cNIBP Protocol（v1.3）

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、Device Packet (Device to Host):

Packet length: 20 bytes

Packet Frequency: Adjustable （Default is 100Hz）

Packet Format:

Byte0：0xff	Head mark1
Byte1：0xaa	Head mark2
Byte2：PktIndex	Packet index
Byte3：Status	Measurement status info
Byte4：SpO2Sat	Blood oxygen saturation
Byte5：PulseRate	Pulse rate (i.e. heart rate)
Byte6：PerfuIndex	Blood perfusion index
Byte7：SBP	Systolic blood pressure
Byte8：DBP	Diastolic blood pressure
Byte9：VI	Vasoactivity Index
Byte10：SI	Signal strength Index
Byte11：PlethWave	Plethysmography wave
Byte12：Battery	Battery power in percent
Byte13：Age	Patient age
Byte14：Height	Patient height
Byte15：Weight	Patient weight
Byte16：SBP_Ref	Systolic blood pressure reference value
Byte17：DBP_Ref	Diastolic blood pressure reference value
Byte18：PacketFreq	Current packets sending frequency
Byte19：Checksum	Checksum of the whole packet

PktIndex:	Range (0~255), the index of current packet, auto increment by 1	
Status:	0x01	SpO2 Sensor Off
	0x02	No finger
	0x04	No pulse signal
SpO2Sat:	Range (35~100, invalid value=127), unit：%	

PulseRate:	Range (25~250, invalid value=255), unit：bpm
PerfuIndex:	Range (1~200, invalid value=0), unit：‰
SBP:	Range (40~230, invalid value=0), unit：mmHg
DBP:	Range (40~230, invalid value=0), unit：mmHg
VI:	Range (1~100, invalid value=0), unit：%
SI:	Range (1~200, invalid value=0), unit：‰
PlethWave:	Range (1~100, invalid value=0)
Battery:	Range (0~100), unit：%
Age:	Range (20~70), unit：years old
Height:	Range (140~190), unit：cm
Weight:	Range (40~100), unit：kg
SBP_Ref:	Range (40~230, invalid value=0), unit：mmHg
DBP_Ref:	Range (40~230, invalid value=0), unit：mmHg
PacketFreq:	Range (1, 50, 100, 200) Represent for current packets sending frequency， valid values: 1, 50, 100, 200, means 1Hz, 50Hz, 100Hz, 200Hz
Checksum	Range (0~255) Formula: Checksum = (Byte0+Byte1+…+Byte18) % 256, % is mod operator

3、Host Command (Host to Device):

Command	Byte1	description
0xff	N/A	Get software version
0xfe	N/A	Get hardware version
0xfd	Age	Set patient age value, Range (20~70)
0xfc	Height	Set patient height value, Range (140~190)
0xfb	Weight	Set patient weight value, Range (40~100)
0xfa	SBP_Ref	Set SBP reference value, Range (40~230)
0xf9	DBP_Ref	Set DBP reference value, Range (40~230)
0xf8	PacketFreq	Set packets sending frequency, Range (1, 50, 100, 200)
0xf7	on/off	Switch reference On/Off, 0x00---Off, 0x01---On

For example:

- Sending “0xff” 1 bytes, means to get software version.
- Sending “0xfe” 1 bytes, means to get hardware version.
- Sending “0xfd 0x28” 2 bytes, means set patient age value to 40 years old.
- Sending “0xfc 0xaa” 2 bytes, means set patient height value to 170 cm.
- Sending “0xfb 0x46” 2 bytes, means set patient weight value to 70 kg.
- Sending “0xfa 0x78” 2 bytes, means set SBP reference value to 120 mmHg.
- Sending “0xf9 0x50” 2 bytes, means set DBP reference value to 80 mmHg.
- Sending “0xf8 0xc8” 2 bytes, means set packets sending frequency to 200 Hz.
- Sending “0xf7 0x00” 2 bytes, means switch reference to Off.

- Software Version Package Example (20 bytes):

0xff 0xaa 0x53 0x56 0x31 0x2e 0x30 0x34 0x2e 0x30 0x30 0x2e 0x33 0x36 0x00 0x00 0x00 0x00 0x00 0x3a

0xff 0xaa ------ Packet head mark

0x53 ------ ASCII ‘S’, mark of software version

0x56 0x31 0x2e 0x30 0x34 0x2e 0x30 0x30 0x2e 0x33 0x36 ------ ASCII string ‘V1.04.00.36’, current software version content

0x00 0x00 0x00 0x00 0x00 ------ Padding bytes of packet

0x3a ------ Checksum byte

- Hardware Version Package Example:

0xff 0xaa 0x48 0x56 0x32 0x2e 0x30 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0xd7

0xff 0xaa ------ Packet head mark

0x48 ------ ASCII ‘H’, mark of hardware version

0x56 0x32 0x2e 0x30 ------ ASCII string ‘V2.0’, current hardware version content

0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 ------ Padding bytes of packet

0xd7 ------ Checksum byte