HANDBOOK

Redbox RB-DSD8

8 Channel Silence Switcher

Manufacturers of audio & video
products for radio & TV broadcasters

SONIFEX

This handbook is for use with the following product:
Redbox RB-DSD8 8 Channel Silence Switcher
Stock Code: 30-182

Revision 2.04, November 2015

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Made in the UK by SONIFEX

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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

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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 Approvals:	BS6301, BS7002, BS415, CTR21, 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 October 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

RoHS COMPLIANT

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.

1. Introduction

Fig 1-1: RB-DSD8 Front Panel

The RB-DSD8 8 provides silence detection over 8 channels of audio, organised as 4 pairs. The pairs can be either analogue or digital and can be used independently to act as 4 independent silence detectors or they can be linked to switch simultaneously. The unit is designed to switch from the main input to the backup input in the event of loss of audio.

The unit can switch:

- Automatically when the main input level is below the set switching level
- Automatically when the digital input becomes unlocked.
- Manually by front panel or remote control button press.
- Manually by webserver or serial interface.

The audio inputs can be analogue or digital, with ADCs incorporated into the input paths. The input path switches based on digital lock, allowing for automatic input selection. The output is also selectable as analogue or digital. This is achieved by a DAC in the output path and can be switched in manually by rear panel DIPswitches. The unit switch level settings are in dBFS. When using analogue signals, the equivalent full scale value can be set to +24dBU, +18dBU, or +12dBU by rear panel DIPSwitches. Since the silence detection feature can be switched off, this means the unit can also be used as an 8 channel AD/DA.

Each pair has individual settings and controls but share settings once they are linked. The foremost pair determines the switching characteristics and controls to be used. Each stereo pair has an AES LED that shows the status of the digital audio on that channel and a selection LED to show which input is currently being sent to each output. Two presence LEDs, one for each mono input of each pair, indicate the current input level.

The unit can switch between sources automatically or manually at the push of a button. If switching manually, silence detection is disabled and the user chooses when to switch using the main or backup buttons. If switching automatically, the unit will switch between the two sources automatically upon the detection of silence. Each pair can be set to switch manually or automatically and the current setting is indicated by the mode LED. The unit can also return back to the main input manually or automatically, and the automatic return can be delayed.

Link/Select buttons are used to group channels to access multichannel operation. Each pair has a Link/Select button which illuminates blue when active. Pressing and holding the first Link/Select button with any other Link/Select button causes all inputs up to that point to be selected.

The RB-DSD8 has a slave mode facility that allows you to connect two RB-DSD8 units and control them simultaneously from one unit.

The silence detect level is adjustable between -27dBFS and -84dBFS in 3dBFS steps via DIPSwitches and this level is compared to peak signals. The silence interval can be adjusted between 2 seconds and 252 seconds in 2 second steps via DIPSwitches. The return duration can also be adjusted between 2 seconds and 252 seconds.

A powerful feature of the RB-DSD8 is that by using the in-built web server or Sonifex SCi serial software, the unit can be programmed for different delay durations, levels and switching functions so that the unit can be set up the unit for any specific application. Set a DIPSwitch to configure the unit to be controlled serially or via web server, this is indicated by a front panel LED. Now you can connect to the unit using either USB or Ethernet. Contact Sonifex for further information if you have a particular requirement that isn't catered for by the RB-DSD8 as standard.

The RB-DSD8 has been designed with dual redundant power supplies. This means that if either power supply fails, the other is ready to take over. In the extremely unlikely event that both fail, the unit has been designed with a passive signal path through the main input. This is essential for applications such as installation at transmitter sites, where a power failure to the unit should not prevent the audio input signal from being output to the transmitter.

Clocking & Synchronisation

All digital input signals are routed to a sample rate converter allowing mixed incoming sample rates to be used. The output sample rates are selectable via DIPSwitches from a predefined master clock of 32kHz, 44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz or 192kHz or the clock can be derived from a synchronisation input. When analogue inputs are selected, the analogue to digital converters are also clocked at that sample rate.

DIPSwitches can be used to choose the synchronisation mode and the synchronisation source from TTL wordclock or AES/EBU through the dual-purpose synchronising input as standard. A front panel indicator shows the status of the synchronization input. Selectable synchronisation modes are as follows:

Master Mode

In this mode the digital output sample rate is simply set by, and locked to, the internal on-board clock generator. No synchronisation signal is used or required.

Auto Lock Mode

In this mode the digital output sample rate will follow the synchronisation input. If the synchronisation signal is removed then the output sample rate will be set by, and locked to, the internal on-board clock generator at the closest frequency available to the previous synchronisation input.

Slave Mode

In this mode the digital output sample rate follows the synchronisation input. When the synchronisation signal is not present the digital output is turned off.

2. Front Panel Controls & Indicators

Fig 2-1: RB-DSD8 Status Buttons

Status Buttons

AUTO Button

This button is used to select automatic mode for all channels that are selected using the Link/Select buttons. This button deactivates MANUAL and SLAVE mode and illuminates green when selected. Press and hold the button for two seconds to activate this mode. This mode can only be selected from one of the other modes if the main signal is present and above the threshold level. The button and the associated mode LED will flash to indicate these conditions have been met. To restore to main from backup in automatic mode push and hold the button for two seconds. This selection is the default for all channels. When in AUTO mode, the switch back can also be automatically controlled. This is set using the ASB Command in the serial protocol or 'Automatic Switch Back' option on the webserver's general settings page.

MANUAL Button

This button is used to select manual mode for all channels that are currently selected. This button illuminates red when selected and deactivates the AUTO and SLAVE mode. Press and hold the button for two seconds to select this mode. The MAIN and BACKUP buttons can then be used to control which channel is selected.

SLAVE Button

This button is used to select the unit as slave controlled and is illuminated yellow. Pressing this button disables both the MANUAL button and the AUTO button. Press and hold this button for two seconds to select this mode. Please note that SLAVE selection is applied across the whole unit. All channels will revert to which ever mode is used to deactivate the SLAVE mode.

MAIN Button

This button selects the main input as the output for the currently selected channels. The button illuminates green if MAIN input is selected. This selection is the default for all channels. Press and hold the button for 2 seconds to select the MAIN source. Please note that pressing and holding this button at any time will select MANUAL mode.

BACKUP Button

This button selects the backup input as the output for the currently selected channels. Press and hold the button for 2 seconds to select the BACKUP source. The button illuminates red if BACKUP input is selected. Please note that pressing and holding this button at any time will select MANUAL mode.

DISPLAY LEDS

Fig 2-2: RB-DSD8 Controls & Indicators For Each Channel

Presence LEDs 1(L) 2(R)

Each stereo input channel has an associated Presence LED which indicates the level of that channel. Each LED has three states:

Green – This indicates that the level on that channel is above threshold
Yellow – This indicates that the level on that channel is below threshold
Red – This indicates that the channel is silent i.e. no audio at all

AES LEDs

Each channel pair has an AES LED associated. This LED indicates the status of the digital audio. Each LED has four states:

Green – AES detected and everything is fine. The input sample rate matches the output sample rate.
Yellow – AES detected and everything is fine. The input sample rate is different to the output sample rate.
Red – AES detected but an error has been detected.
Off – No digital signal is present or the analogue input is being used.

The following errors can create a red state:
CRC error
Parity error
Validity bit error
Biphase encoding error.

SEL LEDs

Each channel pair has a SELection LED associated with each stereo MAIN and BACKUP input. This LED indicates which input is currently being used for the output. The MAIN selection LED illuminates green when the associated output is from the MAIN input. The BACKUP selection LED illuminates red when the associated output is from the BACKUP input. Only one of these two LEDs can be on for any one channel at any given time.

MODE LEDs

Each stereo pair of MAIN and BACKUP inputs has a MODE LED which indicates which switching mode is currently being employed on that channel. The MODE LED has three states:

Green – The channel is in AUTO mode
Yellow – The channel is in SLAVE mode
Red – The channel is in MANUAL mode

LINK/SELECT Buttons & LINK LED

There are four LINK/SELECT buttons, one for each channel pair. To link any inputs simply press and hold the link buttons for 2 channels. All channels between the selected channels will be included in the link. Once linked, the yellow link LED between them will illuminate. For example, to link channels 1 & 2 ,3 & 4 and 5 & 6, press and hold the link buttons on channels 1 & 2 and 5 & 6 for 2 seconds. Whilst channels 1 & 2 and 3 & 4 are linked, there is an additional option to link 5 & 6 and 7 & 8 together individually. To do this press and hold LINK/SELECT 5 & 6 and 7 & 8 for 2 seconds. To release this mode, press and hold either LINK/SELECT 5 & 6 or LINK/SELECT 1 & 2. The left-most channel pair (usually channels 1 & 2) will dominate and all other pairs will inherit their settings, with the new settings being reflected by changes to the status indicators.

Additional Indicators

Fig 2-3: RB-DSD8 Additional Indicators

EXT SYNC LED

This LED displays the synchronisation mode that is currently selected. This LED has five states:

Green	–	Master mode is selected
Yellow	–	Slave mode is selected
Flashing yellow	–	Slave mode selected but synchronisation is lost
Red	–	Auto mode is selected
Flashing red	–	Auto mode selected but synchronisation is lost.

Remote Control Indicator

If remote control mode is selected (see DIPSwitch section for settings) this LED will be illuminated.

PSU (Power Supply) Indicators

Each PSU on the unit has its own indication LED. If both PSUs are working and correct both LEDs are illuminated green. If the internal ADC circuitry detects the level drop below a sufficient level on a particular supply, its representitive LED will illuminate red instead to indicate a fault.

Reset Button

In the unlikely event that the RB-DSD8 unit fails to respond, press the reset button to reboot the unit (see Fig 1-1 for location).

Reset to default settings using the reset button

Press reset and wait for all of the front panel LEDs to illuminate. When they turn off, a 5 second counter begins. Reset the unit within these five seconds to increment the reset tally. Repeat process again to reset to defaults. If the counter ever elapses, the reset tally will return to zero and the whole process will need to start again.

3. Rear Panel DIPSwitch Settings

Fig 3-1: RB-DSD8 Rear Panel DIPSwitches

Rear Panel DIPSwitches: Bank 1 SILENCE LEVEL AND DURATION

Silence Detect Interval Control (DIPSwitches 1-7, Bank 1)

DIPSwitch	1	2	3	4	5	6	7
Seconds	2	4	8	16	32	64	128

The silence detect interval DIPSwitches adjust the duration over which a silence is detected before alarming and ranges from 2-254 seconds by combining raised (ON) DIPSwitches in 2 second intervals with 0 being all DIPSwitches down. The default value is set at 30 seconds but can be changed using the serial port or ethernet. This time can also be overridden by a remote GPI/O input that sets the unit to an override time that is set to 2mins 5 seconds.

Silence Detect Trigger Level (DIPSwitches 8-11, Bank 1)

DIPSwitch	8	9	10	11
Level dBFS	-3	-6	-12	-24

The trigger level DIPSwitches adjust the level below which silence detection occurs. This level may be varied from -27dBFS to -84dBFS in 3db steps by raising different combinations (to ON). Please note the range changes depending on the full scale settings. These represent -15dBU to -60 dBU

Full Scale	Min	Max
12dBU	-27dBFS	-72dBFS
18dBU	-33dBFS	-78dBFS
24dBU	-39dBFS	-84dBFS

Stereo/Mono Switch (DIPSwitch 12, Bank 1)

The configuration of this defines whether you want to switch sources when left and/or right channel of the incoming source go silent. When channels are linked the stereo mode becomes multichannel mode and any single mono channel failure will cause the unit to switch sources; likewise mono mode will require both channels to fail individually before switching sources.

DIPSwitch 12	Description
On	When on, the unit operates in mono mode. In this mode the unit will only switch when both channels go quiet, and requires only one channel to be present before the unit switches back.
Off	When off, the unit operates in stereo mode, whereby if one channel goes quiet the unit will switch, and requires both channels to be present before it switches back.

Rear Panel DIPSwitches: Bank 2 DIGITAL AUDIO SETTINGS

Master Mode Frequency Selection (DIPSwitches 1-3, Bank 2)

These DIPSwitches allow you select what sample rate the output will be when the unit is in master mode.

Sample Rate (kHz)	DIPSwitch 1	DIPSwitch 2	DIPSwitch 3
32	Off	Off	Off
44.1	On	Off	Off
48	Off	On	Off
88.2	On	On	Off
96	Off	Off	On
176.4	On	Off	On
192	Off	On	On

External Synchronisation Source (DIPSwitch 4, Bank 2)

Select which synchronisation source you would like to use by setting this DIPSwitch:

DIPSwitch 4	Synchronise From
On	Wordclock/AESEBU synchronisation input
Off	Main Input Pair 1

Note: This DIPSwitch is redundant when running in synchronisation master mode.

Synchronisation Mode Selection (DIPSwitches 5-6, Bank 2)

These DIPSwitches allow you select which synchronisation mode the unit is in.

DIPSwitch 5	DIPSwitch 6	Synchronisation Mode
Off	Off	Master Mode
On	Off	Auto Mode
Off	On	Slave Mode
On	On	Reserved

Remote Start Mode Switch (DIPSwitch 7, Bank 2)

This defines whether the remote start switch is momentary or latched. Used for starting external equipment when silence is detected on channel 1. The channel can be reassigned through the serial port.

DIPSwitch	Description
On	When off, the remote start pin on the remote connector is pulled low when the unit switches over to the backup input and remains low until the unit switches back to the main source or, if in manual mode, is restored by the user locally or remotely. (Latched contact).
Off	When on, the remote start pin (pin 7) on the remote connector is pulled low for half a second when the unit switches to the Backup input. (Momentary contact). If the level detected on the backup channel is below the switch threshold, the remote start will continue to pulse every 10 seconds until a valid signal is detected.

Loss of Lock Failure (DIPSwitch 8, Bank 2)

This defines whether the unit treats a loss of synchronisation lock as an immediate switch event or as a simple loss of level.

Note: Switch this to 'Off' when using an analogue input.

DIPSwitch 8	Description
On	When on, the unit treats the loss of lock condition as an immediate switch event. The unit switches immediately to the Backup input.
Off	When off, the unit treats the loss of lock no differently to a loss of level.

Output Pair Configuration (DIPSwitches 9-12, Bank 2)

These DIPSwitches allow you select whether each output pair is analogue or digital. Set each DIPSwitch so that:

DIPSwitch 9 - 12	Description
On	When on, the pair outputs a balanced analogue signal.
Off	When off, the pair outputs an AES/EBU digital signal.

DIPSwitch 9 = Channel Pair 1 & 2
DIPSwitch 10 = Channel Pair 3 & 4
DIPSwitch 11 = Channel Pair 5 & 6
DIPSwitch 12 = Channel Pair 7 & 8

Rear Panel DIPSwitches: Bank 3 MISC SETTINGS

Ignore Silence Settings (DIPSwitches 1-8, Bank 3)

Each channel has a DIPSwitch to determine whether it Is ignored when AUTO silence switching.

DIPSwitch 1 - 8	Description
On	When on, the channel is ignored.
Off	When off, the channel is silence detected.

DIPSwitch 1 = Channel 1
DIPSwitch 2 = Channel 2
DIPSwitch 3 = Channel 3
DIPSwitch 4 = Channel 4
DIPSwitch 5 = Channel 5
DIPSwitch 6 = Channel 6
DIPSwitch 7 = Channel 7
DIPSwitch 8 = Channel 8

Remote Control Enable (DIPSwitch 9, Bank 3)

This DIPSwitch enables serial/ethernet settings which are determined by the Sonifex SCi software.

DIPSwitch 9	Description
On	When on, the unit uses the serial/ethernet settings.
Off	When off, the unit uses on board/front panel settings.

Full Scale Line Up (DIPSwitches 10-11, Bank 3)

These DIPSwitches allow you set up the full scale line up of the ADCs and DACs.

Note: These settings affect the silence level setting.

The settings are as follows:

DIPSwitch 10	DIPSwitch 11	Synchronisation Mode
Off	Off	0 dBFS = 24 dBu
On	Off	0 dBFS = 18 dBu
Off	On	0 dBFS = 12 dBu
On	On	Reserved

Boot Mode (DIPSwitch 12, Bank 3)

This DIPSwitch forces the unit into boot mode. The firmware can be updated from here in the unlikely event that the firmware becomes corrupted.

Note: Firmware uploads can only be done via the serial port in boot mode.

Switch	Description
On	When on, the unit powers up and boots into boot mode.
Off	When off, the unit powers up and boots normally.

4. RB-DSD8 Rear Panel Connections

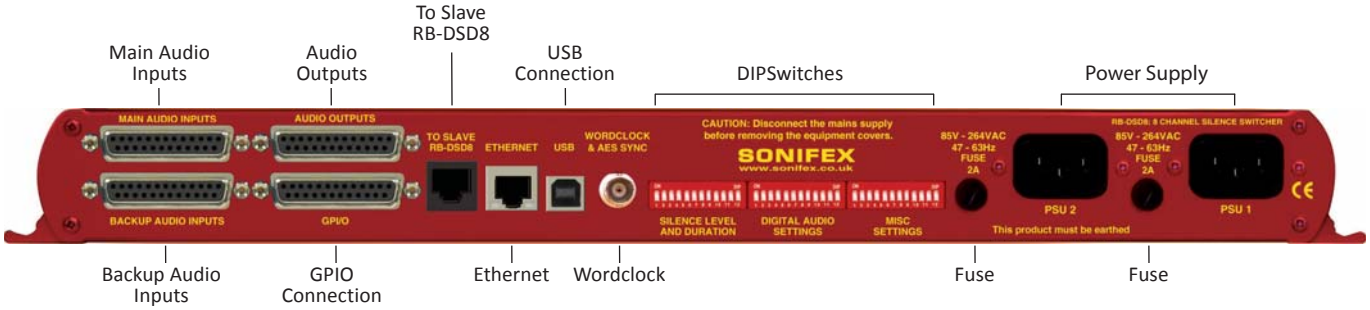

Fig 4-1: RB-DSD8 Rear Panel

Audio Connections

There are 4 x 25-pin female D-type connectors which provide the audio inputs/outputs and the general purpose inputs/outputs (GPI/O).

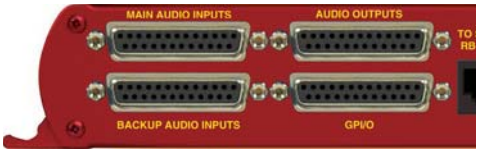

Fig 4-2: Audio & GPI/O Connector Detail

The leftmost two D-types provide for the simultaneous connection of up to four stereo, (eight mono) analogue or digital audio inputs for both Main and Backup sources. The rightmost two D-types provide eight stereo analogue or digital outputs and the Remote GPI/Os, 9 inputs and 14 outputs. The pin assignations are as follows:

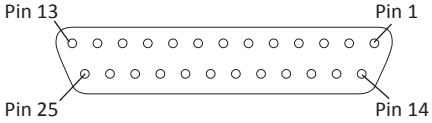

Fig 4-3: Audio Connector Pin Numbers

Connector Pin Number	Audio Inputs	Audio Outputs
1	Analogue Input 1 L+ or Digital Input 1+	Analogue Output 1 L+ or Digital Output 1+
14	Analogue Input 1 L- or Digital Input 1-	Analogue Output 1 L- or Digital Output 1-
2	Analogue Input 1 Ground or Digital Input 1 Ground	Analogue Output 1 Ground or Digital Output 1 Ground
15	Analogue Input 1 R+	Analogue Output 1 R+
3	Analogue Input 1 R-	Analogue Output 1 R-
16	Analogue Input 1 L Ground	Analogue Output 1 L Ground
4	Analogue Input 2 L+ or Digital Input 2+	Analogue Output 2 L+ or Digital Output 2+
17	Analogue Input 2 L- or Digital Input 2-	Analogue Output 2 L- or Digital Output 2-
5	Analogue Input 2 R Ground or Digital Input 2 Ground	Analogue Output 2 R Ground or Digital Output 2 Ground
18	Analogue Input 2 R+	Analogue Output 2 R+
6	Analogue Input 2 R-	Analogue Output 2 R-
19	Analogue Input 2 R Ground	Analogue Output 2 R Ground
7	Analogue Input 3 L+ or Digital Input 3+	Analogue Output 3 L+ or Digital Output 3+
20	Analogue Input 3 L- or Digital Input 3-	Analogue Output 3 L- or Digital Output 3-
8	Analogue Input 3 L Ground or Digital Input 3 Ground	Analogue Output 3 L Ground or Digital Output 3 Ground
21	Analogue Input 3 R+	Analogue Output 3 R+
9	Analogue Input 3 R-	Analogue Output 3 R-
Connector Pin Number	**Audio Inputs**	**Audio Outputs**
22	Analogue Input 3 R Ground	Analogue Output 3 R Ground
10	Analogue Input 4 L+ or Digital Input 4+	Analogue Output 4 L+ or Digital Output 4+
23	Analogue Input 4 L- or Digital Input 4-	Analogue Output 4 L- or Digital Output 4-
11	Analogue Input 4 L Ground or Digital Input 4 Ground	Analogue Output 4 L Ground or Digital Output 4 Ground
24	Analogue Input 4 R+	Analogue Output 4 R+
12	Analogue Input 4 R-	Analogue Output 4 R-
25	Analogue Input 4 R Ground	Analogue Output 4 R Ground
13	N/C	N/C

Unbalanced signals may also be used by linking the out-of-phase (-) signal pin to Ground and applying the unbalanced signal to the in-phase (+) signal pin. Please remember to terminate all unused inputs. Leaving them unterminated can cause the Presence LEDs to show erroneous states.

GPI/O Remotes Connector

Displayed below are the pin connections and 1. Introduction

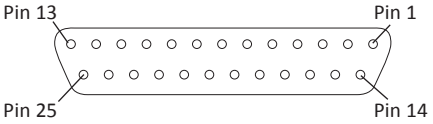

Fig 4-4: GPI/O Remotes Connector Pin Numbers

Pin Number	Signal	I/O	Description
1	Channel 1 & 2 MAIN OK	O	Internal Open Collector to Digital Ground
14	Channel 3 & 4 MAIN OK	O	Internal Open Collector to Digital Ground
2	Channel 5 & 6 MAIN OK	O	Internal Open Collector to Digital Ground
15	Channel 7 & 8 MAIN OK	O	Internal Open Collector to Digital Ground
3	Channel 1 & 2 BACKUP OK	O	Internal Open Collector to Digital Ground
16	Channel 3 & 4 BACKUP OK	O	Internal Open Collector to Digital Ground
4	Channel 5 & 6 BACKUP OK	O	Internal Open Collector to Digital Ground
17	Channel 7 & 8 BACKUP OK	O	Internal Open Collector to Digital Ground
5	Channel 1 & 2 BACKUP SELECTED	O	Internal Open Collector to Digital Ground
18	Channel 3 & 4 BACKUP SELECTED	O	Internal Open Collector to Digital Ground
6	Channel 5 & 6 BACKUP SELECTED	O	Internal Open Collector to Digital Ground
19	Channel 7 & 8 BACKUP SELECTED	O	Internal Open Collector to Digital Ground
7	Remote Start/Audio Fail	O	Internal Open Collector to Digital Ground
20	PSU failure	O	Internal Open Collector to Digital Ground
8	Override Time	I	Diode Protected Input to Microprocessor
21	Select BACKUP channel 1 & 2	I	Diode Protected Input to Microprocessor
9	Select BACKUP channel 3 & 4	I	Diode Protected Input to Microprocessor
22	Select BACKUP channel 5 & 6	I	Diode Protected Input to Microprocessor
10	Select BACKUP channel 7 & 8	I	Diode Protected Input to Microprocessor
23	Select MAIN Channel 1 & 2	I	Diode Protected Input to Microprocessor
11	Select MAIN Channel 3 & 4	I	Diode Protected Input to Microprocessor
24	Select MAIN Channel 5 & 6	I	Diode Protected Input to Microprocessor
12	Select MAIN Channel 7 & 8	I	Diode Protected Input to Microprocessor
25	Digital Ground	DGND	-
13	+5V	PWR	To power up to a maximum 200mA

Alarm Output Pins

Main And Backup Status & Selection Indicators

Pins 1 – 7 & 14 - 20. Each pin sinks current to DGND in the alarm state.

Remote Start/Audio Fail Pin

Pin 7 is used to remotely start an external piece of equipment and it operates on audio fail. It can also be set to be momentary or latched using DIPswitch 7 on the second bank of DIPswitches. If set to be momentary in operation and no valid audio is detected, the pin will continue to pulse at 10 second intervals.

Control Inputs

MAIN/AUTO & BACKUP/MANUAL Selection Inputs

Pins 8 – 12 & 21 - 24 are used to trigger a state by applying a 0V to the pin. The pins are diode protected around 3.3V.

If the BACKUP selection pins (9, 10, 21 & 22) are held low for 2 seconds, the BACKUP input for the pair represented by the pin is selected and the pair will be in MANUAL mode. A momentary stimulation will simply select the

specific channel pair (equivalent of pushing a LINK/SELECT button on the front panel).

The MAIN selection pins (11, 12, 23 & 24) will behave like the BACKUP pins, unless the unit is in MANUAL mode. In MANUAL mode, the MAIN input will be selected by momentary press.

To return the selected pair to AUTO mode, ensure there is a valid signal on the MAIN input (indicated by a flashing status LED) and then hold both the MAIN and BACKUP for that particular input low for two seconds.

Override Time Pin

Pin 8 is to remotely select an override silence time (default is 2min 5sec). This may be useful for the broadcast of Remembrance Day services, or where you expect a silence of up to 2 minutes to be broadcast. The override silence time is set whilst the contact is active, therefore a latching button is recommended. The override time can be changed via the Sonifex SCi software. Pin 13 is a voltage supply pin. 5V is supplied up to a maximum current of 200mA. Pin 25 is a ground reference level.

Slave Socket

An 8 way RJ45 connector allows connection to another RB-DSD8 unit, via RS485.
Pin 4: TX/RX -
Pin 5: TX/RX +
Pin 8: DGND
All other pins are unused.

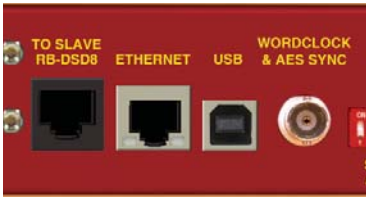

Fig 4-5: Communications Connectors

USB Remote Control

A Type B USB socket carries a standard Universal Serial Bus interface via which advanced configuration options may be set and many functions may be remotely controlled.

The RB-DSD8 will interface directly with personal computer USB ports using a standard USB cable. On first connection, you will be prompted to install the necessary USB driver (supplied), following which the USB connection behaves as a “virtual serial port” with identical data format and command protocol as the RS232 remote control interface.

Ethernet

The 8-way RJ45 socket connector carries a standard Ethernet interface and allows connection to a local area network. The pin assignments are as follows:

Pin 1: Receive data+
Pin 2: Transmit data+
Pin 3: Transmit data+
Pin 6: Receive data-
Pin 5: Ground
All other pins are unused. Please note that the unit uses a 10Mbit connection.

Wordclock & AES Synchronisation Input

This BNC is used as a digital input and has an impedance of 75Ω. The input is autosensing and can be used to provide an external synchronisation signal from an AES3 source or from a TTL wordclock.

Dual IEC Main Inputs

The RB-DSD8 has 2 mains inputs for power supply redundancy, which provides protection against a single point of failure on the internal power supply units, and, if distinct sources are used for the mains inputs, it will also protect against a mains input failure. The inputs are rated at 2A and will accept a voltage range of 85V to 264VAC.

5. Remote Control

Slave Control

The RB-DSD8 can be connected to another unit and controlled. This is useful if you want two units to behave in an identical fashion, simultaneously, as both are controlled from one interface. To achieve this, connect two units together with a standard Ethernet cable via the designated slave RJ45 sockets. Once connected, select Slave Mode on the designated slave unit. Please note that only the switching methods are controlled.

Remote configuration

The unit can be remotely configured using via serial interface or via ethernet. To use the serial interface, connect the unit to a pc via the USB port and use a standard USB cable. This is “plug and play” and the drivers should self-install, although the drivers are included on the installation CD. The unit can also connect via the Ethernet port using a standard RJ45 Ethernet cable. Both methods connect to the Sonifex Serial Control Interface (SCI) software.

Default Settings for the Serial Port	
Baud Rate:	115200
Data Bits:	8
Stop Bits:	1
Parity:	Even
Handshaking:	None

Serial Interface Commands & Responses

Most of the commands follow the same structure: a 3 letter command followed by a colon, followed by a parameter (if any) and terminated by Carriage Return with Line Feed. A Line Feed character may be sent but it will be ignored by the RB-DSD8. Commands are not case sensitive. Responses are CR & LF terminated.

Following are the commands and the expected responses:

Command	Description	Response
ASB:n	Automatic Switch Back where n selects between two options: 0 – Manual switch back 1 – Automatic switch back	-ACK:
CHS:	Channel Status Request a is the channel set number, either 1,2,3 or 4 bb represents the presence settings, where bb is a hex value built from sum of: 0x01 – Main Left Channel Green LED on 0x02 – Main Left Channel Red LED on 0x04 – Main Right Channel Green LED on 0x08 – Main Right Channel Red LED on 0x10– Backup Left Channel Green LED on 0x20– Backup Left Channel Red LED on 0x40– Backup Left Channel Green LED on 0x80– Backup Left Channel Red LED on c is the AES setting for the current channel set where c is a hex value built from: 0x01 – Main channel AES present and not being sample rate converted 0x02 – Main channel AES present but with errors 0x03 – Main channel AES present and being sample rate convereted 0x10 – Backup channel AES present and not being sample rate converted 0x20 – Backup channel AES present but with errors 0x30 – Backup channel AES present and being sample rate convereted d is the selection setting for the current channel set where d is: 0x01– Main is selected 0x02 – Backup is selected e is the mode setting for the current channel set where e is: 0x01– Automatic switching 0x02 – Manual switching 0x03 – Slave mode	-CHS:a,bb_c_d_e_f_g;

Command	Description	Response
	f represents the disable detection DIPswitches where f is a hex value built from: 0x01 – Main left channel detection disabled 0x02 – Main right channel detection disabled g represents the output format where: 0x00 – Digital output 0x01 – Analogue output	
CSB:nnn	Channel Status bit depth nnn is the sum total of the settings for each channel. For channel 1, bit depth = 0 (24 bit), 1(20 bit) or 2(16 bit) For channel 2, bit depth = 0(24 bit), 4(20 bit) or 8(16 bit) For channel 3, bit depth = 0(24bit), 16(20 bit) or 32(16 bit) For channel 4, bit depth = 0(24 bit), 64(20 bit) or 128 (16 bit) Example to set all channels to 20 bit = 1+4+16+64 = 85 so send CSB:085	-ACK:
CSC:nnn	Channel Status channel description nnn is the sum total of the settings for each channel. For channel 1, description = 0 (2 channel), 1(single channel) or 2(Stereophonic) For channel 2, description = 0(2 channel), 4(single channel) or 8(Stereophonic) For channel 3, description = 0(2 channel), 16(single channel) or 32(Stereophonic) For channel 4, description = 0(2 channel), 64(single channel) or 128(Stereophonic) Example to set all channels to single channel = 1+4+16+64 = 85 so send CSC:085	-ACK:
DEF:	Return the unit to default configuration	-ACK:
DFT:	nnn Default Delay length in seconds where nnn is the number of seconds between 2 and 252	-ACK:

Command	Description	Response
DIS:nn	Disable silence detection nn is a hex value built from the sum of: 0x01 – Channel 1 detection disabled 0x02 – Channel 2 detection disabled 0x04 – Channel 3 detection disabled 0x08 – Channel 4 detection disabled 0x10 – Channel 5 detection disabled 0x20 – Channel 6 detection disabled 0x40 – Channel 7 detection disabled 0x80 – Channel 8 detection disabled	-ACK:
DFT: nnn	Default delay length in seconds nnn is the number of seconds between 2 and 252	-ACK:
DTL:nn	Silence detect level nn sets the level of silence between -39 and -84	-ACK:
DTT:nnn	Delay length in seconds nnn is the number of seconds between 2 and 252	-ACK:
DWN:	Initiates a firmware upgrade	-ACK:
FSC:n	Full scale settings where: n is the the selected setting from: 0 – 24 dBFS 1 – 18 dBFS 2 – 12 dBFS	-ACK:
ISL:n	Input selection (manual switch) n represents which mode has been selected 0 – Main channel selected 1 – Backup channel selected	-ACK:
LKS:n	Link/Selection n selects which link channel set is being effected, where: 1 – 1 & 2 2 – 3 & 4 4 – 5 & 6 8 – 7 & 8	-ACK:

Command	Description	Response
LLK:n	Fail immediately or delay on loss of lock where n selects between the two modes 0 - Use standard delay on loss of lock 1 - Fail immediately	-ACK:
LNK:n	Link channels together n selects which channel are linked, where: 0 – None are linked 1 – 1, 2, 3 & 4 are linked 2 – 1, 2, 3, 4, 5 & 6 are linked 3 – all are linked 4 – 1, 2, 3 & 4 are linked and 5, 6, 7 & 8 are linked separately	-ACK:
MAC:	MAC Address Returns the MAC address of the unit in 12 hex characters.	-MAC:XXXXXXXXXXXX
NET:x.x.x.x,y.y.y.y,z.z.z.z	Network Address Settings x.x.x.x is a valid IP address y.y.y.y is a valid subnet mask z.z.z.z is a valid gateway address	-ACK:
NOP:o,v	Network Options o is the option number 0 = Addressing Method v is the option value 0 = Static 1 = Auto IP 2 =DHCP 3 = Both DHCP and Auto IP	-ACK:
OPF:n	Output Format n represents whether the output is digital or analogue where: for channel 1+2 – OX01 for channel 3+4 – OX02 for channel 5+6 – OX04 for channel 7+8 – OX08 i.e. for analogue on outputs 1,2,3 & 4, n is OX03	-ACK:

Command	Description	Response
ORT:nnn	Override Delay length in seconds where nnn is the number of seconds between 2 and 252	-ACK:
STE:n	Mono or multiple selection where n selects between the two options where: 0 – Mono mode 1 – Multiple channel mode	-ACK:
RES:n	Remote start latched or pulsed n selects between the two options where: 0 – Pulsed 1 – Latched	-ACK:
RET:nnn	Return delay length in seconds nnn is the number of seconds between 2 and 252	-ACK:
RSC:n	Remote start channel n selects which channel pair controls the remote start pulse where: 0 – 1 & 2 1 – 3 & 4 2 – 5 & 6 3 – 7 & 8	-ACK:
SAR:nn	Output sample rate selection nn selects which sample rate is selected for the output where: 00 = 32k 01 = 44.1k 02 = 48k 03 = 88.2k 04 = 96k 05 = 176.4k 06 = 192k	-ACK:
SMD:n	Switching mode n is the selected switching mode where: 0 – Automatically 1 – Manually 2 – Slave Mode	-ACK
SRQ:	Status Request	

Command	Description	Response
SYF:n	Synchronisation source select n selects which synchronisation source is used where: 0 - Input 1 1 – AES/Wordclock	-ACK:
SYM:n	Synchronisation mode select n selects which synchronisation mode is used where: 0 - Master 1 – Auto 2 - Slave	-ACK:
UID:	Unit id	-UID:RB-DSD8
VER:	Version number Where x.xxx is the firmware version	-VER:x.xxx

Error Messages

The following error messages can be returned for illegal commands

Err:01 = Return if command is ignored
Err:02 = Return if command is unknown
Err:03 = Return if wrong number of parameters
Err:04 = Return if parameter invalid

6. SCi for RB-DSD8

The free of charge Sonifex SCi software allows you to control the RB-DSD8 remotely. The interface has two tabs including a status page and a miscellaneous options page. The status of the connection, serial number & firmware versions are always visible at the bottom of the screen.

Please note: In order to edit the options on the Status and Miscellaneous pages, the RB-DSD8 must have the back panel Remote Control Enable DIPSwitch set to ON (DIPSwitch 9, Bank 3, see page 9).

Status Page

Fig 6-1: Status Page.

Channel Panels - Click on the panel to select this channel pair. The drop down boxes will display the settings for the selected channel pair.

Each Channel Panel contains:

Presence LEDs – Indicate the current audio levels on the respective inputs.

Link LEDs – Indicate a link between the two adjacent channel sets.

AES LEDs – Indicate whether a digital signal is present and whether any sample rate conversion is occuring.

SEL LEDs - Indicate which input is currently being output for each channel set.

MODE LEDs – Indicate which switching mode is currently set for each channel group.

Detection Disable - Tick the box to disable silence detection for the specific channel.

Output Format – Select an analogue or digital output

Additional Controls:

Switch Mode – Select the switch mode for the selected channel pairs from Manual or Automatic.

Input Selector – Select whether Main or Backup is output for the selected channel pairs.

Link – Link the channel groups together so that they switch together.

Detection Time - The amount of time in seconds that silence is detected before a switch over.

Return Time - The amount of time in seconds that the audio must return at a good level before it switches back.

Default Time – The amount of delay time used, in seconds, if all the delay DIPswitches are placed in the OFF position.

Override Time – The amount of delay time used, in seconds, if the override pin is held in a latched position on the remote port.

Remote Start/Audio Fail – Select the channel pair which will trigger the remote start/audio fail pin on the remote connector.

Detection Level – The level which is considered silence in dBFS.

Sample Rate – Output sample rate when synchronisation mode is set to master.

Synchronisation Mode – Select to synchronise from the internal clock or from an external input.

Synchronisation From – Select which external input is used to synchronise to.

Full Scale – Select the full scale digit settings.

EXT SYNC LED - Indicates which synchronisation mode is selected.

Remote LED – Indicates whether the unit is being controlled remotely.

Power LEDs – These indicate the state of the power supplies. There is one LED for each power supply.

Note: All the above indicators and controls are replicas of the front panel indicators. Please read the relevant sections in the manual to ascertain the meaning of the all the different colours and settings.

Channel Status Page

This page is used to set up the channel status for all output pairs. The bit depth and channel description can be set. Please note that the bit depth setting is not applicable on when using analogue inputs, as the ADC converts automatically to 24 bits which can not be altered.

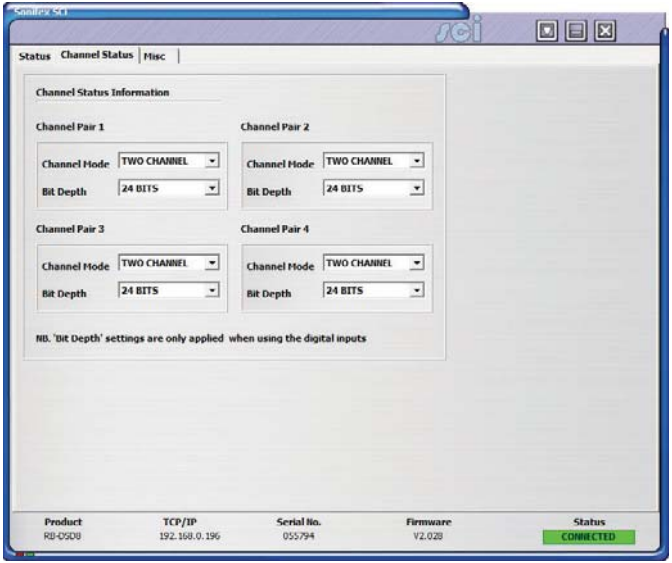

Fig 6-2: Channel Status Page

Miscellaneous Page

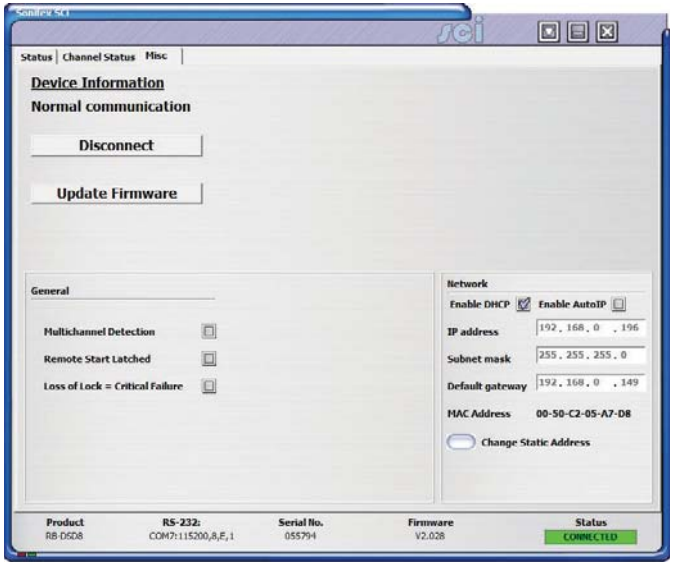

Fig 6-3: Miscellaneous Page

This page is used for the connecting and disconnecting SCi to the unit, updating the
firmware in the units, displaying the current status of the unit and controlling various
settings.

Multiple Channel Detection - If selected, all channels that are linked have to go silent before the channels swap.

Remote Start - If selected the unit latches the remote start signal on the GPI/O pin, otherwise it is pulsed.

Loss of Lock Failure - if selected the unit treats a loss of lock condition as an immediate failure rather than waiting for the detection time.

Network - This displays the current settings and status of the network connection on the unit.

Enable Auto IP - This sets the IP Address of the unit to fixed a value (169.254.1.0). If enabled please make sure the connecting PC also has this feature enabled if a successful connection is to be made. DHCP takes priority over Auto IP.

Enable DHCP - This enables the unit to receive it's IP address, subnet mask and gateway settings from a DHCP server. If one is not available then this should be disabled through the serial port and a valid static address entered. If the unit fails to connect via DHCP, it will connect via auto IP if enabled, or a static address if not. Please note that the DHCP connection attempts will abort after 45 seconds if unsuccessful. While connecting, the IP address, subnet mask and default gateway will all read 0. 0. 0. 0. if read serially.

IP Address - Displays the current IP address of the unit. If DHCP is enabled then this will normally be the IP address supplied by the DHCP server.

Subnet Mask - Displays the current subnet mask for the unit.

Default Gateway - Displays the current default gateway for the unit.

MAC Address - The unit's MAC address. This cannot be changed.

Change Static Address - This allows you to alter the static address stored in the unit. This is the address that is used when DHCP is disabled or a DHCP server is not found. Selecting this button allows manual entry of IP, subnet and gateway addresses in the edit boxes.

Note: The units are discovered using broadcast packets. If your PC has two network cards, then there is a limitation in windows that requires the two addresses to be on different subnet addresses.

7. Webserver

The webserver on the RB-DSD8 provides a method for the user to inspect or modify its settings. The Ethernet port should be connected to a network and then the unit will be accessible to all computers on that network - including smartphones/tablets if the network is WiFi compatible.

Fig 7-1: General Settings Page

Connecting to the device

To connect to the device you will need to know either the unit's IP address or its Bonjour Name. To connect to the device by IP address (eg 192.168.0.100) communicate via a browser by entering http://192.168.0.100 in the address bar of the browser.

To connect via Bonjour Name in a Bonjour enabled device enter the name in the browser address bar. The default name is the device ID 'RB-DSD8' ,a hyphen character '-' , followed by the serial number without leading zeroes '23456' and then followed by '.local/' to indicate the local domain – so RB-DSD8-23456/.local/

First time usage

When you first get the unit it is set to use AutoIP and DHCP. If you have a DHCP on your server simply connect the device to your network and either run the discovery application or ask your network administrator for the assigned IP address or if you have a bonjour enabled device enter the default name in the browser address bar as above. If DHCP is used you should be aware that disconnecting and reconnecting may NOT result in the same IP address being assigned on each connection.

If your system network is unsuitable or doesn't have a DHCP server then the unit will use AutoIP which will poll addresses in the reserved range of 169.254.x.x until it finds an unused address. Unless your network uses this mechanism for IP address assignment, this will most likely be used when connecting a PC with a network cable directly between the unit and the PC. Ensure that the PC has dynamic addressing enabled in its network options and the AutoIP system will ensure that each device has a unique ID in the 169.254.x.x range. Now using the discovery app, find the IP address or if the PC is bonjour enabled type in the device name to the browser as above.

Finally if you are still having issues connecting – set dipswitch 6 to on (up) and power cycle the unit. This will force the device to use a static IP address of 192.168.0.100

Once connection is established in a browser go to the Network tab and set the device to the settings appropriate for your network.

Bonjour

Bonjour is an application created by Apple and is integral to Apple operating systems and the iTunes app. Bonjour for Windows is available as a plug-in for internet explorer - go to our website or other download stores and download the appropriate version for your operating system.

Sonifex Service Discovery App

This is a free download for Windows from our website (SfxSrvDisc.Exe) that looks for classes of devices on the network and allows you to connect via a browser to them where appropriate. If bonjour is installed select the Bonjour tab and then the Sonifex Web Server Service to show all devices. Select the device you wish to connect to, by type and serial number, and then launch to connect via a browser. If Bonjour is unavailable got to the Legacy Discovery tab, press the Refresh button, and if the device has a webserver you can select and launch the device.

Webserver Password

Password set up and logging in

When the webpage is first loaded, the password should be blank which means full access to the webpage is granted. To enter or change a password go to the password settings page and enter a 5 digit, case sensitive, alphanumeric password. Once submitted the password will be active and any subsequent webpage sessions will require password entry to log in. Status and device information is still available without password entry.

Logging out of the webpage

A log out button will become available in the webpage menu bar, once the user is logged in. A timeout period, which logs users out automatically, can also be set on this page. A value of between 1 and 30 minutes can be set. Entering zero will disable this function.

Clearing the password

To clear the password, delete all characters in the password settings box and submit. A reset to defaults through any method, be it serial, webpage or through unit reset button sequence will also clear the password.

8.Updating The Firmware

The RB-DSD8 firmware will at times be updated to add new features, or to correct any possible issues that may arise.

Check for updates at: http://www.sonifex.co.uk/technical/software/

Firmware updates can be conducted through either Serial/Ethernet port, via SCi or the webpage. To update the firmware via SCi, click on the button labelled “Update Firmware” and then select the downloaded firmware file. Firmware files for the RB-DSD8 always have a “.ldr” or “.dwn” extension. A progress bar will appear in SCi, indicating how much of the file has been uploaded to the unit. When the unit switches to update mode, the front panel display LEDs will all be extinguished. The switch mode buttons are then used to display the status of the upload:

Uploading the Code: The SLAVE button will begin to flash amber to confirm the unit is receiving the new firmware to RAM.

Copying Code To Flash Memory: The SLAVE button will be solid amber while the unit checks the integrity of the file and copies the file from RAM to flash memory.

Successful Update: The AUTO button will be solid green for two seconds and the unit will automatically reset and begin running the new code.

Unsuccessful Update: The MANUAL button will be solid red for two seconds and the unit will return to running the last code used.

To update via the webpage, browse and select an update file then click ‘submit’.

Uploading the Code and Copying Code To Flash Memory: The SLAVE button will be solid amber while the unit checks the integrity of the file and copies the file from RAM to flash memory.

Successful Update: The AUTO button will be solid green for two seconds and the unit will automatically reset and begin running the new code.

Unsuccessful Update: The MANUAL button will be solid red for two seconds and then the unit will be automatically reset, running the old code on boot up.

9. Technical Specification For RB-DSD8

Audio Specification - Digital In To Digital Out	
Input & Output Impedances:	110Ω ± 20% AES/EBU balanced I/O 50Ω BNC TTL word clock input
Dynamic Range:	>138dB ref. 0dBFS, 22kHz BW, unity gain
THD+N:	<-137dBFS, 0dBFS, 20-20kHz, unity gain, 20kHz BW
Signal Level:	Balanced: 3V/10V peak to peak min/max
Sample Rates:	32, 44.1, 48, 88.2, 96,176.4 or 192kHz
Bit Depth:	Up to and including 24 bit

Audio Specification - Analogue In To Analogue Out			
Full Scale Setting: (Software Selectable)	0dBFS = +12dBu	0dBFS = +18dBu	0dBFS = +24dBu
Maximum Input Level	+12dBu	+18dBu	+24dbu
Noise (A-weighted, Unity gain, RS=200Ω)	<-93dBu	<-88dBu	<-82dBu
Input Impedance:	>20kΩ bridging balanced		
Dynamic Range:	>105dB ref. +24dBu, 22kHz BW, unity gain		
THD+N:	<0.005%, +8dBu, 20-20kHz, unity gain, 20kHz BW		
Common Mode Rejection:	>60dB @ 1kHz		

Front Panel Operational Controls	
Switch Mode Select:	Via AUTO, MANUAL or SLAVE push-buttons
Manual Source Select:	Via MAIN and BACKUP push-buttons
Group Selection :	Via LINK/SELECT push-buttons

Front Panel Indicators	
Presence LEDs:	For all input channels
Link LEDs:	Show which channels are controlled concurrently
Mode LEDs:	Indicate the current mode selected for each group
Selection LEDs:	Indicate whether MAIN or BACKUP is selected
AES LEDs:	Show the state of the digital input to each group
PSU LEDs:	Show the state of each power supply
Remote Control LED:	Show if remote control is selected
External Synchronisation LED:	Show the state of any synchronisation inputs used.

Rear Panel - Operational Controls	
Silence Threshold:	-27dBfs to -84dBfs in 3dBfs steps, via rear panel DIPSwitches
Silence Duration:	0 - 254 seconds in 2 second intervals duration, via rear panel DIPSwitches
Stereo/Mono Switching:	Stereo or mono, via rear panel DIPSwitch
Master Output Sample :	32, 44.1, 48, 88.2, 96,176.4 or 192kHz, via rear panel
Rate Select:	DIPSwitches
Ignore Silence:	Each channel can be set to ignore silences, via rear panel DIPswitches
Remote Control Enable:	Enabled or disabled, via rear panel DIPswitch
Synchronisation Mode & Source Select:	Synchronisation in master mode or synchronisation from MAIN input1, AES or wordclock synchronisation input in auto or slave mode, via rear panel DIPswitches

9 Technical Specification

Remote Start:	Latched or momentary, via DIPswitch
Input Lock Loss:	Switch immediately or treat as silence delay, via rear panel DIPswitch
Digital or Analogue Output:	Digital or analogue, via rear panel DIPswitches
Full Scale Line Up:	24, 18 or 12 dBu = 0dBFS, via rear panel DIPswitches
Boot Mode:	Boot in boot or normal via rear panel DIPswitch

Connections

Digital/Analogue Inputs:	2 x 8 stereo channel inputs on 2 x 25 pin D-type male
Digital/Analogue Outputs:	1 x 8 stereo channel outputs on 1 x 25 pin D-type female
Synchronisation Inputs:	1 x BNC (Wordclock or AES/EBU)
Remote I/O Port:	25 way D-type female
SCi port:	USB or ethernet
Mains Input:	2 x Universal filtered IEC, continuously rated 85-264VAC @47- 63Hz, max 60W
Fuse Rating:	2 X Anti-surge fuse 2A 20 x 5mm

Equipment Type

RB-DSD8:	8 channel silence switcher

Physical Specifications

Dimensions (Raw):	48cm (W) x 22cm (D *) x 4.2cm (H) 1U 19” (W) x 8.7” (D *) x 1.7” (H) 1U
Dimensions (Boxed):	55cm (W) x 28cm (D) x 17cm (H) 21.7” (W) x 11” (D) x 6.7” (H)
Weight:	Nett: 2.3kg Gross: 3.2kg Nett: 5.1lb Gross: 7.0lb

* Note that this product is deeper than standard Redboxes

Accessories

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

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