



# **VaxALPR** **with MMC and Classification**

*Software Setup and Configuration*

*Main Manual*

*July 2024*

## 1. Table of Contents

2.	Introduction.....	5
3.	Best Practices in positioning and setting up the VIVOTEK camera .....	5
3.1	Camera Positioning .....	5
3.1.1	Suggest Installation .....	5
3.1.2	Recommendation Limitation .....	6
3.1.3	License Plate Character Size.....	6
4.	Camera Setup and configuration for License Plate Recognition.....	7
4.1	Setting up the VIVOTEK Camera .....	7
4.1.1	Set the date and time of the camera .....	7
4.1.2	Setting a DNS Server.....	9
4.1.3	Zoom (Focal Length) and Focus.....	10
4.1.4	Setting the shutter speed and other important image settings .....	11
5.	Starting and Setting for VaxALPR package software On Camera software.....	15
5.1	Starting the ALPR software .....	15
5.2	VaxALPR package software Settings .....	18
5.2.1	VaxALPR package software Settings: Location.....	19
5.2.2	VaxALPR package software Settings: Plate options .....	20
5.2.3	VaxALPR package software Settings: Video .....	23
5.2.4	VaxALPR package software Settings: Environment options .....	25
5.2.5	VaxALPR package software Settings: OCR options .....	27
5.2.6	VaxALPR package software Settings: Vehicle Direction Filters .....	28
5.2.7	VaxALPR package software Settings: MMC and Vehicle Classification.....	30
5.2.8	Frame Options.....	31
5.2.9	Log Level.....	32
5.2.10	VaxALPR package software Settings: Save changes.....	32
5.3	VaxALPR package software Plates .....	34
5.4	VaxALPR package software Database .....	36
5.5	VaxALPR package software Blacklists and Whitelists .....	40
5.6	VaxALPR package software Region of Interest .....	44
5.7	VaxALPR package software Reporting .....	47
5.7.1	Reporting to VAST2 / VSS.....	48

5.7.2	Reporting to Wiegand .....	48
5.7.3	Reporting to Helix.....	48
5.7.4	JSON (JavaScript Object Notation) .....	50
5.7.5	XML.....	51
5.7.6	Genetec LPR Plugin.....	57
5.7.7	Network Optix Integration .....	62
5.7.8	FTP .....	67
5.7.9	TCP Client .....	68
5.7.10	TCP Server .....	69
5.7.11	UTMC Integration.....	70
5.7.12	Output Port .....	71
5.7.13	JSON 2 (JavaScript Object Notation) .....	72
5.7.14	Camera's Submit Reporting Settings.....	73
5.7.15	Testing Reporting .....	73
5.8	VaxALPR package software Show Logfile.....	74
6.	Troubleshooting .....	76
6.1	Edge LPR (V) On Camera software starts and then stops suddenly.....	76
6.2	Edge LPR (V) license is valid but a 'Check license' message appears.....	76
6.3	Edge LPR (V) On Camera software is running but not reading plates.....	76
6.4	Edge LPR (V) is running but it does not read all the plates. ....	77
6.5	Plate patches are inverted on the plates list. ....	77
6.6	JSON or XML setup but no plates being received .....	78
7.	Dynamic Text Replacement Reserved Words .....	79
7.1	Dynamic Text replacement words .....	79
7.2	Additional values.....	81
7.2	Note on UTC time format:.....	82
8.	VaxALPR on Camera HTTP API.....	83
8.1	List management.....	83
8.2	Licensing.....	87
8.3	Configuration File.....	87
8.4	Database .....	88
8.5	Virtual signal trigger .....	89
9.	Changelog.....	89



## 2. Introduction

This guide has been designed to guide you through the process of for setting up and configuring a VIVOTEK camera and the VaxALPR on camera software.

The VaxALPR on camera software is a real-time solution for Automatic License Plate Recognition (ALPR) that runs entirely within some VIVOTEK camera models. The software includes MMC (Make, Model and Color Recognition) with Vehicle Classification.



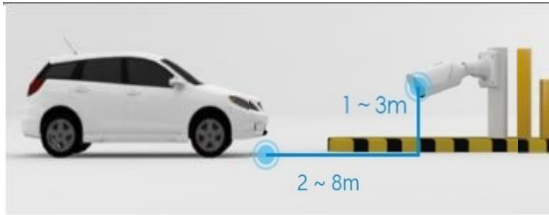
## 3. Best Practices in positioning and setting up the VIVOTEK camera

ALPR (Automatic License Plate Recognition) is an image processing technology used to identify vehicles by their license plates. It is also known as ANPR (Automatic Number Plate Recognition) amongst other names.

A good clear image captured at the optimum angle is essential in order to achieve a good license plate recognition rate.

### 3.1 Camera Positioning




#### 3.1.1 Suggest Installation

Model	Installation Reference	
IB9387-LPR-V2 (f = 3.2~10.5 mm)  IB9387-LPR-V2-W (f = 3.2~10.5 mm)		<ul style="list-style-type: none"> <li>- Lane:1 (Recommend) 2 (Maximum)</li> <li>- Camera Height: 1 - 3 m</li> <li>- Distance: 2-6 m</li> </ul>
IB9387-LPR-V3 (f = 2.7 ~ 13.5 mm)		<ul style="list-style-type: none"> <li>- Lane:1 (Recommend) 2 (Maximum)</li> <li>- Camera Height: 1 - 3 m</li> <li>- Distance: 2-6 m</li> </ul>
IB9387-LPR-V3 (f = 7 ~ 22 mm)		<ul style="list-style-type: none"> <li>- Lane:1 (Recommend) 2 (Maximum)</li> <li>- Camera Height: 1 - 3 m</li> <li>- Distance: 2-8 m</li> </ul>

**Notice:**

The recommendations are general and may vary depending on the selected camera and the site & country they are to be installed.

### 3.1.2 Recommendation Limitation

TiltAngle (Vertical)		<ul style="list-style-type: none"> <li>- Recommend: ~ Approximately 20°</li> <li>- Maximum: 30°.</li> </ul>
PanAngle (Horizontal)		<ul style="list-style-type: none"> <li>- Recommend: ~ Approximately 20°</li> <li>- Maximum: 30°.</li> </ul>
PlateAngle (Rotation)		<ul style="list-style-type: none"> <li>- Recommend: 0° (Parallel to Ground)</li> <li>- Maximum: 25°</li> </ul>

### 3.1.3 License Plate Character Size

Characters in license plates must have an average height between 20 to 80 pixels, being 25 pixels a good reference value. Less resolution may lead to character confusion in some countries. In addition, camera sensitivity affects too. For countries in which there are different character sizes on their license plates, this fact must be kept in mind, so the small characters are included in the detection range.



Figure 1, License Plate Pixel Requirement

## 4. Camera Setup and configuration for License Plate Recognition

In this section, we describe how to set up the VIVOTEK Camera for optimum image quality.

An intelligent ALPR camera is a specialized CCTV camera that has in-built software to identify license plates on still or moving vehicles. The ALPR software has been optimized to run on the **VIVOTEK Camera** taking advantage of the high-speed processor and direct data transfer from the image sensor.

### 4.1 Setting up the VIVOTEK Camera

Once the VIVOTEK camera has been installed it must be set up and configured. Please visit VIVOTEK's website to Install the "Shepherd" software utility. The program will search for VIVOTEK Cameras on the same LAN.

Double-click on the camera's MAC address to open a web console with the camera.



The manual should be read in conjunction with the VIVOTEK camera manual, which can be downloaded from the VIVOTEK website: <https://www.vivotek.com/downloads>

#### 4.1.1 Set the date and time of the camera

To set the **date and time** within the VIVOTEK camera, select the "Configuration" Tab:

The screenshot displays the Vivotek web interface for system configuration. The top navigation bar includes 'Home', 'Client settings', 'Configuration', and 'Language'. The left sidebar lists various system settings categories: System, Media, Network, Security, PTZ, Event, Applications, Recording, and Storage. The main content area is titled 'System > General settings'. Under the 'System' section, the 'System time' sub-section is active. It shows the 'Host name' as 'IB9387-LPR-v2' and a checkbox for 'Turn off the LED indicator'. The 'System time' section includes a 'Time zone' dropdown menu set to 'GMT+01:00 Amsterdam, Berlin, Rome, Stockholm, Vienna, Madrid, Paris, Warsaw, Budapest, Ber...'. Below this, there is a checkbox for 'Enable daylight saving time' which is checked. The 'Starting time' is set to '2023/03/26 02:00:00' and the 'Ending time' is set to '2023/10/29 03:00:00'. There are three radio button options for time synchronization: 'Keep current date and time', 'Synchronize with computer time', and 'Automatic' (which is selected). Below these options, the 'NTP server' is set to 'es.pool.ntp.org' and the 'Updating interval' is set to 'One hour'. A 'Save' button is located at the bottom right of the configuration area. The version number '1.2101.37.01J' is visible in the bottom left corner of the interface.

Here we can set the time zone and synchronize the time with a time server and in this example, we are using one of the “pool.ntp.org” NTP servers syncing every hour.



#### 4.1.2 Setting a DNS Server

When the software is first run, it will attempt to connect to the internet to check for the latest version of the software. To allow this to happen you should configure a DNS server (Domain Name Server). (Note this is also often needed for BOF connections to map your domain names).

To do this go to the main VIVOTEK Configuration Tab menu and select “Network” and then “General settings”:

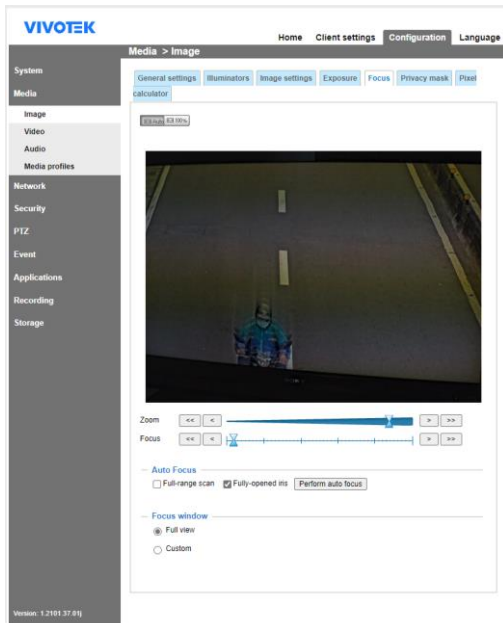
Select a DNS server as follows:

The screenshot displays the VIVOTEK Configuration web interface. The top navigation bar includes links for Home, Client settings, Configuration, and Language. The left sidebar menu lists various configuration categories: System, Media, Network, Security, PTZ, Event, Applications, Recording, and Storage. The 'Network' category is expanded, showing sub-options like General settings, Streaming protocols, DDNS, QoS, SNMP, FTP, and Bonjour. The 'General settings' sub-option is selected, leading to the 'Network > General settings' page. In this page, the 'Network type' is set to 'LAN'. Under the 'LAN' section, the 'Use fixed IP address' option is selected. Below this, there are input fields for IP address (192.168.0.172), Subnet mask (255.255.255.0), Default router (192.168.0.1), Primary DNS (192.168.0.52), Secondary DNS (80.58.61.250), Primary WINS server (192.168.0.1), and Secondary WINS server. There are also checkboxes for 'Enable UPnP presentation' (checked) and 'Enable UPnP port forwarding' (unchecked). At the bottom right, there is a 'Save' button.

Note: If your camera is configured to “Get IP address automatically”, your DHCP server will normally also provide the DNS servers configuration to the camera.

### 4.1.3 Zoom (Focal Length) and Focus

Under the **Configuration** tab you can change camera's field of view (FoV) using the "Zoom" slider to the portion of road that you require (Media -> Image -> Focus). Concentrate the FoV on the road only and do not waste resolution on grass verges, pavements etc. Sometimes this results in not enough resolution being available for accurate results in the main part of the image and it can also slow down recognition times.



The **focal length** of the lens determines how "zoomed in" the image is. It is usually expressed in millimeters (e.g., 6 mm, 25 mm, or 50 mm). The focal length tells us the angle of view (how much of the scene will be captured) and the magnification (how large individual elements will be). The longer the focal length, the narrower the angle of view and the higher the magnification. The shorter the focal length, the wider the angle of view and the lower the magnification.

In the case of zoom lenses, both the minimum and maximum focal lengths are stated, for example 10–40 mm.

VIVOTEK cameras come with motorized zoom lenses

#### 4.1.4 Setting the shutter speed and other important image settings

The camera's image and shutter settings should have been factory set for VaxALPR package software. If you need to change or restore these then click on the Configuration Tab -> Media -> Image.

The following options are displayed:

General Settings

**VIVOTEK**

Home Client settings **Configuration** Language

**Media > Image**

General settings Illuminators Image settings Exposure Focus Privacy mask Pixel calculator

**Video settings**

Video title

☐ Show timestamp and video title in video and snapshots

Position of timestamp and video title on image: Top

Timestamp and video title font-size: 30

Video font (.ttf): Default

Color: ☐ B/W ☒ Color

Power line frequency: ☐ 50 Hz ☒ 60 Hz

Video orientation: ☐ Flip ☐ Mirror ☐ Rotate

**Day/Night settings**

☒ Switch to B/W in night mode

IR cut filter: Auto mode

Day/Night sensitivity: Darkest  Brightest

Version: 1.2101.37.01j

## Illuminators

VIVOTEK

Home Client settings Configuration Language

Media > Image

General settings

Illuminators

Image settings

Exposure


Focus

Privacy mask

Pixel

calculator

Auto 100%



Illuminators

☒ Turn on built-in IR illuminator in night mode  
 Turn on external illuminator in night mode  
 Connector type:  
☐ Digital output 1  
☐ Digital output 2

Anti-overexposure

Restore Save

Version: 1.2101.37.01j

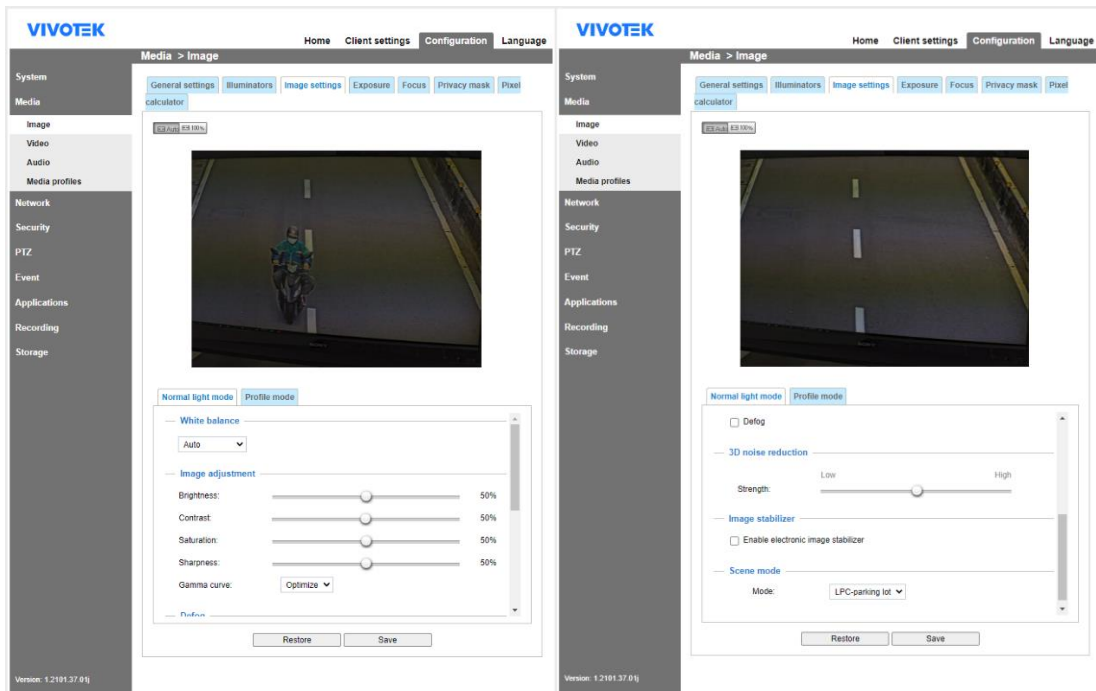
Anti-overexposure

☐ Anti-overexposure

Restore Save

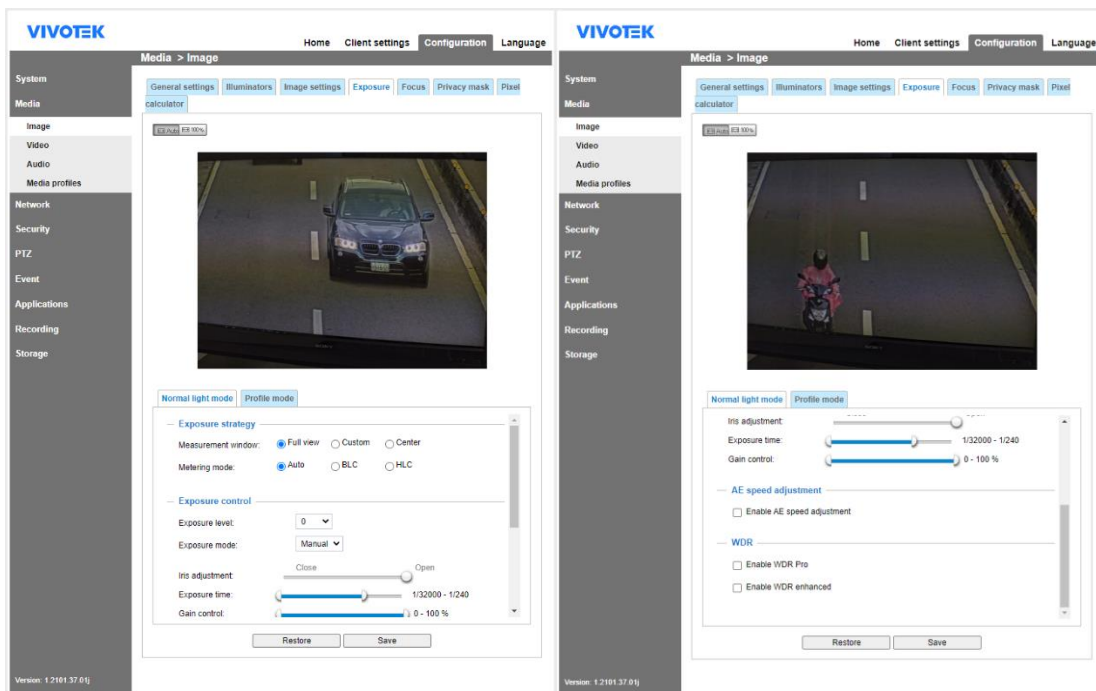
Version: 1.2101.37.01j

## Image Settings

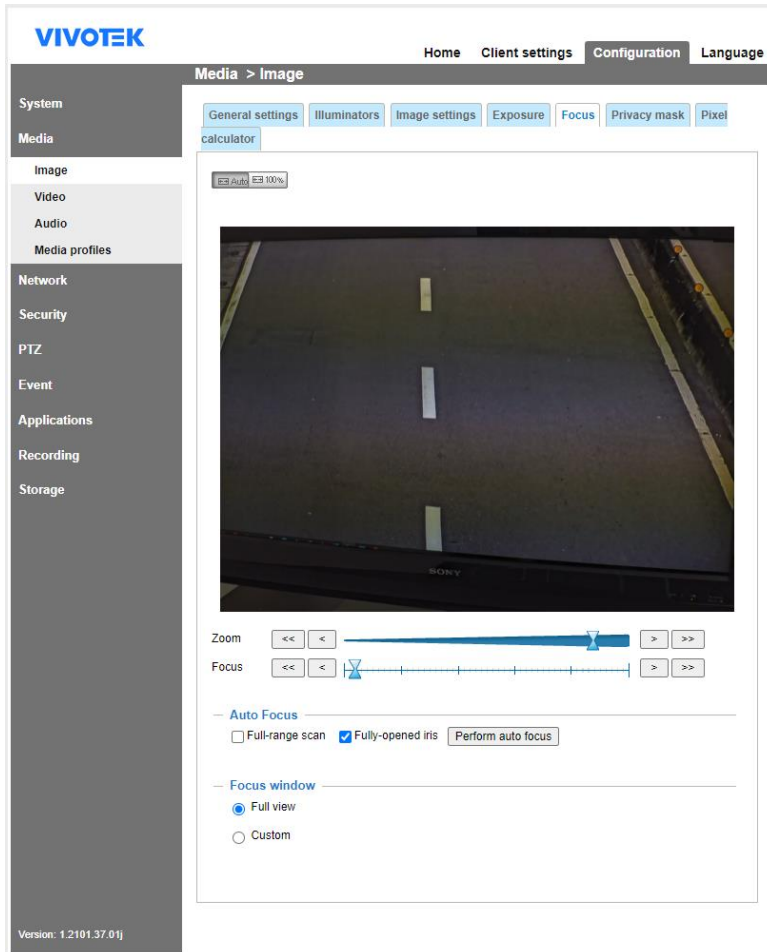


“Profile mode” can be used to have a different Image adjustment for night mode or during a certain schedule.

## Exposure



## Focus



Test the above settings by running through the scenario with a vehicle. For best results, test the settings in the darkest lighting conditions. This way, you get a good result both during nighttime and daytime.

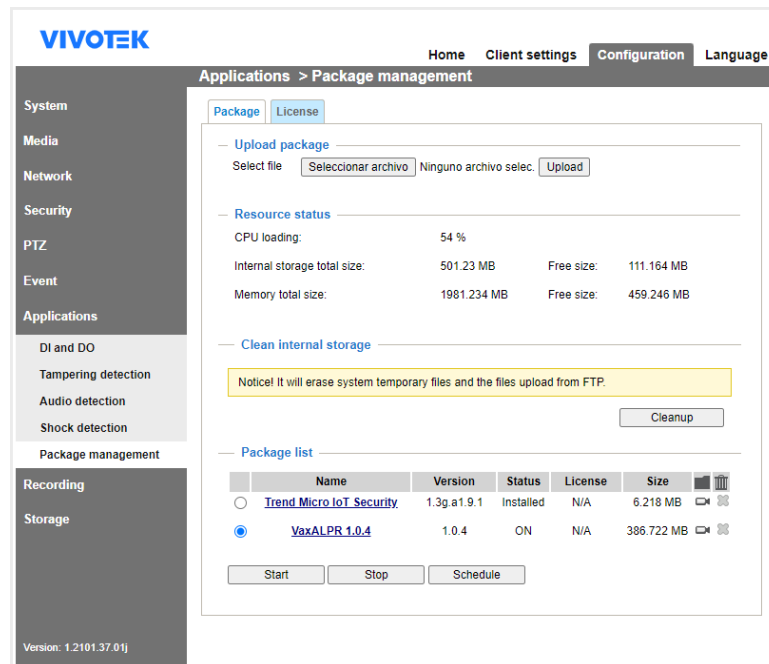
## 5. Starting and Setting for VaxALPR package software On Camera software

### 5.1 Starting the ALPR software

VaxALPR package software software pre-installed in the camera, please follow the next steps:

1. Configuration -> Application -> Package Management

Click on the VaxALPR package and press the button Start if the ALPR service does not run up.

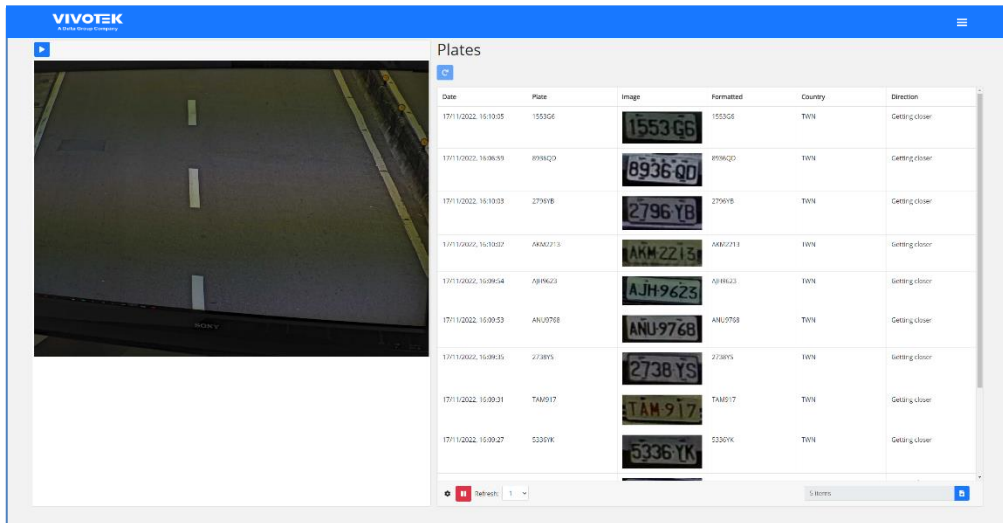


Once service run up, go to the camera's ALPR webpage:

[http://vivotek\\_camera\\_IP/VaxALPR/www/index.html#](http://vivotek_camera_IP/VaxALPR/www/index.html#)

### VaxALPR package software On Camera user interface

This will open a new window with the VaxALPR package software On Camera main interface.



VaxALPR package software On Camera interface

The icon in the top right corner reveals the options menu including:

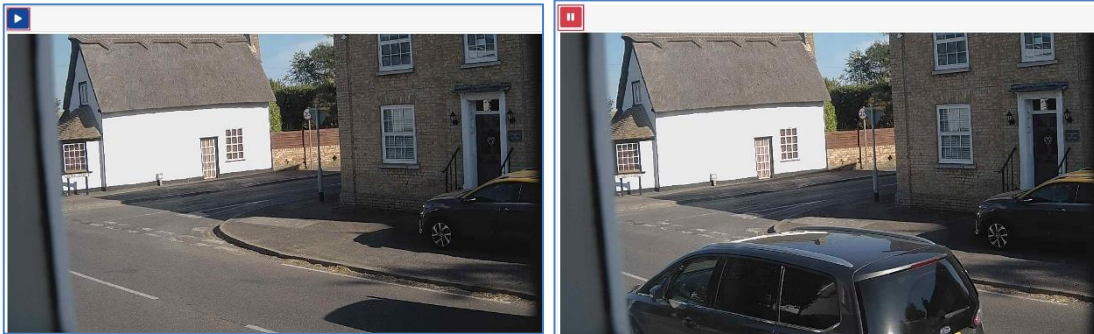
- Plates: To display a live feed of all the most recent plates read
- Settings: To configure VaxALPR package software On Camera software
- Region of Interest : To add/edit ROIs to include or exclude in the OCR analysis.
- Reporting: To configure reporting options for VaxALPR package software On Camera.
- Blacklist: To manage a Blacklist ( e.g. to sound alarms).
- Whitelist: To manage a Whitelist (e.g. to activate a relay)  
(These appear if they have been enabled in Settings)
- Database: To review and search the list of recorded plates (If configured)
- Download Config: To export the VaxALPR package software On Camera settings to a file.  
**The export will not include the black/whitelists or the recorded log file of plates.**
- Upload Config: To import the VaxALPR package software On Camera settings from a file.
- Download license: To download VaxALPR from camera to backup.
- Log file: To display the latest System Log for debugging purposes.



### Live Video Button

When the GUI starts, a single image is grabbed from the camera and frozen for you to select from the menu or view captured plates. Press the Blue Play icon to start the live video.

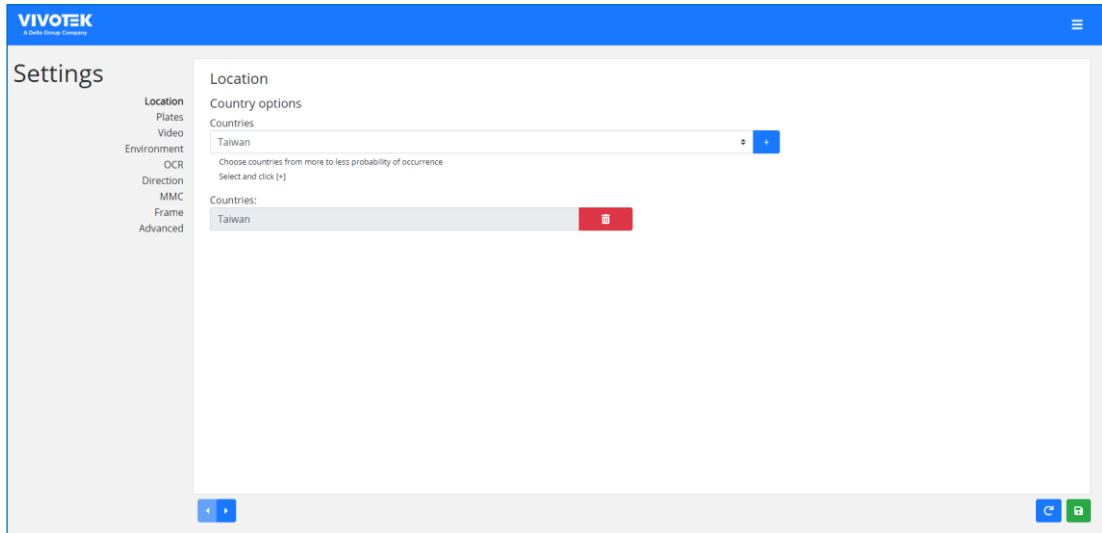
If you do not need to see live video then press the Red Pause icon.



Note that if you are using say a 4g connection to the camera, then by viewing a live image in a browser window you will be streaming data over your connection to your PC which you may be charged for.

## 5.2 VaxALPR package software Settings

In the **VaxALPR package software Setting page** it is possible to configure all the LPR parameters. The settings are divided in 9 different sections.



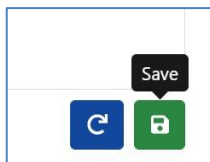
Select each section in turn from the headers on the left or move between them using the left and right arrows at the bottom of the screen:



You can abandon your edits and reload the currently saved configuration file by clicking the Reload symbol, bottom right:



You can also save the current settings at any time by clicking on the disk symbol, bottom right:



(see VaxALPR package software Settings: Summary and Submit changes at the end of the Settings section)

## 5.2.1 VaxALPR package software Settings: Location

### Countries

At least one country must be selected, even if “Disable country analysis” is selected.

- Select a country from the drop-down list and click the  button. The country will be added to the list.
- To remove a country from the list, click the  button.
- Additional countries will be added to the bottom of the list. Make sure that the list is ordered so that those countries with the higher probability of occurrence appear first. *(Tip: Think about this first and then add the countries one-by-one. If you make a mistake you will have to delete one or more entries and add them again.)*

### Required State

If one of selected countries is *United States*, a main state must be selected from the drop-down menu. Several states can be added – again in likely order of occurrence.

Note that the same neural engine (used for matching character shapes) is used for all the Americas, selecting the state simply loads the possible syntax (grammar) for those states to help with the letter O and zero for example. Other states not in the list will still be recognized.

### 5.2.2 VaxALPR package software Settings: Plate options

Plates

☒ Enable database
☒ Enable whitelist

Levenstein distance for whitelist

0

☒ Enable blacklist

Levenstein distance for blacklist

0

Plate mode

Plates in UTF8

☐ Retry notifications
☐ Low coverage

#### Database

**IMPORTANT:** In order to save recorded plates in the camera's storage for later retrieval or viewing, you must install and configure an appropriate SD card in the camera. This can be checked from the camera's System menu under Storage Management.

The application only checks for available space on the SD card when launched and if it becomes full then no new plate reads will be added to the database. There is a default maximum size of 100,000 records and when this limit is reached the oldest records will be overwritten.

Note that if you are using a small SD card then the card may become full before this circular buffer limit is reached and so no new reads will be written to the card and so you should reduce this buffer size accordingly. There is no definite standard record size as this depends on video resolution, the complexity of the image, the jpeg compression factor used etc. As a rough guide a 32GB SD card would store approximately 80,000 reads at 1920h.

☒ Enable database

#### Enable database

- To generate an on-board database (log file) of detected plates, select the ☒ 'Enable Database' checkbox. A maximum of 100,000 records may be stored in the database. The size of each image depends upon image complexity, resolution etc. but a 64GB SD card should store 100,000 reads and images on board.

## Black / White list activation

☒ Enable whitelist  
 Levenshtein distance for whitelist

☒ Enable blacklist  
 Levenshtein distance for blacklist

### Enable whitelist

- Select this checkbox ☒ to enable plate checking against a predefined Whitelist.
- Levenshtein distance for whitelist to allow plates that are different from the value set to be compared and allowed in the list.

Example:

Whitelisted Plate: ABC123

- Distance: 1
- Plate Read:
  - o ABC124 - Allowed
  - o ANC123 - Allowed
  - o ACB123 - Not allowed (more than 1 distance)

### Enable blacklist

- Select this checkbox ☒ to enable plate checking against a predefined Blacklist.  
(see: [VaxALPR package software Blacklists and Whitelists](#) later in this manual )
- Levenshtein distance for whitelist to allow plates that are different from the value set to be compared and allowed in the list.

Note that Black and White lists can be stored centrally on Backend, like Vaxtor's Back Office "Helix" and automatically synchronized with all connected cameras.

### Retry notifications

- Select this checkbox ☒ to retry the sending of any notifications if any fail, for example due to a comms problem. You may then specify a retry period in seconds (see Retry timer below)

### Low coverage mode (FIFO)

- Select this checkbox ☒ if your camera is remote and the communication links (WiFi or 4G/LTE for example) are regularly dropping out. When selected, events are **not** sent in real time to any configured Back Office or recipient (See Reporting options later in this manual). In very bad conditions this would cause a backlog of events being constantly tried.

With Low Coverage Mode selected, reads are retransmitted after a longer interval reducing the chance of an ever-increasing backlog.

**So the system will use a FIFO (First In First Out) policy for sending reads.**

Note this should NOT be used when using UTMIC protocol or when using the system for access control where real time events are essential.

#### Retry Timeout (0-60 seconds)

Retry timer (0 - 60)
10

- You may specify a retry period in seconds to retry the sending of any notifications if any fail, for example due to a comms problem.

*See VaxALPR package software Reporting later in this manual.*

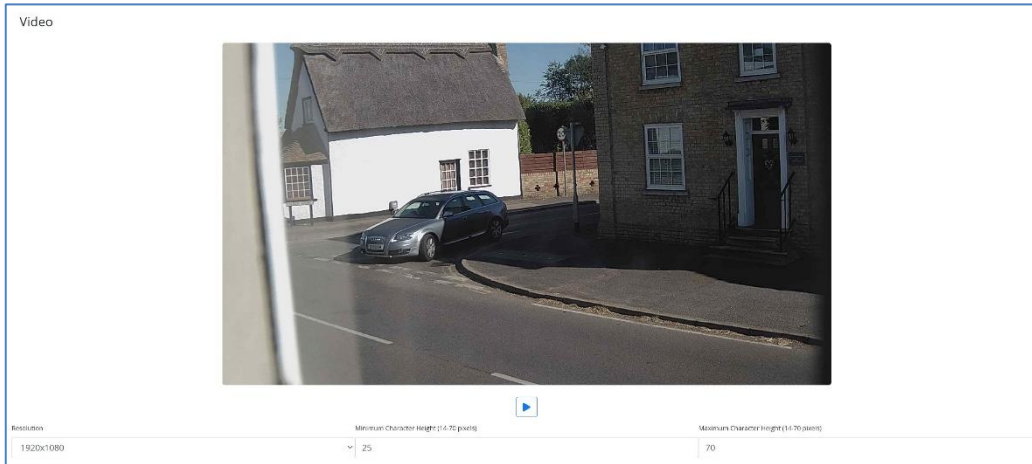
#### How retries work

Normally the transfer process takes approximately 100ms without image, and 300ms with image. If the response from the server takes more than 5 seconds, you will get a timeout error on the camera, BUT this does not mean the data hasn't arrived at the endpoint.

Usually this is caused by the server receiving the request and processing the data **before** sending the data received acknowledgement to the client (the camera). The data is already on the server, but the camera only waits 5 seconds for the response. This can cause the same data to be re-sent as the camera does not receive the OK response and the entry in the camera database is still marked as unsent (or not received).

Check your endpoint software (back office) and ensure that responses are sent to the camera **immediately** after receiving the data before processing the data. **Contact Vaxtor for further information.**

### 5.2.3 VaxALPR package software Settings: Video



This section displays real-time video based on the current settings.

When some parameters are edited such as resolution, the changes are immediately reflected in the video stream.

#### Play/pause video



In order to select a suitable image to verify the Character Height configuration, you can pause the video reproduction, using the play/pause button at the bottom of the image.

#### Resolution

- Select the desired *Resolution* from the drop-down list. Any changes will immediately be shown on the live display. Some cameras have a limited choice of available resolutions.

**NOTE:** when the camera is setup to read plates in a single lane then a resolution of 1024x768 or 1280x720 is recommended. When the camera is setup to read plates in wide or multiple lanes, a resolution of 1920x1080 is recommended.

#### Minimum Character Height (14-70 pixels)

This is the minimum height that a license plate's characters should be before being read. If the camera's lens (zoom) is setup correctly then the plate characters should be about 20-30 pixels high in the area of the field of view where they should be read. Set this too small and the tiny plates will cause misreads.



Note that for small plates such as most Arabic plates - or plates with additional small characters such as Costa Rica, – then a minimum character pixel height of 25 pixels is recommended.

- Set the minimum height of the plate's characters in pixels.

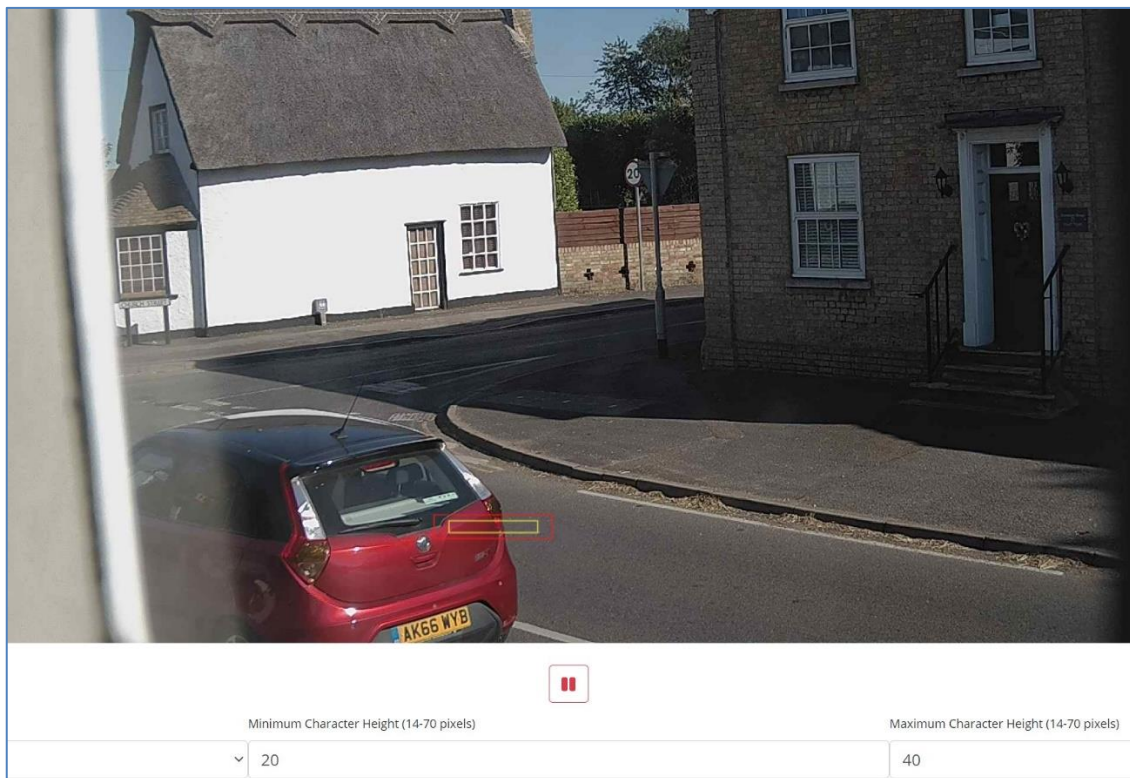
**NOTE:** The recommended difference between the min and max heights is about 10-20 pixels.

### Maximum Character Height (14-70 pixels)

- Set the maximum height of the plate's characters in pixels.

### Verifying the Character Height configuration

To verify that the height settings are correct, click over the live video to show two rectangles which represent the minimum and maximum thresholds. The height of characters on the plate should fall within these two rectangles. You can drag these rectangles around the screen to where your target plates are.





### 5.2.4 VaxALPR package software Settings: Environment options

Environment
Same Plate Delay (seconds)
10
Mutiplate frame
First capture
Mutiplate minimum number of occurrences (1-10)
1
Mutiplate maximum number of occurrences (1-10)
5
Mutiplate recognition timeout (0-10000 milliseconds)
500

#### Same Plate Delay ( Max: 65535 seconds)

Same Plate Delay (seconds)
30

Set the number of seconds that should elapse before reading the same plate twice.

This is to prevent multiple reporting of the same plate in situations when the traffic is slow or stationary. For example, if a vehicle stops at a barrier and the plate is reported but the car doesn't move for 30 seconds, then this delay should be set to say 60 seconds or more to prevent a duplicate read.

#### Mutiplate frame reported

Mutiplate frame
Middle capture
First capture
Middle capture
Last capture

- Select which plate image should be saved from the drop-down list:
  - First capture.
  - Middle capture.
  - Last capture

A plate is normally read several times as it passes through the camera's field of view. You may want to use the largest (Last) image for oncoming traffic & the First image for vehicles moving away from the camera.

### Multiplate minimum number of occurrences (1-10)

Multiplate minimum number of occurrences
1

- Set the minimum number of times that a plate should be read within the Timeout period to be considered a valid plate.

### Multiplate maximum number of occurrences (1-10)

Multiplate maximum number of occurrences
5

- Set the maximum number of times that a plate should be read before being reported (this may happen before the timeout).

### Multiplate Recognition Timeout

Multiplate recognition timeout (0-10000 milliseconds)
900

- Set the number of milliseconds that the engine should spend analyzing a plate.  
(1000 milliseconds = 1 second)

In free-flow mode the engine continuously analyses video frames and reads and reports plates. It makes a final decision on the plate read after an interval of time - the maximum recognition timeout period. There is a dedicated time counter for every plate which starts counting after the first read. When it reaches the preset timeout it stops, checks the number of samples read of the same plate and returns the “best” result.

*If an instantaneous plate read is not needed then set this timer to say 1000ms (1 seconds) so that the engine continues to look for the same plate to read again for as long as possible. Note that if a new plate is spotted during this time, the old one will be reported and a new plate-trace started.*

We call the number of times the same license plate has been read within the maximum recognition period the **multiplate rate**. Several reads of each plate are good and produce better results.

### 5.2.5 VaxALPR package software Settings: OCR options

#### OCR Complexity


- This is the complexity of the analytics to be applied during the ALPR Engine's stage of plate reading. Set this according to the OCR mode and type of traffic expected. There are three possibilities:
  - *Low*: Recommended for very high-speed traffic where the OCR needs to work faster and your preference is for plate detection over perfect recognition.
  - *Medium* (Default): Recommended when the OCR mode is set to free-flow.
  - *High*: Recommended when the OCR mode is set to signaled (triggered.)
- NOTE: Higher complexities give more accurate reading but make the ALPR engine run slower.

#### Working mode selection

##### Working mode

- Select the appropriate option from the drop-down list. There are two options:

- *Free flow*: The system continuously analyzes the video and reports plates when detected. This is the normal mode of operation.

	Notice
<p>VIVOTEK <u>does not</u> recommend user use "freeflow" mode as daily operation setting. Freeflow mode is for function test &amp; debugging. <b>VIVOTEK does not recommend user use this mode as daily operation setting.</b> Since the continuous ANPR recognition process on scene without vehicle will keep system full-loading and low recognition rate.</p>	

- *Signaled*: The system only analyzes the video when a trigger is received.

Working mode
Signaled

- If when triggered, no plate is found in the field of view, then the word 'NONE' will be transmitted as the plate read.

### Signaled Mode

You might use signaled mode in high security scenarios when you are able to detect a vehicle (by a loop or beam for example) and you want to capture an image even if there is no plate or a damaged or disguised plate; in this case you could use a physical port.

In signaled mode, if the software cannot find a plate in the image it will return the plate as "NONE" along with all the normal metadata including the id of the signaling source.

### Enabled IR Mode

With this mode enabled, the color information will be discarded.

## 5.2.6 VaxALPR package software Settings: Vehicle Direction Filters

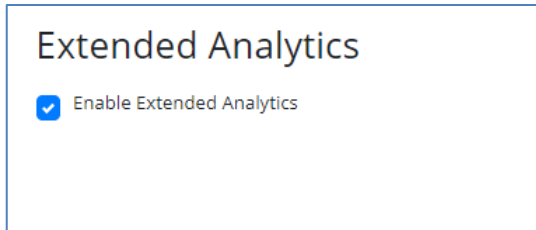
<h3>Direction</h3> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Report vehicles moving away</li> <li><input checked="" type="checkbox"/> Report vehicles approaching</li> <li><input checked="" type="checkbox"/> Report vehicles that are stopped</li> <li><input checked="" type="checkbox"/> Report vehicles with unknown direction</li> </ul>	
---	--

If the camera is pointing at a road or entrance where traffic is moving in both directions, then by ticking the boxes you can choose to only process/report plates in one direction. Note that at least two reads of a plate must have been obtained in order to determine the direction. If a car is maneuvering or stopped (or moving so fast that you only capture the plate once), then by also selecting 'Report vehicles with unknown direction' you will ensure that all required plates are captured.

Select all four options for normal usage.

### 5.2.7 VaxALPR package software Settings: MMC and Vehicle Classification

MMC and Vehicle Classification is included with the VIVOTEK version of the ALPR software which adds a Make, Model and Color recognition capability to the ALPR along with the Vehicle Class. They can be used separately or alongside each other.



When MMC is enabled, the engine will find a plate and the MMC analytic will attempt to identify the make model and, if possible, the color of the vehicle using Deep Learning technology.

The software recognized approximately of **680 car manufacturers and 7,250 models** and can recognize make, model, color from both front and rear views to a very high accuracy. The engine does not require any calibration and automatically determines the orientation of the vehicle. The software will report up to 11 colors but note that colors are often distorted by lighting and reflection on a vehicle.

Vehicle Classification or VClass should be used cameras that are setup to not only read the plate, but show as much of the front or back of the vehicle as possible at a reasonably shallow angle. The software will report vehicle types including: motorcycle (if it has a plate), car, pickup, van, truck and bus.

- Enable Extended Analytics

In the Plates or Database menu you can use the settings icon to display the MMC & Class data:

Plates								
Date	Plate	Image	Formatted	Char height	Make	Model	Color	Class
30/08/2022, 10:19:39	FE12EMF		FE12EMF	18	Toyota	Auris	Black	
30/08/2022, 10:19:34	YK67LCW		YK67LCW	20	Mazda	2	White	
30/08/2022, 10:19:26	MF22UUX		MF22UUX	21	Ford	Transit Custom	Black	

### 5.2.8 Frame Options

This section allows the user to control the image compression and define a watermark for the saved / transmitted images.

### Frame Options

JPEG Compression Quality (1 - 100)

Image Patch JPEG Compression Quality (1 - 100)

☐ Crop Images

☐ Watermark

- Select the required compression ratio for the saved images. The lower the number, the higher the compression ratio (and smaller the image size) but the quality of images will be lower. 80 is a good compromise.
- When a small size is needed you can use the 'Crop images' setting. This crops an area around the license plate to apply the compression to. This is better than over-compressing the whole image which will result in a very low-quality result!

When still images are saved and/or transmitted to Helix or some other back office device using one of the other reporting options then the Watermark feature may be used to write for example the plate text and date onto the still image being sent.

The watermark template field allows you to insert dynamic text that will be overlaid onto the still image of the captured plate. Choose from the following list in the Annex [Dynamic Text Replacement Reserved Words](#)

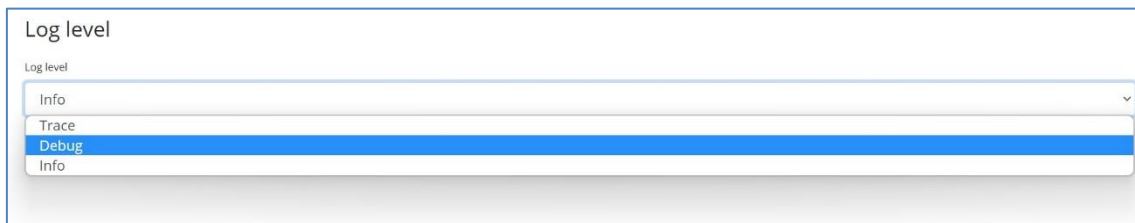
You may then specify the font size to be used from a drop-down list and select one of four preset positions for the watermark to be overlayed.

In this case the Date, time in UTC format, plate details & MMC have been specified:



See here for a [Note on UTC time format:](#)

### 5.2.9 Log Level



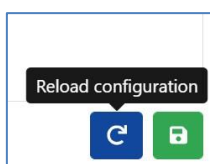
You should only use this feature when requested to do so by Vaxtor Support staff.

It causes the log file to be created with different levels of complexity to aid with identifying problems such as communication errors Etc.

### 5.2.10 VaxALPR package software Settings: Save changes

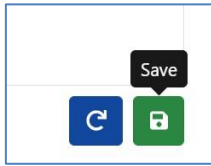
**IMPORTANT:** To avoid unexpected problems, it is recommended that you back up the current configuration to your PC by downloading the configuration XML file  
(see: **Upload config** later in this manual)

You can abandon your edits and reload the currently saved configuration file by clicking the Reload symbol, bottom right:





You must then save the current settings by clicking on the disk symbol, bottom right:



### 5.3 VaxALPR package software Plates

The most recent plate reads are stored in the camera's internal memory and are displayed when the Plates menu is selected:

Date	Plate	Image	Formatted	Country	Direction
18/11/2022, 10:39:26	7068VD		7068VD	TWN	Gettir closer
18/11/2022, 10:39:13	AGD6807		AGD6807	TWN	Gettir closer
18/11/2022, 10:39:12	AKN6890		AKN6890	TWN	Gettir closer
18/11/2022, 10:39:06	RBA7616		RBA7616	TWN	Gettir closer

Refresh: 1 5 items

More can be viewed as they will be stored in the browser's cache.

If the camera has a SD card installed, it is possible to store the LPR activity in a local database which can store up to 100,000 records. See the Database section below.

Click on a plate to view the plate read details:

Date	10/08/2022, 17:58:20
Plate	EX18UNB
Formatted	EX18UNB
Country	GBR
Direction	Unknown

Click the gear icon (top right) to reveal a list of fields that can be shown when a plate is selected:

Fields to show

☐ ID

☒ Plate

☒ Country

☒ Direction

☐ Speed

☐ Confidence

☐ Model

☐ Class

☐ Proc time

☐ Blacklisted

☐ Signaled

☒ Date

☒ Formatted

☐ State

☐ Category

☐ Char height

☐ Make

☐ Color

☐ Multiplate rate

☐ ROI Id

☐ Whitelisted

☐ Signal Id

☒

Note that you can get a more comprehensive view of the vehicle from the Database option described in the next section. You will need to have an SD card fitted to use this feature.

### (OCR) Processing Time

Note that if you do not have an SD card installed, you can look at the logfile to see the OCR processing time. When you view the OCR processing time you will see the multiplate rate alongside it. So if the multiplate rate is say 5 and the OCR processing time shows as 150ms, – then that means that **ONE** of the 5 reads (the one used to display the actual read being examined) took 150ms.

## 5.4 VaxALPR package software Database

- If the camera has a SD card installed, it is possible to store up to 100,000 plate reads in a local database. Once this limit is reached, new plate reads will replace the oldest ones. However, if the SD card becomes full before you set limit is reached then data will no longer be able to be saved.
- As a rough guide a 32GB SD card would store approximately 80,000 reads.

### Database

Database Plates

Search for: [ ] Load [ ] 1 of 1341 [ ]

Date	Plate	Image	Formatted	Country	Direction	Make	Model	Color	Class
11/08/2022, 17:58:20	AD59FDG		AD59FDG	GBR	Getting further				
11/08/2022, 17:58:18	BT16DAO		BT16DAO	GBR	Unknown				
11/08/2022, 17:58:13	GC15SZO		GC15SZO	GBR	Getting closer				
11/08/2022, 17:58:08	GP52KKK		GP52KKK	GBR	Getting further				
11/08/2022, 17:58:06	MT13CSX		MT13CSX	GBR	Getting further				
11/08/2022, 17:57:38	TJ64TCK		TJ64TCK	GBR	Unknown				
11/08/2022, 17:57:25	F1NKS		F1NKS	GBR	Unknown				

20 of 1341 items [CSV]

The Database screen comprises:

- (1) Search and Load area
- (2) Settings
- (3) Play / Pause updating the database with new reads
- (4) Page display control
- (5) Total items stored and CSV download
- (6) Main plate list

### Plate details

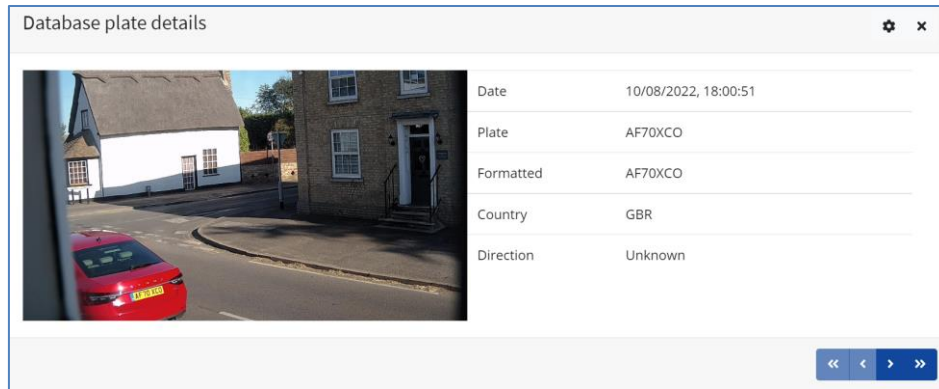
1. To show item details, click on a plate record.

Database Plates

Search for: [ ] Load [ ] 1 of 1341 [ ]

Date	Plate	Image	Formatted	Country	Direction	Make	Model	Color	Class
10/08/2022, 18:00:41	AF70XCO		AF70XCO	GBR	Unknown				
10/08/2022, 18:00:36	CE70YRC		CE70YRC	GBR	Unknown				
10/08/2022, 18:00:07	K068WSN		K068WSN	GBR	Unknown				

2. A new window appears with the vehicle details.



You can move up and down the complete database by using the arrows at the bottom of

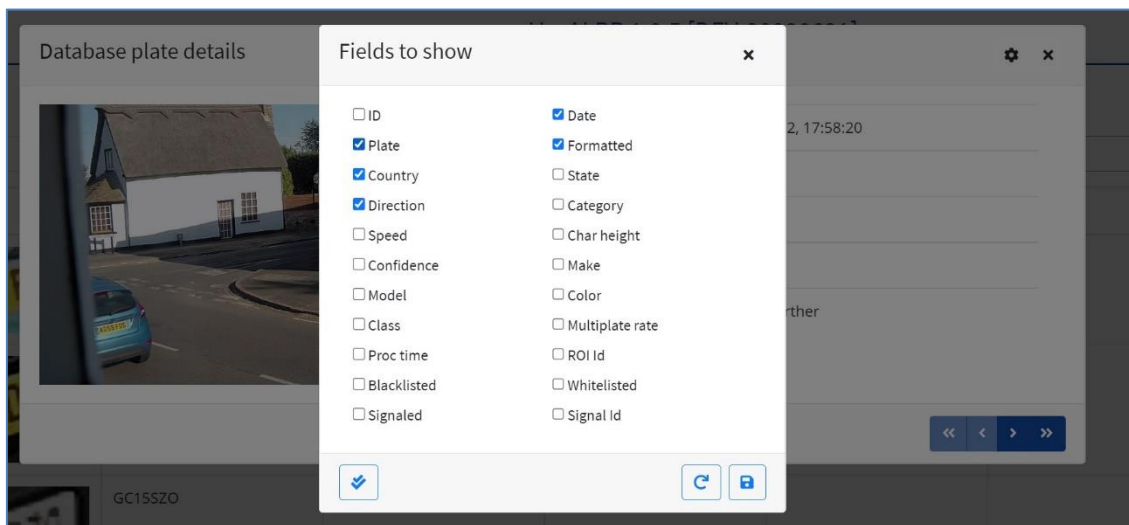


the plate record.

Use the double arrows to move to the first or last record in the database.

Note that if you have performed a Search (see below), then here you can step through all the plates that satisfy the search. E.g. all plates containing the numbers "123".

Use the Settings Icon, top right, to control what information is displayed when you select a plate. i.e. a list of the available stored fields:



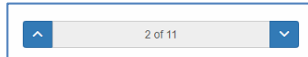
Note that some of these fields may not be available in your version of the software or are used for internal purposes such as communicating with certain third-party applications or Back Offices or VMS systems such as Genetec or Milestone.

When setting up a system the most useful to display include the Height (average character height), OCR (processing time), Confidence, Multiplate (how many reads were processed) etc.

## Page Control

If there are more than 20 stored plate reads, the camera will paginate the results.

1. Use the Page Control box to navigate through the pages



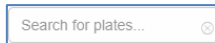
Use the UP and DOWN buttons to scroll 20 plates at a time – or click on the central part of the button (in this case on 2/11) and enter the target page directly and click on GoTo:



## Search and Load Plates

### Load plates

1. To load all the detected plates stored in camera, keep the Search input zone



empty and click the **Load** button

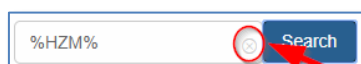
This will refresh the list with the latest captures.

### Search for plates

1. To search for a specific plate or partial plate stored in camera, enter the plate in the Search box and click the **Search** button. Use the symbol “%” as a wildcard character.
2. Example of all plates containing the characters: ‘20’:

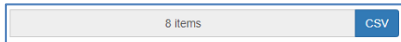
Date	Plate	Image	Formatted	Country	Direction	Make	Model	Color	Class
11/06/2017, 18:14:51	CV20A75		CV20A75	GBR	Unknown				
11/06/2017, 18:06:42	LW20AHL		LW20AHL	GBR	Unknown				
11/06/2017, 18:04:34	AE20XEL		AE20XEL	GBR	Unknown				
11/06/2017, 18:02:37	AK20PBD		AK20PBD	GBR	Coming further				
11/06/2017, 17:59:13	AF20VJJ		AF20VJJ	GBR	Coming further				
11/06/2017, 17:53:44	BT20KKF		BT20KKF	GBR	Coming further				
11/06/2017, 17:17:10	EA20UVM		EA20UVM	GBR	Coming further				

3. To clear the search criteria, click button inside the Search window zone, and click the **Load** button.




### Download the Plate list.

You can download the current Plate list by clicking on the CSV button:



button. The resulting .csv file will be saved in your downloads folder.

**NOTE:** In this example only 8 items were in the search list which were then downloaded successfully. if you need to download the full database, then this must be downloaded page by page, 20 records at a time.

Do this by Pausing the live reads  and then selecting each page in turn and downloading.

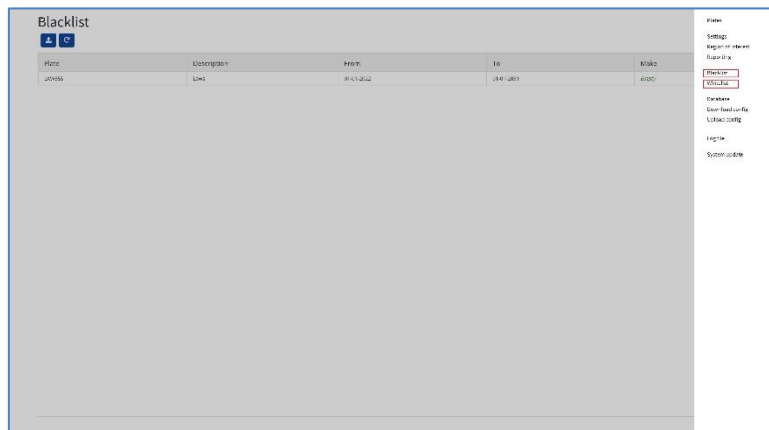
If you need to see all the camera reads, then it is recommended that you send all the plate reads as they happen to a back office such as Helix. The program contains many reporting protocols and methods, - see the Reporting section.

## 5.5 VaxALPR package software Blacklists and Whitelists

The software can be configured to match any captured plates against a blacklist or whitelist or determine if a plate is not in a list. This will generate an event that can be captured and processed.

These lists are stored in the camera or on a network shared location:

1. If a camera SD card is installed, the lists will be stored on it depending on available space. Approximately up to 1 million plates can be stored.
2. If an SD card is not available, then the list will be stored in the camera's internal memory.  
*NOTE: The camera's internal memory is limited and so a maximum of 200 plates can be stored.*



Note that Lists can now be automatically synchronized with a central Helix Server. If you are running the Vaxtor Helix Back Office, you can choose to merge and then synchronize all of your blacklists and similarly your whitelists with any number of connected VIVOTEK cameras running VaxALPR package software. This enables you to perform real time checks or access control on the edge in case a network fails. Once reconnected the lists will synchronize once more. This can be setup in the Helix-6 menu in Reporting. See later in this manual: [Helix Reporting](#).

### VaxALPR package software Blacklist / Whitelist Disabled

Remember to enable black and/or whitelist checking in settings (see earlier in this manual):

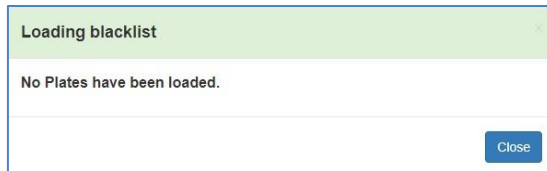
☒ Enable database

☒ Enable whitelist

### VaxALPR package software Blacklist: Initial load

- When Blacklist is first selected, then if no plates have been added to the list, a message appears:





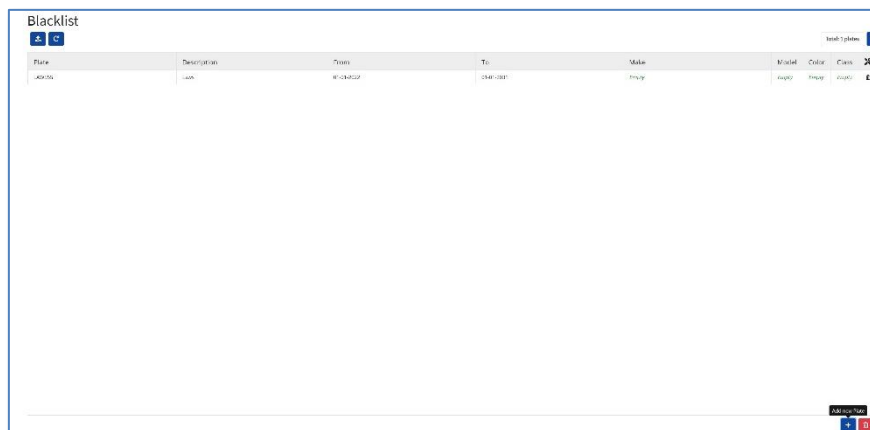
But if the Blacklist *does* already contain plates, then a message appears confirming how many plates have been loaded into temporary memory.

### VaxALPR package software Blacklist: Reload



1. To Reload the saved Blacklist from the camera, click the Reload Icon button and wait for the confirmation (or error) message

### VaxALPR package software Blacklist: Add a Plate



1. To add a Plate to the Blacklist, click the  button and enter the plate details:

Blacklist Detail

Plate number

Plate

Description

desc

Make

Vehicle Make

Model

Vehicle model

Color

Vehicle color

Classification

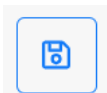
VALID FROM

dd-MM-yyyy

VALID UNTIL

dd-MM-yyyy

- Write a valid Plate (e.g. HA54ETR ) and add an optional description. Plate numbers must not contain spaces or special characters such as “-”.
- Enter the **Valid From** and **Valid To** dates that the vehicle will be checked. In the case of a whitelist, this would be the dates that the vehicle would be allowed access to a site.  
**Note that the maximum “To” date that can be set at present is 31/12/2030.**  
(The reason being that in the 2030s, there is a millennium-type event where the number of seconds since Jan 1<sup>st</sup> 1970 will exceed a 16 bit value! Beware!)
- Add a Make, Model and Color if required.
- Add a Vehicle Class from the drop-down menu ( e.g. car)  
(Note this may not be the same as the MMCV details that the program will generate from the shape of the vehicle.)



- Click the icon to save the plate or close the window to discard the plate.

### Edit a Plate


- Click on a plate entry to re-edit a plate.
- Edit any fields and click Save if required.

### Remove a Plate from the list



- Click the icon to remove a plate and confirm the deletion.

## VaxALPR package software Blacklist: Remove all plates


1. Click the  icon to remove all plates from the local Blacklist and confirm.

## VaxALPR package software Blacklist: Upload/Download a list from a CSV file

### Upload a CSV File

The VaxALPR package software On Camera software can import a whitelist/blacklist from a .csv

### Blacklist

file by using the  upload icon. Simply select the .csv file on your PC.


**IMPORTANT:** At least one of these fields must be included: MAKE, MODEL, **CLASSIFICATION**, **COLOR**, **DESCRIPTION** or **plate\_number**. The first row of the csv file **MUST** contain field names including these headings.

For example:

classification;	COLOR;	DESCRIPTION;	FROM;	id;	MAKE;	MODEL;	plate_number;	TO
CAR;	red;	Fred Bloggs;	2022-07-31T23:00:00.000Z;	10;	Audi;	Q3;	VHY777;	2023-03-01T00:00:00.000Z
VAN;	blue;	Harry Oldham;	2022-07-31T23:00:00.000Z;	11;	Ford;	Kuga;	ABC123;	2022-08-30T23:00:00.000Z
CAR;	pink;	Fozzie Bear;	2022-01-01T23:00:00.000Z;	12;	VW;	Golf;	BCD234;	2022-12-31T23:00:00.000Z

Note that the file should contain semi colons as delimiters and not commas and the date delimiter should be a hyphen, US format).

### Download a CSV file.

1. To download the Blacklist file from the camera to your PC, click the  icon.
2. It will be downloaded to your PC's downloads folder as the file blacklist.csv.

## VaxALPR package software: Whitelists

All the operations described above equally apply to whitelists.

## 5.6 VaxALPR package software Region of Interest

A Region of Interest (ROI), sometimes known as the Crop Zone, is used to define an area within the video frame where the OCR analytics takes place. The user can define a polygon and choose whether the area to look for plates in Inside or Outside this region. The user can then set multiple regions, i.e. multiple ROIs, in complex situations although this is rare.

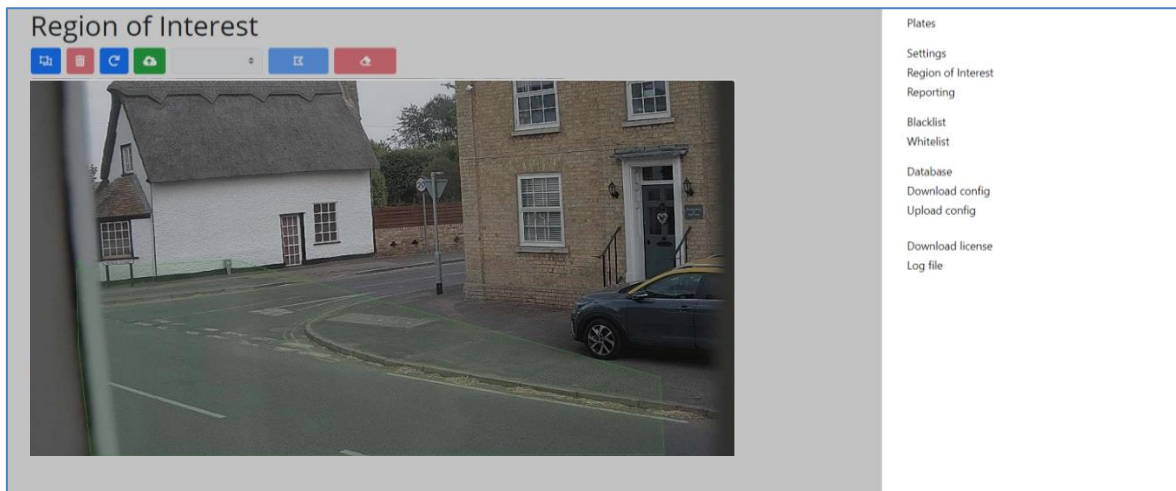
Using an ROI can decrease OCR processing time and reduce false positives.

So, if the camera is looking across a large stretch of road as in the example below, the ROI can be used to limit the OCR to the area near to the camera thus reducing the processor load.

If a plate-shaped house window or road sign for example is within the camera's field of view and keeps getting mistaken for a license plate, then these false positives can be eliminated by creating a crop zone to exclude this part of the image.


Each ROI must be given a unique numeric Identifier from the dropdown list.

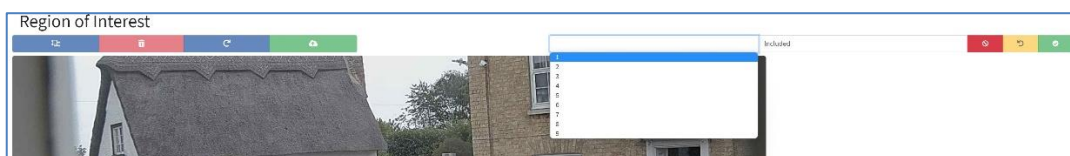
Note that the whole license plate must be in or out the ROI to pass the test.



**IMPORTANT:** ROIs can be configured to either include the areas defined from the OCR – or exclude them. If multiple ROIs are added, they must all be of the same type.

### VaxALPR package software ROI: Add ROIs

1. To add a new ROI, click the main  icon:
2. Then, use the pop-down to allocate an ID number to the ROI that you are adding and if this is the first ROI, then specify the ROI Type between: **Included or Excluded**.





3. Draw points:


- a. Add points: Click on the live image to add new points to define the polygon.





**NOTE:** Each ROI must have at least 3 points but can also be quite complex



- b. To start again, click on the  icon.

- c. To cancel the new ROI, click the  icon.

- d. When you are satisfied with the shape click the  icon.





4. Click  to add more ROIs as required remembering to select a new ID number.
5. ROIs are not stored on the camera until changes are submitted by using the Submit ROIs icon. 

### VaxALPR package software ROI: Remove ROIS

1. To remove one ROI then select the ROI number and click the  icon.
2. To remove all the ROIs click the  icon.

**NOTE:** This only deletes them in the local web interface. If they have been saved to the camera, then you will need to Submit ROIs once more.


## VaxALPR package software ROI: Edit an ROI

1. To edit an existing ROI, select the *ROI Id* from the list and click the  icon:
2. Move any points as required:
  - a. Add an extra point to last point added by moving the cursor and mouse click.
  - b. Or clear all existing points  and start again.
3. To confirm changes by clicking the  button.
4. To reject any changes, click the  icon.

## VaxALPR package software ROI: Save changes

### Submit current ROIs

Once the ROIs have been setup, they **must** be saved into memory in the VIVOTEK camera.

- To save all ROIs, click on the submit ROIs icon  and wait for the confirmation message.

Note: Once deleted, an ROI cannot be recovered. To avoid unexpected problems, it is recommended that you periodically backup the ROI configuration by downloading the current configuration XML file

(see: [Download XML Config section later in this manual](#)).

## VaxALPR package software ROI: Reload ROIs

1. To reload *ROIs* from the camera into the web interface for editing, click the  icon.

## 5.7 VaxALPR package software Reporting

VaxALPR package software is able to output all plate reads in real time using a variety of standard protocols so that the plate reads can be accepted remotely by a variety of programs including Vaxtor's powerful Back Office - Helix, which can accept and store plate reads in real time from hundreds of VIVOTEK cameras.



By selecting one of the listed protocols, a sub-menu will appear with fields for setting up parameters such as remote IP addresses etc.

Reporting	
Vast2	VAST2 --Sends reads to VIVOTEK VMS backend software.
Wiegand	Wiegand --Sends reads to VIVOTEK AO-20W to connect ACS.
Helix	Helix --Vaxtor proprietary protocol, sends reads to Helix using an API key.
JSON	JSON --HTTP / HTTPS POST messages in a JSON object
XML	XML --Sends data in an XML packet via an HTTP /HTTPS POST
Genetec LPR Plugin	Genetec --Sends data to the Genetec Security Center via the Web-based SDK
Network Optix	Network Optix --Sends data to the Network Optix Witness VMS as an Event & Bookmark
FTP	FTP --FTP / SFTP protocol setup
TCP Client	TCP Client --Simple TCP/IP Connector – sends a single string data type
TCP Server	TCP SERVER --TCP Server Setup. The camera acts as a server.
UTMC	UTMC --Urban Traffic Management & Control interface
Output port	Output port --Trigger DO

### 5.7.1 Reporting to VAST2 / VSS

To send ALPR reads to VAST2 / VSS, Select **Active** and enter the IP address of the receiving VMS. E.g. **10.135.12.42** and port number.

Vast2

☒ Active

IP

Port (1 - 65535)

10.135.12.42

17000

Message template

```
<?xml version="1.0" encoding="UTF-8"?>
<infoplate>
  <DateHour>${datehour$}</DateHour>
  <Plate>${plate$}</Plate>
  <Country>${country$}</Country>
  <Confidence>${confidenceprecision$}</Confidence>
  <PlateDescription>${platedescription$}</PlateDescription>
  <CardID>${cardid$}</CardID>
  <Make>${make$}</Make>
  <Model>${model$}</Model>
  <Color>${color$}</Color>
  <Type>${type$}</Type>
  <Direction>${direction$}</Direction>

```

You can find detailed ALPR info in the Data Magnet section. E.g. Date, Time. Car Type, Color, Brand, Model, Direction, etc.

Timestamp	Plate number	Plate image	Type	Color	Brand	Car model	Direction	List name
2023/06/16 16:18:35	XAZ993		UNKNOWN	BLACK	TOYOTA	COROLLA	No direction	not in list
2023/06/16 16:18:24	XAZ993		UNKNOWN	BLACK	TOYOTA	COROLLA	No direction	not in list

### 5.7.2 Reporting to Wiegand

To send ALPR reads to VIVOTEK AO-20W Wiegand converter to Access Control system.

Wiegand

☒ Active

Add the license plate to the whitelist, and fill the comment with the 10 numbers of the ID card linked to that license plate between \*, E.g. \*0012300456\*

IP

Port (1 - 65535)

10.42.2.223

1601

Format

No parity

and you need add ID card number in Whitelist.

Whitelist

Total: 2 plates

Plate	Description	From	To	Make	Model	Color	Class	
HSR1785	*2677414824*	01-01-2022	01-01-2031	Empty	Empty	Empty	Empty	
ABC5678	*4930429722*	01-01-2022	01-01-2031	Empty	Empty	Empty	Empty	

### 5.7.3 Reporting to Helix

To send encrypted reads to Helix, select **Helix**. This supports cameras in different time zones.



**Helix**

☒ Active

Helix server URL  
https://helix-demo.vaxtor.com/helix6

Apikey  
935bd74a2d09442b9ae98e79ef33a5a4

Camera Id  
228

Reader Id  
0

Overview Id  
0

☒ Send Heartbeat

Heartbeat timer  
60

☐ Sync Lists

Select **Active** and enter the IP address (URL) of the receiving PC. E.g. **10.0.0.12:8080/helix6**  
*Note that this can be an http or an https address supporting data encryption.*

Enter the Camera (or Reader ID – see Helix documentation) to be sent to Helix and an optional API key to be used for authentication. Overview ID is used if the camera is to be used as a color overview camera to be associated with another ALPR camera.

### Send Heartbeat

Select this and a time interval for the camera to send a heartbeat ping to Helix. Helix can be programmed to also upload an image from the camera at a predetermined interval to monitor the image quality.

### Sync Lists

☒ Sync Lists

Sync lists timer  
60

Lists can be automatically synchronized with a central Helix Server. If you are running the Vaxtor Helix Back Office, you can choose to merge and then synchronize all of your blacklists and similarly your whitelists with any number of connected cameras running VaxALPR package software. This enables you to perform real time checks or access control on the edge in case a network fails. Once reconnected the lists will synchronize once more.

Select this option and then define a time interval for the lists to be re-synchronized.

Click Submit reporting to store the configuration in the camera.

Submit Reporting configuration

### 5.7.4 JSON (JavaScript Object Notation)

To activate this option:

1. Click on the XML header to expand the HTTP Post XML integration menu.
2. Enable the **Active** checkbox to enable JSON output and send HTTP / HTTPS POST messages in a JSON object

The screenshot shows a configuration window titled 'JSON'. It contains a checkbox labeled 'Active' which is checked. Below it is a 'URL' field with the value 'https://server'. There are 'Username' and 'Password' fields. Another 'Send notifications without images' checkbox is present. At the bottom, a 'Message template' field contains a JSON string: `{"plate":"$plate$","date":"$date$","country":"$country$","confidence":"$confidence$","left":"$left$","top":"$top$","right":"$right$","bottom":"$bottom$","charheight":"$charheight$","processingtime":"$processingtime$"}`.

To setup this option, do the following:

1. Click on the **Active** button to expand the HTTP Post JSON integration menu.
2. Enter the receiving **URL**. The URL should be a 'well-formed' URL such as: <http://myserver.com/> or <https://myserver.com:port/destination/mypage.php>. Both domain names or IP address can be used.  
**IMPORTANT:** If you are using a URL rather than an IP address, make sure that you have setup a DNS server in the main Configuration settings menu.
3. Set the receiving server's username and password.
4. Choose whether to send images or not.
5. Modify the message template as required. The message can use Dynamic text.

**NOTE:** You can use dynamic text replacement to match the current plate information:  
A list is provided at the end of this manual: [Dynamic Text Replacement Reserved Words](#)

*There is also a separate document "Complete List of Dynamic Replacement Reserved Words" for the latest additions.*

- **\$image\$:** Full JPEG image encoded in base64.
- **\$jpegsize\$:** JPEG size in bytes.
- **\$date\$:** Timestamp in ISO8601 format
- **\$plate\$:** Plate number
- **Etc.**

You can add your own parameters into the message, so if you want to add say a site ID, your message might look like this:

```
{ "plate": "$plate$", "date": "$date$", "ip": "$ip$", "country": "$country$", "sitecode": 12345 }
```

6. Click Submit reporting to store the configuration in the camera.

The screenshot shows the bottom of the configuration window. It features a dark blue button with the text 'Submit Reporting configuration' and a small icon of a document with a checkmark.

### 5.7.5 XML

This reporting option will cause VaxALPR package software On Camera to send each plate event in an XML packet via an HTTP POST. This method can also be used to send events to Milestone.

To activate this option:

1. Click on the XML header to expand the HTTP Post XML integration menu.
2. Enable the **Active** checkbox:

3. Enter the target **URL**. The URL should be a 'well-formed' URL such as:  
<http://myserver.com/> or <https://myserver.com:port/destination/mypage.php>

For Milestone connections the URL should be: <http://milestoneserver:9090/>

Both domain names or IP address can be used.

4. Enter a username and password as necessary.
5. Modify the message as needed. By default, the message is a valid Analytic Event for Milestone.

**NOTE:** You can use dynamic text replacement to match the current plate information:

A list is provided at the end of this manual: [Dynamic Text Replacement Reserved Words](#)

*There is also a separate document "Complete List of Dynamic Replacement Reserved Words" for the latest additions.*

- **\$image\$**: Full JPEG image encoded in base64.
- **\$jpegsize\$**: JPEG size in bytes.
- **\$date\$**: Timestamp in ISO8601 format
- **\$plate\$**: Plate number
- **Etc.**

6. Scroll down and save your changes by clicking on the Submit Reporting icon:

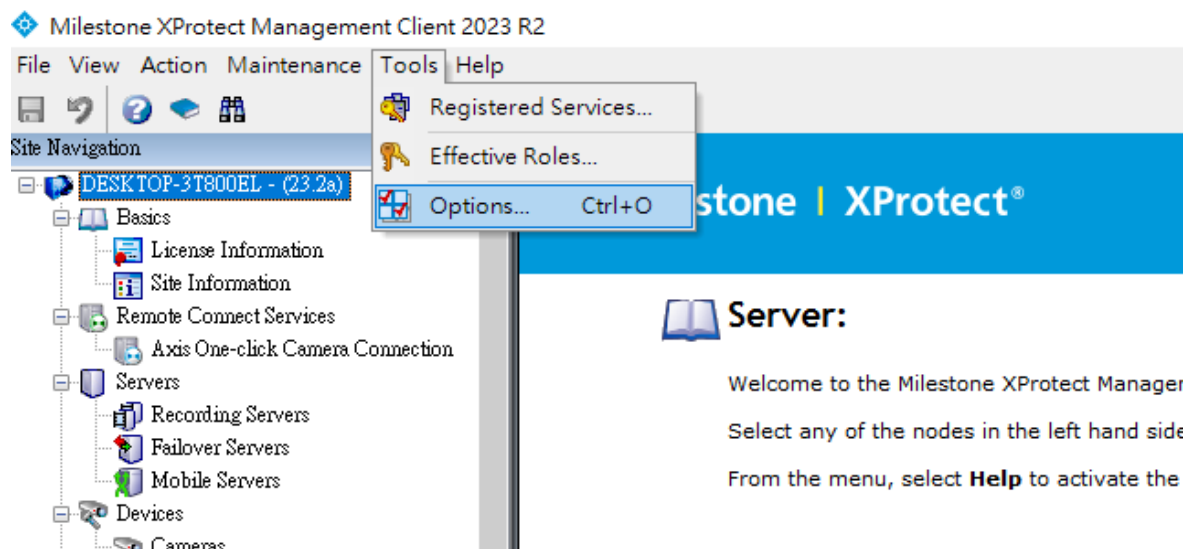
## Configuring Milestone

Once the reporting option HTTP POST is configured, we need to set up Milestone to receive and handle our events. To do this, we recommend the following steps:

1. Enable Milestone to receive VaxALPR events.

In the Milestone Management Application click on the Options menu and then select the Settings option. This opens a new window.

Select the Analytic Events option and tick the **Enabled** checkbox. Save the changes using the **Ok** button.



**Options** [X]

External IDP | Evidence Lock | Audio Messages | Privacy settings | Access Control Settings | **Analytics Events** | Customer I [◀ ▶]

**Analytics events**

☒ Enabled

Port:  
9090

**Security**

Events allowed from:

☒ All network addresses

☐ Specified network addresses:

	Address
*	

Import...

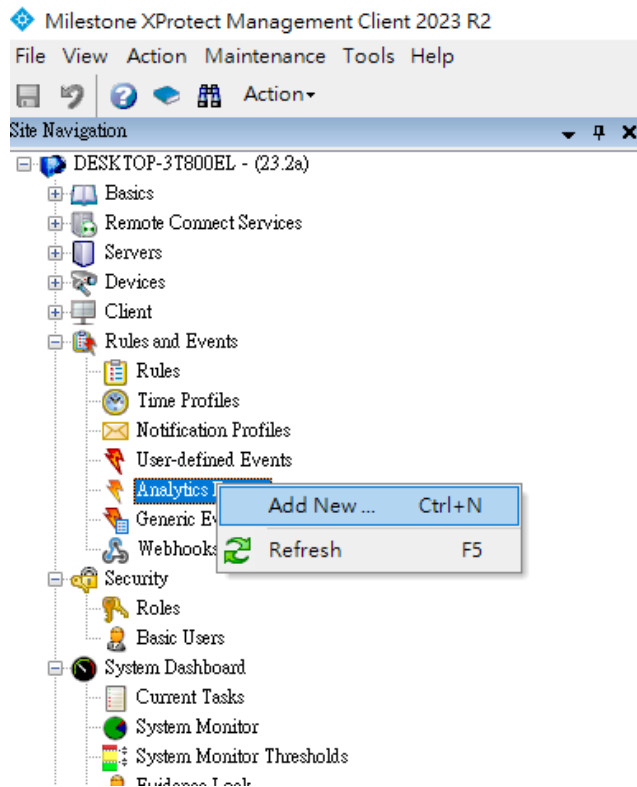
Help OK Cancel

*Milestone Management Application > Options > Settings > Analytic Events: Enabled*

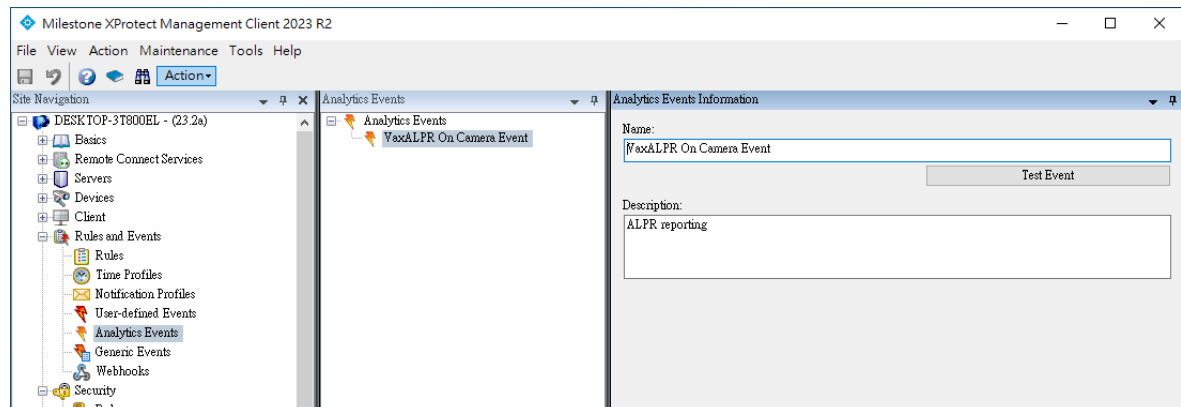
## 2. Create the VaxALPR On Camera Event in Milestone.

Click on the Surveillance Server drop down menu and click on the 'Rules and Events' drop down menu. Click on the 'Analytics Events' option and right-click to access the Create New button. Click on the '**Create New**' button to set up the event:

- Enter a **Name** for the Analytics Event (VaxALPR On Camera Event).  
Finally click on the **Ok** button to save the changes.



Surveillance Server > Rules and Events >Analytic Events: *Add New*



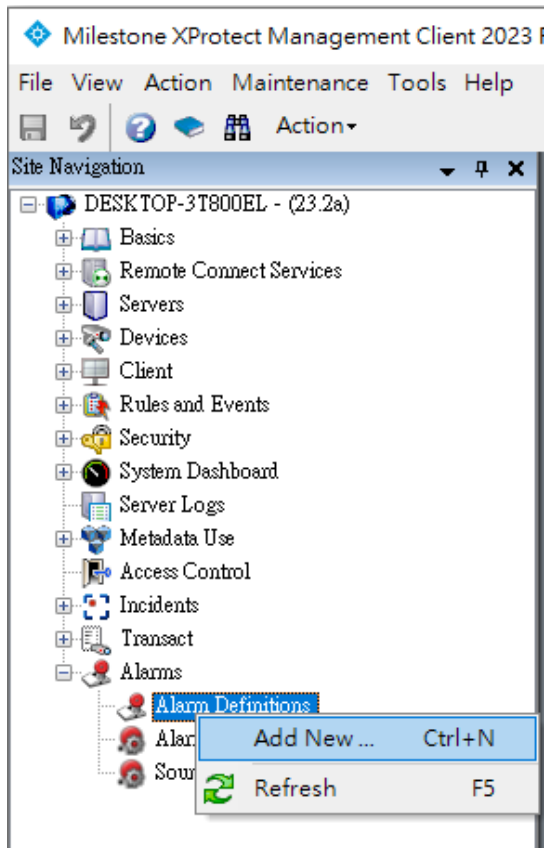
Surveillance Server > Rules and Events >Analytic Events: *VaxALPR On Camera Event*

3. Create the alarm that will trigger when Milestone receives the VaxALPR On Camera Event:

Click on the Surveillance Server drop down menu and then select the 'Alarms' drop down menu.

Click on the 'Alarm Definitions' option and on right-click to access the 'Create New' button.

Click on the **Create New** button to set up the alarm:



*Surveillance Server > Alarms > Alarm Definitions option: Add New*

- Select the **Enable** checkbox to activate the alarm.
- Enter a **Name** of the alarm (Plate Detected).
- Select a **Triggering event** from the drop-down list. The Triggering event should be the **Analytics Event**. A second drop-down list will appear.
- Select the **VaxALPR On Camera Event** from the second drop-down list.
- Select a **Source** (the camera with the installed VaxALPR On Camera software).

Finally click on the **Ok** button to save the changes.

**Alarm Definition Information**

**Alarm definition**

Enable: ☒

Name: Alarm Definition

Instructions:

**Trigger**

Triggering event: Analytics Events

VaxALPR On Camera Event

Sources: VIVOTEK IB9387-LPR-v2-W (10.42.2.44) - Camera 1 Select...

**Activation period**

☒ Time profile: Always

☐ Event based: Start: Select... Stop: Select...

**Map**

Alarm manager view: ☐ Smart map ☒ Map

Related map:

**Operator action required**

Time limit: 5 minutes

Events triggered: Select...

**Other**

Related cameras: Select...

Initial alarm owner:

Initial alarm priority: 1: High

Alarm category:

Events triggered by alarm: Select...

Auto-close alarm: ☐

Alarm assignable to Administrators: ☒

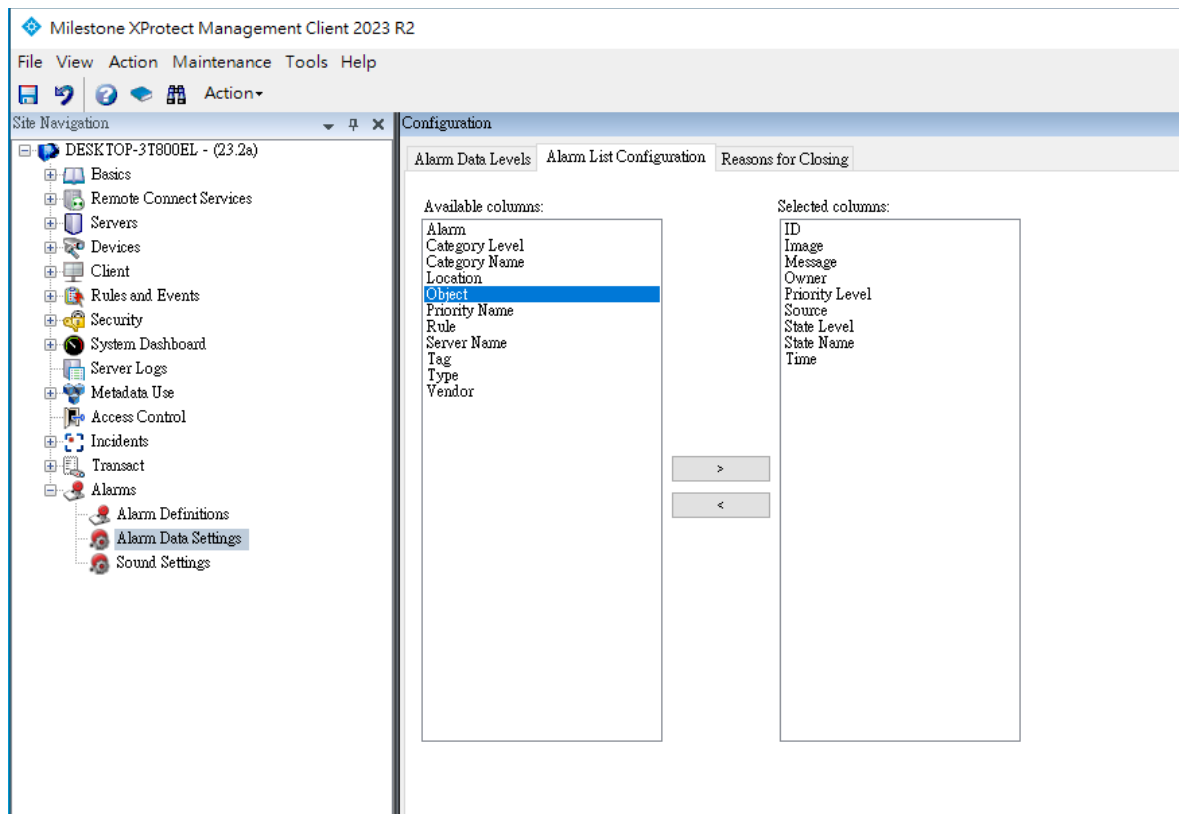
*Surveillance Server > Alarms > Alarm Definitions: Plate Detected*

#### 4. Modify the Alarm Data Settings.

Click on the Surveillance Server drop down menu. Next click on the Advanced Configuration drop down menu and then on the Alarms drop-down menu.

Next click on the Alarm Data Settings option and select the 'Alarm List Configuration' Tab and move the **Object** column from the Available columns to the Selected columns. This column will then indicate the plate number in Milestone.





*Surveillance Server > Alarms > Alarm Data Settings: Alarm List Configuration*

### 5.7.6 Genetec LPR Plugin

This reporting option will cause VaxALPR package software On Camera to send each plate event to Genetec Security Centre as an ALPR event (not just a bookmark). The received reads can be used within Security Centre to generate alarms, open barriers etc.

Contact Genetec for more information and to obtain a license for the Genetec software.

To activate this option:

1. Click on the XML header to expand the Genetec LPR Plugin integration menu.
2. Enable the **Active** checkbox:

Genetec LPR Plugin

Active

URL

https://server

Username

Username

Camera Id

camera\_id

Latitude

0

Password

Password

Camera Name

camera\_name

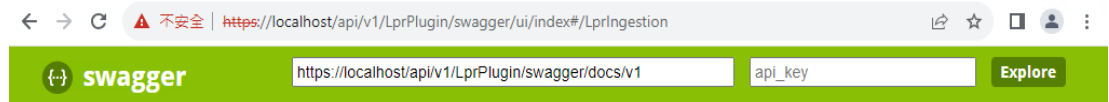
Longitude

0

Configuration values must be collected from the Genetec Security Center:

- **Url:** Genetec Security Center URL  
as: <http://myserver.com/api/v1/LprPlugin/lpringestion/reads> or  
<https://myserver.com:port/api/v1/LprPlugin/lpringestion/reads>

If you still have not well-formed the connected URL, please visit the below link on the Genetec server to check



## Genetec ALPR Plugin API

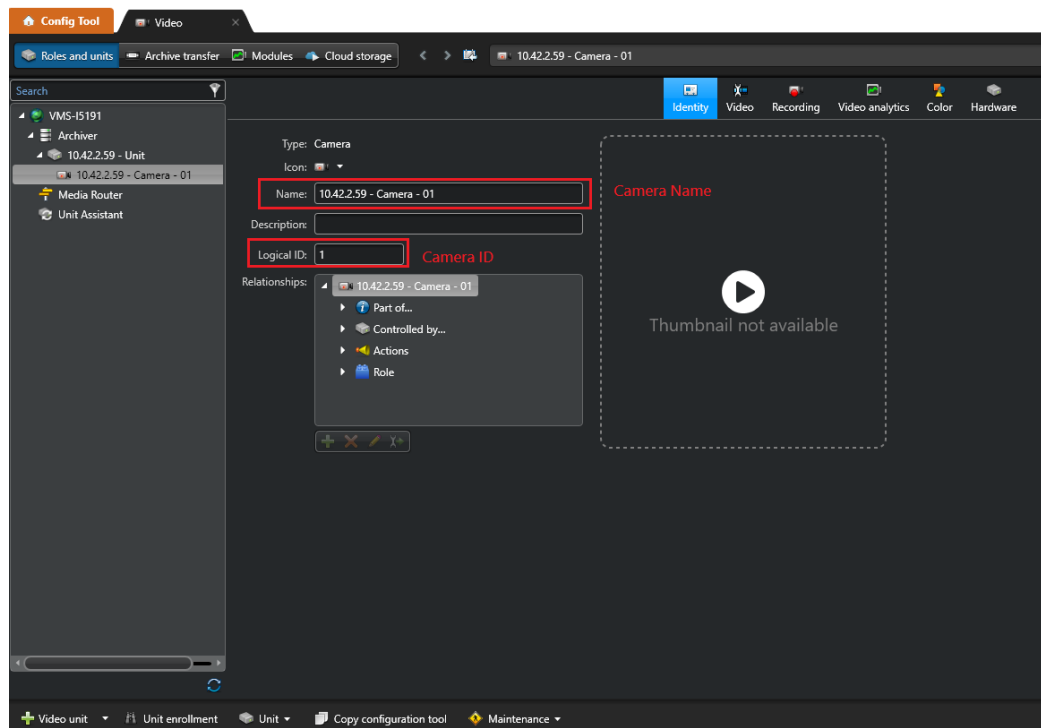
### LprIngestion

Show/Hide | List Operations | Expand Operations

POST /lpringestion/Reads

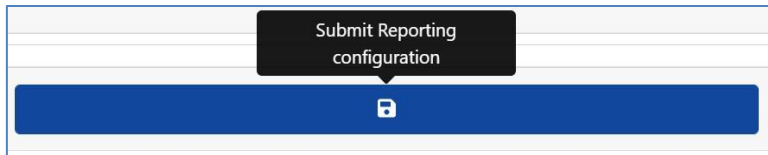
[ BASE URL: /api/v1/LprPlugin , API VERSION: v1 ]

- **Username & Password:** Genetec Security Center user with permissions to create
- **Camera Logical ID:** The Camera Logical ID must be the same as that configured in the Genetec Security Center.



- **Latitude & Longitude:** Keep Latitude & Longitude in 0 if you didn't enable GPS features.

3. Complete all other fields as necessary and click the Submit Reporting icon:



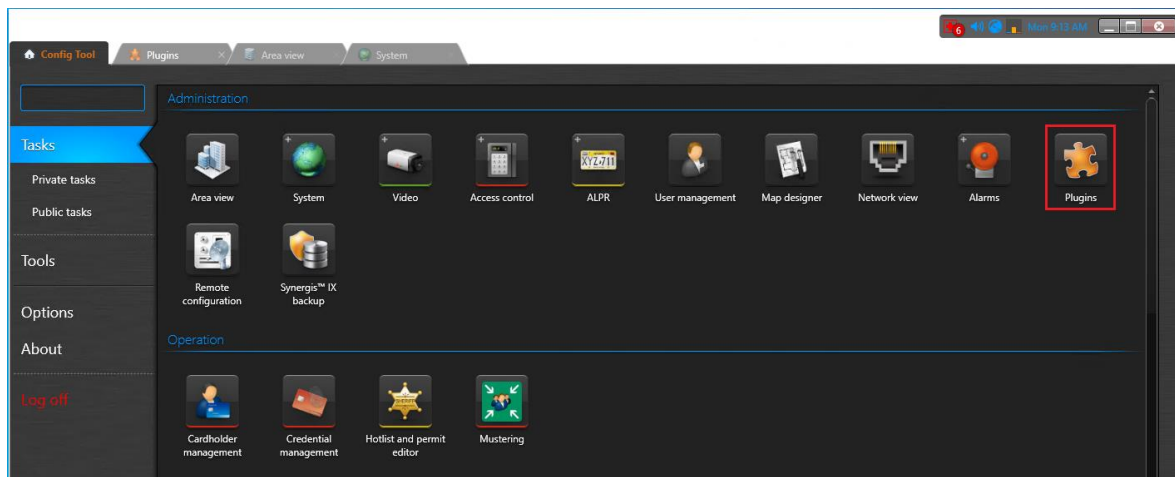
## Configuring Genetec

For details on how to set up documents, please search Genetec™ Third-Party ALPR Plugin Guide on Genetec TechDoc Hub. It will describe the license and system requirements. Also, it includes steps for deploying the ALPR plugin.

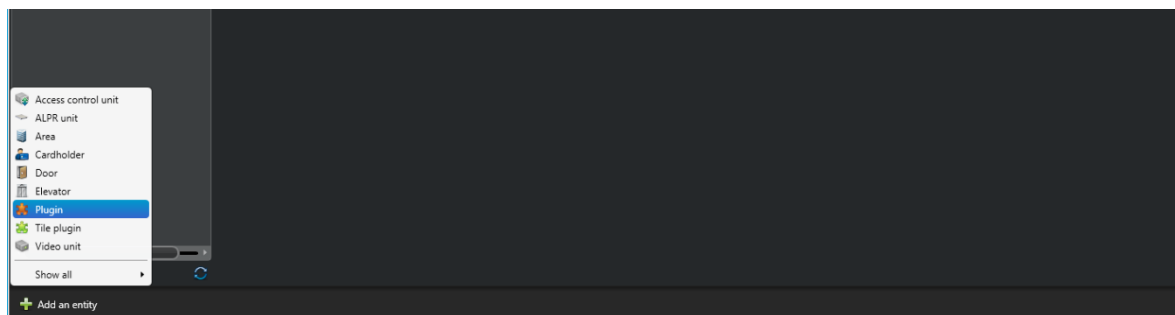
<https://techdocs.genetec.com/r/en-US/GenetecTM-Third-Party-ALPR-Plugin-Guide-5.10.0>

To create the plugin role:

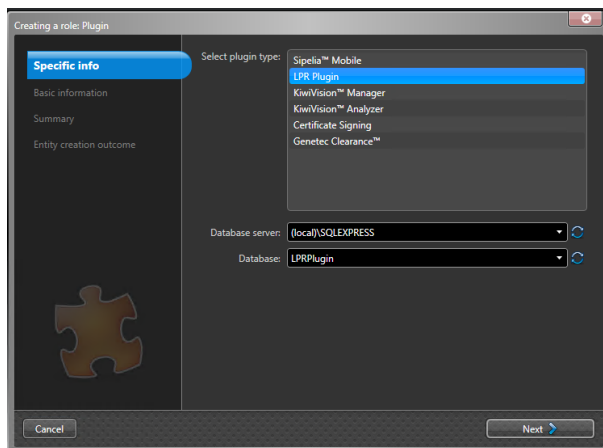
From the Config Tool home page, open the *Plugins* task.



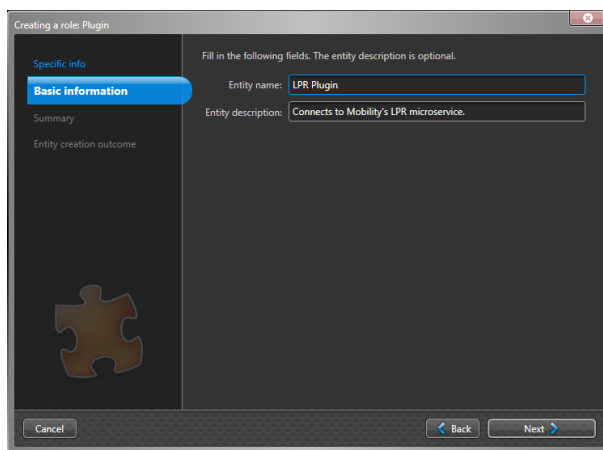
## Add Plugin



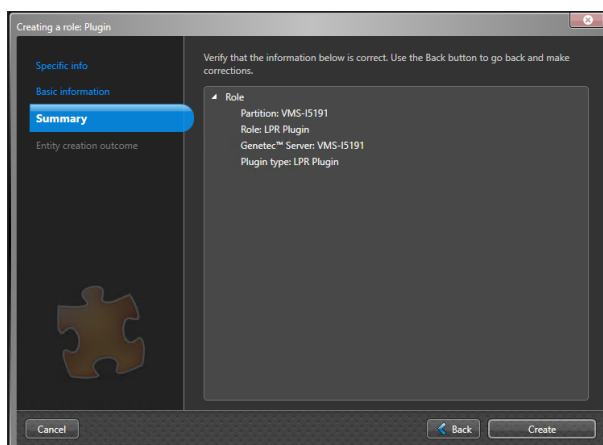
## Select plugin type



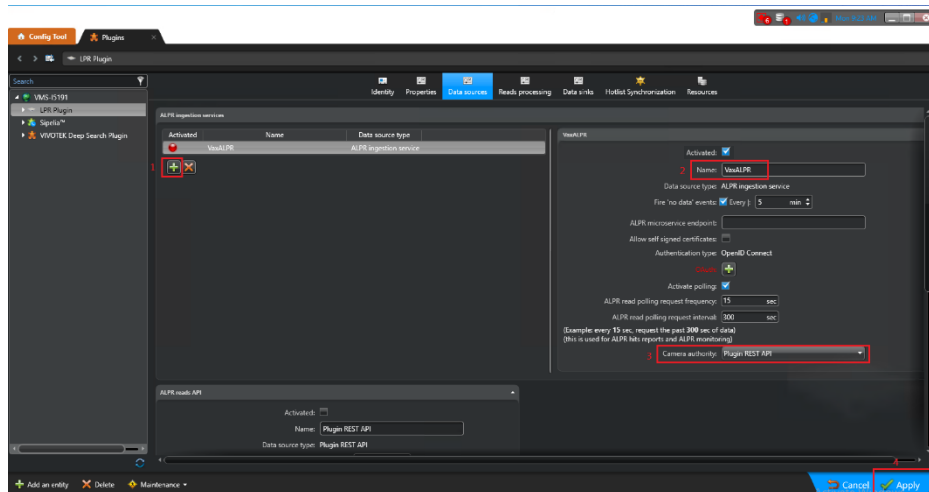
## Name of plugin



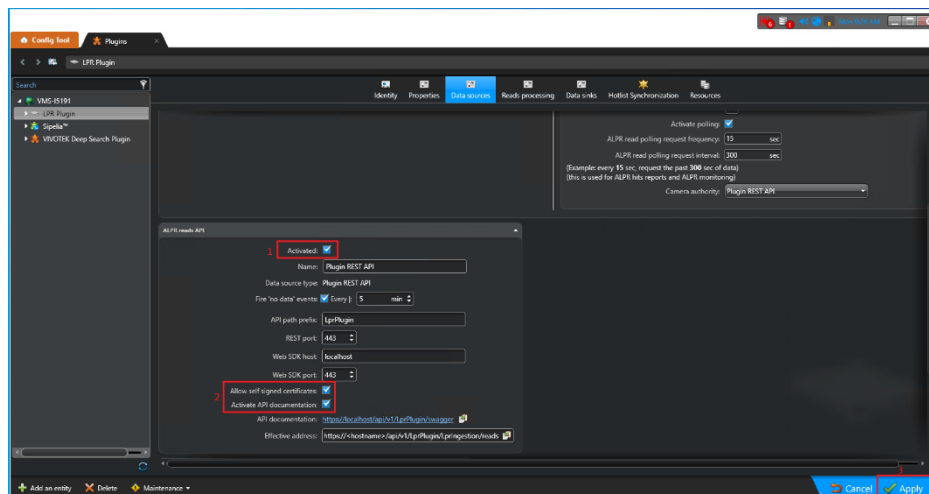
## Create



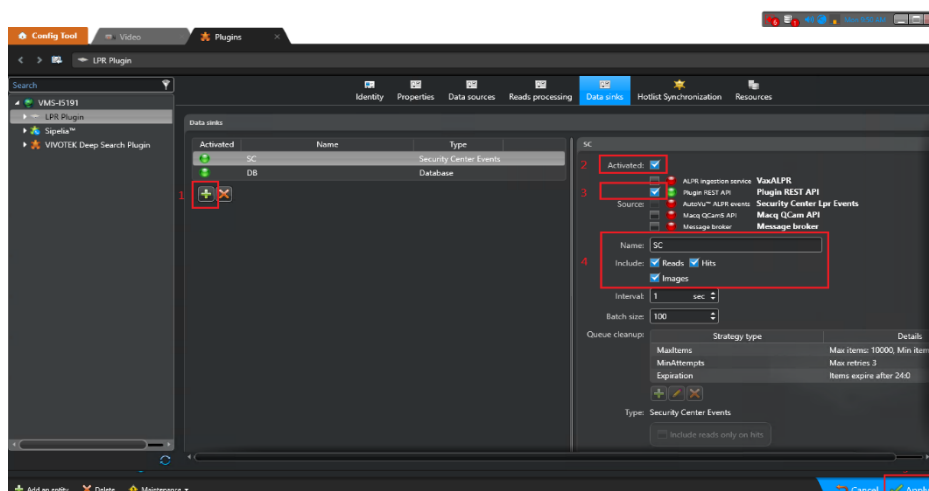
## Create Data Source



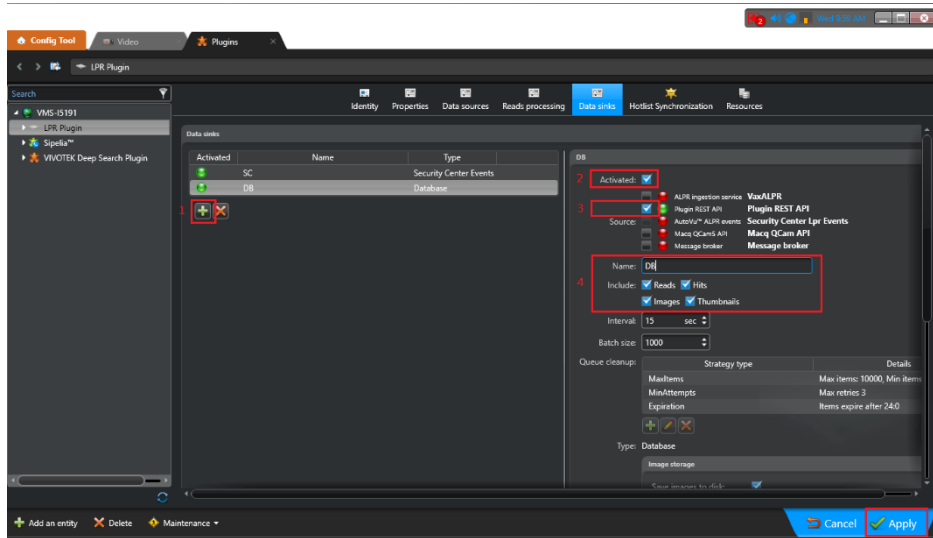
## Activated ALPR Plugin



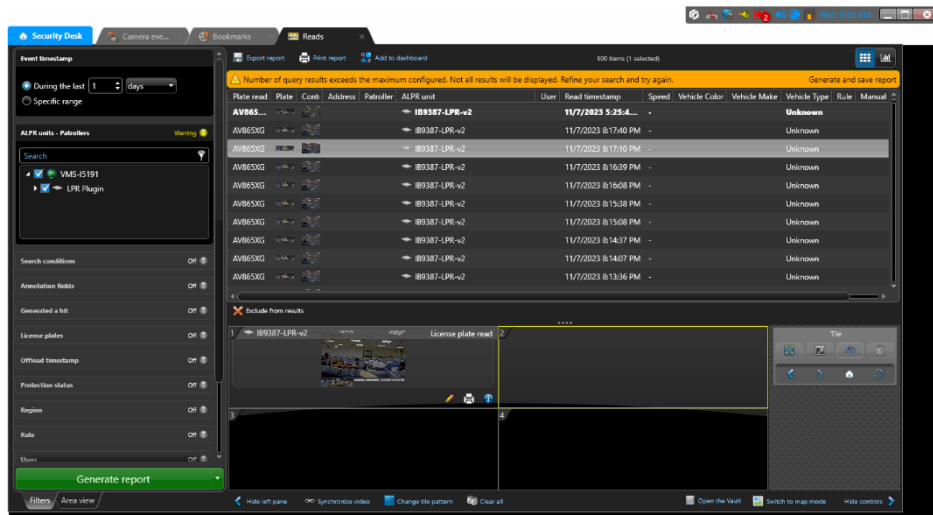
## Add Data sinks for "Security Center Event"



## Add Data sinks for “Database”



You can find VaxALPR push results in Reads.



### 5.7.7 Network Optix Integration

This reporting options sends generic events and bookmark data to the **Network Optix n<sup>x</sup> Witness VMS** system.

To setup this option, do the following:

1. In Reporting click on the Network Optix option to expand the integration menu.

Network Optix	
<input checked="" type="checkbox"/> Active	
URL https://server	
Camera Id camera_id	Source Source
Caption \$plate\$	Description \$plate\$ (\$country\$)
Username user	Password ****

2. Enable the **Active** checkbox.
3. Enter the **URL**. The URL should be the address of the NX host server using port 7001:  
<http://nxserver:7001> e.g. <http://192.168.0.41:7001>  
Note that the latest Optix NX enforces https.  
(ensure that the IP address of the camera is on the same subnet)
4. Enter your Username & Password.
5. Enter a "Source" parameter. This is used by the NX Server to reference the events received. E.g. 'LPR'. This will mark all NX events as "LPR" events.
6. Enter the Caption and Description templates. This data will be saved with each event. Modify the two messages as required. The message can use Dynamic text replacement such as in the Overlay reporting option.

**NOTE:** You can use dynamic text replacement to match the current plate information:  
A list is provided at the end of this manual: [Dynamic Text Replacement Reserved Words](#)

**There is also a separate document "Complete List of Dynamic Replacement Reserved Words" for the latest additions.**

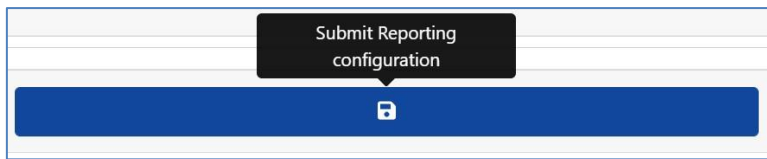
- **\$image\$:** Full JPEG image encoded in base64.
- **\$jpegsize\$:** JPEG size in bytes.
- **\$date\$:** Timestamp in ISO8601 format
- **\$plate\$:** Plate number
- **\$plate\$ - \$make\$ \$model\$ \$color\$:** Plate number and MMC information
- **Etc...**

You can add your own parameters into the message, so if you want to add say a site ID, your message might look like this:

```
{ "plate": "$plate$", "date": "$date$", "ip": "$ip$", "country": "$country$", "sitecode": 12345 }
```

7. Enter the Camera ID. This is the ID that has been setup in the NX VMS settings. This can be found in Camera Settings.

8. When finished click on **Submit Reporting** icon:



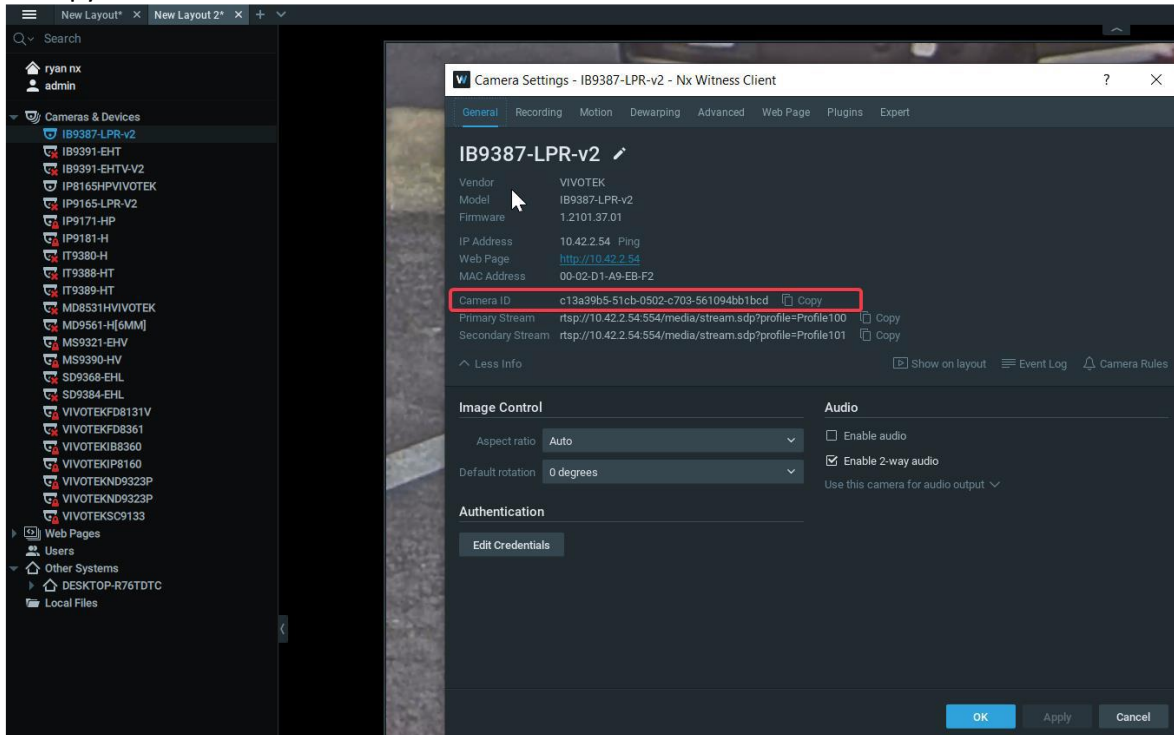
## Configuring Network Optix

1.Go Nx, and check camera setting.

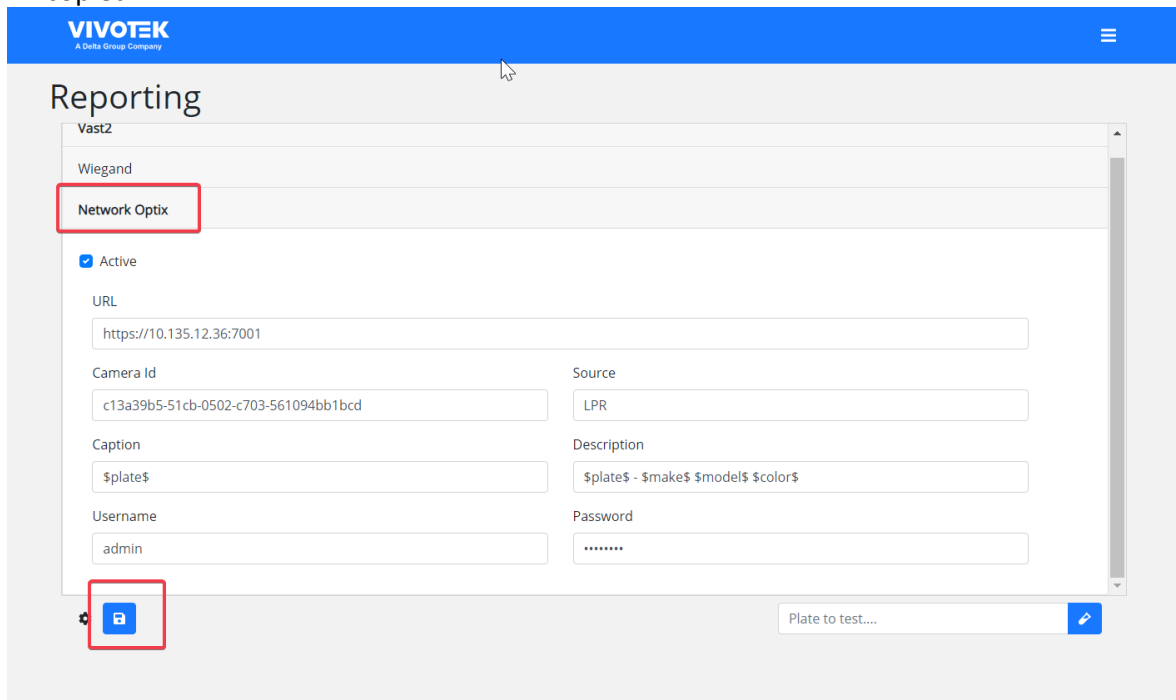




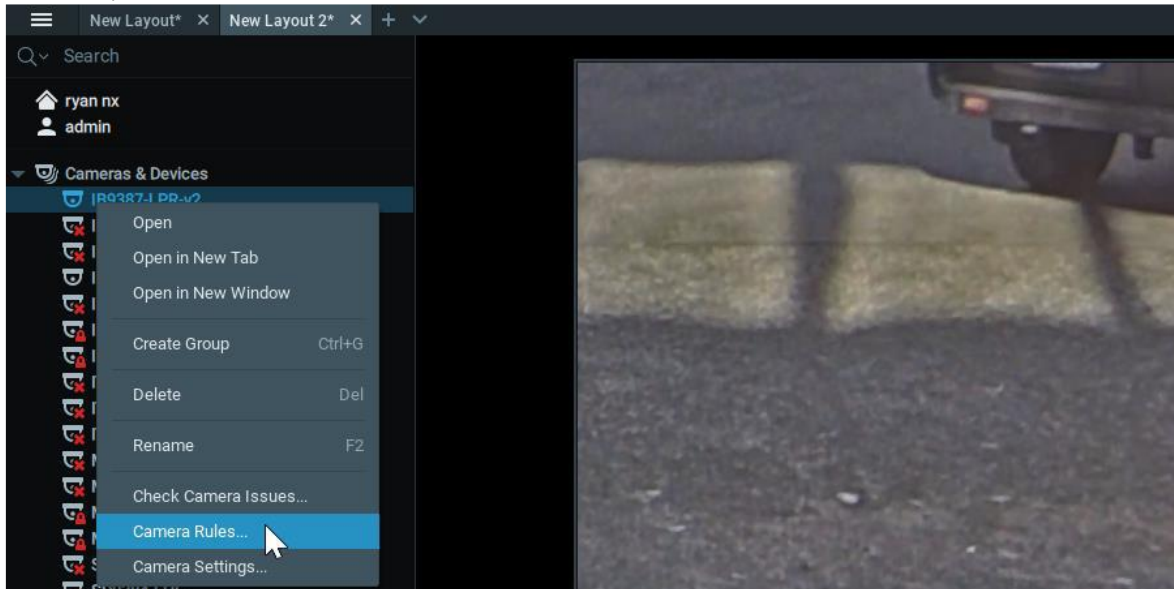
2. Copy the camera ID.



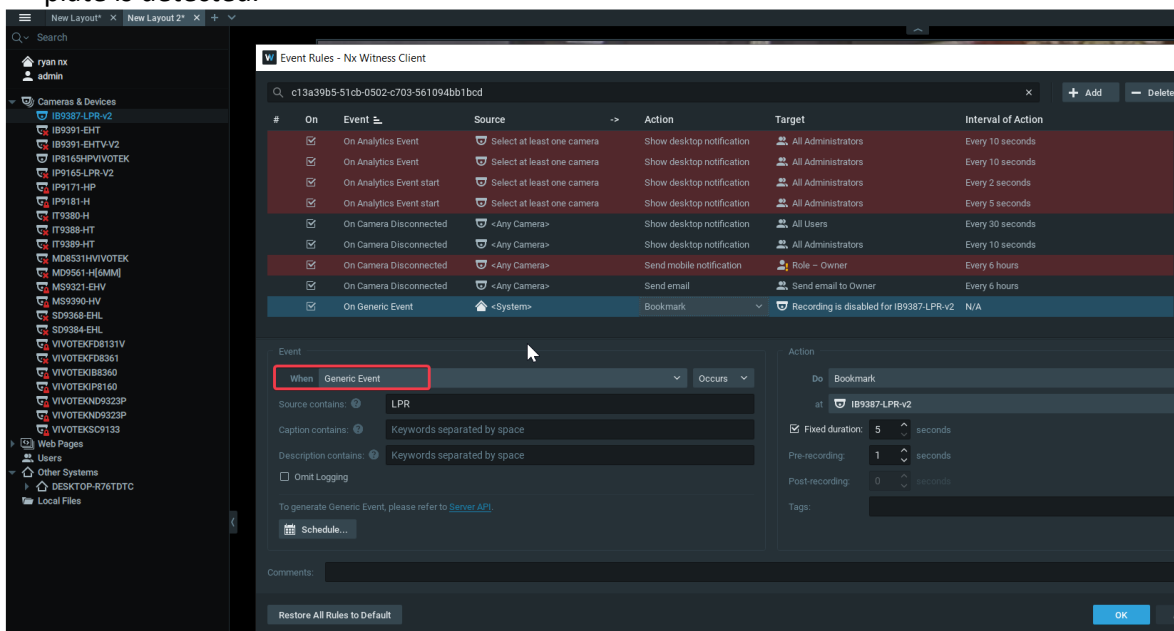
3. Go Vaxtor LPR > Reporting, and fill in the Nx server information and the camera ID just copied.



4. Go Nx, and add camera rules.



5. Add an “Generic Event”. Input “LPR” in the source column. And make a bookmark once car plate is detected.



6. When a van passed by, camera Vaxtor LPR detected the MMC of the car and sent the information to Nx and displayed on BOOKMARKS.



### 5.7.8 FTP

FTP

☒ Active

URL

FTP server URL

Username

Username

Password

Password

Filename

\$uuid\$.ftpfiletype\$

Template

\$date\$, \$plateutf8\$

☒ Send Image

☐ Send Patch

☐ Send CSV file

This reporting option will cause VaxALPR package software On Camera to send each plate event in an **FTP** Server.

To activate this option:

1. Click on the FTP header to expand the FTP integration menu.
2. Enable the Active checkbox:
3. Enter the target URL. The URL should be a 'well-formed' URL such as: <ftp://myserver.com:port> / or <ftp://10.42.2.10:21>
4. Enter a username and password as necessary.
5. Enter the message of templates. This data will be saved with each event.

The message can use Dynamic text replacement, such as in the Overlay reporting option.

**NOTE:** You can use dynamic text replacement to match the current plate information: A list is provided at the end of this manual: [Dynamic Text Replacement Reserved Words](#)

*There is also a separate document “Complete List of Dynamic Replacement Reserved Words” for the latest additions.*

- **\$image\$**: Full JPEG image encoded in base64.
- **\$jpegsize\$**: JPEG size in bytes.
- **\$date\$**: Timestamp in ISO8601 format
- **\$plate\$**: Plate number
- **Etc...**

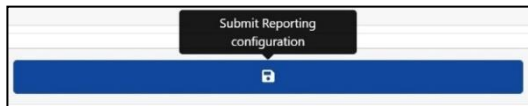
6. Select those options and snapshot patch, image, and CSV file synchronized.

☒ Send Image

☐ Send Patch

☐ Send CSV file

7. Click Submit reporting to store the configuration in the camera.



### 5.7.9 TCP Client

**TCP Client**

☒ Active

IP

TCPClient IP is required!

Port (1 - 65535)

Message template

@"\$plate\$#"

This reporting option will cause VaxALPR package software On Camera to send each plate event to a TCP Server.

To activate this option:

1. Click on the **TCP Client** header to expand the TCP Client integration menu.
2. Enable the **Active** checkbox:
3. Enter the target IP Address & Port number.
4. Enter the Message templates. This data will be saved with each event.
5. Modify the messages as required. The message can use Dynamic text replacement, such as in the Overlay reporting option.

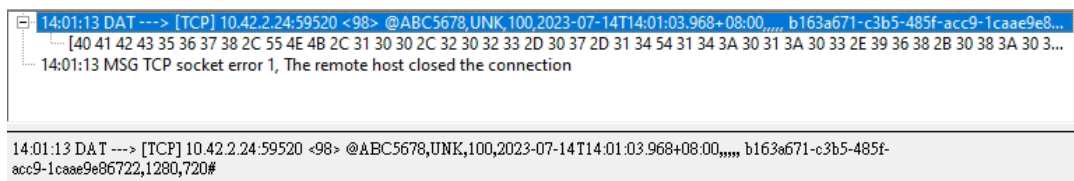
**NOTE:** You can use dynamic text replacement to match the current plate information: A list is provided at the end of this manual: [Dynamic Text Replacement Reserved Words](#)

There is also a separate document “Complete List of Dynamic Replacement Reserved Words” for the latest additions.

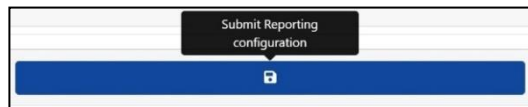
- **\$image\$:** Full JPEG image encoded in base64.
- **\$jpegsize\$:** JPEG size in bytes.
- **\$date\$:** Timestamp in ISO8601 format
- **\$plate\$:** Plate number
- **Etc...**

You can add your own parameters into the message, so if you want to add say a site ID, your message might look like this:

{ @\$plate\$, \$country\$, \$confidence\$, \$date\$, \$make\$, \$model\$, \$color\$, \$class\$# }



6. Click Submit reporting to store the configuration in the camera.



## 5.7.10 TCP Server

TCP Server

☒ Active

Template

Port (1024 - 65535)

@\$plate\$#

3000

This reporting option will cause VaxALPR package software On Camera to send each plate event to a TCP Client.

To activate this option:

1. Click on the **TCP Server** header to expand the TCP Server integration menu.
2. Enable the **Active** checkbox:
3. Enter the target Port number.
4. Modify the messages as required. The message can use Dynamic text replacement, such as in the Overlay reporting option.

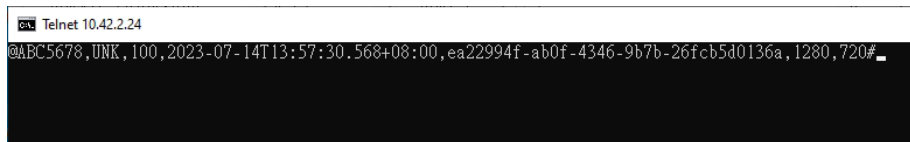
**NOTE:** You can use dynamic text replacement to match the current plate information:  
A list is provided at the end of this manual: [Dynamic Text Replacement Reserved Words](#)

There is also a separate document “Complete List of Dynamic Replacement Reserved Words” for the latest additions.

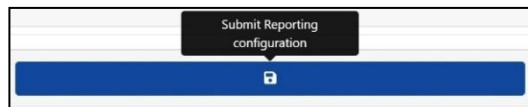
- **\$image\$:** Full JPEG image encoded in base64.
- **\$jpegsize\$:** JPEG size in bytes.
- **\$date\$:** Timestamp in ISO8601 format
- **\$plate\$:** Plate number
- **Etc...**

You can add your own parameters into the message, so if you want to add say a site ID, your message might look like this:

{ @\$plate\$, \$country\$, \$confidence\$, \$date\$, \$make\$, \$model\$, \$color\$, \$class\$# }



5. Click Submit reporting to store the configuration in the camera.



### 5.7.11 UTMC Integration

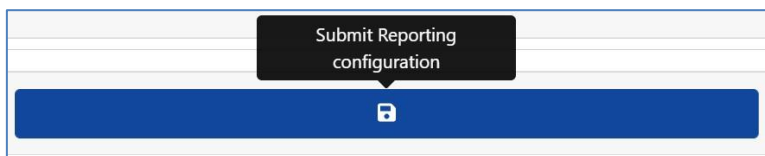
Choose this reporting option if you want VaxALPR package software On Camera to send plate reads using UTMC protocol. The Urban Traffic Management & Control program is a UK initiative for a more open method of communication in the ITS industry, especially in urban areas.

Plates can be sent in real time (individually) or in batches.

UTMC	
<input checked="" type="checkbox"/> Active	
URL <input type="text" value="https://server"/>	Camera Id <input type="text" value="1"/>
Username <input type="text" value="Username"/>	Password <input type="text" value="Password"/>
Heartbeat timer (seconds) <input type="text" value="60"/>	Diagnostic timer (seconds) <input type="text" value="0"/>
Plate retry timer (seconds) <input type="text" value="10"/>	Amount of plates per message <input type="text" value="1"/>
<input checked="" type="checkbox"/> Send plates in realtime <input checked="" type="checkbox"/> Send Plate Number <input checked="" type="checkbox"/> Send Tags	<input checked="" type="checkbox"/> Send Image <input checked="" type="checkbox"/> Send Plate Patch <input type="checkbox"/> Send Image as Overview

To activate this option, do the following:

1. Click on the UTMC protocol header to expand the UTMC setup menu as shown above.
2. Enable the **Active** checkbox.
3. Enter the **URL** of the receiving server.
4. Enter the **Heartbeat and Diagnostics** intervals to monitor the connection.
5. Enter a Camera **ID** (unique identifier for each camera).
6. All other fields are self-explanatory and define what data is transmitted to the UTMC BOF. Note that the default timeout is set to 5 seconds. If your server takes longer than this to respond, then you should increase this value.
7. Click on the **Submit reporting** button to store the information in the camera.
8. Complete all other fields as necessary and click the Submit Reporting icon:



### 5.7.12 Output Port

This option allows the user to trigger the camera's output port (relay, some models will not have it) when certain events occur. This could be used for example to open a barrier or sound an alarm.

To activate this option:

1. Click on the Output Port header to expand the menu.
2. Enable the **Active** checkbox:

The user can cause an event to be triggered Trigger in any or all the following conditions:

- |                               |   |  |
|-------------------------------|---|--|
| <b>Trigger with all</b>       | - | Trigger the output port when a plate is read                         |
| <b>Trigger with whitelist</b> | - | Trigger the output port when a plate is read & is in the whitelist   |
| <b>Trigger with Blacklist</b> | - | Trigger the output port when a plate is read & is in the blacklist   |
| <b>Trigger with no list</b>   | - | Trigger the output port when a plate is read and is not in any lists |

Select the output port to be triggered. See VIVOTEK documentation for configuring and wiring the output port.

### 5.7.13 JSON 2 (JavaScript Object Notation)

To activate this option:

1. Click on the XML header to expand the HTTP Post XML integration menu.
2. Enable the **Active** checkbox to enable JSON output and send HTTP / HTTPS POST messages in a JSON object



The screenshot shows a configuration window titled 'JSON'. It contains the following elements:

- An 'Active' checkbox, which is currently checked.
- A 'URL' field with the value 'https://server'.
- Fields for 'Username' and 'Password'.
- A checkbox labeled 'Send notifications without images'.
- A 'Message template' field containing the following JSON string: `{"plate":"$plate","date":"$date","country":"$country","confidence":"$confidence","left":"$left","top":"$top","right":"$right","bottom":"$bottom","charheight":"$charheight","processingtime":"$processingtime"}`

To setup this option, do the following:

1. Click on the **Active** button to expand the HTTP Post JSON integration menu.
2. Enter the receiving **URL**. The URL should be a 'well-formed' URL such as: <http://myserver.com/> or <https://myserver.com:port/destination/mypage.php>. Both domain names or IP address can be used.  
**IMPORTANT:** If you are using a URL rather than an IP address, make sure that you have setup a DNS server in the main Configuration settings menu.
3. Set the receiving server's username and password.
4. Choose whether to send images or not.
5. Modify the message template as required. The message can use Dynamic text.

**NOTE:** You can use dynamic text replacement to match the current plate information:  
A list is provided at the end of this manual: [Dynamic Text Replacement Reserved Words](#)

*There is also a separate document "Complete List of Dynamic Replacement Reserved Words" for the latest additions.*

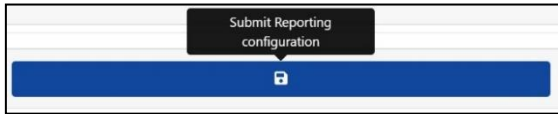
- **\$image\$:** Full JPEG image encoded in base64.
- **\$jpegsize\$:** JPEG size in bytes.
- **\$date\$:** Timestamp in ISO8601 format
- **\$plate\$:** Plate number
- Etc.

You can add your own parameters into the message, so if you want to add say a site ID, your message might look like this:



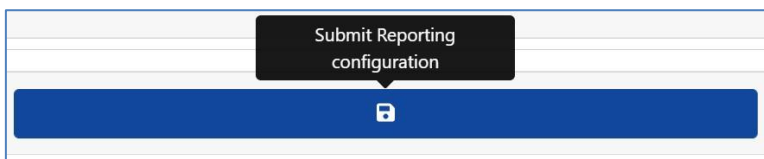
```
{ "plate": "$plate$", "date": "$date$", "ip": "$ip$", "country": "$country$", "sitecode": 12345 }
```

6. Click Submit reporting to store the configuration in the camera.



#### 5.7.14 Camera's Submit Reporting Settings

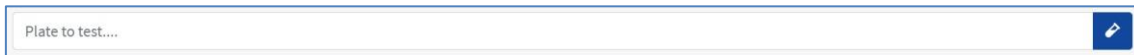
Once you have configured your reporting options then remember to save them by pressing



at the bottom of the screen.

#### 5.7.15 Testing Reporting

After configuring a notification, it is possible to simulate a read transmission. This feature can be used to confirm that the notification has been set up and is operating correctly.



To simulate a plate read notification:

1. Enter a plate number to test in the test window at the bottom of the screen  
e.g. ABC123



2. Click on the Test reporting icon:

The plate will be sent to all enabled reporting end points.

You can check if the plates have been successfully sent by checking the log file –

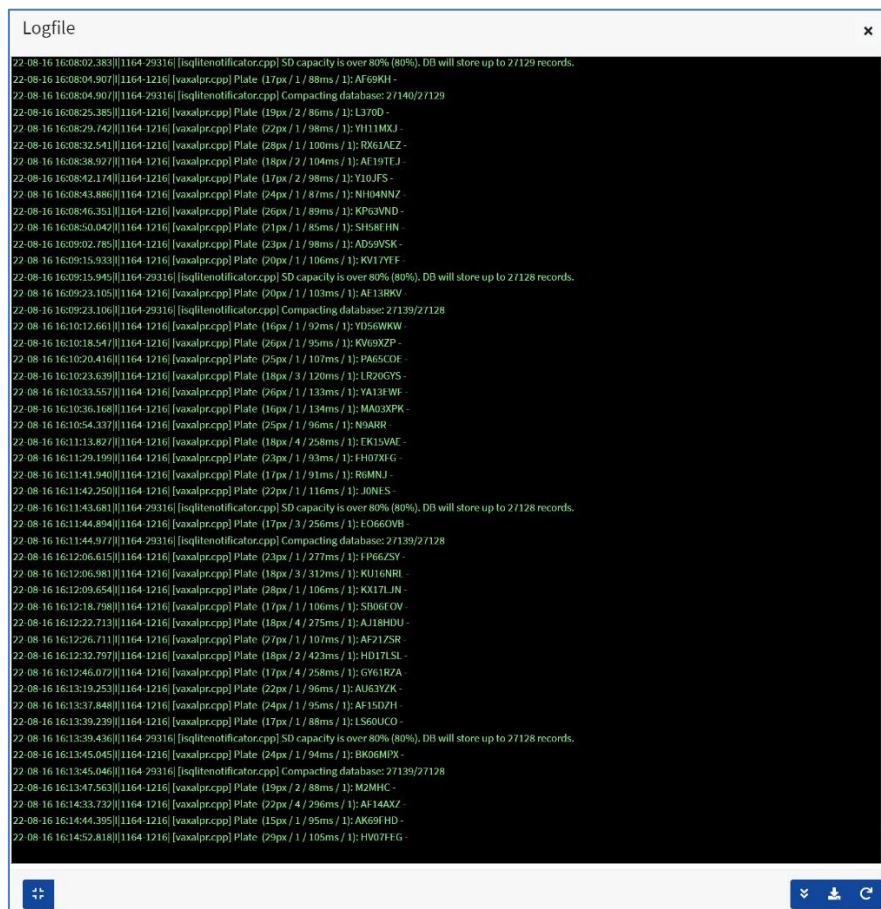
See next section.

## 5.8 VaxALPR package software Show Logfile

This function displays the current System Log for debugging and testing purposes.



The application log appears as follows:



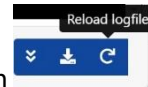
Note that the latest information is added to the bottom of the file so use the slider bar on the

right to navigate up and down. Use the '**Scroll to bottom**' icon:



to move to the end of the file.

If new data is being recorded whilst you are browsing, then use the '**Reload**' icon



to re-open the latest version of the file.

Error messages will appear here including if the program has failed to send data to a third-party application for some reason – or it has been rejected by a server.

Basic plate data includes the plate height, number of reads, time to process etc.

The logfile can be downloaded to your PC by selecting the '**Download Logfile**' icon:



Pressing the icon allows you to reposition the logfile display in any one of four positions on your screen (to allow you to view settings around the window).



Selecting reverts to the larger window, centre screen.

## 6. Troubleshooting

Many license plate reading issues are caused due to:

- Incorrect positioning of the camera
- Incorrect camera lens (or zoom setting)
- Insufficient illumination
- Incorrect camera settings - e.g. shutter speed
- Incorrect settings of the ALPR App.

In this section, we will study the most common of these issues and how to fix them.

### 6.1 Edge LPR (V) On Camera software starts and then stops suddenly.

Solution:

Check that you have uploaded the license key and check that the date and time of the VIVOTEK camera is set correctly.

### 6.2 Edge LPR (V) license is valid but a 'Check license' message appears.

Solution:

Check that the date and time of the VIVOTEK camera is set correctly.

### 6.3 Edge LPR (V) On Camera software is running but not reading plates.

Solution:

Check if you can see the license plate in the image and that the image is of good quality, not under or over exposed. As a rule, if you can't easily read the plates then the software won't be able to read them either!

Image is everything so first try to adjust the camera lens to zoom in or out. Failing that, check if the camera itself can be repositioned closer or further from the reading point. The captured image should show the complete vehicle. This however depends on the resolution that the camera has been set to.

If the video quality looks good, then go to the camera's settings and ensure that the shutter speed is set high enough. (See earlier in this manual for a guide to shutter speeds)

If you CAN see the license plate clearly in the image and the software is not reading anything, try changing following parameters in the settings section of the App to be more tolerant:

1. In the Country options, do not select the **Grammar Strict** checkbox.
2. In the Video options, change the **Minimum Character Height** to 14 pixels.
3. In the Video options, change the **Maximum Character Height** to 60 pixels.
4. In the OCR options, change the **Minimum Global Confidence** to 50.
5. In the OCR options, change the **Minimum Character Confidence** to 25.
6. In the Region of Interest section, delete any existing **Region of Interests** (ROIs).

Once you can see the license plate image and the software is now reading, change these settings back one by one.

## 6.4 Edge LPR (V) is running but it does not read all the plates.

Solution:

In the VaxALPR package software configuration, in the Video options, check that value of the resolution in the drop-down list is adequate.

View the log file and scroll to the end and look for the message:

*[INFO] Vaxreader[xxxx]: -Plate 0 (<pixel height> - <milliseconds>): <plate>*

and check the value of the plate's character pixel height registered in the log.

If the resolution is 1280 x 960 and the pixel height of the plate is 40, It is recommended you set the resolution to a lower value.

## 6.5 Plate patches are inverted on the plates list.

After installing a new VIVOTEK camera, sometimes the plate patches appear upside down after being read. Note that the camera has an auto-sensor to determine the orientation.

Solution:

Set the correct orientation required in the VIVOTEK Camera Settings/ Stream section:

After changing this (or any other settings in the camera) you should stop start and restart In the VaxALPR package software Application – and all should be well.

## 6.6 JSON or XML setup but no plates being received

### Solution

If you are using a remote URL to receive the data, check that a DNS server has been selected in the main VIVOTEK setup.

**IMPORTANT:** If you are using a URL rather than an IP address, make sure that you have setup a DNS server in the main configuration settings menu.

## 7. Dynamic Text Replacement Reserved Words

### 7.1 Dynamic Text replacement words

<b>\$date\$</b>	Timestamp in ISO8601 format
<b>\$plate\$</b>	Plate number
<b>\$tag\$</b>	Unique hash for this plate number. Same plate number will always give the same \$tag\$. Format based on UTMC algorithm.
<b>\$plateutf8\$</b>	Plate number in utf8 format.
<b>\$formatted\$</b>	Plate number formatted for user visualization in UTF8 format.
<b>\$country\$</b>	Full country of origin name.
<b>\$countrycode\$</b>	3 letter country code.
<b>\$countrycode2\$</b>	2 letter country code.
<b>\$state\$</b>	Plate State for countries that support it.
<b>\$category\$</b>	Plate category for countries that support it.
<b>\$blacklist\$</b>	Description on the blacklist linked to the plate number.
<b>\$whitelist\$</b>	Description on the whitelist linked to the plate number.
<b>\$ifblacklist\$ .... \$ifblacklist\$</b>	If the plate is on the blacklist, the text in the 'if clause' will be displayed.
<b>\$ifwhitelist\$ .... \$ifwhitelist\$</b>	If the plate is on the whitelist, the text in the 'if clause' will be displayed.
<b>\$ifnolist\$...\$ifnolist\$</b>	If the plate is not on a list, the <u>text</u> in the 'if clause' will be displayed.
<b>\$iflist\$...\$iflist\$</b>	If the plate is on a list, the text in the 'if clause' will be displayed.
<b>\$confidence\$</b>	Global confidence (0-100).

<b>\$charheight\$</b>	Average charheight (pixels).
<b>\$processingtime\$</b>	Processing time in milliseconds.
<b>\$left\$</b>	Left coordinate for the plate on the image (pixels).
<b>\$top\$</b>	Top coordinate for the plate on the image (pixels).
<b>\$right\$</b>	Right coordinate for the plate on the image (pixels).
<b>\$bottom\$</b>	Bottom coordinate for the plate on the image (pixels).
<b>\$absoluteleft\$</b>	Plate left position based on the total image width (0-1).
<b>\$absolutetop\$</b>	Plate top position based on the total image height (0-1).
<b>\$absoluteright\$</b>	Plate right position based on the total image width (0-1).
<b>\$absolutebottom\$</b>	Plate bottom position based on the total image height (0-1).
<b>\$width\$</b>	OCR image width.
<b>\$height\$</b>	OCR image height.
<b>\$mac\$</b>	Camera mac address.
<b>\$roid\$</b>	Roi ID where the plate number is found.
<b>\$multiplate\$</b>	Number of times that the plate has been read before reporting.
<b>\$signaled\$</b>	True if the read was caused by a trigger.
<b>\$uuid\$</b>	Unique ID for this read.
<b>\$direction\$</b>	Enumerate with the vehicle direction (0: Unknown, 1: Towards, 2: Away, 3: Stopped)
<b>\$signalid\$</b>	Signal ID in case of a trigger read.



<b>\$plateimage\$</b>	Plate crop JPEG image encoded in base64.
<b>\$platejpegsize\$</b>	JPEG size in bytes.
<b>\$utcdatetime\$</b>	Will report the date at ISO8601 format but always in UTC. (2020-12-31T16:11: 30.000Z)
<b>\$etx\$</b>	End transmission character (03)
<b>\$stx\$</b>	Start transmission character (02)

## 7.2 Additional values

<b>\$image\$</b>	Full JPEG image encoded in base64.
<b>\$jpegsize\$</b>	JPEG size in bytes.
<b>\$make\$</b>	The vehicle make
<b>\$model\$</b>	The vehicle model
<b>\$color\$</b>	The vehicle color
<b>\$class\$</b>	The vehicle classification (type “ e.g. car, van etc)
<b>\$year\$</b>	Year
<b>\$month\$</b>	Month number
<b>\$day\$</b>	Day number
<b>\$hour\$</b>	Hour
<b>\$minute\$</b>	Minute
<b>\$second\$</b>	Seconds

## **7.2 Note on UTC time format:**

Time UTC: 2021-04-13T00:50:15.000Z

( YYYY-MM-DDTHH:MM:SS.mmmZ - The last Z indicates the time is UTC)

Local Time: 2021-04-13T00:50:15.000-03:00

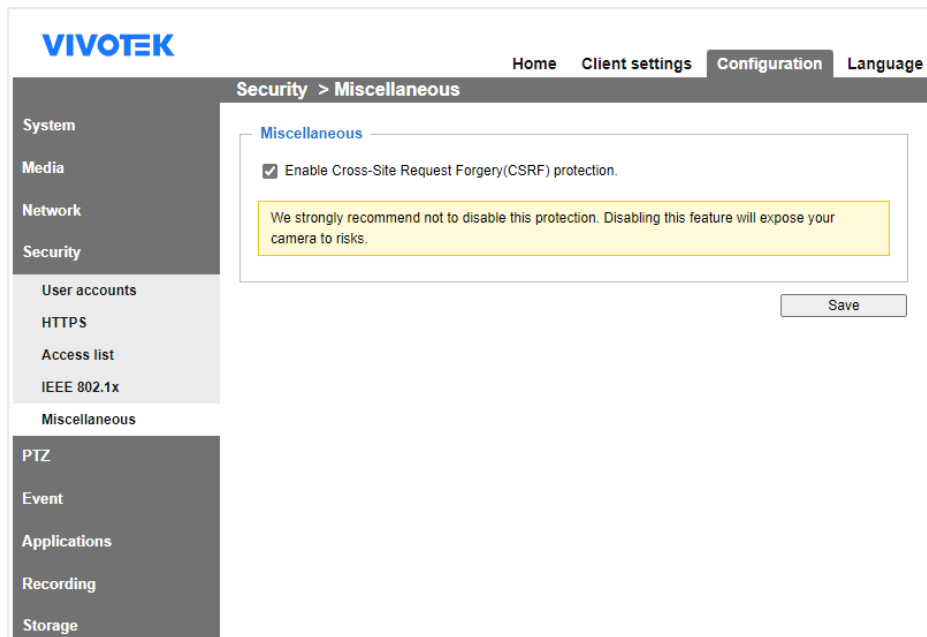
( YYYY-MM-DDTHH:MM:SS.mmm±hh:mm - Where the last ±hhmm is the difference from UTC time )

## 8. VaxALPR on Camera HTTP API

VaxALPR On Camera now supports an HTTP API that allows third parties to:

- Modify the whitelist and blacklists on the camera.
- Upload and download the configuration file.
- Query information from the local plate database  
(if the database is enabled).

[note] Before using API sent to the camera, please disable CSRF



### 8.1 List management

1. GET Retrieve Blacklist items:

<http://cameraip/VaxALPR/api/blacklist.cgi>

2. POST Upsert Blacklist items:

<http://cameraip/VaxALPR/api/blacklist.cgi>

This endpoint upserts items to the Blacklist on POST request.

The body content must be a JSON object with following keys:

- clean [ boolean ] - If "true" then content of the blacklist will be removed before upserting the items.
- items [ array ] - Array of item objects to be upsert
  - plate\_number [ string ] - Indicates the plate number
  - make [ string ] - Indicates the vehicle make
  - model [ string ] - Indicates the vehicle model
  - color [ string ] - Indicates the vehicle color [ Beige | Black | Blue | Brown | Golden | Green | Grey | Orange | Red | Violet | White | Yellow ]

- classification [ string ] - Indicates the vehicle classification [ Any | Bus | Car | Motorcycle | Truck | Van ]
- from [ string ] - Start of the valid period in ISO 8601 [ 2023-10-05T22:00:00.000Z ]
- to [ string ] - End of the valid period in ISO 8601 [ 2023-10-05T22:00:00.000Z ]
- description [ string ] - Item description

#### Example (Clean all list table and upload new list table)

POST ▼ http://10.42.2.6/VaxALPR/api/blacklist.cgi Try ↗

Params Headers **Body** ● none ● form-data ● x-www-form-urlencoded ● raw ● binary ● GraphQL JSON ▼ Beautify

```

1  {
2    "clean": true,
3    "items": [
4      {
5        "plate_number": "12AB456",
6        "make": "Audi",
7        "model": "Q3",
8        "color": "Black",
9        "classification": "CAR",
10       "from": "2023-10-05T22:00:00.000Z",
11       "to": "2023-10-05T22:00:00.000Z",
12       "description": "Test Plate 01"
13     },
14     {
15       "plate_number": "34DE567",
16       "make": "Volkswagen",
17       "model": "Golf",
18       "color": "White",
19       "classification": "CAR",
20       "from": "2023-10-09T22:00:00.000Z",
21       "to": "2024-10-09T22:00:00.000Z",
22       "description": "Test Plate 02"
23     }
24   ]
25 }
```

If clean = false it allows the user to add a single list entry or edit

#### Example (Edit single record based on ID number)

POST ▼ http://10.42.2.12/VaxALPR/api/whitelist.cgi

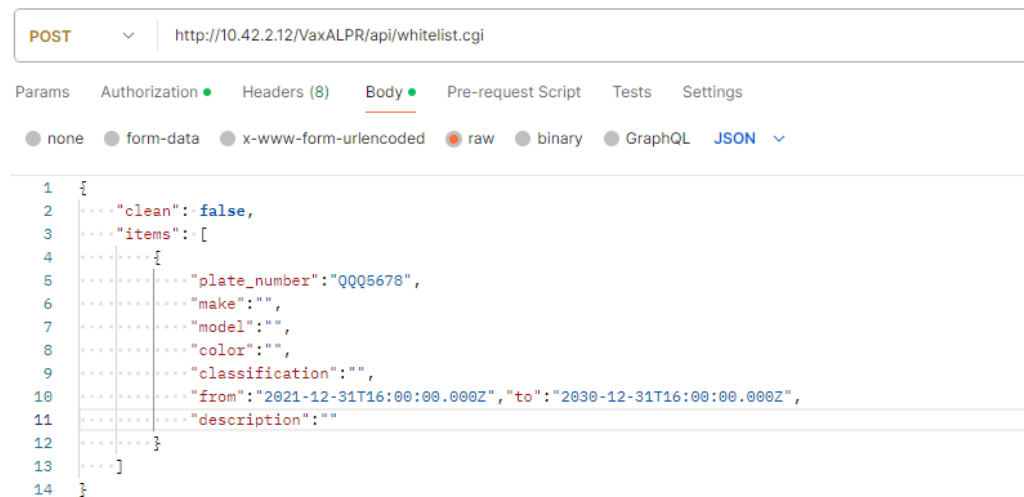
Params Authorization ● Headers (8) **Body** ● Pre-request Script Tests Settings

● none ● form-data ● x-www-form-urlencoded ● raw ● binary ● GraphQL JSON ▼

```

1  {
2    "clean": false,
3    "items": [
4      {
5        "plate_number": "ABC5678",
6        "make": "",
7        "model": "",
8        "color": "",
9        "classification": "",
10       "from": "2021-12-31T16:00:00.000Z", "to": "2030-12-31T16:00:00.000Z",
11       "description": "",
12       "id": "1a325468-2c9d-4f9d-9964-d36c50d93024"
13     }
14   ]
15 }
```

### Example (Add single record on list)



### 3. GET Retrieve Whitelist items:

<http://cameraip/VaxALPR/api/whitelist.cgi>

### 2. POST Upsert Whitelist items:

<http://cameraip/VaxALPR/api/whitelist.cgi>

This endpoint upserts items to the Whitelist on POST request.

The body content must be a JSON object with following keys:

- clean [ boolean ] - If "true" then content of the blacklist will be removed before upserting the items.
- items [ array ] - Array of item objects to be upsert
  - plate\_number [ string ] - Indicates the plate number
  - make [ string ] - Indicates the vehicle make
  - model [ string ] - Indicates the vehicle model
  - color [ string ] - Indicates the vehicle color [ Beige | Black | Blue | Brown | Golden | Green | Grey | Orange | Red | Violet | White | Yellow ]
  - classification [ string ] - Indicates the vehicle classification [ Any | Bus | Car | Motorcycle | Truck | Van ]
  - from [ string ] - Start of the valid period in ISO 8601 [ 2023-10-05T22:00:00.000Z ]
  - to [ string ] - End of the valid period in ISO 8601 [ 2023-10-05T22:00:00.000Z ]
  - description [ string ] - Item description

### Example (Clean all list table and upload new list table)

POST

http://10.42.2.6/VaxALPR/api/whitelist.cgi

Send

Params

Authorization

Headers (9)

Body

Pre-request Script

Tests

Settings

Cookies

none

form-data

x-www-form-urlencoded

raw

binary

GraphQL

JSON

Beautify

```

1  {
2    "clean": true,
3    "items": [
4      {
5        "plate_number": "12AB456",
6        "make": "Audi",
7        "model": "Q3",
8        "color": "Black",
9        "classification": "CAR",
10       "from": "2023-10-05T22:00:00.000Z",
11       "to": "2023-10-05T22:00:00.000Z",
12       "description": "Test Plate 01"
13     },
14     {
15       "plate_number": "34DE567",
16       "make": "Volkswagen",
17       "model": "Golf",
18       "color": "White",
19       "classification": "CAR",
20       "from": "2023-10-09T22:00:00.000Z",
21       "to": "2024-10-09T22:00:00.000Z",
22       "description": "Test Plate 02"
23     }
24   ]
25 }

```

If clean = false it allows the user to add a single list entry or edit

### Example (Edit single record based on ID number)

POST

http://10.42.2.12/VaxALPR/api/whitelist.cgi

Params

Authorization

Headers (8)

Body

Pre-request Script

Tests

Settings

none

form-data

x-www-form-urlencoded

raw

binary

GraphQL

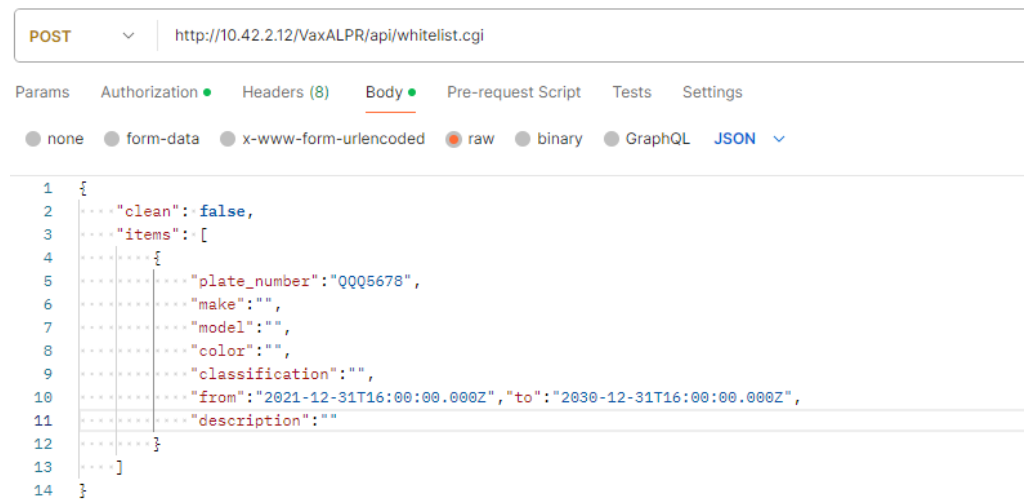
JSON

```

1  {
2    "clean": false,
3    "items": [
4      {
5        "plate_number": "ABC5678",
6        "make": "",
7        "model": "",
8        "color": "",
9        "classification": "",
10       "from": "2021-12-31T16:00:00.000Z", "to": "2030-12-31T16:00:00.000Z",
11       "description": "",
12       "id": "1a325468-2c9d-4f9d-9964-d36c50d93024"
13     }
14   ]
15 }

```

### Example (Add single record on list)



The screenshot shows a REST client interface with the following details:

- Method:** POST
- URL:** http://10.42.2.12/VaxALPR/api/whitelist.cgi
- Body Type:** JSON
- Body Content:**

```

1  {
2    "clean": false,
3    "items": [
4      {
5        "plate_number": "QQQ5678",
6        "make": "",
7        "model": "",
8        "color": "",
9        "classification": "",
10       "from": "2021-12-31T16:00:00.000Z", "to": "2030-12-31T16:00:00.000Z",
11       "description": ""
12     }
13   ]
14 }
```

## 8.2 Licensing

1. GET Retrieve VALPR version & License  
<http://cameraip/VaxALPR/api/license.cgi>

## 8.3 Configuration File

1. GET Retrieve Configuration  
<http://cameraip/VaxALPR/api/lprconfig.cgi>
2. POST Upload Configuration  
<http://cameraip/VaxALPR/api/lprconfig.cgi>

This endpoint uploads the configuration.

The content of the body must be a JSON object.

## Example

POST

http://10.42.2.6/VaxALPR/api/lprconfig.cgi

Send

Params

Authorization

Headers (9)

Body

Pre-request Script

Tests

Settings

Cookies

none

form-data

x-www-form-urlencoded

raw

binary

GraphQL

JSON

Beautify

```

1 curl --location -g 'http://10.42.2.6/VaxALPR/api/lprconfig.cgi' \
2 --data-raw '{
3   ...."advanced": {
4     ...."log": 4
5   },
6   ...."notifications": {
7     ...."crop_height": 480,
8     ...."crop_width": 640,
9     ...."do_crop": false,
10    ...."do_watermark": false,
11    ...."enable_blacklist": true,
12    ...."enable_db": true,
13    ...."enable_memory": true,
14    ...."enable_whitelist": true,
15    ...."jpeg_quality": 80,
16    ...."low_coverage": false,
17    ...."patch_jpeg_quality": 80,
18    ...."retry_notifications": false,
19    ...."retry_timeout": 10,
20    ...."sd_available": true,
21    ...."watermark_position": 0,
22    ...."watermark_size": 1,

```

Note: Trought lprconfig.cgi to change or modify reporting settings

## 8.4 Database

Query results from the Database

### 1. POST Retrieve Plates Paged

<http://cameraip/VaxALPR/api/getplates.cgi>

This endpoint retrieves records from the Database on POST request.

The body content must be a JSON object with following keys:

page [ int ] - Number of page to retrieve

amount [ int ] - Amount of records per page

### Example

POST

http://10.42.2.6/VaxALPR/api/getpagedplates.cgi

Send

Params

Authorization

Headers (9)

Body

Pre-request Script

Tests

Settings

Cookies

none

form-data

x-www-form-urlencoded

raw

binary

GraphQL

JSON

Beautify

```

1 {
2   ...."page": 2,
3   ...."amount": 10
4 }

```

### 2. GET Retrieve Plates – Last 5 Results

<http://cameraip/VaxALPR/api/getplates.cgi>



## 8.5 Virtual signal trigger

This API allows backend software to send a virtual signal trigger to VaxALPR act license plate recognition like a DI trigger from the camera.

<http://cameraip/VaxALPR/api/signal.cgi>

**IMPORTANT:** Set Working mode in Signed is MUST.

## 9. Changelog

Date	Ver.	Author	Details	Remarks
2023/10/19	V1.0	Liber	Initial version	Based on 1.1.5
2023/11/8	V1.1	Liber	Add Genetec setting	
2024/02/27	V1.2	Liber	Add revised package features	Based on 1.1.10
2024/07/03	V1.3	Liber	Add JSON 2 features	Based on 1.1.15