

Electrocardiography (ECG) Sensor Datasheet

ECG 10082020

SPECIFICATIONS

- > **Gain:** 1019
- > **Range:** $\pm 1.47\text{mV}$ (with $V_{CC}=3\text{V}$)
- > **Bandwidth:** 25-100Hz
- > **Input Impedance:** $>100\text{G}\Omega$
- > **CMRR:** 100dB
- > **Cable Length:** $100\pm 0.5\text{cm}$ (customizable)
- > **Connector Type:** UC-E6 (Male)

FEATURES

- > Bipolar differential measurement
- > Pre-conditioned analog output
- > High signal-to-noise ratio
- > Medical-grade raw data output
- > Ready-to-use & miniaturized form-factor

APPLICATIONS

- > Life sciences studies
- > Heart rate & heart rate variability
- > Human-Computer Interaction
- > Biometrics
- > Affective computing
- > Physiology studies
- > Psychophysiology
- > Biofeedback
- > Biomedical devices prototyping

GENERAL DESCRIPTION

Our low-noise ECG local differential triode configuration enables fast application and unobtrusive single-lead ECG data acquisition (although custom electrode cable configurations are available). The state-of-the-art design of the analog frontend on this sensor is specifically targeted at analyzing minutiae in the data and provides medical-grade raw sensor data.

This sensor can be used to extract heart rate data and other ECG features, enabling its application in research fields such as biomedical, biofeedback, psychophysiology, and sports, among many others.

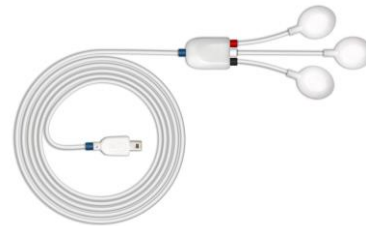


Fig. 1. Standard biosignalsplux ECG sensor with short electrode cables (4cm + 6cm + 4cm).

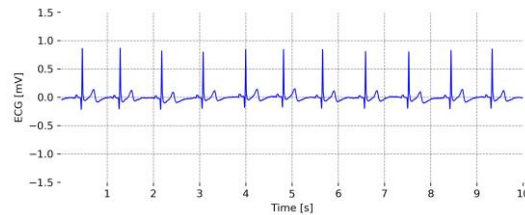


Fig. 2. Typical raw ECG data (acquired with biosignals).

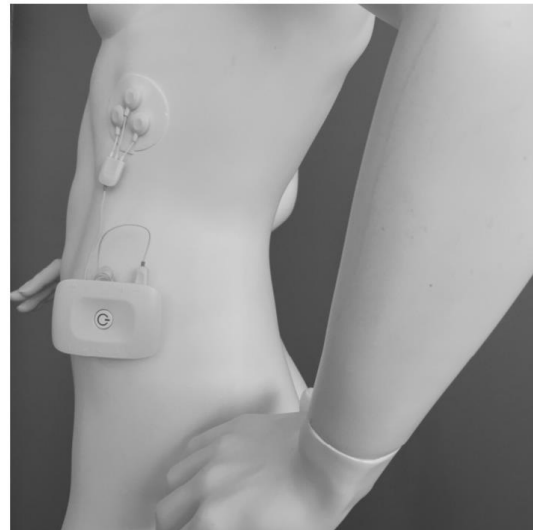


Fig. 3. Example sensor placement using an ECG triode (equivalent to a standard medical-grade V6 lead).

biosignalsplux
wearable body sensing platform

PLUX – Wireless Biosignals, S.A.
Av. 5 de Outubro, n. 70 – 2.
1050-059 Lisbon, Portugal
plux@plux.info
<http://biosignalsplux.com/>

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TRANSFER FUNCTION

[-1.47mV, +1.47mV]

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

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

$VCC = 3V$ (operating voltage)

$G_{ECG} = 1019$ (sensor gain)

$ECG(V)$ – ECG value in Volt (V)

$ECG(mV)$ – ECG value in millivolt (mV)

ADC – Value sampled from the channel

n – Number of bits of the channel¹

ELECTRODE CONNECTIONS

Sleeve Color	Red	Black	White
Electrode Cable	+	-	Reference

PHYSICAL CHARACTERISTICS

> $W1 \times L1 \times H1$: 1.5 x 2.1 x 0.4cm

> $W2 \times L2 \times H2$: 1.4 x 1.7 x 0.5cm

> $A1$: 105±0.5cm

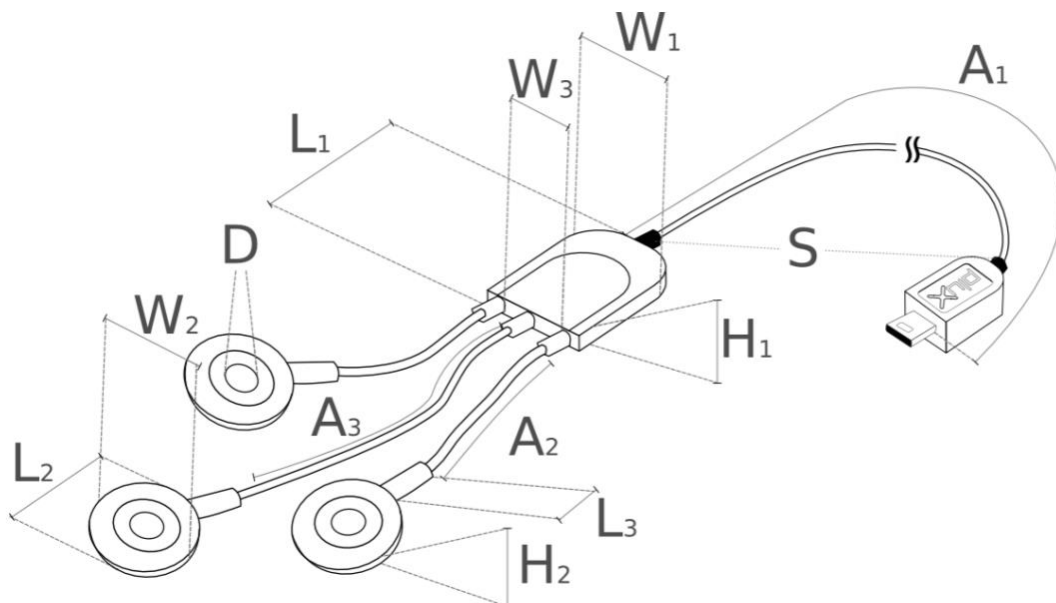
> $A2$: 4±0.5cm

> $A3$: 6±0.5cm

> D : 0.4cm

> **Weight:** 9g

> **Available Sleeve Colors:** White, Black, Blue, Green, Red, Yellow, Gray, and Brown



Note: This sensor is also available with the electrodes cables ($A2$ & $A3$) in 30cm lengths.

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 on older devices.

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ORDERING GUIDE

Reference	Package Description
SENSPRO-ECG1	Electrocardiography (ECG) sensor with standard physical characteristics and a random cable sleeve color