

Radar Sensor User Manual

Read this manual carefully before using the product and keep it properly

Product Presentation

A dual-zone wide-beam radar sensor for detecting moving and stationary targets



- 77-81GHz FMCW radar system for high-precision distance, angle, and velocity detection of both stationary and moving objects
- Maximum detection width: 150 degrees
- Maximum detection range of vehicle: 200 meters
- Multiple antenna configuration detects targets
- CAN/UART/4IO interfaces | Program can be upgraded via CAN
- <0.1s fast startup time
- Working temperature: -40 ~ 85°C
- Power short circuit, positive and negative connection protection
- Maintains stable detection performance unaffected by adverse weather conditions (wind/rain/snow/fog), temperature/humidity variations, or light interference

Model	Detection Range	Connection	Working Voltage	Output
QRM-GTP	0-200 meters	8-pin waterproof terminal	12V/24V DC	CAN / UART



Warning: Make No Modifications to this product

Without authorization from our company, any modification to this product may result in the failure of the operation of the equipment or the loss of official support. Contact Q GLOBAL Solutions (Xiamen) Electronics Corp. for more information.



Warning: Do not use for personnel safety protection

⚠ Do not use this device as a sensor for personnel safety protection!

The device does not have the self-test redundant circuit or fault protection mechanism required for personal safety protection.

Sensor failure or misoperation may lead to abnormal output signal (such as wrong trigger or failure), which may lead to serious injury or even death.

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FCC Warning

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Any changes or modifications not expressly approved by the party responsible for

compliance could void the user's authority to operate the equipment. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment .

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment should be installed and operated with minimum distance 20cm between the radiator& your body.

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Specifications

Detection Range: 0-200m for objects with high dielectric constants (e.g., metal, wood). Detection range is adjustable as required.

Output Configuration:

CAN output (default baud rate 500k)

UART output (default baud rate 19200)

12V trigger output (Zone A output: green wire, Zone B output: white wire)

Function adjustment: the radar detection range, sensitivity and response time can be adjusted by the programmer

Max. RF Output Power (EIRP) : 33.66dBm(EU)

Detection Capability: Stationary and moving targets

Working Principle: Frequency Modulated Continuous Wave (FMCW) radar technology

Operating Frequency: 77-81GHz

Working Voltage: 12V/24V DC

Power Protection: Integrated reverse polarity protection circuit prevents damage from incorrect power connections

Fast Start Time: < 0.1 seconds

Output Protection : short circuit protection design

Working temperature: -40 ~ 85°C

Environmental Protection: IP67-rated

Connection: 8-pin waterproof terminal

Material :

Front cover/ Radar interface: PC

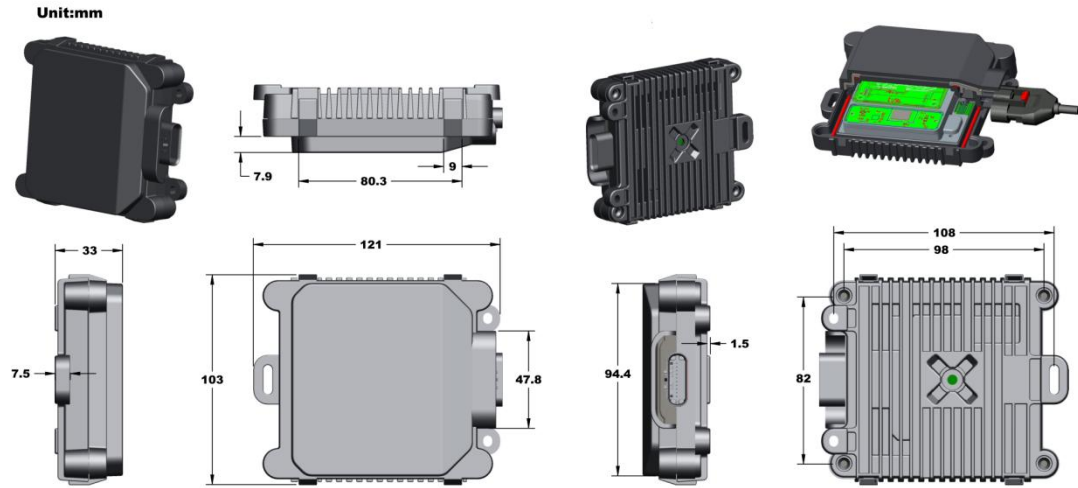
Rear cover/ Baffle: aluminum alloy

Beam Angle: horizontal Angle 120°, pitch Angle 10°

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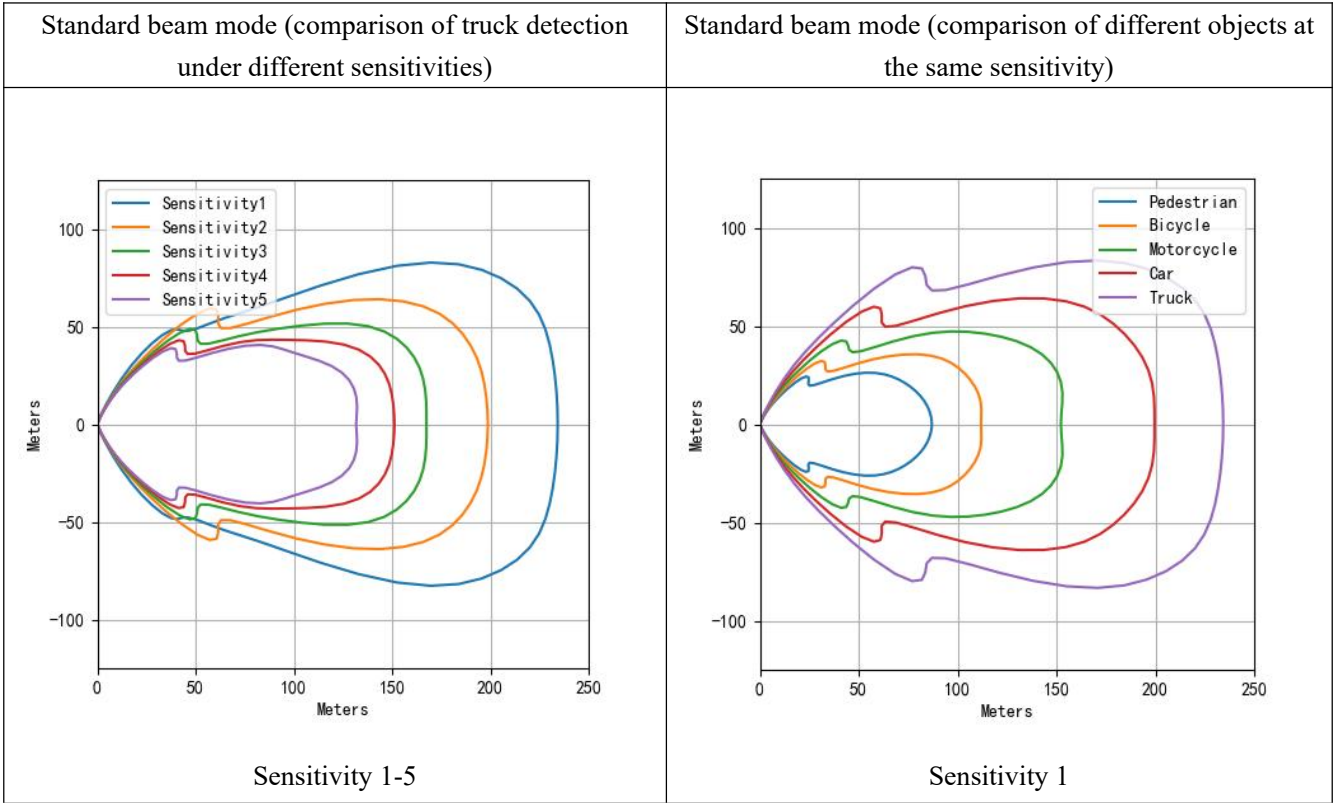
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Product Image



Beam Patterns

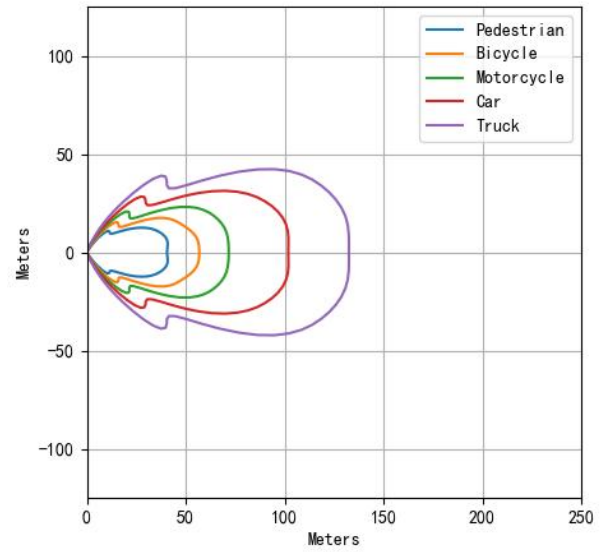
Antenna Mode 1



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- 1、Pedestrian (radar RCS = -5dBsm)
- 2、Bicycle (RCS radar = 0dBsm)
- 3、Motorcycle (radar RCS = 5dBsm)
- 4、Car (RCS radar = 10dBsm)
- 5、Truck (radar RCS = 15dBsm)



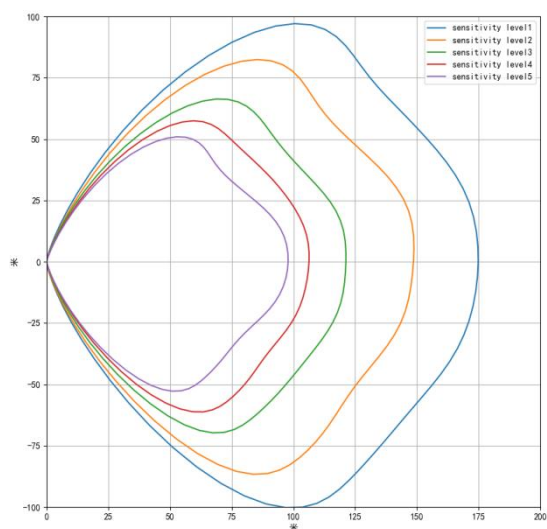
Sensitivity 5

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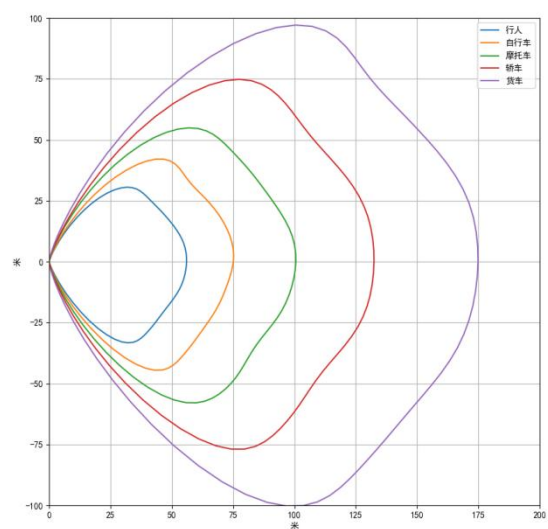
Antenna Mode 2

Standard beam mode (comparison of truck detection under different sensitivities)



Sensitivity 1-5

Standard beam mode (comparison of different objects at the same sensitivity)



Sensitivity 1

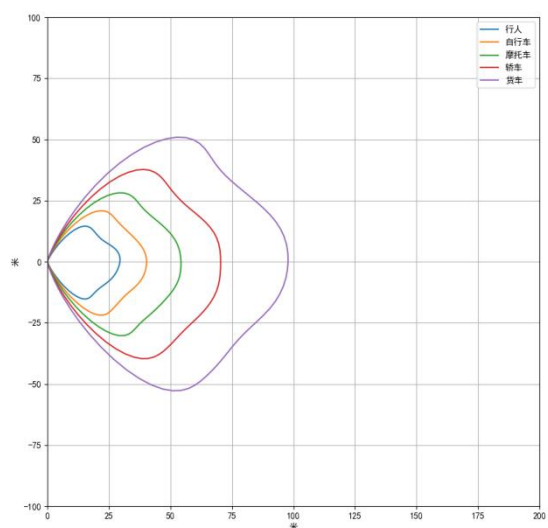
6、Pedestrian (radar RCS = -5dBsm)

7、Bicycle (RCS radar = 0dBsm)

8、Motorcycle (radar RCS = 5dBsm)

9、Car (RCS radar = 10dBsm)

10、Truck (radar RCS = 15dBsm)



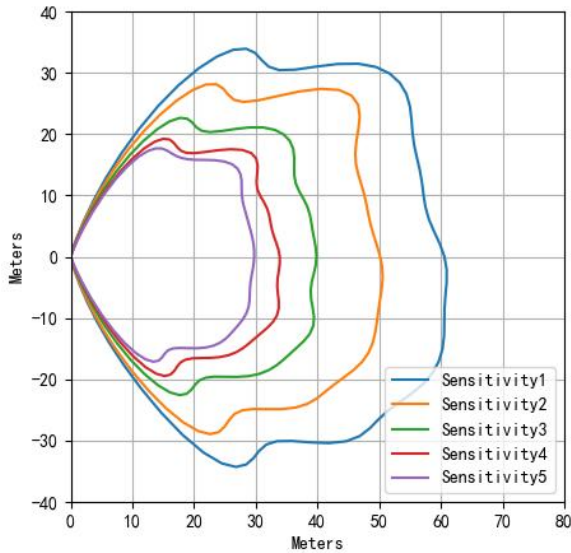
Sensitivity 5

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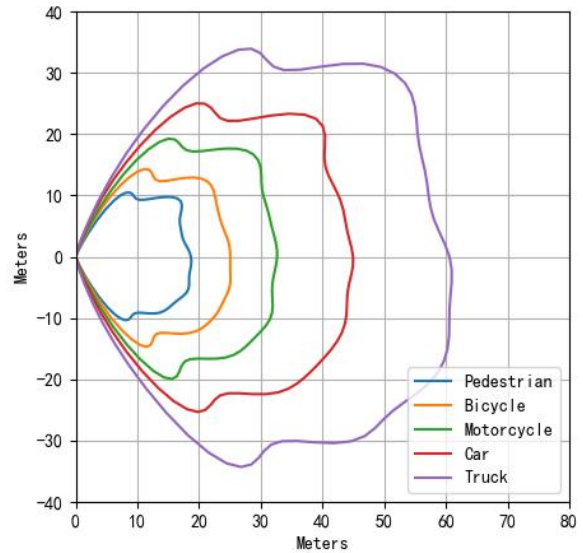
Antenna Mode 3

Standard beam mode (comparison of truck detection under different sensitivities)



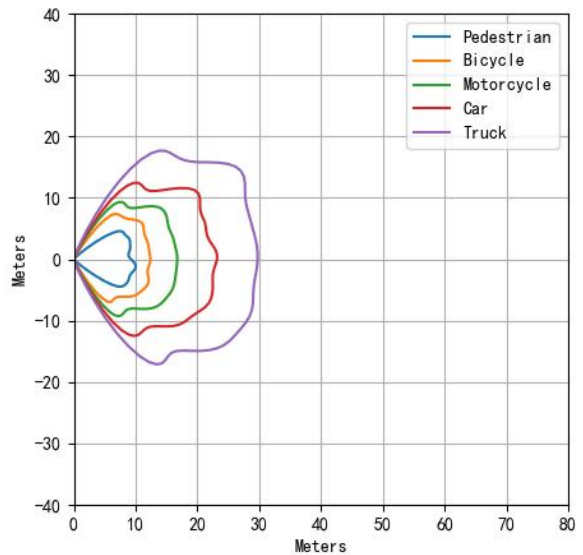
Sensitivity 1-5

Standard beam mode (comparison of different objects at the same sensitivity)



Sensitivity 1

- 11. Pedestrian (radar RCS = -5dBsm)
- 12. Bicycle (RCS radar = 0dBsm)
- 13. Motorcycle (radar RCS = 5dBsm)
- 14. Car (RCS radar = 10dBsm)
- 15. Truck (radar RCS = 15dBsm)



Sensitivity 5

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Product overview

Q Global radar sensor uses high-frequency radio wave technology to emit accurate beam signals through the internal antenna and receive the echo reflected by the target. The signal processing unit accurately calculates the distance between the sensor and the target object based on the time delay (ToF, Time of Flight) principle.

The radar sensor supports two independent configurable sensing zones for partitioned monitoring:

1. Default distance parameter: The trigger distance of the two sensing zones is preset at the factory, and it can be run by plugging in without initial configuration;
2. Obstacle-free environment calibration: The sensor has been pre-calibrated for sensitivity in an undisturbed environment (no fixed obstacles, no strong reflective background) before leaving the factory to ensure optimal detection performance under standard conditions.

Radar Installation Precautions

This radar sensor supports installation behind a glass or plastic window, but the following technical requirements should be noted:

Installation specifications require:

1. Penetration tests must be performed prior to installation
2. The spacing between the sensor and the window must be precisely controlled
3. Signal compensation must be performed: signal attenuation is about 20%

2mm polycarbonate window has good effect. The thinner (0-1.5mm) window has strong reflection, and the actual effect is affected by the material, thickness and installation distance.

To minimize window reflection interference, it is recommended to install the sensor at the position with the least reflection. The reflection intensity varies periodically with the distance between the sensor and the window, with a period of 1.9mm. Once the distance exceeds 150mm, the impact of reflection significantly diminishes. It is recommended to use factory-pre-certified window materials, which have been tested to maintain stable performance at any installation distance.

It is recommended to install a deflector hood above the window to prevent water accumulation from freezing and affecting detection. Note:

1. Rain, light fog or a few water droplets usually do not affect performance
2. But persistent water accumulation and ice may be mistaken for dielectric boundaries

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Quality Assurance Clause

Warranty scope:

Our company guarantees that the materials and processes of its products are in line with quality standards within one year from the date of factory delivery. For products found to have quality defects during the warranty period, free repair or replacement services will be provided after confirmation by our company.

Disclaimer :

The following situations are not covered by the warranty:

Damage caused by misuse, abuse or improper operation

Failure caused by abnormal installation or use

Any indirect loss or joint liability

This limited warranty is exclusive and supersedes all other warranties, express or implied (including but not limited to any warranties of merchantability or fitness for a particular purpose), whether arising out of performance, course of dealing or trade practices.

Q GLOBAL Solutions (Xiamen) Electronics Corp. is solely responsible for repairing or replacing products during the warranty period. Under no circumstances will the company be liable for indirect or incidental damages, or for any additional costs, expenses, losses, profit losses, or any incidental, consequential, or special damages incurred by the buyer or any other individual or entity due to any product defects or the use or inability to use the product, whether under contract or warranty, regulations, tort, strict liability, negligence, or otherwise.

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