HANDBOOK

Redbox RB-SD1IP

Silence Detection Unit With Ethernet & USB

Manufacturers of audio & video products for radio & TV broadcasters

SONIFEX

This handbook is for use with the following product:
Redbox RB-SD1IP Silence Detection Unit With Ethernet & USB
Stock Code: 30-279

Revision 1.06, December 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

SONIFEX *Sonifex Limited • 61 Station Road • Irthlingborough • Northamptonshire • NN9 5QE • United Kingdom*
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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 December 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.

RB-SD1IP Silence Detection Unit

Introduction

Fig 1-1: RB-SD1IP Front Panel

The RB-SD1IP Silence detection unit is an upgraded version of the existing Sonifex RB-SD1. The unit is a 1U rack mount device used to monitor an unattended stereo studio feed and in the event of the signal going “quiet” after a given period the unit will switch through an alternative stereo audio signal. This signal could be a recorded message (e.g. “Normal service will be resumed”, etc), a feed from a CD or minidisc player, or an alternative recorded program. Controls are provided to start external equipment and to provide remote status indication.

The RB-SD1IP has several new features in addition to the functionality of the standard RB-SD1.

Ethernet connectivity provides the ability to set up and control the unit via a browser based Graphical User Interface (GUI). The network capabilities allow the user to more finely control silence Levels (-60dBu to 0dBu in 3dBu steps) and Time delays (1 second to 24 hours), you can also remotely lock/unlock the front panel controls on the unit and choose to use either the hardware configured settings or web based settings. In addition to the front panel LEDs the GUI home page also offers a real time view of signal levels and alarm statuses.

Also using the GUI, left and right channels can be treated independently, remote relay triggers can be configured as one of many events including the new GPI pins. You can also choose to lock/unlock the use of the remote pins to control the unit. Firmware updates can also be performed using the web GUI.

SNMP V1 is implemented so that the unit can be monitored by existing Network Management Systems (NMS). The addition of 6 extra GPI pins to the rear panel, allows customisable functionality, including the use of the RB-SD1IP network interface to generate SNMP Traps on behalf of other, non-networked, hardware.

The RB-SD1IP has been fitted with a USB interface on the front panel and can act as a host in two ways. Firstly the USB port can be used to upgrade the firmware on the unit from a USB flash drive. Such a drive can also hold a pre-recorded message which the unit can play out in the event that both main and auxiliary signals both fall silent.

As on the standard RB-SD1, the RB-SD1IP has 2 balanced stereo audio inputs with a maximum input level of +28dBu. Each input is user-defined as either the main source or auxiliary source and all channels are monitored for failure. In the event of the main source dropping below a pre-set level for a pre-determined amount of time, the unit will automatically attempt to switch through to a valid auxiliary signal. The silence detect level is adjustable between -60dBu and -15dBu in 3dB steps via a 16 position rotary switch on the rear panel. The silence interval can be adjusted between 2 seconds to 30 seconds in 2 second steps, or, alternatively, set to 2 minutes 5 seconds also via a 16 position rotary switch on the rear panel. More fine control of the detection levels and times can be set using the web browser based GUI. The audio inputs and outputs use stereo professional balanced XLR-3 connectors.

1 Introduction

The unit has 2 operational modes for restoring a signal - automatic or manual. In both modes the unit will automatically switch over to a valid auxiliary source upon detecting silence. When a valid main signal returns it will either restore to the main channel automatically or manually depending on the mode selected.

The RB-SD1IP has a number of remote operational features. Rear panel remote outputs provide separate relay contact closures for failure of the main and auxiliary inputs. You can also remotely control all of the front panel switches for source selection, mode selection and signal Restore. You can remotely start and stop another piece of equipment on alarm failure and main signal return respectively. A silence time of 2 minutes and 5 seconds can be set remotely, which is useful if you are expecting to broadcast a long silence.

The unit has three signal type operational modes – Stereo, Mono and Independent. In stereo mode, the unit will alarm if either the left or right channel falls silent. In mono mode the unit will only alarm if both left and right channels fall silent. In independent mode the unit can be configured to operate as a 2 channel mono silence detector, alarming and switching the two input channels independently. There are also options to set the remote start output as momentary or latched, to disable switching to the auxiliary input on alarming and to increase the gain on the auxiliary inputs so that unbalanced sources can be used, for example, from a domestic flash memory/USB player.

Front panel LED indicators show individually left and right programme status and alarm conditions for both the main and auxiliary inputs. The status of the source, mode and alarm state are also shown on the front panel with LED indicators.

The RB-SD1IP has been designed to have a passive signal path through the main input, so if power to the unit fails, the signal input will still be routed through to the output. 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.

System Block Diagram

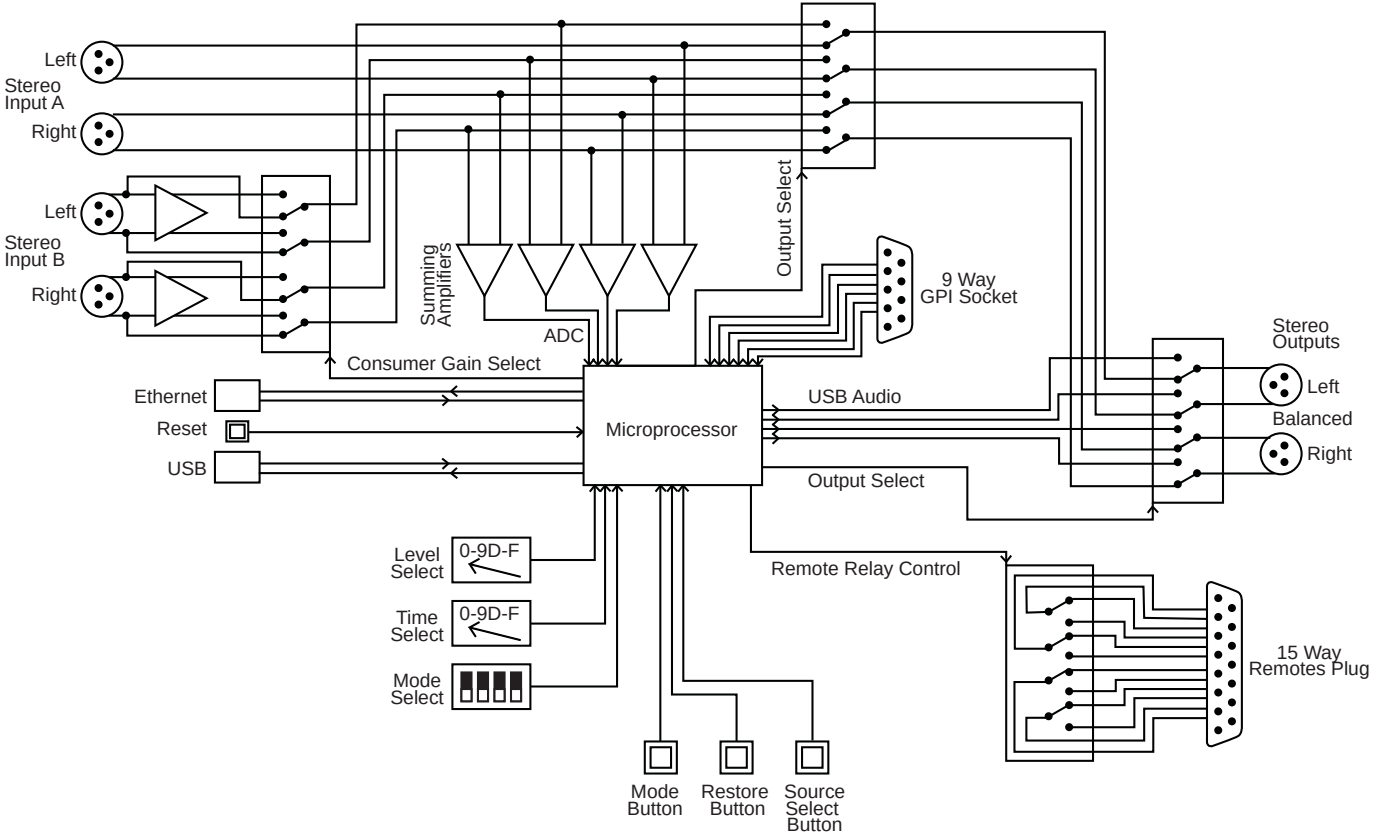


Fig 1-2: RB-SD1IP System Block Diagram

Rear Panel Connections and Operation

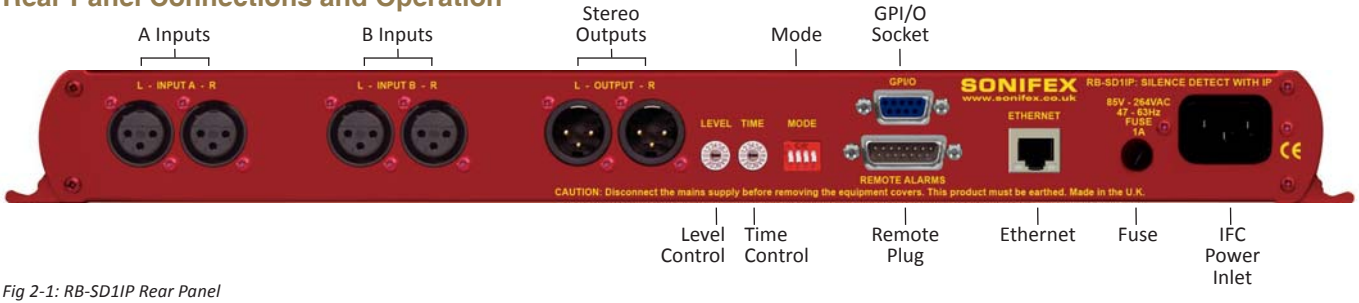


Fig 2-1: RB-SD1IP Rear Panel

A/B Inputs (Left and Right)

There are four XLR-3 inputs, two for channel A (Left & Right) and another two for channel B (Left & Right). The XLR 3 pin sockets are used for the input channels and are electronically balanced. They have the following connections: -

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

Outputs

The stereo output consists of two XLR male connectors professionally balanced with following connections: -

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

Silence Detect Trigger Level

The Level rotary switch adjusts the level below which silence detection occurs. This level may be varied from –15dB to -60db in 3db steps by adjusting the switch according to the following table:

Switch	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Level dBu	-60	-57	-54	-51	-48	-45	-42	-39	-36	-33	-30	-27	-24	-21	-18	-15

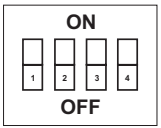
Silence Detect Interval Control

The silence detect interval rotary switch (Time) adjusts the duration over which a silence must persist before alarming the unit. The time ranges from 2 to 30 seconds (0 – E in 2 second intervals) with F on the switch being a 2 min 5 second silence. This maximum time can also be activated or de-activated remotely using the remote connector.

Switch	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Seconds	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	125

Note: Better control of the Silence Detect Level and Interval are available by using the Webserver built into the RB-SD1IP. See section 4 for more information.

Mode DIP Switch Settings



1. Stereo/Mono.
2. Remote Start Mode Switch.
3. Professional levels/Consumer levels (Input B).
4. Switch/No switching when alarmed.

1. Stereo/Mono Switch – The configuration of this defines whether you want to switch sources when left and/or right channel of the incoming source go silent.

Switch	Description
On	When on, the unit operates in stereo mode, whereby if one channel falls silent the unit will switch, and requires both channels to be present before it switches back.
Off	When off, 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.

Note: the Independent channel option can only be configured using the web based GUI not by using physical rear panel controls.

2. Remote Start Mode Switch – This defines whether the remote start switch is momentary or latched. Used for starting external equipment when silence is detected.

Switch	Description
On	When on, the remote start pin (pin 15) on the remote connector is pulled low for half a second when the unit switches to the auxiliary input. (Momentary contact).
Off	When off, the remote start pin on the remote connector is pulled low when the unit switches over to the auxiliary 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).

3. Professional/Consumer Switch – This allows you to use an unbalanced piece of equipment as the auxiliary input, by raising the input gain.

Switch	Description
On	When on, Input B accepts professional balanced signal level.
Off	When off, Input B accepts consumer unbalanced signal level and raises the input gain received by 8dB.

4. Switch/No Switching in Alarm State – This defines whether the unit switches to the auxiliary input upon silence detection.

Switch	Description
On	When on, if the unit goes into the alarm state the unit switches to the auxiliary input.
Off	When off, if the unit goes into the alarm state the unit does not switch to the auxiliary input.

Remote Alarms Connector

Displayed below are the pin connections and descriptions for the remote plug connector:

Pin No.	Signal	I/O	Description
Pin 1	Digital Ground	-	-
Pin 2	Restore Switch	I	Momentary make to Pin 1
Pin 3	Mode Indicator	O	Internal Open Collector to Digtal Ground
Pin 4	Mode Switch	I	Momentary make to Pin 1
Pin 5	Relay 2 Normally Closed	I/O	Relay 2 N/C to Pin 14
Pin 6	Relay 2 Normally Open	I/O	Relay 2 N/O to Pin 14 Ground
Pin 7	Relay 1 Normally Closed	I/O	Relay 1 N/C to Pin 15
Pin 8	Relay 1 Normally Open	I/O	Relay 1 N/O to Pin 15
Pin 9	Remote Start	O	Internal Open Collector to Digital Ground
Pin 10	Source Select Switch	I	Momentary make to Pin 1
Pin 11	Source Select Indicator	O	Internal Open Collector to Digital Ground
Pin 12	+5V	O	To power up to a maximum 200mA

Pin 13	Relay 2 Common	I/O	N/O to Pin 6, N/C to Pin 5
Pin 14	Max Time Whilst Latched	I	Active Low make to Pin 1
Pin 15	Relay 1 Common	I/O	N/O to Pin 8, N/C to Pin 7

Please note: Pins 5, 6, 7, 8, 13 and 15 are for external use to break/make contacts in response to a configurable event in the unit. For example these relays can be used to replicate the alarm conditions for the Main and Auxiliary inputs. Options for these relays may be configured using the web based GUI. The operation of Relay 1 and Relay 2 can be re-configured through the Configuration>Remotes web page.

By default Relay 1 is set as the Main alarm and will alarm on either Main left or Main right - in the alarm state pin 8 closes to pin 15 and pin 7 is open. Relay 2 is set as the Aux alarm and alarms on Aux left or Aux right - under the alarm condition pin 6 closes to pin 14 and pin 5 is open.

Pins 2, 3, 4, 10 and 11 are to replicate the switches and indicators for the Source Select, Mode and Restore functions.

Note: The remote source select, pin 10, may be held low in order to force the unit to route stereo input source B to the outputs.

Pins 1 & 12 are Ground and +5V respectively and can be used to source up to 200mA of current to power external circuitry such as LED indicators or relays.

Pin 14 is to select remotely a silence time of 2 minutes and 5 seconds. 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 maximum silence time is set whilst the contact is latched.

Pin 9 is used to remotely start an external piece of equipment and operates on audio fail.

GPI/O Connector

There are 6 GPI pins available on a 9 way female D-type connector located above the Remote Alarms Connector. These pins have been included to provide more customised behaviour of the RB-SD1IP which could enable non-networked hardware to generate alarms for an existing Network Management System by using the network interface of the RB-SD1IP.

Currently each of the GPI pins can be used to trigger one or both of the relays available to the Remote Alarms Connector. Each GPI can also generate SNMP traps to follow pin activity.

Power and ground connections are available on this connector from the same source as the 200mA +5V fused supply on the Remotes connector.

Pin No.	Signal	I/O	Description
Pin 1	GPI 1	I	General Purpose Input 1
Pin 2	GPI 3	I	General Purpose Input 3
Pin 3	GPI 5	I	General Purpose Input 5
Pin 4	Digital Ground	-	Ground Return For External Circuits
Pin 5	+5VD Fused	-	5V Supply Pin to Power External Circuits
Pin 6	GPI 2	I	General Purpose Input 2
Pin 7	GPI 4	I	General Purpose Input 4
Pin 8	GPI 6	I	General Purpose Input 6
Pin 9	Digital Ground	7	Ground Return for External Circuits

Ethernet Connector

The unit supports 10/100 Mbps Ethernet via a standard RJ45 connector. The Green LED shows link status/activity and the Amber LED indicates connection speed (On = 100 Mbps, Off = 10 Mbps).

A Webserver is built into the RB-SD1IP to allow easier configuration and remote operation.

Front Panel Selectors and Indicators

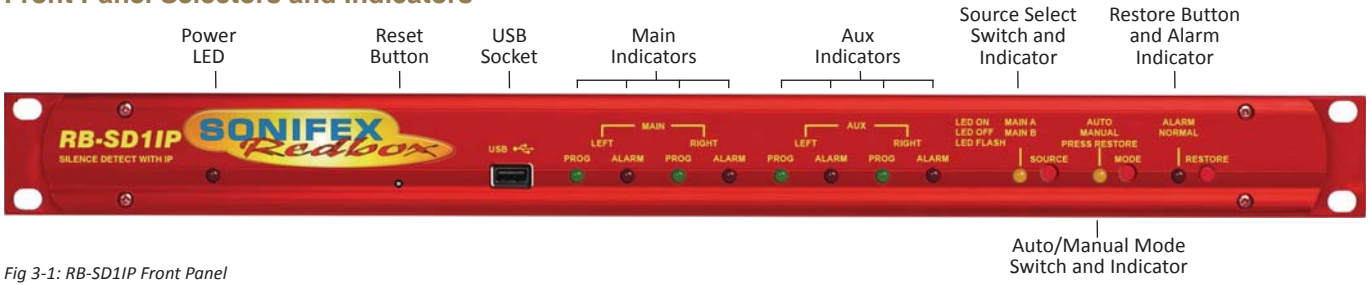


Fig 3-1: RB-SD1IP Front Panel

Power Indicator

A single red LED confirms the presence of an active power supply to the unit.

Reset Button

The recessed reset button allows you to perform a hardware reset on the unit without powering down.

USB Port

The USB port enables the unit to act as a host for low power mass storage devices (such as flash drives) which are formatted to either FAT or FAT32. Such devices may be used for the playback of audio files.

The USB functionality is configured using the browser based GUI and allows you to play out wave (.wav) files in the event of both the Main and Auxiliary sources falling silent. The currently supported file format is .wav extensions in PCM 16 bit Stereo encoding.

The unit supports the following sample rates: 8 kHz, 11.025 kHz, 12 kHz, 16 kHz, 22.050 kHz, 24 kHz, 32 kHz, 44.1 kHz, 48 kHz

Only files located in the root directory of the USB device will be available for playback. The unit supports a playlist in the form of an ordered list of filenames delineated by a new line.

For example:
Track_05.wav
Track_01.wav
03_Song.wav
Melody.mp3
customer_message.wav

The playlist file should be designated “playlist.txt” or “playlist.m3u” and placed in the root directory with the audio files. Any files in the list which are invalid (such as the .mp3 in the above example) or not present will be ignored. If a playlist is not present then the audio files will be played out in the order of their creation on the USB device.

Note: It is recommended that files of a single sample rate range are used in order to avoid a small delay (up to 3 seconds) between the playback of tracks with sample rates in different frequency ranges.

The USB audio playback feature can be remotely enabled or disabled using the GUI. Other USB audio options include: Default Sample Rate Selection, Track Recall, Looped Playback and SNMP Trap Generation.

Default Sample Rate:
This option sets up the system clock to be ready to play out files with a sample rate from a specific frequency range. For example; if your USB

device contains files at a sample rate of 24 kHz, set the default sample rate to 48 kHz range, which also supports the subfrequencies 12kHz & 24kHz, to ensure the unit always boots up ready to play at the correct clock frequency.

Track Recall:
When this option is disabled, every time USB audio is routed to the output, the playback will begin from the first available file. When this option is enabled the unit will remember the previous track it was playing out from USB and upon USB audio being routed to the output, playback will begin from the start of the next available file. Note that Track Recall will be lost when the unit is powered down, or when the USB device is removed.

Looped Playback:
When enabled, this option will play all valid audio files on the USB device in a loop whenever USB audio is route to the output. When this option is disabled the audio files on the USB device will only be played through once, per instance, of the USB audio being routed to the output.

SNMP Trap Generation:
The unit can generate SNMP Traps to inform a Network Management System (NMS) that a USB device has been plugged into, or unplugged from the front of the unit.

Main and Aux Indicators

On the front panel there are four Main indicators and four Aux indicators. Each left/right channel has a Program Content and Alarm Status indicator. The Program Content Indicator represents the input signal level for that channel and the Alarm Status LED indicates whether the channel has dropped below the threshold for longer than the time selected.

Both the Main and Aux inputs are continuously monitored so that you can check that your backup signal is operating correctly, as well as your main input source.

Note: Although one channel of the stereo input may have alarmed, the main alarm may not be set, due to the setting of the Stereo/Mono Dipswitch.

Source Select and Indicator

The preferred Main input source is selectable via a recessed push button switch on the front panel, or it can be controlled remotely (pin 10) and from the GUI. This allows you to define whether input A, or input B is going to be the Main audio input. There is an LED to indicate which state the source select is in:

LED	Description
LED On	Main source is input A, Aux source is input B
LED Off	Main source is input B, Aux source is input A

The GUI can be used to configure the source select LED to indicate the current input which is being routed to the output. In this case:

LED	Description
LED On	Input A is being routed to the output
LED Off	Input B is being routed to the output
LED Flashing	USB Audio is being routed to the output

Note: If the unit is powered off, for example during a black-out, input A routes through to the output. Therefore if the unit is subject to a power fail while the main source is set to input B, the unit will output source A.

Auto/Manual Mode Selector and Indicator

The Auto/Manual Mode Switch defines how the unit should operate during an alarm condition, when the main audio source returns. There is an option to allow the device to switch back Automatically or Manually. The mode is selected by a push switch accessed through a hole on the front panel with a corresponding LED to represent its state, it can be controlled remotely (pins 3 and 4) or by using the GUI.

LED	Description
LED On	Automatic Mode – During an alarm condition when the main source returns, it is switched back automatically, although a valid signal must persist for at least the configured Restore Time period.
LED Off	Manual Mode – the LED will begin to flash once a valid main signal is detected, indicating that manual restore can now be performed.
LED Flashing	Manual Mode – The main audio has returned after an alarm condition. To switch to the main source, push the Restore button (or control it remotely).

Note: When using Independent Channels in Manual Mode you will need to press restore once for each channel.

Restore Alarm Indicator

The Restore Alarm Indicator situated on the front panel is used to display the alarm status of the Main input. Its operation is dependent on the selected mode (See Mode DIP Switch Settings):

- Stereo mode - the unit alarms on a single main channel timeout.
- Mono mode - alarms on both main channels timing out.

The unit exits the alarm state on the return of the main source signal, depending on the setting of the Stereo/Mono Dipswitch.

Restore Button

The Restore button is used for restoring the main source signal when the unit is operating in Manual Mode. When the main source signal returns after it has timed out, the Mode LED flashes, indicating that the source signal can be restored. When the Restore button is pressed the main source returns. This can be remotely controlled using pin 2 of the remotes connector. There is also a restore button present on the web based GUI.

Reset to Defaults

It is possible to reset the unit to default configuration settings, including network settings, from the front panel. To perform a full reset you must press and hold the Restore button whilst resetting or power cycling the unit.

Physical Configuration

It is possible to force the unit to use physical configurations (rear panel dip & hex switches) rather than the browser based GUI settings. To do this you must press and hold the Source Select button whilst resetting or power cycling the unit.

Note: When switching to physical configuration from webpage configuration, the operation of the unit could change significantly.

Boot Mode

In the unlikely event that the RB-SD1IP becomes inoperable due to corruption of the main firmware, you can force the unit into Boot Mode. To do this you must hold down both the Source Select and Mode buttons whilst resetting or power cycling the unit. To indicate that Boot Mode is active the Source, Mode and Restore LEDs will flash. A unit in “Boot Mode” can be discovered and updated through the webpage in the same way as for main firmware.

Additional Modes

The original RB-SD1 offered the option to configure the unit into various additional modes of operation. The RB-SD1IP offers these options through a webserver based GUI.

RB-SD1IP Network Discovery and Webserver

In addition to any physical controls the RB-SD1IP has a built in webserver which can allow you to control and configure the unit remotely through a web browser. The webpage interface also enables you to view status information, alter network settings, and update product firmware.

The RB-SD1IP network interface employs Zeroconf networking, meaning that it supports DHCP, AutoIP and MDNS-SD using Bonjour. We provide a free application available for download from our website (www.sonifex.co.uk/technical/software) to facilitate the discovery and use of Sonifex network enabled hardware, see below for more information.

Connecting to the unit: Connecting to the webpage interface is as simple as typing the IP address of the unit into the address bar of a web browser on a PC connected to the same network.

DHCP

The RB-SD1IP will have DHCP and AutoIP enabled by default, if your network has a DHCP server then the unit will be assigned an IP address which can be found easily by using the Sonifex service discovery application, or by contacting your network administrator. The nature of DHCP means that the unit is not guaranteed to maintain a fixed IP address each time it is reconnected to the network. See the section on static network settings below for information on how to fix the IP address of the unit.

AutoIP

If your network does not support DHCP or it is disabled, then with AutoIP enabled the unit will assign itself an IP address from the AutoIP range (169.254.1.0 to 169.254.254.255). Once an AutoIP address has been assigned you will need to connect the unit directly to a PC using an Ethernet cable. Ensure that the PC has dynamic addressing enabled and you will be able to use the Sonifex discovery application on this mini network to access the webpage interface.

Static Network Settings

Accessing the webpage interface allows you to configure the network settings as you like. To give the unit a fixed network address, enter appropriate static details and disable both DHCP and AutoIP. The unit will now apply the static network settings whenever it is connected to a network.

MDNS-SD and Bonjour

Bonjour is a hardware discovery service developed by Apple and as such it is natively supported by Apple devices and operating systems. Bonjour for Windows is available, go to our website (www.sonifex.co.uk/technical/software) or other download stores and download the appropriate version for your operating system.

On a Bonjour enabled device or system, you can connect to a unit using only its hostname. By default the hostname for the RB-SD1IP will be the hardware ID appended by the unique serial number of the unit:

[Hardware ID] – [Serial No.]
RB-SD1IP-654321

To connect to a unit using Bonjour you can simply discover and launch the webpage interface from the Sonifex service discovery application. Alternatively you can simply type the hostname appended by the local domain name into the address bar of your web browser, for the example above you would enter the following:

RB-SD1IP-654321.local.

The hostname is independent of the IP address and this means that the unit can always be discovered and accessed in this way, regardless of which IP address it has been assigned by a DHCP server. The hostname can be changed to make it more memorable or descriptive of an implementation, however, conflicting names should be avoided.

Sonifex Service Discovery App

This is a free download for Windows, available from our website (www.sonifex.co.uk/technical/software). This application uses Bonjour to locate networked hardware and discover what services it has to offer. On a device or system running Bonjour you can discover Sonifex hardware and launch the webserver interface if available. The application also offers legacy discovery for systems which do not support Bonjour or for Sonifex hardware which is not running MDNS-SD.

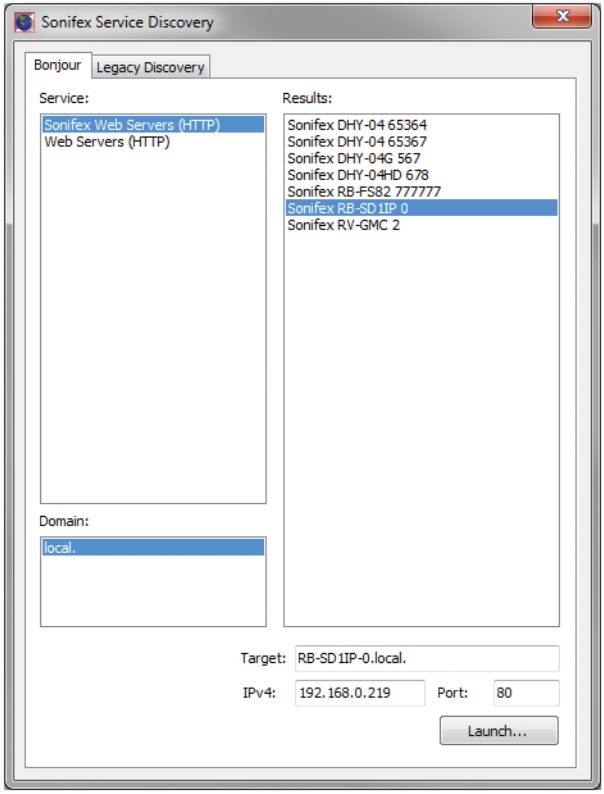


Fig 4-1: Sonifex Service Discovery - Bonjour Page

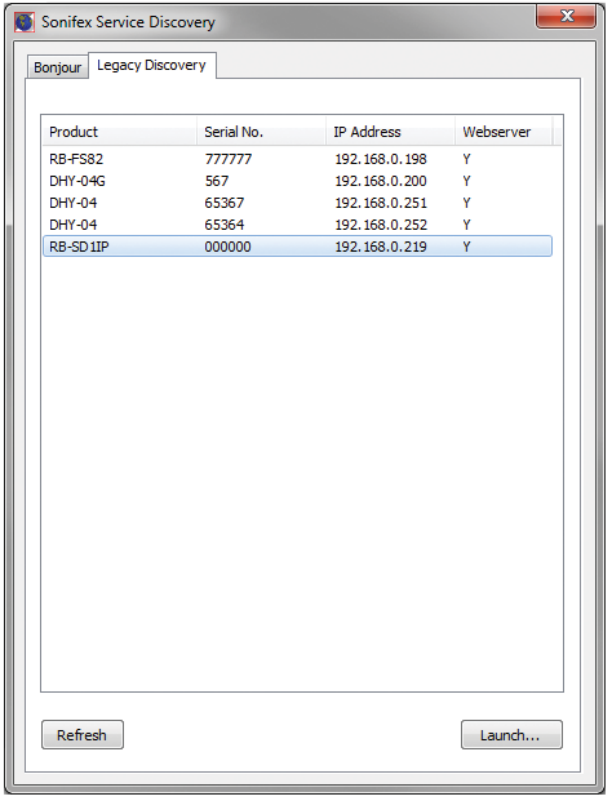


Fig 4-2: Sonifex Service Discovery - Legacy Discovery Page

Fig 4-3: RB-SD1IP Screenshot of the Webserver Home Page

The web based GUI has a menu bar that allows you to navigate through various pages to configure different aspects of the unit. Each page follows the same standard layout as the Home page, with current status/configuration settings on the left and tooltip explanations in the box on the right. The page footer contains contact details for Sonifex Ltd.

Home Page

Signal Level

The approximate current audio level for each channel.

Silence Level

The current silence detection level for each channel

Alarm Status

Alarm Indicator for each channel where green is a Valid Signal and red is a Silence Alarm

Signal Output

This indicates the signal which is currently being routed to the left and right output channels. If the outputs have been locked by the remote source select pin or by the SNMP interface this will be indicated to the right of the signal output.

Restore

This button works in the same way as the front panel Restore button, to bring back a valid Main audio signal in Manual Mode.

Configuration

When in Physical configuration mode, various settings within the webpage are overridden by the hardware switches on the back panel of the unit. The configuration mode can be changed on the Physical Settings webpage.

2 Minute Silence

This indicates whether the 2 minute silence detection override has been activated by the remote connector or the SNMP interface.

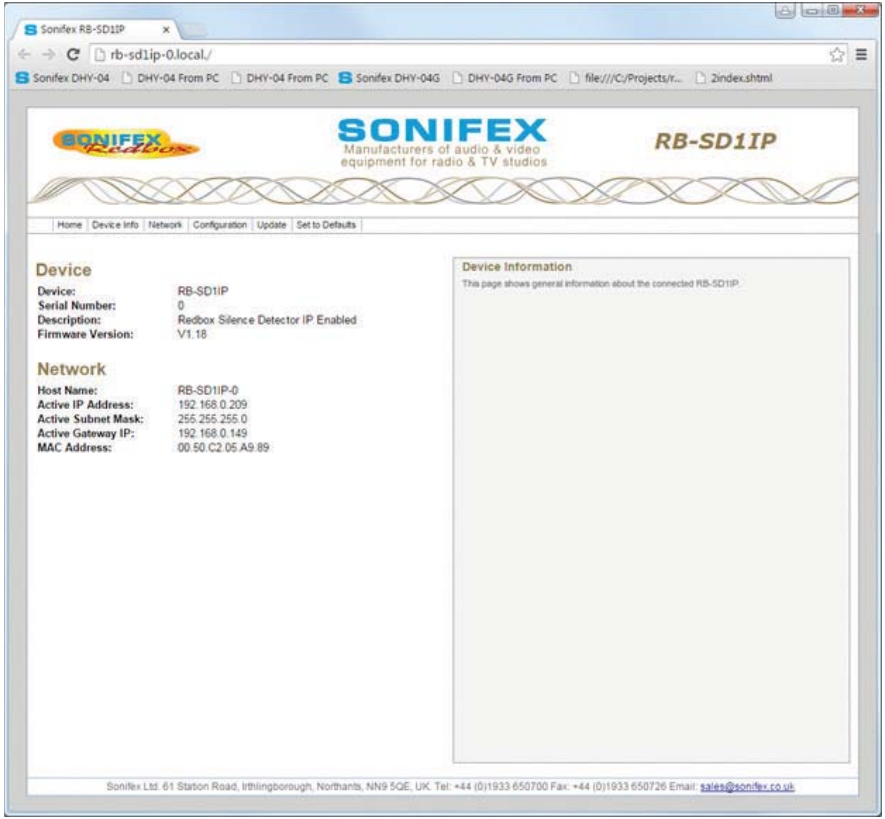


Fig 4-4: RB-SD1IP Screenshot of the Webserver Device Page

Device Information

This page shows general information about the connected RB-SD1IP.

Fig 4-5: RB-SD1IP Screenshot of the Webserver Network Settings Page

Network Settings

Host Name

The Host Name for this unit is used for Multicast DNS Service Discovery. The default Host Name is the unit Hardware Type, appended with the unique Serial Number.

IP Address

Please enter the static IP Address that you wish to assign to this unit. The address must be in the correct form, the default address is: 192.168.0.100

Netmask

Please enter the Netmask of the network you wish to connect to. The default subnet mask is: 255.255.255.0

Gateway Address

Please enter the Gateway Address of your router. The default gateway address is: 192.168.0.149

Dynamic Addressing

Enable Dynamic Addressing or disable to force the use of the static network settings entered above. When enabled, DHCP and AutoIP are used, the unit will use AutoIP until DHCP server is detected.

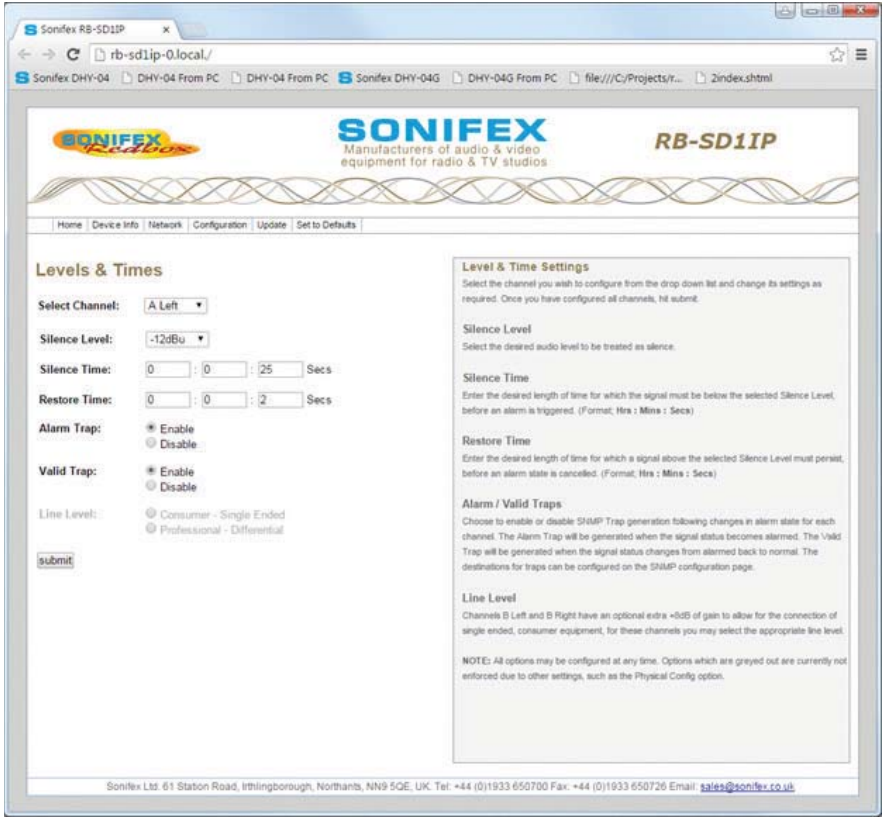


Fig 4-6: RB-SD1IP Screenshot of the Webserver Level & Time Settings Page

Configuration : Level & Time Settings

Select the channel you wish to configure from the drop down list and change its settings as required. Once you have configured all channels, hit submit.

Silence Level

Select the desired audio level to be treated as silence.

Silence Time

Enter the desired length of time for which the signal must be below the selected Silence Level, before an alarm is triggered. (Format; Hrs : Mins : Secs)

Restore Time

Enter the desired length of time for which a signal above the selected Silence Level must persist, before an alarm state is cancelled. (Format; Hrs : Mins : Secs)

Alarm / Valid Traps

Choose to enable or disable SNMP Trap generation following changes in alarm state for each channel. The Alarm Trap will be generated when the signal status becomes alarmed. The Valid Trap will be generated when the signal status changes from alarmed back to normal. The destinations for traps can be configured on the SNMP configuration page.

Line Level

Channels B Left and B Right have an optional extra +8dB of gain to allow for the connection of single ended, consumer equipment, for these channels you may select the appropriate line level.

Note: All options may be configured at any time. Options which are greyed out are currently not enforced due to other settings, such as the Physical Config option.

Fig 4-7: RB-SD1IP Screenshot of the Webserver Sources Page

Configuration : Source Settings

Main Source

Select the pair of channels that you wish to use as the Main Source. The other channels will become the Auxiliary Sources to be used at instances of silence.

Source Indication

Choose the status that you wish the front panel Source LED and the remote Source Select pin to indicate. Main Selection - indicates which input is currently selected as the Main source. Output Signal - indicates which input is currently being routed to the output, active for A, inactive for B and flashing for USB.

Note: Source Indication will be forced to Main Selection when the unit is in Independent channel mode.

Restore Mode

Restoration back to Main channels from Auxiliary channels can be manual (button press) or automatic.

Auto Lock Mode

When enabled, this mode forces the Main Source to be input A whilst the unit is in Automatic Restore mode.

Main Follower Mode

When an alarm causes the unit to switch sources, the new source is redefined as the Main Source. The Main Follower option does not apply in Independent Channel Mode.

Left & Right Output Trap

These are SNMP Traps which, when enabled, will be generated whenever the source being routed to the relevant output is changed; such as switching from Main to Auxiliary. The destinations for traps can be configured on the SNMP configuration page.

Fig 4-8: RB-SD1IP Screenshot of the Webserver Alarms Page

Configuration : Alarm Settings

Channel Mode

Control how alarm signals are handled with regard to audio switching:

Stereo - both Main channels are required, the unit will attempt to switch sources if either falls silent.

Mono - only one Main channel is required, the unit will only attempt to switch to Auxiliary if both Main channels fall silent.

Independent - channel switching is handled separately, silence on Main left/right channel will only switch in the left/right Aux respectively.

Alarm Actions

You can configure the action that the unit will take in each channel mode, when an alarm is triggered.

Fast Restore

Fast Restore Mode automatically lowers the Restore times to a minimum value in instances where all sources are Alarmed. This can allow the unit to restore audio faster and avoid dead air for longer than necessary.

Note: All options may be configured at any time. Options which are greyed out are currently not enforced due to other settings, such as the Physical Config option.

Fig 4-9: RB-SD1IP Screenshot of the Webserver SNMP Page

Configuration : SNMP Settings

This page allows you to configure the SNMP community string and SNMP Trap destinations. The traps themselves are enabled on the relative webpages, for example GPI and Levels & Times.

Community String

The Community String may be up to 20 characters long.

Trap Destination IP Addresses

You can set up to 3 different IP addresses which will receive all traps generated by the unit. Each destination can be enabled or disabled individually.

Note: The default Community String is "public", it is recommended that you change this to make it harder to guess, or descriptive of the implementation. However, SNMP Version 1 community strings are not secure, they are sent as raw bytes over the network, there is no encryption.

Fig 4-10: RB-SD1IP Screenshot of the Webserver USB Page

Configuration : USB Settings

USB Audio

Enable or disable the use of USB Audio as a secondary back up source, to be switched in when both Main and Aux sources are silent.

Default Rate

We recommend that a USB device is loaded with files which are all in the same sample frequency range (e.g. 48 kHz, 24 kHz and 12 kHz), this will avoid any detection or playback delays between tracks as the internal clock is adjusted for different sample rates.

This option allows you to select the sample rate range that you wish the unit to initialize with. The unit will still play files of any sample rate (8 - 48 kHz) regardless of this setting. See handbook for more details regarding sample rates and delays.

Track Recall

Enabling this option prevents the unit from starting at the first track every time USB audio is switched in. The unit will recall the track that was previous playing, and play out the next available track.

Playback Mode

Choose to either loop the playback of the audio files on the USB device, or to only play through once.

Plugged / Unplugged Trap

Enable or disable the generation of an SNMP Trap when a USB device is plugged into or unplugged from the unit.

Note: The destinations for traps can be configured on the SNMP configuration page.

Fig 4-11: RB-SD1IP Screenshot of the Webserver Remotes Page

Configuration : Remote Settings

This page allows you to configure how you would like the pins on the rear panel, 15 way, remote connector to behave.

Remote Controls

This allows you to Lock or Unlock Pins 5, 7, 10 and 14. Preventing (or allowing) connected hardware to trigger Modes, Restore, Max Silence Time and Source Select.

Remote Start

The Remote Start Pin 15 is pulled low when the selected trigger occurs. This pin can either be latched low for the duration of the alarm, or only held low for 500ms.

Remote Start Trigger

Select the alarm on which you would like remote start to be triggered.

Remote Relay Action

Select the condition on which you would like each remote relay to engage.

Note: If you select a GPI pin as a relay trigger, you will need to set up the GPIO options accordingly, otherwise the relay may not engage.

Note: All options may be configured at any time. Options which are greyed out are currently not enforced due to other settings, such as the Physical Config option.

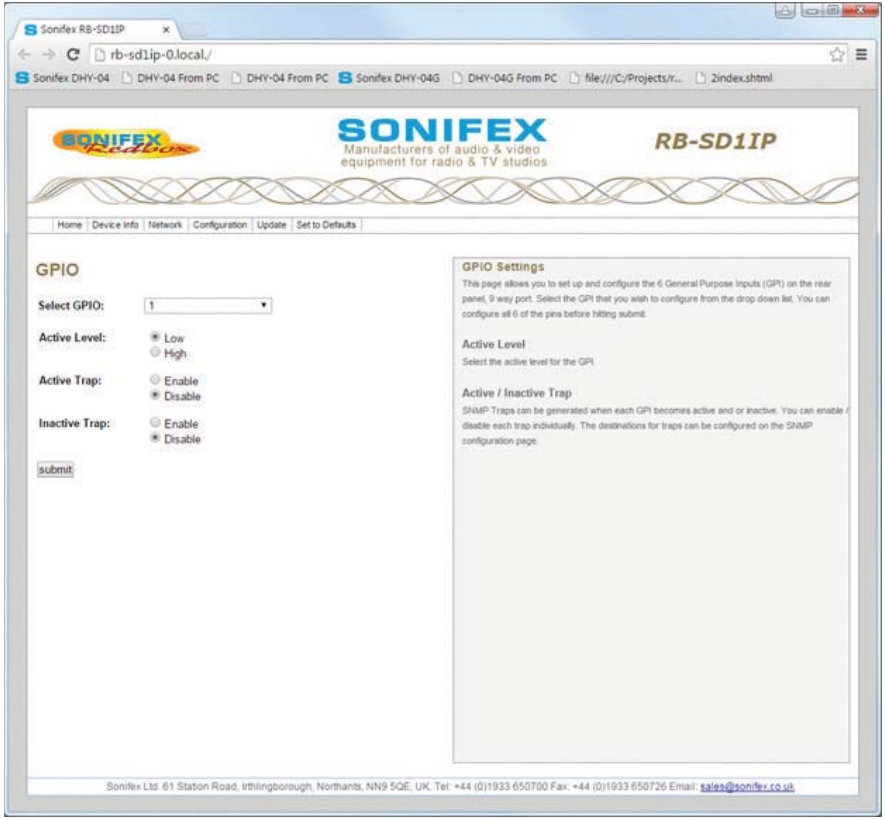


Fig 4-12: RB-SD1IP Screenshot of the Webserver GPIO Page

Configuration : GPIO Settings

This page allows you to set up and configure the 6 General Purpose Inputs (GPI) on the rear panel, 9 way port. Select the GPI that you wish to configure from the drop down list. You can configure all 6 of the pins before hitting submit.

Active Level

Select the active level for the GPI.

Active / Inactive Trap

SNMP Traps can be generated when each GPI becomes active and or inactive. You can enable / disable each trap individually. The destinations for traps can be configured on the SNMP configuration page.

Fig 4-13: RB-SD1IP Screenshot of the Webserver Physical Settings Page

Configuration : Physical Settings

This page shows you the settings which are currently selected according to the physical switches on the back panel of the unit.

Configuration

This option allows you to select whether to use the options set by the physical controls on the unit, or the options set up using this webserver. When using the physical control settings many options on the webpage will become grey to indicate that they are not currently enforced.

Front Panel

This option allows you to lock or unlock the use of the three front panel buttons; Source, Mode and Restore.

Brightness Level

This option allows you to control the brightness of the LEDs on the front panel of the unit, with 3 being the brightest.

Note: You may have to refresh the web page in order to be sure that you are seeing the most current physical settings for this unit.

Power On Auto

When enabled, this option enforces certain conditions on unit boot up. The Restore Mode will be set to Automatic, the Auto Lock Mode will be turned on and Source Indication will be set to Output Signal. All other configurations will be retained.

Note: The settings affected by Power On Auto may be reconfigured whilst the unit is running. They will only return to the configuration stated above on boot up. Power On Auto will be disabled when the unit is reset to default configuration.

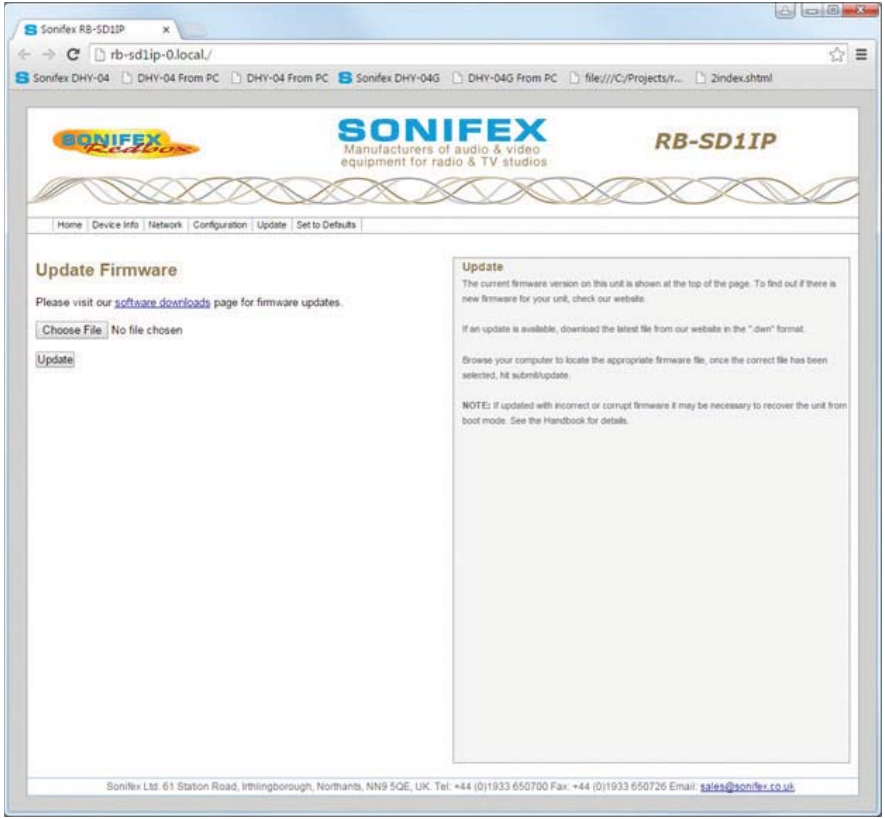


Fig 4-14: RB-SD1IP Screenshot of the Webserver Update Firmware Page

Update

The current firmware version on this unit is shown at the top of the page. To find out if there is new firmware for your unit, check our website.

If an update is available, download the latest file from our website in the ".dwn" format.

Browse your computer to locate the appropriate firmware file, once the correct file has been selected, hit submit/update.

Note: If updated with incorrect or corrupt firmware it may be necessary to recover the unit from boot mode. See the Handbook for details.

Technical Specification RB-SD1IP

Audio Specification	
Maximum Input Level:	+28dBu
Input Impedance:	>100kΩ balanced
Maximum Output Level:	+28dBu
Output Impedance:	As input, except when using unbalanced auxiliary input where output impedance <50Ω
Frequency Response:	20Hz - 20kHz ±0.1dB
Gain:	+8dB (for unbal input B - optional)
Noise:	<-93dB, unity gain, ref +8dBu output for unbal input
Distortion:	As input for balanced input, <0.02% @ 1kHz ref +8dBu output for unbalanced input

Rear Panel Connections and Controls	
Inputs (Main & Auxiliary):	4 x XLR 3 pin female (balanced, auxiliary can be unbalanced)
Output:	2 x XLR 3 pin male (balanced)
Remotes:	15 way D-Type plug
GPIO:	9 way D-Type socket
Alarm Threshold:	-15dBu to -60dBu in 3dB steps via rotary switch 0dBu to -60dBu in 3dB steps via web GUI
Silence Detect Duration:	2 - 30 seconds in 2 second intervals & 125 second option via rotary switch 1 second – 24 hours using web GUI
Detection Type:	Mono or Stereo, via DIP switch Mono, Stereo, or dual mono via web GUI
Silence Switch Defeat:	Disable/enable silence switching, via DIP switch or GUI
Remote Start:	Latched or momentary, via DIP switch or GUI
Ethernet:	10/100Mbps on 1xRJ45 socket with status LEDs
Mains Input:	Filtered IEC, continuously rated 85-264VAC @47-63hz 10W max
Fuse Rating:	Anti-surge fuse 1A 20 x 5mm (250VAC)

Front Panel Controls and Indicators	
Controls (With Indicators):	Source Select, Mode Select and Restore
Indicator:	Program and Alarm indicators for left and right source for both Main and Auxiliary channels, power indicator
Reset:	Recessed push button
USB Port:	1 x USB A socket

USB

The RB-SD1IP can act as a host for low powered USB Mass Storage devices in order to playback Audio files as an emergency backup system for when both Main and Auxiliary sources fail.

File System(s):	FAT & FAT32
Supported Audio:	.wav extension (16 bit Stereo PCM @ 44.1kHz or 48kHz) 8 kHz, 11.025 kHz, 12 kHz, 16 kHz, 22.050 kHz, 24 kHz, 32 kHz, 44.1 kHz, 48 kHz

Note: Additional Audio support may be added in future updates

Equipment Type	
RB-SD1IP	Redbox Silence Detection unit with Ethernet & USB

Physical Specification	
Dimensions (Raw):	48cm (W) x 10.8cm (D) x 4.2cm (H) (1U) 19” (W) x 4.3” (D) x 1.7” (H) (1U)
Dimensions (Boxed):	58.5cm (W) x 22.5cm (D) x 7cm (H) 23” (W) x 8.9” (D) x 2.8” (H)
Weight:	Nett: 1.4kg Gross: 2.0kg Nett: 3.1lbs Gross: 4.4lbs

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