

Specification

Product Name: 24GHz Large-space presence sensor (Tuya Zigbee version)

Product Model: MSA201 Z (Order NO:3022010001022)

Product Version: V1.0

Versions	Release Date	Record	Publishing
V1.0	2024.04.07	Initial release	Jacky

【Product Description】

MSA201 Z is a 24GHz radar sensor based on Merrytek patented orthogonal antenna. Its antenna has high gain and wide detection range. Combined with Merrytek's unique 4th generation human presence detection software algorithm and FMCW modulation, it can accurately detect micro movements brought by human in almost all indoor spaces and provide fast and accurate front-end sensing input for smart home, smart hotel, smart office and other scenes.

【Product Feature】

- Exclusive Merrytek Lifebeing Presence Detection
- FMCW modulation technology applied to detect micro movement brought by breathing
- Merrytek plug-play AI self-learning function to recognize room size itself
- Germany RF technology applied for 5-year guarantee assurance
- Accurate Presence/Absence Output
- Daylight Sensor Available
- Support TUYA ZIGBEE communication
- 24Ghz ISM Band Millimeter Wave Radar technology
- Major/Minor/Micro Motion detection diameter: 7-9m Max
- Major/Minor/Micro Motion detection range are highly coincide
- Round radiation. Effectively managing a whole space by a single sensor
- Flush mounting and Surface mounting installation available
- Sensor parameter adjustable by Tuya APP or MH18 remote
- Sensing function based on millimeter wave radar technology
- Low RF power output. No harm to human health
- Not affected by temperature, humidity, noise, airflow, dust, light and other environments



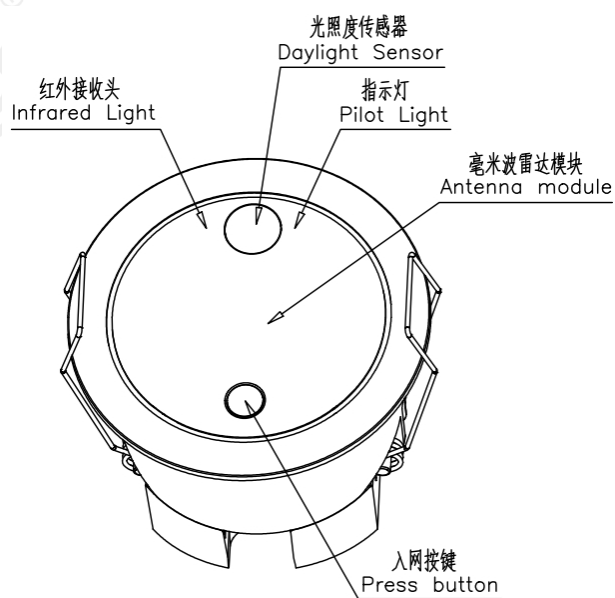
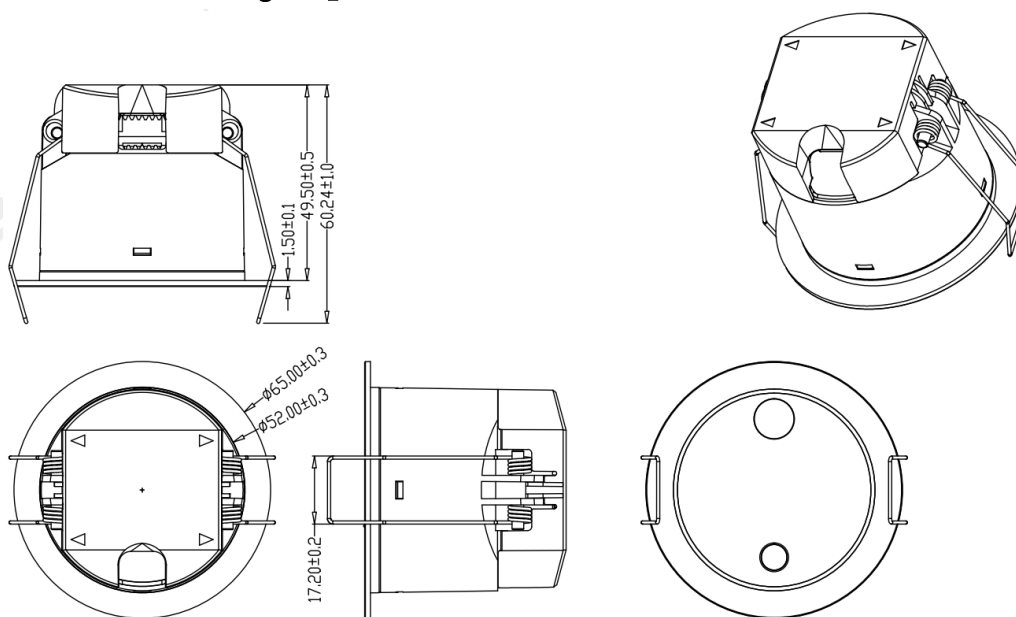
【Product dimension】

- Dimension: $\phi 65 \times 49.5 \text{mm}$
- Connection: 2-pin terminal

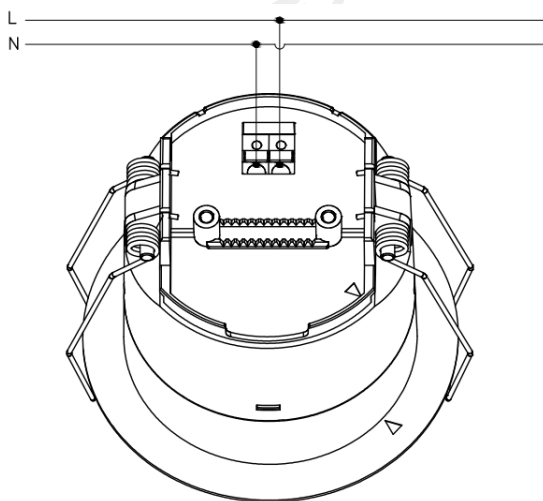
【Parameter】

Input/Output	Input voltage	220-240Vac 50Hz/60Hz
	Rated voltage	220V AC
	Working Current	80mA max
	Working Power	≤1.5W 230V AC
Wireless communication module	Zigbee frequency	2.4GHz-2.484GHz ZIGBEE Transmitting Frequency: 10dB Receiving Sensitivity: -101±2dBm
Sensor Parameter	Radar frequency	24GHz-24.25GHz ISM band
	Transmitting Power	5mW Max.
	Detection Area	APP setting: 0-4m (0.5m per tapping)
	Hold Time	APP setting: 3-7200s
	Daylight change difference	Daylight sensor value will refresh and report when its daylight change reach as you set, you can set 10-100lux by TUYA APP
	Daylight sensor range	0-1295Lux (our daylight sensor can only report the lighting value near it, this might be different from user's application lighting value)
	Radius detection range	major/minor/micro movement (3m height installation) : 4±0.5m (based on 41m² open area test and might change due to different space)
	Remote control	Available(MH18 remote)
	Mounting height	2.5-4.0m typical value:3m
	Detecting Angle	120°
Application Environment	Drill hole	Φ55mm
	Working Temperature	0°C...+50°C
	Storage Temperature	-25°C~+80°C Humidity:≤85% (non-condensation)
Certificate Standard	Certificate	FCC/RED
	Environmental Requirement	Compliant to RoHS
	IP Rating	IP20
	Guarantee	5 year (only for product quality problem)
Note: "N/A" means not available.		

【Dimension and Function diagram】



【Wiring instruction】



Wiring layout suggestion:

1. Our sensor is recommended layout in UPS circle to guarantee instant smart scene execution or electrical appliance operation

【Initialization】

When powered on, sensor indicator will turn off after flashing for 10S and will enter a 20S detection cycle, if there's presence detected, then sensor will report presence and enter hold time calculating, if absence detected, then sensor will report absence. During initialization, sensor will not detect moving signal and you can use our MH10 remote to adjust detection area, hold time and daylight sensor etc parameter.

【Factory setting】

Detection Area: 4m

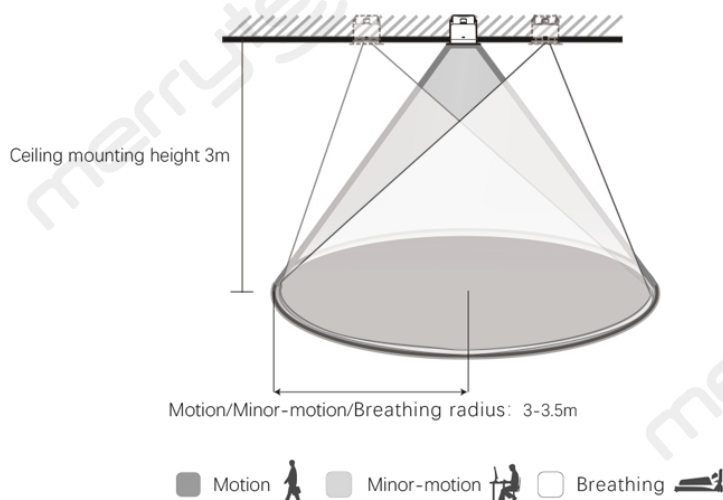
Hold Time: 30s

Indicator light: open

Sensitivity: Medium sensitivity

【Detection radiation】

MSA201 Z is highly recommended ceiling flush mounting and its detection radiation is as below shows:



【Detection Signal】

The product detects human moving, minor moving, and presence signals, and realizes the detection of human-existing/no-human in non-sleep state. The following is a description of the moving, minor moving and presence signals:

- **Major movement:** detect the human significant moving (walking) in the detection area.
- **Minor movement:** detect the human slight moving in the detection area, such as leaning forward, leaning forwarder and back, swinging limbs, shaking head, typing, playing with mobile phones and so on.
- **Micro movement:** detect human abdominal and thoracic expansion behaviors caused by breathing, but not detect moving signal and minor moving signal.



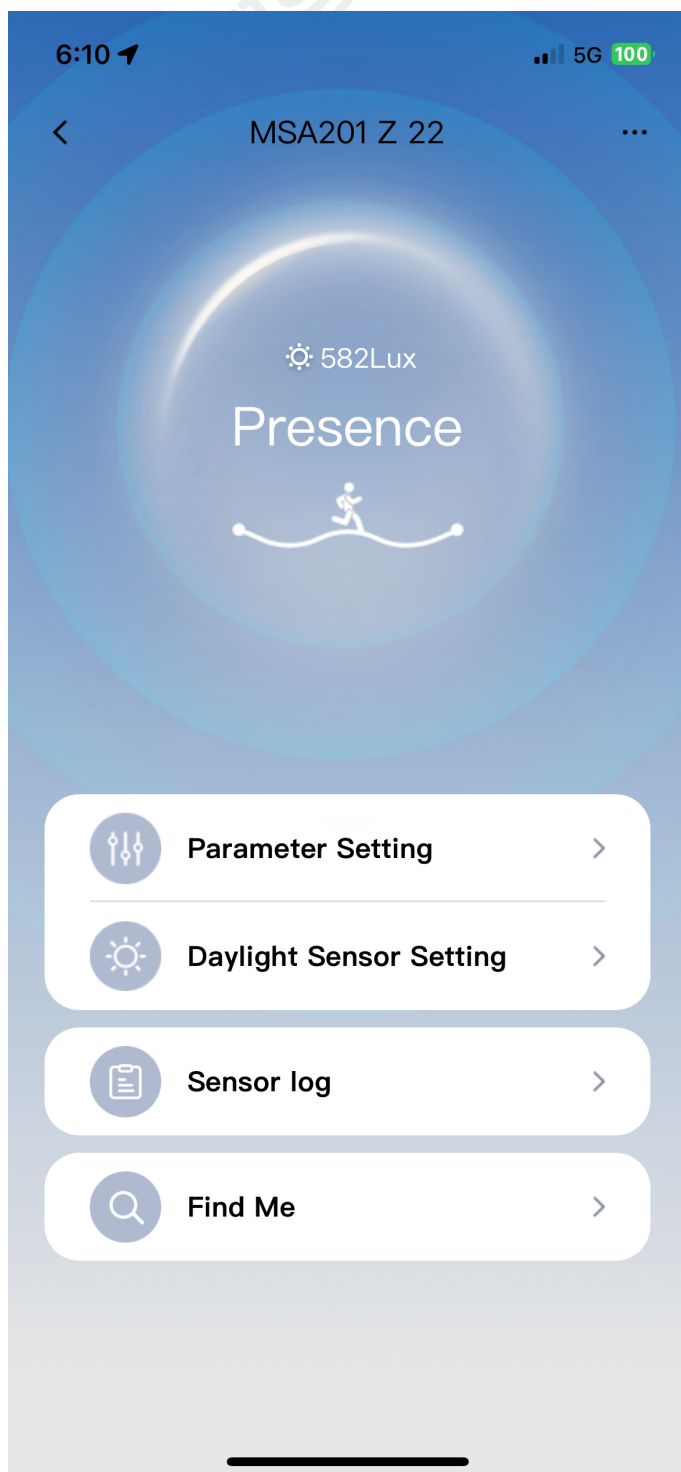
Major movement



Minor movement



Micro movement



Status:

1. Absence: nobody within detecting area
2. Presence: somebody within detecting area
3. Sensor disable: when sensor is disabled, it'll report this status

Status report logic:

1. Presence info will report to tuya cloud when somebody enters the detecting area which was absence
2. Absence info will ONLY report to tuya cloud when nobody is in the detecting area AND hold time runs away

Parameter setting:

It includes all of our sensor's parameter settings; you can set your ideal detection area and eliminate interference by setting proper sensor parameters.

Daylight sensor setting:

It includes daylight sensor's parameter settings.

Sensor log:

It records presence/absence history during a day.

Find me

It reports current environment lux, and the value will only change when lux difference hits the value you set.

【Sensor automation DP introduction】

Sensor IF DP introduction:

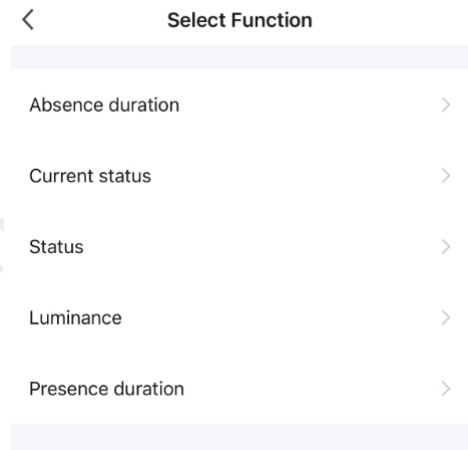
Sensor status: presence\absence\disable sensor

Sensor presence duration: higher\equal\lower than a time interval

Sensor absence duration: higher\equal\lower than a time interval

Luminance: higher\equal\lower than a lux value

Current status: approaching\away



Sensor THEN DP introduction:

Trigger distance setting: 0.5m-4m available

Hold time setting: 3-7200s available

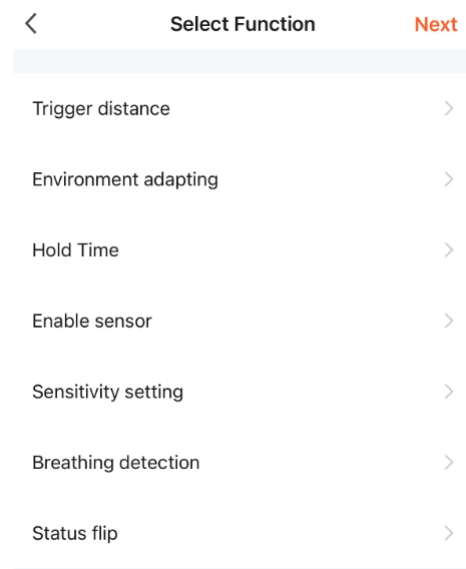
Sensitivity setting: high sensitivity\medium sensitivity\low sensitivity

Breathing detection: enable\disable

Enable sensor: ON\OFF

Environment self-learning: ON/OFF

Status flip: it'll turnover current presence to absence or absence to presence instantly



【Disclaimer】

Due to the complexity of product technology and differences in application environment, it is difficult to guarantee a completely accurate or complete description, so this specification is only for user reference.

We will reserve the right to make changes to the product specifications without notifying the user, and do not make any commitments and guarantees in the legal sense. At the same time, our company encourages users to supplement or modify the contents of our specifications after using our products.