

Vehicle Type: Car
Vehicle Color: Blue
Plate: MS1123
Plate Color: White
Vehicle Brand: Mercedes-Benz
Detection Region: 2
Direction: Approach



MS 1234C

Milesight PlateXpert Technology

Precision Redefined Beyond ANPR



A MILESIGHT TECHNOLOGY MOMENT

Milesight

Technical Background and Challenges

License plate recognition (LPR) by cameras often faces significant challenges, particularly in achieving high accuracy. **Low recognition accuracy** is primarily caused by environmental factors such as **varying lighting conditions** and **viewing angles**. Additionally, reflective materials used in license plates can lead to glare, further interfering with recognition performance. The **size and distance of the license plate** also impact recognition accuracy, making it difficult to achieve reliable results in all scenarios. Moreover, the **diverse traffic regulations and license plate formats across different countries or regions** pose an additional challenge, requiring cameras to adapt to local standards effectively. Addressing these complexities is essential for any professional intelligent traffic camera. This is precisely what Milesight's **PlateXpert** technology is designed to achieve, delivering exceptional performance in license plate recognition, and more.



What is Milesight PlateXpert Technology?

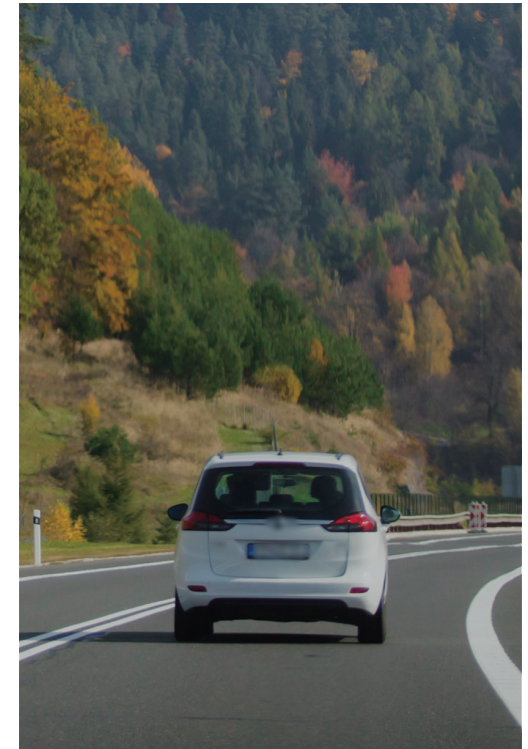


By integrating [continuous deep learning AI algorithms](#) with advanced license plate recognition technology, PlateXpert technology is able to enhance camera's ability to adapt and improve over time. This dynamic combination ensures that the recognition model continuously evolves, [learning from new plate data and diverse environments](#) to provide more accurate and reliable results. Trained on an extensive dataset of license plate samples from various countries, PlateXpert technology is finely tuned to deliver exceptional recognition performance across diverse conditions and environments with a [98% Plate Recognition Rate & Accuracy](#).

Also, the PlateXpert algorithm model [leverages the strengths of seven commonly used OCR models](#), including Transformer and PP-TinyV2. Through comprehensive combinational testing, it has been refined into a [proprietary neural network specifically optimized for Milesight devices](#), independent of other public open-source frameworks.

How does Milesight PlateXpert addresses LPR challenges ?

- 1 Recognize Smarter
- 2 Recognize Better Under Challenging Conditions
- 3 Recognize with High Accuracy
- 4 Recognize Broader
- 5 Recognize More than License Plate

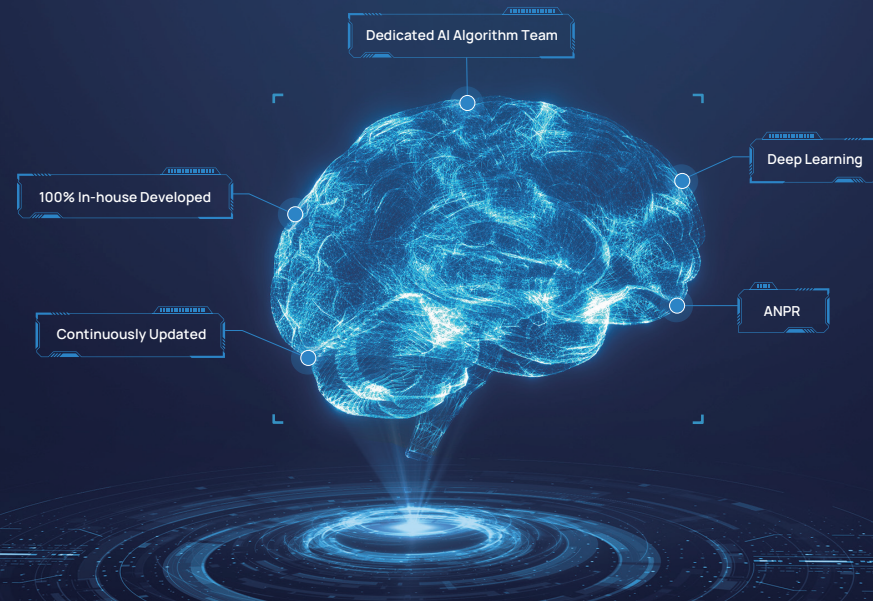


Recognize Smarter

Smart & Deep Learning Algorithm Trained for Accuracy



Deep Learning Algorithm



Smart Algorithm Trained for Accuracy

The high recognition rate and accuracy of the PlateXpert algorithm can be attributed to two key factors:

- The algorithm has been trained on a vast amount of sample data.
- It continuously improves through deep learning.

As a result, the PlateXpert algorithm is exceptionally intelligent. It not only accurately identifies license plates and delivers highly precise results but also effectively avoids recognizing non-license plate objects as license plates, significantly reducing the likelihood of false detections.

Recognize Better Under Challenging Conditions

- Frame Parity Flashing
- 740nm/850nm IR Wavelength
- Automatic Parameters Adjustment for Seamless Day/Night Transition
- Up to 630ft Long Distance LPR



Frame Parity Flashing

Frame Parity Flashing means the cameras take several images of the vehicle with different illumination levels, and the system will then **automatically select the best image for ANPR processing**. It ensures clear capture of the vehicle body and license plate (reflective & non-reflective plates). Two different intensities of the built-in illumination may be defined for the even/odd frames.

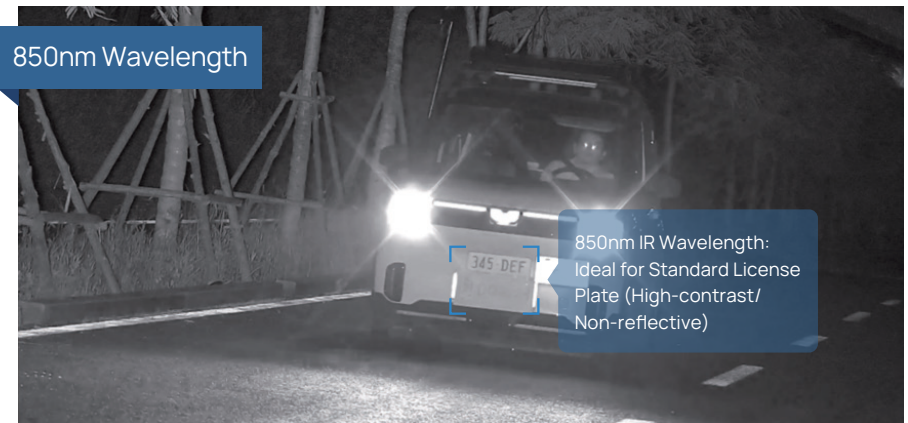
740nm/850nm IR Wavelength

Quality images are crucial for any security system or traffic monitoring application. Choosing the right type of light for the ANPR (Automatic Number Plate Recognition) process is an important consideration. Each light type has its own characteristics, and its suitability will depend on the specific scenario and lighting objectives. For this reason, **we provide with two different IR Wavelengths options (740nm and 850nm), as these two wavelengths provide the best image quality and enhance the accuracy of ANPR results.**

Infrared 850nm

Infrared 850nm wavelength is a semi-covert light and is typically the preferred choice for most surveillance applications. Security cameras are most sensitive to this wavelength of IR, making it ideal for capturing high-quality night-time images and ensuring the camera performs at its best. Therefore, **850nm is the optimal choice for recognizing standard license plates, specifically high-contrast or non-reflective plates.**

850nm Wavelength



850nm IR Wavelength:
Ideal for Standard License
Plate (High-contrast/
Non-reflective)

Infrared 740nm

Infrared 740nm wavelength is a highly effective choice for surveillance and ANPR (Automatic Number Plate Recognition) applications. Positioned just outside the visible light spectrum, this wavelength offers excellent performance in low-light conditions while being largely invisible to the human eye. Security cameras are particularly responsive to this wavelength, ensuring clear, high-contrast images that enhance the accuracy of vehicle recognition. Therefore, **740nm is ideal for capturing low-contrast and reflective license plates, ensuring precise recognition even in challenging lighting conditions.**

740nm Wavelength



740nm IR Wavelength:
Ideal for Low-contrast/
Reflective License Plate



Automatic Parameters Adjustment for Seamless Day/Night Transition

We have meticulously calibrated the image parameters to dynamically adjust based on ambient light conditions, effectively mitigating issues such as overexposure, focus inaccuracies, and improper day-night transitions. This ensures optimal image clarity for reliable recognition during both early dawn and nighttime scenarios.



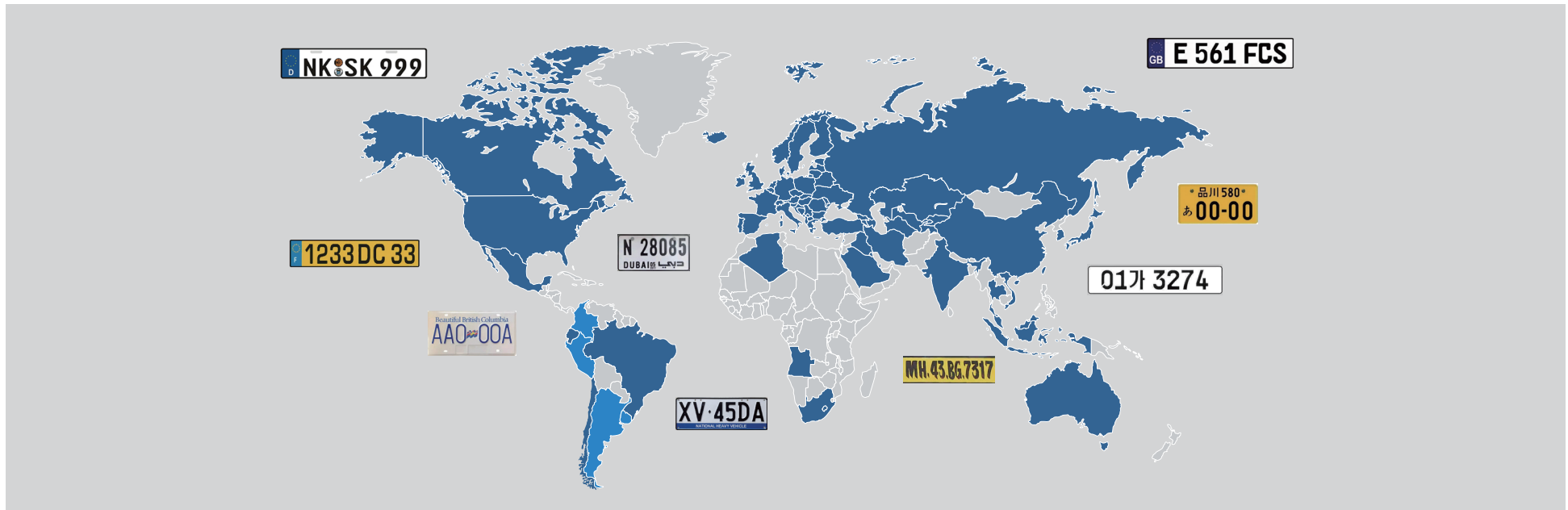
Up to 630ft Long Distance LPR

Leveraging our Smart IR II technology, license plates can be clearly captured from distances of up to 630 feet with Milesight AI Road Traffic Speed Dome Camera, even in low ambient lighting and reduced daytime visibility on highways.

Recognize Broader

Over 50+ Countries Supported

- Localized and EU-Compatible
- Support Special Characters Recognition

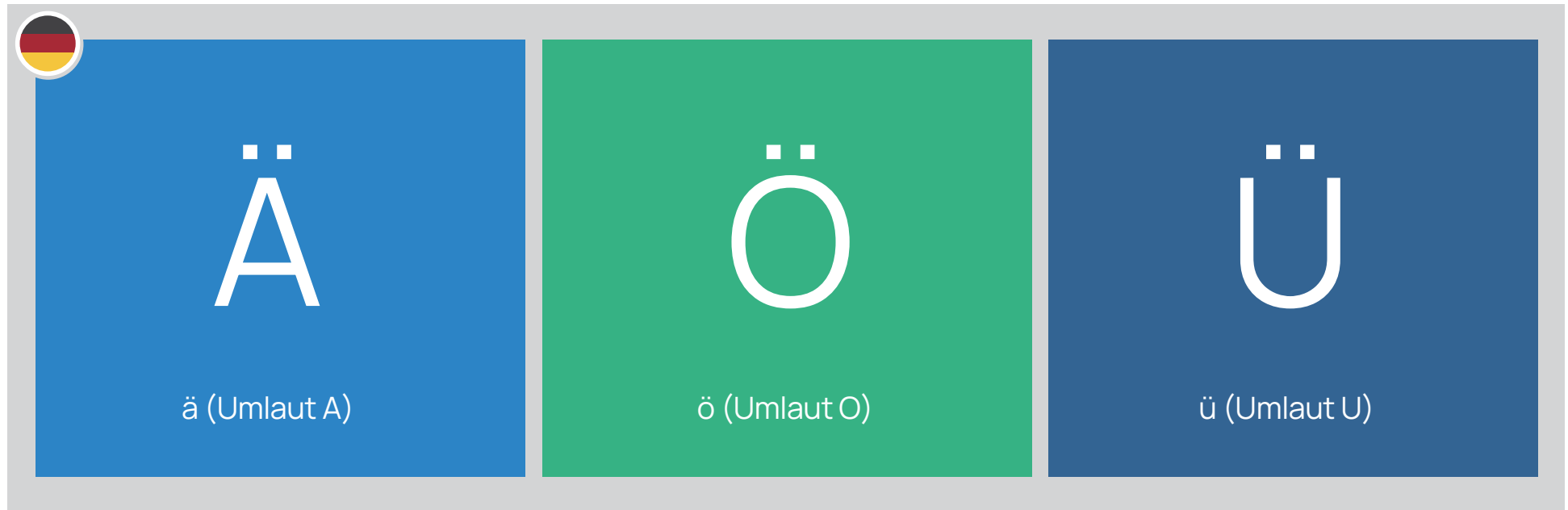


Localized and EU-Compatible

We combine [local license plate regulations](#) with [extensive sample training](#) to enhance PlateXpert's AI algorithms. After deep learning-based license plate recognition, a [secondary filtering process](#) is applied based on local regulations, ensuring more accurate recognition results.

Due to our focus on integrating local plate rules, PlateXpert, powered by LPR and AI, [supports over 50 countries worldwide](#). Furthermore, PlateXpert incorporates an [EU fusion algorithm](#): license plates from any EU member state can be accurately recognized across all EU countries, eliminating the need for separate recognition algorithms for each member state. This approach ensures that a plate from Member State A will be recognized in Member State B, avoiding issues where plates could not be recognized when crossing borders.

Furthermore, PlateXpert is designed for continuous expansion, with plans to support more countries and regions in the future. [With sufficient sample data, the system can undergo ongoing training and learning](#), enabling seamless adaptation to new license plate formats and standards worldwide.



Support Special Characters Recognition

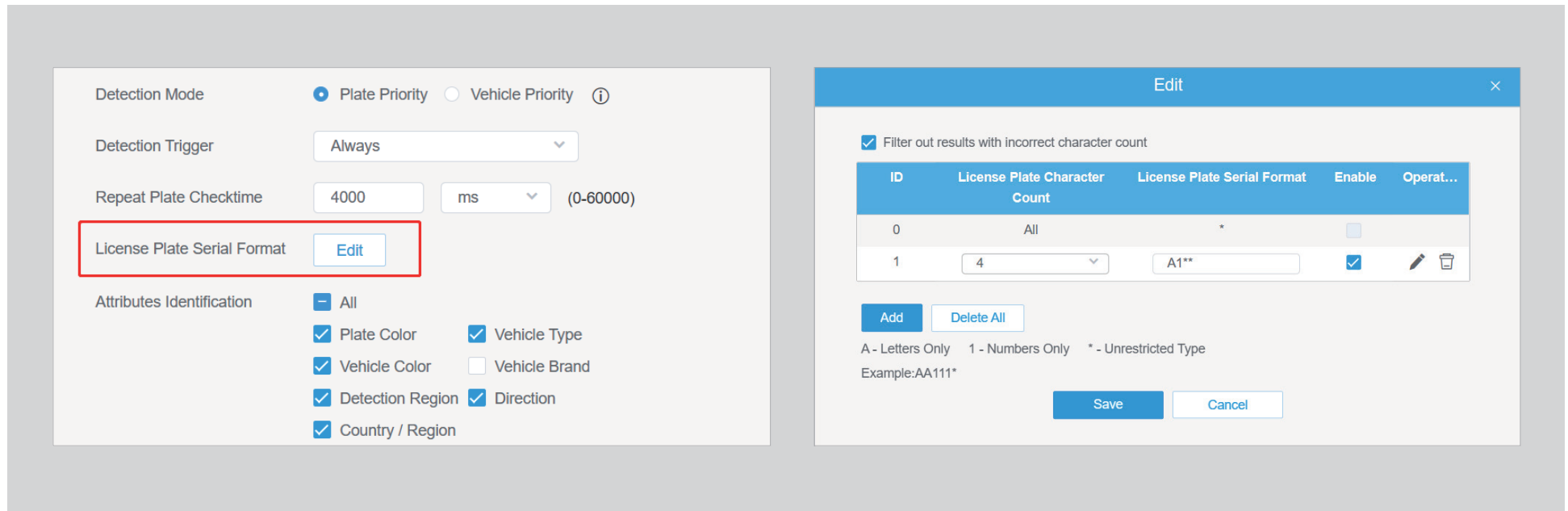
PlateXpert supports the recognition of special characters.

For example, the recognition of German special characters Ä, Ö, Ü is supported. German special characters typically refer to characters used in the German language that are not found in the basic English alphabet. These special characters are integral to the German language.

By accurately recognizing these special characters, PlateXpert ensures high accuracy in license plate identification across Germany and other regions where these characters are used, providing reliable and precise results even in areas with diverse linguistic and character sets.

Recognize with High Accuracy

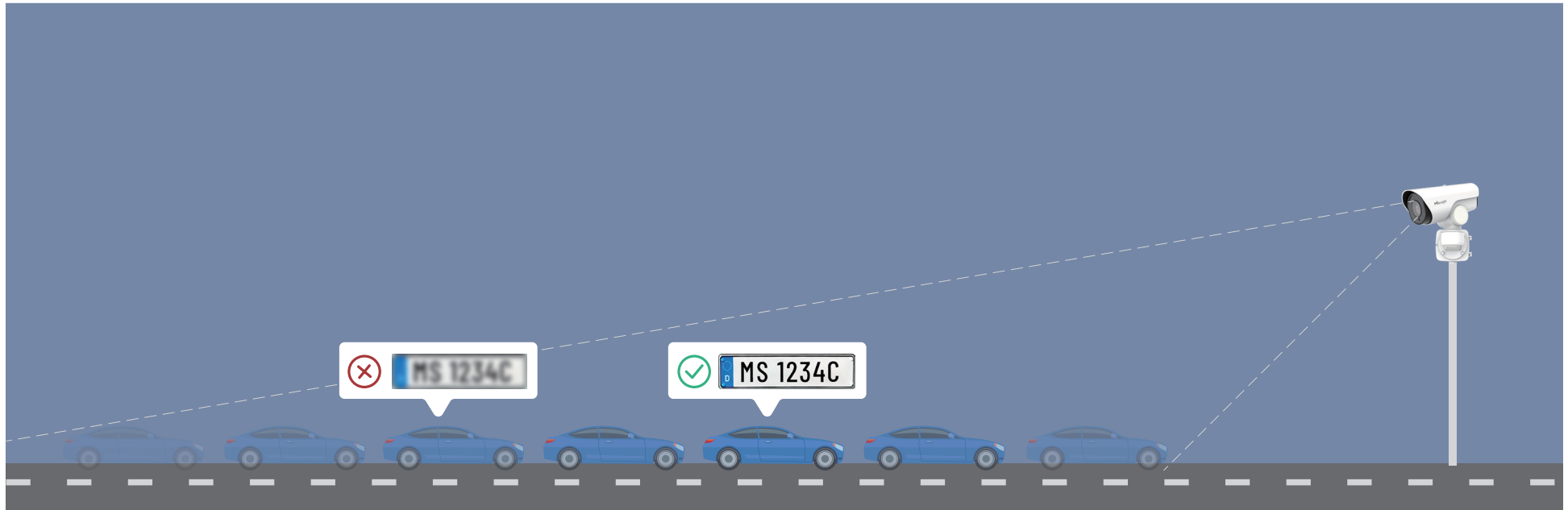
- Configurable Serial Format
- Continuous Recognition and Optimal Result Selection
- Filtering Out Small-Sized License Plates
- Line-Cross Triggering to Reduce False Recognition
- Plate Confidence Level



Configurable Serial Format

Users can manually configure the [License Plate Character Count](#) and [License Plate Serial Format](#) based on local license plate rules to achieve more accurate recognition results.

For example, the plate format can be set to only allow four characters, with the first character restricted to letters only. This ensures that the algorithm filters out recognition results that do not match the specified format, such as plates with more or fewer than four characters or those where the first character is not a letter. By doing so, it effectively [avoids misrecognition issues, such as confusing the letter "O" with the number "0"](#).



Continuous Recognition and Optimal Result Selection

Based on PlateXpert's intelligent algorithm, Milesight LPR cameras begin continuous recognition as soon as a vehicle enters the frame, generating multiple recognition results. Ultimately, PlateXpert's algorithm selects the optimal result from the detected area, ensuring the most accurate recognition outcome.



Filtering Out Small-Sized License Plates

In scenarios where cameras are installed at lower positions, especially at entry and exit points, detection zones (indicated by the blue area) may cover a large field of view. Without a filtering mechanism, **license plate recognition could start prematurely when a vehicle is still far away**, leading to less accurate results due to the distance.

By implementing a size filter, **the camera will ignore license plates smaller than the set threshold**, postponing recognition and result notifications until the vehicle is closer and the license plate appears larger within the frame. This **ensures more accurate recognition and reliable results**.



Line-Cross Triggering to Reduce False Recognition

To reduce false detections, users can now choose to [draw an additional trigger line](#) (the green line in the image) along with the detection zone (the blue line area). Combined with PlateXpert technology, objects entering the detection area will only [trigger license plate recognition](#) once they cross the trigger line, ensuring more accurate recognition results.

The screenshot shows the Milesight Network Camera interface. The main window displays a street scene with several cars. A pop-up window shows detailed LPR (License Plate Recognition) data for a specific vehicle. The data includes:

- Time: 2022-12-30 00:30:42.176
- License Plate: DG56058
- Plate Confidence: 0.80
- Plate Color: White
- Vehicle Color: Gray
- Vehicle Brand: Volkswagen
- Speed: -
- Direction: -
- Detection Region: 1
- Country / Region: AUS
- Event Type: LPR

A red box highlights the 'Plate Confidence: 0.80' value. A zoomed-in inset of the pop-up window further emphasizes the 'Plate Confidence: 0.80' value.

Plate Confidence Level

The plate confidence level has been added to represent the reliability of the recognition results. A high confidence level (e.g., 0.9) typically indicates that the recognition result is highly reliable and can be used directly for subsequent processing. Conversely, a low confidence level (e.g., 0.4) suggests that the recognition result may require further validation or manual review to ensure accuracy. [The confidence level helps users make more informed decisions about the accuracy of the license plate recognition](#), allowing them to take appropriate actions based on the reliability of the results.

Recognize More than License Plate

- Recognition of ADR Plates
- Plate Attributes & Vehicle Attributes Recognition



Recognition of ADR Plates

Milesight's LPR cameras now [support the recognition of ADR \(Autorisation Dangerous Road\) license plates](#), enabling enhanced traffic management and safety for vehicles transporting hazardous materials. With this advanced feature, the cameras can efficiently identify and record ADR plates, ensuring compliance with regulations and facilitating monitoring in high-risk or restricted areas. This innovation underscores Milesight's commitment to providing cutting-edge solutions for smarter and safer roadways.

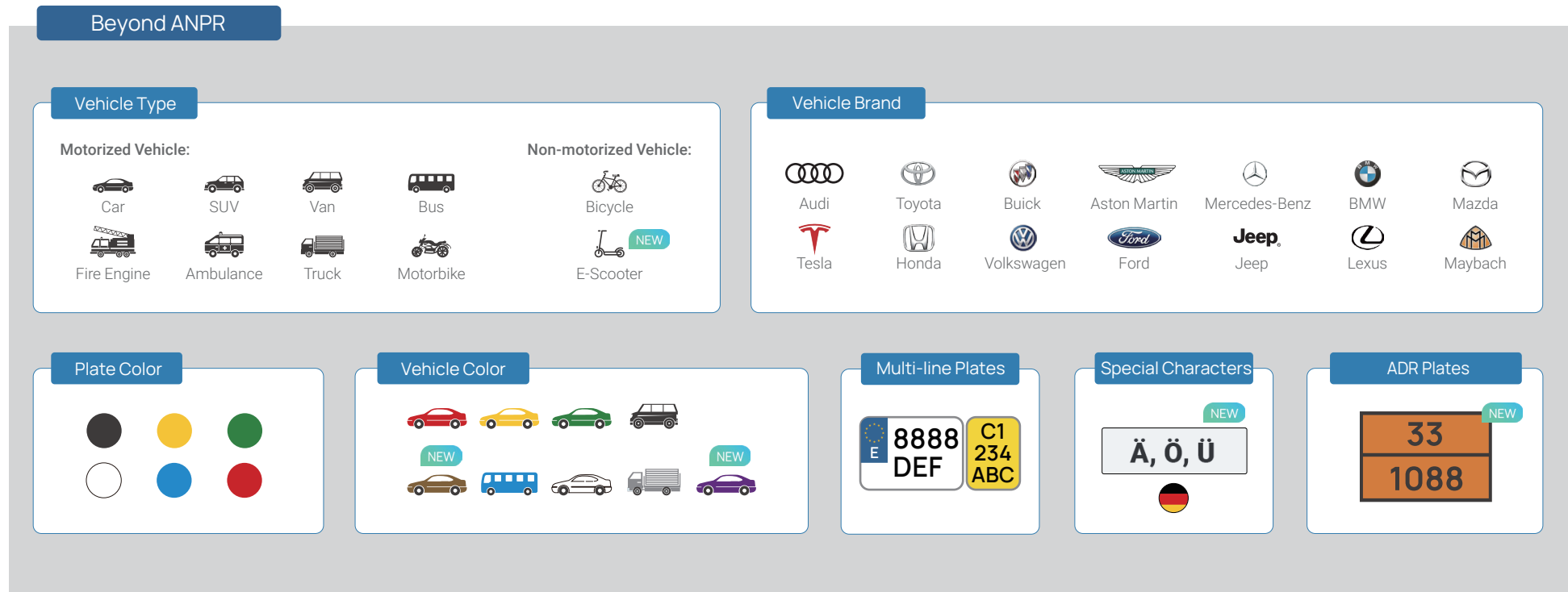


Plate Attributes & Vehicle Attributes Recognition

PlateXpert is capable of recognizing not only license plates but also accurately identifying various plate and vehicle attributes. These include [license plate numbers](#), [plate colors](#), [vehicle colors](#), [vehicle types](#), [vehicle brands](#), and more.

————— Make Sensing Matter —————

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