Learn fast! Rd-01 Human Body Induction Module Detailed Tutorial

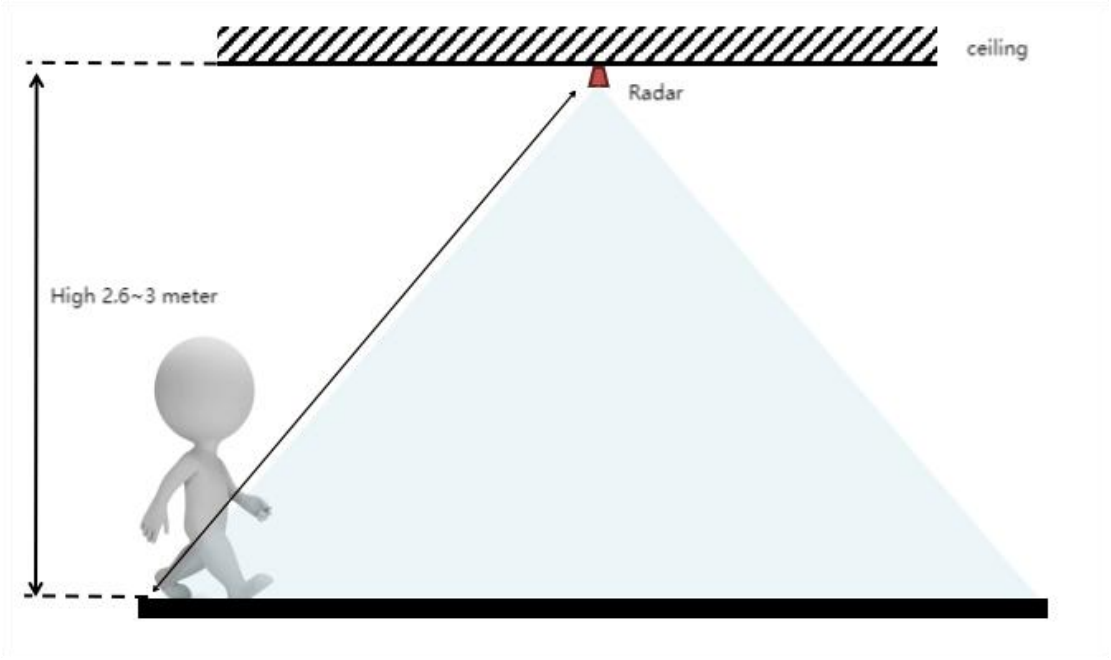
01

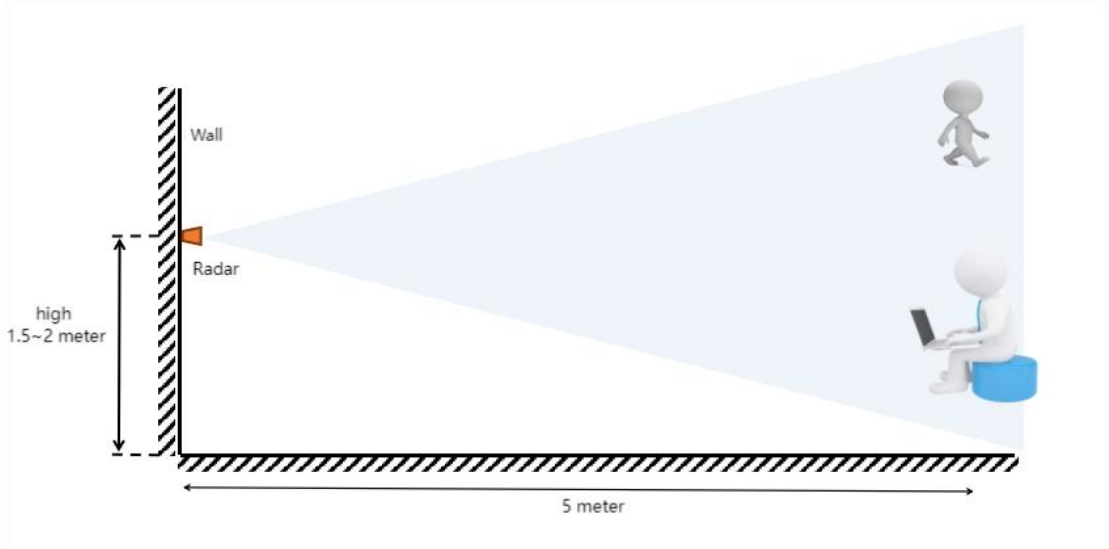
Module related introduction

The working principle of the Rd-01 human body sensing module is to use FMCW FM continuous wave to detect the human body target in the set space, combined with radar signal processing and accurate human body sensing algorithm, to achieve high sensitivity human presence state sensing, can identify the human body in motion and static state, and can calculate the distance of the target and other auxiliary information.

This product is mainly used in indoor scenes, sensing whether there is movement or micro movement of the human body in the area, real-time output of detection results. The maximum sensing distance can reach 5 meters, and the distance resolution is 0.75m. Provide visual configuration tools, which can easily configure the induction distance range, induction sensitivity of different intervals and unmanned delay time, etc., to adapt to different specific application requirements.

Support GPIO and UART output, plug and play, can be flexibly applied to different intelligent scenarios and end products.





02

Application scenarios

Rd-01 human body sensing module can detect and identify the moving, micro-moving, standing, sitting and lying human body, support multi-level tuning, can be widely used in AIoT various scenarios, common types are as follows:

- Human Body Sensor Light Control

Sensing the presence of people in the space, automatic control of lighting, such as lighting equipment in public places, various induction lights, bulb lights, etc.

- Advertising Screen and Other Devices Human Body Induction Awakening

People to automatically open, no automatic sleep to save electricity, information delivery more accurate and efficient.

- Life Safety Protection

UV lamp work protection, to prevent UV lamp in the surrounding people to open the personal injury;

Automatic detection of dangerous places alarms to prevent people from entering specific high-risk Spaces, such as coal mine blasting prohibited personnel to enter high-risk places.

- Intelligent Household Appliance

No one in the room for a long time, TV air conditioning and other electrical appliances automatically shut off, energy saving and safety.

- Intelligent Security

Detection and identification of intrusions, stays, etc. within designated areas.

03

Use and configuration

Factory firmware acquisition

Download link: https://docs.ai-thinker.com/_media/2088_rd-01_v4.18_p1.0.0.zip

Module wiring

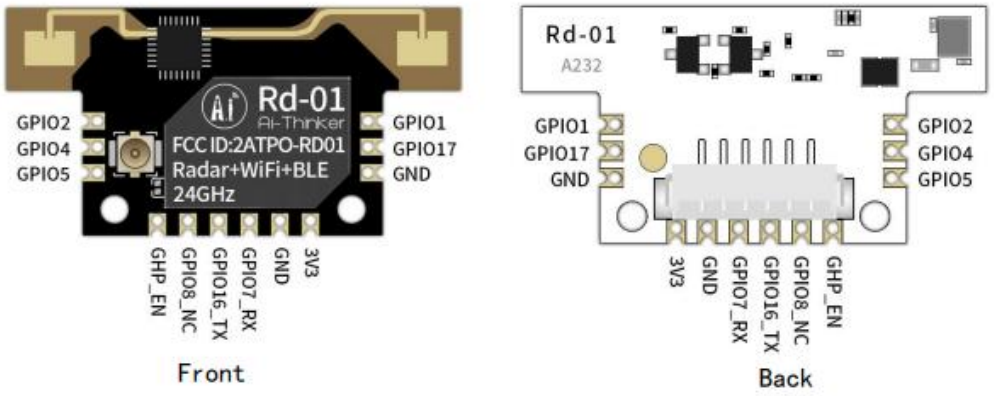


Figure 6 Pin diagram

Rd-01	USB转TTL
3V3	Vo（Near TXD）
GND	GND
GPIO7_RX	TXD
GPIO16_TX	RXD
CHP_EN	RTS

Visual configuration tool description

In order to facilitate users to test and configure the module quickly and efficiently, the host computer configuration tool on the PC is provided. Users can use this tool software to connect the serial port of the module, read and configure parameters of the module, receive the detection result data reported by the module, and perform real-time visual display, which greatly facilitates users' use.

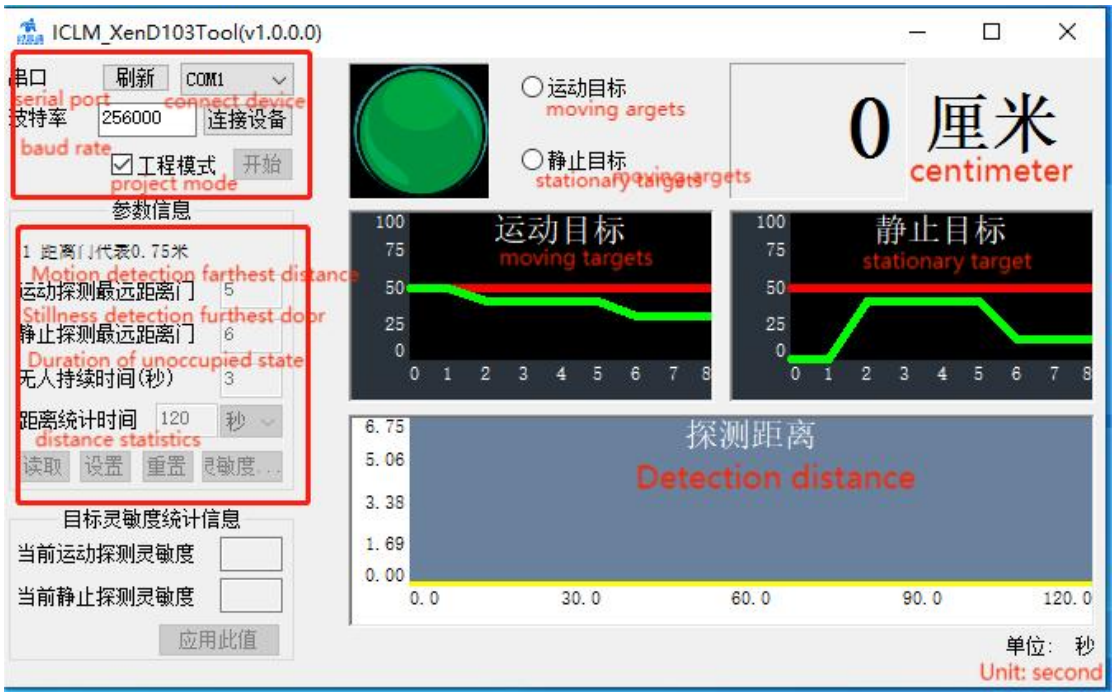
Visual configuration tool Download link:

https://docs.ai-thinker.com/_media/xend103tool.zip

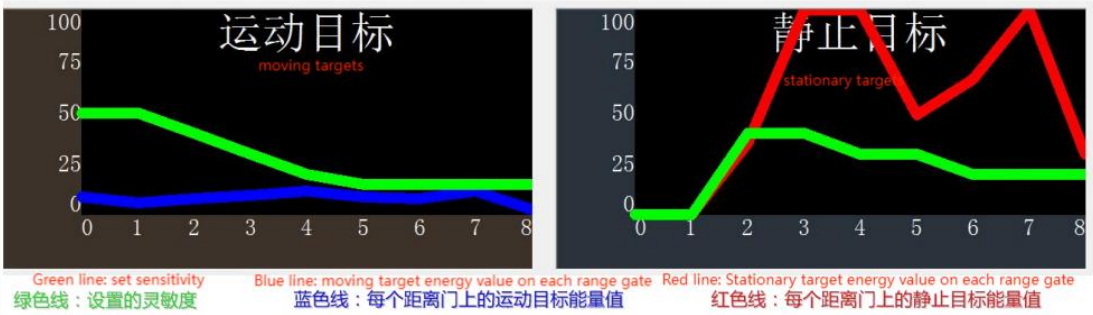
How to use visual configuration tool:

1. Use the USB to serial port tool to correctly connect the module serial port;
2. Select the corresponding serial port number in the upper computer tool, set the baud rate to 256000, select engineering mode, and click Connect device;
3. After the connection is successful, click the Start button, the right graphical interface will display the detection results and data;
4. After the connection, do not click the start button, or click stop after the start, the mode parameter information can be read or set;
5. Note: Parameters cannot be read and configured after clicking Start, and can be configured only after stopping.

The interface and common functions of the visual configuration tool are as follows:



The ball is the target state output indicator: red represents someone as the moving target, purple represents someone as the stationary target; Green for nobody.



Function of configuration parameters

Users can modify module configuration parameters through the serial port of Rd-01 to meet different application requirements. The configuration content is not lost in a power failure. The configurable parameters include the following:

Maximum detection range

Set the farthest detectable distance, and only human objects that appear within this farthest distance will be detected and output results.

Set in unit of distance door, each distance door is 0.75m.

Including motion detection farthest distance door and static detection farthest distance door, the range can be set from 1 to 8, for example, if the farthest distance door is set to 2, only the presence of a human body within 1.5m can be effectively detected and output results.

In addition, if the sensitivity of a distance gate is set to 100, the effect of not recognizing the target under the distance gate can be achieved. For example, if the sensitivity of distance gate 3 and distance gate 4 is set to 20, and the sensitivity of other distance gates is set to 100, it can only detect the human body within the range of 2.25 ~ 3.75m of the distance module.

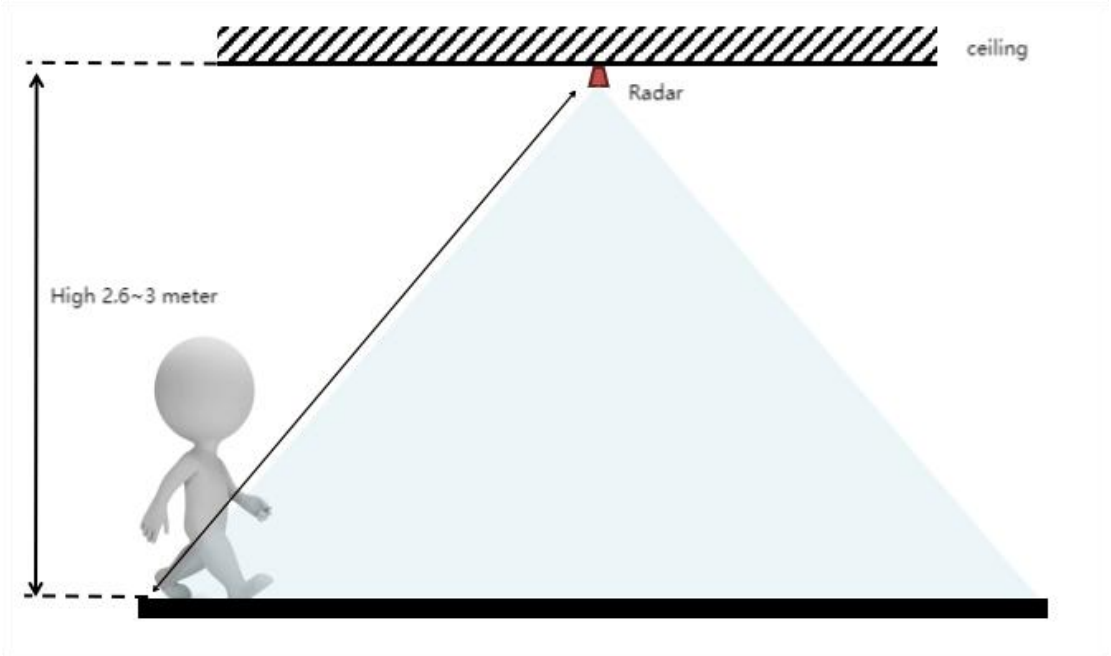
Sensitivity

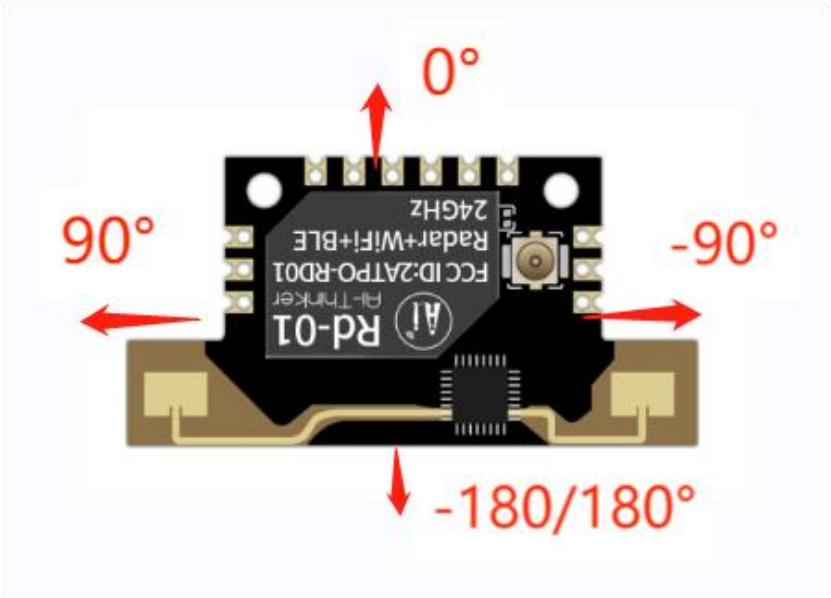
When the detected target energy value (range 0 ~ 100) is greater than the sensitivity value, the target will be judged to exist, otherwise it will be ignored.
The sensitivity value can be set from 0 to 100. Each range gate can be independently set sensitivity, which can be accurately adjusted for detection in different range, local precision detection or filtering of interference sources in a specific area.

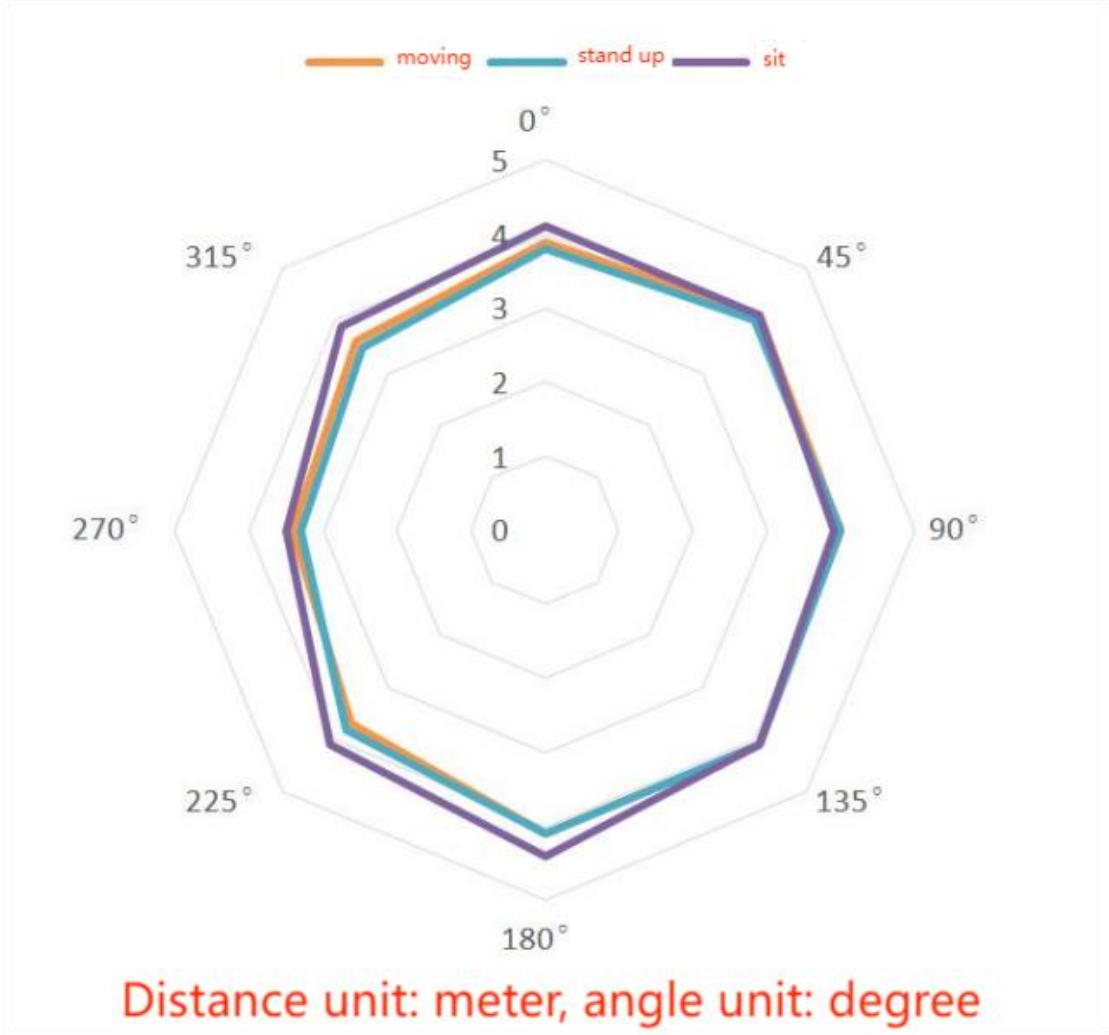
Unmanned duration

When the radar output from human to unmanned results, will continue to report a person for a period of time, if the radar test range continues to be unmanned, radar report no one; If the radar detects someone during this time period, the time is refreshed again, in seconds. It is equivalent to the unmanned delay time. After the person leaves, the state will be output as unmanned only after the duration is kept unmanned.

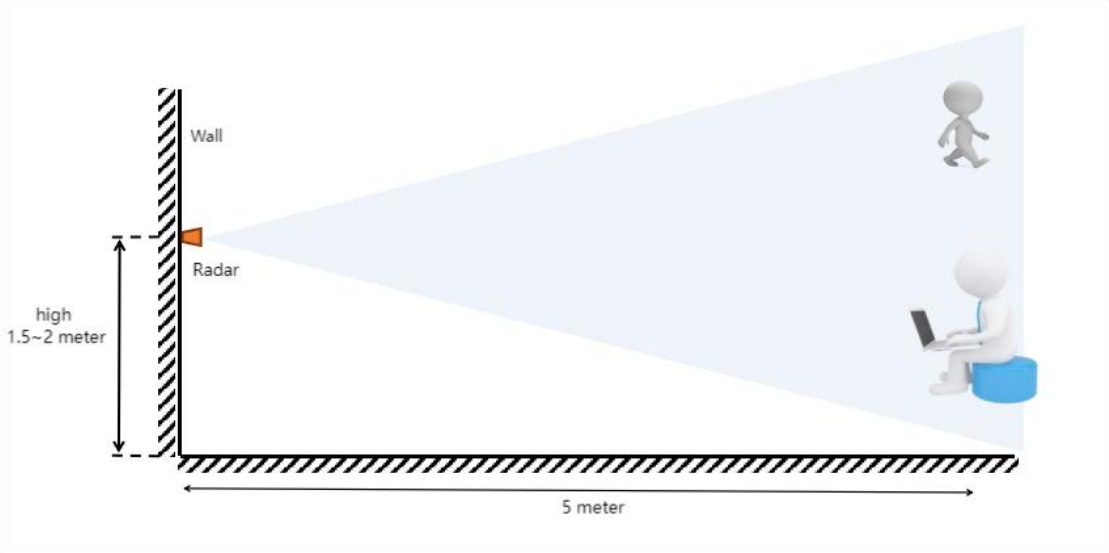
Installation mode and sensing range
1. Roof mounting diagram

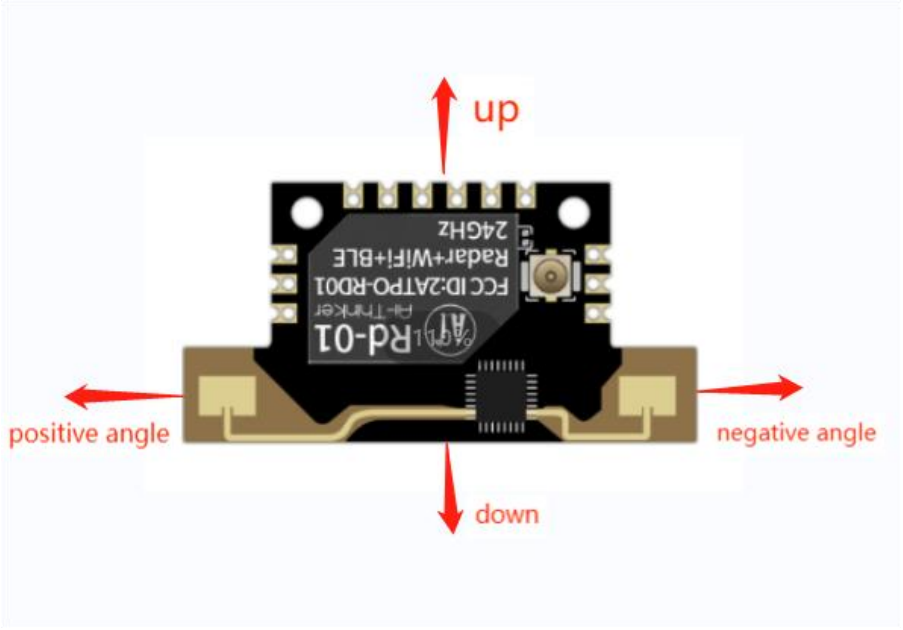


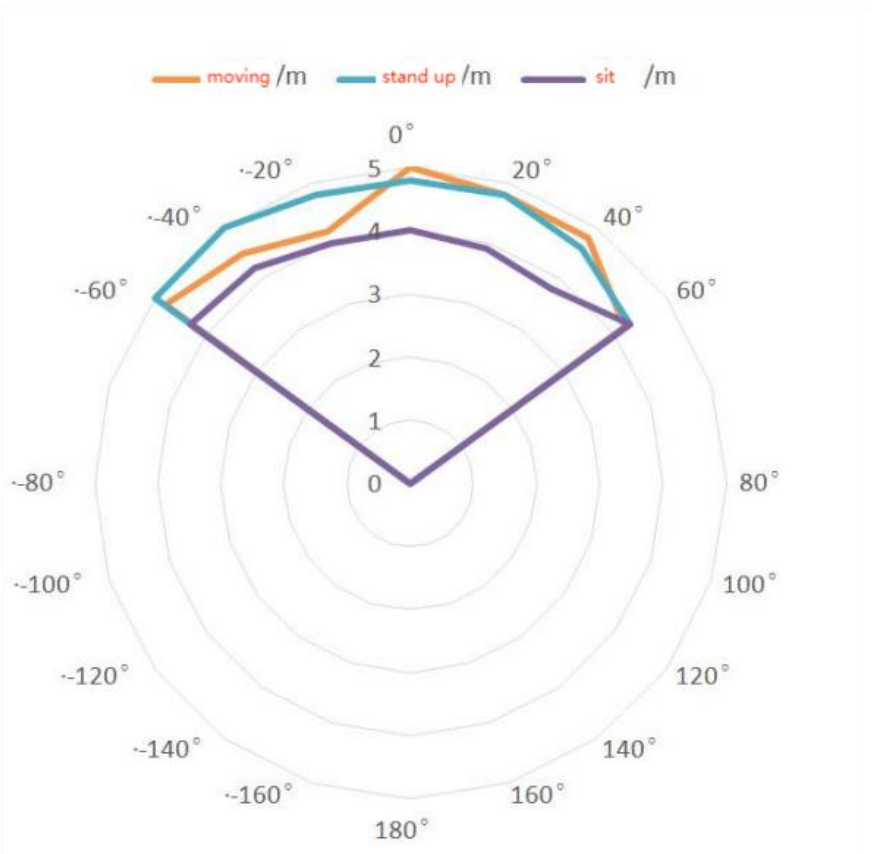

0°
90°
-90°
-180/180°
24GHz
Radar+WiFi+BLE
FCC ID:2ATPO-RD01
Rd-01
AI-Thinker


moving
stand up
sit
0°
45°
90°
135°
180°
225°
270°
315°
5
4
3
2
1
0
Distance unit: meter, angle unit: degree

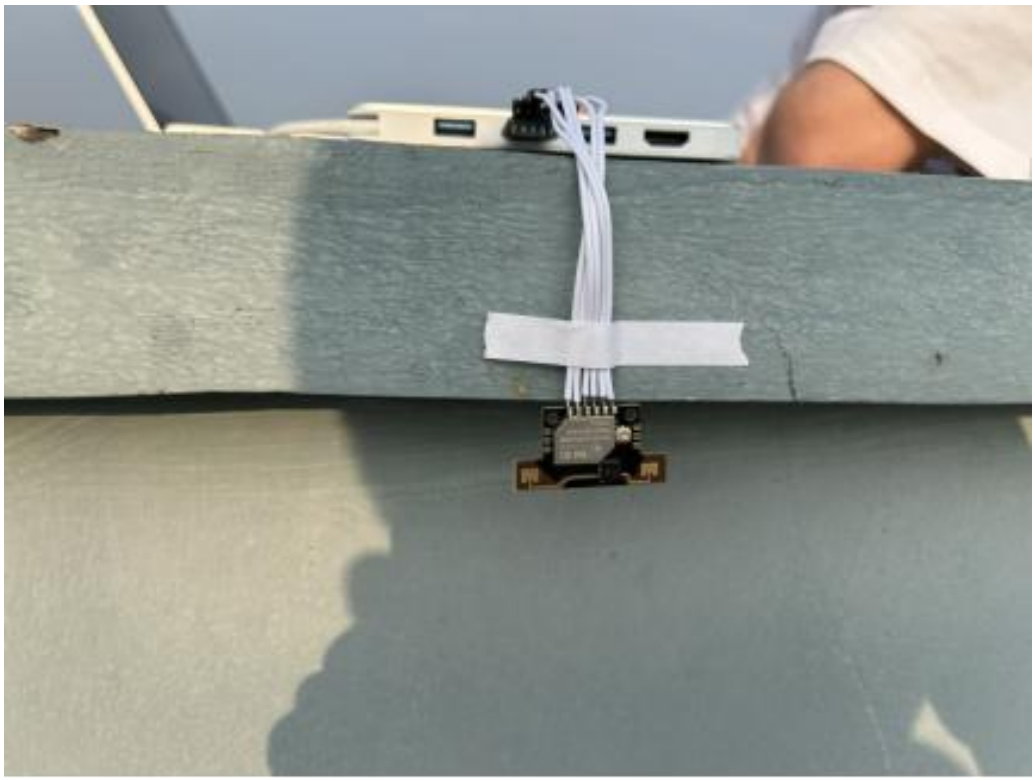
2. Wall mounting diagram



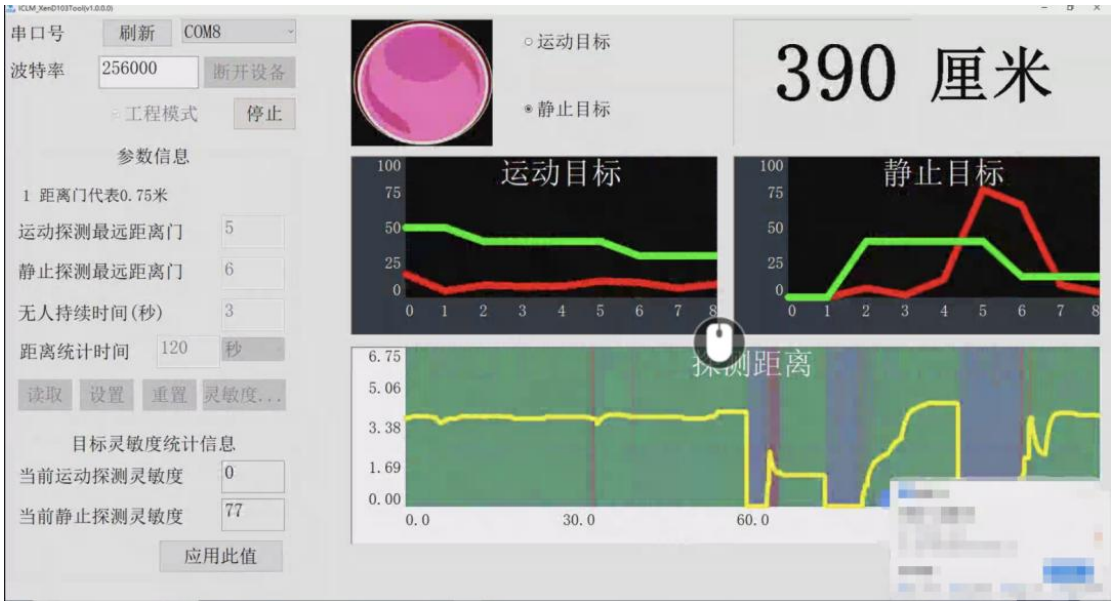




Module actual test effect




380 1 2 3 4 5 6 7 8 9 390 1 2 3 4 5 6 7 8 9


串口号
刷新
COM8
波特率
256000
断开设备
工程模式
停止
参数信息
1 距离门代表0.75米
运动探测最远距离门
5
静止探测最远距离门
6
无人持续时间(秒)
3
距离统计时间
120
秒
读取
设置
重置
灵敏度...
目标灵敏度统计信息
当前运动探测灵敏度
0
当前静止探测灵敏度
77
应用此值
运动目标
静止目标
390 厘米
运动目标
静止目标
探测距离
6.75
5.06
3.38
1.69
0.00
0.0
30.0
60.0