



Security Radar

Quick Start Guide





Foreword

General

This manual introduces the structure, installation, and network configurations of the security radar.

Safety Instructions

The following categorized signal words with defined meaning might appear in the manual.

Signal Words	Meaning
 CAUTION	Indicates a potential risk which, if not avoided, could result in property damage, data loss, lower performance, or unpredictable result.
 NOTE	Provides additional information as the emphasis and supplement to the text.

Revision History

Version	Revision Content	Release Time
V1.0.0	First release.	December 2019

Interface Declaration

This manual mainly introduces the relevant functions when you use the device. The interfaces used for manufacture, returning to the factory for inspection, and locating fault are not described in this manual. Please contact technical support if you need information about these interfaces.

About the Manual

- The manual is for reference only. If there is inconsistency between the manual and the actual product, the actual product shall prevail.
- We are not liable for any loss caused by the operations that do not comply with the manual.
- The manual would be updated according to the latest laws and regulations of related regions. For detailed information, see the paper manual, CD-ROM, QR code or our official website. If there is inconsistency between paper manual and the electronic version, the electronic version shall prevail.
- All the designs and software are subject to change without prior written notice. The product updates might cause some differences between the actual product and the manual. Please contact the customer service for the latest program and supplementary documentation.
- There still might be deviation in technical data, functions and operations description, or

errors in print. If there is any doubt or dispute, please refer to our 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 the company names in the manual are the properties of their respective owners.
- Please visit our website, contact the supplier or customer service if there is any problem occurred when using the device.
- If there is any uncertainty or controversy, please refer to our final explanation.

Important Safeguards and Warnings

The following contents are about the proper ways of using the radar, preventing dangers and property damage when it is in use. Read the manual carefully before using the radar, strictly abide by the manual and properly keep it for future reference.

Environmental Requirements

- As for ground within the detection area, hard ground like concrete ground is optimal. As for ground covered by vegetation, the vegetation height should be below 20 cm.
- Make sure that there is no vegetation, buildings and vehicles within the monitoring area that hinder the work of the radar.
- Make sure that there is no electromagnetic interference like air conditioner exterior units and transformers around where the radar is installed.
- Transport, use and store the radar within permitted temperature range and humidity level.
- Do not put the radar in humid, dusty, extremely hot or cold, and intense electromagnetic radiation places.
- Pack the radar with packaging provided by its manufacturer or packaging with the same quality before transporting it.
- Do not press hard, violently vibrate, and soak the radar when transporting, storing, and installing it.

Electrical Safety

- All installation and operation should conform to your local electrical safety codes.
- Make sure that the power supply is correct before operating the radar.
- The power source shall conform to the requirement of the Safety Extra Low Voltage (SELV) standard, and supply power with rated voltage which conforms to Limited power Source requirement according to IEC60950-1. Please note that the power supply requirement is subject to the device label.
- A readily accessible disconnect device shall be installed for emergency power off.
- Prevent the power cable from being trampled or pressed, especially wires around the holes where the plug, power socket, and the junction are threaded through.

Operation and Daily Maintenance

- Do not spray paint, stick stickers, put colors and any other objects or smudges on the surface of the radar; otherwise the performance of the radar will be greatly influenced.
- Do not disassemble the radar, for there are no components inside that can be repaired by users. Disassembling might result in water leakage.
- Clean the surface of the radar with a soft dry cloth. If there are stains, clean the surface with a soft cloth dipped in neutral detergent, and then dry the surface. Do not use detergent with strong abrasiveness and volatile solvents like ethyl alcohol, benzene, and

diluent; otherwise the coating on the surface will be damaged and the performance of the radar will be degraded.



- Use accessories suggested by the manufacturer, and install and maintain the radar by professional personnel.
- Do not use two or more than two kinds of power supply modes to provide power for the radar at the same time; otherwise, the device might be damaged.

Table of Contents

Foreword	I
Important Safeguards and Warnings	III
1 Product Information	1
1.1 Unpacking the Box	1
1.2 Dimensions	1
1.3 Icons and Indicator Lights	2
1.4 Reset Button and SD Card Installation	3
1.4.1 Using the Reset Button	4
1.4.2 Installing SD Card	4
1.5 Connection	4
2 Installation Preparations	7
2.1 Environmental Requirements	7
2.2 Installation Tools and Cables	7
3 Installation	8
3.1 Detection Range	8
3.2 Installation	10
3.2.1 Bracket Dimensions	10
3.2.2 Installation Procedures	11
3.2.3 Adjusting Angles	17
3.3 Verification after the Installation	18
4 Network Configuration	19
4.1 Debugging Preparations	19
4.2 Radar Configuration	19
4.2.1 Device Initialization	19
4.2.2 First-time Login	22
4.2.3 Modifying IP Address	24
4.2.4 PTZ Camera	24
4.2.5 Linkage	26
4.2.6 Region Management	30
4.2.7 Protection Zone Management	34
4.2.8 IVS Configuration	36
Appendix 1 FAQ	37
Appendix 2 Cybersecurity Recommendations	39

1 Product Information



Figures that do not distinguish between the models in this manual all take 50/120m radar as an example.

1.1 Unpacking the Box

After unpacking the box, check if there is obvious damage to the appearance of the radar, and make sure that the components are complete against the packing list. For packing list, see Table 1-1, and the actual product shall prevail.

Table 1-1 Packing list

Item	Quantity
Radar	1
Waterproof connector	1
Wrench	1
Quick start guide	1
Legal and regulatory information	1
Quality certificate	1
QR code label	1

1.2 Dimensions

Figure 1-1 50/120 m radar (mm [inch])

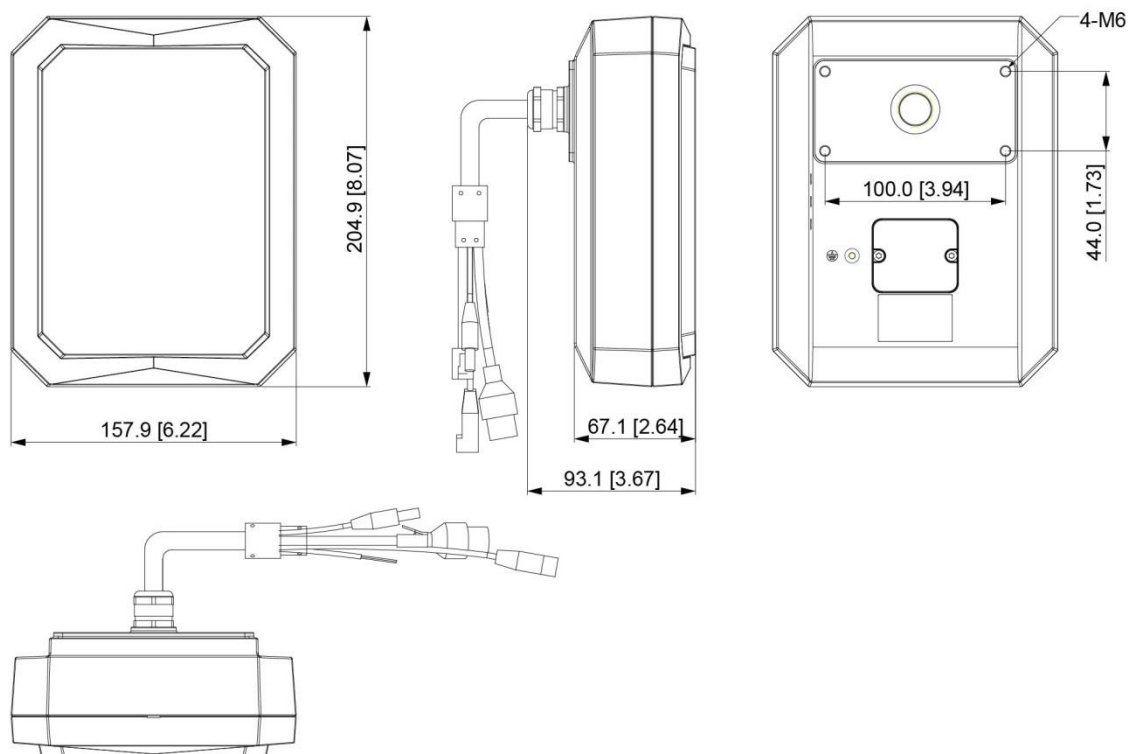
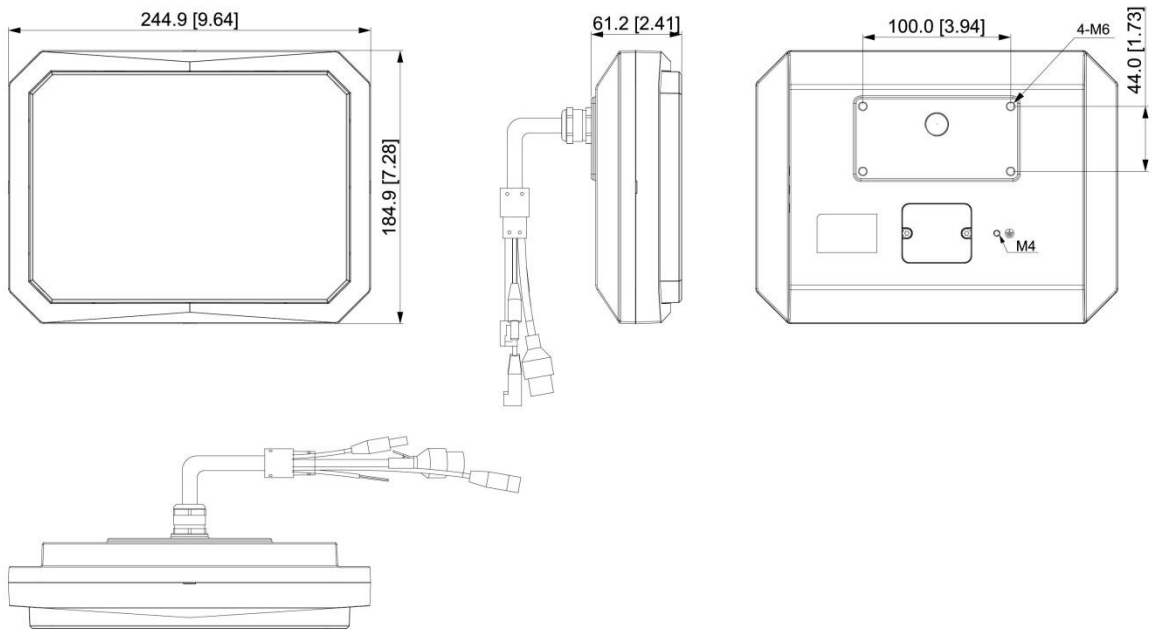


Figure 1-2 300/450 m radar (mm [inch])



1.3 Icons and Indicator Lights

For icons and indicator lights on the rear of the radar, see Figure 1-3. For detailed descriptions, see Table 1-2.

Figure 1-3 Icons and lights

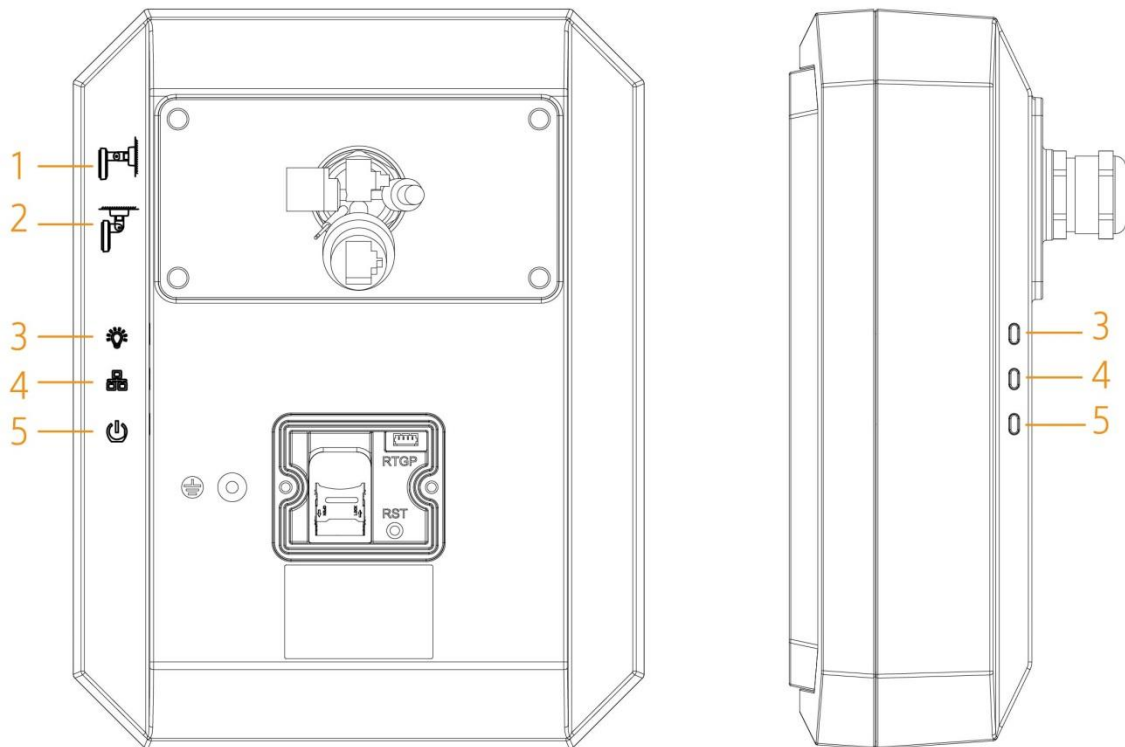


Table 1-2 Icon and light descriptions

No.	Name	Description
1	Wall mount indicator icon	Indicate a wall mount radar. A mount bracket is needed.
2	Ceiling mount indicator icon	Indicate a ceiling mount radar. A mount bracket is needed.
3	Status indicator light	<ul style="list-style-type: none"> The indicator light glows green: Radar is running normally. The indicator light flashes red: Alarm events happened in radar's detection region.
4	Network indicator light	<ul style="list-style-type: none"> The indicator light glows yellow: Network is connected. The indicator light is off: Network is not connected.
5	Power indicator light	<ul style="list-style-type: none"> The indicator light glows green: Radar is running normally. The indicator light flashes green: Radar is upgrading.

1.4 Reset Button and SD Card Installation

Open the rear cover of the radar with a screwdriver. The reset button and SD card slot are displayed. See Figure 1-4 and Table 1-3.

Figure 1-4 Reset button and SD card slot (1)

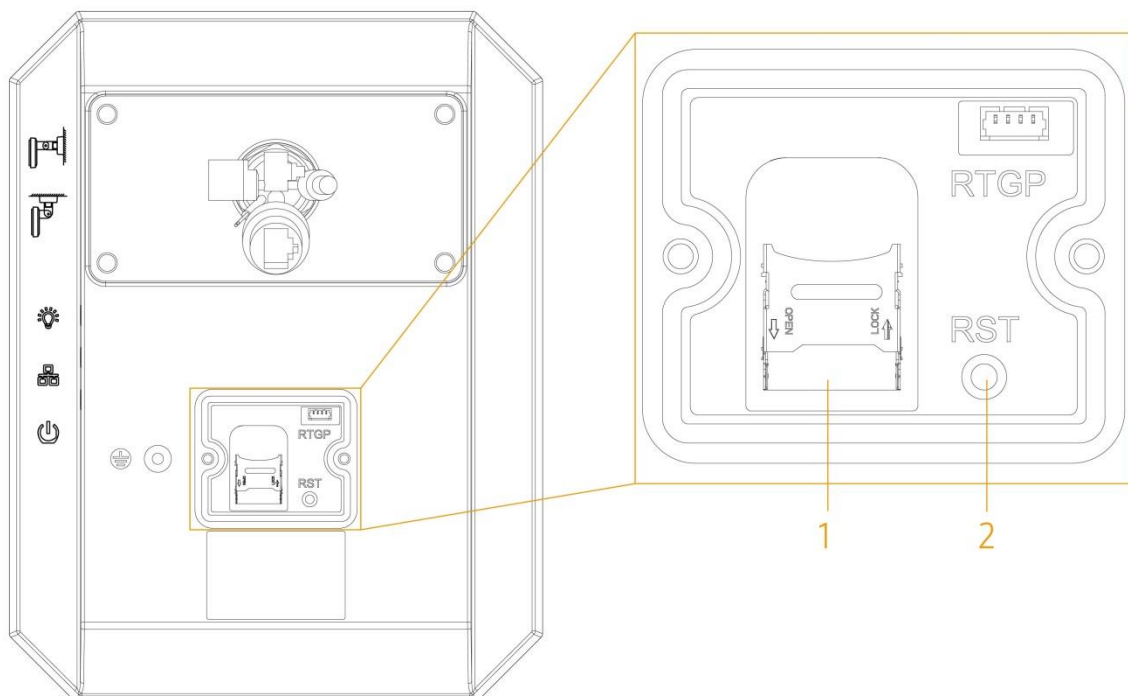


Table 1-3 Reset button and SD card slot (2)

No.	Name	No.	Name
1	SD card slot	2	Reset button

1.4.1 Using the Reset Button

The reset button is for resetting network system.

Open the rear cover of the radar, press and hold the reset button for over 15 s, and then the radar will be restored to the factory settings.

1.4.2 Installing SD Card

The SD card is for data storage.

Face the SD card with metal contacts downwards, and insert the card into the card slot. Pay attention to the insertion direction.



The SD card cannot be removed when the radar is reading or writing data; otherwise files might be lost and the SD card might be damaged.

1.5 Connection



In actual usage, see the labels attached to the radar; otherwise the device might be damaged.

Figure 1-5 External connection (50/120 m radar)

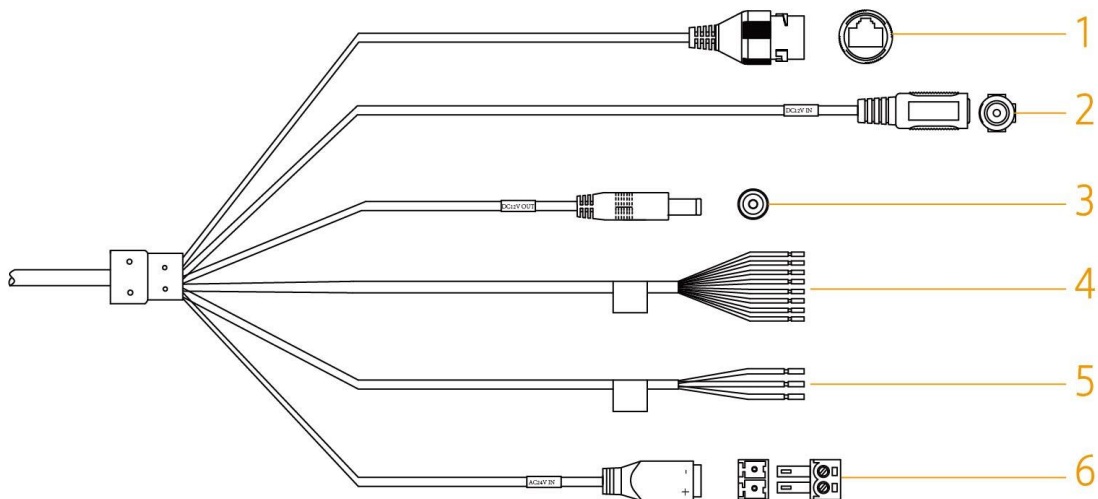


Table 1-4 External connection descriptions (50/120 m radar)

No.	Name	Function
1	Network cable (female port)	Connect to a standard Ethernet cable. Support PoE power supply. Comply with IEEE 802.3at standard when using PoE power supply.
2	Power input port	12V DC power input.

No.	Name	Function
3	Power output port	12V DC power output and the rated power is 2W.
4	Alarm port	<ul style="list-style-type: none"> ● Green: Alarm input ground. ● Blue: Alarm input. ● Brown: Alarm output 1. ● White: Alarm output 2. ● Grey: Alarm output ground 1. ● Yellow: Alarm output 3. ● Purple: Alarm output 4. ● Orange: Alarm output ground 2.
5	Alarm port (strong current)	<ul style="list-style-type: none"> ● Yellow: Alarm output ground. ● Blue: Alarm output NC (default). ● White: Alarm output NO.
6	Power input port	24V AC power input.

Figure 1-6 External connection (300/450 m radar)

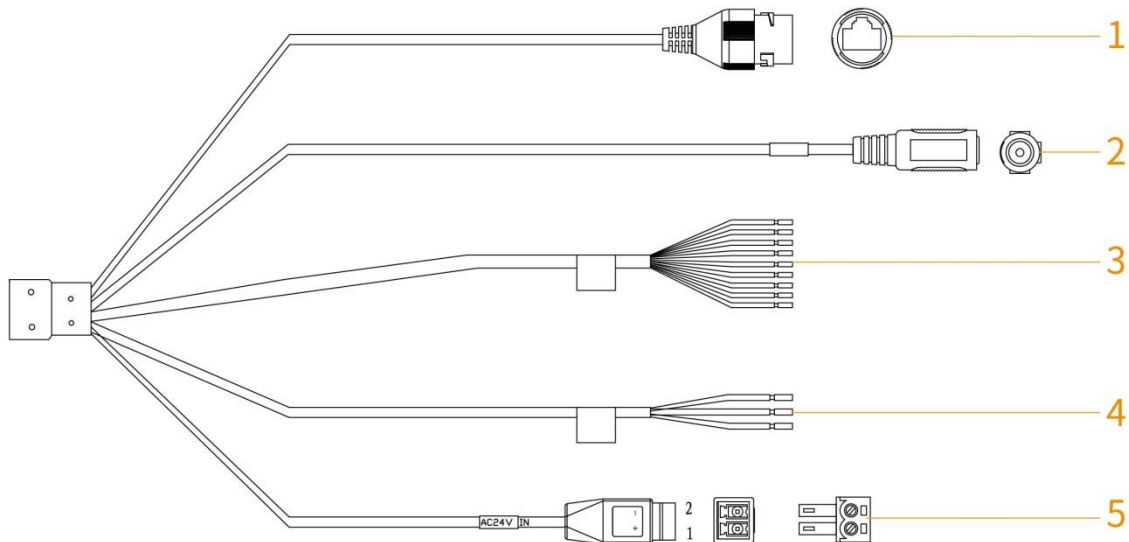




Table 1-5 External connection descriptions (300/450 m radar)

No.	Name	Function
1	Network cable (female port)	Connect to a standard Ethernet cable. Support PoE power supply.  Comply with IEEE 802.3at standard when using PoE power supply.
2	Power input port	12V DC power input.

No.	Name	Function
3	Alarm port	<ul style="list-style-type: none"> ● White: Alarm input ground. ● Blue: Alarm input. ● Brown: Alarm output 1. ● Pink: Alarm output 2. ● Green: Alarm output ground 1. ● Red: Alarm output 3. ● Purple: Alarm output 4. ● Light green: Alarm output 5. ● Black: Alarm output ground 2.
5	RS-485 port	<ul style="list-style-type: none"> ● Yellow: RS-485_A. ● Orange: RS-485_B. ● Grey: GND.  <p>Reserved function. Not supported now.</p>
6	Power input port	24V AC power input.

2 Installation Preparations

2.1 Environmental Requirements

- The installation site has enough space to install the radar and its mounting components.
- The wall and pole for installation can sustain eight times the weight of the radar and its mounting components.
- For wall mount, the wall shall be thick enough to install expansion bolts.
- No large areas of metals or glass objects are within the radar detection range; otherwise mirrored alarm sites might occur. If the metal or glass object cannot be removed, do not let it face the front side of radar during installation. Because radar electromagnetic wave cannot penetrate objects such as buildings, rocks, and glasses, a blind zone might be formed behind these objects.
- No weed and swaying branch exists within the radar detection range, and trim regularly if any.
- No interference devices with strong electromagnetic or periodically rotating objects are near the radar installation location or within its detection range, such as outdoor air conditioners and wind-driven generators.
- Make sure that the radar is installed securely and stably. Swaying will reduce its detection precision, or cause misinformation which influences the normal usage of radar.

2.2 Installation Tools and Cables

You need to prepare the following tools and cables before installation:

Power cord, lightning protector, distribution box, air switch, PoE switch (optional), electric screwdriver, network cable, ladder, insulating gloves, and other things as needed.

3 Installation

3.1 Detection Range

Horizontal Direction

Make sure that the front side of the radar faces the central part of the detection area. See Figure 3-1 and Table 3-1.

Figure 3-1 Horizontal direction

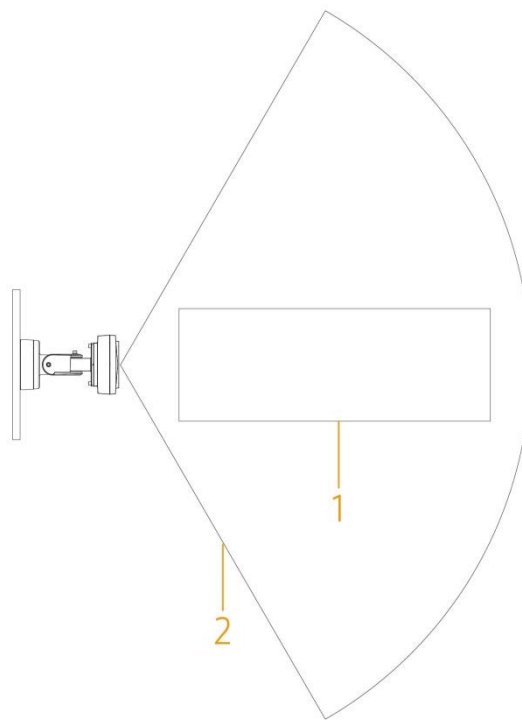


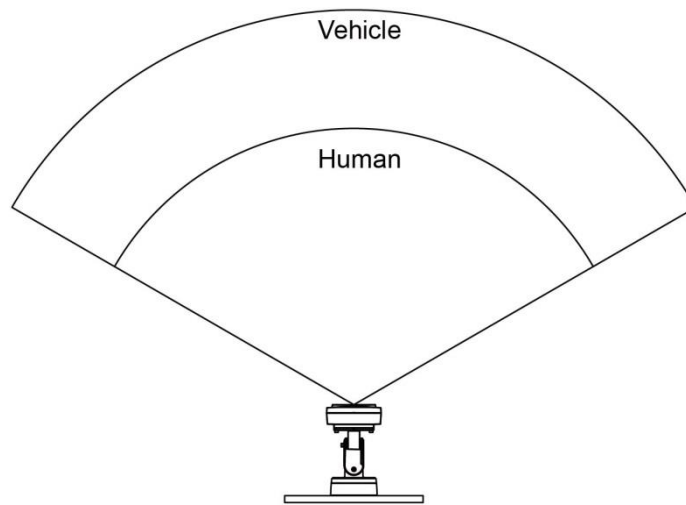
Table 3-1 Horizontal direction descriptions

No.	Name	No.	Name
1	Central detection targets	2	Detection region of the radar

Detection Range

The horizontal detection angle of the radar is 120°. Due to its microwave feature, the detection distance of margins is short, and the central detection distance is long. See Figure 3-2.

Figure 3-2 Detection distance



Blind Zone for Short Distance

The height of central point of the equivalent reflection interface of detected objects such as humans and vehicles is above 1 m. Radar's maximum distance of blind zone is shown in Figure 3-3. For detailed descriptions, see Table 3-2.

For other maximum blind zone distance with typical parameters, see Table 3-2, Table 3-3, Table 3-4, Table 3-5, and Table 3-6.

Figure 3-3 Max. blind zone distance

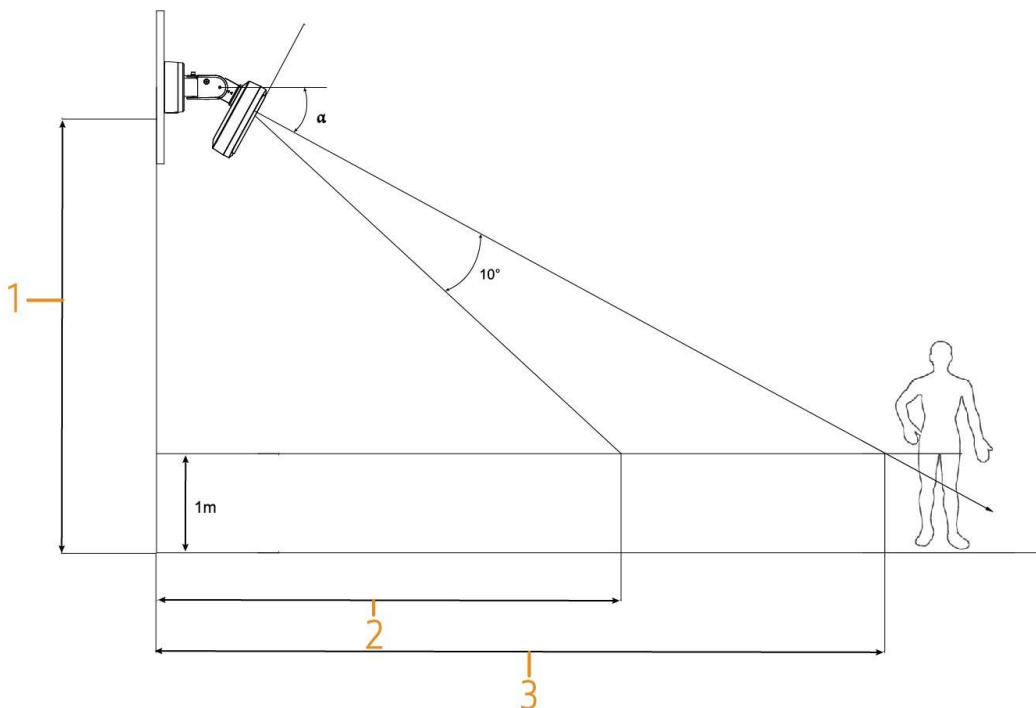


Table 3-2 Max. blind zone distance descriptions

No.	Name
1	Radar installation height (h)
2	Max. blind zone distance
3	Max. detection distance

Table 3-3 Max. blind zone parameters (50 m radar)

Radar Installation Height	Pitch Angle α	Max. Blind Zone	Max. Detection Distance
2.0 m (6.56 ft)	1°	5.0 m (16.40 ft)	50.0 m (164.04 ft)
3.0 m (9.84 ft)	2°	9.0 m (29.53 ft)	50.0 m (164.04 ft)
4.0 m (13.12 ft)	3°	13.0 m (42.65 ft)	50.0 m (164.04 ft)

Table 3-4 Max. blind zone parameters (120 m radar)

Radar Installation Height	Pitch Angle α	Max. Blind Zone	Max. Detection Distance
3.0 m (9.84 ft)	1°	10.0 m (32.81 ft)	120.0 m (393.70 ft)
4.0 m (13.12 ft)	2°	14.0 m (45.93 ft)	120.0 m (393.70 ft)
5.0 m (16.40 ft)	3°	19.0 m (62.34 ft)	120.0 m (393.70 ft)

Table 3-5 Max. blind zone parameters (300 m radar)

Radar Installation Height	Pitch Angle α	Max. Blind Zone	Max. Detection Distance
3.0 m (9.84 ft)	1°	12.0 m (39.37 ft)	300.0 m (984.25 ft)
4.0 m (13.12 ft)	2°	16.0 m (52.49 ft)	300.0 m (984.25 ft)
5.0 m (16.40 ft)	3°	24.0 m (78.74 ft)	300.0 m (984.25 ft)

Table 3-6 Max. blind zone parameters (450 m radar)

Radar Installation Height	Pitch Angle α	Max. Blind Zone	Max. Detection Distance
3.0 m (9.84 ft)	1°	12.0 m (39.37 ft)	450.0 m (1476.38 ft)
4.0 m (13.12 ft)	2°	16.0 m (52.49 ft)	450.0 m (1476.38 ft)
5.0 m (16.40 ft)	3°	24.0 m (78.74 ft)	450.0 m (1476.38 ft)



Installation height of the radar is recommended to be 3.0 m (9.84 ft).

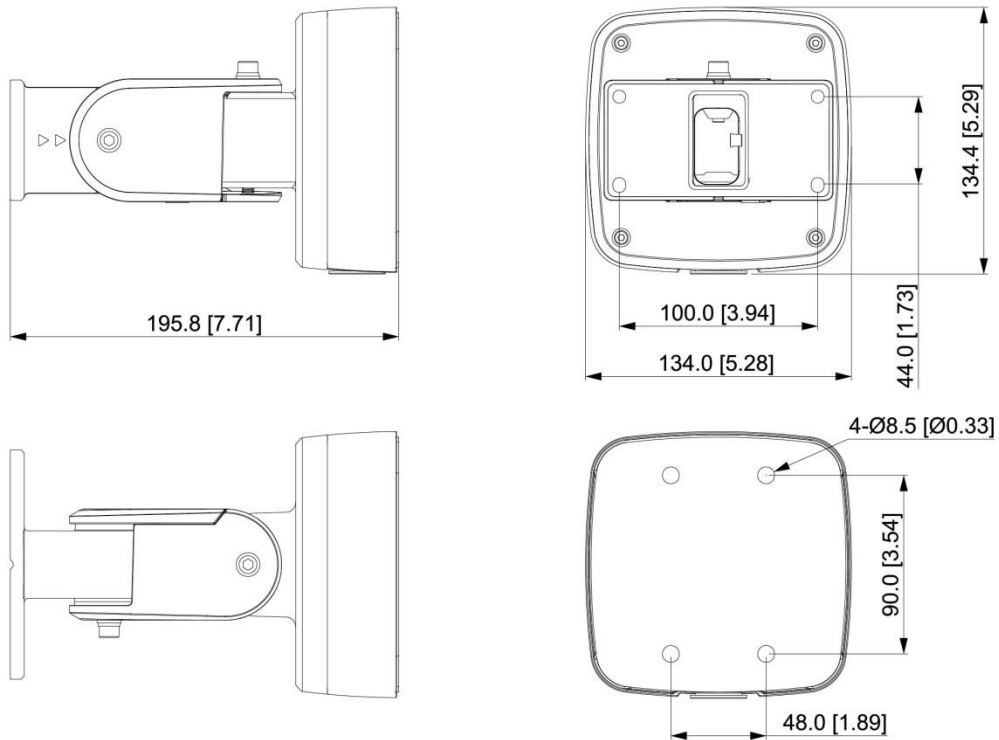
3.2 Installation



Read "2.1 Environmental Requirements" and "3.1 Detection Range" carefully before installation.

3.2.1 Bracket Dimensions

Figure 3-4 Bracket dimensions (mm [inch])



Brackets are not provided. Contact us if you need them.

3.2.2 Installation Procedures

This section takes 50/120 m radar as an example.

Figure 3-5 Step 1

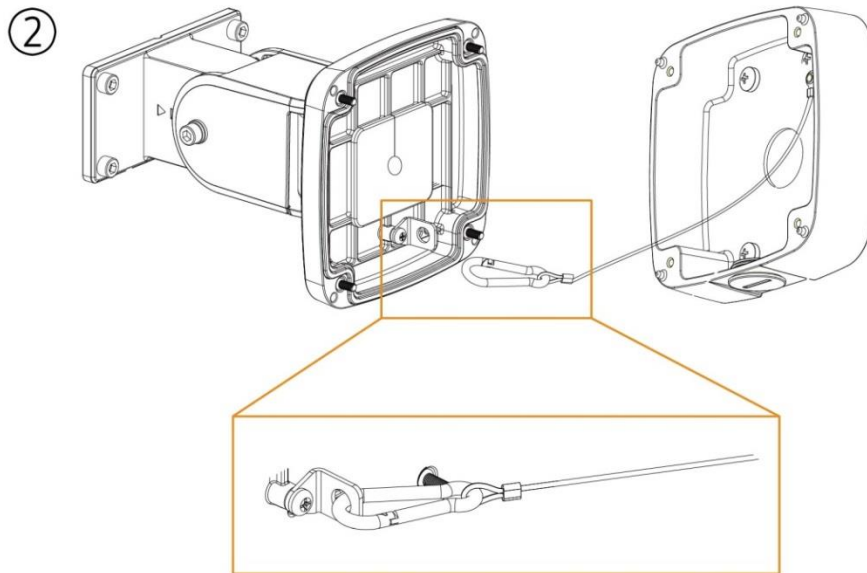
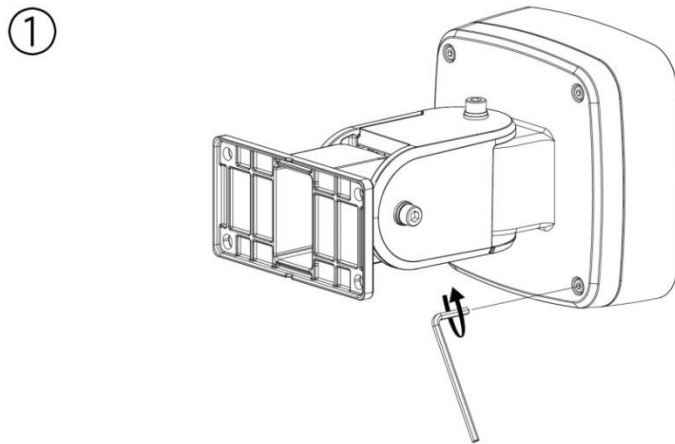


Figure 3-6 Step 2

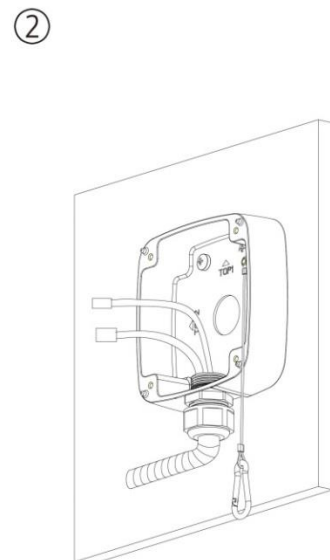
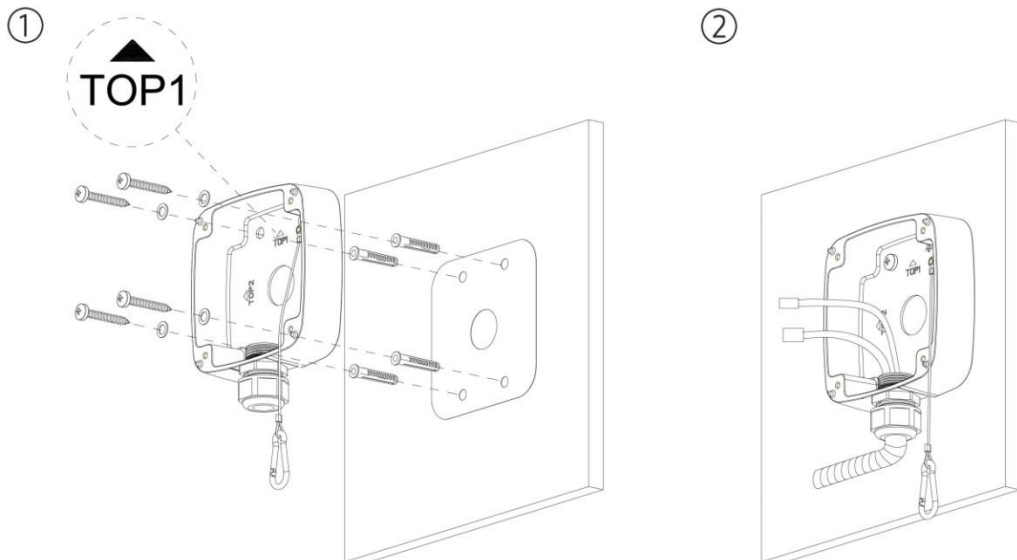


Figure 3-7 Step 3

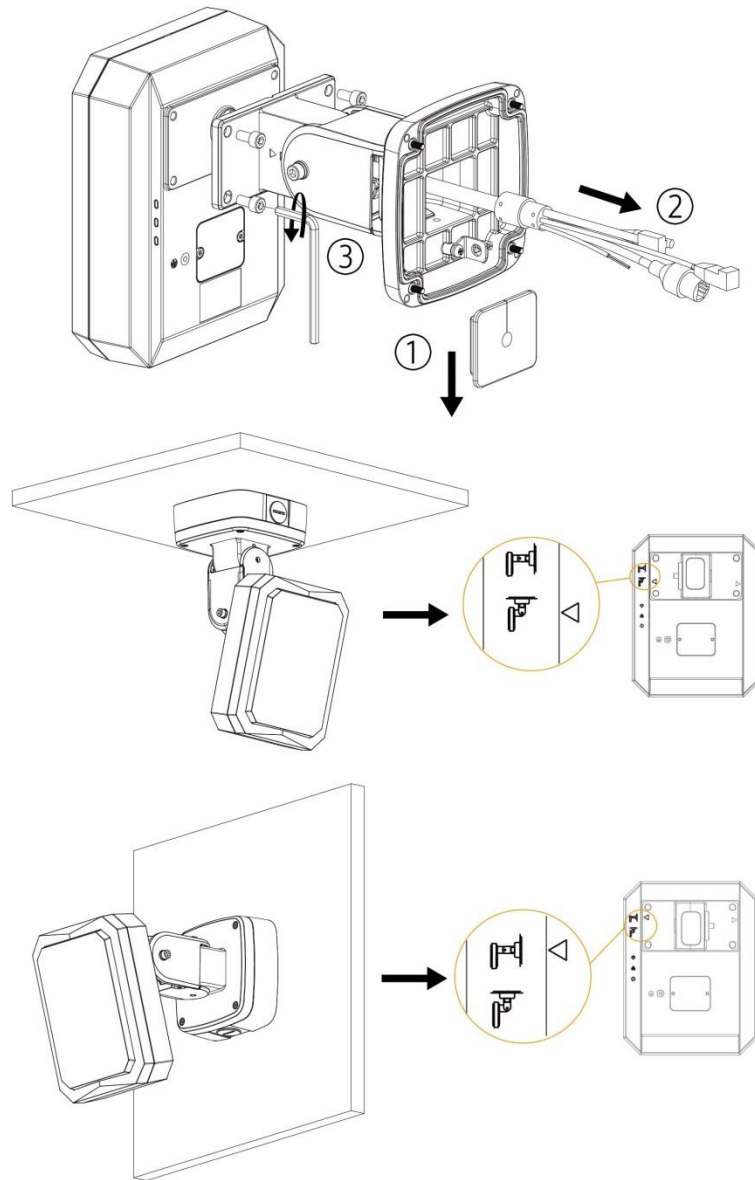


Figure 3-8 Step 4

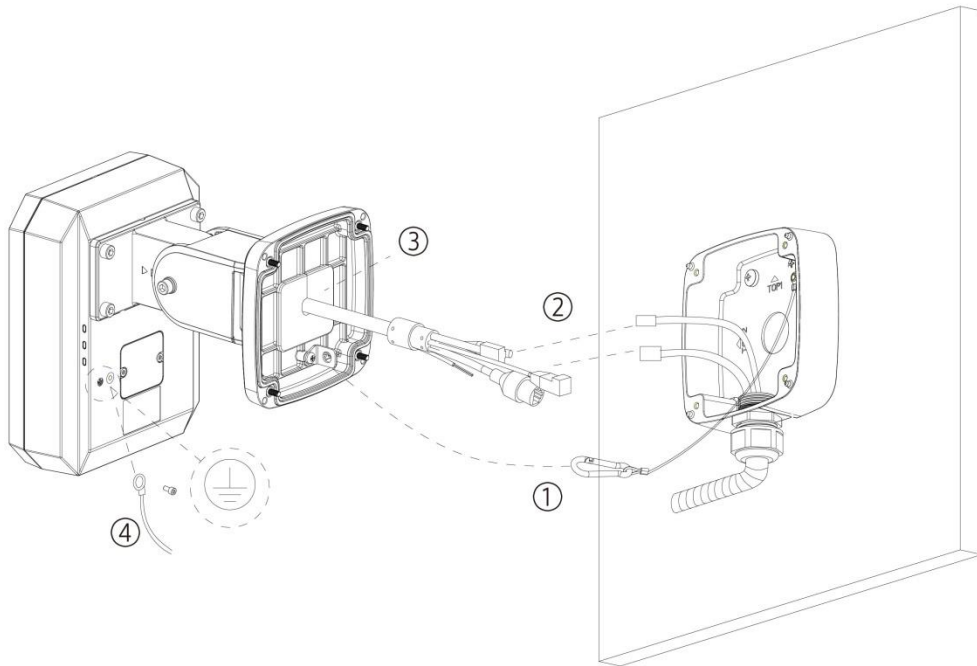


Figure 3-9 Step 5

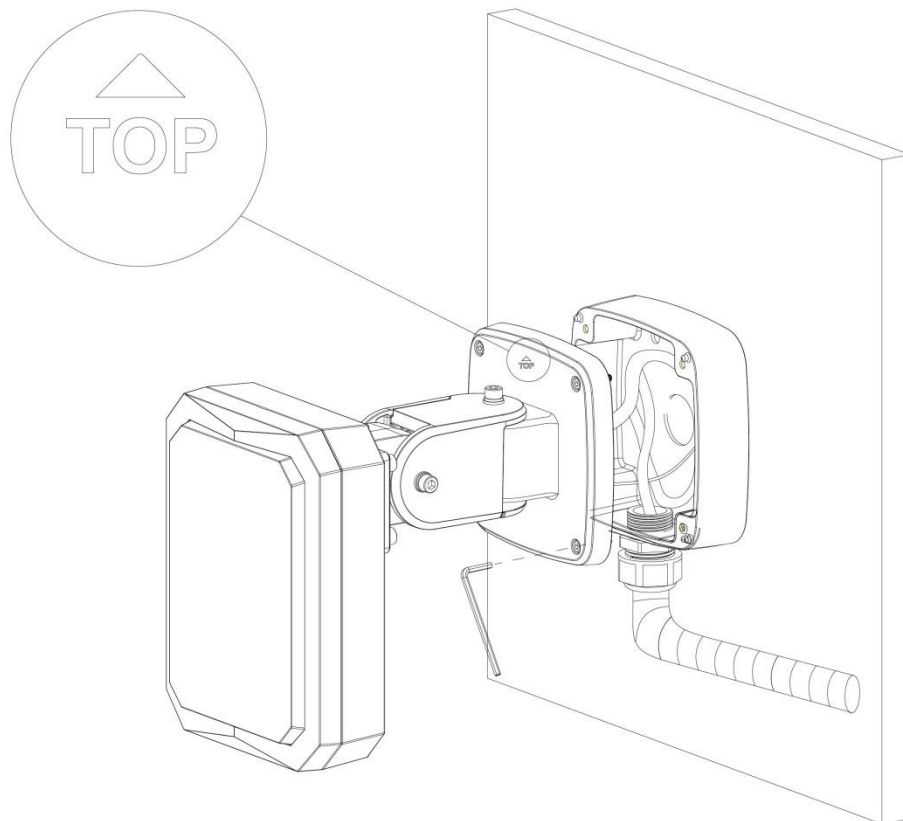


Figure 3-10 Step 6

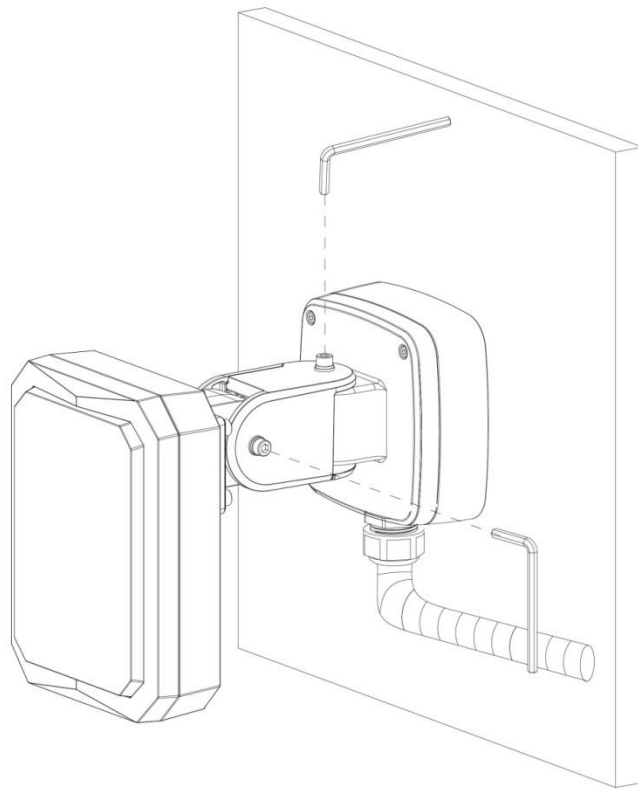


Figure 3-11 Step 7

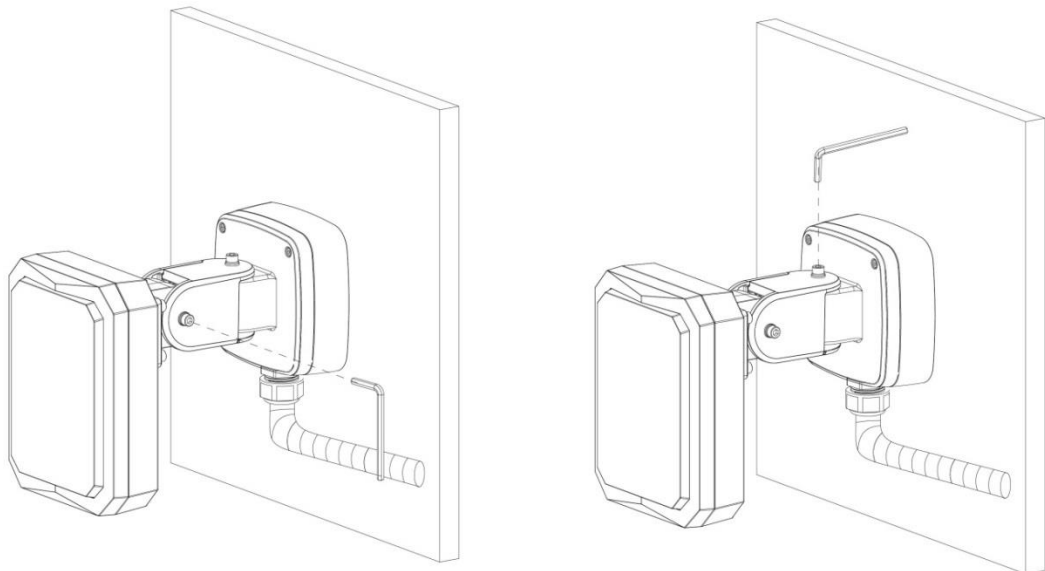


Figure 3-12 Installation methods

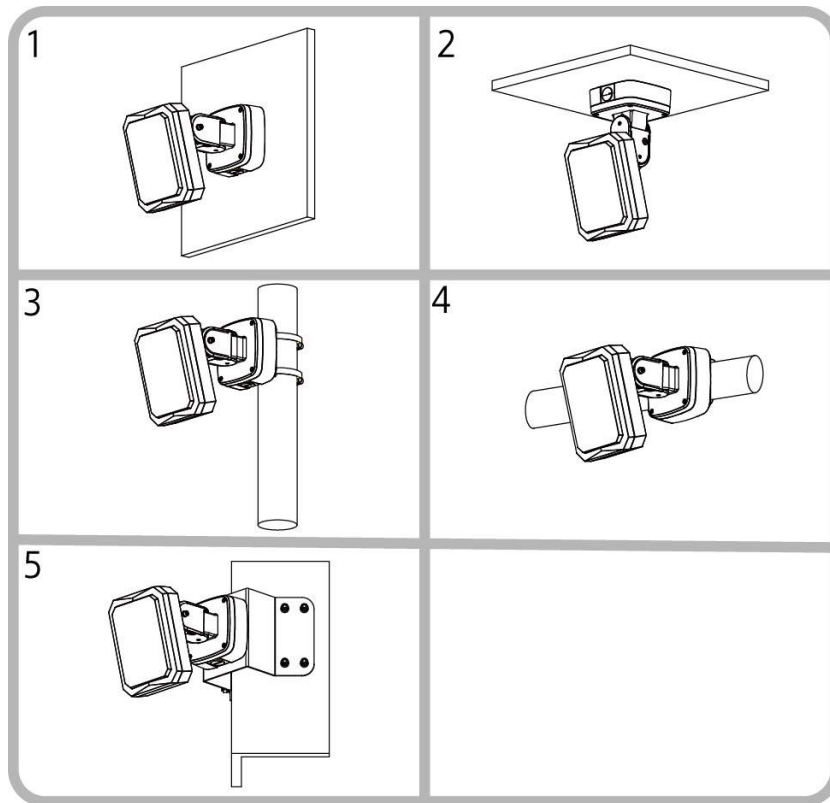


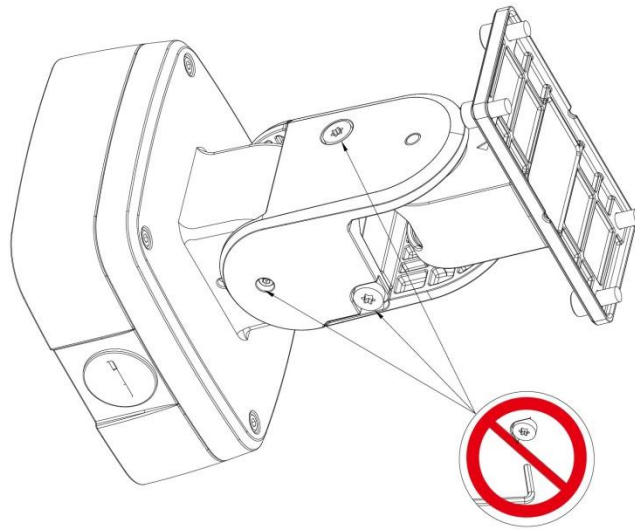
Table 3-7 Installation descriptions

No.	Installation
1	Wall mount
2	Ceiling mount
3	Vertical pole mount
4	Horizontal pole mount
5	Corner mount



There are three screws on the brackets that cannot be dismantled. See Figure 3-13.

Figure 3-13 Screws cannot be dismantled



3.2.3 Adjusting Angles

3.2.3.1 Pitch Angles

- Loose screw A anticlockwise, rotate component C once clockwise (10°), and then rotate component C once anticlockwise (9°). See Figure 3-14.
- The initial angle is 0° , and adjustable angle range is from -90° to 20° , with 1° accuracy. See Figure 3-15.
- Rotate component C clockwise once, and then rotate it once anticlockwise for 1° clockwise adjustment.

Figure 3-14 Adjust pitch angles

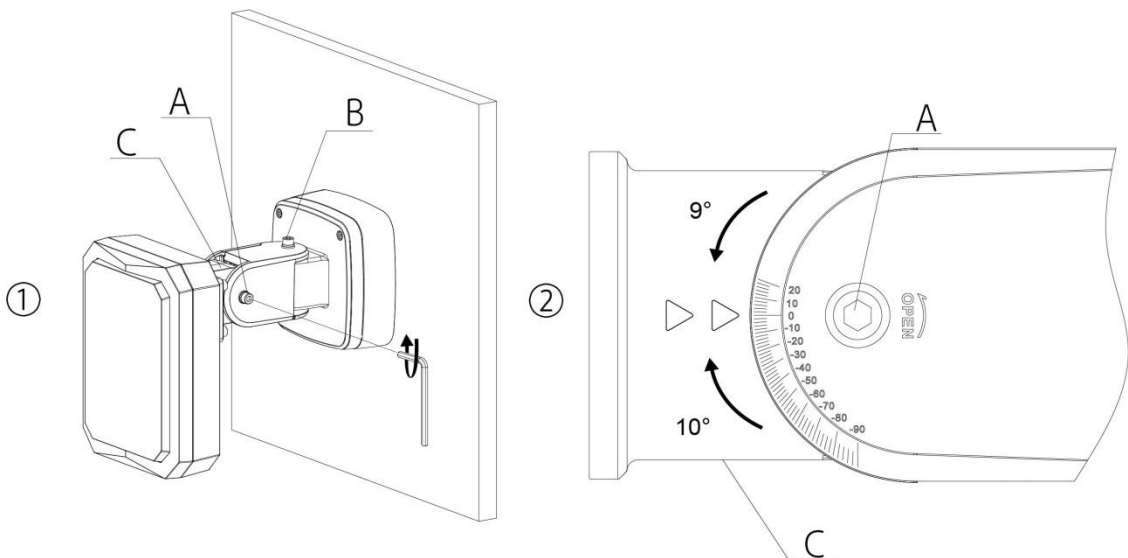
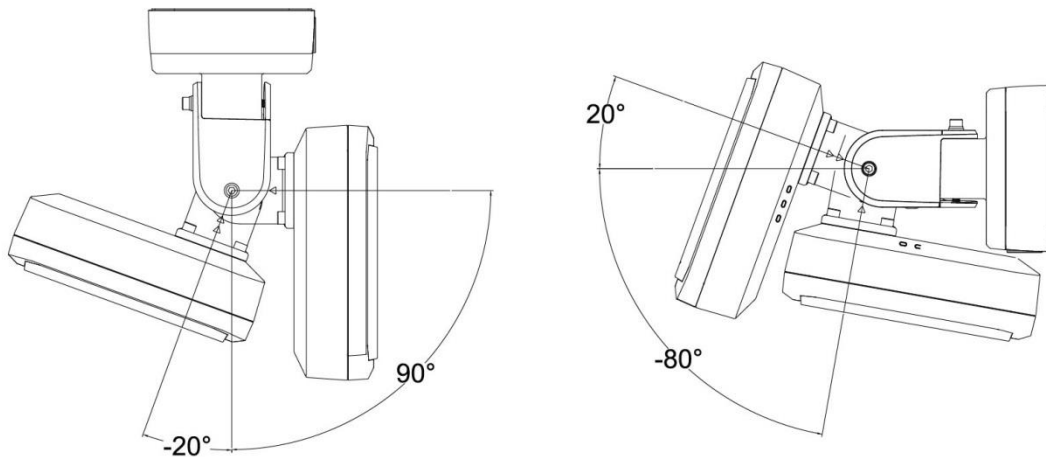


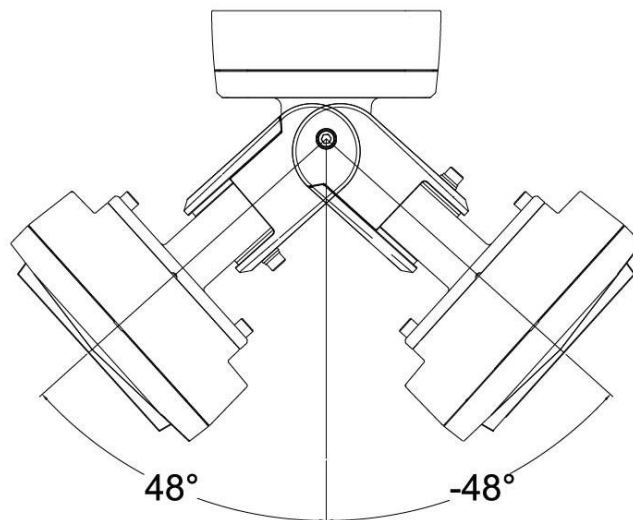
Figure 3-15 Adjustable range of pitch angles



3.2.3.2 Horizontal Angles

- Loose screw B anticlockwise, lift the radar to adjust angles as needed, and then tighten screw B.
- The initial angle is 0°, and adjustable angle range is from -48° to 48°, with 12° accuracy when rotating once. See Figure 3-16.

Figure 3-16 Adjustable range of horizontal angles



3.3 Verification after the Installation

After the installation and all the wires are connected, verify if the radar can work normally. See the following standards:

- Power indicator light glows green after the radar is powered.
- Status indicator light glows green after the radar starts.
- Network indicator light glows yellow after network is connected.

4 Network Configuration



The figures shown in this chapter are for reference only, and the actual interface shall prevail. See *radar web user's manual* for detailed function instructions.

4.1 Debugging Preparations

- A PC with software installed such as a browser.
- Make sure that the IP addresses of PC and the radar are in the same network segment.
- For debugging, you need to have basic knowledge and know how to operate speed domes and radars.

4.2 Radar Configuration

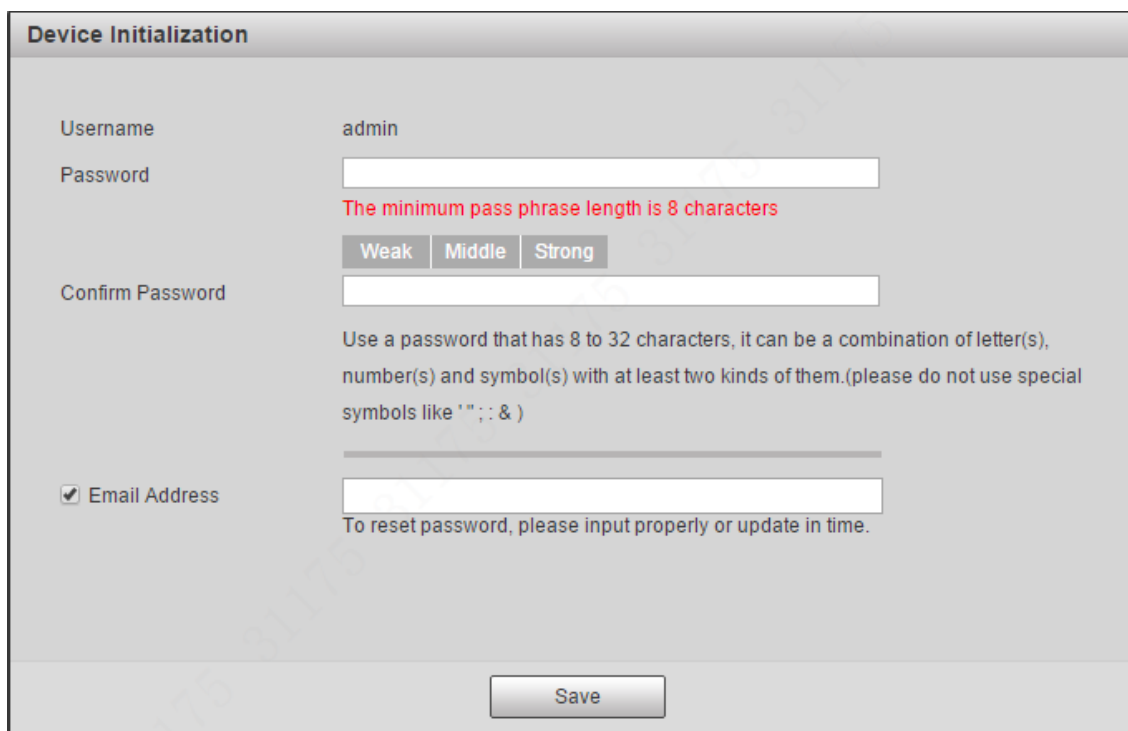
4.2.1 Device Initialization

The radar needs to be initialized for the first-time use.

Step 1 Open IE browser, enter the IP address of the radar in the address bar, and then press Enter key.

After the radar is successfully connected, the **Device Initialization** interface is displayed. See Figure 4-1.

Figure 4-1 Device initialization



The screenshot shows a web browser window titled "Device Initialization". The interface includes the following elements:

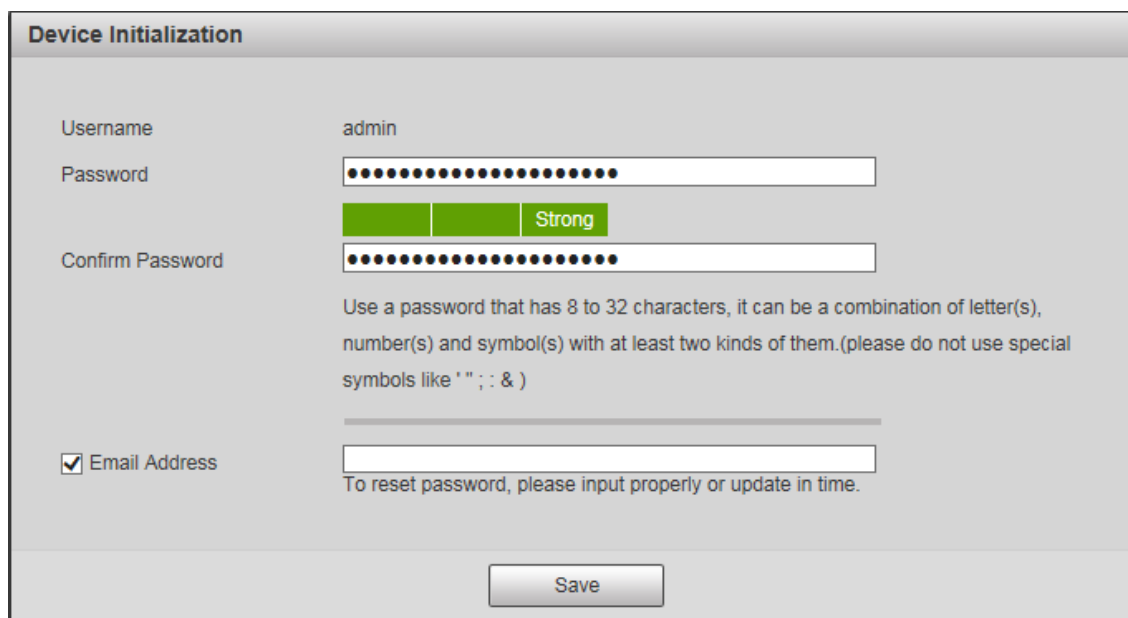
- Username:** A text field containing "admin".
- Password:** A text field with a red warning message below it: "The minimum pass phrase length is 8 characters". Below the warning are three buttons: "Weak", "Middle", and "Strong".
- Confirm Password:** A text field.
- Instructions:** A paragraph of text: "Use a password that has 8 to 32 characters, it can be a combination of letter(s), number(s) and symbol(s) with at least two kinds of them.(please do not use special symbols like '"; : &)".
- Email Address:** A checkbox labeled "Email Address" which is checked, followed by a text field. Below the field is the text: "To reset password, please input properly or update in time."
- Save Button:** A button labeled "Save" at the bottom center of the form.

Step 2 Set the password. See Figure 4-2.



The password should consist of 8 to 32 non-blank characters and contain at least two types of characters among upper case, lower case, number, and special characters (excluding ' " ; : &). Make sure that the password and the confirmed password are the same. Follow the password strength prompt to set a password with high security.

Figure 4-2 Set admin password



Device Initialization

Username: admin

Password: [masked] **Strong**

Confirm Password: [masked]

Use a password that has 8 to 32 characters, it can be a combination of letter(s), number(s) and symbol(s) with at least two kinds of them.(please do not use special symbols like ' " ; : &)

Email Address [input field]
To reset password, please input properly or update in time.

Save

Step 3 (Optional) Set the email address which is used to reset password.

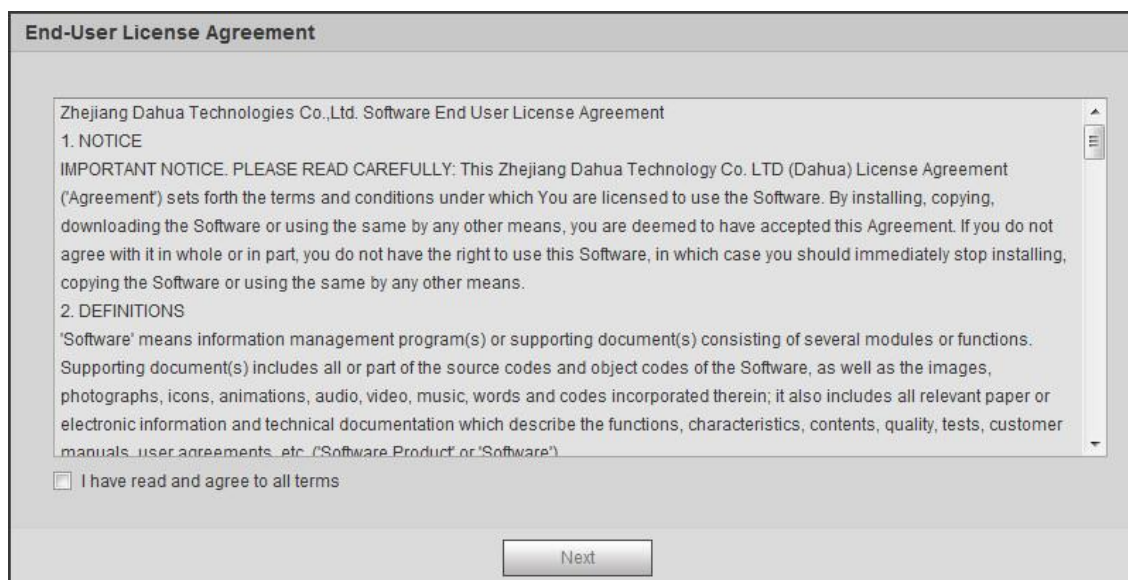


Email address function is enabled by default and you can disable it. We recommend you to enter the email address to guarantee normal use of the radar.

Step 4 Click **Save**.

The **End-User License Agreement** interface is displayed. See Figure 4-3.

Figure 4-3 End-user license agreement



End-User License Agreement

Zhejiang Dahua Technologies Co.,Ltd. Software End User License Agreement

1. NOTICE
IMPORTANT NOTICE. PLEASE READ CAREFULLY: This Zhejiang Dahua Technology Co. LTD (Dahua) License Agreement ('Agreement') sets forth the terms and conditions under which You are licensed to use the Software. By installing, copying, downloading the Software or using the same by any other means, you are deemed to have accepted this Agreement. If you do not agree with it in whole or in part, you do not have the right to use this Software, in which case you should immediately stop installing, copying the Software or using the same by any other means.

2. DEFINITIONS
'Software' means information management program(s) or supporting document(s) consisting of several modules or functions. Supporting document(s) includes all or part of the source codes and object codes of the Software, as well as the images, photographs, icons, animations, audio, video, music, words and codes incorporated therein; it also includes all relevant paper or electronic information and technical documentation which describe the functions, characteristics, contents, quality, tests, customer manuals, user agreements, etc. ('Software Product' or 'Software')

I have read and agree to all terms

Next

Step 5 Select **I have read and agree to all terms** check box, and then click **Next**.

The **P2P** interface is displayed. See Figure 4-4.

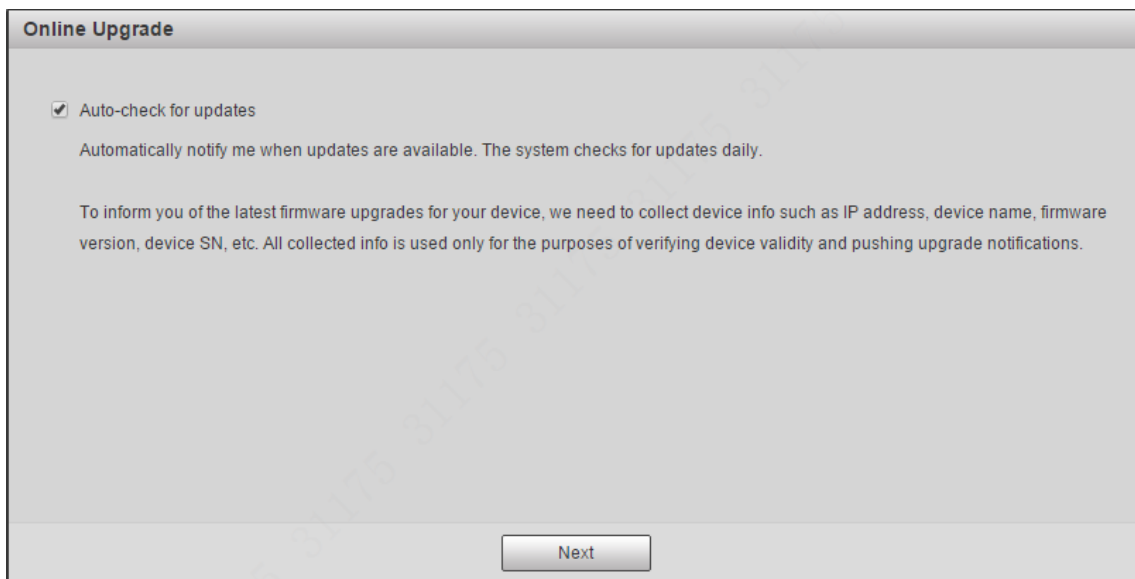
Figure 4-4 P2P



Step 6 Read on-screen notifications, select P2P as needed, and then click **Next**.

The **Online Upgrade** interface is displayed. See Figure 4-5.

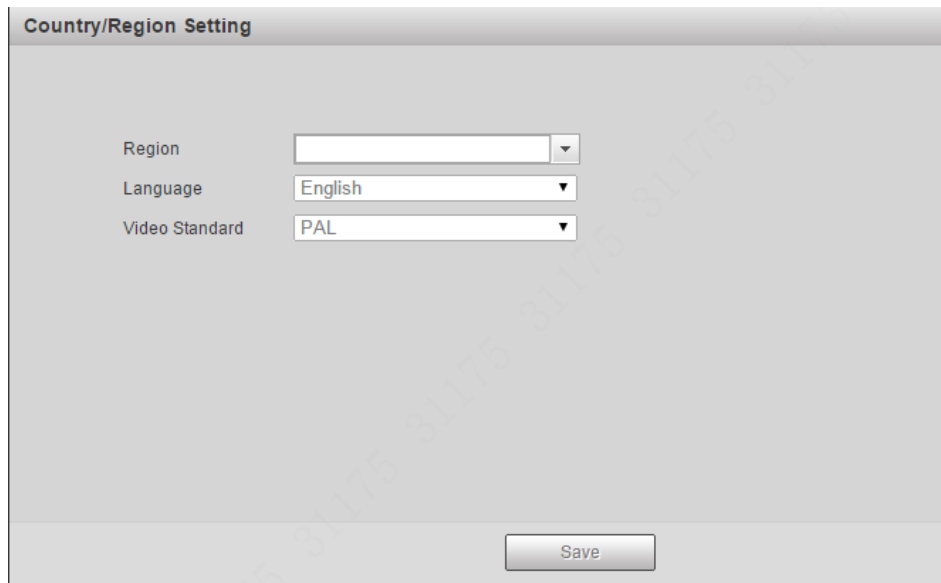
Figure 4-5 Online upgrade



Step 7 Read on-screen notifications, select **Auto-check for updates** check box as needed, and then click **Next**.

The **Country/Region Setting** interface is displayed. See Figure 4-6.

Figure 4-6 Country or region setting



The image shows a dialog box titled "Country/Region Setting". It contains three dropdown menus: "Region" (empty), "Language" (set to "English"), and "Video Standard" (set to "PAL"). A "Save" button is located at the bottom right of the dialog.

Step 8 Select region, language, and video standard as needed, and then click **Save**. The login interface is displayed. See Figure 4-7.

Figure 4-7 Login



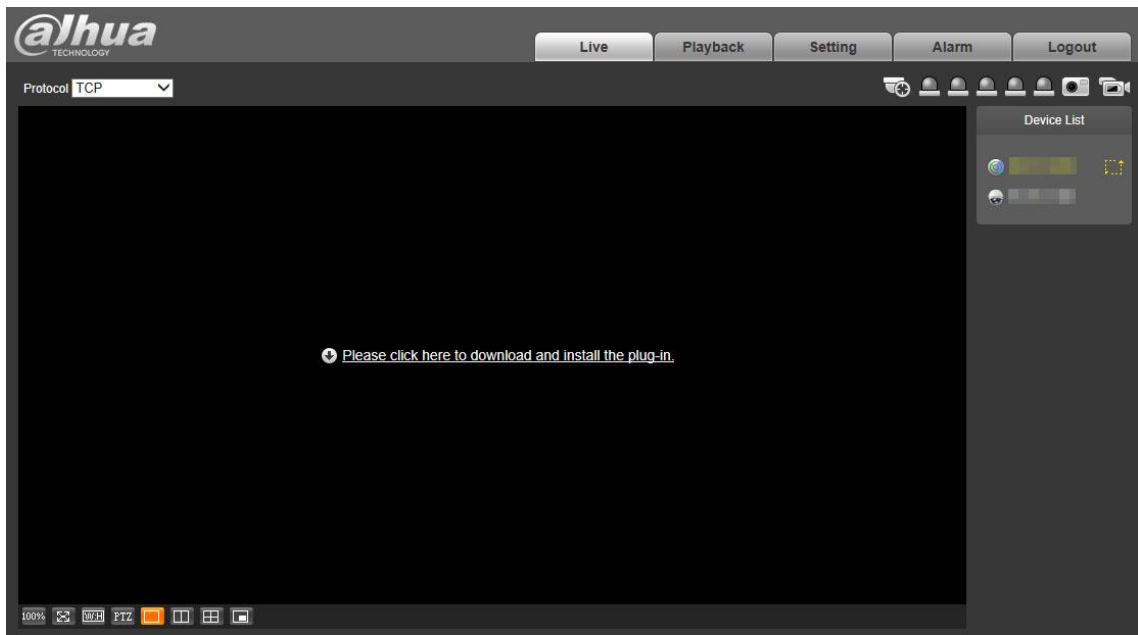
The image shows the login interface. At the top left is the "dahua TECHNOLOGY" logo. Below the logo are two input fields: "Username:" and "Password:". To the right of the "Password:" field is a link that says "Forgot password?". At the bottom are two buttons: "Login" and "Cancel".

4.2.2 First-time Login

You need to download and install the plug-in for the first time logging in to the web interface.

Step 1 On radar web interface, enter username and password, and then click **Login**. The **Live** interface is displayed. See Figure 4-8.

Figure 4-8 Install the plug-in



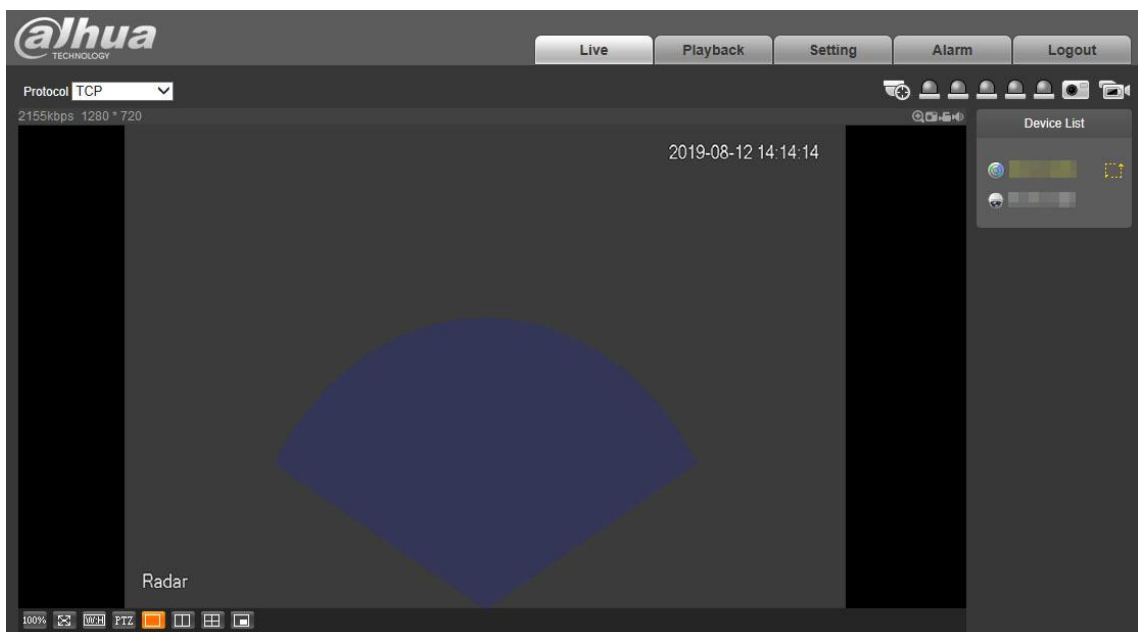
- If you enter the wrong password for continuously 5 times, the account will be locked for 5 minutes. After the locked time ends, you can log in to the radar again.
- You can set the allowed wrong password times in **Setting > Event > Abnormality > Illegal Access**.

Step 2 Download and install the plug-in according to the on-screen instructions.

Step 3 After the plug-in is installed, the login interface is displayed automatically. Enter username and password, and then click **Login**.

The **Live** interface is displayed. See Figure 4-9.

Figure 4-9 Live





The **Live** interface might vary with different radar models, and the actual interface shall prevail.

4.2.3 Modifying IP Address

Plan IP address appropriately according to the actual network usage, and make sure that the radar can access the network.

Step 1 Log in to the web interface of the radar.

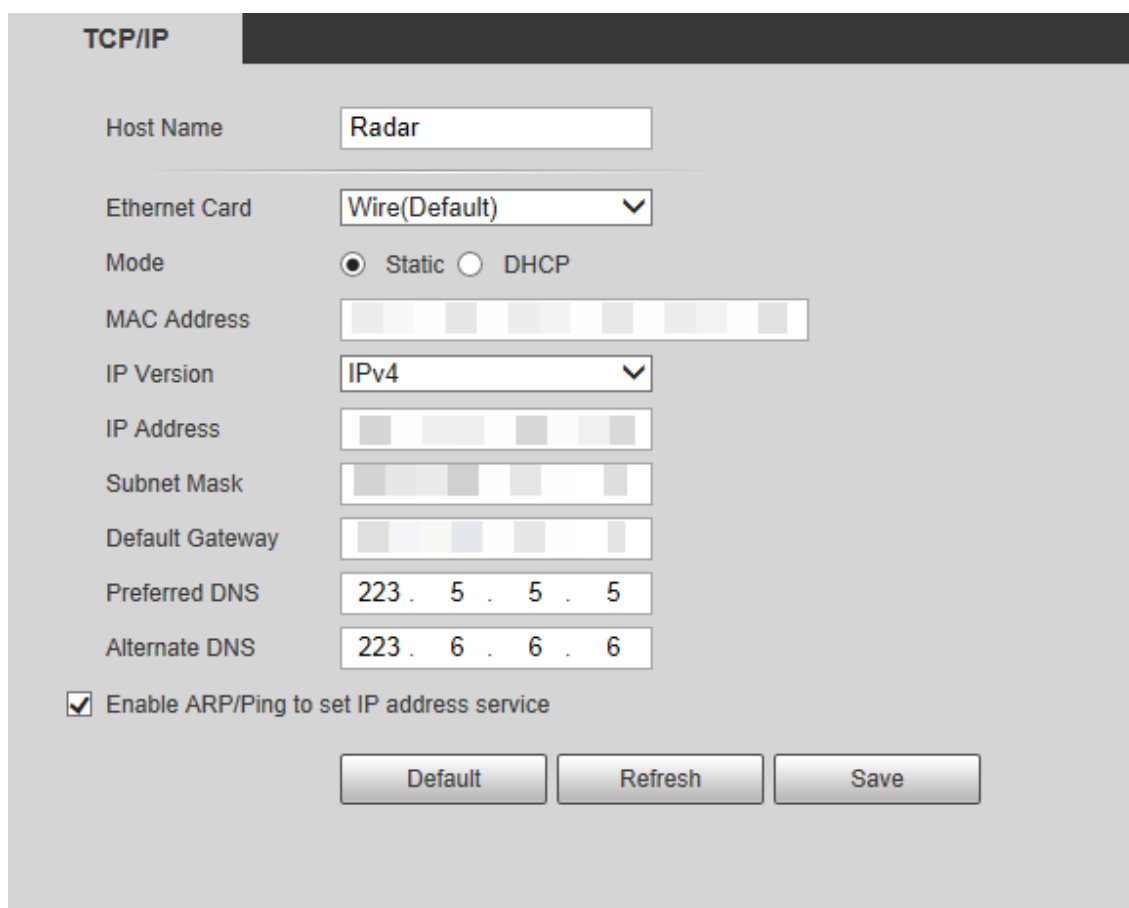


- The IP address of the radar is 192.168.1.108 by default.
- The default username is admin, and the password is the one that you set during radar initialization.

Step 2 Select **Setting > Network > TCP/IP**.

The **TCP/IP** interface is displayed. See Figure 4-10.

Figure 4-10 TCP/IP



TCP/IP

Host Name: Radars

Ethernet Card: Wire(Default)

Mode: Static DHCP

MAC Address: [Empty]

IP Version: IPv4

IP Address: [Empty]

Subnet Mask: [Empty]

Default Gateway: [Empty]

Preferred DNS: 223 . 5 . 5 . 5

Alternate DNS: 223 . 6 . 6 . 6

Enable ARP/Ping to set IP address service

Default Refresh Save

Step 3 Modify IP address and configure other parameters as needed, and then click **Save**.

4.2.4 PTZ Camera

You can add or delete PTZ cameras, set camera name and type, and enable or disable alarm track.

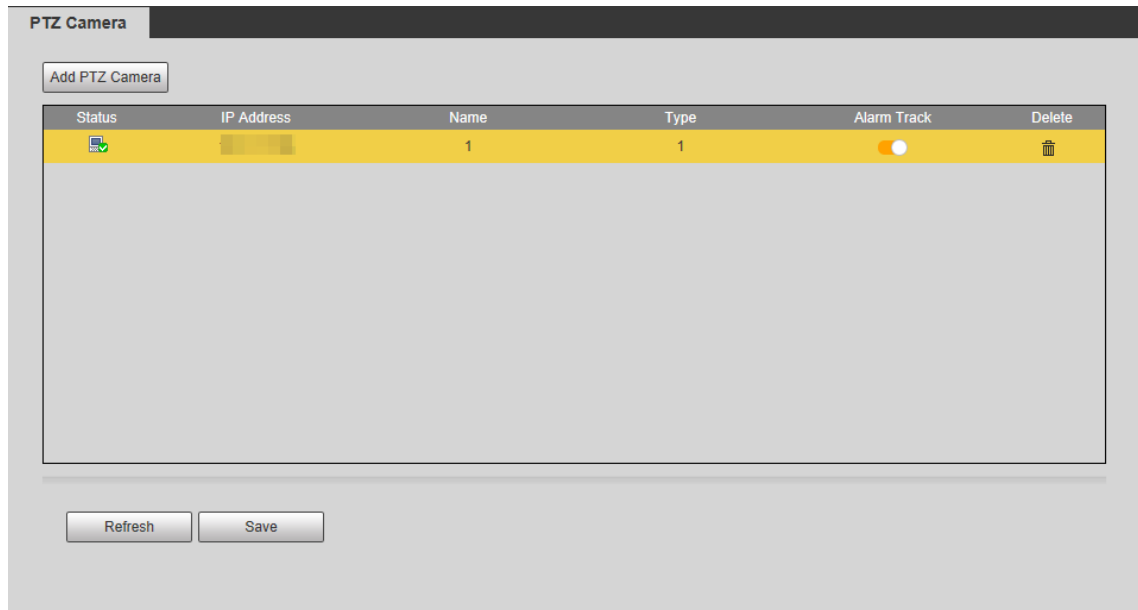


- PTZ camera configuration is only for radar speed dome tracking system, and you can skip this setting as needed.
- You can only add PTZ cameras that support radar speed dome tracking.
- The radar and the camera need to be in the same LAN.

Step 1 Select **Setting > Radar Settings > PTZ Camera**.

The **PTZ Camera** interface is displayed. See Figure 4-11.

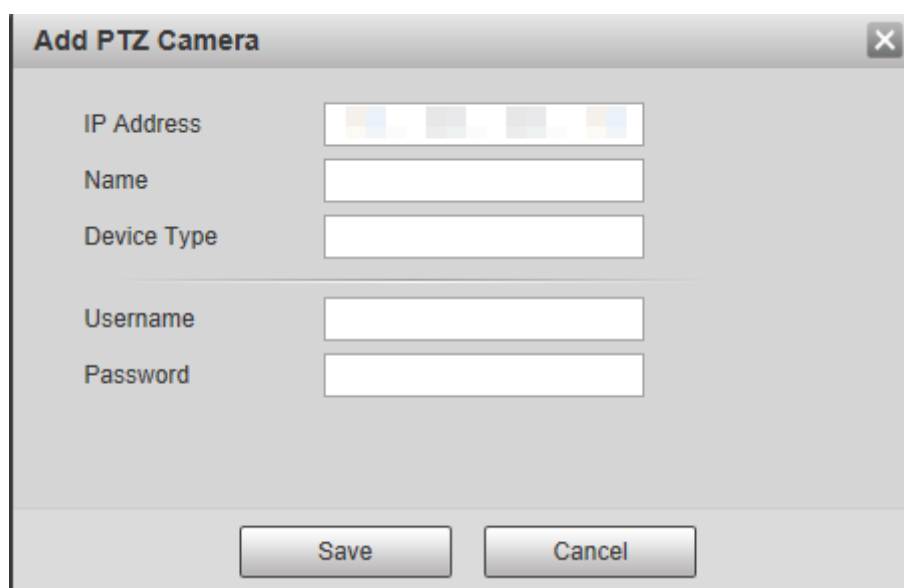
Figure 4-11 Set PTZ camera



Step 2 Click **Add PTZ Camera**.

The camera adding interface is displayed. See Figure 4-12.



Figure 4-12 Add PTZ camera



Step 3 Enter IP address, camera name, type, username, and password.

Step 4 Click **Save**.



Switch  to  to enable alarm track linkage between the radar and the selected camera.

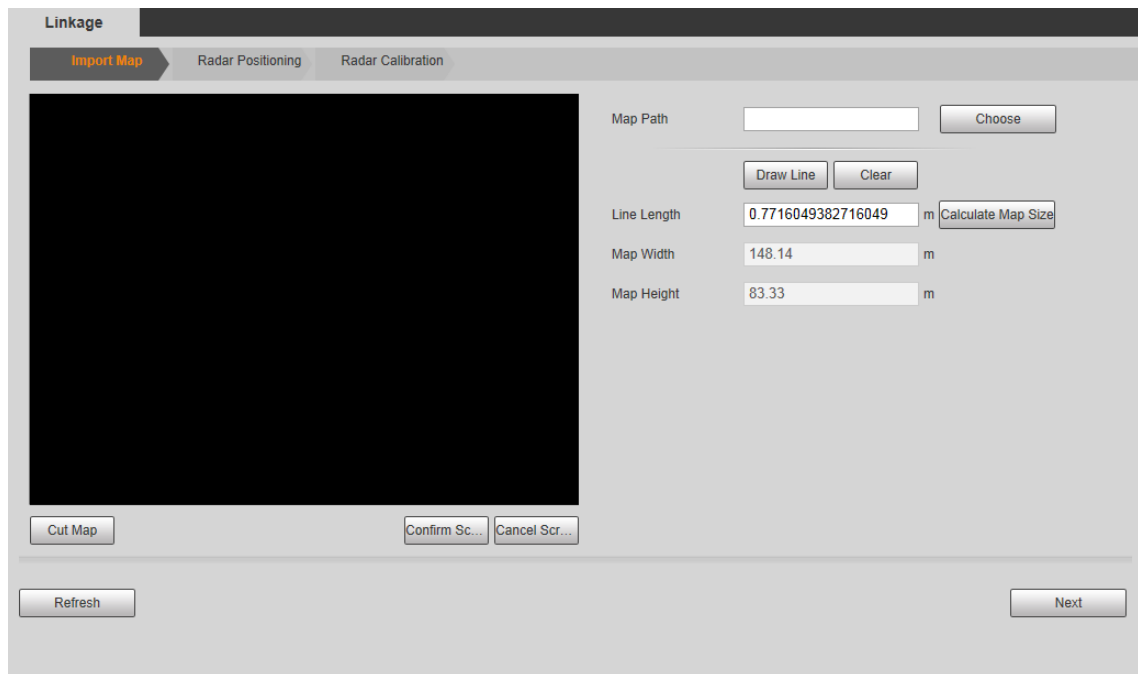
4.2.5 Linkage

You can import a map, and set linkage between the radar and the added cameras after finishing radar positioning and calibration.

Step 1 Select **Setting > Radar Settings > Linkage**.

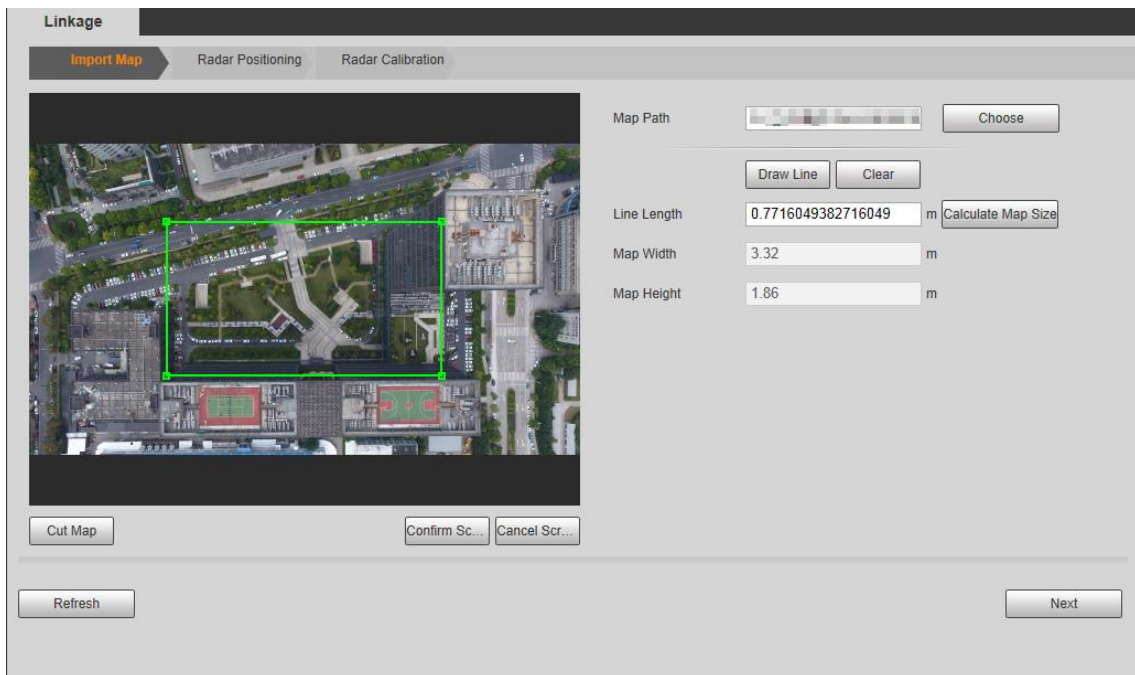
The **Linkage** interface is displayed. See Figure 4-13.

Figure 4-13 Linkage



Step 2 Import a map. See Figure 4-14.

Figure 4-14 Import a map



Step 3 Click **Choose** to select a map, and then import the map.



Maps of .png, .jpg, and .bmp format can be imported.

Step 4 Cut the map according to the detection range of the radar. Drag the map cutting box to select the map range, and then click **Cut Map**.

Step 5 Click **Confirm Screen** to get the map with the range you need.



Click **Cancel Screenshot** to cancel the cutting.

Step 6 Click **Draw Line**, and then you can draw lines on the map to calculate the map area.

- 1) Draw a line on an area whose actual length is already measured, and the system will calculate the map width and map height.
- 2) Press and hold the left mouse button to start drawing lines, and then release the button to end drawing.



- Double-click the map to enter full screen display for more accurate drawing.
- Click **Clear** to clear the lines you have drawn.

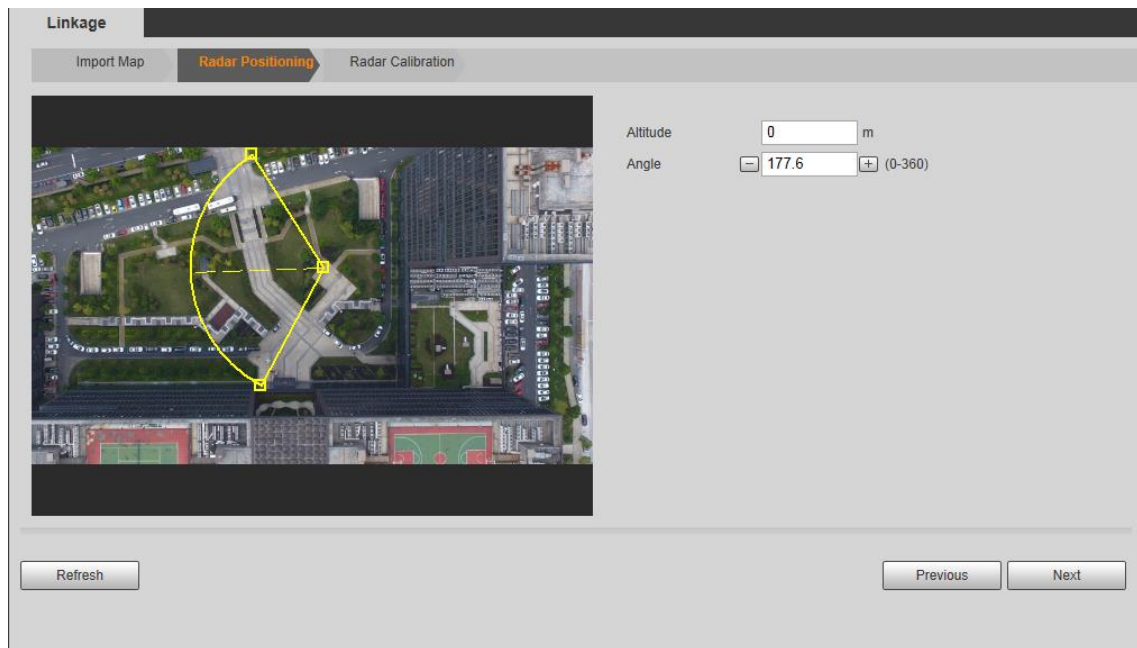
- 3) Enter the actual measured length of the line you drew in the **Line Length** box and then click **Calculate Map Size**.

The system will automatically get the map width and height.

- 4) Click **Next**.

The **Radar Positioning** interface is displayed. See Figure 4-15.

Figure 4-15 Radar positioning



Step 7 Configure radar position.

- 1) Click and drag the two edge points of the yellow sector on the map to make the sector and radar be at the same position and the dotted line face the same direction as the radar.



- The dotted line, pointing to the right horizontally, is considered as 0°. The degree value increases clockwise, and you can also adjust degree value by clicking / or entering angle value.
- Double-click the map to enter full screen for more accurate positioning.

- 2) Enter installation height of the radar in **Altitude** box.
Enter height of the radar center (front side); otherwise the camera-radar linkage effect will be reduced.
- 3) Click **Next**.
The camera login interface is displayed.

Step 8 Configure radar calibration.



Radar calibration configuration is only for radar speed dome tracking system, and you can skip this setting as needed.

- 1) Log in to the linked PTZ camera. Enter the username and password of the camera, and then click **OK**. See Figure 4-16.

The **Radar Calibration** interface is displayed. See Figure 4-17.



If you have logged in to the camera during live view, the camera login interface will not be displayed.

Figure 4-16 Log in to the camera

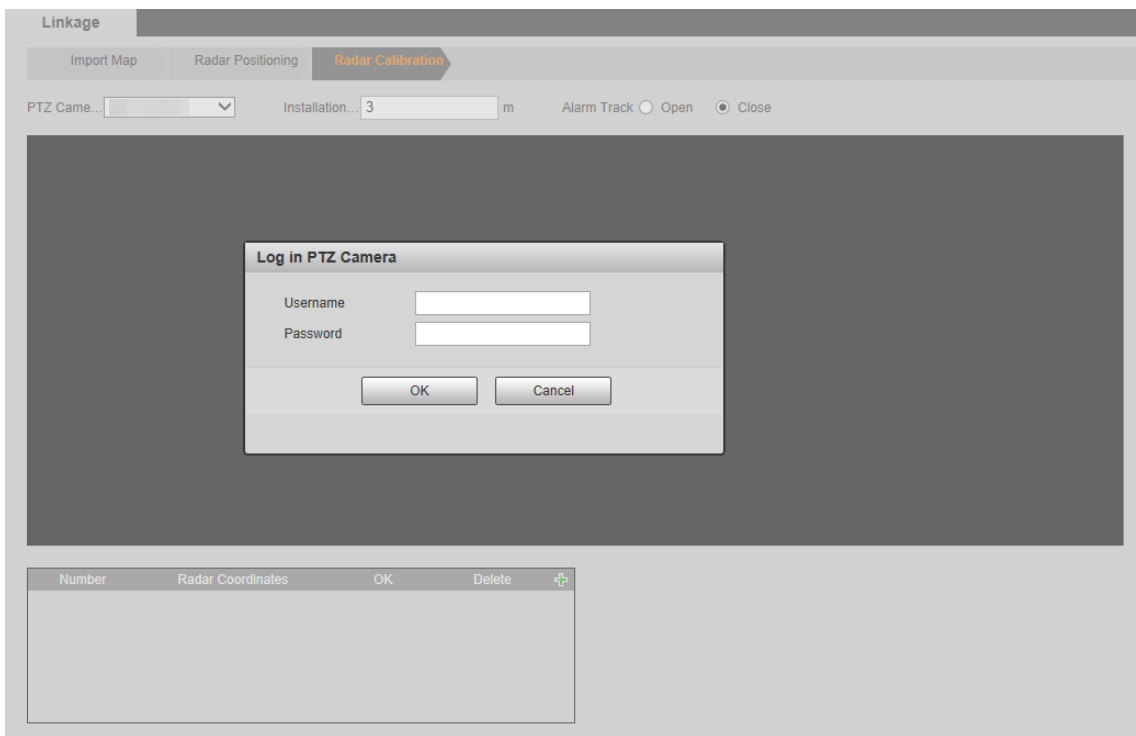
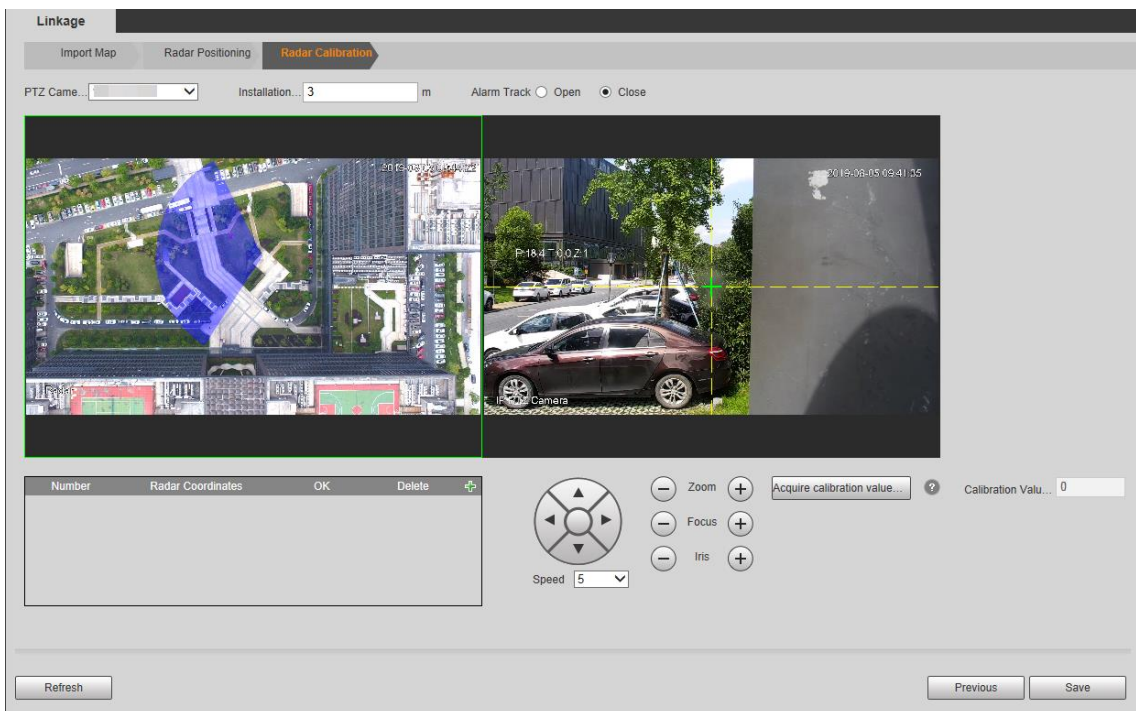





Figure 4-17 Radar calibration



- 2) Enter the installation height of the camera
Enter the height of the lens; otherwise the camera-radar linkage effect will be reduced.
- 3) Select **Close** of the **Alarm Track**; otherwise you cannot calibrate the camera.
- 4) Add radar coordinates.
 - ◇ Click to add radar coordinates. 2 radar coordinates are needed.

- ◇ Select a reference position within the radar detecting range, and then click the left mouse button. The  is displayed on the map. You can also double-click the map to enter full screen, and drag the  to be positioned more accurately.
 - ◇ Move the monitoring image of the camera to where the radar coordinate is set by clicking PTZ direction icons. Make sure that the crosshair of the camera and the radar coordinate you set are overlapped.
 - ◇ Click  to save the settings.
 - ◇ Repeat the above steps to add the second radar coordinate, and then save settings.
- 5) Select a target point (More than 10 m away from the camera is recommended) with the same height as the lens. Adjust monitoring image of the camera by using PTZ control icons to move the crosshair to the target point. Then click **Acquire calibration value**.



If multiple cameras need to be linked, click **PTZ Camera List** at the upper-left corner above the live image to switch to another camera, and then repeat operations.

- 6) Enable **Alarm Track** on the interface, and then click **Save** to complete radar calibration.

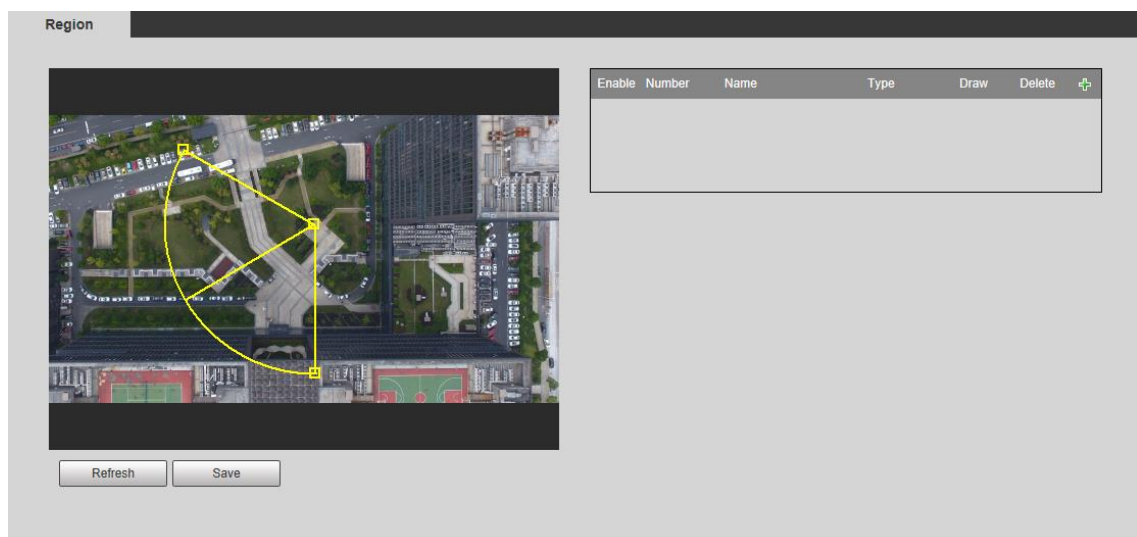
4.2.6 Region Management


You can add different types of regions, draw alarm, pre-warning, or shield areas, set arm periods, filter objects in regions, and more.

Step 1 Select **Setting > Radar Settings > Region**.

The **Region** interface is displayed. See Figure 4-18.

Figure 4-18 Region



Step 2 Click  to add regions, and then select **Enable** check box to enable region management.

Step 3 Double-click the name under the **Name** column to modify the region name.

Step 4 Configure the region type.

Double-click **Pre-warning** under the **Type** column to select region type from **Alarm** (red), **Pre-warning** (yellow), and **Shield** (green). The type with blue background is selected. Alarm priority: Alarm region > Pre-warning region > Shield region.



For detailed descriptions about alarm rules of different regions, see Table 4-2.

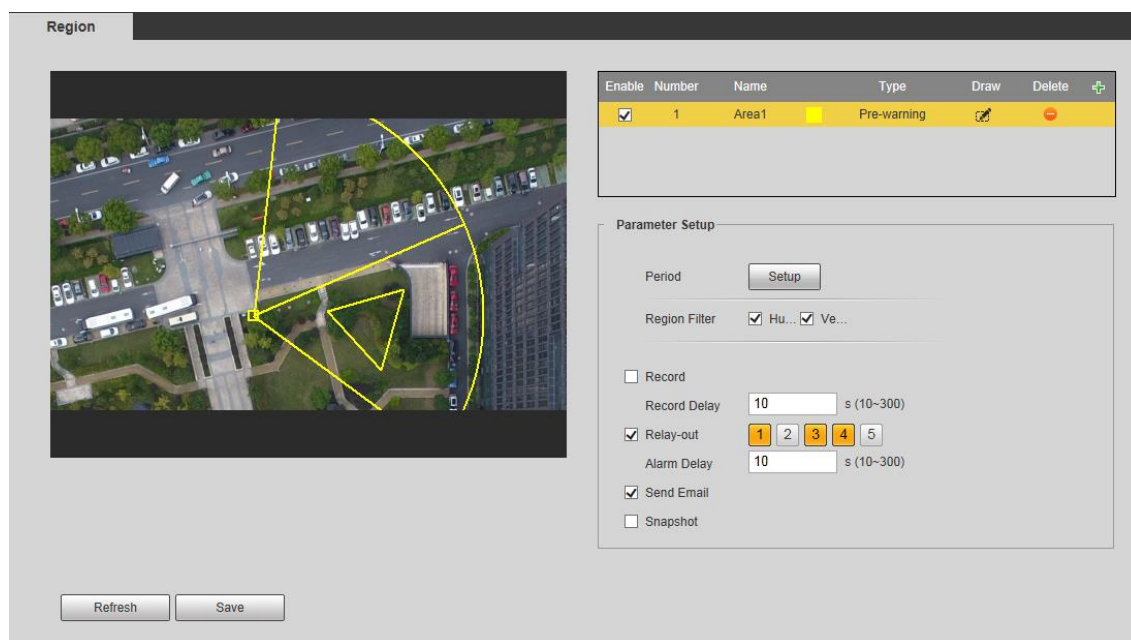
Step 5 Click  to draw an area within radar detection range.

Click the left mouse button to start drawing lines, and then click the right mouse button to end the drawing. The start and end point will automatically be connected. See Figure 4-19.



The area you draw can exceed the edge part of the detection region because it might be difficult to draw accurately.

Figure 4-19 Draw an area



Step 6 Click **Setup** to configure arm period. See Figure 4-20.

Figure 4-20 Set arm period

- 1) Set arming periods, and the alarm can only be triggered when it occurs during the defined period. The time period in green on the timeline is armed.
 - ◇ Method one: Click **Setting** of the day you want to set. Directly press and drag the left mouse button on the timeline.
 - ◇ Method two: Click **Setting** of the day you want to set. Select the check box in front of the time period to enable it. Enter start time and end time of that time period.



- Select **All** or the check box of any other day, and the set time period will apply to the selected days.
- You can set 6 time periods per day.

- 2) Click **Save** to return to the **Region** interface.

Step 7 Configure parameters as needed. For details, see Table 4-1. For alarm rules of different regions, see Table 4-2.

Table 4-1 Region management parameter descriptions

Name	Description
Period	Click Setup to set the arming period, and the alarm can only be triggered when it occurs during the defined period.
Region Filter	Select monitoring target to be filtered from Human and Vehicle .



Name	Description
Record	By selecting Record , the system will record automatically when the alarm is triggered.  <ul style="list-style-type: none"> • Before enabling this function, you need to configure record period in Setting > Storage > Schedule > Record. In Setting > Storage > Record Control, select Auto for the Record Mode. • When the alarm track is enabled, the radar will control the camera to record, and the record rules of the camera are invalid. When the alarm track is disabled, the radar will not control the camera, and the camera will record under its own recording rules.
Record Delay	The alarm record keeps running for the defined time (from 10 s to 300 s) after the alarm is ended.
Relay-out	By selecting Relay-out , the corresponding alarm output device will be linked through alarm output port when the alarm is triggered.  Five alarm output ports. No.5 is connected to the strong current device. 300/450 m radar does not support alarm from strong current devices.
Alarm Delay	The alarm keeps running for the defined time (from 10 s to 300 s) after the alarm is ended.
Send Email	By selecting Send Email , the system automatically sends email to the specified mailbox when the alarm is triggered. You can configure the mailbox in Setting > Network > SMTP (Email) .
Snapshot	By selecting Snapshot , the system automatically captures images when the alarm is triggered. You can configure the snapshot taking period in Setting > Storage > Schedule > Snapshot .

Table 4-2 Alarm rules of different regions

Region	Description
Alarm area	<ul style="list-style-type: none"> The highest priority. The target will be tracked preferentially when it enters the alarm area. When targets appear both in the alarm area and pre-warning area, only the target in alarm area will be tracked. Pre-warning area and shield area are subject to alarm area, when three areas overlap.
Pre-warning area	<ul style="list-style-type: none"> Secondary priority. The target will be tracked when it enters the pre-warning area. Shield area is subject to pre-warning area, when they overlap.
Shield area	<ul style="list-style-type: none"> The target will not be tracked, and its trace will not be displayed in the shield area. When there are areas with objects that might cause misinformation such as trees in radar detection area, but not in alarm or pre-warning areas, you can set them as shield area.

Step 8 Click **Save**.

4.2.7 Protection Zone Management

You can set trajectory duration, select channels for radar, configure alarm track, and more.

Step 1 Select **Setting > Radar Settings > Protection Zone Management**.

The **Protection Zone Management** interface is displayed. See Figure 4-21 and Figure 4-22.

Figure 4-21 Protection zone management (50/120 m radar)

The screenshot shows the 'Protection Zone Management' configuration window. It contains the following elements:

- Trajectory Duration:** A text input field with the value '5' and a unit 's (3-30)' with a help icon.
- Select Channel:** Two buttons labeled '1' and '2', where '2' is highlighted in yellow.
- Hide Protection Zone:** A checkbox that is currently unchecked.
- Alarm Track:** A section containing:
 - Track Mode:** A dropdown menu with 'Tour' selected and a help icon.
 - Track Time:** A text input field with the value '5' and a unit 's (1-15)' with a help icon.
- Buttons:** Three buttons at the bottom: 'Default', 'Refresh', and 'Save'.



Figure 4-22 Protection zone management (300/450 m radar)


The screenshot shows the 'Protection Zone Management' interface. It features the following elements:

- Trajectory Duration:** A text input field containing '5' followed by 's (3-30)' and a help icon.
- Detection Region:** A dropdown menu currently showing '150'.
- Hide Protection Zone:** An unchecked checkbox.
- Alarm Track:** A sub-section containing:
 - Track Mode:** A dropdown menu showing 'Tour'.
 - Track Time:** A text input field containing '8' followed by 's (1-15)' and a help icon.
- Buttons:** Three buttons at the bottom: 'Default', 'Refresh', and 'Save'.

Step 2 Configure parameters as needed. For details, see Table 4-3.

Table 4-3 Parameter descriptions of protection zone management

Name	Description
Trajectory Duration	Trajectory duration of targets, ranging from 3 s to 30 s.
Select Channel	<p>You can select different channels for radar to avoid co-channel interference.</p>  <ul style="list-style-type: none"> The function is for 50/120 m radars only. Co-channel interference: In radar's protection zone, interference signals from other devices in the same frequency band lead to radar trajectory clutter and make false negatives and misinformation increased.
Detection Region	<p>Select from two detection regions according to scenarios.</p>  <ul style="list-style-type: none"> The function is for 300/450 m radars only. The radar will restart after switching the detection region.
Hide Protection Zone	Select the check box to hide protection zone.
Track Mode	<ul style="list-style-type: none"> Tour: The camera tracks all targets in the detection region in turn. Distance Priority: The camera tracks the target nearest to the radar in the detection region. Time Priority: The camera tracks the target appearing earliest in the detection region.

Name	Description
Track Time	The maximum tracking time of each target, ranging from 1 s to 15 s.  Track time is only for Tour track mode.

Step 3 Click **Save**.

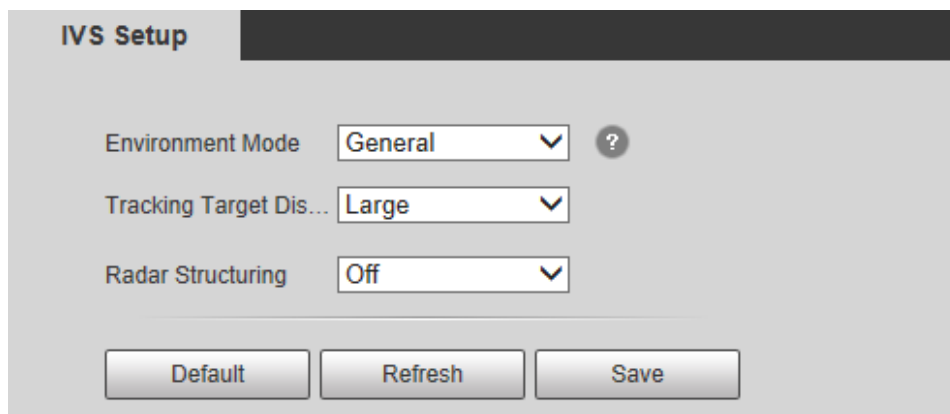
4.2.8 IVS Configuration

You can select environment mode, set displaying scale of the tracked target, and enable or disable radar structuring.

Step 1 Select **Setting > Radar Settings > IVS Setup**.


The **IVS Setup** interface is displayed. See Figure 4-23.

Figure 4-23 IVS setup



Step 2 Configure parameters as needed. For details, see Table 4-4.

Table 4-4 IVS setup parameter descriptions

Name	Description
Environment Mode	<ul style="list-style-type: none"> ● General: Apply to detection regions without shrubs, except large barriers such as cars. ● Shrub: Apply to detection regions with trees, shrubs, and other swaying objects that might cause misinformation. ● Capacious: Apply to detection regions without trees, shrubs, or large barriers.  300/450 m radars do not support the function.
Tracking Target Display	Display the tracking target in four scales: Large, middle, small, and ultra-small.
Radar Structuring	By enabling Radar Structuring , the tracking distance, angle, moving speed, and type of the tracked target will be displayed on live view interface.

Appendix 1 FAQ

Problem	Solution
No response after the radar is powered on.	<ul style="list-style-type: none"> ● When the radar is powered on, the power indicator light will glow. If not, check whether the power cord is firmly connected. ● The polarity of the power cord is correct. The supply current and voltage conform to the radar label, or PoE (802.3at) power supply is normal.
Power supply is normal but the radar cannot detect objects.	<ul style="list-style-type: none"> ● Make sure that radar's installation direction is correct. See "0 ● Installation ● Detection Range" and "3.2 Installation." ● The network port is connected.
No object is found in the detection area but there are detection signals.	<ul style="list-style-type: none"> ● Radar installation direction faces the detection region, and there is no intense electromagnetic equipment in the detection region to interfere the radar. ● The pole with the radar installed on is not swaying. ● No weed or swaying branch in the detection region. If any, prune them regularly or draw a shield area around them.
Does a target behind a solid object can be detected by the radar?	Electromagnetic wave of the radar cannot penetrate objects such as cement, rocks, glasses, and metals, thus a blind zone will be formed behind these objects.
Is radar's detection range a sector?	No. The detection distance in front of the radar is farther than the sector shows, but for the margin area, it is shorter than the sector shows.
Targets close to the radar cannot be detected.	Due to limitations of installation height and horizontal detection angles of the radar, a blind zone will be formed close to the radar. The vertical detection angle of the radar is $\pm\alpha$ (Generally, if signal strength is -3dB , α is 10°). For detailed maximum blind zone distance, see "Table 3-3 Max. blind zone parameters (50 m radar) " and "Table 3-4 Max. blind zone parameters (120 m radar)."

Problem	Solution
How does the radar perform in heavy weather?	<ul style="list-style-type: none">● Electromagnetic wave of the radar can detect the target in blurry visual conditions such as heavy fog.● In foggy or rainy days, radar's detection range might decrease slightly for the reason that electromagnetic wave might be damaged more or less. However, there is certain redundancy for the radar performance when it leaves the factory, so it can conform to the standard requirements even though it is influenced by adverse factors.● A false alarm might occur in areas with hail or heavy snow.

Appendix 2 Cybersecurity Recommendations

Cybersecurity is more than just a buzzword: it's something that pertains to every device that is connected to the internet. IP video surveillance is not immune to cyber risks, but taking basic steps toward protecting and strengthening networks and networked appliances will make them less susceptible to attacks. Below are some tips and recommendations on how to create a more secured security system.

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