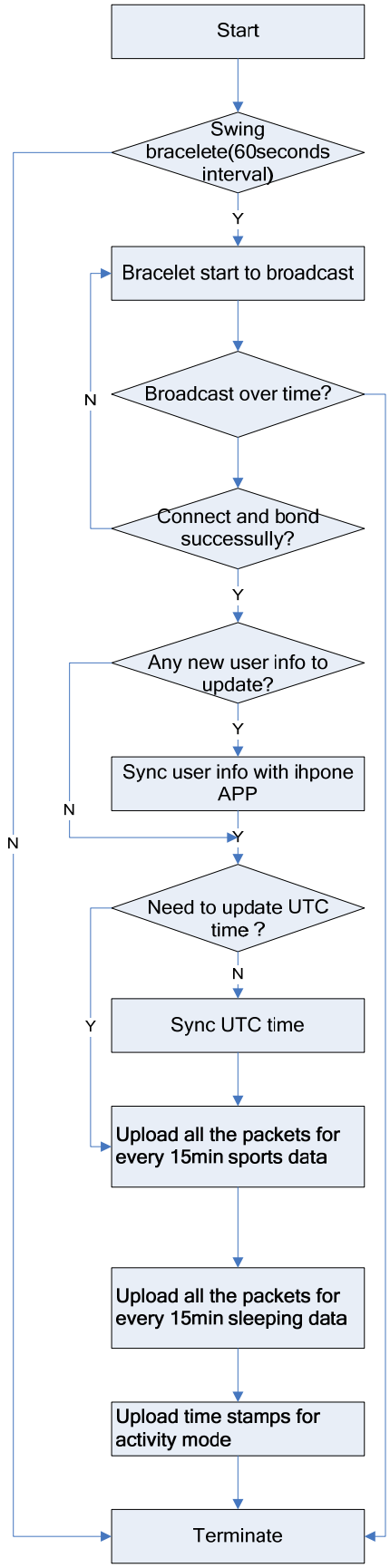
Pedometer BLE Protocol

V1.1.3

Version	Description	Date
V1.0.0	First version	Apr 20, 2012
V1.0.3	1 Modify the procedure of “BLE connection” 2 Split the “15 min packet into 2 packets in BLE transfer 3 Modify data packet head	May 30, 2012
V1.0.4	1 Modify the UTC synchronizing method 2Modifypair and connect method 3Add device ID	June18, 2012
V1.0.5	Some expression errors in point 4	June18, 2012
V1.0.6	0xD1 packet will contain current user information, and remove 0xD3 packet	Sep 17, 2012
V1.0.7	Add a “0xD6” packet in the end	Jan 15,2013
V1.0.8	1.Add sleep data packet 2.Add target download	Nov 11,2013

1. Communication Main Flow



2. BLE Connect

Press and hold Active key for more than 3 sec, to turn the bracelet to broadcast mode. In this mode, the content of CompleteLocalName in the broadcast packet is fixed to the device name “HealthBit”.

Meanwhile, some operation should be done to the APP by the users, to turn iphone to start to scan for device, the APP will decrease BLE power for scanning. And then follow the following procedure:

2.1 User should confirm his/her bracelet by some way checking the device nameand service UUID received in the App.
Service UUID:0xFC00
Characteristic1 UUID:0xFC20 for notify data to APP
Characteristic2 UUID:0xFC21 APP can write data by this characteristic

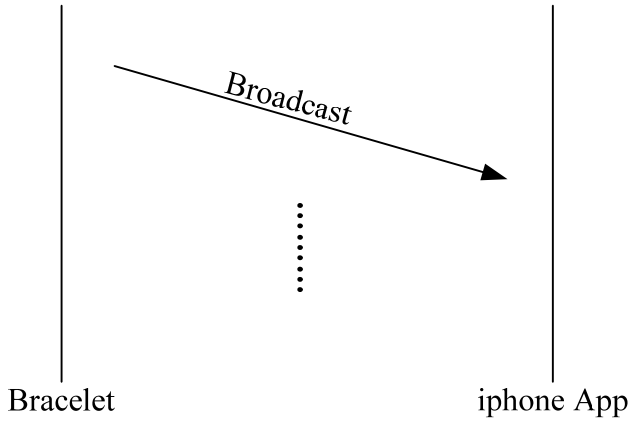
2.2 If the 2.1 confirmation is OK, BLE connection start.

2.3 After BLE connection succeed in , go to 2.3

2.4 After 2.3 BLE connection is OK, the Client Characteristic(UUID: 0x2902) should be set to 0x01:0x00.

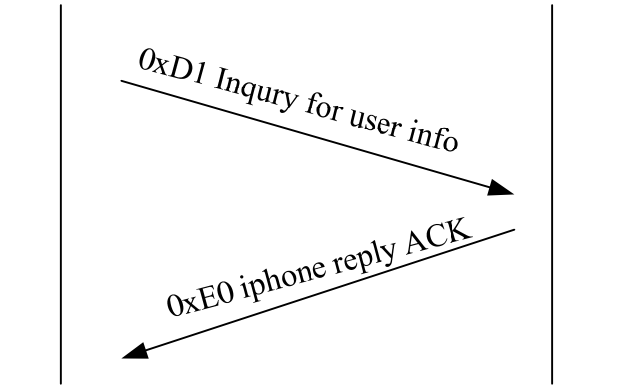
2.5 After 2.4 setting successfully, the APP will received the device ID which contain in 0xD1 data packet, if the device ID is correct, do next step, otherwise the APP will disconnect the connection with device.

2.6 Step into normal data transfer as section 3 to 8.

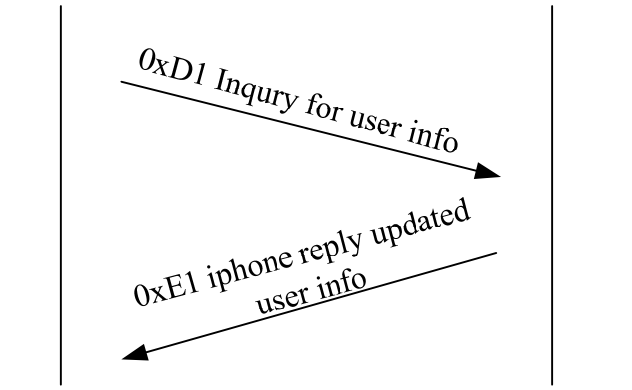


3. Download User Info

After BLE connection is succeed, bracelet will send “0xD1” packet to iphone App to check if there’s any update for user info. Iphone App will reply “0xE1” packet containing user info if any new updating is detected. If not, iphone App will reply “0xE0”.



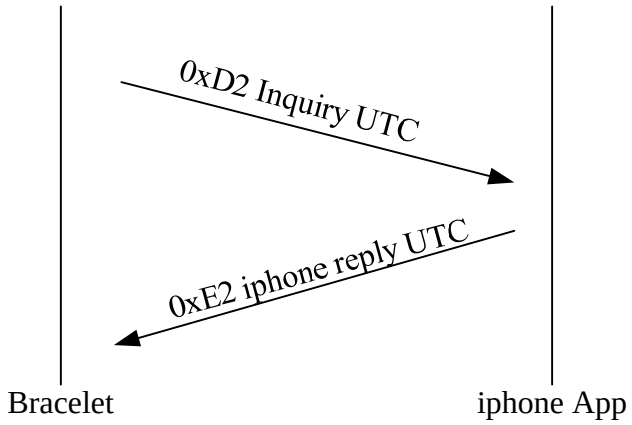
No user info updated



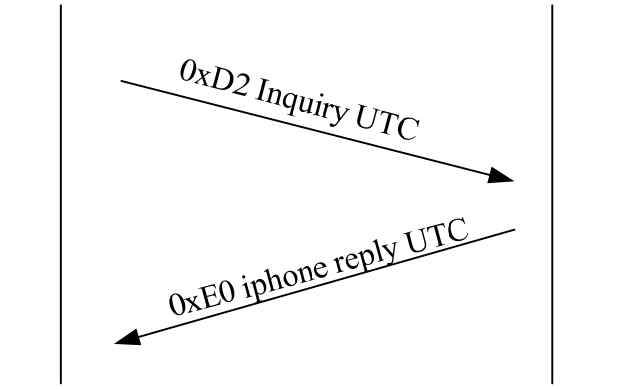
User info updated

4. **UTC updating**

The bracelet will send “0xD2” packed toask whether need to updateUTC or not when every time synchronizing. Iphone app should reply UTC by reply “0xE2” packet if need to update UTC or reply “0xE0” packet if no need to update UTC.

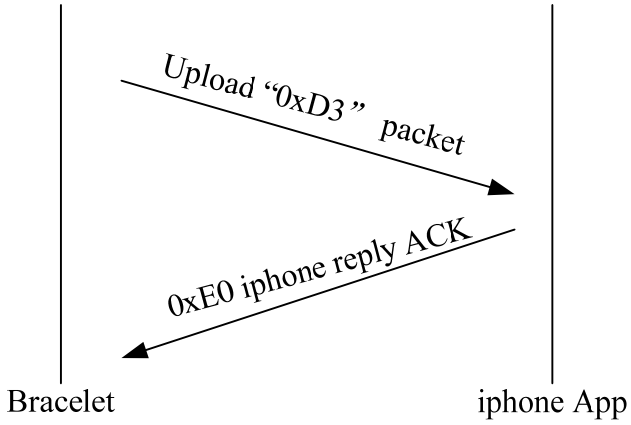


Need to update UTC



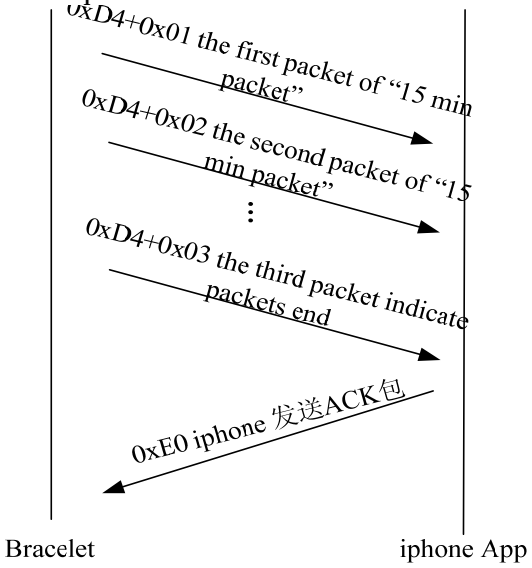
No Need to update UTC

5. **Upload time and date last sync and total steps and calories since last sync.**

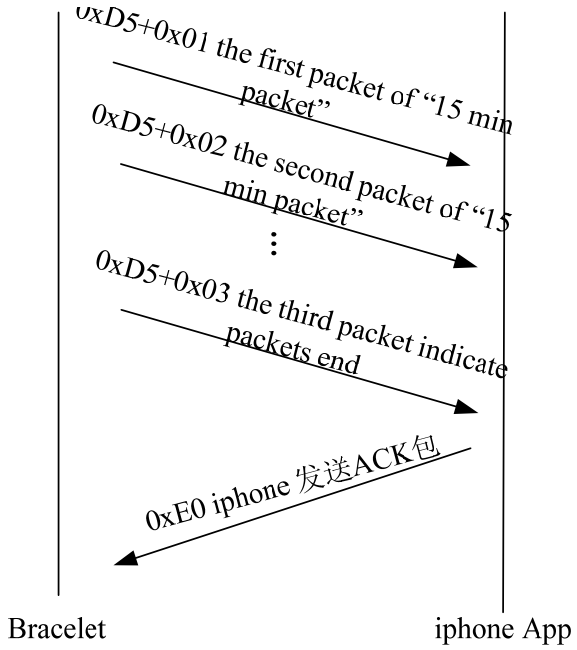


6. **Upload packet for every 15min(maximun)**

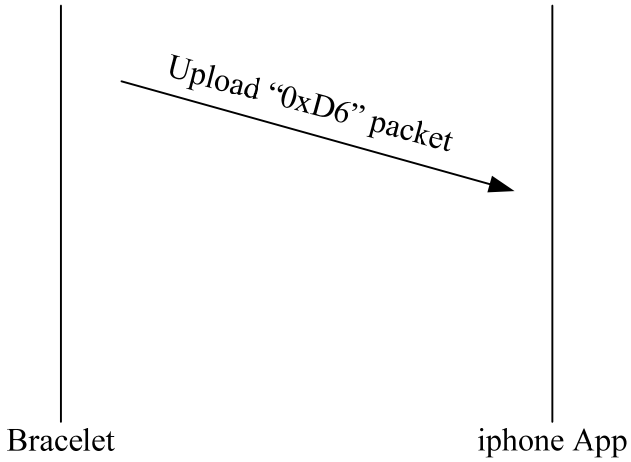
Since the size of "15min packet data" is big, every "15min packet data" will be divided into 2 packets and sent to App. The 2 packets will be marked by "0x01" and "0x02"(see data format in 9.5) to indicate the sequence.



7. **Upload packet for sleeping data**
   Each packet contains maximum 15 minutes sleeping data. (see data format in 9.6)



8. **This packet means that the bracelet has transferred completely, The iphone app can disconnect from bracelet.**



Note: For each of the procedures above, if any of the two devices didn't receive any packet from the other in 500 ms, BLE connection will be break down and should be reconnected.

9. Packet format

9.1 Packet for inquire user info

Byte	Value	Description
0	0x-1	High 4 bit are sequence number
1-6	0x--	Device ID of bracelet
7-8	0x--	Weight(Unit: 0.1Kg)
9	0x--	Age
10	0x--	Height(Unit: 1cm)
11	0x--	Stride(Unit: 1cm)
12	0x00/0x01	0x00:Female 0x01:Male
13	0x--	Current Steps target
14		
15		
16	0x--	Checksum of the above

9.2 Packet for asking or UTC sync

Byte	Value	Description
0	0x-2	High 4 bit are sequence number
1-4	0x--	Current UTC of bracelet
5	0x--	Checksum of the above

9.3 Packet for uploading time and date last sync and total steps and calories since last sync.

Byte	Value	Description
0	0x-3	High 4 bit are sequence number
1-4	0x--	Current UTC of bracelet
5-7	0x--	steps
8-10	0x--	distance
11-13	0x--	calorie
14	0x--	checksum

9.4 Packets for every 15 min(maximun)

Byte	Value	Description
0	0x-4	High 4 bit are sequence number
1	0x01	0x01: the first packet
2-5	0x--	Utc of the packet
6-18	0x--	Steps/calorie per minute
19	0x--	Checksum of the above

Byte	Value	Description
0	0x-4	High 4 bit are sequence number

1	0x02	0x02: the second packet
2-18	0x--	Calorie /Steps per minute
19	0x--	Checksum of the above

Byte	Value	Description
0	0x-4	High 4 bit are sequence number
1	0x03	0x03: the third packet
2	0x--	Total packets num(except this packet)
3	0x--	Checksum of the above

1. **Steps/calorie/steps/calorie…..**
2. **Maximum packet length is 20 bytes**
3. **Calorie unit:0.1 KCal**
4. **The 0xD4-0x03 Packet indicate that the packets is end, APP can ACK**
5. **Both of total packets number and checksum of every packets are correct, Then the app acknowledge right. Otherwise acknowledge false.**

9.5 Packet for sleeping data

Byte	Value	Description
0	0x-5	High 4 bit are sequence number
1	0x01	0x01: the first packet
2-5	0x--	Utc of the packet
6-18	0x--	Sleeping data per 5 minute
19	0x--	Checksum of the above

Byte	Value	Description
0	0x-5	High 4 bit are sequence number
1	0x02	0x02: the second packet
2-3	0x--	Sleeping data per minute
4	0x--	Checksum of the above

Byte	Value	Description
0	0x-5	High 4 bit are sequence number
1	0x03	0x03: the third packet
2	0x--	Total packets num(except this packet)
3	0x--	Checksum of the above

1. **Maximum packet length is 20 bytes**
2. **The 0xD5-0x03 Packet indicate that the packets is end, APP can ACK**
3. **Both of total packets number and checksum of every packets are correct, Then the app acknowledge right. Otherwise acknowledge false.**

9.6 This packet means that the bracelet has transferred completely, The iphone app can disconnect from bracelet.

Byte	Value	Description
0	0x-6	High 4 bit are sequence number
1	‘d’	
2	‘o’	
3	‘n’	
4	‘e’	
5	0x--	Checksum of the above

9.7 Packet for iphone ACK

Byte	Value	Description
0	0xE0	
1	0x--	Sequence number
2	0x00/0x01	0x00:Succeed 0x01:Faild
3	0x--	Checksum from byte0 to byte 1

9.8 User’s information replied by iphone

Byte	Value	Description
0	0xE1	
1	0x--	Sequence number
2-3	0x--	Weight(Unit: 0.1Kg)
4	0x--	Age
5	0x--	Height(Unit: 1cm)
6	0x--	Stride(Unit: 1cm)
7	0x00/0x01	0x00:Female 0x01:Male
8	0x--	Steps target
9		
10		
11	0x--	Checksum of the above

9.9 Packet for iphone replying UTC for updating

Byte	Value	Description
0	0xE2	
1	0x--	Sequence number
2-5	0x--	Current UTC(must add time zone)
6	0x--	Checksum of the above