# AI Workplace Occupancy Sensor

# VS121

## ◆ Introduction

Milesight VS121, is an AI workplace sensor designed to monitor occupancy and utilization in modern workspace, which can reach up to 98% recognition rate[1] based on its AI algorithm. Milesight VS121 has dual versions transmitting data through LoRaWAN® or Ethernet for different applications.

Based on standard LoRaWAN® protocol, VS121 can work with Milesight LoRaWAN® gateway and mainstream LoRaWAN® network servers. They are equipped with Wi-Fi for easy configuration without any configuration tools.

With Ethernet transmission, VS121-P is available to provide more applications. Rich serial interfaces such as DI, DO, and RS485 are provided in VS121-P for various scenarios. VS121-P supports data push via HTTP(S)/MQTT(S) for easily integration and allows for remote management via Milesight DeviceHub or Milesight Development Platform.

VS121 can be used in workplaces, retail stores and airports, etc.



**VS121** **VS121-P**

# ◆ Features

## Shared Values

- Recognition rate is up to 98%[1] based on advanced AI identification and analysis technologies
- Wide installation height and detection range with two versions for various scenarios
- Compliant with GDPR without images collected, free from privacy concerns
- Support regional people counting, occupancy detection and dwell time detection
- Support up to 16 mapped regions for detection
- Allow for bi-directional line-crossing people counting and people flow analysis
- Smart U-turn counting to filter redundant counting of people wandering around the area
- Support people flow analysis to calculate the traffic from different directions
- Support normal or blur mode and privacy masks up to 8 regions
- Support local data storage and data retransmission to collect data securely

## LoRaWAN® Version Only

- Equipped with Wi-Fi for web GUI configuration
- Support Milesight D2D protocol to enable ultra-low latency and directly control without gateway
- Function well with standard LoRaWAN® gateways and network servers
- Quick and easy management with Milesight IoT Cloud

## PoE Version Only

- Support scheduled detection
- Support Milesight DeviceHub or Milesight Development Platform management remotely
- Adapt to more applications with rich industrial interfaces
- DC or PoE power supply optional
- High compatibility of data transmission via Ethernet port (HTTP/MQTT/HTTP API/HTTPS)
- BACnet/IP native integration for building management systems

# ◆ Specifications

| Model | VS121 | VS121-P |
|---|---|---|
| **People Counting** | | |
| Field of View | 190 ° Horizontal, 112 ° Vertical | |
| Installation Height | 2.3m to 4m | |
| **Advanced Function** | | |

| | | |
|---|---|---|
| Regional People Counting & Dwell Time Detection | Up to 16 areas (up to 10 sides for each area) for regional people counting and dwell time detection | |
| Bi-Directional People Counting | Support | |
| U-turns Filtering | Filter redundant counting of people wandering in the bi-directional people counting areas | |
| People Flow Analysis | Calculate the traffic of different directions at most 4 edges | |
| Privacy Mask | Up to 8 privacy masks to cover certain areas | |
| Data Retransmission | Support 1000 data retransmission packets | MQTT(S): Support 1000 data retransmission packets<br>HTTP(S): Up to 3 × 1000 data retransmission packets |
| **LoRaWAN® Transmission** | | |
| Protocol | LoRaWAN®, Milesight D2D | --- |
| 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 | |
| Mode | OTAA/ABP Class C | |
| **Ethernet Transmission** | | |
| Ethernet Port | - | 1 × RJ45 10/100 Mbps (PoE PD) |
| Ethernet Isolation | | 1.5 kV RMS |
| Network Protocol | | MQTT(s), HTTP(s), RTSP, NTP, SSH, BACnet/IP, etc. |
| **Other Interfaces** | | |
| Wi-Fi | IEEE 802.11 b/g/n, 2.4GHz (AP Mode for Configuration) | - |
| DI/DO | - | 1 × DI, 1 × DO |
| Serial Interface | - | 1 × RS485 (Under development) |
| Button | 1 × Reset Button,1 × Wi-Fi Button | 1 × Reset Button |
| LED Indicators | 1 × Status | |
| Power Input | - | 2-pin 3.5 mm Terminal Block |
| **Physical Characteristics** | | |
| Power Supply | DC 5V/ 2A by Type-C Port | 1. DC 5V/2A by Terminal Block |

| | | |
|---|---|---|
| | | 2. 802.3af PoE |
| Power Consumption | 8.1W | 1. DC:6.5W<br>2. POE:7.2W |
| Operating Temperature | -20°C ~ +60°C | |
| Relative Humidity | 0 ~ 95% (Non-condensing) | |
| Ingress Protection | IP30 | |
| Housing | PC + Cast Aluminium | |
| Color&Weight | White/Black (Optional), 130g | White, 178.6g |
| Dimension | 85 × 85 × 20 mm<br>(3.35 × 3.35 × 0.79 in) | 85 × 85 × 30 mm<br>(3.35 × 3.35 × 1.18 in) |
| Installation | Ceiling Mounting | |
| **Approvals** | | |
| Regulatory | CE, FCC, SRRC GDPR | CE, FCC, SRRC, GDPR |
| Environmental | RoHS | |

## ◆ Installation Height and Detection Range

To better utilize the advantage of AI algorithm, it's recommended to follow the below installation heights:

| Object | Height | Note |
|---|---|---|
| Sitting object | >2.5 m (8.2ft) | Commonly used for region people counting |
| Standing object | > 3 m (9.8ft)<br>(the optimum height is 3m) | Commonly used for line cross counting |

It's recommended to refer to below detection ranges[2] for people counting at different heights for accurate recognition:

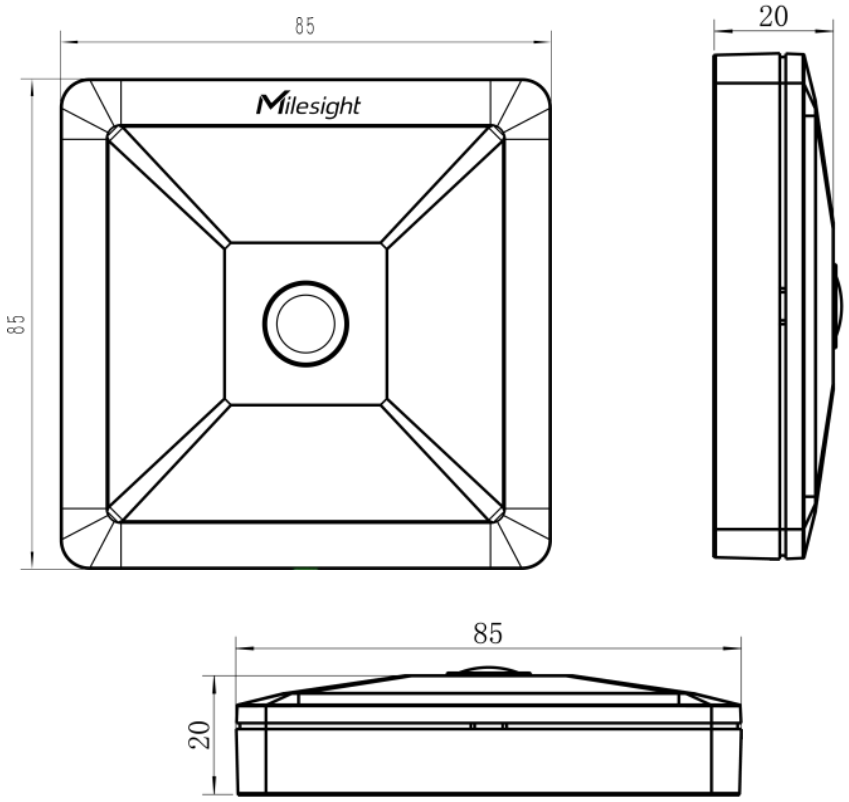
| Installation Height (m) | Detection Range ($m^2$) |
|---|---|
| 2.3 | 2.6 × 8.6 |
| 2.5 | 3.2 × 9.8 |
| 2.7 | 4.2 × 13.6 |
| 3.0 | 4.8 × 14.0 |
| 3.2 | 5.2 × 15.4 |
| 3.5 | 6.0 × 17.0 |
| 4.0 | 6.8 × 18.8 |

[1] Tested for line-crossing detection within the recommended detection range.

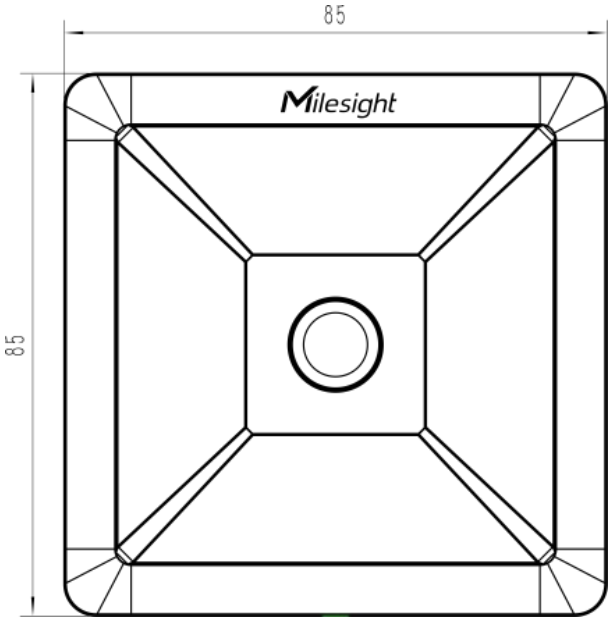
[2] The actual detection range may vary based on the height of the target individual.

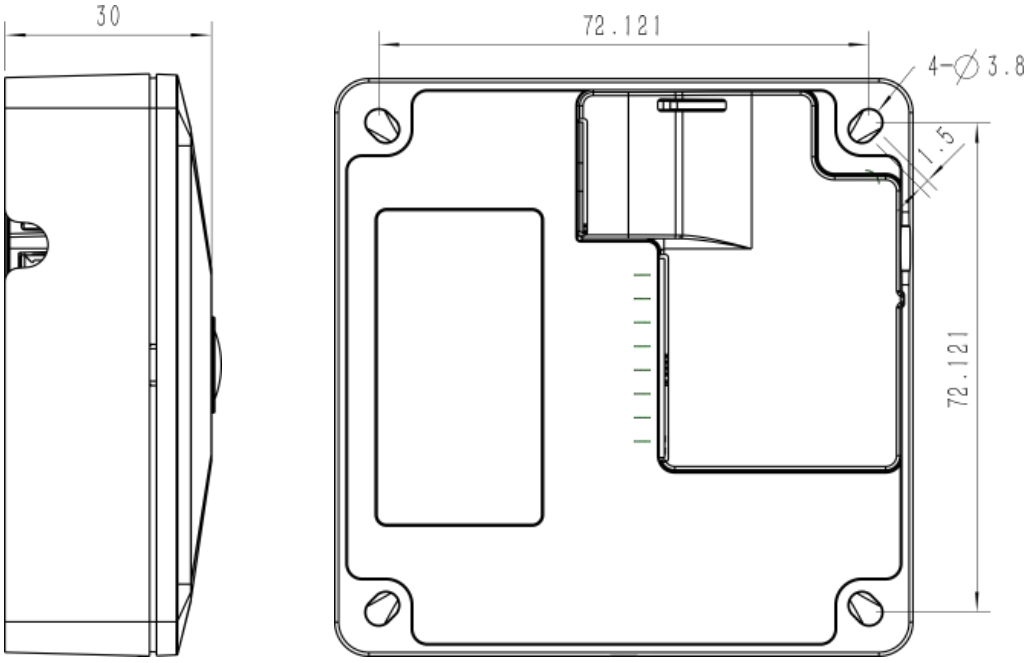
## ◆ Dimensions (mm)

**VS121：**




**VS121-P：**








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