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WxS 880-019MR

LoRaWAN Microwave radar sensor

Product Highlights

- ✓ The microwave sensor is a sensor that uses the Doppler principle to transmit and receive high-frequency microwave signals (accurately sense the movement of an object), and to generate an alarm signal through signal amplification and intelligent recognition of a single-chip program.
- ✓ The spherical detection radius is 4~5 meters, which can penetrate non-metallic objects to identify moving objects.
- ✓ 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
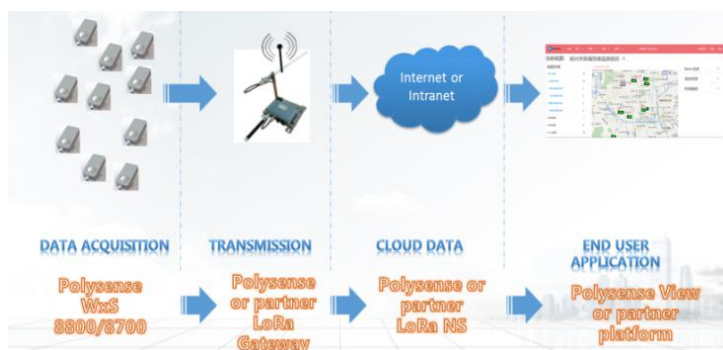
Smart City
Intelligent building
Smart security
Intelligent rail transit

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Specifications

| Parameter	Value
Sensor	
Detection radius	5 meters
Detection behavior	movement of people (objects)
Installation location	height > 2 meters or room top
Working environment	indoor and outdoor optional
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)；-20C to +80C (sensor)
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-SOCl2 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 IC	FCC(America): 2AO7W-WXS8000, IC(Canada): 23701-WXS8000 CE(European Union)：B1810246 ROHS(European Union): R2BJ180927F0664E

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:
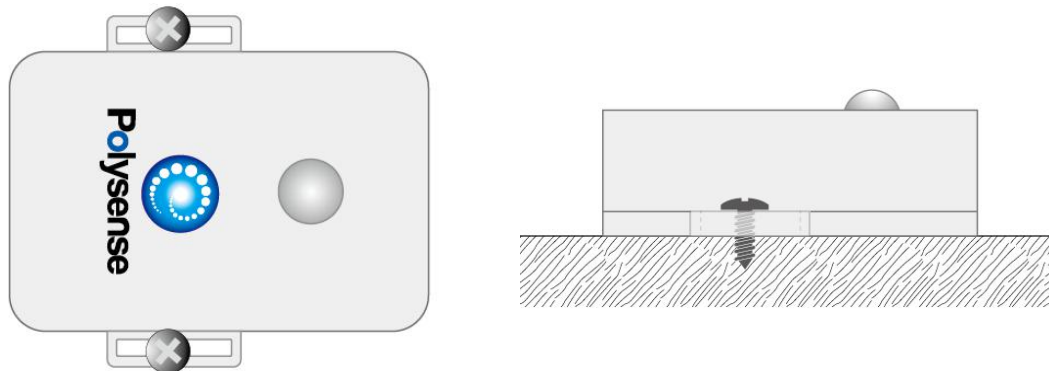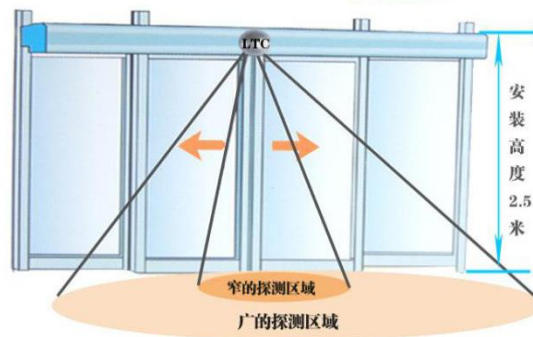
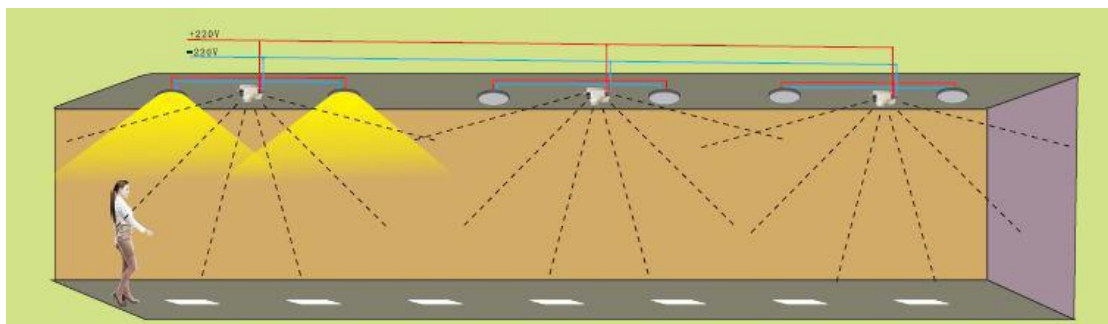Below is the recommendation of the self-tapping screw and its sizes:
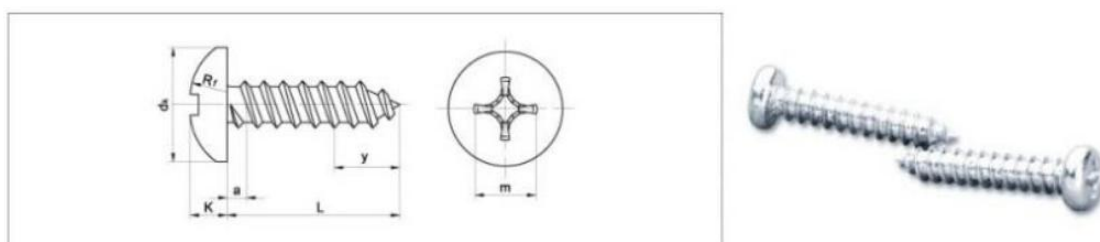
| 螺纹规格		ST2.2	ST2.9	ST3.5	ST4.2	ST4.8	ST5.5	ST6.3
dk	min	3.7	5.3	6.64	7.64	9.14	10.57	11.57
K	min	1.4	2.15	2.35	2.8	3.4	3.7	4.3
m		1.9	3	3.9	4.4	4.9	6.4	6.9
L		4.5mm–100mm						

Product application scenario

Opening of the automatic door: After the detecting personnel approach the gate, the system is notified to open the corresponding motor.


Intelligent corridor lights: evenly distribute the sensors according to the length of the corridor. When the person moves, the sensor commands the system to turn on the corresponding light.
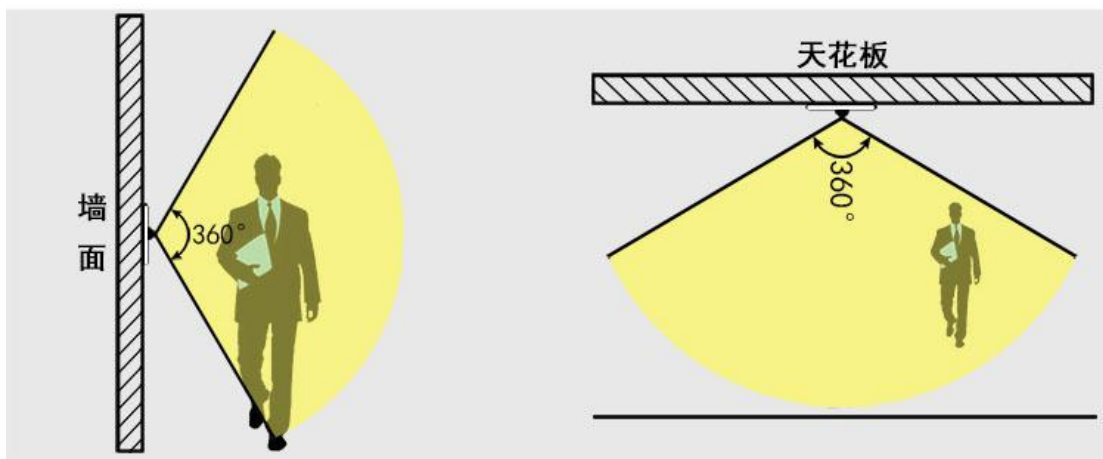
Space personnel detection: detect signs of activity in offices, conference rooms, corridors, key security and other places.

Sensor characteristics

Microwave induction mainly reacts to the movement of an object (human body), and the reaction speed is fast. Suitable for detecting objects that approach or move away from the microwave sensor at a certain speed. For example, a person walking at a certain speed can be easily detected by microwave through a certain place.
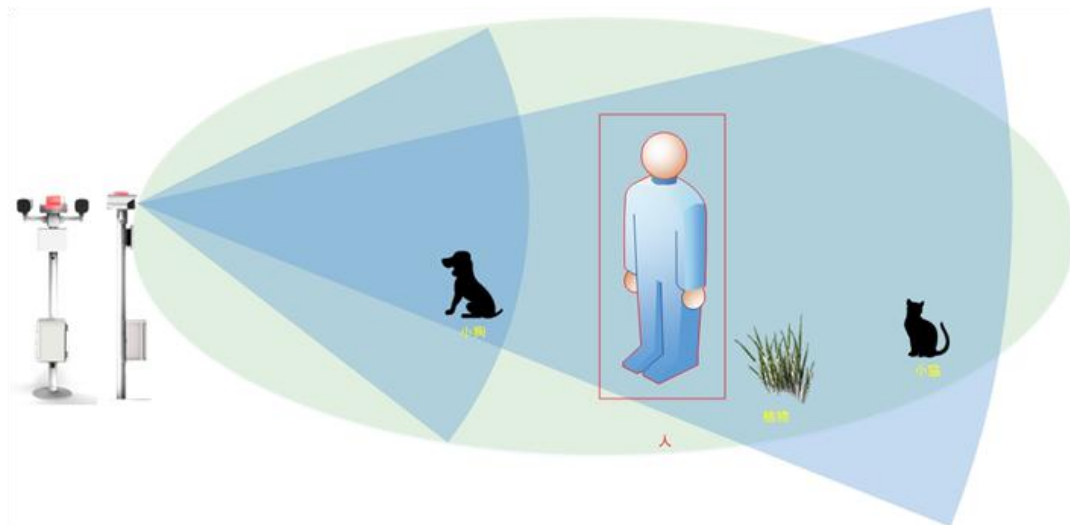

■   The difference between microwave radar and infrared detection sensor

Infrared detector probes work by detecting infrared rays emitted by human bodies or other objects. The disadvantage is that it is easily interfered by various heat sources and light sources. After the infrared radiation of the human body is blocked, it is not easily received by the probe. When the ambient temperature is close to the human body temperature, the detection and sensitivity are significantly reduced.

The radar switch senses farther distances, has a wide angle, has no dead zone, can penetrate glass, and thin wood. Depending on the power, you can penetrate walls of different thicknesses. Not affected by the environment, temperature, dust, etc. The temperature is constantly changing at 37 degrees, and does not affect the sensing ability.

Sensor principle
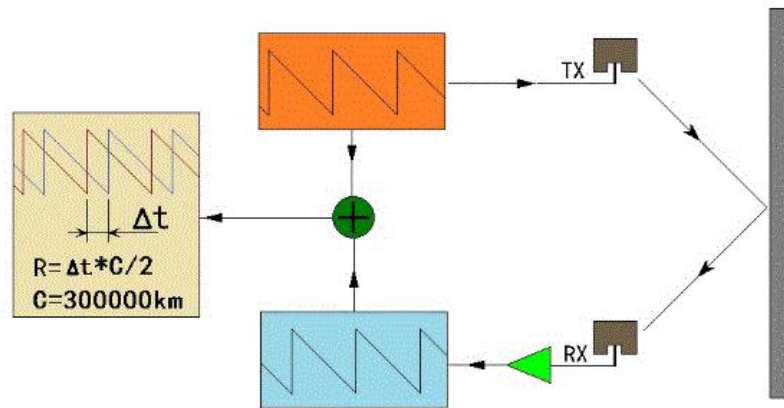
Microwave Inductive Sensor: Also known as microwave radar, it utilizes the Doppler working principle of electromagnetic waves. Any wave has a characteristic of reflection. When a wave of a certain frequency hits the barrier, a part of the wave is reflected back. If the barrier is stationary, the wavelength of the reflected wave is constant. If the barrier moves toward the source, the wavelength of the reflected wave is shorter than the wavelength of the source. Microwave induction is to sense whether an object moves by changing the reflected wave.

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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