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## **BSG-LAB-SERIES: THE FIRST CHOICE FOR APPLICATIONS IN ACOUSTOFLUIDICS**

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The new gold-standard of highest-precision signal generators for the operation of SAW actuators.

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[www.belektronig.de](http://www.belektronig.de)

# THE PERFECT TOOL FOR **APPLICATIONS IN ACOUSTOFLUIDICS**

Made in  
Germany



## Highest-precision and compact frequency controller Made in Germany

The BELEKTRONIG SAW Generator BSG is used to control SAW actuators for professional applications in acoustofluidics. It integrates network analyzer, frequency generator, power amplifier and power meter in a single compact device. It is capable of replacing the cost-intensive and complex setups that have been necessary so far to drive and characterize SAW actuators. The SAW actuators are driven by a high-frequency alternating voltage with variable frequency and amplitude. The optimal excitation frequency is automatically re-adjusted when deviations are tracked.

- ✓ **Scalar network (S-parameter measurement  $|S_{11}|$ )**
- ✓ **Easy and intuitive operation**
- ✓ **Compact and portable device**
- ✓ **Automatic and manual operation modes**
- ✓ **Output power of 40  $\mu$ W ... 4 W**
- ✓ **Frequency range from 5 ... 215 MHz**
- ✓ **Permanent characterization of the SAW actuator state**

## BSG Soft: Characterize and monitor SAW actuators in operation

With the user software BSG Soft all functions of the BELEKTRONIG signal generators can be conveniently controlled. The clear interface allows to set the output frequency, output power and signal phase as well as the frequency limits. Users can also choose between different operation modes. The device status (output frequency and output power) as well as the actuator properties (reflection factor) are continuously monitored. The data can also be recorded. The full documentation includes the interface protocol as well as LabView VIs for easy integration into your own software projects.



## Connected and Ready to Use in Three Simple Steps (Exemplary Shown at Fluid Atomization)



### Connect

Connect the SAW actuator to the SAW Generator BSG.



### Configure

Set the output power on the device.



### Control

The SAW Generator now automatically detects and tracks the optimum excitation frequency of the SAW actuator.

## Three at a time: complexity reduction, time savings and cost savings

For acoustofluidic experiments so far, complex experimental setups have been made out of several cost-intensive measuring and control devices. Additionally specific knowledge in the field of high-frequency technology was required. To change this, we have integrated a scalar network analyzer, a frequency generator as well as power amplification and measurement in a single device: the SAW Generator BSG. Automated scanning capabilities allow you simple characterization of the connected SAW actuators and tracking of the excitation frequency.

- › Versatile usable for R&D tasks with SAW actuators
- › Time and cost savings through high integration and short processing times
- › Automatic detection and tracking of the optimum excitation frequency
- › Two-channel device for generating standing wave fields
- › Generation of SAW pulses possible
- › Including trigger connections to control external devices such as high-speed cameras

### State of the Art

Complex experimental setups made of cost-intensive single instruments



### SAW Generator BSG

Characterization of SAW actuators, signal generation, signal amplification and monitoring

### SAW Actuator Platform

Various acoustofluidic applications like acoustic tweezer, fluid atomization and many more



### Additional Benefits

Compact design, no switching between separate single devices necessary

## Technical Data for SAW Generator BSG-LAB-Series

### Frequency Control

- › Frequency range: 5...215 MHz
- › Frequency resolution: 1 Hz
- › Accuracy of frequency: 10 ppm typ.
- › Fully automatical re-adjusting of optimal excitation frequency
- › Adjustable scan parameter and scan ranges
- › Modes of operation: [1] Power measurement, [2] Frequency generator (manual mode), [3] Automated detection and readjustment of minima/maxima, [4] Channel 2 synchronized with Chan.1

### Output Power

- › Signal shape: AC, sinusoidal
- › Power adjustable: 40 µW...4 W at 50 Ω
- › Pulsed operation: PWM up to 100 Hz
- › Sampling rate adjustable
- › Modes of operation: [1] Power adjustable on device panel, [2] Power adjustable via PC, [3] Channel 2 synchronized with Chan.1

### Output Phase

- › Adjustable phase: -180...180°

### Trigger Input and Output

- › 2 × Trigger In to trigger the output signal by external devices
- › 2 × Trigger Out to control external devices (e.g: cameras)

### Power Measurement, S-Parameter

- › Measurement of the back and forth power wave
- › Detection of S-parameter:  $|S_{11}|$ ,  $|S_{21}|$ ,  $|S_{12}|$ ,  $|S_{22}|$
- › Functionality of scalar network analyzer

### Interface

- › USB 2.0 including drivers for virtual COM port

### Software Control

- › PC software
- › LabView VIs
- › ASCII command set

### Power Supply, Dimensions and Conditions of Operation

- › Power supply: 24 V (maximal 65 W)
- › Dimensions (L×W×H): 285×250×100 mm<sup>3</sup>
- › Weight: ~3.5 kg
- › Operating temperature: 10...45 °C
- › Relative humidity: 0...80 %, not condensating

### Scope of Delivery

- › SAW Generator BSG
- › Power supply
- › SMA and USB cable
- › Termination resistor 50 Ω
- › PC software

## Configurations

BSG -LAB-...	F10	F20
Output channels	1	2
$ S_{11} $	✓	✓
$ S_{21} $ $ S_{12} $ $ S_{22} $	✗	✓

Developed in close collaboration with the SAWLab Saxony at IFW Dresden e.V., Germany.



Learn more about the technical details of our devices and easily request a quote for your individual frequency control needs.

[www.belektronig.de](http://www.belektronig.de)

