**EEG\_SDK\_v1.3**

**Update:**

New format for eeg packet containing both electrode status data and eeg signal data.

Add “disable function” for both eeg and heartrate module.

Note: All the operation below are based on Bluetooth connection between host(eg. PC) and EEG device..

Word in yellow indicates changed SDK.

EEG\_API

***eeg\_reading\_enable***

Description: this operation will start eeg module and enable notification.

Implementation: Should set value “01:00” to uuid “0x2902” or Handle “0x0013” on EEG device through Bluetooth.

Then device will keep transmitting 20-bytes packets back to uuid “0x0012” or handle “0x2D37” in hex format.

Every EEG sample takes 3 bytes, so every packet contains 6 EEG samples. The EEG sampling rate is 250 samples/second.

***eeg\_reading\_disable***

Description: this operation will shut down eeg module and disable notification.

similar to “eeg\_reading\_enable”, but need to set value “00:00” to uuid “0x2902” or Handle “0x0013” on EEG device through Bluetooth.

***6-channel eeg signal data***

Description: eeg information is stored in the last 18 bytes of each packet.

Each sample for one channel is 3 bytes. Then 18 bytes = 3 bytes/ sample \* 6 channel. For each packet: 20 bytes = 2 bytes(**electrode status bytes**) + 3 bytes/ sample \* 6 channel.

**Electrode-off data**

Description: electrode status information is stored as **electrode status bytes** in the first 2 bytes of each packet.

The first byte represents for 8 **positive** electrode lead’s status, each bit indicate one electrode. The bit’s value 1 means for “electrode is on”, 0 means for “electrode is off”.

Similarly, the second byte represents for 8 **negative** electrode lead’s status.

Heartrate\_API

***heartrate\_reading\_enable***

Description: this operation will start heartrate module and enable heartrate notification.

Implementation: should set value “01:00” to uuid “0x2902” or Handle “0x0020” on EEG device through Bluetooth. (NOTE: eeg\_reading’s uuid is same with heartrate\_reading’s uuid, maybe better to use handle for operation)

Then device will keep transmitting 16-bytes packets back to uuid “0x001F” or handle “0x2E37”.

Each heart rate data sample takes 2 bytes, so every packet contains 8 samples. The heart rate module sampling rate is 50 SPS.

***heartrate\_reading\_disable***

Description: this operation will shut down heartrate module and disable heartrate notification.

Implementation: should set value “00:00” to uuid “0x2902” or Handle “0x0020” on EEG device through Bluetooth. (NOTE: eeg\_reading’s uuid is same with heartrate\_reading’s uuid, maybe better to use handle for operation)

Haptic\_sensor\_API

Description: haptic sensor in our device has attributes: duration, period, amplitude. Duration means how long haptic sensor keep running for one activation instruction; period means the how frequently it will vibrate; amplitude means for amplitude of vibration.

***haptic\_activate***

Description: this operation will activate haptic sensor and make it vibrate for a period of time.

Implementation: should write value **1** to Handle “0x001C” or Uuid “0x2D3A”.

***Haptic\_stop***

Description: this operation will stop the haptic sensor.

Implementation: should write value **2** to Handle “0x001C” or Uuid “0x2D3A”.

***Haptic\_increase\_duration***

Description: this operation will increase the time that haptic sensor work for one activation instruction, every “Haptic\_increase\_duration” operation will increase 1s.

Implementation: should write value **3** to Handle “0x001C” or Uuid “0x2D3A”.

***Haptic\_decrease\_duration***

Description: this operation will decrease the time that haptic sensor work for one activation instruction, every “Haptic\_increase\_duration” operation will decrease 1s.

Implementation: should write value **4** to Handle “0x001C” or Uuid “0x2D3A”.

***Haptic\_increase\_period***

Description: this operation will increase the period time that haptic sensor vibrate, every “Haptic\_increase\_period” operation will increase vibrating period for 100ms.

Implementation: should write value **5** to Handle “0x001C” or Uuid “0x2D3A”.

***Haptic\_decrease\_period***

Description: this operation will decrease the period time that haptic sensor vibrate, every “Haptic\_decrease\_period” operation will decrease vibrating period for 100ms.

Implementation: should write value **6** to Handle “0x001C” or Uuid “0x2D3A”.

***Haptic\_increase\_amplitude***

Description: this operation will increase the amplitude that haptic sensor vibrate, every “Haptic\_increase\_amplitude” operation will increase vibrating amplitude for one level.

Implementation: should write value **7** to Handle “0x001C” or Uuid “0x2D3A”.

***Haptic\_decrease\_amplitude***

Description: this operation will decrease the amplitude that haptic sensor vibrate, every “Haptic\_decrease\_amplitude” operation will decrease vibrating amplitude for one level.

Implementation: should write value **8** to Handle “0x001C” or Uuid “0x2D3A”.

Note: please notice since the firmware is still not all settled down, We may need to change the Handle/uuid for some operation in the future. But right now this API should work fine with our device.