



FG-WM400 Series

High-speed wireless transmission
Inclinometer

Technical Manual

V3.0



Introduction

FG-WH400 4G wireless transmission inclination sensor is a compact and intelligent digital inclination sensor designed for structural health monitoring. It can output three-axis inclination angle and three-axis acceleration, using high-capacity lithium sub-battery (optional rechargeable lithium battery), uploading data once an hour can be used continuously for 3 years. Support 4G full network can transfer data to the cloud.

Sensitive mechanism using the latest technology, microelectromechanical production process of the tilt unit, small size, low power consumption, consistency and stability is very high, because it is a digital tilt sensing module, linearity is more easily corrected. The working temperature reaches industrial level $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$.

Feature

- Resolution: 0.001°
- Biaxial inclination measurement, range $\pm 60^{\circ}$
- Magnetic Switch
- transferred to the cloud
- Accuracy: 0.005°
- Power query
- Timed wake up
- Exercise wake

Application

- Dangerous housing monitoring
- Bridge tower inclination measurement
- Dam monitoring
- Slope disaster prevention
- Ancient building protection monitoring
- Tunnel monitoring
- Foundation pit inclinometer
- Tower tilt monitoring

Product Feature



Mechanical index

Connector	Aviation connector
Protection level	IP68(1 m water depth, 24 hours continuous test)
Shell material	ABS+30% glass fiber + magnesium aluminum alloy anodized base
Installation	Four M6 screws



Performance index

Measurement range	Condition	±60	°
Measurement axis	Mutually perpendicular	X-Y	
Accuracy	Room temperature	0.005	°
Resolution		0.001	°
Zero temperature drift	-40 ~ 85°C	±0.001	°/°C
Cross axis error	25°C	0.001	°
Output frequency		Up to 50	Hz
Mean No Failure Working hours MTBF	≥90000 h		
Electromagnetic compatibility	According to GBT17626		
Insulation resistance	≥100 MΩ		
Impact resistance	2000g, 0.5ms, 3times/axis		
Dimensions	L105.2*W85*H76 (mm) (Antenna not included)		
Weight	/		

Resolution: The smallest change value of the measured value that the sensor can detect and distinguish within the measurement range.

Accuracy: The root mean square error of the actual angle and the sensor measuring angle for multiple (≥16 times) measurements.

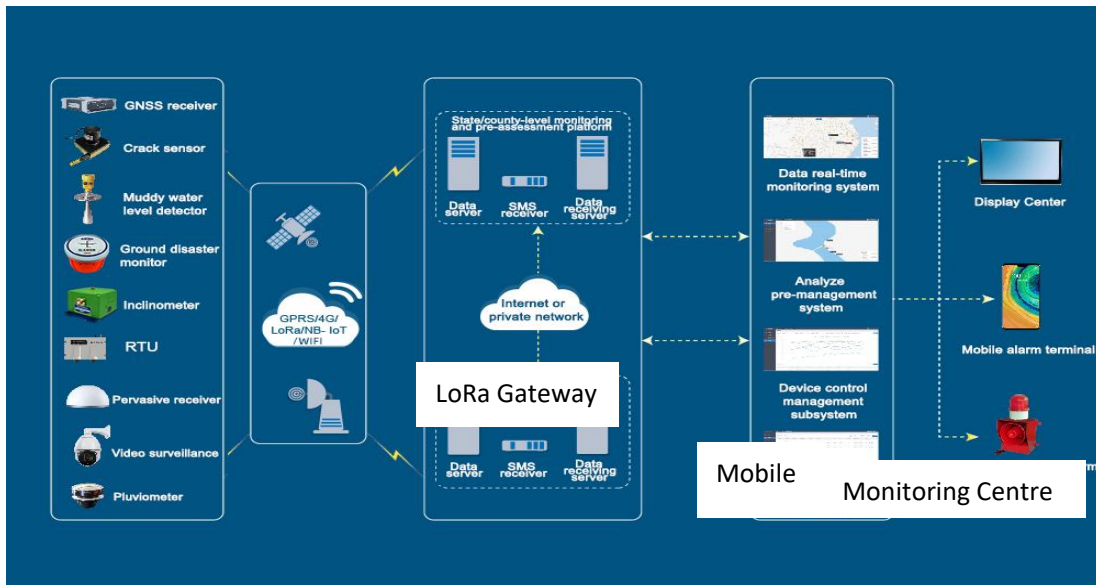


Electrical index

Power connector	Power voltage	4.2VDC
	Disposable dry cell voltage	3.6VDC
	Working current	50mA (Average value)
	Stand-by current	6μA(Typical values)
	Rechargeable battery capacity	6000mAH
	Disposable dry cell battery capacity	19000mAH
	Transmit power	13~16dBm
Receiving sensitivity	-90~-67dBm	



Network topology





Package product size

Product size: (Antenna not included) L105.2*W85*H76 (mm) , the length and width may be a 1mm error, please refer to the actual product

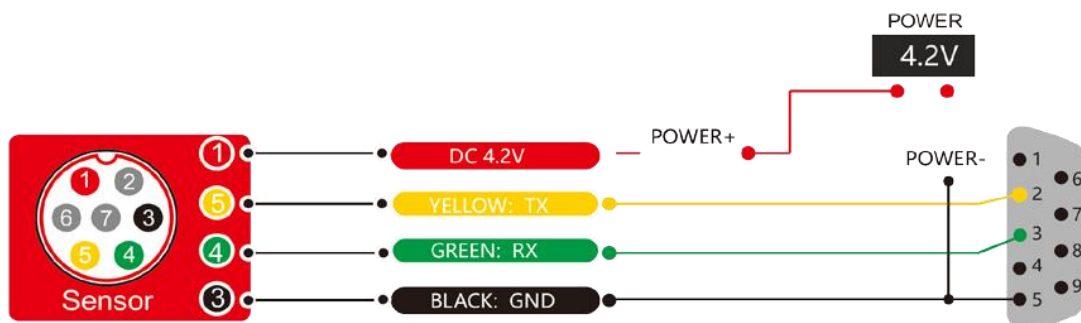
Standard antenna height: 159mm (this product without antenna cap)

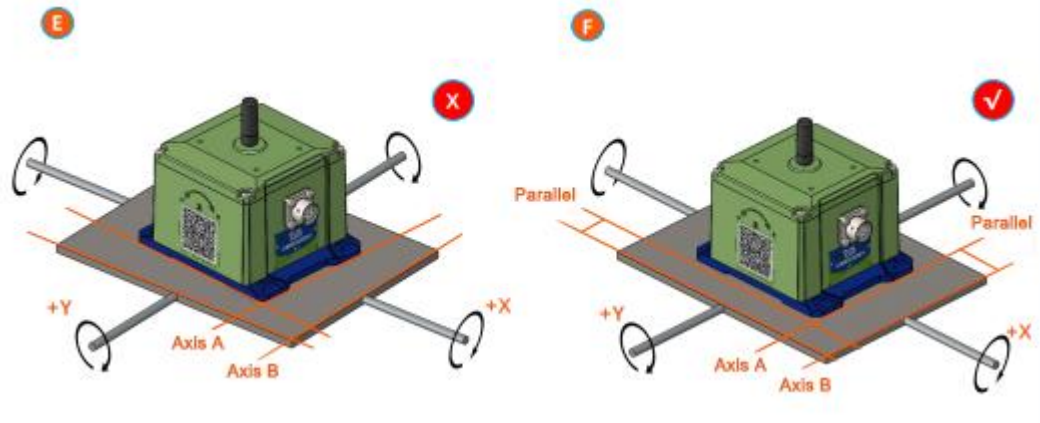


Electrical connections

Aviation plug wiring definition

	RED	BLACK	GREEN	YELLOW
Wiring color	1	3	4	5
function	4.2V	GND	RXD	TXD





Finally, the mounting surface of the sensor and the surface to be measured must be tightly fixed, smooth in contact, and stable in rotation, and measurement errors due to acceleration and vibration must be avoided.



Executive standard

- National Standard for Static Calibration Specifications for Dual-Axis Inclination Sensors (Draft)
- GB/T 191 SJ 20873-2003 General Specification for Inclinometers and Levels

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