79 GHz Anti-smashing Radar

User's Manual

Foreword

General

This manual introduces the installation, functions and operations of the 79 GHz anti-smashing radar (hereinafter referred to as "the Radar"). Read carefully before using the device, and keep the manual safe for future reference.

Safety Instructions

The following signal words might appear in the manual.

Signal Words	Meaning
⚠ DANGER	Indicates a high potential hazard which, if not avoided, will result in death or serious injury.
⚠ WARNING	Indicates a medium or low potential hazard which, if not avoided, could result in slight or moderate injury.
⚠ CAUTION	Indicates a potential risk which, if not avoided, could result in property damage, data loss, reductions in performance, or unpredictable results.
⌐ TIPS	Provides methods to help you solve a problem or save time.
📖 NOTE	Provides additional information as a supplement to the text.

Revision History

Version	Revision Content	Release Time
V1.1.0	● Updated parameter configurations of the Radar. ● Added precautions when using the Radar.	February 2022
V1.0.1	Added note for drilling holes when installing the radar.	June 2021
V1.0.0	First release.	February 2021

Privacy Protection Notice

As the device user or data controller, you might collect the personal data of others such as their face, fingerprints, and license plate number. You need to be in compliance with your local privacy protection laws and regulations to protect the legitimate rights and interests of other people by implementing measures which include but are not limited: Providing clear and visible identification to inform people of the existence of the surveillance area and provide required contact information.

About the Manual

● The manual is for reference only. Slight differences might be found between the manual and the product.
● We are not liable for losses incurred due to operating the product in ways that are not in compliance with the manual.
● The manual will be updated according to the latest laws and regulations of related jurisdictions. For detailed information, see the paper user's manual, use our CD-ROM, scan the QR code or visit

our official website. The manual is for reference only. Slight differences might be found between the electronic version and the paper version.

- All designs and software are subject to change without prior written notice. Product updates might result in some differences appearing between the actual product and the manual. Please contact customer service for the latest program and supplementary documentation.

- There might be errors in the print or deviations in the description of the functions, operations and technical data. If there is any doubt or dispute, we reserve the right of final explanation.

- Upgrade the reader software or try other mainstream reader software if the manual (in PDF format) cannot be opened.

- All trademarks, registered trademarks and company names in the manual are properties of their respective owners.

- Please visit our website, contact the supplier or customer service if any problems occur while using the device.

- If there is any uncertainty or controversy, we reserve the right of final explanation.

Important Safeguards and Warnings

This section introduces content covering the proper handling of the device, hazard prevention, and prevention of property damage. Read carefully before using the device, and comply with the guidelines when using it.

Transportation Requirements

⚠️

- Pack the device with packaging provided by its manufacturer or packaging of the same quality before transporting it.
- Transport the device under allowed humidity and temperature conditions.

Storage Requirements

⚠️

Store the device under allowed humidity and temperature conditions.

Installation Requirements

⚠️ WARNING

- Do not connect the power adapter to the device while the adapter is powered on.
- Strictly comply with the local electric safety code and standards. Make sure the ambient voltage is stable and meets the power supply requirements of the device.
- Do not connect the device to two or more kinds of power supplies, to avoid damage to the device.
- Use the accessories suggested by the manufacturer. Installation and maintenance must be performed by qualified professionals.
- When using a laser beam device, avoid exposing the surface of the device to laser beam radiation.

⚠️

- Personnel working at heights must take all necessary measures to ensure personal safety including wearing a helmet and safety belts.
- Do not place the device in a place exposed to sunlight or near heat sources.
- Keep the device away from dampness, dust, and soot.
- Put the device in a well-ventilated place, and do not block its ventilation.
- Use an adapter or cabinet power supply provided by the manufacturer.
- The power supply must conform to the requirements of ES1 in IEC 62368-1 standard and be no higher than PS2. Please note that the power supply requirements are subject to the device label.
- Put the device in a well-ventilated place, and do not block its ventilation.

Operation Requirements

⚠️

- Check whether the power supply is correct before use.
- Do not unplug the power cord on the side of the device while the adapter is powered on.

- Operate the device within the rated range of power input and output.
- Use the device under allowed humidity and temperature conditions.
- Do not drop or splash liquid onto the device, and make sure that there is no object filled with liquid on the device to prevent liquid from flowing into it.
- Do not disassemble the device without professional instruction.
- Do not aim the device at strong light sources (such as lamplight, and sunlight) when focusing it.
- Do not vibrate, squeeze or immerse the device in liquid during transportation, storage or installation.
- We recommend you use the device with a lightning protection device for stronger protection against lightning. For outdoor scenarios, strictly comply with the lightning protection regulations.
- Ground the function earthing portion of the device to improve its reliability. The device is a class I electrical appliance. Make sure that the power supply of the device is connected to a power socket with protective earthing.

Maintenance Requirements

⚠

Clean the device with a soft dry cloth or a clean soft cloth dipped in neutral detergent.

Table of Contents

1 Product Information

1.1 Overview

The 79 GHz anti-smashing radar adopts leading technologies of high-precision microwave measurement and high-speed digital signal processing, endowing it with high accuracy, free of commissioning, and high stability. The radar is ideal for working with boom barrier to monitor and control vehicles that enter and leave, and prevent the barrier arm from hitting people or vehicles when it falls. It can also work with the camera to read and recognize license plate, providing reliable evidence for parking management.

The Radar sends the information of detection target to the host computer or central platform through RS-485 communication or Wi-Fi, so the real-time information can be displayed on the computer or the platform. It can also send the information to the relay to trigger the camera for taking snapshots, and helps control barrier opening and closing.

1.2 Features

- 79 GHz monolithic microwave integrated circuit (MMIC) technology allows higher resolution and more stable detection.
- Uses the latest algorithm to filter interference, suitable for advertising barriers, fence arm barriers, straight arm barriers, and folding arm barriers.
- Uses MIMO (multiple-input multiple-output) technology to recognize movement directions of targets, ideal for scenes with both vehicles and people entering and leaving.
- Adjustable detection distance and width, and no need of reading scene data, applicable to complicated scenes.
- Applicable to multiple complex onsite environments without background learning.
- Supports updating through RS-485 and mobile app (with Wi-Fi connection), and allows online commissioning and firmware upgrade, providing ease of operation.
- Convenient installation and maintenance: Comparing with loops, you can easily install the Radar by tightening the screws, with no need of road construction.
- Capable of identifying vehicles and people, preventing the barrier arm from hitting the vehicles and people.
- Long service life of 5–10 years.
- Two LED indicators are designed to better know the working status of the Radar: Red for power, and green for activity.
    - ◇ Solid red: Powered on.
    - ◇ Solid green: Target is detected. When the target leaves, the green indicator turns off.
- Automatically goes to the last working status before it is powered off.
- Adaptable to harsh environments and its detection performance will not be influenced by electromagnetic interference, light, dust, rain, and snow.

2 Structure

2.1 Appearance

Figure 2-1 Appearance

2.2 Dimensions
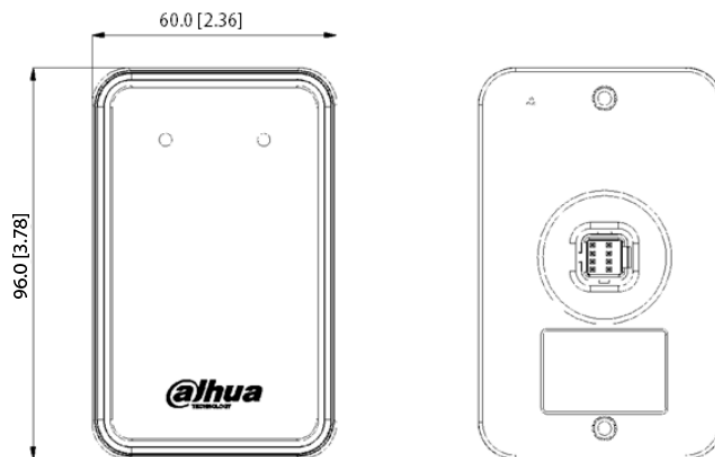
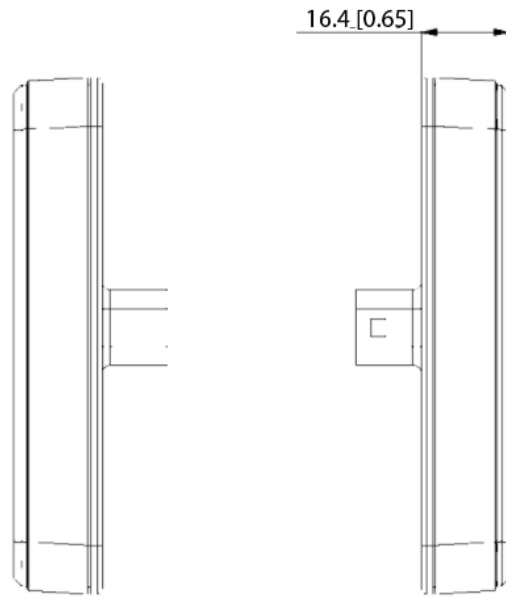Figure 2-2 Front and rear panels (mm [inch])

Figure 2-3 Side panel (mm [inch])

16.4 [0.65]

3 Installation

3.1 Tools

Hole opener, Phillips screwdriver, straight screwdriver, wire stripper, RS-485 cable, and computer.
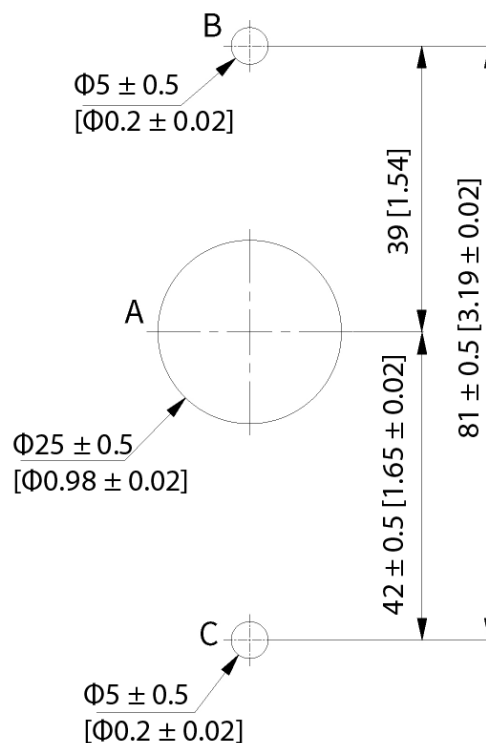
3.2 Installing the Radar

Step 1   Drill holes.

Step 2   Drill aφ23 mm (0.9'') circular hole (hole A) on the casing of the advertising barrier and at a height of 68 cm (26.8'') from the ground 78 cm (30.7'') is recommended when large trucks are frequently seen), and then drill twoφ5 mm (0.2'') circular holes (holes B and C). The distance between holes A and B is 39 mm (1.5''), and the distance between holes A and C is 85 mm (3.3'').

📖

Holes for installing the Radar onto Dahua barrier casing are preserved by standard. Skip drilling holes when you are using Dahua barriers.

Figure 3-1 Hole size (mm [inch])

Step 3   Fix the Radar.

Step 4   Install waterproof joints between the Radar and the casing. Fix the Radar to the casing through A, B and C holes with screws. Connect radar cables to the barrier through hole A. See Figure 3-3 for the installation result.

Hole A is for securing the Radar, and hole B and C are for keeping the Radar straight. When using Dahua barriers, fix the Radar through the preserved hole A and B.
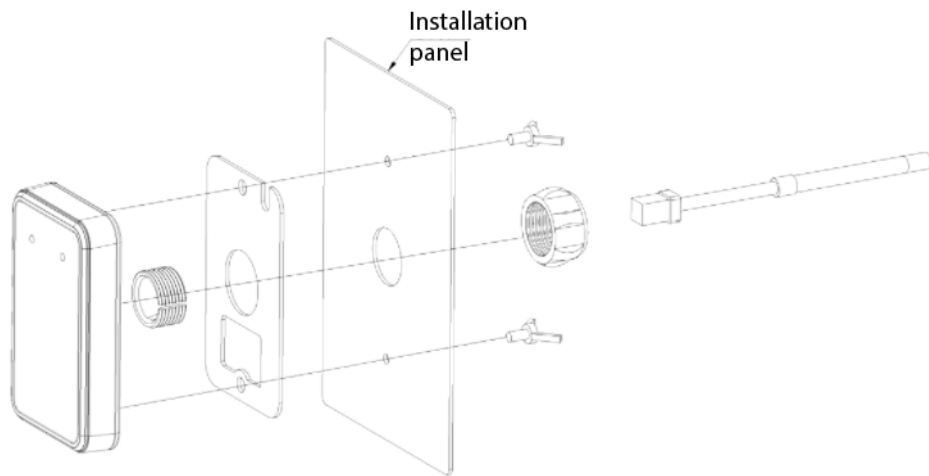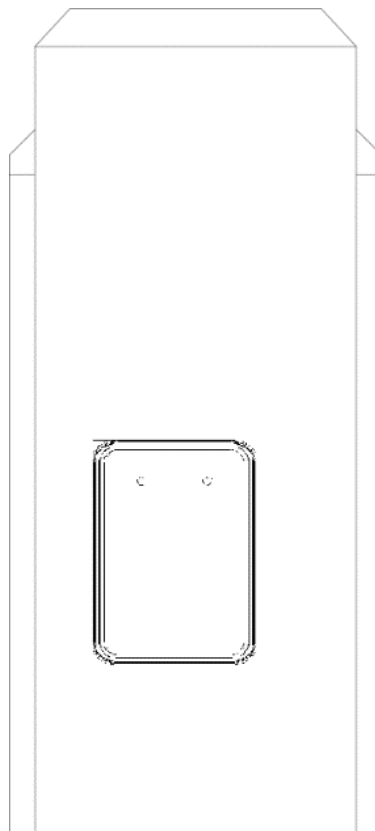
Figure 3-2 Fix the Radar

Figure 3-3 Illustration of successful installation

- The Radar can be installed either on the barrier casing or the mounting pole. See Figure 3-4. For both of the installation methods, the Radar needs to be installed within 50 cm (19.7") of the barrier arm. **Right Width** and **Left Width** should be more than 0.5 m (1.6 ft) to avoid interference from the barrier arm.
- The installation of different arms is different, refer to the specific installation guide for details. Contact technical support for complex scenarios.

Figure 3-4 Radar installation methods
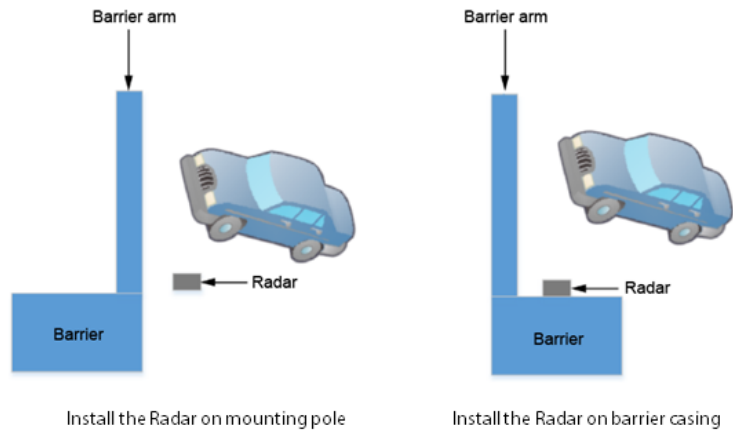
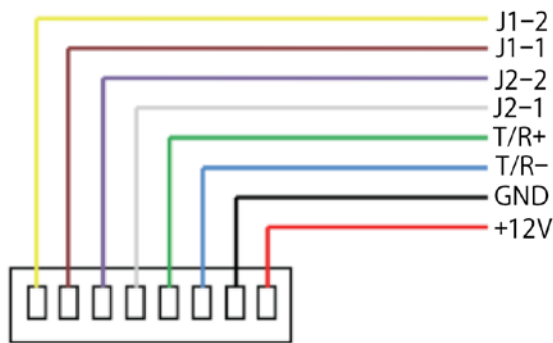## 3.3 Wiring

3.3.1 Cables

Figure 3-5 Cable connection

Table 3-1 Cable description

Cable	Color	Description
J1-1	Brown	Relay output. Connects to the radar/loop port and GND/common port of the barrier. The connection does not distinguish between the positive and negative.
J1-2	Yellow	
J2-1	White	79 GHz radar cannot be downgraded to earlier versions using the standard update method. You have to short-circuit this port to downgrade it.
J2-2	Purple	⚠ Do not short-circuit the port during normal use to avoid compromising the performance of the Radar.
T/R-	Blue	RS-485 port.
T/R+	Green	
GND	Black	Power input of the Radar. We recommend using a 12 V/1 A external adaptor for power supply.
+12V	Red	

3.3.2 Cable Connection

Connect the ports of the Radar to external devices.

- Connect +12 V (red) and GND (black) to positive and negative terminals of a 12 V power supply respectively.
  - ◇ A solid red indicator on the Radar indicates that the power supply is normal.
  - ◇ Check the power supply if the indicator flashes red.
- Connect J1-1 (brown) and J1-2 (yellow) to the loop and COM ports of the barrier.
- Connect J2-1 (white) and J2-2 (purple) to a switch, and then you can short-circuit them to update the Radar to any available versions.

  The connection does not distinguish between positive and negative.
- T/R- (blue) and T/R+ (green) connection.
  - ◇ Connect to a computer through RS-485 cable to debug the configuration application of the Radar.
  - ◇ Connect to an access camera to read operation logs of the Radar from the camera without interfering the Radar. The green cable connects to the 485-2A of the camera and the blue cable connects to 485-2B.

4 App Commissioning

Scan the QR code provided in the accessory to download and install the STJ79 app.

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Make sure that you have granted the App permissions of your Bluetooth, location, network and storage information.

4.1 Connecting Radar

Step 1   Download the App.

Step 2   Scan corresponding QR code to download the App on your phone.

Figure 4-1 App download QR code

IOS   Android

Step 3   Enable Wi-Fi on your phone and connect the one starting with RADAR.
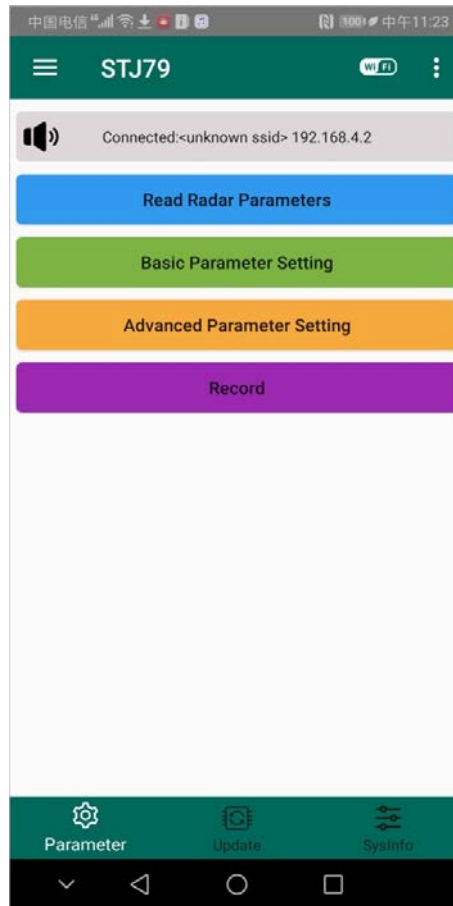Default password is 123456789.

📖

To avoid unauthorized parameter changing, we recommend you change the Radar name and password by tapping **WIFI** on system information page.

Step 4   Open the App.

Step 5   Tap at the upper-right corner on the homepage to connect the radar.

Figure 4-2 Connection succeeded

4.2 Configuring Radar Parameter

After the Radar is installed and connected to the app, you need to adjust the corresponding parameters based on the actual site.

⚠️

Unsuitable parameters might increase the risk of vehicles being smashed by the barrier arm.

📖

When you face the Radar and the indicator lights are at the upper side, your left and right hand are the left and right side of the Radar.

Table 4-1 Parameter description of the Radar

| Parameter	Description
MaxRange	The maximum lengthways detection distance of the Radar. The recommended value is the actual arm length deducting 0.3 meters. Set a lower value when there is metal interference at the end of the arm.

Parameter	Description
MinRange	The range filtered by the Radar. We recommend you leave it as default (0.3 meters). When there is interference near the Radar, set a higher value to avoid false alarms. The value should be no higher than 1 meter to avoid the risk of vehicles being smashed by the barrier arm.
LeftWidth	Detection width at the left or right side of the Radar normal line. Set them to values that are not below 0.5 meters. The wider the detection range, the more stable the detection.
RightWidth	
FallingTime	Set based on the actual falling duration of the arm. This is only for signal feedback. The speed the arm falls at will not be affected.
Sensitivity	Reserved parameter.
Mode	Select according to the actual arms, such as straight arm, fence arm and advertising arm.
FilterSingle	• **Yes**: The Radar detects vehicles only. • **No**: The Radar detects both vehicles and pedestrians. For higher detection sensitivity, leave the parameter as default.
Direction	Whether to filter out the vehicles coming from the wrong way. Only available in trigger mode.

Step 1 Tap **Read Radar Parameters** to view current parameters after the Radar is successfully connected.

Figure 4-3 Current parameter
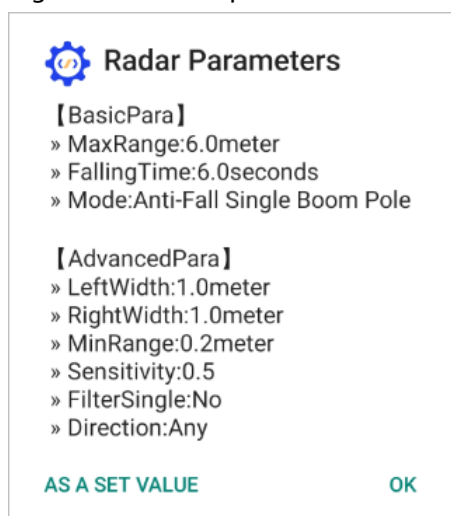
Step 2 Configure basic and advanced parameters.

    1) Tap **Basic Parameter** and **Advanced Parameter** on the homepage to configure them

as needed.

Figure 4-4 Basic parameters

Figure 4-5 Advanced parameters

2) Tap the green frame next to the corresponding parameter to save the configuration.

4.3 Testing the Radar

After the parameter configuration is complete, make sure to test the Radar before put it to use.

- The Radar identifies people and vehicles.
    1. After opening the barrier and making a person enter the radar detection range, the green indicator does not turn on, and after the person leaves, the barrier arm does not fall. This means the radar successfully identified the person.
    2. After opening the barrier and driving a vehicle to the radar detection range, the green indicator turns on, and after the vehicle leaves, the barrier arm does not fall. This means the radar successfully identified the vehicle.
- The barrier arm does not hit vehicles.
    1. Open the barrier, and drive a vehicle at speed lower than 10 km/h to pass the barrier. When it passes the barrier, the green indicator keeps on, and the barrier arm does not jitter or hit the vehicle.
    2. Open the barrier, and drive a vehicle to the radar detection range. Stop the vehicle in the detection range for 1 minute, the green indicator keeps on, and the barrier arm does not jitter or hit the vehicle.
- The barrier arm does not hit people.
    1. When the barrier arm falls after a vehicle leaves, a person passes the barrier, the green indicator turns on, and the barrier arm does not hit the person.
    2. A person moves back and forth along the direction of the barrier arm, the green indicator keeps on, and the barrier arm does not hit the person.
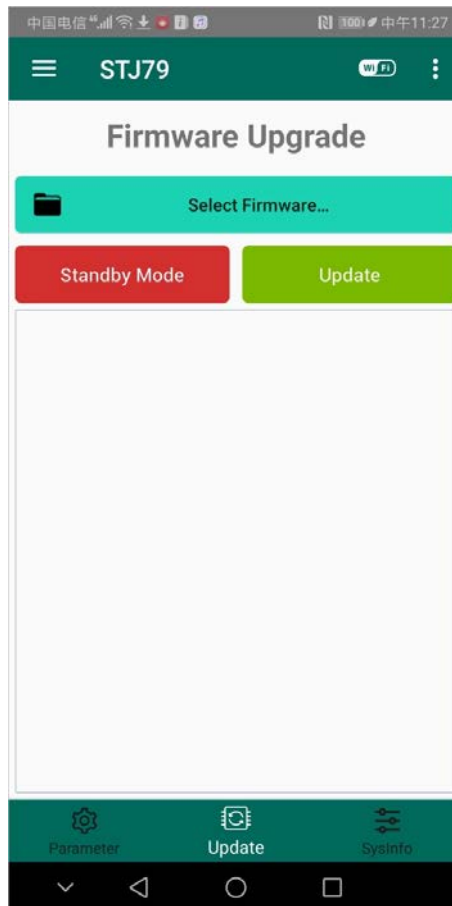
4.4 Updating Firmware

View available firmware list on the **Firmware Upgrade** page.

Step 1   Tap **Update** after successful connection.

Step 2   Tap **Select Firmware**.

Step 3   Tap **Update Radar**.

Figure 4-6 Update the Radar

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● Do not exit the App or switch to other apps during update. Otherwise the update may fail.
● If update fails, disconnect and restart the Radar to restore the firmware to previous version.
● Contact technical support if update keeps failing or the Radar stays stuck.

4.5 Displaying Target Information

You can view the target points within current detection range of the Radar and eliminate noise of them.
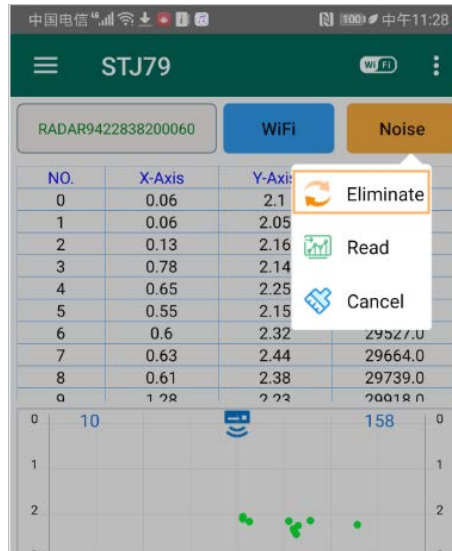
● View target points
Select **SysInfo** > **Open** to view target points. Tap **Close**, and then target points are displayed with detailed coordinates.

Figure 4-7 Search for targets
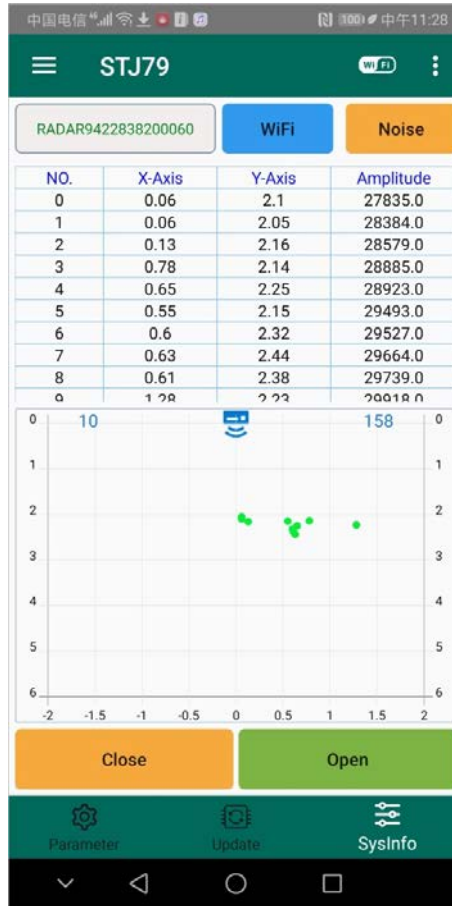
- Eliminate noise

  Select **SysInfo** > **Noise**, and then tap **Eliminate**.

Figure 4-8 Eliminate noise

$\boxed{\square}$

- This function is only available when the Radar detects noise and the barrier arm cannot rise or fall normally.
- Make sure that the barrier arm is arisen when eliminating noise. If many false targets appear, we recommend adjusting background environment or starting the Radar on background learning again.

4.6 Other Functions

- Tap ⁝ at the upper-right corner of the App to view product manual, language and **About** menu information, which contains version, update, privacy protocol, user agreement and other admin permission related functions. You can only access admin functions by admin password.

5 Software Commissioning

5.1 Installing the Software

Double-click setup.exe and follow the on-screen instructions to install the software. When installation is complete, the Radar generates a shortcut ![icon].

5.2 Software Homepage

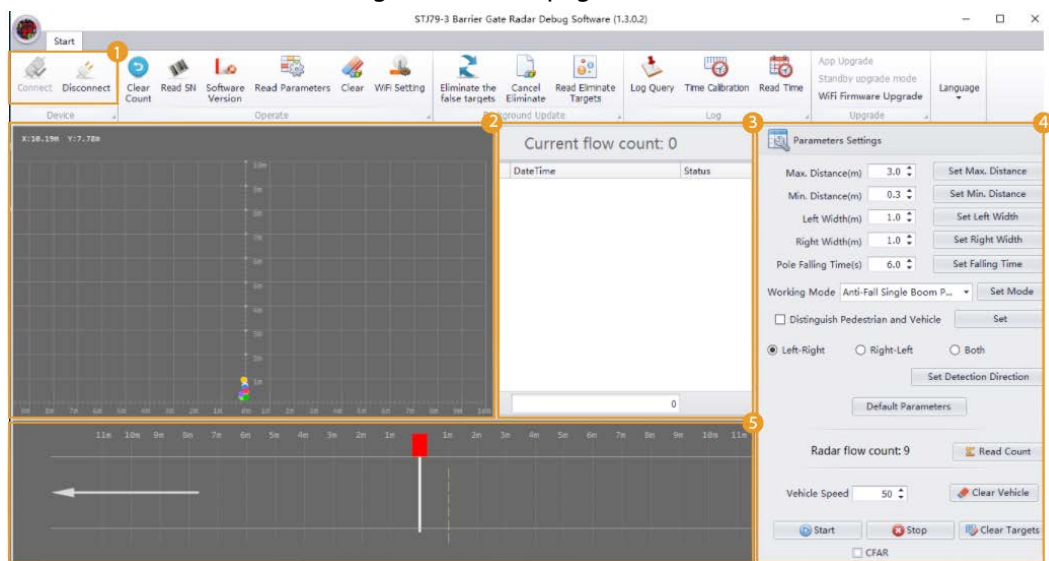Double-click the shortcut to open the software.

Figure 5-1 Homepage

Table 5-1 Homepage description

No.	Description
1	Connects and disconnects the Radar.
2	Target points display area.
3	Dynamic display area of targets entering and leaving.
4	Parameter configuration area of the Radar.
5	Animated display area of targets entering and leaving.

5.3 Connecting the Radar

Click **Connect** at the upper-left corner. **Connection Setting** dialog box pops up. Select **Ethernet** if the Radar supports Wi-Fi. Otherwise, select **Serial**.

Figure 5-2 Connecting the Radar
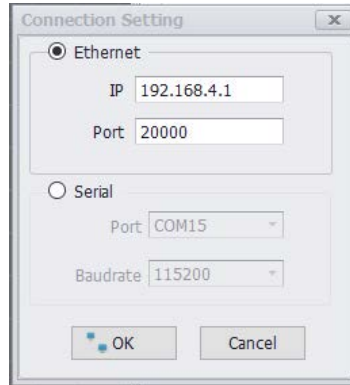
5.3.1 Wi-Fi Connection

Step 1   Power on the Radar and connect your PC with the Wi-Fi hotspot of the Radar.

Step 2   The default Wi-Fi of the Radar is RADAR + 13 digits number and the password is 123456789.

Step 3   Set the IP to 192.168.4.1 and port to 20000.

Step 4   Click **OK**.

5.3.2 COM Connection

Step 1   Make sure that the serial device (USB-RS-485) driver is installed and you can see the occupied COM port in PC device manager.

Step 2   Select port according to the port in **Device Manager** (the port to be connected will automatically appear when only one serial device is available), and 115200 as baud rate.

Step 3   Click **OK**.

5.4 Clearing Current Count

Click 🔘 and then click **Yes** in the pop-up window to clear flow data.
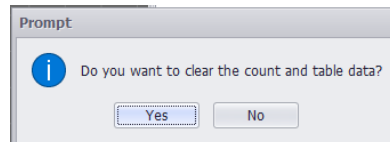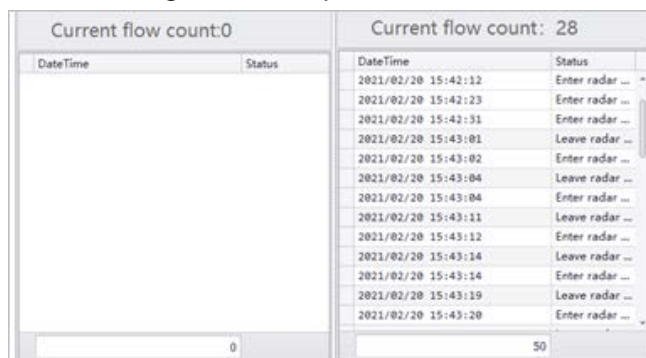
Figure 5-3 Confirm clearing

Figure 5-4 Comparison

5.5 Configuring Radar Parameter

For detailed parameter descriptions, see Table 4-1.

5.5.1 Setting Detection Range

You can set the detection range of the Radar, including the maximum, minimum, left and right side detection range.
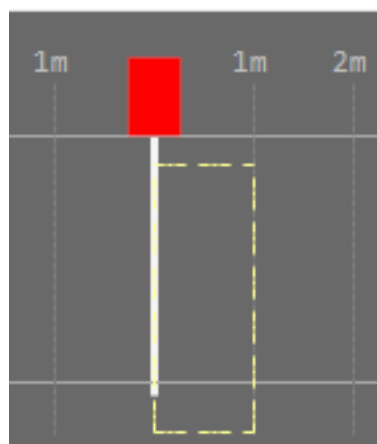
When setting range parameter, corresponding effect displays on the right side. Click the corresponding button on the right side after configuration and a notice will prompt to show whether the configuration completes.

Figure 5-5 Set parameter

Figure 5-6 Effect


5.5.2 Configuring Barrier Arm Falling Time

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This configuration is only available for anti-smashing radar.

Configure the arm falling time of anti-smashing radar according to the period of the barrier arm from

rising to full falling. The parameter is only for feedback, which has no impact on arm falling speed. The default falling time is 6 s. Enter the corresponding falling time and click **Set Falling Time** on the right side.

Figure 5-7 Configure arm falling time
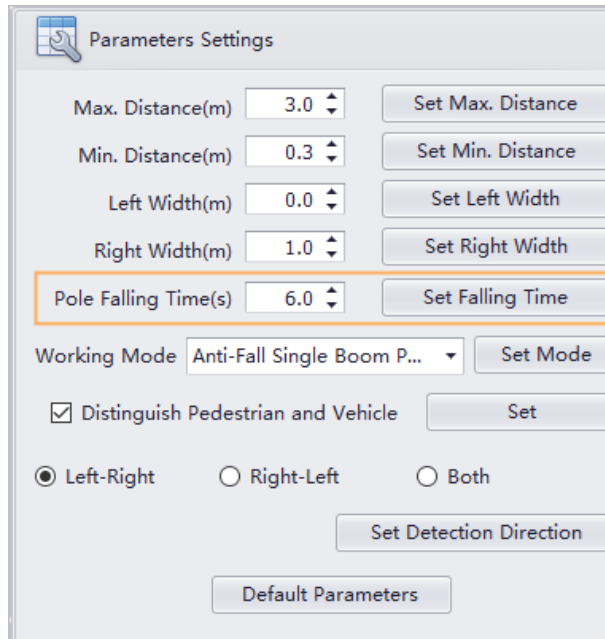
5.5.3 Distinguishing Pedestrian and Vehicle

- Select whether to distinguish pedestrian from vehicle, and then click **Set**.
- Select **Distinguish Pedestrian and Vehicle**: The Radar detects vehicles only and only vehicles can trigger the Radar.
- Cancel selecting **Distinguish Pedestrian and Vehicle**: Both people and vehicles can trigger the Radar.

Figure 5-8 Distinguish pedestrian and vehicle configuration
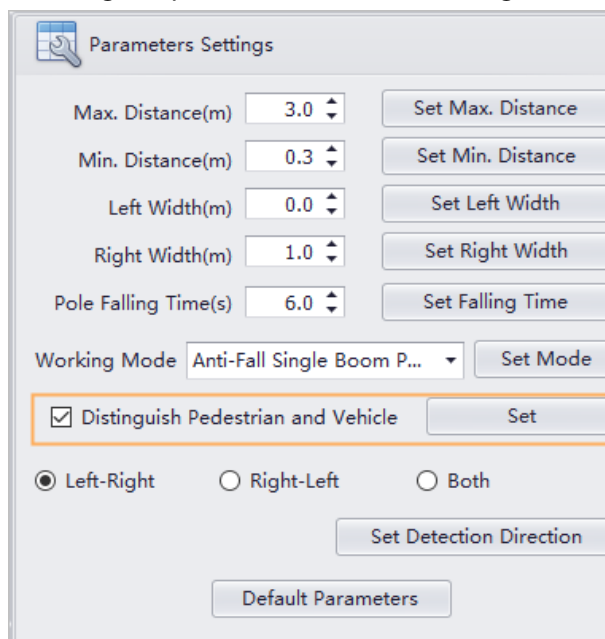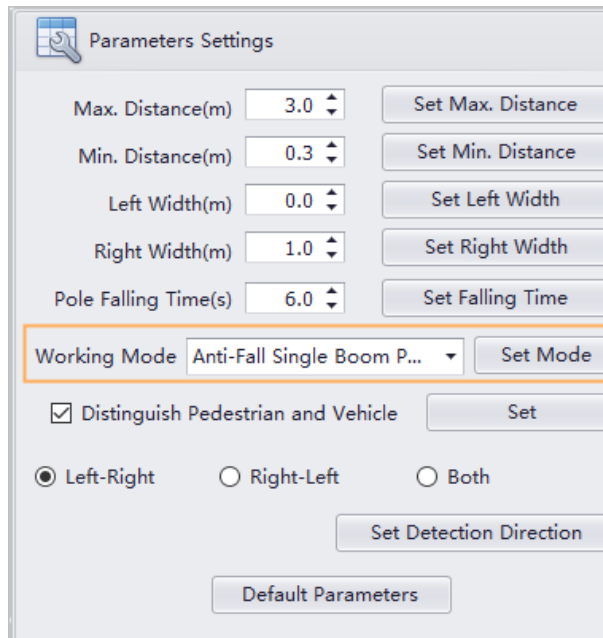
5.5.4 Configuring Barrier Arm Position

Select barrier position from **Boom Pole on Radar Left**, **Boom Pole on Radar Right**, **Anti-fall Single Boom pole**, **Trigger Mode**, **Rail Fence on Radar Left** and **Rail Fence on Radar Right**.

Corresponding effect is displayed on the left side.

Figure 5-9 Arm position configuration

Figure 5-10 Arm position comparison
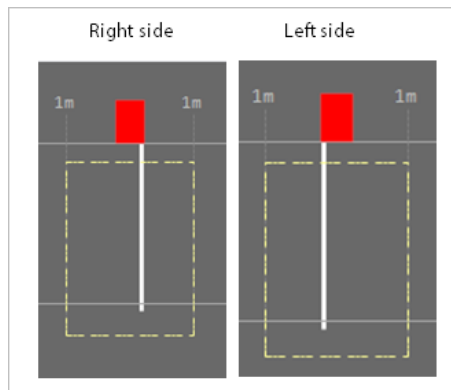
5.5.5 Configuring Detection Direction

📖

This function is only available in trigger mode.

Configure the direction of approaching vehicles and the Radar detects only vehicles approaching from the defined direction.

Figure 5-11 Detection direction configuration
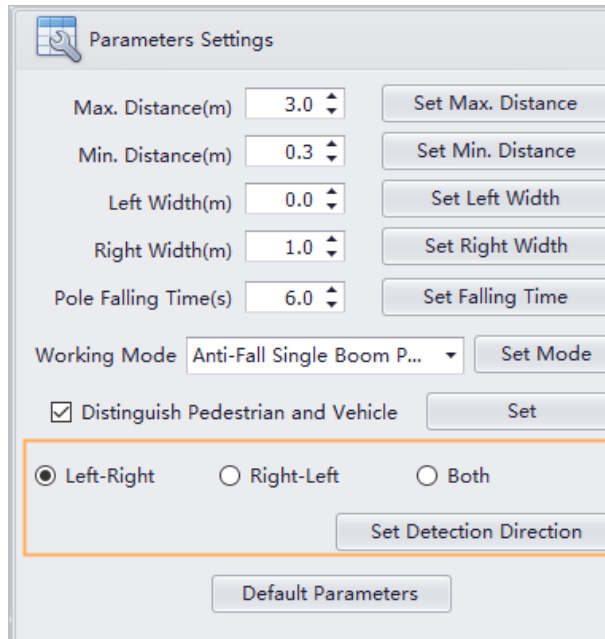
5.5.6 Radar Flow Count

Click **Read Count** to upload currently collected vehicle flow data. **Read Overtime** appears when there is no data uploaded, and then you need to upload again.

Figure 5-12 Radar flow count
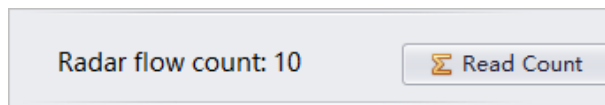
5.5.7 Clearing Counts

Click **Clear Vehicle** to clear previous vehicles flow counts and the data turns to 0. **Clear Overtime** appears when clearing fails, and then you need to clear again. If it succeeds, you can count the vehicle flow again.

5.5.8 Reading Radar Parameter

Click **Read Parameters** to read current parameter configurations of the Radar, and then you can click **Yes** to automatically copy those parameters to the Radar configuration.

Figure 5-13 View parameters
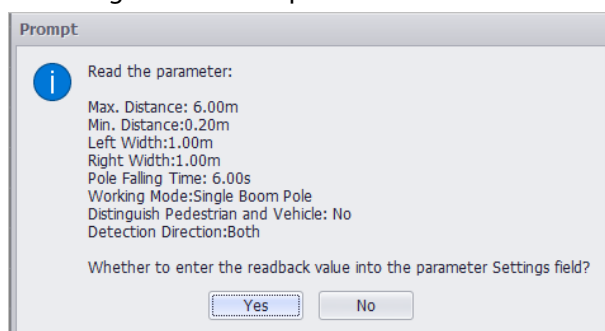
5.5.9 Checking Radar Interference

You can check whether there is interference in front of the Radar for first time commissioning. Click **Start** at the lower-right corner to view target information and click **Stop** to display information value of the target. If there is no interference within detection range during arm rising, the Radar works normally.

Figure 5-14 Target information

6 Precautions

- We recommend connecting the Radar to an external 12 V/1 A adapter for a stable power supply. This is to avoid affecting the performance of the Radar.
- For small passing vehicles, the recommended installation height is 60 cm. For large vehicles passing, the recommended installation height is 70 cm.
- The Radar antennas are concealed inside of it. When the surface is covered by foreign objects, such as water drops, frost, rain and snow, or dust, the Radar performance can be affected. Clean the Radar in time.
- Make sure no objects, such as metal fences, advertising boards, ANPR cameras or walls, exist within the Radar detection range, to avoid the Radar receiving interference.
- Do not use the Radar with a fence arm and an advertising arm in single passages. Install another radar on the other side of the arm to assure safe passing for vehicles.
- For situations where vehicles that have a gap wider than 1 meter on their body, such as semi-trailers and tank cars, we recommend using two radars or control the barrier arms through remote control.
- Do not install the Radar on muddy roads, or under extreme weathers, such as cloudbursts and blizzards, to avoid impacting the performance of the Radar.
- Make sure to securely fix the barrier at a wobble angle no larger than 5°. In addition, when railings are installed outside the lane, make sure they are securely fixed to avoid the Radar moving or wobbling.
- Do not place objects made of metal within one meter range of the Radar. Make sure to install railings or speed bumps that contain metal far away from the Radar.
- Do not use the Radar in environments with strong magnetism.
- Make sure to insulate the unused bare wires after installation.
- Contact technical support when the Radar is installed in special environments.

Appendix 1 Cybersecurity Recommendations

Mandatory actions to be taken for basic device network security:

1. **Use Strong Passwords**

   Please refer to the following suggestions to set passwords:
   - The length should not be less than 8 characters.
   - Include at least two types of characters; character types include upper and lower case letters, numbers and symbols.
   - Do not contain the account name or the account name in reverse order.
   - Do not use continuous characters, such as 123, abc, etc.
   - Do not use overlapped characters, such as 111, aaa, etc.

2. **Update Firmware and Client Software in Time**
   - According to the standard procedure in Tech-industry, we recommend to keep your device (such as NVR, DVR, IP camera, etc.) firmware up-to-date to ensure the system is equipped with the latest security patches and fixes. When the device is connected to the public network, it is recommended to enable the"auto-check for updates" function to obtain timely information of firmware updates released by the manufacturer.
   - We suggest that you download and use the latest version of client software.

"Nice to have" recommendations to improve your device network security:

1. **Physical Protection**

   We suggest that you perform physical protection to device, especially storage devices. For example, place the device in a special computer room and cabinet, and implement well-done access control permission and key management to prevent unauthorized personnel from carrying out physical contacts such as damaging hardware, unauthorized connection of removable device (such as USB flash disk, serial port), etc.

2. **Change Passwords Regularly**

   We suggest that you change passwords regularly to reduce the risk of being guessed or cracked.

3. **Set and Update Passwords Reset Information Timely**

   The device supports password reset function. Please set up related information for password reset in time, including the end user's mailbox and password protection questions. If the information changes, please modify it in time. When setting password protection questions, it is suggested not to use those that can be easily guessed.

4. **Enable Account Lock**

   The account lock feature is enabled by default, and we recommend you to keep it on to guarantee the account security. If an attacker attempts to log in with the wrong password several times, the corresponding account and the source IP address will be locked.

5. **Change Default HTTP and Other Service Ports**

   We suggest you to change default HTTP and other service ports into any set of numbers between 1024–65535, reducing the risk of outsiders being able to guess which ports you are using.

6. **Enable HTTPS**

   We suggest you to enable HTTPS, so that you visit Web service through a secure communication channel.

7. **MAC Address Binding**

   We recommend you to bind the IP and MAC address of the gateway to the device, thus reducing

the risk of ARP spoofing.

8. **Assign Accounts and Privileges Reasonably**

According to business and management requirements, reasonably add users and assign a minimum set of permissions to them.

9. **Disable Unnecessary Services and Choose Secure Modes**

If not needed, it is recommended to turn off some services such as SNMP, SMTP, UPnP, etc., to reduce risks.

If necessary, it is highly recommended that you use safe modes, including but not limited to the following services:

- SNMP: Choose SNMP v3, and set up strong encryption passwords and authentication passwords.
- SMTP: Choose TLS to access mailbox server.
- FTP: Choose SFTP, and set up strong passwords.
- AP hotspot: Choose WPA2-PSK encryption mode, and set up strong passwords.

10. **Audio and Video Encrypted Transmission**

If your audio and video data contents are very important or sensitive, we recommend that you use encrypted transmission function, to reduce the risk of audio and video data being stolen during transmission.

Reminder: encrypted transmission will cause some loss in transmission efficiency.

11. **Secure Auditing**

- Check online users: we suggest that you check online users regularly to see if the device is logged in without authorization.
- Check device log: By viewing the logs, you can know the IP addresses that were used to log in to your devices and their key operations.

12. **Network Log**

Due to the limited storage capacity of the device, the stored log is limited. If you need to save the log for a long time, it is recommended that you enable the network log function to ensure that the critical logs are synchronized to the network log server for tracing.

13. **Construct a Safe Network Environment**

In order to better ensure the safety of device and reduce potential cyber risks, we recommend:

- Disable the port mapping function of the router to avoid direct access to the intranet devices from external network.
- The network should be partitioned and isolated according to the actual network needs. If there are no communication requirements between two sub networks, it is suggested to use VLAN, network GAP and other technologies to partition the network, so as to achieve the network isolation effect.
- Establish the 802.1x access authentication system to reduce the risk of unauthorized access to private networks.
- Enable IP/MAC address filtering function to limit the range of hosts allowed to access the device.

ENABLING A SAFER SOCIETY AND SMARTER LIVING