

*Signature Series*

Maximum Resilience Broadcast Audio



*SD1+*

## **Audio Silence Detector**

*User Guide*

### **GlenSound**

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# GlenSound Electronics Ltd

Thank you for choosing a new GlenSound product.

All rights reserved.

Information contained in this manual is subject to change without notice, if in doubt please contact us for the latest product information.

If you need any help with the product then we can be contacted at:

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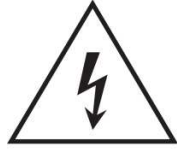
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Technical enquires: [techinfo@glenSound.co.uk](mailto:techinfo@glenSound.co.uk)

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## IMPORTANT SAFETY INSTRUCTIONS



This symbol is intended to warn that dangerous voltages within the product are present and constitute a risk of electric shock.

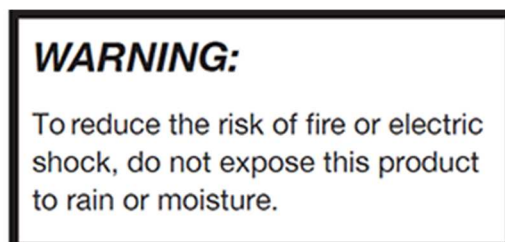
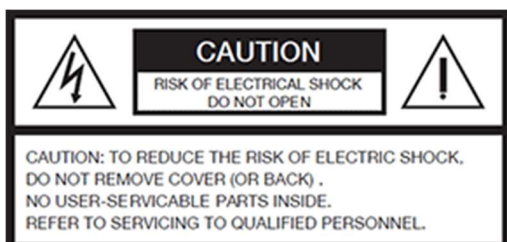


This symbol is intended to highlight that there are important operating & maintenance instructions in the literature accompanying this unit.

- 1) Read these instructions
- 2) Keep these instructions
- 3) Heed all warnings
- 4) Follow all instructions
- 5) Do not use this apparatus near water
- 6) Clean only with a dry cloth
- 7) Do not block any ventilation openings. Install in accordance with manufacturer's instructions
- 8) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat
- 9) Do not defeat the safety purpose of the polarized or grounding type plug. A polarized plug has 2 blades with one wider than the other. A grounding type plug has 2 blades and third grounding prong. The wider blade or the 3<sup>rd</sup> prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet
- 10) Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles and the point where they exit from the apparatus
- 11) Only use attachments/ accessories specified/ supplied by the manufacturer



- 12) Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/ apparatus combination to avoid injury from tip over
- 13) Unplug this apparatus during lightning storms or when unused for long periods of time
- 14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped
- 15) Do not attempt to modify this product. Doing so could result in personal injury and/ or product failure





### **IMPORTANT: MAINS PLUG WIRING INSTRUCTIONS**

This Signature unit is supplied with a moulded mains plug fitted to the AC mains lead.

Mains wiring colours/ connections:

The Green/ Yellow or Green wire must be connected to the terminal in the plug marked 'E' or with the Earth Symbol.

The Blue or Black wire must be connected to the terminal in the plug marked 'N' (Neutral).

The Red or Brown wire must be connected to the terminal in the plug marked 'L' (Live).




**THIS UNIT MUST BE EARTHED**



**THIS UNIT IS FITTED WITH AN INTERNAL MAINS FUSE.**

The fuse is located internally between the Live terminal of the IEC plug and the Live input of the power supply. The fuse should only be changed by a qualified service engineer. If replacing the fuse care should be taken to fit a correctly rated replacement. The fuse rating can be found in the technical specifications page of this handbook.



This equipment manufactured by GlenSound Electronics Ltd of Brooks Place  
Maidstone Kent ME14 1HE is  marked and conforms to:

Low Voltage Directive: EN60065

Emissions: EN55103.1

Immunity: EN55103.2

## **WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT REGULATIONS 2006 (WEEE)**

GlenSound Electronics Ltd is registered for business to business sales of WEEE in  
the UK our registration number is:

WEE/JJ0074UR

## **RoHS2 DIRECTIVE**

EC directive 2011/65/EU restricts the use of the hazardous substances listed below  
in electrical and electronic equipment.

This product conforms to the above directive and for this purposes, the maximum  
concentration values of the restricted substances by weight in homogenous  
materials are:

Lead	0.1%
Mercury	0.1%
Hexavalent Chromium	0.1%
Polybrominated Biphenyls	0.1%
Polybrominated Diphenyl Ethers	0.1%
Cadmium	0.01%

## **PRODUCT WARRANTY:**

All equipment is fully tested before dispatch and carefully designed to provide you with trouble free use for many years.

We have a policy of supporting products for as long as possible and guarantee to be able to support your product for a minimum of 10 years.

For a period of one year after the goods have been despatched the Company will guarantee the goods against any defect developing after proper use providing such defects arise solely from faulty materials or workmanship and that the Customer shall return the goods to the Company's works or their local dealer.

All non-wear parts are guaranteed for 2 years after despatch and any defect developing after proper use from faulty materials or workmanship will be repaired under this warranty providing the Customer returns the goods to the Company's works or their local dealer.



## SD1+ Audi Silence Detector

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Description

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## **OVERVIEW**

The Signature SD1+ is a silence detector used to switch audio to a backup source when the primary audio source falls below accepted silence thresholds in level or time. These are often used on a broadcast path to prevent dead air should a technical problem occur with the audio.

The audio connections are stereo, on analogue XLRs. There is an input pair for the primary source, and an input pair for the backup source. The SD1+ can also be configured as a twin single channel silence detector. The backup source is usually coming from an audio player which can be remotely started by the SD1+ via a GPO should silence be detected.

Each channel can have the configuration parameters set independently. The threshold at which the unit detects a low level is configurable, as is the amount of time that the audio needs to be under this level before an alarm condition is triggered and the audio is switched to the backup input.

A comprehensive set of GPIOs allow for triggering external devices when the secondary input has been triggered.

Intelligent modes can be set to allow for switching back to the primary audio source once a sustained audio level has returned.

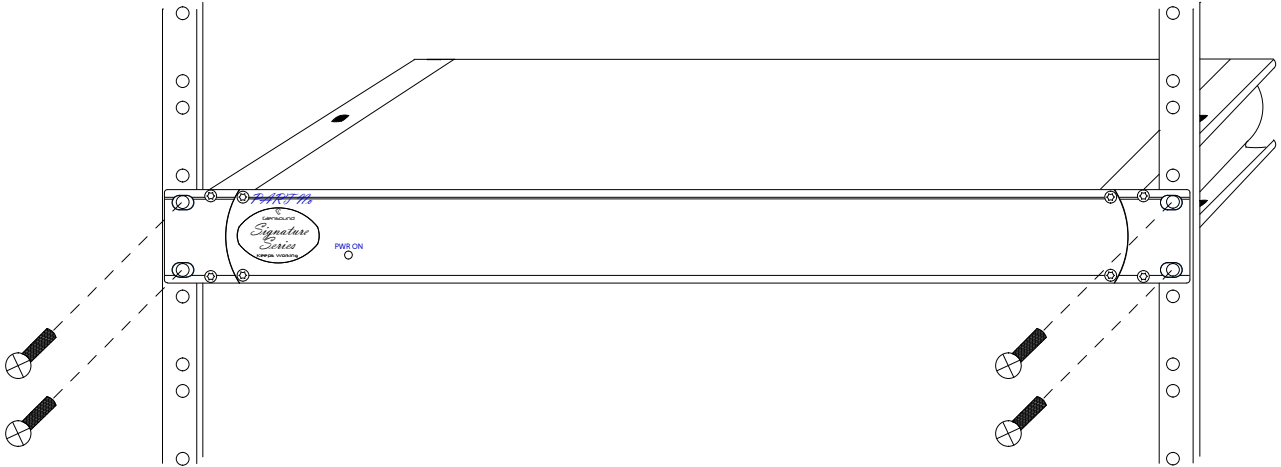
With a stereo audio source, if one channel should fail, the SD1+ can be set to switch this single input to both outputs, making a problem unnoticeable to any listeners, whilst at the same time still providing alarm outputs so the engineers can be alerted.

The SD1+ is powered from an internal switch mode mains power supply fed from a filtered IEC mains plug suitable for use Worldwide. It has an internal fuse for safety. The unit can also alternatively be powered from an external +/-12V DC power source (such as the Signature Series PS1). If both mains and external DC power sources are present then, if one power source were to fail the unit would continue to work seamlessly from the other source.

## **PHYSICAL INSTALLATION**

The GlenSound Signature Series have been designed to be highly versatile for installation and can be installed in 19" racks with either their front or rear panels facing the front of the rack. They can also be mounted underneath desks or work tops and can be either permanently mounted or stood (using the supplied feet) on top of desks or worktops.

### **INSTALLING SIGNATURE SERIES IN A 19" RACK**



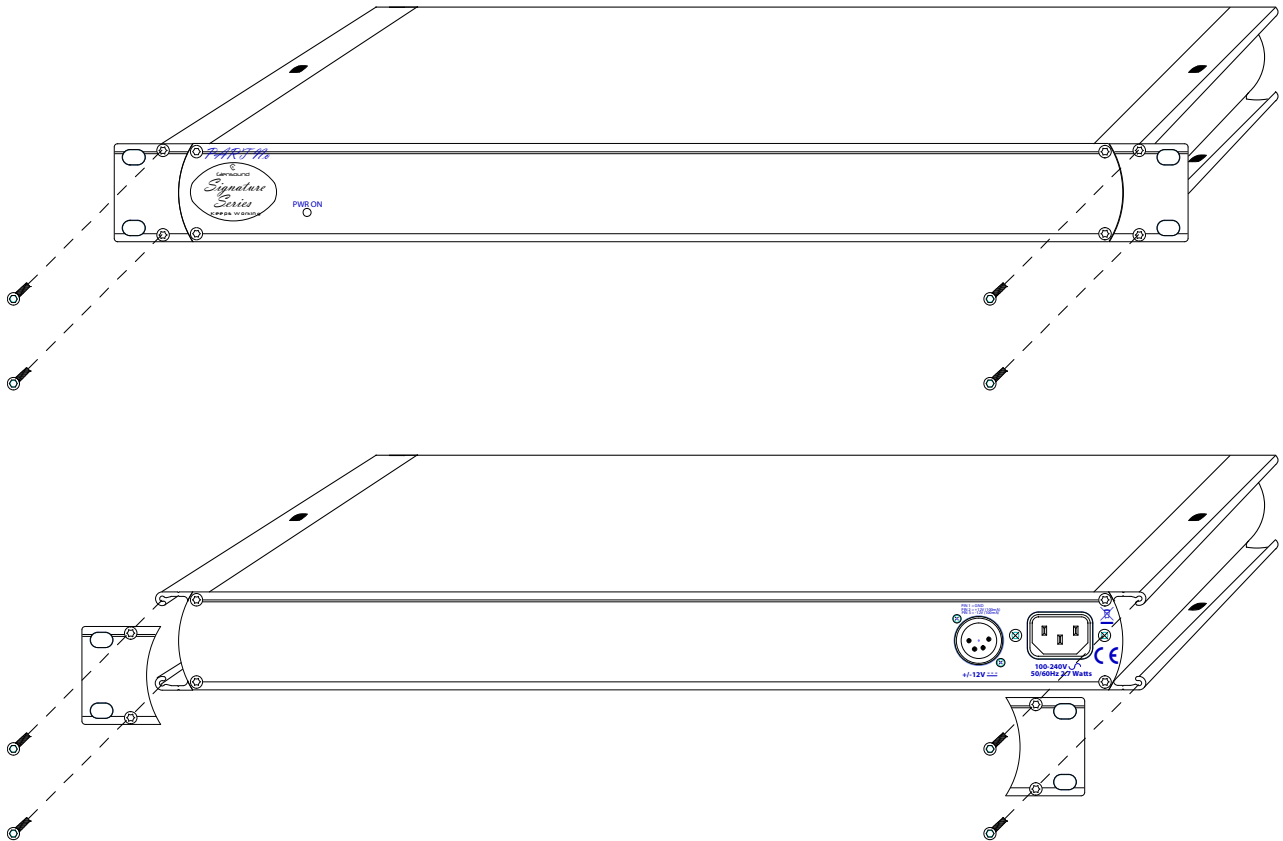
Firmly hold the signature subrack within the 19" rack and locate in 1RU of space. Use the supplied 6mm rack screws to securely attach the unit to the rack.

### **INSTALLING ADHISIVE FEET FOR NON PERMANENT TABLE TOP MOUNTING**



Remove the front rack ears (if they are not required), turn the unit upside down and attach the supplied 4 sticky feet as per the above drawing.

## **SWAPPING RACK EARS TO ALLOW THE REAR TO BE INSTALLED AT THE FRONT OF A RACK**

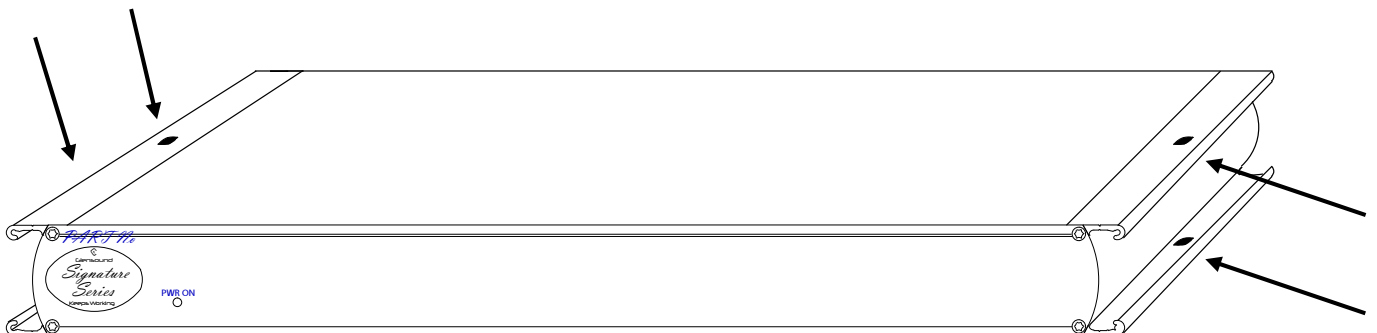


First remove the 4 silver button head screws that fix the rack ears onto the front of the unit as shown in the top picture above.

Remove the rack ears and turn the unit around for access to its back panel.

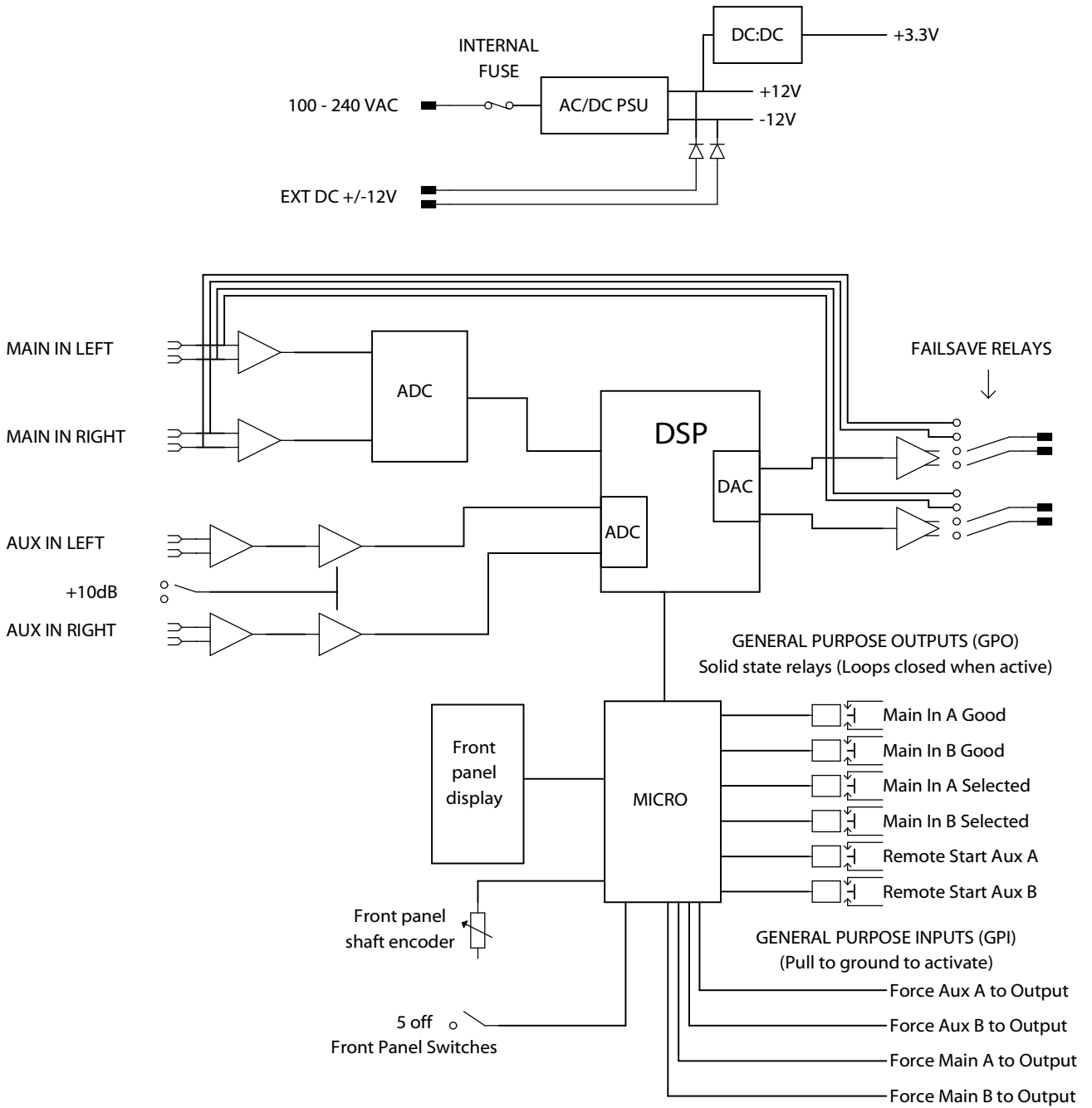
Re-fit the 2 rack ears using the same 4 silver button head screws that were removed from the front as per the bottom picture above.

## **USING THE MOUNTING HOLES FOR PERMANENTLY ATTACHING THE UNIT ABOVE OR BELOW A WORKTOP/ DESK**



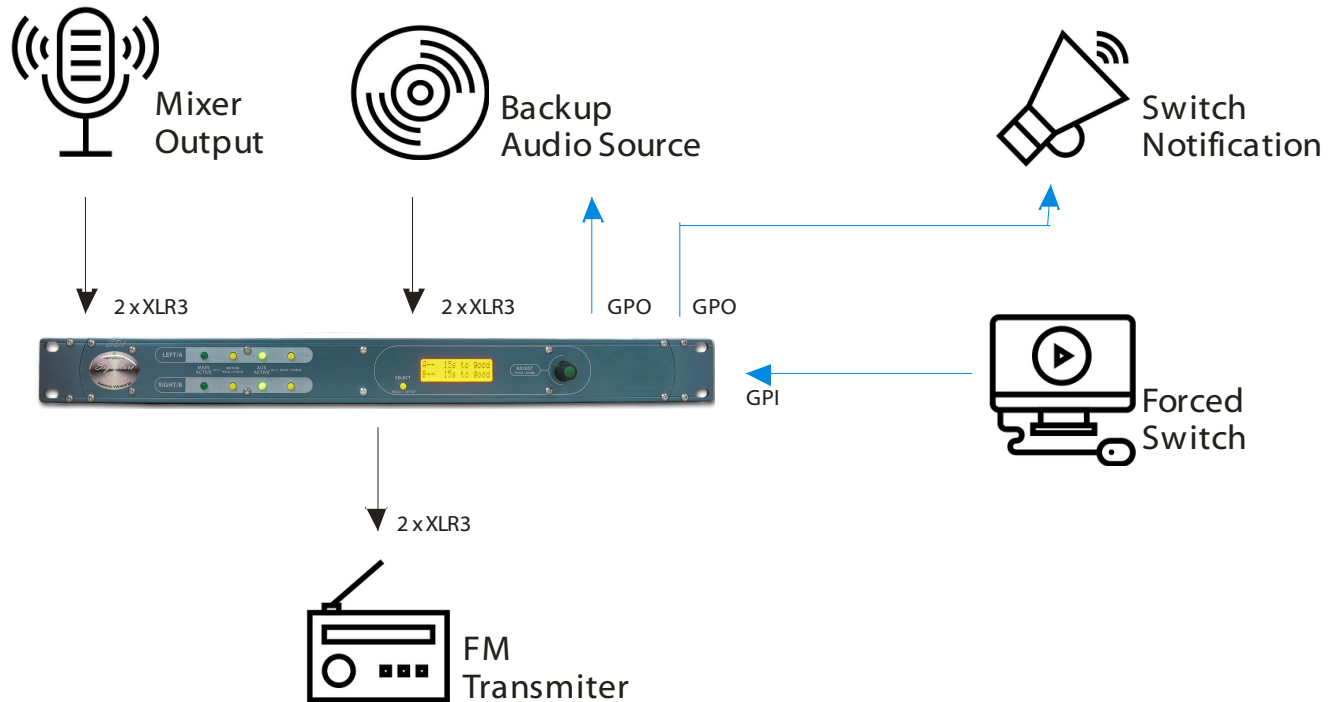
Use either the top or bottom mounting holes as indicated above to use suitable screws to attach the signature unit to a worktop or bench. **\*\*PLEASE ENSURE THAT YOU USE SUITABLE FIXINGS\*\***

# BLOCK DIAGRAM



## EXAMPLES OF USE

### 1. Stereo Radio Station Transmitter Site



This is the typical application for the SD1+ Silence Detector. It acts as a master fail alarm for main programme audio for a radio station.

The main stereo programme audio from the mixer or the automation PC connects to the SD1+ as the primary audio source. In normal operation, this audio passes straight through to the stereo outputs of the SD1+ which connect to the transmitter.

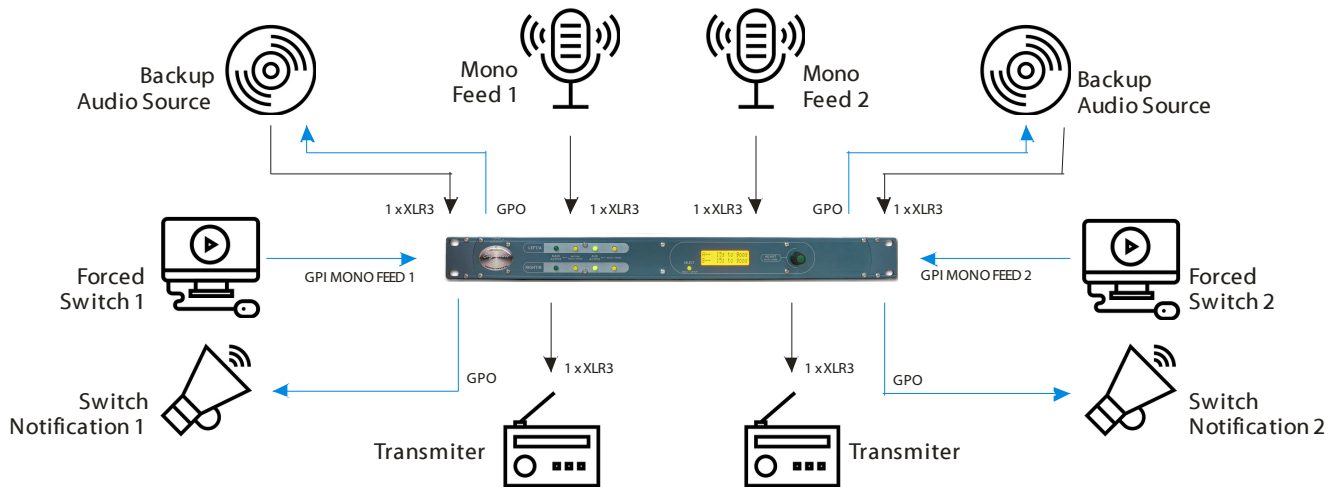
An audio threshold needs to be set in order for the SD1+ to make a silence detection. This is achieved by setting an audio level threshold, under which the SD1+ will start a timer. The audio threshold is configurable from -60dB to -10dB and the timer is also configurable from 5 seconds to 5 minutes. These levels are often set at different points depending on the nature of the source audio.

Once the primary audio source has been under the threshold for the preset amount of time, the SD1+ will silently switch to the backup stereo input. A remote start will also be triggered to start playing the backup audio source, which is now connected directly to the main stereo outputs. A further GPO is also triggered to notify an external system that the SD1+ is now operating using the backup audio source. This will alert the engineers to investigate.

GPI control is always available by an external system to allow engineers to manually switch between the primary and backup inputs. If the SD1+ is set in manual mode, then an external GPI switch would be needed to switch back to the primary input.

In automatic mode, after the backup audio source has been selected, the primary audio source is still being continually monitored to check for the return of the audio. When the primary source has been active again for a preset amount of time, the SD1+ will silently switch back to the primary source. The recovery time to automatically switch back to the primary input can be set between 5-60 seconds.

## 2. Two Mono Audio Feeds



The SD1+ is effectively two single channel silence detectors. The example above shows the operation of the unit when it is monitoring 2 separate mono signals, as a twin master fail alarm. All functions are duplicated on both sides of the unit, and they can be set independently. The info below is the same for mono feed 1 and selectable separately for mono feed 2.

The mono feed audio from a mixer or link connects to the SD1+ as the primary audio source. In normal operation, this audio passes straight through to output of the SD1+ which connects to the transmitter.

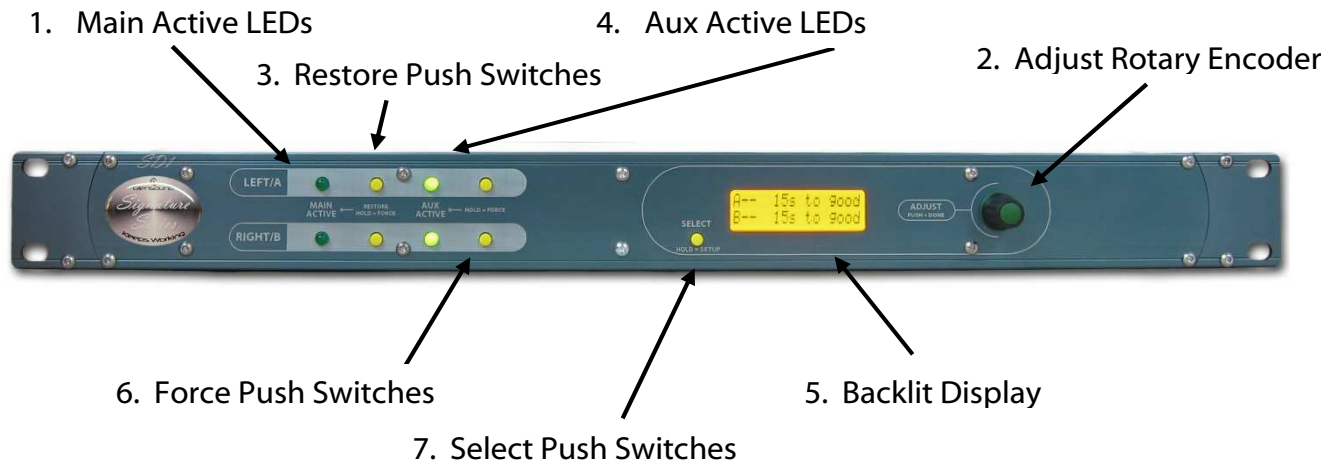
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## USER CONTROLS FRONT



### **1. Main Active LEDs**

When on these 2 LEDs indicate that the main audio input is being routed to the output. If flashing they indicate that the main audio input is being forced by the user to the output and therefore the automatic switching of the silence detector is being bypassed.

### **2. Aux Active LEDs**

When on these 2 LEDs indicate that the aux audio input is being routed to the output. If flashing they indicate that the aux audio input is being forced by the user to the output and therefore the automatic switching of the silence detector is being bypassed.

### **3. Restore Push Switches**

Pressing and holding these switches for about 3 seconds will force the associated main input to the output (The main active LEDs will flash to indicate this). Once in the 'forced' mode another quick press of this switch will return the silence detector to full automatic mode.

### **4. Force Push Switches**

Pressing and holding these switches for about 3 seconds will force the associated aux input to the output (The main active LEDs will flash to indicate this). Once in the 'forced' mode another quick press of this switch will return the silence detector to full automatic mode.

### **5. Select Push Switch**

Pressing and holding this switch for about 3 seconds will allow access to the setup up menu which once entered will appear on the display. Once in the setup menu each press of this switch selects the next menu option. (Note to exit the setup menu the 'Adjust Rotary Encoder' should be pushed)

## 6. Backlit Display

This 2 line display provides a clear indication of the state of the current audio of the silence detectors' main inputs.

The '*X seconds to fail*' shows how many seconds the audio on the associated main input needs to be below the user set audio level threshold for before the unit will switch to the aux input.

The '*X seconds to good*' indicates how many seconds the audio on the associated main input needs to be above the user set audio level threshold for before the unit will switch back to the main input.

If in menu setup then the display will show the menus and related settings.

## 7. Adjust Rotary Encoder

The rotary encoder is only used when in the setup menu. It has 3 functions:

- 1) Turning it clockwise will depending on the menu selected increase time, increase level or select another option (if available).
- 2) Turning it anticlockwise will depending on the menu selected decrease time, decrease level or select another options (if available).
- 3) Pushing it in about 1 mm until a click is felt (it is a switch) will save any alterations and exit the setup menu. Note that pushing it in if you are not in the setup menu will have no effect.

## USER CONTROLS REAR



## 8. GPIO 'D' Connector

This General Purpose Input & Output (GPIO) provides 6 solid state relay outputs and 4 inputs to allow basic remote control and remote indication of the silence detector's status.

## 9. Aux Input 10dB Gain

This toggle switch adds 10dB of gain to the Aux input, useful if your back up source is a domestic audio source such as a CD player with unbalanced outputs where the nominal output level from the unbalanced source is likely to be -10dB.



# **SETUP MENU AND OPTIONS**

## **Entering Setup Menus**

Press & hold the yellow 'SELECT' push switch (next to the display) for about 4 seconds until the display changes and shows the first menu option.

Once in setup mode pressing the 'SELECT' switch again will move through the menus.

### **1. Threshold**

The '*Threshold*' is the audio level in dB that the input must fall below before the silence detector starts the countdown timer prior to switching the audio source.

The threshold can be set between -60 & -10dB

### **2. Fail Delay**

The '*Fail Delay*' is the length of time in seconds or minutes and seconds that the main audio input must be below its threshold setting before the silence detector will switch the aux input to the output.

The fail delay can be set between 5s (5 seconds) and 5m00s (5 minutes & 0 seconds).

### **3. Recovery Delay**

The '*Recovery Delay*' is the length of time in seconds or minutes and seconds that the main audio input must be above its threshold setting before the silence detector will switch the main input back to the output.

The recovery delay can be set between 5s (5 seconds) and 60s (60 seconds).

### **4. Auto Recover**

The '*Auto Recover*' mode determines when the silence detector switches back to the main inputs after silence had been detected and the Aux inputs are being routed to the outputs.

Option 1 is '*Auto*' where the silence detector will automatically switch back to the main inputs as soon as valid audio appears on them (as per the settings in menu 1 & 3)

Option 2 is '*Manual*' where the Aux inputs continue to be routed to the outputs even after valid audio returns to the main inputs. The front 'Restore' yellow push switches must be pushed or the rear 'force loops' must be made manually in order to return the main inputs to the outputs.

### **5. Link/split**

The '*Link/split*' menu provides the option of associating the 2 inputs (A & B) together (i.e. *Linking* or treating the inputs as stereo) or treating the A & B inputs as completely separate audio circuits with no correlation with each other (i.e. *Splitting* or treating the inputs as individual Mono circuits (Dual Mono)).

## 6. Mono First

The '*Mono First*' menu is only active if the link/split menu is set to '*Stereo*'. There are 2 options within this menu, Yes & No.

If set to '*Yes*' then if one input of the stereo pair fails then the remaining good input will be switched to both outputs. (If both inputs of the stereo pair fail then the aux input will be routed to the output).

If set to '*No*' then if just one input of the stereo pair fails then the silence detector will route the aux inputs to both outputs.

## 7. Smart Fail

The '*Smart Fail*' option is designed to add some intelligence to the silence detection and to try to prevent false triggers.

Smart Fail Mode I adds a requirement for a 4s minimum length of audio before the fail countdown is reset, and is intended to prevent clicks, etc. on an otherwise dead line from being recognised as valid audio.

There are 2 options in the smart fail mode: On or Off

## 8. Smart Recovery

The '*Smart Recovery*' option is designed to add some intelligence to the silence detector and prevent false recovery happening due to noise on the main circuits.

Smart Recover Mode I allows brief periods of subthreshold audio embedded in an otherwise-valid signal without resetting the recovery countdown. This actually loosens the criteria for valid audio, but should be a better match for some real-world signals and may allow the threshold level to be set higher for greater overall discrimination.

There are 2 options in the smart recovery mode: On or Off

## 9. Start GPIO

The '*Start GPIO*' menu alters the units '*Remote Start Aux A*' and '*Remote Start Aux B*' loop outputs. These outputs are usually connected to external equipment and used to tell that external equipment to start sending audio.

The '*Remote Start Aux A*' and '*Remote Start Aux B*' loop outputs become active when the main audio inputs have failed and the silence detector switches to the Aux inputs.

There are 2 options for the '*Start GPIO*' menu: '*Continuous*' or '*Pulsed*'.

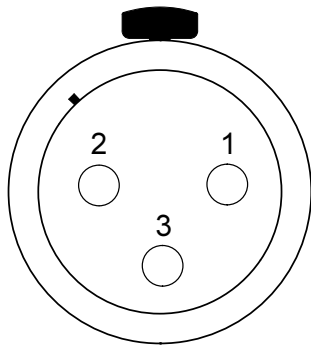
When active & set to '*Continuous*' the loop output will be permanently on.

When active & set to '*Pulsed*' the loop output will alternate between on and off.



## WIRING INFORMATION

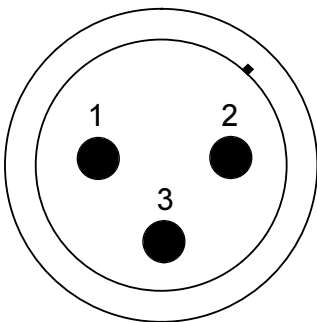
### 1. Standard Pin Outs



XLR SOCKET (FEMALE)

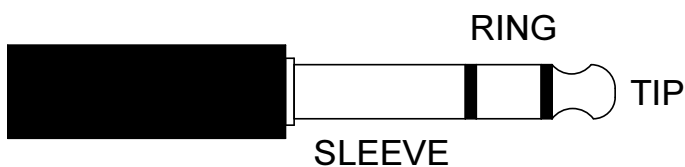
#### STANDARD XLR AUDIO PINOUTS:

- 1: Ground/ Earth
- 2: INPHASE/ POSITIVE/ MIC +
- 3: MATE/ NEGATIVE/ MIC -



XLR PLUG (MALE)

#### STANDARD HEADPHONE WIRING:



- TIP: A/ LEFT Ear
- RING: B/ RIGHT Ear
- SLEEVE: Common/ Earth

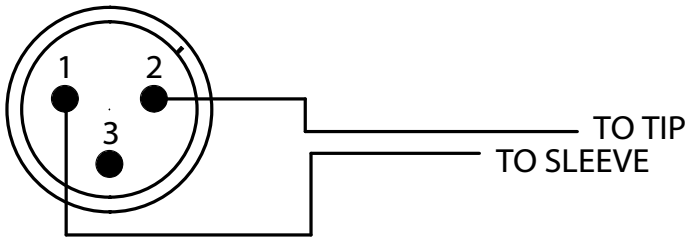
#### HEADPHONE WIRING NOTE:

The *Signature Series* range of products feature sophisticated headphone amplifiers whose stereo outputs can be connected directly to mono headphone jacks without damaging the headphones internal amplifiers.

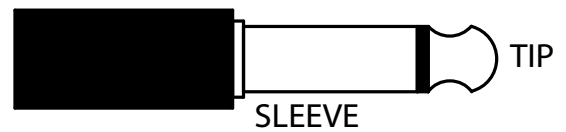
## 2. Wiring to unbalanced devices

The input & output circuits of the *Signature Series* can be connected to unbalanced (domestic style) devices. The wiring diagrams below show a mono jack plug as the unbalanced end of the cable but this of course could easily be a different type of connector such as an RCA Phono or 'D' type connector.

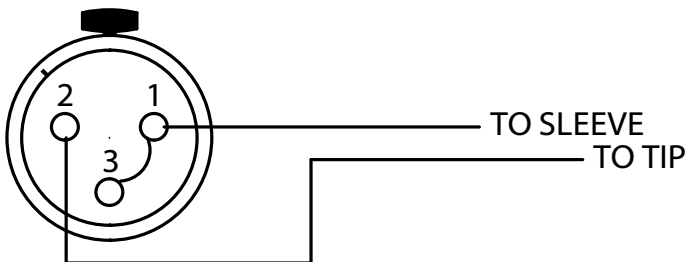
### BALANCED OUTPUT ON SIGNATURE UNIT



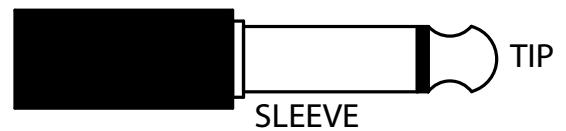
### UNBALANCED INPUT OF EXTERNAL DEVICE



### BALANCED INPUT ON SIGNATURE UNIT



### UNBALANCED OUTPUT OF EXTERNAL DEVICE



### 3. GPIO Wiring

The General Purpose Inputs & Outputs can be connected to external devices to allow simple monitoring & remote control of the silence detector.

	PIN NO	FUNCTION
①	1	SSR Output Loop Indicating Main Audio in A is OK
	14	SSR Output Loop Indicating Main Audio in A is OK
②	2	SSR Output Loop Indicating Main Audio in B is OK
	15	SSR Output Loop Indicating Main Audio in B is OK
③	3	SSR Output Loop Indicating that Main In A is currently selected
	16	SSR Output Loop Indicating that Main In A is currently selected
④	4	SSR Output Loop Indicating that Main In B is currently selected
	17	SSR Output Loop Indicating that Main In B is currently selected
⑤	5	SSR Output for Remote Start (Active when Aux A audio is selected)
	18	SSR Output for Remote Start (Active when Aux A audio is selected)
⑥	6	SSR Output for Remote Start (Active when Aux B audio is selected)
	19	SSR Output for Remote Start (Active when Aux B audio is selected)
⑦		
⑧		
⑨		
⑩		
⑪	11	Force Main A audio input to A output
	24	Force Main B audio input to B output
⑫	12	Force Aux A audio input to A output
	25	Force Aux B audio input to B output
⑬	13	Ground (earth) for use with pins 11,12,24,25 see note below

‘SSR’ stands for Solid State Relay which are highly reliable and provide much greater life than standard relays. For connecting to external devices both connections of the SSR should be used to form a ‘loop’. When the associated SSR function is active on the silence detector then the SSR loop will be made and a connection will be present between the 2 contacts of the SSR.

The absolute maximum ratings of the loop of the SSR are 100mA and 400V.

To make the ‘Force’ inputs work you need to connect the pin number of the function you want to activate to Ground (pin 13). So for example if you want to force the Aux B audio input to the B output then connect pins 25 and 13 together.



## TECHNICAL SPECIFICATION

### AUDIO

**Frequency Response**

± 1dB 22Hz to 22kHz

**Backup Input Gain Selection**

0dB 0r +10dB

**Maximum Input Level**

>+24dB

**Maximum Output Level**

+24dBu

**Input Impedance**

>30k Ohm

**Output Impedance**

=<50 Ohms

**Distortion**

0.008% @ 100Hz, 0.009% @ 1kHz, & 0.007% @ 10kHz THD. Reference to +8dBu output

**Noise**

-85dB ref +8dBu output, unity gain  
RMS (22Hz to 22kHz)

**Common Mode Rejection**

Circa -65dB @ lineup

**Output Type**

Electronically balanced (can be wired unbalanced) on Neutrik 3 pin XLR plug

**Input Type**

Electronically balanced (can be wired unbalanced) on Neutrik 3 pin XLR plug

### SILENCE DETECTION

**Audio Threshold**

-60dB to -10dB selectable

**Time Threshold**

5 seconds to 5 minutes

**Recovery Time**

5 seconds to 60 seconds

**Operational Modes**

Stereo or 2 x single channel

**GPIO Loops**

On a 25 pin d type connector

### POWER

**Mains Input**

Filtered IEC, 100 to 240VAC  
47 - 63Hz

**AC Consumption**

2.8 Watts @ 230VAC

**DC Input**

4 Pin Neutrik XLR plug ± 12V

**Internal Mains Fuse**

20mm 500mA Anti Surge

**On Power Fail**

Primary input switches directly to outputs via bypass relays

### PHYSICAL

**Size**

445 x 164 x 44mm (LxDxH) no rack ears  
482mm 19" (1RU) with rack ears

**Weight**

1.11kg

**Mechanics**

All aluminium construction, anodized and laser etched

**Shipping Carton**

Rugged export quality cardboard carton  
610 x 420 x 130mm LxDxH

**Shipping Weight**

2.1kg