



Product Name	Smart Iot Wireless Vibration Sensor
Product SKU	GAOTek-IoTS-103
Product URL	https://gaotek.com/product/gaotek-smart-iot-wireless-vibration-sensor/

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Safety instructions

- (1) Read the following safety instructions carefully.
- (2) Save this product specification for future reference.
- (3) Do not throw away the battery at will. Please dispose of it according to environmental protection requirements.
- (4) The equipment should be placed on a reliable surface during installation. Dropping may cause damage to the equipment.
- (5) The installation position of the sensor should be reasonable, so as not to affect the safe operation of the equipment.
- (6) Attention should be paid to all cautions and warnings on the equipment.
- (7) Never pour liquids into equipment, which may cause fire or electric shock.
- (8) Do not open the equipment at will as this may affect the sealing. The equipment is only allowed to be installed by professionals
- (9) Have the equipment inspected by a qualified service provider if one of the following conditions occurs:
 1. Battery is died or power connector is damaged
 2. Liquid infiltration equipment
 3. Equipment failure or inability to operate in accordance with the operation manual
 4. The equipment has obvious signs of breakage
- (10) Do not place the equipment in an environment below -40°C or above 85°C.
- (11) Battery power may cause damage and the equipment should be placed in a controlled environment.



(12) **WARNING:** There is a risk of explosion if the battery is not replaced correctly. Replace batteries only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

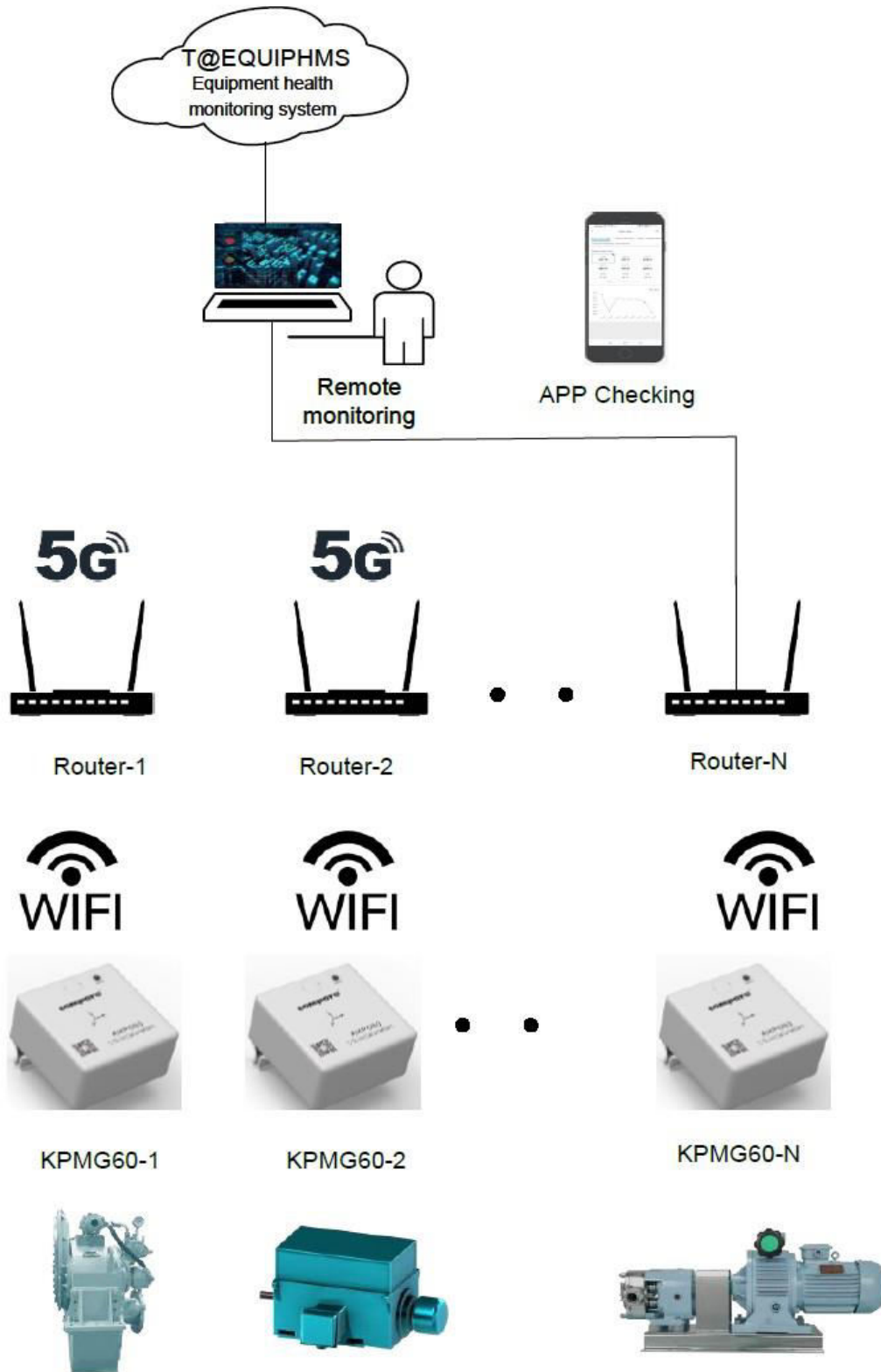
1 Product Overview

1.1 Product Introduction

The Intelligent temperature and vibration sensor is a new type vibration data acquisition sensor that replaces traditional piezoelectric analog output sensors. It is based on the wireless MQTT protocol and are actively uploaded to the equipment health management system by WIFI. The product is waterproof, dustproof, easy to install and maintain, and the wireless digital signal transmission method eliminates the noise interference caused by long cable transmission, and the whole measurement system has high measurement accuracy and anti-interference capability. The collected data is transmitted wirelessly to the central server, and the outdoor visual communication distance is 150m (open and unobstructed environment) according to the site communication conditions.

1.2 System Architecture

Vibration data from the equipment is collected by the sensors and transmitted wirelessly to the platform via WIFI router. This architecture enables both localized data monitoring and remote monitoring and diagnosis of the data.



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2 Technical indicators

Vibration Characteristics	Measurement of vibration parameters	3 axes (each axis contains displacement peak value, acceleration peak value, velocity RMS value)
	Speed measurement range	0.01-200mm/s
	Acceleration measurement range	±16g
	Resolution	0.01m/s ²
	Precision	Acceleration: ±5%@80Hz Speed: ±5%@80Hz Displacement: ±5%@80Hz
	Frequency Response Range	10Hz-1600Hz
Temperature Characteristics	Measurement Range	-40 ~ 85°C
	Resolution	0.1°C
	Precision	±1°C (under temperature stable condition)
Ultrasonic measurements	Microphone	Range of amplitude: 0.6 mN/m ² - 20 N/m ²
		Measurement frequency: 100Hz~80kHz
Power supply parameters	Power supply method	3.6V (Li-ion battery)
	Battery Capacity	Battery capacity 12000mAh, 3.6V
	Standby current	<30uA
	Operating current	<20mA during acquisition, <300mA during data upload
Housing parameters	Housing	Stainless steel/reinforced PBT
	Dimension(L*W*H)	86mm*86mm*41.9mm
	Installation method	Aluminum clamp, flat bottom mounting (on equipment platform or heat sink bars)
	Protection level	IP66
Working Environment	Hitting the Limits	100g
	Ambient temperature range	-40~85°C

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Communication requirements	WIFI+ Bluetooth	<p>Bluetooth:</p> <ol style="list-style-type: none"> 1、 For setting and commissioning period: distribution network and threshold and other parameters setting 2. Bluetooth® v5.0 compliant 3. Frequency: 2.400 GHz to 2.482 GHz 4、 Communication range: within 10 m 5、 Antenna built-in <p>WIFI:</p> <ol style="list-style-type: none"> 1, for motor data transmission (MQTT protocol) and firmware upgrade 2. IEEE 802.11 b/g/n compliant 3. Frequency: 2.400 GHz to 2.48 GHz 4、 Communication range: 150 m or more 5、 Built-in Antenna 6、 Low power consumption: working <150mA, standby <50uA
Storage	Built-in memory	When the connection to the platform is interrupted, data is saved for at least 48 hours (in the case of a 5-minute data measurement interval) and the un-uploaded data is automatically uploaded when the platform is connected.
Remote Upgrade	Remote firmware upgrade via WIFI	
Application Scenarios	<ol style="list-style-type: none"> 1、 Supported clicks: Asynchronous and synchronous motors. Block: IEC motor block number 56 to 500 2、 Driving equipment (pumps, fans, gearboxes) 	

3 Applications

Motors, fans, pumps

Online monitoring of motors and machine and pump groups under large industrial scenarios, currently mainly for common motors above 100kW and lifecycle management of large special motors and large rotating equipment. Extending to thermal power, nuclear power, petrochemical, steel, coal and other fields.

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Rotating parts (e.g. gearboxes, bearings)

Vibration temperature acoustic fault monitoring for key points of key components of rotating equipment in industrial scenarios to reduce downtime losses, timely repair and replacement of core components, such as gearboxes, bearings and other parts or equipment. Extend to rail transportation, trams, special vehicle axles, CNC machine tools and other industries.

Electrical equipment

Such as transformers, inverters, high-voltage switches and other grid equipment.



4 Customer Value

The Intelligent temperature and vibration sensor is an industrial-grade equipment for rotating machinery, with intelligent diagnosis as the core, integrating data collection, status monitoring, real-time alarm and other functions, by monitoring the status of key units and important pumps, it can show the health condition and operation trend of equipment in an intuitive and in-depth way, accurately capture the abnormal status of equipment, timely determine the cause and part of the fault, and assist in maintenance decision making. It can avoid the economic loss caused by the stoppage of key equipment and greatly improve the efficiency of the unit.

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Value to customers:

Improve the efficiency of equipment usage

To ensure the "safe, stable, long-time, full load and excellent" operation of large key units, avoid safety hazards, reduce accident losses, improve the efficiency of equipment use, and exchange small investments for large benefits. Extended equipment life Realize the maintenance mode from planned maintenance to predictive maintenance, helping enterprises to arrange maintenance plans scientifically and reasonably, reduce maintenance costs, and effectively extend the service life of equipment.

Free up manpower with technology

Avoid overtime repair, reduce the labor intensity of enterprise employees, effectively reduce labor costs, and improve the level of intelligent and information management of enterprises.



5 Use and installation instructions

5.1 Appearance

The top cover is made of PC+ABS fireproof high strength engineering plastic. The base is made of metal alloy with special treatment on the surface to prevent aging and corrosion.

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5.2 Key components

After opening the top cover, the main components are as follows:

1. **Antenna.** Antenna frequency 2.4GHz~2.5GHz, positioned at the back of the top of the PCB, below the battery box. Do not damage the antenna, so as not to affect the antenna transmission distance.
2. **Switch.** Left (battery connector direction) is OFF, used to turn off the sensor. Right is ON, used to start the sensor.
3. **Battery.** The battery is three ER18505 parallel connection. The location is at the top of the PCB. Battery replacement method: Switch to OFF to disconnect the battery. Then you can replace the matching battery.

Touch key description

Button	Mode	Function
Touch keys	Click	Awakening
	Double click	Turn on BLE
	Long press (more than 5 seconds)	Report data once

Status light description:

Indicator light	Status	Function	Trigger
Red Light	Rapid flashing	Connect to Wifi	Turn on Wireless
	Fast flashing	Synchronous Time Sync	
Green Light	Rapid flashing	Connect to Wifi	
	Fast flashing	Connecting to MQTT	
	Faint flicker	Sending MQTT	
	Blinking	Free	
Yellow light	Rapid flashing	Turn on SPP	
	Fast flashing	Turn on BLE	
	Blinking	Turn on the radio	

5.3 Installation Instructions

The following diagram shows the sensor installation instructions, the sensor and the equipment between the installation, the following describes several common installation methods. The mounting bracket is optional spare parts, can be customized according to the actual installation needs of the customer site processing, factory default magnetic suction mounting method.

5.3.1 Aluminum clamp installation method



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5.3.2 Flat bottom mounting method



Bolt and mounting hole parts can be properly coated with screw adhesive, thread locking fixative type can be used loctite 271. Bolt size is pitch 1mm, diameter M6.

Note: The above installation methods can be reused according to the use of the site. The bottom bolt diameter of the sensor is M6. Adhesive is not an accessory for the sensor shipment, customers can choose to purchase the use of structural adhesive: Loctite AA326 accelerator: Loctite SF7649 or the same type of replaceable other brands and models of adhesive.

5.4 Commissioning

Download the APP KPM Config and follow the steps below to configure the relevant parameters. (Currently supports Android system, scan the right QR code with your browser to download)





Step 1: Enter user name: admin Password: 123456.

Modify the server address (the following is an example):

IP address: 171.8.196.146

Port number: 30333

 A screenshot of the 'KPM Config' login interface. At the top is a blue icon with a cloud and gear, labeled 'KPM Config'. Below it are two input fields: 'Account' with the text 'admin' and 'Password' with masked characters '.....'. A link to 'Read user privacy policy' is present. A large blue 'Log in' button is centered, with links for 'Modify server address' and 'Forgot password' below it.

Step 2: Double-click the touch key on the right side of the sensor, the sensor's light becomes yellow and in fast blinking state, click on the smart sensor to enter the list.



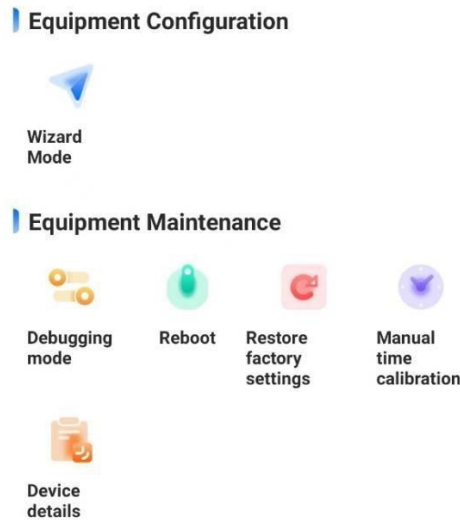
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Step 3: Click on the temperature vibration sensor, open the Bluetooth and enter the list.



Step 4: Click on the sensor to be configured and enter the password (6 digits after the sensor number) to display the content to be configured:



Step 5: Wizard mode



WiFi Configuration(1/7)

Country / Region

WiFi SSID:

WiFi Password:

Note: The WiFi information configured here is taken from My, you can change the default configuration in My

MQTT(2/7)

Client ID:

Server IP:

Port:

User name:

Password:

Topic:

Upload data(3/7)

Acceleration peak and RMS values

Velocity peak and RMS values

Displacement peak and rms values

Temperature

Inclination

Magnetic Fields

Noise

Battery Capacity

Device status

Storage entries

Upload interval(4/7)

Data measurement interval: Minute

Data sending interval: Hour

NTP server(5/7)

Country / Region:

NTP server 1:

NTP server 2:

NTP server 3:

Alarm configuration(6/7)

Standard Type: ISO standard Customize

ISO standard:

Level C Alarm

X-axis intensity mm/s	<input type="text"/>
Y-axis intensity mm/s	<input type="text"/>
Z-axis intensity mm/s	<input type="text"/>
Temperature °C	<input type="text"/>

Barely working

Level D Alarm

X-axis intensity mm/s	<input type="text"/>
Y-axis intensity mm/s	<input type="text"/>
Z-axis intensity mm/s	<input type="text"/>
Temperature °C	<input type="text"/>

Non-working status

Parameter settings(7/7)

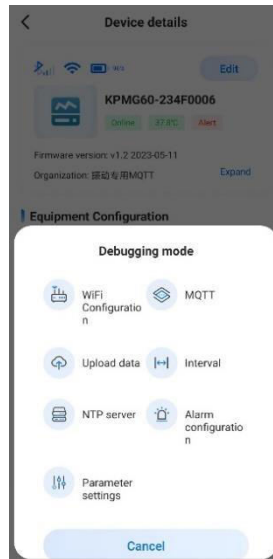
User Password:

Confirm password:

Note:
1. The password length is 6-20 characters.
2. It must contain uppercase letters, lowercase letters, and numbers.
3. It supports special symbols - _

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Step 6: Debug mode. (For configuration of individual parameters, refer to Wizard mode)



Step 7: Login to the T@EQUIPHMS Equipment Health Management System to view the collected data.

5.5 Three-axis direction

A: Axial direction

R: Radial direction

T: Vertical direction



6 Common troubleshooting and troubleshooting

6.1 Sensor does not work

6.1.1 Sensor is not powered or battery power is insufficient

Step 1: Check whether the battery connector is disengaged and if the switch is on.



Step 2: Check the battery voltage. If the battery voltage is lower than 3V, the sensor can not work properly, need to change a new one.

6.1.2 The sensor has been in a long dormant state

The sensor has been set to hibernate and mistakenly thinks the sensor is not working because of the long hibernation time. Stand alone or press and hold the touch key for more than 5 seconds to observe if the LED communication light will flash.

Note: The sensor is in hibernation state to reset the hibernation time shortcut: click the touch key to wake up the sensor, long press the touch key for more than 5 seconds, the sensor will actively upload data once.

6.2 Sensor and platform cannot communicate

Mismatch of parameter configurations between sensors and routers; The router data cable has unreliable contact or is damaged.

6.3 Unsatisfactory communication distance

Onsite router network is poor, affect the communication. Sensor antenna has damaged, affecting the communication distance. The site environment is complex. There are too much blocking material between the sensor and the router or the installation position has metal shielding phenomenon.

7 Notes

The caveats are as follows:

1. Prohibit users to discard the sensor to pollute the environment, the battery is included.
2. Do not replace components or change the structure of qualified products at will.
3. In the process of use, if the sensor has been in a low temperature or high temperature environment, the normal working life of the sensor will be shortened, when the sensor is not used for a long time, please put it aside in a cool, dry place.
4. The product should avoid installation in a fully enclosed metal cabinet.

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5. Do not charge it ! The battery is non-rechargeable lithium battery.