Electrogastrography (EGG)
Sensor Data Sheet

SPECIFICATIONS
> **Gain:** 5809
> **Range:** ±0.28mV (with VCC = 3.3V)
> **Bandwidth:** 0.016-0.16Hz
> **Consumption:** ~3mA
> **Input Voltage Range:** 1.8-5.5V
> **Input Impedance:** >100GOhm
> **CMRR:** 100dB

Fig. 1. Pin-out and physical dimensions.

FEATURES
> Single-channel sensor
> Bipolar differential measurement
> Pre-conditioned analog output
> Small form factor
> Raw data output
> Easy-to-use

APPLICATIONS
> Bowel motility analysis
> Gastric contractions detection
> Sleep studies
> Neurophysiology studies
> Psychophysiology
> Biomedical devices prototyping

GENERAL DESCRIPTION
Our electrogastrography (EGG) sensor has been designed for user-friendly recording of the electrical activity of the stomach. Multiple sensors can be used simultaneously, and either used in standalone or together with other modalities, our sensor can be a cost-effective and straightforward way to assess bowel motility and overall gastric activity. The bipolar configuration, with two measurement electrodes, detects the electrical potentials in the specific stomach region of choice, with respect to a reference electrode (placed in an area of low bioelectrical activity). The resulting signal is the amplified difference between these two leads, eliminating the common unwanted signals. Its convenient form factor enables a discrete application in the typical EGG electrode placement locations.
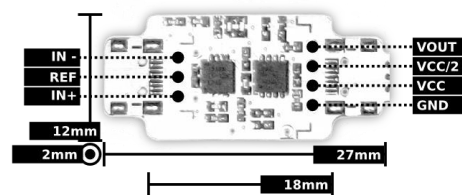
REV B

BEWARE: DIRECT OR INDIRECT COUPLING TO THE MAINS MAY RESULT IN SHOCKING HAZARD

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This sensor has a high amplification gain, reason for which it is particularly sensitive to noise resulting electromagnetic and motion sources. For optimal performance, it is therefore recommended that data acquisition is done in an appropriate environment and with the subject in stationary position. Power supplies, lighting and other common household elements are prone to introduce parasite signals. Measurement in dynamic conditions is prone to be affected by motion artifacts.

TRANSFER FUNCTION
$[-0.28mV, 0.28mV]$

$$EGG(V) = \frac{\left(\frac{ADC}{2^n} - \frac{1}{2}\right) \times VCC}{G_{EGG}}$$

$$EGG(mV) = EGG(V) \times 1000$$

$VCC = 3.3V$ (operating voltage)
$G_{EGG} = 5809$ (sensor gain)

$EGG(V)$ – EGG value in Volt (V)
$EGG(mV)$ – EGG value in millivolt (mV)
ADC – Value sampled from the channel
n – Number of bits of the channel[1]

ORDERING GUIDE

Part #	Description
SENS-EGG-NC	Electrogastrography (EGG) sensor without connectors
SENS-EGG-UCE6	Electrogastrography (EGG) sensor with UC-E6 sockets on both sides for seamless plug & play connection to a BITalino (r)evolution Plugged or Core
SENS-EGG-SHER	Electrogastrography (EGG) sensor with a Molex Sherlock 4-pin socket on one side and a Molex Sherlock 3-pin socket on the other for easy power and signal cable connection or pin breakout using PCB wires

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[1] The number of bits for each channel depends on the resolution of the Analog-to-Digital Converter (ADC); in BITalino the first four channels are sampled using 10-bit resolution ($n = 10$), while the last two may be sampled using 6-bit ($n = 6$).