S!NG™

Sine Wave Generator

- Complete sine wave test tool
- Remotely controllable
- Very pure sine THD<0.5%
- Precise output level -20dBu
- Logarithmic frequency sweep
- Chirps
- Differential and common mode
- Phantom-powered
- Cable analyser
- Key ring fob

FlatKeys
Unit 12 Falsgrave Mews, Scarborough, YO12 5ET
www.brikworm.co.uk Made in the UK

S!NG™

Main modes:

1. Continuous sine **DM**
2. Continuous sine **CM**
3. Continuous sine **DM** & **CM;** 2 seconds of each
4. Pulsed sine slow **DM**
5. Pulsed sine fast **DM**
6. Clicked sine **DM**
7. Swept sine 20Hz–10kHz logarithmic **DM** & **CM**
8. Chirps: fast narrow band logarithmic sweeps **DM**
9. Tools: heartbeat & random note generator **DM**

Used for:
Analysing room acoustics; checking balance in preamplifiers, multicore cables, XLR leads; checking system phasing; listening to distortion; setting amplifier delays for large venues; analysing the frequency response of PA systems; comparing balanced to unbalanced operation... and many more

How to use S!NG™:
Plug S!NG™ into an XLR microphone input & switch on phantom power. At power on, S!NG™ will semaphore the current settings (using the LED and by sending notes). To change the current setting, switch off the phantom power in the first semaphore to increment the main mode, or the second semaphore to increment the sub-mode. A complete list of modes and sub-modes is printed on the rear of this page. See also 'More on changing modes' below.

More on changing modes:
The audio semaphore S!NG™ sends is 'bracketed' by three 'peeps'. The first 'peep' is there to let you know that the first semaphore which indicates the main mode is about to be sent. The second 'peep' lets you know that the first semaphore is complete and that the second, sub-mode, semaphore is about to start. The final 'peep' lets you know that the semaphore is complete.

To increment the main mode, turn off the phantom power at any time from the moment you can hear the first 'peep' to the end of the first semaphore, during which the LED flashes green. To increment the sub-mode, turn off the phantom power at any time from the start of the second 'peep' to the end of the second semaphore, during which the LED flashes red.

S!NG™ uses two lengths of note/LED flash: long and short. The long pulse stands for 5, whereas the short pulse stands for one, so 'long-long-short' would be a count of 5+5+1= 11 (=sub-mode 11).

Note that the LED does not flash during the 'peep'.

As a last resort, if the phantom power switch is not accessible, you can change modes by unplugging the S!NG™ at the appropriate time.

Keyring
Use S!NG™ as a key ring fob – you'll always have a handy sound source with you! The stainless steel band can also be used to hang S!NG™ on a microphone stand or to hang it up in a tool cabinet.

Specifications

Power:	+48V phantom power
Frequency response:	20Hz-10KHz +/- 0.5dB
Frequency accuracy:	+/- 5%
Output impedance:	600 Ω (+/- 5%)
THD	<0.5% @ 1kHz
Sweep function	Logarithmic

We recommend the use of S!NG™ with our range of digital audio multicore products.

FlatKeys customer care

We want you to be entirely satisfied with our products, so if this one pleases you, please tell others; if not, please tell us. We pride ourselves on our products but more importantly on our customer care.

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Complete list of main modes and sub-modes: (**DM** = differential mode; **CM** = common mode)

1 Continuous sine **DM**
1) 27.5Hz 2) 55Hz 3) 110Hz 4) 220Hz
5) 440Hz 6) 660Hz 7) 880Hz 8) 1 kHz
9) 2 kHz 10) 4 kHz 11) 8 kHz 12) 10 kHz
13) Automatic one of each every 5 seconds

2 Continuous sine **CM**
1) 27.5Hz 2) 55Hz 3) 110Hz 4) 220Hz
5) 440Hz 6) 660Hz 7) 880Hz 8) 1 kHz
9) 2 kHz 10) 4 kHz 11) 8 kHz 12) 10 kHz
13) Automatic one of each every 5 seconds

3 Continuous sine **DM** & **CM** 2s each
1) 27.5Hz 2) 55Hz 3) 110Hz 4) 220Hz
5) 440Hz 6) 660Hz 7) 880Hz 8) 1 kHz
9) 2 kHz 10) 4 kHz 11) 8 kHz 12) 10 kHz
13) Automatic one pair of each

4 Pulsed sine **DM** 2s on, 4s off
1) 27.5Hz 2) 55Hz 3) 110Hz 4) 220Hz
5) 440Hz 6) 660Hz 7) 880Hz 8) 1 kHz
9) 2 kHz 10) 4 kHz 11) 8 kHz 12) 10 kHz
13) Automatic one of each

5 Pulsed sine **DM** 0.2s on, 2s off
1) 27.5Hz 2) 55Hz 3) 110Hz 4) 220Hz
5) 440Hz 6) 660Hz 7) 880Hz 8) 1 kHz
9) 2 kHz 10) 4 kHz 11) 8 kHz 12) 10 kHz
13) Automatic one of each

6 Click sine **DM** 0.001s on, 3s off
1) 27.5Hz 2) 55Hz 3) 110Hz 4) 220Hz
5) 440Hz 6) 660Hz 7) 880Hz 8) 1 kHz
9) 2 kHz 10) 4 kHz 11) 8 kHz 12) 10 kHz
13) Automatic one of each

7 Swept sine 20Hz-10kHz
1) **DM** 10s per octave 2) **DM** then **CM** 10s per octave 3) **CM** 10s per octave
4) **DM** 1s per octave 5) **DM** then **CM** 1s per octave 6) **CM** 1s per octave
7) **DM** 0.1s per octave 8) **DM** then **CM** 0.1s per octave 9) **CM** 0.1s per octave

8 Chirps **DM** 0.1s log sweep, 2s off
1) 100-200Hz 2) 150-300Hz 3) 200-400Hz 4) 300-600Hz
5) 400-800Hz 6) 600-1.2k Hz 7) 800-1.6kHz 8) 1.2-2.4kHz
9) 1.6-3.2kHz 10) 2.4-4.8kHz 11) 3.2-6.4kHz 12) 4.8-9.6kHz
13) Automatic one of each

9 Tools **DM**
1) Heartbeat 27.5Hz, Positive first ½ cycle, 0.4s off, Negative second ½ cycle, 1.2s off
2) Heartbeat 500Hz, Positive first ½ cycle, 0.4s off, Negative second ½ cycle, 1.2s off
3) Random note generator, 0.2s each
4) Random note generator, 0.1s each

Semaphore of note and LED pulses are: **Long = 5**, Short = 1


= 7

S!NG™ for analysing room acoustics:
The surfaces of untreated walls have reflective properties which cause undesirable side effects. Reflections cause sound to 'meet itself coming back' where the two add or subtract to some extent. In the case of very large rooms these 'reflections' can be heard as reverberation, like those heard in a church.

The pure sine wave can be used to asses the reflective properties of walls. The simplest way to do this is to emit a tone and listen to it using just one ear (finger in the other ear). Then move your head slowly to find places in the room where the note gets louder or quieter. The wavelength of the note emitted will dictate how often these 'nodes' appear.

The chirps S!NG™ produces can be used in larger rooms to listen to inherent reverberation effects.

Proper treatment of room surfaces will reduce this effect to a large extent. This is also a good way of measuring the effectiveness of such materials.

Phasing:
Pin 2 of the XLR connector is called 'positive' and pin 3 is called 'negative'. When pin 2 is more positive than pin 3 the speaker should move outwards. As there are many stages in modern systems, amplifiers, crossovers, equalisers and so on, it is possible for this 'phasing' (positive causing positive movement) to be reversed. The effect of this is a 'muddy' sounding system.

S!NG™ has two ways to check phasing. In mode 1 (<600Hz) the LED is red when the sine wave is more than 25% positive, green when it is more than 25% negative and off the rest of the time. This can be used like a 'strobe' light by pointing at the surface of the loudspeaker and seeing if the red light is 'in front' of the green.

The second method is to use the 'heartbeat' in tools mode. The heartbeat is a positive half cycle where the LED is red followed 0.4s later by a negative half cycle where the LED is green. Then after a further 1.2s the cycle repeats. By placing a finger on the loudspeaker you can 'feel' the effect.

Be aware that crossovers (amongst other things) can make this effect hard to distinguish.

S!NG™ for analysing frequency response of speakers:
The sine sweep S!NG™ produces can be used to listen to a sound system to hear how 'flat' it sounds. The three speeds can be used as required. The slowest speed is 10s per octave. There are 9 octaves covered by each sweep and so at 10s per octave it will take around 90 seconds to do the complete sweep.

Start by using the 0.1s per octave sweep to get an overview of the system, then use the slower sweeps to do a more in-depth study.

Balanced or not?
The system of 'balance' used in sound systems is achieved by sending two opposite polarity signals from the source to the preamplifier. The preamplifier is designed to amplify the **difference** between the two. Anything **common** is rejected by the preamplifier.

Any interference picked up by the cabling is applied to both signals and so they would appear common to the preamplifier which in turn would reject them. S!NG™ allows you to hear the common mode rejection of the preamplifier as well as to hear how well balanced the multicore or XLR leads are.

The easiest way to analyse leads for balance is to use sine sweep in common mode. It is usual to hear the higher frequencies to some extent as these are harder for the preamplifier to reject.

Start by listening to how much rejection the preamplifier gives and then compare this to how much rejection the leads give.

Delays:
In outdoor or large venues there are often many sets of amplification and loudspeakers. In order for the majority of the audience to hear the mixture of these at the same time, delays need to be used in the amplifier path. S!NG™ can be used to set these delays accurately.

Set S!NG™ to mode 6 – click sine. Choose an appropriate frequency for the loudspeakers and adjust the delay between two until the shortest possible click is heard. Repeat for other frequency bands.