

# Eagle Eye Application Note - AN041

## Eagle Eye LPR Integration with Moxa for Vehicle Access Control

2024-09-05 Revision 2.0

### Target Audience

This Application Note is intended for Eagle Eye Networks Cloud VMS administrators who would like to integrate Eagle Eye LPR (License Plate Recognition) with the Moxa I/O unit to open gates for vehicle access control through License Plate Local ID. A basic working knowledge of the Eagle Eye Cloud VMS and Eagle Eye LPR is recommended before making any changes to configuration settings.

If you need additional details on the camera installation aspect of LPR and VSP, please read [AN033 Camera Installation Considerations for LPR/ANPR](#) and [AN034 Configuring LPR in the Eagle Eye VMS](#).

### Introduction

The Eagle Eye Cloud VMS allows the use of License Plate Recognition (LPR) analytics to read the license plates of vehicles. The license plate recognition from Eagle Eye can be used for applications such as access control to open gates.

Eagle Eye LPR with Local ID enables verifying license plates with a preconfigured allow list and/or deny list, and triggering an I/O event on detection of an allowed or denied vehicle. The LPR service running on the Bridge is integrated with the MOXA ioLogik E1214 I/O module for access control applications (e.g., trigger a gate). This document describes how to configure this setup.

# Architecture

The part numbers needed for this setup are:

Part Number	Description	Remark
EN-ANA-022-X Or ENi-ANA-022-X	Eagle Eye Analytic License Plate Recognition w/Local ID	For Brivo, Moxa Integration. Part number for access control deployments.
EN-PA-001-X or ENi-PA-001-X	Eagle Eye Vehicle Surveillance Package (VSP)	VSP subscription required per camera.
	Any video subscription (except SD1, as LPR is not supported on analog cameras)	Video subscription is mandatory for any camera connected to Eagle Eye Cloud VMS.

- MOXA IoLogik E1214 (sourced separately):  
<https://www.moxa.com/en/products/industrial-edge-connectivity/controllers-and-ios/universal-controllers-and-i-os/iologik-e1200-series/iologik-e1214>

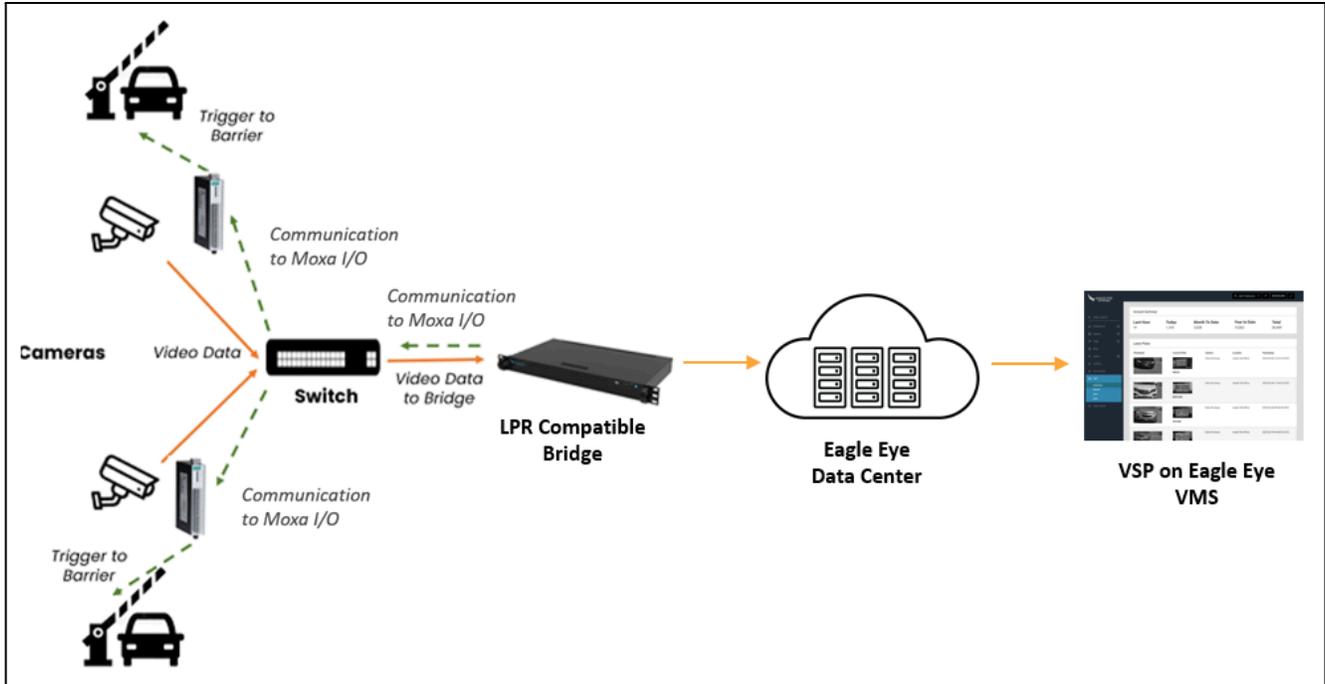
Required Bridges/CMVRs:

Bridges/CMVR	Max Cameras*	Max LPR Cameras for Gate/Street Configurations	Additional Analytics*	Local Display
304+/324+	5	1/0	0	No
401/403/420	5	2/1	0	No
406+/426+	10	2/1	2	No
524+/504+	10	4/2	2	No
501/520	15	4/2	5	Yes
620e/701/820e/901	50	8/5	10	Yes

\* Please note; the number of supported cameras changes when LPR is activated. Be sure to reference the latest [data sheet](#) and discuss with your sales representative before purchasing.

\* Number of additional analytics supported on the same bridge running LPR.

LPR processing is performed on the Eagle Eye Bridge/CMVR, and Moxa is integrated to the LPR services on the Bridge to ensure the system will function even without an active internet connection. LPR events on the VSP and the database changes will be reflected in the LPR service when the network connection is reestablished.

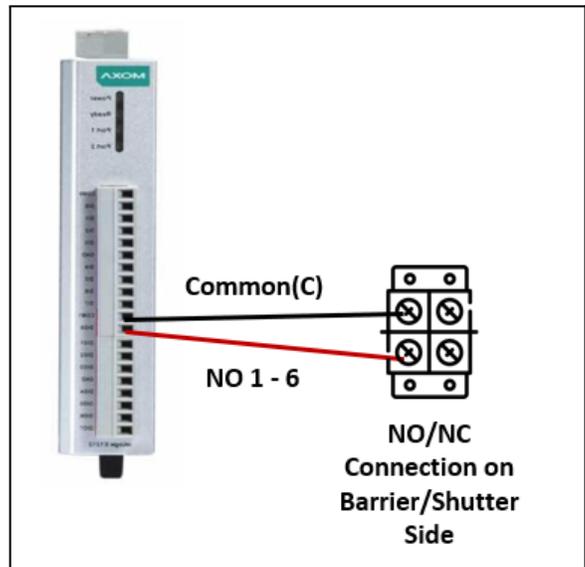


## Physical Connections

The MOXA unit has six relay outputs which are used to trigger the gate. They are marked from **NO1** to **NO6**, and their respective common is marked as **C** next to **NO** pins. The relay outputs should not be confused with digital output. We are only using the relay outputs, marked **RX\_NO** (where **X** is the output number).

If the gate is connected to R1\_NO, then output 1 needs to be configured in the LPR Configuration page in Eagle Eye Cloud VMS for the allow list. An example connection for the channel to the barrier and light is provided here.

For additional wiring details, please refer to the manufacturer's [User Guide](#).



# MOXA I/O Configuration

Very little configuration needs to be done in the I/O module itself, since we send all the parameters (which relay, pulse time, etc.) to Moxa from the LPR Application. The license plate list is uploaded to the LPR application (see below for more on LPR configuration). This enables the integration to still work seamlessly in offline mode if the internet connection is lost.

For more information, see the [MOXA User Manual](#). The default IP address of the unit is 192.168.127.254. You can also scan the network to find it using a tool provided by the manufacturer called "ioSearch," which is available on their [website](#).

If multiple ioLogik E1200 units are installed on the same network, remember that each unit has the same default IP address. You will need to assign a different IP address to each unit to avoid IP conflicts. Also please ensure the Bridge/CMVR and Moxa are in the same IP range (IP address and subnet).

Moxa network settings:

The screenshot displays the Moxa web interface for configuring an ioLogik Remote Ethernet I/O Server. At the top, the Moxa logo and product name are visible. A status bar shows key information: Model (E1214 Ethernet I/O Server), Name, Location, IP (10.1.140.128), Serial No. (T22481033378), System Elapsed Time (1392:58:08), MAC Address (00:90:e8:8f:aa:7c), and Firmware (V3.1.0.0.0.15). The main content area is titled "Ethernet Configuration" and "Ethernet Parameters". It includes a "DHCP" dropdown menu, and input fields for "IP Address" (10.1.140.128), "Subnet Mask" (255.255.252.0), and "Gateway" (0.0.0.0). A "Submit" button is located at the bottom of the configuration section. A left-hand navigation menu lists various settings options such as Overview, Network Settings, General Settings, Ethernet Configuration, and System Management.

# Configuring LPR Analytics

Eagle Eye LPR Analytics are enabled from the **Analytics** section within the Cloud VMS and can be found under **Camera Settings**. Once enabled, LPR configuration is accessed by clicking to open LPR Settings. Please ensure the LPR Add-on Feature **Local ID** is enabled as this activates the access control tab in the configuration UI.

Enable **LPR**

**Enable Analytics** ?

Counting:  **Counting** - Object counting is used to count the number of objects crossing over a line. This can be used for counting cars, people, or other objects. Total count per day is maintained. Graphs are available.

Line Crossing:  **Line Crossing** - Detects when an object crosses a line. Direction may be specified and Notifications may be generated

Intrusion Detection:  **Intrusion Detection** - Intrusion detection is used to generate an alert when an object enters a forbidden area. The forbidden area may be any size and shape. Notifications may be sent.

Loitering:  **Loitering** - Loitering detection is used to generate an alert when a moving object remains in a predefined area for a specific amount of time. Notifications may be sent.

Tampering:  **Tampering** - Tampering detection is used to generate an alert when someone is trying to block the camera's view or the image is greatly altered.

License Plate Recognition(LPR):  **LPR** - License Plate Recognition/ Number Plate Recognition is used to read the license plate of the vehicle. Database functionality is available which allows to have alert for a specific license plates.

**LPR Add-On Features**

**Local ID** - Enable LPR system to integrate with external access control system using locally stored license plate information.

Cancel Save Changes

Camera Settings // [redacted]

Camera Retention Resolution Motion **Analytics** Audio Location Metrics

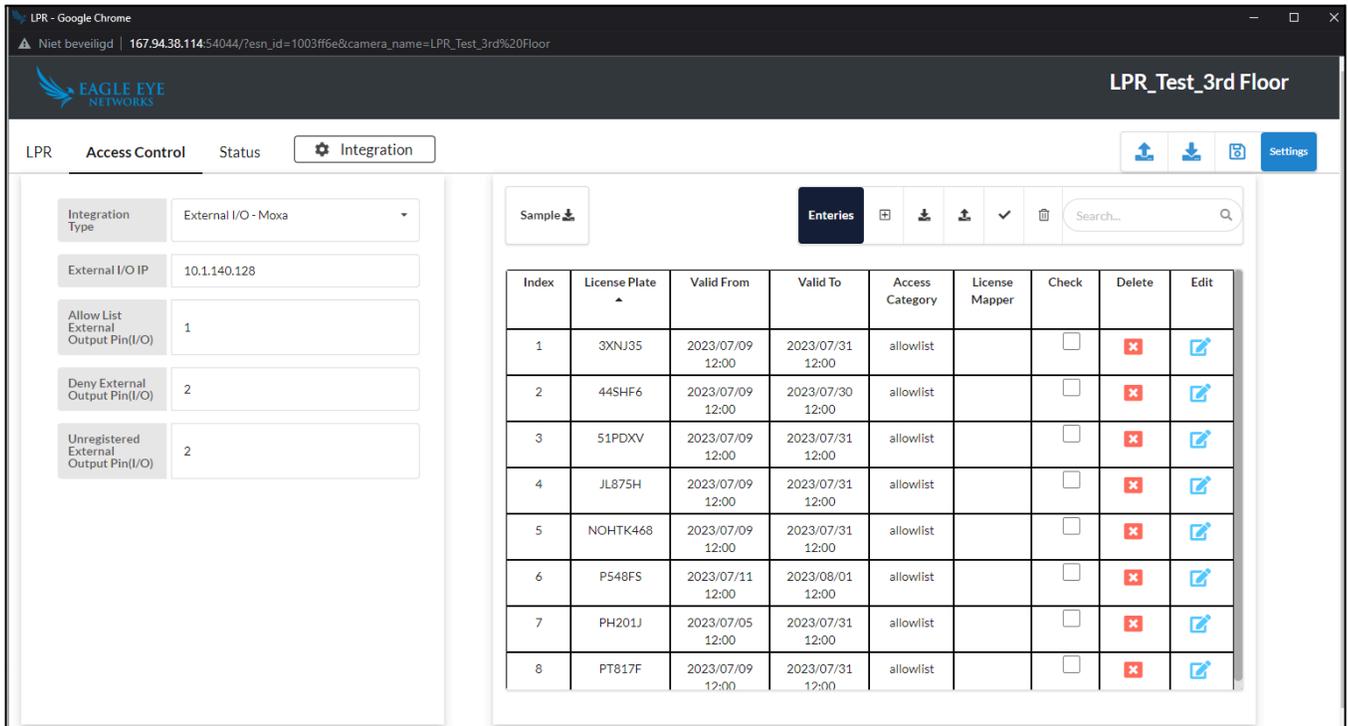
Enable VSP **LPR**

**Open LPR Settings** ?

03:10:03.645 PM



Cancel Save Changes



#### Setup notes:

- Integration Type must be set to External I/O Moxa.
- Enter the MOXA IP Address under External I/O IP.

The next three fields are used to define the relay that needs to be triggered for:

- Allow list (access granted)
- Deny list
- Unregistered vehicles

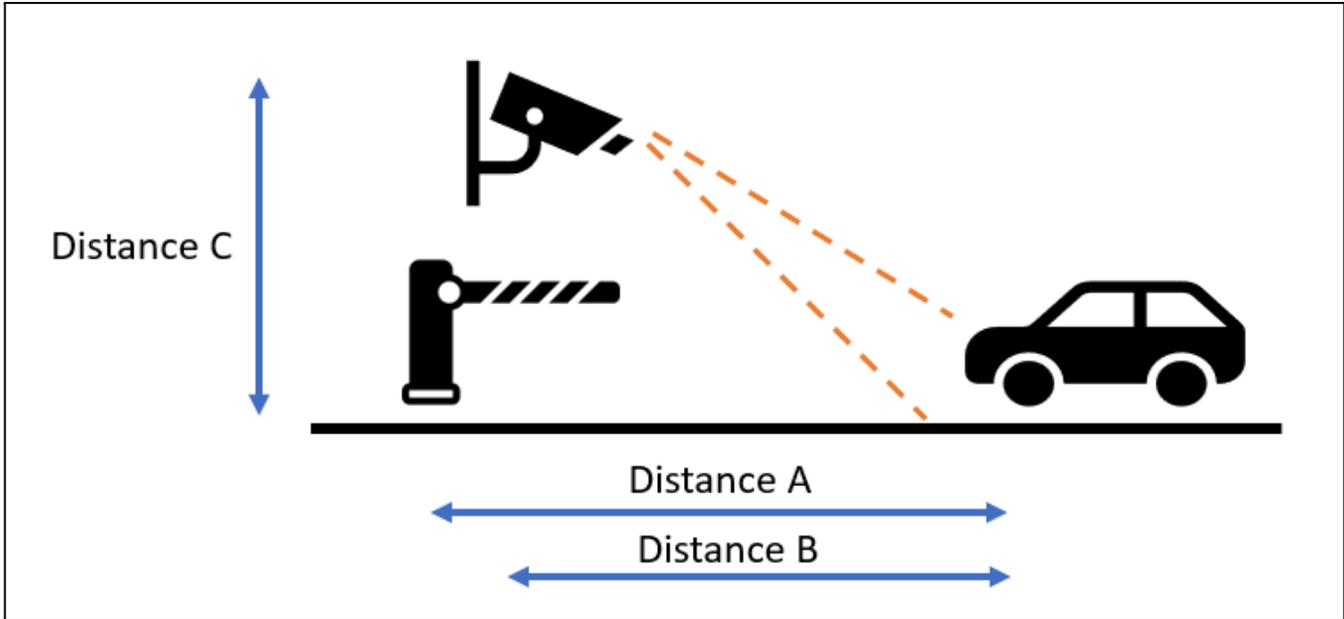
If no relay needs to be triggered for the last two options, leave them blank.

The list of license plates (LPs) can be entered manually by clicking the + icon on the screen, or you can upload a .csv file with the LPs. An example .csv can be downloaded to ensure you format the file with the correct headers. Post configuration, click on the save button to save the configurations and vehicle list.

## Camera Installation Considerations

Camera positioning is paramount to a smooth, high-accuracy LPR installation. Once installed properly, implementing and utilizing a License Plate Credential becomes a seamless experience as the gate/barrier or door is automatically opened when authorized vehicles approach.

## Front License Plate Capture



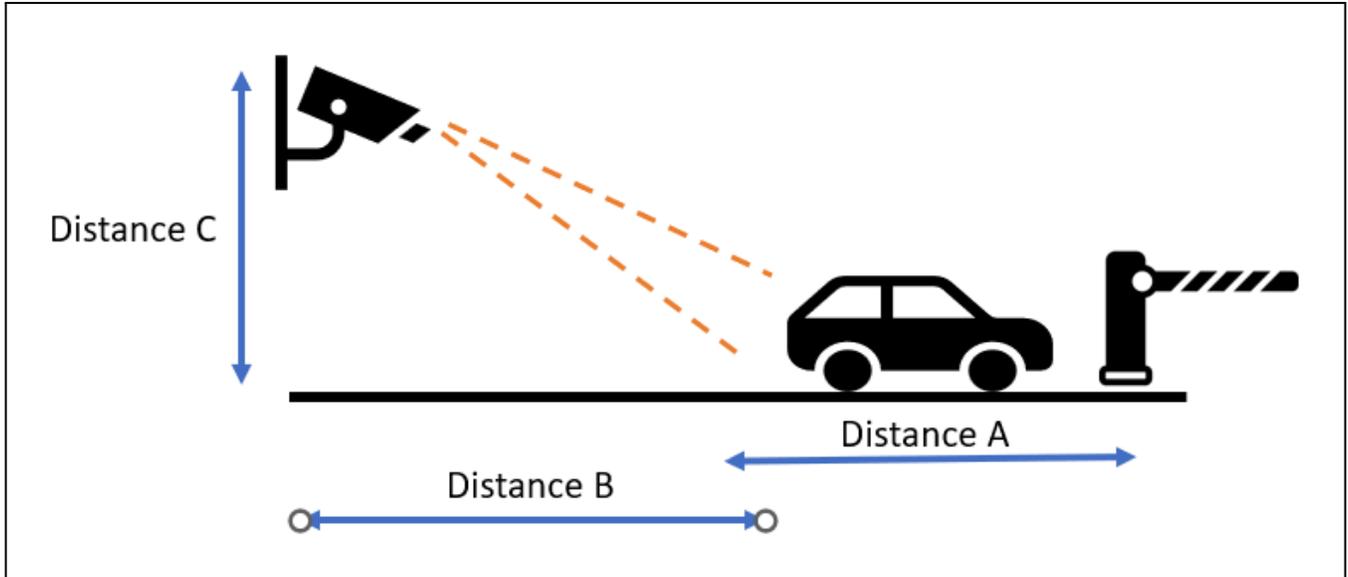
Note: Always keep in mind that the barrier should not block the camera's field of view, or it could interfere with reading license plates. It is also best practice to place the camera ahead of the gate/barrier, rather than behind it.

**Distance A** - The distance between the barrier to the LPR imaging area. The distance is best kept from 3–10 feet (~1–3 meters). This is to ensure that the vehicle triggers are sent to the barrier in a timely manner so it opens as the vehicle approaches but no additional space is left to allow for unauthorized vehicle access.

**Distance B** - The distance between the camera and the LPR imaging area. For gate access control, the distance is best kept from 6–12 feet (~2–4 meters). Access control necessitates high accuracy, which requires clear imaging of license plates to enable consistent LPR. A shorter distance allows for a better night-time imaging as the IR power can best illuminate only nearby plates.

**Distance C** - The height of camera installation. For gate access control, it is best if cameras are positioned between 4–8 feet (~1.5–2.5 meters) high. Note that the camera should be angled down by approximately 30 degrees to avoid direct sunlight.

## Rear License Plate Capture



**Distance A** - The distance between the barrier to the LPR imaging area. The distance is best kept from 15–25 feet (~5–8 meters). This is to ensure that vehicle triggers are sent to the barrier in a timely manner, so it opens as the vehicle approaches, but no space is left to allow for unauthorized vehicle access. The vehicle imaging area considered here is the rear license plate.

**Distance B** - The distance between the camera and the LPR imaging area. For gate access control, the distance is best kept from 6–10 feet (~2–4 meters). Access control necessitates high accuracy, which requires clear imaging of license plates to enable consistent LPR. A shorter distance allows for better night-time imaging as the IR power can best illuminate only nearby plates.

**Distance C** - The height of camera installation. For gate access control, it is best if cameras are positioned between 4–9 feet (1.5–3 meters) high. The camera should be angled down by approximately 30 degrees to avoid direct sunlight.

## Related Application Notes and Collateral

- [AN033 Camera Installation Considerations for LPR/ANPR](#)
- [AN034 Configuring LPR in the Eagle Eye VMS](#)
- [AN035 Configuring VSP in the Eagle Eye VMS](#)
- [Eagle Eye LPR Data Sheet](#)
- [Eagle Eye Bridge/CMVR Data Sheets](#)
- [Eagle Eye LPR Website](#)