

WxS 880-017

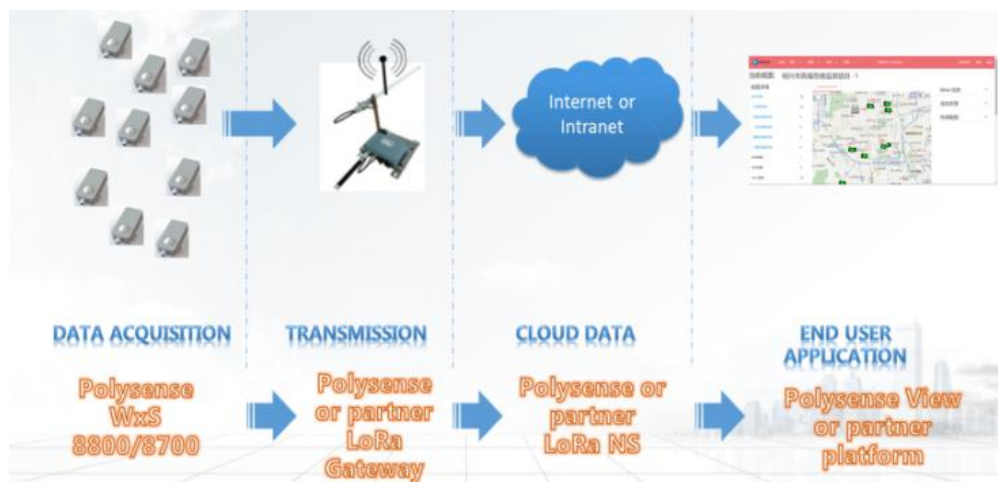
LoRaWAN distance sensor

Product Highlights

- ✓ Long-life conductive plastic material, made of high-precision displacement sensor.
- ✓ Displacement range 50mm, accuracy 0.01mm
- ✓ Used for long-term monitoring and recording of cracks at high altitudes and locations that are not easily accessible to structures
- ✓ 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 and Sample Applications



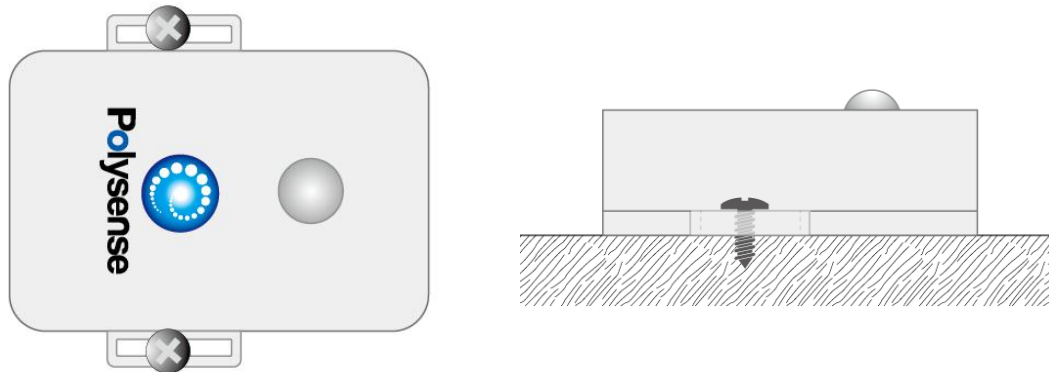
Building structure inspection , bridge structure inspection , highway slope detection

Specifications

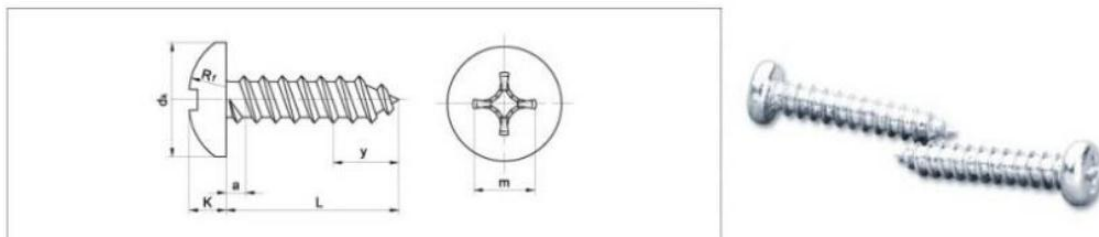
Parameter	Value
Sensor	
Displacement range	0~50mm
Linearity	±0.05% FS
Resolution	0.01mm
Temperature range	-60~150°C
Service life	> 100*10 ⁶ times
Maximum operating speed	10M/S
Protection level	IP65
Data Report	Cross-threshold report, plus periodic report every 2 hours (the threshold and the periodic report cycle are both user-configurable)
Wireless	
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)
Mechanical	
Dimension	60mm x 100mm x 30mm (WxS8800)
IP rating	IP67 (WxS8800)
Operating Temperature	-40C to +85C (WxS8800);
Cable length	0.5 meters
Total Weight	120 g
Electrical	
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)
Compliance/Certification	
 LoRa Alliance	LoRaWAN 1.0.2
 FC  Industry Canada	FCC ID: 2A07W-WXS8000, IC: 23701-WXS8000

Installation Guide

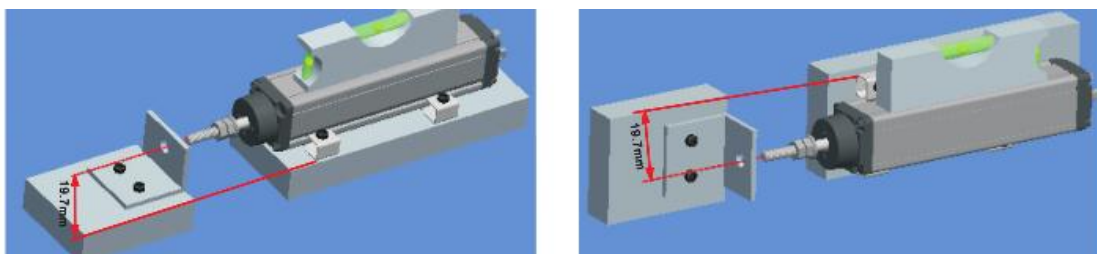
Below diagram shows the general installation guide for WxS8800, it can be installed on any flat and solid surface, the lid is contacted with the surface and fixed via 2 self-tapping screws:



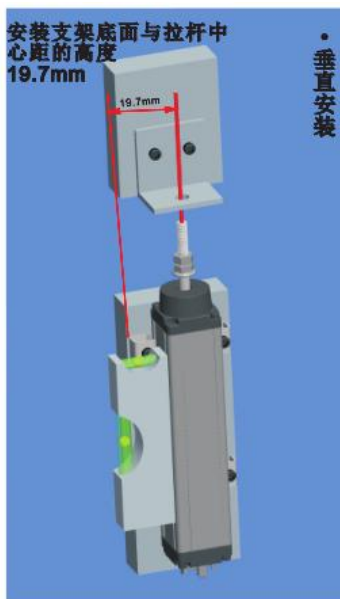
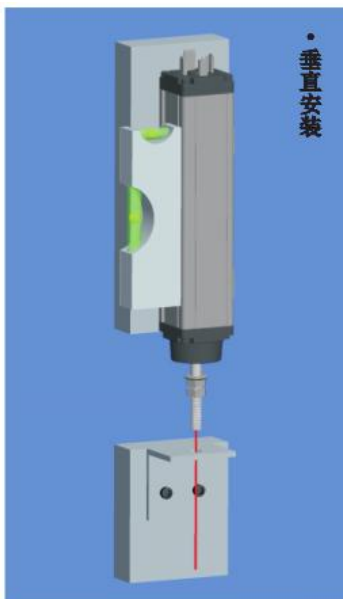
Below is the recommendation of the self-tapping screw and its sizes:



螺纹规格		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						



Horizontal installation



■ Vertical installation



■ The sensor has a good anti-stain structure inside.
Protection class IP65



■ Consider the long-term outdoor work and configure an outdoor waterproof box.



■ The picture on the left is the crack detection of the dangerous structure of POLYSENSE in Shaoxing, China.

Product application



Cracks in the bridge structure and expansion joints reserved for the bridge



Structural cracks in beams, walls, panels, etc. of old buildings



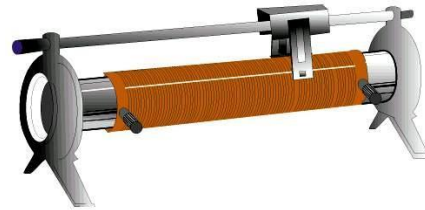
Crack detection of external walls of historical heritage buildings



Structural crack detection of important venues

Sensor principle

The function of the linear displacement sensor is to convert the linear mechanical displacement into an electrical signal. In order to achieve this effect, the variable resistance rail is usually placed at a fixed portion of the sensor. Different resistance values are measured by the displacement of the slider on the slide rail. The sensor rail is connected to a steady-state DC voltage that allows a small current to flow through the microamperes, and the voltage between the slider and the start is proportional to the length of the slider movement. Using the sensor as a voltage divider minimizes the accuracy of the total resistance of the rail, as changes in resistance caused by temperature changes do not affect the measurement.



Depending on the application scenario, the following is a multi-format displacement sensor appearance available.



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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