

77Ghz Microwave Sensor Anti-Collision Warning System Spec

Product Model: K20



I. Product Introduction

Thank you for choosing the 77Ghz microwave sensor obstacle avoidance warning terminal produced by Zerow. The product consists of a 77Ghz microwave short-range obstacle avoidance sensor, a voice announcer and a connecting harness.

Product Applications:

The K20 sensor is a compact, short-distance, medium- and low-speed obstacle avoidance sensor in the 77GHz frequency band. The sensor emits a cone of electromagnetic waves to the front, detects the reflection of the electromagnetic waves, determines whether there is an obstacle in front, and feeds back information such as the relative distance, angle, and speed between the obstacle and the sensor; it accurately prompts the driver with obstacle information when the low-speed vehicle is moving forward or reversing.

The sensor has a large detection angle (horizontal and pitch detection angles are both 120°), which can accurately analyze the target's information, category, and motion status. The sensor is compact (housing 40x40x24.5mm), has a long measurement distance (20 meters), and has an integrated peripheral interface (CAN/485). It has a slow forward/backward collision avoidance function, which can meet the rapidly growing demand for low-speed forward or backward reverse safety assisted driving, and can also meet the various obstacle avoidance needs of robots.

II. Product List

Product Name	Quantity
77Ghz Microwave Sensor	1pcs
Voice Warning Device	1pcs
Power Cable	1pcs
Sensor Extension Cable	5M*1pcs, (10m, 15m optional)
Voice Warning Device Extension Cable	3M*1pcs
Sensor Bracket	1 group
Accessory Pack	1 pack

III. K20 Microwave Sensor Overview

K20 is a short-range V-band microwave sensor with a detection distance of 20 meters. It uses FMCW modulation mode and can detect the distance, speed, and angle of moving targets with high ranging and speed measurement accuracy.

K20 has the ability to detect short-range and low-speed targets and can support front/rear collision avoidance for low-speed vehicles.



Figure 1: K20 microwave sensor



Figure 2: Voice warning device

Two-stage voice warning device, the volume can be manually adjusted, and the voice broadcast content can be customized.

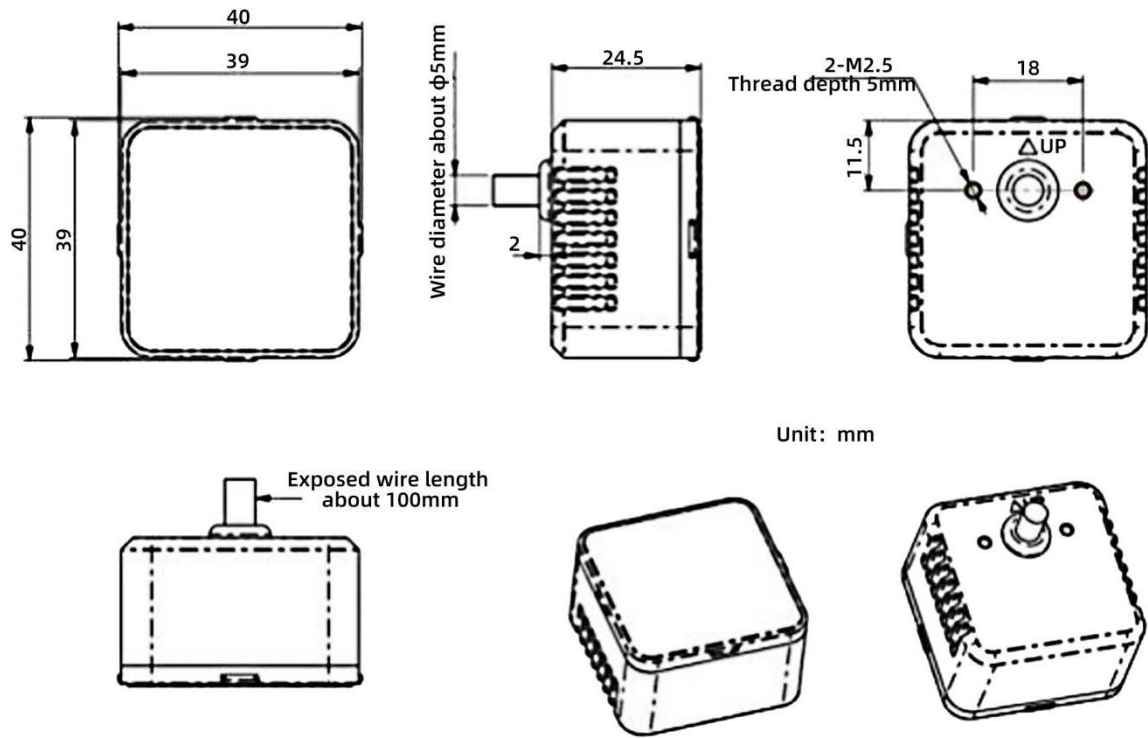
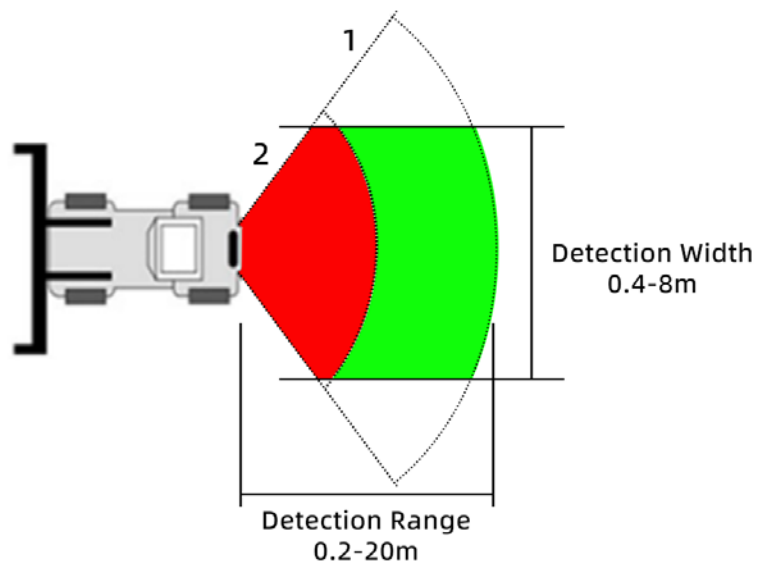


Figure 3: Sensor dimensions

IV. Product Features



The detection distance is 0.2-20 meters, and the detection width is 0.4-8 meters. The detection distance and width can be set according to needs.

Level 1 warning: Voice broadcast: Please slow down, please slow down, please slow down;

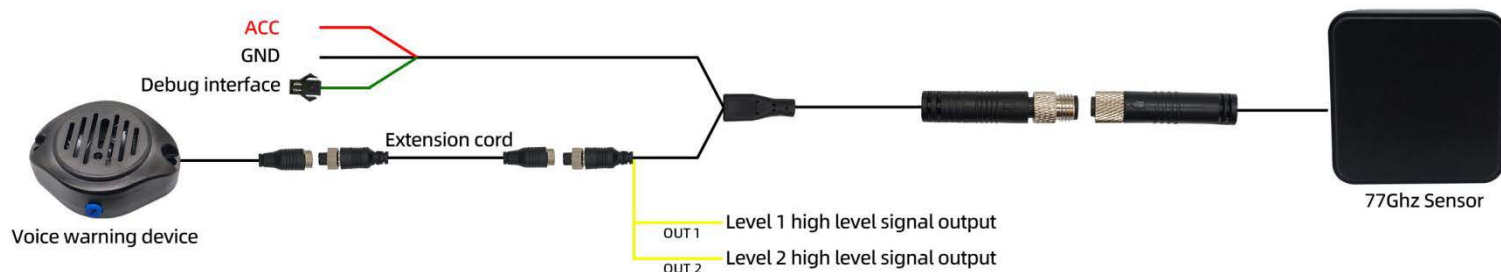
Level 2 warning: Voice broadcast: Please brake, please brake, please brake.

V. Product Parameters

NO.	Items	specification
01	Operating Voltage	9-24V
02	Sensor Operating Frequency Band	76-77Ghz
03	Operating Temperature	- 40 °C + 85 °C
04	Power Consumption	2.5W
05	Number of Channels	3TX4RX
06	Pitch Beamwidth(6dB)	— 60°~+ 60°
07	Horizontal Beamwidth(6dB)	— 60°~+ 60°
08	Sensor Waterproof Rating	Ip67
09	Sensor size (L*W*H)	40x40x24.5mm
10	Distance Resolution	0.2M
11	Speed Resolution	0.36m/s
12	Speed Range	±60km/h
13	Modulation	FMCW
14	Detection Distance	Detection length 0.2~20m, detection width 0.4-8m, detection length and width can be limited, up to 2 detection areas can be set (the distance of each area can be configured)

The K20 sensor uses a 485 communication network interface. The universal external communication interface is convenient for integration with a host computer or other sensor modules.

VI. Product Wiring Diagram



VII. Application



Sensor stand-alone use:

1. Red-positive, black-negative, connected to DC power supply, the other 2 core wires connected to 485 to USB box, connected to the computer and use the host computer software to adjust the warning area parameters.
2. The wiring harness outputs 2 groups of high-level, connected to the voice warning device, each throwing out a high-level output line, which can be connected to the trigger line of external products such as sound and light alarms, prompt lights, buzzers, etc. (need to share the ground).
3. High level signal, can be used to trigger solenoid valve or relay; only suitable for low speed vehicles such as forklifts, bulldozers, etc.
4. An extension cord can be added between the sensor and the power cord.
5. Through the host computer software, two warning areas can be set independently, corresponding to two warning lights (high level) output respectively, and the output voltage is consistent with the input voltage (it is recommended to add a step-down voltage regulator module).

VIII. Application Cases

Low-speed vehicle collision avoidance system, agricultural vehicle collision avoidance system, robot collision avoidance system, etc. use K20 microwave sensor to sense the environment in front of or behind the vehicle, output the distance, speed, angle information of the target and send it to the main control box. The main control box combines the sensor's surrounding environment information with the vehicle information, and makes a comprehensive decision-making system to perform risk warning or automatic braking functions.



Forward collision
avoidance(FCW):

- 1、 Robot obstacle avoidance
- 2、 Sanitation vehicles
- 3、 Forklift

Rear collision
avoidance(RCW):

- 1、 Engineering Vehicles
- 2、 Airport Shuttle
- 3、 Crane

Advantages of K20 in
applications:

- 1、 Compact size, solid-state technology;
- 2、 High cost performance, large detection angle;
- 3、 High detection accuracy;
- 4、 Leading performance and durability.