

# WxS 880-007

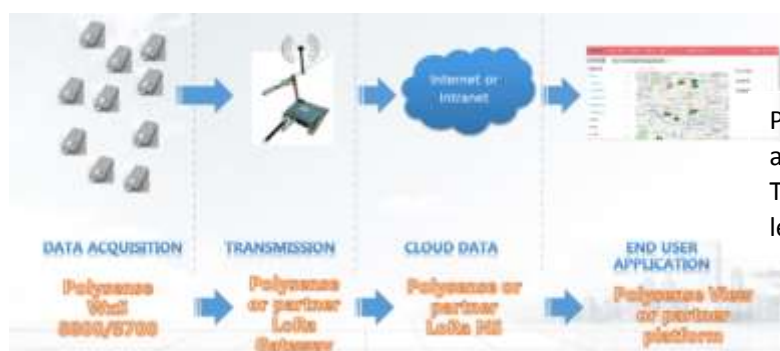
LoRaWAN Tilt sensor

## Product Highlights

- ✓ It is a high accuracy, digital inclinometer that accommodates both single-axis ( $\pm 180^\circ$ ) and dual-axis ( $\pm 90^\circ$ ) operation.
- ✓ Configurable operating parameters include sample rate, power management, digital filtering, auxiliary analog and digital output, offset/null adjustment, and self-test for sensor mechanical structure. operates over a temperature range of  $-40^\circ\text{C}$  to  $+125^\circ\text{C}$ .
- ✓ Cross-threshold report, plus periodic report every 2 hours (the threshold and the periodic report cycle are both user-configurable)
- ✓ OTA (Over The Air) firmware upgrade, including to upgrade loader and application images
- ✓ Analog and digital interface for external sensor connectivity and pulse counting (MPI)
- ✓ Low power consumption, 5 – 10 years of battery operational life with 2 x AA Li-SOCI2 Battery
- ✓ Optional DC 5V power source
- ✓ Integrated internal antenna, or optional external SMA/IPEX antenna
- ✓ Up to 5km reach in NLoS (Non-Line-of-Sight) and up to 18km LoS (Line-of-Sight) environments
- ✓ IP67 enclosure rating





## Application Architecture



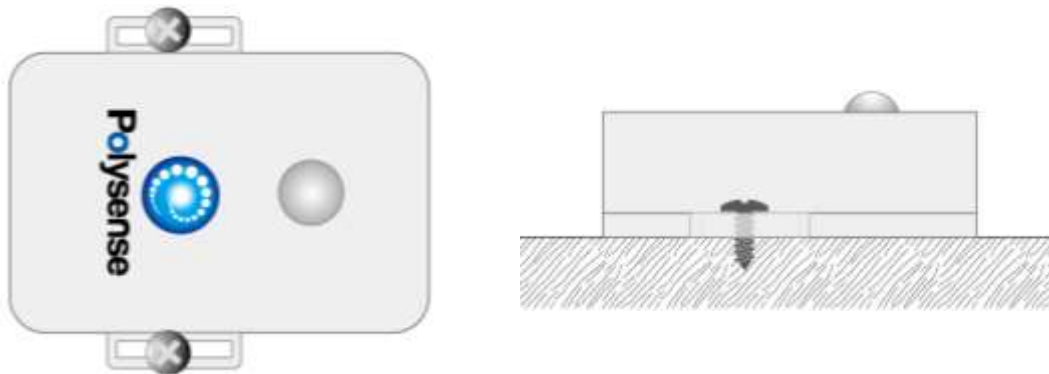
Platform control, stabilization, and alignment;  
Tilt sensing, inclinometers, leveling;

## Specifications

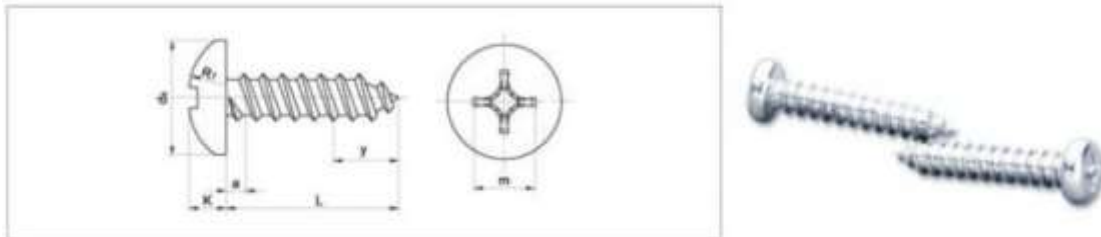
Parameter	Value
<b>Sensor</b>	
Dual-axis	horizontal operation, $\pm 90^\circ$
Single-axis,	vertical operation, $\pm 180^\circ$
High accuracy	0.1°
Digital inclination data	0.025° resolution
Digital acceleration data	0.244 mg resolution
acc measurement range	$\pm 1.7$ g
powered shock survivability	3500 g
Data Report	Cross-threshold report, plus periodic report every 2 hours (the threshold and the periodic report cycle are both user-configurable)
<b>Wireless</b>	
ISM Band	EU 863 – 870MHz; US 902 – 928MHz China 779 – 787MHz; EU 433MHz AS 923MHz; CN 470 – 510MHz
Maximum Link Budget	168dB
Distance	Up to 5km NLOS; up to 18km LOS
Antenna	Integrated internal antenna or external 1/2 wavelength whip antenna (SMA)
<b>Mechanical</b>	
Dimension	60mm x 100mm x 30mm (WxS8800)
IP rating	IP67 (WxS8800)
Operating Temperature	-40C to +85C (WxS8800); -40C to +125C (sensor)
Cable length	0.5 meters
Total Weight	120 g
<b>Electrical</b>	
Supply Voltage	3.0 – 3.8 VDC
Power Type	Replaceable 1 or 2 AA 3.6V Li-SOCI2 Battery; DC 4.5V – 12V optional
Battery Life	5 – 10 years (assume one motion event one day)
<b>Compliance/Certification</b>	
 LoRa Alliance	LoRaWAN 1.0.2
	FCC ID: 2A07W-WXS8000, IC: 23701-WXS8000

## Installation Guide

Below diagram shows the general installation guide for WxS8800, it can be installed on any flat and solid surface, the lid is contacted with the surface and fixed via 2 self-tapping screws:



Below is the recommendation of the self-tapping screw and its sizes:



螺钉规格		ST2.2	ST2.9	ST3.5	ST4.2	ST4.8	ST5.5	ST6.3
dk	min	3.7	5.3	6.64	7.64	9.14	10.57	11.57
K	min	1.4	2.15	2.35	2.8	3.4	3.7	4.3
m		1.9	3	3.9	4.4	4.9	6.4	6.9
L		4.5mm~100mm						



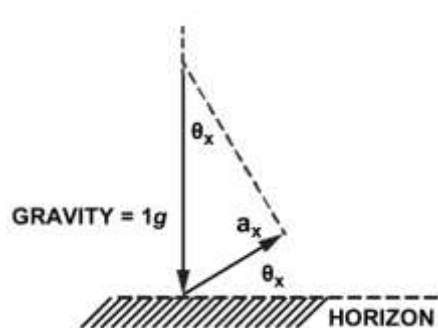
Can be mounted on the external wall by metal brackets for structural monitoring of dangerous buildings

## Product Sample Applications

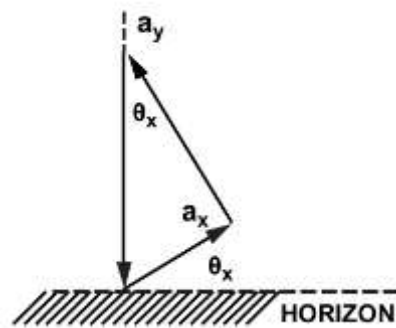


## Sensor principle

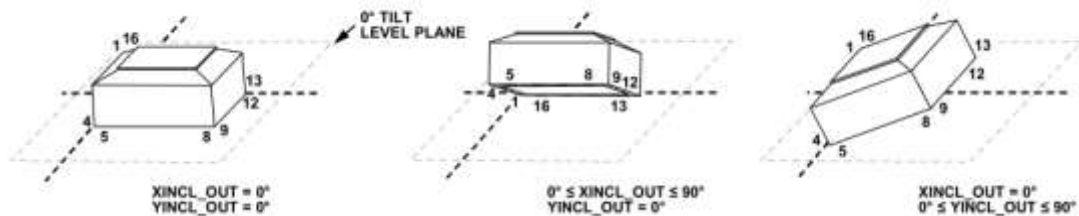
The WxS8800 tilt sensing system uses gravity as its only stimulus, and a MEMS accelerometer as its sensing element. MEMS accelerometers typically employ a tiny, spring-loaded structure that is interlaced with a fixed pick-off finger structure. The spring constant of the floating structure determines how far it moves when subjected to a force. This structure responds to dynamic forces associated with acceleration and to static forces, such as gravity.



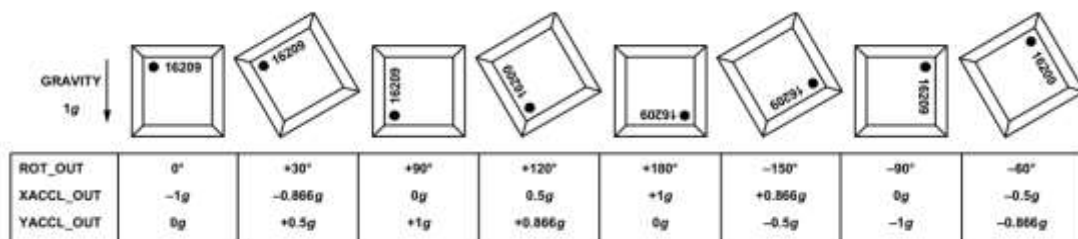
Single-Axis Tilt Theory Diagram



Dual-Axis Tilt Theory Diagram



Horizontal Incline Angle Orientation



Vertical Angle Orientation



# Polysense Technologies

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## About Polysense

Polysense develops products and solutions for Industrial IoT and smart homes, including distributed fiber sensing, LPWAN LoRa and NB-IoT based wireless IoT sensors, Passive Optical Network (PONs) and cloud based data management and analytic platform.

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