

Eagle Eye Application Note - AN041

Eagle Eye LPR Integration with Moxa

2023-12-19 Revision 01.02

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 IO unit to open gates for vehicle access control through License Plate Credentials. 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 side of LPR (and VSP), please review the [Camera Installation Considerations for LPR/ANPR](#) Application Note (AN033). There is also an Application Note (AN034) for configuring LPR titled, [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.

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Architecture

The part numbers needed for this setup are:

- ENi-PA001-1 Eagle Eye Vehicle Surveillance Package (VSP) Monthly
- ENi-ANA-022-1 Eagle Eye Analytic License Plate Recognition w/LocalID Monthly
- ENi-HDx-Dx-x Camera subscription, max HD2

- MOXA IoLogik E1214 (sourced separately)

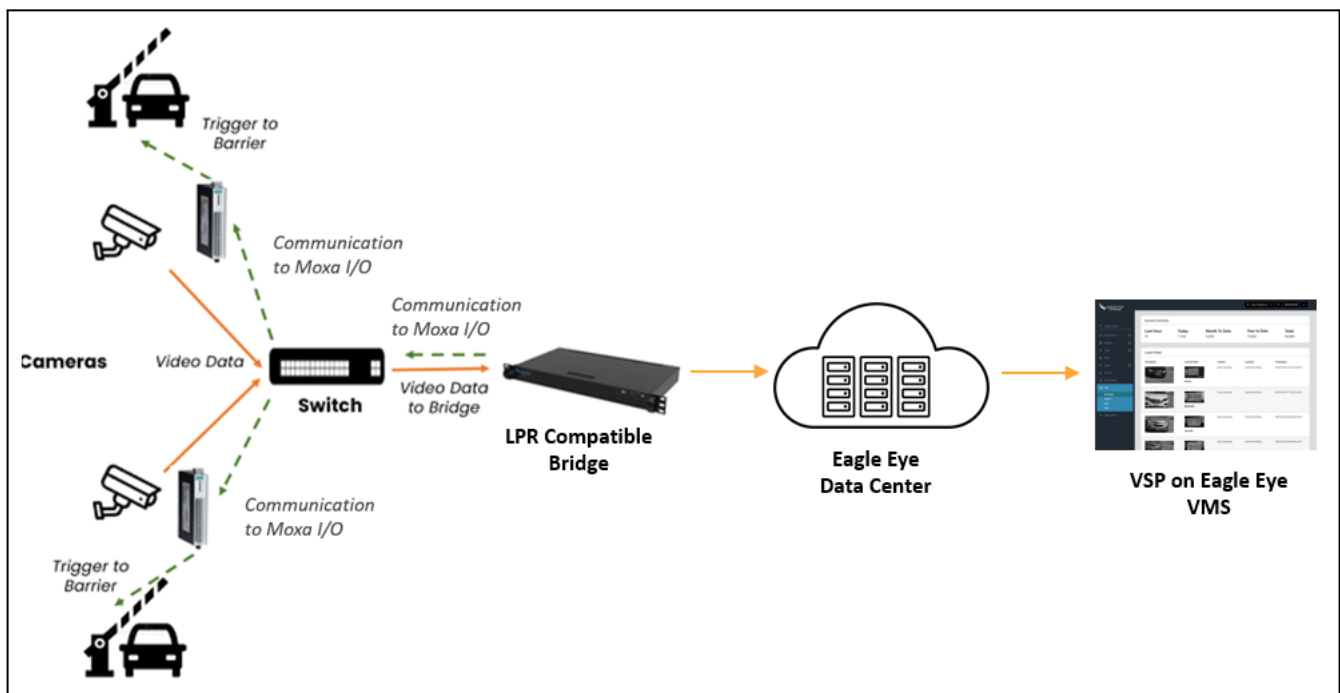
<https://www.moxa.com/en/products/industrial-edge-connectivity/controllers-and-ios/universal-controllers-and-i-os/iologik-e1200-series/iologik-e1214>

Required Bridges/CMVRs:

SUPPORTED HARDWARE AND NUMBER OF CAMERAS			
Bridges/CMVR	Gate LPR 10 MPH (20 KM/Hr)	Street LPR 30 MPH (50 KM/Hr)	Highway LPR 70 MPH (110 KM/Hr)
306+/406+/420	2	1	–
401/403/430	2	1	1
501/520/504+	4	2	1
701/901	8	5	3

Note that the number of supported cameras may be different than what is listed above so be sure to reference the latest data sheets and discuss with your sales representative before purchasing.

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 still work without internet. LPR events on the VSP and the database changes will be reflected in the LPR service once the network resumes.



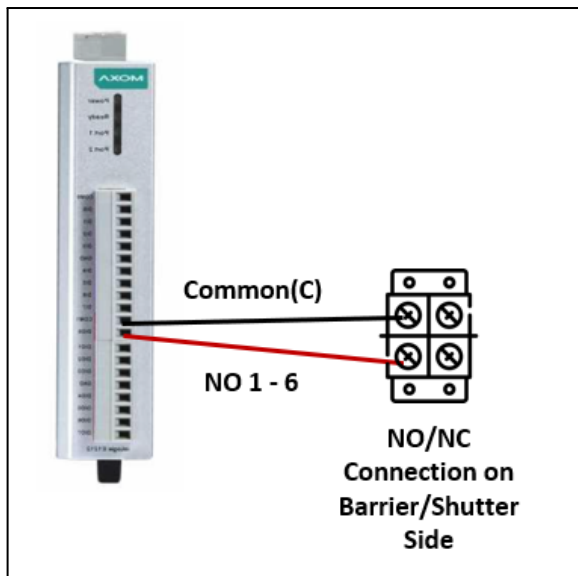
Physical connections

The MOXA unit has 6 relay outputs which are used to trigger the gate. They are marked as **NO1**, **NO2** 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 VMS for the allow list.

An example connection for the channel to the barrier and light is provided below:



For additional wiring details please refer to the manufacturer's User Guide:

<https://www.moxa.com/Moxa/media/PDIM/S100000327/moxa-iologik-e1200-series-manual-v15.2.pdf>

MOXA IO Configuration

Very little configuration needs to be done in the IO 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 Bridge (see below Bridge configuration). **This enables the integration to still work seamlessly if the internet connection is lost (offline).**

For more information, see the MOXA User Manual:

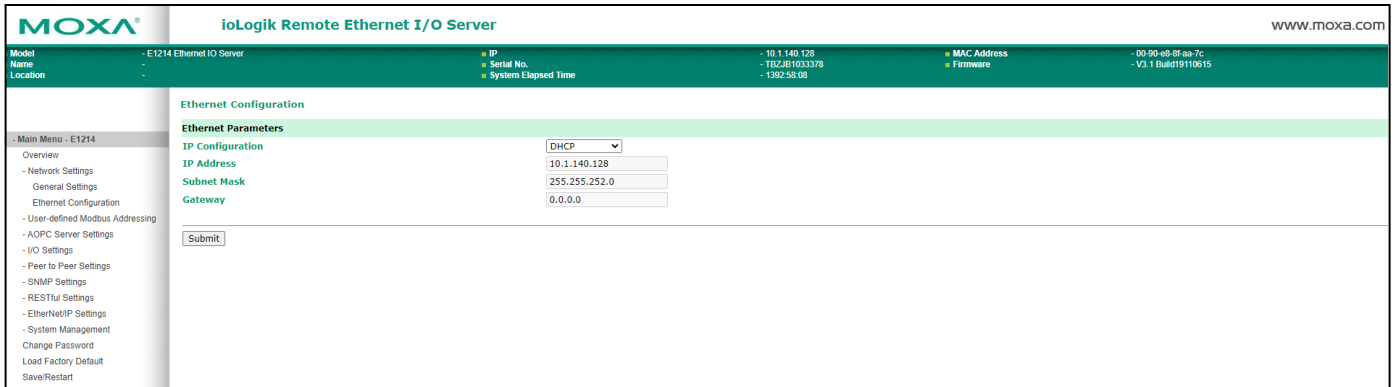
<https://www.moxa.com/Moxa/media/PDIM/S100000327/moxa-iologik-e1200-series-manual-v15.2.pdf>

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 "io Search", which is available on their website:
<https://moxa.com/en/support/search?psid=42116>.

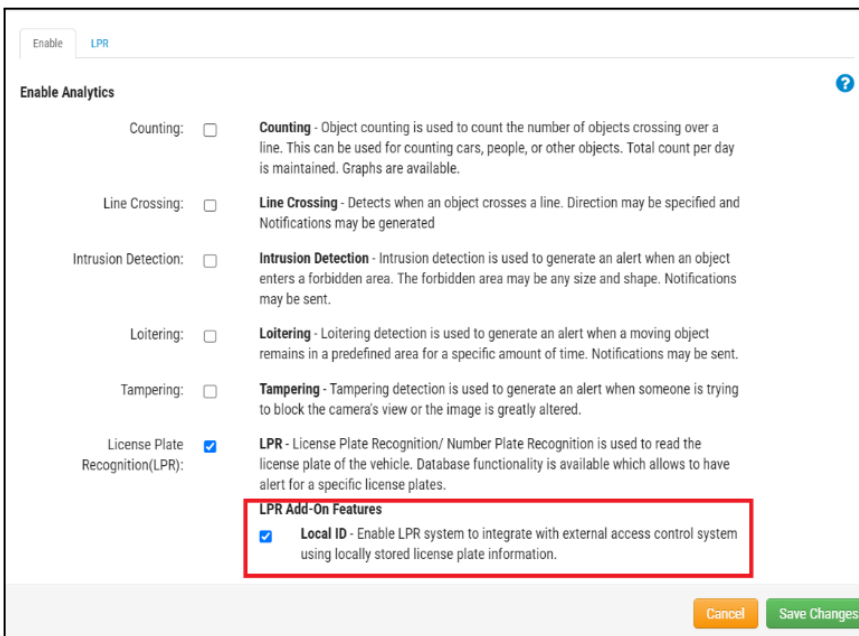
If multiple ioLogik E1200 units are installed on the same network, remember that each unit has the same default IP address. You will need to assign a different IP address to each unit to avoid IP conflicts.

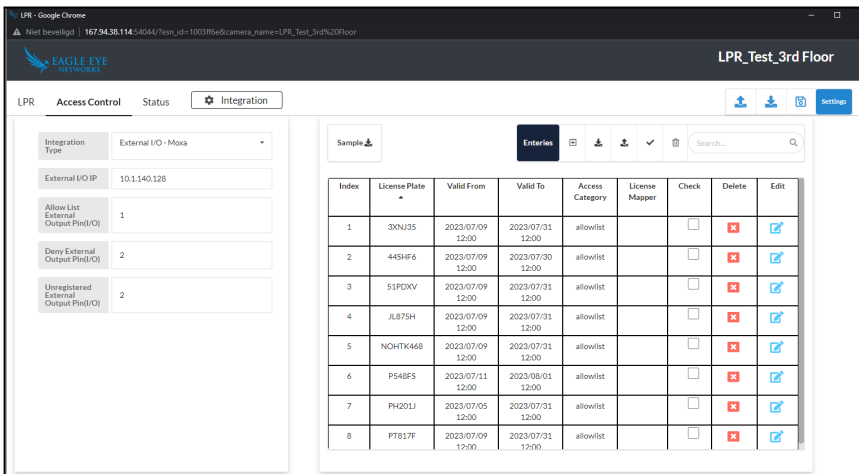
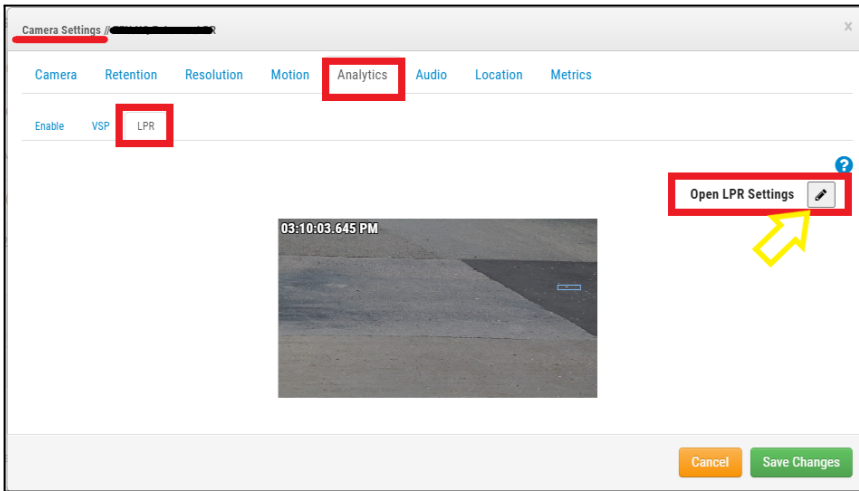
Moxa network settings:



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.





Set up notes:

- Set integration type needs to be External I/O Moxa.
- Enter the MOXA IP Address under External I/O IP.

The next 3 fields are used to define the relay that needs to be triggered for:

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

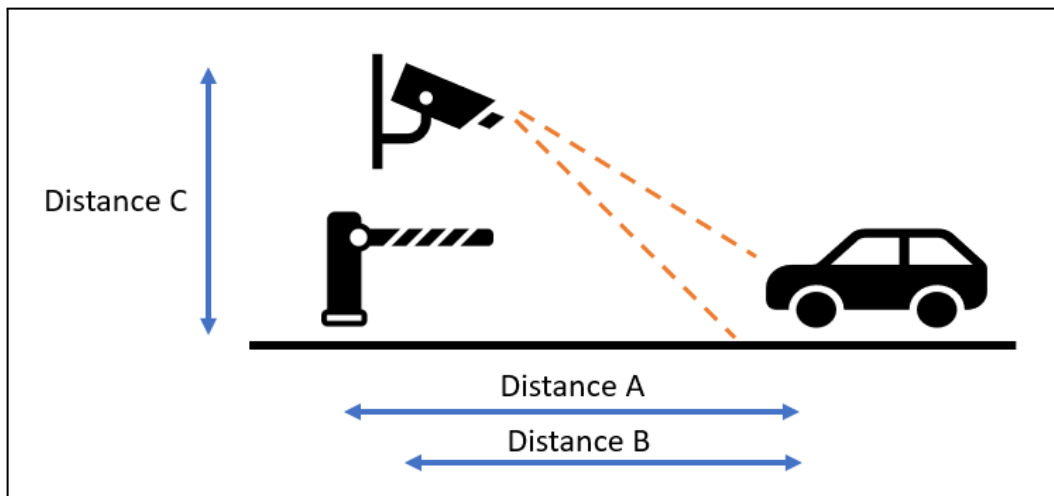
If no relay needs to be triggered for the last two options, leave them blank.

The list of license plates (LP) 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.

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



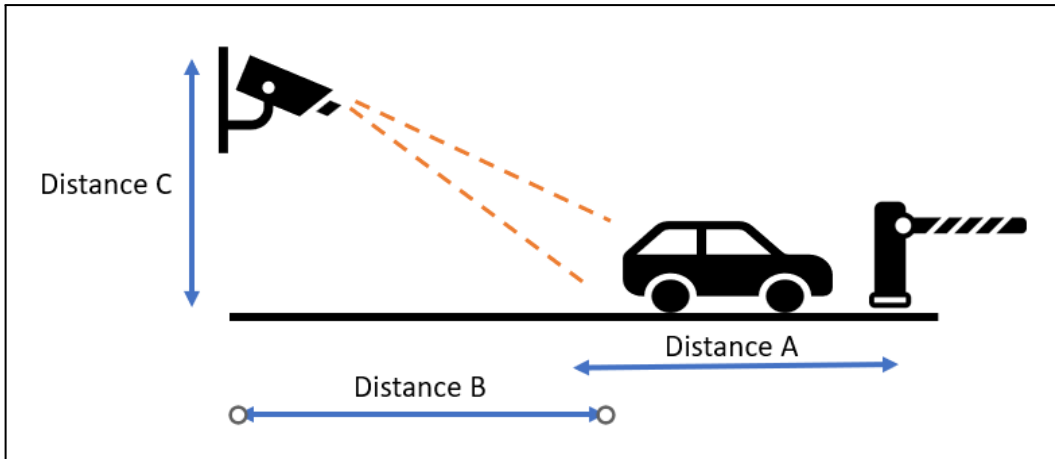
Note: Always keep in mind that the barrier should not block the camera's field of view, or it could interfere with reading license plates. It is also best practice to place the camera ahead of the gate/barrier.

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 is only possible if the license plates are best imaged for LPR. A shorter distance allows for a better imaging at night as the IR power can best illuminate 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 demands high accuracy, which is only possible if license plates are best imaged for LPR. A shorter distance allows for a better imaging at night as the IR power can best illuminate 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 - [Link](#)
- AN034 - Configuring LPR in Eagle Eye VMS - [Link](#)
- AN035 - Configuring VSP in Eagle Eye VMS - [Link](#)
- Eagle Eye LPR Brochure - [Link](#)
- Eagle Eye Bridge/CMVR Data Sheets - [Link](#)
- Eagle Eye LPR Website - [Link](#)