# Vehicle Detection Sensor (Model: ITS-AX1)

*anti-collision type*

# User Manual

please carefully read this manual before installation.

# Copyright Notice

Thank you for choosing our vehicle detection sensor. This kind of sensor is mmWave technology radar sensor with accurate detection and is widely used in parking industry.

It is installed on parking barrier box and detect the area under the barrier arm, which ensures that if people or vehicle is detected within the detection area, the barrier arm will not close so that can avoid the damage to people or vehicle.

To ensure the best performance of the sensor product, please carefully read this user manual before use ,and then install and config it strictly following the instructions provided in this manual.

****specifications &design may be changed without prior notice.*

# Content

# 1.Introduction

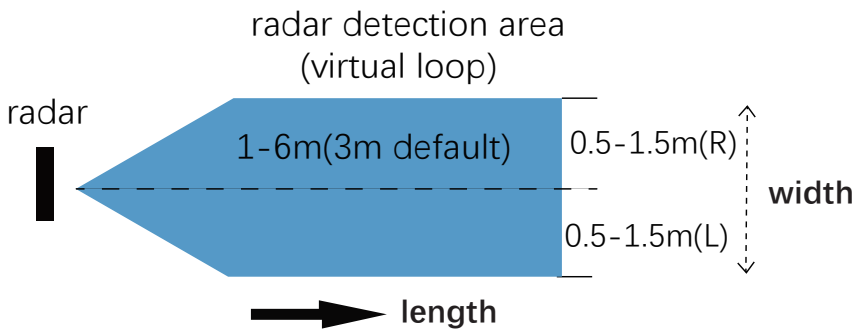
Vehicle detection sensor ITS-AX1 is designed for the entrance and exit management of parking lot or underground garage.It can be used as barrier arm anti-collision sensor or trigger sensor which can precisely control the open&close of the barrier arm by cooperating with the gate main control board , the sensor detection area can be configured by mobile App via bluetooth, compared with traditional loop detectors, it ‘s much more convenient and smarter, meanwhile no need any saw cuts. which greatly improve customer experience with its excellent performance and competitive cost.

The sensor is millimeter wave technology radar sensor with the highly integrated RF chip SOC scheme, which has the characteristics of small size, low cost, all-weather working capability, high detection,sensitivity, high precision,easy debug&installation, very good stability and reliability. It is a new type detector which can be perfect alternative of loop detectors.

The sensor antenna is MIMO design that enables the sensor good angular resolution and high angle measuring accuracy. The signal processing and control unit apply DSP+ARM dual core architecture. Through the combined optimization design of software and hardware, this product can accurately identify and judge the targets passing through the barrier arm area, and avoid the accident of "vehicle or person hurt " and "barrier not closed".

# 2.Technical Specifications

| | |
|---|---|
| Model: | ITS-AX1 |
| Detection distance | 1-6m （default 3m） |
| Detection width | 0.5-1.5m （left） /0.5-1.5m(right) |
| Working frequency | 79GHz |
| Supply voltage | 9-24VDC/ (12VDC)/1A |
| Power | < 2.5W |
| Output | Relay: NO/NC |
| Interface | bluetooth/RS485 |
| Dimension | 107.9*73.6*17.2mm |
| Net weight | 140g |
| Enclosure rating | IPX7 |
| Working T° | -40°C~85°C |
| Cable length | 1m |
| Installation | barrier gate box install |
| Certification | CE.FCC.RoHS |




(by App configuration， for anti-collison mode)

# 3.Features

Sensor appearance shown in Figure 1. The main features are:

## ● LED indicators：

Two LED indicators on the front of sensor.
Red LED is for power, it will stay on when power on.
Green LED is for signal, it will stay on when objects detected in the detect area and turns off when there is no objects.

## ● Detection area configuration:

anti collision mode sensor default detection length is 3m in front and 0.5m left & right side.
trigger mode sensor default detection length is 1.9m in front and 0.5m left & right side.

*different detection areas can be configured via mobile APP or laptop debugging software.*

## ● Configuration parameters saving and reload:

Configuration such as detection area can be automatically saved, and the latest configuration parameters will be loaded after sensor power off and restart.

## ● Firmware upgrade:

The firmware can be upgraded online through App or RS-485 ,no need to dismantle the sensor, and the new firmware will be effective just by restarting the sensor power.

## ● Stable performance:

millimeter wave technology is strong and work perfectly in harsh environments such as different light conditions, rain, fog, snow & dust.

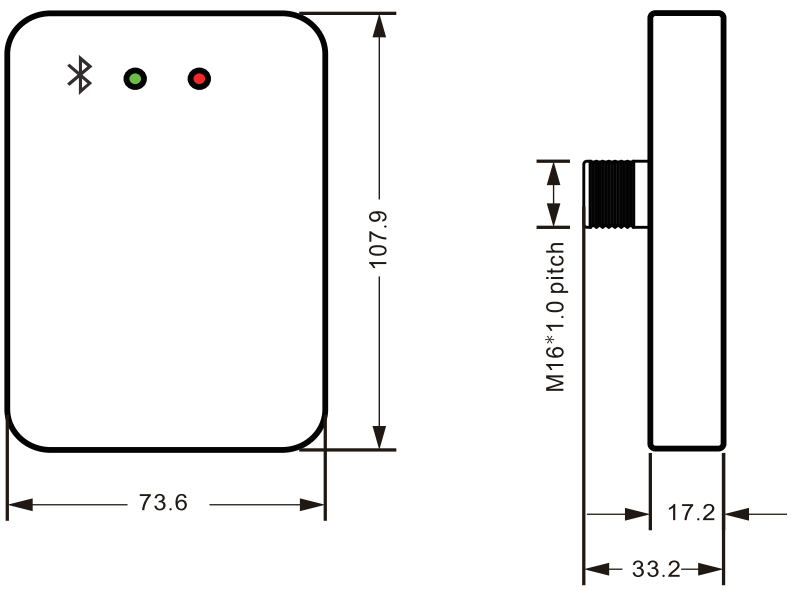
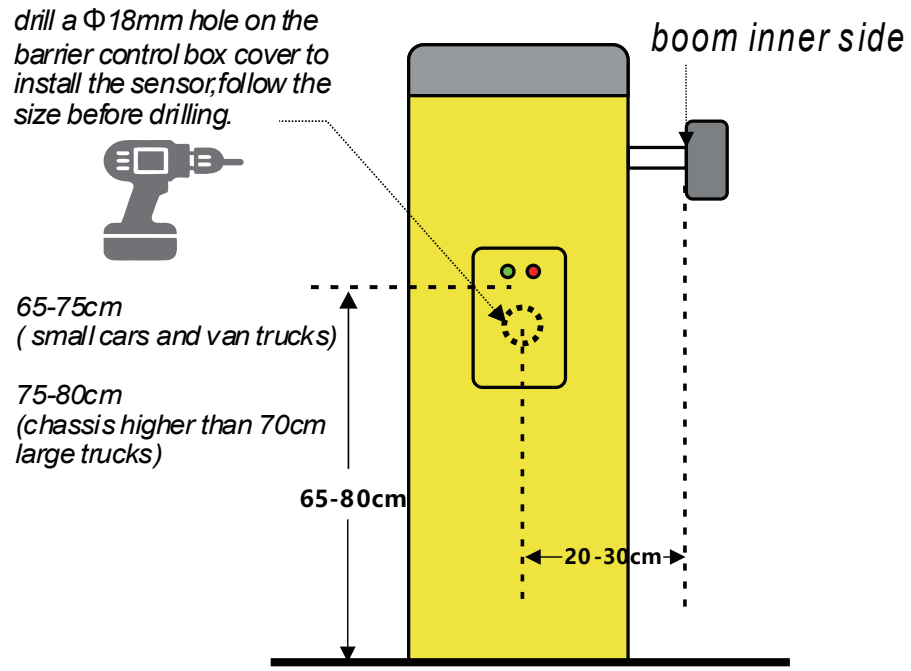


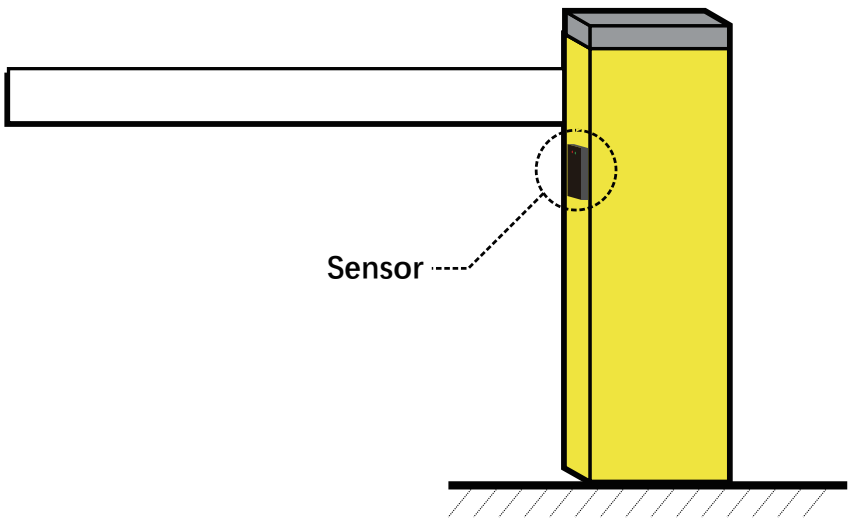

Figure 1. appearance（picture for reference only）

# 4.Installation Instructions

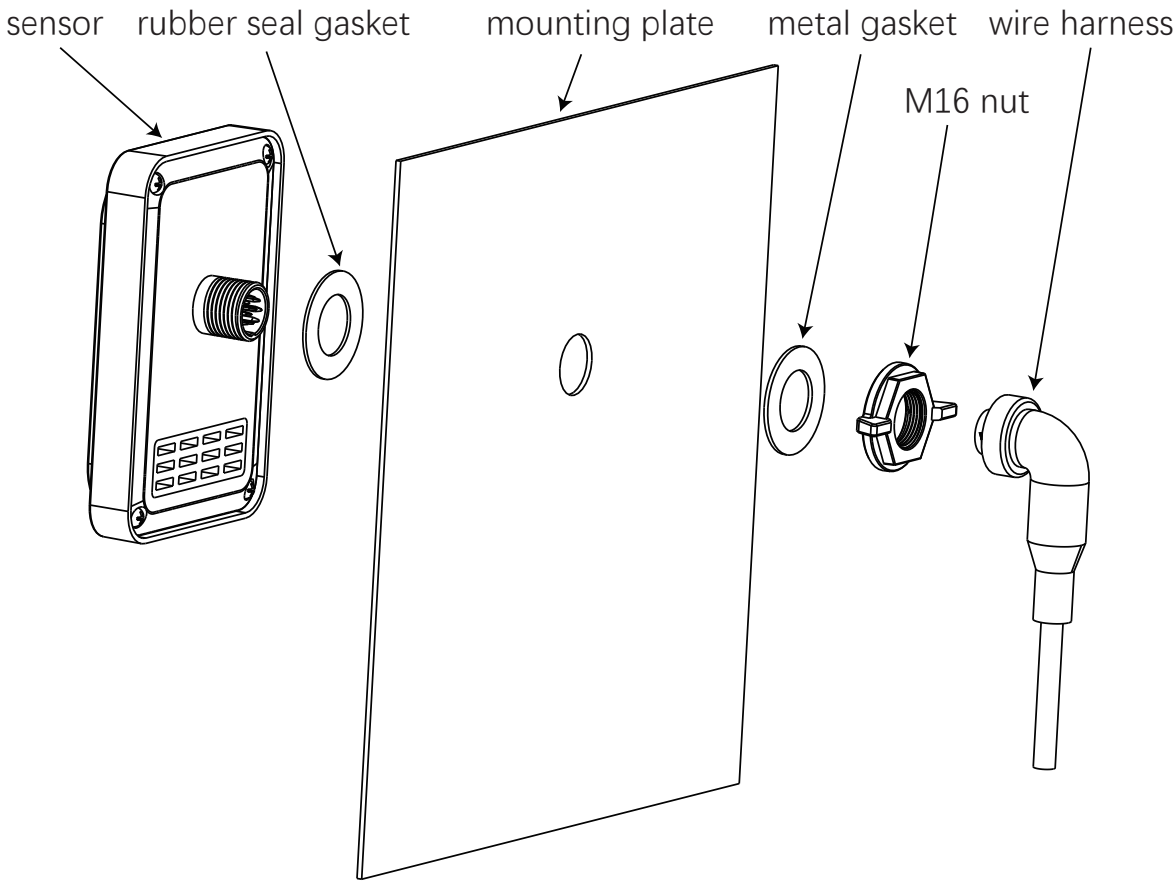
The sensor should be installed on the surface of barrier gate box and vertically to the ground. The installation must follow the below steps:

## Step1. installation position(for anti-fall use)

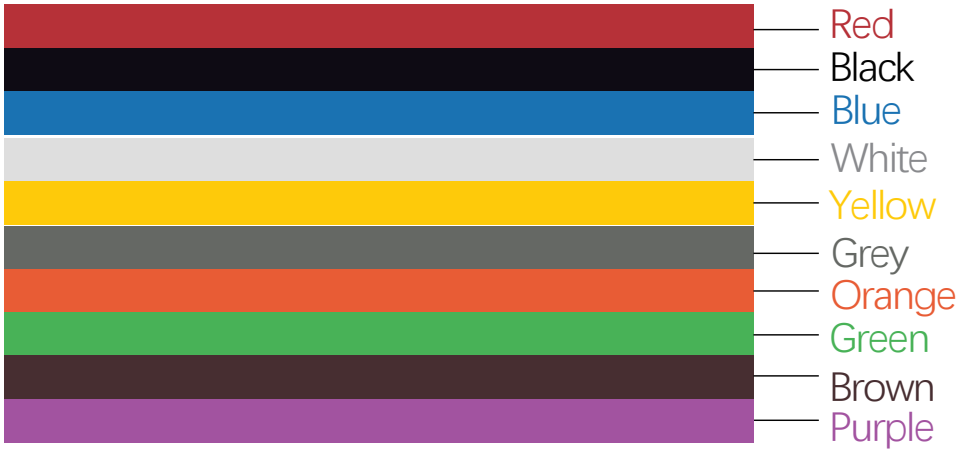


## Step2. mounting process

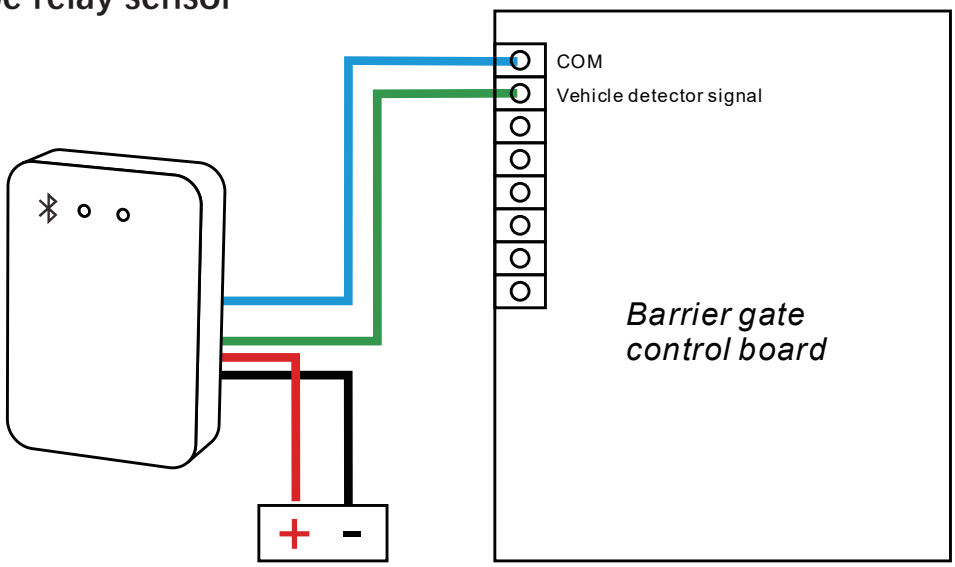


# 5.Cable Interface Definition



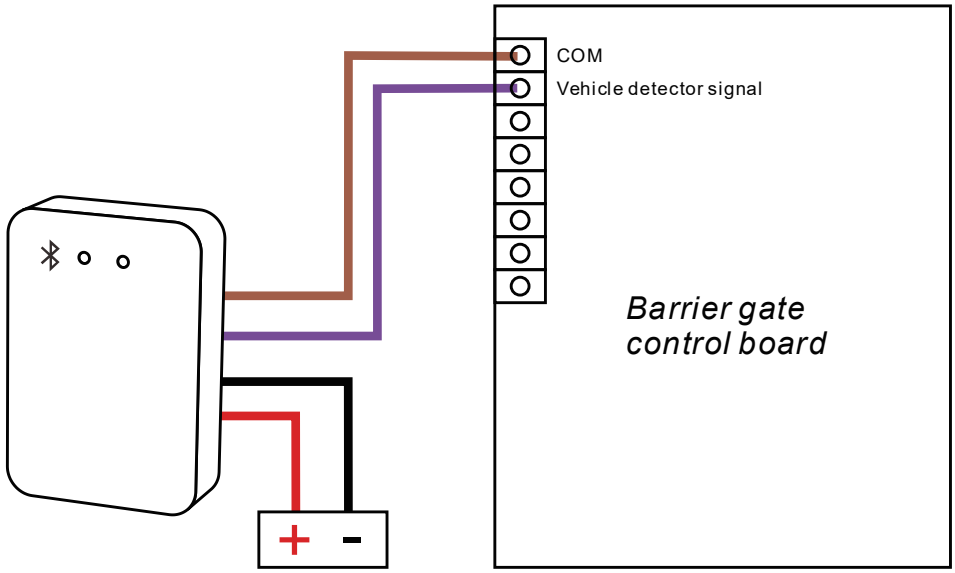

| No. | Cable ID | Color | Description |
|---|---|---|---|
| 1 | 9~24V | Red | positive pole |
| 2 | GND | Black | negative pole |
| 3 | B-/RX | White | RS485 B- |
| 4 | A+/TX | Gray | RS485 A+ |
| 5 | NO1 | Blue | Normally Open1 |
| 6 | NO1 | Green | Normally Open1 |
| 7 | NC2 | Brown | Normally Close2 |
| 8 | NC2 | Purple | Normally Close2 |
| 9 | INPUT | Orange | Spare |
| 10 | GND | Yellow | |

## NO type relay sensor




power supply 9-24VDC (12V/1A preferred)

## NC type relay sensor




power supply 9-24VDC (12V/1A preferred)

# 6.Configuration Instructions

The sensor can be configured by mobile App or the computer software.

## Mobile App configuration:

1- download the App to the mobile phone, click the App icon and see the user interface as Figure 2. click Connect device button then shown in Figure 3, select the correct radar built-in bluetooth name and start bluetooh connect.

bluetooth name: "Radar···" or ” Mbit...”
user password: 88888888.

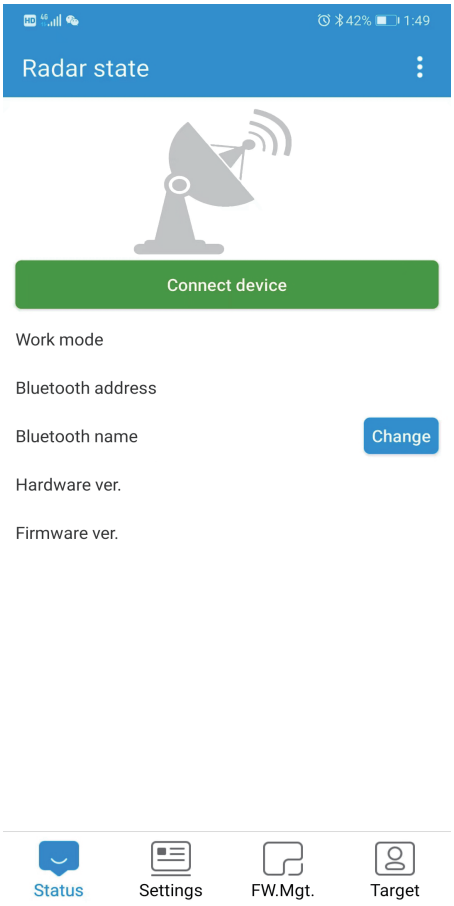



Figure 2

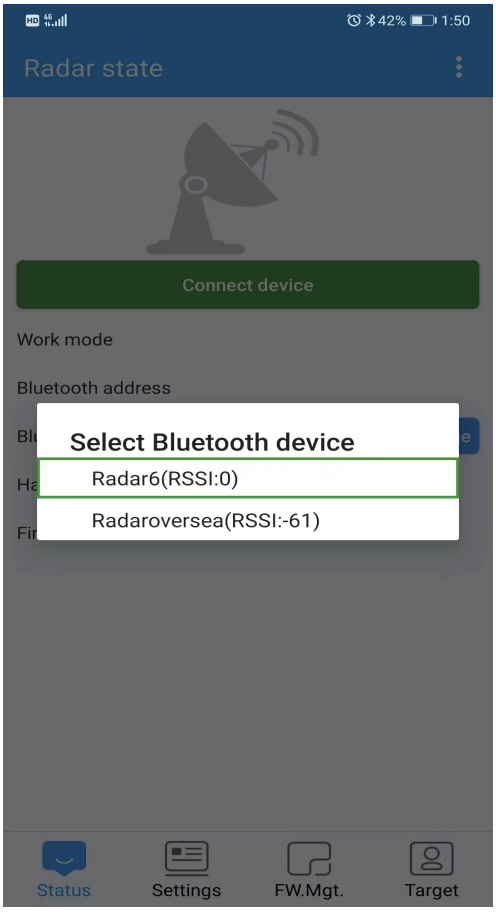



Figure 3

after successful connection, select sensor type, as shown in Figure 4, and enter App(App interface as Figure 5, 6,7,8,9).

## Anti-collision mode

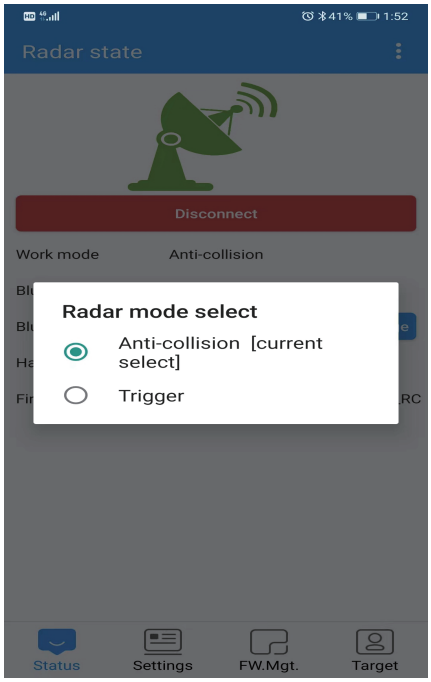



Figure 4

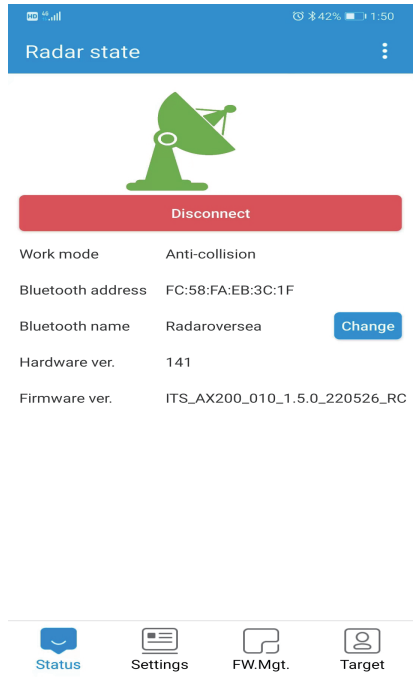



Figure 5

2-set or change the sensor parameters based on real situation, then click background learining after setting. if firmware upgrade needed, select F.M.Mgt. button below, select the firmware for sensor firmware upgrade, click upgrade firmware and wait for the completion.

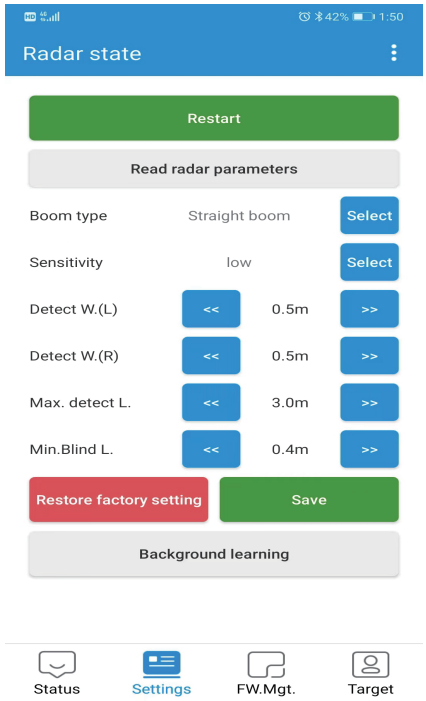



Figure 6

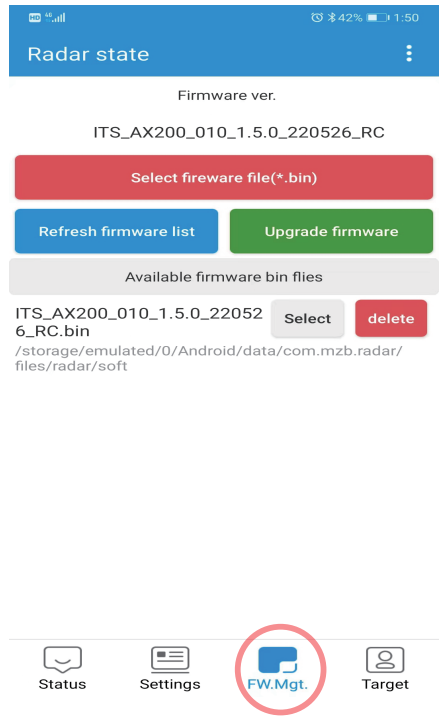



Figure 7

3-you may select Target button to check any false alarm, If any false alarms happened after background learning, click display false alarm to check, during the process of display false alarm,  do not do other operations except stop display.

If needed, click Remote debug as shown in Figure 9, assistance can be provided remotely by mobile connection with radar.

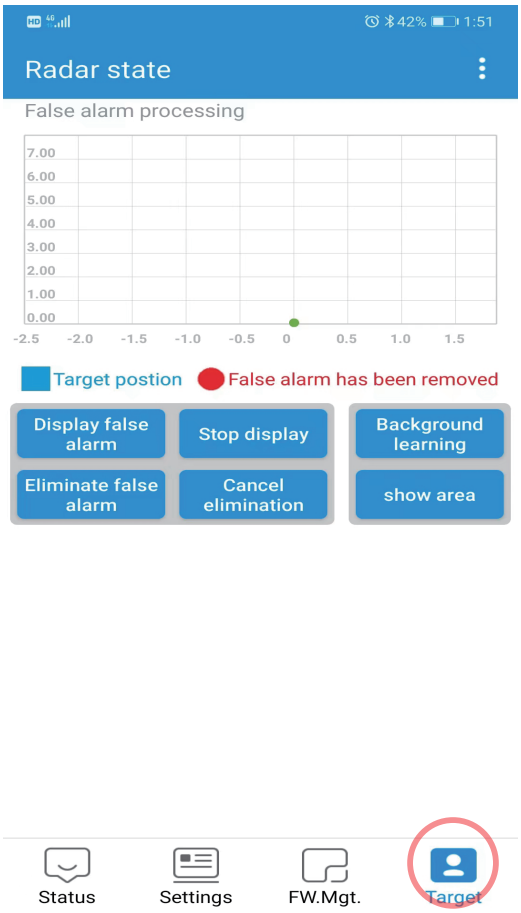



Figure 8

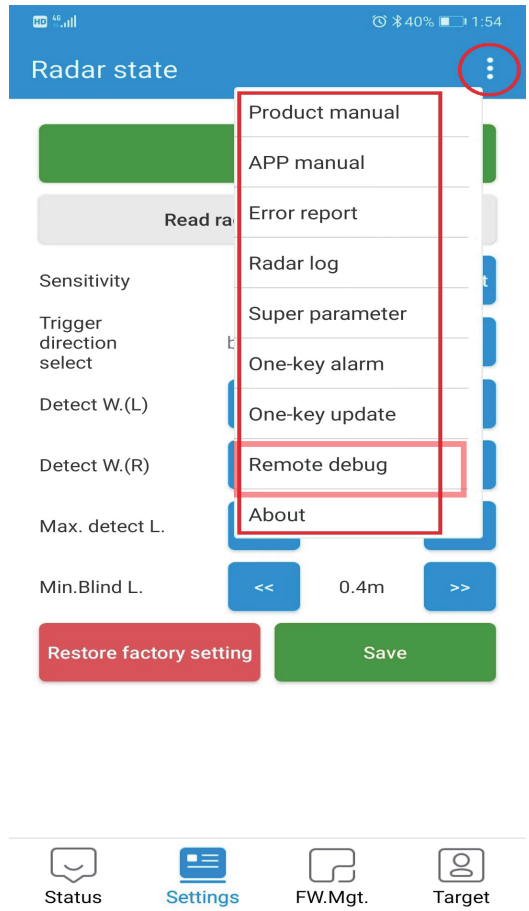



Figure 9

# 7.Remarks

Please read the following instructions carefully before using sensor:

- Ensure stable power supply to avoid affecting the sensor performance, It is recommended to use 12V /1A power adapter separately for power supply.
- Sensor antenna is integrated inside. if sensor surface covered with other things(such as water drops, snow, dust, etc.) which may affect the normal operation of the sensor, it shall be cleaned in time.
- If environment changes (such as installing the guide column, ice cream cone, etc.) in the detection area, please learn to record the environment again.
- There shall be no objects (such as metal fence, billboard, license plate recognition camera, wall, etc.) in the sensor detection field which will affect the normal operation.
- It is not recommended to use sensor in a single lane where different types of barriers installed.
- it is recommended to install 2 sensors or remote control barrier arm when for entry&exit of semi trailer, concrete mixer, and other vehicles which chassis higher than 1m.
- It is not recommended to install sensor on muddy roads &extreme weather (rainstorm, heavy snow) which may affect the sensor operation stability.
- Set the detection range based on the barrier arm length, normally this range is slightly less than or equal to the barrier arm length, so as to prevent people or objects from being detected by sensor when.passing beyond the gate arm.
- When environment record & learning, the fence / advertising type arm may shake when it falls to the ground. operation can be carried out after the arm falls completely.
- Relearn the background If there is arm rebound caused by the sensor.

- The installation height of the sensor should be 75-80cm in case of the metal strong scatterers like deceleration belt (for example iron plate) are directly in front of the sensor.

- Sensor applicable power supply : 9~24VDC. preferred 12V/1A power supply or connected to camera 12/24VDC power supply.

If radar working environment is special, please contact supplier first. then install according to the suggestions.

## 8.Common problems

1-Q:The sensor green light always on after installation and the barrier arm doesn’ t fall.

A: new enhanced reflectors within the sensor detection area need to be removed from sensor field of view or background learning should be carried out again.

2-Q: the person stand in front of the sensor, the green light is not on.

A: The sensor is activated pedestrian / vehicle classification function, when vehicles trigger the sensor and green light on,The sensor then can detect.

3-Q: The sensor red light flashes.

A: It is recommended to connect an extra 12V-1A power adapter.

# 9.Packing List

| No | Parts | Q’ ty |
|---|---|---|
| 1 | Sensor | 1 |
| 2 | M16 nut | 1 |
| 3 | Gasket | 2 |
| 4 | Wire harness | 1 |
| 5 | Certificate | 1 |
| 6 | User Manual | 1 |

Mobile debugging App download:(android & IOS)

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