VAXALPR

AXIS COMMUNICATIONS

VAXTOR

VaxALPR On Camera for Axis Cameras

Main User Manual v3.0.1

13 Jun 2024

CONTENT

1. Introduction

VaxALPR is a license plate recognition application developed by Vaxtor Recognition Technologies for the most demanding scenarios using our proprietary OCR engine.

This user manual will guide the user through the installation, configuration and result publishing procedures for the **VaxALPR On Camera Software embedded in Axis Cameras**.

This software can be installed in Axis cameras with processors **Artpec-6**; **Artpec-7** and **Artpec-8.**

2. Installation and Licensing Process

2.1. Prerequisites

1. **Update Camera Software**: Ensure the camera is updated to the latest available firmware version. (https://www.axis.com/support/device-software)

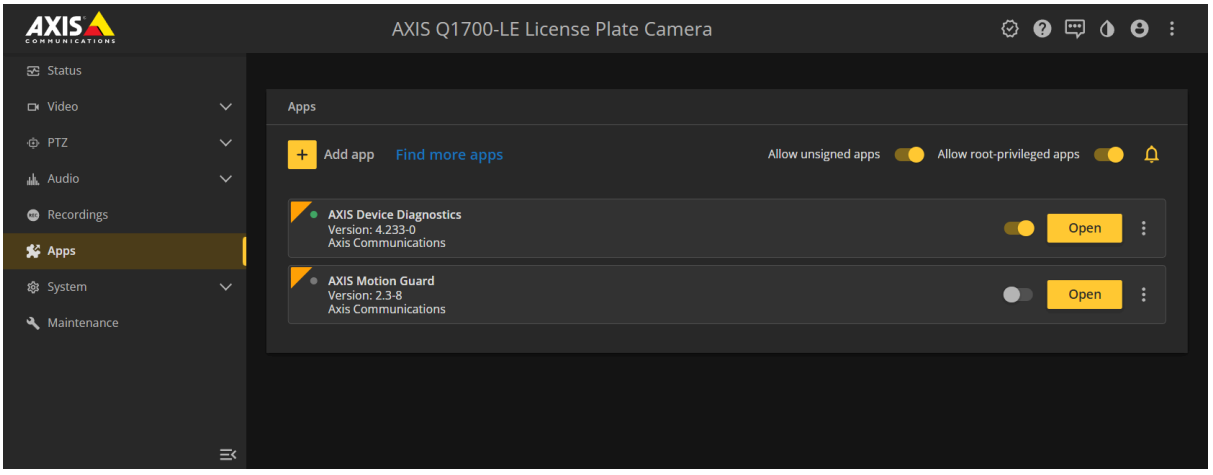
2. **Check Date and Time**: Verify that the camera date and time settings are correct. It is recommended to use an NTP server, ideally the same one used by the server to which the data will be sent, to ensure full synchronization of the results.

2.2. Installation Process

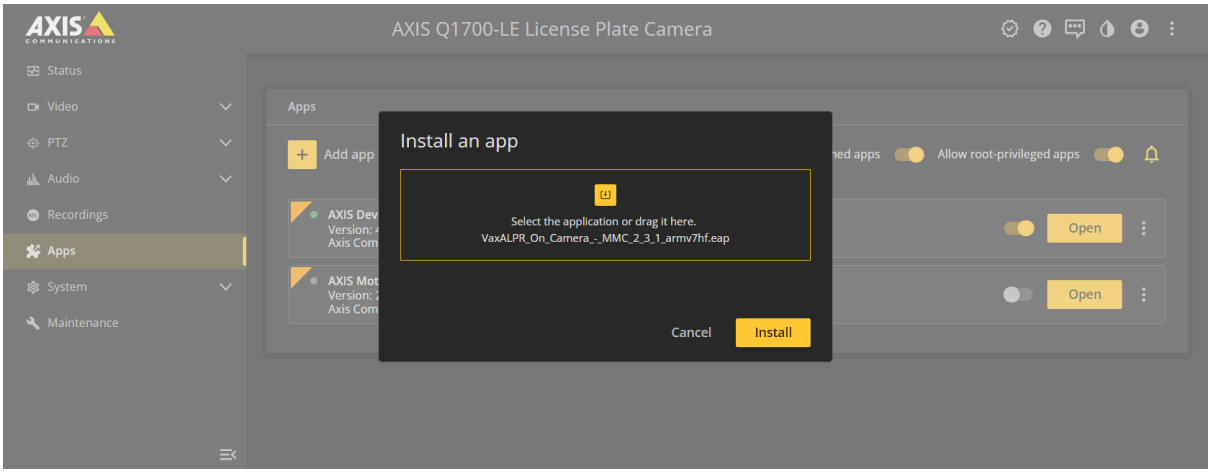
1. **Download Software**: Download the camera software from our website.

   https://www.vaxtor.com/download-center/software-downloads/?_sft_brand=axis

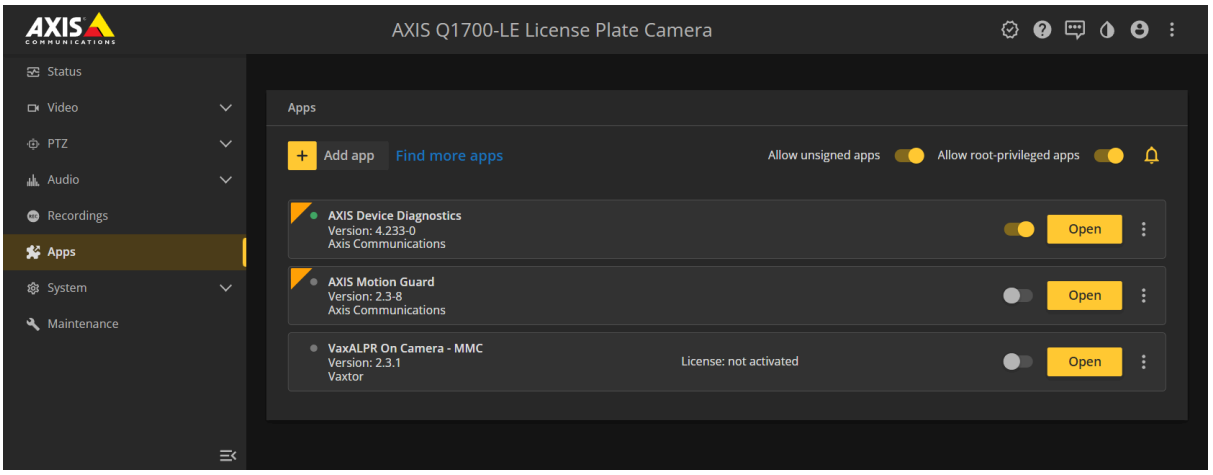
2. **Access Camera Web Interface**: Navigate to the camera's web interface and go to the "Apps" tab.



3. **Add and Install the App**: Click on the "Add app" button. Select the installer or drag it to the installation box, then click "Install."



4. **Installation Confirmation**: A message will indicate that the application is being installed. Once completed, the application will be available in the "Apps" list.



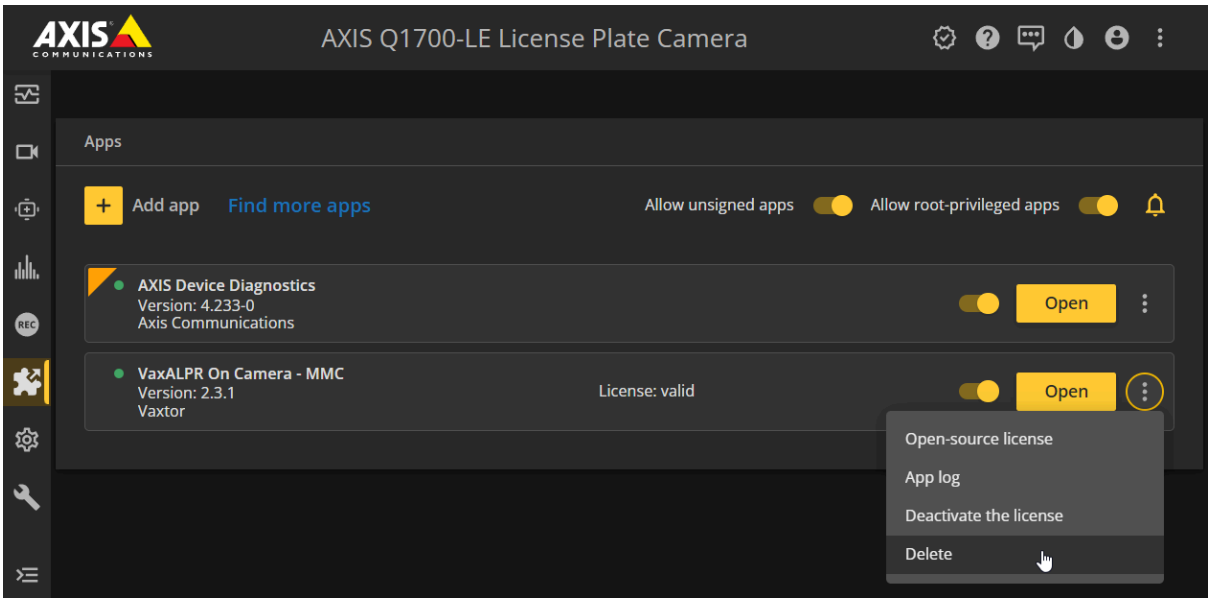
2.3. Update Process

Updating the application follows the same steps as the installation process, with the distinction that a previous version of the application is already installed.

To update, the user does not need to uninstall the previous version. This ensures that neither the license nor the configuration is affected.

If the application is uninstalled, all related data will be removed as well, including the license, configuration, results, and list items.

2.4. Uninstallation Process



The uninstallation process is straightforward. Follow these steps:

1. Go to the "**Apps**" screen in the camera web interface.
2. Click the three-dot icon on the right side of the application's row in the table.
3. Select "**Delete**."

This action will remove the application along with the license activation, configuration, and any stored ALPR records and list items.

2.5. Licensing Process

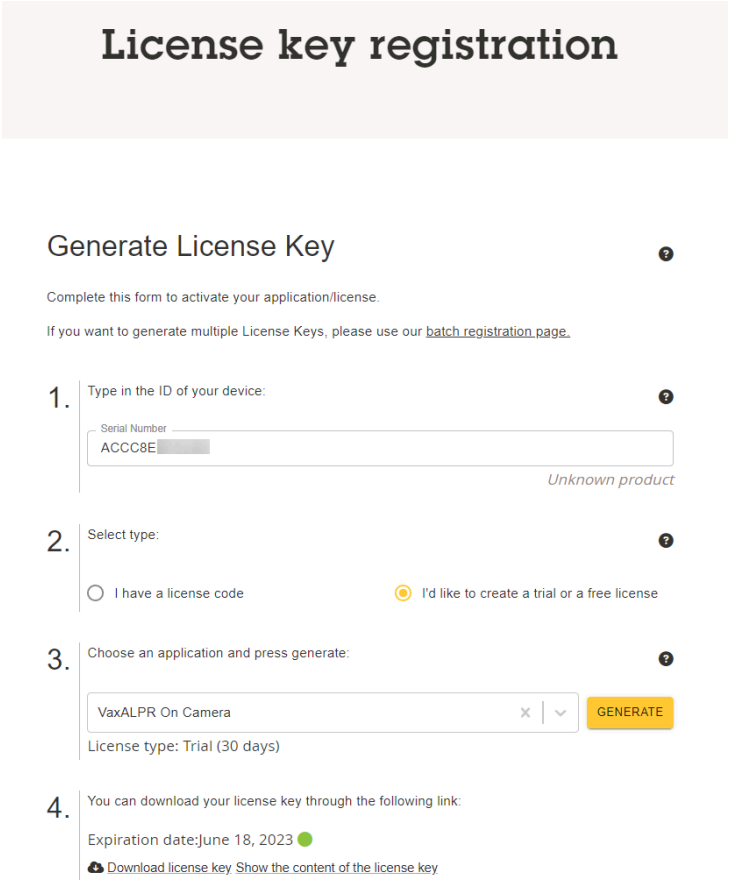
The VaxALPR On Camera software requires a license key. Whether you need a 30 day trial license or already have a paid-for permanent license code.

2.5.1. Getting a 30-Days Trial license

Visit Axis License Key registration website:

https://www.axis.com/support/license-key-registration#/registration

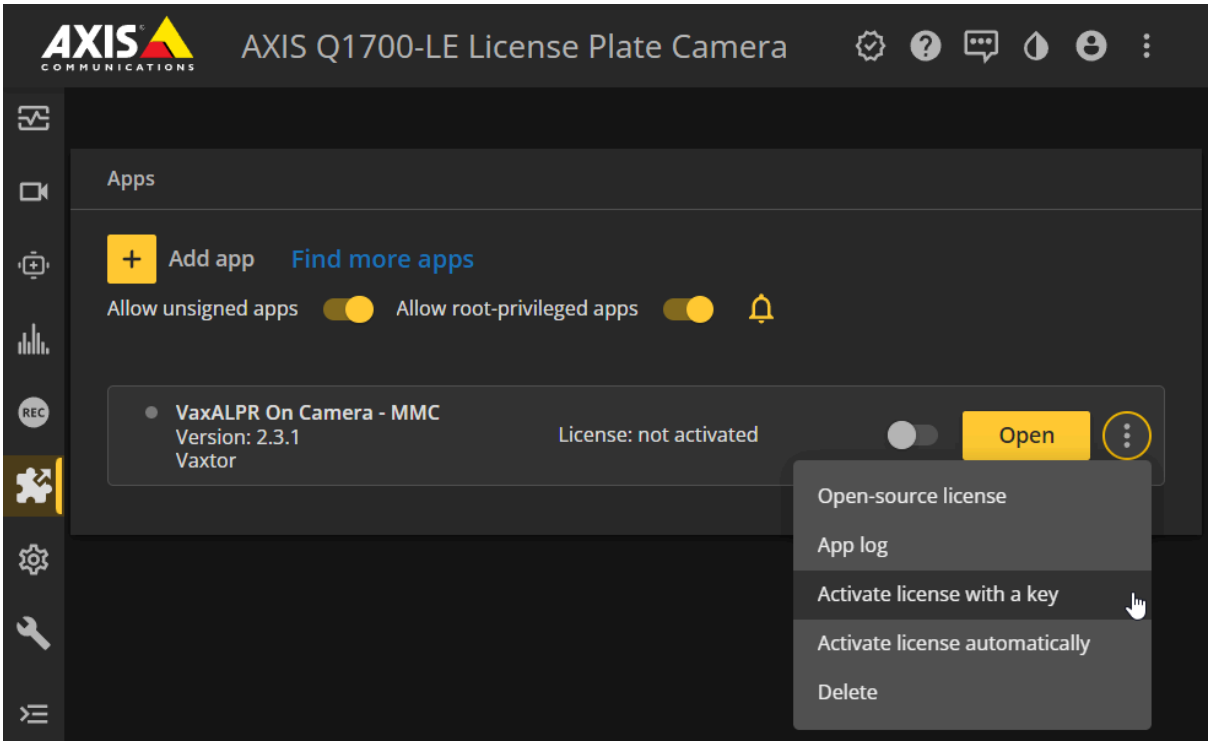
1. Enter your camera **Serial Number**
2. Select **I'd like to create a trial or a free license**
3. Pick the **VaxALPR On Camera** application and click **Generate**
4. Download the **.key license file** and upload it to your camera using the **Activate license with a key** option available in the application Menu



2.5.2. Activating the License

There are two methods for activating a license:

- **Online/Automatic**: This method uses a license code and requires the camera to have an internet connection.
- **Offline/Manual**: This method uses a .key license file and does not require an internet connection.



By following the below steps, you can ensure that your application is properly licensed and ready for use.

2.5.2.1. Online Activation

Online activation is the fastest and easiest method. Follow these steps:

1. Navigate to the "**Apps**" screen in the camera's web interface.
2. Click the three-dot icon on the right side of the application's row and select "**Activate license automatically**."
3. Enter the product code provided by Vaxtor.
4. Click "**Activate**."

2.5.2.2. Offline Activation

Offline activation is suitable for cameras without an internet connection. It requires a **.key license file**, which can be obtained from the Axis website getting a trial or using a perpetual license code provided by Vaxtor. Follow these steps:

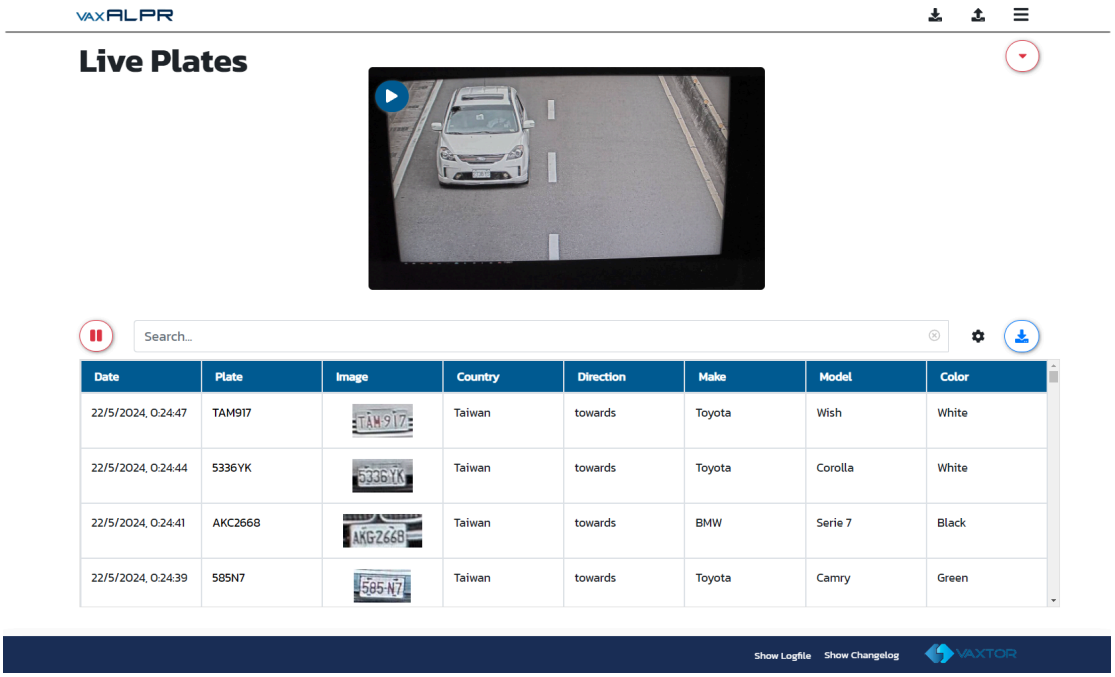
1. Obtain the **.key license file** from the Axis website by entering the provided license code.
   https://www.axis.com/support/license-key-registration#/registration

2. Navigate to the "**Apps**" screen in the camera's web interface.
3. Click the three-dot icon on the right side of the application's row and select "**Activate license with a Key.**"
4. Select the **.key license file**.
5. Click "**Activate**."

3. User Interface Description

3.1. Getting Familiar with the User Interface

The user interface of the **VaxALPR** application has been designed to maintain a consistent and uniform layout across all screens divided into four main sections: the **Title Bar**, the **Body Content** of the screen, the **Footer**, and the **Menu**.



Title Bar

The **Title Bar** is located at the top of each screen and contains the application logo, the icon to open the menu, and two additional buttons for downloading and uploading the application configuration.

Body Content

The **Body Content** is the main area of the screen where the primary content and interactive elements are displayed. This section varies depending on the specific screen you are viewing (e.g., Live Plates, Settings, Reporting, etc).

Footer

The **Footer** is located at the bottom of each screen and includes two links to display the **Logfile** and the **Changelog** of the current version, as well as the Vaxtor logo.

Menu

The **Menu** expands on the right side of the screen and provides navigation links to the different screens of the application, allowing users to switch between **Live Plates**, **Settings**, **Reporting**, **Lists**, and **Database** screens with ease.

3.2. Screen Layout and User Interface Navigation

3.2.1. Title Bar

Below is an overview of the button functionalities included in the **Title Bar**:

VAXALPR

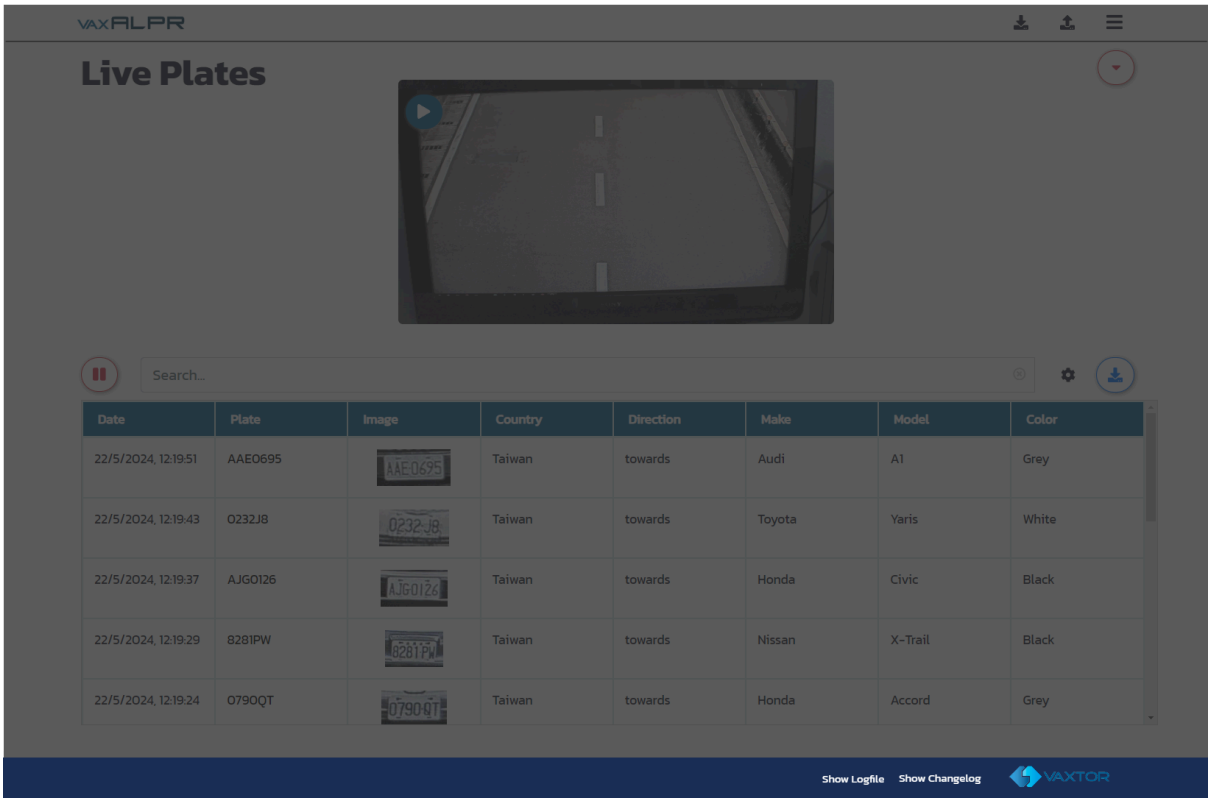
The **VaxALPR** logo has two functions:

1. Right-clicking it navigates to the **Live Plates** screen.
2. Hovering the mouse over it displays the current installed version.

Right-clicking the three lines button shows the **Menu**.

The **Download Config** and **Upload Config** buttons allow the user to export and import the application configuration in XML format. The filename follows this structure: **<cameraIP>.config.xml** (e.g., **192.168.0.49.config.xml**).

3.2.2. Footer



Below is an overview of the functionalities included in the **Footer**:

Right-clicking the **Vaxtor** logo it navigates to the **Live Plates** screen.

The "**Show Logfile**" link displays the log content in a floating window.

The "**Show Changelog**" link shows a popup with the changes included in the current version.

3.2.3. Menu

Below is an overview of the five main screens that can be accessed from the Menu and their functionalities:

Live Plates — The **Live Plates** screen displays real-time video feed and the latest ALPR results.

Settings — The **Settings** screen allows the user to adjust the ALPR parameters, configure additional analytics, set video preferences, and modify other general application settings.

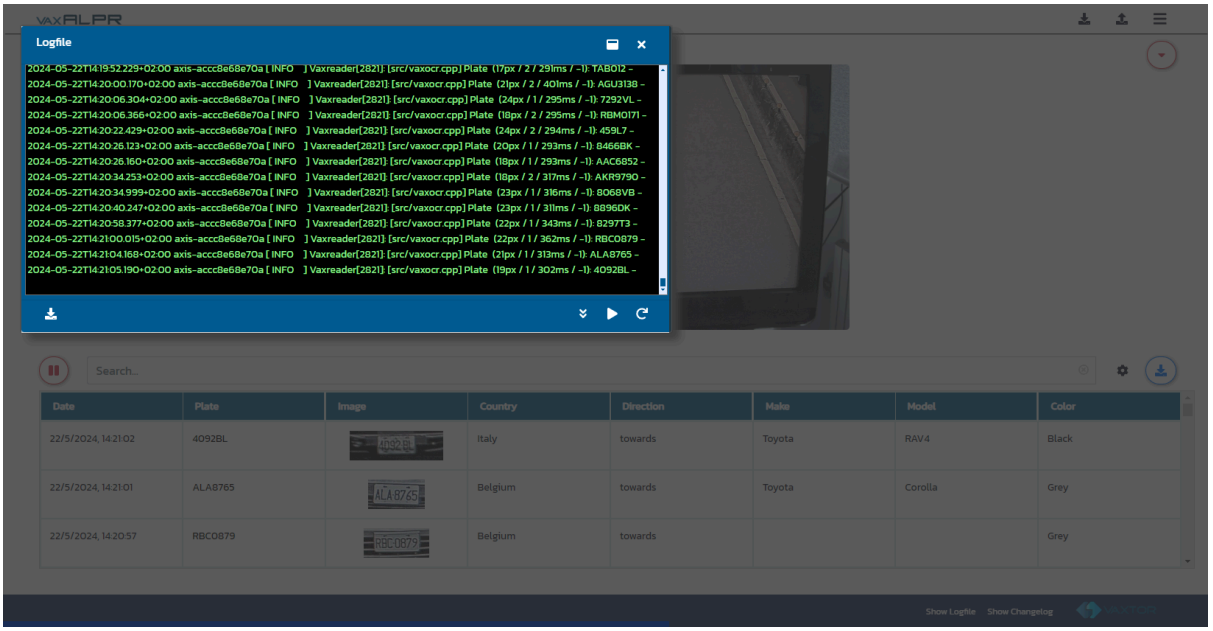
Reporting — On the **Reporting** screen, the user can manage data outputs to external servers and set up local data persistence.

Lists — The **Lists** screen is where the user can manage the blacklist and whitelist.

Database — The **Database** screen provides access to the local database, allowing the user to query and review stored records.

Note: **Database** is only available if it is set in the Persistence settings

3.2.4. Logfile



When the user clicks the **Show Logfile** link in the **Footer**, a floating window appears displaying the log content. If the user clicks the **Logfile** window title, it moves following the cursor, and when the user clicks again, the window becomes fixed in place.

Below is an overview of the button functionalities included in the **Logfile** window:

At the top right corner there are two buttons for:

Closing the **Logfile** window.

Maximise / **Restore** the window size.

At the bottom right corner there are three buttons for:

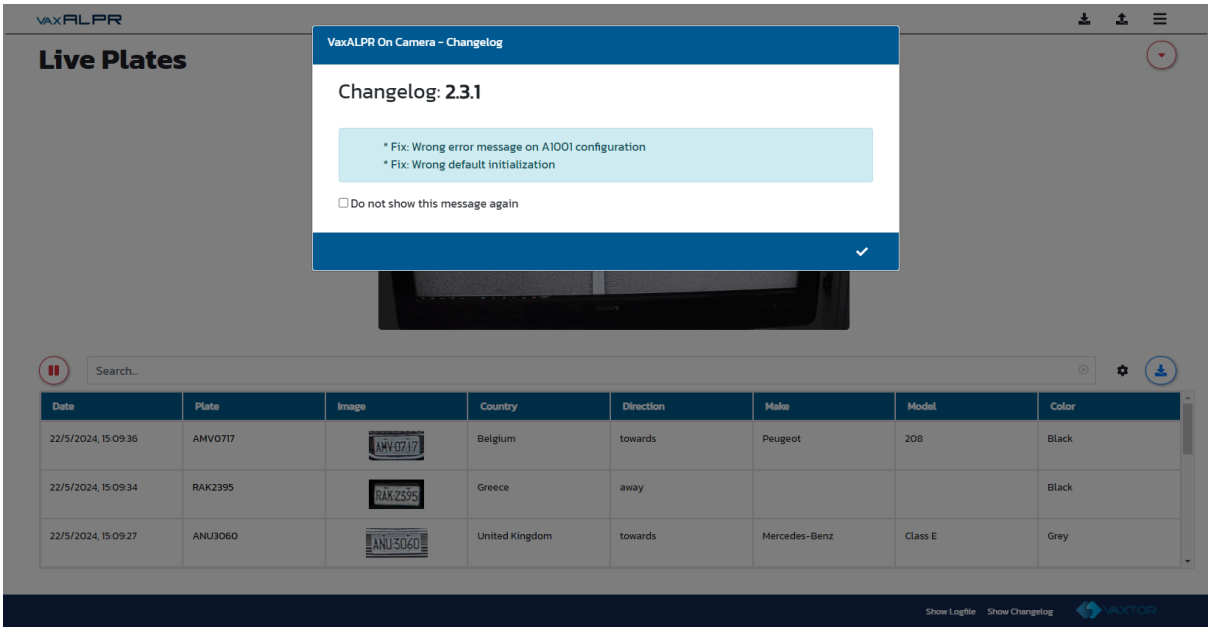
Refresh the **Logfile** content.

Activate / **Pause** the Auto refresh content.

Scroll down to the end of the **Logfile** content.

At the bottom left corner there is a button to **Download** the **Logfile** content into a TXT file.

3.2.5. Changelog

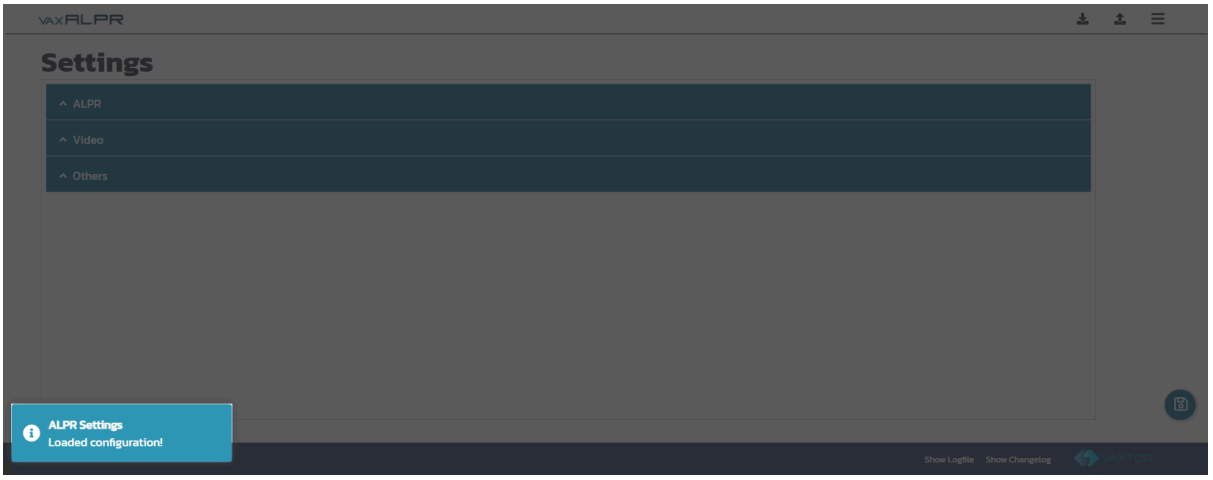


When the user clicks the **Show Changelog** link in the **Footer**, a popup window appears displaying the changes included in the currently installed version.

This window is automatically shown every time the user accesses the application. To prevent this, the user can check the option **Do not show this message again**. This will prevent the changelog from appearing until a new version is installed.

3.2.6. Application User Feedback

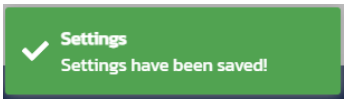
The application's user interface displays messages to inform the user about the status of their actions.



These messages are displayed at the bottom left side of the screen and can be of various types:

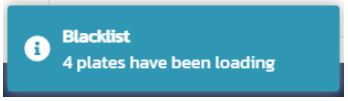
Confirmation Message

These messages are displayed in green and inform the user that their action has been successfully completed. For example, when a user saves the application settings, a confirmation message saying "**Settings have been saved!**" is displayed.



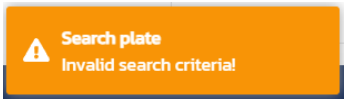
Informative Message

These messages are displayed in blue and provide information to the user about the application or their action. For example, when a user accesses the list management, a message is shown informing them how many records have been loaded into the list.



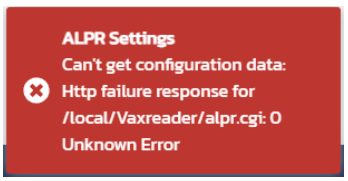
Warning Message

These messages are displayed in yellow and warn the user about something that may affect the application's functionality or the desired outcome. For example, if the filter search criteria are not correct.

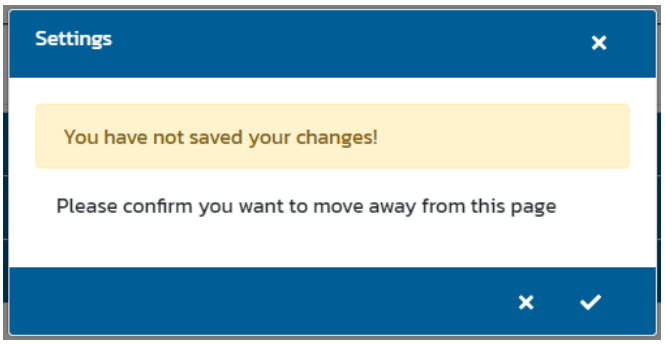


Error Message

These messages are displayed in red and inform the user that an error has occurred and provide a brief description of the error. For example, if the user settings could not be loaded correctly.

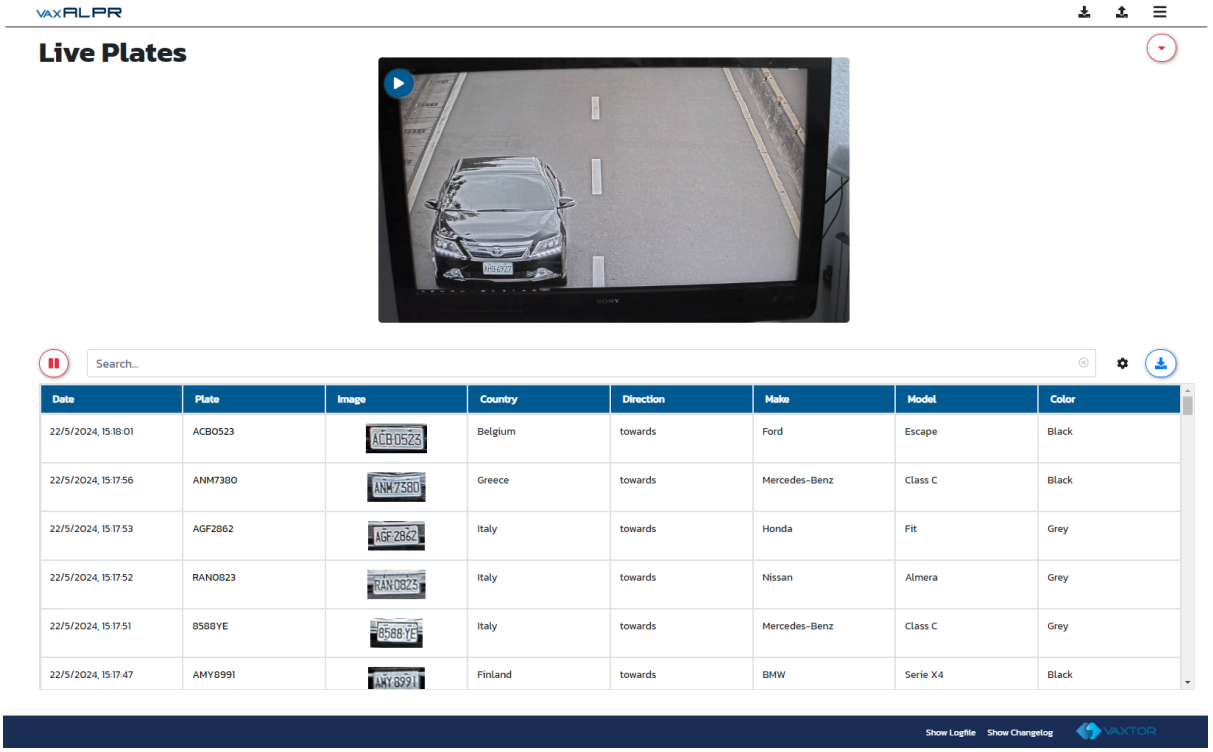


A warning message will appear if the user modifies the settings and leaves the screen without saving the changes. This warning is shown on both the **Settings** and **Reporting** screens.



3.3. Main Screens

3.3.1. Live Plates



Live Plates screen consists of two main elements: the real-time video player and a table showing the latest results obtained.

The user can interact with the real-time video by hiding, playing, or pausing it. Additionally, the user can view the latest results in the table, enable or pause auto-refresh to display the newest results automatically, filter through the latest results, and view the details of a specific record by clicking on the row in the table for that record result, which will bring up the **Plate Detail** window.

The columns in the results table can be adjusted to show more or fewer details according to the user's preference.

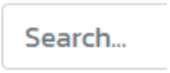
A CSV file can be downloaded with the results visible in the table. These results have accumulated since the application was opened in the browser and may not match the ones stored in the database, which could contain more entries.

Below is an overview of the button functionalities included in the **Live Plates** screen:

At the top right corner of the screen the button allow the user to **Hide** / **Show** the Video Player

At the top left corner of the Video Player the user can **Play** / **Pause** the video feed.

At the top left side of the results table the user can control the **Auto Refresh** functionality for showing the newest result automatically.



At the top of the results table there is a Search field that allows the user to filter the results visible in the table.

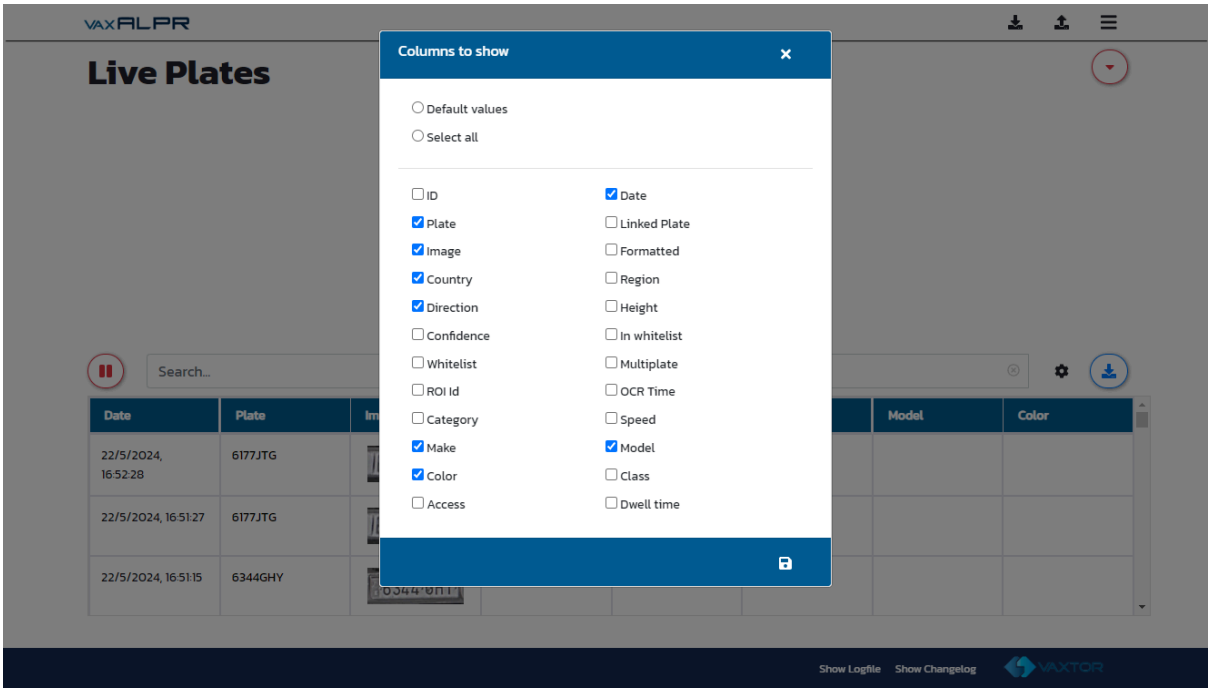
The live search will search across all text fields and filter as the user types.

Note: these results are live results and might not match with the results stored in the database.

At the top right side of the results table there are two buttons for:

- **Tailor** the columns to display in the results table.
- **Download** the results visible in the table into a CSV file.

3.3.1.1. Adjusting the Columns to Show in the Live Results Table



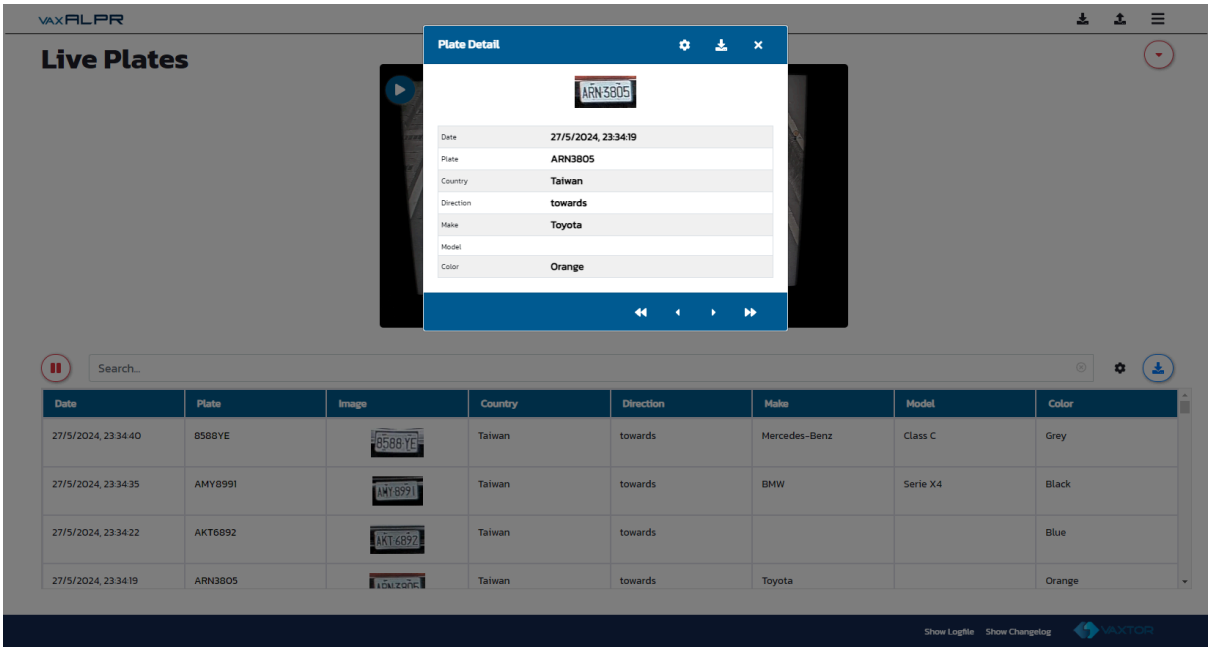
The user can choose which columns to display in the **Live Results** Table, allowing them to tailor the displayed information to their needs.

To make adjustments, the user should click on the gear icon in the top right corner of the results table.

In the pop-up that appears, the user can select the columns to display. In addition to the tailored selection there are options to display the **Default values** or **Select all** available columns.

Once the user has selected the desired columns to display, they should click on the save button

3.3.1.2. Viewing the Plate Details for a Specific Result.



The user can view the details of a specific ALPR result in the **Live Plates** table by clicking on the row for the desired result. This will bring up the details of the captured license plate, allowing the user to see the image of the plate and the ALPR details of the result.

The user can tailor which details are displayed to suit their needs, navigate between different records and download the image.

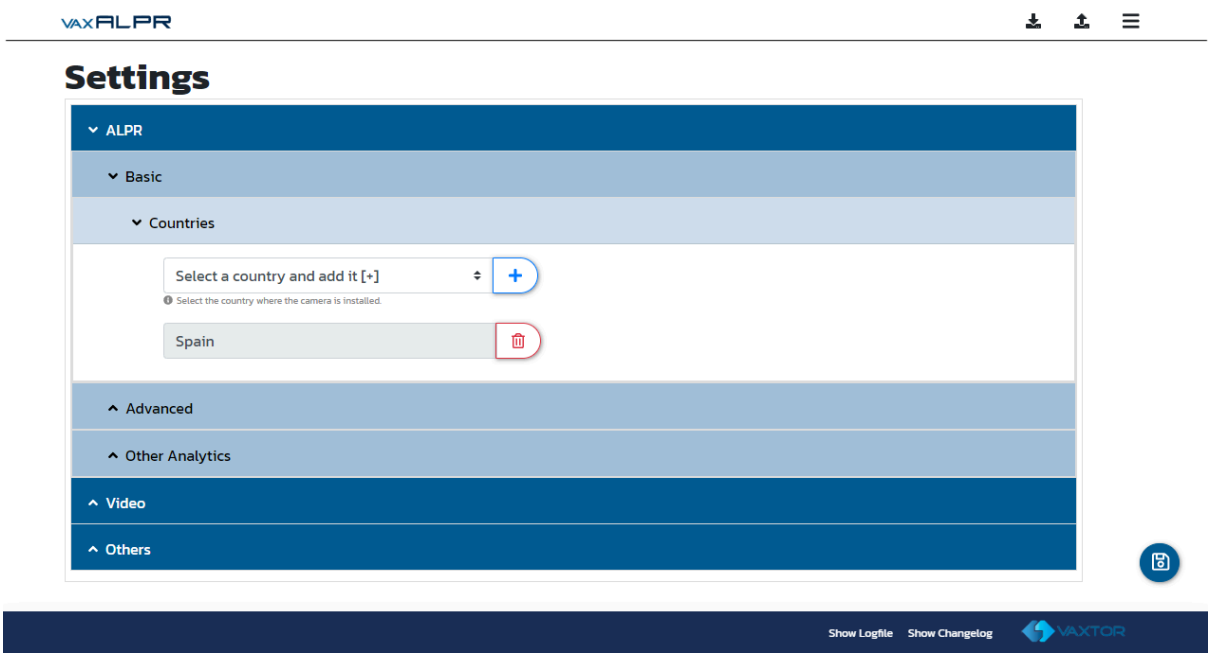
Below is a description of the available controls in the **Plate Detail** window

At the top right corner of the window the gear icon will open the Fields to show selector, where the user can adjust the fields they want to display on the **Plate Detail** window. In addition to the tailored selection there are options to display the **Default values** or **Select all** available fields.

At the top right corner of the window the download icon will download the current register plate image.

At the bottom side of the window there is a navigation bar allowing the user to easily move along the results.

3.3.2. Settings

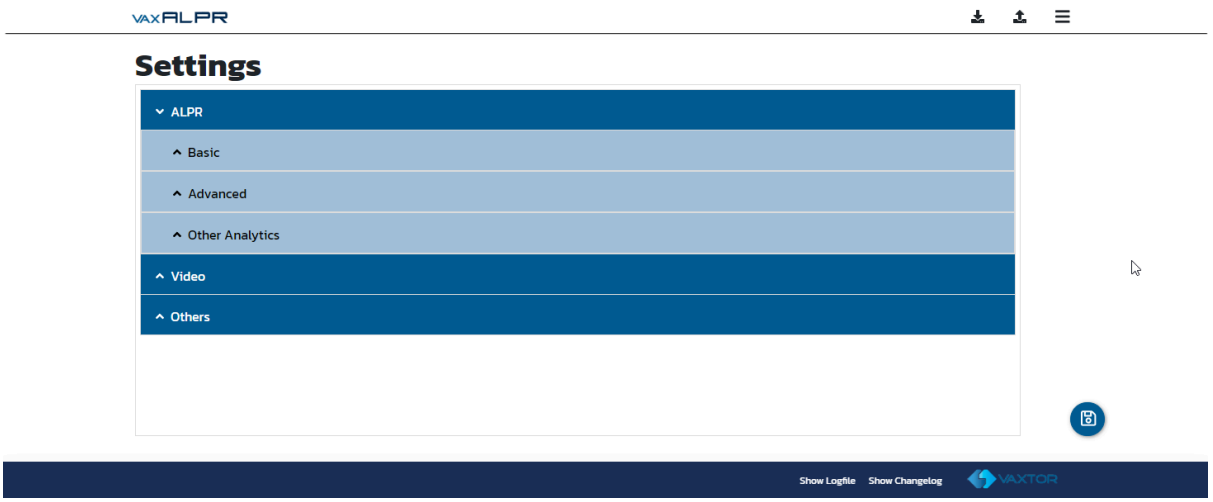


The **Settings** screen is structured in expandable or collapsible blocks that group together various settings. It allows the user to make necessary adjustments to configure ALPR analytics, video settings, and other preferences.

Once the user has made the desired modifications, they can confirm and save the changes by clicking the save button 

Bellow is a detailed description of every block and parameter adjustable:

3.3.2.1. ALPR Settings



3.3.2.1.1. Basic

3.3.2.1.1.1. Countries

At least one country must be selected. Except in special scenarios, it is not necessary to include more than one country. The selected country should be where the camera is installed or the country with the highest prevalence among the license plates to be detected. The OCR engine will automatically detect and recognize license plates from the same region as the selected country. E.g. If Spain is selected, the OCR engine will be able to recognize plates from more than 40 countries in the European region.

- 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.

3.3.2.1.2. Advanced

Working Mode

The OCR Engine can operate in two working modes, **Free flow** and **Signaled**:

Working Mode	**Free flow**	The system continuously analyzes the video and reports the license plates when detected. This is the normal mode of operation.
	Signaled	The system only analyzes one frame from the video when a trigger is received.
	Free flow & Signaled	Both working modes run simultaneously.
Multiplate recognition timeout (0-2000 ms)	Only visible if **Free flow** mode is enabled. The maximum recognition period to provide a result since the license plate is read for the first time.	
Multiplate minimum number of occurrences	Only visible if **Free flow** mode is enabled. Minimum number of times the license plate should be read within the maximum recognition period before providing the result.	
Multiplate maximum number of occurrences	Only visible if **Free flow** mode is enabled. Maximum number of times the license plate should be read within the maximum recognition period. If this value is reached before the maximum recognition period has elapsed, the OCR engine will force the result to be output.	
Virtual Port?	Only visible if **Signaled** mode is enabled. If active, the specified **Port** must be virtual.	
Port	Only visible if **Signaled** mode is enabled. Port whose status is monitored. When Port status is active, a frame is captured for processing. The rising edge is detected.	
Consecutive Trigger Ignore Time (0 - 5000 ms)	Only visible if **Signaled** mode is enabled. Time during which new triggers are ignored. Prevents signal bounce.	
Delay (ms)	Only visible if **Signaled** mode is enabled. Wait time from when the signal is received until the frame to be processed is captured.	
Signaled send only one result	Only visible if **Signaled** mode is enabled. If active, only the most confident value is reported.	
Signaled send NONE	Only visible if **Signaled** mode is enabled. If active, NONE is reported as Plate Number when the triggered reading finds no result.	

Check **Working on Signaled Mode** section for further details.

Plate Mode

Allows the user to choose how the OCR displays results when working with license plates that include special characters.

Plate Mode	**Plate in UTF8**	The license plate is displayed exactly as it appears in reality.
	Plate in ASCII	The plate is displayed with characters adapted to their corresponding ASCII values.
	Plate formatted	The plate is displayed in a human-readable format, including specific characteristics of the countries involved in this mode.

Check **Working with License Plates including Special Characters** section for further details.

OCR Engine Trade Off

This is the analytics load the OCR engine uses to detect and read a license plate. The possible values are:

Speed (faster)	Favors speed over detection rate, providing faster processing. Cannot read plates with 2 or 3 characters.
Balanced	The recommended setting for most scenarios. Can handle plates with 3 or more characters.
Accuracy (slower)	Prioritizes detection rate and accuracy, with slower processing. Can read plates with 2 or more characters.

The accuracy rates among the different levels are small whereas the detection rates become more noticeable, specifically with bad quality images.

The OCR complexity rate affects the capacity of reading small plates (like plates with only 2 or 3)

Enter-Exit mode

There are two special modes than can be activated, **Dwelling** and **Link Mode**:

Disabled	No special mode running.
Dwelling	Calculates the time of stay for a vehicle that remains visible.
Link Mode	Links two related license plates read consecutively. The possible relationships are standard **license plate + ADR** and **truck license plate + trailer license plate**. The two readings are stored in a single record in the database.
Dwelling timeout (sec)	Only visible if **Dwelling** mode is enabled. The elapsed time since the last plate was read. If the vehicle is "unseen" for more than "timeout" seconds the OCR engine considers such vehicle has left the scenario.

Dwelling time or time of stay is the period a license plate remains visible and readable to the OCR engine.

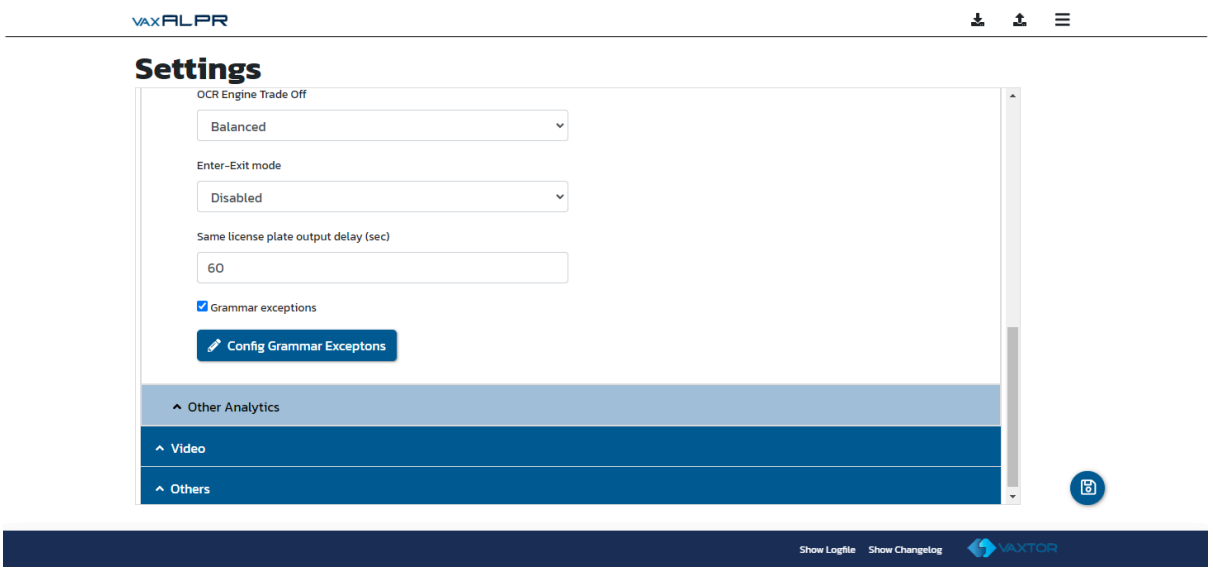
When this feature is enabled the OCR engine may return two plate results per vehicle:

1. The first time the vehicle enters the scenario.
2. The last time the vehicle is seen/read in the scenario after the timeout. This result will include the "dwelling time" or time difference between the last and the first read.

Same license plate output delay (sec)

Sets how often a license plate that remains visible generates a new result.

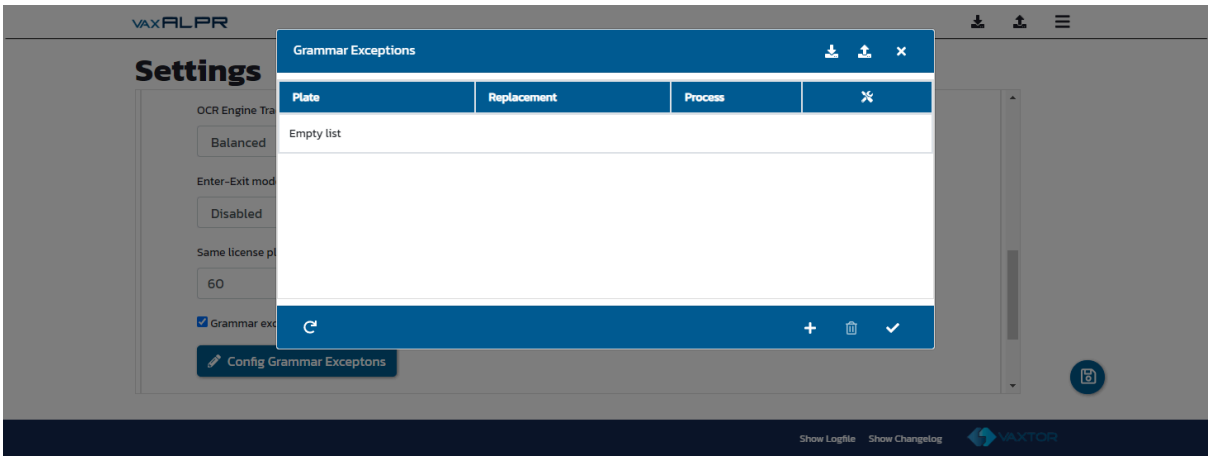
Grammar exceptions



The OCR engine allows the user to “force” and accept, reject, or modify the results of some plates.

Grammar Exceptions allows the user to define the rules that will process the output results.

The user can access the rule editor by clicking the "**Config Grammar Exceptions**" button. In the window that appears, the user can **add** or **edit** entries, as well as **export** and **import** records in bulk or **delete** an individual or all defined rules.



Below is a description of the control available in the **Grammar Exceptions** window

At the top right side of the window there are two button for export and import the Grammar Exceptions in CSV file format.

At the bottom left side of the windows there is button to reload the items.

At the bottom right side of the window there are three buttons for **Add** a new item, **Clear All** the items and **Accept** the changes and close the window.

Remove an individual item.

Adding a new item

When adding a new entry, the available options are:

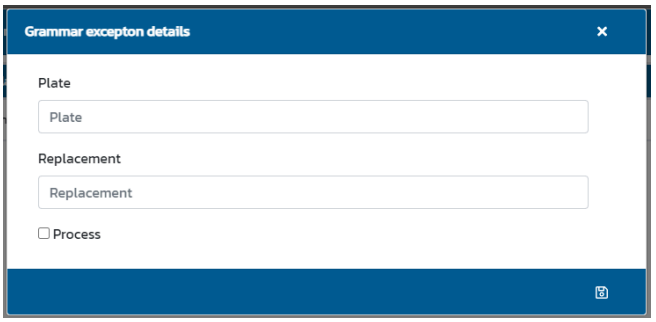


Plate The license plate number to be evaluated.

Replacement Optional. The value to replace the evaluated license plate.

Process If enabled, the evaluated license plate is processed and replaced with the specified **Replacement** value. If not enabled, the evaluated license plate is ignored, not shown in the results, not stored, and not logged in the logfile.

The user can **Save** the item clicking in the save button 

Edit an item

To edit an item the user must click in the row of the item and this will bring up the **Grammar exception details** windows.

Import and Export items in batch

The user can import and export multiple items from the lists using CSV files.

The file format is the same for both the exported files and the files that can be imported.

Below is a sample file content and the description of each column:

Sample file:

```
PLATE       REPLACEMENT           PROCESS
1234ABC                           false
11ABC11     11ABC22               true
```

Sample CSV content:

```
PLATE;REPLACEMENT;PROCESS
7491MDY;;false
11ABC11;11ABC22;true
```

3.3.2.1.3. Other Analytics

3.3.2.1.3.1. Vehicle Analytics

Enable Vehicle Analytics

The OCR engine can provide extra **Vehicle Analytics**:

Vehicle Make, Model and Color	Identifies Make, Model and Color of the license plate' vehicle. Color can return the following values: Beige, Black, Blue, Brown, Golden, Green, Grey, Orange, Red, Violet, White, Yellow
Vehicle Pose	Identifies if the vehicle is seen from the front or rear. It might help to correct the vehicle's direction if necessary.
Vehicle Classification	Identifies the Vehicle Class and can return the following values: Bus, Car, Minivan, Motorcycle, Pickup, SUV, Truck, Van

These analytics involve heavy OCR processing so do not activate if you don't need them.

3.3.2.1.3.2. Filter OCR Result by Vehicle Motion Direction

Filter by vehicle direction causes the OCR Engine to report only the license plates from vehicles matching the direction of travel defined by the filter.

The available filters are:

- Report vehicles moving away
- Report vehicles approaching
- Report vehicles stopped
- Report vehicles with unknown direction

3.3.2.1.3.3. Special Plates

Enable ADR

If active, the OCR Engine will output ADR plates (Dangerous goods). This feature requires an additional license.

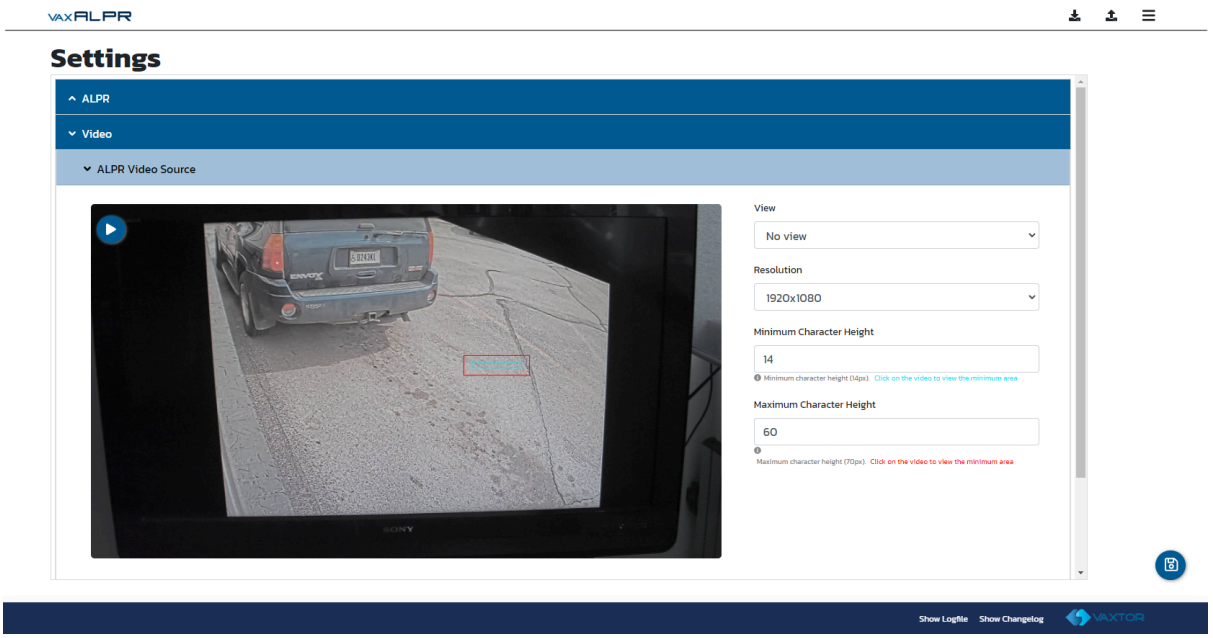
3.3.2.1.3.4. Speed

This feature requires an additional license and allows for the calculation of the instantaneous speed of a vehicle passing by the camera. To obtain an accurate result, the setup and position of the camera must meet a series of requirements described in the section **Instant Speed Analytics Guidelines**

Store Calibration	If active, the Speed analytics calibration will be stored after it is completed.
Delete Calibration	If active, the stored calibration will be removed after submitting the settings and the control becomes inactive automatically.
Sensor Width (mm)	Camera sensor Width in millimetres.
Sensor Height (mm)	Camera sensor Height in millimetres.
Camera Height (m)	Camera height in meters from the ground.
Camera Lane Distance (m)	Perpendicular distance from the base of the pole to the center of the road in meters.
Camera Tilt Angle (0-45)	Vertical tilt angle of the camera.
Minimum Focal Length (mm)	Minimum focal lengths for the camera
Maximum Focal Length (mm)	Maximum focal lengths for the camera
Zoom Level (0-100)	Zoom level applied to the camera. Where 0 is the minimum and 100 the maximum level.
Speed Factor (m)	Correction factor applied to the detected speed to adjust the result.
Minimum Tracking Time (ms)	Minimum tracking time between license plate samples.
Units	Pick between Kph or Mph

3.3.2.2. Video Settings

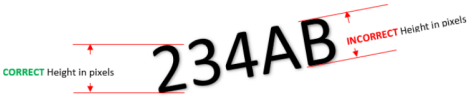
3.3.2.2.1. ALPR Video Source



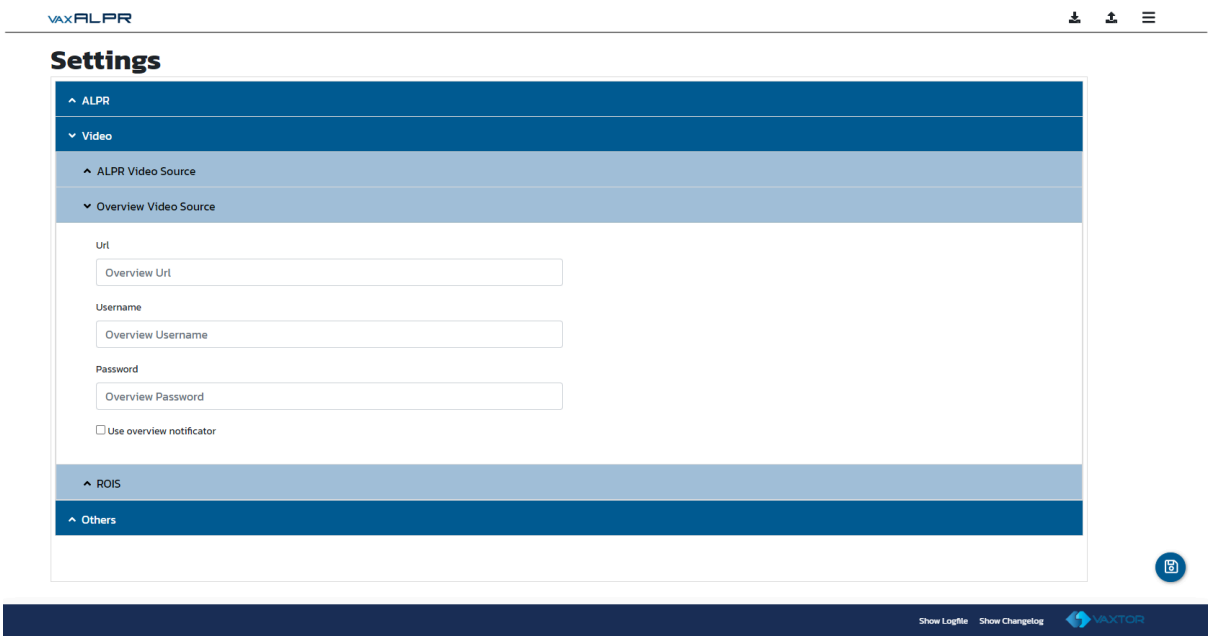
ALPR Video Source settings allow the user to configure the main ALPR video feed, including the view area to be analyzed, the working resolution, and the minimum and maximum license plate character pixel height.

View	A view area is defined as a separate view from the camera view and can take up either the full or parts of that view. The user can choose to use No View or a specific View
Resolution	Resolution at which the OCR will load and process the ALPR video.
Minimum Character Height	Minimum license plate character height recognized, measured in pixels. Being 14px the minimum value.
Maximum Character Height	Maximum license plate character height recognized measured in pixels. Being 70px the minimum value.

To verify height settings, the user can click on the video to display two rectangles representing the minimum and maximum thresholds. The license plate character height should fall within these rectangles, which can be dragged to the target plates' position. Character height is measured in pixels, from the top to the bottom pixel. Be cautious with angled plates.



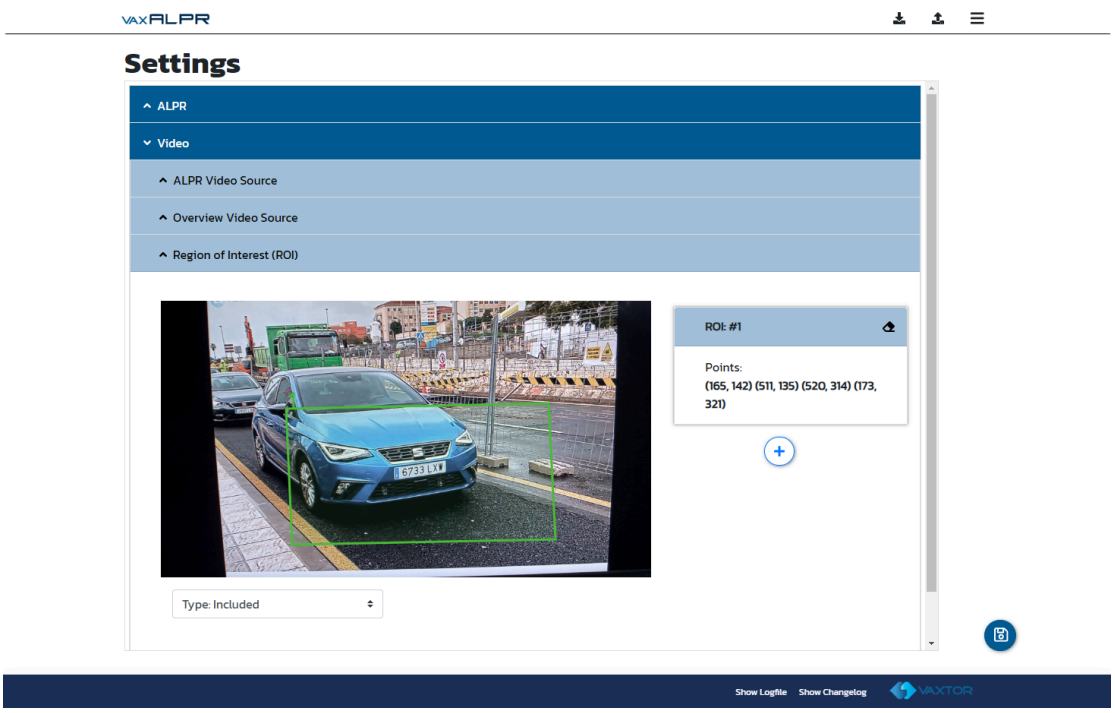
3.3.2.2.2. Overview Video Source



Overview Video Source setting allows the user to capture images from a second camera at the moment a license plate is detected by the ALPR camera, linking both images to the same result. The associated camera must have the **VaxOverview** application installed, be time-synchronized, and have a network connection to the ALPR camera.

Url	URL that connects to the Overview application. URL has this shape: **http://<camera_ip>/local/Overview**
Username	Username on the Overview camera
Password	Password on the Overview camera
Use Overview notificator	If active, the overview image is sent from the overview camera using its notification settings. If not active, the ALPR collects the overview image and output using its own settings.

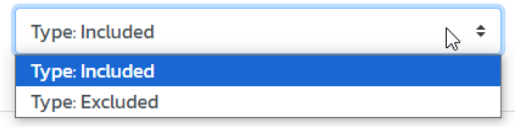
3.3.2.2.3. Region of Interest (ROI)



The **Region of Interest** (ROI) allows the user to define an area within the image where the OCR analytics takes place in both directions: inclusion or exclusion.

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 only common to distinct results from each lane on a double lane scenario.

To adjust the ROIs, the user must first choose between Included or Excluded type (Both types cannot be defined simultaneously). The control to adjust it is available below the video



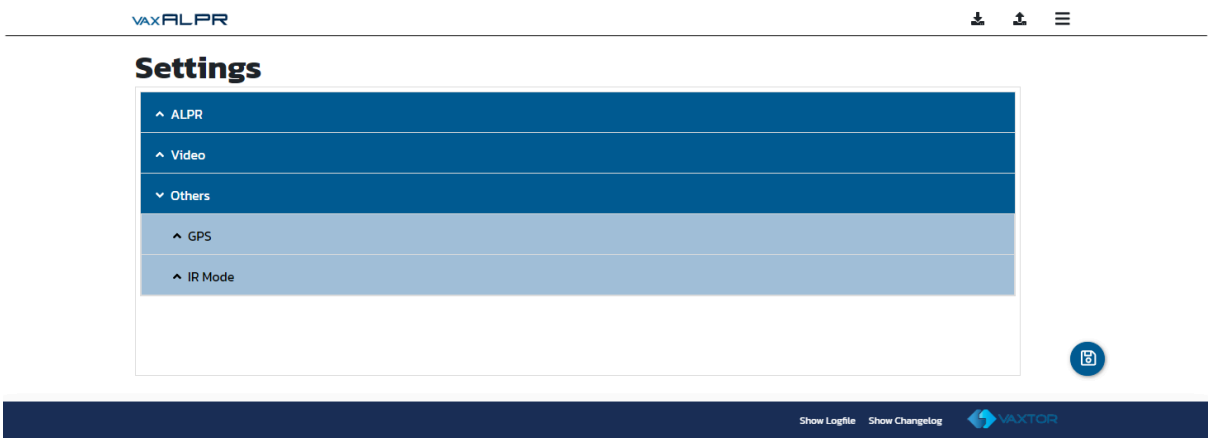
To start drawing a ROI click the add button and click in the video to define the desired area. While editing the ROI the polygon remains in blue colour and the user has the following options:

Confirm the ROI. Clear the current polygon. Cancel the ROI editing.

A list of active ROIs will be shown at the right side of the video. The user can remove a created ROI by clicking the remove button on each ROI details box title.

Once the user has made the desired modifications, they can confirm and save the changes by clicking the save button

3.3.2.3. Others Settings



3.3.2.3.1. GPS

If active, the application will listen for **GPS** information on the specified port.

The coordinates gathered will be used as the location latitude and longitude for the next ALPR result.

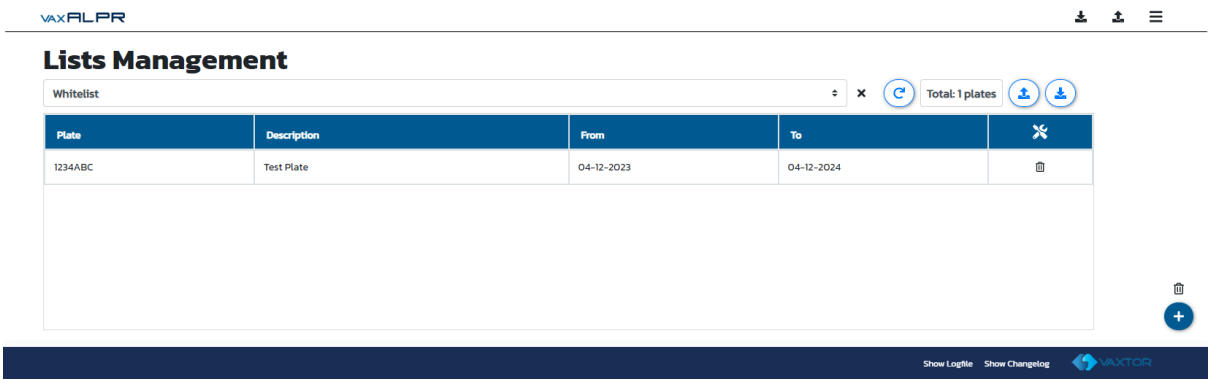
The application filters **NMEA GGA** messages arriving, so any device or system providing this kind of TCP message can feed **GPS coordinates** into the application.

3.3.2.3.2. IR Mode

The **IR Mode** forces the OCR Engine to process the video excluding the colour information, which might improve the processing time.

If active, the results will output in grayscale, even if the video feed is in colour.

3.3.3. List Management



The **List Management** screen allows the user to adjust the **whitelist** and **blacklist** that will generate the associated events when a license plate included in the lists is detected.

NOTE: This screen will not be available if **Helix** list synchronization is enabled in the **Reporting** settings. This is to prevent errors and to ensure privacy and security of the list contents.

The first step is to select the list the user wants to work with using the list selector located below the page title. The user can choose between the whitelist and the blacklist. The screen will display the items in the selected list when it is active and contains items. Otherwise, it will show "**Empty list**" or **"Disabled list.**"

The available actions on this screen are:

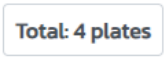
- **Select** list to manage.
- **Enable** or **Disable** the list monitoring.
- **Add**, **Edit** or **Remove** a single item into the list.
- **Clear All** the items in the list.
- **Export** all the items into a CSV file.
- **Import** a CSV file containing items.
- **Show** total items in the list.

At the right side of the list selector the user can **Enable** or **Disable** the list monitoring.

 Disable list monitoring.

 Enable list monitoring.

Refresh the list content.



Total items registered in the list.

Import and Export the list items in CSV format.

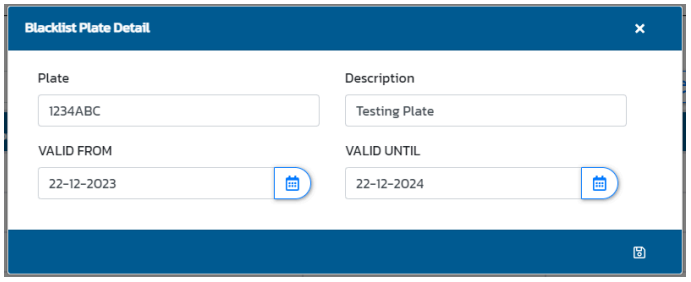
Remove individual or all list items.

Add an individual item manually.

3.3.3.1. Managing individual list items

The user can **add**, **edit**, and **delete** individual list items.

To **add** an item, the user must click the "Add Item" button and fill in the details of the item in the form that appears.



The details to fill in are:

Plate The license plate number, which can include numbers, letters, and spaces to accommodate plates with special characters. See **Working with License Plates including Special Characters**

Description A description associated with the license plate.

Valid From The start date from which the detection of the license plate will generate the associated event.

Valid Until The end date until which the detection of the license plate will generate the associated event.

Once all fields are filled out, the user can confirm and save the entry by clicking the save button

To **edit** an existing entry, the user must click on the row in the table for that entry, which will bring up the edit form with the same fields described above. After editing the entry, the user can confirm and save the changes by clicking the save button

To **delete** an individual entry, the user must click the delete icon on the right side of the row in the table for the entry they wish to delete. A confirmation message will appear, which the user must accept to proceed.

3.3.3.2. Import and Export List Items in Batch

The user can import and export multiple items from the lists using CSV files.

The file format is the same for both the exported files and the files that can be imported.

Below is a sample file content and the description of each column:

Sample file:

```
PLATE       DESCRIPTION          FROM                        TO
1234ABC     Testing Plate        2023-12-21T00:00:00.000Z    2024-12-21T00:00:00.000Z
12AA345     Testing Plate 2      2023-12-21T23:00:00.000Z    2024-12-21T23:00:00.000Z
M ÜN4689    Plate with spaces    2024-04-22T22:00:00.000Z    2025-04-22T22:00:00.000Z
```

Sample CSV content:

```
PLATE;DESCRIPTION;FROM;TO
1234ABC;Testing Plate;2023-12-21T00:00:00.000Z;2024-12-21T00:00:00.000Z
12AA345;Testing Plate 2;2023-12-21T23:00:00.000Z;2024-12-21T23:00:00.000Z
M ÜN4689;Plate with spaces;2024-04-22T22:00:00.000Z;2025-04-22T22:00:00.000Z
```

Plate The license plate number. It can contain spaces and this will alter the match occurrences.

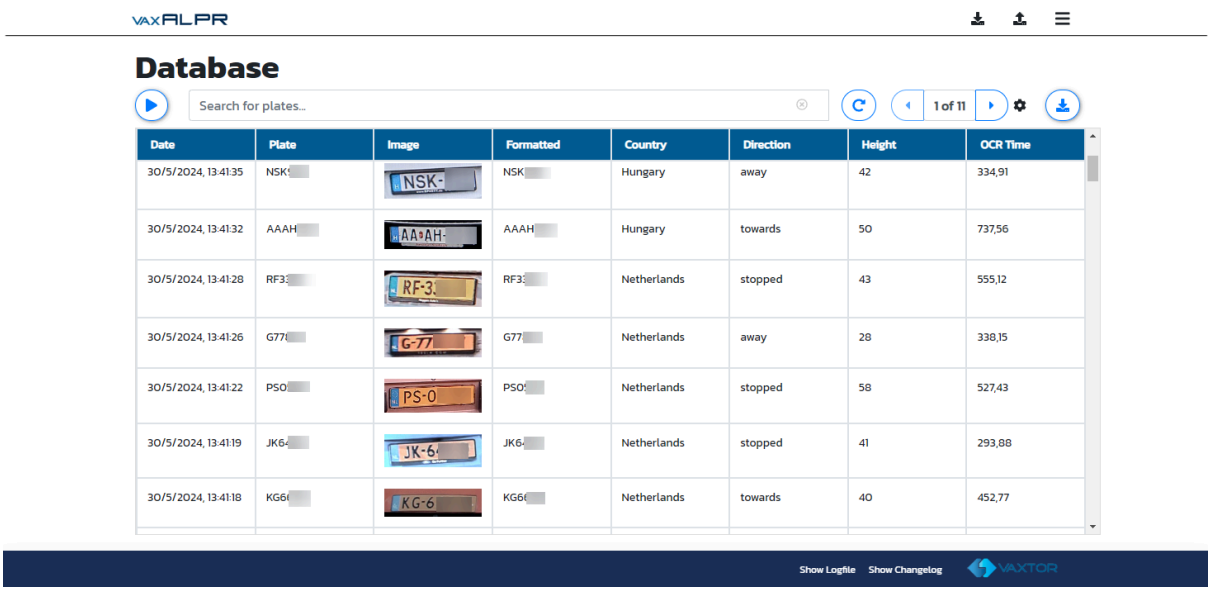
Description A description associated with the license plate.

Valid From Start date in ISO 8601 format from where the associated event will be generated.

Valid Until End date in ISO 8601 format until where the associated event will be generated.

When the user imports a list, all existing records in that list will be deleted before importing the file's content. A confirmation message will appear, and the user must confirm to proceed.

3.3.4. Database



The **Database** screen provides access to the local database, allowing the user to query and review stored records and consists of two main elements: the control bar located just below the page title and the results table at the bottom of the page.

Note: **Database** is only available if it is set in the Persistence settings

The control bar includes the following controls:

Auto-Refresh Toggle: This control allows the user to activate or pause the automatic refresh of the table, ensuring that new results are displayed automatically.

Search Bar: Users can search and filter results using this bar. It supports wildcard characters _ and % to refine search criteria.

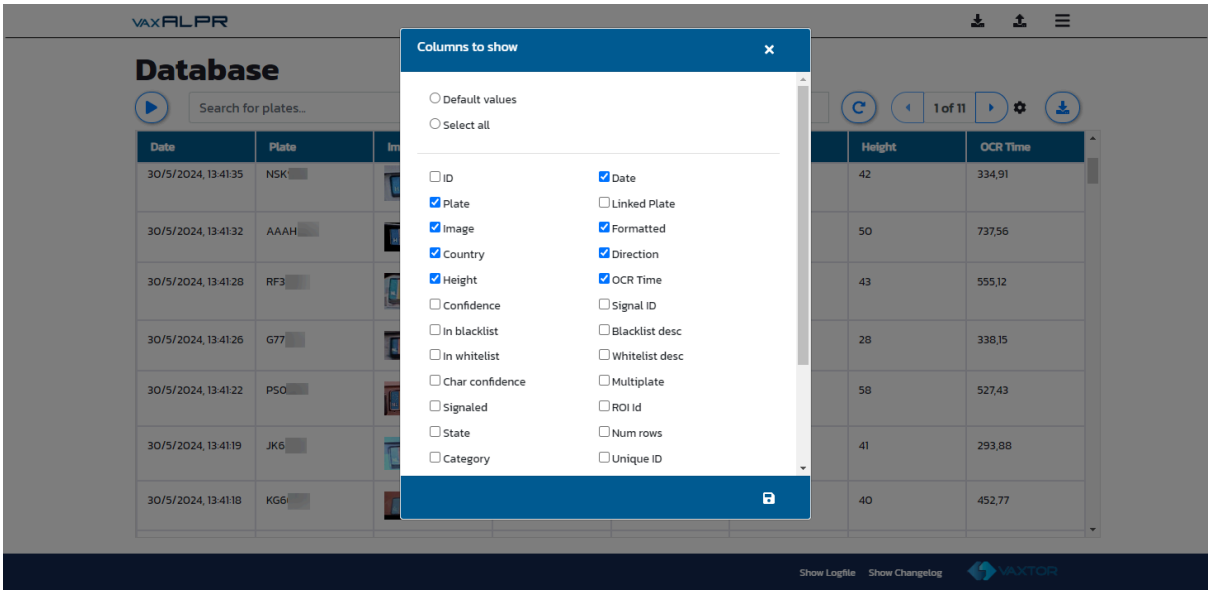
Manual Refresh Button: Clicking this button manually refreshes the table showing newest results.

Pagination Control: This control lets users navigate between different pages. Hovering over the control shows the total number of stored results. Clicking the side buttons navigates between pages, and clicking the page number allows the user to manually enter the desired page number.

Column Adjustment Button: Clicking this button opens the column selection window, where users can choose which columns to display. Users can select a tailored set of columns, display all available columns, or revert to the default column set.

Download Button: This button allows users to download the results displayed on the current page as a CSV file.

3.3.4.1. Adjusting the Columns to Show in the Database Table



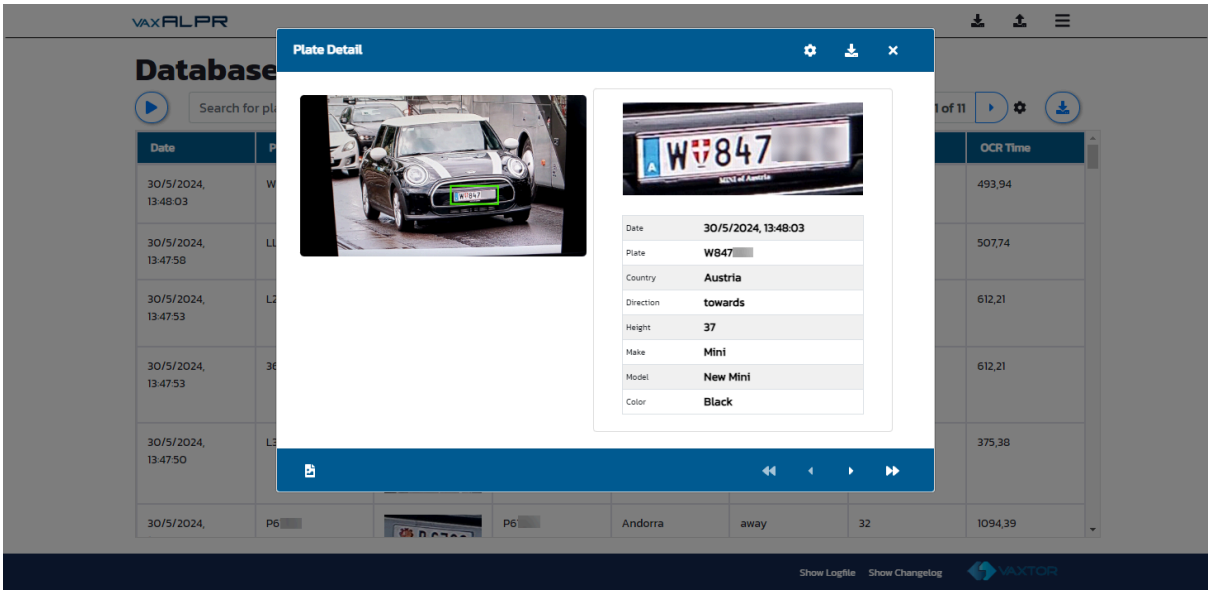
The user can choose which columns to display in the **Database** Table, allowing them to tailor the displayed information to their needs.

To make adjustments, the user should click on the gear icon in the top right corner of the results table.

In the pop-up that appears, the user can select the columns to display. In addition to the tailored selection there are options to display the **Default values** or **Select all** available columns.

Once the user has selected the desired columns to display, they should click on the save button

3.3.4.2. Viewing the Plate Details for a Specific Result.



The user can view the details of a specific ALPR result in the **Database** table by clicking on the row for the desired result. This will bring up the details of the captured license plate, allowing the user to see the full ALPR image and the image of the plate along with the ALPR details of the result.

The user can customize which details are displayed to suit their needs, navigate between different records and download the image.

Below is a description of the available controls in the **Plate Detail** window

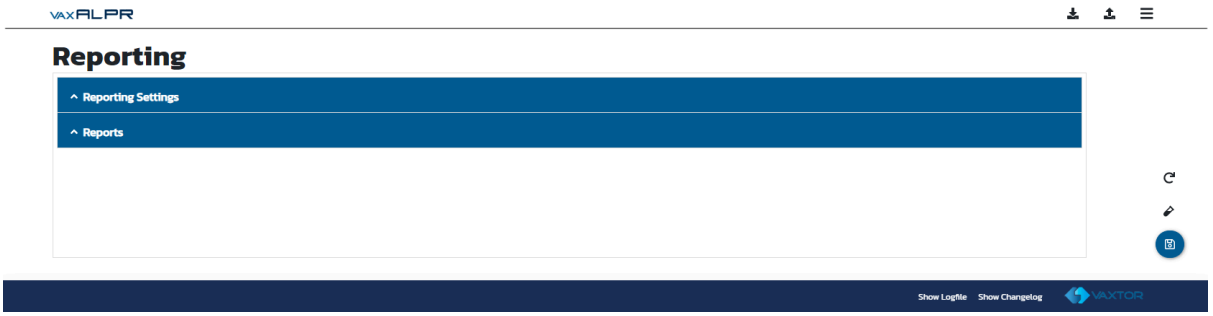
At the top right corner of the window the gear icon will open the Fields to show selector, where the user can adjust the fields they want to display on the **Plate Detail** window. In addition to the tailored selection there are options to display the **Default values** or **Select all** available fields.

At the top right corner of the window the download icon will download the current register plate image.

At the bottom side of the window there is a navigation bar allowing the user to easily move along the results.

If **Store RAW images for debug purposes** is active in the Report settings, there will be an additional button at the bottom left side of the **Plate Detail** window that allows the user to download the RAW image file.

3.3.5. Reporting



The **Reporting** screen allows the user to configure data output. It is divided into two sections:

Reporting Settings Adjust general options for images, data persistence, and more.

Reports Configure data outputs, divided into three sections:

- **Main Reports**: Most frequent Reports.
- **Partner Reports**: Reports from our Partners.
- **Generic Reports**: Other Reports.

At the bottom right side of the screen there are three buttons allowing the user to:

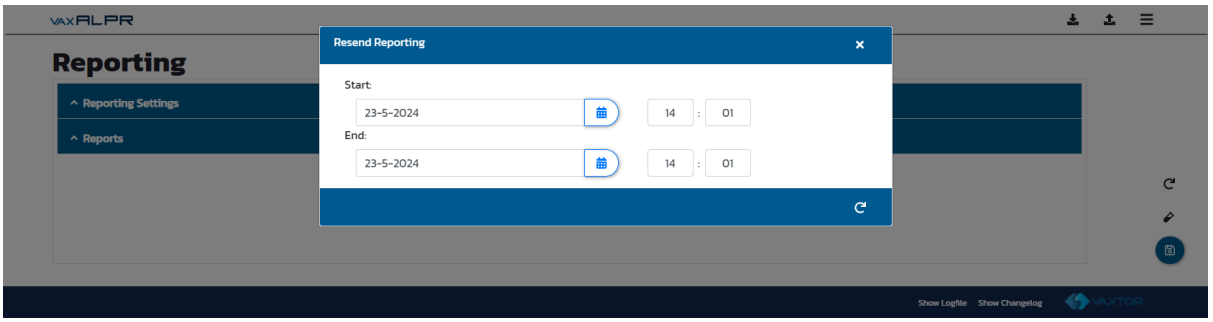
Resend results stored in the database for a specified time range.

Simulate a license plate read for testing purposes.

Confirm and submit the changes in the **Reporting** settings.

3.3.5.1. General Reporting Actions

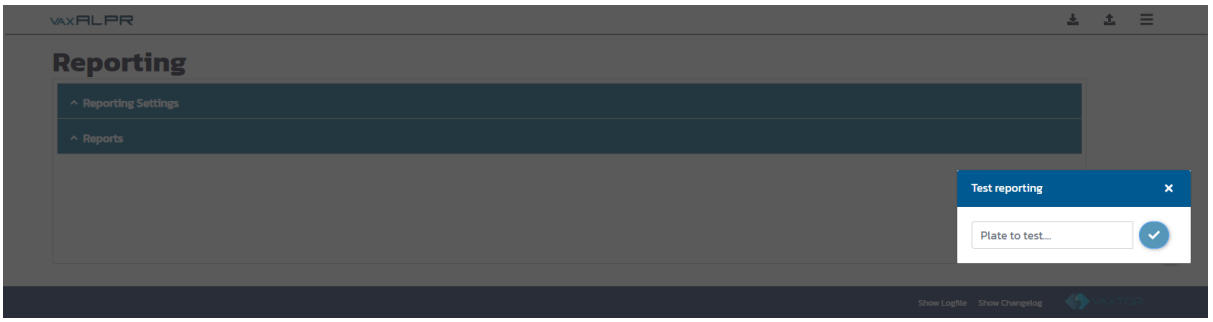
3.3.5.1.1. Resend Reporting



Resend Reporting allows the user to resend results stored in the database for a certain period.

The data within the period specified will be resend to all the current active **Reportings**.

3.3.5.1.2. Test Reporting



Test Reporting allows the user to simulate a license plate read.

To send a test report, the user must click the test button to open a new **Test reporting** window and enter the desired plate number to simulate a read.

This simulated read will generate a new license plate record using the plate number specified in the **Plate to test** field. A new record will be output in the active Reports, displayed on the **Live Plates** screen and stored in the database if it is active.

The remaining ALPR data parameters will be filled with mock values. The image will be the current video frame at the time the test is launched.

3.3.5.2. Reporting Settings

3.3.5.2.1. Basic

3.3.5.2.1.1. Image

Image settings allow the user to adjust the configuration related to the images collected in the ALPR recognition.

JPEG quality (1 to 100) Indicate the quality level of the JPEG image result.

Where higher values indicate better quality/less compression. Higher values also result in larger size images.

Maximum JPEG size (0 is unlimited) Limits the maximum size allowed for an image result. If the size of the result image is bigger than the specified value, the image is discarded, which means neither reported nor stored in the database. The unit is bytes.

Plate reported As there can be multiple image samples for the same ALPR read, the user can choose between the **First**, **Middle** or **Last capture** which one will be selected as the result image.

Perform report crop If active, two new fields appear and the resulting image will be cropped from the center of the license plate position to the specified size in the **Crop Width** and **Crop Height** fields.

Crop Width (320 - 1920) Only visible if the **Perform report crop** is active.

Width in pixels of the result cropped image.

Crop Height (200 - 1080) Only visible if the **Perform report crop** is active.

Height in pixels of the result cropped image.

Insert overlay on reported image If active, new fields are available and allow the user to adjust an overlay text that will be printed in the result image. See below.

Template Only visible if the **Insert overlay on reported image** is active.

User-defined text template that will be overlaid in the result image, using DTR words lists.

Position Only visible if the **Insert overlay on reported image** is active.

The position where the text overlay will be printed. The user can choose between **Left top**, **Right top**, **Left bottom** or **Right Bottom**

Font size Only visible if the **Insert overlay on reported image** is active.

Size of the text overlay, between 1 and 7. Where 1 is smaller.

3.3.5.2.1.2. Persistence

Persistence settings allow the user to adjust how they want to keep stored the data and images related to the ALPR reads.

Generate Plates database?	If active, the results will be stored in the local database. **The camera must have an SD card inserted.**
Store database images?	If active, the image's results will be stored.
Maximum database entries (1 to 100,000)	Limits the maximum records stored in the database. Once the limit is reached, the oldest records, along with their associated images and RAW images, are removed to make room for new ones.
Generate log on the SD? (requires the application to be restarted)	If active, the application logs will be stored in the SD card. Up to 5 files of 10MB each. **The camera must have an SD card inserted.**
Store RAW images for debug purposes?	If active, RAW images will be stored. These images are not compressed and contain the same information processed by the OCR. Activate this option only if Vaxtor advises it during a debugging process. Note that these images can result in very large file sizes. **The camera must have an SD card inserted.**

3.3.5.2.2. Advanced

Reporting Advanced settings allows the user to adjust other settings that might affect the behaviour of the output data.

HTTP timeout (seconds)	This timeout applies to all the HTTP communications, like Reporting JSON, XML or Helix among others.
Report away description	User-defined description for the results with vehicle direction moving away.
Report approaching description	User-defined description for the results with vehicle direction approaching.
Report stopped description	User-defined description for the results with vehicle direction stopped.
Report unknown description	User-defined description for the results with vehicle direction unknown.

User-defined directions are later replaced from the DTR word $directionstr$ and used as default direction value in some predefined Reportings.

Check **3.4. Dynamic Text Replacement** section for further details.

3.3.5.3. Reports

3.3.5.3.1. Main Reports

3.3.5.3.1.1. Heartbeat

Heartbeat report sends a periodic HTTP POST JSON message to a server url with some camera and application status.

Below is the description for the available parameters:

Heartbeat timer (1 - 30 minutes) How often the heartbeat message is sent

URL Server url

Header This field allows the user to define a custom Header to be included in the http request headers. Example: **token: 123abc**

The message content sent by the **Heartbeat** report includes the following details:

Body payload

```
{
   "Pending": 0,
   "SoftwareVersion": "2.3.3",
   "BuildNumber": "DEV-20240522",
   "Manufacturer": "Axis",
   "SerialNumber": "ACCC8E68E70A",
   "Model": "P1367-E",
   "FirmwareVersion": "10.12.228",
   "Date": "2024-05-23T21:28:11Z",
   "PID": "279e7b5d-31dc-4458-a85d-5ef855baad08",
   "IP": "192.168.0.49"
}
```

Pending Total plates in queue pending to be reported.

SoftwareVersion Current software version installed.

BuildNumber Current software build installed.

Manufacturer Device Brand where the software is installed.

SerialNumner Device Serial number.

FirmwareVersion Device Firmware version.

Date Datetime in ISO-8601 format

PID Unique identifier for the running OCR process that will change on a new process start.

IP Device IP Address

3.3.5.3.1.2. Helix

Helix report allows the user to adjust the result output into a Helix server.

Below is the description for the available parameters:

Send images?	If enabled, images will be reported to the Helix server
Sign images?	If enabled, images will be signed before sending. Allowing Helix to display a tamper alert if the image is modified on the server.
Sync lists?	If enabled, the application will sync lists from Helix periodically. Local list management will become unavailable for security and privacy reasons.
List sync period (minutes)	Only visible if **Sync lists** is active. Indicates how often the application will query Helix to check updates in the lists.
Send heartbeat?	If enabled, the application will send a Heartbeat message to the Helix server periodically with some camera and application status details.
Heartbeat period (seconds)	Only visible if **Send heartbeat** is enabled. Indicates how often the application will send the heartbeat message to Helix Server.
Camera Id	This is the Camera Id in Helix server to associate the ALPR results with. This field is hidden if **Reader Id** is set. Use this Id as default for reporting data into Helix server.
Reader Id	This is the Plate Reader ID on the Helix server to associate the ALPR results with. This field is hidden if the **Camera Id** is set. Use this identifier instead of the **Camera Id** when the ROI ID information is used to link results to their corresponding cameras on the Helix server. For example, if the user wants to divide the detected results into multiple ROIs (e.g. one per traffic lane) and link them to their corresponding cameras on the Helix server.
Overview Camera Id	This is the Camera Id for the Overview/Environment camera on the Helix server to associate the Overview image with.
URL	Helix server URL. Example: http://192.198.100.10:8080/helix
Apikey	The user APIKEY in Helix server to authenticate the communication between the application and the Helix server.

3.3.5.3.1.3. JSON

JSON report sends an HTTP request with the header **Content-Type: application/json** to the specified server. By default, the **HTTP POST** method is used.

The user can customise the body message using the **Dynamic Text Replacement (DTR**) words available. Check **3.4. Dynamic Text Replacement** section for further details.

The Message configuration tool is available by clicking the icon

Below is the description for the available parameters:

Url	Server URL.
Message	User-defined message template including DTR words to compose it.
Authorization header	This field allows the user to define a custom Header to be included in the http request headers. Example: **token: 123abc**
Retry notifications even if there is no frame stored?	If active, queued results pending reporting will be resubmitted even if their associated image is not available.
Use HTTP PUT verb?	If active, the HTTP PUT method will be used rather than POST.

3.3.5.3.1.4. UTMC

Version	Choose either **Version 1** or **Version 2** based on backend compatibility.
Url	UTMC server URL.
ID	This field is used for camera identification.
Heartbeat (seconds)	Indicates the frequency of the heartbeat message being sent. If no response is received from the server, an error will be logged. Set to 0 to deactivate.
ANPR Diagnostics (seconds)	Indicates how often the diagnostics message is sent. If no response is received from the server, an error will be logged. Set to 0 to deactivate.
Send plates in batch (seconds)	Specifies the frequency at which plates in the batch queue are sent.
Maximum amount of plates in batch	Determines the maximum number of plates that will be delivered on a batch message.
Timeout	Specifies the HTTP connection timeout in seconds.
Send plate in real time	When enabled, plates are sent immediately upon detection. If communication fails, the plate is stored in the batch queue and will be sent according to the batch send configuration.
Send images	Includes the full result image in the message.
Send plate images	Includes the cropped plate image in the message.
Send overview images	When enabled, sends an overview/environment image if available. If the overview image is not available, the full result image is sent instead.
Send tags	When enabled, includes an additional tag field that contains a hashed version of the plate (anonymized).
Send Guid As Id	When enabled, replaces the ID field with the GUUID generated at the time the plate was detected.
Allow empty responses	When enabled, allows empty responses from the server. Even if the response is empty, it must still be an HTTP 200 response.
Lanes	(Reconfigure lanes data due to inconsistencies with ROI data) This configuration is related to the ROI (Region of Interest) setup and allows for the identification of different lanes in the image.

3.3.5.3.1.5. Vapix

ID	Numeric identifier that will be included in the events data.
Use v3 format?	If active, events structure will use ALPRv3 rather than ALPRv2
Send OCR image?	Only visible if **Use v3 format** is active. If active, the full image results will be appended to the **image** field in the event.
Send Plate patch?	Only visible if **Use v3 format** is active. If active, the plate crop image results will be appended to the **crop** field in the event.

3.3.5.3.1.6. Vaxtor Protocol

Vaxtor Protocol report outputs the ALPR results using the TCP Vaxtor Protocol.

Below is the description for the available parameters:

Host	Server host address or IP.
Port	The port to establish the communication.
ID	ID associated with the Plate Reader identifier.
Send duplicate images	If active, consecutive results for the same plate number will send the image.
Use extended fields	If active, fields including details for the extended analytics in the protocol are appended to the message data.

3.3.5.3.1.7. XML

XMLreport sends an HTTP request with the header **Content-Type: text/xml** to the specified server. By default, the **HTTP POST** method is used.

The user can customise the body message using the **Dynamic Text Replacement** words available. Check **3.4. Dynamic Text Replacement** section for further details.

The Message configuration tool is available by clicking the icon 

Below is the description for the available parameters:

Url	Server URL.
Message	User-defined message template including DTR words to compose it.

3.3.5.3.2. Partner Reports

3.3.5.3.2.1. Axis

Since there are multiple reports available for the Axis Partner the user can adjust which reports to view in the window shown by clicking the gear button to the right of the Axis block title.

AXIS CSSE

Host (IP address)	The Axis Camera Station server IP Address
Api Key	The APIKEY in the Axis CSSE to authenticate the communication.

To perform a test communication the user can click the button test

AXIS Camera Overlay

Axis Camera Overlay report allows the user to define an overlay template message that will be displayed on the Axis camera Overlay according to the View details

The Message configuration tool is available by clicking the icon

Check **3.4. Dynamic Text Replacement** section for further details.

User	Axis camera User
Password	Axis camera Password.
Port	Axis camera Port. (Default 80)
Message	User-defined message template including DTR words to compose it.
View	Axis camera view where the overlay will be displayed.

A1001

Host (IP Address)	Axis A1001 module IP Address.
User	Axis A1001 module User.
Password	Axis A1001 module Password.

To perform a test communication the user can click the button test

3.3.5.3.2.2. 2N

IP	2N server IP Address
Use HTTPS	If active, HTTPS will be used to connect.
Username	2N server username
Password	2N server password
Barrier used for	User can choose between **Entry** or **Exit**

3.3.5.3.2.3. Digital Barriers

The Message configuration tool is available by clicking the icon

IP	Digital Barriers server IP Address.
Apikey	Digital Barriers Apikey to authenticate the communication.
Template	User-defined message template including DTR words to compose it.
Maximum size	Packet maximum size in bytes.
Ignore maximum size?	If active, all the results will be sent no matter the packet size.

Note: Direction description values can be adjusted. See **Reporting Settings > Advanced** section (**3.3.5.2.2. Advanced**) for further details.

3.3.5.3.2.4. Dorlet

Host	Dorlet controller address or IP Address
Port	Port to establish the communication with the Dorlet controller.
Vial ID	Dorlet controller Vial ID.
LAM	Dorlet controller
Send NONE as	User-defined license plate to be sent if the license plate result returns NONE. Set to 0 will send the default message
Send seconds	If active, the times in the communications will include seconds.

3.3.5.3.2.5. Genetec

Genetec report allows the user to adjust the results output into the Genetec ALPR Plugin.

Reference camera Id	Genetec server Camera Id
Camera name	Genetec server Camera name
Url	Genetec LPR plugin URL for feeding data.
Username	Genetec server Username
Password	Genentec server Password
Latitude	If set to 0, the value will use the latitude available in the ALPR read details if available. If set to another value, the latitude will always be the specified value.
Longitude	If set to 0, the value will use the longitude available in the ALPR read details if available. If set to another value, the longited will always be the specified value.

3.3.5.3.2.6. Network Optix

The Message configuration tool is available by clicking the icon 
Check **3.4. Dynamic Text Replacement** section for further details.

Url	Network Optix server Url.
Source	Network Optix server Source details.
Username	Network Optix server Username.
Password	Network Optix server Password.
Caption template	User-defined message template including DTR words to compose it.
Description template	User-defined message template including DTR words to compose it.
Camera ID	Network Optix server Camera Id.

3.3.5.3.2.7. Passport

Client Id	Passport server Client Id.
Client secret	Passport Server Client Secret.
Operator Id	Passport Server Operator Id.
Zone Id	Passport Server Zone Id.
Sensor Id	Passport Server Sensor Id.

Note: Direction description values can be adjusted. See **Reporting Settings > Advanced** section (**3.3.5.2.2. Advanced**) for further details.

3.3.5.3.2.8. Smart Parking

Url	FTP Server address.
Site Name	Smart Parking Site Name.
Send OCR image?	If active, the full ALPR image will be sent.
Send Plate patch	If active, the Plate crop image will be sent.
Send Overview image?	If active, Overview image will be sent, if available.

Note: Direction description values can be adjusted. See **Reporting Settings > Advanced** section (**3.3.5.2.2. Advanced**) for further details.

3.3.5.3.3. Generis Reports

3.3.5.3.3.1. BOF 2

Url	BOF 2 server url.
PNC Id	
Latitude (decimal minutes)	Latitude in decimal minutes. Example: 40.416981 Decimal Degrees = 2425.01886 Decimal Minutes
Longitude (decimal minutes)	Longitude in decimal minutes. Example: -3.703464 Decimal Degrees = -222.20784 Decimal Minutes
Camera Id Type	Users can choose between **Template**, **Direction Based** and **Fixed**.
Send Plate Image	If active, the plate image will be sent.
Send Overview Image	If active, the Overview image will be sent.
Template	Only visible if **Camera Id Type** is set to **Template**.
Camera Id Towards	Only visible if **Camera Id Type** is set to **Direction Based**.
Camera Id Farther	Only visible if **Camera Id Type** is set to **Direction Based**.
Camera Id	Only visible if **Camera Id Type** is set to **Fixed**.
Source Id	

3.3.5.3.3.2. Daily Upload

Daily Upload report uploads a daily report for the detected ALPR reads available in the local database to a FTP server as a CSV file.

SD card installed and **Generate Database** setting are mandatory for this report to work.

The upload is done every day at midnight. And will:

- Export all data since the last time it ran. If there is no new data it will export yesterday's data only.
- Upload all the files available. If a file fails to upload it is stored on the SD card and retried at the next execution (every 30 minutes until it is sent successfully).
- Once the file is uploaded it is deleted from the SD card.

The Message configuration tool is available by clicking the icon

The Header can be generated from the Format value by clicking the icon

FTP or SFTP	The FTP or SFTP server address
Prefix	Prefix to append in the file name uploaded.
Format	Row content format using DTR words. Example: $plate$;$date$
Header	Header of the CSV file Example: PLATE;DATE

Sample CSV file reported:

Name: LPR_2024-06-03.csv

Content:

```
PLATE;DATE
BN04ABD;2024-06-03T18:01:47.514Z
AB55BGY;2024-06-03T19:00:01.784Z
PL19RAT;2024-06-03T19:01:07.452Z
```

3.3.5.3.3.3. FTP

FTP report send the ALPR reads to the specified FTP server.

Url	FTP server Url
Filename	User-defined message file name including DTR words to compose it. Check **3.4. Dynamic Text Replacement** section for further details.
Send OCR image?	If active, the full ALPR image will be sent.
Send Plate patch?	If active, the Plate crop image will be sent.
Send Overview image?	If active, Overview image will be sent, if available.

In order to prevent image files to be overwritten make sure to include the DTR word **$imagetype$** in your **Filename** template. This will add a label to file name according to the image type:

OCR image	Will append "**ocr**" Example: 20240603_170912_1973AAA_ocr.jpg
Plate patch	Will append "**patch**" Example: 20240603_170912_1973AAA_patch.jpg
Overview image	Will append "**overview**" Example: 20240603_170912_1973AAA_overview.jpg

3.3.5.3.3.4. JSON2

JSON2 report allows the user to output results to a secondary JSON server. Please refer to the JSON report in the Main Reports sections.

3.3.5.3.3.5. M3

Url	M3 server Url
Header	Request Header
Camera User	M3 server User
Camera Password	M3 server Password
Agent Id	M3 server Agent Id
Send ANPR Image as Overview	If active, the full ALPR image result will be sent as Overview image.

3.3.5.3.3.6. NEDAP Protocol

Host	NEDAP server address.
Port	Port to establish the communication with the NEDAP server.

3.3.5.3.3.7. Pushbullet

The Message configuration tool is available by clicking the icon 

Check **3.4. Dynamic Text Replacement** section for further details.

Apikey	Access Token providing access to the Pushbullet account.
Notification title	User-defined message template including DTR words to compose it.
Notification body	User-defined message template including DTR words to compose it.
Send image	If active, the result image will be included in the notification.

3.3.5.3.3.8. TCP Server

TCP Server report open a TCP socket allowing external clients to connect and listen for new results that will be published in real time.

The Message configuration tool is available by clicking the icon

Check **3.4. Dynamic Text Replacement** section for further details.

Port	Listening port for incoming clients connection.
Message	User-defined message template including DTR words to compose it.

3.3.5.3.3.9. TCP

The Message configuration tool is available by clicking the icon 

Check **3.4. Dynamic Text Replacement** section for further details.

Host	TCP server address.
Port	Port to establish the connection.
Message	User-defined message template including DTR words to compose it.

3.3.5.3.3.10. UTMC2

UTMC2 report allows the user to output results to a secondary UTMC server. Please refer to the UTMC report in the Main Reports sections.

3.3.5.3.3.11. Wiegand

Add the license plate to the white list and fill the record description field with the 10 numbers of the identity document linked to that license plate between asterisks. E.g *0012300456*

When there is a match with a license plate on the list, its associated identity document will be sent to the Wiegand device.

IP	Wiegand device IP address.
Port	Wiegand device Port to establish the connection.
Format	Users can choose between **No parity**, **Even/Odd parity** or **Odd/Even parity**.
Type	Users can choose between **24 bits** or **32 bits**.

3.3.5.3.3.12. Write Result

Write Result report stores the ALPR results, including the ALPR images and Plate crop images, into the SD card and/or Network Share storage adjusted in the Axis Camera settings.

The Message configuration tool is available by clicking the icon

Check **3.4. Dynamic Text Replacement** section for further details.

SD	If active, stores the results to the SD card
Network share	If active, stores the results to the Network share
Write images	If active, stores the ALPR result images.
Write overview images	If active, stores the overview images.
Write plate images	If active, stores the plate crop images.
Line template	User-defined row template including DTR words to compose the CSV columns.

Please note that this report does not monitor stored results, meaning that all stored data is not deleted periodically and may fill your storage if left unmonitored.

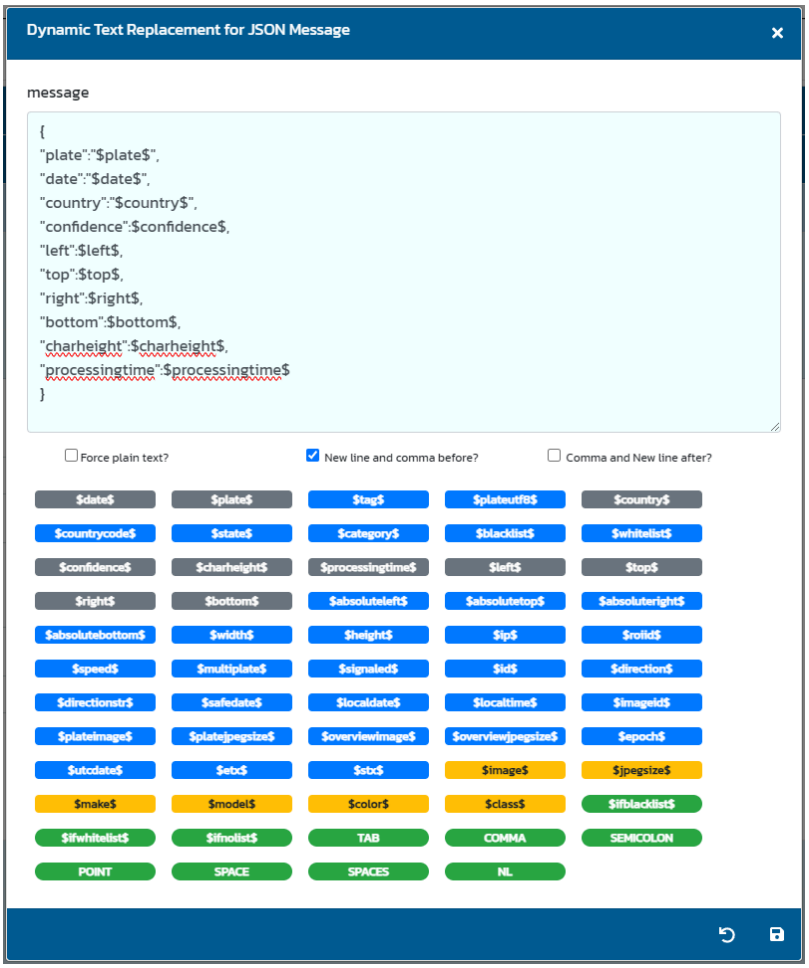
4. Annexes and Additional Guidelines

4.1. Dynamic Text Replacement

Dynamic Text Replacement is a set of words that allows users to easily customize message templates for various reports that support this functionality. These words are always enclosed in dollar symbols (e.g. $plate$) and act as aliases that will be replaced during the composition of the final message to be sent.

To facilitate message editing, a tool is available that allows users to see the complete list of available words, along with a brief description of the related real data. This tool enables users to easily select and insert words into the message field they are adjusting. For JSON and XML message types, it also allows users to insert elements adapted to the syntax, adding elements and nodes with the same name as the inserted DTR word (e.g. "plate":"$plate$" or <plate>$plate$</plate>).

In the message fields where this tool is available there is a gear button that will open a window with the controls to compose the message.



A full list of the available DTR words is available in our Knowledge Database:

https://support.vaxtor.com/portal/en/kb/articles/axis-on-camera-dynamic-text-replacement

4.2. Working on Signaled Mode

The VaxALPR application can operate in Signaled Mode, which means that the OCR remains on standby until it receives a signal that triggers the processing of a frame.

This frame can be captured instantly after receiving the signal or its capture can be delayed by adjusting the Signaled Mode Delay parameter.

There are three ways to trigger the OCR:

VaxALPR API Call

By making a call to the application's API, an ID can be included as a parameter with the trigger call. This ID will be recorded with the result and can be reported.

https://camera_ip/local/Vaxreader/trigger.cgi

https://camera_ip/local/Vaxreader/trigger.cgi?id=12345

Monitoring a Digital Input Port

The camera's digital input port can be monitored for a signal. Axis cameras have an I/O interface with ports that can serve as inputs or outputs.

Calling the Axis API

By making a call to the Axis API, the signal is sent to a virtual port. The Signaled Mode should be configured accordingly to monitor the corresponding virtual port.

http://camera_ip/axis-cgi/io/virtualinput.cgi?action=6:/500\

That will trigger the virtual port 1 for 500 ms

- 6 = virtual port 1 in VaxALPR

- 7 = virtual port 2 in VaxALPR

4.3. Working with License Plates including Special Characters

Since there are license plates featuring special characters and formats VaxALPR incorporates unique design features to accommodate various customer needs and ensure flexibility.

Plate Mode was implemented to allow the user to choose how the OCR displays results when working with license plates that include special characters.

These are the available **Plate Mode** options:

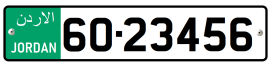
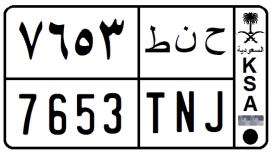
Plate in UTF8 The license plate is displayed exactly as it appears in reality.

Plate in ASCII The plate is displayed with characters adapted to their corresponding ASCII values.

Plate formatted The plate is displayed in a human-readable format, including specific characteristics of the countries involved in this mode.

The selected **Plate Mode** affects how the results are displayed, how they are matched with items on the lists and how they are reported into Helix back office. The results of the three modes are stored in the DB.

Below are samples for the countries including special characters and the output for each **Plate Mode**:

Country	Plate Image	Plate ASCII	Plate UTF8	Plate Formatted
Egypt		3594TGS	س ج ط٣٥٩٤	س ج ط3594
Germany		MÜN4689	MÜN4689	M ÜN4689
Jordan		6023456	6023456	60-23456
KSA		7653TNJ	ح ن ط٧٦٥٣	ح ن ط7653
Thailand		AO2058	กท2058	กท2058

4.4. Instant Speed Analytics Guidelines

The camera needs to be really well set up and the program will then use the precise timing and position of plates approaching to accurately determine the speed of the vehicle to within a couple of percent accuracy. (A typical speed camera is normally only accurate to 10%). The software works best on front plates as these tend to be set at a consistent height from the ground. It is imperative that the following guidelines be met:

- Use **single lane** only detection to achieve the highest accuracy. Do this by focusing on one lane – or by using an ROI to capture in one lane only – preferably the one closest to the camera. (Dual lanes are possible if the camera is positioned between the two lanes).
- Set the **maximum side angle** from the camera to the capture point to be **15º** This is the horizontal camera angle (the vertical angle is the tilt) so if the camera was positioned exactly at the edge of the road then this would be the angle from along the road to the capture point).
- The **working distances** should be between **15-20 meters for slow** and urban deployments and between **20-30 meters for higher-speed** measurements.
- Camera mounting height 4-6 meters.
- The **Plate Height** in Pixels (average plate character height) should be a minimum of **21 px**
- Use **gantry or rigid pole mounting** to eliminate camera roll and vibration. This can affect accuracy.
- The **road must be level** and not undulating.
- The camera should NOT be placed near to road bends, speed-bumps, road junctions, traffic lights or roundabouts or anywhere where vehicles are likely to be accelerating or decelerating. The detection area must NOT be on a curve in the road.

VERSION CONTROL

Version	Date	Changes
3.0.1	13 Jun 2024	Inserted - Details about the warning message when the user leaves the settings without saving changes. Sec. 3.2.6.
3.0.0	3 Jun 2024	First edit.