DS-TMG033 Barrier Gate Radar

User Manual

User Manual

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About this Manual

This Manual is applicable to DS-TMG033 Barrier Gate Radar.

The Manual includes instructions for using and managing the product. Pictures, charts, images and all other information hereinafter are for description and explanation only. The information contained in the Manual is subject to change, without notice, due to firmware updates or other reasons. Please find the latest version in the company website (http://overseas.hikvision.com/en/).

Please use this user manual under the guidance of professionals.

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FCC Information

Please take attention that changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC compliance: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC Conditions

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.

2. This device must accept any interference received, including interference that may cause undesired operation.

EU Conformity Statement



This product and - if applicable - the supplied accessories too are marked with "CE" and comply therefore with the applicable harmonized European standards listed under the EMC Directive 2014/30/EU, the LVD Directive 2014/35/EU, the RoHS Directive 2011/65/EU.



2012/19/EU (WEEE directive): Products marked with this symbol cannot be disposed of as unsorted municipal waste in the European Union. For proper recycling, return this product to your local supplier upon the purchase of equivalent new equipment, or dispose of it at designated collection points. For more information see: www.recyclethis.info



2006/66/EC (battery directive): This product contains a battery that cannot be disposed of as unsorted municipal waste in the European Union. See the product documentation for specific battery information. The battery is marked with this symbol, which may include lettering to indicate cadmium (Cd), lead (Pb), or mercury (Hg). For proper recycling, return the battery to your supplier or to a designated collection point. For more information see: www.recyclethis.info

Industry Canada ICES-003 Compliance

This device meets the CAN ICES-3 (A)/NMB-3(A) standards requirements.

Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
NOTE	Provides additional information to emphasize or supplement important points of the main text.
WARNING	Indicates a potentially hazardous situation, which if not avoided, could result in equipment damage, data loss, performance degradation, or unexpected results.
DANGER	Indicates a hazard with a high level of risk, which if not avoided, will result in death or serious injury.

Safety Instructions

- Proper configuration of all passwords and other security settings is the responsibility of the installer and/or end-user.
- In the use of the product, you must be in strict compliance with the electrical safety regulations of the nation and region. Please refer to technical specifications for detailed information.
- Input voltage should meet both the SELV (Safety Extra Low Voltage) and the Limited Power Source according to the IEC60950-1 standard. Please refer to technical specifications for detailed information.
- Do not connect several devices to one power adapter as adapter overload may cause over-heating or a fire hazard.
- Please make sure that the plug is firmly connected to the power socket.
- If smoke, odor or noise rise from the device, turn off the power at once and unplug the power cable, and then please contact the service center.

Preventive and Cautionary Tips

Before connecting and operating your device, please be advised of the following tips:

- Ensure unit is installed in a well-ventilated, dust-free environment.
- Unit is designed for indoor use only.
- Keep all liquids away from the device.
- Ensure environmental conditions meet factory specifications.
- Ensure unit is properly secured to a rack or shelf. Major shocks or jolts to the unit as a result of dropping it may cause damage to the sensitive electronics within the unit.

- Use the device in conjunction with an UPS if possible.
- Power down the unit before connecting and disconnecting accessories and peripherals.
- A factory recommended HDD should be used for this device.
- Improper use or replacement of the battery may result in hazard of explosion. Replace with the same or equivalent type only. Dispose of used batteries according to the instructions provided by the battery manufacturer.
- Ensure to use the attached power adaptor only and not to change the adaptor randomly.

Table of Contents

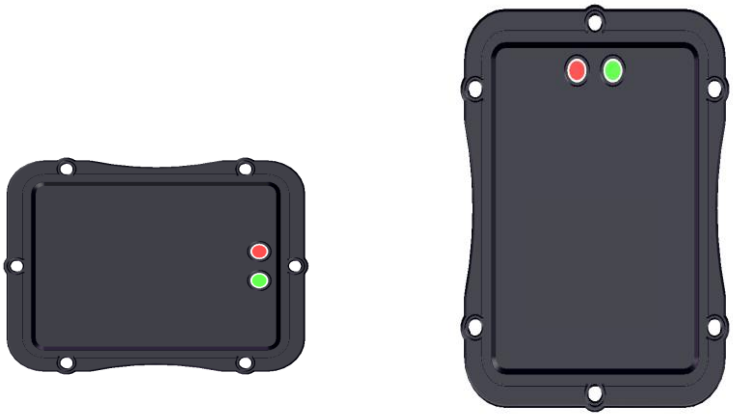
Chapter 1 Introduction 7
1.1 Product Overview 7
1.2 Features and Functions 8
Chapter 2 Barrier Gate Radar Installation 9
2.1 Cautions 9
2.2 Interface Explanation 10
2.3 Barrier Gate Radar Installation 11
2.3.1 Anti-Fall Radar 11
2.3.2 Capture-Trigger Radar 12
2.3.3 Cabling 13
2.3.4 Auto Calibration 14
Chapter 3 Configuration 15
3.1 Install Software 15
3.2 Configure Radar Parameters 16
3.3 Read and Clear Count 17
3.4 View Target Status 17
3.5 Other Operation 18
Chapter 4 FAQ 19

Chapter 1 Introduction

1.1 Product Overview

The barrier gate radar, with the international advanced microwave high precision positioning and high-speed digital signal processing technology, features in high precision, free debugging, high reliability, etc.

The barrier gate radar is composed of capture-trigger radar and anti-fall radar. The anti-fall radar is used to control the rising and falling of the arm of the barrier gate, avoiding it falling down when there is vehicle or pedestrian passing. The capture-trigger radar is used to trigger the capture camera to capture the license plate picture.



Capture-Trigger Radar

Anti-Fall Radar

Figure 1-1 Barrier Gate Radar Components

The barrier gate radar is applicable to parking lot, entrance, and exit of underground garage. It can control the arm of the barrier gate to rise and fall automatically, and control the capture camera to capture license plate pictures, recognize illegal vehicle, and provide reliable evidence for parking charges and management. It plays an important role in intelligent parking system. The typical application is shown as below.



Figure 1-2 Typical Application

1.2 Features and Functions

- The barrier gate radar can send the target information to the upper computer to display in real time via RS-485 serial port. It can also send information to the relay to trigger camera capturing pictures. Meanwhile, it controls the arm of barrier gate to rise or fall. If target is detected, the relay will work. If there is no target, the relay will disconnect.
- The LED indicator can indicate the working status of radar. There are two LED indicators. The red one is the power supply indicator, and the green one is the status indicator. When the radar is initializing, the green indicator is solid green. When the radar is calibrated, the green indicator flashes. After the target is detected, the green indicator lights on. If the target disappears, the green indicator lights off.
- 24 GHz MMIC with better performance.
- Advanced signal processing technology with stable performance and low false alarm rate.
- Convenient to install and maintain. For the inductive loops, the constructors have to damage the pavement in installation and maintenance. After installation, they have to repair the pavement again. It requires high labor cost. While for the radar, the installation and maintenance do not need to damage the pavement, and need little manual labor and short labor-hour.
- Vehicle and pedestrian can be distinguished. The inductive loops can only recognize vehicle, resulting in hitting the pedestrian accidently. While the radar can recognize both vehicle and pedestrian, avoiding the accident happening.
- Long service life. The service life of inductive loops is two years. The service life of radar can reach 5 to 10 years.
- RS-485 communication with more stable signal and longer communication distance.
- Automatically recognize background, convenient operation, and strong versatility.
- Radar detection distance adjustable according to the barrier gate arm length or road width.
- Firmware upgrade via serial port.
- With wide universality to be installed internally and externally.
- The configuration parameters of radar can be recorded automatically. The working status can be restored to the previous status after reboot.
- Strong environmental adaptability to the illumination, dust, rain, snow, etc.

Chapter 2 Barrier Gate Radar Installation

2.1 Cautions

- The installation of anti-fall radar and capture-trigger radar must be perpendicular to driveway. The anti-fall radar is installed on the case beneath the arm of the barrier gate, while capture-trigger radar is installed on the card reader or individual upright tube. It is suggested to install the bottom edge of radar 0.6 meter (1.97 inch) above the ground, as shown in figure 2-1.

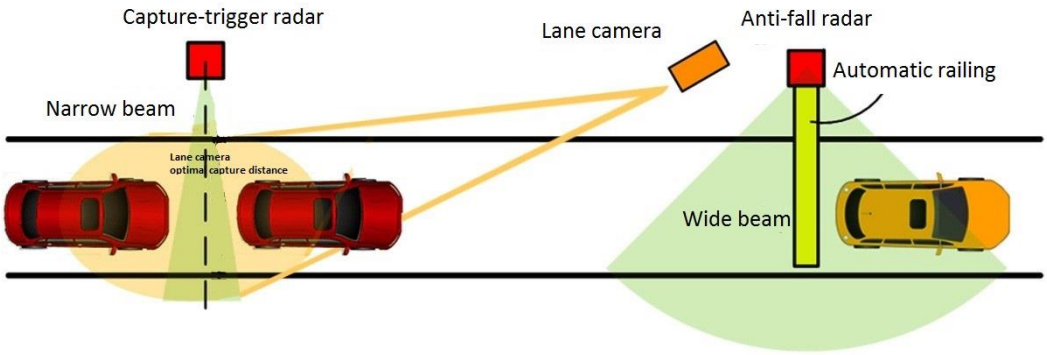


Figure 2-1 Figure 2-1 Barrier Gate Radar Installation Environment

- Barrier must be firmly installed with an inclination angle smaller than 5°.
- Do not block the front of the radar.
- Proper power supply.
- Do not hot plug in serial ports.
- If there is a guardrail outside driveway, fix the guardrail firmly. Do not use contraction band or traffic cone as guardrail, it is not stable and may cause waggling.
- Don’t place any objects in radar detection range, except arm of barrier gate.
- Recharge radar and update background clutter map timely if the environment changes.
- Extend the guardrail outside the barrier gate by a certain length L to guarantee barrier gate safety, as shown in figure 2-2.

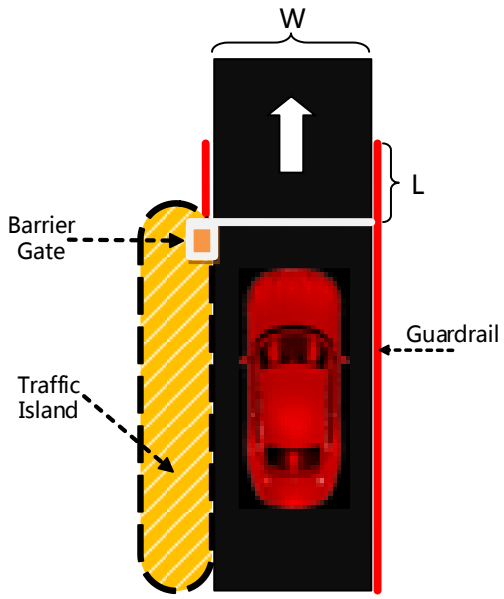


Figure 2-2 Extending Length of Guardrail

The corresponding relation between guardrail extending length and driveway width is shown in table 2-1.

Table 2-1 Corresponding Relation between Guardrail Extending Length and Driveway Width

Driveway Width W（m）	Guardrail Extending Length L（m）
≤3.0	0.6
3.2	1.0
3.4	1.2
3.6	1.6
3.8	2.0
4.0	2.2
4.2	2.6
≥4.4	3.0

2.2 Interface Explanation

Radar interfaces are shown as figure 2-3.

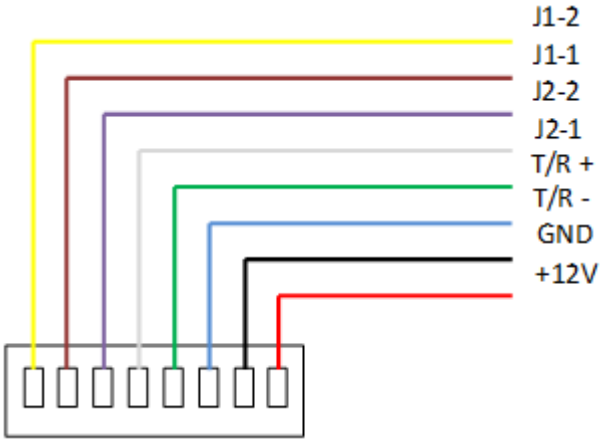


Figure 2-3 Radar Cable and Interfaces

Table 2-2 Corresponding Table of Cables and Interfaces

Cable	Interface
J1-1(Brown), J1-2(Yellow)	Relay output
J2-1(White), J2-2(Purple)	Calibration button input
T/R+(Green), T/R-(Blue)	485 communication
GND(Black), +12V(Red)	12 V power supply

2.3 Barrier Gate Radar Installation

Barrier gate radar supports both external and internal installation. Detailed installation is shown as below.

2.3.1 Anti-Fall Radar

Anti-fall radar must be longitudinally mounted.

Step 1 Install six welding studs on the rack as shown in figure 2-4.

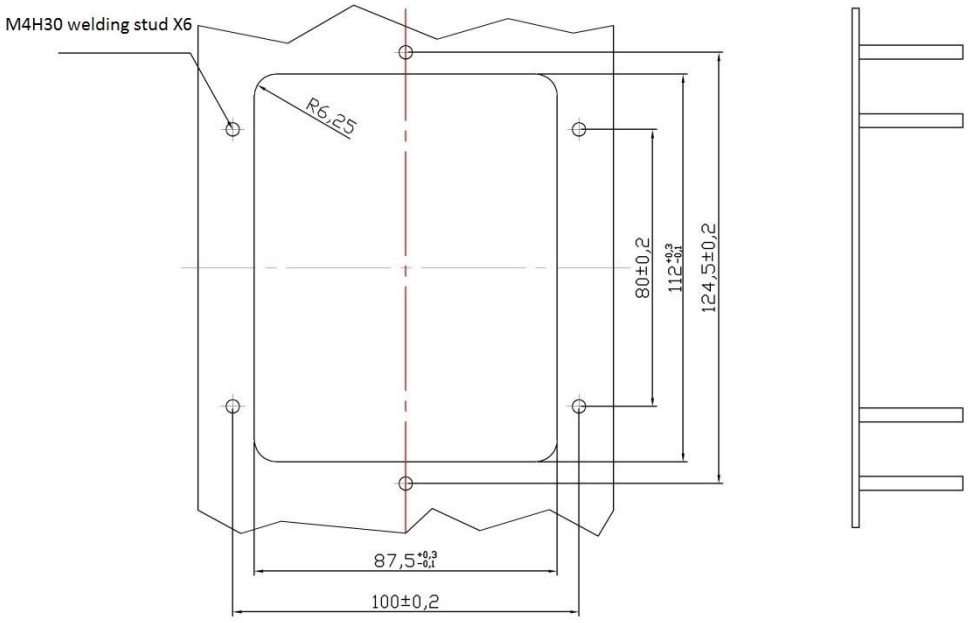


Figure 2-4 Welding Studs Position

Step 2 Embed sealing gasket into the edge of radar.

Step 3 Drive the welding studs into four fixing holes of radar and tighten the nuts.

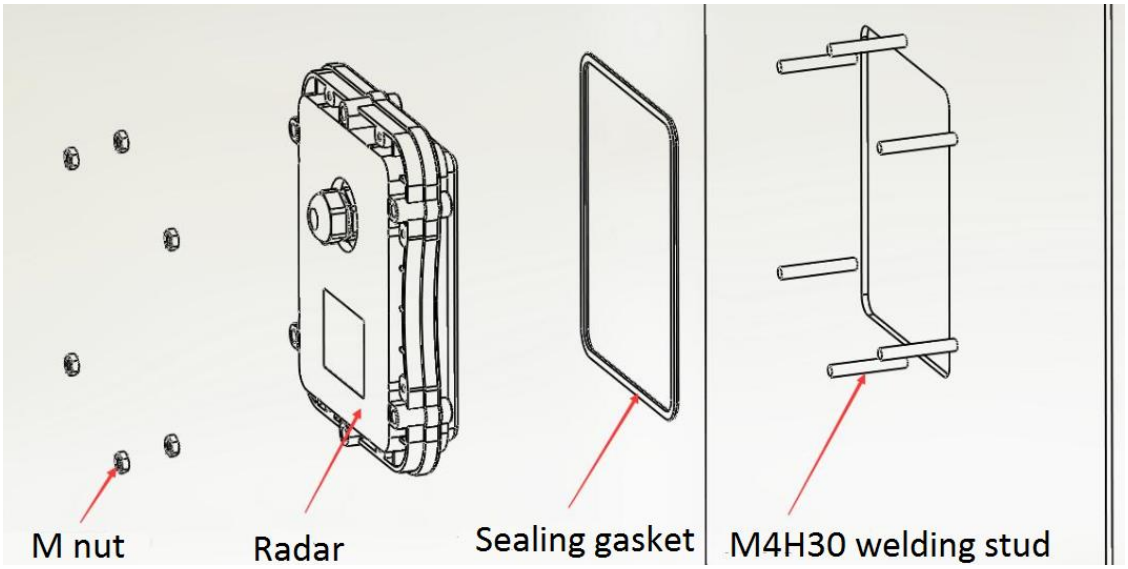


Figure 2-5 Internal Installation of Anti-Fall Radar

2.3.2 Capture-Trigger Radar

Step 1 Punch two mounting holes on the rack.

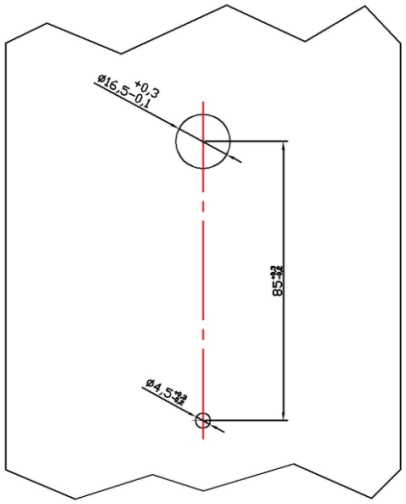


Figure 2-6 Hole Size

Step 2 Install gaskets.

Put gaskets for connector hole outside the waterproof connector.

Embed gaskets for threaded hole into threaded hole.

Step 3 Fix capture-trigger radar on rack and tighten screws.

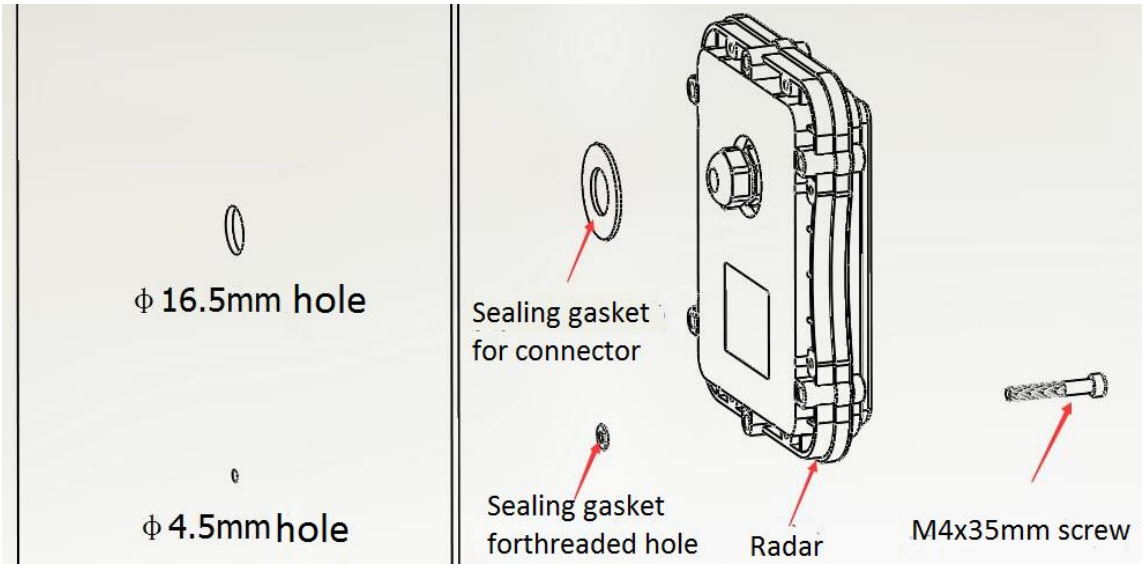


Figure 2-7 Install Capture-Trigger Radar

2.3.3 Cabling

Connect radar plug to communication plug.

- Connect “+12 V” to output positive terminal of 12 VDC power supply, while connect “GND” to output negative terminal of power supply.
- Connect capture –trigger radar J1-1 and J1-2 to camera trigger terminal.

- Connect anti-fall radar J1-1 and J1-2 to induction coil terminal and public terminal in barrier gate control box.
- Connect capture-trigger radar J2-1 and J2-2 to a normal switch button.

NOTE

If you merely charge and update background, you can choose not to connect. But you have to ensure proper ground insulation.

NOTE

“Delay fall” refers to that gate barrier falls automatically when having not detected targets for a certain period in rising state. If “delay fall” is disabled, you can choose not to connect. But you have to ensure insulation.

- Skip the below cabling if you do not use upper computer.

  To view radar status in upper computer, connect “T/R+” to the T/R+ of 485 interface, “T/R-” to the T/R- of 485 interface, and 485 serial port cable to computer serial port.

2.3.4 Auto Calibration

Radar records background clutter automatically when charging. Red indicator is solid red when radar is powered on normally. Green indicator flickers when radar calibrates automatically. Make sure no object passes radar range in 5 seconds. After 5 seconds, green indicator stops flicking and radar finishes automatic calibration and works normally.

Chapter 3 Configuration

3.1 Install Software

Step 1 Double click *setup.exe* in the installation package, follow the prompts to finish installation. After installation, a shortcut would be generated on desktop, as shown in figure 3-1.



Figure 3-1 Software Installation

Step 2 Run the ETGRadar icon to start the software, and the interface is shown as figure 3-2.

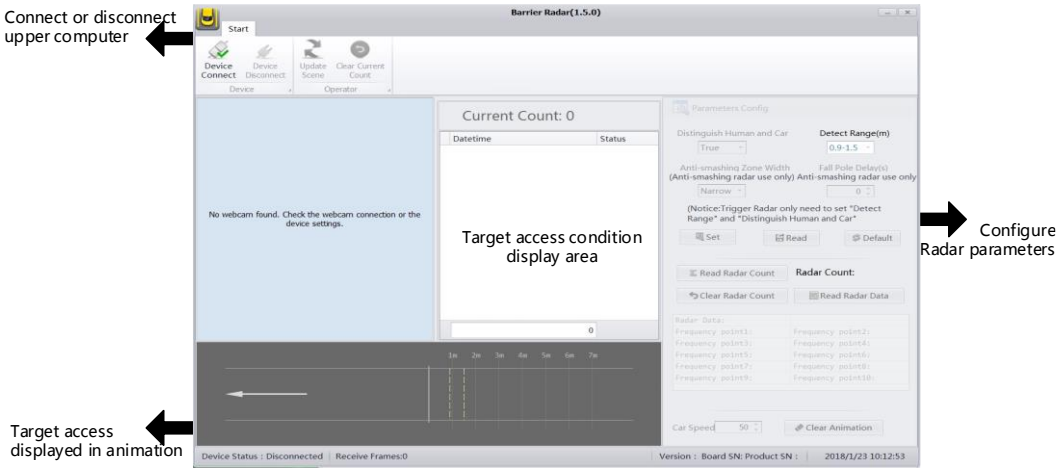


Figure 3-2 Software Interface

Step 3 Connect devices.

1) Click **Device Connect**, a dialog box pops up as shown in figure 3-3.

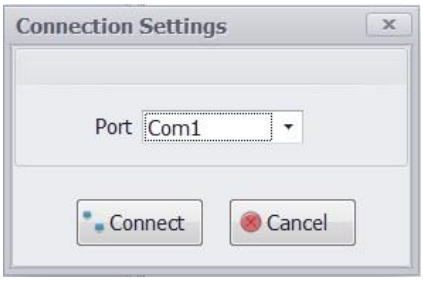


Figure 3-3 Port Selection

The software automatically detects all available ports and you can click serial ports as needed. Corresponding ports can be viewed in the computer device management.

Radar baud rate is set to 115200 bps, parity bit to odd, stop bit to 2 bits, and data bits to 8 bits by default.

2) Click **Connect** after finishing configuration.

Step 4 Click **Update Scene** in menu bar, and click **Yes** in the pop-up dialog box.

Green indicator flickers during calibration, and make sure no pedestrians or cars pass in 5 seconds. Green indicator stops flickering in 5 seconds when the calibration finished.

NOTE

When **Update timeout** pops up or scene changes, you have to conduct calibration again.

Step 5 Clear current count.

If you need to recount the traffic flow, click **Clear Current Count**, and click **Yes** in the pop-up prompt to clear the traffic flow counting.

3.2 Configure Radar Parameters

Step 1 Configure parameters

The radar parameters to be configured is shown in figure 3-4, among which, **Anti-smash Zone Width**, **Fall Pole Delay**, **Distinguish Human and Car** are only applicable to anti-fall radar. For capture-trigger radar, you need to configure detect distance. Configure parameters as needed.

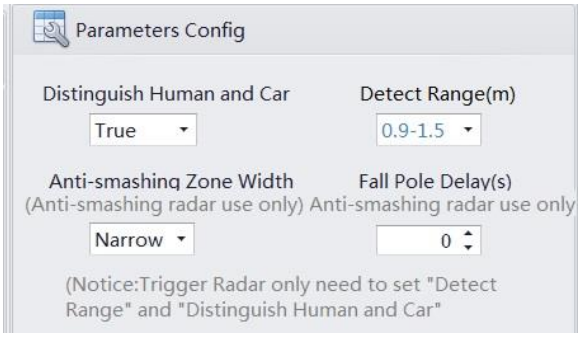


Figure 3-4 Radar Parameters

- **Detect Range**: Pavement width covered by radar beam. The range starts from where radar is perpendicular to the ground. The detect distance is 0 to 6 meters and precision is 0.3 meter.

  Different scenes correspond to different radar detect distances. In “capture-trigger radar/anti-fall radar”, configure the detect distance of capture-trigger radar/anti-fall radar.

- **Anti-smash Zone Width**: Total width of the left and right sides of the arm of barrier gate radar beam covers. There are “**Broad**” and “**Narrow**” two types. “**Broad**” corresponds to 1.5 meters, while “**Narrow**” corresponds to 1 meter.

  “**Broad**” suits scenes where the angle between car and pavement is less than 30^{o} when car passes anti-smash zone, while “**Narrow**” suits scenes where the angle is less than 20^{o}.

- **Fall Pole Delay**: Time taken from complete rise to complete fall.

- **Distinguish Human and Car**: Sensitivity of target detection. There are “**True**” and “**False**” two types. Higher the sensitivity is, stronger the radar identification ability is. Radar of “**True**” sensitivity detects individual pedestrian, while radar of “**False**” sensitivity detects multiple pedestrians and small electric car, and small electric car underreporting can occur.

Step 2 Distribute Parameters.

Click **Set** to distribute parameters to radars. Prompts of **Set successfully** indicates successful distribution.

Step 3 Read Parameters.

Click **Read** to read current radar parameters.

NOTE

Click **Default** to restore radar parameters to default values.

3.3 Read and Clear Count

- Read count: Click **Read Radar Count** to view current traffic flow count.
- Clear count: Click **Clear Radar Count** to clear current traffic flow count.

NOTE

When prompts of **Read overtime** or **Clear overtime** pop up, you have to conduct read/clear again.

3.4 View Target Status

You can view the vehicle access conditions after radar is connected to serial ports.

On the top left of the display area is traffic flow count, on the left bottom is the time conditions of vehicles and pedestrian access to radar range, on the top right is live view, and on the right bottom is the vehicle passing images in simulation.

3.5 Other Operation

Click **Device Disconnect** to disconnect device and close software to stop viewing radar operating state.

Chapter 4 FAQ

- Unable to connect to software.

Step 1 Check whether power supply is connected properly, serial ports is connected firmly, cables are connected properly.

Step 2 Check whether serial port cables and converters are damaged.

- Unable to detect targets.

Step 1 Run upper computer to check whether bytes received increases. If not, there are problems with serial port connection. Please make sure serial port is connected properly and serial port parameters are configured correctly.

Step 2 If bytes received increases, you have to charge and calibrate radar again. Make sure there is no target in radar range when charging radar.

- Relay won't jump when a target is detected.

  Run upper computer to check whether bytes received increases. If so, you have to charge and calibrate radar again. Make sure there is no target in radar range when charging radar.

0100001080125


See Far, Go Further