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DANS

Ambient Noise Sensing

Manual: V1.1

DANS User Manual

Revision History

Version	Modifications	Date
1.0	Initial Draft	14/12/99
1.1	Revised	18/06/02

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DISCLAIMER

This manual contains information that is correct to the best of Audix Systems knowledge. It is intended to be a guide and should be used as such. It should not be considered as a sole source of technical instruction, replacing good technical judgement, since all possible situations cannot be anticipated. If there are any doubts as to exact installation, configuration and/or use, call Audix Systems at +44 (0)1799 540888

Technical Support

In the unlikely event of you having problems with your DANS Noise Sensing Equipment please contact our Customer Services Department.

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Hardware Specification

Model	DANS
Dimensions(width, depth, Height)	(NSF) 485mm,385mm,135mm (3u)
Power Requirement	(NSF c/w 8 x DA/NS) 1A. 24V D.C.
Weight	(NSF c/w 8 x DA/NS) 8kg
Terminations	NSF Screw terminations for all I/O
	DA/NS Edge Connectors
Input Signal	Electronically Balanced Microphone Input. Transformer Balanced Line Input (main signal path)
Output Signal	Transformer Balanced Line Output
Adjustment Range	(DA/NS) +/-6dB
Mounting Arrangements	A2-36025 microphone: Flush Mounted D130E microphone: suspended from XLR box (not included)
Input Sensitivity	A2-36025: -72dB D130E: -72dB
	Access to (DA/NS) 2 Screw front fixing. Hinge down lid
Power Failure Provision	Automatic By-pass of noise Sensing

Overview

Audix Noise Sensing systems are installed in many large public buildings including Airports, Exhibition Halls and Convention Centres where fluctuations in background noise are sufficient to necessitate an automatic adjustment of system sound pressure level.

A modular system of noise sensing cards, each providing 3 levels of automatic level adjustment of a loudspeaker zone.

Up to 8 cards can be mounted within the standard 3u 19" rack frame.

Ambient noise level is continuously sampled during system activity.

Lock at either high, medium or low position at instance of operation an input source, such as a microphone speak button.

Level is held until microphone speak button is released.

Signal adjustment range of +/-6dB.

System is by-passed automatically on failure of power supply

System can be forced to High output during a Voice Alarm (VA) announcement.

Threshold adjustments can be made to vary sensitivity to suit individual requirements.

System Operation

Noise sensing microphones are selected and positioned in accordance with the acoustic characteristics of the sound installation in question. Where loudspeaker zones are served by individual amplifiers it is customary to designate one or more noise sensing microphones to each zone. Where there are several microphones an "average" reading of ambient noise is fed back to the Audix noise sensing system housed within the equipment rack.

Each DA/NS noise sensing card has a separate input and output which forms part of the signal path into the amplifier for the loudspeaker zones in question. Once in operation, the Audix noise sensing equipment provides automatic adjustment of the amplifier outputs to compensate for variations in background noise. Each DA/NS card embodies the edge card indicators and control to adjust the triggering threshold.

SCOPE

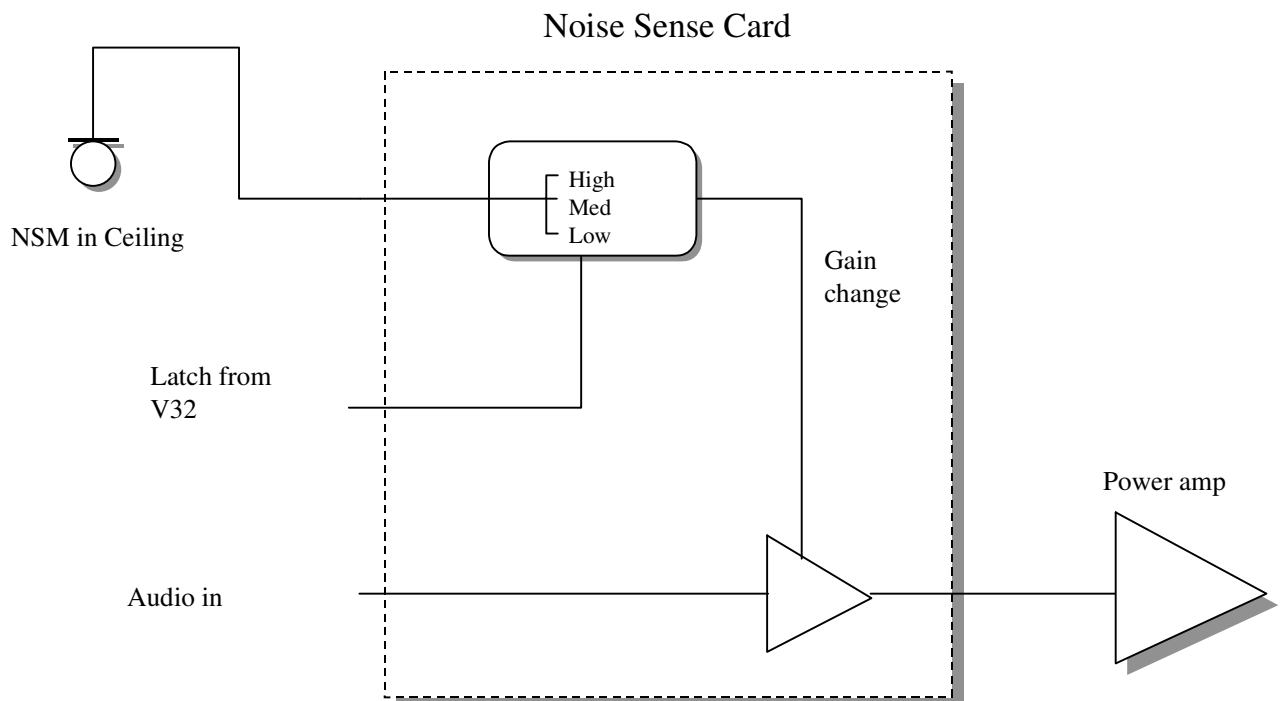
This procedure covers the setting up of the Audix Noise Sensing System

1. Overview

Automatic Noise Sensing microphones are installed at strategic locations within the zones of public address. A PA zone is equipped with a noise sensing microphone in accordance with the requirements placed on the performance of that zone by the specification

Each noise sensing microphone (NSM) has a noise sensing card (DANS) associated with it located in a 19" 3U Noise Sense frame (NSF) within the main equipment rack. The NSF can hold up to 8 cards. The card is functionally between the output of the matrix and the input to the power amplifier and provides three levels of adjustment; 0dB, -6dB and -12dB. The ambient noise level is sampled continuously and the level is locked at either the high, medium or low position when an input source is routed to the sensed zone. This level is held until the PTT is released. For example, if the area is generally quiet and there is an increase in ambient noise prior to pressing the PTT the PA system will compensate, i.e. the volume will be increased for the duration of the broadcast. A noise sense microphone can only control one group of speakers.

The Noise Sensing system is by-passed automatically on failure of the 24V dc supply. Adjustments can be made to vary the sensitivity of the system to suit individual requirements.



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Noise sensing microphones

Noise sensing microphones should be installed according to the drawings. When microphone level signals are used cabling should be in separately screened sections of trunking or separated by 300mm from any mains power or 100 volt loudspeaker lines where they run in parallel. These circuits are not monitored or fire protected.

Signal Levels

The DANS system maintains a minimum signal to noise ratio of 15dBA within the spaces served up to the maximum level as specified in

Ambient Noise (Without system)	DANS Attenuator Gain
>70dB(A)	0dB
>68dB(A)	0dB
>66dB(A)	0dB
>64dB(A)	-6dB
>62dB(A)	-6dB
>60dB(A)	-6dB
>58dB(A)	-12dB
>56dB(A)	-12dB
>55dB(A)	-12dB

1.1. Technical

Dimensions (Noise Sense Frame)
485mm x 385mm x 135mm

Power req (NSF + 8 cards)
1A 24Vdc

Weight (NSF + 8 cards)
8kg

Input
Balanced mic input (Noise sense mic)

Transformer balanced line input (main signal path)

**Adjustment
Range**

+/- 6dB

**Input
Sensitivity**

-72dB

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Noise Sensing System Setup

Equipment required;
Noise Generating Equipment comprising;
“Pink” noise source
60W power amplifier
15W loudspeaker
Sound Pressure Level meter

To set up the Noise Sensing Microphone operation the Commissioning Engineer will undertake the following activities;

Set-up the Noise Generating equipment in the Noise Sensing Area ensuring that the speaker is not pointing directly at the Noise Sensing Microphone.

Adjust the output power of the Noise Generator amplifier until the Sound Pressure Level in the space as measured on the SPL meter corresponds to the medium noise level stated in the specification.

At the Noise Sensing frame, on the front of the Noise Sense card corresponding to the area under test, adjust the input sensitivity of the microphone channel by turning the multi-turn potentiometer (marked “Threshold”) until D19 just turns off. Check correct settings by backing off VR9 until D19 just turns on (approx 1/2 to 1 turn), readjusting carefully until D19 just turns off again.

D20	<input checked="" type="checkbox"/>	ON
D19	<input type="checkbox"/>	OFF

This is the medium (typical) noise level

Adjust the output power of the Noise Generator amplifier until the Sound Pressure Level in the space as measured on the SPL meter corresponds to the high noise level stated in the specification.

At the Noise Sensing frame, on the front of the Noise Sense card corresponding to the area under test, check that the switching level LEDs in the middle of the board are as shown.

D20	<input type="checkbox"/>	OFF
D19	<input type="checkbox"/>	OFF

If they are not, adjust high gain level pot (VR3) until D20 just turns off. Check the setting by backing VR3 off slightly until D20 just turns on and readjusting VR3 carefully until D20 just turns off.

This is the high noise level

Note

VR9 is used for fine adjustment. Should further gain be required VR4 may be used for coarse adjustment. This is normally set fully anticlockwise for minimum gain.

Turning VR4 to mid position will give approx 10dB extra gain. Adjustment past this may cause difficulties in achieving the low gain audio setting

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Warranty

Performance

Any performance figures given by the Company are based upon Company experience and as expected from on test. The Company will, however, accept no liability if those figures are not obtained unless specifically guaranteed, subject to the tolerance and rejection limits applicable to such figures.

Delays in Delivery

If delivery is delayed at Customer request the Company reserves the right to increase its price to cover the extra cost of storage, insurance and interest. Interest will be at the rate of 3% above Bank of England base rate per month calculated on a day to day basis for the value of the goods held.

Storage

Where equipment is stored on Site prior to installation, it is the Purchasers' responsibility to ensure the safety and good condition of the equipment. Any damage to equipment on Site shall not prejudice payment by the due date.

Damage or Loss in Transit (UK)

When the price quoted includes delivery or where this is specifically charged, the Company will repair or replace free of charge goods damaged in transit provided that the Company and the carriers receive written notification within 3 days of delivery. The Company must be informed in writing within 14 days of your receipt of our Advice of dispatch if any goods are not delivered.

Damage or Loss in Transit (Export)

The Company will not be responsible for any loss or damage to goods which occur beyond the point of shipment in the case of F.O.B., F.A.S. and C & F contracts, or beyond the point of delivery stated in the quotation in C.I.F. Contracts.

Liability for Defects

Liability in respect of any defect in or failure of the goods or equipment supplied or for any loss damage or injury attributed thereto is limited to replacement or repair of defective design materials or workmanship within a period of 12 months of despatch or commissioning by the Company provided that the commissioning takes place within 6 months after dispatch and PROVIDED THAT such defected parts are promptly returned carriage paid by the Customer to the Company unless otherwise arranged. The right to make a charge for labour, handling expenses and return carriage on the repaired or replacement parts is reserved.

The Company shall be under no liability in contract, tort or otherwise for any personal injury, loss or damage or whatsoever kind of howsoever caused or for anything done or omitted in connection with the goods or equipment or any work in connection therewith.

Installation and Commissioning

In the case of contracts involving installation and commissioning, it is understood that good and materials will be unloaded, stacked and stored by the Purchaser at the Purchaser's risk. Unless otherwise stated in the tender, it is assumed that:

- The site is accessible, clear, before the arrival of our installers, level and dry, and where floor and/or wall fixing is necessary that there is no circumstances to prevent this
- Electricity supply is available for light and power tools
- That sufficient working space is allocated to ensure maximum output, sufficient secure storage space is provided free of charge for our immediate use on or adjacent to the Site for plant.
- That our engineers are given every facility to complete their work without undue hindrance.

The Company reserves the right to charge extra should these conditions not be adhered to. Where other Contractors are also involved, it is assumed that their programme will be such as to permit our work to be carried out with continuity and with the specified number of visits to Site. Should we be subject to delays or require to make a return visit to Site, this will involve additional charge. Detailed Method Statements are available on request

Environment

The Company cannot be held responsible for any defects arising from humidity and excessive temperatures - the products are designed for use at normal room temperatures, typically in the range 15 °C to 21 °C.

Title of Goods

All items remain property of the Company until payment for the goods is made in full. The Company reserves the right to repossess and paid. Title of goods may not be transferred until all monies owing are paid, full details of our retention of title clause are displayed in our Sales Office.

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Laws

These conditions shall be governed and construed in accordance with English Law and shall be subject to the exclusive jurisdiction of English courts

SAFETY CONSIDERATIONS

Only a qualified and trained electronics engineer should be permitted to make any type of adjustment or repair to the Public Address System.

A number of safety factors should be considered before attempting to maintain or repair the Public Address and Voice Alarm system.

Safety Hazards

- Electrical
- Heat
- Chemical
- Weight

Electrical

High Voltages exist within this equipment installation in the form of:

- 240 volt mains
- Loudspeaker Line Audio Signals.

The equipment rack primary supply is 240v AC 50Hz. This is distributed by a fused mains distribution panel to the rack apparatus.

The mains supply within each of the equipment rack apparatus are protected by insulated shrouds. No part of the mains supply can be easily touched unless these covers are removed.

The VPA Amplifiers are capable of producing over 100 Volt RMS audio signals. These signal voltages are directly proportional to the announcement level. They are present at the:

- Amplifier Output terminals
- Loudspeaker Line Termination Panels (Within Rack)
- Loudspeaker Circuit Cables
- Loudspeakers
- End of Line Transducers

The mains supply should be removed from any apparatus that requires maintenance.

Heat

There is a potential temperature hazard within the rear of the equipment rack. The VPA power amplifier heat sinks may become **Very Hot**. This is generally when an alarm has been broadcast for a long period of time. Heating may also occur if the amplifier power block is in a fault condition.

Weight

If an amplifier, *alpha* or battery frame is to be removed from the equipment rack, the appropriate lifting code of practice should be followed.

Approximate frame weight in kilograms;

<i>alpha</i> Matrix	8kg
VPA Power Amplifier (with 4 x 60W PowerBolc's)	16kg
Battery Pack (SBS241)	45kg

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Maintenance

It is recommended that all members of staff are urged to report problems with the Public Address system (i.e. distortion, speakers not operating, poor coverage) to the department Responsible for PA maintenance and that a fault log is kept.

For BS5839 compliant systems please refer to BS5839 Part 1 (Code of practice for system design, installation and servicing) for recommend maintenance levels.

For Assistance, please contact our Customer Services Department to obtain advise on Planned maintenance and Service Contracts

Maintenance Levels

The maintenance is be outlined for the following timescales;

- Daily
- Weekly
- Monthly
- Yearly

Daily

Regular use of the system will ensure that faults are brought to the attention of the operator.

Weekly

Check that on the weekly test message broadcast that the voice messages can be heard in all areas of the building.

Monthly

Check that there is no mechanical damage to;
Equipment racks

Yearly

It is proposed that the following tests are carried out in each zone;

- A visual check should be made of each speaker in the zone
- A visual check should be made of each visible speaker cable in the zone
- Using a test message or continuous music check that each speaker is operating.
- Check that a live broadcast can be made to the zones for which a microphone is responsible
- Check that the Sound Pressure level in the zone is correct

Glossary

The following descriptions define the terms in this manual, most of the terms have evolved over a period of time and represent PA system language unique to Audix Systems.

Source

A source is any audio input to the switching matrix e.g. Microphone, CD player.

Destination

A destination is an audio output for the switching matrix this can be an output to an external amplifier or a line level output.

Audio Switching Matrix

The Audio switch matrix allows any one of the source inputs to be switched to any output destination or destinations. With the *alpha* this switching is configured using software, and is controlled by the embedded processor.

PA/VA

Public Address/Voice Alarm

BS5839 – Fire detection and alarm systems for buildings

Part 1. Code of practice for system design, installation and servicing.

Part 8. Code of practice for the design, installation and servicing of voice alarm systems.

BS7443 (BS EN 60849)

Specification for Sound systems for emergency purposes

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RASTI

Rapid Assessment of Speech Transmission Index