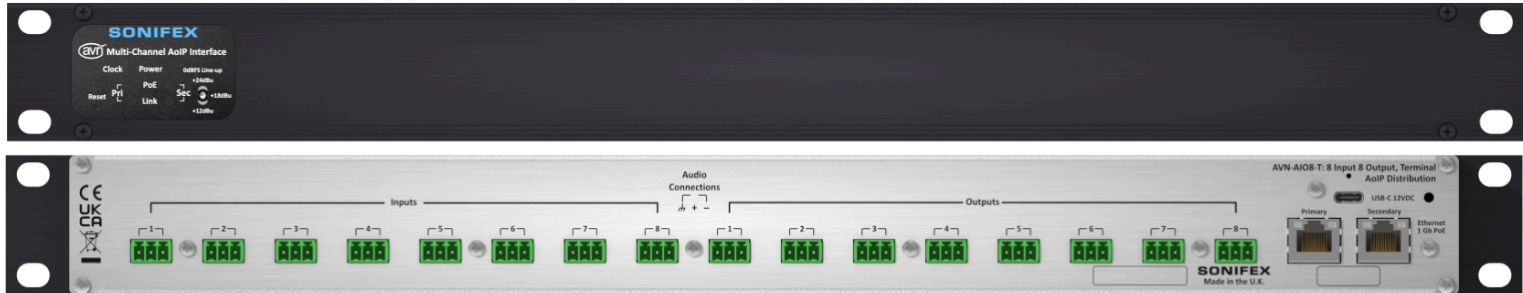


RAVENNA Multi-Channel Audio Interfaces Handbook

AES67 & ST 2110 built-in



AVN-AIO8-T-RAV 8 Input, 8 Output Terminal Block RAVENNA Interface

AVN-AI16-T-RAV 16 Input Terminal Block RAVENNA Interface

AVN-AO16-T-RAV 16 Output Terminal Block RAVENNA Interface

SONIFEX

Audio Solutions for
AV & Broadcast Media

This Handbook is for use with the following products:

AVN-AIO8-T-RAV, AVN-AI16-T-RAV, AVN-AO16-T-RAV, Multi-Channel RAVENNA/AES67 Analogue Audio Interfaces

Revision 1.13, June 2026

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Register Online for an Extended 2 Year Warranty

As standard, Sonifex products are supplied with a 1 year back to base warranty.

If you register the product online, you can increase your product warranty to 2 years and we can also keep you informed of any product design improvements or modifications

To register your product, please go online to www.sonifex.co.uk/register

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;

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.

Warranty Registration

- 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.
- 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.

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: <https://www.sonifex.co.uk/declarations>

Safety & Installation of Equipment

There are no user serviceable parts inside the equipment. If you should ever need to look inside the unit, always disconnect the mains supply before removing the equipment covers. The cover is connected to earth by means of the fixing screws. It is essential to maintain this earth/ground connection to ensure a safe operating environment and provide electromagnetic shielding.

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 in case 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.

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

1. Introduction

These multi-channel RAVENNA/AES67 audio interfaces convert balanced and un-balanced analogue inputs and outputs to RAVENNA/AES67 AoIP. Simple to configure and operate, these cost-effective rack-mount solutions provide an easy integration path for AV professionals and system integrators.

Sonifex Part Numbers and Descriptions:

- **AVN-AIO8-T-RAV**
Provides 8 analogue audio inputs and 8 analogue audio outputs on terminal block connectors.
- **AVN-AI16-T-RAV**
Provides 16 analogue audio inputs on terminal block connectors.
- **AVN-AO16-T-RAV**
Provides 16 analogue audio outputs on terminal block connectors.

Features:

- Dual PoE for data and power redundancy.
- USB-C power input, if PoE is unavailable.
- Accepts balanced and unbalanced analogue line-level signals.
- Adjustable global OdBFS line-up (+12dBu/+18dBu/+24dBu = OdBFS).
- 1U 19" rack-mount aluminium chassis.
- Lightweight and compact with a front-back depth under 11cm (4.4 inches).
- Rear-panel mount for single/top locking USB-C cables.
- Configuration using ANEMAN, **see page 6**.

2. Controls, Indicators, and Connections

This section contains information about the interactivity of the different panels of the device, such as LED descriptions, functions and connector pin-outs.

Front Panel

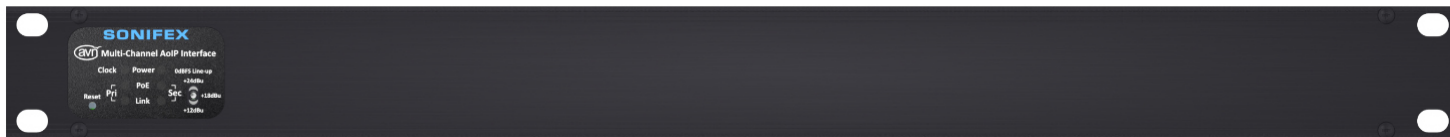


Fig 2-1: Front Panel



Fig 2-2: Indicators and Reset

On the left-hand side of the front panel are the status LEDs and reset button.

Clock

The clock status LED is illuminated green when the device is a PTP master or synced to a valid PTP master.

Power

The power status LED is illuminated green when USB-C power is available.

PoE

The PoE status LED is illuminated when power over Ethernet is available. Independent LEDs show PoE status on both Primary and Secondary Ethernet connections.

Link

The link status LED is illuminated when the device is connected to a valid network. Independent LEDs show link status on both Primary and Secondary Ethernet connections.

0dBFS line-up

The 0dBFS line-up level is selectable between +12dBu, +18dBu and +24dBu. It is a global setting that affects all inputs and outputs.

Reset

In the unlikely event that the unit fails to respond, press the reset button to reboot the unit. This does not remove the ANEMAN configured settings.

Back Panel

The back panel of the device provides access to all the inputs and outputs.

AVN-AIO8-T-RAV 8 Input, 8 Output RAVENNA/AES67 Interface with Terminal Block Connectivity

Eight terminal block inputs and eight terminal block outputs are available.



Fig 2-3: AVN-AIO8-T-RAV Rear Panel

AVN-AI16-T-RAV 16 Input RAVENNA/AES67 Interface with Terminal Block Connectivity

Sixteen terminal block inputs are available.

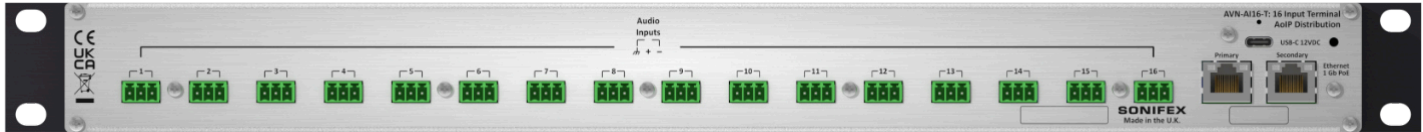


Fig 2-4: AVN-AI16-T-RAV Rear Panel

AVN-AO16-T-RAV 16 Output RAVENNA/AES67 Interface with Terminal Block Connectivity

Sixteen terminal block outputs are available.

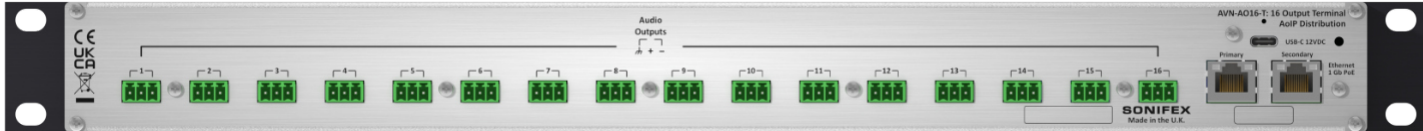


Fig 2-5: AVN-AO16-T-RAV Rear Panel

2 Controls, Indicators and Connections

Each of the analogue audio inputs and outputs can be routed in ANEMAN (page 6), to receive/transmit AoIP streams.

The 0dBFS line-up level is selectable between +12dBu, +18dBu and +24dBu using the front panel switch. It is a global setting that affects all inputs and outputs.

Terminal Block Line Inputs

The terminal block input connectors can take balanced professional levels, or unbalanced by connecting the non-phase to the signal ground.

The line inputs have the following pin-out.

Pin	Function
1	Chassis Ground/Screen
2	Input Phase/Positive
3	Input Non-Phase/Negative



Terminal Block Line Outputs

The terminal block outputs are electronically balanced, and can be wired unbalanced. Each output is individually buffered so that a short circuit on one output will not affect the others. The line outputs have the following pin-out.

Pin	Function
1	Chassis Ground/Screen
2	Output Phase/Positive
3	Output Non-Phase/Negative



Ethernet RAVENNA/AES67 Connection(s)

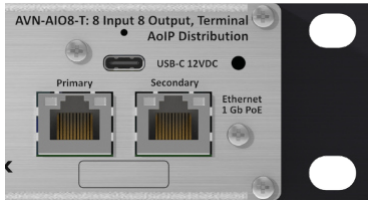


Fig 2-6: Ethernet, PoE & USB-C Connections

On the right hand side of the rear panel is a dual redundant Ethernet/PoE & USB-C 12V DC connection.

The Ethernet connections provide PoE and networking capability. There are two status LEDs on the RJ45 connector. The left LED indicates the link speed, the right indicates link activity.

Left LED	Green	Off
Link Speed	1Gbps	100Mbps

The LED on the right indicates traffic on the connection. When the LED is flashing Amber / Yellow, data is being transmitted/received.

3. ANEMAN Audio Network Manager

Before configuring any RAVENNA or AES67 audio routes for this product, ANEMAN must be installed on the control computer. ANEMAN (Audio Network Manager) is the application used to discover, manage, monitor, and route compatible networked audio devices on the network.

ANEMAN is required to create and manage RAVENNA/AES67 audio subscriptions and verify network connectivity between devices.

Key Features

- Required for configuring and managing RAVENNA/AES67 audio routing.
- Discover, connect, monitor, and manage networked audio devices from a single application.
- View a comprehensive network overview with integrated matrix routing capabilities.
- Create, save, and recall network patch configurations.
- Monitor connection status and PTP clock synchronisation across the network.
- Receive diagnostic feedback when connections cannot be established.
- Automatically manage audio streams while simplifying network setup workflows.
- Support multiple manufacturers and device types through an open plug-in framework.
- Integrate with existing systems to extend compatibility and streamline operation.
- Available free of charge for Windows and macOS platforms.

Download & Manual

Follow the link below to read more about ANEMAN and download the latest version: <https://www.merging.com/products/aneman/downloads>

4. Technical Specification

Audio Input Performance Specifications

Input Impedance:	>20k Ω balanced
0dBFS line-up:	User selectable +12dBu/+18dBu/+24dBu
Frequency Response:	20Hz to 20kHz, +0/-0.2dB
THD+N:	<-110dBFS, -30dBFS, 20Hz to 20kHz, 20kHz BW
Noise:	-110dBFS, 20kHz BW, $R_s=200\Omega$
Crosstalk:	<-100 dB
Common Mode Rejection:	>60dB @ 1kHz

Audio Output Performance Specifications

Output Impedance:	<50 Ω balanced
0dBFS line-up:	User selectable +12dBu/+18dBu/+24dBu
Frequency Response:	20Hz to 20kHz, +0/-0.5dB
THD+N:	<-107dBFS, -30dBFS, 20Hz to 20kHz, 20kHz BW
Noise:	-107dBFS, 20kHz BW
Crosstalk:	<-100dB

Balanced Line Input Terminal Block Pinout

Pin	Function
1	Chassis Ground/Screen
2	Input Phase/Positive
3	Input Non-Phase/Negative

Balanced Line Output Terminal Block Pinout

Pin	Function
1	Chassis Ground/Screen
2	Output Phase/Positive
3	Output Non-Phase/Negative

RAVENNA/AES67

Sample Rate:	44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, 192kHz
Encoding:	PCM 16, PCM 24, PCM 32

PoE Power

Standard:	802.3af
Class:	0
PD Power Range:	0.44W to 12.94W
Typical PSE Power Usage:	(AVN-AIO8-T-RAV): 7.5W (AVN-AI16-T-RAV): 6W (AVN-AO16-T-RAV): 8W
Max PSE Power Usage:	All Units: 15.4W

USB-C Power Input

Voltage:	9V - 15V
Power:	12W

Equipment Type

AVN-AIO8-T-RAV	8 Input, 8 Output RAVENNA/AES67 Interface
AVN-AI16-T-RAV	16 Input RAVENNA/AES67 Interface
AVN-AO16-T-RAV	16 Output RAVENNA/AES67 Interface

Physical Specification

Dimensions (Raw):	48cm (W) x 11cm (D) x 4.3cm (H)(1U) 19" (W) x 4.3" (D) x 1.7" (H)
Weight (AVN-AIO8-T-RAV, AVN-AI16-T-RAV, AVN-AO16-T-RAV):	Nett: 1.1kg Gross: 1.6kg Nett: 2.4lbs Gross: 3.5lbs

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