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**ITC237-PW1A-IRZ**  
**Installation Manual**

**V 1.0**

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# 1 Overview

## 1.1 Objective

Standard construction documents for the sales staff, regional technical support, engineering and construction personnel to ensure the device installed in accordance with regulatory requirements.

## 1.2 Scope

The instructions apply to model ITC237-PW1A-IRZ integrated camera to snapshot the construction commissioning guidance. The camera is suitable for parking management systems, residential entrance management systems.

## 1.3 Device Structure

### 1.3.1 Appearance

ITC237-PW1A-IRZ appearance is shown in Figure 1- 1.



Figure 1- 1

### 1.3.2 Dimensions

ITC237-PW1A-IRZ dimensions are shown in Figure 1- 2. Unit is mm.

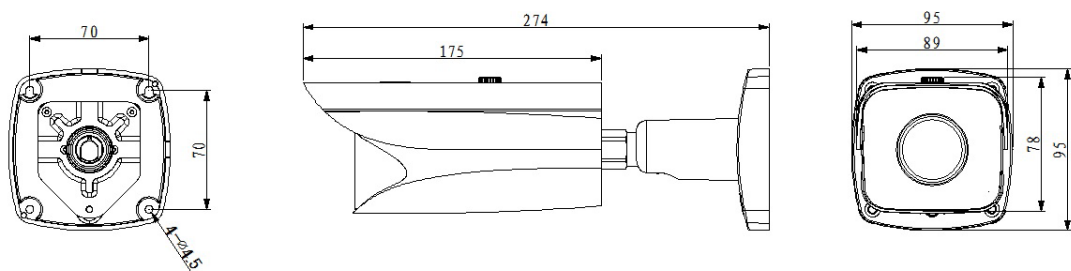


Figure 1- 2

### 1.3.3 Technical Parameter and Port Wiring

Parameter Type	Parameter Name	Value
Model		ITC237-PW1A-IRZ
Camera	Sensor Type	1/1.9 inch CMOS
	Shutter	1/12.5~1/10000, manual or auto
	Min Illumination	0.002Lux/F1.2 (color) ,0.0002Lux/F1.2 (B/W)
	Scan Method	Progressive
	Day/Night	IR-CUT
	Exposure Mode	Full auto, customize range, customize
	White Balance	Full auto, color temperature range auto, customize color temperature
	HLC	Support
	Edge Enhance	Support
Lens	Lens Port	φ14
	Focus	4mm~8mm
	Aperture	F1.8
	Aperture Control	DC drive
	Zoom Type	Motorized
Image Parameter	Image Compression Standard	JPEG
	Image Resolution	1920×1080
	Video Compression Standard	H.264/H.264H/
	Video Bit Rate	H.264 rate adjustable
	Video Frame Rate	50
	Video Resolution	1920×1080

Parameter Type	Parameter Name	Value
Trigger Mode	I/O Coil Trigger	Support
	Video Detection	Support
Function	White List	Max support 10000 white list vehicles, may directly link gateway output
	Intelligent Recognition	Plate recognition, plate color, vehicle color, brand recognition
	Remote Control	Remote config, control via WEB
	OSD Overlay	Support, may customize time, location, direction, lane no.
	Waterproof	Support, video/picture with watermark parity
Port	Built-in IR Light	Built-in 2 LED IR lights
	Network Port	1, 100M/1000M Ethernet port
	Alarm Input Port	2-ch, optocoupler input(switch), for coil input
	Alarm Output	1-ch, relay output, may used to link gateway
	Audio Port	N/A
General	Power Supply	AC 24V
	External Frequency Sync	Support
	Consumption	<15W
	Work Temperature	- 30°C ~ + 60°C
	Protection Level	IP66
	Work Humidity	≤95%
	Dimensions	94.92mmX94.92mmX272.90mm
	Weight	1.4kg

Waterproof group wiring port is shown in Figure 1- 3.

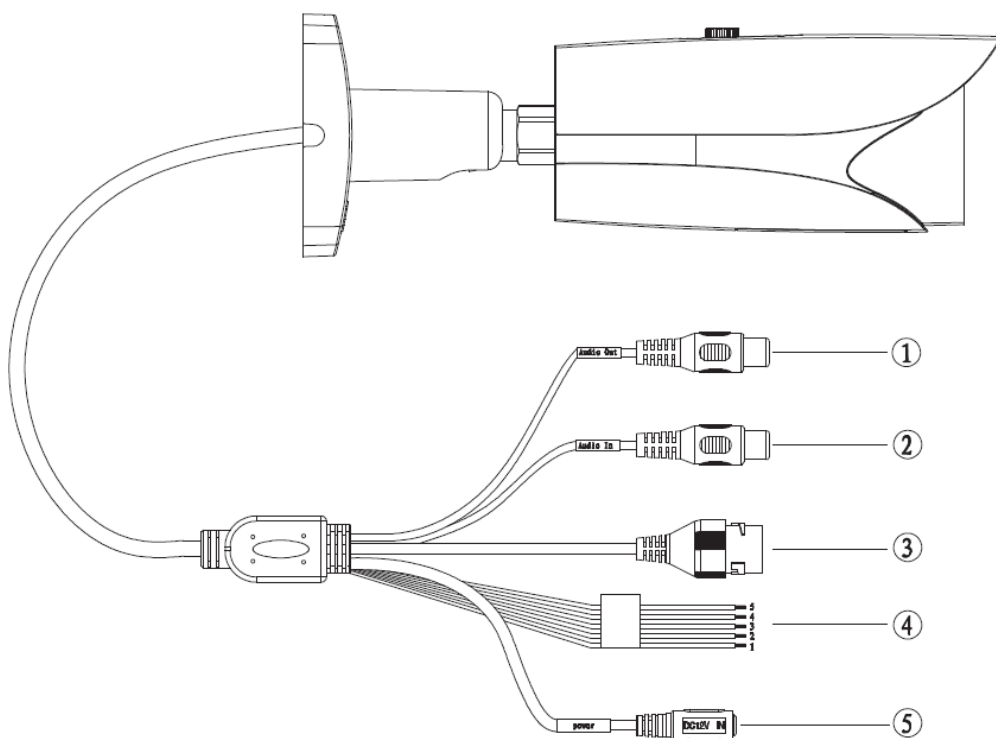


Figure 1- 3

No.	Port Note		Port Function
①	Audio Out	Audio Output Port	Output audio signal (N/A)
②	Audio In	Audio Input Port	Input audio signal (N/A)
③	-	Network Port	Connect to standard Ethernet
④	ALARM_N O	Alarm Output Port	Output alarm signal
	ALARM_C OM		
	ALARM_IN 1	Alarm Input Port 1	IO input port, max support 2-ch
	ALARM_IN 2	Alarm Input Port 2	
	ALARM_G ND	GND	
⑤	POWER	Power Port	Input AC24V power

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## 2 Device Installation

### 2.1 Installation Specifications

#### 2.1.1 Standard Installation

See Figure 2- 1.

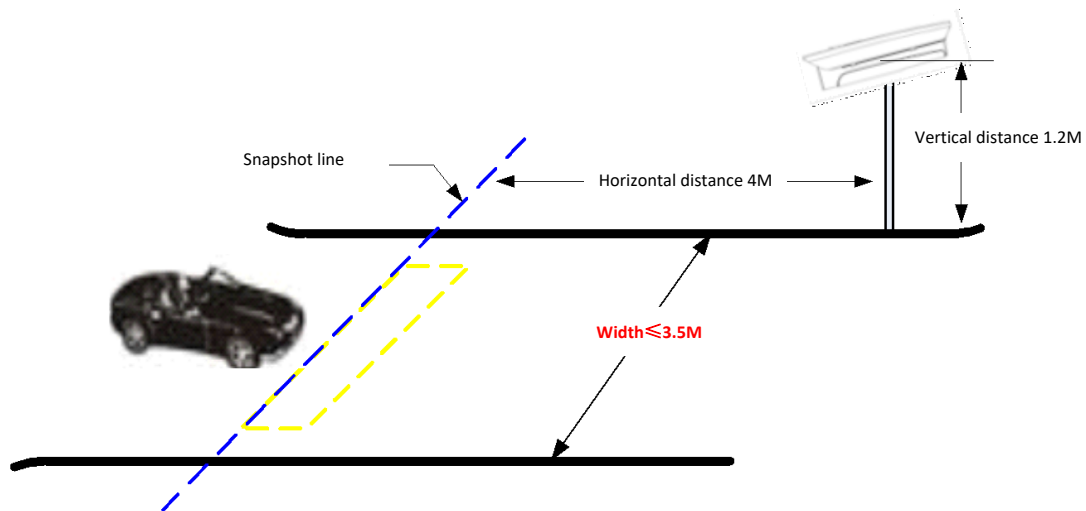


Figure 2- 1

Note:

1. Camera monitoring the scene channel width requirements  $\leq 3.5$  m.  $> 3.5$  m, requiring physical isolation parallel with the camera at 3.5 m spacing, make the passageway to meet the requirements of  $\leq 3.5$  m;
2. The camera is mounted on the safety of the island, mounting bracket and channel boundary spacing should be  $< 0.15$  m.  $> 0.15$  m, it will increase the angle of view of the license plate, the effects of camera algorithm.
3. The camera installation height of 1.2 to 1.5 m, 1.2 m recommended;
4. Snapshot camera is mounted on the snapshot line (or coil) pitch (horizontal distance) from 4 to 6 meters location, recommended 4 m;
5. Scene width adjustment, take a picture of the license plate from 100 to 140 pixels to identify the best effect.
6. We recommend using a coil to snapshot program.

## 2.1.2 Before Installation

Many factors affect the camera identification, such as channel width outside the camera monitoring capabilities, the camera installation point setting unreasonable. These are the physical factors related vision camera can face up to identify whether the conditions of the license plate or license plate angle question meets, from a technical level, cannot be solved. Therefore, in front of the camera installation is a good program, to be circumvented. The following is a preliminary plan to install cameras Important note:

1. The installation position of the camera in the vehicle into the parking lot should be planned passage complete turn, straighten the front and then moved back 4 meters. The vehicle has a turning procedure when entering (or exiting) parking lot entrance channel, when the license plate and the camera is a certain angle, cause the camera not face license plate or license plate angle is too large, the impact of recognition. Therefore, the camera should be set up to snapshot the point of complete turn in the vehicle at the camera front plate. Determine the position of the camera to snapshot the line, the camera mounting position can be determined by reference to standard protocols that snapshot the line after 4 meters.

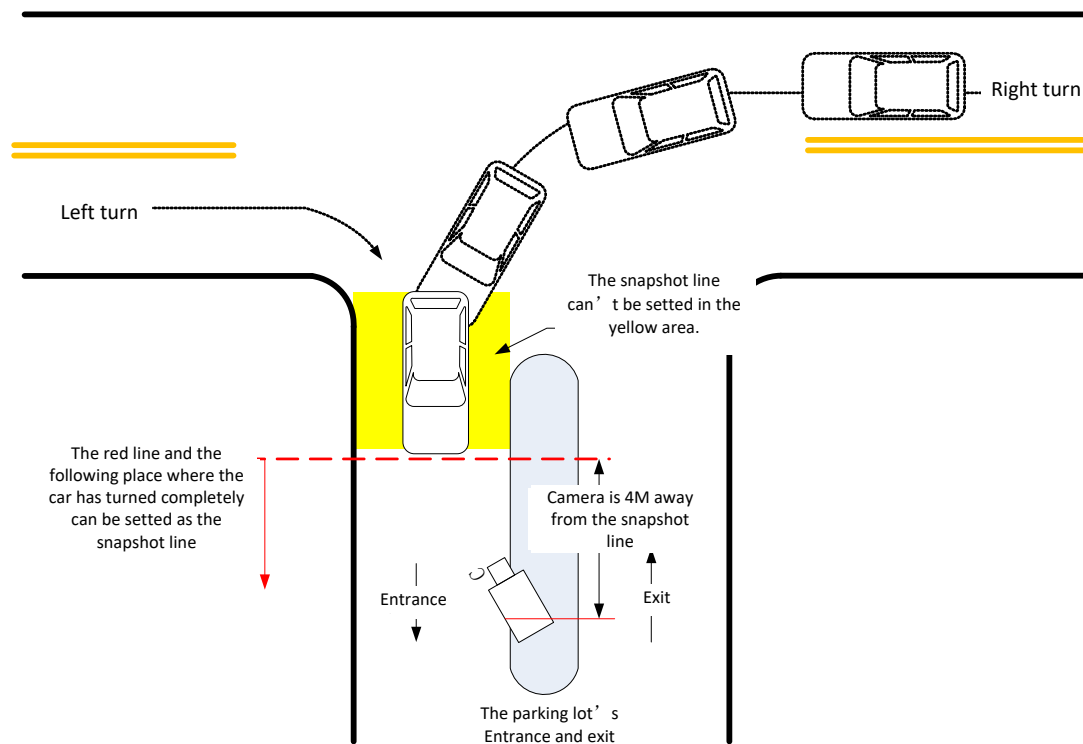


Figure 2- 2

2. The camera monitor channel width 3.5 meters maximum. Greater than 3.5 m, and respond channel do physical isolation, to meet the requirements;
3. The camera bracket mounting points and channel boundary of Requirement: The camera mounting bracket and channel boundary spacing of less than 0.15 m spacing, as shown in:

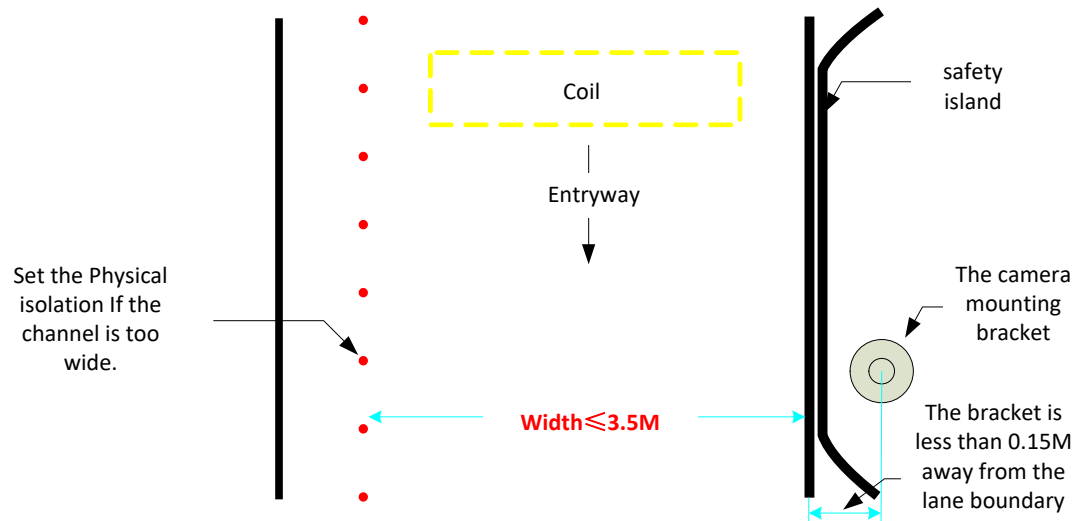


Figure 2- 3

## 2.2 Coil Cut

### 2.2.1 Coil Cut Specification

Select coil snapshot scheme system, need to cut coil, see Figure 2- 4.



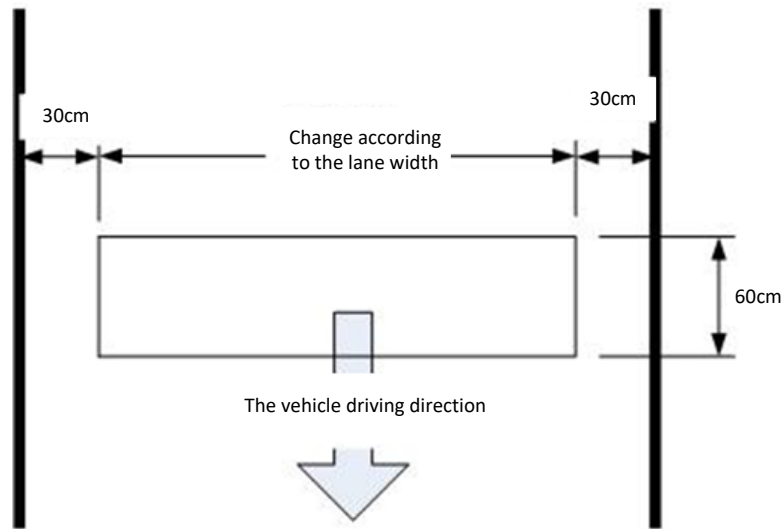


Figure 2- 4

Note:

1. Coil edge safety distance 30cm;
2. Coil edge depends on lane width;
3. Coil length (vehicle driving direction) 60cm;
4. Coil wind 4 times.

### 2.2.2 Coil Recommendation

Loop coils are buried beneath the road surface, it is required that it should have good heat resistance, cold resistance, pull, anti-corrosion performance and flexibility. FVN1.5 m<sup>2</sup> recommended temperature cables.

### 2.2.3 Process Requirement

Coil detection system, in order to ensure that the camera is stable coil normal snapshot, and correct construction process coil is a coil job security. Therefore, make construction according to process requirements.

Coil cut process is in Figure 2- 5,

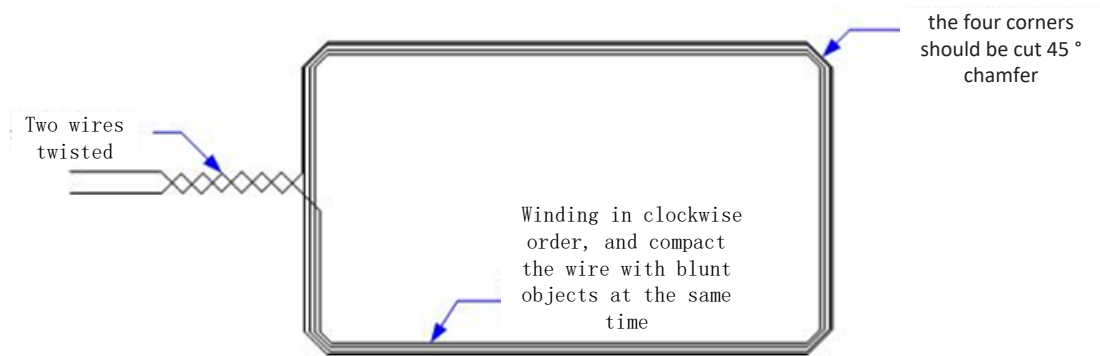


Figure 2- 5

**Note:**

1. Grooving width requirement of 8mm width, depth requirement 30~50mm;
2. When cutting, the four corners should be cut 45 ° chamfer, the coil wire protection;
3. Before the assembly line, to deal with grooving to clean up, to ensure that no debris trough; if cleaned with water trough, the need for air-drying operation blow tank, to be completely dry before winding groove;
4. Wrap, tap to be reserved well refuges hand in hand well set aside a certain redundancy;
5. Wind clockwise order around 5 bar. When wound, blunt-by-turn required the cable compaction;
6. A coil to the cable hand hole section leads to two lines to be twisted, requires at least 20 pair / m density;
7. Upon completion of the winding, the need to refill the survey line groove. The main test parameters off and the coil inductance inductance values required to be between 80 ~ 1000uH;
8. Recommend to use about 80 °C asphalt fill slots. Avoid foaming when filling slots drip hollow, uneven, etc., affect the performance and appearance. After the asphalt dried, the excess part of the road leveled.

## 2.3 AUX Installation Bracket

ITC237-PW1A-IRZ model of camera, can be used for docking two stents, one for companies supporting pole bracket, the other is widely used in engineering all-direction bracket. According to user matching stand is different, their installations vary greatly, the following camera supports the installation of two stents described in detail.

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### 2.3.1 Standard Bracket Installation

Standard bracket and pedestal are shown in Figure 2- 6.

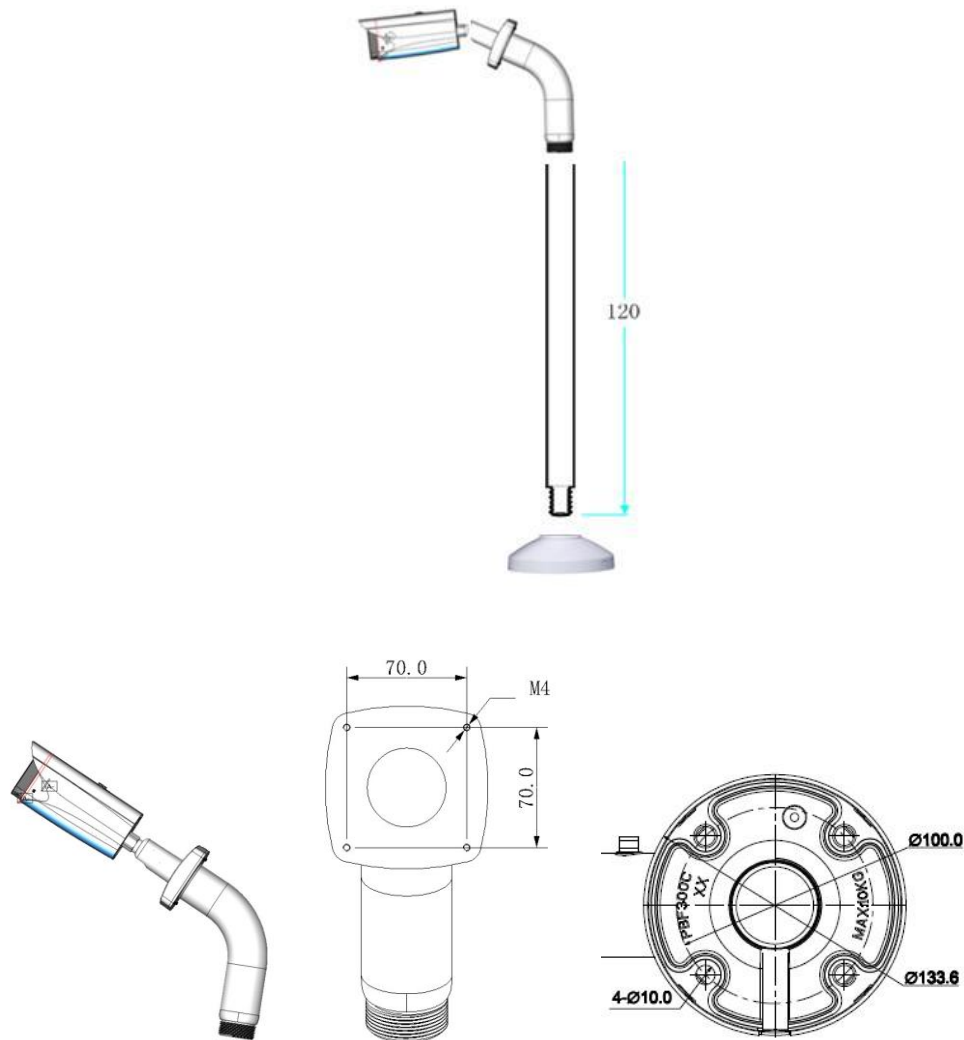


Figure 2- 6

### 2.3.2 All-direction Bracket Matching

Project common all-direction bracket has two models of WS2790 and 8081, both are identical interfaces. The following uses 8081 stand as an example, this project uses bracket installation method:

1. Adopts all-direction joint to install, must used all-direction bracket, see Figure 2- 7.



Figure 2- 7

2. The whole effect after installation. See Figure 2- 8.



Figure 2- 8

3. Bracket dimensions are shown in Figure 2- 9.

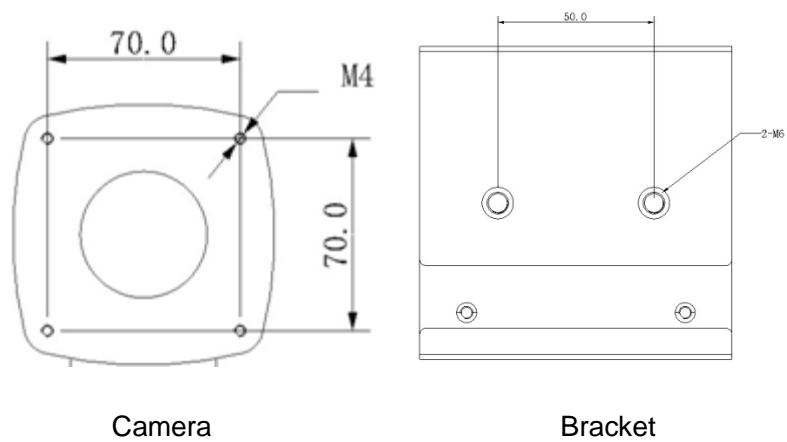


Figure 2- 9

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## 3 Common Application and Wiring Reference

### 3.1 Camera Common Application

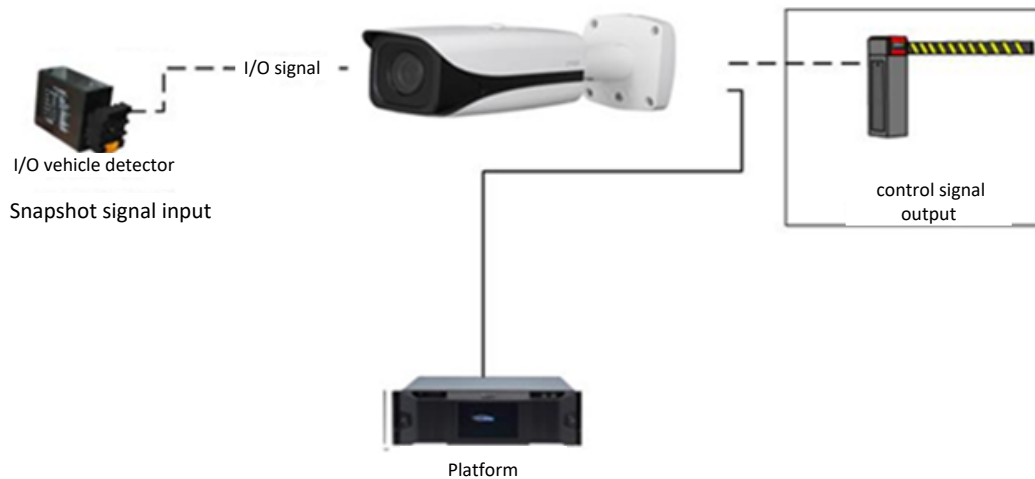


Figure 3- 1

Note:

1. In above figure, dotted line is an optional device connected to device, the actual project have this device, determined according to the user program.
2. In above figure, the two vehicle inspection device, the camera supports IO signal vehicle inspection device access;

### 3.2 Wiring Reference

Device connected to camera are vehicle detector, gateway. Network connects to platform at rear. See Figure 3- 2.

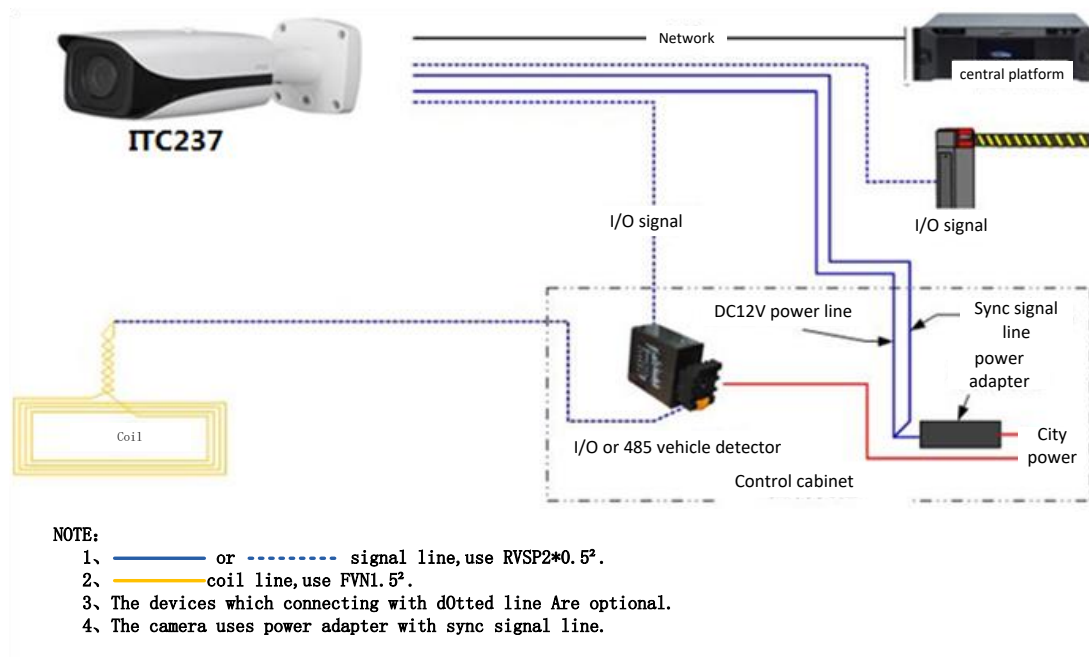


Figure 3- 2

### 3.3 Camera Wiring Network Waterproof

When you wire camera, you shall make sure network is water-proof, prevent crystal head copper aging.

The accessories bag provides network water-proof joint, see Figure 3- 3.

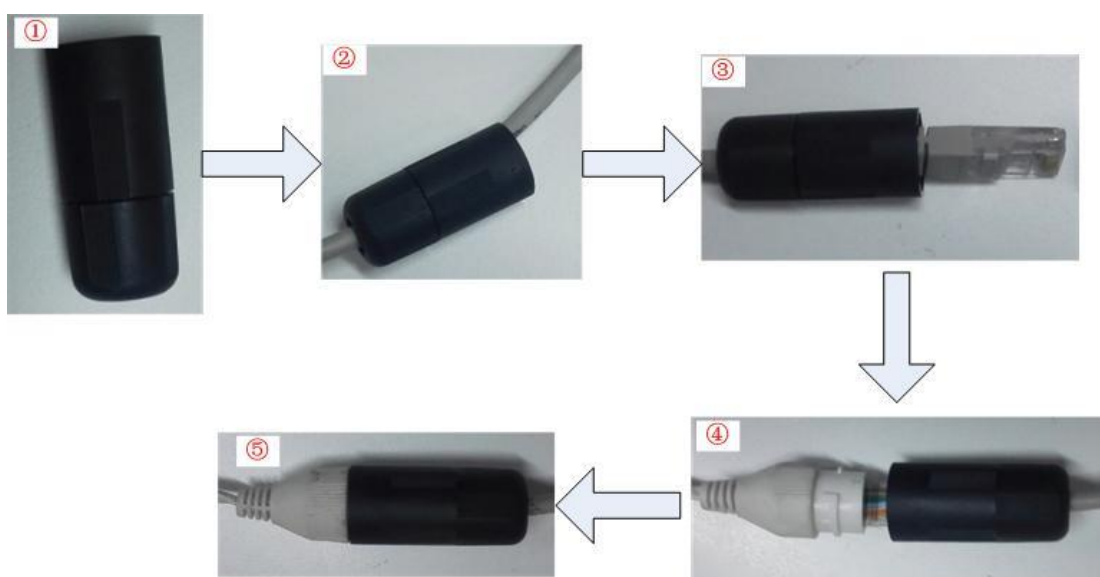


Figure 3- 3

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Note:

- Take out network waterproof head from random accessories bag;
- Insert network head in to waterproof joint;
- Make crystal head, test cable;
- Match cable, fasten waterproof joint.

## **4 System Debugging**

### **4.1 Device Login**

Access camera via IE, on WEB you can browse and set camera real-time data and parameter, default IP address is 192.168.1.108. If you use IP to login device for the first time, you shall notice the following.

#### **4.1.1 IE Browser Recommendation**

Windows XP OS requires IE 7 or higher version. Windows 7 OS requires IE 7 to 9 versions.

Note:

If you use a high version of IE, you may encounter abnormalities in login and display.

#### **4.1.2 Download Browser Control Unit**

Initial use IE browser to log device can not log situation is likely to arise, it is because the computer IE browser internet options, security protection level is set too high to prevent the camera caused WEB control download, so Adjustment IE browser security settings. Open IE browser, in the Properties → Security → Custom Level option can be browser security level adjustment, this will ActiveX control / plug-in option is set to Enable, you can successfully download controls.

To adjust IE Browser security level:

1. Right-click on Internet option of the IE browser's Properties or click on the IE page tool, open Internet Properties / Options window, select the Security tab, click Custom Level parameter button, see Figure 4- 1.

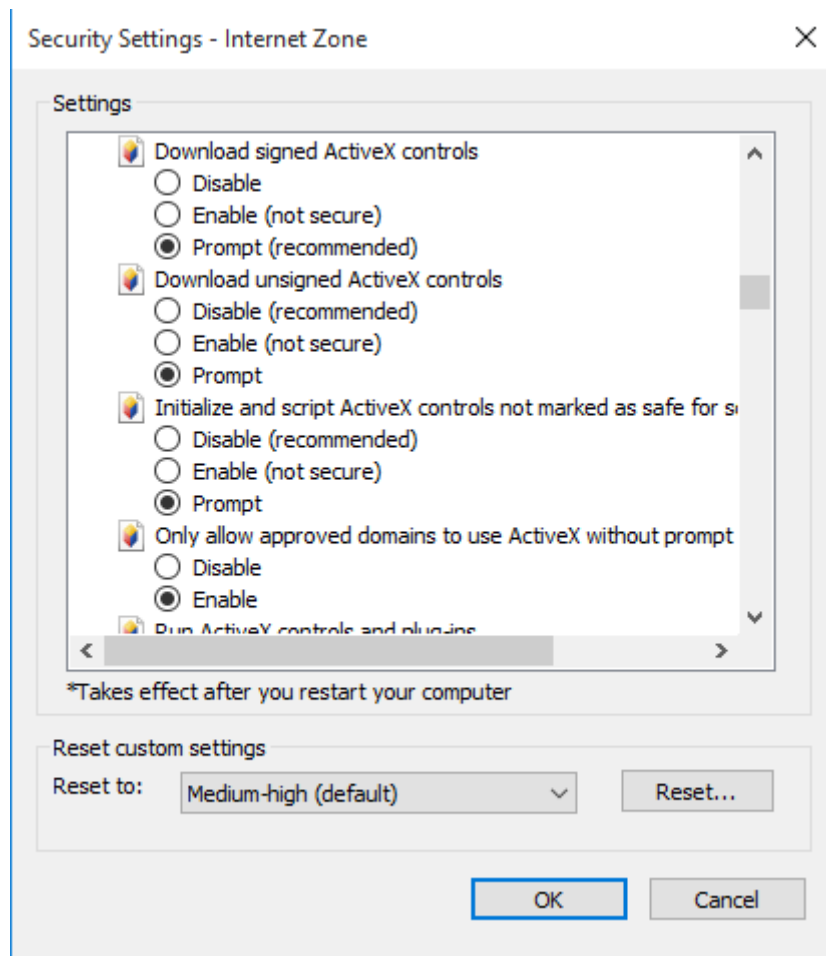


Figure 4- 1

2. The ActiveX controls and plug-related options are set to enable;
3. Click Apply to complete the IE browser security level configuration.

### 4.1.3 Browser Notification

Company facilities are using IE to access, log in to different procedure is recommended before the camera, remove the PC version of original download WEB controls and browser history, to avoid conflict.

To remove controls and IE browser history data:

- ✧ Delete browsing history IE browser: Right-IE browser → Properties → General → delete browser history → Delete All;



- 
- ✧ Delete computer WEB control methods: My computer → C disk → Program Files → Remove webrec folder.  
Note: WEB control shall be closed before deleting the browser.

#### 4.1.4 WEB Page Intro

IE after login camera, WEB page display, see Figure 4- 2, please refer WEB Operation Manual for page functions.

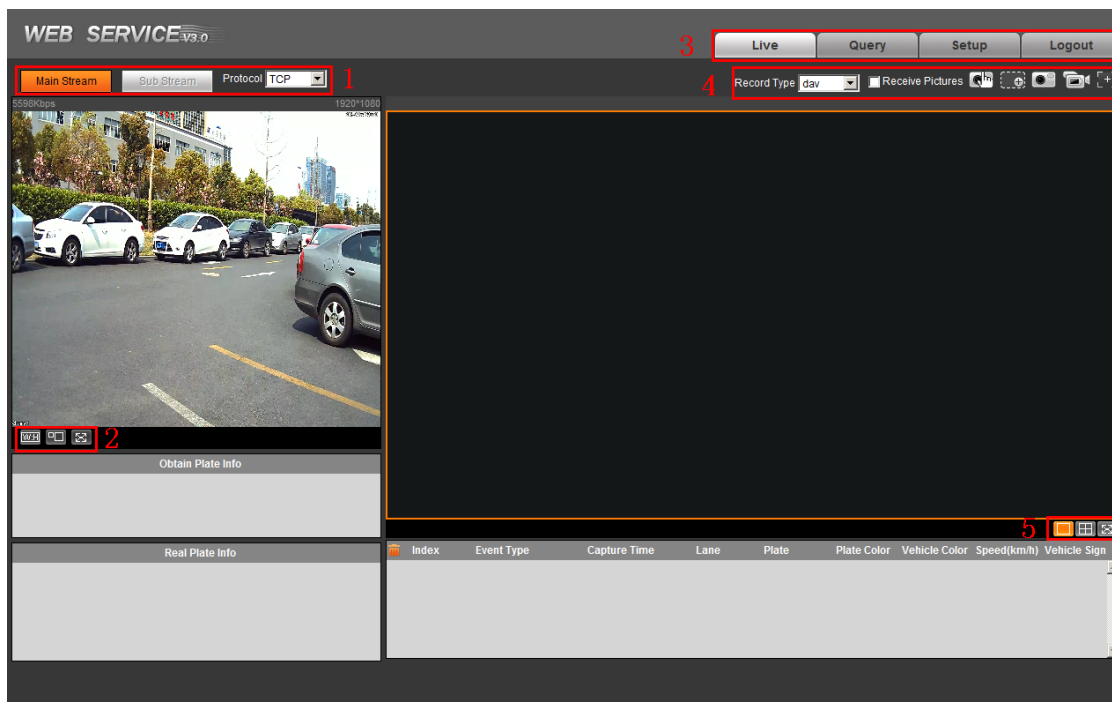


Figure 4- 2

#### 4.2 Scene Requirements

See Figure 4- 3.

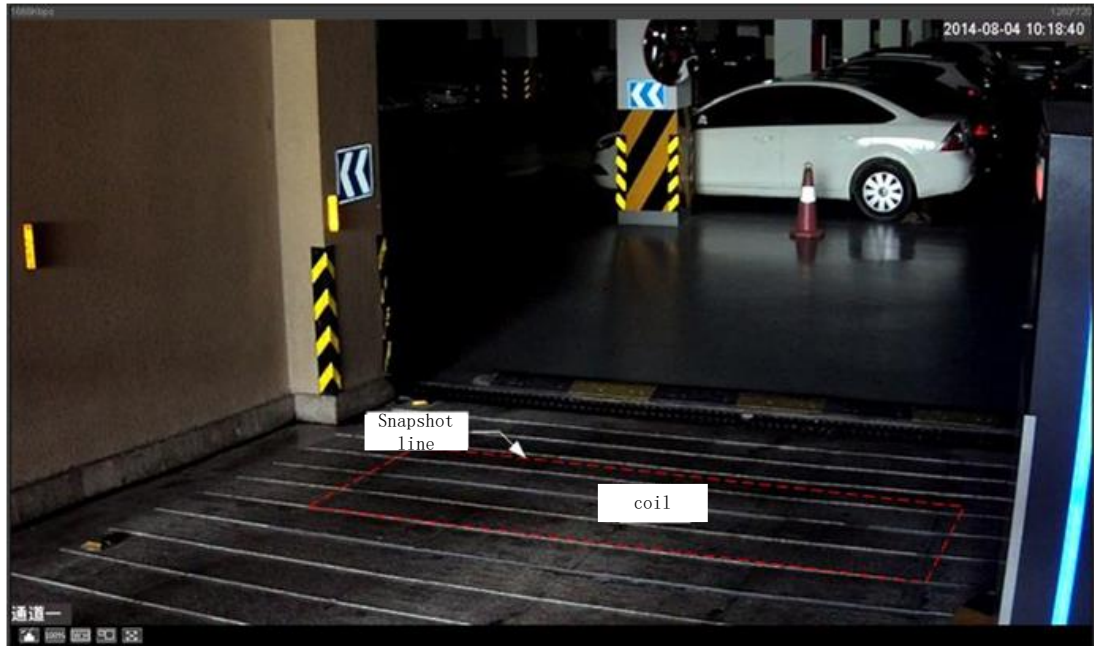


Figure 4- 3

Note:

- ✧ View of all channels on the right, leaving the left side of excess;
- ✧ Trigger lines (snapshot) in the image at 1/3;
- ✧ When adjust the camera angle, try to make sure the license plate level.

## 4.3 Camera General Parameter Note

The camera in the parking lot entrances and exits the application, common (possibly modified) are snapshot, intelligent business, white list, camera attributes and Network parameters, related parameters are described below.

### 4.3.1 Snapshot

Intelligent traffic all relevant parameters are associated with intelligent transportation business, its highly targeted, unable to cope with the global default parameters. Therefore, some parameters need to be adjusted according to project requirements.

#### 4.3.1.1 Lane Property

Lane Properties page, the most commonly used is the enable snapshot and Event Configuration Advanced Configuration two parameters. enable snapshot can be selected as the machine monitoring capability, maximum support open 5-lane snapshot, the default

one lane open. Advanced Configuration parameter event configuration, it can perform snapshot direction (the direction of the camera relative to the vehicle) the selection, provide forward, reverse two-way three directions, default bidirectional.

See Figure 4- 4.

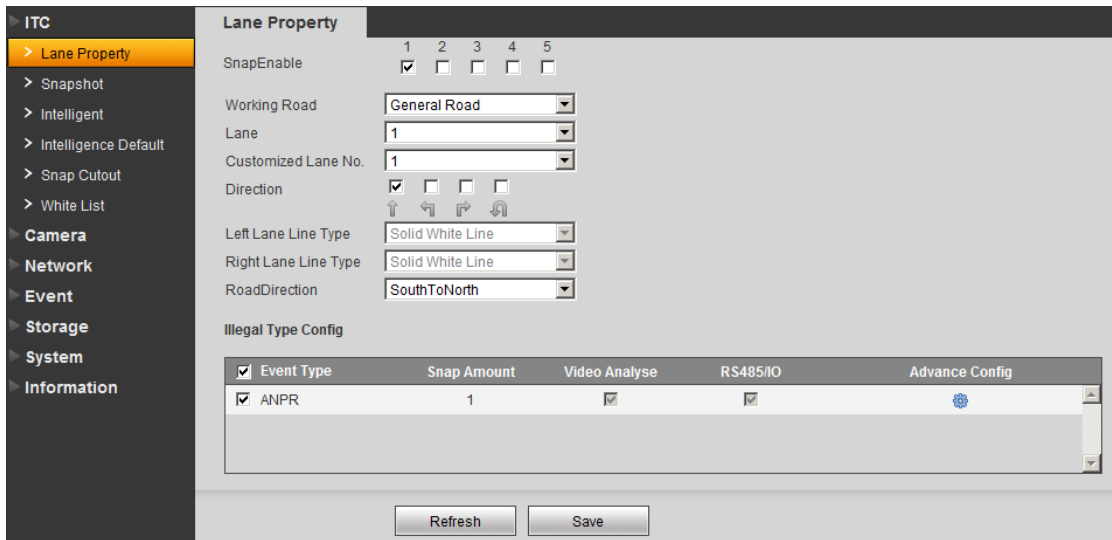


Figure 4- 4

4.3.1.2 Snapshot

Snapshot page, often uses OSD parameter. OSD parameter is overlaid information after the camera snapped pictures of parameters, selected according to the actual situation of the project, see Figure 4- 5.

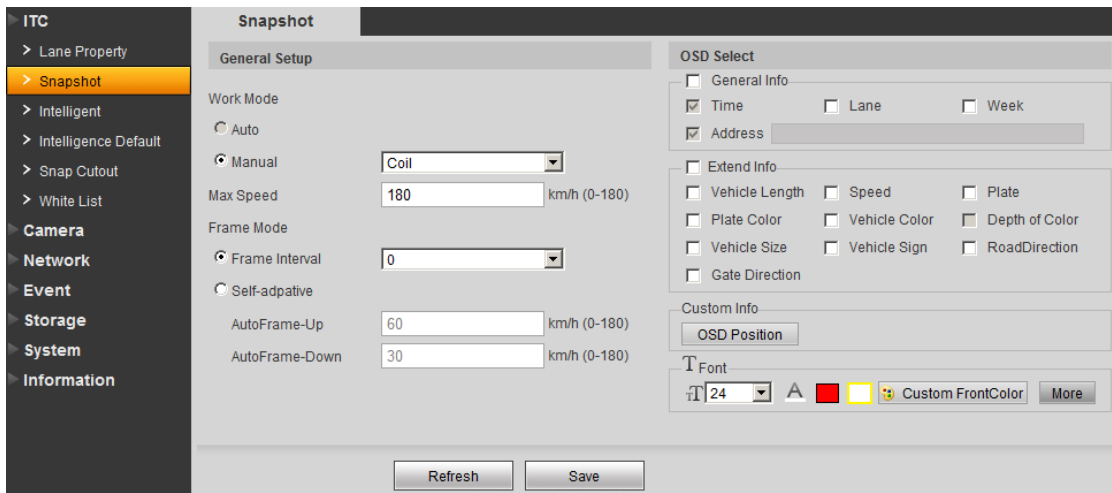


Figure 4- 5

### 4.3.1.3 Intelligent Business—Scene

Intelligent Business parameter page, used scene configuration, recognition parameter. In scene configuration page, to be based on the use of environmental conditions paint lane recognition area.

See Figure 4- 6.

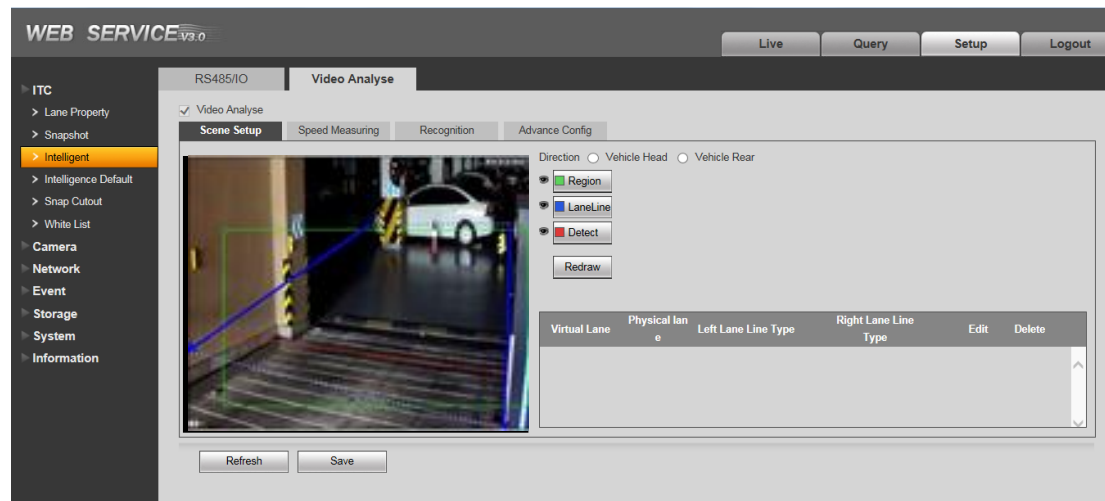


Figure 4- 6

To configure scene:

Step 1. Click Video Analysis tab.

Step 2. According to the actual scene conditions, draw area line, lane line and detection line and other parameters. To ensure effective identification plate, regional line range should contain the whole vehicle into the capture process, about two-thirds of the screen.

Step 3. Save config.

### 4.3.1.4 Intelligent Business—Recognition

In the Recognition parameter page, you need to set the local word parameters based on user location, raising the rate to improve character recognition. See Figure 4- 7.

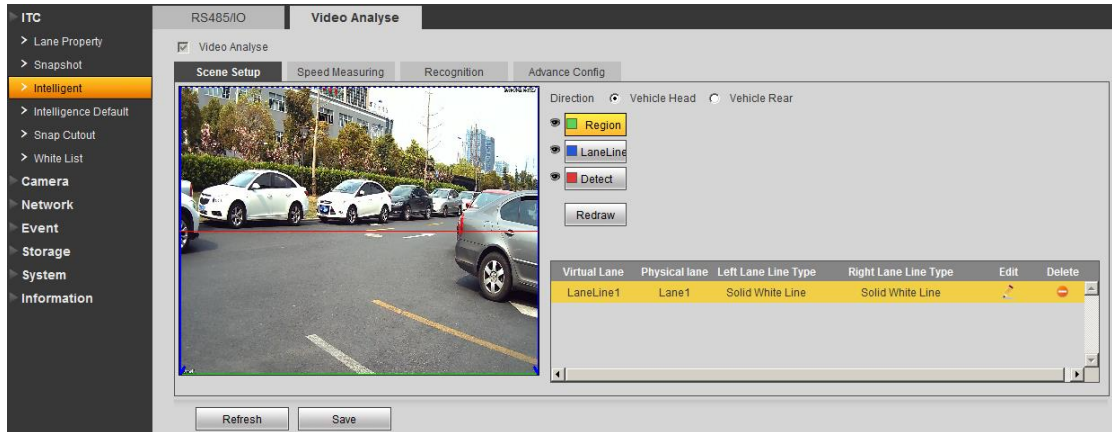


Figure 4- 7

### 4.3.1.5 White List

Some enterprises, toll-free parking, check user permissions on camera, under the authority to determine whether the applications of the gate opening, which use the camera a white list function.

The camera's white list function involves white list and linkage gateway two parts, white list can be divided into white list settings and white list data, white list settings are some of the class argument white list data was white list database management parameters. Linkage gateway output is to select the camera control gates gate way.

See Figure 4- 8 and Figure 4- 9.



Figure 4- 8

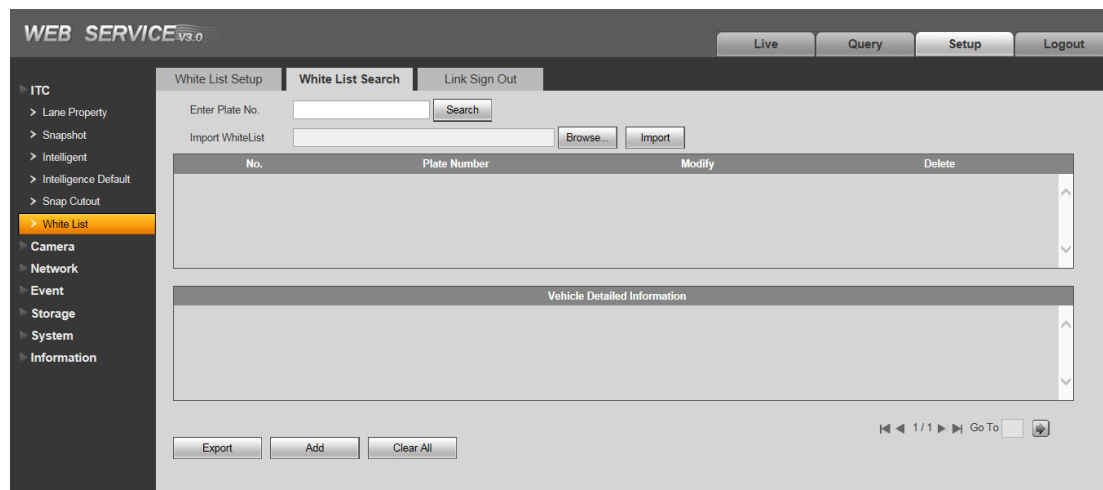


Figure 4- 9

### 4.3.1.6 Linkage Gateway Output

See Figure 4- 10.

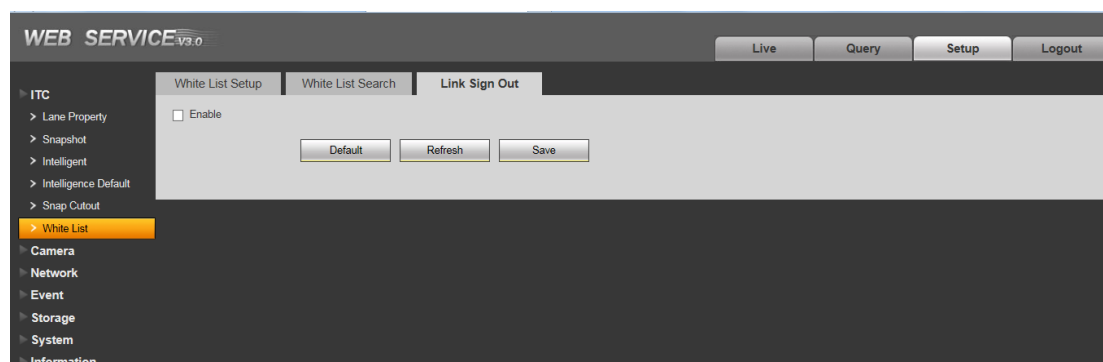


Figure 4- 10

Note:

- ✧ Enable: Is option is enabled;
- ✧ Gateway Control: The camera offers three kinds of barrier of control options, you can also check the radio, where the white list gate with all vehicles are mutually exclusive.
- ✧ Alarm Output: Select the Barrier signal transmission channel, the actual application, the need to match the physical wiring;
- ✧ Output delay: a long Barrier control signal output, default 1000ms.

### 4.3.2 Image Parameter

Camera attribute parameter is image-related parameters, including shutter, gain, saturation, sharpness. The camera image parameters appropriately adjusted for differences in the actual application environment, and can enhance the camera image.

See Figure 4- 11.

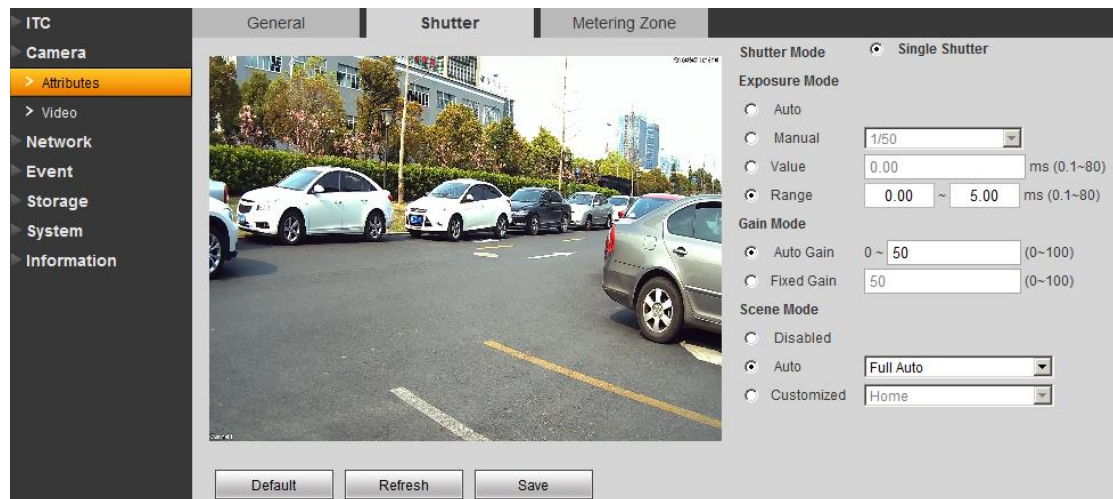


Figure 4- 11

We recommended dual shutter, video shutter is 0 to 10, gain is 40; picture shutter is 0 to 5, gain is 40.

### 4.3.3 Network

All devices' default IP address is 192.168.1.108. Before combining LAN, you shall modify device IP to avoid conflict. Modify device IP in TCP/IP in Network. See Figure 4- 12.

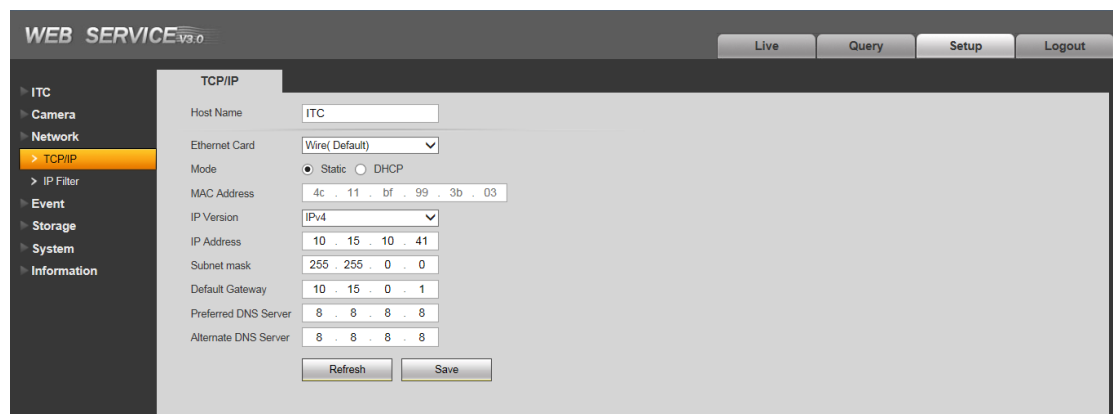


Figure 4- 12

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After IP is modified, you shall test network, ensure IP is modified correctly. Use PC ping command to test.

## 4.4 Device Program Upgrade

Cameras WEB page has integrated update function; can use the Quick Configuration Tool (config tools) to upgrade two upgrade options. The following details the two upgrade.

### 4.4.1 WEB Upgrade

Step 1. WEB log in, then click on the "Settings" "System Management" to "Firmware Update" page, see Figure 4- 13.

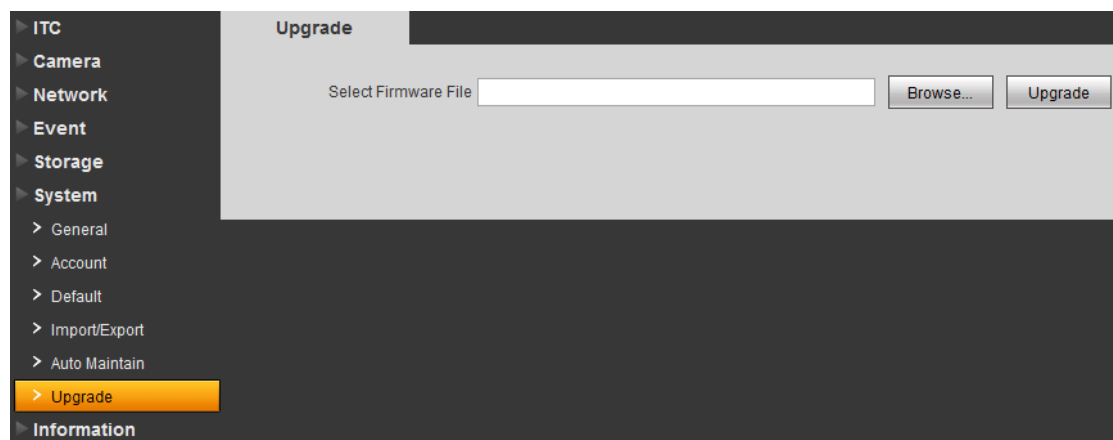


Figure 4- 13

Step 2. Click Browse, see Figure 4- 14.

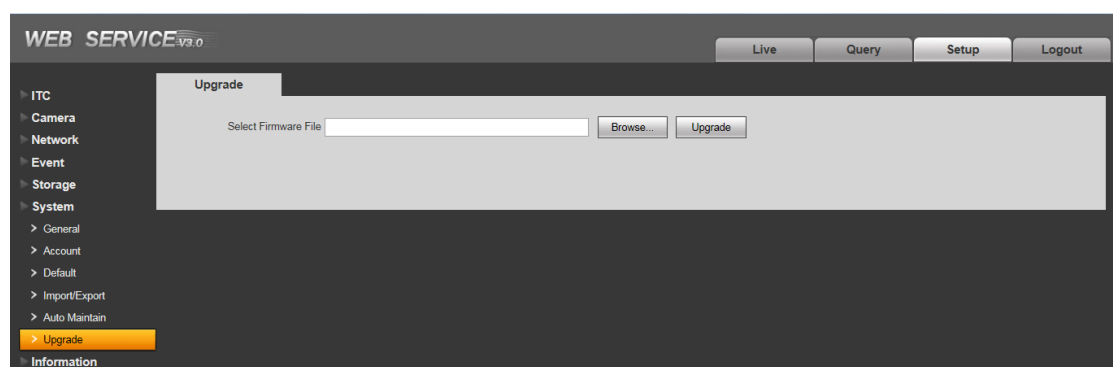


Figure 4- 14

Find the program in the parameter page, and select the upgrade program.

Step 3. Click Upgrade button. When device starts to upgrade, progress bar pops up, see Figure 4- 15.



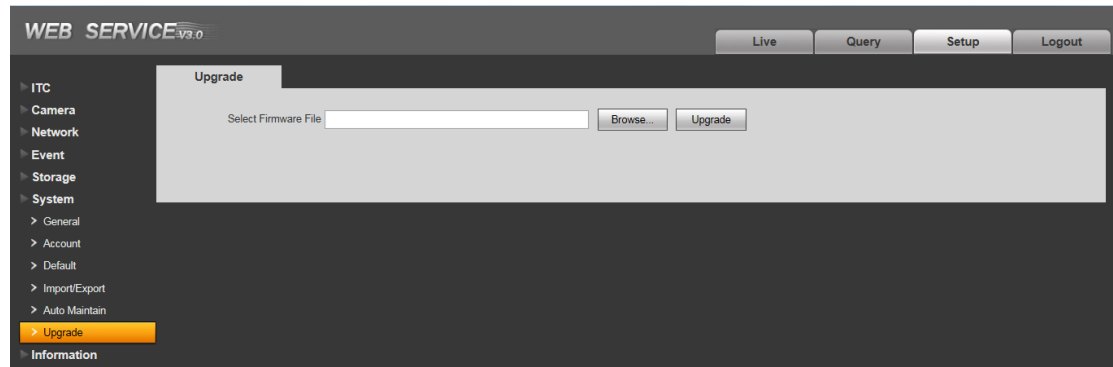


Figure 4- 15

After upgrading completes, device will auto reboot. See Figure 4- 16.

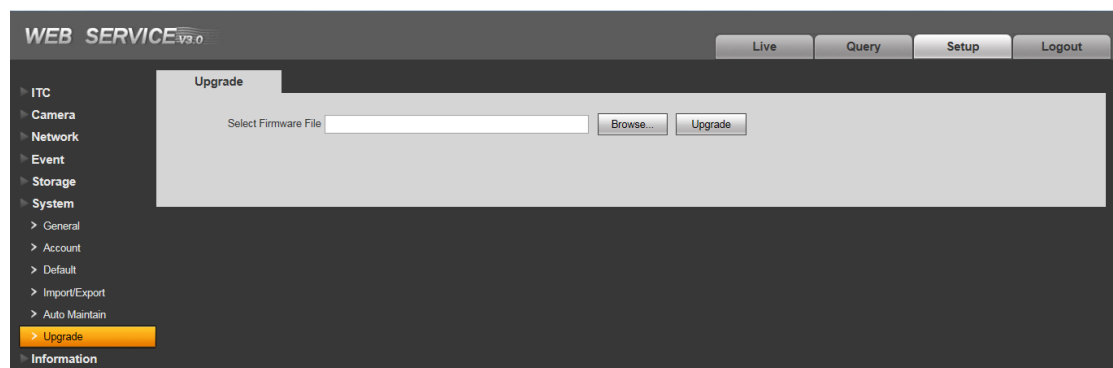


Figure 4- 16

## 4.4.2 Config Tool Upgrade



You can upgrade device via this Quick Configuration Tool either one by one or as a batch.

Please follow the steps listed below to upgrade the device.

1. Log in the configuration page of device.
2. Click on system upgrade tab. See Figure 4- 17.

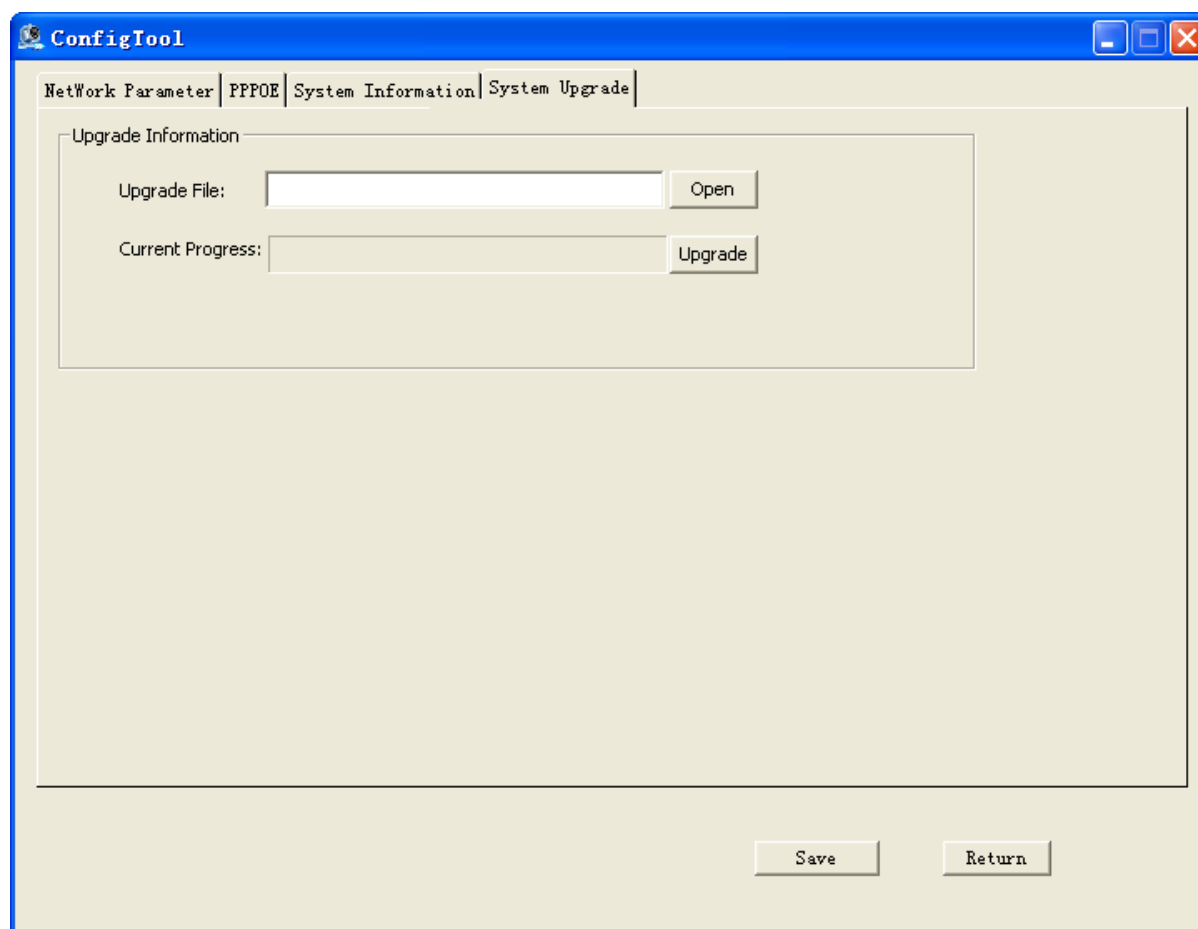


Figure 4- 17

3. Click on open. The open box pops up.
4. Select upgrading file of the device and click on upgrade.  
You can see a prompt "system is transferring the file, please wait...." After transferring the file, system begins to upgrade.
5. When upgrading is done, system pops up a dialogue box. Please click OK to complete upgrading process. The device will reboot automatically.

If you cannot upgrade, please follow the steps listed below:

- First, please check if device upgrading file is right or not. You shall select the proper version to upgrade the device.
- If the device is running properly and you still cannot upgrade. Please reboot the quick configuration tool and then log in again to update the device.
- If the program error occurs, while the device kernel has booted up, you can use background upgrade port 3800 to log in the configuration tool's main interface to upgrade. **Please note: the other values such as PPPoE, system information are invalid.**

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### 4.4.3 Restore Default Config

Device upgrade two adjacent versions of the program, the controls basically compatible, not anything unusual after the upgrade. But before and after the upgrade version spans much of the program, such as upgrading from first base to third base (V2.1-V2.3), because the device capabilities expand, prone not compatible control and cause problems, such as WEB page display abnormal function key failure, some features cannot be achieved, etc., affect the actual use of the device.

In such cases, resolve via device Restore Default action.

Camera Design software reset and hardware reset in two ways, the effects are the same, the user can choose according to the scene. Here two recovery default method Details are as follows:

1. Software reset
  - a) After the upgrading is complete, via WEB login device.
  - b) WEB page for the device in successive click Setup → System Management → Default to restore the factory default page, click Default button to restore the factory system configuration settings.

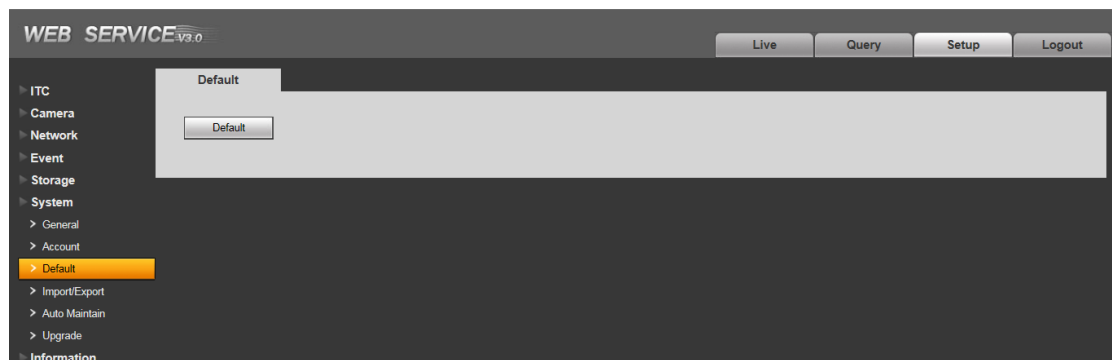


Figure 4- 18

#### 2. Hardware Reset

After the upgrading is complete the device start, press cable RESET button to restore the default camera, the device default IP: 192.168.1.108

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#### 4.4.4 Before Upgrading

1. If the device system upgrading fails, users find out the cause. If the device has upgrading file error, the user will replace the device upgrade file to the correct version and then upgrade the device. If the device is running, and other causes make the device unable to update the system, restart the quick configuration tool, log on fast configuration tool for device upgrade.
2. After the system upgrading is complete, and if to restore the default configuration , you can select more than two devices to restore the default configuration method.

Note: hardware reset, the device can restore the default IP.

## 5 FAQ

Problem	Solution
I cannot boot up the device.	<ul style="list-style-type: none"><li>● Check power supply.</li><li>● Please click RESET button for at least five seconds to restore factory default setup.</li></ul>
A few minutes after boot up, device auto reboots or system crash.	<ul style="list-style-type: none"><li>● The input voltage is unstable or too low.</li><li>● Camera hardware fault.</li><li>● Upgrading error. Press Reset button for 5s, if not work, contact customer service.</li></ul>
Unstable network connection	<ul style="list-style-type: none"><li>● Network instability.</li><li>● IP address conflicts.</li><li>● MAC address conflicts.</li><li>● Camera is rebooting.</li></ul>
Cannot login the device via IE	<ul style="list-style-type: none"><li>● Check the device start-up and network connectivity;</li><li>● Browser security level is too high, preventing WEB control download;</li><li>● Local computer control and camera space conflict, delete the control re-download;</li><li>● Username Password error;</li><li>● Camera program does not start properly, press the Reset button for 5 seconds to reset to try;</li><li>● Hardware failure, contact customer service.</li></ul>

Problem	Solution
Image color, brightness distortion or video blurred	<ul style="list-style-type: none"> <li>● Camera parameters is not properly configured ,restore the default;</li> <li>● Camera bit stream parameter setting is unreasonable, improve camera stream;</li> <li>● Camera image sensor fault, contact customer service.</li> </ul>
Wrong time	<ul style="list-style-type: none"> <li>● Synchronize with the PC;</li> <li>● Device hardware failure, contact customer service.</li> </ul>
PC cannot play Dahua record file	<ul style="list-style-type: none"> <li>● Dahua play is not installed, please download it from Dahua website.</li> <li>● Play version is too low, update the player.</li> </ul>
Video mode no snapshot when a car passes	<ul style="list-style-type: none"> <li>● Plate pixel is too big or too small, adjust camera scene according to Ch 3.1.2;</li> <li>● Picture of the license plate too steep;</li> <li>● No fill light, license plate recognition luminance did not meet the requirements, please check the camera parameters and fill light angle;</li> <li>● Plate overexposure, cause the camera does not recognize, please fill light trimming angle;</li> </ul>
Coil mode does not snapshot	<ul style="list-style-type: none"> <li>● Check the physical connection;</li> <li>● Camera parameters are not set correctly, check IO parameters;</li> </ul>

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**Note:**

- **This installation manual is for reference only. Slight difference may be found in user interface.**
- **All the designs and software here are subject to change without prior written notice.**
- **All trademarks and registered trademarks are the properties of their respective owners.**
- **If there is any uncertainty or controversy, please refer to the final explanation of us.**
- **Please visit our website or contact your local service engineer for more information.**