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TZONE DIGITAL TECHNOLOGY CO..LTD

LoRa
Temperature and Humidity
Sensor

---User Guide

1 Overview

LoRa Sensor wireless temp sensor is a high quality product designed by Tzone Digital Technology Co.,Ltd.Well overcome many shortcomings happened in similar products,with full consideration on tough environment and more.Long range(5km),small volume(106mm*57mm*33mm),long time use features(Stand by 3years with 15mins interval).Validated by many vital projects with stability and reliance features.LoRa Sensor can collect temp readings with preset interval and send out via LoRa 433MHz module,then gateway products can translate raw data to temperature and battery voltage information.Widely used in temperature monitoring applications with our gateway product.

2 Applications

1. Walk-in and reach-in refrigerators

2. Agricultural greenhouses

3. Plants and workshops

4. Cold chain reefers and refrigerated trailers

5. Pharmacy warehouses and laboratories

3 Features

1. Use SENSIRION temperature and humidity sensor, with reliable stability, large measure range and quick response.

2. LoRa 433Mhz use the new generated wireless sensor SX1278 from American Semtech, with strong sending power, long transmission distance, powerful penetrability and low attenuation. Beside, it adopts the frequency hopping and time sharing technology to make sure the reliability of the communication.

3. The data collecting time could be set by customers from 1 minute to 1 hour,we suggest every 15mins in most occasion.

4. The sensor have 3 working mode: Normal working mode,low voltage mode and temperature alarming mode. To better track the ambient temperature change, the

data collecting time is different in each mode.

5. Built-in ER18505M/3500mAh/3.6V battery , long time standby and stable performance. The electricity is less than 7uA when in the sleep mode.

4 Advantages of Lo-Ra Technology

The wireless communication of devices is based on SEMTECH RF integrated chip SX127X RF module, which is a high-performance Internet of things wireless transceiver, the special LoRa debugging method can greatly increase the communication distance, so it can be widely used in various occasions, to meet needs in long distance Internet of things wireless communications.

Compared with the traditional 433Mhz wireless communication, LoRa combines digital spread spectrum, digital signal processing and forward error correction coding technology, and has the advantages of unprecedented volume, low power consumption, low transmission distance and strong anti-interference ability. It uses spread spectrum modulation technology to demodulate less than 20 db of noise, 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 Specifications

Items	Features
Battery	Built-in 3500mAh /3.6V
Measure media	Ambient air
Range of temp sensor	Humidity 0%RH ~ 100%RH
	Temp -40℃ ~ +125℃
Accuracy of temp sensor	Humidity ±3%RH
	Temp ±0.3℃
Working conditions	-20℃~+60℃；0%RH ~ 85%RH(Non-condensed)
RF Frequency	433MHz
Modulation	Lo-Ra
Maximum range in open area	5km
Transmit power	20dbm（Adjustable）

Transmit interval	1min-60mins (User definable)
Low voltage alarm	Yes (User definable)
Temp alarm	Yes (User definable)
Stand-by currents	<7uA
IP Level	IP54
Battery life	3years(in 15mins interval)
N.W.	135g
Dimension	106mm*57mm*33mm(4.17in*2.24in*1.30in)

6 Working modes

Working modes	Working status
Normal mode	LoRa Sensor will collect temp readings and send out as settings via Lo-Ra 433MHz module.
Low voltage mode	Device will send data each 30mins (Default 30mins,adjustable) after enter low voltage mode,voltage lower than 2.2V(Default 2.2V,adjustable),and please change new one a.s.a.p.
Temp and humidity alarming mode	Device will send alarming readings in shorter interval than customers`settings(Default 1min,adjustable),in order to keeping alerts and make a obvious records.

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

7 Functions of Button

1.Access to configuration mode

Step1:Please open the case and you will see a Button,a USB interface,and please connect the USB cable with computer for using.Please check the structure of device as picture shown below.

Step2:Device will start configuration mode by pushing Button for 5 seconds,and LED light will keep on.Meanwhile,Device will quit automatically without operation for 30 seconds,and LED light will turn off.

Step3:Please configure it according to command list and be aware that:all configuration will execute unless you send #DS to save all operations.

2.Send a fresh data by pressing the button for less than 1 second

LED light will on when press the button for less than 1 second,and LoRa Sensor will send out a readings,LED light will turn off when finished.

8 LED indications

1. LED light will turn on when LoRa Sensor send a reading out;LED light will turn off by when it finished.
2. LED light will keep on in configure mode until configuration ends.
3. LED light will on when you push Button quickly,and LoRa Sensor will send out a readings,LED light will turn off when finished.

9 Command list

1.Use serial port configuration tools to configure the devices,and serial port configure as below:

Baud rate:19200

Data character:8

Stop character:1

Checksum:None

Flow control:None

2.LoRa Sensor Command List

	Instruction	Format	Note
1	Set ID	*00,X#	X:8characters,could be [A-F] and (0-9)
2	Low voltage alarming function	*01,A,X ,Y#	A:0 disable this function 　1 enable this function (default) X:low voltage threshold,[2000-3600],unit:1mV,default:2200 　Y:transmit interval after low voltage alarming,[1-60],unit:min,default:30
3	Set heartbeat packet interval	*02,X#	X:[1-60],unit:min,default:15
4	Set high/low temperature/ humidity alarming function	*03,A,X ,Y,M,N,Z#	A:0 disable this function (default) 　1 enable this function X:high temperature threshold,[-40-125],unit:℃,default:100; 　Y:low temperature threshold,[-40-125],unit:℃,default:0; 　M:high humidity threshold,[0-100],unit:%,default:100 　N:low humidity threshold,[0-100],unit:%,default:0 　Z:transmit interval after temperature/humidity alarming, [1-60],unit:min,default:1
5	Set transmit power	*04,X#	15=20dbm,default; 14=19dbm; 13=18dbm; 12=17dbm; . . . 3=8dbm; 2=7dbm; 1=6dbm; 0=5dbm;

6	Save command	#DS	
7	Search single command	#D5X	X:command
8	Search all commands	#DE	
9	Quit configuration	#DQ	
10	Default setting	#DO	
11	Reboot device	#DR	

10 Compatibility

LoRa Sensor is a temperature sensor node,which should work with our LoRa gateway product,Please check its user guide or contact us directly.

11 Precautions

1.Please keep away from metal objects and don't put into metal sealed small space.

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.