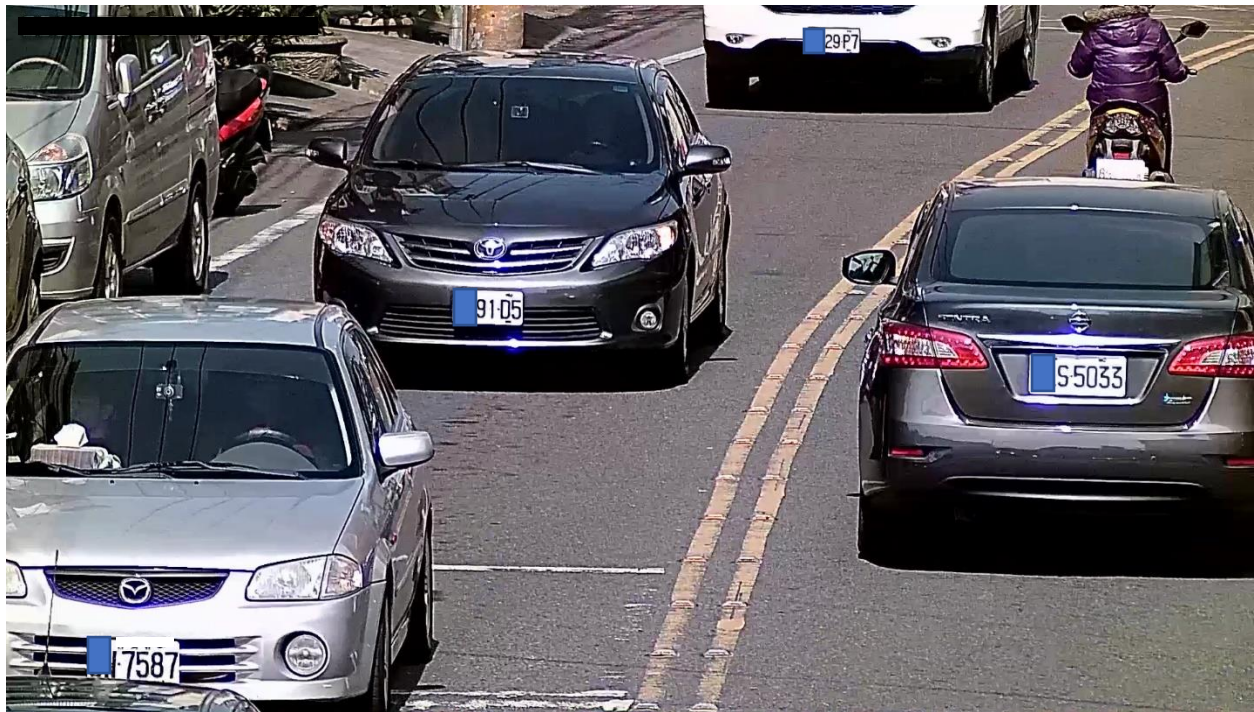


Camera installation tips for License Plate Recognition using Dinion IP 6000/7000 HD cameras

Streaming Networks License Plate Recognition (LPR) system (LPR-10xD) is designed to read vehicle license plates using infra red as well as color IP cameras. The system can handle standard definition (SD) and high definition (HD) IP cameras. In HD mode, the system can input 720P (1280x720) video streams. Through proper camera installation, a 720P stream can cover up to two traffic lanes. The system is capable of handling dual-lane bi-directional traffic for each 720P stream as shown below.



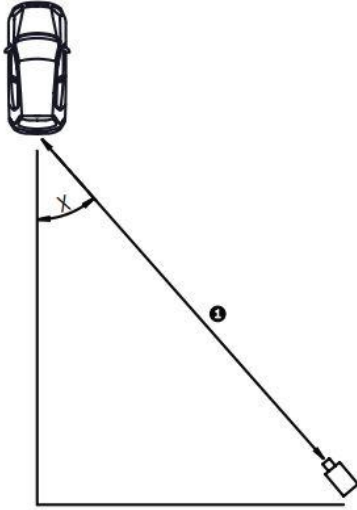
For best LPR results please follow the instructions given below while installing the LPR camera:

The system selects the best license plate image in the camera's field of view out of a sequence of video images. For North American plates, the plate width at the capturing point must be greater than 100 pixels. **For optimum performance we recommend a minimum plate width of 120 pixels.** Consider the image below where the LPR unit is mounted on a car parked on the road side and positioned to capture rear plates of moving vehicles.

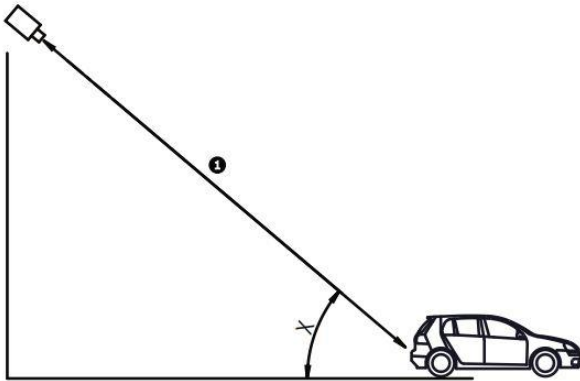


The license plate enters the field of view of the camera from the left side of the image. The plate width **W** is maximum near the left edge of the image. At this point, **W** should be at least 120 pixels. The camera lens' focal length or zoom option should be adjusted to obtain proper plate capture sizes. To assist in capturing the correct plate size please make use of the camera setup preview mode provided by the system. Moving a car in front of the camera, the width of the captured plate is displayed in this mode.

The captured plate sizes can also be controlled to a certain degree by varying the horizontal and vertical camera mounting angles as shown below. **In general, by increasing the mounting angles the capture distance decreases and the captured plate sizes increase.** However, **maximum limits on horizontal and vertical camera mounting angles must not be violated.**



Maximum horizontal mounting angle X is 30 degrees



Maximum vertical mounting angle X is 30 degrees

The LPR system is able to extract license plates from images reliably. However, **in color cameras, cases may arise where the license plates are dull having low contrast owing to inadequate illumination by the camera LEDs, while the surrounding image is bright and sunny. In such cases the license plate capture rate can be adversely affected.** To handle these difficult cases the LPR system provides a masking feature whereby irrelevant image areas (where plates can not occur) can be masked out.



In the above image the plate contrast is low while the background image is bright and sunny, and of high contrast. Here, it may be appropriate to use the following capture mask.



Please note that the high contrast image areas outside the mask are not relevant as readable plates will never fall there. Hence, these areas can be safely masked out and their adverse affect on plate capturing can be eliminated.

Likewise, for frontal plate captures, appropriate masks (if needed) are shown below:



Please note that masking is not needed if plates are well illuminated and of high contrast.

High camera shutter speed is vital for sharp plate captures. Shutter speeds higher than 1/1000 sec must be selected.



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