

## SQN Electronics Ltd

### SQN-2S Miniature 4:2 ENG Audio Mixer

*The smallest of our broadcast quality stereo portable mixers  
for TV, film and radio locations*

The **SQN-2S** creates new size and weight benchmarks for the miniature ENG mixer. This elegant design puts the essence of the well known SQN-4S Series IVe 4:2 mixer into a case identical in size to the SQN-3M mono mixer.



The **SQN-2S** has been developed by further reducing the size of the essential elements of the SQN-4S Series IVe which now also appear in the SQN-5S. Although this tiny mixer does not have the full functionality of its parent, it is capable of carrying out virtually any of the tasks commonly required of a portable mixer in location recording and outside broadcast.

Two of the input channels, CH1 & CH2, are conventional microphone channels with the full range of powering bass cut and attenuation. This pair can also be MS matrixed.

The second pair, CH3 & CH4, have a reduced gain and no powering. They are intended for use with Radio Mics or other self-powered mics. All channels can be routed Left, Right or Centre (both).

The mixer includes balanced transformerless input and output amplifiers, virtually unbreakable analogue level meters, pre-fade listening (on CH4), slating microphone, a minimal length audio path with the option of MS matrixing of CH1 & CH2. The limiter is identical to the design already proven in the SQN-4S as is the low distortion tone oscillator. MS decoding of the monitoring is also provided.



The essential information for connecting to and operating the mixer is permanently printed on the baseplate.



### Features and Specification - SQN-2S

**Mixer Inputs CH1 & CH2** Transformerless balanced inputs using XLR-3 type female connectors.

Each channel is switchable for:

1. Powering:
  - 12V T (Din AB)
  - 48V Phantom
  - Dynamic (150 to 600 Ohms)
2. Attenuation:
  - 0dB, -10dB or -20dB.
3. Bass Cut:
  - Flat, -6dB or -12dB at 50Hz

**Sensitivity** -78dBu for nominal line level (PPM4, 0VU) with the channel gain at maximum and the master gain at 0dB

**Max Level, Mic Inputs** -20dBu (+4dBu with full attenuation)

**Noise Figure** -130dBu (A weighted) from a 200 Ohm source.

**Mixer Inputs CH3 & CH4** Transformerless balanced inputs using XLR-3 type female connectors.

Each channel is switchable for:

1. Attenuation:
  - 0dB or -10dB.
2. Line Attenuation:
  - Adds 40dB of attenuation before the mic preamp.

**Sensitivity** -68dBu for nominal line level (PPM4, 0VU) with the channel gain at maximum and the master gain at 0dB

**Max Level, Mic Inputs** -20dBu (+4dBu with full attenuation)

**Noise Figure** -126dBu (A weighted) from a 200 Ohm source.

**Frequency Response** 20Hz to 20kHz +0, -1dB, referred to 1kHz.

**Crosstalk** Isolation, channel to unrelated channel: 75dB at 1kHz, 60dB at 15kHz.

**Channel Configuration** The mixer has four input channels, arranged as two pairs. All channels can be routed to Left, Right and Centre (both). In addition to simple routing CH1 & 2 can be ganged into a Stereo pair and arranged into a MS to Stereo decoding matrix.

<b>Channels 1 &amp; 2 [GANG 1-2]</b>	<p>The operation of the CH1, CH2 pair is controlled by the GANG 1-2 switch on the front panel. This switch has three positions:</p> <ol style="list-style-type: none"> <li>1. Twin MONO [O] in which the channels are ungangled and each input channel can be routed to either or both of the output channels.</li> <li>2. Stereo [S] ganging in which the Channel 1 fader controls the gain of both channels; the routing arrangements are unaltered..</li> <li>3. Mid-Side [MS] ganging in which the Channel 1 fader controls the gain of both channels and the Channel 2 fader acts as an additional gain control, giving equality of gains when at maximum. The feed from CH2 which is routable to the Right channel is inverted. If the routing switches for CH1 &amp; CH2 are both set to Centre, then the outputs at Left and Right will be CH1 + CH2 and CH1 - CH2, i.e. an MS to AB matrix will be formed. CH2 fader, by varying the relative level of the CH2 feed will act as a Stereo Width control.</li> </ol> <p>CH2 Phase Switch Channel 2 can have its phase inverted by means of a switch on the right hand side panel. This has the incidental effect of interchanging left and right in an MS encoded signal.</p>
<b>Channels 3 &amp; 4</b>	<p>The operation of the CH3, CH4 pair is much simpler than the CH1, CH2 pair. Each channel can be routed to Left, Right or Centre (both).</p>
<b>Monitor Return Input</b>	<p>Balanced inputs with a range of sensitivity from -20dBu to +20dBu for loudness parity with the internal monitoring. The sensitivity is adjusted by a screwdriver preset on the connector side panel. Internal switches allow the overall sensitivity to be reduced to make adjustment easier when used with equipment that has only line level monitor returns.</p>
<b>Balanced Outputs</b>	<p>Two line driver amplifiers provide the balanced output channels which are available on a 5-Way XLR and a combined Multi-way connector.</p>
<b>Output Attenuators</b>	<p>A switch on the baseplate allows the level at the Multi-way connector to be attenuated by 50dB to provide a nominally microphone level feed.</p>
<b>Line Drivers</b>	<p>Electronically balanced sources with a clipping level of +20dBm into 600 Ohms. Distortion at the nominal peak level of +8dBm is less than 0.01% with a 600 Ohm load 20Hz to 20kHz. The output resistance is 75 Ohms.</p>
<b>Unbalanced Outputs</b>	<p>A 3.5mm jack connector [UB] carries separately buffered outputs at a level 6dB below the balanced outputs. These outputs are also available on the Multi-way connector (12-Way version only).</p>
<b>Meters</b>	<p>Twin peak reading, logarithmic level meters with Peak Programme Meter (PPM) dynamics. Meter Scaling may be BBC PPM, Nordic Norm, or SMPTE. VU meters can also be provided. The meters are normally calibrated with the mixer driving a bridging load of 10k Ohms. While the mixer is operating, the meters are illuminated by low power light emitting diodes.</p>
<b>Line Output Level</b>	<p>The nominal line level is normally set at 0dBu for PPM metered mixers and +4dBu for VU metered mixers. Peak level, which is used as a reference for the limiters, is considered to be 8dB above this setting. Other calibration levels are readily available to order.</p>
<b>Output Limiters</b>	<p>[O]ff [M]ono [S]tereo (gangled) Attack time constant 0.5ms, release time 100ms. The limiter range is 20dB. An LED for each output channel indicates limiter action. This Graph shows the entry into limiting on a steady signal for a nominal peak level of 8dBu</p>
<b>Line-up Tone</b>	<p>The Line-up tone is a sine wave at 1kHz with distortion below 0.1% which is inserted into both channels, displacing the audio output. When the [GANG 1-2] switch is in either of the gangled positions, the left hand channel tone is interrupted for 250ms every 3s. The tone switch on the front panel is a three position toggle, shared with the Slating Microphone.</p>

<b>Monitoring</b>	Amplifiers with adjustable gain capable of driving most types of headphone to a suitable level. Headphones with a resistance of around 25 to 200 Ohms per side will make best use of battery power. Pre-Fade listening to input channel 4 is possible as is MS matrixing of the two output channels so that an MS recording may be monitored in the equivalent AB stereo.
<b>Monitoring Mode Selector</b>	The monitoring mode rotary selector switch on the front panel [PHONES] has the following functions. <ul style="list-style-type: none"> <li>• S Stereo</li> <li>• R Right Channel</li> <li>• L Left Channel</li> <li>• MS MS Matrix (MS heard as AB stereo)</li> <li>• L+R Sum of L &amp; R Channels</li> <li>• O Mute</li> </ul>
<b>Monitoring Switches</b>	Monitoring is selected by the MXR / AUX switch on the front panel. Choices are: <ul style="list-style-type: none"> <li>• Mixer Output</li> <li>• External Monitor Return</li> <li>• Pre Fader signal from CH4 input amplifier (spring bias)</li> </ul>
<b>Pre-Fade Listen</b>	Pre-Fade listening is available on CH4. The output of the CH4 Mic. amplifier may be monitored in the headphones even when the fader is closed. This is selected by a third, biased position on the MXR / AUX switch.
<b>Slating Microphone</b>	A microphone is mounted behind the front panel near the centre of the mixer. When in use, the output of the microphone is levelled by a compressor and displaces the normal audio, appearing on the mixer outputs and in the monitoring system. While the microphone is active, the monitoring mode automatically reverts to the internal or [MXR] setting. The Slating Microphone switch on the front panel is a three position toggle, shared with the Line-up tone.
<b>Batteries</b>	Six AA (UM-3) size cells housed in a quick change compartment. The acceptable range of battery voltages is 5V dc to 18V dc allowing the use of NiCd or NiMH rechargeable cells, Alkaline-Manganese cells or even Lithium cells. Access is provided to the battery terminals for recharging. A fresh set of Alkaline-Manganese cells will power the unit for about 10 hours when using dynamic microphones.
<b>Battery Test</b>	The right channel meter is fitted with a suppressed-zero scale, brought into operation by a front panel push button.
<b>External Power</b>	A supply in the range 5V dc to 18V dc may be used. The maximum consumption will be 2.2W and quiescent consumption, without microphones, 1.3W. The power input terminals float with respect to the SQN-2S ground so that external supplies of either polarity may be used. Alternatively, a power supply which does not share a ground with the SQN-2S may be used e.g. a camera battery.
<b>Power Distribution</b>	The mixer carries two four-way connectors, one of which [DC] gives access to the internal batteries for charging and also serves to connect to an external power source. The second connector [PT] is an output which provides a switched, short circuit proof connection to the power supplied to [DC]. This allows the mixer to be used as the focal point for a system of interconnected devices, all controlled from the mixer's power switch.
<b>Temperature Range</b>	The mixer is designed to work over the temperature range of -20 to +60 °C.
<b>Dimensions</b>	The dimensions of the mixer case are: Height 44mm, Width 210mm, Depth 120mm
<b>Weight</b>	The weight of the mixer without batteries is 1.1kg

**Construction** The outer case of the mixer is made of aluminium. The end blocks holding the connectors and the panpots are milled from solid aluminium bar. The circuitry is constructed on multi-layer printed circuit boards with internal ground and power planes which ensure the integrity of the internal grounding system.

All control knobs are special to SQN and are turned and milled from solid aluminium bar. The internal battery compartment is milled and bored from a solid block of polyacetal engineering plastics material and the moving parts are aluminium and stainless steel.

All labels and legends on the mixer are permanent. On the end blocks they are engraved; on the front panel they are printed into the hard-anodised surface; on the baseplate they are reverse printed on a polycarbonate label.

The mechanical construction is a development of a system which has proven in the past to be resistant to mechanical damage.

***The SQN-2S mixer offers the professional recordist:***

- Unsurpassed sound quality
- Industry standard acceptability
- User friendly ergonomic layout
- Tried and tested electronic design
- Superior mechanical engineering
- Lowest running costs
- Highest resale value
- Long trouble-free service
- The utmost in portability
- Efficient factory back-up service