



HANDBOOK **Redbox RB-DA24MD**
24 Way Mono Audio
Distribution Amplifier



Manufacturers of audio & video
products for radio & TV broadcasters

SONIFEX

This handbook is for use with the following product:

Redbox RB-DA24MD 24 Way Mono Audio Distribution Amplifier

Stock Code: 30-260

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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

Product Warranty - 2 Year

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 within 30 days of purchase, you can increase your product warranty to 2 years. Go to the Sonifex website at: <http://www.sonifex.co.uk/technical/register/index.asp> to apply for your 2 year warranty.

Note: For your own records the product serial number is recorded on the CE certification page of this handbook.

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
IEC Mains lead fitted with moulded mains plug	1
Handbook and warranty card	1

If you require a different power lead, please let us know when ordering the product.

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.



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CE Declaration of Conformity and Approval Information

This document certifies that the Sonifex product that you have purchased is compliant with CE specifications. If you would like further information on compliance of all Sonifex products, please check the website at the address above where full information is available.

Sonifex Limited hereby certify that the following product with serial number shown has been designed and manufactured in accordance with the following specifications :

Product: _____

 Serial No: _____

EMC: EN 55103-1: 1997 Electromagnetic Compatibility.
 Limits of disturbance for audio apparatus for professional use
 For use in environments 1 to 4.

EN 55103-2: 1997 Electromagnetic Compatibility.
 Limits of disturbance for audio apparatus for professional use
 For use in environments 1 to 4.

Safety: EN 60950: 1992 Safety of Information Technology Equipment
 Including Electrical Business Equipment.

Hybrid BS6301, BS7002, BS415, CTR21,
 Approvals: R&TTE directive (1999/5/EC)

The Reference Technical Justification File for this product is available at Sonifex Ltd.

Authorised By:

Name: Chris Stills

Position: Technical Director

Date of Issue: 01 January 2015

Signature:

Safety & Installation of Mains Operated 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.

Voltage Setting Checks





Ensure that the machine operating voltage is correct for your mains power supply by checking the box in which your product was supplied. The voltage is shown on the box label. The available voltage settings are 115V, or 230V. Please note that all products are either switchable between 115V and 230V, or have a universal power supply.

Fuse Rating

The product is supplied with a single fuse in the live conducting path of the mains power input. For reasons of safety it is important that the correct rating and type of fuse is used. Incorrectly rated fuses could present a possible fire hazard, under equipment fault conditions. The active fuse is fitted on the outside rear panel of the unit.

Power Cable & Connection

An IEC power connector is supplied with the product which has a moulded plug attached – this is a legal requirement. The mains lead is automatically configured for the country that the product is being sent to, from one of:

Territory	Voltage	IEC Lead Type	Image
UK & Middle East	230V	UK 3 pin to IEC lead	
Europe	230V	European Schuko round 2 pin to IEC lead	
USA, Canada and South America	115V	3 flat pin to IEC lead	
Australia & New Zealand	230V	Australasian 3 flat pin to IEC lead	

Connect the equipment in accordance with the connection details and before applying power to the unit, check that the machine has the correct operating voltage for your mains power supply.

Important Note: If there is an earth/ground terminal on the rear panel of the product then it must be earthed/grounded.

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.

RoHS Directive



The RoHS directive limits the use of certain hazardous substances currently used in EEE manufacture, including lead, mercury, cadmium, hexavalent chromium, and halide-containing compounds PBB (polybrominated biphenyl) and PBDE (polybrominated diphenyl ether). Elimination of these substances will result in more environmentally friendly recycling of electronic equipment.

Sonifex Ltd practices lead-free (LF) manufacturing processes and does not use any of the hazardous substances identified in the European Union’s Restriction of Hazardous Substances (RoHS) directive. The manufacturing

processes include the assembly of purchased components from various sources. Product is offered as RoHS compliant, or LF, only after sufficient evidence is received from the component manufacturers that their components are RoHS compliant. Sonifex Ltd relies solely on the distributor, or manufacturer, of the components for identification of RoHS compliance. Thus whilst every effort is made to ensure compliance, Sonifex Ltd makes no warranty, or certification, or declaration of compliance concerning said components.

Atmosphere

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

Fitting Redboxes

Redboxes can be fixed to the underside of a mixing desk, or other surfaces using 4.2mm holes in the sides and fixed with 2 x M4 screws or 2 x No. 6 countersink wood screws.

They can also be rack-mounted, with either the front, or rear of the Redbox positioned at the front of the rack:

Rear Mounting a 1U Rackmount Redbox:

The RB-RK3 1U rear panel rack kit can be used for large 1U rackmount Redboxes.



Note: When fitting the RB-RK3 rear-mounting rack-kits, a notch has been left on the inside of the right-hand rack-piece for the mains cable to pass through. Make sure that the mains cable has been put through the notch before attaching the right hand rack-piece.

Introduction



Fig 1-1: RB-DA24MD Front Panel

The RB-DA24MD is a 1U rack mount high performance 24 way audio distribution amplifier. It has 2 inputs which can be each individually routed to 12 outputs, or mixed and routed to all 24 outputs.

The XLR inputs and D-type outputs are electronically balanced and can be wired unbalanced. Each output is individually buffered so that a short circuit on one won't affect the others. Each output is also protected against connection to both POE (power over Ethernet) and phantom power circuits.

The RB-DA24MD has master gain controls for both input 1 and input 2 which are pre-set potentiometers accessible through the rear panel. These controls allow the gain to be adjusted from -15dB to +15dB, useful for normalising consumer to professional signals and vice versa. An LED power indicator on the front panel shows the unit is powered.

A 125Hz 6dB per octave roll off filter is activated by a push switch on the rear panel. When selected the filter is applied to both inputs.

System Block Diagram

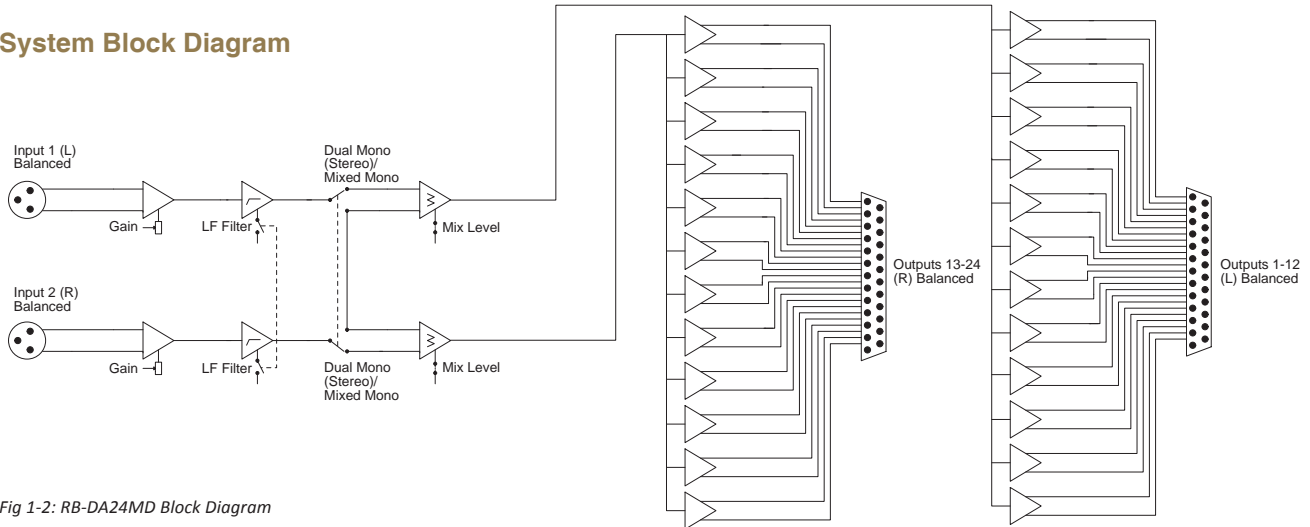


Fig 1-2: RB-DA24MD Block Diagram

Connections And Operation

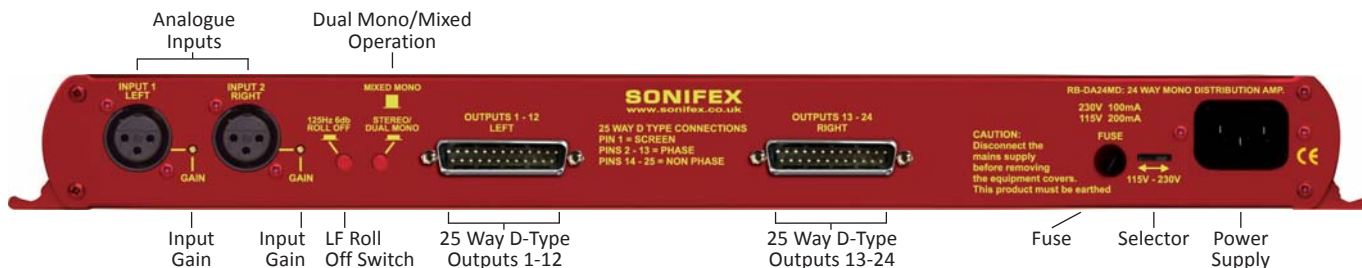


Fig 1-3: RB-DA24MD Rear Panel

Inputs (1&2)

The XLR-3 input connectors can take balanced professional levels, or unbalanced consumer levels by connecting the non-phase to the signal ground and adjusting the rear panel input gain controls. The inputs can be configured as either dual mono, input 1 routed to outputs 1-12 and input 2 routed to outputs 13-24, or mixed mono, inputs 1 and 2 mixed at a pre-set level and routed to all 24 outputs. The XLR 3 pin input has the following connections:

- Pin 1: Screen
- Pin 2: Phase
- Pin 3: Non-Phase

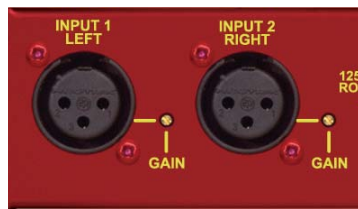


Fig 1-4: Analogue Inputs

Outputs (1 – 24)

The 25 way D-type outputs are electronically balanced, and can be wired unbalanced (not recommended). Each output is individually buffered so that a short circuit on one output will not affect the others. The outputs are also protected from connection to POE (power over Ethernet) and phantom power circuits. They have the following connections:



Fig 1-5: 25 Way D-Type Outputs

	Outputs 1-12 D-Type	Outputs 13-24 D-Type
Pin No.	Signal	Signal
Pin 1	Screen	Screen
Pin 2	Output 1 - Phase	Output 13 - Phase
Pin 14	Output 1 - Non-Phase	Output 13 - Non-Phase
Pin 3	Output 2 - Phase	Output 14 - Phase
Pin 15	Output 2 - Non-Phase	Output 14 - Non-Phase
Pin 4	Output 3 - Phase	Output 15 - Phase
Pin 16	Output 3 - Non-Phase	Output 15 - Non-Phase
Pin 5	Output 4 - Phase	Output 16 - Phase
Pin 17	Output 4 - Non-Phase	Output 16 - Non-Phase
Pin 6	Output 5 - Phase	Output 17 - Phase
Pin 18	Output 5 - Non-Phase	Output 17 - Non-Phase
Pin 7	Output 6 - Phase	Output 18 - Phase
Pin 19	Output 6 - Non-Phase	Output 18 - Non-Phase
Pin 8	Output 7 - Phase	Output 19 - Phase
Pin 20	Output 7 - Non-Phase	Output 19 - Non-Phase
Pin 9	Output 8 - Phase	Output 20 - Phase
Pin 21	Output 8 - Non-Phase	Output 20 - Non-Phase
Pin 10	Output 9 - Phase	Output 21 - Phase
Pin 22	Output 9 - Non-Phase	Output 21 - Non-Phase
Pin 11	Output 10 - Phase	Output 22 - Phase
Pin 23	Output 10 - Non-Phase	Output 22 - Non-Phase
Pin 12	Output 11 - Phase	Output 23 - Phase
Pin 24	Output 11 - Non-Phase	Output 23 - Non-Phase
Pin 13	Output 12 - Phase	Output 24 - Phase
Pin 25	Output 12 - Non-Phase	Output 24 - Non-Phase

Input Gain Control

The input gain on the RB-DA24MD can be varied between -15dB and +15dB by adjusting the pre-set potentiometers. These are accessible through the holes in the rear panel. The RB-DA24MD has separate input 1 and input 2 gain controls.

LF Roll Off Filter

A low frequency roll off filter is activated by a push switch on the rear panel. This implements a 125Hz 6dB per octave roll off filter which is applied to both inputs.

Dual Mono/Mixed Mono Operation

The method of operation may be switched between stereo/dual mono and mixed mono. When the RB-DA24MD is set to dual mono each input is distributed separately to outputs 1-12 and 13-24. Input 1 is routed to outputs 1-12 and input 2 to 13-24. When it is set to mixed mono mode both inputs are mixed and routed to all 24 outputs.



Fig 1-6: 25 Roll Off and Dual Mono/Mixed Operation Switches

Mixed Mono Settings

When set to mixed mono operation there are 3 different mix level modes, selected by the 4 jumpers on the PCB.

Jumper Link	Mix Mode
Off	(Input 1 + Input 2) -6dB
Pin 1 & 2	(Input 1 + Input 2) -3dB
Pin 2 & 3	Input 1 + Input 2

All jumpers (J1 to J4) must be set the same for correct operation.

Technical Specifications

Audio Specifications:

Input Impedance:	>20k Ω bridging (balanced)
Output Impedance:	<50 Ω
Maximum Input Level:	+28dBu
Maximum Output Level:	+28dBu
Frequency Response:	20Hz to 20kHz \pm 0.1dB (600 Ω load, ref 1kHz)
Gain Range:	Adjustable -15dB loss to +15dB gain
Common Mode Rejection:	>66dB typically
LF Roll Off Filter	125Hz at 6dB/octave
Distortion:	0.01%THD @ 1kHz, red + 8dBu output
Noise:	-100dB unity gain, ref +8dBu output

Connections:

Inputs:	2 x XLR 3 pin female (balanced)
Outputs:	2 x 25 way D-type plug (balanced, can be unbalanced)
Mains Input:	Filtered IEC, switchable 110-120V, or 220-240V, fused, 12W maximum
Fuse Rating:	Anti-surge fuse 100mA x 5mm (230VAC) Anti-surge fuse 200mA x 5mm (115VAC)

Equipment Type:

Equipment Type: 24 Way Mono Distribution Amplifier



Physical Specification:

Dimensions (Raw):	48cm (W) x 15.8cm (D) x 4.2 (H) (1U) 19" (W) x 6.2" (D) x 1.7" (H) (1U)
Dimensions (Boxed)	58.5cm (W) x 27.4cm (D) x 10.8cm (H) 23" (W) x 10.9" (D) x 4.3" (H)
Weight	Nett: 1.6kg Gross: 2.2kg Nett: 3.5lbs Gross: 4.8lbs

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