Wireless AI Occupancy Sensor

Featuring LoRaWAN®

VS321

◆ Introduction

VS321 is a low-power, battery-operated wireless occupancy sensor empowered by advanced AI algorithms. It achieves up to 95% occupancy detection accuracy powered by its AI algorithm. It is equipped with built-in temperature, humidity, and ambient light sensors to provide comprehensive environmental monitoring. Its wire-free design enables effortless and flexible installation.

With simple configuration and wireless detection, VS321 can be integrated with the Milesight LoRaWAN® gateway and Milesight Development Platform, enabling remote monitoring, data visualization, and centralized management. As a Milesight D2D controller, VS321 seamlessly communicates with other Milesight D2D devices, peer-to-peer interaction without gateway dependency.

VS321 can be used in scenarios such as meeting rooms, offices, and campuses to detect space occupancy or personnel activity.

◆ Features

- Achieves up to 95% detection accuracy with advanced AI recognition and analysis technologies

- Adopting a low-power AI chip and PIR triggered detection, combined with scheduled hibernation, effectively reduces overall power consumption
- Supports switching between People Counting and Desk Occupancy modes to meet various needs across different scenarios
- Integrates temperature, humidity and light sensors to enable comprehensive environmental awareness and intelligent scenario-based control
- Wireless and battery-operated design ensures simple, fast and easy installation
- Stores local historical records and supports retransmission to prevent data loss
- Fully GDPR-compliant, with no image collection, ensuring privacy and data security
- Supports Milesight D2D protocol for ultra-low latency, direct device-to-device control without a gateway
- Fully compatible with standard LoRaWAN® gateways and network servers
- Supports remote monitoring and management via the Milesight Development Platform

◆ Specifications

Measurement	
People Counting & Occupancy Detection	
Field of View	129 ° Horizontal, 93 ° Vertical
Installation Height	2.4m ~ 4m
Required illumination	50 Lux
PIR Measuring Angle	115°
PIR Detection Area	Radius: 4 m (15°C, 3m Installation Height)
Recognition Rate	Up to 95%[1]
Temperature	
Operating Principle	Digital CMOSens® technology (MEMS)
Measuring Range	-40 °C~125 °C
Accuracy	±1 °C
Resolution	0.1 °C
Humidity	
Operating Principle	Digital CMOSens® technology (MEMS)
Measuring Range	0~100 %RH
Accuracy	± 2.5 %RH
Resolution	0.5 %RH
Light	

Operating Principle	Photodiode
Status	Bright/Dim
Transmission	
Protocol	LoRaWAN®, Milesight D2D
Antenna	Internal Antenna
Frequency	CN470/IN865/RU864/EU868/US915/AU915/KR920/AS923-1&2&3&4
Tx Power	16 dBm (868 MHz)/20 dBm (915 MHz)/19 dBm (470 MHz)
Sensitivity	-137 dBm @300bps
Work Mode	OTAA/ABP Class A
Others	
USB	1 × Type-C Port for Power Supply
LED Indicator	1 × Status Indicator
Button	1 × Multi-function Button
Software	
Configuration	Bluetooth
Advanced Feature	Milesight D2D Controller, Data Storage (2045 entries), Data Retransmission, Data Retrievability, Threshold Alarm, Hibernate Mode
Physical Characteristics	
Power Supply	1) 4 × 2700 mAh ER14505 Li-$SOCl_2$ Replaceable Batteries 2) DC 5V/ 1A by Type-C Port
Battery Life[2] (Working 12h per day, 2-min detection interval, 25 °C)	Around 4.4 Years (SF7, EU868) Around 4.1 Years (SF7, US915) Around 2.5 Years (SF10, EU868 & US915)
Operating Temperature	0°C ~ +30°C
Relative Humidity	0 ~ 95% (Non-condensing)
Ingress Protection	IP30
Housing&Color	Plastic (UL94, V2) & White/Black (Optional)
Weight	145g (Batteries excluded)
Dimension	100 × 100 × 26 mm (3.94 × 3.94 × 1.02 in)
Installation	Ceiling Mounting (Screws or Adhesive Backed Fixed)
Approvals(Planned)	
Regulatory	CE, FCC
Environmental	RoHS

[1] Tested within Optimal Detection Range.

[2] Tested under laboratory conditions and for guideline purposes only.

◆ Detection Range

To fully leverage the AI capabilities, it is recommended to follow the installation height guidelines below:

Object	Height
Sedentary object	> 2.4 m
Standing object	> 3 m

For accurate people counting, please refer to the following detection ranges corresponding to different installation heights:

Installation Height (m)	Effective Detection Range (m^2)*	Optimal Detection Range (m^2)*
2.4m	2.6m × 5.0m	1.4m × 3.0m
2.5m	2.3m × 5.2m	1.6m × 3.6m
2.6m	2.6m × 5.6m	1.8m × 4.0m
2.7m	2.8m × 6.1m	2.0m × 4.3m
2.8m	3.1m × 6.3m	2.1m × 4.6m
2.9m	3.4m × 6.8m	2.3m × 5.0m
3.0m	4.0m × 7.2m	2.3m × 5.0m
3.1m	4.0m × 7.6m	2.7m × 5.7m
3.2m	4.1m × 8.0m	2.9m × 6.0m
3.3m	4.4m × 8.4m	3.0m × 6.4m
3.4m	4.7m × 8.7m	3.3m × 6.7m
3.5m	5.0m × 9.0m	3.3m × 7.4m
3.6m	5.2m × 9.5m	3.0m × 7.5m
3.7m	5.5m × 9.8m	3.8m × 7.8m
3.8m	5.7m × 10.2m	4.0m × 8.1m
3.9m	6.0m × 10.6m	4.2m × 8.4m
4.0m	6.0m × 11.0m	4.6m × 8.7m

* The effective and optimal detection range may differ with the height of the person being detected.

◆ Dimensions (mm)