SONIFEX Redbox

HANDBOOK

S0
Radio Broadcast Mixer

Manufacturers of audio & video
products for radio & TV broadcasters

SONIFEX

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This handbook is for use with the following product:
S0 Radio Broadcast Mixer
AW Stock Code: 30-192

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Sonifex Ltd, 61, Station Road, Irthlingborough,
Northants, NN9 5QE, England.
Tel: +44 (0)1933 650 700
Fax: +44 (0)1933 650 726
Email: sales@sonifex.co.uk
Website: http://www.sonifex.co.uk

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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.

Product: _____

_____

Serial No: _____

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SONIFEX Sonifex Limited • 61 Station Road • Irthlingborough • Northamptonshire • NN9 5QE • United Kingdom
Tel: +44 (0)1933 650 700 • Fax: +44 (0)1933 650 726 • Email: technical.support@sonifex.co.uk • Internet: www.sonifex.co.uk

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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.

CE Conformity

The products in this manual comply with the essential requirements of the relevant European health, safety and environmental protection legislation.

The technical justification file for this product is available at Sonifex Ltd.

The declaration of conformity can be found at:
http://www.sonifex.co.uk/declarations

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.

The mains plug or IEC power connector is used as the disconnect device. The mains plug and IEC power connector shall remain readily operable to disconnect the apparatus in case of a fault or emergency.

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.

This apparatus is of a class I construction. It must be connected to a mains socket outlet with a protective earthing connection.

Important note: If there is an earth/ground terminal on the rear panel of the product then it must be connected to Earth.

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.

Atmosphere/Environment

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

This apparatus shall not be exposed to dripping or splashing, and no objects filled with water, such as vases shall be placed on the apparatus.

1. Introduction

The S0 is a high quality yet simple to operate radio broadcast mixer ideally suited to community radio stations, for educational purposes and for internet radio. It is easy to use and provides the ideal solution for those who do not require the advanced functionality of a more complex unit.

Easy to understand, the S0 includes a telephone hybrid for making and recording telephone calls and a 3.5mm stereo jack for plugging in an mp3 player. The addition of a USB port allows for recording to a PC and for playing a PC automation system directly through the mixer. The headphone outputs have a built in limiter to offer hearing protection and the studio speakers mute when a microphone fader is open, with automatic mic live sign switching.

Using many of the same components found on the S2 and S1 mixers, the S0 offers quality and reliability in a cost effective package. It also allows presenters and DJs to be up and running quickly with a fully featured radio studio mixer.

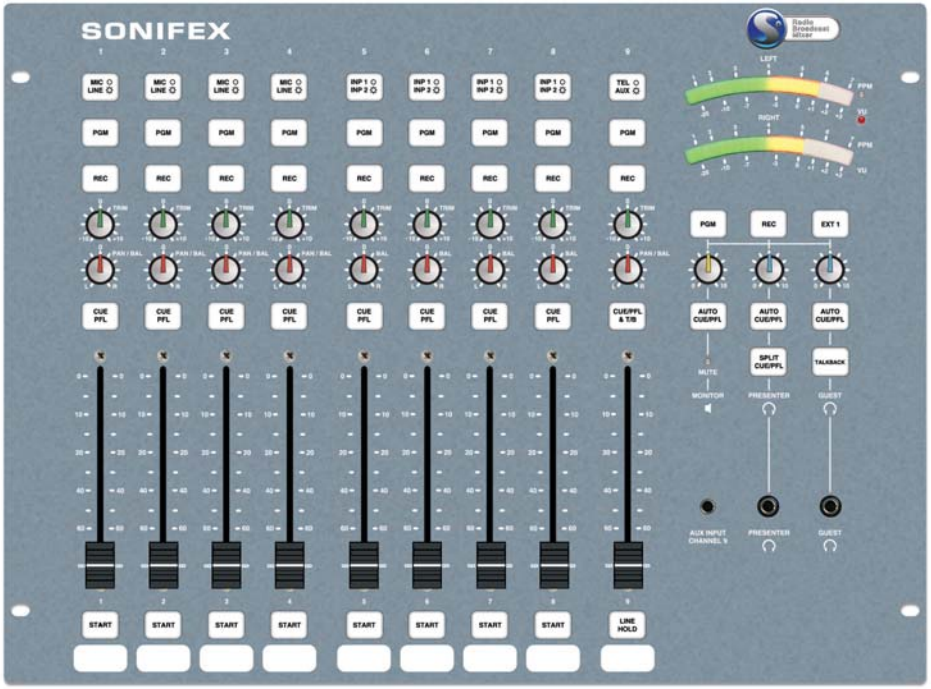


Fig 1-1: S0 Mixer - Top View.

Feature Summary & Overview of Use

- Fixed format 9 channel mixer.
- Can be rack mounted or used as a flush mounted desktop mixer.
- Large backlit buttons allow you to see the status of the mixer at all times.
- The analogue signal paths use low noise circuitry to provide superb audio performance.
- The high reliability and build quality of the S0 minimises the chance of failure, avoiding lost air-time.
- ALPS long throw 100mm faders give a smooth, repeatable response.
- The use of VCAs controlled by the faders ensures tight stereo tracking and eliminates mechanical and electronic noise.
- The S0 has an internal power supply providing regulated, ripple-free power to the mixer.

Features

- Clear, simple and intuitive layout.
- 4 microphone/line input channels.
- 4 dual line input channels.
- Built in telephone interface channel.
- Auxiliary input for miscellaneous sources such as MP3 players.
- Independent Program and Record bus outputs.
- Pre-Fade Listen available on all channels.
- VU and PPM metering on a large LED display.
- Build in headphone volume limiter.
- Remote outputs on each channel to control external equipment such as CD players.
- Automatic muting of the monitor output when a microphone channel is open.
- Switching output to control external microphone live light.
- USB Audio input selectable on all dual line input channels, which can be automatically routed to Pre-Fade Listen.
- USB Audio output from the Record bus.
- User configurable options, accessible using the Sonifex SCi software or directly by using the S0 Setup Mode, allowing for flexible setup and operation.

The Sonifex S0 mixer is a compact, low cost, fixed format broadcast mixing console designed for on-air radio use. It uses the same high quality circuitry and components as the Sonifex S2 and S1 mixers to provide an audio experience second to none. The S0 can be fitted flush into a desk-top or can be rack mounted directly using the front panel mounting holes.

The uncomplicated and intuitive front panel layout ensures that the unit appeals to novices and broadcast professionals alike, whilst a range of user configurable options allows for flexible operation.

The console consists of nine input channels:

- 4 x mono balanced XLR mic/stereo unbalanced RCA phono line inputs.
- 4 x dual stereo unbalanced RCA phono line inputs.

- 1 x telephone balance unit (with line and handset ports)/stereo unbalanced RCA phono auxiliary input with a parallel 3.5mm stereo jack input on the front panel.

Providing in total 4 mic, 12 stereo line, 1 TBU & 1 stereo auxiliary inputs which you can switch between.

Input Channels

Input source buttons at the top of each channel strip are used to select the required mono or stereo source. The mixer has two main stereo buses, PGM (Program) and REC (Record), so each channel also has PGM and REC buttons to independently select which mixer bus the selected input is routed to.

The XLR microphone inputs on channels 1 to 4 have individually selectable +48V phantom power and a gain calibration potentiometer providing up to 65dB of gain for the pre-amp. Input channel 1 also serves as the microphone input for a dedicated talkback channel.

The stereo RCA phono line inputs on channels 1 to 8 have 10dB of gain at the input to compensate for unbalanced consumer inputs.

Input channel 9 is a TBU and stereo auxiliary input channel. The TBU allows direct connection to a telephone line and allows calls to be made and received through the mixer using the handset connection. The auxiliary channel can switch between 2 independent inputs, one on the rear panel and one on the front panel.

Any channel which has the fader up is routed to the selected output, either PGM or REC or both.

Gain for each channel is trimmed by the front panel TRIM control providing ±15dB of gain. A PAN/BAL(ance) control is available to facilitate stereo imaging.

The use of VCAs controlled by the ALPS long throw 100mm faders gives a smooth, repeatable response and ensures tight stereo tracking while eliminating mechanical and electronic noise.

USB Audio for Playback & Recording

The S0 has the option to send and receive audio over USB. This allows the audio on the REC bus to be sent to a PC for recording or monitoring purposes. Also, the S0 can receive a USB audio stream from a PC and route it to the auxiliary inputs on channel 8. Alternatively, this signal can be routed to channels 5, 6 or 7 if required.

Output Channels

The S0 has separate stereo PGM and REC bus outputs. The PGM bus is output on balanced stereo XLRs and the REC bus is output on unbalanced stereo RCA phono connectors. There are monitor outputs for presenter headphones, guest headphones and loudspeakers.

Monitoring & Headphone Limiter

The monitor loudspeakers, presenter headphones and guest headphones are on 6.35mm stereo jack sockets and the headphones can be plugged in to the front and rear of the mixer. The monitor loudspeaker and headphone levels are independently variable between 0 (cut off) and 10 (max).

With the concerns over listening levels being too high in headphones, the addition of an adjustable limit level potentiometer on the rear panel of the mixer is a great idea which limits the maximum level of the audio routed to the presenter and guest headphone outputs. An illuminated MUTE LED shows when a live microphone channel has muted the loudspeakers and there is a MUTE contact output available to illuminate a ‘MIC LIVE’ light via a 6.35mm stereo jack socket on the rear panel.

A three way electronically interlocking illuminated switch bank selects the source routed to the loudspeaker and headphone outputs from either PGM, REC or from an additional unbalanced stereo RCA phono input EXT 1. This external input can be used for monitoring an off air signal or studio output.

Green illuminated AUTO CUE/PFL (pre fade listen) buttons adjacent to each level control allow the automatic monitoring of any channel that has been selected to pre-fade, either to the monitors or headphones.

For the presenter headphones, SPLIT CUE/PFL can be selected which places the selected source in mono in the left ear, and pre-fade in mono in the right ear.

Metering

A pair of bright 21 segment LED meters can be configured to show either VU or PPM metering. The meters follow the selection of the presenter headphones including any pre-fade or split pre-fade function.

Talkback

A separate TALKBACK button is provided to allow the presenter to talk to a guest on the guest headphones. The S0 uses input channel 1 as the talkback source.

Channel Remotes

The remote outputs for each channel are highly configurable providing a comprehensive range of options to interface external equipment to the mixer. Each channel input has its own START and STOP remote controls which can be triggered when the channel is routed to the PGM or REC bus and the fader is opened or closed. The remotes can be set-up to be either pulsed or continuous latched outputs, and if in pulsed mode the START button has the capability to produce repeated start pulses.

Configuration Settings

The S0 has a range of software configurable options which can be used to customize the operation of the mixer. It is possible to enable or disable specific inputs, enable phantom power for the microphone channels and limit which buses each channel can be routed to. Other settings control auto cancelling of PRE FADE when the channel fader is opened and all the remote output configurations.

The S0 has an integral universal switch mode power supply, which uses an IEC mains inlet.

Installation Notes

Atmosphere

The S0 mixer should be installed in an area which is not subject to excessive heat or cold. Also, you should avoid installing it in atmospheric conditions which are dusty, smoky or dirty, or where there is moisture or vibration. Do not use any liquids to clean the fascia of the mixer: a soft dry brush is ideal. Use a clean cloth moistened with water or ethyl alcohol to clean the trim. Other solvents may cause damage to paint or plastic parts.

Electromagnetic Radiation

Avoid using the S0 mixer close to strong sources of electromagnetic radiation such as, video monitors or high power electric cabling. This may cause degradation of the audio quality due to induced voltages in connecting leads and chassis. In all cases the S0 mixer should be installed and serviced by qualified personnel.

Dimensions and Cut-Out Size for Flush Mounting

External dimensions: 483mm (W) x 356mm (D) x 125mm (H)

The cut-out size is for reference only and should be checked with your mixer.

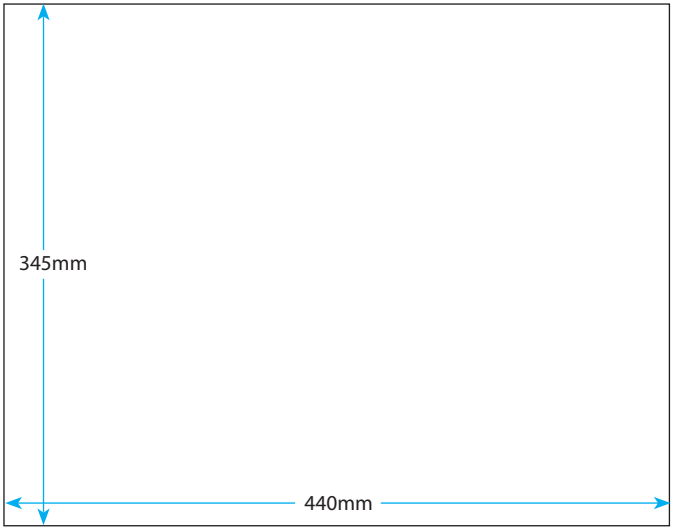


Fig 1-2: S0 Mixer - Cut-out Sizes.

2. User Guide

Many of the options and default settings described in this section can be modified. Full details of all the configuration options and their default settings can be found in the Configuration Options section on page 20.

S0 Input Channels

The S0 has 9 fixed format channels with up to 3 selectable inputs on each channel.

Channels 1-4:	Mono Balanced XLR Microphone / Stereo Unbalanced RCA Line inputs
Channels 5-8:	Dual Stereo Unbalanced RCA Line / USB Audio inputs
Channel 9:	Telephone Interface / Stereo Unbalanced RCA Auxiliary (Rear) / Stereo Unbalanced Jack Auxiliary (Front) inputs

Channels 1-4 Mono Balanced Mic/Stereo Unbalanced Line inputs

MIC INPUT

This mono balanced XLR is the microphone input to the channel. The S0 supports both dynamic (unpowered) and condenser (powered using 48V DC phantom power) microphones. By default, only channel 1 is configured to supply phantom power. The phantom power settings are part of the Configuration Options.

MIC TRIM

This small multi turn screw adjuster sets the amplification level for the microphone input, which is applied prior to the channels TRIM control. The available gain range is from +24dB to +65dB (ref -50dBu input) and allows a wide range of microphone types to be used.

Fig 2-1: Channel 1 Rear Panel Connectors.

LINE INPUT

This stereo unbalanced RCA (phono) is the line input to the channel. It has 10dB of gain at the input and is designed to connect directly to consumer level equipment such as CD players and other hi-fi equipment.

REMOTE OUTPUT

This 6.35mm (¼") stereo jack socket is the remote output for the channel. It can be used to control external equipment such as turning on a "Mic Live" indication, or starting a CD player. There are 2 separate signals, remote start and remote stop, which are both open collector outputs. These signals can be configured to act differently depending on the input selected. The remote output settings are part of the Configuration Options.

MIC / LINE Button

Pressing this button changes the channel input selection between MIC and LINE. The button illuminates red to indicate that the LINE input is selected. When the channel's fader is open, the input selection cannot be changed. When the MIC input is selected, these channels can be configured to supply 48V to microphones requiring Phantom Power.

This button can be disabled so that the selected input cannot be changed. The button operation and phantom power settings are part of the Configuration Options.

Fig 2-2: Channel 1 MIC/ LINE Button.

PGM Button

This button allows the output of the channel to be mixed onto the Program Bus output. The button illuminates green to indicate the channel is active on

the Program Bus. This button can be disabled via the Configuration Options, so that it is permanently on or off.

REC Button

This button allows the output of the channel to be mixed onto the Record bus output. The button illuminates red to indicate the channel is active on the Record Bus. This button can be disabled via the Configuration Options, so that it is permanently on or off.

TRIM Control

This control allows the level of the audio on this channel to be adjusted by ±15dB. This additional gain is applied prior to the channels fader, and is useful for setting relative levels between audio sources on different channels.

Note: It is a good idea to set up all the audio channels so that they are all at the same reference level when the fader is fully up, meaning the mix levels are determined solely by the position of the faders.

PAN/BAL Control

This control has two functions depending on whether MIC or LINE is selected.

In MIC mode the control acts as PAN and allows the mono input to be positioned in the stereo image. With the control in the centre position, the signal is present on both the left and right channels. Turning the control fully anti-clockwise pans the signal to the left by increasing the level by 3dB and the signal on the right channel is turned off. Turning the control fully clockwise pans the signal to the right by increasing the level by 3dB. The signal on the left channel is turned off.

Fig 2-3: Mic/Line Channel Strip.

In LINE mode the control acts as BAL (balance) and is used to alter the stereo image of the stereo input. With the control in the centre position, the signal is un-altered. Turning the control fully anti-clockwise shifts the signal to the left by increasing the gain by 6dB and the signal on the right channel is reduced by 6dB. Turning the control fully clockwise shifts the signal to the right by increasing the gain by 6dB while the signal on the left channel is reduced by 6dB.

CUE PFL Button

Selecting CUE PFL routes the pre-fader input signal to the monitoring section where the signal can be heard on the Monitor, Presenter or Guest headphones (provided that the associated AUTO CUE/PFL button is selected). The level can then be checked on the meters

and adjusted via the TRIM control, and the pan or balance can be set with the PAN/BAL control. Provided that the fader is closed, the signal will not be routed to the PGM or REC outputs even if they are selected. This button is illuminated green to indicate CUE PFL is active and it has a momentary and latched action: if the button is held down, CUE PFL is cancelled when released. There is a Configuration Option to automatically cancel CUE PFL when the fader is opened. This option is enabled by default.

FADER Control

The 100mm VCA fader is a linear level control that operates between fully attenuated in its lowest position to unity gain when fully open.

START Button

This button has a different function depending on whether MIC or LINE is selected. When in MIC mode, the button is an indicator and shows the state of the channel and the remote output as follows:

Off	The channel is not routed to either the PGM or REC bus.
Illuminated Red	The channel is routed to the PGM or REC bus, the fader is closed and the remote stop output is enabled.
Illuminated Green	The channel is routed to the PGM or REC bus, the fader is open and the remote start output is enabled.

This is the default operation when in MIC mode, but this can be changed in the Configuration Options.

When in LINE mode, the button indicates the state of the channel, and also controls the operation of the remote outputs as follows:

Off	The remote outputs are disabled. Pressing the button will enable/ disable the remote outputs, but they can only be disabled when the fader is closed.
Flashing Red	The remote outputs are enabled, but the channel is not currently routed to the PGM or REC bus so the remote start and stop outputs are inactive.
Illuminated Red	The remote outputs are enabled, the channel is routed to the PGM or REC bus and the fader is closed. If the fader is opened, the remote start output will become active and give a momentary pulse for 0.5 seconds.
Illuminated Green	The remote outputs are enabled, the channel is routed to the PGM or REC bus and the fader is open. If the button is pressed, the remote start output will become active and give a momentary pulse for 0.5 seconds.

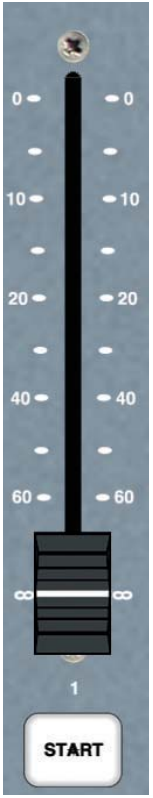


Fig 2-4: Channel 1 FADER Control & START Button.

This is the default operation when in LINE mode, but this can be changed in the Configuration Options.

Channels 5-8 Dual Stereo Unbalanced Line/USB Audio Inputs

LINE INPUTS

The dual stereo unbalanced RCA phonos are the line inputs to the channel. They have 10dB of gain at the input and are designed to connect directly to consumer level equipment such as CD players and other hi-fi equipment. There are two stereo inputs per channel fader.

REMOTE OUTPUT

This 6.35mm (¼") stereo jack socket is the remote output for the channel. It can be used to control external equipment such as starting a CD player. There

Fig 2-5: Channel 5 Rear Panel Connectors.

are 2 separate signals, remote start and remote stop which are both open collector outputs. These signals can be configured to act differently depending on the input selected. The remote output settings are part of the Configuration Options.

INP1/INP2 Button

Pressing this button changes the channel selection between the two LINE inputs. INP1 corresponds to the lower numbered line input, i.e. on channel 5, INP1 is line 5/1 and INP2 corresponds to the higher numbered line input, i.e. on channel 5, INP2 is line 5/2. It can also be configured to allow the USB Audio input to the mixer to be routed to this channel. The button is illuminated red to indicate when the INP2 input is selected, and amber to indicate when the USB Audio input is selected. When the channel's fader is open, the input selection cannot be changed. This button can be disabled so that the selected input cannot be changed. The button operation settings are part of the Configuration Options. By default, channel 8 is enabled for INP1/INP2 and USB Audio to be selectable. For channels 5-7, INP1/INP2 only are selectable.

PGM Button

This button allows the output of the channel to be mixed onto the Program Bus output. The button is illuminated green to indicate the channel is active on the Program Bus. This button can be disabled via the Configuration Options, so that it is permanently on or off.

Fig 2-6: Dual Stereo Channel Input & Bus Selections.

REC Button

This button allows the output of the channel to be mixed onto the Record bus output. The button is illuminated red to indicate the channel is active on the Record Bus. This button can be disabled via the Configuration Options, so that it is permanently on or off.

TRIM Control

This control allows the level of the audio on this channel to be adjusted by ±15dB. This additional gain is applied prior to the channels fader, and is useful for setting relative levels between audio sources on different channels.

Note: It is a good idea to set up all the audio channels so that they are all at the same reference level when the fader is fully up, meaning the mix levels are determined solely by the position of the faders.

BAL Control

This control is used to alter the stereo image of the stereo input. With the control in the centre position, the signal is un-altered. Turning the control fully anti-clockwise shifts the signal to the left by increasing the gain by 6dB with the signal on the right channel reduced by 6dB. Turning the control fully clockwise shifts the signal to the right by increasing the gain by 6dB with the signal on the left channel reduced by 6dB.

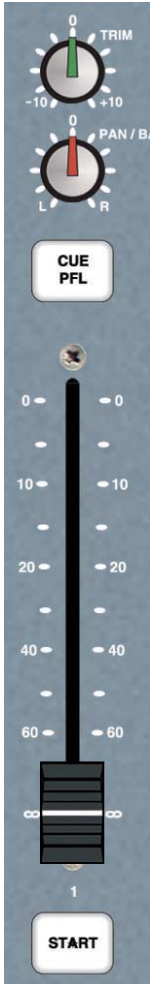


Fig 2-7: Dual Stereo Channel Strip.

CUE PFL Button

Selecting CUE PFL routes the pre-fader input signal to the monitoring section where the signal can be heard on the Monitor, Presenter or Guest headphones (provided that the associated AUTO CUE/PFL button is selected). The level can then be checked on the meters and adjusted via the TRIM control, and the balance set with the BAL control. Provided that the fader is closed, the signal will not be routed to the PGM or REC outputs even if they are selected. This button is illuminated green to indicate CUE PFL is active and it has a momentary and latched action: if the button is held down, CUE PFL is cancelled when released. There is a Configuration Option to automatically cancel CUE PFL when the fader is opened. This option is enabled by default.

FADER Control

The 100mm VCA fader is a linear level control that operates between fully attenuated in its lowest position to unity gain when fully open.

START Button

This button indicates the state of the channel, and also controls the operation of the remote outputs as follows:

Off	The remote outputs are disabled. Pressing the button will enable/disable the remote outputs, but they can only be disabled when the fader is closed.
Flashing Red	The remote outputs are enabled, but the channel is not currently routed to the PGM or REC bus so the remote start and stop outputs are inactive.
Illuminated Red	The remote outputs are enabled, the channel is routed to the PGM or REC bus and the fader is closed. If the fader is opened, the remote start output will become active and give a momentary pulse for 0.5seconds.
Illuminated Green	The remote outputs are enabled, the channel is routed to the PGM or REC bus and the fader is open. If the button is pressed, the remote start output will become active and give a momentary pulse for 0.5 seconds.

This is the default operation, but this can be changed in the Configuration Options.

Channel 9 Telephone Interface/ Stereo Unbalanced Auxiliary Inputs

AUX INPUT

This stereo unbalanced RCA (phono) is the auxiliary input to the channel. It has 10dB of gain at the input and is designed to connect directly to consumer level equipment such as CD players and other hi-fi equipment. There is a second auxiliary 3.5mm stereo jack socket input, which is also routed to channel 9, which is located on the front panel below the monitor mute indicator. The AUX inputs can be mixed or selected independently depending on the Configuration Options chosen.

Fig 2-8: Channel 9 Rear Panel Connectors.

R-BAL and C-BAL Controls

These small multi turn screw adjusters are used to tune the telephone interface to the characteristics of a standard analogue telephone line. They are factory set and should not need to be adjusted.

LINE (Telephone Interface)

This RJ11 socket allows the S0 to be connected directly to an analogue telephone line.

HANDSET

This RJ11 socket is the connection for an analogue telephone handset. With the S0 connected to an analogue telephone line, the handset allows calls to be made and received.

REMOTE OUTPUT

This 6.35mm (¼") stereo jack socket is the remote output for the channel. It can indicate the status of the telephone interface when the channel is in TEL mode, or it can be used to control external equipment such as starting a CD player when the channel is in AUX mode. There are 2 separate signals, remote start and remote stop which are both open collector outputs. These signals can be configured to act differently depending on the input selected. The remote output settings are part of the Configuration Options.

TEL/AUX Button

Fig 2-9: Channel 9 TEL/ AUX Button.

Pressing this button changes the channel input connection between TEL and AUX. There are two auxiliary inputs to channel 9, one on the rear panel and one on the front panel below the monitor mute indicator. By default, these inputs can be independently selected. The button is illuminated red to indicate when the rear panel AUX input is selected, and amber to indicate when the front panel AUX input is selected. When the channels fader is open, the input selection cannot be changed. This button can be disabled so that the selected input cannot be changed. The button operation settings are part of the Configuration Options.

PGM Button

This button allows the output of the channel to be mixed onto the Program Bus output. The button is illuminated green to indicate the channel is active on the Program Bus. This button can be disabled via the Configuration Options, so that it is permanently on or off.

REC Button

This button allows the output of the channel to be mixed onto the Record bus output. The button is illuminated red to indicate the channel is active on the Record Bus. This button can be disabled via the Configuration Options, so that it is permanently on or off.

TRIM Control

This control allows the level of the audio on this channel to be adjusted by ±15dB. This additional gain is applied prior to the channels fader, and is useful for setting relative levels between audio sources on different channels.

Note: It is a good idea to set up all the audio channels so that they are
all at the same reference level when the fader is fully up, meaning the mix levels are determined solely by the position of the faders.

PAN/BAL Control

This control has two functions depending on whether TEL or AUX is selected.

In TEL mode the control acts as PAN and allows the mono input to be positioned in the stereo image. With the control in the centre position, the signal is present on both the left and right channels. Turning the control fully anti-clockwise pans the signal to the left by increasing the level by 3dB and the signal on the right channel is turned off. Turning the control fully clockwise pans the signal to the right by increasing the level by 3dB and the signal on the left channel is turned off.

Fig 2-10: Channel 9 Strip.

In AUX mode the control acts as BAL (balance) and is used to alter the stereo image of the stereo input. With the control in the centre position, the signal is un-altered. Turning the control fully anti-clockwise shifts the signal to the left by increasing the gain by 6dB with the signal on the right channel reduced by 6dB. Turning the control fully clockwise shifts the signal to the right by increasing the gain by 6dB with the signal on the left channel reduced by 6dB.

CUE/PFL & TB Button

Selecting CUE/PFL & TB routes the pre-fader input signal to the monitoring section where the signal can be heard on the Monitor, Presenter or Guest headphones provided the associated AUTO CUE/PFL button is selected. The level can then be checked on the meters and adjusted via the TRIM control, and the pan or balance set with the PAN/BAL control. When the channel is in TEL mode, selecting CUE/PFL & TB also enables talkback from the channel 1 microphone to the caller on the telephone, without having to open the fader on channel 1. Provided the fader is closed, the signal will not be routed to the PGM or REC outputs even if they are selected. This button is illuminated green to indicate CUE/PFL & TB is active, and it has a momentary and latched action; if the button is held down, CUE/PFL & TB is cancelled when released. There is a Configuration Option to automatically cancel CUE/PFL & TB when the fader is opened. This option is enabled by default.

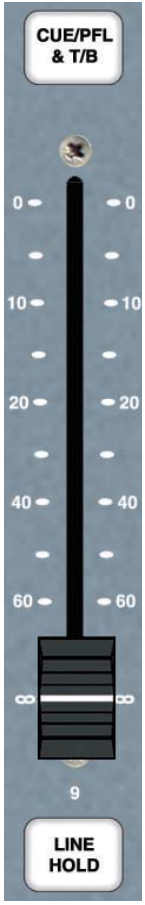


Fig 2-11: CUE/ PFL, Fader & LINE/HOLD Button.

FADER Control

The 100mm VCA fader is a linear level control that operates between fully attenuated in its lowest position to unity gain when fully open.

LINE HOLD Button

This button has a different function depending on whether TEL or AUX is selected. When in TEL mode, the button controls the connection to the telephone line and indicates the state of the connection as follows:

Off	The telephone line is disconnected. The remote stop output is active. Pressing the button will connect the channel to the telephone line.
Flashing Red	The channel is connected to the telephone line, but it is not currently routed to the PGM or REC bus. The remote start output is active. Pressing the button will disconnect the channel from the telephone line.
Illuminated Red	The channel is connected to the telephone line and it is routed to the PGM or REC bus. The remote start output is active. Pressing the button will disconnect the channel from the telephone line.
Pulsing Red	This indicates that the telephone line is ringing. Pressing the button will connect the channel to the telephone line and pick up the call.

This is the default operation when in TEL mode, but this can be changed in the Configuration Options.

When in AUX mode, the button indicates the state of the channel, and also controls the operation of the remote outputs as follows:

Off	The remote outputs as disabled. Pressing the button will enable/disable the remote outputs, but they can only be disabled when the fader is closed.

Flashing Red	The remote outputs are enabled, but the channel is not currently routed to the PGM or REC bus so the remote start and stop outputs are inactive.
Illuminated Red	The remote outputs are enabled, the channel is routed to the PGM or REC bus and the fader is closed. If the fader is opened, the remote start output will become active and give a momentary pulse for 0.5 seconds.
Illuminated Green	The remote outputs are enabled, the channel is routed to the PGM or REC bus and the fader is open. If the button is pressed, the remote start output will become active and give a momentary pulse for 0.5 seconds. If the fader is closed, the remote stop will become active and give a momentary pulse for 0.5 seconds.

This is the default operation when in AUX mode, but this can be changed in the Configuration Options.

Main Outputs

The S0 has 2 main outputs mounted on the rear panel.

PROGRAM OUTPUT

This is the main mixing desk output which would normally be connected to the transmission or encoding system. All input channels that have the PGM bus selected and the fader open will be mixed onto this stereo balanced XLR output.

Fig 2-12: Mains Outputs.

RECORD OUTPUT

The record output provides an independent mix that would typically be used as a record source for jingles, program content and pre-recorded interviews. All input channels that have the REC bus selected and the fader open will be mixed onto this stereo unbalanced RCA (phono) output. By default, the content of the record output is also routed to the USB Audio output channel. This can be changed so that the program output audio is routed to the USB Audio output channel. See the USB Audio section on page 29 for more details.

S0 Monitor I/O & USB Channels

MONITOR OUTPUT

This stereo unbalanced 6.35mm (¼") socket output is typically used to feed the studio monitor speakers. This output is automatically muted if a microphone channel is routed to the PGM or REC bus and the fader is open. This is to stop unwanted feedback. A suitable external amplifier is required to drive the loudspeakers from this output. Alternatively, active loudspeakers can be connected directly.

LIGHT CONTROL

This 6.35mm (¼ inch) socket provides a switching contact to allow an external "MIC LIVE" indicator to be controlled. The connector provides a normally open switch between the Tip and Sleeve, and a normally closed switch between the Ring and the Sleeve. The switch is activated when a microphone channel is routed to the PGM or REC bus and the fader is open.

Fig 2-13: MONITOR I/O & USB.

PRESENTER Headphones

This stereo 6.35mm (¼”) socket is the feed to the presenter headphones. It is wired in parallel with the presenter headphone connector on the front panel of the mixer.

GUEST Headphones

This Stereo 6.35mm (¼ inch) socket is the feed to the guest headphones. It is wired in parallel with the guest headphone connector on the front panel of the mixer.

H/PHONE LIMIT Control

This small multi turn screw adjuster sets the maximum audio level of the signal fed to the presenter and guest headphones. It is designed to protect the headphone users from excessive audio levels. Once the audio level exceeds the limit threshold, the audio feed to the headphones remains at the limit level. When the limiter is active, the audio may become distorted. If this happens either reduce the audio level of the headphone signal or increase the headphone limit level. **Note:** This limiter has been added to protect the hearing of the users of this mixer, so please use the H/PHONE LIMIT control sensibly.

USB AUDIO

This USB Type B connector is the bi-directional USB Audio port that provides a USB Audio output of the signal on the REC or PGM bus, and can accept a USB Audio input which is routed to channels 5-8. The USB Audio input signal can also be routed automatically to the CUE/PFL bus allowing the audio to be heard in any on the monitor channels that have the AUTO CUE/PFL selected. This setting is part of the configuration options. See the USB Audio section on page 29 for more details.

USB SERIAL

This USB Type B connector provides the USB Serial port to allow the S0 to be connected to a PC. Using this connection, the Configuration Options can be modified using the Sonifex SCi software. Full details of all the configuration options and their default settings can be found in the Configuration Options section on page 20.

EXT 1 INPUT

These stereo unbalanced RCA phonos provides an external input that would typically be used to monitor the on-air or post-processor output to ensure it is correct.

LED Meter Display

The LED Meters give a visual representation of the audio routed to the presenter headphones including CUE/PFL and SPLIT CUE/PFL signals. They can be configured to display either PPM or VU. The PPM meters have a 1-7 scale and are configured such that a 1 kHz signal, at 0dBu at the PGM output, will indicate a meter reading of 4. Each mark on the PPM scale indicates a 4 dB change in signal level. The VU meter operates between -20 and +3 volume units and follows the standard definition for a VU meter. A red LED indicates which scale is currently selected. To change scale, ensure all faders are closed, press and hold the PGM button and then press the EXT 1 button.

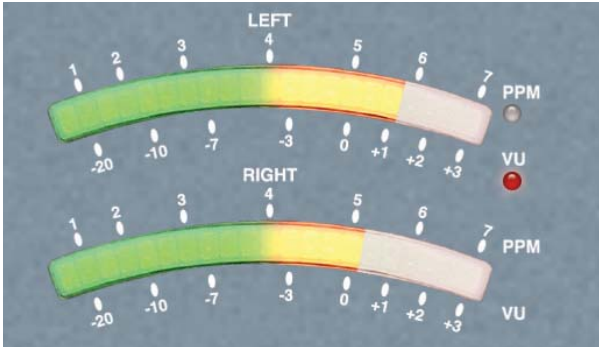


Fig 2-14: LED Meter Display.

PGM, REC & EXT 1 Buttons

These buttons select the source for the monitoring section of the S0. The selected source will be routed to the monitor output and the presenter and guest headphones. These buttons do not affect the signals on the Main Program and Record outputs. The PGM button illuminates green, the REC button illuminates red and the EXT 1 button illuminates amber when selected. One button is selected at all times.

Fig 2-15: PGM, REC and EXT 1 Buttons.

Monitor, Presenter & Guest Level Controls

These controls independently adjust the volume of the signals sent to the loudspeaker monitor, presenter and guest headphones. The presenter and guest outputs are protected by a level limiter that restricts the audio level fed to the headphones.

Monitor AUTO CUE/PFL Button

When this button is selected, the normal output fed to the monitor loudspeaker will be replaced if one or more input channels have CUE PFL selected. The channels with CUE/PFL selected will be mixed and fed to this output without having to have the fader open. This button illuminates green when selected.

Monitor MUTE Indicator

This indicator illuminates to show when the monitor loudspeaker output has been automatically muted due to one of the microphone channels being open and routed to the PGM or REC bus. The LIGHT CONTROL output on the rear panel gives the option to use an external indicator to show when the monitor loudspeaker is muted, i.e. when a microphone output is active.

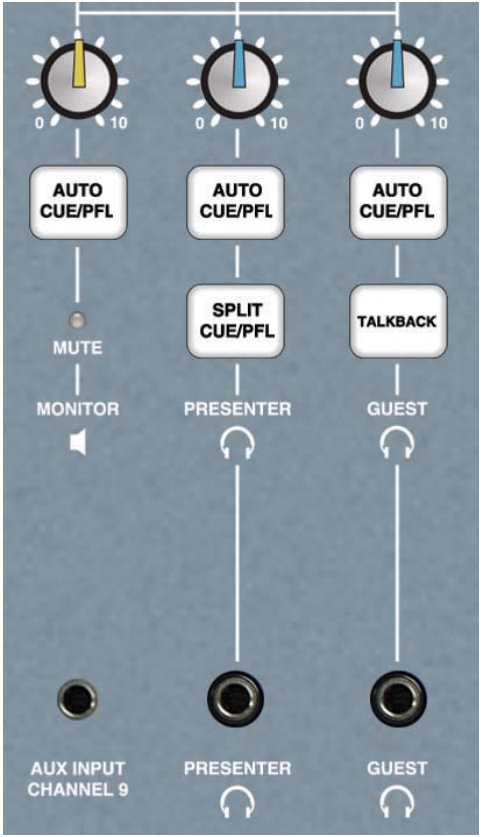


Fig 2-16: Monitor, Presenter and Guests Controls.

AUX INPUT CHANNEL 9

This stereo unbalanced 3.5mm jack socket is the auxiliary input to channel 9. It has 10dB of gain at the input and is designed to connect directly to consumer level equipment. This input is in addition to the primary auxiliary input on the rear panel.

Presenter AUTO CUE/PFL Button

When this button is selected, the normal output fed to the presenter's headphones will be replaced if one or more input channels have CUE/PFL selected. The channels with CUE/PFL selected will be mixed and fed to this output without having to have the fader open. This button illuminates green when selected.

Presenter SPLIT CUE/PFL Button

This button allows the presenter to simultaneously monitor the selected source (PGM, REC or EXT 1), and any channel that has CUE/PFL selected. The selected source is routed in mono to the left ear and the CUE/PFL channels are routed in mono to the right ear. This button can only be selected if the presenter AUTO CUE/PFL button is selected and it illuminates amber when selected.

PRESENTER Headphones

This stereo 6.35mm (¼") socket is the feed to the presenter headphones. It is wired in parallel with the presenter headphone connector on the rear panel of the mixer.

Guest AUTO CUE/PFL Button

When this button is selected, the normal output fed to the guest's headphones will be replaced if one or more input channels have CUE/PFL selected. The channels with CUE/PFL selected will be mixed and fed to this output without having to have the fader open. This button illuminates green when selected.

Guest TALKBACK Button

This button allows a presenter using a microphone on channel 1 to communicate with the guest via the guest headphones. When the button is selected, the microphone signal on channel 1 is routed to the guest headphones without the need to select CUE PFL or open the fader on channel 1. This button is illuminated red to indicate that TALKBACK is active, and it has a momentary and latched action; if the button is held down, TALKBACK is cancelled when released.

GUEST Headphones

This stereo 6.35mm (¼") socket is the feed to the guest headphones. It is wired in parallel with the guest headphone connector on the rear panel of the mixer.

Using the Telephone Interface

The Telephone Interface built into the S0 allows you to directly connect a standard analogue telephone line and telephone handset. You can then route telephone calls through the S0 mixing desk allowing you to perform telephone interviews, broadcast requests or host 'phone in' style programs.

Connect the LINE connector on the rear of the S0 to a standard analogue telephone line using a suitable cable. Connection to a standard BT phone socket will typically require a cable with a male RJ11 to a BT phone plug. Connect the HANDSET connector on the rear of the S0 to a standard telephone handset. If all the connections are correct, on lifting the telephone handset, a standard dial tone should be heard.

Making A Telephone Call and Routing It Through The S0

1. Connect all cables as described above.
2. Select TEL mode on channel 9. The TEL/AUX button should not be illuminated.
3. Ensure the LINE HOLD button is not selected.

4. Using the telephone handset, dial the required number.
5. When the call is answered, it can be transferred to the S0. Ensure the fader on channel 9 is closed and then press CUE/PFL & TB. This will automatically activate the LINE HOLD button which will connect the call to the S0. The presenter can talk to the person on the telephone via microphone channel 1 and listen on the headphones, but the audio will not be routed to the PGM or REC bus outputs.
6. The telephone handset can now be replaced if required.
7. To put the call to air, open the fader on channel 9. The audio will appear on the selected PGM or REC output.
8. To terminate the call, close the fader on channel 9 and press the LINE HOLD button to disconnect the mixer from the telephone line.

Receiving A Telephone Call and Routing It Through The S0

1. When a telephone call is received, the handset will ring, and the LINE HOLD button will pulse to indicate a caller is waiting.
2. The call can be answered either by lifting the telephone handset, or by pressing the CUE/PFL button. Ensure the fader on channel 9 is closed. The presenter can talk to the person on the telephone via microphone channel 1 and listen on the headphones. Provided the fader is closed, the audio will not be routed to the PGM or REC bus outputs.
3. If the telephone handset was used, it can now be replaced if required.
4. To put the call to air, open the fader on channel 9. The audio will appear on the selected PGM or REC output.
5. To terminate the call, close the fader on channel 9 and press the LINE HOLD button to disconnect the mixer from the telephone line.

Skype On CHANNEL 9

The latest upgrade to the S0 mixer allows a presenter to operate Skype on channel 9, with the only interconnection being a USB cable. The S0's USB audio feature has previously allowed either PROGRAMME or RECORD bus audio (selected by jumper) to be routed to a PC via USB interface for the purpose of audio recording, with a return path useful for providing a pre-fade listen (PFL) for a playout system.

The upgrade gives you a third option, allowing the cleanfeed output from the telco channel to be routed to a PC via the USB. Setting both the "microphone" and "speakers" within Skype to 'S0' then allows full duplex communication between the S0 presenter and a caller, enabling the user to audition the caller on PFL to set levels before either going to air or recording a feature. See Appendix 2, S0 Skype Modification.

3. Configuration Options

The S0 has a range of configuration options that allow different aspects of the mixer's operation to be customised. This can be done using the Sonifex SCi software that runs on a PC, or through a dedicated setup mode on the mixer itself.

Modifying the Configuration Options Using Setup Mode

The setup mode allows the configuration options to be modified directly, without the need to connect the S0 to a PC. The configuration settings are presented in pages, with the current page displayed on the PPM scale on the LED meters display. To change a setting, first select the relevant page, then using the details in the table below, press the relevant button to select the required option setting. The buttons used to select the settings will continually flash a number of times to indicate the current setting. For example, for a setting with mode 4 selected, a button would repeatedly flash 4 times with a short pause between each sequence of 4 flashes.

To Enter Setup Mode:

1. Ensure all faders are closed.
2. Press and hold the Monitor, Presenter and Guest AUTO CUE/PFL buttons.
3. Press the Monitor PGM button 5 times within 2 seconds.
4. A single sweep on the LED meters indicates that setup mode has been entered and the buttons can be released.

To change the current page, press the Guest TALKBACK button. The LED meters display will indicate the new page on the PPM scale.

To Exit Setup Mode:

1. Press and hold the Guest TALKBACK button for 2 seconds.
2. A dual sweep on the LED meters indicates return to normal operation and the button can be released.

To return all configuration options to the default settings:

1. Remove power from the unit.
2. Ensure all faders are closed.
3. Press and hold the Monitor REC, Monitor AUTO CUE/PFL, Presenter AUTO CUE/PFL and Guest AUTO CUE/PFL buttons.
4. Apply power to the unit. A single sweep on the LED meters indicates that the configuration options are being returned to defaults. The buttons can be released.
5. A dual sweep on the LED meters indicates return to normal operation.

Page 1 – Input Select Modes (LED on PPM Scale 1)

Channels 1-4 Input Select Modes are set using the MIC/LINE buttons for each channel.

Mode 1	MIC & LINE inputs available for selection. Phantom power is off (default for channels 2-4).
Mode 2	MIC & LINE inputs available for selection. Phantom power is on (default for channel 1).
Mode 3	MIC input only, the button is disabled. Phantom power is off.
Mode 4	MIC input only, the button is disabled. Phantom power is on.
Mode 5	LINE input only, the button is disabled. Phantom power is off.

Channels 5-8 Input Select Modes are set using the INP1/INP2 buttons. INP1 refers to the line input with the lower number on the channel i.e. on

channel 5 INP1 is LINE 5/1. INP2 refers to the line input with the higher number on the channel i.e. on channel 5 INP2 is LINE 5/2.

Mode 1 INP1 & INP2 inputs available for selection (default for channels 5-7).

Mode 2 INP1 input only, the button is disabled.

Mode 3 INP2 input only, the button is disabled.

Mode 4 INP1 & USB Audio inputs available for selection.

Mode 5 INP2 & USB Audio inputs available for selection.

Mode 6 USB Audio input only, the button is disabled.

Mode 7 INP1 & INP2 & USB Audio inputs available for selection (default for channel 8).

Channel 9 Input Select Modes are set using the TEL/AUX button. AUX1 refers to the AUX input on the rear panel. AUX2 refers to the AUX input on the front panel.

Mode 1 TEL & AUX1 & AUX2 inputs available for selection (default).

Mode 2 TEL & AUX1 inputs available for selection.

Mode 3 TEL & AUX2 inputs available for selection.

Mode 4 TEL input only, the button is disabled.

Mode 5 AUX1 & AUX2 inputs available for selection.

Mode 6 AUX1 input only, the button is disabled.

Mode 7 AUX2 input only, the button is disabled.

Channel 9 Cleanfeed Control when CUE/PFL TALKBACK is active. This is set using the CUE/PFL TALKBACK button.

Mode 1 Cleanfeed is muted when CUE/PFL TALKBACK is active (default).

Mode 2 Cleanfeed level is reduced when CUE/PFL TALKBACK is active.

USB Audio Input CUE/PFL Mode. This is used to automatically route the USB Audio input to the CUE/PFL bus allowing it to be monitored on the Monitor, Presenter and Guest Headphone outputs. It is set using the Monitor AUTO CUE/PFL button.

Mode 1 The USB Audio input is automatically routed to the CUE/PFL bus as well as being available on channels 5-8 (default).

Mode 2 The USB Audio input is not routed to the CUE/PFL bus.

Press the guest talkback button to go to page 2.

Page 2 – PGM and REC Button Modes (LED on PPM Scale 2)

PGM Button Modes are set using the PGM buttons on channels 1-9 and can be activated on a per channel basis.

Mode 1 PGM is selectable (default).

Mode 2 PGM is always on, the button is disabled.

Mode 3 PGM is always off, the button is disabled.

REC Button Modes are set using the REC buttons on channels 1-9 and can be activated on a per channel basis.

Mode 1 REC is selectable (default).

Mode 2 REC is always on, the button is disabled.

Mode 3 REC is always off, the button is disabled.

Page 3 – PFL Modes (LED on PPM Scale 3)

CUE/PFL Automatic Cancel Mode is set using the CUE/PFL buttons on channels 1-9 and can be activated on a per channel basis.

Mode 1 CUE/PFL is automatically cancelled when the fader is opened (default).

Mode 2 CUE/PFL is not automatically cancelled when the fader is opened.

AUTO CUE/PFL Button Modes are set using the Monitor, Presenter and Guest AUTO CUE/PFL buttons.

Mode 1 AUTO CUE/PFL is selectable (default).

Mode 2 AUTO CUE/PFL is always on, the button is disabled.

Mode 3 AUTO CUE/PFL is always off, the button is disabled.

Page 4 – Remote Output Modes (LED on PPM Scale 4)

Remote Output Modes are set using the START buttons on channels 1-8 and the LINE HOLD button on channel 9. The Remote output modes are set independently for all inputs on each channel. The input select buttons on each channel select which input the remote mode is assigned to. A channel is considered active when either PGM or REC is selected and the fader is open.

Mode 1 Latching remote start when channel or LINE HOLD is active. Latching remote stop when channel or LINE HOLD is inactive.

Mode 2 Momentary remote start for 0.5 seconds when the channel becomes active. Additional momentary remote starts, for 0.5 seconds each, can be activated by pressing the START button. Momentary remote stop for 0.5 seconds when the channel becomes inactive.

Mode 3 Momentary remote start for 0.5 seconds when the channel becomes active. Repeat start is disabled. Momentary remote stop for 0.5 seconds when the channel becomes inactive.

Mode 4 The remote outputs are disabled.

Mode 5 Remotes and START button states are set by USB Serial commands.

Mode 6 Latching remote start when LINE HOLD is active, telephone line ringing indicated on remote stop. Available for selection on channel 9 TEL mode only.

Defaults:	Channels 1-4	MIC	Mode 1
		LINE	Mode 2
	Channels 5-8	INP1	Mode 2
		INP2	Mode 2
		USB Audio	Mode 2
	Channel 9	TEL	Mode 6
		AUX Rear	Mode 2
		AUX Front	Mode 2

The CUE/PFL buttons are used to set whether the remotes are active when CUE/PFL is activated and deactivated or not.

Mode 1 Remotes are active when CUE/PFL is activated/deactivated (default).

Mode 2 Remotes are not active when CUE/PFL is activated/deactivated.

Modifying the Configuration Options Using SCi Software

Sonifex SCi software is a free of charge software package available to configure the S0 Mixer, as well as many other Sonifex products. The S0 Mixer is supported in SCi version 2.0.5 and above. SCi is designed to run on a computer running Microsoft Windows® XP or later.

Download the latest SCi Software

This is located on the Sonifex website in the Sonifex Downloads section: http://www.sonifex.co.uk/technical/software/index.shtml

Download and then run the installer, and follow the on screen instructions to install the software.

Connecting the USB Serial Port

The S0 uses a USB Serial port instead of a standard RS232 with a 9-way 'D' type connector. Connect the S0 to a spare USB port on the computer using a standard USB lead. The computer will automatically install the required drivers when the S0 is connected for the first time.

Using SCi For The First Time

Once the S0 Mixer is connected to the computer, launch the SCi program. The first thing to appear is the SCi Launcher which shows a list of current devices, which initially will be blank. Click on the large "plus" button to start the device discovery scan. The SCi Device List will be shown and the software will search for any Sonifex products that are connected to the computer's serial and network ports. Once the scan is complete, the S0 Mixer should appear in the Device List window. If it is not listed, check the cable between the S0 and the computer and that the S0 is powered and repeat the scan. With the scan successfully completed, the Device List can be closed and the Launcher should now show the devices that were discovered. If the S0 is in the list, but it has been reported as "Not Supported", this indicates that the specific driver file for the S0 is not installed. Visit the Sonifex website to download the S0 driver, restart SCi and repeat the device discovery scan.

Fig 3-1: SCI Launcher Window.

Click on the S0-Mixer entry to launch the S0 SCi interface.

SCi for the S0

The S0 SCi interface offers an alternative method of setting the configuration options. The available options are divided into 3 main sections; Channel Configuration, Monitor Configuration and Info & Updates. The bottom of the main screen shows the product and version information of the connected unit.

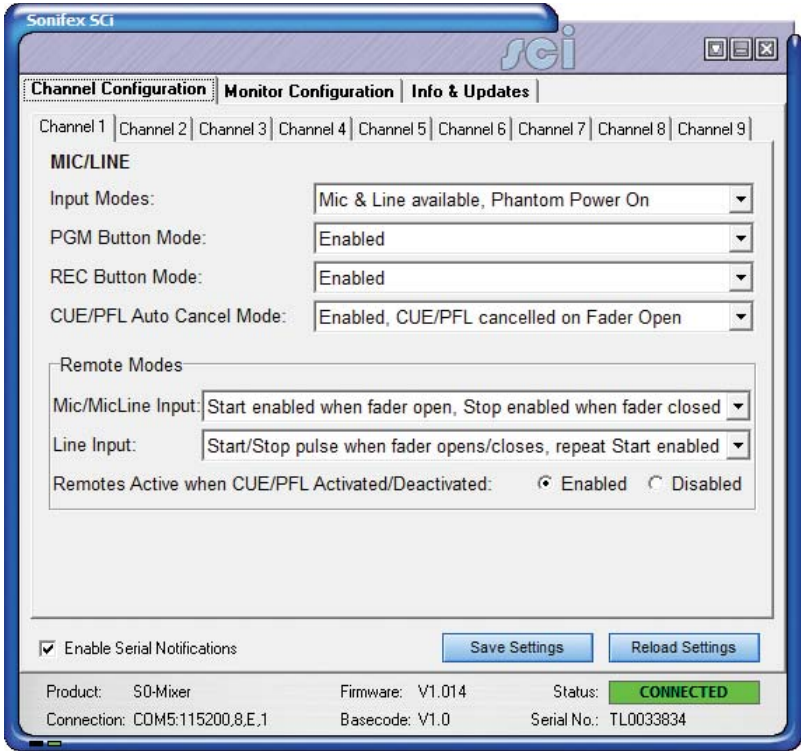


Fig 3-2: SCI Channel Configuration Screen.

The first tab shows the Channel Configuration options. The settings are shown individually for each of the 9 input channels and set the input and button modes and the remotes operation. To change the settings on any channel, first select the relevant channel and then select the required settings for that channel.

This tab also has a general option to enable notification messages to be sent via the USB Serial port when the state of any of the channel or monitor controls change. This allows user developed control software to respond to these changes.

The second tab shows the Monitor Configuration options.

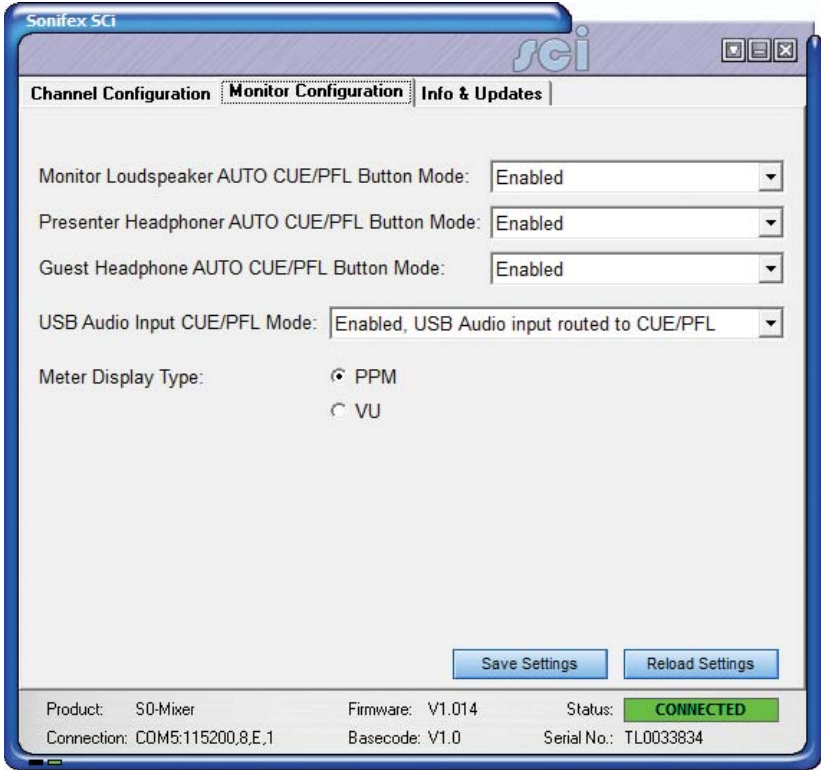


Fig 3-3: SCI Monitor Configuration Screen.

These settings control the operation of the AUTO CUE/PFL button modes and the audio meter display type. This section also controls the USB Audio input CUE/PFL mode. This determines whether the USB Audio input channel is automatically routed to the monitor section. If enabled, the USB Audio input will be available on any of the monitor channels that have the AUTO CUE/PFL function enabled.

To store the configuration option settings onto the connected S0, press the Save Settings button. The S0 will then restart with the new option values.

The current configuration option settings on the connected S0 can be reloaded into SCi at any point by pressing the Reload Settings button. Any changes made since the settings were last reloaded or saved will be lost.

The last tab, Info & Updates allows the current configuration settings in SCI to be saved to a file on the computer. This makes it easier to configure multiple units with the same configuration settings. First select the required settings in the Channel and Monitor Configuration tabs, and then press the Save Configuration button. A save dialog will be displayed allowing the filename to be entered. Upon pressing the save button the current settings will be stored in the selected file. These settings can then be loaded whilst connected to a different unit by pressing the Load Configuration button. The settings stored in the file will be loaded into SCI and automatically uploaded into the connected S0.

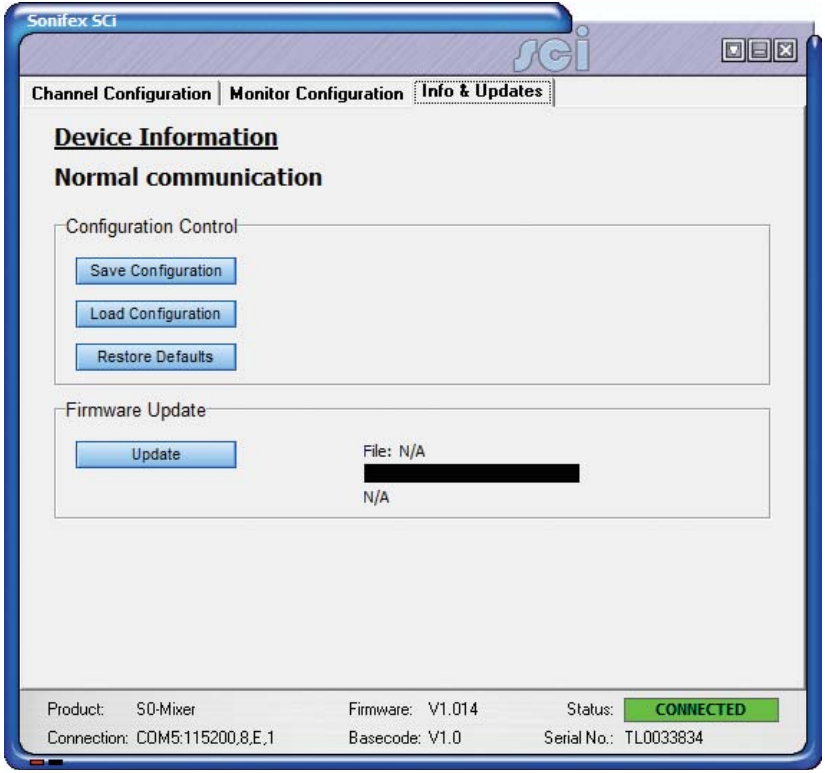


Fig 3-4: SCI Info & Updates Screen.

The Restore Defaults button returns the configuration options on the connected S0 to factory default settings.

The Firmware Update function allows the S0 firmware to be regularly updated with new features and bug fixes. New firmware releases will be made available on the Sonifex website. To update the firmware, press the Update button and select the firmware file. The update only takes a few minutes and the process can be monitored on the progress bar on SCi and the meter display on the S0, which gradually changes from fully illuminated to off. When the update is complete, the S0 will automatically reboot and SCi will reconnect and show the new firmware version number.

The S0 is designed to power up in the same state it was in when power was removed. It is possible to clear these saved settings so the mixer starts with all buttons and routing switched off, except for those enabled by the default configuration options:

1. Ensure all faders are closed.
2. Press and hold the Monitor EXT1, Monitor AUTO CUE/PFL, Presenter AUTO CUE/PFL and Guest AUTO CUE/PFL buttons.
3. Press Reset Switch as shown in image below. A single sweep on the LED meters indicates that the saved states are being reset. The buttons can be released.
4. A dual sweep on the LED meters indicates return to normal operation.

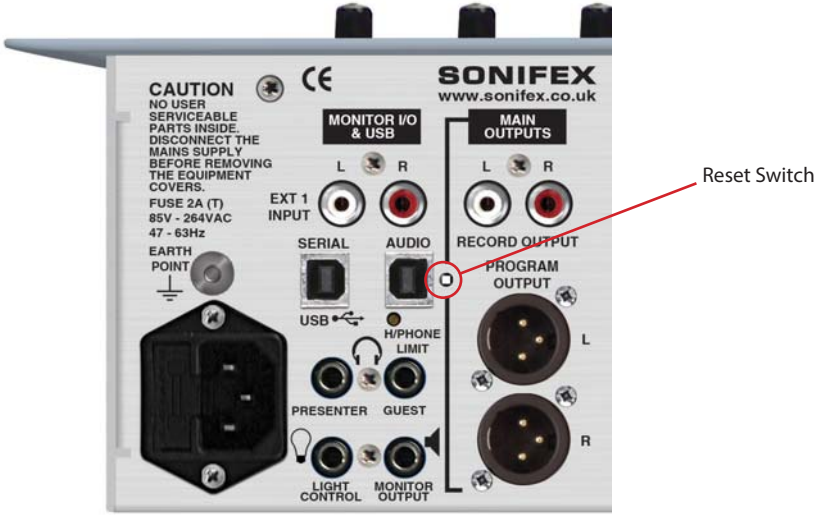


Fig 3-5: Reset Switch.

4. USB Audio

The USB Audio port on the S0 allows live audio transfer between the mixer and a computer or other compatible USB Audio device. This effectively provides an additional input channel to the mixer that can be routed to channels 5-8, and a simultaneous output which contains the audio from either the PGM or REC output. The stereo USB Audio port is configured to run at a sample rate of 44.1 kHz with 16 bit samples in both directions.

No special software drivers are required; simply connect a standard USB cable between the S0 and the computer. To check that a connection has been made, open the Device Manager in Microsoft Windows®, and locate the Sound, video and game controllers section. A new entry should appear “S0 USB Audio”.

Fig 4-1: PC Device List.

USB Audio Output from the S0

The USB Audio output from the S0 is, by default, encoded from the audio signal on the REC bus. It is possible to change this so that the USB Audio output is encoded from the audio signal on the PGM bus. This involves changing 2 jumper settings that are located on the PCB directly under the front panel on the S0. Contact Sonifex Technical Support for details on how to change these settings.

Once the USB Audio port is connected to a computer, it is possible to listen to and record the audio. Microsoft Windows® identifies the USB Audio input from the S0 as an additional Line input recording device with the device name S0 USB Audio.

USB Audio Input to the S0

Microsoft Windows® identifies the USB Audio output from the computer as an additional Line output playback device with the device name S0 USB Audio. The USB Audio input to the S0 is decoded and routed to channels 5-8. The USB Audio input on these channels is selected when the INP1/INP2 button is illuminated amber. It might be necessary to change the configuration options to enable this input to be selected. The USB Audio input can also be used as a pre-fade input such that the audio is automatically routed to any of the monitor and headphone outputs with AUTO CUE/PFL selected once audio is present.

5. Connectors and Cabling

Many of the problems associated with installing and maintaining a mixing console are due to the use of poor cables or faulty connections. It is recommended that, wherever possible, pre-wired cables are purchased from recommended manufacturers. If you need bespoke cables making, please ensure that a qualified engineer carries out the work.

The main types of connectors used with the S0 mixers are the following:

XLR 3 Pin Connectors

The following diagram shows the pin details for the 3 pin XLR sockets and plugs:

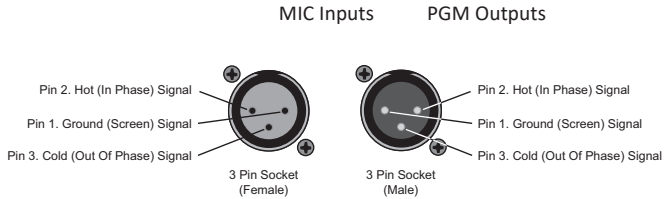


Fig 5-1: XLR 3 Pin Connectors.

RCA (Phono) Connectors

This connector is used on the LINE, AUX (Rear) and EXT1 inputs and the REC output.

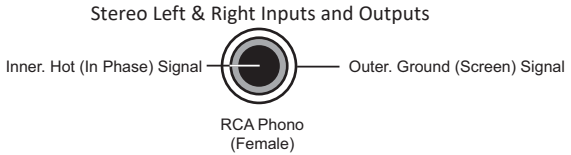


Fig 5-2: RCA (Phone) Connectors.

6.35mm (¼") 'A' Gauge Stereo Jack Plugs

This connector is used on the Monitor Loudspeaker output and the Presenter and Guest headphone outputs.

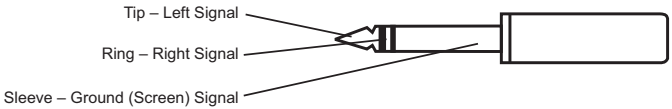


Fig 5-3: 6.35mm (¼ inch) 'A' Gauge Stereo Jack Plugs Used For Headphones And Monitor Outputs.

This connector type is also used on the Remote Outputs.

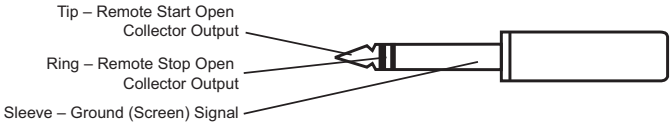


Fig 5-4: 6.35mm (¼ inch) 'A' Gauge Stereo Jack Plugs Used For Remote Outputs.

This connector type is also used on the Light Control Output.

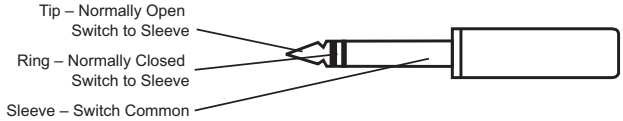


Fig 5-5: 6.35mm (¼ inch) 'A' Gauge Stereo Jack Plugs Used For Light Control Output.

Technical Specification For S0

Mic Inputs Audio Specification	
Input Impedance:	> 1k5Ω electronically balanced
Input Gain Range:	Preset pot +24dB to +67dB ref -50dBu, TRIM pot ± 15dB
Frequency Response:	40Hz to 20kHz –1dB, +0dB
Mic input E.I.N.:	-130dB with 150Ω source
Phantom Power:	+48V to each mic input (SCi selectable)
Common Mode Rejection Ratio:	> 60dB typically
Pan Range:	Off/-3dB Centre/Off

Stereo Line Inputs Audio Specification	
Input Impedance:	> 20kΩ electronically unbalanced
Input Gain Range:	+10dB ref 0dBu at PGM output, TRIM pot ± 15dB
Frequency Response:	20Hz to 20kHz –0.5dB, +0dB
Noise (20Hz-20kHz):	-92dBu ref 0dB (fader down, no routing)
Total Harmonic Distortion:	0.015% at 1kHz, 0.015% at 10kHz ref +8dBu
Balance Range:	± 6dB

Outputs Audio Specification	
Output Impedance:	PGM output: < 50Ω electronically balanced REC output: < 75Ω unbalanced Monitor output: < 75Ω unbalanced Headphone output load: > 16Ω, recommended 250Ω
Maximum Output:	PGM output: +26dBu balancedREC output: Level:+16dBu unbalanced

Input & Output Connections	
Audio Inputs:	4 x Microphone XLR-3 pin sockets 12 x Pair stereo line RCA phono sockets 1 x Pair stereo aux RCA phono sockets 1 x Stereo aux 3.5mm jack socket
Audio Outputs: PGM: REC:	 2 x XLR-3 pin plug (balanced) 1 x Stereo pair RCA phono sockets
Monitor Inputs:	1 x Stereo pair RCA phono sockets
Monitor Outputs:	5 x 6.35mm (1/4”) stereo jack sockets (2 x presenter, 2 x guest, 1 x loudspeaker)
Remote Outputs:	9 x 6.35mm (1/4”) stereo jack sockets (one per channel) 1 x 6.35mm (1/4”) stereo jack socket for light control
Telephone:	2 x RJ11 6/4 (1 x line, 1 x handset)
USB Audio:	1 x Type-B receptacle

USB Serial:	1 x Type-B receptacle
Mains Input:	Filtered IEC, continuously rated 85-264VAC, 47-63Hz, 45w nominal, 50w peak
Fuse Rating:	Anti-surge fuse 2A 20 x 5mm

Equipment Type	
S0:	S0 radio broadcast mixer

Physical Specification	
Dimensions (Raw):	48.3cm (W) x 35.6cm (D) x 12.5cm (H) 19” (W) x 14” (D) x 4.9” (H)
Dimensions (Boxed):	67cm (W) x 44cm (D) x 25cm (H) 26.4” (W) x 17.3” (D) x 9.84” (H)
Cut-Out Dimensions:	44cm (W) x 34.7cm (D) 17.32” (W) x 13.66” (D)
Weight:	Nett: 8.5kg Gross: 10.12kg Nett: 18.7lb Gross: 22.26lb

7. Appendix 1: S0 – USB Serial Command Set

The USB Serial Port Settings are: BAUD: 115200, DATA BITS: 8, STOP BITS: 1, PARITY: EVEN.
All commands sent to the S0 should be terminated with Carriage Return.

Get serial number
Returns the factory set serial number of the unit
Command to S0 Response from S0
SER: **SER:ccccccc**
where c = 7 digit serial number

Get unit ID
Returns the unit identifier specific to the S0 mixer
Command to S0 Response from S0
UID: **UID:S0**

Read firmware version information
Returns the firmware version number
Command to S0 Response from S0
VER: **VER:m.nnn**
where m = major version number
nnn = minor version number

Return all settings to defaults
Resets all settings to factory defaults
Command to S0 Response from S0
DSU: **ACK:**

Get channel control status
Returns the control states for the specified channel
Command to S0 Response from S0
STAC:c **STAC:ss** if the command was successfully completed
ERR if the parameter is out of range
where c = channel identifier (1-9),
ss = channel status (0-3Fh)
channel status =
bits 1:0 = input selected (0=input1, 1=input2, 2=input3)
bit 2 = PGM bus state (0=off, 1=on)
bit 3 = REC bus state (0=off, 1=on)
bit 4 = PFL bus state (0=off, 1=on)
bit 5 = fader state (0=down, 1=up)

Get all channels control status
Returns the control states for all channels
Command to S0 Response from S0
STAC:0 **STAC:11_22_33_44_55_66_77_88_99**
where 11 = channel status
22 = channel 2 status
33 = channel 3 status
44 = channel 4 status
55 = channel 5 status
66 = channel 6 status
77 = channel 7 status
88 = channel 8 status
99 = channel 9 status
channel status = bits 1:0 = input selected (0=input1, 1=input2, 2=input3)
bit 2 = PGM bus state (0=off, 1=on)
bit 3 = REC bus state (0=off, 1=on)
bit 4 = PFL bus state (0=off, 1=on)
bit 5 = fader state (0=down, 1=up)

Get START button LED status
Returns the status of the START button on the specified channel
Command to S0 Response from S0
STAS:c **STAS:s** if the command was successfully completed
ERR if the parameter is out of range
where c = channel identifier (1-9)
s = LED state (0-9) 0 = off
1 = red
2 = green
3 = amber
4 = flash red
5 = flash green

6 = flash amber
7 = flash red/green
8 = flash red/amber
9 = flash green/amber

Select input on a channel
Sets the input on the specified channel
Command to S0 Response from S0
RCIP:ci **ACK** if the command was successfully completed
ERR if the command could not be completed or the parameters are out of range
where c = channel identifier (1-9)
i = input selection (1-3)

Select PGM on a channel
Enables/disables PGM on the specified channel
Command to S0 Response from S0
RCPG:cp **ACK** if the command was successfully completed
ERR if the command could not be completed or the parameters are out of range
where c = channel identifier (1-9)
p = PGM control (0=off, 1=on)

Select REC on a channel
Enables/disables REC on the specified channel
Command to S0 Response from S0
RCRE:cr **ACK** if the command was successfully completed
ERR if the command could not be completed or the parameters are out of range
where c = channel identifier (1-9)
r = REC control (0=off, 1=on)

Select PFL on a channel
Enables/disables PFL on the specified channel
Command to S0 Response from S0
RCPF:cp **ACK** if the command was successfully completed
ERR if the command could not be completed or the parameters are out of range
where c = channel identifier (1-9)
p = PFL control (0=off, 1=on)

Select START on a channel (Line Hold for channel 9 if input 1 is selected)
Emulates START button press on the specified channel
Command to S0 Response from S0
RCST:cs **ACK** if the command was successfully completed
ERR if the command could not be completed or the parameters are out of range
where c = channel identifier (1-9)
s = START control (0=off, 1=on)

Set START button LED states
Sets the state of the START button on the specified channel
Note: Only valid when the Remote Mode for the current input on the specified channel is set to USB Serial Control
Command to S0 Response from S0
RCSL:cs **ACK** if the command was successfully completed
ERR if the command could not be completed or the parameters are out of range
where c = channel identifier (1-9)
s = LED state (0-9) 0 = off
1 = red
2 = green
3 = amber
4 = flash red
5 = flash green
6 = flash amber
7 = flash red/green
8 = flash red/amber
9 = flash green/amber

Set the monitor/headphone selection to PGM
Routes the PGM bus to the monitor and headphone outputs
Command to S0 Response from S0
RMPG: **ACK**

Set the monitor/headphone selection to REC
Routes the REC bus to the monitor and headphone outputs
Command to S0 Response from S0
RMRE: **ACK**

Set the monitor/headphone selection to EXT1
Routes the EXT1 input to the monitor and headphone outputs
Command to S0 Response from S0
RMBC: **ACK**

Select AUTO PFL for the monitor output
Enables/disables AUTO PFL on the monitor output
Command to S0 Response from S0
RMAP:a **ACK** if the command was successfully completed
ERR if the command could not be completed or the parameters are out of range
where a = AUTO PFL control (0=off, 1=on)

Select AUTO PFL for the presenter headphone output
Enables/disables AUTO PFL on the presenters headphones
Command to S0 Response from S0
RPAP:a **ACK** if the command was successfully completed
ERR if the command could not be completed or the parameters are out of range
where a = AUTO PFL control (0=off, 1=on)

Select SPLIT PFL for the presenter headphone output
Enables/disables SPLIT PFL on the presenters headphones
Command to S0 Response from S0
RPSP:s **ACK** if the command was successfully completed
ERR if the command could not be completed or the parameters are out of range
where s = SPLIT PFL control (0=off, 1=on)

Select AUTO PFL for the guest headphone output
Enables/disables AUTO PFL on the guests headphones
Command to S0 Response from S0
RGAP:a **ACK** if the command was successfully completed
ERR if the command could not be completed or the parameters are out of range
where a = AUTO PFL control (0=off, 1=on)

Select TALKBACK for the guest headphone output
Enables/disables TALKBACK on the guests headphones
Command to S0 Response from S0
RTBK:t **ACK** if the command was successfully completed
ERR if the command could not be completed or the parameters are out of range
where t = TALKBACK control (0=off, 1=on)

Control Notifications
Sent from the S0 when the associated control changes state.

Start button press notification
Signal channels' start button has been pressed
Command from S0
#1z
where z = channel number (1-9)

Fader open change notification
Signal channels' fader has been moved to off-bottom
Command from S0
#2z
where z = channel number (1-9)

Fader close notification
Signal channels' fader has been closed
Command from S0
#3z
where z = channel number (1-9)

Input 1 selected notification
Signal channels' 1st input has been selected
Command from S0
#4z
where z = channel number (1-9)

Input 2 selected notification
Signal channels' 2nd input has been selected
Command from S0
#5z
where z = channel number (1-9)

Input 3 selected notification
Signal channels' 3rd input has been selected
Command from S0
#6z
where z = channel number (1-9)

PGM selected notification
Signal channels' PGM has been selected
Command from S0
#7z
where z = channel number (1-9)

PGM deselected notification
Signal channels' PGM has been deselected
Command from S0
#8z
where z = channel number (1-9)

REC selected notification
Signal channels' REC has been selected
Command from S0
#9z
where z = channel number (1-9)

REC deselected notification
Signal channels' REC has been deselected
Command from S0
#az
where z = channel number (1-9)

PFL selected notification
Signal channels' PFL has been selected
Command from S0
#bz
where z = channel number (1-9)

PFL deselected notification
Signal channels' PFL has been deselected
Command from S0
#cz
where z = channel number (1-9)

Mic Live inactive notification
Signal mic live light control is inactive
Command from S0
#d1

Mic Live active notification
Signal mic live light control is active
Command from S0
#d2

8. S0 Skype Modification

The latest upgrade to the S0 mixer allows the presenter to operate Skype on channel 9, with the only interconnection being a USB cable. The S0's USB audio feature has previously allowed either PROGRAMME or RECORD bus audio (selected by jumper) to be routed to a PC via USB interface for the purpose of audio recording, with a return path useful for providing a pre-fade listen (PFL) for a playout system.

The upgrade gives you a third option, allowing the cleanfeed output from the telco channel to be routed to a PC via the USB. Setting both the "microphone" and "speakers" within Skype to 'S0' then allows full duplex communication between the S0 presenter and a caller, enabling the user to audition the caller on PFL to set levels before either going to air or recording a feature.

Overview

The following modification procedure should be completed if you intend to use Skype on channel 9 of your S0.

Note: In doing so, the front panel auxiliary input will no longer function.

Tools Required

- Pozi/Phillips screwdriver.
- Tweezers

Procedure

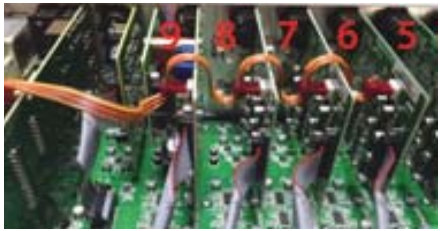
1. Remove the ten screws highlighted below:

2. Remove the bottom panel.

3. Locate jumpers J22, J23 and J24. Reposition the two shorting links to the configuration shown below (use tweezers if necessary):

4. Disconnect the 3 way ribbon cable molex that connects to channel 9. Leave disconnected and tidy.

5. Remove the daisy-chained 3 way ribbon cable that connects to channels 5-8 and reposition it so that instead it spans channels 6-9.



6. Replace the bottom panel and re-fit the ten screws.

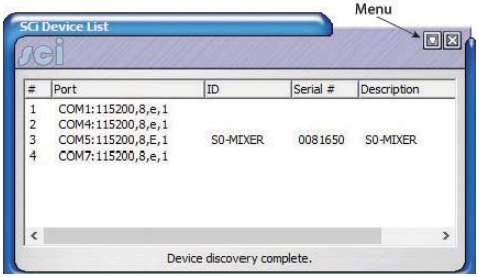
7. Upgrading the S0 Radio Broadcast Mixer Firmware

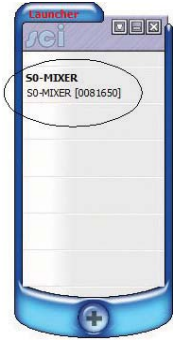
   If not already installed, download and install the SCI 2 Software from the Sonifex Support website: http://www.sonifex.co.uk/technical/software/sci/setup.exe

   Power up the S0 mixer and connect a USB cable from your PC to the 'Serial' socket on the desk.

Open the SCI 2 Software, the following screen should appear:

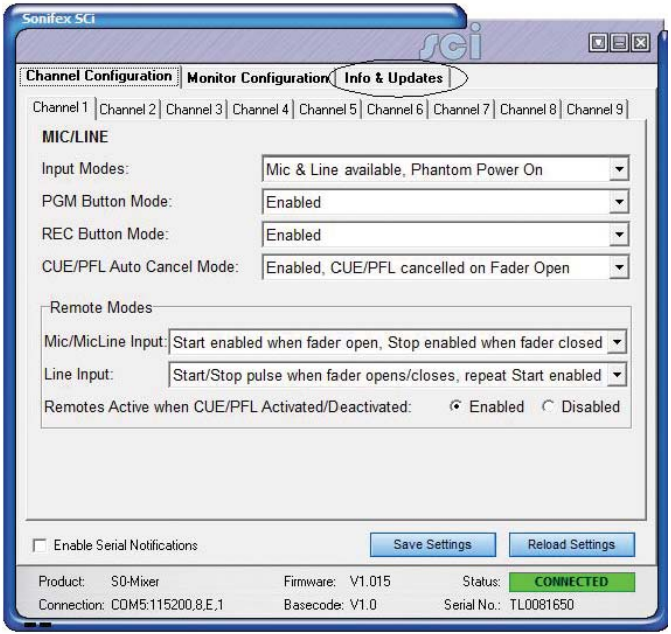
If your device is not listed click the plus sign then your device should appear in the list with a COM port number:

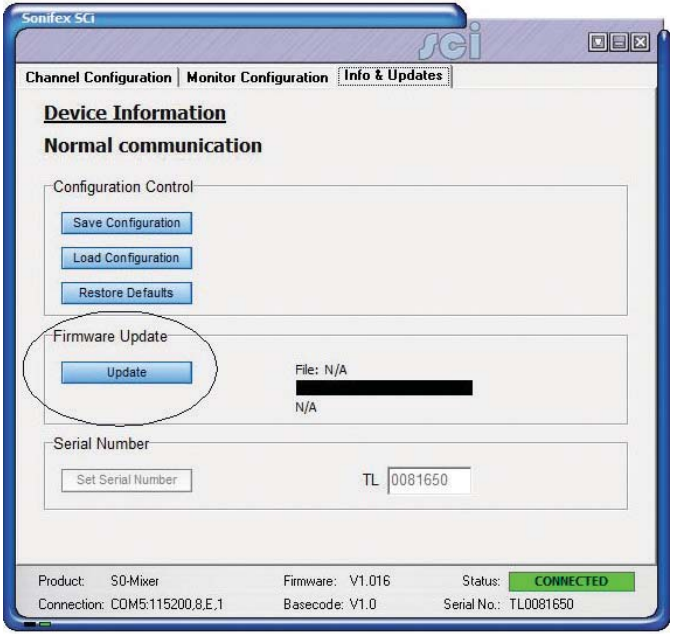




If your device still does not appear, click 'Discover Devices' from the drop down menu. Then either click 'File and Save from the menu, or 'Save' when prompted (after clicking 'x' to close the window).

Click on the discovered mixer from the Launch screen. This will then bring up the S0 Mixer options.

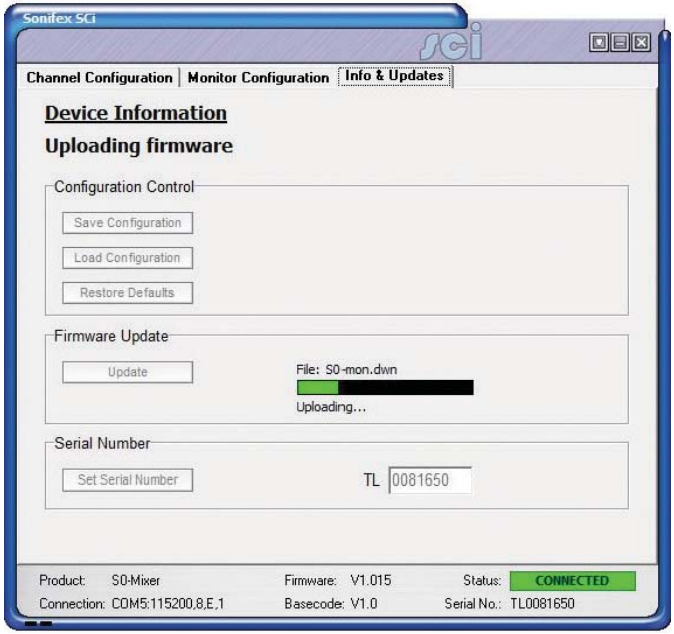




You should now be looking at a similar window to the one above. Now click the 'Info & Updates' Tab. Then click on 'Update' as shown above right:

After clicking 'Update' you should now be able to browse the Firmware file on your PC. Firmware files are available to download from our website. If you haven not already done so download and Unzip the file. http://www.sonifex.co.uk/technical/software/index.shtml#s0

Browse and open the unzipped Firmware file. The update process will now begin.



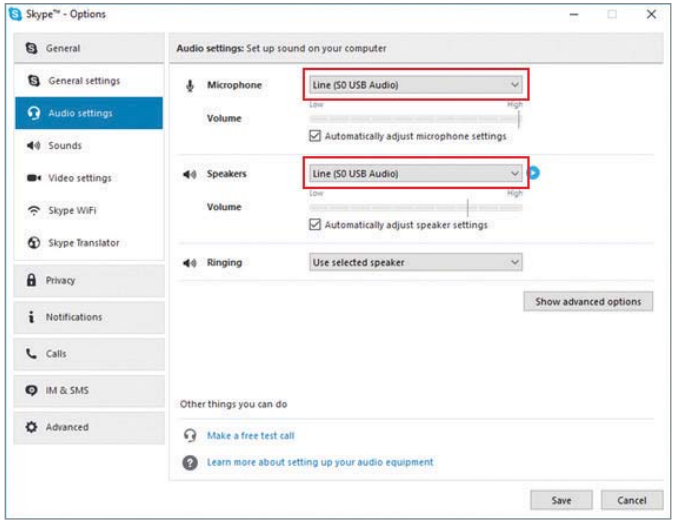
Once completed, the S0 Mixer will reset. The page will update and should show the new Firmware revision.

8. Power off the unit.

9. Hold down the following buttons whilst powering up the unit to enable Skype mode:

The LED meter should perform a single sweep to indicate Skype mode is being applied, and will perform a double sweep to confirm that Skype mode is enabled.

10. The S0 can now be connected via USB to a PC (using the audio USB port). Open up Skype and go to Tools > Options. Select the 'Audio Settings' tab/menu, and ensure the Microphone and Speakers are both set to "Line (S0 USB Audio)".



11. Perform a test as follows:

- Connect a microphone to one of the microphone inputs and set the fader for that channel fully up.
- Set input 9 to Aux Input 2 mode (press the top button until it turns amber) and set the channel 9 fader fully up.
- Insert a set of headphones into the presenter jack socket and ensure the volume is not turned fully down (but be careful not to set it too loud).
- Complete a Skype test call, speaking into the microphone when instructed to. If the S0 is set up correctly, you will be able to hear the instructions of the test call, and your own voice played back to you at the end of the test call.

To disable Skype mode:

1. Hold down the following buttons whilst powering up the unit to disable skype mode:

The LED meter should perform a single sweep to indicate skype mode is being removed, and will perform a double sweep to confirm the mode is disabled.

1. Reverse the cable and jumper movements detailed in this document.

Notes

SONIFEX
www.sonifex.co.uk
t:+44 (0)1933 650 700
f:+44 (0)1933 650 726
sales@sonifex.co.uk