

# Milesight-Troubleshooting

## Radar AI LPR Setting

# 1. About Milesight Radar AI LPR Camera

For Milesight, the Radar AI LPR Network Camera not only supports the embedded LPR algorithm, but also the deep learning algorithm based on the AI platform, which can achieve higher detection accuracy and richer intelligent functions. With the higher added value brought by the application of radar technology, Milesight Radar AI LPR Network Camera is definitely a industry-leading innovative product in the market.

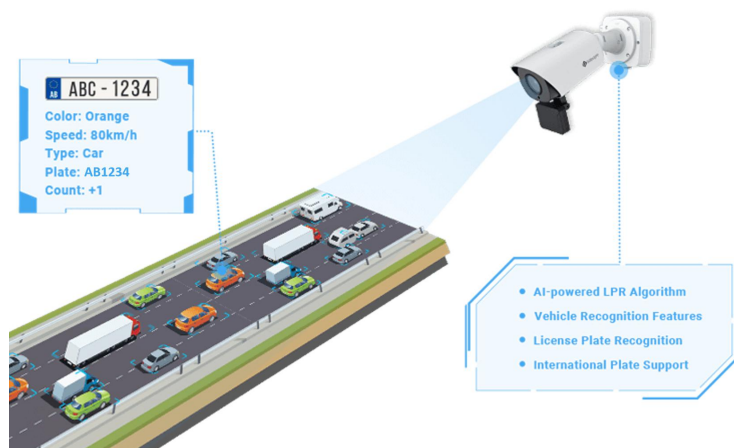


Figure 1 Radar AI LPR Network Camera

## ● Milesight Radar AI LPR Cameras

Radar AI LPR 4X/12X AF Pro Bullet Network Camera

### ! Notes

The integration with NVR/CMS is in processing, which is going to bring another supreme experience.

## ● Milesight AI LPR Cameras with Radar Technology

Milesight Radar AI LPR camera is a truly all in one integrated camera.

The radar module is directly integrated in the camera, making installation more convenient.

Milesight AI LPR camera with industry-leading 3D radar detection technology is suitable for traffic flow monitoring, violation detection, traffic safety protection, etc.

The main advantages include:

- ✓ Detecting moving targets can avoid false triggering of some stationary targets and ensure higher detection accuracy;
- ✓ 3D radar supports detection of up to 4 lanes, more professional and powerful road

detection;

- ✓ It can obtain the distance, speed and angle information of the object, and can support the speed detection of high-speed vehicles up to 200km/h;
- ✓ It can support the direction recognition of the detected object, including approaching, far away, etc., and can be widely used for road violation detection;
- ✓ Accurate and real-time display of the motion trajectory of the detected object, providing a powerful counting function to help analyze the traffic flow.

## 2. Installation Considerations

To increase the accuracy of license plate recognition and Radar detection, be sure to install the Radar LPR cameras properly to capture the license plates with the correct image size, lighting conditions and camera angle. The following highlights are the tips for camera installation:

### A. Recommended installing the camera in front of the vehicle:

Ensure the camera can capture the full view of the vehicle.

### B. Recommended installation height:

To avoid capturing unnecessary contents in the image, the Radar AI LPR camera should be installed in a higher position, the installation height of the camera (from the ground) is from 2 to 7meters (It is recommended to install below 6meters);

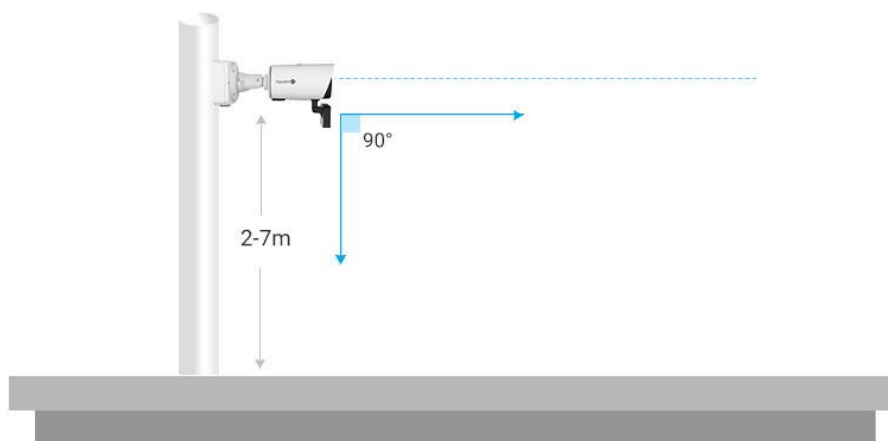


Figure 2 Installation Height

### C. Recommended installation angle:

Install the camera at a suitable angle (Vertical angle is less than 30°; Horizontal angle is no more than 30°; Tilt angle is less than 5°) to capture the front of the vehicle;



Figure 3 Installation Angle

#### D. Instructions for use of radar module:

- ✓ The radar board is used to transmit and receive radar waves, and the angle can be adjusted. We recommend that you keep it vertical to the horizontal field of view of the camera when using it (The angle of the radar board can be adjusted from  $-20^{\circ}$  to  $90^{\circ}$ );
- ✓ The detection range of the radar module is vertical angle  $17^{\circ}$ , left and right  $56^{\circ}$ . Keep the detection range of the radar board unobstructed and cover the detection target;

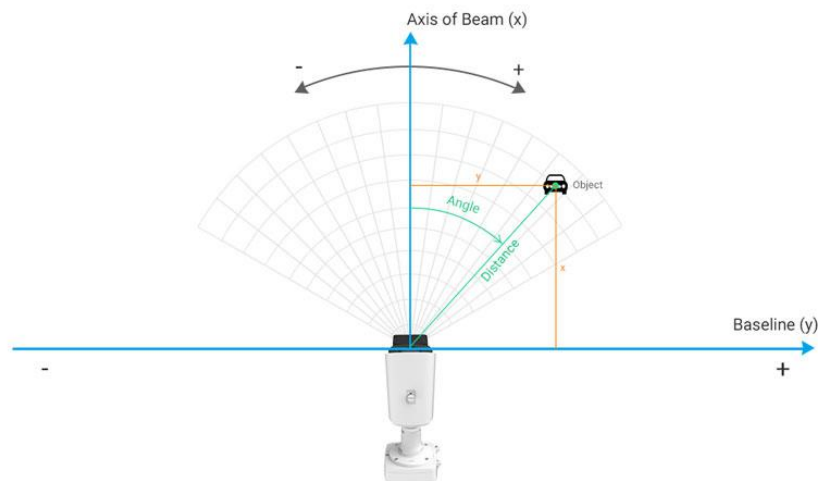


Figure 4 Detection Range of the Radar Module

- ✓ The detection distance of the radar module is up to 90m. Please ensure that the detection target is within the detection range.

#### ! Notes

**In order to ensure the stable use and high accuracy of the radar detection function, you need to pay attention to:**

- ✓ Keep away from other signal antennas when installing;
- ✓ The surface of the radar antenna should be kept as flat as possible to avoid scratches. Any slight bend will have a great influence on the detection result;
- ✓ It is necessary to fully protect against static electricity during the process of radar transportation, storage, use and handling.

#### E. Detection performance of radar module:

Milesight Radar AI LPR Camera uses 60GHz millimeter wave radar, which is a medium-range radar. It can detect target distance, speed and angle information by receiving radar reflections.

Function	Description
3D Radar	1~4 lanes vehicle detection, lane recognition rate $\geq 95\%$
Detection Distance Range	Up to 90m
Distance Detection Accuracy	$\pm 0.4\text{m}$
Speed Detection Range	Up to 200km/h
Speed Detection Accuracy	$\pm 0.36\text{km/h}$
Multi-target Detection	32
Target Detection Rate	$\geq 99\%$ , More than 95% of traffic jams

### 3. How to Set Radar AI LPR Camera

After successfully installing the camera, to use the Radar AI LPR related functions, you also need to set the necessary web page configurations, for the relevant settings of the LPR function, please refer to the manual for operation. The following steps on the relevant settings for the application of Radar technology.

#### (1) Settings

**Step1:** After logging in the web, go to “LPR”→ “Settings”→ “General”.

Check the checkbox “Enable License Plate Recognition”, areas of interest can be drawn on the screen.

There will be shown in the blue box as below.

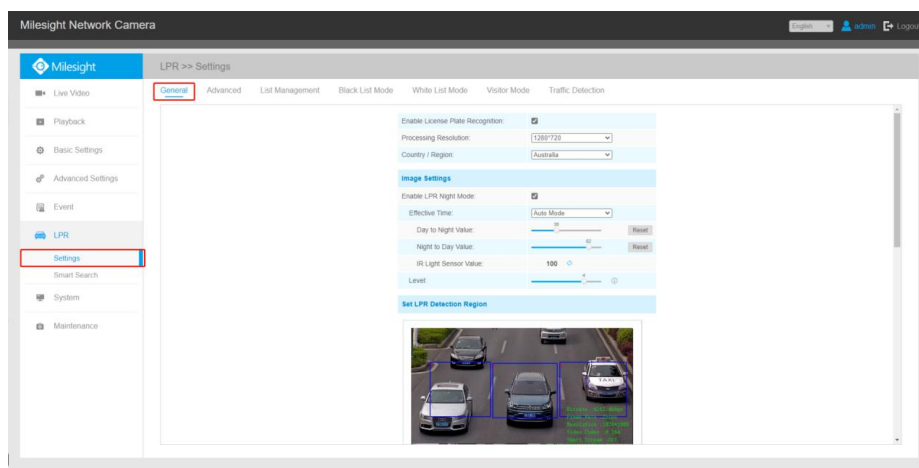


Figure 5 LPR - Settings page

### Notes

- ✓ It is recommended that the LPR area be drawn at a distance of more than 30 meters from the Radar AI LPR Camera and the upper edge of the detection area remains on the same horizontal line. Do not place the detection area too large to avoid the situation where it can contain multiple vehicles in front and behind.
- ✓ Complete other LPR related settings, for the relevant settings of the LPR function, please refer to the **LPR Camera User Manual** for operation. The following focus steps on the relevant settings for the application of Radar technology.

**Step2:** Traffic Detection Settings, go to the “LPR” → “Settings” → “Traffic Detection”.

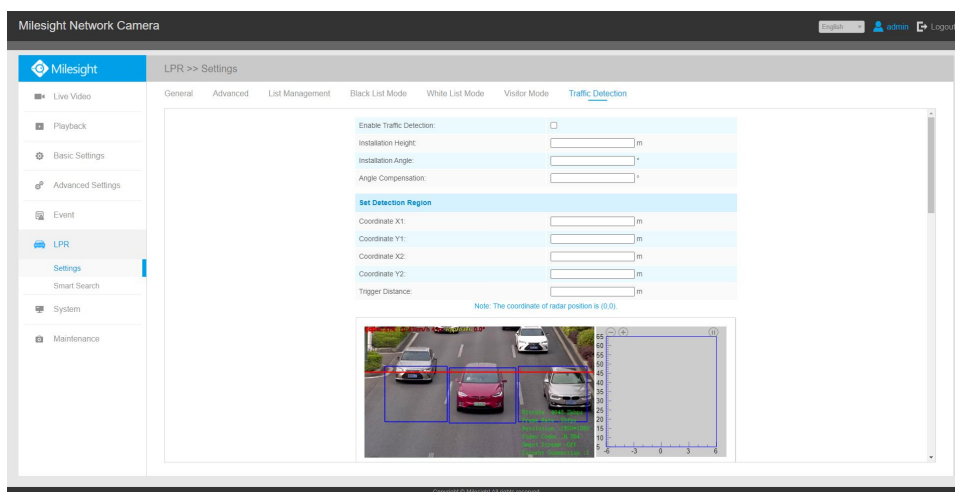


Figure 6 LPR - Traffic Detection page

**[Installation Height]:** Please fill in the installation height according to the actual installation height of the camera;

**[Installation Angle]:** Please fill in the installation height according to the actual installation angle between the camera's field of view and the horizontal;

**[Angle Compensation]:** Support angle compensation range:  $-30^{\circ} \sim 30^{\circ}$ , default  $0^{\circ}$ . Angle compensation is mainly used as horizontal angle compensation, such as the radar cannot be installed in the middle of the road, in order to detect data more accurate, the angle between the installation position and the road can be compensated and corrected.

Angle Compensation value=  $\theta_1$

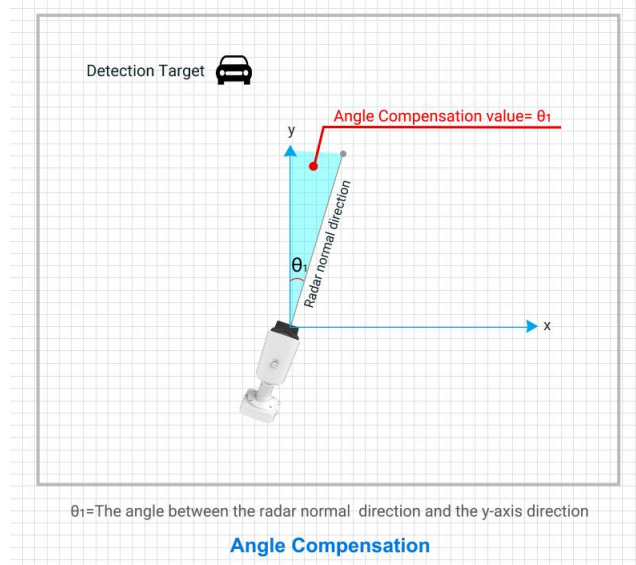


Figure 7 Angle Compensation Description

**Step3:** Set Detection Region. Configure the radar detection area on the basis of the successful saving of the LPR detection area settings.

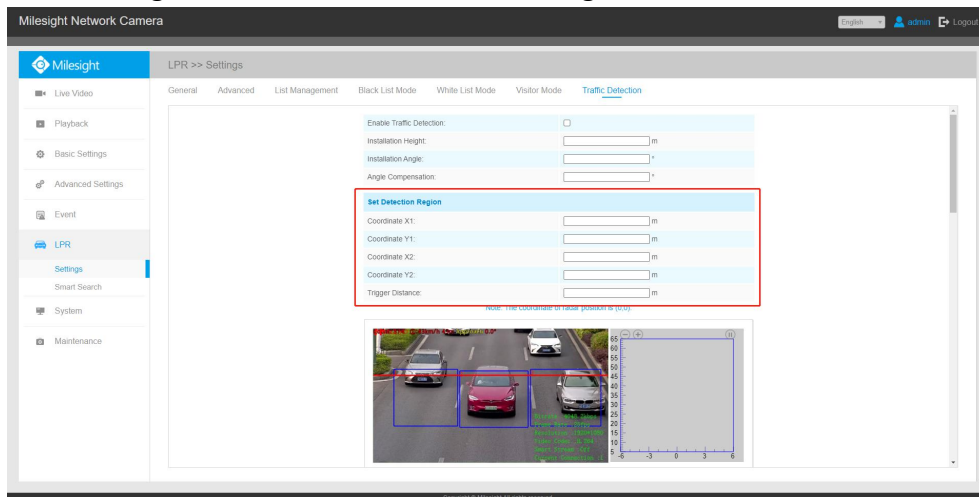


Figure 8 Set Detection Region

1. As shown in the figure below, there are two coordinate points (figure 9). Points P1 and P2 are used to facilitate the user's spatial positioning.

The user needs to measure the actual spatial position coordinates of the two coordinate points (relative to the Radar AI LPR Camera position).

e.g.: You can adjust the position of P1, P2 by mouse, as shown in the figure below (figure 9), move the P1 point to the white traffic line in the lower right corner, then you need to measure the horizontal and vertical distance from the camera to the actual position corresponding to the P1 point. Similarly, please complete the distance measurement of point P2.

We recommend that you can move the P1 point marker to a more Obvious target (such as trees or other landmarks) , so you can measure the distance easier.

The Radar detection area is a rectangle with diagonal lines in the two coordinate points (figure 10);

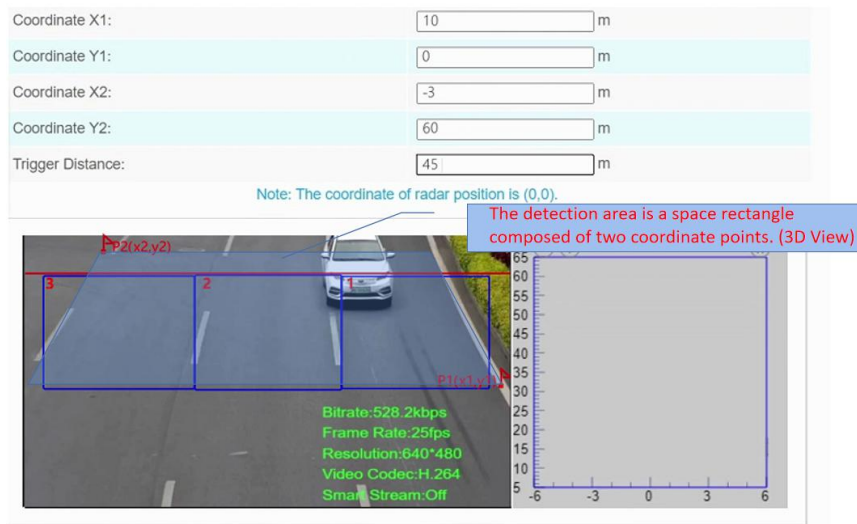


Figure 9 Set Detection Region

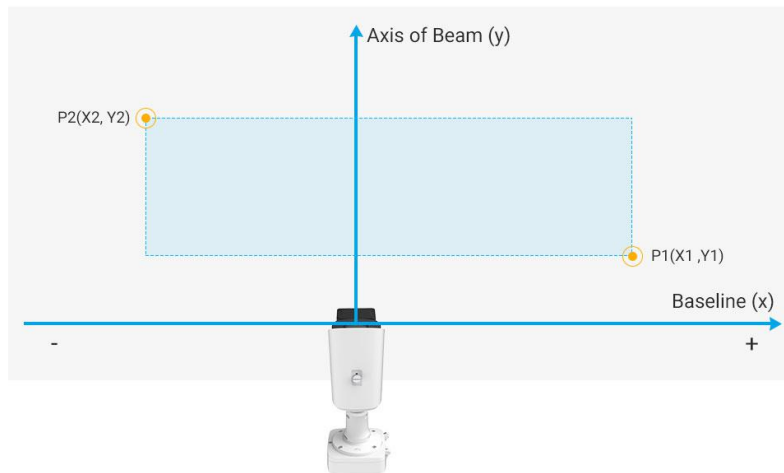


Figure 10 Coordinate Point Space Description

### ! Notes

- ✓ The P2 limit can only be at the top and left of P1. When operating the moving position, the movement limit is performed. The parameters of P2 are fixed to the right of the point, and the parameters of P1 are displayed to the left of the point.
- ✓ The default positions of P2 and P1 are the upper left and lower right corners bounded by half of the screen.

2. Please measure the actual position of the plane coordinates of the two vertices,



taking the radar position as the zero position (0,0). Then fill in the parameter input boxes for the following two vertices:

Coordinate X1:	<input type="text"/>	m
Coordinate Y1:	<input type="text"/>	m
Coordinate X2:	<input type="text"/>	m
Coordinate Y2:	<input type="text"/>	m

Figure 11 Set Detection Region

**[Coordinate X1&Y1]:** X and Y axis parameters of P1 coordinates;

**[Coordinate X2&Y2]:** X and Y axis parameters of P2 coordinates;

The configuration is not filled in by default. If there is no configuration, there is no limit to the detection area of the radar. The radar will detect the target in the full range involved. For more accurate detection, we recommend that you fill in as much as possible based on the actual measurement.

**[Trigger Distance]:** As shown in the radar configuration page in the figure below, there will be a red line in the preview box of the configuration page. The red line is the position that can be adjusted up and down, and the Trigger Distance is the horizontal distance from the red line to the radar. To ensure relative accuracy, users need to fill in after actual measurement. The LPR detection triggers the start of recognition through this distance, which promotes a better match between the LPR data and the radar data.



Note: Please adjust the position of P1,P2 and the red line by mouse.

Figure 12 Trigger Distance Settings

### ! Notes

- ✓ In order to provide more accurate radar detection, we recommend that the detection red line is set above the detection frame and close to the detection frame to ensure that the vehicle first passes the detection line to obtain the positioning information, and then enters the detection frame, which can ensure more complete and accurate data detection.

**[LPR Detection Region Calibration]:**

To match LPR data, please configure LPR detection region calibration after radar detection. The calibration of the LPR detection area is mainly to match the space coordinates. The number of this configuration item shows the corresponding number according to the number of the LPR detection area. The data filled in is based on the corresponding trajectory map on the right when the target vehicle enters the area to find the target and fill in the X value shown above. To match LPR data, please configure LPR detection region calibration after radar detection.

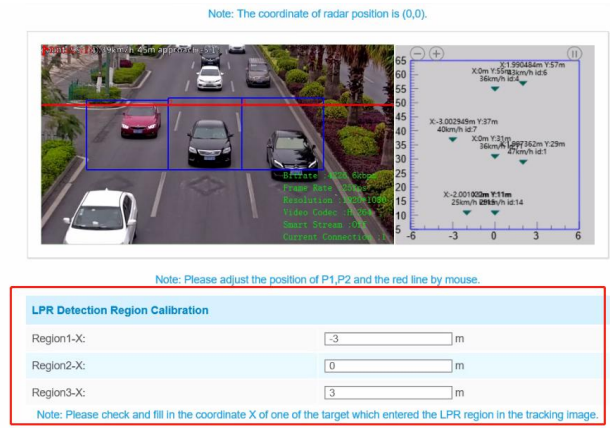


Figure 13 LPR Detection Region Calibration

For example, after you have drawn 3 detection areas, you can find the coordinate information corresponding to the targets in the three detection areas from the radar coordinates. You only need to fill in this coordinate information;

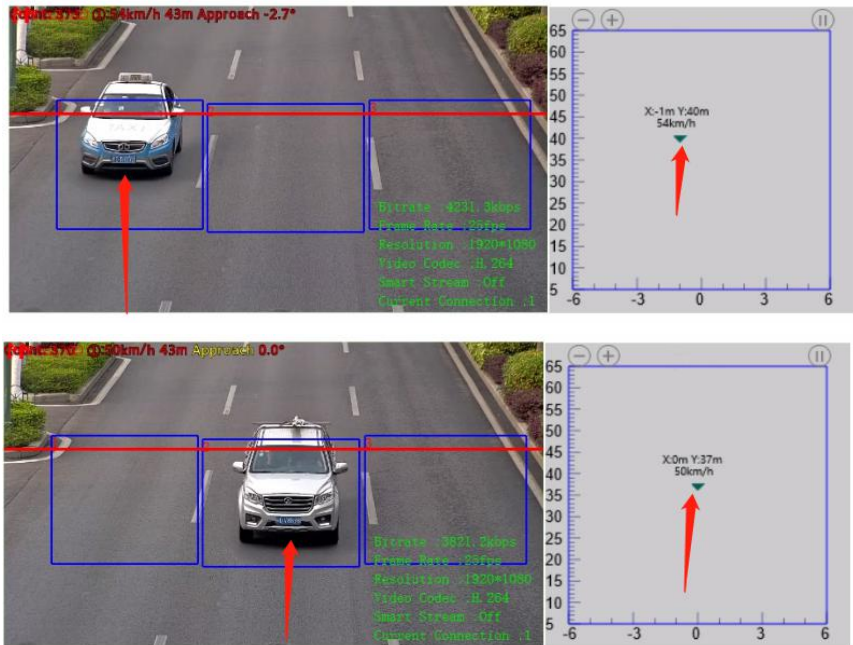




Figure 14 LPR Detection Region Calibration

**Notes**

- ✓ After the vehicle has passed the trigger distance, click the button on the upper right of the coordinates (as shown in the figure below) to pause the screen and watch the radar data of the vehicle at this time.

**Step4:** Schedule Settings. Set the effective time of traffic detection.

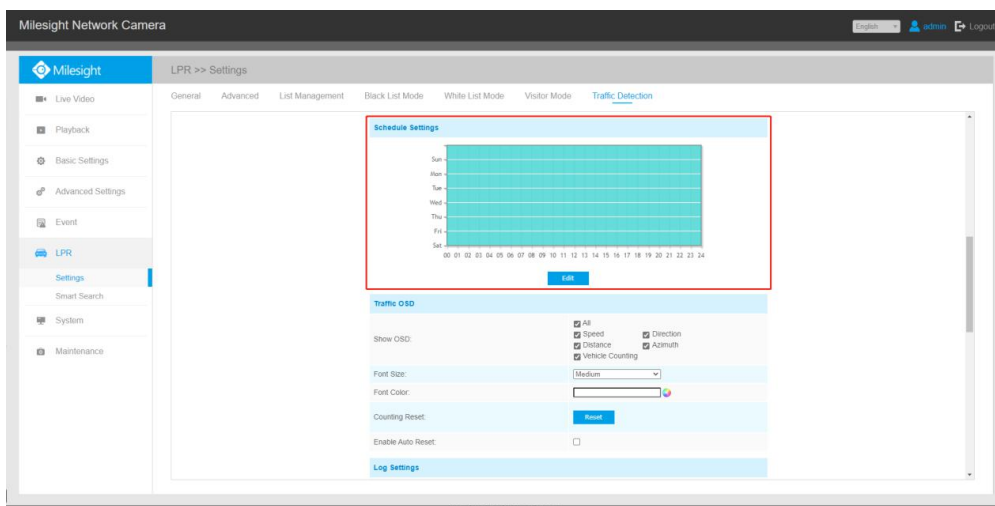


Figure 15 Schedule Settings

**Step5:** Traffic OSD Settings. Customers can choose the information that needs to be displayed in Live Video and the display format, such as color, size, etc.

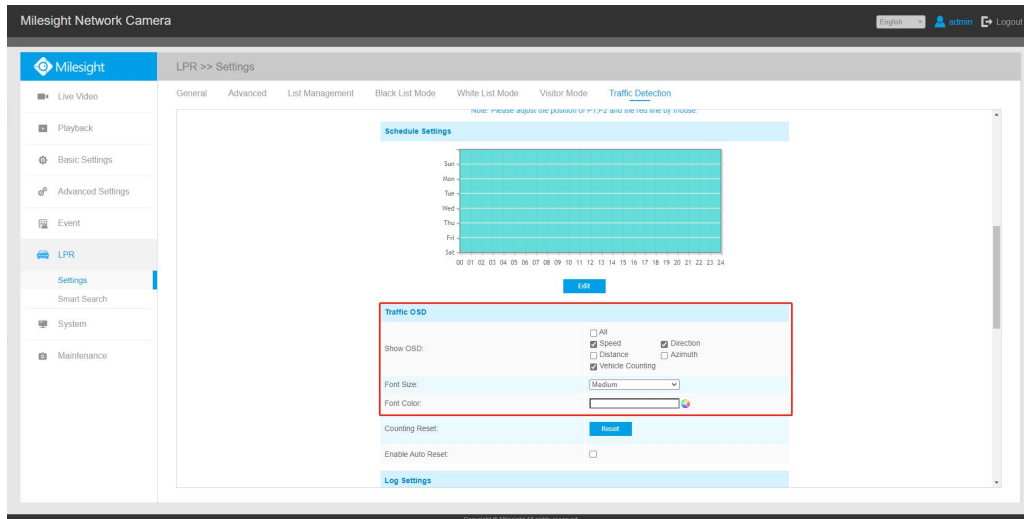


Figure 16 Traffic OSD Settings

**[Show OSD]:** Users can choose the information they want to display in Live Video;  
**[Font Size][Font Color]:** The font size and color of the OSD display, the default size is Medium;  
 When Speed, Direction, and Vehicle Counting are checked, the Live View interface is displayed as shown in the figure below:

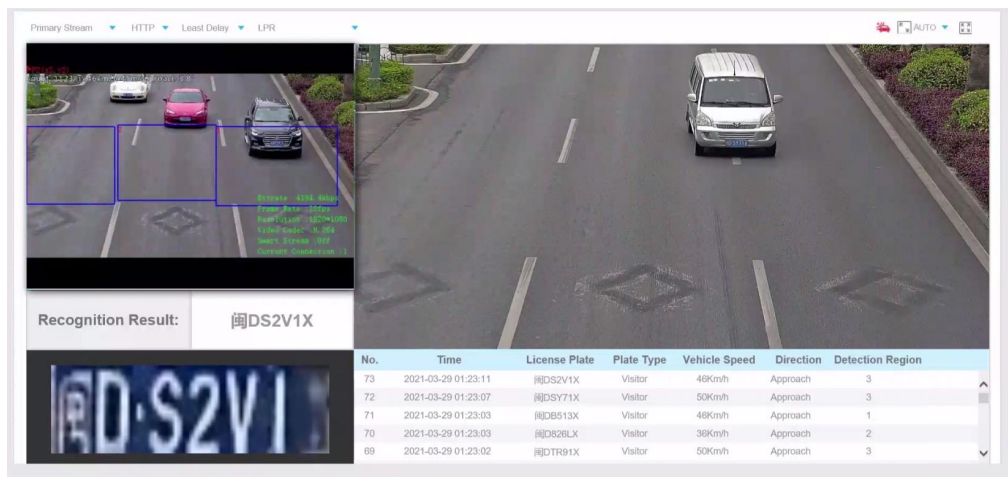


Figure 17 Live Video Interface

**[Counting Reset]:** Click the "Reset" button to manually reset the vehicle count;  
**[Enable Auto Reset]:** It is used to automatically clear the vehicle count at regular intervals (Just reset the OSD count for Live Video). After enabling, the interface is as shown in the figure below, just follow the prompts to set it.

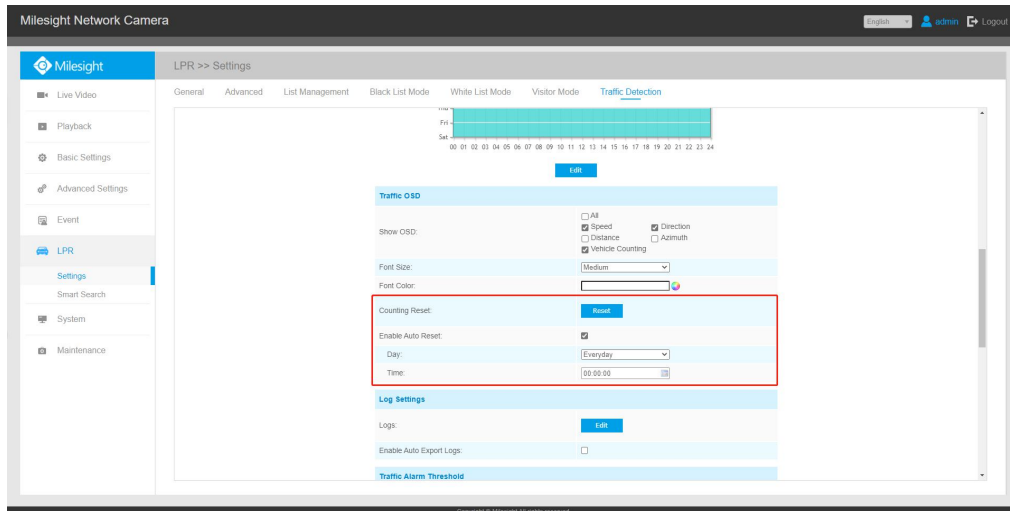


Figure 18 Traffic OSD Settings

**Step5: Log Settings.** Click the "Edit" button, and a pop-up window as shown in the figure below (Figure 20) will appear, allowing users to search for various types of logs and support the log export function;

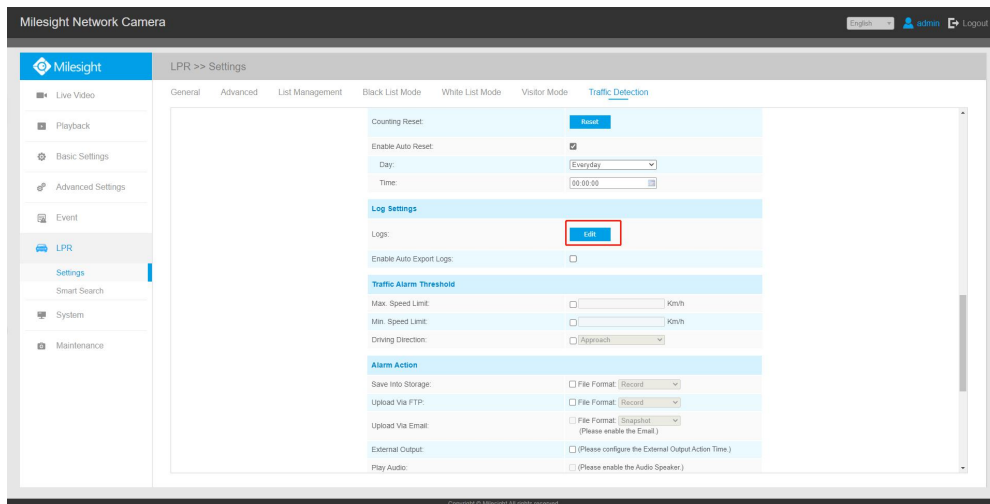


Figure 19 Log Settings

Milesight Network Camera

Show  entries

Time	Speed	Direction	Distance	Azimuth	Vehicle Counting	Log Search
2021-04-19 18:49:01	50Km/h	Approach	44m	4°	14	
2021-04-19 18:49:00	48Km/h	Approach	44m	5°	13	
2021-04-19 18:48:59	52Km/h	Approach	44m	5°	12	
2021-04-19 18:48:58	55Km/h	Approach	44m	6°	11	
2021-04-19 18:48:56	54Km/h	Approach	44m	6°	10	
2021-04-19 18:48:54	47Km/h	Approach	44m	5°	9	
2021-04-19 18:48:50	54Km/h	Approach	44m	7°	8	
2021-04-19 18:48:50	44Km/h	Approach	44m	0°	7	
2021-04-19 18:48:49	44Km/h	Approach	44m	0°	6	
2021-04-19 18:48:49	44Km/h	Approach	44m	0°	5	
2021-04-19 18:48:49	65Km/h	Approach	44m	8°	4	
2021-04-19 18:48:48	32Km/h	Approach	44m	3°	3	
2021-04-19 18:48:48	33Km/h	Approach	44m	5°	2	
2021-04-19 18:48:48	64Km/h	Approach	44m	7°	1	

Type:  
 All  
 Speed  
 Direction  
 Distance  
 Azimuth  
 Vehicle Counting

Start Time:

End Time:

Showing 1 to 14 of 14 entries    First    Previous    **1**    Next    Last   

Figure 20 Logs Edit

**[Enable Auto Export Logs]:** Support regular automatic export of logs to FTP, Email and Storage.

Milesight Network Camera

English    admin    Logout

Milesight

LPR >> Settings

General    Advanced    List Management    Black List Mode    White List Mode    Visitor Mode    **Traffic Detection**

Log Settings

Logs:

Enable Auto Export Logs:

Day:

Time:

Export Time Range:

Export to:  FTP     Email     Storage

Traffic Alarm Threshold

Max. Speed Limit:  Km/h

Min. Speed Limit:  Km/h

Driving Direction:

Alarm Action

Save Into Storage:  File Format:

Upload Via FTP:  File Format:

Upload Via Email:  File Format:  (Please enable the Email.)

External Output:  (Please configure the External Output Action Time.)

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Figure 21 Logs Settings

**Step5:** Traffic Alarm Threshold. Used to set traffic alarm thresholds, such as maximum and minimum speed limits, and driving direction limits;

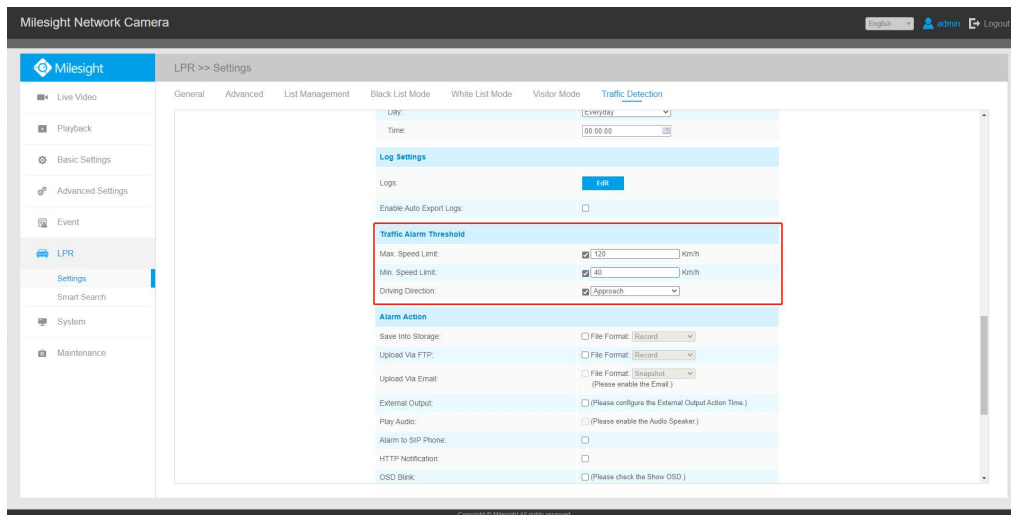


Figure 22 Traffic Alarm Threshold

**Step6:** Alarm Action & Alarm Settings. Set the alarm action. This part is the same as the regular alarm settings. For details, please refer to the Milesight Network Camera User Manual. Also note that the OSD Blink here needs to be turned on after the OSD function (Figure 23).

When an alarm is triggered, the OSD information will flash and alarm, and you can also set the duration of the OSD Blink Time, which supports 1~10s.

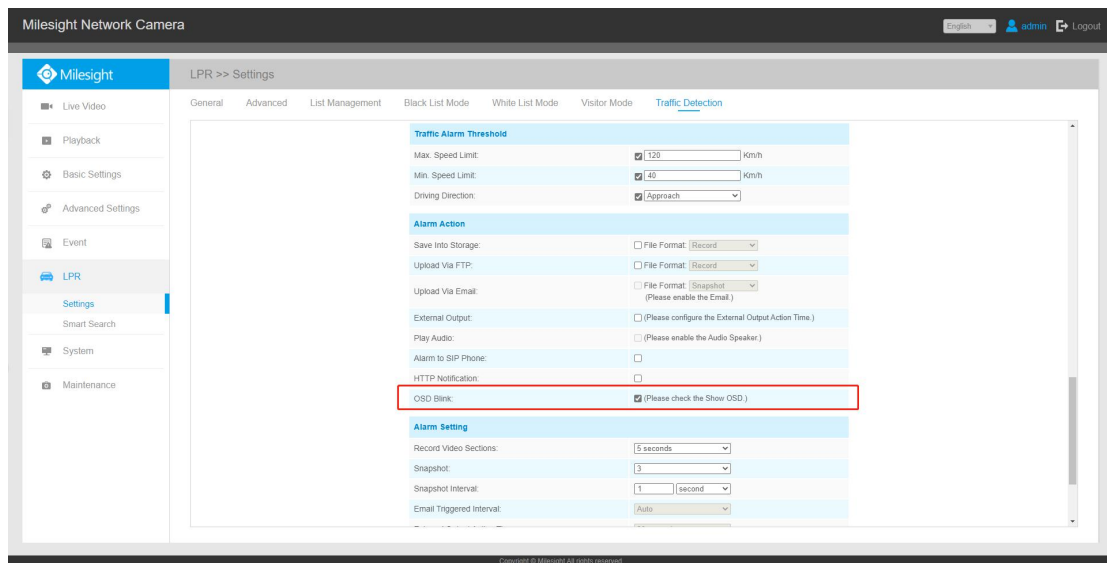


Figure 23 Alarm Action

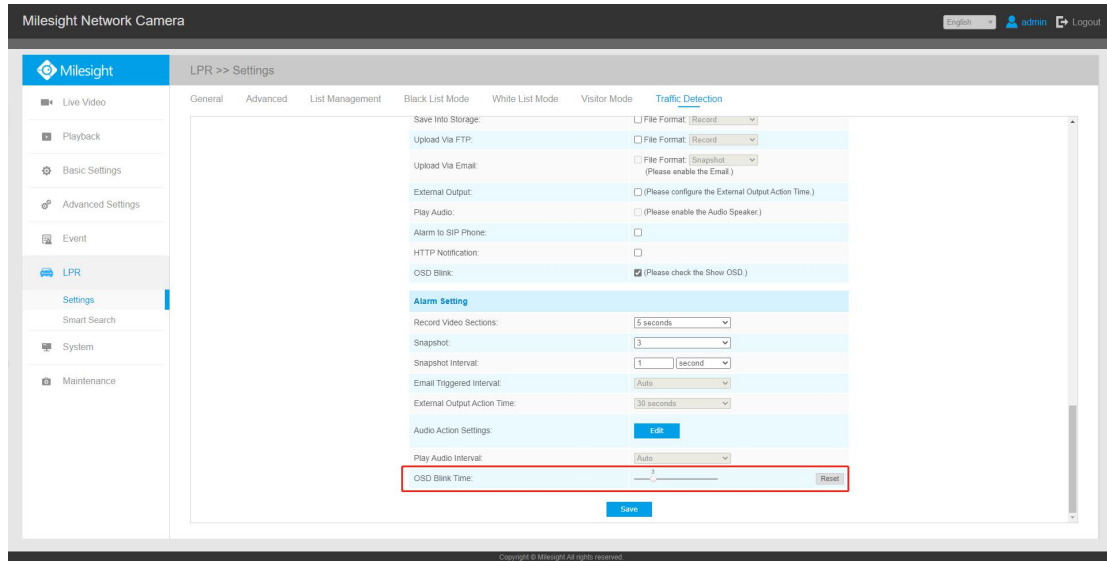


Figure 22 Alarm Settings

## (2) Live View

After completing the LPR and Traffic Detection related settings, you can use the related functions of Radar AI LPR Camera normally. The following is the real-time display in the Live View interface:

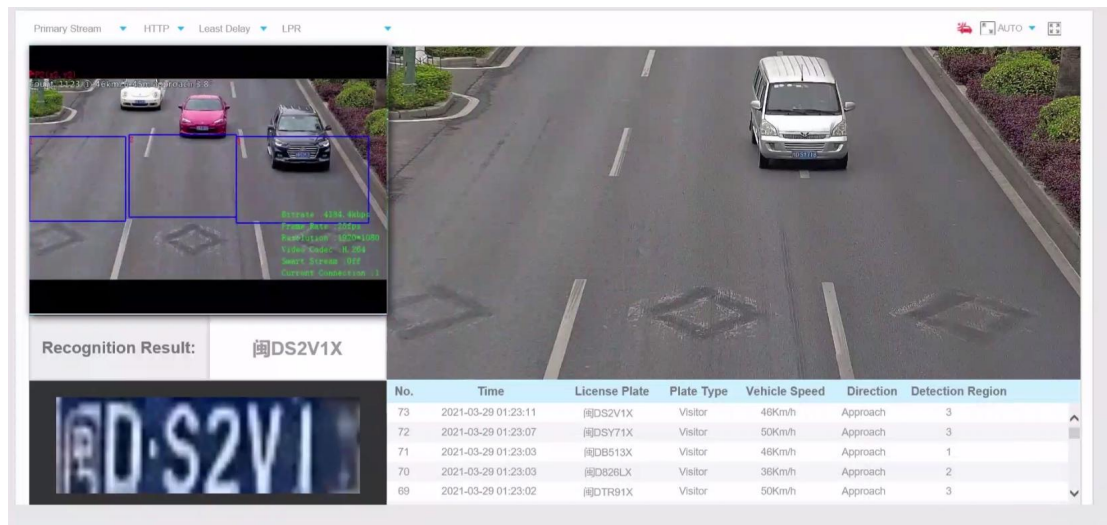


Figure 23 Live Video Interface

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