

LPR Network Camera

Installation Instruction Manual

Version: 26.1.22.1

Statement

Thank you for using our products, please read this manual carefully before use.

This manual applies to license plate recognition network camera products.

The content of this manual will be updated as the product is iterated and updated. Updated content will be added to new versions without further notice.

If there are some differences between the description of the product in the manual and the actual product, the actual product shall always prevail.

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License plate recognition cameras play a crucial role in the normal entry and exit of parking lots. If the installation method or angle is inappropriate, it may lead to abnormal vehicle recognition. Next, we will introduce the installation guidelines for license plate recognition cameras.

1. Camera Installation Location

1.1 Positioning Principles

- (1) The camera is installed next to the barrier gate's main unit on the side facing oncoming traffic, ensuring that the camera's view is not obstructed when the barrier arm is raised or lowered.
- (2) The ideal recognition distance for the camera is 1-5 meters, with 2-4 meters being the optimal range. The effective recognition area can be limited by setting a recognition zone. Simultaneously, it's crucial that the vehicle awaiting passage is straight and aligned at this distance. If not, the installation position must be adjusted, moving the camera backward. If moving the camera backward is not feasible in the actual scenario, an auxiliary camera should be considered.
- (3) The camera should be placed as close as possible to the main unit of the barrier gate (approximately 40cm-50cm away) without affecting the operation of the barrier gate.
- (4) The installation location must ensure that the license plate can be captured regardless of the direction the vehicle approaches. If this cannot be achieved, an auxiliary capture device must be installed.
- (5) The side and top angles of the camera's positioning point and the vehicle's imaging angle should ideally be controlled to around 15 degrees, and should not exceed 30 degrees at most, otherwise it will affect the recognition rate. If this requirement cannot be met, alternative positioning points should be found.
- (6) Considering the differences in nighttime imaging effects for license plates of

different colors, if some license plates exhibit severe fading or discoloration, to improve capture accuracy, the built-in lighting should be turned off, and external lighting compensation should be considered. This involves installing supplementary lights and turning them on at night to improve image quality. White LED supplementary lights, 20-30W, with a focused beam, are recommended. The installation height should be maintained at 0.5-0.7 meters above the camera. The bright spot of the external supplementary light should be directly aimed at the license plate or slightly below it. Fine-tuning can be made based on overexposure of the license plate; for example, if the camera is 1.5 meters above the ground, the supplementary light can be mounted on the same column at a height of 0.8-1 meter.

- (7) Light control: Avoid shooting in direct light or backlight; backlighting is recommended.
- (8) Image stabilization design: Uses a sturdy crossarm or duckbill bracket to prevent wind-induced image blurring.
- (9) Ensure that vehicles and pedestrians at the location will not accidentally hit the capture camera.

2. Installation Method

2.1 Single Straight Lane

A straight, standard lane is the ideal installation environment, allowing for the acquisition of high-quality images when a vehicle enters the recognition area.

- (1) During construction, the camera should be installed on the side of the barrier gate closest to the direction of oncoming traffic.

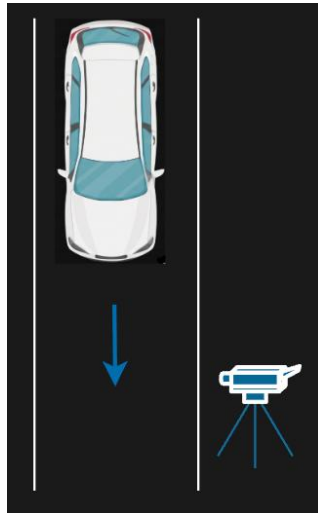


Figure 1

- (2) The optimal recognition distance is 4 meters. It is recommended to install speed bumps about 5 meters away from the integrated machine to prevent excessive vehicle speed from affecting license plate capture and recognition.

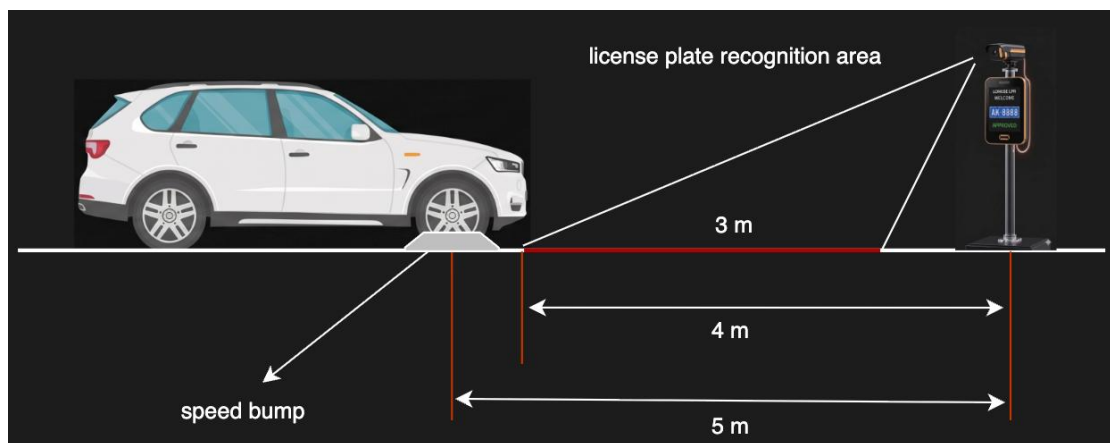


Figure 2

2.2 Install on Wide Lanes or Multi-lane Roads

If there are wide lanes (over 5 meters) or multiple lanes with vehicles traveling in unpredictable directions, the front of the vehicle may tilt left or right when entering, which can affect the recognition effect. Cones, bollards, or other obstacles can be used to isolate parts of the lanes, narrowing them and straightening the vehicle's direction. If it is impossible to guide vehicles to enter at a fixed angle, auxiliary capture devices must be installed.

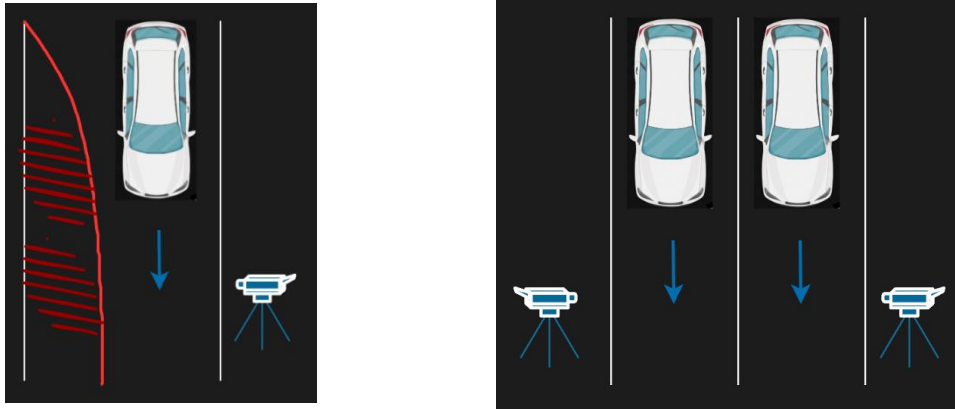


Figure 3

2.3 Special Lane Installation

- (1) If the lane is short (less than 2 meters), when a car approaches from a certain direction, the vehicle body is usually angled to one side. In this case, the camera can be installed on the side where the front of the car is angled, so that the front of the car is directly facing the camera when taking the picture. If the angle deviation is too large and affects license plate recognition, an auxiliary camera must be added.

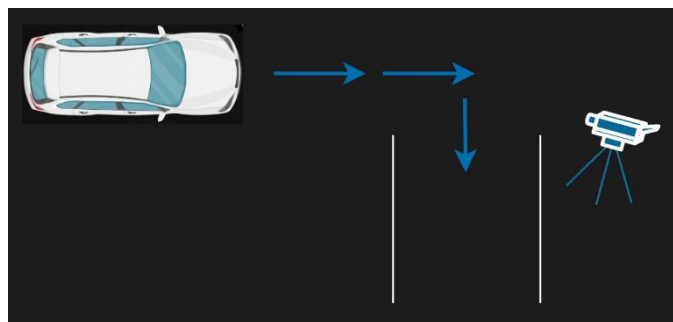


Figure 4

- (2) If the lane has a significant bend (greater than 60°), when installing the license plate recognition device, the vehicle's direction of travel should be towards the outside of the bend, and the camera should be installed on the outer side of the lane. This way, when a vehicle enters the recognition area, the camera can capture a relatively straight image of the license plate.

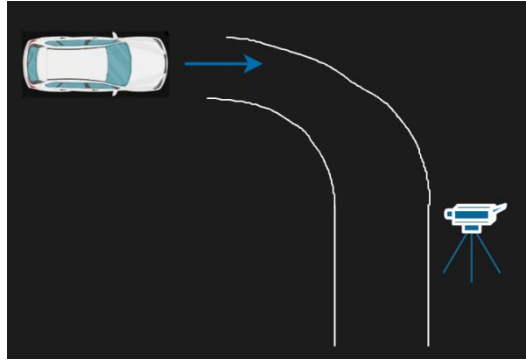


Figure 5

- (3) If an exit or entrance receives vehicles from two or more directions, a single camera cannot identify vehicles coming from each direction; therefore, an auxiliary camera must be installed.

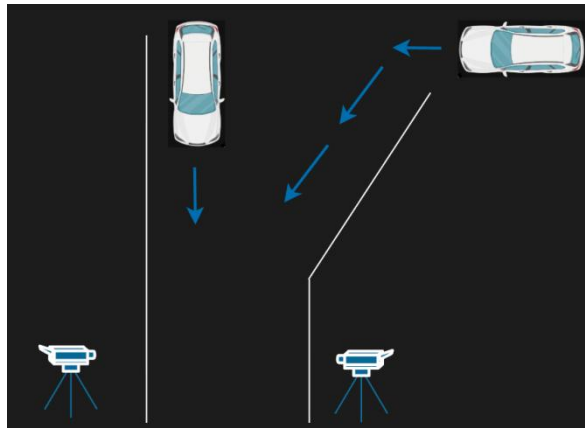


Figure 6

2.4 Installation in underground parking garage

Underground parking garages are relatively complex environments (dim lighting, numerous overhead pipes, and frequent vehicle intersections). To ensure the high accuracy of AI-based illegal parking detection algorithms, the installation location and angle of the cameras are crucial.



Figure 7

The recommended installation height is 2.4m - 3m. It is strictly forbidden to directly fix the camera bracket to equipment with continuous vibration, such as large exhaust fans or water pump pipes, as even slight vibrations can cause image blurring and affect recognition performance. The recommended monitoring distance is 2.5m - 5m. Too close a distance will result in excessive vehicle distortion or incomplete image, while too far a distance will result in insufficient pixels to support accurate identification of illegal parking by the algorithm. Large reflective walls or glass surfaces should be avoided within the camera's field of view to prevent vehicle reflections from causing misjudgments by the algorithm.

It is recommended to first power on the camera and connect it to the monitor, adjusting the camera's tilt and horizontal angles. Place a test vehicle in the illegally parked area, ensuring the entire vehicle is visible in the upper center of the frame, as shown in the image below. Define the "illegally parked detection zone" (ROI) in the system's backend. Use the test vehicle to simulate illegal parking and observe whether the system accurately triggers the alarm after the set time (e.g., 3 minutes). If the target area is too dark, it is recommended to install additional white light supplemental lighting.



Figure 8