

Introduction to EPOC X

EPOC X is the 10th-anniversary edition of the award-winning EPOC headset. This Brainwear® device has been designed for scalable and contextual human brain research — providing access to professional-grade brain data with an improved and easy-to-use design. EPOC X features include:

- 14-channel EEG — for whole brain sensing
- A rotating headband — for maximized wearability
- Saline-based electrodes — with a new and easy to rehydrate design
- Redesigned electroplated electrodes — to reduce oxidation and sensor breakages
- Enhanced performance and connectivity — with our updated antenna and radio
- Improved signal quality — with adjusted and relocated amplifiers

Specifications

EEG sensors

14 channels: AF3, F7, F3, FC5, T7, P7, O1, O2, P8, T8, FC6, F4, F8, AF4

2 references: CMS/DRL references at P3/P4; left/right mastoid process alternative

Sensor material: Saline soaked felt pads

Connectivity

Wireless: Bluetooth® Low Energy (improved connectivity with new antenna) Bluetooth® 5.0 Ready – We currently use Bluetooth® SMART (also known as Bluetooth 4.0 Low Energy Protocol) support for Bluetooth® 5.0 will be available with upcoming software and firmware updates.

Proprietary USB receiver: 2.4GHz band

USB: to change headset settings & Extender

EEG signals

Sampling method: Sequential sampling, single ADC

Sampling rate: 2048 internal downsampled to 128 SPS or 256 SPS (user configured)

Resolution: LSB = 0.51µV (14 bits mode), 0.1275µV (16 bits mode)

Bandwidth: 0.16 – 43Hz, digital notch filters at 50Hz and 60Hz

Filtering: Built in digital 5th order Sinc filter

Dynamic range (input referred): 8400 µV(pp)

Coupling mode: AC coupled

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Motion sensor

IMU part: ICM-20948

Quaternions: normalized, 4D

Resolution: 16 bits

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Available detections

Mental Commands: neutral + up to 4 pre-trained items per training profile

Performance Metrics: Excitement, Engagement, Relaxation, Interest, Stress, Focus

Facial Expressions: Blink, Wink L/R, Surprise, Frown, Smile, Clench, Laugh, Smirk L/R

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Power

Battery: Internal Lithium Polymer battery 595mAh

Battery life: up to 12 hours using USB receiver, up to 6 hours using Bluetooth Low Energy

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Weight

170g

Dimension

9 x 15 x 15cm

Notice: Limited beta support on Ubuntu & Raspberry Pi, subject to OS changes.