

# TT SMART VISION

## Car License Plate Recognition



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The system composing of 2 engines, which are car plate detection engines and car plate recognition engine to translate from image to text data, which also can provide the car brand and colors of the car

The screenshot displays the software interface for car license plate recognition. It features a 'Live' video feed on the left showing a silver car at a toll booth. To the right, a 'Last Plate' window shows the detected license plate '3A0137' and its color '@ White' with a 'Start' button. Below these is a 'Live Feed' table listing recent detections.

No	Image	Number Plate	Color	Brand	Calculate time	Date-Time	File path
57	3D-2104	3D2104	Green	@	454ms	2017-10-10_09-12-45	C:\AppServ\www\save\201710
56	3A-303	3A303	White	HINO	437ms	2017-10-10_09-12-05	C:\AppServ\www\save\201710
55	3A-5593	3A5593	White	@	469ms	2017-10-10_09-11-22	C:\AppServ\www\save\201710
54	3D-3776	3D3776	White	@	474ms	2017-10-10_09-10-45	C:\AppServ\www\save\201710
53	3A-0178	3A0178	White	HINO	517ms	2017-10-10_09-07-55	C:\AppServ\www\save\201710

## Software Specification

- Use Video Loop Detector to detect license plates. No coil or sensor needed to detect the car.
- Automobile license plate detection which do not catch people or animals.
- 95% accuracy for numbers and letters on labels.
- 50% accuracy for car brand detection. (customization required for new market)
- 50% accuracy for vehicle color depends on lighting conditions.
- The system supports speeds of up to 180 km/hr. It depends on the camera used.
- Can be used as a mobile license plate reader on the Mobile Patrol Car.
- VIP Alert, Member, Blacklist
- Automatically announcement car registration as Blacklist/VIP alerts with Text to Voice technology.
- Real Time Synchronize with external database. To connect with the central software.
- Supports SQL database, MySQL, Oracle.

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### Features of Camera Detection

- High resolution Network Camera, The license plate is more accurate (\*\* Recommended resolution of the license plate is 150-300 pixels).
- A camera that can change the distance of the lens. To get the desired image range. The size of the lens is about 12-40 mm or 8-50 mm.
- Low pass filter technology for bright lighting (Headlights) to get a clear picture.
- Infrared For night vision
- The camera supports IP66-rated base when used outdoors.

### There are two types of car registration.

- Parking license plate system in the parking lot. Entrance - Exit the building. The characteristics of the vehicle will run at relatively low speed. The speed of the car up to 60 km/hr. The camera should be a lens that can change the size of about 4-18 mm.
- High Way Road Vehicle Registration System The characteristics of the vehicle that will be detected will run at relatively high speed. Introducing a camera designed specifically for license plates. And can change the lens. The lens should be approximately 12-40 mm or 8-50 mm.

### Equipment required for installation

- IP Network Camera and Housing
- Infrared illumination kit (in low light areas and night vision)
- Specially-formulated PC processor, Core i7 Gen7 3.0GHz or higher, 8GB RAM, 500GB SSD
- Power Supplies for Local Devices
- Network Switch
- Webserver Kit (for central administration)
- ADSL Router (if you want to link and view data centrally)

### License Plate Recognition Diagram



#### อุปกรณ์สำหรับติดตั้ง 1 จุด

1. IP Camera 3 ตัว (LPR = 1, OV = 2)
2. Computer ประมวลผล 1 ชุด
3. Network Switch 1 ตัว
4. ADSL Router 1 ตัว
5. UPS 1 ชุด

หมายเหตุ : ข้อมูล ณ จุดติดตั้งจะถูกส่งไปเก็บยัง Server ส่วนกลางผ่านอินเทอร์เน็ต

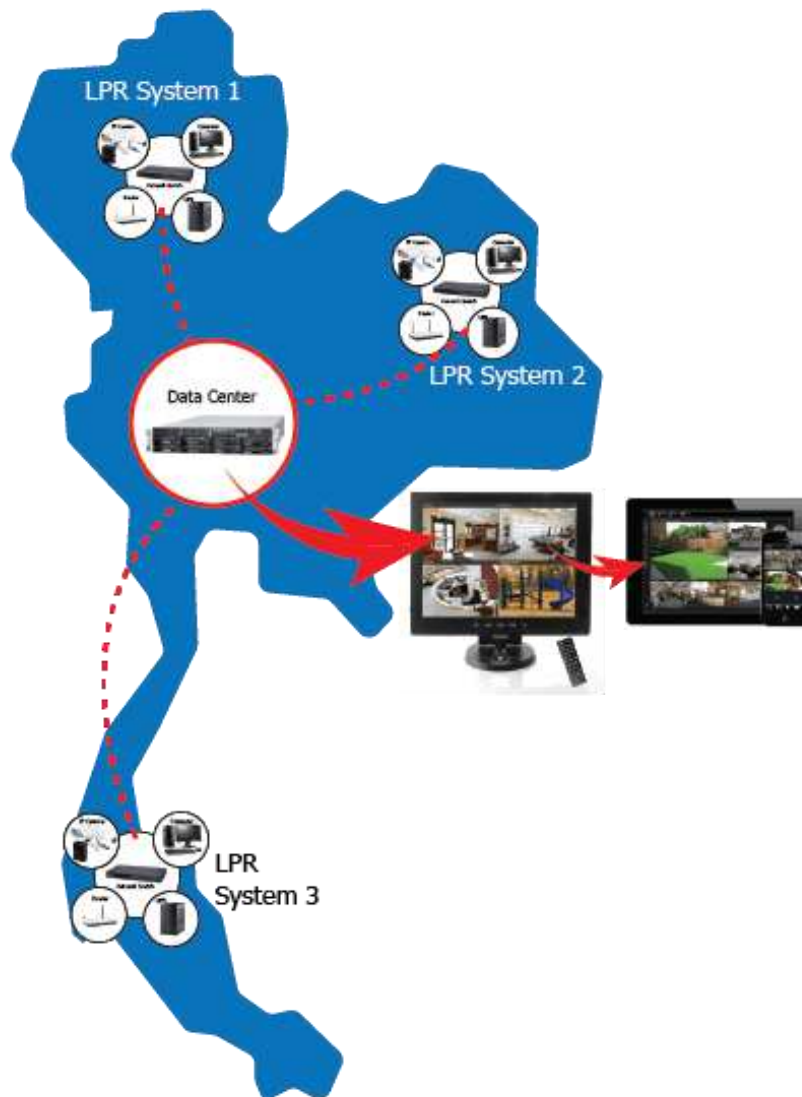
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## Centralized Management License Plate Recognition Diagram



The central control system has a central Web server that collects information from the camera's installation site. It can display information on devices such as computers, tablets, and mobile phones.

\*\* If you want to do Web Server for Access, central information. There will be a cost to install the CMS Software.

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### Restrictions of LPR system

- View and position of the camera. Must be tested before actual installation. For the most accurate and accurate results.
- The license plate that the camera can handle should be sharp, ranging from 150-300 pixels, to provide accurate and accurate information.
- If you want to capture the red license plate. And the license plate is a graphic card. Set the camera to a black-and-white Night Mode by using the Infrared Illuminator to capture the license plate of the type clearly.
- The license plate is damaged or unclear. Apart from the Department of Land Transport. This may reduce the accuracy of the data.



Bad and illegal license plate.

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### Example of Software work

The screenshot displays the software's live view interface. On the left, a 'Live' video feed shows a brown pickup truck with a license plate '2AK4531' highlighted by a red box. To the right, the recognized license plate '2AK4531' is shown in a box, followed by '@ Green' and the date '2017-10-10\_09-18-41'. Below this is a 'Start' button. On the far right, a 'Last Plate' video feed shows a white car with license plate '3A-0137'. Below the main interface is a 'Live Feed' table with the following data:

No	Image	Number Plate	Color	Brand	Calculate time	Date-Time	File path
58		3A0137	White	@	527ms	2017-10-10_09-13-45	C:\AppServ\www\live\201710
57		3D2104	Green	@	484ms	2017-10-10_09-12-45	C:\AppServ\www\live\201710
56		3A303	White	HINO	437ms	2017-10-10_09-12-05	C:\AppServ\www\live\201710
55		3A5593	White	@	469ms	2017-10-10_09-11-22	C:\AppServ\www\live\201710
54		3D3776	White	@	474ms	2017-10-10_09-10-45	C:\AppServ\www\live\201710

Below the table is an empty 'Alert' box.

Preview of the program while running (Live view)

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The screenshot displays the software interface with the following components:

- Live Feed:** A video stream of a car at night with a bounding box around it.
- License Plate Recognition Results:**
  - 2AM2138
  - @ Black
  - 2017-10-10\_22-25-20
  - Start button
- Last Plate:** A zoomed-in image of the license plate with the text 2AM-2138.
- Live Feed Table:**

No	Image	Number Plate	Color	Brand	Calculate time	Date-Time	File path
0	2AM-2138	2AM2138	Black	@	643ms	2017-10-10_22-25-20	C:\AppServ\www\aveve\20171010\
- Plot:** A blank area for data visualization.

Preview of the program while running (Live view)

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