BCI Protocol (V1.4)

-----For Bluetooth & USB Oximeter

1、Bluetooth Service Information (UUIDs)：

Comm Service: 49535343-FE7D-4AE5-8FA9-9FAFD205E455
Send Characteristic: 49535343-1E4D-4BD9-BA61-23C647249616
Receive Characteristic: 49535343-8841-43F4-A8D4-ECBE34729BB3
Rename Characteristic: 00005343-0000-1000-8000-00805F9B34FB
MAC Address Characteristic: 00005344-0000-1000-8000-00805F9B34FB

PS: Host application should use the notification of the 'Send Characteristic' for package fetching.

2、USB-Com Port Settings：

Baud Rate：115200，Bits：8，Stop bits：1，Parity bit：none

3、Package Format (Device to Host):

Package Length: 5 bytes
Package Rate: 100 Hz
Package Content:

Byte	Bit	Description
1	0~3	Signal strength (0~8, invalid value = 0xF)
	4	1＝no signal，0=OK
	5	1＝probe unplugged, 0=OK
	6	1＝pulse beep
	7	Sync bit = 1 (Packet Header)
2	0～6	Pleth（0-100，invalid value = 0）
	7	Sync bit = 0
3	0～3	Bargraph（0-15，invalid value = 0）
	4	No finger=1, 0=OK
	5	Pulse research=1, 0=OK
	6	Bit 6 of Byte 3 is bit 7 of the Pulse Rate
	7	Sync bit = 0

4	0～6	Bits 0-6 of Byte 4 are bits 0-6 of the Pulse Rate
	7	Sync bit = 0
5	0～6	SpO2 （0-100%）
	7	Sync bit = 0

Tips:

Invalid Signal strength = 0xF, Invalid pleth = 0, Invalid Bargraph = 0,

Invalid Pulse Rate = 0xFF, Invalid Spo2 = 0x7F

4、Host Command (Host to Device):

Command length: 1 byte

Command type:

0xff ---------- Get Software Version

0xfe ---------- Get Hardware Version

0xfd ---------- Get Bluetooth Version (Optional)

For example:

(1). Assuming the software version string is “V1.00.00.00”, the device will return three consecutive 5 bytes response packets after a single byte command 0xff is sent by the host.

The 1st 5 bytes response packet: 0xff 0x56 0x31 0x2e 0x30 (ASCII string for "V1.0")

The 2nd 5 bytes response packet: 0xff 0x30 0x2e 0x30 0x30 (ASCII string for "0.00")

The 3rd 5 bytes response packet: 0xff 0x2e 0x30 0x30 0x00 (ASCII string for ".00")

(2). Assuming the hardware version string is “V1.0”, the device will return only one 5 byte response packet after a single byte command 0xfe is sent by the host.

The 5 bytes response packet: 0xfe 0x56 0x31 0x2e 0x30 (ASCII string for "V1.0")

(3). Assuming the bluetooth version string is “V2.00.00.00”, the device will return three consecutive 5 bytes response packets after a single byte command 0xfd is sent by the host.

The 1st 5 bytes response packet: 0xfd 0x56 0x32 0x2e 0x30 (ASCII string for "V2.0")

The 2nd 5 bytes response packet: 0xfd 0x30 0x2e 0x30 0x30 (ASCII string for "0.00")

The 3rd 5 bytes response packet: 0xfd 0x2e 0x30 0x30 0x00 (ASCII string for ".00")

Demo:

Android:

BLE demo: https://github.com/zh2x/SpO2-BLE-for-Android *

Classic Bluetooth demo: https://github.com/zh2x/SpO2-Bluetooth-for-Android *

iOS:

Swift demo: https://github.com/zhuchengji-berry/BluetoothDemo *

Objective-C demo: https://github.com/zh2x/SpO2-BLE-for-iOS *

*** Single BLE Bluetooth's MAC address begins with "00 A0 50". if not, dual mode Bluetooth module inside, but BLE Mode is only available for iOS, and the Classic Mode for Windows and Android.**

Change Log：

history	content	date
V1.1	Add android and iOS demo source code github link. Add change log.	2015-11-10
V1.2	Add Classic Bluetooth demo.	2017-03-20
V1.3	Add BLE service and version information.	2019-11-26
V1.4	Update iOS demo source code github link.	2021-03-24