AVN-DIO19

Dante® to AES3 16 Channel I/O Converter

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-DIO19 Dante® to AES3 16 Channel I/O Converter
Artwork: AW11043 Stock Code: 30-395

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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
A4 Handbook	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.

AVN-DIO19 Dante® to AES3 16 Channel I/O Converter

Fig 1: AVN-DIO19 Front Panel

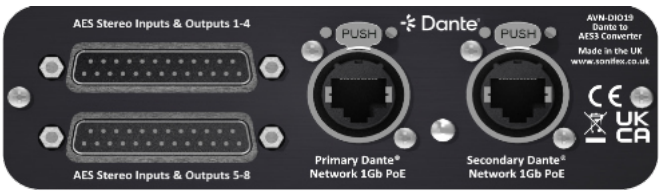


Fig 2: AVN-DIO19 Rear Panel

The AVN-DIO19 audio converter and interface converts up to eight digital stereo AES3 inputs and eight digital stereo AES3 outputs to and from the Dante Audio-over-IP networking standard. Each input can accept sample rates from 32kHz to 192kHz, which will be sample rate converted to the Dante system sample rate. All outputs follow the Dante system sample rate.

It's powered using Power over Ethernet (PoE), using Neutrik EtherCON® connectors, with primary and secondary ports for power and data redundancy. The AVN-DIO19 uses the latest Audinate Dante® chipsets so is AES67 and Dante Domain Manager® compliant.

There are front panel LEDs to indicate network clock status, AoIP Primary and AoIP Secondary link status, PoE Primary power and PoE Secondary power active. In addition to these there are 8 AES3 input lock status LEDs.

A web interface is available for firmware updates, status information, network and device settings. Up to 3 of the AVN-DIO19 units can be rackmount in the 1U AVN-DIORK

- 8 x balanced digital stereo AES3 inputs and outputs on 2 x 25-way D-types.
- Sample rate conversion of physical inputs to Dante system sample rate.
- Physical output sample rate matches Dante system sample rate.
- Dual redundant Primary and Secondary Dante network ports using Neutrik EtherCON® Ethernet connectors.
- Powered via PoE (Power over Ethernet) with PoE dual redundancy.
- Fully Dante compliant device.
- AES67 compatible.
- Dante Domain Manager compliant.
- Web interface for configuration.
- Clock, PoE, Network link and AES3 input lock LEDs.
- All available Dante sample rates supported.
- 3 x units rackmount in the AVN-DIORK

Dante® Controller

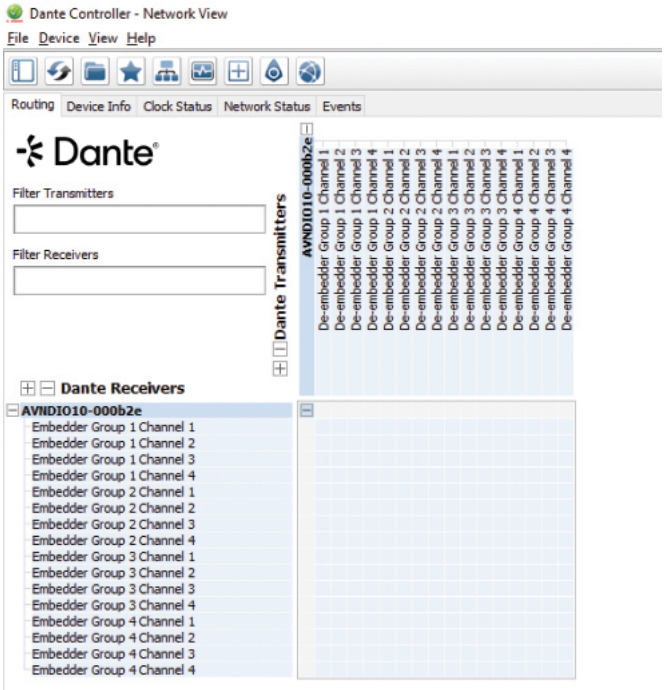
Dante Controller is an application provided by Audinate and can be downloaded from their website: https://www.audinate.com/

Use Dante Controller as you normally would to setup the audio routes on the unit. For 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/



Embedded Web Server

The AVN-DIO19 has an embedded web server which provides easy access to device information, network settings and allows for firmware updates when new releases are available.

The device has two Ethernet ports on the back panel. One is the 'Primary' Ethernet port and the other is the 'Secondary' Ethernet port. When set to switched mode in Dante Controller, either of these ports can be connected to a network and a computer on the same network which can then access the embedded web server. When set to redundant mode, only the primary Ethernet port will allow access to the web server.

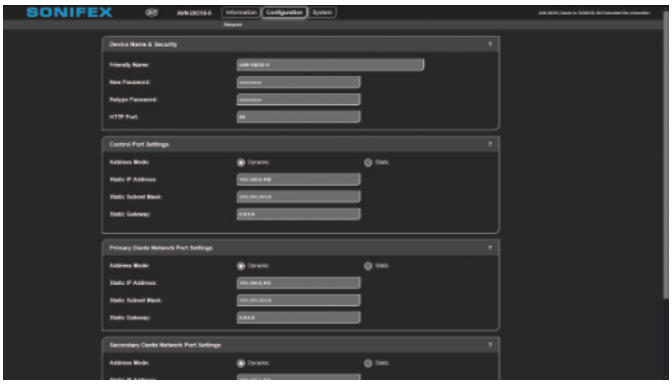
By default, the embedded web server is set to static address mode and the IP address is 192.168.0.100 with a subnet mask of 255.255.255.0. If the network address mode for the port to be used has been set to 'Dynamic', the unit will attempt to acquire an IP address from a DHCP server. If no DHCP server is found an automatically generated IP address will be used.

The active IP address for the network port can be found using a service discovery tool such as the 'Discovery Application' which can be found on the Sonifex website (http://sonifex.co.uk/technical/software/index.shtml#sfxsrvdisc).

Information

The Information tab shows the current status of the unit as well as the software versions of the various modules running on the unit. When contacting Sonifex technical support, it is important to provide the information shown on this page. The lower half of the page shows the configuration of the network ports; the 'Control Port Information' shows the network address configuration of the embedded web server which can be accessed on both the 'Primary' and 'Secondary' Ethernet connections.

The 'Primary Dante Port Information' and the 'Secondary Dante Port Information' shows the configuration information of each port to the Dante audio network. The network settings of these two ports can be controlled via the Dante controller application or via the 'network' configuration web page. If the Dante redundancy setting for the unit is set to "Switched" via Dante controller then only the Control Port and Primary Dante Port Information are shown here.



Status

The status page shows the lock status of each AES input.

Configuration

The Configuration tab has the Network page which shows the current configuration of the control port which is used to access the devices web server. The friendly name and security options can also be set here.

Friendly Name

The friendly name identifies the unit on the network. It is a good idea to assign a user name or location as this is easily recognised by other users. The default friendly name is made from the device ID and the 7-digit product serial number i.e. AVN-DIO19-1234567. The friendly name can only contain letters, numbers and hyphens although it cannot start or end with a hyphen.

Password

In order to prevent other users connected to the same network from modifying the configuration of the device it is possible to protect your device with a password. The password may be between 4 and 8 characters long and may only contain numbers and letters.

Removing Password Protection

Password protection can be removed from a device by clearing both the 'Password' and 'Retype Password' fields and clicking submit.

HTTP Port

The HTTP port number can be set to any integer from '1024' up to and including '65535', or to '80' the default value. The value entered determines which port the web server on the device will use. When the port number is modified the unit will be restarted automatically. To view the web pages of a device with a modified port number, the port number must be specified in the address bar of the web browser after the IP address and separated by a colon. For example, if the HTTP port of a unit is set to '1024' and the IP address of the unit is '192.168.0.100' then 'http://192.168.0.100:1024' would need to be entered into the address bar of the web browser. When the port is set to its default value of '80' a port number doesn't need to be specified when accessing the web server. The web server on the unit is advertised as an Avahi / Bonjour service so tools like Sonifex Service Discovery or avahi-browse will be able to discover the address and port number being used by the unit's web server.

Address Mode

The address mode determines how the port obtains its IP address. When set to dynamic, the unit will attempt to acquire an IP address automatically from either a DHCP server or via auto configuration if no DHCP server is found. The actual IP address is shown on the device information page. When static mode is used, the IP address & subnet mask values entered will be assigned to the port.

Static IP Address

This is the IP address that will be assigned to the port when static address mode is selected. It is important to ensure that this IP address is not currently in use on the network. This value is not used when the address mode is dynamic.

Static Subnet Mask

This is the subnet mask that will be used for the port when static address mode is selected. This value is not used when the address mode is dynamic.

Static Gateway

The router IP address used for the port when static address mode is selected.

Note

If the device is in switched mode the secondary Dante network port settings are not displayed. If any of the network configuration options are changed, the unit automatically restarts to implement the new settings. If the address mode of the control port is changed, a new connection is made once the unit has restarted and the IP address assigned via DHCP is known. Otherwise, the new page will be reloaded automatically once the restart of the unit is complete.

Device

The device page of the configuration tab currently provides the following option.

Enable Red LEDs

When this option is checked, the status LEDs are lit red when not green.

System

The System tab is used for the following;

- Updating the unit.
- Rebooting and resetting the unit.

Update Firmware

In this section the current firmware version on the connected unit is shown. New versions of firmware will be released as new features are added, and when any bug fixes are completed, click on the software downloads link to visit the firmware downloads webpage of the Sonifex website. If an update is available for your unit you can download it as a zipped archive file, you will need to extract the 'DWN' file from the archive, this can be done in Windows by right-clicking the archive and selecting extract all.

Reboot or Factory Reset

The unit can be rebooted using the reboot button, a quick reboot can often fix any issues with the unit, after rebooting the webpage should automatically be reloaded. The factory reset button restores the unit to factory settings, restoring the factory settings will also cause the unit to reboot.

Bootstrap Mode

In the unlikely event that power is lost during a firmware upgrade then the unit may enter bootstrap mode. This is a limited firmware set that allows firmware upgrades to take place to return the unit to a normal working state. This is indicated by both primary and secondary PoE and Link LEDs flashing in unison. Firmware updates are performed using a TFTP client running on a host PC.

Forcing Bootstrap Mode

If you need to force the unit into bootstrap mode, this is done by pressing and holding the reset button down for more than 5 seconds. After 5 seconds the front panel LEDs will start to flash slowly, this indicates that the unit will be forced into bootstrap mode with a static IP address of 192.168.0.100. If the reset button is held for more than 10 seconds, the LEDs will flash faster which indicates that the unit will be forced into bootstrap mode with dynamic mode addressing set. The unit will now attempt to get an address from a DHCP server or fall back to a link-local IP address using Auto-IP. If the reset button is held for more than 15 seconds, the LEDs will flash even faster and the unit will now perform a factory reset and clear all of the current configuration settings.

Upgrading Firmware in Bootstrap Mode

Once the device has been put into bootstrap mode, a TFTP client can be used to transfer firmware to it. The IP address of the device must be known - the Sonifex Service Discovery Application can be used to find the IP

address of the device. Many TFTP clients are available, on MS Windows a free application called TFTPD64 is available. Within TFTPD64, select the TFTP tab, enter the device's address in the host field and 69 in the port field. Next navigate to the firmware update file (this has the .dwn file extension). The r'emote file' field should be left blank and the 'block size' left on default. Finally press the button labelled 'Put', the progress of the upload will then be displayed. The device will reboot and now be using the uploaded firmware. If you are still experiencing issues, try holding the reset button for 15 seconds to perform a factory reset.

D-Sub (DB-25) Stereo Digital Inputs And Outputs

The AVN-DIO19 has 2 female digital D-Sub (DB-25) inputs and outputs.

TASCAM AES-59 digital pinout.

AES Stereo Inputs and Outputs 1-4:

Pin 1: Out Channel 7/8 + (Phase)
Pin 2: Out Channel 7/8 ground
Pin 3: Out Channel 5/6 – (Non-phase)
Pin 4: Out Channel 3/4 + (Phase)
Pin 5: Out Channel 3/4 ground
Pin 6: Out Channel 1/2 – (Non-phase)
Pin 7: In Channel 7/8 + (Phase)
Pin 8: In Channel 7/8 ground
Pin 9: In Channel 5/6 – (Non-phase)
Pin 10: In Channel 3/4 + (Phase)
Pin 11: In Channel 3/4 ground
Pin 12: In Channel 1/2 - (Non-phase)
Pin 13: No connection
Pin 14: Out Channel 7/8 – (Non-phase)
Pin 15: Out Channel 5/6 + (Phase)
Pin 16: Out Channel 5/6 ground
Pin 17: Out Channel 3/4 – (Non-phase)
Pin 18: Out Channel 1/2 + (Phase)
Pin 19: Out Channel 1/2 ground
Pin 20: In Channel 7/8 – (Non-phase)
Pin 21: In Channel 5/6 + (Phase)
Pin 22: In Channel 5/6 ground
Pin 23: In Channel 3/4 – (Non-phase)
Pin 24: In Channel 1/2 + (Phase)
Pin 25: In Channel 1/2 ground

AES Stereo Inputs and Outputs 5-8:

Pin 1: Out Channel 15/16 + (Phase)
Pin 2: Out Channel 15/16 ground
Pin 3: Out Channel 13/14 – (Non-phase)
Pin 4: Out Channel 11/12 + (Phase)
Pin 5: Out Channel 11/12 ground
Pin 6: Out Channel 9/10 – (Non-phase)
Pin 7: In Channel 15/16 + (Phase)
Pin 8: In Channel 15/16 ground
Pin 9: In Channel 13/14 – (Non-phase)
Pin 10: In Channel 11/12 + (Phase)
Pin 11: In Channel 11/12 ground
Pin 12: In Channel 9/10 - (Non-phase)
Pin 13: No connection
Pin 14: Out Channel 15/16 – (Non-phase)
Pin 15: Out Channel 13/14 + (Phase)
Pin 16: Out Channel 13/14 ground
Pin 17: Out Channel 11/12 – (Non-phase)
Pin 18: Out Channel 9/10 + (Phase)
Pin 19: Out Channel 9/10 ground
Pin 20: In Channel 15/16 – (Non-phase)
Pin 21: In Channel 13/14 + (Phase)
Pin 22: In Channel 13/14 ground
Pin 23: In Channel 11/12 – (Non-phase)
Pin 24: In Channel 9/10 + (Phase)
Pin 25: In Channel 9/10 ground

Fig 1-4: AVN-DIOMT Deskbar Fittings

AVN-DIOMT Deskbar

Fig 1-6: Iso View Shown with AVN-DIOMT Deskbar Attached

Fig 1-8: AVN-DIO Front Iso View Shown without Accessories

Fig 1-9: AVN-DIO Rear Iso View Shown without Accessories

Technical Specification For AVN-DIO19

AES3 I/O	
Input & Output Impedance:	110Ω Balanced
Sample Rates:	32 – 192kHz
Connections:	8 x stereo AES3 inputs and outputs on 2 x 25-way D-types using AES59 pinout
Network and AoIP	
AoIP Standard:	Dante
Channels:	16 receive, 16 transmit
Flows:	16 receive, 16 transmit
Sample Rates:	44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, 192kHz
Encoding:	PCM 16, PCM 24, PCM 32
AES67 Support:	Yes
Connectivity:	2 x etherCON (RJ45 compatible)
Speed:	1Gbps or 100Mbps
Network Modes:	Switched or redundant
Dante Domain Manager Ready:	Yes
Clock Source:	Internal (PTP Leader) or from Network PTP Leader
PoE Power	
Standard:	802.3af
Redundancy:	Yes
Class:	0
PD Power Range:	0.44 W to 12.94 W
Typical PSE Power Usage:	4.6W
Max PSE Usage:	15.4 W
Equipment Type	
AVN-DIO19:	Dante to AES3 16 channel I/O converter
Physical Specification	
Dimensions (Raw):	14.0cm (W) x 13.6cm (D) x 4.2cm (H) 5.5” (W) x 5.4” (D) x 1.7” (H)
Dimensions (Boxed):	17.8cm (W) x 17cm (D) x 5.6cm (H) 7.0” (W) x 6.7” (D) x 2.2” (H)
Weight:	Nett: 0.5kg Gross: 0.9kg Nett: 1.1lbs Gross: 2.0lbs
Accessories	
AVN-DIOMT:	AVN-DIO Large Unit Underdesk Mount
AVN-DIORK:	AVN-DIO 1U 19” rack kit (5 x small DIO or 3 x large DIO)
CBL-D25-4XI4XO:	AES3 balanced cable, DB25 to 4 x XLR3M and 4 x XLR3F, 3m
CBL-D25-D25:	AES3 balanced cable, DB25 to DB25, 3m

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