

Introduction

License plate recognition (LPR/ANPR) camera, is a specialized type of video surveillance camera designed to recognize the numbers and letters of license plates on still or moving vehicles. They are designed with built-in algorithm that compensates for speed, weather, and headlight glare, which are typically for traffic solutions. Designing a surveillance system to monitor traffic and capture license plates is a more technical process than designing a traditional security camera system.

What Is License Plate Recognition (LPR/ANPR)

- License Plate Recognition

License Plate Recognition is a technology that uses optical character recognition on images to read vehicle registration plates. It can use existing closed-circuit television, road-rule enforcement cameras, or cameras specifically designed for the task to store the images captured by the cameras as well as the text from the license plate.

- How License Plate Recognition Works

License plate recognition involves capturing photographic video or images of license plates, whereby they are processed by a series of algorithms that are able to provide an alpha numeric conversion of the captured license plate images into a text entry.

- Milesight License Plate Recognition

Milesight LPR/ANPR is embedded in Milesight Network Cameras. It automatically detects and captures licence plate in real time and then compares to a predefined list. Independent of the back end products, they are able to achieve standalone LPR functionality, realizing the further black and white list management.

Core Value of Algorithm Technology

The core dependence of any License Plate Recognition system is the effectiveness of its algorithms. The algorithms are quite meticulous and typically require hundreds of thousands lines of software code to compensate for such complexities. As a whole, a series of five primary algorithms are necessary for a License Plate Recognition system to be successful.

- License Plate Localization

Localizing is an algorithmic function that determines what aspect of the vehicle's image is the license plate. For example, the algorithm must rule out a vehicle's mirror, grill, headlight, bumper, sticker, etc. In general, algorithms look for geometric shapes of rectangular proportion. (Figure 1)



Figure 1

- Optimal Size and Orientation

They are components of algorithms that adjust for the angular skew of the license plate image to accurately sample, correct, and proportionally recalculate to an optimal size.

Note: The license plate should be more than 130 pixel in width and no more than 5° tilt; The recognition of vertical and horizontal angle should be less than 30° and no more than 30° respectively. (Figure 2)

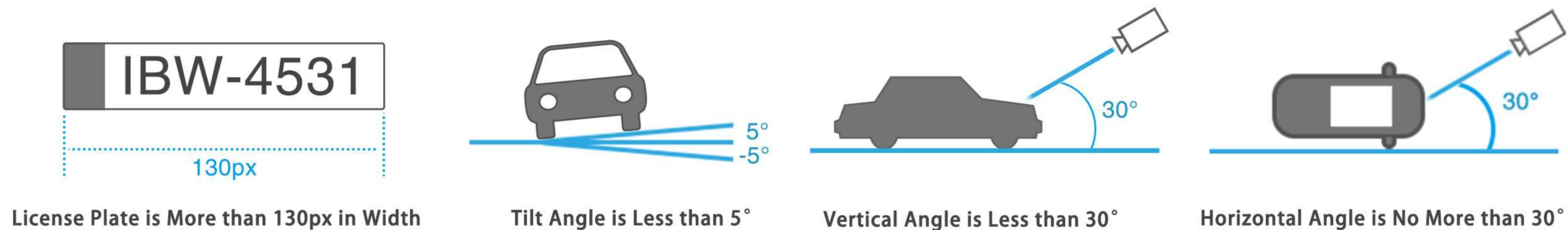


Figure 2

- Character Segmentation

It is a algorithm that locates the separate alpha numeric characters on a license plate, which is able to figure out the letters and numbers for different countries and regions. (Figure 3)

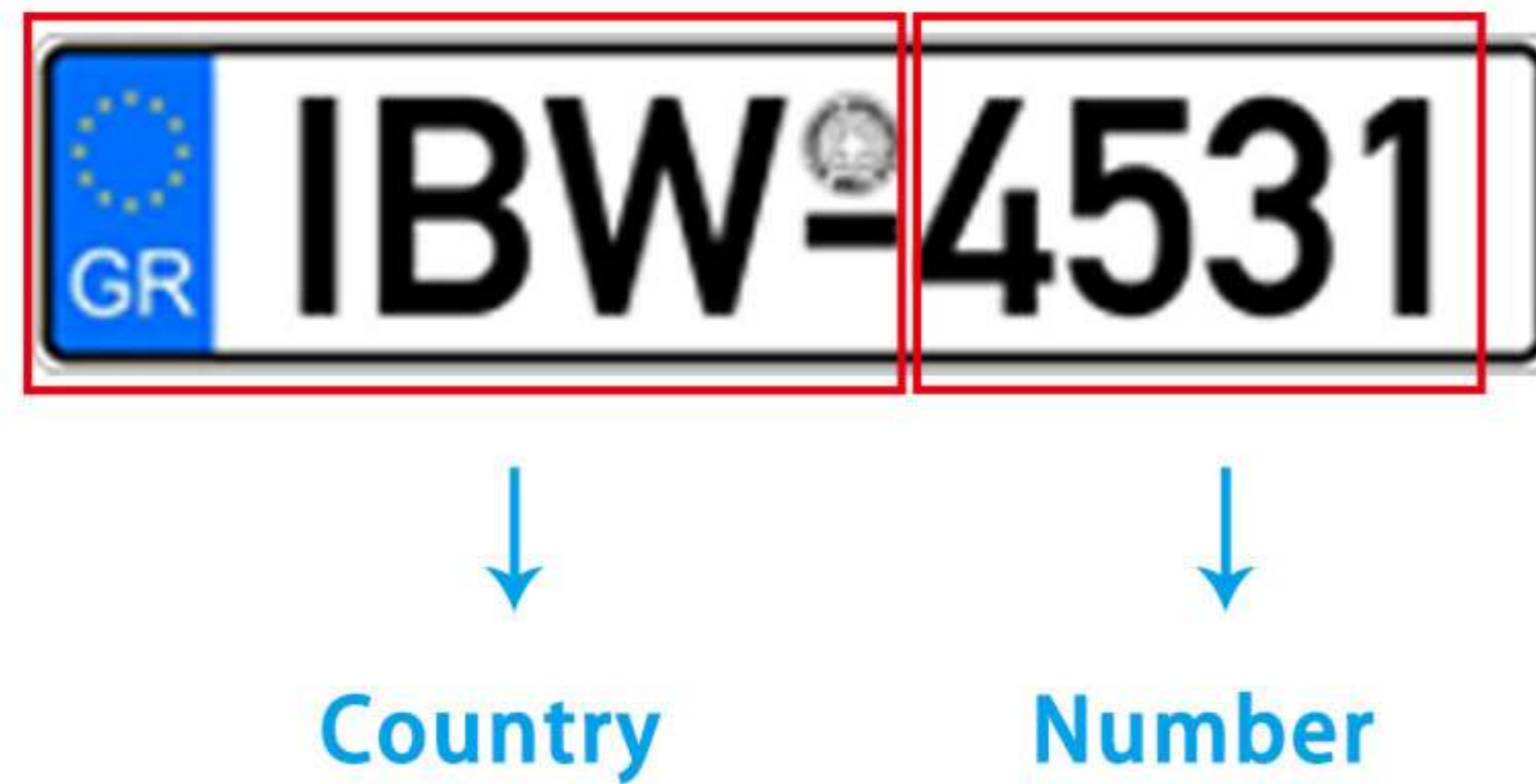


Figure 3

- Optical Character Recognition (OCR)

It is a algorithm for Translating the captured image into an alpha numeric text entry. (Figure 4)

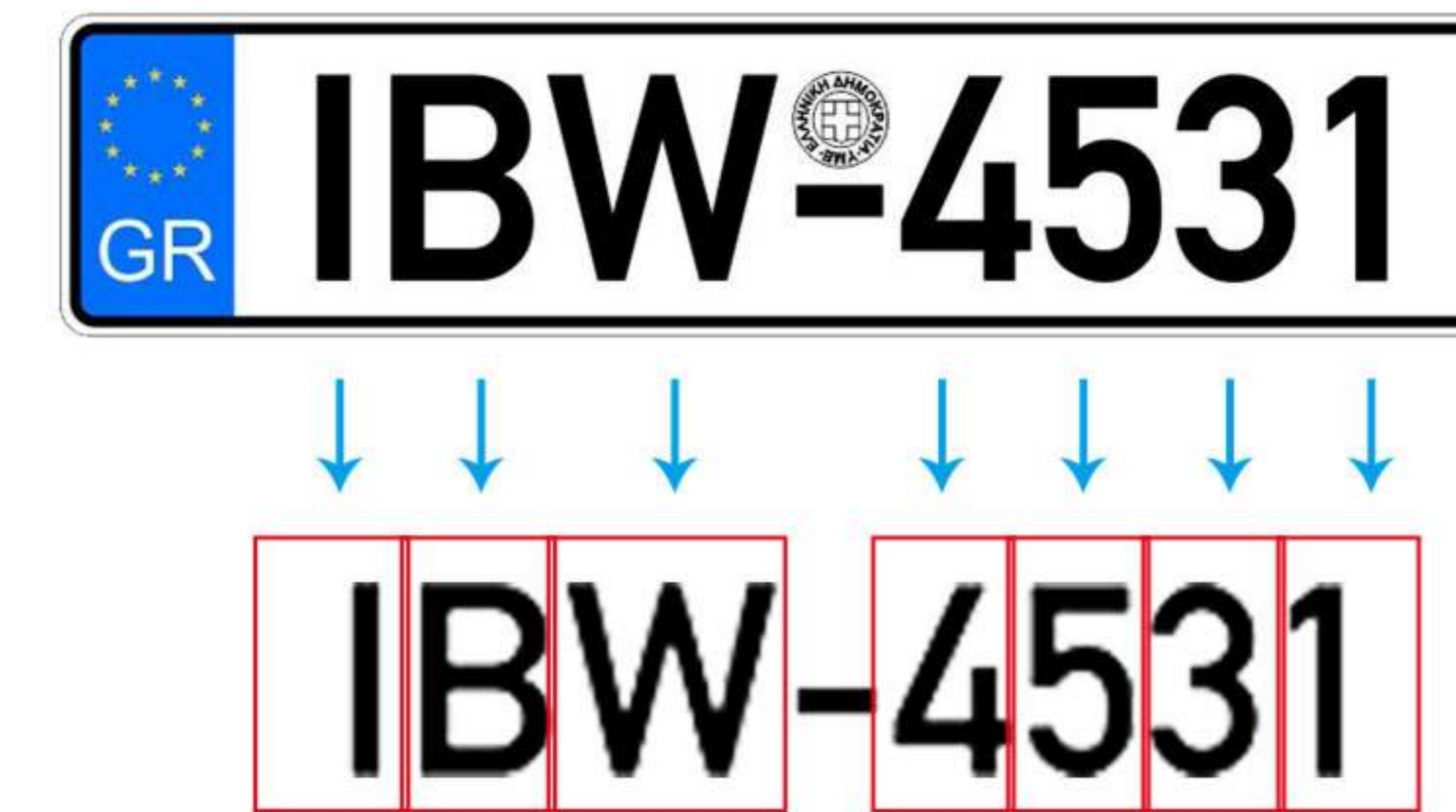


Figure 4

- Recognition Confidence Level

It is a algorithm to ensure the accuracy of the recognition to avoid the confusion of some similar characters. For example, the letter "l" and the number "1" which are alike could be rightly distinguished and correctly outputted. So does the letter "E" and the number "3". (Figure 5)

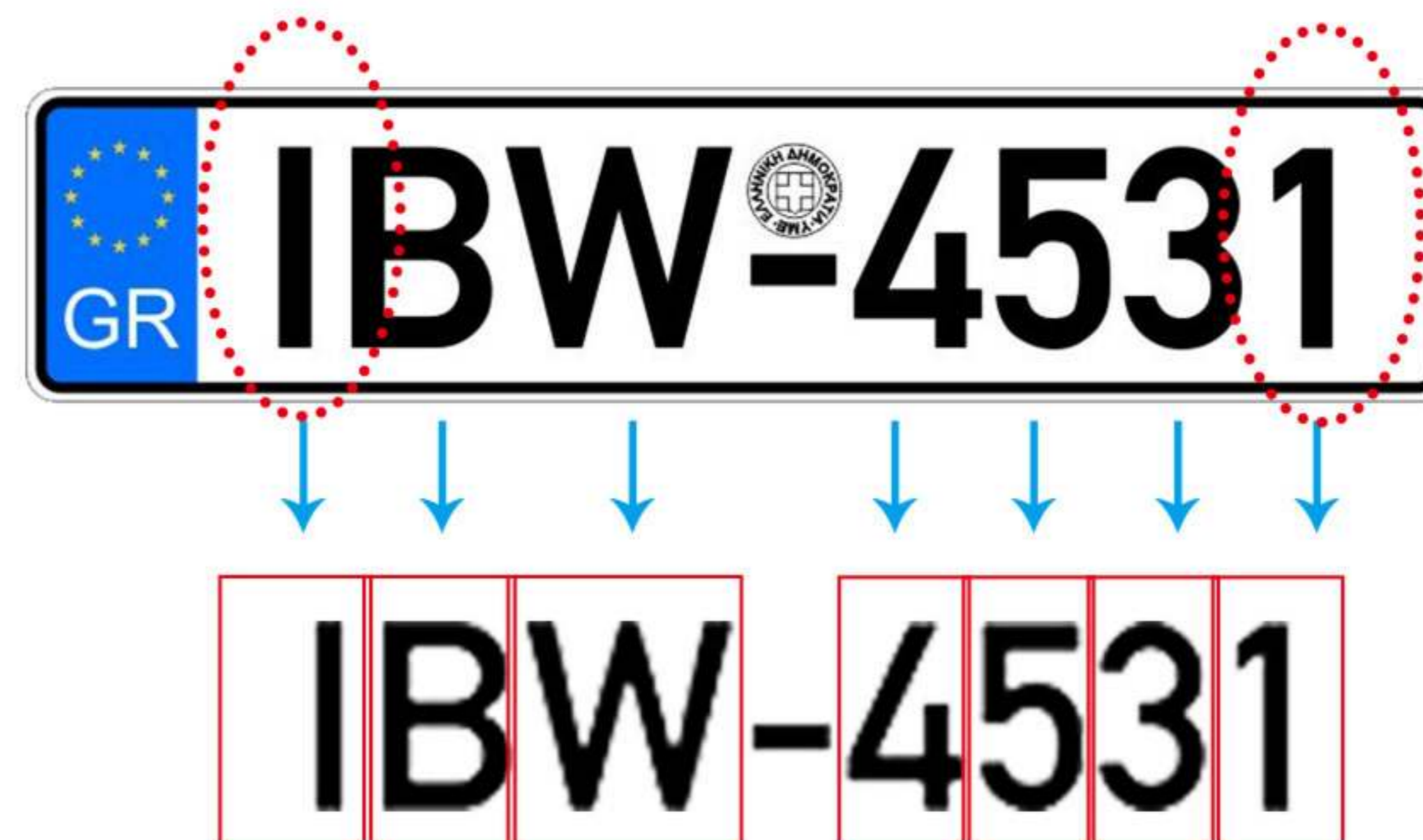


Figure 5

Black/White List Management

Add the license plates to this interface as Black or White type (Black/White List), and then you can set the alarm action for these license plates in the corresponding black list mode or white list mode interface. When these license plates are detected, the camera will respond accordingly to your settings.

Note: When a license plate that is not marked as "Black" or "White" is detected, the camera will respond as visitor mode settings. (Figure 9)

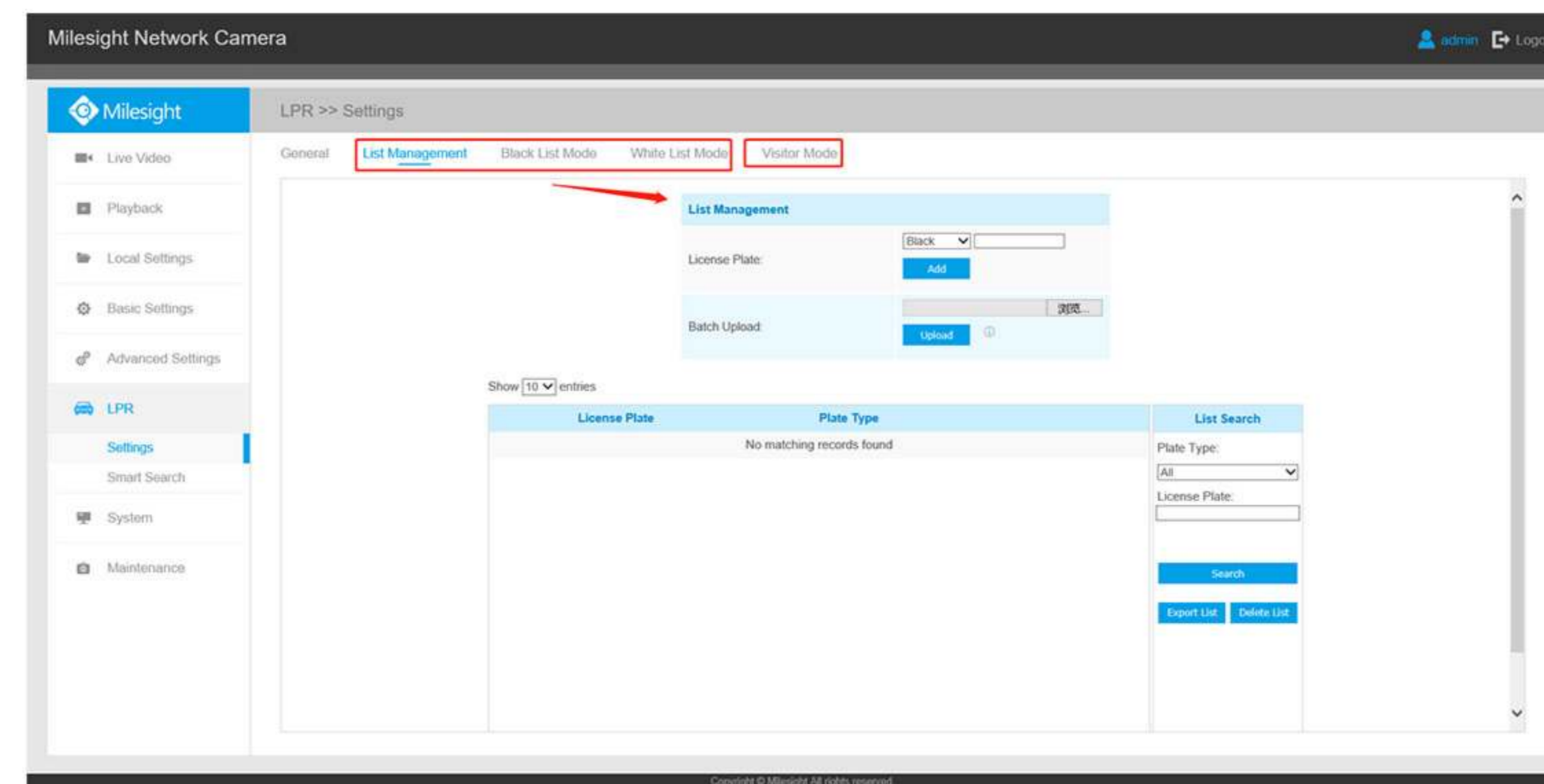


Figure 9

LPR Night Mode

Enable LPR Night Mode, then you can adjust the different parameter levels to achieve the best effect of LPR night recognition. You can also schedule the Start Time and End Time so it will switch to the night mode automatically. (Figure 10)

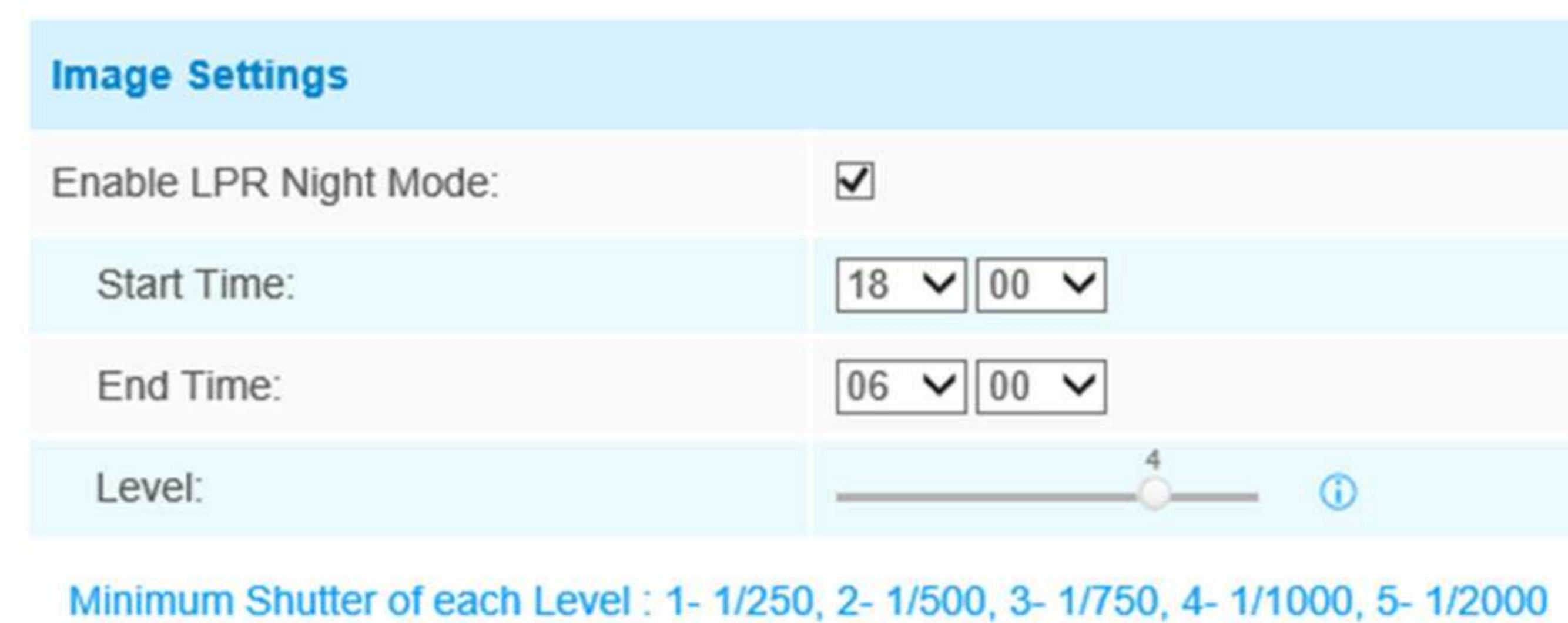


Figure 10

License Plate Serial Format

By formulating identification rules, the LPR cameras can automatically filter wrong license plate information to achieve more intelligent and accurate license plate recognition. (Figure 11)

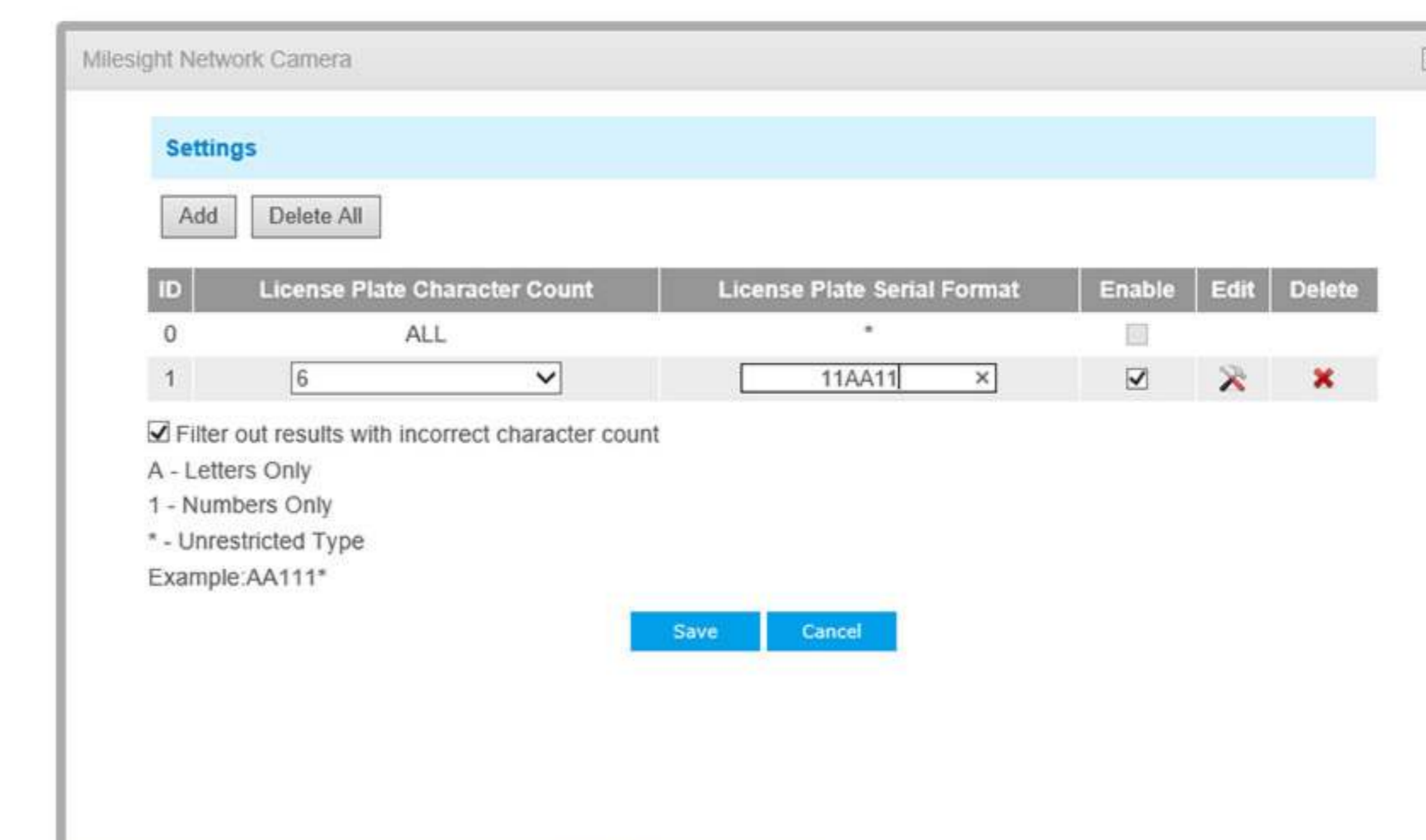


Figure 11

Regional Support of Milesight LPR Network Camera

Vehicles are large mass objects with a variety of shapes, designs and colors. Algorithms must be able to determine what part of the vehicle is actually the license plate. Different countries, states, cities and regions have different standards, dimensions, colors and character sets for license plates. This inconsistency requires algorithms to be inclusive to such extensive criteria. Milesight LPR Cameras support various regions and countries. (Figure 12)

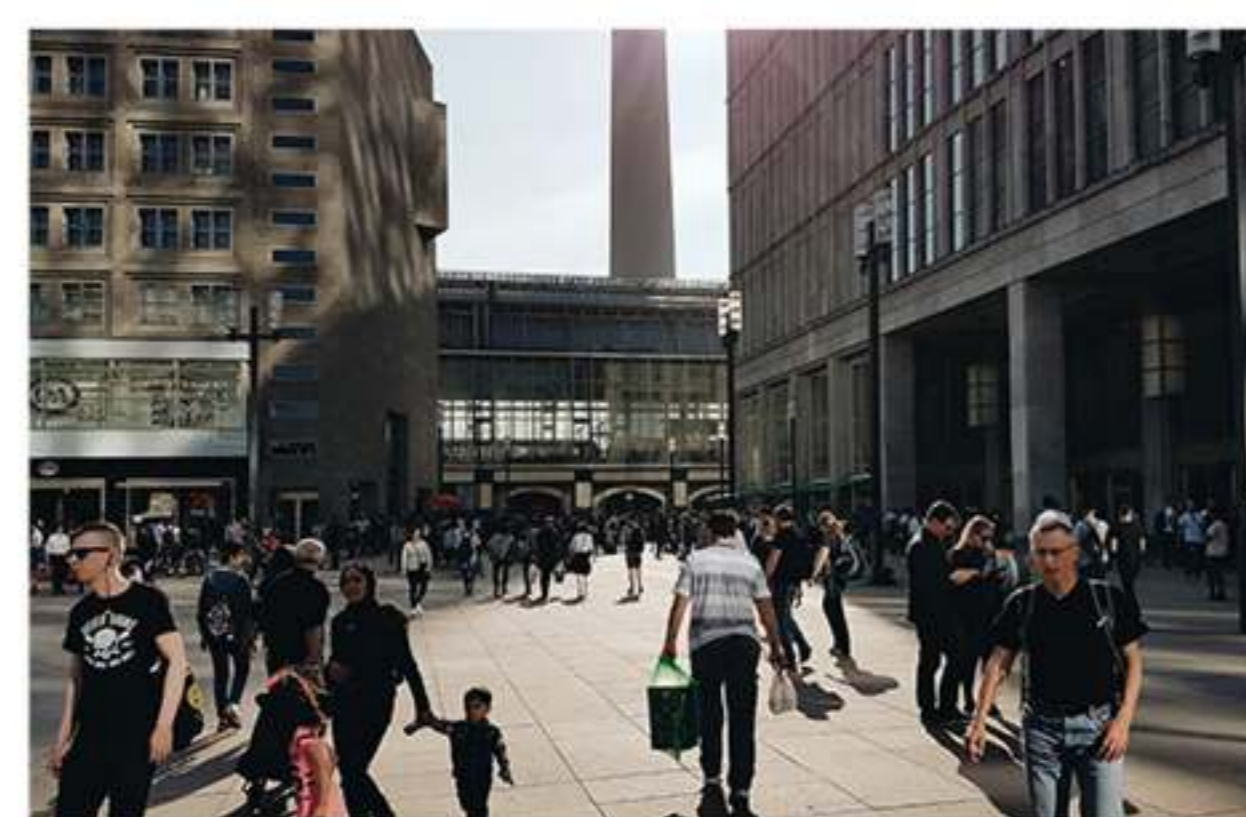
Country/Region	
Albania	Luxembourg
Angola	Macau
Australia	Macedonia
Austria	Malaysia
Belgium	Malta
Bosnia /Herzegovina	Montenegro
Bulgaria	Netherlands
Chile	Norway
Croatia	Poland
Cyprus	Portugal
Czech Republic	Romania
Denmark	Saudi Arabia
Estonia	Serbia
Finland	Singapore
France	Slovakia
Germany	Slovenia
Greece	South Korea
Hong Kong	Spain
Hungary	Sweden
Iceland	Switzerland
India	Taiwan
Indonesia	Thailand
Ireland	The United Kingdom
Israel	Turkey
Italy	United States
Japan	Vatican City State
Latvia	Vietnam
Lithuania	...
...	

CIS (former Soviet Union)

Country/Region	
Armenia	Moldova
Azerbaijan	Russian Federation
Belarus	Tajikistan
Georgia	Turkmenistan
Kazakhstan	Ukraine
Kirgizstan	Uzbekistan
...	...

Figure 12

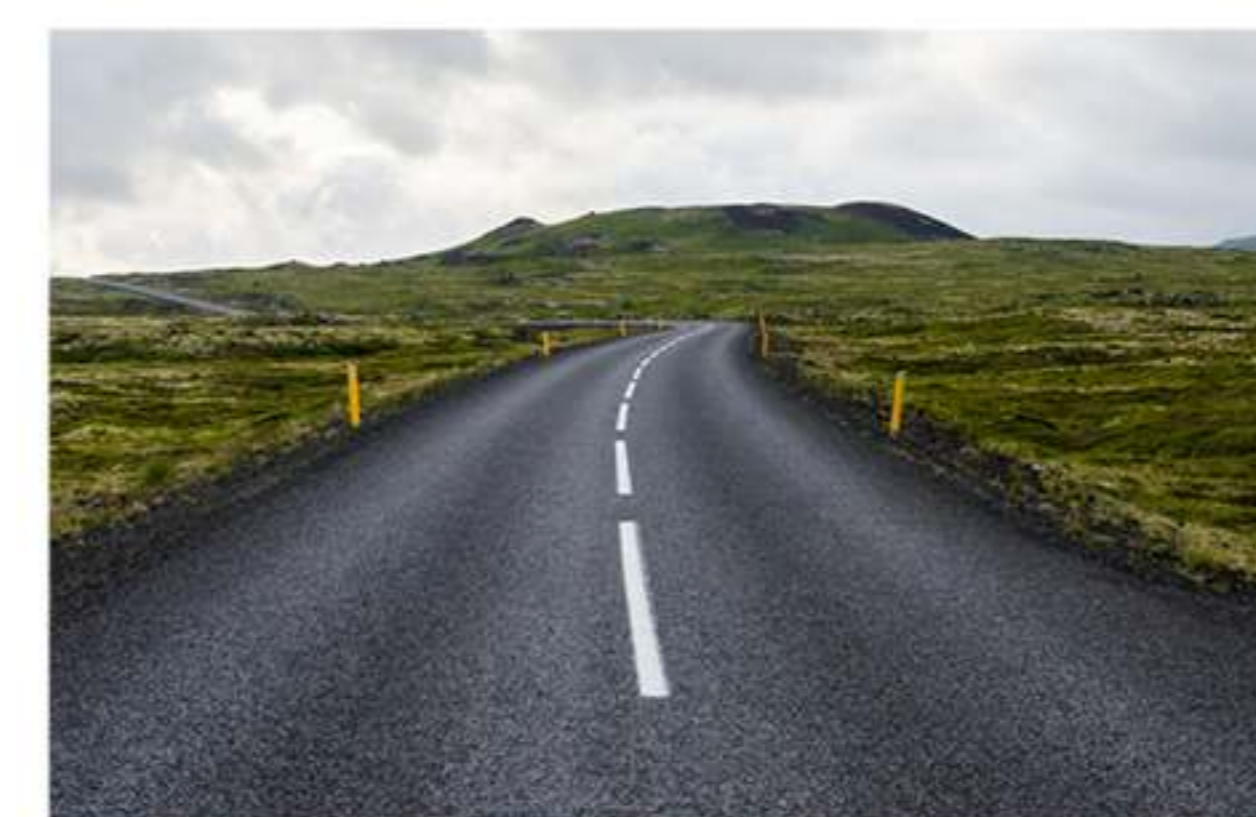
Typical Applications



Business Centre



Parking Lot



Rural Road



Urban Road



Gate Control

Figure 13

Key Features of Milesight LPR Network Cameras

- Recognition Accuracy Reaches 95%
- Highest Recognizable Speed of 120km/h
- Compliant with CGI and Other Third Party VMS
- Ultra High Frame Rate up to 120fps
- 3 in 1 Super WDR Pro

Related Products

- LPR H.265+ Mini Bullet Network Camera
- LPR H.265+ Vandal-proof Motorized Mini Bullet Network Camera
- LPR H.265+ Motorized Pro Bullet Network Camera
- LPR 12X H.265+ AF Motorized Pro Bullet Network Camera
- LPR H.265+ ABF Pro Box Network Camera
- LPR 12X H.265+ Mini PTZ Bullet Network Camera

Conclusion

Reliable License plate recognition(LPR/ANPR) has traditionally been costly and only relevant for a limited number of applications. The rapid development of network cameras now allow for wider use of LPR solutions. They are of great help for increasing efficiency and security, and will become more widely used in the coming days.