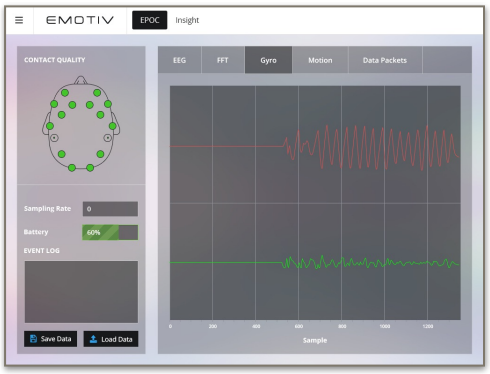
EMOTIV EPOC

BRAIN COMPUTER INTERFACE & SCIENTIFIC CONTEXTUAL EEG

EMOTIV EPOC & TESTBENCH™ SPECIFICATIONS

CONTENTS

BCI & Practical EEG Research



The Emotiv EPOC is a high resolution, multi-channel, portable system which has been designed for practical research applications.

License our Testbench™ software to receive raw EEG data from the Neuroheadset and our proprietary software toolkit that exposes our APIs and detection libraries: Mental Commands, Performance Metrics & Emotional States and Facial Expressions.

Performance Metrics & Emotional States

This suite monitors the user's emotional states in real-time. It enables an extra dimension in interaction by allowing the computer to respond to a user's emotions. Characters can transform in response to the user's feeling. Music, scene lighting and effects can be tailored to heighten the user's experience in real-time. The user's state of mind can be monitored so that difficulty can be tailored and adjusted to suit each situation.

The suite can be combined with other inputs such as eye tracking devices to provide real-time feedback from the entire user experience for neuromarketing applications. Adaptive interfaces can monitor user engagement, boredom, excitement, frustration and meditation level in real time.

Facial Expressions

This uses the signals measured by the Emotiv EPOC to interpret player facial expressions in real-time. It provides a natural enhancement to interaction by allowing characters to come to life. When a user smiles, their avatar can mimic the expression even before they are aware of their own feelings. Artificial intelligence can now respond to users naturally, in ways only humans have been able to until now.

Mental Commands

This detection suite reads and interprets a user's conscious thoughts and intent. Users can manipulate virtual or real objects using only the power of their thought! For the first time, the fantasy of magic and supernatural power can be experienced.

Emotiv EPOC

	EEG HEADSET
Number of channels	14 (plus CMS/DRL references, P3/P4 locations)
Channel names (International 10-20 locations)	AF3, F7, F3, FC5, T7, P7, O1, O2, P8, T8, FC6, F4, F8, AF4
Sampling method	Sequential sampling. Single ADC
Sampling rate	128 SPS (2048 Hz internal)
Resolution	14 bits 1 LSB = 0.51µV (16 bit ADC, 2 bits instrumental noise floor discarded)
Bandwidth	0.2 - 45Hz, digital notch filters at 50Hz and 60Hz
Filtering	Built in digital 5th order Sinc filter
Dynamic range (input referred)	8400µV (pp)
Coupling mode	AC coupled
Connectivity	Proprietary wireless, 2.4GHz band
Power	LiPoly
Battery life (typical)	12 hours
Impedance Measurement	Real-time contact quality using patented system

EMC and Telecom: Class B
ETSI EN 300 440-2 V1.4.1
EN 301 489-1
EN 301 489-3
AS/NZS CISPR22 :2009
AS/NZS 4268 :2008
FCC CFR 47 Part 15C (identifiers XUE-EPOC01, XUE-USBD01)

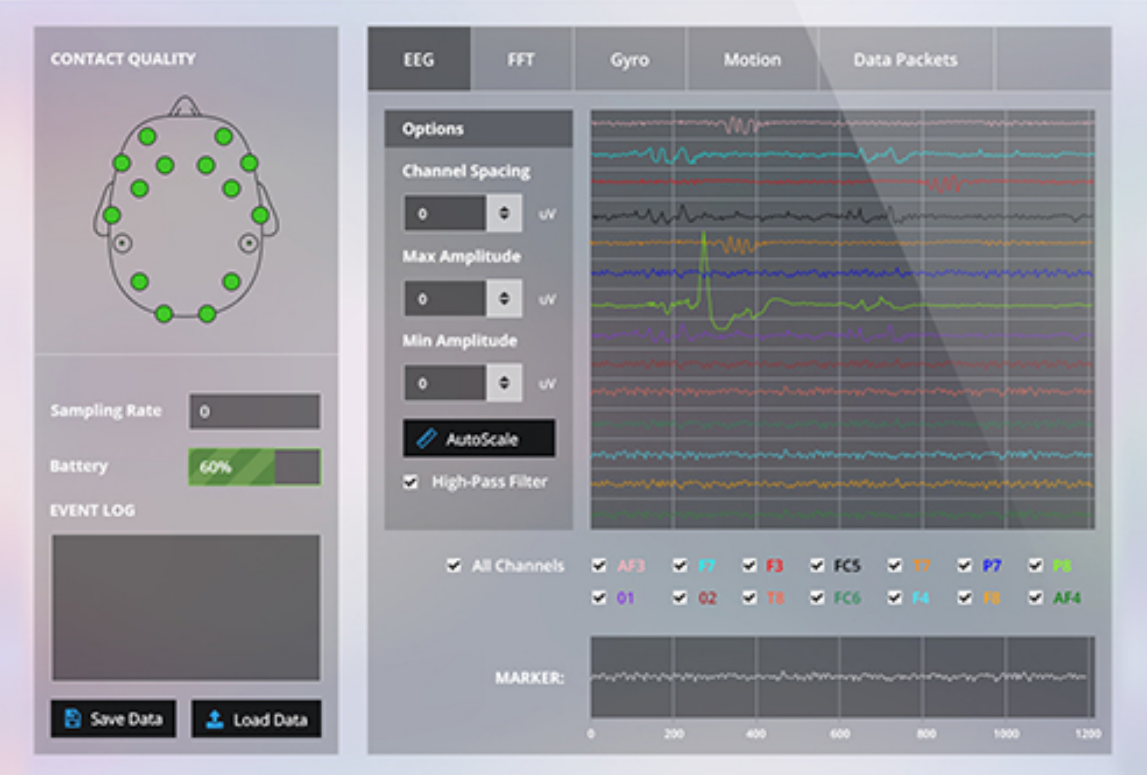
Safety:
EN 60950-1:2006
IEC 60950-1:2005 (2nd Edition)
AS/NZS 60950.1:2003 including amendments 1, 2 & 3
CB Certificate JPTUV-029914 (TUV Rheinland)

TestBench™

Real-time display of the Emotiv headset data stream, including EEG, contact quality, FFT, gyro (if fitted – custom option), wireless packet acquisition/loss display, marker events, headset battery level.

Record and replay files in binary EEGLAB format. Command line file converter included to produce .csv format.

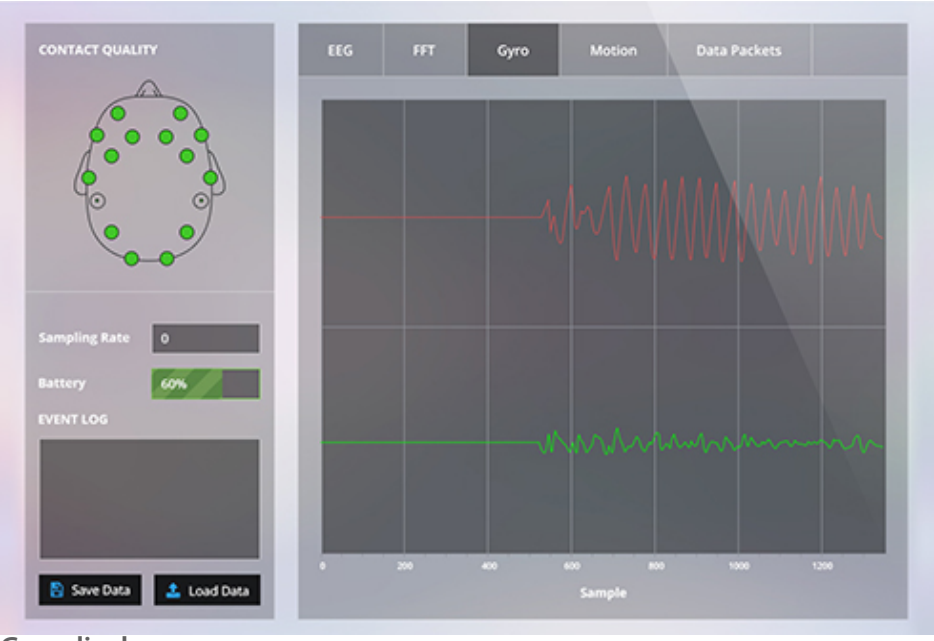
Define and insert timed markers into the data stream, including on-screen buttons and defined serial port events. Markers are stored in EEG data file. Marker definitions can be saved and reloaded. Markers are displayed in real time and playback modes.



EEG display:

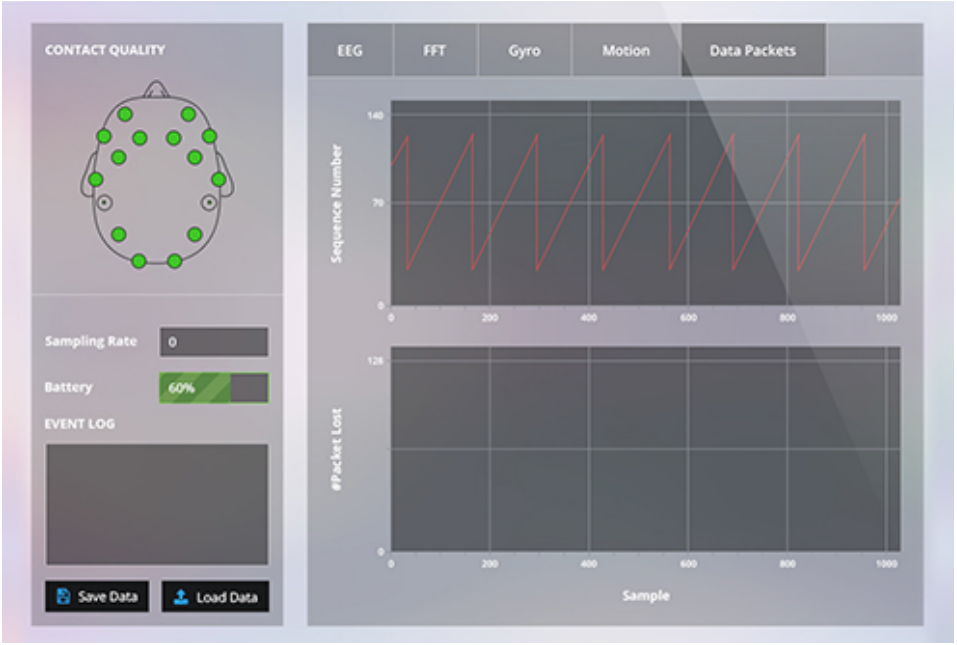
- 5 second rolling time window (chart recorder mode)
- ALL or selected channels can be displayed
- Automatic or manual scaling (individual channel display mode)
- Adjustable channel offset (multi-channel display mode)
- Synchronized marker window

TestBench™



Gyro display:

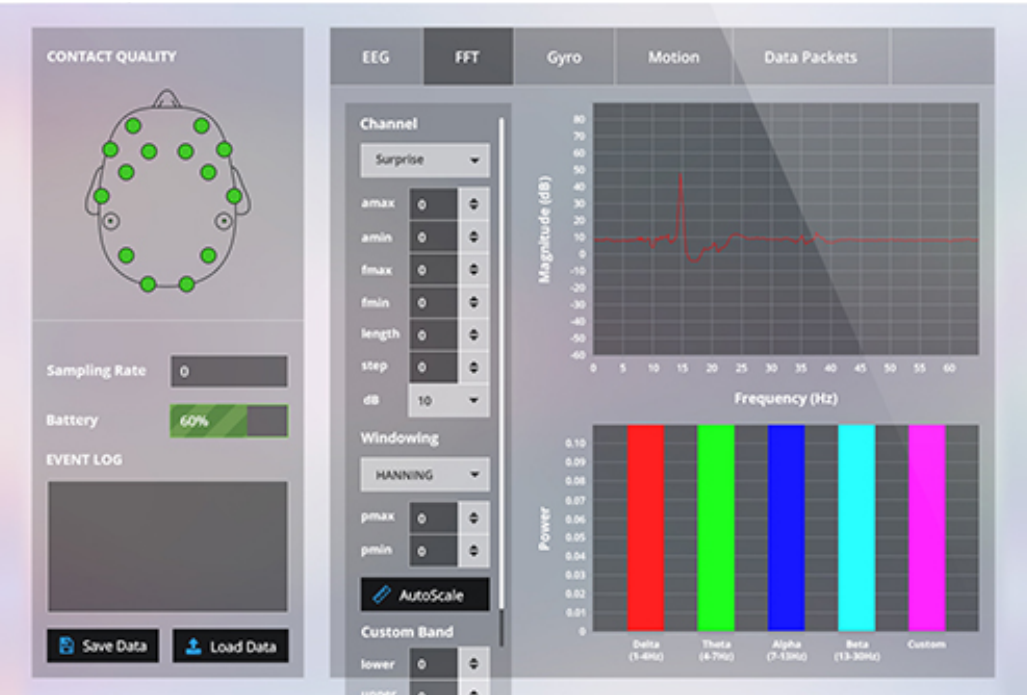
- 5 second rolling time window (chart recorder mode)
- X and Y deflection



Data Packet display:

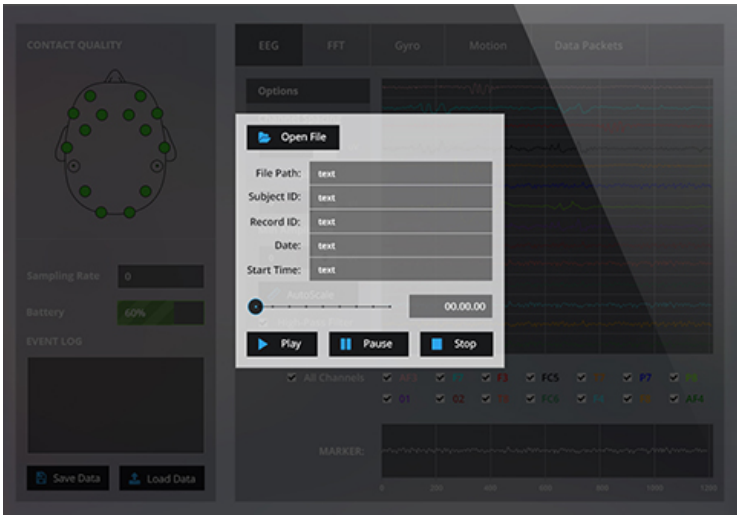
- 5 second rolling graph of Packet Counter output
- Packet loss – integrated count of missing data packets
- Verify data integrity for wireless transmission link

TestBench™



FFT display:

- Selected channel only
- ALL or selected channels can be displayed
- Adjustable sampling window size (in samples)
- Adjustable update rate (in samples)
- dB mode – power or amplitude calculations
- dB scale
- FFT window methods: Hanning, Hamming, Hann, Blackman, Rectangle
- Predefined and custom sub-band histogram display – Delta, Theta, Alpha, Beta, custom bands



Data Recording and Playback:

- Fully adjustable slider, play/pause/exit controls.
- Subject and record ID, date, start time recorded in file naming convention.