Updated:	**2020-01-21**
Latest version always at:	

TraFFic CaMMRa

User Manual

TraFFic CaMMRa application

About the application

TraFFic CaMMRa is an ACAP (Axis Camera Application Platform) app for Axis cameras. With TraFFic CaMMRa becomes Axis camera an ultimate traffic sensor containing vehicle make, model, color, speed, type and license plate recognition for city and highway traffic monitoring. With TraFFic CaMMRa you collect all important traffic data in one app. Install the cameras on all roads going to and from the city and get full control over traffic flows in your city, track stolen cars, collect data for law enforcement or statistical purposes. TraFFic CaMMRa is designed for higher speeds and multiple lanes. For integration, there is open API available and the meta-data are already integrated with major VMS systems: Milestone XProtect (via Axis Optimizer), Qognify Cayuga, Genetec Security Center, iVisec, Digivod. The meta-data is also integrated in Traffic Scanner, Smart Plate and NumberOK Meta. The solution is a fully server-less, all the analytics are done on edge using camera processing power.

Supported cameras

The application can be installed in compatible Axis network video devices that support AXIS Camera Application Platform. A complete list of IP cameras is following:

- AXIS P1367-E
- AXIS P1368-E
- AXIS P1375-E
- AXIS P1445-LE
- AXIS P1445-LE-3
- AXIS P1447-LE
- AXIS P1448-LE
- AXIS Q1645-LE
- AXIS Q1647-LE
- AXIS Q1798-LE
- AXIS Q1785-LE (Recommended)
- AXIS Q1786-LE (Recommended)
- AXIS Q1700-LE (Recommended)

Browser support

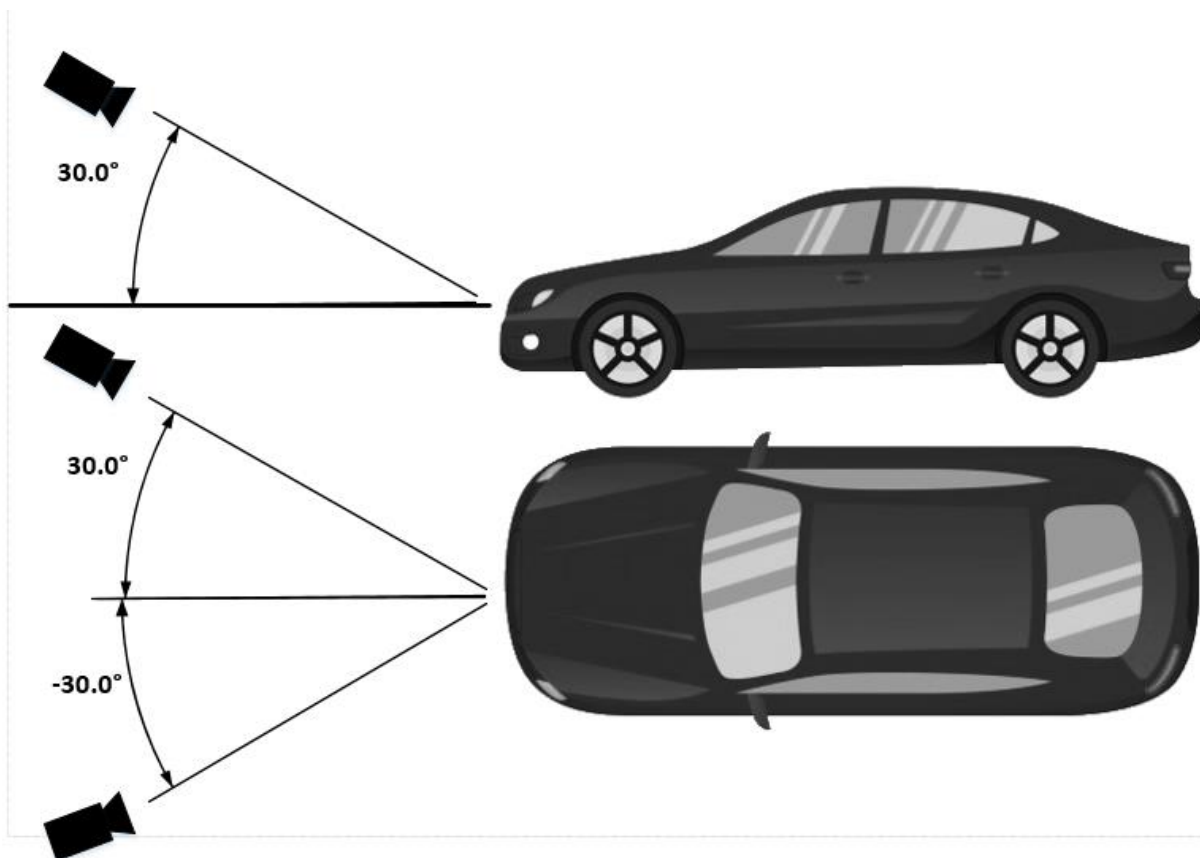You can use the device with the following browsers:

	Chrome	Firefox	Edge	Safari
Windows®	recommended	x	x	
OS X®	recommended			x
Other operating systems	x	x		

Camera mounting recommendations:

The camera's mounting angle should not be more than 30°.

The image of the license plate should not tilt more than 5° horizontally. If the image is tilted more than 5°, we recommended to adjust the camera so that the license plate is displayed horizontally in the live stream.

Optimal camera installation point

Adjusting the camera settings

Place a vehicle in the region of interest.
To make sure the license plate is big enough for the application to detect it, go to System > Orientation and select the pixel counter. Check that the width of the license plate equals at least 130 pixels for license plates with one row and at least 70 pixels for license plates with two rows.

Go to the camera's webpage, select the Image tab and do the following adjustments:

● Set the autofocus area on the license plate and click Autofocus. If the license plate is still not in focus, fine-tune using the manual focus.
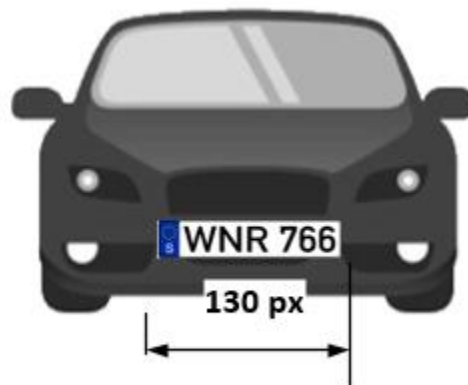
- Turn off Wide dynamic range.
- Set Local contrast to 20. This reduces noise during nighttime, but still lights up the license plates enough to make them visible. A higher local contrast value makes the license plates more visible during nighttime, but increases noise.
- Turn "Auto" the IR-cut filter .
- Set Max shutter to 1/500.
- Set Max gain to 24 dB to optimize the blur and noise trade-off in most scenes. If the license plate gets overexposed, adjust the max gain down to 9 dB.
- Turn off Lock aperture. This sets the iris to automatic mode, which we recommend especially if the vehicle faces direct sunlight.

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.

Installing the application

- Go to the camera web page.
- Go to Settings > Apps.
- Click Add to upload the application file (.eap) to the camera.
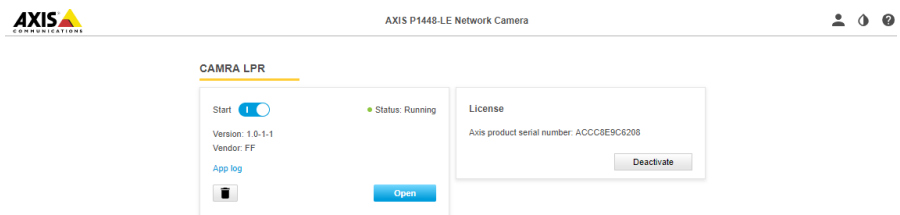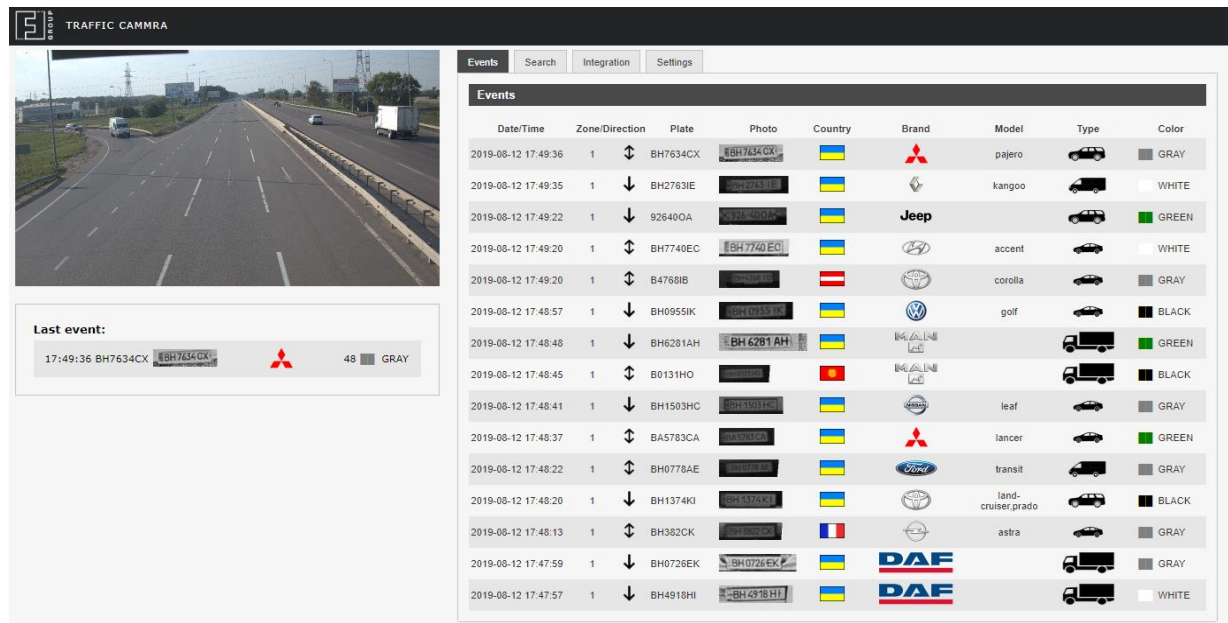
To activate the license, you need a license key, that is generated by the license code and the
Axis device serial number. If you don't have a license key on the computer, do the following:
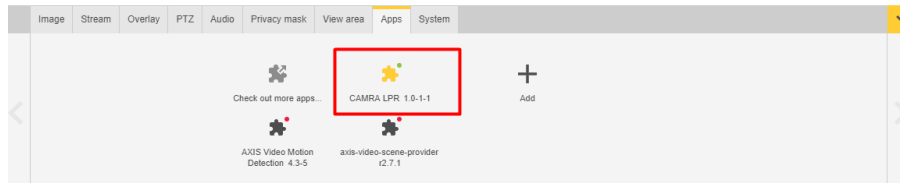
- Go to axis.com/applications
- Go to License key registration
- Enter the license code and the serial number.
- Save the license key file on the computer. Browse to select the file and then click Activate.

Access the application settings

In the camera's webpage, go to Settings > Apps, select the application and click Open.

Set up the region of interest and direction

Go to the application's web page and select the **Settings tab.**

Keep the region of interest (ROI) as small as possible. Never place the ROI to the top image edge.

To get the correct direction of car movement, point the arrow in the driving direction. The detected direction shows up in the Direction column in Events log.

Click and rotate the green arrow to set the preferred vehicle movement.
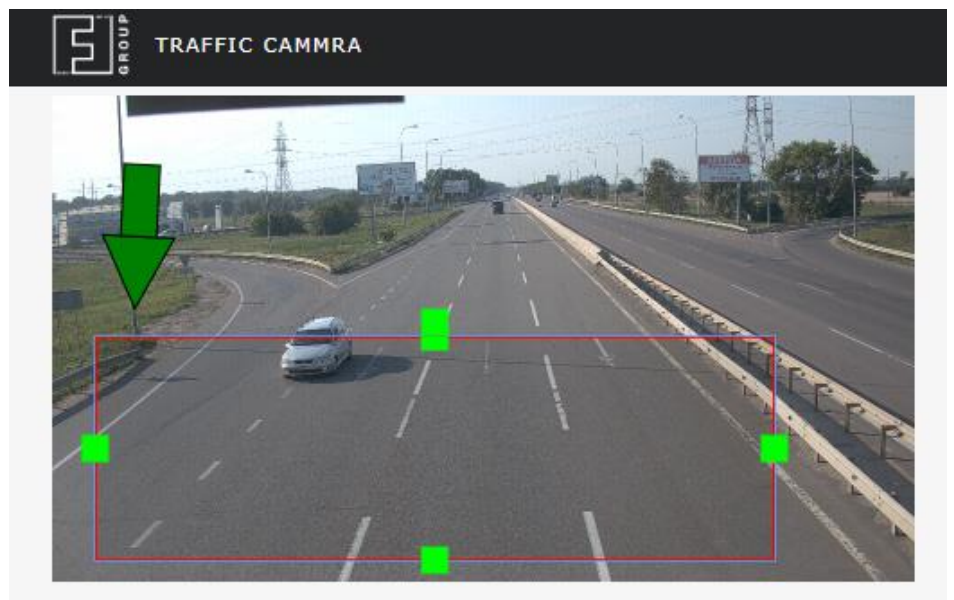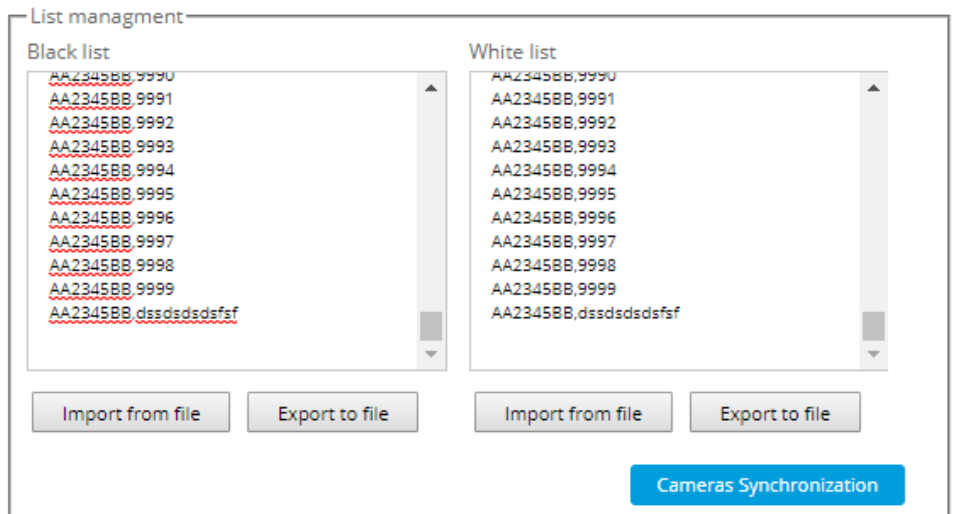
Add license plates to black and white lists

Add blacklisted directly by web or
import from csv file

Csv file structure:
- License plate1,
Description1
- License plate2,
Description2
- License plate3,
Description3

The description field is not necessary
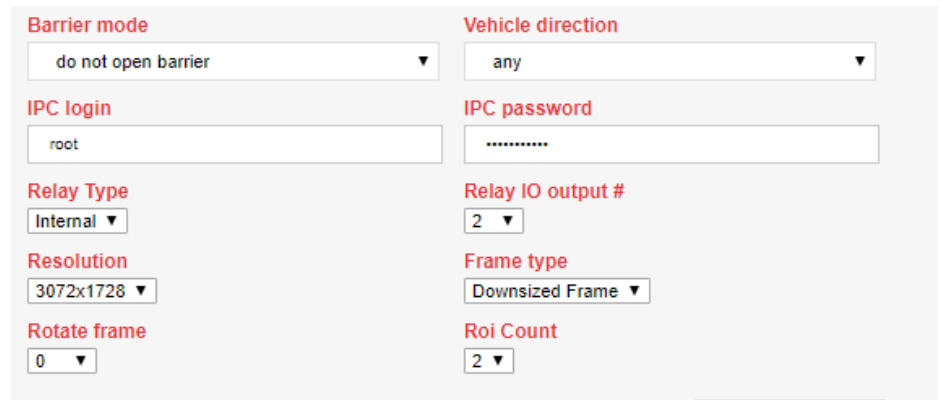
Set up camera settings

Set right camera password
Set resolution:
- Full HD - 2 lanes
- 5 MP - 3 lanes
- 8 MP - 8 lanes

Set the size of the saved image

Settings of stored events

```
┌─Events storage settings─────────────────────────────────────
│ Keep only events:                    Keep every event during:
│ ┌─────────────┐                      ┌─────────────────┐
│ │ All       ▼ │                      │ 1 day         ▼ │
│ └─────────────┘                      └─────────────────┘
│ SD card :                            Stored Events :
│ NOT INSERTED                         49
└─────────────────────────────────────────────────────────────
```

1. Keep only events:
   - All
   - Whitelisted
   - Blacklisted
   - None - events aren't stored but only sent to 3rd party systems (e.g. A1001, cloud, VMS)

2. Keep all events:
   - as long as possible
   - 1 day
   - 7 days
   - 30 days

When a new event occurs, it is assigned a storing time according to current settings.
Changing settings affect only new events.

Advanced settings

- Plate size min. and max. (use default)
- Number of symbols. Set range as minimum as possible in the region / country templates.
- LPR confidence threshold: in most of the cases 0.6 - 0.7 is recommended. The lower threshold, the higher is detection rate, but the higher is also false exception.
- Comparison of blacklisted plates
  - Strict comparison
  - Soft comparison. The differences in one or two characters in the license plate are allowed
- Enable overlay text. The overlay contains: day, month, year, time and license plate, brand and model of the car.

- Regions - supported LPR regions. VMMCR work in EU, CIS, EU+CIS, South Africa. Other regions are only for license plate recognition particular libraries.

- •   Enable MMR - turn on or turn OFF make and model recognition. If only license plate recognition (LPR) is required, make and model recognition (MMR) is recommended to be turned off. Turn off also, when the view is turned to the rear side of the cars.
- ● MMR confidence - setting the threshold (0-100) depends on the task TraFFic CaMMRa should fulfil. Recommended range, when accurate make and model recognition required: 30 - 60. Recommended range for type classification: 10. Current confidence level is displayed on the realtime screenshot - the number between brand logo and color.
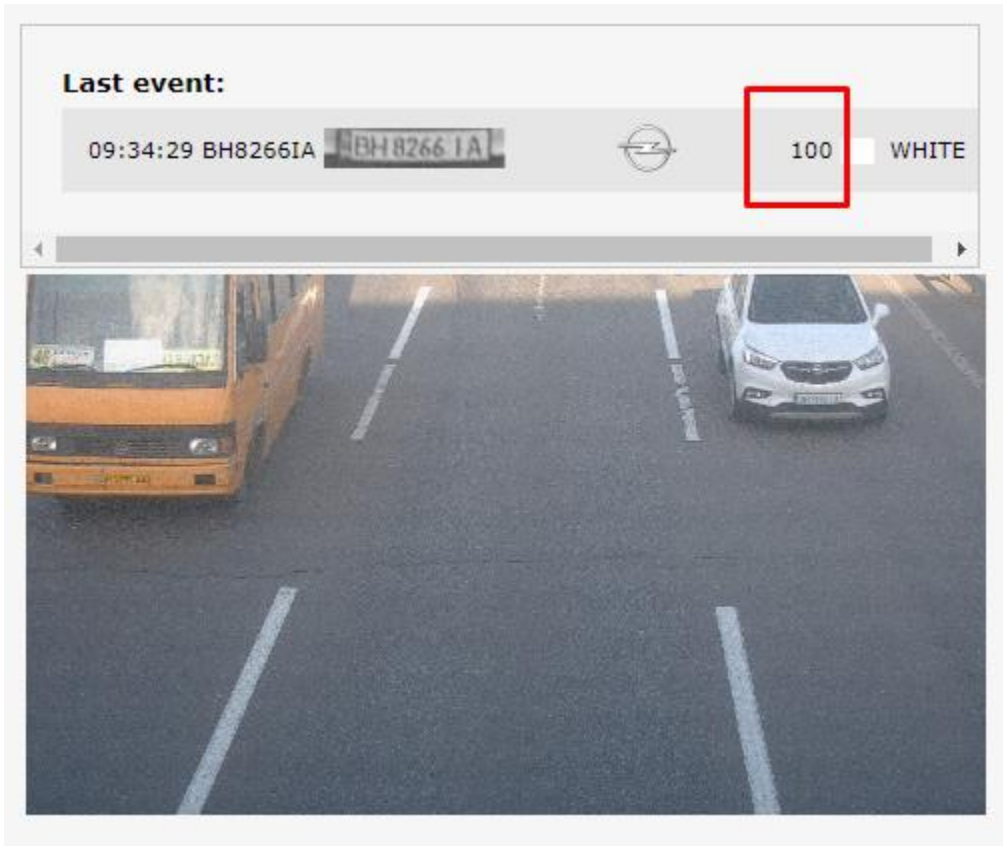
- ● Security/HTTPS - you can turn on using HTTPS encryption and self-signed certificates.

TraFFic CaMMRa

Generating reports

Go to the application's web page and select **Search.**

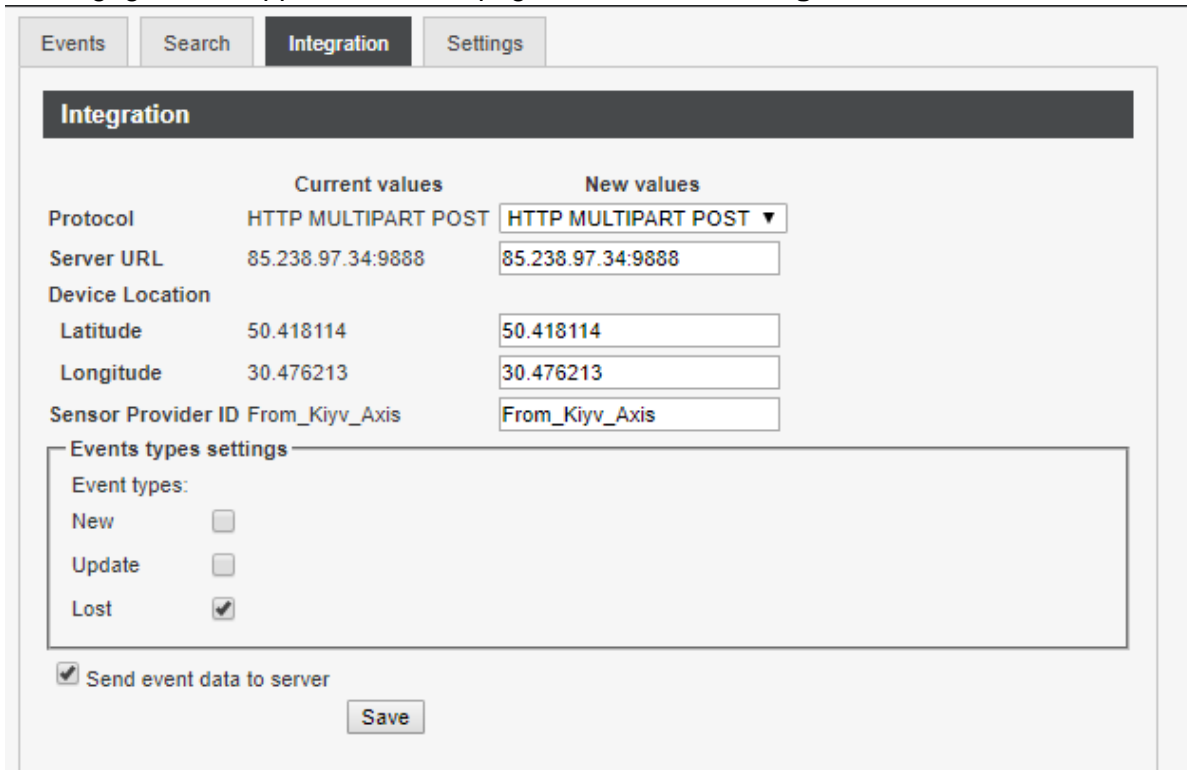**To get report:**
- Choose filters,
- Click **Search,**
- Click **Export.**

FF-Events

For to send the recognized data to other applications (VMS, Data Management System, etc.), you can use FF-events. There are two options available: TCP and HTTP POST. For to setup events sending, go to the application's web page and select the **Integration tab.**

- Protocols:
  - TCP
  - HTTP MULTIPART POST
- Data structure: Please refer to FF protocol documentation: **API FF Integration HTTP POST** JSON
- Server URL: link where to send data
- Sensor Provide ID: unique identifier of sent packets from a camera
- Events type:
  - **New** - New - This event occurs when the vehicle has been detected for the first time. The direction is undefined
  - **Update** - This event occurs when the date in the package was changed and updated
    - The recognized license plate was an update
    - The direction was calculated and added
    - Recognition zone was changed
  - **Los**t - This event occurs when the detected vehicle has been absent in the recognition zone more than 5 seconds

Details here (API)   https://docs.google.com/document/d/1NbUrK_j34WqtozimofT2AzxCI-kv3g7wxP1V3K0xOoY/edit?usp=sharing