



EVA Advanced Analytics

Administration Guide

3 Jun 2025

Table of Contents

Table of Contents.....	2
1. System Installation and First Start.....	8
General.....	8
2. Single PC System Installation.....	9
Requirements.....	9
System Installation.....	10
3. Initial Server Launch.....	16
4. Initial Luxriot EVA settings.....	21
Initial setup.....	21
System Setup.....	21
1. Middleware-Core Update.....	22
2. License Activation.....	22
3. Plugin Installation.....	24
4.1. Add Luxriot EVO Connection.....	25
5. Connect EVO with EVA.....	27
Creating the Dedicated Crosslink tab in the Luxriot EVO Console.....	27
6. Plugin Marketplace.....	28
Overview.....	28
Plugin Marketplace.....	28
Marketplace tab.....	29
Installed Tab.....	30
Extra Settings.....	31
Adding Channels without a VMS connector.....	33
PLUGINS	
Face Recognition.....	35
Introduction.....	35
What is Face Recognition?.....	35
Primary Capabilities.....	35
Overview.....	35
Use and Functionality.....	36

Create Analytics.....	37
General Tab.....	38
Recognition Options.....	38
Hardware Tab.....	40
Notifications Tab.....	41
Permissions Tab.....	41
Edit Analytics.....	42
Advanced Settings Tab.....	43
Analytics Status.....	44
View Analytics.....	45
View Search Results.....	47
Delete Analytic.....	48
Face Recognition: Search.....	48
Overview.....	48
Use and Functionality.....	48
Face Recognition: Lists.....	51
Overview.....	51
Use and Functionality.....	51
Off-List Notification Settings.....	52
Create List.....	53
List Permissions Configuration.....	55
Edit List.....	56
Delete List.....	57
View List.....	57
Create ID Card.....	60
Import Multiple ID Cards.....	63
Edit ID Card.....	65
Delete ID Card.....	67
View ID Card.....	68
Search by Photo.....	70
Search by Name.....	71
Face Recognition: Events.....	72

Overview.....	72
Use and Functionality.....	73
Face Recognition: Statistics.....	75
Introduction.....	75
Overview.....	75
Use and Functionality.....	76
Hours Tab.....	76
Days, Weeks, and Months Tabs.....	77
Lists Tab.....	78
LPR.....	79
Introduction.....	79
What Is LPR?.....	79
Primary Capabilities.....	79
LPR: Analytics.....	79
Overview.....	79
Use and Functionality.....	80
Create Analytics.....	81
General Tab.....	82
General Options.....	83
Recognition Options.....	83
Hardware Tab.....	84
Notifications Tab.....	85
Advanced Settings Tab.....	86
Permissions Tab.....	87
Edit Analytics.....	88
Analytics Status.....	89
View Analytics.....	90
View Search Results.....	92
Delete Analytics.....	92
LPR: Search.....	93
Overview.....	93
Use and Functionality.....	93

LPR: Lists.....	96
Overview.....	96
Use and Functionality.....	97
Lists: Lists.....	97
Overview.....	97
Use and Functionality.....	97
Off List Notification Settings.....	98
Create List.....	99
List Permissions Configuration.....	101
Edit List.....	102
Delete List.....	103
View List.....	103
Edit Card.....	105
View Card.....	105
Search by Number.....	107
Lists: Events.....	108
Overview.....	108
Use and Functionality.....	108
Lists: Report.....	110
Overview.....	110
Use and Functionality.....	110
Camera Tab.....	111
Days Tab.....	112
Weeks and Months Tab.....	113
LPR: Vehicle Statistics.....	113
Overview.....	113
Use and Functionality.....	114
Camera Tab.....	115
Hours Tab.....	115
Days Tab.....	116
Weeks Tab.....	117
LPR: Speed Control.....	118

Overview.....	118
Use and Functionality.....	119
Speed Control: Rules.....	119
Overview.....	119
Use and Functionality.....	119
Create Rule.....	120
Speed Control: Events.....	121
Overview.....	121
Use and Functionality.....	121
Speed Control: Report.....	122
Overview.....	123
Use and Functionality.....	123
Time Interval Report Tab.....	123
General Report Tab.....	124
LPR: Supported Countries.....	126
Object Detection.....	128
Introduction.....	128
What Is Object Detection?.....	128
Primary Capabilities.....	128
Object Detection: Analytics.....	128
Overview.....	128
Use and Functionality.....	129
Create Analytics.....	130
General Tab.....	131
Recognition Options.....	132
Hardware Tab.....	134
Notifications Tab.....	135
Permissions Tab.....	136
Edit Analytics.....	138
Advanced Settings Tab.....	139
Analytics Status.....	140
View Analytics.....	141

View Events.....	144
Delete Analytics.....	144
Object Detection: Triggers.....	144
In Zone.....	144
Out of Zone.....	148
Object Counter.....	151
Presence Control.....	154
Intrusion.....	158
Crowd.....	161
Object Detection: Advanced Settings.....	165
Detector Accuracy.....	165
Model.....	166
Tracker Buffer Time.....	166
Minimum Object Width and Height.....	168
Object Detection: Events.....	169
Overview.....	169
Use and Functionality.....	170

!N.B. PLEASE, CONSIDER THAT YOU ARE USING THE BETA VERSION OF THIS FEATURE. WE CAN'T GUARANTEE ITS STABILITY. ALTHOUGH WE ARE HAPPY TO RECEIVE YOUR FEEDBACK THROUGH OUR SUPPORT ENGINEERS, SOME ISSUES MAY BE RESOLVED ONLY WITH THE NEXT RELEASES.

1. System Installation and First Start

General

The Luxriot EVO is a highly sophisticated yet user-friendly Video and Data Monitoring Software. We constantly enhance its functionality and provide options for 3rd-party software integrations with our Luxriot EVO Monitor interface. The Luxriot EVO consists of three main modules:

- The **Luxriot EVO Server**
- Stands behind all the backend processes, such as streaming and recording capabilities.
- The **Luxriot EVO Console**: Allows to configure Luxriot EVO and is meant for administration purposes.
- The **Luxriot EVO Monitor**: Displays preconfigured video and data channels, allowing the person and the connected analytics software to review and analyze those channels.

In the age of rising AI, additional capabilities provided by external AI tools can't be ignored, and Luxriot EVO allows you to integrate those tools seamlessly into your existing workflow.

However, this document focuses on EVA Advanced, an external analytical module that provides enhanced capabilities. EVA Advanced is an external service and integrates with Luxriot EVO to offer advanced analytics beyond the basic built-in features. The integration follows a specific architecture where the EVA Advanced module operates independently but communicates with Luxriot EVO to deliver sophisticated analytical insights.

To summarize, here is the architecture breakdown:

- **EVA Basic**: Built-in analytics with core functionalities (refer to the EVA Basic guide for details).
- **EVA Advanced**: External service providing advanced analytics integrated into the Luxriot EVO workflow as an independent module (covered in this guide).

This document contains step-by-step quick-start guidance for the installation and primary configuration of the Luxriot EVA Advanced analytics system.

2. Single PC System Installation

Use this step-by-step guide to learn how to install system components for a single server running on the Windows operating system.

Requirements

- Make sure you have administrator rights to make changes to the system.
- If you have an NVIDIA graphics card, ensure that the installed driver is version 471.41 or later.
- MySQL, PostgreSQL, and MSSQL should be installed and configured before installing the analytics system for further connection to the server. (You can also use the internal DB without any additional settings)
- Software installation does not require an internet connection.
- Recommended hardware configuration: The minimal requirements will depend on the actual plugins, but we recommend at least 16GB of RAM, a consumer-grade Nvidia RTX GPU series, or a CPU with AVX 2.0 instructions.

Download the archive containing the installation files. Copy the files to the desired directory, unpack the archive, and open the installation files folder.

!N.B. If you have already installed EVA 23.2 and want to update it to the 23.3 version while preserving the data, you will need to take a few extra steps:

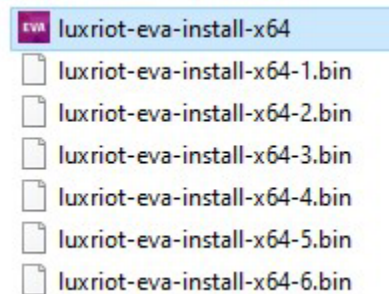
1. Uninstall your current version using the Add/Remove Programs feature.
2. Manually delete folders:
 - a. `c:\programdata\eva\process-runner`
 - b. `c:\programdata\eva\middleware-core\core_plugins`
3. Inside the folder, `c:\programdata\eva\middleware-core\plugins`, delete all files except **luxriot_config.json**.
4. Inside the folder, `c:\programdata\eva\middleware-core`, find the file `config.json` and rename it to **config.json.bak**
5. Run **luxriot-eva-install-x64.exe** and install it in the same folder (by default, `C:\ProgramData\EVA`). Use the same database configuration as the previous (23.2) installation (by default, its type is internal).

6. After installation is completed, open EVA in the web interface or use Luxriot EVO Monitor *crosslinks* to install all the necessary plugins.

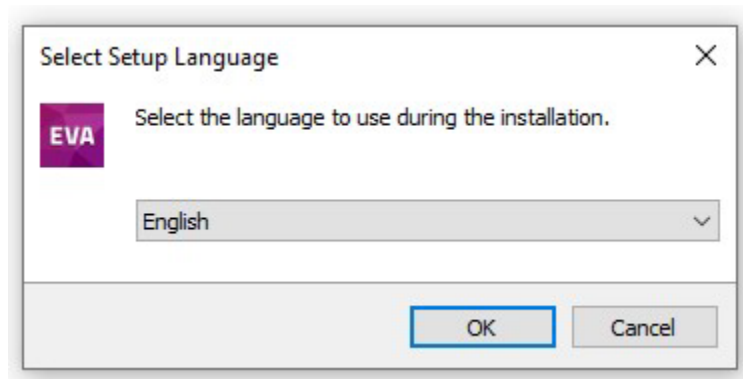
If data preservation is not your priority, simply delete the *C:\ProgramData\EVA* folder and install EVA 23.3 as a new installation.

System Installation

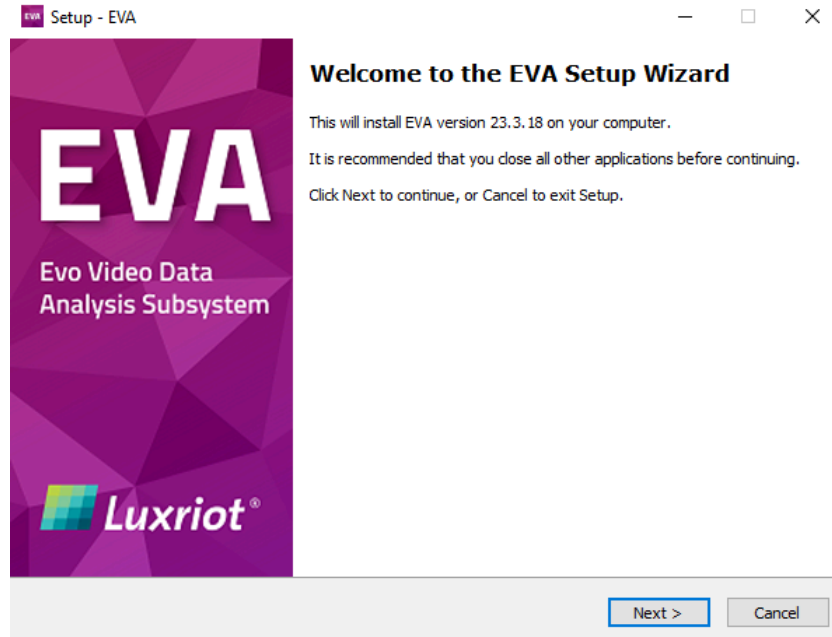
1. Run the *luxriot-eva-install-x64.exe* file by double-clicking it.



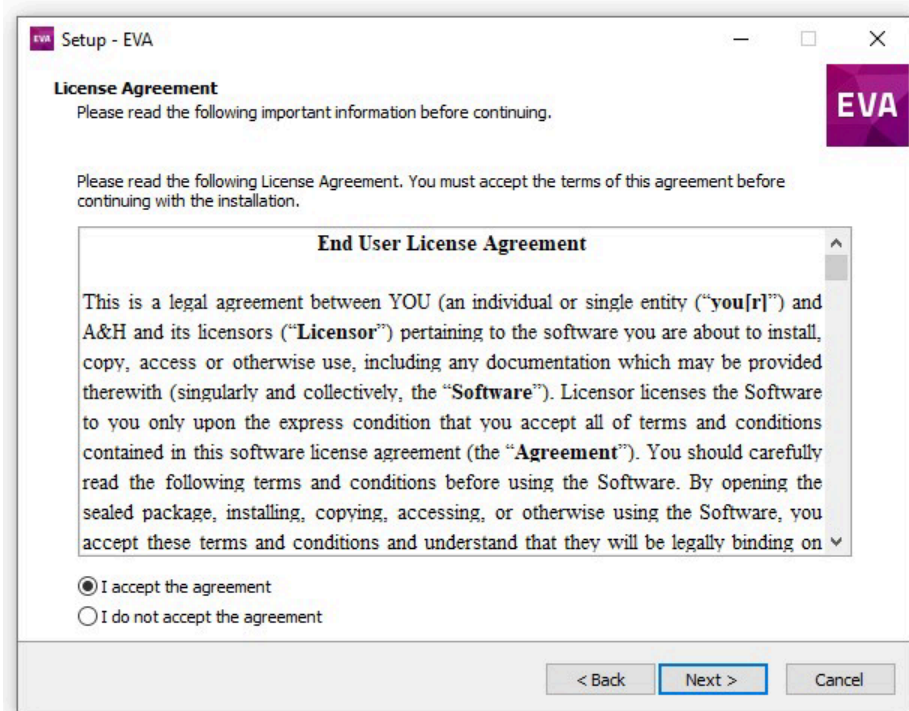
2. Choose the desired language and press the *OK* button.



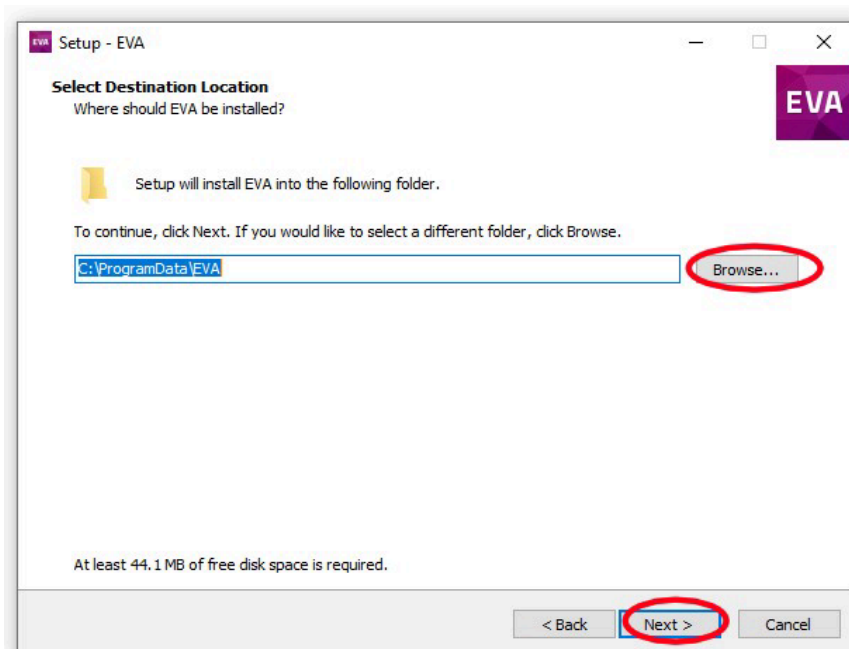
3. Check the setup information and click the *Next* button. If the system is busy with other tasks, Windows updates are pending, or the system lacks a stable power supply, click *Cancel* to terminate the installation. Solve the issues, and rerun the wizard later.



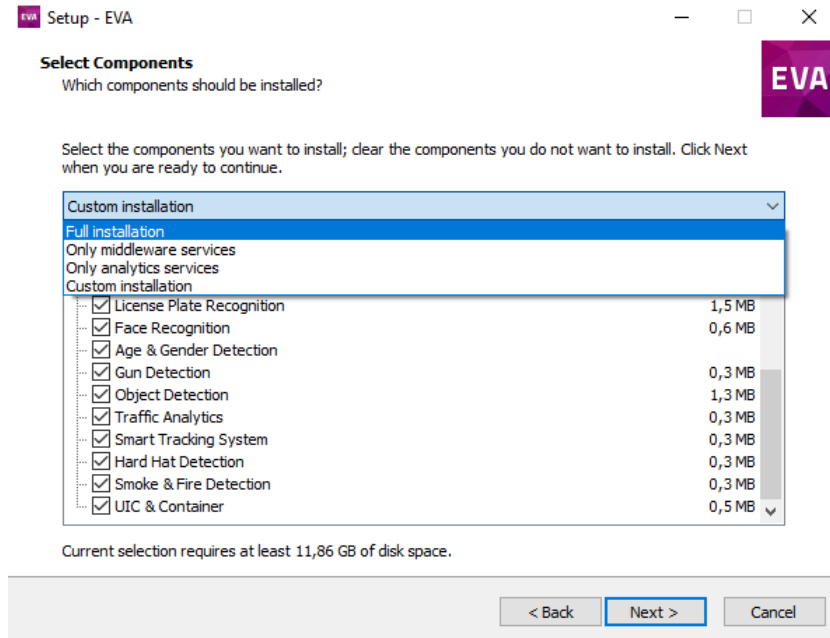
4. Read and accept the *License agreement*.



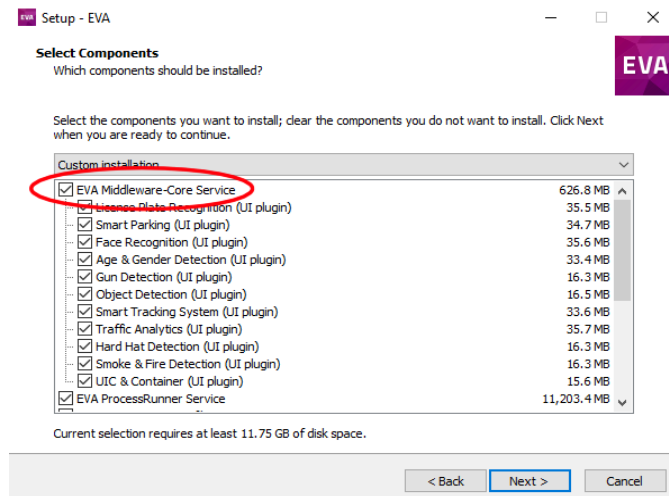
5. Use the *Browse* button to change the installation folder or continue with the default installation path. When done, click the *Next* button to proceed.



6. Select Full Installation from the drop-down menu to choose all system elements. We recommend marking all components, including Face Recognition. This does not require any additional resources but will make it easier to expand the configuration later, if necessary.



- 6.1. For offline installation, please mark the corresponding plugins inside the EVA Middleware-Core Service section.



7. The only available *Component setting* is *Server ID in Cluster*. Use the Default value (1) for the single server installation setup. If you plan to use a cluster system, you must use the Process

Runner ID as the server ID. However, the address in NATS must point to the central system with the middleware software installed.

Configuration example:

Middleware-core server

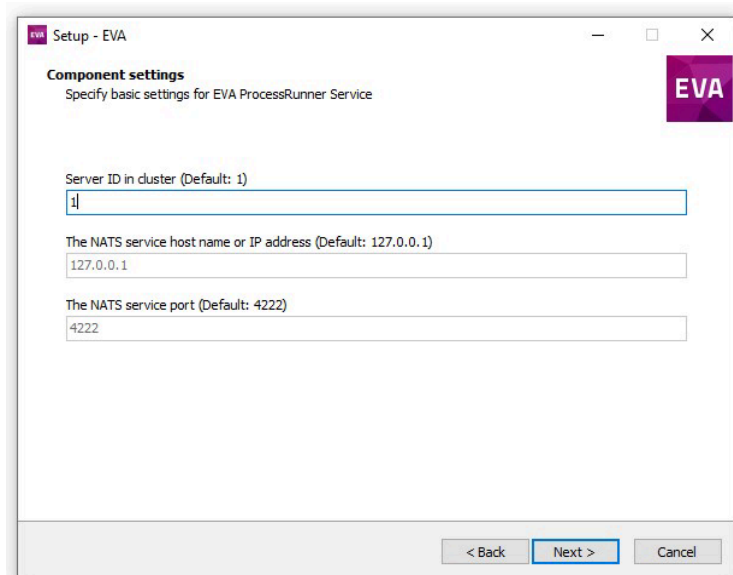
Server ID: 1

NATS: localhost (192.168.1.59)

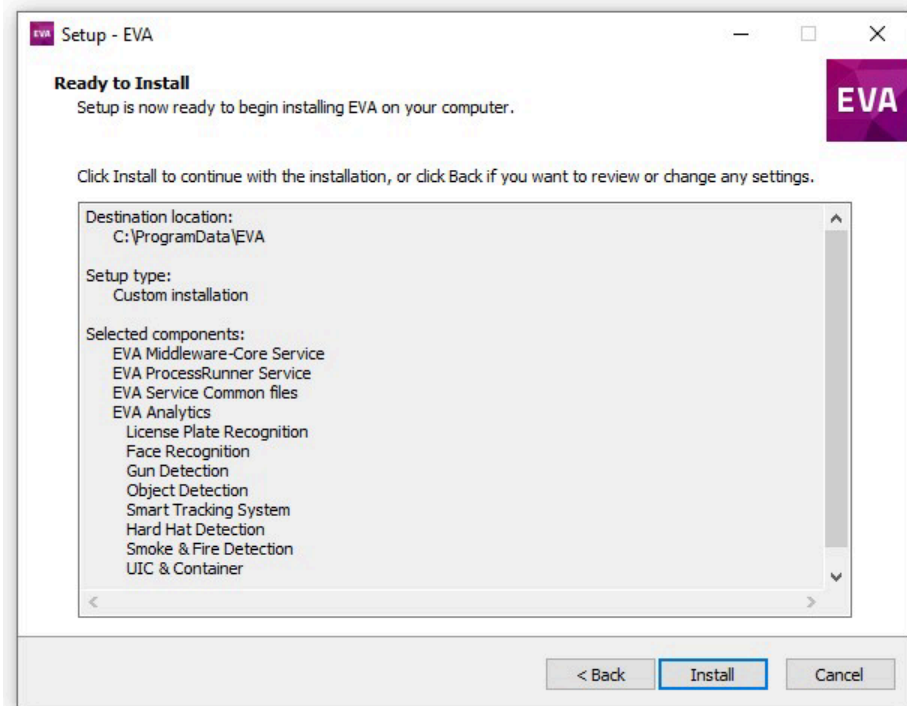
Process runner only server (without middleware)

Server ID: 2

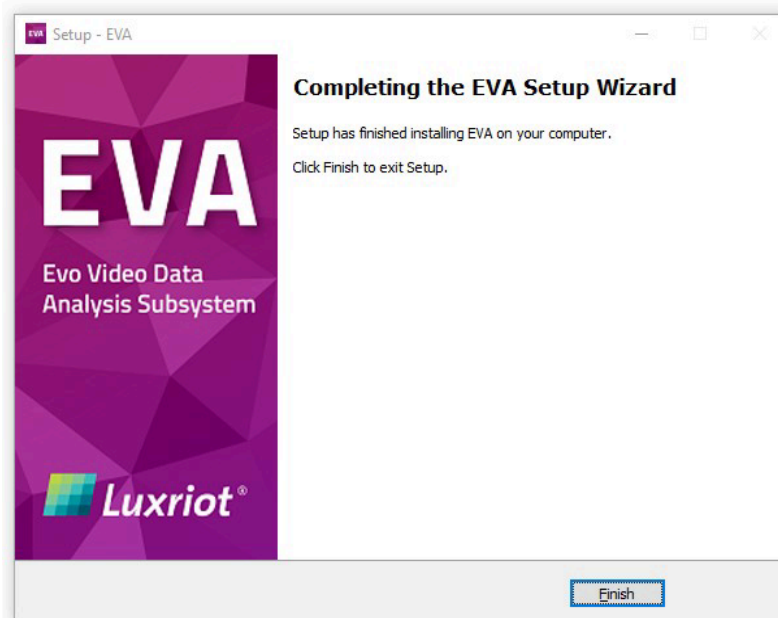
NATS: 192.168.1.59



8. Review the pre-installation summary and click the *Install* button. The installation wizard will extract the files and complete the installation; wait for the installation to complete. The wizard will also install additional OS components, if necessary.



9. Click the *Finish* button to close the setup window.



The Luxriot EVA Advanced system installation is complete.

3. Initial Server Launch

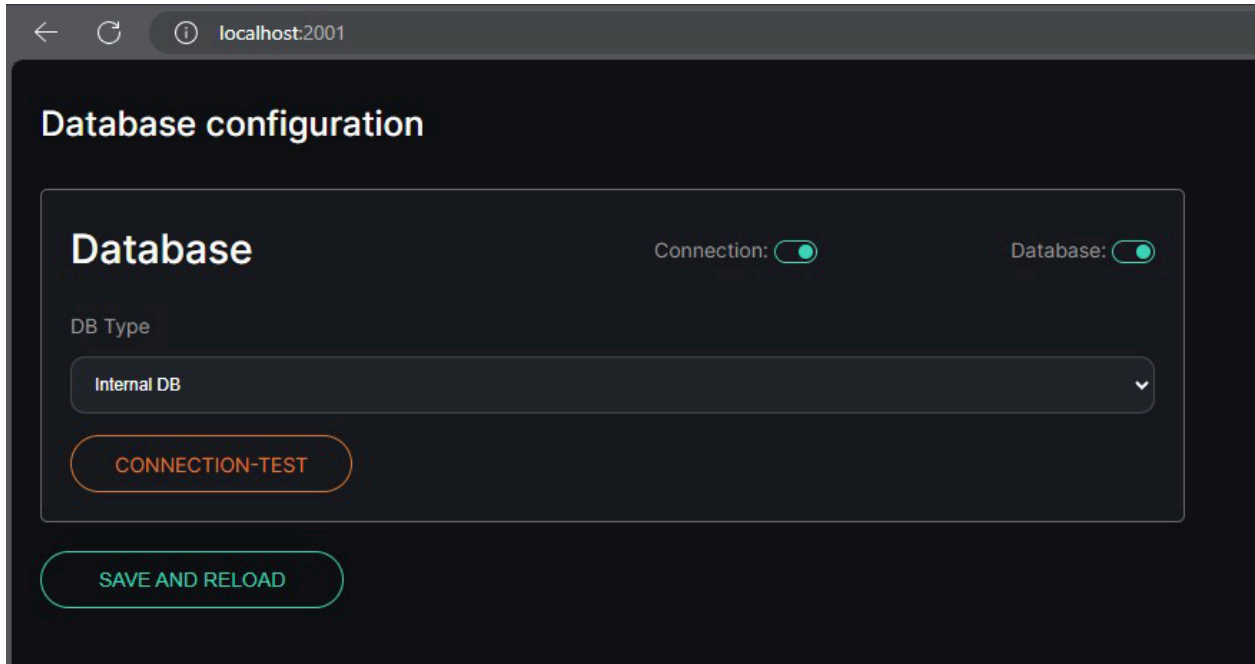
The Luxriot EVA analytics system runs silently as a set of Windows services. You can manage Luxriot EVA Advanced via the Web interface; the service is reachable via **HTTP port 2001**.

After installing Luxriot EVA, you must initialize the system to prepare it for operation.

Open the service URL in your browser:

- **http://localhost:2001/** for local access (if the system was installed on the current PC), or
- **http://IP:2001/**, where *IP* is the IP Address of the server (if the system was installed on a remote PC)

In the *Database* block:



!N.B. There is no simple solution to switch the Database type (*internal/MySQL/PostgreSQL/MSSQL*) after the installation is complete! **Consider your architecture before deploying the system!**

- Select the *DB type* from the drop-down list:
 - Leave the *Internal DB* for small projects with up to 20 analytics with low server load (Make sure you are making weekly **backups** with the internal DB)
 - Choose *MySQL/PostgreSQL/MSSQL* for bigger projects over 20 analytics
- Fill in the *DB connection* fields (only for *MySQL/PostgreSQL/MSSQL* type):
 - **Host** (IP address of the server with your pre-installed and pre-configured DB)
 - **DB Login**
 - **DB Password**
- Click the *Connection Test* button to check the *DB connection* (the Connection toggle will turn green if the connection has been successfully established) and create the database (corresponding green *Database* toggle for the *Internal DB* type)

!N.B. *MySQL* is preferable if you plan to expand the system to a server cluster in the future, or if you already have 20 or more analytics channels.

- The root *Login* and *Password* are used only once to create a limited internal user to work with MySQL.

!N.B. Unfortunately, MSSQL can't handle automatic user and database SCHEMA creation. If you need to use MSSQL for some reason, you need to:

1. Create a Database named "*videoanalytics*" (**CREATE DATABASE videoanalytics**) in your MSSQL Server client.
2. Add the database connection details to the EVA configuration and test the connection. You will receive an error — it is expected.
3. Stop EVA middleware-core service and find file:

"C:\ProgramData\EVA\middleware-core\config.json"

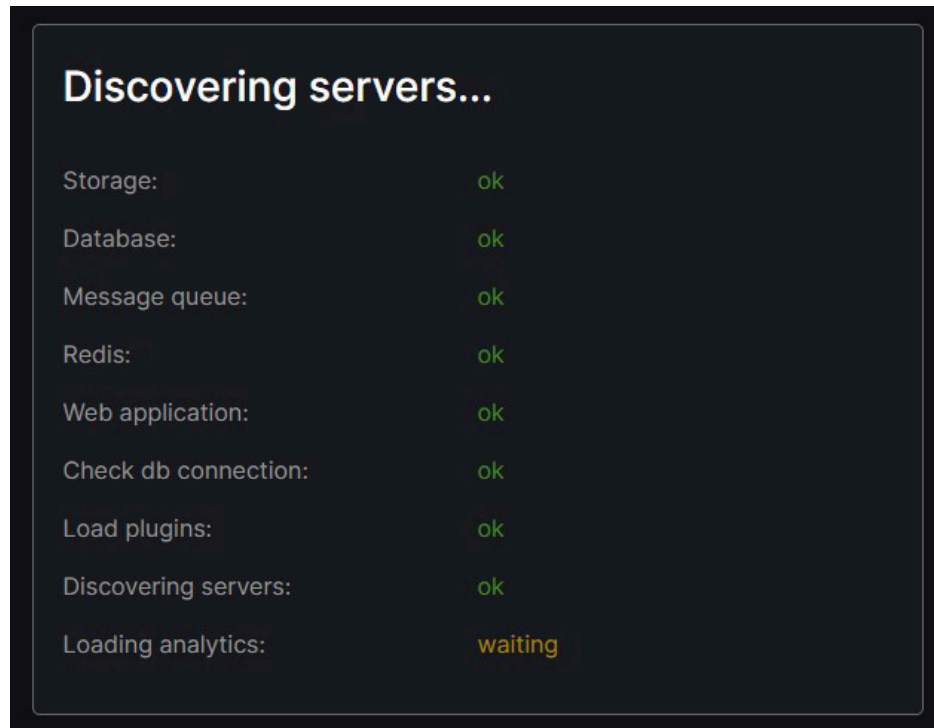
4. Add your created database configuration to the JSON file here:

```
"db":{"host":"jdbc:sqlserver://localhost:1433;databaseName=videoanalytics;encrypt=false",  
  "password":"password",  
    "type":"sqlserver",  
    "user":"admin"  },
```

5. Save the changes to the file and restart your EVA middleware-core service.

SAVE AND RELOAD

Wait while the system completes the plugin checks.

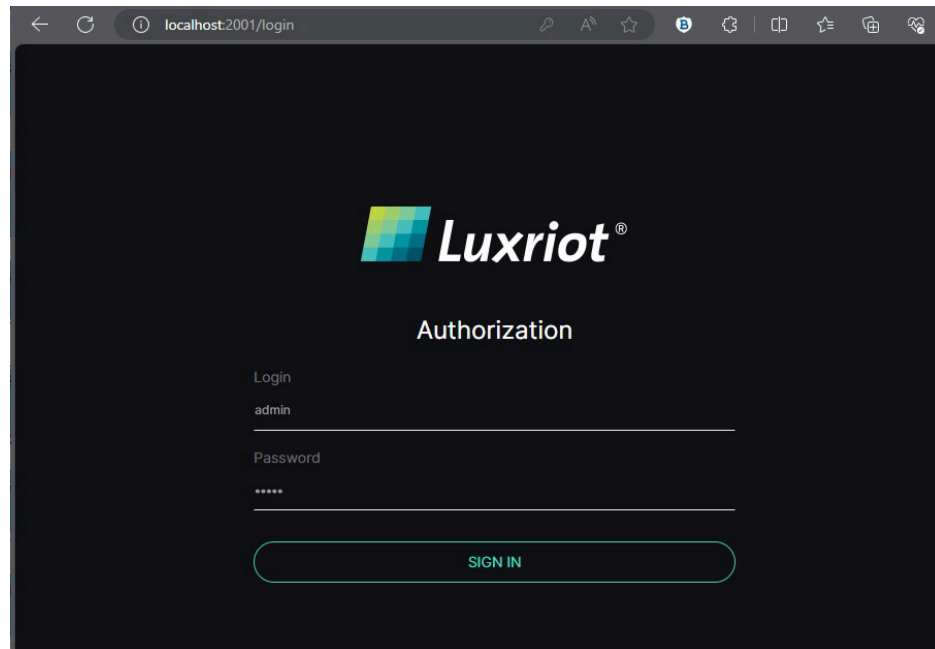


The initial system setup is now finished. Refresh the page and enter the system using the following default user credentials:

- **Login:** admin
- **Password:** admin

!N.B. By default, the system is accessible via **port 2001**, with the default user profile **admin/admin**.

Enter credentials and click the *Sign In* button.

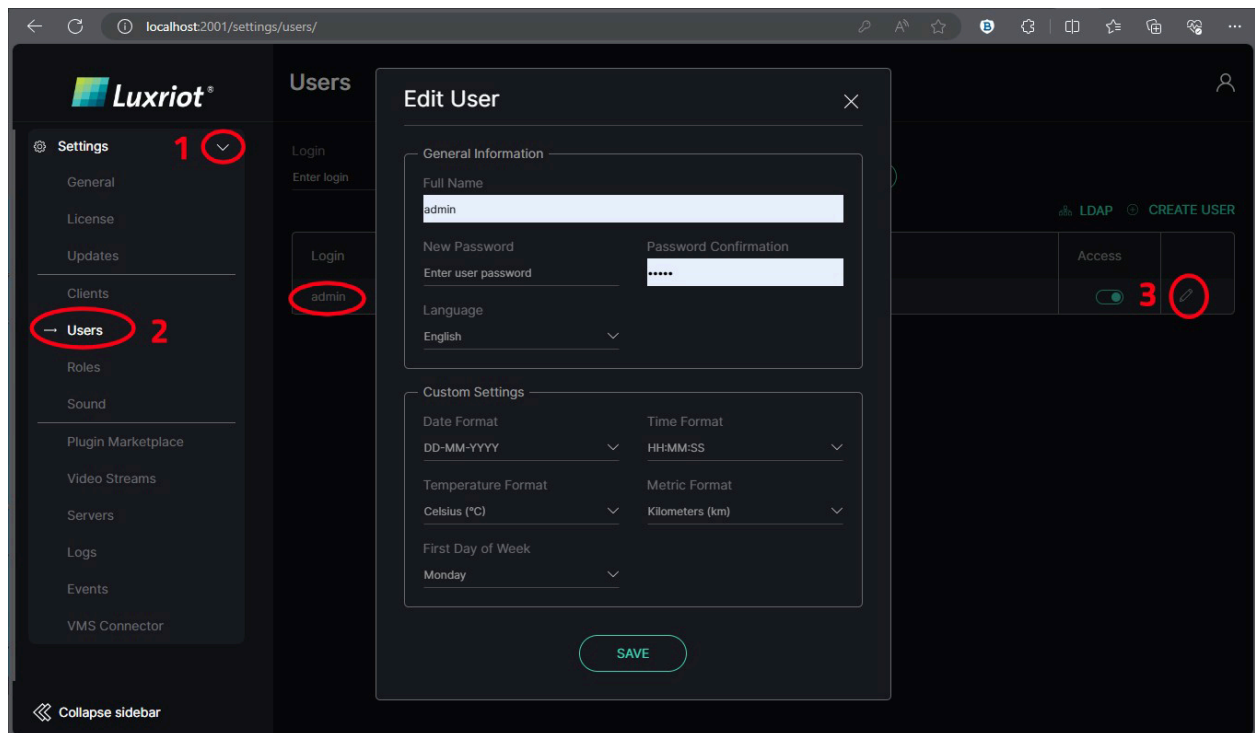


You can now proceed with the analytics configuration.

4. Initial Luxriot EVA settings

Initial setup

It is recommended that you change the Administrator password to a secure one before connecting any plugins, especially cameras. You can access the corresponding user's profile via the main menu *Settings -> Users -> admin*.



System Setup

To start using the system, the following minimal configuration is mandatory:

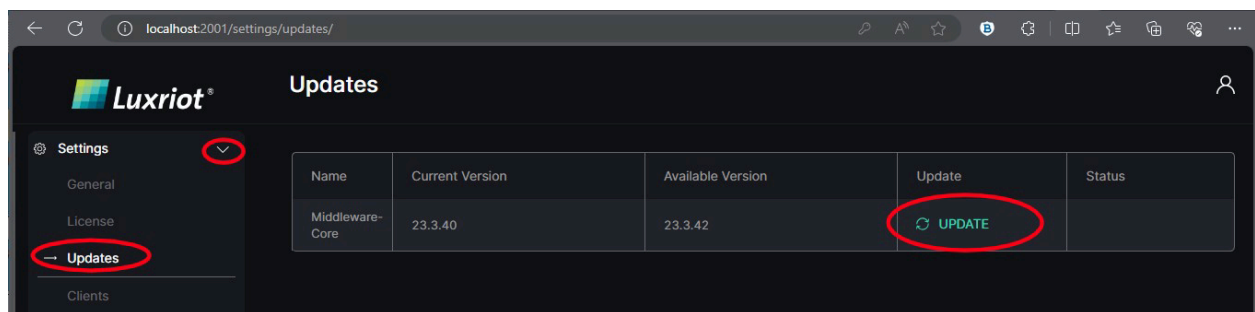
1. Update Middleware-core to the latest version (Please follow Settings -> Updates)
2. Activate the license key (online / offline)
3. Install desired plugin(s) in Settings -> Plugin marketplace (note: if you have already installed it within the installation package, you can skip this step).
4. Update plugin(s) in Plugin Marketplace -> Installed
5. Connect your Luxriot EVO server via VMS connector

6. Import desired streams and set them up for analytics
7. Connect the system in the *Console* app via External services
8. Start analytics and wait for the results

Steps 1-8 are briefly explained below. For more details on each menu item, refer to the corresponding detailed topics.

1. Middleware-Core Update

It is highly recommended that you update the **Middleware-Core** component before taking any other action. After installing Luxriot EVA and logging in, go to *Settings* -> *Updates* and click the *UPDATE* button.



2. License Activation

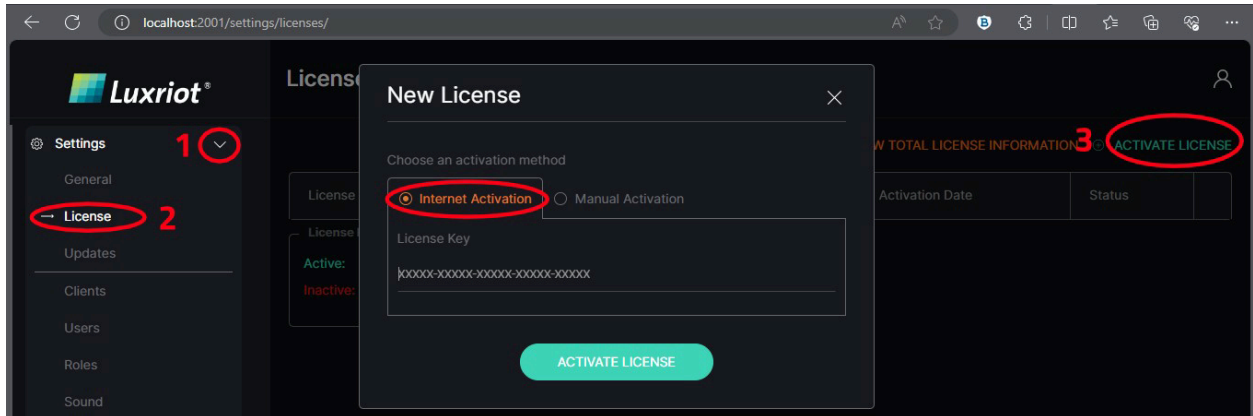
If this is the first Luxriot EVA installation on the particular hardware, you will have a trial license by default with one video stream for each analytic already activated. The trial license is valid for 30 days, or unless you reinstall Luxriot EVA.

!N.B. The trial license allows only one analytics instance to run simultaneously. To test different plugins with the default trial license, turn off already running analytics and only then add a new stream to the chosen plugin.

For the production license, there are two license activation scenarios:

1. Online activation.
2. Offline (Manual) activation.

If your system has internet access, and it will be available all the time, we recommend using online activation. Navigate to *Settings* → *License* → *Activate License*, enter your activation key, and click the *Activate License* button. Your license will be activated immediately.



If your security requirements do not permit direct access to the Internet or if your system has an unstable Internet connection, we recommend manually activating the license key. Select the *Manual Activation* tab inside the *License* pop-up window, fill in the *License key* field with your license key, and download the generated *Hardware ID* file. Then, contact our *Support Team* via email: support@luxriot.com (note: support responds only during working hours) and send us your license key and hardware ID file.

Please note that the review process is not immediate, and responses from the *Support team* may take up to 24 hours due to the verification steps required. However, in most cases, you will receive your activation key file sooner. Once received, transfer the key file to your offline system and drag it into the *Activation Key File* field. Then, click the *Activate License* button to complete the activation.

!N.B. If the license was previously activated on the particular configuration, it can lead to an *Unknown error*. Only one demo license is allowed per instance. Please contact EVA support to solve this situation.

New License

×

Choose an activation method

☐ Internet Activation

☒ Manual Activation

License Key

XH2YH-MW3H-3K8U-2J8E5-BW7 7F

To obtain a License Activation file please send the provided Hardware ID file to your partner/reseller.

Hardware ID File

activation.txt

DOWNLOAD

Activation Key File

Drag and drop or click

BROWSE

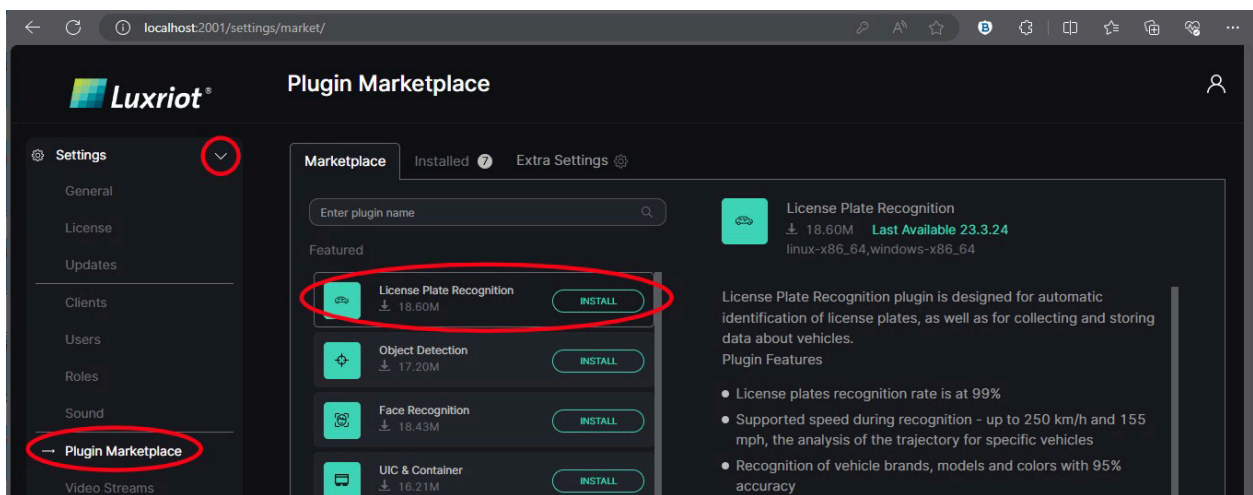
ACTIVATE LICENSE

3. Plugin Installation

Analytics plugins are installed separately for each type of analytics. For example, container recognition, license plate recognition, and face recognition use different detection engines.

To install any desired plugin:

1. Click the *Plugin Marketplace* menu item: the *Marketplace* tab will be opened in the main area
2. Locate the required plugin in the list
3. Click *Install* to add the plugin (System will refresh the page after installation is complete)



Once you install a plugin, it will be labeled as *Installed* in the *Marketplace* tab. Additionally, it will appear in the *Installed* tab, which lists only the plugins currently installed on your system.

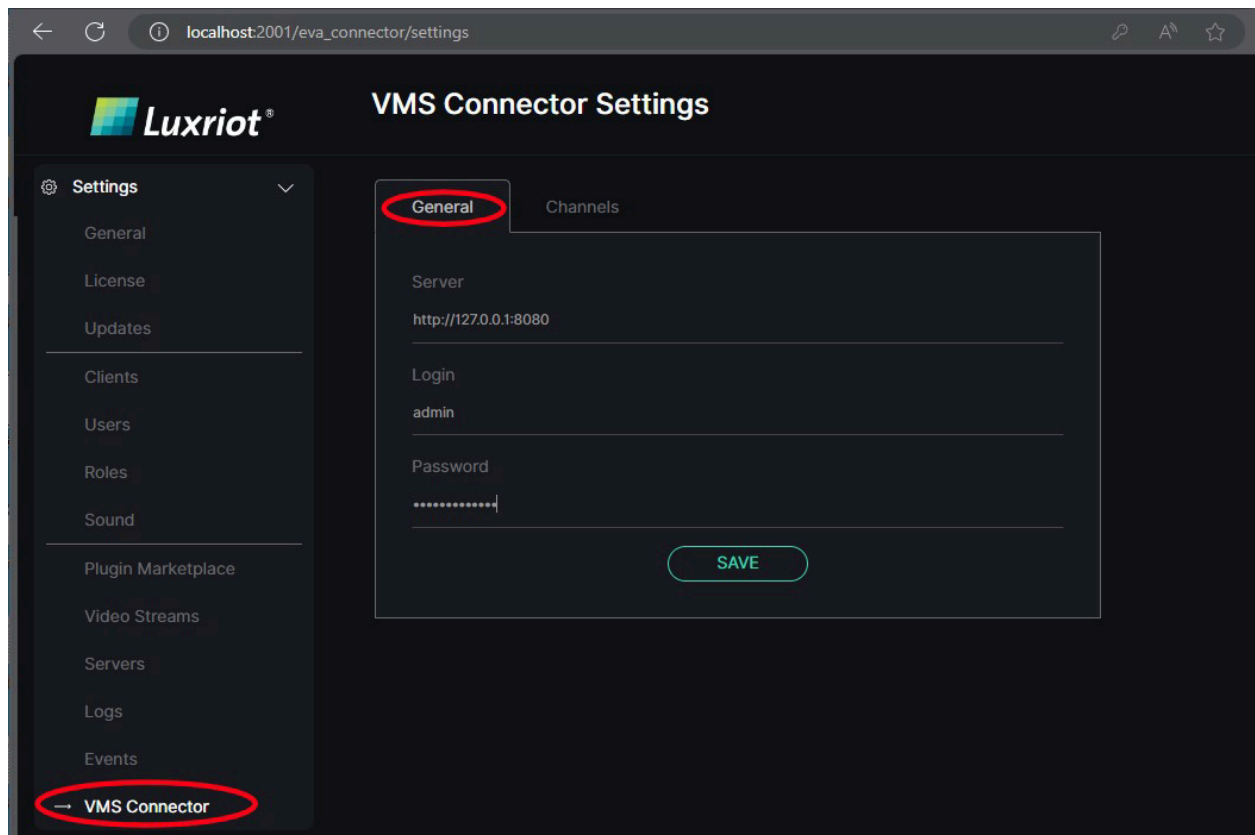
Learn more about plugin management here: [Plugin Marketplace](#).

4.1. Add Luxriot EVO Connection

Plugins require a video stream to operate. To retrieve video from Luxriot EVO, configure a connection to the target Luxriot EVO server—this can be either a Luxriot EVO S or Luxriot EVO Global system.

To connect to multiple Luxriot EVO servers simultaneously, a Luxriot EVO Global system is required, as it provides a single point of entry (IP address) for Luxriot EVA. Please note that the connection should always be to EVO Global, not the recording server.

To access the Luxriot EVO server settings, navigate to Settings → VMS Connector (you may need to scroll down), then open the General tab in the main page area.



To add the Luxriot EVO server:

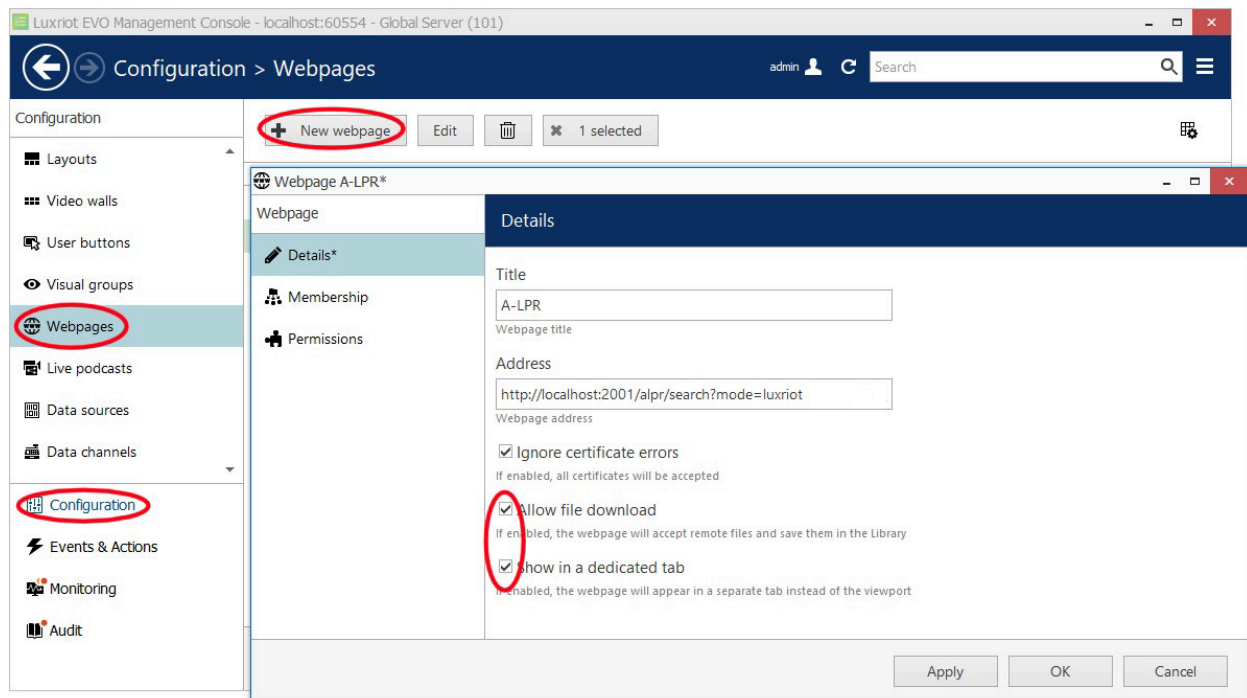
1. Open the *VMS Connector* menu item and open the *General* tab
2. Enter the Luxriot EVO server **IP address** and **HTTP port** (default port: 8080) (or localhost if it is used on the same machine).
3. Enter *Credentials* for the Luxriot EVO user.

5. Connect EVO with EVA

Creating the Dedicated Crosslink tab in the Luxriot EVO Console

To create the Dedicated *Crosslink* tab and connect it with the preinstalled plugin, go to:

1. *Luxriot EVO Console -> Configuration -> Crosslinks*
2. Click on the **+New Crosslink** button to bring up the *Crosslink* pop-up window
3. Inside the *Details* tab, fill in the *Title* field with the name you want to see inside the Luxriot EVO Monitor as the plugin tab name
4. Fill in the *Address* field with the link to your web-based interface connection details:
http://localhost:2001/?mode=normal
5. Mark the Show in a Dedicated tab checkbox, and confirm with the *Apply* and *OK* buttons.



!N.B. The CrossLink Basic and CrossLink Advanced are not included by default and **are optional**. If you wish to use it, please contact the sales department to inquire about available options.

6. Plugin Marketplace

Overview

Currently, there are two types of plugins represented inside the *Plugin Marketplace*:

1. Analytics
2. Event Management.

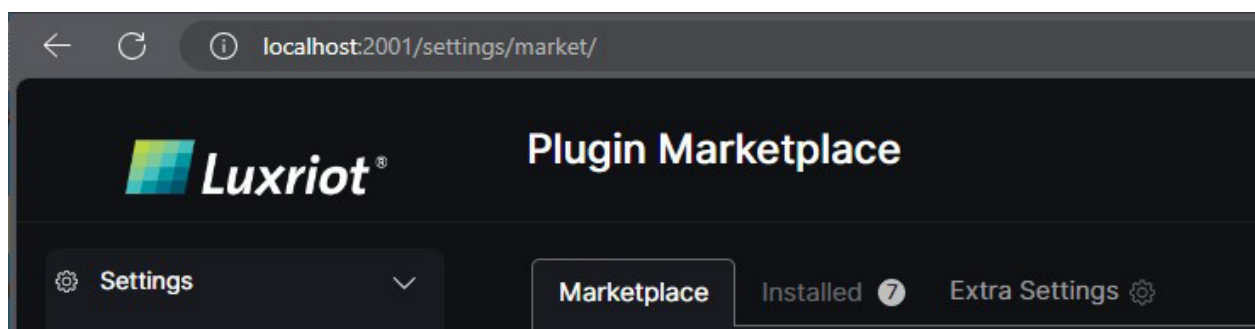
Each type of Analytics and Event managers are represented by its own plugin. Each plugin may be installed, updated, or removed from the system separately. Inside the marketplace, you will also find a **VMS connector** that stands out from all other plugins - it connects a standalone Luxriot EVA with the Luxriot EVO server.

Plugin Marketplace

To access the Plugin Marketplace, navigate to Settings → Plugin Marketplace.

The Plugin Marketplace space consists of three tabs:

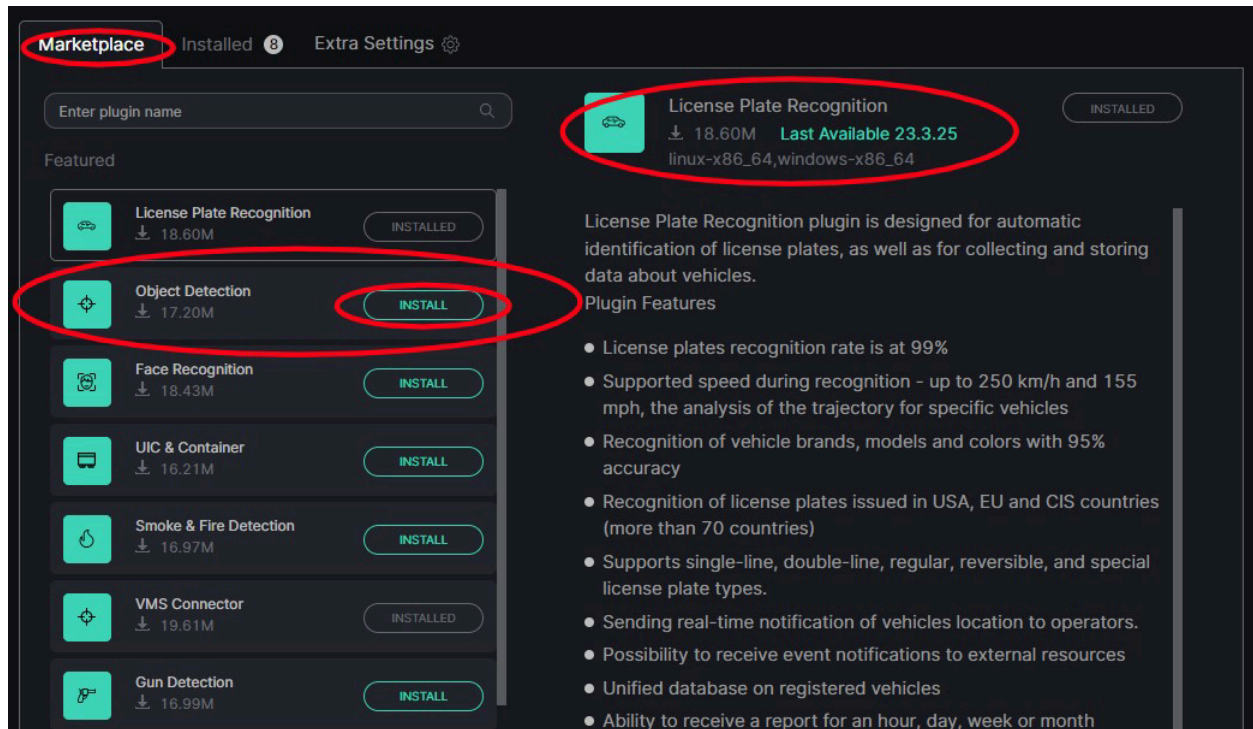
1. **Marketplace tab:** Browse all available plugins, view a brief description of each plugin's functionality, and install them individually.
2. **The Installed tab:** Displays all plugins currently installed on your system. From here, you can update, enable, or disable plugins—either individually or in bulk.
3. **Extra settings:** If your system has limited or no internet access, you can manually add a new plugin from a local file. This section also allows bulk management of installed plugins.



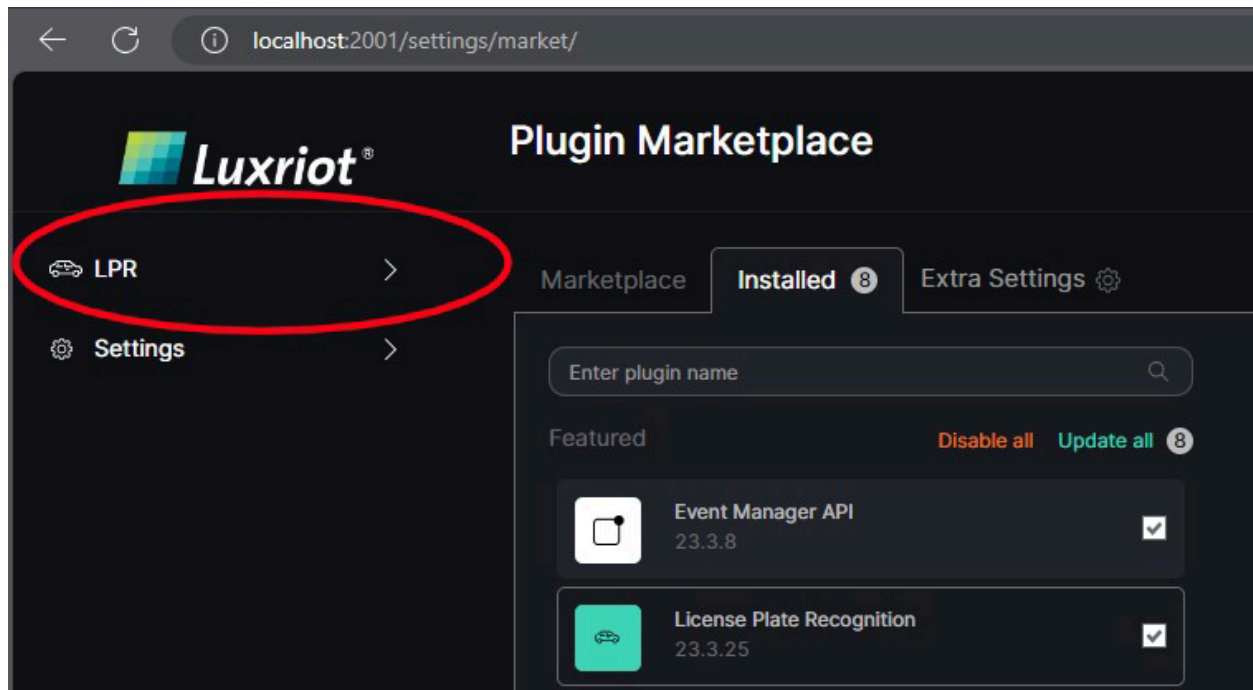
Marketplace tab

Before installation, you can review the particular plugin by clicking it in the left part of the *Marketplace* tab. All plugins include information about the latest version available and the operating systems they support. Analytics plugins will also have a brief description of their functionality and key features.

To install a specific plugin, click the Install button located to the right of the plugin name. Once the installation is complete, the button will be grayed out, indicating that the plugin is successfully installed and ready for use.



After the installation, your analytics module will appear as a new tab at the top of the *Main Menu*, providing access to its features and settings.



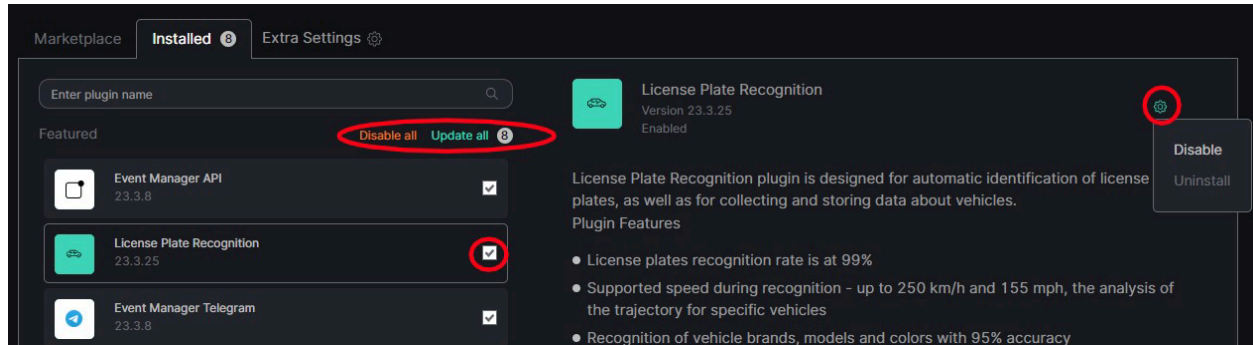
!N.B. Before installing any plugins, ensure the Middleware-Core is updated to the latest version. To check for the latest **Middleware-Core** version, go to the *Main menu* -> *Settings* -> *Updates* and verify that the current version matches the latest available version. If not, run the update and only then continue with the plugin installation.

Installed Tab

You can manage plugins that have already been installed from the *Installed* tab. Under the *search bar*, you will find the controls to *Disable* or *Update* all the installed plugins at once. To disable an individual plugin, simply uncheck the box next to its name.

Please note: Disabling an analytics plugin will also remove its tab from the Main Menu.

To uninstall the plugin completely, hover the mouse over the *Gear* icon  in the top-right corner of the description section of the *Installed* tab and select *Uninstall*.



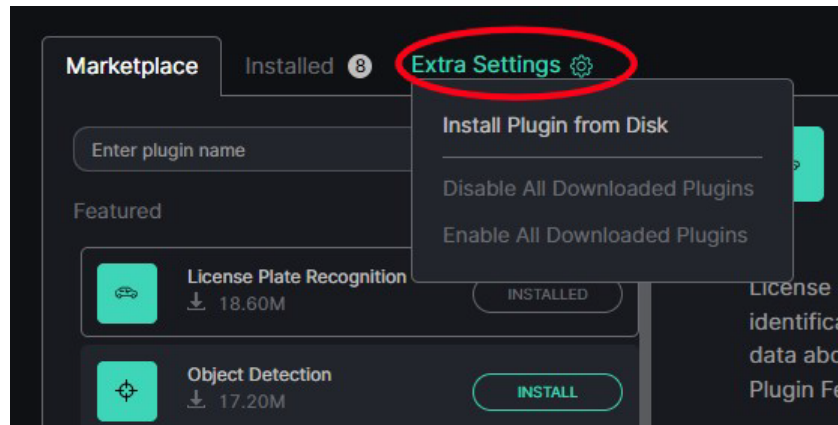
Extra Settings

Extra Settings offer additional plugin management options. Hover over the tab to reveal the dropdown menu.

If your system is isolated from the internet, you can install plugins from a local file. To do so, hover over *Extra Settings*, select *Install Plugin from Disk*, browse the plugin installation file, and confirm by clicking *Open*.

!N.B. Offline plugin installation is not recommended. If you proceed, please ensure you have the correct and compatible plugin version. Manual installation is performed at your own risk.

If you have any questions or uncertainties regarding the offline installation process, we strongly advise contacting the Support Team before proceeding.

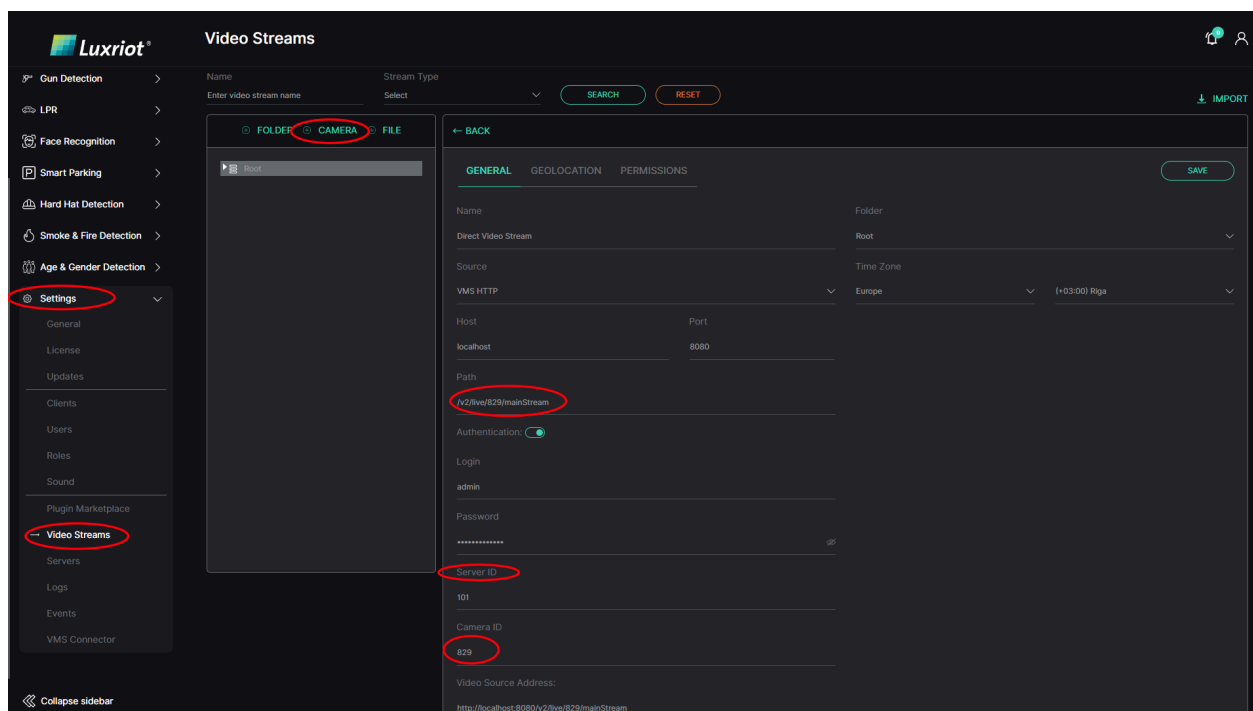


You can also enable or disable all plugins at once by using the corresponding option in the menu.

Adding Channels without a VMS connector

In some cases, you may need to add a channel to EVA Advanced without using the VMS Connector. This option is available for particular scenarios; however, we recommend using VMS Connector instead of manual channel import. To do this, navigate to:

1. *Settings* → *Video Streams* → *+Camera*.
2. Enter a meaningful name for the video stream.
3. Select *VMS HTTP* as the source.
4. Provide the *VMS IP/hostname* and *port* (default is **localhost:8080**).
5. In the *Path* field, enter: */v2/live/channelID/mainStream*, replacing *channelID* with the actual *channel ID* from your Luxriot EVO Console.
6. Enter the *Connected Luxriot Server ID* (**default: 101**) and specify the *Camera ID*, the same as the *channel ID*.



Confirm your settings with the *Save* button. You will now find an additional video stream alongside the other streams from the VMS Connector.

!N.B. To receive messages in the *Luxriot Monitor* notification panel and receive data in the *External tab* — External services within the Luxriot EVO Console must be properly configured.

PLUGINS

Face Recognition

Introduction

Use this guide to understand the interface and features of the Face Recognition plugin and learn how to utilize it for the best results.

What is Face Recognition?

Face Recognition detects people in the frame, verifies and identifies the person (compares with the base of faces), and determines age and gender. The plugin allows users to customize face lists, alert settings, and view statistical reports.

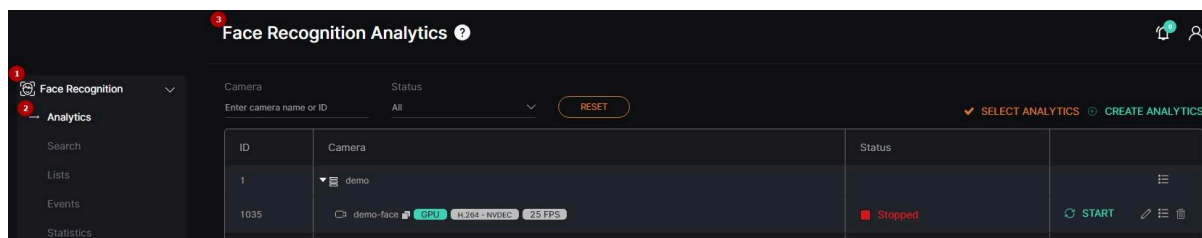
Primary Capabilities

Face Recognition is capable to:

- Identify a face with 98% accuracy
- Capture and recognize the face within 0,1 second
- Recognize up to 200 faces in the frame simultaneously
- Support face recognition with glasses, caps, masks, beards, and moderate facial rotation
- Determinate the age and gender

Overview

To open the Analytics item, in the left menu:

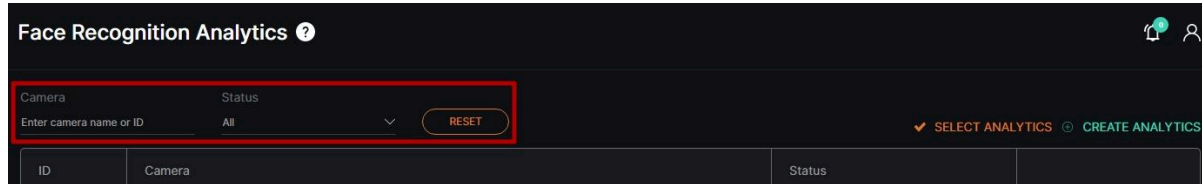


1. Select the Face Recognition section

2. Choose the Analytics item
3. See analytics

Use and Functionality

The Face Recognition Analytics functional menu allows to:



- Fill in the Camera field with:
 - Camera name or characters in the name
 - Analytics ID
 - Video stream ID
- Select the required analytics status
- Click the Reset button to clear the filters

The status options comprise All, Active, and Stopped.

See the list of analytics in the table below. It contains:

Camera

Status

Enter camera name or ID

All

RESET

✓ SELECT ANALYTICS

⊕ CREATE ANALYTICS

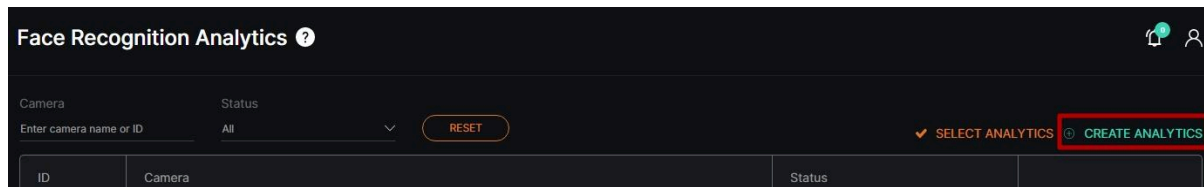
ID	Camera	Status	
1	demo		
1035	demo-face GPU H.264 - NVDEC 25 FPS	Active (00:00:18 / 3) Server: 1, GPU: 0	STOP
938	demo-face CPU H.264 - CPU 25 FPS	Stopped	START

- Analytics and folder ID
- Camera comprises:
 - Folders' and separate video streams' names
 - Copy the Name icon to copy the video stream name
 - Video source type
 - Additional hardware parameters
- Video stream or video file playback status. For the Active and Offline statuses, the system also displays:

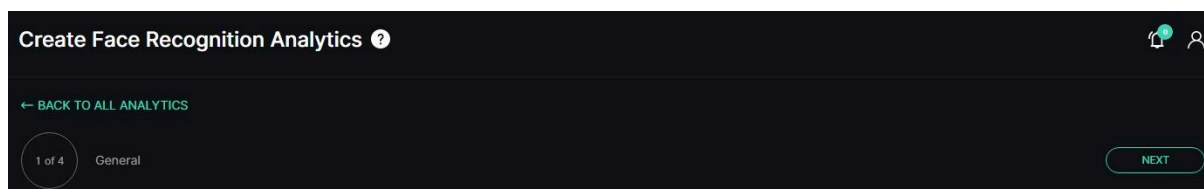
- Countdown since analytics launch
 - Last server connection to analytics (seconds ago)
- The toolbox comprises:
 - Start/Stop
 - Edit
 - Search Results
 - View
 - Delete
- To learn more about grouping video streams into folders and making the appropriate changes in the Video Streams item, read Video Streams.
- To find out the ID of the CPU/GPU and the server running the video stream, hover the mouse over the circle next to the status of the running analytics.

Create Analytics

To create new analytics, click the Create Analytics button:



The Create Face Recognition Analytics navigation menu allows to:

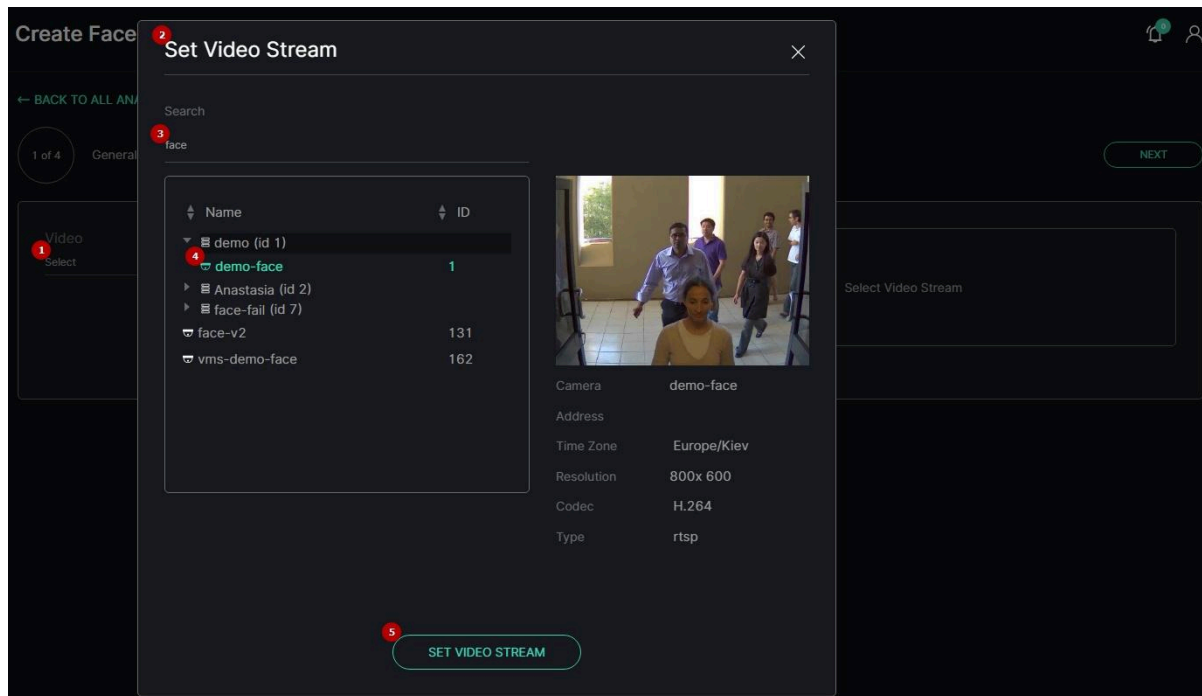


- Click the Back to All Analytics button to return to the main Analytics item
- See the title and serial number of the current tab
- Click the Back or Next button to move among tabs:
 - General
 - Hardware
 - Notifications
 - Permissions

General Tab

The General tab provides the ability to set a video stream and customize analytics parameters.

To set a video stream:

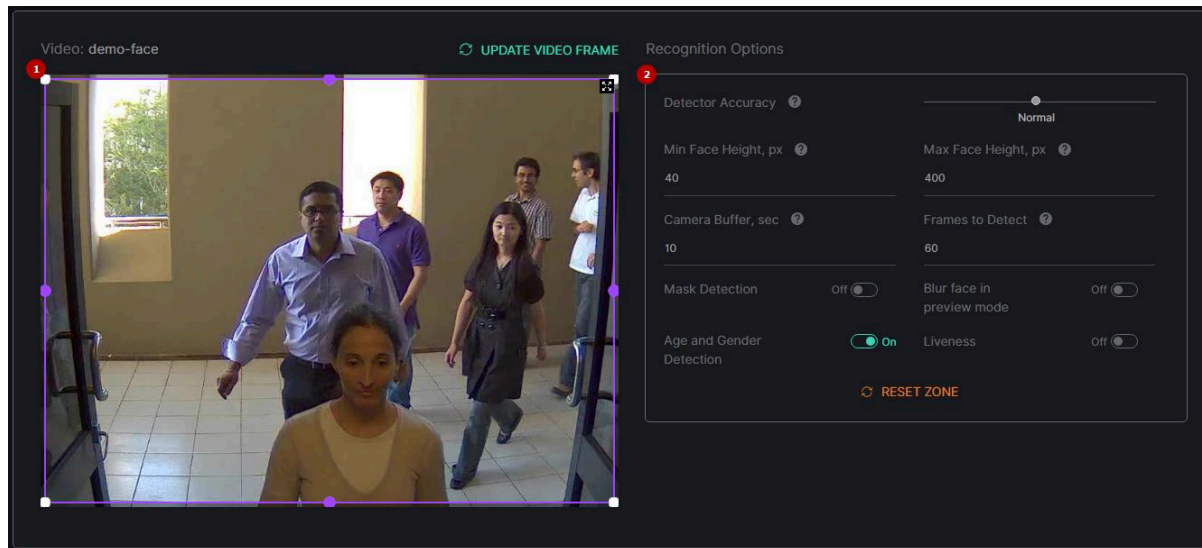


1. Click the Video field
2. See the Set Video Stream pop-up window
3. Fill in the Search field with:
 - Camera name or characters in the name
 - Video stream ID
4. Select the required camera from the filtered list
5. Click the Set Video Stream button to confirm the intention

To refresh the video preview, upon selecting the Set Video Stream button, click the Update Video Frame button above the frame. This button is available upon adding the video stream.

Recognition Options

To perform the recognition, apply these recognition options:



1. Set the parameters:

- Move the slider to the left (to decrease) or to the right (to increase) the detector accuracy
- Set the minimum and maximum face height in pixels for detection
- Set the delay time in seconds before recognizing the same face again in the Camera Buffer, sec parameter
- Set the number of frames for the sample from which the best frame is selected for face detection in the Frames to Detect parameter
- Click the toggles to enable/disable:
 - Medical mask detection
 - Age and gender detection
 - Blur face in preview mode for blurring the face area in the analytics live view mode
 - Liveness recognition

2. Modify the detection zone:

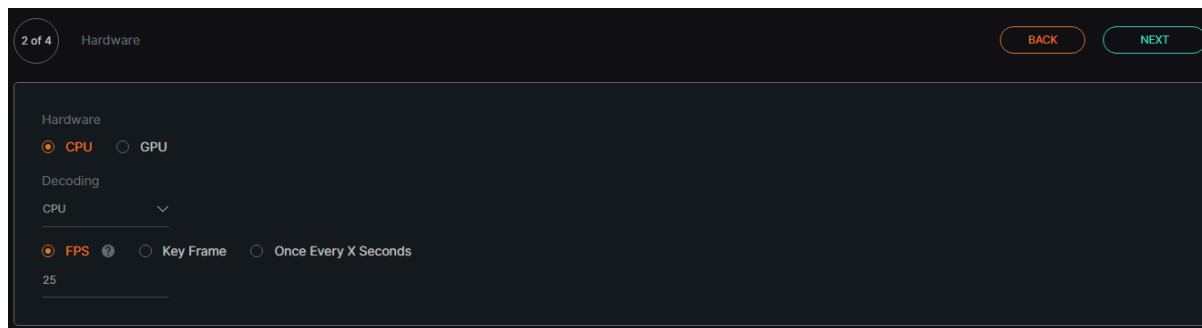
- Click and drag the handles with LMB to set the zone borders
- Click and drag the area inside the zone with LMB to move the whole zone
- Click the handle with RMB to delete it
- Click the Reset Zone button to return the detection zone borders to their original position
- Increasing the Detector Accuracy parameter results in more accurate recognition; however, the analytics recognize fewer objects, and some objects may be skipped. While decreasing the

parameter, the recognition accuracy decreases, and the analytics recognizes more objects, but false recognitions are possible.

- The minimum value for the Min Face Height, px parameter is 20 pixels.
- The maximum value for the Max Face Height, px parameter is limited only by the height of the frame. Set the value to 0 to remove the limit on the maximum height of the face in pixels.
- The possible range for the Camera Buffer, sec parameter is from 1 to 600 sec. The optimal value depends on the average duration of the expected face presence in the zone. The parameter serves as a trigger for re-detection, initiating the process of re-detecting and recognizing faces after the specified time interval has elapsed. A value of 0 disables this process.
- The possible range for the Frames to Detect parameter is from 5 to 100 frames. The lower the value is set, the faster the sample is processed; however, the quality of detection is also lower. The higher the value is set, the more accurate the face detection is, but it takes more hardware resources and time to choose the best frame for detection.
- The Liveness parameter is responsible for verifying the authenticity of a person's face image, excluding artificial elements such as mannequins, dolls, and masks.
- The detection zone is based on at least 3 handles.

Hardware Tab

The Hardware tab provides the ability to customize hardware parameters:

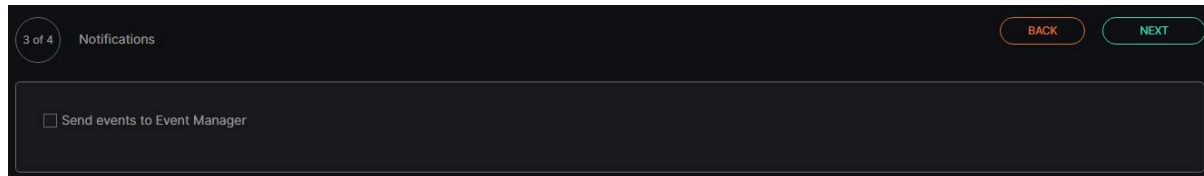


- Choose the CPU or GPU hardware acceleration
- Select the hardware decoder from the drop-down list:
 - CPU
 - Intel
 - NVDEC
- Select the frame processing mode:
 - FPS to set the desired number of frames per second
 - Key Frame to set the frame processing only by keyframes

- Once Every X Seconds to set intervals in seconds between frame processing
- The recommended value for the FPS mode is 25.
- The default parameters allow the production of analytics. To customize the analytics, set the required parameters.
- To learn more about hardware settings, read 'How to Configure the Hardware Tab Settings'.

Notifications Tab

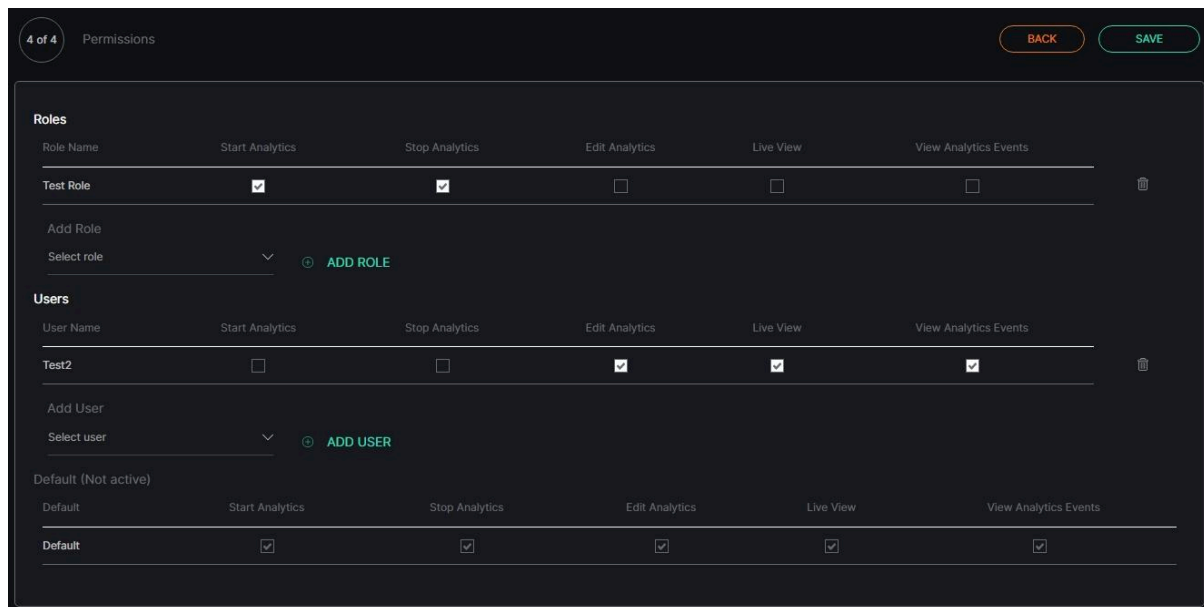
The Notifications tab allows you to manage event notifications. Check the Send Events to Event Manager box to enable the system to send all notifications to the Event Manager and then to external resources:



The default parameters allow the production of analytics. To customize the analytics, set parameters as required.

Permissions Tab

The Permissions tab provides the ability to:



Role Name	Start Analytics	Stop Analytics	Edit Analytics	Live View	View Analytics Events
Test Role	☒	☒	☐	☐	☐

Add Role
Select role ⊕ ADD ROLE

User Name	Start Analytics	Stop Analytics	Edit Analytics	Live View	View Analytics Events
Test2	☐	☐	☒	☒	☒

Add User
Select user ⊕ ADD USER

Default (Not active)

Default	Start Analytics	Stop Analytics	Edit Analytics	Live View	View Analytics Events
Default	☒	☒	☒	☒	☒

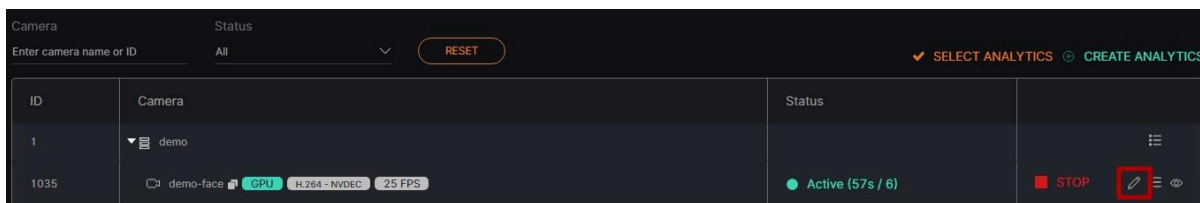
- Assign analytics access rights for Roles:
 1. Select the required role from the drop-down list
 2. Click the Add Role button
 3. Select the checkboxes for the required access rights
 4. Click the Delete icon to remove the unnecessary role
- Assign analytics access rights for Users:
 1. Select the required user from the drop-down list
 2. Click the Add User button
 3. Select the checkboxes for the required access rights
 4. Click the Delete icon to remove the unnecessary user
- Select the checkboxes for the required analytics access rights by default
- Select the Save button to confirm the intention in the navigation menu
- The default parameters are active only if no Roles or Users are added.
- The quantity of added Roles and Users is not limited.

Once saved, the Face Recognition Analytics editor opens to allow the users to:

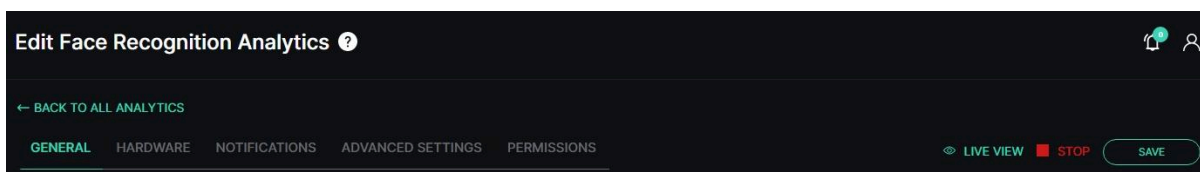
- Modify parameters
- Set parameters
- Run the created analytics
- Proceed to live view mode

Edit Analytics

To edit settings in the selected analytics, click the Edit icon on the toolbox:



The Edit Face Recognition Analytics navigation menu allows to:

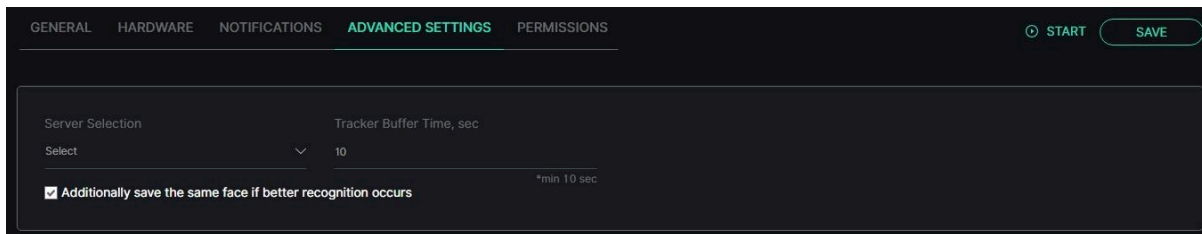


- Click the Back to All Analytics button to return to the main Analytics item
- See the setting tabs and move among them by clicking their titles:
 - General
 - Hardware
 - Notifications
 - Advanced Settings
 - Permissions
- Select the Stop button to disable the analytics:
 - Yes, to confirm the analytics disabling
 - No, to cancel the intention or close the pop-up window
- Select the Start button to enable the analytics
- Click the Live View button to see the selected analytics process in real-time
- Select the Save button to apply the changes to the selected analytics
- The current tab is always highlighted.
- Analytics editing is available only when the selected analytics is disabled.
- The Stop button is available only when the current analytics is active.
- The Start button is available only when the current analytics is stopped.
- The Live View button is available only when the current analytics is active.

To view editing parameters for the General, Hardware, Notifications, and Permissions tabs, except for Video Stream editing, read Create Analytics.

Advanced Settings Tab

The Advanced Settings tab allows users to:

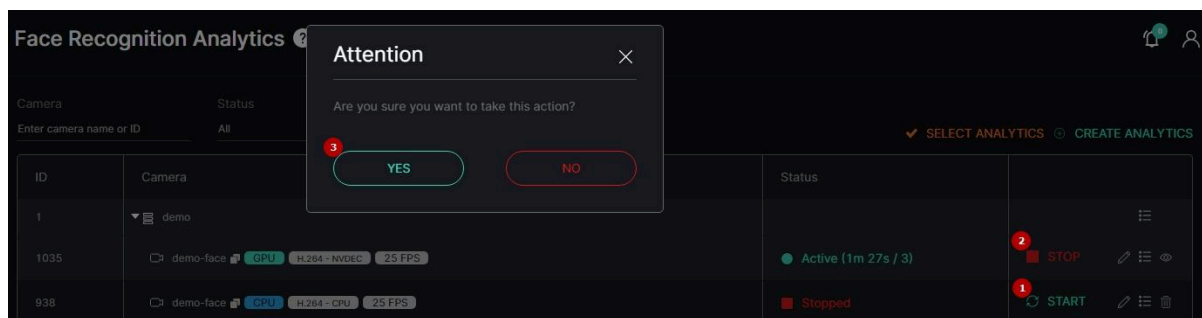
The screenshot shows the 'ADVANCED SETTINGS' tab selected in a dark-themed interface. At the top, there are five tabs: 'GENERAL', 'HARDWARE', 'NOTIFICATIONS', 'ADVANCED SETTINGS' (highlighted in green), and 'PERMISSIONS'. To the right of these tabs are two buttons: 'START' with a play icon and 'SAVE'. Below the tabs, the 'Server Selection' section features a dropdown menu with 'Select' and a downward arrow. To its right is a text input field for 'Tracker Buffer Time, sec' containing the value '10'. A small note '*min 10 sec' is positioned below the input field. At the bottom left, there is a checked checkbox with the text 'Additionally save the same face if better recognition occurs'.

- Select a server from the drop-down list to run the analytics
- Enter the recognized face storage time in the buffer (in seconds)

- Select the Additionally Save the Same Face if Better Recognition Occurs checkbox to save an additional event with the same face if subsequent frames show a clearer or more accurate recognition of that face
- The minimum value for the Tracker Buffer Time parameter is 10 sec.
- When the Additionally Save the Same Face if Better Recognition Occurs checkbox is enabled, after detecting a face and saving the event with it, the analytics will continue to analyze video with the same face as long as it remains in the frame. If a clearer or more accurately recognized image of the same face appears in subsequent frames, the system will save this improved recognition as an additional event. This ensures that the best possible image of a detected face is captured, enhancing the accuracy and quality of face recognition results.

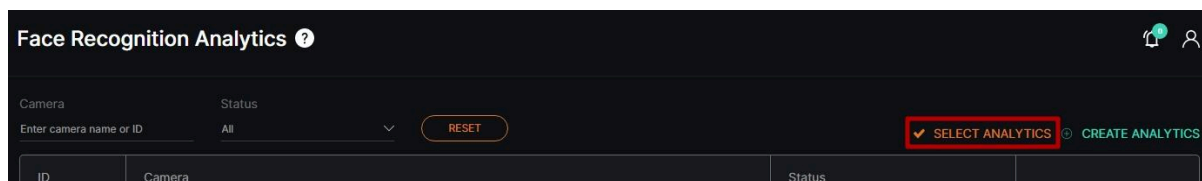
Analytics Status

To enable or disable the analytics and view the change of the analytics status:

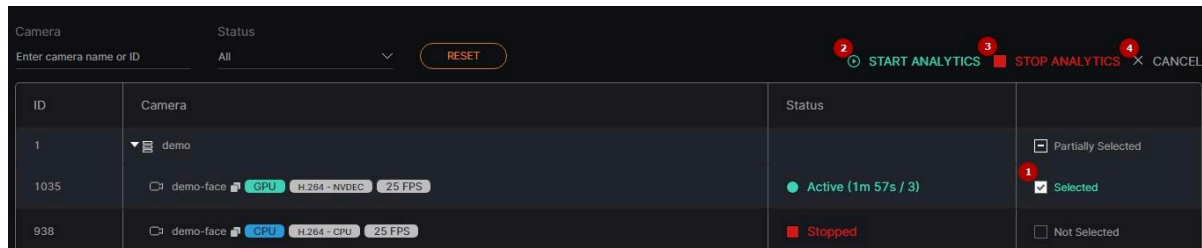


1. Select the Start button to enable the analytics
2. Click the Stop button to disable the analytics process
3. Confirm the intention

To enable or disable multiple analytics at once, click the Select Analytics button:



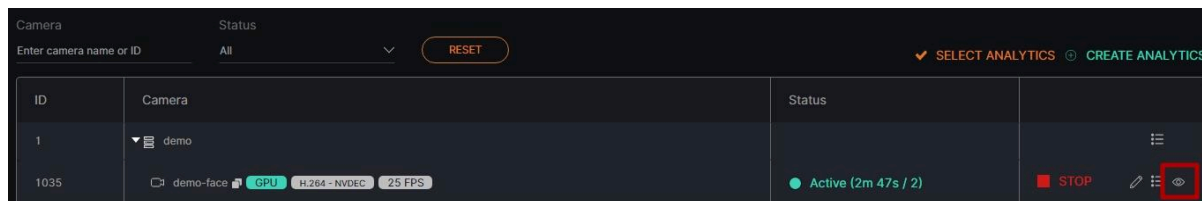
The Select Analytics functional menu allows to:



1. Check the boxes next to the required folders or separate analytics to select them
2. Click the Start Analytics button and confirm the intention in the pop-up window to enable all selected analytics
3. Click the Stop Analytics button and confirm the intention in the pop-up window to disable all selected analytics
4. Click the Cancel button to quit the analytics selection

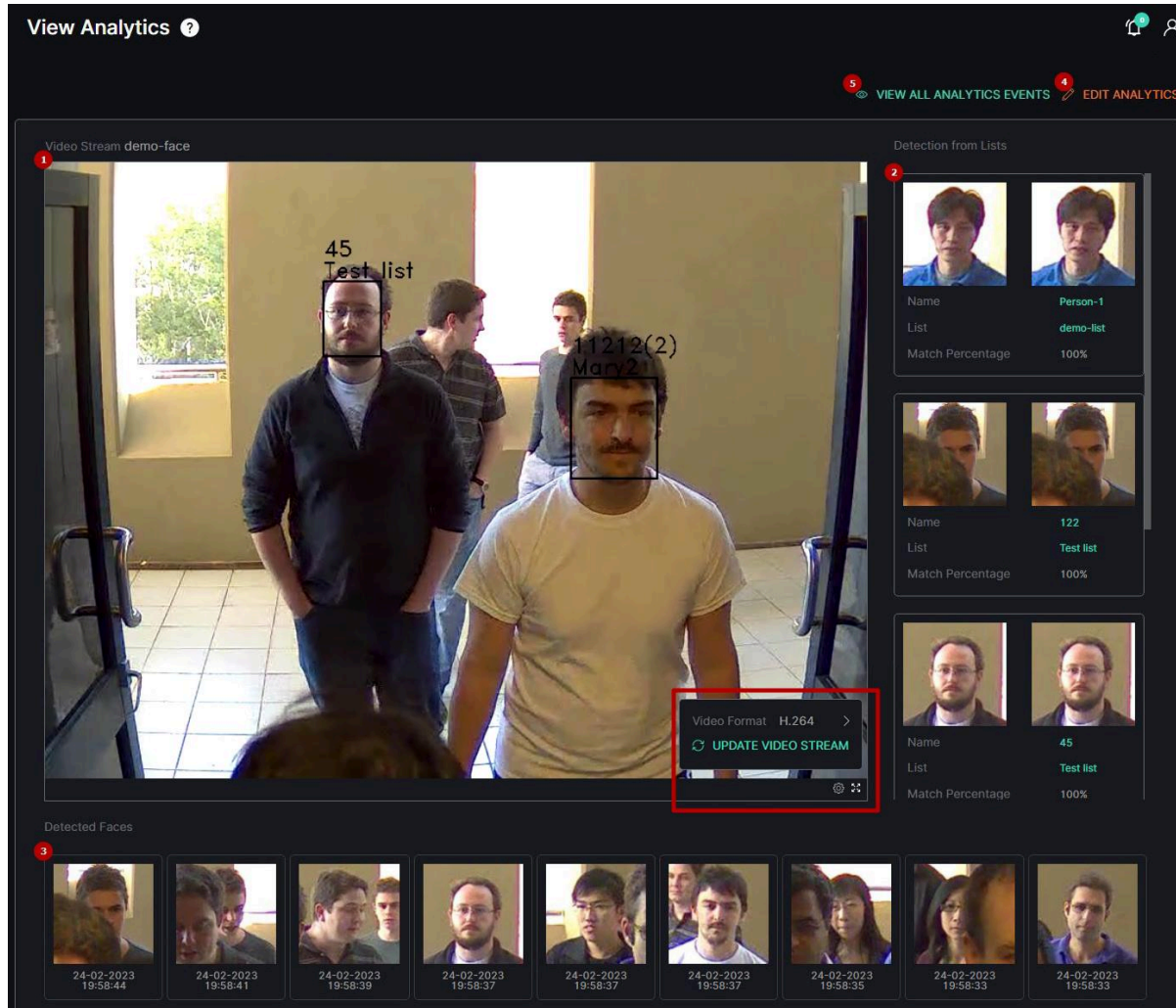
View Analytics

To see the selected analytics in real-time, click the View icon on the toolbox:



The View icon becomes available only when selected analytics is active.

Live view analytics mode allows to:

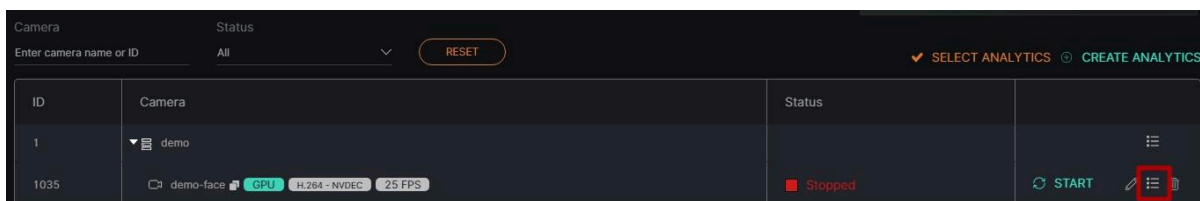


1. View the video from the camera in real-time mode. At the bottom of the block:
 - Hover the mouse over the Settings icon to:
 - Select the desired video format
 - Click the Update Video Stream button to update the video manually
 - Click the Enlargement icon to expand the video to full-screen
2. View recognized faces from lists:
 - Click the required frame to open the extended face recognition information. In the pop-up window:
 - See the person's data
 - Use frame view tools:
 - Zoom Out icon (-) to zoom out from a specific area of the frame
 - Zoom In icon (+) to zoom in on a specific area of the frame

- Reset View icon (~) to reset the frame to its original size and position
 - Target icon to zoom in on the detected object in the frame
 - Enlargement icon to open the frame in full-screen (in full-screen, press the Esc button to return to default view)
 - Hover the mouse over the Extra Options icon to:
 - Select the Save Image option to download the event frame in full size
 - Select the Export Event option to download the PDF report of the event
- Click the required person's name to open the ID Card
 - Click the required list name to open the list
3. View all faces detected by the analytics and click the required frame to open the extended face recognition information.
 4. Click the Edit Analytics button to make changes to the current analytics settings
 5. Click the View All Analytics Events button to see all events from the selected analytics.
 - The ID Card and list names are also displayed in the video next to the person with the ID Card in the list.
 - Click and drag the image across the zoomed-in frame to view different parts of it.
 - The Event Information pop-up window for faces without lists contains the additional option to add a person to the list by clicking the Create ID Card in List button.

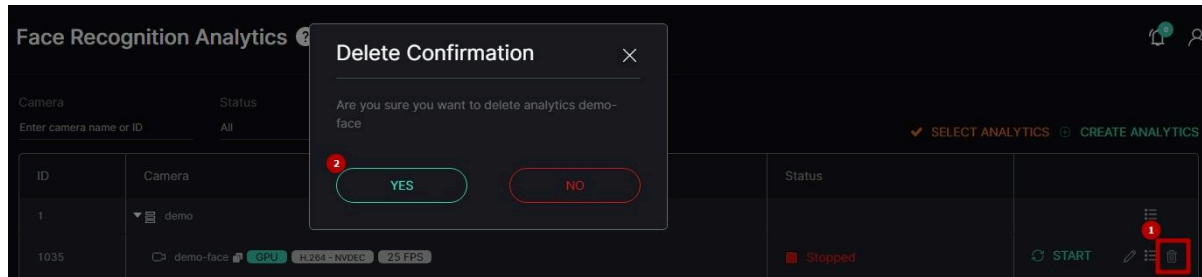
View Search Results

To view selected analytics search results in the Analytics item, click the Search Results icon on the toolbox:



Delete Analytic

To delete the analytics:

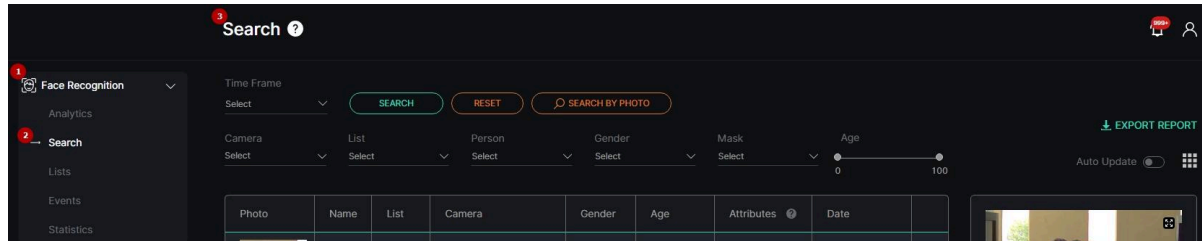


1. Select the Delete icon on the toolbox
2. Confirm the intention

Face Recognition: Search

Overview

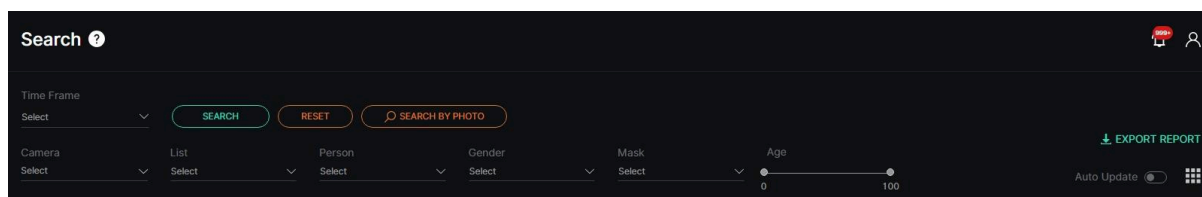
To open the Search item, in the left menu:



1. Select the Face Recognition section.
2. Choose the Search item
3. See the face search functional menu

Use and Functionality

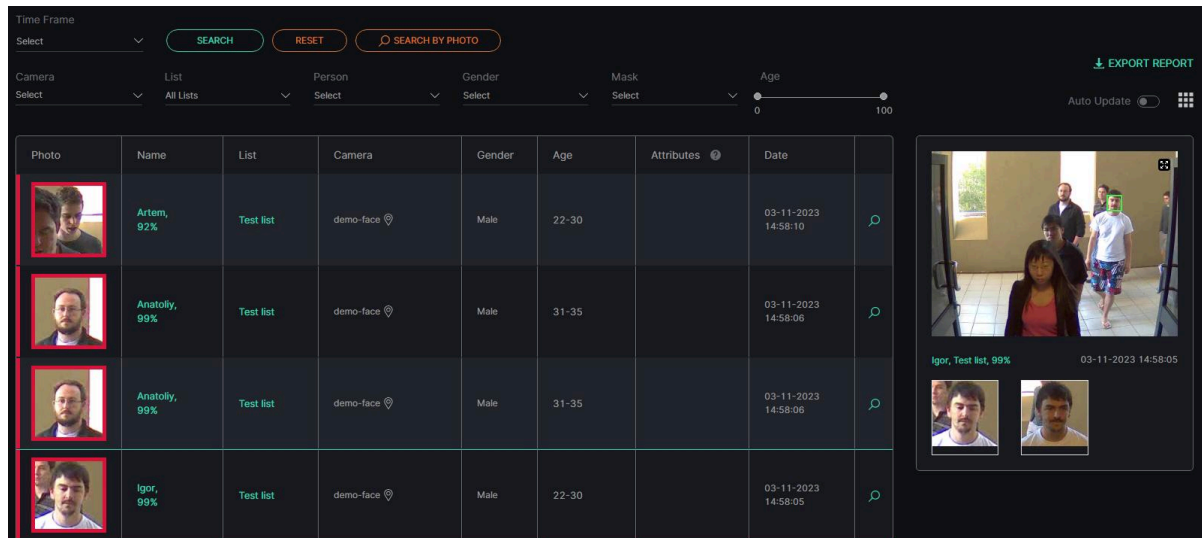
The Search functional menu allows you to:



- Select the desired time frame
- Click the Camera parameter to choose the desired video analytics. In the pop-up window:
 - Check the boxes next to the required video analytics and folders
 - Click the Select Video Analytics button
- Select a necessary list name, the All Lists or Off the List option from the drop-down list
- Select a required person from a drop-down list
- Choose the gender from the drop-down list
- Set a medical mask presence or absence on a face
- Set the age range by moving the sliders
- Click the Find button to start filtering
- Click the Reset button to clear the filters
- Click the Search by Photo button to identify faces among chosen photos on a device
- Click the Export Report button to download the PDF report. In the Export Settings pop-up window, set the parameters:
 - Enter the required number of the newest results collected for the report
 - Check the Add Frames with Faces box to include relevant cropped photos of faces in the report
 - Check the Add Full-Size Event Frame box to include full-size event frames in the report
 - Click the Export button to confirm the intention
- Select the Auto Update toggle to enable or disable auto-update of the search results
- Move between List and Grid view modes by clicking the corresponding toggle

The Person drop-down list contains options only if a specific list is selected.

Once selected and filtered, in the search results:



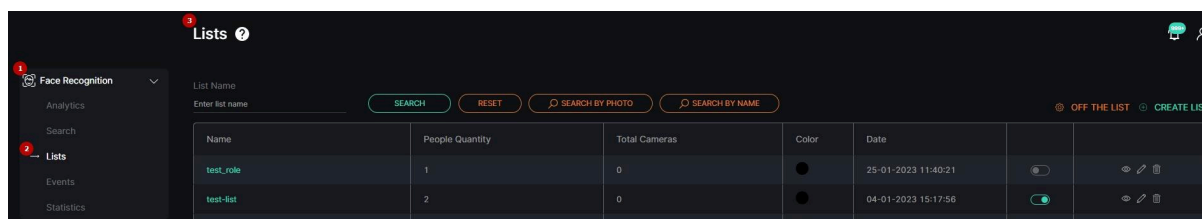
- View recognized people data, date, and time Faces have been recognized by the analytics
- View recognized attributes: mask presence or absence, liveness
- Click the list name to open the List View item or add a person to the required list by clicking the Add to List button. In the Add Person to List pop-up window:
 1. Enter the person's full name
 2. Write a comment about the person in the Notes field
 3. Select a required list
 4. Click the Save button
- View the selected camera location on the map by clicking the corresponding icon in the Camera column
- Click the Magnifying Glass icon in the required row to filter search results only for the selected face. In the Search by Confidence pop-up window:
 1. Set the confidence start value in percentage
 2. Click the Search button
- Select the enlargement icon in the upper-right corner of the frame preview to view the additional information. In the pop-up window:
 1. See the person's data
 2. Use frame view tools:
 - Zoom Out icon (-) to zoom out from a specific area of the frame
 - Zoom In icon (+) to zoom in on a specific area of the frame
 - Reset View icon (~) to reset the frame to its original size and position
 - Target icon to zoom in on the detected object in the frame

- Enlargement icon to open the frame in full-screen (in full-screen, press the Esc button to return to default view)
- 3. Hover the mouse over the Extra Options icon to:
 - Select the Save Image option to download the event frame in full size
 - Select the Export Event option to download the PDF report of the event
- 4. Add a person to the list by clicking the Create ID Card in the List button
 - The same options are available in the grid view mode.
 - Click and drag the image across the zoomed-in frame to view different parts of it.

Face Recognition: Lists

Overview

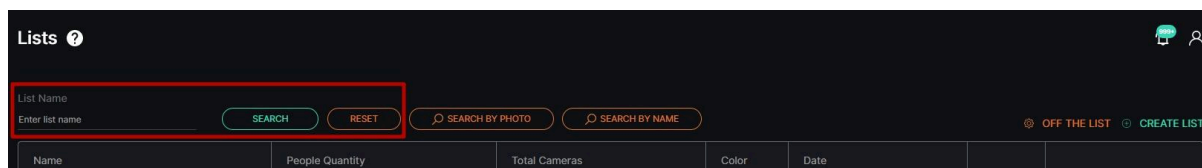
To open the Lists item, in the left menu:



1. Select the Face Recognition section.
2. Choose the Lists item
3. See lists

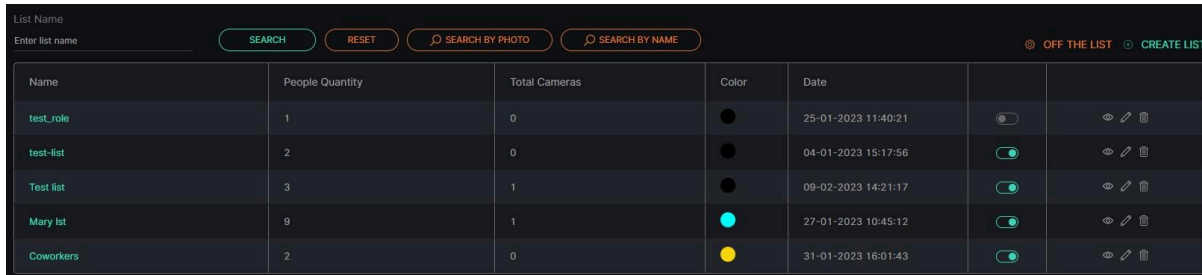
Use and Functionality

The Lists functional menu allows to:



- Enter the list name or characters in the name to filter lists
- Select the Search button to start filtering
- Select the Reset button to clear the filters

See the filtered lists in the table below. It contains:



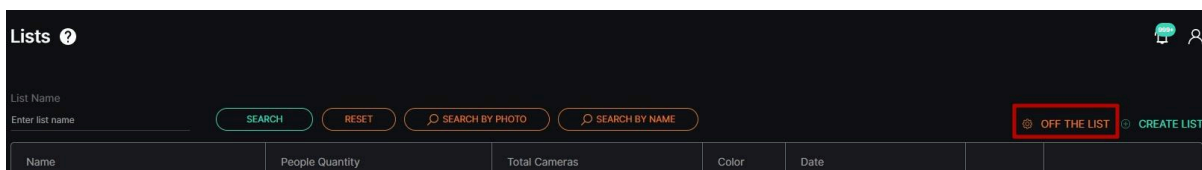
Name	People Quantity	Total Cameras	Color	Date		
test_role	1	0	●	25-01-2023 11:40:21	☐	
test-list	2	0	●	04-01-2023 15:17:56	☒	
Test list	3	1	●	09-02-2023 14:21:17	☒	
Mary list	9	1	●	27-01-2023 10:45:12	☒	
Coworkers	2	0	●	31-01-2023 16:01:43	☒	

- List name
- Number of people included in the list
- Total number of video streams involved in the list
- List color
- List creation date and time
- Enabled/Disabled list toggle
- The toolbox comprises:
 - Edit List
 - Delete List
 - View List

Enable or disable the toggle to match the list elements in the search results and receive list notifications.

Off-List Notification Settings

To set up notifications about recognized faces off lists, select the Off the List button:



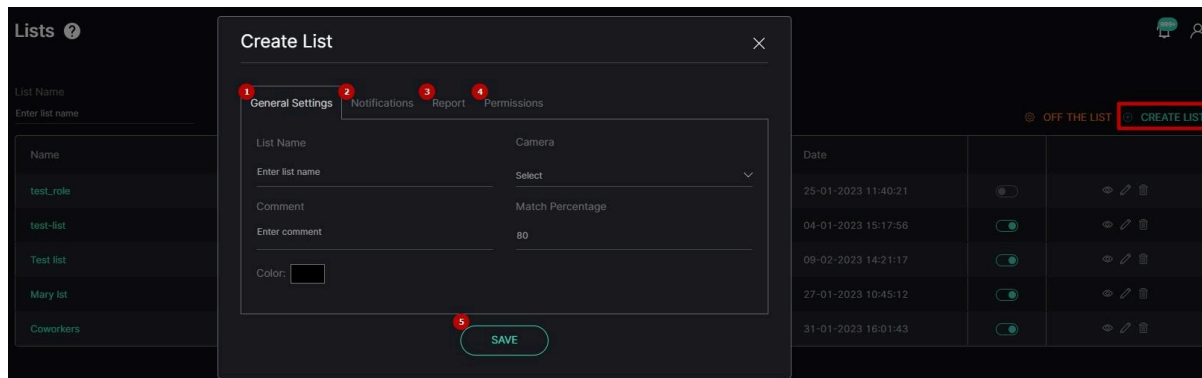
In the Off List Notification Settings pop-up window:

- Click the Camera parameter to choose the desired video analytics. In the pop-up window:
 1. Check the boxes next to the required video analytics and folders
 2. Click the Select Video Analytics button

- Check the Internal Notification box to allow the system to send all notifications to the Events item
- Check the Send Events to Event Manager box to allow the system to send all notifications about people out of lists to the Event Manager and then to external resources
- Click the Save button

Create List

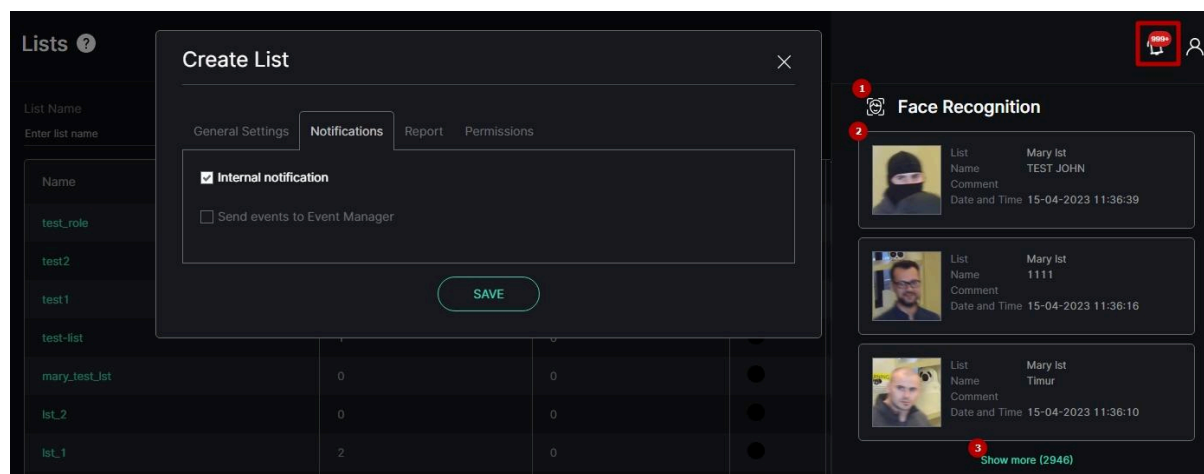
To create a new list, click the Create List button. In the Create List pop-up window:



1. Configure the General Settings tab's parameters:
 - Enter the list name
 - Click the Camera parameter to select the desired video analytics. In the pop-up window:
 - Check the boxes next to the required video analytics and folders
 - Click the Select Video Analytics button
 - Type a comment to the list in the Notes field
 - Set the confidence threshold in percentage
 - Click on the Color block to pick a color for the list
2. Configure the Notifications tab's parameters:
 - Check the Internal Notification box to allow the system to send all notifications related to the list to the Events item
 - Check the Send Events to Event Manager box to allow the system to send all notifications about people in the list to the Event Manager and then to external resources

3. Select the Report tab to check the Time & Attendance box to set entrance and exit cameras for list report generation
4. Configure the Permissions tab's parameters:
 - Assign list access rights for roles:
 - Select the required role from the drop-down list
 - Click the Add Role button
 - Select the checkboxes for the required access rights
 - Click the Delete icon to remove the unnecessary role
 - Assign list access rights for users:
 - Select the required user from the drop-down list
 - Click the Add User button
 - Select the checkboxes for the necessary access rights
 - Click the Delete icon to remove the unnecessary user
 - Select the checkboxes for the required list access rights by default
5. Click the Save button to save parameters and create a new list
 - The Permissions tab's default parameters are active only if no Roles or Users are added.
 - The quantity of added Roles and Users in the Permissions tab is not limited.
 - Checking the Internal Notification box allows you to receive event notifications only when the Enabled/Disabled list toggle is turned on.

Once the list is created with the checked Internal Notification box, the Enabled/Disabled list toggle is turned on, and at least one of the selected analytics is enabled, the Notification icon signals about each new event notification. Click the Notification icon to open the Notification Panel. It comprises:



1. Plugin name box to:
 - Collapse/expand the list of event notifications by clicking the plugin name
 - Clear all plugin event notifications at once from the Notification Panel by clicking the Close button (this action doesn't affect events in the Events item)
2. Event notification box to:
 - View short event information and frame preview for up to 3 last notifications
 - Open the event pop-up window by clicking the required notification
 - Clear the desired event notification from the notification list by clicking the Close button inside the box (this action doesn't affect the event in the Events item)
3. Show More button with the total number of events to open the Events item and view all events

List Permissions Configuration

For example, it is necessary to grant full access to a new list to all users associated with a specific role, and at the same time, to restrict the ID Card managing access rights in the list for one of the users related to this role. For this purpose:

1. In the Roles item of the Settings section, assign all required Face Recognition permissions to the role, including:
 - View Face Lists
 - Create an ID Card in the List
 - Edit ID Card in List
 - Delete ID Card from List
2. In the Users item of the Settings section, assign the selected role to all required users
3. In the Create List pop-up of the Lists item, open the Permissions tab

Configure the parameters in the Permissions tab:

Create List

General Settings Notifications Report **Permissions**

Roles

Role Name	View Face List	Create ID Card in List	Edit ID Card in List	Delete ID Card from List
Mail Role	☒	☒	☒	☒

Add Role

Select role **ADD ROLE**

Users

User Name	View Face List	Create ID Card in List	Edit ID Card in List	Delete ID Card from List
Mary 3	☒	☐	☐	☐

Add User

Select user **ADD USER**

Default (Not active)

Default	View Face List	Create ID Card in List	Edit ID Card in List	Delete ID Card from List
Default	☒	☒	☒	☒

Note

Only the administrator can make changes to permissions while editing the list

SAVE

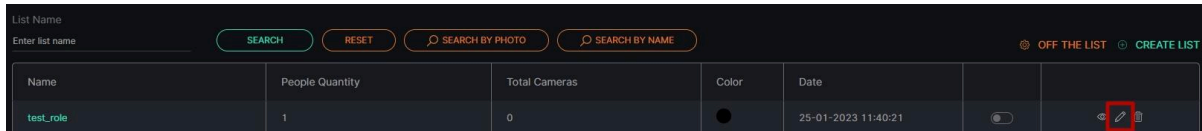
1. In the Roles block, add the required role and check all access rights boxes.
2. In the Users block, add the required user and check only the View Face Lists access right box
3. Finish the list configuration and save it.

Once the list is created, all users with the selected role can view the new list and manage ID Cards in it. At the same time, the chosen additional user can only view the latest list but cannot manage ID Cards in this list.

- User permissions take precedence over role permissions.
- The sequence of access rights validation in the list by the system:
 1. Global permissions
 2. User permissions
 3. Role permissions
 4. Default permissions

Edit List

To edit the list, select the Edit icon on the toolbox:

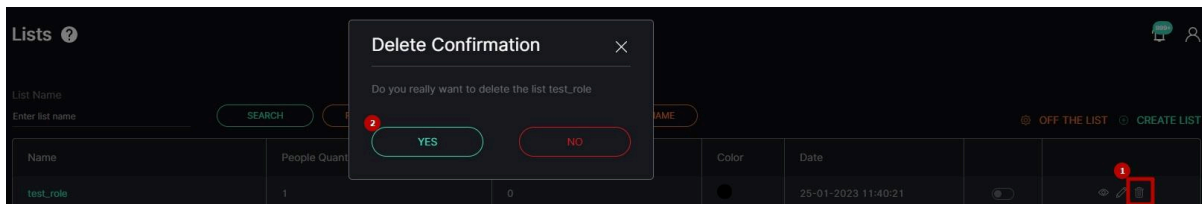


To view editing list parameters, read Create List.

Only the administrator can make changes to permissions while editing the video stream. For other system users, the Permissions tab is disabled.

Delete List

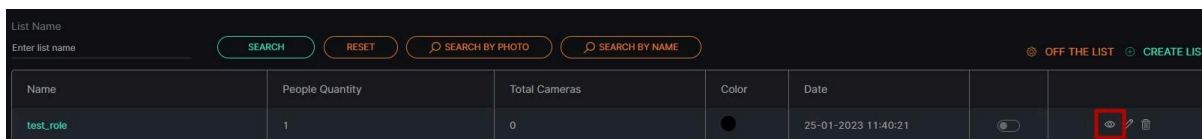
To delete the list:



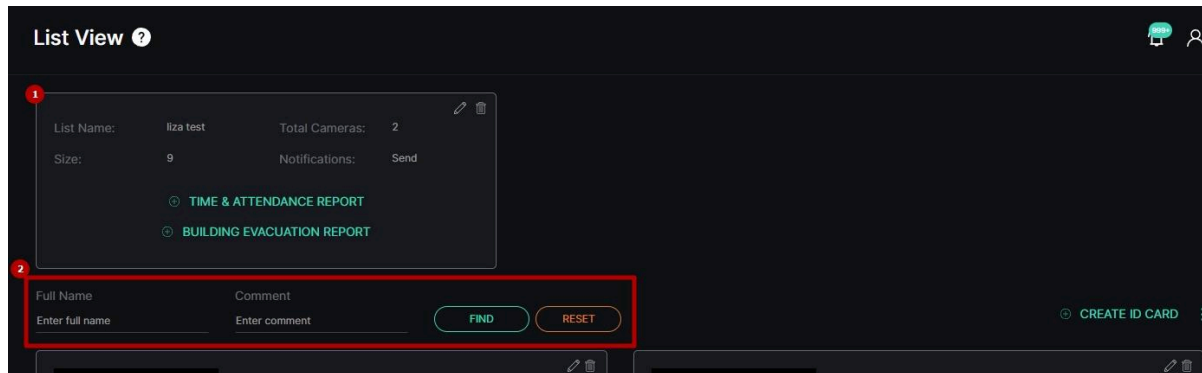
1. Select the Delete icon on the toolbox
2. Confirm the intention

View List

To view the list, select the View icon on the toolbox:



The List View functional menu comprises:



1. List Info Box contains:

- List parameters
- Edit List tool
- Delete List tool
- Time & Attendance Report and Building Evacuation Report buttons to generate a list report. In the Generate a Report pop-up window:
 - Select the required time frame
 - Select the report file format type (CSV)
 - Click the Generate button

2. Filters to:

- Enter the person's full name or characters in the name
- Enter the comment or characters in the comment
- Click the Find button to start filtering
- Click the Reset button to clear the filters
- Time & Attendance Report and Building Evacuation Report options become available only upon checking the Time & Attendance checkbox in the Report tab of the Create/Edit List pop-up window.
- Time & Attendance Reports and Building Evacuation Reports are generated based on records from entrance and exit cameras selected in the Report tab of the Create/Edit List pop-up window. The system analyzes the time when an employee is recognized by the entrance and exit cameras and provides the results in the form of a CSV file.

The generated Time & Attendance Report comprises the following data:

- Date
- Employee's full name
- Time the employee was recognized by the entrance camera during the first visit within the selected period of time

- Time the employee was recognized by the exit camera during the last visit within the selected period of time
- Total presence time between employee recognitions by entrance and exit cameras during all visits within the selected period of time
- Records of a person's entrance and exit times, with the total time of their presence during separate visits

If the person is not identified by the entrance or exit camera as being on the list, the system will be unable to calculate the total presence time and generate the correct report.

Time & Attendance Report data example. By the time the report was generated, employees Igor and Anatoliy had not left the building yet (or had not been identified by the exit camera as being on the list), while employees Valeriy and Artem had two visits to the building:

```
Date;Employee;In;Out;Presence Time
14/09/2023;Igor;12:29;;no checkout
14/09/2023;Valeriy;12:29;17:20;04h03m
"";;12:29;15:23;02h53m
"";;16:10;17:20;01h10m
14/09/2023;Anatoliy;12:29;;no checkout
14/09/2023;Artem;12:29;17:40;04h54m
"";;12:29;15:23;02h54m
"";;15:40;17:40;02h00m
```

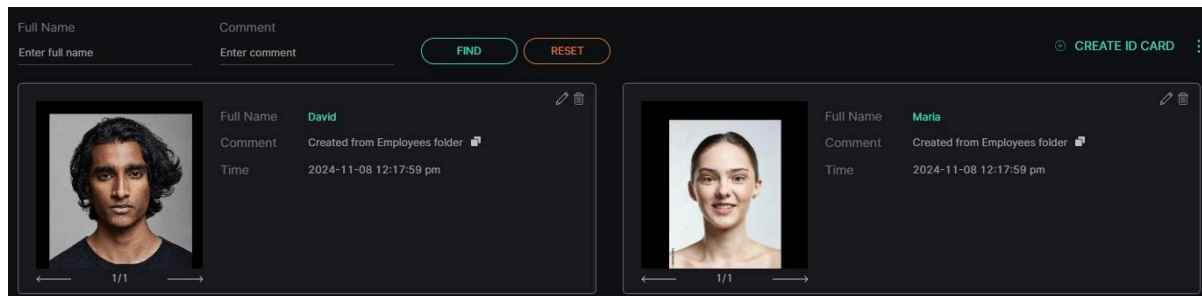
The generated Building Evacuation Report comprises the following data:

- Date
- Employee's full name
- Presence indicator:
 - True, to indicate the employee is still inside the building. Executes in case the entrance camera detected the employee, but the exit camera didn't detect the same employee after that
 - False, to indicate the employee has left the building. Executes in case both entrance and exit cameras detected the employee on the specified date

Building Evacuation Report data example. By the time the report was generated, all employees had not left the building yet (or had not been identified by the exit camera as being on the list):

```
Date;Employee;Present
01-09-2023;Igor;true
01-09-2023;Valeriy;true
01-09-2023;Artem;true
01-09-2023;Anatoliy;true
```

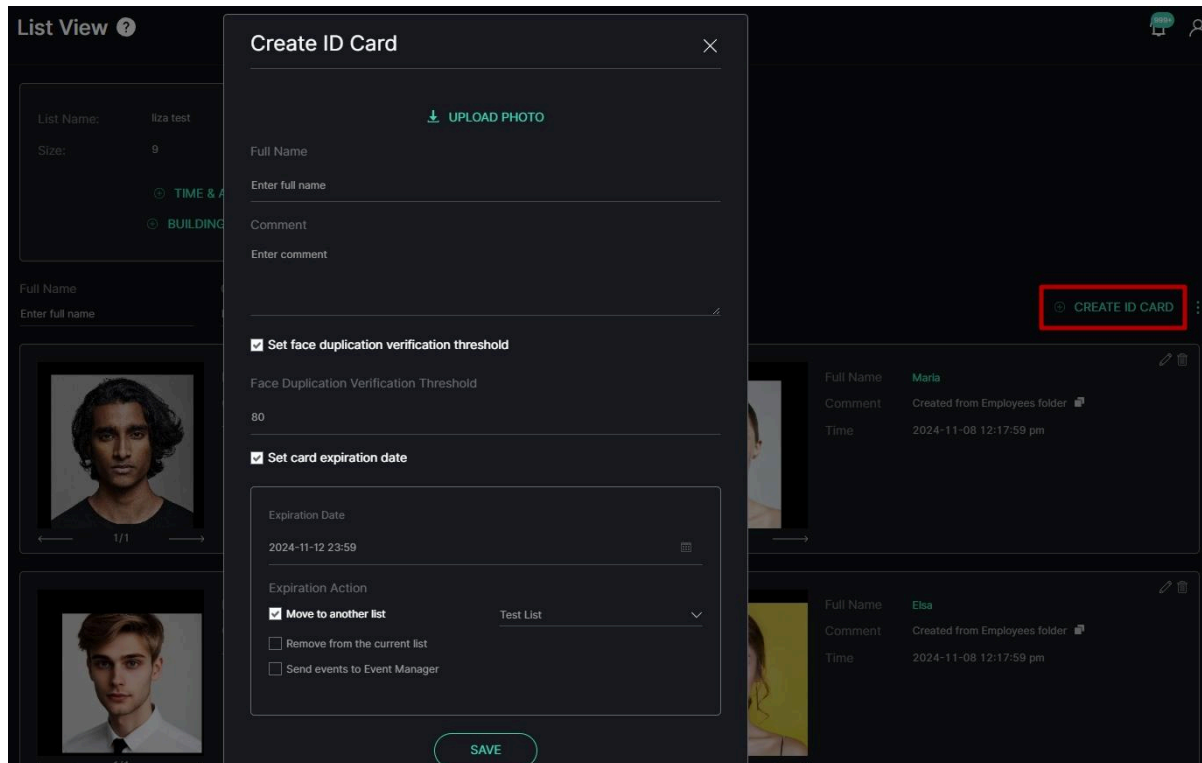
The tiles with ID Cards contain:



- Clickable photo of the person
- Person's full name
- Comment about the person
- Copy Comment icon to copy the required comment to the clipboard
- Date and time the person was added to the list
- Edit ID Card tool
- Delete ID Card tool

Create ID Card

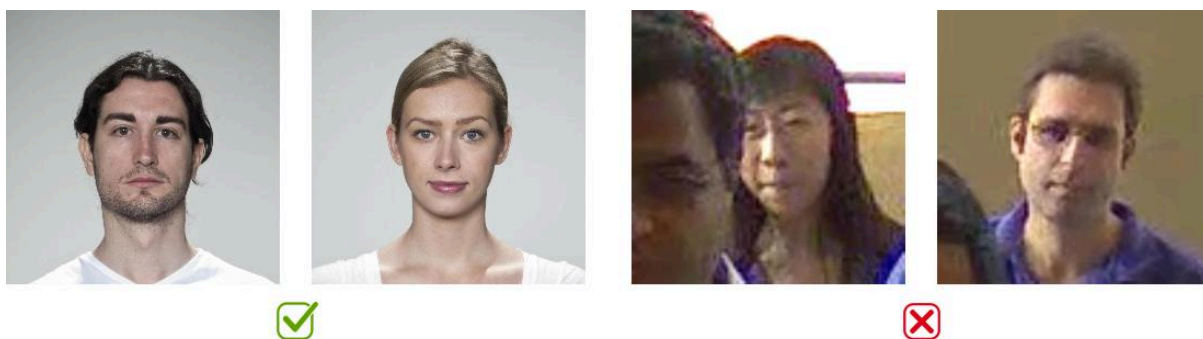
To add a person to the list and create the ID Card, click the Create ID Card button. In the Create ID Card pop-up window:



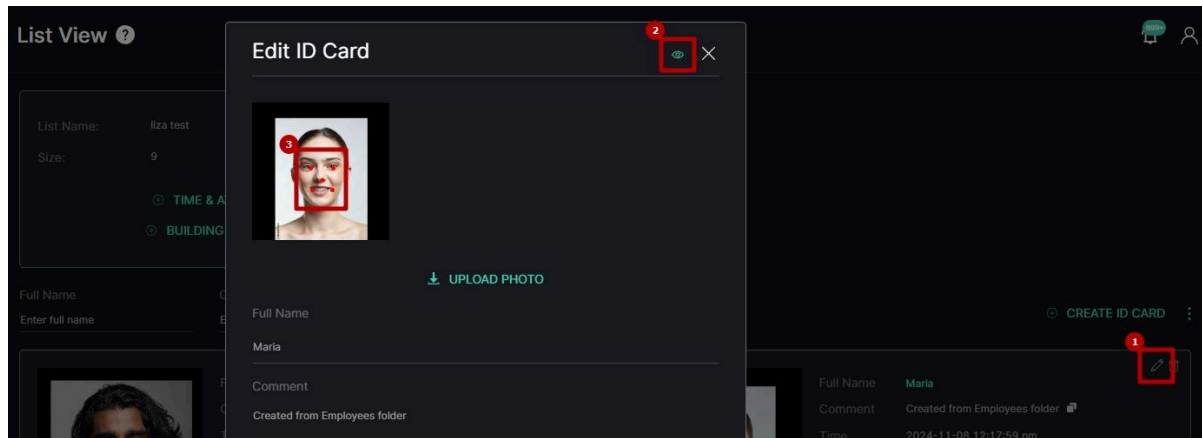
- Upload multiple photos of a person for comparison and identification by clicking the Upload Photo button
- Enter the person's full name
- Type a comment to the person in the Message field
- Check the Set Face Duplication Verification Threshold box to manually define the verification threshold for all new ID cards. In the Face Duplication Verification Threshold field:
 - Decrease the value in percentage to lower the threshold for face duplication verification. This allows a broader range of facial features to be considered as potential matches, increasing the likelihood of identifying individuals from ID cards with less strict similarity criteria.
 - Increase the value in percentage to raise the threshold for face duplication verification. This enhances the precision of duplicate recognition, ensuring that only individuals with very similar facial features are identified as matches. Higher values reduce the chance of creating a new ID card for the same person.
- Check the Set Card Expiration Date box to set the ID Card expiration parameters:
 - Select the date and time

- Choose the action after the expiration. Check the:
 - Move to Another List box and select another list to move the ID Card
 - Remove from the Current List box to remove the ID Card from the list
 - Send Event to Event Manager box to allow the system to send the notification about ID Card expiration to the Event Manager and then to external resources
- Click the Save button
- Before adding a photo to the ID Card, ensure that:
 - The face occupies no more than 70-80% of the overall photo dimensions.
 - The selected photo has a minimum resolution of 150x150 pixels in both width and height.
 - The selected photo meets quality standards comparable to official documents, including sharpness, color accuracy, lighting, background uniformity, size, focus, absence of artifacts, and appropriate pose and facial expression.
- To delete the photo in the Create ID Card pop-up window, hover the mouse over the required photo and select the Delete icon.
- To create the ID Card, select at least one photo.
- If the Set Face Duplication Verification Threshold checkbox is deselected, the default value of 80% for face similarity verification will be applied.
- The Face Duplication Verification Threshold parameter persists at the browser level, offering convenience in filtering out duplicates for the specific user adding them. The selected threshold remains consistent across sessions, ensuring efficient management of duplicate verification. This parameter can be modified at any time by editing any ID Card in any desired list.

Examples of appropriate and inappropriate reference photos in the ID Card:



Once the ID Card is saved, check if the faces in the added reference photos are properly recognized:



1. Open the desired ID Card again
2. Select the View icon
3. See the red dots over the reference photos indicating 5 facial key points:
 - Two for eyes
 - One for nose
 - Two for corners of the mouth
- To disable the visibility of the red dots, click the View icon again.
- If some red dots are not positioned according to the specified facial key points or are missing entirely, it means the reference photo was not recognized correctly and needs to be replaced with a more suitable one. Correct positioning of the dots in accordance with the facial key points is crucial for improving the accuracy of person identification analytics.
- The recognition of facial key points and the subsequent display of red dots on the reference photo is possible only for photos added to the ID Card via the Upload Photo button. This does not apply to reference photos added by creating an ID Card from search results.

Import Multiple ID Cards

This built-in functionality is best suited for importing smaller batches of photos (a few thousand). For larger volumes, up to millions of photos, we recommend using an external script, which imports approximately 20 photos per second, significantly reducing import time compared to the built-in functionality.

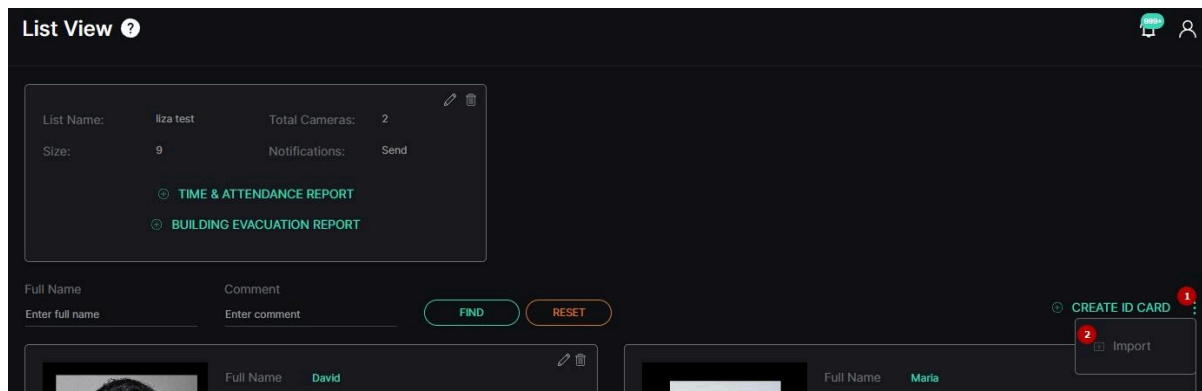
For assistance with the script, please get in touch with our technical specialists via the Help Desk.

Please note: This procedure may require third-party scripting by relevant specialists. In case of project evaluation, please contact support for further discussion.

To import multiple ID Cards at once, prepare a folder with reference photos of individuals. These photo files must meet the following requirements:

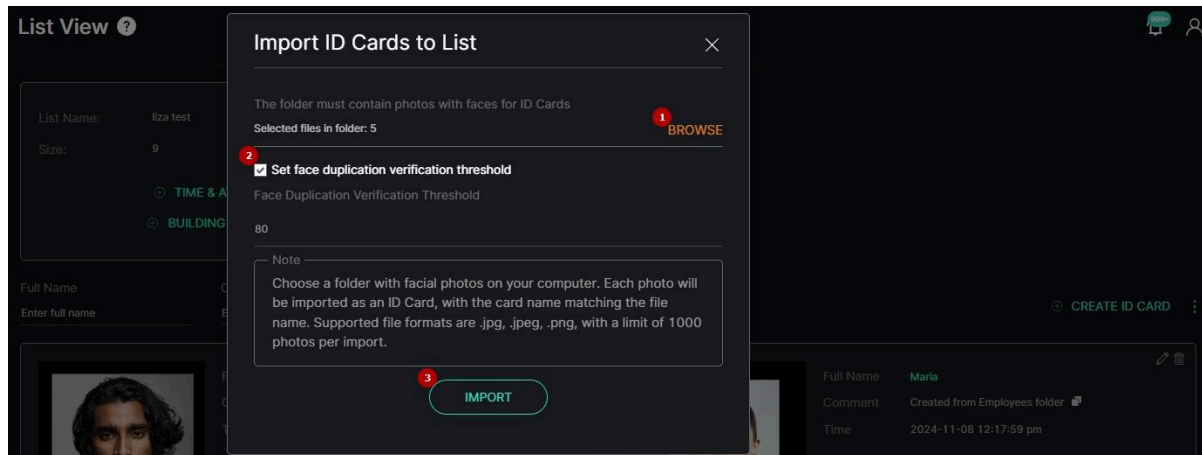
- The file name must match the first and last name of the person in the photo, as it will correspond to the ID Card name.
- The face occupies no more than 70-80% of the overall photo dimensions.
- The photo has a minimum resolution of 150x150 pixels in both width and height.
- The photo meets quality standards comparable to official documents, including sharpness, color accuracy, proper lighting, uniform background, correct size, focus, and the absence of artifacts. The pose and facial expression should also be appropriate.
- Supported photo formats: .jpg, .jpeg, .png.

Once the folder with photos is prepared:



1. Click the ":" menu
2. Select Import

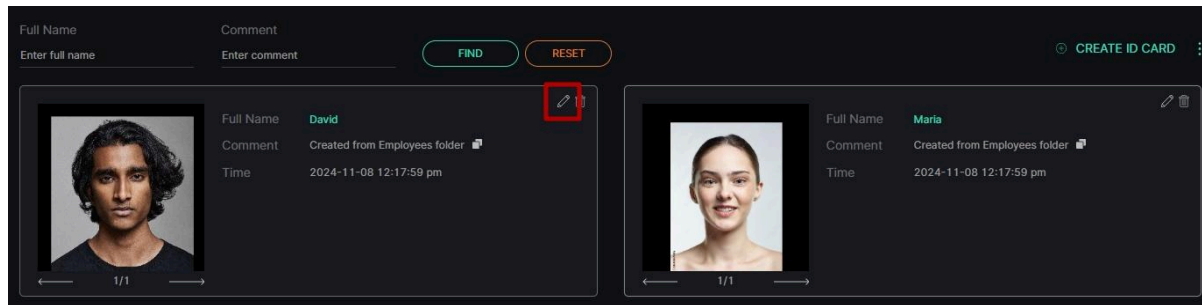
In the Import ID Cards to List pop-up window proceed with the following steps:



1. Click Browse and select the prepared folder with photo files from your computer.
2. Check the Set Face Duplication Verification Threshold box to manually define the verification threshold for all new ID cards. In the Face Duplication Verification Threshold field:
 - Decrease the percentage value to lower the threshold for face duplication verification. This will consider a broader range of facial features as potential matches, increasing the likelihood of identifying individuals from ID cards with less strict similarity criteria.
 - Increase the percentage value to raise the threshold for face duplication verification. This will enhance the precision of duplicate recognition, ensuring that only individuals with very similar facial features are identified as matches. Higher values reduce the chance of creating a new ID card for the same person.
3. Click the Import button to import all photo files from the selected folder and create ID Cards.
 - The selected folder must contain no more than 1000 photo files, as this is the maximum number of photos that can be imported at once.
 - If the Set Face Duplication Verification Threshold checkbox is deselected, the default value of 80% for face similarity verification will be applied.
 - If an ID card with the same name as an imported photo file already exists in the list, a new ID Card will not be created, and the duplicate will be skipped.

Edit ID Card

To edit the ID Card, select the Edit icon:



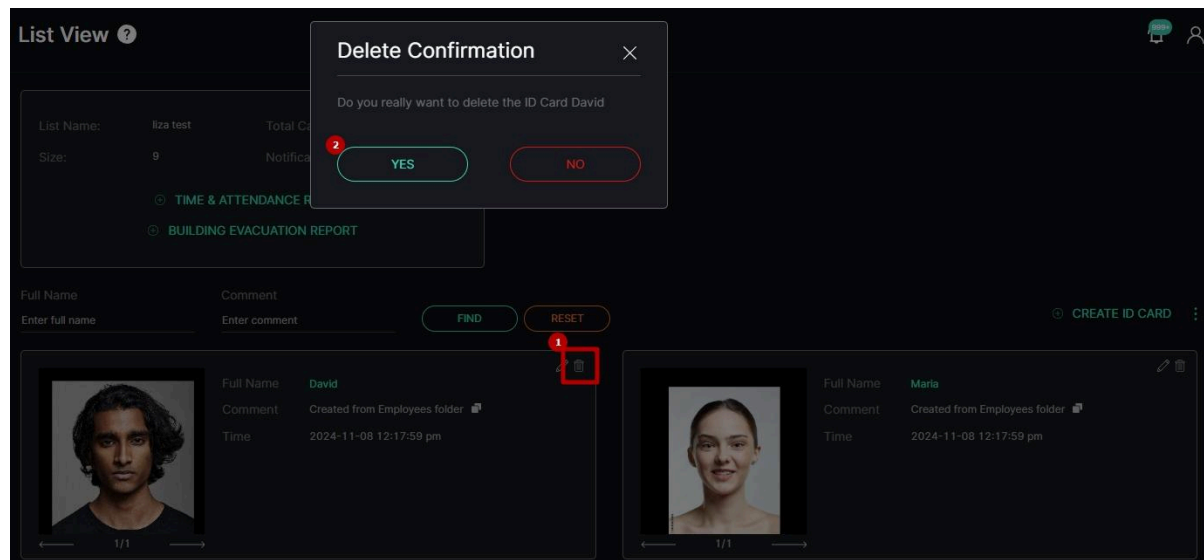
In the Edit ID Card pop-up window:

- Add other photos with a person for comparison and identification by clicking the Upload Photo button
- Delete the photo by hovering the mouse over the required photo and selecting the Delete icon
- Change the person's full name
- Type a comment to the person in the Message field
- Select another list to move the ID Card
- Check the Set Face Duplication Verification Threshold box to manually define the verification threshold for all new ID cards. In the Face Duplication Verification Threshold field:
 - Decrease the value in percentage to lower the threshold for face duplication verification. This allows a broader range of facial features to be considered as potential matches, increasing the likelihood of identifying individuals from ID cards with less strict similarity criteria.
 - Increase the value in percentage to raise the threshold for face duplication verification. This enhances the precision of duplicate recognition, ensuring that only individuals with very similar facial features are identified as matches. Higher values reduce the chance of creating a new ID card for the same person.
- Check the Set Card Expiration Date box to set the ID Card expiration parameters:
 - Select the date and time
 - Choose the action after the expiration. Check the:
 - Move to Another List box and select another list to move the ID Card
 - Remove from the Current List box to remove the ID Card from the list

- Send Event to Event Manager box to allow the system to send the notification about ID Card expiration to the Event Manager, and then to external resources
- Click the Save button
- Before adding a photo to the ID Card, ensure that:
 - The face occupies no more than 70-80% of the overall photo dimensions.
 - The selected photo has a minimum resolution of 150x150 pixels in both width and height.
 - The selected photo meets quality standards comparable to official documents, including sharpness, color accuracy, lighting, background uniformity, size, focus, absence of artifacts, and appropriate pose and facial expression.
- To delete the photo in the Create ID Card pop-up window, hover the mouse over the required photo and select the Delete icon.
- To create the ID Card, select at least one photo.
- If the Set Face Duplication Verification Threshold checkbox is deselected, the default value of 80% for face similarity verification will be applied.
- The Face Duplication Verification Threshold parameter persists at the browser level, offering convenience in filtering out duplicates for the specific user adding them. The selected threshold remains consistent across sessions, ensuring efficient management of duplicate verification. This parameter can be modified at any time by editing any ID Card in any desired list.

Delete ID Card

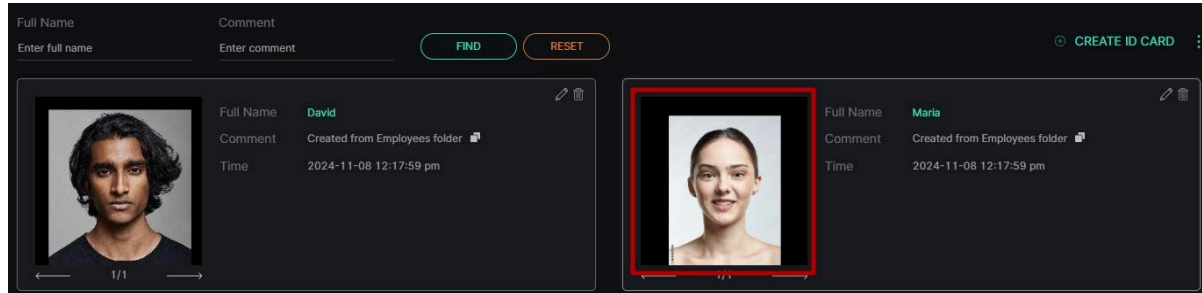
To delete the ID Card:



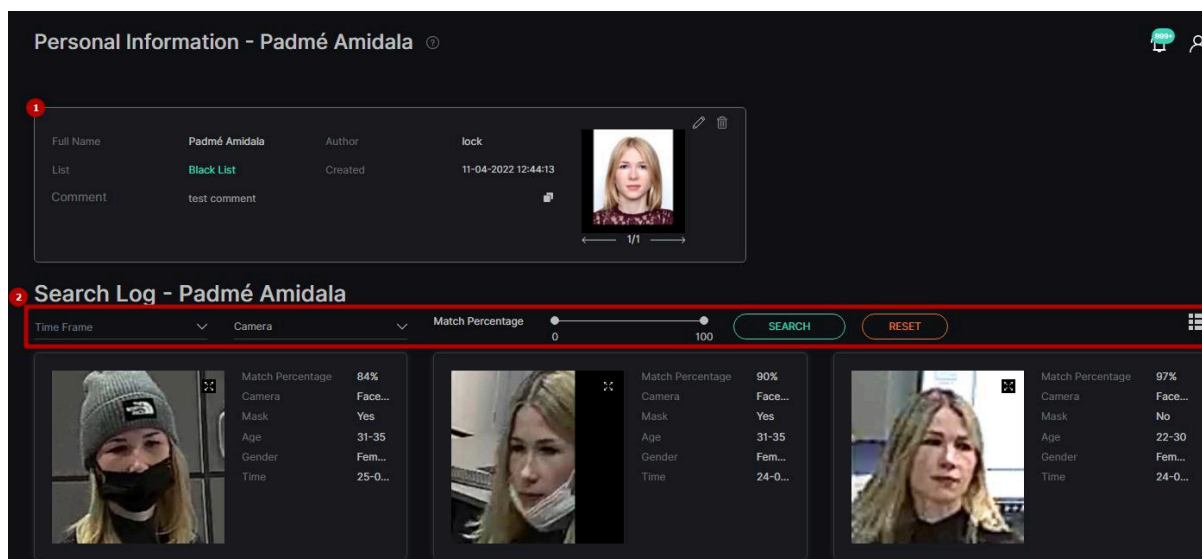
1. Select the Delete icon
2. Confirm the intention

View ID Card

To view the required ID Card, click the photo of a person:



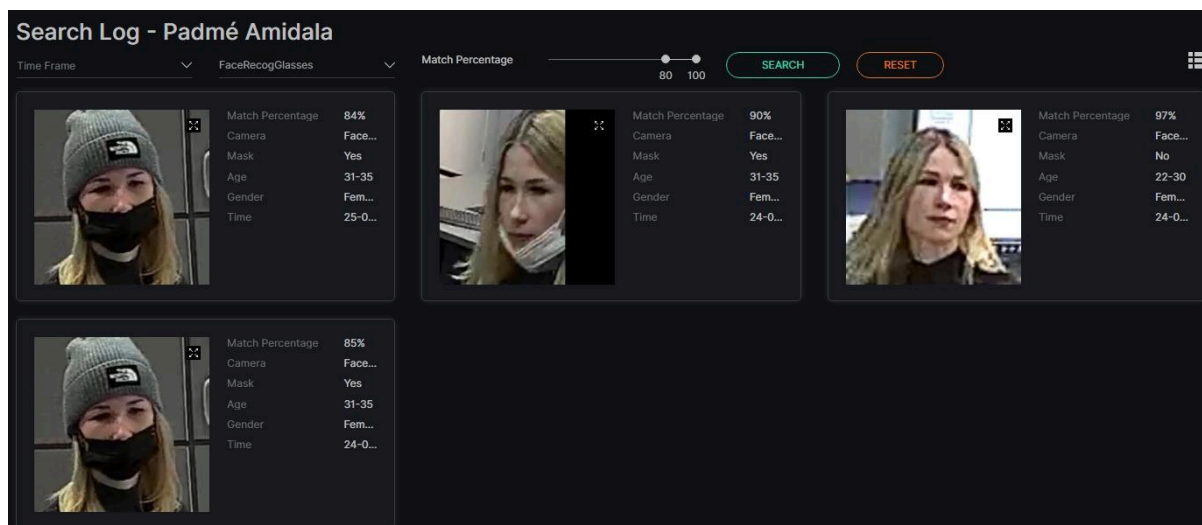
The Personal Information functional menu comprises:



1. ID Card Info Box contains:
 - Information about the person
 - Copy Comment icon
 - Photos of a person for comparison and identification
 - Edit ID Card tool
 - Delete ID Card tool
2. Search Log filters to:

- Select the required time frame
- Click the Camera parameter to select the desired video analytics. In the pop-up window:
 - Check the boxes next to the required video analytics and folders
 - Click the Select Video Analytics button
- Set the range of coincidence in percentage by moving the sliders
- Click the Search button to start filtering
- Click the Reset button to clear the filters
- Move between List and Grid view modes by clicking the corresponding toggle

Once selected and filtered, in the search log:

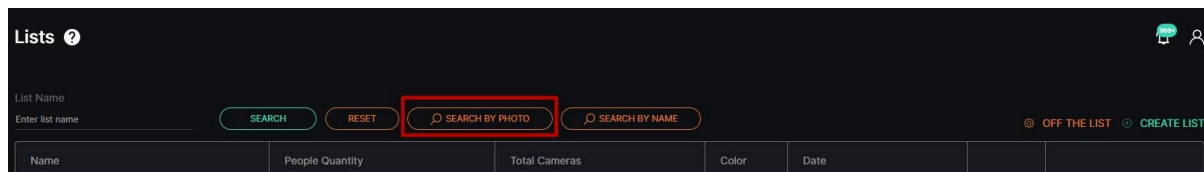


- View the recognized person's data, the date, and time the person has been recognized, and the coincidence in percentage
- View the camera location on the map by clicking the corresponding icons in the Camera parameter
- Select the Enlargement icon to open the frame with the person. In the pop-up window:
 - See the person's data
 - Use frame view tools:
 - Zoom Out icon (-) to zoom out from a specific area of the frame
 - Zoom In icon (+) to zoom in on a specific area of the frame
 - Reset View icon (~) to reset the frame to its original size and position
 - Target icon to zoom in on the detected object in the frame

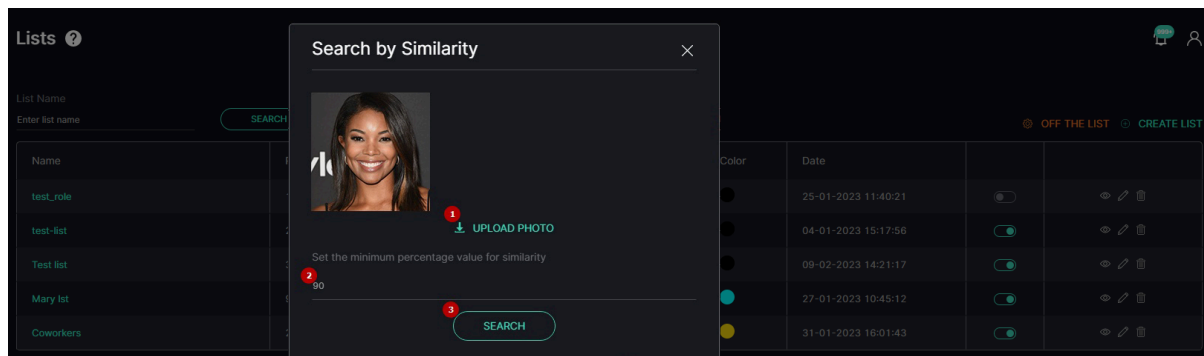
- Enlargement icon to open the frame in full-screen (in full-screen, press the Esc button to return to default view)
- Hover the mouse over the Extra Options icon and click the Save Image button to download the event frame in full size
- The same options are available in the grid view mode.
- Click and drag the image across the zoomed-in frame in order to view different parts of it.

Search by Photo

To identify faces among chosen photos on a device, on the main Lists item, click the Search by Photo button:

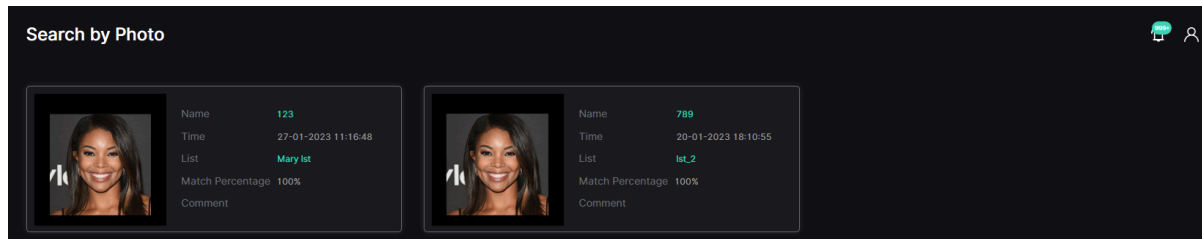


In the Search by Similarity pop-up window:



1. Click the Upload Photo button to upload photos from the device
2. Set the minimum percentage value for similarity
3. Select the Search button to find similar faces among ID Cards in the lists

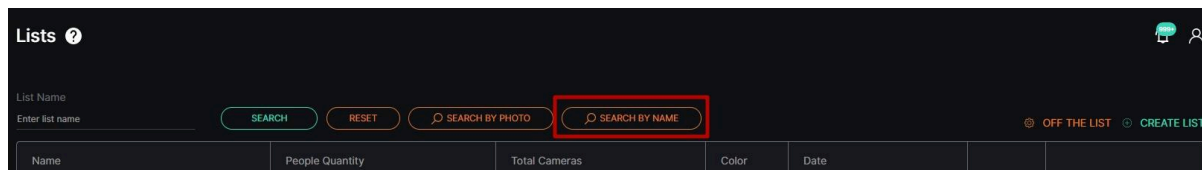
Once search results are ready, ID Cards are displayed on the Search by Photo page. They comprise:



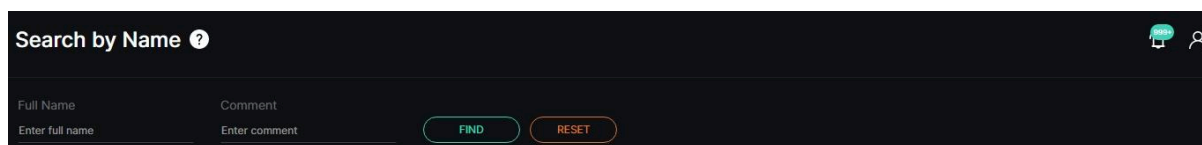
- Clickable photo of a person
- Person's full name
- The time the ID Card was created
- A list that contains the ID Card
- Percentage of similarity
- Comment on the ID Card

Search by Name

To quickly find an ID Card, on the main Lists item, click the Search by Name button:

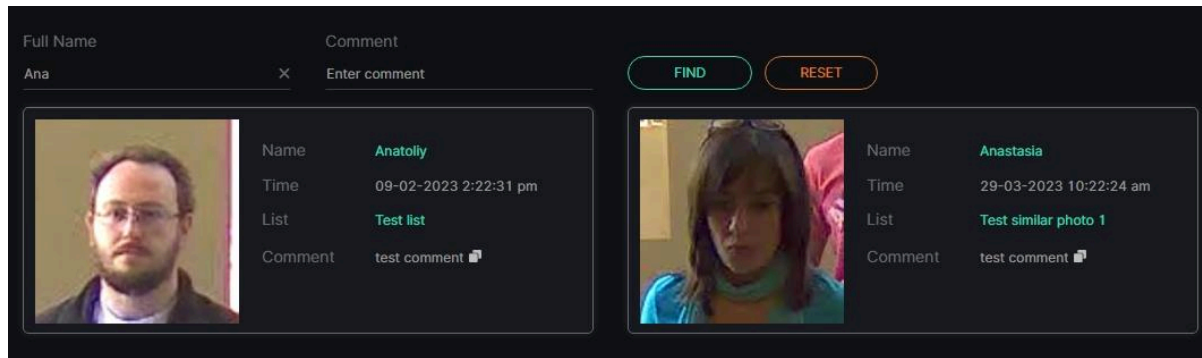


The Search by Name functional menu allows you to:



- Enter the person's full name or characters in the name
- Enter the comment or characters in the comment
- Click the Find button to start filtering
- Click the Reset button to clear the filters

View the search results in the tiles below. They comprise:



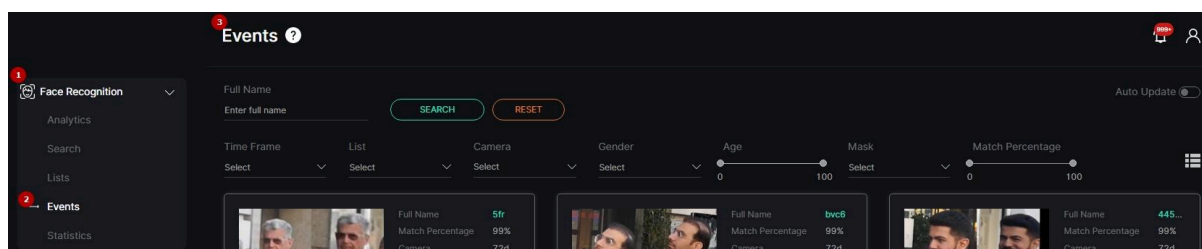
- Clickable photo of a person
- Person's full name
- Date and time the person was added to the list
- A list that contains the ID Card
- Comment on the ID Card
- Copy Comment icon to copy the required comment to the clipboard

Face Recognition: Events

This page comprises the Events item overview and functionality description. The item displays the event notifications comprising a name, age, and gender, presence of a mask, date and time, camera data, and a frame with a detected person.

Overview

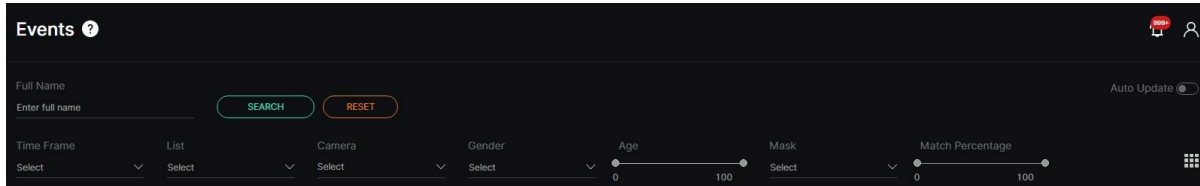
To open the Events item, in the left menu:



1. Select the Face Recognition section
2. Choose the Events item
3. See event notifications

Use and Functionality

The Events functional menu allows you to:



- Enter the person's full name to filter events
- Select the required time frame
- Choose the desired list
- Click the Camera parameter to select the desired video analytics. In the pop-up window:
 1. Check the boxes next to the required video analytics and folders
 2. Click the Select Video Analytics button
- Choose the gender from the drop-down list
- Set the age range by moving the sliders
- Set a medical mask presence or absence on a face
- Set the range of coincidence in percentage by moving the sliders
- Click the Search button to start filtering
- Click the Reset button to clear the filters
- Select the Auto Update toggle to enable or disable auto-update of the event notifications
- Move between List and Grid view modes by clicking the corresponding toggle

Once selected and filtered, in the event notifications:

The screenshot displays the Luxriot EVA Advanced software interface. At the top, there is a search bar with 'Full Name' and 'Enter full name' labels, and buttons for 'SEARCH' and 'RESET'. To the right is an 'Auto Update' toggle. Below the search bar are filters for 'Time Frame', 'List', 'Camera', 'Gender', 'Age' (with a range slider from 20 to 40), 'Mask', and 'Match Percentage' (with a range slider from 0 to 100). The main area is a table with the following columns: Photo, Name, List, Camera, Gender, Age, Mask, Date, Comment, and Frame. Three rows of data are visible, each with a corresponding photo on the left.

Photo	Name	List	Camera	Gender	Age	Mask	Date	Comment	Frame
	Artem, 92%	Test list	demo-face	Male	22-30		09-08-2023 1:27:59 pm		
	Anatoliy, 99%	Test list	demo-face	Male	31-35		09-08-2023 1:27:54 pm	test comment	
	1235, 99%	test3	demo-face	Male	31-35		09-08-2023 1:27:54 pm		

- View recognized people data, date, and time faces have been detected by the selected camera
- Click the person's name to open the Personal Information Card
- Click the list name to open the List View item or add a person to the required list by clicking the Add to List button. In the Add Person to List pop-up window:
 - Enter the person's full name
 - Write a comment about the person in the Notes field
 - Select a required list
 - Click the Save button
- View the selected camera location on the map by clicking the corresponding icon in the Camera column
- Read the message related to the recognized person
- Select the View icon to view the detection information. In the pop-up window:
 - See the person's data
 - Use frame view tools:
 - Zoom Out icon (-) to zoom out from a specific area of the frame
 - Zoom In icon (+) to zoom in on a specific area of the frame
 - Reset View icon (~) to reset the frame to its original size and position
 - Target icon to zoom in on the detected object in the frame
 - Enlargement icon to open the frame in full-screen (in full-screen, press the Esc button to return to default view)
 - Hover the mouse over the Extra Options icon to:

- Select the Save Image option to download the event frame in full size
- Select the Export Event option to download the PDF report of the event
- The same options are available in the grid view mode.
- Click and drag the image across the zoomed-in frame to view different parts of it.

Face Recognition: Statistics

Introduction

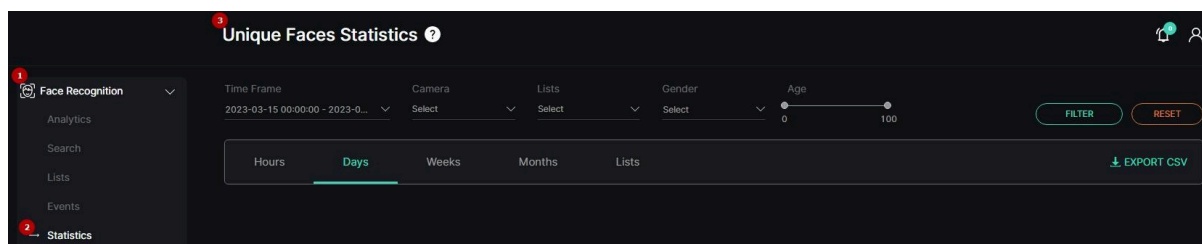
Unique faces are considered as separate individuals detected by the analytics each day, regardless of the number of times they appear in the camera's field of view. For example, when one customer enters the shop five times during a day, they will be calculated as one unique face in the statistics.

Within a selected time period longer than a day, such as a week or a month, the statistics summarize the number of unique faces detected for each day. This information is valuable in calculating the average quantity of unique faces per day over the specified time span.

Please note: Statistics on unique faces are updated at midnight, once per day.

Overview

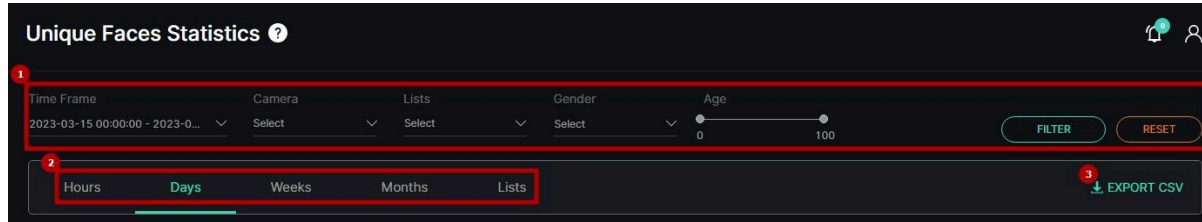
To open the Statistics item, in the left menu:



1. Select the Face Recognition section
2. Choose the Statistics item
3. See unique faces statistics

Use and Functionality

The Unique Faces Statistics functional menu comprises:



1. Filters to:

- Select the desired time frame to produce statistics
- Click the Camera parameter to select the desired video analytics. In the pop-up window:
 - Check the boxes next to the required video analytics and folders
 - Click the Select Video Analytics button
- Select multiple lists
- Choose the gender from the drop-down list
- Set the age range by moving the sliders
- Click the Filter button to start filtering
- Click the Reset button to clear the filters

2. Tabs to filter statistics data by:

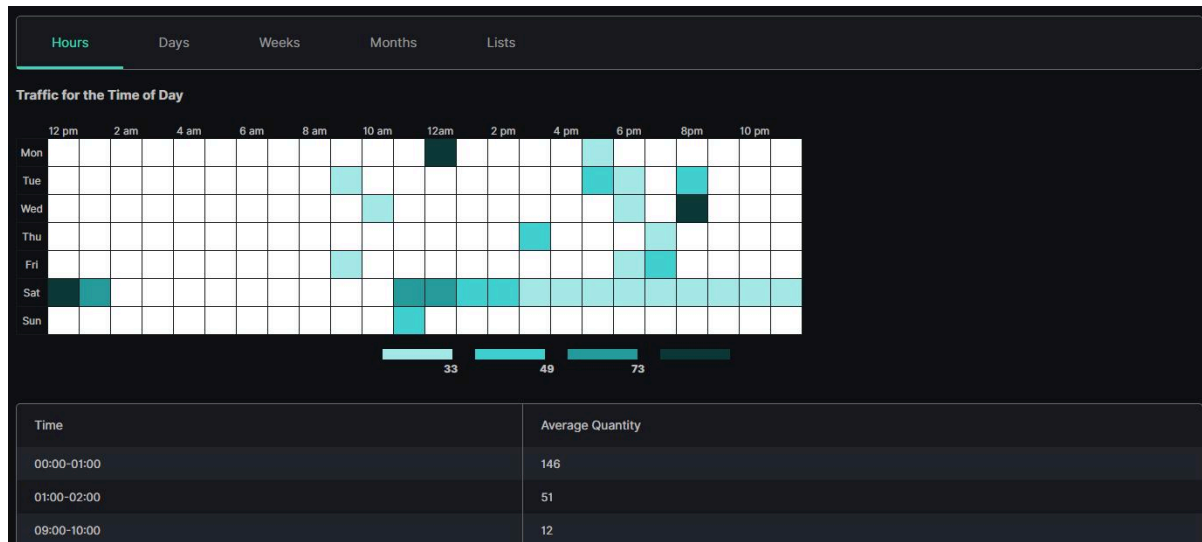
- Hours
- Days
- Weeks
- Months
- Lists

3. Export CSV option to download the statistics report in CSV format

- The Unique Faces Statistics item opens with the Days tab by default.
- The Export CSV option is available only for the Days and Lists tabs.
- To filter unique faces that have not been added to any list, select Off the List in the Lists filter.

Hours Tab

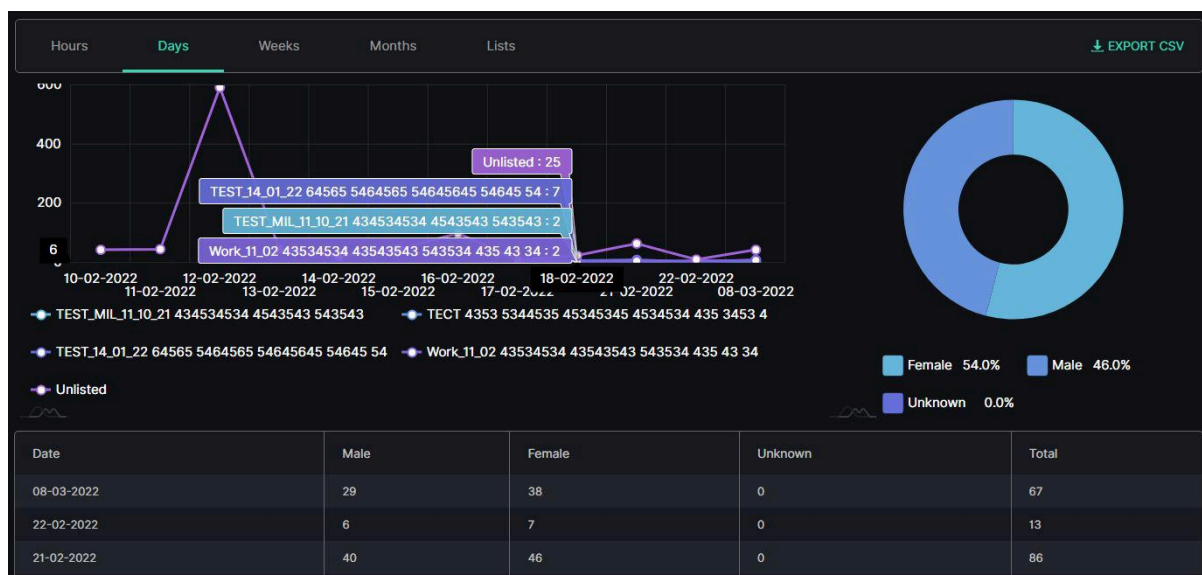
The Hours tab shows:



- A table chart with the unique faces data by hours and days of the week
- Table with Time and Average Quantity columns

Days, Weeks, and Months Tabs

The Days tab shows:



- Checkpoints on the graphs by the listed and unlisted unique faces quantity and date
- Slices on the donut chart with the number of unique faces recognized by gender in percentage

- Table columns by date and gender
- Hover the mouse over the graphs to see the unique faces quantity and amount.
- The Weeks and Months tabs' content differs with the usage of week and month time intervals instead of days.

Lists Tab

The Lists tab shows the tables per selected dates that comprise:

Hours	Days	Weeks	Months	Lists	↓ EXPORT CSV
08-03-2022					
List	Male	Female	Unknown	Total	
TEST_MIL_11_10_21 434534534 4543543 543543	0	3	0	3	
TECT 4353 5344535 45345345 4534534 435 3453 4	1	1	0	2	
TEST_14_01_22 64565 5464565 54645645 54645 54	6	4	0	10	
Work_11_02 43534534 43543543 543534 435 43 34	5	3	0	8	
Unlisted	17	27	0	44	
Total Number by Camera	29	38	0	67	
22-02-2022					
List	Male	Female	Unknown	Total	
TEST_14_01_22 64565 5464565 54645645 54645 54	1	1	0	2	
Unlisted	5	6	0	11	
Total Number by Camera	6	7	0	13	

- List column with the preselected list name(s)
- Gender columns with the preselected gender

LPR

Introduction

Use this guide to understand the interface and features of the LPR plugin and learn how to utilize it for the best result.

What Is LPR?

LPR automatically identifies license plates, collects and stores vehicle data in the database.

Primary Capabilities

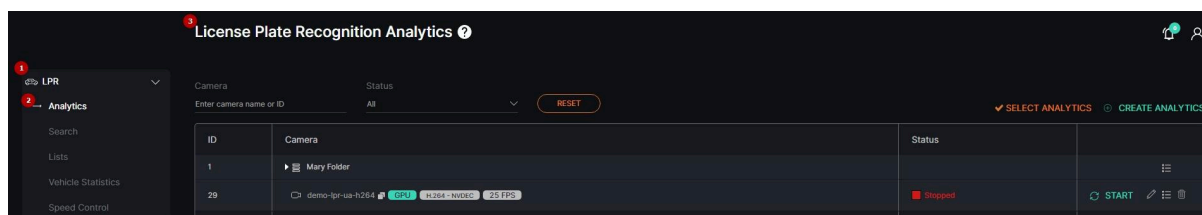
LPR is capable to:

- Capture and recognize the license plate within 8–30 milliseconds
- Support license plate recognition at speeds up to 250 km/h
- Recognize the make, model, and color of the vehicle, as well as the country identifier with 95% accuracy
- Determinate the route and direction of the vehicle

LPR: Analytics

Overview

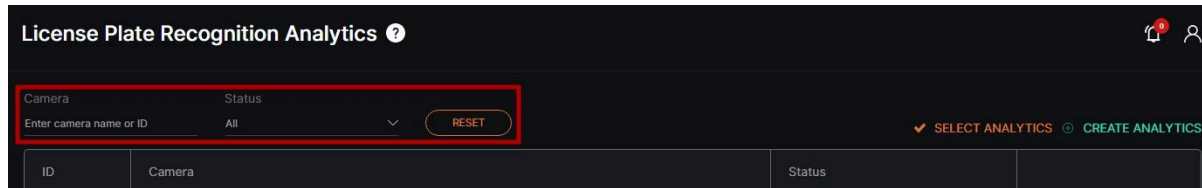
To open the Analytics item, in the left menu:



1. Select the LPR section
2. Choose the Analytics item
3. See analytics

Use and Functionality

The License Plate Recognition Analytics functional menu allows to:



- Fill in the Camera field with:
 - Camera name or characters in the name
 - Analytics ID
 - Video stream ID
- Select the required analytics status
- Click the Reset button to clear the filters

The status options comprise All, Active, and Stopped.

See the list of analytics in the table below. It contains:

The screenshot shows the analytics table with the following data:

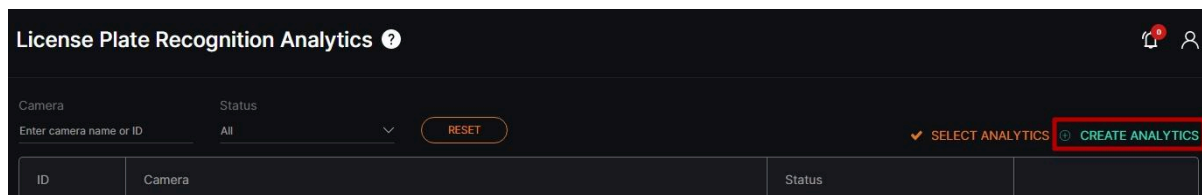
ID	Camera	Status	
1	▶ Mary Folder		⋮
29	▶ demo-lpr-ua-h264 GPU 6.264 - NVDEC 25 FPS	● Active (48s / 2)	STOP ⚙ ⋮
26	▶ copy-control-2 GPU 4.265 - NVDEC 25 FPS	Server: 999, GPU: 0	START ⚙ ⋮

- Analytics and folders ID
- Camera comprises:
 - Folders' and separate video streams' names
 - Copy Name icon to copy the video stream name
 - Video source type
 - Additional hardware parameters
- Video stream or video file playback status. For the Active and Offline statuses, the system also displays:
 - Countdown since analytics launch
 - Last server connection to analytics (seconds ago)
- Toolbox comprises:

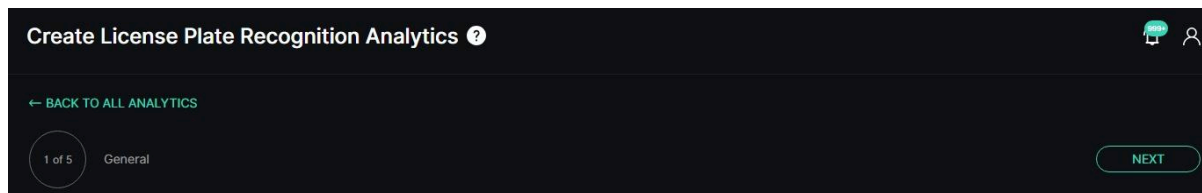
- Start/Stop
 - Edit
 - Search Results
 - View
 - Delete
- To learn more about grouping video streams into folders and making the appropriate changes in the Video Streams item, read Video Streams.
 - To find out the ID of the CPU/GPU and the server running the video stream, hover the mouse over the circle next to the status of the running analytics.

Create Analytics

To create new analytics, click the Create Analytics button:



The Create License Plate Recognition Analytics navigation menu allows to:

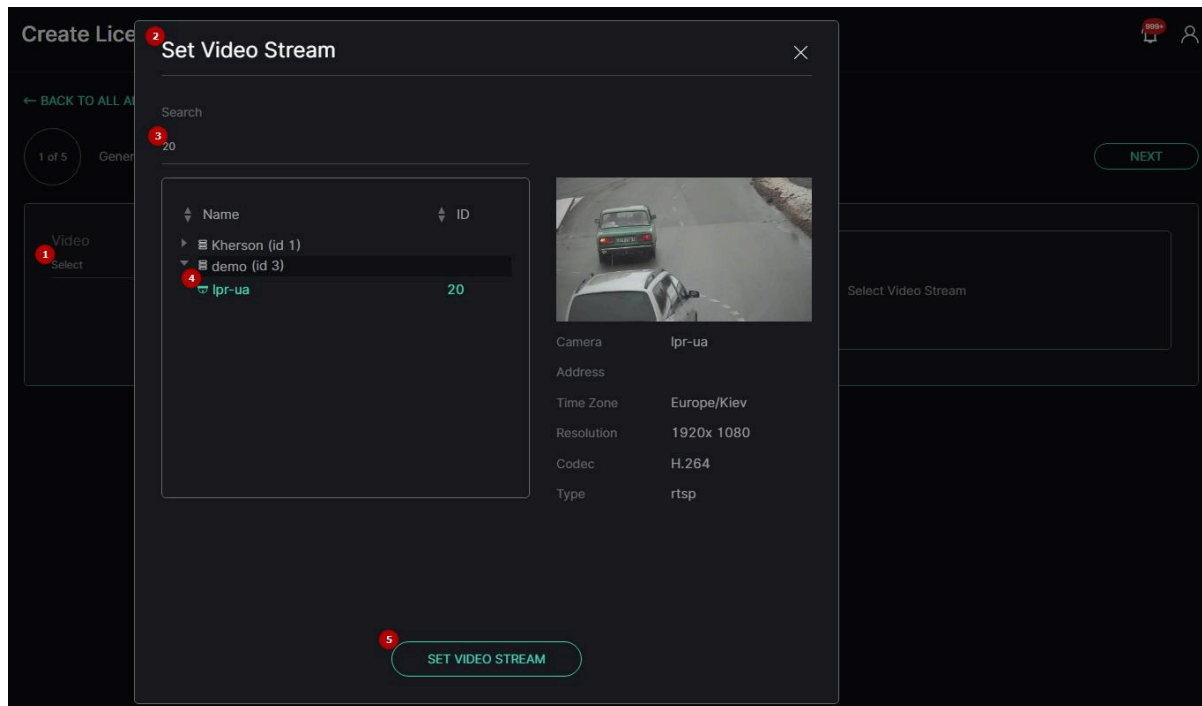


- Click the Back to All Analytics button to return to the main Analytics item
- See the title and serial number of the current tab
- Click the Back or Next button to move among tabs:
 - General
 - Hardware
 - Notifications
 - Advanced Settings
 - Permissions

General Tab

The General tab provides the ability to set a video stream and customize analytics parameters.

To set a video stream:

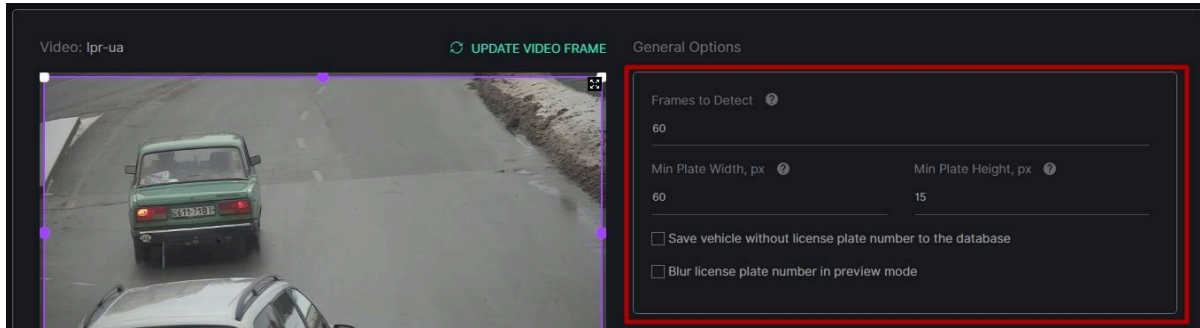


1. Click the Video field
2. See the Set Video Stream pop-up window
3. Fill in the Search field with:
 - Camera name or characters in the name
 - Video stream ID
4. Select the required camera from the filtered list
5. Click the Set Video Stream button to confirm the intention

To refresh the video preview, upon selecting the Set Video Stream button, click the Update Video Frame button above the frame. This button is available upon adding the video stream.

General Options

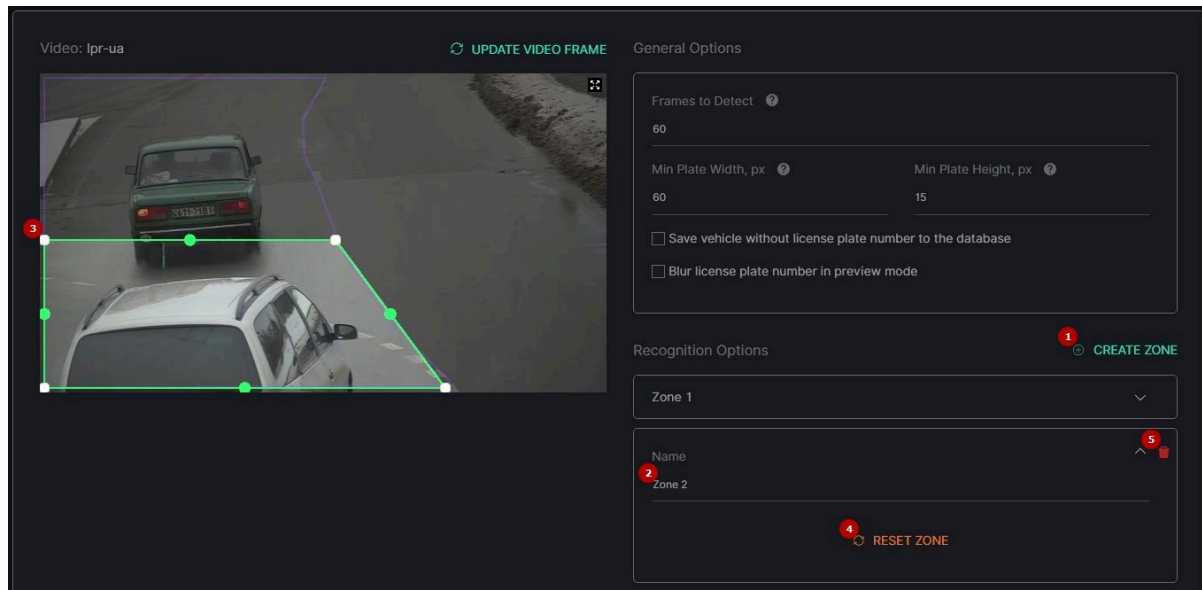
The General Options block determines the parameters of all zones:



- Set the number of frames for the sample from which the best frame is selected for vehicle detection
- Set the minimum plate width for recognition (in pixels)
- Set the minimum plate height for recognition (in pixels)
- Select the Save Vehicle Without License Plate Number to the Database checkbox to save detected vehicles with absent or unrecognizable license plate numbers to the database
- Select the Blur License Plate Number in Preview Mode checkbox to blur the license plate area in the analytics live view mode
- The possible range for the Frames to Detect parameter is from 3 to 100 frames.
- The minimum value for the Min Plate Width, px parameter is 40 pixels.
- The minimum value for the Min Plate Height, px parameter is 15 pixels.

Recognition Options

To perform the recognition, apply these recognition options:



1. Select the Create Zone button to create a new detection zone
2. Enter the zone name
3. Modify the detection zone:
 - Click and drag the handles with LMB to set the zone borders
 - Click and drag the area inside the zone with LMB to move the whole zone
 - Click the handle with RMB to delete it
4. Click the Reset Zone button to return the detection zone borders to their original position
5. Click the red Delete Zone icon to delete the detection zone section

The detection zone is based on at least 3 handles.

Hardware Tab

The Hardware tab provides the ability to customize hardware parameters:

The screenshot shows the 'Hardware' configuration tab, which is the second of five steps. It features a 'BACK' button and a 'NEXT' button. The main content area is titled 'Hardware' and contains several settings: a radio button selection for 'CPU' or 'GPU' (with 'GPU' selected), a 'Decoding' section with a dropdown menu currently set to 'NVDEC', a radio button selection for 'FPS', 'Key Frame', or 'Once Every X Seconds' (with 'FPS' selected), a numeric input field for 'FPS' set to '25', and a checkbox labeled 'Use motion detection for AI' which is checked.

- Choose the CPU or GPU hardware acceleration
- Select the hardware decoder from the drop-down list:
 - CPU
 - Intel
 - NVDEC
- Select the frame processing mode:
 - FPS to set the desired number of frames per second
 - Key Frame to set the frame processing only by keyframes
 - Once Every X Seconds to set intervals in seconds between frame processing
- Select the Use motion detection for AI checkbox to enable analytics to process frames only when motion is detected in the frame
- The recommended value for the FPS mode is 25.
- The Use motion detection for AI checkbox is available only for FPS frame processing mode.
- The default parameters allow the production of analytics. To customize the analytics, set parameters as required.
- To learn more about hardware settings, read [How to Configure the Hardware Tab Settings](#).

Notifications Tab

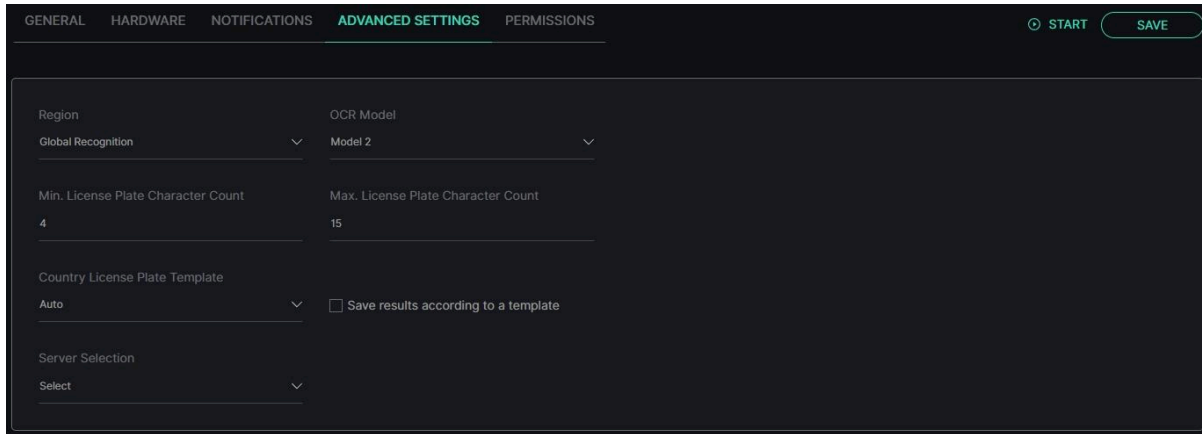
The Notifications tab allows managing the events notifications. Check the Send Events to Event Manager box to allow the system to send all notifications to the Event Manager and then to external resources:

The screenshot shows the 'Notifications' configuration tab, which is the third of five steps. It features a 'BACK' button and a 'NEXT' button. The main content area is titled 'Notifications' and contains a single checkbox labeled 'Send events to Event Manager' which is currently unchecked.

The default parameters allow the production of analytics. To customize the analytics, set parameters as required.

Advanced Settings Tab

The Advanced Settings tab allows the users to:



The screenshot shows the 'ADVANCED SETTINGS' tab selected in a navigation bar. The interface is dark-themed. At the top right of the settings area, there are 'START' and 'SAVE' buttons. The settings are organized into several sections: 'Region' with a dropdown menu showing 'Global Recognition'; 'OCR Model' with a dropdown menu showing 'Model 2'; 'Min. License Plate Character Count' with a numeric input field set to '4'; 'Max. License Plate Character Count' with a numeric input field set to '15'; 'Country License Plate Template' with a dropdown menu showing 'Auto' and a checkbox labeled 'Save results according to a template' which is currently unchecked; and 'Server Selection' with a dropdown menu showing 'Select'.

- Choose a region for license plate recognition based on predefined templates:
 - Global Recognition
 - Europe + CIS
 - USA + Canada + Mexico
 - Australia + New Zealand
 - Japan
 - Thailand
 - Middle East
 - Latin America
- Select an OCR model for recognition
- Enter the values from 1 to 15 for the minimum and maximum license plate character count
- Select a specific country (recommended) for focused license plate recognition and dynamic adaptation to the detected country's license plate templates, or leave the Auto option to ensure targeted recognition for a predefined region
- Enable the Save Results According to a Template option to filter and recognize license plates that match the specified country template, ensuring only relevant plates are processed and saved in the results

- Select a server from the drop-down list to run the analytics
- Utilize various OCR models to optimize results based on specific scenarios. Experiment with different models to identify and select the most suitable one that aligns with your requirements.
- Employ the Min. License Plate Character Count and Max. License Plate Character Count parameters to control the character count in the license plate number, providing flexibility in customizing the length as needed.
- Refer to the Supported Countries documentation for comprehensive information on the list of supported countries within each region (analytical model).

Permissions Tab

The Permissions tab provides the ability to:

Roles

Role Name	Start Analytics	Stop Analytics	Edit Analytics	Live View	View Analytics Events	
avttest	☒	☒	☒	☐	☐	
Add Role						
Select role	ADD ROLE					

Users

User Name	Start Analytics	Stop Analytics	Edit Analytics	Live View	View Analytics Events	
avttest	☐	☐	☐	☒	☒	
Add User						
Select user	ADD USER					

Default (Not active)

Default	Start Analytics	Stop Analytics	Edit Analytics	Live View	View Analytics Events	
Default	☒	☒	☒	☒	☒	

- Assign analytics access rights for Roles:
 1. Select the required role from the drop-down list
 2. Click the Add Role button
 3. Select the checkboxes for the required access rights
 4. Click the Delete icon to remove the unnecessary role
- Assign analytics access rights for Users:
 1. Select the required user from the drop-down list
 2. Click the Add User button
 3. Select the checkboxes for the required access rights

4. Click the Delete icon to remove the unnecessary user

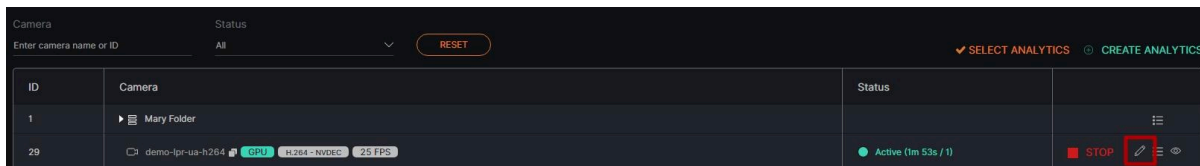
 - Select the checkboxes for the required analytics access rights by default
 - Select the Save button to confirm the intention in the navigation menu
 - Default parameters are active only if no Roles or Users are added.
 - The quantity of added Roles and Users is not limited.

Once saved, the LPR Analytics editor opens to allow the users to:

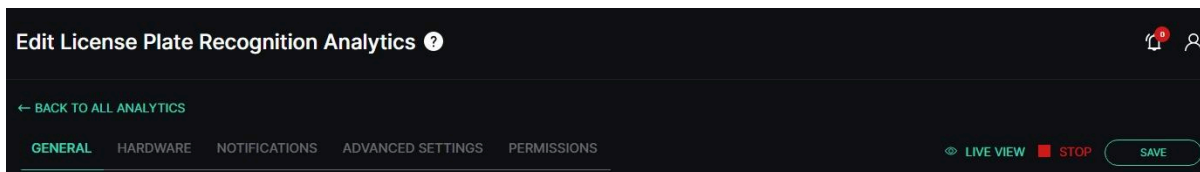
- Modify parameters
- Set parameters
- Run the created analytics
- Proceed to live view mode

Edit Analytics

To edit settings in the selected analytics, click the Edit icon on the toolbox:



The Edit License Plate Recognition Analytics navigation menu allows to:



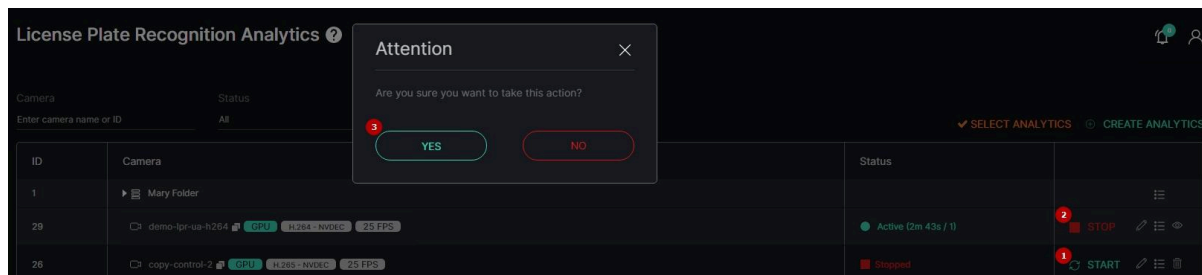
- Click the Back to All Analytics button to return to the main Analytics item
- See the setting tabs and move among them by clicking their titles:
 - General
 - Hardware
 - Notifications
 - Advanced Settings
 - Permissions
- Select the Stop button to disable the analytics:
 - Yes to confirm the analytics disabling

- No to cancel the intention or close the pop-up window
- Select the Start button to enable the analytics
- Click the Live View button to see the selected analytics process in real-time
- Select the Save button to apply the changes to the selected analytics
- The current tab is always highlighted.
- Analytics editing is available only when selected analytics is disabled.
- The Stop button is available only when the current analytics is active.
- The Start button is available only when the current analytics is stopped.
- The Live View button is available only when the current analytics is active.

To view editing parameters for the General, Hardware, Notifications, Advanced Settings, and Permissions tabs, read Create Analytics.

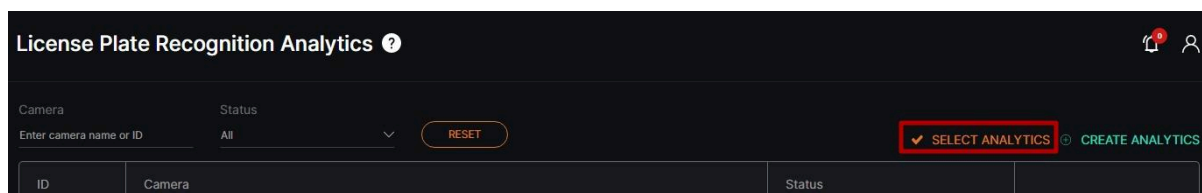
Analytics Status

To enable or disable the analytics and view the change of the analytics status

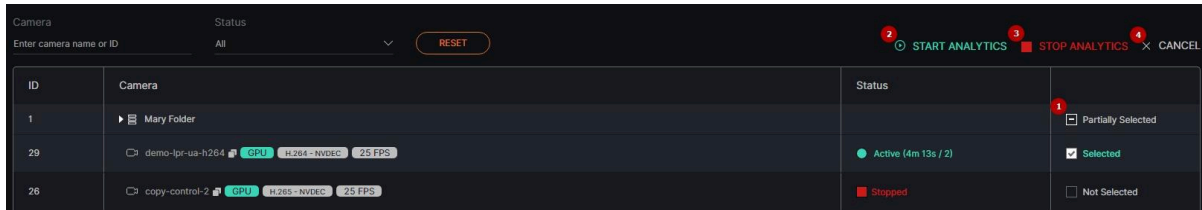


1. Select the Start button to enable the analytics
2. Click the Stop button to disable the analytics process
3. Confirm the intention

To enable or disable multiple analytics at once, click the Select Analytics button:



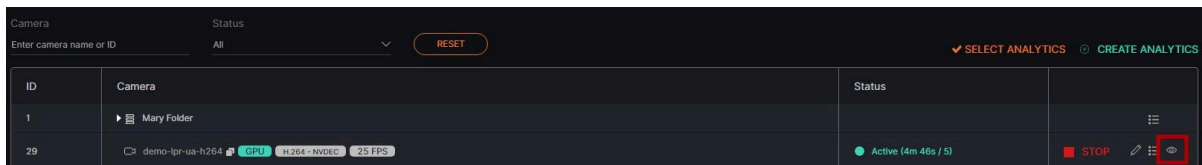
The Select Analytics functional menu allows to:



1. Check the boxes next to the required folders or separate analytics to select them
2. Click the Start Analytics button and confirm the intention in the pop-up window to enable all selected analytics
3. Click the Stop Analytics button and confirm the intention in the pop-up window to disable all selected analytics
4. Click the Cancel button to quit the analytics selection

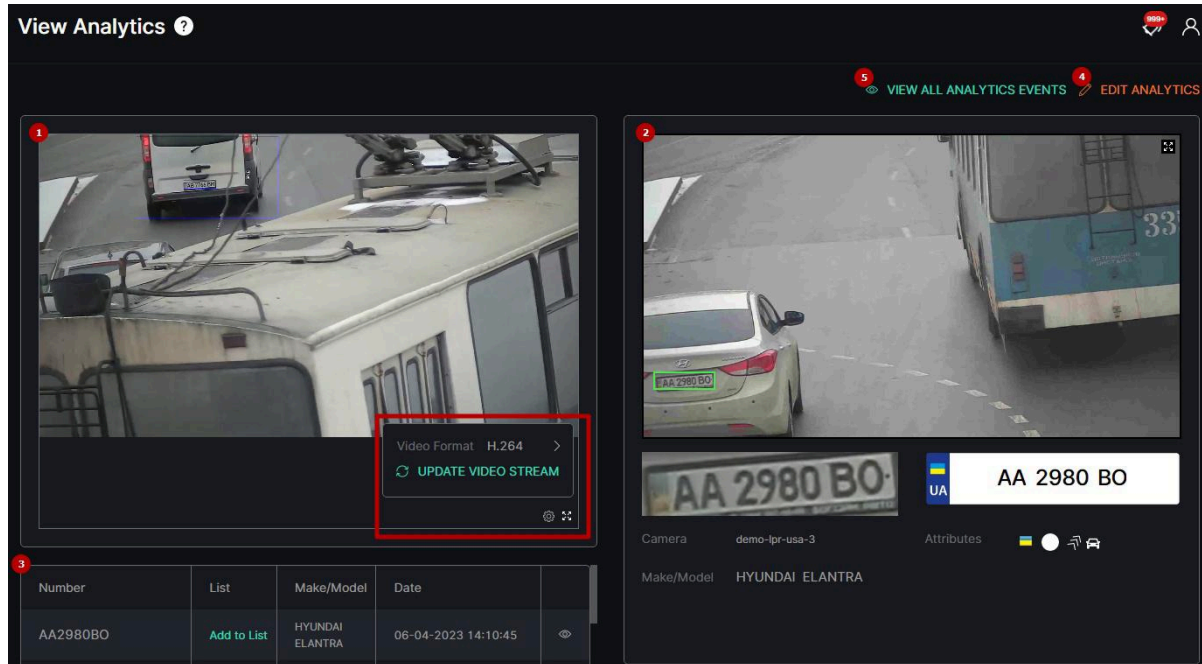
View Analytics

To see the selected analytics in real-time, click the View icon on the toolbox:



The View icon becomes available only when selected analytics is active.

Live view analytics mode allows to:



1. In the video block:

- View the video from the camera in real-time mode
- Hover the mouse over the Settings icon to:
 - Select the desired video format
 - Click the Update Video Stream button to manually update the video
- Click the Enlargement icon to expand the video to full-screen

2. In the vehicle data block:

- View the frame preview with the recognized license plate number
- View the recognized vehicle information

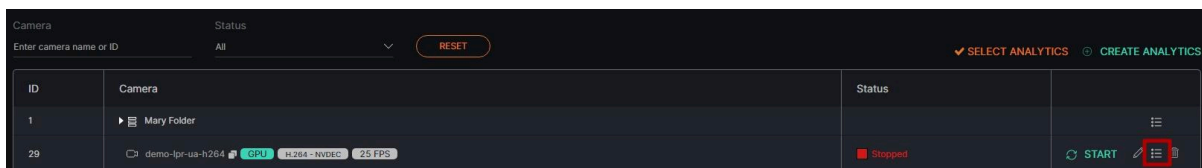
3. In the table below:

- Select the Add to List button to add the license plate number to the required list. In the pop-up window:
 - Write a comment about the license plate number in the Notes field
 - Select a required list
 - Click the Save button
- Select the View icon to view the additional information. In the pop-up window:
 - See the extended vehicle data
 - Use frame view tools:
 - Zoom Out icon (-) to zoom out from a specific area of the frame
 - Zoom In icon (+) to zoom in on a specific area of the frame

- Reset View icon (~) to reset the frame to its original size and position
- Target icon to zoom in on the detected object in the frame
- Enlargement icon to open the frame in full-screen (in the full-screen press the Esc button to return to default view)
- Hover the mouse over the Extra Options icon. In the drop-down menu:
 - Select the Add to List button to add the vehicle to the desired list
 - Click the Save Image button to download the event frame in full-size
 - Select the Export Event option to download the PDF report of the event
- 4. Click the Edit Analytics button to make changes to the current analytics settings
- 5. Click the View All Analytics Events button to see all events from the selected analytics
 - Click the enlargement icon in the upper-right corner of the frame preview to open the full-screen view mode.
 - Click and drag the image across the zoomed-in frame to view different parts of it.

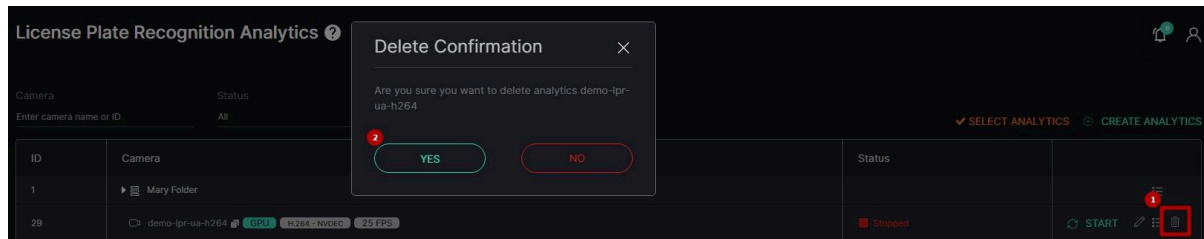
View Search Results

To view selected analytics search results in the Analytics item, click the Search Results icon on the toolbox:



Delete Analytics

To delete the analytics:

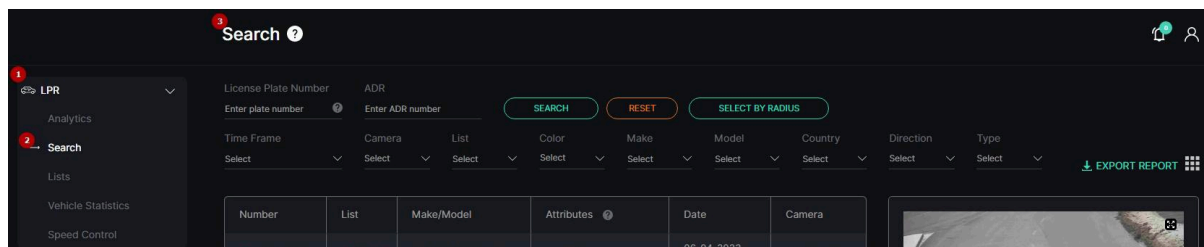


1. Select the Delete icon on the toolbox
2. Confirm the intention

LPR: Search

Overview

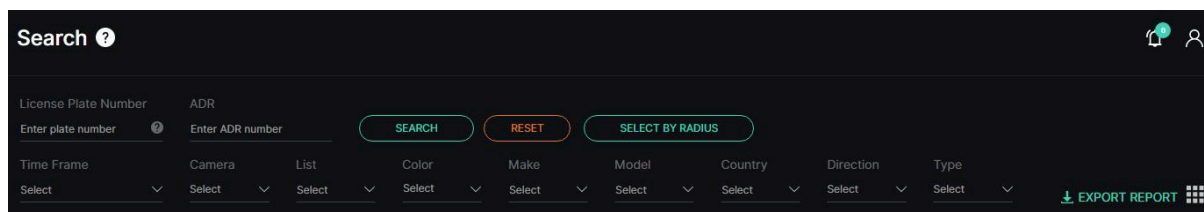
To open the Search item, in the left menu:



1. Select the LPR section
2. Choose the Search item
3. See vehicle search

Use and Functionality

The Search functional menu allows to:



- Enter the license plate number or part of the number
- Enter the ADR code or part of the code

- Select the required time frame
- Click the Camera parameter to choose the desired video analytics. In the pop-up window:
 - Check the boxes next to the required video analytics and folders
 - Click the Select Video Analytics button
- Select a necessary list name, the All Lists or Off the List option from the drop-down list
- Select from the drop-down lists the estimated vehicle's:
 - Color
 - Make
 - Model
 - Country of registration
 - Direction of movement
 - Type
- Click the Search button to start filtering
- Click the Reset button to clear the filters
- Click the Select by Radius button to set the area for search. In the pop-up window:
 - Enter the radius in kilometers
 - Click the map at the desired spot to set the center of the search circle
 - Select the Search button
- Click the Export Report button to download the report. In the Export Settings pop-up window, set the parameters:
 - Select the required report file format:
 - PDF
 - CSV
 - Enter the required number of the newest results collected for the report
 - Check the Add Frames with License Plate Numbers box to include relevant cropped photos of license plates in the report
 - Check the Add Full Size Event Frame box to include full-size event frames in the report
 - Click the Export button to confirm the intention
- Move between List and Grid view modes by clicking the corresponding toggle

Once selected and filtered, in the search results:

The screenshot displays the Luxriot EVA Advanced interface. At the top, there are search filters for License Plate Number, ADR, Time Frame, Camera, List, Color, Make, Model, Country, Direction, and Type. Below these filters is a table with the following columns: Number, List, Make/Model, Attributes, Date, and Camera. The table contains several rows of vehicle data. To the right of the table, there is a detailed view of a vehicle, showing a photo of two yellow trucks, the license plate number WND29667, and the vehicle type SCANIA.

Number	List	Make/Model	Attributes	Date	Camera
27A231	Add to List	UAZ UAZ-3151	[Icons]	09-12-2022 18:08:21	demo-adr
Y732C15	Add to List	VOLVO TRUCKS	[Icons]	09-12-2022 18:08:15	demo-adr
M627BM93	Add to List	MERCEDES-BENZ UNIMOG	[Icons]	09-12-2022 18:08:07	demo-adr
CGD70IX	Add to List	LAND-ROVER DEFENDER	[Icons]	09-12-2022 18:08:03	demo-adr
WND29667	Add to List	SCANIA	[Icons]	09-12-2022 18:08:03	demo-adr
AS46511	Add to List	VOLVO TRUCKS	[Icons]	09-12-2022 18:07:59	demo-adr
4921	Add to List	MERCEDES-BENZ UNIMOG	[Icons]	09-12-2022 18:07:49	demo-adr

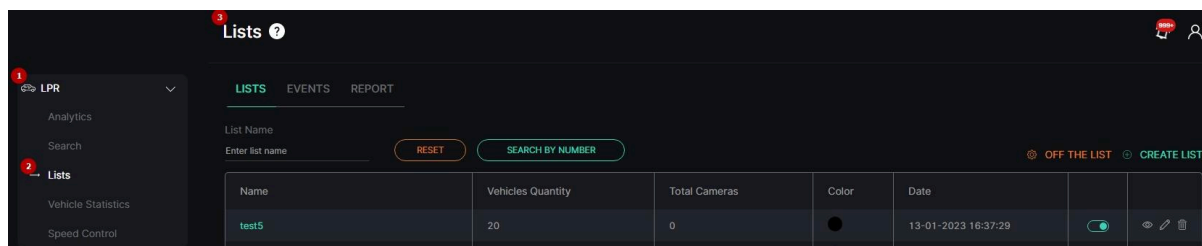
- Click the Magnifying Glass icon next to the required number to filter search results only for the selected number
- View recognized vehicle data, date, and time the license plate number has been recognized by the selected analytics
- View recognized vehicle attributes:
 - Country of registration
 - Color of the vehicle
 - Direction of movement
 - Vehicle type:
 - Car
 - Motorbike
 - Bus
 - Truck
 - Van
 - Pickup
 - SUV
 - ADR code (in case a vehicle carries dangerous goods)
- Click the list name to open the List View item or add a license plate number to the required list by clicking the Add to List button. In the pop-up window:
 - Write a comment about the license plate number in the Notes field
 - Select a required list
 - Click the Save button
- View the vehicle route and camera location on the map by clicking the corresponding icons in the Camera column

- Click the row in the table with the desired license plate number to see the frame with a vehicle preview
- Select the enlargement icon in the upper-right corner of the frame preview to view the additional information. In the pop-up window:
 - See the extended vehicle data
 - Use frame view tools:
 - Zoom Out icon (-) to zoom out from a specific area of the frame
 - Zoom In icon (+) to zoom in on a specific area of the frame
 - Reset View icon (~) to reset the frame to its original size and position
 - Target icon to zoom in on the detected object in the frame
 - Enlargement icon to open the frame in full-screen (in the full-screen press the Esc button to return to default view)
 - Hover the mouse over the Extra Options icon. In the drop-down menu:
 - Select the Add to List button to add the vehicle to the desired list
 - Click the Save Image button to download the event frame in full-size
 - Select the Export Event option to download the PDF report of the event
- The same options are available in the grid view mode.
- Click and drag the image across the zoomed-in frame to view different parts of it.

LPR: Lists

Overview

To open the Lists item, in the left menu:



1. Select the LPR section
2. Choose the Lists item
3. See lists navigational menu

Use and Functionality

The Lists navigational menu consists of 3 tabs:

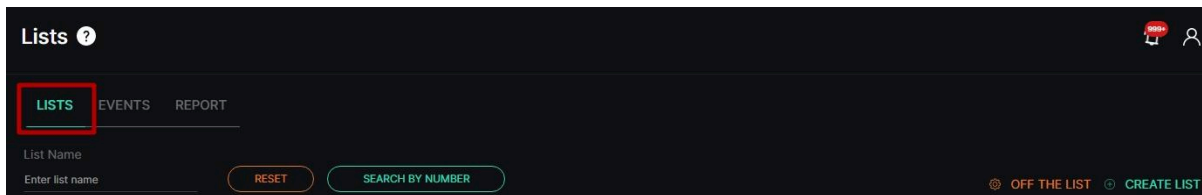


- Lists
- Events
- Report
- The Lists item opens with the Lists tab by default.
- The selected tab is always highlighted.

Lists: Lists

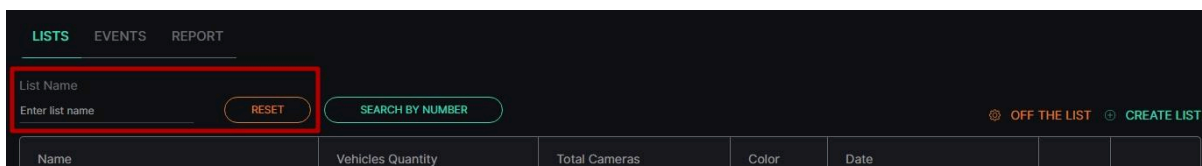
Overview

Select the Lists tab in the tabs menu:



Use and Functionality

The Lists tab functional menu allows to:



- Enter the list name or characters in the name to filter lists
- Select the Reset button to clear the filters

See the filtered lists in the table below. It contains:

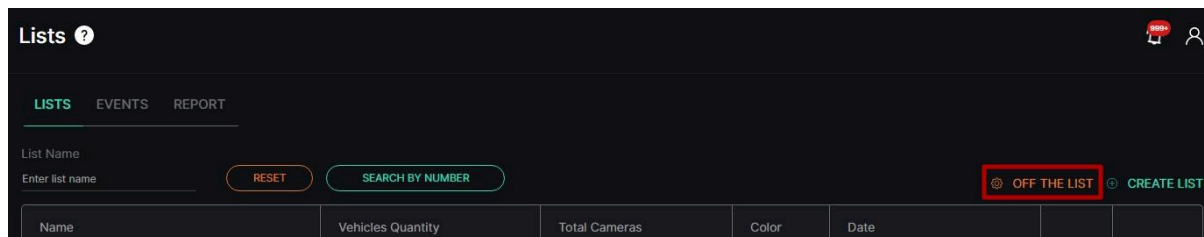
List Name						
Enter list name		RESET	SEARCH BY NUMBER	OFF THE LIST CREATE LIST		
Name	Vehicles Quantity	Total Cameras	Color	Date		
test5	0	0	●	13-01-2023 16:37:29	☐	 
test3	0	0	●	16-01-2023 09:33:58	☐	 
test2	1	0	●	16-01-2023 09:39:43	☒	 

- List name
- Number of vehicles included in the list
- Total number of video streams involved in the list
- List color
- List creation date and time
- Enabled/Disabled list toggle
- Toolbox comprises:
 - Edit List
 - Delete List
 - View List

Turn on the Enabled\Disabled toggle to get matches with the list elements in the search results and receive list notifications.

Off List Notification Settings

To set up notifications about recognized license plates out of lists, select the Off the List button:



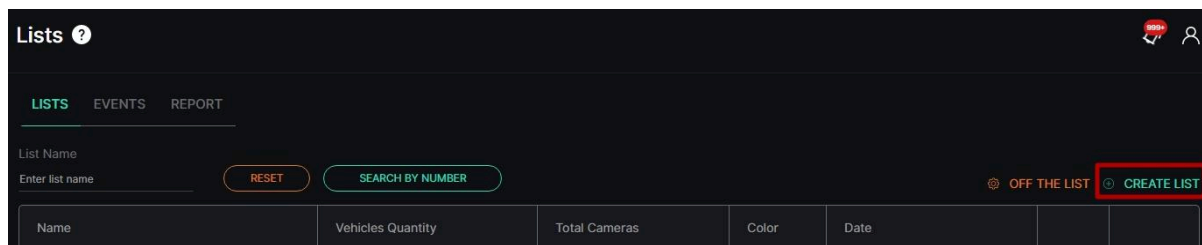
In the Off List Notification Settings pop-up window:

- Click the Camera parameter to choose the desired video analytics. In the pop-up window:

1. Check the boxes next to the required video analytics and folders
 2. Click the Select Video Analytics button
- Check the Internal Notification box to allow the system to send all notifications to the Events tab of the Lists item
 - Check the Send Events to Event Manager box to allow the system to send all notifications about license plates out of lists to the Event Manager and then to external resources
 - Click the Save button

Create List

To create a new list, click the Create List button:

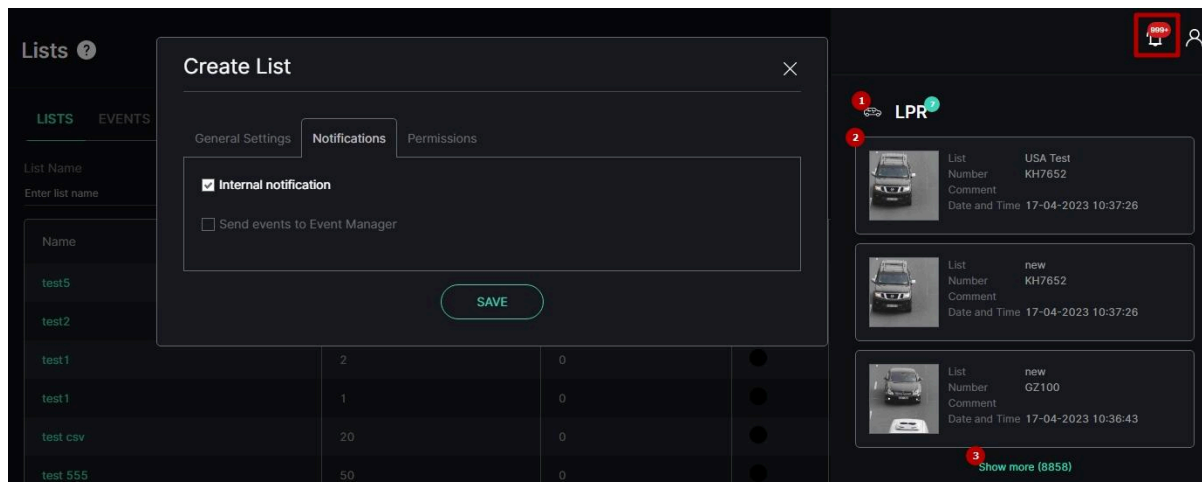


The Create List pop-up window allows to:

- Configure the General Settings tab's parameters:
 - Enter the list name
 - Click the Camera parameter to select the desired video analytics. In the pop-up window:
 1. Check the boxes next to the required video analytics and folders
 2. Click the Select Video Analytics button
 - Type a comment to the list in the Notes field
 - Click on the Color block to pick a color for the list
- Configure the Notifications tab's parameters:
 - Check the Internal Notification box to allow the system to send all notifications related to the list to the Events tab of the Lists item
 - Check the Send Events to Event Manager box to allow the system to send all notifications about license plates in the list to the Event Manager and then to external resources

- Configure the Permissions tab's parameters:
 - Assign list access rights for Roles:
 1. Select the required role from the drop-down list
 2. Click the Add Role button
 3. Select the checkboxes for the required access rights
 4. Click the Delete icon to remove the unnecessary role
 - Assign list access rights for Users:
 1. Select the required user from the drop-down list
 2. Click the Add User button
 3. Select the checkboxes for the required access rights
 4. Click the Delete icon to remove the unnecessary user
 - Select the checkboxes for the required list access rights by default
- Click the Save button to save parameters and create a new list
- The Permissions tab's default parameters are active only if no Roles or Users are added.
- The quantity of added Roles and Users in the Permissions tab is not limited.
- Checking the Internal Notification box allows getting event notifications only in case the Enabled/Disabled list toggle is turned on.

Once the list is created with the checked Internal Notification box, the Enabled/Disabled list toggle is turned on, and at least one of the selected analytics is enabled, the Notification icon signals about each new event notification. Click the Notification icon to open the Notification Panel. It comprises:



1. Plugin name box to:
 - Collapse/expand the list of event notifications by clicking the plugin name

- Clear all plugin event notifications at once from the Notification Panel by clicking the Close button (this action doesn't affect events in the Events tab of the Lists item)
2. Event notification box to:
 - View short event information and frame preview for up to 3 last notifications
 - Open the event pop-up window by clicking the required notification
 - Clear the desired event notification from the notification list by clicking the Close button inside the box (this action doesn't affect the event in the Events tab of the Lists item)
 3. Show More button with the total events number to open the Events tab of the Lists item and view all events

List Permissions Configuration

For example, it is necessary to give full access to a new list to all users related only to a specific role, and at the same time, to restrict the vehicle card managing access rights in the list for one of the users related to this role. For this purpose:

1. In the Roles item of the Settings section assign all required LPR permissions to the role, including:
 - View Vehicle Lists
 - Add New Vehicle to List
 - Edit Vehicle List Elements
 - Delete Vehicle List Elements
2. In the Users item of the Settings section assign the selected role to all required users
3. In the Create List pop-up of the Lists item open the Permissions tab

Configure the parameters in the Permissions tab:

Create List

General Settings Notifications **Permissions**

Roles

Role Name	View Vehicle List	Add New Vehicle to List	Edit Vehicle List Elements	Delete Vehicle List Elements
Mari Role	☒	☒	☒	☒

Add Role

Select role **ADD ROLE**

Users

User Name	View Vehicle List	Add New Vehicle to List	Edit Vehicle List Elements	Delete Vehicle List Elements
Mary 3	☒	☐	☐	☐

Add User

Select user **ADD USER**

Default (Not active)

Default	View Vehicle List	Add New Vehicle to List	Edit Vehicle List Elements	Delete Vehicle List Elements
Default	☒	☒	☒	☒

Note

Only the administrator can make changes to permissions while editing the list

SAVE

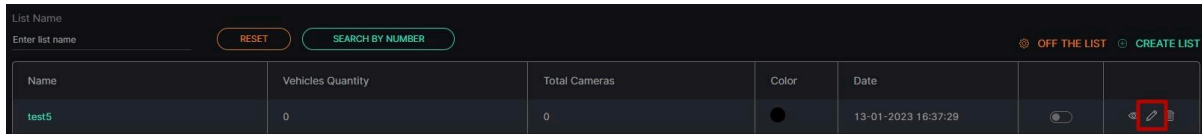
1. In the Roles block, add the required role and check all access rights boxes
2. In the Users block, add the required user and check only the View Vehicle Lists access right box
3. Finish the list configuration and save it

Once the list is created, all users with the selected role can view the new list and manage vehicle cards in it. At the same time, the additionally selected user can only view the new list but cannot manage vehicle cards in this list.

- User permissions are with higher priority than Role permissions.
- The sequence of access rights validation in the list by the system:
 1. Global permissions
 2. User permissions
 3. Role permissions
 4. Default permissions

Edit List

To edit the list, select the Edit icon on the toolbox:

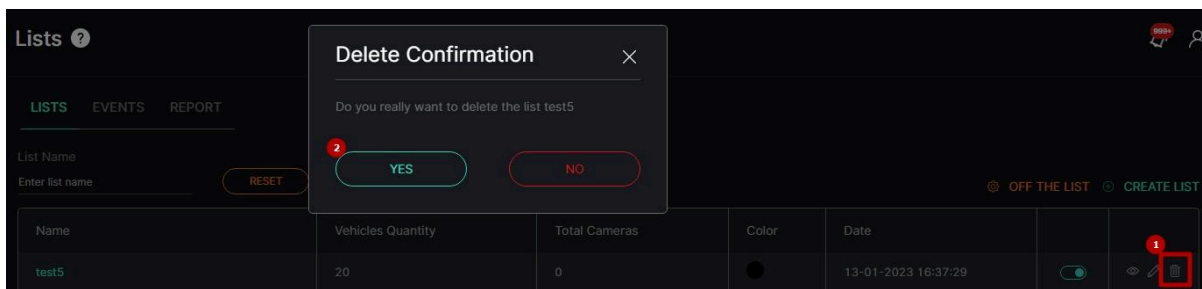


To view editing list parameters, read [Create List](#).

Only the administrator can make changes to permissions while editing the video stream. For other system users, the Permissions tab is disabled.

Delete List

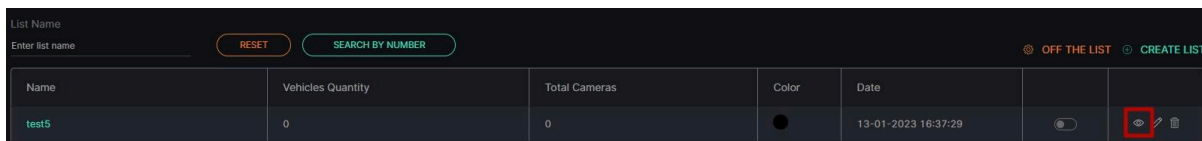
To delete the list:



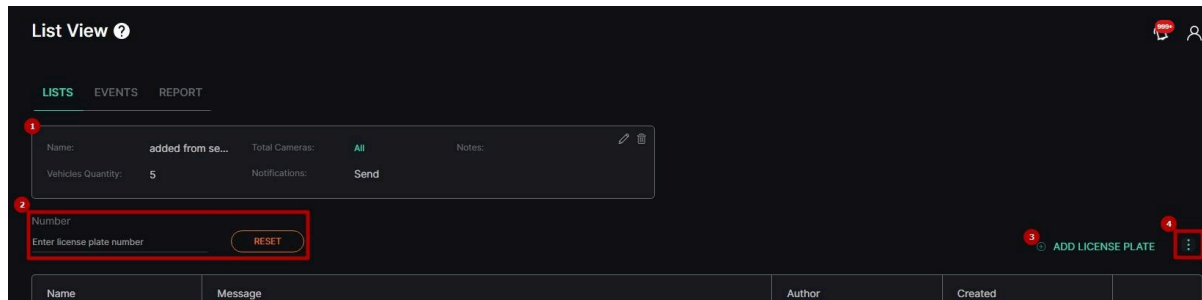
1. Select the Delete icon on the toolbox
2. Confirm the intention

View List

To view the list, select the View icon on the toolbox:\



The List View functional menu comprises:



1. List Info Box contains:
 - List parameters
 - Edit List tool
 - Delete List tool
2. Filters to:
 - Enter the license plate number to filter vehicles
 - Click the Reset button to clear the filters
3. Add License Plate button to add a license plate number to the list. In the pop-up window:
 - Enter the desired license plate number
 - Type a comment to the vehicle in the Message field
 - Click the Save button
4. Options to import and export the list of vehicle information cards in CSV

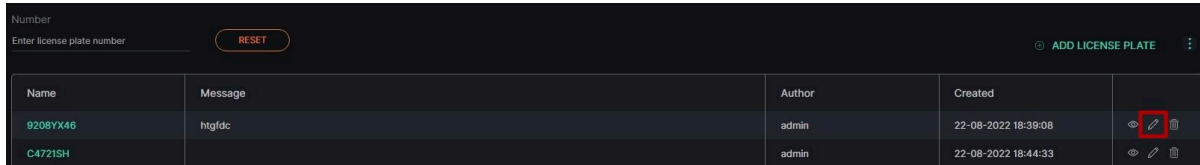
See the list of license plate numbers in the table below. It contains:

Number				
Enter license plate number				
RESET				
ADD LICENSE PLATE				
Name	Message	Author	Created	
9208YX46	htgfdc	admin	22-08-2022 18:39:08	👁️ ✎️ 🗑️
C4721SH		admin	22-08-2022 18:44:33	👁️ ✎️ 🗑️

- License plate number
- Author's username and comment
- Date and time the number was added to the list
- Toolbox comprises:
 - Edit Card
 - Delete Card
 - View Card

Edit Card

To edit the vehicle information card, select the Edit icon on the toolbox:

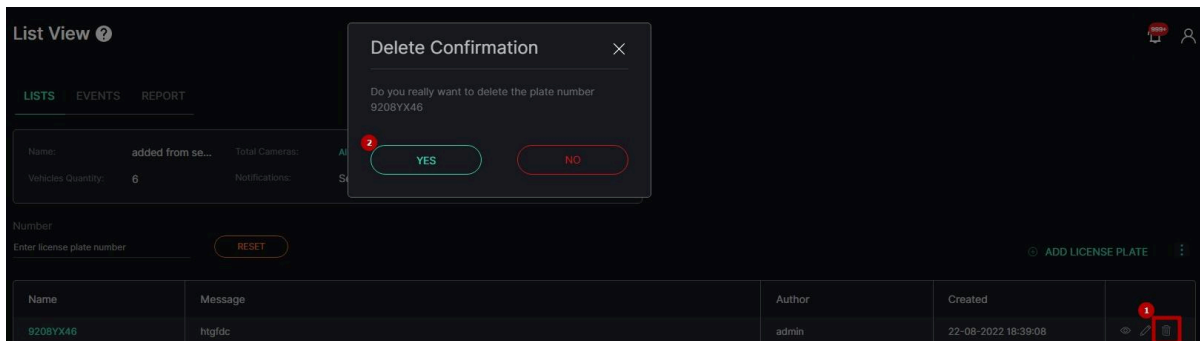


In the pop-up window:

- Change the license plate number
- Type a comment to the vehicle in the Message field
- Choose another list to move the vehicle card
- Click the Save button

Delete Card

To delete the vehicle card:



1. Select the Delete icon on the toolbox
2. Confirm the intention

View Card

To view the required vehicle card, select the View icon on the toolbox:

Number

Enter license plate number

RESET

ADD LICENSE PLATE

Name	Message	Author	Created	
9208YX46	htgfdc	admin	22-08-2022 18:39:08	
C4721SH		admin	22-08-2022 18:44:33	

The Card Info Box contains:

Card ?

List: **USA Test**

Author: admin

Created: 10-02-2023 14:37:27

Comment:

License Plate Number: IHQ1684

Make/Model: HYUNDAI ACCENT

Date: 13-02-2023 09:19:36



- Vehicle info
- Frame with a vehicle
- Enlargement icon over the frame preview to view the image in the full-size
- Edit Card tool
- Delete Card tool

The vehicle's Events Log in the table below allows users to:

Events Log - IHQ1684					
Object	Number	Make/Model	Camera	Date	Frame
	IHQ1684	HYUNDAI ACCENT	 demo-lpr-usa  Route	13-02-2023 09:19:36	
	IHQ1684	HYUNDAI ACCENT	 demo-lpr-usa  Route	13-02-2023 09:18:48	
	IHQ1684	HYUNDAI ACCENT	 demo-lpr-usa  Route	10-02-2023 14:38:15	

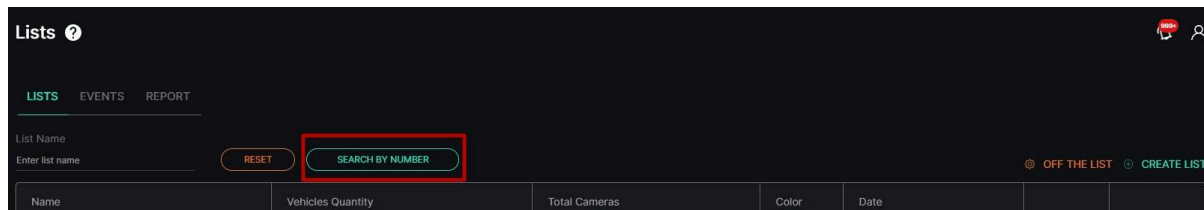
- View recognized vehicle data, date, and time the license plate number has been recognized
- View the vehicle route and camera location on the map by clicking the corresponding icons in the Camera column
- Select the View icon to open the frame with the vehicle. In the pop-up window:

- See the extended vehicle data
- Use frame view tools:
 - Zoom Out icon (-) to zoom out from a specific area of the frame
 - Zoom In icon (+) to zoom in on a specific area of the frame
 - Reset View icon (~) to reset the frame to its original size and position
 - Target icon to zoom in on the detected object in the frame
 - Enlargement icon to open the frame in full-screen (in the full-screen press the Esc button to return to default view)
- Hover the mouse over the Extra Options icon and click the Save Image button to download the event frame in full size

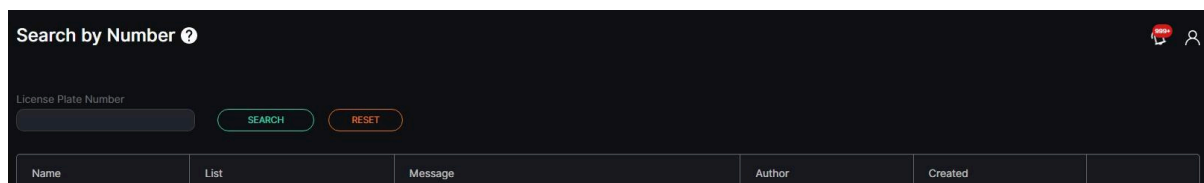
Click and drag the image across the zoomed-in frame in order to view different parts of it.

Search by Number

To quickly find a vehicle card, on the main Lists tab, click the Search by Number button:

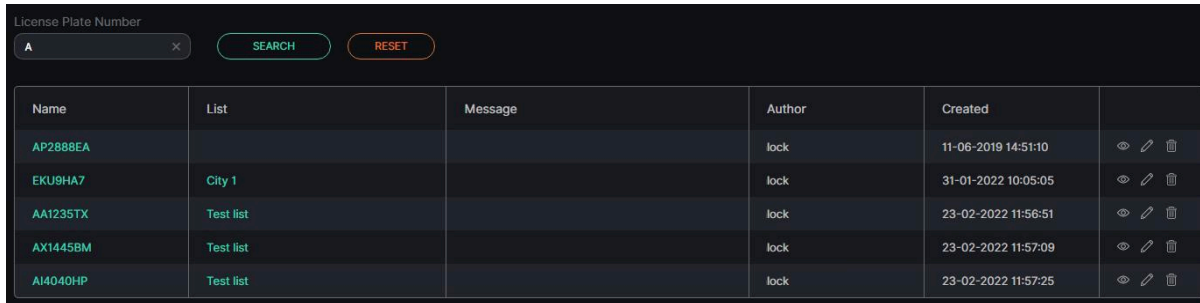


The Search by Number functional menu allows to:



- Enter the license plate number to filter vehicle cards
- Click the Search button to start filtering
- Click the Reset button to clear the filters

View the search results in the table below:



License Plate Number

A SEARCH RESET

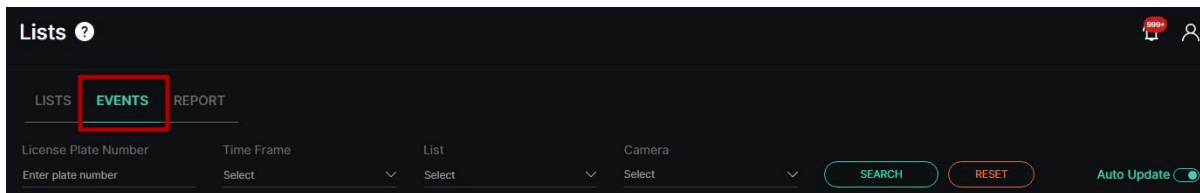
Name	List	Message	Author	Created	
AP2888EA			lock	11-06-2019 14:51:10	👁️ ✎️ 🗑️
EKU9HA7	City 1		lock	31-01-2022 10:05:05	👁️ ✎️ 🗑️
AA1235TX	Test list		lock	23-02-2022 11:56:51	👁️ ✎️ 🗑️
AX1445BM	Test list		lock	23-02-2022 11:57:09	👁️ ✎️ 🗑️
AI4040HP	Test list		lock	23-02-2022 11:57:25	👁️ ✎️ 🗑️

- License plate number
- The name of the list which contains the required number
- Author's username and comment
- Date and time the number was added to the list
- Toolbox comprises:
 - Edit Card
 - Delete Card
 - View Card

Lists: Events

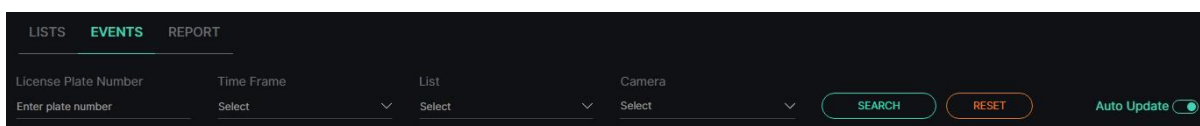
Overview

Select the Events tab in the tabs' menu:



Use and Functionality

The Events tab functional menu allows to:



- Enter the license plate number to filter vehicles
- Select the required time frame
- Choose the desired list
- Click the Camera parameter to select the desired video analytics. In the pop-up window:
 1. Check the boxes next to the required video analytics and folders
 2. Click the Select Video Analytics button
- Click the Search button to filter the events
- Click the Reset button to clear the filters
- Select the Auto Update toggle to enable or disable the events' auto update

Once selected and filtered, in the event notifications:

License Plate Number	Time Frame	List	Camera					
Enter plate number	Select	new	Select	SEARCH	RESET	Auto Update		
Number	Comment	List	Camera	Object	Make/Model	Attributes	Date	Frame
AA8001KX	some comment	new	demo-lpr-ua Route		TOYOTA HIGHLANDER		31-07-2023 2:54:34 pm	
RJA84337		new	demo-lpr-ua Route		VOLKSWAGEN SHARAN		31-07-2023 2:51:45 pm	
61171BI	some comment	new	demo-lpr-ua Route		VAZ 2107		31-07-2023 2:51:45 pm	
AB2805CM		new	demo-lpr-ua Route		RENAULT MEGANE		31-07-2023 2:51:45 pm	

- Click the desired license plate number to open the License Plate Information Card item
- Read the comment related to the recognized license plate number
- Click the Copy Comment icon next to the required comment to copy it to the clipboard
- Click the list name to open the List View item or add a license plate number to the required list by clicking the Add to List button. In the pop-up window:
 - Write a comment to the license plate number in the Notes field
 - Select a required list
 - Click the Save button
- View the vehicle route and camera location on the map by clicking the corresponding icons in the Camera column
- View recognized vehicle data, date, and time the license plate number has been recognized by the selected analytics
- Select the View icon to open the frame with the vehicle. In the pop-up window:

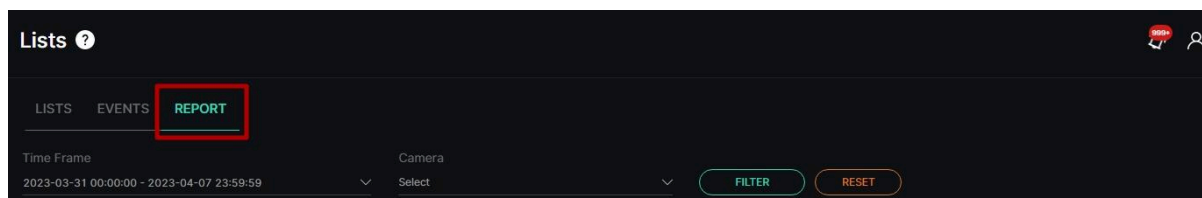
- See the extended vehicle data
- Use frame view tools:
 - Zoom Out icon (-) to zoom out from a specific area of the frame
 - Zoom In icon (+) to zoom in on a specific area of the frame
 - Reset View icon (~) to reset the frame to its original size and position
 - Target icon to zoom in on the detected object in the frame
 - Enlargement icon to open the frame in full-screen (in the full-screen press the Esc button to return to default view)
- Hover the mouse over the Extra Options icon to:
 - Select the Save Image option to download the event frame in full-size
 - Select the Export Event option to download the PDF report of the event

Click and drag the image across the zoomed-in frame to view different parts of it.

Lists: Report

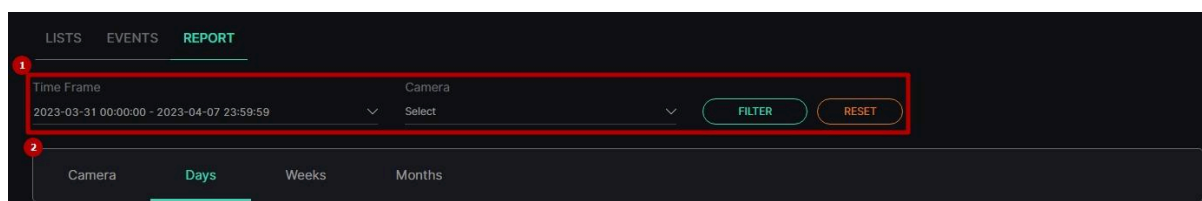
Overview

Select the Report tab in the tabs menu:



Use and Functionality

The Report tab functional menu comprises:



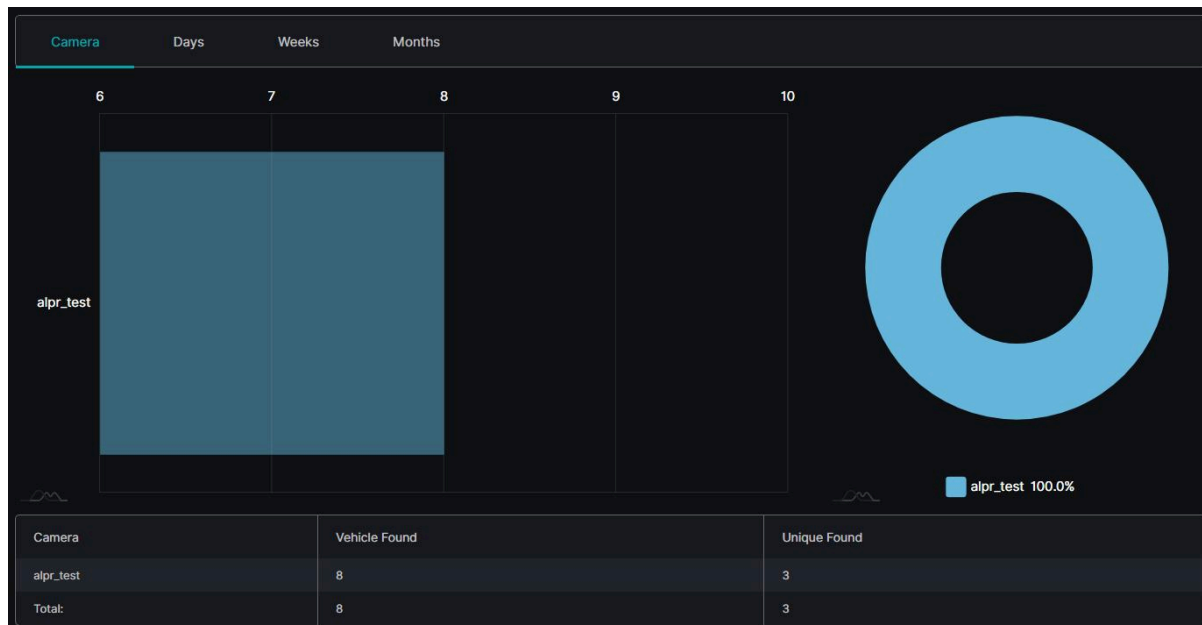
1. Filters to:
 - Select the desired time frame to produce statistics

- Click the Camera parameter to choose the desired video analytics. In the pop-up window:
 - Check the boxes next to the required video analytics and folders
 - Click the Select Video Analytics button
 - Click the Filter button to start filtering
2. Tabs to filter statistics data by:
- Camera
 - Days
 - Weeks
 - Months

The Report tab opens with the Days tab by default.

Camera Tab

The Camera tab shows:



- Rectangular bars on the bar chart with lengths proportional to the vehicles from lists quantity detected by selected cameras
- Slices on the donut chart with the amount of the found by selected cameras vehicles from lists in percentage

- Table columns by selected cameras, detected vehicles from lists, and unique vehicles (detected by the desired camera or by all cameras in general)
- Vehicle Found column counts every time the vehicle from the lists was detected by the camera.
- Unique Found column counts only detected unique vehicle numbers from the lists. The unique vehicle number is counted only once for the selected time frame.

Days Tab

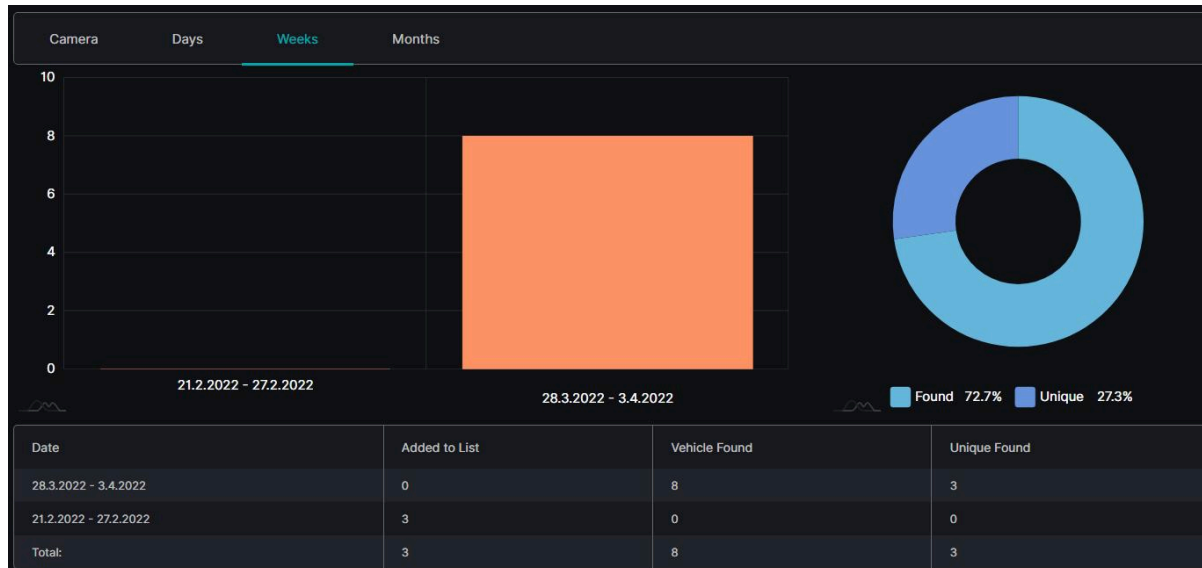
The Days tab shows:



- Columns on the combo chart with heights proportional to the number of vehicles from the lists (scale with numbers to the left of the graph) detected within the required date
- Checkpoints on the combo chart by vehicles' quantity (scale with numbers to the right of the graph) added to the list within the required date
- Slices on the donut chart with the amount of the total found and unique vehicles from lists in percentage
- Table columns by date, number of vehicles added to the lists, detected vehicles from lists, and unique vehicles (detected by the desired camera or by all cameras in general)

Weeks and Months Tab

The Weeks tab shows:

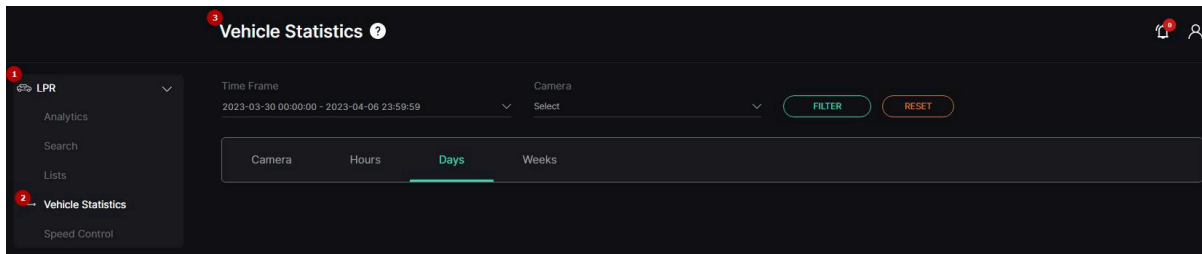


- Columns on the column chart with heights proportional to the number of vehicles from the lists detected within the required weeks
- Slices on the donut chart with the amount of the total found and unique vehicles from lists in percentage
- Table columns by weeks, number of vehicles added to the lists, detected vehicles from lists, and unique vehicles (detected by the desired camera or by all cameras in general)
- Hover the mouse over the graphs to see the object quantity and amount.
- The Months tab content differs with the usage of month time intervals instead of weeks.

LPR: Vehicle Statistics

Overview

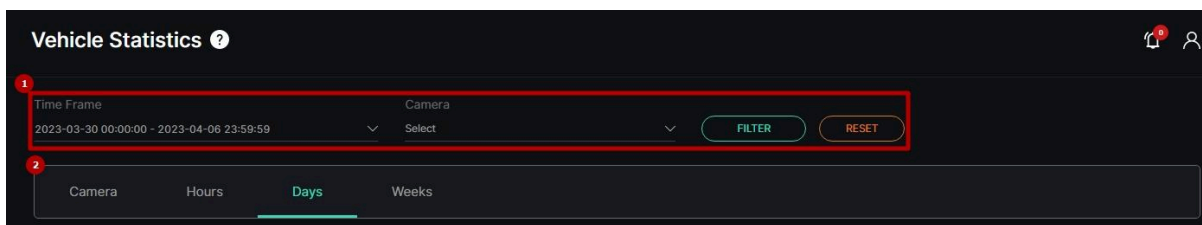
To open the Vehicle Statistics item, in the left menu:



1. Select LPR section
2. Choose Vehicle Statistics item
3. See statistics

Use and Functionality

The Vehicle Statistics functional menu comprises:

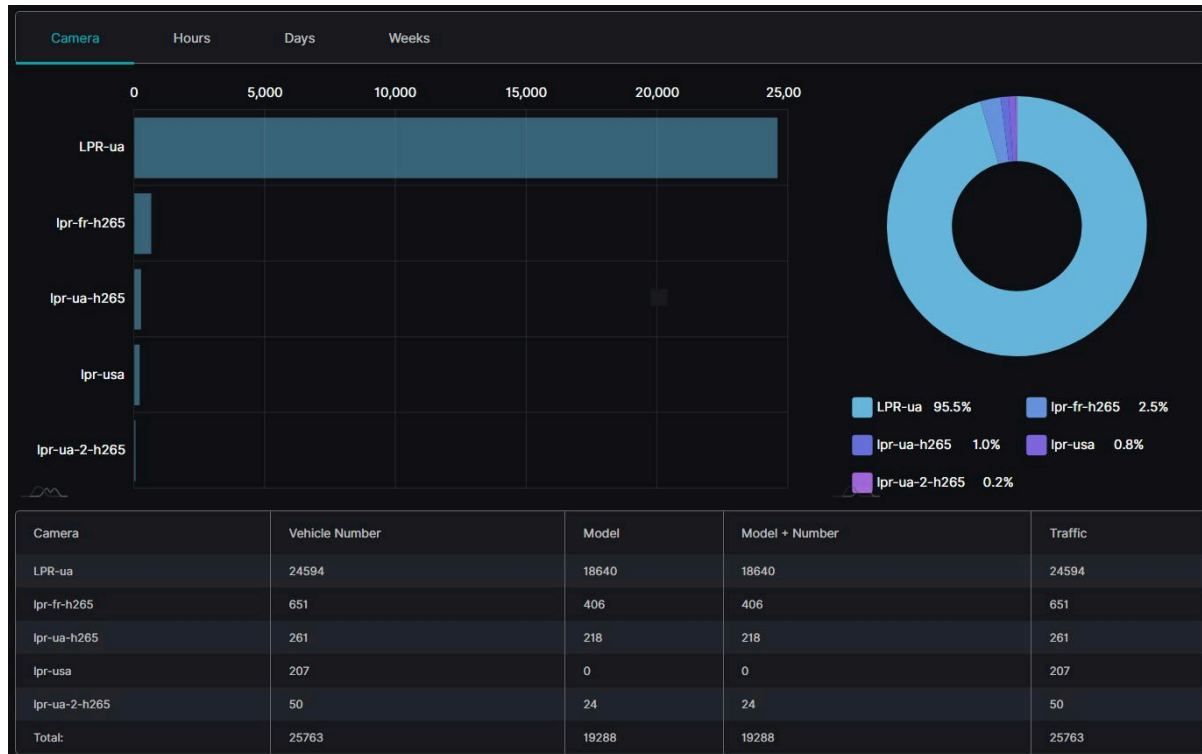


1. Filters to:
 - Select the desired time frame to produce statistics
 - Click the Camera parameter to choose the desired video analytics. In the pop-up window:
 - Check the boxes next to the required video analytics and folders
 - Click the Select Video Analytics button
 - Click the Filter button to start filtering
2. Tabs to filter statistics data by:
 - Camera
 - Hours
 - Days
 - Weeks

The Vehicle Statistics item opens with the Days tab by default.

Camera Tab

The Camera tab shows:

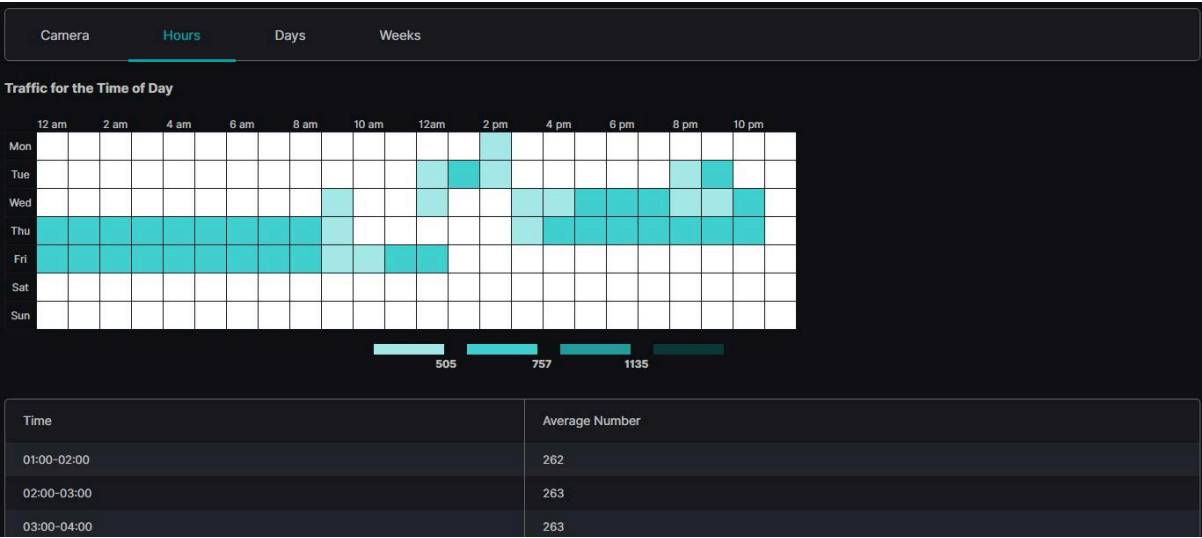


- Rectangular bars on the bar chart with lengths proportional to the vehicle quantity detected by selected cameras
- Slices on the donut chart with the amount of the found by selected cameras vehicles in percentage
- Table columns by selected cameras, detected vehicle number and model, as well as their total number detected by the desired camera or by all cameras in general

Hover the mouse over the donut chart's slices to see the found vehicle quantity and amount by a required camera.

Hours Tab

The Hours tab shows:

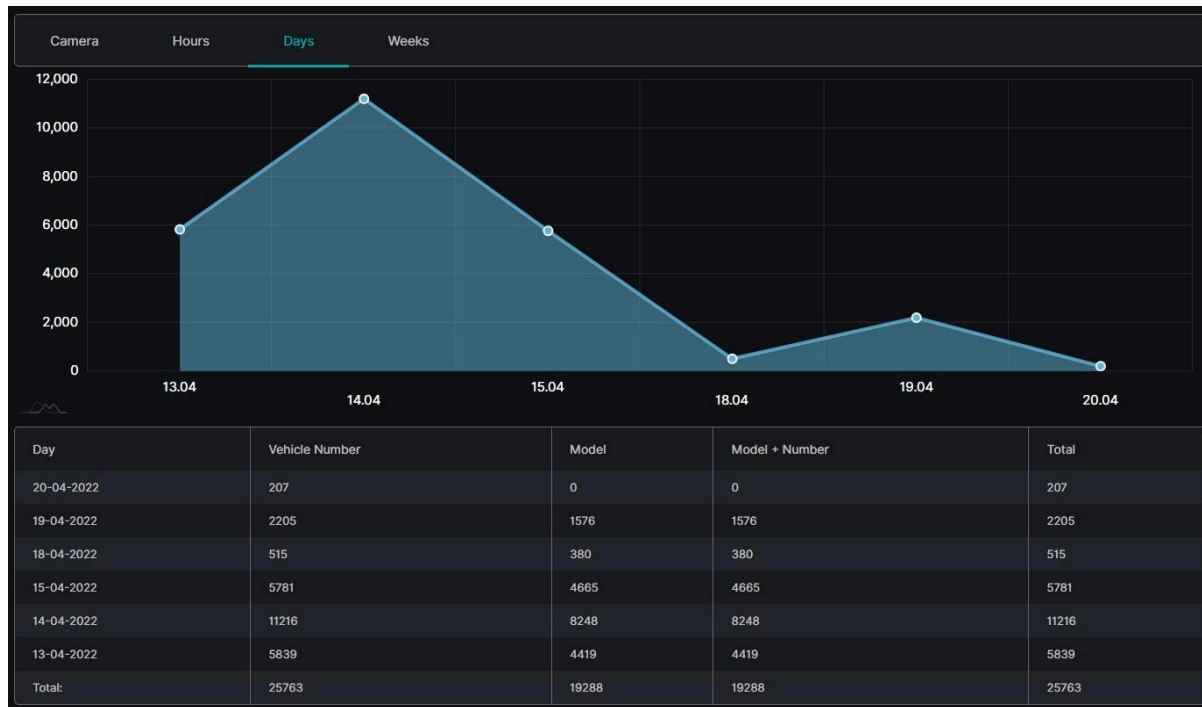


- Table chart with the number of the vehicles by hours and days of a week
- Table with Time and Average Number columns

Hover the mouse over the colored squares to see the found vehicle quantity for the required time interval.

Days Tab

The Days tab shows:

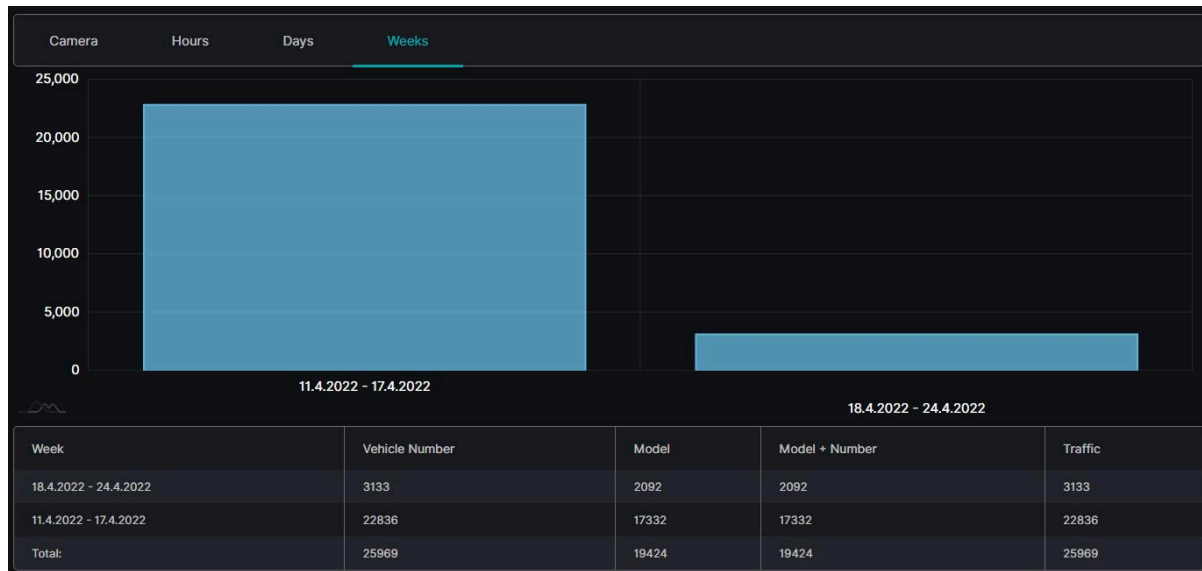


- Checkpoints on the area chart by found vehicle quantity and date
- Table columns by date, detected vehicle number and model, as well as their total number for a specific day or for a required time frame in general

Hover the mouse over the checkpoints to see the found vehicle quantity for a required date.

Weeks Tab

The Weeks tab shows:



- Columns on the column chart with heights proportional to the vehicle quantity detected during the required weeks
- Table columns by weeks, detected vehicle number and model, as well as their total number for a specific week or for a required time frame in general

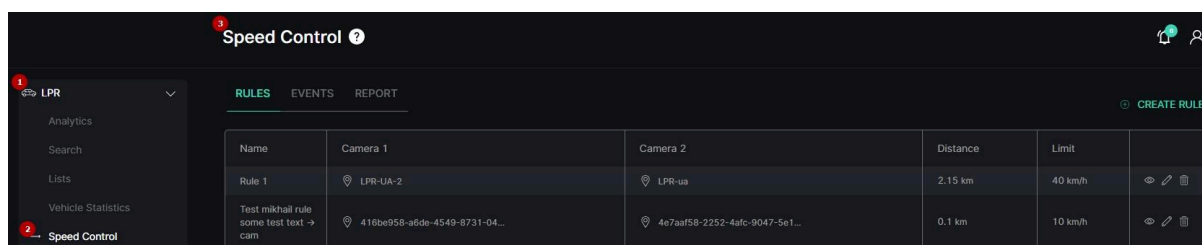
Hover the mouse over the chart columns to see the found vehicle quantity for a required week.

LPR: Speed Control

Overview

Speed violation monitoring tool — set speed limits for specific areas, define detection rules, and receive alerts when those limits are exceeded.

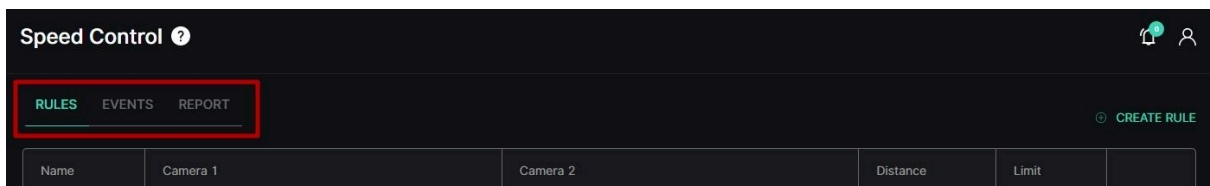
To open the Speed Control item, in the left menu:



- 1. Select LPR section
- 2. Choose the Speed Control item
- 3. See the speed control navigational menu

Use and Functionality

The Speed Control navigational menu consists of 3 tabs:

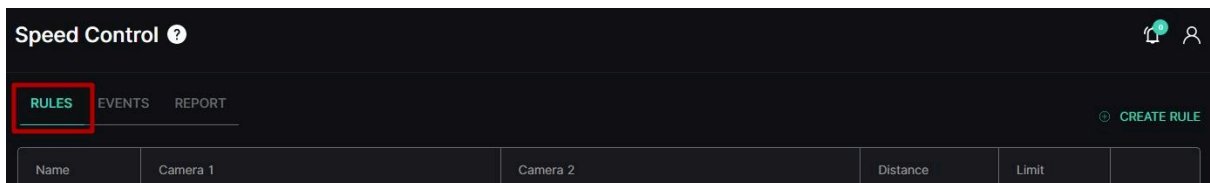


- Rules
- Events
- Report
- Speed Control item opens with the Rules tab by default.
- The selected tab is always highlighted.

Speed Control: Rules

Overview

Select the Rules tab in the tabs menu:



Use and Functionality

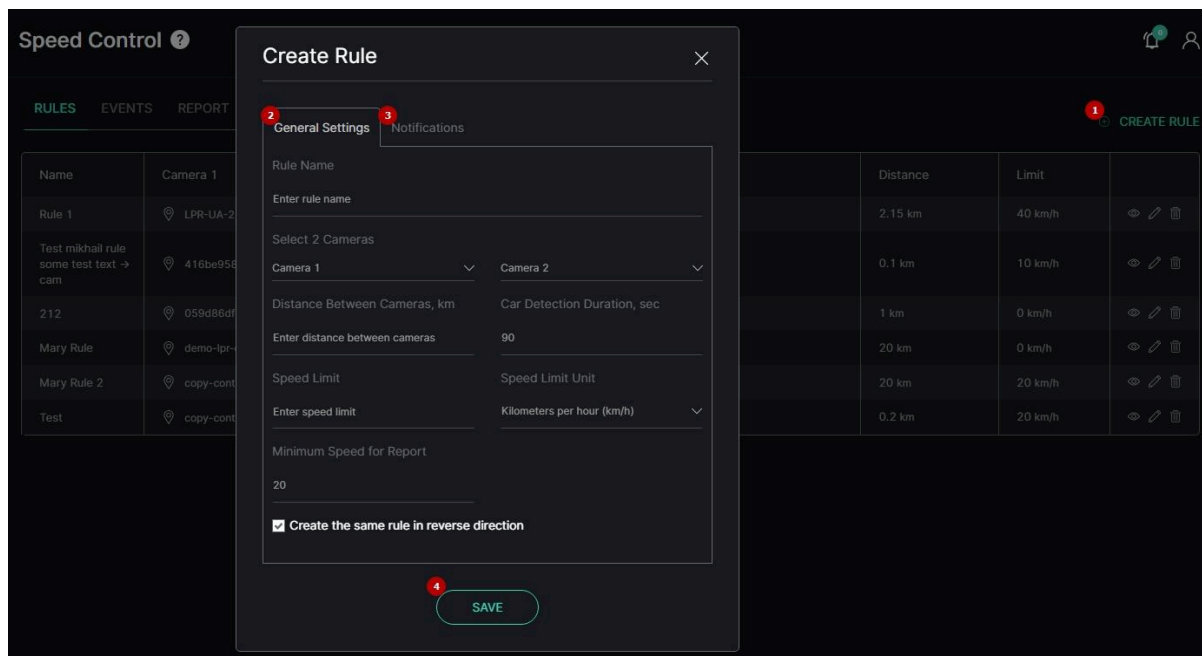
See the list of rules in the table. It contains:

Name	Camera 1	Camera 2	Distance	Limit	
rule test	Motorbike	London traffic	6 km	65 km/h	  
rule test	London traffic	Motorbike	6 km	65 km/h	  

- Rule name
- Pair of selected cameras for vehicle recognition
- Road distance between the selected cameras
- Speed limit, exceeding which triggers an event notification
- Toolbox comprises:
 - View Events icon to see all events related to the selected rule
 - Edit icon to change the selected rule settings
 - Delete icon to delete the selected rule

Create Rule

To create a new rule:



1. Click the Create Rule button
2. Set the required parameters in the General Settings tab:
 - Enter the new rule name
 - Select cameras for vehicle recognition
 - Enter the distance between the selected cameras in kilometers
 - Enter the maximum time in seconds for which the vehicle is supposed to overcome the distance between the selected cameras

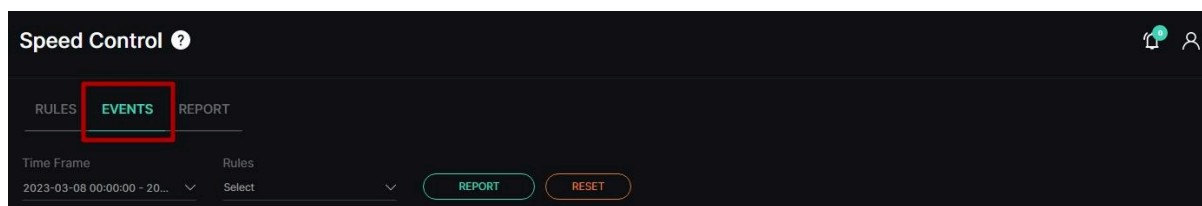
- Enter the vehicle speed limit, exceeding which triggers a speeding record in the Events tab
 - Select speed units (km/h or mi/h) from the drop-down list
 - Enter the minimum vehicle speed for displaying in the Report tab
 - Check the Create the Same Rule in Reverse Direction box to create one extra rule with the same parameters but with the reverse route between the selected cameras
3. Check the Send Events to Event Manager box in the Notifications tab to allow the system to send all rule events notifications to the Event Manager and then to external resources
 4. Click the Save button to apply settings

The Edit Rule pop-up window allows editing the same parameters, except for the Create the Same Rule in Reverse Direction checkbox.

Speed Control: Events

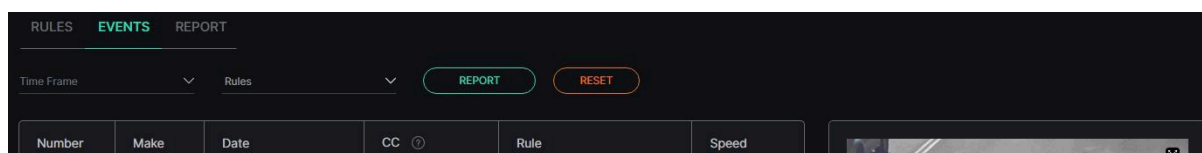
Overview

Select the Events tab in the tabs' menu:



Use and Functionality

The Events tab functional menu allows to:



- Set the required time frame
- Select multiple rules from the drop-down list
- Click the Report button to start filtering
- Click the Reset button to clear the filters

Once selected and filtered, in the event notifications:

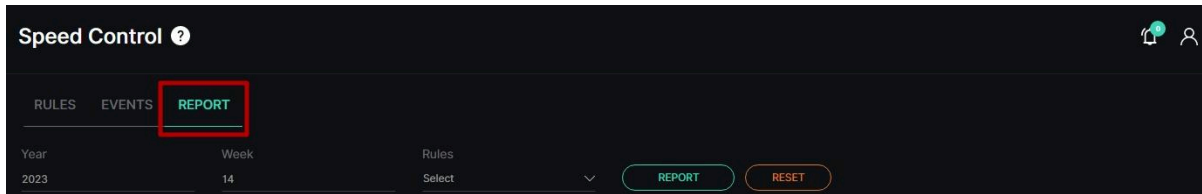
Time Frame ▼ 2 ▼ REPORT RESET					
Number	Make	Date	CC ?	Rule	Speed
AB3070CM	RENAULT SANDERO STEPWAY	13-05-2022 15:15:21		2	5.0 km/h
AB6292HI		13-05-2022 15:14:46		2	5.0 km/h
AB1439EK	PEUGEOT 3008	13-05-2022 15:14:12		2	5.0 km/h
AB9003AM		13-05-2022 15:13:36		2	5.0 km/h
BX7663CX		13-05-2022 15:13:03		2	5.0 km/h
AB1545EH	AUDI A4	13-05-2022 15:13:01		2	5.0 km/h
AB8151EC	MITSUBISHI PAJERO SPORT	13-05-2022 15:12:26		2	5.0 km/h
AB7773AA	BMW 5 SERIES	13-05-2022 15:12:25		2	5.0 km/h
KA8510BC	CHEVROLET LACETTI	13-05-2022 15:11:52		2	5.0 km/h
AB7049AC	FORD ECONOLINE	13-05-2022 15:11:19		2	5.0 km/h
AB8059BE	SSANGYONG KORANDO	13-05-2022 15:11:16		2	5.0 km/h
AB1747HI	FORD ECOSPORT	13-05-2022 15:11:14		2	5.0 km/h
AM1514EB	HYUNDAI I30	13-05-2022 15:11:12		2	5.0 km/h

- View recognized vehicle data, date, and time the vehicle has been recognized by the second selected camera in the rule, rule name, and average vehicle speed
- Click the row in the table with the desired license plate number to view the frame preview from the route entry and exit cameras in the selected rule
- View the camera location on the map by clicking the corresponding icon next to the name of the camera
- Select the enlargement icon in the upper-right corner of the frame preview to open the image
- See the extended vehicle data in the pop-up window and save the image in the full-size

Speed Control: Report

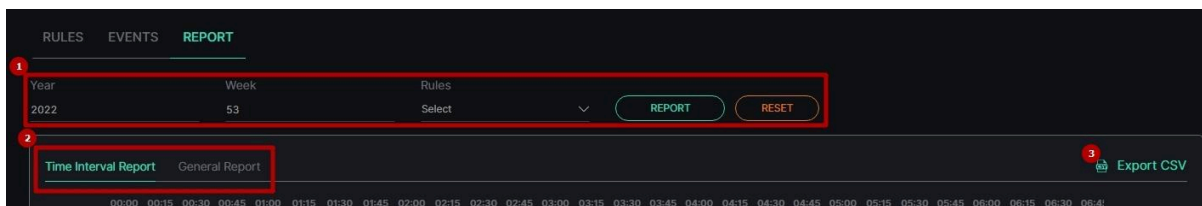
Overview

Select the Report tab in the tabs menu:



Use and Functionality

The Report tab functional menu comprises:



1. Filters to:

- Enter the required year and week
- Select multiple rules from the drop-down list
- Click the Report button to start filtering
- Click the Reset button to clear the filters

2. Tabs to display statistics in:

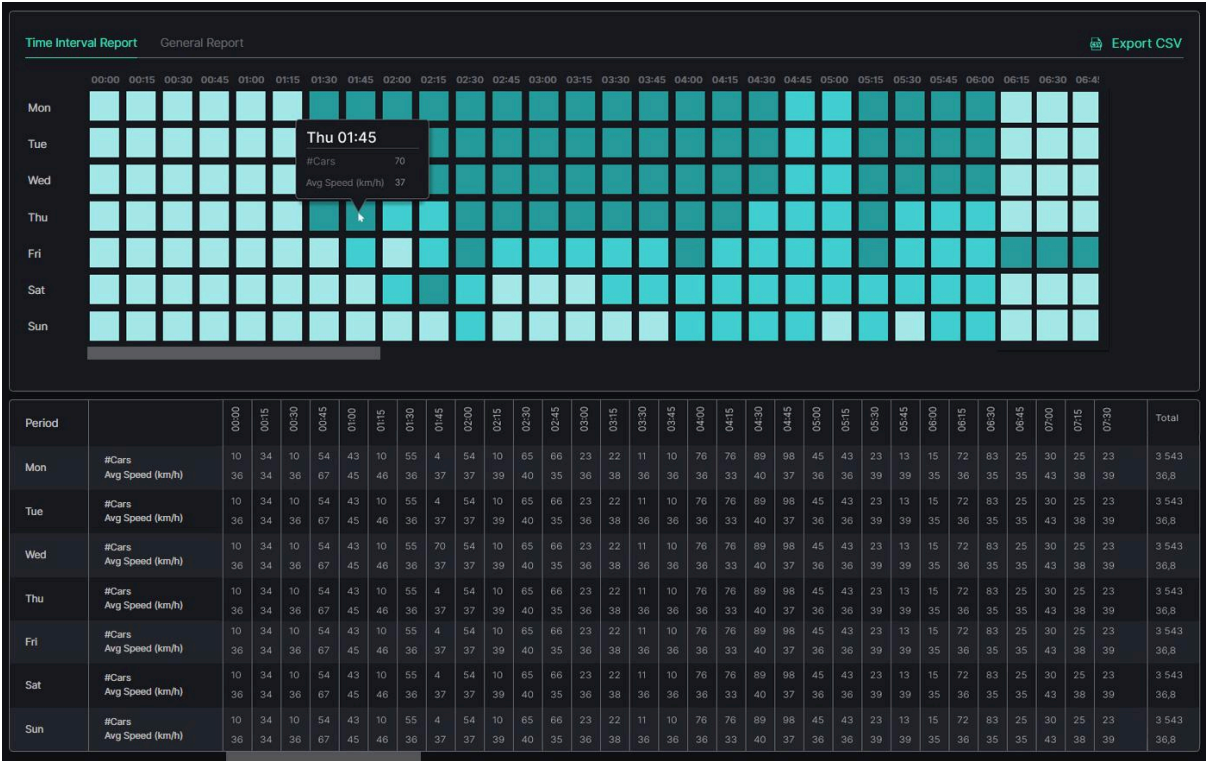
- Time Interval Report
- General Report

3. Export option to download the speed report in the CSV format

- The Time Frame filter is enabled only for the General Report tab.
- The Export option is available only for the Time Interval Report tab.

Time Interval Report Tab

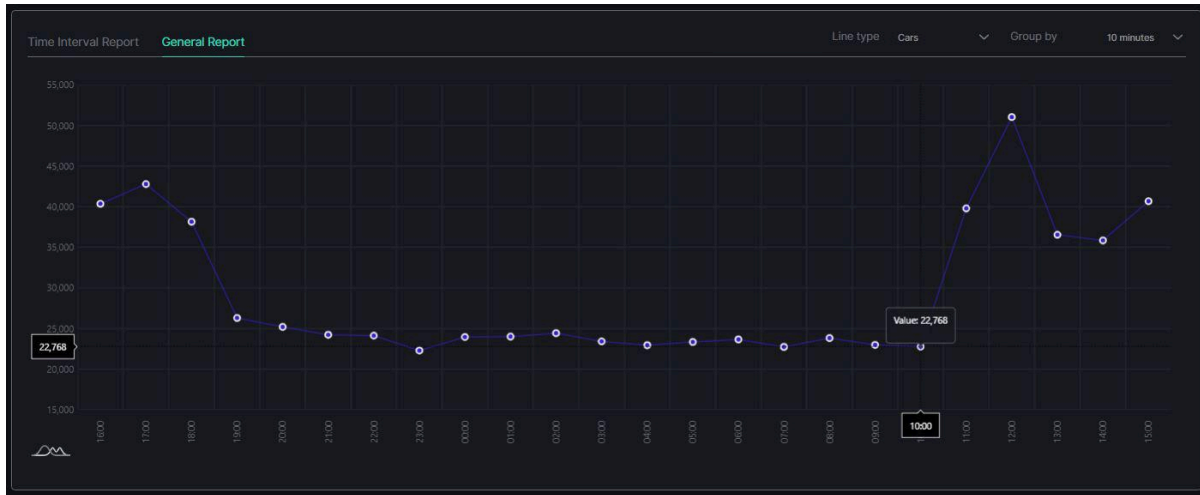
The Time Interval Report shows:



- Table chart with the number of vehicles and average speed by 15 minutes time intervals and days of a week
- Table with columns by 15 minutes time intervals and rows by days of the week, number of vehicles, and average speed

General Report Tab

The General Report allows to:



- Select the Line Type parameter from a drop-down list that the curve displays on the graph:
 - Average speed (km/h)
 - Average speed (mi/h)
 - Cars quantity
- Select the desired time intervals from a Group By drop-down list to set the intervals between the graph breakpoints
- Hover the mouse over the desired breakpoint on the graph to view the specific statistics data

LPR: Supported Countries

USA + Canada + Mexico Model	Latin America Model	Middle East Model	Japan Model	Thailand Model	Australia + New Zealand Model	Europe + CIS Model
Canada	Argentina	Bahrain	Japan	Thailand	Australia	Albania
Mexico	Bolivia	Egypt			New Zealand	Armenia
USA	Chile	Iran				Austria
	Colombia	Iraq				Azerbaijan
	Costa Rica	Jordan				Belarus
	Dominican Republic	Kuwait				Belgium
	Ecuador	Oman				Bosnia and Herzegovina
	El Salvador	Qatar				Brazil
	Guatemala	Saudi Arabia				Bulgaria
	Honduras	Syria				Croatia
	Nicaragua	Tunisia				Cyprus
	Panama	United Arab Emirates				Czech Republic
	Paraguay	Yemen				Denmark
	Peru					Estonia
	Uruguay					Finland
						France

						Georgia
						Germany
						Greece
						Hungary
						Ireland
						Italy
						Kazakhstan
						Kosovo
						Kyrgyzstan
						Latvia
						Lithuania
						Luxembourg
						Moldova
						Monaco
						Montenegro
						Netherlands

Object Detection

Introduction

Use this guide to understand the interface and features of the Object Detection plugin and learn how to utilize it for the best results.

What Is Object Detection?

Object Detection determines the type of object and issues an alert according to the specified rule.

Primary Capabilities

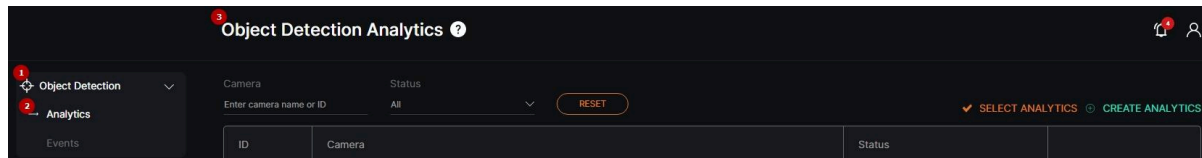
Object Detection is capable of:

- Determining the type of object (such as a person, bicycle, car, motorbike, bus, truck, animal, or bag)
- Checking the presence or absence of an object within a specified timeframe in the selected area
- Tracking and classifying up to 30 objects simultaneously, whether they are moving or stationary
- Counting objects according to selected types to analyze congestion at intersections and on streets
- Identifying gatherings of people by considering the distance between individuals in the frame

Object Detection: Analytics

Overview

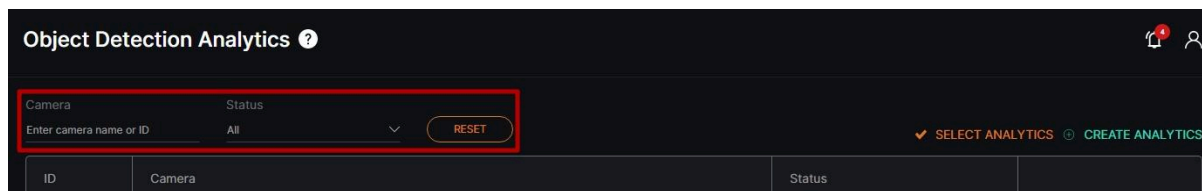
To open the Analytics item, in the left menu:



1. Select the Object Detection section
2. Choose the Analytics item
3. See analytics

Use and Functionality

The Object Detection Analytics functional menu allows to:



- Fill in the Camera field with:
 - Camera name or characters in the name
 - Analytics ID
 - Video stream ID
- Select the required analytics status
- Click the Reset button to clear the filters

The status options comprise All, Active, and Stopped.

See the list of analytics in the table below. It contains:

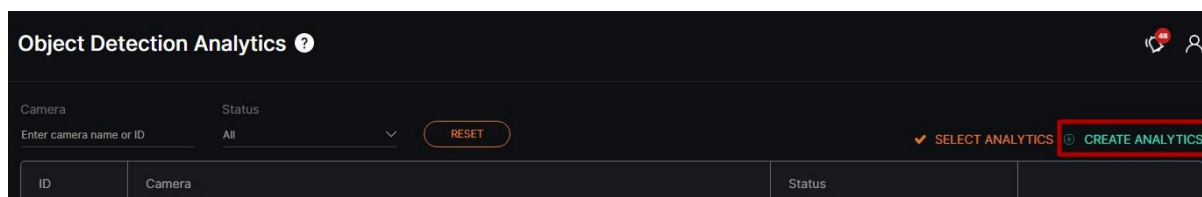
Camera		Status	
Enter camera name or ID		All	RESET
ID	Camera	Status	
1	demo		
1209	load-testing-v2 GPU H.264 - NVDEC 25 FPS	Active (29s / 2)	STOP
1130	demo-cashier GPU H.264 - NVDEC 25 FPS	Stopped	START

- Analytics and folder ID
- Camera comprises:

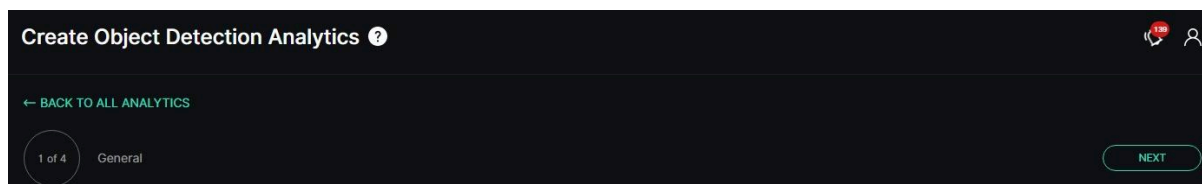
- Folders' and separate video streams' names
- Copy the Name icon to copy the video stream name
- Video source type
- Additional hardware parameters
- Video stream or video file playback status. For the Active and Offline statuses, the system also displays:
 - Countdown since analytics launch
 - Last server connection to analytics (seconds ago)
- The toolbox comprises:
 - Start/Stop
 - Edit
 - Events
 - View
 - Delete
- To learn more about grouping video streams into folders and making the appropriate changes in the Video Streams item, read Video Streams.
- To find out the ID of the CPU/GPU and the server running the video stream, hover the mouse over the circle next to the status of the running analytics.

Create Analytics

To create new analytics, click the Create Analytics button:



The Create Object Detection Analytics navigation menu allows you to:



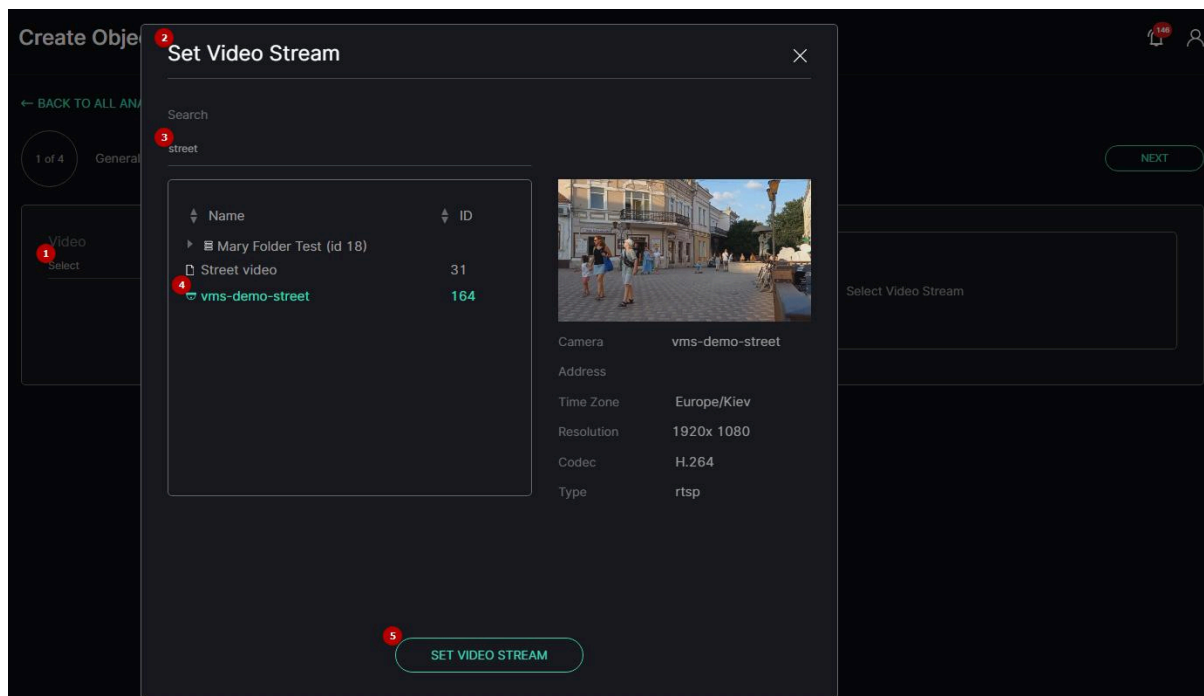
- Click the Back to All Analytics button to return to the main Analytics item

- See the title and serial number of the current tab
- Click the Back or Next button to move among tabs:
 - General
 - Hardware
 - Notifications
 - Permissions

General Tab

The General tab allows you to set a video stream and customize analytics parameters.

To set a video stream:



1. Click the Video field
2. See the Set Video Stream pop-up window
3. Fill in the Search field with:
 - Camera name or characters in the name
 - Video stream ID
4. Select the required camera from the filtered list
5. Click the Set Video Stream button to confirm the intention

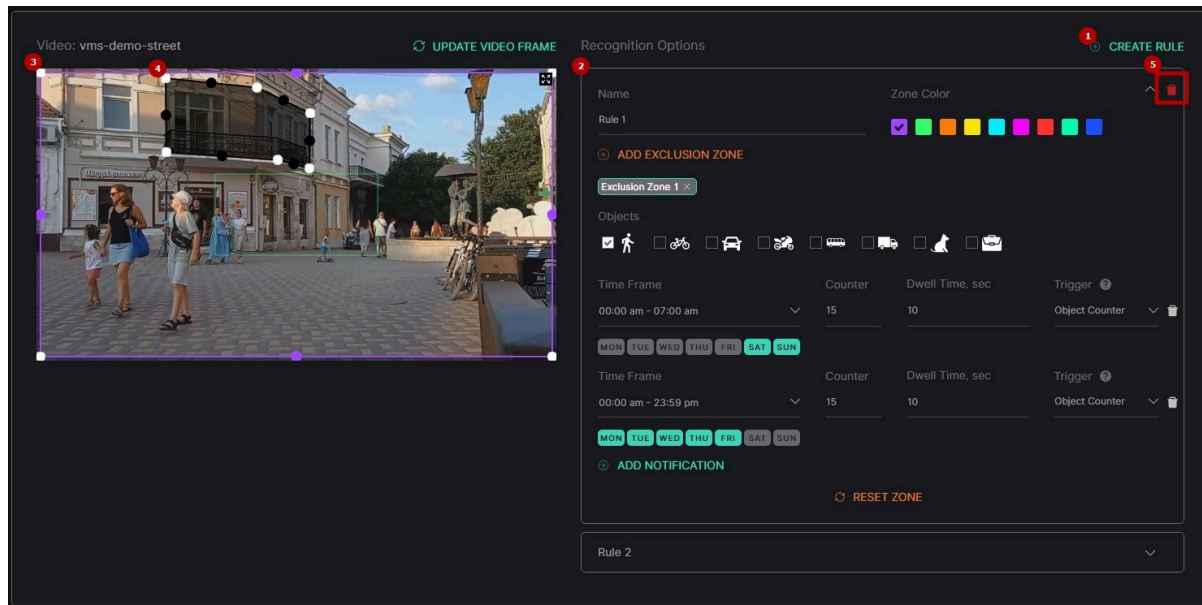
To refresh the video preview, upon selecting the Set Video Stream button, click the Update Video Frame button above the frame. This button is available upon adding the video stream.

Recognition Options

- In Zone trigger type executes if an object of the selected type enters the empty detection zone (or initially occupies it) and is within it for the specified time.
- The out-of-zone trigger type executes if the object leaves the detection zone and remains outside for at least the specified time. The trigger does not execute if at least one object is still in the detection zone. The trigger executes only when the detection zone is completely empty.
- The Object Counter trigger type calculates the number of simultaneously detected objects within the detection zone. It triggers provided that the number of objects in the detection zone is equal to or greater than the specified parameter.
- Presence Control trigger type is executed with the In Zone tag for each object that enters the detection zone (or initially occupies it) and remains within it for the specified dwell time. The trigger is then executed again with the Out of Zone tag when the same object leaves the detection zone and stays outside for the specified dwell time. This scenario is applied separately to each detected object.
- The intrusion trigger type executes if an object enters the detection zone and remains inside it for the specified duration.
- The crowd trigger type calculates the number of simultaneously detected Person objects within a detection zone over a specified duration. The trigger considers the distance between Person objects to identify people gatherings and executes when the specified crowd density threshold is met or exceeded.

To learn more about triggers and view the examples of their use, read [Triggers](#).

To perform the recognition, apply these recognition options:

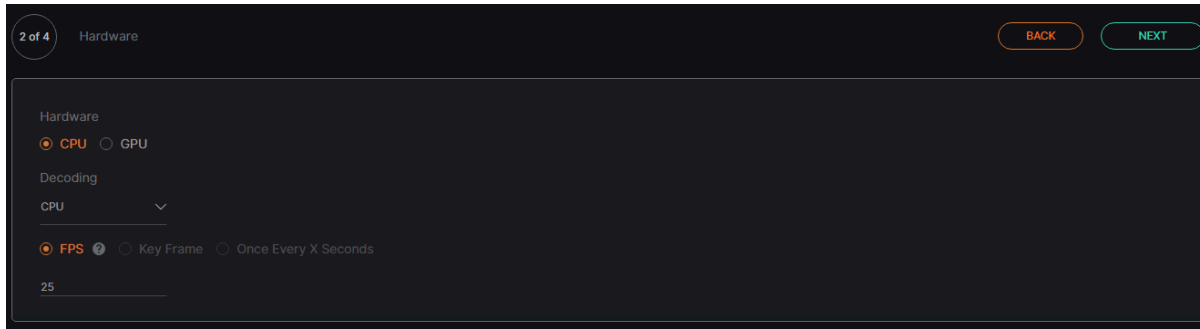


1. Select the Create Rule button to create a new rule
2. Set the notification parameters:
 - Enter the rule name
 - Select the color of the detection zone
 - Select the required checkboxes to set objects:
 - Person
 - Bicycle
 - Car
 - Motorcycle
 - Bus
 - Truck
 - Animal (dogs and cats)
 - Bag
 - Select the required time frame to specify the analytics working hours
 - Set the detection time in seconds for the Dwell Time, sec parameter
 - Set the amount of the required objects for the Counter parameter
 - Select the notification trigger type:
 - In Zone
 - Out of Zone
 - Object Counter
 - Presence Control

- Intrusion
 - Crowd
- Select days of the week to receive the specified notifications
- Click the Add Notification button to create multiple sets of notification parameters
- Click the white Delete icon to delete the set of notification parameters
- 3. Modify the detection zone:
 - Click and drag the handles with LMB to set the zone borders
 - Click and drag the area inside the zone with LMB to move the whole zone
 - Click the handle with RMB to delete it
 - Click the Reset Zone button to return the detection zone borders to their original position
- 4. Modify the exclusion zone:
 - Click the Add Exclusion Zone button to add up to 3 exclusion zones in each rule
 - Click and drag the handles with LMB to set the exclusion zone borders
 - Click and drag the area inside the zone with LMB to move the whole exclusion zone
 - Click the handle with RMB to delete it
 - Click the Close button next to the required exclusion zone name to remove it
- 5. Select the red Delete icon to delete the required rule section
 - All days of the week are selected by default. Buttons become grey when deselected.
 - The Counter parameter becomes available only for the Object Counter and Crowd trigger types.
 - The detection and exclusion zones are based on at least 3 handles.
 - Sets of notification parameters within one rule differ only by Time Frame and days of the week. Counter, Dwell Time, and Trigger parameters duplicate in all sets and can be changed only in the very first set, which leads to similar changes in all further sets.

Hardware Tab

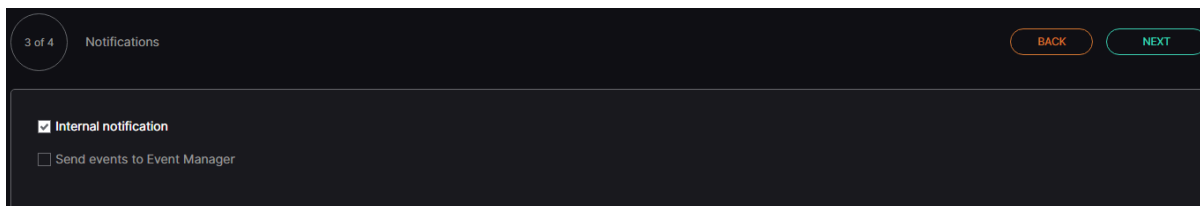
The Hardware tab provides the ability to customize hardware parameters:



- Choose the CPU or GPU hardware acceleration
- Select the hardware decoder from the drop-down list:
 - CPU
 - Intel
 - NVDEC
- Select the FPS frame processing mode to set the desired number of frames per second
- The recommended value for the FPS mode is 25.
- The Key Frame and Once Every X Seconds options are disabled for the Object Detection analytics.
- The default parameters allow the production of analytics. To customize the analytics, set parameters as required.
- To learn more about hardware settings, read [How to Configure the Hardware Tab Settings](#).

Notifications Tab

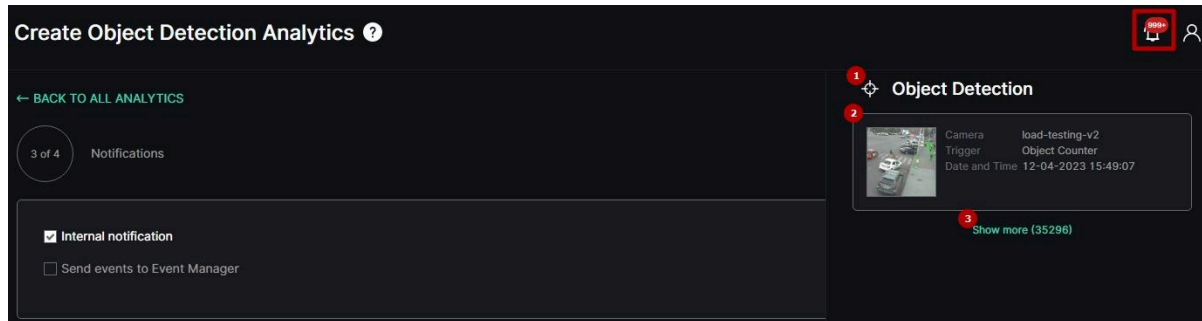
The Notifications tab allows managing the event notifications:



- Check the Internal Notification box to allow the system to send all notifications to the Events section
- Check the Send Events to Event Manager box to allow the system to send all notifications to the Event Manager and then to external resources

The default parameters allow the production of analytics. To customize the analytics, set parameters as required: Check one of them or use both simultaneously.

Once the Internal Notification box is checked, and the analytics is created and enabled, the Notification icon signals about each new event notification. Click the Notification icon to open the Notification Panel. It comprises:



1. Plugin name box to:
 - Collapse/expand the list of event notifications by clicking the plugin name
 - Clear all plugin event notifications at once from the Notification Panel by clicking the Close button (this action doesn't affect events in the Events item)
2. Event notification box to:
 - View short event information and frame preview for up to 3 last notifications
 - Open the event pop-up window by clicking the required notification
 - Clear the desired event notification from the notification list by clicking the Close button inside the box (this action doesn't affect the event in the Events item)
3. Show More button with the total events number to open the Events item and view all events

Permissions Tab

The Permissions tab provides the ability to:

Roles

Role Name	Start Analytics	Stop Analytics	Edit Analytics	Live View	View Analytics Events
Plugin permissions test	☒	☒	☐	☐	☐

Add Role
Select Role ADD ROLE

Users

User Name	Start Analytics	Stop Analytics	Edit Analytics	Live View	View Analytics Events
test_user	☐	☐	☐	☒	☒

Add User
Select User ADD USER

Default (Not active)

Default	Start Analytics	Stop Analytics	Edit Analytics	Live View	View Analytics Events
Default	☒	☒	☒	☒	☒

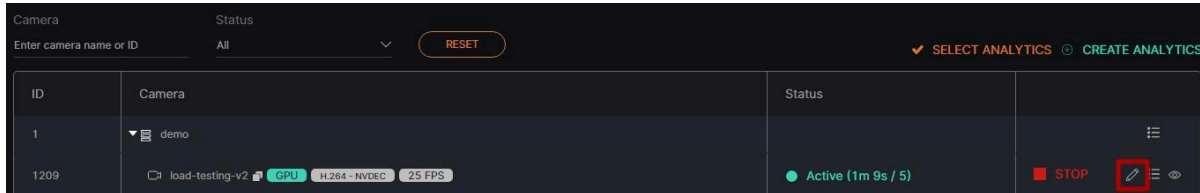
- Assign analytics access rights for Roles:
 1. Select the required role from the drop-down list
 2. Click the Add Role button
 3. Select the checkboxes for the required access rights
 4. Click the Delete icon to remove the unnecessary role
- Assign analytics access rights for Users:
 1. Select the required user from the drop-down list
 2. Click the Add User button
 3. Select the checkboxes for the required access rights
 4. Click the Delete icon to remove the unnecessary user
- Select the checkboxes for the required analytics access rights by default
- Select the Save button to confirm the intention in the navigation menu
- The default parameters are active only if no Roles or Users are added.
- The quantity of added Roles and Users is not limited.

Once saved, the Object Detection Analytics editor opens to allow the users to:

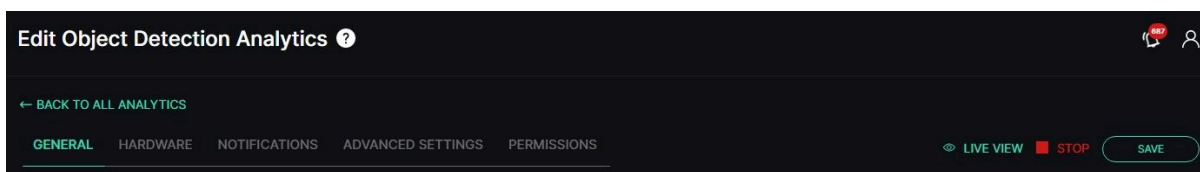
- Modify parameters
- Set parameters
- Run the created analytics
- Proceed to live view mode

Edit Analytics

To edit settings in the selected analytics, click the Edit icon on the toolbox:



The Edit Object Detection Analytics navigation menu allows to:

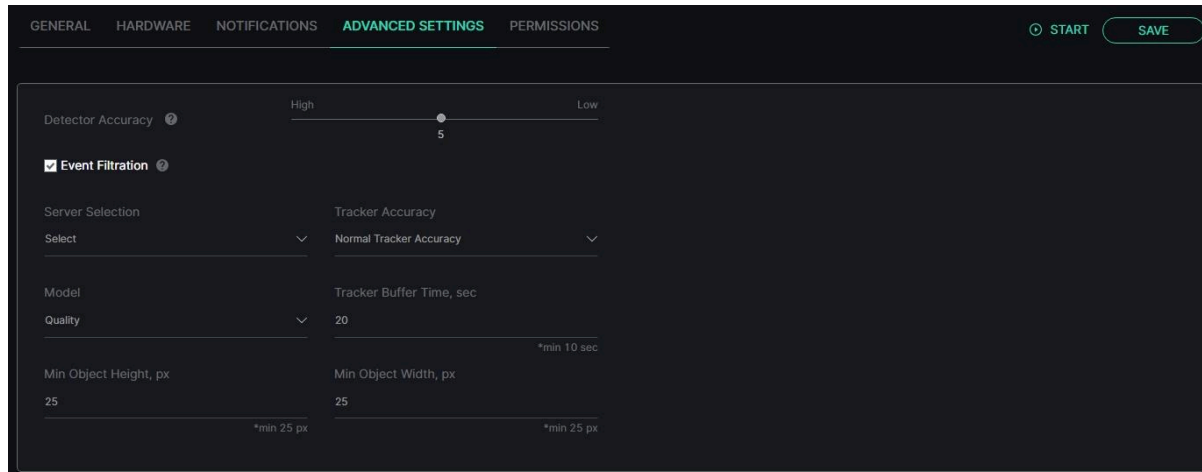


- Click the Back to All Analytics button to return to the main Analytics item
- See the setting tabs and move among them by clicking their titles:
 - General
 - Hardware
 - Notifications
 - Advanced Settings
 - Permissions
- Select the Stop button to disable the analytics:
 - Yes, to confirm the analytics disabling
 - No, to cancel the intention or close the pop-up window
- Select the Start button to enable the analytics
- Click the Live View button to see the selected analytics process in real-time
- Select the Save button to apply the changes to the selected analytics
- The current tab is always highlighted.
- Analytics editing is available only when the selected analytics is disabled.
- The Stop button is available only when the current analytics is active.
- The Start button is available only when the current analytics is stopped.
- The Live View button is available only when the current analytics is active.

To view editing parameters for the General, Hardware, Notifications, and Permissions tabs, read Create Analytics.

Advanced Settings Tab

The Advanced Settings tab allows users to:



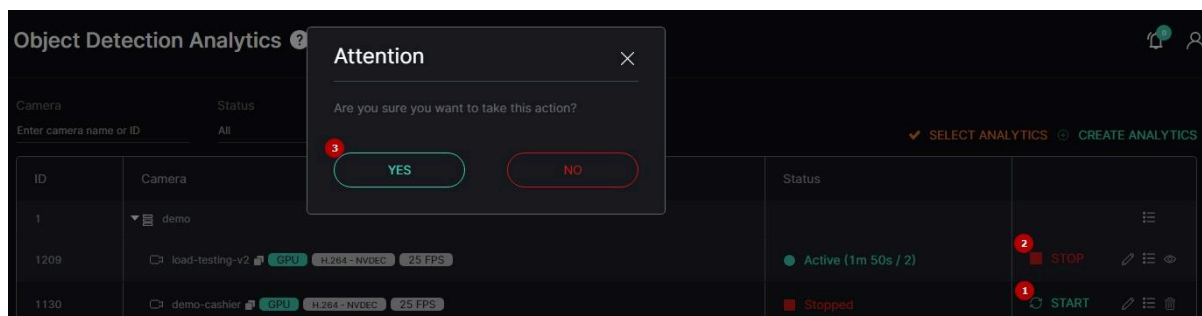
- Move the slider to the left (to increase) or to the right (to decrease) the detector accuracy
- Select the Event Filtration checkbox to enable filtering out re-detections of the same objects
- Select a server from the drop-down list to run the analytics
- Select the tracker type:
 - Tracker with normal accuracy
 - Tracker with increased accuracy
- Select an analytics model:
 - Quality
 - Performance
 - Head Recognition
- Enter the recognized object storage time in the buffer (in seconds)
- Set the minimum height of an object for recognition (in pixels)
- Set the minimum width of an object for recognition (in pixels)
- The parameters of the original image determine the Detector Accuracy setting. A High value is recommended for a low-quality image to increase the detection probability, and a Low value is better for a high-quality image to avoid false detection. The possible range is from 2 to 8; the value is five by default.

- The Event Filtration option uses AI to compare potential new detections with the last 10 events, filtering out duplicates. However, it's advisable to disable this feature when expecting many similar objects in the frame.
- The tracker with increased accuracy consumes more resources compared to a normal one. However, in scenarios where objects briefly overlap each other, it increases the chances of preventing the recognition of the same objects as new ones.
- The Quality model provides exceptional detection quality at the expense of analytics performance.
- The Performance model provides exceptional analytics performance at the expense of detection quality.
- The Head Recognition model uses the head detector, as opposed to the Quality and Performance models, which use the body detector.
- The minimum value for the Tracker Buffer Time parameter is 10 sec. The default value is 20 sec.
- The minimum value for the Min Object Height is 25 pixels. The default value is 25 pixels. The maximum value is limited by the frame height.
- The minimum value for the Min Object Width is 25 pixels. The default value is 25 pixels. The maximum value is limited by the frame width.
- Default parameters allow the production of analytics. To customize the analytics, set parameters as required.

To learn more about the analytics advanced settings and view examples of their usage, read [Advanced Settings](#).

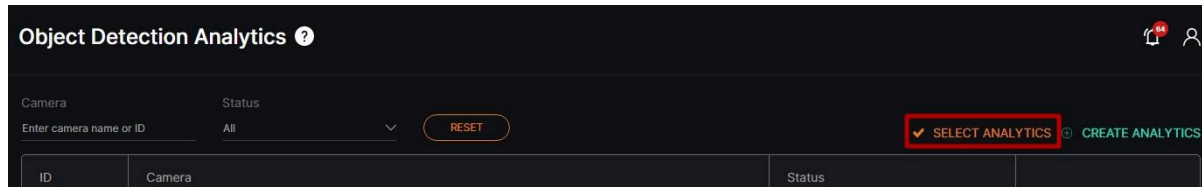
Analytics Status

To enable or disable the analytics and view the change in the analytics status:

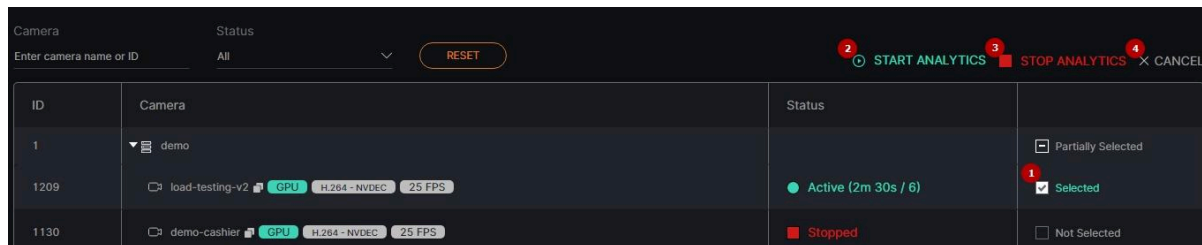


1. Select the Start button to enable the analytics
2. Click the Stop button to disable the analytics process
3. Confirm the intention

To enable or disable multiple analytics at once, click the Select Analytics button:



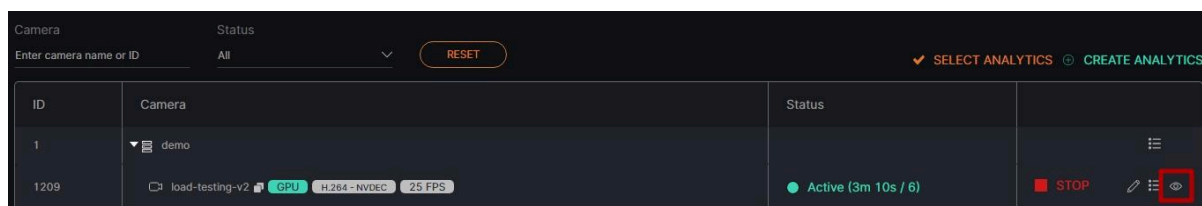
The Select Analytics functional menu allows you to:



1. Check the boxes next to the required folders or separate analytics to select them
2. Click the Start Analytics button and confirm the intention in the pop-up window to enable all selected analytics
3. Click the Stop Analytics button and confirm the intention in the pop-up window to disable all selected analytics
4. Click the Cancel button to quit the analytics selection

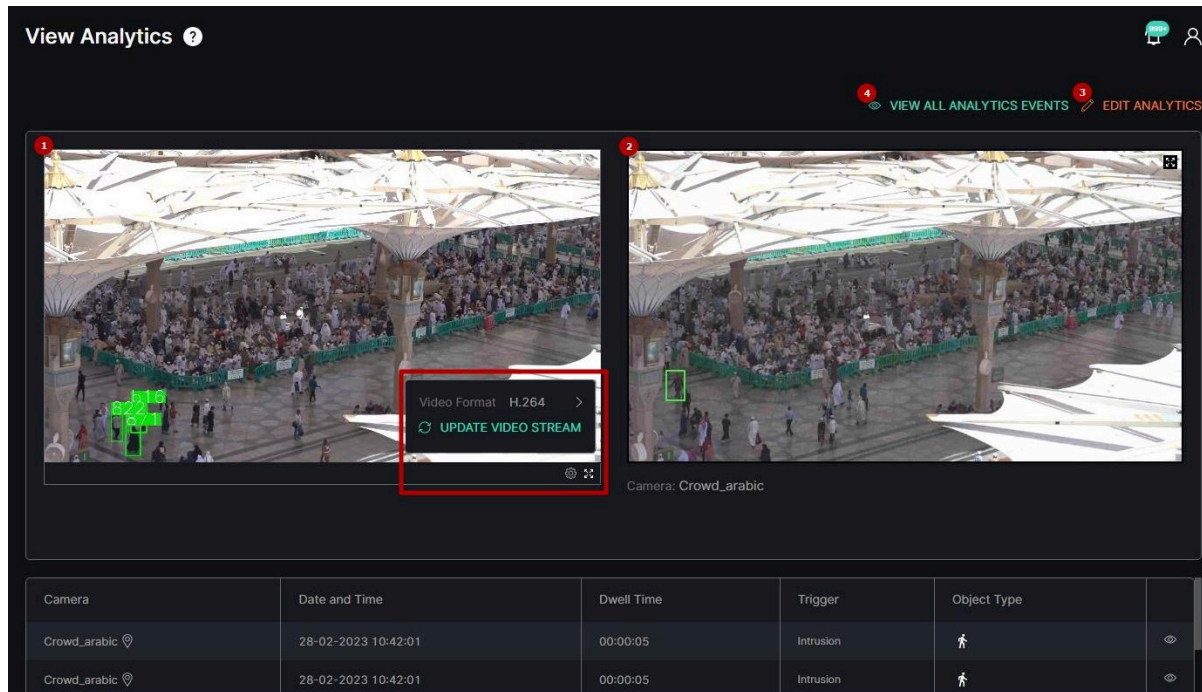
View Analytics

To see the selected analytics in real-time, click the View icon on the toolbox:



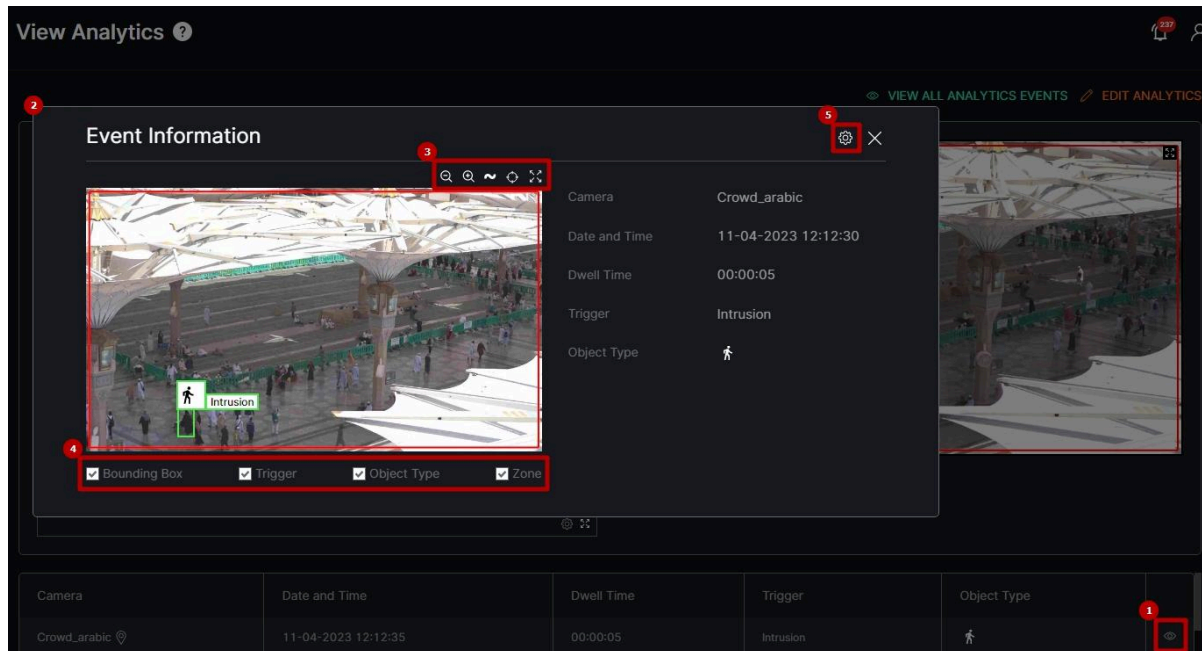
The View icon becomes available only when selected analytics is active.

Live view analytics mode allows:



1. View the video from the camera in real-time mode. At the bottom of the block:
 - Hover the mouse over the Settings icon to:
 - Select the desired video format
 - Click the Update Video Stream button to manually update the video
 - Click the Enlargement icon to expand the video to full screen
2. View the frame preview with recognized objects
3. Click the Edit Analytics button to make changes to the current analytics settings
4. Click the View All Analytics Events button to see all events from the selected analytics

To view the required event:

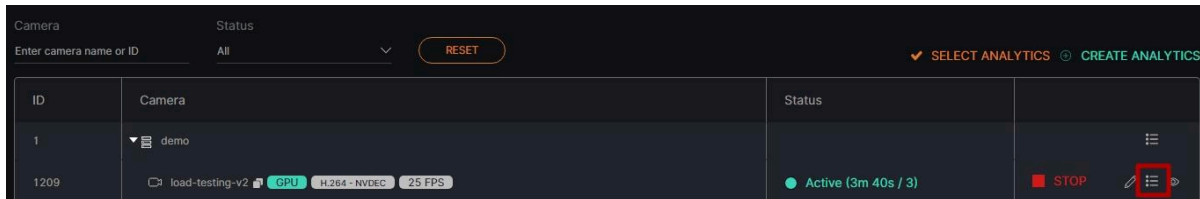


1. Click the View icon in the table below
2. See the event's pop-up window
3. Use frame view tools:
 - Zoom Out icon (-) to zoom out from a specific area of the frame
 - Zoom In icon (+) to zoom in on a specific area of the frame
 - Reset View icon (~) to reset the frame to its original size and position
 - Target icon to zoom in on the detected object in the frame (available for the Presence Control and Intrusion trigger types)
 - Enlargement icon to open the frame in full-screen (in full-screen, press the Esc button to return to default view)
4. Check the required boxes to enable or disable the display elements in the frame:
 - Bounding Box
 - Trigger
 - Object Type
 - Zone
5. Hover the mouse over the Extra Options icon. In the drop-down menu:
 - Click the Edit Analytics button to make changes to the settings of the analytics related to the selected event
 - Click the Save Image button to download the event frame in full size

- Hover the mouse over the bounding box in the frame to see its width and height parameters in pixels and analytics sensitivity value.
- Click and drag the image across the zoomed-in frame to view different parts of it.

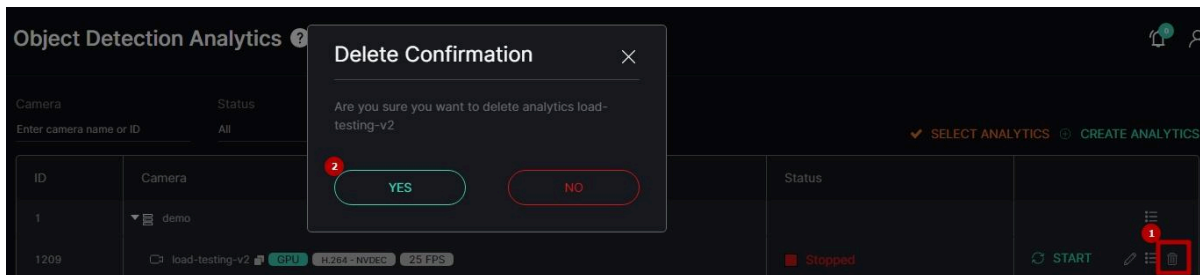
View Events

To view selected analytics events in the Analytics item, click the Events icon on the toolbox:



Delete Analytics

To delete the analytics:



1. Select the Delete icon on the toolbox
2. Confirm the intention

Object Detection: Triggers

In Zone

The In Zone trigger is designed for use in situations where it is necessary to monitor the presence of objects that exceed the allowable time of stay in indoor or outdoor areas with restricted or forbidden access.

Such territories include, for example:

- Places with an increased level of security, such as a closed bank vault, server room, weapons or military equipment warehouse, or dangerous goods warehouse
 - Areas adjacent to critical infrastructure, including engineering systems for power, electricity, heat, gas, and water supply, and transport depots
 - Dangerous areas, such as construction sites or underground or aboveground structures (tunnels, bridges, overpasses, or buildings) undergoing reconstruction or in emergency condition
 - Zones at the front entrance of a building, such as a hotel, shopping mall, entertainment complex, or administrative office
 - Checkpoint areas, including gates, barriers, and turnstiles
 - Expedition areas in a store, warehouse, river/sea port, or airport
 - Transport routes, such as an airport runway, railroad tracks, or highway
-

Case 1

Case 2

Case 1: Control of Unauthorized Access to a Closed Bank Vault

For example, it is necessary to strengthen the security of a closed bank vault. Suppose that bank personnel who have access to the vault door can open it within 5 minutes, while an intruder may need much more time to disable the security system and break in.

To track unauthorized attempts of intrusion into the vault, it is necessary to set up 24/7 video surveillance of the vault door area and configure Object Detection analytics with the following parameters:

- The detection zone should cover the full area of the vault door and adjacent wall and floor areas where intruders may be located
- The object type should be set to Person
- The trigger type should be set to In Zone
- The dwell time should be set to 310 seconds
- The detection time frame should be set from midnight to 11:59 p.m., with all days of the week selected

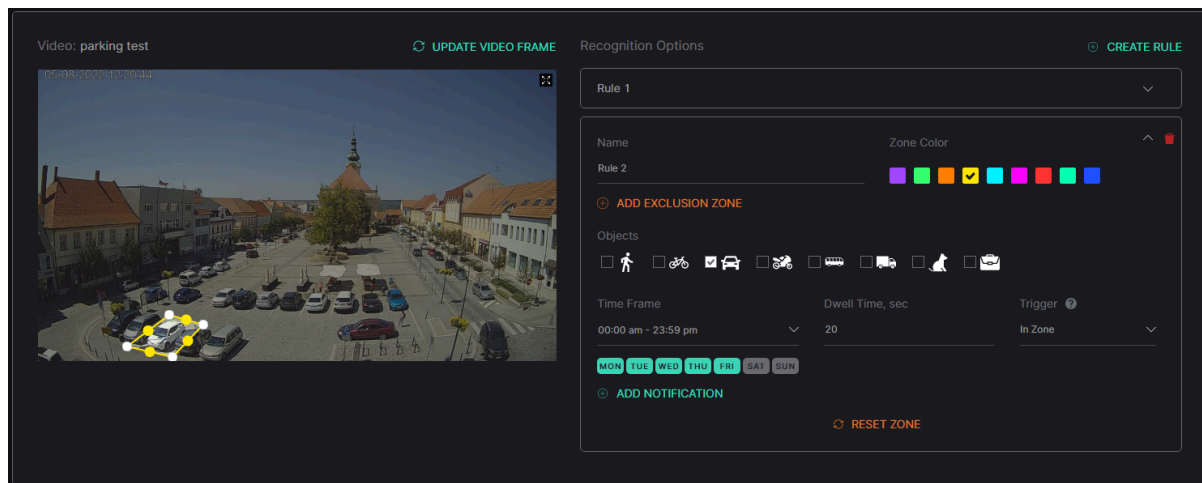
With these settings, if any person enters the detection zone at any time of the day, the countdown timer starts. If they leave the detection zone before 5 minutes and 10 seconds

have elapsed (e.g., bank personnel walks past the door, or personnel with access rights enters the vault on time without being delayed), and the area near the vault door is empty again, the time counter will reset and no notification will be sent. If this person does not leave the detection zone within 5 minutes and 10 seconds, the system sends a notification with an event frame about the suspiciously long presence of this person near the vault door. In case of a security threat, this allows for a quick reaction and appropriate measures to be taken.

Use the In Zone trigger type to receive event notifications during the specified time frame on each selected day of the week when the detection zone is occupied by the first object of the selected type that entered the initially empty detection zone. This tracking will continue regardless of how many other objects of the selected types may also enter the zone while the first entered object remains inside the zone.

Before analytics is started, the detection zone must be empty or initially occupied by an object of the selected type.

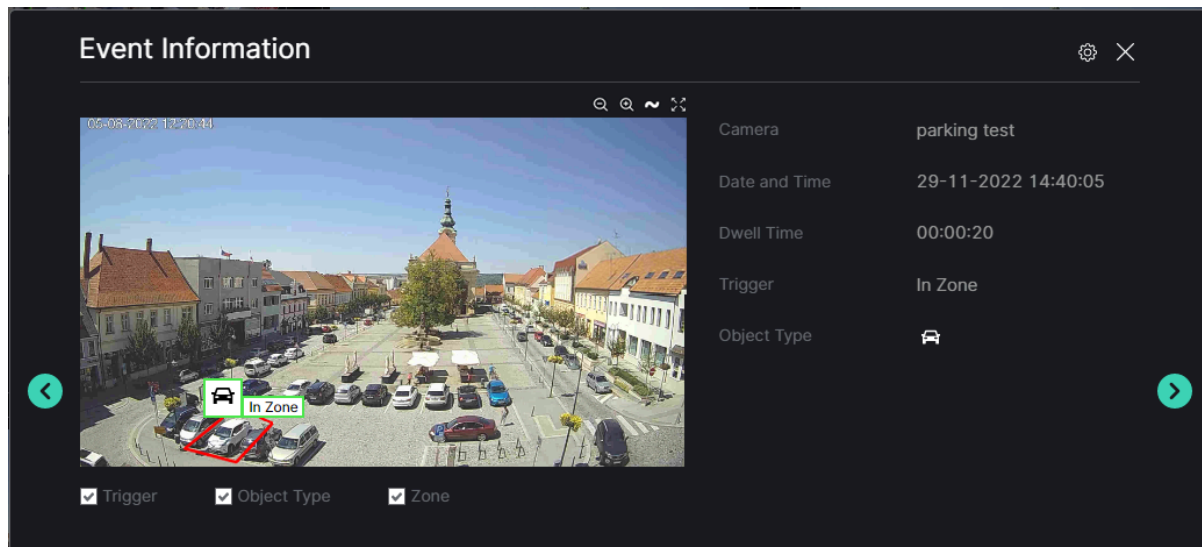
For example, set the parameters:



- Select the required video stream
- Modify the detection zone by clicking and dragging the handles
- Check the Car object type box
- Set the Time Frame parameter to 00:00-23:59

- Enter the value 20 in the Dwell Time field
- Select In Zone from the Trigger drop-down list
- Deselect the Saturday and Sunday buttons on the days of the week

After the settings are saved and analytics is started, wait for detection. If any object of the selected type enters the detection zone or is initially present inside, the analytics monitors the zone. Once the analytics detects that this object has occupied the zone for the specified time and all rule conditions are met, the system will send an event notification with the results as shown in this example:



- Date is Tuesday, November 29, 2022
- Time is 14:40:05
- Dwell time is 20 seconds
- Trigger is In Zone
- Object type is Car

At 14:40:05 on Tuesday, November 29th, 2022, the selected camera detected a car in the required detection zone. At this point, the detection zone had been continuously occupied by this car for 20 seconds.

The In Zone trigger will not execute again until the object that first entered the zone has left it.

Out of Zone

The Out of Zone trigger is designed for use in situations where objects that are supposed to remain in a controlled area for a certain period of time leave it, causing the zone to become empty.

Such situations include, for example:

- Absence of personnel at their workplace during working hours: cash register, administrator's desk, security post or patrol zone, production line
- Absence of a vehicle on a secured territory: private property, residential complex parking lot, car dealership
- Absence of a patient under observation in the ward: hospital, psychiatric clinic, nursing home, rehabilitation center

Case 1

Case 2

Case 1: Cashier Presence Control at Workplace to Optimize Personnel Management

For example, it is necessary to track the presence of a cashier at the cash register area in a supermarket from 9 a.m. to 10 p.m. every day. Assuming that the cashier may leave the workplace several times per day for a lunch break or other, another employee should come to serve customers at the cash register for 5 minutes during the shift.

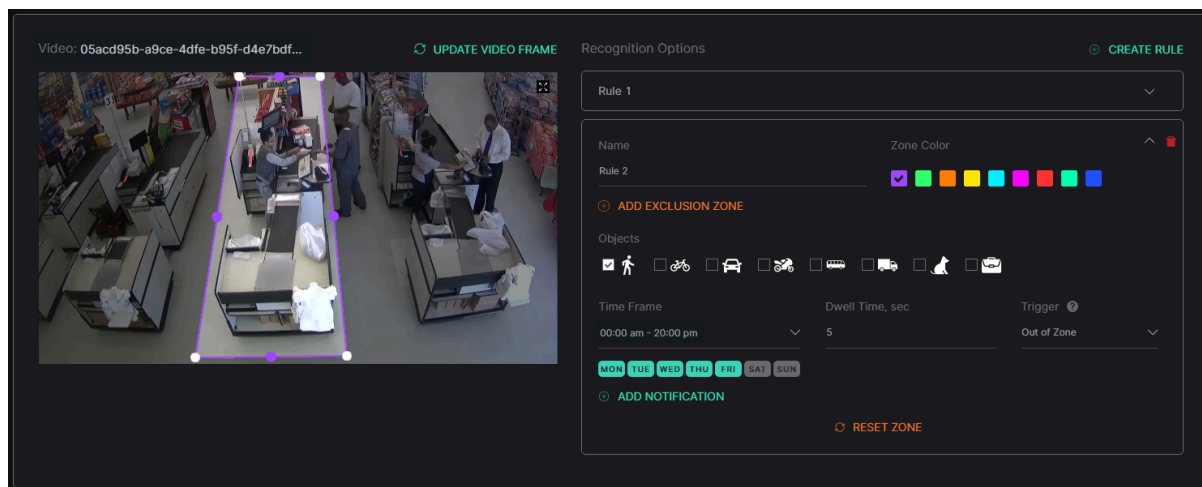
To automatically determine when the cash tasks area remains unattended for a long time, it is necessary to set up video surveillance of the cash register area and configure Object Detection analytics with the following parameters:

- A separate rule should be created for each cash register area in the surveillance zone
- The detection zone should be set to fully capture the cashier's work area
- The object type should be set to Person
- The trigger type should be set to Out of Zone
- The dwell time should be set to 5 minutes
- The detection time frame should be set from 9 a.m. to 10 p.m., with all days of the week selected

With these settings, every day from 9 a.m. to 10 p.m., when a person leaves the detection zone, the timer begins counting down. If the person returns to the detection zone in less than 5 minutes (for example, if it's the same cashier or their substitute), the time counter resets, and no notification is sent. However, if the person does not return to the detection zone within 5 minutes, the system will send a notification with a frame of the event, alerting that the cashier did not show up at their workplace on time, and the cash register area has been unattended for 5 minutes already. A timely response to personnel absences enables management to take measures to ensure a constant presence of cashiers at their workplaces, plan work schedules, improve the customer service process, and prevent potential financial losses.

Use the Out of Zone trigger type to receive event notifications during the specified time frame on each selected day of the week if the detection zone is empty for at least a specified time in seconds after all objects of the selected type, which were noticed inside the zone, have left it.

For example, set the parameters:



- Select the required video stream
- Modify the detection zone by clicking and dragging the handles
- Check the Person object type box
- Set the Time Frame parameter to 00:00-20:00
- Enter the value 5 in the Dwell Time field

- Select Out of Zone from the Trigger drop-down list
- Deselect the Saturday and Sunday buttons on the days of the week

After the settings are saved and analytics is started, wait for detection. Once the analytics notices the empty detection zone, the system will send an event notification with the results as shown in this example:



Event Information	
Camera	05acd95b-a9c...
Date and Time	06-28-2022 7:26:15 pm
Dwell Time	00:00:05
Trigger	Out of Zone
Object Type	Person

☒ Trigger ☒ Object Type ☒ Zone

- Date is Tuesday, June 28, 2022
- Time is 7:26:15 p.m.
- Dwell time is 5 seconds
- Trigger is Out of Zone
- Object type is Person

At 7:26:15 p.m. on Tuesday, June 28th, 2022, the selected camera identified the required detection zone as empty. At this point, the person, who was inside the detection zone, left and was outside for 5 seconds while the detection zone remained completely empty.

The trigger does not execute if an object of the selected type leaves the zone, but at least one more object of the selected type remains inside it.

Object Counter

The Object Counter trigger is designed for use in situations where it is necessary to obtain data on the number of objects occupying the area of interest.

It is useful in a variety of situations, such as:

- Monitoring passenger flow in urban transport systems
 - Analyzing attendance in retail stores and shopping centers
 - Controlling the presence of people in production facilities and construction sites
 - Monitoring traffic density on roads
 - Monitoring vehicle queues at product/order delivery areas, gas stations, and car washes
 - Monitoring the presence of stray animals in residential areas to prevent potential threats to public safety and health
 - Monitoring baggage belt usage at airports
 - Monitoring the presence of bags and suitcases at bus stops and train stations
-

Case 1

Case 2

Case 1: Passenger Flow Monitoring for Improving the Public Transportation System in the City

For example, it is necessary to collect data daily to analyze passenger flow at public transportation stops during the period of time from 5 a.m. to 11 p.m.

To automatically determine the number of people waiting for transportation at each public transportation stop, it is necessary to set video surveillance and configure Object Detection analytics with the following parameters:

- The detection zone should cover the full area of the public transportation stop, including seating areas
 - The object type should be set to Person
 - The trigger type should be set to Object Counter
 - The number of objects should be set to 3
-

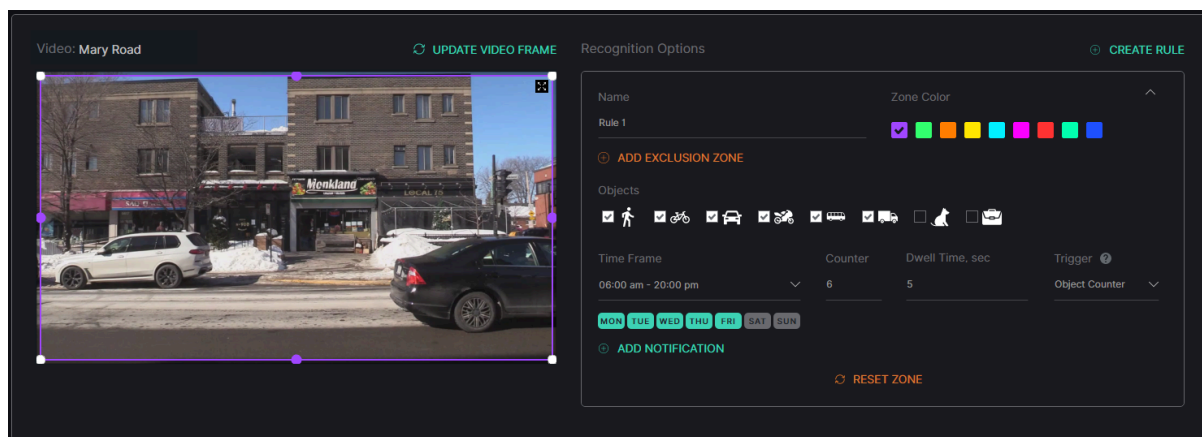
- The dwell time should be set to 0 seconds
- The detection time frame should be set from 5 a.m. to 11 p.m., with all days of the week selected

With these settings, the analytics will calculate the number of people at the stop from 5 a.m. to 11 p.m. If there are 1-2 people, or no one at the stop, no notification will be sent. However, if three or more people are detected waiting for transportation at the stop, the system will send a notification with the event frame and the total number of people detected.

The collected data can help in improving the public transportation system by taking measures such as increasing the number of vehicles on the busiest routes at different times of the day and days of the week, changing the transportation schedule, or redirecting the routes. Furthermore, the data can also be used to install more comfortable stops or update the transport fleet.

Use the Object Counter trigger type to count the total number of objects of the selected types in the detection zone for the required time frame during each selected day of the week and receive event notifications, provided that the total number of objects in the detection zone is greater than or equal to the specified counter parameter simultaneously or during the specified dwell time.

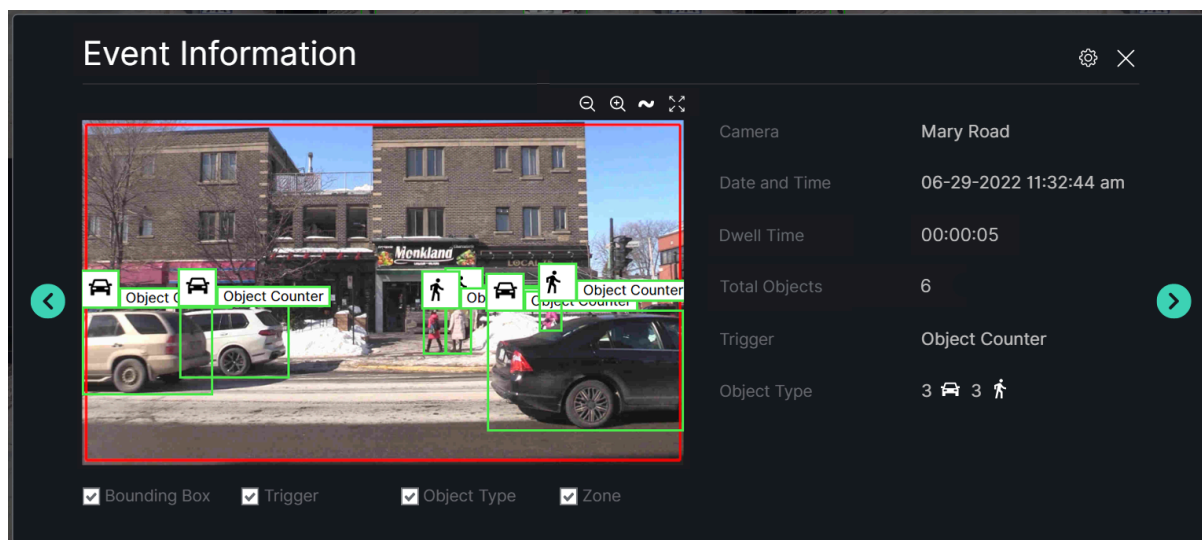
For example, set the parameters:



- Select the required video stream
- Modify the detection zone by clicking and dragging the handles

- Check the Person, Bicycle, Car, Motorcycle, Bus, and Truck object type boxes
- Set the Time Frame parameter to 06:00-20:00
- Select Object Counter from the Trigger drop-down list
- Enter the value 6 in the Counter field
- Enter the value 5 in the Dwell Time field
- Deselect the Saturday and Sunday buttons on the days of the week

After the settings are saved and the analytics is started, wait for detection. Once the analytics detects the set number of selected objects simultaneously in the detection zone and meets all the specified conditions, the system will send an event notification with the results as shown in this example:



- Date is Wednesday, June 29, 2022
- Time is 11:32:44 a.m.
- Dwell time is 5 seconds
- Total objects number is 6
- Trigger is Object Counter
- Object types are Car and Person

At 11:32:44 a.m. on Wednesday, June 29th, 2022, the selected camera found three people and three cars (a total of 6, as set by the Counter parameter) simultaneously remaining in the required detection zone for 5 seconds.

If the Dwell Time parameter is set to 0 seconds, the system sends notifications every second if there are enough objects in the frame. However, if the parameter is set to 1 second or more, the notification will be sent when enough objects have been detected for a specified time in seconds, and the next notification will only be sent after the number of objects decreases below the set value and then becomes equal to or greater than the set number again.

Presence Control

The Presence Control trigger is designed to monitor the presence of objects within the detection zone and receive timely notifications about their entry and exit, ensuring efficient tracking and management. It allows the system to send notifications based on the following scenario: the first notification for each object with the In Zone tag is sent when an object enters the area of interest and remains there for a specified dwell time, and the second notification with the Out of Zone tag is sent when the same object leaves the area and stays outside for a specified dwell time. This scenario is applied separately to each detected object.

Such areas include, for example:

- Parking lots
- Self-service areas, such as car washes, cash registers, cafe tables
- Workspaces in coworking spaces, such as offices, photo studios, workshops
- Customer zones in various service sectors, such as bank branches, beauty salons
- Classrooms in educational institutions and sports sections
- Event venues, such as conference halls, banquet rooms, VIP rooms

Case 1

Case 2

Case 1: Tracking the Availability of Spaces at a Self-Service Car Wash for Efficient Visitor Flow and Business Process Optimization

For example, at a self-service car wash it is essential to consistently monitor the washing bays' occupancy and availability to ensure smooth visitor flow and enhance operational efficiency.

To promptly monitor the availability of washing bays, it is essential to set up 24/7 video surveillance near each bay and configure Object Detection analytics with the following parameters:

- The detection zone should cover the entire washing space, taking into account the maximum dimensions of the vehicle
- The object types should include Car, Motorcycle, Bicycle, Truck, Bus
- The trigger type should be set to Presence Control
- The dwell time should be set to 10 seconds
- The detection time frame should be set from midnight to 11:59 p.m., with all days of the week selected

With these settings, if a car, motorcycle, bicycle, truck, or bus enters the detection zone at any time of the day, the countdown timer starts. If the vehicle leaves the detection zone in less than 10 seconds (for example, passes through the washing bay without stopping), the time counter resets, and no notification is sent. However, if the vehicle remains in the detection zone for 10 seconds or more, the system sends a notification with the In Zone tag along with a captured frame clearly showing the vehicle that entered the designated detection zone. When the same vehicle leaves the washing bay and remains outside the zone within 10 seconds, the system sends a notification with the Out of Zone tag, indicating that the space has become available.

Using these sequential notifications, it is possible to promptly inform queued visitors about available spaces, plan for maintenance and repair of the washing bays, and, with sufficient data, forecast peak hours and days considering seasonal fluctuations. This enables more efficient resource allocation and optimization of business processes.

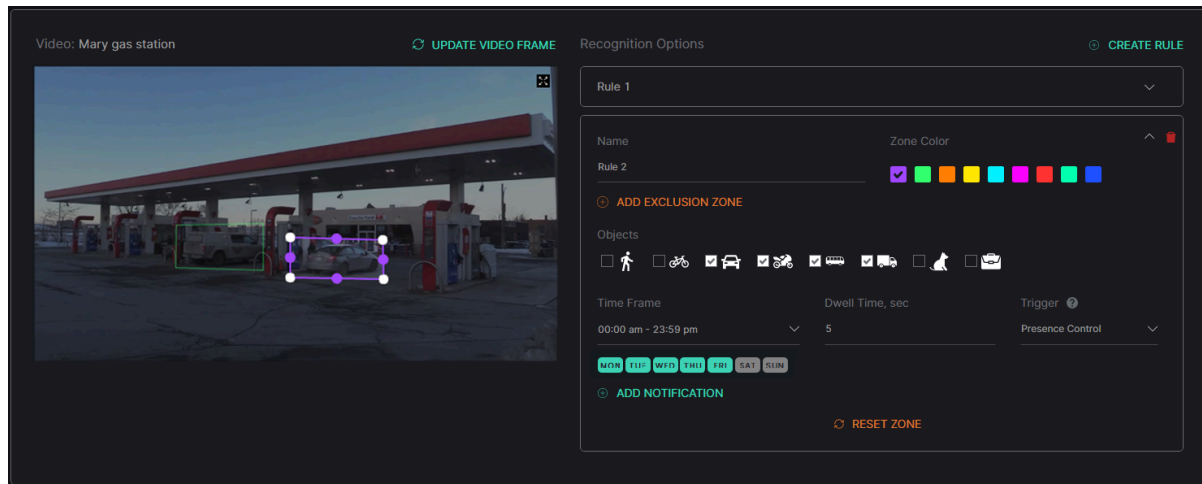
Use the Presence Control trigger type to receive event notifications for each selected day of the week, within the specified time frame, regarding each individual object. The trigger operates as follows:

1. When an object of the selected type enters the detection zone and remains inside it for the specified dwell time in seconds, a notification will be generated, indicating the object's presence with the In Zone tag.

2. When the same object of the selected type leaves the detection zone and stays outside of it for the specified dwell time in seconds, a notification will be generated, indicating the object's absence with the Out of Zone tag.

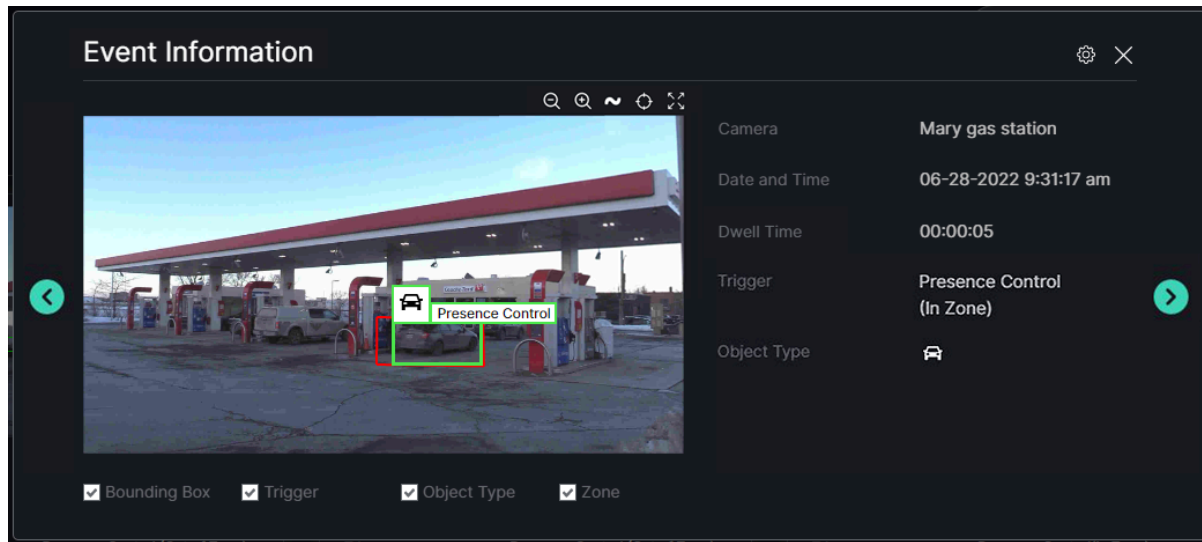
If multiple objects appear within the zone, the trigger will activate individually for each object.

For example, set the parameters:



- Select the required video stream
- Modify the detection zone by clicking and dragging the handles
- Check the Car, Motorcycle, Bus, and Truck object type boxes
- Set the Time Frame parameter to 00:00-23:59
- Enter the value 5 in the Dwell Time field
- Select Presence Control from the Trigger drop-down list
- Deselect the Saturday and Sunday buttons on the days of the week

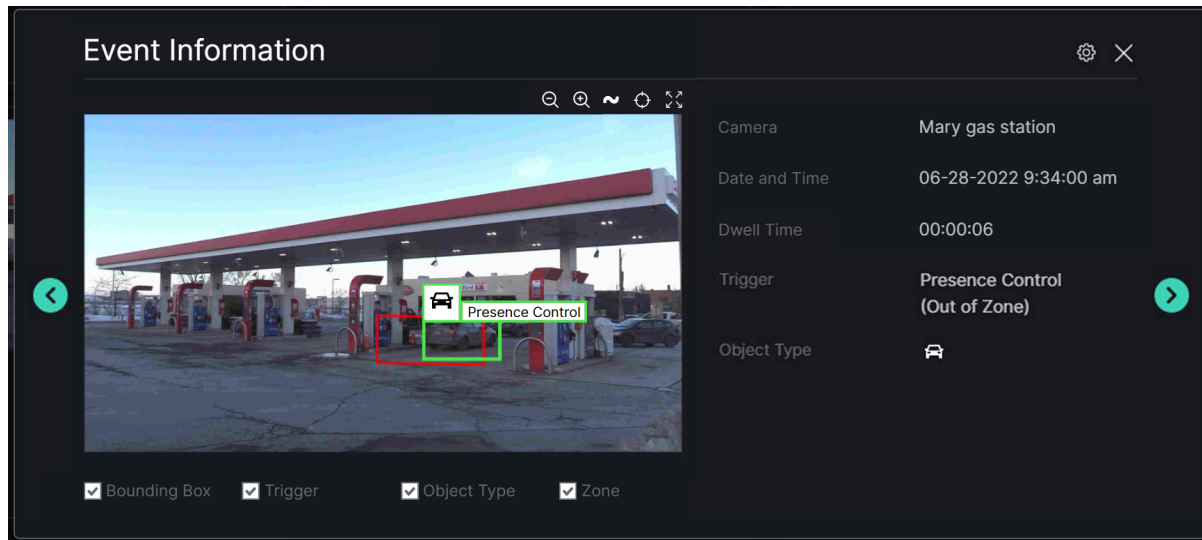
After the settings are saved and analytics is started, wait for detection. When the analytics identifies an object of the selected type present in the detection zone for the specified dwell time and all the conditions of the rule are met, the system will send an event notification with the results as shown in this example:



- Date is Tuesday, June 28, 2022
- Time is 9:31:17 a.m.
- Dwell time is 5 seconds
- Trigger is Presence Control with the In Zone tag
- Object type is Car

At 9:31:17 a.m. on Tuesday, June 28th, 2022, the selected camera detected the presence of a car within the designated detection zone for a duration of 5 seconds.

Once the same object has entirely exited the detection zone and remained outside for the specified duration, the system will generate the subsequent event notification with the corresponding results, as demonstrated in the following example:



- Date is Tuesday, June 28, 2022
- Time is 9:34:00 a.m.
- Dwell time is 6 seconds
- Trigger is Presence Control with the Out of Zone tag
- Object type is Car

At 9:34 a.m. on Tuesday, June 28th, 2022, the selected camera detected that the car had exited the designated detection zone. At that moment, the car had been outside the detection zone for a duration of 6 seconds.

For the event with the Out of Zone tag, the event frame will display the last moment when the object was still inside the detection zone before exiting it.

Intrusion

The Intrusion trigger is designed to alert about every object present in the control zone.

This can help with solving tasks such as:

- Detecting cars parking on sidewalks, bike lanes, green areas, and other prohibited locations
- Detecting violations of temporary parking/standing rules for vehicles
- Detecting traffic rules violations for vehicles on bus/ambulance lanes

- Controlling compliance with the schedule for truck traffic on city roads
 - Detecting the presence of animals in prohibited areas, such as shopping centers, hotels, playgrounds, schools, and kindergartens
 - Detecting the presence of people, bicycles, or animals on the roadway
 - Securing the enterprise territory during non-working hours and preventing unauthorized access
 - Protecting private property from trespassing and unauthorized entry
 - Notifying about arriving visitors at retail or service locations, such as shops, cafes, restaurants, gas stations, etc.
-

Case 1

Case 2

Case 1: Tracking Vehicle Arrival at a Gas Station for Prompt Service Provision

For example, it is necessary to ensure prompt vehicle service at a gas station on a daily basis.

To automatically detect when new vehicles arrive for service, it is necessary to set up 24/7 video surveillance near each refueling column and configure Object Detection analytics with the following parameters:

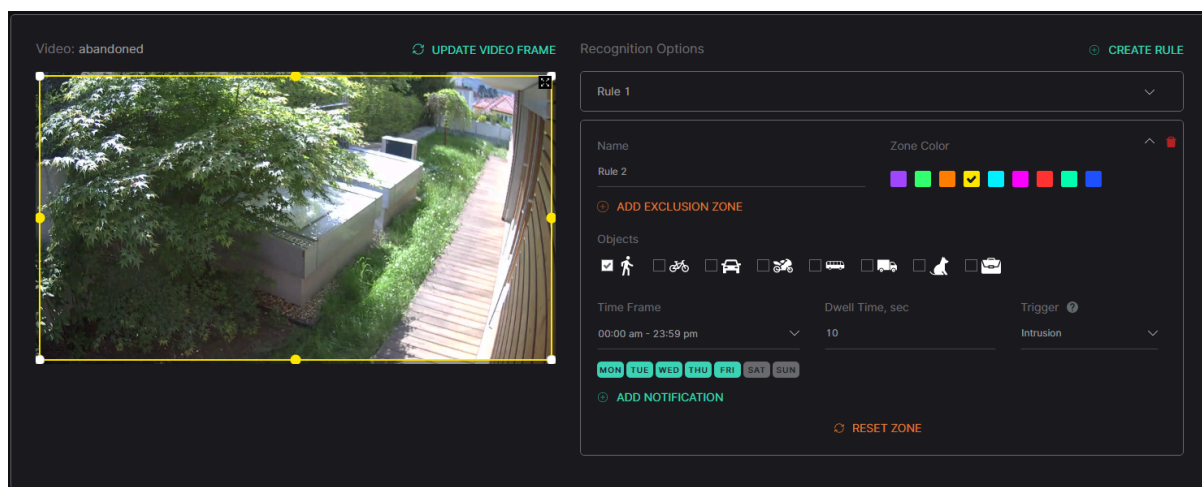
- The detection zone should cover the entire refueling area, taking into account the maximum dimensions of the vehicle
- The object types should include Car, Motorcycle, Truck, Bus
- The trigger type should be set to Intrusion
- The dwell time should be set to 10 seconds
- The detection time frame should be set from midnight to 11:59 p.m., with all days of the week selected

With these settings, if a car, motorcycle, truck, or bus enters the detection zone at any time of the day, the countdown timer starts. If the vehicle leaves the detection zone in less than 10 seconds (for example, it drives through the refueling area without stopping), the time counter resets, and no notification is sent. However, if the vehicle does not leave the detection zone within 10 seconds, the system sends a notification with an event frame, clearly showing the vehicle that entered the refueling area. This allows the gas station staff

to efficiently track every vehicle that arrives at the refueling area, enabling them to respond promptly and provide swift service.

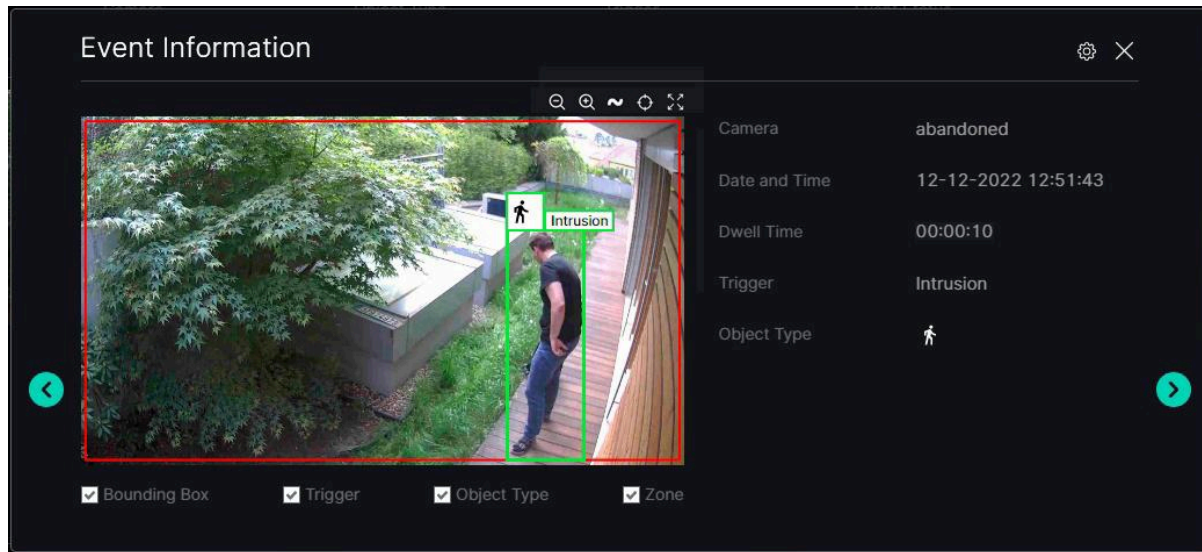
Use the Intrusion trigger type to receive event notifications during the selected days of the week for the required time frame about an object of the selected type that has entered the detection zone and remained inside it for a specified time in seconds.

For example, set the parameters:



- Select the required video stream
- Modify the detection zone by clicking and dragging the handles
- Check the Person object type box
- Set the Time Frame parameter to 00:00-23:59
- Enter the value 10 in the Dwell Time field
- Select Intrusion from the Trigger drop-down list
- Deselect the Saturday and Sunday buttons on the days of the week

After the settings are saved and analytics is started, wait for detection. Once the analytics detects the object that meets all specified conditions, the system will send an event notification with the results as shown in this example:



- Date is Monday, December 12, 2022
- Time is 12:51:43
- Dwell time is 10 seconds
- Trigger is Intrusion
- Object type is Person

At 12:51:43 on Monday, December 12th, 2022, the selected camera detected a person in the designated detection zone. At this point, the detected person entered the detection zone and remained there for 10 seconds.

Crowd

The Crowd trigger is intended for situations where it's important to monitor and manage the density of people in specific areas. It is particularly useful in environments where overcrowding could pose safety risks, disrupt operations, or negatively impact the user experience. By alerting when a crowd reaches a predefined size, the trigger enables timely interventions to maintain safety, comfort, and order in busy or confined spaces.

It is useful in various situations, such as:

- Managing crowd control in public events and gatherings
- Enhancing safety and security in transportation hubs (airports, train stations, bus terminals)

- Monitoring customer density in retail stores and shopping centers
 - Ensuring compliance with capacity limits in venues and public spaces
 - Managing queue lengths and customer flow in entertainment parks and attractions
-

Case 1

Case 2

Case 1: Managing Crowds at an Event Venue Entrance

Consider a large venue, such as a convention center or stadium, that regularly hosts various events. The venue owners need to manage crowd density at the entrance gates to ensure safety and smooth entry for attendees during these events.

To detect an increasing crowd at the entrance gate, it is necessary to place a camera to cover the main entrance gate zone and configure the Object Detection analytics with the following parameters:

- The detection zone should include the entire entrance area where attendees queue up to enter the event
- The trigger type should be set to Crowd
- The counter parameter should be set to 30, indicating the maximum number of people allowed in a dense crowd at the gate
- The dwell time should be set to 120 seconds
- The detection time frame should cover the entire event day, for example, from 8 a.m. to 10 p.m.

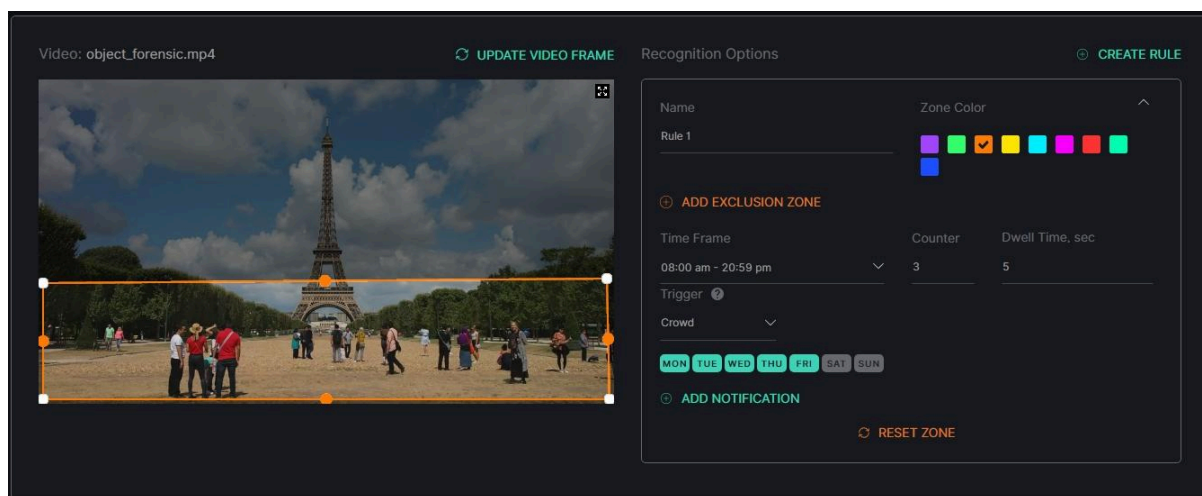
With these settings, the system will monitor the crowd density at the entrance. If more than 30 people in a dense group are detected within 2 minutes, the system will send a notification with an event frame about an increasing crowd. This allows event staff to take action, such as opening additional gates or directing the crowd to different entrances, ensuring a smooth and safe entry process.

Utilize the Crowd trigger type to tally the total number of Person objects within the detection zone for the specified timeframe on each chosen day of the week. Receive event notifications

if the total number of objects within the detection zone meets or exceeds the specified counter parameter during the selected dwell time.

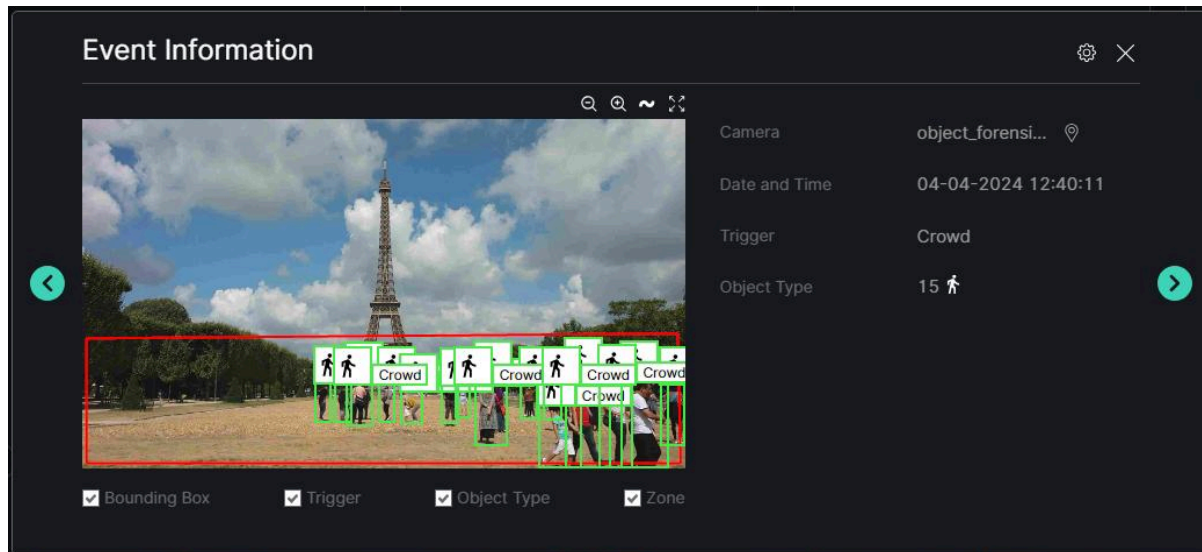
- The tracker only monitors one crowd of people at a time, rather than all potential crowds within the detection zone.
- The tracker does not differentiate objects based on their size or spatial position, nor does it consider real-world perspective. All objects are treated equally, and the distance between them is determined solely in pixels on the frame.
- During object tracking, it is important to consider that unsuitable conditions such as low resolution, overly bright light or dimness, and excessive overlapping of objects can adversely affect the accuracy of the tracker's operation.

For example, set the parameters:



- Select the required video stream
- Modify the detection zone by clicking and dragging the handles
- Set the Time Frame parameter to 08:00-20:59
- Select Crowd from the Trigger drop-down list
- Enter the value 3 in the Counter field
- Enter the value 5 in the Dwell Time field
- Deselect the Saturday and Sunday buttons on the days of the week

After the settings are saved and the analytics is started, wait for detection. Once the analytics detects the set number of People objects in the detection zone and meets all the specified conditions, the system will send an event notification with the results as shown in this example:



- Date is Thursday, April 4, 2024
- Time is 12:40:11 p.m.
- Trigger is Crowd
- Total objects number is 15
- Object type is Person only

At 12:40:11 p.m. on Thursday, April 4th, 2024, the selected camera detected fifteen people simultaneously crowded in the required detection zone for 5 seconds.

The tracker monitors objects within the detection zone to link them into the crowd. When the number of objects reaches or exceeds the minimum threshold, the system sends a notification about the detected crowd. For tracking crowds, video analytics analyzes distances between objects (people) within the detection zone. The operational principle can be outlined as follows:

1. Initially, the analytics detects objects (people) within the zone.
2. Then it measures the distance for each detected object in pixels to every other object within the zone.
3. The obtained distances are summed for each object. Consequently, the sum of distances to all other objects is computed for each object.
4. The total sum of distances is divided by the total number of objects detected within the zone. This yields the average distance between objects.
5. Subsequently, the analytics compares the average distance with distances between pairs of objects:

- If the distance between pairs of objects is less than or equal to the average distance, they are considered part of the same crowd.
- Conversely, if the distance exceeds the average, the objects are not considered part of the same crowd.

Object Detection: Advanced Settings

Detector Accuracy

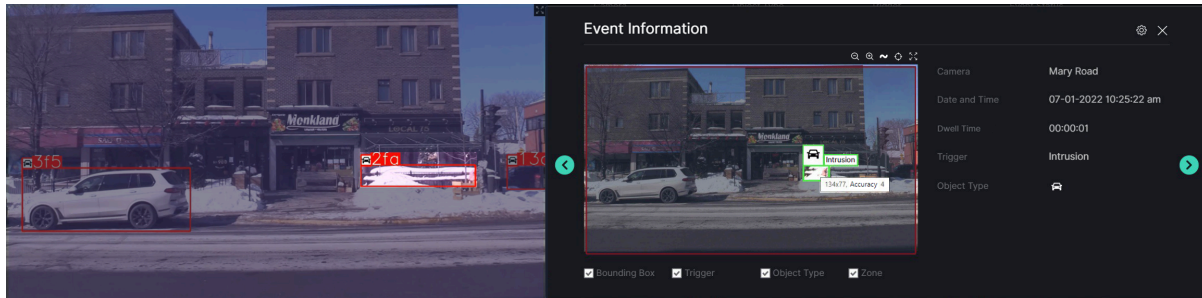
Increase the Detector Accuracy parameter value in case the analytics skips the selected objects.

In this example, the analytics has not detected the second person in the detection zone with the Detector Accuracy parameter value set to 8:



Decrease the Detector Accuracy parameter value in case the analytics recognizes inappropriate objects as required ones.

In this example, the analytics has identified an inappropriate object in the detection zone as a Car with the Detector Accuracy parameter value set to 4:



Model

Choose the most appropriate analytics model:

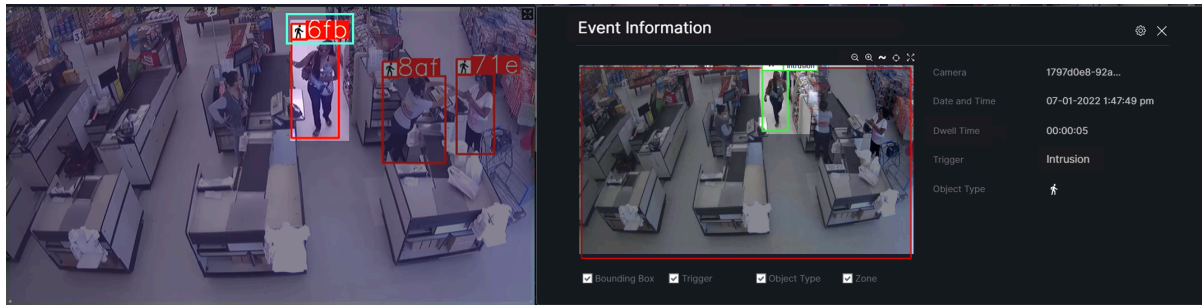
- The Quality model consumes three times more resources than the Performance model but provides better results.
- The Performance model is preferable to use when there are not enough resources to process the Quality model, but in this case, the quality of the provided results is significantly reduced.

To calculate the required amount of resources consumed by the model, use Calculator in Partners Portal.

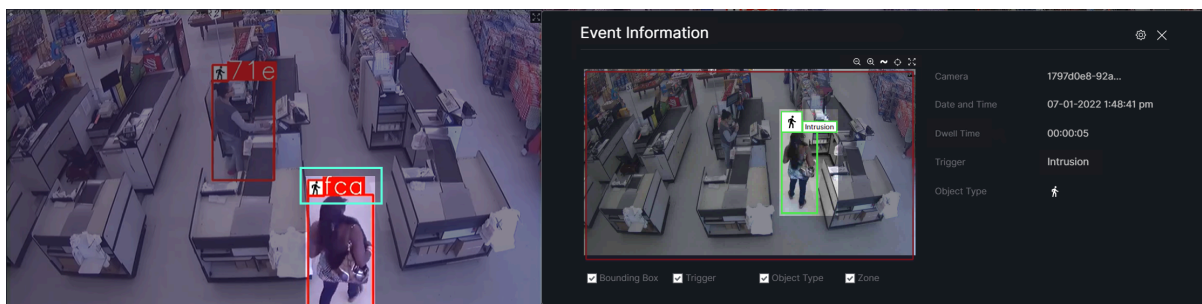
Tracker Buffer Time

The Tracker Buffer Time parameter means the time the recognized object is stored in the buffer. If an object was recognized, but later disappeared from the surveillance area, then this object is sent to the buffer and stays there for a specified amount of time in seconds. If during the specified time the same object returned to the surveillance area, it is removed from the buffer, and the analytics does not react to this object again.

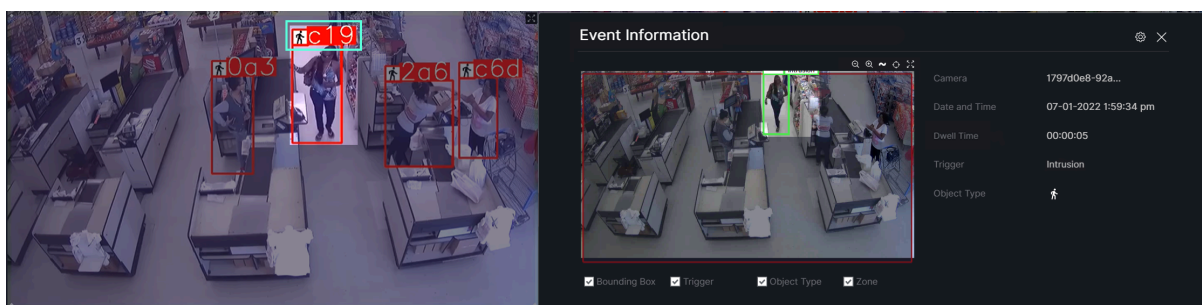
Example 1: The Tracker Buffer Time value is set as 10 seconds. An object that meets all conditions entered the detection zone for the first time, so the system sends an event notification, and the object is buffered.



After some time, the object leaves the detection zone for more than 10 seconds and therefore is removed from the buffer after the specified time has elapsed. When the same object returns to the detection zone, the analytics perceives it as a new unique object and sends a new event notification.



Example 2: The Tracker Buffer Time value is set as 200 seconds. An object that meets all conditions entered the detection zone for the first time, so the system sends an event notification, and the object is buffered.



After some time, the object leaves the detection zone for less than 200 seconds, and therefore it is not removed from the buffer. When the same object returns to the detection zone, the analytics perceives it as an object that has previously entered the detection zone, and therefore it does not send a new event notification.



Minimum Object Width and Height

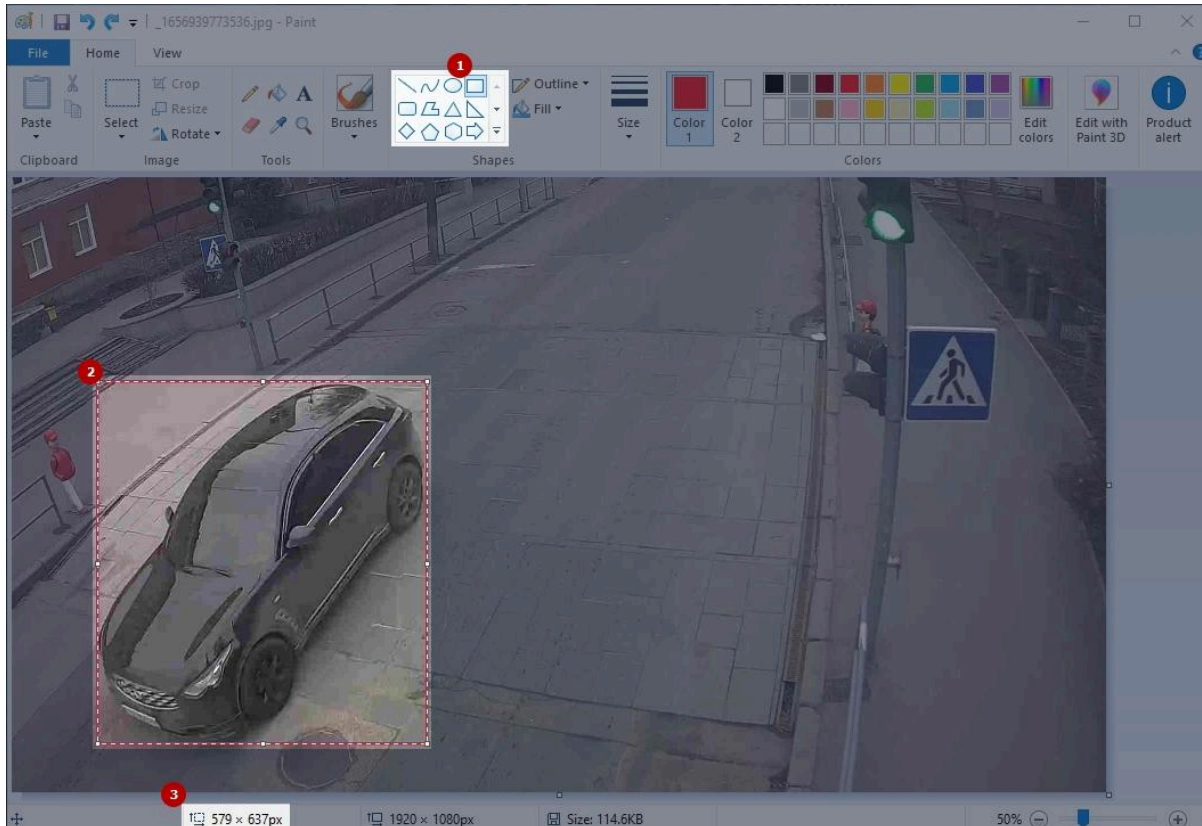
The minimum width and height of the object is preferably at least 25 px. Otherwise, the image quality is insufficient for correct object recognition.

The object size (WxH) upon camera resolution 2MPx supported for:

- Person size for detection: minimum is 25x40 px, recommended is 50x125 px
- Car size for detection: minimum is 25x25 px, recommended is 150x100 px
- Bicycle size for detection: minimum is 40x70 px, recommended is 90x100 px
- Motorcycle size for detection: minimum is 25x30 px, recommended is 70x90 px
- Bus size for detection: minimum is 90x75 px, recommended is 200x150 px
- Truck size for detection: minimum is 80x70 px, recommended is 180x150 px
- Animal size for detection: minimum is 30x40 px, recommended is 120x140 px
- Item size for detection: minimum is 30x40 px, recommended is 100x150 px

Determine the object's width and height in pixels using a graphics editor (e.g. Paint).

Save a frame from the video and open it in Paint:

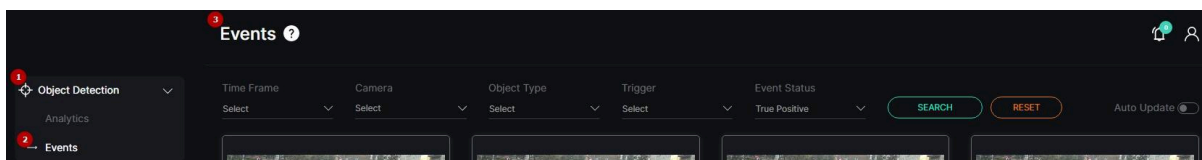


1. Select the Rectangle shape in the Shapes toolbox
2. Select the object by its extreme points with a rectangle
3. View the object's width and height in pixels

Object Detection: Events

Overview

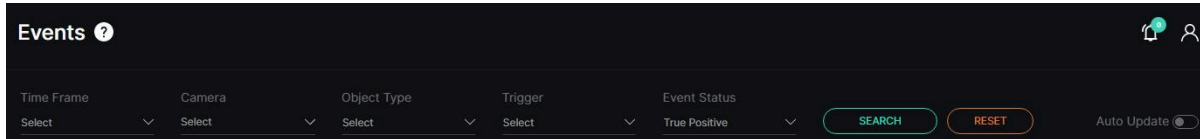
To open the Events item, in the left menu:



1. Select the Object Detection section
2. Choose the Events item
3. See event notifications

Use and Functionality

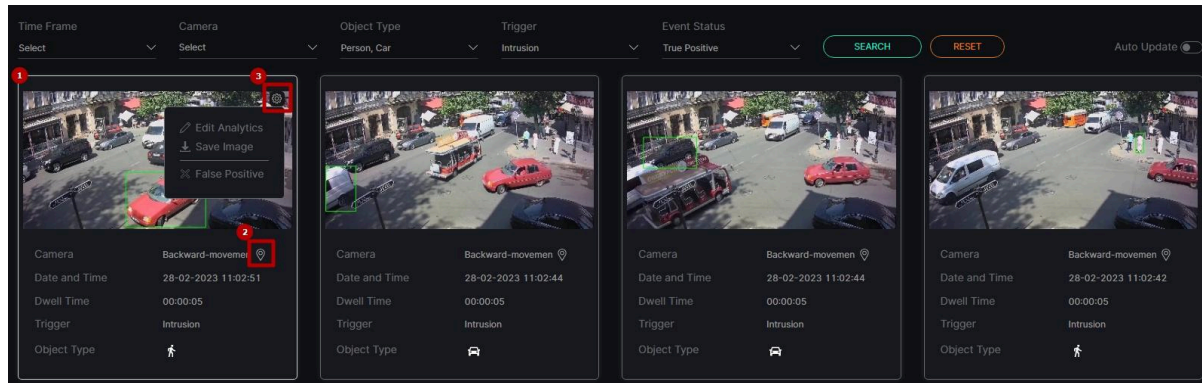
The Events functional menu allows to:



- Select the required events time frame
- Click the Camera parameter to select the desired video analytics. In the pop-up window:
 - Check the boxes next to the required video analytics and folders
 - Click the Select Video Analytics button
- Select multiple object types:
 - Person
 - Bicycle
 - Car
 - Motorbike
 - Bus
 - Truck
 - Animal (dogs and cats)
 - Bags
- Select multiple triggers:
 - In Zone
 - Out of Zone
 - Object Counter
 - Presence Control
 - Intrusion
 - Crowd
- Select the event status:
 - True Positive to view only valid event notifications
 - False Positive to view only event notifications marked by the user as false
- Click the Search button to filter the events
- Click the Reset button to clear the filters

- Select the Auto Update toggle to enable or disable the auto update of the event notifications

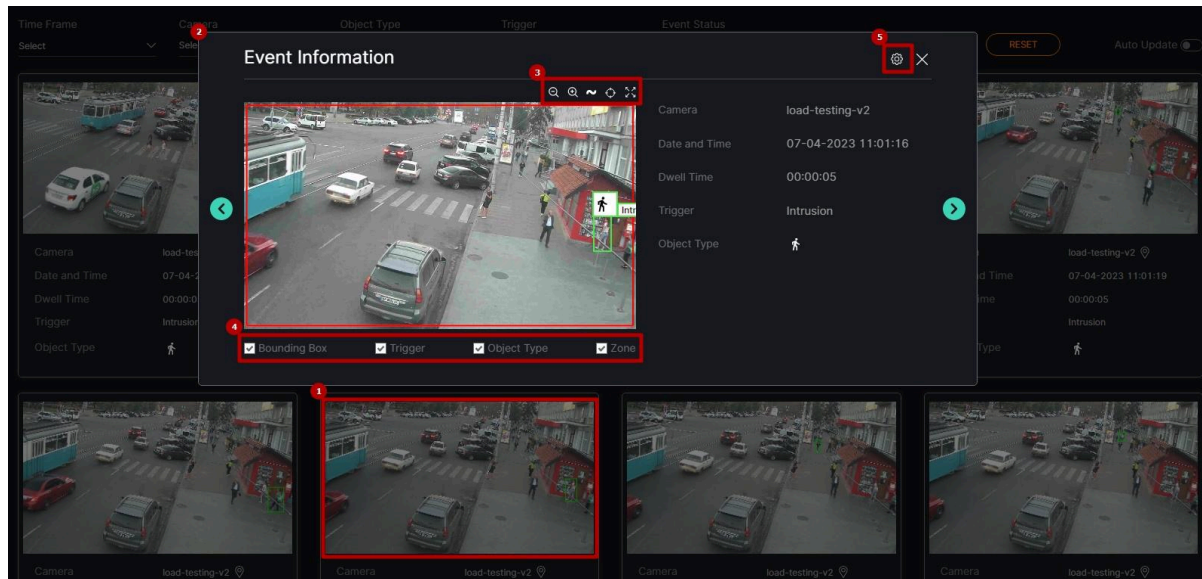
Once selected and filtered, in the events:



1. View the frame preview and information about the event. To filter events by the recognized data, in the required event block:
 - Click the camera name to filter events only by the camera related to the event
 - Click the date to filter events only by the date related to the event
 - Click the trigger name to filter events only by the trigger related to the event
 - Click the object type icon to filter events only by the selected object type related to the event
2. View the camera location on the map by clicking the View Geolocation icon in the event block
3. Hover the mouse over the event block and select the Extra Options icon. In the drop-down menu:
 - Click the Edit Analytics button to make changes to the settings of the analytics which is related to the selected event
 - Click the Save Image button to download the event frame in full size
 - Click the False Positive or True Positive button and confirm the intention to change the event status and move the selected event to the appropriate set of filtered events
- The False Positive button is available in the Settings drop-down list only if the True Positive event status has been previously selected in filters.
- The True Positive button is available in the Settings drop-down list only if the False Positive event status has been previously selected in filters.
- The selected Presence Control trigger divides filtered events into two types:

- Presence Control (In Zone) in case the object has entered the set zone and stayed there for the specified time
- Presence Control (Out of Zone) in case the object left the set zone, after which the zone was empty for a certain period of time

To view the required event:



1. Click the frame preview
2. See the event's pop-up window
3. Use frame view tools:
 - Zoom Out icon (-) to zoom out from a specific area of the frame
 - Zoom In icon (+) to zoom in on a specific area of the frame
 - Reset View icon (~) to reset the frame to its original size and position
 - Target icon to zoom in on the detected object in the frame (available for the Presence Control and Intrusion trigger types)
 - Enlargement icon to open the frame in full-screen (in the full-screen press the Esc button to return to default view)
4. Check the required boxes to enable or disable the display elements on the frame:
 - Bounding Box
 - Trigger
 - Object Type
 - Zone
5. Hover the mouse over the Extra Options icon. In the drop-down menu:

- Click the Edit Analytics button to make changes to the settings of the analytics which is related to the selected event
- Click the Save Image button to download the event frame in full size
- Click the False Positive or True Positive button and confirm the intention to change the event status and move the selected event to the appropriate set of filtered events
- Hover the mouse over the bounding box in the frame to see its width and height parameters in pixels and analytics sensitivity value.
- Click and drag the image across the zoomed-in frame in order to view different parts of it.