Advanced EEG and biosignal technologies for real-world monitoring

Bitbrain catalogue
About our hardware

Practical EEG and biosignals monitoring for real-world research.

We have developed innovative human behaviour monitoring technologies practical for real-world applications:

- **Comfortable**: mobile, wireless and ergonomically designed for the user to capture natural behaviour.
- **Fast and simple**: easy to set up anywhere by non-technical personnel in just a few minutes.
- **Reliable**: outstanding signal quality thanks to electronic and mechanical designs that strongly reduce artifacts, even under movement or difficult recording circumstances.

Wearable and mobile devices for real-time monitoring of: **EEG**, **biosignals** (ExG, GSR, RESP, TEMP, etc.), **movement activity** (EMG, IMUs, etc.), **eye tracking** (screen-based and mobile), and people **location and tracking** (indoor/outdoor positioning system). Bitbrain technologies can be seamlessly integrated with VR devices.

Wide range of **software compatibility** with many third party scientific tools, development tools and Bitbrain platforms.

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**Bitbrain Software Kit** *(included)*

- Real-time SDK. C/C++ Windows and Linux and Python.
- Data acquisition and visualization suite.
- Third parties real-time I/O (LabStreamLayer LSL).
- Third parties data analysis (Matlab, EEGLAB, BCILAB and more).

**Bitbrain software platforms** *(optional)*

- Bitbrain Human Behaviour Research Lab.
- Bitbrain Cognitive Training Lab.
- Bitbrain Programming Platform.
# Product overview

## EEG

| Minimal dry-EEG family | The world’s most innovative family of wearable dry-EEG systems for real-world applications. | • Diadem  
• Hero  
• Immersive  
• Air | P.5 |
|------------------------|------------------------------------------------------------------------------------------|---------------------------------|---------|
| Versatile semi-dry EEG family | Versatile and flexible family of mobile and semi-dry EEG systems for real-world research. | • Versatile EEG 8 / 16 / 32ch  
• Versatile EEG 64ch | P.17 |

## Biosignals and movement

<table>
<thead>
<tr>
<th>Minimal biosignal device</th>
<th>Wearable and wireless device for real-world monitoring of GSR and BVP.</th>
<th>• Ring</th>
<th>P.23</th>
</tr>
</thead>
</table>
| Versatile biosignal amplifier | Versatile and flexible amplifier for mobile physiological monitoring in human-behaviour research. | • Versatile Bio  
• Biosignals sensor kit  
• Movement sensor kit  
• Customized sensor kit | P.29 |

## Indoor localization

| Indoor positioning system (IPS) | Wearable and accurate indoor positioning and tracking system for real-world research. | • InTrack  
• Coverage extension kit | P.35 |

## Eye Tracker

| Wearable or screen-based | Family of wearable or screen-based eye tracking systems for real-world research. | • Tobii Pro Glasses 2  
• Tobii Pro X2-30, X2-60, X3-120, Tobii Pro Nano, and Tobii Pro Spectrum | P.41 |

## Software

| Software tools and labs | Wide range of practical software tools compatible with third parties and Bitbrain software platforms. | • Bitbrain Software Kit  
• Human Behaviour Research Lab  
• Cognitive Training Lab  
• Bitbrain Programming Platform | P.49 |
Minimal EEG family

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

**Minimal EEG family**

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 provides 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.8

**Hero**
Wearable EEG optimized for the estimation of cognitive and sensorimotor states. With 12 dry-EEG sensors over fronto-central, central and centro-parietal brain areas.

P.10

**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.12

**Immersive**
Wearable dry-EEG that can be seamlessly integrated with Oculus Rift and HTC Vive Pro, and optimized for cognitive and sensorimotor state estimation. With 12 dry-EEG sensors over fronto-central, central and centro-parietal 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.

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.

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.

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.

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.

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.

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.

Third party compatibility
Compatible with Matlab (EEGLAB, BCILAB, etc), Python (MNE), LabStreaming Layer (BCI2000, OpenVibe, NeuroPype, etc), and with Bitbrain Human Behaviour Lab and Cognitive Training Lab.
Minimal EEG Diadem

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

Some applications

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

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

Learn about neural correlates of human behaviour in combination with other biosensors, eye trackers, indoor positioning system (IPS), and more.

More info www.bitbrain.com

- **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 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.

- **Wearable and comfortable**
  Fast and simple to set up. Participants forget that they are wearing it in few minutes.

- **Dry EEG sensors**
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- **Connectivity and storage**
  Bluetooth real time EEG streaming and local SD storage.

- **Battery**
  8+ hours in streaming and in local SD storage.
**Minimal EEG family**

**Diadem**

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 without maintenance.

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### Hardware specifications

<table>
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<tr>
<th>Sensor and headset</th>
<th>12 x EEG (Fp1, Fp2, AF7, AF8, F3, F4, P3, P4, P7, P8, O1, O2), REF (A1) and DRL (Fpz)</th>
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<td>Type of sensors/electronics</td>
<td>EEG dry sensors with active shielding and optimized DRL</td>
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<tr>
<td>Head perimeter</td>
<td>53cm - 61cm</td>
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</table>

**Wireless Amplifier**

- Sampling rate/resolution: 256 SPS at 24 bits
- Bandwidth: DC – 40Hz (3rd 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 GO

**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

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### Software specifications

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<th>Bitbrain software kit (included with equipment)</th>
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<td>Bitbrain real-time SDK</td>
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<tr>
<td>Third parties data processing</td>
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### Bitbrain software platforms (optional)

- Bitbrain Human Behaviour Research Lab
  - Practical research platform for experiment design and data acquisition with 30+ sensor modalities seamlessly synchronized, and analysis with a wide range of emotional and cognitive biometrics available.
- Bitbrain Cognitive Training Lab
  - Software platform for QEEG and cognitive training for health and wellness.
- Bitbrain programming framework
  - Multimodal real-time neuroscience or brain-computer interface development.

### Bundle includes

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

### Additional services

**Onsite Installation and Initial Training**

Our team provides a one-day training course that includes the onsite installation of your EEG headset and software. You and your team will gain a basic understanding of how to operate the system.

**Hardware and Software Customization**

Aesthetics (color, logos, etc), functionality (number of sensors, location, etc) or software customization. You will receive a tailored technology for your research or business.
Minimal EEG Hero

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

Available in 2020

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**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 emotional performance, individually or in groups.

Learn about the brain patterns of human behaviour during the exposition of stimuli, combined with other monitoring technologies.

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More info: www.bitbrain.com

info@bitbrain.com
Minimal EEG family
Hero

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 and store without maintenance.

### Technical overview

#### Hardware specifications

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<th>Sensors and headset</th>
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<tbody>
<tr>
<td>EEG channels</td>
<td>10 x EEG (FC3, FCz, FC4, C3, Cz, C4, CP3, CPz, CP4, A2), REF (A1) and DRL (A1)</td>
</tr>
<tr>
<td>Type of sensors/ electronics</td>
<td>EEG dry sensors, active shielding and optimized DRL</td>
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<tr>
<td>Head breadth</td>
<td>13.5 - 16.5 cm</td>
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**Wireless Amplifier**

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<tr>
<th>Sampling rate/resolution</th>
<th>256 SPS at 24 bits</th>
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<tr>
<td>Bandwidth</td>
<td>DC – 40Hz (3º order LPF)</td>
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<td>Online/real-time impedance check</td>
<td>Yes (relative contact impedance)</td>
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<tr>
<td>Integrated sensors</td>
<td>Integrated IMU (9 axis): accelerometer, gyroscope and magnetometer</td>
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<td>Other inputs</td>
<td>1 x Digital input (1 bit), 1 x optical trigger</td>
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<td>Input range and noise</td>
<td>± 100 mV, &lt; 1 µVRMS (0.5 – 30Hz) @256Hz</td>
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<tr>
<td>CMRR / Input impedance</td>
<td>&gt; 100 dB @50Hz, &gt; 50 GΩ</td>
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</table>

**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                 | > 3 h |

**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     | In C/C++ 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, BCI2LAB, etc), Python (MNE, etc) and more. |

**Bitbrain software platforms (optional)**

| Bitbrain Human Behaviour Research Lab | Practical research platform for experiment design and data acquisition with 30+ sensor modalities seamlessly synchronized, and analysis with a wide range of emotional and cognitive biometrics available. |
| Bitbrain Cognitive Training Lab | Software platform for QEEG and cognitive training for health and wellness. |
| Bitbrain Programming Platform | Multimodal real-time neuroscience or brain-computer interface development. |

**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

**Onsite Installation and Initial Training**

Our team provides a one-day training course that includes the onsite installation of your EEG headset and software. You and your team will gain a basic understanding of how to operate the system.

**Hardware and Software Customization**

Aesthetics (color, logos, etc), functionality (number of sensors, location, etc) or software customization. You will receive a fully made to order technology for your research or business.
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.

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

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

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

More info: www.bitbrain.com
**Minimal EEG family**

**Air**

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.

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### Technical overview

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<td>8 x EEG (Fp1, Fp2, AF7, AF8, P07, P08, O1, O2), REF (A1) and DRL (Fpz)</td>
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<th>Wireless Amplifier</th>
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<td>Sampling rate/resolution</td>
<td>256 SPS at 24 bits</td>
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<tr>
<td>Bandwidth</td>
<td>DC – 40Hz (3º order LPF)</td>
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<tr>
<td>Online/real-time impedance check</td>
<td>Yes (relative contact impedance)</td>
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<td>Integrated sensors</td>
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<td>CMRR / Input impedance</td>
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<tr>
<td>Data backup</td>
<td>Yes (removable µSD card) (max 8GB, Class ≥ 10)</td>
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<tr>
<th>Data streaming and store</th>
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<tr>
<td>Data transmission and range</td>
<td>Bluetooth 2.1 + EDR with 10 meters in direct sight</td>
</tr>
<tr>
<td>Data files</td>
<td>CSV</td>
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</table>

<table>
<thead>
<tr>
<th>Power</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Battery</td>
<td>Rechargeable lipo battery. Charging time &lt;3h</td>
</tr>
<tr>
<td>Autonomy</td>
<td>&gt; 8 h</td>
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</table>

<table>
<thead>
<tr>
<th>General</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>Headset: 130g, Amplifier: 82g</td>
</tr>
<tr>
<td>Maintenance</td>
<td>Wipes moistened in tap water.</td>
</tr>
<tr>
<td>Warranty</td>
<td>2 years</td>
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<td>Certifications</td>
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**Bitbrain software kit (included with equipment)**

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**Bitbrain software platforms (optional)**

| Bitbrain Human Behaviour Research Lab | Practical research platform for experiment design and data acquisition with 30+ sensor modalities seamlessly synchronized, and analysis with a wide range of emotional and cognitive biometrics available. |
| Bitbrain Cognitive Training Lab | Software platform for QEEG and cognitive training for health and wellness. |
| Bitbrain Programming Platform | Multimodal real-time neuroscience or brain-computer interface development. |

### Bundle includes

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

### Additional services

**Onsite Installation and Initial Training**

Our team provides a one-day training course that includes the onsite installation of your EEG headset and software. You and your team will gain a basic understanding of how to operate the system.

**Hardware and Software Customization**

Aesthetics (color, logos, etc), functionality (number of sensors, location, etc) or software customization. You will receive a fully made to order technology for your research or business.
Minimal EEG
Immersive

Wearable dry-EEG device seamless integrated with VR, and with sensors located in central brain areas for cognitive and sensory-motor states estimation.

Some applications

Capture natural human behaviour for **optimal user experience in entertainment VR**, such as video games, cinema or online TV.

Evaluate and train professional skills in defence, health, space or automation, combining VR and brain data, individually or in groups.

Develop new therapies in healthcare based on VR and brain-computer interfaces for cognitive or motor neurorehabilitation.

Learn about the neurophysiological correlates of human behaviour combining the VR stimulation with other monitoring devices.

**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 head morphology and hair volume.

**Connectivity and storage**
Bluetooth real time EEG streaming and local SD storage.

**Battery**
8+ hours in streaming and 10+ in local SD storage.

Available in 2020

More info: www.bitbrain.com
Minimal EEG family
Immersive

Layout optimized for mu-ERD/ERS, MRCPs, alfa ERD/ERS, N400 and CVN, among others.

Wearable and ultralight (262g) 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 and store without maintenance.

Technical overview

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<td>Fits heads</td>
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<table>
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</tr>
<tr>
<td>• Power supply</td>
</tr>
<tr>
<td>• Storage base</td>
</tr>
<tr>
<td>• Charger USB-microUSB</td>
</tr>
<tr>
<td>• 2 rechargeable batteries 700mAh</td>
</tr>
<tr>
<td>• Instructions</td>
</tr>
<tr>
<td>• Suitcase</td>
</tr>
<tr>
<td>• Bitbrain Software Kit</td>
</tr>
</tbody>
</table>

Additional services

Onsite installation and initial training
Our team provides a one-day training course that includes the onsite installation of your EEG headset and software. You and your team will gain a basic understanding of how to operate the system.

Hardware and software customization
Aesthetics (color, logos, etc), functionality (number of sensors, location, etc) or software customization. You will receive a tailored technology for your research or business.
Versatile EEG family

Versatile and flexible family of mobile and semi-dry EEG systems for real-world research.
Versatile and reliable family of mobile and semi-dry EEG systems for real-world research.

Family of versatile semi-dry EEG with 8/16/32/64ch for mobile and wireless EEG monitoring. With a very quick and easy set up for the researcher and comfort and freedom of movement for the user. Following the international 10-10 and 10-20 system, the semi-dry sensors (tap water humidity) can perform 6+ hours of continuous recording with outstanding signal quality, even under the most demanding recording circumstances.

The semi-dry EEG family combines all the advantages of the gel-EEG and dry-EEG worlds: the highest EEG quality in the most adverse circumstances as gel-based systems, while retaining the comfort, speed and cleanliness of dry-EEG systems.

Semi-dry EEG products

Versatile 8 / 16 / 32
Mobile semi-dry EEG system with 8/16/32ch for high-quality real-time EEG monitoring. International 10-20 and 10-10 system.

P.20

Versatile 64
Link together two EEG 32ch systems to record 64ch synchronized, or use them independently.

*The figure displays 32ch amplifier.

Compatible with

VR compatibility
Compatible with Oculus Rift and with HTC Vive Pro.
Key features

**Freedom in real-world research**
Semi-dry EEG family of headsets that can be integrated with Oculus and HTC Vive Pro. Mobile and wireless systems that provide maximum freedom of movement.

**From low to high density EEG**
Systems range from 8 to 64 channels, and can be placed in any position of the international 10-10 and 10-20 system. They cover from the most basic to the most sophisticated neurophysiological recordings.

**Highest standards of EEG quality**
Innovative system of semi-dry EEG sensors with a mechanical design that ensures stable contacts. DRL and active shielding to eliminate artifacts even under high movement conditions.

**Very easy and fast set-up**
The setup time is 2 minutes on average for the 16ch system. They all have an intuitive operation, and can be easily placed by following the procedures displayed by the system.

**Comfort and cleanliness**
Design with advanced ergonomics. Does not require the application of gel-based electrolytic substances, which eliminates user reluctance to gels and the need to wash hair.

**Data stream 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 or EDF.

**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.

**Hygienic with little maintenance**
Uses absorbent materials moistened with tap water for 6+ hours of continuous recording before evaporation. No gel or syringes are needed, simplifying the maintenance of the equipment and lab.

**Third party compatibility**
Compatible with Matlab (EEGLAB, BCILAB, etc), Python (MNE), LabStreamingLayer (BCI2000, OpenVibe, NeuroPype, etc), and with Bitbrain Human Behaviour Lab and Cognitive Training Lab.
Versatile EEG
8 / 16 / 32 / 64ch

The most outstanding reliability and signal quality in out-of-lab scenarios with these wireless semi-dry EEG devices.

- **Mobile and wireless**
  Very comfortable technology that is easy to set up and wear. Can be integrated with VR.

- **Semi-dry EEG sensors**
  Sensors moistened with tap water. Up to 6+ hours of continuous recording.

- **Advanced electronics**
  Active shielding with optimized DRL to improve SNR and reduce artifacts.

- **Mechanical support**
  International 10-10 system with transpirable caps in different sizes.

- **Connectivity and storage**
  Bluetooth real time EEG streaming and local SD storage.

- **Battery**
  8+ hours in streaming and 10+ in local SD storage.

Some applications

Expand your research scenarios in **psychology** and **neuroscience** by monitoring brain activity out of the lab.

Perform clinical research, new neurorehabilitation therapies or assessment of interventions based on EEG patterns.

Explore new EEG correlates in real world applications such as **sports science**, **education**, **UX** or in **professional workspaces**.

Combine EEG correlates with other biosignals (GSR, EMG, HR, etc.) and **Virtual Reality** to explore and learn about human behaviour.

More info: www.bitbrain.com
**Versatile EEG family**

8 / 16 / 32 / 64ch

---

**Technical overview**

- Flexible or predefined layout within the international 10-20 and 10-10 system.
- Wireless, mobile and ultralight (amplifier from 83g - the 8ch). Fast and easy to use.
- Reliable semi-dry EEG up to 256Hz and 24 bits during 8+ hours. Bluetooth streaming and/or on-board SD storage.
- Clean technology that works with absorbent materials moistened with tap water. Easy to transport and with minimal maintenance.

---

### Hardware specifications

<table>
<thead>
<tr>
<th>Sensors and headset</th>
<th>8ch</th>
<th>16ch</th>
<th>32ch</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEG channels</td>
<td>8 x EEG, REF</td>
<td>16 x EEG, REF</td>
<td>32 x EEG, REF</td>
</tr>
<tr>
<td>Type of sensors</td>
<td>Semi-dry sensors, active shielding and optimized DRL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Head perimeter</td>
<td>24cm - 66cm (Cap sizes S, M, L, XL)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Wireless Amplifier**

- **Sampling rate / Resolution**: 256Hz at 24 bits
- **Bandwidth**: DC – 40Hz (3ºLPF) / DC – 70Hz (3ºLPF)
- **Real-time check impedance**: 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 (photodiode), 1x optical trigger, 1x digital input 2x Bipolar ExG
- **Input range and noise**: ± 100 mV, < 1 µVRMS (0.5 – 30Hz) @256Hz / ± 400 mV, < 4 µVRMS (0.5 – 30Hz) @256Hz (bipolar ExG)
- **CMRR / Input impedance**: > 100 dB @50Hz, > 50 GΩ
- **Data backup**: Yes (removable µSD card) (max 8GB. Class ≥ 10)
- **Data streaming and store**: 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 (complete)**: 192g / 290g / 450g
- **Maintenance**: Gentle soap and disinfectants.
- **Warranty**: 2 years
- **Certifications**: CE and CB, with EN 60950, EN 55032, EN 55024

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### Software specifications

<table>
<thead>
<tr>
<th>Bitbrain software kit (included with equipment)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bitbrain real-time SDK</td>
</tr>
<tr>
<td>Bitbrain data acquisition and visualization suite</td>
</tr>
<tr>
<td>Third parties real-time I/O</td>
</tr>
<tr>
<td>Third parties data processing</td>
</tr>
</tbody>
</table>

**Bitbrain software platforms (optional)**

- **Bitbrain Human Behaviour Research Lab**: Practical research platform for experiment design and data acquisition with 30+ sensor modalities seamlessly synchronized, and analysis with a wide range of emotional and cognitive biometrics available.
- **Bitbrain Cognitive Training Lab**: Software platform for QEEG and cognitive training for health and wellness.
- **Bitbrain Programming Platform**: Multimodal real-time neuroscience or brain-computer interface development.
- **Bitbrain health platform**: Platform for QEEG and cognitive training

### Bundle includes

- EEG amplifier
- 1 sensor set (8/16/32 respectively)
- Sensor bases (17/33/65 units)
- Table to store and organize sensors
- Power supply
- 2 caps (M and L size)
- Sponges (200 units)
- Cable fixation tape
- Metric tape
- Instructions
- Suitcase
- Bitbrain Software Kit

### Additional services

**Onsite installation and initial training**

Our team provides a one-day training course that includes the onsite installation of your EEG headset and software. You and your team will gain a basic understanding of how to operate the system.

**Hardware and software customization**

Aesthetics (color, logos, etc), functionality (number of sensors, location, etc) or software customization. You will receive a tailored technology for your research or business.
Minimal biosignal device

Wearable and wireless device for real-world monitoring of GSR and BVP.
Wearable and wireless device for real-time monitoring of GSR and BVP in real-world applications.

Ring is a wearable and wireless monitoring device for real-life scenarios. This device has an ultralight and comfortable design with two key biosensors for a basic estimation of emotions (galvanic skin response - GSR, and blood volume pressure - BVP), and a 3-axis solidary accelerometer to estimate the noise generated by finger movements. Its ergonomics, reliability and ability to self-positioning open an infinite range of possibilities. For example, it can be used in or out of the lab scenarios, such as workplaces, shopping centers, etc.

In addition to this, it is possible to combine (seamlessly sync) with biometric devices and scientific research software platforms for even deeper insights into human behaviour.

Products

Minimal biosignal device

Ring
Wearable and wireless device for real-world monitoring of GSR, BVP and movement (accelerometer).
**Minimal biosignal device**

**Ring**

### Key features

#### Real-world applications

Wearable GSR and BVP that provide great comfort and freedom of movement to the user, in order to capture natural behaviour in real-world applications.

#### Optimized to track emotions

Wearable device with the most widely accepted sensors used by the research community to estimate emotions (GSR and BVP).

#### Highest standards of data quality

Sensors located over the optimal measurement points as agreed by the research community (2nd finger phalanges), and with an accelerometer to filter artifacts caused by finger movements.

#### Very easy and intuitive set-up

The set up time is less than 10 seconds on average. With an intuitive operation, it can be easily self-placed without previous experience.

#### High acceptance by the user

Designed with advanced ergonomics for maximum comfort. No need to apply electrolytic substances, which increases user acceptance and eliminates the need to wash skin or the device after each use.

#### Data stream 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.

#### Sync with other biometrics

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

#### Clean and with zero maintenance

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

#### Compatibility with scientific platforms

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

---

**More info** [www.bitbrain.com](http://www.bitbrain.com)
Ring

Wearable and wireless device for real-time monitoring of GSR and BVP in real-world applications.

- **Adaptable and adjustable**
  Very comfortable technology that can be set up easily in less than 10 seconds.

- **GSR, BVP and ACC sensors**
  Dry-sensors located on the fingers’ first and second phalanges (optimal measurement points).

- **Advanced electronics**
  Signal acquisition layer optimized to improve S/N, while reducing external artifacts.

- **Mechanical support**
  The technology mitigates artifacts produced by finger movements (anyway are measured by the solidary accelerometer).

- **Connectivity and storage**
  Bluetooth real-time data streaming and local SD storage.

- **Battery**
  10+ hours in streaming and in SD storage.

Some applications

Explore new research scenarios in psychology and neuroscience with fast and easy monitoring in and out-of-the lab.

In **clinical research**, perform biofeedback applications for stress, or assessments based on physiological responses.

Understand physiological correlates in real-world applications, such as education, UX or in **professional workspaces**.

Learn about the physiological patterns of human behaviour in combination with EEG, biometrics, VR technologies, etc.

More info: www.bitbrain.com

info@bitbrain.com
Minimal biosignal device
Ring

Technical overview

Layout optimized to measure GSR and BVP (cardiac activity), in order to estimate emotional states.

Wireless, mobile, compact and ultralight (60g). Very easy to use, even allowing self-placement.

Reliable biosignal monitoring at 32Hz and 16 bits during 10+ hours on Bluetooth streaming.

No maintenance and easy to transport.

Hardware specifications

<table>
<thead>
<tr>
<th>Sensors</th>
<th>1 x EDA (µS), 1 x BVP (bpm), 1 x ACC (3-axis)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wireless amplifier</td>
<td>Sampling rate 32 SPS (samples per second)</td>
</tr>
<tr>
<td></td>
<td>Resolution 16 bits</td>
</tr>
<tr>
<td></td>
<td>Bandwidth DC − 16Hz (2º order LPF)</td>
</tr>
<tr>
<td></td>
<td>Input range and noise</td>
</tr>
<tr>
<td></td>
<td>0.1 - 100 µS, (GSR)</td>
</tr>
<tr>
<td></td>
<td>0 - 250 bpm, (BVP)</td>
</tr>
<tr>
<td></td>
<td>± 4G (Accelerometer)</td>
</tr>
<tr>
<td>Integrated sensors</td>
<td>Integrated Accelerometer (3 axis)</td>
</tr>
<tr>
<td>Data backup</td>
<td>Yes (removable micro SD card) (max 8GB. Class ≥ 10)</td>
</tr>
<tr>
<td>Indicators</td>
<td>On/off/connection state LED battery state LED</td>
</tr>
<tr>
<td></td>
<td>micro SD card state LED</td>
</tr>
</tbody>
</table>

Data streaming and store

<table>
<thead>
<tr>
<th>Power</th>
<th>Rechargeable lipo battery. Charging time &lt;3.5h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autonomy</td>
<td>&gt; 10 h</td>
</tr>
</tbody>
</table>

General

<table>
<thead>
<tr>
<th>Weight</th>
<th>60g</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleaning and maintenance</td>
<td>Wipes moistened in tap water.</td>
</tr>
<tr>
<td>Warranty</td>
<td>2 years</td>
</tr>
<tr>
<td>Certifications</td>
<td>CE and CB, with EN 60950, EN 55032, EN 55024</td>
</tr>
</tbody>
</table>

Software specifications

<table>
<thead>
<tr>
<th>Bitbrain Software Kit (included with equipment)</th>
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<td>Bitbrain real-time SDK</td>
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</table>

<table>
<thead>
<tr>
<th>Bitbrain software platforms (optional)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bitbrain Human Behaviour Research Lab</td>
</tr>
<tr>
<td>Bitbrain Programming Platform</td>
</tr>
</tbody>
</table>

Bundle includes

- Wearable device
- Cable USB-microUSB
- Instructions
- Packaging box
- Bitbrain Software Kit

Additional services

Onsite installation and initial training
Our team provides a one-day training course that includes the onsite installation of your Ring and software. You and your team will gain a basic understanding of operating the system.

Hardware and software adaptation
Aesthetics (color, logos, etc), funcionatility (type of sensors, location, etc) or software customization. You will receive a tailored technology for your research or business.
Versatile biosignal amplifier

Versatile and flexible amplifier for mobile physiological monitoring in human-behaviour research.
Versatile biosignal amplifier

Mobile and versatile biosignal amplifier to monitor up to 35 physiological variables simultaneously with milli-second synchronization.

Versatile Bio is a mobile and practical real-time biosignal acquisition amplifier, which provides great **flexibility** to monitor a large number of simultaneous physiological variables together allowing freedom of movement. It can record for **8+ hours up to 35 simultaneous channels** of analog biosignals (GSR, ExG, RESP, TEMP, etc.), movement activity and location (EMG, IMUs, GPS, etc.), behavior inputs (pedals and push buttons), and communication inputs/outputs (LPT, digital, etc.).

Combine it **seamlessly synchronized** with biometric devices and scientific research software platforms for even deeper insights into human behaviour.

Products

**Versatile Amplifier**
Mobile and compact amplifier with up to 21ch (multiplexed to 35ch) for monitoring behavioural signals.

**Amplifier inputs/outputs**
- 9 bipolar analog inputs
- 7 unipolar analog inputs
- 2 digital COM inputs (extensible to 16)
- 1 digital Input
- 1 digital Output
- 1 internal IMU

**Biosignals sensor kit**
- 9x ExG bipolar lead + GND lead
- 16x ECG/EMG electrodes
- 1x respiratory effort band
- 1x air flow sensor
- 1x GSR sensor

**Movement sensor kit**
- 2x IMUs multiplexed
- 16x IMUs 9 d.o.f.
- 1x GPS
- 9x ExG bipolar lead + GND lead

**Customized sensor kit**
Any combination of all the biosignals, movement, localization and behavioural sensors.

More info: www.bitbrain.com
Key features

**Flexible for all types of research**
Mobile amplifier that provides maximum freedom of movement with remote/local monitoring. Maximum flexibility and multiple combinations of sensor modalities.

**35 biosignals simultaneously**
Acquire simultaneously bipolar electrical biosignals (ExG), analog biosignals (GSR, RESP, TEMP, etc.), movement and location (IMUs, GPS), behaviour inputs (push buttons), digital inputs / outputs (LPT, etc.).

**Millisecond sync of all sensors**
All the biosignals and inputs are digitaled at 256 Hz sampling rate, so all the signals are synchronized with a precision under <4 milliseconds. Hardware sync also with other equipments thanks to the digital I/O.

**Highest standard of data quality**
High sensor quality in an innovative system with stable contacts to mitigate mechanical artifacts. Active shielded ExG to mitigate electromagnetic interferences and artifacts caused by movement.

**Data stream 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.

**Fast and intuitive set-up**
The amplifier can be placed on the arm, waist or leg. The sensor setup follows standard procedures with an intuitive operation and minimal learning time.

**Easy maintenance and storage**
All sensors require low maintenance using off-the-shelf consumables, and are packed with the amplifier in a suitcase for easy storage and transportation.

**Sync with other biometrics**
Seamless integration with more than 30 complementary technologies as EEG, eye trackers, indoor positioning systems, microphones and cameras, and many more.

**Compatibility with scientific platforms**
Compatible with Matlab (EEGLAB, BCILAB, etc), Python (MNE), LabStreamingLayer (BCI2000, OpenVibe, NeuroPype, etc), and with Bitbrain Human Behaviour Lab and Cognitive Training Lab.
Versatile Bio

Explore new research scenarios in psychology and neuroscience with a complete physiological human monitoring in or out-of-the lab.

Perform clinical research, new neurorehabilitation therapies, or assessment/interventions based on physiological responses.

Understand physiological correlates in real world applications such sports science, education, UX or in professional workspaces.

Learn about the physiological correlates of human behaviour in combination with EEG, biometrics, VR technologies, etc.

• Mobile and compact
  Multi-purpose technology that is easy to set up and wear.

• 21+ channels
  That can monitor up to 35 physiological variables with millisecond sync.

• Advanced electronics
  Active shielding with optimized DRL to improve SNR and reduce artifacts.

• Flexible position
  The amplifier can be placed on the arm, waist or leg.

• Connectivity and storage
  Bluetooth real time data streaming and local SD storage.

• Battery
  8+ hours in streaming and in local SD storage.

• Mobile and compact
  Multi-purpose technology that is easy to set up and wear.

Some applications
### Technical overview

**Versatile technology to monitor up to 35 physiological variables simultaneously.**

**Wireless, mobile, compact and ultralight (172g). Very easy to use.**

**Reliable biosensing monitoring up to 256Hz and 24 bits during 8+ hours. Bluetooth streaming and/or on-board SD storage.**

**Minimal maintenance and easy to transport (everything fits in a suitcase).**

### Hardware specifications

#### Sensors

- **Biosignal channels**: 2x Auxiliary digital inputs (sensors like IMU, GPS).
  - Streaming mode: Up to 2 HUB (1 on each input to multiplex up to 8 IMU on each input).
  - Backup mode: Only 1 HUB to multiplex up to 8 IMU in the selected input.
- 9x bipolar ExG + GND
- 6x Auxiliary analog inputs (analog sensors like GSR, RESP, TEMP, BVP...)
- 1x Digital input (3 bits)
- 1x Digital output (1 bit)

#### Wireless Amplifier

- **Sampling rate**: 256 SPS at 24 bits
- **Bandwidth**: DC – 100Hz (3º order LPF)
- **Integrated sensors**: Integrated IMU (9 axis): accelerometer, gyroscope and magnetometer
- **Input range and noise**: ± 420 mV, < 4 µVRMS (0.5 – 30Hz) @256Hz (Bipolar ExG)
- **CMRR / Input impedance**: > 100 dB @50Hz, > 50 GΩ
- **Data streaming and storage**: 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**: Rechargeable lipo battery. Charging time <3h
  - **Autonomy**: > 8 h
- **General**
  - **Weight**: 172gr.
  - **Amplifier maintenance**: Not required
  - **Sensor maintenance**: Off-the-shelf consumables
  - **Warranty**: 2 years
  - **Certifications**: CE and CB, with EN 60950, EN 55032, EN 55024

### Software specifications

#### Software compatibility (included with equipment)

- **Bitbrain real-time SDK**: In C/C++ 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, BCLAB,etc), Python (MNE, etc) and more.

#### Bitbrain software platforms (optional)

- Bitbrain Human Behaviour Research Lab
  - Practical research platform for experiment design and data acquisition with 30+ sensor modalities seamlessly synchronized, and analysis with a wide range of emotional and cognitive biometrics available.
- Bitbrain Programming Platform
  - Multimodal real-time neuroscience or brain-computer interface development.

### Bundle includes

- Amplifier
- Power supply
- Instructions
- Suitcase
- Arm and waist adjustable band
- (Biosignal kit) see sensors in pg. 30
- (Movement kit) see sensors in pg. 30
- Bitbrain Software Kit

### Services

#### Onsite installation and initial training

Our team will provides a one-day training course that includes the onsite installation of your amplifier and software. You and your team will gain a basic understanding of operating the system.

#### Hardware and software adaptation

Aesthetics (color, logos, etc), funcionatility (number of sensors, location, etc) or software customization. You will receive a tailored technology for your research or business.

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More info: [www.bitbrain.com](http://www.bitbrain.com)
Indoor positioning system

Wearable and accurate indoor positioning and tracking system for real world research.
Indoor positioning system

Wearable, fast and very accurate indoor positioning and tracking system for real world applications.

A wearable and ultralight positioning system for real-world applications. The system is composed of 5 anchors that can be easily placed on walls, and a pendant for the participant that can be placed in seconds. This practical technology autocalibrates the position of the anchors without manual processes, and has outstanding precision under 30cm on average within areas of 200m² (expandable to 800m² or more). Autonomy of 8 hours in data streaming and local storage.

In addition to this, the device is seamlessly synchronized with other biometric devices and scientific research software platforms for even deeper insights into human behaviour.

Products

InTrack
Wearable indoor positioning system with one mobile tag (pendant) and five stationary anchors. Total of 200m² coverage.

Coverage extension kit
Each package of five additional anchors increases coverage by 600m².
**Key features**

**Independence and freedom**
Wearable and unobstructive positioning system that provides maximum freedom of movement to the participant.

**Outstanding accuracy indoors**
Fusion of time of flight (ToF), signal strength (RSSI) and inertial data to track the location every 125 milliseconds with an accuracy of 30cm of error on average.

**Great coverage for hours**
Coverage of 200 m² with 5 anchors (expandable by adding extra anchors) for 8 hours. Anchors have rechargeable and exchangeable batteries.

**Comfortable and natural**
The pendant is lightweight and comfortable, and facilitates natural and spontaneous behaviour in real-world research.

**Quick and easy set up**
The set up of the tag only consists of putting the pendant on the user’s neck. The placement of the anchors is also simple thanks to their magnetic bases, and its automated auto-calibration.

**Easy transportation and without maintenance**
The whole system fits in a suitcase for an easy storage and transportation. No consumables or maintenance required.

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

**Sync with other biometrics**
Seamlessly integrated with more than 30 complementary monitoring technologies, such as mobile EEG, eye trackers, microphone and cameras, and many more.

**Third party compatibility**
Compatible with Matlab (EEGLAB, BCILAB, etc), Python (MNE), LabStreamingLayer (BCI2000, OpenVibe, NeuroPype, etc), and with Bitbrain Human Behaviour Lab.
Wearable and very easy to set up indoor positioning system with outstanding precision and high coverage.

- **Mechanical support**
  Ultralight and unobstructive tag to allow maximum freedom of movement, and compact anchors easily to place thanks to magnetics bases

- **Connectivity and storage**
  Bluetooth Low Energy technology positioning streaming and local SD storage.

- **Battery**
  Swappable and rechargeable batteries with 8+ hours in streaming and local SD storage.

**Some applications**

- **Wearable and mobile**
  Very comfortable pendant device easy to set up in less than 2 seconds.

- **Advanced technology**
  Fusion of time of flight (ToF), signal strength (RSSI) and inertial data to improve the accuracy of real time positioning.

- **Automatic calibration**
  Easy and fast process to calibrate anchors’ position, without manual procedures.

Get objective and powerful insights into how consumers behave in real stores or during customer experiences.

Optimize stores, hotels or other experiences by understanding how people explore the scenarios.

Evaluate and improve professional workspaces and optimize processes by understanding movement behaviour.

Understand human movement in combination with other biometric techniques such as EEG, eye tracking or biosensors.

More info: www.bitbrain.com
**Tag**: Wireless, comfortable and ultralight (72g) device that is fast and easy to use.

**Anchors**: 5 anchors to cover 200m² for 8+ hours in streaming or local storage. Rechargeable batteries.

**Real-time location tracking** with less than 30cm location error on average at 8Hz.

**Easy to transport** (everything fits in a suitcase) and without maintenance.

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### Technical overview

#### Hardware specifications

<table>
<thead>
<tr>
<th><strong>Tag</strong></th>
<th><strong>Sampling rate</strong></th>
<th>8 SPS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Localization accuracy</strong></td>
<td>30 cm</td>
<td></td>
</tr>
<tr>
<td><strong>Other sensors</strong></td>
<td>Integrated IMU (9 axis): accelerometer, gyroscope and magnetometer</td>
<td></td>
</tr>
<tr>
<td><strong>Indicators</strong></td>
<td>On/Off/ Recording state LED Battery state LED</td>
<td></td>
</tr>
<tr>
<td><strong>Battery</strong></td>
<td>No-removable rechargeable lithium battery Charging time: &lt;2 h</td>
<td></td>
</tr>
<tr>
<td><strong>Autonomy</strong></td>
<td>&gt; 8 h</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Anchor</strong></th>
<th><strong>Coverage</strong></th>
<th>200 m² using 5 Anchors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Indicators</strong></td>
<td>On/Off/ Recording State LED Battery State LED</td>
<td></td>
</tr>
<tr>
<td><strong>Battery</strong></td>
<td>Swappable and rechargeable lithium battery Charging time: &lt;2 h</td>
<td></td>
</tr>
<tr>
<td><strong>Autonomy</strong></td>
<td>&gt; 8 h</td>
<td></td>
</tr>
</tbody>
</table>

#### Connectivity and storage

**Data transmission**: Bluetooth Low Energy 4.2 (online)

**Data backup**: Tag: Yes (removable µSD card) Anchor: No

**General**

**Weight**: Tag: 72g. Anchor: 114g

**Cleaning and maintenance**: Wipes moistened in tap water.

**Warranty**: 2 years

**Certifications**: CE and CB, with EN 60950, EN 55032, EN 55024

---

### Software specifications

**Software Compatibility (included with equipment)**

- **Bitbrain real-time SDK**: In C/C++ 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), Neuroguide and more.

**Bitbrain software platforms (optional)**

- **Bitbrain Human Behaviour Research Lab**: Practical research platform for experiment design and data acquisition with 30+ sensor modalities seamlessly synchronized, and analysis with a wide range of emotional and cognitive biometrics available.
- **Bitbrain Programming Platform**: Multimodal real-time neuroscience or brain-computer interface development.

### Bundle includes

- Pendant wearable (Tag)
- Dongle BLE 4.2
- 5 Anchors
- 6 cables USB-microUSB
- 5 lithium batteries

### Services

**Onsite installation and initial training**

Our team provides a one-day training course that includes the onsite installation of your InTrack and software. You and your team will gain a basic understanding of operating the system.

**Hardware and software adaptation**

Aesthetics (color, logos, etc), functionality or software customization. You will receive a tailored technology for your research or business.
Eye Tracker family
Family of wearable or screen-based eye tracking systems for real-world research.
Eye Tracker family

Family of wearable and screen-based eye tracking systems for real-world research.

This family includes Tobii Pro eye tracking devices for all types of applications, these range from mobile scenarios with the Tobii Pro Glasses 2, to all screen-based systems such as the Tobii Pro X2-30, X2-60 or X3-120, Tobii Pro Nano or the Tobii Pro Spectrum.

The Tobii Pro Glasses 2 are a wearable and ultralight eye tracking system to obtain an objective vision of human behavior by showing exactly what the user is looking at, while moving freely in any real-world environment. The family of screen-based eye trackers measure the gaze exploration patterns of stimuli that are displayed on the screen. Both can be operated with a PC, a laptop or on mobile devices.

Bitbrain allows to combine all eye tracking devices seamless sync with other EEG and biometric devices and scientific research software platforms, for even deeper insights into human behaviour.

Products

Tobii Pro Glasses 2
Wearable eye tracker technology to analyze visual behavior in mobile real-world applications.

Screen-based
Tobii Pro X2-30, X2-60, X3-120, Tobii Pro Nano or Tobii Pro Spectrum
Portable, remote eye tracker technology to analyze visual behaviour in screen-based real-world applications.
Key features

Real-world research applications
Wearable and screen-based eye trackers to capture natural behaviour of participants, by providing minimum intrusion and large freedom of movement.

Wearable Tobii Pro Glasses 2 eye tracker
Wearable eye tracking system that captures what a person is looking, by merging the gaze tracker within the video recorded by the integrated camera.

Screen-based eye trackers
This family of screen-based eye trackers, can be used to track natural gaze in any format, such as PC, laptop or mobile devices.

Data stream and recording
The Tobii Pro Glasses 2 (on-board SD card storage or/and Wifi data stream) and the screen-based (USB) have full access to raw data under Windows or Linux SDK. Alternatively, build your own applications with Bitbrain development platform.

Precision and reliability
All eye trackers use a proprietary 3D eye model created by Tobii Pro, which provides maximum accuracy and reliability while allowing free head movement.

Very easy and intuitive set up
The set up time for all devices is on average less than 2 minutes including calibration. They all have an intuitive operation, and can be easily placed without previous experience with the help of a step-by-step guide.

Sync with other biometrics
Bitbrain has seamlessly integrated these eye trackers with more than 30 complementary technologies as EEG and biosensors such as GSR, EMG, BVP, etc, indoor/outdoor positioning systems and many more.

Easy transportation and maintenance
All eye tracking devices are easily transported in a small suitcase. Very little time is required for cleaning and maintenance.

Compatibility with scientific platforms
Compatible with Tobii Pro Glasses 2 Lab, NeuroPye, EEGLAB, BCILAB, MATLAB, Python, BCI2000, OpenVibe, among others. Also compatible with Bitbrain platforms.
Wearable, comfortable and ultralight eye tracking technology to capture and analyze visual human behaviour in real-world applications.

Some applications

Get objective and powerful insights about what captures the attention of consumers in real stores or during real-world customer experiences.

Capture natural human behaviour to evaluate interfaces, physical products or environments for optimal user experience.

Improve professional workspaces, and optimize processes and factors that influence training.

Understand human gaze in combination with other biometric techniques such as EEG, biosensors or indoor positioning systems.

- **Wearable and light**
  Non-intrusive device for real environments for real-world research.

- **Easy to use**
  Intuitive recording and calibration methods to help you with field work.

- **Comfortable**
  Participants forget they are wearing them in few minutes.

- **Unobtrusive**
  To ensure ecological data collection with the highest data quality.

- **Sample rate**
  You can choose between 50 and 100Hz depending on your research needs.

- **Reliable**
  Slippage compensation and 3D eye model that ensures stability and data capture.

Wearable and light, non-intrusive device for real environments for real-world research.

Easy to use, intuitive recording and calibration methods to help you with field work.

Comfortable, participants forget they are wearing them in few minutes.

Unobtrusive, to ensure ecological data collection with the highest data quality.

Sample rate, you can choose between 50 and 100Hz depending on your research needs.

Reliable, slippage compensation and 3D eye model that ensures stability and data capture.
Technical overview

Wireless, comfortable and ultralight (45gr) device. Very easy and intuitive to use.

Pocket-sized recording unit that records (SD) and streams data via Wifi or ethernet.

Software for calibration, recording and live viewing.

Easy to transport (everything fits in a suitcase), and without maintenance.

Hardware specifications

**Eye tracker**
- Sampling rate: 50Hz or 100Hz
- Calibration procedure: 1 point
- Calibration validation: Yes
- Parallax Compensation tool: Automatic
- Binocular eye tracking: Yes
- Slippage compensation: Yes, 3D eye model
- Eye tracker technique: Corneal reflection, dark pupil
- Pupil measure: Yes, total measure

**Head Unit**
- Number of eye tracking cameras: 4 eye cameras
- Sensors: Gyroscope and accelerometer
- Scene camera format and resolution: H.264 1920 x 1080 pixels @25 fps
- Scene camera field of view: 90º 16:9
- Scene camera recording angle/visual angle: 82º horizontal 52º vertical
- Sound recording / microphone: Yes
- Frame dimensions and weight: 179 x 159 x 57mm (7.0 x 6.3 x 2.2”), 45g (1.6 oz) including protective lens

**Recording Unit**
- Battery recording time: 120 min
- Storage media: SD card (SDXC)
- Connectors: HDMI, Micro USB, 3.5mm jack, ethernet
- Wireless: 2.4 GHz and 5 GHz band
- Dimensions: 130 x 85 x 27mm (5.1 x 3.3 x 0.9”)
- Weight: 312g (11 oz) including battery

Software specifications

**Tobii Pro software kit (included with equipment)**
- Tobii Pro real-time SDK and Tobii Pro Glasses 2 API: In C/C++ for Windows and Linux
- Tobii Pro Glasses Controller data acquisition and visualization: Live visualization, streaming or SD recording, data export in *.json and raw data visualization.
- Third parties data processing: Matlab y Python.

**Bitbrain software platforms (optional)**
- Bitbrain Human Behaviour Research Lab: Practical research platform for experiment design and data acquisition with 30+ sensor modalities seamlessly synchronized, and analysis with a wide range of emotional and cognitive biometrics available.
- Bitbrain Programming Platform: Multimodal real-time neuroscience or brain-computer interface development.

**Bundle includes**
- Eye tracker & recording unit
- Nose Pads in different sizes (6 pcs)
- Rechargeable Li-ion batteries type 18650 (3 pcs)
- SD memory cards (3 pcs) + sleeves + SD/USB adapter
- Calibration cards (3 pcs)
- Carry case for Tobii Pro Glasses 2
- USB memory stick with documentation and software
- Ethernet cable (3 meters)
- SD Card Reader
- Bundle includes

**Services**

**Onsite Installation and Initial Training**
Our team provides a one-day training course that includes the onsite installation of your eye tracker and software. You and your team will gain a basic understanding of operating the system.
Screen-based eye trackers

• Top-of-the line
  The most advanced screen-based eye tracking family.

• Fast to set up
  Plug and play via USB or ethernet connection.

• Accurate and precise
  All Tobii Pro’s eye tracking family has world leading accuracy and precision.

Portable screen-based eye tracking technology to capture and analyze visual human behaviour in real-world applications.

• Remote
  The participant does not need to wear anything.

• Freedom of movement
  With a big tracking box it allows free head movement without losing tracking.

• Sample rate
  Adapts to your needs, from 30Hz up to 1200Hz.

Some applications

Get objective and powerful insights about what captures the attention of consumers in branding, packaging or advertising.

Capture natural human behaviour to evaluate digital interfaces, websites and products for optimal user experience.

Improve professional workspaces, and optimize processes and factors that influence training.

Understand gaze attention and its patterns, in combination with other biometric techniques such as EEG, biosignals, movement and many others.

More info: www.bitbrain.com

info@bitbrain.com
Technical overview

USB, portable and ultralight (200gr) device that is very easy and intuitive to use.

Can be used with the majority of screen-based devices.

Software for calibration and video/gaze recording.

Easy to transport (everything fits in a small box) and without maintenance.

Hardware specifications

<table>
<thead>
<tr>
<th>Eye Tracking Specifications</th>
<th>X2-30</th>
<th>X2-60</th>
<th>X3-120</th>
<th>Spectrum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gaze sampling frequency</td>
<td>30Hz</td>
<td>60Hz</td>
<td>120Hz</td>
<td>150 up to 1200Hz</td>
</tr>
<tr>
<td>Accuracy</td>
<td>0.4º</td>
<td>0.3º</td>
<td>0.3º</td>
<td>0.3º</td>
</tr>
<tr>
<td>Precision (RMS)</td>
<td>0.34º</td>
<td>0.24º</td>
<td>0.06º</td>
<td>0.06º</td>
</tr>
<tr>
<td>Freedom of head movement</td>
<td>50 x 36 cm</td>
<td>50 to 90 cm</td>
<td>50 x 40 cm</td>
<td>34x26 @ 55 to 75cm</td>
</tr>
<tr>
<td>width x height operating</td>
<td>40-90 cm</td>
<td>80cm</td>
<td>50-90 cm</td>
<td>50-90 cm</td>
</tr>
<tr>
<td>distance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>System latency</td>
<td>50-70ms</td>
<td>&lt;35ms</td>
<td>&lt;11ms</td>
<td>Less than 3 frames</td>
</tr>
<tr>
<td>Gaze recovery time</td>
<td>For Blinks immediate</td>
<td>After lost tracking &lt;100ms</td>
<td>1 frame (immediate)</td>
<td></td>
</tr>
<tr>
<td>Recommended screen size</td>
<td>Up to 25&quot;</td>
<td></td>
<td>23.8&quot;</td>
<td></td>
</tr>
<tr>
<td>Tracking technique</td>
<td>The system automatically selects bright or dark pupil.</td>
<td>Binocular</td>
<td>Binocular bright and dark pupil with two cameras that record stereos images.</td>
<td></td>
</tr>
<tr>
<td>Eye tracking unit</td>
<td>Dimensions</td>
<td>324 x 20 x 17mm</td>
<td>324 x 20 x 17mm</td>
<td>55x18x6cm</td>
</tr>
<tr>
<td>Weight</td>
<td>200g</td>
<td>118g</td>
<td>5.1Kg</td>
<td></td>
</tr>
<tr>
<td>Processing</td>
<td>On local PC</td>
<td>On EPU</td>
<td>On local PC or EPU</td>
<td>On the tracker</td>
</tr>
<tr>
<td>Connection</td>
<td>USB 2.0</td>
<td>USB 3.0 (battery charging 1.2)</td>
<td>Ethernet with EPU</td>
<td>Ethernet</td>
</tr>
</tbody>
</table>

Software specifications

<table>
<thead>
<tr>
<th>Tobii Pro software kit (included with equipment)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tobii Pro real-time SDK</td>
</tr>
<tr>
<td>In C/C++ for Windows and Linux</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Third parties data processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matlab and Python.</td>
</tr>
</tbody>
</table>

Bitbrain software platforms (optional)

<table>
<thead>
<tr>
<th>Bitbrain Human Behaviour Research Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practical research platform for experiment design and data acquisition with 30+ sensor modalities seamlessly synchronized, and analysis with a wide range of emotional and cognitive biometrics available.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bitbrain Programming Platform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multimodal real-time neuroscience or brain-computer interface development.</td>
</tr>
</tbody>
</table>

Bundle includes

- Eye tracking unit
- Magnetic mount
- Carrying case
- USB with software and user manual

Services

Onsite Installation and Initial Training
Our team provides a one-day training course that includes the onsite installation of your eye tracker and software. You and your team will gain a basic understanding of operating the system.
Software tools

Wide range of practical software tools with high compatibility with third parties and with Bitbrain software platforms.
Wide range of practical software tools with high compatibility with third parties and Bitbrain platforms.

All Bitbrain’s equipment include a software kit with programming and data acquisition tools, which are compatible with third parties and Bitbrain software solutions.

The **Bitbrain Software Kit** gives versatility to the researcher to work at a programming level (development of applications), or at a user level (acquire, visualize and export data). It provides straightforward connectivity with real-time third parties based on LabStreamingLayer (LSL), or off-line data analysis tools based on Matlab or Python.

The **Bitbrain software platforms** for: 1) Human behaviour research simplifying the synchronized data collection and biometrics analysis; 2) Cognitive enhancement in health and wellness; and 3) Development Platform, to speed up the development and programming of real-time neuroscience or brain-computer interface applications.

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### Products

#### Software tools

**Bitbrain Software Kit and compatibility (included with all devices)**

Data acquisition suite, SDK for programming, and compatibility with real-time I/O and third parties data processing.

P.52

#### Human Behaviour Research Lab

Experimental design and data collection with 30+ sensor modalities seamless synchronized, and data analysis including a wide range of emotional and cognitive biometrics.

P.54

#### Cognitive Training Lab

Technology for cognitive rehabilitation in mental disorders, cognitive maintenance in active aging, and cognitive enhancement in high performance.

P.56

#### Programming Platform

Programming platform to boost the development of neurotech applications, supporting a wide variety of hardware and software plugins for acquisition, processing and interaction.

P.58
Key features

**Advanced software easy to use**
Adaptation of the software for different users’ profiles as the key to building innovative and advanced technology, but simplified for each context of use.

**Software adapted for different use cases**
Complete software solutions adapted for each user and research context, simplifying the experimental design, synchronized data collection and analysis. For human behaviour research, cognitive training and programming.

**Software for scientific research**
Advanced labs for experimental design and data collection with 30+ sensor modalities seamlessly synchronized, with hardware and software technology that is practical and simplified to enable real-world research.

**State of the art**
All the hardware and software technologies have been developed under R&D projects that follow the most strict European standards (FP6/FP7 and H2020), and implemented by a R&D team that has produced 300+ research papers.

**One provider with expert support**
Bitbrain is the manufacturer of all the hardware technologies (except Tobii Pro products) and all the software technologies. This ensures you have the most advanced partner interlocutor for your support.

**Software for biometrics analysis**
Complete research labs adapted for consumer behaviour and UX research, which provides a wide range of experimental protocols already designed and advanced data analysis including behavioural, emotional and cognitive biometrics.

**State of the art**
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**State of the art**
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**Software for scientific research**
Advanced labs for experimental design and data collection with 30+ sensor modalities seamlessly synchronized, with hardware and software technology that is practical and simplified to enable real-world research.

**Practical neurotechnology**
Innovative and practical Hw and Sw for real-world applications: 1) Comfortable, mobile, wireless and ergonomically designed for the user; 2) Fast and simple - easy to set up almost everywhere in few minutes; 3) Reliable - with outstanding signal quality.

**Software multimodal programming**
Development software tools to boost neurotech applications, supporting a wide variety of hardware and software plugins for acquisition, processing and interaction.

**Software for cognitive enhancement**
Elevvo is an effective technology for cognitive rehabilitation, maintenance and enhancement using the most advanced brain sensing technologies and procedures to generate neuroplasticity.
Bitbrain Software Kit

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

- **Simplified data acquisition and setup**
  Collect data with the help of visual cues to assure a proper setup and high quality monitoring.

- **Flexible programming**
  Easy to use and versatile SDK to address a wide variety of applications.

- **Powerful real-time applications**
  LSL compatibility ensures real-time data recording from any platform.

- **In depth data analysis**
  Compatible with advanced platforms such as Matlab, EEGLab, Python, or MNE among others. VR compatibility with Unreal and Unity.

Some applications

- **Practical data collection.** Easy to use visualization software with stationary and mobile devices.

  **Connect your device** with real-time third party scientific platforms based on LabStreamLayer (LSL) such as BCI2000, OpenVibe, etc.

- **Develop your own applications** on different platforms thanks to our versatile SDK, which includes examples for a shorter learning time.

  **Analyze your data** with standard data analysis scientific platforms based on Matlab and Python, among others.

More info: www.bitbrain.com

 info@bitbrain.com
Software tools
Bitbrain Software Kit

Technical overview

Live data acquisition, on/off line data visualization and export in CSV and EDF formats.

Real-time C/C++ SDK for Windows and Linux including Python bindings.

Compatible with real-time third parties based on LSL (BCI2000, OpenVibe, NeuroPype, and more).

Import data into analysis tools based on Matlab (EEGLAB, BCILAB, etc), Python (MNE, etc), Neuroguide and more.

Bitbrain data acquisition suite

<table>
<thead>
<tr>
<th>Compatible equipments</th>
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<tbody>
<tr>
<td>Bitbrain devices</td>
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</table>

<table>
<thead>
<tr>
<th>Data acquisition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simultaneous streaming / local recording</td>
</tr>
<tr>
<td>Local data integrity</td>
</tr>
<tr>
<td>Remote data integrity</td>
</tr>
<tr>
<td>Online data connectivity</td>
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<table>
<thead>
<tr>
<th>Data stream and storage</th>
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<tbody>
<tr>
<td>Data files</td>
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<tr>
<td>Importable SD card data</td>
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</table>

<table>
<thead>
<tr>
<th>Data visualization/record of EEG and Biosignals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw data</td>
</tr>
<tr>
<td>EEG impedance level</td>
</tr>
<tr>
<td>Available data with filters</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data visualization/record Indoor positioning system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw data</td>
</tr>
<tr>
<td>Calibration of device</td>
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<tr>
<td>Visualization of processed data</td>
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</tbody>
</table>

Programing SDK

<table>
<thead>
<tr>
<th>SDK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supported OS</td>
</tr>
<tr>
<td>Programming language</td>
</tr>
<tr>
<td>Main functionalities</td>
</tr>
</tbody>
</table>

Third Party compatibility

<table>
<thead>
<tr>
<th>Third parties real-time I/O</th>
</tr>
</thead>
<tbody>
<tr>
<td>LabStreamLayer (LSL)</td>
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<table>
<thead>
<tr>
<th>Third parties data processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matlab</td>
</tr>
<tr>
<td>Python</td>
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<tr>
<td>Neuroguide</td>
</tr>
</tbody>
</table>

Software kit includes

- Installer of data acquisition suite
- Data acquisition suite documentation
- SDK libraries, with compatibility examples and documentation.

Note: Minimum hardware requirements -- Intel Celeron/AMD Athlon processor, Bluetooth 2.1 (Cysmart 4.0 Bluetooth dongle for indoor localization). Software requirements -- Linux (any with bluetooth and Qt supported) and Windows (7 and newer). InTrack is only available for Windows.

Additional services

Onsite Installation and Initial Training
Our team provides a half-day training course that includes the online installation and basic software training. You and your team will gain a basic understanding of how to operate the system.

Software Customization
Customization of the software in terms of SDK for specific Linux distributions, aesthetics (color, logos, etc) or functionality (visual display, communications, etc). You will receive a tailored technology for your research or business.
Human Behaviour Research Lab

Software for experimental design and data collection with 35+ sensor modalities seamlessly synchronized, and data analysis including a wide range of emotional and cognitive biometrics.

• 35+ sensor modalities
Synchronizes EEG, GSR, ExG, eye trackers and more in one software and one computer.

• Variety of stimuli presentation
Images, videos, websites, surveys and much more.

• Sophisticated study design
Flexibility to create specific presentations, randomizations, block designs, and more.

Some applications

Enhance your research in psychology, neuroscience and sociology in real-world contexts with a technology that integrates +30 practical sensor modalities.

Perform complex data experiments with many types of stimuli such as videos, images, webs, or free tasks among many others.

Get in depth biometric insights in neuromarketing, UX, and gaming through participants' visual, behavioural, emotional and cognitive states.

Data analysis with research tools that allows you to work on raw data or biometrics, at individual or group levels.

More info www.bitbrain.com

Software tools
Human Behaviour Research Lab
**Human Behaviour Research Lab**

**Sync Data collection (Hardware)**
- **EEG**: Dry-EEG and Semi-dry EEG Bitbrain families.
- **Biosignals**: GSR, ECG, EMG, EDG, Respiratory effort band, Air flow, Temperature, BVP/SPO2, Snore sensor, Optical trigger.
- **Movement**: Inertial motion units (9 d.o.f.).
- **Behaviour**: 1/3/7 buttons box, 1 pedal button.
- **Localization**: Indoor positioning system and outdoor GPS.
- **Eye tracking**: All screen-based and mobile (Tobii Pro Glasses 2).
- **Immersive (VR)**: Oculus Rift and HTC Vive Pro.
- **Cameras + micro**: USB camera and micro, screen capture (PC/mobile devices).
- **Tests**: Questionnaires, implicit association/response tests.

**Experimental protocols**
- **Basic stimuli**: Images, videos, audio, free tasks.
- **Advanced stimuli**: Webpages, apps, focus groups, interviews, surveys, experiences.
- **Protocol settings**: Randomizations, rotations, events, TCP/IP event recording.
- **Compatibility with stimulation platforms**: E-Prime, Tobii Pro Lab.

**Data analysis and export**
- **Supported files**: CSV.
- **Compatibility with data analysis platforms**: Compatible with data analysis tools based on Matlab (EEGLAB, BCILAB, etc.), Python (MNE, etc), Tobii Pro Lab, Neuroguide QEEG and more.

**Real-time I/O connectivity**
- **Compatibility with real-time platforms**: Compatible with real-time third parties based on LabStreamLayer LSL (BCI2000, OpenVibe, NeuroPype, and more).
- **Real-time API**: Yes (bidirectional). Streams data and registers external events.

**Biometrics plugin**

**Human behaviour metrics**
- Emotional biometrics: Valence, emotional activation, emotional impact.
- Cognitive biometrics: Attention, memorization, engagement.
- Behavioral metrics: Mouse tracking, time.
- Eye tracking metrics: Visual attention, fixations.
- Implicit motivation and actitudes: Implicit association response tests (IAT and Priming).
- IPS metrics: Position tracking.

**Metrics representations**
- **Individual**: For biometrics, time and implicit association: Bar charts & statistical differences tables.
- For eye tracking, mouse localization and indoor localization: heat maps, ratio maps, trajectory maps, areas of interest (Time to First Fixation, Time spent, Ratio, Revisits, Average Time of Fixations, Previous Fixations) & aggregated fixation video.
- **Combined**: Emotional positioning maps, videos combining metrics, stimuli, cameras & microphones (aggregated, aggregated by segment or individual).

**Output format**
- **Files**: All biometrics (individual and aggregated) in CSV format, compatible with third party tools (Matlab, Excell, etc).
- **Visualization software**: Bitbrain biometrics visualization software. Analysis of intervals and areas of interest.
- **Multimedia materials**: Representations and videos included for reporting.

**Services**

Many services are available. These range from adaptation of the Human Behaviour Research Lab software and its biometrics up to several applied neuroscience services.
Cognitive Training Lab

Effective technology for cognitive rehabilitation in mental pathologies, maintenance in active aging, and enhancement in high performance.

• Effectiveness
Cognitive rehabilitation and enhancement between 10% and 30% in analyzed populations.

• Technical-scientific rigorousness
Patented, developed and validated following rigorous scientific and technological standards.

• Simplicity and comfort
Comfortable equipment that is easy to use by professionals, with simple interventions for users, and with portable design to carry out sessions anywhere.

Some applications

Help your patients with mental disorders to improve working memory, sustained attention, and processing speed.

Practice with a technology oriented for professionals that require high cognitive performance such as athletes, army or special corps.

Improve the cognitive capabilities of the general population who wish to maintain cognitive functions at high levels, or encourage healthy aging.

Perform QEEG or normative quantitative EEG with FDA approved technologies such as Neuroguide.

Software tools
Cognitive Training Lab

More info www.bitbrain.com

• Individualization of interventions
Adapts the session individually to the user brain activity and evolution throughout training sessions.

• Integral Programs (evaluation)
Pre/post neurophysiological and cognitive evaluations in an automatic report.

• Integral Programs (training)
Cognitive exercises adapted for the user. Easy to apply by professionals and to use by participants.

• Effectiveness
Cognitive rehabilitation and enhancement between 10% and 30% in analyzed populations.

• Technical-scientific rigorousness
Patented, developed and validated following rigorous scientific and technological standards.

• Simplicity and comfort
Comfortable equipment that is easy to use by professionals, with simple interventions for users, and with portable design to carry out sessions anywhere.

Some applications

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Software tools
Cognitive Training Lab

More info www.bitbrain.com
**Technical overview**

Practical EEG equipment with dry or semi-dry sensors, and with a placement time 2 minutes on average.

Software for management of users, execution of Interventions and Programs.

Effective interventions with cognitive improvement between 10% and 30% in the analyzed populations.

Results reports at neurocognitive and neurophysiological levels.

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**Cognitive Training Lab**

<table>
<thead>
<tr>
<th>Compatible Hardware</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry-EEG</td>
<td>Minimal EEG Diadem (see Pg. 5)</td>
</tr>
<tr>
<td>Semidry-EEG</td>
<td>Versatile EEG family 8/16/32/64ch (see Pg. 17)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Software Core</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Database</td>
<td>Participants and programs/studies.</td>
</tr>
<tr>
<td>Intervention modules</td>
<td>Select the intervention programs from the available modules.</td>
</tr>
<tr>
<td>Execution setup of the session</td>
<td>EEG placement guided by the system and visual guides to follow the tasks.</td>
</tr>
<tr>
<td>Execution of the program</td>
<td>Calibration and execution of the cognitive training automatically handled by the system.</td>
</tr>
<tr>
<td>Execution of the evaluation</td>
<td>Digitalized neurocognitive tests such as Pasat, Digit inverse, etc.</td>
</tr>
<tr>
<td>Data analysis and report</td>
<td>Automated report generated by the system with the result of the pre/post neurophysiological and neurocognitive improvements.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Report</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Neurocognitive results</td>
<td>Quantitative results of the pre/post cognitive tests.</td>
</tr>
<tr>
<td>Neurophysiological results</td>
<td>Quantitative results of the pre/post EEG tests.</td>
</tr>
<tr>
<td>Intrasessions EEG results</td>
<td>Quantitative results of the intrasessions EEG changes.</td>
</tr>
<tr>
<td>Program results advice</td>
<td>Automated proposal of program termination or continuation based on results obtained.</td>
</tr>
<tr>
<td>Format of the results</td>
<td>Document with self-explanatory tables and figures, which are provided separately to personalize the report.</td>
</tr>
</tbody>
</table>

**Software intervention modules**

| Medical | 8 Programs to improve working memory, sustained attention, and processing speed in patients with mental disorders. |
| Wellness | 9 Programs for cognitive improvement of the general population who wish to maintain cognitive functions at high levels, or encourage healthy aging. |
| Peak performance | 9 Programs oriented for professionals that require high cognitive performance such as athletes, army or special corps. |
| QEEG | QEEG compatibility with Neuroguide |

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More info: [www.bitbrain.com](http://www.bitbrain.com)
Programming Platform

Platform to accelerate the development of brain-computer interface applications starting from a wide variety of hardware and software plugins for acquisition, processing and interaction.

- **Start from the state-of-the-art**
  From a wide variety of hardware and software plugins for acquisition, processing and interaction.

- **Mature technology**
  Ten years of platform development, which has been utilized in a high number of public and private neurotechnology projects, constantly evolving and updating.

- **Compatibility and scalability**
  Real-time integration of 30+ complementary technologies within Windows OS and Linux, and compatible with Matlab, Python, Unity and Unreal.

- **Professional support**
  Professionally maintained with efficient support, periodical updates, and services to minimize development time, such as training or development of customized units.

Some applications

Start your brain-computer interface project with a perfect integration of **30+ complementary technologies**. Compatibility with Matlab, Python and Unity, among others.

Use our tools to build **straightforward interaction** with immersive technologies or gaming (Unity and Unreal), or communication with other devices (cellphones, tablets) or cloud services.

Speed up the development relying on the **real-time data processing** of scientific programming languages like Matlab and Python.

Professionally maintained by efficient support, periodical updates and services to minimize development time, such as training or development of customized units.

More info: www.bitbrain.com
**Technical overview**

Parameterized set up and configurations of applications based on the acquisition, data processing and interaction.

- Real-time acquisition and synchronization of more than 30 complementary multimodal technologies.
- Near real-time distributed processing in C++, including Matlab and Python plugins.
- Interaction with immersive technologies, streaming, and cloud services, and other devices (cellphones, tablets).

**Bitbrain data acquisition suite**

<table>
<thead>
<tr>
<th>Compatible equipments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bitbrain devices</td>
</tr>
<tr>
<td>All Bitbrain devices (EEG, Biosignals, InTrack).</td>
</tr>
<tr>
<td>Eye tracking devices</td>
</tr>
<tr>
<td>Tobii Pro stationary or mobile (Tobii Pro Glasses 2) devices.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>General features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closed-loop applications</td>
</tr>
<tr>
<td>Out-of-the-box support for multimodal closed-loop applications.</td>
</tr>
<tr>
<td>Configurable pipeline</td>
</tr>
<tr>
<td>Configurable pipeline of elements through scripts.</td>
</tr>
<tr>
<td>Support high processing demands</td>
</tr>
<tr>
<td>Platform can be distributed through various computers in a local area network.</td>
</tr>
<tr>
<td>Automatic file saving</td>
</tr>
<tr>
<td>Data is automatically saved to a proprietary format.</td>
</tr>
<tr>
<td>Offline data processing</td>
</tr>
<tr>
<td>Data saved can be loaded and offline analysed using scientific programming languages: Matlab, Python.</td>
</tr>
<tr>
<td>Modular design</td>
</tr>
<tr>
<td>Designed as a set of modules (OS processes) and programming units with a message-passing architecture.</td>
</tr>
<tr>
<td>Multiplatform, desktop solution</td>
</tr>
<tr>
<td>Windows and Linux.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Modules for data acquisition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simultaneous recording</td>
</tr>
<tr>
<td>Simultaneous recording of multiple data streams.</td>
</tr>
<tr>
<td>Real time sync</td>
</tr>
<tr>
<td>Timestamped recordings for synchronization.</td>
</tr>
<tr>
<td>Interoperability standard</td>
</tr>
<tr>
<td>Allows inter-operability from third parties devices using Lab Streaming Layer (LSL).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Modules for processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serial / parallel processing</td>
</tr>
<tr>
<td>Allows for serial or parallel processing.</td>
</tr>
<tr>
<td>Sync. processing</td>
</tr>
<tr>
<td>Timestamped recordings are transferred for online synchronization.</td>
</tr>
<tr>
<td>Scientific programming prototyping</td>
</tr>
<tr>
<td>Processing algorithms can be easily integrated using state-of-the-art scientific programming languages such as Matlab and Python (or native C++).</td>
</tr>
</tbody>
</table>

**Modules for interaction**

<table>
<thead>
<tr>
<th>Interconnectivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available near real-time TCP/IP communication protocol with third party platforms, to send/receive data streams or messages.</td>
</tr>
</tbody>
</table>

**Software bundle includes**

- Software libraries for development
- Software examples
- Documentation

**Note**: the programming framework is usually adapted to the client needs to reduce the learning curve and speed up development.

**Services**

**Onsite Installation and Initial Training**

Our team provides a half-day training course that includes the online installation and Bitbrain platform programming training. You and your team will gain a basic understanding of how to operate the system.

**Software Customization**

Customization of the software in terms of specific requirements of the applications usually in terms functionality (pre-configuration of system dynamics, modules and communications). You will receive a made-to-order technology for your research or business.
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), 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, indoor positioning systems and other complementary human monitoring technologies to approach real world research.

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.

Cognitive Training Lab
Neurotechnology for cognitive rehabilitation in mental disorders, cognitive maintenance in active aging, and cognitive enhancement in high performance.

Programming Platform
Programming platform to boost the development of neurotech applications, with a wide variety of hardware and software plugins for acquisition, processing and interaction.
Bitbrain products are favored by leading universities, government research and development funding, and forward-thinking companies around the world — with over 600 individual institutions relying on our products for the best in physiological and neurological research.

### Clients & Partners

#### Academy
- MIT
- Stanford University
- EPFL
- Imperial College London
- TU Delft
- VUB Brussels
- University of Glasgow
- National Research Network
- The University of Nottingham
- UAF
- Universitat de Barcelona
- CSIC
- CNRS
- ONERA
- IE Business School
- University of Reading

#### Private institutions
- Coca-Cola
- NISSAN
- Johnson & Johnson
- IBM
- L’Oreal Paris
- SEAT
- Intel
- Hero
- Disney
- Telefonica
- GfK
- KANTAR McWARD BROWN
- O’Reilly
- everis
- AMC Group
- PUIG

### Funding
- European Commission
- Horizon 2020 European Union funding for Research & Innovation
- Ministerio de Economía y Competitividad
- GOBIERNO DE ESPAÑA
- GOBIERNO DE ESPAÑA, MINISTERIO DE ECOLOGIA Y MEDIO AMBIENTE
- GOBIERNO DE ESPAÑA, MINISTERIO DE ECONOMIA Y COMPETITIVIDAD
<table>
<thead>
<tr>
<th>Location</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spain</td>
<td>Passeig de Gràcia, 87, 6th floor, Barcelona, Catalonia, 08008</td>
</tr>
<tr>
<td>Zaragoza</td>
<td>Paseo de Sagasta 19, Entlo. Dcha, Zaragoza, 50008</td>
</tr>
<tr>
<td>United States</td>
<td>361 Newbury Street, Boston, MA 02115</td>
</tr>
</tbody>
</table>