

# Emotiv Epoc X



## EPOC X

14 sensors  
Saline soaked felt  
Yes  
5.0 Ready  
Higher  
Fixed  
Rotating  
3-5 min

## Specification

### 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

### Motion sensors

**IMU part:** ICM-20948

**Quaternions:** normalized, 4D

**Resolution:** 16 bits

### Connectivity

**Wireless:** Bluetooth Low Energy (improved connectivity with new antenna)

**Proprietary USB receiver:** 2.4GHz band

**USB:** to change headset settings & Extender

### Available detections\*\*

**Mental commands:** neutral + up to 4 pretrained 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

### EEG signals

**Sampling method:** Sequential sampling, single ADC

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

**Resolution:** LSB = 0.51  $\mu$ V (14 bits mode), 0.1275  $\mu$ V (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  $\mu$ V(pp)

**Coupling mode:** AC coupled

### Power

**Battery:** Internal Lithium Polymer battery 595mAh

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

### Weight

170g

### Dimensions

9 x 15 x 15 cm

## Key features

### Rotating headband

We redesigned EPOC X with a rotating headband that can be positioned on top, or at the rear of the head. This enables more data collection opportunities, including for sleep studies, and comfortable support for users with a head restraint or where headrest support is required.

### Reduced rehydration time

We modified the sensor design to allow for openings at the rear of each sensor. This opening makes it easy to re-hydrate sensors while in place and reduces overall set-up time so you can conduct longer duration experiments with ease.



#### Robust sensor redesign

With the aim of making EMOTIV Brainwear, robust and even easier to use, we electroplated our contacts and redesigned our sensors so they stay fixed. This redesign reduces oxidation and also avoids fragile plastic sensor clip breakages.



#### Improved signal quality

We know EEG is highly susceptible to noise and continue to research new methods to minimize noise and improve signal quality. Our new, adjusted and relocated amplifiers increase the headset's ability to reject noise and improve signal quality.



#### Enhanced connectivity & performance

Better performance, and device connectivity with our updated antenna, and radio.



#### Eco friendly design & packaging

With sustainable design in mind, we've created new eco-friendly packaging and reduced the number of removable and replaceable components. EPOC X is now packaged in a protective, reusable travel case making it truly portable.