

**ANPR product functions and  
problem troubleshooting**

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# 1. Problem feedback

## 1.1 Information collection






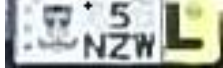

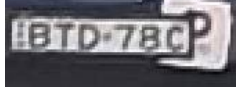




### 1.1.1 Basic information

Items with \* are required

Information collector:		
Date of information collection:		
Project category	Example	Feedback information
Project*	N/A	
Equipment model*	iDS-2CD7A26G0/P-IZHSY iDS-2CD7A46G0/P-IZHSY(C)	
SN of issue Equipment*	D12345678	
Firmware version*	V 5.7.80 build 210909	
Custom order number*	DZ123456789	
Total number of equipment*	It refers to the total number of equipment purchased by the customer in the same batch (including normal + issue equipment)	
Total number of issue equipment*	It refers to the number of all equipment that feedback issue phenomena this time	
Frequency of issue*	It refers to the time when the issue equipment first appears issue	
Recognition rate Capture rate*	For example, 90% (20 / 400), 200 pictures in the day and 200 pictures in the night (the pictures need to be continuous), use the attachment tool for statistics, and please attach the original pictures captured Count 200 cars in succession, how many cars were captured and how many cars were missed*	
Platform*	What platform is the camera connected to	

<b>Equipment installation time*</b>	It refers to the installation time of the same batch of equipment (including normal + Issue equipment)	
<b>Site information*</b>	<p>Need to shoot the installation position of the camera from the outside and attach the values of installation height and angle</p> <p>Height: 6.3m</p> <p>Depression angle: 15°</p> <p>Horizontal deflection angle: 15°</p> 	

## 1.1.2 Issue information

Misidentified Plates			
Type	Remark	Misidentified plate figure	Real plate figure
Letter misidentify	O identified as Q		
	D identified as 0		
	<b>Total number of issues</b>		/
Special vehicles/plate	Dual decker	/	/
	P/L plate		
	P/L plate		
	<b>Total number of issues</b>		/
Non-plate identified as plate	Light/Shadow		/
	Railing		/
	<b>Total number of issues</b>		/
Missed plates	/	/	
	/	/	
	/	/	/

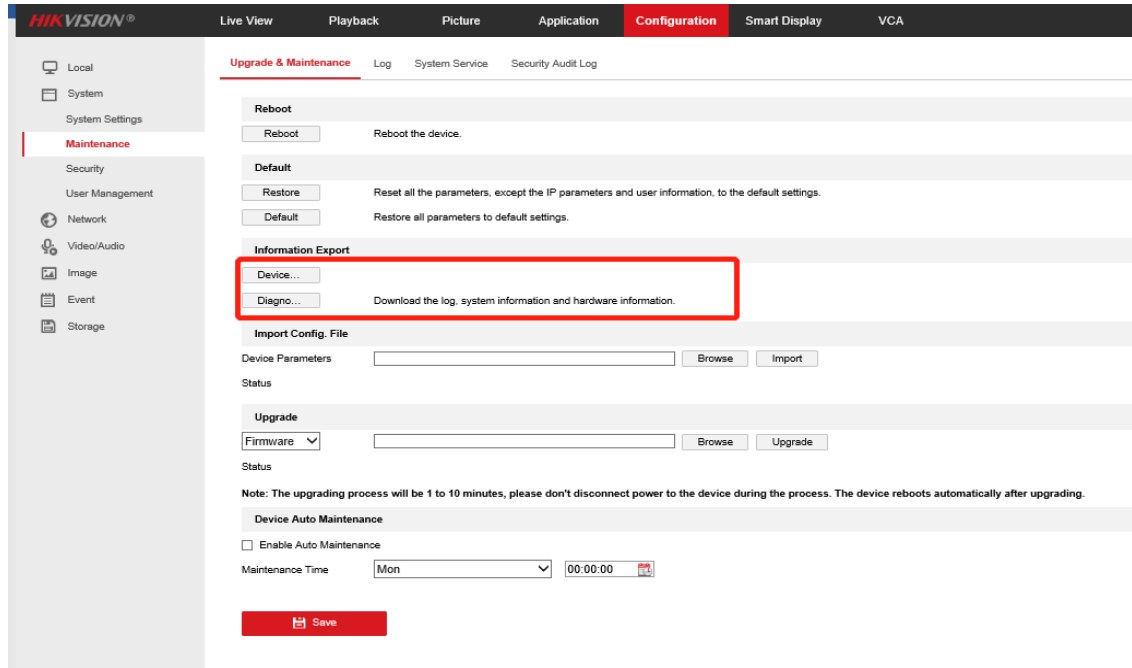
	<b>Total number of issues</b>	/
<b>Remark</b>	<i>The naming rule of the plates in this country</i>	

## 1.1.3 Camera files

Please attach **All captured figures** and the **Screenshot of Road Traffic page**.

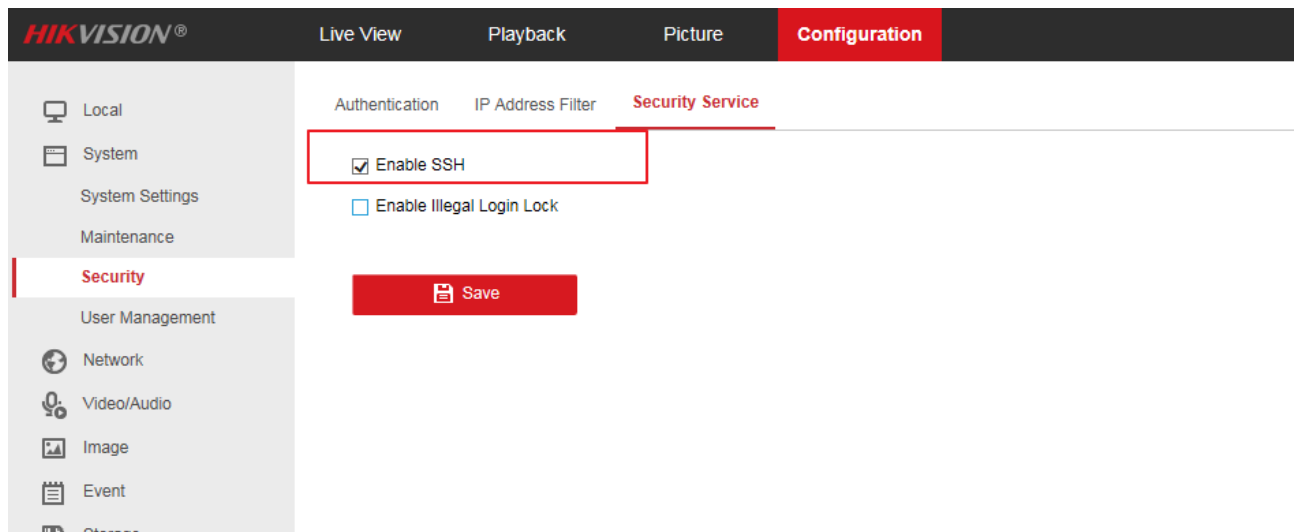
Configuration of road traffic page

And export the **Diagnose Information** and **Device Configuration Data** (and the password when exporting it) and send these to HQ

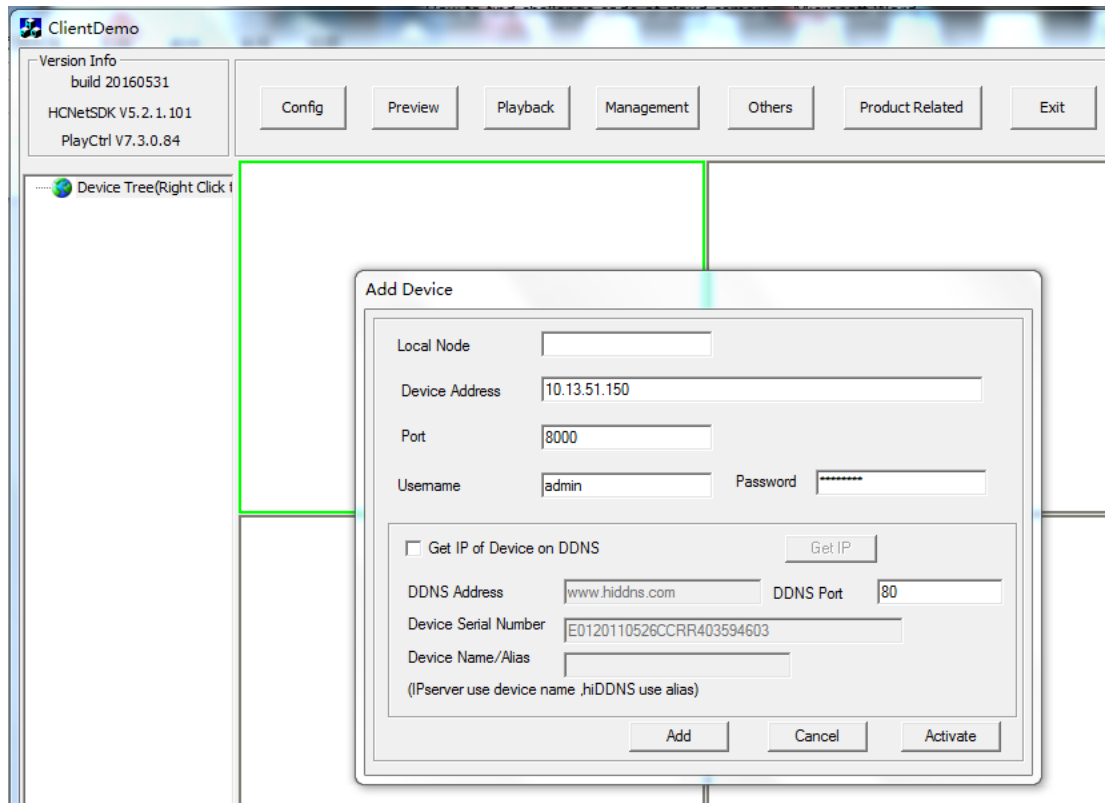


## 1.1.4 Print information

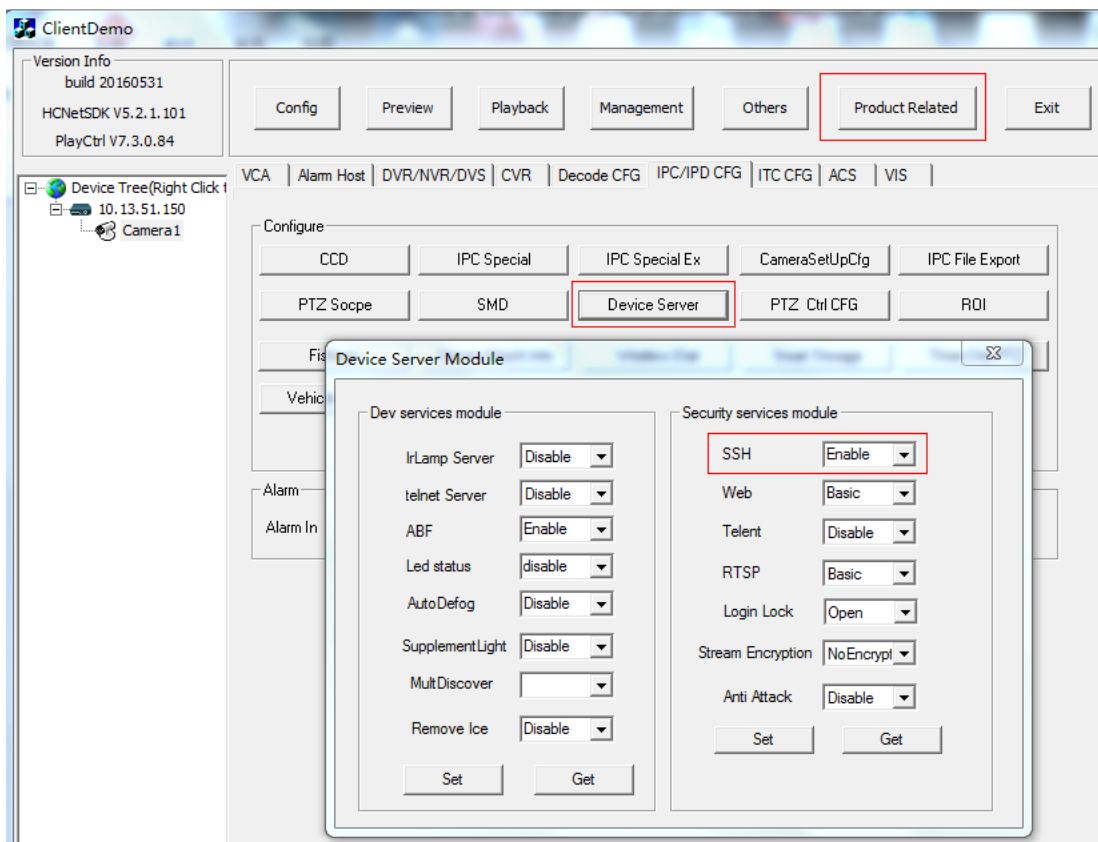
1. Serial port connection device; Or SSH login device.
2. There are two ways to enable SSH. One is enabled via web interface directly.



3. Another one which doesn't support enable it via web interface, it needs to use ClientDemo tool. Add the camera to ClientDemo tool.



4. Choose the camera and select the below path: Product Related>IPC/IPD CFG>Device Server>Enable SSH, then click Set to save the setting.



5. PSH unlocking device:



Input **debug**

Then use the OA terminal console to query the password to unlock the device.

6. Input command, release printing
  - 1) Input: **prtHardInfo**
  - 2) Input: **setDebug -1 7 -d 111 -m ROAD\_TRAFFIC** (Note: Input manually. You can use the commands in the table below to replace as requested by tech support colleagues)
  - 3) Input: **outputOpen**
7. Common print commands for H7, H8 devices.

ANPR basic information	setDebug -1 7 -d 111 -m ROAD_TRAFFIC
General module	setDebug -1 7 -d 111 -m EDA_UTILITY
SDK Upload Center	setDebug -1 7 -d 111 -m EDA_UPLOADER
Alarm output	setDebug -1 7 -d 111 -m EDA_ALARM_OUT
HTTP listening	setDebug -1 7 -d 111 -m EDA_HTTP_LISTEN
FTP	setDebug -1 7 -d 111 -m EDA_FTP
Capture	setDebug -1 7 -d 111 -m EDA_CAPTURE
Storage	setDebug -1 7 -d 111 -m EDA_STORAGE
webSocket	setDebug -1 7 -d 111 -m EDA_WS
Mail linkage module	setDebug -1 7 -d 111 -m EDA_EMAIL
Alarm host	setDebug -1 7 -d 111 -m EDA_HOST
ISUP linkage module	setDebug -1 7 -d 111 -m EDA_ISUP
Wiegand	setDebug -1 7 -d 111 -m IPC

8. Common print commands for R3, H3 devices.

setDebug -1 7 -d 111 -m alarm\_exp

setDebug -1 7 -d 111 -m dsp

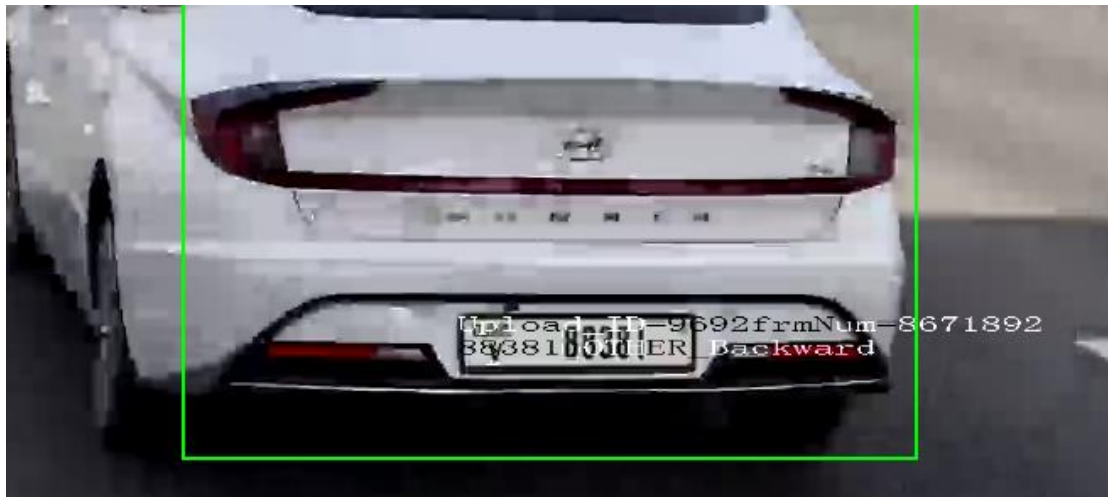
setDebug -1 7 -d 111 -m sdkcmd

setDebug -1 7 -d 111 -m all

## 1.2 POS video

Please collect POS video while collecting print, if you are not sure whether the POS information can be parsed, you can play the collected video first with VSPlayer for test. If you see a line of small words beside the license plate, it means that the POS information is released successfully





## 1.2.1 H3 + Web Record

### A. Operation 1.

Control login, in the Configuration - Local - Play parameters, *Rule information* and *POS information overlay* Click enable

### B. Operation 2.

1. SSH or serial port login device; PSH unlocking device;
2. Input command: *setRtpLen 7988* (note the space in the middle of the command, as well as the following commands)
3. reboot device:

### C. Operation 3.

1. SSH or serial port login device; PSH unlocking device;
2. Confirm RtpLen size: Enter *getRtpLen* If the return value is 7988, it means that the rtplen of the device is correct. Otherwise, operate according to **operation 2** again.
3. Let go of intelligent printing of road monitoring: *dsp\_debug -setPrtLevel HSSS DBG* (Note that the horizontal bar in the middle of the command is in lower case)
4. Release algorithm POS information, to record POS video: *dsp\_debug -setVtsPosFlag 1* At this time, the target box, DSP POS information algorithm POS information will open.
5. Then input *outputOpen* Record the log and the control starts recording

## 1.2.2 H5/H7 + Web Record

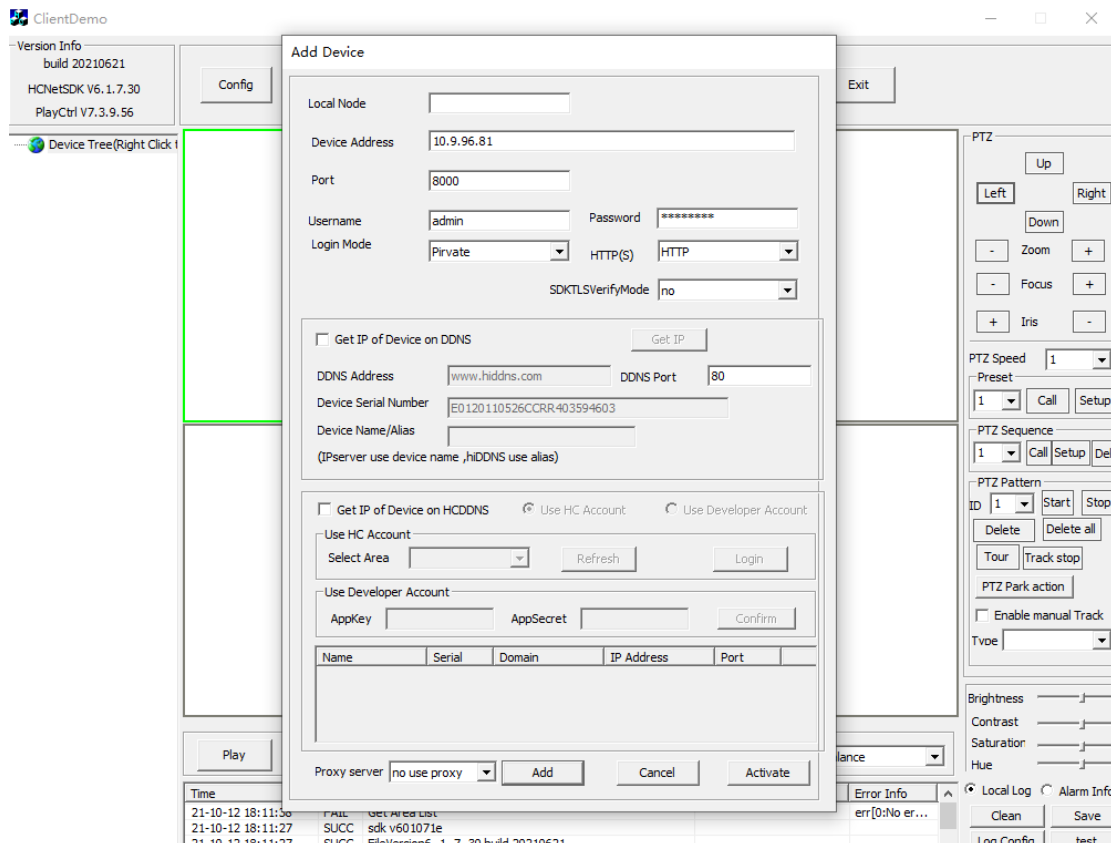
The H5/H7 platform is relatively simple to operate due to the integration of a new sub-packaging library.

1. Log in to the web, in the *Configuration-Local- Live View Parameters*, Enable the *Rules* and *Display POS Information*.
2. SSH or serial port login device; PSH unlock device;
3. Input: *dsp\_debug -setVtsPosFlag 1* (Note: underline); At this time, the target box, DSP POS information, and algorithm POS information will be turned on

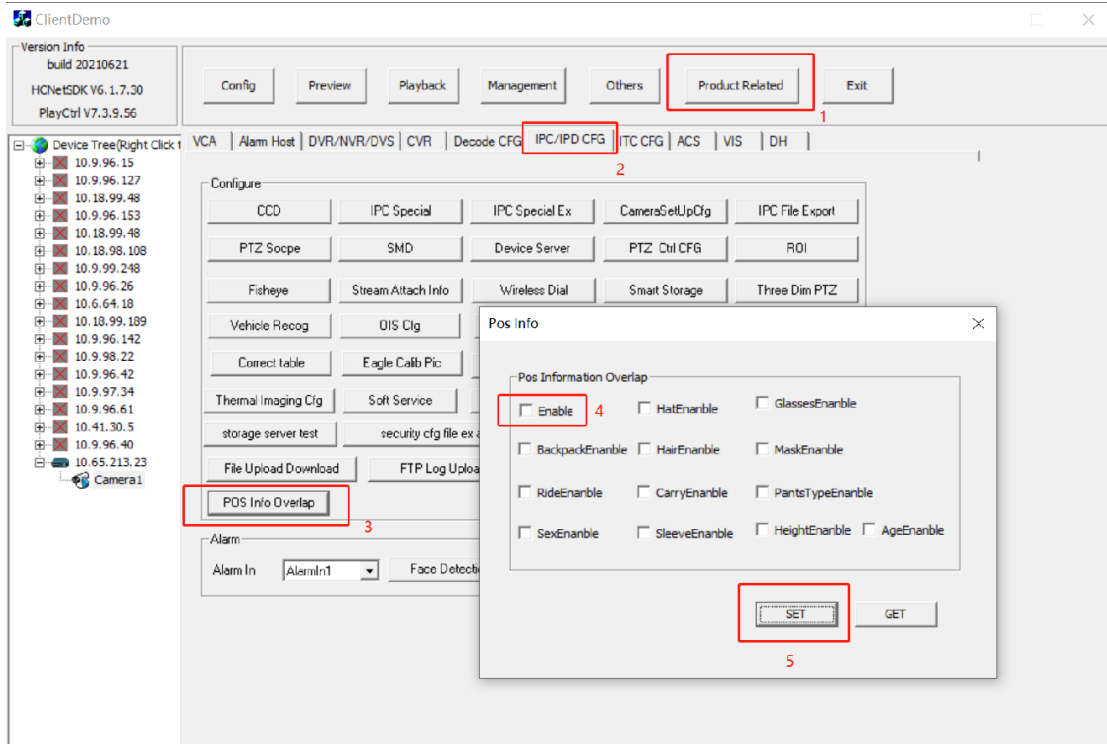
4. Web click to start recording

## 1.2.3 H8 + Web Record

1. Download SDK Demo via following FTP link:  
*FTP path: /01 IPC/13 Troubleshooting/带 POS 信息英文版 SDK Demo*
2. Log in to the web, in the *Configuration - Local - Live View Parameters*, Enable the *Rules* and *Display POS Information*.
3. Add the camera on SDK Demo,



4. Enable POS info overlay:



- Record the video on the camera's web page. The directory of the recorded file can be change in [Configuration]-[Local]-[Record File Setting]. It's recommended to run the browser as administrator.



## 1.2.4 (H3/H5/H7) + SD card recording

SD card video because there is no packaging problem, so the operation is relatively simple

- Control login, in the Configuration - Local - Play parameters, **Rule information** and **POS information overlay** Click enable
- SSH or serial port login device; PSH unlocking device;
- Release the POS information of the algorithm, in order to record POS Video: ***dsp\_debug -setVtsPosFlag 1***

At this time, the target box, DSP POS information algorithm POS information will open.

4. SD card starts record video

### 1.2.5 H8 + SD card recording

1. Refer to step 1.2.3 1-4
2. SD card starts record video

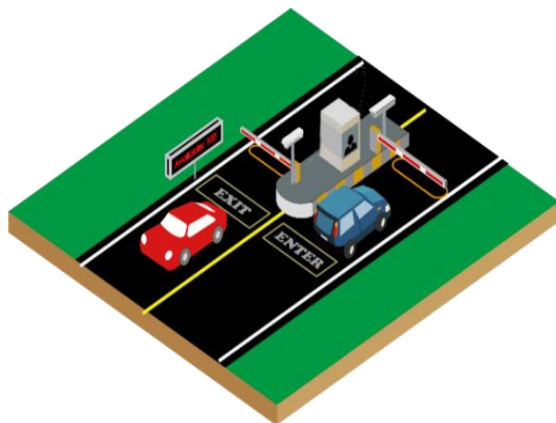
## 2. Installation requirements

### Terminology:

**License plate height:** The character height. The number of pixels between the upper and lower bounds of the main characters in the license plate;

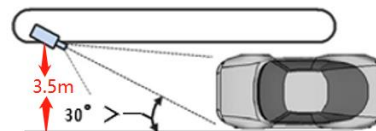
### 2.1 Entrance / exit

1. The camera cannot be installed behind the barrier gate. It needs to be installed in front of the barrier gate next to the barrier gate, or the camera needs to be installed in the side of the barrier gate.
2. Camera installation height: the height is about 1.6-2m. The depression angle should not be too small, and should be greater than 30 ° to avoid direct light from the head light.
3. Lane width: Less than 3.5m



#### Horizontal angle

The view angle of the camera should be within 30 degrees to the path of movement.



#### Vertical angle

The angle between lens direction and horizontal should be less than 30 degrees.



### 2.1.1 Entrance / exit -Standard installation

Key points of standard installation at the entrance and exit:

1. the installation height is 1.6m-2m (not too high or too low);
2. The deflection angle of the camera is about 30 °;

3. Only 1 lane can be configured, width less than 3.5m.

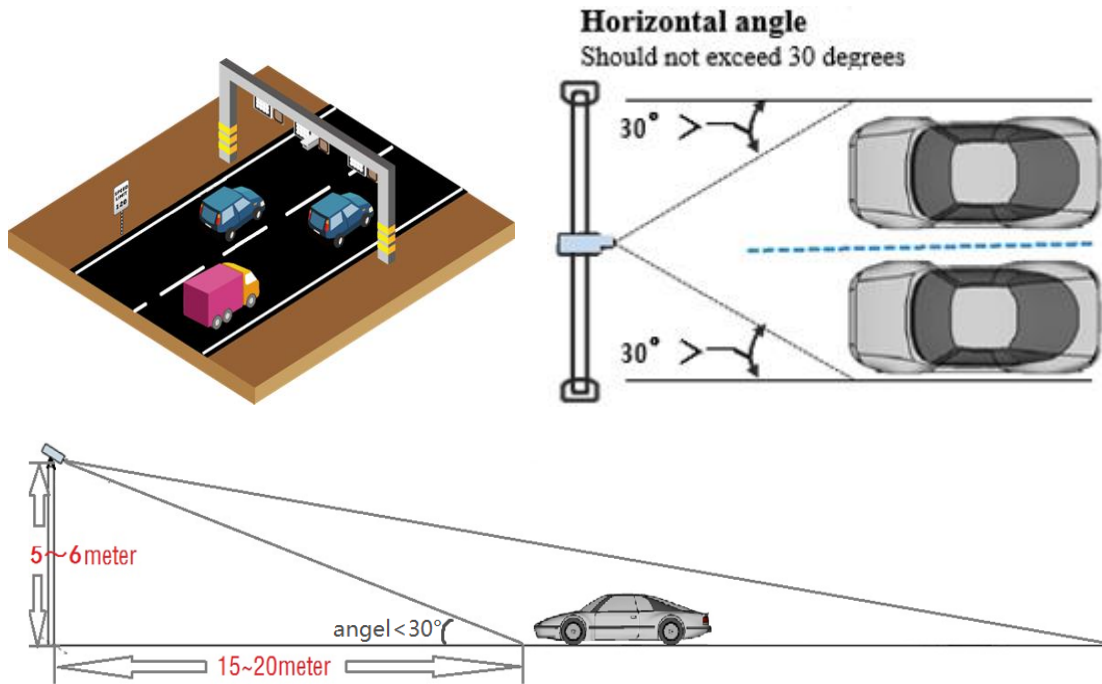


Requirement:

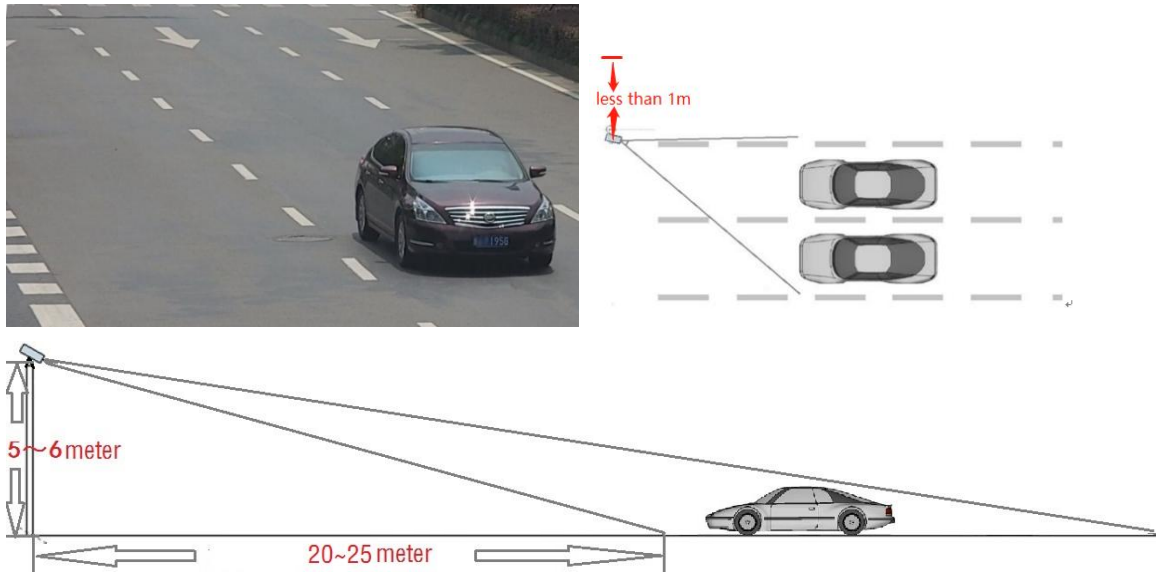
1. The imaging is normal, and the license plate is clear and recognizable
2. The angle is normal, the vehicle queue is exposed one by one, and there is no driving route that leads to vehicle occlusion and intersection problems
3. The field of view is normal, and the vehicle is completely exposed, which does not affect the model and brand effect of the vehicle.
4. The scale is normal, and the license plate needs to meet the character height greater than 16 pixels within the capture range

## 2.2 City street

1. When supporting two lanes: the camera needs to be installed in the middle of the gantry; However, when the speed exceeds 60km/h, the lane line should be configured as a single lane.
2. Horizontal angle should not exceed 30°.
3. Camera installation height: More than 6m. Horizontal distance between camera and vehicle: 15-20m, and Vertical angle should not exceed 30°.
4. Lane width: Single lane less than 4m



5. The camera can also be installed on the side of the gantry. It is necessary to ensure that the camera field of vision is not blocked. The camera installation site shall not be more than 1m away from the road.



## 2.2.1 City street -Standard installation

Key points of standard installation at middle of gantry:

1. Installation height  $\geq 6\text{m}$ ; The camera pitch angle is about  $30^\circ$ ;
2. The vision is wide, and the body of large vehicles should be completely exposed



Requirement:

1. The imaging is normal, and the license plate is clear and recognizable
2. The angle is normal, the vehicle attitude is correct, and the vehicle brand and model can be tested
3. The field of view is normal, and the vehicle is completely exposed, which does not affect the model and brand effect of the vehicle.
4. The scale is normal, and the license plate meets the requirements that the character height is greater than 16 pixels within the capture range

Key points of standard installation at side of gantry

1. Installation height >6m;
2. The camera depression angle is about 30 °; Camera deflection angle <30 °;
3. The body of large vehicles should be completely exposed



Requirement:



1. The imaging is normal, and the license plate is clear and recognizable
2. The angle is normal, the camera installation height is greater than 6m, and the inclination angle is less than 30 degrees
3. The field of view is normal, and the vehicle is completely exposed, which does not affect the model and brand effect of the vehicle.
4. The scale is normal, and the license plate meets the requirements that the character height is greater than 16 pixels within the capture range

## 3. Configuration

4. Go to **Image>Display Settings>Day/Night Switch** and set the Day/Night Switch to the “Triggered by Video” ;

### ^ Day/Night Switch

Day/Night Switch	Triggered by Video	▼
Sensitivity	4	▼
Filtering Time	<input type="range" value="5"/>	5
Smart Supplement Light	OFF	▼
Supplement Light Mode	IRlight Supplement Light	▼
Light Brightness Control	Auto	▼

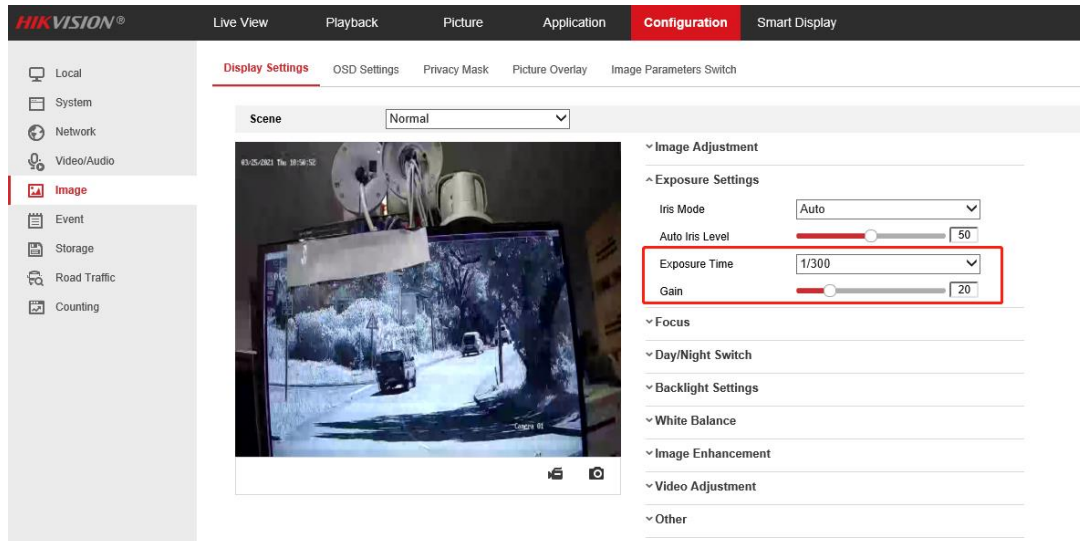
5. Go to **Image Display Settings** to change **Exposure Time** and **Gain** according to the standard below (the Gain control can be operated only after step 1 is finished ):

Speed < 30km/h — Exposure Time : **1/150-1/200**;

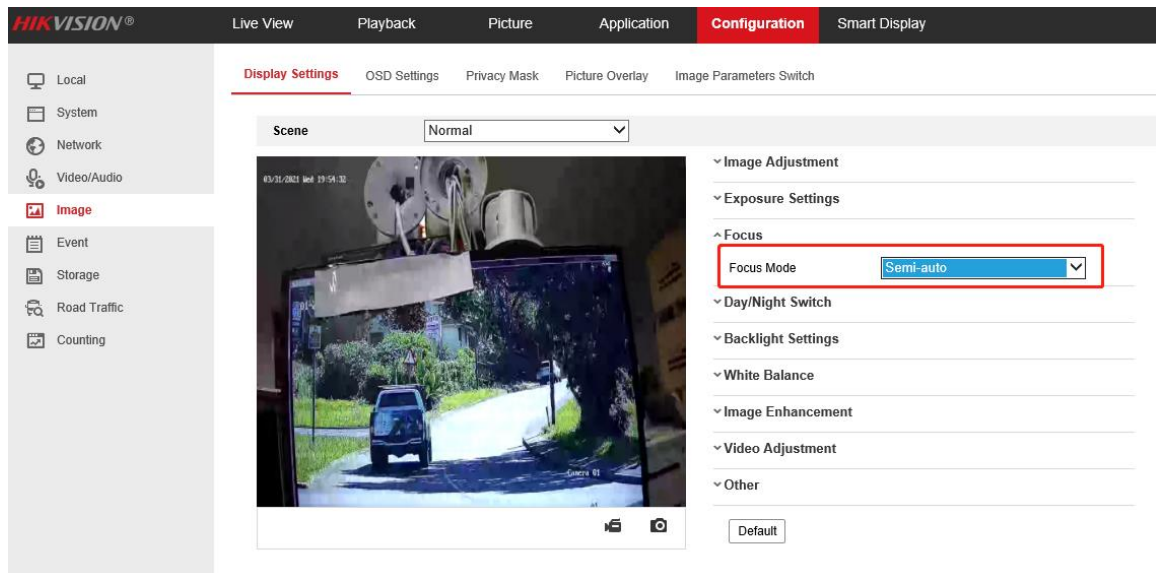
30km/h < Speed < 60km/h — Exposure Time : **1/250-1/500**;

60km/h < Speed — Exposure Time : **1/500-1/1000**

Gain : Generally set as **20** and we usually don't change this.

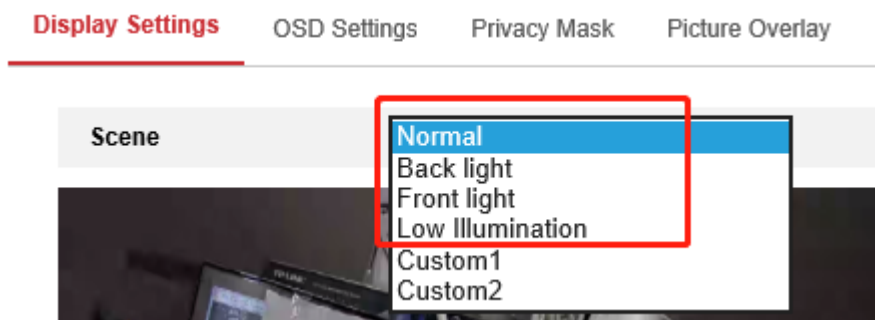


6. Make sure the **Focus Mode** is semi-auto.



7. If the image effect is not satisfied:

- a. Choose the pre-settings Scene and the referring using scenario to try whether the effect is getting better.



- b. WDR or HLC will make the image easier to perform the “ghost image” or detail lost. So if the strong light can be solved by the exposure and gain settings, we don’t recommend you

enable these to counter strong lights.

## ^ Backlight Settings

BLC Area	OFF
WDR	OFF
HLC	OFF

## ^ White Balance

- c. Double check whether the installation angle is smaller than 30° and the installation height satisfy the full observation of full scale of vehicle.

8. Go to **Picture** to choose the text overlay on the picture as the scenario needs;

The screenshot shows the Hikvision Configuration interface with the 'Picture' tab selected. The 'Text Overlay' section is expanded, showing various options for text overlay on the picture. The options are:

- Device No.
- Capture Time
- Vehicle Type
- Moving Direction
- Plate No.
- Camera Info.
- Camera No.
- Validity
- Vehicle Color
- Vehicle Brand

Type	Sorting
Camera No.	↑ ↓
Camera Info.	↑ ↓
Device No.	↑ ↓
Capture Time	↑ ↓
Plate No.	↑ ↓
Vehicle Color	↑ ↓
Vehicle Type	↑ ↓
Vehicle Brand	↑ ↓

FTP Picture Name

Default  Custom

Example: IP\_Channel No.\_Time\_Type.jpg

9. Go to **Road Traffic** to select detection type;

Detection type can be set as Vehicle detection or Mixed-traffic Detection.

Vehicle detection: the passed vehicle can be detected and the picture of its license plate can be captured.

Mixed-traffic Detection: motor vehicle and non-motor vehicle can be detected, and the picture

of the object or license plate can be captured

Note: Only one lane supported at mixed-traffic detection type.

10. Go to **Road Traffic** to select lane numbers (1~2) and traffic mode;

**Note:**

- **Blue Detection Line:** Mainly used for Entrance/Exit with a purpose of improving the capture efficiency. The line is the trigger line of license plate and we highly recommend you put it middle-lower of the screen to make sure the car can pass it with the plate and the full scale.
- **Detect Area:** The Actual detect area is the 2 yellow lane and the square they seized.
- **Entrance & Exit:** It means the camera is set to monitor the Entrance & Exit and will get a better performance at this scenario. Also, Entrance & Exit mode only supports 1 lane.
- **City Street:** It means the license plate information of the detected vehicle will be uploaded when the vehicle passes the detection area and triggers the detection. City Street can support 2 lanes.

- **Alarm Input:** It means the input alarm will trigger a license plate capture and recognition action.

- **Detection Mode:** Vehicle priority and License plate & Vehicle mode:

Vehicle priority mode: the classic mode of the ANPR camera, it will detect the vehicle scale first, then catch the plate out to make the analysis. It will get the better accuracy but sometimes it will lose some results in the not-satisfied installation scenario.

License plate & Vehicle mode: this mode will allow the ANPR camera to capture the vehicle plate simultaneously with the scale of vehicle is detected. This mode will greatly improve the recognition at some not-satisfied installation scenario.

So we recommend you to use **Vehicle priority mode first** if there is no issues on installation and filling lights. After the issues of plate recognition is carried out, you can **switch the mode to License plate & Vehicle mode.**

11. Go to **Arming Schedule** and **Linkage Method** to continue; here you can set the arming schedule and linkage action **independently** for white list, black list and other list, so you need to set them one by one;

12. Select a direction here. The **Forward** means vehicle moves toward the camera; **Reverse** means vehicle moves away from the camera. Only the vehicles moving as the selected direction can trigger selected linkage methods. **We highly recommend you choose All if there is no special use;**

**Linkage Method**

Direction  All  Forward  Reverse

<input checked="" type="checkbox"/> Normal Linkage	<input checked="" type="checkbox"/> Trigger Alarm Output
<input checked="" type="checkbox"/> Notify Surveillance Center	<input checked="" type="checkbox"/> A->1
<input checked="" type="checkbox"/> Upload to FTP/Memory Card/...	

13. Remember to enable **Notify Surveillance Center** and Upload to FTP/xxxx;

**Linkage Method**

Direction  All  Forward  Reverse

<input checked="" type="checkbox"/> Normal Linkage	<input checked="" type="checkbox"/> Trigger Alarm Output
<input checked="" type="checkbox"/> Notify Surveillance Center	<input checked="" type="checkbox"/> A->1
<input checked="" type="checkbox"/> Upload to FTP/Memory Card/...	

14. The last part is to import the **Blacklist & Whitelist**. If you don't have such a list in advance, export the template first to make one;

The screenshot shows the HIKVISION web interface. The top navigation bar includes 'Live View', 'Playback', 'Picture', and 'Configuration'. Under 'Configuration', there are sub-tabs: 'Detection Configuration', 'Picture', 'Camera', 'Blacklist & Whitelist' (highlighted with a red box), and 'Real-time LPR Result'. The 'Blacklist & Whitelist' section contains:
 

- 'Import Blacklist & Whitelist' section with a text input for 'Blacklist & Whitelist File', 'Browse', and 'Import' buttons.
- 'Status' section with a note: 'Note: You can set at most 2048 license plates in whitelist and blacklist in total.'
- 'Export Blacklist & Whitelist' section with an 'Export' button.
- 'Blacklist & Whitelist Content' section with a table:

No.	Plate No.	Type	Creation Time

The template looks like this:

(when inputting the plate number, input several consecutive numbers/letters with no blank included.)

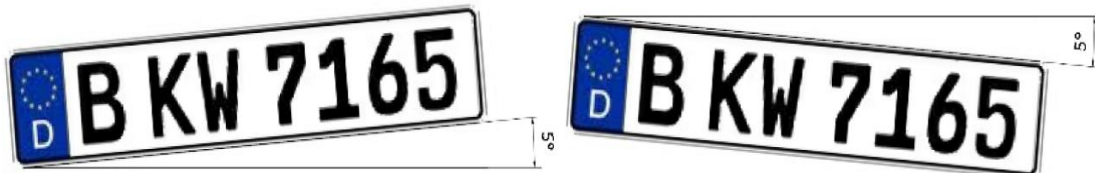
D8	:	<input type="checkbox"/> <input checked="" type="checkbox"/> fx	
	A	B	C
1	No.	Plate Num	Group(0 black list, 1 white list)
2			
3			
4			
5			

## 4. Imaging requirements

1. The license plate in the field of view must be clear and discernible without motion blur;
2. The size of the license plate shall be moderate, and it shall not be too large or too small, so as to avoid blurred strokes and overexposure of the license plate.
3. You can check the number of pixels of license plate characters in the drawing software of windows. The height of main characters is recommended to be between 20-40 pixels.
4. If it is also necessary to identify sub fields at the same time, the height of the sub field shall be at least 16 pixels; For license plates with a large number of single line characters, the length of the main field shall not exceed 200 pixels



5. The inclination angle of the license plate is less than  $\pm 5^\circ$ ; Now it is OK not to exceed  $\pm 15^\circ$  (not necessary)



6. Check whether the lens is in manual light exposure mode, and the focusing effect is the best.

## 5. Problem analysis

### 5.1 Error identification

1. Some license plates were missed
2. Some license plate characters are incorrectly recognized
3. Inaccurate judgment of license plate driving direction

**Analysis and solution:**

## 1. Missed capture

Improper installation (adjusting the installation height / angle),

Focus too far or too close (adjust focus),

The image is not clear, and the image is overexposed (adjusting parameters)

License plate detection parameters (license plate recognition mode (mixed traffic, entrances and exits, urban roads, alarm input), check snap lines, number of lanes, license recognition area)

## 2. There is a snapshot, but it is not recognized

**The pixel size of the license plate does not meet the requirements** (installation height, angle, gain, shutter, WDR...);

The license plate is not clear (adjust the image parameters and focal length);

License plate detection parameters (check the snap line, the number of lanes, and the license recognition area)

### If it still cannot be solved:

1. Software version number /dsp version number, customization order number / customization responsible project manager,
2. Complete screenshots of image parameters and screenshots of license plate setting parameters
3. Scene map (1 license plate map, 1 equipment erection scene map), erection height, angle, formal / side installation

After checking the above conditions, provide all printing (including DSP printing) of the camera from Startup to problem recurrence, and provide POS video screen.

## 5.2 Dark background



**Analysis and solution:** this problem is not a product problem, but an existing design mechanism. The camera usage scene demand of license plate recognition is license plate recognition, and scene monitoring is an additional feature, so the configuration of camera image effect is to ensure the license plate recognition effect as the priority. For the scene where the license plate recognition effect is affected by too bright lights, the design scheme is to ensure the capture effect of the license plate by limiting the shutter and gain. The limiting gain is to make the license plate not exposed and the font clearly visible. Therefore, the shutter and gain restrictions may affect the image brightness of the background. The insufficient background brightness in this scenario is consistent with the

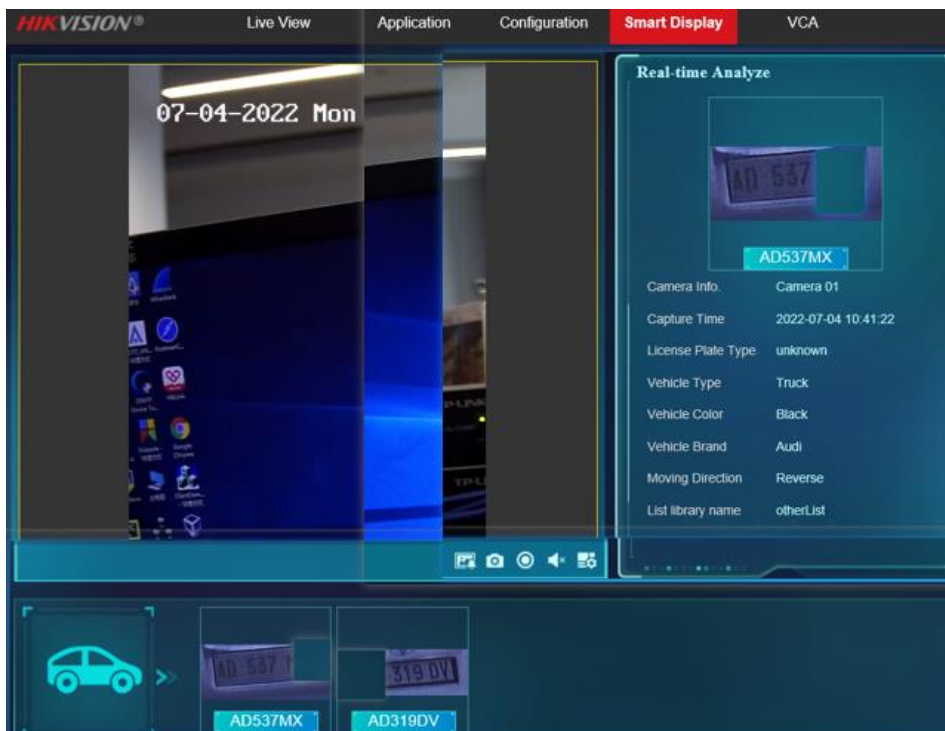


product design specifications.

## 5.3 Incomplete recognition

No.	Capture Time	Plate No.	Captured Picture	Lane No.	Direction	Matching Result
20	06-11-2018 10:52:38	E7JPD		1	Forward	White List
19	06-11-2018 10:36:07	E7JPD		1	Forward	White List
18	06-11-2018 10:26:04	E7JPD		1	Unknown	White List
17	06-11-2018 10:25:55	PD		1	Unknown	Other List

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### Analysis and solution:

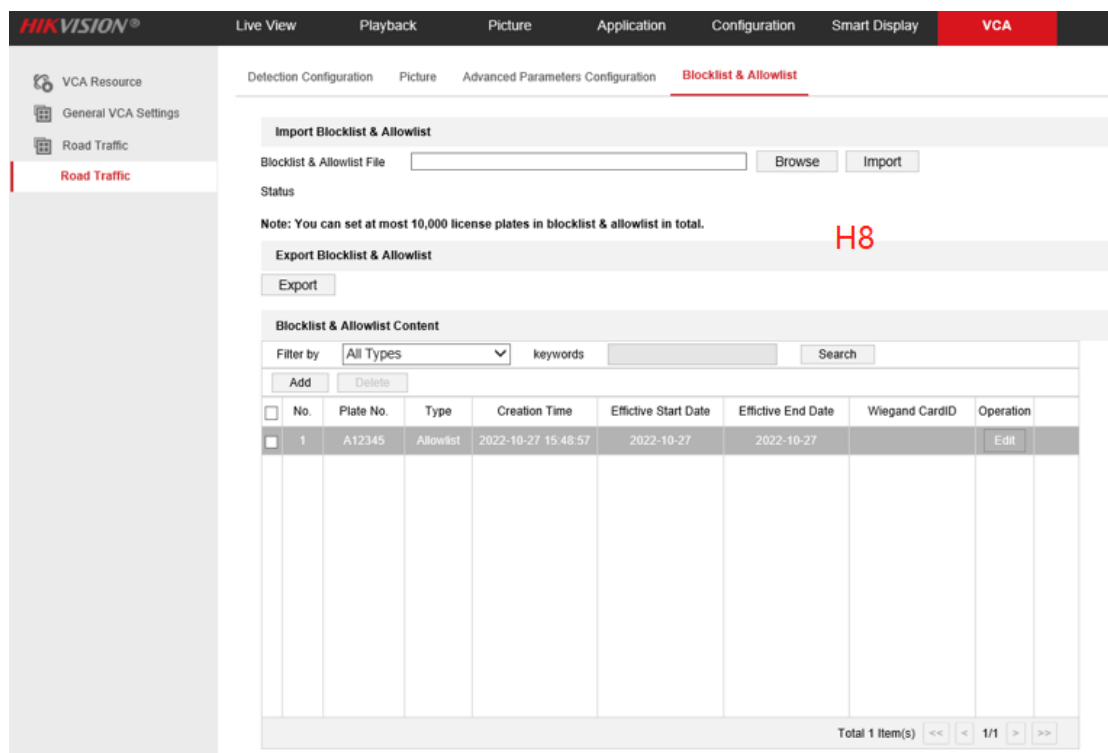
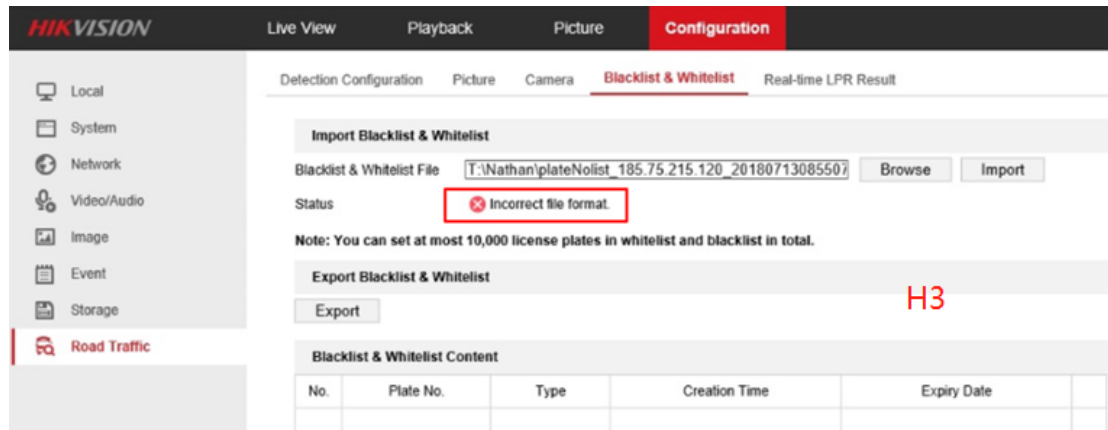
The license plate is correctly identified, but the license plate matting is incomplete. Check the direction

Configuration parameters, **pixels of the character part of the license plate** in the large picture of the vehicle

**When the above checks are normal, POS videos and POS pictures can be provided for analysis**

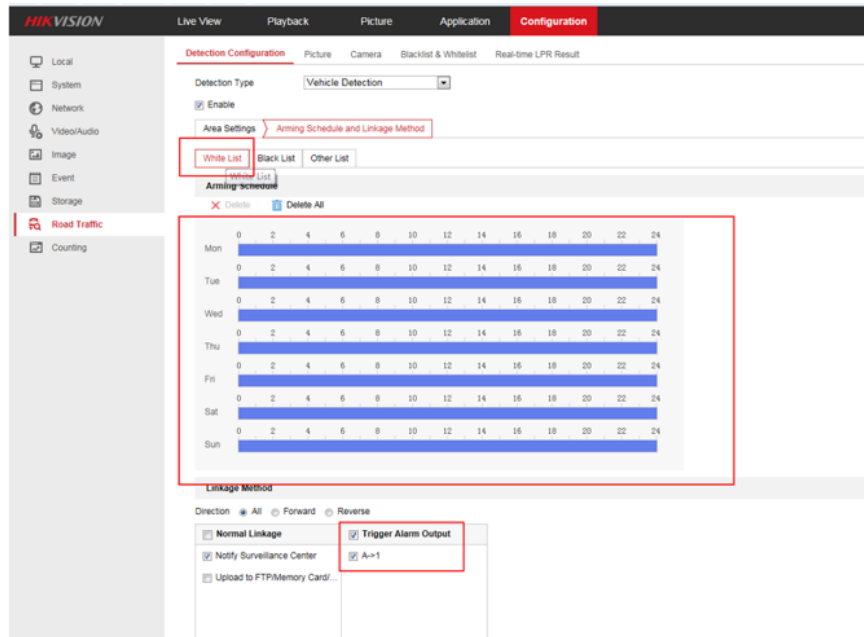
## 5.4 Block and allow list

1. The blacklist cannot be found in the save path after exporting
2. Failed to import / add black and white list of license plate camera



**Analysis and solution:** when importing the black-and-white list into the license plate recognition camera, you will encounter the problem of prompt incorrect file format. In this case, it is often due to the problem of the imported black-and-white list format; Another reason may be that the customer creates the black-and-white list template himself, resulting in the format of the imported black-and-white list cannot match. In this case, it is necessary to explain clearly to the customer that when using the import and export black-and-white list function, we must export the template from the device side, and then fill in the license plate information.

3. Black and white list linkage external barrier or alarm failure



1. Confirm whether the deployment time and linkage options of the three lists (black / White / other lists) are configured.
2. If it is confirmed that there is no problem with the configuration of the equipment, check whether the wiring of the external gateway and the camera is correct

## 5.5 Duplicated license plates

Implemented by algorithm,

it is divided into two processing methods:

1. The same adjacent license plate
2. Same but not adjacent license plates

H3: 5.5.62 program: do not filter the same and non adjacent license plates,

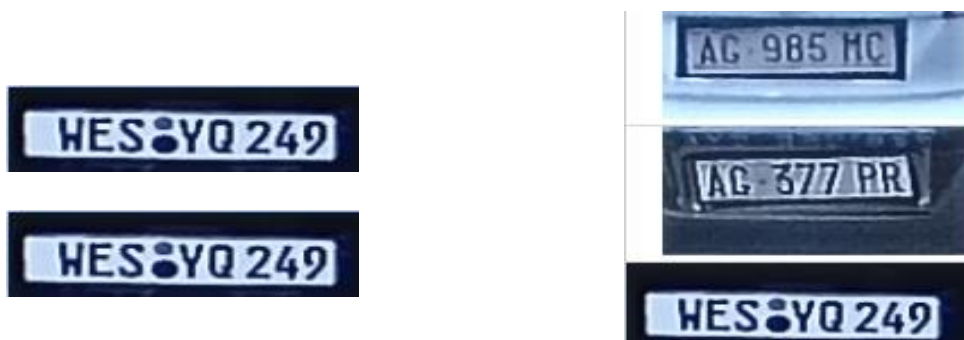
Filter the same adjacent license plates for 4 minutes (frame rate 25FPS), which is on by default

H3: 5.6.10 program: filter in both cases, 4 minutes, on by default

H7, H8: the web side supports 0-4 minutes of the same brand filtering configuration

Remove Duplicated License Plates

Time Interval  minute(s)





Same adjacent license plate



Same but not adjacent license plate

## 5.6 Wiegand

1. R3 and H3 cannot distinguish whether the current camera supports Wiegand function by camera name,
2. H7 and H8 cameras can use whether the suffix of the camera name has the letter "Y". If the suffix has the letter "Y", the camera supports Wiegand
3. Wiegand wiring reference Wiegand documentation
4. H7 and H8 baselines support Wiegand; R3, H3 customized support Wiegand
5. Release Wiegand print (provide print log for RD):

```
setDebug -l 7 -d 111 -m IPC
```

- Local
- System
- Network
- Video/Audio
- Road Traffic

Detection Configuration   Picture   Camera   Blocklist & Allowlist   Real-time LPR Result   **Wiegand**

Enable

Wiegand Type

Card ID 26bit

SHA-1 26bit

Hik 34bit

H3

[Save](#)

- Local
- System
- System Settings**
- Maintenance
- Security
- User Management
- Network
- Video/Audio
- Image
- Event
- Storage

Live View   Playback   Picture   Application   **Configuration**   S

Basic Information   Time Settings   DST   RS-232   RS-485   metadata Settings   **Wiegand**

Enable

Protocol

Card ID 26bit

SHA-1 26bit

Hik 34bit

NEWG 72bit

H8 Device

[Save](#)

## 5.7 Print information

1. H7 and H8 use the new framework, which is different from the previous R3, H3 and other platforms when collecting and printing,
2. Select and release the corresponding print according to the module in question:

Common print commands for H7, H8 devices.

ANPR basic information	setDebug -l 7 -d 111 -m ROAD_TRAFFIC
General module	setDebug -l 7 -d 111 -m EDA_UTILITY
SDK Upload Center	setDebug -l 7 -d 111 -m EDA_UPLOADER
Alarm output	setDebug -l 7 -d 111 -m EDA_ALARM_OUT
HTTP listening	setDebug -l 7 -d 111 -m EDA_HTTP_LISTEN
FTP	setDebug -l 7 -d 111 -m EDA_FTP
Capture	setDebug -l 7 -d 111 -m EDA_CAPTURE
Storage	setDebug -l 7 -d 111 -m EDA_STORAGE
webSocket	setDebug -l 7 -d 111 -m EDA_WS
Mail linkage module	setDebug -l 7 -d 111 -m EDA_EMAIL
Alarm host	setDebug -l 7 -d 111 -m EDA_HOST
ISUP linkage module	setDebug -l 7 -d 111 -m EDA_ISUP
Wiegand	setDebug -l 7 -d 111 -m IPC

Common print commands for R3, H3 devices.

```
setDebug -l 7 -d 111 -m alarm_exp
setDebug -l 7 -d 111 -m dsp
setDebug -l 7 -d 111 -m sdkcmd
setDebug -l 7 -d 111 -m all
```

## 6. Problem cases

### 6.1 Prohibit installation scenario

#### 6.1.1 Large deflection angle

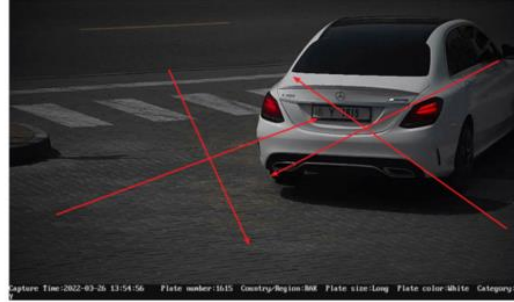
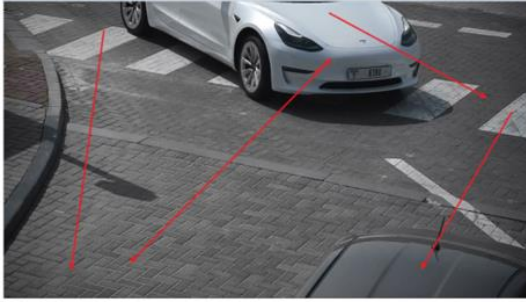


Large vehicle deflection angle and depression angle greater than 30 degrees will lead to:

1. When the vehicle approaches the horizontal position, the vehicle target detection effect becomes worse, resulting in the target can not be continuously tracked, resulting in false capture
2. The vehicle attitude is poor, resulting in a large deflection angle of the license plate, and it is difficult for the license plate to have a stable license recognition result on the driving track, resulting in the final license recognition error
3. Poor vehicle attitude, non-standard bayonet entrance and exit scene, wrong judgment of vehicle type, vehicle brand and vehicle color.

#### 6.1.2 Open scene

**Non standard cases:** there is no clear lane line, the vehicle driving direction is arbitrary or even conflict, and one camera undertakes the task of multiple cameras



Problem - vehicles with multiple directions in a scene:

1. Large vehicle deflection angle: poor vehicle detection effect, affecting vehicle attributes / vehicle capture
2. The side of the car body drives at a large angle, which is easy to make mistakes
3. The license plate recognition area is not easy to set, and the license plate may be incomplete
4. The characters on the side body are easy to be misidentified

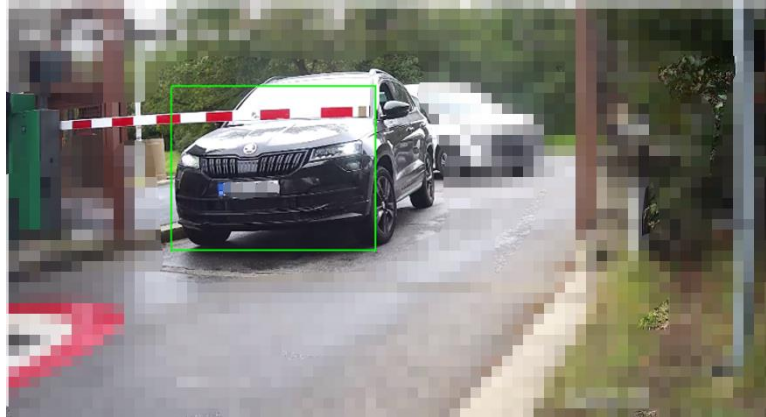
## 6.1.3 Far from the target



The camera is too far away from the vehicle / license plate: the size of the license plate does not meet the requirements (the minimum character height is 16 pixels)

## 6.1.4 Far behind the barrier





The configuration parameters shown in the figure above can recognize the license plate, but the problem is that when the vehicle stops in front of the pole, the license plate is still in the recognition area. The algorithm judges that the license plate does not leave the recognition area, and will not give the upload signal. When the uplink signal is not received, the pole will not be lifted.

Erection improvement:

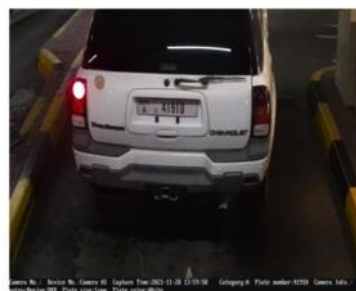
All cameras at the entrance and exit must be erected at or in front of the cross bar! It cannot be erected behind the cross bar. The erection height shall be more than 1.5m with a certain depression angle.

## 6.2 Not recommended scenario

### 6.2.1 The body is not fully exposed

It can make ANPR, but the effect of vehicle type and other attributes is poor

The driving direction of the vehicle is fixed, so license plate recognition can be done, but the body cannot be completely exposed, so if it is necessary to do vehicle type recognition, it cannot be met







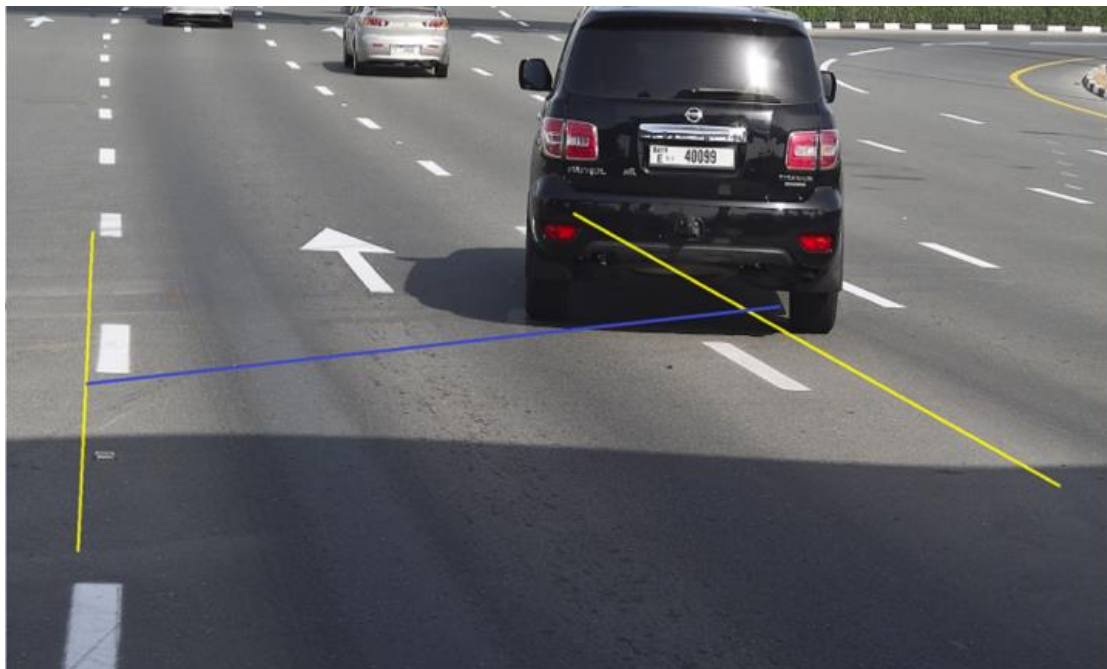
Problems:

1. The car body snapshot is incomplete, so it is impossible to make vehicle attributes
2. The installation height is low, and the license plate may block the snapshot

## 6.2.2 Uncontrollable driving direction

**It's barely feasible, and the capture will be affected**

Non standard case: the angle and height are not a big problem, but the driving direction of the vehicle is uncontrollable



Problems:

1. The license plate is blocked and captured by mistake
2. Being caught by mistake when the license plate is incomplete

