


BSD

BSD

**Blind spot monitoring
system**

Use instructions

77 Ghz millimeter wave single radar 

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I. Product Introduction

Thank you for choosing the blind area monitoring and parallel driving assistance system produced by our company. The product consists of a 77Ghz millimeter wave radar, two indicator lights (or special blind area rearview mirrors), a buzzer, a host box and a connecting harness.

This system product can warn the dangerous targets in the adjacent lanes. The unique ability of 77Ghz millimeter radar to penetrate smoke, fog and dust can realize all-weather and all-time application, detect the objects in the signal area in real time, and calculate the speed, angle and relative displacement of 64 objects at the same time. It can detect the target within 50M at the farthest, and finally output the alarm signal, which includes the first-level alarm and the second-level alarm.

II. Product List

Name	Quantity
77Ghz millimeter wave radar	1
In-car warning light	2
Power cord	1
Buzzer	1
Power extension line	1
Indication lamp extension line	2
Radar box	1
Installing support	1
Accessories package	1
Instructions	1

III. Technical Parameters

No.	Project	Specifications
01	Operating voltage	9 V- 32 V
02	Operating frequency band	77 -79Ghz
03	Working temperature	- 25°C ~ +75°C
04	Power consumption	< 3 W
05	Waterproof grade	Ip 67
06	Distance resolution	0 . 2 m
07	Ranging accuracy	Is better than 0. 1 m.
08	Detection range	0-50 m
09	Horizontal angle range	150°
10	Pitch angle range	±10°
11	Velocity measurement accuracy	0.1m/s

IV. Product Functions

Explanation

- After the ACC is powered on, the system can immediately enter the working state after the environmental adaptation test. When the car is turned off, the radar stops working.
- The system is in the first-level early warning state except when the turn signal lamp is turned on, double flashing warning lamp and R reverse gear is engaged.
- When the turn signal is turned on, double flashing warning lights and R reverse gear is engaged, the system is in the second-level early warning state.

Level 1 alarm: the reminder light is always on.

Level 2 alarm: the warning light flashes+the buzzer sounds.

The alarm range is centered on the rear of the car. The lateral distance is X and the longitudinal distance is Y. The left lateral distance of the center is negative, and the right lateral distance of the center is positive.

1. Product self-inspection:

Normal state of equipment:

- 1) After the equipment is powered on, the left and right indicator lights flash 3 times respectively;
- 2) When the car speed exceeds 15km/h and there is a target car in the blind area, the indicator light is on, and the steering buzzer sounds and the indicator light flashes.

Equipment abnormal situation:

- 1) After the equipment is powered on, the left and right lights flash once, the control box is normal, and the radar is abnormal.
- 2) After the equipment is powered on, the indicator light always goes off, and the radar of the control box does not work normally. Please check whether the power-on signal intervenes normally.

2. Blind area monitoring function -BSD

- System starting speed: $V \geq 15 \text{ Km/h}$
- Horizontal range of early warning: $1.5 \text{ m} \leq X \leq 4.4 \text{ m}$, $-4.4 \text{ m} \leq x \leq -1.6 \text{ m}$.
- Longitudinal range of early warning: $0 \text{ m} \leq Y \leq 6.5 \text{ m}$
- Early warning strategy: alarm for moving targets in the alarm area
- Including active overtaking or passive overtaking, the relative overtaking speed is not more than 20km/h.

BSD early warning mode:

A. When the moving object enters the blind area monitoring area (the car does not turn on the turn signal), it will give a first-class warning until the target object leaves the monitoring area and cancel the warning;

B. When the moving object enters the blind area monitoring area (the vehicle turns on the turn signal), a second-level warning will be generated until the target object leaves the monitoring area, and the warning will be cancelled.

3. Parallel auxiliary approach early warning function -LCA

- System starting speed: $V \geq 15 \text{ Km/h}$
- Horizontal range of early warning: $1.5 \text{ m} \leq X \leq 4.4 \text{ m}$, $-4.4 \text{ m} \leq x \leq -1.6 \text{ m}$.
- Longitudinal range of early warning: $0 \text{ m} < y \leq 50 \text{ m}$
- Early warning strategy: approach time $\leq 4.0 \text{ s}$.

LCA vehicle approach early warning mode:

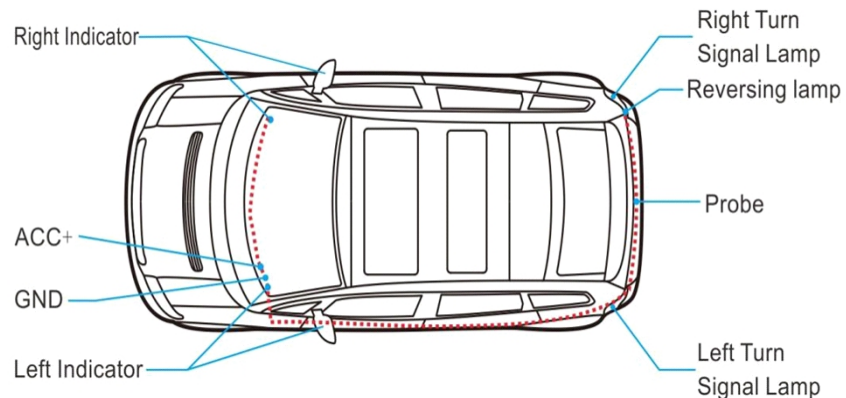
A. When the target enters the alarm range (the car does not turn on the turn signal), a first-class warning is generated, until the target leaves the alarm area, cancel the warning;

B. When the target enters the alarm range (the car turns on the turn signal), a second-level warning will be generated until the target leaves the alarm area, and the warning will be cancelled;

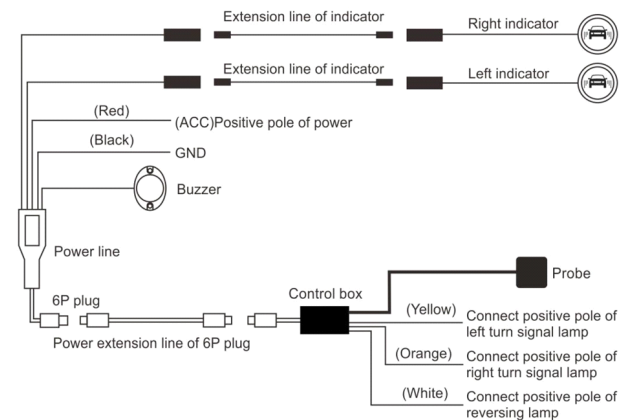
4. Rear collision warning function -RCW

- System starting speed: $V > 2\text{Km/h}$
- Horizontal range of early warning: $-1.6\text{m} \leq x \leq 1.6\text{m}$.
- Longitudinal range of early warning: $10\text{m} < y \leq 50\text{m}$
- Early warning strategy: approach time $\leq 1.5\text{s}$.
- In the lane directly behind the car, there is a car approaching quickly and there is a warning message, and the left and right LED lights flash.

V. Installation Schematic Diagram



VI. Legend of Line Connection



1. Connection method of power cord:

- Connect the black line of the power cord to the negative pole of the car or ground it.
- Connect the red line of the power cord to the ACC power supply of the car (the car starts normally/turns off without electricity).
- Correspond the extension line of the reminder lamp and the reminder lamp according to the left and right labels, and connect the male and female connectors.

2. Connection method of power extension cord:

Route the power extension cord from the front of the car to the rear of the car. Plug the front of the car into the power cord, and plug the rear of the car into the box line of the radar mainframe.

3. Main box wire link method:

- The special plug of the host box is plugged into the host box.
- 6Pin hole end plug and power extension cord are plugged oppositely.
- 5 pin-end plug and radar cable are plugged into each other.
- The yellow line is connected to the positive pole of the left turn signal lamp.
- The orange line is connected to the positive pole of the right turn signal lamp.
- The white line is connected to the positive pole of the reversing lamp

VII. Installation Methods

1. Schematic diagram of installation of radar module and angle adjustable bracket



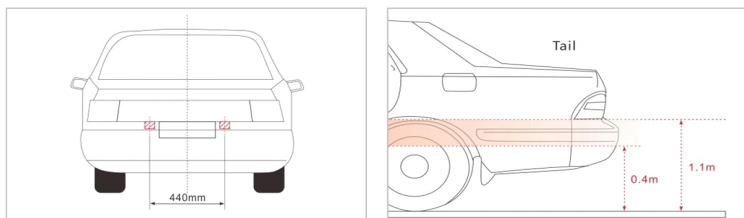
2. Radar installation location



Note: the outlet is at the top.

3. Schematic diagram of radar installation

The specific installation requirements are as follows:

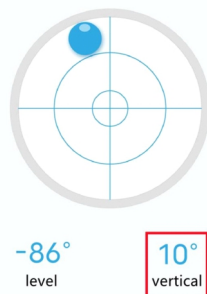


Note: A. The range of radar installation height from the ground is 0.4 to 1.1m;
 B. Installation pitch angle: the radar plane dips $10 \pm 2^\circ$;
 C. The included angle between the radar axis plane and the car body axis plane is 0 ± 1.5 .
 (Important note: Please operate the radar strictly according to the height & angle specified in the steps!!!)

4. Radar inclination adjustment method:

A. Horizontal adjustment: the radar should be parallel to the cross section of the car body, and the bracket can be parallel to the cross surface of the rear license plate.

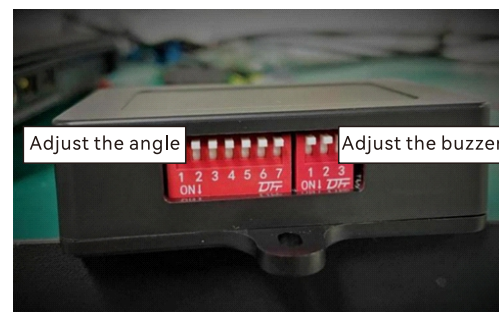
B. Pitch angle adjustment: the mobile phone downloads the "level" APP. When in use, the mobile phone is attached to the radar head and the radar head tilts downward. When the vertical angle on the APP is 10° , tighten the fixing screw to keep the radar tilted downward by 10° !



VIII. Use method of host box

The control box is placed at the rear of the car, which is suitable for installation, fixing and routing.

Instructions for use of control box dip switch:



Note:

A. Dial down:
 ON, dial up: OFF;
 b.ON: 1, OFF: 0;

Adjustment:

Function	Control switch	Encode	Definition
Adjust height	1、2	00	0.85m
		01	1.1m
		10	0.6m
		11	0.4m
		Default	0.85m
Angle	3、4、5	000	0°
		001	1°
		010	2°
		011	-1°
		100	-2°
		Default	0°
Lateral offset	6、7	00	The center of the car is 0.25m to the right.
		01	Center of car
		10	The center of the car is 0.25m to the left.
		Default	The center of the car is 0.25m to the right.

Buzzer volume adjustment:

Function	Control switch	Encode	Definition
Buzzer	1、2、3	000	Mute
		001	Turn down the volume
		010	Medium volume
		100	Loud volume
		Default	Mute

IX. Simple troubleshooting and maintenance

Fault phenomenon	Possible reasons	Exclusion method
The left/right LED indicators show that the target warning position is opposite	The left and right lights are installed upside down and the radar is installed upside down.	1. Check the left and right light signs.
		2. Check whether the radar surface is installed correctly.
When the system detects the early warning target, turn on the turn signal, and the buzzer has no alarm sound.	1. Buzzer is on 2. Turn signal input problem	1. Check whether the buzzer is normal.
		2. Is the signal line of the turn signal on?
The lights are always on and off after power-on.	1. Wiring harness problem 2. LED lamp damage	1. Wiring harness plugging inspection
		2. Replace the LED lamp for inspection.

warning

Before the actual lane change, be sure to visually inspect the surrounding area.
The system is only used to assist you in detecting the cars behind you when changing lanes. Due to some limitations of the actual working environment, sometimes the cars are already in the adjacent lanes, but the system alarm signal lights do not flash or may delay flashing. You can't rely on this system completely, and our company won't be responsible for any accidents.

X. Matters needing attention

1. Under the following circumstances, the radar may not give a warning:

- A. The car is located in the blind area behind the adjacent lane, and keeps the relative same speed for a long time.
- B. The adjacent lane where the car is located is extremely wide, which exceeds the calculation range of radar signals.
- C. When crossing the peak of hill or mountain road.

2. If the road width is narrow, two-lane vehicles may be detected.

3. The warning signal lamp of this system may turn on in response to stationary objects (such as guardrails/walls/tunnels/green belts, etc.) on the road or roadside.

