



HANDBOOK

DIO Audiophile Dante® Interfaces

AVN-DIO09 Microphone Input to Dante®

Handbook



SONIFEX

Manufacturers of Audio Products for AV,
Installed Sound, Broadcast Radio & Broadcast TV



Registration & Warranty

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This handbook is for use with the following products:
 AVN-DIO09 Microphone Input to Dante®
 Artwork: AW10982 Stock Code: 30-386

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Made in the UK by **SONIFEX**

Register Online for an Extended 2 Year Warranty

Product: _____

Serial No: _____

www.sonifex.co.uk/register

Product Warranty - 2 Year Extended

As standard, Sonifex products are supplied with a 1 year back to base warranty. In order to register the date of purchase and so that we can keep you informed of any product design improvements or modifications, it is important to complete the warranty registration online. Additionally, if you register the product on the Sonifex website, you can increase your product warranty to 2 years. Go to the Sonifex website at: www.sonifex.co.uk/register to apply for your 2 year warranty.

Sonifex Warranty & Liability Terms & Conditions

1. Definitions

‘the Company’ means Sonifex Ltd and where relevant includes companies within the same group of companies as Sonifex Limited.
 ‘the Goods’ means the goods or any part thereof supplied by the Company and where relevant includes: work carried out by the Company on items supplied by the Purchaser; services supplied by the Company; and software supplied by the Company.
 ‘the Purchaser’ means the person or organisation who buys or has agreed to buy the Goods.

‘the Price’ means the Price of the Goods and any other charges incurred by the Company in the supply of the Goods.

‘the Warranty Term’ is the length of the product warranty which is usually 12 months from the date of despatch; except when the product has been registered at the Sonifex website when the Warranty Term is 24 months from the date of despatch.

‘the Contract’ means the quotation, these Conditions of Sale and any other document incorporated in a contract between the Company and the Purchaser.

This is the entire Contract between the parties relating to the subject matter hereof and may not be changed or terminated except in writing in accordance with the provisions of this Contract. A reference to the consent, acknowledgement, authority or agreement of the Company means in writing and only by a director of the Company.

2. Warranty

- a. The Company agrees to repair or (at its discretion) replace Goods which are found to be defective (fair wear and tear excepted) and which are returned to the Company within the Warranty Term provided that each of the following are satisfied:
 - i. notification of any defect is given to the Company immediately upon its becoming apparent to the Purchaser;
 - ii. the Goods have only been operated under normal operating conditions and have only been subject to normal use (and in particular the Goods must have been correctly connected and must not have been subject to high voltage or to ionising radiation and must not have been used contrary to the Company’s technical recommendations);
 - iii. the Goods are returned to the Company’s premises at the Purchaser’s expense;
 - iv. any Goods or parts of Goods replaced shall become the property of the Company;
 - v. no work whatsoever (other than normal and proper maintenance) has been carried out to the Goods or any part of the Goods without the Company’s prior written consent;
 - vi. the defect has not arisen from a design made, furnished or specified by the Purchaser;
 - vii. the Goods have been assembled or incorporated into other goods only in accordance with any instructions issued by the Company;
 - viii. the defect has not arisen from a design modified by the Purchaser;
 - ix. the defect has not arisen from an item manufactured by a person other than the Company. In respect of any item manufactured by a person other than the Company, the Purchaser shall only be entitled to the benefit of any warranty or guarantee provided by such manufacturer to the Company.
- b. In respect of computer software supplied by the Company the Company does not warrant that the use of the software will be uninterrupted or error free.
- c. The Company accepts liability:
 - i. for death or personal injury to the extent that it results from the negligence of the Company, its employees (whilst in the course of their employment) or its agents (in the course of the agency);
 - ii. for any breach by the Company of any statutory undertaking as to title, quiet possession and freedom from encumbrance.

- d. Subject to conditions (a) and (c) from the time of despatch of the Goods from the Company's premises the Purchaser shall be responsible for any defect in the Goods or loss, damage, nuisance or interference whatsoever consequential economic or otherwise or wastage of material resulting from or caused by or to the Goods. In particular the Company shall not be liable for any loss of profits or other economic losses. The Company accordingly excludes all liability for the same.
- e. At the request and expense of the Purchaser the Company will test the Goods to ascertain performance levels and provide a report of the results of that test. The report will be accurate at the time of the test, to the best of the belief and knowledge of the Company, and the Company accepts no liability in respect of its accuracy beyond that set out in Condition (a).
- f. Subject to Condition (e) no representation, condition, warranty or other term, express or implied (by statute or otherwise) is given by the Company that the Goods are of any particular quality or standard or will enable the Purchaser to attain any particular performance or result, or will be suitable for any particular purpose or use under specific conditions or will provide any particular capacity, notwithstanding that the requirement for such performance, result or capacity or that such particular purpose or conditions may have been known (or ought to have been known) to the Company, its employees or agents.
- g. i. To the extent that the Company is held legally liable to the Purchaser for any single breach of contract, tort, representation or other act or default, the Company's liability for the same shall not exceed the price of the Goods.
ii. The restriction of liability in Condition (g)(i) shall not apply to any liability accepted by the Seller in Condition (c).
- h. Where the Goods are sold under a consumer transaction (as defined by the Consumer Transactions (Restrictions on Statements) Order 1976) the statutory rights of the Purchaser are not affected by these Conditions of Sale.

Unpacking Your Product

Each product is shipped in protective packaging and should be inspected for damage before use. If there is any transit damage take pictures of the product packaging and notify the carrier immediately with all the relevant details of the shipment. Packing materials should be kept for inspection and also for if the product needs to be returned.

The product is shipped with the following equipment so please check to ensure that you have all of the items below. If anything is missing, please contact the supplier of your equipment immediately.

Item	Quantity
Product Unit	1

Repairs & Returns

Please contact Sonifex or your supplier if you have any problems with your Sonifex product. Email technical.support@sonifex.co.uk for the repair/upgrade/returns procedure, or for support & questions regarding the product operation.

CE Conformity

The products in this manual comply with the essential requirements of the relevant European health, safety and environmental protection legislation.

The technical justification file for this product is available at Sonifex Ltd.

The declaration of conformity can be found at: <http://www.sonifex.co.uk/declarations>

WEEE Directive



The Waste Electrical and Electronic Equipment (WEEE) Directive was agreed on 13 February 2003, along with the related Directive 2002/95/EC on Restrictions of the use of certain

Hazardous Substances in electrical and electronic equipment (RoHS). The Waste Electrical and Electronic Equipment Directive (WEEE) aims to minimise the impacts of electrical and electronic equipment on the environment during their life times and when they become waste. All products manufactured by Sonifex Ltd have the WEEE directive label placed on the case. Sonifex Ltd will be happy to give you information about local organisations that can reprocess the product when it reaches its "end of use", or alternatively all products that have reached "end of use" can be returned to Sonifex and will be reprocessed correctly free of charge.

Atmosphere/Environment

This apparatus should be installed in an area that is not subject to excessive temperature variation (<0°C, >50°C), moisture, dust or vibration.

This apparatus shall not be exposed to dripping or splashing, and no objects filled with water, such as vases shall be placed on the apparatus.

DIO Audiophile Dante® Interfaces

The DIO Audiophile Dante® Interfaces are simple plug and play audio interfaces which provide a convenient and elegant method of connecting legacy analogue and digital audio equipment to the Dante AoIP audio network.

There are a range of different products to suit different needs and this handbook is for the following product:

- AVN-DIO09 Microphone Input to Dante

The A/D circuitry offers a world-class E.I.N. of 129dB. All DIO products use Dante Controller for configuration and are powered by PoE. They use rugged aluminium boxes with side slots for screw-mounting and contain superior audio circuitry for optimal audio performance. All feature rugged Neutrik EtherCon® connectors and Neutrik lockable audio connectors for ultra-reliable connectivity.

AVN-DIO09

The AVN-DIO09 is a Microphone input to Dante converter in the Sonifex DIO range of Dante input/output devices. It features a balanced analogue XLR input and one Neutrik EtherCon® connector for direct connection to a Dante AoIP network. Route the outputs of the DIO09 via Dante Controller.



Gain Adjustment

The AVN-DIO09 has coarse and fine mic gain. The coarse gain is set using the toggle switch, which provides 20dB/50dB of gain. The fine gain can be set using a trimmer adjustment tool, or small flat blade screwdriver, and adds between 0dB and 36dB of additional gain.

High Pass Filter

An on/off toggle switch turns the high pass filter on or off. When enabled, it acts on frequencies below 125Hz at a rolloff of 6dB/octave.

Phantom Power

Phantom power is enabled/disabled via a toggle switch on the front panel. When enabled, a 48V DC supply is provided to power an appropriate microphone. The red LED illuminates to show phantom is enabled.

Audio Level LED

To help you to set the gain, a level LED is provided on the front panel to display the audio level being sent to the Dante network. The indicator thresholds are as follows:

- Off: Level is under -38dBFS (-20dBu)
- Green: Level is between -38dBFS (-20dBu) and -18dBFS (0dBu)
- Amber: Level is between -18dBFS (0dBu) and -10dBFS (+8dBu)
- Red: Level is above -10dBFS (+8dBu)

N.B. If using a phantom powered microphone, it may be necessary to earth the unit using the rear panel earth tag to eliminate mains hum.

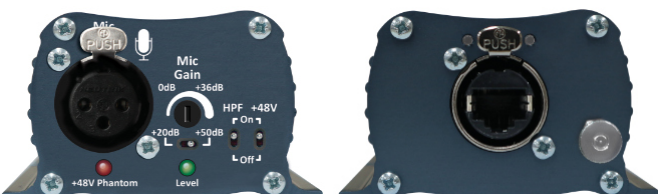


Fig 1-1: AVN-DIO09 Front and Rear View

Setup

The DIO Dante device is configured with a dynamic network address, so to initially get the unit working, connect it to a network with a DHCP server (such as a router) and a suitable IP address will be given to the unit. Once connected, a different IP address can be given to the DIO using Dante Controller. See the following section on Network Troubleshooting if you're having problems connecting your DIO device.

Simply plug an Ethernet connector into the Ethernet port of the DIO and the other end of the Ethernet connector into a PoE enabled switch.

Alternatively, if the switch doesn't support PoE, a PoE adaptor can be used to provide the power.

The audio inputs/outputs should be connected to the legacy equipment and this allows the legacy equipment to transmit audio and receive audio through the Dante® network.

A computer on the Dante® network can then configure connections between the DIO and other Dante® enabled devices, using Dante Controller.

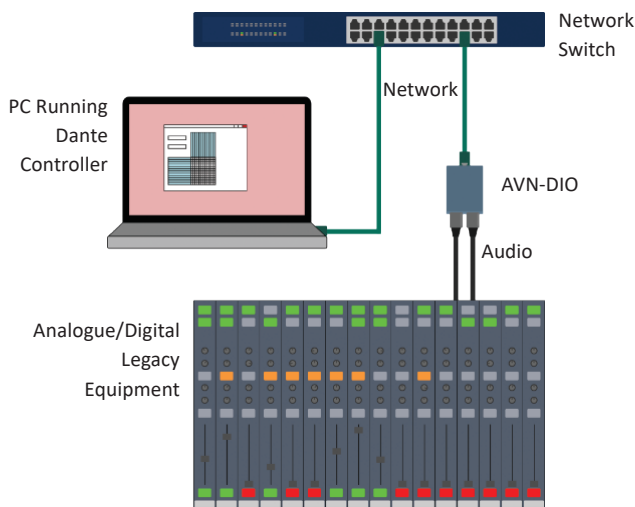


Fig 1-1: Setup

Link

Link status is indicated using the top-left status LED. Once power has been supplied to the unit the link status LED turns red. The link status LED turns amber when a link is established with a link speed of 100 Mbps.

Link activity is indicated using the top-right status LED which blinks when data is incoming, or when outgoing data is sensed on the port.

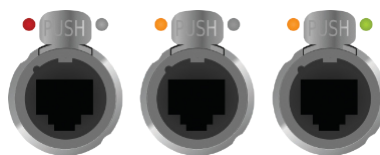


Fig 1-2: Power, Link, and Activity LEDs

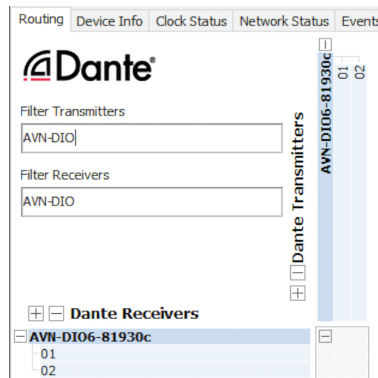
Dante Controller

Once a link has been established Dante Controller can be used to configure the device. Dante Controller is an application provided by Audinate and can be downloaded from their website.

<https://www.audinate.com/>

Within Dante Controller the unit should be visible within the Routing tab.

Fig 1-3: Routing



Network Troubleshooting

The device can be seen within Dante® Controller if it is connected to the same network as the computer. If the device doesn't show up in Dante® Controller please check that the connection to the network is correct and that the device and computer are on the same network.

If the computer and the device are on different IP subnets, the device will appear in Dante® Controller with red text:

Device Name	Sync	Mute	Clock Source	Domain Status	Primary Status
AVN-CU4-0006dc	■		Dante	N/A	Slave
Matt-PC	■		Dante	N/A	Slave
Recording-Studio	■		Dante	N/A	Master
AVN-DIO6-81930c	■		Dante	N/A	Slave

Fig 1-4: Red Device Name Indicates Different Network Subnet

Opening the **Device View** for the device will provide details about the problem.

Dante Controller has discovered an address for device 'AVN-DIO6-81930c' that does not match the subnet configuration of the local Dante interface 'Ethernet 2'.

Possible causes of this problem include:

- Multiple DHCP servers on the network
- Using a static IP address on a local interface that is on a different subnet to the DHCP address obtained by the device

Details:

- Resolved device address on Dante interface is 192.168.1.200
- Local address on Primary Dante interface 'Ethernet 2' is 10.0.60.1/255.0.0.0

Fig 1-5: Problem Details

In this example notice the device is on the 192.168.1.X subnet and the computer is on the 10.X.X.X subnet. To correct this, edit the computer's IP address.

In Windows 10, type **View Network Connections** into the search bar. Right-click the network that the device is connected to and select **Properties**. Double click **Internet Protocol Version 4 (TCP/IPv4)** in the item list and edit the IP address.

Obtain an IP address automatically

Use the following IP address:

IP address: 192 . 168 . 1 . 201

Subnet mask: 255 . 255 . 255 . 0

Default gateway: . . .

Fig 1-6: Windows IPv4 Settings

Save the changes made to the settings then close and re-open Dante® Controller. The device should now appear correctly. If the device name is still red, you may need to disable the other network connections on the computer. To do this, in Windows 10, type **View Network Connections** into the search bar. Right-click the network connection to disable and select **Disable**.

Now that the device appears in Dante® Controller, it can be configured and the network settings can be modified so that the device is in the correct subnet.

Open the **Device View** for the device and select the **Network Config** tab. Within this tab are options to obtain an IP address automatically, or to configure an IP address manually.

After configuring the devices address, click the **Reboot** button and then revert your computers IP address so that it is on the original subnet using the process above.

Dante Redundancy

Current: [Dropdown]

New: [Dropdown]

This feature cannot be configured

Addresses

Obtain an IP Address Automatically (default)

Manually configure an IP Address

IP Address: 10 . 0 . 60 . 2

Netmask: 255 . 0 . 0 . 0

DNS Server: [] . [] . [] . []

Gateway: [] . [] . [] . []

Apply Revert

Reset Device

Reboot Clear Config

Fig 1-7: Dante Controller Network Config

For more troubleshooting information please see the official Dante® FAQs at:

<https://www.audinate.com/resources/faqs>

And Dante® Controller User Guide at:

<https://dev.audinate.com/GA/dante-controller/userguide/pdf/latest/>

Routing Audio

Audio can be routed seamlessly between each Dante® enabled device on the network by creating connections between the transmit channel of one device and the receive channel of another device. When a routing is initially created, an hour glass is displayed to show the connection is being created. After a short time a green tick is displayed to indicate the connection has been created successfully.

Transmitters and receivers can also be filtered by typing a name into the corresponding filter field. Further filtering options are available from the filter pane.

Dante Controller - Network View - Filtered

File Device View Help

Grand Master Clock: Recording-Studio

Routing Device Info Clock Status Network Status Events

Filter Transmitters: AVN

Filter Receivers: AVN-DIO

Dante Transmitters: AVN-CU2-0006dc

Dante Receivers: AVN-DIO6-81930c

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16

P: ■ S: ■ Unmanaged Multicast Bandwidth: 9Mbps Event Log: ■ Clock Status Monitor: ■

Fig 1-8: Routed Audio Stream

To remove a connection simply click on the green tick.

Transmit and receive channels in a diagonal can be quickly routed together by holding **Ctrl** and clicking on the minimise/maximise button on the routing grid.

Device View

Open up the **Device View** by double clicking on the device name in the routing grid.

Status

Within the **Status** tab, information about the device can be seen, such as the product type and the current IP address.

Device Information

Manufacturer: Sonifex
 Product Type: AVN-DIO06
 Product Version: 1.0.0
 Software Version: 1.0.0
 Firmware Version: 1.0.0

Dante Information


Model: UltimoX2
 Dante Firmware Version: 4.1.4.2
 Hardware Version: 4.1.1.1
 ROM/Boot Version: 1.0.0

Clock Synchronisation

Mute Status: Unmuted
 Sync Status: Locked
 External Word Clock: No
 Preferred: No
 Frequency Offset: 11 ppm

Interfaces

P



IP Address: 10.0.2.86
 MAC Address: 00:1D:C1:81:93:0C
 Tx Utilisation: 1 Kbps Errors: 0
 Rx Utilisation: 39 Kbps Errors: 0

Fig 1-9: Status

Device Configuration

Within the **Device Config** tab the following can be modified.

- Device Name
- Sample Rate
- Encoding
- Clocking
- Device Latency

An option is also available to clear the configuration, resetting all settings to their default values.

Rename Device

AVN-DIO6-81930c

Sample Rate

Sample Rate: 48k Pull-up/down:

This device does not support Pull-up/down configuration.

Encoding

Preferred Encoding: PCM 24

Clocking

Unicast Delay Requests: Disabled

Device Latency

Latency: 1.0 msec

Reset Device

Fig 1-10: Device Config

Technical Specification For AVN-DIO10

Microphone XLR Input Pin-out	
Pin	Function
1	Chassis Ground
2	Input Phase
3	Input Non Phase

Power Supply - Class 0 802.3af PoE	
Device	Power Consumption (Watts)
DIO09	< 6 W

Microphone Input - XLR	
Parameter	Description
Input Impedance:	2.2kΩ balanced
Maximum Input Level:	-68dBu (max gain) to -8dBu (min gain)
Gain	Adjustable 20dB to 86dB
Frequency Response:	20Hz to 20kHz, +0/-0.5dB (ref 1kHz)
High Pass Filter Response:	Fc = 125Hz @ 6dB per octave
THD+N:	<0.01%, -32dBu input, 40dB gain, 20Hz to 20kHz, 20kHz BW
E.I.N.:	129dBu, 20kHz BW, max gain, Rs=200Ω
Common Mode Rejection:	>60dB @ 1kHz
Phantom Power	+48V ± 4V

Dante	
Parameter	Description
Sample Rates:	44.1kHz, 48kHz, 88.2kHz, 96kHz
Encoding:	PCM 16, PCM 24, PCM 32

PoE Power	
Standard	802.3af
Class	0
PD Power Range	0.44 W to 12.94 W
Typical PSE Power Usage	4 W
Max PSE Power Usage	15.4 W

Equipment Type	
AVN-DIO09:	Microphone Input to Dante®

Physical Specification	
Dimensions (Raw):	10.6cm (W) x 7.3cm (D) x 4.3cm (H) 4.2" (W) x 2.9" (D) x 1.7" (H)
Dimensions (Boxed):	17.4cm (W) x 9.5cm (D) x 5.6cm (H) 6.9" (W) x 3.7" (D) x 2.2" (H)

Weight	
	Nett: 0.2kg Gross: 0.3kg Nett: 0.44lbs Gross: 0.66lbs

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