

WIRELESS VIBRATION SENSOR



Product Introduction

Zhice Yunlian wireless vibration sensor adopts advanced digital signal processing technology to perform on-board vibration data analysis, and integrates algorithms for acceleration, velocity, displacement feature extraction and waveform calculation.

- Adopts advanced MEMS sensing technology, achieves 0Hz frequency response with a minimum noise density of $15\mu\text{g}/\sqrt{\text{Hz}}$.
- Built-in high-precision temperature sensor enables integrated measurement of temperature and vibration.
- Equipped with large-capacity on-board memory, capable of storing 100,000-point waveforms for each of the three axes after algorithm processing.
- Supports ultra-low power mode: automatically powers off when no data is transmitted, and can be woken up by vibration trigger or built-in timer.
- Supports real-time mode: outputs real-time acceleration, velocity and displacement data via on-board algorithm calculation.
- Supports local data storage mode: built-in 8GB high-capacity storage meets long-term, high-volume data recording requirements. The device is fitted with a high-speed USB interface for quick export of complete datasets.
- Up to 3 years of service life on a single charge.
- Full aluminum alloy and industrial-grade plastic housing with IP68 protection rating, resistant to electromagnetic interference and ultraviolet radiation, ensuring long-term reliable operation.
- Provides complete MQTT interface protocol, ready to use out of the box.



Parameters

Unless specified, all under 25°C.

Basic Parameters	Specification
Operating Temperature Range	-20°C ~ 60°C
Storage Temperature Range	-20°C ~ 45°C (Short-term Storage) -15°C ~ 35°C (Long-term Storage)
IP Protection Rating	IP68
Dimension	Approx. 1508050mm
Weight	Approx. 500g
Housing Material	Aluminum Alloy
ESD Level	HBM Contact Discharge: 8KV, Air Discharge: 15KV
System Power Supply	Specification
Internal Power Supply	3.7V 10500mAh Ternary Lithium Battery
External Power Supply Mode	External 3.6~4.2VDC Battery Input External 9VDC~30VDC Input External 5VDC~6VDC Solar Panel Input
Charging Power	5W @ 5V/1A
Charging Time	Typical 10h @ 5V/1A
Service Life / Working Duration	Standard Mode & Trigger Mode (Full Operation): Approx. 150h(With external 3.7V 35000mAh battery, continuous working for 14 days) Low Power Mode 1 (Sleep when no data transmission): 2500h Low Power Mode 2 (Auto power-off with no data): About 3 Years
Communication Interface	Specification
Communication Standard	4G Cat.1 Full Netcom
Communication Speed	Typical 50KB/s
Communication Protocol	MQTT Protocol
Communication Distance	Depends on the signal strength of operator base stations
Configuration Interface	High-speed USB Aviation Connector Interface
Configuration Protocol	Configure parameters via disk configuration file
RAM Capacity	8MB
CPU Main Frequency	240MHz
Disk Capacity	8GB
Computing Performance	800 CoreMark®
Display Screen	0.96-inch Color OLED Screen





Parameters

Unless specified, all under 25°C.

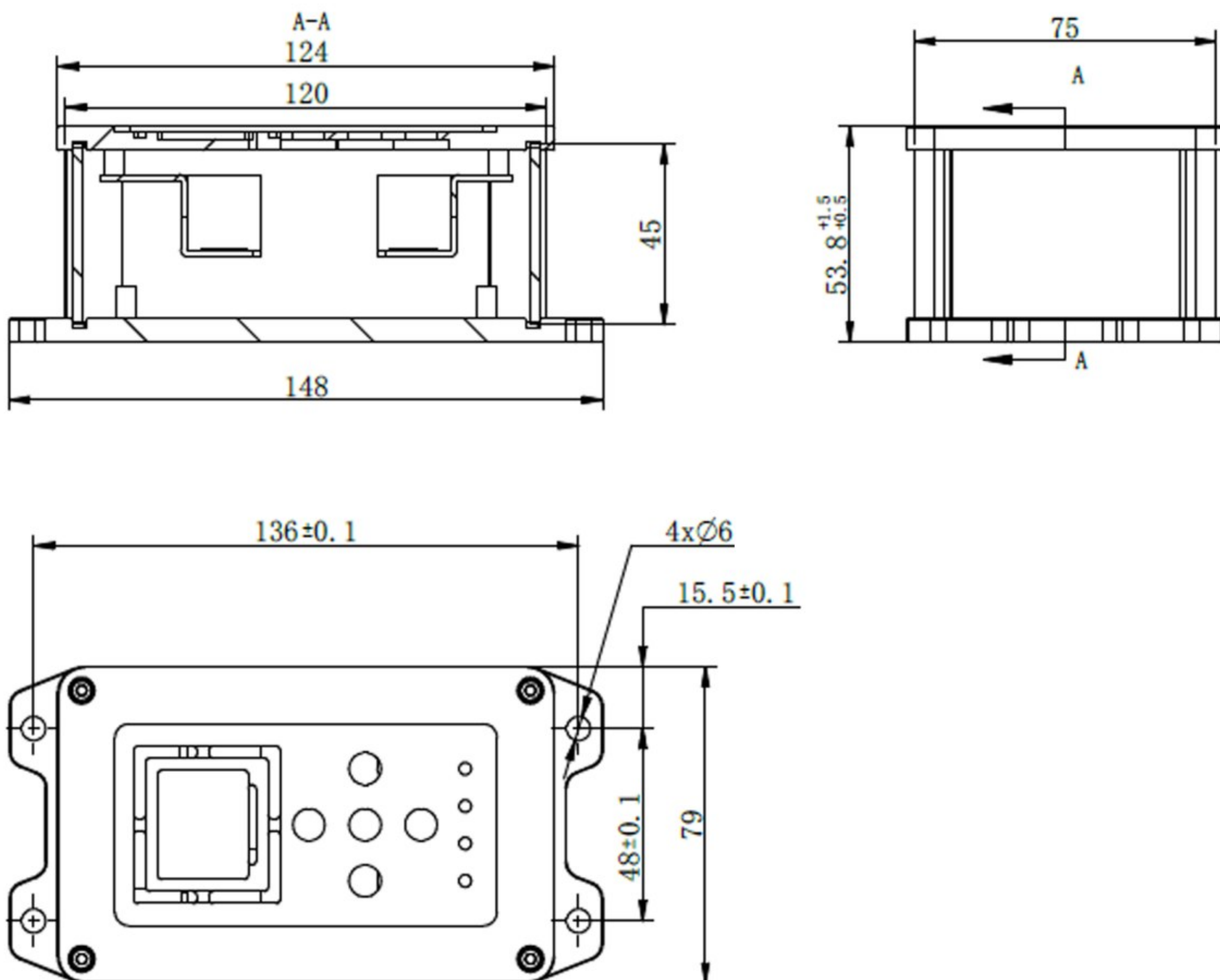
Category	Item	Specification
Basic Parameter	Operating Temperature Range	-20°C ~ 60°C
Data Output Types	Features	Peak acceleration, RMS acceleration; Peak displacement, peak-to-peak displacement; Peak velocity, RMS velocity; Peak frequency; Instantaneous temperature
	Waveforms	Time-domain waveforms of acceleration, displacement and velocity; Frequency-domain waveforms of acceleration, displacement and velocity
Acceleration(260Hz bandwidth version)	Number of Axes	XYZ three axes
	Sampling Rate	833Hz, 416Hz, 208Hz, 104Hz
	3dB Bandwidth	0Hz ~ 260Hz (3 axes)
	Measurement Range	±0.5g, ±1g, ±2g, ±3g
	Resolution	Min. 0.015mg (at ±0.5g range)
	Noise Density	Typical 15μg/√Hz
	Accuracy	±4%
Velocity	Measurement Range	0 ~ 1m/s
	Resolution	0.01mm/s
	Accuracy	±4% (within 100Hz frequency range)
Displacement	Measurement Range	0 ~ 100m
	Resolution	1μm
	Accuracy	±10%
Sampling Duration for Feature & Waveform Calculation(260Hz bandwidth version)	—	500ms ~ 150000ms @ 833Hz sampling rate 500ms ~ 300000ms @ 416Hz sampling rate 500ms ~ 600000ms @ 208Hz sampling rate 500ms ~ 1200000ms @ 104Hz sampling rate
FFT	Calculation Points	128 points, 256 points, 1024 points, 2048 points, 4096 points
Temperature	Measurement Range	-50°C ~ 150°C
	Resolution	0.0625°C
	Accuracy	-20°C ~ 85°C: Typical ±0.5°C -50°C ~ 150°C: Typical ±0.75°C
	Thermal Response Time (4)	≤100s



⚠ Precautions

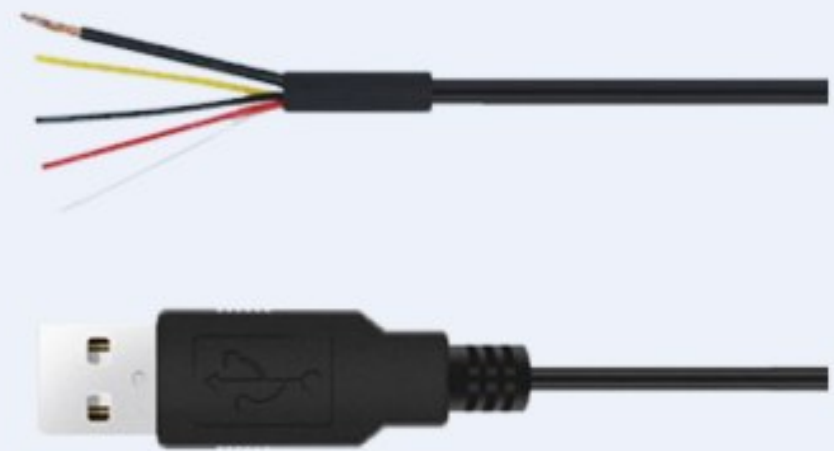
- (1) Short-term storage duration: less than 1 month.
- (2) MQTT protocol, QoS 2 service level: average transmission speed calculated from 100 rounds of 1MB data transmission.
- (3) The upper limit of the 3dB bandwidth is restricted by the configured sampling rate, and is always lower than half of the sampling rate.
- (4) Time required for the sensor to reach 63% of its final stable reading when immersed in 85°C silicone oil, tested at 25°C ambient temperature.

⚠ Dimensions and Installation Method



M8 mounting holes are reserved at the bottom of the sensor. The sensor can be fixed to the surface of the measured object using expansion screws.

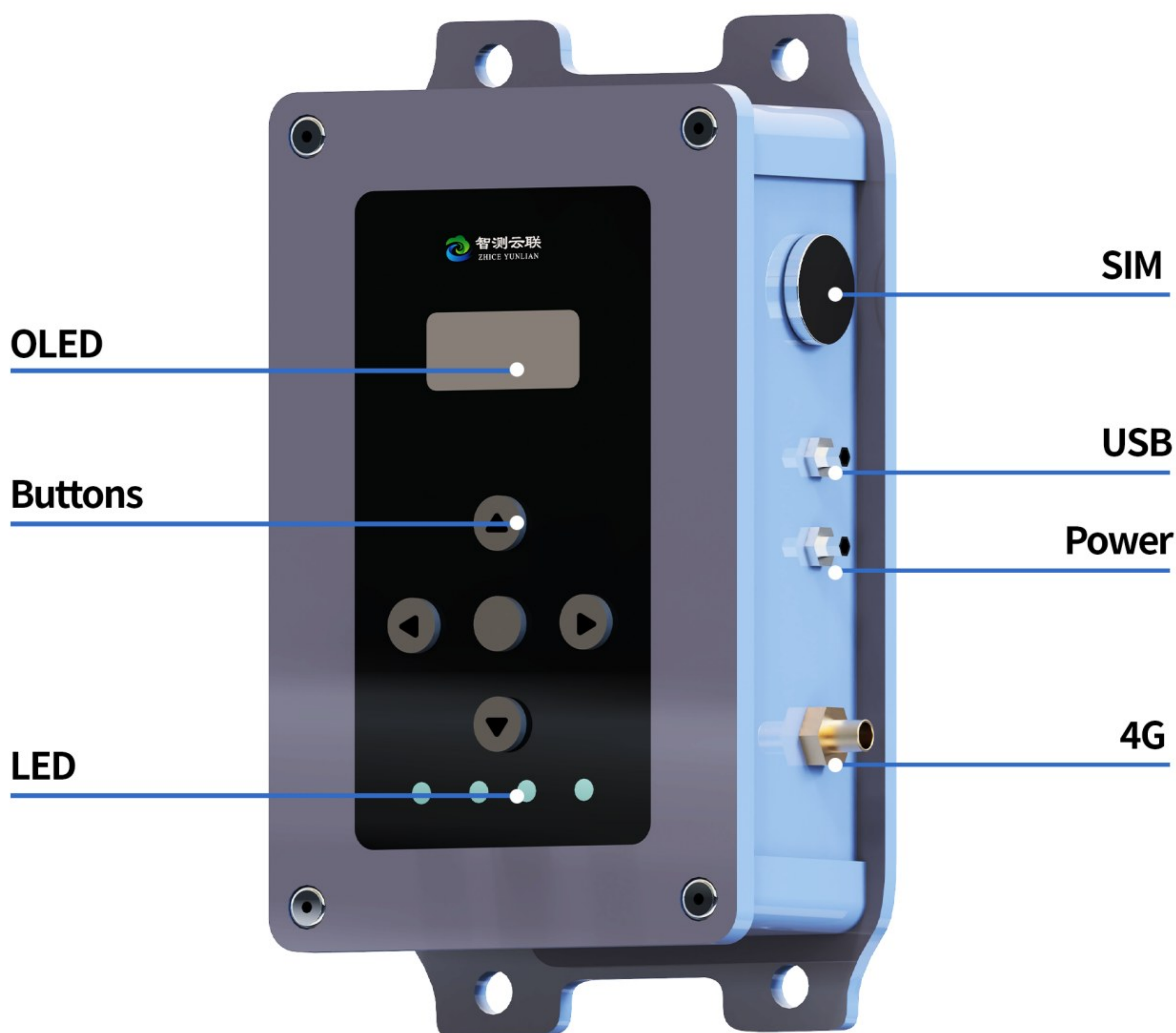
Accessories

Name	Specification	Illustration
Aviation Connector	M5 plastic 4-core female connector, 2m length Operating temperature: -40°C ~ 85°C	
	Pinout: Yellow (DC 9-30V) White (GND) Red (RS485-A) Black (RS485-B)	
Aviation Connector	M5 4-core shielded female straight connector to USB 2.0 male, 1000mm length Operating temperature:-20°C ~ 85°C	
External Battery	30 pieces of 18650 cells Approx. dimensions: 160mm × 80mm × 70mm	
	Housing dimensions: 200×120×80mm	

Inspection, Storage and Precautions

- Unpacking: Verify quantity, accessories & certificate match packing list.
- Storage: Dry, well-ventilated room.
- Magnetic mounting: Slide sensor from edge onto surface — NO impact.
- Temperature limit: Do not store long-term above 105°C (accuracy loss).
- Lens protection: NO sharp objects into silicone lens (breaks IP68 seal).
- Torque: Avoid excessive torque to prevent thread damage.

Interfaces and Indicators



- OLED display: Full-color, wide temp -40 to $+80^{\circ}\text{C}$; shows status, diagnostics & full interactive menu. All key parameters can be checked and configured directly via front panel — no phone or PC needed.
- 5 external buttons: Power on/off and configuration.
- 4 LED indicators: System status & power status.
- SIM slot: Tool-free twist-off knob — just unscrew by hand to replace SIM quickly.
- Connectors:
 - (1) 2 waterproof aviation connectors: one USB (for configuration), one for external DC power.
 - (2) External antenna connector: SMA female (better adaptability to different scenarios).

Interface Name	Symbol	Definition
KEY UP	▲	Page Up
KEY DOWN	▼	Page Down
KEY LEFT	◀	Page Left
KEY RIGHT	▶	Page Right
KEY ON/OK	⏻	Short press: Power on Long press: Power off / Confirm
LED RUN	⋯	System Operation Status Indicator Normal operation: Green on for 100ms, off for 1000ms periodically
LED CHARGE	⚡	Low battery: Red on for 100ms, off for 100ms periodically Charging: Solid red Fully charged: Solid green
LED TX	↑	System Data Transmission Status Indicator Data transmitting: Green on for 100ms
LED RX	↓	System Data Reception Status Indicator Data receiving: Green on for 100ms
SIM	—	SIM Card Slot Cover
I/F USB	DP	USB DP Pin
	DN	USB DN Pin
	VBUS	USB VBUS Pin
	GND	USB GND Pin
I/F POWER	VIN DC	DC Power Input Positive (9VDC ~ 30VDC)
	VIN BAT	External Battery Power Input Positive (3.6V ~ 4.2V)
	VIN SOLAR	Solar Panel Power Input Positive (5VDC ~ 6VDC)
	GND	Power Input Negative
4G ANT	—	4G Antenna Interface