



Redbox RB-VHDA8
3G/HD/SD-SDI
1 Input, 8 Output Video
Distribution Amplifier

User Handbook



RB-VHDA8 USER HANDBOOK



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This handbook is for use with the following product:
RB-VHDA8 3G/HD/SD-SDI 1 Input, 8 Output Video Distribution Amplifier

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Warranty

Warranty and Liability

Important: the purchaser is advised to read this clause

- (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 12 months of the date of despatch 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.



WARRANTY

WARRANTY



WARRANTY

- (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.



WARRANTY

Unpacking the RB-VHDA8

The RB-VHDA8 is shipped with the following equipment. Please check your packaging to ensure that you have all of the items below. If anything is missing, please contact the supplier of your equipment immediately.

Item	Quantity RB-VHDA8
RB-VHDA8	1
IEC Mains lead fitted with moulded mains plug	1
Handbook and warranty card	1

Fig A: Packing List

Each RB-VHDA8 is shipped in protective packaging and should be inspected for damage before use. Where an item is found to have transit damage, 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.

Returning the Warranty Card

In order to register the date of purchase so that we can keep you informed of any design improvements or modifications, it is important to complete the warranty registration document that is enclosed and return it to Sonifex Ltd in the UK.

For your own records you should write down the serial number (which can be found on the rear of the RB-VHDA8).

Serial Number
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SAFETY INFORMATION



SAFETY INFORMATION

Safety Information

Safety of Mains Operated Equipment



This equipment has been designed to meet the safety regulations currently advised in the country of purchase and it conforms to the safety regulations specified by use of the CE Mark.

Warning : 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.

Voltage Setting Checks

Ensure that the machine operating voltage is correct for your mains power supply by checking the box in which your Redbox was supplied. The voltage is shown on the box label. This product is continuously rated 85 - 264 VAC, 47 - 63Hz. Please note that all Redboxes are either switchable between 115V and 230V, or have a universal power supply.

Fuse Rating

The RB-VHDA8 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 fuse rating for the RB-VHDA8 is:

Continuously rated 85 - 264 VAC, 47 - 63Hz - 2A, 5 x 20mm SB

The active fuse is fitted on the outside rear panel of the unit.

Power Cable and Connection

An IEC power connector is supplied with the RB-VHDA8 which has a moulded plug attached – this is a legal requirement. If no moulded plug has been supplied with your RB-VHDA8, please contact your supplier, because an IEC connector is always supplied from the Sonifex factory.

If for any reason, you need to use the RB-VHDA8 with a different power cable, you should use the following wiring guidelines.

Wire Colour	Connection
Green, or green and yellow	Earth (E)
Blue, or Black	Neutral (N)
Brown, or Red	Live (L)

Fig B: Power Connections

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 : The terminal marked on the rear panel must be earthed.



SAFETY INFORMATION

Ordering the Correct Mains Lead

When ordering a Redbox from Sonifex, it is helpful if you can specify your required operating voltage and mains lead. After the product code add:

UK, for 230V, UK 3 pin to IEC lead	
EC, for 230V, European Schuko 2 pin to IEC lead	
US, for 115V, 3 pin to IEC lead	
AU for 230V, Australasian 3 pin to IEC lead	

Fig C: Mains Lead Table

E.g. order RB-VHDA8 UK for a UK IEC lead to be supplied.

Installation Information

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.

Electromagnetic Radiation

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.

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 The RB-VHDA8: The **RB-RK3** 1U rear panel rack kit can be used for large Redboxes such as the RB-VHDA8.



Fig D: RB-RK3 Large Redbox Rear Rack-mount Kit

Note: When fitting the 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.

SAFETY & INSTALLATION INFORMATION



SAFETY & INSTALLATION INFORMATION

WEEE & RoHS Directives - Sonifex Statement



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. It applies to a huge spectrum of products. It encourages and sets criteria for the collection, treatment, recycling and recovery of waste electrical and electronic equipment. All products manufactured by Sonifex Ltd have the WEEE directive label placed on the case. It gives a contact for individuals who are unsure about the correct procedure when the product has reached its “end of use”.

Sonifex Ltd will be happy to give you information about local organisations that can reprocess the products, or alternatively all products that have reached “end of use” can be returned to Sonifex and will be reprocessed correctly free of charge.

Sonifex Ltd has phased out the use of certain hazardous substances identified in the European Union’s **Restriction of Hazardous Substances (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. For the products which Sonifex manufacture, the main area where products were affected was in the use of lead for manufacturing and assembling electronics circuit boards.

Sonifex Ltd practices lead-free (LF) manufacturing processes. LF solder is used on the surface-mount PCB manufacturing processes and for hand soldering. The printed circuit boards (PCBs) used are either gold plated, or immersion tin plated, both of which use no lead. Historically the PCBs were hot air solder levelled (HASL) PCBs which used tin/lead based solder.

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.

Sonifex Ltd defines “Lead Free” as pertaining to any product, which has been manufactured by Sonifex Ltd using components which have been declared by the manufacturers as “Lead Free”. All statements by Sonifex Ltd of RoHS compliance are based on component manufacturer documentation.



RB-VHDA8 3G/HD/SD-SDI 1 Input, 8 Output Video Distribution Amplifier

Introduction



Fig 1: RB-VHDA8 Front Panel

The RB-VHDA8 is a high performance, reliable eight way digital video distribution amplifier for re-clocking and distributing a 3G, HD (high definition) or SD (standard definition) SDI source to eight outputs. The unit provides automatic input detection, re-clocking and cable equalisation of the input signal to 100/350 meters (HD/SD) of coax cable.

The full range of SD, HD and 3G standards are supported by the unit, allowing NTSC and PAL composite digital signals right up to component digital signals at 1080p 60Hz.

The rear panel has a single female BNC connector for the 3G/HD/SD-SDi input and a further eight female BNC connectors for the outputs. Each output is buffered providing driven outputs for greater reliability.

As well as an AC power input on a filtered IEC, the unit also has an adjacent 12V DC input on a 2.5mm co-axial connector, for use, for example, in outside broadcast vehicles. Both power inputs can be used to give a dual redundant power supply; whichever voltage is higher will be used.

The front panel of the case has a single bi-colour LED which indicates amber to show power is present, then green should a valid incoming SDI signal be detected.



Fig 2: RB-VHDA8 Rear Panel



INTRODUCTION



System Block Diagram

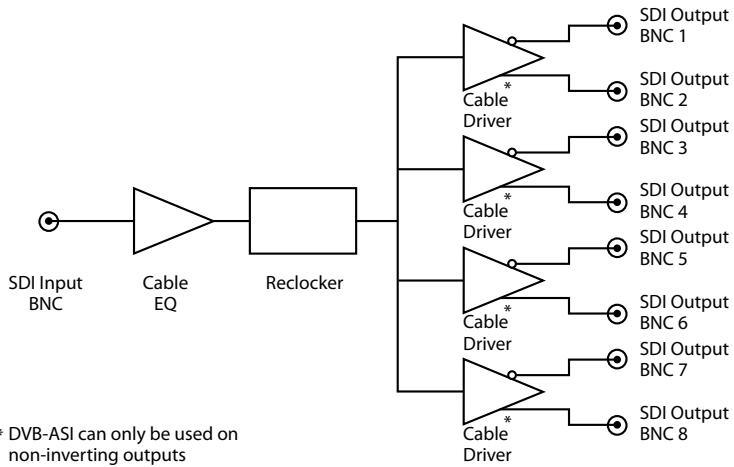


Fig 3: RB-VHDA8 System Block Diagram

Front Panel Controls & Indicators

The front panel of the case has a single bi-colour LED which indicates amber to show power is present, then red should a valid incoming SDI signal be detected.

Rear Panel Connections

3G/HD/SD-SDI Input

The single input uses a BNC connector.

3G/HD/SD-SDI Outputs

The eight outputs use BNC connectors.

Technical Specification For RB-VHDA8

Compatible	SMPTE-424M (3G)
Standards:	SMPTE-292M (HD-SDI) SMPTE-259M-AC ¹ (SD-SDI) SMPTE 344M ¹ DVB-ASI ² at 270Mb/s

¹ Other rates will be passed without relocking.

² Non inverted outputs only.

Impedance:	75Ω terminating
Equalisation:	Up to 100m of Belden 1694A at 1.485Gbps Up to 350m of Belden 1694A at 270 Mbps
Data Rates:	Fully supported: 143, 270, 1483.5, 1485, 2967 & 2970Mbps Passed but not relocked: 177, 360 & 540Mbps
Relocking & Equalisation:	Automatic
Resolution:	Automatic
Return Loss:	>15dB at 1500MHz
Output Jitter:	<0.2UI
Signal Level:	800mV ±10%

Front Panel Indicators

Power LED:	Amber indicates power is present, Red indicates detection of valid incoming SDI signal
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Rear Panel Connections

HD/SD-SDI Video Input: 1 x BNC (Unbalanced)

HD/SD-SDI Video Outputs: 8 x BNC (Unbalanced)

Power Supply:

AC: Filtered IEC, continuously rated 85-264VAC, 47-63Hz, fused



TECHNICAL SPECIFICATION



Fuse Rating: Anti-surge fuse 2A 20 x 5mm

DC: 12V 300mA max, DC supply, 2.5mm socket fused

Equipment Type

RB-VHDA8: 3G/HD/SD-SDI 1 Input, 8 Output Video Distribution Amplifier



Physical Specification

Dimensions (Raw): 48cm (W) x 10.8cm (D) x 4.3cm (H)
19" (W) x 4.3" (D) x 1.7" (H) (1U)

Dimensions (Boxed): 59cm (W) x 20.5cm (D) x 6cm (H)
21" (W) x 8" (D) x 2.4" (H)

Weight : Nett: 1.3kg Gross: 1.9kg
Nett: 2.9lbs Gross: 4.2lbs

Accessories

RB-RK3: 1U Rear panel rack kit for large Redboxes



Lined area for taking notes, consisting of 25 horizontal lines.



NOTES

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