Forehead thermometor—Bluetooth protocol V0.2_20191029

1. Transmission mode:The thermometer uses Bluetooth module as the medium of data communication, Bluetooth module is Passthrough Mode.

2. *Communication protocol detail:*

2.1 Head code and tail code:

2.1.1 Whether the Bluetooth thermometer sends data to the app or the app sends data to the Bluetooth thermometer, must have the head code be the tail code

HEAD CODE: 0xFE,0xFD;
TAIL CODE: 0x0D,0x0A。

2.2 Data definition:

2.2.1 The byte definition of data sent by app to Bluetooth thermometer

Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8	Byte9	Byte10	Byte11
FE	FD	Year	Month	Day	Hour	Minute	Seconds	Signature	0D	0A

	Function description	Byte9
Signature instruction	Send this code to thermometer every time APP receives the temperature data.	0x5A
	Set thermometer temperature unit to ℃	0x1A
	Set thermometer temperature unit to ℉	0x15
	Get history data stored in thermometer	0x8C
	Clear device parameters Ka and Kb, switch to CB2 (For use during production process)	0x30
	Clear device parameters Ka and Kb, switch to CB2 (For use during production proces)	0x31

	App send default config to the device Ka Kb Kb2 (For use during production proces)
	gs_userConfig.Cal_Step = CAL_STEP_OVER;
	gs_userConfig.Ka = 0.07953;
	gs_userConfig.Kb = 1.126;
	gs_userConfig.Kb2 = 1.126;
	gs_userConfig.operation_count = 4;
	gs_userConfig.tempStandard = 0;
		0x35

Instruction:

1. Must organize data according to the format above when connecting to the thermometer or transmit data to the thermometer.

2. The time byte above refrer to the current datetime of the app.

2.2.2 The byte definition of data sent by Bluetooth thermometer to APP

Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8	Byte9	Byte10	Byte11	Byte12	Byte13

FE	FD	Year	Month	Day	Hour	Minute	Seconds	TH	TL	ignatur	0D	0A

Signature instruction	Function description	Byte10	Byte11	Byte9
	Battery voltage normal , measure succeed	TH	TL	0x80
	Battery low, measure succeed	TH	TL	0x81
	The battery is dead	0x00	0x00	0x82
	Temperature measured is too high	0x00	0x00	0x83
	Temperature measured is too low	0x00	0x00	0x84
	Operating environment temperature is too high	0x00	0x00	0x85
	Operating environment temperature is too low	0x00	0x00	0x86
	Device hardware error	0x00	0x00	0x87
	Config unit successfully	0x00	0x00	0x88
	Config unit failed	0x00	0x00	0x89
	Data format error	0x00	0x00	0x8A
	Memory size	0x00	Memory size value	0x8B

Instruction:

1. When Bluetooth thermometer is connecting with APP :The thermometer transmit measure result to APP every time after measurements
2. The app must transmit signature code 0x5A to answer the Bluetooth thermometer every time accepts temperature data.
3. Bluetooth thermometer will try to transmit temperature data again if it doesn't receive answer from app, If no response is received from the Bluetooth thermometer for 3 consecutive times, it will be regarded as data transmission failure and stop transmassion.
4. Temperature data are sent in hexadecimal way of ℃。for example TH=0x0E, TH=0x74, means temperature data is 37.00℃.

2.3 **Extra data record definition:**

2.3.1 When under unconnected status or transmission failure, temperature data measured by Bluetooth thermometer will be stored in the memory unit inside the Bluetooth thermometer.

2.3.2 The maximum recorded data of Bluetooth thermometer is 60 groups.

2.3.3 Invalid data measured by the Bluetooth thermometer will not be stored.

2.3.4 Temperature data will be stored in hexadecimal mode of ℃.

2.3.5 When Bluetooth thermometer is turnned on and connected with app, Bluetooth thermometer will transmit data in device memory unit to app.

2.3.6 When Bluethooth thermomter is turnned on but not connected with app, Bluetooth thermometer will not transmit data in device memory unit to app

Bluetooth module basic definition

Service UUID: 6e400001-b5a3-f393-e0a9-e50e24dcca9e
Write UUID: 6e400002-b5a3-f393-e0a9-e50e24dcca9e
Notify UUID: 6e400003-b5a3-f393-e0a9-e50e24dcca9e
Bluetooth must transmit these status code to MCU:
Broadcast turnned on 08 A5 0A 01 01 0F 0F 0F 0F
Bluetooth connected 08 A5 0A 01 02 0F 0F 0F 0F
Bluetooth disconnected 08 A5 0A 01 03 0F 0F 0F 0F
Broadcast turnned off 08 A5 0A 01 04 0F 0F 0F 0F
When the MCU sends data to BLE, a byte will be added before the existing data packet to indicate the length of the data packet, but this byte will not be reported to APP. The maximum length of each packet does not exceed 19 bytes.

Device bluetooth name format: Comper IR-FT-XXXXXXXXXXX X means mac address