Cara-S Tracker platform quick starter guide

ESMT Inc.

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I. Background:

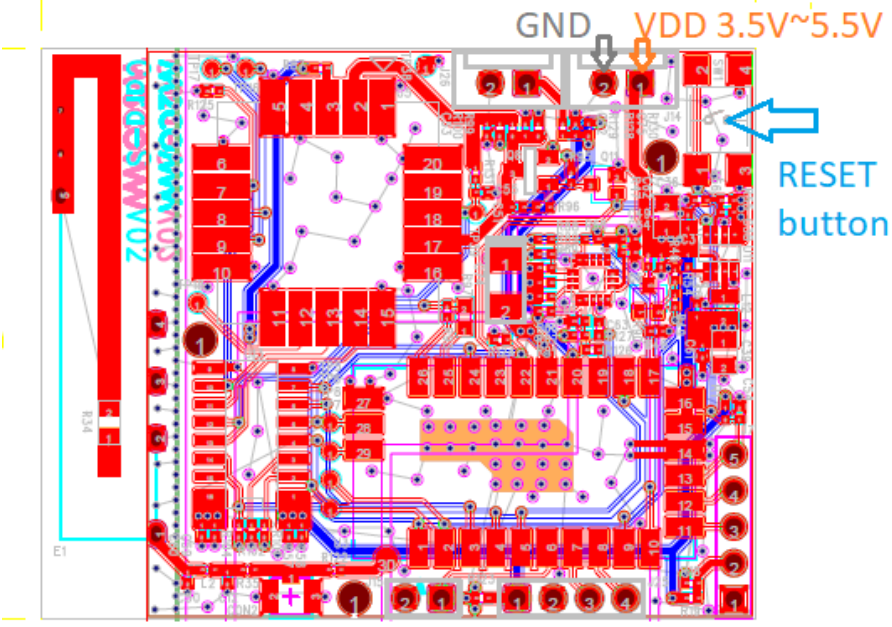
Cara-S is the most cost effective and ready-to-go platform for global asset tracking. It integrates GPS , thermistor and G-sensor with Sigfox uplink for RCZ12345(6) . It also carries preloaded firmware to send data to Sigfox network.

II. Features highlight of Cara-S

Category	Item	Description
Regular Monitoring (report to Sigfox network every 1 hour default, configurable)	Temperature	+-1C accuracy
	G-shock stress level	0~2G max (absolute value only)
	Battery level	0~100% (16 levels)
	GPS location	Latitude , longitude
Event trigger (configurable threshold levels)	Over temperature	>50C
	Over Stress	>0.5G
Local recording (data is written into local flash memory)	Temperature and G-shock level	Every 15 minutes for 3 months

III. Initiate Cara-S

The Cara-S may come with a battery holder and a housing or a PCBA only. Cara-S starts up upon a voltage of 3.5V to 5.5V is applied across the power pins.



To ensure proper startup, press the RESET button after power is attached to the unit. Then the unit enters cold start for its first time operation, the unit must be put with access to the sky for the first time. Then a message will be sent to Sigfox backend. This indicates a successful startup.

IV. Sigfox network packet format

12 bytes of data is sent in every packet.

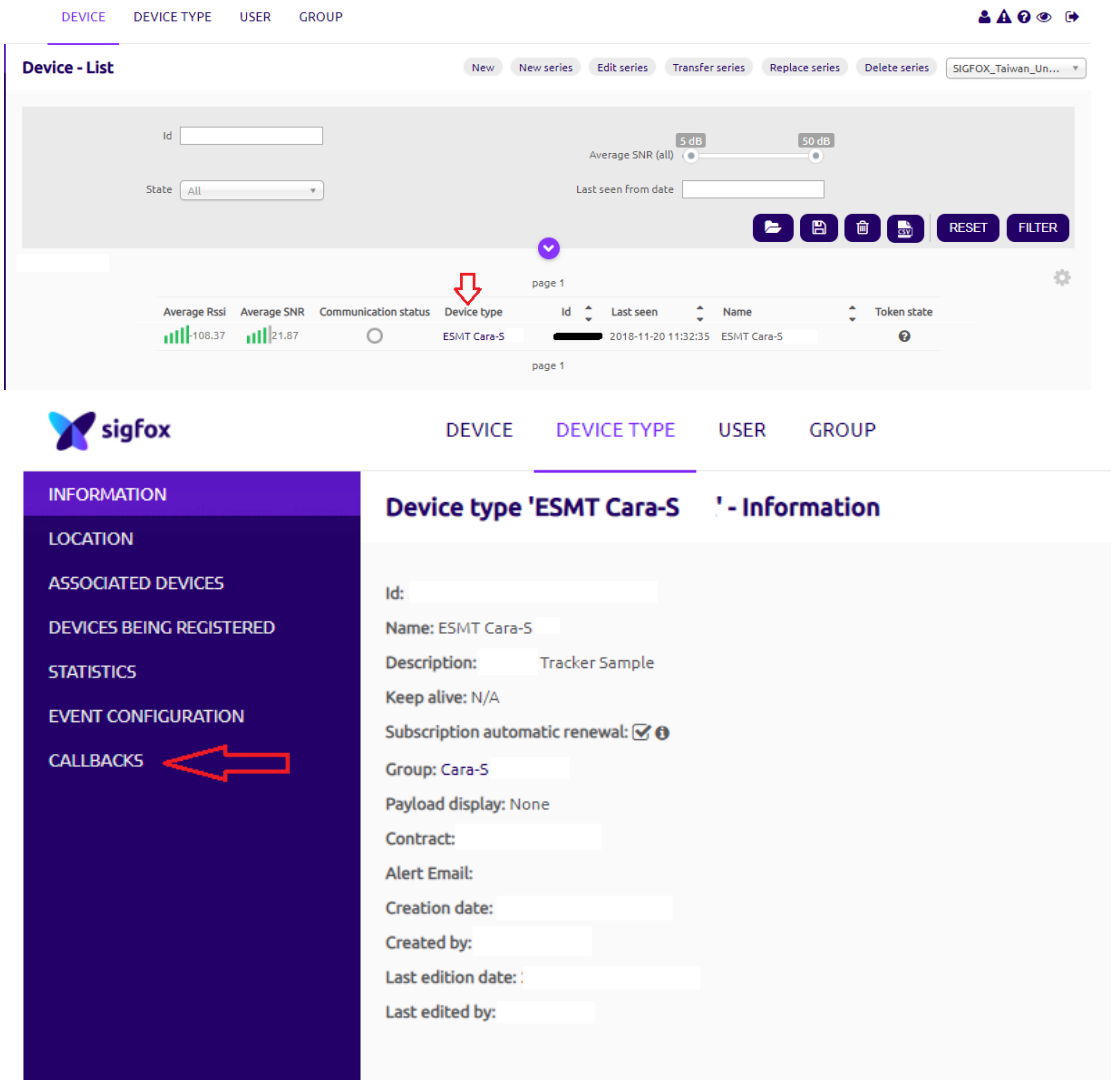
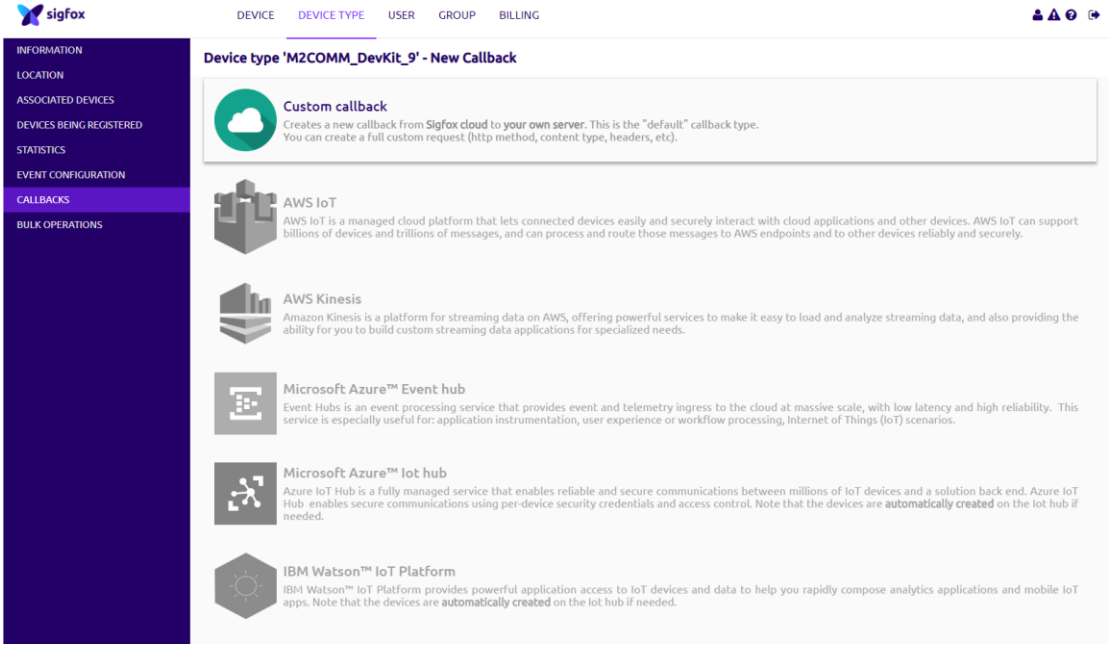
Byte Index	Item	Name	Description
0	State Register		
	-bit[7]	Device exposed to stress	If the device is exposed to 3 times over temperature event or 5 strong G-force event, this bit is set to 1 and will only be cleared by manual reset.
	-bit[6]	OverTemperature event	If 2 consecutive over temperature event is recorded (30 mins in total), a packet is sent with this field set to 1 and the over stressed temperature is carried in byte 2 if the device temperature changes from over temperatuere to normal for 2 consecutive interval, a packet is sent with this filed set to 0. It is a set and reset event logic .
	-bit[5]	Over Stress event	if the G-sensor event is triggered, a packet is sent with this field set to 1. The byte 3 will carry the value of G-force that triggers the event
	-bit[4]	GPS data valid	if a valid GPS data is acquired, a packet is sent with this field set to 1. byte 4 to 11 will carry the valid GPS data . If this field is 0, no GPS data is sent. (to keep the frame shorted to save power)
	-bit[3]	Battery[3]	4 bit battery level (1111 full, 0000 empty)
	-bit[2]	Battery[2]	
	-bit[1]	Battery[1]	
	-bit[0]	Battery[0]	
1		Current Temperature Data	Temperature in byte (UINT8 0x00 = -40C; 0x78 = 80C)
2		Reserved	
3		Overstressed G-sensor value	Average G-shock in milli-G. G-sensor is set to 3axis, HPF, trigger on impact, level is read from G-sensor and max is reported. This byte carries the value (abs(X)+abs(Y)+abs(Z))/24)
4		GPS Latitude	When GPS data is acquired successfully, data is carried in this field. The GPS coordinate can be calculated by equation *{HEX2DEC([byte4; byte5; byte6; byte7;)/10000000, HEX2DEC([byte8; byte9; byte10; byte11;)/10000000]* If not GPS data is acquired, 0x77,0x35,0x94,0x00,0x77,0x35,0x94,0x00 are sent which indicates GPS coordinate 200,200
5			
6			
7			
8		GPS longitutde	
9			
10			
11			

sample packet		**134500010ec917fe4824d224**	Bit value	Value
Byte Index	Item	Name		
0	State Register		13	
	-bit[7]	Device exposed to stress		0
	-bit[6]	OverTemperature event		0
	-bit[5]	Over Stress event		0
	-bit[4]	GPS data valid		1

	-bit[3]	Battery[3]	0	20%
	-bit[2]	Battery[2]	0	
	-bit[1]	Battery[1]	1	
	-bit[0]	Battery[0]	1	
1		Current Temperature Data	45	29C°
2		Reserved		
3		Overstressed G-sensor value	01	8mG
4		GPS Latitude	0e	24.8059902°
5			c9	
6			17	
7			fe	
8		GPS longitutde	48	121.0372644°
9			24	
10			d2	
11			24	

V. Sigfox Backend setup

Callback functions are available at the Sigfox backend portal (i.e. backend.sigfox.com). Device type -> Callbacks



Basically, when a packet is received by the Sigfox network regardless the country or SNO, the packet data will be decoded and be available at Sigfox backend. User can configure the active upon receiving a packet.