Deployment Guide for 4MP Bullet LPR Camera

Version: V3.0.0

Revision History

Version	Firmware Version	Release	Date	Author
V3.0.0	ANPR_B1107-D001SP02 ANPR_B1105-D003SP02 ANPR_B1103-D005SP02	See details in the Revision History	2025-04-25	Z09747、Z05773

Disclaimer and Safety Warnings

Export Compliance Statement

We comply with applicable export control laws and regulations worldwide, including that of the People's Republic of China and the United States, and abides by relevant regulations relating to the export, re-export and transfer of hardware, software and technology. Regarding the product described in this manual, we ask you to fully understand and strictly abide by the applicable export laws and regulations worldwide.

Disclaimer

- The company shall not be liable for any special, incidental, consequential, or indirect damages arising from the use of this manual or the company's products, including but not limited to loss of business profits, loss of data, or documents.
- The products described in this document are provided "as is." Unless required by applicable law, this manual serves only as a user guide, and all statements, information, and recommendations do not constitute any express or implied warranties, including but not limited to warranties of merchantability, satisfactory quality, fitness for a particular purpose, or non-infringement of third-party rights.
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- The company's total liability for all damages shall not exceed the amount you paid for the product purchased from the company.

Privacy Protection Reminder

We comply with appropriate privacy protection laws and is committed to protecting user privacy. You may want to read our full privacy policy at our website and get to know the ways we process your personal information. Please be aware, using the product described in this manual may involve the collection of personal information such as face, fingerprint, license plate number, email, phone number, GPS. Please abide by your local laws and regulations while using the product.

About This Manual

- This manual is intended for multiple product models, and the photos, illustrations, descriptions, etc., in this manual may be different from the actual appearances, functions, features, etc., of the product.
- This manual is intended for multiple software versions, and the illustrations and descriptions in this manual may be different from the actual GUI and functions of the software.
- Despite our best efforts, technical or typographical errors may exist in this manual. We cannot be held responsible for any such errors and reserve the right to change the manual without prior notice.
- Users are fully responsible for the damages and losses that arise due to improper operation.
- We reserve the right to change any information in this manual without any prior notice or indication. Due to such reasons as product version upgrade or regulatory requirement of relevant regions, this manual will be periodically updated.

Network Security

Please take all necessary measures to enhance network security for your device.

The following are necessary measures for the network security of your device:

- **Change default password and set strong password**: You are strongly recommended to change the default password after your first login and set a strong password of at least nine characters including all three elements: digits, letters and special characters.
- **Keep firmware up to date**: It is recommended that your device is always upgraded to the latest version for the latest functions and better security. Visit our official website or contact your local dealer for the latest firmware.

The following are recommendations for enhancing network security of your device:

- **Change password regularly**: Change your device password on a regular basis and keep the password safe. Make sure only the authorized user can log in to the device.
- **Enable HTTPS/SSL**: Use SSL certificate to encrypt HTTP communications and ensure data security.
- **Enable IP address filtering**: Allow access only from the specified IP addresses.

- **Minimum port mapping**: Configure your router or firewall to open a minimum set of ports to the WAN and keep only the necessary port mappings. Never set the device as the DMZ host or configure a full cone NAT.
- **Disable the automatic login and save password features**: If multiple users have access to your computer, it is recommended that you disable these features to prevent unauthorized access.
- **Choose username and password discretely**: Avoid using the username and password of your social media, bank, email account, etc., as the username and password of your device, in case your social media, bank and email account information is leaked.
- **Restrict user permissions**: If more than one user needs access to your system, make sure each user is granted only the necessary permissions.
- **Disable UPnP**: When UPnP is enabled, the router will automatically map internal ports, and the system will automatically forward port data, which results in the risks of data leakage. Therefore, it is recommended to disable UPnP if HTTP and TCP port mapping have been enabled manually on your router.
- **SNMP**: Disable SNMP if you do not use it. If you do use it, then SNMPv3 is recommended.
- **Multicast**: Multicast is intended to transmit video to multiple devices. If you do not use this function, it is recommended you disable multicast on your network.
- **Check logs**: Check your device logs regularly to detect unauthorized access or abnormal operations.
- **Physical protection**: Keep the device in a locked room or cabinet to prevent unauthorized physical access.
- **Isolate video surveillance network**: Isolating your video surveillance network with other service networks helps prevent unauthorized access to devices in your security system from other service networks.

Safety Warnings

The device must be installed, serviced and maintained by a trained professional with necessary safety knowledge and skills. Before you start using the device, please read through this guide carefully and make sure all applicable requirements are met to avoid danger and loss of property.

Storage, Transportation, and Use

- Store or use the device in a proper environment that meets environmental requirements, including and not limited to, temperature, humidity, dust, corrosive gases, electromagnetic radiation, etc.
- Make sure the device is securely installed or placed on a flat surface to prevent falling.
- Unless otherwise specified, do not stack devices.
- Ensure good ventilation in the operating environment. Do not cover the vents on the device. Allow adequate space for ventilation.
- Protect the device from liquid of any kind.
- Make sure the power supply provides a stable voltage that meets the power requirements of the device. Make sure the power supply's output power exceeds the total maximum power of all the connected devices.
- Verify that the device is properly installed before connecting it to power.
- Do not remove the seal from the device body without consulting our company first. Do not attempt to service the product yourself. Contact a trained professional for maintenance.
- Always disconnect the device from power before attempting to move the device.
- Take proper waterproof measures in accordance with requirements before using the device outdoors.

Power Requirements

- Install and use the device in strict accordance with your local electrical safety regulations.
- Use a UL certified power supply that meets LPS requirements if an adapter is used.
- Use the recommended cordset (power cord) in accordance with the specified ratings.
- Only use the power adapter supplied with your device.
- Use a mains socket outlet with a protective earthing (grounding) connection.
- Ground your device properly if the device is intended to be grounded.

Battery Use Caution

- When battery is used, avoid:
  - Extremely high or low temperature and air pressure during use, storage and transportation;
  - Battery replacement.
- Use the battery properly. Improper use of the battery such as the following may cause risks of fire, explosion or leakage of flammable liquid or gas.
  - Replace battery with an incorrect type;
  - Dispose of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery;
- Dispose of the used battery according to your local regulations or the battery manufacturer's instructions.

Contents

1 Revision History

1. Overall structure and format update.
2. Added ANPR-1107 to the Applicable product models

2 Introduction

2.1 Applicable product models

Version	Model	Description and Specification	Remarks
ANPR_B1107	PKC2641-Z100-IR-P(-NB)	4MP Overseas Recognition Of Vehicle License Plate Bullet IP Camera (10-50mm, PoE, H.265, Infrared), Overseas Version	Recommended for road scenes
	PKC2641-Z100-P(-NB)	4MP Overseas Recognition Of Vehicle License Plate Bullet IP Camera (10-50mm, PoE, H.265, White Light), Overseas Version	
	PKC2641-Z80-IR-P(-NB)	4MP Overseas Recognition Of Vehicle License Plate Bullet IP Camera (8-32mm, PoE, H.265, Infrared), Overseas Version	
	PKC2641-Z80-P(-NB)	4MP Overseas Recognition Of Vehicle License Plate Bullet IP Camera (8-32mm, PoE, H.265, White Light), Overseas Version	
	PKC2641-Z28-IR-P(-NB)	4MP Overseas Recognition Of Vehicle License Plate Bullet IP Camera (2.8-12mm, PoE, H.265, Infrared), Overseas Version	Recommended for entrance/exit scenes
	PKC2641-Z28-P(-NB)	4MP Overseas Recognition Of Vehicle License Plate Bullet IP Camera (2.8-12mm, PoE, H.265, White Light), Overseas Version	
ANPR_B1103/ ANPR_B1105	PKC2640@Z28-P(-NB)	UNV, PKC2640@Z28-P, 4MP Vehicle License Plate Recognition Bullet IP Camera (2.8-12mm, PoE, H.265, White Light), Overseas Version	Recommended for entrance/exit scenes
	PKC2640@Z28-IR-P(-NB)	UNV, PKC2640@Z28-IR-P, 4MP Vehicle License Plate Recognition Bullet IP Camera (2.8-12mm, PoE, H.265, Infrared), Overseas Version	
	PKC2630@Z28-P(-NB)	UNV, PKC2630@Z28-P, 3MP Vehicle License Plate Recognition Bullet IP Camera (2.8-12mm, PoE, H.265, White Light), Overseas Version	
	PKC2630@Z28-IR-P(-NB)	UNV, PKC2630@Z28-IR-P, 3MP Vehicle License Plate Recognition Bullet IP Camera (2.8-12mm, PoE, H.265, Infrared), Overseas Version	
	PKC2640@Z80-P(-NB)	UNV, PKC2640@Z80-P, 4MP Vehicle License Plate Recognition Bullet IP Camera (8-32mm, PoE, H.265, White Light), Overseas Version	Recommended for road scenes
	PKC2640@Z80-IR-P(-NB)	UNV, PKC2640@Z80-IR-P, 4MP Vehicle License Plate Recognition Bullet IP Camera (8-32mm, PoE, H.265, Infrared), Overseas Version	
	HC121@TS8C(R)-Z(-NB)	UNV, HC121@TS8C-Z, 2MP Vehicle License Plate Recognition Bullet IP Camera (4.7-47mm, Starlight, PoE, H.265, White Light), Overseas Version	Used for entrance/exit and road scenes

2.2 Site Survey

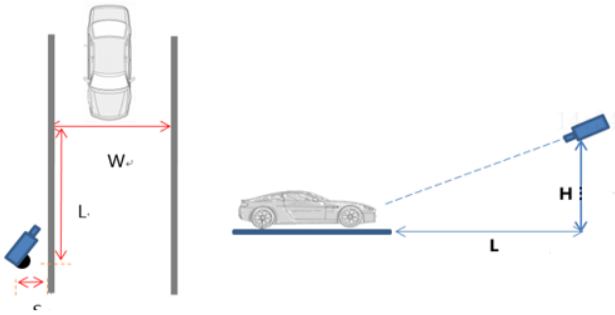
Before the site survey, you need to have a comprehensive understanding of the project, including background, scale, quality objectives, cycle, bidding documents, contracts, design plans, and drawings. Then you can conduct a survey on site based on the above information, and combine the survey results with the customer's needs to decide the exact installation location of the device.

2.1 Scene Requirements

2.1.1 Entrance/Exit Scenes

1. Supported speed ≤ **30km/h**.
2. It is recommended to install the camera on the side of the road. The ideal environment is that the lane width is **3m** to **4.5m**, and the capture distance is over 3 meters from the camera to the capture point, which allows the vehicle to adjust the vehicle body angle and its license plate can be fully captured when the vehicle passes through the capture point. If the actual environment differs significantly from the ideal environment, please contact the product department to confirm the installation scheme.
3. Avoid any obstruction of the camera by road signs, guide signs, trees, sentry boxes, etc.

Table 2-1 Normal snapshot in entrance/exit



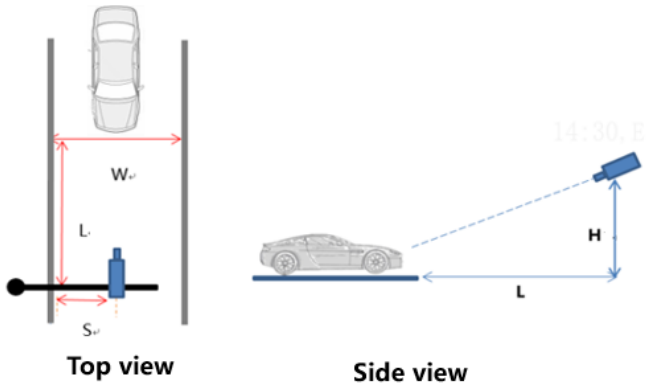
Top view Side view

2.1.2 Road Scenes

1. Supported speed **≤ 80km/h**.

2. It is recommended to install the camera on the center of the road, facing the incoming vehicles. For winding roads or uphill and downhill roads with big slope, please contact the product department to confirm the installation scheme.
3. Determine a suitable distance from the pole to the capture point. Otherwise, the capture rate may be affected.
4. Avoid any obstruction of the camera by road signs, guide signs, trees, sentry boxes, etc.

Table 2-2 Normal snapshot in road



3 Device Installation

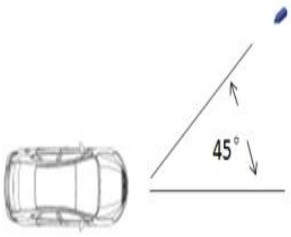
3.1 Angle Requirements

3.1.1 Installation requirements:

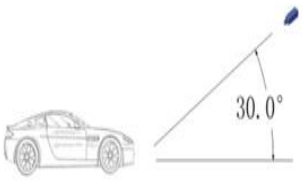
1. The horizontal angle of the camera to the license plate center should be no more than 45°.
2. The vertical angle of the camera should be no more than 30° (recommended: about 20°).
3. The horizontal tilt angle of the license plate should be no more than ±15°.
4. The pixel size of the license plate should be 90 to 300px (optimal recognition pixel: about 130px).

Wong example: Horizontal angle > 45°
If the angle meets the site requirement, the license plate recognition **rate can reach more than 95%**
If the angle exceeds the requirement, the license plate recognition rate may be 80% to 85%. The larger the angle, the lower the recognition rate.

Wong example: Vertical angle > 30°

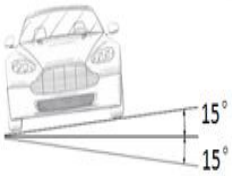


The horizontal angle ↵
should be no more than 45°



The vertical angle ↵
should be no more than 30°

Wong example: Horizontal tilt angle > 15°



The horizontal tilt angle ↵
should be no more than ±15°

The pixel size of the license plate
should be between 90 to 300pix

Wong example: Too small pixel size of the license plate

3.2 Installation Scheme

Scene	Device Model	Road Width W (m)	Camera Height H (m)	Capture Distance L (m)	Distance from Camera to Roadside S (m)	Recommended Scheme	Supported Speed (km/h)
Entrance/Exit	PKC2641-Z28-P (-NB) PKC2641-Z28-IR-P (-NB)	W≤4	1.5 - 2	3 -11	0 - 0.3	H=1.5m, L=4m	V≤30
		4<W≤5	2 - 2.5	4 - 13		H=2m, L=5m	
		5<W≤6	2.5 - 3	5 - 16		H=2.5m, L=7m	
	PKC2630@Z28 PKC2640@Z28 HC121@TS8C-Z HC121@TS8CR-Z	W≤4	1.5-2	3-11		H=1.5m, L=4m	
		4<W≤5	2-2.5	4-13		H=2m, L=5m	
		5<W≤6	2.5-3	5-16		H=2.5m, L=7m	
Road	PKC2641-Z80-IR-P (-NB) PKC2641-Z80-P (-NB) PKC2641-Z100-IR-P (-NB) PKC2641-Z100-P (-NB)	6<W≤7	3 -6	6 -48	0 -7	(1)H=3m, L=8 m (2)H=4m, L=10 m (3)H=5m, L=13m (4)H=6m, L=16m	V≤80
	PKC2640@Z80	6<W≤7	3-6	6-48		H=3m, L=8 m	
						H=4m, L=10m	
						H=5m, L=13m	
						H=6m, L=16m	
	HC121@TS8C-Z HC121@TS8CR-Z	6<W≤7	3-6	6-60		H=3m, L=8m	

4 Site Deployment Configuration

4.1 Log In

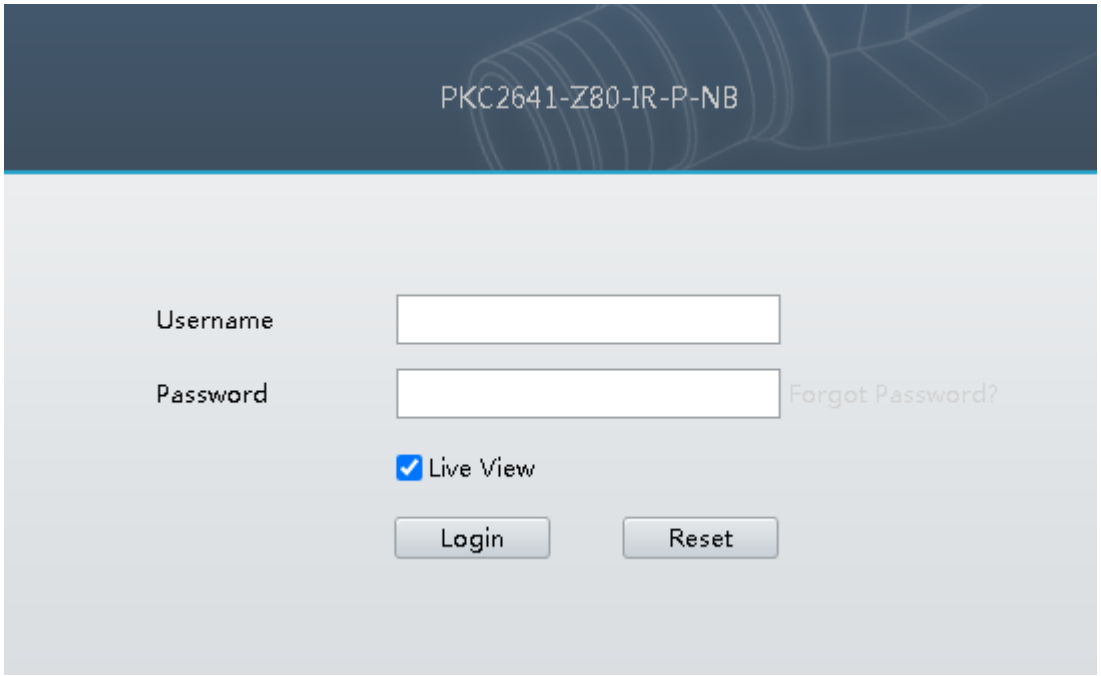
It is recommended to use a non-IE browser to log in to the camera. Some functions are unavailable to IE.

4.2 Device Login

By default, DHCP is enabled for the camera. If a DHCP server is configured, the camera IP may be dynamically assigned by the DHCP server, and in this case, please use the actual IP for login. If there is no DHCP server, use the default IP **192.168.1.13**.

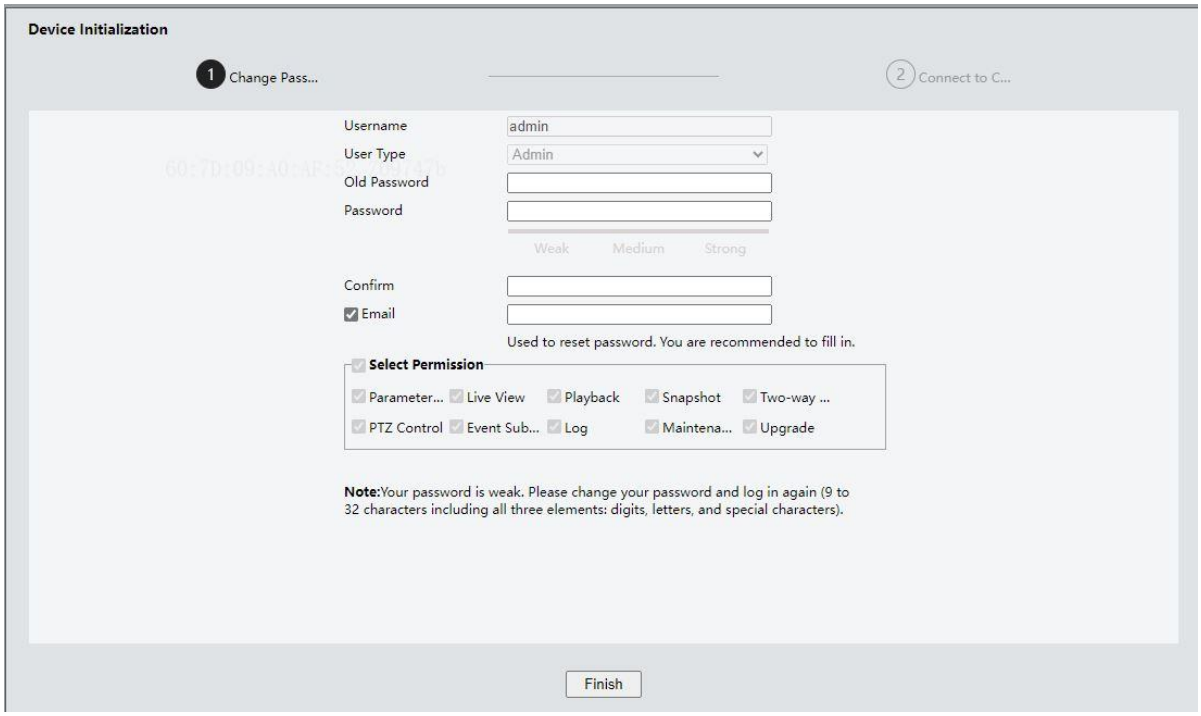
Login steps:

1. Visit the camera IP using a web browser, and input the username and password to log in to the camera. The default username/password is **admin**/**123456**.
2. You can click **Reset** to clear the username and password.



4.3 Password Change

The password must be changed to a strong one when the camera is used for the first time.

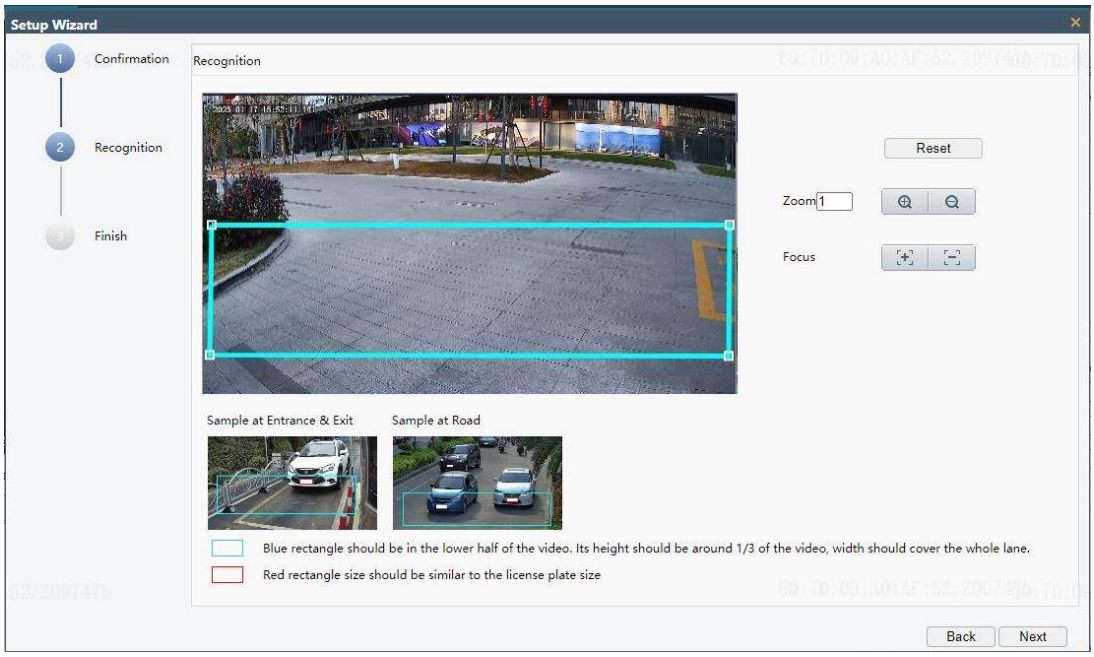


4.4 Setup Wizard

4.4.1 Confirmation

the version information is ANPR-B1103/1105/1107.XXX

4.4.2 Recognition



1. Commissioning

3. Preliminary adjustment of camera installation angle: Park a vehicle at the capture point for adjusting the camera's installation angle.
4. Adjust the zoom and focus manually.
5. Adjust the zoom by clicking zoom **+** or zoom **-**, or enter a zoom value (max. 160) directly. Adjust appropriately according to the actual requirements on site

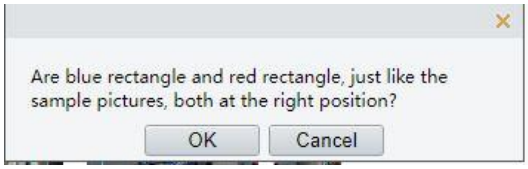
6. Click focus **+** or focus **-** till the license plate is properly focused.

2. Draw detection area (detection rules)

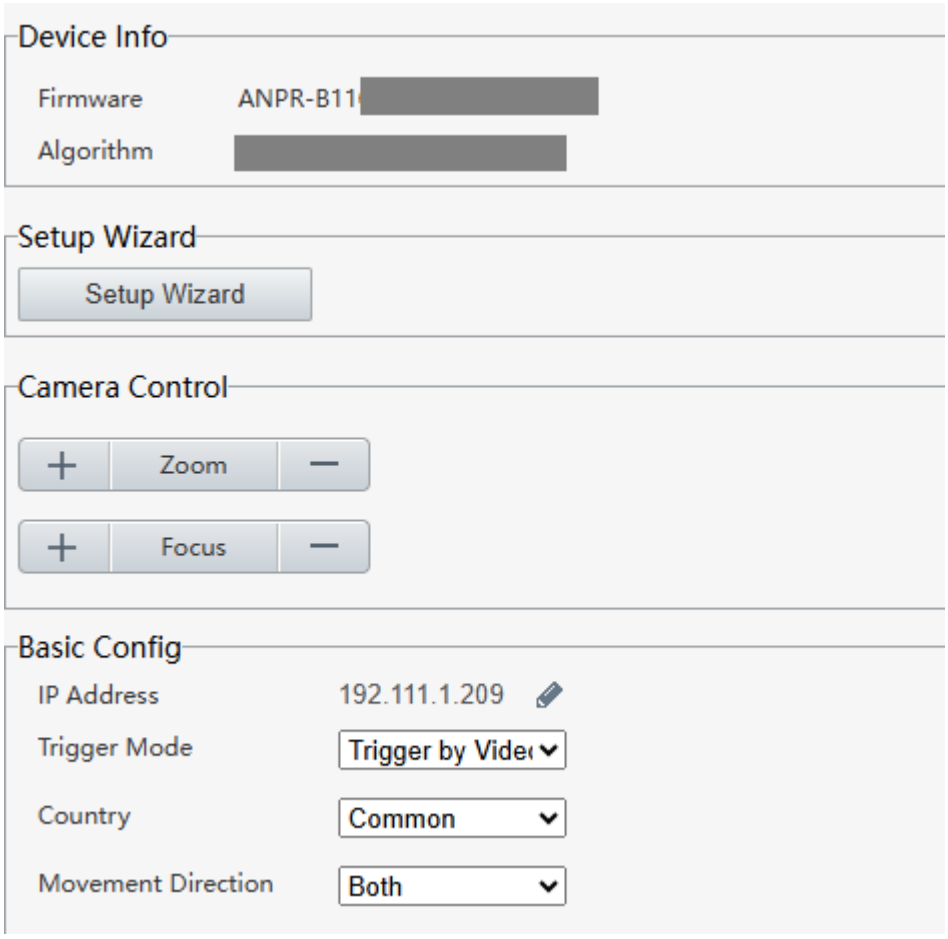
- Position: Usually the detection area is at the lower part of the image
- Height: The height of the detection area occupies 1/3 to 1/2 of the total height. It is necessary to consider both large trucks and small cars, as the license plates of trucks are much higher than those of small vehicles.
- Width on both sides: It must include the outermost left and right parts where vehicles may pass through. At the same time, make sure the detection area is not too wide (not exceeding 2/3 of the image width), otherwise there may be problems of prolonged capture time and mistaken capture of adjacent vehicles.

3. Finish

After finishing drawing the detection area and confirming that the size of the license plate matches the requirements, click **Next** button. A dialog box as shown below appears. Click **OK** to complete the configuration

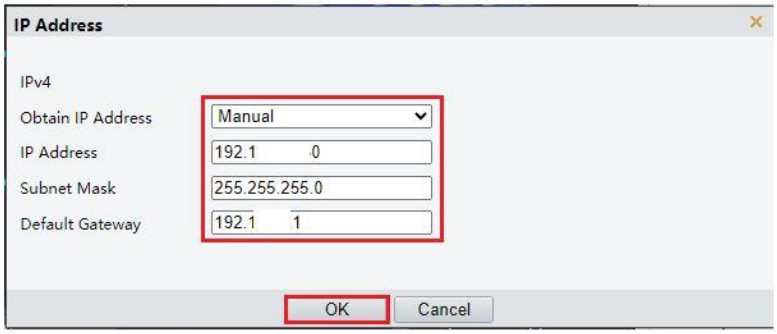


4.5 Basic Config



4.5.1 IP Configuration

Choose **View>Basic Config**. Change **IP Address**, **Subnet Mask**, and **Default Gateway**, and click **OK** to save the configuration



4.5.2 Trigger Mode

The default is **Trigger by Video**, complete the configuration according to the actual requirements.

Trigger Mode	Description
Trigger by Video	When a vehicle passes the recognition frame, if the capture condition is met, the camera will capture and recognize the vehicle automatically.
Trigger by Loop	When the camera's alarm input is connected to an external device such as a detection loop, a vehicle passing by the external device will trigger the camera to capture and recognize the vehicle

4.5.3 Country

Complete the configuration according to the actual requirements

4.5.4 Movement Direction

Complete the configuration according to the actual requirement

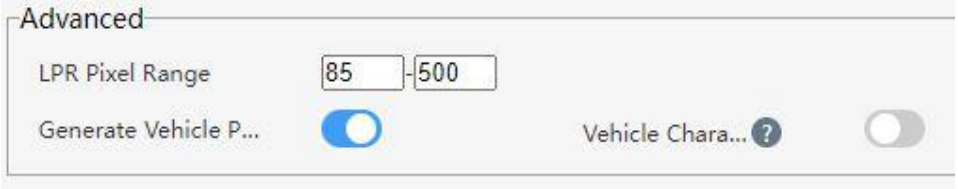
Movement Direction	Description
Both	Vehicles enter the live video image from both directions.
Downward	Vehicles enter the live video image from the top.
Upward	Vehicles enter the live video image from the bottom.

5 Function Configuration (Optional)

The configurations described in this chapter are optional and should be set according to the on-site requirements.

5.1 Advanced

5.1.1 ANPR-1105/ANPR1107



1. Generate Vehicle Pass-thru Records Without Recognition

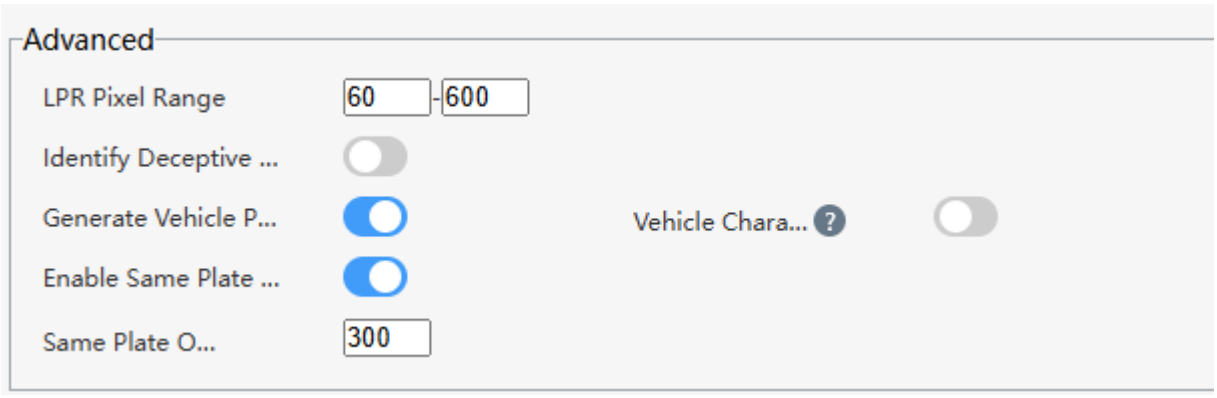
When **enabled**, the camera can capture images of unlicensed vehicles and generate records. When **disabled**, unlicensed vehicles will not be captured and no records will be generated.

This function is enabled by default. Configurations should be adjusted based on the actual site needs.

2. Vehicle Characteristics Recognition

This function is disabled by default. When enabled, the camera can recognize vehicle feature information.

5.1.2 ANPR-1103



1. Generate Vehicle Pass-thru Records Without Recognition

When **enabled**, the camera can capture images of unlicensed vehicles and generate records. When **disabled**, unlicensed vehicles will not be captured and no records will be generated.

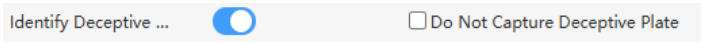
This function is enabled by default. Configurations should be adjusted based on the actual site needs.

2. Vehicle Characteristics Recognition

This function is disabled by default. When enabled, the camera can recognize vehicle feature information.

3. Identify Deceptive License Plate

When **enabled**, the camera can filter out plates without driving trajectories and non-genuine license plates.



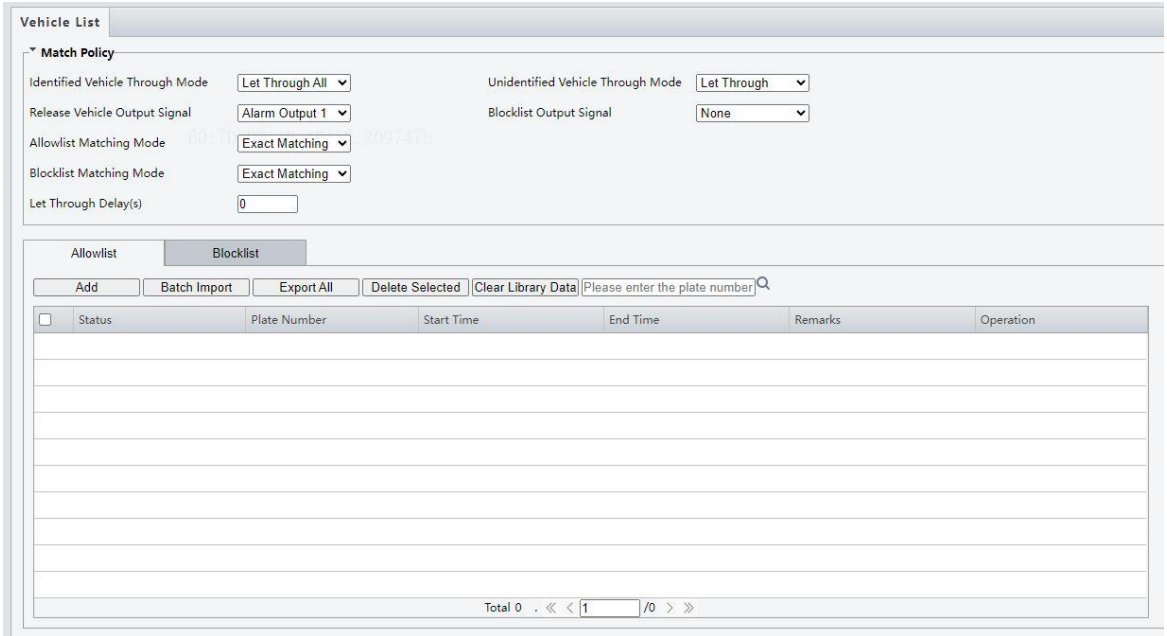
View the **[True/False]** field after the plate number in the photo OSD.

4. Same Plate Output

Repeated snapshots can be taken when the same vehicle stays in the live view after the "Same Plate Output Interval" time has passed

5.2 Vehicle List

You can allow specific vehicles to pass freely by configuring a vehicle list and a let-through policy. When operating alone, the camera determines whether to let vehicles pass based on the vehicle list and let-through policy saved on the camera. When connected to a server, both the camera and the server can control automatic vehicle passing.



5.2.1 Identified Vehicle Through Mode

Identified Vehicle Through Mode	Let Through All	Let Through Allowlist Vehicle	Let Through Allowlist Vehicle When Offline	Let Through Non-Blocklist Vehicle
Allowlist	Let through	Let through	Let through	Let through
Blocklist	Let through	Not be let through	Not be let through	Not be let through
Non-Blocklist / Non- Allowlist	Let through	Not be let through	Not be let through	Let through

NOTE!

Let Through Allowlist Vehicle When Offline. This setting is effective only when the camera is registered with the server via the HTTP protocol.

5.2.2 Matching Mode

- Allowlist Matching Mode/Blocklist Matching Mode
  - Exact Matching: Default mode. In this mode, a full matching plate number is required before the vehicle is let to pass through or not pass through.
  - Matching: Performs fuzzy matching through Allow Unmatched Character(s).
- Allow Unmatched Character (s): The allowed number of non-matching characters can be set to 0/1/2, corresponding to the number of characters in the plate that are allowed to not match. Within this range, the vehicle is considered on the allowlist or blocklist

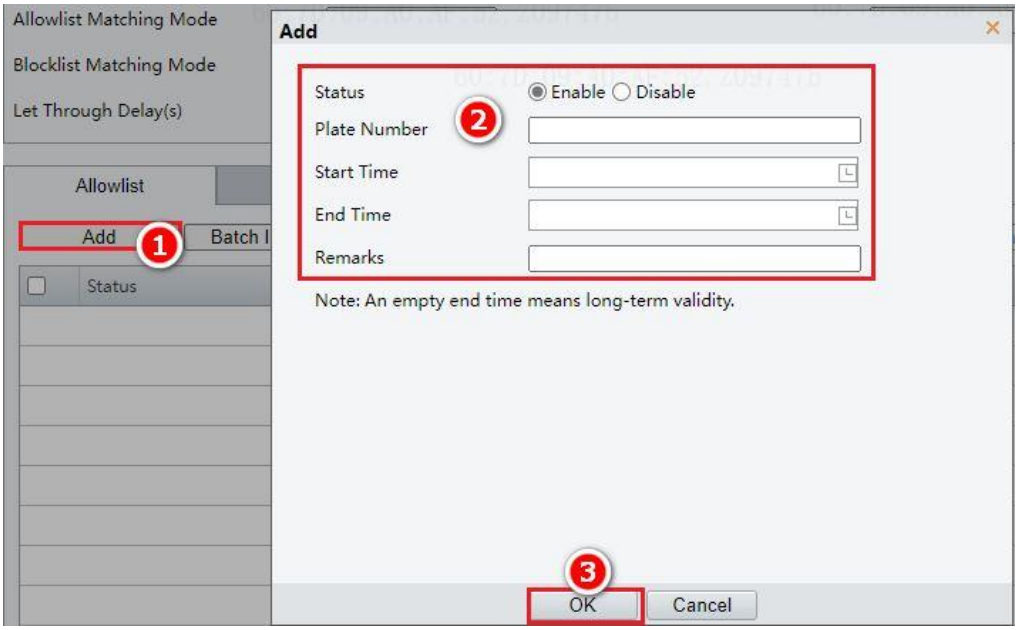
5.2.3 Let Through Delay (s)

The default and recommended value are 0s. This parameter is effective when the camera operates alone (not connected to any server).

5.2.4 Vehicle List

1. Add

Click Add, enter the **Plate Number**, **Start Time**, **End Time**, and then click **OK**. The vehicle is added to the **Allowlist/Blocklist**.



2. Batch Import

- Import plate numbers to allowlist in batches

Export the template, complete vehicle information in accordance with the template format, and then import the file

LicensePlateNumber	StartTime	EndTime	Status(0-Enable/1-Disable)	Reserve	Remarks
ABCD123456	2020/01/01-00:00:00	2020/12/31-23:59:59	0	0	Remarks
ABCD66666	2020/01/01-00:00:00	FF(The default padding is permanent when the end time is FF)	0	0	Remarks

NOTE!

- Import will fail if start time and end time are not specified in the imported file;

- Import plate numbers to blocklist in batches

Export the template, complete vehicle information in accordance with the template format, and then import the file.

LicensePlateNumber	StartTime	EndTime	Status(0-Enable/1-Disable)	Reserve	Remarks
ABCD123456	2020/01/01-00:00:00	2020/12/31-23:59:59	0	0	Remarks
ABCD66666	2020/01/01-00:00:00	FF(The default padding is permanent when the end time is FF)	0	0	Remarks

NOTE!

- Import will fail if start time and end time are not specified in the imported file;

3. Delete Selected

Select vehicle (s) in the list, and then click Delete Selected. The selected vehicle (s) are deleted.

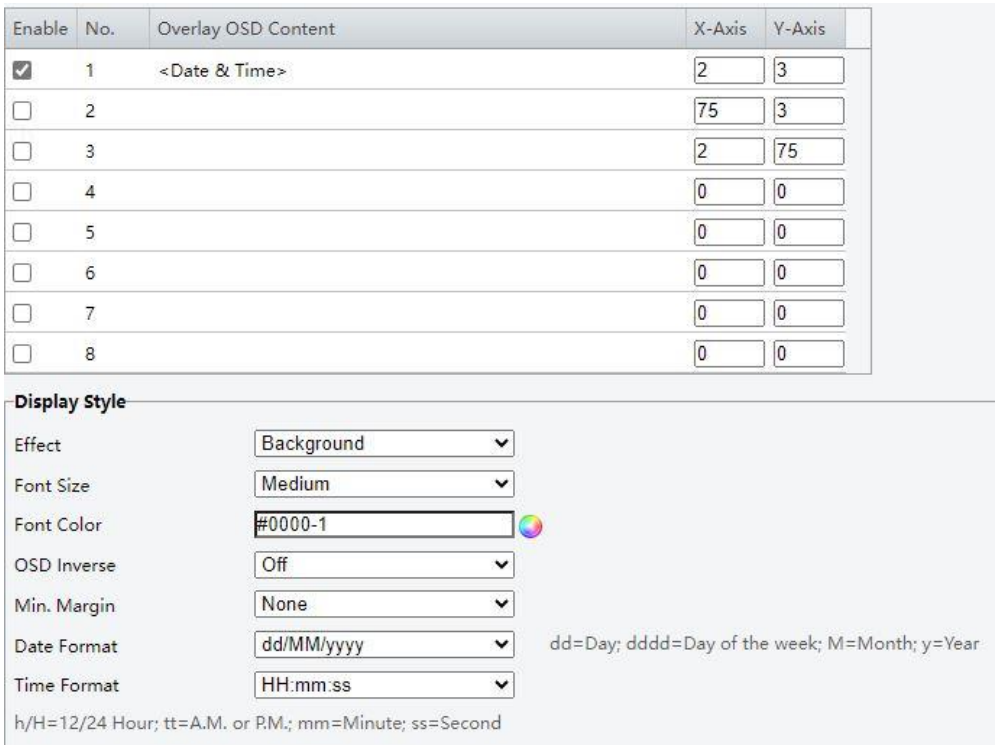
4. Clear Library Data

Caution: The Clear Library Data operation will delete all data from the list.

5.3 OSD

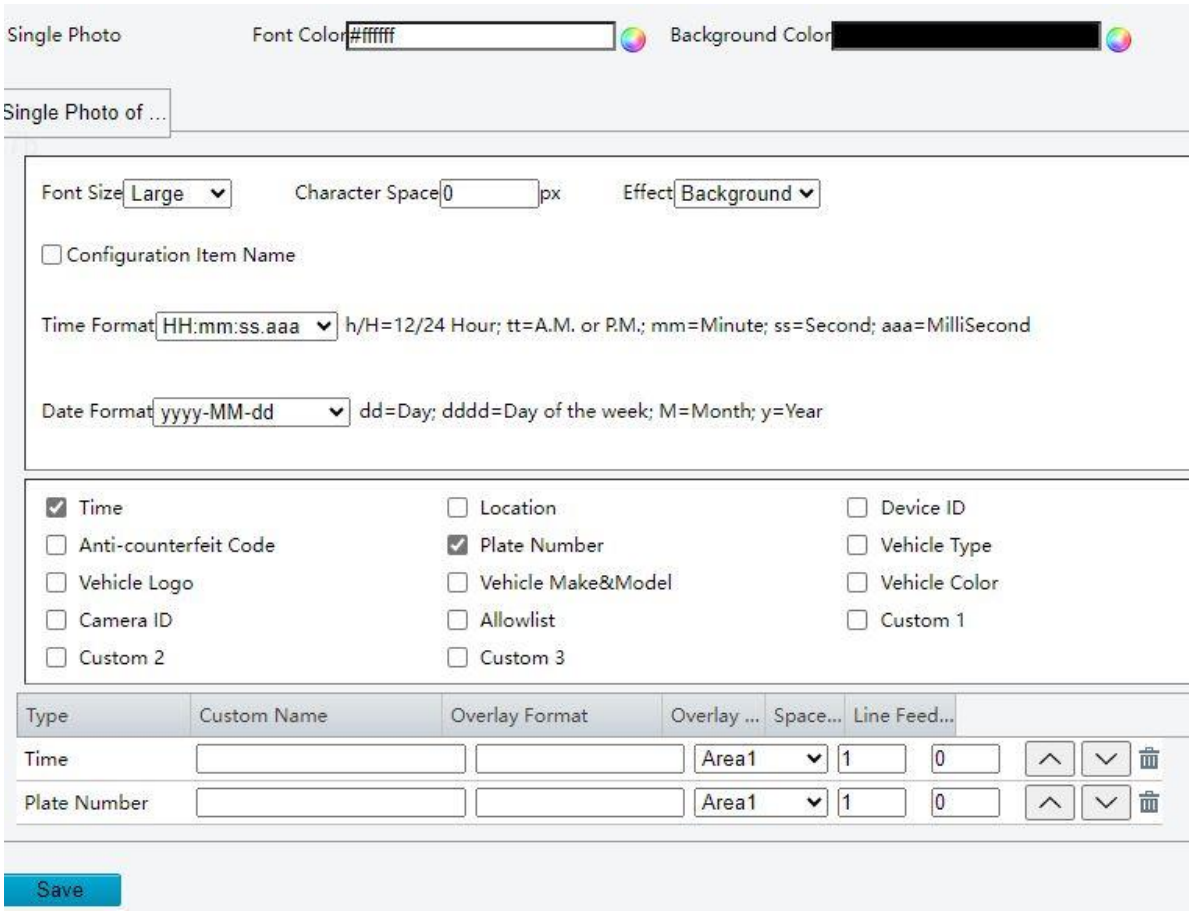
5.3.1 Live View

Configure live video OSD at **Setup** > **OSD** > **Live View** according to actual requirements. Date & Time OSD is enabled by default.



5.3.2 Photo

Configure photo OSD at **Setup** > **OSD** > **Photo** according to actual requirements. Time and Plate Number OSDs are enabled by default.



NOTE!

The camera can not recognize vehicle features. Recommend unchecking **Vehicle Logo**, **Vehicle Make&Model**, **Vehicle Color**, **Vehicle Type** in photo **OSD** settings

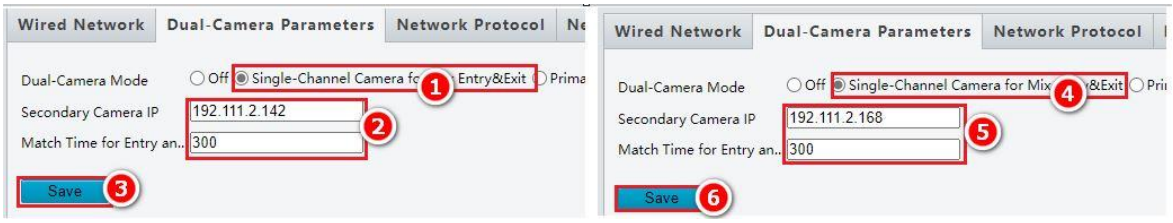
5.4 Dual-Camera Parameters

NOTE!

- The camera does not support enabling **Single-Channel Camera for Mix Entry&Exit** and **Primary and Secondary Cameras** on Same Side simultaneously.
- Configure two LPR cameras: IPC1 and IPC2.The software versions of IPC1 and IPC2 cameras need to be consistent.

5.4.1 Single-Channel Camera for Mix Entry&Exit

This solution is applicable when the lanes are not wide enough to provide an entrance and an exit separately



1. Log in to IPC1's web interface, choose **Setup > Network > Dual-Camera Parameters**. Select **Single-Channel Camera for Mix Entry&Exit**.
2. For **Secondary Camera IP**, set IPC2's IP as the **Secondary Camera IP**
3. The default setting for **Match Time for Entry and Exit Mix (s)** is 300, and you can modify the value as needed.
4. Log in to IPC2's web interface, choose **Setup > Network > Dual-Camera Parameter**s. Select **Single-Channel Camera for Mix Entry&Exit**.
5. For **Secondary Camera IP**, set IPC1's IP as the **Secondary Camera IP**
6. The default setting for Match Time for Entry and Exit Mix (s) shall be kept the same as that of IPC1

5.4.2 Primary and Secondary Cameras on Same Side

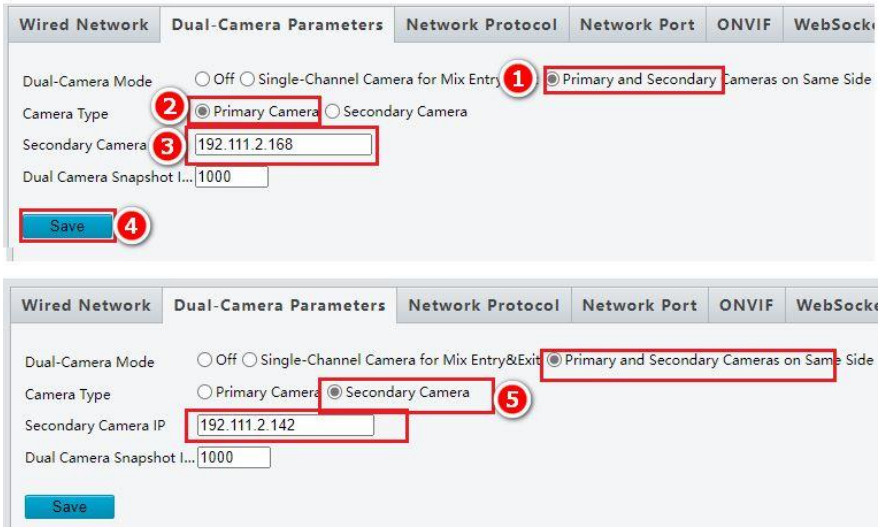
Suitable for wide-lane scenarios, where the primary and secondary cameras will capture the same scene simultaneously, and the primary camera will judge the capture result

1. IPC1 Configuration

1. Log in to IPC1's web interface, choose Stup > Network > Dual-Camera Parameters. **Select Primary and Secondary Cameras on Same Side**
2. Camera Type select **Primary Camera**
3. For **Secondary Camera IP**, set IPC2's IP as the **Secondary Camera IP**

2. IPC2 Configuration

The parameters of IPC2 will be modified by IPC1, no configuration is required.



CAUTION!

- When **Primary and Secondary Cameras on Same Side** is enabled, **Quick Report of Vehicle Passing Records** through HTTP is unavailable. If you enable **Quick Report of Vehicle Passing Records**, it will be disabled by force when uploading data.
- After the primary camera is configured, its configuration will be synced to the secondary camera. The secondary camera needs no extra configuration.
- After **Primary and Secondary Cameras on Same Side** is enabled, the secondary camera will sync time with the primary camera.
- The primary camera and the secondary camera must have the same version number.
- If the two cameras are different products, please contact technical support before you configure **Primary and Secondary Cameras on Same Side**.

5.5 Image

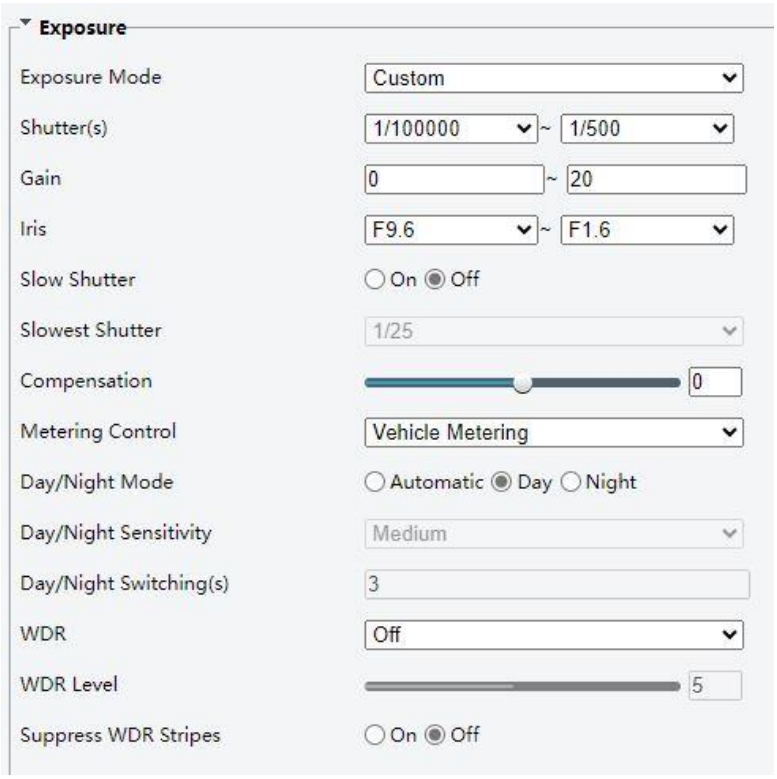
By default, no reconfiguration is required. However, if issues arise on-site, the following configurations should be given particular attention.

Description:

- It is recommended to make adjustments within 20%.

5.5.1 Exposure

Choose **Stup** > **Video & Audio** > **Image** to adjust the exposure parameters. In general, the default exposure parameters shown in the image below are suitable for entrance/exit scenes.



Parameter modification is recommended under the following circumstances:

- When strong backlight or frontlight occurs, causing a decrease in image recognition rate, you can add an **Image Scene Template** in **Scenes** and configure exposure compensation during the strong backlight or frontlight time period for optimization.
  - In frontlight scenes, reduce **Compensation** appropriately.
  - In backlight scenes, increase **Compensation** appropriately.
- When customers require higher brightness for nighttime images, and noise is acceptable, you can slightly increase the gain. Increasing the shutter is not recommended. When the shutter is above 1/4000, license plates may exhibit motion blur, affecting license plate recognition.

5.5.2 Smart Illumination

Choose **Setup** > **Video & Audio** > **Image**. The default illuminator settings are as shown below. You can adjust the illumination brightness as needed.

Illumination level: The higher the setting, the brighter the light. Adjust according to the brightness of the license plate on-site. It is recommended to keep the default setting.

6 Server Integration

Register the camera with the NVR through the private and ONVIF protocol.

6.1 Networking

There are two networking options for connecting the camera and NVR:

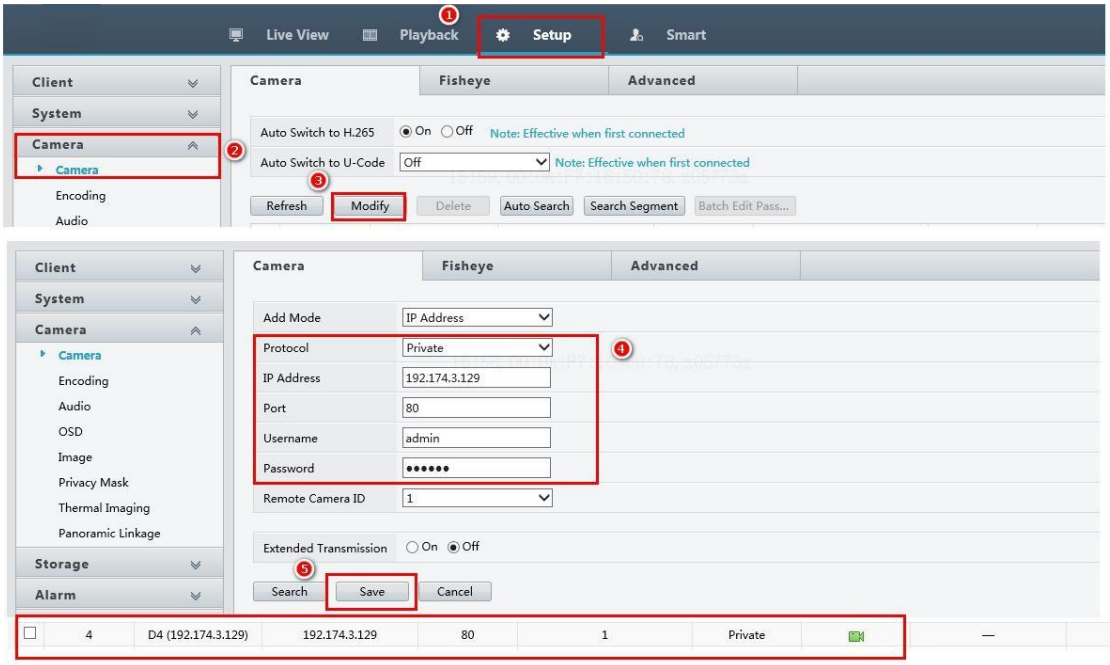
1) Networking 1: default, the camera can be directly connected to the NVR via a network cable, without extra configuration on the IPC and NVR required.
2) Networking 2: The camera is connected to the NVR via a switch. Ensure that the communication between the camera and NVR is normal. Configuration details can be found in 5.2 Add the camera on the NVR.

6.2 Add the camera on the NVR

Connect the camera to the NVR through a network switch. Make sure the IP addresses of the camera and the NVR are within the same network segment. No additional configuration is needed for the camera. Follow the steps below for configuring the server;

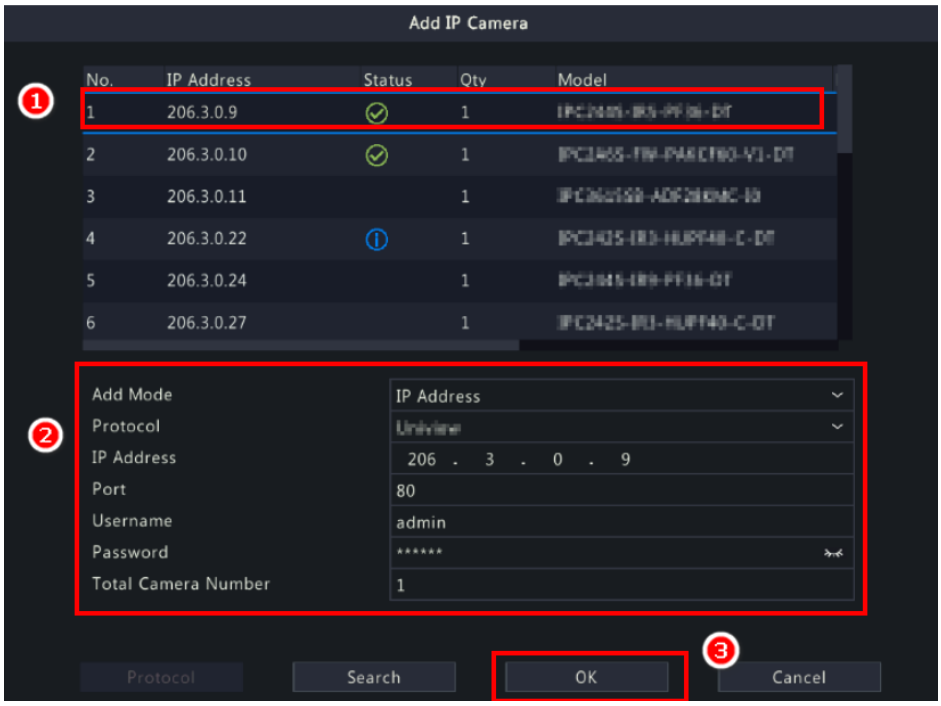
6.2.1 Add the camera on the NVR's web interface

Log in to the NVR's web interface, go to **Setup** > **Camera** > **Camera**. Choose a channel, click **Modify**, and then set **Add Modes** to **IP Address**, set **Protocol** to **Private** or **ONVIF**, and set the camera's IP address, port number, username, and password according to the actual configuration of the camera



6.2.2 Add the camera on the NVR's local interface

Log in to the NVR's local interface, go to **Setup** > **Camera** > **Camera**. Click **Custom Add**, choose the camera to add, enter the correct password of the camera, choose **Private** or **ONVIF** as the protocol, and then click **OK**. The camera is added. Check the icon under **Status**. A green icon means the camera is online. A gray icon means the camera is offline



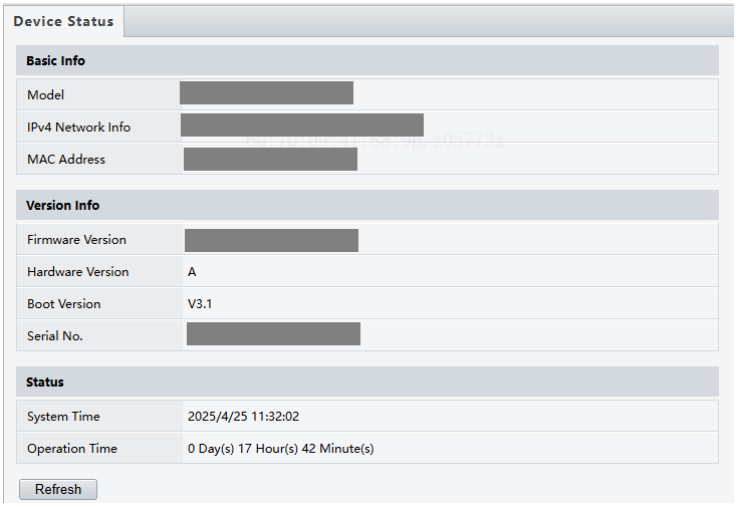
7 Maintenance

7.1 Upgrade

In this pane, you can upgrade or roll back the camera firmware version. The operation steps are as follows:

1. Store the upgrade package to a local path, such as D:\update.
2. Choose **Maintenance** > **Maintenance** > **Maintenance**
3. Click **Browse...** and select the upgrade package so that the text box shows the path, such as D:\update\Upgrade package name
4. Click **Upgrade**. Then, a progress bar is displayed during the upgrade.

5. After the upgrade, log in to the camera again.
6. Choose **Maintenance** > **Maintenance** >**Device Status**, check the version information



7.2 Diagnosis Info

You can export camera diagnosis information to a specific directory or directly open the camera diagnosis information file to locate problems. The operations are as follows:

1. Choose Maintenance > Maintenance > Maintenance
2. Click Browse..., select a local path, and click Export to export the camera diagnosis information for problem locating.