Wireless Sensor (Bluetooth Version)

（iSensor Profile(base)）

Shenzhen Kaipule Technology Co., Ltd.

Security & Smart Home Department

Versions

Version/Status	Engineer	participant	Date	Note
V1.0	Daqiang Deng		2015-11-18	initial version

1. What is iSensor

iSensor is the lastest wireless communication technology for smart home sensor developed by Shenzhen Kaipule Technology Co., Ltd. It adopts Bluetooth 4.1 (BLE) technology, communicating with Bluetooth master device via broadcast mode.
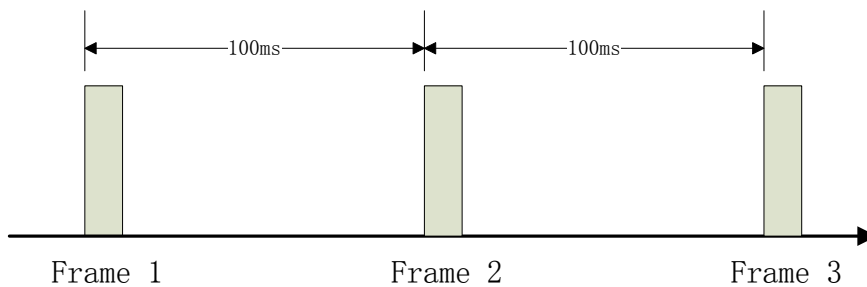
2. Descriptions

(1) Support Bluetooth 4.1 - Bluetooth Low Energy (BLE) protocol standards.

(2) Continuously sending 3 frames of data under broadcast mode, each frame sends once in all 3 channels (37,38,39), sending sequence refers to Bluetooth Protocol Standard.

Broadcast Channel List

Channel	Frequency
37	2402MHz
38	2426MHz
39	2480MHz

(3) It is disconnected data (ADV_NON_CONN_IND), and sends 1 frame data in every 100 milliseconds.

(4) Sending broadcasting data only, not for connection. Master device doesn't need to send data to other sensors.

2. Data Frame Description

PACKET FORMAT

Preamble (1 Octet)	Access Address (4 Octets)	PDU (2-39 Octets)	CRC (3 Octets)

Preamble, Access Address & CRC refer to Bluetooth Protocol Standards. Access Address of broadcast data must be 0x8E89BED6. And composition data of PDU is as follows:

PDU

Header (2 bytes)	MAC (6 bytes)	Data (up to 31 bytes)

MAC is Bluetooth MAC address of sensor devices, specific coding rules refer to Bluetooth 4.1

Standards.

Thereinto, the Data field with 31 bytes (the basic data sent from sensors to master device) includes 3 parts in iSensor Profile:

02(Length)	0x01(GAP_AD_TYPE_FLAGS)	0x06(Value)	data type identification
09(Length)	0x08(GAP_AD_TYPE_SHORTENED_NAME)	'iSensor '	Names, all are "iSensor "
09(Length)	0xFF(GAP_AD_TYPE_MANU_SPECIFIC_DATA)	SensorData	Sensors data

The first column of above sheet is the total length for each part, basic unit is " byte". For example, the total length for part 3 is 9 bytes, including 1 attribute byte & the following 8 bytes of data. The 2nd part data is basic name of Profile, totally 8 bytes: 'iSensor', please note that there is a space character behind.

The 3rd part is sensors data, mainly includes sensor device ID, alarm information etc. specific data analysis refer to KAIPULE's <<Sensor Data Communication Protocol.pdf>>

3. Heartbeat Packet Mechanism

Heartbeat packet mechanism is used to inform receiver the current status of device in one-way data channel. In iSensor Profile (base), device will send 1 data packet every 10 minutes under quiescent circumstance to inform master device to refresh sensors online status. If master device can't receive the heartbeat packet 3 times continuously, the sensor will be regarded in offline status.

Data frame format & standard alarm frame data of heartbeat packet are the same, please check the related document for specific information.

4. Data Encryption

Support Bluetooth encryption standard in the air, but in this iSensor Profile(base) verison, there is no encryption for sensors data. The following iSensor Profile (main) version will support this function, as well as the rolling code technology standard.