Notice

Thank you for choosing this vehicle detection sensor. This kind of sensor is widely used with parking barri ers and to detect the area beneath the barrier boom and ensures that if target remains under the barrier boo m, the barrier cannot be lowered to damage the target.

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

The specifications and designs of this product may be changed without notifications.

***Specifications are subject to changes without prior notice

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4.Installation Instructions

The sensor should be installed on the surface of gate box body and the sensor surface with LED indicators must be perpendicular to the lane (vehicle access) direction. The installation must follow the below steps:

Step1.confirm the sensor mounting location.

The inner side of the boom is 200-300mm away from the sensor installation hole, 650-750mm away from the driveway ground (non cement pier) (both for small cars and Van trucks), 750-800mm (chassis higher than 700mm large

The installation position is shown in Figure 2.

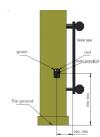


Figure 2. Installation position

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Step2.Trepanning

A mounting hole of M18 should be drilled on the surface of gate box according to the installation position (see figure 2). Recommended diameter of drilling hole must be 18mm.



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Content

Vehicle detection sensor is developed for the entrance and exit management of parking lots or underground garages. It can precisely control the rising and falling of the barrier arm by cooperating with the gate main control unit, which could effectively avoid the "accidental injury" of the gate arm to the passing vehicles or pedestrians which in the sensor field of view, and realize intelligent anti fall function.

1.Introduction

The sensor is radar sensor and adopts millimeter wave technology 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.

The sensor working frequency is 79GHz, with Linear Frequency Modulation and Continuous Waveform, which makes the available bandwidth up to 4GHz. The range resolution is up to 4cm, and ranging accuracy is better than 2cm. The radar antenna adopts multiple transmitting and multiple receiving design that enables the radar good angular resolution and high angle measuring accuracy. The signal processing and control unit apply DSP+ARM dual core architecture. Through the joint optimization design of software and hardware, this product can accurately identify and distinguish the targets passing through the barrier arm area, and avoid the accident of "damage the targets such as vehicle or person" and "not dropping arm".

Terms Parameter Value Input Voltage 9 ~ 24V Temperature Range -40°C ~ 85°C Power < 2.5W Working Water Rissistance Level IP66 Condition Connection Interface RS485; Bluetooth 107.5*73.2*18mm Size 138g(without packing) Unit Gross Weight Default±0.5m (configurable within Left/Right side ±1.5m) Detection Zone Default 3m (configurable Front within 6 m) Serial Port/ Bluetooth Online debug Debug Upgrade & Debug Serial Port/ Bluetooth Online upgrade Upgrade Application For all types of parking barrier arm

2.Technical Specifications

3

			Black
		-	- Blue
			Blue White
			Yellov
			- Grev
			— Grey — Orang — Green
			Green
			Brown Purple
			- Pumle

NO.	Cable Color	Cable Identification	Description	Wiring	
1	Red	9 ~ 24V	Power	The red wire connected to the power positive output terminal; The black wire "GND"	
2	Black	GND	GND	connected to the negative output terminal of the power supply.	
3	Gray	A+/TX	A+	The gray wire "A +" is connected to T / R + terminal of 485;	
4	White	B-/RX	B-	The white wire "B-" is connected to the T/R-terminal of 485.	
5	Blue	Normally	NO1	The green wire and blue wire are relay normall open signal wire, which are connected to the ground induction co	
6	Open Signal Wire		NO1	terminal and the commor terminal of the gate control box (no distinction between positive and negative).	

NO.	Cable Color	Cable Identification	Description	Wiring	
7	Brown	Normally	NC1	The brown wire and purple wire are relay normally close signal wire, which are connected to the ground induction coil terminal and common	
8	Purple	Purple Close Signal Wire		terminal and common terminal of the gate control box (no distinction between positive and negative).	
9	Orange	Input	Input	spare wiring,	
10	Yellow	GND	GND	Spare willing,	

The appearance of sensor is shown in Figure 1. The main features

3.Features

LED indicators:

There are two LED indicators on the front of sensor

The red LED is the power state lamp which will stay on when the power supply is turned on. The green LED is the operating status lamp which will be automatically trigger on when objects detected in the access area and it goes off when there is no objects.

• Detection zone configuration:

The default detection zone of the sensor is 3 meters front and 0.5 meters on the left and right sides(±0.5m). Different detection areas can be configured via mobile APP or debugging software running on computer.

• Configuration parameters saving and reload:

Configuration such as detection area could be automatically saved, and the latest configuration parameters after power failure and restart will be reloaded.

• Firmware upgrade:

The firmware can be upgraded online through RS-485 or APP interface with host computer without taking off the cover board and the new firmware can take effect just by restarting the power of radar

• Stable performance:

Millimeter wave sensing capablity stay nearly the same under different light illuminations, climates such as rain, fog or snow and dust.



Figure 1. Appearance and Size (picture for reference only)

6.Configuration Instructions

The sensor can be debugged through either the mobile App or the debuging software on the uphost computer.

Mobile application debugging instructions:

After downloading the App to the mobile phone, dick the App icon and see the user interface as Figure 5.

Click Connect Device button as shown in Figure 6, and select "Radar..." Bluetooth pairing connection

Bluetooth connection

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



Figure 6

Click Select Bluetooth Device

Figure 5

After successful connection, select radar mode, as shown in Figure 7, and enter App(App interface as Figure 8, 9,10,11). 10

5. Cable Interface Definition

	COIOI	- radinamodadori			
1	Red	9 ~ 24V	Power	The red wire connected to the power positive output terminal; The black wire "GND" is	
2	Black	GND	GND	connected to the negative output terminal of the power supply.	
3	Gray	А+/ТХ	A+	The gray wire "A +" is connected to T / R + terminal of 485;	
4	White	B-/RX	B-	The white wire "B-" is connected to the T/R-terminal of 485.	
5	Blue	Nomally	NO1	The green wire and blue wire are relay normally open signal wire, which are connected to the	

As shown in Figures 3 (a)-(c), the sensor is fixed to the gate
box through the bottom bolt. Firstly the sensor is installed
on the gate box, then cover the washer with M16 screws
to fix it, then insert the end of the wire harness into the
sensor in the correct direction and lock the meta buckle.
The final installation effect is shown as Figure 4.

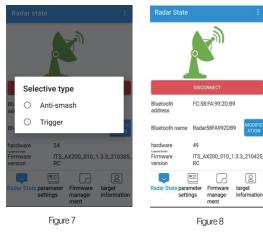
Figure 3. mounting and fixing steps schematic

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Step3. mounting and fixing



Figure 4. Installation Demonstration



The radar parameters can be modified and the background can be learned according to the actual environment. After selecting the firmware for radar firmware upgrade, dick upgrade firmware and wait for the upgrade to complete.





Figure 16 self learning



Figure 17 end of self learning

After learning, please click the soft restart button to restart the radar.

Attention:

1.when "self-learning", it is necessary to ensure that there is no movable target in the radar detection area. If there is a target entering or passing through the radar detection area during the learning and recording of environmental background, it is necessary to restart the radar and learn again;

2. For fence and advertising arm: It is forbidden to set personnel to stand in the radar detection area to observe the change of the radar green light during the "self-learning", It is necessary to stand outside the radar detection range to observe the change of the radar green light.

3.After background learning, you can click Show false alarm to view false alarm. During the process of show false alarm, please do not perform other operations except stop display. Other detailed operations can be seen in the product manual and app manual.



Computer software debugging instructions

Step1: use USB to 485 cable to connect radar and computer. For radar interface, please refer to chapter 5. Cable Interface Definition.

Step2: open debugging software, select serial port and baud rate, and click "confirm".



Figure 13 select serial port(Note: The baud rate MUST be 115200.)

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Step 6: radar jamming view

After the initial debugging of radar and the environment learning is completed, this function can be used to check whether there is interference in front of the radar.

Step 6.1 - open the debugging software.

Step 6.2 - select "false alarm handling"



Figure 18 false alarm processing

Step 6.3 - dick "show false alarm" to view the target information.

Step 6.4 - click "eliminate false alarm" to eliminate false alarm jamming. If there is no target jamming within the detection range of the lifting arm, the radar can be used normally.



Figure 14 obtaining radar parameters

Step4: enter the required setting parameters in the corresponding options, select reset to save the radar parameters.



Figure 15 setting radar parameters

Table 4-1 radar parameter description

ltem	Remark		
Max. forward distance	The default is 3m, which should be set according to the length of the gate arm		
Min. forward distance	The default is 0.2m, which is the non detection area of radar in short range, and can be adjusted according to the field.		
Left range of action	The default ±0.5m, the straight arm can be set ±1.5m according to the actual situation, the fence type & advertising type arm is limited 1m which is not adjustable.		
Right range of action			

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7.Remarks

Please read the following instructions carefully before using radar:

- Ensure stable power supply to avoid affecting the radar performance, It is recommended to connect 12A/1A power adapter separately to power supply.
- Radar antenna is integrated inside. When the radar surface is covered with other things(such as water drops, frost, rain, snow, dust, etc.) which may affect the normal operation of the radar, it shall be deaned in time.
- When the 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.) which affect the detection of the target in the radar detection field, to avoid interference to the radar.
- It is not recommended that radar be used in a single channel mixed out scene with fence and billboard pole type.
- For the scene of entry&exit of semi trailer, concrete mixer, and other vehicles which body spaces exceeds 1m, it is recommended to adopt the dual radar installation scheme or remote control barrier arm.
- This product is not recommended to be deployed on muddy roads. Extreme weather (rainstorm, heavy snow) may affect the stability of radar performance.
- In general, please set the detection distance according to the length of the arm. The detection distance is slightly less than or equal to the length of the arm, so as to prevent people or objects passing outside the gate arm from being detected by radar.
- When environment record & learning, the fence / advertising type arm may shake when it falls to the ground. operation can be carried out after the pole falls completely.
- If there is a arm rebound caused by the radar, please releam the background.

Type of barrier gate	The default gate type is "straight arm", which can be set according to the actual situation
Pedestrian/Vehivle recognition function	The default mode is pedestrian/vehicle differentiation, which can be set according to the actual situation.
Radar log	reserve
Time delayed	Distinguish the time delay for people and vehicles, and match the arm drop time.

- -Click Reset to make the new setting parameters effective after restart of radar.
- -Click "get" to get the current radar configuration.
- -Click "factory settings" to restore the default configuration of radar.

Step5: after setting, click "self-learning" to learn and record the environment background. After the operation, restart the radar to take effect.

- for straight arm: To ensure that there is no movable target in the radar detection area, lift the straight arm, and then click "self learing" button, after 6S, restart the radar

- for fence and advertising arm: to ensure that there is no movable target in the radar detection area. Connect the radar to the gate control end (please refer to chapter 5. Cable Interface Definition for details), lift the gate arm, and then dick "self-learning" button. At this time, the gate arm will automatically drop and radar green light will flash quickly. After the gate arm falls to the position, use the gate key to "lift" the gate arm. when the gate arm is opened to the position, use the gate key to "drop" the gate arm Repeat such operation until the radar green light always on. this process takes different time according to different scenes, the longest time is 3 minutes, can observe the green light status outside the radar detection area, and restart the radar after the green light is always on.

The learning interface is as follows:

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- When the metal strong scatterers like deceleration belt (for example iron plate) are directly in front of the radar, the installation height of the radar is 750-800mm.
- Please contact us first when the radar working environment is special, and then install it correctly according to our suggestions.

8.Common problems

 $1\mbox{-}Q\mbox{:The radar green light always on after installation and the barrier arm doesn't fall.$

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

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

A: The Radar is actived Pedestrian / Vehivle recognition function, when vehicles trigger the Radar and radar green light always on, The Radar then detect without pedestrian/Vehivle recognition.

3-Q: The red light of Radar flashes and low power supply even the 12V power supplied by the gate control board.

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







Parking barrier gate electronic module (Model: ITS-AX1)

Vehicle detection sensor

User Manual

please carefully read this user manual before installation.



9.Packing List

No	Parts	Q' ty
1	sensor (with DC female head)	1
2	M16 nut	1
3	Gasket	1
4	Rubber waterproof ring	1
5	M3 self tapping screw	2
6	Wire harness	1
7	Certificate	1
8	User Manual	1

Mobile debugging App download:



android phone download



Search "radar assitant" in App Store and download

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