Electrodermal Activity (EDA) Sensor Datasheet

EMG 03092020

SPECIFICATIONS

> Range: 0-25μS (@VCC=3V)
> Bandwidth: 0-3Hz
> Consumption: ±0.1mA
> Input Bias Current: ±70pA
> CMRR: 130dB
> Measurement: continuous
> Current: DC

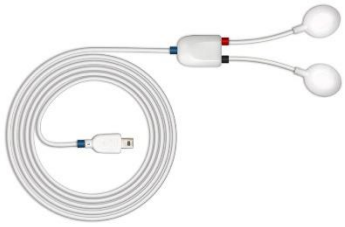

Fig. 1. BIOSIGNALSPLUX EDA SENSOR (STANDARD VERSION).

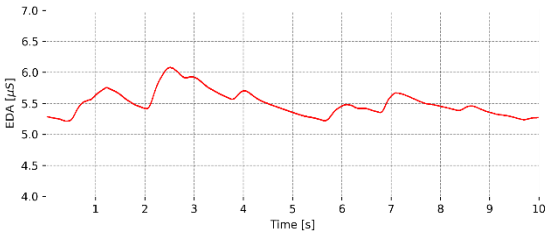

Fig. 2. Typical raw EDA data (acquired with biosignalsplux).

FEATURES

> Skin resistance measurement
> Unobtrusive & lightweight sensor
> Pre-conditioned analog output
> High signal-to-noise ratio
> Ready-to-use form-factor
> Medical-grade raw data output

APPLICATIONS

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

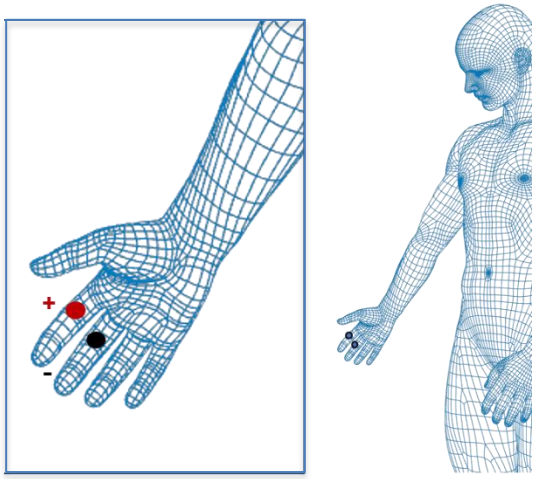

Fig. 3. Example EDA placement on the index and middle finger.

GENERAL DESCRIPTION

The biosignalsplux EDA sensor is capable of accurately measuring the electrical properties of the skin which changes. These changes are caused by alterations in sweat secretion and sweat gland activity as a result of changing sympathetic nervous system activity. The low-noise signal conditioning and amplification circuit design provide optimal performance in the detection of even the most feeble electrodermal skin response events.

APPLICATION NOTES

The biosignalsplux EDA sensor is designed to acquire the change of skin activity such as sweat with two measuring electrodes. One example is the placement of the electrodes on the anterior side of the hand on two adjacent

biosignalsplux
wearable body sensing platform

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fingers of interest (see Fig. 3). The electrodes are then connected to the sensor cable of the EDA sensor.

TRANSFER FUNCTION

[0µS, 25µS]

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

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

$VCC = 3V$ (operating voltage)

$EDA(\mu S)$ – EDA value in microsiemens (µS)
$EDA(S)$ – EDA value in in siemens (S)
ADC – Value sampled from the channel
n – Number of bits of the channel[1]

ELECTRODE CONNECTIONS

Electrode Cable	+	-
Sleeve Color	Red	Black

PHYSICAL CHARACTERISTICS

> W1 x L1 x H1:	1.6x2.2x0.5cm	**> W2 x L2 x H2:**	1.5x1.75x0.55cm
> W3:	0.9cm	**> L3:**	0.5cm
> A1:	105.0±0.5cm	**> A2:**	5.0±0.5cm
> A3:	5.0±0.5cm	**> D:**	0.4cm
> Available sleeve colors:	White, Black, Blue, Green, Red, Yellow, Gray, and Brown		
> **Weight:**	13g		

[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.

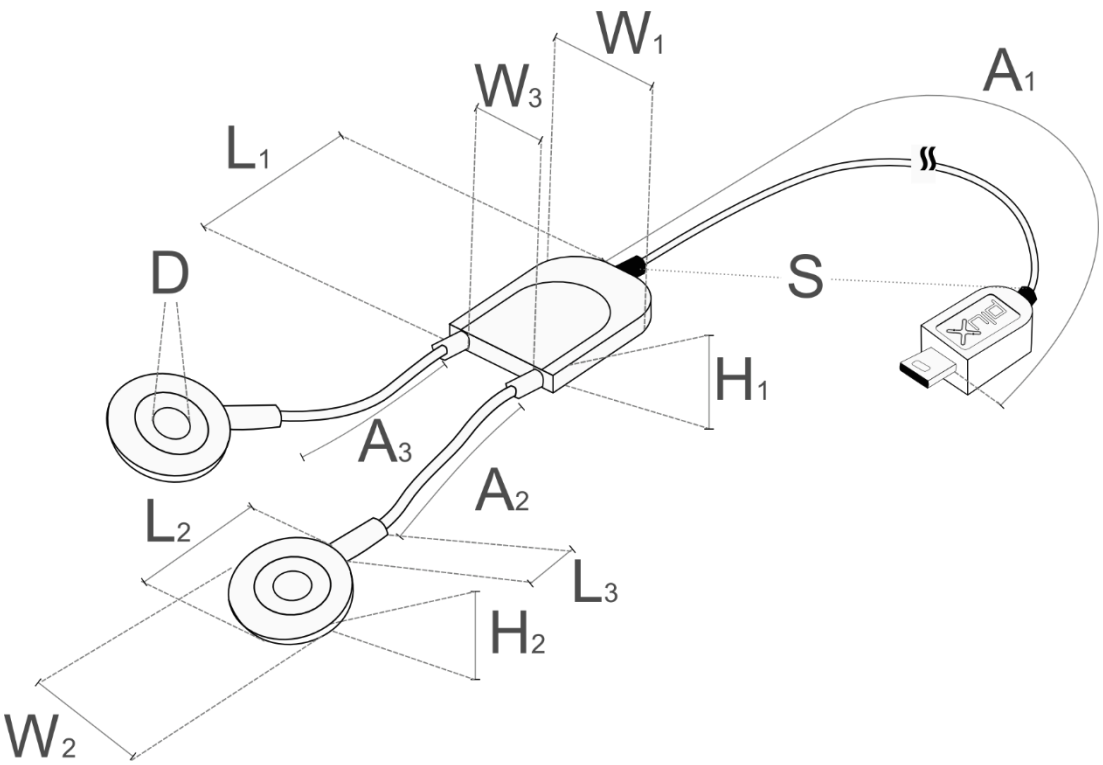

Figure 1: Physical characteristics of the standard Electrodermal Activity (EDA) sensor.

ORDERING GUIDE

Reference	Package Description
SENPRO-EDA1	Electrodermal Activity (EDA) sensor with standard physical characteristics and a random cable sleeve color
SENPRO-EDA1-A1-A2-A3-S	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. Examples: > EDA1-200-0-0-0: Otherwise all-standard EDA sensor except for a 200cm cable A1 > EDA1-0-0-0-Yellow: Otherwise all-standard EDA sensor except for a yellow cable sleeve > EDA 1-50-10-10-Red: Fully custom EDA sensor with a 50cm cable A1, 10cm electrode cables A2 & A3, and a red cable sleeve