

**IMPORTANT
INFORMATION**

License Plate Recognition (LPR) QUICK REFERENCE GUIDE

This product **MUST** be installed by a certified Hanwha STEP Partner!



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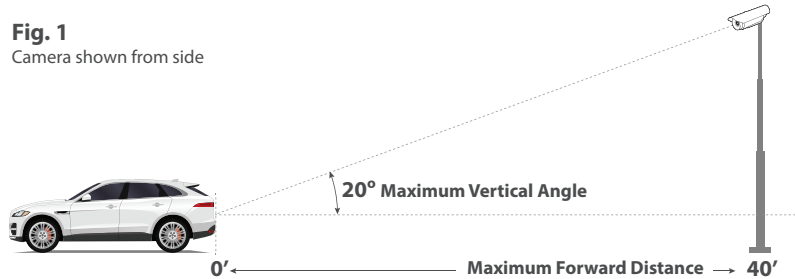


1 PRE-INSTALLATION

1.1 Choosing a Location

The license plate recognition (LPR) technology running on this camera will provide you with the best results when following the recommended installation constraints below.

Fig. 1
Camera shown from side

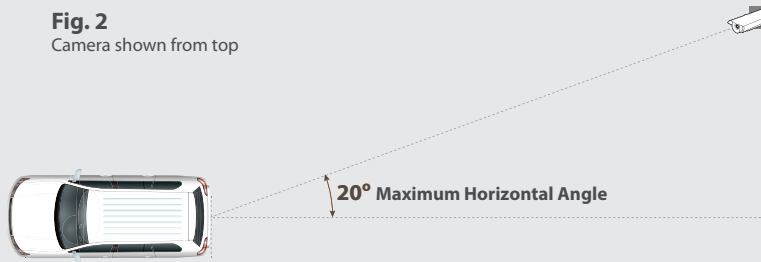


Recommended

20 degrees Maximum Vertical Angle

40 feet Maximum Forward Distance

Fig. 2
Camera shown from top



Recommended

20 degrees Maximum Horizontal Angle

1.2 Measure

For this step you will need three measurements in feet. **A** Lane Offset (from center of plate to the line parallel to the curb intersecting the bottom of the camera) **B** Forward Distance (min and max expected) **C** Camera Height (min and max expected)

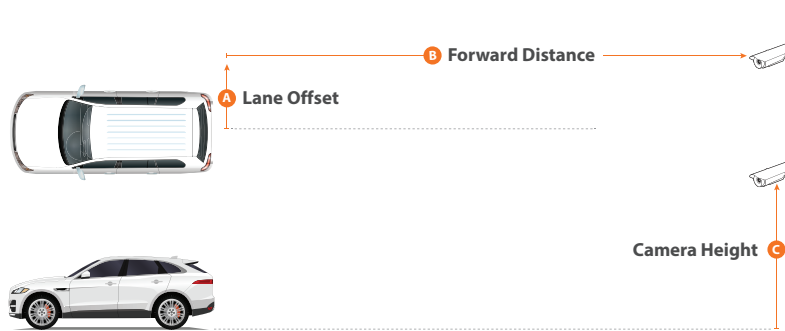


Chart **Your** Measurements Here

A Lane Offset	
B Forward Distance	
C Camera Height	

1.3 Checking Camera Position

The diagram and tables on page 4 illustrate recommended locations based on known offsets. Verify that the camera height and forward distance indicated by orange dots fall within the measurements you took in previous step, *1.2 Measure*.

PLEASE READ CAREFULLY:

Distances Measured in Feet. The **orange dots** on the tables below are recommended installation measurements. If your measurements differ greatly from those represented on the table - such as for installations that fall somewhere between the offset, forward distance, or height shown, please consult Detailed LPR Install Tables article in the Hanwha Knowledge Base.



0' LANE OFFSET

Camera Height	Forward Distance							
	5'	10'	15'	20'	25'	30'	35'	40'
	4'			•	•	•	•	•
6'				•	•	•	•	•
8'					•	•	•	•
10'						•	•	•
12'							•	•
14'								•

5' LANE OFFSET

Camera Height	Forward Distance							
	5'	10'	15'	20'	25'	30'	35'	40'
	4'				•	•	•	•
6'				•	•	•	•	•
8'					•	•	•	•
10'						•	•	•
12'							•	•
14'								•

10' LANE OFFSET

Camera Height	Forward Distance							
	5'	10'	15'	20'	25'	30'	35'	40'
	4'						•	•
6'						•	•	•
8'						•	•	•
10'						•	•	•
12'							•	•
14'								•

2

INSTALLING AND POSITIONING CAMERA

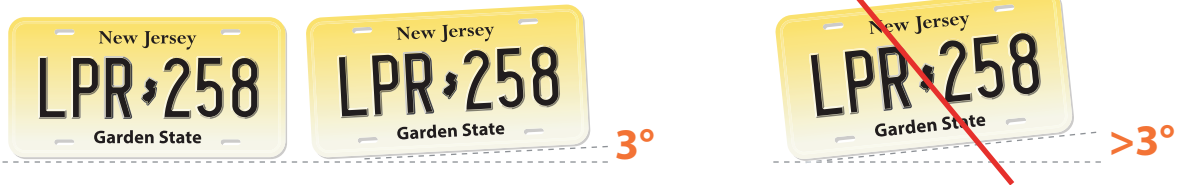
2.1 Camera Installation

NOTE: Refer to XNO-6120R or XNV-6120R installation guide and follow the installation instructions.

2.2 Adjust for Plate "Rotation" Angle

For best results, check the angle of your plate compared to the horizontal angle and rotate the camera to less than 3° as shown below (Recommended Angle(s)).

Recommended Angle(s)



3 CONFIGURING YOUR CAMERA

NOTE: The default username and password to access the camera settings are: **1) User Name: admin** **2) Password:** Same as the MAC Address of the unit (numbers and uppercase letters only) **3) Please change the default password at the first instance when you access the camera settings.** **4) Make sure to set correct date and time for the camera before going in to any additional settings.**

3.1 Field of View

The below steps you will perform in the Wisenet camera configuration webpage

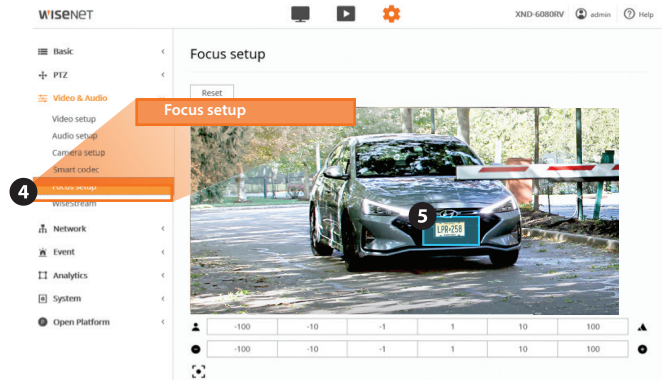
- 1 Configure camera so left and right are correct, not mirrored.
- 2 Set camera zoom to capture license plate at about 20% of the width of the image
- 3 Adjust camera view angle so plate passes through the middle of the image.

3.2 Simple Focus on Plate Read Area

A unique feature of this camera allows you to select the plate area and hit a button to perform a “Simple Focus” on this plate area.

- 4 From the Video & Audio menu, select **Focus Setup**.
- 5 Click and drag to draw an area of focus where the license plate is displayed.
- 6 Click the **Simple Focus** button to initiate a focus operation on the user-specified area.

NOTE: The area indicated is not stored. If you need to perform a new Simple Focus, please draw a new area on-screen.



3.3 Configure Initial Camera Settings

Choose the location below that best describes your LPR needs.

	FREE FLOW (Plate read while moving up to 35MPH)	STOP N' GO (Plate read while stopped)
SDDR : Levels can increase the brightness		
SDDR	Enables * - Tune this setting in step 4	Enable
Level	6	1
D Range	Wide	Narrow
WHITE BALANCE		
Mode	ATW	ATW
BACKLIGHT		
Mode	OFF	OFF
EXPOSURE		
Brightness	50	50
Min. Shutter	1/500	1/120
Max. Shutter	1/12000	1/12000
Prefer Shutter	1/500	1/120
Anti Flicker	OFF	OFF
SSNR	OFF	OFF
Iris	DC (Auto)	DC (Auto)
AGC	Low * - In step 4	Middle
DAY/NIGHT : Set the day/night mode always in b/w		
Mode	B/W	B/W
SPECIAL		
DIS	OFF : Digital Image Stabilization is not applicable for LPR settings	OFF : Digital Image Stabilization is not applicable for LPR settings
Sharpness	OFF	OFF
Gamma	0.45	0.45
Contrast	50	50
Color Level	50	50
Defog	OFF	OFF
OSD : You can display camera title, time etc using this feature		

3.3 (Continued)

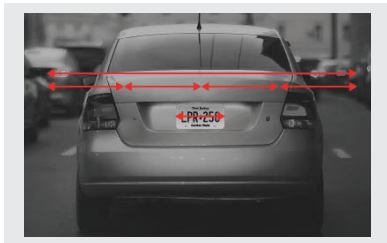
	FREE FLOW (Plate read while moving up to 35MPH)	STOP N' GO (Plate read while stopped)
FOCUS		
Mode	Manual	Manual
Digital Zoom	OFF	OFF
Zoom Mode	Manual	Manual
Zoom Speed	Fast	Fast
Lens Reset	Manual	Manual
IR : Built in ir light helps to illuminate reflective plates specially when the environment has low light condition		
Mode	Manual	Manual
Level	100 * - In step 4	100

NOTE: The settings indicated with a * may be adjusted for real-world performance during step 4.

3.4 Observing PROPER Installation

Image captured by the camera must be sharp and the license plate should pass near the center of the image.

Fig. 1



Zoom and Focus

The total width of the License Plate should be between 1/5 and 1/4 of the entire image. For best reading image should be centered.

Fig. 2

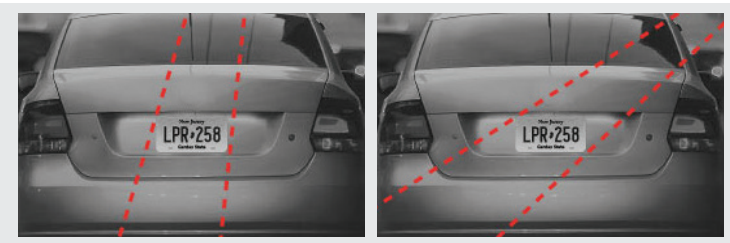


Plate Visibility

Path of plate motion should cross the image as close to the center as possible.

3.5 Examples of IMPROPER Installation



Too Far



Too Dark



Not Focused



Washed Out and Over Exposed



Car Too Fast, Not Zoomed in, Cut off



Not Zoomed In

3.6 Verify Plate Rotation is Correct

After plate area focus is complete, verify that you successfully rotated the camera less than 3° angle as shown below.

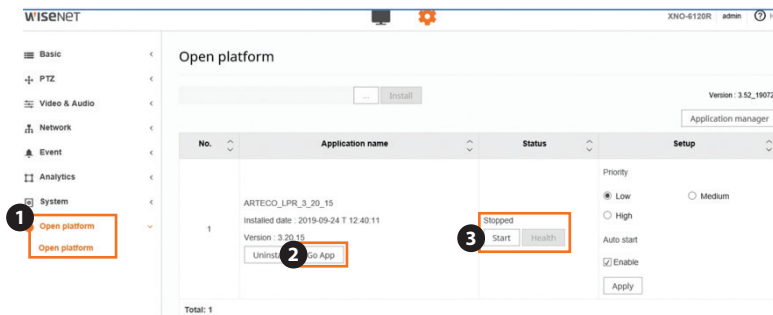


4 CONFIGURE LPR APPLICATION

4.1 Optimizing the LPR Application Settings

LPR application is an open platform application pre-installed and licensed along with the camera.

- 1 Connect to camera browser through the **Open Platform**
- 2 Go to **App**
- 3 Click **Start**



Once you are in the app, another browser tab will open up.

- 4 Navigate to the **Setup** tab as shown.
- 5 Configure **OCR Settings** as follows and observe the read accuracy as the cars pass through.

Character height Min.	20
Character height Max.	30
Threshold	70
Plate color	Dark Text on light background
Double line Plate	Disabled

The screenshot displays the ARTECO LPR application interface. The top navigation bar includes 'Monitoring' and 'Setup' (highlighted with a red box and a '4'). A sidebar on the left lists 'Main', 'Ocr', 'Area', 'Event action setup', and 'Plate List 1-4'. The 'Ocr settings' panel (highlighted with a red box and a '5') contains the following configuration: 'Char height' with 'Min' set to 20 and 'Max' to 30; 'Threshold' set to 70; 'Plate color' set to 'Dark text on light background'; 'Correction' set to 'Perspective'; and 'Double line plate' set to 'Disabled'. Below the settings is a live camera feed of a white car's rear, showing the license plate 'U88JEE' and a smaller plate 'S:100A' (highlighted with a red box). A circular gauge on the right, labeled 'ZOOM OUT', shows 'Plate height' in pixels with a scale from 0 to 40 and a current reading of 25. The gauge has a green section (0-20) and a red section (20-40), with a red 'C' at the 25 mark and a red 'B' at the 15 mark.

NOTE: Observe the dial position as the pointer moves through the dial. Ideally you should target the vehicle to be at the center of the image, well zoomed in as in the above picture. Notice the **A Threshold** on the image is 100%, **B Dial** pointer is at the center of the Plate Height gauge and **C Pixels** captured are 25. This is a 100% accurate read. Your target should be anything from 90-100 threshold for a reliable read. If the readings are not within these guidelines, refer back to sections 2 and 3 for further adjustments.

4.2 Adjusting the Zoom Level

Using the dial pointer on the Plate Height gauge, zoom in / out and observe the needle.

Zoom in / out: Zoom in or out and observe the needle to get it in the green range.



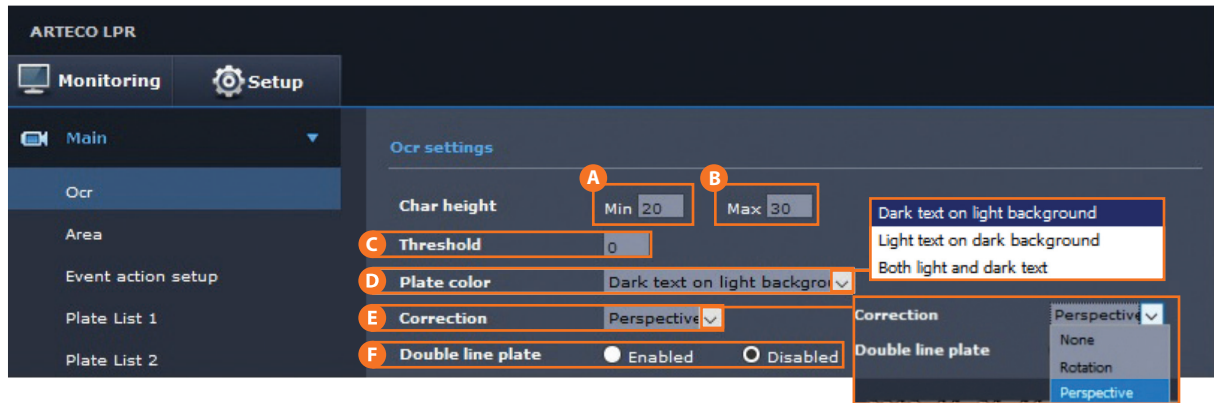
Example of Good Read



Example of Bad Read

4.3 Fine Tuning Settings

Try changing the following settings for a clear picture.



Check for Character Height & Threshold

- Check the **A** "Char height Min" (Minimum Character Height) to the number of pixels [pixels] expected by software, while **B** "Char height Max" (Maximum character height) is the maximum character height [pixel] expected by software. Minimum acceptable character is 20 pixels.
- **C** **Threshold** will allow to cutout readings with weak confidence in order to avoid fake readings. Note this may make some plates that are read partially to be missed.
- A bright, clear and well sized plate image generate a score = 100. A misreading will fall below 50. A good initial setting for the threshold is = 70.
- You may adjust these values to optimize the readings in your installation

Adjust for Plate Text Contrast & Plate Correction Settings

- **D Plate Color:** Here you will be allowed to set the plate color and background with the options above. Our recommendation is to set it as “Dark text on white background” to easily identify the number plates.
- **E Correction:** Opening the “Correction” drop down menu, you will be allowed to select one of two distortion corrections: Perspective or Rotation. Choose for the dominant image distortion, if any. Otherwise select “none” to preserve camera CPU resources.
- **F Double line plate:** If enabled will allow OCR to read plates split over 2 lines, which may not be applicable to US number plates. After changing the parameters click on “apply” to confirm the changes.
- After changing the parameters click on “Apply” to confirm the changes

NOTE: *These settings are mainly for camera settings for a good License plate capture. Refer to additional user manual for other settings for VMS integration & data access options.*

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For more information visit us at

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