

Protocol of OKOK APP

The History:

Versions	Amended	Date
REV1.0	Original	2014-12-11
REV1.1	Connected with product ID	2015-05-08
REV1.3	Amended version, with history data	2015-08
REV1.4	<ul style="list-style-type: none"> ➤ Modify the 0x10 synchronous user information instructions ➤ Added 0x15 multi user matching acknowledgement acknowledgement command ➤ Modify 0x00-0x01 broadcasts to send weighting data instructions ➤ Add Table 1 (message body property definition) ➤ Modify 0x12 Add Table 1 (message body property definition) transmit data by sending data ➤ Modify the 0x13 send through history to weigh data instructions ➤ Added 0x14 multi user matching acknowledgement instruction 	2016-01-20

1. Protocol overview

The document describes in detail the access to OKOK health scale APP communication frame format, as well as equipment and APP interactive process.

Currently available devices are Bluetooth body scales and Bluetooth body fat scales, in which Bluetooth body scales are used in blue Dental broadcast mode and APP transmission data, the Bluetooth body fat scale uses the broadcast + transparent transmission mode to transmit data.

1.1 Protocol frame format

Description	Start bit	Version number	Data field length	Data domain	Body check bits
Code	0xCA	Ver	Len	DATA	CS
Byte	1	1	1	Variable	1

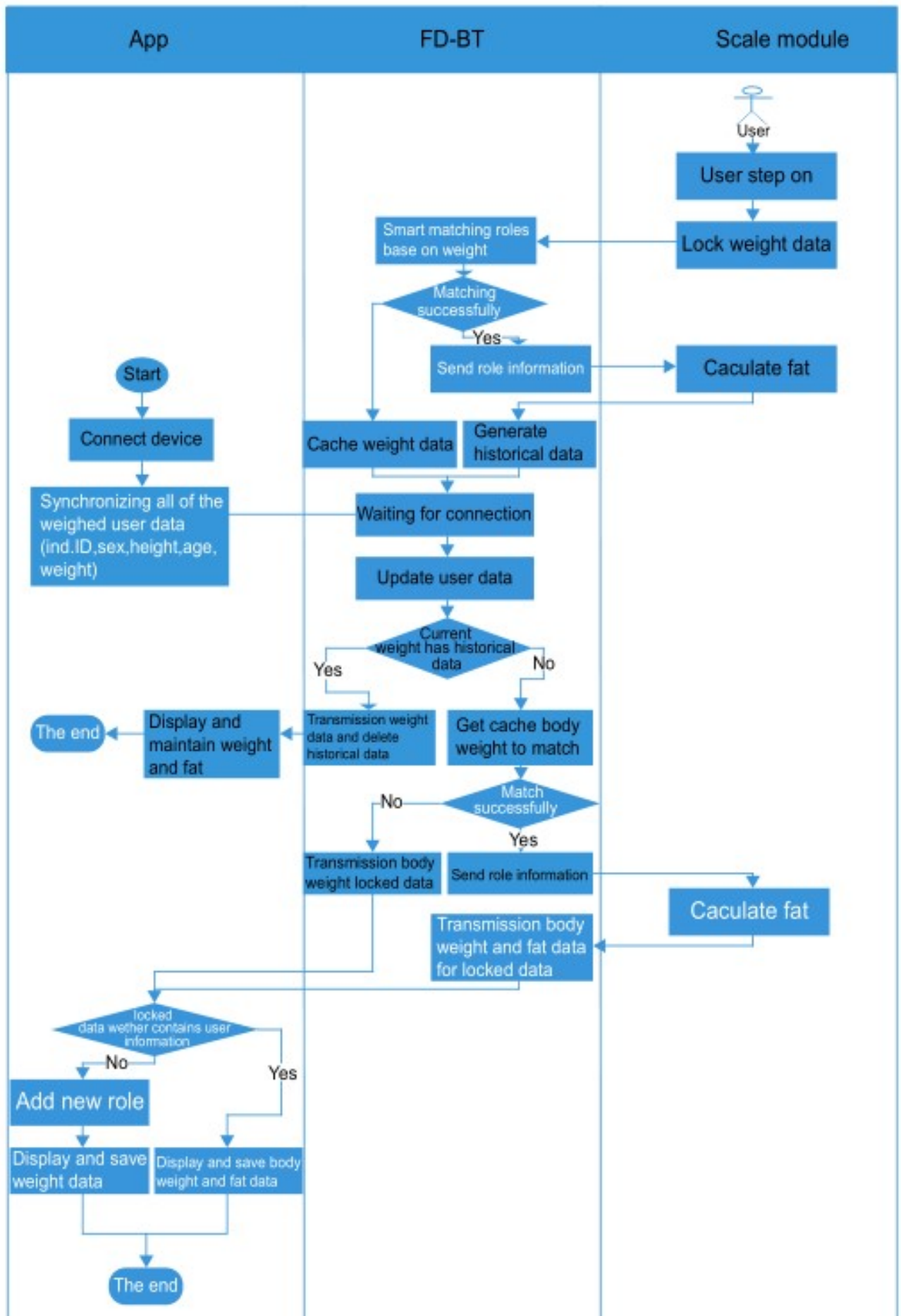
Frame format field description:

Field name	Description
Start bit	The command starts with 0xCA to determine whether the start of a frame.
Version number	The version number of the frame for use when the subsequent frame is extended.
Data field length	To indicate the length of the data domain text and how many bytes are in it.
Data domain	Here to save all the information and data that is associated with the device.
Check digital bit	(version number begins at the end of the data domain text, bit by bit or XOR).

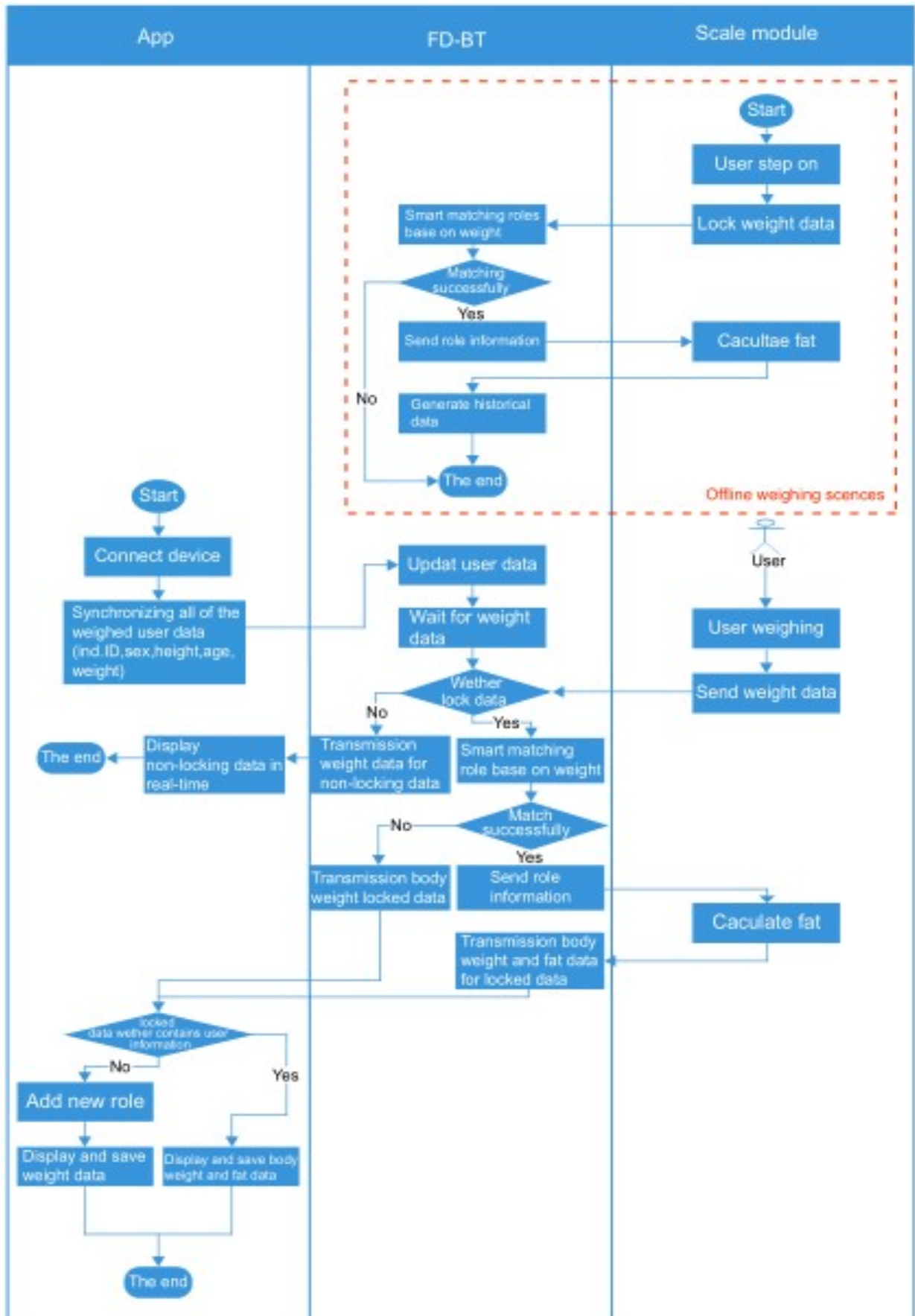
2. The Access Protocol of Bluetooth Body-fat scale.

2.1. Using scenario diagrams.

2.1.1. Scence 1. Interactive flow chart of weighing and locking in advance of Bluetooth body-fat scale.



2.1.2. Scene 2 APP advance connection weighing interaction flow chart(Contains offline weighing scenarios)



2.2 Data frame format

2.2.1 APP send to BLE data format

1) 0x10 synchronizes all user information instructions (first packs):

Byte	Value	Description
1	0xCA	Frame head
2	0x11	Version V1.1
3	0x10	Data domain length
4	0x10	Command byte, 0x10
5	0x--	Subcontracting information (high four bits representing current packages, low four representing packages) Number)
6	0x--	Current App time, in seconds Note: current time is between January 1, 1970, 00:00:00.0, UTC, total seconds.
7	0x--	
8	0x--	
9	0x--	
10	0x--	Hold back
11	0x--	Hold back
12-15	0x--	First user' s ID
16	0x--	Sex and age, the highest position is 1 for men and 0 for women .
17	0x--	Height
18	0x--	High weight byte
19	0x--	Low weight byte
20	0x--	Check code

Follow-up package:

Byte	Value	Description
1	0xCA	Frame head
2	0x11	Version V1.1
3	0x0A	Data domain length
4	0x10	Command byte, 0x10
5	0x--	Subcontracting information (high four bits representing current packages, low four representing packages)
6-9	0x--	Second user' s ID
10	0x--	Sex and age, The highest position is 1, for men and 0 for women .
11	0x--	Height
12	0x--	High weight byte
13	0x--	Low weight byte
14	0x--	Check code

Note: since BLE4.0 is transmitted with a maximum of 20 bytes per frame, the maximum number of bytes in the case of the 8 characters is at most 5 times send.

2) 0x11 Synchronous historical data instruction:

Byte	Value	Description
1	0xCA	Frame head
2	0x11	Protocol version number, V1.1
3	0x02	Data domain length
4	0x11	The command byte, 0X11, represents synchronous historical data
5	0x01	Device type, Bluetooth body grease scale
6	0x00	Check code

Note: after receiving this instruction, BLE will return the saved historical data to APP.

3) 0x15 Multiple user matching acknowledgement response command.

Byte	Value	Description
1	0xCA	Frame head
2	0x11	Protocol version number, V1.1
3	0x10	Data domain length
4	0x15	The command byte, 0x15
5	0x--	The final user number selected by the user
6	0x--	
7	0x--	
8	0x--	
9	0x--	Check code

2.2.2 BLE send to APP data format

1) 0x00-0x01 broadcast send weighing data instructions

Byte	Value	Description
1	0xCA	Start bit
2	0x11	Protocol version number, V1.1
3	0x0F	Data domain length
4	0x--	0x00 not locked 0x01 locked
5	0x01	Device type, Bluetooth body grease scale
6	0x--	High weight byte
7	0x--	Low weight byte
8-11	0x--	Product ID
12	0x	Message body properties, defined reference tables 1
13	0x00	Hold back
14	0x00	Hold back
15	0x00	Hold back
16	0x00	Hold back
17	0x00	Hold back
18	0x00	Hold back
19	0x--	Check code

Table 1

Message body properties	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0																
	Hold			Unit selection		Decimal point		hold																
<p>Bit4-3 Unit selection</p> <p>00 =KG(default)</p> <p>01 =Jin</p> <p>10 = LB</p> <p>11 = ST:LB</p> <p>Bit2-1 Decimal digit selection</p> <p>00 = 1 decimal(default)</p> <p>01 = 0 decimal</p> <p>10 = 2 decimal</p> <p>Hold back 1 decimal, the upload weight is 10 times the actual value, and 2 decimal places are retained. The weight value uploaded is 100 times of the actual value, and so on.</p> <p>Instructions on the number of units and decimals: the number of decimal digits displayed by APP is determined by the scale, which is determined by the decimal number of the message body, the default unit is kg, and the decimal digit is 1 bits.</p> <p>e. g.</p> <table border="1"> <thead> <tr> <th>Item</th> <th>Message body properties</th> <th>High weight byte</th> <th>Low weight byte</th> </tr> </thead> <tbody> <tr> <td>50kg, 1 decimal, not locked</td> <td>0X00</td> <td>0X01</td> <td>0XF4</td> </tr> <tr> <td>50LB, 1 decimal, not locked</td> <td>0X10</td> <td>0X01</td> <td>0XF4</td> </tr> <tr> <td>4:13 ST:LB, 1 decimal, not locked</td> <td>0X00</td> <td>0X04</td> <td>0X82</td> </tr> </tbody> </table> <p>Note: the 1.ST:LB unit defaults to: ST bytes are fixed to integers, and LB bytes are fixed to 1 decimal places. The decimal point at this point selects the bits that are converted into other units.</p>									Item	Message body properties	High weight byte	Low weight byte	50kg, 1 decimal, not locked	0X00	0X01	0XF4	50LB, 1 decimal, not locked	0X10	0X01	0XF4	4:13 ST:LB, 1 decimal, not locked	0X00	0X04	0X82
Item	Message body properties	High weight byte	Low weight byte																					
50kg, 1 decimal, not locked	0X00	0X01	0XF4																					
50LB, 1 decimal, not locked	0X10	0X01	0XF4																					
4:13 ST:LB, 1 decimal, not locked	0X00	0X04	0X82																					

2) **0x12** Transmit data by sending data through instruction

The first package:

Byte	Value	Description
1	0xCA	Frame head
2	0x11	Protocol version number, V1.1
3	0x10	Data domain length
4	0x12	The command byte, 0x12
5	0x--	Subcontracting information (high four bits representing current packet number, low four representing total package)
6	0x--	Weighing time is in seconds Note: weighing time is between January 1 and 1970 00:00:00.0 UTC total seconds.
7	0x--	
8	0x--	
9	0x--	
10	0x--	Message body properties, defined by reference table 1
11	0x--	Hold back
12-15	0x--	User ID
16	0x--	High weight byte
17	0x--	Low weight byte
18	0x--	High body-fat byte
19	0x--	Low body-fat byte
20	0x-	Check code

The second package:

Byte	Value	Description
1	0xCA	Frame head
2	0x11	Protocol version number, V1.1
3	0x0B	Data domain length
4	0x12	The command byte, 0x12
5	0x--	Subcontracting information (high four bits representing current packet number, low four representing total package)
6	0x--	High water byte
7	0x--	Low water byte
8	0x--	High byte of muscle
9	0x--	Low byte of muscle
10	0x--	BMR high byte
11	0x--	BMR low byte
12	0x--	Visceral fat high byte
13	0x--	Visceral fat low byte
14	0x--	Bone
15	0x--	Check code

3) 0x13 Transmit & send instructions of weigh history data

The first package

Byte	Value	Description
1	0xCA	Frame head
2	0x11	Protocol version number, V1.1
3	0x10	Data domain length
4	0x13	The command byte, 0x13
5	0x--	Subcontracting information (high four bits representing current packet number, low four representing total package)
6	0x--	Weighing time is in seconds Note: weighing time is between January 1 and 1970 00:00:00.0 UTC total seconds.
7	0x--	
8	0x--	
9	0x--	
10	0x--	Message body properties, defined reference tables 1
11	0x--	Hold back
12-	0x--	User ID
16	0x--	High weight byte
17	0x--	Low weight byte
18	0x--	High body-fat byte
19	0x--	Low body-fat byte
20	0x-	Check code

The second package:

Byte	Value	Description
1	0xCA	Frame head
2	0x11	Protocol version number, V1.1
3	0x0B	Data domain length
4	0x13	The command byte, 0x13
5	0x--	Subcontracting information (high four bits representing current packet number, low four representing total package)
6	0x--	High water byte
7	0x--	Low water byte
8	0x--	High byte of muscle
9	0x--	Low byte of muscle
10	0x--	BMR high byte
11	0x--	BMR low byte
12	0x--	Visceral fat high byte
13	0x--	Visceral fat low byte
14	0x--	Bone
15	0x--	Check code

4) 0x14 Multi user matching acknowledgement instruction:

Byte	Value	Description
1	0xCA	Frame head
2	0x11	Protocol version number, V1.1
3	0x10	Data domain length
4	0x14	The command byte, 0x14
5	0x--	Subcontracting information (high four bits representing current packet number, low four representing total package)
6	0x--	High weight byte
7	0x--	Low weight byte
8	0x--	Message body properties, defined reference tables 1
9	0x--	Match user 1 number
10	0x--	
11	0x--	
12	0x--	
13	0x--	
13	0x--	Match user 2 number
14	0x--	
15	0x--	
16	0x--	
17	0x--	
18	0x--	
19	0x--	
20	0x-	

Byte	Value	Description
1	0xCA	Frame head
2	0x11	Protocol version number, V1.1
3	0x10	Data domain length
4	0x14	The command byte, 0x14
5	0x--	Subcontracting information (high four bits representing current packet number, low four representing total package)
6	0x--	Match user 3 number
7	0x--	Match user 4 number
8	0x--	
9	0x--	
10	0x--	
11	0x--	Match user 5 number
12	0x--	
13	0x--	
14	0x--	
15	0x--	Match user 6 number
16	0x--	
17	0x--	
18	0x--	
19	0x--	Match user 7 number
20	0x-	Check code

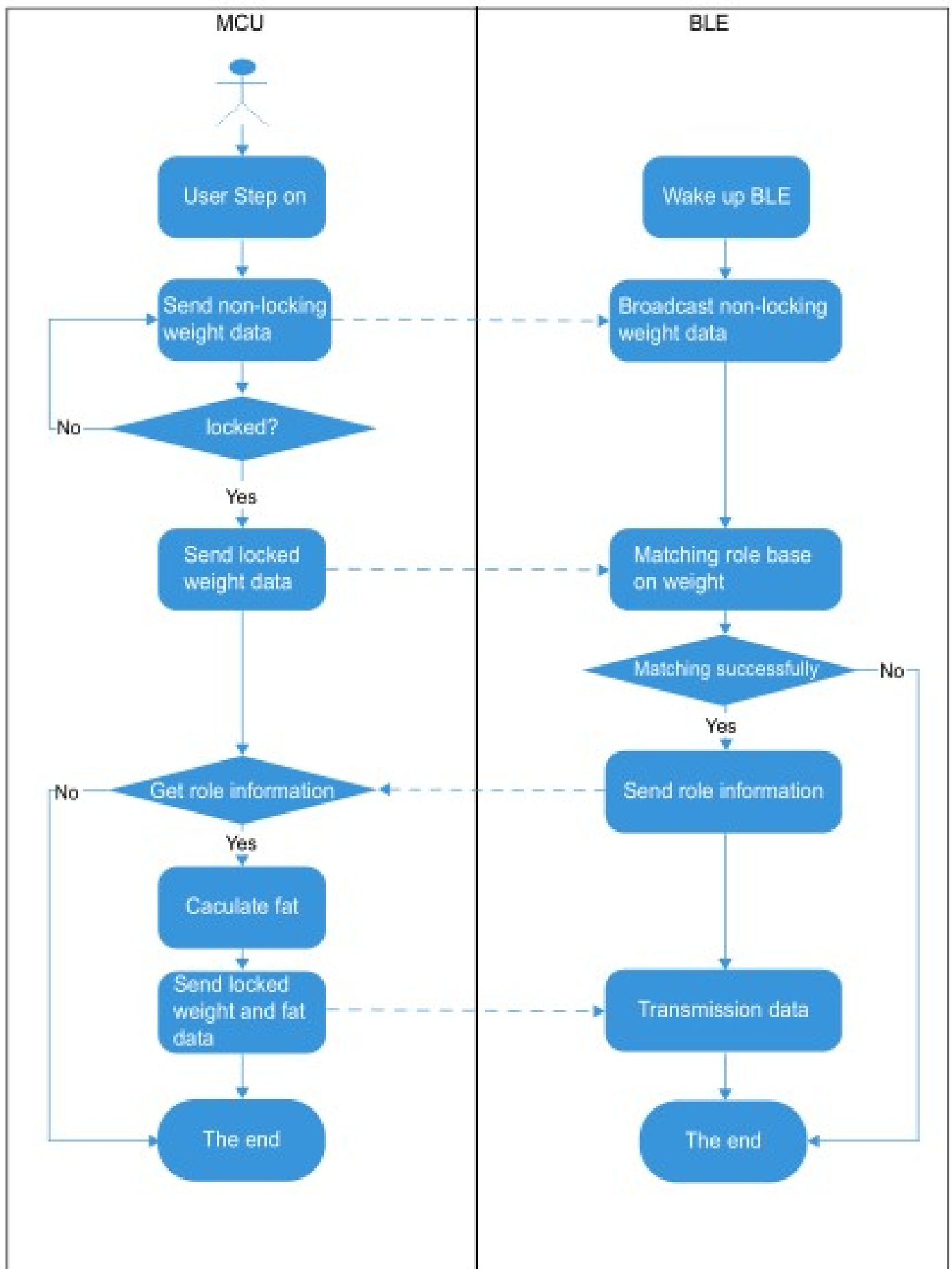
Byte	Value	Description
1	0xCA	Frame head
2	0x11	Protocol version number, V1.1
3	0x10	Data domain length
4	0x14	The command byte, 0x14
5	0x--	Subcontracting information (high four bits representing current packet number, low four representing total package)
6	0x--	Match user 7 number
7	0x--	
8	0x--	
9	0x--	Match user 8 number
10	0x--	
11	0x--	
12	0x--	
13	0x--	Check code

REMARKS:

Bluetooth status through the P1.3 pin, High level indicates broadcast, low level indicates connection. V1.4 version send data with 96 instructions, sleep with 80 command, only these 2 commands.

2.2.3 MCU and BLE data interaction format (for MCU Engineers)

1. Interaction flow chart between MCU and BLE



2、Data command

1) the instruction that BLE sends to MCU

Synchronous command:

Byte	Value	Description
1	0xCA	Frame head
2	0x0A	Data length, length 3-11 bytes
3	0x10	Synchronous command
4	0x--	User number, 0x00~0x09
5~8	0x--	Time, the unit is second, is relative to a certain benchmark time offset, the reference time is defined as the benchmark in the C function library time (1970 1)April 1, 0, 0), high byte in front, low byte in back.
9	0x--	Gender, 0x80 means male, 0x00 means female
10	0x--	Age
11	0x--	Height, unit is cm
12	0x--	
13	0x--	Check code
Note: the direction BLE-->MCU		

2) MCU send data to BLE, not locked body weight

data (MCU→BLE)

Byte	Value	Description
1	0xCA	Frame head
2	0x11	Version number 3
3	0x0F	Data domain length
4	0x--	0x00 not locked
5	0x01	Bluetooth body-fat scale: 0x01
6	0x--	High weight byte, Small end mode, 10 times the actual weight value
7	0x--	Low weight byte
8-11	0x--	Product ID
12	0x	Message body properties, defined by reference table 1
13	0x00	Hold back
14	0x00	Hold back
15	0x00	Hold back
16	0x00	Hold back
17	0x00	Hold back

18	0x00	Hold back
19		XOR check value
<p>Description: Command direction MCU→BLE, the command data using small end data format, and the data is 10 times the actual value, so as to retain 1 decimal places. For example: 65.5KG = 655 = 0x28F</p>		

Send locked weight data (MCU→BLE)

Byte	Value	Description
1	0x--	Message body properties, defined by reference table 1
2-5	0x--	Time, the unit is second, the offset is relative to a certain base time, Quasi time is defined as the benchmark in the C function library (January 1, 1970, 0, time), 0 minutes) high byte in front, low byte in back.
6	0x--	User code, 0x00~0x09
7	0x--	High weight byte, Unit: kg (Modifiable)
8	0x--	Low weight byte
9	0x--	Fat high byte, percent
10	0x--	Fat low byte
11	0x--	Water high byte, percent
12	0x--	Water low byte
13	0x--	Muscle high byte, kg
14	0x--	Muscle low byte
15	0x--	BMR high byte, kcal
16	0x--	BMR low byte
17	0x--	Visceral fat, high byte, percentage
18	0x--	Visceral fat, low byte
19	0x--	Bone , kg
20	0x--	Exclusive or checksum value, exclusive or value of byte 1-19

Description: Command direction MCU→BLE, the command data using small end data format, and the data is 10 times the actual value.

In order to retain 1 decimal places. For example: 65.5KG = 655 = 0x28F.

Table 1:

Message	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
	Hold back			Unit selection		Decimal point		Not locked/locked
<p>Bit4-3 Unit selection</p> <p>02 = KG(default)</p> <p>03 = Jin</p> <p>10 = LB</p> <p>11 = ST:LB</p> <p>Bit2-1 decimal places selection</p> <p>00 = 1 decimal places (default)</p> <p>01 = 0 decimal places</p> <p>10 = 2 decimal places</p> <p>Retain 1 decimal places, the weight of the uploaded value is 10 times the actual value, and retain 2 decimal places, then upload the weight value of 100 times the actual value, and so on.</p> <p>Bit0 Non lock / lock data</p> <p>0 = Non lock data</p> <p>1 = lock data</p> <p>Instructions on the number of units and decimals: the number of decimal digits displayed by APP is determined by the scale, which is determined by the decimal number of the message body attribute, the default unit is kg, and the decimal digit is 1 bits.</p>								

e. g. :

Item	Message body	High weight byte	Low weight byte
50kg, 1 decimal, not locked	0x00	0x01	0xF4
50 Jin, 1 decimal, not locked	0x08	0x01	0xF4
50LB, 1 decimal, not locked	0x10	0x01	0xF4
4:13 ST:LB, 1 decimal, not locked	0x00	0x04	0x82

Note: the 1.ST:LB unit defaults to: ST bytes are fixed to integers, and LB bytes are fixed to 1 decimal places. The decimal point at this point. Select bits represent small bits that are converted to other units.

Sleep command:

Byte	Value	Description
1-4	0x10 00 00 C5	Frame head, fixed as 10 00 00 C5
5	0x01	Length
6	0x80	Sleep command
7	0x44	Check code
Description: Command direction MCU-->BLE, which enables Bluetooth to enter deep sleep mode.		

If Bluetooth have storage history data commands:

Byte	Value	Description
1	0xC5	Frame head
2	0x01	Length
3	0x--	0x03, have history data 0x04, non history data
4	0x--	Check, 1~3 byte XOR value
Description: Command direction BLE-->MCU, the command Bluetooth power (or wake up) sent to the MCU.		