



Quick Configuration Guide

Stop-and-go LPR Camera

Table of Contents

Revision History	3
Overview	3
Hardware Configuration	4
Software Configuration	6

Revision History

- Rev. 1.0: Initial release
- Rev. 1.1: Revise content on Software configuration Step 3 to 5
- Rev. 1.2: Revise content on Software configuration Step 4
- Rev. 1.3: Revise content on Software configuration Step 3, 4, 10 Add Step 8 and 12
- Rev. 1.4: Revise content on Software configuration Step 3, 10 and 11
- Rev. 1.5: Revise content on Software configuration Step 3
- Rev. 1.6: Revise installation height and Add hardware related information

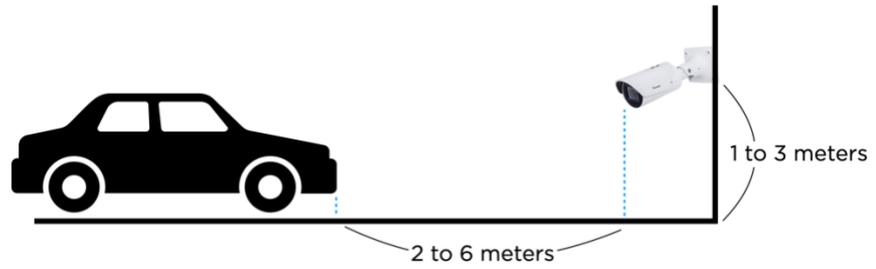
Overview

VIVOTEK's LPR camera is a standalone LPR camera system, featuring a built-in license plate recognition system as well as white-list and black-list for license plate verification. It can read the markings of multiple countries or states simultaneously (e.g., Singapore and Malaysia; Texas, Oklahoma and neighboring states). It also offers various APIs for integration with 3rd party systems such as parking management, toll collection, and weighbridge systems. The camera is ideal for use in parking access control and stop-and-go toll systems.

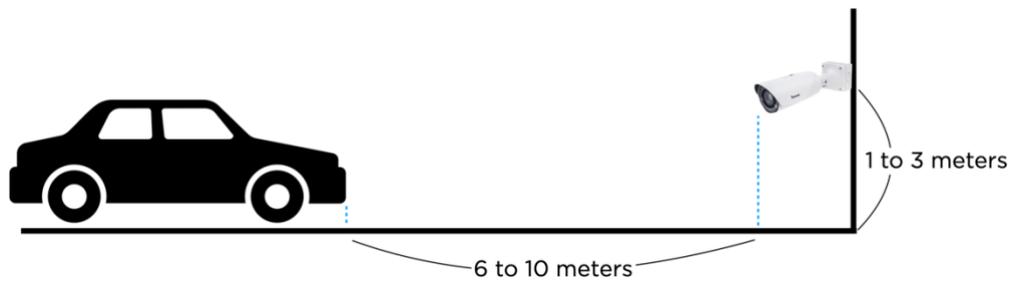
In this document, we will show you how to configure LPR camera from hardware and software different point of views. And please refer to the full user guide for details after having read this configuration guide.

Hardware Configuration

- For IB9387-LPR



- For IB9365-LPR



Left one is set on 1-meter height and right one is set on 0.8-meter height
(The experiment result for installation Height shows left one is better)

- Horizontal angle



Less than 35 degree

- License plate rotation angle



Less than 25 degree

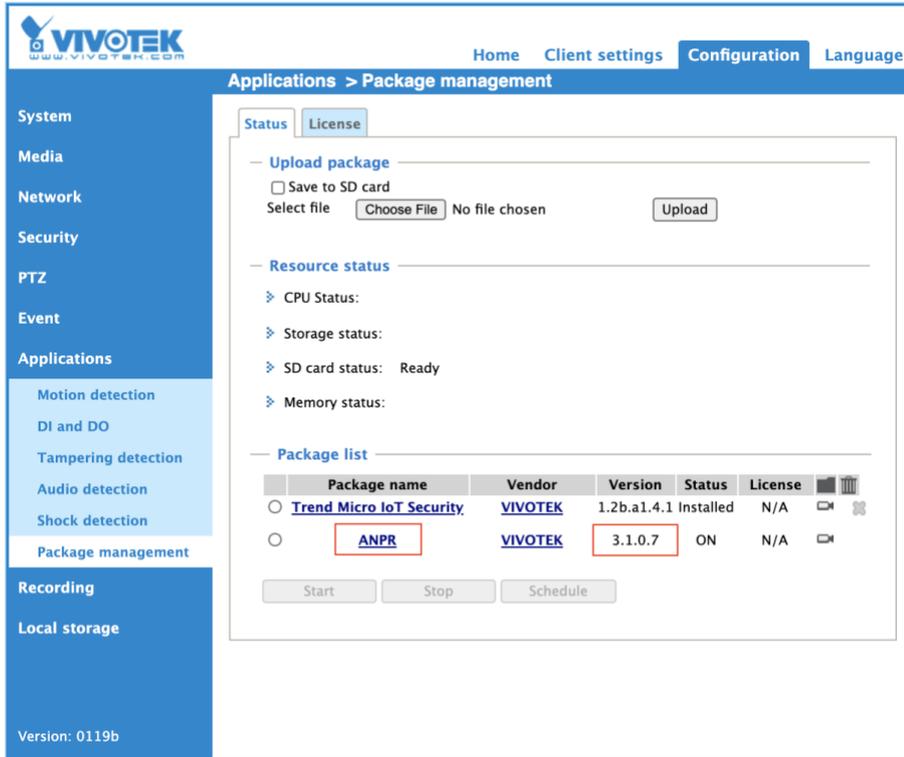
- To avoid rain or water sticking on front glass, we can use rearview mirror water repellent product.



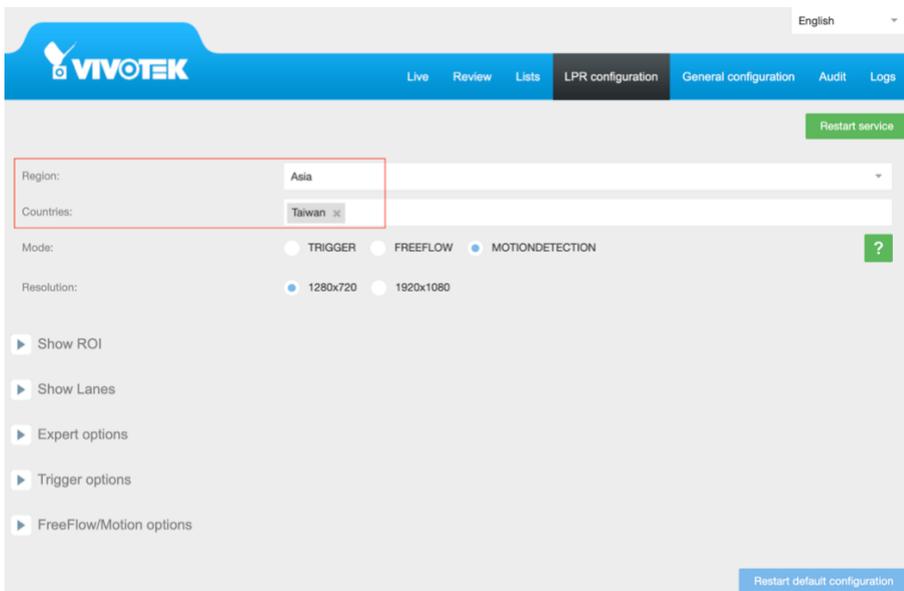
left one is used water repellent product, but right is not
(The experiment result shows left one is better)

Software Configuration

1. Click “ANPR” link on application on camera to launch ANPR software management web console.
Check if ANPR version is updated. (you can download the latest version from <https://www.vivotek.com/downloads/anpr-package>)



2. Configure the region and country of used license plate.



3. Configure the height of license plate character and the accepted confidence level.

Through setting maximum and minimum character height that can help LPR engine to limit on reading the height of license plate character that you set, and ignore unwanted information. Usually the character height of license plate around 25 to 80 pixels can be recognized.

Minimum confidence (tpc) is minimum reliability in the reading of a license plate to consider it valid. Reliability is a parameter returned by the engine for recognizing license plates (value of 1-100, where 100 is the most reliable).

We recommend to keep using default character height settings (25 and 80 pixels) and if needed you can try to adjust confidence level first.

The screenshot shows the VIVOTEK LPR configuration interface. The 'Info' section is highlighted with a red box, containing the following settings:

Parameter	Value
Minimum character height:	25
Maximum character height:	80
Minimum confidence (tpc):	80

Other visible settings include:

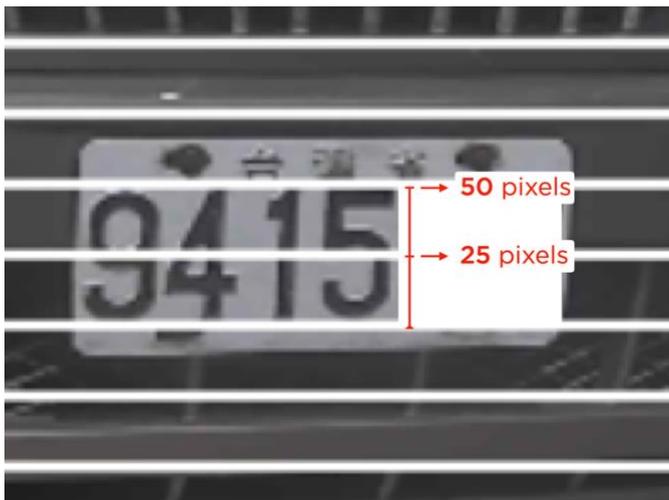
- Region: Asia
- Countries: Taiwan
- Mode: TRIGGER (selected), FREEFLOW, MOTIONDETECTION
- Resolution: 1280x960 (selected), 1920x1440
- Connection type: VIVOTEK (selected)
- Timeout LPR (millis): 500

- Go to Live page and click Calibration pattern, to check the height of license plate character.

Attribute	Value	Last Change
Results:	11469	10:16:41.233 10/07/2020
Actions:	51002	10:16:41.520 10/07/2020
Exports:	26	14:51:00.170 22/05/2020
Imports:	92040	10:05:16.436 10/07/2020
Triggers received:	0	00:00:00.000 01/01/2018
Frames processed:	12354923	10:17:20.515 10/07/2020
FPS:	2	09:32:41.269 10/07/2020
SD space free (tpc):	99	09:32:41.326 10/07/2020
Camera space free (tpc):	70	09:32:41.345 10/07/2020
Last Size (pixels):	26	10:16:43.168 10/07/2020
Last OCR time (millis):	662	10:16:43.136 10/07/2020
Mode:	MOTION	10:17:20.580 10/07/2020

License Plate	Confidence	Height (px)	Time
AQE9660 (Taiwan)	93.16%	23.71px	2020-07-10 10:11:21.477
AXF0651 (Taiwan)	99.36%	23.92px	2020-07-10 11:26.545
AXB5250 (Taiwan)	87.70%	26.14px	2020-07-10 12:48.573
ANA7736 (Taiwan)	90.06%	33.71px	2020-07-10 10:47.325
9415FV (Taiwan)	99.90%	26.00px	2020-07-10 10:40.530

Our recommended character height is 25~50 pixels. The numbers should cover 1 to 2 segments, which each segment is indicated by the guiding gridlines. (The best coverage is around 1.5 segments; It is the best recognition height for engine)



(You can go to image focus page in camera configuration to zoom in/out the camera to adjust the height of license plate character, please refer Step 5)

5. Go to camera configuration, and check if camera is focused, and the height of license plate character cover 1 to 2 segments.
(Regarding our recommended character height, please refer Step 4)
- Zoom in/out the camera to adjust the height of license plate character.
 - Select “Custom” mode in Focus window section to draw the area you would like to focus, for example the license plate display area. And click “Perform auto focus” to trigger auto focus.

The screenshot displays the Vivotek camera configuration web interface. The top navigation bar includes 'Home', 'Client settings', 'Configuration', and 'Language'. The main content area is titled 'Media > Image' and contains several tabs: 'General settings', 'IR control', 'Image settings', 'Exposure', 'Focus', and 'Privacy mask'. The 'Focus' tab is active, showing a live video feed of a silver SUV with a license plate '9415'. A blue rectangular box is drawn around the license plate. Below the video feed are controls for 'Zoom' and 'Focus', each with a slider and directional buttons. Under the 'Auto Focus' section, the 'Fully-opened iris' checkbox is checked, and a 'Perform auto focus' button is visible. In the 'Focus window' section, the 'Custom' radio button is selected. The interface also shows a sidebar with various system settings and a version number '0119b' at the bottom left.

6. Switch to 100% view, to make sure the license plate is clear.

The screenshot displays the VIVOTEK web interface for camera configuration. The top navigation bar includes 'Home', 'Client settings', 'Configuration', and 'Language'. The left sidebar lists various system settings categories: System, Media, Image, Video, Audio, Network, Security, PTZ, Event, Applications, Recording, and Local storage. The main content area is titled 'Media > Image' and contains several sub-tabs: 'General settings', 'IR control', 'Image settings', 'Exposure', 'Focus', and 'Privacy mask'. The 'Focus' tab is active, showing a camera view of a car's front grille and license plate '94 15'. A red box highlights the 'Auto' and '100%' view selection buttons. Below the image, there are 'Zoom' and 'Focus' sliders with directional buttons. The 'Auto Focus' section includes options for 'Full-range scan' (unchecked) and 'Fully-opened iris' (checked), with a 'Perform auto focus' button. The 'Focus window' section has radio buttons for 'Full view' and 'Custom' (selected). The bottom left corner of the interface shows 'Version: 0119b'.

7. Check the area that shows license plate is clear and focused, you can adjust the focus manually.

VIVOTEK
WWW.VIVOTEK.COM

Home Client settings **Configuration** Language

Media > Image

General settings IR control Image settings Exposure **Focus** Privacy mask

Auto 100%

Zoom << < > >>

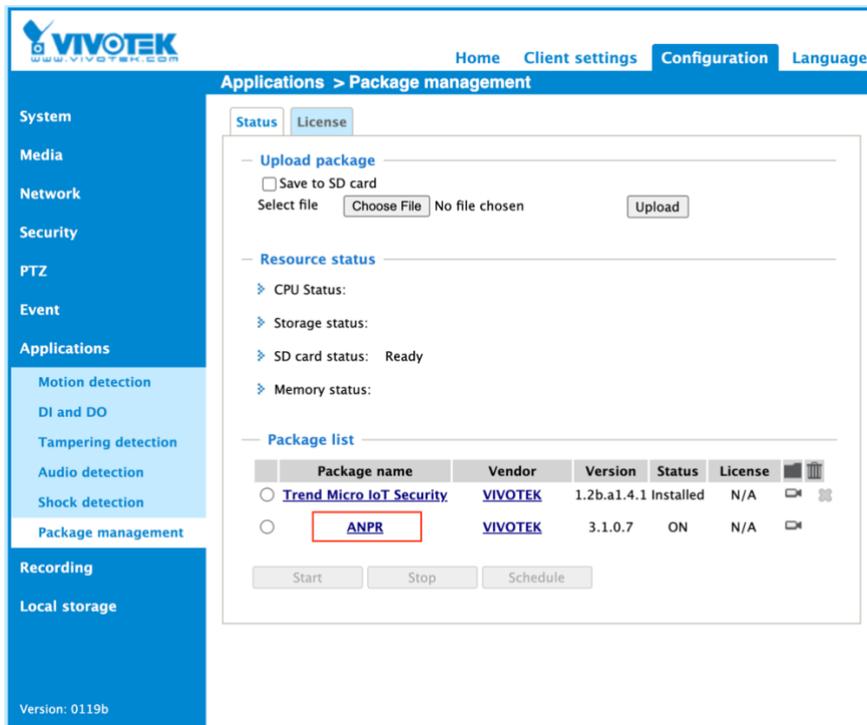
Focus << < > >>

— Auto Focus —
 Full-range scan Fully-opened iris Perform auto focus

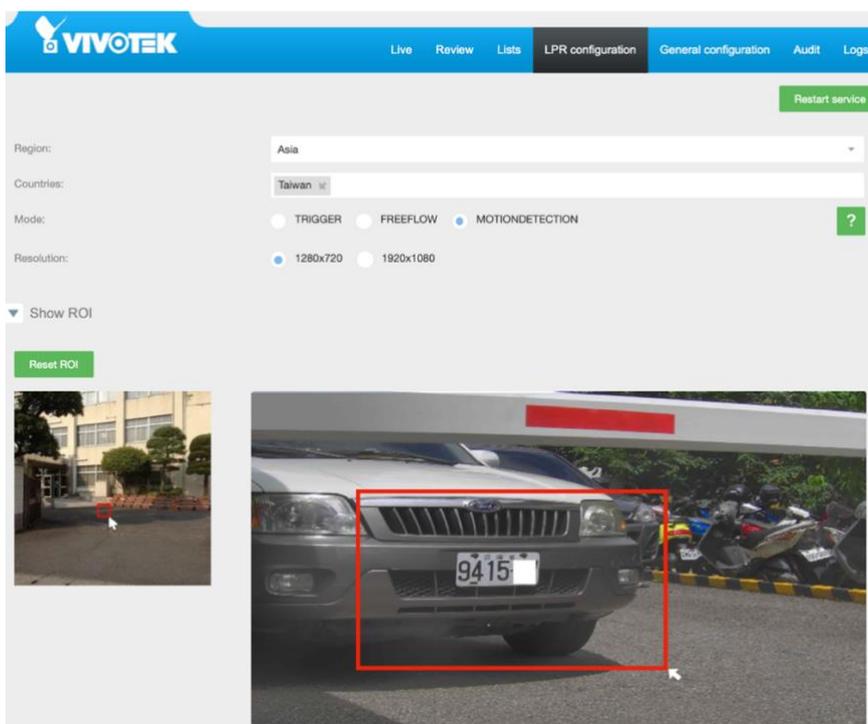
— Focus window —
 Full view
 Custom

Version: 0119b

8. Back to ANPR software management web console, click configuration on top menu, and click Application -> Package management on left menu, click the ANPR link in Package list.



9. Last but not least, draw a ROI on ANPR software management web console, this can help the LPR engine to narrow down the recognition area to improve the accuracy.



10. Set freeflow mode to test, and select time on freeflow filter mode and set filter time to 5000 milliseconds and restart service. It would start recognizing license plate periodically.

The screenshot shows the Vivotek LPR configuration interface. The top navigation bar includes 'Live', 'Review', 'Lists', 'LPR configuration', 'General configuration', 'Audit', and 'Logs'. The 'LPR configuration' tab is active. A 'Restart service' button is located in the top right corner. The main configuration area includes the following settings:

- Region: Asia
- Countries: Taiwan
- Mode: FREEFLOW, TRIGGER, MOTIONDETECTION
- Resolution: 1280x720, 1920x1080
- Free flow/Motion filter mode: TIME, CAPTURES, NONE
- Free Flow/Motion filter captures: 5
- Free Flow/Motion filter time (millis): 5000
- Minimum characters difference: 1
- Motion threshold: 15
- Motion queue: 10

Additional options include 'Show ROI', 'Show Lanes', 'Expert options', 'Trigger options', and 'FreeFlow/Motion options'. A 'Restart default configuration' button is located at the bottom right. The footer contains 'Copyright © 2019'.

11. Check the result in Live page, in the result you can see the height of license plate character is 26 pixels which is between 25 to 80 pixels we set in Step 3, and the confidence level is 99.9% which is also higher than 80% we set in Step 3. Moreover, you also can see the license plate information and the time it captured.

The screenshot shows the VIVOTEK Live interface. On the left, a car with license plate 9415 is visible. On the right, a table displays system statistics:

Attribute	Value	Last Change
Results:	11469	10:16:41.233 10/07/2020
Actions:	51002	10:16:41.520 10/07/2020
Exports:	26	14:51:00.170 22/05/2020
Imports:	92040	10:05:16.436 10/07/2020
Triggers received:	0	00:00:00.000 01/01/2018
Frames processed:	12354885	10:17:01.150 10/07/2020
FPS:	2	09:32:41.269 10/07/2020
SD space free (tpc):	99	09:32:41.326 10/07/2020
Camera space free (tpc):	70	09:32:41.345 10/07/2020
Last Size (pixels):	26	10:16:43.168 10/07/2020
Last OCR time (millis):	662	10:16:43.136 10/07/2020
Mode:	MOTION	10:17:02.383 10/07/2020

Below the main image, there are five smaller images showing different license plates: AQE96, AXF06, AXB52, ANA77, and 9415. The 9415 image is highlighted with a red box. Each image includes its license plate number, confidence percentage, character height in pixels, and capture timestamp.

12. Switch to the default motion detection mode and set filter mode to captures or any mode you prefer to use after verifying results. And don't forget to restart service.

The screenshot shows the VIVOTEK configuration page. The 'Mode' is set to 'MOTIONDETECTION'. Under 'FreeFlow/Motion options', the 'Free flow/Motion filter mode' is set to 'CAPTURES'. The 'Free Flow/Motion filter captures' is set to 5. Other settings include 'Free Flow/Motion filter time (millis): 5000', 'Minimum characters difference: 1', 'Motion threshold: 15', and 'Motion queue: 4'.