The Device

The fBASe™ is a non-invasive, wearable EEG sensor for continuous brain monitoring. The system is composed of hardware and software modules and facilitates the capture and labeling of electrophysiological data as well as enables reviewing the processed data in real time.

The device is composed of an electrode-patch, sensing hardware and a cloud-based computerized interpretation that provides reading of the electrophysiological activity. Signal acquisition and transmission module includes:

(A) 3-electrode patch attached to the subject's forehead. This is a medical grade electrode patch that includes dry gel for optimal signal transduction at minimal discomfort. The electrodes are located at Fp1 and Fp2 and a reference electrode at Fpz. The electrode patch is disposable and showed no evidence of causing cell lysis, toxicity, or skin irritation upon testing.

(B) Low-noise instrumentation amplifier with an amplification of 100 (AD8429). This includes all required measures to protect both the subject and the circuit.

(C) 18-bit Analog to Digital converter (AD7982) and Sub-sampling to 500 Hz. The device runs at a high sampling rate of 32kHz and the result is averaged to increase the number of effective bits and improve the signal to noise ratio.

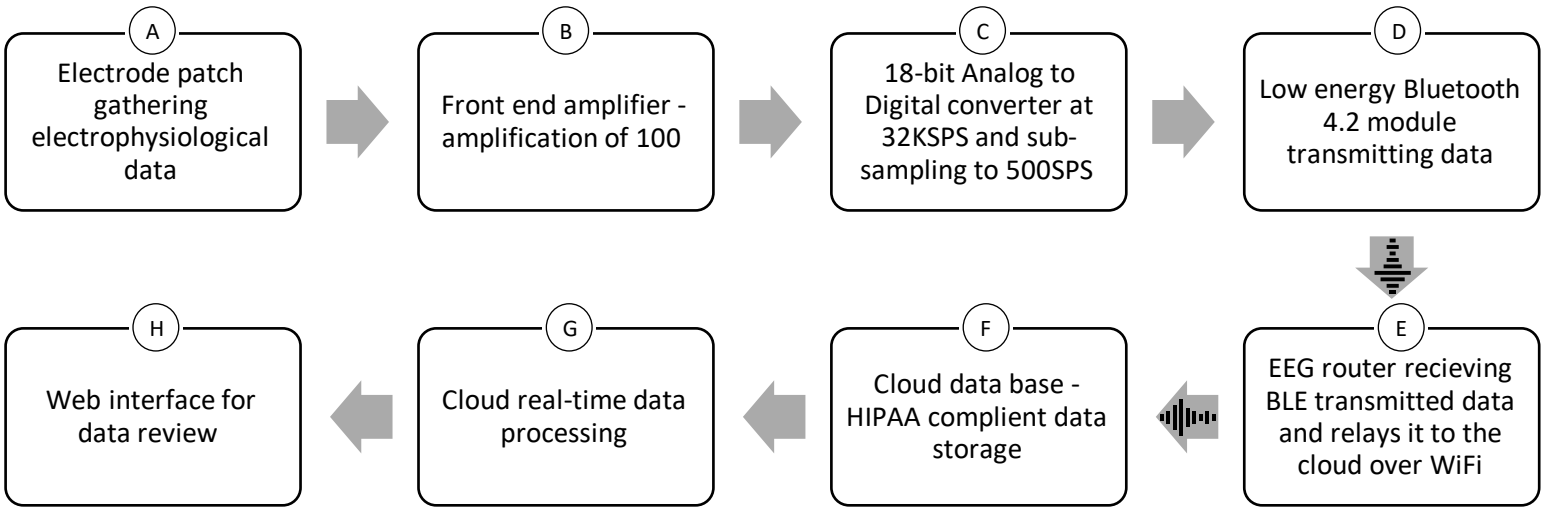
(D) Low-energy Bluetooth 4.2 module (CYBLE-222014-01 EZ-BLE). The data gathered by the device is sent over standard low energy Bluetooth (BLE) connection.

(E) EEG router in the form of Neurosteer android-app or Raspberry-Pi monitor receives BLE transmitted data and relays the data over mobile or Wi-Fi communication to the cloud.

(F) Cloud data base - data is stored in the cloud in compliance with HIPAA regulation.

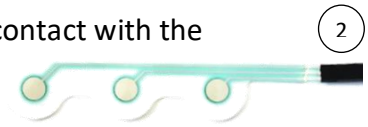
(G) Data analysis performed in the cloud transforms the electrophysiological signal into readable brain activity data.

(H) The processed data is accessible via Neurosteer's web interface.

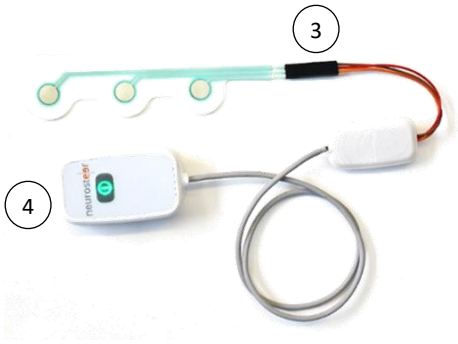


Sensor Operation

1. Skin preparation – wipe the forehead with an electrode prep-pad or alcohol wipe.
2. Open the electrode package and remove the electrode sticker so that the adhesive foam is exposed.
3. Place the electrode strip on the forehead, 1cm above the eyebrows. The middle electrode should be located between the eyebrows. Make sure the electrode is in full contact with the skin (image 1).



4. Locate the black connector located in the edge of the electrode patch (image 2).
5. The white sensor is composed of the box, a wire and a black connector array (with 3 pins) in the edge of the wire.



6. Attach the electrode patch connector to the device connector array. Make sure the 3 pins are all inserted at the in the proper manner when making the connection (image 3).
7. Press the ON/OFF button on the sensor for 3sec, a blinking red light will appear. The light indicated that the device is turned on.
8. When the device is connected to the system, a green light will appear. Only when the green light is on the device is transmitting information (image 4).
9. To disconnect the system: unplug the black connectors between the electrode patch and the sensor and press the sensor's ON/OFF button for 3 seconds. The sensor is turned off when the light in the ON/OFF button turns off. The electrode patch is disposable, remove it from the forehead carefully and dispose of it.