

# Electrodermal Activity (EDA) Sensor Data Sheet

EDA 21112015

## SPECIFICATIONS

- > **Range:** 0-13 $\mu$ S
- > **Bandwidth:** 0-3Hz
- > **Consumption:** ~0.72mA
- > **Input Impedance:** >1GOhm
- > **CMRR:** 100dB

## FEATURES

- > Skin resistance measurement
- > Pre-conditioned analog output
- > High signal-to-noise ratio
- > Shielded miniaturized cables
- > Medical-grade raw data output
- > Ready-to-use form factor

## APPLICATIONS

- > Sympathetic nervous system monitoring
- > Arousal detection
- > Human-Computer Interaction
- > Emotional cartography
- > Affective computing
- > Physiology studies
- > Psychophysiology
- > Relaxation biofeedback
- > Biomedical devices prototyping

## GENERAL DESCRIPTION

Electrodermal Activity (EDA) can be defined as a transient change in certain electrical properties of the skin, resulting from sweat secretion and sweat gland activity. These changes can result from elicited or natural stimuli that trigger a regulatory response by the sympathetic nervous system. Our EDA sensor is capable of accurately measuring the skin activity with high sensitivity in a miniaturized form factor. The low-noise signal conditioning and amplification circuit design provides optimal performance in the detection of even the most feeble electrodermal skin response events. Examples:

<http://bit.ly/1HGyYE5>

<http://bit.ly/1Gw9r1x>

<http://bit.ly/1JraXmy>

<http://www.plux.info/files/ftp/docs/PaperMedeTel-HG.pdf>

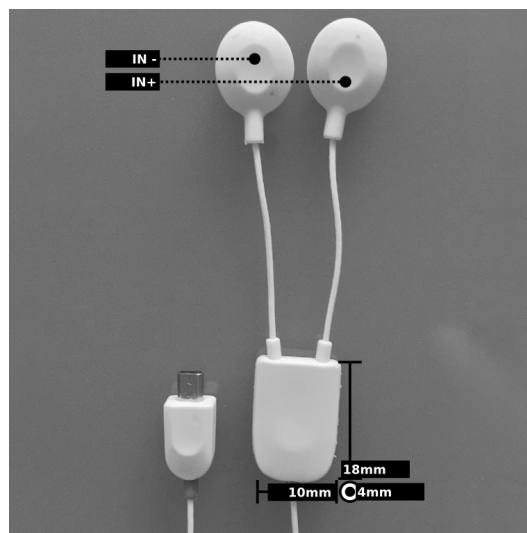


Fig. 1. Miniaturized form factor for minimally-intrusive application on the subjects.

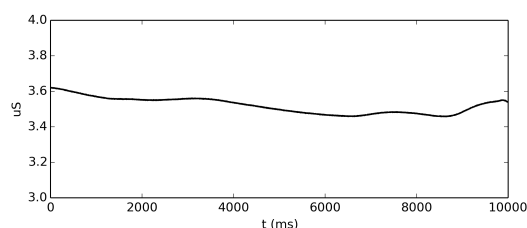


Fig. 2. Typical raw EDA data (acquired with biosignals).



Fig. 3. Example placement on the index and ring fingers.

**biosignalsplux**  
wearable body sensing platForm

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## TRANSFER FUNCTION

$[-1.2\mu S, 13.7\mu S]$

$$EDA(\mu S) = \frac{\frac{ADC}{2^n} \cdot VCC}{0.12}$$

$$EDA(S) = EDA(\mu S) \cdot 1 \times 10^{-6}$$

$VCC = 3V$  (operating voltage)

$EDA(\mu S)$  – EDA value in microsiemens ( $\mu S$ )

$EDA(S)$  – EDA value in Siemens ( $S$ )

$ADC$  – Value sampled from the channel

$n$  – Number of bits of the channel<sup>1</sup>

## PHYSICAL CHARACTERISTICS

> **W1 x L1 x H1:** 1.0x1.8x0.4cm

> **W2 x L2 x H2:** 1.5x2.3x0.4cm

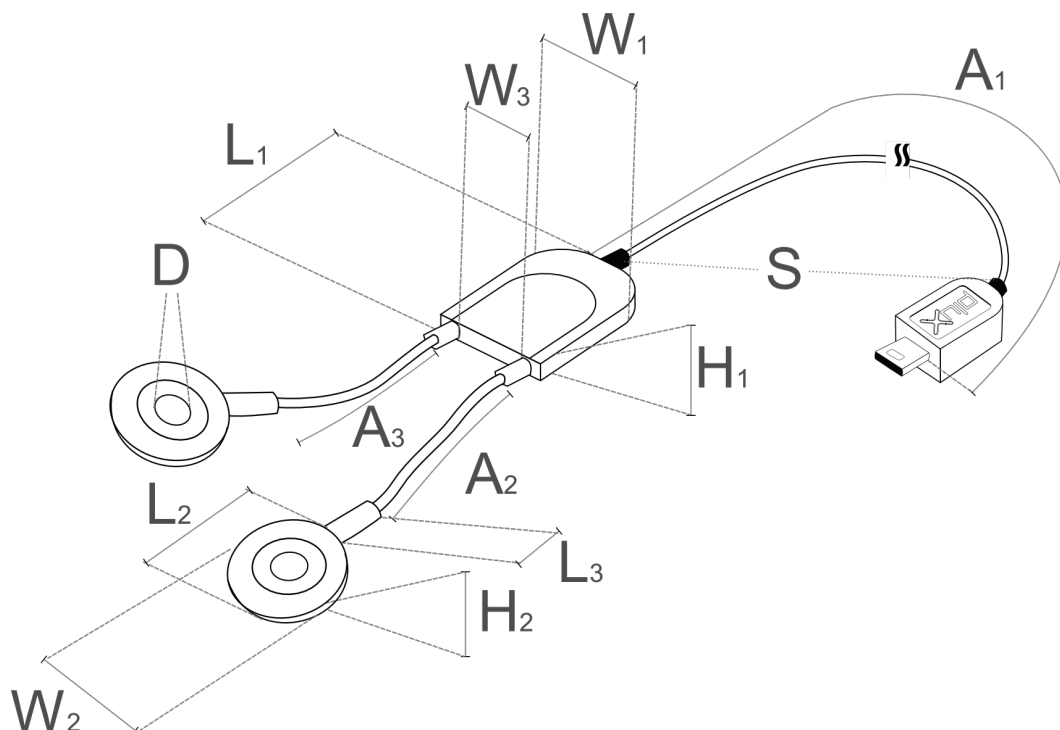
> **A1:** 105.0±0.5cm

> **A2:** 5.0±0.5cm

> **A3:** 5.0±0.5cm

> **D:** 0.4cm

> **S:** White, Black, Blue, Green, Red, Yellow, Gray, or Brown



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<sup>1</sup> 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.

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## ORDERING GUIDE

Reference	Package Description
EDA1	Electrodermal Activity (EDA) sensor with standard physical characteristics and a random cable sleeve color
EDA1-A1-A2-A3-S	<p>Electrodermal Activity (EDA) sensor built with custom lengths A1, A2 and/or A3 (all in cm), and custom sleeve color S; for standard physical characteristics in A1, A2, A3, or S use 0.</p> <p>Examples:</p> <ul style="list-style-type: none"><li>&gt; EDA1-200-0-0-0: Otherwise all-standard EDA sensor except for a 200cm cable A1</li><li>&gt; EDA1-0-0-0-Yellow: Otherwise all-standard EDA sensor except for a yellow cable sleeve</li><li>&gt; EDA1-50-10-10-Red: Fully custom EDA sensor with a 50cm cable A1, 10cm electrode cables A2 &amp; A3, and a red cable sleeve</li></ul>