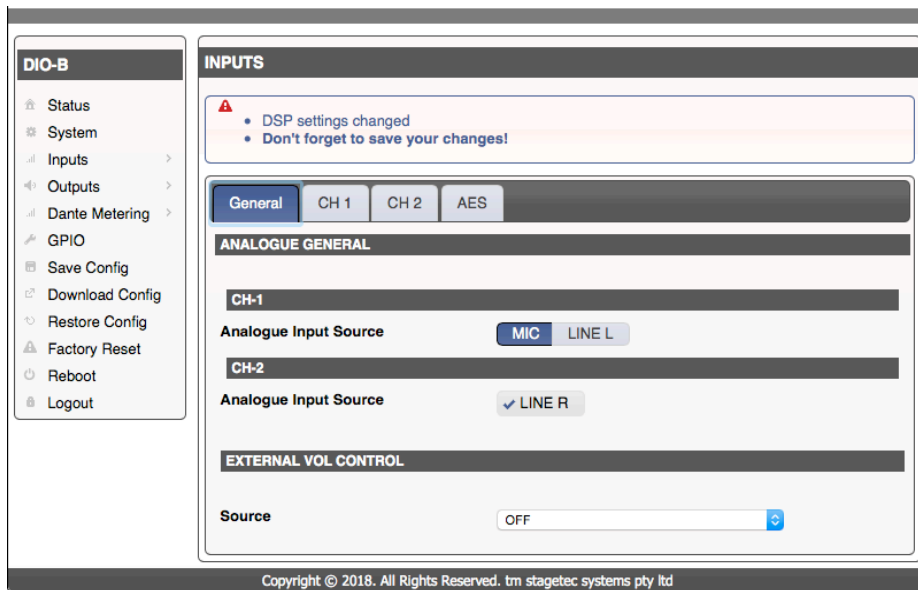
Under the menu item **SYSTEM Dante Network** you can configure the following settings for the Primary and Secondary network:

- 1 Shows the current status.
- 2 If DHCP is set to on the IP address is assigned by the DHCP sever. If no DHCP server is available in the network all devices with the setting will receive a zero conf address.

If DHCP is set to off the device is configured to use a static IP address that can be changed in the sections below.

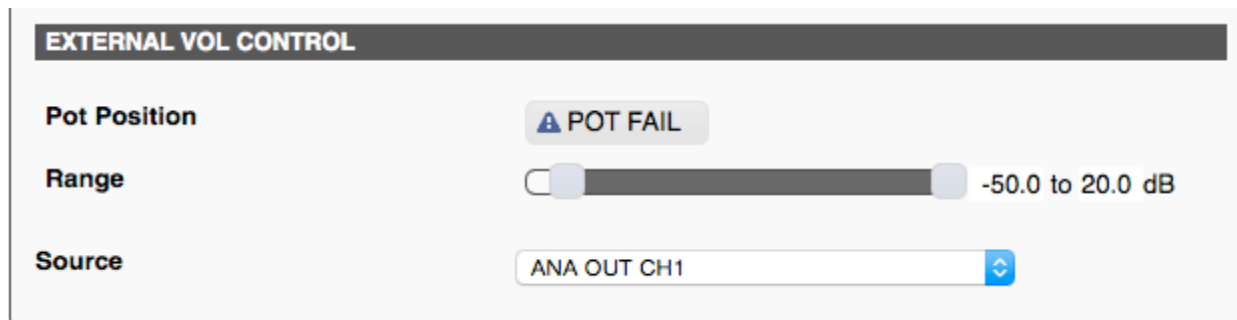
## DEVICE SETUP

### Input General

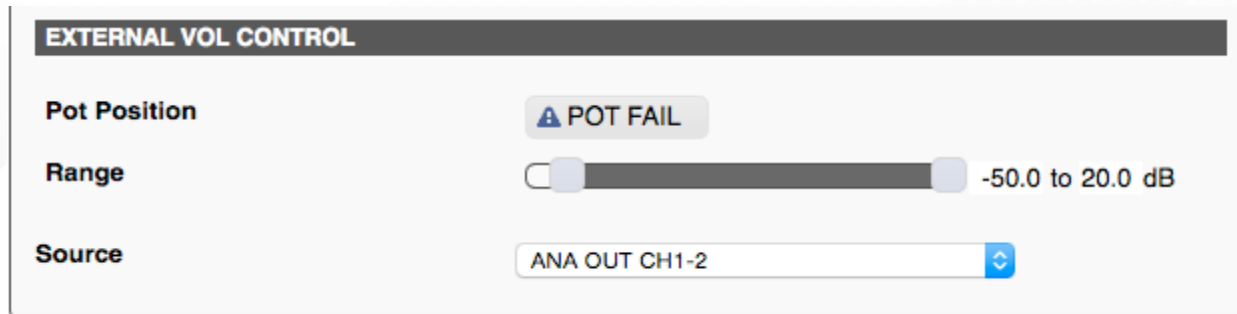


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1



2



Under the menu item **Inputs General** you can configure the following.

- 1 You can select if the analogue input source for channel 1 is MIC or Line L. Channel 2's analogue input source is always Line R and cannot be changed.
- 2 You can select which source you wish to control the volume of. You may also select the level range that the pot control. The DIO will indicate the position of the external pot and can also detect pot failure. When adjusting the external volume control you will need to refresh the browser to monitor any changes on the browser.

**INPUTS**

General **CH 1** CH 2 AES

**MICROPHONE**

**PREAMPLIFIER**

Phantom Power  ON  OFF

Trim  0.0 dB

**AUTOMATIC LEVEL CONTROL**

Enable  ON  OFF

Maximum Gain  24 dB

Desired Level  -6 dB

relFS

Hold  ms

Attack  ms

Release  ms

AGC Gate  ON  OFF

AGC Gate Threshold  -48 dBFS

Under the menu option **Inputs-General-CH1** you can configure the following if your channel 1 analogue input source is set to MIC.

- 1 You can enable phantom power and set the input trim
- 2 If you enable automatic level control by selecting the on button. You may set the maximum gain, desired level and other settings such as Hold, Attack and release. An AGC Gate (Automatic Gain Control) may also be implemented and the threshold can be set on this page.

## DEVICE SETUP

### Inputs CH1 & 2

The screenshot shows the 'CH 1' tab selected. At the top, there are four tabs: 'General', 'CH 1', 'CH 2', and 'AES'. Below the tabs, the title 'ANALOGUE INPUT CHANNEL 1' is displayed. Underneath, the 'Trim' control is shown as a horizontal slider with a blue knob, and the value '0.0 dB' is indicated to the right.

The screenshot shows the 'CH 2' tab selected. At the top, there are four tabs: 'General', 'CH 1', 'CH 2', and 'AES'. Below the tabs, the title 'ANALOGUE INPUT CHANNEL 2' is displayed. Underneath, the 'Trim' control is shown as a horizontal slider with a blue knob, and the value '0.0 dB' is indicated to the right.

The screenshot shows the 'AES' tab selected. At the top, there are four tabs: 'General', 'CH 1', 'CH 2', and 'AES'. Below the tabs, the title 'AES INPUT' is displayed. Underneath, the 'Lock Status' is shown as a button with a warning icon and the text 'FAULT'.

- If **CH1** analogue input source is set to Line L you may only adjust the Trim.
- Under the tab **CH2** in the Inputs menu option you may adjust the Trim.
- The **AES** tab under the Inputs menu option will indicate the Lock Status and the Sync Status of your AES connection.

**OUTPUTS**

**Warning:**

- DSP settings changed
- Don't forget to save your changes!

**General** | Line-HP CH 1 | Line-HP CH 2 | DSP CH 1 | DSP CH 2 | AES

**LINE REDUNDANCY**

Audio Redundancy:  ON  OFF

**TONE GENERATOR**

Tone: WHITE

Volume: 0.0 dB

**DSP DELAY**

DSP Channel: NONE

Delay: 1 ms

**EXTERNAL VOL CONTROL**

Source: OFF

Under the menu option **Outputs-General** you can configure the following.

If Audio Redundancy is turned on it will switch between the Primary and Secondary inputs if required. See the block diagram in 5. Technical Data.

A Tone Generator is available at each output. On this page you can select the level of the tone and choose between white noise, pink noise and a 1kHz sine wave.

This External Volume Control is the same as the Control available in Inputs - General. It will mirror any changes made in the input section.

## Output Analogue & DSP CH 1 & 2

**OUTPUTS**

⚠ DSP settings changed  
• Don't forget to save your changes!

General | **Line-HP CH 1** | Line-HP CH 2 | DSP CH 1 | DSP CH 2 | AES

**ANALOGUE OUTPUT CHANNEL 1**

**1** Redundancy Status: PRIMARY

**2** Source: ANA-L(MIC-LINE)

**3** Line Mute: MUTE | UN-MUTE

**4** Volume: 0.0 dB

**5** Soft Clipper: ON | OFF

**6** Soft Clipper Threshold: 1.0

**VOX CONTROL**

VOX Source: CH1 DANTE

VOX Enable: OFF | ON

VOX Mode: ROUTE | DIM | MIX

VOX Timeout: 2 Sec

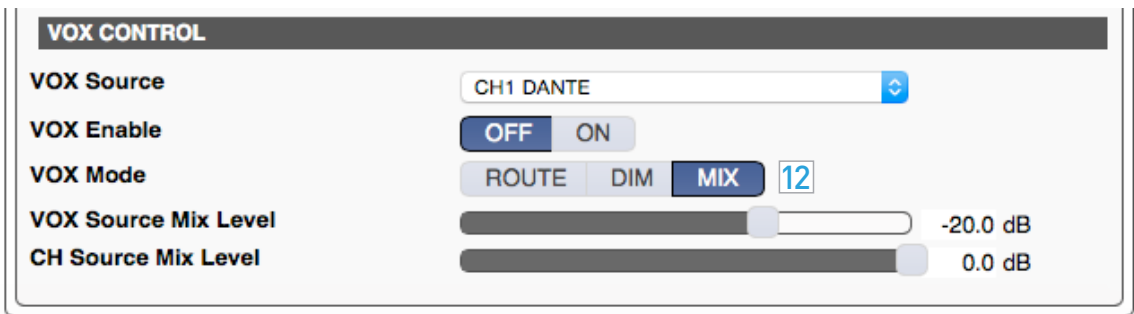
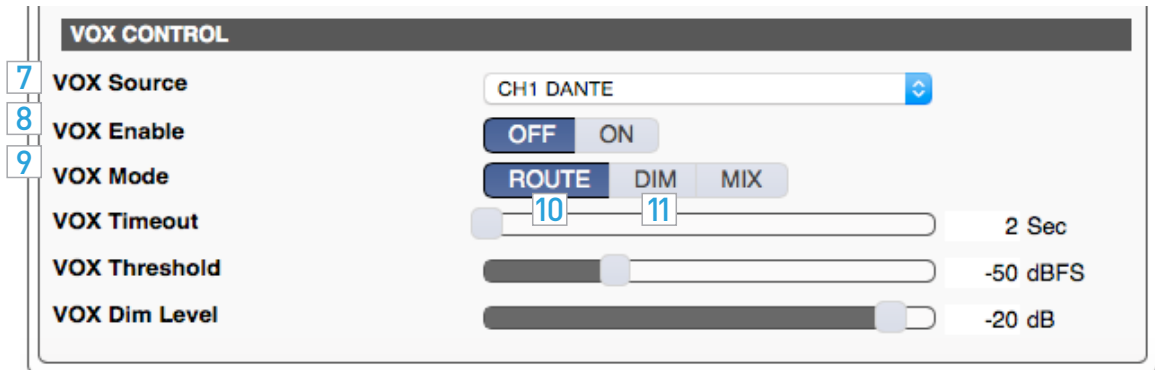
VOX Threshold: -50 dBFS

VOX Dim Level: -20 dB

Under the Menu option **Outputs- General-Analogue CH1** the following functions are available:

- 1** If the DIO's audio redundancy is on this will indicate if it is using the Primary or Secondary inputs.
- 2** Allows selection of which input source will go to Analogue CH1 output.
- 3** Allows the output to be muted from this page.
- 4** Allows control of the output volume.
- 5** Select on to activate the Soft Clipper
- 6** The Soft Clipper will reduce the peaks of the wave if they pass the set threshold. The threshold works on a scale of 0-10. Zero being the soft, ten being hard.

## Output Analogue & DSP CH 1 & 2



- 7 Select which input you wish to be your VOX Source.
- 8 Enable Vox function.
- 9 Select the VOX Mode.
- 10 Selecting the Route Mode will control which source goes to the output. There is a gate in line with the VOX Source, when the level is below the threshold the Analogue channel 1 source will be routed. If the VOX Source surpasses the threshold, it will be routed to the output instead. Vox Timeout defines the release time of the gate. Vox threshold defines the Threshold of the gate. The dim option has no effect in this mode.
- 11 When the Vox source surpasses the threshold it will dim the Analogue output. You can define the release time, threshold and dim level below.
- 12 This mode will mix the channel source and the Vox source. You can control the level of each source below.

The screenshot shows the 'OUTPUTS' configuration interface with the 'AES' tab selected. The 'AES OUTPUT' section contains the following settings:

- Redundancy:** ON OFF (OFF is selected)
- Transparency:** ON OFF (OFF is selected)
- Primary Status:** ▲ FAULT
- Secondary Status:** ▲ FAULT
- Active Interface:** ✓ PRIMARY
- Source:** DANTE

Under the Menu option **Outputs-General-AES** the following functions are available:

- 1 Indicates if the Primary AES output has a fault.
- 2 Indicates if the Secondary AES output has a fault.
- 3 Indicates if the Primary or Secondary output is currently in use
- 4 Allows you to activate redundancy between the Primary and Secondary AES outputs.
- 5 Allows you to activate Transparency which will allow the AES output to also contain data.



**1** FIR Filter  ON  OFF

**2** FIR Filename N/A

**FIR FILTER FREQUENCY RESPONSE**

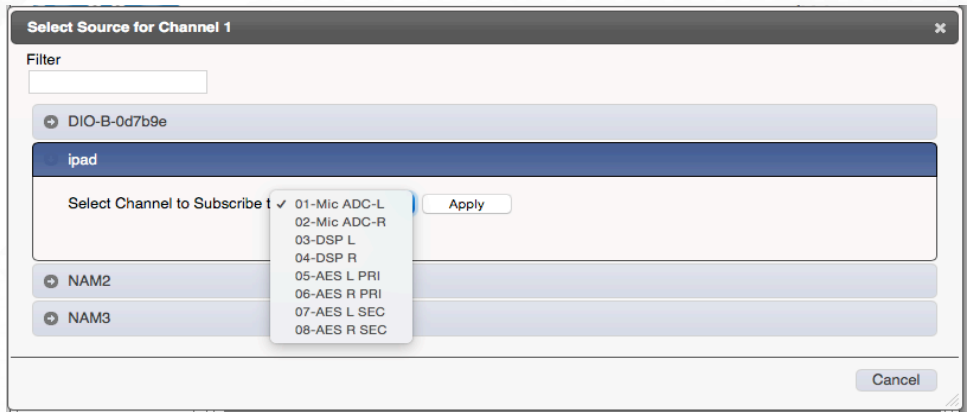
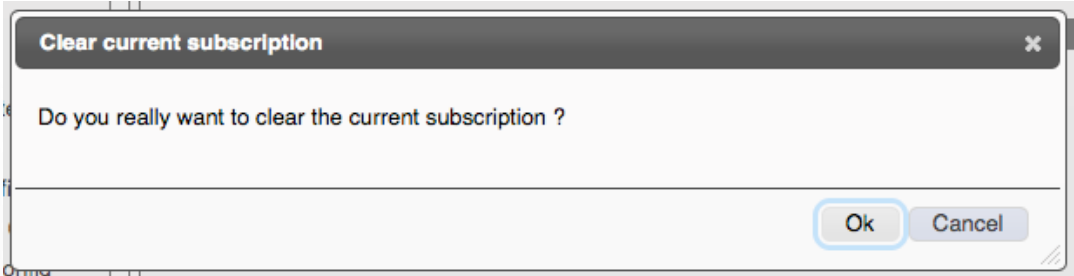
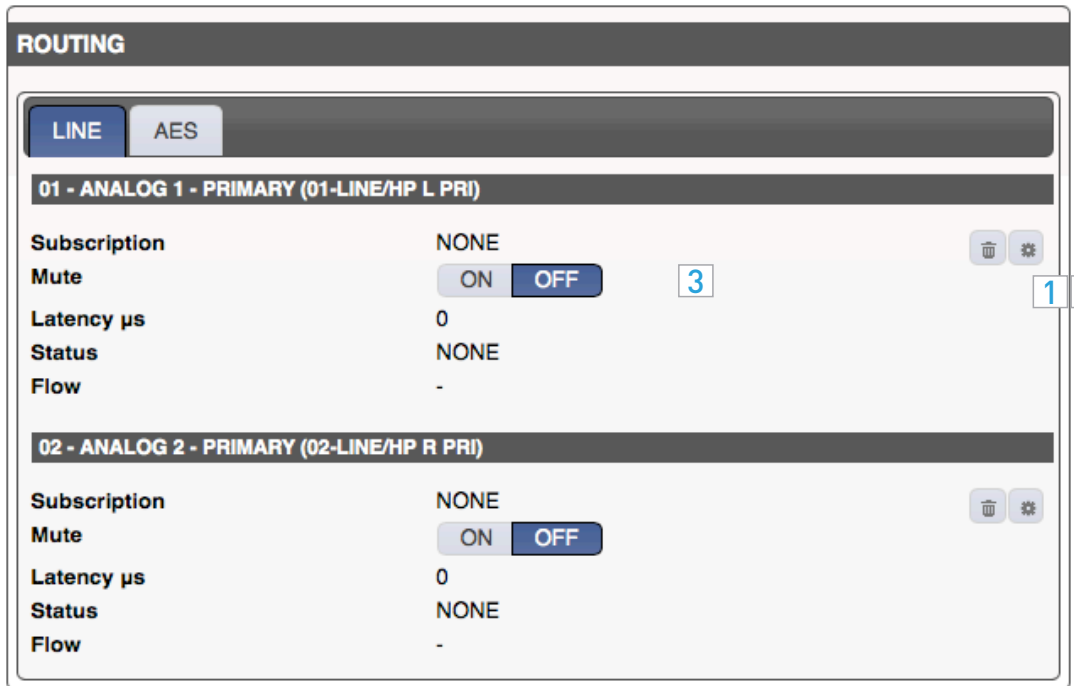
Gain [dB]

Frequency [Hz]

Under the Menu option **Outputs - FIR Filter** the following functions are available:

- 1** This allows you to activate an FIR filter on the analogue outputs
  - 2** Using this function along with the Upload FIR Coefficients button will allow you to upload and FIR Filter to the DIO.
- FIR Filter Frequency Response will provide a graphic representation of which frequencies and by how much gain (dB) the uploaded Filter is affecting.

Outputs Routing



Under the Menu option **Outputs - Routing** the following settings are available for Line and AES outputs:

- 1 Use the trash can symbol to clear the subscription of the respective Dante output.
- 2 Use this button to select the input signal of the respective
- 3 Enables or Disables the output.

#### DANTE RECEIVERS

Channel names

INDEX / TYPE	NAME
01 - Analog 1 (Primary)	<input type="text" value="01-Line/HP L PRI"/>
02 - Analog 2 (Primary)	<input type="text" value="02-Line/HP R PRI"/>
03 - Analog 1 (Secondary)	<input type="text" value="03-Line/HP L SEC"/>
04 - Analog 2 (Secondary)	<input type="text" value="04-Line/HP R SEC"/>
05 - AES L (Primary)	<input type="text" value="05-AES L PRI"/>
06 - AES R (Primary)	<input type="text" value="06-AES R PRI"/>
07 - AES L (Secondary)	<input type="text" value="07-AES L SEC"/>
08 - AES R (Secondary)	<input type="text" value="08-AES R SEC"/>

Under the Menu option **Outputs - Names** you are able to change the name of each output.

Dante Metering Receivers

DANTE RECEIVERS									
Peak Values									
01 - Analog 1 (Primary)	-72	-63	-54	-45	-36	-27	-18	-9	-126 dBFS
02 - Analog 2 (Primary)	-72	-63	-54	-45	-36	-27	-18	-9	-126 dBFS
03 - Analog 1 (Secondary)	-72	-63	-54	-45	-36	-27	-18	-9	-126 dBFS
04 - Analog 2 (Secondary)	-72	-63	-54	-45	-36	-27	-18	-9	-126 dBFS
05 - AES L (Primary)	-72	-63	-54	-45	-36	-27	-18	-9	-126 dBFS
06 - AES R (Primary)	-72	-63	-54	-45	-36	-27	-18	-9	-126 dBFS
07 - AES L (Secondary)	-72	-63	-54	-45	-36	-27	-18	-9	-126 dBFS
08 - AES R (Secondary)	-72	-63	-54	-45	-36	-27	-18	-9	-126 dBFS

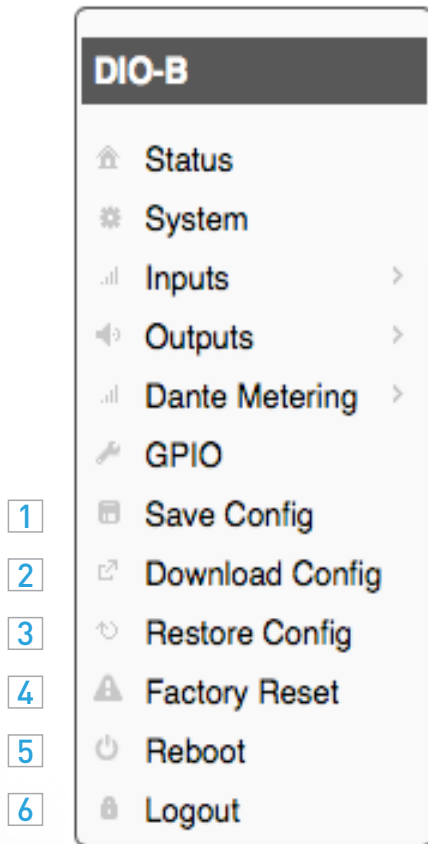
Under the Menu option **Dante Metering - Receivers** you are able to access the level meters for each input.

Dante Metering Transmitters

DANTE TRANSMITTERS										
Peak Values										
01 - Microphone 1 (Primary)	-72	-63	-54	-45	-36	-27	-18	-9		-85 dBFS
02 - Analog 1 (Primary)	-72	-63	-54	-45	-36	-27	-18	-9		-85 dBFS
03 - 03-DSP L	-72	-63	-54	-45	-36	-27	-18	-9		-91 dBFS
04 - 04-DSP R	-72	-63	-54	-45	-36	-27	-18	-9		-85 dBFS
05 - AES L (Primary)	-72	-63	-54	-45	-36	-27	-18	-9		-126 dBFS
06 - AES R (Primary)	-72	-63	-54	-45	-36	-27	-18	-9		-126 dBFS
07 - AES L (Secondary)	-72	-63	-54	-45	-36	-27	-18	-9		-126 dBFS
08 - AES R (Secondary)	-72	-63	-54	-45	-36	-27	-18	-9		-126 dBFS

Under the Menu option **Dante Metering - Transmitters** you are able to access the level meters for each output.

### Additional Navigation Menus



- 1 Save Configuration**

All changes made are available temporarily (other than those which require a reboot). If the settings remain static, the configuration must be saved to the unit. If not the DIO will resolve to last saved settings after a reboot.
- 2 Download Configuration**

The configuration which was saved last within the DIO will be transferred to the connected PC and can be named and saved there.
- 3 Restore Configuration**

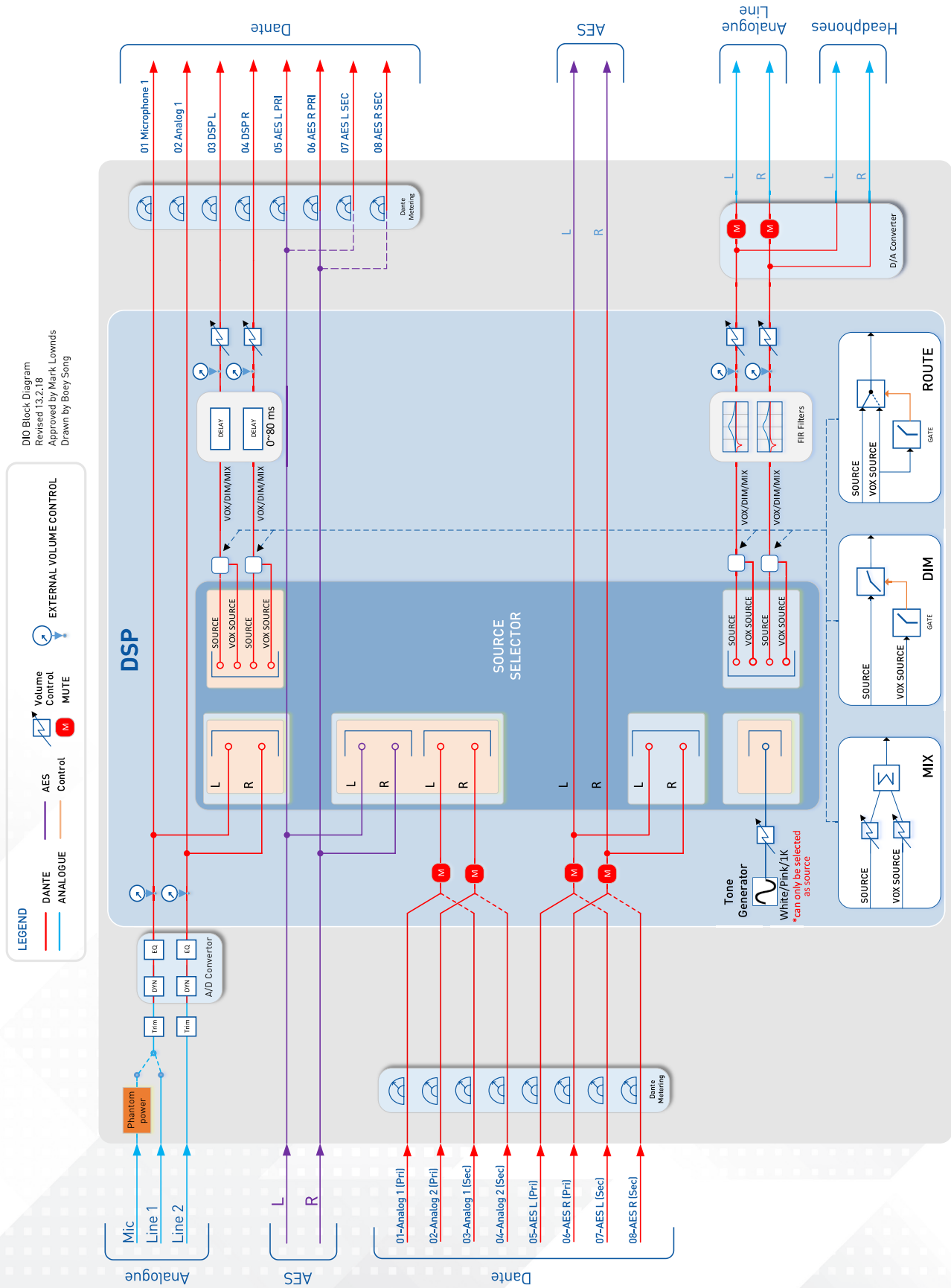
Uploads a previously saved configuration to the unit and reboots it.
- 4 Factory Configuration**

Returns all settings back to the factory default
- 5 Reboot**

Will reboot the device.
- 6 Logout**

Will logout of the device's web browser interface.

# 5. TECHNICAL DATA



# TECHNICAL DATA

## DIO Specifications

### Analogue Audio

Balanced Inputs	(D25 Connector)
Channels Sample Rate	2 x Balanced, Max input level +24dBu 48 kHz (24bit)
Dynamic Range	> 95dB (A weighted)
THD	< -83dB 1kHz +18dBu input, -6dBFS output
Frequency Response	20Hz - 20kHz
Channel gain control	+6dB to -12dB in 0.5db increments

Balanced Inputs	(D25 Connector)
Channels	2 x Balanced, Max input level +24dBu 48 kHz (24bit)
Sample Rate of A/D	> 95dB (A weighted)
Dynamic Range	<-86dB 1kHz -6dBFS , 18dBu output
THD	20Hz - 20kHz
Frequency Response	+20dB to -57dB in 0.5db increments

Input (Microphone)	(Phoenix Connector)
Input Gain Block	+55.5 to -12dB in 0.75db Increments
Dynamic Range	> 95dB (A weighted) unity gain , -112 dBu EIN 150ohm reference -50dBu input level
Frequency Response	20Hz - 20kHz
THD	< -80dB 1kHz 0dBu input , -3dBFS output
Attack	TC 6ms to 2000ms
Release	TC 24ms to 786430ms
Hold	2ms to 87491ms
Noise Gate Threshold	30 to -77db relFS
Phantom Power	+48v selectable
External DC output	+24v 40ma

Headphone Amplifier	(D25 Connector)
Channels	2 eh , 15vpp 2200hm load, 8vpp 50ohm load, short circuit protected
Dynamic Range	> 97dB (A weighted)
Frequency Response	20Hz - 20kHz
THD	< -85dB 1kHz -6dBFS
Soft Clipper	0.1 to 10, in 0.1 increments
External Val Control	Channel and gain range selectable

### Digital Audio

Input	(RJ45 Connector)
Sample Rate	48 kHz (32bit)
Modes	Transparent / Non Transparent
Redundancy	2 x Buffered inputs (via Dante)
Output	(RJ45 Connector)
Sample Rate	48 kHz (32bit)

### Message Player (Option)

WAV, MP3 Message player triggered by GPIO or UDP protocol

### Ethernet

Input	(RJ45 Connector)
Sample Rate	48 kHz (32bit)
Modes	Transparent / Non Transparent
Redundancy	2 x Buffered inputs (via Dante)

### GPIO

Inputs	2 x Opto Inputs - Max 5mA Sink
Outputs	x Isolated Outputs - 200V Max 150mA

### Power

External	12-48 Volts
Power Over Ethernet	POE Switch required
Power	10 watts
Redundancy power is provided between both inputs	



# TECHNICAL DATA

## DIO Specifications

### DSP Options

#### Filters

First and Second Order IJR
Single and Double Precision IIR
Crossover (2 & 3 way)
Tracking Filter
DC Blocking
De-emphasis
State Variable
FIR - 2 X 1000 Point

#### Counters

Stop Watches
Counters
Pulse Counter

#### GPIO Conditioning

Push Button Volume Control
Rotary Encoder Volume Control
Up/Down Table

#### Basic DSP

Absolute Value
Signal Add
Signal Subtract
Divide
Multiply

#### Square Root

Clipper
AB in/out Condition
Tolerance Analyser
Logic - And, Or, Nand, Nor
Invert
One-Shot
Linear Gain
Value Cross Detection
Linear Interpolator
Delay
Voltage Controlled Delay
Readback

#### Dynamics Processors

Peak Detector
RMS Detector
Limiter

#### Level Detectors, Lookup Tables

Level Detectors
Lookup Tables

#### Mixers, Splitters

Mixers
Splitters

#### Muxes, Demuxes

Switches
Multiplexers
Demultiplexers

#### Hard/Soft Clipping

Hard Clipping
Soft Clipping

#### Sources

DC
Beep
Sine, Square, Triangle, Sawtooth Waves
VCO

#### Value Hold

Signal Invert
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#### Project Design Tools

Image, Comment insert
Hierarchy design support
Filter magnitude/phase response
Support for MLSSA response files

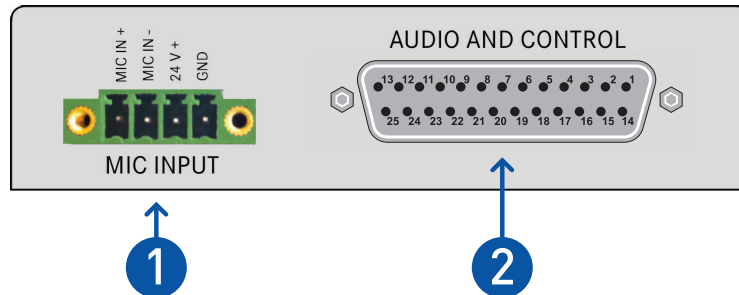
#### Volume Controls, Mute

Volume Control
Mute

# TECHNICAL DATA

## DIO Specifications

### PINOUTS



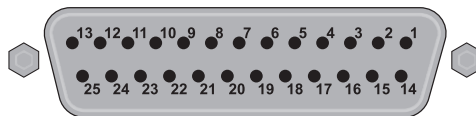
#### 1 Mic Input



1 2 3 4

- 1: MIC IN +
- 2: MIC IN -
- 3: GPI VE
- 4: GND

#### 2 Audio and Control

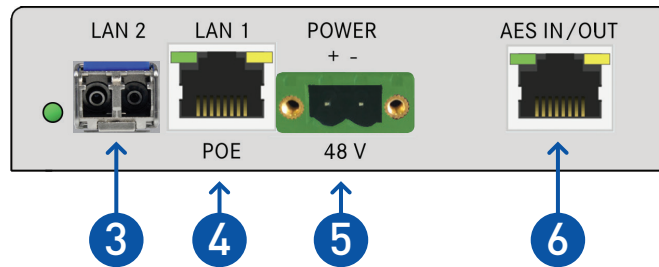


- |               |                |
|---------------|----------------|
| 1: GPI VE +24 | 14: GPO 1/2 CE |
| 2: GPI 1/2 CA | 15: GPO 1      |
| 3: GPI 1      | 16: GPO 2      |
| 4: GPI 2      | 17: VCA C      |
| 5: GND        | 18: GND        |
| 6: GND        | 19: R OUT -    |
| 7: R OUT+     | 20: L OUT -    |
| 8: L OUT+     | 21: GND        |
| 9: GND        | 22: R IN -     |
| 10: R IN+     | 23: L IN -     |
| 11: L IN+     | 24: GND        |
| 12: GND       | 25: R HP       |
| 13: L HP      |                |

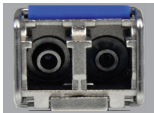
# TECHNICAL DATA

## DIO Specifications

### PINOUTS



#### 3 SFP Cage (1 Gbit Switch) \*SFP not included



Suitable for:

1. Single mode fibre
2. multi mode fibre
3. Copper SFP's

#### 5 Power



1 2

1: DC +  
2: DC -

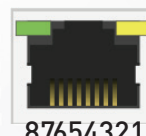
#### 4 LAN with POE (1 Gbit Switch)



87654321

1: TxRx A+ [Model A: DC+]  
 2: TxRx A- [Model A: DC+]  
 3: TxRx B+ [Model A: DC -]  
 4: TxRx C+ [Model B: DC+]  
 5: TxRx C- [Model B: DC+]  
 6: TxRx B- [Model A: DC -]  
 7: TxRx D+ [Model B: DC -]  
 8: TxRx D- [Model B: DC -]  
 GND: CHASIS

#### 6 AES



87654321

1: AES TX +  
 2: AES TX -  
 3: -  
 4: EDC FLAG  
 5: 232 RX to DIO  
 6: 232 TX from DIO  
 7: AES RX +  
 8: AES RX -  
 GND: CHASIS

## TECHNICAL DATA

### DIO Specifications

### Dimensions

