

Positioning System

Installation Manual



V1.0.0

Foreword

General

This manual introduces the structure, installation and operations of the Positioning System (hereinafter referred to as "the Camera").

Safety Instructions

The following signal words might appear in the manual.

Signal Word	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.

Frequently Used Functions

Button	Description
Apply/Save	Save the configurations.
Refresh	Refresh the configurations to the latest.
Default	Restore the configurations to the default.
Clear	Clear the configurations.
Delete	Delete the configurations.

Revision History

Revision Content	Release Time	Revision Content
V1.0.0	First release.	October 2023

Privacy Protection Notice

As the device user or data controller, you might collect the personal data of others such as their face, audio, 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.

Interface Declaration

This manual mainly introduces the relevant functions of the device. The interfaces used in its manufacture, the procedures for returning the device to the factory for inspection and for locating its faults are not described in this manual. Please contact technical support if you need information on these interfaces.

About the Manual

- The manual is for reference only. Slight differences might be found between the manual and the props.
- We are not liable for losses incurred due to operating the props 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 props 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

The manual will help you to use the Device properly. Read the manual carefully before using the Device, and keep it well for future reference.

Transportation Requirements



- Transport the device under allowed humidity and temperature conditions.
- Do not place heavy stress on the device, violently vibrate or immerse it in liquid during transportation.
- The complete package is necessary for transportation. Please keep the packing box safe. Whether it is delivered by the contractor or returned to the factory for repair, we will assume no responsibility for any damage or problems caused during transportation due to the incomplete package being sent.

Storage Requirements



- Do not place heavy stress on the camera, violently vibrate or immerse it in liquid during storage.
- Store the device under allowed humidity and temperature conditions.

Installation Requirements



DANGER

- Make sure that the power is off when you connect the cables, install or disassemble the device.
- All installation and operations must conform to the local electrical safety code and standards.
- Buckle the safety hook before installing the device if it is included.
- Use batteries that conform to the requirements to avoid the risk of fire and explosions.
- Make sure to use the same model when replacing the battery.
- Use power cords that conform to your local requirements, and are rated specifications.
- Use the standard power adapter or cabinet power supply. We will assume no responsibility for any injuries or damages caused by the use of a nonstandard power adapter.
- Install the device horizontally or in a location that is stable to prevent it from falling.



WARNING

- Using the device in a domestic environment might cause radio interference, in which case you might be required to take adequate measures.
- For devices that support lasers, do not aim the laser directly at eyes. And keep it a proper distance away from flammables to avoid the risk of fire.



- The device must be installed in a location that only professionals can access.
- When installing the device, make sure that the converter is installed inside the bracket.
- To avoid damage, keep the device away from televisions, radio transmitters, electromagnetic devices, electric machines, transformers, and speakers. Do not install it in places with smoke or vapor, high temperature, and lots of dust. Do not install the device near a heating furnace and other heat sources, such as a spotlight, kitchen, and boiler room.
- Prevent the device from falling down and from being exposed to violent vibrations.
- We recommend you use the camera with a lightning surge protector for stronger protection against lightning. For outdoor scenarios, strictly comply with the lightning protection regulations.
- Before installing the device, confirm the salt spray tolerance level corresponding to its model. Do not install the device in an environment with higher salt spray levels than it can tolerate. There are three salt spray tolerance levels for the device.
 - ◇ Devices with high salt spray tolerance levels can be installed in areas that are within 1500 meters of the sea, or on an offshore platform.
 - ◇ Devices with medium salt spray tolerance levels can be installed in areas that is 1500 meters away from the sea.
 - ◇ Devices that do not have salt spray tolerance can only be installed in areas that are 3000 meters away from the sea.
- The installer of the device must have required certification or qualified training for installing closed-circuit television (CCTV) systems. They must also be trained and certified to work at heights, and must have knowledge and skills in the following areas:
 - ◇ Basic knowledge and skills in installing CCTV systems and components.
 - ◇ Basic knowledge and skills in low-voltage wiring and in connecting low-voltage electronic circuits.
 - ◇ The ability to read and understand the manual.
- Requirements for lifting the device:
 - ◇ The device lifting equipment must be able to adapt to the installation site and the installer must have knowledge of the installation method.
 - ◇ The device lifting equipment must reach the installation height.
 - ◇ The device lifting equipment must have a high safety rating.

Operating Requirements



DANGER

- Make sure the power supply meets the SELV (Safety Extra Low Voltage) requirements, and rated voltage conforms to the IEC60065 or IEC60950-1 standard. The requirements of the power supply are subject to the device label.
- Do not connect multiple devices to the same power adapter to avoid the risk of overheating or fire if the rated load is exceeded. Please use the power adapter provided by the manufacturer.



WARNING

Immediately cut the power and disconnect the power cord if smoke, noise or a disgusting smell comes from the camera. Make sure to contact your local retailer or after-sales service.



- Operate the device within the rated range of power input and output.
- Use the device under allowed humidity and temperature conditions.

- When the device is not in use for a long time, charge it regularly (such as every 3 months) to avoid the device becoming unusable.
- Make sure there are no foreign metal objects or flammables in the device. Foreign objects inside the device might cause fire, short-circuits and damage to the device. Carefully protect the device from rain and sea water. Power off the device and disconnect the power cord immediately if water or other liquids flow into it, and contact after-sales service.
- Do not aim the lens at intense light sources, including sunlight and incandescent light to avoid the lens becoming damaged.
- After unpacking, even if the packing bag is damaged or leaking air, and the desiccant particles are different colors, the normal use of the device will not be affected.
- We are not liable for any problems caused by the incorrect use of the device. Do not disassemble the Device; otherwise it might cause dangers or device damage. Contact your local retailer or customer service center for internal setup or maintenance requirement.
- We are not liable for any problems caused by overuse of certain components.

Maintenance Requirements



- Clean the casing with a soft cloth. To remove the dirt, dip the soft cloth in detergent, wring it out to wipe away the dirt. Dry the casing with a dry soft cloth. Do not use gasoline, paint thinner, or other chemicals to clean the casing, and avoid long time contact between the plastic or rubber material and the casing. This is to avoid the casing becoming deformed and paint flaking.
- Contact your local dealer or the service center nearest to you if the device needs internal configuration or maintenance. Do not dismantle or modify the device without a qualified professional present to avoid the risk of danger or damage to the device. We will assume no responsibility for any problems caused by unauthorized modifications or maintenance.
- All maintenance personnel of the device must have required certification or qualified training for performing maintenance on closed-circuit television (CCTV) systems. They must also be trained and certified to work at heights, and must have knowledge and skills in the following areas:
 - ◇ Basic knowledge and skills in installing CCTV systems and components.
 - ◇ Basic knowledge and skills in low-voltage wiring and in connecting low-voltage electronic circuits.
 - ◇ The ability to read and understand the manual.
- The dome cover is an optical component. When it is contaminated with dust, grease, or fingerprints, use degreasing cotton moistened with a little ether or a clean soft cloth dipped in water to gently wipe it clean. An air gun is useful for blowing dust away.
- Strictly follow the instructions to disassemble the device. Non-professionals dismantling the device can result in it leaking water or producing poor quality images.

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1 Unpacking the Box

After opening the trolley case, check whether there is obvious damage to the appearance of the Camera, and whether the components are complete against the packing list.

Table 1-1 Packing list

Name	Quantity
Aluminum Trolley Case	1
Positioning System	
Installation Tray	
Power Adapter	
Power Cord	
Steel Wire Rope	
Main Aviation Connector Cable	
Screwdriver	
Legal and Regulatory Information	
QR Code	
Installation Manual	

Some optional accessories are available for you to choose from.

Table 1-2 Optional accessories

Name	Quantity
Backup Battery	1
8-Wire Aviation Connector Cable	
Bluetooth Earphones	
Tripod	
Base Charger	
Car Power Adapter	

2 Device Structure

2.1 Appearance

The supported ports vary with device model, and the actual product shall prevail.

Figure 2-1 Appearance

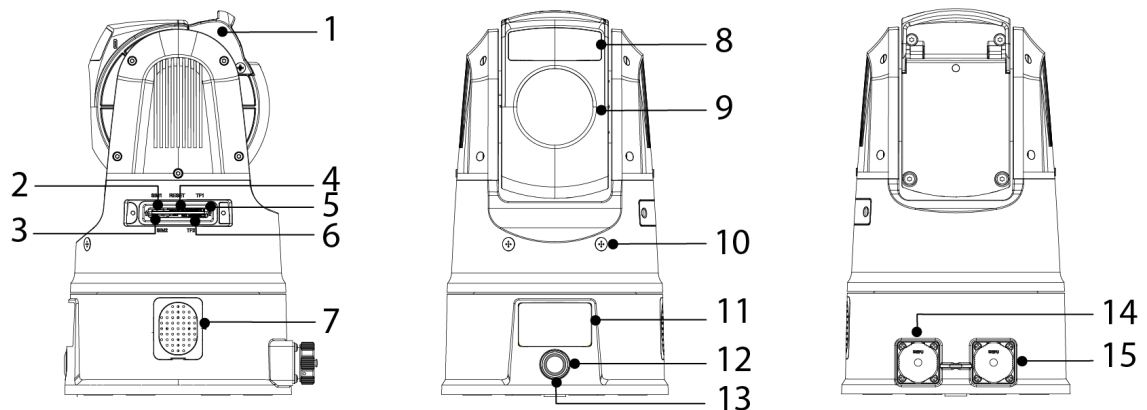


Table 2-1 Structure description

No.	Name	Description
1	Handle	Carry the Camera through the handle.
2	SIM1	Install Micro SIM card to connect to network.
3	SIM2	 Dual SIM cards are supported by select models.
4	Reset button	Press and hold the button for at least 5 seconds when the Camera is working, and then release to restore the Camera to factory settings.
5	TF1	Install Micro SD card to store data.
6	TF2	 Dual TF cards are supported by select models.
7	Speaker	Plays voice prompt.
8	IR illuminator	For illumination when the Camera is working in low lighting condition.
9	Lens	Captures video images.
10	Microphone	Sound pickup.

No.	Name	Description
11	Display	Displays device information including powering on or off, IP address, time, network connection status, Wi-Fi hotspot connection, Bluetooth connection, satellite positioning status, battery level, TF card status, recording status and more. For description of icons, see Table 2-2 .
12	Power button	- When the Camera is shut down, press and hold the button for 3 – 4 seconds until the indicator is on, which means the device is being started. - When the Camera is powered on, press and hold the button for 3 seconds until "Shutdown now!" is displayed, which means the Camera is being shut down.
13	Indicator	Displays the device status. For detailed description, see Table 2-3 .
14	Main aviation connector	Connects to aviation connector cable. For details, see "2.2 Cables".
15	Sub aviation connector	

Table 2-2 Display content description

Content	Meaning		
Starting...	When the Camera is connected to power supply or battery level is high, press and hold the power button until "Starting..." is displayed on the screen, which means the device is powered on.		
Shutdown now!	When the device is powered on, press and hold the power button until Shutdown now! is displayed on the screen, which means the device is powered off.		
	4G signal connection status and signal strength	• 1 at the lower-left corner represents the signal of SIM card 1, and 2 represents the signal of SIM card 2. × at the lower-right corner means no signal for the SIM card. • Bars at the lower-right corner represent signals. The more bars, the stronger the signal. 	
			
	5G signal connection status and signal strength		• Both 4G and 5G are available. The supported SIM modes vary with device models. This manual is for reference only, and might differ from the actual page. • Dual SIM cards are supported by select models.
			

Content	Meaning
	Hotspot connection status. : Hotspot disabled. : Hotspot is enabled, but the Camera is not connected to any wireless device (such as mobile phone). : Hotspot is enabled, and the Camera is connected to a wireless device.
	
	
	Bluetooth connection status. : Bluetooth disabled. : Bluetooth is enabled, but not paired. : Bluetooth is enabled and paired with another Bluetooth device.
	
	
	 The function is available on select models.
	Satellite positioning status and signal strength. : Satellite positioning failed. : Satellite positioning succeeded. The more bars, the stronger the signal.
	
	Battery level and charging status. : Full battery under discharge status. : Charging in progress. : Charging in progress when the Camera is shut down. : Battery exception or no battery is detected. - Low Power!: Battery level too low (less than 3%) and the Camera cannot be powered on.
	
	
	
Low Power!	
	The status of TF1 and TF2. : TF card 1 has been inserted; : TF card 1 has not been inserted. : TF card 2 has been inserted; : TF card 2 has not been inserted.
	
	
	
	 Dual TF cards are supported by select models.
	Recording status. : Recording in progress. : Recording not started or has been stopped.
	

Content	Meaning
	Speaker status.
	
	Microphone status.
	

Table 2-3 Indicator description

Status	Meaning
Orange	The Camera is being started or shut down.
Flashes orange quickly	Low battery (less than 20%).
Flashes blue slowly	Camera started and PTZ self-check completed, but not connected to network.
Solid green	The Camera is connected to network and working normally.
Flashes red quickly	Overtemperature.  The priority is like this: Overtemperature alarm > low battery > network disconnection. When these three exceptions occur at the same time, the indicator flashes red quickly.

2.2 Cables

Main aviation connector cable (including power cable, RS-485 cable, network cable and serial cable), power cord and power adapter come with the Camera.



- The cables vary with device models, and the actual product shall prevail. The section introduces the cables as complete as possible.
- Sub aviation connector cable is not included with the Camera, and is sold separately.

Figure 2-2 Main aviation connector cable

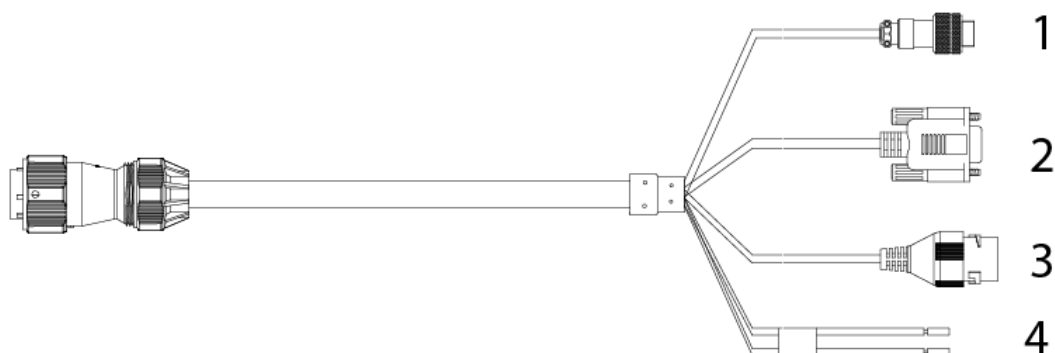


Table 2-4 Main aviation connector cable description

No.	Name	Description
1	12 V power input	Inputs 12 V DC power.  Make sure that you supply power as instructed on device label; otherwise the Camera might be damaged.
2	Serial port	Connects to PC for debugging.
3	Network port	Connects to standard Ethernet cable for network connection.
4	RS-485 port	Connects to PTZ for controlling external PTZ.

Figure 2-3 Sub aviation connector cable

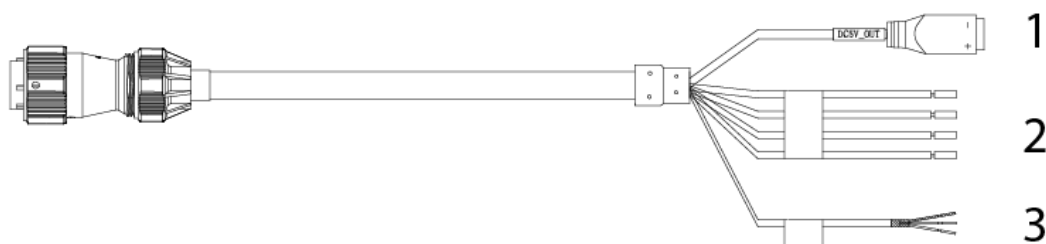


Table 2-5 Sub aviation connector cable description

No.	Name	Description
1	5 V output	Outputs 5 V DC power to supply power for peripheral device.
2	Alarm input and output	Connects to alarm input and output device.
3	Audio input and output	Connects to audio device.

2.2.1 Alarm Cable Connection

Background Information

Here are the alarm cable connection and configuring procedure.

Procedure

- Step 1 Connect the alarm input device to alarm input cable of the Camera.
- Step 2 Connect the alarm output device to alarm output cable of the Camera.



The alarm output is relay switch output.

- Step 3 Go to the webpage of the Camera to complete settings for alarm input and output devices. The alarm input on the webpage is corresponding to the alarm input of the camera cable. Set the corresponding NO and NC output according to the high and low level signal generated by alarm input devices when alarms are triggered.
- Step 4 Set the alarm output of camera cable on the webpage.

2.2.2 Video Cable Requirements

- 75 Ω impedance.
- Pure copper cored cables.
- 95% braided copper shielding.

Table 2-6 Cables and maximum transmission distance

Model	Maximum Transmission Distance
RG59/U	750 ft/229 m
RG6/U	1,000 ft/305 m
RG11/U	1,500 ft/457 m

2.2.3 RS-485 Cable Requirements

When using 0.56 mm (24AWG) twisted-pair line, depending on different baud rates, the theoretical maximum transmission distance is different.

Table 2-7 Theoretical maximum transmission distance

Baud Rate	Maximum Transmission Distance
2400 bps	1800 m
4800 bps	1200 m
9600 bps	800 m

The maximum transmission distance will be reduced in the following conditions: When thinner communication cables are used; the Camera is used in places with intense electromagnetic interference; too many devices are connected to the bus. Otherwise, maximum transmission distance will be increased.

2.2.4 Selecting Power Cable

For 12 V DC power supply, see "附录 1 Cable Diameter (12 V DC) and Transmission Distance".

2.3 Dimensions

Figure 2-4 Camera dimensions

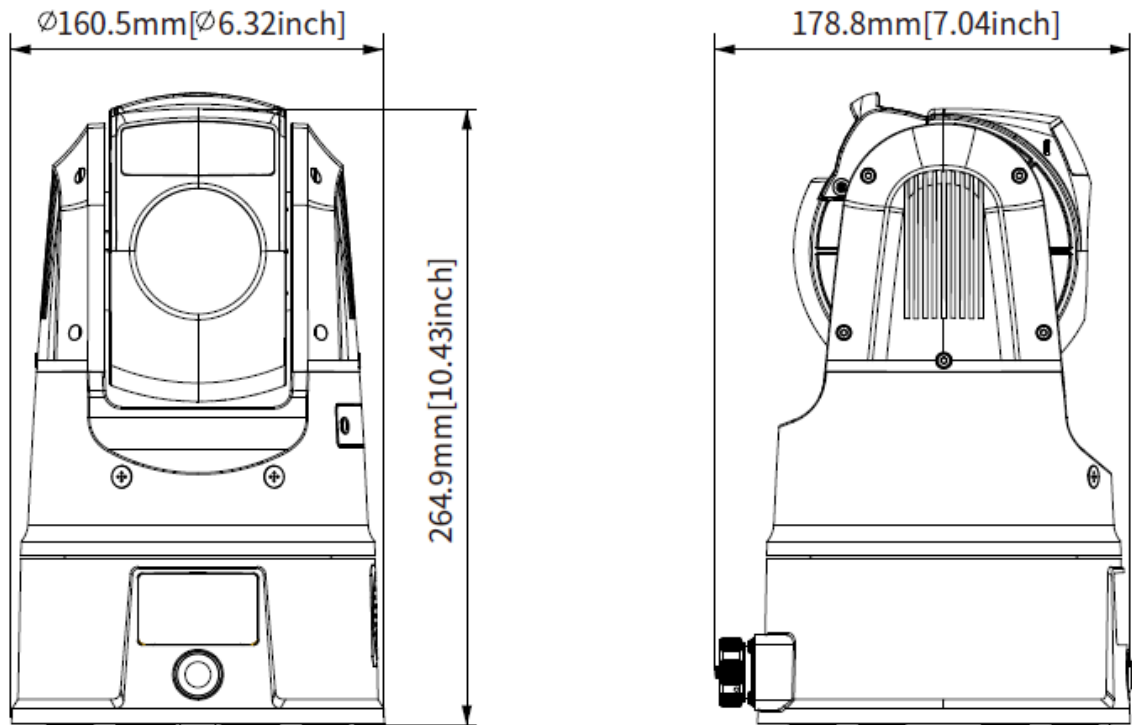
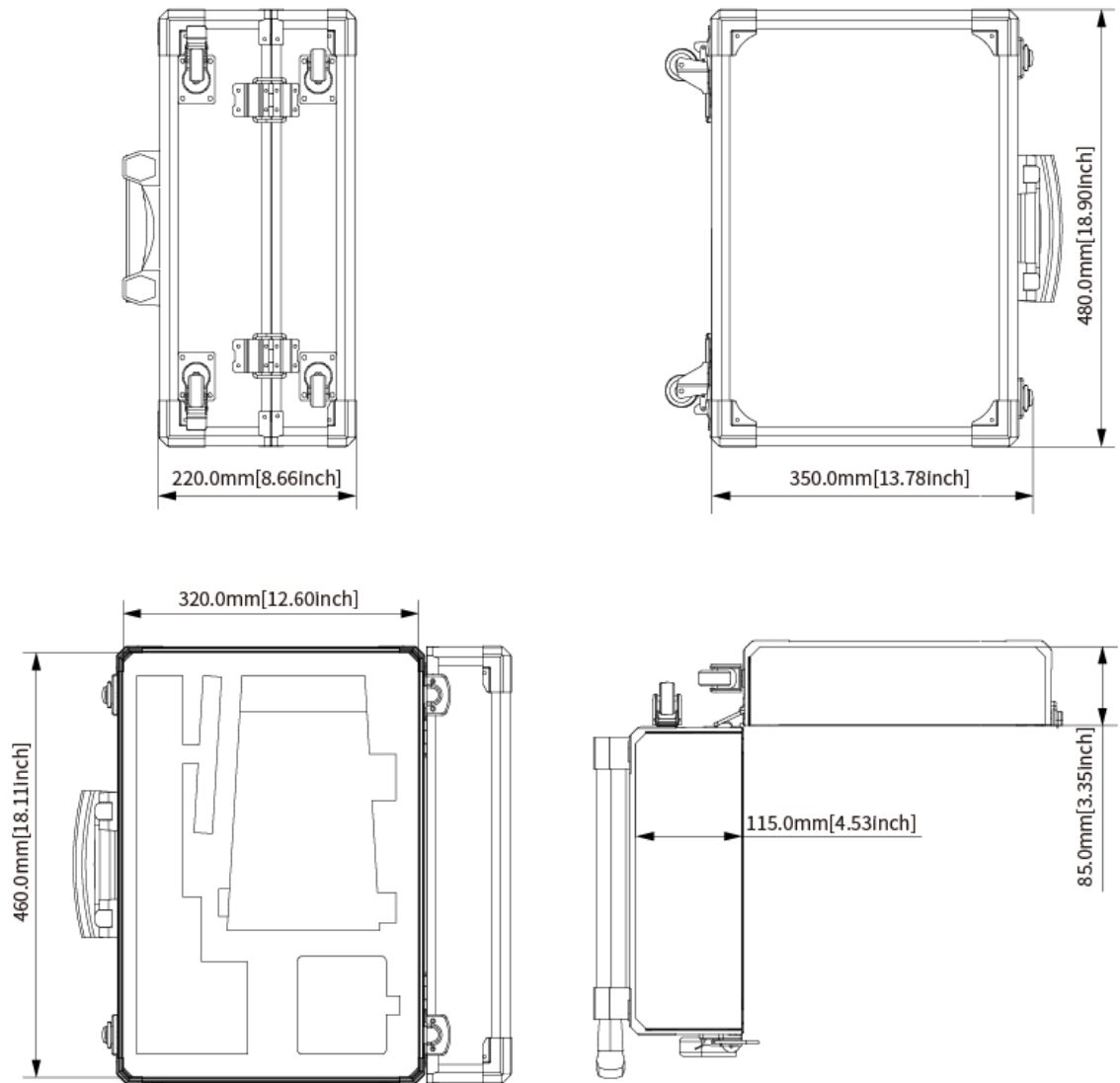


Figure 2-5 Trolley case dimensions



3 Device Installation

3.1 Preparation

3.1.1 Basic Requirements

- All installation and operations shall conform to your local electrical safety regulations, fire protection regulations, and other relevant regulations.
- Make sure that the application scenario conforms to installation requirements. Contact your local retailer or customer service center if there is any problem.
- Use the Camera according to the operating environment.
- Keep the original packing material well because you might need it to pack the Camera and send it back for repair.

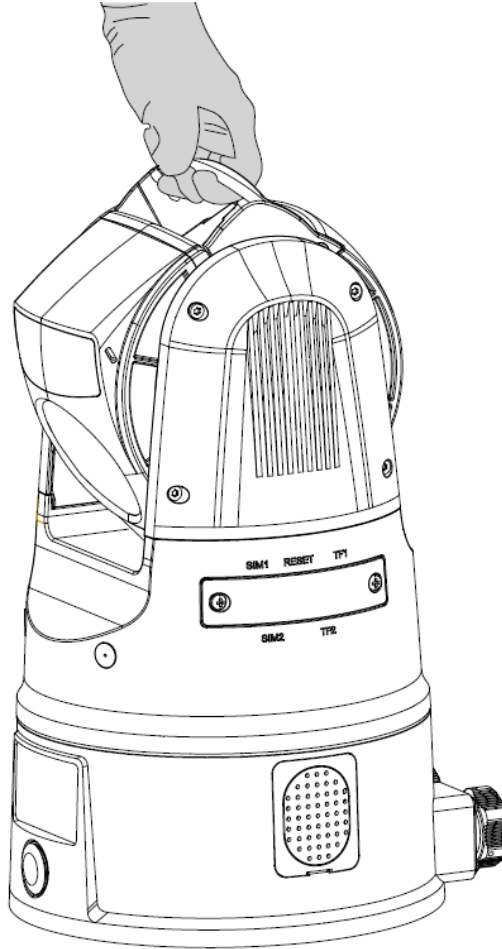
3.1.2 Installation Check

- Make sure that the installation location has enough space to hold the Camera and its mounting accessories.
- Make sure that the installation surface can sustain 8 times the weight of the Camera and its mounting accessories.
- Make sure that the installation surface is thick enough to install expansion bolts (Users need to buy expansion bolts separately).

3.2 Precautions

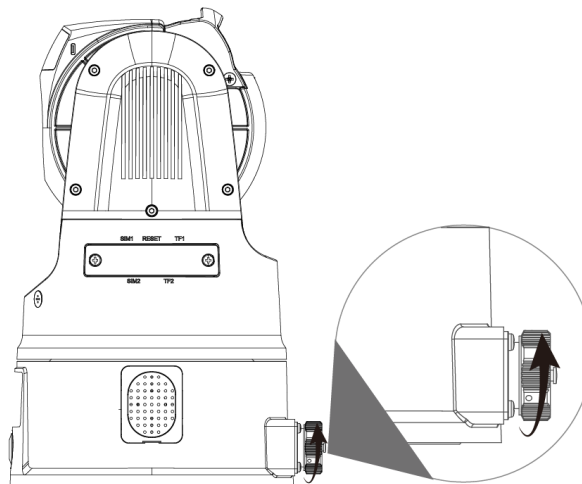
- Lift the Camera with the handle. Do not carry it by pulling the cable.

Figure 3-1 Lift through the handle



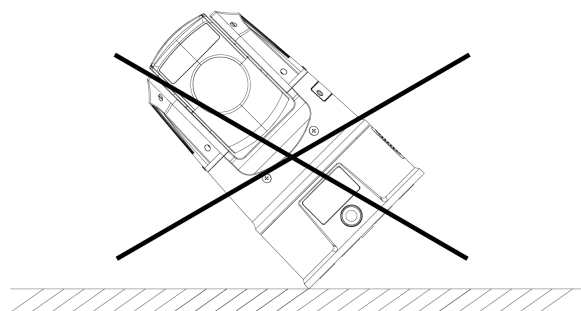
- When the aviation connector is not in use, tighten the cover of the connector to avoid water entering into it.

Figure 3-2 Tighten aviation connector



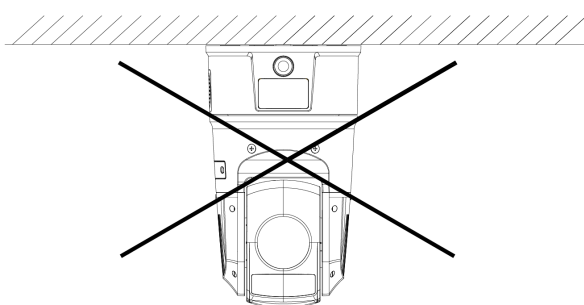
- When using the Camera, place it in a stable place to avoid falling.

Figure 3-3 Avoid falling



- Do not put the Camera upside down.

Figure 3-4 Avoid putting upside down

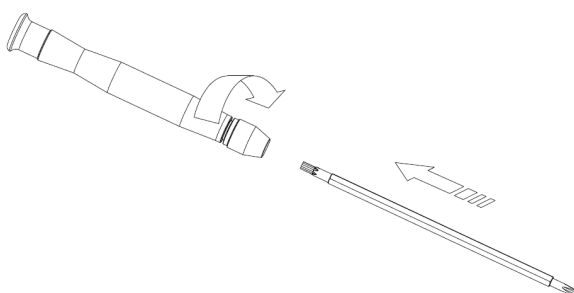


3.3 Installing SIM Card and Memory Card

Procedure

- Step 1 Connect the screwdriver handle and head.

Figure 3-5 Assemble screwdriver



- Step 2 Remove the protective cover from the Camera.
You can see TF1 and TF2 card slots and SIM1 and SIM2 card slots.

Figure 3-6 Remove protective cover

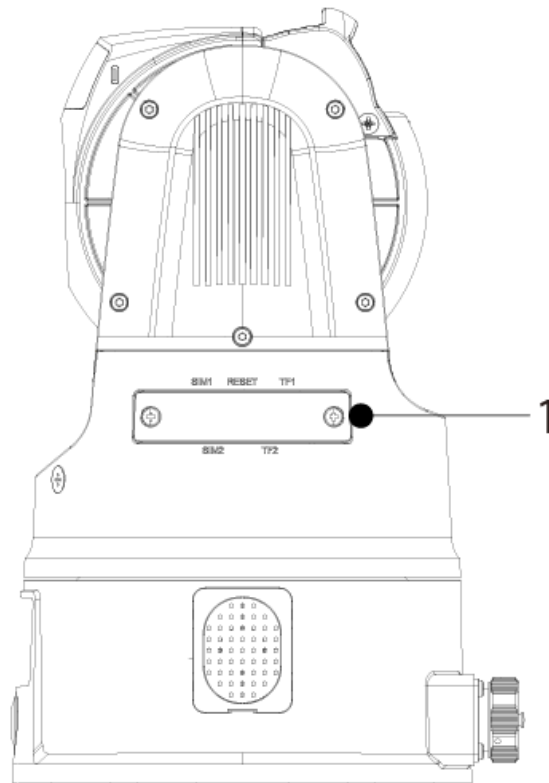


Table 3-1 Protective cover

No.	Name
1	Protective cover

Step 3 Install TF card and SIM card as needed.

When installing devices supporting dual TF cards and dual SIM cards, pay attention to the following points.

- Insert the SIM card into the SIM1 card slot or SIM2 card slot with the gold contacts facing down and facing up respectively.
- Insert the TF card into the TF1 card slot or TF2 card slot with the gold contacts facing down and facing up respectively.



If you want to replace the TF card or SIM card, press the inserted card to allow it to pop out.

Step 4 Install the protective cover back and tighten the screws.



After inserting the SIM card, you need to restart the Camera for the card to take effect.

3.4 Installing Camera

Background Information

After assembling the tripod, install the Camera onto the tripod for easy operation and capture.



The tripod is not included in the packing box. You can buy it separately.

Procedure

- Step 1 Assemble the tripod.
1. Take out the tripod, press the leg button, and then rotate the three legs by 150° in the direction indicated by the arrow.

Figure 3-7 Extend tripod

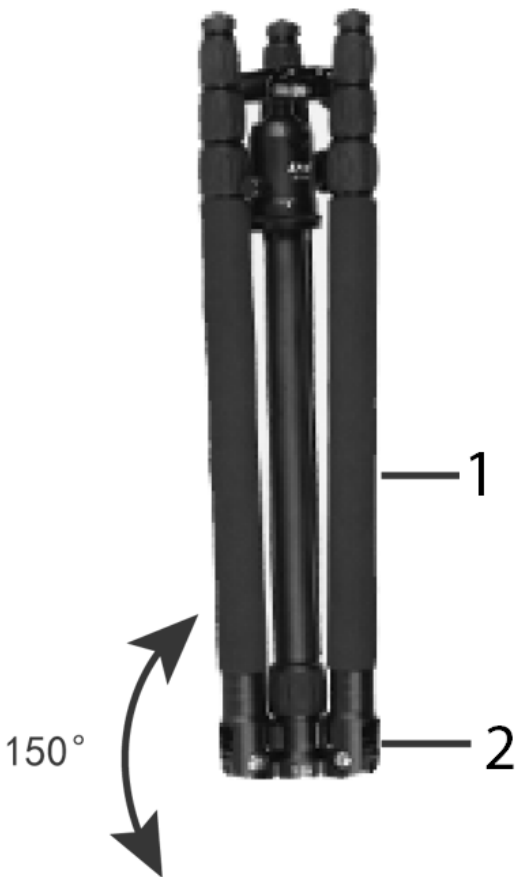


Table 3-2 Extend tripod

No.	Name	No.	Name
1	Leg	2	Leg button

2. Adjust the tripod to a proper height through the knob.

Figure 3-8 Adjust tripod height

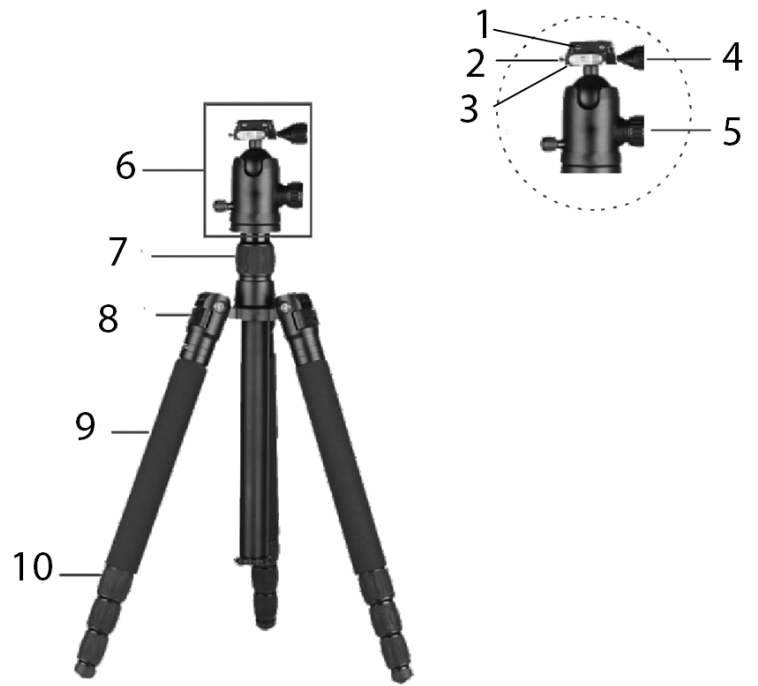


Table 3-3 Tripod description

No.	Component	Description
1	Mounting plate	For fixing the Camera to the tripod.
2	Retractable button	You can adjust the angle of the external level by rotating the button next to it.
3	External level	
4	Fastening knob	Locks external level.
5	Locking knob	Locks tripod head to prevent it from rotating.
6	Tripod head	—
7	Central axis fastening knob	Adjust the tripod head to a proper height for capturing images.
8	Leg button	Press the button to flexibly adjust the expansion angle of the legs to adapt to different environments.
9	Leg	—
10	Leg adjusting knob	Adjust the leg length.

Step 2 Install the Camera.

1. Press and hold the retractable button next to the external level to detach the mounting plate on the level.



Only after detaching the mounting plate, can you install the tray coming with the Camera onto the PTZ.

2. Install the tray onto the tripod head, adjust it to a proper height, and then tight the fastening knob to fix the mounting tray.

Figure 3-9 Fix mounting tray



Table 3-4 Fix mounting tray

No.	Name	No.	Name
1	Mounting tray	2	Fastening knob

3. Magnetically attach the Camera to the mounting tray.

Figure 3-10 Installation complete



3.5 Charging Battery



Transport, use, and store the Camera under the allowed temperature conditions. Due to the physical characteristics of the battery, when the ambient temperature is above or below a certain value, the Camera may be slow to charge, unable to charge or have abnormal discharge.

When battery level is low, you can charge it in three ways.

- Direct charging: Connect the Camera to a socket through the power adapter. The socket supplies power to the battery through the Camera. Charging status is displayed on the screen.

Figure 3-11 Direct charging

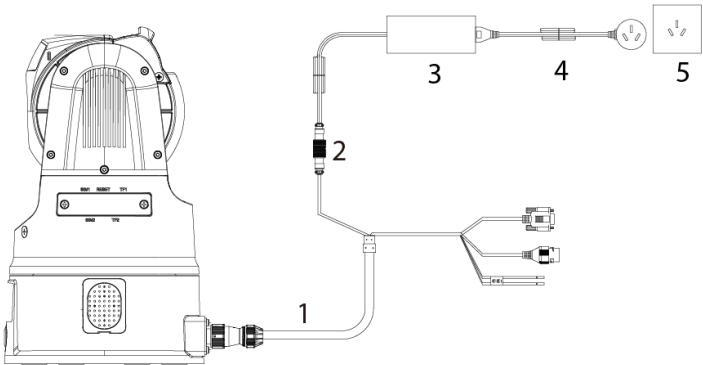


Table 3-5 Direct charging description

No.	Name	No.	Name
1	Main aviation connector cable	2	12 V power input port
3	Power adapter	4	Power cord
5	Socket	—	

- Connect battery to socket: Press the retractable sheet on two sides of the battery, and then lift to take out the battery. Charge the battery through the base charger which is not included in the packing box. You can buy it separately.

Figure 3-12 Take out the battery

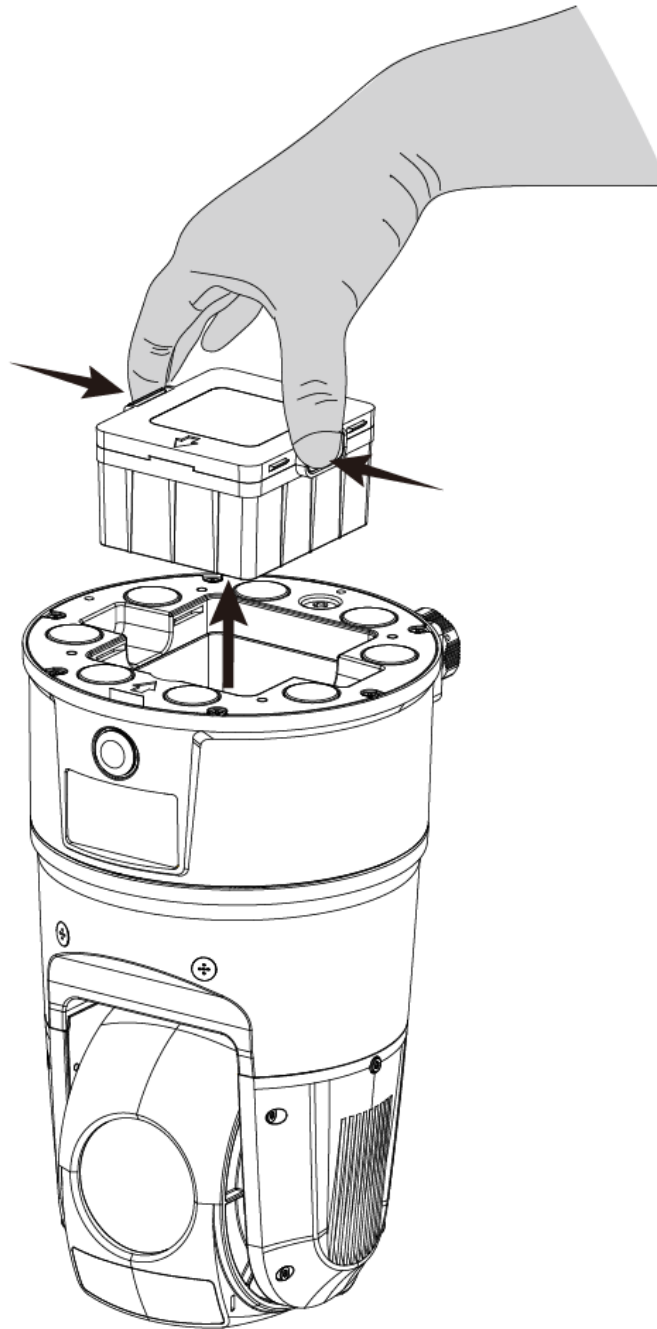


Figure 3-13 Connect battery to socket

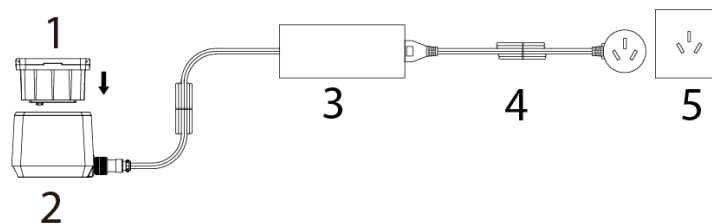


Table 3-6 Connect battery to socket

No.	Name	No.	Name
1	Battery	2	Base charger
3	Power adapter	4	Power cord
5	Socket	—	

- Powered by cigarette lighter: Press the retractable sheet on two sides of the battery, and then lift to take out the battery. See. Charge the battery through the cigarette lighter. Vehicle power adapter is not included in the packing box. You can buy it separately.

Figure 3-14 Powered by cigarette lighter

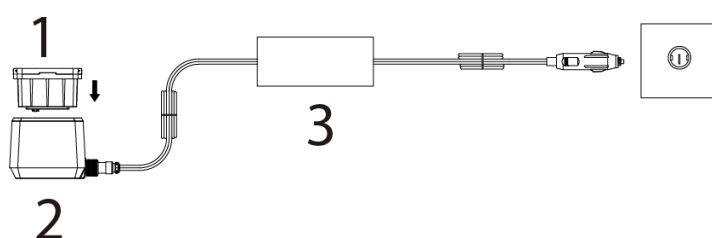


Table 3-7 Powered by cigarette lighter

No.	Name	No.	Name
1	Battery	2	Base charger
3	Vehicle power adapter	—	

Figure 3-15 Install battery

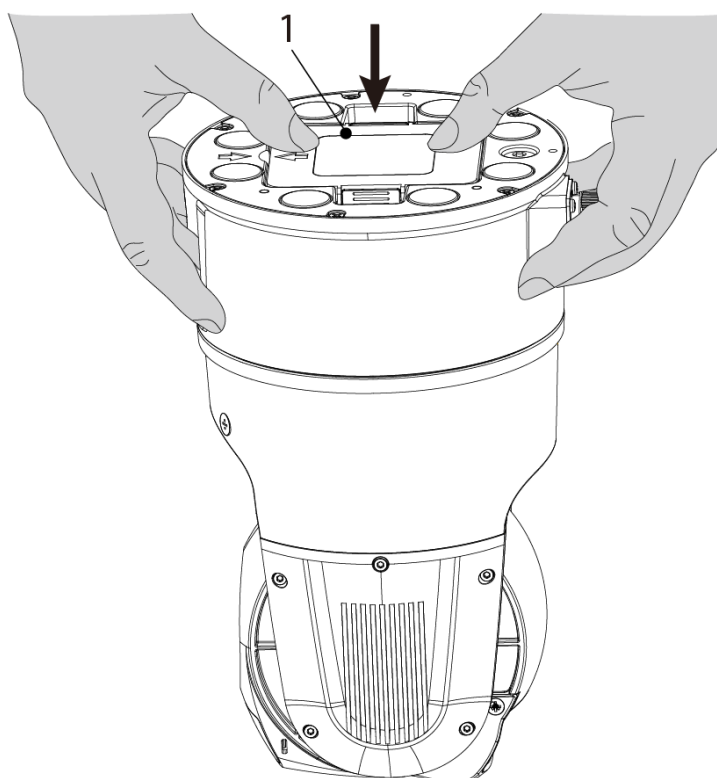


Table 3-8 Install battery

No.	Name
1	Battery

4 Device Operations



The following pages are for reference only, and might differ from the actual page.

4.1 Initializing Camera

Background Information

You need to initialize the Camera for first-time usage or after it is restored to factory settings, including setting password of admin user, selecting upgrade method and more. The section introduces how to initialize the Camera on webpage. You can also initialize it through ConfigTool, NVR (Network Video Recorder) and platform.



- For device safety, keep your login password of admin well after initialization, and change the password regularly.
- When initializing the Camera, keep the computer IP and device IP in the same network.
- It is recommended to use Internet Explorer 11 or Google Chrome.

Procedure

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



The IP is 192.168.1.108 by default.

- Step 2 Select the area, language, and video standard according to the actual situation, and then click "Next".

Figure 4-1 Region setting

Region Setting — Time Zone Setting — Password Setting — P2P — Online Update

Area

Language

Video Standard

Next

- Step 3 Configure the time parameters, and then click "Next".

Figure 4-2 Time zone setting

Step 4 Set the password for admin account.

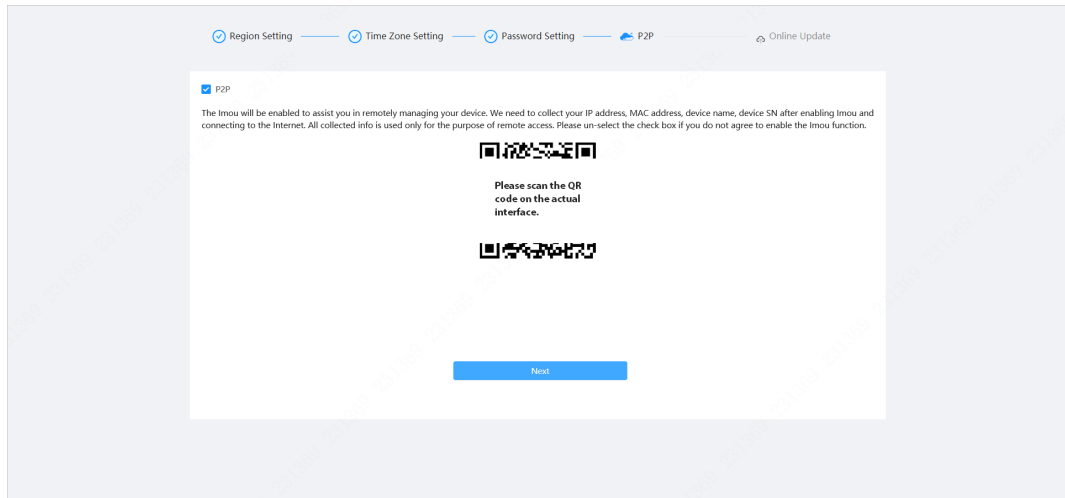
Figure 4-3 Password setting

Table 4-1 Description of password configuration

Parameter	Description
Username	The default username is admin.
New Password	The password must consist of 8 to 32 non-blank characters and contain at least two types of characters among upper case, lower case, number, and special character (excluding ' " ; : &). Set a high security level password according to the password security notice.
Confirm Password	
Email Address	Enter an email address for password reset. It is selected by default. When you need to reset the password of the admin account, a security code for password reset will be sent to the reserved email address.

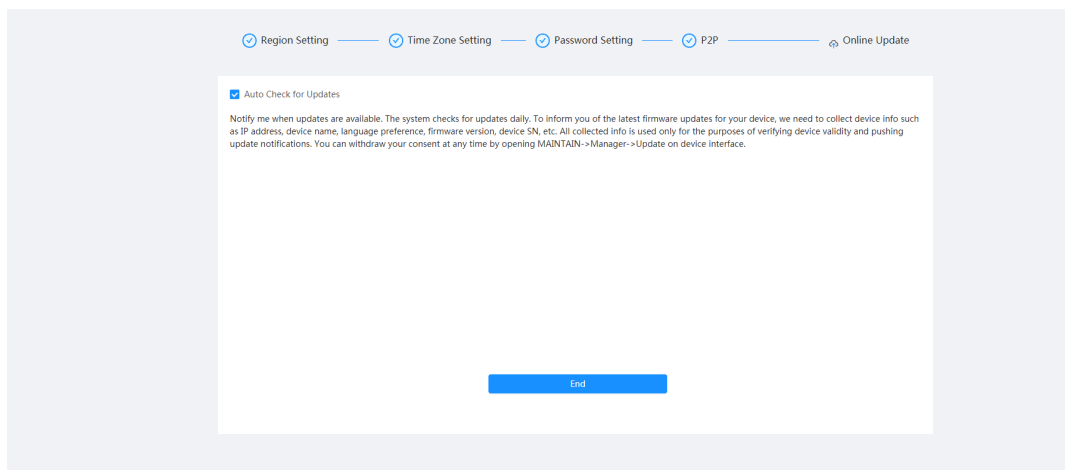
Step 5 Click "Next", and the "P2P" page is displayed.

Figure 4-4 P2P



Step 6 Click "Next", and then click "End" to complete initialization.

Figure 4-5 Online update



4.2 Logging in to the Camera

Background Information



- For device safety, keep your login password of admin well after initialization, and change the password regularly.
- When initializing the Camera, keep the computer IP and device IP in the same network.
- It is recommended to use Internet Explorer 11 or Google Chrome.

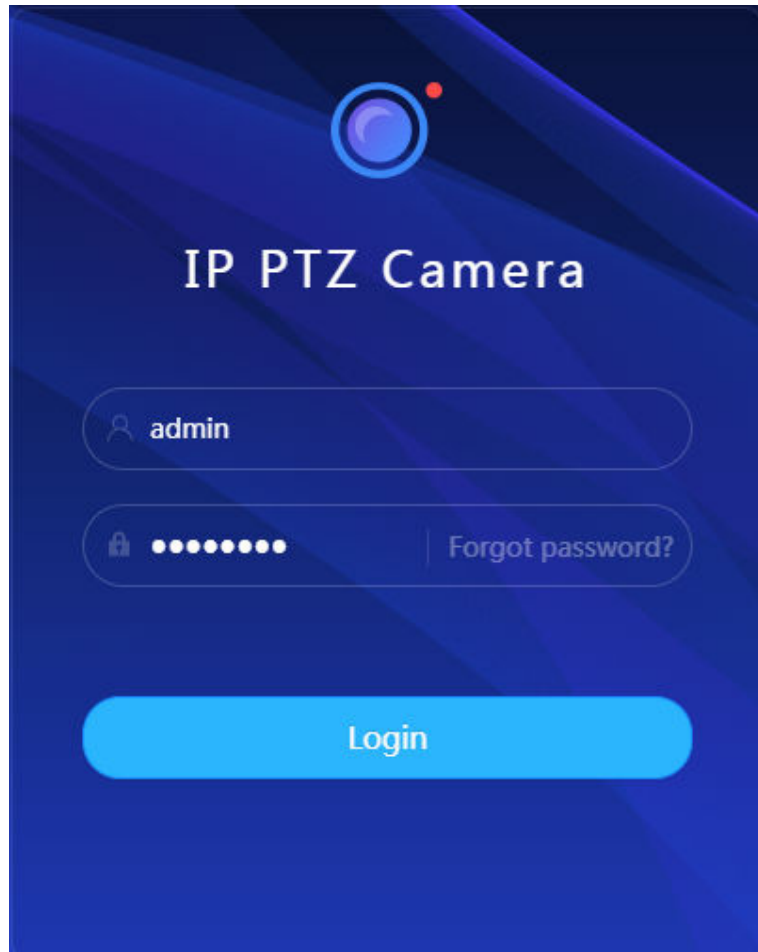
Procedure

- Step 1 Open IE browser, enter the IP address of the Camera (192.168.1.108 by default) in the address bar, and then press Enter.
- Step 2 Enter the username and password, and then click **Login**.
The username is admin by default.



Click **Forgot password?** to reset the password of the admin through the reserved phone number.

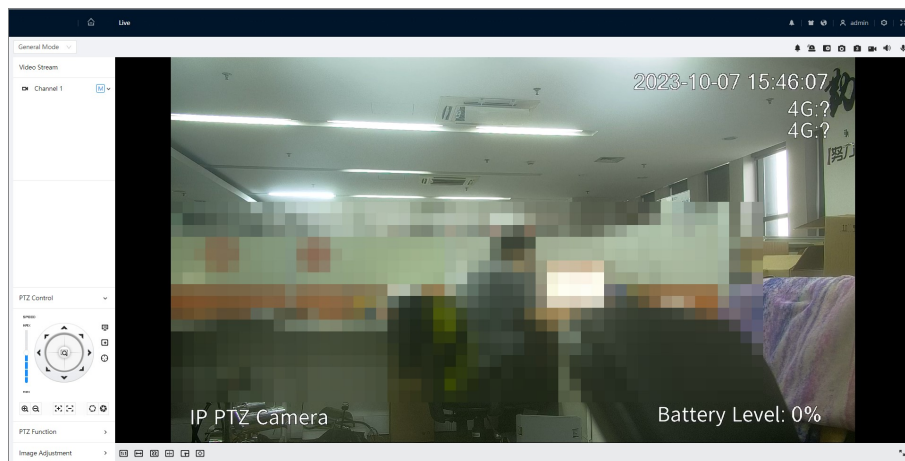
Figure 4-6 Login



Step 3 Download and install the plug-in according to the on-screen instructions.

After the plug-in is installed, the webpage is refreshed automatically, and the video is displayed on the **Live** page.

Figure 4-7 Live view



4.3 Changing IP Address

Background Information

Configure IP address, DNS (Domain Name System) server and more according to network planning.
Make sure that the Camera can connect to other devices in the network.

Procedure

- Step 1
- Click  on the upper-right corner of the page, and then select "Network Settings > TCP/IP".
- Step 2
- Enter the IP address, subnet mask, default gateway, and other parameters.

Figure 4-8 TCP/IP

TCP/IP

Host Name

IPDome

ARP/Ping

☒

NIC

Wired(Default) ▼

Set as default NIC

Mode

☒ Static ☐ DHCP

MAC Address

IP Version

IPv4 ▼

IP Address

Test

Subnet Mask

255

.

255

.

0

.

0

Default Gateway

Preferred DNS

Alternate DNS

MTU

1500

(600-1500) ⓘ

Apply

Refresh

Default

Table 4-2 TCP/IP parameter description

Parameter	Description
Host Name	Enter the host name.
	 The maximum length is 32 characters.

Parameter	Description
ARP/Ping	Click  to enable ARP/Ping to set IP address service. Get the camera MAC address, and then you can change and configure the device IP address with ARP (Address Resolution Protocol) /ping command. This is enabled by default. During restart, you will have no more than 2 minutes to configure the device IP address by a ping packet with certain length, the server will be turned off in 2 minutes, or it will be turned off immediately after the IP address is successfully configured. If this is not enabled, the IP address cannot be configured with ping packet.
Ethernet Card	Select the network adapter to be set. Both wired and wireless are supported, and Wire(Default) is set by default.
Set as Default Card	Set Wireless or Wire(Default) as default network adapter according to the actual network connection. When the Camera is connected to network through both wired and wireless mode, and the user accesses the Camera across network segments, the Camera transmits data with the default network adapter.
Mode	Set the method with which the Camera obtains IP address. - Static: Configure IP Address, Subnet Mask, and Default Gateway manually, and then click Save. The login page with the configured IP address is displayed. - DHCP (Dynamic Host Configuration Protocol): If there is a DHCP server in the network, select DHCP, and the Camera can automatically obtain dynamic IP address. You do not need to manually configure the IP address.
MAC Address	Displays the MAC (Media Access Control) address of the Camera.
IP Version	Select address format from IPv4 or IPv6 .
IP Address	When selecting Static as the mode, you need to enter the IP address, subnet mask, and default gateway according to network planning.
Subnet Mask	
Default Gateway	
	 - No subnet mask for IPv6. - IP address and default gateway must be on the same network segment.
Preferred DNS	IP address of the DNS server.
Alternate DNS	Alternate IP address of the DNS server.

Parameter	Description
MTU	Adjust MTU value of the network adapter according to the network environment and communication conditions to achieve great transmission. 1500 byte is selected by default. Changing MTU will restart the network adapter, resulting network disconnection and affecting running network services. Here are the recommended MTU values. • 1500: The maximum value of Ethernet information package. It is the default value. This is the typical setting without PPPoE or VPN in connection, and it is also the default value of some routers, network adapters, and switches. • 1492: Optimized value for PPPoE. • 1468: Optimized value for DHCP. • 1450: Optimized value for VPN.

Step 3 Click "Apply".

Related Operations

Configuring IP address with ARP/Ping

1. Keep the camera that needs to be configured and the PC within the same local network, and then get a usable IP address.
2. Get the MAC address of the camera from device label.
3. Open command editor on the PC and enter the following command.

Figure 4-9 Edit command

Windows syntax↵
<pre>arp -s <IP Address> <MAC> ↵ ping -l 480 -t <IP Address> ↵</pre>
Windows example↵
<pre>arp -s 192.168.0.125 11-40-8c-18-10-11↵ ping -l 480 -t 192.168.0.125↵</pre>
UNIX/Linux/Mac syntax↵
<pre>arp -s <IP Address> <MAC> ↵ ping -s 480 <IP Address> ↵</pre>
UNIX/Linux/Mac example↵
<pre>arp -s 192.168.0.125 11-40-8c-18-10-11↵ ping -s 480 192.168.0.125↵</pre>

4. Restart the camera.
5. Check the PC command line, if information such as "Reply from 192.168.0.125..." is displayed, the configuration succeeds.
6. Enter `http://(IP address)` in the browser address bar to log in.

4.4 Connecting to DMSS App

Background Information

DMSS App is a mobile monitoring software that is designed for professional security surveillance. It has functions such as live view, video playback, alarm notification push, and cloud storage. The Camera can be used with the app for easy monitoring and management.

Procedure

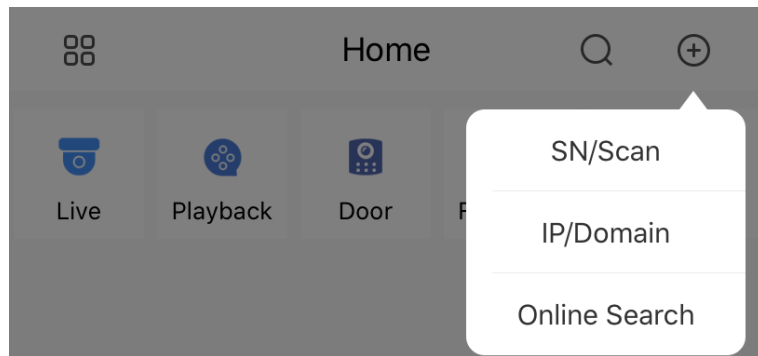
Step 1 Download DMSS APP on app stores such as Google Play, and then install the app on the mobile phone.

Step 2 Open the app, go to the **Home** page, tap , and then select **SN/Scan**.



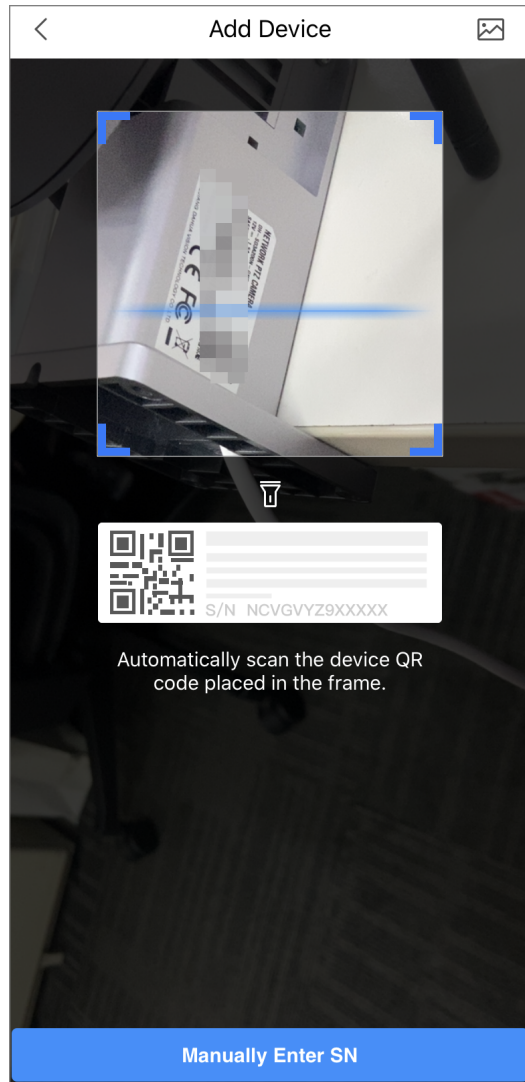
Before adding the Camera, make sure that it is powered on.

Figure 4-10 Home



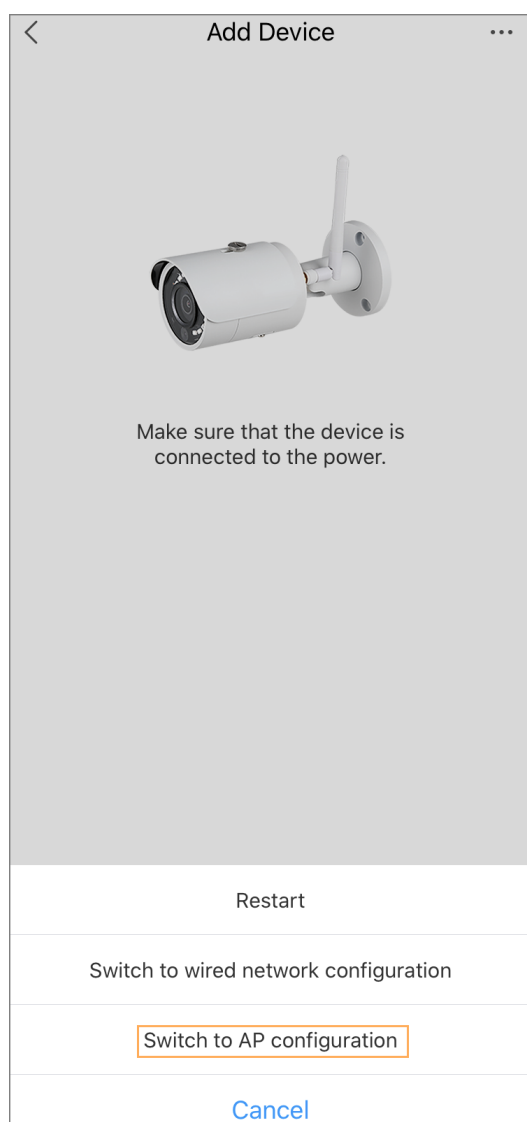
Step 3 Scan the QR code on the Camera, or manually enter SN, and then tap **Next**.

Figure 4-11 Scan QR code



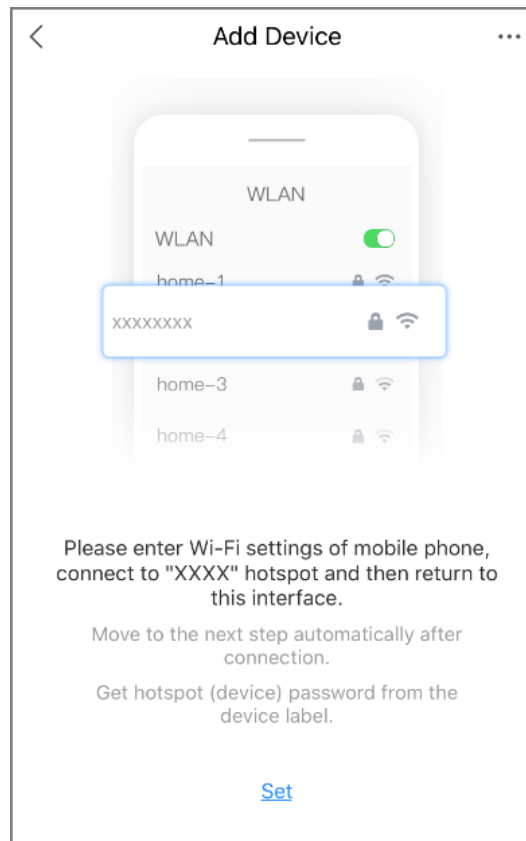
- Step 4 Select **Wireless Camera**, tap ... at the upper right corner, select **Switch to AP configuration**, and then tap **Next**.

Figure 4-12 Switch network configuration



- Step 5 Connect the mobile phone to the hotspot of the Camera.
1. Tap **Set** on the following interface to enter Wi-Fi settings of the mobile phone.

Figure 4-13 Set Wi-Fi



2. Select the network (named "DAP-device SN") of the Camera, enter the password, and then tap **Join**.



The safety code on the device is the initial password.

Figure 4-14 Enter password

Enter the password for "DAP-XXXXXXXXXXXX"		
Cancel	Enter Password	Join
Password		

4.5 Basic Operations

4.5.1 Configuring Cellular Network

After the device is installed with the SIM (Subscriber Identification Module) card, the device can be connected to the network through dial-up settings or mobile settings, and then you can remotely preview the real-time video of the device through the platform client or mobile phone client.

- Dial-up setting: Connects the device to the network within a specified time period.
- Mobile setting: Connects the device to the network by sending messages or making calls through mobile phones, and alarm information can be received through messages.

4.5.1.1 Dial-up Settings

Connects the device to the network through dial-up settings. For the network type, please refer to the actual page. The following text uses a 4G device as an example.

Procedure

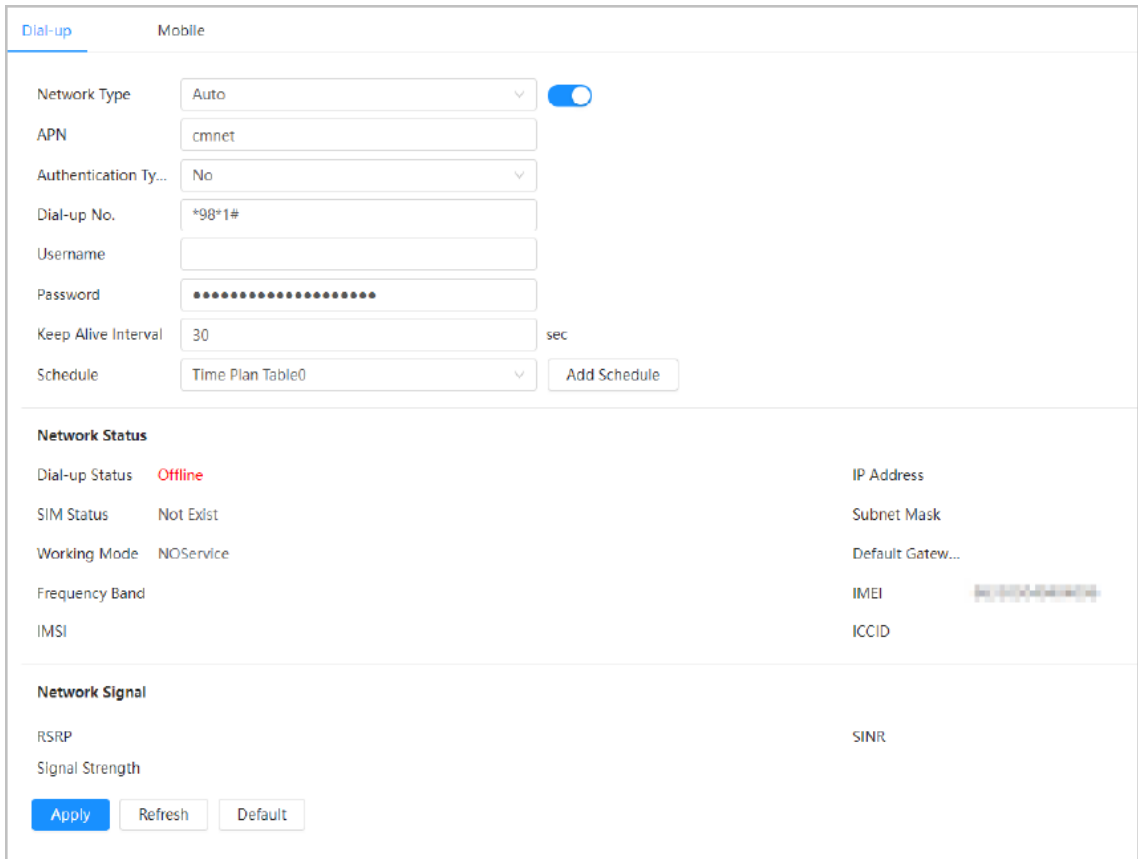
- Step 1 Click  on the upper-right corner of the page, and then select "Network Settings > Cellular Network > Dial-up".



After the SIM card is installed, the module information, network status and network signal are displayed.

- Step 2 Select "Network Type", and then click  to enable the 4G dial-up function.

Figure 4-15 Dial-up Setting



- Step 3 Configure dial-up parameters.



The APN, authentication type, dial-up number, username and password of certain network cards vary, and you need to contact the card suppliers for related information.

Table 4-3 Description of dial-up setting parameters

Parameter		Description
Network Type		The network types are as follows: • "4G (TD-LTE)": Dial (For China Mobile/Telecom/Unicom SIM card). • "4G (FDD-LTE)": Dial (For Telecom/Unicom SIM card). • "Auto": We recommend you use the auto mode, and then the system automatically selects the signal type. • "3G (WCDMA)": Dial, text, call (For China Unicom SIM card). • "5G (NR)": Dial, text, call (For China Mobile/Telecom/Unicom special network card).
APN		For ordinary cards, the APN (Access Point Name) of telecom is ctnet, the mobile is cmnet, and the Unicom is 3gnet.
Authentication Type		For ordinary cards, the authentication type of telecom is CHAP (Challenge Handshake Authentication Protocol) or PAP (Password Authentication Protocol). The mobile and Unicom have no authentication type.
Dial-up No.		For ordinary cards, the dial-up number of telecom is #777, the mobile is *98*1#, and the Unicom is *99#.
Username		For ordinary cards, the username of telecom is ctnet@mycdma.cn or card. The mobile and Unicom have no username.
Password		For ordinary cards, the password of telecom is vnet.mobi or card. The mobile and Unicom have no password.
Keep Alive Interval		It refers to the connection time for the mobile user to activate the device to access the 5G network outside the set time period. The default value is 30 seconds, and the value ranges from 0 seconds to 7,200 seconds. After the "Keep Alive Interval" ends, the device actively disconnects the network to achieve the purpose of saving traffic.
Schedule		Configure the dial-up time period, and then the device will connect to the network within this specified time period. If the added schedule does not meet requirements, click "Add Schedule" to add a new schedule. For details, see the following related operations.
Network Status	Dial-up Status	After the dial-up succeeds, the obtained information, such as the IP address, is displayed. • IMSI: Displays international mobile subscriber identity. • IMEI: Displays international mobile equipment identity. • ICCID: Displays integrate circuit card identity.
	SIM Status	
	Working Mode	
	IP Address	
	Subnet Mask	

Parameter		Description
	Default Gateway	
	Frequency band	
	IMSI	
	IMEI	
	ICCID	

Step 4 Click "Apply".

Related Operations

"Add Schedule": Configure arming schedule. The system only performs corresponding linkage action in the defined period.

1. Click "Add Schedule" next to "Schedule".
2. Click "Time Plan Table".

You can set up multiple time plan tables for selection.

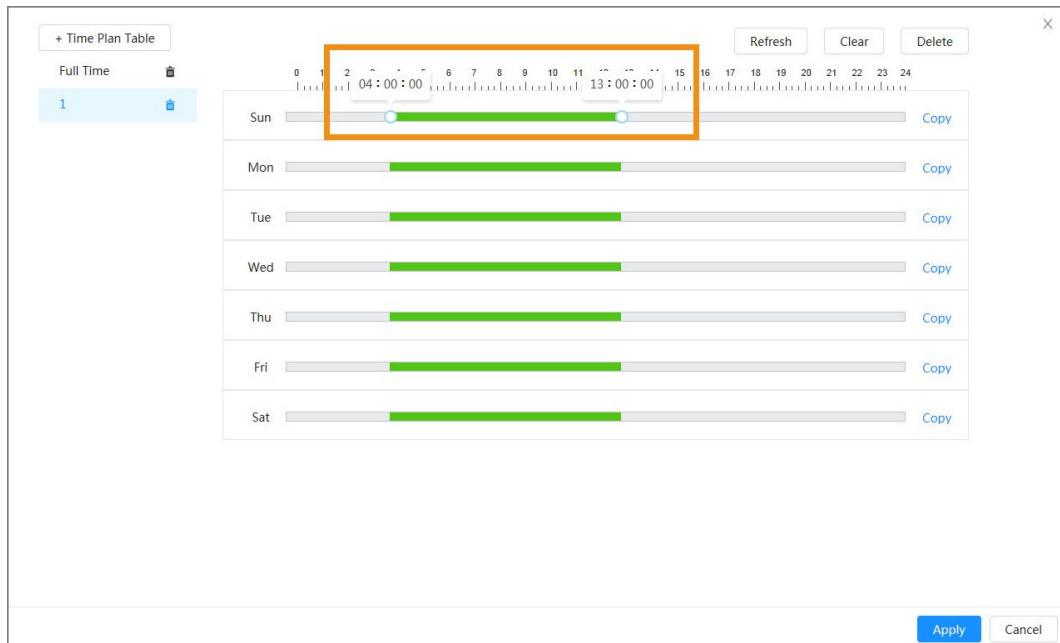
3. Configure the name of the "Time Plan Table".
4. Configure arming periods.
 - a. Press and drag the left mouse button on the timeline to set arming periods. The green area on the timeline means that this time period has been armed.

Figure 4-16 Configure arming period

The screenshot displays the 'Time Plan Table' configuration window. On the left, there is a sidebar with a '+ Time Plan Table' button and a 'Full Time' section containing a table with one row labeled '1'. The main area shows a 24-hour timeline at the top. Below it, there are seven rows representing the days of the week: Sun, Mon, Tue, Wed, Thu, Fri, and Sat. Each row features a horizontal timeline with a green bar indicating the arming period from 4:00 to 13:00. To the right of each timeline is a 'Copy' button. At the bottom right of the window are 'Apply' and 'Cancel' buttons. At the top right are 'Refresh', 'Clear', and 'Delete' buttons.

- b. Click the selected time period, and then enter the specific time in the text box to configure exact arming period.

Figure 4-17 Configuring exact arming period



5. (Optional) Click "Copy", select weeks, and then click "Apply".
Time plans for the current week can be quickly copied to other weeks.
6. Click "Apply".

4.5.1.2 Mobile Settings

Connects the device to the 5G network by sending messages or making calls through mobile phones, and alarm information can be received through messages.

Background Information

- Send SMS: Set the mobile phone number of the receiver, and then all kinds of alarms can be linked with the Platform to send alarm SMS to the receiver.
- Activate by SMS: Set the mobile phone number of the sender, and the sender can send an activation command SMS to the device to enable the device to connect to the network, disconnect from the network, or reboot.
 - ◇ Send SMS command "On": means to connect the device to the network.
 - ◇ Send SMS command "Off": means to disconnect the device from the network.
 - ◇ Send SMS command "Reboot": means to reboot the device.
- Activate by phone: Set the mobile phone of the caller, and then the caller can call the device and activate the device to access the network.

Procedure

- Step 1 Click  on the upper-right corner of the page, and then select "Network Settings > Cellular Network > Mobile".
- Step 2 Enable "Send SMS", "Activation by SMS", or "Activation by phone" according to actual needs.

Figure 4-18 Mobile Setting

Dial-up Mobile

Send SMS ☒

Receiver Add

Title

Activate by SMS ☒

Sender Add

Activate by phone ☒

Caller Add

Apply Refresh Default

Step 3 Enter the phone numbers of receiver, sender and caller, and then click "Add" to add the mobile phone users to the list.



- Click to delete the user number.
- When setting SMS, you can modify the title of the SMS message.

Step 4 Click "Apply".

4.5.2 Configuring Fan

Background Information

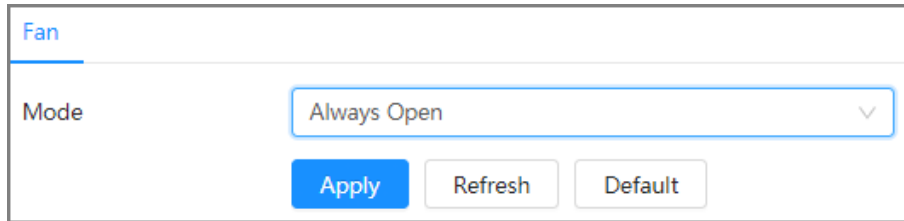


The default fan mode is always open. After the fan is opened, it is beneficial for internal air circulation of the Camera and avoids a risk of fogging in extreme situations. Due to a fact that the fan consumes a certain amount of power and generates noise, if there are high requirements for device endurance and sound pickup quality, please manually turn off the function.

Procedure

- Step 1 Click  on the upper-right corner of the page, and then select "System > Peripheral > fan".
- Step 2 Select "Always Open" or "Close" in the "Mode" drop-down list.
- Always open: Opens the fan automatically when the Camera is started.
 - Close: Always closes the fan.

Figure 4-19 Configuring fan



Fan

Mode

Always Open

Apply Refresh Default

- Step 3 Click "Apply".

4.5.3 Configuring Wi-Fi

Connect the Camera with a function of Wi-Fi to wireless networks.

Background Information

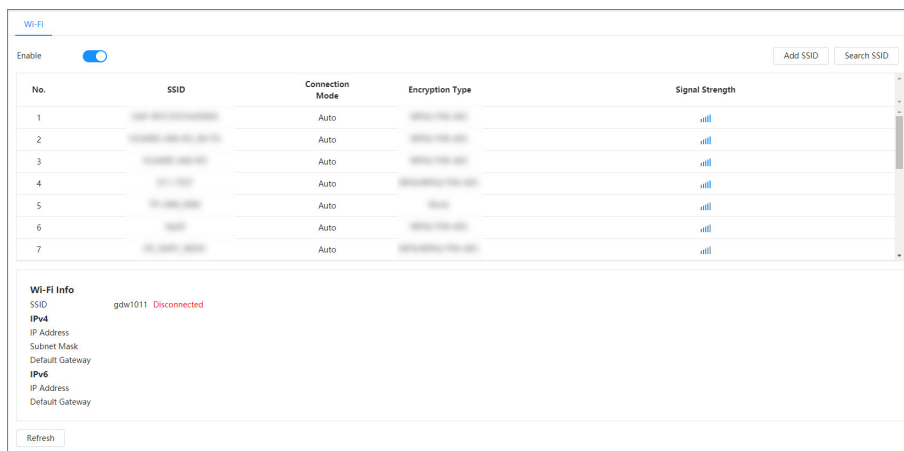
SSID (Service Set Identifier):

SSID technology divides a wireless local area network into multiple subnets requiring authentication, each of the multiple subnets requires the independent authentication. Only an authenticated user can enter a corresponding subnet.

Procedure

- Step 1 Select " > Network Settings > Wi-Fi > Wi-Fi".
- Step 2 Click  to enable the function.

Figure 4-20 Wi-Fi



Wi-Fi

Enable 

Add SSID Search SSID

No.	SSID	Connection Mode	Encryption Type	Signal Strength
1	SSID 1	Auto	WPA2-PSK	Signal Strength 1
2	SSID 2	Auto	WPA2-PSK	Signal Strength 2
3	SSID 3	Auto	WPA2-PSK	Signal Strength 3
4	SSID 4	Auto	WPA2-PSK	Signal Strength 4
5	SSID 5	Auto	WPA2-PSK	Signal Strength 5
6	SSID 6	Auto	WPA2-PSK	Signal Strength 6
7	SSID 7	Auto	WPA2-PSK	Signal Strength 7

Wi-Fi Info

SSID: gdw1011 Disconnected

IPv4

IP Address

Subnet Mask

Default Gateway

IPv6

IP Address

Default Gateway

Refresh

- Step 3 Connect to a wireless network.
- Connect to the wireless network through search.
 1. Click "Search SSID", and the list will display wireless network hotspots in an environment where the Camera is located.

2. Click a network you want to connect to.
3. Enter the password in a pop-up page.



Click "OK" if you do not need to enter the password.

Figure 4-21 Connect to WI-FI (search SSID)

Connect to D11-TEST

Signal Strength 84%

Encryption Type WPA2-PSK

Password

Cancel OK

4. Click "OK".
- Manually add a wireless network.

When the Camera cannot search for a wireless network, for example, when a router has turned off the SSID broadcast function, you can manually add the wireless network.

1. Click "Add SSID".
2. Enter the name in a pop-up page, and then click "OK".

Figure 4-22 Manually add wireless network

Add SSID

SSID

Cancel OK

3. Enter the Wi-Fi password.



Click "OK" if you do not need to enter the password.

4. Click "OK".

Step 4 Click "Refresh" to obtain a connection status.

4.5.4 Configuring AP

Background Information

You can use the Camera as wireless AP (Access Point), and other devices such as mobile phones can connect to the Camera by searching for the network name. You can then log in to the Camera through the browser on your device. At most 5 accounts can log in to the Camera at the same time. AP and Wi-Fi cannot be both enabled at the same time, and AP is disabled by default.

Procedure

- Step 1
- Click  on the upper-right corner of the page, and then select "Network Settings > Wi-Fi > AP".
- Step 2
- Click  to enable the function, and then set AP information.

Figure 4-23 AP settings

Wi-Fi

AP

On



SSID

9BC

Frequency Band

2.4G

Verification Type

Connection Password

Host IP

No.	IP	MAC Address
 No Data		

Apply

Refresh

Default

Table 4-4 AP parameters description

Parameter	Description
SSID	The default name is "device serial number_SD".
Frequency Band	Both 2.4G and 5G are available.
Verification Type	It is WPA2 PSK by default, and cannot be changed.
Connection Password	Set the connection password which is required when other devices connect to the Camera. It is 12345678 by default.
Host IP	Displays the IP address of AP.

- Step 3
- Click **Apply**.

Results

- Open your device such as mobile phone, search for the network name of the AP in the wireless signal list, and then connect to the network.
After it is successfully connected, the IP address and MAC address of the device is displayed on the **AP** page.
- Open a browser on your device, enter the host IP on the **AP** page or IP address on the **TCP/IP** page, and then you can go to the login page of the Camera.
- Enter the username and password, and then log in to the Camera.



Live view is available on select devices.

4.5.5 Configuring Bluetooth

Background Information

You can connect the Camera to Bluetooth devices such as Bluetooth headset for voice broadcast of alarms and voice intercom with the platform.



The function is available on select models.

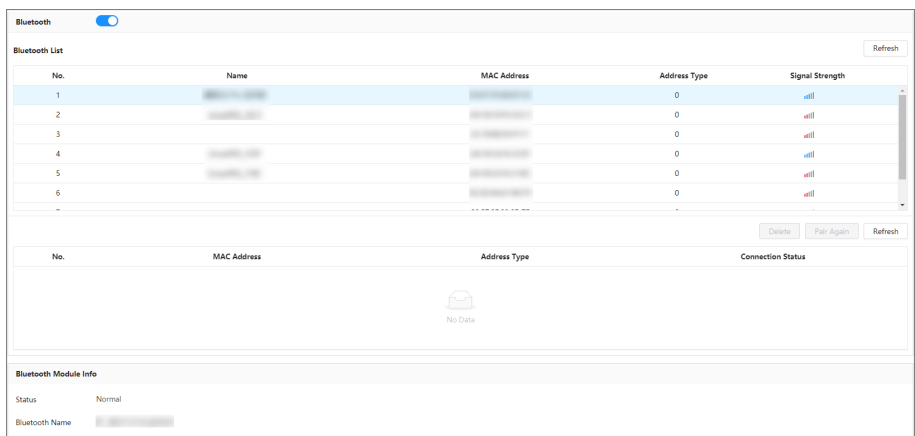
Procedure

Step 1 Click  on the upper-right corner of the page, and then select "Network Settings > Bluetooth".

Step 2 Click  to enable the function.

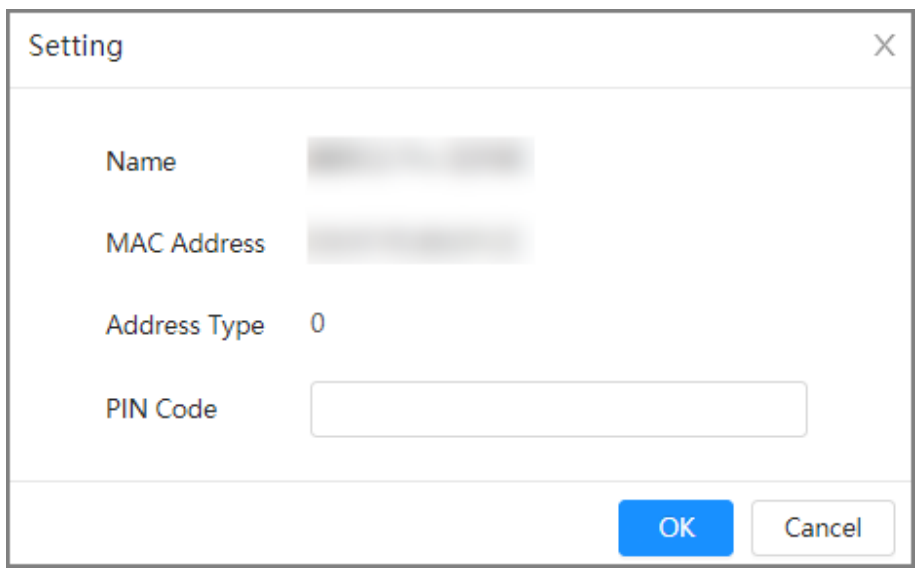
The searched Bluetooth devices are displayed in the **Bluetooth List**. Click **Refresh** at the lower-right corner of the list to search for **Bluetooth** devices again.

Figure 4-24 Bluetooth list



Step 3 Double-click the name of Bluetooth device, and then set PIN on the **Setting** page. For the PIN of the Bluetooth device, see the corresponding user' s manual.

Figure 4-25 Connect to Bluetooth device



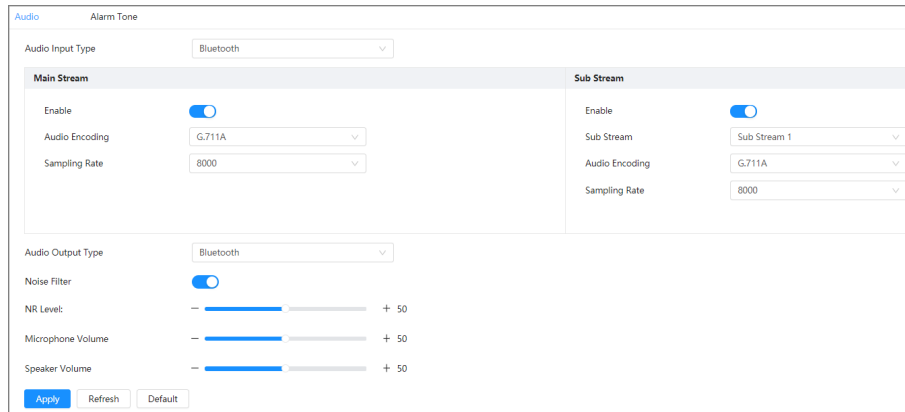
Step 4 Click **OK**.

The connected Bluetooth device is displayed in the list below.

Step 5 Click  on the upper-right corner of the page, select "Camera > Audio > Audio", and then set audio input and audio output types to **Bluetooth**.

You can also select "Camera" on the main page, and then select "Audio".

Figure 4-26 Audio



Related Operations

- Click **Refresh** at the lower-right corner of the list to get information of paired Bluetooth devices again.
- Click **Pair Again** to quickly connect to Bluetooth devices paired before.
- Click **Delete** to delete the Bluetooth device.

4.5.6 Configuring Audio

Background Information

You can set the audio input type, volume and more. After you enable main stream or sub stream, the network stream contains both audio and video; otherwise it is only video stream.



Before enabling sub stream audio, Click  on the upper-right corner of the page, and then select "Camera > Encode > Encode" to enable video in sub stream.

Procedure

Step 1 Click  on the upper-right corner of the page, select "Camera > Audio > Audio".

You can also select "Camera" on the main page, and then select "Audio".

Step 2 Click  to enable the audio function in main stream or sub stream.



Please activate or deactivate the audio acquisition function based on the requirements of the scene.

Step 3 Configure parameters.

Figure 4-27 Audio

The screenshot shows the 'Audio' configuration page with the 'Alarm Tone' tab selected. The 'Audio Input Type' is set to 'Bluetooth'. Below this, there are two sections: 'Main Stream' and 'Sub Stream'. Each section has an 'Enable' toggle (both are turned on), 'Audio Encoding' (both set to 'G.711A'), and 'Sampling Rate' (both set to '8000'). At the bottom, the 'Audio Output Type' is set to 'Bluetooth', and there are sliders for 'Noise Filter' (turned on), 'NR Level', 'Microphone Volume', and 'Speaker Volume', all set to '+ 50'. At the very bottom are 'Apply', 'Refresh', and 'Default' buttons.

Table 4-5 Audio parameter description

Parameter	Description
Enable	Enable audio in main stream or sub stream.  Audio can be enabled only when video has been enabled.
Audio Encoding	The audio encoding mode selected here applies to both audio streams and voice talks. We recommend you to keep the default value.
Sampling Rate	The number of audio signals sampled per second. The higher the sampling frequency, the more samples obtained per unit time, and the more accurate the restored audio signals.
Audio Input Type	• LineIn: The Camera collects audio signals through an external audio device. • Mic: The Camera collects audio signals through the built-in microphone. • Bluetooth: The Camera collects audio signals through a Bluetooth device.  Bluetooth is available on select models.
Audio Output Type	• LineOut: The Camera outputs audio signals through an external audio device. • Speaker: The Camera outputs audio signals through the built-in speaker. • Bluetooth: The Camera outputs audio signals through a Bluetooth device.  Bluetooth is available on select models.
Noise Filter	After the function is enabled, noise in the environment will be filtered.

Parameter	Description
NR (Noise Reduction) Level	Adjust the noise reduction level.  This parameter takes effect when noise filter is enabled.
Microphone Volume	Adjust the microphone volume.
Speaker Volume	Adjust the speaker volume.

Step 4 Click **Apply**.

4.5.7 Configuring Longitude and Latitude Overlay

You can overlay longitude and latitude on the monitoring image.

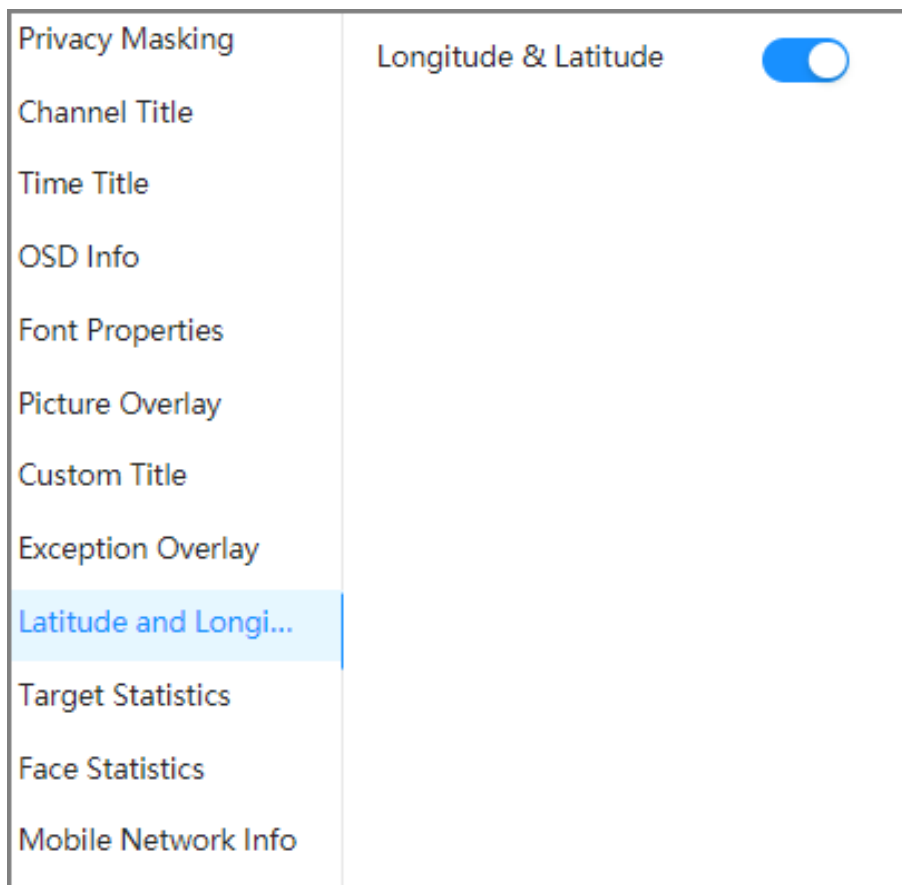
Procedure

Step 1 Click  on the upper-right corner of the page, select "Camera > Encode > Overlay > Longitude & Latitude".

You can also select "Camera" on the main page, and then select "Encode > Overlay > Longitude & Latitude".

Step 2 Click  to enable the function.

Figure 4-28 Latitude & longitude



Step 3 Click **Apply**.

Longitude and latitude is displayed at the upper-left corner of the monitoring image.

4.5.8 Enabling Smart Plan

Background Information

Smart plan includes face detection, construction monitoring, IVS and video metadata. Only after you enable and configure the smart plan, can it become effective.



The supported smart plans vary with device model.

Procedure

Step 1 Select "AI" on the main page, and then select "AI Config > Smart Plan".

Step 2 Enable the smart plan as needed.

- Enable global plan: In **Global** section, click ☐ next to the smart plan that you want to enable, and then click "Apply".
- Enable smart plan by preset: Select a preset in **Preset** drop-down list, click ☐ next to the smart plan that you want to enable, and then click "Apply".



Before setting a preset point solution, please add an appropriate preset point first. For details, see the corresponding user's manual.

Figure 4-29 Enable smart plan

Step 3 Configure smart plan rules according to actual needs. For details, see the corresponding user's manual.

Appendix 1 RS-485 Cable

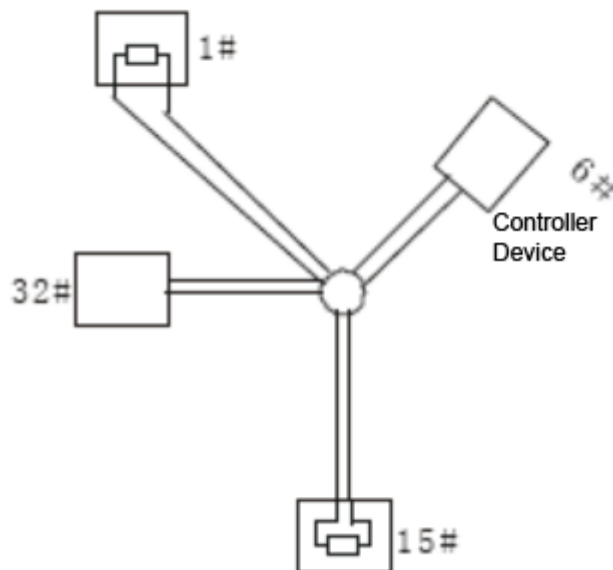
Appendix 1.1 Basic Features

RS-485 industrial buses are half-duplex communication buses whose characteristic impedance is $120\ \Omega$. Its maximum load is 32 payloads (including controller devices and controlled devices).

Appendix 1.2 Common Issues in Use

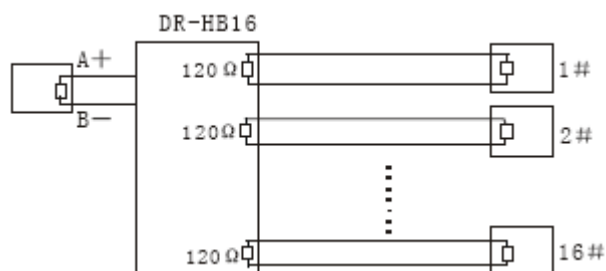
Users tend to connect devices as the way displayed in Appendix Figure 1-1. In this case, the terminal resistance must be connected to the two devices whose cable length is the longest among all the devices (in Appendix Figure 1-1, cable length between 1# and 15# is the longest). However, this connection manner does not comply with the RS-485 industrial standard. As a result, common issues like signal reflection and anti-interference capability reduction will occur. And the Device is out of control or cannot stop.

Appendix Figure 1-1 Common method to connect devices



To fix the issues, it is recommended to use RS-485 distributors. The RS-485 distributor can help avoid the common connection issues so as to improve transmission quality.

Appendix Figure 1-2 Connecting method with RS-485 distributors



Appendix 1.3 FAQ on RS-485 Cable

Appendix Table 1-1FAQ on RS-485 Cable

Malfunction	Possible Reason	Solution
The Device can perform self-check, but is out of control.	Baud rate/address of the host and Device are not matched.	Modify the baud rate/address of the host or Device to be matched.
	Positive electrode and negative electrode of RS-485 cable are misconnected.	Connect cables to the positive electrode and negative electrode correctly.
	Loose connection.	Connect the cables firmly.
	RS-485 cable is broken.	Replace RS-485 cable.
The Device can be controlled, but the operation is not smooth.	RS-485 cable is in poor contact.	Connect the RS-485 cable firmly.
	RS-485 cable is broken.	Replace RS-485 cable.
	The distance between the host and the Device is too long.	Install terminal resistance.
	Too many cameras are connected parallely.	Install RS-485 distributors.

Appendix 2 Cable Diameter (12 V DC) and Transmission Distance

The recommended transmission distances are for reference only, and the actual conditions shall prevail. The following table shows the maximum transmission distance of cables with certain diameter when the 12 V DC power source voltage loss rate is below 10%.

For devices powered by direct current, the maximum voltage loss rate allowed is 10%. The cables mentioned in the following table are all copper cables with electrical resistivity $\rho = 0.0175 \Omega \times \text{mm}^2/\text{m}$.



In the following table, the unit for diameter is mm, and the unit for transmission distance is foot (m).

Appendix Table 2-1 Cable diameter (12 V DC) and transmission distance

Transmission Power (W)	Transmission Distance (Diameter: 0.80)	Transmission Distance (Diameter: 1.00)	Transmission Distance (Diameter: 1.25)	Transmission Distance (Diameter: 2.00)
5	98 (30)	153 (47)	239 (73)	611 (186)
10	49 (15)	76 (23)	119 (36)	305 (93)
15	33 (10)	51 (16)	80 (24)	204 (62)
20	24 (7)	38 (12)	60 (18)	153 (47)
25	20 (6)	31 (9)	48 (15)	122 (37)
30	16 (5)	25 (8)	40 (12)	102 (31)
35	14 (4)	22 (7)	34 (10)	87 (27)
40	12 (4)	19 (6)	30 (9)	76 (23)
45	11 (3)	17 (5)	27 (8)	68 (21)
50	10 (3)	15 (5)	24 (7)	61 (19)
55	9 (3)	14 (4)	22 (7)	56 (17)
60	8 (2)	13 (4)	20 (6)	51 (16)
65	8 (2)	12 (4)	18 (6)	47 (14)
70	7 (2)	11 (3)	17 (5)	44 (13)
75	7 (2)	10 (3)	16 (5)	41 (12)
80	6 (2)	10 (3)	15 (5)	38 (12)
85	6 (2)	9 (3)	14 (4)	36 (11)
90	5 (2)	8 (3)	13 (4)	34 (10)
95	5 (2)	8 (2)	13 (4)	32 (10)
100	5 (1)	8 (2)	12 (4)	31 (9)

Appendix 3 Wire Gauge Reference Sheet

Metric Bare Wire Diameter (mm)	AWG	SWG	Bare Wire Cross Section Area (mm ²)
0.050	43	47	0.00196
0.060	42	46	0.00283
0.070	41	45	0.00385
0.080	40	44	0.00503
0.090	39	43	0.00636
0.100	38	42	0.00785
0.110	37	41	0.00950
0.130	36	39	0.01327
0.140	35	/	0.01539
0.160	34	37	0.02011
0.180	33	/	0.02545
0.200	32	35	0.03142
0.230	31	/	0.04115
0.250	30	33	0.04909
0.290	29	31	0.06605
0.330	28	30	0.08553
0.350	27	29	0.09621
0.400	26	28	0.1257
0.450	25	/	0.1602
0.560	24		0.2463
0.600	23		0.2827
0.710	22		0.3958
0.750	21	/	0.4417
0.800	20	21	0.5027
0.900	19	20	0.6362
1.000	18	19	0.7854
1.250	16	18	1.2266
1.500	15	/	1.7663
2.000	12	14	3.1420
2.500	/		4.9080
3.000			7.0683

Appendix 4 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.