

How to Set Up Hikvision ANPR

Automatic Number Plate Recognition (ANPR), sometimes known as License Plate Recognition (LPR), allows a camera to automatically detect and recognise a car's number plate as it moves through the scene. The camera can take a still / clip of the plate in question, as well as perform an action based on a whitelist / blacklist such as opening an automated gate for example.

This requires a specialised ANPR camera and pairing it with an NVR you also need one that can support ANPR functionality.

First of All – IP Camera Setup

Your camera will require specialist firmware to activate the ANPR functionality, as by default it will not have the ANPR-specific firmware. This is a firmware version that isn't publicly released by Hikvision, and so you'll have to contact Traders Warehouse for access to the firmware.

Once the required firmware has been installed on the camera, reset your device to default settings. The camera will not function properly unless you do so.

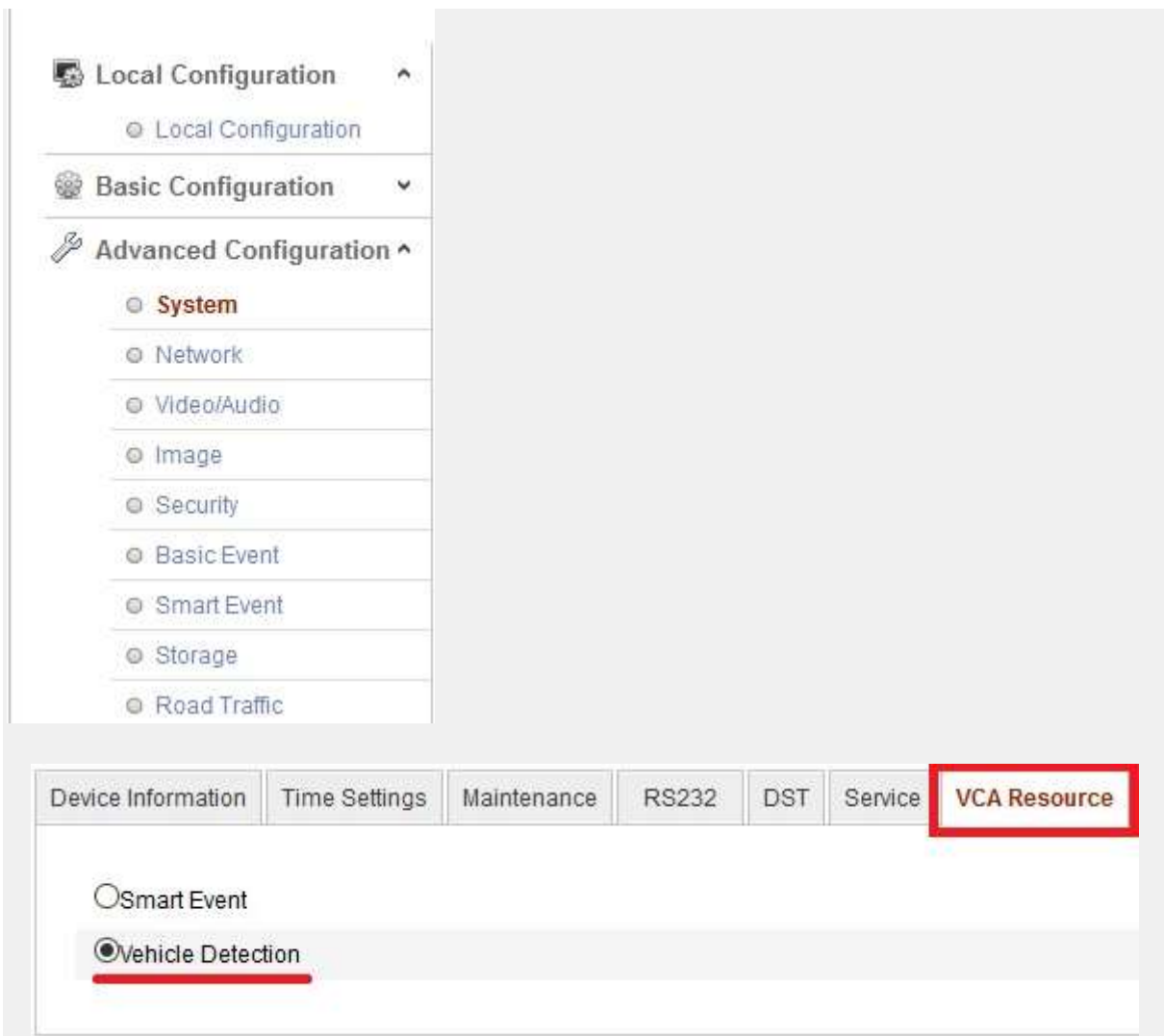
Navigate to **Configuration > Advanced Configuration > System > Maintenance to do so.**

Once the device has rebooted and you've reactivated it with a strong password,

Navigate and login to the camera through a web browser-

Configuration > Advanced Configuration > System > VCA Resource and **ensure the Vehicle Detection option is ticked** as opposed to Smart Event, and then hit Save.

This essentially allocates more resources to Vehicle Detection as opposed to Smart Events, ensuring more reliable ANPR functionality at the expense of Smart Event functionality.



Once you've done this, power cycle the device (no need to reset it again).

It is absolutely essential you complete the above steps, regardless of how you're planning to configure ANPR afterwards.

Setting up a Hikvision ANPR camera

Once you've completed the above steps, log back in to your ANPR camera via a web browser and navigate to Configuration > Advanced Configuration > Road Traffic



On the "Detection Configuration" tab, ensure that the Detection Type dropdown has Vehicle Detection selected, and that Enable is ticked.

A screenshot of the 'Detection Configuration' tab. The tab is active and highlighted in red. Below the tab, there are four sub-tabs: 'Picture', 'Camera', 'Real-time LPR Result', and 'Blacklist & Whitelist'. The 'Detection Type' dropdown menu is set to 'Vehicle Detection'. Below the dropdown, there is a checkbox labeled 'Enable' which is checked. Both the dropdown and the checkbox are highlighted with red boxes.

Underneath you'll see a small image preview of your camera. This is where you'll define the detection area and number of lanes you wish the camera to pick up plates from.

Define the number of lanes you're going to be monitoring and what region the camera is located in. The number of yellow configurable lines on the preview will adjust depending on the selected number of lanes.

NOTE - only one plate can be captured at any one time for each lane

Area Settings

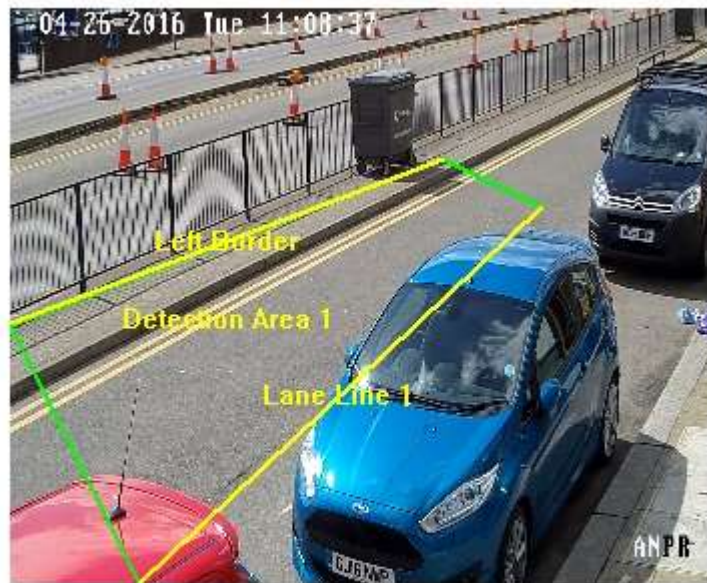


Total Number of Lanes	1
Region	Europe Region

The area between these two yellow lines is the detection area the camera will monitor. It's not absolute - the camera will pick up plates from a small area outside of the detection area.

Click and drag the yellow lines to your desired area.

Area Settings



Total Number of Lanes	1
Region	Europe Region

NB: The camera used in the demo is not mounted in an optimal position. Ideally, it'd be facing toward the incoming traffic as much as possible, using a narrow field of view (and thus zoom) to achieve optimal plate recognition. This is just for demo purposes.

Look towards the License Plate Settings just below the detection area configuration.

License Plate Settings

License Plate Width	Min. 130	Max. 500	<input checked="" type="checkbox"/> Enable Real-time LPR Result
Select Mode	<div>City Street City Street Entrance/Exit Arming Sched Custom</div>		

To ensure optimal detection, you should enter the minimum and maximum plate widths that are going to be present in your scene. You can measure this manually by grabbing a still from the camera when a car drives through the scene and measuring the pixel width of the plate using a program such as MS Paint or Photoshop. Typically, the default values of Min. 130 and Max. 500 tend to be okay, but optimisation is always a good thing.

Below are Hikvision's rules regarding pixel width.

For EU region:

Restrictions to plate width minimum acceptable width is 130 pixels, and 70px for a two-row plates. Max plate width should be at least 2*min plate width and not exceed 3*min plate width.

For CIS region:

Restrictions to plate width minimum acceptable width is 150 pixels, and 100px for a two-row plates. Max plate width should be at least 2*min plate width and not exceed 3*min plate width.

For Universal region (combining EU and CIS) :

Restrictions to plate width minimum acceptable width is 130 pixels, and 70px for a two-row plates. Max plate width should be at least 2*min plate width and not exceed 3*min plate width.

In the Select Mode dropdown, choose the scenario that best describes your application environment, either City Street or Entrance / Exit or a Custom value. Essentially, this dictates the time interval between detection and uploading of a snapshot of the detected car and plate - City Street uploads the plate information after the car leaves the detection area, whereas Entrance/Exit uploads it immediately.

Real-time LPR Result will allow you to monitor plates captured by the camera via the web interface which we'll come to in a moment. When enabled, a tab will be visible in which you can view the real-time LPR results.

By default, the Arming Schedule is set to be active 24/7, but this can be configured if required. If you're familiar with Hikvision recording schedules or event arming schedules like motion detection, it's the exact same principle.

[illegible]

Active periods are marked blue on the timeline. Click Edit to open another window which will allow you to configure the arming schedule.

Mon Tue Wed Thu Fri Sat Sun

☒ All Day
☐ Custom

Period	Start Time	End Time
1	00:00	24:00
2	00:00	00:00
3	00:00	00:00
4	00:00	00:00
5	00:00	00:00
6	00:00	00:00
7	00:00	00:00
8	00:00	00:00

Copy to Week ☐ All
☒ Mon ☐ Tue ☐ Wed ☐ Thu ☐ Fri ☐ Sat ☐ Sun

Copy OK Cancel

Define the periods you want ANPR to be active, and then copy it to other days if necessary - otherwise, individually configure the other days of the week too. Hit OK when you're done.

Linkage Method

Triggering Source ☒ All Whitelist

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

Next, configure the Linkage Method of the camera when a plate is recognised. The camera can alert surveillance center software, such as iVMS 4200 and iVMS 4500, as well as upload the captured still to an FTP server and trigger an alarm output on the camera if one is available.

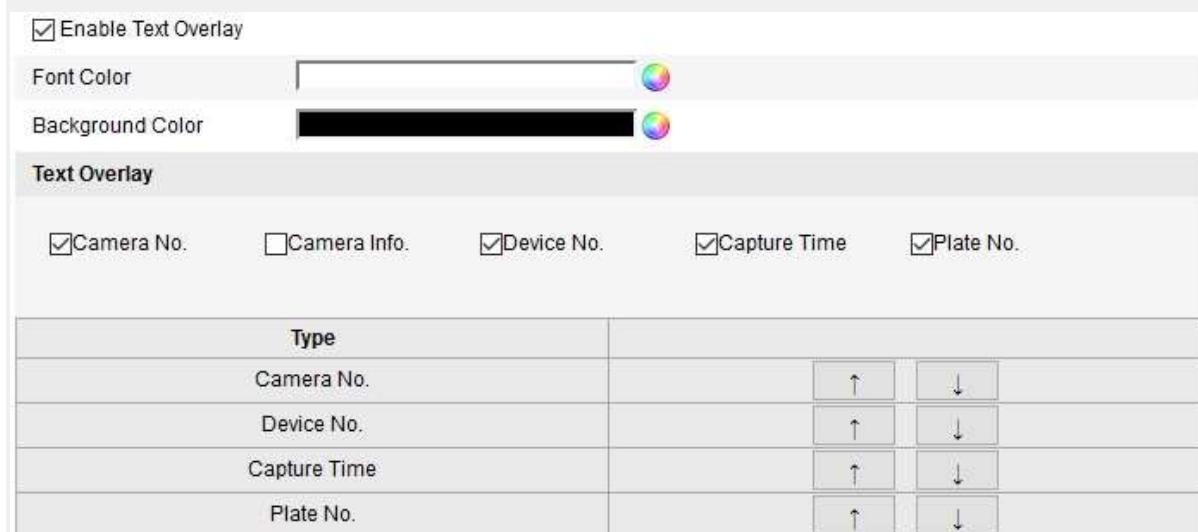
These can be separately configured for different triggering sources, from a Whitelist, Blacklist or "Other", selectable from the dropdown menu.

Once you're done, hit Save and click on the Picture tab. Within this window, you'll configure the stills taken by the camera whenever a plate is grabbed.



Choose between either a defined Picture Size or a Picture Quality slider with values ranging from 0-100. This will determine the file size and thus quality of your captures. Remember, if you don't have the camera paired with an NVR, you will need to install a microSD card into the camera to store captured plates to.

Below this, enable or disable the Text Overlay that accompanies LPR stills. This is a small bar that runs along the bottom of the image (added to the bottom, not covering part of your camera view) which will display the timestamp information of when the still was taken, the actual Plate No. as well as what camera took it etc.



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

You can customise the font and background colour of the overlay to your own preferences, as well as what information is actually displayed and in what order. In the above example, Camera No. is displayed first and Plate No. comes last.

In a similar fashion, you can dictate the name of the stills uploaded to your FTP server if one such FTP server is available to the camera. By default, the Default option is selected, but you can choose Custom to determine the naming scheme of the captures, similar to

the above.

FTP Picture Name

☐ Default ☒ Custom

☐ Camera Name ☒ Capture Time ☒ Plate No. ☒ Alarm Type

Type	
Capture Time	<div>↑</div> <div>↓</div>
Plate No.	<div>↑</div> <div>↓</div>
Alarm Type	<div>↑</div> <div>↓</div>

Once you're done, hit Save and click on the Camera tab. In this window, you can dictate the Camera and Device No. as well as the Camera Info., all of which will be displayed on the text overlay we configured in the previous window.

These fields can be filled with whatever you wish.

Detection ConfigurationPicture**Camera**Real-time LPR ResultBlacklist & Whitelist

Device No.

01

Camera No.

01

Camera Info.

ANPR Cam

Hit Save and then click on the Real-time LPR Result tab. If everything has been configured correctly so far, you'll be able to use this tab to verify whether the camera is able to detect plates, either by driving a car past the detection area yourself or waiting for one to go past.

Detection Configuration

Picture

Camera

Real-time LPR Result

Blacklist & Whitelist

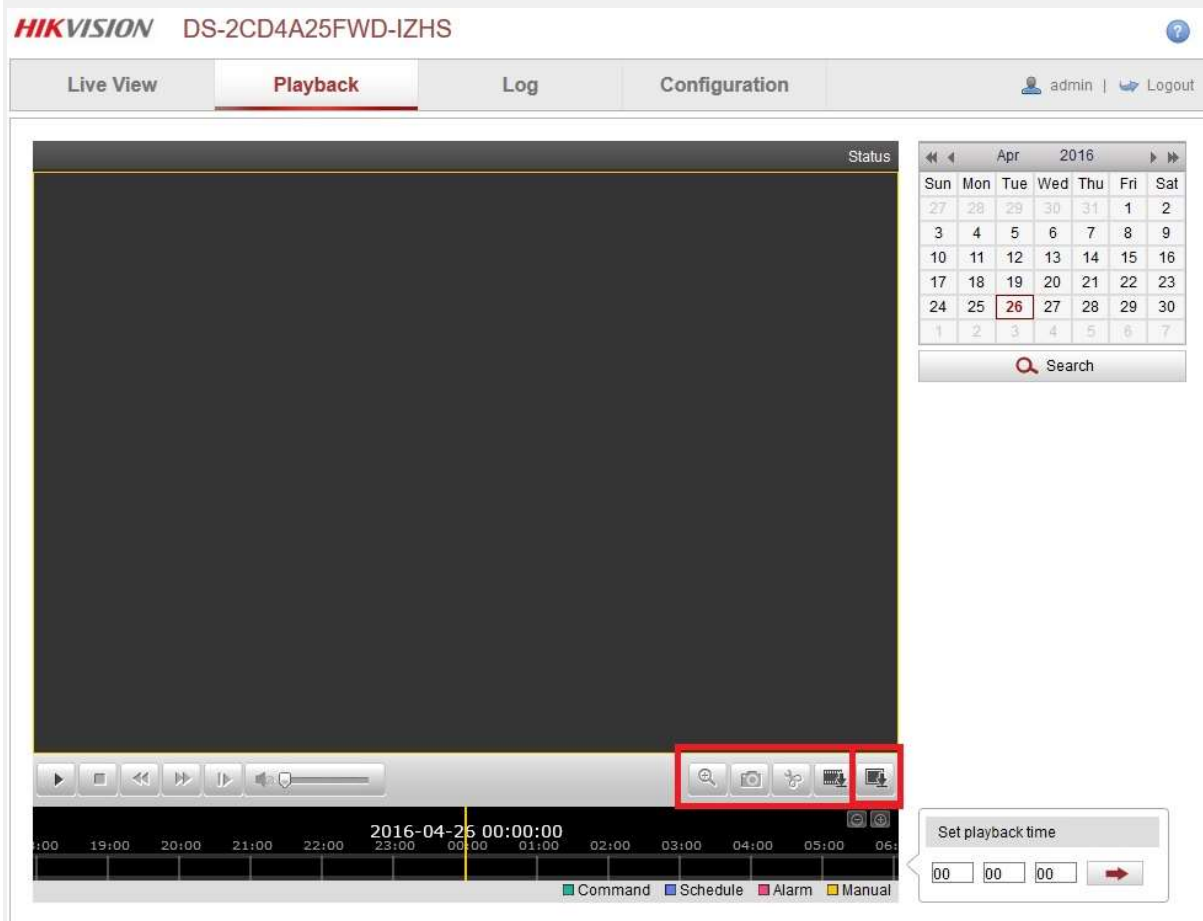
04-26-2016 Tue 11:20:58

14	04-26-2016 11:21:02	T135TFW		Great Britain(GBR)	1	Forward
13	04-26-2016 11:20:58	GJ16NWP		Great Britain(GBR)	1	Reverse

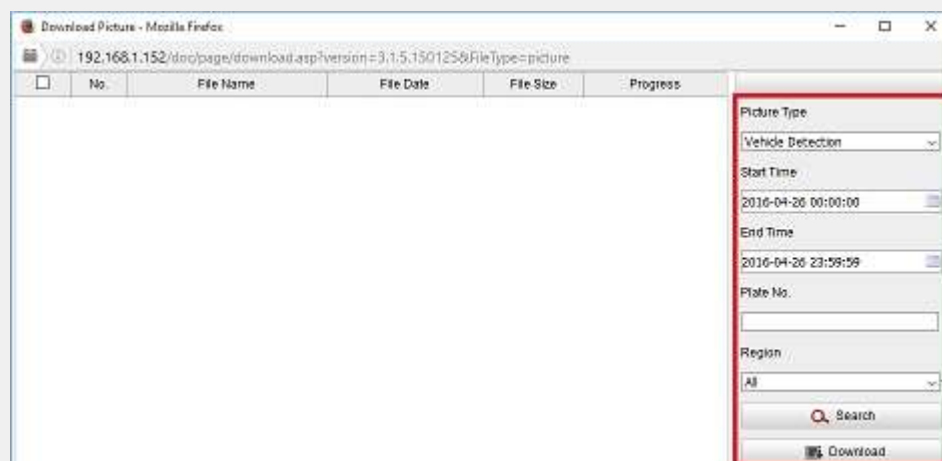
Once again, it displays a preview window of the camera's live stream, and it also displays a preview of the 20 most recently recognised plates as well as some information about them, including the country of origin and the direction they were travelling in.

Click on the Blacklist & Whitelist tab. In here is where you'll upload or export a Blacklist & Whitelist file that you would need to create yourself.

to the Playback tab of the camera via a web browser and click on the Download Pictures button.



On the right hand side, set the Picture Type to "Vehicle Detection", define the start and end period of your search, a desired Plate No. to search for (you can leave this blank) and a particular region the plate came from and hit search. Results will appear on the left for you to view and download.



That's it, you're done!

The process is very similar when configuring via an NVR, but there are a few key differences that we'll cover below, but it's recommended that you complete the above steps on the camera itself before moving on to the NVR as, depending on firmware versions, some configuration options are only available on the camera and *must* be accessed.

Setting up a Hikvision ANPR camera via an NVR

Configuring an ANPR camera via an NVR is very similar to the above process, with a few differences which I'll cover below. Mostly, it's a case of a few configuration options that are located in different places, but some are only accessible by the camera itself.

One of the key benefits of using an NVR with an ANPR camera is the ability to simultaneously record footage of cars as they drive past. When searching for captured plates, the NVR will also provide a short clip of the car as it drove past the camera. You can also review footage if an incident occurred and you have a suspected number plate, providing a bit more clarity on what happened as opposed to a still image of the captured plate. This recording is not possible when using an ANPR camera with a microSD card installed.

Like with most things, a Hikvision NVRs own settings will take precedence over the settings on the camera, and so a setting on the NVR will replace the configuration on the camera itself. For the quickest set up, you'd simply configure ANPR as you did above but on the NVRs own configuration options as opposed to the camera. As discussed, this will not allow you to optimise the image parameters of the camera however. I tend to suggest that you configure all the settings you want on the camera, and then do the same on the NVR too, to ensure you've optimised everything as much as possible and avoid the issue of necessary configuration options not being present on an NVR.

If you're connecting your camera directly to the POE ports of an NVR and need to access its configuration options, you would need to [activate a feature called Virtual Host](#).

Connect to your NVR via a web browser (it's also possible via a HDMI connection to a monitor) and navigate to Configuration > Vehicle Detection > Vehicle Detection Configuration.

HIKVISION

- Local
- System
- Network
- Video/Audio
- Image
- Event
- Storage
- Vehicle Detection**
- VCA

Vehicle Detection Configuration

Picture

Camera

Channel No.

IP Camera8

☒ Enable Vehicle Detection

Type

Other

Black List

White List

Other

Area Settings

Arming

Schedule

Linkage Method



Draw Detection Area

Total Number of Lanes

1

As discussed, the configuration is almost identical to what is described above, which I'd suggest you read first.

You will need to ensure that you select the appropriate Channel No. from the dropdown menu, as well as what detection type you wish to use (Black List, White List, Other) from the second dropdown menu.

Once again, define the number of lanes and detection area to however you wish.



Total Number of Lanes

Export

Import Config. File

Black List/White List

Status

The options to import and export Black List / White List have also moved, and are now present at the bottom of each page in the Vehicle Detection subsection. Functionality remains the same, although there is no real-time display of the list contents.

One of the added benefits of using an NVR is the greater range of Linkage Methods available. The NVR is able to audibly warn you when a plate is triggered, send you an email or activate full screen monitoring of the camera. It can also trigger a great number of alarm outputs, and initiate recording of different cameras too.

Area Settings Arming Schedule Linkage Method		
<input type="checkbox"/> Normal Linkage	<input type="checkbox"/> Trigger Alarm Output	<input type="checkbox"/> Trigger Channel
<input type="checkbox"/> Audible Warning	<input type="checkbox"/> A->1	<input type="checkbox"/> D1
<input type="checkbox"/> Send Email	<input type="checkbox"/> A->2	<input type="checkbox"/> D2
<input checked="" type="checkbox"/> Notify Surveillance Center	<input type="checkbox"/> A->3	<input type="checkbox"/> D3
<input type="checkbox"/> Full Screen Monitoring	<input type="checkbox"/> A->4	<input type="checkbox"/> D4
	<input type="checkbox"/> D4->1	<input type="checkbox"/> D5
	<input type="checkbox"/> D6->1	<input type="checkbox"/> D6
	<input type="checkbox"/> D7->1	<input type="checkbox"/> D7
	<input type="checkbox"/> D8->1	<input checked="" type="checkbox"/> D8
		<input type="checkbox"/> D9
		<input type="checkbox"/> D10
		<input type="checkbox"/> D11
		<input type="checkbox"/> D12
		<input type="checkbox"/> D13

These are the only features currently that have been moved around. As mentioned, there are some features on the camera you'd need to configure that aren't available via the NVR, including minimum and maximum plate pixel width, as well as the region the camera is located in.

Picture / Capture settings and OSD overlay settings are the same. There is no Real-time LPR Result window available to you on the NVR.

To access captured stills of detected plates, you would need to navigate to the Picture tab at the top of the NVRs web access GUI.



Once again, on the left hand side choose which camera to search for, as well as selecting Vehicle Detection as the File Type. Define a country and Plate No. if desired, and a time period to search.

Results will be displayed on the right hand side, at which point you can view or

download them.

Download by File

Search Conditions		File List			
Channel No.	<div><input type="checkbox"/> No.</div>	File Name	Start Time		
IP Camera8	<div><input type="checkbox"/> 1810</div>	ch0008_010100012650259217883005_HN55FXE	2016-04-25 11:30:04		
File Type	<div><input type="checkbox"/> 1811</div>	ch0008_010100012650259736027004_DS65YKX	2016-04-25 11:35:29	2	
Vehicle Detection	<div><input type="checkbox"/> 1812</div>	ch0008_010100012650260214235004_BU11NGY	2016-04-25 11:39:34	2	
Country	<div><input type="checkbox"/> 1813</div>	ch0008_010100012650260688859004_EO53YNN	2016-04-25 11:49:34	2	
All	<div><input type="checkbox"/> 1814</div>	ch0008_010100012650261189083005_MK53MHA	2016-04-25 11:54:35	2	
Plate No.	<div><input type="checkbox"/> 1815</div>	ch0008_010100012650261690843005_DY16NHH	2016-04-25 11:56:08	2	
	<div><input type="checkbox"/> 1816</div>	ch0008_010100012650262731739004_K124JAR	2016-04-25 12:08:35	2	
Start Time	<div><input type="checkbox"/> 1817</div>	ch0008_010100012650263228379005_YS54NKC	2016-04-25 12:08:41	2	
2016-04-25 00:00:00	<div><input type="checkbox"/> 1818</div>	ch0008_010100012650263748059005_GN11AJU	2016-04-25 12:23:48	2	
End Time	<div><input checked="" type="checkbox"/> 1819</div>	ch0008_010100012650264262619005_JC06BOY	2016-04-25 12:27:42	2	
2016-04-25 23:59:59	<div><input type="checkbox"/> 1820</div>	ch0008_010100012650264784347004_GF05DLE	2016-04-25 12:29:33	2	
	<div><input type="checkbox"/> 1821</div>	ch0008_010100012650265275867005_BF14HXY	2016-04-25 12:30:34	2	
	<div><input type="checkbox"/> 1822</div>	ch0008_010100012650265785307005_EN07OVF	2016-04-25 12:33:53	2	

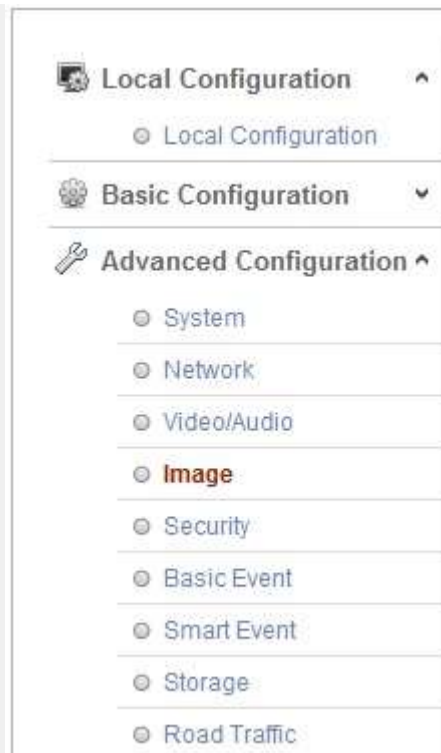
This should be all you'd need to configure ANPR via a camera using a microSD card on its own, or by connecting it to an NVR too.

Below are some recommended image parameters from Hikvision to improve detection accuracy, particularly at night.

Recommended Image Settings for ANPR

It is important that you optimise the image settings of your Hikvision ANPR camera to ensure maximum detection accuracy. You should do this anyway for all of your Hikvision cameras based on their environment, but it's absolutely necessary for an ANPR camera in particular. For example, motion blur can cause a number plate to be too blurry, or a headlight might blind the camera and it won't see the plate unless you take the following steps.

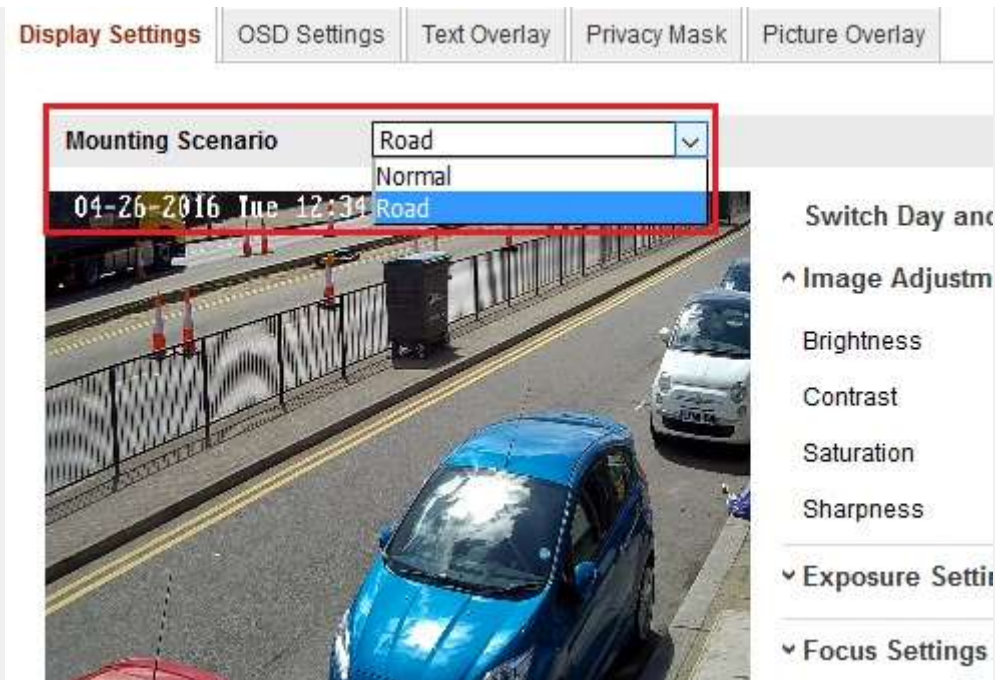
Log into your camera's web browser access, and navigate to Configuration > Advanced Configuration > Image



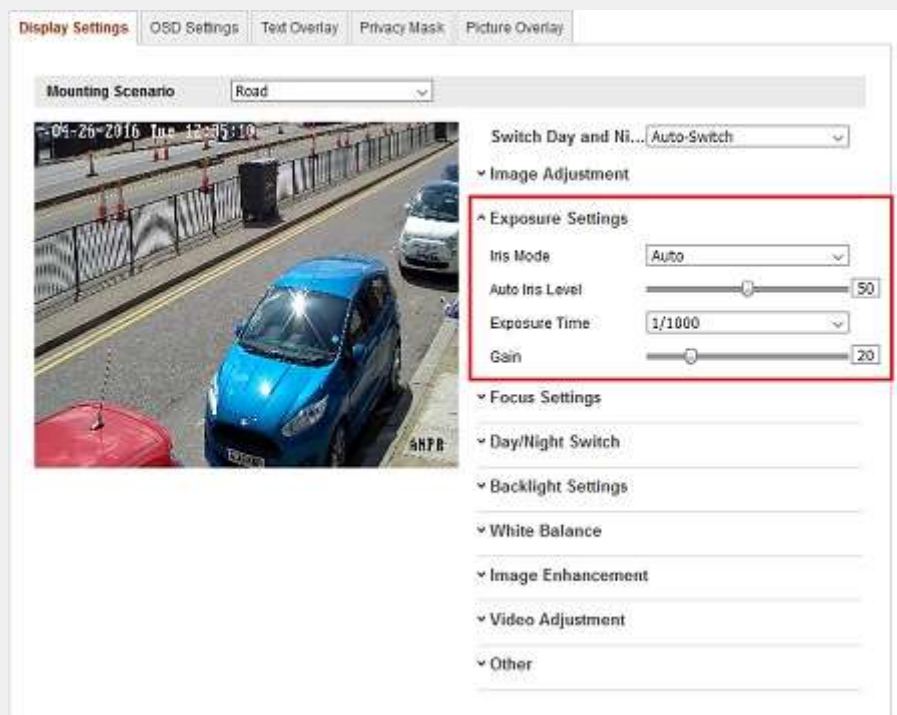
Again, you'll be greeted with a live view preview of your camera, as well as a list of menu options which will allow you to configure the image settings of your camera.

Changing the Mounting Scenario from Normal to Road via the dropdown menu will automatically configure your camera with Hikvision's recommended image settings for ANPR purposes.

These are covered below, and you can configure them manually too.



Click on the Exposure Settings menu option on the right.



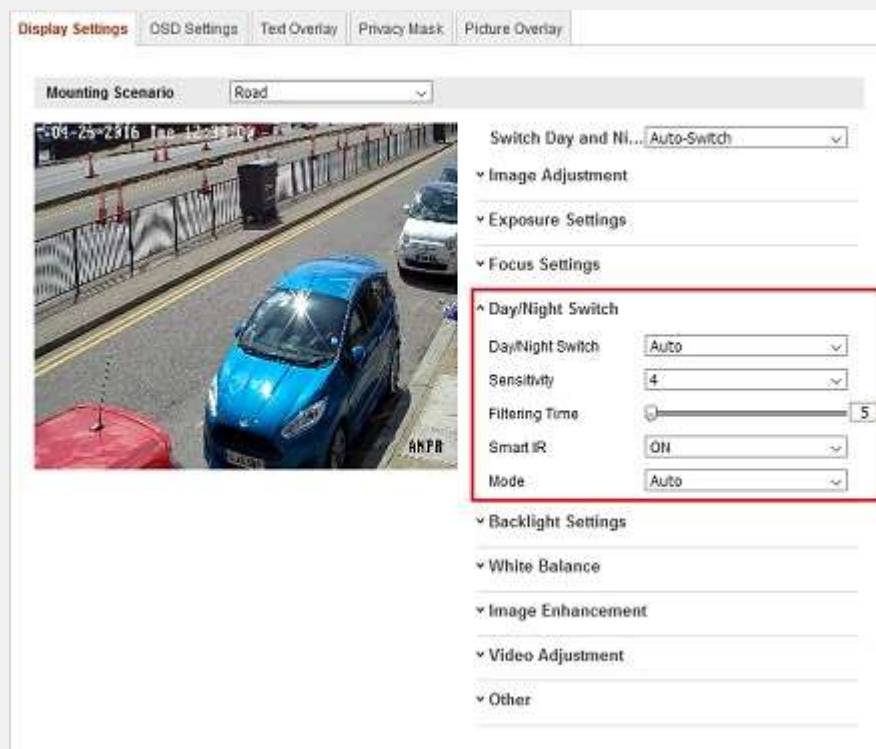
- Iris Mode : Auto
- Auto Iris Level : 50
- Exposure Time : 1/1000
- Gain : 20

Exposure Time / Shutter Speed is absolutely crucial to set correctly. Setting the exposure too long will introduce motion blur and allow too much light in to the camera, blinding the camera at night from car headlights. Setting it too slow will not allow enough light in, causing images to become unusable at night as they are too dark. Below are Hikvision's suggestions:

- **Entrance / Exit :** Low speed (<30km/h). Exposure time: 1/150 - 1/200
- **Street:** Medium speed (30-60km/h). Exposure time: 1/250 - 1/500
- **Road:** High speed (>60km). Exposure time: 1/500 - 1/1000

Gain should be set less than 30 when WDR is disabled, and less than 50 when it's enabled.

Click on the Day/Night Switch menu option on the right.



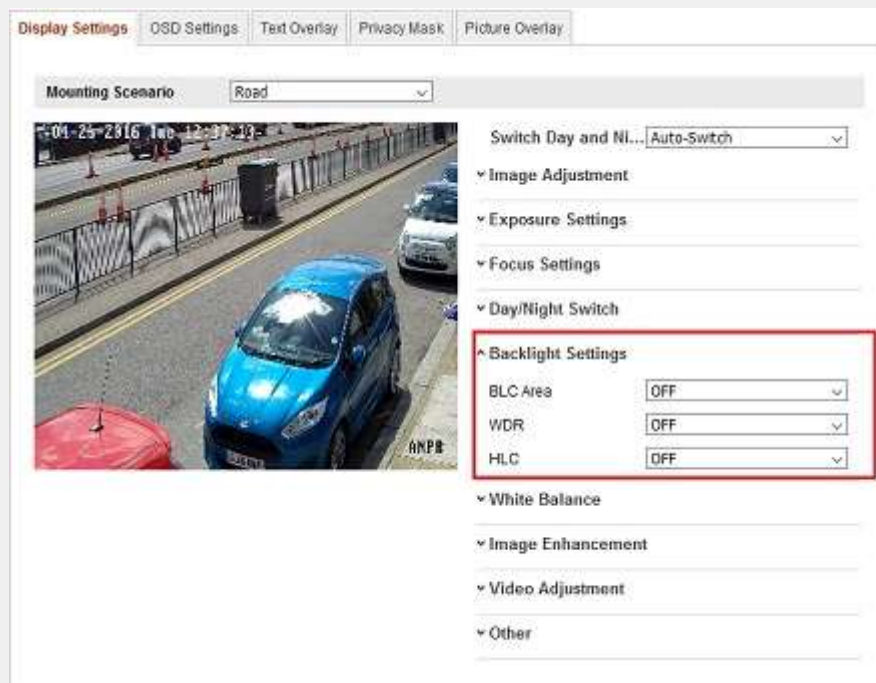
- Day / Night Switch : Auto
- Sensitivity : 4
- Filtering Time : 5
- Smart IR : ON
- Mode : Auto

These options will configure how the camera switches between day and night modes. These are Hikvision's recommendations, but this is heavily dependent on your own light

environment, and would require you to optimise based on your own needs.

Typically, an auto switch is fine, but a scheduled switch is also available.

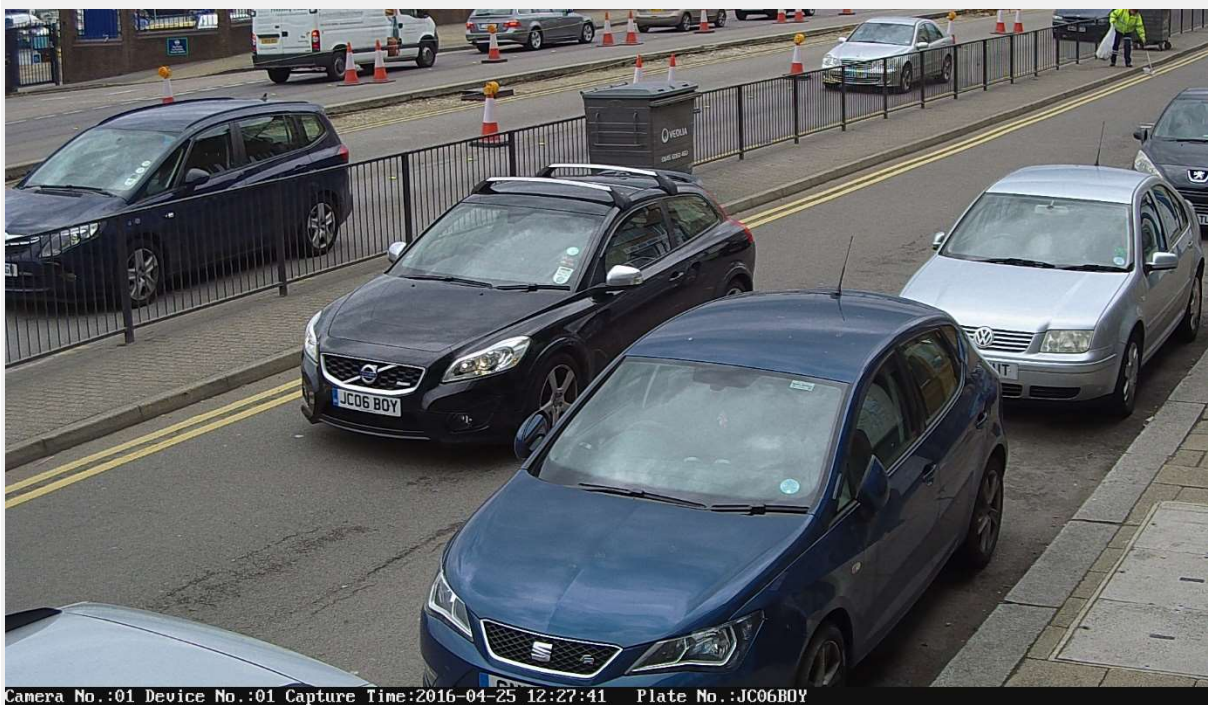
Finally, click on the Backlight Settings menu option.



- BLC Area : OFF
- WDR : OFF

These features can negatively affect a camera's ability to recognise number plates, so wherever possible it is recommended you disable them.

The above settings will give you results similar to the below at night. The plate will be visible, but the rest of the image will be too dark to see much.



That's it, you're done!

Your ANPR camera should be up and running, automatically recognising number plates and storing them to your preferred method.