Acoustic
Sensor Data Sheet

SPECIFICATIONS

> **Type:** High-performance, low-power, silicon microphone
> **Range:** 0-3V (0-1 normalized)
> **Gain:** 410
> **Bandwidth:** 29Hz – 1591Hz

FEATURES

> Audio power measurement
> Silicon microphone
> Pre-conditioned analog output
> Small form-factor
> Raw data output

APPLICATIONS

> Biomedical research
> Auditive gastric activity monitoring
> Audio power measurement
> Sound (impulse) detection

GENERAL DESCRIPTION

The biosignalsplux Acoustic Sensor is designed for audio power and audio impulse measurements, which can be used to monitor ambient noises, physiological sounds, and/or sound impulses. This sensor can be used in combination with the biosignalsplux acquisition unit and other biosignalsplux sensors (e.g. ECG), to track the changes of physiological signals as results of induced auditive stimuli or changing activity of physiological processes (e.g. abdominal sounds caused by gastrointestinal activity).
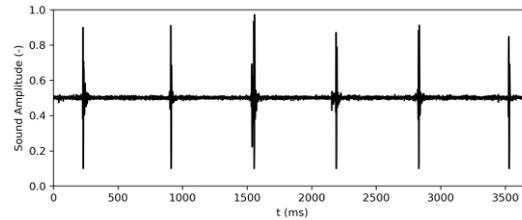

Fig. 1. Typical raw audio data of a series of sound impulses (acquired with biosignalsplux and the acoustic sensor).

SENSOR (SEN)
Sensor Data Sheet

TRANSFER FUNCTION
[0V, 3V]

$$ACOUSTIC(V) = \frac{(\frac{ADC}{2^n - 1} - \frac{1}{2}) \times VCC}{G_{Acoustic}}$$

Normalized: [0, 1]

$$ACOUSTIC(-) = \frac{ADC}{(2^n - 1)}$$

$ACOUSTIC(V)$	– Sensor output in V
$ACOUSTIC(-)$	– Normalized sensor output
ADC	– Value sampled from the channel
n	– Number of bits of the channel[1]
VCC	– 3V (operating voltage)

PHYSICAL CHARACTERISTICS
> Size (W x L x H): 1.0x1.8x0.4cm
> Cable Length (A): 105.0±0.5cm
> Weight: 9g±1g
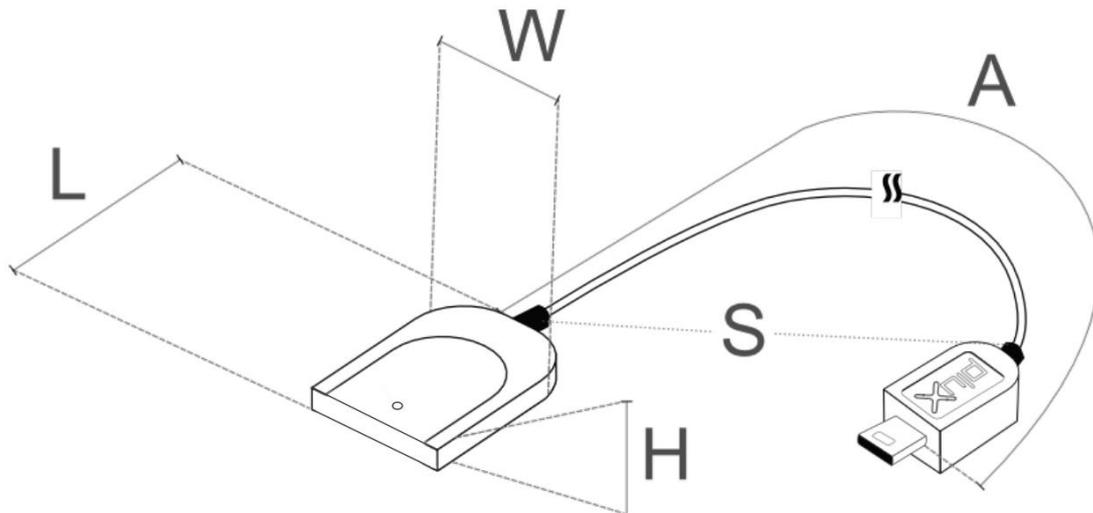**> Sleeve:** White, Black, Blue, Green, Red, Yellow, Gray, or Brow

Fig. 2. Physical characteristics of the sound sensor.

ORDERING GUIDE

Reference	Package Description
SENSPRO-ACOUSTIC-1	Acoustic sensor with standard physical characteristics and random sleeve color.
SENSACOUSTIC-1-A-S	Acoustic sensor with custom cable length A and/or custom sleeve color S; for standard physical characteristics for A or S use 0.

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[1] The number of bits for each channel depends on the resolution of the Analog-to-Digital Converter (ADC); in biosignalsplux the default is 16-bit resolution ($n = 16$), although 12-bit ($n = 12$) and 8-bit ($n = 8$) may also be found.