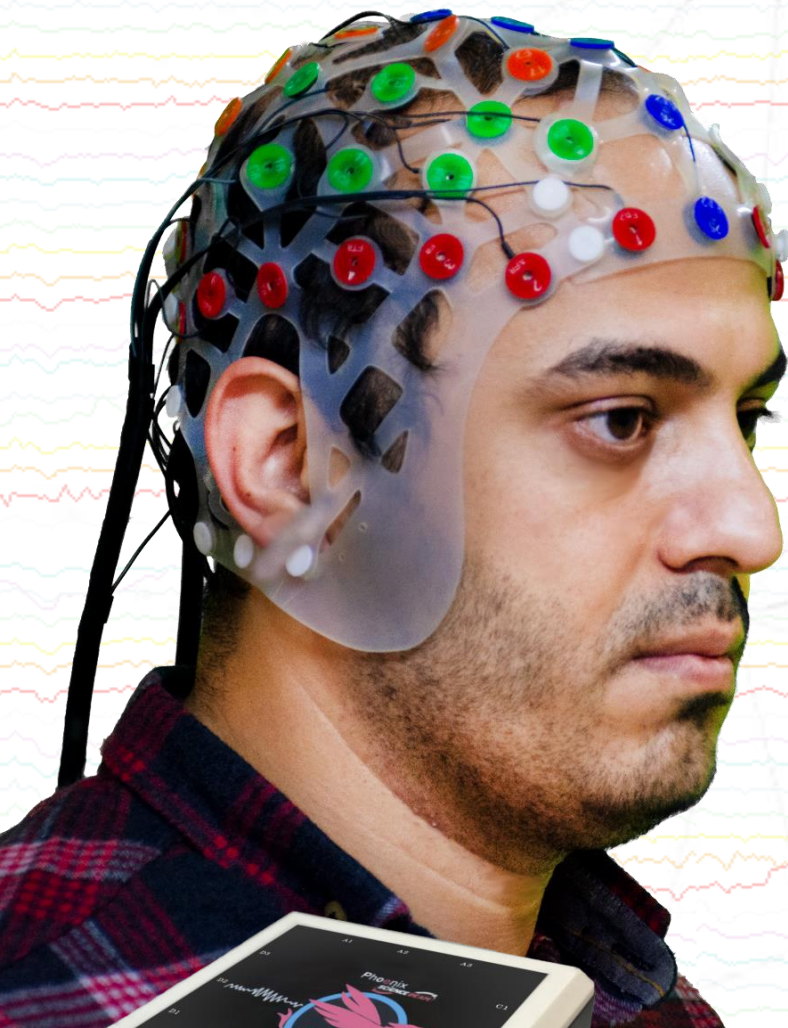


eWave (EEG/ERP/EXG/BCI/BMI):

Electrophysiology systems, EEG/ERP

32/40/64/72/128/256 Channels



eWave is a multi-channel bio-signal amplifier, which has 32, 40, 64, or 128 recording channels. eWave provides a wide input sensitivity to record various bio-signals such as EEG, EMG, ECG, and EOG. Besides, eWave is a special **ERP** acquisition system with high precision. Sciencebeam has also offered **eCap** series of EEG caps to provide consistent signal recording of up to 128 electrodes. Furthermore, external body sensors can be connected in order to record various **biological** signals. eLife software, which is a user-friendly software that is compatible with eWave device, is also offered by Sciencebeam company for visualization and analysis of recorded signals. Also, all 128 channels can be analyzed in **real-time** with eBridge **Simulink** software.

eWave (EEG/ERP/EXG/BCI/BMI):

Powerful EEG/QEEG/ERP Recording System

Description

eWave is a compact, **portable**, and **lightweight** bio-signal amplifier designed specifically for research purposes. The eWave amplifier provides all the resources needed for EEG/ERP studies in EEG or EEG/ERP labs and research centers. Pre-amplifiers, amplifiers, signal conditioners, analog-to-digital conversion, and an impedance check are all packed solidly into this small, lightweight, portable, and reliable package.

eWave is a **high-performance** and high-accuracy biosignal amplifier for the acquisition and processing of physiological signals. Using eWave, you can record physiological activity from the brain, eyes, heart, and muscles. Besides, using the extra Biosense module, you can record further physiological activities, including respiration, Galvanic Skin Response (GSR), temperature, and many other physiological and physical parameters.



eWave 32/64/128 (EEG/ERP)

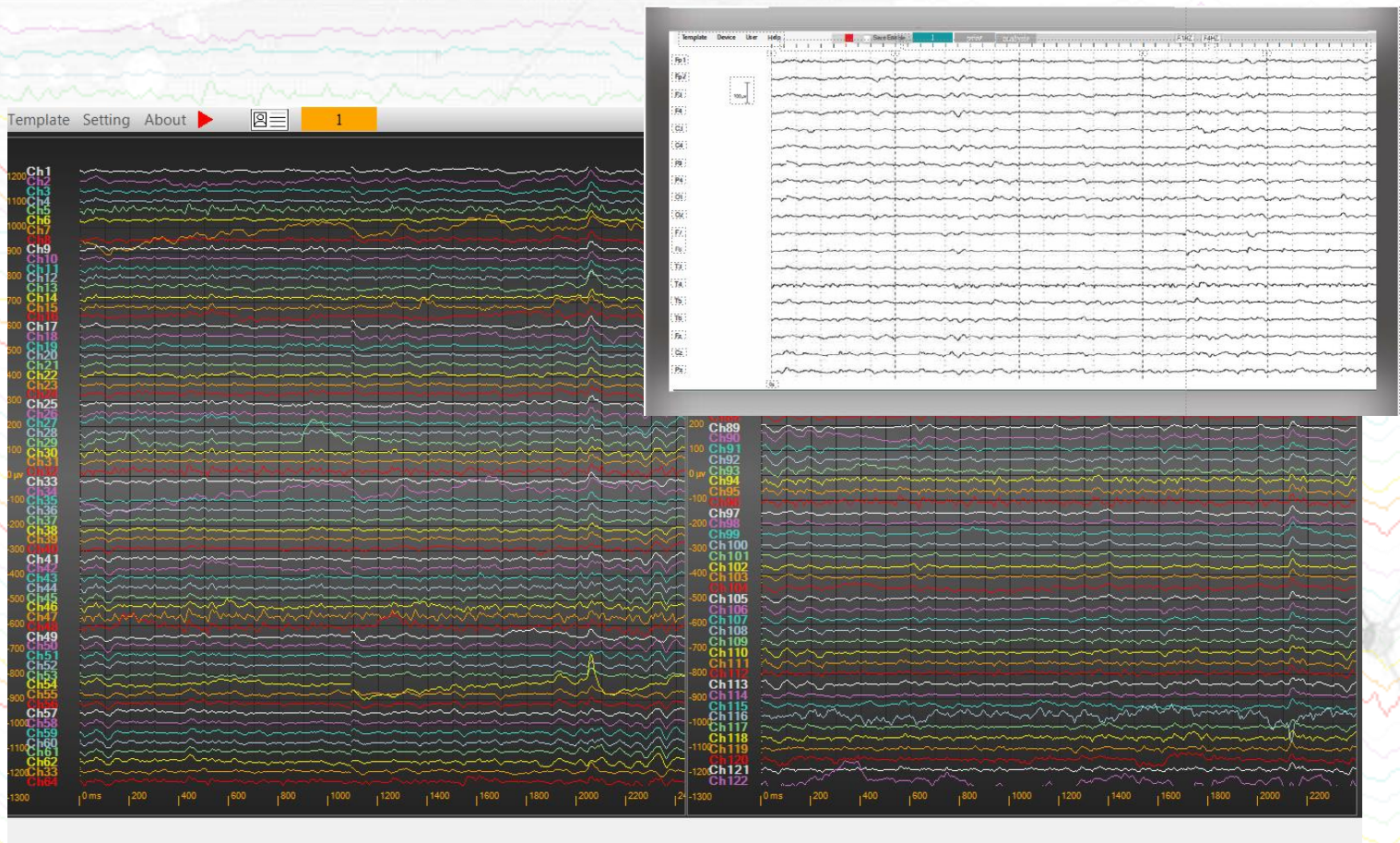


Why do I choose eWave+ for my researches?

- Able to record a wide range of bio-signals, including the brain, muscle, heart, eye, and other parameters, such as Galvanic Skin Response (GSR), temperature, and Blood Volume Pulse (BVP), with one device.
- Coming with user-friendly software (eLife) for real-time and offline visualization and analysis of bio-signals.
- High sampling rate (up to 1 kHz) that prevents losing information in signals.
- Going together with the fantastic ERP sensor, which makes eWave an excellent choice for the Event-Related Potentials (ERPs) research.
- Easy to set up and start the EEG recording.
- Rechargeable battery.
- USB and WIFI interfaces.
- Simultaneous TMS and tDCS are possible.

eWave 32/64/128 (EEG/ERP)

eLife software for Signal recording



eWave is an EEG device, providing high-quality signals through state-of-the-art hardware and software design. This device can be used for EEG, Event-Related Potential (ERP) data acquisition for medical and research institutions. The eWave device is coming with a user-friendly software environment enabling you to quickly and efficiently record EEG signals from many clients during the day. The flexible and easy-to-use software enables you to use lots of montages, including Laplacian, Bipolar, Banana, Longitudinal, Double Banana, and QEEG, for EEG recording. EEG package is coming with the eStim, which is a powerful photic stimulator and enables you to detect abnormal epileptogenic sensitivity to flickering light. This wireless and portable system is easy to apply.

If you are looking for a reliable EEG system for many years, we recommend eWave

eWave 32/64/128 (EEG/ERP)

RECORD EEG, TMS, AND TDCS SIMULTANEOUSLY

Transcranial Magnetic Stimulation (TMS), which is a non-invasive form of brain stimulation, uses a changing electromagnetic field to cause electric current at a specific area of the brain. Due to the latest developments, simultaneous recording of EEG and TMS has become possible. The combination of TMS with simultaneous EEG provides the possibility to non-invasively probe the brain's excitability in real-time.

Transcranial Direct Current Stimulation (tDCS) is a form of brain stimulation, where very low levels of constant current are delivered to specific areas of the brain. Basically, tDCS is developed to help patients with brain injuries or psychological conditions such as depression. The combination of tDCS with simultaneous EEG provides valuable information about tDCS mechanisms. The combined EEG-tDCS system can also be used for the preventive treatment of neurological conditions. eWave+ device has provided a simultaneous recording of EEG with TMS and tDCS.



eWave 32/64/128 (EEG/ERP)

eCap

Fast Mounting Time and High-quality EEG Recording

Fast preparation: eCap is an excellent match for recordings requiring fast preparation, as well as long time duration recordings without hydrating.

Gel-based: Simple and cost-effective. Apply and record EEGs. Due to the very low-noise eWave amplifier, you can use ultrasonic gels, which are much more cost-effective, instead of EEG gels.

Silver (AG/AGCL) electrode and Silicone material: Flexible design allows a faster application, ease of use, and comfortable fit.

Ease of use: No subject head preparation, such as abrading the skin or cleaning, is required.

Size: Several eCap sizes, providing whole-head coverage in three different sizes, enabling the use for adults and children.



eWave 32/64/128 (EEG/ERP)



Wave Specifications:

Size: 120 (L) × 120 (W) × 41 (H)

Weight: 318 gr

Interface: USB, WIFI

Digital inputs: 4 digital trigger inputs

Supply: 5V DC, Lithium battery

Bandwidth: 0-400 Hz

Resolution: 24-bit

Noise level: less than 0.5 $\mu\text{v rms}$

Amplifier type: DC, differential

Input impedance: 109 Ω

Product Highlights:

Fully integrated into eLife software environment for visualization and real-time analysis

1-128 DC-coupled wide-range input channels able to record any type of biological signals (EEG, EMG, ECG, EOG, and connected various sensors)

Supports ECoG grids for cortical recording

Sampling frequency: 1000 Hz per channel (increasable to 16000 Hz per channel in USB connection)

Impedance check

Easy configuration and setup with Smart Box BCI system

Rechargeable battery

Easy configuration and setup with eBridge

Simulink environment

Simultaneous TMS and tDCS possible

eWave system32/64/128(EEG/ERP)

DATA ACQUISITION

Technology: ARM Cortex 32

Processor: 160 MHz

Data Connection: wireless, up to 10 meters

ANALOG TO DIGITAL CONVERTER

Number of channels: 32/40/64/72/128

ADC resolution: 24 bit

Linearity error: 7.6 ppm (maximum)

Sample rate: 500- or 1000 samples per second per channel (up to 16000 per channel)

BIO AMPLIFIER

Number of channels: 32/40/64/72/128

Amplifier type: Differential; DC

Gain: 4

Common mode rejection ratio: 75 dB @ 500 Hz

Low cut filter: DC

High cut filter: 500 Hz

Input voltage range: 2.5 V

Maximum analog input voltage: 2.5 V

Input impedance: 1000 Giga ohm

Input leakage current: 60 PA (typical)

Input capacitance: 8 pf

OTHER SPECIFICATIONS

AUX channels: Skin conductance, Temperature, BVP/HR

EXG Channels: EMG, EEG, EOG, ECG (8 channels)

Power: Battery (Lithium, 3.7 V), Battery Charger 5 V



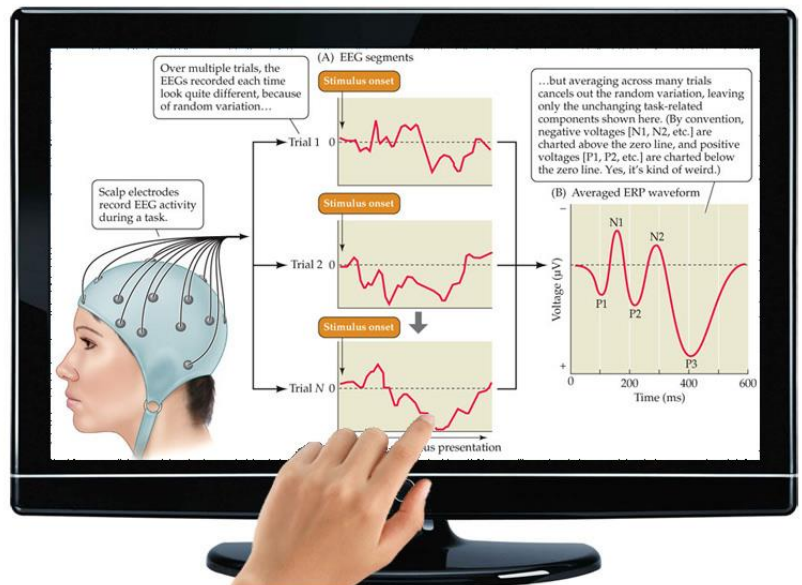
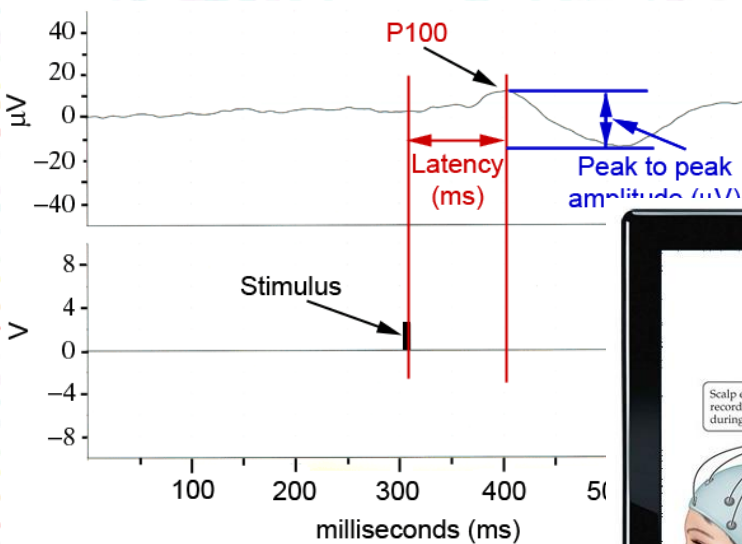
eWave 32/64/128 (EEG/ERP)

AN EFFICIENT ERP ACQUISITION SYSTEM

ERP (Event-Related Potentials) are small Changes in scalp recorded EEG that are time-locked to an onset Auditory or visual stimulus. ERP is used to investigate the process of information in the brain.

In ERP recording results, there is a time gap between stimulus presentation and the point of "Max" value (peak). Presumably components in the laptop that the time-gap or delay occurs are; CPU, motherboard, and graphic card. This delay depicts the time taken by the stimulus information to generate the ERP results. To prevent this pause and get a precise result in a recording; We have designed a module in our eWave+ that omits the delay and enables the ERPs recording to happens in realtime and leaves no gap between stimulus presentation and the subject's experience.

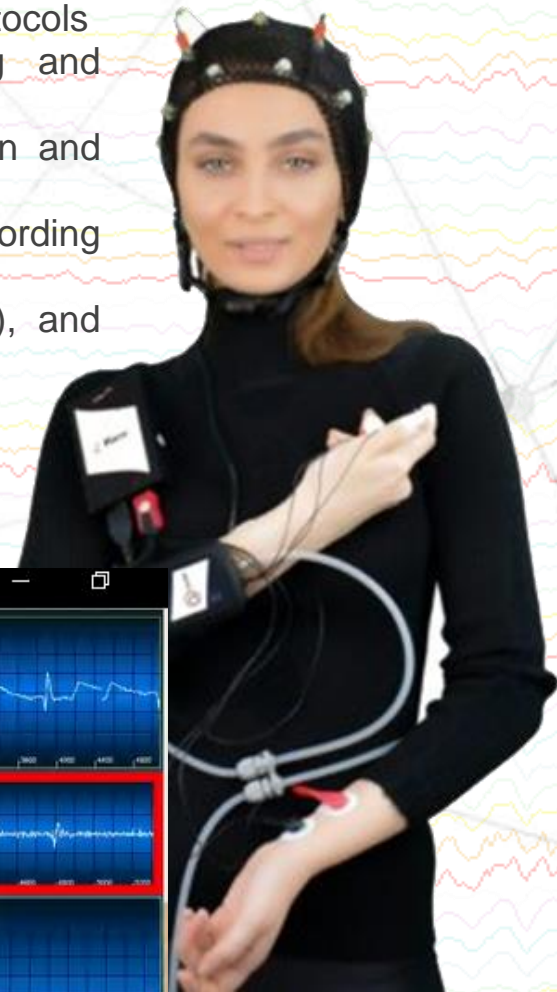
Other ERP acquisition systems record ERP as command executes from the monitor, except eWave+, which records stimulus presentation synchronously in ERP Results. This exclusive feature only exists in eWave+ and makes it the most explicit ERP acquisition system in the world.



eWave 32/64/128 (EEG/ERP)

Biosensors features

- Up to 8 channels for simultaneous recording of biological signals
- Connectable to various kinds of eWave
- Very precise data capture with very low noise amplifier
- Finger and forehead blood volume pressure (BVP) sensor
- Function-based on diagnostic and therapeutic protocols
- Precise and powerful software for recording and analyzing data
- Equipped with temperature, pressure, respiration and skin resistance sensors
- Equipped with heart rate variability (HRV) recording system
- ECG sensors, surface electromyography (EMG), and EMG needle
- Ability to use pelvic floor sensors



The biofeedback device is connected to the body by the eWave device through a set called **Biosense**, which is a set of biosensors that measures biological signals.

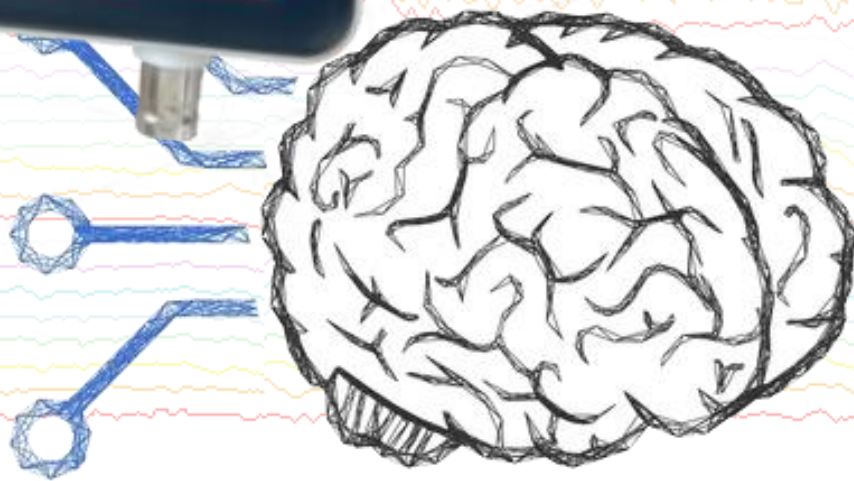
Accessory for EEG :(Trigger Box For ERP)

trigger Box

The Trigger Box consists of 4 digital outputs (BNC connectors), which enable you to connect any output module, such as eye tracker, response box, force plate, keyboard, etc. with the digital output to it. This Trigger Box connects through the USB connection to the laptop

ERP Module

While recording ERPs, the lag between each target stimulus onset and the related potential peak is not constant for the different stimulus repetitions, which is caused by latency jitter. The latency jitter, which is a long-standing but still under-explored problem, is caused by the CPU, motherboard, and graphic card. Notably, if strong enough amounts of latency jitter across conditions, may suppress true condition effects in amplitude. Therefore, it is imperative to inve



Accessory for EEG :(Biosensors)

Respiratory sensor

Respiratory control is an important parameter for biofeedback therapy. Changes in breathing depth as well as the number of breaths per minute can be assessed using this sensor, which is placed in the chest or abdomen. This sensor is used to control anxiety spectrum disorders.



Skin temperature sensor

Skin temperature changes measured by a temperature sensor attached to the skin, indicates blood flow and blood pressure and is used to control stress and anxiety.

Blood volume pressure sensor

Display the number of blood flow changes in the arteries as well as the heart rate used to control and treat blood pressure, headaches and migraines. This device comes in two types of finger and forehead.



Galvanic Skin Response (GSR)

Increased secretion of sweat glands by stimulating the sympathetic nervous system in various conditions causes a change in skin resistance. This sensor is used to measure dry skin resistance and control disorders such as anxiety, fear or phobia, PTSD, etc.

Accessory for EEG :(eCap)

eCap Flex

19, 32 or 64 or 128 channels
Ability to record EEG and fNIRS simultaneously
Ag electrode material
Has 3 bipolar channels
Silicon Material

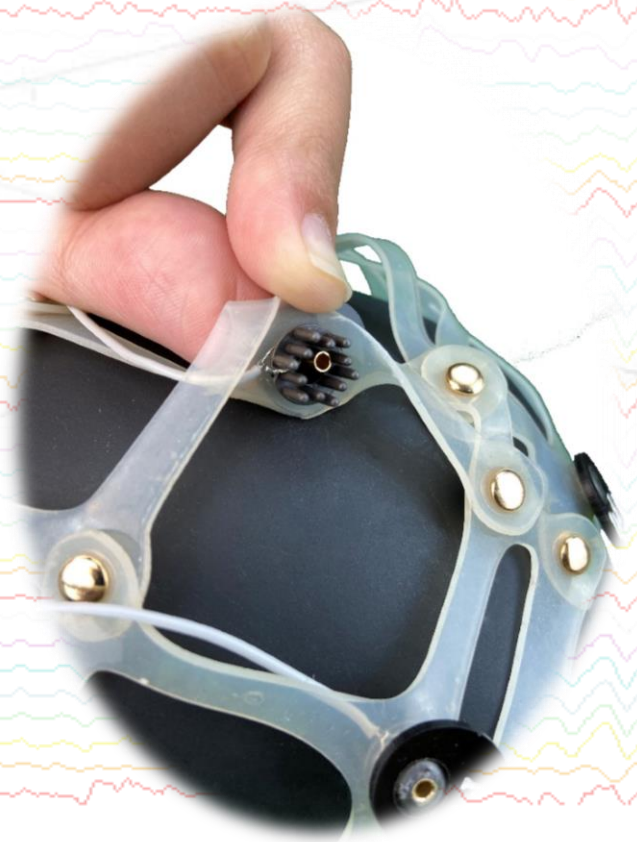
eCap Flex consists of 19, 32, or 64 or 128 labeled standard positions (based on 10-20 and 10-10 international systems) for EEG recordings. That is a silicone cap that is flexible and robust.



eCap Dry

- 19, 32, or 64 channels
- Dry electrodes
- Silver (AG) electrode material
- Has 3 bipolar channels
- Silicon material

eCap Dry consists of 19, 32, or 64 labeled standard positions (based on 10-20 and 10-10 international systems) for EEG recordings. That is a Silicone cap that is flexible and robust.



Accessory for EEG: eToy

BCI with eToy

toy model of BMI(Brain machine interface)

Sciencebeam offers a novel fantastic tool to control some toys for BCI/BMI. Our novelty can accelerate

eToy

Bluetooth connection
Can be used in neurofeedback and muscle biofeedback
It has an internal battery and can be recharged via a USB charger





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ScienceBeam is a worldwide leader in research and clinical Neuro-electrophysiology technologies, including Neurofeedback, QEEG, EEG/ERP, etc.

ScienceBeam was founded in 2000 with the aim of designing and developing a wide range of research equipment for human and animal studies, by recording and analysis of various extracellular bio-signals.

After a few years, ScienceBeam started designing and development of the most up-to-date, compact, and portable electronic systems for Neurofeedback, QEEG, and EEG/ERP applications.

ScienceBeam team includes dozens of psychologists and psychiatrists, medical engineers, electronics and computer scientists, physiologists, and neuroscientists.

We do believe in providing science and knowledge, as much as we are able to, to the interested researchers and clinicians all over the world. So, ScienceBeam has held more than 300 Neuroscience and Electrophysiology workshops and courses and participated in hundreds of seminars and congresses during these years.

