Q-global QRSSK Series Radar-Based Dual-Zone Narrow-Beam Sensors User Manual

Contents

Q-Global

Q-global QRSSK Series Radar-Based Dual-Zone Narrow-Beam Sensors

Specifications

- **Name:** QRSSK Series Sensor
- **Sensing Range:** 1 to 60 meters
- **Connection:** 8-pin Waterproof terminal
- **Supply Voltage:** 12V/24V DC
- **Output:** CAN/UART DATA
- **Range:** The sensor is able to detect a proper object(see Detectable Objects) from 1 to 60m, depending on target
- **Detectable Objects:** Static objects, Moving objects.
- **Operating Principle:** Frequency-modulated continuous-wave (FMCW) radar
- **Operating Frequency:** 77-81GHz
- **Supply voltage:** 12V/24V DC
- **Supply Protection Circuitry:** Protected against reverse polarity
- **Delay at Power-up:** Less than 100 seconds
- **Output Protection:** Protected against short circuit conditions
- **Construction**
    - **Front Housing:** PPO
    - **Rear Housing:** Aluminium Alloy
    - **Access Cap:** PVC
- **Operating Temperature:** 40-85°C
- **Environmental Rating:** IP67
- **Connections:** 8-pin Waterproof terminal
- **Certifications:** CE FCC E-MARK
    - Beam Angles
    - Long distance mode: azimuth 120°, elevation 50°.
    - Short distance mode: azimuth 80°, elevation 90°.

DATASHEET
Radar-based Dual-Zone Narrow-Beam Sensors for Detection of Moving and Stationary Targets FMCW radar, operating frequency 77-81G, detects static objects, and can detect the distance, angle and speed of the target.

Name	Sensing Range	Connection	Supply Voltage	Output
QRSSK	1 to 60 meters	8-pin Waterproof terminal	12V/24V DC	CAN/UART DATA

Maximum beam width 120 degrees.
The maximum detection range is up to 60 meters for small cars. Multiple antenna configurations to detect target CAN\UART\4IO, The program CAN be upgraded through CAN Fast startup time of less than 100s.

Operating temperature: -40-85℃
Power short circuit, positive and negative connection protection

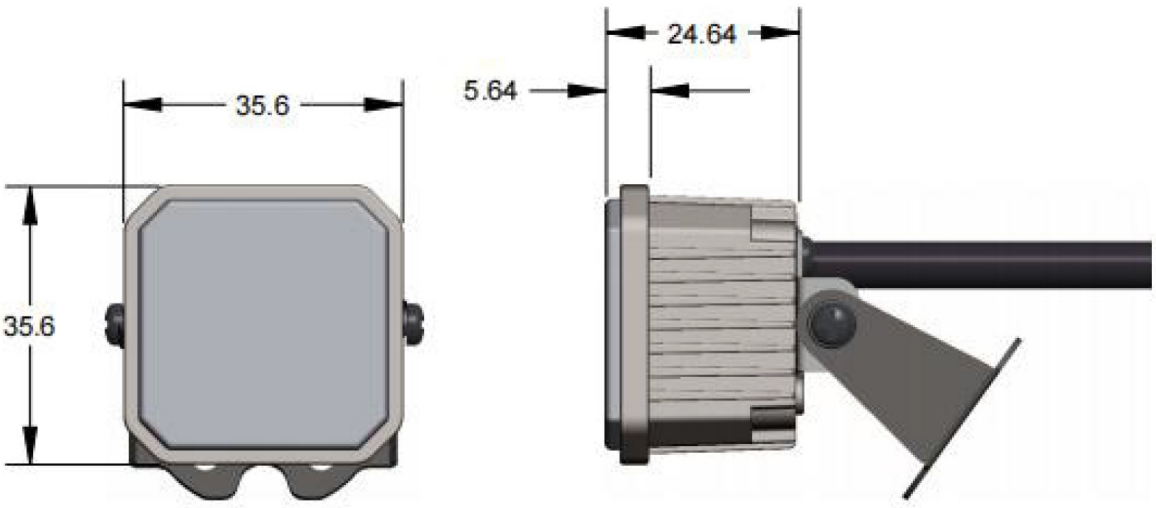
CAUTION: Make No Modifications to this product
Any modifications to this product not expressly approved by Q-Globle could void the user's authority to operate the product. Contact Q-Globle for more information.

WARNING: Not to Be Used for Personnel Protection
Never use this device as a sensing device for personnel protection. Doing so could lead to serious injury or death. This device does not include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A sensor failure or malfunction can cause either an energized or de-energized sensor output condition.

Overview
The Q-Global sensor emits a well-defined beam of high-frequency radio waves from an internal antenna. Some of this emitted energy is reflected back to the receiving antenna. Signal processing electronics determine the distance from the sensor to the object based on the time delay of the return signal. The sensor can be configured to two independent sensing zones. The two sensing zones are factory pre-set to default distance; The sensor is plug-in ready for immediate operation. The sensitivity is precalibrated at the factory, assuming that the sensing field will be clear of obstacles.

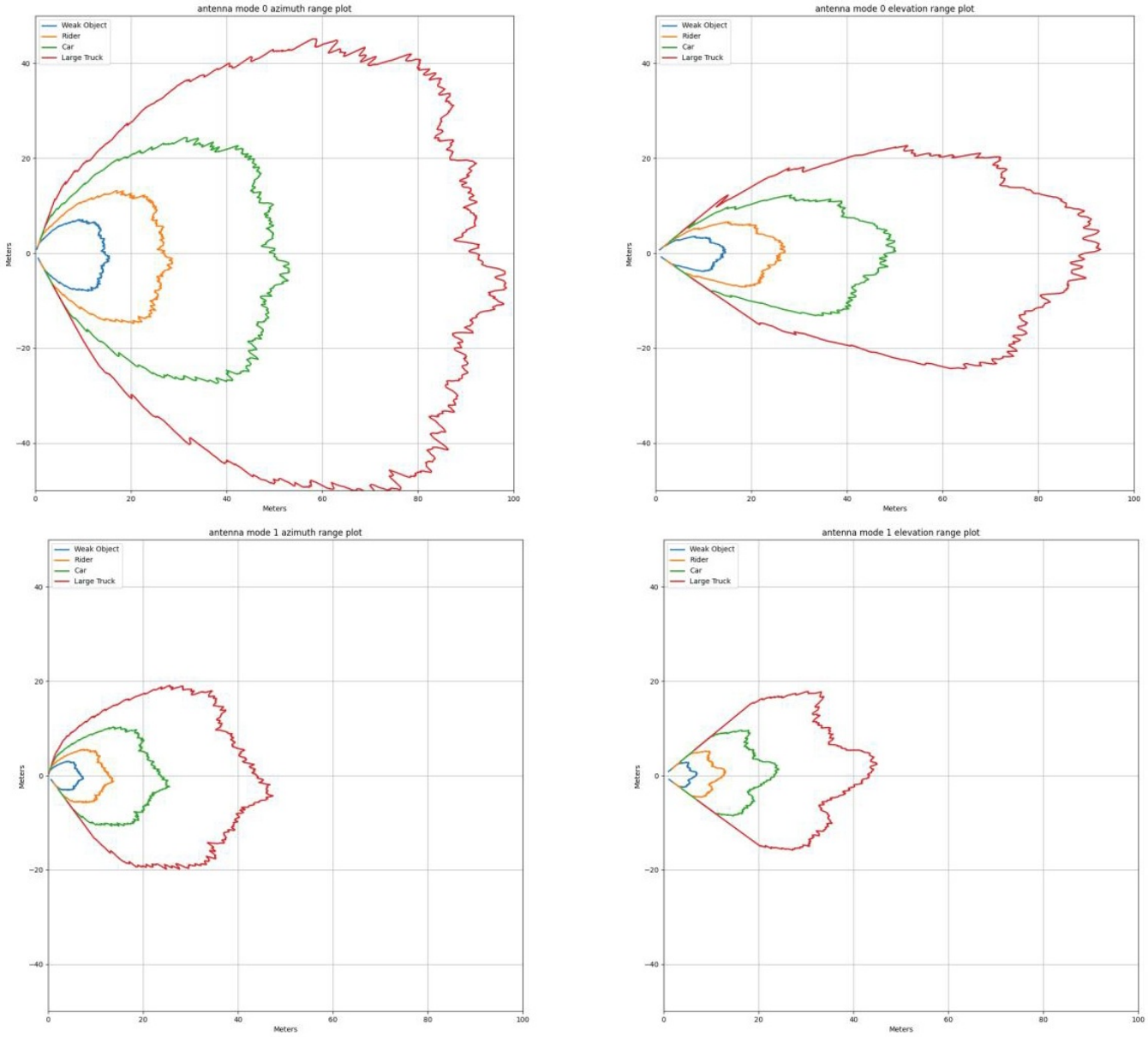
Product Usage Instructions

Overview
The Q-Global sensor emits high-frequency radio waves from an internal antenna and processes the reflected signals to determine the distance, angle, and speed of the target. It can detect static and moving objects within a range of 1 to 60 meters.



Installation
Ensure the sensor is connected to a 12V/24V DC power source using the provided 8-pin waterproof terminal. The sensor is plug-in ready for immediate operation.

Beam Patterns



1. Weak Object(RCS = -10)
2. Rider (RCS = 0)
3. Car(RCS = 10)
4. Larger Truck(RCS = 20)

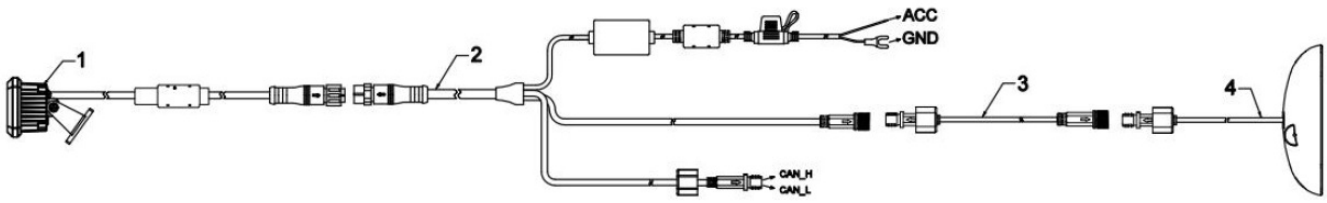
Operating Instructions
The sensor operates using FMCW radar technology with an operating frequency of 77-81GHz. Ensure the sensor is positioned to have a clear field of view without obstacles within its detection range.

Window Placement
If placing the sensor behind a window, ensure the configuration is tested and the distance from the sensor to the window is determined and controlled. Note that there may be a 20% signal reduction when the sensor is behind a window.

Windows
The Q-Global sensor can be placed behind a glass or a plastic window, but the configuration must be tested and the distance from the sensor to the window must be determined and controlled prior to installation. There is typically a 20% signal reduction when the sensor is placed behind a window. Polycarbonate at 2mm thickness performs well in most situations, but the performance depends on filler materials. Thinner (0 to 1.5mm) windows have high reflection. The amount of reflection depends on the material, thickness, and distance from the sensor to the window. Locate the sensor in a position of minimum reflection from the window, which will repeat every 1.9 mm of distance between the sensor and the window. The position of maximum reflection from the window repeat between the minimums, and decrease in effect until the window is approximately 150mm away. Consult the factory for pre-tested window materials which can be used at any distance without issue. Additionally, the face of the window should be protected from flowing water and ice by use of a flow diverter or hood directly above the window. Falling rain or snow in the air in front of the window, light water mist, or small beads on the face of the window are typically not an issue. However, a thick, continuous surface of water or ice directly on the face of the window can be detected as a dielectric boundary.

(Front radar)

Wiring Diagram



System components

NO.	Parts	Count
1	Radar	1
2	Main Cable	1
3	LED light	2
4	Accessories bag	1

Accessories bag:

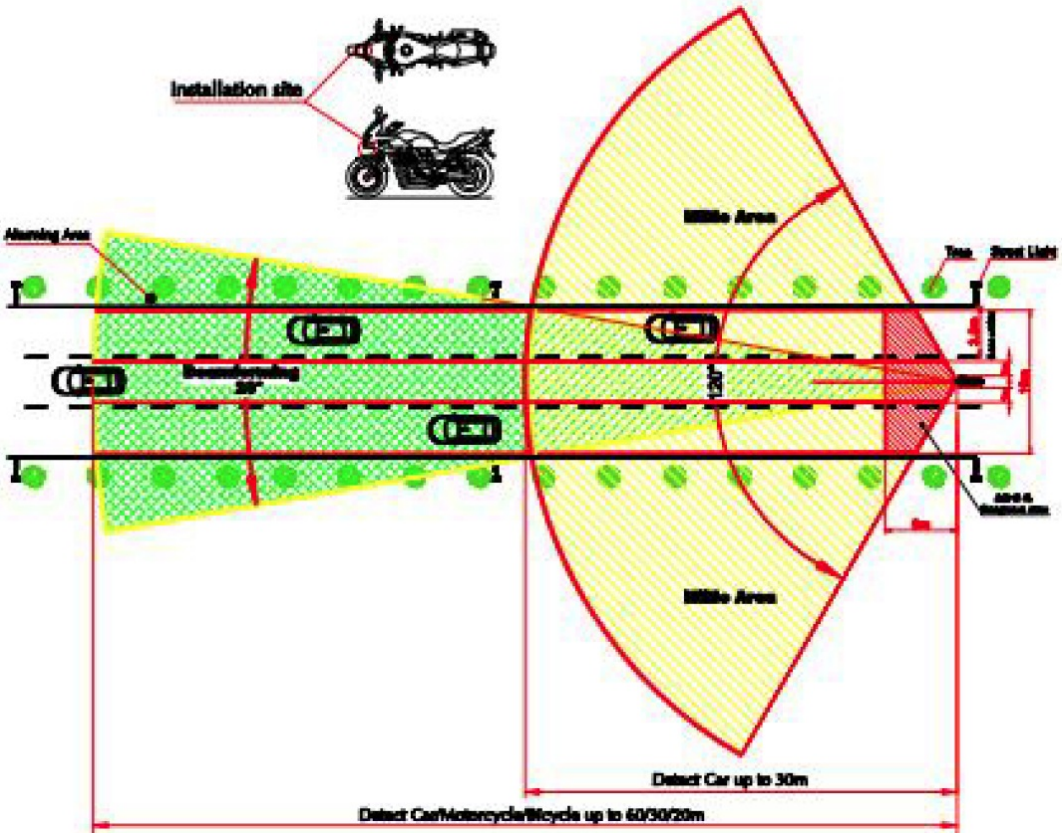
- Adjustable bracket x 1 set:
- Spring washer x 10:
- M3 screw x 7;
- M3 Self-tapping screw x 3;
- 3M glue x 1;
- Cable tie x 8;
- Fuse X 1;
- Alcohol swab X 1;
- Silicone Case X 1;
- Rubber X 1.

System function

- **Left green light:** the left lane length is detected: 20+vehicle_speed/25m, **width:**2m-6m that detected moving

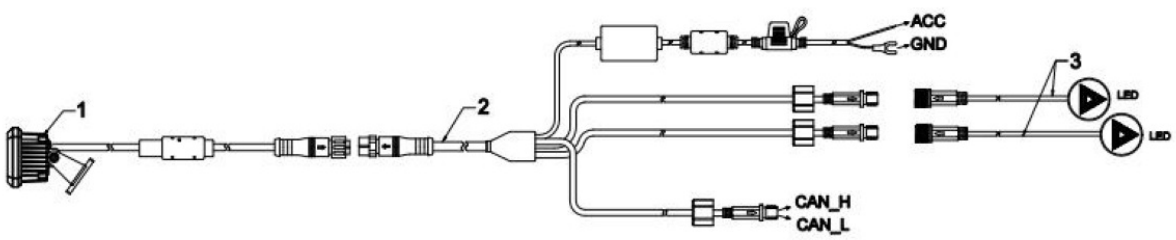
objects.Fox example, the radar detect 20m forward when the vehicle speed is 0 km/h, the detect distance will be 24m when vehiclespeed is 100(100/25m=4m).

- **Right green light:** the right lane length is detected: 20+vehicle_speed/25m, and the width is 2m-6m that detected moving objects.
- **Middle digital tube:** the distance to the nearest object in the middle lane the width#2m,and the length is 2m-90m.
- **Simultaneous yellow lights on both sides:** safe following distance warning (vehicle_speed/3)m.
- **Simultaneous red lights on both sides:** collision warning (collision time <3s, vehicle speed>20KM/H).
    - (The current version 1.0 is recommended to be used at a speed of 20KM/H or above, and the recognition rate of static obiect collision detection is not high).



(Rear radar)

Wiring Diagram



System components

NO.	Parts	Count
1	Radar	1
2	Main Cable	1
3	LED light	2
4	Accessories bag	1

Accessories bag:

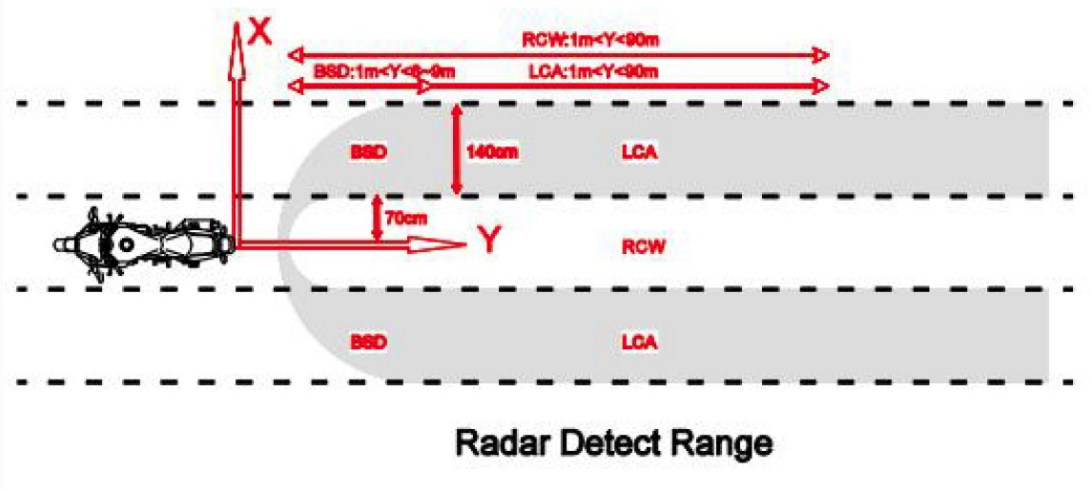
- Adjustable bracket x 1 set;
- Spring washer x 10;
- M3 screw x 7;
- M3 Self-tapping screw x 3,
- 3M glue x 1:
- Cable tie x 8,
- Fuse X 1;
- Alcohol swab X 1;
- Silicone Case X 1;
- Rubber X 1.

Product function

Product Function / Triggering Condition	Blind Spot Detect -BSD	Lane Change Assist -LCA	Rear Collision Warning -RCW
System Starting Speed	V≥15Km/h		
Lateral warning range	Left, right lane	Left, right lane	Home lane
Longitudinal warning range	1m<Y<8-9m According to speed	1m<Y<90m	1m<Y<90m
The Warning Mstrategy	Alarm of moving target in alarm area,including passive overtaking and samespeed following.	Alarm of moving target in alarm area,including passive overtaking and samespeed following.	There is a vehicle approaching fast in the lane directly behind the vehicle,there are moving objectswithin 6m.
Alarm Trigger Condition	There are targets in the warning range, and the corresponding direction of the warning light is on for a long time to remind the driver.	If there is a target vehicle within the warning range and TTC time ≤3s, the alarm light is on.	If there is a target vehicle within the warning range and TTC time ≤3s, the bidirectional alarm light flashes.

Note:

- The radar is centred on the left and right, and the area extending 0.7m outward is the current motorcycle lane; the 0.7m on both sides of the radar is the left and right adjacent lanes.
- The lane width defined by radar detection is 1.4m, the lane position may be offset when the vehicle body is not parallel to the actual lane line on the road surface.



Radar Detect Range

Warranty

Q-Global warrants its product to be free from defects in material and workmanship for one year following the date of shipment. Q-Globle will repair or replace, free of charge, any product of its manufacture which, at the time it is returned to the factory, is found to have been defective during the warranty period. This warranty does not cover damage or liability for misuse, abuse, or improper application or installation of the Q-Global product.

THIS LIMITED WANRRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES WHETHER EXPRESS OR IMPLIED (INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE), AND WHETHER ARISING UNDER THE COURSE OF PERFORMANCE, COURSE OF DEALING OR TRADE USAGE.

This warranty is exclusive and limited to repair or, at the discretion of Q-Global replacement. IN NO EVENT SHALL Q-GLOBAL BE LIABLE TO BUYER OR ANY OTHER PERSON OR ENTITY FOR ANY EXTRA COSTS, EXPENSES, LOSSES, LOSS OF PROFITS, OR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES RESULTING FROM ANY PRODUCT DEFECT OR FROM THE USE OR INABILITY TO USE THE PRODUCT, WHETHER ARISING IN CONTRACT OR WARRANTY, STATUTE, TORT, STRICT LIABILITY, EGLIGENCE, OR OTHERWISE.

R-Global reserves the right to change, modify or improve the design of the product without assuming any obligations or liabilities relating to any product previously manufactured by Q-Global. Any misuse, abuse, or improper application or installation of this product or use of the product for personal protection applications when the product is identified as not intended for such purposes will void the product warranty. Any modifications to this product without prior express approval by Q-Global will void the product warranties. All specifications published in this document are subject to change; Q-Globle reserves the right to modify product specifications or update documentation at any time.

For the most recent version of any documentation, refer to: www.q-solutions.com.cn.

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 the receiver.
- Connect the equipment to 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 a minimum distance between the radiator& your body.

FAQ

Can the sensor detect both static and moving objects?
Yes, the sensor can detect both static and moving objects within its specified range of 1 to 60 meters.

What is the maximum detection range for small cars?
The maximum detection range for small cars is up to 60 meters.

Can the sensor be used for personnel protection?
No, the sensor should not be used for personnel protection as it lacks the necessary redundant circuitry for such applications.

Documents / Resources

	Q-global QRSSK Series Radar-Based Dual-Zone Narrow-Beam Sensors [pdf] User Manual QRSSK Series Radar-Based Dual-Zone Narrow-Beam Sensors, QRSSK Series, Radar-Based Dual-Zone Narrow-Beam Sensors, Based Dual-Zone Narrow-Beam Sensors, Dual-Zone Narrow -Beam Sensors, Zone Narrow-Beam Sensors, Narrow-Beam Sensors, Beam Sensors, Sensors

References

- q-solutions.com.cn
- User Manual