Bitbrain

Minimal EEG family

The world's most innovative family of wearable dry-EEG systems for real-world applications.

Bitbrain

About Bitbrain

We fusion neuroscience and engineering to develop the latest generation of practical neurotechnology integrated in solutions with high value for our society.

Bitbrain was founded in 2010 as a spin-off company of a research team from the University of Zaragoza (Spain), a pioneer in approaching brain-computer interface applications outside research labs. Its DNA holds all knowledge in neurotechnology, biomedical engineering, artificial intelligence and data science accumulated at the university since 1998.

Today, the company is a reference with over 600 individual institutions in more than 35 countries relying on our products to advance the penetration of neurotech research and development in our society.

Equipment

Innovative and practical EEG, biosignals, eye trackers and other complementary human monitoring technologies to approach real world research.

Bitbrain Viewer Software

Software for data acquisition and visualization, with large compatibility with real-time I/O and data processing third parties.

Bitbrain Software Development kit

Software kit consisting of different scripts that allow communication and control of the hardware used. It is a starting point for the development of brain-computer interface applications.

Human Behaviour Research Lab

Labs for experimental design and data collection with 30+ sensor modalities seamlessly synchronized, and data analysis including a wide range of emotional and cognitive biometrics.

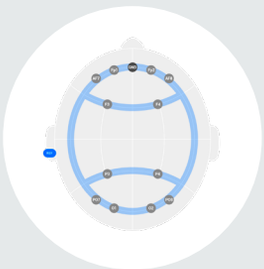
Minimal EEG family

The world's most innovative family of wearable and dry-EEG systems for real-world monitoring

Family of wearable **dry-EEG** devices with optimized designs to capture the user's natural behaviour in real-world environments. The designs are very **comfortable**, **fast** and **easy to set up** by non-technical personnel anywhere in just a few minutes. The high-performance active shielding and mechanical design provide **outstanding robustness and signal quality,** even under movement or during long recording periods.

The EEG devices can be easily combined with other biometric devices and scientific research software platforms for even deeper insights into human behaviour.

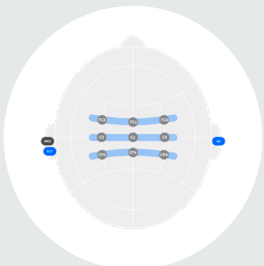
Dry-EEG products



Diadem

Wearable EEG optimized for the estimation of emotional and cognitive states. With 12 dry-EEG sensors over pre-frontal, frontal, parietal and occipital brain areas.

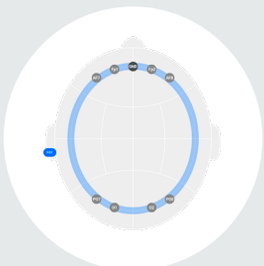
P.10



Hero

Wearable EEG optimized for the estimation of cognitive and sensorimotor states. With 9 dry-EEG sensors over fronto-central, central and centro-parietal brain areas.

P.12



Air

Wearable EEG optimized for the estimation of basic emotional and cognitive states. With 8 dry-EEG sensors over pre-frontal and occipital brain areas.

P.14

Key features

Independence and freedom

Wearable dry-EEG devices that provide maximum freedom of movement, virtually anywhere and under any circumstances.

Highest standards of data quality

Innovative active shielding for dry-EEG sensors with a patented mechanical design, which ensures stable contacts and strongly reduces artifacts and interference even under movement or electromagnetic noise.

Minimalistic headset designs

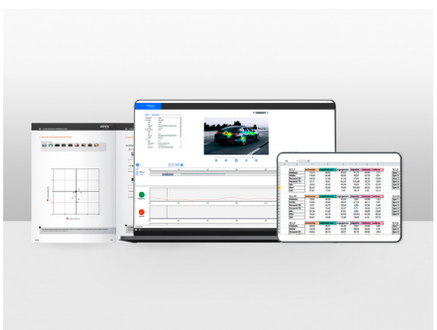
EEG headsets with a minimal number of sensors over specific brain areas, to facilitate the estimation of emotional, cognitive or sensory/motor states.

High acceptance by the user

Design with advanced ergonomics for maximum comfort. No need to apply electrolytic substances, which eliminates user reluctance to gels and the need to wash hair and devices after each use.

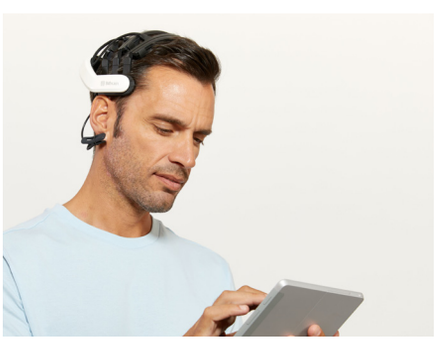
Fast and very simple set-up

The setup time is around 2 minutes on average for all devices. They all have an intuitive operation, and can be easily placed without previous experience assisted by the software.



Third-party compatibility

Compatible with Matlab (EEGLAB, BCILAB, etc), Python (MNE), LabStreaming Layer (BCI2000, OpenVibe, NeuroPype, etc), and with Bitbrain Human Behaviour Lab.



Data streaming and recording

Real-time streaming of raw data via Bluetooth and on-board SD card recording. Develop applications on Windows and Linux using the SDK, and export data to CSV.

Clean and with zero maintenance

The devices are easily stored, transported and cleaned with wipes. No expenses on consumables (jars of gels, syringes, shampoo, etc.), and no additional maintenance costs.

Sync with other biometrics

Seamless integration with more than 30 complementary technologies as eye trackers, biosignals such as GSR, EMG, etc, indoor/outdoor positioning systems, microphones and cameras, and many more.

Minimal EEG Diadem

Wearable dry-EEG device with sensors over frontal and posterior brain areas, and optimized for cognitive and emotional state estimation.

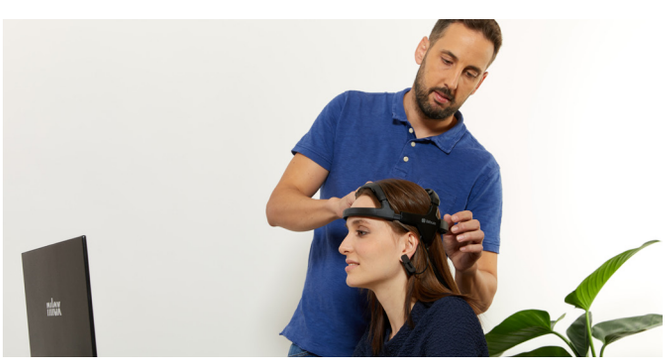
- **Wearable and comfortable**
  Fast and simple to set up. Participants forget that they are wearing it in a few minutes.
- **Dry EEG sensors**
  No need to apply electrolytic substances or saline solutions.
- **Advanced electronics**
  Active shielding with optimized DRL to improve SNR and reduce artifacts.

- **Mechanical support**
  Flexible arcs and sensor adjustments that ensure comfort, and can adapt to head morphology and hair volume.
- **Connectivity and storage**
  Bluetooth real-time EEG streaming and local SD storage.
- **Battery**
  8+ hours in streaming and in local SD storage.

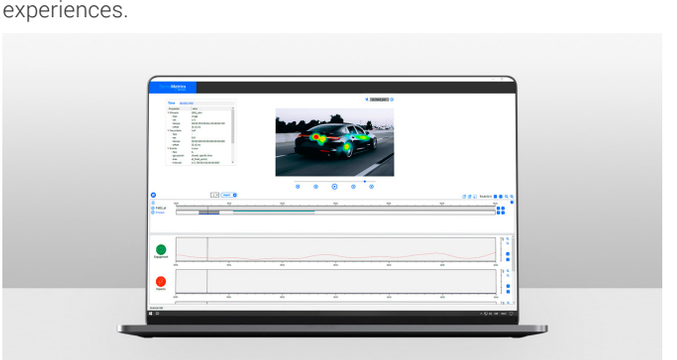
Some applications

Evaluate and improve real-life workspaces by measuring workload, attention, or stress levels in natural conditions.

Evaluate the natural human behaviour of customers when interacting with **marketing and communication materials**, or new experiences.

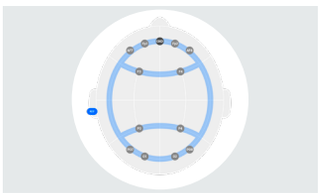


Develop new therapies based on brain-computer interfaces for cognitive neurorehabilitation.



Learn about neural correlates of human behaviour **in combination with** other biosensors, eye trackers, and more.

Technical overview



Layout optimized for frontal alpha asymmetry, occipital alpha -ERD/ERS, P300, N400 and CVN, among others.

Wearable and ultralight (185g) EEG headset. Quick and easy set up anywhere and under any circumstances.

Reliable dry-EEG monitoring with 24 bits at 256Hz for 8+ hours. Bluetooth streaming and/or on-board SD storage.

Clean technology that is easy to transport and store.

Hardware specifications

Sensors and headset	
EEG channels	12 x EEG (Fp1, Fp2, AF7, AF8, F3, F4, P3, P4, PO7, PO8, O1, O2), REF (A1) and GND (Fpz)
Type of sensors/ electronics	EEG dry sensors with active shielding and optimized DRL
Head perimeter	53cm - 61cm
Wireless Amplifier	
Sampling rate/resolution	256 SPS at 24 bits
Bandwidth	DC – 40Hz (3º order LPF)
Online/real-time impedance check	Yes (relative contact impedance)
Integrated sensors	Integrated IMU (9 axis): accelerometer, gyroscope and magnetometer
Other inputs	1 x Digital input (1 bit)/optical trigger (photodiode)
Input range and noise	± 100 mV, < 1 µVRMS (0.5 – 30Hz) @256Hz
CMRR / Input impedance	> 100 dB @50Hz, > 50 GΩ
Data streaming and store	
Data transmission and range	Bluetooth 2.1 + EDR, 10 meters in direct sight.
Data backup / files	Yes (removable micro SD card) / CSV (max 8GB. Class ≥ 10)
Power	
Battery	Rechargeable lipo battery. Charging time <3h
Autonomy	> 8 h
General	
Weight	Headset: 185g. Amplifier: 122g
Maintenance	Wipes moistened in tap water.
Warranty	2 years
Certifications	CE and CB, with EN 60950, EN 55032, EN 55024

Software specifications

Bitbrain software kit (included with equipment)	
Bitbrain real-time SDK	In C/C++ with Python bindings for Windows and Linux
Bitbrain data acquisition and visualization suite	Live visualization, streaming or SD recording, data export in CSV, and raw data visualization.
Third parties real-time I/O	LabStreamingLayer LSL compatibility (Matlab, Python, BCI2000, OpenVibe, NeuroPype, etc).
Third parties data processing	Matlab (EEGLAB, FieldTrip, BCILAB, etc), Python (MNE, etc), and more.

Bitbrain software platforms (optional)	
Bitbrain Viewer Software	Software for data visualization and recording, with large compatibility with real-time I/O and data processing third parties.
Bitbrain Software Development Kit	Software kit consisting of different scripts that allow communication and control of the hardware used. It is a starting point for the development of brain-computer interface applications.
Bitbrain Human Behaviour Research Lab	Practical research platform for experiment design and data acquisition with 30+ sensor modalities seamlessly synchronized and analyzed with a wide range of emotional and cognitive biometrics available.

Bundle includes

- EEG headset and amplifier
- Power supply
- Storage base
- Instructions
- Suitcase
- Bitbrain Software Kit

Additional services

Installation and Initial Training
Our team provides a training course that includes the installation of your EEG headset and software.

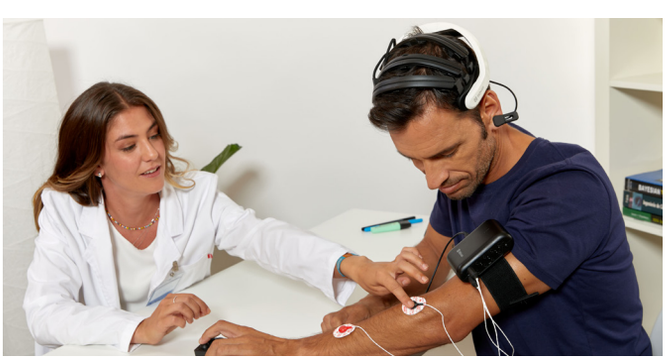
Minimal EEG Hero

Wearable dry-EEG device with sensors over central brain areas, optimized for cognitive and sensory-motor state estimation.

- **Wearable and comfortable**
  Fast and simple to set up.
- **Dry EEG sensors**
  No need to apply electrolytic substances or saline solutions.
- **Advanced electronics**
  Active shielding with optimized DRL to improve SNR and reduce artifacts.

- **Mechanical support**
  Flexible arcs and sensor adjustments that adapt to head morphology and hair volume.
- **Connectivity and storage**
  Bluetooth real-time EEG streaming and local SD storage.
- **Battery**
  Swappable batteries for 3+ hours in streaming and local SD storage.

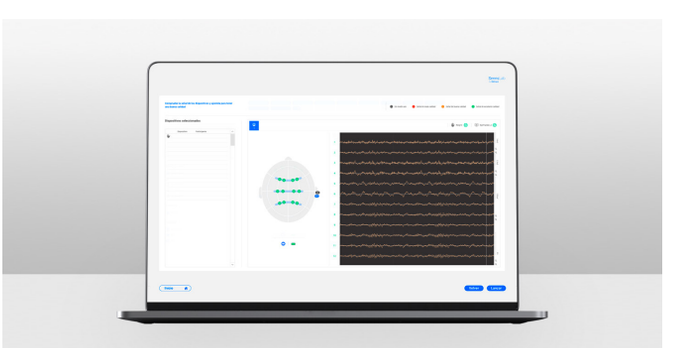
Some applications



New health interventions based on brain-computer interfaces for cognitive or motor neurorehabilitation.

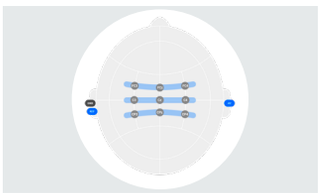
Capture natural human behaviour to **evaluate interfaces or physical products** to build optimal user experiences.

Improve educational workspaces by measuring cognitive or sensory-motor estates, individually or in groups.



Learn about the **brain patterns of human behaviour** during reactions and interactions, combined with other monitoring technologies.

Technical overview



Layout optimized for mu/alpha ERD/ERS, ERPs (P300, N400), MRCPs, and CVN, among others.

Wearable and ultralight (250g) EEG headset. Quick and easy set up anywhere, and under any circumstances.

Reliable dry-EEG monitoring with 24 bits at 256Hz for 3+ hours. Bluetooth streaming and/or on-board SD storage.

Clean technology that is easy to transport.

Hardware specifications

Sensors and headset	
EEG channels	10 x EEG (FC3, FCz, FC4, C3, Cz, C4, CP3, CPz, CP4, A2), REF and GND (A1)
Type of sensors/ electronics	EEG dry sensors, active shielding and optimized DRL
Head breadth	13,5 - 16,5cm
Wireless Amplifier	
Sampling rate/resolution	256 SPS at 24 bits
Bandwidth	DC – 40Hz (3º order LPF)
Online/real-time impedance check	Yes (relative contact impedance)
Integrated sensors	Integrated IMU (9 axis): accelerometer, gyroscope and magnetometer
Input range and noise	± 100 mV, < 1 µVRMS (0.5 – 30Hz) @256Hz
CMRR / Input impedance	> 100 dB @50Hz, > 50 GΩ
Data streaming and store	
Data transmission and range	Bluetooth 2.1 + EDR with 10 meters in direct sight.
Data backup / files	Yes (removable micro SD card) / CSV (max 8GB. Class ≥ 10)
Power	
Battery	Swappable lipo battery. Charging time <3h
Autonomy	>3h per battery
General	
Weight	250g
Maintenance	Wipes moistened in tap water.
Warranty	2 years
Certifications	CE and CB, with EN 60950, EN 55032, EN 55024

Software specifications

Bitbrain software kit (included with equipment)	
Bitbrain real-time SDK	C/C++ with Python bindings for Windows and Linux
Bitbrain data acquisition and visualization suite	Live visualization, streaming or SD recording, data export in CSV and raw data visualization.
Third parties real-time I/O	LabStreamingLayer LSL compatibility (Matlab, Python, BCI2000, OpenVibe, NeuroPype, etc).
Third parties data processing	Matlab (EEGLAB, FieldTrip, BCILAB, etc), Python (MNE, etc) and more.

Bitbrain software platforms (optional)	
Bitbrain Viewer Software	Software for data visualization and recording, with large compatibility with real-time I/O and data processing third parties.
Bitbrain Software Development Kit	Software kit consisting of different scripts that allow communication and control of the hardware used. It is a starting point for the development of brain-computer interface applications.
Bitbrain Human Behaviour Research Lab	Practical research platform for experiment design and data acquisition with 30+ sensor modalities seamlessly synchronized and analyzed with a wide range of emotional and cognitive biometrics available.

Bundle includes

- EEG headset
- Power supply
- Cable USB-micro USB
- 2 rechargeable batteries 700mAh
- 3 sizes lateral extensions
- Instructions
- Suitcase
- Bitbrain Software Kit

Additional services

Installation and Initial Training
Our team provides a training course that includes the installation of your EEG headset and software.

Minimal EEG Air

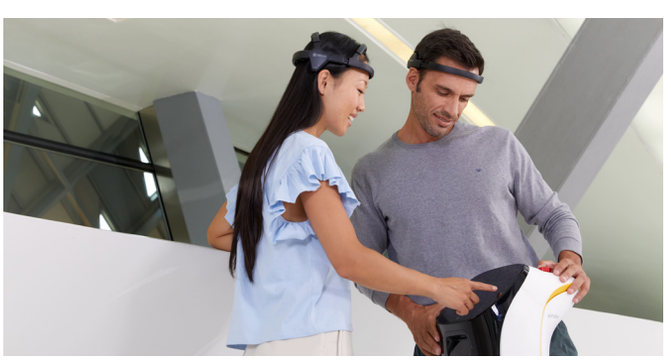
Wearable dry-EEG device with sensors located over frontal and occipital brain areas, optimized for basic cognitive and emotional states estimation.

- **Wearable and comfortable**
  Fast and simple to set up. Participants forget that they are wearing it in few minutes.
- **Dry EEG sensors**
  No need to apply electrolytic substances or saline solutions.
- **Advanced electronics**
  Active shielding with optimized DRL to improve SNR and reduce artifacts.

- **Mechanical support**
  Flexible arcs and sensor adjustments that adapt to the head morphology and hair volume.
- **Connectivity and storage**
  Bluetooth real time EEG streaming and local SD storage.
- **Battery**
  8+ hours in streaming and in local SD storage.

Some applications

Develop new ways to monitor EEG brain signals in natural and ecological real-world scenarios.

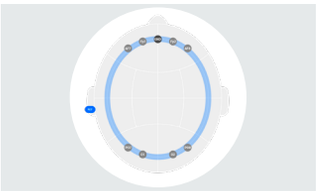


Discover new forms of interaction with digital and physical products, environments or new experiences.

Create new interventions based on brain-computer interfaces for health and wellness.

Learn about the brain correlates of human behaviour **in combination with other biosignal technologies, eye trackers, and more.**

Technical overview



Layout optimized for pre-frontal alpha asymmetry, occipital alpha, visual P300 and others.

Wearable and ultralight (130g) EEG headset. Quick and easy set up anywhere, and under any circumstance.

Reliable dry-EEG monitoring with 24 bits at 256Hz for 8+ hours. Bluetooth streaming and/or on-board SD storage.

Clean technology that is easy to transport and store without maintenance.

Hardware specifications

Sensors and headset	
EEG channels	8 x EEG (Fp1, Fp2, AF7, AF8, PO7, PO8, O1, O2), REF (A1) and GND (Fpz)
Type of sensors/ electronics	EEG dry sensors with active shielding and optimized DRL
Head perimeter	53cm - 61cm
Wireless Amplifier	
Sampling rate/resolution	256 SPS at 24 bits
Bandwidth	DC – 40Hz (3º order LPF)
Online/real-time impedance check	Yes (relative contact impedance)
Integrated sensors	Integrated IMU (9 axis): accelerometer, gyroscope and magnetometer.
Other inputs	1 x Digital input (1 bit), 1 x optical trigger
Input range and noise	±100 mV, < 1 µVRMS (0.5 – 30Hz) @256Hz
CMRR / Input impedance	>100 dB @50Hz, > 50 GΩ
Data backup	Yes (removable µSD card) (max 8GB. Class ≥ 10)
Data streaming and store	
Data transmission and range	Bluetooth 2.1 + EDR with 10 meters in direct sight
Data files	CSV
Power	
Battery	Rechargeable lipo battery. Charging time <3h
Autonomy	> 8 h
General	
Weight	Headset: 130g, Amplifier: 82g
Maintenance	Wipes moistened in tap water.
Warranty	2 years
Certifications	CE and CB, with EN 60950, EN 55032, EN 55024

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Additional services

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Real-world research and applications

Bitbrain

Europe

Zaragoza, Spain
Calle. Sta. Teresa de Jesús, 32,
50006 Zaragoza
+34 931 444 823

America

New York, United States
228 E 45th Street. Suite 9E
New York, NY 10017

Email
info@bitbrain.com

Website
www.bitbrain.com