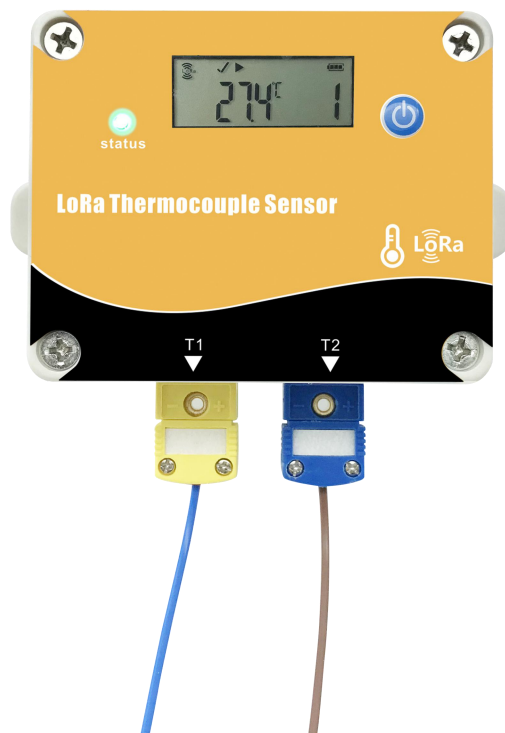


TZ-Tag09

---User Guide



1. Overview

TZ-Tag09 is a high quality LoRa Thermocouple Sensor designed by Tzone Digital Technology Co., Ltd. Its features include long rang(5km), compact enclosure (106mm*57mm*33mm), long battery life, simple installation, stable and reliable.

TZ-Tag09 collects temperature data and transmits it periodically via LoRa technology. While the gateway receives, packages and sends the data to the cloud. It realizes real-time data transmission and storage at the same time. TZ-Tag09 is equipped with LCD, LED and buzzer for more intuitive viewing of temperature data, RSSI signal strength, battery power, as well as sound and light alarms etc. It could be widely used in temperature monitoring applications with our Tzone LoRa Gateway.

2. Application

1. Freezer, refrigerator, etc.;
2. Agricultural greenhouse;
3. Plant and workshop;
4. Cold chain reefer and refrigerated trailer;
5. Pharmacy warehouse and laboratory;
6. High temperature area such as steel making furnace and coke oven;
7. Refining petroleum and producing chemical raw materials;
8. Pipe temperature measurement and tank temperature measurement.

3. Feature

1. Dual channels, K-Type thermocouple, strong anti-interference ability, and quick response;
2. Wide measuring range, good linearity, high precision and long service life;
3. LoRa communicating module uses the new generated LoRa chip from American Semtech, with strong sending power, powerful penetrability and low attenuation;
4. The data sending interval could be set by customers from 1 minute to 1440minute, with widely application;
5. The sensor has 3 working modes: Normal mode, low voltage mode, Temp alarming mode, more effective and more intelligent to complete temperature monitoring;
6. Built-in high performance li-soc12 battery, long time stand-by and stable performance. The electricity is less than 5uA when in the sleep mode,it is equipped with a super capacitor to effectively realize the full utilization of the battery, and solve the problem of battery instability at high and low temperatures;
7. All the data collected by the sensor can be stored in memory, and can be read out through USB;
8. Using FDMA, TDMA and other technologies to avoid wireless conflict;
9. Ensure data is not lost with ACK function;

10. When disconnected, it will automatically updates the sending interval to reduce power consumption;
11. It supports to receive the command from gateway to set parameters.
12. With LCD display, the message(temperature data, RSSI signal strength, battery power etc.,)can be visually viewed;
13. The buzzer will alarm when the temperature exceeds the limit.

4. Advantages of LoRa Technology

The wireless communication of the device is based on SEMTECH RF integrated chip SX127X RF module, which is a high-performance wireless transceiver for the Internet of things, the special LoRa debugging method can greatly increase the communication distance, so it can be widely used in various occasions, compared with the traditional wireless communication, LoRa combines digital spread spectrum, digital signal processing and forward error correction coding technology, and has the advantages of small volume, low power consumption, long transmission distance and strong anti-interference ability. It uses spread spectrum modulation technology to demodulate noise less than 20dB, which ensures a high sensitivity and reliable connection while improving communication efficiency and eliminating interference. LoRa technology achieves the communication distance which is much longer than other wireless protocols, which makes the LoRa system can work well without a repeater, thus reducing the total cost of projects.

5. Specification

Item	Feature
Battery	Built-in 4000mAh/3.6V
Measure Media	Ambient air
Range of Thermocouple measuring	K type thermocouple: -200℃ to 1370℃ T type thermocouple: -200℃ to 400℃
Accuracy of Thermocouple	>100℃ (-148°F): ±1℃ (±1°F) <100℃ (-148°F): ±2℃ (±3.6°F)
Working environment	-30℃~+60℃; 0%RH ~ 85%RH(non condensing)
RF Frequency	433/470/868/915(optional)
Modulation	LoRa
Maximum Range in Open Area	5KM
Transmit Power	20dbm(adjustable)
Transmit Interval	1min-1440mins(user definable)
Low Voltage Alarm	Yes (user definable)
Temp/RH Alarm	Yes (user definable)
Stand-by Current	<5uA
IP Level	IP54
Memory Capacity	50000
Battery Life	3 years (in 15mins interval)
N.W.	135g
Dimension	109mm*69mm*40mm

6. Working Mode

Working Mode	Working Status
Normal Mode	LoRa Sensor will collect the temperature at a set collection interval and send it out via the LoRa communicating module.
Low voltage mode	Device will send data each 30mins (adjustable) after entering low voltage mode, voltage lower than 2.2V (adjustable), please change new one ASAP.
Temp alarming mode	When the ambient temperature exceeds the range set by the user, the transmitter can collect and send data at a relatively fast interval, which is convenient for customers to record the change of the ambient temperature.

P.S.: Priority: Temp alarming mode > Low voltage mode > Normal mode

7. Device status when sending data

The device LED will flash once when the device is sending a packet of data, and the Send icon will display on LCD.

LED bright status:

Green: normal.

Red: Something wrong with device, such as temperature exceed the limit, low voltage.

LCD display please refer 9.LCD display indication

8. Function of Button

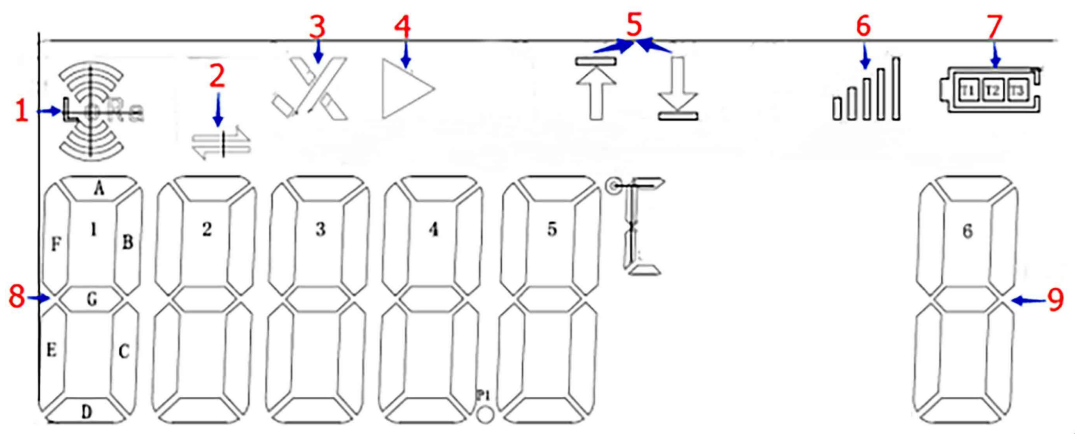
Mode	Operation	Device status	Indication
ON	Keep button pressed for 3s	1. The green LED bright in 5s 2. LCD display turn on	The device starts sending data
OFF	Keep button pressed for 3s	1. The red LED bright in 5s 2. LCD display turn off	The device stops sending data
Data Send	Press shortly	LED bright one time	Only valid in Boot mode LED flash status when sending data: abnormal(red),normal(green)


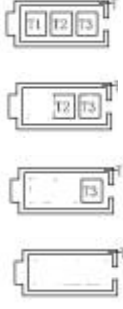
9. LCD Display Indication

Shutdown mode: the LCD doesn't display.

Boot mode: the LCD displays.

LCD will display LORA icon, Send icon, Temperature alarm icon, Running status, Temperature icon, RSSI signal icon, Battery status, Temperature information.



NO.	Function	Indication
1	LORA icon	LORA Sensor
2	Transmission icon	It flashes when sending data, and then off
3	Temperature alarm icon	Normal: √ Alarm: ×
4	Running status	▷ Start running
5	Temperature icon	Upper limit: ↑ Lower limit: ↓ Upper Lower limit: ↑↓
6	RSSI signal icon	 <p>Very strong signal</p> <p>Strong signal</p> <p>Good signal</p> <p>General signal</p> <p>Poor signal</p> <p>The RSSI value is updated every time the gateway response after receiving the data, so the RSSI value is not displayed, if you don't turn on ACK or no response</p>
7	Battery level	 <p>Full battery</p> <p>High battery</p> <p>Medium</p> <p>Low</p>
8	Temperature	Unit: °C, °F optional (configured by 09 command) Resolution: 0.1 When abnormal, it display-----
9	Thermocouple number	When "T1" displays, it indicates LCD shows the data of the left thermocouple; When "T2" displays, it indicates LCD shows the data of the right thermocouple.

10. Buzzer working mode

When temperature exceeds the limit, the buzzer rings with bee-bee sound.

Open instruction:1. 03 command

2. 36 command

How to close buzzer:

1. Temperature return to normal
2. Press button shortly;
3. Enter configuration mode;
4. Turn off;
5. The USB sends a close instruction
6. The gateway sends a close instruction
7. The buzzer working time has ended

PS:

1. The buzzer will not ring again until next abnormal temperature (the temperature returns to normal first and then abnormal).
2. The buzzer function is off by default. Please turn it on if you need.
3. The buzzer with high power consumption, it will reduce battery life, Please set this function according to your application.

11. Instructions

The factory setting of the device is off mode by default. Please refer to the button function after you get it. Press and hold the button for 3s to start up, and the device will automatically send data to the gateway. The data transmission interval is 15 minutes by default. If you want to send data quickly, please press the button shortly. TZ-Tag09 is a data sender, which should work with our Tzone LoRa gateway series. Please check the user guides or contact us directly. After completing the above steps, you can query the data on our company's platform. If you want configure parameters, please open the upper cover of device, and insert our configure cable. At this time the green LED is bright which indicates the device has entered the configuration mode. For detailed configuration instructions and configuration methods, please refer to "TAG09" Configure Software Manual.

12. Notes

1. Being close to a metal object will interfere with the signal, causing the signal to be weaken.
2. Please keep away from water and corrosive chemicals.
3. Please tell us your application and configuration requests, we will try to configure it well before delivery and guide you how to install properly.