DAL ACOUSTICS

S4N | i4N

Professional Sound Reinforcement Loudspeaker System

Operation Instructions

DAL Acoustics loudspeaker systems are designed and manufactured in Germany by German Audio Engineering GmbH. German Audio Engineering works exclusively with upstream suppliers who can guarantee consistent and verifiable quality of their components and parts.
If you have a problem with one of our products, or if you need a spare part, please contact your local distributor or contact us directly.
Thank you for choosing a DAL Acoustics product.

System Description:

The S4N and the i4N systems are small sized point sources with a high efficient broadband cone transducer in a closed cabinet. The cabinet is made from aluminium extrusion with a two component PU varnish coating available in all RAL colours on request. The cabinet includes a mounting yoke for suspended installations. Appropriate control settings of a DAL Control & Drive System are provided for the necessary equalisation of the broadband transducer. The S4N and i4N offering sufficient headroom for equalisation probably necessary for paging applications in evacuation systems. The full metal cabinet and protective grill enables the opportunity to acquire local fire resistance approval by handling authorities. The Variants providing different connectivity. The system is protected by a robust grille with outside foam cover. The S4N and i4N systems are primarily intended for distributed installations, but can also be used for near field monitoring with appropriate equalisation. In stand-alone or spaced array operation it can be used as an effect speaker or in museum displays. Due to its neutral reproduction characteristics and the high maximum SPL Level, it is equally suitable for speech and music transmission. For low end support, the DAL Sub-Low system, BR8N is suitable.
The 4N systems are featuring an efficient 4" NDym cone transducer with 1"voice coil and weather protected cone. With an internal heat sink, coupling transducer and cabinet, the 4N system is providing an AES power handling of 50W for an audio bandwidth of 130Hz - 16KHz with a Peak power handling of 100W and a peak SPL of 110db/SPL/1m.
The 4N systems should be operated with the DAL Control & Drive Systems. When operated with the DAL Control & Drive System, the system is parametrized for sonic quality and protected for maximum continuous and peak sound pressure levels.

The S4N/i4N offers a wide radial dispersion of 120° from 500Hz to 5000Hz.

For 70/100V Line operation with a third party amp and control system a variant with transformer (i4N-100) is available.

S4N/i4N Acessories

U-Mounting Yoke (suspending)

U-Mounting Yoke (standing)

Microphone Stand Adapter M5 – 3/8inch

Truss C-Clamp small

Notes On The Operating Instructions:

Observe the explanations and notes in these operating instructions. If you lend or pass on this product to third parties, please refer to this operating manual, pass on this operating manual.

This symbol in connection with the signal word "Beware" indicates a possibly dangerous situation. Failure to observe this safety instruction may result in serious injury or even death.

This symbol in connection with the signal word "Warning" indicates a possibly dangerous situation for persons with pacemakers. Non-observance can lead to serious injuries or even death.

This symbol in connection with the signal word "Caution" indicates a possibly dangerous situation with a high ambient noise level. It is recommended to wear hearing protection in case of high noise level.

This symbol in conjunction with the signal word "Caution" indicates a warning of a magnetic field present in the immediate vicinity of the object.

This symbol in connection with the signal word "Warning" indicates commands to observe product-relevant operating conditions.

Intended use and application

General information: Operating Instructions DAL S4N / i4N.
The information in this operating manual is given to the best of our knowledge and is valid at the time of printing. We reserve the right to change specifications of the product at any time. German Audio Engineering does not guarantee the quality or suitability for use. German Audio Engineering GmbH (for DAL) assumes no liability for direct or indirect damage or consequential damage resulting from the use and operation of this product.
German Audio Engineering reserves the right to continuously develop the product further and to make changes to the product as a result. German Audio Engineering is always pleased to receive suggestions for improvement and comments on the product.

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Safety and operational reliability

Observe the following safety instructions when operating loudspeakers to avoid risks. The S4N / i4N loudspeaker has been designed exclusively for professional use in sound reinforcement systems. The loudspeaker may only be used by instructed and qualified personnel. Observe the operating modes described in these operating instructions. Other applications are not permitted.
The S4N / i4N should not be operated without the DAL Control & Drive systems.

In operation avoid Feedback, distorted signals (clipping), peaks resulting from plugging or unplugging devices in the signal chain, long term pure sine wave tones with high power and power amplifiers not specified by their power ratings. Such signals and devices can cause loudspeaker overload or damages and are not covered by our warranty.

Configuration parameters for external system controller

S4N			
Limiter	+31,3dBu	(50W@16Ohm)	
Polarity	+		
Gain	0,0dB		
Delay	to be adjusted locally		
High Pass	150Hz	Butterworth 2rd Order	
EQ1	3,72KHz	BW0,3 – Q4,8	-3dB
EQ2	5,00KHz	BW5,0 – Q 2,6	+5dB
High Shelving	7.00KHZ	BW 10,0 – Q3,0	-7dB

Safety instructions:

Warning

Warning

Loudspeakers have a permanent magnetic field. Persons with pacemakers must not be in the immediate vicinity of loudspeakers, as magnetic fields can lead to interference with pacemakers. When repairing loudspeakers, it must be ruled out that the magnetic components come into contact with persons wearing pacemakers.

Caution

Warning

Loudspeakers have a permanent magnetic field. This can interfere with the operation of other components in the immediate vicinity that are magnetically sensitive.

Beware

Beware

The S4N and i4N are suitable for suspended operation and offering hardware options for this purpose. For flown operation, the original Manufacturer hardware must be used and a proven static of the hanging point is mandatory. When installing and commissioning in standing or stacked operation, pay careful attention to secure footing and solid professional mounting. In stacked operation, the loudspeakers must be secured as a group against slipping or falling over, e. g. with suitable tension straps on stages. A falling loudspeaker can cause great damage to property and personal injury. Use only material specified by DAL for the installation and mounting of DAL loudspeakers. This work must be carried out by qualified personnel. Observe the applicable safety regulations when doing so.

Caution

Caution

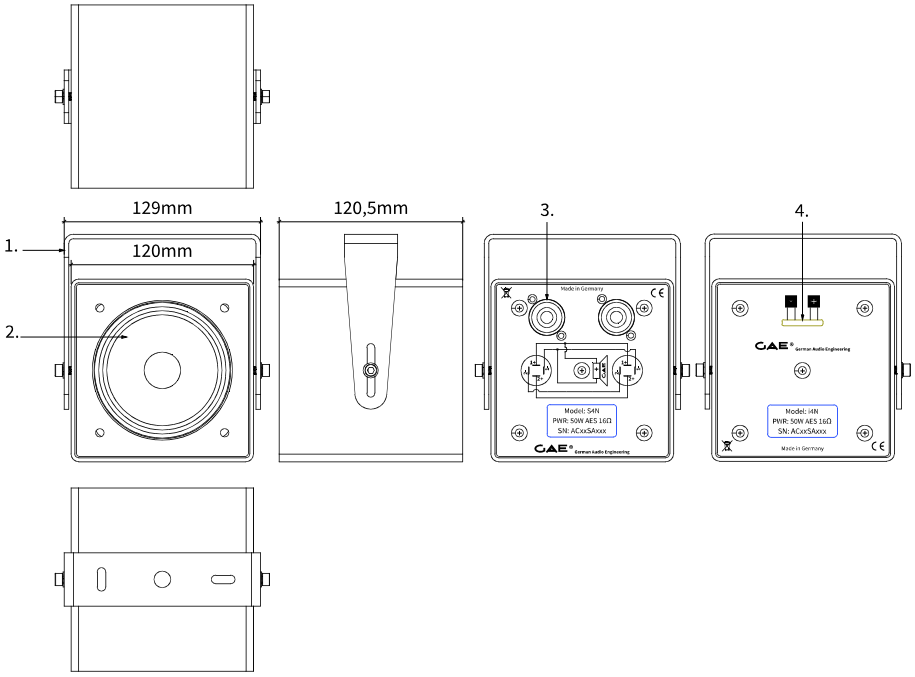
Do not stay in the immediate vicinity of loudspeaker systems that are operated at high sound pressure levels. Wear hearing protection when testing and setting up speaker systems. These speaker systems - operated at high sound pressure levels - can endanger health. Even seemingly low sound pressure levels of 90dB/SPL can cause long-term impairment or damage to hearing.

Attention

Attention

When setting up, storing and transporting loudspeakers, ensure that excessive environmental influences such as direct sunlight, moisture, vibrations and dust have no effect. When operating the loudspeakers, avoid feedback, distorted signal transmission and playback as well as signal peaks that can be caused by switching devices in the signal chain on and off or disconnecting them from the signal chain during operation. Make sure that the loudspeaker is not exposed to permanent thermal overloads, which may cause fire and result in damage to property and personal injury. DAL will not be liable for any damage caused in this way and will not accept any warranty or liability for consequential damage.

Technical Overview



(1.) Mounting yoke for suspended installation: Replacement: 100557

(2.) 4“ NDym broadband cone transducer with coated Cone: Replacement DAL 4TN02-19-025C, Order Code 1000658

(3.) NL4 connectors in parallel (DAL S4N version)

(4.) 2x2 pole screw connection terminal (DAL i4N version)

Tools required for maintenance: Srewdriver and Bits: PH3

Model: S4N
PWR: 50W AES 16Ω
SN: ACxxSAxxx

S4N Manufacturer Label With Serial Number

Purchase Of Spare Parts

Please state the serial number of your product when ordering spare parts. The serial number identification of your product can be found on the serial number sticker on the rear wall of the loudspeaker system.
The illustration of the serial number sticker is shown on the left. The S/N designation is followed by the serial number of the speaker system.

Technical Specifications

Acoustical Bandwidth (S4N FR-Mode) with DAL DS-4S / DS-4M: 130Hz – 16KHz

Dispersion S4N (h x v): typically 120° radial 500Hz - 5000Hz

Dispersion i4N (h x v): typically 120° radial 500Hz - 5000Hz

Electrical Phase Response: +/- 45°: 150Hz – 16KHz

Nominal Impedance (Re): 16Ohm

System Power: 50W (AES), 100W Peak

Continous SPL: >110dB/1m

Peak SPL: > 110dB/1m, Music Signal[1]

Dimensions (H x W x D mm): 120 x 120 x 120,5

Net Weight: 2,1kg

Connectivity S4N: 2 x Speakon™ NL4 1+/1- alternative 2+/2-

Connectivity i4N: 2 x 2 pole screw terminal

Recommended Control & Drive System: DAL DS-4S

For operation recall the following controller setups for DAL DS-4S: S4N-FR

S4NFR/i4NFR: Full Range stand - alone operation, spaced arrays

Parallel connection of multiple S4N/i4N systems and DAL Control & Drive Systems: DS-4S is 6 systems S4N/i4N per channel

Technical Notes

Safety steels may be used with the threw holes in the mounting yoke for non permanent installation or rigs.

DAL protective grilles with foam lamination are the mechanical protection component for the built-in transducers and offer a high acoustic transmission as well as their affixing minimizes sonic influences of the grilles. The backing or covering of the grilles with foam serves also as UV-light protection, dust protection and improves the optical unobtrusive of the systems. Only undamaged grilles and foams can fulfil these tasks. Replace warped grilles or worn foams to maintain their function.

DAL loudspeaker systems with Poly Urea-coated or painted enclosures are basically suitable for temporary outdoor operation, even in the rain.

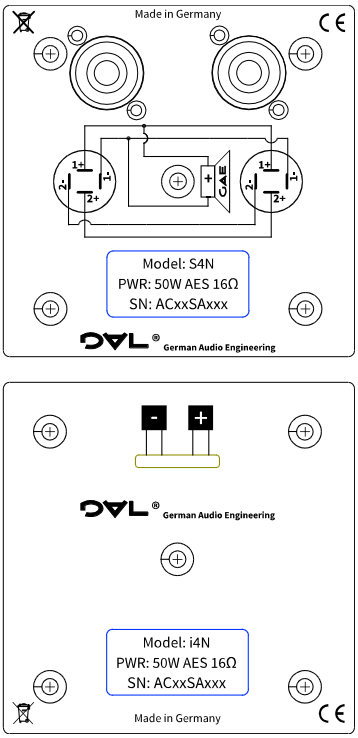
For indefinite operation outdoors as in fixed installations, the loudspeaker systems must be protected with a hood against direct sunlight and rain. If necessary, the loudspeaker should be equipped with the optional front grille with weather protection.

Most DAL loudspeaker systems can be supplied for extra charge from the factory in a weatherproof (WR) or sea-weatherproof (SWR) variant.

For indefinite operation outdoors in subtropical and tropical areas, the loudspeaker should be ordered as the WR variant. For indefinite operation at sea and other areas with a humid and salty atmosphere, the loudspeaker should be ordered in the SWR equipment variant. Both variants are manufactured at the factory only.

1 Peak SPL Level with DAL DS-4L

Connectivity And Electrical Operation



S4N and i4N connectivity

The S4N is connected via 2 Speakon® NL4 sockets connected in parallel on the connector panel. The connectivity is 1+/1- as standard. Alternatively, the connector panels can be supplied as a version with the Neutrik NL4 connectivity for 2+/2-. For fixed installations the i4N is connected by a 2x2 pole screw terminal.

Connectors Pin Assignment 1+(2+)/1-(2-) or + : The S4N/i4N is wired in such a way that a positive voltage at 1+ (2+) or + moves the cone of the transducer outwards.

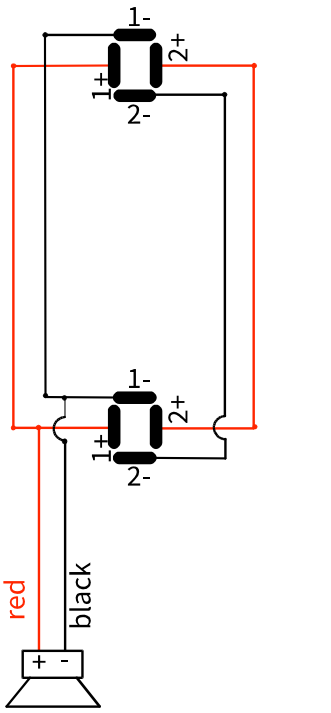
The S4N should not be operated without a dedicated system controller. Since the size of the transducer limits the low frequency reproduction and causes an increasing“beaming” effect for frequencies above 5000Hz.

Keep in mind that you may need to increase the required cable cross-section for parallel operation of multiple S4N / i4N on one amplifier channel. The same applies to long and longer cables between power amplifier and S4N / i4N. We recommend a minimum cross section of 2.5 qmm up to 20m cable length @8Ohm. Here the loss through the cable is approx. 5% of the amplifier power.

Installation And Rigging

The S4N / i4N is designed for standing or suspended operation. When setting up, suspending and positioning the system, make sure it is on a firm and levelled surface and that the selected load points have a proven load-bearing capacity. Use approved stands and approved mounting accessories that are designed for the weight load. Additionally secure the ground stacked or flown speaker system before commissioning to prevent personal injury and property damage.

Test And Maintenance



S4N - internal wiring schematic

The wiring of the loudspeaker components inside the cabinet is according to the diagram to the left. With an impulse phase checker, which delivers a signal of non-inverted phase, a signal of positive polarity is obtained directly measured in front of the cone transducer. If the same test is performed in front of the high frequency driver/horn, also a signal with positive polarity is obtained.

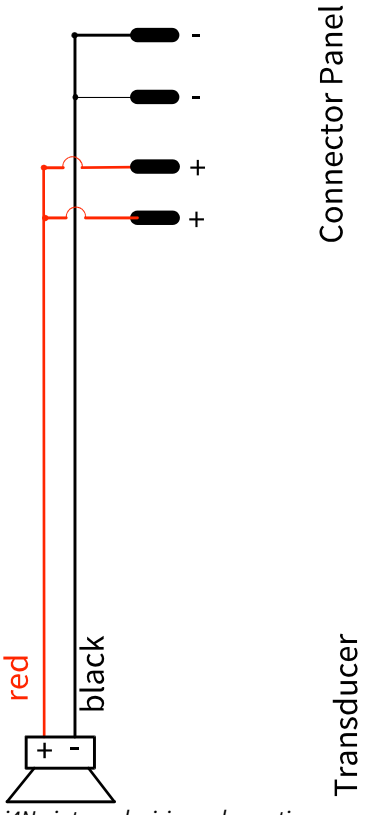
If the diaphragm of the high-frequency driver is replaced, make sure that the original spacer ring (if originally fit) made of a thin plastic material remains in the driver so that the new voice coil is correctly positioned in the magnetic field. Cone transducer and horn need to fit back airtight in the cabinet after service.

It is good practice to check loudspeaker systems frequently in concern of mechanical integrity and distortion free sound reproduction.

Here is a simple way to quickly check sound reproduction. Use a sine wave generator with sweep function or a tunable sine wave generator and a power amplifier. Adjust the test system to deliver an appropriate sound power level and tune the sine wave generator from low to high frequencies. Listen to the acoustic output the loudspeaker delivers. The signals should be free of audible distortions. Mechanical noise from the system or unwanted reproduction of side tones should be followed up by inspection and search for the root cause.

Please note for test with advanced audio analysers that the acoustic reference axis of the system is the centre between horn and cone loudspeaker.

Fixing and mounting points should be inspected frequently.



i4N - internal wiring schematic

Note on disposal

Observe the applicable national regulations and rules for disposal.
All products manufactured by German Audio Engineering GmbH are B2B products and are supplied to commercial customers. The adjacent symbol of the crossed-out trash bin can indicate that this product will be disposed of exclusively by German Audio Engineering GmbH. For DAL products that do yet bear this marking, the owner is responsible for proper disposal.
Our registration according to Elektro G is: WEEE-Register-Nr. DE 72073104

Manufacturer's declaration

The declaration applies to: DAL S4N 1000540 and i4N 1000660 and all model variants that correspond to the factory design and have not been modified by others.
Applied national standards and technical specifications:
DIN 18800, DIN 1055, DGUV regulation 17, BGI 810-13
Hamburg, 01.06.2018