

# INTELLIGENT BIO-IMPEDANCE SENSOR FOR BIOMEDICAL APPLICATIONS

## ABSTRACT

The present invention refers to a portable sensor capable of taking bio-impedance measurements for multiple frequencies, processing data to obtain both magnitude and phase of bio-impedance for every frequency, and transmitting the results wirelessly.

It was developed by researchers belonging to the University of Sevilla (US); and the Biomedical Research Networking Center in Bioengineering, Biomaterials and Nanomedicine (CIBER-BBN).

## DESCRIPTION

The sensor is in contact with the biological environment to be measured through several electrodes, in a way that both injects electrical current inside the biological environment and measures the tension produced by the said current circulation, according to the whole operation of the following subsystems:

- 1- Sensing subsystem: it produces and injects an alternating current in the human body through two electrodes, and, by means of other two electrodes, it measures bio-impedance in a part of the body, an organ, a tissue or a fluid.
- 2- Processing subsystem: it calculates magnitude and phase of bio-impedance for every frequency.
- 3- Communication subsystem: wireless communication in both directions. In one sense, it sends results and, in the other, it sends commands for the remote configuration of the sensor.
- 4- Timing subsystem: it registers the moment when every measurement is taken. It also commands the proper time for every scheduled operation to be done.
- 5- Data storage subsystem
- 6- Energy subsystem: power supply

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## APPLICATIONS

- mHealth, eHealth
- Continuous monitoring of physiological variables and health condition
- Portable electronic device useful in the areas of information and communications technology, biomedical engineering and medical technology

## DEVELOPMENT STATUS

Developed  
Laboratory tested

## IP STATUS

Spanish Patent granted

## AVAILABLE FOR

- Exclusive license agreement
- Non-exclusive license agreement
- Further research or development

## INDUSTRIAL PROPERTY

Spanish Patent **ES 2537351 B1**

International Patent Application  
**PCT/ES2014/070822**, filed on  
November 4, 2014

European phase **EP14858675.3**, filed  
on June 3, 2016

## TECHNOLOGICAL OFFER

## INNOVATIVE ASPECTS AND ADVANTAGES

Improved accuracy in bio-impedance measurement

Integration of novel features, not previously gathered.

Advanced capability of measurement

Two new different and complementary models of detection

Measurement in different sections of the biological environment

Analysis mono- and multi-frequency

Independent of both the type of electrode and different trademark medical tool

Number and values of the frequencies can be remotely configured, even in real time.

Capable of updating and adjusting to the monitored subject for a customized measurement

Bidirectional communication: sending data and receiving remote commands and configurations.

Accessible design, no training needed.

Reduced size, portability, cost and energy saving.

## CONTACT DETAILS

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