



Wireless Sensor Data (BLE Version)

Communication Protocol

Version No.	Approved By	Date	Remarks
V1.0	Zhou Zhongyang	2015-10-08	Initial version

1. Data Frame Structure Definition

Firmware Version	Device ID	Data	Checksum
1 byte	3 bytes	3 bytes	1 byte

Checksum calculation method: checksum = Byte0+ Byte1+ Byte2+ ...+ Byte7

2. Data Description

Type ID	Event Data	Control Data
1 byte	1 byte (defined according to different types)	1 byte

3. Type ID Definition

bit7	Uni and Bi-direction device tagging		1. Bi-direction device 0. Uni-direction device	
bit6	send /not send status report		1. To send at a fixed interval of time 0. No status report	
bit5-0	codes of device type	bit5=0, for alarm type devices	0x0	undefined device
			0x1	IR fence
			0x2	PIR detector
			0x3	natural gas detector
			0x4	panic button
			0x5	smoke detector
			0x6	door sensor
			0x7	glass break detector
			0x8	vibration sensor
			0x9	water level detector
			0xa	high temperature sensor
			0xb	CO alarm
		bit5=1, for control type devices	0x16	doorbell button
			0x19	remote key fob
			0x1C	wireless keypad
			0x1E	wireless siren
			0x1F	remote switch

4. Event Data Definition

bit7-4	reserved
bit3-0	function & status: pls check "Description of Protocol" below

5. Description of Protocol

undefined device IR fence PIR detector natural gas detector smoke detector door sensor glass break detector vibration sensor water level sensor high-temperature sensor CO alarm	bit3	status report	send a heartbeat signal periodically, the status report bit=1
	bit2	low voltage report	normal battery level=0 low battery=1
	bit1	alarm	alarm=1 no alarm=0
	bit0	anti-tamper	normal status=0 tamper alarm=1

panic button	bit3		=0
	bit2		=0
	bit1	SOS	=1 (press the button)
	bit0		=0

Remote key fob	bit3	SOS key	press SOS key=1 no operation=0
	bit2	home arm key	press home arm key=1 no operation=0
	bit1	away arm key	press away arm key=1 no operation=0
	bit0	disarm key	press the disarm key=1 no operation=0

wireless siren	bit3-0	0x0	close siren/close LED	wireless siren control response: response with 3 bytes of address code, add 0x70 to second byte, basic data=lower line data;
		0x1	short siren sound	
		0x2	siren sounds & LED flashes, but will close together in the limited time	
		0x5	short siren sound	
		0x6	LED indicator normally flashes	
		0x7	short siren sound & LED indicator normally flashes	
		0x8	short siren sound & LED indicator off	
		0x9	siren off & LED indicator flashes once	
		0xA	siren off & LED indicator flashes twice	
		0xB	siren maintenance command	

remote switch	bit3	0: control 1: report	when the Main Control sends control code=0; when controlled device responses its status=1;
	bit2	0: off 1: on	the Main Control sends operation command to open switch=1; the Main Control sends operation command to turn off switch=0; controlled switch off report =0; controlled switch on report =1;
	bit1		=0
	bit0		=0

doorbell button	bit3		=0
	bit2	low voltage report	normal battery level=0 low battery=1
	bit1	doorbell sounds	=1 (press the button)
	bit0	anti-tamper	normal status=0 tamper alarm=1

Temperature and humidity sensor	Adv data [20]	Bit3		sending a heartbeat signal at set intervals, the status report bit=1
		Bit2	low voltage report	(normal battery power=0; low battery=1)
		Bit1		=0
		Bit0		=0
	Adv_ Data [22]		Integral part of temperature	In broadcast data, negative temperature is displayed in positive numbers: The actual temperature is equal to the display temperature -256
	Adv_ data [23]		Decimal part of temperature	
	Adv_ Data [24]		Integral part of humidity	
	Adv data [25]		Decimal part of humidity	

6. Control Data Definition

bit7-5	reserved	
bit4-0	frame ID	frame ID: plus 1 every sending, range 0x01-0x1f; devices that don't consume power frequently (eg:remote key fob)=0x00

7. Additional instructions

7.1 BLE Advertising PDU, take the below photo for example (door sensor)

P.nbr.	Time (us)	Channel	Access Address	Adv PDU Type	Adv PDU Header				AdvA	AdvData	CRC	RSSI (dBm)	FCS
					Type	TxAdd	RxAdd	PDU-Length					
3	+29997 -994858	0x25	0x8E89BED6	ADV_NON_CONN_IND	2	0	0	29	0x087CBE555B16	02 01 06 09 08 69 53 65 6E 73 6F 72 20 09 FF 10 16 5B 55 46 02 03 21	0x49167D	-38	OK

Adv_data

Adv_data[0]	02	AD LENGTH	1byte
Adv_data[1]	01	AD TYPE	1byte
Adv_data[2]	06	MFG ID	1byte
Adv_data[3]	09		1byte
Adv_data[4]	08		1byte
Adv_data[5]	69	i	1byte
Adv_data[6]	53	s	1byte
Adv_data[7]	65	e	1byte
Adv_data[8]	6E	n	1byte
Adv_data[9]	73	s	1byte
Adv_data[10]	6F	o	1byte
Adv_data[11]	72	r	1byte
Adv_data[12]	20	Device name Terminator	1byte
Adv_data[13]	09	Data length of sensor	1byte
Adv_data[14]	FF	Sensor data bit	1byte
Adv_data[15]	10	Firmware version	1byte
Adv_data[16]	16	Device ID	1byte
Adv_data[17]	5B		1byte
Adv_data[18]	55		1byte
Adv_data[19]	46	Type ID	1byte
Adv_data[20]	02	Event Data	1byte
Adv_data[21]	03	Control Data	1byte
Adv_data[22]	21		1byte
Adv_data[23]	Only for Temperature and humidity sensor	Integral part of temperature	1byte
Adv_data[24]		Decimal part of temperature	1byte
Adv_data[25]		Integral part of humidity	1byte
Adv_data[26]		Decimal part of humidity	1byte
Adv_data[26]			

7.2 Adv_data[20] (status data)

Binary	HEX	HEARTBEAT REPORT	BATTERY REPORT	ALARM REPORT	TAMPER REPORT
00000001	01				✓
00000010	02			✓	
00000011	03			✓	✓
00000100	04		✓		
00000101	05		✓		✓
00000110	06		✓	✓	
00000111	07		✓	✓	✓
00001000	08	✓			
00001001	09	✓			✓
00001010	A	✓		✓	
00001011	B	✓		✓	✓
00001100	C	✓	✓		
00001101	D	✓	✓		✓
00001110	E	✓	✓	✓	
00001111	F	✓	✓	✓	✓

7.3 Heartbeat report

Door sensor /water sensor	Once /10 mins
Temperature and humidity sensor	Once/ 1 hour
PIR sensor/smoke detector/gas detector	Once/ 24 hours