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ANPR Solution Guidance

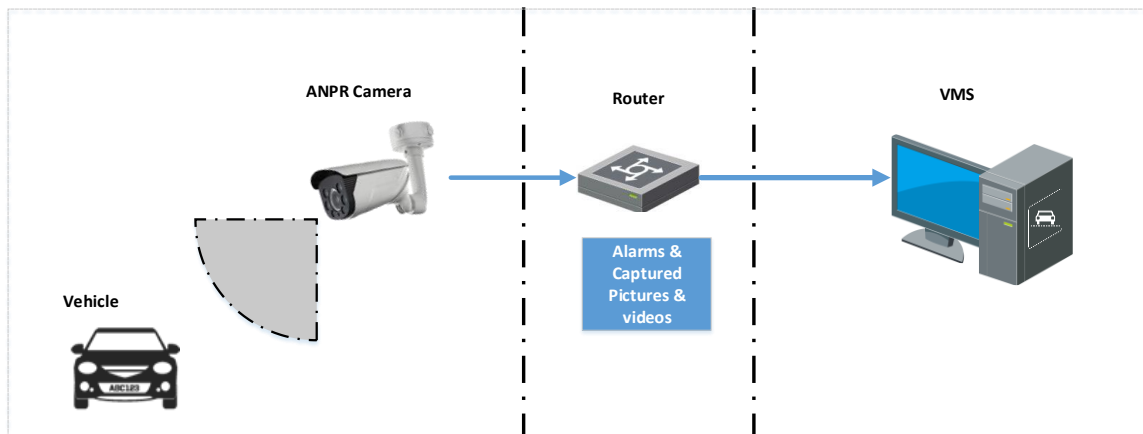
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20180409	Newly added	jianghuaiyu@hikvision.com.cn
20180511	Edited	jianghuaiyu@hikvision.com.cn

Chapter 1 Solution Combinations

1.1 ANPR Camera + NVR

In this solution, we can use the ANPR camera to capture & save the license plate pictures, and use the NVR to save both the license plate pictures & videos.

1.1.1 Topology



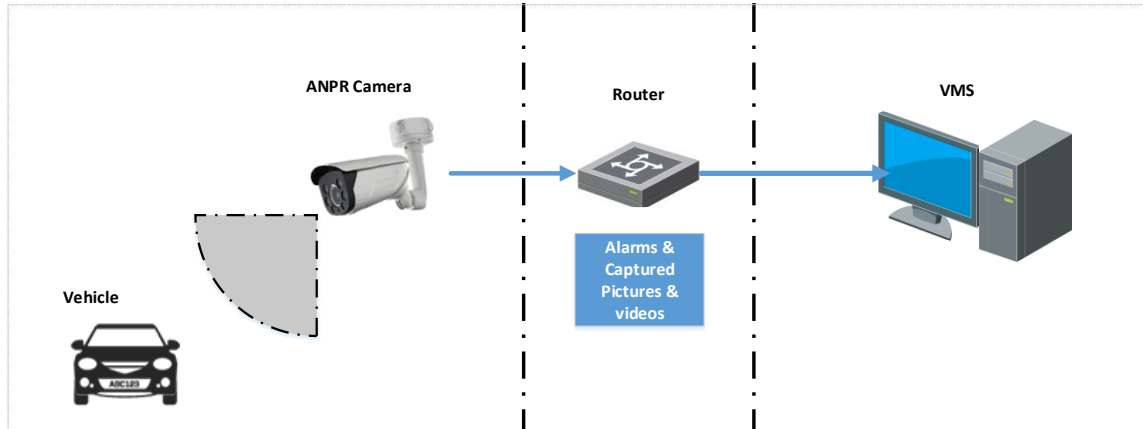
1.1.2 Models and software version requirement:

	Model	Version
Camera	DS-2CD4X26FWD/P	Latest baseline version
	iDS-2CD8626G0/P	Latest baseline version
	DS-2CD7A26G0/P-IZ(H)S	Latest baseline version
NVR	-E/-K/-I series	Latest baseline version
AI NVR	All series	Latest baseline version

1.2 ANPR Camera + VMS

In this solution, we can use the ANPR camera to capture & save the license plate pictures, and use the VMS to save both the license plate pictures & videos.

1.2.1 Topology



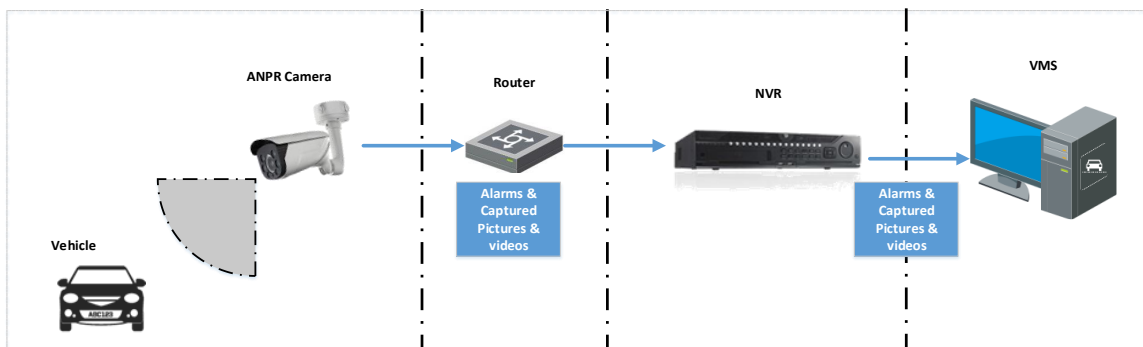
1.2.2 Models and software version requirement:

	Model	Version
Camera	DS-2CD4X26FWD/P	Latest baseline version
	iDS-2CD8626G0/P	Latest baseline version
	DS-2CD7A26G0/P-IZ(H)S	Latest baseline version
VMS	iVMS-4200	Latest baseline version

1.3 ANPR Camera + NVR + VMS

In this solution, we can use the ANPR camera to capture & save the license plate pictures, and use either the NVR or VMS to save both the license plate pictures & videos.

1.3.1 Topology



1.3.2 Models and software version requirement:

	Model	Version
Camera	DS-2CD4X26FWD/P	Latest baseline version
	iDS-2CD8626G0/P	Latest baseline version

	DS-2CD7A26G0/P-IZ(H)S	Latest baseline version
NVR	-E/-K/-I series	Latest baseline version
AI NVR	All series	Latest baseline version
VMS	iVMS-4200	Latest baseline version

Chapter 2 ANPR Camera Installation Specifications

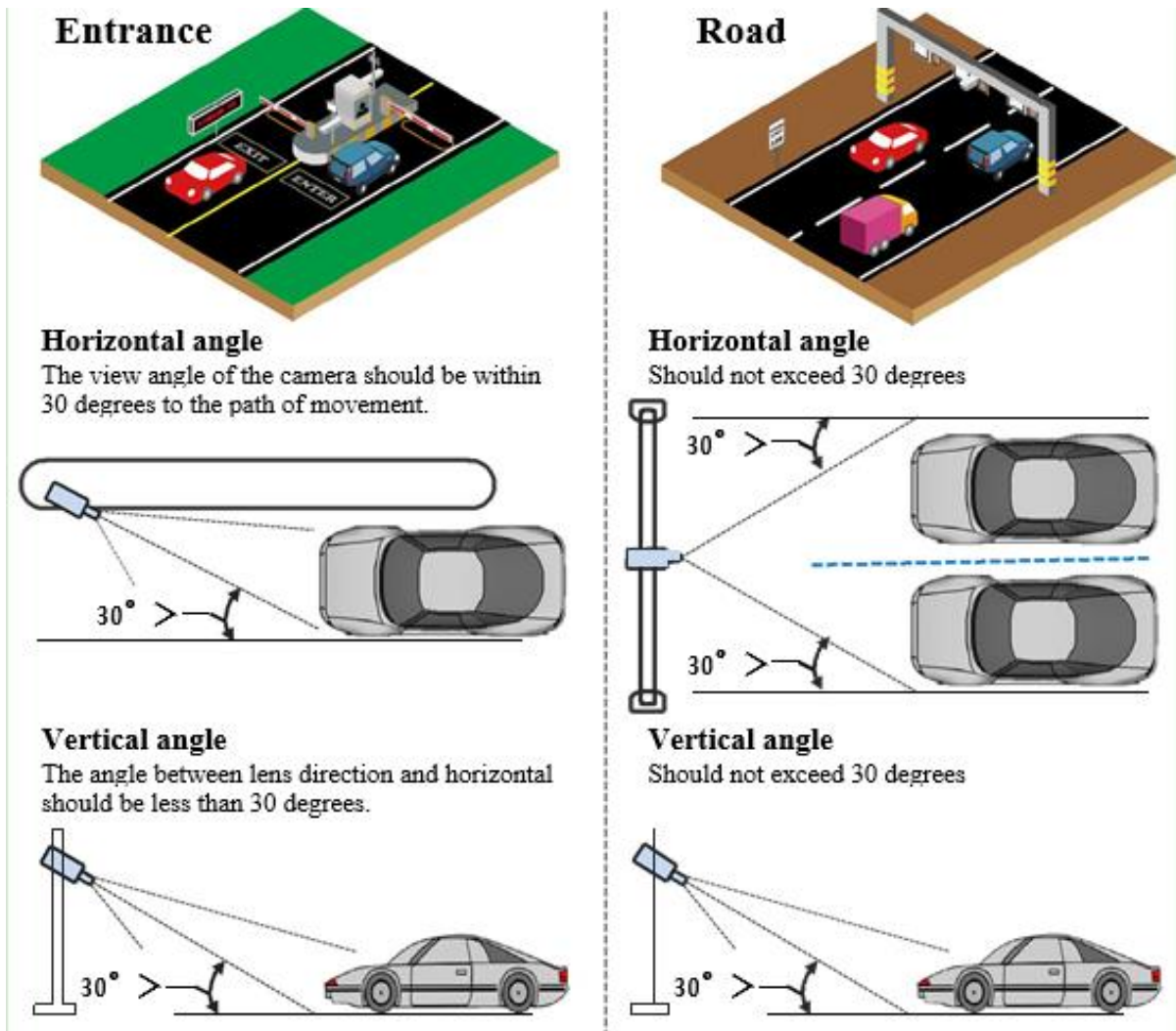
In order to have a better ANPR performance, please refer to this chapter for camera installation.

Note:

- It's recommended to cover one lane for each 2MP camera;
- It's recommended the min height of a license plate should be 20 to 30 pixels in the image captured by a 2 megapixel resolution camera.

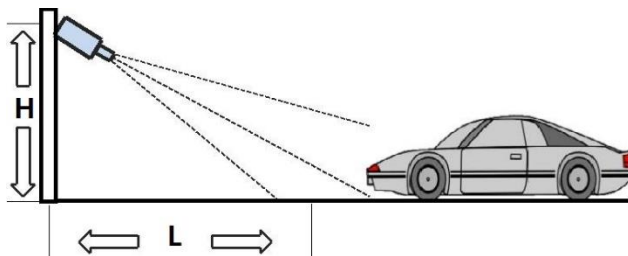
2.1 Camera Installation Angle

Hikvision Automatic Number Plate Recognition cameras help users detect passing vehicles and capture the license plates. To obtain the maximum license plate recognition accuracy, you need to install the ANPR camera in a proper way to get a clear image.



2.2 Camera Installation Height

The installation height (H) needs to be fixed firstly, and then the detection range (L) could be calculated by a simple equation $L = \tan 30^\circ \cdot H$.



$$L = \tan 30^\circ \cdot H = 1.7 \cdot H$$

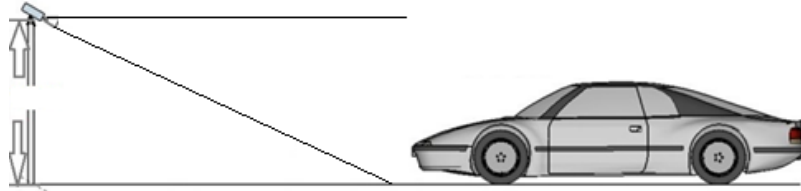
Note:

Height(m)	Min L (m)
1.5	4
2	4
3	5.1
3.5	6
4	6.8

For entrance application, it's better to install the camera between the height 1.5m and 4m, and ensure the detection range is no longer than 4m.

2.3 Camera Lens Selection

The recognition distance is based on the camera focal length. You should select a proper lens in order to get enough pixels in the frame.



The table below is for your reference:

Camera	Lens(mm)	Min recognition distance (m)	Max recognition distance (m)
DS-2CD4X26FWD/P	2.8~12	4	18
iDS-2CD8626G0/P	3.8~16		
	8~32		
DS-2CD7A26G0/P-IZ(H)S	7~33		
	11~40		
	8~96	12	142

2.4 License plate tilt angle

The license plate should be as horizontal as possible and the recommended tilt angle is within +/-5 degrees.



Also, the vehicles in the detection area should go as straight as possible instead of turning left or right.

Chapter 3 Configurations

You can set the ANRP function via camera or NVR from web configuration

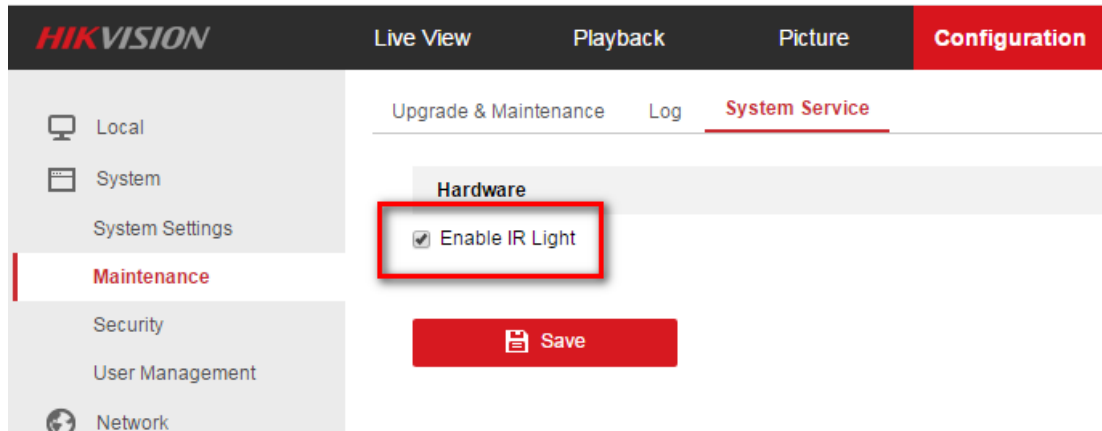
interface, local configuration interface or iVMS client.

The steps are similar.

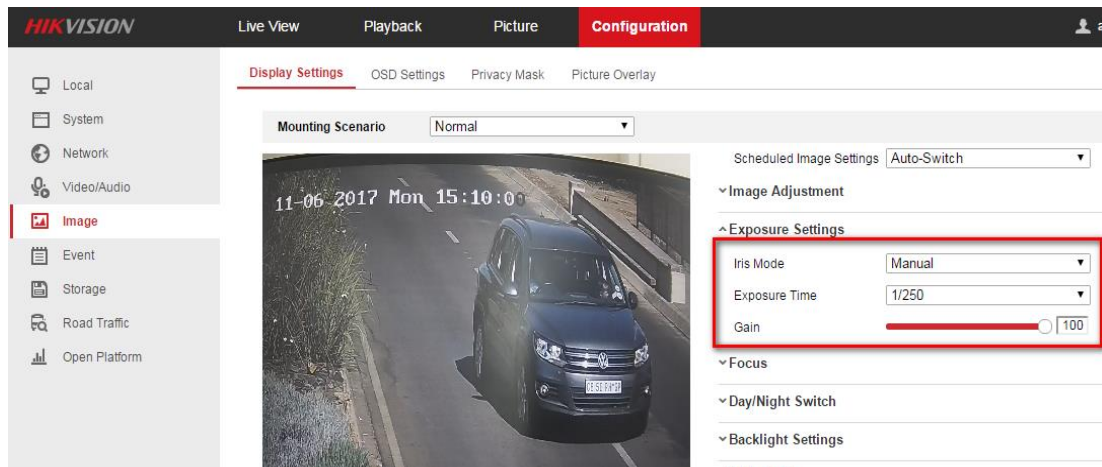
3.1 Set ANRP Function via Camera Web Configuration Interface

Steps:

1. Go to **System>Maintenance>System Service** to enable the IR light;



2. Go to **Image Display Settings** to change **Exposure Time** to 1/250 -1/500;



3. Set the **Day/Night Switch** to **Auto**;

The screenshot shows the Hikvision Configuration interface. The 'Configuration' tab is active, and the 'Day/Night Switch' settings are highlighted with a red box. The settings are as follows:

- Day/Night Switch: Auto
- Sensitivity: 4
- Filtering Time: 5
- Smart Supplement Light: OFF

4. Go to **Picture** to choose the text overlay on the picture;

The screenshot shows the Hikvision Configuration interface with the 'Picture' tab selected. The 'Text Overlay' section is expanded, showing the following settings:

- Picture Quality: 100
- Picture Size: 1024 kb
- Overlay:
- Font Color: [Color Picker]
- Background Color: [Color Picker]

The 'Text Overlay' section includes the following checkboxes:

- Device No.
- Capture Time
- Direction
- Plate No.
- Camera Info.
- Camera No.
- Validity

The 'Text Overlay' table is as follows:

Type	Sorting
Camera No.	↑ ↓
Device No.	↑ ↓
Capture Time	↑ ↓
Plate No.	↑ ↓

The 'FTP Picture Name' section includes the following options:

- Default
- Custom

Example: IP_Channel No._Time_Type.jpg

5. Go to **Road Traffic** to select lane numbers (1~4) and traffic mode;

The screenshot displays the Hikvision web interface for configuring road traffic detection. The main navigation bar includes 'Live View', 'Playback', 'Picture', and 'Configuration'. The left sidebar lists various system settings, with 'Road Traffic' highlighted. The 'Detection Configuration' section is active, showing 'Detection Type' as 'Vehicle Detection' and 'Enable' checked. The 'Area Settings' sub-tab is selected, displaying a video feed of a road with a car. The video feed shows two detection areas (green lines) and a blue detection line. The interface also includes a sidebar with navigation options like Local, System, Network, Video/Audio, Image, Event, Storage, Road Traffic, and Open Platform. Below the video feed, there are settings for 'Total Number of Lanes' (2), 'Plate Mode' (Large), and 'Select Mode' (Entrance/Exit).

Note:

- **Blue Detection Line:** Mainly used for Entrance/Exit with a purpose of improving the capture efficiency. The line is generated automatically, please keep it in the detection area and close to the vehicle license plate.
- **Small:** It means the height of a license plate should be 20 to 30 pixels in the image captured by a 2 megapixel resolution camera.
- **Large:** It means the height of a license plate should be 30 to 40 pixels in the image captured by a 2 megapixel resolution camera.
- **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.
- **Alarm Input:** It means the input alarm will trigger a license plate capture

and recognition action.

- 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;

The screenshot displays the configuration interface for the 'Arming Schedule and Linkage Method'. On the left, a sidebar lists various system settings, with 'Road Traffic' highlighted. The main panel shows the 'Arming Schedule and Linkage Method' settings. The 'Enable' checkbox is checked. The 'Area Settings' dropdown is set to 'Arming Schedule and Linkage Method'. Below this, there are tabs for 'White List', 'Black List', and 'Other List'. The 'Arming Schedule' section includes a 'Delete' button and a 'Delete All' button. A 24-hour grid is shown for each day of the week (Mon-Sun), with blue bars indicating the arming schedule.

- 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;

The screenshot shows the 'Linkage Method' configuration page. The 'Direction' section has three radio buttons: 'All' (selected), 'Forward', and 'Reverse'. Below this, there are several checked options: 'Normal Linkage', 'Trigger Alarm Output', 'Notify Surveillance Center', and 'Upload to FTP/Memory Card/...'.

- 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/...	

9. 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 template looks like this:

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

	A	B	C
1	No.	Plate Num	Group(0 black list, 1 white list)
2			
3			
4			
5			

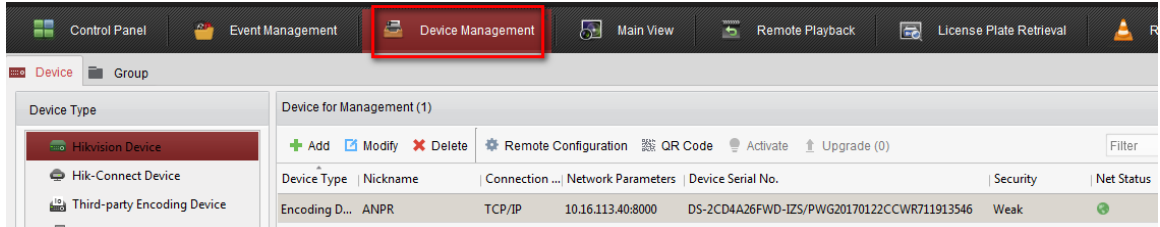
3.2 Set ANRP Function via NVR Web Configuration Interface

Please refer to Chapter 3.1;

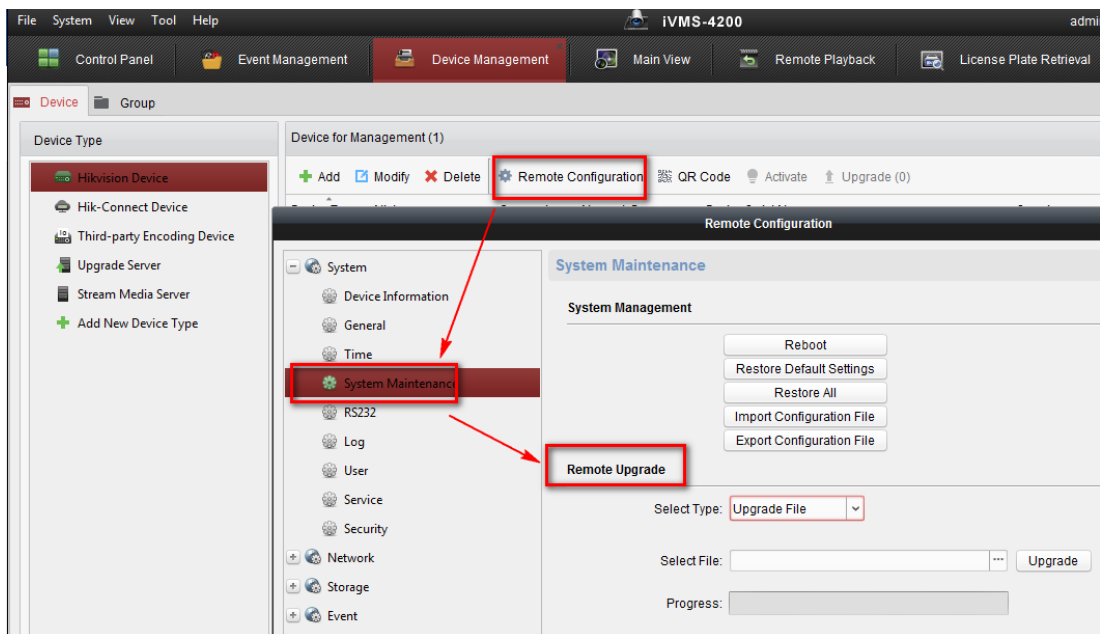
3.3 Set ANRP Function via iVMS-4200

Steps:

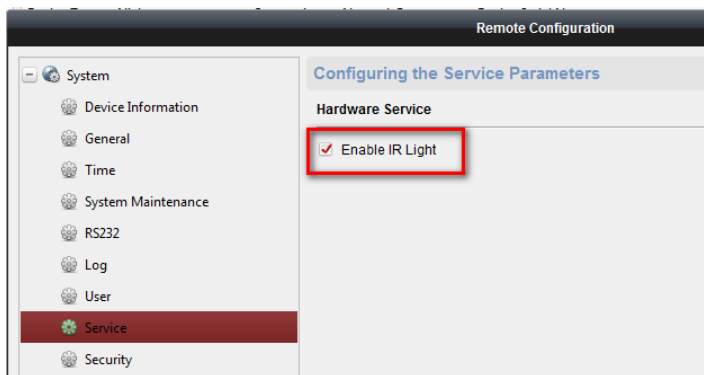
1. Add the ANRP camera to 4200 client in **Device Management** interface;



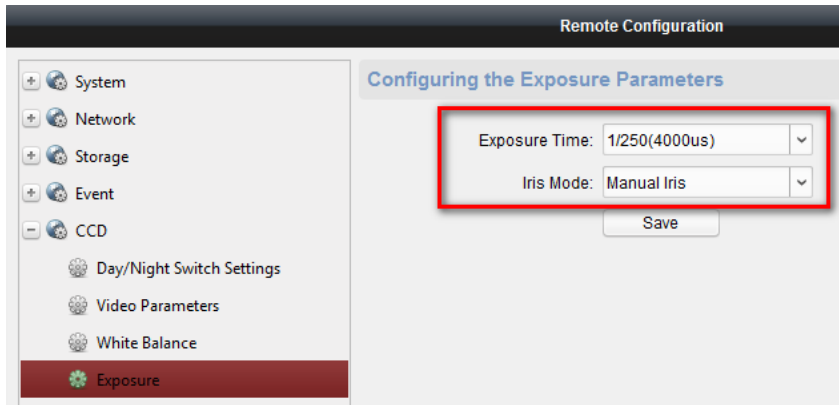
2. Go to **Remote Configuration-> System Maintenance** to upgrade the device to the latest version;



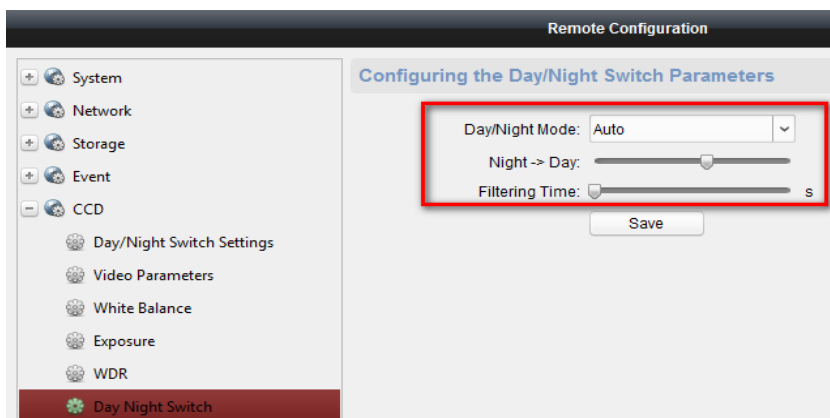
3. Enable IR Light in **System -> Service**;



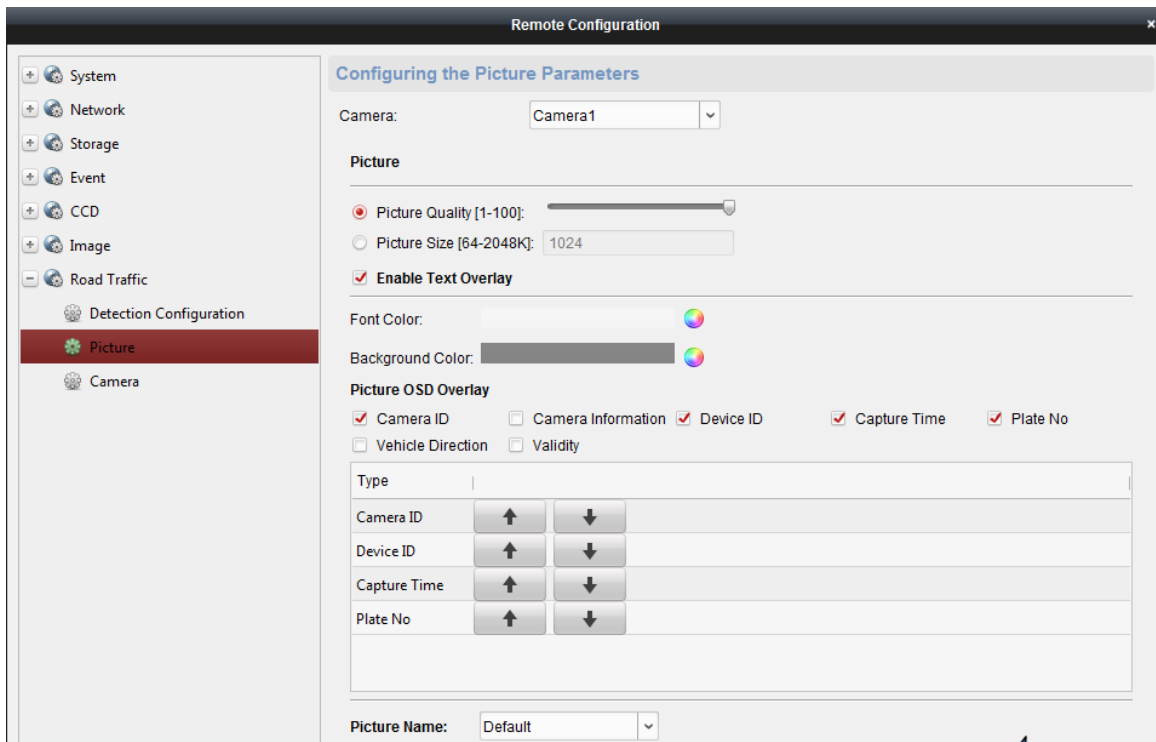
4. Go to CCD to set **Exposure Time** to 1/250 -1/500 & **Iris Mode** to Manual;



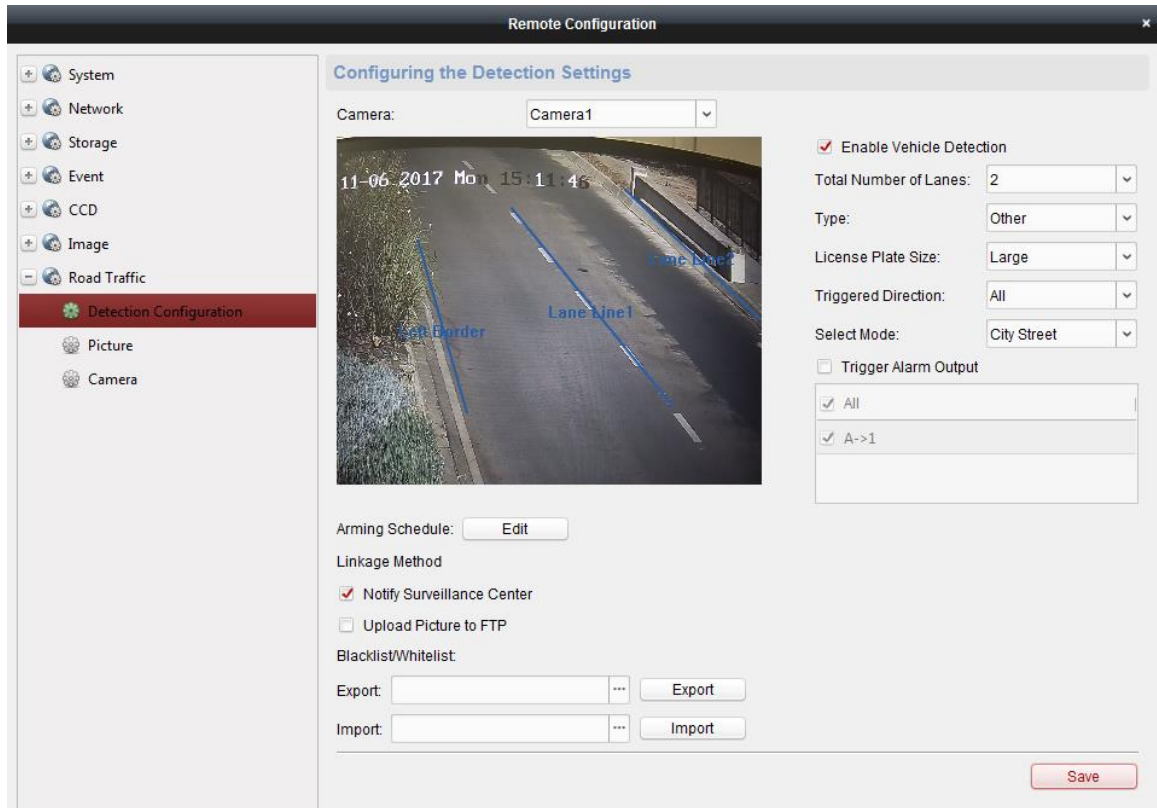
5. Set the **Day/Night Switch** to Auto;



6. Go to **Picture** to choose the text overlay on the capture;



7. Go to **Road Traffic** to set detailed configurations which are similar to those configured in device web configuration interface (please refer to chapter 3.1);



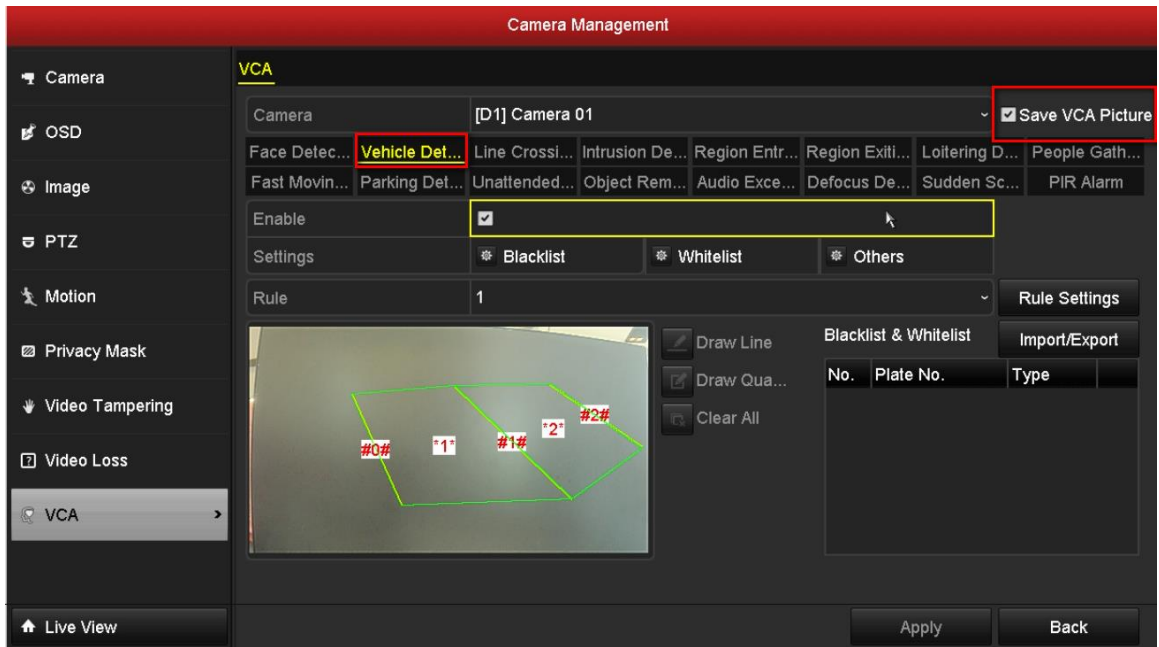
3.4 Set ANPR Function via NVR Local Configuration Interface with GUI 3.0

Preparations:

Please refer to chapter 3.1 & chapter 3.3;

Steps:

1. Go to **Menu->Camera Management->VCA->** select the camera channel->Vehicle Detection to enable ANPR function. Remember to check Save VCA Picture.
2. For detailed steps, please refer to chapter 3.1 & chapter 3.3;



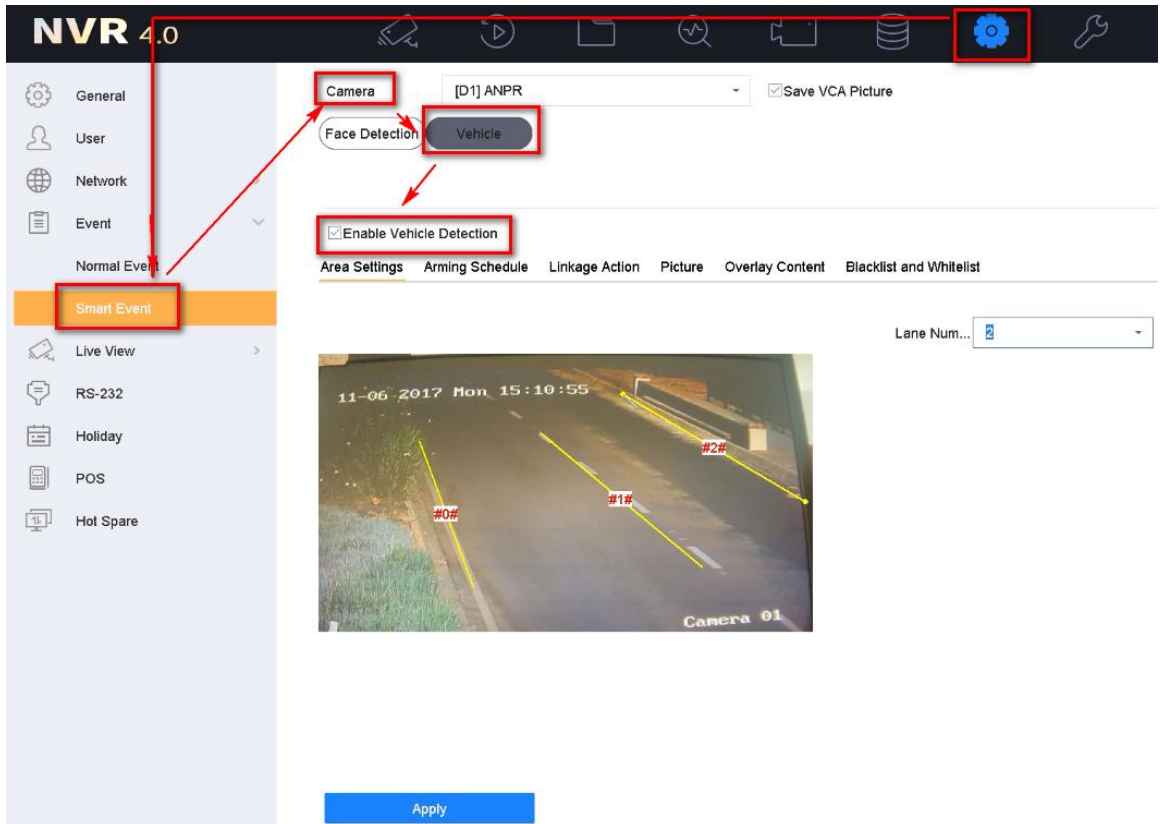
3.5 Set ANRP Function via NVR Local Configuration Interface with GUI 4.0

Preparations:

Please refer to chapter 3.1 & chapter 3.3;

Steps:

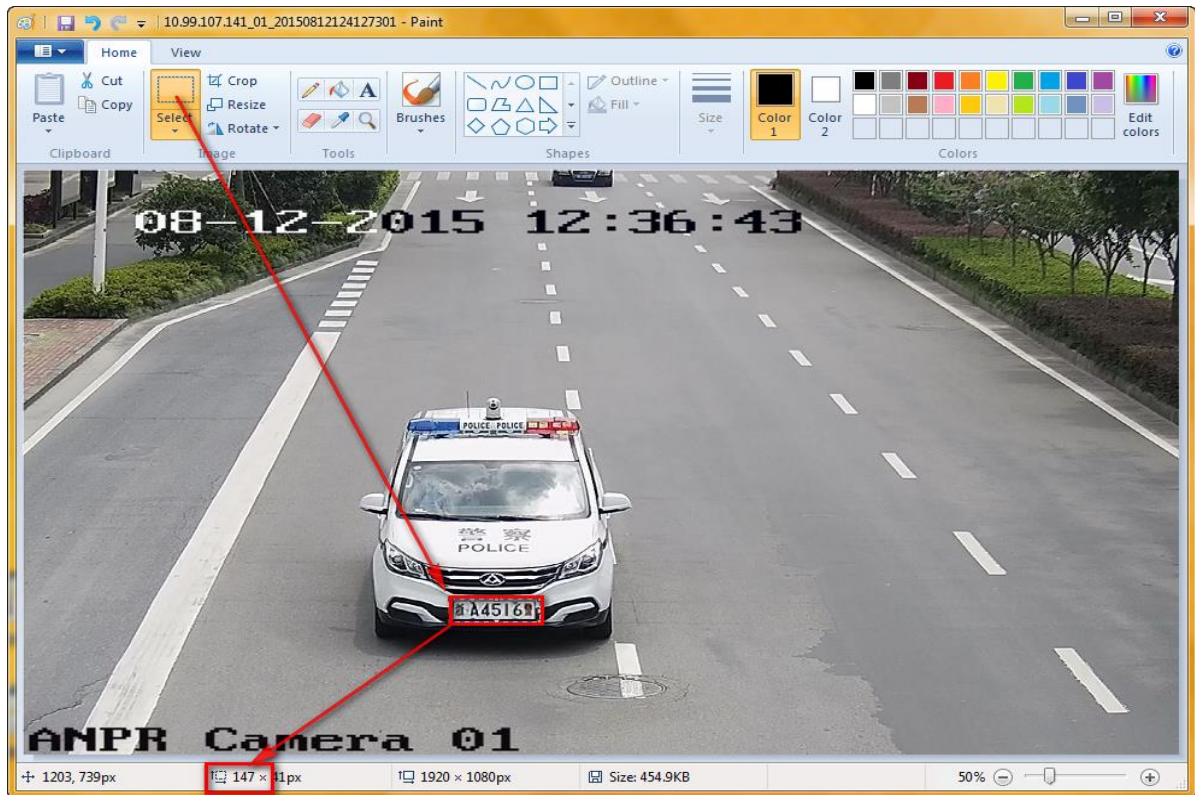
1. Go to **System->Event->Smart Event->** select the camera channel->Vehicle to enable ANRP function. Remember to check Save VCA Picture;
2. For detailed steps, please refer to chapter 3.1 & chapter 3.3.



3.6 Method to check ANPR picture pixels

Steps:

1. Save a picture with vehicle license plate information to PC, then open it with paint tool;
2. Click Select, draw a rectangle to cover the vehicle license plate;
3. Check the pixel at the bottom of the picture.



Chapter 4 Performance

4.1 Search ANRP pictures & videos via Camera Web Configuration Interface

Steps:

1. You can search or download the pictures in Picture interface by selecting the File Type as Vehicle Detection.

Note:

Make sure the SD card in camera is working.

No.	File Name	Time	File Size	Progress
1	20180409095913_TFTPUP4T	2018-04-09 09:59:13	364 KB	
2	20180409095922_C6HFGX8	2018-04-09 09:59:22	404 KB	
3	20180409095925_VYS420S69	2018-04-09 09:59:25	504 KB	
4	20180409095926_TFTPUPi8	2018-04-09 09:59:26	491 KB	
5	20180409095927_1617	2018-04-09 09:59:27	504 KB	
6	20180409095927_VMS4200	2018-04-09 09:59:27	509 KB	
7	20180409095931_1617	2018-04-09 09:59:31	483 KB	
8	20180409095950_H1617	2018-04-09 09:59:50	463 KB	
9	20180409101422_1617	2018-04-09 10:14:22	482 KB	
10	20180409101441_HG4400	2018-04-09 10:14:41	468 KB	
11	20180409101441_VMS4200VNS	2018-04-09 10:14:41	469 KB	

- You can also check the real-time captured license plate in **Real-time LPR Result** interface;

No.	Capture Time	Plate No.	Captured Picture	Lane No.	Direction	Matching Result
22	04-08-2018 18:41:50	CB50PHGP		2	Unknown	Other List

4.2 Search ANRP pictures & videos via iVMS-4200

Steps:

- You can search or download the captured pictures in Road Traffic interface. Vehicle Information could also be exported here;

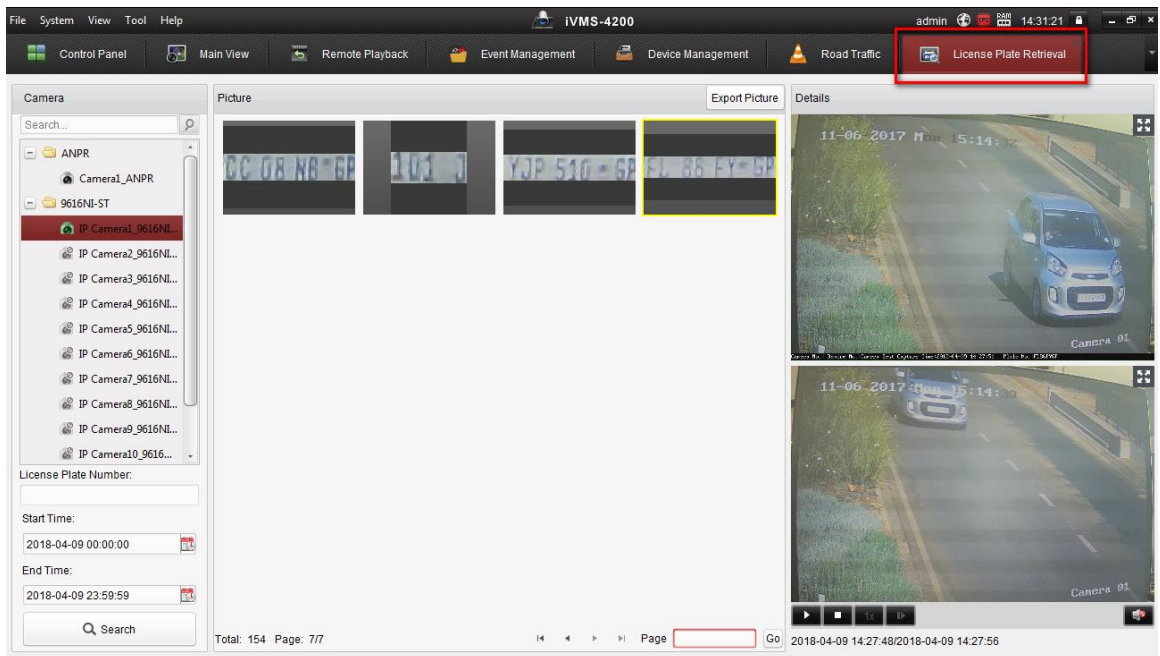
Note:

Make sure the SD card in camera is working, or you have set up storage server for iVMS-4200;

Index	Time	License Plate Number	Picture
37	2018-04-08 17:13:44	D10UC	
38	2018-04-08 17:13:47	OPEN	
39	2018-04-08 17:13:50	RESET	
40	2018-04-08 17:13:51	LANPGE	
41	2018-04-08 17:13:51	DC12V	
42	2018-04-08 17:13:55	CB50PHGP	

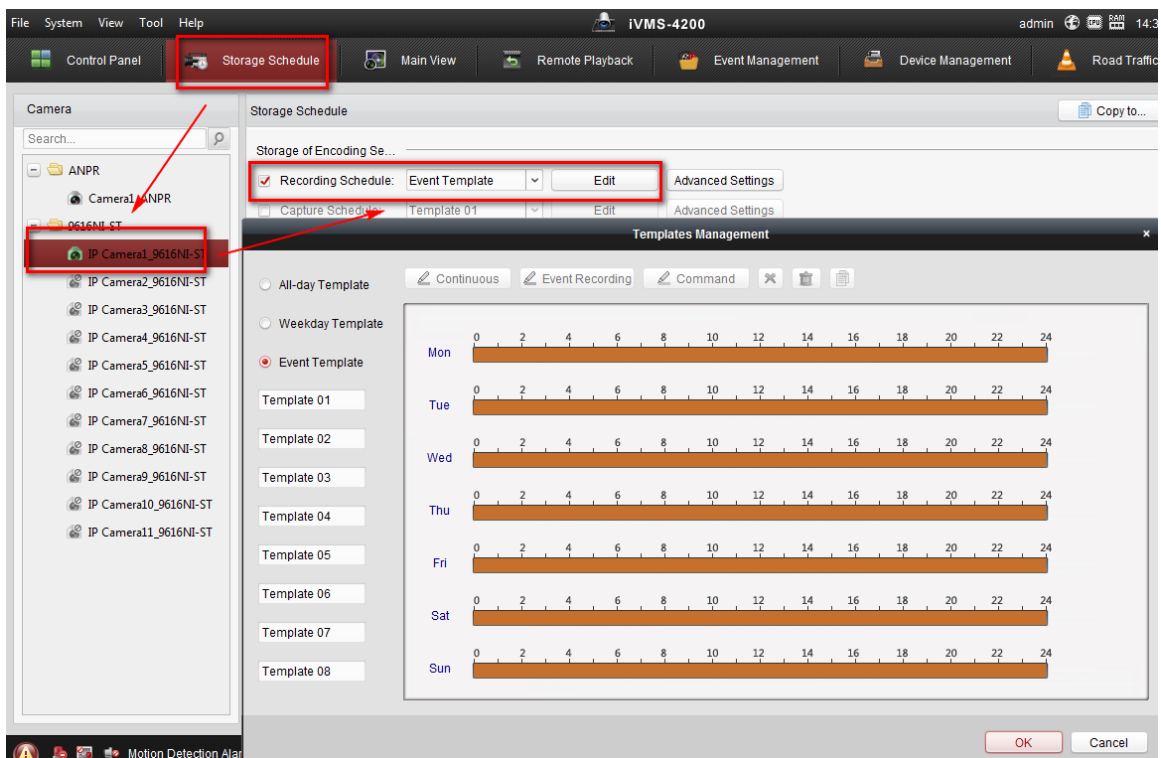
- If the camera is also added into NVR, you can search or download the

captured pictures in **License Plate Retrieval** interface;



3. You need to set an **EVENT** recording schedule in NVR in advance.

Otherwise there will be only pictures;



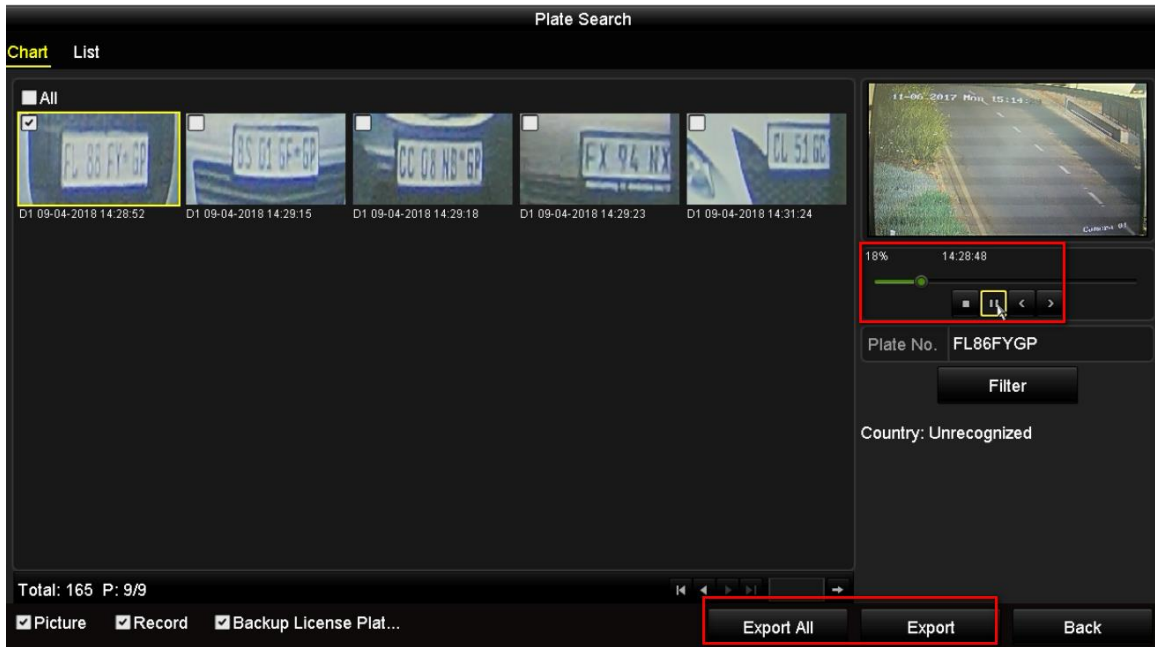
4.3 Search ANRP pictures & videos via NVR Local Configuration Interface with GUI 3.0

Steps:

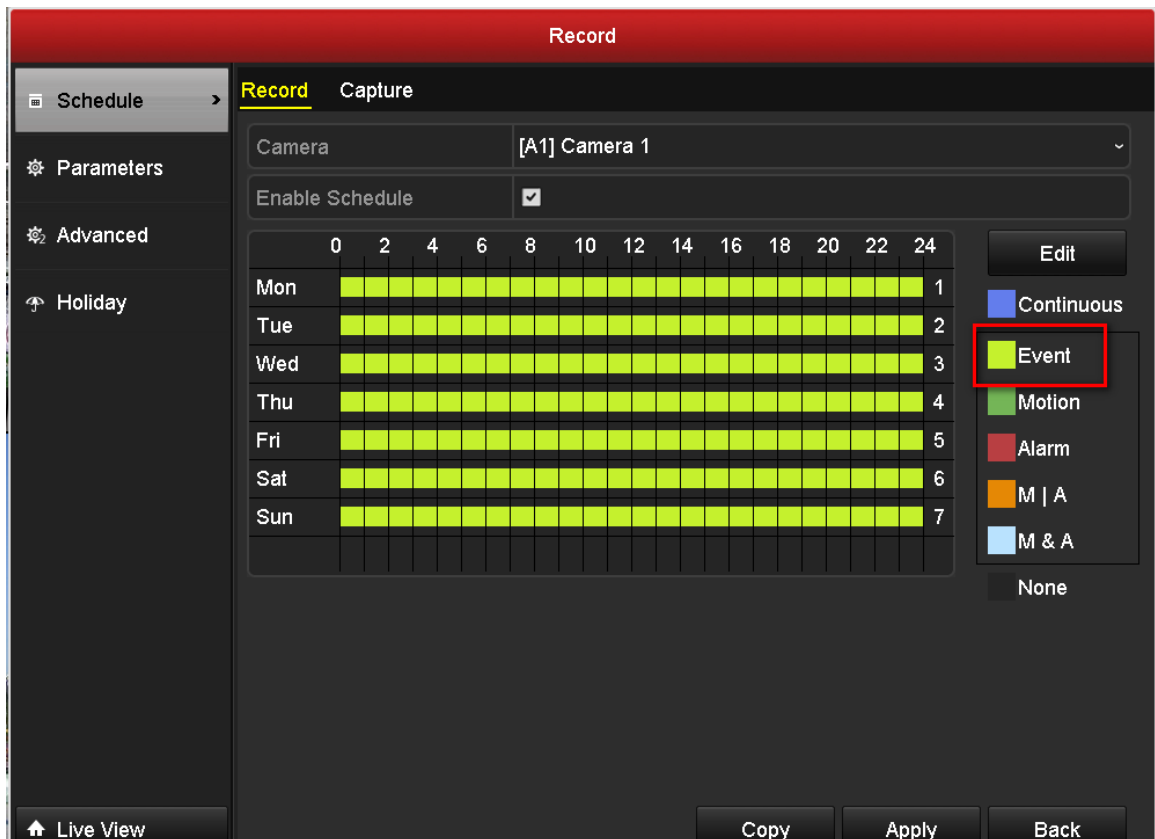
1. Go to **Menu->VCA Search->Plate Search** to search & export the captured license plate pictures & videos;



2. After clicking Search button, all the captured license plate pictures & videos would be displayed;



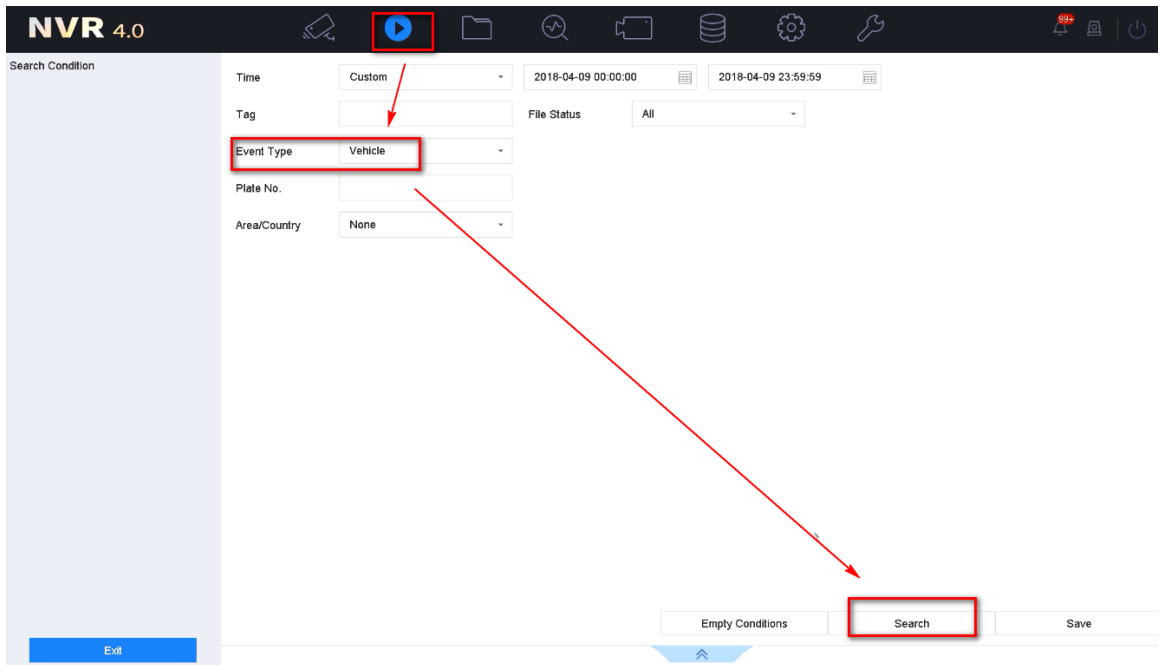
3. You need to set an **EVENT** recording schedule in NVR in advance. Otherwise there will be only pictures;



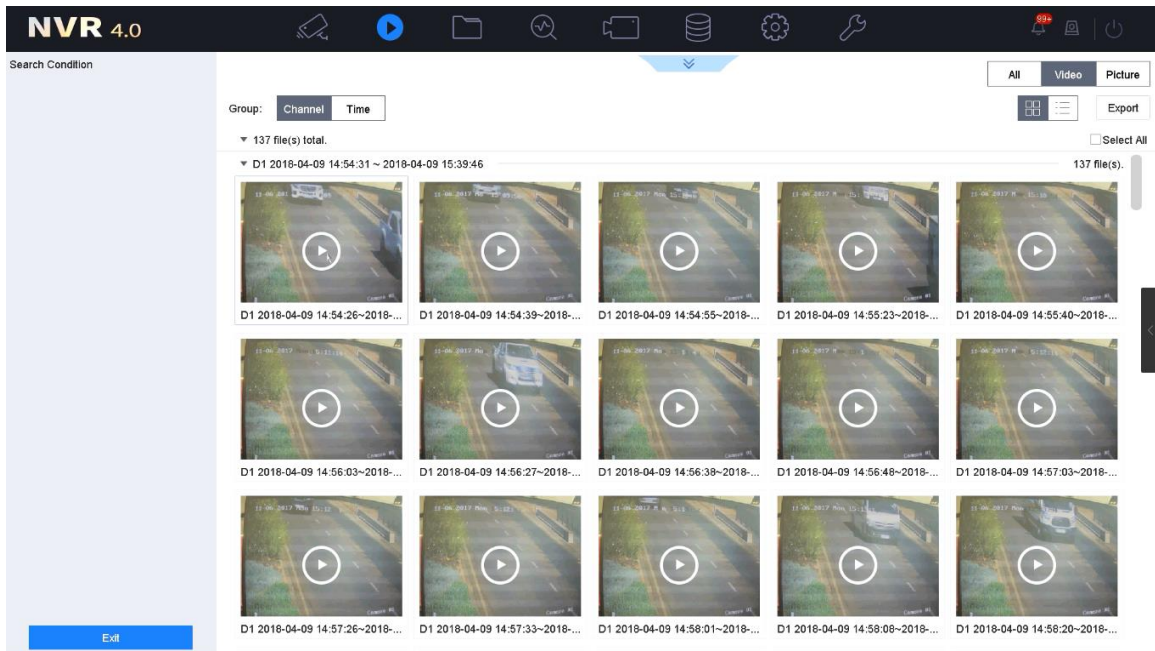
4.4 Search ANRP pictures & videos via NVR Local Configuration Interface with GUI 4.0

Steps:

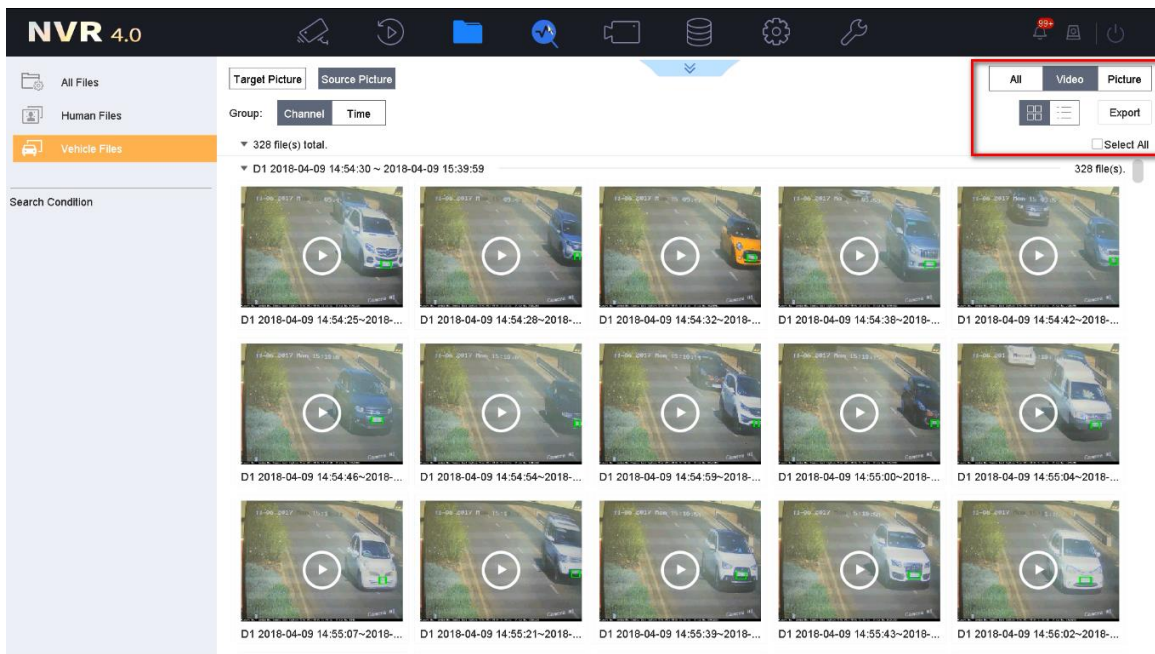
1. You can go to **Playback-> Custom Search->** select the Event Type as Vehicle to search & export the captured license plate pictures & videos;



2. After clicking Search button, all the captured license plate pictures & videos would be displayed. You can click any of these to watch the video;



3. You can also go to **File Management->Vehicle Files** ->click Search button, then all the captured license plate pictures & videos would be displayed. You can click any of these to watch the video;



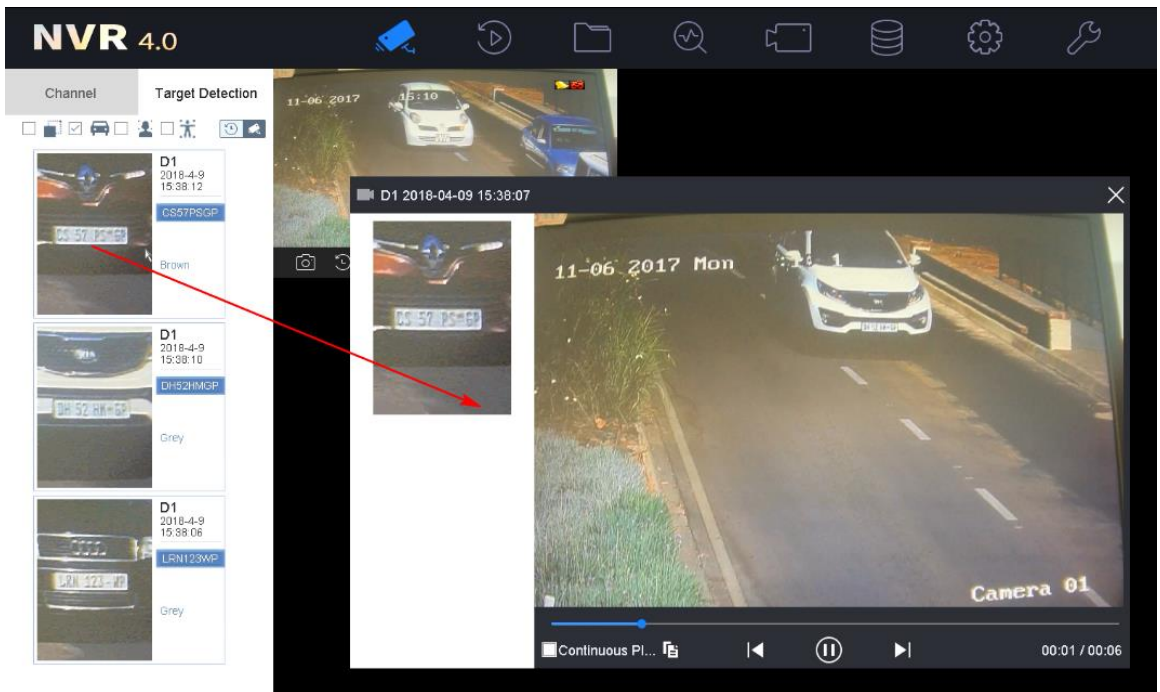
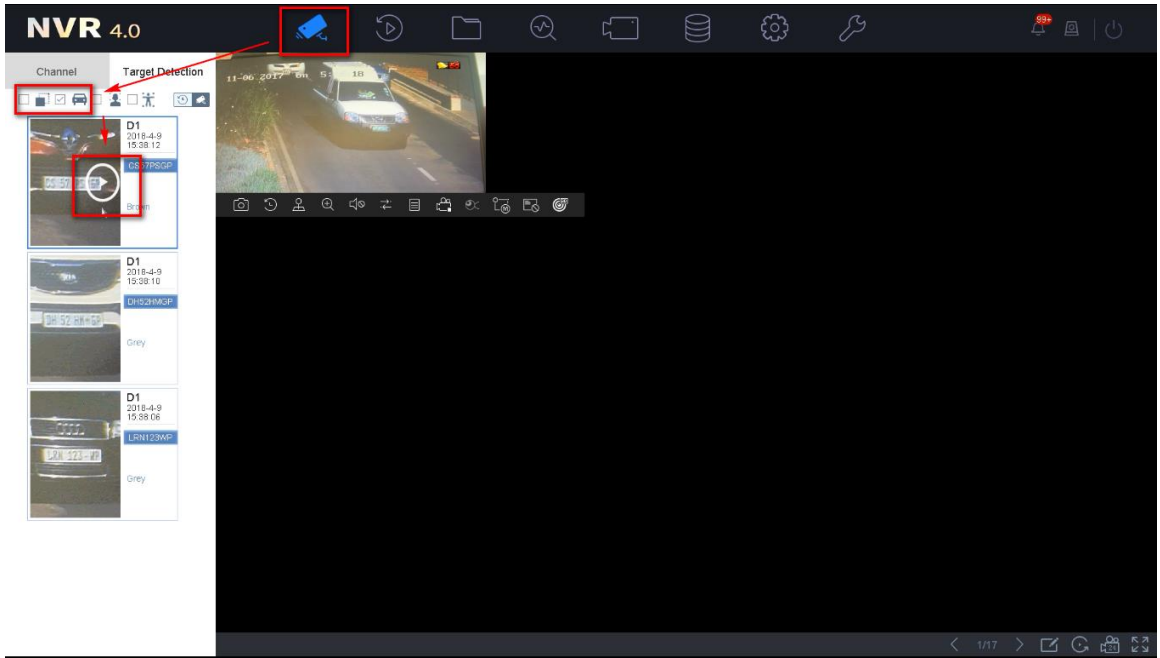
4. Vehicle detailed information could also be exported later if you enable the **Backup License Plate Statistics Info**, which would be included in an .excel file;

The screenshot shows the NVR 4.0 interface. On the left, there is a sidebar with 'All Files', 'Human Files', and 'Vehicle Files' (highlighted). Below the sidebar is a 'Search Condition' section. The main area contains search filters: 'Time' (Custom, 2018-04-09 00:00:00 to 2018-04-09 23:59:59), 'Camera' ([D1] ANPR), 'Plate No.' (empty field), and 'Area/Country' (All). At the bottom, there is a 'Backup License ...' button with a checkbox, which is highlighted with a green box. Other buttons include 'Empty Conditions', 'Search', and 'Save'.

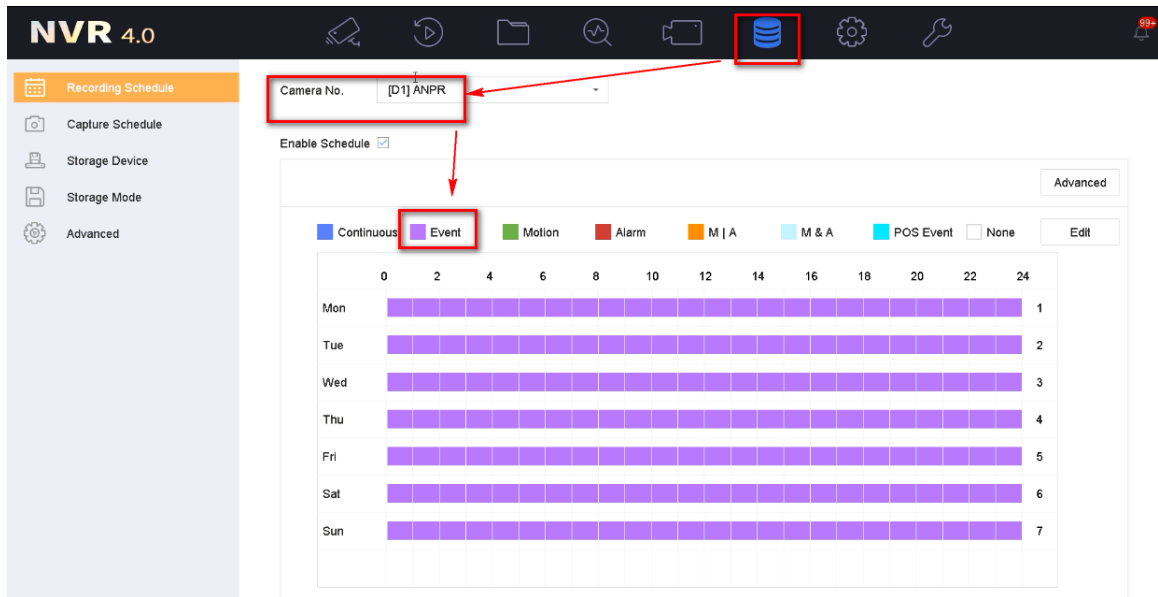
vehicleinfo_20180510134800.xls 5/10/2018 1:48 ... Microsoft Excel ... 66 KB

	A	B	C	D	E
1	Sequence Number	Plate Number	Chan Name	Date(Year/Month/Day)	Time(Hour:Minute:Second)
2	1	D7S1411	-	2018/05/10	12:30:03
3	2	D7A1411	-	2018/05/10	12:30:21
4	3	D71411	-	2018/05/10	12:30:28
5	4	D7Q1411	-	2018/05/10	12:30:33
6	5	D71411	-	2018/05/10	12:30:42
7	6	D7R1411	-	2018/05/10	12:30:47
8	7	D7Q1411	-	2018/05/10	12:30:52
9	8	D741411	-	2018/05/10	12:31:01
10	9	D7961411	-	2018/05/10	12:31:13
11	10	D71411	-	2018/05/10	12:31:25

5. Go to **Live view**->**Target Detection**-> Select Vehicle Detection to watch the real-time captured license plate pictures & videos;



6. You need to set an EVENT recording schedule in NVR->Storage->Recording Schedule in advance. Otherwise there will be only pictures.



Chapter 5 Appendix

1. Spec of ANPR cameras (4x26 series):
/00 Oversea Products/01 IP/01 SPEC, A&E SPEC/SPEC/01 IPC/08 4 Series ANPR(4X26FWD)/
2. Spec of AI NVR:
/00 Oversea Products/01 IP/01 SPEC, A&E SPEC/SPEC/03 NVR/DeepinMind NVR/

First Choice for Security Professionals
***HIK*VISION Technical Support**