

ESAP-UPLYNX-005
TriGo Device User Guide

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Revision History

Rev	Date	Description of Change	Approved
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Preliminary

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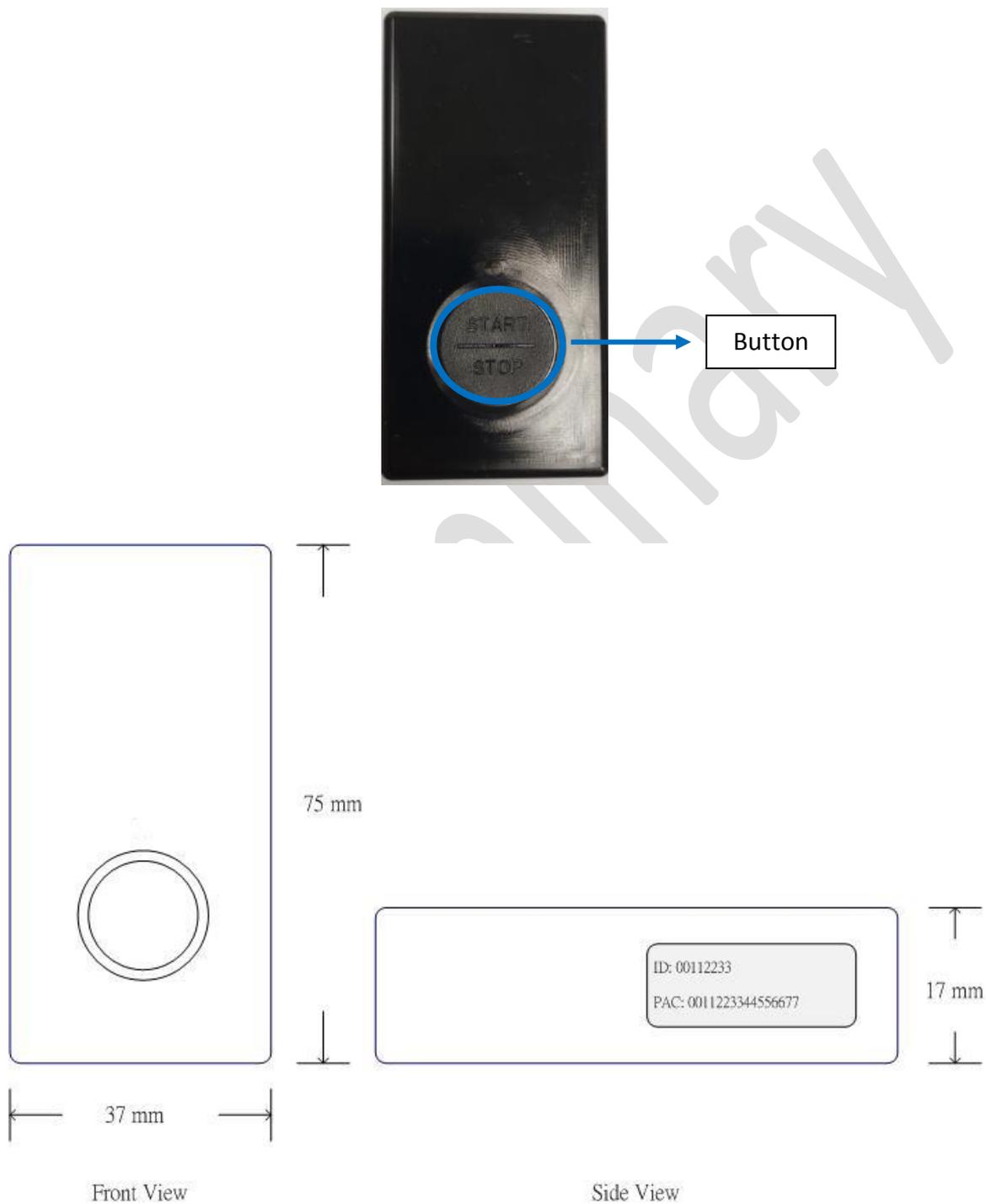
1 **Description**

This user guide describes the usages of the TriGo device. There will be descriptions of basic operations, device behaviors and payload format. This document introduces you to everything you need to know about how to use the device.

2 **Features**

- ◆ Sigfox RC1234567 Compliant
- ◆ Uplink class 0u for all zone
- ◆ Battery Life: 30 days (max)
- ◆ Geolocation Tracking through Sigfox Atlas
- ◆ Dimension : 73mm X 35mm X 17mm
- ◆ Operating Temperature : -10°C ~ 60°C
- ◆ High performance PCB antenna
- ◆ IP64
- ◆ Temperature Sensor: $\pm 3^{\circ}\text{C}$

3 Product Appearance and Dimensions



4 **Basic Operation**

The device is operated by a single button. Its behavior is quite simple:

User Operation	Status
Install battery	Device powers up and then goes into Sleep Mode .
Press the button	Device goes into Normal Operation Mode . Device will start transmitting data via Sigfox. Data content and format explained in the payload section.
Press the button again	Device goes back to Sleep Mode . Device halts Sigfox transmission and goes back to sleep mode.

NOTE: Before the device's batteries are depleted, you can toggle between the Normal Operation Mode and Sleep Logger Mode by pressing the button.

5 **Basic Device Settings**

Basic settings that determines the device's basic behaviors and their default values:

Transmission Interval: 10 minutes

Sample Rate: 10 minutes

Transmission Interval is the time gap between two periodic Sigfox transmissions. This is set at 10 minutes by default.

Sample Rate determines how often the device takes a reading from the sensor(s). For example, SenLog Pro device takes a temperature reading every 2.5 minutes.

6 Payload format

B0	B1	B2
Temperature #1 - T1 (@ t = 10)		Battery Capacity (%)
T1_Integer	T1_Float	
19	38	00
25.56°C		0

Note : During each transmission interval, which is fixed at **10 min** by default, the device samples temperature data either **1** (TriGo), **2** (SenLog) or **4** (SenLog Pro) times. The payload of the different models carry different number of data points.

Appendix A: Raw temperature data conversion

When converting raw temperature to actual temperature value, please keep in mind that:

1. The Integer byte is a signed int and the floating byte is unsigned. The floating value is calculated by $\text{floating_byte} * 10^{-2}$
2. When the integer byte is negative, to compute the right value please do $-(\text{integer_byte} + \text{floating_byte})$.

To determine whether the temperature is positive or negative:

If((integer_byte & 0x80) == 0x80)

Negative number; // (MSB = 1), MSB: most significant bit

else

positive number; // (MSB = 0)

To convert floating_byte to actual temperature value: **temperature value = floating_byte*10⁻²**

So if the number is negative: **-(integer_byte + (floating_byte*10⁻²))**

Otherwise it's positive: **integer_byte + (floating_byte*10⁻²)**

Example 1:

Temperature raw data : 0x88 0x09

$(0x88 \& 0x80) == 0x80$ //negative number (MSB = 1)

Integer byte : 0x88 value is 8 (7 bitwise)

Floating byte: 0x09 9, value is $9 * 10^{-2}$

Temperature is : $-(8 + (9/100)) = -8.09$

Example 2:

Temperature raw data : 0x19 0x03

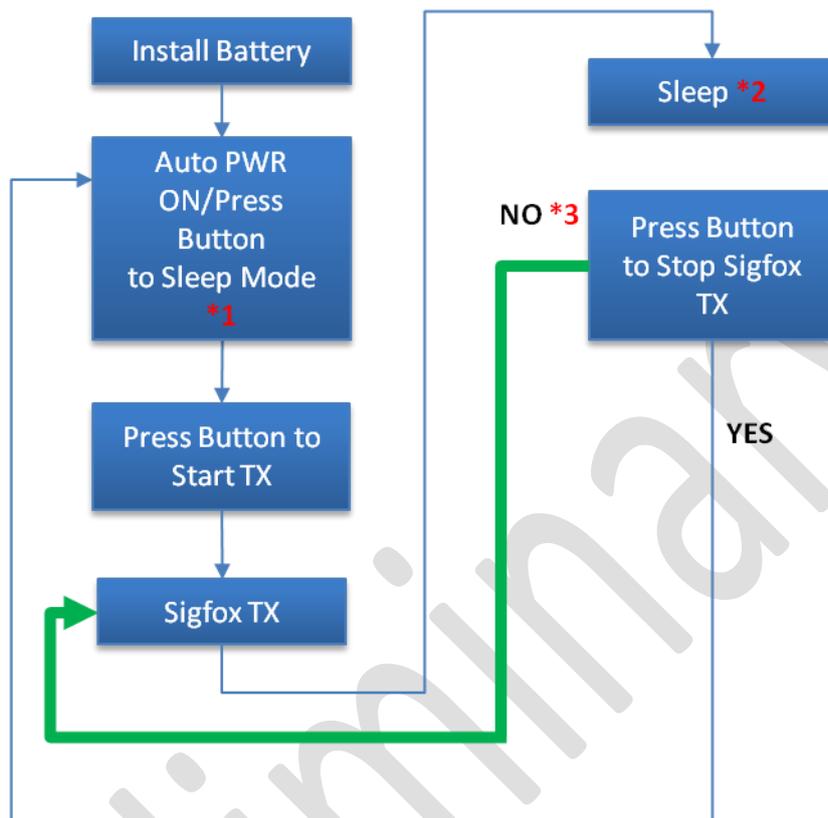
$(0x19 \& 0x80) = 0x00$ //It is positive number (MSB = 0)

Integer byte : 0x19 value is 25 (7 bitwise)

Floating byte: 0x03 3, value is $3 * 10^{-2}$

Temperature is : $25 + (3/100) = 25.03$

Appendix B: Operation Flow Chart



Note :

1. Insert batteries (AAA, 2) to power on the device. Device goes into Sleep Mode automatically after boot up. The device would start its operation until the button is pressed.
2. Once the button is pressed, device will periodically (transmission interval) wake up from sleep to take the current temperature reading.
3. Device also transmits the temp. data via Sigfox after taking the reading before going back to sleep.
4. When the button is pressed the 2nd time, it will stop Sigfox TX and goes back to Sleep Mode.
5. If the button is pressed again, data transmission via Sigfox will resume.
6. Remove the batteries to cease all operations and reset the entire operation flow.

Appendix C: Device Behavior Flow

TriGo: TX interval = 10 min, Sensor sampling rate = 10 min (1 TX interval)

