



Administrator's Guide

Eocortex

Version 4.1

eocortex.com

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[Online documentation](#)



[What's new](#)



[Change log](#)



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Documentation archive

Version 3.5

Introduction

This guide describes the operation process of the **Eocortex** software suite designed for intelligent analysis, processing, archiving and display of video data, and one point to manage cameras in a video surveillance system based on IP cameras.

The guide may contain screenshots of previous versions or other products of **Eocortex** software. In this case it is supposed that the functionality described in these screenshots have not changed in the current version of **Eocortex**.

After the release and publication of the next version of **Eocortex** software the manual can be supplemented with changes. To receive up-to-date documentation, please check the publication date of the **Eocortex** on site.

What's new

Novelties in Version 4.1:

Video analytics

- Added the new [Emergency Vehicle Detection](#) module, which allows detecting ambulances, fire trucks and police cars in real time.
- The [Uniform Detector](#) module has been improved. Now it has become possible to check the presence of workwears for employees.
- The [Face Recognition Complete](#) module has been improved. The accuracy of sex and age recognition has increased, and it is now possible to set the minimum threshold of facial similarity to a photo from the database more precisely.
- The [Unique Visitors Counting](#) module has been improved. The accuracy of counting and the speed of generating reports over a large time interval have increased.

Video processing

- It is now possible to perform [Decoding on GPU](#) for streams received from cameras. This will help to reduce the load on CPU when using analytics modules.
- Added support for the [H.264+](#), [H.265+](#), [WiseStream](#), [Zipstream](#) and [Smart Stream](#) codecs, the use of which would allow to reduce the load on the network and reduce the size of the archive without loss of video quality.

Vizualization

- The [Maps](#) section has been redesigned and improved. The following have been added: improved navigation and search on the map, transition to related plans, flexible camera field of view customization, configuration of video displaying inside the field of view, and event status markers.
- The [Plans](#) section has been redesigned and improved. The following have been added: transition to the map, an extended list of supported image formats for uploading as a plan, adjustable camera field of view and video displaying inside it, and flexible group addition of sensors.

Eocortex Client

- It is became possible to display events of the camera's embedded analytics on the timeline in the [Synchronous archive](#) and [Fragments mode](#).
- Added the ability to overlay a [watermark](#) with user data when exporting an archive, saving and printing a frame in the **Eocortex Client** application.

Eocortex Web-client

- Now it is possible to view the [Event log](#) in the **Eocortex Web-client** application.

Archive and Event Log

- The **Long-term database** service has been developed, which allows storing events of desired types without being limited by the archive storage time.

Automation

- It is possible now to create unique [custom notifications and webhooks](#) to send detailed and customized information to external users and automated systems.

Integrations

- [Integration with POS terminals](#) has been enhanced. Added step-by-step viewing of video recorded during the checkout process, as well as setting the positioning of this video on the timeline.
- Improved integration with **Suprema BioStar 2** ACS. It is now possible not only to receive events from the ACS, but also to send commands to it to control doors.

Previous Versions

Novelties in Version 4.0:

Video Analytics

- New video analytics module is available: **Object Classification and Counting**. The **Object Classification and Counting** counts objects that are crossing specified lines or contained in predefined areas of arbitrary shape, distinguishing them by categories.
- The **Face Recognition (Complete)** module has been improved: CPU and GPU resources consumption has been reduced without loss of recognition accuracy, which allows to host more cameras with the module on one server.
- [Using multiple video analytics modules on the same camera](#) at the same time has become more comfortable. Now, when several modules are enabled simultaneously, it is possible to select the data of which module should be displayed on the screen in the **Eocortex Client** application and **Eocortex Web Client**.

Eocortex Client

- The **Eocortex Client** application now has the ability of [displaying watermarks](#) on live and archived video.
- Now it is possible, when viewing the archive in [Fragments mode](#), view fragments specifically for analytics, motion and alarm events. It is also possible to group selected fragments to export them as a seamless video.
- Responsiveness of the user interface in the **Eocortex Client** application has been improved.

Eocortex Web-client

- The **Eocortex Web-client** application now has the ability to [display H.264 video streams](#).
- The **Eocortex Web-client** application now can automatically [adapt to any screen resolution of the device](#).

Eocortex Configurator

- Now, it is possible to [create automation tasks for folders](#) that will be inherited by cameras in these folders.

Server applications

- Internal databases of system events and all analytics were ported from Firebird to [PostgreSQL](#). With this, the report formation time was reduced when the speed of accessing the events and the modules' data was increased.

- Support is discontinued for **Windows 7** and **Windows Server 2008** operating systems, as well as 32-bit versions of [other operating systems](#).

Automation

- Now it became possible to set up [playing audio on a camera speaker](#) automatically as a response to a selected event or as a user task.

Security

- [Active Directory pass-through authorization](#) option has been added.

API

- New **archive_events** and **archive_event_types** request types for retrieving archive events have been added to the HTTP API.

Novelties in Version 3.6:

Video Analytics

- The neural networks package used in previous versions has been renamed to **Eocortex Neural Networks Standard**. A new, more effective neural networks package has been developed: **Eocortex Neural Networks Special**. [Any of these packages can be used](#), depending on the capabilities of the hardware.
- Objects detection accuracy has been improved for the **Tracking, Search for Objects, Uniform Detector, Face Mask Detector, Face Recognition (Complete)** modules.
- Now the **License Plate Recognition (Complete)** and **License Plate Recognition (Light)** modules have the ability to count the number of vehicles and their persistence in the parking area.
- Support for 32-bit versions of the **License Plate Recognition (Complete)** and **License Plate Recognition (Light)** modules has been discontinued.
- Now only one of the License Plate Recognition modules can be installed on the same server: either **License Plate Recognition (Complete)** or **License Plate Recognition (Light)**.

Eocortex Client

- Now in the **Eocortex Client** application, any camera can be viewed separately using the **Overview monitor** feature.
- Now in the **Eocortex Client** application, for each monitor the [Start view](#) can be set.
- Now in the **Eocortex Client** application, [positioning on plans](#) can be performed with left mouse button.
- Now the Events log of the **Eocortex Client** application displays [authorization events](#) of web clients and mobile applications.
- The **Eocortex Client** application now has the ability to [display time for cameras](#) either in the time zone of the client computer or in the time zone of the cameras themselves.
- The possibility of [frame-by-frame playback](#) has been added to the **Simultaneous archive viewing mode**.

Eocortex Configurator

- Now in the system settings, [a group of cameras based on the selected one](#) can be created.
- The **Eocortex Configurator** application now has a search feature for camera brand and model in the related drop-down menus, as well as for servers on the **Cameras** and **Servers** tabs.

Server applications

- The ability to keep selected important archive fragments without time limit has been added with the [Episode archive](#) feature.

Integration

- [Integration with ZKBioSecurity access control system](#) has been implemented.
- [Integration with POS terminals](#) has been improved. The ability to [receive and display Receipt total amount](#) has been implemented. In addition, the **Received a check from a POS-terminal** event type has been added.

API

- The query to launch automatic views switching in the **Eocortex Client** application has been added to the HTTP API.

Novelties in Version 3.5:

Video Analytics

- The **Hard Hat detector** module has been renamed to the **Uniform Detector** module. Now can to detect of people not wearing uniform. [Depending on the settings](#), to can determine: the color of the uniform, the absence of vests, the absence of hard hats. It is also possible to [add zones and lines](#) for which alarms will be generated.
- The **Tracking** module has been improved: added the ability [to filter alarm events](#) by object categories, as well as by certain types of transport. In addition, in the **Eocortex Client** application can to enable the [display of object frames](#) depending on the object category.
- The [face database Eocortex](#) now has the ability to sort records.
- Now for the **Face Recognition (Complete)** module, the search for faces [in the database](#) by photo is available.
- Now group operations are available [in the faces database](#) intended for the simultaneous work with several records.
- Now the [Face Recognition report](#) can be saved in PDF format.
- Added the **Report regarding groups of face database**.
- Now can to enable the display of face frames in the **Eocortex Client** application.
- Now the **Tracking, Search for Objects** and **Uniform Detector** modules running on the same camera share the processor and video card resources.
- Now in the **Eocortex Web-client** for the **Face Recognition** and **People Counting** modules [the liveview video analytics](#) is available.
- Now the **Fire and Smoke Detector** module uses a neural network. This has improved the detection.

Eocortex Client

- The **Eocortex Client** application now has a [archive fragments playback](#) mode.
- Added a [cell pinning](#) on the alarm monitor grid.

Server applications

- Now can to receive [up to four video streams](#) from cameras.
- Now all **Eocortex** functionality for **Enterprise** and **ULTRA** license types, including **Eocortex System Monitoring**, is available on Linux.

Mobile applications

- Now, for mobile applications, it is possible to view the placement of cameras on online maps.
- Now mobile assistant Eva can play the archive at the requested point in time.

Eocortex Union

- The **Eocortex Union** has been created, provides convenient access from the same point to several **Eocortex** video surveillance systems at the same time. The **Eocortex Union** includes client applications, configuration and system state monitoring tools.

Integration

- Integration with POS terminals has been implemented. Now **Eocortex** video surveillance systems can receive information about cash transactions from POS terminals in real time, display this information on the screen, store it in an archive and use it in automation scripts.
- Implemented integration **Biostar 2** security platform by **Suprema**. Now **Eocortex** video surveillance systems can receive events from **Biostar 2** in real time, store them in the archive and use them in automation scenarios.

Novelties in Version 3.4:

Video Analytics

- The support of the inherited **Face Recognition (Basic)** module has been discontinued.
- The **Interactive Search** module has been renamed to **Search for Objects**. Now it is possible to Search for Objects by the following categories: people, vehicles, weapons, bags, animals; the search for separate types of vehicles is also available. The search speed has been increased, and it is now possible to launch the module on a video analytics server.
- The **Face Recognition (Complete)** module has been enhanced: the accuracy of Face Detection and recognition has been improved; [the recognition of turned and masked faces](#) has been added; the events that allow to set [scenarios](#) based on the presence or absence of a mask on the face and on the face turned away from the camera have been added; now, when adding new faces to [the database](#), it has become possible to learn that there are duplicates present; it is now possible to add persons who do not meet the requirements for samples of persons to [the database](#). At the first launch of the improved module, the face database will be automatically updated; it will take some time.
- Testing of **Eocortex** video analysis modules [has become even easier](#).
- In the **People Counting** module, it is now possible to set [individual counter reset parameters](#) for each camera.
- [New settings](#) for each Sabotage Detector have been added to the **Sabotage Detector**; the number of false triggering events has been reduced the sensitivity of several detectors has been increased.
- It is now possible to set [individual face and license plate databases](#) for different cameras.
- A black body calibrator setting for the **Temperature for recognized faces** video analytics built into a thermal camera has been added.

Server applications

- It is now possible to indicate [two addresses](#) for a server in the **Eocortex Configurator** application.
- Now, it is possible to [generate RTSP links](#) directly in the **Eocortex Configurator** application in order to connect to the **Eocortex** server via RTSP.
- It is now possible to receive H.265 video streams via ONVIF.
- Several improvements have been introduced to the ONVIF server: the **HTTP Digest** authorization (in addition to the existing **WS UsernameToken**); in response to a query for video and audio configuration, the information regarding the unavailability of Multicast has been added; responses to certain queries have been adjusted to comply with the applicable standard.
- A number of improvements have been made to the RTSP server: now an unknown command does not stop the video broadcasting, and the software with the ability to switch between TCP and UDP can correctly switch from UDP to TCP by default, without specifying the protocol in the settings.
- It is now possible to distribute the [reencoding of video streams for mobile applications](#) among various servers.

Security

- It is now possible to sign saved frames and video clips to be exported with an [electronic signature](#).

- In **Eocortex** it is now possible to [limit the number of connections](#) to the video surveillance system under the same account.

Eocortex Client

- It is now possible to [connect](#) to the **Eocortex** server, to the **Eocortex** server via P2P, and to **Eocortex Cloud** using the **Eocortex Client** application.
- Now can be configure on the alarm monitor [to open the video with a delay](#) to see the situation at the time of the alarm.
- The consumption of hardware resources when operating in full screen mode has been reduced in the **Eocortex Client** application.
- 9 new grids have been added (2 of them with vertical alignment).

Integration

- The queries allowing to enable, disable and set up the **Face Recognition (Complete), Unique Visitor Counting, License Plate Recognition (Complete), Counting People in Queue, People Counting** video analysis modules have been added to REST API.
- Now, all the main license plate database interaction operations are available in REST API: obtaining, adding, editing and deleting data regarding vehicles and groups.
- The **Face recognized** and the **Large number of people in the queue** events, as well as the conditions for actions at occurrence of these events have been added to REST API.
- In HTTP API, the information regarding the coordinates of the detected objects has been added for those events that include frames of the objects. Also, in the Face Detection and recognition events, a field with the trajectory identifier has been added. In addition, a binary time field has been added to the above events.
- The **Send Push notifications to mobile devices** action has been added to REST API.

Deployment

- The size of the distribution kit has been significantly reduced by excluding PDF documentation from the installation packages. Now, in case there is no internet connection on the application deployment site, it is required to download the PDF documentation from the site in advance.
- The option of [silent install under Linux](#) has been added.

Novelties in Version 3.3:

- To facilitate setup of the systems with **Enterprise** and **ULTRA** licenses, the possibility to [set up user rights immediately upon creating a view](#) has been introduced.
- The [integration with Paxton Net2 systems](#) has been performed.
- The [synchronization of face database with external systems](#), allowing to upload data from the files located in a folder on the disc to the Eocortex face database has been implemented.
- The volume of data transmitted thru the network by the **Eocortex System Monitoring** subsystem has been reduced.
- The possibility to [reduce the frequency of data exchange between the primary and secondary servers of the system](#) has been added.
- The following new [access rights](#) have been added: Access to maps, Camera cell control, Access to face and license plate databases, Accept alarms without obligatory comments, Blurring disabled.
- The following archive export capabilities have been added: Adding a Watermark, Encrypting the Archive Using a Password.
- The [Frame Area Blurring module](#) intended for blurring the specified areas of a real-time video has been introduced.

- The time of operation of the server without the floating license key has been increased in order to reduce the risks of video surveillance system failure in case of network issues.
- Obtaining video encoded with H.265 (w/o B frames) [using direct queries to the server via RTSP](#) has been implemented.
- Now, the separate events and archive bookmarks are displayed on the timeline when viewing the archive of several cameras simultaneously.
- The [constant camera redundancy](#) is now available.
- The following improvements have been introduced to the Face Recognition modules: delays and discrepancies when displaying the recognized faces have been remedied, the requirements imposed on the images of the faces to be added to the database have been relaxed.
- The NVIDIA GeForce RTX™ 30 video cards based on the Ampere architecture are now supported by the modules that use neural networks.
- The **License Plate Recognition (Complete)** module has been updated: new license plate templates have been added for some countries; new settings and recognition methods have been added; now the module can be used on a Linux based server.
- The **License Plate Recognition (Light)** module has been updated: the recognition of license plates of five more countries has been added; new license plate templates for several countries have been added.
- The **Counting People in Queue** module has been improved: the counting accuracy has been increased; the consumption of resources when using the GPU has been reduced.
- The view selection menu of the **Eocortex Client** application has been modified.
- Now, the [Face Recognition \(Complete\)](#) and [Unique Visitor Counting](#) modules can recognize emotions.
- The [video analytics built in the cameras](#) is now supported.
- Now, a server can be assigned as a video analytics server.

Novelties in Version 3.2:

- Now it is possible to use most video analysis modules and Sentinel (HASP) license protection on Linux-based servers.
- A capability of setting counting zones and, subsequently, determining the number of people in the zones in real time has been added to the **People Counting** module.
- **Tracking** video analysis module has been upgraded.
- **Search for Objects** video analysis module has been upgraded.
- [A capability of sending temperature data registered by a thermal camera to the Face Recognition module](#) has been added.
- In the **Eocortex Configurator** application, the **Video analytics** page with the summarized info regarding the use of the video analysis modules in the system has been added. Also, the settings of the automated reports for some of the video analysis modules have been moved to this page.
- Now it is possible [to place cameras, sensors, and relays on the geographical online maps](#) provided by **Google Maps** and **OpenStreetMap**.
- [Decoding of B-frames](#) encoded in H.264 and H.265 is provided.
- Now, [the switching of channels to a backup server](#) is ensured not only when there is no access to the main server but also when all the archive drives of the main server fail.
- [The intervals of prerecording and additional recording](#) available for setting up have been increased to 10 seconds.
- Now, moving a camera to another server is done without losing the archive.

- The capability of [P2P connection using the Eocortex Client application to the Eocortex server](#) has been added.
- Smart assistant that allows to interact with the application using voice and text commands has been added to the Android app.
- Face Recognition technologies used in the **Face Recognition (Light)** module have successfully passed FRVT conducted by NIST. The test results are available here: <https://pages.nist.gov/frvt/html/frvt11.html>.

Novelties in Version 3.1:

- [Server and Client views](#) have replaced screen grids in the Client Application.
- [Floating licensing](#) is now available in **Eocortex**.
- **Eocortex Web-client** is now fully in HTML5 (in the previous version, Adobe Flash Player was used in the full screen mode).
- [Replication of the remote database](#) allowing to perform recognition even in the temporary absence of a connection with the remote face and license plate databases has been implemented for the Face Recognition and License Plate Recognition modules.
- The trial version ordering tool has been incorporated into the setup interface of the **License Plate Recognition (Complete)** module. The trial version allows to test the module during 60 days.
- Now, the ONVIF server of **Eocortex** can use not only **Base Notification** but also **Pull-Point Notification** for transferring events.
- **Enterprise** license added.
- Now, the server and client software for all types of licenses is [installed from a single distribution kit](#).
- The [Work time logging \(Complete\) report](#) has been developed for the **Face Recognition (Complete)** module.
- The **Sabotage Detector** module's operation has been improved.
- It is now possible to connect RTSP devices using the following type of a connection string: **rtsp://login:password@address**.

Novelties in Version 3.0:

- [Server application for Linux](#).
- Possibility to [execute tasks on commands of the users of client applications](#).
- Possibility to [send HTTP requests](#) to external web applications and to devices with web control.
- When sending a message created on the basis of the **Face recognized** event [to the messengers](#), the image of a face from the archive at the moment of recognition and the reference image from the database will be attached to the message.
- Now the [Face Recognition \(Complete\)](#) and the [Unique Visitor Counting](#) video analysis modules use all the video cards installed on the server.

Novelties in Version 2.8:

- New video analysis module added: [Face Recognition \(Complete\)](#).
- New video analysis module added: [Unique Visitor Counting](#).
- New video analysis module added: [Face Recognition \(Light\)](#).
- Video analysis module removed: **Face Recognition module (Expert)**.

- In the [License Plate Recognition \(Light\)](#) video analysis module, the list of countries whose license plate numbers are supported has been extended, as well as new patterns of license plates for several supported countries have been added.
- To ensure the protection of data being transmitted between cameras and the **Eocortex** server and between the server and the **Eocortex Client** and **Eocortex Configurator** applications, the capability of using [SSL/TLS security certificates](#) has been added.
- [The integration with the Honeywell's Pro-Watch® comprehensive security platform](#) has been implemented. Due to this integration, it is now possible to receive and display **Honeywell's Pro-Watch®** events and set up various responses to them.

Features

Analytics

Usage of neural networks

Part of the **Eocortex** video analysis modules uses neural networks.

Neural networks are presented as an additional installation package.

Starting from version 3.6 of **Eocortex**, two different packages can be used:

- The **Eocortex Neural Networks Standard** package
- The **Eocortex Neural Networks Special** package



Eocortex Neural Networks Standard and **Eocortex Neural Networks Special** packages support simultaneous use of multiple video cards for analyzing video streams. However, correct work of the analytics is possible only when using video cards that are identical to each other by their technical properties.

Comparison of neural networks packages

Capabilities	Eocortex Neural Networks Standard	Eocortex Neural Networks Special
The first appearance of the neural network package in Eocortex ,	2.5	3.6
Operating systems	Windows 10 Windows Server 2016 Ubuntu 20.04 Debian 10 CentOS 7	Windows 10 Windows Server 2016 Ubuntu 20.04 Debian 10 CentOS 7
Silent installation on Windows systems	Yes	No

The ability of some modules to work without a discrete graphics card	Yes	No
Minimum requirements when using a discrete graphics card	<p>A processor that supports AVX instructions;</p> <p>An NVIDIA video card (GPU) with the computation capacity index of at least 6.5 and with at least 4 Gb of memory; the parameters and performance of the video card must be similar or better than those of NVIDIA GTX 1650 Super model;</p> <p>version of the video card driver at least 460;</p> <p>swap file at least half of the total RAM size.</p>	<p>A processor that supports AVX instructions;</p> <p>An NVIDIA graphics card (GPU) with an index of compute capability of at least 7.0 or higher and video memory capacity of at least 6 GB; herewith, other characteristics and performance of the graphics card must be no lower than that of NVIDIA RTX 3050 or NVIDIA RTX 2060 model;</p> <p>version of the video card driver at least 460;</p> <p>swap file at least half of the total RAM size.</p>
Advantages	X	Frames are processed faster
	X	The load on the graphics card has been significantly decreased, which allows processing many more cameras simultaneously
Consumption of resources of the central processing unit (CPU) and random access memory (RAM)	Does not depend on the used neural network package	
	Depends on the number of cameras being processed	
	Depends on the video analysis modules used	
Consumption of resources of the graphics card (GPU)	Depends on the video analysis modules used	
Technologies supported by CUDA	FP32	FP32, FP16
When the central processing unit (CPU) load is high	Video analysis frequency decreases	Analysis modules stop working

Video analytics		
Counting People in Queue	Yes	Yes
Emergency Vehicle Detection	Yes	Yes
Face Mask Detector	Yes	Yes
Face Recognition (Complete) and Unique Visitor Counting	Yes	Yes
Face Recognition (Light)	Yes	Yes
Fire and Smoke Detector	Yes	Yes
Object Classification and Counting	Yes	Yes
Search for Objects	Yes	Yes
Tracking	Yes	Yes
Uniform Detector	Yes	Yes

Related references

[Installation of neural networks](#)

Video analytics server

Video analytics server is a server exclusively dedicated to launching video analysis modules that process video data sent from other servers. Having said that, the video analytics server does not perform archiving of the video data being analyzed nor its broadcasting to client workplaces; these actions are performed on the general servers of a video surveillance system. Thus, the Video analytics server allows to remove the load associated with video analysis from the rest of the servers.

Pictures



Details

The Video analytics server supports all the video analysis modules apart from the following:

- Loud Sound Detection
- FishEye Dewarping

If the Video Analytics Server is operating under Linux, it will also be affected by the corresponding restrictions on the video analytics modules.

To assign a server as a video analytics server, it is required to install a special license on it. At that, other licensing capabilities will become unavailable on this server.

Consequently, if the server was used as a video surveillance server before, it is required to transfer all of its cameras to another video surveillance server before using it as a video analytics server.

The server can be assigned as a Video Analytics server for a camera in the [camera connection settings](#) of the **Eocortex Configurator** application.

Features and limitations

The Video analytics server must be of the same version as the video surveillance servers whose video it processes.

A single video surveillance server may have connections with several video analytics servers, and a single video analytics server can process video streams from several video surveillance servers.

If a video analytics server has been assigned for a camera, a motion detection will also be performed on the video analytics server; all the features that use the results of the operation of the motion detector, however, will continue running on the main server.

If a video analytics server has been assigned for a camera, all the video analytics enabled on the camera, with the exception of the unsupported modules, will be processed on the video analytics server.

The video analytics server does not perform recording of the archive, events or any other data related to video processing, apart from the logs that monitor operability. All the events and the archive are recorded on the main server.

To ensure proper operation of the license plate recognition modules and the modules that use neural networks, the corresponding components are required to be installed on the video analytics server. However, it is not necessary to install such components on the video surveillance server.

For the license plate recognition module to work, it is required to install the corresponding license protection key on the video analytics server.

The video analytics server cannot be set as main, backup or replication server for the cameras.

The video analytics server cannot operate under Windows 7 operating system.

The main server cannot use a video analytics server if it runs under Windows 7.

It is not recommended to use the video analytics server as a main server in a multiserver system since it may lead to malfunctions of such system due to the fact that the video analytics server is under high load of the video analysis modules.

The operation of the archive on the main server when recording by the signal of a motion detector running on the video analytics server is described below.

- When recording to the archive by the signal of a motion detector, the results of data processing on the video analytics server will be used.
- In case the connection with the video analytics server is lost, the continuous recording to the archive will be enabled. The recording to the archive will stop as soon as the connection with the video analytics server is restored.
- The continuous recording to the archive will also start if the video analytics server has not sent any events of movement or lack thereof in the course of 30 seconds.

If the connection with the video analytics server is lost, the video from the camera will not be analyzed. The software motion detection will not work either.

Testing of video analysis modules

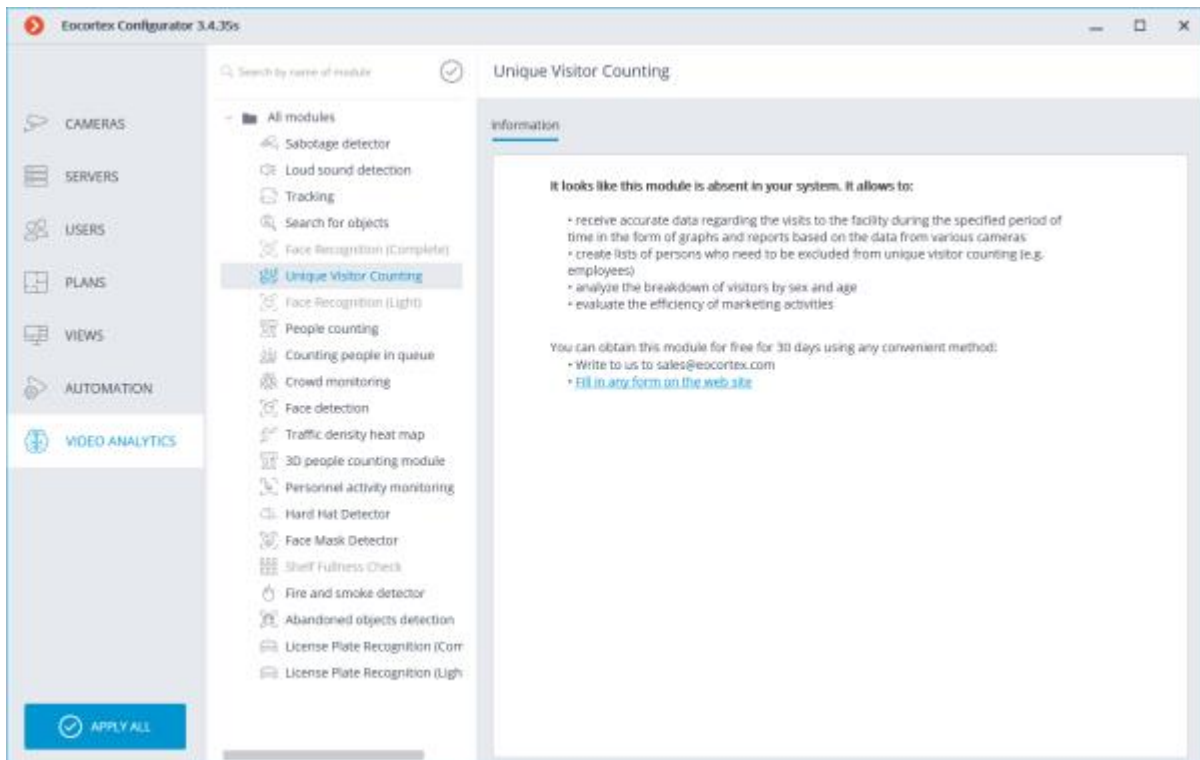
Eocortex provides a simple way of obtaining trial licenses for any video analysis modules used in the current version of the software.

To obtain a trial license, please do the following:

Step 1: Launch the [_Eocortex Configurator](#) application.

Step 2: Open the  [Video analytics](#) page.

Step 3: Select the module highlighted grey (this color is used to mark the modules that are not used in the system).



Step 4: Call the number indicated on the **Information** tab or follow the link and fill in any form.
The **Automatic reports** tab is not available for the trial modules.

Trial license for the License Plate Recognition (Complete) module

The trial license ordering tool that allows trying out the module to the full extent is embedded into the configuration interface of the **License Plate Recognition (Complete)** module's settings in the **Eocortex Configurator** application.



This tool permits to order one of the following **License Plate Recognition (Complete)** licenses that allow to perform recognition of the license plates during 60 days on 4 cameras assigned to the server:

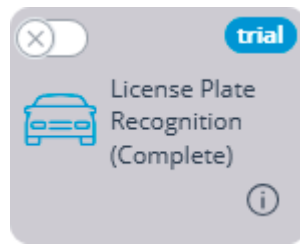
- Type of license: **Highway (25 fps)**
- Type of license: **Parking (6 fps)**

These temporary licenses will not work on virtual machines.

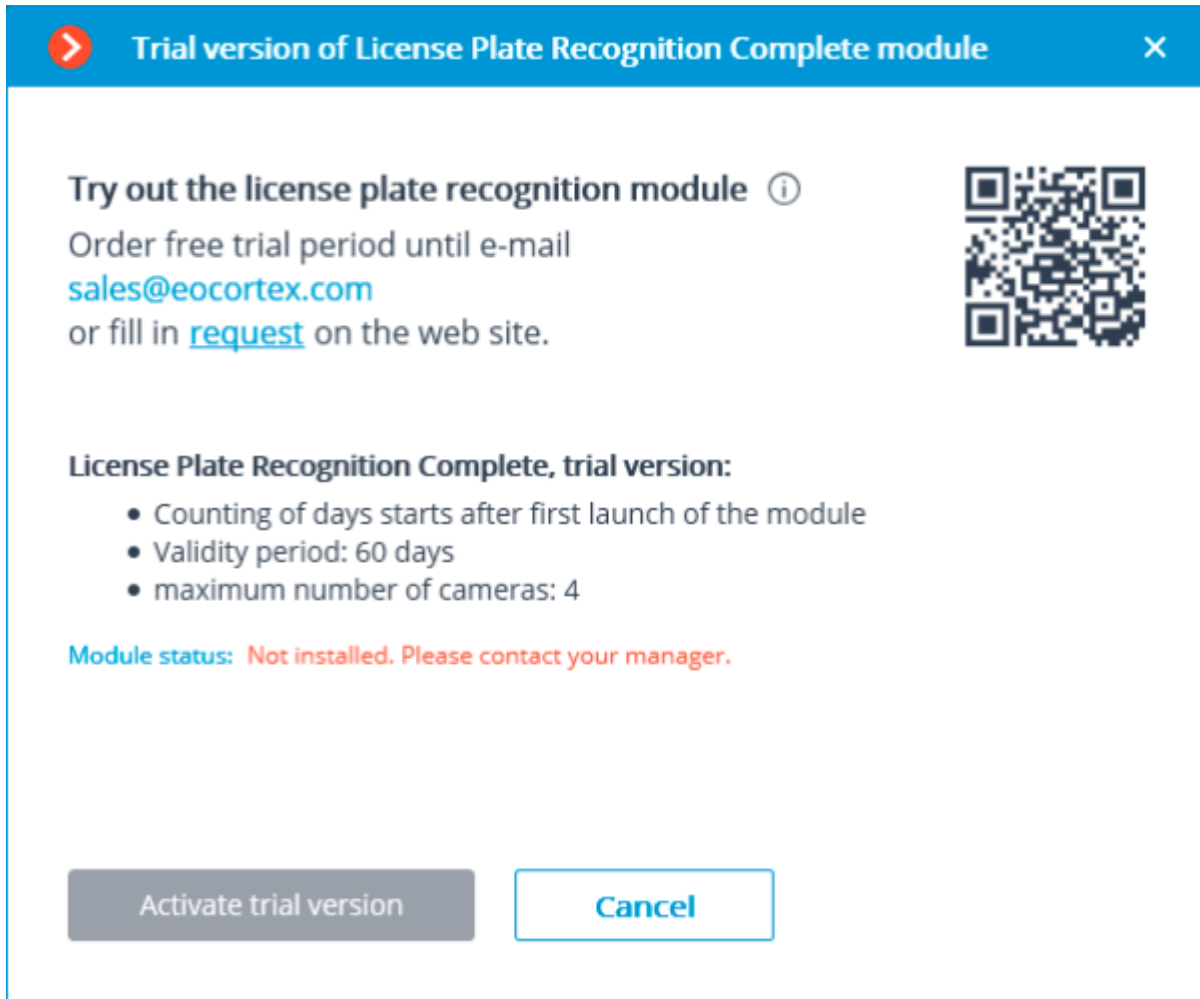
Requesting and installing a temporary license

Before ordering and using a temporary license, it is required to [install the License Plate Recognition \(Complete\) module](#) on your server.

To order a trial license, launch the **Eocortex Configurator** application, go to the  **Cameras** tab, then select a camera in the list on the left side of the page, switch to the **Analytics** tab and press the  button located in the upper right corner of the module's card.



The trial license ordering and Tracking window will open.



You need to request the issuance of a trial license, using one of the following ways:

Contact your personal manager at **Eocortex**;

Call the telephone number shown in the window;

Fill in the form made available in the link shown in the window (by clicking the word **request**);

Scan the QR code shown in the window and complete the form on the web site using your mobile device (the QR code leads to the license request form).

Upon receiving a notification from the manager of **Eocortex** that the update of the **Eocortex** server license has been completed (i.e. when the **License Plate Recognition (Complete)** trial license has been added to the server license), it is required to update the license on the server. To do that, it is required to click on the **Update license** link in the trial license ordering and Tracking window. The **License installation** wizard will open. In this window, you will be offered to perform an automatic update of the license on your server. Depending on the existing license, you will be offered to automatically update your software or USB key (see [License update](#)).

As soon as the **Eocortex** license on the server is updated and the server is restarted, it will be possible to activate the trial license of the **License Plate Recognition (Complete)** module. To

perform the activation, it is required to click on the **Activate trial version** button in the trial license ordering and Tracking window.

To activate, it is necessary to specify the type of the module for which the license will be activated: **Parking** or **Highway**. After that, press **Select**.

As soon as the trial license is successfully activated, the trial license ordering and Tracking window will show the license data.

Instead of the **trial** button, the number of days left before the end of the trial period will be displayed.

End of the temporary license validity period

Starting from the ninth day before the end of the trial license validity period, every time the client application is launched, the notification regarding the upcoming stop of the module's operation will appear.

Additionally, the day counter in the **Eocortex Configurator** application will change its color to attract the attention of the system administrator.

When the trial license validity period ends, the **License Plate Recognition (Complete)** module will stop functioning, and the notification regarding the absence of a license key required for starting the module will appear in the client application. However, the **Eocortex** license for using the **License Plate Recognition (Complete)** module will be retained, and it will be possible to use it in the future provided that the permanent license for the module is purchased.

Also, the **trial** button will disappear from the module's card upon expiration of the trial version validity period.

Errors during activation and use of the trial license

Below is the list of errors displayed in the **Module status:** line of the trial license ordering and Tracking window.

It is required to request and update the license of your server. Please contact your manager. This status is displayed in case of an absence of the **License Plate Recognition (Complete)** module license on the server.

Not installed. Please download the module from the web site and install it. This status appears when there is no **License Plate Recognition (Complete)** module installed on the server.

No connection with server. Please wait until the server restarts. This status is shown in the process of restarting the server after updating the **Eocortex** license.

Error when receiving info from server. The appearance of this status is unlikely. For example, it can appear if the server was rolled back from version 3.1 to an earlier version, while the trial license ordering and Tracking window was still open.

Frequently asked questions

Q: I installed version 3.1, but the **trial** button never appeared.

A: There are several possible causes of the **trial** button not appearing:

Server version is earlier than 3.1;

Camera is bound to a different server;

Eocortex Configurator has no direct access to the server to which the camera is attached;

The trial license has already been used on the given server;

A permanent license is already installed on the given server.

Q: What will happen if another temporary license for the **License Plate Recognition (Complete)** module is installed in **Eocortex Configurator**?

A: Such license will be displayed as well as the trial license. I.e., a day counter will be displayed in **Eocortex Configurator**, and 9 days before the license expiration date a corresponding notification will appear in the client application.

At the same time, if in the earlier version of **Eocortex** a trial license has already been activated on this server, it will not be possible to activate a new trial license.

Q: Is it possible to activate a separate trial license on each server of a multi-server system, or it is only allowed to activate a trial license on one of the servers of such system?

A: It is possible to activate a trial license on each server of a multi-server system.

Q: The following error message appears when attempting to activate a trial license: **Failure to activate trial license. Possible cause: installation on virtual machine.** What to do in this case?

A: Probably, an old version of the **License Plate Recognition (Complete)** module is installed on the server. It is required to install version 3.1 or later of the module.

Related references

[License Plate Recognition \(Complete\) module description](#)

[License Plate Recognition \(Complete\) module installation](#)

[License Plate Recognition \(Complete\) module setup](#)

Different databases of faces and license plates for different cameras

Eocortex permits to create a database of faces or license plates for a specific camera or a group of cameras. It allows to add cameras of different users to the system and to work with various databases.

The support of several databases is available for the following modules:

- **Face Recognition (Complete).**
- **License Plate Recognition (Complete).**

The setup of different databases for different cameras is available only via **REST API**.

Setup


It is required to specify the same unique identifier of a database to use the same unique database on several cameras.

The identifier of the database is the DbId string that can only be set via REST API.

To perform the setup, it is required to do the following:

Step 1: Enable the module on the camera in the **Eocortex Configurator** application.

Step 2: Send a request with the same value of the **DbId** parameter to modify the settings of the corresponding recognition module via REST API for all cameras on which it is required to use the same unique database.

Step 3: In the **Eocortex Configurator** application, go to the  **Users** tab and press the **Users of Eocortex applications** button, then set up the rights in such a way as to grant each user the access only to those cameras that have the same database identifier.

When editing a database from the **Eocortex Client** application, it is imperative that all the cameras of the connected client have the same database; otherwise, one of the databases will be selected randomly.

Limitations and unique features

The **Database identifier** field has been added to the settings of each module to enable the user to set a unique database.

The screenshot shows a software window titled "Face Recognition (Complete)". The window has a blue header bar with a close button (X) on the right. Below the header, there are four tabs: "Main settings", "Detection zone", "Database "Complete"", and "Time logging areas". The "Database "Complete"" tab is currently selected and underlined. The main content area is white and contains the following elements:

- Two radio buttons: "Local" (unselected) and "Remote" (selected).
- Three input fields: "Address" (192.168.200.228), "Port" (3050), and "Type".
- The "Type" field has two radio buttons: "Windows" (selected) and "Linux" (unselected).
- Two input fields: "Name" (SYSDBA) and "Password" (masked with 10 dots and a toggle icon).
- A blue link labeled "Connection check".
- A "Database identifier" label above a text input field containing "Db1".

At the bottom of the window, there are two buttons: a blue "Save" button and a white "Cancel" button with a blue border.

License plate recognition

Countries Barrier gate control Recognition settings License Plate Database "Complete" Automation

Local
 Remote

Enter IP address and port of server with vehicle license plate database (for multi-server configuration)

Address: 127.0.0.1 Port: 3050 Type: Windows Linux

User name: SYSDBA Password:

[Connection check](#)

Database identifier: 123

Apply Cancel By default

The **Database identifier** field is not initially displayed upon enabling the **License Plate Recognition (Complete)** or **Face Recognition (Complete)** modules.

Face Recognition (Complete)

Main settings Detection zone Database "Complete" Time logging areas

Local
 Remote

Address: 192.168.200.228 Port: 3050 Type: Windows Linux

Name: SYSDBA Password:

[Connection check](#)

Save Cancel

License plate recognition

Countries Barrier gate control Recognition settings License Plate Database "Complete" Automation

Local
 Remote

Enter IP address and port of server with vehicle license plate database (for multi-server configuration)

Address: 127.0.0.1 Port: 3050 Type: Windows Linux

User name: SYSDBA Password:

[Connection check](#)

Apply Cancel By default

To use this feature, it is required to specify the **Database identifier** via REST API.

The blank value of the identifier is indicative of the fact that all the cameras are interacting with the same database.

The quantity of the unique databases is not limited.

The number of cameras that can be connected to the selected database is not limited.

Filename creation rules

For the face database: <DatabaseID_>FRDATABASECOMPLETE.FDB.

E.g.:

FRDATABASECOMPLETE.FDB: common face database Complete.

USER12713_FRDATABASECOMPLETE.FDB: unique face database Complete.

For license plate databases: <DatabaseID_>PRDATABASE.FDB.

E.g.:

PRDATABASE.FDB: common license plate database.

USER12713_PRDATABASE.FDB: unique license plate database.

The similar rules apply for the replicated databases.

The similar rules apply for the replicated databases.

The filename (**Database ID**) must be no more than 32 symbols long, contain Latin letters, numbers and the underscore (_). If this rule is not followed, the unique database will not be set.

The **Database ID** is case-insensitive, the same database will be created for **myperfectdb** and **MyPeRfeCtDb**.

Work time logging (Complete) report

Work time logging (Complete) report is formed by areas (zones). An area is a territory where it is required to monitor the presence of persons. The people's faces must be recognized at the entrance to and the exit from the area by the **Face Recognition (Complete)** module. Several cameras may be used for a single area both at the entrance and at the exit.

Related references


[Setting up areas for report](#)

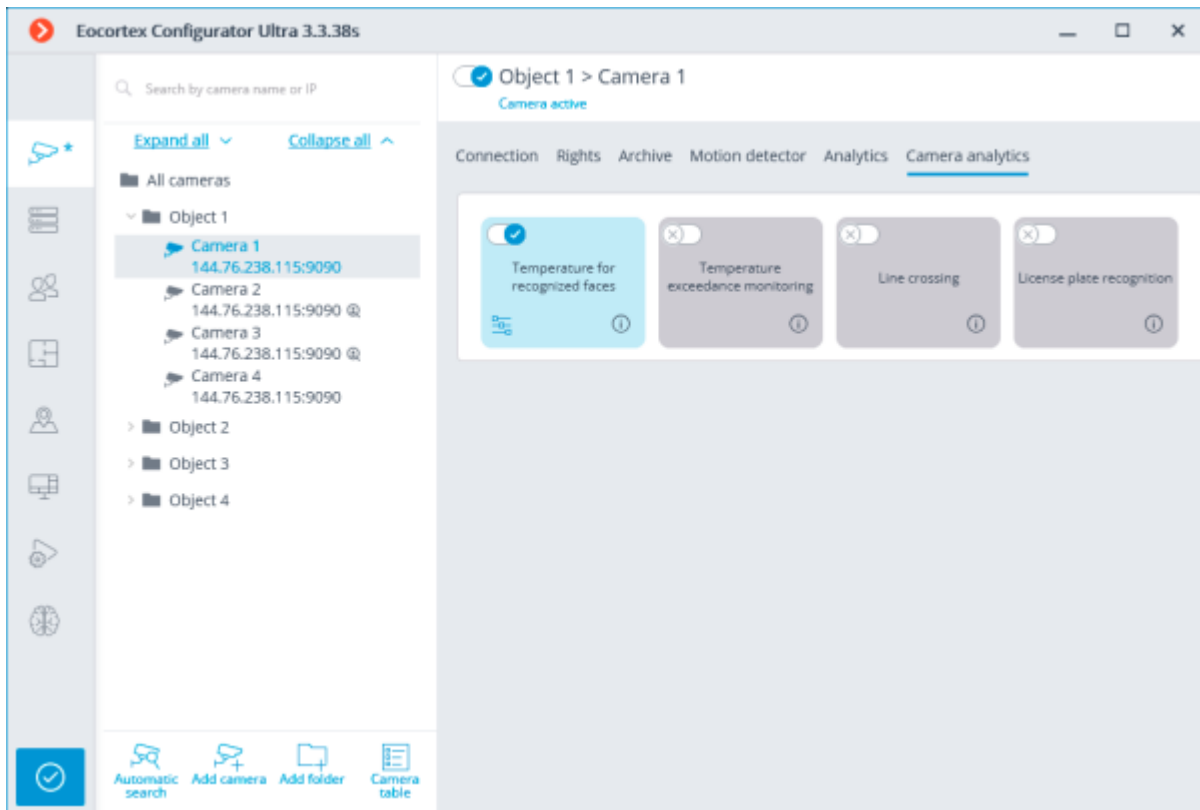
[Report generation](#)

Integration of thermal cameras and Face Recognition

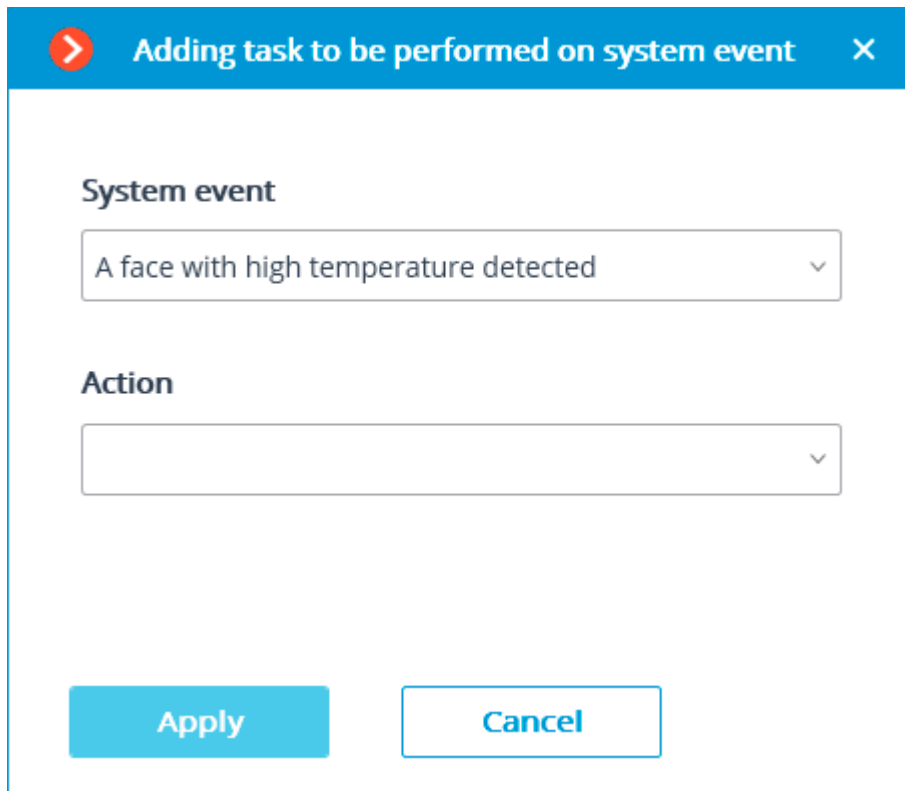
For some camera models that combine the features of a thermal camera and a normal surveillance one, it is possible to send the thermal camera data to the Face Recognition module.

This capability is for a limited number of camera models only and can be used exclusively in the 64-bit Windows version of **Eocortex**.

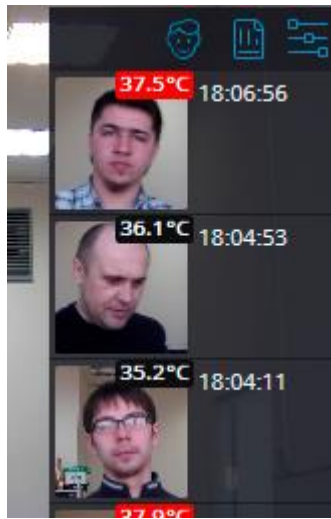
To enable this capability, go to the **Camera analytics** tab in the camera settings of the **Eocortex Configurator** application, activate **Temperature for recognized faces**, open the settings window by pressing  and set the alarm temperature that will generate the alarm events. It is also required to enable and set up any Face Recognition module on the camera.



That done, it will be possible to set up a task upon the event of **Face with high temperature detected**.



In the **Eocortex Client** application, the temperature of the person will be displayed in the real-time video on the Face Recognition panel.



In case a person running a fever is detected, a corresponding event will be registered in the event log. The corresponding frame from the archive will be displayed upon selecting this event; the recognized face will be highlighted by a rectangular frame.

Date	Time	Type	Event description
02.09.2020	18:09:23	▲	Camera 3. A face with high temperature detected: 37.6 °C. Face Recognition (Complete).
02.09.2020	18:08:51	i	Event log opening. User root, IP-address 127.0.0.1, computer petrovich.
02.09.2020	18:07:55	▲	Camera 3. A face with high temperature detected: 38.7 °C. Face Recognition (Complete).
02.09.2020	18:07:47	▲	Camera 3. A face with high temperature detected: 38.7 °C. Face Recognition (Complete).
02.09.2020	18:06:56	▲	Camera 3. A face with high temperature detected: 37.5 °C. Face Recognition (Complete).
02.09.2020	18:03:57	▲	Camera 3. A face with high temperature detected: 37.9 °C. Face Recognition (Complete).
02.09.2020	18:03:12	▲	Camera 3. A face with high temperature detected: 38.7 °C. Face Recognition (Complete).
02.09.2020	18:03:07	▲	Camera 3. A face with high temperature detected: 38.5 °C. Face Recognition (Complete).
02.09.2020	18:03:06	▲	Camera 3. A face with high temperature detected: 38.3 °C. Face Recognition (Complete).
02.09.2020	18:02:19	▲	Camera 3. A face with high temperature detected: 38.5 °C. Face Recognition (Complete).
02.09.2020	18:01:54	▲	Camera 3. A face with high temperature detected: 37.5 °C. Face Recognition (Complete).
02.09.2020	18:01:33	▲	Camera 3. A face with high temperature detected: 38.4 °C. Face Recognition (Complete).
02.09.2020	18:01:22	▲	Camera 3. A face with high temperature detected: 37.5 °C. Face Recognition (Complete).
02.09.2020	18:00:01	i	Monitoring. User root, IP-address 127.0.0.1, computer petrovich.

Mode Cameras Types Events Initiators

Show events (system) not attached to cameras

Search by name or IP of camera

Expand all Collapse all

Camera 2 Camera 3 Camera 4

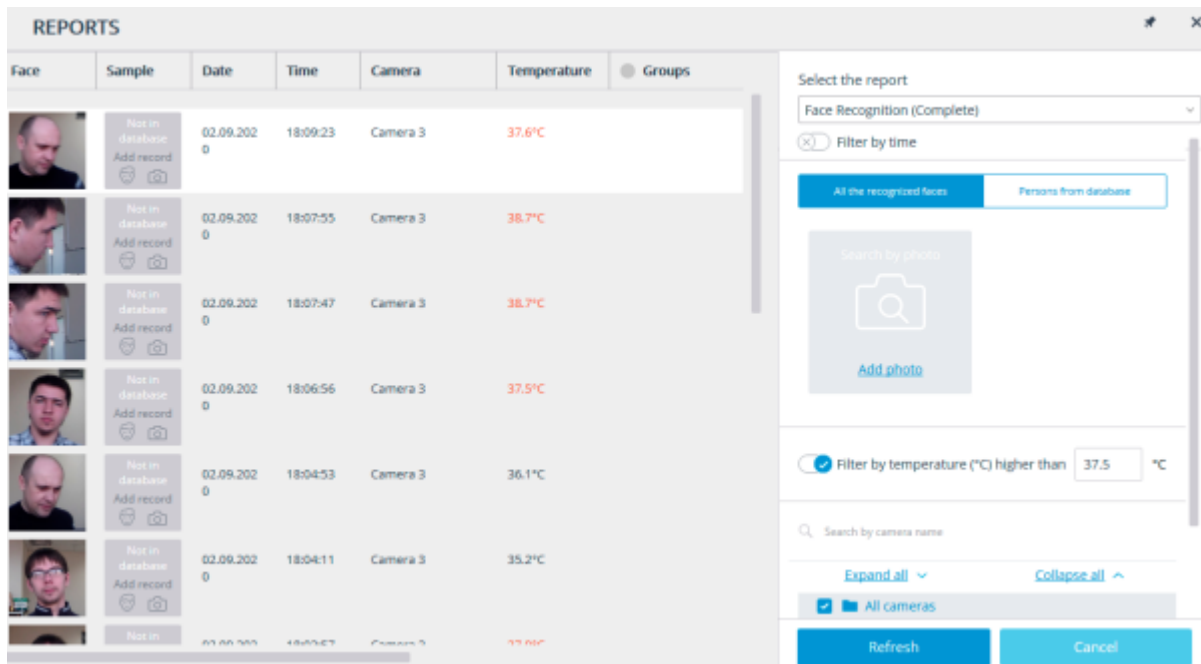
Apply filter Export

ARCHIVE: Camera 3, 02.09.2020 18:07:47.049

17:40:25 02 September 18:00 18:07:47 18:40:25 02 September

The temperature of the person will be registered in the report regarding the recognized faces. Persons running a fever will be marked by orange rectangular frames, those with normal temperature will be marked by grey frames.

It is also possible to filter the list to display the persons with high temperature.



Replication of remote databases of faces and license plate numbers

For the Face Recognition and license plate recognition modules, the replication of the remote database allowing to perform recognition even in the temporary absence of a connection with the remote databases has been implemented.

The replication works as follows:

When a remote database (hereinafter face or license plate database is meant) is used on the server where the recognition is performed (to which the recognition cameras are bound), a local copy (replica) of the remote database is created. Further, a synchronization of the local copy with the remote database is performed. In the event of losing connection with the remote database, its local copy will be used.

All the modifications made to the database (adding, editing and removing entries) is performed exclusively upon availability of a connection with the remote database. When the connection is lost, the recognition will be performed on the basis of the entries present in the local copy of the database.

The remote database is copied (replicated) to the server in the following cases:

- Immediately after the changes to the database are made by the camera bound to the server or by the client computer connected to the server;
- Immediately after the connection of the server with the remote database is established (in case the connection was lost before that or the server has just been launched);
- Once every minute (if the connection has not been interrupted, and no changes have been made from the computer).

The replication was introduced in Version 3.1. In addition, the structure of the database has changed, as compared with the versions 3.0 and earlier. Due to that fact, in order to work properly with the remote database, it is required to update the version on all the video surveillance system servers, including the one where the remote database is located.

If for some reason it becomes necessary to roll back to Version 3.0 or earlier, it is required to contact [Eocortex technical support team](#).

Eocortex Client

Alarms

In **Eocortex**, the term **Alarm** refers to an event requiring attention.

Description

In the **Eocortex Client** application, an alarm is triggered on a camera only when the **Guard mode** is enabled on that camera.

The **Guard mode** can be enabled from the context menu of the camera cell either manually or automatically, using a schedule. The Guard mode schedule can be set in the [current workplace settings](#).

The alarm on the camera is triggered in the following cases (in such cases, the **Guard mode** on the camera must be enabled):

- From the context menu of the [cell](#);
- When the [on-screen button](#) is pressed (in this case, the alarm will be triggered on cameras specified in the settings of the current workplace);
- When the motion detector is triggered;
- When the **Alarm generation** action is performed (it can be configured in the **Eocortex Configurator** application, in the **Automation** section).

Alarms are [displayed on screen](#) as follows:

- If an alarm is triggered on a camera that is displayed on the screen in real time, the alarm icon in the upper right corner of the camera cell will flash.
- If an alarm is triggered on a camera that is not displayed on the screen, or is reproducing the archived video at the time of the alarm, a large alarm icon will blink in the lower right corner of the screen.

Every alarm must be accepted. To accept the alarm, it is required to click on the cell of the alarm camera. An alarm not accepted within 60 seconds is considered missed.

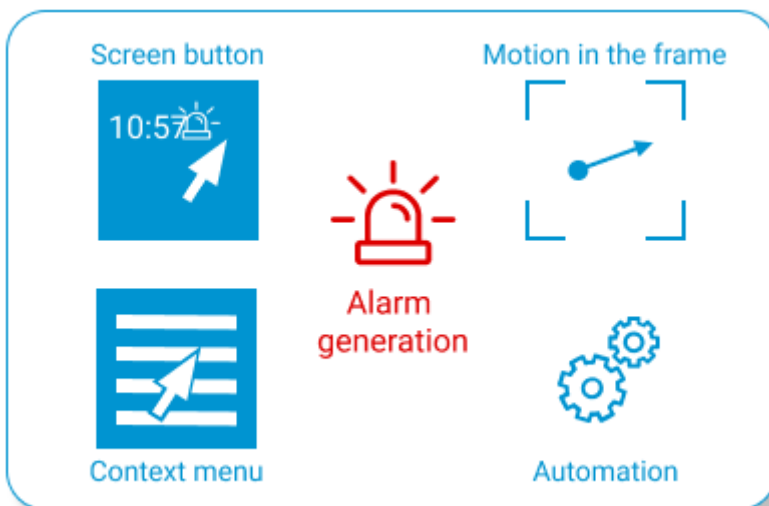
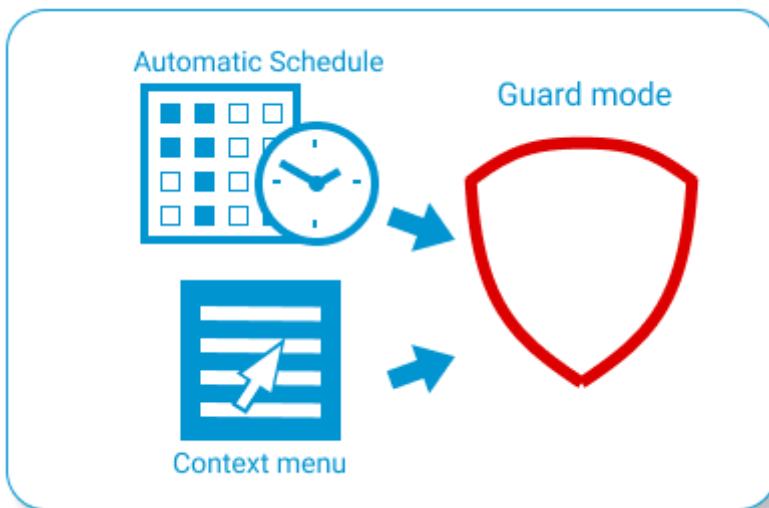
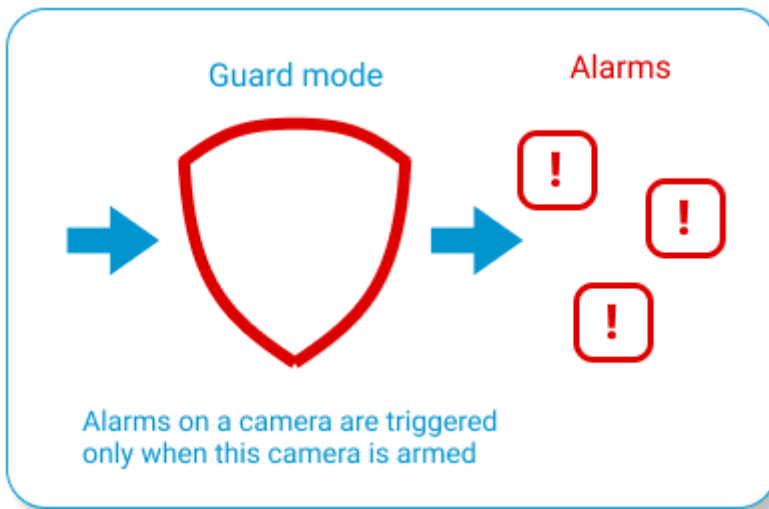
All alarms are stored in the **Event Log**. When viewing the **Event Log**, it is possible to filter alarms by various criteria, including whether they have been accepted or missed. In this case, it is possible to go to the archive from the **Event Log** to see the situation that caused the alarm.

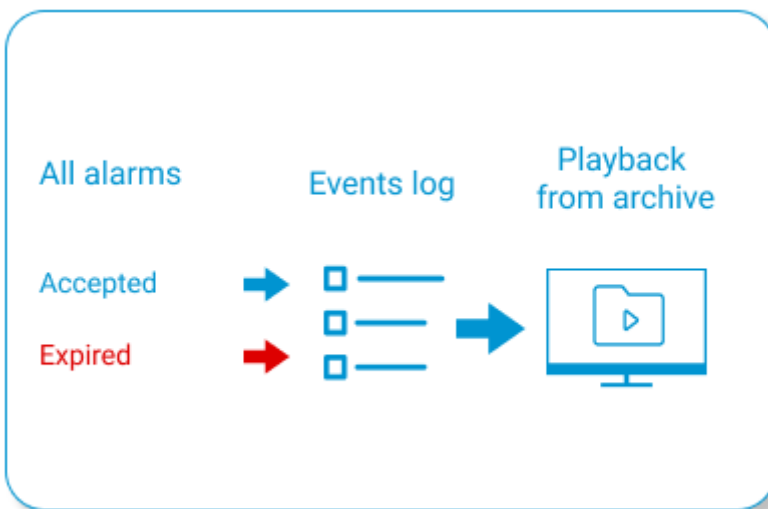
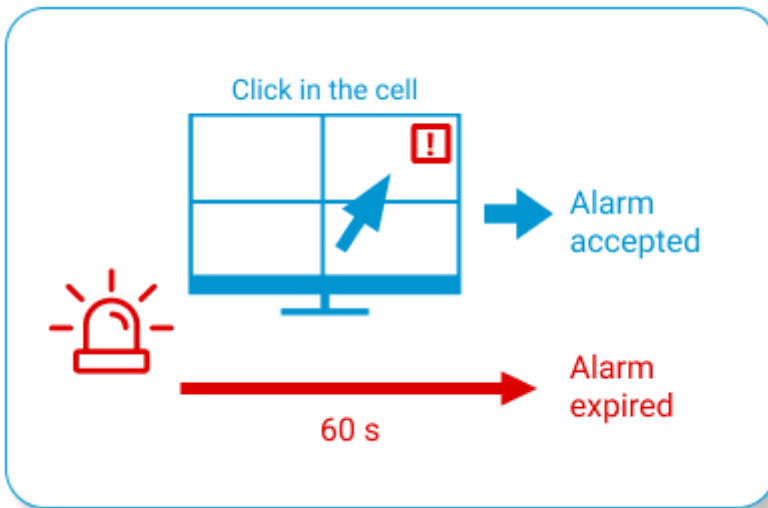
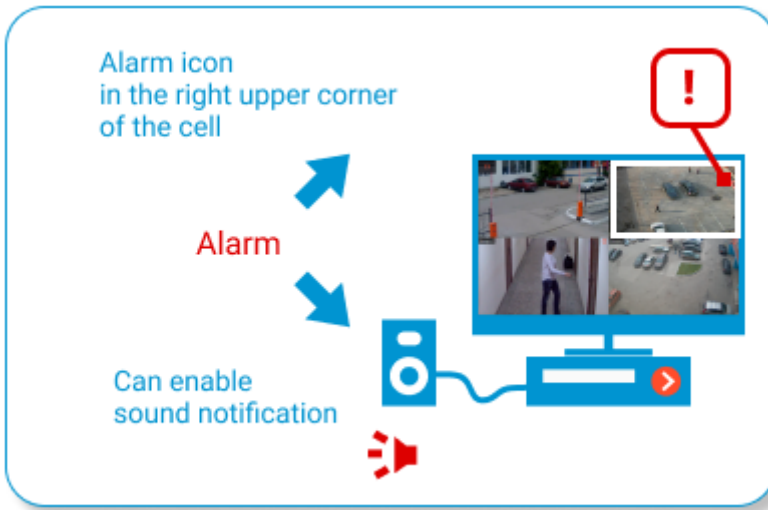
Some of the cells on the screen can be used as alarm cells. In such a case, the cameras that are not on the screen at the time of alarm will be displayed in alarm cells. If all the alarm cells are occupied, the cameras will remain hidden and a large alarm icon will flash in the lower right corner of the screen. A cell is considered free if no cameras are displayed in it, or when a camera with an already received or missed alarm is displayed.

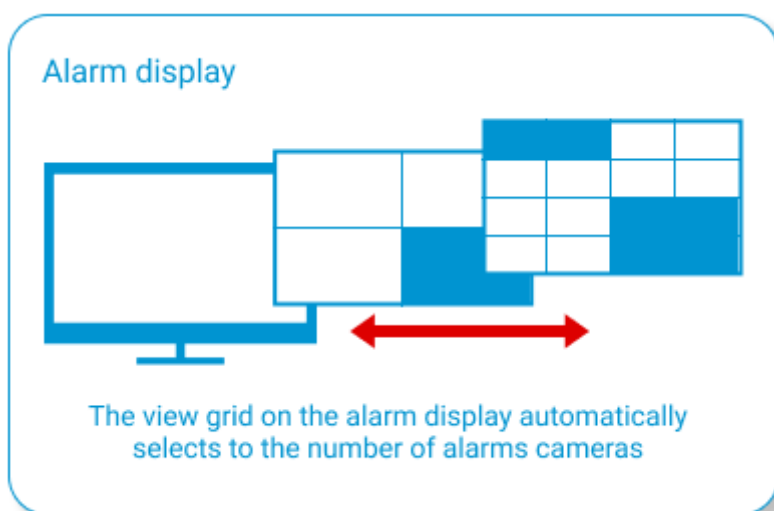
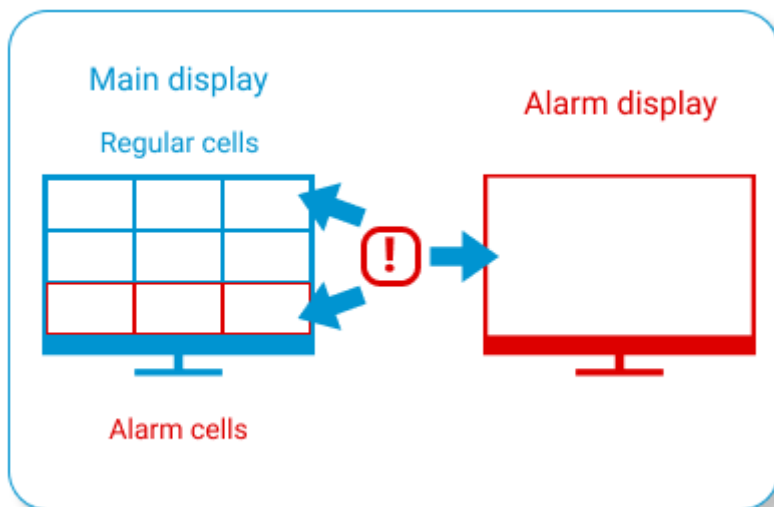
One of the monitors can be used as an alarm monitor. In this case, the cameras that are absent in the normal cells of the main monitors at the time of the alarm will be displayed on the alarm monitor. The screen grid on the alarm monitor is automatically selected so that all the alarm cameras are displayed on the screen. The cells with alarms already received or missed are considered free. Can also [pin a cell to grid](#) on the alarm monitor.

If the workplace has audio playback devices, it is possible to configure audio alerts for alarms.

Pictures







Related references

[Working with alarms](#) in the **Eocortex Client** application

[Setting up alarm buttons and cells](#)

[Setting up alarms, sound annunciation and scheduled guard mode](#)

[Selecting cameras for user alarm](#)

[Setting up alarm monitor](#)

Alarm generation actions



User tasks

The users of **Eocortex** client applications can start any actions implemented in the video surveillance system, as well as the sequences of such actions, by themselves. To enable that, the user tasks are added to the **Eocortex Configurator** application, following which these tasks can be launched in Android, iOS and Windows client applications.

To prevent an erroneous launch of the tasks, the launch confirmation option has been introduced: the tasks where this option is enabled will only be launched after an additional confirmation by the user.

It is possible to forbid launching user tasks in the user rights settings: all the tasks on all cameras or individual tasks on the specified cameras can be forbidden. By default, all users have permission to launch user tasks.

Launching tasks in the client applications is performed in a similar manner, differing only in details.

If user tasks are set up on a camera, and the user has the rights to execute these tasks, then, in the client application, in the observation mode, during the activation of such camera, the  or  button will be displayed in the cell, depending on the quantity of tasks that can be launched on the camera (one or more).

If only one task is set up on the camera, it will be executed upon pressing the button.

If there are several tasks set up on the camera, a list of those tasks will open upon pressing the button, and the task will be executed only as it is selected in the list.

If the launch confirmation has been set in the configuration of the task, a dialog will open before the launch. In this dialog, it will be possible to confirm or cancel the launch.

After launching the task, the corresponding notification will appear on the screen.

Related references

[Adding, modifying and deleting user tasks](#)

[Setting up rights of access to user tasks](#)

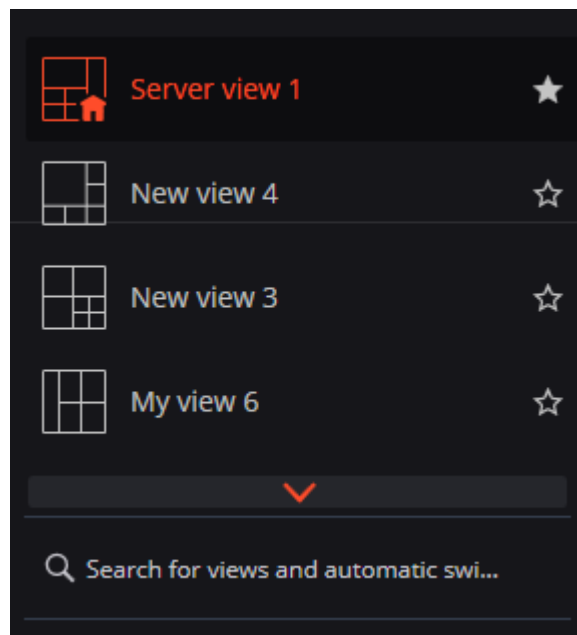
Server and Client views

To display the images from the cameras on the screen in the client applications, **Eocortex** uses **Views** – grids with the images from the cameras shown in the cells. There are two types of views: Server and Client ones.

- **Server View** is a view created by a video surveillance system administrator in **Eocortex Configurator**. The server views are available in the **Eocortex Client** application as well as in the mobile client applications working under Android and iOS. In a multi-server system, the server views are available when connecting to any server of the system via the client application. At that, the server view is added to the client application at the moment of launching it. Thus, if you create or modify a server view, the changes will appear only after the restart of the application.
- **Client View** is a view created by a user in the client application. The client views are available only on a particular device or computer on which they were created, and only for the particular user who created them. Upon the termination of a session of working with the client application, all the client views that contain no cameras are deleted.

The server views that contain no cameras will not be added to the client application when it is launched.

In the client application, a server view can be distinguished from a client view by the presence of an icon in the form of a house in the lower right corner of the schematic representation of this view of the server application.



Until version 3.0 inclusively, it was possible to use server views only for displaying cameras. That said, it was possible to select a screen grid in the client application and place cameras in its cells as required.

Related references

[Server view setup](#)

Electronic signature

The electronic signature permits to confirm the authenticity of the exported file, as well as its ownership.

The availability of an electronic signature is one of the requirements of the General Data Protection Regulation (GDPR).

Preparation of electronic signature

The exported files are electronically signed using X509 certificates. Only the certificates that use the RSA asymmetric algorithm are supported.

The signatory's root certificate can be either a self-signed root certificate or a certificate purchased from a certification authority.

The end certificates must be generated on the basis of the signatory's main certificate, one for each user. These certificates must be installed on a computer. Their installation is carried out either by means of the operating system or using specialized software.

The signatory's root certificate must be included in the trusted list of the relying party.

Certificate generation

File signing certificates can be generated using the free [OpenSSL](#) utility.

It is necessary to select the version of the **OpenSSL v1.1.1s Light** distribution kit that matches the bitness of the operating system used.

The steps below are a sequence of commands that should be executed on the **Command line**.

Step 1. Add the **OpenSSL** folder to the **PATH** environment variable.

For Win64 OpenSSL v1.1.1s Light use:

```
path=%path%C:\Program Files\OpenSSL-Win64\bin\;
```

For Win32 OpenSSL v1.1.1s Light use:

```
path=%path%C:\Program Files\OpenSSL-Win32\bin\;
```

Step 2. Create a directory that will contain the generated certificates. On the command line, navigate to the created directory.

Step 3. Create the root certificate private key file:

```
openssl genrsa -out *rootCertKeyName*.key 2048
```

Step 4. Create the root certificate:

```
openssl req -x509 -new -key *rootCertKeyName*.key -days 10000 -out *rootCertName*.crt
```

The command will prompt for the certificate details.

Step 5. Create the service private key:

```
openssl genrsa -out *serviceCertKeyName*.key 2048
```

Step 6. Create the Certificate Signing Request (CSR):

```
openssl req -new -key *serviceCertKeyName*.key -out *serviceCertRequestName*.csr
```

The command will prompt for the certificate details.

An important point is to fill in information about the **Common Name (e.g. server FQDN or YOUR name)** with the IP address of the service.

Step 7. Create the service certificate by signing the CSR with the root certificate:

```
openssl x509 -req -in *serviceCertRequestName*.csr -CA *rootCertName.crt -CAkey *rootCertKeyName*.key -CAcreateserial -out *serviceCertName*.crt -days 5000
```

Step 8. Export the certificate and private key into a single file:

```
openssl pkcs12 -export -out *serviceCertFileName*.pfx -inkey *serviceCertKeyName*.key -in *serviceCertName*.crt -certfile *rootCertName*.crt
```

Steps 5 - 8 should be repeated for each user who needs to generate a certificate. To do this, you need to replace the ***serviceCertName*** string in the commands with the **username** written in Latin letters without spaces.

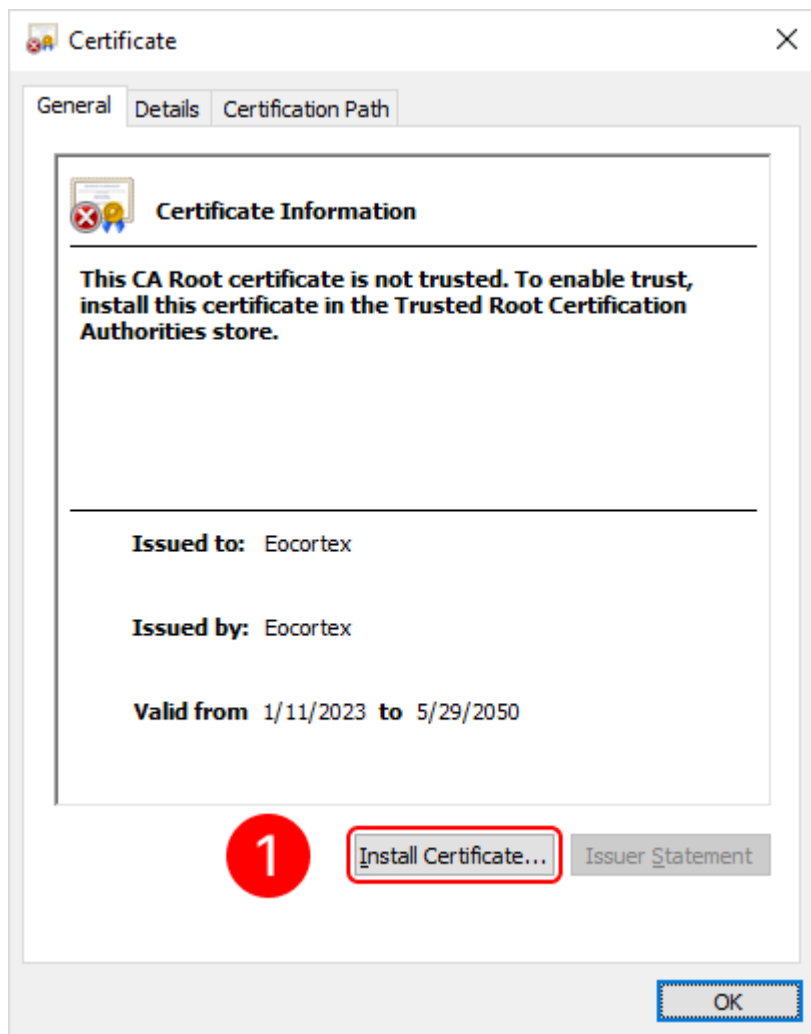
The corresponding **.pfx** files must be given to users and [imported into the operating system](#) at their workstations.

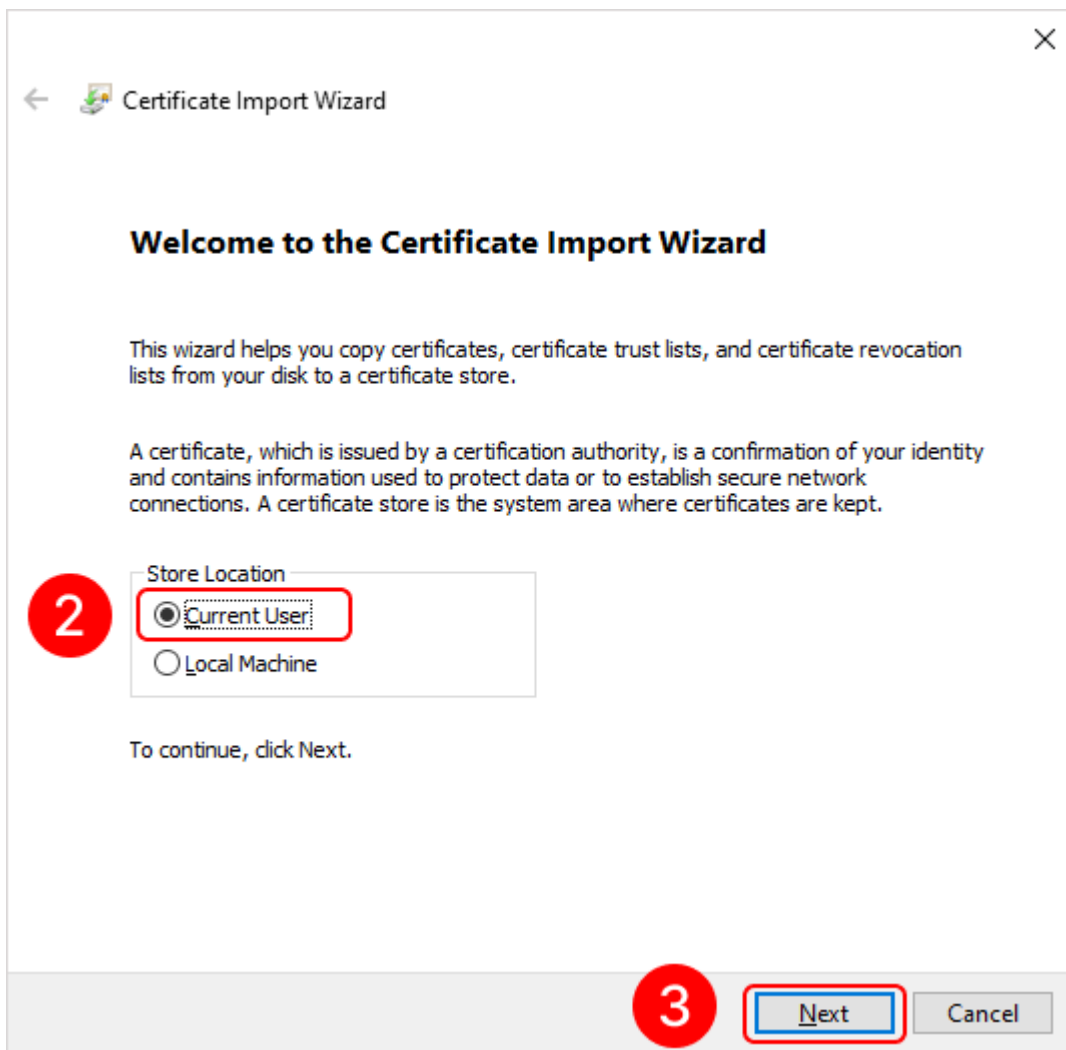
The root certificate ***rootCertName*.crt** must be [imported into the operating system](#) at all workstations where it is planned to verify the electronic signature.

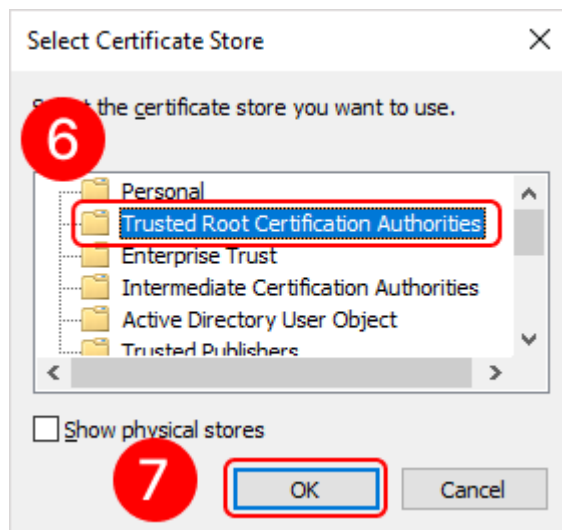
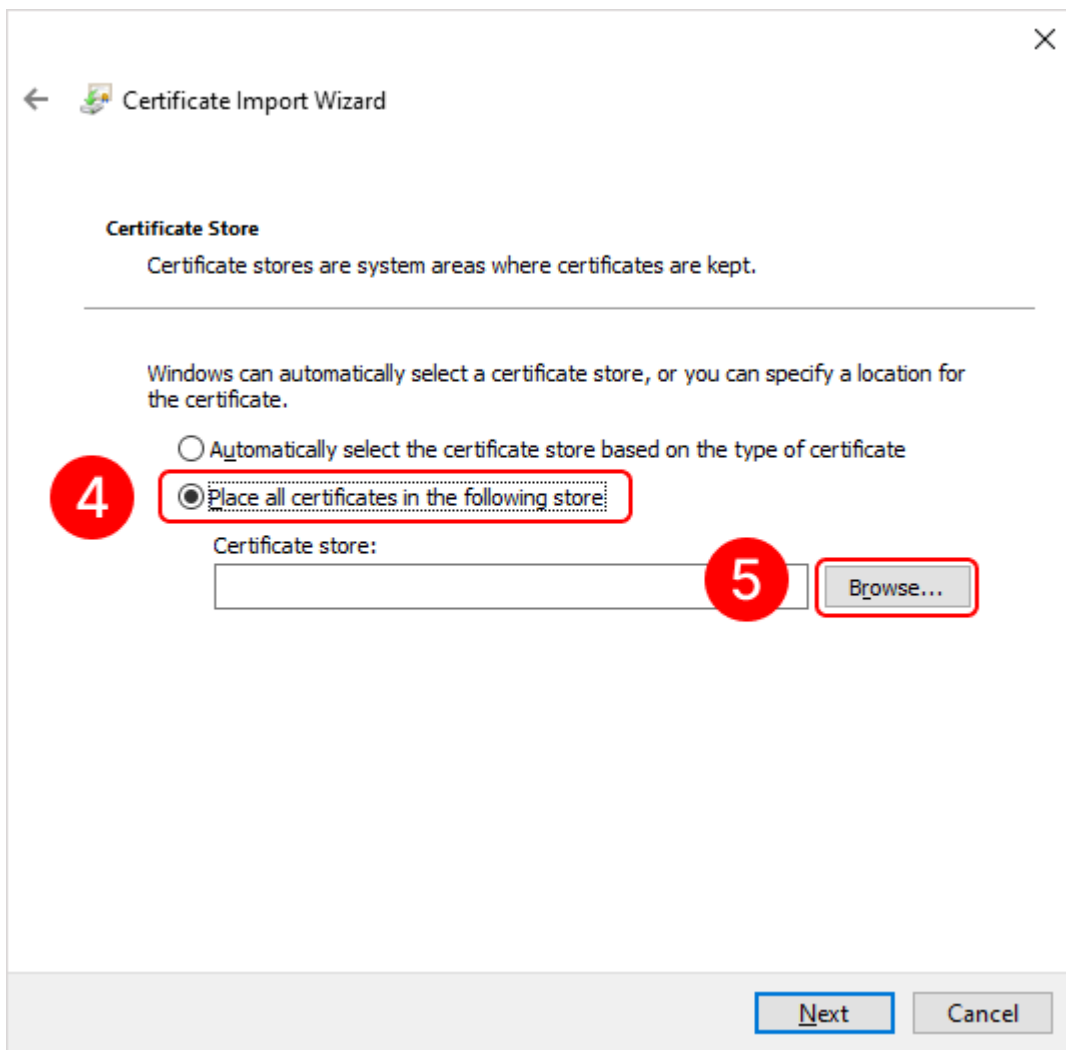
Importing certificates into the system

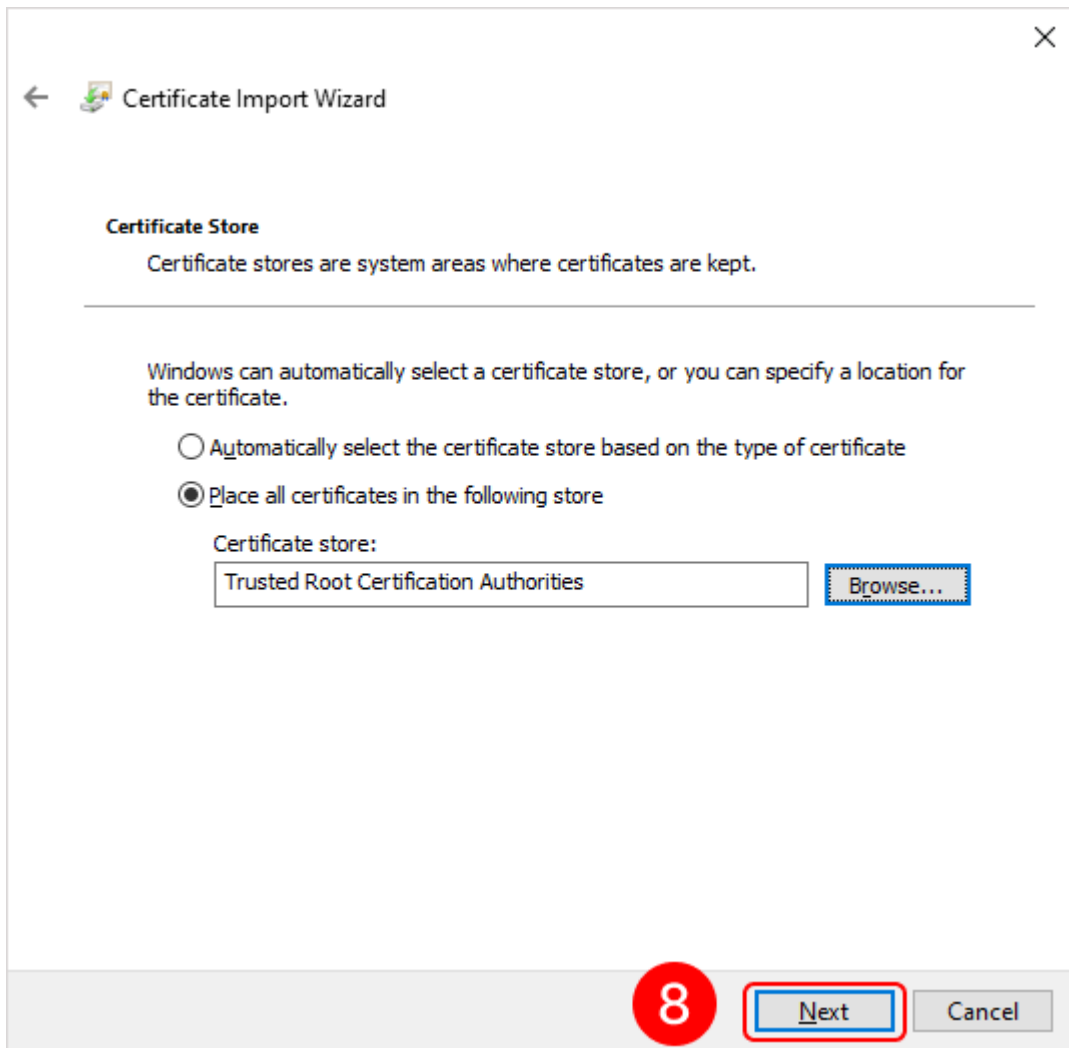
Importing the root certificate by the Relying Party

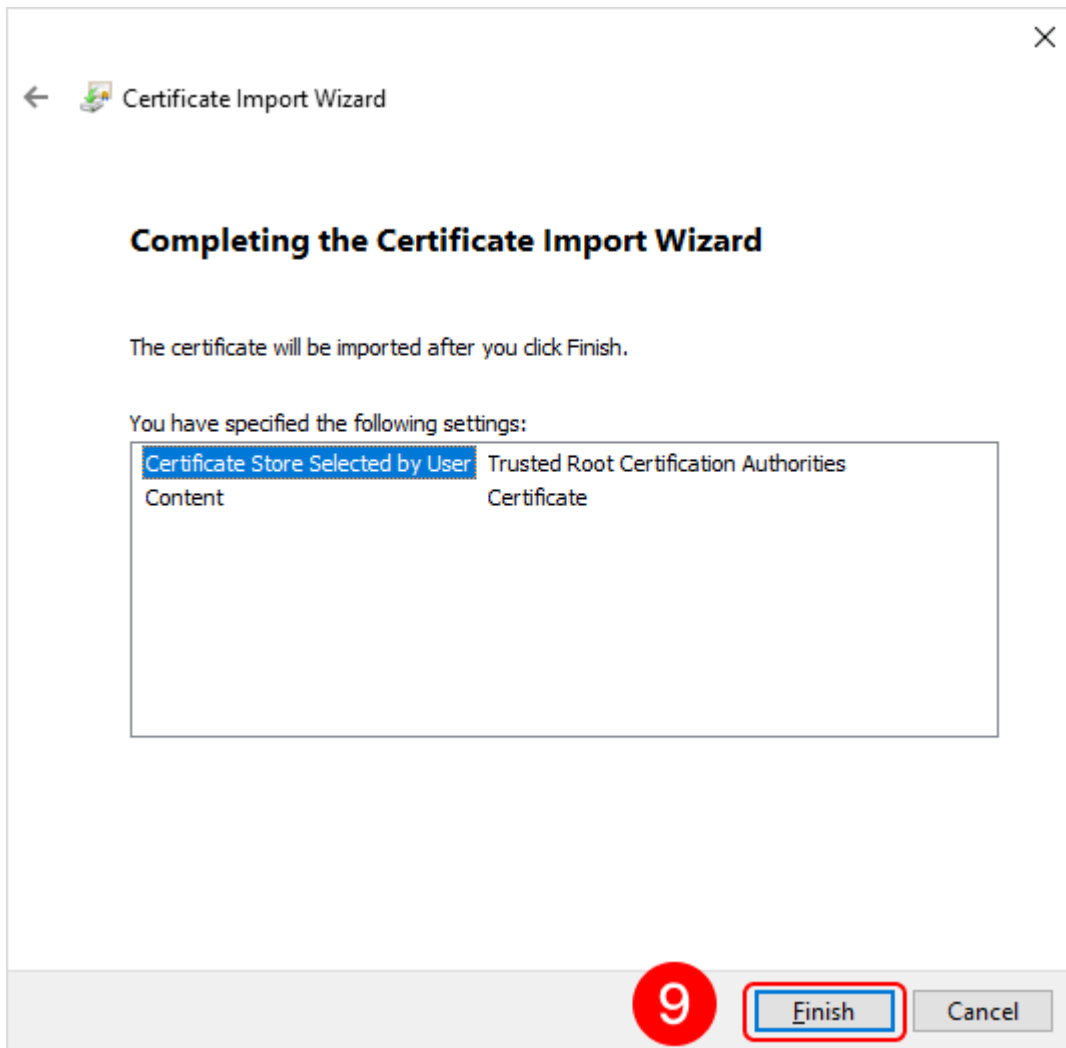
To add a root certificate, double-click on the ***rootCertName*.crt** file. This will open the **Add Certificate Wizard** window. Next, follow the steps indicated by the numbers in the images below:





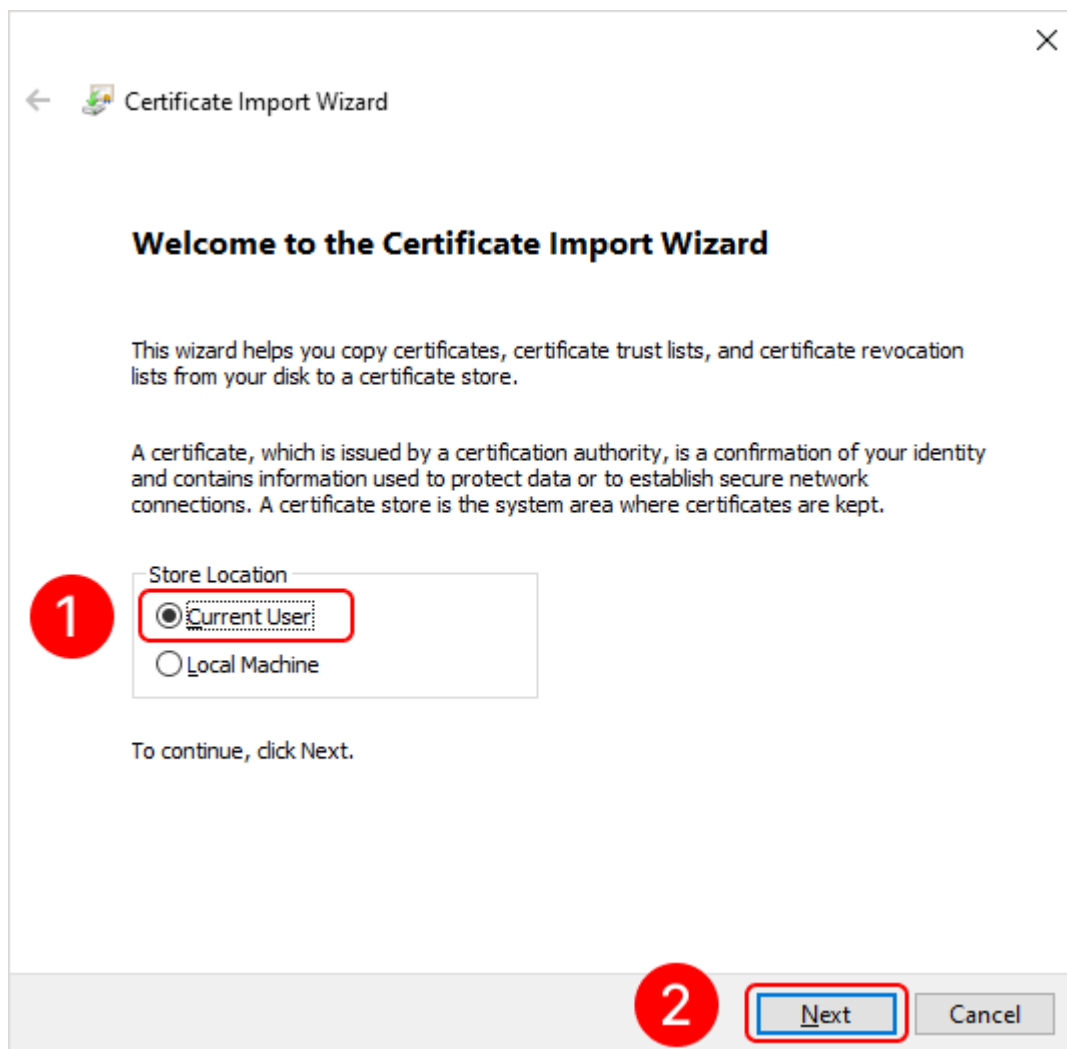


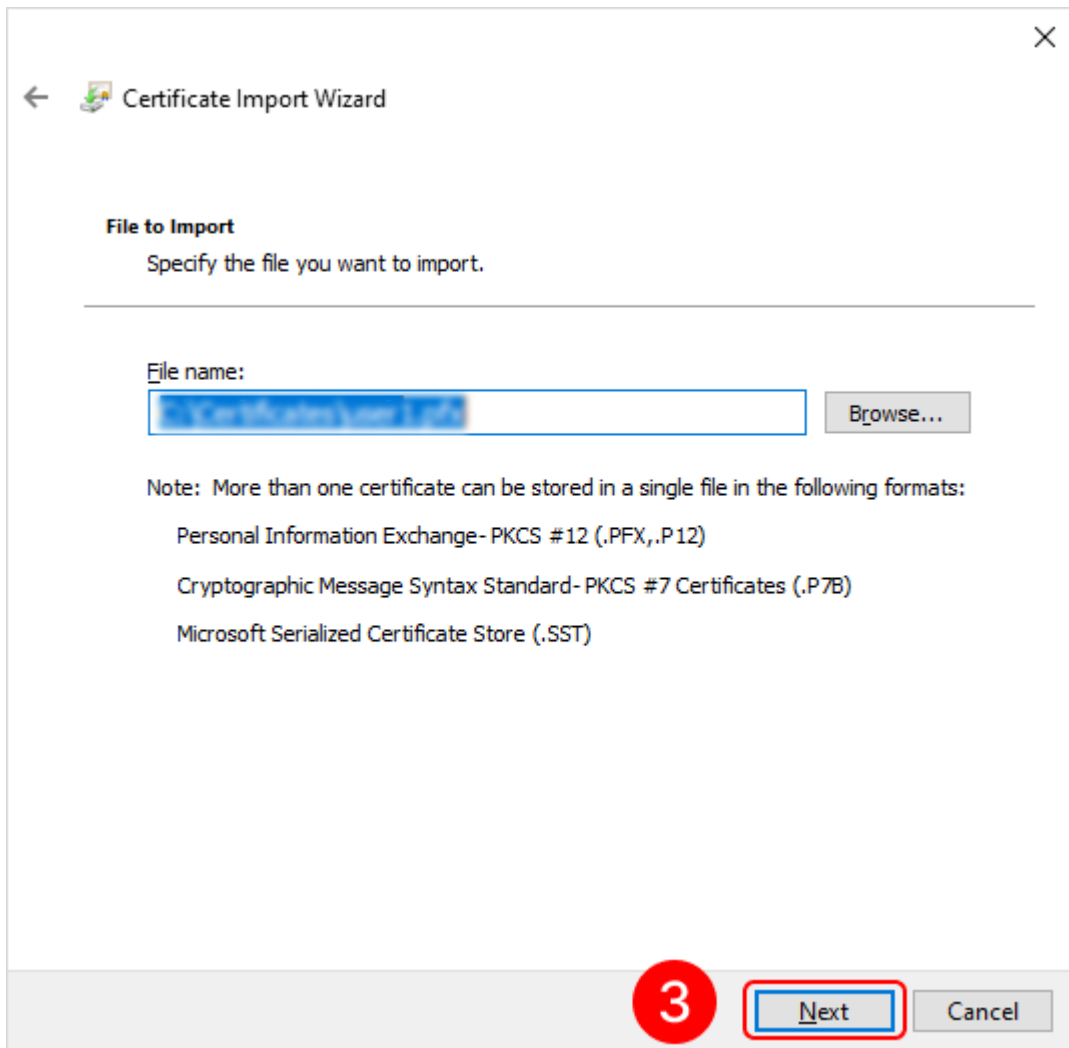


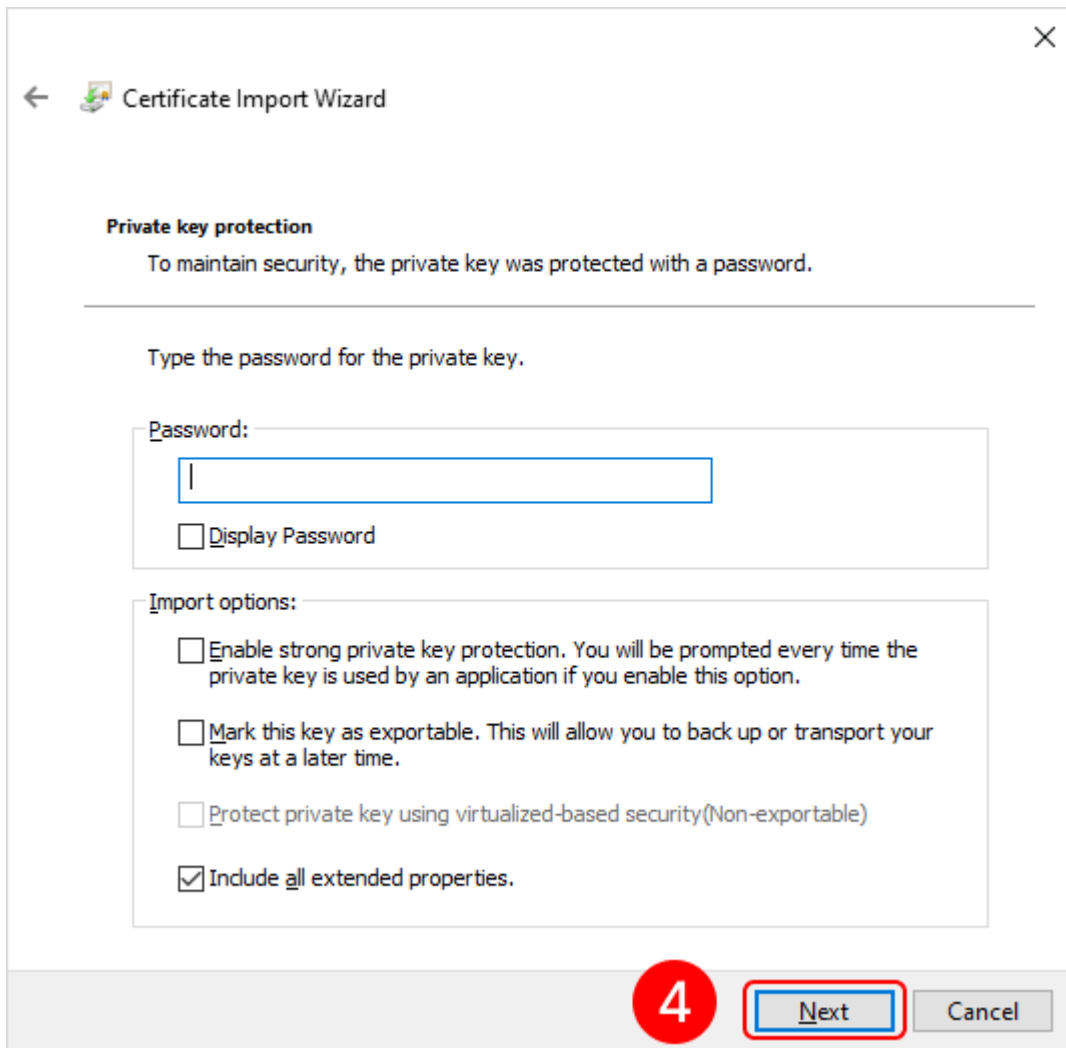



Importing a user certificate by a Signer

To add a personal user certificate that will be used for signing files, double-click on the **user.pfx** file. This will open the **Add Certificate Wizard** window. Next, you need to follow the steps in the images below:







←  Certificate Import Wizard ×

Private key protection
To maintain security, the private key was protected with a password.

Type the password for the private key.

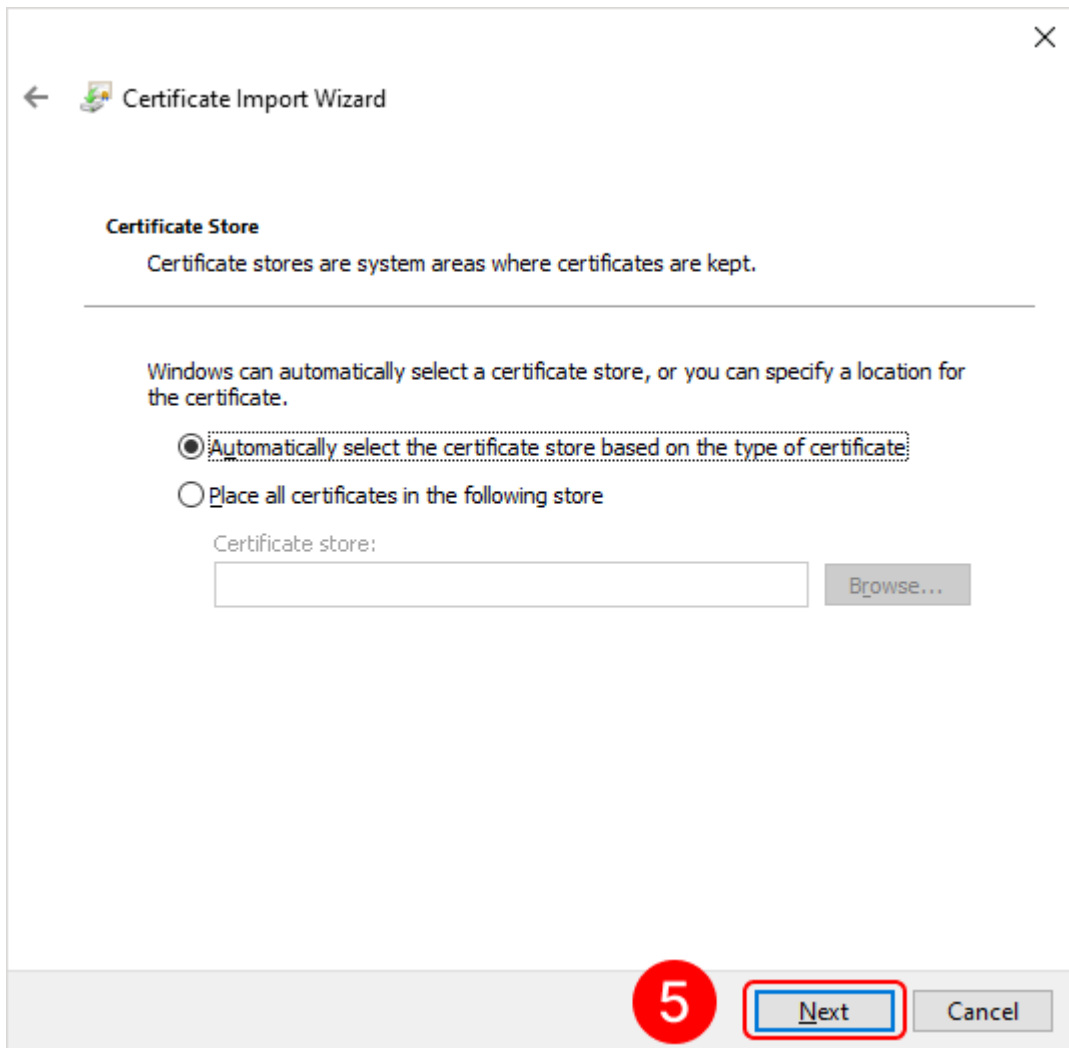
Password:

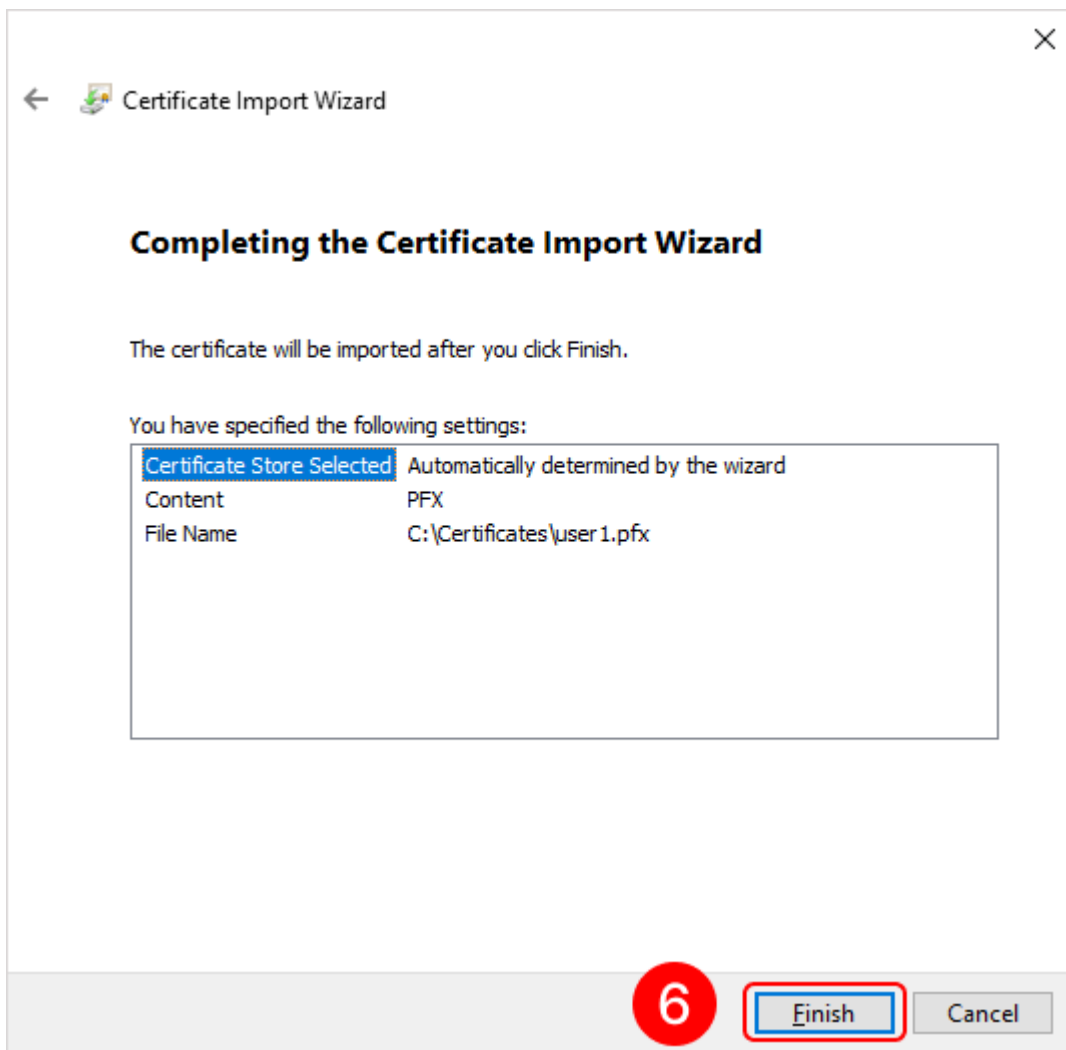
Display Password

Import options:

- Enable strong private key protection. You will be prompted every time the private key is used by an application if you enable this option.
- Mark this key as exportable. This will allow you to back up or transport your keys at a later time.
- Protect private key using virtualized-based security(Non-exportable)
- Include all extended properties.

4







Eocortex Client application setup

Step 1: Open the **Eocortex Client** application under the account that will be used to export the signed files.

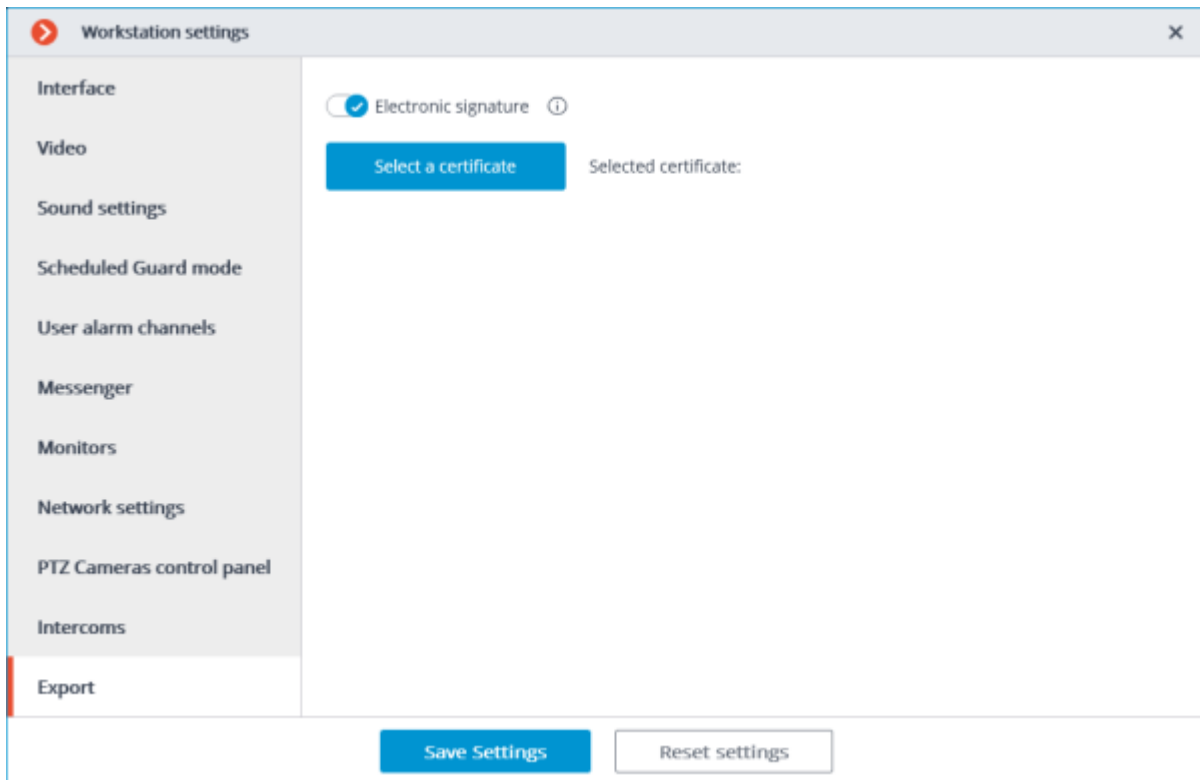
Step 2: Go to the control panel clicking on the button  located in the upper left corner of the window.

Step 3: Select the item  **Settings** in the menu, then select the subitem  **Workplace settings**.

Step 4: Go to the **Export** tab.

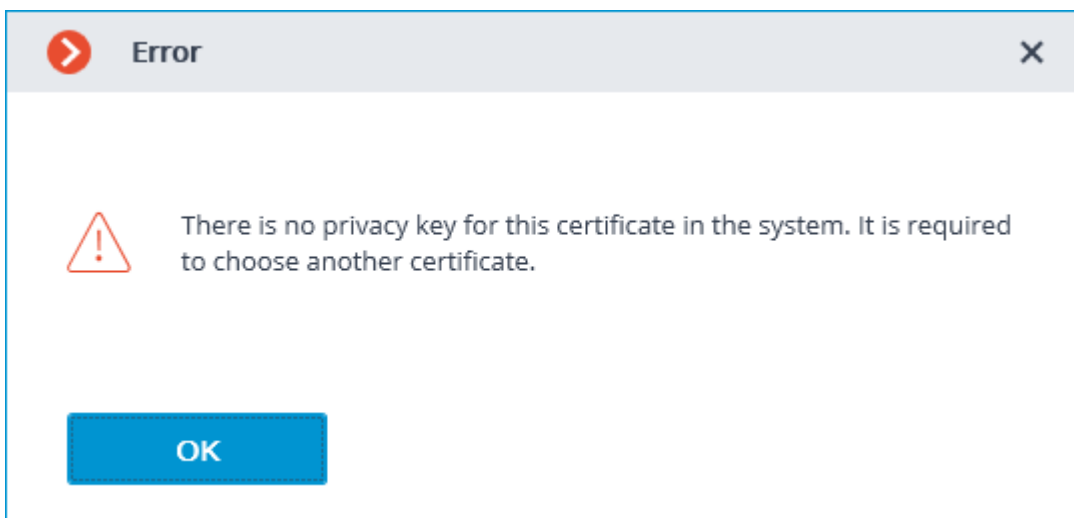
Step 5: Enable the **Electronic signature** option using the switch .

Step 6: Press the button **Select a certificate**.



Step 7: In the opened window, select the certificate that the given user will use for signing the files.

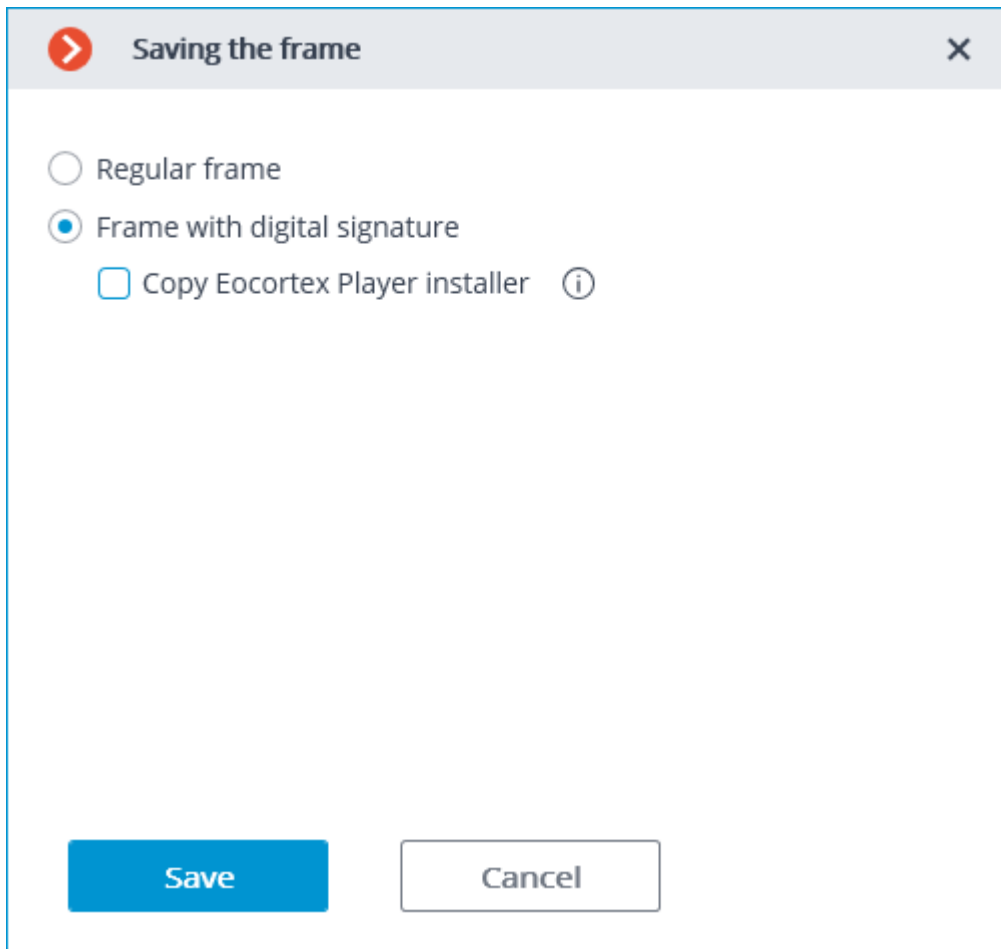
It is important that the imported certificate has a private key. If there is no such key, or the certificate uses an asymmetric algorithm other than RSA, then when you will receive the following error message when trying to select such a certificate:



Signing a saved frame

In order to sign a saved frame, click on the icon  in the active cell or in the archive cell, or open the context menu and select the **Save frame** item.

Subsequently, open the item **Frame with digital signature** in the window that has appeared.

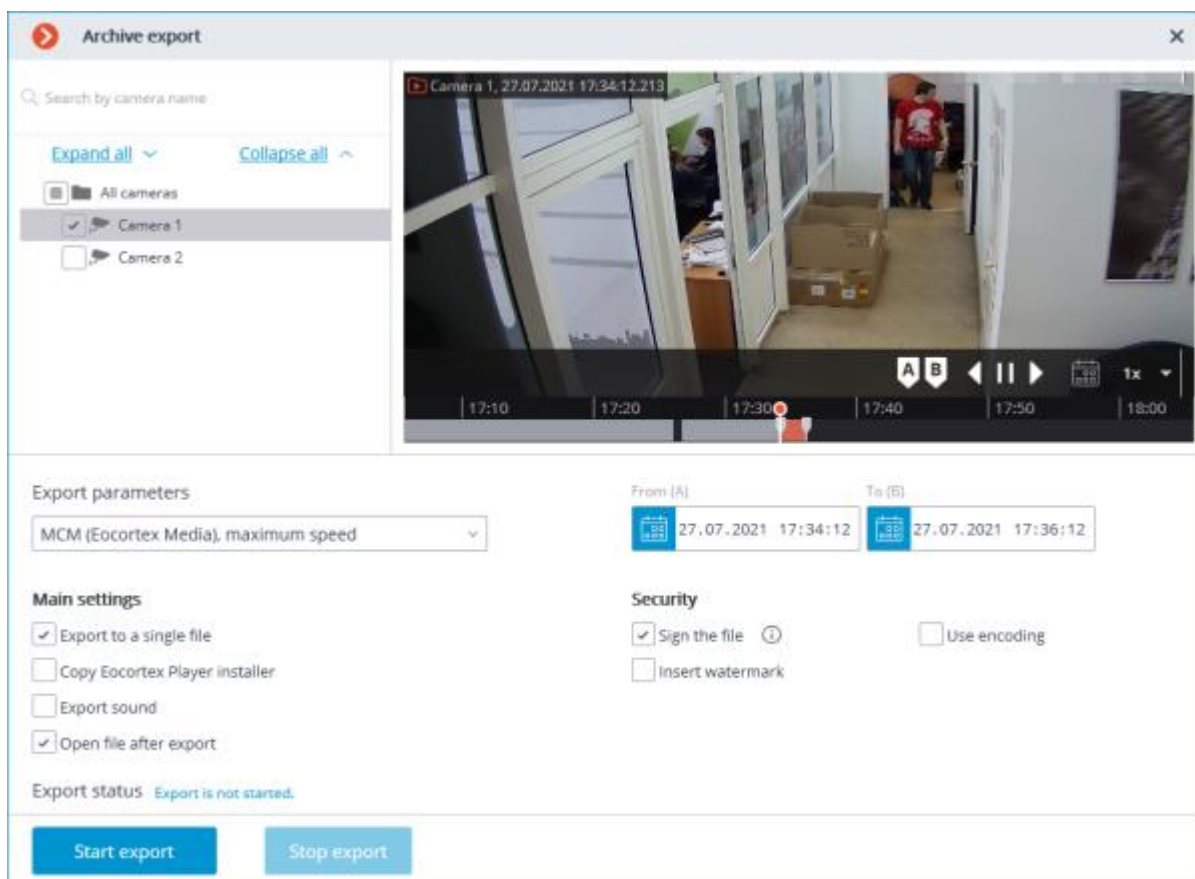


Pressing the **Save** button opens the dialog screen with the option of selecting the storage location for the frame to be saved.

If an electronic signature has not been set, the dialog screen with the option of selecting the storage location for the frame to be saved will open immediately instead of the **Save frame** window.

Signing video clips to be exported

Enable the option **Sign the file** in the [Archive export](#) window in order to sign the archive to be exported.

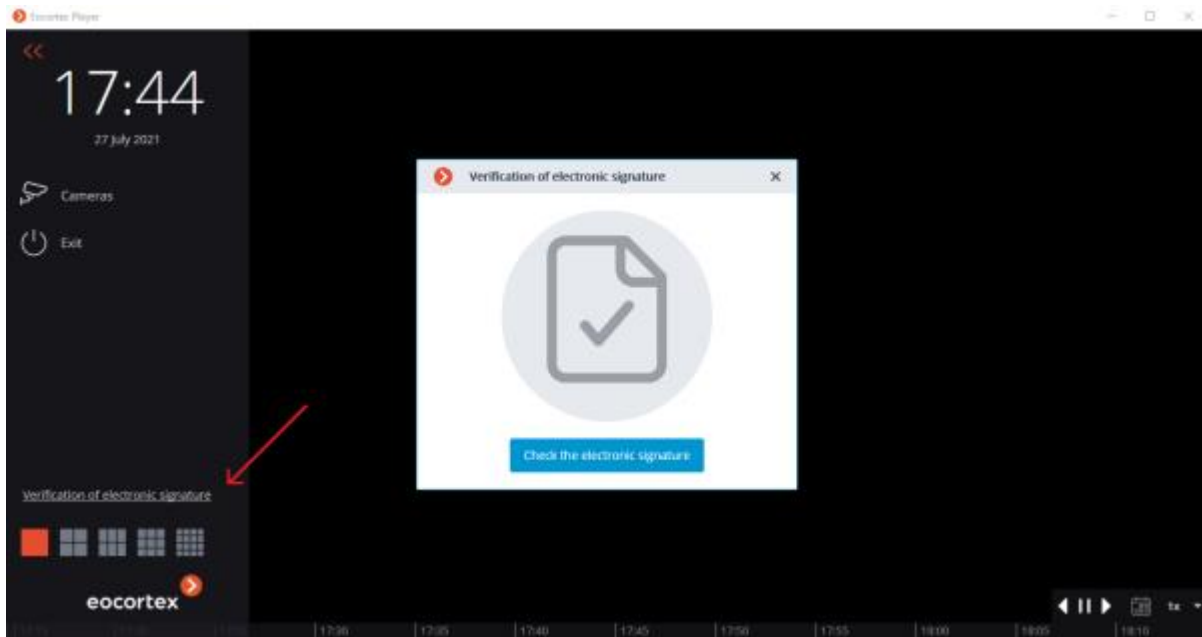


If an electronic signature has not been set, the **Sign the file** item will not be available.

The electronic signature file is saved alongside the exported file. The signature file name consists of the exported file name and the **msig** extension.

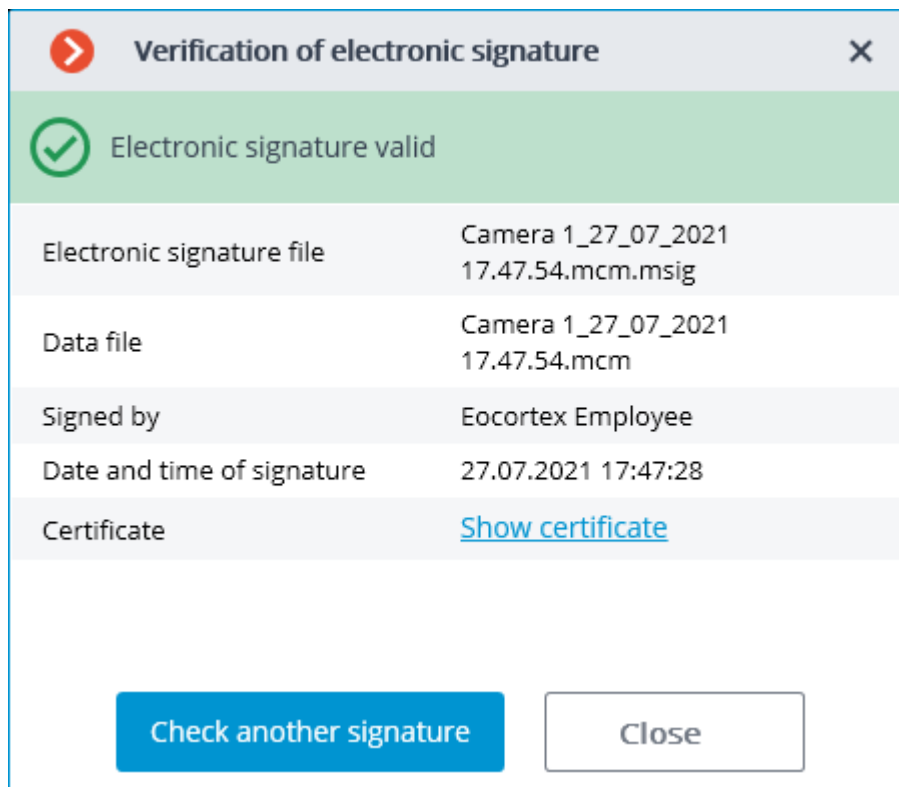
Verification

The **Eocortex Player** application is used to check the signed files. To check the electronic signature of a file, open the file with the msig extension, or open it with the **Check electronic signature** button in the window of the application.

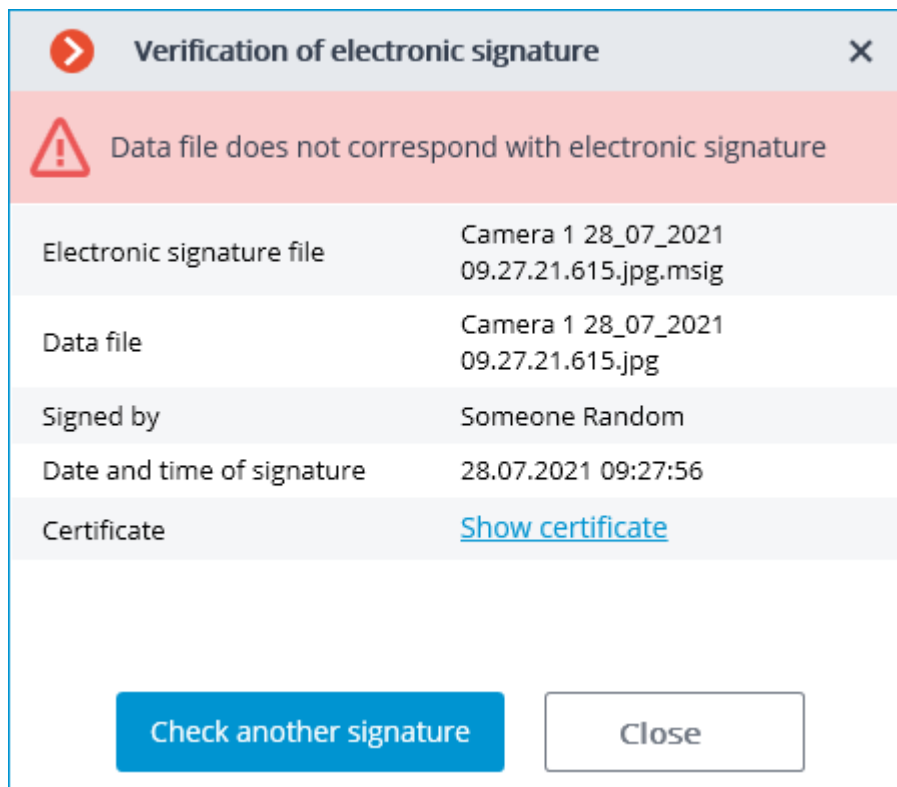


Eocortex Player will try to find and check the exported file automatically. If an error occurs during the process, you will be prompted to select the file manually.

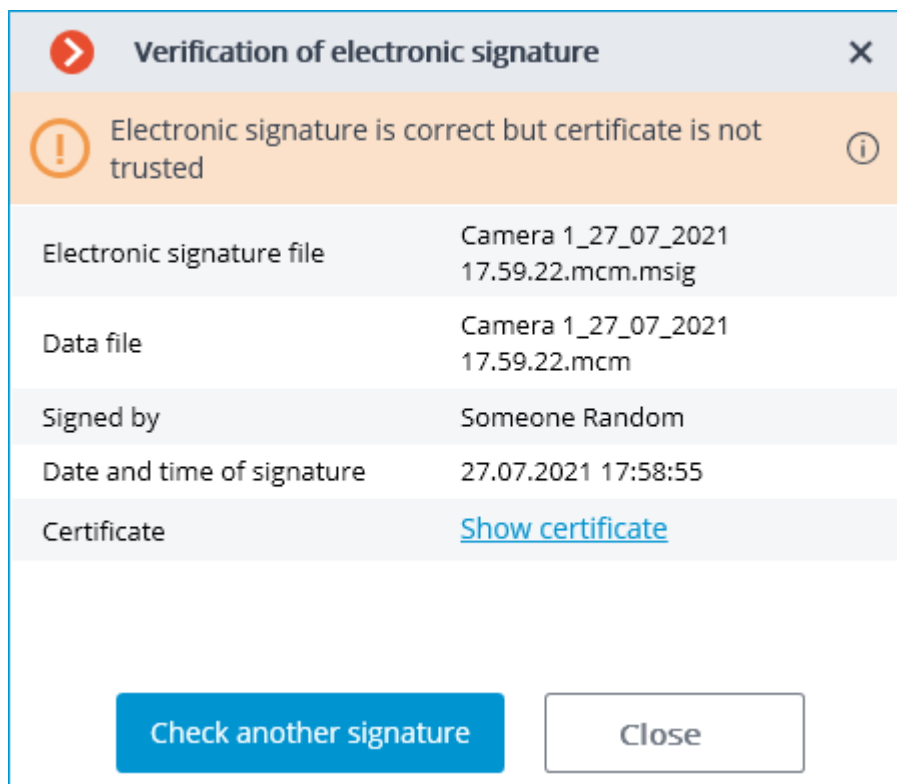
The following window will appear in case of a successful verification:



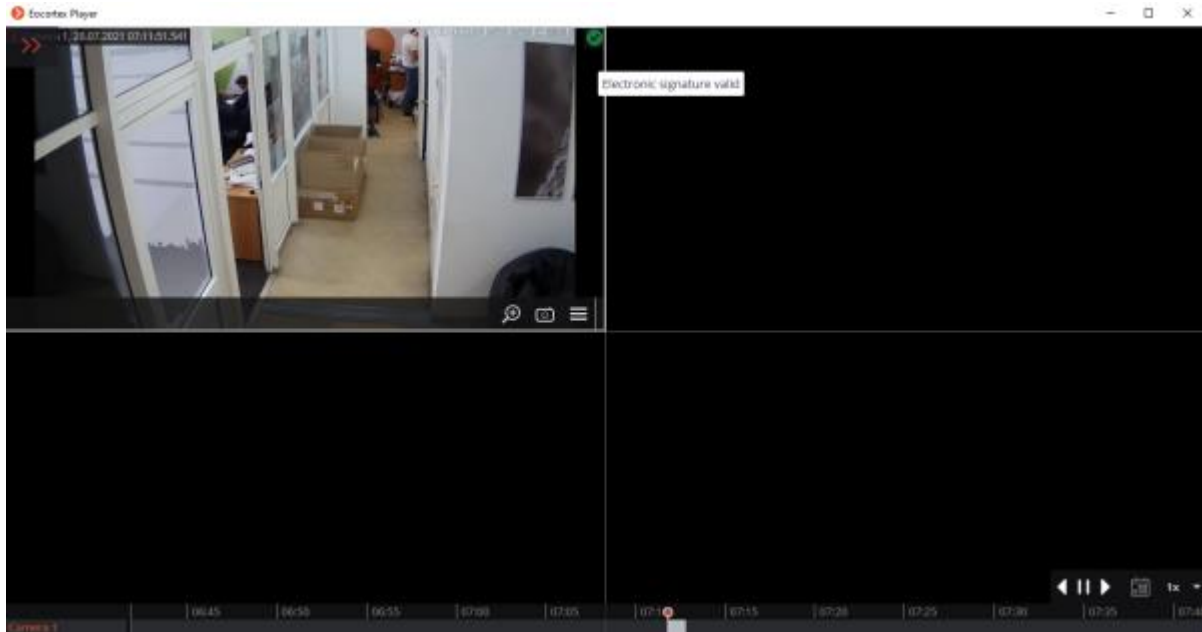
If the file has been modified, the following window will appear:



If the certificate is not a trusted one but the file has not been modified, the following window is displayed:



Additionally, the status of the electronic signature can be viewed in MCM format in the cells of the **Eocortex Player**. To do this, it is required to move the cursor over the status icon. The verification takes place automatically if the corresponding signature file was found.



Click on the status icon to view the details.

Related references

[Archive export](#)

[Enabling Electronic signature](#)

Watermark on video

Eocortex has the ability to overlay a watermark on live and archived video. This will help to identify the source of video content leakage occurred when viewing and exporting video, as well as saving and printing a frame in the **Eocortex Client** application. When the watermark is enabled, the information about the user who has downloaded the video or frame will be displayed on the video and frame.

Description

Watermark option allows overlaying the camera image with information about the user who is accessing the camera. The watermark can be applied both when viewing the video in the **Eocortex Client** application and when exporting archive fragments and saving or printing individual frames.

Overlay and display settings can be configured by the surveillance system administrator in the **Eocortex Configurator** application. By default, both the overlay and display options are disabled.

The watermark applies to an image as text composed as follows:

Date and time of the device where the **Eocortex Client** application is running

Name of computer

Username of **Eocortex** user

Watermark can be composed of all attributes at once, or only some of them.

For the applied watermark it is possible to set the color and transparency, as well as to choose the method of text arrangement on the image as one of the following options:

One watermark on the diagonal

Multiple watermarks on the diagonal

One watermark on the horizontal

Multiple watermarks on the horizontal

Individual watermark overlay settings can be set for each camera.

The overlay settings are consistent for the camera, so the watermark will have the same appearance and structure both when viewing the video in the **Eocortex Client** application and when exporting the video or frames. So, even when exporting an archive for a group of cameras at once, each camera will have its own watermark according to the specified settings.

If the **Date and time** attribute is enabled, its behavior will be different when viewing video and frames in the **Eocortex Client** application and exporting. So, when viewing video in the application, this attribute displays the current computer time, while in the exported video and on the saved frame it will display the time when the export process started.

Watermark overlay settings are set for the camera, so the watermark will have the same appearance and structure for all users who are defined to see it. At the same time, different groups of users can be provided with different watermark display settings in the **Eocortex Client** application by selecting one of the following display options:

Only on live view

Only on archive view

Always

If the **Only on live view** option is selected, the watermark will not be applied to exported archive fragments and frames saved or printed from the archive.

Watermark is compatible with the option of [overlaying an image from a file](#).

Configuring the watermark in Eocortex Configurator

Configuration of the watermark displaying for a camera is available only to users, who have rights to configure that camera.

Configuring an individual camera

To set up the watermark displaying for a single camera, do the following:

Run the **Eocortex Configurator** application.

Go to the  **Cameras** section.

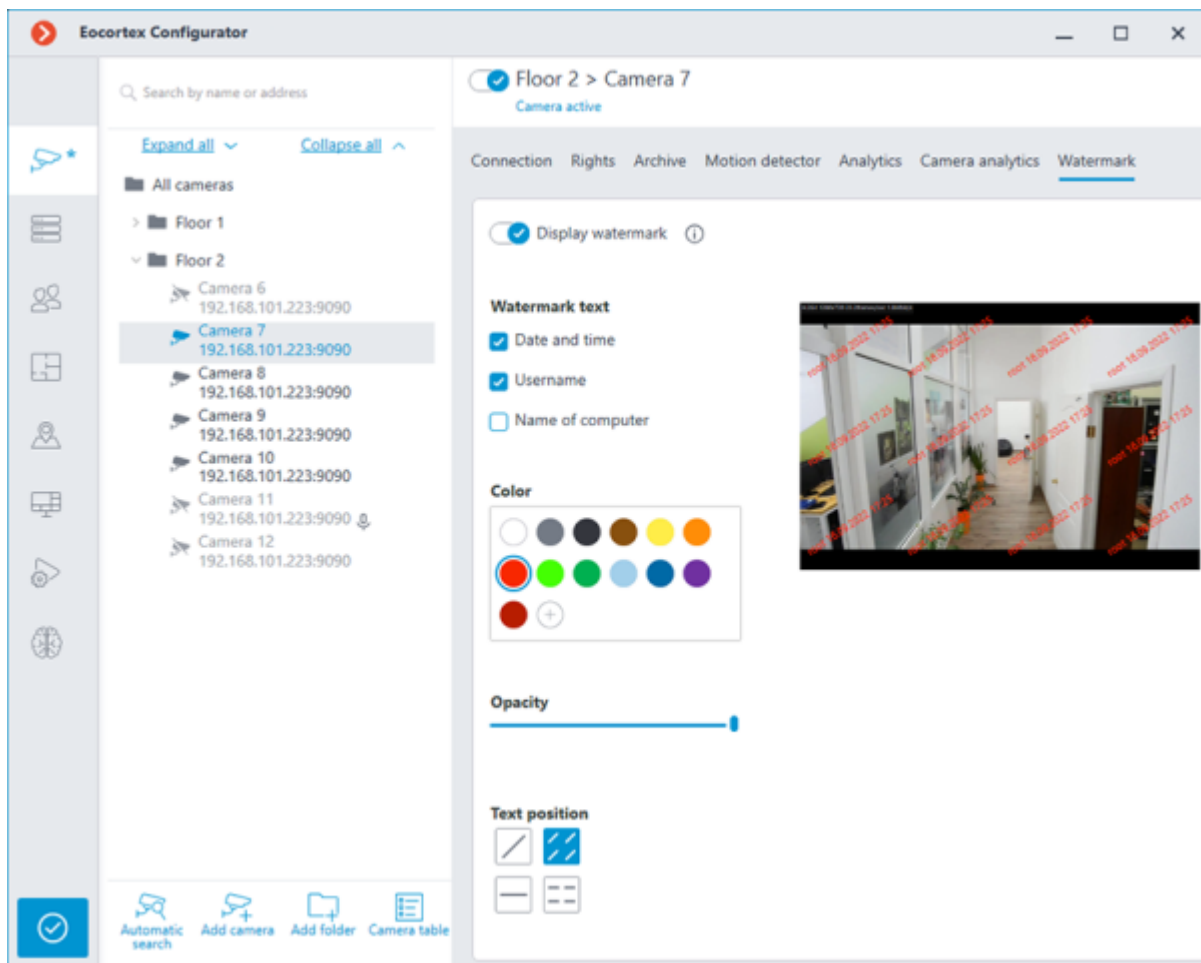
Select a camera in the list.

Switch to the **Watermark** on the right part of the window.

Enable the  **Display watermark** feature.

By default, this option is disabled.

Configure [the watermark displaying](#).



Enable displaying of the watermark in the [user rights settings](#).

[Apply settings](#).

Configuring a group of cameras

To set up the watermark displaying for a group of cameras, do the following:

Run the **Eocortex Configurator** application.

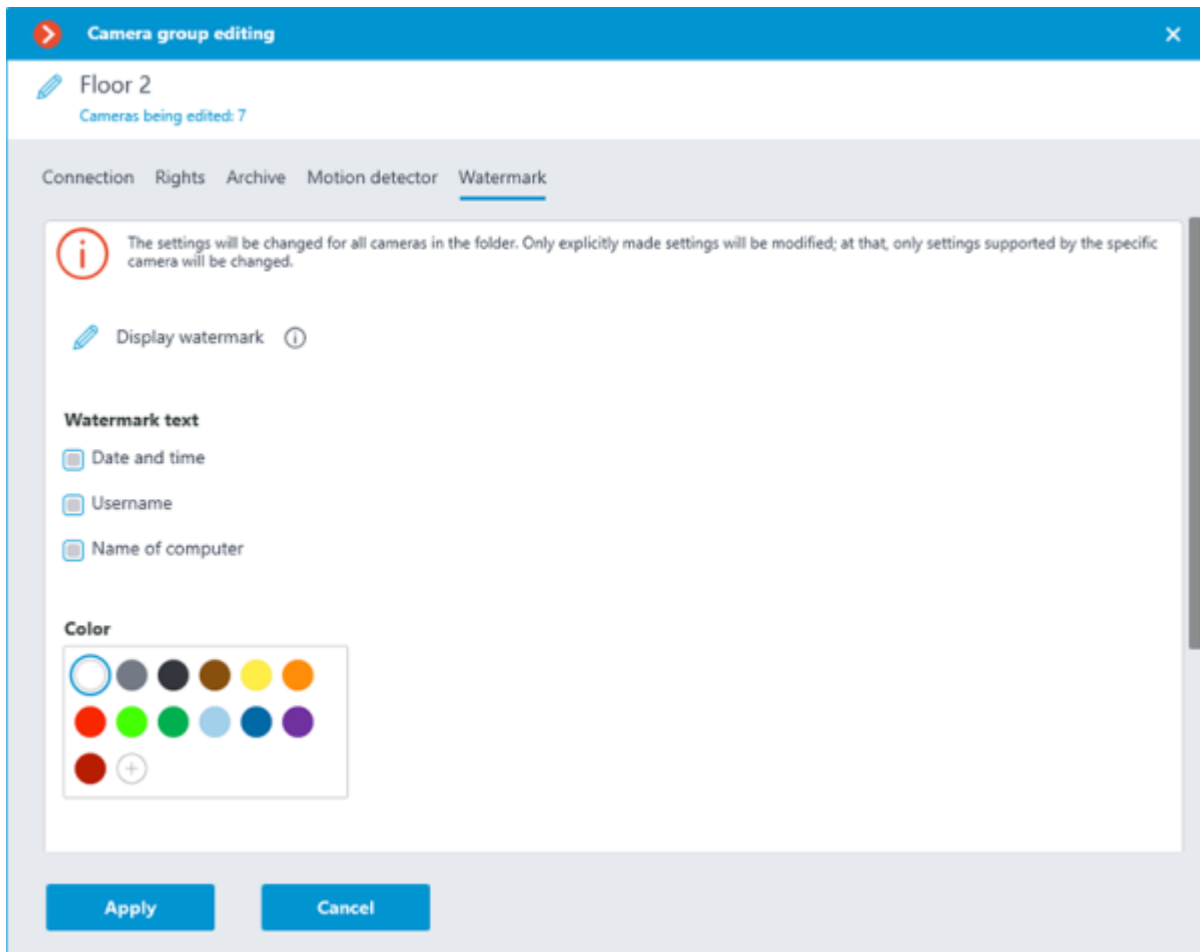
Go to the  **Cameras** section.

Select a group of cameras in the list.

Click the **Change camera group settings** button on the right part of the window;

In the window that opens, switch to the **Watermark** tab;

Configure [the watermark displaying](#).



The watermarked video preview is not available when setting up a camera group.

To change the settings for all cameras in the selected group, click **Apply**.

Enable displaying of the watermark in the [user rights settings](#).


[Apply settings](#).

Configuring the watermark properties

Below is a description of the available settings:

Watermark text: In this group of settings, it is possible to select the parameters that will be displayed in the watermark:




- **Date and time**
- **Username** running **Eocortex Client**.
- **Name of computer**, on which **Eocortex Client** is running.

Color: the color of the watermark text. If the desired color is not presented in the preset palette, it can be added by pressing the  button.

Opacity: The leftmost position of the slider corresponds to the minimum opacity value — 10%; the rightmost position of the slider corresponds to 100%.

Text position: location and orientation of the watermark. The following options are available:

- : Single watermark diagonally from left to right, bottom to top;

- : Multiple watermarks diagonally from left to right, bottom to top;
- : Single watermark horizontally, in the center of the cell;
- : Multiple horizontal watermarks.

When selecting options with multiple watermarks, the number of marks is determined by the size of the cell.

Configuring user rights

By default, displaying of the watermark is disabled for all user groups.

In **Eocortex** systems running with **Enterprise** and **ULTRA** licenses, the watermark is not visible in the **Eocortex Client** application and is not overlaid on exported content for users with **Senior administrator** access rights.

To enable displaying/hiding of the watermark for a user group, follow these steps:

Run the **Eocortex Configurator** application.

Go to the  **Users** section.

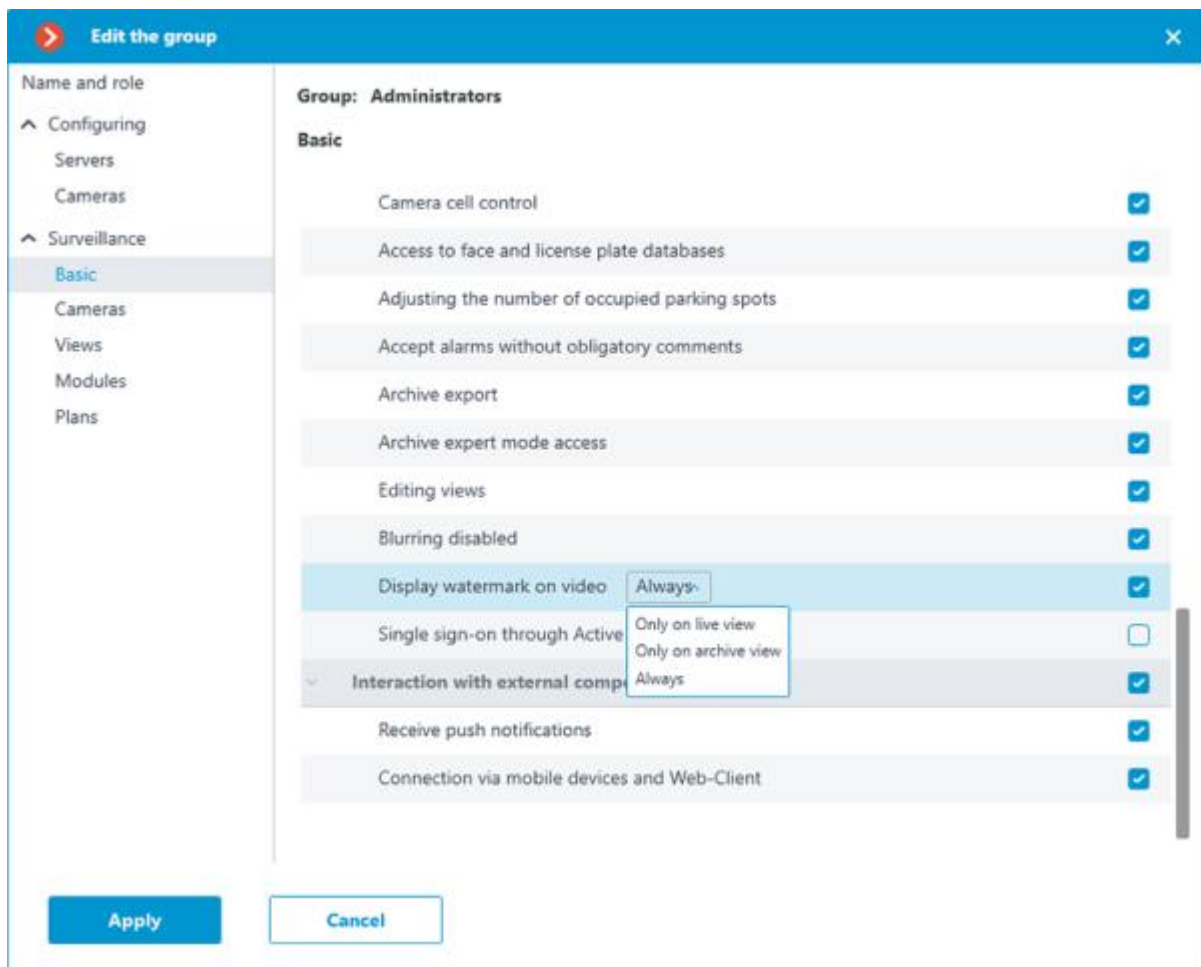
Select the **Users of Eocortex applications** subsection.

Select a group of users and click the **Edit** button.

In the window that opens, switch to the **Basic** tab.

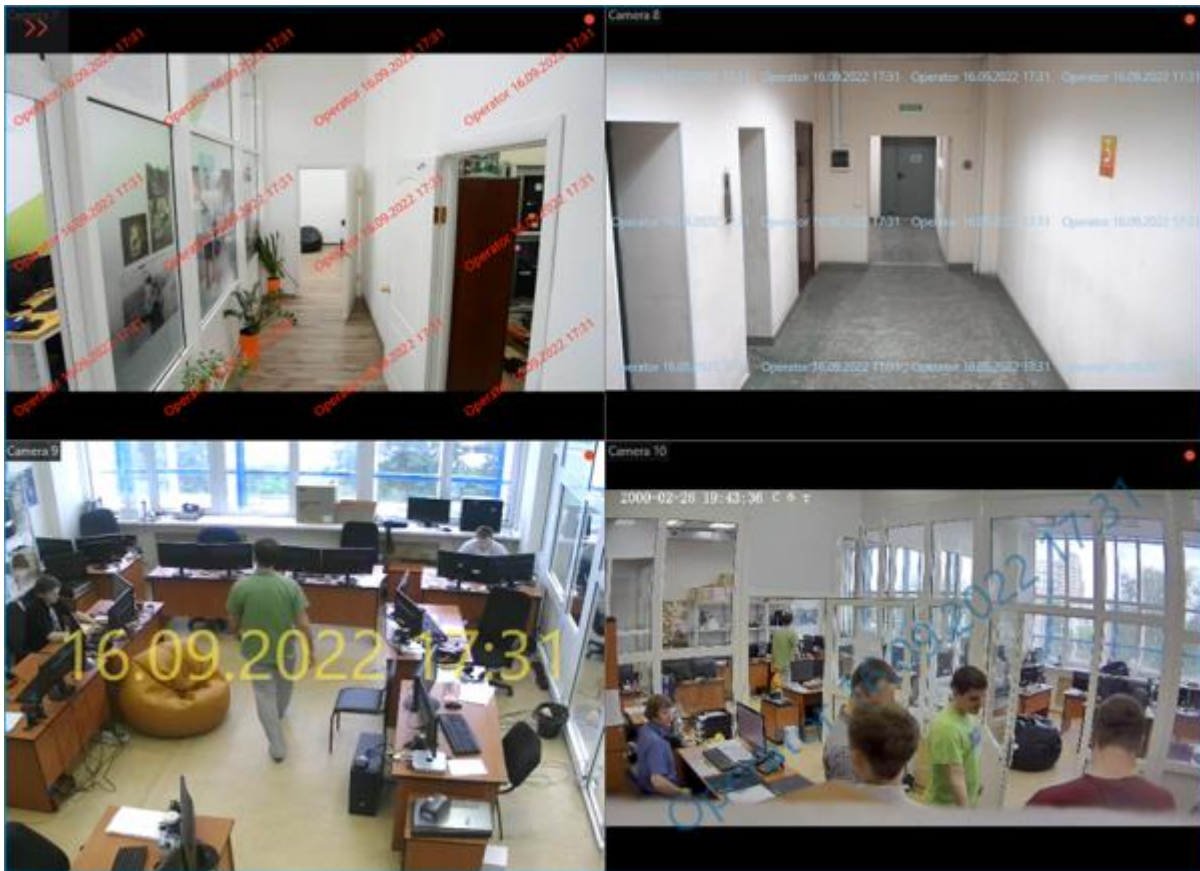
Enable the **Display watermark on video** permission and set the desired displaying mode.

If the option **Only on live view** is selected, the watermark will not be applied to the exported archive fragments and frames.



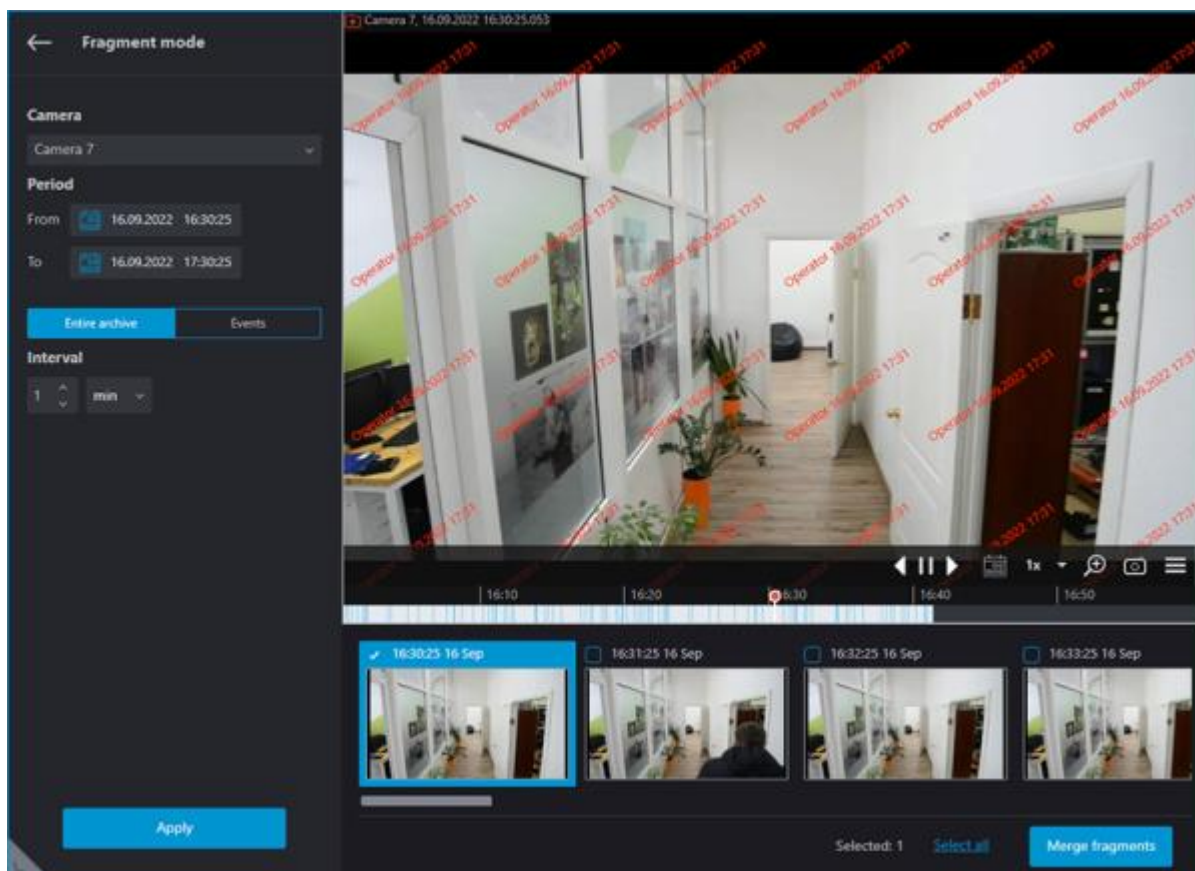
Using in the Eocortex Client application

If the camera is set to display a watermark and the user has been given the **Display watermark on video** permission, the **Eocortex Client** application will display the watermark in the cell with the video stream from that camera both during live viewing and archive playback.



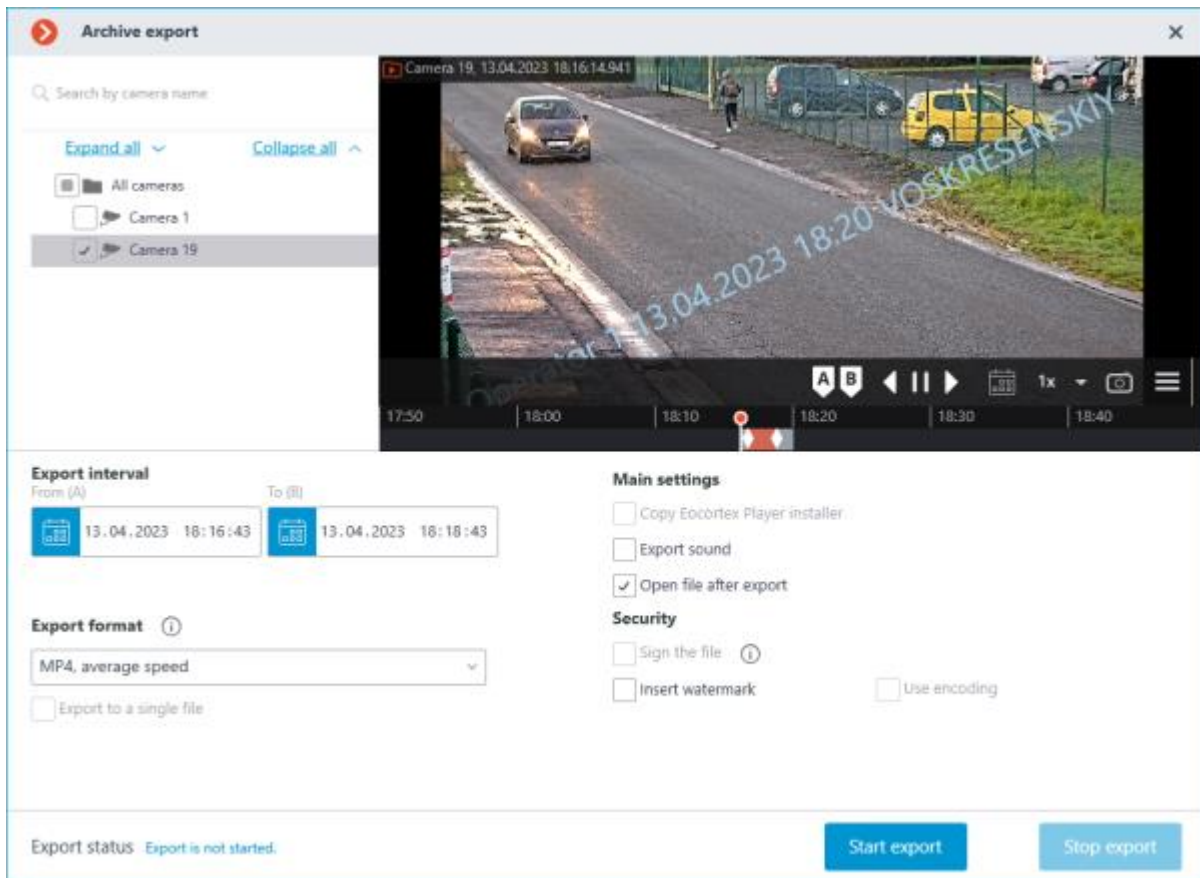
In **Ecortex** systems running with **Enterprise** and **ULTRA** licenses, the watermark is not visible in the **Ecortex Client** application and is not overlaid on exported content for users with **Senior administrator** access rights.

The watermark is not visible in the preview section of the Fragments mode.



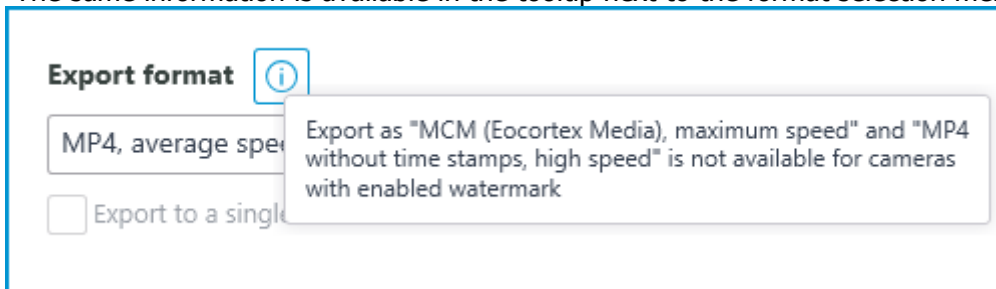
When saving or printing a frame, the watermark that is currently displayed in the camera cell will be applied to an image with all lines and columns unchanged.

To watermark the exported video, go to the **Archive export** window and click **Start export**. When selecting a camera from the list of cameras, the watermark configured for that camera will be displayed on the preview.

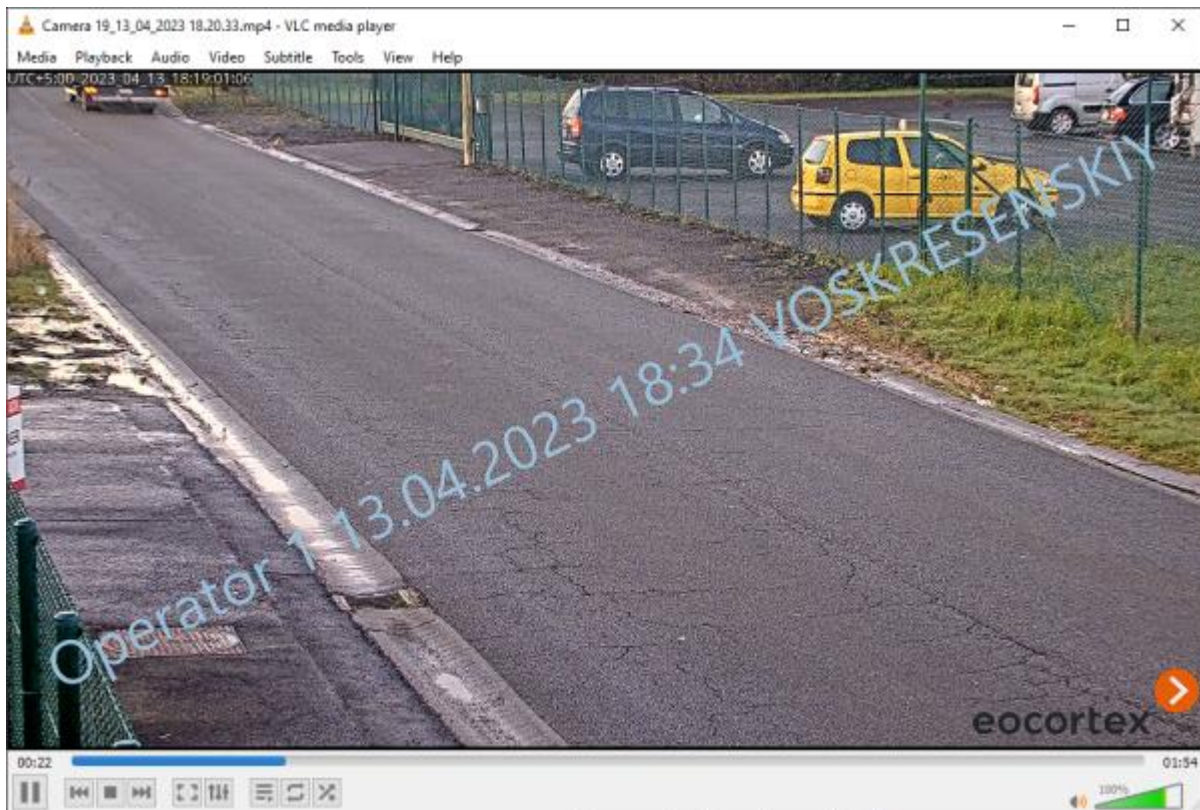


For cameras with applied watermark, exporting the archive in the formats **MCM** and **MP4 without time stamps, high speed** is not available. If at least one camera with enabled watermark is selected when exporting an archive for a group of cameras, exporting to the specified formats will be blocked for the entire group.

The same information is available in the tooltip next to the format selection menu.



In addition to the text watermark, when exporting videos it is possible to [overlay an image from a file](#) to the lower right corner of the frame. These options are compatible with each other and can be used simultaneously. The image from the file will overlay the watermark text.



Requirements and recommendations

In **Eocortex** systems running with **Enterprise** and **ULTRA** licenses, the watermark is not visible in the **Eocortex Client** application and is not overlaid on exported content for users with **Senior administrator** access rights.

The watermark is not visible in the preview section of the Fragments mode.

For cameras with a watermark overlay, exporting the archive via HTTP API and mobile application is not available.

For cameras with applied watermark, exporting the archive in the formats **MCM** and **MP4 without time stamps, high speed** is not available. If at least one camera with enabled watermark is selected when exporting an archive for a group of cameras, exporting to the specified formats will be blocked for the entire group.

If the **Username** in the watermark will be too lengthy, its display will be scaled to fit on the screen.

If the option **Only on live view** is selected, the watermark will not be applied to the exported archive fragments and frames.

The watermark will not be applied to frames saved with the **Save frame** action, which can be created on the **Automation** tab of the **Eocortex Configurator** application.

Displaying camera time zones

Time of a camera can be displayed in the **Eocortex** applications in two modes:

in the time zone of the client workstation;

in the time zone of the camera.

Description

Setting the time zones of the cameras and selecting the time display mode on the cameras are available for **Eocortex** applications version 3.6 and higher. Earlier versions of **Eocortex** applications do not support these features.

By default, configuration of the time zones is not active. When this feature is enabled, it is enabled centrally for the entire system.

If the camera time zone setting is not active, then in client applications, the time on the cameras will always be displayed in the time zone of the computer or device where the application is running.

If the camera time zone setting is active:

By default, the camera has the same time zone as the server it is linked to.

By default, the server has the same time zone as the operating system it is installed.

The server may be assigned a different time zone than the operating system's time zone.

The camera may be assigned a different time zone than the server's time zone.

In the client application, it is possible to select which time zone will be displayed for the camera: the time zone of the client workstation/device or the camera's own time zone.

By default, client applications display time on the camera in the time zone of the client computer/device.

Setting the time zones of servers and cameras is carried out in the **Eocortex Configurator** application.

The selection of time display mode on the camera is carried out in client applications.

Setting in Eocortex Configurator

To activate the camera time zone display feature:

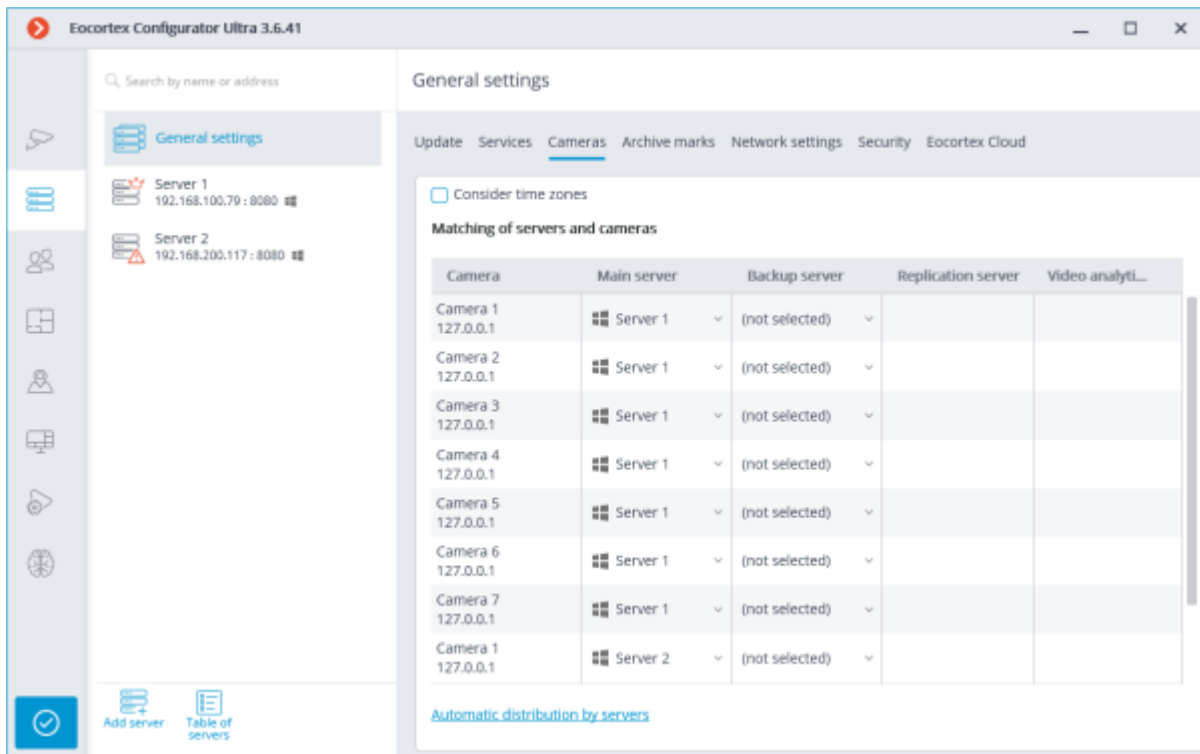
Launch the **Eocortex Configurator** application.

Open the  **Servers** section.

In the list of servers, select the  **General settings**.

Switch to the **Cameras** on the page that opens.

Activate the **Consider time zones** feature.



To set up the time zone of the server:

Launch the **Eocortex Configurator** application.

Open the  **Servers** section.

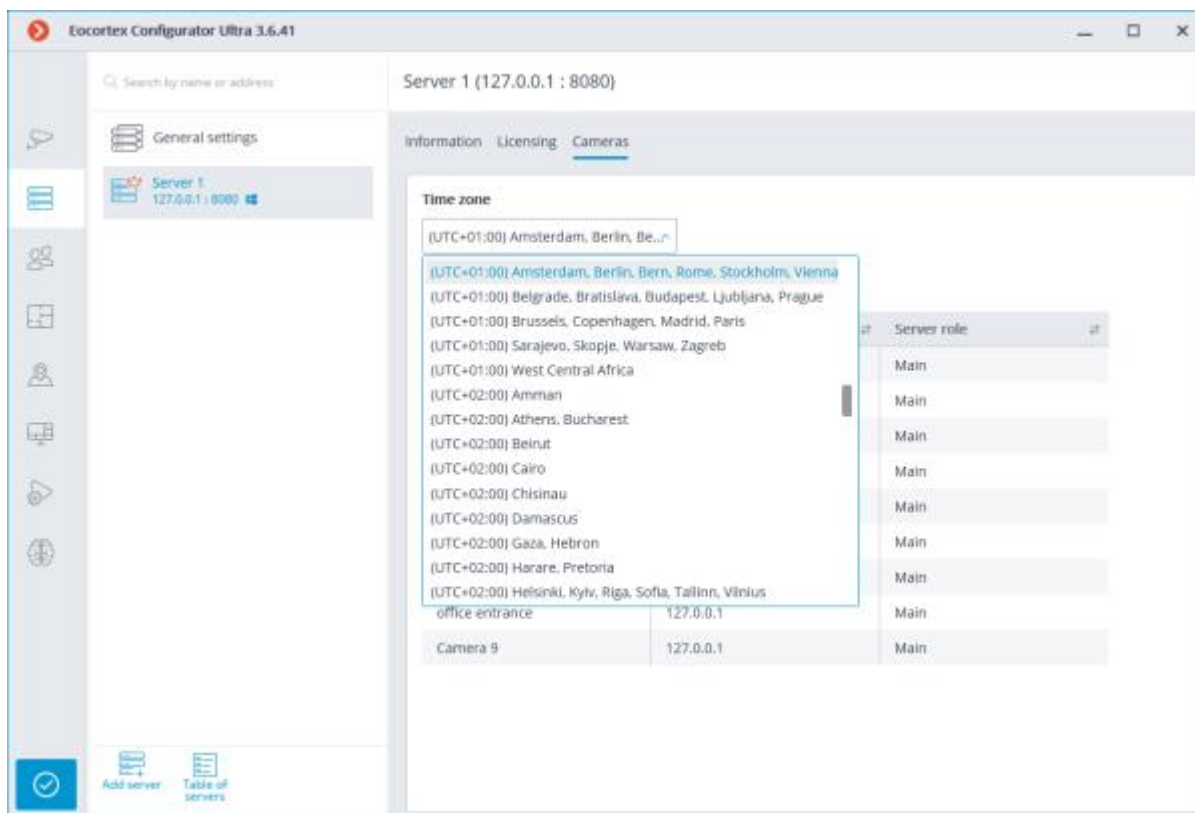
Select the server in the list.

Switch to the **Cameras** on the page that opens.

In the drop-down menu, select the needed time zone.

Along with the change of the server time zone, the time zone of the cameras linked to it will also change.

The list of available time zones depends on the operating system on which the **Eocortex Configurator** application is running.



To set up the time zone of the camera to be different from the time zone of the server the camera is linked to:

Launch the **Eocortex Configurator** application.

Open the  **Cameras** section.

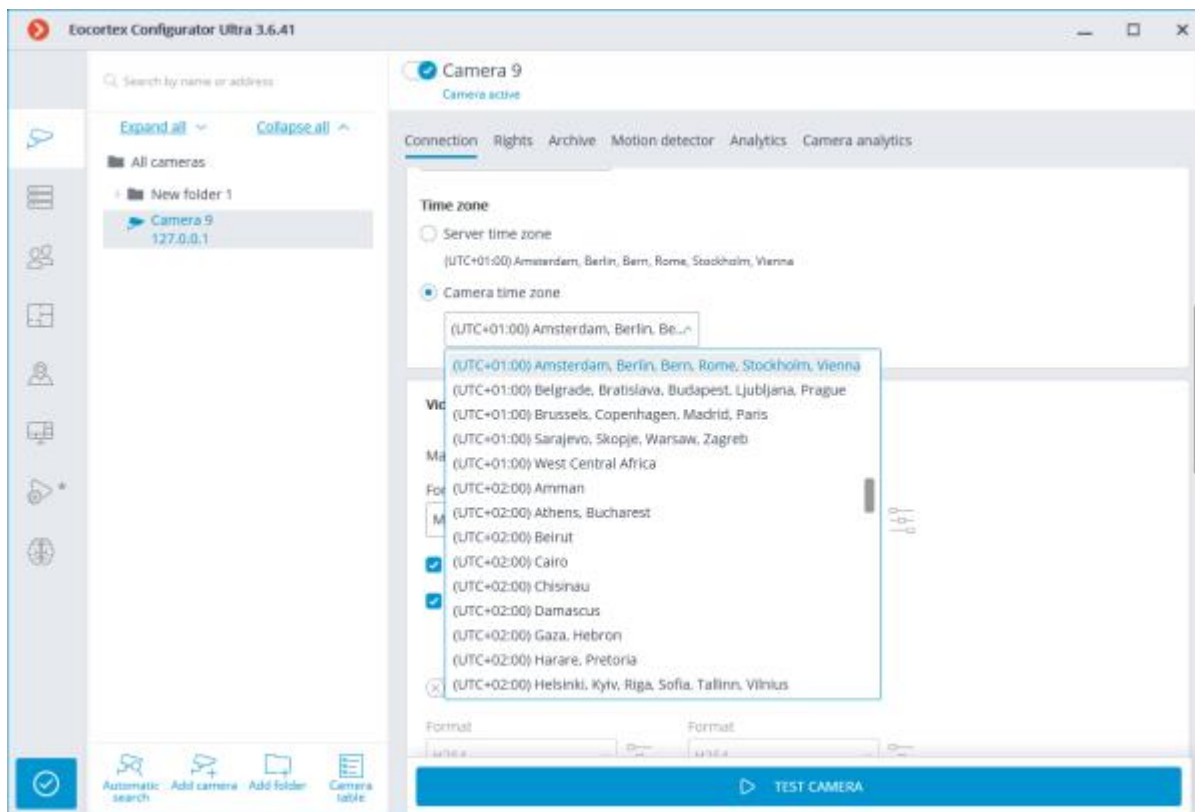
Select the camera in the list.

Select the **Connection** tab on the page that opens.

In the **Time zone** group of settings, set the time zone:

Server time zone: the time zone of the server the camera is linked to will be used.

Camera time zone: the selected time zone will be used, regardless of what time zone has the server the camera is linked to.



If the time zone settings must be changed for the group of cameras:

Launch the **Eocortex Configurator** application.

Open the  **Cameras** section.

Select the group of cameras in the list.

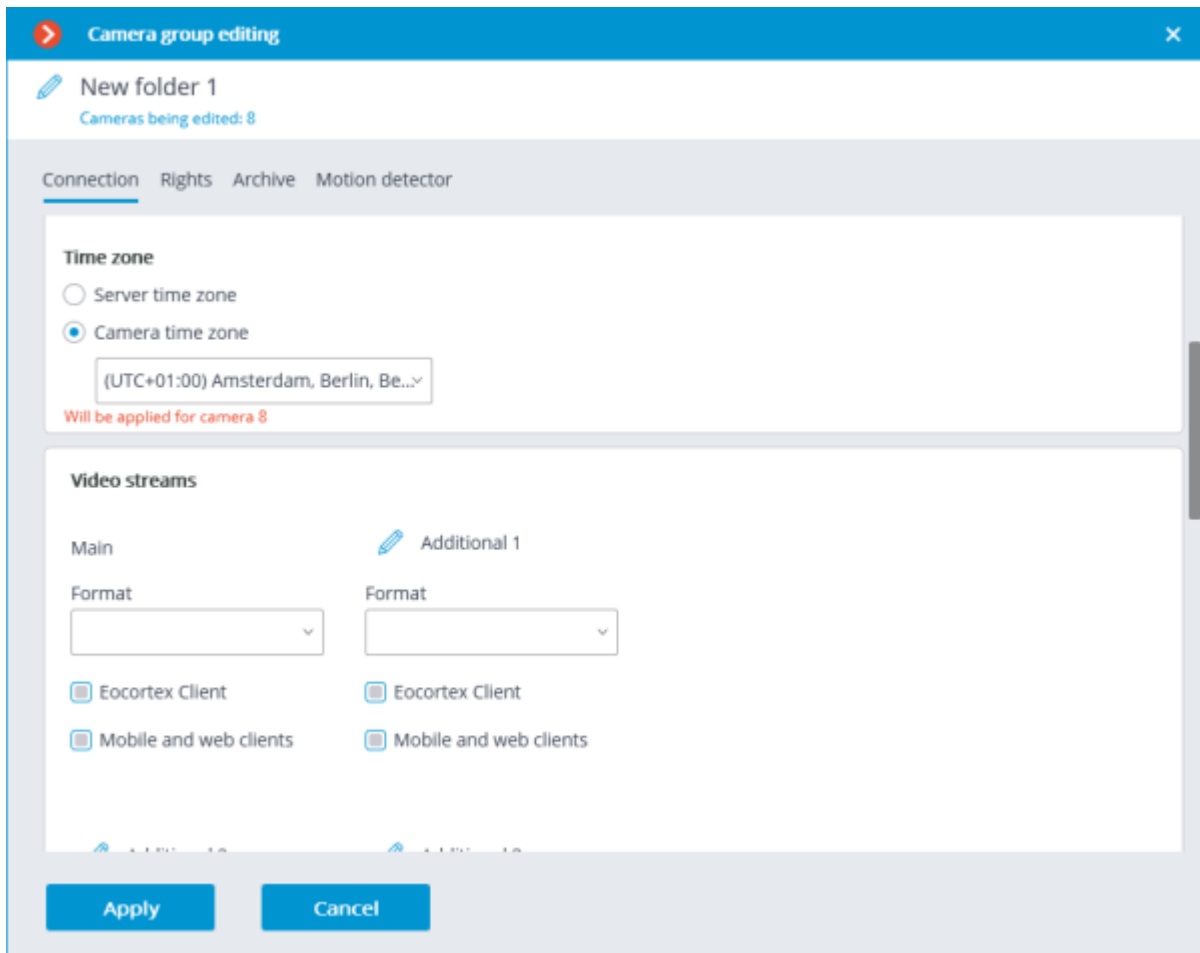
Click the **Change camera group settings** button on the page that opens.

In the **Time zone** group of settings, set the time zone:

Server time zone: the time zone of the server the camera is linked to will be used.

Camera time zone: the selected time zone will be used, regardless of what time zone has the server the camera is linked to.

If the **Server time zone** option is selected for the group of cameras and the Main server has not been changed for this group in the group settings window, each camera will use the time zone of the server it is linked to.



In case of the multiserver system, the main server must have the version of **Eocortex** 3.6 or higher to be installed. Otherwise, the entire system will not be able to use the time zone settings.

Recommendations for upgrading servers in a multiserver system to **Eocortex** version 3.6 from lower versions:

1. Update the main server.
2. Update the subordinate servers.

The time zone on the subordinate server will be set when:

- the update process will be completed;
- connection with the main server will be restored.

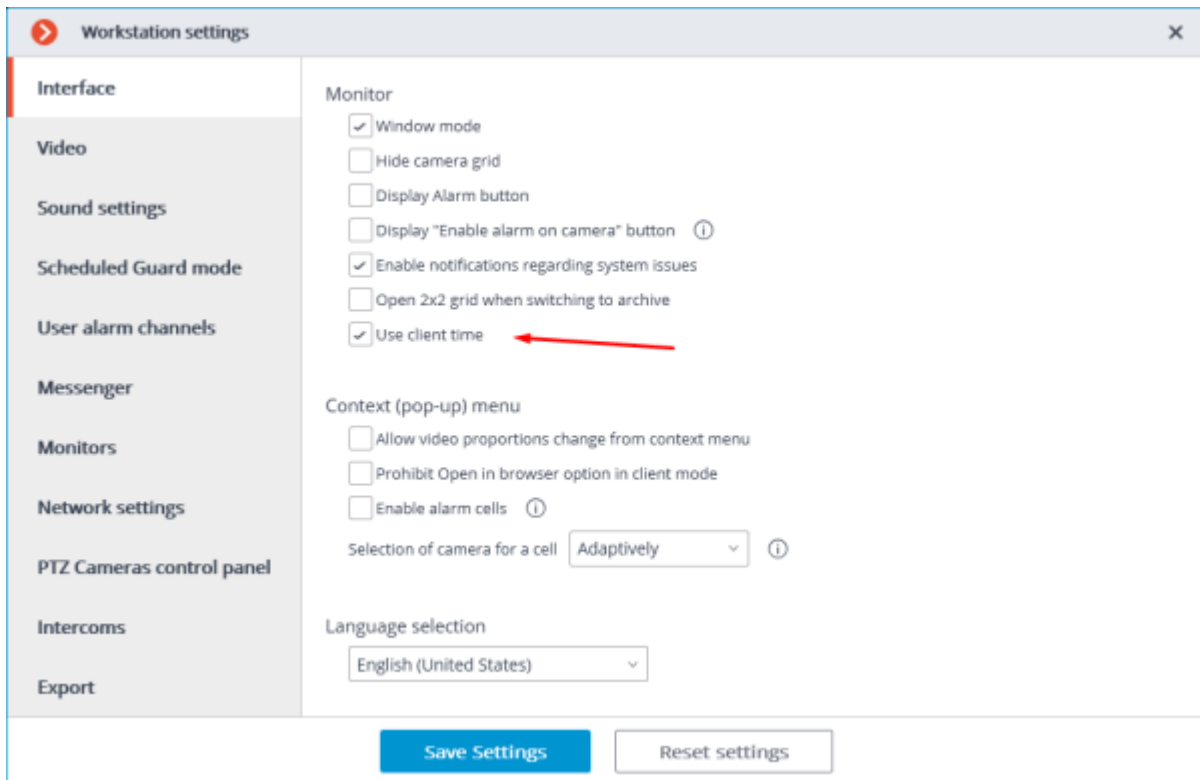
Setting in Eocortex Client

If the **Consider time zones** option is enabled in the **Eocortex Configurator** application, the **Eocortex Client** application will work in the time zones configured on the cameras/servers.

To work in the time zone of the computer running the **Eocortex Client** application, the user need

to select the  **Settings** section, open the  **Workplace settings** subsection and on the **Interface** tab enable the **Use client time** option.

By default, this option is disabled.

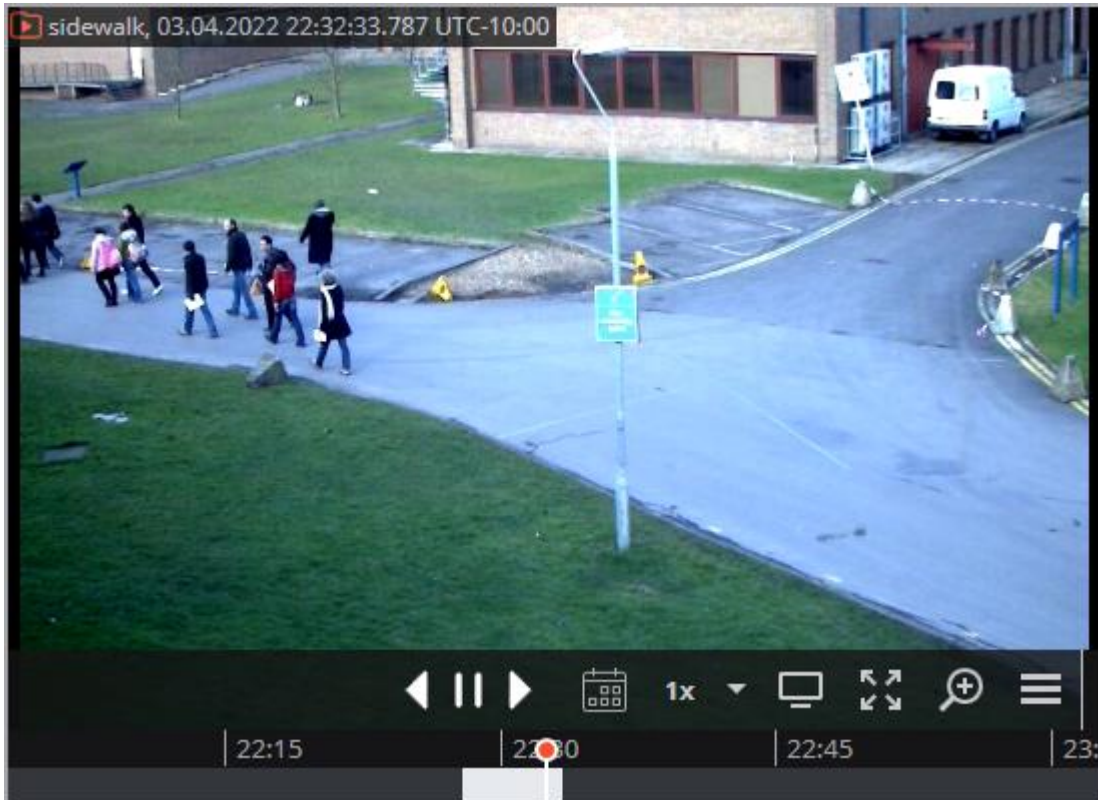


Using time zones

Viewing the single camera archive

When [viewing the single camera archive](#), the archive cell displays the time zone that is configured on the selected camera.

The actual offset displayed in the cell may differ from the offset in the list of time zones in the **Eocortex Configurator** application settings, if the daylight saving is applicable for the selected time zone.

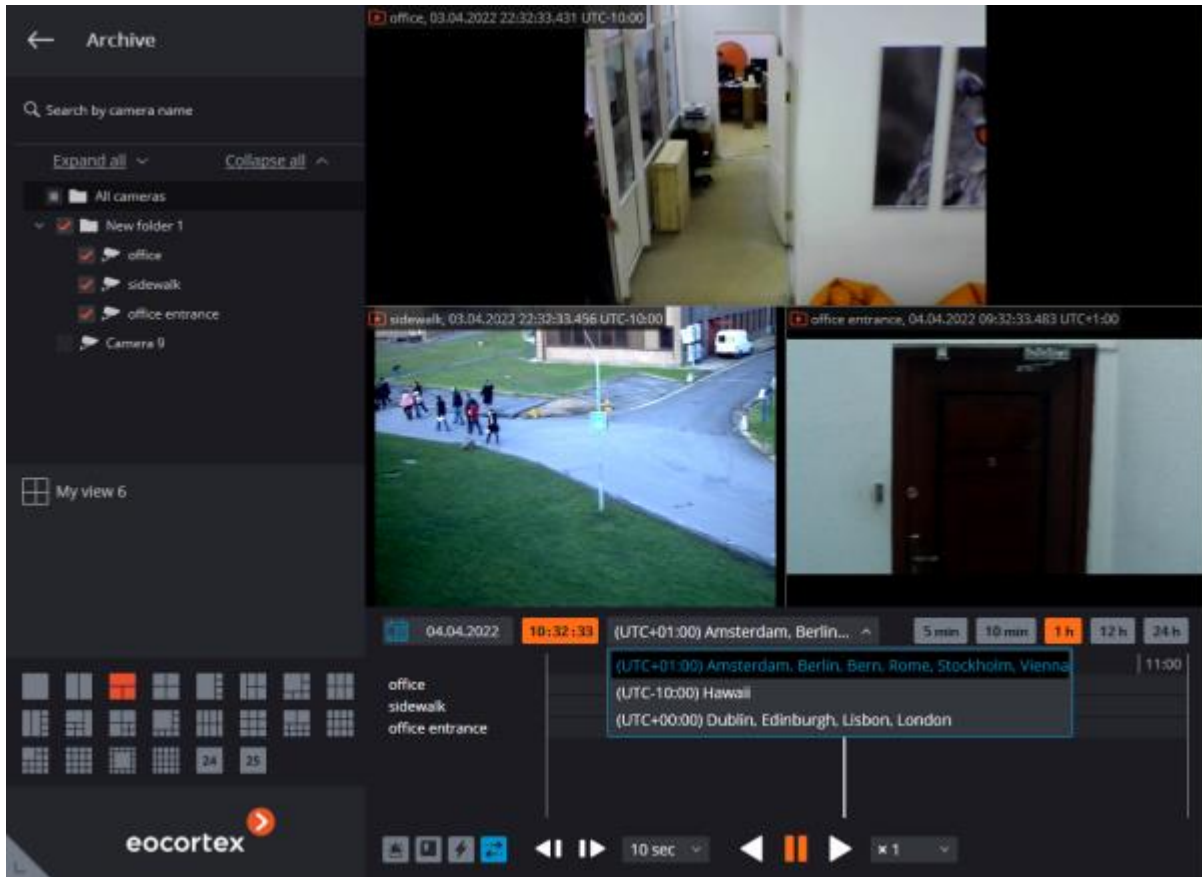


Simultaneous viewing of archive of multiple cameras

When several cameras are selected for [simultaneous viewing of the archive](#), the time is displayed for the selected time zone.

The list of available time zones consists of those time zones that are configured on cameras and servers, as well as the time zone of the computer running the **Eocortex Client** application.

By default, the time zone of the computer running the **Eocortex Client** application will be selected.



When a new time zone is selected, the time on the timeline will change according to the selected time zone. For example, if the user changes the time zone from UTC+05:00 to UTC+03:00, then the values on the timeline would decrease by 2 hours.

During video playback in synchronous view, the time and the time zone at the top of the camera cells are not displayed.

Events log

Search for archive events in the Event log can be configured considering the time zone.

Mode Cameras Types Events Initiators

Real time Archive

Sort events by time ascending

Period from to

04.04.2022 04:43:40 04.04.2022 10:43:40

in the time zone

(UTC+01:00) Amsterdam, Berlin, Bern, Rome, Stockholm, Vienna
(UTC-10:00) Hawaii
(UTC+00:00) Dublin, Edinburgh, Lisbon, London

Apply filter Export

The **Camera time** column displays the time of the event in the time zone of camera.

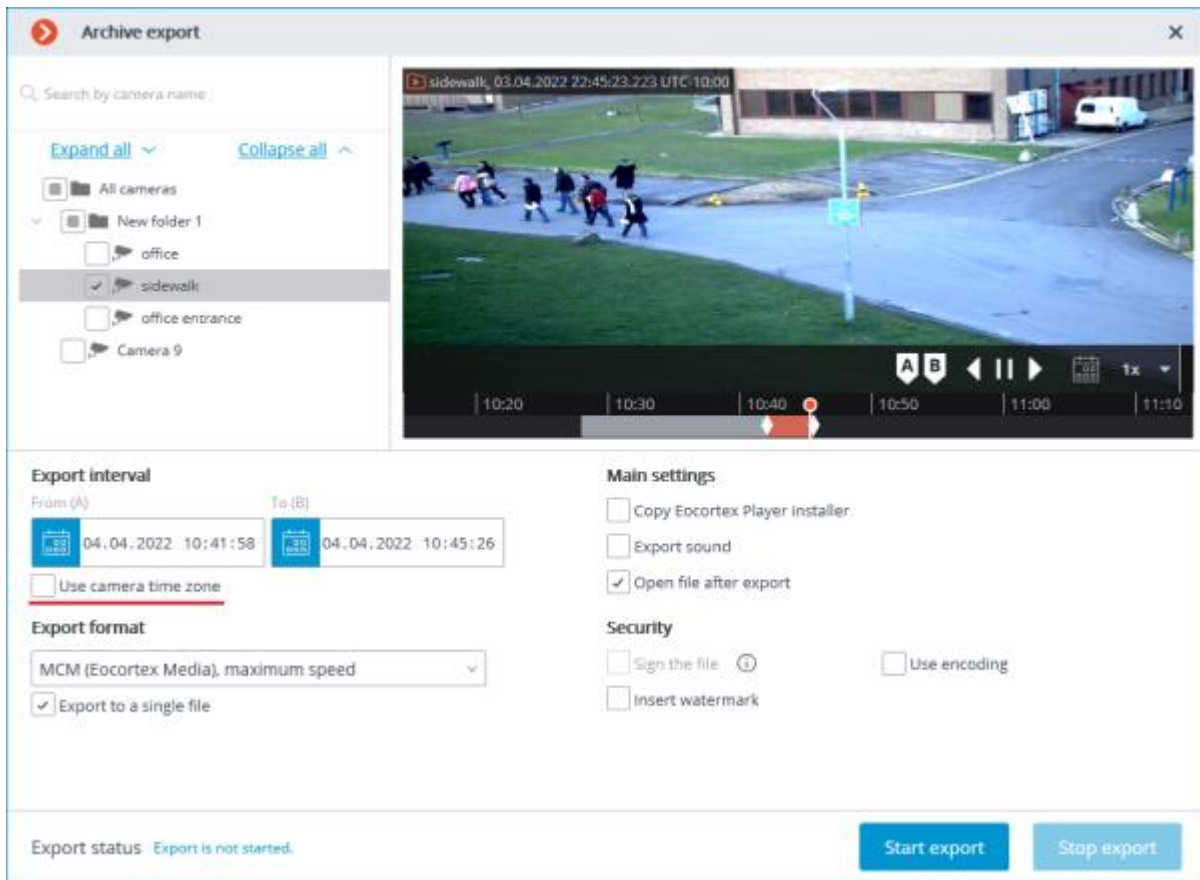
Time	Camera time	Type	Event description
22.03.2022 10:25:39 <u>UTC+5:00</u>	21.03.2022 19:25:39 <u>UTC-10:00</u>	🚨	Camera 7. Missed alarm of event Large number of people in the queue. Client type: Desktop, user: root, IP-address: 127.0.0.1, computer: simon...
22.03.2022 10:25:39 UTC-10:00	21.03.2022 19:25:39 UTC-10:00	🚨	Camera 7. Large queue: "Zone 1". Counting people in queue.
22.03.2022 10:23:39 UTC-10:00	21.03.2022 19:23:39 UTC-10:00	🚨	Camera 7. Missed alarm of event Large number of people in the queue. Client type: Desktop, user: root, IP-address: 127.0.0.1, computer: simon...
22.03.2022 10:23:39 UTC-10:00	21.03.2022 19:23:39 UTC-10:00	🚨	Camera 7. Large <u>Camera time: 21 March 2022, 19:25:39, 779</u> Camera: Camera 7.
22.03.2022 10:21:39 UTC-10:00	21.03.2022 19:21:39 UTC-10:00	🚨	Camera 7. Missed Event: Large number of people in the queue. Client type: Desktop, user: root, IP-address: 127.0.0.1, computer: simon...
22.03.2022 10:21:39 UTC-10:00	21.03.2022 19:21:39 UTC-10:00	🚨	Camera 7. Large initiator: External module.
22.03.2022 10:19:39 UTC-10:00	21.03.2022 19:19:39 UTC-10:00	🚨	Camera 7. Missed Description: Camera 7. Large queue! "Zone 1". Counting people in queue. Client type: Desktop, user: root, IP-address: 127.0.0.1, computer: simon...

Archive export

By default, the archive is exported in the time zone of the computer running the **Eocortex Client** application.

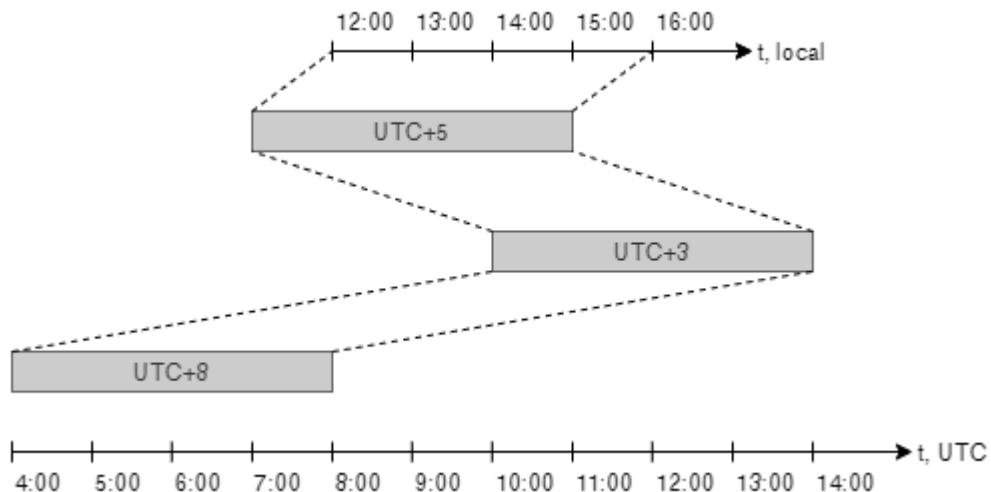
To export the archive considering the time zone of camera, the **Use camera time zone** option need to be activated.

In this mode, the archive fragments for each of the selected cameras will be exported at an individual time interval, based on the specific time zones selected for each of them. The time value specified as the beginning and end of the exported fragment will correspond to the same intervals of the time zones of each of the cameras.



For example, the **Eocortex Client** application is running on a computer with the UTC+4:00 time zone. It is required to export the archive from 12:00 to 16:00 for three cameras located in the following time zones: UTC+5, UTC+3 and UTC+8.

If the archive fragment has been exported considering the time zones, then when viewing the export result for several cameras with different time zones, in the **Eocortex Player** application, archive fragments will be displayed on the timeline with the shift equal to the difference between the time zone of each camera and the local time zone of the workstation.

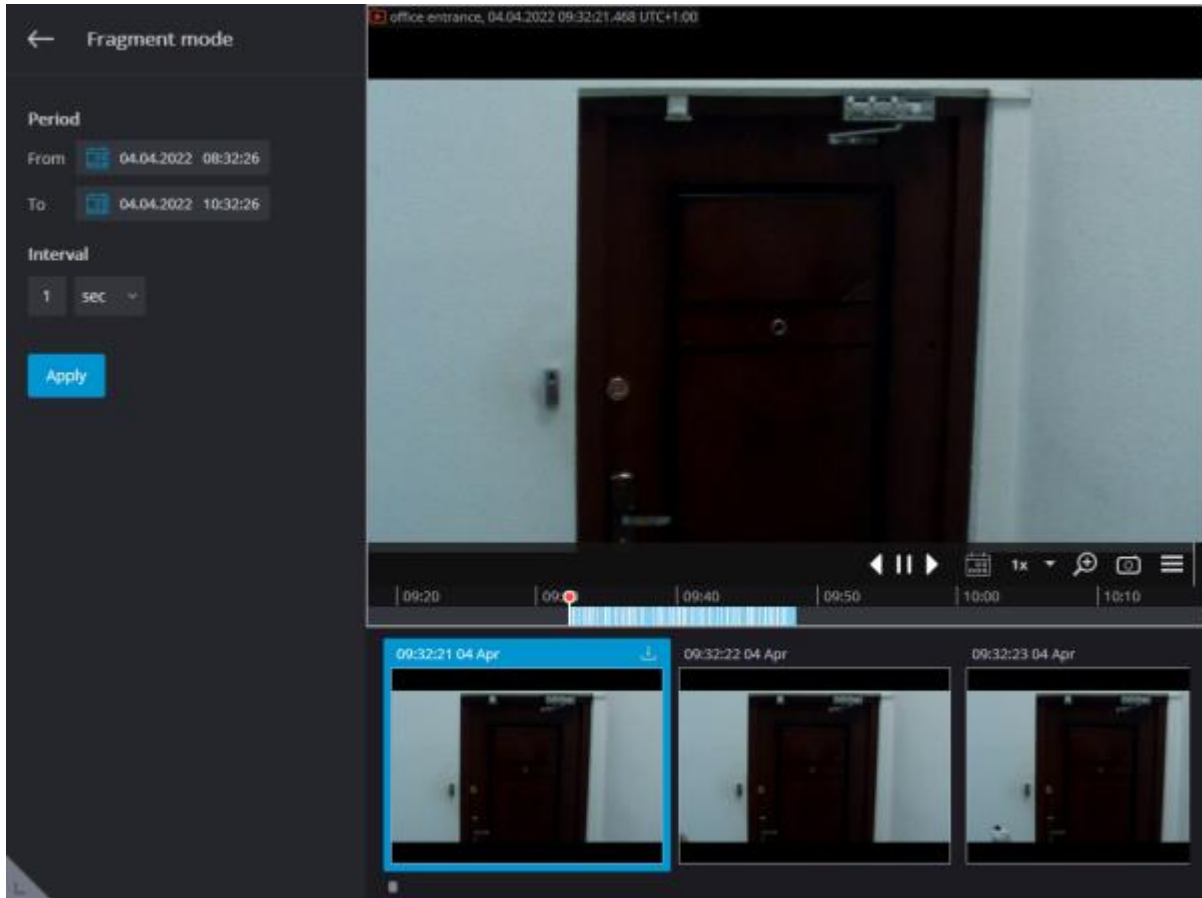


It is recommended to export archive fragments recorded with the same time zone selected.

The time for archive fragments exported in AVI and MP4 format will be displayed considering the time zones in which they were recorded, regardless of whether the feature is enabled or not.

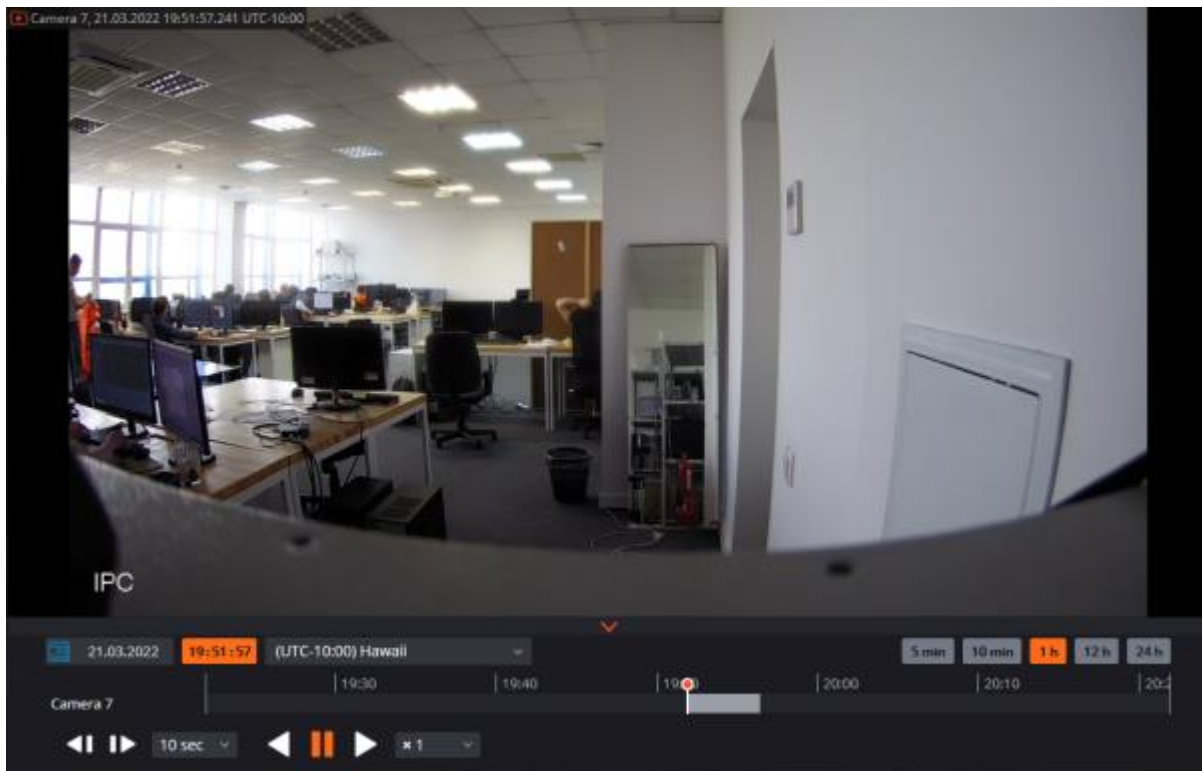
Fragment mode

When using the [fragment mode](#), the time zone of the selected camera is used to display and set up all times.



Eocortex Player

In the **Eocortex Player** application, the time zone can be selected from the drop-down menu.



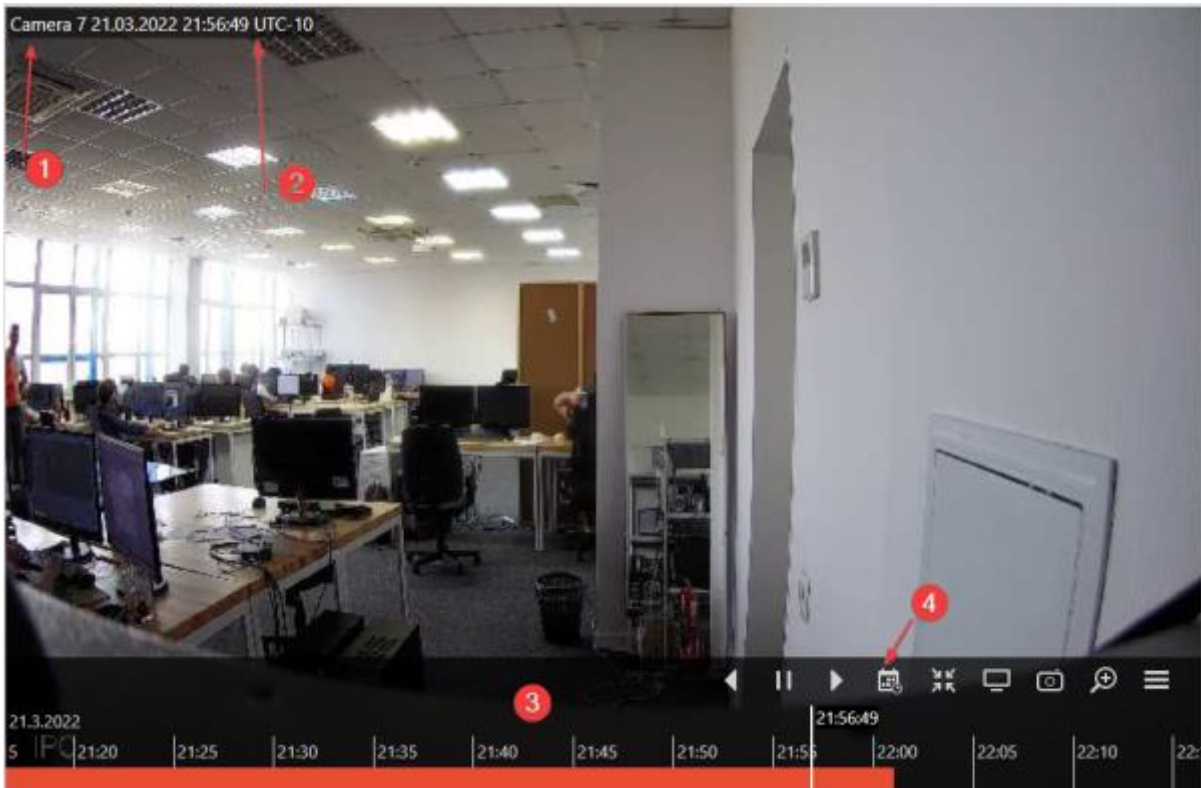
For selection will be available those time zones that were configured on the exported cameras.

If several MCM files or an MCM file with multiple cameras exported using camera time zones in the **Eocortex Player** application is open, the time zone of the first exported camera will be selected by default.

If the file that open has been exported without considering the time zones, the time zone of the computer on which the **Eocortex Player** application is running will be selected by default.

Eocortex Web-client

In the **Eocortex Web-client**, when viewing an archive, the video is displayed in the configured camera time zone.



Camera name;

Time zone;

Timeline of the archive;

Calendar for selecting a timestamp.

If the **Consider time zones** option is enabled on the **Eocortex** server, then:

- the camera cell displays the actual time with the shift of the time zone, considering daylight saving time, relevant at the time the page was opened;
- the timeline and calendar for time selection are displayed in the time zone of the camera.

If the **Consider time zones** option is disabled on the **Eocortex** server, then:

- camera time zone is not displayed;
- the timeline and calendar for time selection are displayed in the local time of the computer/device.

Analytics events with timestamps, such as events in the panel of recognized faces, are displayed in the local time of the computer/device; when the user goes to the archive for the selected event, the time in the archive will be displayed in the camera time zone.

Related references

[Enabling considering time zones](#) in the **Eocortex Configurator** application

[Setting the server time zone](#) in the **Eocortex Configurator** application

[Setting the camera time zone](#) in the **Eocortex Configurator** application

[Setting the client time zone](#) in the **Eocortex Client** application

Server features

Multiserver system

To ensure scalability and fault tolerance of multiserver video surveillance systems, as well as to minimize service data exchange over the network and reduce collisions associated with server synchronization, **Eocortex** uses a master server architecture. A description of this architecture can be found below.

The master server architecture was first introduced in **Eocortex** version 2.2. Previously, all servers in a multi-server system had equal rights which could lead to significant performance degradation and collisions.

In a multiserver system, only one server is the master server. The rest of the servers in the multiserver system are called slave servers and interact with the master server to update settings. Since the settings are synchronized by the slave servers making queries to the master server and not vice versa, the master server must be accessible to all servers in a multiserver system.

All servers in a multiserver system must have Eocortex installed of the same version by major and minor version numbers.

The version number of the **Eocortex** has three parts: **M.N.R**; **M**: major version, **N**: minor version, **R**: release number.

Main server

The main server stores and allows to edit the following data:

General system settings: data regarding servers, cameras, users etc.;

Data regarding licenses of each server;

Information about the most recent connection of each slave server to the main server;

Site plans.

The information about the most recent connections of the slave server to the master is used, in particular, for diagnostics: if the slave server has not connected to the master within the last 2 minutes, then its status will be changed accordingly.

Also, the functions of the main server include checking the authorization of each incoming queries from system users, including those from external applications.

Slave server

The slave server stores and allows you to modify its own single-server configuration, which contains the settings of this server and cameras bound to it, as well as a number of other parameters, including the location (address: port) of the main server. Also, the slave server stores a copy of the general settings obtained from the master server, in case the main server fails.

Every few seconds the slave server connects to the master server for synchronization purposes. The interval between connections is determined automatically and ranges from 5 to 15 seconds. In

addition, the connection to the master server occurs immediately after changes are made to the settings of the slave server.

The following tasks are performed within the scope of synchronization (moreover, some of the tasks are not performed during each synchronization session, but only when certain events occur or certain conditions are met):

The main server receives the information regarding the operability of the slave server;

The slave server performs time synchronization with the main server;

The main server receives information regarding the modification of settings and about licenses of the main server;

The slave server receives from the main server the information regarding the necessity to launch or stop the backup or channel replication processes coming from other servers;

The slave server downloads a copy of the general settings from the main server.

In addition to synchronization requests, the slave server redirects requests from client applications to the master server, if necessary.

Fail safety

To ensure that the main server does not become a common point of failure, a mechanism of transferring a copy of the general system settings to each slave server has been implemented. Below is the list of events and conditions for the general settings to be automatically downloaded by the slave servers:

Once every 12 hours;

Upon the launch of the slave server;

When the number of servers in the system has changed;

When the number of channels in the system has changed;

When the system users have changed;

Upon the change of binding of cameras to the servers;

When the bindings of replication or backup bindings have changed.

Thus, in the event of a failure of the main server, any of the remaining servers in the system can be designated as the main server.

Adding other servers and multiserver systems

The following terms are introduced for the purposes of this document:

Current system is a multiserver system or a system consisting of a single server connected to the **Eocortex Configurator** application at the given moment.

External system is a multiserver system or a system consisting of a single server that is being connected to the current system.

To connect an external system, it is required to connect only one of the external system servers to the current system - after connecting, the **Eocortex Configurator** application will send information to the other servers of the external system that the main server of the current system becomes their main server. In other words, when a server of another system joins the current system, all servers on that external system will join the current system.

In the process of connecting an external system, the **Eocortex Configurator** application must have access to all servers of this system in order to inform them of the new address of the main server.

In case the **Eocortex Configurator** application does not have access to any server of the external system at the time of connecting, such server will attempt to automatically

receive information about the change of address of the main server from the server that was the main server in the external system.

If the operation of obtaining a new address of the main server by an unavailable server automatically did not lead to the connection of this server to the current system (for example, if the main server of the external system was unavailable), it is necessary to make direct connection to this server using the **Eocortex Configurator** application, subsequently changing the address of the main server on the server (specifying the address of the main server of the current system).

The following happens when an external system is connected:

All the servers of the external system will be added to the current system.

On the former main server of the external system, all the general settings of the external system will be deleted, including users and the associated permissions. Further, to connect to the former servers of the external system, the authorization system of the current system will be used.

All the cameras and folders of the external system will be added to the current one. In this case, the camera settings and the distribution of cameras among servers will be preserved.

All site plans, archive bookmark categories, screen profiles and profile switching lists will be added to the current system from the external one.

If the **Eocortex Configurator** application is connected to the servers of the external system at the time of connecting, then, depending on whether the username and password of the current and external systems for this session match or not, the client application will either automatically restart or remain idle until the user restarts it under the correct username and password.

Disconnections of servers

The following terms are introduced for the purposes of this document:

Current system is a multiserver system or a system with a single server to which the **Eocortex Configurator** application is connected at the moment of disconnection.

Disconnected system is a system with a single server that is disconnected from the current system.

The master server cannot be disconnected from a multiserver system. If such need arises, it is required to designate another server in the system as the master one before disconnecting.

The following happens when a server is disconnected from the system:

The disconnected server is removed from the general settings of the current system. This means that all the cameras for which the disconnected server was the primary one, as well as all replication and backup bindings associated with the disconnected server will be removed from the general settings and site plans.

The disconnected server becomes the main server of the single-server system.

General settings for the single server system are created on the disconnected server. At the same time, all cameras for which this server was the main one at the time of disconnection are preserved. However, all replication and backup bindings are removed from the settings, as well as all cameras for which this server has been designated as a replication or backup server. If the server was a replication one before disconnection, after disconnection it becomes a basic server.

The disconnected system retains all users of the current system with their assigned permissions.

The disconnected system retains all site plans, archive bookmark categories, screen profiles, and profile switch lists. At the same time, all cameras that remain in the current system will be removed from the site plans.

The archive of replicated and backup cameras will remain on the disconnected server and it will be possible to view it using the **Local monitoring and backup archive** utility. This archive will be deleted as the disk space is filled with the current archive from the cameras remaining on the disconnected server. In this case, if the disconnected server is re-connected to the current system, the archive of replicated and backup cameras will become available for viewing in the **Eocortex Client** application.

If the **Eocortex Client** application is connected to the servers at the time of disconnection, it will continue to operate and will be automatically restarted only if the system is modified in such a way that the parameters of the current display, user rights, settings of currently displayed channels and a number of other settings are affected.

As a result, two systems with the same set of users and their rights, as well as site plans, categories of archived bookmarks, screen profiles and profile switching lists will be available after the server's disconnection.

Interaction of client applications with servers

Eocortex client applications include **Eocortex Client**, **Eocortex Web-client** and mobile client applications.

To work in a multiserver system, the users of client applications do not need to know the address of the main server and connect specifically to it - it will be sufficient to connect to any of the servers in the system. In this case, if the user connects to a slave server that does not have access to the master server, the client application will only have access to those cameras that are bound to that server.

Floating licensing

The **Floating licensing** implemented in **Eocortex** allows using a single license key on several **Eocortex** servers.

This capability is not present in all types of licenses.

In the terminology of **Eocortex**, the keys with the floating license are called network keys to distinguish them from the traditional keys that are now called local keys.

The total number of cameras, modules and other licensed features are shown in the floating license. The administrator of a video surveillance system can distribute the cameras among servers at his/her discretion. However, it is not required to distribute the licenses among servers because the system core does it automatically. Whereby, upon binding the cameras to another server, the corresponding licenses will be moved accordingly.

Only one license can be activated on a single server, irrespective of whether this license is local or floating.

The network key must be installed on a computer where the **Eocortex** server is installed.

The network keys can only be used on the **Eocortex** servers of versions 3.1 and later. It is not possible to use the network keys on the earlier versions of the software, even as local keys.

In order to ensure access to a network key, it is required to allow the outgoing TCP and UDP traffic for the 1947 port both on the server where the key is installed and on the servers that use this key.

A single network key can be used in several **Eocortex** video surveillance systems. In such a case, the parameters of the key will not be shown correctly in the **Eocortex Configurator** application of each system because the systems have no information regarding the usage of licenses by other systems.

A network key is to be installed on any **Eocortex** server of the same local network or VLAN where the servers using that key are located.

Several network and local keys can be installed in the same **Eocortex** video surveillance system. However, the number of local keys is limited by the quantity of **Eocortex** servers, but the number of network keys is unlimited.

The floating licenses can be used on any Sentinel (HASP) keys, be it software or USB ones.

Related references

[Installing and updating the license](#)


[Server licenses](#)

Two addresses for the same server

In **Eocortex**, it is possible to use two addresses for connecting for the same server:

- **Local address:** the main address of the server. It is possible to use this address for connecting to a server within the local network.
- **Additional address:** the address that is set optionally. This address will be used in a situation when it is not possible to connect to the server using a local address.

Setup

In order to use the additional address, it is required to enable the option **Use additional (public) address** on the **Information** tab located on the  **Servers** page.

Information Licensing Cameras

Network address for accessing server ✓ ✕

Local address	Port	SSL port
127.0.0.1	8080	18080

Use additional (public) address ⓘ

Additional address	Port	SSL port
	8080	18080

Status

main

Configure

Archive storage parameters, networks, mobile devices, etc.

[Diagnostics](#)

The connection to the server is always carried out using the local address first. If the connection to the local address fails, the connection to the additional address shall be made.

One exception is the connections to the server for the purpose of broadcasting live video. In such a case, if the connection to the local address is unsuccessful, a connection to the additional address will be made. Then, in case of a successful connection, a timer starts, which checks the availability of the local address every 10 minutes. When access to the local address is restored, a connection to this address occurs.

This algorithm is used not only for client connections to the server but also for connecting servers that broadcast real-time video in proxy mode.

Related references

[Setting up two addresses of the server in the configurator.](#)

Client P2P connection to server

The P2P (Peer-to-peer) technology allows to connect to the **Eocortex** server using the **Eocortex Client** application running on a remote computer from anywhere in the world, provided that both of them have internet access. At that, the **Eocortex** server does not have to have a public static IP address or to be in the same VLAN with the client computer. Thus, when it is required to connect to

the **Eocortex** servers via internet, it becomes significantly easier to set up the networks and the need to rent public static IP addresses or VLAN servers is eliminated.

Before connecting to the **Eocortex** server via the **Eocortex Client** application using the P2P technology, it is required to do the following:

1. Create an account in **Eocortex Cloud**.
2. Connect **Eocortex** servers to **Eocortex Cloud**.
3. Connect to **Eocortex Cloud** via **Eocortex Client**.

Creating an account in **Eocortex Cloud**

To create an account in **Eocortex Cloud**, it is required to follow the link <https://cloud.eocortex.com/account/register>

After creating an account, a message will be sent to the indicated address. To confirm, go to the link in the message or press **Activate**.

Connecting servers to **Eocortex Cloud**

After creating the account in **Eocortex Cloud**, it is required to connect a video surveillance system to it. To do that, go to the general server settings in the **Eocortex Configurator** application, then go to the **Eocortex Cloud** tab, enter the **Eocortex Cloud** account data (email and password) and, finally, press the **Connect** button.

The **Eocortex Cloud** connection setup is only available to the users with full rights (in case of the **Enterprise** and **ULTRA** licenses these are the users who are included in the group with the **Senior administrators** rights).

After the successful connection, the status will change to **System connected**.

The settings will come into effect only after they are [applied](#).

Client P2P connection

After having connected the video surveillance system to **Eocortex Cloud**, it becomes possible to connect to it using P2P. For that end, a new type of connection was added to the authorization window of the **Eocortex Client** application called **Connection to Eocortex Cloud**. To connect, it is required to enter the email and password of the **Eocortex Cloud** account.

Description of **Eocortex Client** in case of its connection to server via P2P:

When making a connection via P2P using **Eocortex Cloud**, the user of **Eocortex Client** will enjoy full rights for the access to the video surveillance system.

On the other hand, the **Eocortex Configurator** application does not support the P2P access; thus, the user who has connected to the system via P2P, will not be able to launch **Eocortex Configurator** from the client application.

Besides, when connecting via P2P, the **Eocortex Configurator** application will not be able to perform an automatic upgrade to the server's version.

When connected to a multi-server system via P2P, it is possible to view the cameras only from those servers that are connected to **Eocortex Cloud** have internet access.

At the same time, if the main server has access to the internet, it is possible to gain the P2P access to the cameras of the servers without internet access but which are in the same local network or VLAN with the main server by enabling a proxy access through the main server.

If the **Eocortex** server is disconnected from the system that is already connected to **Eocortex Cloud**, that server will be disconnected from **Eocortex Cloud** and its **Eocortex Cloud** connection settings will be deleted.

When combining two systems connected to **Eocortex Cloud**, the system being connected will be disconnected from the initial **Eocortex Cloud** account and connected to the account of the system to which it is being connected.

Since in case of a P2P connection the data, in most instances, will be transmitted via internet, a secure connection will be employed.

Failure to connect to system via P2P

First, it is required to make sure that the system is connected to **Eocortex Cloud**. To do so, go to the **Eocortex Cloud** account and check the list of the connected servers. If the list is empty, it may be possible that the main server has no internet access and cannot connect to **Eocortex Cloud**.

If there are servers in the list but the main server has the **Disconnected** status, it is required to make sure that the server is in a working order.

In case the main server has the **Connected** status, but it is impossible to connect to the system, it is likely that the server or the client are in the network that does not support P2P connections.

Below are the options of the network organization that do not support P2P connections:

Server and client are on the computer that is in the network after the router with *Symmetric NAT*.

Server and client are on the computer that is in the network after two or more routers with different NATs.

Questions and answers

Q: How many video surveillance systems can be connected to a single **Eocortex Cloud** account?

A: Only one video surveillance system can be connected to a single **Eocortex Cloud** account.

Q: Are there any limitations as regards the number of system servers connected to **Eocortex Cloud**?

A: There are no such limitations.

Q: Is the load on the client and the server different depending on the type of connection (standard or P2P)?

A: On the client, the load is the same in both cases. The server, on the contrary, may consume somewhat more CPU resources when connected via P2P. The load depends on the volume of traffic sent by the server via P2P. The maximum increase of the load via P2P can reach 50% of the standard connection load. For example, if the server used 20% of the CPU capacity to transmit data to the client applications under the standard connection, this load can increase to 30% when all the clients are connected via P2P.

Q: Are there any traffic limitations in case of a P2P connection?

A: Yes. First, the maximum throughput of a single channel with the camera stream is around 40 Mbps. Second, since in the majority of cases the connection is via internet, the speed depends on a provider's internet plan.

Decoding B frames of H.264 and H.265 video streams

In H.264 and H.265 codecs, the following types of frames are used for video stream compression:

- **I-frames** (reference frames, key frames) contain all the fragments of the image being encoded.
- **P-frames** (differentially dependent frames) contain new fragments of the image being encoded or the changes in relation to the key frame.

- **B-frames** (bidirectionally dependent) encode the difference between the neighboring frames by making reference to the encoded fragments in the key and differentially dependent frames.

The video stream compressed using the B-frames have higher rate of compression in comparison with the video streams that were compressed using I and P-frames only. Thus, the video stream compressed using the B-frames requires less channel width for transmission via the network (from the camera to the server and from the server to the client application). It also occupies less drive space when stored in the archive. The volume of storage saving may reach 40% as compared with the video where only I and P-frames are used.

The practically achievable compression value depends on many parameters, such as the number of details in a frame, the intensity of movement, the resolution, the frame rate and other characteristics, including those related to the codec's developer. At that, in most cases, the compression rate increases with the increase of the resolution and the frame rate.

At the same time, more computing power is needed for encoding the B-frames in comparison with encoding I and P-frames only.

Moreover, the use of the B-frames results in the increased delay in real-time video. It happens because the encoding and decoding of the B-frames requires buffering.

The capability of encoding the B-frames is usually indicated in the documentation of a camera. For example, the **IBP** or **IBBP** support may be stated. In such a case, the H.264/H.265 video codec must, as a rule, support the profile not lower than the **Main Profile**.

It is possible to ascertain if **Eocortex** supports the reception of a video stream with B-frames from a certain camera by contacting **Eocortex** technical support team.

The debugging information can provide data regarding the presence of the B-frames in a video stream. To obtain this data, it is required to enable the output of the debugging information in the **Eocortex Client** application. The indication of **(B)** will imply that the B-frames are present in the video stream.

Decoding on GPU

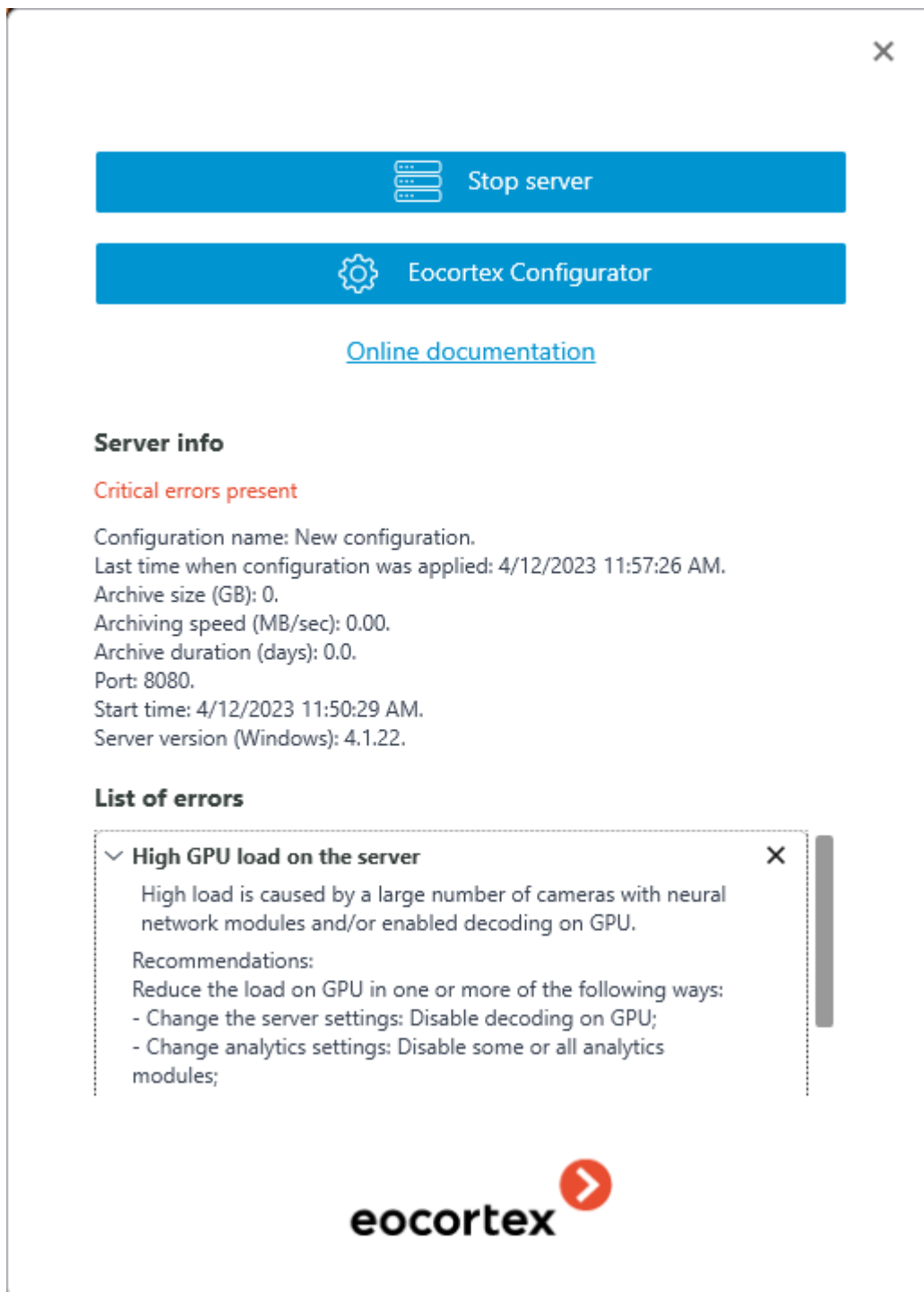
Decoding on GPU allows to reduce the load on CPU caused by processing camera streams, especially when using video analytics modules. It also allows decoding more cameras on a single server. In addition, the cost of the server can be reduced by purchasing a less powerful CPU.



By default, this option is disabled. When enabling it on a server without GPU, decoding will continue on CPU.

At high GPU load a corresponding warning will be displayed in the **Eocortex Client** and **Eocortex Status Info** applications.

Below is an example of such warning in **Eocortex Status Info** with recommendations on how to solve the case of overloading.



The warning appears when the total load on GPU exceeds 85%. If the load becomes less than the threshold value, the warning will disappear.

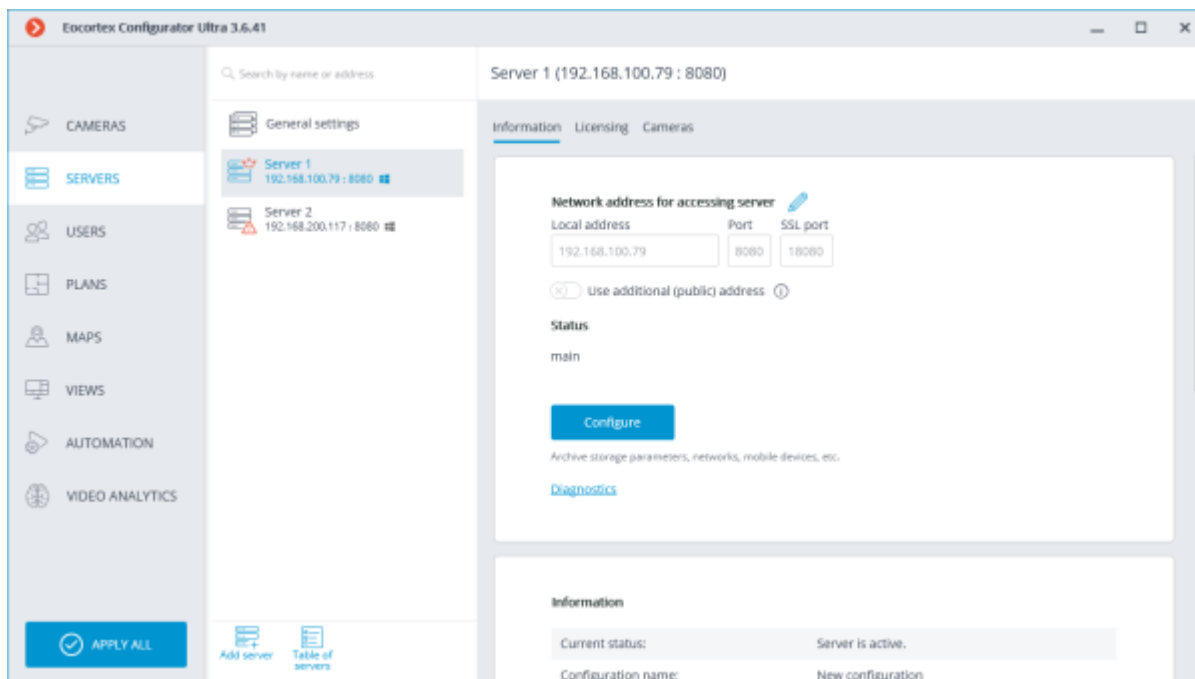
The load on GPU can be reduced in one or more of the following ways:

- Change server settings: disable decoding on GPU;
- Change video analytics settings: disable some or all video analytics modules;
- Re-assign a part of the cameras to another server.

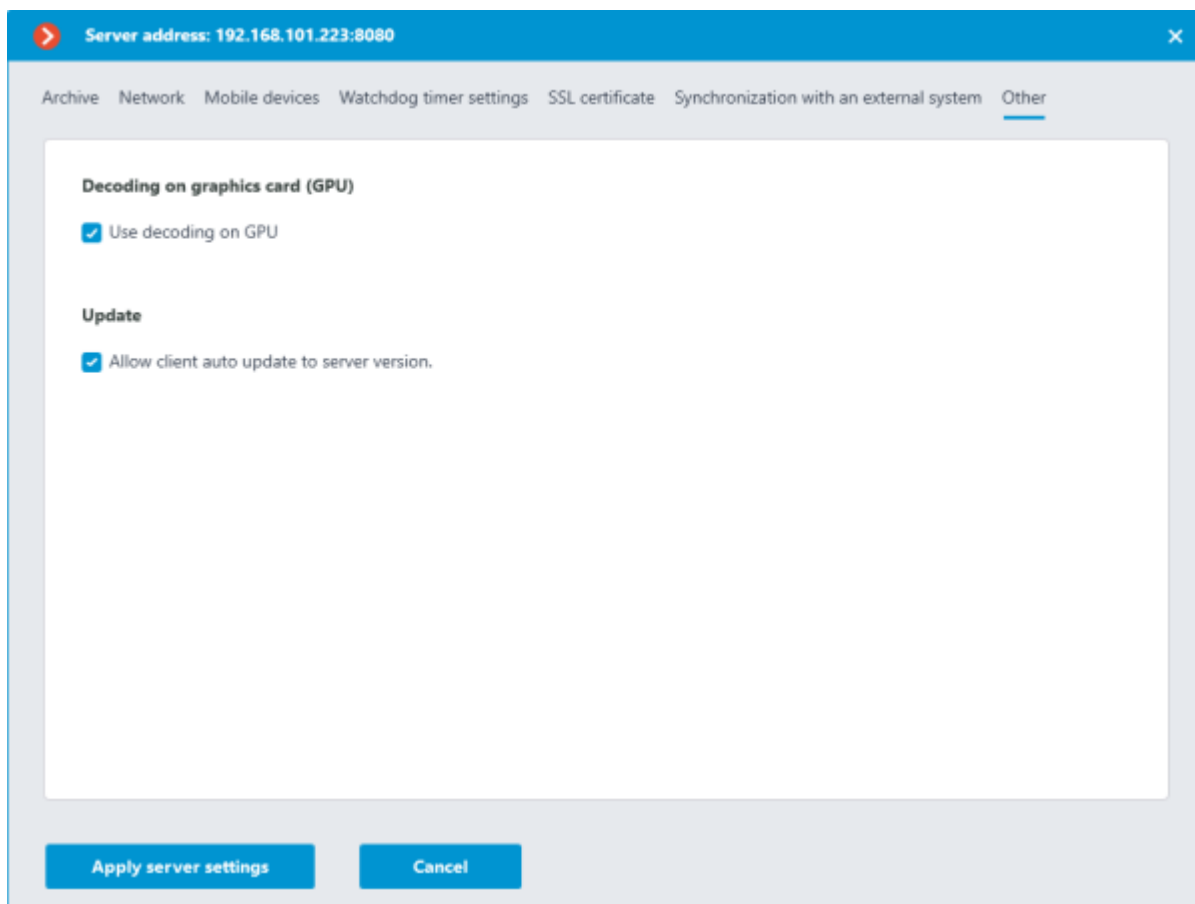
Option settings

Decoding on GPU can be configured in the advanced server settings window.

To open the additional server settings window, select the server on the **Servers** page of **Eocortex Configurator** application and then either select **Configure** in the context menu or click **Configure** on the **Information** tab of the server settings tab.



On the **Other** tab, enable the **Use decoding on GPU** option.



Requirements and recommendations

Only NVIDIA graphics cards are supported.

Only the following codecs are supported: H.264, H.265.

A list of video cards and the codecs they support can be found [in the manufacturer's official table](#).



It is not recommended to use GPU decoding for MJPEG codec due to low efficiency.



It is not recommended to use GPU decoding for enhanced versions of codecs like H.264+ or Wisestream. High GOV value may cause issues with initializing the decoder.

Load balancing

Depending on the GPU load, this option performs a transfer of the processing of part of the cameras to the CPU and vice versa.

- Balancing performs automatically every 10 seconds.
- When the server starts, all cameras are decoded on CPU. Decoding on GPU will start only after 30-40 seconds of server activity.
- If the camera has multiple streams, all streams will be transferred to the selected processing unit during load balancing.
- The load balancing does not count cameras that are disabled or deleted in the **Eocortex Configurator** application.
- If the load on the decoding unit of GPU does not exceed 75%, the cameras will be transferred in parts to GPU until the optimal load is reached.
- If the load on the decoding unit of GPU exceeds 85%, the cameras will be transferred in parts back to CPU.
- Load balancing is supposed to ensure optimal average load on the decoding unit of GPU in the range of 75% to 85% and video memory utilization up to 80-90%.

Generation of RTSP links to cameras in Eocortex Configurator application

The generation of RTSP links allows to facilitate the process of setting up the receipt of the video stream from a camera via the RTSP server of **Eocortex**.

Before, the RTSP links had to be created manually. The detailed process is described in the SDK and API documentation.

Generating a link for a specific camera

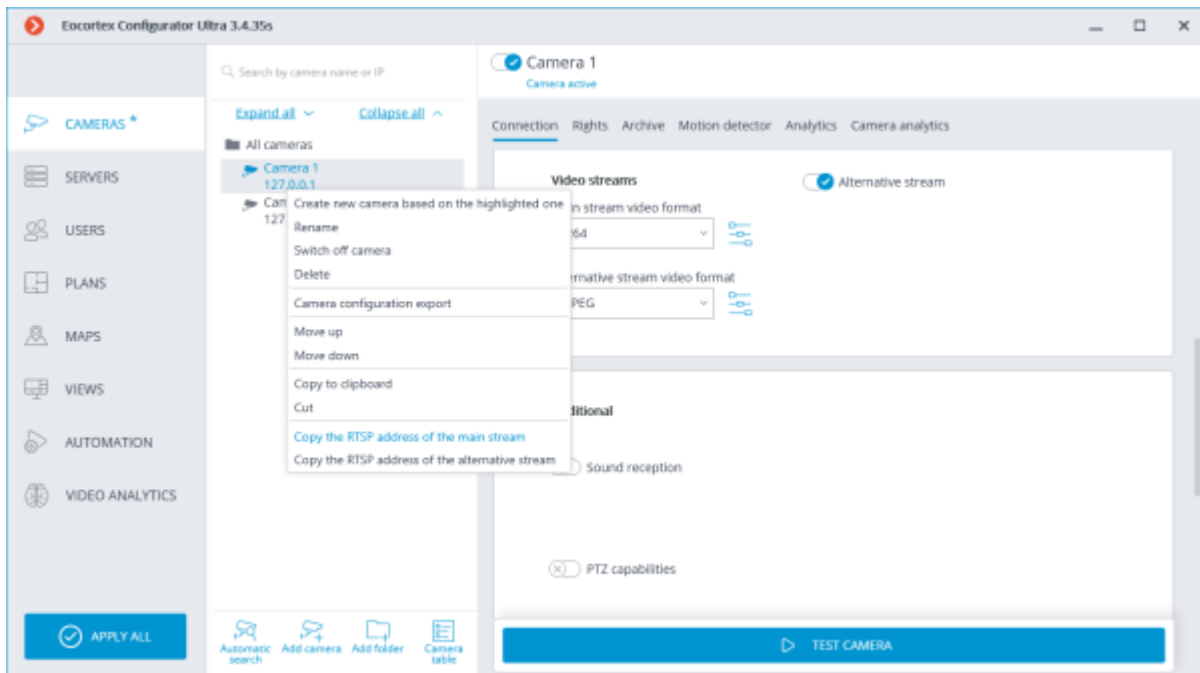
To obtain a RTSP link, it is required to perform the following steps:

Step 1: Launch the **Eocortex Configurator** application.

Step 2: Open the  **Cameras** page.

Step 3: Select a camera and open the context menu with the right mouse button.

Step 4: Select the item that allows to copy the RTSP address of the main or alternative stream.



A separate link is generated for each of the streams – main and alternative. At that, the parameter **streamtype=alternative** is used for the alternative video stream.

Generating links for a list of cameras

To obtain the RTSP links, do the following:

Step 1: Launch the **Eocortex Configurator** application.

Step 2: Open the  **Cameras** page.

Step 3: Press the **Cameras table button**.

Step 4: Press the **Export** button.

Step 5: Save the file in the CSV format.

The link does not contain user's login or password – they need to be entered manually in the system where the link is copied.

The RTSP links are not generated if the XPS format has been selected for export.

The RTSP links are also generated for those cameras that have been disabled in the configuration.

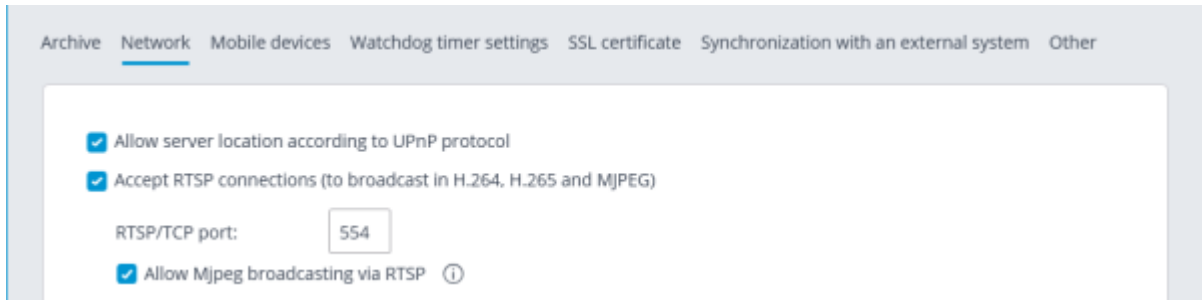
For many systems, the login and password can be pasted directly into the link after the protocol and before the address as follows:

rtsp://login:pass@address/rtsp?channelid=0eea2046-7d4c-4a25-9df8-e0aedae99bed.

Some applications allow to indicate login and password in the separate entry fields or request them.

The RTSP broadcasting may be disabled on the **Eocortex** server; that is why it is required to enable the possibility of RTSP connections to the server before the generation of links.

By default, the IP cameras use port 554 for RTSP broadcasting. However, the port can be modified in the [network settings of the server](#).



Samples of RTSP links

Non-standard RTSP port, main stream:

rtsp://192.168.100.118:556/rtsp?channelid=0eea2046-7d4c-4a25-9df8-e0aediae99bed

Non-standard RTSP port, sound reception enabled, alternative stream:

rtsp://192.168.100.118:556/rtsp?channelid=00c8365c-8c42-46a3-bcdd-5187461e9bb2&login=test&password=81DC9BDB52D04DC20036DBD8313ED055&sound=on&streamtype=alternative

Example use of a RTSP link


To connect to the **Eocortex** server via RTSP from the same server as well as from another server, including the cloud one, it is required to do the following:

Step 1: Copy the RTSP link from the server from which the video stream is received via RTSP.

Step 2: Using the **Eocortex Configurator** application, connect to the server that will receive the video stream.

Step 3: Add a RTSP camera and insert the RTSP link into the address field. Enter the **Eocortex** login and user name in the corresponding fields.

Address (IP address or URL)



Device

Brand	Device type	Model
<input type="text" value="RTSP/RTP device"/>	<input type="text" value="Camera"/>	<input type="text" value="RTSP/RTP device"/>

Authorization

Username	Password
<input type="text" value="test"/>	<input type="password" value="••••"/>

The RTSP link is inserted in other applications in the similar fashion, e.g., Windows Media, VLC, MPlayer, RealPlayer, Media Player Classic video players.

Limitation of client connections

Eocortex permits to limit the number of connections to the video surveillance system under the same account.

This option is initially disabled.

Setup of group rights

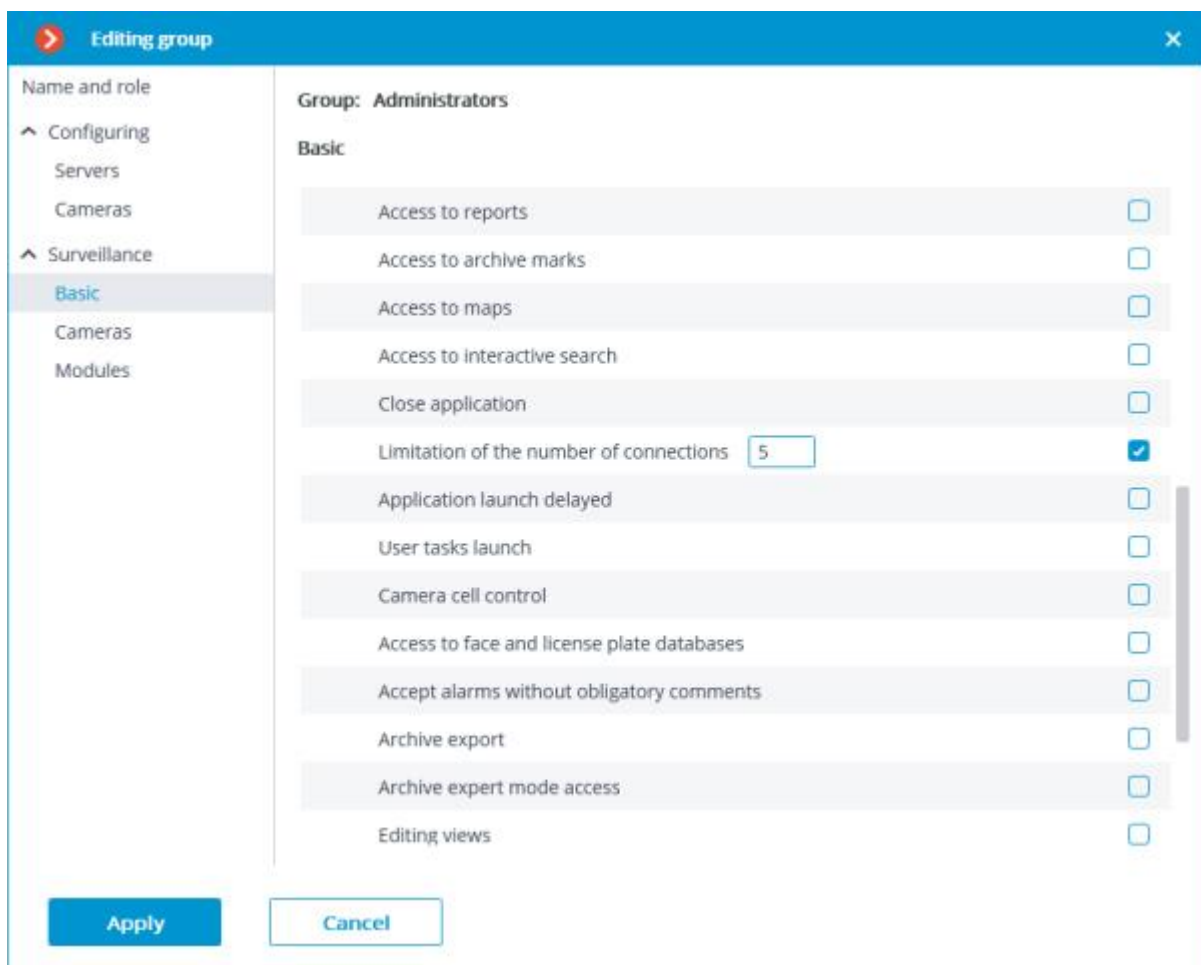
To limit the number of client connections to a user group, it is required to configure the group rights as follows:

Step 1: Open the **Eocortex Configurator** application, go to the tab  **Users** and press the button **Users of Eocortex applications**.

Step 2: Select a group and press **Edit**.

Step 3: Go to the tab **Basic**.

Step 4: Enable the **Limitation of the number of connections** right and indicate the maximum number of connections for the group members.



The value of the number of connections for users of the group must be at least 1 and no more than 1000. When the right is enabled for the first time, the value is equal to 1.

Step 5: Apply settings.

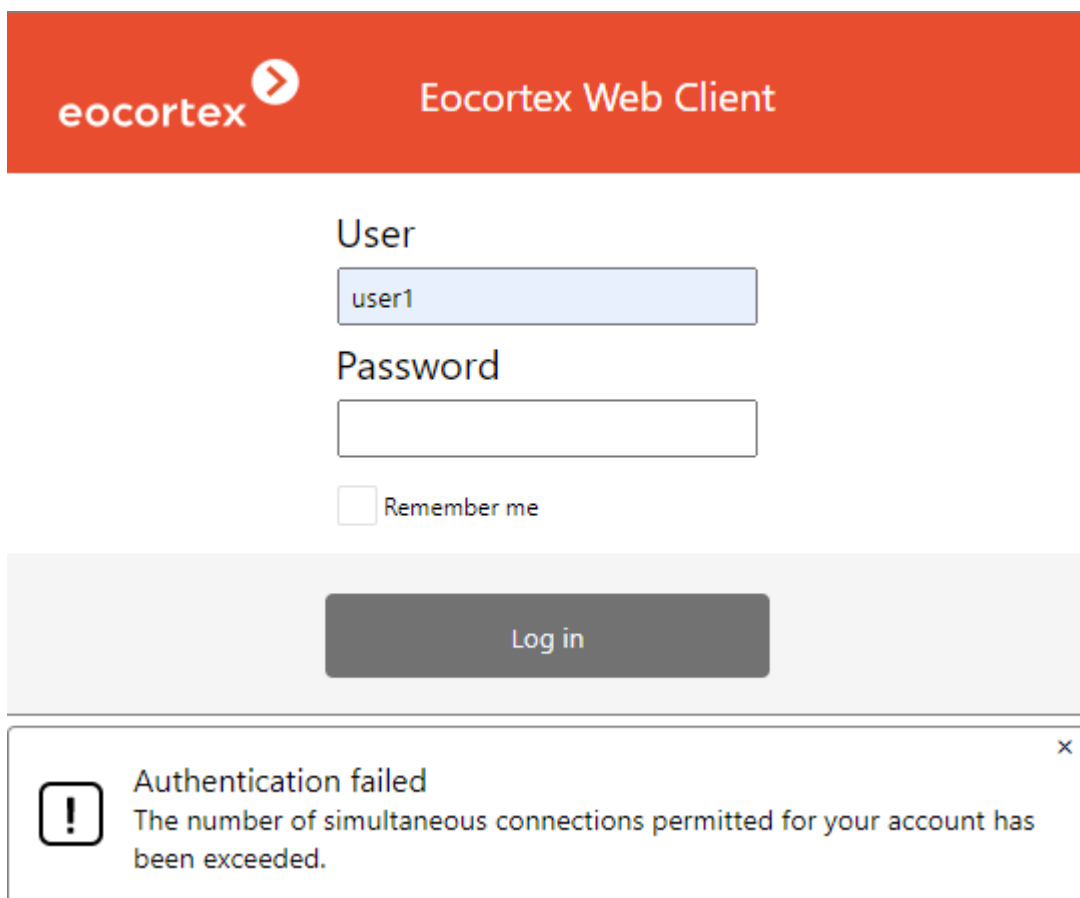
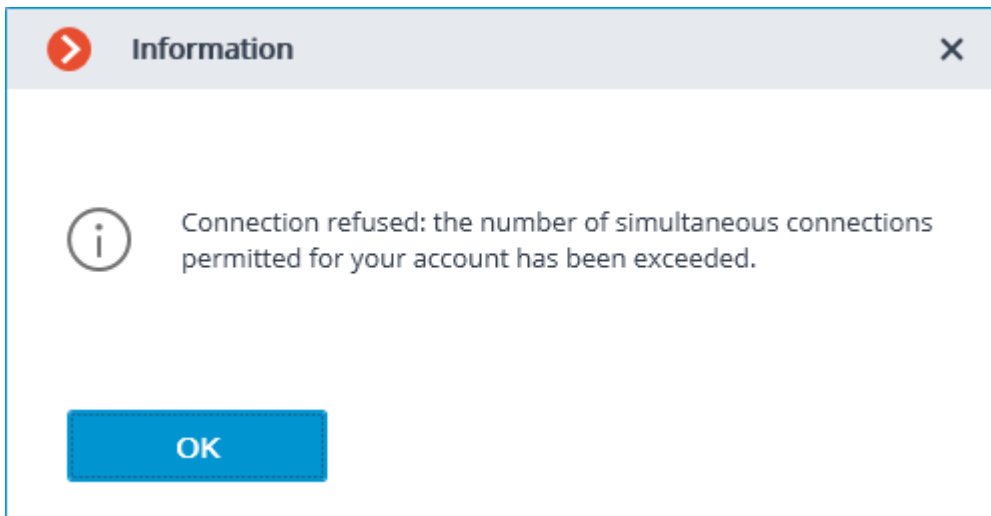
New settings will become effective as soon as they are applied.

The stated limitation applies to each user of the group.

The limitation on the number of client connections also applies to Active Directory users, whereby:

- If an Active Directory user is added to the group as a user, the restriction will apply to him, as well as to the regular users of **Eocortex**.
- If an Active Directory group is added as a user, the restriction will be applied separately to each user of this group.

If the limit has already been reached, an attempt to connect via the client application will result in a message that the number of client connections has been exceeded.



Management of client connections

Client Connection Limitation is the maximum number of unique client connections made under the same user account.

The connections are counted for each account, not as a total for a group of users.

A unique connection identifier is used to track the connections. Each connection to the system is unique in the **Eocortex Client** application. In the **Eocortex Web-client** application, a unique identifier is bound to the address of the client connection to the server.

If the browser is running in the **Incognito** mode, each tab will have its own identifier.

If **Eocortex Web-client** is launched from another browser, it will have a different identifier.

After enabling the right and applying the settings, client connections exceeding the limit will be disconnected randomly.

After reducing the number of connections and applying the settings, current connections that exceed the new limit are not terminated.

A client connection is considered completed if it has not sent requests to the server within 6 minutes.

Thus, when the connection limit is reached, after the completion of one client application, at least 6 minutes must pass to allow a new connection using the same credentials.

Requirements, limitations, features

For this feature to work correctly, it is necessary to ensure that each **Eocortex** server has access to the main server of the system. The reason is that it is the main server that is responsible for counting the client connections throughout the system.

When the connection to the main server is lost, the member server will only count its own connections and restrict connections based on this data. Thus, if the main server is unavailable, the number of client connections for the system as a whole may be exceeded.

After the connection is restored, the main server updates its data using the information from the member server. If after updating the total number of connections by one user has exceeded the limit, the client applications will remain connected. However, new connections by the same user will not be possible.

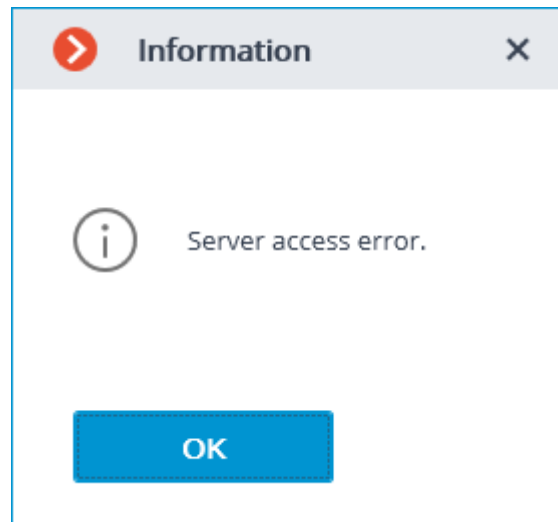
The limitation will not work correctly if the system has servers running Windows 7, since the connections for such servers will be counted locally.

If the main server is using Windows 7, all servers in the system will count the connections locally.

Since **Eocortex** version **4.0**, support for **Windows 7** and **Windows Server 2008** operating systems, as well as **32-bit versions** of other operating systems, is no longer available. This should be considered when installing or upgrading **Eocortex** to version **4.0** or higher.

If the system has servers with **Eocortex** version 3.3 or lower, the client connections to such servers will not be taken into account when limiting the overall number of connections.

When connecting to the **Eocortex** server of version 3.4 and higher with **Eocortex Client** application of version 3.3 or lower, such connections will be counted. In this case, if the connection limit is exceeded, the following error window will appear in the client application:



Using PostgreSQL

This feature is available for all **Eocortex** licenses and requires no additional licensing. Starting from version 3.4 of **Eocortex**, certain components use PostgreSQL database management system of version 11 or later.

Using PostgreSQL in Eocortex

Version Eocortex	Required PostgreSQL version	Components Eocortex	PostgreSQL installation	
			Windows	Linux
3.3 or lower	Not required	—	Not required	Not required
3.4–3.6	11	Search for Objects analytics module	Automatically, when installing the Search for Objects module with the Eocortex Neural Networks package	Separate PostgreSQL installation
4.0 or higher	12	All Eocortex databases	Automatically, when installing Eocortex Server or Eocortex Standalone from the common distributive	Separate PostgreSQL installation

Requirements and recommendations

The minimum required DBMS version when working with **Eocortex** 3.6 or lower is PostgreSQL 11.

The minimum required DBMS version when working with **Eocortex** 4.0 or higher is PostgreSQL 12.

If the system version 3.4-3.6 uses or has previously used the **Search for Objects** module, then after updating to version 4.0 the first time **Eocortex** starts, the module database will be moved to the **EocortexArchive\db** directory common to all databases. Module's operation will be suspended while the database is being moved.

If the system previously used Face or License Plate Recognition modules, then after updating to version 4.0 the first time **Eocortex** starts, databases of these modules will migrate from Firebird to PostgreSQL. The modules will be suspended during the migration.

Before installing the required version of PostgreSQL, it is recommended to uninstall other DBMS versions to avoid conflicts.

It is recommended to install PostgreSQL automatically during the installation of **Eocortex** components.

It is recommended to use local disks for storing the database. The use of network drives for this purpose is prohibited.

In large systems it is not recommended to use the same disk for parallel recording of the video archive and the database, as it may adversely affect the performance of the database.

The proper operation of **Eocortex** is not guaranteed when transferring database privileges to manually created DBMS users.

Related references

- [Using PostgreSQL under Windows](#)
- [Using PostgreSQL under Linux](#)

Client Authorization events

In the [Event log](#) of **Eocortex Client** application, authorization events for **Desktop**, **Web** and **Mobile** clients can be viewed.

Events		
Time	Type	Event description
21.03.2022 16:41:12	i	Successful authentication. Client type: Web, user: root, IP-address: 192.168.100.79.
21.03.2022 16:41:11	i	Successful authentication. Client type: Desktop, user: root, IP-address: 127.0.0.1, computer: [redacted].
21.03.2022 16:41:06	i	Successful authentication. Client type: Mobile, user: root, IP-address: 192.168.50.145.

Events are generated at the first authorization and after 6 minutes of no connection with the client.

If at the moment of authorization, the user is blocked in the system or the number of allowed connections is exceeded, then the event is not generated.

If an authorization attempt is made by a mobile application with version 3.3 or lower to the **Eocortex** server with version 3.6 or higher, then the event is not generated.

Audio playback on the camera

In **Eocortex** it is possible to play the audio file on the camera speaker by scenario or as a user task. This feature makes it possible to ensure safety and inform people, e.g., in case of smoke or fire on the site.

Playback of the audio recording on the camera is performed by transmitting a pre-selected audio file from the **Eocortex** server to the camera.

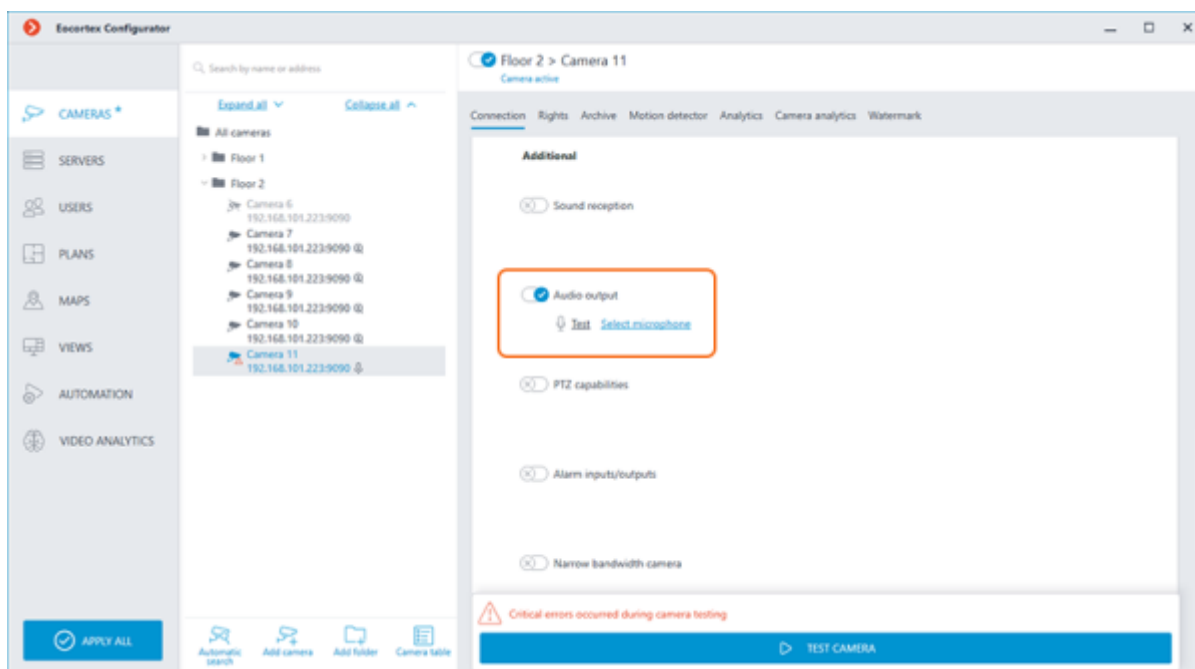
Setting in Eocortex Configurator

Audio playback is only available on cameras that have a built-in speaker or that allows to connect an external one.

Do the following to set up audio playback on the camera:

Run the **Eocortex Configurator** application.

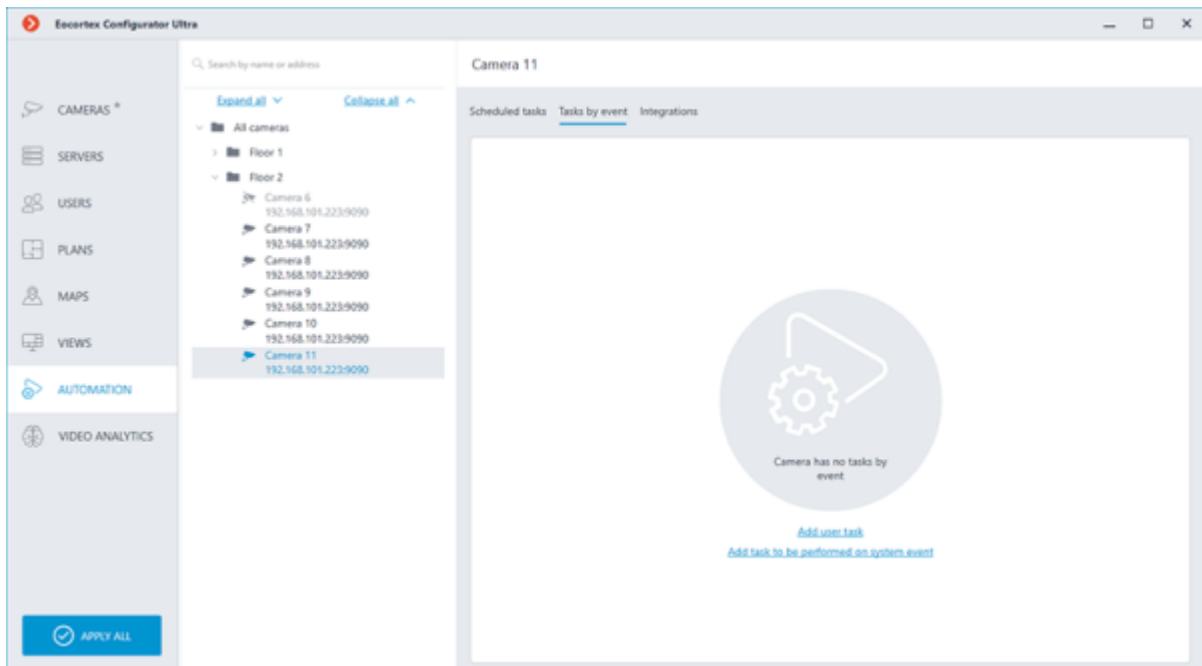
Go to the  **Cameras** page.



Select a camera in the list.

Scroll down the camera settings to the **Additional** section and activate the  **Sound transmission** slider.

Go to the  **Automation** page.

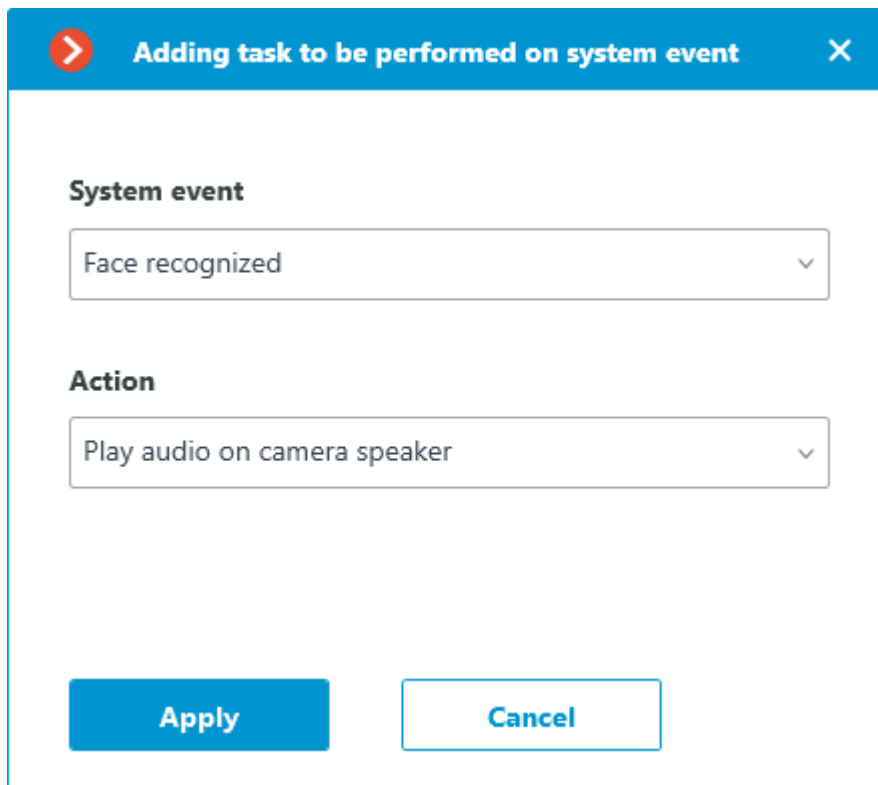


Select the camera or an entire folder in the list.

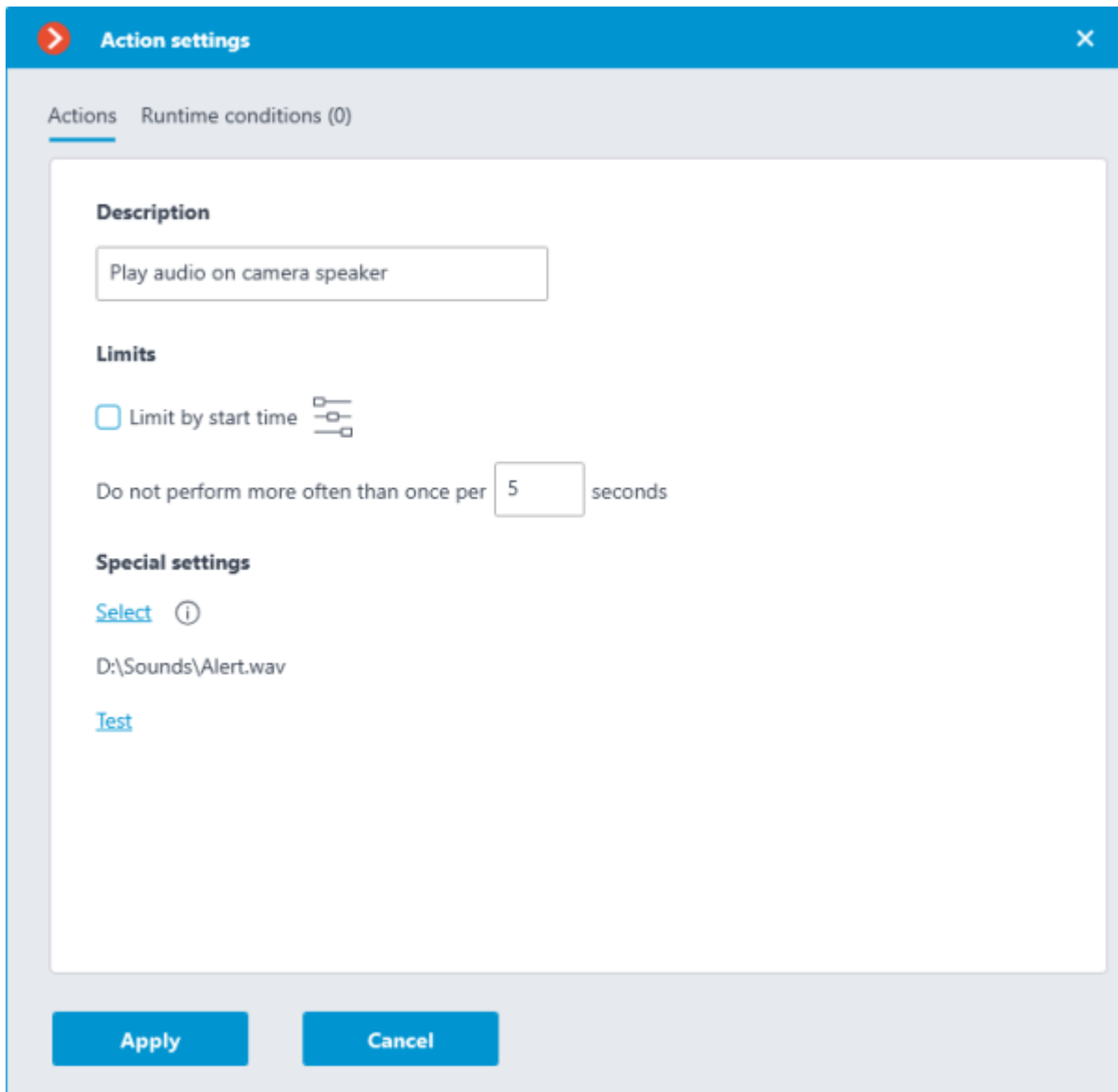
On the right part of the window, switch to the **Tasks by event** tab.

Select from the Events menu the event in the system for which the audio recording is to be played.

Select from the Actions list the **Play audio on camera speaker** and press the **Apply** button.



Select an audio file.



The audio file must be on the same computer with the **Eocortex** server to which the camera is connected. When configuring the **Play audio on camera speaker** action, the **Eocortex Configurator** application must be launched on this computer.

The duration of the audio record should not exceed the time interval specified in the **Do not perform more often than once per** parameter.

Test the playback of the audio on the camera by pressing the **Test** button.

[Apply settings](#).

The same way can be configured [user tasks](#), executing the **Play audio on camera speaker** action.

Requirements to the audio file

File format: WAV

Sampling Rate: 8000Hz

Bits Per Sample: 16

Channels: 1

It is recommended to make a short pause at the beginning of the audio track, since part of the track can be lost if the connection with the camera takes a long time.

Related references

[Tasks on system events](#)

[Actions](#)

Custom notifications and webhooks

Eocortex provides the option of sending extended and customizable information about the event to external users and automated systems. This is possible by adding special template variables when configuring [actions](#) in the **Automation** section.

Only certain **Actions** can be set up with template variables.

This feature can be used, for example, to send the name, group and ID of a recognized person to the ACS so that the ACS will open the door.

Read more about [custom notifications and webhooks](#).

Security

Active Directory Single Sign-On

Eocortex supports the capability of logging into the system using **Active Directory** Pass-Through Authentication. This allows users to log into the **Eocortex** system through a domain user account without re-entering the login and password manually.

This feature is available only for **Enterprise** and **ULTRA** licenses.

Single Sign-On through **Active Directory** is available only for servers running on Windows.

Use



To log in to the system through **Active Directory** SSO, do the following:

Run the **Eocortex Client**, **Eocortex Configurator** or **Eocortex Standalone** application.



Select the  **Active Directory** account type.

✕


Eocortex Client

Server

User



Password


Account type

- ✓ Eocortex (default)
- Active Directory

Save

Connect

[Online documentation](#)

eocortex 

Select the user to log in at the bottom of the authorization window.

Eocortex Client

Server

127.0.0.1


User

Password

Save

Connect

Sign in as

 **CCTV Admin**
cctvadmin@mydomain.com

eocortex

For **Active Directory** accounts, the user name is specified as: **username@domain**; where **domain** is the domain name, **username** is the name of the user in the domain.

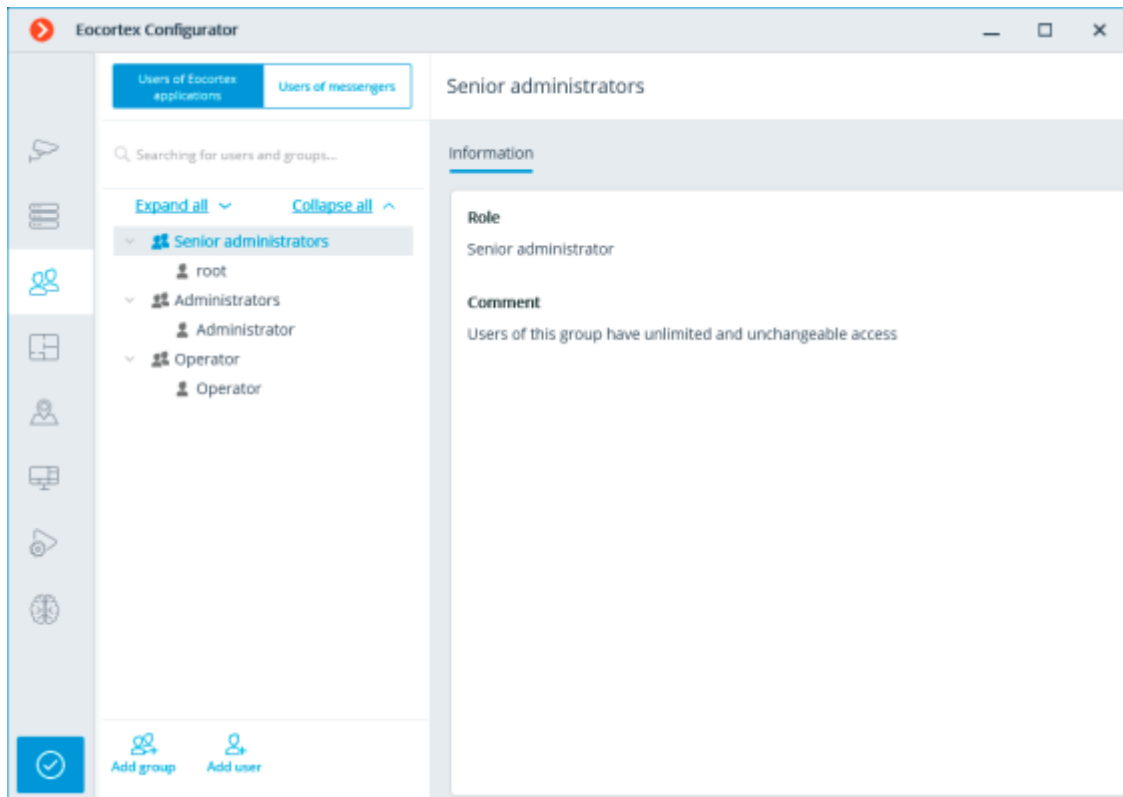
An **Active Directory** domain user, in order to be able to log into **Eocortex**, must be added by the system administrator to the **Eocortex** user list.

Adding Active Directory user

To add an **Active Directory** domain user (or entire group of users) to the system, do the following:
Run the **Eocortex Configurator** application.

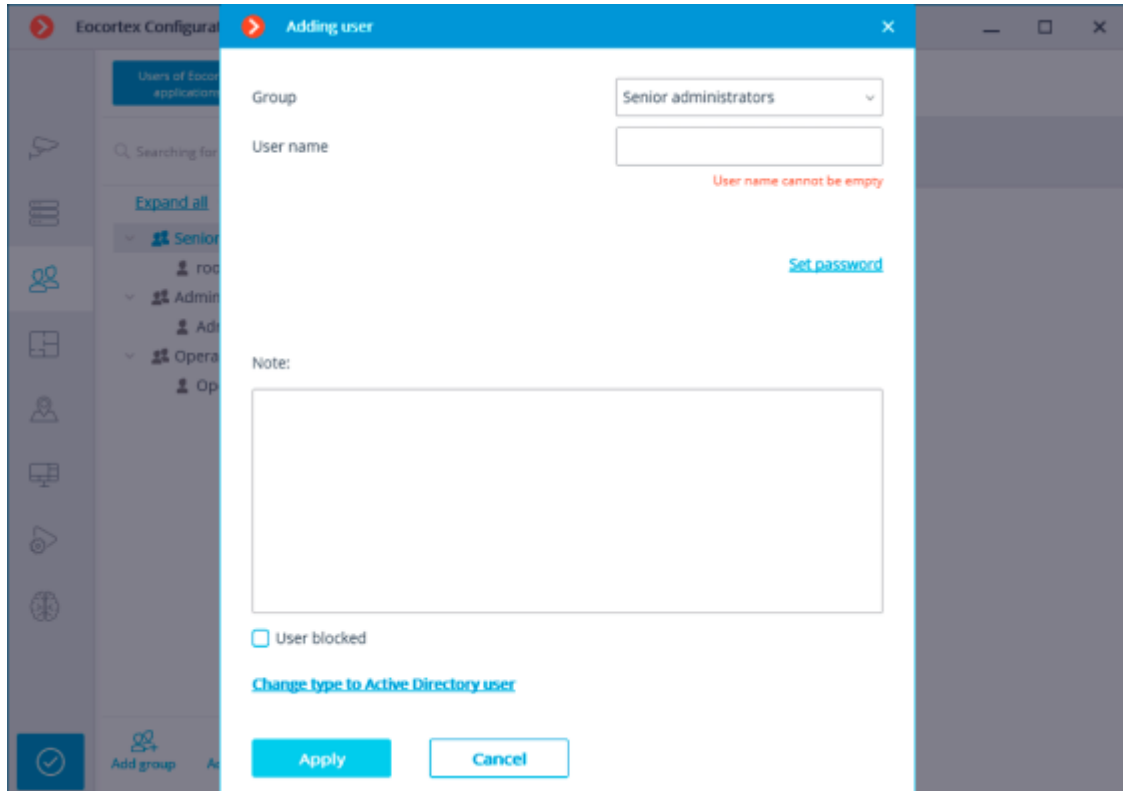
Open the  **Users** page.

Select the **Users of Eocortex applications** tab.

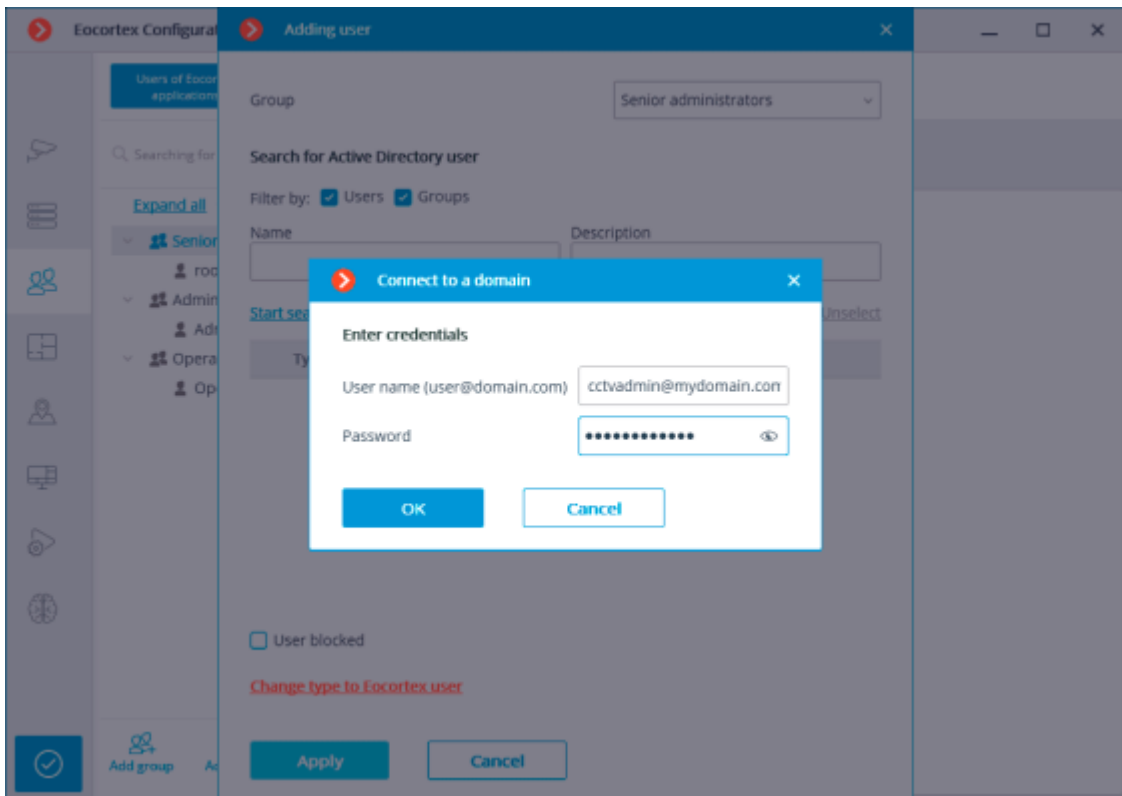


Click the  **Add user** button.

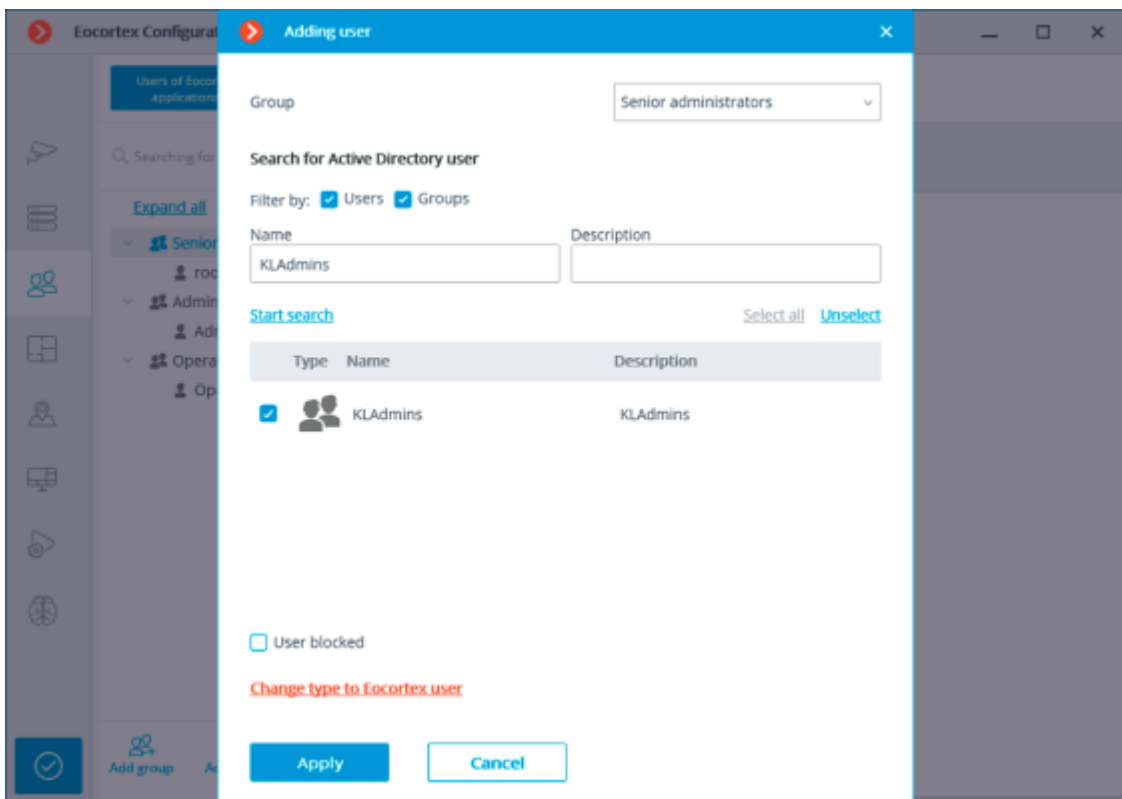
In the window that opens, click the **Change type to Active Directory user** link.



Type the username and password of the **Active Directory** account that has rights to search in **Active Directory** domain.



Find and select needed individual users or groups of users.



When adding a group of **Active Directory** users to the system, the same access rights set in the system will apply to all users of this group.

Configuring access rights

Active Directory Single Sign-On authorization is enabled by default only for the **Senior administrators** user group.

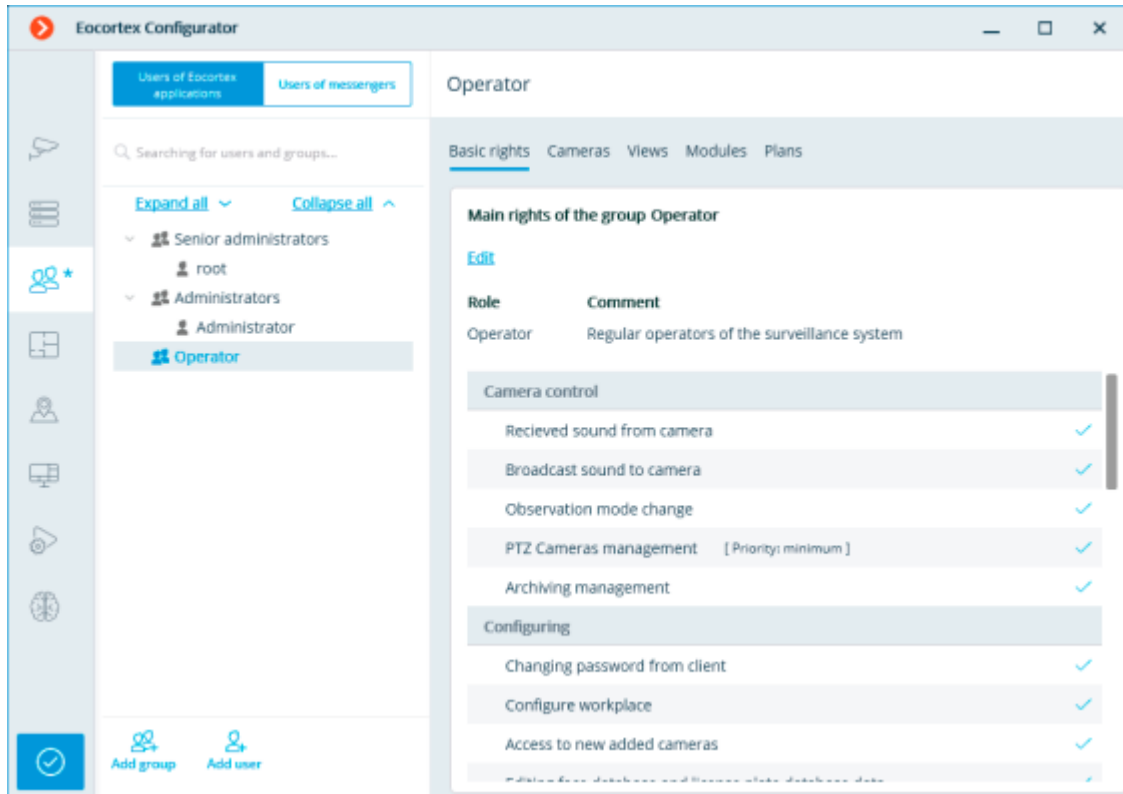
To enable Single Sign-On authorization for other users, do the following:

Run the **Eocortex Configurator** application.

Open the  **Users** page.

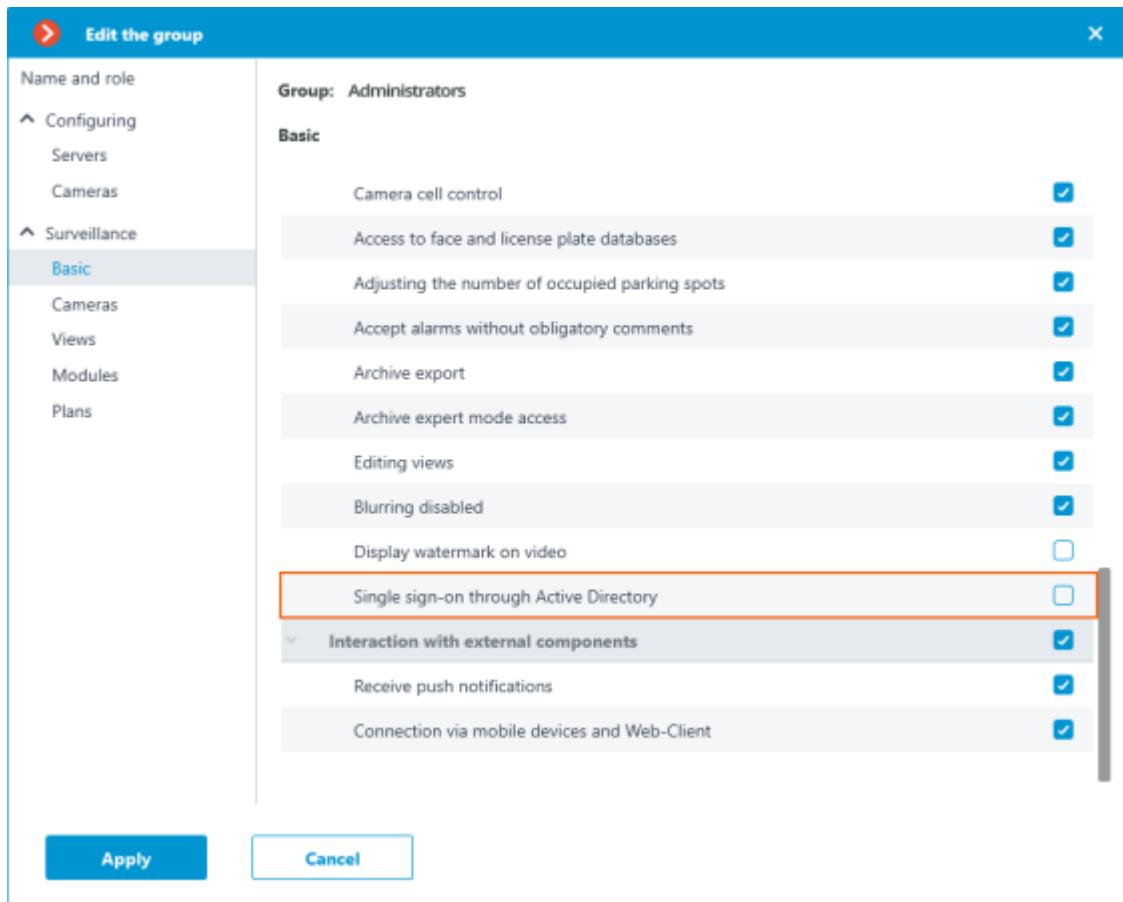
Select the **Users of Eocortex applications** tab.

Select a group of users to provide permissions to use **Active Directory** SSO and click the **Edit** button.



Switch to the **Basic** tab of the window that opens.

Enable the **Single sign-on through Active Directory** permission.



Requirements

Eocortex Standalone and **Eocortex Server** require being running under the domain user.

For **Eocortex Standalone**, log in to the operating system under the domain user and run the application.

For **Eocortex Server**, set the domain user credentials to the Log On tab of the service properties.

By default, **Eocortex Server** is launched under the LOCALSYSTEM user.

Related links

[Autorun for Eocortex Client and Eocortex Standalone](#)

[Disabling Active Directory Single Sign-On button](#)

[Users of Eocortex applications \(Enterprise and ULTRA licenses\)](#)

Video analytics

Abandoned Objects Detection

The **Abandoned Objects Detection** is intended for finding objects that have stayed in the field of view of the camera without moving for the time that exceeds the preset value.



When an abandoned object is detected, the corresponding alarm is generated and the object becomes highlighted in the frame. It is possible to set a user action scenario for this alarm. Moreover, all the alarms are stored in the event log, allowing to view all the abandoned objects in the video archive.

The module can be used for locating abandoned objects outside or inside.

Details

For the correct operation of the module, it is required to properly place and set up the camera, enable and adjust the module.

Compatibility with other modules

OS	Requires Eocortex motion detector		Neural network	Compatible with modules		Incompatible with modules
			Standard	Special		
√	√	√	–	–	Auto Zoom Counting People in Queue Crowd Monitoring Emergency Vehicle Detection Face Detection Face Mask Detector Face Recognition (Complete) Face Recognition (Light) Fire and Smoke Detector Frame Area Blurring	FishEye Dewarping

OS	Requires Eocortex motion detector	Neural network	Compatible with modules	Incompatible with modules
		Standard	Special	
				License Plate Recognition (Complete) License Plate Recognition (Light) Loud Sound Detection Object Classification and Counting People Counting Personnel Activity Monitoring Sabotage Detector Search for Objects Shelf Fullness Check Tracking Traffic Density Heat Map Uniform Detector Unique Visitor Counting

- √ supported and required for the module to work
- + supported and provides additional features of the module
- not supported or not required for the module to work



Use

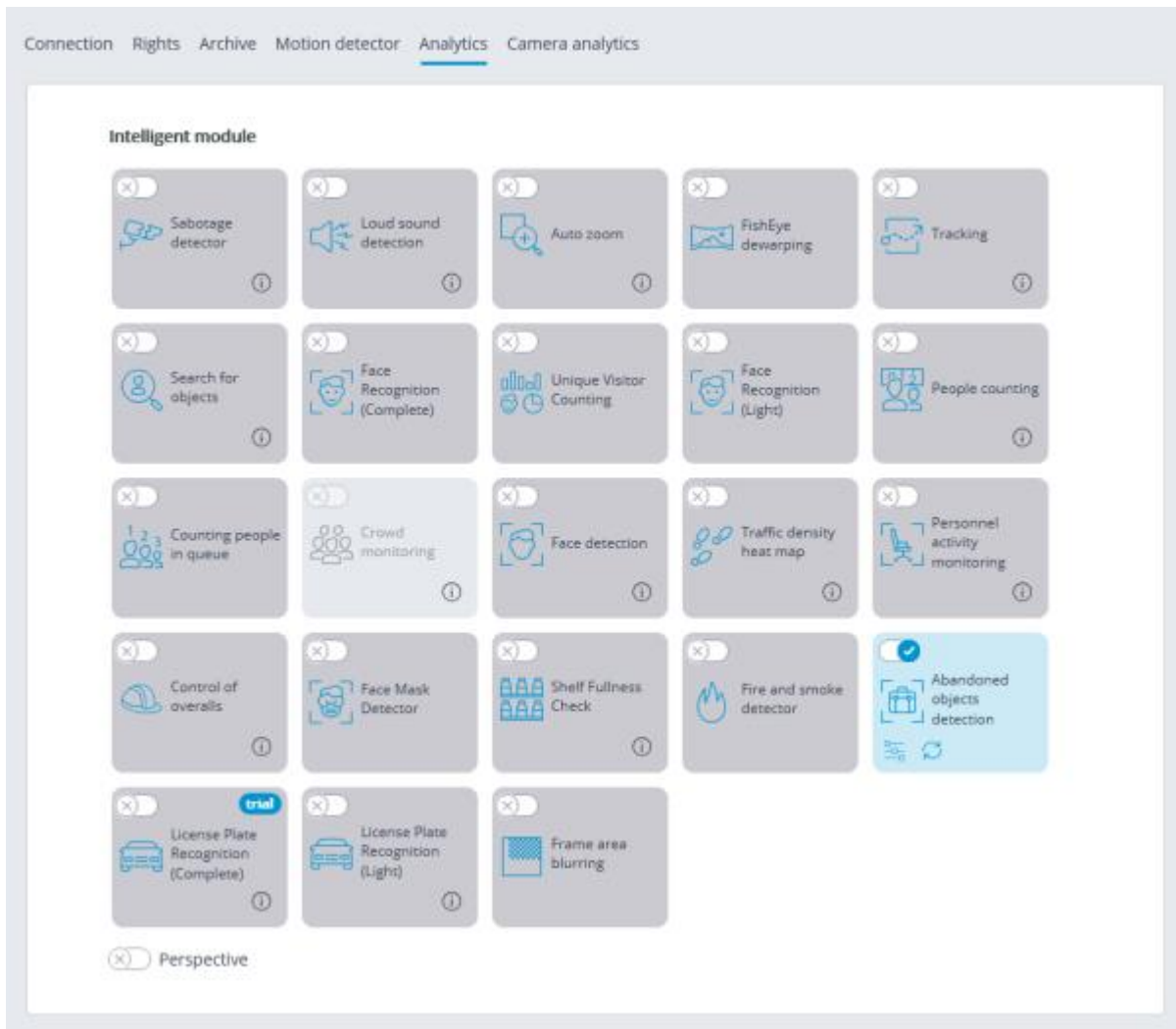
The use of video analytics modules in **Eocortex Client** is described in the **User's guide**, in the **Eocortex Client / Video analytics** section.

Module setup

To use the module, enable and set up the software motion detector, then activate the module itself.

To do that, [launch the Eocortex Configurator application](#), go to the [Cameras](#) tab, select a camera in the list, and set up the motion detector on the [Motion detector](#) tab on the right part of the page.

Then go to the [Analytics](#) tab and enable the module using the  switch, then adjust it pressing the  button.



Abandoned objects detection

Detection parameters

Detection time ⓘ

[Set object size limits](#)

[Set detection zone](#)

Algorithm settings

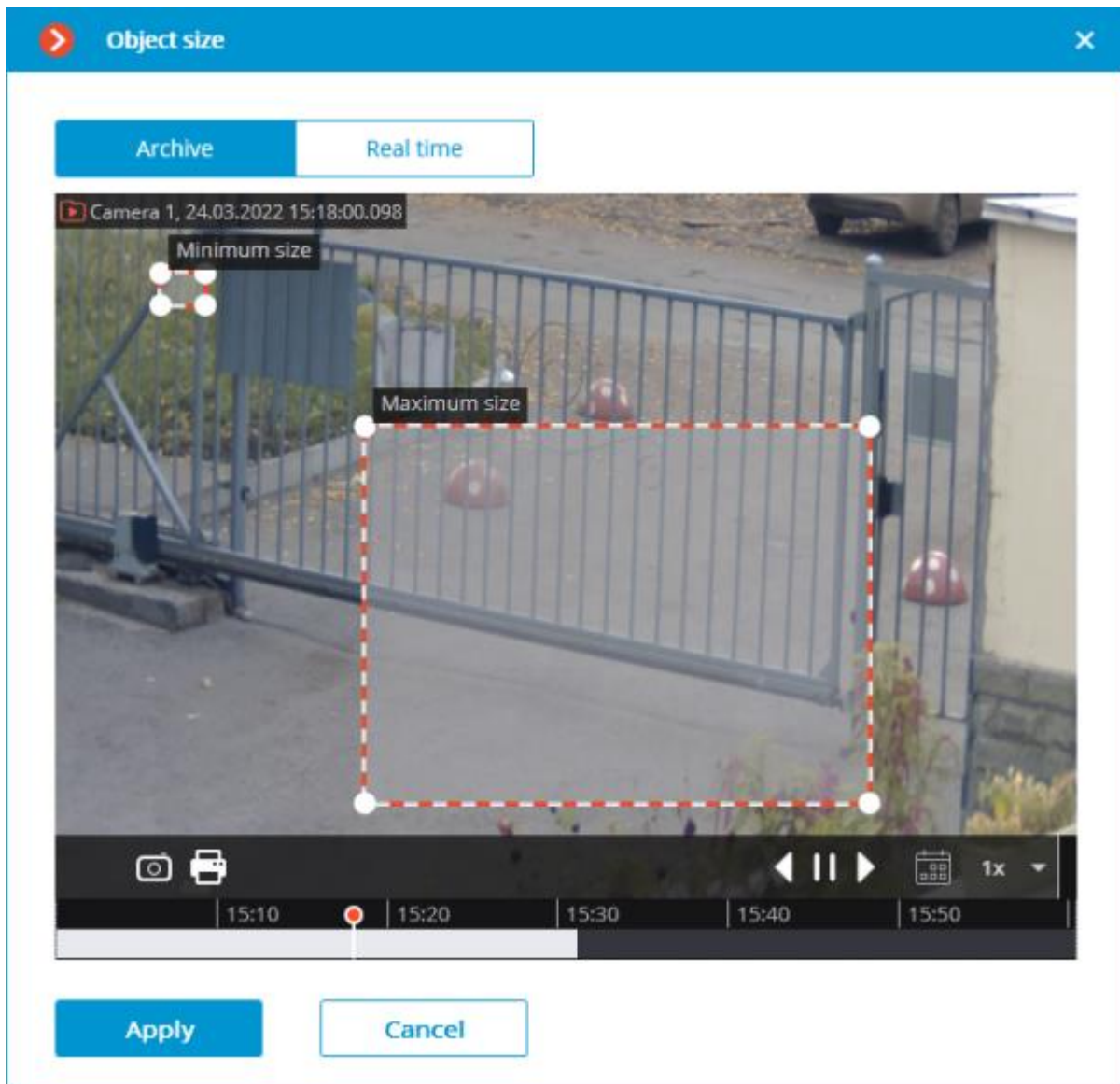
Sensitivity ⓘ

Save **Cancel**

In the opened window the following settings have to be made:

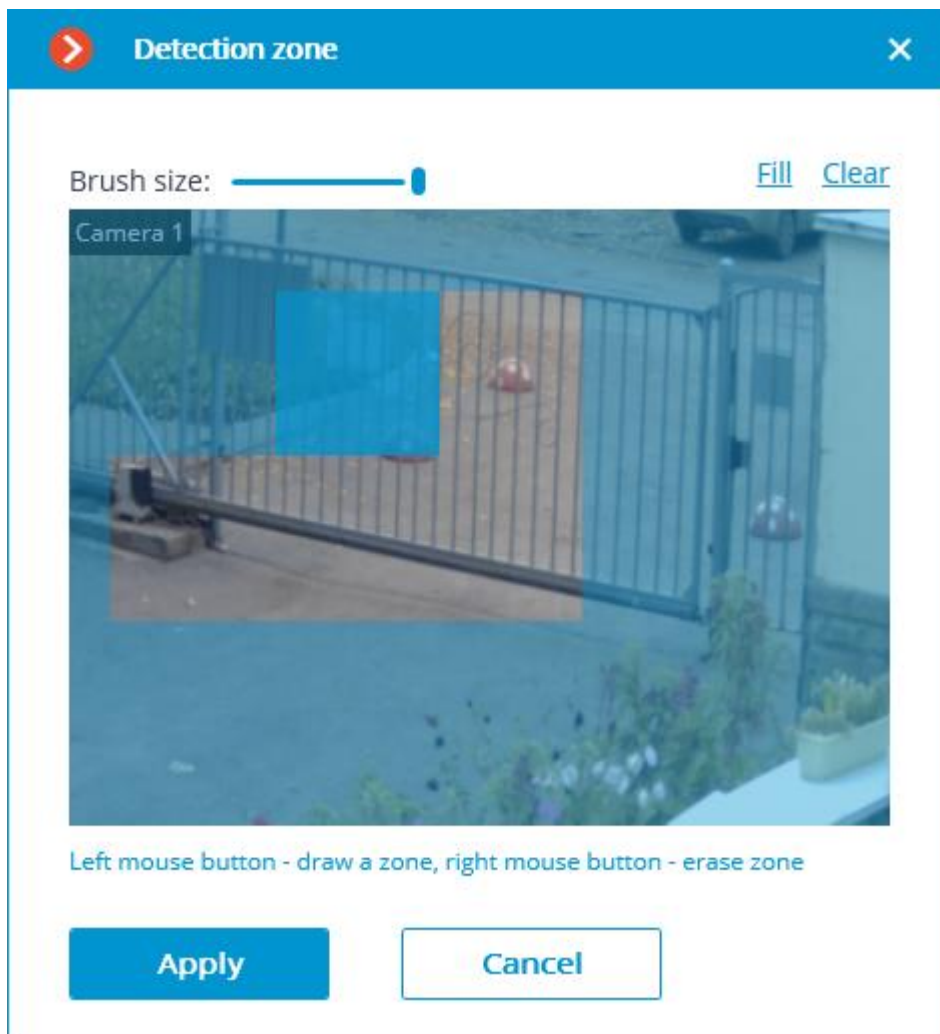
Detection time: the objects that do not move during the time that exceeds the time preset in this window will be considered abandoned. The time from 30 seconds to 10 minutes can be set.

Set object size limits: opens the window where the minimum and maximum sizes of the objects that may be considered abandoned are set.



Set detection zone: opens the window where the Abandoned Objects Detection zone is set.

Detection zones are the zones of the frame bounded by a closed polygon. The zone configuration can be changed by dragging the key points at the corners of the polygon. To add a key point, it is required to double-click the left mouse button on the line; to delete - right-click on the key point.



The module will start working only when [the settings are applied](#).

After launching or relaunching, the module will need time for learning. During the learning process the objects will not be detected. This period roughly equals the double detection time set in the settings.

For reducing module learning errors, it is recommended to ensure that during the launch of the video surveillance server there are no moving objects in the frame, and the static background is not blocked by temporary static and slow-moving objects.

Requirements and recommendations

For detecting the abandoned objects, it is required to provide the following conditions:

- Static and reliable camera fixing.
- View from the above, or perspective view from the above.
- Absence of refocusing and changing image sharpness.
- Absence of non-mobile or slow-moving objects in the frame, for example, trees or clerks sitting at their desks. Such objects in the frame may lead to false triggering of the detector. At the same time, the presence of a non-mobile object close to the abandoned object may result in the triggering of the detector since the abandoned object and the non-mobile object may incorporate into one moving area.
- Absence of the light sources slowly changing their position in the frame.

The most favorable conditions are as follows:

- Static background.
- No windows in the frame.
- Small quantity of moving objects.
- Constant lighting; for example, light fixtures in the premises.
- The abandoned objects are not blocked by other objects.
- The abandoned object color differs significantly from the color of the background.
- Absence or small number of the outstanding small-size objects.

Influence of the module's settings:

- Detection zones: if more than a half of the object is in the zone, the object is detected; if not, it is not detected.
- Maximum dimensions: if both dimensions (width and height) are smaller than the set maximum dimensions, the object is detected; if at least one of the dimensions exceeds the set limitations, the object is not detected.
- Minimum dimensions: if both dimensions (width and height) are larger than the set minimum dimensions, the object is detected; if at least one of the dimensions is smaller than the set limitations, the object is not detected.
- If one of the dimensions of the object is close to the set limitations, the probability of the detector's triggering decreases.

Since the current version of the module cannot determine the shifts of the objects (insignificant changes of the object's position), such shifts will result in the triggering of the detector.

There are no more particular requirements to the frame's parameters or the software motion detector's settings.



Auto Zoom

The **Auto Zoom** module serves to display a separate zoomed-in area of the frame with the moving objects in the **Eocortex Client** application.



Details

The **Auto Zoom**, **FishEye Dewarping** and **Frame Area Blurring** modules are mutually exclusive, meaning that only one of these modules can be used on a camera at a given moment.

Compatibility with other modules

OS	Requires Eocortex motion detector		Neural network	Compatible with modules		Incompatible with modules
			Standard	Special		
✓	✓	✓	–	–	Abandoned object detection module Counting People in Queue	FishEye Dewarping Frame Area Blurring

OS	Requires Eocortex motion detector	Neural network	Compatible with modules	Incompatible with modules
		Standard	Special	
				<p>Crowd Monitoring</p> <p>Emergency Vehicle Detection</p> <p>Face Detection</p> <p>Face Mask Detector</p> <p>Face Recognition (Complete)</p> <p>Face Recognition (Light)</p> <p>Fire and Smoke Detector</p> <p>Frame Area Blurring</p> <p>License Plate Recognition (Complete)</p> <p>License Plate Recognition (Light)</p> <p>Loud Sound Detection</p> <p>Object Classification and Counting</p> <p>People Counting</p> <p>Personnel Activity Monitoring</p> <p>Sabotage Detector</p> <p>Search for Objects</p> <p>Shelf Fullness Check</p> <p>Tracking</p>

OS	Requires Eocortex motion detector	Neural network	Compatible with modules	Incompatible with modules
		Standard	Special	
				Traffic Density Heat Map Uniform Detector Unique Visitor Counting

- √ supported and required for the module to work
- + supported and provides additional features of the module
- not supported or not required for the module to work

The module is intended only for visual conversion of the video displayed in the **Eocortex Client** application and does not affect the original stream from the camera used by other modules for analysis.



Use

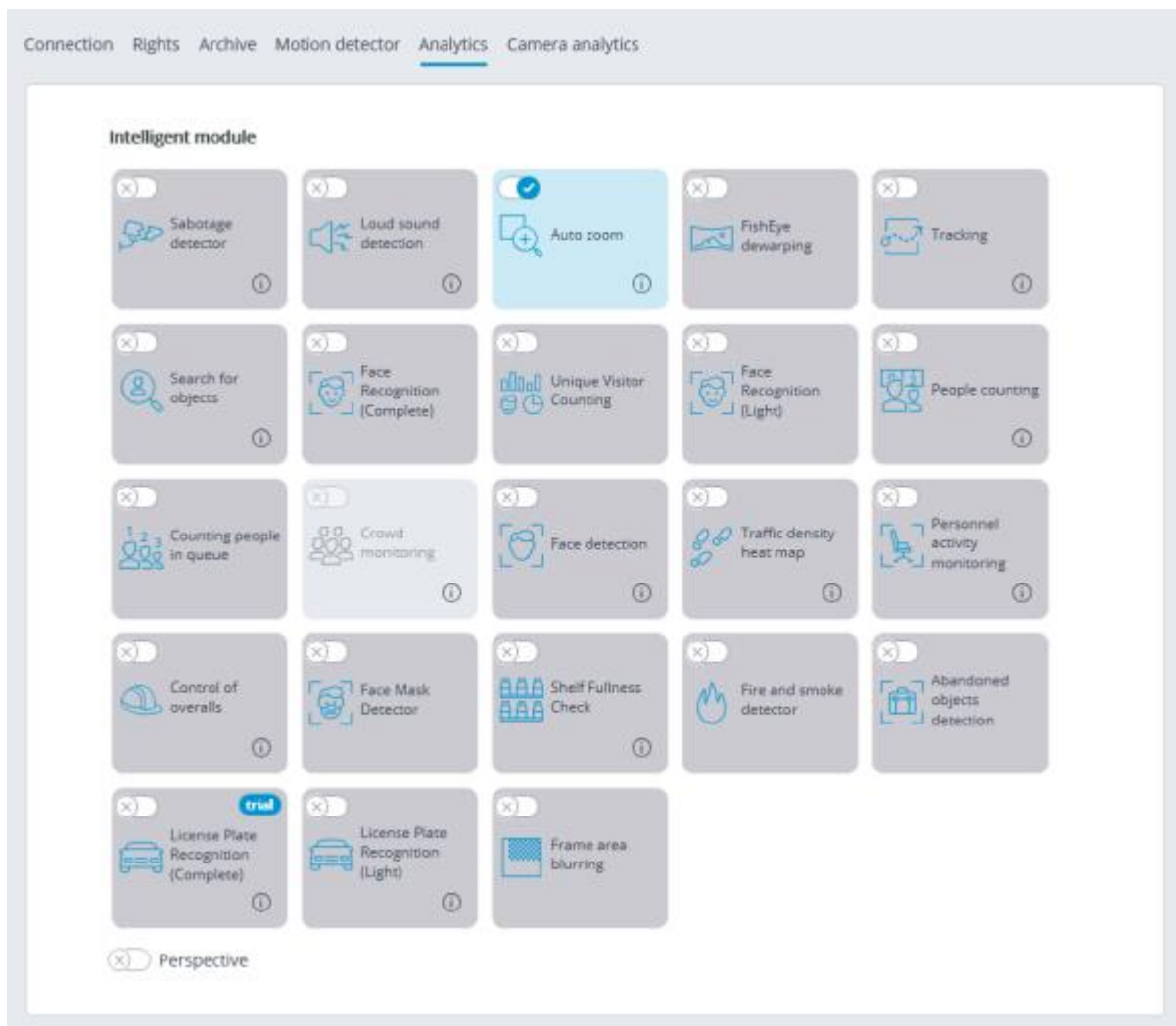
The use of video analytics modules in **Eocortex Client** is described in the **User's guide**, in the **Eocortex Client / Video analytics** section.

Module setup

To use the module, enable and set up the software motion detector, then activate the module itself.

To do that, [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list, and set up the motion detector on the [Motion detector](#) tab on the right part of the page.

Then go to the [Analytics](#) tab and enable the module using the  switch, then adjust it pressing the  button.





The module will start working only when [the settings are applied](#).


Camera analytics


The video analytics built into a camera can be set up in the camera settings on the **Camera analytics** tab of the **Eocortex Configurator** application.



The video analytics is enabled using the toggle switch .

The button  opens the prompt for video analytics.

If the analytics is set up in the **Eocortex Configurator** application, the settings window of this video analytics can be opened upon clicking on the button .

If the analytics is set up directly on the camera, the camera's web interface can be opened by clicking the button .

Temperature for recognized faces


Description

The **Eocortex** server receives the temperature of a person from the camera. If the automatic calibration using a black body calibrator has been configured, the resulting temperature is corrected according to the specified settings.

Setup

To enable support of the **Temperature for recognized faces** video analytics used on a thermal camera, it is required to toggle the switch  on the **Camera analytics** tab in the camera settings in the **Eocortex Configurator** application.



To open the analytics settings, it is required to press .

Settings of thermal capabilities

Alarm temperature, °C

Black body settings

Set black body temperature, °C ⓘ

Measured black body area coordinates, pixels (X, Y, W, H) ⓘ

Measured black body coordinates, pixels (X, Y) 0; 0

Thermal frame resolution, pixels (W x H)

Measured black body temperature, °C

[Update black body settings](#)

OK

Alarm temperature, °C: If this preset temperature threshold is reached or exceeded, an alarm will be triggered.

If a black body calibrator is used to automatically calibrate the thermal camera, it can be configured by enabling the **Black body settings** option and setting the following parameters:

Temperature set on black body.: Set black body temperature, °C.

Measured black body area coordinates, pixels (X, Y, W, H): Optional. Frame area where the search for black body will be performed by the highest temperature. 0,0, _, _ - upper left corner coordinates.

In order to update the black body settings on the server, it is required to click the **Update black body settings** link. In this case, the fields **Measured black body coordinates, pixels (X, Y)**, **Thermal frame resolution, pixels (W x H)** and **Measured black body temperature, °C** will display data transmitted by the camera.

Use

To set up automatic calibration, it is required to follow the steps below.

1. Enter the temperature set on the black body calibrator in the **Temperature set on black body.** field. If a value of zero **0** is entered, no automatic temperature compensation will be performed.



2. Make sure that there are no people in the frame and click the **Update black body settings** link.
3. If the coordinates or the temperature of the black body do not match the actual values, adjust the area of the black body.
4. Press **OK** and apply the settings.

Requirements and recommendations

Ideally, there should be no objects in the frame whose temperature is higher than that of a person.

Since the highest temperature on the face is usually found in the inner corner of the eye, in the cases described below the temperature of a person may be determined as being lower than in reality:

- if the face of a person is tilted and the inner corner of the eye is not visible to the camera;
- if a person is far from the camera and the inner corner of the eye in the frame is too small;
- if a person is wearing glasses, the temperature of the inner corners of their eyes cannot be determined.

If a person is too close to the camera, the thermal camera may pick up hot objects (e.g., incandescent lamps) behind the person since the thermal camera and the video camera are at a distance between them.

The following can be done to improve the accuracy of the measurements:

- make the thermal imaging background for cameras more or less uniform;
- remove any objects with the temperature that exceeds the human temperature from the thermal imaging background (e.g., by bringing the camera closer or moving it);
- move the black body so that it is as close to the detected person as possible.

By changing the value of **Temperature set on black body.**, it is possible to compensate for the temperature detection in the current conditions.

Troubleshooting

If the displayed temperature does not approach the actual temperature on the black body or the coordinates are much displaced, the area should be adjusted (in particular, it will be required to remove all objects whose temperature exceeds the black body temperature) and update the settings.

Counting People in Queue

The **Counting People in Queue** module is intended for counting people in lines and warning the operator about the exceedance of the preset threshold.

Capabilities of the module



- Setting of up to six lines (queues) in the frame as the non-intersecting controlled zones.
- Counting people in each of the lines.
- Generation of the alarm when the preset threshold of the number of persons in a line is exceeded.
- Generation of the reports regarding the number of people in each of the lines.
- Real-time display of the quantity of people in each of the lines.

Details

For the module to work properly, it is necessary to correctly position and configure the camera, install the **Eocortex Neural Networks** package, and enable and configure the module.

Compatibility with other modules

OS	Requires Eocortex motion detector		Neural network	Compatible with modules		Incompatible with modules
			Standard	Special		
√	√	–	√	√	Abandoned object detection module Auto Zoom Crowd Monitoring Emergency Vehicle Detection Face Detection Face Mask Detector Face Recognition (Complete) Face Recognition (Light) Fire and Smoke Detector Frame Area Blurring	FishEye Dewarping Object Classification and Counting

OS	Requires Eocortex motion detector	Neural network	Compatible with modules	Incompatible with modules
		Standard	Special	
				Frame Area Blurring License Plate Recognition (Complete) License Plate Recognition (Light) Loud Sound Detection People Counting Personnel Activity Monitoring Sabotage Detector Search for Objects Shelf Fullness Check Tracking Traffic Density Heat Map Uniform Detector Unique Visitor Counting

- √ supported and required for the module to work
- + supported and provides additional features of the module
- not supported or not required for the module to work


Use



The use of video analytics modules in **Eocortex Client** is described in the **User's guide**, in the **Eocortex Client / Video analytics** section.

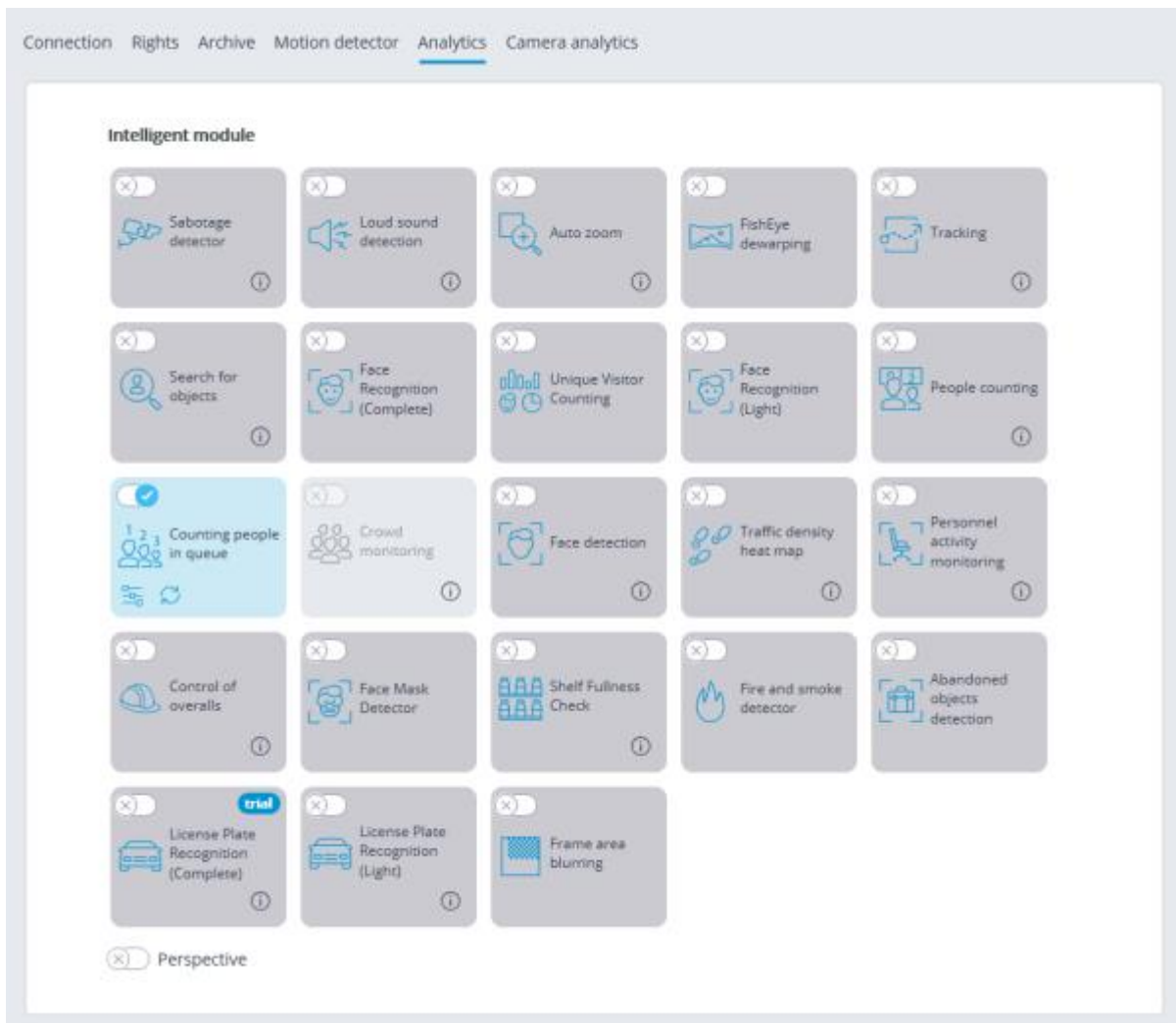
Module setup

Before using the module, it is required to [install the Eocortex Neural Networks software package](#).

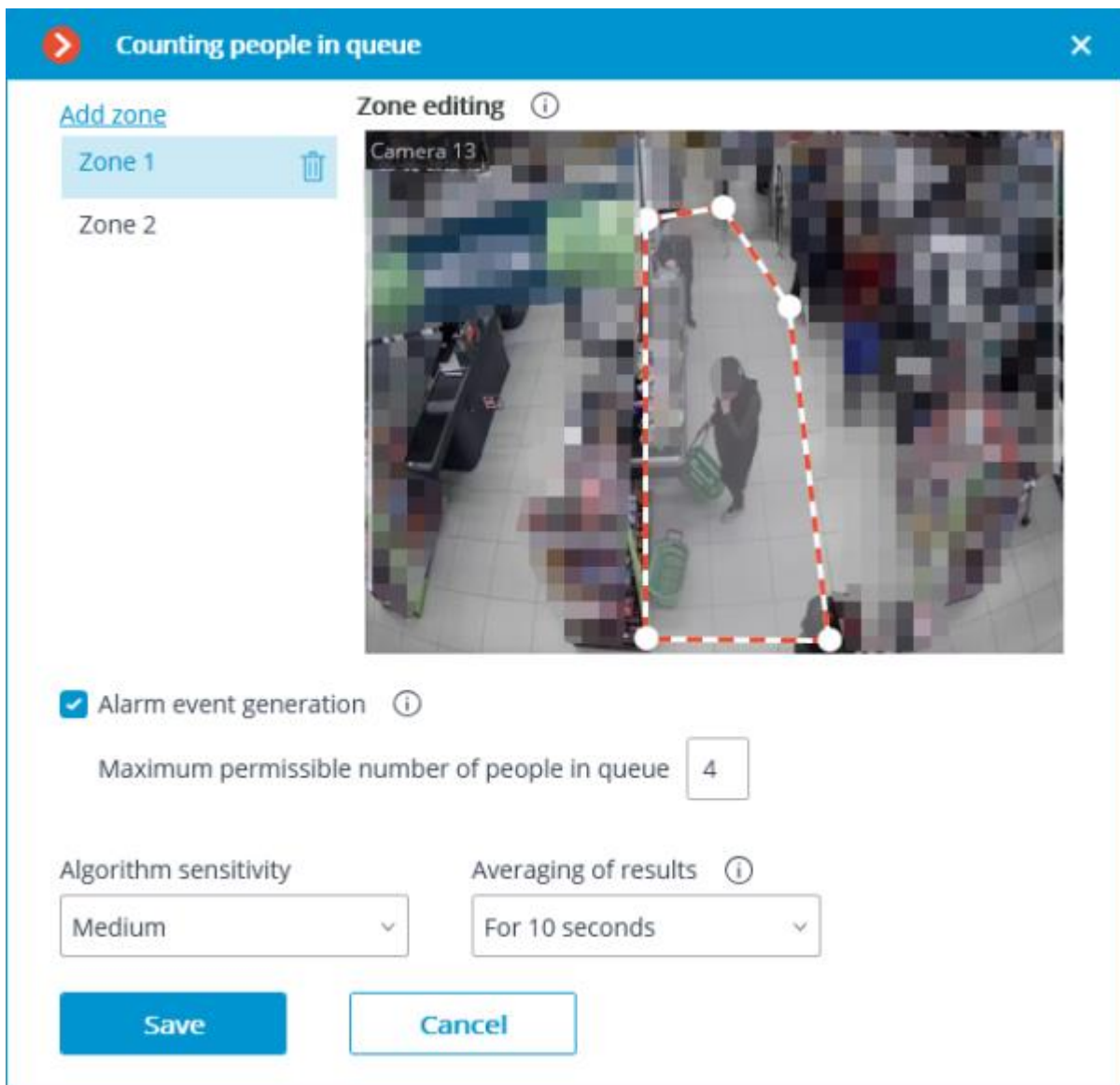
To use the module, enable and set up the software motion detector, then activate the module itself.

To do that, [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list, and set up the motion detector on the [Motion detector](#) tab on the right part of the page.

Then go to the [Analytics](#) tab and enable the module using the  switch, then adjust it pressing the  button.



In the opened window, it is required to set the detection zones (up to 6) and set the line parameters for each of the zones.



Detection zones are the zones of the frame bounded by a closed polygon. The zone configuration can be changed by dragging the key points at the corners of the polygon. To add a key point, it is required to double-click the left mouse button on the line; to delete - right-click on the key point.

Alarm event generation: when this option is enabled and in the case of the number of people in the zone exceeding the value set in the Maximum permissible number of people in queue, the **Large number of people in the queue** alarm event will be generated.

Algorithm sensitivity is the internal value of the module. If the module fails to correctly detect people in the set zone, it is required to increase the sensitivity; if the module counts the foreign objects as people, it is needed to lower the sensitivity.

Averaging of results allows to make counting more resistant to the sharp changes of the quantity of people in the zone. At the same time, the raise of the averaging interval leads to the lag between the actual change of the number of people in the queue and the reflection of this change in the system. The following averaging periods are available: 10, 15, 30 and 60 seconds; it is also possible to disable the usage of averaged results.

The module will start working only when [the settings are applied](#).

Requirements and recommendations

Image requirements

The camera must be fixed in position.

The camera tilt angle must be between 40 and 70 degrees to the vertical plane.

A person to be counted must have at least 70% of its head visible.

The people may overlap each other but to ensure detection of both the overlapped and the one who overlaps him/her the overlapping in the head and shoulders area shall not exceed 30%.

The head and shoulders of a person must comprise at least 10% of the largest dimension of the counting zone and have a size of at least 30×30 pixels.

The head and shoulders of a person must comprise less than 50% of the largest dimension of the counting zone.

The image must be in color.

The image must have a moderate contrast; the people must be distinguishable from the background.

The people to be detected must not be too blurred.

The image compression rate shall ensure the medium or better image quality; the compression must not create significant artifacts.

The optimal image resolution for ensuring proper operation of the module is HD or FullHD.

Hardware and software requirements



Eocortex Neural Networks package must be installed before it will be possible to use neural networks-based features of the module.

The following equipment is required to use this neural network-based module:

- A processor with AVX instructions support;
- swap file at least half of the total RAM size.

It is also possible (optional) to use a video card. In this case, an NVIDIA video card (GPU) with a computing capability index of at least 6.5 and a memory size of at least 4GB is required, and the characteristics and performance of the graphics card must be at least as good as the NVIDIA GTX 1650 Super.

If the package will be installed on a virtual machine, it may additionally be required to:

- Enable support for AVX instructions in the guest machine settings;
- Use GRID drivers for GPU virtualization.



Eocortex must use video cards selected for running neural networks in monopoly mode. It is not allowed to use such card for other applications or tasks that consume GPU resources, including for displaying video. Simultaneous use of a video card for several tasks may lead to incorrect system operation: from analytics performance degradation to server instability.



The neural network works with the 64-bit version of **Eocortex** only.



When upgrading Eocortex to another version, it is necessary to also upgrade the **Eocortex Neural Networks** package to the corresponding version.

Performance

The time it takes the CPU to process one frame, depending on the CPU used, may be up to 2 seconds.

The time it takes the module to update the data for each camera is in a linear dependence of the number of cameras using the module.

The usage of the GPU permits to lessen the CPU load and reduce the time of processing of one frame.

All the cameras are processed by the same module, so the increase of the number of cameras using the module does not lead to the proportional raise of the computational load; only the decoding time for each additional camera will be longer.

When the module operates on the CPU, its load will always be relatively high, so it is advisable to use the GPU for the module's operation.

The architecture of the module is such that when it is launched on even a single camera, the module immediately allocates a large volume of computing resources for its needs. When the number of cameras using the module is increased later, the load is only moderately increased.

Directly after the launching, the module allocates a significant amount of RAM - around 1,5 Gb. After several minutes the majority of the resources is freed and the usage of RAM by the module becomes low.

Crowd Monitoring

The **Crowd Monitoring** is intended to count people in crowds and alert the operator in case of the preset limit is exceeded.

Capabilities of the module

- Setting up to six zones in the frame and setting a quantitative criterion for each zone: the maximum acceptable level.
- Counting of the number of people in each zone.
- Alarm generation in case of exceedance of maximum acceptable level in the zone.
- Creation of reports with the number of people in each of the zones.
- Real-time display of the number of people in each zone and the maximum acceptable level.



Estimation of the number of people is performed analytically, with the help of the special algorithms, so the estimated number of people may differ from their actual quantity.

Details

For correct operation of the module it is imperative to properly place and set up the camera, enable and adjust the software motion detector, perspective and the module itself.

Compatibility with other modules

OS	Requires Eocortex motion detector		Neural network	Compatible with modules		Incompatible with modules
			Standard	Special		
√	√	√	-	-	Abandoned object detection module Auto Zoom Counting People in Queue Emergency Vehicle Detection Face Detection Face Mask Detector Face Recognition (Complete) Face Recognition (Light) Fire and Smoke Detector Frame Area Blurring Frame Area Blurring License Plate Recognition (Complete) License Plate Recognition (Light) Loud Sound Detection Object Classification and Counting People Counting Personnel Activity Monitoring Sabotage Detector Search for Objects	-

OS	Requires Eocortex motion detector	Neural network	Compatible with modules	Incompatible with modules
		Standard	Special	
				Shelf Fullness Check Tracking Traffic Density Heat Map Uniform Detector ▲ FishEye Dewarping

- ✓ supported and required for the module to work
- + supported and provides additional features of the module
- not supported or not required for the module to work
- ▲ not recommended for use with the current module

Use



The use of video analytics modules in **Eocortex Client** is described in the **User's guide**, in the **Eocortex Client / Video analytics** section.

Module setup

Before using the module, it is required to [enable and set up the perspective](#).

To use the module, enable and set up the software motion detector, then activate the module itself.

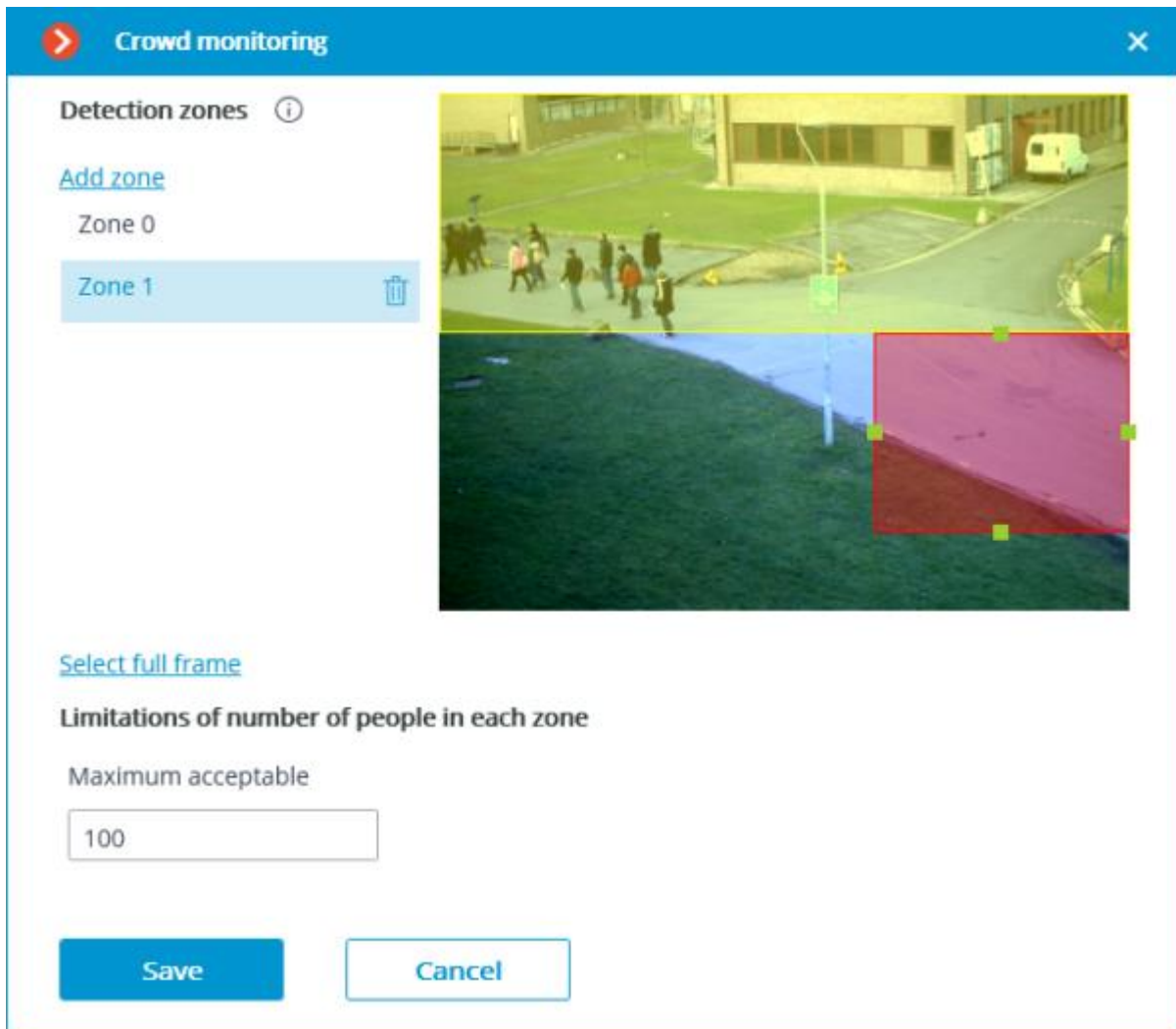
To do that, [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list, and set up the motion detector on the [Motion detector](#) tab on the right part of the page.

Then go to the [Analytics](#) tab and enable the module using the  switch, then adjust it pressing the  button.

Intelligent module

<input type="checkbox"/> Sabotage detector	<input type="checkbox"/> Loud sound detection	<input type="checkbox"/> Auto zoom	<input type="checkbox"/> FishEye dewarping	<input type="checkbox"/> Tracking
<input type="checkbox"/> Search for objects	<input type="checkbox"/> Face Recognition (Complete)	<input type="checkbox"/> Unique Visitor Counting	<input type="checkbox"/> Face Recognition (Light)	<input type="checkbox"/> People counting
<input type="checkbox"/> Counting people in queue	<input checked="" type="checkbox"/> Crowd monitoring	<input type="checkbox"/> Face detection	<input type="checkbox"/> Traffic density heat map	<input type="checkbox"/> Personnel activity monitoring
<input type="checkbox"/> Control of overalls	<input type="checkbox"/> Face Mask Detector	<input type="checkbox"/> Shelf Fullness Check	<input type="checkbox"/> Fire and smoke detector	<input type="checkbox"/> Abandoned objects detection
<input type="checkbox"/> License Plate Recognition (Complete) trial	<input type="checkbox"/> License Plate Recognition (Light)	<input type="checkbox"/> Frame area blurring		

Perspective 



In the opened window, set and adjust up to six detection zones.

Detection zones are the zones of the frame bounded by a closed polygon. The zone configuration can be changed by dragging the key points at the corners of the polygon. To add a key point, it is required to double-click the left mouse button on the line; to delete - right-click on the key point.

To avoid counting errors at the zone borders it is recommended, wherever practical, to use the smallest possible number of zones.

It makes sense to use several zones in the following situations:

- If there are an automobile road and a pedestrian zone in the frame. In this case it is required to limit the controlled area to the pedestrian zone.
- If there is a rest area in the frame that is crossed by the pedestrian way with heavy foot traffic. In case it is necessary to prevent people from flocking in the recreational area, the controlled area shall be limited to the rest area.

It is needed to indicate the limit of the number of people for each zone: **Maximum acceptable** level.

The module will start working only when [the settings are applied](#).

Requirements and recommendations

When installing the camera, it is recommended to meet the following requirements:

- Heads and shoulders of the people to be counted must be in full view.

- Minimum head size is 1/30 of the largest dimension of the zone. For example, for the 1024x640 zone the size of the head must be no less than $1024/30 = 34$ pixels.

There are no specific requirements regarding the framerate and video stream format.

Emergency Vehicle Detection

The **Emergency Vehicle Detection** module allows recognizing fire, ambulance, and police vehicles in the real-time mode. The recognition is available for predefined areas of the frame. To avoid false positives, a minimum time can be set for special vehicles to be in the area. Recognition events can be used in automation scenarios. For example, to automatically open the barrier.

Capabilities of the module

The following emergency vehicles can be recognized:

Ambulance,

Fire engine,

Police car.



All the module events are recorded in the [Events log](#).

Details

Before using the module, it is required [to install the Eocortex Neural Networks package](#).

To use the module, enable and set up the software motion detector, then enable and set up the module itself.

Compatibility with other modules

OS	Requires Eocortex motion detector		Neural network	Compatible with modules		Incompatible with modules
			Standard	Special		
√	√	√	√	√	Abandoned object detection module Auto Zoom Counting People in Queue Crowd Monitoring Face Detection Face Mask Detector	FishEye Dewarping Object Classification and Counting

					Face Recognition (Complete)	
					Face Recognition (Light)	
					Fire and Smoke Detector	
					Frame Area Blurring	
					License Plate Recognition (Complete)	
					License Plate Recognition (Light)	
					Loud Sound Detection	
					People Counting	
					Personnel Activity Monitoring	
					Sabotage Detector	
					Search for Objects	
					Shelf Fullness Check	
					Tracking	
					Traffic Density Heat Map	
					Uniform Detector	
					Unique Visitor Counting	

- √ supported and required for the module to work
- + supported and provides additional features of the module
- not supported or not required for the module to work


Use



The use of video analytics modules in **Eocortex Client** is described in the **User's guide**, in the **Eocortex Client / Video analytics** section.

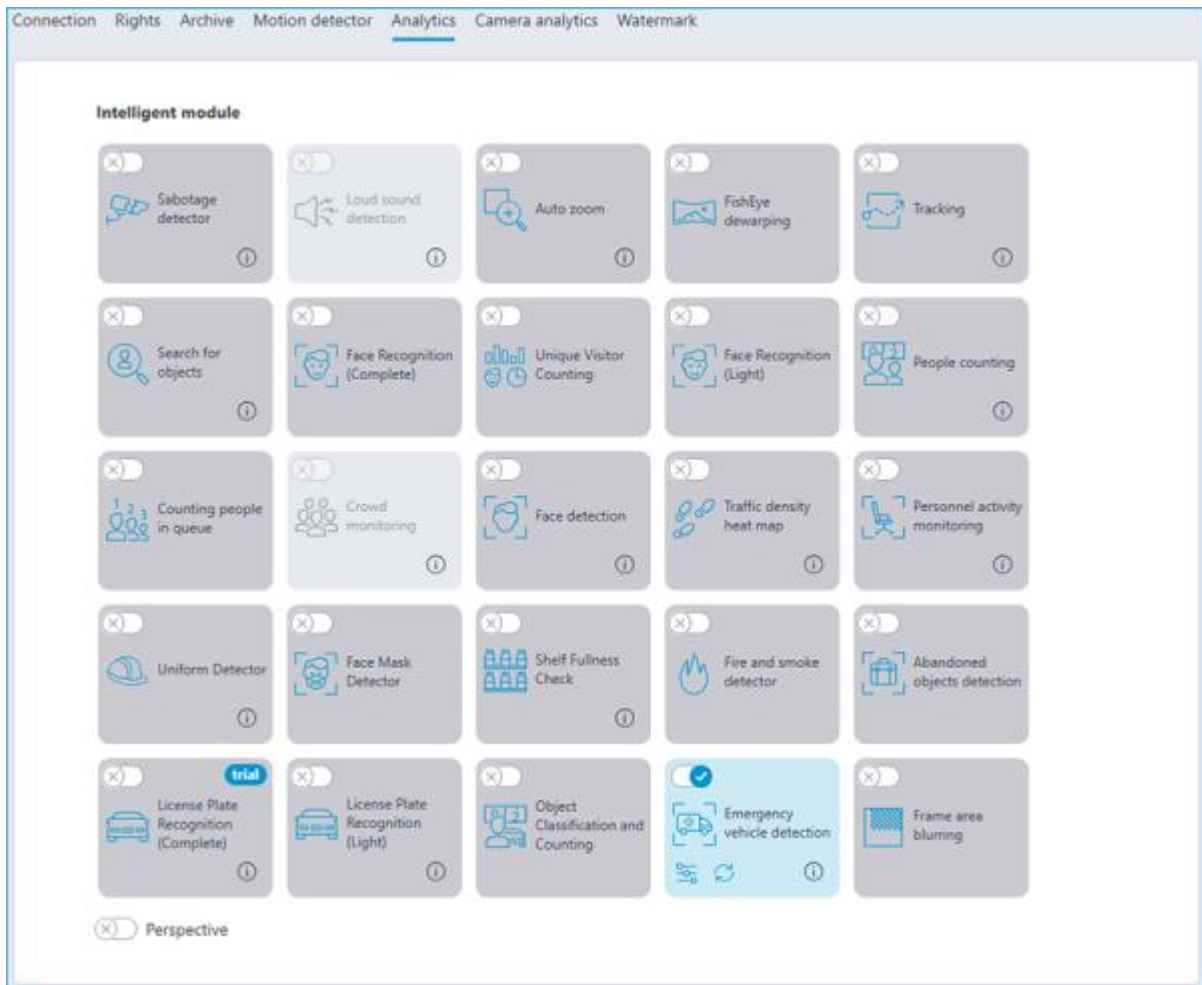
Module setup


Before using the module, it is required [to install the Eocortex Neural Networks package](#).

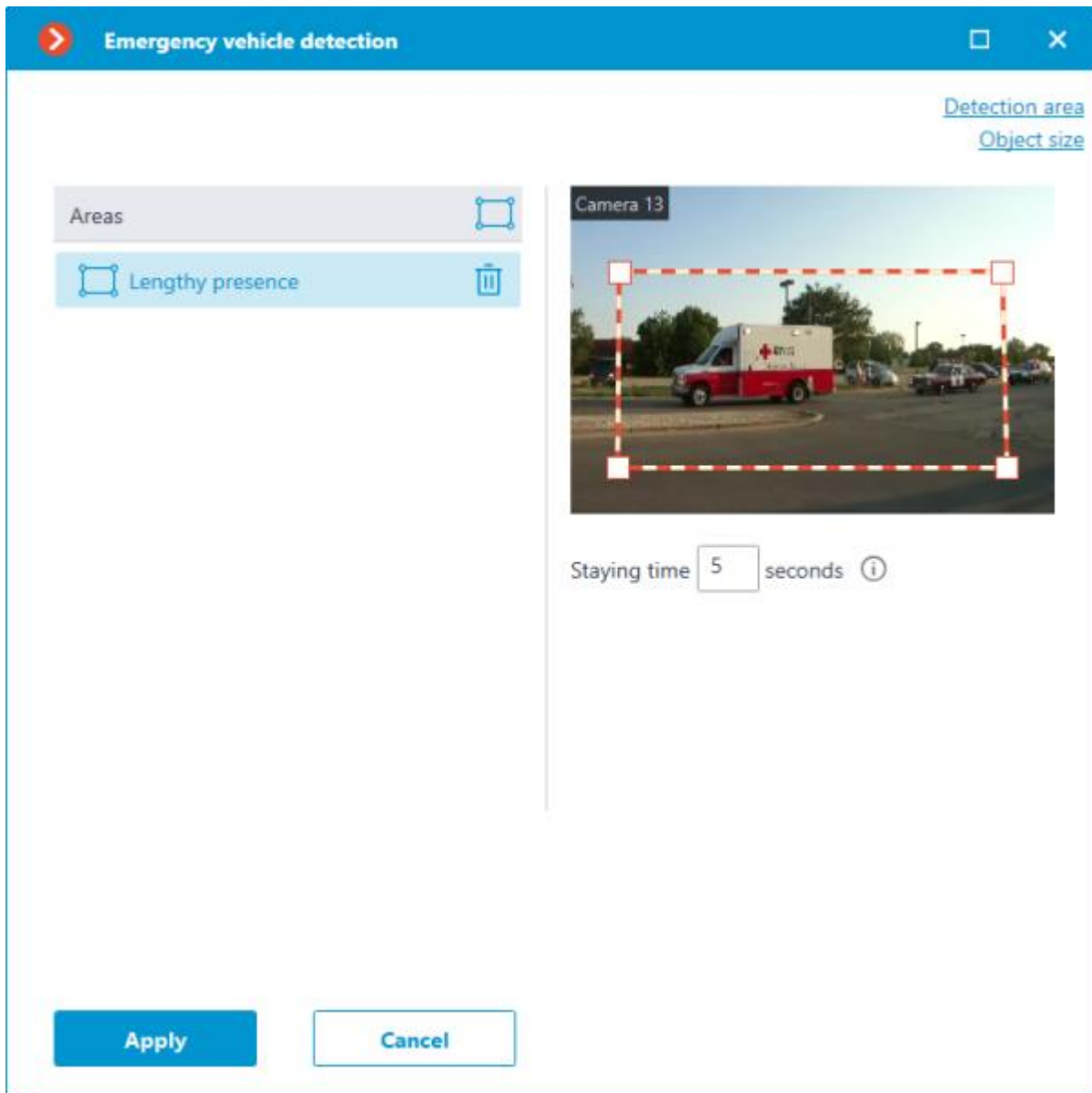
To use the module, enable and set up the software motion detector, then activate the module itself.


To do that, [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list, and set up the motion detector on the [Motion detector](#) tab on the right part of the page.

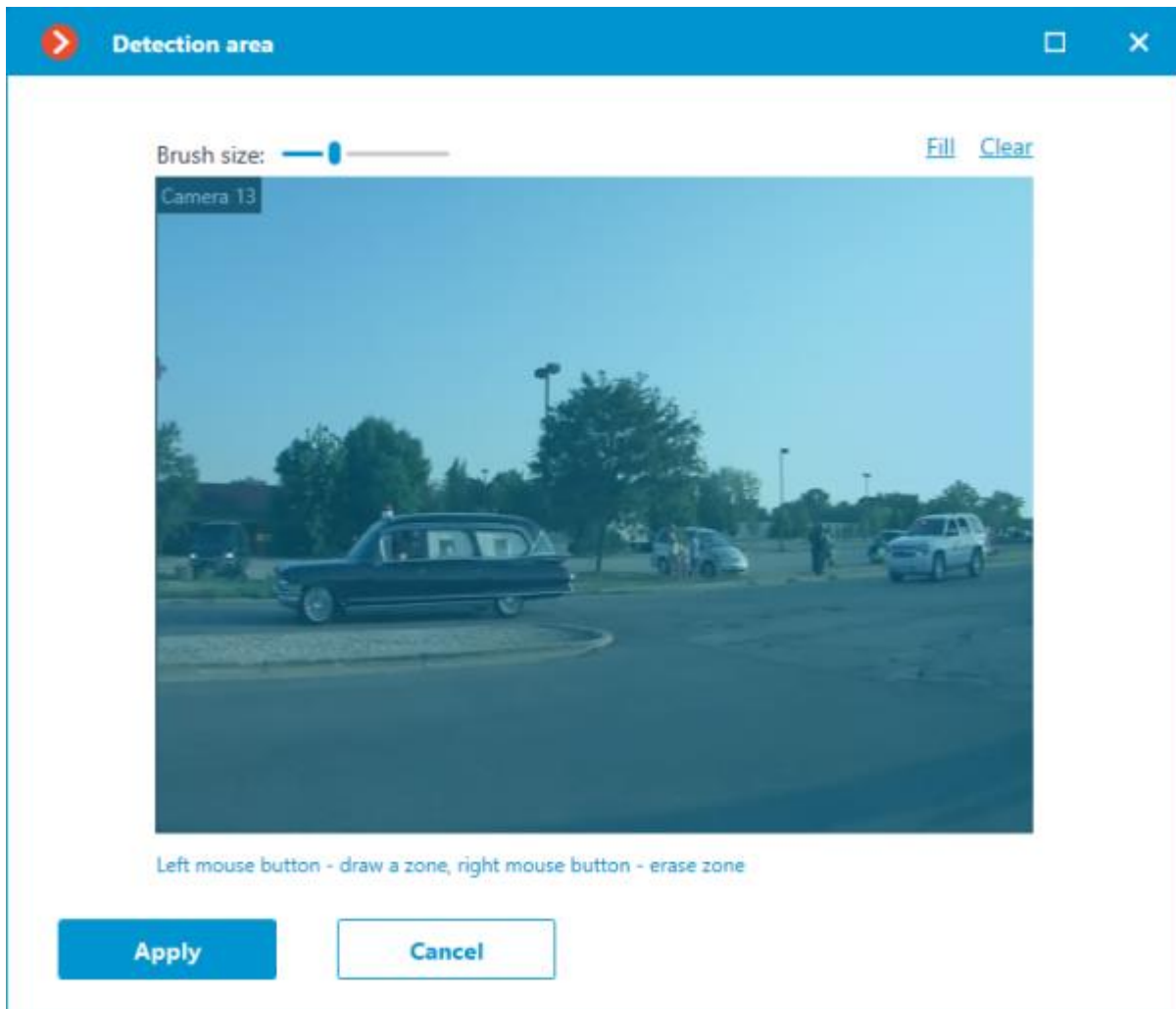
Then go to the [Analytics](#) tab and enable the module using the  switch, then adjust it pressing the  button.



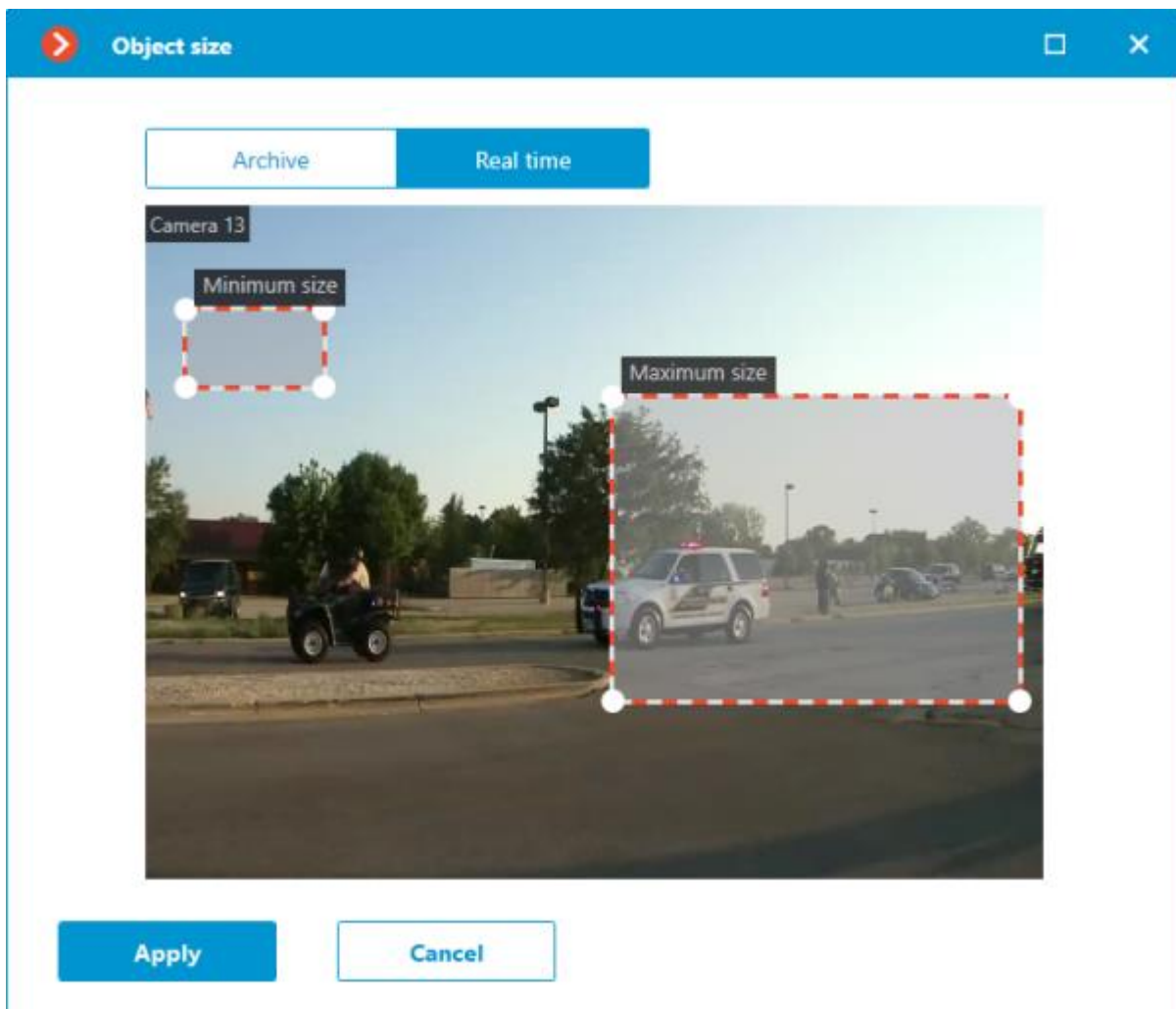
Clicking the  button opens the module setup window.



If no zones have been set up before, a standard zone of full frame size will be created. To add a new zone, click the  button. Each zone can be given its own name, borders, and the time the vehicle can stay in this zone before recognition. The time can be set in the range from 0 to 300 seconds. Clicking the **Detection area** button opens a window for editing the active zone.



Clicking the **Object size** button opens the window for editing the minimum and maximum size of the detected object.



When an emergency vehicle is recognized, the **Emergency vehicle detected** event will be generated.

The module will start working only when [the settings are applied](#).

Requirements and recommendations

Hardware and software



Eocortex Neural Networks package must be installed before it will be possible to use neural networks-based features of the module.

The following equipment is required to use this neural network-based module:

- A processor with AVX instructions support;
- An **NVIDIA** video card (GPU) with the computation capacity index of at least 6.5 and with at least 4 Gb of memory; the parameters and performance of the video card must be similar or better than those of **NVIDIA GTX 1650 Super** model;
- version of the video card driver at least 460;
- swap file at least half of the total RAM size.

If the package will be installed on a virtual machine, it may additionally be required to:

- Enable support for AVX instructions in the guest machine settings;

- Use GRID drivers for GPU virtualization.



Eocortex must use video cards selected for running neural networks in monopoly mode. It is not allowed to use such card for other applications or tasks that consume GPU resources, including for displaying video. Simultaneous use of a video card for several tasks may lead to incorrect system operation: from analytics performance degradation to server instability.



The neural network works with the 64-bit version of **Eocortex** only.



When upgrading Eocortex to another version, it is necessary to also upgrade the **Eocortex Neural Networks** package to the corresponding version.

Performance

The tables below show the allowed number of cameras for different video streams and server configurations without displaying.

CPU	GPU	RAM, GB	Number of cameras
Stream: 2 Mpix, 25 fps			
Intel® Core™ i5-2400	NVIDIA GeForce GTX 1050 Ti	8	5
Intel® Core™ i7-2600	NVIDIA GeForce GTX 1060	8	9
Intel® Core™ i7-7700	NVIDIA GeForce RTX 2070	8	13
Intel® Core™ i9-9900	NVIDIA GeForce RTX 2080	12	20
Stream: 1 Mpix, 25 fps			
Intel® Core™ i5-2400	NVIDIA GeForce GTX 1050 Ti	8	8

Video stream

Frame frequency: no lower than 10 frames per second;

Image resolution: no lower than HD (1280x720).

Scene and camera position

Emergency vehicle must be fully in the frame;

Objects less than 40 pixels in height will not be detected. Recommended object height is more than 80 pixels;

The camera angle must be adequate to correctly identify the type of emergency vehicle;

Emergency vehicle must not be covered by other objects;

Emergency vehicle must be clearly distinguishable from the background;
Vehicle should not be overexposed.

Module's performance

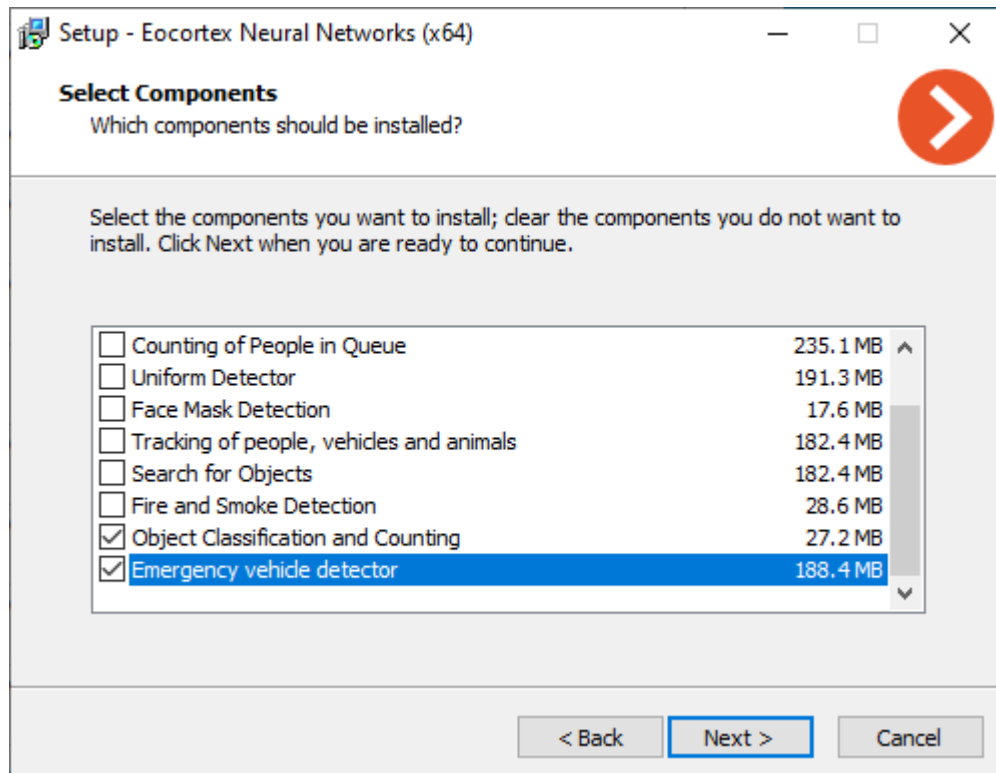
The accuracy of Emergency Vehicle Detection is 95%;

The accuracy of determining the type of emergency vehicle is 90%.

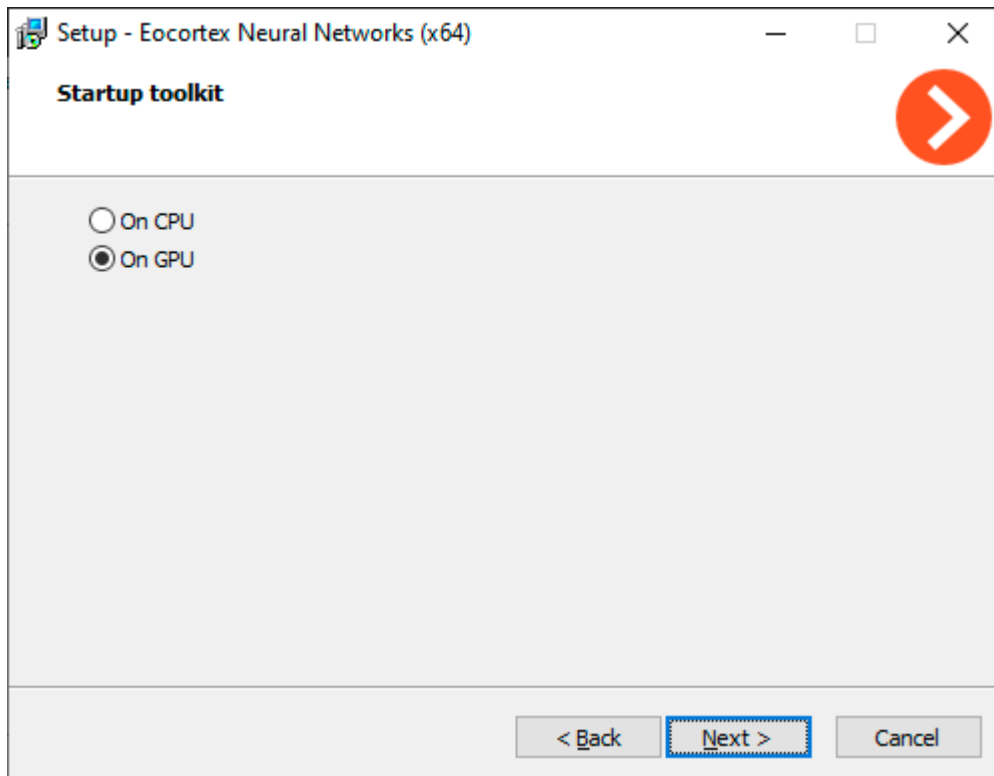
Deployment of the module

Before using the module, it is required [to install the Eocortex Neural Networks package](#).

While installing the package, select the relevant component.



It is recommended to use graphics card (GPU) to run the module.





Face Detection

The **Face Detection** module finds faces in the frame allowing to watch them in the **Eocortex Client** application both in real time and in the archive. It is possible to set the scenarios to be performed by the events of Face Detection, as well as save the frames with the detected faces to disc or send them by email.

Details

For the correct operation of the module it is required to set up the software motion detector. There are no specific requirements to the image.

Compatibility with other modules

OS	Requires Eocortex motion detector		Neural network	Compatible with modules		Incompatible with modules	
			Standard	Special			
√	√	√	–	–	Abandoned object detection module Auto Zoom Counting People in Queue Crowd Monitoring	–	

OS	Requires Eocortex motion detector	Neural network	Compatible with modules	Incompatible with modules
		Standard	Special	
				Emergency Vehicle Detection Face Mask Detector Face Recognition (Complete) Face Recognition (Light) Fire and Smoke Detector Frame Area Blurring License Plate Recognition (Complete) License Plate Recognition (Light) Loud Sound Detection Object Classification and Counting People Counting Personnel Activity Monitoring Sabotage Detector Search for Objects Shelf Fullness Check Tracking Traffic Density Heat Map Uniform Detector  FishEye Dewarping

- ✓ supported and required for the module to work
- + supported and provides additional features of the module
- not supported or not required for the module to work
- ⚠ not recommended for use with the current module



Use

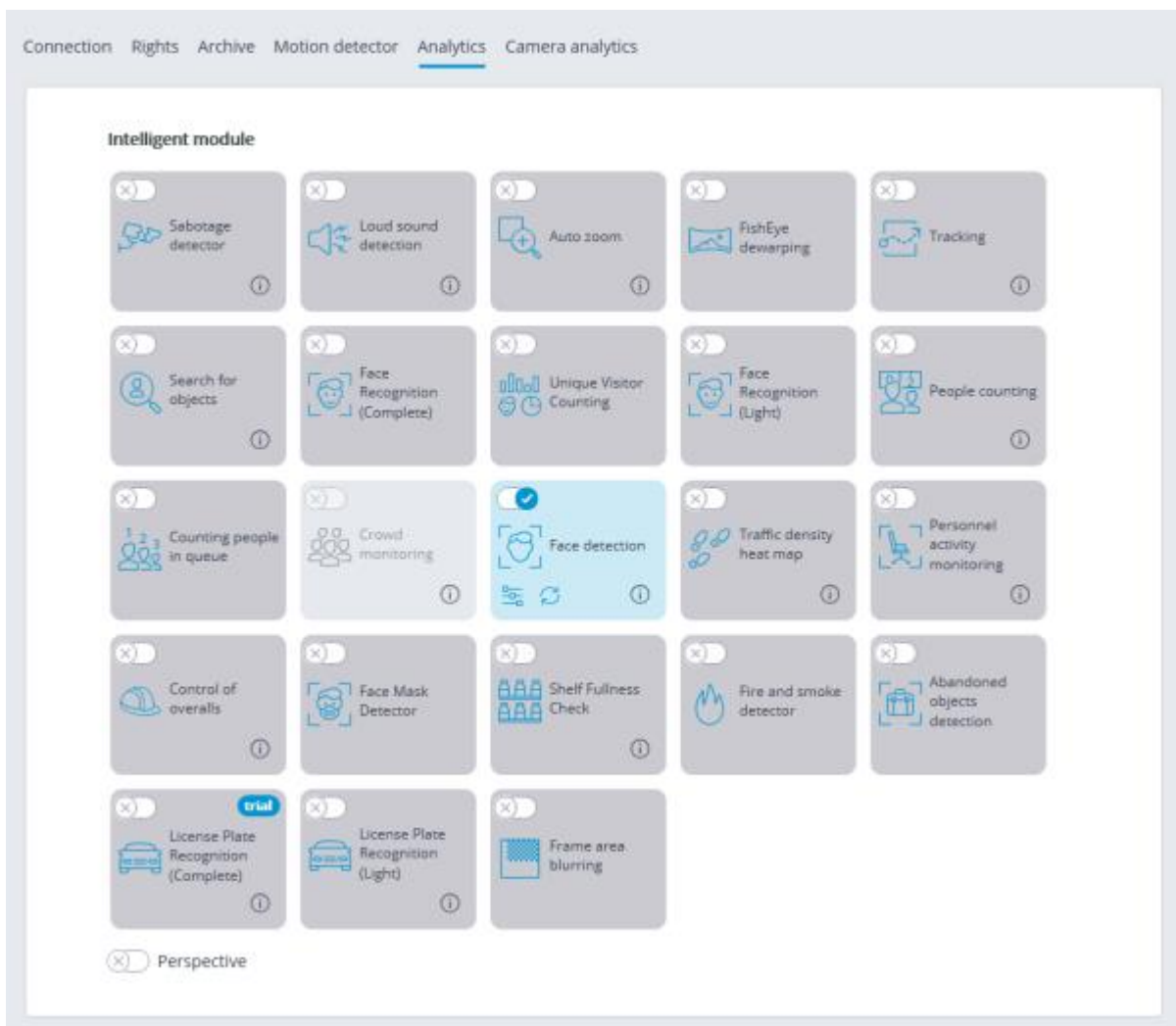
The use of video analytics modules in **Eocortex Client** is described in the **User's guide**, in the **Eocortex Client / Video analytics** section.

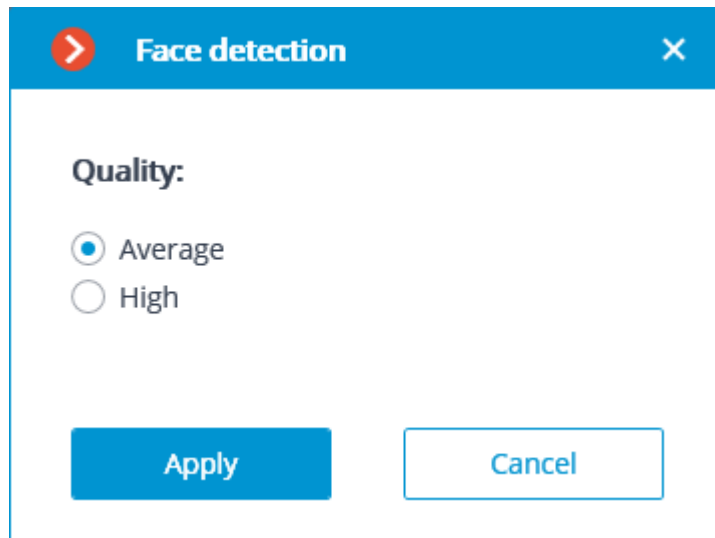
Module setup

To use the module, enable and set up the software motion detector, then activate the module itself.

To do that, [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list, and set up the motion detector on the [Motion detector](#) tab on the right part of the page.

Then go to the [Analytics](#) tab and enable the module using the  switch, then adjust it pressing the  button.





In the settings window it is required to set the module efficiency. This parameter influences the computer system resources: processor load and RAM usage. High efficiency of the module operation consumes more system resources than the medium efficiency.

The module will start working only when [the settings are applied](#).



Face Mask Detector

The **Face Mask Detector** module is designed to detect people not wearing medical face masks in the frame. When such persons are detected, the module highlights them in the frame with a square in real time and enters the event in the event log.

Details

For the module to work properly, it is necessary to correctly position and configure the camera, install the **Eocortex Neural Networks** package, and enable and configure the module.

Compatibility with other modules

OS	Requires Eocortex motion detector	Neural network	Compatible with modules	Incompatible with modules
		Standard	Special	
√	√	–	√	Abandoned object detection module Auto Zoom Counting People in Queue Crowd Monitoring FishEye Dewarping Object Classification and Counting

OS	Requires Eocortex motion detector	Neural network	Compatible with modules	Incompatible with modules
		Standard	Special	
				Emergency Vehicle Detection Face Detection Face Recognition (Complete) Face Recognition (Light) Fire and Smoke Detector Frame Area Blurring License Plate Recognition (Complete) License Plate Recognition (Light) Loud Sound Detection People Counting Personnel Activity Monitoring Sabotage Detector Search for Objects Shelf Fullness Check Tracking Traffic Density Heat Map Uniform Detector Unique Visitor Counting

- √ supported and required for the module to work
- + supported and provides additional features of the module
- not supported or not required for the module to work

Use

The use of video analytics modules in **Eocortex Client** is described in the **User's guide**, in the **Eocortex Client / Video analytics** section.


Module setup



Before using the module, it is required [to install the Eocortex Neural Networks package](#).

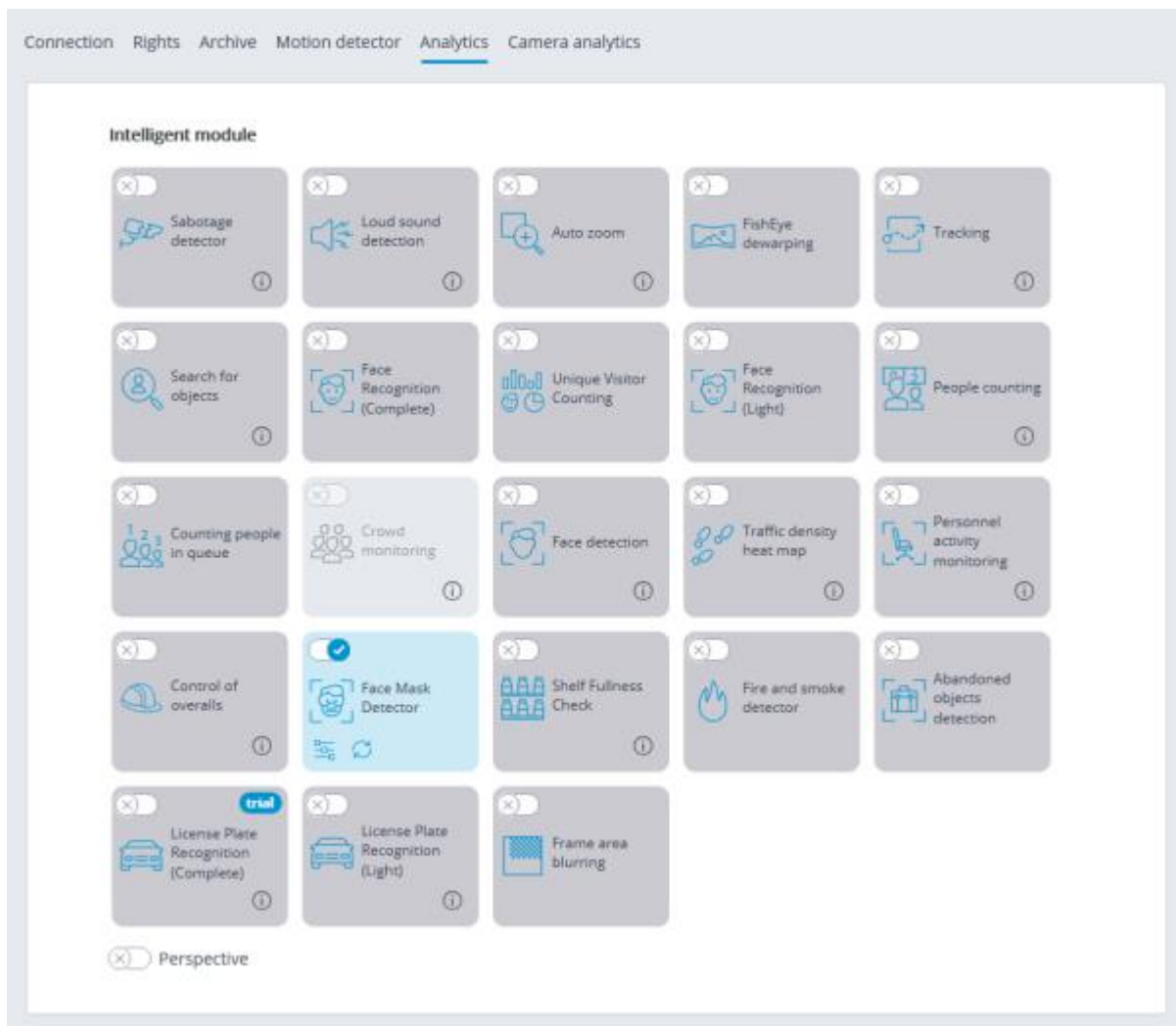
The neural network works with the 64-bit version of **Eocortex** only.

When updating **Eocortex** to a different version, it is also required to update the **Eocortex Neural Networks** package to the relevant version.

To use the module, enable and set up the software motion detector, then activate the module itself.

To do that, [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list, and set up the motion detector on the [Motion detector](#) tab on the right part of the page.

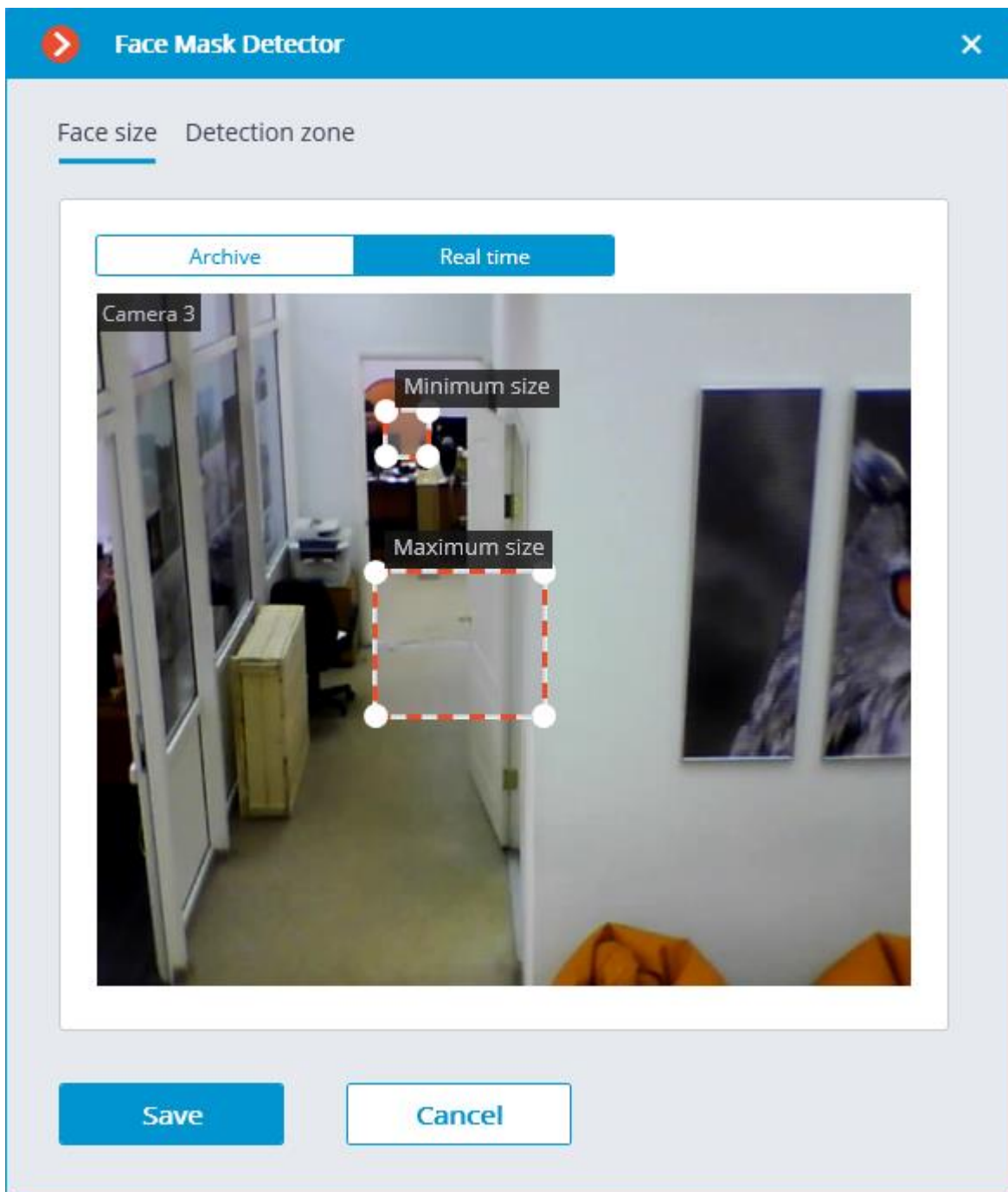
Then go to the [Analytics](#) tab and enable the module using the  switch, then adjust it pressing the  button.



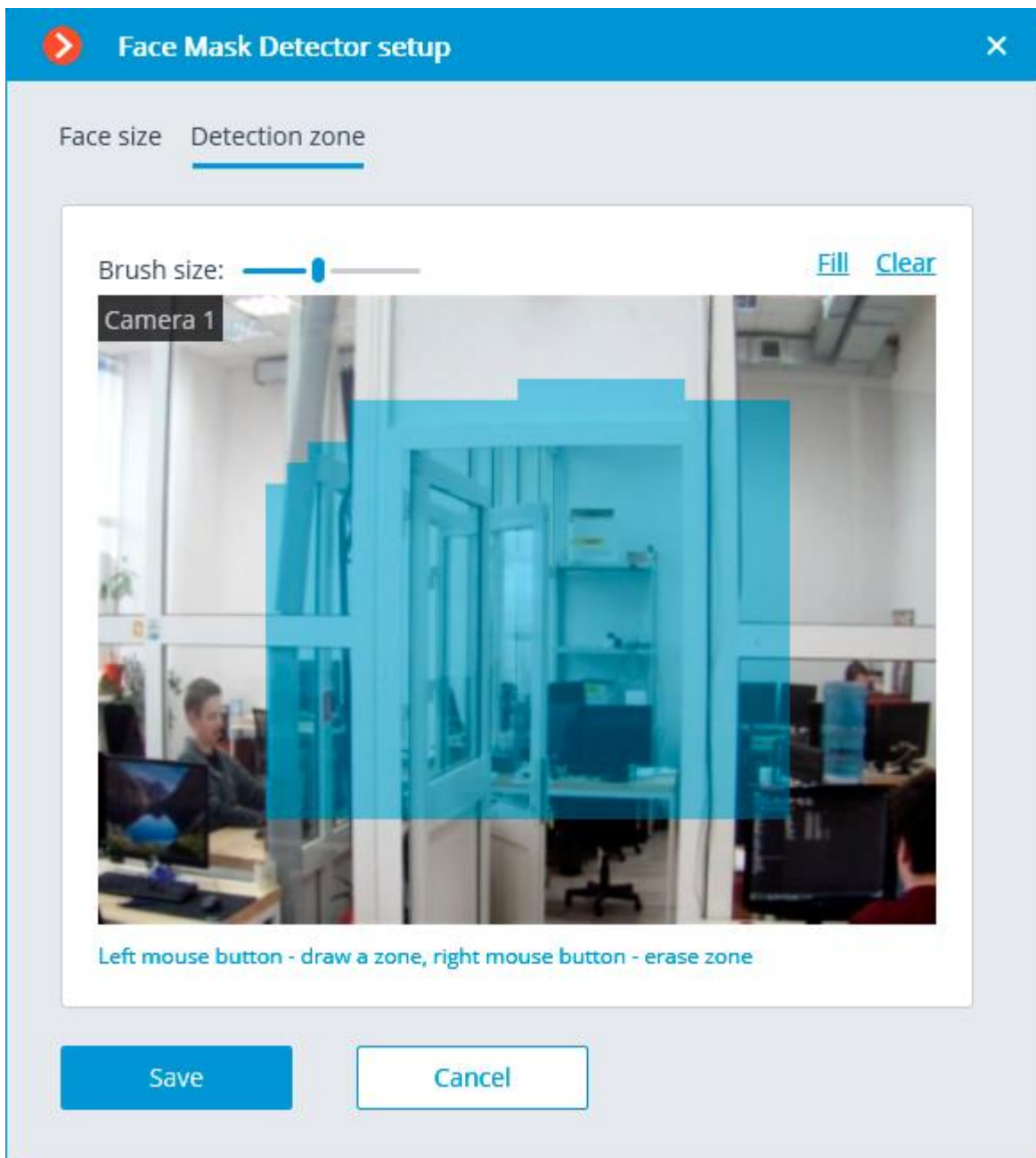
Clicking the  button opens the module setup window.

In the opened window, it is required to make the appropriate settings in the corresponding tabs.

Face size: the minimum and maximum sizes of the faces of the people to be monitored.



Detection zone is the zone of the frame filled with the semitransparent blue fill in the settings window. The mouse is used for modifying the zone: left mouse button serves for filling the zone, and the right one is used for clearing it. With the help of the **Fill** and **Clear** buttons you can fill or clear the whole area of the frame. The corresponding slider is used to modify the **Brush size**.



The module will start working only when [the settings are applied](#).

Requirements and recommendations

Detection

The module is capable of detecting up to ten people not wearing face masks in the frame at the same time (if allowed by the computing capacity).

The module does not recognize (identify) faces, it cannot tell one person from the other or compare a person's face with the faces from a database; it only finds people without face masks in the frame.

When an infringement event (no mask) is detected, the module briefly highlights the person's face with a red square in the client application and creates a corresponding event in the event log. The repeated detection of the infringement by the same person will become possible only after the disappearance of this person from the frame for three seconds minimum (e.g. when the person leaves the frame or covers his/her face completely).

Hardware and software



Eocortex Neural Networks package must be installed before it will be possible to use neural networks-based features of the module.

The following equipment is required to use this neural network-based module:

- A processor with AVX instructions support;
- An **NVIDIA** video card (GPU) with the computation capacity index of at least 6.5 and with at least 4 Gb of memory; the parameters and performance of the video card must be similar or better than those of **NVIDIA GTX 1650 Super** model;
- version of the video card driver at least 460;
- swap file at least half of the total RAM size.

If the package will be installed on a virtual machine, it may additionally be required to:

- Enable support for AVX instructions in the guest machine settings;
- Use GRID drivers for GPU virtualization.



Eocortex must use video cards selected for running neural networks in monopoly mode. It is not allowed to use such card for other applications or tasks that consume GPU resources, including for displaying video. Simultaneous use of a video card for several tasks may lead to incorrect system operation: from analytics performance degradation to server instability.



The neural network works with the 64-bit version of **Eocortex** only.



When upgrading Eocortex to another version, it is necessary to also upgrade the **Eocortex Neural Networks** package to the corresponding version.

Module settings

Setting too small minimum face size may lead to false positives due to low image quality.

The shape of the detection area can be arbitrary.

Masks

The examples of supported face masks:



The supported colors are as follows: white, black, yellow, different tones of green, blue and red.
The face covered by a hand or a scarf will trigger the detector unless the area of a nose is covered.

Video stream

Image resolution: no lower than HD (1280x720).

Framerate: 15 fps or more.

Lighting and image quality

Illumination of faces in the frame must be uniform and constant.

If the camera is installed opposite a bright source of light (sun behind the entrance door, etc.), it is required to adjust the exposure or brightness in such a way that the face in the frame is light. The overexposed background is acceptable.

The image quality must be medium or better. Significant compression artefacts are not acceptable.

No blurring of moving people's faces is allowed.

The image must be in color.

Scene and camera position

The faces must be fully seen in the frame.

There must be no mirror surfaces giving reflections in the frame (glass, mirrors, etc.).

Strong lateral illumination (e.g. sunlight from the window) resulting in the overexposure of one part of the face is not acceptable.

The camera may be placed above the face level, directly facing the people to be recognized. In such a case, the camera elevation angle must not exceed 35°.

The distance between the pupils of a face to be recognized must be at least 30 pixels.

The camera must directly face the people to be recognized. The camera angle between the face direction and the lens axis must not exceed 30°.

Examples of non-compliance with the requirements

Covering (overlapping):



✓

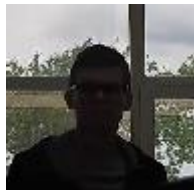


X

Face illumination:



✓



X



X

Blurring of face in motion:



✓



X

Unacceptable distance between pupils:



30
pixels

✓



15
pixels

X

Video stream quality:



✓



X

Camera tilt:



35°

✓



50°

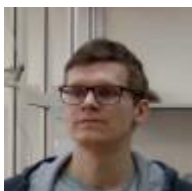
!



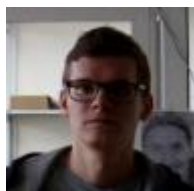
70°

X

Lateral light source:



✓



X

Reflecting surfaces:



✓



X

Horizontal turn of camera from face plane:



0° 15° 30° 45° 60° 90°

✓ ✓ ✓ ! X X

Black and white image (night mode):



✓

X

Recommended camera settings

Quality: highest.

Bitrate: maximum possible.

Profile: maximum possible.

I-frame interval (GOV): 50.

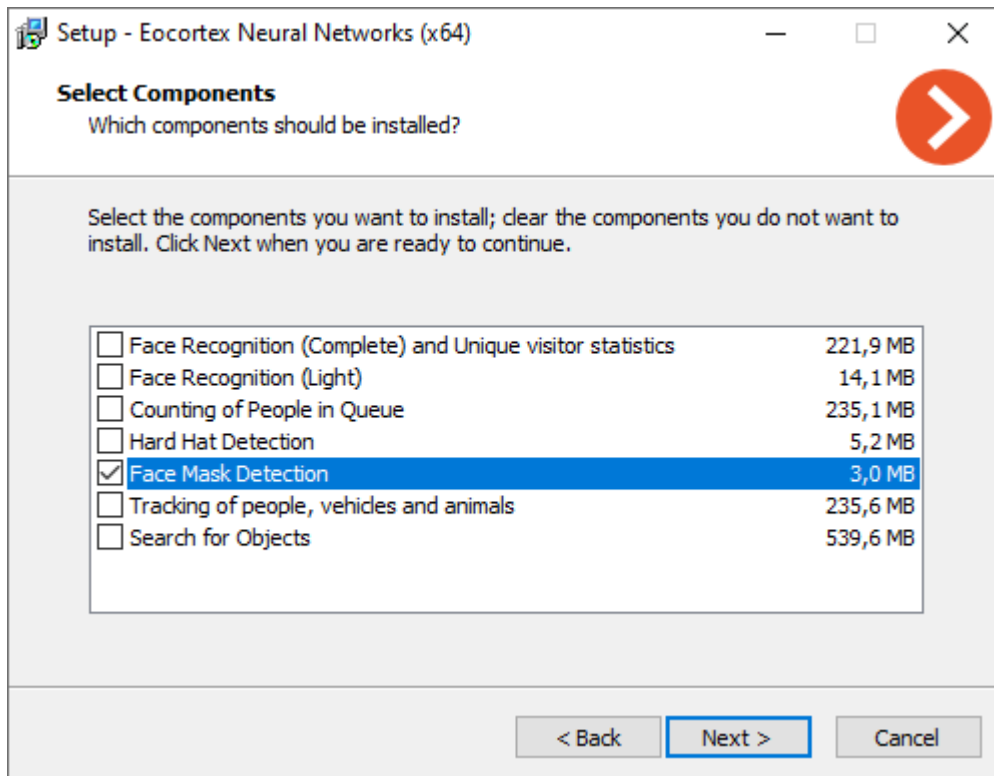
Stream anti-aliasing: off.

Exposure and brightness: ensuring that the face is clearly seen (if the camera faces the light source, the overexposed background is acceptable).

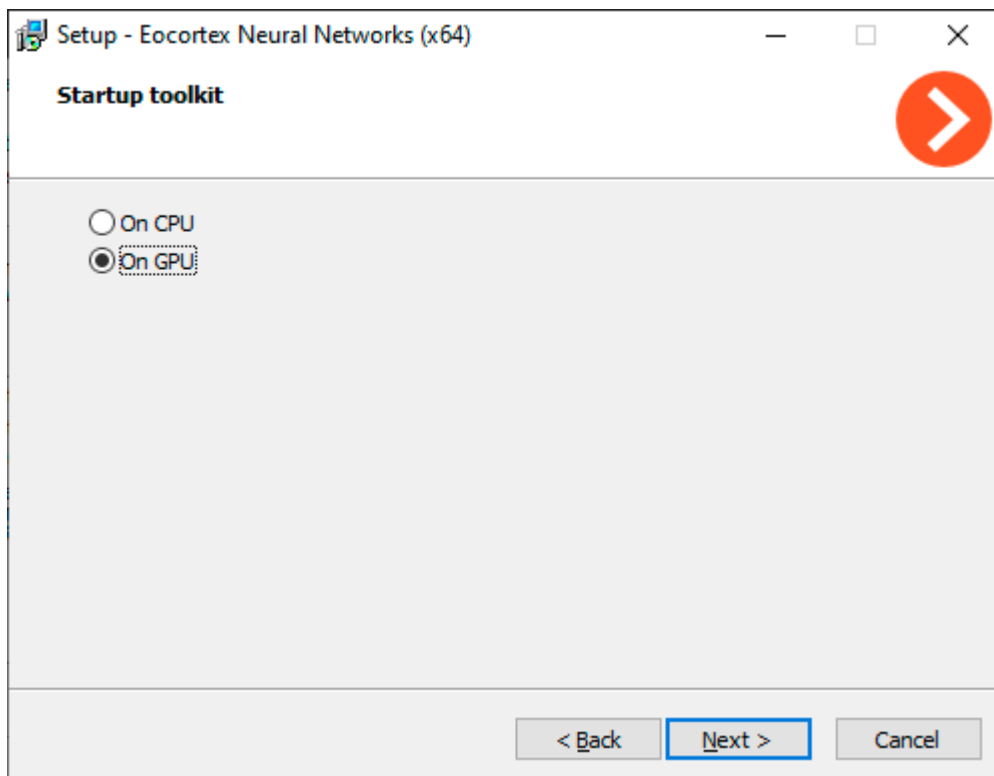
Shutter speed: must not be too low (more than 1/50), because in such a case the blurring of moving objects will occur.

Before using the module, it is required to [install the Eocortex Neural Networks software package](#).

In the process of installation of **Eocortex Neural Networks** it is required to select the **Face Mask Detector** component.



It is recommended to use video cards (GPUs) for the optimum operation of the module.



Face Recognition

Eocortex allows to use several modules that perform Face Recognition using a database: **Face Recognition (Complete)**, **Face Recognition (Light)** and **Unique Visitor Counting**.

However, it is not possible to use **Face Recognition (Light)** module with other Face Recognition modules on one camera at the same time.

The modules ensure high recognition accuracy and can be used together with access control systems at the facilities with high security requirements, for example, at banks or restricted access facilities. Another important use of the modules can be automatic identification of the hotel guests, restaurant customers, and the visitors of other similar enterprises.

Comparison of modules

Capabilities		
	Face Recognition (Light)	Face Re
Identification of faces contained in a database	√	√
Identification of people wearing sunglasses, headgear, etc.	–	√
Relative recognition accuracy	Medium	
Number of people in database	Up to 500	
Determination of sex and age	–	√
Recognition of emotions	–	√
Recognition of faces in archive	–	√
Reports regarding faces	√	√
Reports regarding unique visitors	–	–
Usage of high-performance video card (GPU)	+	√
Usage of several video cards (GPUs)	–	√

√ Yes

– No

+ Optionally

Details

Face Recognition (Complete) and **Unique Visitor Counting** modules use all the suitable video cards installed on the server. Every camera with the recognition module enabled is assigned to one of the cards.

When the number of cameras with the recognition modules enabled exceeds the quantity of video cards used, the cameras will be uniformly distributed among the video cards, as applicable, without considering the characteristics of the video streams coming from the cameras and the performance of the video cards (i.e. an equal number of cameras will be assigned to each video card, wherever possible).

Unique Visitor Counting module is intended for generating Unique Visitor Counting reports based on detecting and recognizing faces. It is possible to exclude faces pertaining to certain groups from the counting, for example, to avoid counting employees.

The **Face Recognition (Complete)**, **Face Recognition (Light)** and **Unique Visitor Counting** modules determine the uniqueness of a face on the basis of the set of features jointly called the "index". The modules do not use individual points (dots) of faces when determining the index; instead, the image with the size of 100x100 pixels (using the "points" terminology, a face is recognized using approximately 10 thousand points). For each face located, an entry is created in the archive of the server where this face was found, even if the face has not been explicitly entered into the database. Subsequently, these events will be available for viewing in the event archive. These modules are capable of recognizing several faces present in the frame at the same time (10 or more, if the computing capacity allows it).

The **Face Recognition (Complete)** module can identify masked faces with high accuracy; provided that the database contains samples of these persons without a mask. Also, this module can recognize turned faces; despite the fact that only images of faces looking directly into the camera are entered into the database.

The face database may be located on the same server where the recognition is being performed, or, alternatively, on another server of a unified multiserver video surveillance system.

Each entry in the face database contains the following:

One or more images (screenshots and/or photographs) of a person's face;

Surname, first name, patronymic of a person that are entered manually and are optional;

Additional information (optional text box);

Group affiliation (optional parameter).

The uniqueness of the entries of the database is determined by the face index. Thus, the database can contain several entries with the coincident surname, first name and patronymic (including the empty field).

It is possible to work with the face database from the **Eocortex Client** application, or using the API.

Compatibility with other modules (Complete)

OS	Requires Eocortex motion detector	Neural network	Compatible with modules	Incompatible with modules
		Standard	Special	
√	√	-	√	√ Auto Zoom Abandoned object detection module Counting People in Queue Crowd Monitoring Emergency Vehicle Detection Face Detection Face Mask Detector Fire and Smoke Detector Frame Area Blurring License Plate Recognition (Complete) ¹ License Plate Recognition (Light) ¹ Loud Sound Detection People Counting ¹ Personnel Activity Monitoring Sabotage Detector Search for Objects Shelf Fullness Check Tracking

Face Recognition (Light)
 FishEye Dewarping
 Object Classification and Counting

						Traffic Density Heat Map	
						Uniform Detector	
						Unique Visitor Counting	

¹ If used in combination, module selection is available to display the results of the analysis in the Eocortex Client application

- ✓ supported and required for the module to work
- + supported and provides additional features of the module
- not supported or not required for the module to work

Compatibility with other modules (Light)

OS		Requires Eocortex motion detector		Neural network		Compatible with modules		Incompatible with modules	
				Standard	Special				
✓	✓	-		✓	✓	Abandoned object detection module		Face Recognition (Complete)	
						Auto Zoom		FishEye Dewarping	
						Counting		Object Classification and Counting	
						People in Queue		Unique Visitor Counting	
						Crowd Monitoring			
						Emergency Vehicle Detection			
						Face Detection			
						Face Mask Detector			
						Fire and Smoke Detector			
						Frame Area Blurring			
						License Plate Recognition (Complete) ¹			

					License Plate Recognition (Light) ¹
					Loud Sound Detection
					People Counting ¹
					Personnel Activity Monitoring
					Sabotage Detector
					Search for Objects
					Shelf Fullness Check
					Tracking
					Traffic Density Heat Map
					Uniform Detector

¹ If used in combination, module selection is available to display the results of the analysis in the Eocortex Client application

- ✓ supported and required for the module to work
- + supported and provides additional features of the module
- not supported or not required for the module to work

Use



The use of video analytics modules in **Eocortex Client** is described in the **User's guide**, in the **Eocortex Client / Video analytics** section.

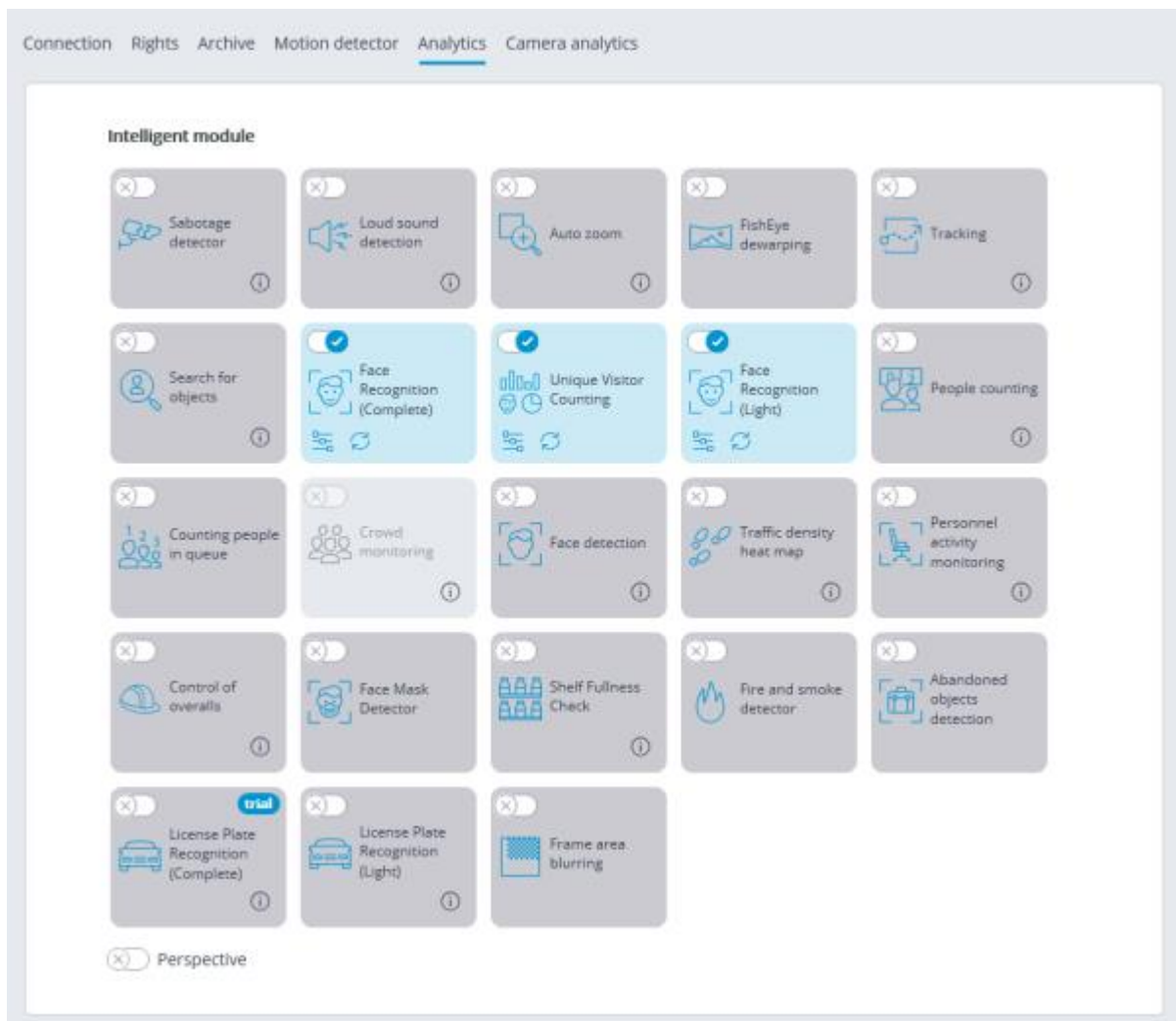
Module setup


Before using the Face Recognition or Unique Visitor Counting modules, it is required [to install the additional components on the server](#).

To use the module, enable and set up the software motion detector, then activate the module itself.

To do that, [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list, and set up the motion detector on the [Motion detector](#) tab on the right part of the page.

Then go to the [Analytics](#) tab and enable the module using the  switch, then adjust it pressing the  button.



Clicking the  button opens the module setup window.

It is possible to simultaneously enable on the same camera only those modules that are based on the Face Recognition technology: **Face Recognition (Complete)** and **Unique Visitor Counting**. No other Face Recognition modules can be enabled simultaneously on the same camera.

The minimum width and height of an object in the software motion detector settings must be smaller than the size of a face.

Some of the settings of the modules are the same; others are unique for each one. The module settings are described below.


Main settings

The **Main settings** tab is used to set the general settings for recognition.

Face Recognition (Light) ✕

Main settings Detection zone Database "Light"

Face size



Camera 1

Minimum size

Maximum size

Parameters

Minimum recognition positiveness: 80 % ⓘ

Minimum number of frames for recognition: 2 ⓘ

Detection sensitivity: Medium ⓘ

Limit time for repeated recognitions: 5 seconds ⓘ

SaveCancel


Face Recognition (Complete)

Main settings | Detection area | Database "Complete" | Time logging areas

Face size

Archive | **Real time**

Camera 6



Minimum size

Maximum size

Parameters

Minimum recognition positiveness: 99.99 % ⓘ

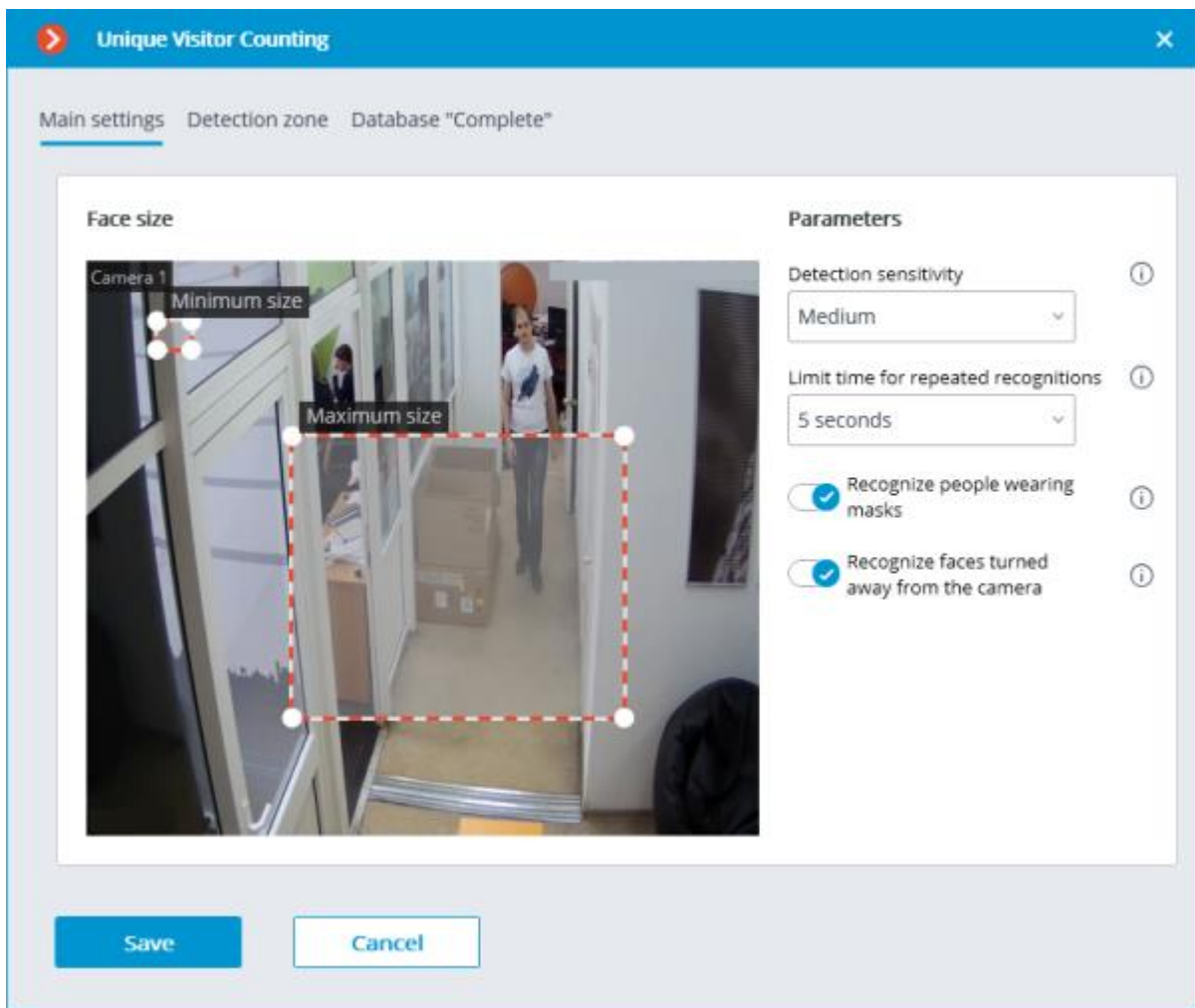
Detection sensitivity: Medium ⓘ

Limit time for repeated recognitions: 5 seconds ⓘ

Recognize people wearing masks ⓘ

Recognize faces turned away from the camera ⓘ

Save | Cancel



Minimum size and **Maximum size**: Allow to set, using frames, the minimum and the maximum size of a face to be detected. The minimum size that is too small may lead to false detections due to the low quality of small images of the faces.

Minimum recognition positiveness: the cases of recognition with the similarity value lower than the specified threshold will not count. Lowering the value will allow to better recognize people wearing sunglasses, with partially covered faces, etc., but, at the same time, may lead to false recognitions. The available range of values is 70–100%; default value: 80%.

Detection sensitivity: The higher the sensitivity, the lower the minimum acceptable quality of the images of the faces required for recognition. The higher value can help in case of low light conditions, but may also result in erroneous detections and in detecting bad quality images of the faces. The lower value reduces the module's capability to detect faces turned away from the camera. The allowable range of values is as follows: **Minimum, Low, Medium, High** and **Maximum**; the default value is **Medium**.

Limit time for repeated recognitions: the minimum time between detections of a face of the same person. It prevents occurrence of the identical entries in case of the successive appearances of the same person in the frame. The allowable range of values: **Not to limit, 5 seconds, 30 seconds, 1 minute**; the default value is **Not to limit**.

Minimum number of frames for recognition: if a person was detected in the camera field of view less than a specified number of times, no recognition will be performed. The available range of values is 1-5; the default value is 2.

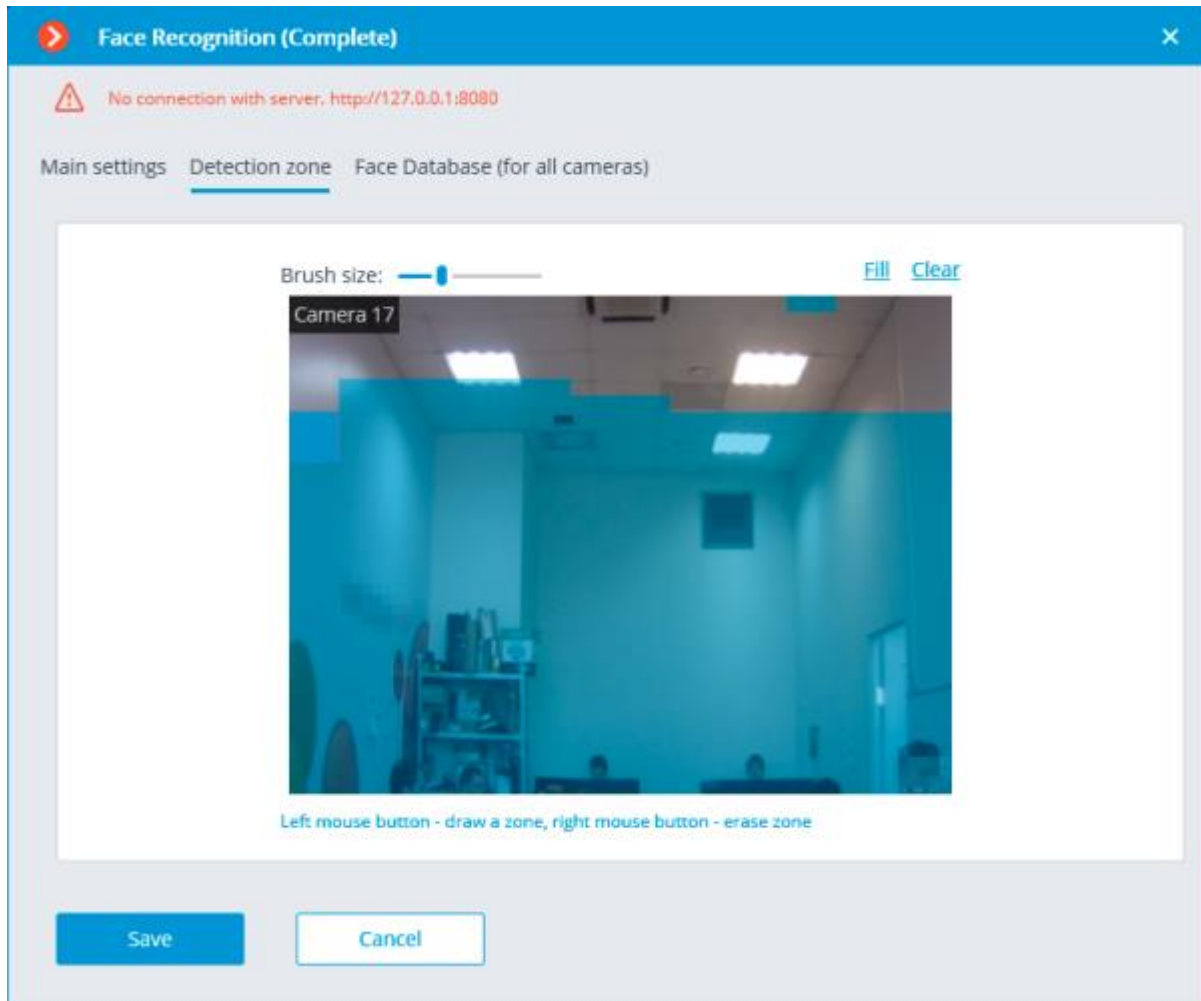
Recognize people wearing masks and **Recognize faces turned away from the camera**: allow more flexible configuration of the module: if these parameters are disabled, this will reduce the number of potentially false triggerings, and if they are enabled, the module will detect and recognize faces more accurately.

These parameters only affect the ability to identify masked and turned away faces, detection will be performed in any case.

In [Tasks by event](#), it is possible to set [scenarios](#) based on the presence or absence of a mask on a person's face, as well as by the attribute of whether a person's face is turned away from the camera.

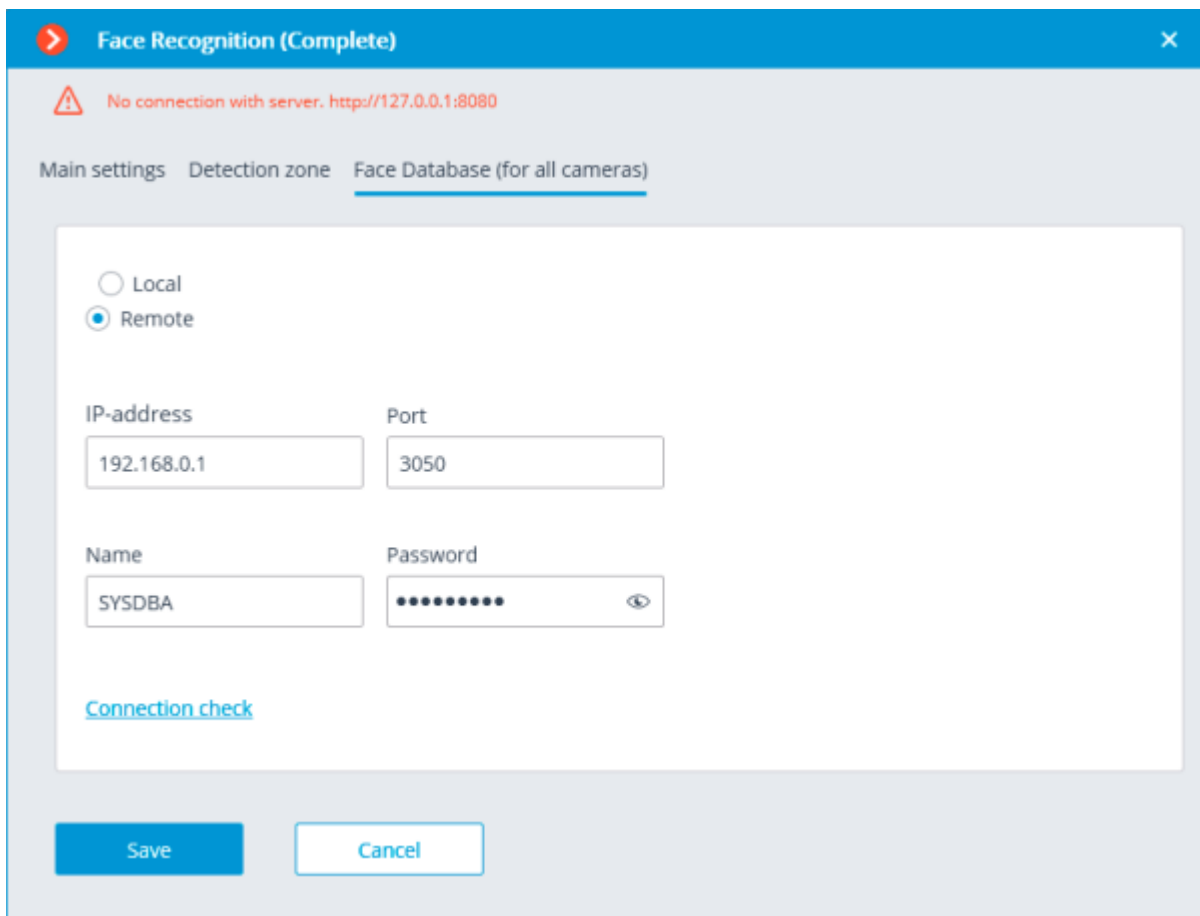
Detection area

On the **Detection area** tab, the user can specify the area where the system will search for faces. By default, the detection zone occupies the whole frame.



Card-file

On the **Database "Complete"** tab, the parameters of connection to the face database are set.



Two database deployment options are available: **Local** or **Remote**.

If the recognition process runs on only one server, it is recommended deploying the database on this server by selecting **Local**.

If the recognition process is running on several servers, the database should still be hosted only on one of them. For this purpose, select the **Remote** option for all cameras and specify the database connection parameters: server address, name and password of the database administrator. The same applies when the database of the module is deployed on one server, and the camera with the module enabled is attached to another one.

Eocortex version 3.6 and lower uses **Firebird** DBMS with the following default values:

- **Port:** 3050
- **Username:** SYSDBA
- **Password:** masterkey

Starting from version **Eocortex** 4.0, the module's database is handed over to the [PostgreSQL DBMS](#) with the following default values:

- **Port:** 5432
- **Username:**
 - For Windows: postgres
 - For Linux: eocortex
- **Password:** masterkey

Remote access to databases is not allowed by default in PostgreSQL and must be additionally configured if remote databases are used for analytics. All settings must be

done for the server where the database is stored. Settings are slightly different for [Windows](#) and [Linux](#) operating systems.

When the server is running for the first time after upgrading **Eocortex** to version 4.0 or higher, the existing module database will be automatically transformed to be compatible with **PostgreSQL**.

If connecting to a **Remote** database, use the DBMS **Username** and **Password** that are valid for the server storing the database.

Independent of the database location, the recognition events (date and time of recognition, coordinates of the object in the frame, binding of the recognized object to the database) will always be stored on the server to which the camera with the corresponding events is bound.

Synchronization with the database located on a remote server can take some time

When using a remote database, the [remote database replication mechanism](#) will be applied.

It is possible to check the availability of the database clicking the **Connection check** link. If the server is unavailable, the corresponding message will be displayed.

It is possible to set the [own face database](#) for the **Face Database Complete** for an individual camera of a group of cameras using the field **Database identifier**.

The field **Database identifier** is not initially displayed at the launch of the module.

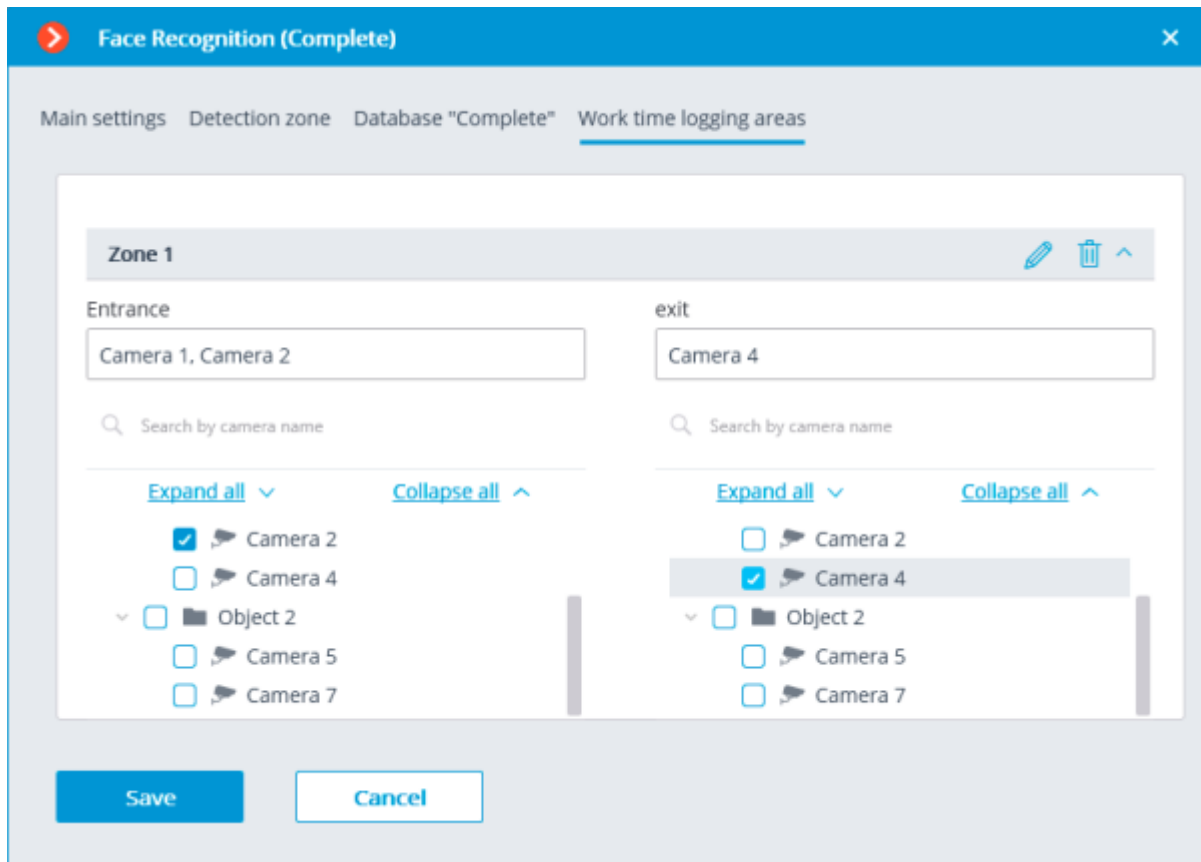
To use this capability, it is required to set **Database identifier** via REST API.

The screenshot shows a configuration window titled "Face Recognition (Complete)" with a close button (X) in the top right corner. The window has four tabs: "Main settings", "Detection zone", "Database 'Complete'", and "Time logging areas". The "Database 'Complete'" tab is selected and underlined. Inside the configuration area, there are two radio buttons: "Local" (unselected) and "Remote" (selected). Below these are four input fields: "Address" (containing "192.168.200.228"), "Port" (containing "3050"), "Name" (containing "SYSDBA"), and "Password" (containing masked characters and a visibility icon). To the right of these fields is a "Type" section with two radio buttons: "Windows" (selected) and "Linux" (unselected). Below the input fields is a blue link labeled "Connection check". At the bottom of the configuration area is a "Database identifier" label and a text input field containing "Db1". At the very bottom of the window are two buttons: "Save" (blue) and "Cancel" (white with blue border).

Time logging areas

This tab is only available in the settings of the **Face Recognition (Complete)** module.

The parameters to be used for creating **Work time logging (Complete)** report are set on the **Time logging areas** tab.



Work time logging (Complete) report is formed by areas (zones). An area is a territory where it is required to monitor the presence of persons. The people's faces must be recognized at the entrance to and the exit from the area by the **Face Recognition (Complete)** module. Several cameras may be used for a single area both at the entrance and at the exit.

For each area, it is possible to open the settings and set the cameras for performing Face Recognition on the entrance and exit. Only the cameras with the **Face Recognition (Complete)** module enabled will be shown in the hierarchical list.

The module will start working only when [the settings are applied](#).

Requirements and recommendations

Face Recognition (Complete)

Server



Eocortex Neural Networks package must be installed before it will be possible to use neural networks-based features of the module.

The following equipment is required to use this neural network-based module:

- A processor with AVX instructions support;
- An **NVIDIA** video card (GPU) with the computation capacity index of at least 6.5 and with at least 4 Gb of memory; the parameters and performance of the video card must be similar or better than those of **NVIDIA GTX 1650 Super** model;
- version of the video card driver at least 460;
- swap file at least half of the total RAM size.

If the package will be installed on a virtual machine, it may additionally be required to:

- Enable support for AVX instructions in the guest machine settings;
- Use GRID drivers for GPU virtualization.



Eocortex must use video cards selected for running neural networks in monopoly mode. It is not allowed to use such card for other applications or tasks that consume GPU resources, including for displaying video. Simultaneous use of a video card for several tasks may lead to incorrect system operation: from analytics performance degradation to server instability.



As an example, Simultaneous execution of tasks of video displaying and analysis with the **Face Recognition (Complete)** or **Unique Visitor Counting** modules working on the **Eocortex Neural Networks Standard** package can cause significant lags of Face Recognition processes when using graphics cards of **GTX 10XX** and **GTX 16XX** series with 4 GB of video memory or less. It is recommended to use dedicated graphics cards for these tasks.



The neural network works with the 64-bit version of **Eocortex** only.



When upgrading Eocortex to another version, it is necessary to also upgrade the **Eocortex Neural Networks** package to the corresponding version.

Faces

The images to be added to the database must conform to the following requirements:

Face position: strictly face forward, no turns;

Look: directly into the lens;

Neutral facial expression;

Eyes open and clearly seen;

No headgear or sunglasses;

Sharp and clear image;

No heavy shadows;

No scanning artifacts, no retakes from screens;

No disfigured proportions;

Lateral illumination is not permissible (e.g. sunshine from window);

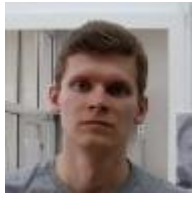
The module is tolerant to appearance modification:



DB



✓



✓



✓



✓

Video Stream

Optimum resolution for the module's operation: HD or FullHD.

Framerate: 10 fps or more.

No mirrored (horizontally flipped) stream.

Illumination and image quality

Illumination of faces in the frame must be uniform and constant.

If the camera is installed opposite a bright source of light (sun behind the entrance door, etc.), it is required to adjust the exposure or brightness in such a way that the face in the frame is light. The overexposed background is acceptable.

The image quality must be medium or better. Significant compression artefacts are not acceptable.

No blurring of moving people's faces is allowed.

The image must be in color.

Scene and camera position

The faces must be fully seen in the frame.

There must be no mirror surfaces giving reflections in the frame (glass, mirrors, etc.).

Strong lateral illumination (e.g. sunlight from the window) resulting in the overexposure of one part of the face is not acceptable.

The camera may be placed above the face level, directly facing the people to be recognized. In such a case, the camera elevation angle must not exceed 35°.

The distance between the pupils of a face to be recognized must be at least 30 pixels.

The camera must directly face the people to be recognized. The camera angle between the face direction and the lens axis must not exceed 30°.

Examples of non-compliance with the requirements

Covering (overlapping):



✓

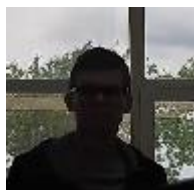


X

Face illumination:



✓



X



X

Blurring of face in motion:



✓



X

Unacceptable distance between pupils:



30
pixels

✓



15
pixels

X

Video stream quality:

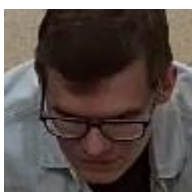


✓



X

Camera tilt:



35°

50°

70°

✓

!

X

Lateral light source:



✓

X

Reflecting surfaces:



✓

X

Horizontal turn of camera from face plane:



0°

15°

30°

45°

60°

90°

✓

✓

✓

⚠

X

X

Black and white image (night mode):



✓

X

Recommended cameras

Tested camera models:

DS-2CD2723G0-IZS

DH-IPC-HFW2431TP-ZS

Recommended camera settings

Quality: highest.

Bitrate: maximum possible.

Profile: maximum possible.

I-frame interval (GOV): 50.

Stream anti-aliasing: off.

Exposure and brightness: ensuring that the face is clearly seen (if the camera faces the light source, the overexposed background is acceptable).

Shutter speed: must not be too low (more than 1/50), because in such a case the blurring of moving objects will occur).

Use of computing resources

The modules use much RAM during launching. Due to that fact, in the course of starting the server with the operating module it is recommended to have a reserve of free RAM in the amount of 3–5 GB. At that, the swap file must be enabled on the server (when setting its size, you may choose **Select automatically**).

Acceptable number of cameras for various server configurations, without displaying.

For video stream from camera: 2 MP, 25 fps:

CPU	GPU	RAM, GB	No. of cameras
Intel Core i5-2400	NVIDIA GeForce GTX-1050 Ti	8	5
Intel Core i7-2600	NVIDIA GeForce GTX-1060	8	9
Intel Core i7-7700	NVIDIA GeForce RTX-2070	8	13
Intel Core i9-9900K	NVIDIA GeForce RTX-2080	16	20

For video stream from camera: 1 MP, 25 fps:

CPU	GPU	RAM, GB	No. of cameras
Intel Core i5-2400	NVIDIA GeForce GTX-1050 Ti	8	8

Face Recognition (Light)

Server



Eocortex Neural Networks package must be installed before it will be possible to use neural networks-based features of the module.

The following equipment is required to use this neural network-based module:

- A processor with AVX instructions support;
- swap file at least half of the total RAM size.

It is also possible (optional) to use a video card. In this case, an NVIDIA video card (GPU) with a computing capability index of at least 6.5 and a memory size of at least 4GB is required, and the characteristics and performance of the graphics card must be at least as good as the NVIDIA GTX 1650 Super.

If the package will be installed on a virtual machine, it may additionally be required to:

- Enable support for AVX instructions in the guest machine settings;
- Use GRID drivers for GPU virtualization.



Eocortex must use video cards selected for running neural networks in monopoly mode. It is not allowed to use such card for other applications or tasks that consume GPU resources including for displaying video. Simultaneous use of a video card for several tasks may lead to incorrect system operation: from analytics performance degradation to server instability.



The neural network works with the 64-bit version of **Eocortex** only.



When upgrading Eocortex to another version, it is necessary to also upgrade the **Eocortex Neural Networks** package to the corresponding version.

Faces

Face position: strictly face forward, no turns;

Look: directly into the lens;

Neutral facial expression;

Eyes open and clearly seen;

No headgear or sunglasses;

Sharp and clear image;

No heavy shadows;

No scanning artifacts, no retakes from screens;

No disfigured proportions;

Lateral illumination is not permissible (e.g. sunshine from window);

The faces being recognized in the frame must correspond to the faces from the database as accurately as possible. The people whose faces are covered by sunglasses, hoods, headgear, etc. will be significantly more difficult to recognize.

Video Stream

Optimum resolution for the module's operation: HD or FullHD.

Framerate: 10 fps or more.

No mirrored (horizontally flipped) stream.

Illumination and image quality

Illumination of faces in the frame must be uniform and constant.

If the camera is installed opposite a bright source of light (sun behind the entrance door, etc.), it is required to adjust the exposure or brightness in such a way that the face in the frame is light. The overexposed background is acceptable.

The image quality must be medium or better. Significant compression artefacts are not acceptable.

No blurring of moving people's faces is allowed.

The image may be black and white or color.

Scene and camera position

The faces must be fully seen in the frame.

There must be no mirror surfaces giving reflections in the frame (glass, mirrors, etc.).

Strong lateral illumination (e.g. sunlight from the window) resulting in the overexposure of one part of the face is not acceptable.

The camera may be placed above the face level, directly facing the people to be recognized. In such a case, the camera elevation angle must not exceed 35°.

The distance between the pupils of a face to be recognized must be at least 30 pixels.

Examples of non-compliance with the requirements

Covering (overlapping):



✓

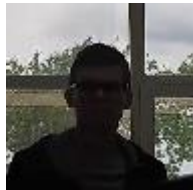


X

Face illumination:



✓



X



X

Blurring of face in motion:



✓



X

Unacceptable distance between pupils:



30
pixels

✓



15
pixels

X

Video stream quality:



✓



X

Camera tilt:



35°

✓



50°

!



70°

X

Lateral light source:



✓



X

Reflecting surfaces:



✓



X

Horizontal turn of camera from face plane:



0°

✓



15°

✓



30°

⚠



45°

X



60°

X



90°

X

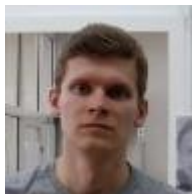
Modified appearance:



DB



✓



X



X



X

Recommended cameras

Tested camera models:

DS-2CD2723G0-IZS

DH-IPC-HFW2431TP-ZS

Recommended camera settings

Quality: highest.

Bitrate: maximum possible.

Profile: maximum possible.

I-frame interval (GOV): 50.

Stream anti-aliasing: off.

Exposure and brightness: ensuring that the face is clearly seen (if the camera faces the light source, the overexposed background is acceptable).

Shutter speed: must not be too low (more than 1/50), because in such a case the blurring of moving objects will occur).

Use of computing resources

The modules use much RAM during launching. Due to that fact, in the course of starting the server with the operating module it is recommended to have a reserve of free RAM in the amount of 3–5 GB. At that, the swap file must be enabled on the server (when setting its size, you may choose **Select automatically**).

Acceptable number of cameras for various server configurations, without displaying.

For video stream from camera: 2 MP, 25 fps:

CPU	RAM, GB	No. of cameras
Intel Core i5-2400	8	1
Intel Core i5-2600	8	2

For video stream from camera: 1 MP, 25 fps:

CPU	RAM, GB	No. of cameras
Intel Core i5-2300	8	1
Intel Core i5-2400	8	2
Intel Core i5-3570	8	3
Intel Core i5-2600	8	4

Unique Visitor Counting

Server



Eocortex Neural Networks package must be installed before it will be possible to use neural networks-based features of the module.

The following equipment is required to use this neural network-based module:

- A processor with AVX instructions support;
- An **NVIDIA** video card (GPU) with the computation capacity index of at least 6.5 and with at least 4 Gb of memory; the parameters and performance of the video card must be similar or better than those of **NVIDIA GTX 1650 Super** model;
- version of the video card driver at least 460;

- swap file at least half of the total RAM size.

If the package will be installed on a virtual machine, it may additionally be required to:

- Enable support for AVX instructions in the guest machine settings;
- Use GRID drivers for GPU virtualization.



Eocortex must use video cards selected for running neural networks in monopoly mode. It is not allowed to use such card for other applications or tasks that consume GPU resources, including for displaying video. Simultaneous use of a video card for several tasks may lead to incorrect system operation: from analytics performance degradation to server instability.



As an example, Simultaneous execution of tasks of video displaying and analysis with the **Face Recognition (Complete)** or **Unique Visitor Counting** modules working on the **Eocortex Neural Networks Standard** package can cause significant lags of Face Recognition processes when using graphics cards of **GTX 10XX** and **GTX 16XX** series with 4 GB of video memory or less. It is recommended to use dedicated graphics cards for these tasks.



The neural network works with the 64-bit version of **Eocortex** only.



When upgrading Eocortex to another version, it is necessary to also upgrade the **Eocortex Neural Networks** package to the corresponding version.

Faces

The images to be added to the database must conform to the following requirements:

Face position: strictly face forward, no turns;

Look: directly into the lens;

Neutral facial expression;

Eyes open and clearly seen;

No headgear or sunglasses;

Sharp and clear image;

No heavy shadows;

No scanning artifacts, no retakes from screens;

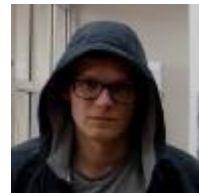
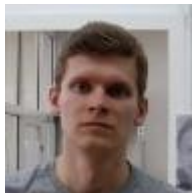
No disfigured proportions;

Lateral illumination is not permissible (e.g. sunshine from window);

The module is tolerant to appearance modification:



DB



Video Stream

Optimum resolution for the module's operation: HD or FullHD.

Framerate: 10 fps or more.

No mirrored (horizontally flipped) stream.

Illumination and image quality

Illumination of faces in the frame must be uniform and constant.

If the camera is installed opposite a bright source of light (sun behind the entrance door, etc.), it is required to adjust the exposure or brightness in such a way that the face in the frame is light. The overexposed background is acceptable.

The image quality must be medium or better. Significant compression artefacts are not acceptable.

No blurring of moving people's faces is allowed.

The image must be in color.

Scene and camera position

The faces must be fully seen in the frame.

There must be no mirror surfaces giving reflections in the frame (glass, mirrors, etc.).

Strong lateral illumination (e.g. sunlight from the window) resulting in the overexposure of one part of the face is not acceptable.

The camera may be placed above the face level, directly facing the people to be recognized. In such a case, the camera elevation angle must not exceed 35°.

The distance between the pupils of a face to be recognized must be at least 30 pixels.

The camera must directly face the people to be recognized. The camera angle between the face direction and the lens axis must not exceed 30°.

Examples of non-compliance with the requirements

Covering (overlapping):



✓

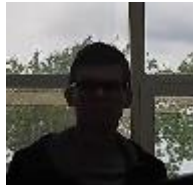


X

Face illumination:



✓



X



X

Blurring of face in motion:



✓



X

Unacceptable distance between pupils:



30
pixels

✓



15
pixels

X

Video stream quality:



✓



X

Camera tilt:



35°

✓



50°

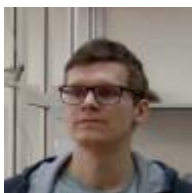
!



70°

X

Lateral light source:



✓



X

Reflecting surfaces:



✓



X

Horizontal turn of camera from face plane:



0°

✓



15°

✓



30°

✓



45°

⚠



60°

X



90°

X

Black and white image (night mode):



✓



X

Recommended cameras

Tested camera models:

DS-2CD2723G0-IZS

DH-IPC-HFW2431TP-ZS

Recommended camera settings

Quality: highest.

Bitrate: maximum possible.

Profile: maximum possible.

I-frame interval (GOV): 50.

Stream anti-aliasing: off.

Exposure and brightness: ensuring that the face is clearly seen (if the camera faces the light source, the overexposed background is acceptable).

Shutter speed: must not be too low (more than 1/50), because in such a case the blurring of moving objects will occur).

Use of computing resources

The modules use much RAM during launching. Due to that fact, in the course of starting the server with the operating module it is recommended to have a reserve of free RAM in the amount of 3–5 GB. At that, the swap file must be enabled on the server (when setting its size, you may choose **Select automatically**).

Acceptable number of cameras for various server configurations, without displaying.

For video stream from camera: 2 MP, 25 fps:

Processor	GPU	RAM	No. of cameras
Intel Core i5-2400	NVIDIA GeForce GTX-1050 Ti	8 GB	5
Intel Core i7-2600	NVIDIA GeForce GTX-1060	8 GB	9
Intel Core i7-7700	NVIDIA GeForce RTX-2070	8 GB	13
Intel Core i9-9900K	NVIDIA GeForce RTX-2080	16 GB	20

For video stream from camera: 1 MP, 25 fps:

Processor	GPU	RAM	No. of cameras
Intel Core i5-2400	NVIDIA GeForce GTX-1050 Ti	8 GB	8

Deployment of the module

Before using the module, it is required [to install the Eocortex Neural Networks package](#).

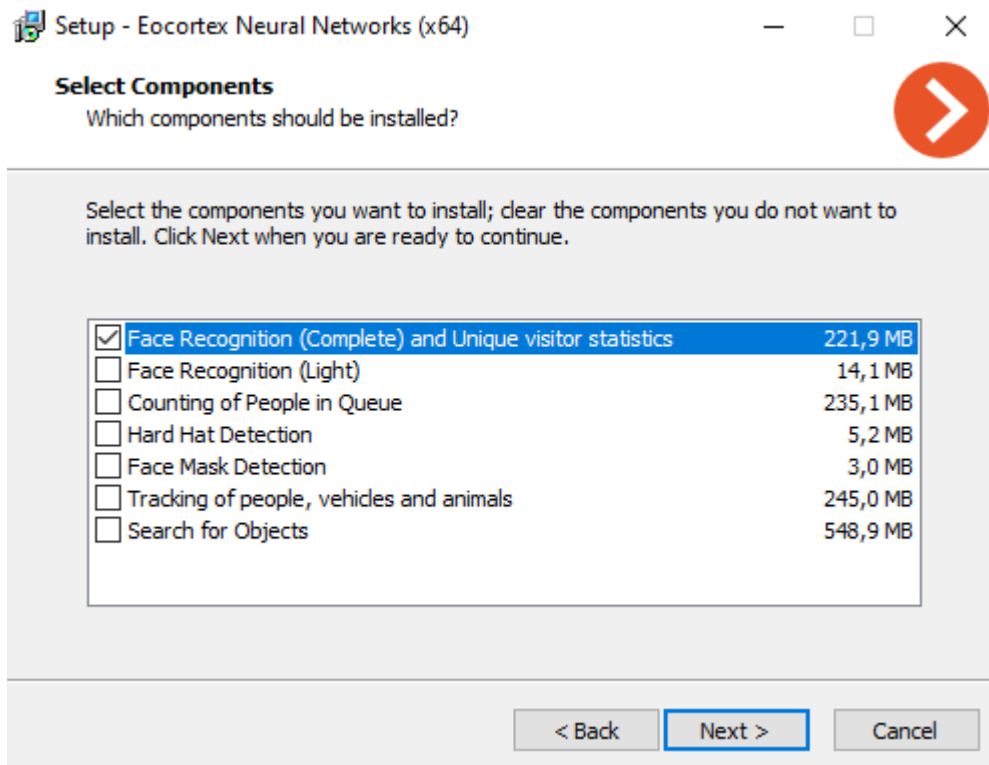
The neural network works with the 64-bit version of **Eocortex** only.

When updating **Eocortex** to a different version, it is also required to update the **Eocortex Neural Networks** package to the relevant version.

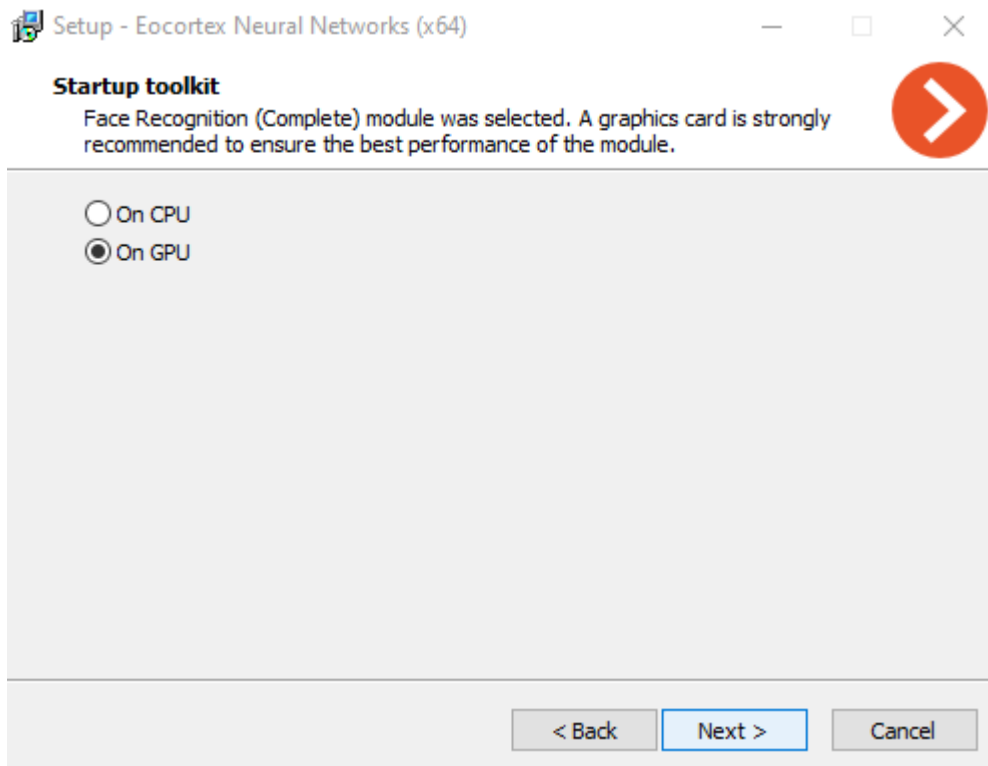
If the **Face Recognition (Complete)** module is used, the face databases will be automatically updated at the first start after updating **Eocortex** and the **Eocortex Neural Networks** package from version 3.3 or lower to version 3.4 or higher. It will take some time.

Simultaneous execution of tasks of video displaying and analysis with the **Face Recognition (Complete)** or **Unique Visitor Counting** modules working on the **Eocortex Neural Networks Standard** package can cause significant lags of Face Recognition processes when using graphics cards of **GTX 10XX** and **GTX 16XX** series with 4 GB of video memory or less. It is recommended to use dedicated graphics cards for these tasks.

In the process of installation of **Eocortex Neural Networks** it is required to select the corresponding components.



For the **Face Recognition (Complete)** and the **Unique Visitor Counting** modules, it is required to select the **On GPU** option at the **Startup toolkit** settings screen. For the **Face Recognition (Light)** module, selecting this option is preferable but not obligatory.



Fire and Smoke Detector

The **Fire and Smoke Detector** module is intended for detecting smoke and open flame in the frame.

Details

For the **Based on neural networks** operating mode, it is required [to install the Eocortex Neural Networks software package](#); a video card [with the parameters matching the module's requirements](#) is also necessary.

For the correct operation of the module, it is required to properly place and set up the camera, enable and adjust the software motion detector and the module itself.

Compatibility with other modules

OS	Requires Eocortex motion detector		Neural network	Compatible with modules		Incompatible with modules
			Standard	Special		
✓	✓	✓	+	+	Abandoned object detection module Auto Zoom Counting People in Queue Crowd Monitoring	–

OS	Requires Eocortex motion detector	Neural network	Compatible with modules	Incompatible with modules
		Standard	Special	
				Emergency Vehicle Detection Face Detection Face Mask Detector Face Recognition (Complete) Face Recognition (Light) Frame Area Blurring License Plate Recognition (Complete) License Plate Recognition (Light) Loud Sound Detection Object Classification and Counting People Counting Personnel Activity Monitoring Sabotage Detector Search for Objects Shelf Fullness Check Tracking Traffic Density Heat Map Uniform Detector  FishEye Dewarping

√ supported and required for the module to work


- + supported and provides additional features of the module
- not supported or not required for the module to work
- ▲ not recommended for use with the current module





Use

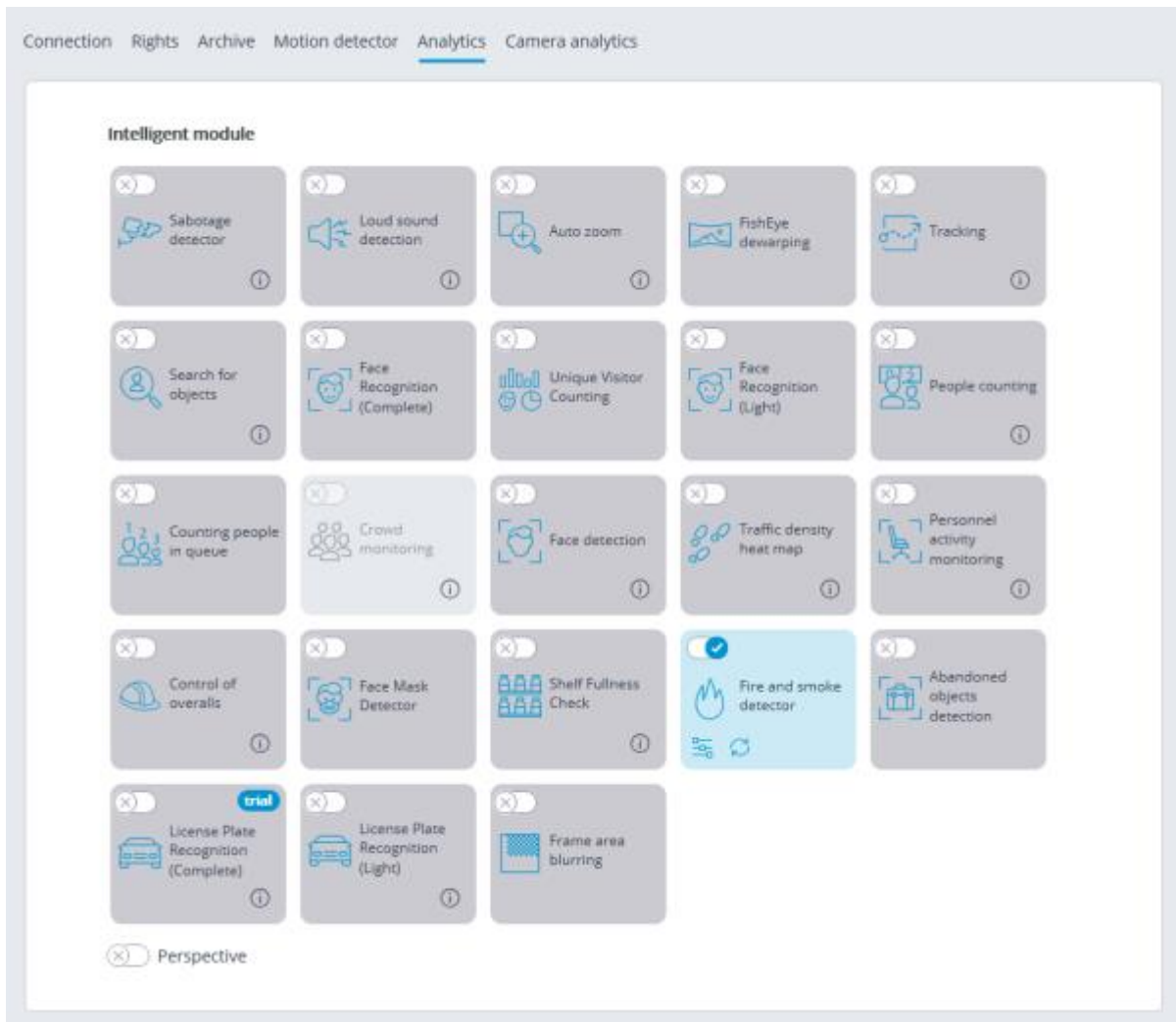
The use of video analytics modules in **Eocortex Client** is described in the **User's guide**, in the **Eocortex Client / Video analytics** section.




Module setup

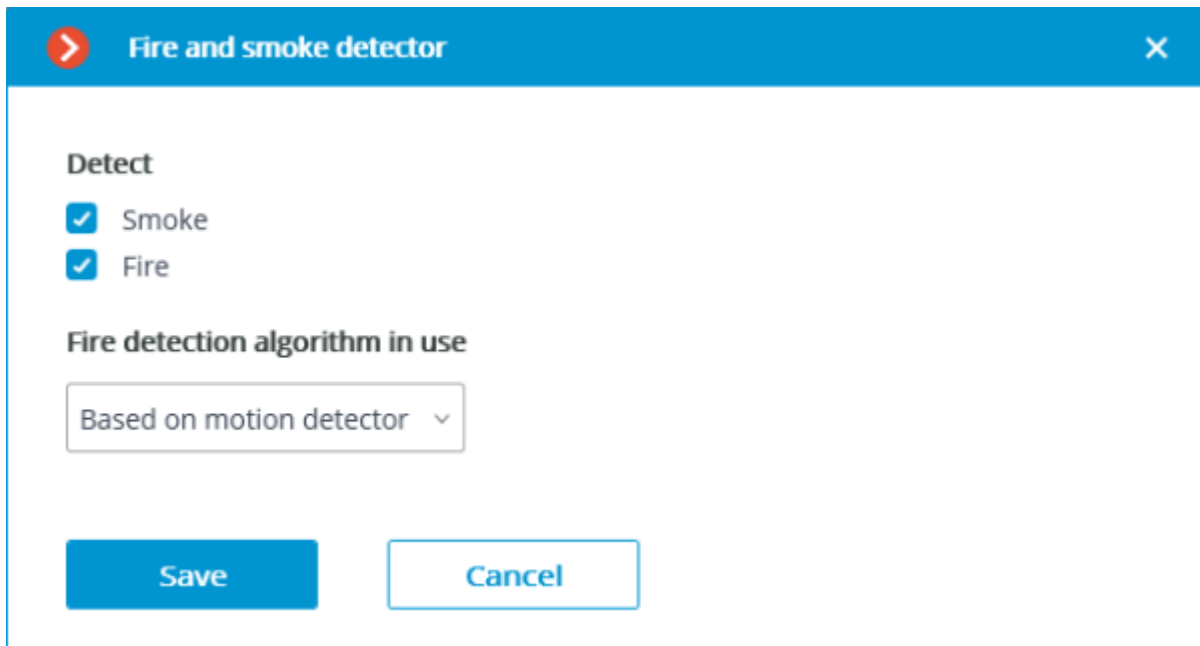
To use the module, enable and set up the software motion detector, then activate the module itself.

To do that, [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list, and set up the motion detector on the [Motion detector](#) tab on the right part of the page.

Then go to the [Analytics](#) tab and enable the module using the  switch, then adjust it pressing the 

 button.



Clicking the 

 button opens the module setup window.



In the opened settings window, select one of the detection options: **Smoke**, **Fire**.

Two operating modes are available for fire detection: **Based on motion detector** and **Based on neural networks**.

Based on neural networks operating mode ensures more accurate fire detection.

For the **Based on neural networks** operating mode, it is required [to install the Eocortex Neural Networks software package](#); a video card [with the parameters matching the module's requirements](#) is also necessary.

The module will start working only when [the settings are applied](#).

Requirements and recommendations

Hardware and software



Eocortex Neural Networks package must be installed before it will be possible to use neural networks-based features of the module.

For the **Based on neural networks** operating mode, the following are required:

- A processor with AVX instructions support;
- An **NVIDIA** video card (GPU) with the computation capacity index of at least 6.5 and with at least 4 Gb of memory; the parameters and performance of the video card must be similar or better than those of **NVIDIA GTX 1650 Super** model;
- version of the video card driver at least 460;
- swap file at least half of the total RAM size.

If the package will be installed on a virtual machine, it may additionally be required to:

- Enable support for AVX instructions in the guest machine settings;
- Use GRID drivers for GPU virtualization.



Eocortex must use video cards selected for running neural networks in monopoly mode. It is not allowed to use such card for other applications or tasks that consume GPU resources,

including for displaying video. Simultaneous use of a video card for several tasks may lead to incorrect system operation: from analytics performance degradation to server instability.



The neural network works with the 64-bit version of **Eocortex** only.



When upgrading Eocortex to another version, it is necessary to also upgrade the **Eocortex Neural Networks** package to the corresponding version.

Image

Image and background must be static: the camera shall be rigidly fixed, there shall be no constantly moving objects in the frame.

Video stream

Minimum permissible resolution of the frame is 400x300 pixels.

Minimum permissible frame rate is 15 and 5 frames per second for fire detection and smoke detection modes respectively.

Lighting and image quality

The illumination of the detection area must not change drastically (for example, when the light is switched on, when the camera switches to night mode, etc.).

In the smoke detection mode, it is necessary to ensure minimum required illumination and to avoid that the direct light shines on the lens.

Scene and camera position

The camera shall be placed at the angle of 0 - 70 degrees in reference to the level surface.

The objects of potential hazard must be located in the line of site of the camera. That means that they must not be blocked by other objects.

In the camera field of view there must be no "benign" sources of smoke and fire, such as furnaces, steam boilers or pipes, welding equipment etc.

The dimensions of the objects to be detected (smoke and fire areas) must be no less than 10% of each linear measure of the frame.



FishEye Dewarping

The **FishEye Dewarping** is designed to perform software dewarping (converting) the images obtained from the panoramic cameras.

Details

The **Auto Zoom**, **FishEye Dewarping** and **Frame Area Blurring** modules are mutually exclusive, meaning that only one of these modules can be used on a camera at a given moment.

Compatibility with other modules

OS	Requires Eocortex motion detector	Neural network	Compatible with modules	Incompatible with modules	
		Standard	Special		
√	√	–	–	<ul style="list-style-type: none"> Loud Sound Detection Sabotage Detector Object Classification and Counting ▲ Fire and Smoke Detector ▲ Crowd Monitoring ▲ Personnel Activity Monitoring ▲ Uniform Detector ▲ Face Detection ▲ People Counting ▲ Search for Objects ▲ Traffic Density Heat Map ▲ Tracking 	<ul style="list-style-type: none"> Auto Zoom Abandoned object detection module Face Mask Detector Shelf Fullness Check Counting People in Queue Unique Visitor Counting Frame Area Blurring License Plate Recognition (Complete) License Plate Recognition (Light) Face Recognition (Complete) Face Recognition (Light)

- √ supported and required for the module to work
- + supported and provides additional features of the module
- not supported or not required for the module to work
- ▲ not recommended for use with the current module



The module is intended only for visual conversion of the video displayed in the **Eocortex Client** application and does not affect the original stream from the camera used by other modules for analysis.

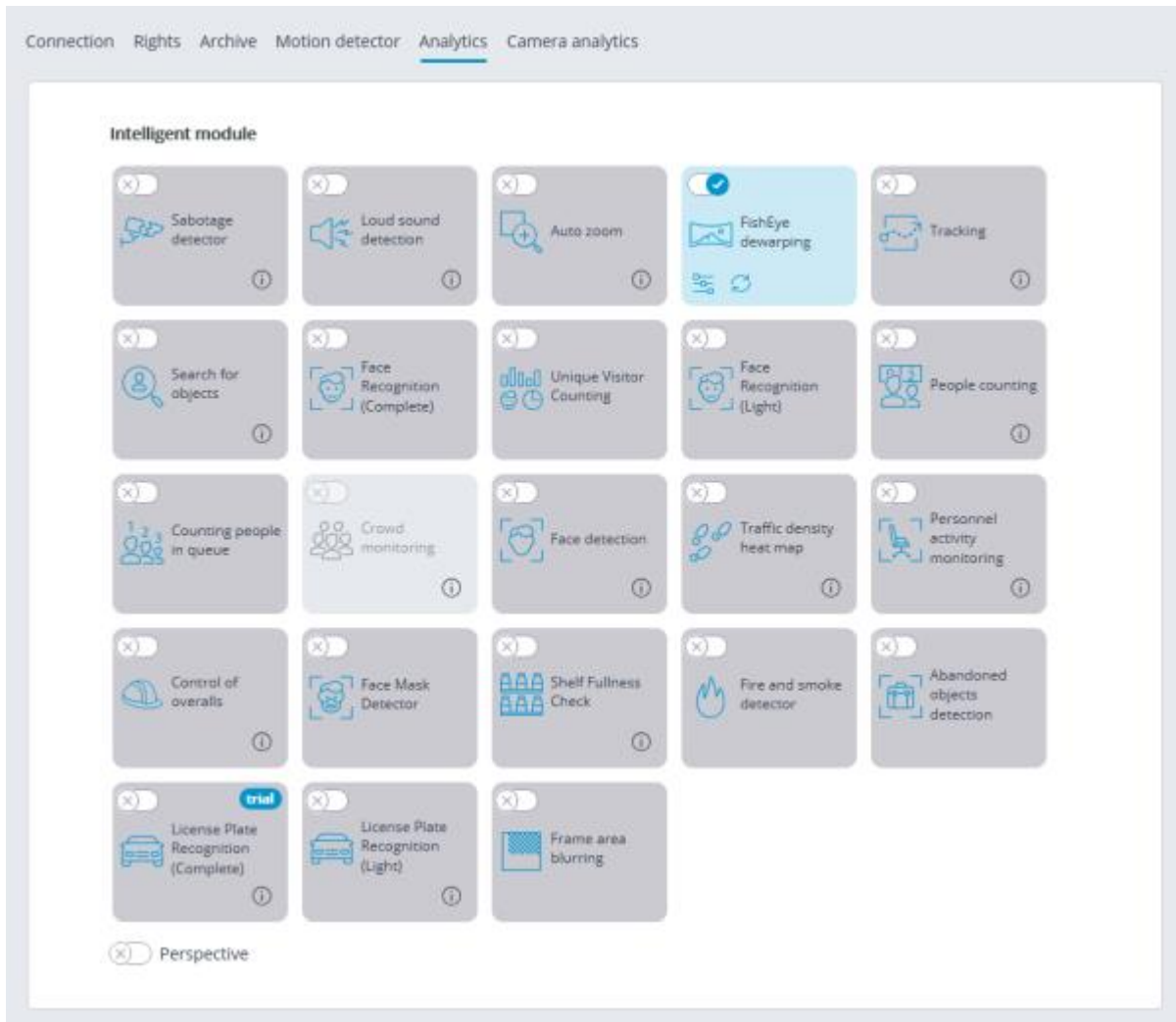
Use

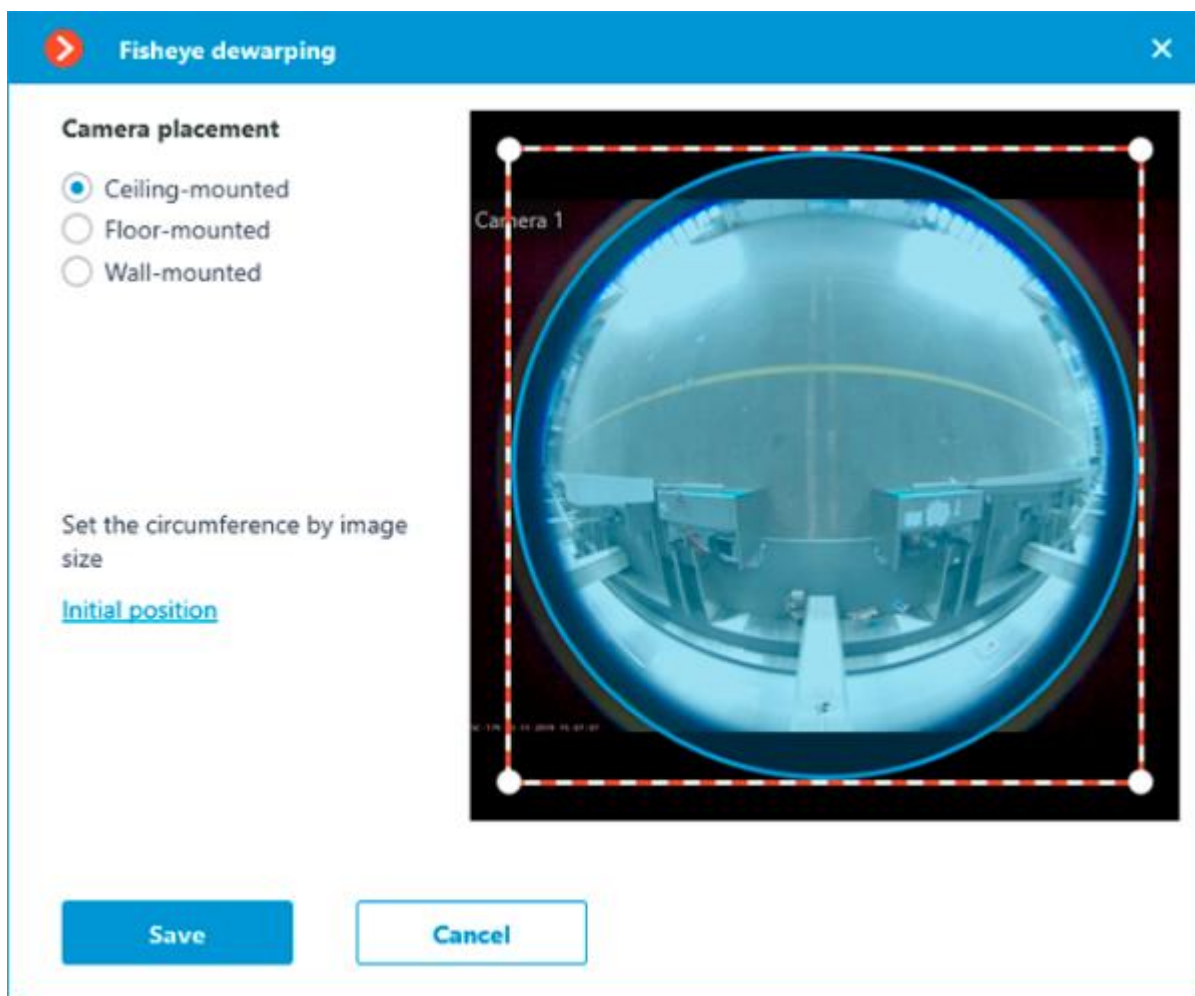
The use of video analytics modules in **Eocortex Client** is described in the **User's guide**, in the **Eocortex Client / Video analytics** section.

Module setup

To use the module, enable and set it up.

To do that, [launch the Eocortex Configurator application](#), go to the [Cameras](#) tab, select a camera in the list on the left side of the page, go to the [Analytics](#) tab, enable the module using the  switch and adjust it pressing the  button.





In the settings it is required to indicate the image radius and the "By default" view direction by clicking on the image boundary: the circle must coincide with the camera image boundary. The arrow will indicate the "By default" view direction. It is also possible to drag the center of the circle using the mouse.

The module will start working only when [the settings are applied](#).

Frame Area Blurring



The **Frame Area Blurring** module is designed to blur the specified areas of the frame on a real-time and archived video.

Details

The **Auto Zoom**, **FishEye Dewarping** and **Frame Area Blurring** modules are mutually exclusive, meaning that only one of these modules can be used on a camera at a given moment.

Compatibility with other modules

OS	Requires Eocortex motion detector	Neural network	Compatible with modules	Incompatible with modules
		Standard	Special	
√	√	-	-	Abandoned object detection module Auto Zoom FishEye Dewarping Counting People in Queue Crowd Monitoring Emergency Vehicle Detection Face Detection Face Mask Detector Face Recognition (Complete) Face Recognition (Light) Fire and Smoke Detector License Plate Recognition (Complete) License Plate Recognition (Light) Loud Sound Detection Object Classification and Counting People Counting Personnel Activity Monitoring Sabotage Detector Search for Objects

OS	Requires Eocortex motion detector	Neural network	Compatible with modules	Incompatible with modules
		Standard	Special	
				Shelf Fullness Check Tracking Traffic Density Heat Map Uniform Detector Unique Visitor Counting

- √ supported and required for the module to work
- + supported and provides additional features of the module
- not supported or not required for the module to work




The module is intended only for visual conversion of the video displayed in the **Eocortex Client** application and does not affect the original stream from the camera used by other modules for analysis.

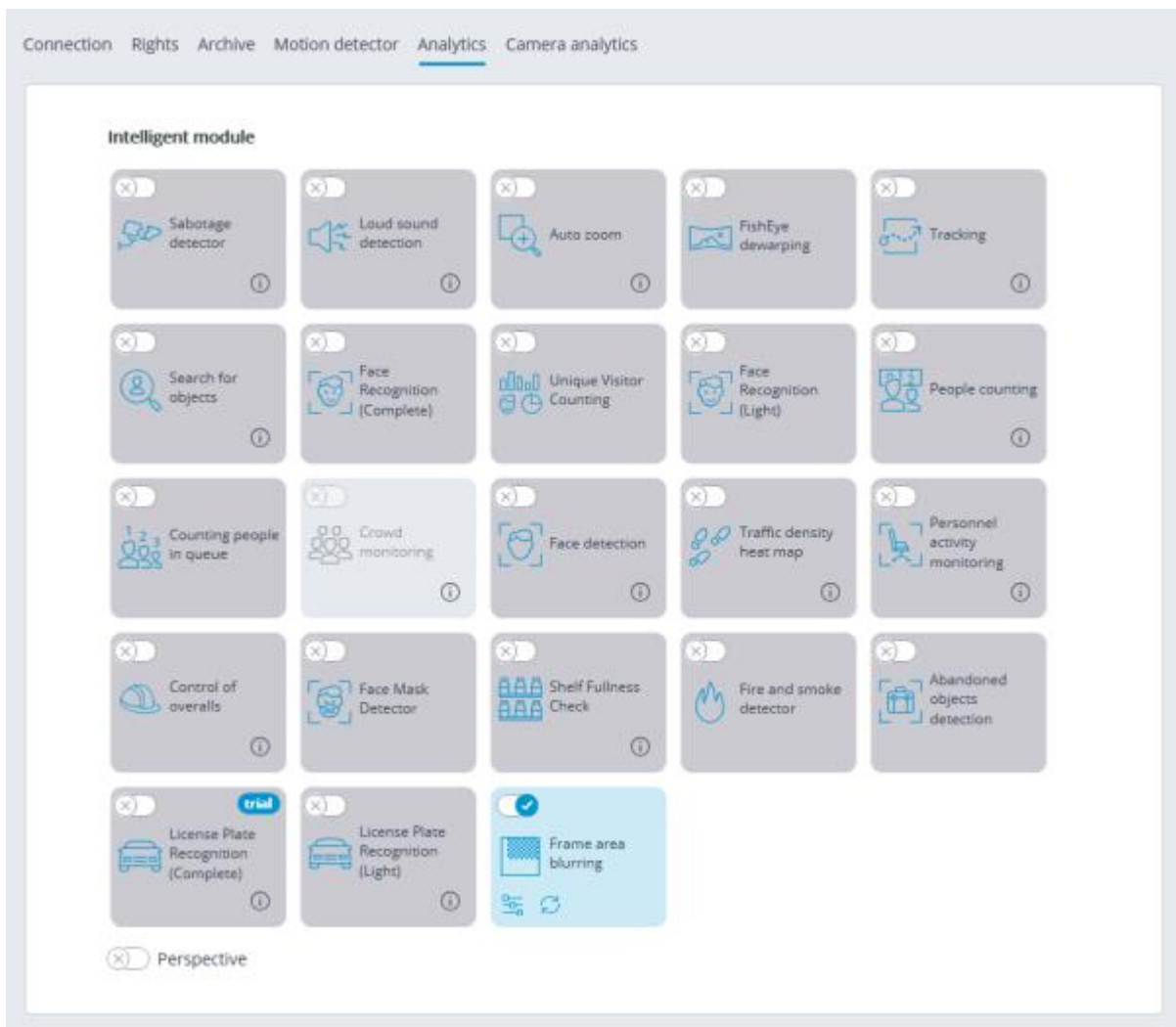
Use


The use of video analytics modules in **Eocortex Client** is described in the **User's guide**, in the **Eocortex Client / Video analytics** section.

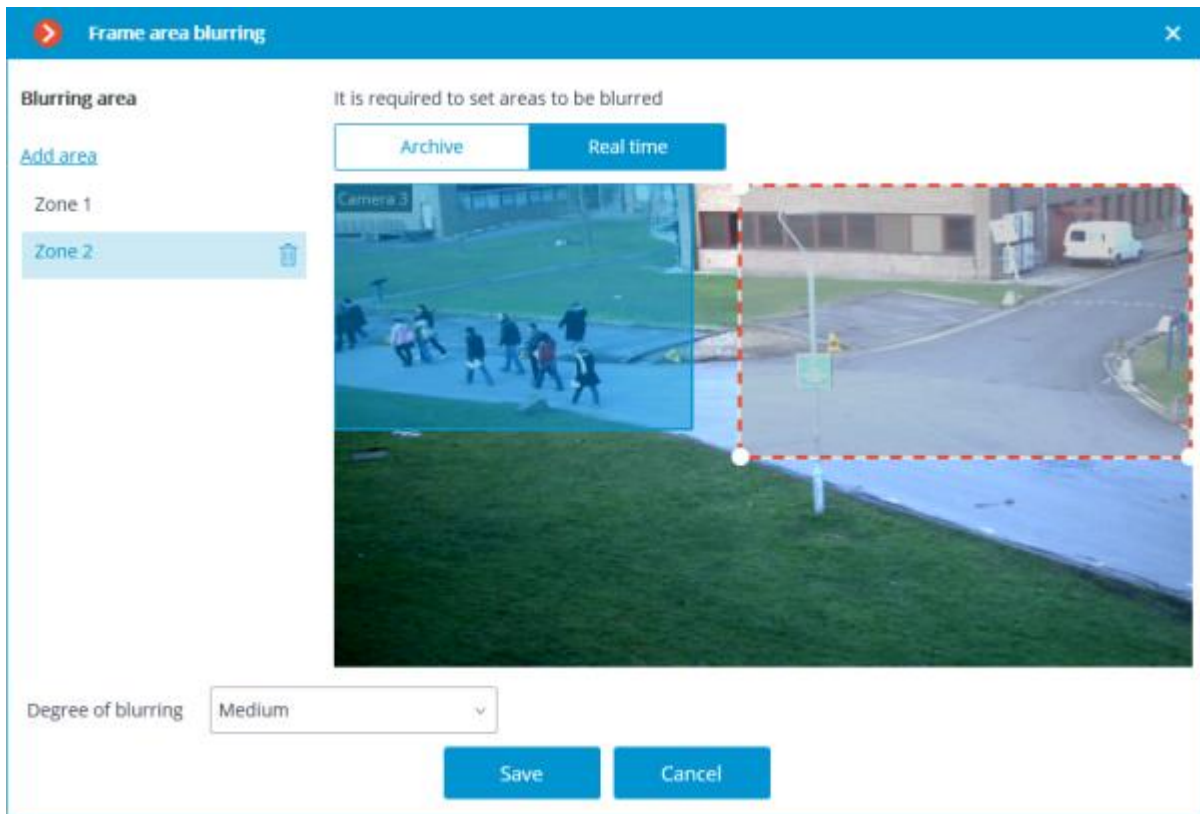
Module setup

To use the module, enable and set it up.

To do that, [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list on the left side of the page, go to the [Analytics](#) tab, enable the module using the  switch and adjust it pressing the  button.



Clicking the  button opens the module setup window.



In the window that opens, it is required to specify one or more rectangular blurring zones, as well as the degree of blurring.

In total, it is possible to add up to 10 blurring zones. All the zones will have the same degree of blurring.

Frame Area Blurring works when viewing live and archived video in the **Eocortex Client** application.

Frame Area Blurring does not directly affect the video received from the camera and recorded to the archive. Thus, blurring does not work when exporting archive video and saving frames.

The module will start working only when [the settings are applied](#).

Traffic Density Heat Map

The **Traffic Density Heat Map** is designed for the visualization of the traffic intensity in the different areas of the frame. The heat map is generated by the way of summing up the time during which the movement is observed in the selected point. As a result, the areas where the objects are staying during the longest period of time are highlighted.

Capabilities of the module

For the visualization, the color scale is used: the color areas hued depending on the intensity of traffic are superimposed on the video image as a semitransparent layer. For example, when using the four-color scale, the area with high traffic density is colored red, with low traffic density – blue; the green and yellow areas are transitional.

The module can be used for determining the popularity of various locations in the shopping mall, to visualize the preferred routes of visitors or vehicles on the premises, for analyzing statistics of visits to various facilities etc.

There are three ways of using the heat maps:

- real time mode;
- report;
- superimposition of the heat map on the camera field of view on the facility plan.



In the real time mode, the areas of the frame where movement has been registered in the course of the last 10 minutes are displayed. In the report, the time interval is set during which the information regarding movement intensity in the frame will be analyzed. The heat map superimposition mode allows to generate the heat map not only in the frame, but also on the facility plan.

Details

For the correct operation of the module, it is required to properly place and set up the camera, enable and adjust the software motion detector and the module itself.

Compatibility with other modules

OS	Requires Eocortex motion detector		Neural network	Compatible with modules		Incompatible with modules
			Standard	Special		
√	√	√	–	–	Abandoned object detection module Auto Zoom Counting People in Queue Crowd Monitoring Face Detection Face Mask Detector Face Recognition (Complete) Face Recognition (Light) Fire and Smoke Detector Frame Area Blurring License Plate Recognition (Complete) License Plate Recognition (Light) Loud Sound Detection	–

OS	Requires Eocortex motion detector	Neural network	Compatible with modules	Incompatible with modules
		Standard	Special	
				Object Classification and Counting People Counting Personnel Activity Monitoring Sabotage Detector Search for Objects Shelf Fullness Check Tracking Uniform Detector Tracking ⚠ FishEye Dewarping

- ✓ supported and required for the module to work
- + supported and provides additional features of the module
- not supported or not required for the module to work
- ⚠ not recommended for use with the current module



Use

The use of video analytics modules in **Eocortex Client** is described in the **User's guide**, in the **Eocortex Client / Video analytics** section.

Module setup

To use the module, enable and set up the software motion detector, then activate the module itself.

To do that, [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list, and set up the motion detector on the [Motion detector](#) tab on the right part of the page.

Then go to the [Analytics](#) tab and enable the module using the  switch, then adjust it pressing the  button.

Connection Rights Archive Motion detector Analytics Camera analytics

Intelligent module

<input type="checkbox"/> Sabotage detector	<input type="checkbox"/> Loud sound detection	<input type="checkbox"/> Auto zoom	<input type="checkbox"/> FishEye dewarping	<input type="checkbox"/> Tracking
<input type="checkbox"/> Search for objects	<input type="checkbox"/> Face Recognition (Complete)	<input type="checkbox"/> Unique Visitor Counting	<input type="checkbox"/> Face Recognition (Light)	<input type="checkbox"/> People counting
<input type="checkbox"/> Counting people in queue	<input type="checkbox"/> Crowd monitoring	<input type="checkbox"/> Face detection	<input checked="" type="checkbox"/> Traffic density heat map	<input type="checkbox"/> Personnel activity monitoring
<input type="checkbox"/> Control of overallz	<input type="checkbox"/> Face Mask Detector	<input type="checkbox"/> Shelf Fullness Check	<input type="checkbox"/> Fire and smoke detector	<input type="checkbox"/> Abandoned objects detection
<input type="checkbox"/> License Plate Recognition (Complete) trial	<input type="checkbox"/> License Plate Recognition (Light)	<input type="checkbox"/> Frame area blurring		

Perspective

Traffic density heat map

Visualization parameters

Wake decay time when viwing in real time

10 minutes

Autosaving of data on plan

Unload data every: Hour

[Open plans](#)

Path to files: D:\Temp

[Select folder](#)

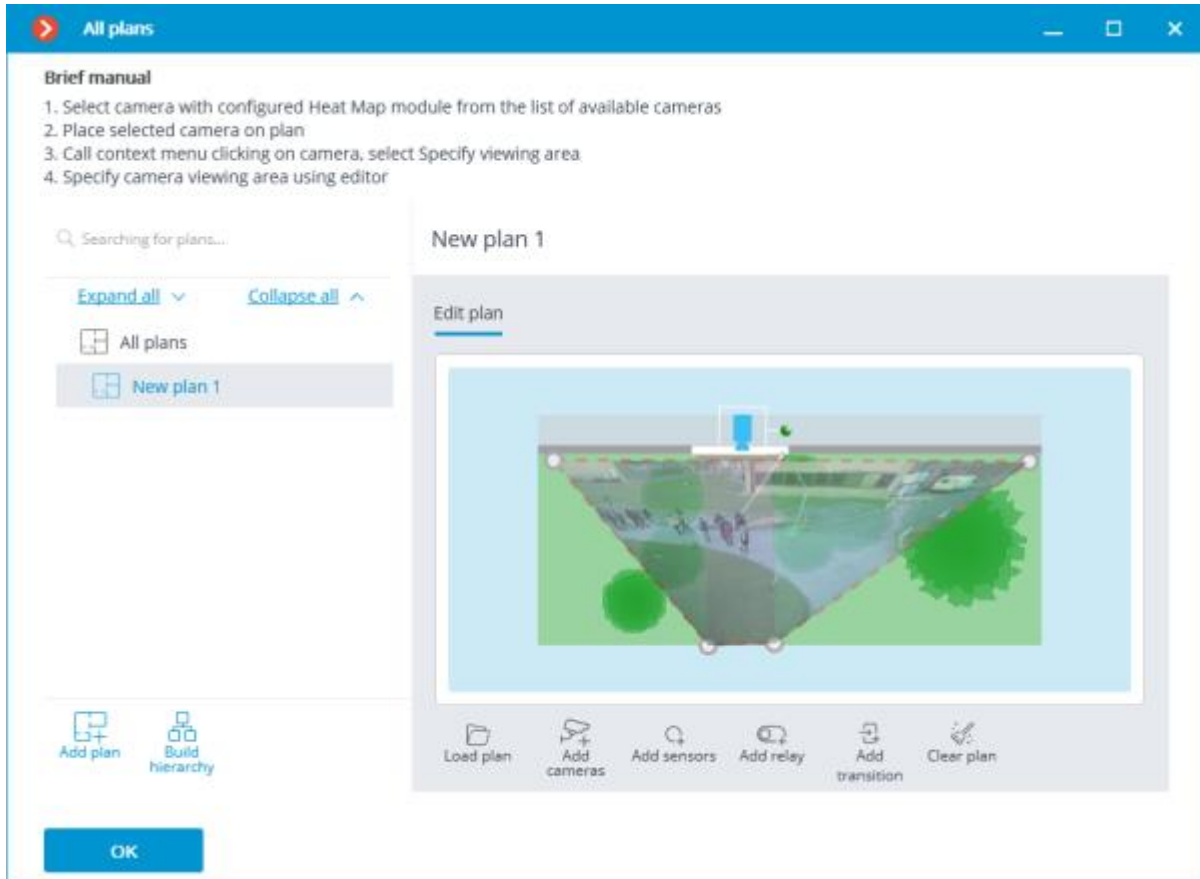
Save Cancel

The following settings are to be made in the opened window:

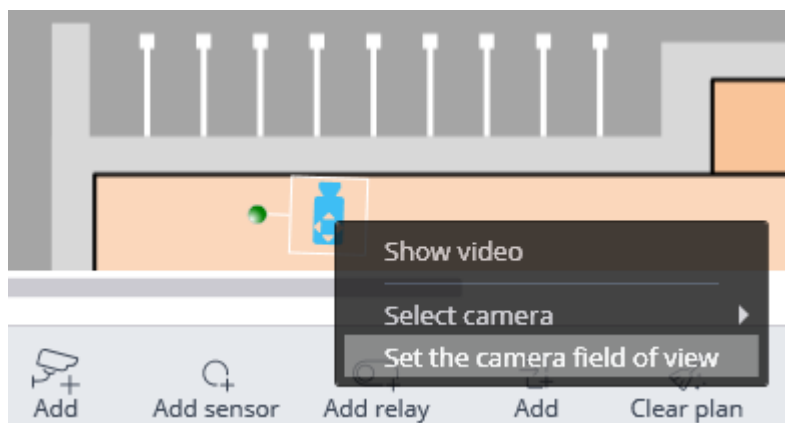
Wake decay time when viewing in real time: sets the time during which the wake of the moving object in the frame disappears completely.

Autosaving of data on plan: when this option is enabled, the server, with the indicated regularity, will save the plan images with the superimposed heat maps for the specified period. This option will work only if the camera being set up and its field of view are placed on the plan.

Clicking on the **Open plans** link will open the plan setup window.



For setting up the field of view, it is required to load the plan, place the camera on it, select the **Set the camera field of view** item in the context menu, then stretch the field of view by the corners to make the image correspond with the plan, then save the field of view settings by pressing **OK**.



For interactive selection of a folder on the drive, click on the **Select folder** link.

It is only advisable to select the folder interactively if the **Eocortex Configurator** application is launched directly on the server, because in case of performing remote setup, the file explorer of a local computer used for making adjustments will be opened when selecting a folder. Consequently, when

performing adjustments from the remote computer, the path shall be entered as text, thereupon the folder must already exist on the server.

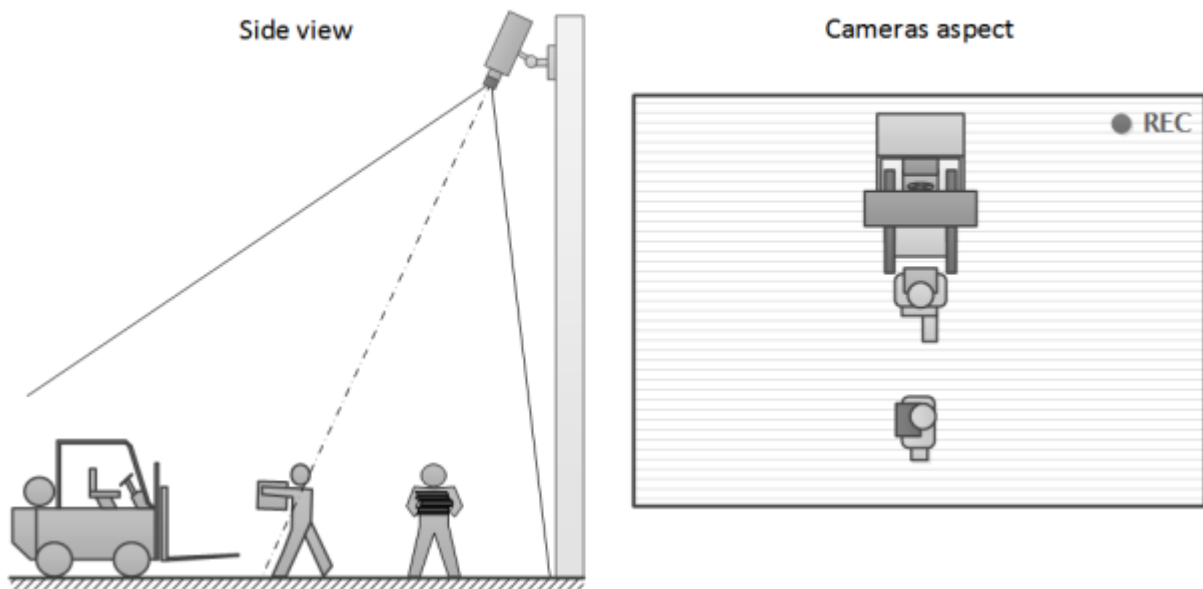
The module will start working only when [the settings are applied](#).

Requirements and recommendations

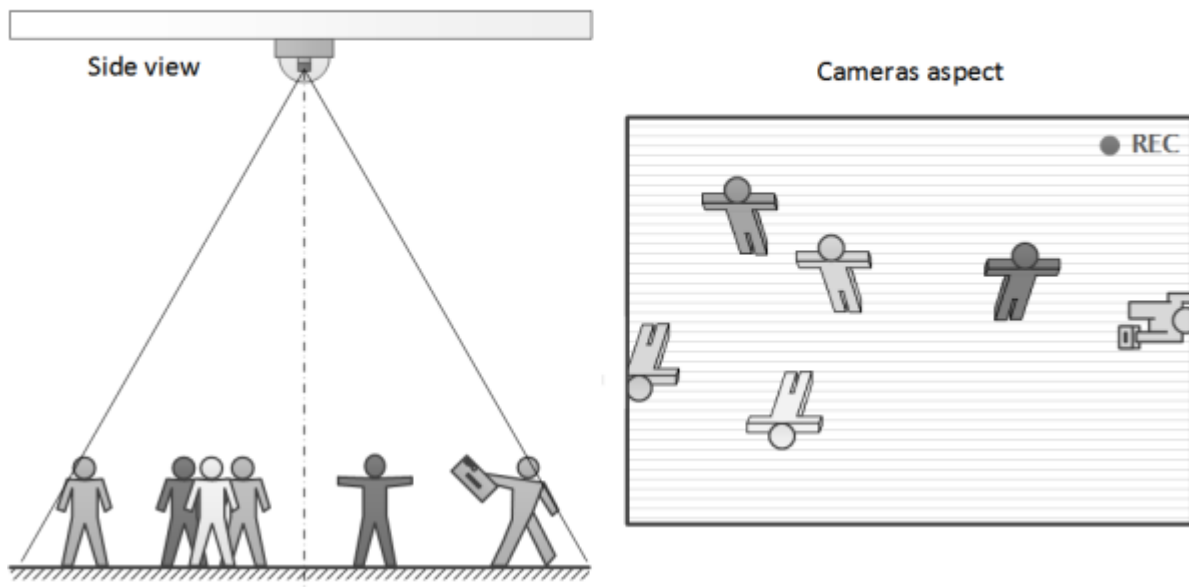
For the proper operation of the module, it is required to install the camera as high as possible to minimize the influence of the perspective and avoid the superimposing of the objects of the foreground on the remote areas. The ideal position of the camera is from above, at right angle to the horizontal plane.

There are no specific requirements regarding framerate, resolution and video stream format.

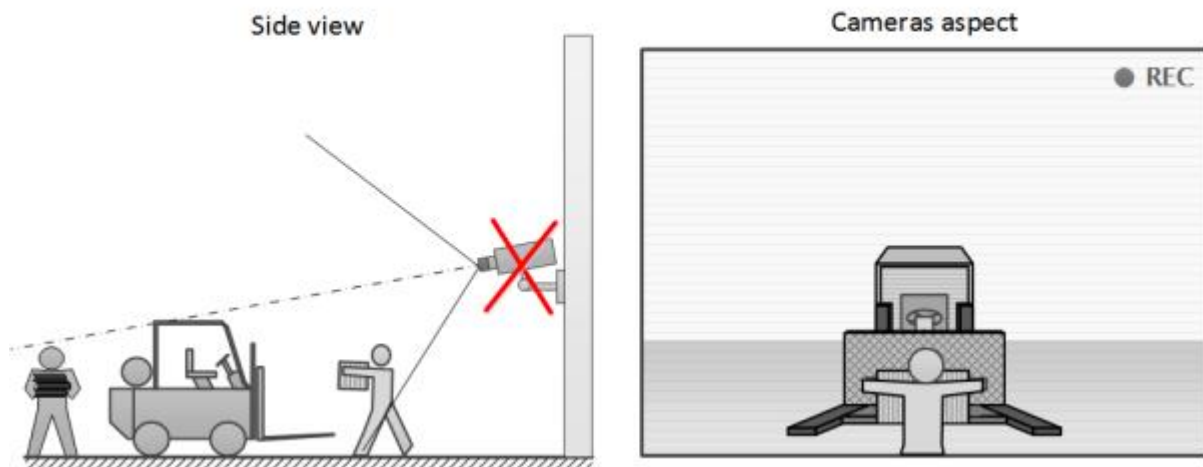
Correct installation



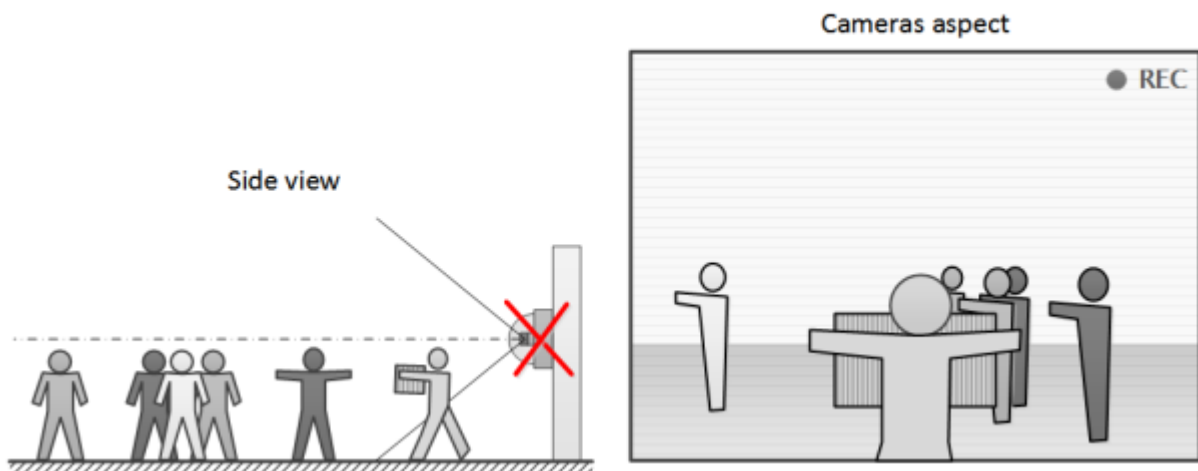
Correct installation



Wrong installation



Wrong installation



License Plate Recognition (Complete)

The **License Plate Recognition (Complete)** module is intended for recognizing the license plates of the moving vehicles and saving the information regarding the time and date of recognition, the license plate number and the reference to the corresponding video frame.

Capabilities of the module

- Real-time recognition of the license plate numbers of moving vehicles.
- Recognition of the license plate numbers of the vehicles of 120 countries:

Abhasia, Accord Dangereuses Route, Albania, Algeria, Andorra, Angola, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahrain, Belarus, Belgium, Bolivarian Republic of Venezuela, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Cameroon, Canada, Chile, China, Colombia, Costa Rica, Croatia, Cuba, Cyprus, Czech Republic, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Estonia, Ethiopia, Finland, France, Georgia, Germany, Gibraltar, Greece, Grenada, Guatemala, Holy See (Vatican City State), Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Islamic Republic of Iran, Israel, Italy, Japan, Jordan, Kazakhstan, Kenya, Kosovo, Kuwait, Kyrgyzstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Madagascar, Malaysia, Malta, Mexico, Monaco, Mongolia, Montenegro, Netherlands, New Zealand, Nicaragua, Nigeria, Norway, Oman, Ossetia, Panama, Paraguay, Peru, Philippines, Plurinational State of Bolivia, Poland, Portugal, Pridnestrovian Moldavian Republic, Puerto Rico, Qatar, Republic of Korea, Republic of Moldova,

Republic of North Macedonia, Romania, Russian Federation, Saudi Arabia, Serbia, Seychelles, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Tajikistan, Tunisia, Turkey, Turkmenistan, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, USSR, Uzbekistan, Vietnam, Zambia.

- Recognition of the license plate numbers of vehicles travelling with the following velocities:
- up to 250 km/h for the **Highway** license
- up to 20 km/h for the **Parking** license.
- Recognition of up to 10 license plates in the frame.
- Saving the recognized license plate number in the archive, including the date and time of recognition and the link to the corresponding video frame.
- Real-time comparison of the recognized license plate numbers with the license plate number database and generation of the alarm if the recognized number is in the list of the vehicles to be intercepted.
- Working with the integrated database of automobile license plate numbers: adding and editing of numbers, providing additional information regarding the vehicles, such as color, owner, etc.
- Possibility to import the license plate numbers into the database from a CSV file.
- Creating the groups of license plate numbers for interception, automatic opening of a rising arm barrier etc.; adding a number to one or more groups.
- Searching for the recognized numbers in the archive by time, by date and by additional information from the database.
- Downloading of the recognized license plate numbers to Microsoft Excel or CSV format.
- Automatic sending of the lists of recognized license plate numbers by email.
- Rising arm barrier control.
- Counting the number of vehicles in parking lots.
- Counting the time spent by vehicle in the parking lot.

Details

Since this module is external and is not included into the basic Eocortex installation package, before setting it up and using it install it on the computer to which the cameras that will use this module are connected.



The module is intended for recognizing the license plates of moving vehicles only. The parked vehicles' numbers will not be recognized.

It is possible to use the capabilities of the **Eocortex API** for the automation of the downloading of the recognized license plate lists.

Interaction with the rising arm barriers is performed via signal outputs of the IP cameras.

Compatibility with other modules

OS	Requires Eocortex motion detector		Neural network	Compatible with modules		Incompatible with modules
			Standard	Special		
√	√	√	–	–	Abandoned object detection module Auto Zoom Counting People in Queue Crowd Monitoring Emergency Vehicle Detection Face Detection Face Mask Detector Face Recognition (Complete) ¹ Face Recognition (Light) ¹ Fire and Smoke Detector Frame Area Blurring Loud Sound Detection Object Classification and Counting ¹ People Counting ¹ Personnel Activity Monitoring Sabotage Detector Search for Objects Shelf Fullness Check	FishEye Dewarping License Plate Recognition (Light) Unique Visitor Counting

OS	Requires Eocortex motion detector	Neural network	Compatible with modules	Incompatible with modules
		Standard	Special	
				Tracking Traffic Density Heat Map Uniform Detector

¹ If used in combination, module selection is available to display the results of the analysis in the Eocortex Client application

- ✓ supported and required for the module to work
- + supported and provides additional features of the module
- not supported or not required for the module to work

Only one of the License Plate Recognition modules can be installed on the same server: either **License Plate Recognition (Complete)** or **License Plate Recognition (Light)**.

Use



The use of video analytics modules in **Eocortex Client** is described in the **User's guide**, in the **Eocortex Client / Video analytics** section.

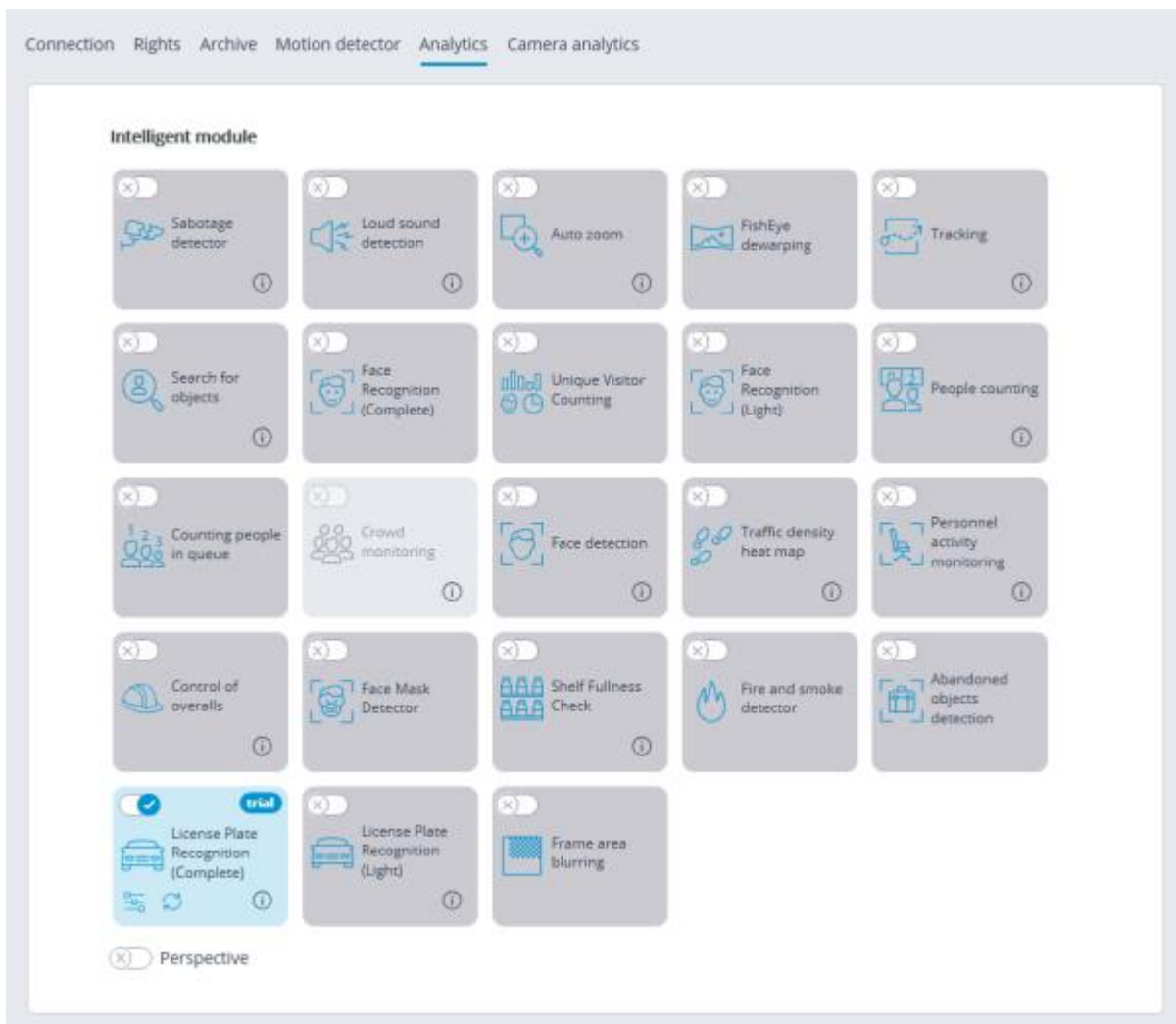
Module setup


This module is distributed as a separate installation package. The package should be installed on the server to which the cameras using this module are connected. After installation, an additional license key need to be activated on the server to license the module.

To use the module, enable and set up the software motion detector, then activate the module itself.

To do that, [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list, and set up the motion detector on the [Motion detector](#) tab on the right part of the page.

Then go to the [Analytics](#) tab and enable the module using the  switch, then adjust it pressing the  button.



Clicking the  button opens the module setup window.

It is only possible to use one of the two versions of the module on the same camera: **License Plate Recognition (Complete)** or **License Plate Recognition (Light)**.

In the software motion detector settings, the minimum width and height of the object must be smaller than the dimensions of a vehicle.

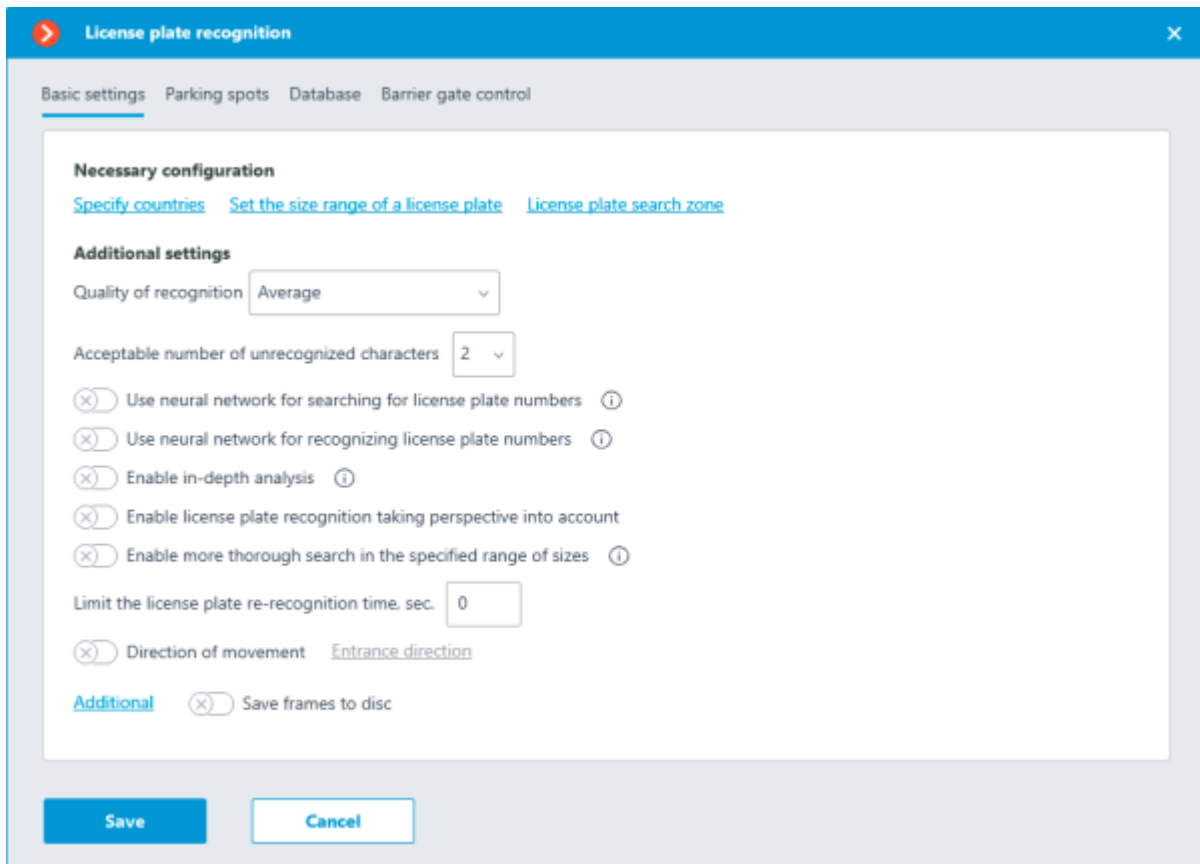
Additionally, it is recommended to set the whole frame as the detection area for the software motion detector to ensure reliable recognition.

In the right bottom corner of the module settings window, the version of the SDK libraries used by the License plate recognition module is indicated.

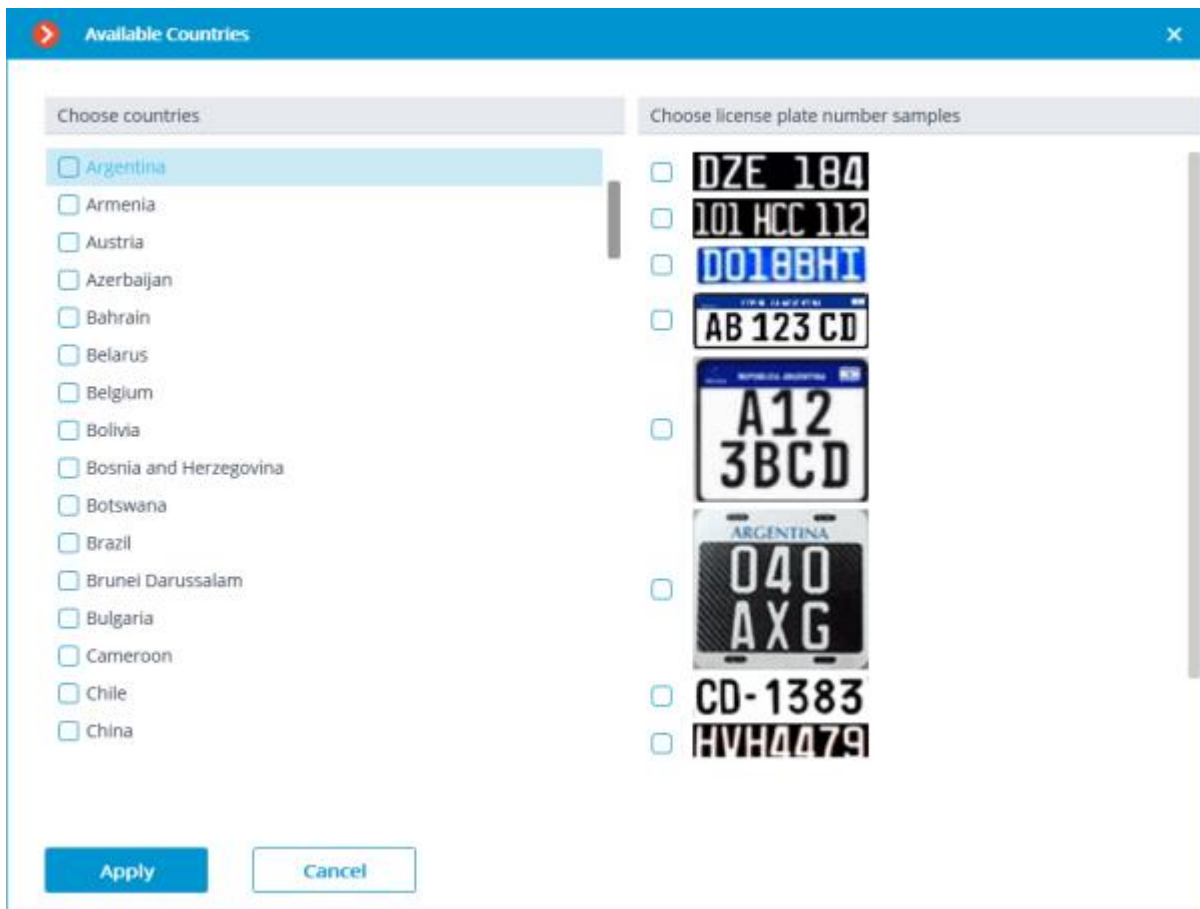
The module settings description is given below.

Basic settings

The settings of the license plate recognition can be set on the **Basic settings** tab.



Specify countries: opens a window where license plates and countries that should be recognized can be selected.

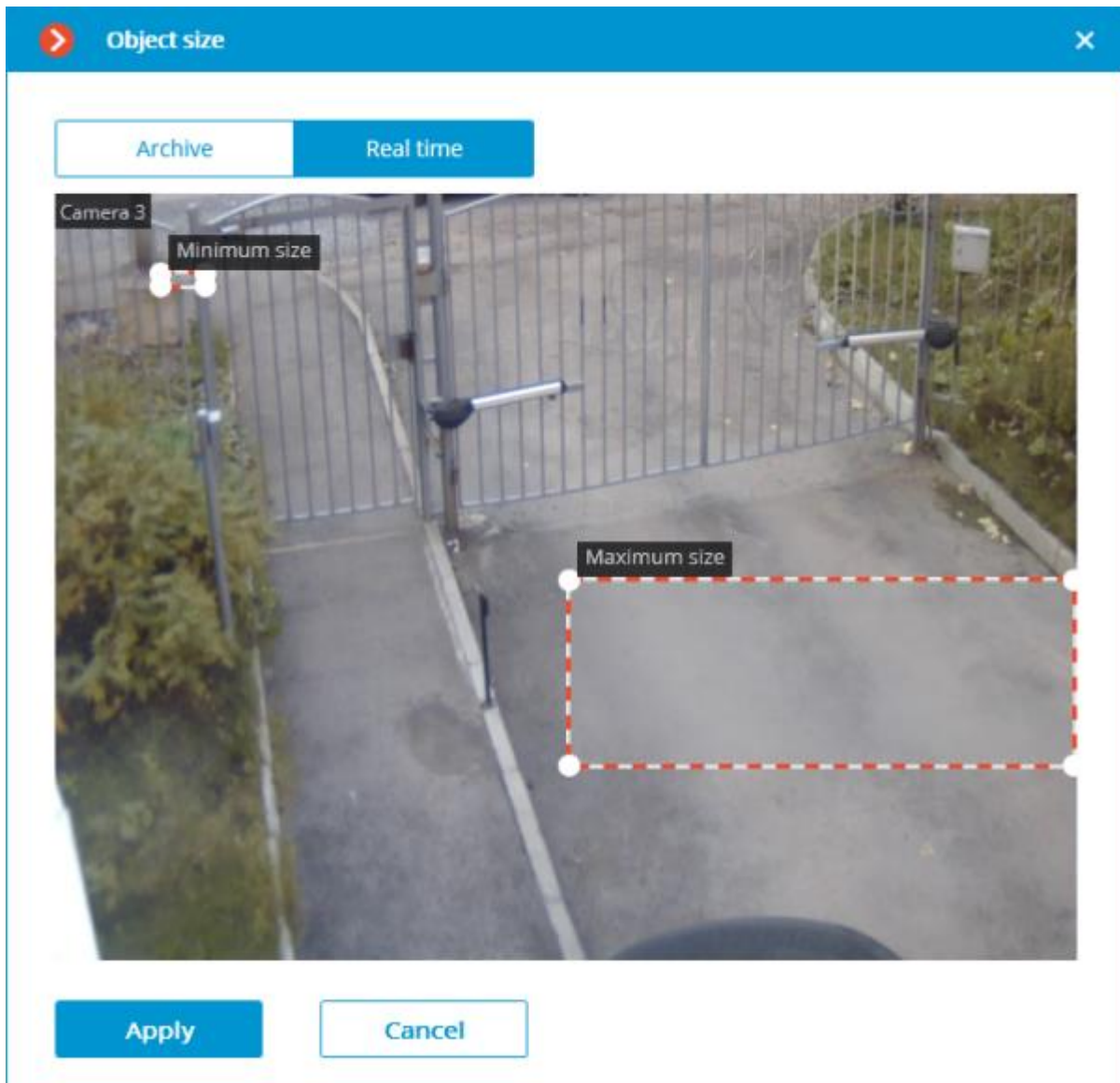


In the window that opens, mark the countries whose license plates should be recognized and select license plate templates for each selected country. Unmarked countries and templates will not be recognized.

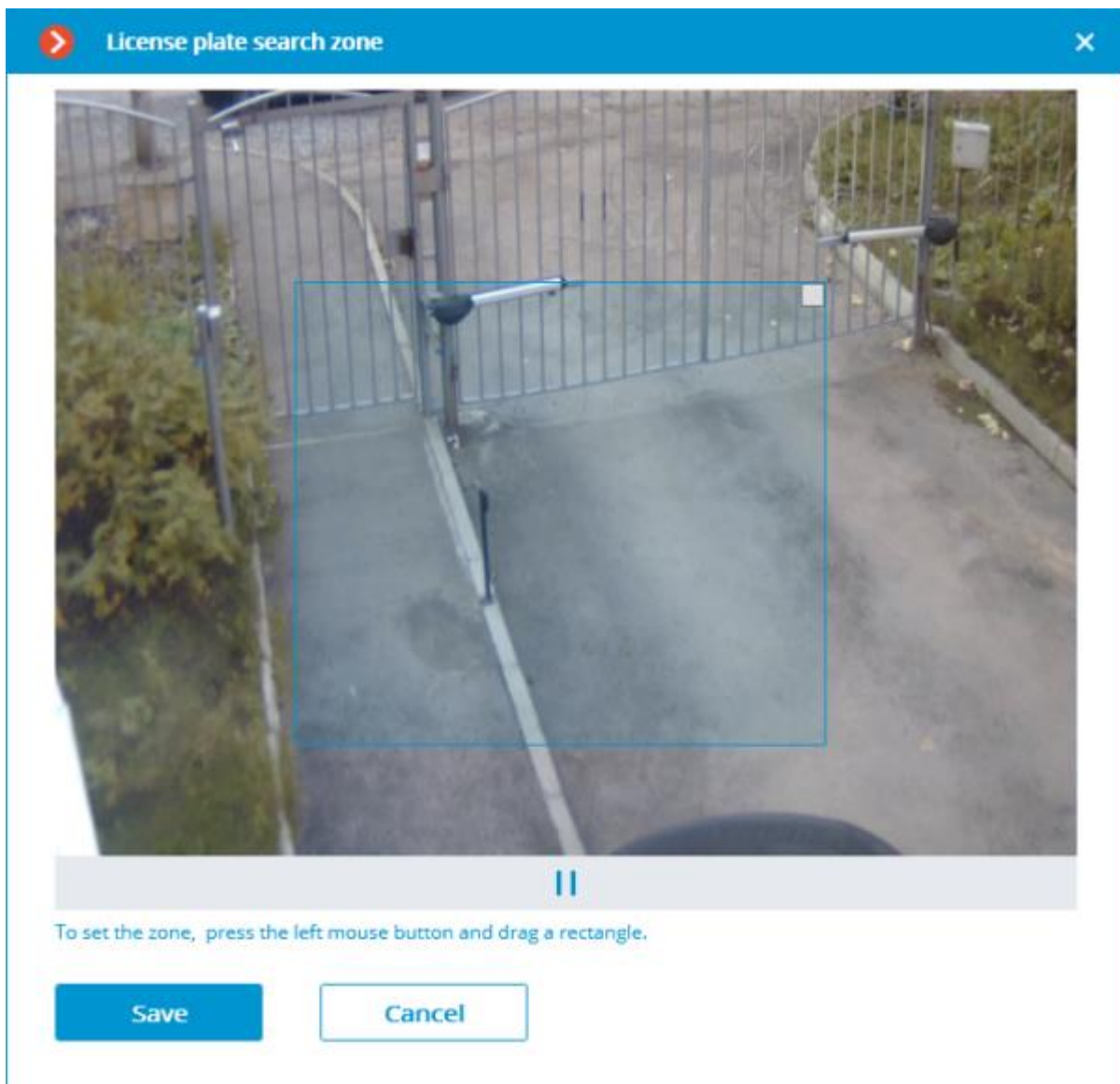
The empty list of countries means that the License Plate Recognition (Complete) module is not installed, or that errors occurred during its installation, or that there is no protection key, or its activation encountered problems.

The more countries and samples have been selected for recognition, the higher the computing load on the server. When the processor load exceeds 80%, the recognition quality may drop significantly.

Set the size range of a license plate opens the window of setting the minimum and maximum width of the license plates to be recognized.



License plate search zone opens the window of setting up the zones of the frame where the license plate numbers to be recognized will appear.



For creating a new zone, it is required to press the left mouse button and, holding it, select a rectangular area. The total area uniting all the set zones will be used for recognition. To delete the zone, click on the close icon in the upper right corner of the zone.

Quality of recognition is the internal parameter of the module's operation. It sets the filtering by the quality of recognition, meaning that the license plates the reliability of whose recognition is lower than a preset value will be automatically discarded. The value of this parameter shall be selected tentatively: when it is higher, the reliability of the recognized numbers will be higher, but the total quantity of the recognized numbers will be smaller; when it is lower, the quantity of the recognized numbers will be larger, but the number of recognition mistakes will increase.

The Acceptable number of unrecognized characters setting filters the license plate numbers by the quantity of the unrecognized symbols: the plates where the number of unrecognized symbols is bigger than the preset value will be automatically discarded.

Use neural network for searching for license plate numbers: Enabling this option allows to increase accuracy of searching for number plates. However, the server load from the given camera will increase 50% approx.

Use neural network for recognizing license plate numbers: Enabling this option will increase accuracy of license plate symbols' recognition. However, the load on the server from the given camera will increase 50% approx.

Enable in-depth analysis: Enabling this option allows to improve license plate recognition accuracy under unfavorable conditions, e.g. when the camera's parameters are not in complete

conformance with the relevant requirements, or when the weather conditions are poor. Using this option leads to the increase of the frame processing time of 20 to 30%. Under normal conditions, this parameter has no effect on the recognition quality.

Enable license plate recognition taking perspective into account: allows to make allowance for a perspective distortion.

Enable more thorough search in the specified range of sizes: Enabling this option allows to improve recognition accuracy in a case when the difference between the minimum and the maximum dimensions of the license plate number is very big (more that three times). In this case, the load on the server from the given camera will increase 30% approx.

Limit the license plate re-recognition time, sec.: allows to set the period of time from the initial recognition of the plate number, during which no attempts will be made to recognize the same number.

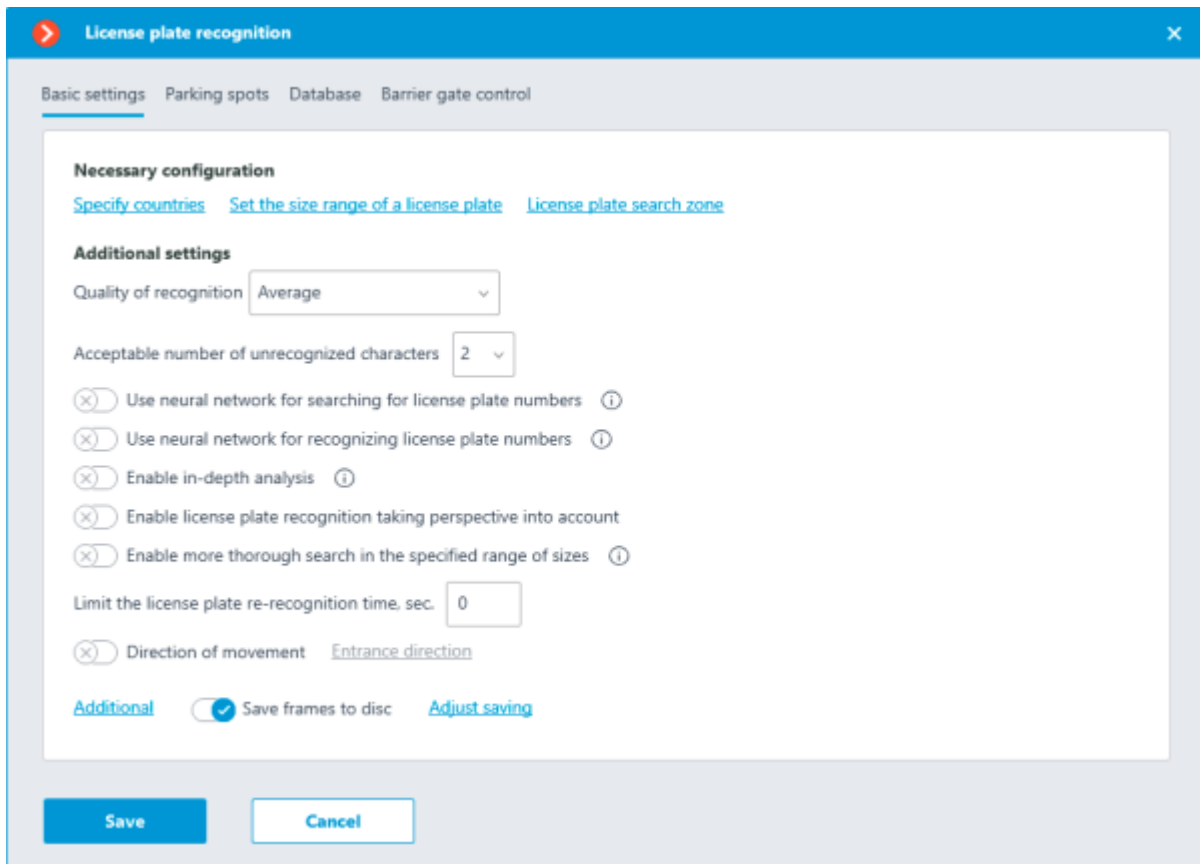
This setting may be useful, for example, for the situations involving the automatic opening of a rising arm barrier, when the vehicle stops before the barrier and the module may attempt to recognize its license plate one more time after the vehicle starts to move again. Such repeated recognition may also happen when the license plate was temporarily blocked by some object.

Direction of movement: enabling this option allows to configure the definition of the movement direction of the plate on the camera frame. After enabling this option, it is needed to set the entry direction by clicking the **Entrance direction** link and selecting the arrow in the window that opens. At the same time, vehicles moving in the opposite direction will be considered as driving out.

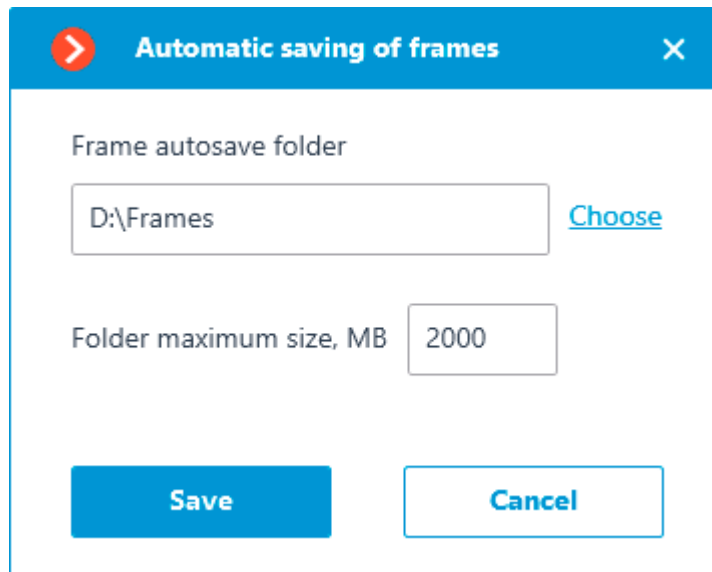


Additional: Allows importing and exporting settings of the license plate recognition module.

Save frames to disc: Allows saving frames with detected license plates to a folder on the server.



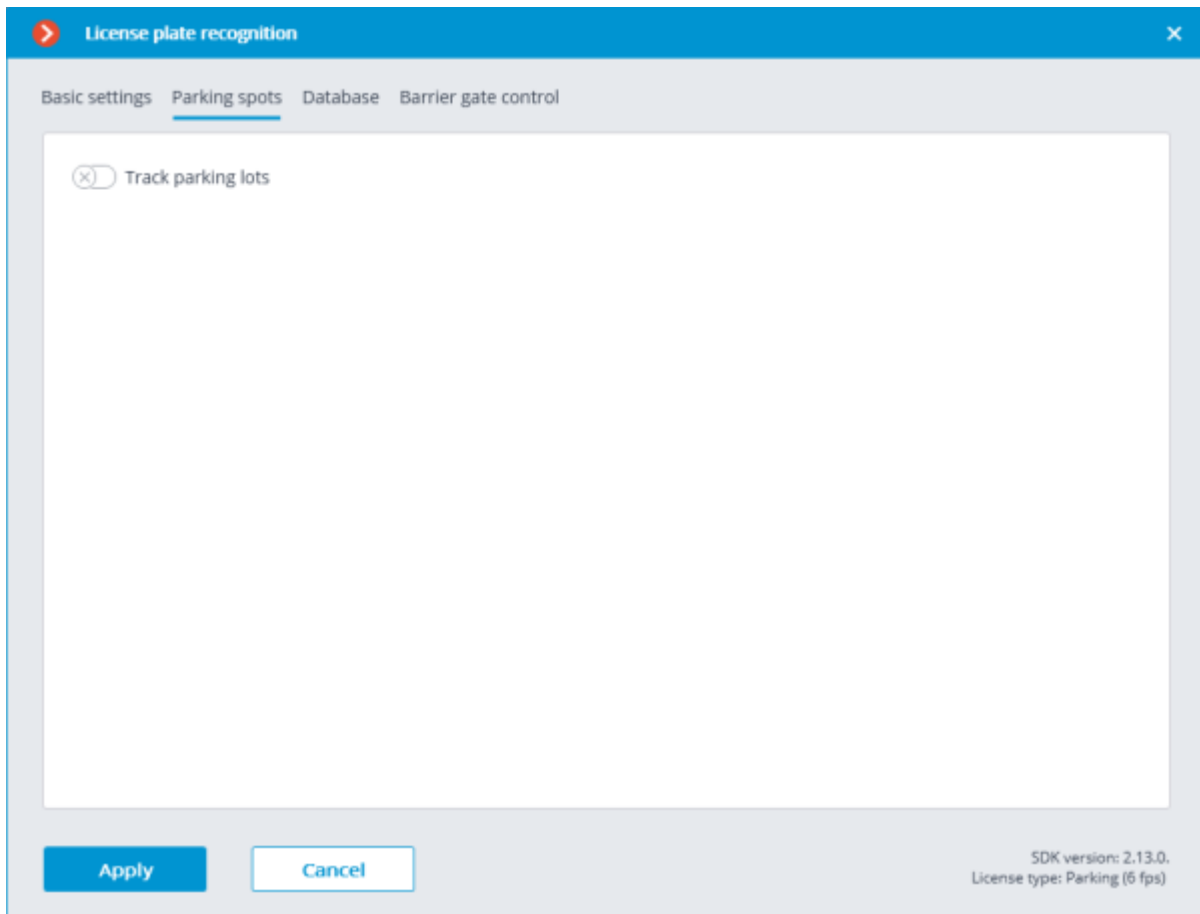
The option must be configured after enabling by clicking the **Adjust saving** link.



In the window that opens, specify the path to the directory where the frames should be stored, as well as its maximum size.

Parking spots

On the **Parking spots** tab, settings for parking lots can be made.



To access the settings for parking lots, turn on the **Track parking lots** slider.

Parking lot settings are set for the entire system.

The following actions can be performed in the settings window:

create a new parking lot;

edit or delete an existing parking lot.

The following settings can be set for a parking lot:

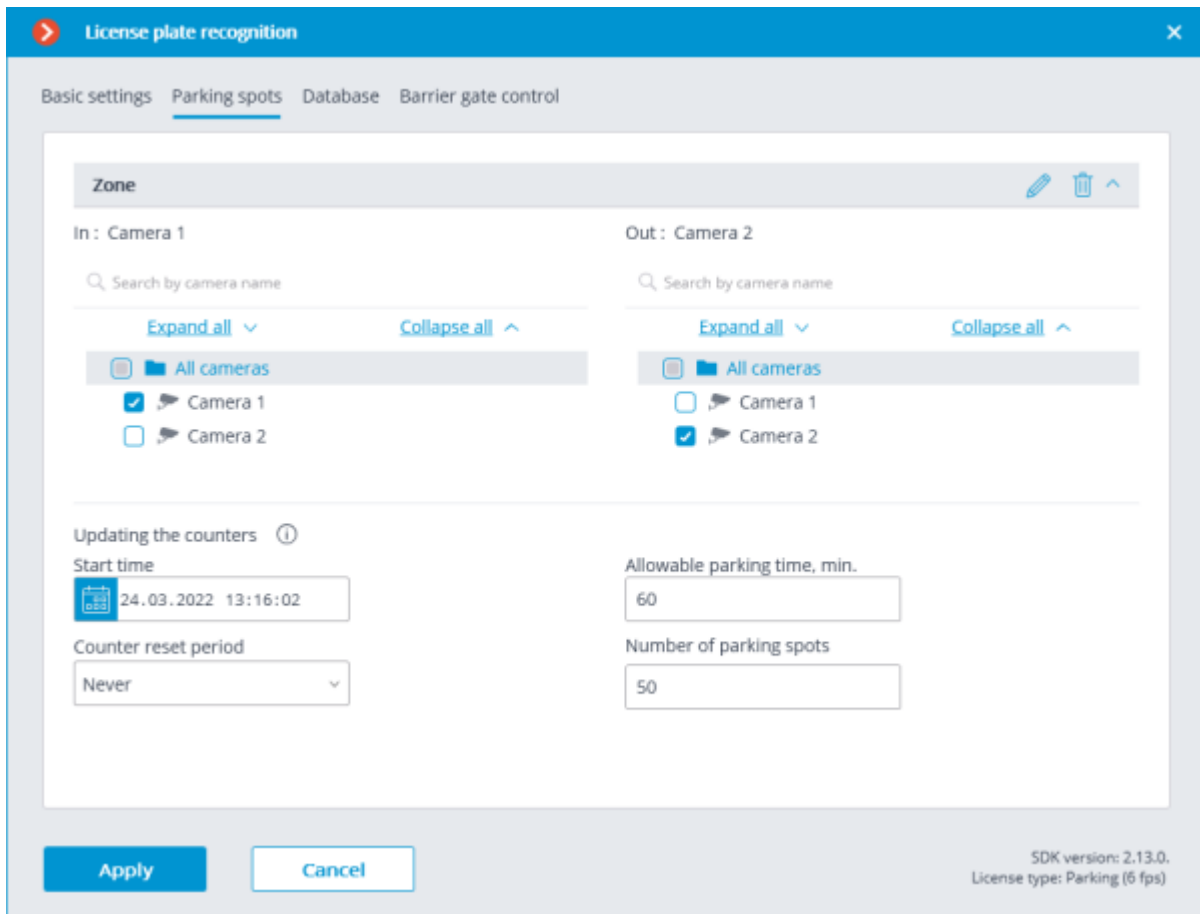
name;

one or more cameras working as entry and exit points;

permissible parking time;

number of parking spots;

period and time of resetting the counter.



The following events were added to the [Tasks by event](#) tab of the Automation section:

[Parking vehicle counter has been changed](#)

[Parking event](#)

[Parking lot occupancy has changed](#)

A new [user right](#), **Adjusting the number of occupied parking spots**, has been added to the Users section. This right allows the user to change the value of the occupied parking spots counter in the **Ecortex Client** application. By default, this right is enabled.

Database

The access to the license plate database can be set on the **Database** tab.

The screenshot shows a software window titled "License plate recognition" with a blue header. Below the header are four tabs: "Basic settings", "Parking spots", "Database" (which is selected and underlined), and "Barrier gate control". The "Database" tab contains the following configuration options:

- Radio buttons for "Local" and "Remote". "Remote" is selected.
- Text boxes for "Address" (containing "127.0.0.1") and "Port" (containing "3050").
- Text boxes for "User name" (containing "SYSDBA") and "Password" (containing masked characters "*****").
- Radio buttons for "Type": "Windows" (selected) and "Linux".
- A blue link labeled "Connection check".
- A text box for "Database identifier" (containing "123").

At the bottom of the window, there are two buttons: "Apply" (blue) and "Cancel" (white with blue border). In the bottom right corner, the text "SDK version: 2.13.0. License type: Parking (6 fps)" is displayed.

Two database deployment options are available: **Local** or **Remote**.

If the recognition process runs on only one server, it is recommended deploying the database on this server by selecting **Local**.

If the recognition process is running on several servers, the database should still be hosted only on one of them. For this purpose, select the **Remote** option for all cameras and specify the database connection parameters: server address, name and password of the database administrator. The same applies when the database of the module is deployed on one server, and the camera with the module enabled is attached to another one.

Eocortex version 3.6 and lower uses **Firebird** DBMS with the following default values:

- **Port:** 3050
- **Username:** SYSDBA
- **Password:** masterkey

Starting from version **Eocortex** 4.0, the module's database is handed over to the [PostgreSQL DBMS](#) with the following default values:

- **Port:** 5432
- **Username:**
 - For Windows: postgres
 - For Linux: eocortex
- **Password:** masterkey

Remote access to databases is not allowed by default in PostgreSQL and must be additionally configured if remote databases are used for analytics. All settings must be

done for the server where the database is stored. Settings are slightly different for [Windows](#) and [Linux](#) operating systems.

When the server is running for the first time after upgrading **Eocortex** to version 4.0 or higher, the existing module database will be automatically transformed to be compatible with **PostgreSQL**.

If connecting to a **Remote** database, use the DBMS **Username** and **Password** that are valid for the server storing the database.

Independent of the database location, the recognition events (date and time of recognition, coordinates of the object in the frame, binding of the recognized object to the database) will always be stored on the server to which the camera with the corresponding events is bound.

Synchronization with the database located on a remote server can take some time

When using a remote database, the [remote database replication mechanism](#) will be applied.

It is possible to check the availability of the database clicking the **Connection check** link. If the server is unavailable, the corresponding message will be displayed.

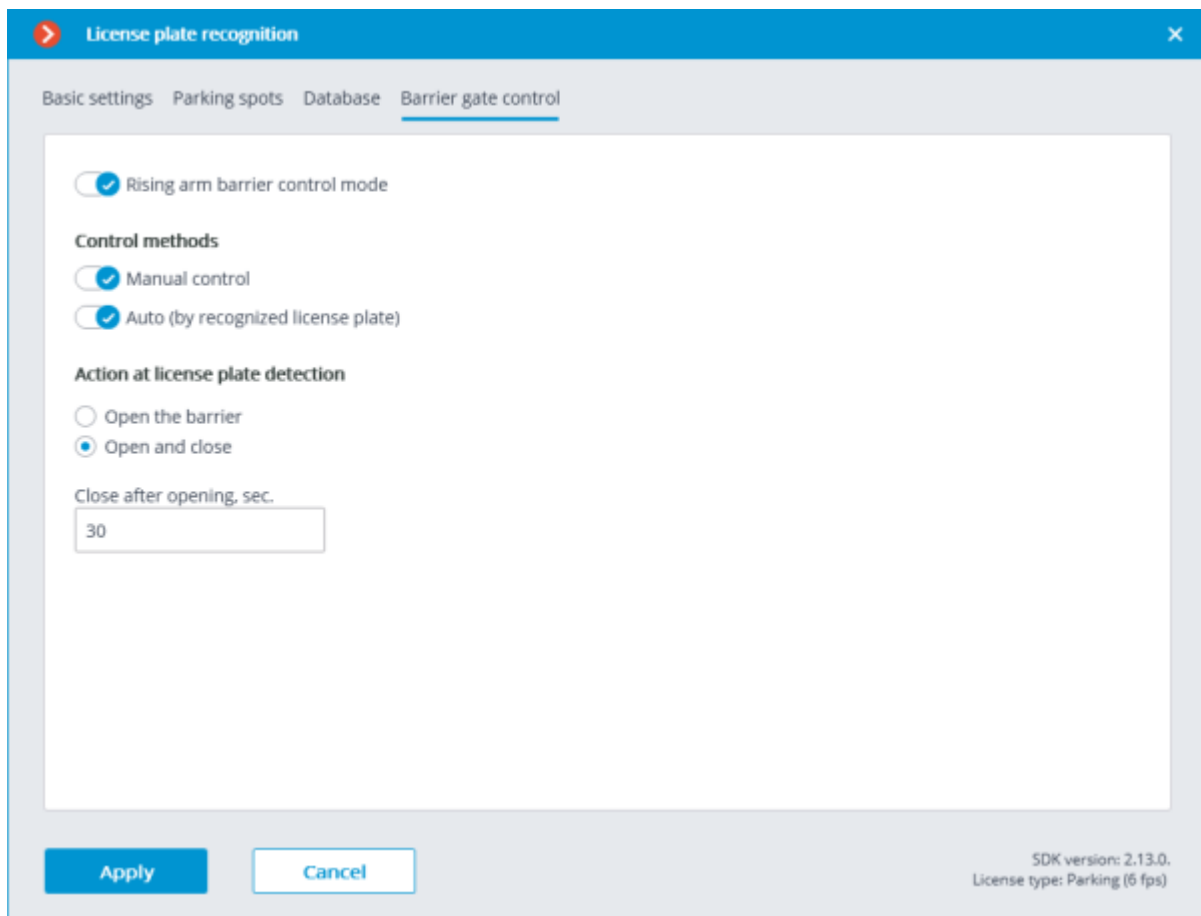
The **Database identifier** field sets its [own license plate database](#) for an individual camera or groups of cameras.

The field **Database identifier** is not initially displayed at the launch of the module.

To use this capability, it is required to set **Database identifier** via REST API.

Barrier gate control

The settings of the module's interaction with a rising arm barrier can be made on the **Barrier gate control** tab.



The **Rising arm barrier control mode** must be activated to access the settings of the module's interaction with a rising arm barrier.

To use the module only for controlling a rising arm barrier, the **License Plate Recognition (Complete)** module license or protection key is not required. However, for ensuring the abovementioned functionality, it is necessary to have the **License Plate Recognition (Complete)** module support indicated in the **Eocortex** license file or software key for the corresponding quantity of cameras.

When the rising arm barrier control mode is activated, the following capabilities are available:

Control methods:

Manual control: allows the operator to open and close the barrier using the **Eocortex Client** application.

Auto (by recognized license plate): allows to open the rising arm barrier automatically if the recognized number is in the white list, i.e. is included in the group of vehicles for which the automatic opening of the barrier is envisioned.

In case the automatic rising arm barrier control is activated, the following options are available:

Open the barrier: if the recognized number is in the white list, the **Eocortex** server generates a command to open the barrier.

Open and close: if the recognized number is in the white list, the Eocortex server generates a command to open the barrier; then, in a number of seconds set in the **Close after opening in (sec)** field, a command for closing the barrier is generated.

Most of the modern rising arm barriers automatically close after the passing of one vehicle. For such barriers, the **Open the barrier** option shall be selected.

When the **Open and close** option is selected, it is imperative that the barrier itself has a feature of preventing its closing when a car is below the rising arm. It means that after generating the closing command the barrier's automatics must check if there is a vehicle or a person on the line of closing, and proceed with the closing only in the absence of the above.

Both in manual and in automatic barrier control mode, the opening or closing command is understood as the generation of the [Request to open rising arm barrier](#) or [Request to close rising arm barrier](#) event, correspondingly. To control the rising arm barrier, it is required to set the actions for these events depending on the control wiring diagram of the particular barrier.

For the **License Plate Recognition (Complete)** module, the following types of [Automatic reports](#) can be configured: **License plate recognition, Entry/exit time recording, Vehicle counting**.

The module will start working only when [the settings are applied](#).

Related references

[Setting tasks by events](#)

[Setting automatic reports](#)

[Setting user rights](#)

Requirements and recommendations

The module works only with 64-bit version of **Eocortex**.

For the proper operation of the module, it is imperative to correctly select, place and set up the camera, adjust the software motion detector and the module itself. When choosing the camera, it is recommended to consider the image quality requirements, control zone particularities, and the conditions of the camera installation and operation.

Requirements to the license plate image

It is assumed that the license plates of the vehicles to be recognized correspond to the requirements of the Vienna Convention on Road Traffic (Part I: Convention on Road Traffic – Attachment 2), in particular:

"2. The registration number shall be so composed and displayed as to be legible in normal daylight at a distance of at least 40 m by an observer placed on the axis of the vehicle, the vehicle being stationary ..."

"3. When the registration number is displayed on a special plate, this plate shall be flat and fixed in a vertical or nearly vertical position and at right angles to the vehicle's median longitudinal plane".

The license plate number will be recognized only if its image is rich in contrast and fits entirely in the frame.

Additionally, there is a requirement regarding the minimum height of a symbol on the image of the license plate in the frame (i.e. the height at which it is still possible to provide recognition): 30 pixels. This limitation is illustrated on the picture below. You can also see the minimum permissible dimensions for the license plate of Ukraine and Russia (the overall width is given for reference because it may help when calculating the focal length).



When the camera is installed outside, the natural noise pollution of the video image may happen due to the unfavorable weather conditions (rain, snow). In order to improve recognition in such circumstances, it is advisable to increase the size of the license plates in the frame.

Recommendations on camera installation

In this section you will find the recommendations on camera installation that need to be followed in order to ensure the reliable recognition of license plates in the control zone. Each installation location has its individual characteristics. This section contains the typical camera installation diagrams. They are to be taken into consideration at the stage of designing the traffic video surveillance systems with due account for the specific parameters of the site.

The correctly performed installation must ensure the following:

The license plate image in the frame must correspond with the requirements specified in the previous section;

The maximum duration of presence of the license plate in the frame.

It is also necessary to fulfill the following requirements listed below (both for highway and checkpoint installation locations).

To minimize the occurrence of false triggering in the process of recognition, it is imperative to install the camera in such a way as to avoid the presence of the high-contrast objects in the frame, for example, billboards, trees, grille fences etc.).

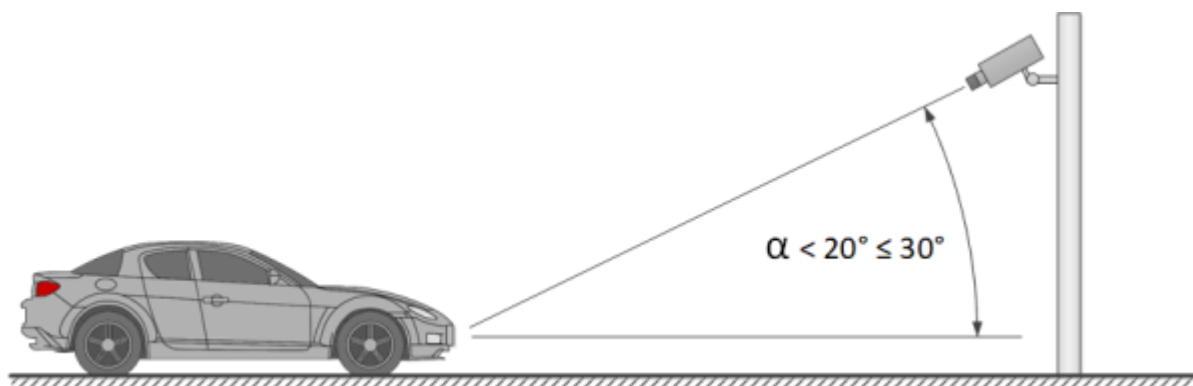
In order to avoid camera flaring, it shall not be directed at the light sources (the Sun, streetlamps) and at the highly reflective objects.

To prevent the distortion of the symbols on the license plate image, it is advisable to ensure the optimal camera installation angles. When performing the surveillance on descending or ascending vehicles, the road inclination angle must also be taken into consideration.

Vertical camera installation angle

Recommended: up to 18–20°

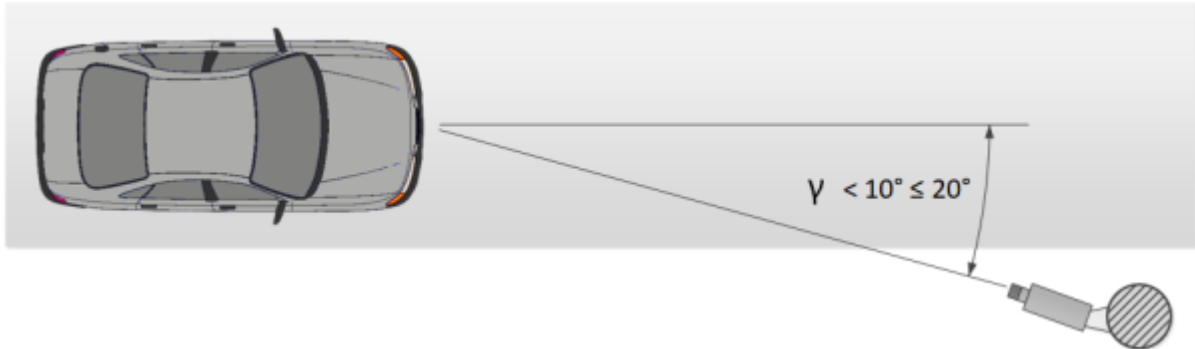
Maximum permissible: 30°



Horizontal camera installation angle

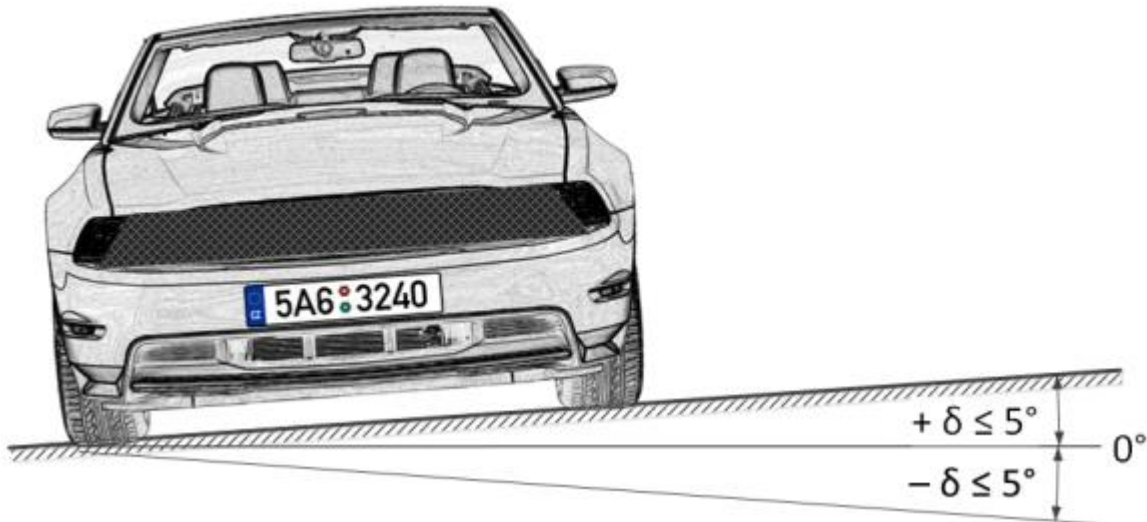
Recommended: up to 5–10°

Maximum permissible: 20°



In the course of the installation, it is required to ensure that the tilt of the license plate on the image in relation to the horizontal plane of the camera does not exceed 5° both clockwise and counterclockwise. When recognizing the single line numbers with no more than six symbols it is possible to check the appropriateness of the selected camera tilt angle using the "single line rule": the imaginary horizontal line must cross the first and the last symbols of the license plate.

Permissible license plate banking angle



Single line rule

The distance from the camera installation location to the beginning of the viewing zone is determined by the focal length of the lens. And conversely, if the distance from the camera installation location to the center of the control zone is known, it is required to ensure the appropriate focal length of the lens.

When using the separate IR illuminator, the angle of the infrared light must correspond to the camera viewing angle. The correspondence of the IR illuminator beam angle and the camera lens viewing angle is especially important at the large distances, when the camera operates at the limit of its sensitivity.

The typical camera installation diagrams for license plate recognition are given below.

Camera installation on a checkpoint

When performing video surveillance of the entrances and exits of the protected areas, the speed of the vehicles normally do not exceed 20 km/h, meaning that it is possible to use the license plate recognition module in the Parking mode. In this case, the camera is normally installed at the edge of the lane.

The camera installation height shall be above the level of the headlights of the vehicles.

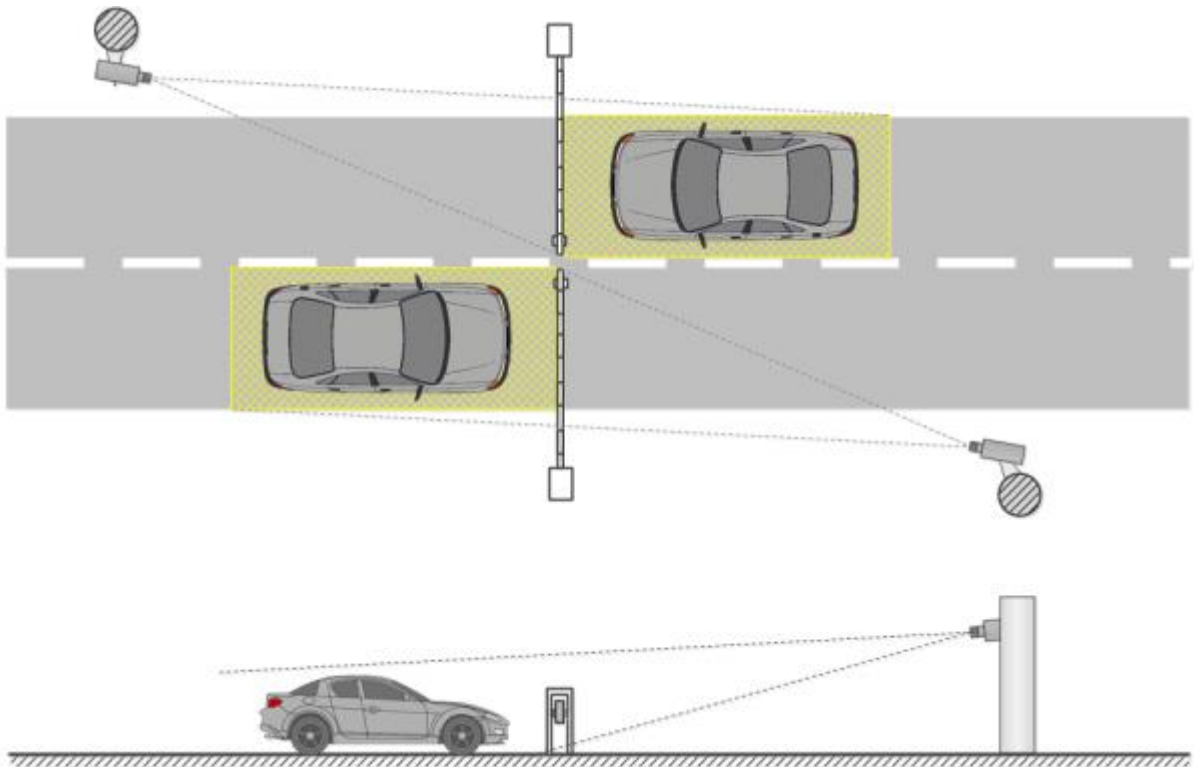
The distance between the place of installation and the focus area must be at least 3 meters.

The installation of the camera in close proximity to the prospected license plate detection area and the usage of the short focus lenses lead to the depth of field reduction and the distortion of the image at the edges. Both must be avoided to ensure reliable recognition.

For the separate control of the exits and entrances, it is recommended to install separate cameras, one on the entrance and the other on the exit. When only one camera is used, the vehicles travelling in the opposite directions may block one another. Moreover, it is advisable to separate the traffic lanes not only with road marking, but also with a barrier, where the width of the road allows it.

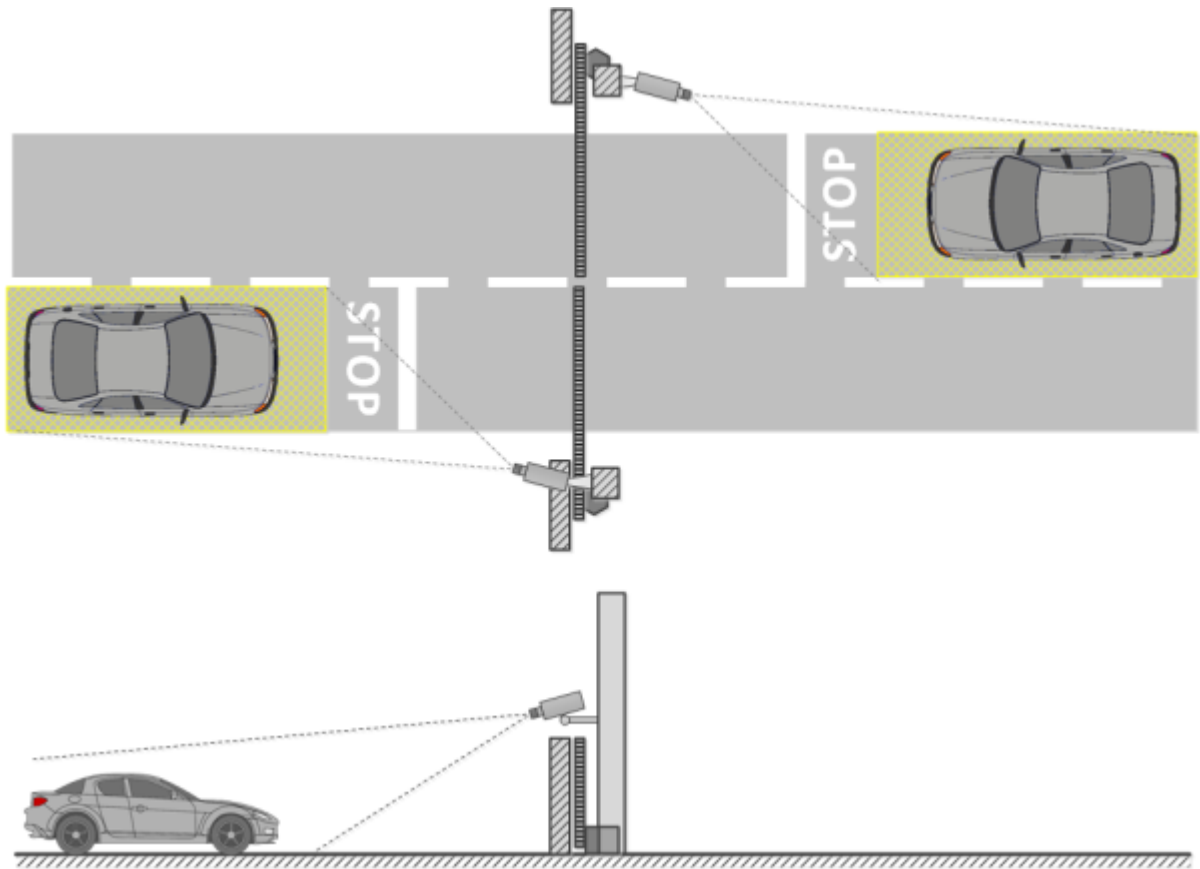
When using the rising arm barrier, the controlled area may start immediately before it. In this case the camera is to be installed at a distance from the barrier line.

Controlled areas with separate lanes and a rising arm barrier



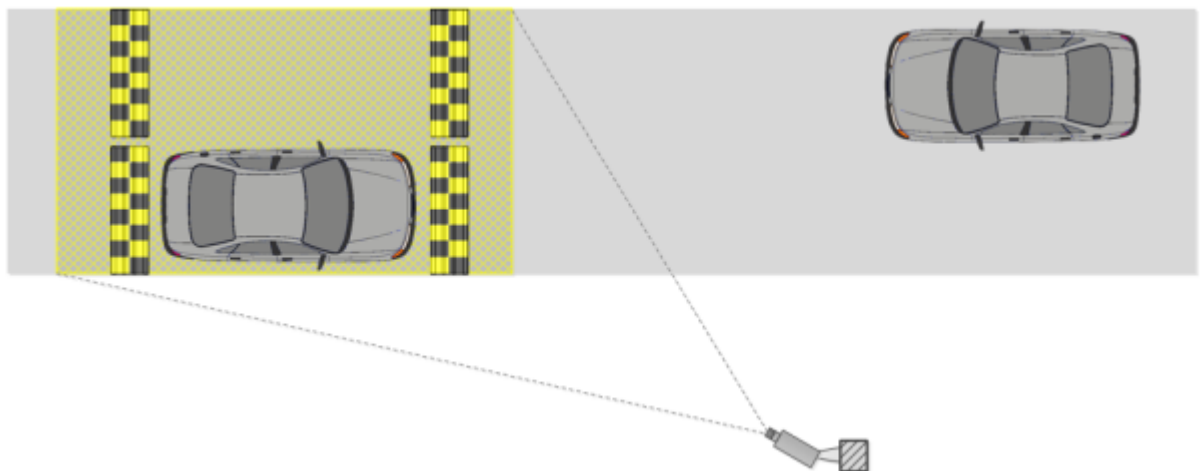
When using the gates, the controlled area must not start immediately before the gates, because the camera is usually installed at the level of the gates. In such a case a stop line, a mandatory stop sign or a traffic light is used for stopping the vehicle in the controlled area.

Controlled areas with separate lanes and gates



At the unregulated crossing points it is required to use speed bumps (road humps) to make the drivers reduce speed to ensure successful recognition; it is also advisable to use additional means such as the speed limit signs (up to 5 km/h), mandatory stop signs, stop lines etc.

Open controlled area with two-way traffic



The suggested camera installation parameters for surveillance of exits and entrances calculated for the cameras with the sensor size of 1/3" are shown in the following table. These parameters allow to provide the minimum distance between the camera installation location and the controlled area of the given width. It is also required to be guided by the quality of the license plate image in the focusing area in the course of the installation.

Sensor size: 1/3"						
Installation height (m)	1	1,5	2	2,5	3	4
Area width: 3 m						
Vertical angle, °	18	25	30	30	30	30
Focal distance (mm)	5	5	6	7	8	11
Near zone (m)	1,3	1,6	1,9	2,6	3,5	5
Focal zone (m)	3,1	3,4	3,5	4,3	5,2	7
Far zone (m)	∞	20	8,5	9	9,6	10
Area width: 6 m						
Vertical angle, °	9	14	19	23	28	30
Focal distance (mm)	5	5	5	5	5	6
Near zone (m)	1,7	2,2	2,5	2,7	2,7	4
Focal zone (m)	5,7	6	5,8	5,9	5,6	7
Far zone (m)	∞	∞	∞	44	21	17

The parameters shown in the above table are indicative. It is strongly recommended to calculate the camera installation parameters individually, using the CCTV calculator, with due regard for the design and operational characteristics of the particular cameras and their working environment.

Camera installation on a highway

When organizing the surveillance on a highway, the camera is normally installed on an L-shaped pole at the edge of the lane or on the arch support above the center of the lane.

The standard installation height is 4 to 6 (maximum 20) meters.

The vertical camera tilt angle is regulated by the basic guidelines.

The distance to the controlled area and, correspondingly, the focal length of the lens are determined based on the camera installation height, tilt angle and width of capture.

The higher the camera is installed, the higher is the probability that the license plates of the vehicles moving at a small distance from one another (for example, in case of a traffic jam) will get into the frame. But it needs to be noted that the increase of height leads to the higher distortion of the license plate images, and the symbol size may be close to the permissible minimum (or may even be unacceptable). In such cases it is possible to shift the region of interest to the higher distance by reducing the camera vertical tilt angle and changing the focal length in order to ensure reliable recognition.

The modern IP cameras are capable of covering several (up to 4) traffic lanes. Thus, it is possible to reduce the quantity of cameras to be installed in the controlled area. But in this case it is required to choose the installation height, tilt angle, and focal length in such a way as to minimize the optical image distortion (for example, the short focus lenses give significant image distortion on the periphery of the frame).

In the table below you will find the approximate parameters of camera installation for performing video surveillance on a highway. The camera parameters used for the calculation are as follows: 1/3" sensor and 5-50 mm varifocal lens. The values shown in the table allow to provide the minimum distance from the camera installation location to the controlled zone of the specified width. In the course of the installation it is imperative to ensure the quality of the license plate image to be obtained by the camera in the focal zone.

Sensor size: 1/3"					
Installation height (m)	4	6	10	15	20
Area width: 3 m					
Vertical angle, °	30	30	30	30	30
Focal distance (mm)	11	17	28	42	(56)*
Near zone (m)	5	8,2	15	23,6	(32)
Focal zone (m)	7	10,4	17	26	(34,6)
Far zone (m)	10	13,5	20	29	(37,4)
Area width: 6 m					
Vertical angle, °	30	30	30	30	30
Focal distance (mm)	6	8	14	21	28

Near zone (m)	4	6,5	13	21,5	30
Focal zone (m)	7	10,4	17	26	34,6
Far zone (m)	17	19,2	24	32	40,4

The table above contains the indicative values. It is strongly advised to perform calculations of camera installation parameters individually, using the CCTV calculator, with due consideration to the design and operational characteristics of the particular cameras and their working environment.

Recommendations on choosing and setting up a camera and lens

When choosing a camera for the license plate recognition purposes, be guided by the above requirements for the received image and recommendations for the camera mounting, as well as the following recommendations for the stream generation settings. Note that some features and settings may be not presented in the description and/or design of specific cameras.

General settings

Frame resolution: This parameter must be calculated individually for each camera setup, as depends on the requirements for the minimum allowable size of the license plate on the frame, the distance from the camera to the license plate, the characteristics of the camera lens, and other parameters.

Frame rate (fps): Depends on the requirements, settings, and mode of operation of the module.

Camera color mode: Monochromatic (black and white) image is a recommended option.

Colored image is allowed if necessary but a camera must have a full-fledged Day/Night mode with a retractable IR-cut filter.

Codec: MJPEG, MPEG-4, H.264 or H.265.

When choosing a codec and video stream compression settings, it is necessary to ensure the maximum possible preservation of fine details and the absence of any artifacts on the frame.

Bitrate type: When choosing the type of bitrate between constant (**CBR**) and variable (**VBR**), **VBR** is preferred.

Image sensor and signal processing

Sensor type: Both Complementary Metal-Oxide Sensor (**CMOS**) and Charged Coupled Device (**CCD**) sensors are suitable for the recognition of license plates.

CCDs have slightly better light sensitivity and less noise than CMOS sensors. Higher light sensitivity provides better image in low light conditions. But CCDs are more expensive and can consume up to 100 times more power than CMOS, and sometimes when using a CCD sensor, a smearing effect may occur that interferes with the plate recognition process:



Nowadays, CMOS sensors are very close in terms of image quality to CCDs. At the same time, CMOS sensors reduce the overall cost of the camera because they contain all the necessary logic to build the camera and provide more integration capabilities and features than CCDs.

Sensor size: 1/3" or bigger (pixel size is more important).

Pixel size: 3.75 μm (micron) or bigger

Increasing the pixel size increases the image quality in low light conditions.

The size of a single pixel (x_1) can be calculated by dividing the sensor width in mm by the sensor width in pixels:

$$x_1 = w/W$$

Where:

w is a sensor width in millimeters.

W is a sensor width in pixels.

Typical sensor sizes in mm are shown in the table below. It should be taken into account that the dimensions of specific sensors may differ from typical ones.

Sensor size	Sensor dimensions (Width \times Height), mm
4/3"	17,3 \times 13,0
1"	12,8 \times 9,6
2/3"	8,8 \times 6,6
1/1,8"	7,2 \times 5,3
1/2"	6,4 \times 4,8
1/2,3"	6,16 \times 4,62
1/2,5"	5,8 \times 4,3

1/2,7"	5,4 × 4,0
1/3"	4,8 × 3,6
1/3,2"	4,54 × 3,42
1/3,6"	4 × 3
1/4"	3,6 × 2,7

As an example, the calculation of the pixel size for a 1/3" sensor with a resolution of 1024x768:

$$x_1 = 4.8/1024 = 0.00468 \text{ mm} = 4.68 \text{ }\mu\text{m}$$

Light sensitivity: 0.1 - 0.01 lux (in combination with a high-aperture lens).

Caution should be exercised with a camera with a claimed sensitivity below 0.003 lux, as this level of sensitivity requires additional signal processing. This significantly degrades the image quality and causes fast moving objects to blur, which as a result interferes with the recognition process.

IR Light Sensitivity: Availability of the Day/Night mode is recommended for round-the-clock recognition of license plates.

Dynamic Range: minimum 60 dB (an approximate contrast ratio is 1:1000).

Wide Dynamic Range (WDR): Activation of WDR is recommended. WDR significantly improves the image quality in high-contrast lighting conditions, which allows to capture details both in dark and bright parts of the field of view.

Lens

If the camera is designed to allow lens interchangeability, it is very important to choose the right one. A lens designed to work with a 1/2" sensor is compatible with 1/2", 1/3" and 1/4" sensors, but it would not work with a 2/3" sensor.

If the lens is designed to work with a sensor smaller than the one installed in the camera, then the image will have black borders. If the lens is designed to work with a sensor larger than the camera's, then the field of view will be smaller than the capabilities of the lens, and part of the image will be left outside the sensor, creating a telephoto effect when the image looks enlarged.

Nowadays, cameras with the three most common types of lenses can be found:

Fixed lens: A lens with a constant focal length and therefore only one field of view available.

Varifocal lens: A lens with the configurable focal length that allows to get multiple fields of view. The field of view can be manually adjusted, but users then have to manually refocus the lens.

Afocal system (Zoom lens): Similar to a varifocal lens, afocal lens has a range of focal lengths and fields of view. However, the lens does not need to be manually refocused if the field of view is changed. Focus is maintained over the entire focal length range (for example, 6 to 48 mm). Moving the lens can be carried out manually or mechanized (with remote control). If the lens has the ability to zoom, then the magnification factor (multiplicity) corresponds to the ratio of the maximum focal length of the lens to the minimum.

Lens type: It is recommended to use lenses with configurable focal length (including afocal system) for the recognition of license plates.

Resolving power: The number of line pairs per millimeter must correspond to the physical resolution of the sensor.

When getting acquainted with the characteristics of a lens that can potentially be used for the recognition of license plates, it is necessary to take into account the number of line pairs per mm

(LP/mm) that it is capable to project onto the sensor. For example, 5 dark and 5 light lines per mm form a resolution of 10 lines per mm, i.e. 5 pairs of lines per millimeter.

To calculate the exact number of pairs of lines per millimeter that the lens must provide visual distinction with a known sensor size, divide the sensor width in pixels by the sensor size in millimeter, then divide the result by two. Such a calculation can be represented as the formula below:

$$L_{mm} = (W / w) / 2 = (1 / x_1) / 2$$

Where:

L_{mm} is the number of pairs of lines per millimeter

W is the sensor width in pixels

w is the sensor width in millimeters

x₁ is the size of a single pixel in millimeters

As an example, the calculation of LP/mm number for a 1/3" sensor with a resolution of 1024x768:

$$L_{mm} = (1024 / 4,8) / 2 \approx 107 \text{ pairs of lines per mm.}$$

It should be taken into account that the resolving power may be affected by other factors. In particular, resolution may vary depending on different f-stop values (resolution is at its minimum when the iris is completely open). Minimum resolution value is provided in lens specifications. As the iris is closing, the resolution becomes higher (residual optical-system aberrations are reduced). It's important to keep in mind that focusing mistakes may reduce resolving power as well.

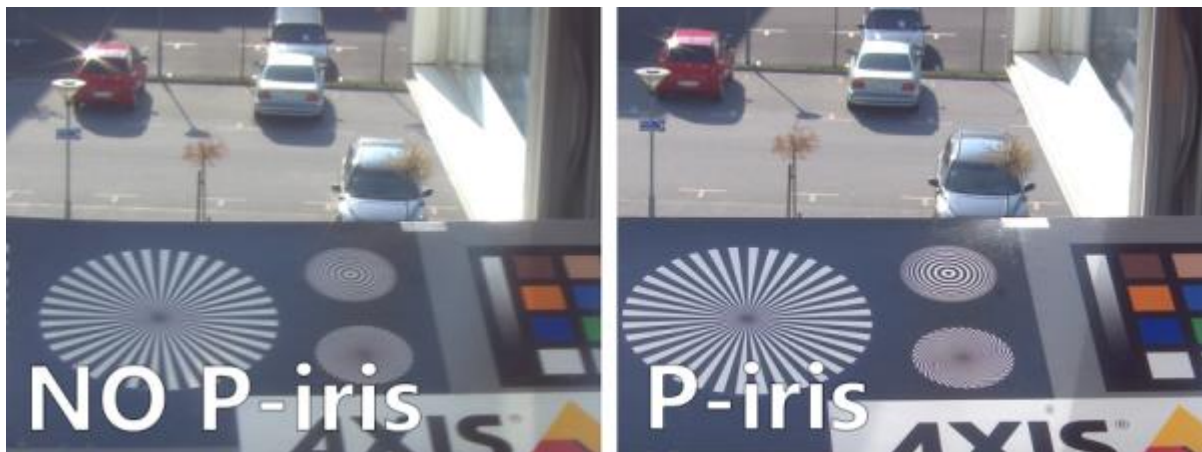
It's important to keep in mind that focusing mistakes may reduce resolving power as well.

Focal length range: Recommended ranges are 5-50 mm, 7-70 mm.

Aperture (f) number: 1.0, 1.2, 1.3, 1.4, 1.8.

Aperture control:

P-Iris. The recommended option, especially in non-constant lighting conditions. It allows avoiding diffraction (blurring of the image) effect and increasing the sharpness of the image, allowing video surveillance in a wide range of lighting conditions and distances - both in parking lots and on highways. This is achieved by automatically limiting aperture narrowing in strong light conditions. The limits for automatic control of the aperture additionally can be configured through the user interface of the camera.



For some cameras with P-iris, the user interface allows to configure the aperture opening on an index scale - from maximum to minimum. With this function, the iris position, which is set by auto adjustment for most lighting conditions, can be adjusted to the desired position.

DC-Iris. The allowed option. Comparing with P-iris, it only manages the exposure of the sensor. When DC-iris is opened, the sharpness is affected and auto-tuning of this image quality is not available.

Fixed or manual aperture. This option can only be used for surveillance under constant lighting conditions (e.g. indoor parking) when there is no need for constant aperture adjustment. The exposure in this case is set by adjusting shutter speed and AGC that is not as flexible as dynamic aperture tuning. A fixed aperture is set constructively during the manufacture of the lens, a manual aperture is set during lens adjustment and is not automatically adjusted during operation.

IR correction. Required to avoid overexposure if IR projector is used. Lenses of the kind usually have IR index in their marking.

Focal length

To select a proper lens for a camera, it is needed to know the following values: sensor size, distance between the camera and the object and width of the object. Those three values are enough to calculate focal length of the lens in mm (or, if the focal length is available, calculate the width of field of view at set distance) using various CCTV and Lens Calculators.

Such calculators are available online (for example, on camera/lens manufacturers' websites).

Moreover, approximate focal length may be calculated using the following formula:

$$f = d * w / W$$

Where:

f is a focal length in millimeters.

d is a distance between the camera and the object in meters.

w is a width of the sensor in millimeters.

W is a width of the object in meters.

Camera's angle of view is determined by focal length value. When calculating the angle of view, the following points must be borne in mind:

The shorter the focal length, the larger the angle of view, and vice versa.

The smaller the sensor size, the smaller the angle of view (for a lens with the same focal length).

The following table represents the correlation between angle of view and sensor size as well as focal distance of the lens. A standard CCTV Calculator was used for calculations.

Distance to the object (m)	Object width (m)	Sensor size	Focal length (mm)	Field of view (°)
3	4	1/3	4	85
3	4	1/2	5	65
3	3	1/3	5	65
3	3	1/2	6	55
7	4	1/3	8	40
7	4	1/2	10	35
7	3	1/3	10	35

7	3	1/2	12	25
11	4	1/3	13	28
11	4	1/2	18	22
11	3	1/3	18	22
11	3	1/2	23	16
15	4	1/3	18	22
15	4	1/2	23	16
15	3	1/3	23	16
15	3	1/2	30	12

Depth of field

Depth of field refers to the distance in front of and behind the focus point within which objects are sharp. The depth of field is an important value when recognizing license plates.

Depth of field is affected by the following three factors: focal length, aperture opening and distance from the camera to the object. A long focal length, long aperture opening or a short distance between the camera and the subject limiting the depth of field.

Many modern surveillance lenses are designed to provide a great depth of field over a wide range of focal lengths.

For some lenses it may be needed to adjust the depth of field manually. In this case, set the focal length first and only then configure the back focus. Adjust the back focus either in natural low light (evening or night) or artificially reduced daylight using an external neutral density filter (the ND filter usually places in front of the lens). Adjusting the back focus in bright daylight may cause an out-of-focus image at night. Adjust the back focus when the aperture is fully open (the maximum aperture is needed to reduce the depth of field to make back focus adjustment easier and more accurate). Sometimes it is difficult to precisely adjust the back focus, in which case it is recommended to set the focus to infinity.

Note that if the depth of field is shallow, the license plate number may not be recognized correctly or not at all. This is due to the fact that the application uses several adjacent frames received during the movement of the vehicle through the controlled area for recognition. With a shallow depth of field, the license plate can not be clearly recognized only in one sharp image, while in the rest of the frames it will be blurred.

Lenses with automatic iris (fixed and adjustable focal length) can have two settings:

Automatic or **Auto Light Control (ALC)**, which controls the sensitivity of the automatic iris control circuitry to changes in light levels.

Level, which allows setting the average value of the iris.

For such lenses, it is recommended to set the medium value for the **Automatic** adjustment and configure the **Level** as follows: set the maximum value and point the camera so that the maximum amount of light enters the lens (it is strictly forbidden to point the lens directly to the sun as it will lead to sensor malfunction) and then cover the camera lens for 5 seconds. After opening the lens, the image should reappear. If this does not happen — repeat the adjustment.

Shutter speed

Shutter speed (Exposure) is one of the critical parameters when recognizing license plates. It is highly recommended to use cameras with manual shutter speed control for license plate recognition.

It is important to keep in mind that too slow shutter speed result in the blurring effect of the license plate characters on the image. Moreover, while watching a video, they may seem clear, but when viewed frame-by-frame, distortions are clearly visible.

For each movement speed mode there is a range of recommended values which should be set for shutter speed depending on the maximum speed of vehicles in the control area.

Maximum vehicle speed in the control area (kmph)	Shutter speed (sec)
17	1/200
20	1/250
90	1/1000
130	1/1500
180	1/2000

In addition, if the horizontal camera rotation angle to the license plate plane exceeds 10°, it is recommended to halve the shutter speed, since the license plate image in this situation is blurring along several axes.

Infrared illumination

To provide round-the-clock recognition in the area with changing lighting conditions, an infrared illumination (by means of either embedded or standalone IR projector) is required. In this case, it is necessary to select a camera with an infrared-sensitive sensor (so called day/night camera). The camera must be equipped with a lens with infrared correction (IR compensation). Marking of such lenses usually contains the "IR" index. As a result, an informative monochromatic image will be provided even for a poorly illuminated areas.

IR illumination range: Recommended value for license plate recognition is **850–880 nm**. It has sufficient recognition distance and generates a comparatively low amount of visible illumination.

IR illumination mode: It is recommended to use IR projector in impulse mode when the illumination impulse is synchronized with global shutter operating mode. This provides more rational use of projector's energy resources, prologing its service life and saving electricity.

Angle of illumination (if standalone IR projector is used): Should be the same as the camera angle of view. If illumination angle of IR projector is lower that camera angle of view, an exterior light source or well-lit object may get captured in the field of view making the shutter work under the average frame lighting value and thus lower the exposure (equal to forced decreasing of the camera sensitivity). Balancing illumination angle of IR projector and angle of view of the camera is especially important for long-distance surveillance when the camera works at the limit of its sensitivity.

Back focus and depth of field with IR lighting: Since IR light has a longer wavelength and lower refractive index than conventional light, the plane of the focused image is positioned slightly behind the plane of the image sensor.

ND filters

When surveillance is carried out under changing lighting conditions (usually, outdoors), an overexposure may occur. In such cases, a required f-stop is achieved by combining the features of mechanic iris and a neutral density (ND) filter. This type of filter is also useful for minimizing the depth of field when adjusting the back focus or adjusting the auto iris level during the day.

There are built-in and external ND filters. It should be noted that the optical accuracy of ND filters is very important, because as the f-number increases, the resolving power of the lens must be maintained, which theoretically is at its maximum in the middle of the mechanical aperture setting range and decreases as the f-number increases/decreases (this is different from the depth-of-field effect). The possibility of the neutral-gray filter reducing the resolution of the lens has to be taken into account.

Filter properties may be specified in different ways:

ND* and ***X** indicate light blocking by how many times the filter attenuates the light.

***.* ND** indicates the optical density number of the filter.

f-stop reduction value indicates the number of exposure compensation steps (aperture steps, f-number).

Light blocking	Density	f-stop reduction	
ND2	2X	0.3 ND	1
ND4	4X	0.6 ND	2
ND8	8X	0.9 ND	3
ND16	16X	1.2 ND	4
ND32	32X	1.5 ND	5
ND64	64X	1.8 ND	6
ND100	100X	2.0 ND	6 $\frac{2}{3}$
ND256	256X	2.4 ND	8
ND400	400X	2.6 ND	8 $\frac{2}{3}$
ND500	500X	2.7 ND	9
ND1000	~1,000X	3.0 ND	10
ND10000	~10,000X	4.0 ND	13
ND100000	~1,000,000X	6.0 ND	20

Filters can be combined to achieve the desired degree of light attenuation. For example, combining the ND8 and ND100 results in a filter with attenuation of 800 times.

Module installation and update

Only one of the License Plate Recognition modules can be installed on the same server: either **License Plate Recognition (Complete)** or **License Plate Recognition (Light)**.

The module works only with 64-bit version of **Eocortex**.

Installation under Windows OS

This module is external; it is not included in the basic **Eocortex** distribution package and requires individual installation.

The module must be only installed on the computer with **Eocortex Server** or **Eocortex Standalone** application, to which the license plate recognition cameras are bound. The computers with just **Eocortex Client** application installed do not require installation of the module.

The module's version must match the version of **Eocortex** software installed on a particular computer.

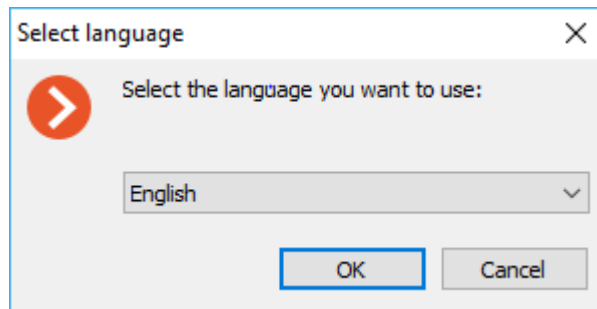
The installation files must be run under the administrator's account.

To update the module, it is required to perform the same steps as for the initial installation of the module. After selecting the installation language but prior to launching the installation wizard, the windows offering to uninstall the previous version will appear. It is required to confirm the uninstall. After the uninstall is complete, the module installation wizard will appear.

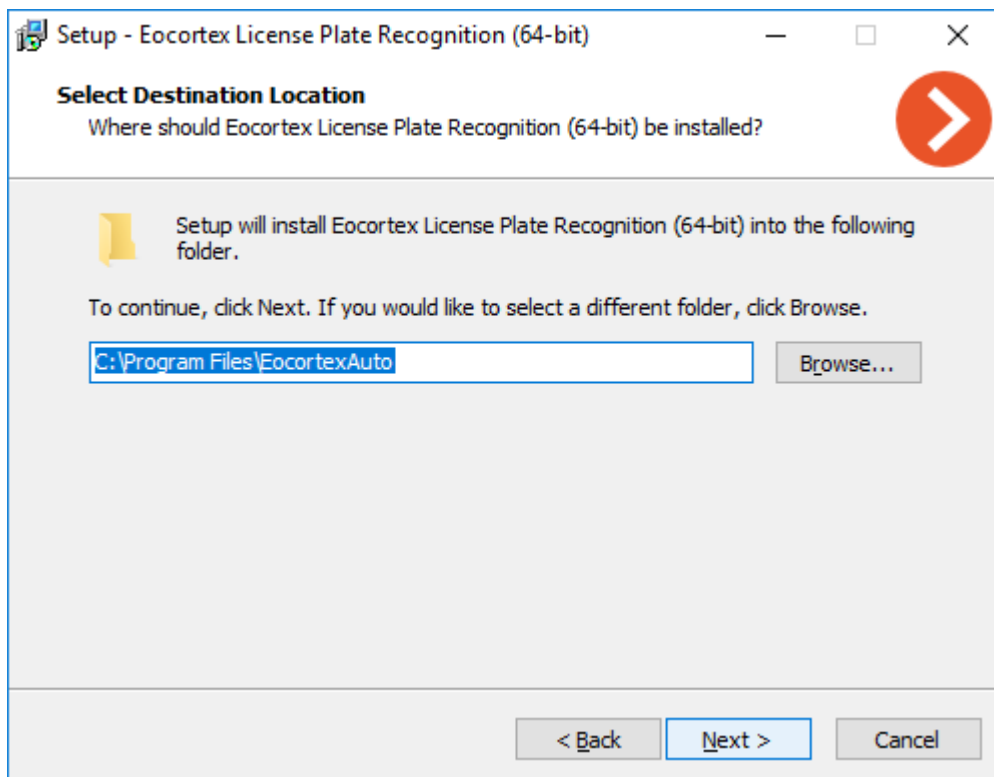
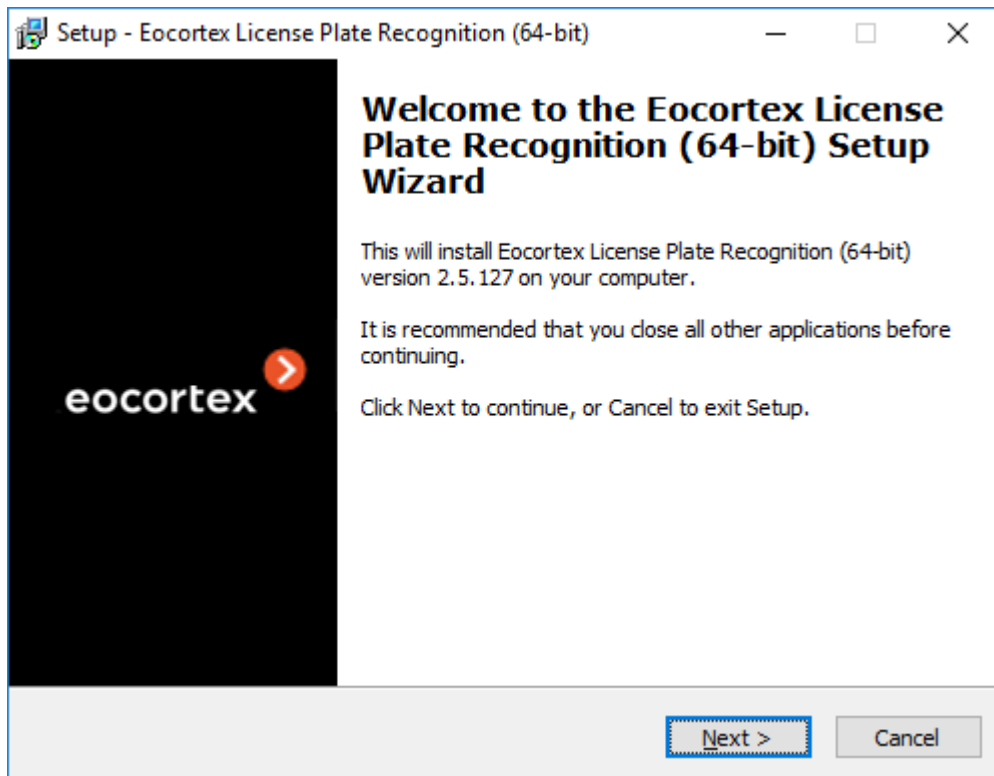
Before installing the module, it is required to stop all the **Eocortex** applications running on the computer, and to insert the module protection key in the USB port.

To install the module, it is required to run **EocortexAuto Installer_x64.exe** file.

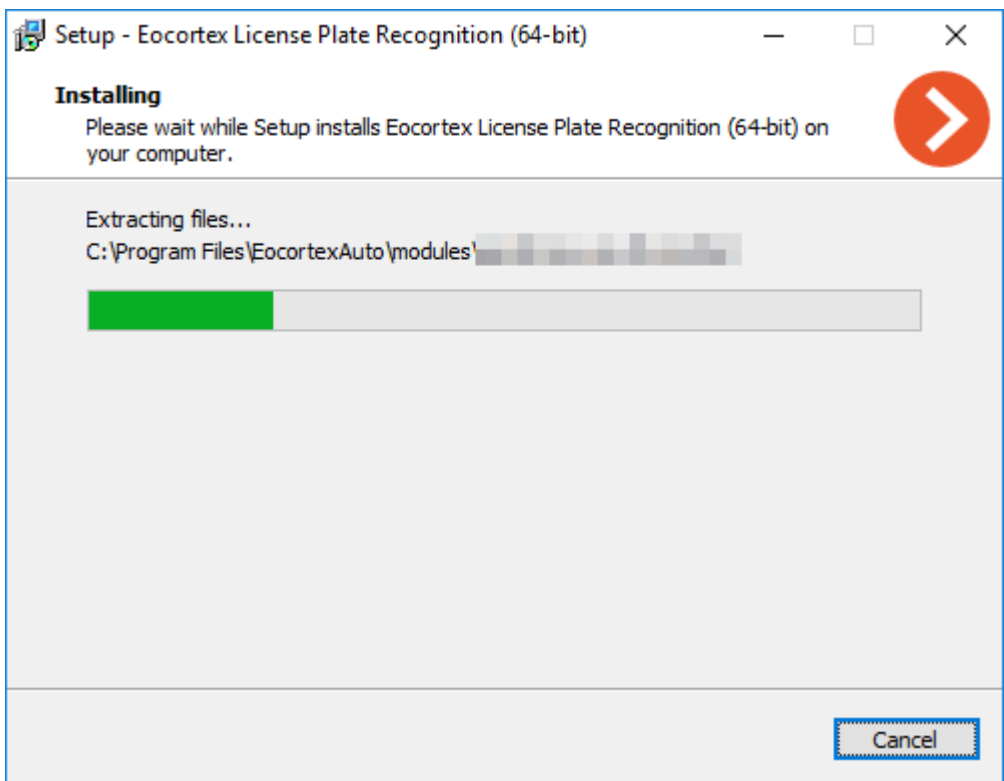
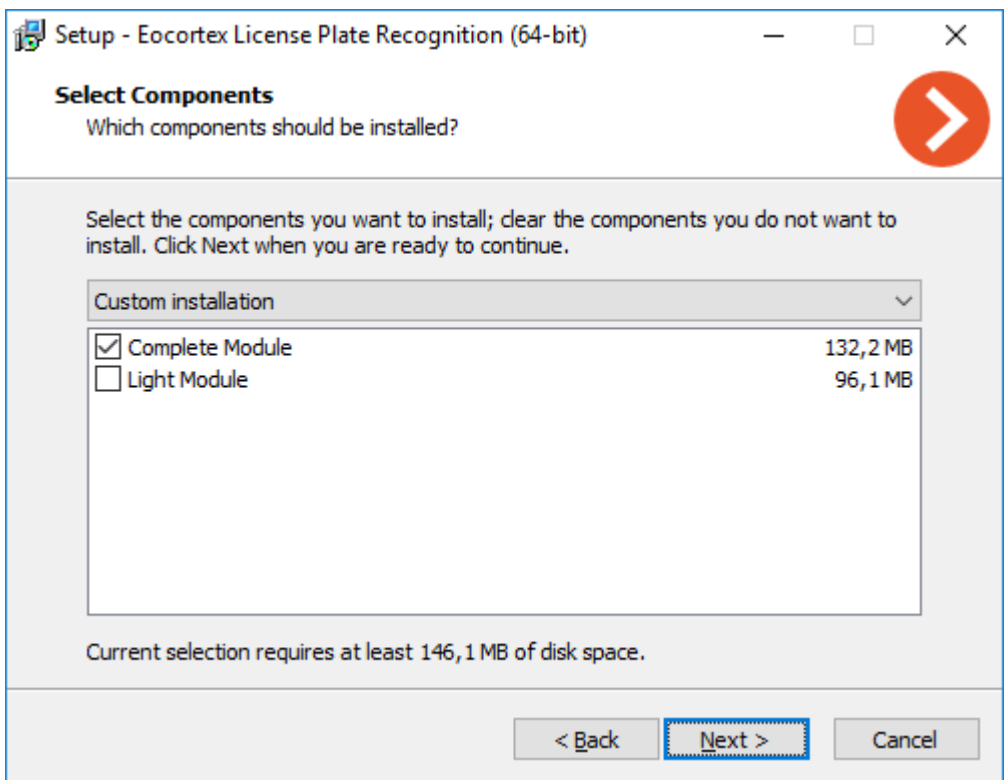
It is required to choose the installation language in the opened **Select language** window.

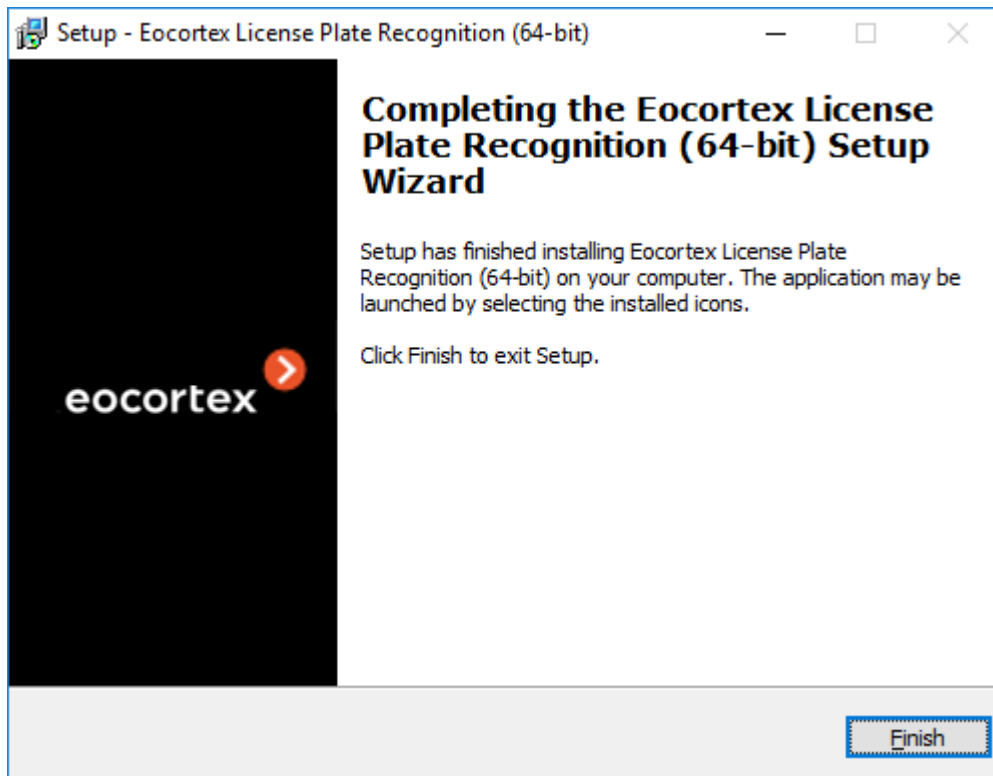


Then it is necessary to follow the steps of the installation wizard.



At the **Select component** step, choose the **License Plate Recognition (Complete)** option.





By default, the module will be installed to **C:\Program Files\EocortexAuto** folder.

Installation under Linux OS

This module is external, meaning that it is not a part of the main distribution kit of **Eocortex** and needs to be installed separately.

It is required to install the module exclusively on a computer that already has the **Eocortex Server** application installed; this computer must have the cameras for license plate recognition bound to it.

The module's version has to be the same as the version of **Eocortex** installed on the given computer.

The module is installed on Linux using the standard procedure. The files are located in the repository:

rpm package: <http://packages.eocortex.com/rpm/>.

deb package: <http://packages.eocortex.com/deb/pool/main/e/>.

Depending on the type of processor and recognition procedure, it is necessary to choose one of the following packages:

With neural network technology:

eocortex-plate_(version)_amd64.deb

eocortex-plate-(version)-1.x86_64.rpm

Without neural network technology:

eocortex-plate-non-dnn_(version)_amd64.deb

eocortex-plate-non-dnn-(version)-1.x86_64.rpm

Licensing the module

Since the module uses libraries developed by a third party and requires separate licensing, two elements are used for its licensing protection: the **License Plate Recognition (Complete)** module's hardware protection key and the license, bound to the **Eocortex** protection key.

The need to use two elements of the license protection at the same time is only a technical feature: upon purchase, only one license is paid for each server, which indicates the type of module - **Highway** or **Parking** - and the number of cameras for plate recognition on this server.

The module's hardware protection key is a Sentinel (HASP) USB dongle:



[The Eocortex protection key](#) can be either hardware or software.

The module is licensed according to the type of license, groups of recognizable countries and the number of recognition channels.

Types of license:

- **Highway:** Recognition of license plates moving with the speed up to 250 kmph. Stream analysis is performed either with the actual frame rate received from the camera or according to the analysis rate specified in the settings of the software motion detector.
- **Parking:** Recognition of license plates moving with the speed up to 20 kmph. Stream analysis is performed at a frequency of no more than 6 frames per second, regardless of the actual frame rate received from the camera.

Below is the list of currently supported countries:

Abhasia, Accord Dangereuses Route, Albania, Algeria, Andorra, Angola, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahrain, Belarus, Belgium, Bolivarian Republic of Venezuela, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Cameroon, Canada, Chile, China, Colombia, Costa Rica, Croatia, Cuba, Cyprus, Czech Republic, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Estonia, Ethiopia, Finland, France, Georgia, Germany, Gibraltar, Greece, Grenada, Guatemala, Holy See (Vatican City State), Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Islamic Republic of Iran, Israel, Italy, Japan, Jordan, Kazakhstan, Kenya, Kosovo, Kuwait, Kyrgyzstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Madagascar, Malaysia, Malta, Mexico, Monaco, Mongolia, Montenegro, Netherlands, New Zealand, Nicaragua, Nigeria, Norway, Oman, Ossetia, Panama, Paraguay, Peru, Philippines, Plurinational State of Bolivia, Poland, Portugal, Pridnestrovian Moldavian Republic, Puerto Rico, Qatar, Republic of Korea, Republic of Moldova, Republic of North Macedonia, Romania, Russian Federation, Saudi Arabia, Serbia, Seychelles, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Tajikistan, Tunisia, Turkey, Turkmenistan, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, USSR, Uzbekistan, Vietnam, Zambia.

The **Eocortex** server that handles license plate recognition cameras must have the module's own protection key plugged in. In addition, this server must have a **Eocortex** license with the **License Plate Recognition (Complete)** module usage supported.

One **Eocortex** server can have only one **License Plate Recognition (Complete)** module protection key.

Only one speed mode can be used on the same **Eocortex** server at the time: **Highway** or **Parking**.

The number of cameras recognizing license plates on the server can be increased. To do this, purchase the license update for the module, [update the Eocortex license](#) on the server and then [update the module protection key](#).

License type of the module can be changed, but only from the **Parking** to **Highway** speed mode. To do this, purchase the license update for the module and [update the module protection key](#). It is not necessary to update **Eocortex** license if the number of plate recognition cameras is not changed.

In a multiserver system, the license plate recognition module can be applied to cameras connected to different **Eocortex** servers, with the following conditions:

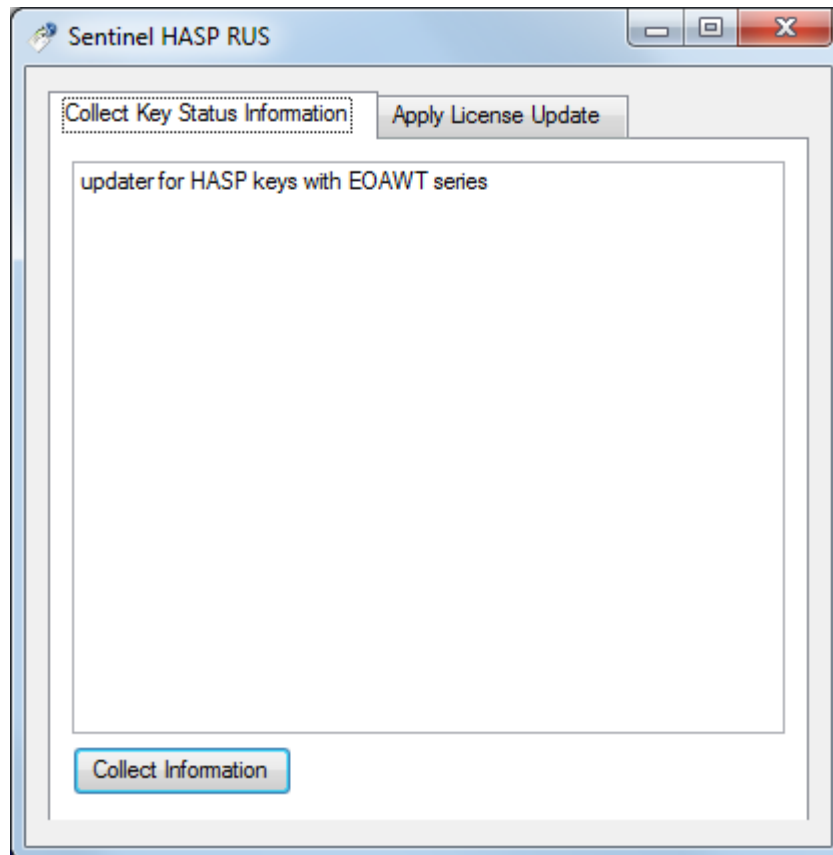
- Each server must use its own separate module protection key and installed **Eocortex** licenses with the appropriate number of cameras that recognize license plates.
- All cameras in the system will use the same license plate database and archive of recognized plates.

If any other software that use Sentinel (HASP) license protection keys is installed on the same computer with the **Eocortex** server, then the **License Plate Recognition (Complete)** module may operate unstable.

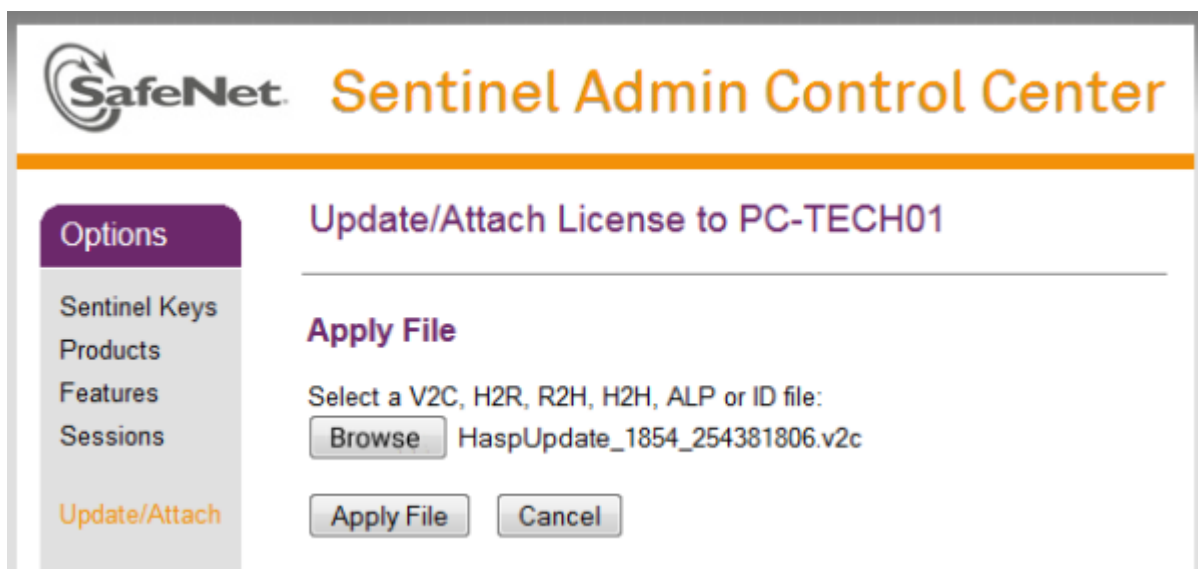
Updating the module protection key

There may be a situation when it is necessary to change the license parameters of the module protection key. To do this, follow these steps:

- With the **License Plate Recognition (Complete)** module protection key plugged into the computer's USB port, open the Sentinel (HASP) driver web interface in any browser on the **Sentinel Keys** page: <http://127.0.0.1:1947/int/devices.html>. Copy the values of the **Key ID** and **Vendor** fields and tell them to the company where the **Eocortex** license was purchased.
- A utility (hasp_update.exe) to take a snapshot of the key will be sent in response. Each **Vendor** uses its own utility, but they have the same user interface.
- With the **License Plate Recognition (Complete)** module protection key plugged into the computer's USB port, run the utility and go to the **Collect Key Status Information** tab. Press the **Collect Information** button and save the resulting c2v-file. It is recommended to use the **Key ID** value as the file name.



- Send the c2v-file to the company where the **Eocortex** was purchased.
- An update file (with *.v2c extension) will be sent in response. Save this file.
- With the **License Plate Recognition (Complete)** module protection key plugged into the computer's USB port, open the Sentinel (HASP) driver web interface in any browser on the **Update/Attach** page: <http://127.0.0.1:1947/int/checkin.html>. Click the **Select file** button and find the v2c-file. Click the **Apply file** button to apply the key update, which takes a few seconds to complete.
- After updating the key, the **Eocortex** server must be restarted for the changes to take effect.



Troubleshooting

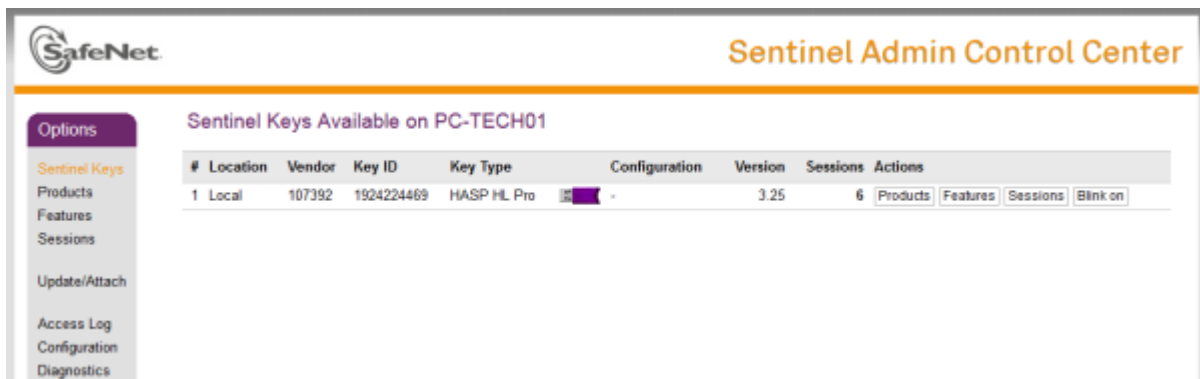
If the **License Plate Recognition (Complete)** module does not work correctly, or does not work at all, the following diagnostics should be performed:

Work correctness of the Sentinel (HASP) protection key driver and module libraries

To check the correctness of Sentinel (HASP) protection key driver installation, try to open the <http://127.0.0.1:1947/int/devices.html> page in any browser on the server. The module protection key must be plugged into the server.

The address above must be entered completely, including the http:// prefix.

If as a result, the browser displays a page similar to the one shown below, then the Sentinel (HASP) driver is installed correctly. The **Key ID** line should contain the identifier of the protection key. It is recommended to provide this identifier to the technical support specialists in case of issues with the module. The License Plate Recognition module protection key must have one of two possible values in the **Vendor** line: 106763 (AAOTB) or 107392 (EOAWT).



If the Sentinel (HASP) driver page does not open, try to open it in another browser.

If other browsers also fail to open the Sentinel (HASP) driver page, then the Sentinel (HASP) driver is most likely installed incorrectly or not installed at all.

Case 1

Sentinel (HASP) driver is not installed or installed incorrectly.

Possible causes and solutions

Cause 1.1

Installation is not finished.

Solution 1.1

Restart the computer. Sometimes the installation process of the driver may require rebooting the server machine.

If the driver page does not open after reboot, reinstall **Eocortex Server / Standalone** - the Sentinel (HASP) driver is installed as a component of the system during the main installation process. Restart the computer again after reinstalling **Eocortex Server / Standalone**.

Cause 1.2

Installation is blocked by antivirus software.

Solution 1.2

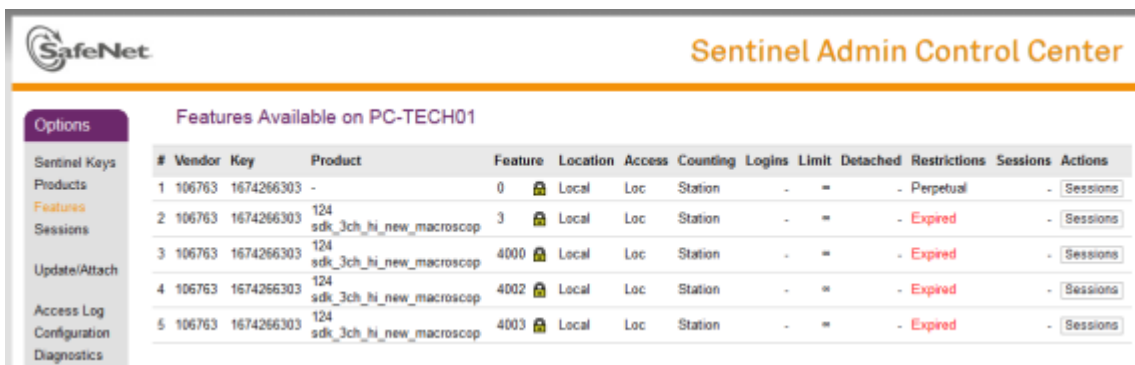
Stop AV software if any installed on the server and reinstall **Eocortex Server / Standalone**.

It is not recommended to use AV software on **Eocortex** servers, but if security policies require it, make sure that all **Eocortex** components are whitelisted and excluded from scanning.

All installation files must be run as administrator.

If the **Eocortex Server / Standalone** is running and at least one camera has the License Plate Recognition module configured, then the **Session** line must have a non-zero value, which indicates that the License Plate Recognition module is currently running.

Case 2



The screenshot shows the Sentinel Admin Control Center interface. The main heading is "Sentinel Admin Control Center" and the sub-heading is "Features Available on PC-TECH01". A table lists the following features:

#	Vendor	Key	Product	Feature	Location	Access	Counting	Logins	Limit	Detached	Restrictions	Sessions	Actions
1	106763	1674266303	-	0	Local	Loc	Station	-	=	-	Perpetual	-	Sessions
2	106763	1674266303	124 sdk_3ch_hi_new_macroscop	3	Local	Loc	Station	-	=	-	Expired	-	Sessions
3	106763	1674266303	124 sdk_3ch_hi_new_macroscop	4000	Local	Loc	Station	-	=	-	Expired	-	Sessions
4	106763	1674266303	124 sdk_3ch_hi_new_macroscop	4002	Local	Loc	Station	-	=	-	Expired	-	Sessions
5	106763	1674266303	124 sdk_3ch_hi_new_macroscop	4003	Local	Loc	Station	-	=	-	Expired	-	Sessions

The License Plate Recognition module is not working and the **Session** line is empty or have a dash as its value.

Possible causes and solutions

Cause 2.1

The License Plate Recognition module is not activated for any camera on the server. The server configuration was not applied after module activation. **Eocortex Server / Standalone** was not restarted after applying the configuration.

Solution 2.1

Activate the License Plate Recognition module at least for one camera on the server. Apply the configuration after activating the module. Stop and start again **Eocortex Server / Standalone** manually.

Cause 2.2

The license on the key has expired.

Solution 2.2

In some cases, the user may be provided with a time-limited test key for the License Plate Recognition module. If the license has expired, then in the **Restrictions** field on the **Features** tab of the key on the Sentinel (HASP) driver page will be the **Expired** value.

Cause 2.3

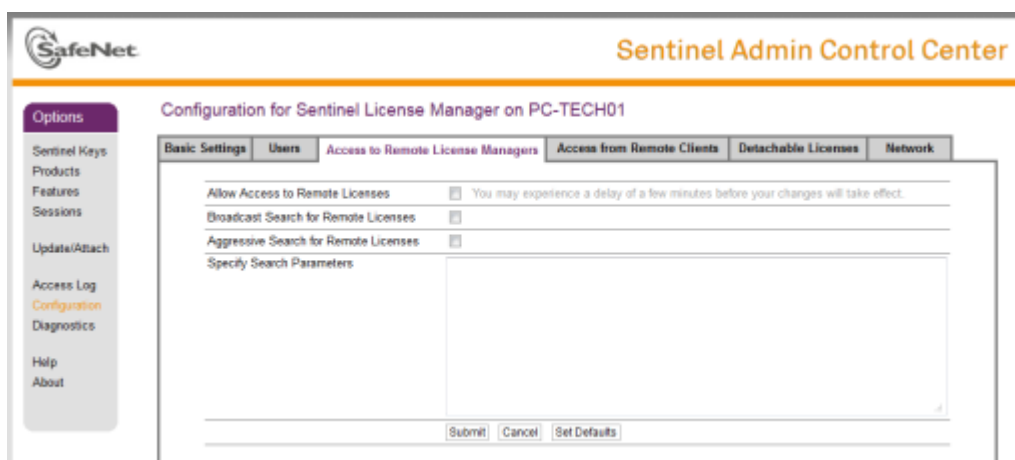
Protection keys conflict. The License Plate Recognition module key conflicts with another Sentinel (HASP) protection key installed on **Ecortex Server / Standalone**.

Solution 2.3

It is not recommended to install **Ecortex Server / Standalone** on a computer that has other software that uses Sentinel (HASP) protection keys installed.

The **Ecortex** license can also be provided as a Sentinel (HASP) protection key with Vendor ID 104213. It does not conflict with the protection key of the License Plate Recognition module.

To ensure that no Sentinel (HASP) protection keys (including those required by third-party software) other than needed for the License Plate Recognition module are installed on the same computer with **Ecortex Server / Standalone**, open the Sentinel (HASP) driver web-interface, go to the **Configuration** page and switch to the **Access to Remote License Managers** page (or simply open the link: http://127.0.0.1:1947/int/config_to.html) where disable all checkboxes.



The next step is to open the **Sentinel Keys** page (<http://127.0.0.1:1947/int/devices.html>) and make sure that there are no other Sentinel (HASP) protection keys available on this computer.

If other Sentinel (HASP) protection keys except the License Plate Recognition protection key (**Vendor ID: 106763** or **107392**) and optional **Eocortex** protection key (**Vendor ID: 104213**) are installed on the computer, unplug them and restart **Eocortex Server / Standalone**. Check if the module is working.

If the License Plate Recognition module is working after extracting third-party keys (the **Session** line contains a non-zero value), then either third-party software protected with Sentinel (HASP) keys or **Eocortex Server / Standalone** needs to be transferred to another computer.

Work correctness of the License Plate Recognition module

Below are typical issues that may be encountered when using the License Plate Recognition module, as well as recommendations on how to fix them.

Case 1

None of the license plates are recognized. Specific types of license plates or license plates of the specific country are not recognized. Most of the plates visible on the frame are not recognized.

Solution 1.1

Make sure that the desired country and all the needed templates are selected in the module settings. Note that in addition to the Country checkbox, the checkboxes for all desired templates must also be enabled.

Solution 1.2

The minimum and maximum sizes of the license plate in the module settings do not match the actual size of the license plate on the frame. Set the sizes so that the license plate on the frame will be in the range between the minimum and maximum sizes.

Solution 1.3

The search area may be configured incorrectly in the module settings. Set the search area so that the license plates are included in this area. If multiple separate search areas are used for plate recognition, make sure that there are no uncovered spaces between them. A simple search area consisting of a single rectangle is more preferable to a complex one consisting of multiple parts.

Solution 1.4

The software motion detection may not be activated or configured. Activate and configure the software motion detector.

Solution 1.5

The image received from the camera may not be suitable for plate recognition (image is blurry, noisy, contains artifacts or distortions). Run the **Eocortex Client**, open the video archive of the camera with the license plate recognition module activated and find the frame with license plate that must be recognized. Save the frame in TIFF or BMP format (resolution of the saved frame must match the resolution of the frame received from the camera) and open it in any graphics editor. Set the scale to 1:1 and make sure the license plate image is clear and legible. If the image is blurry or noisy, adjust the camera to get a clearer image (additional lens focus and codec compression changes may be required).

Solution 1.6

The camera position or field of view may not match the recommendations provided on the **Requirements and recommendations** page. Adjust the camera position and field of view to meet the requirements to the license plate image.

Solution 1.7

The low-resolution stream may be selected for plate recognition. Run the **Eocortex Configurator** and open the camera settings. If [more than one stream](#) is activated in the **Video streams** section of the **Connection** tab, make sure that the **Main** stream or the stream with the most suitable resolution is selected in the **Video stream for analysis** section of the **Motion detection** tab.

Case 2

Not all license plates on the frame are recognized. Some license plates of the same type and size are not recognized on the same part of the frame.

Solution 2.1

See solutions 1.5 - 1.7 above.

Solution 2.2

Reduce the requirements for recognition quality in the module settings: decrease the level of the **Quality of recognition** parameter, increase the value of the **Acceptable number of unrecognized characters** parameter.

Solution 2.3

If the **Parking** license type is used for licensing the module, then unsuccessful recognitions can be caused by vehicle speed close to or greater than 20 kmph. In such case, if it is necessary to improve recognition accuracy and there is no way to limit the

movement speed in the control area, then it is recommended to change the module license type from **Parking** to **Highway**. Note that recognition with the **Highway** license type processes more frames to get an accurate result, which significantly increases CPU usage.

Case 3

Too many license plates are recognized incorrectly or not completely (Asterisks * instead of symbols in the recognition result)

Solution 3

Amplify the requirements for recognition quality in the module settings: increase the level of the **Quality of recognition** parameter, decrease the value of the **Acceptable number of unrecognized characters** parameter.

License Plate Recognition (Light)

The **License Plate Recognition (Light)** module is intended for recognizing the license plates of the moving vehicles and for saving the information regarding the time and date of recognition, the license plate number and the reference to the corresponding video frame.

Capabilities of the module

License plate recognition for the countries listed below:

Azerbaijan (AZ), Armenia (AM), Belarus (BY), Belgium (BE), Bulgaria (BG), Czech Republic (CZ), Estonia (EE), Finland (FI), France (FR), Georgia (GE), Germany (DE), Great Britain (GB), Greece (GR), Hong Kong (HK), Hungary (HU), Ireland (IE), Italy (IT), Israel (IL), Kazakhstan (KZ), Kuwait (KW), Kyrgyzstan (KG), Latvia (LV), Lithuania (LT), Luxembourg (LU), Moldova (MD), Mongolia (MN), Montenegro (ME), Netherlands (NL), Poland (PL), Portugal (PT), Qatar (QA), Romania (RO), Russia (RU), South Korea (KR), Spain (ES), Sweden (SE), Tajikistan (TJ), Turkey (TR), Turkmenistan (TM), Ukraine (UA), United Arab Emirates (AE), Uzbekistan (UZ), Vietnam (VN).

Real-time recognition of the license plate numbers of moving vehicles.

Recognition of the license plate numbers of vehicles travelling with the following velocities:

- Up to 150 km/h for the **Highway** license.
- Up to 30 km/h for the **Parking** license.

Saving the recognized license plate number in the archive, including the date and time of recognition and the link to the corresponding video frame.

Real-time comparison of the recognized license plate numbers with the license plate number database and generation of the alarm if the recognized number is in the list of the vehicles to be intercepted.

Working with the integrated database of automobile license plate numbers: adding and editing of numbers, providing additional information of the vehicles, such as color, owner, etc.

Possibility to import the license plate numbers into the database from a CSV file.

Creating the groups of license plate numbers for interception, automatic opening of a rising arm barrier etc.; adding a number to one or more groups.

Searching for the recognized numbers in the archive by time, by date and by additional information from the database.

Downloading of the recognized license plate numbers to Microsoft Excel or CSV format.

Automatic sending of the lists of recognized license plate numbers by email.

Rising arm barrier control.

Counting the number of vehicles in parking lots.

Counting the time spent by vehicle in the parking lot.

Details

The module is intended for recognizing the license plates of moving vehicles only. The parked vehicles' numbers will not be recognized.

It is possible to use the capabilities of the **Eocortex API** for the automation of the downloading of the recognized license plate lists.

Interaction with the rising arm barriers is performed via signal outputs of the IP cameras.

Compatibility with other modules

OS	Requires Eocortex motion detector	Neural network	Compatible with modules	Incompatible with modules	
		Standard	Special		
√	–	√	–	<ul style="list-style-type: none"> Abandoned object detection module Auto Zoom Counting People in Queue Crowd Monitoring Emergency Vehicle Detection Face Detection Face Mask Detector Face Recognition (Complete)¹ 	<ul style="list-style-type: none"> FishEye Dewarping License Plate Recognition (Complete) Unique Visitor Counting

OS	Requires Eocortex motion detector	Neural network	Compatible with modules	Incompatible with modules
		Standard	Special	
				Face Recognition (Light) ¹ Fire and Smoke Detector Frame Area Blurring Loud Sound Detection Object Classification and Counting ¹ People Counting ¹ Personnel Activity Monitoring Sabotage Detector Search for Objects Shelf Fullness Check Tracking Traffic Density Heat Map Uniform Detector

¹ If used in combination, module selection is available to display the results of the analysis in the Eocortex Client application

- √ supported and required for the module to work
- + supported and provides additional features of the module
- not supported or not required for the module to work

Only one of the License Plate Recognition modules can be installed on the same server: either **License Plate Recognition (Complete)** or **License Plate Recognition (Light)**.


Use



The use of video analytics modules in **Eocortex Client** is described in the **User's guide**, in the **Eocortex Client / Video analytics** section.

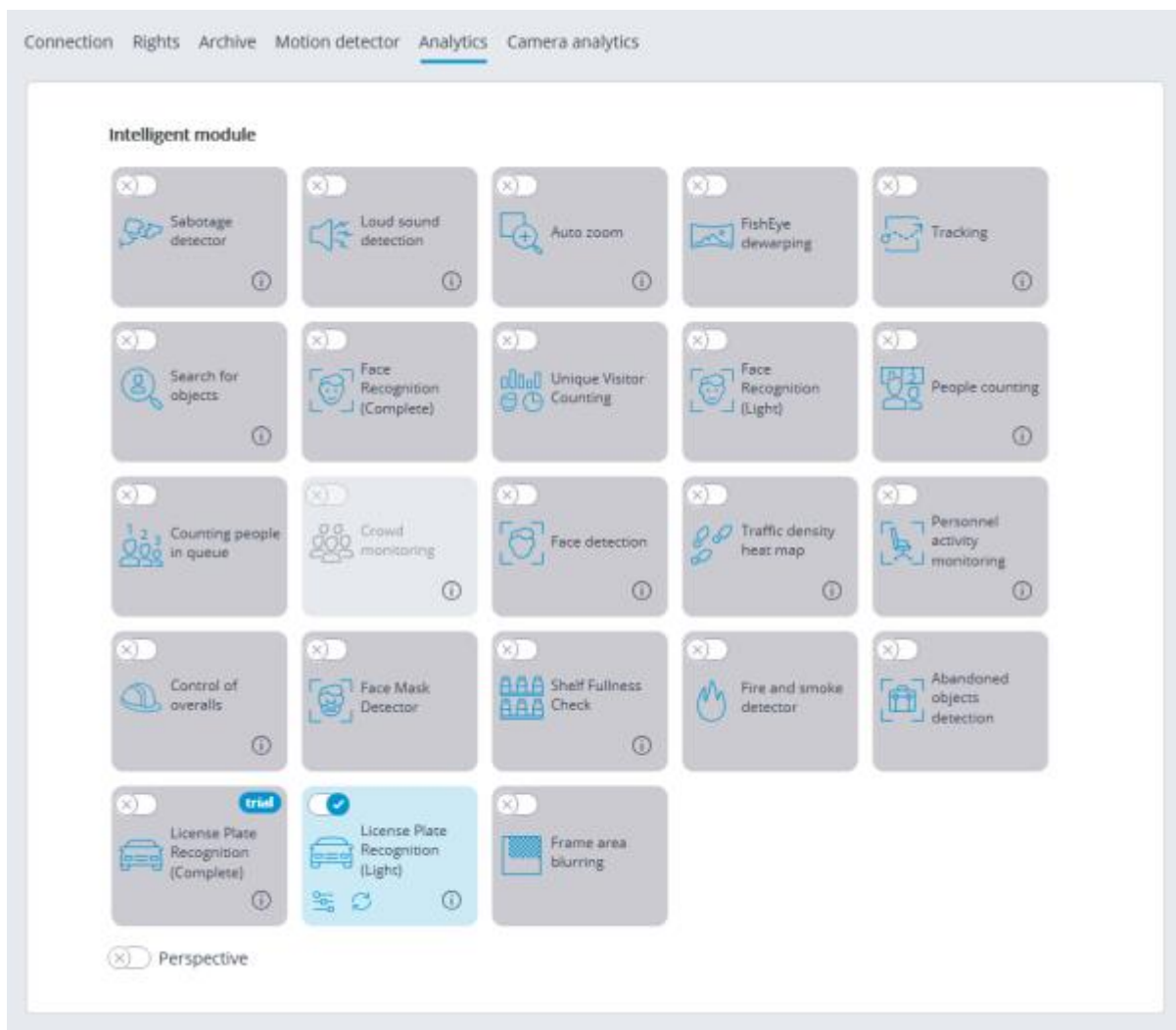
Module setup


Since this module is external and is not included into the basic Eocortex installation package, before setting it up and using it install it on the computer to which the cameras that will use this module are connected.

To use the module, enable and set up the software motion detector, then activate the module itself.

To do that, [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list, and set up the motion detector on the [Motion detector](#) tab on the right part of the page.

Then go to the [Analytics](#) tab and enable the module using the  switch, then adjust it pressing the  button.



Clicking the  button opens the module setup window.

It is only possible to use one of the two versions of the module on the same camera: **License Plate Recognition (Complete)** or **License Plate Recognition (Light)**.

Basic settings

The settings of the license plate recognition can be set on the **Basic settings** tab.

License plate recognition

Basic settings | Parking spots | Database | Barrier gate control

Necessary configuration

[Specify countries](#) | [Set the size range of a license plate](#) | [License plate search zone](#)

Additional settings

Use neural network for searching for license plate numbers ⓘ

Use neural network for recognizing license plate numbers ⓘ

The minimum number of frames with recognized car plate

The maximum number of unrecognized characters

Re-recognition lockout time, sec.

The minimum number of frames with unrecognized car plate

Quality of recognition 50%

Use motion detector

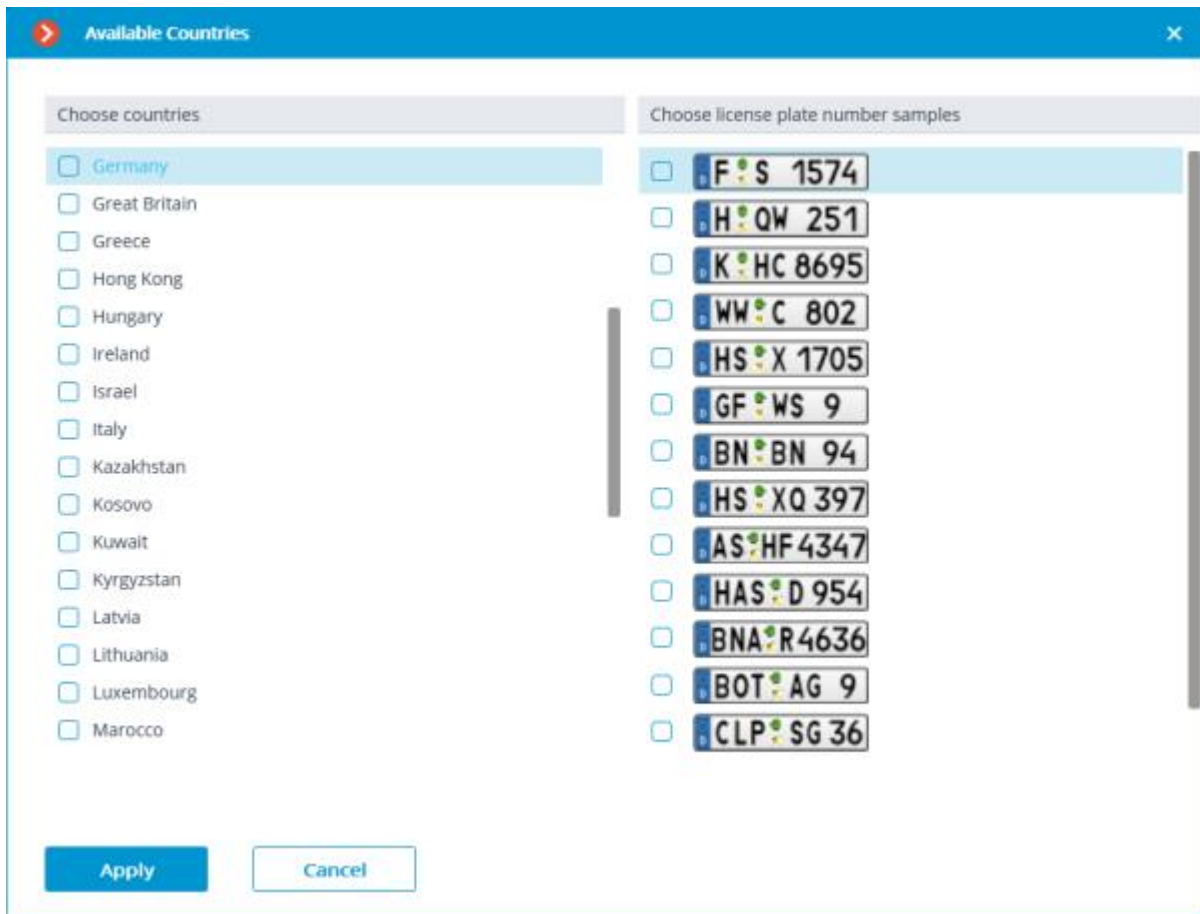
Direction of movement

Additional Save frames to disc

Save **Cancel**

SDK version: 2.41.1-rtm.
License type: Highway mode

Specify countries: opens a window where license plates and countries that should be recognized can be selected.

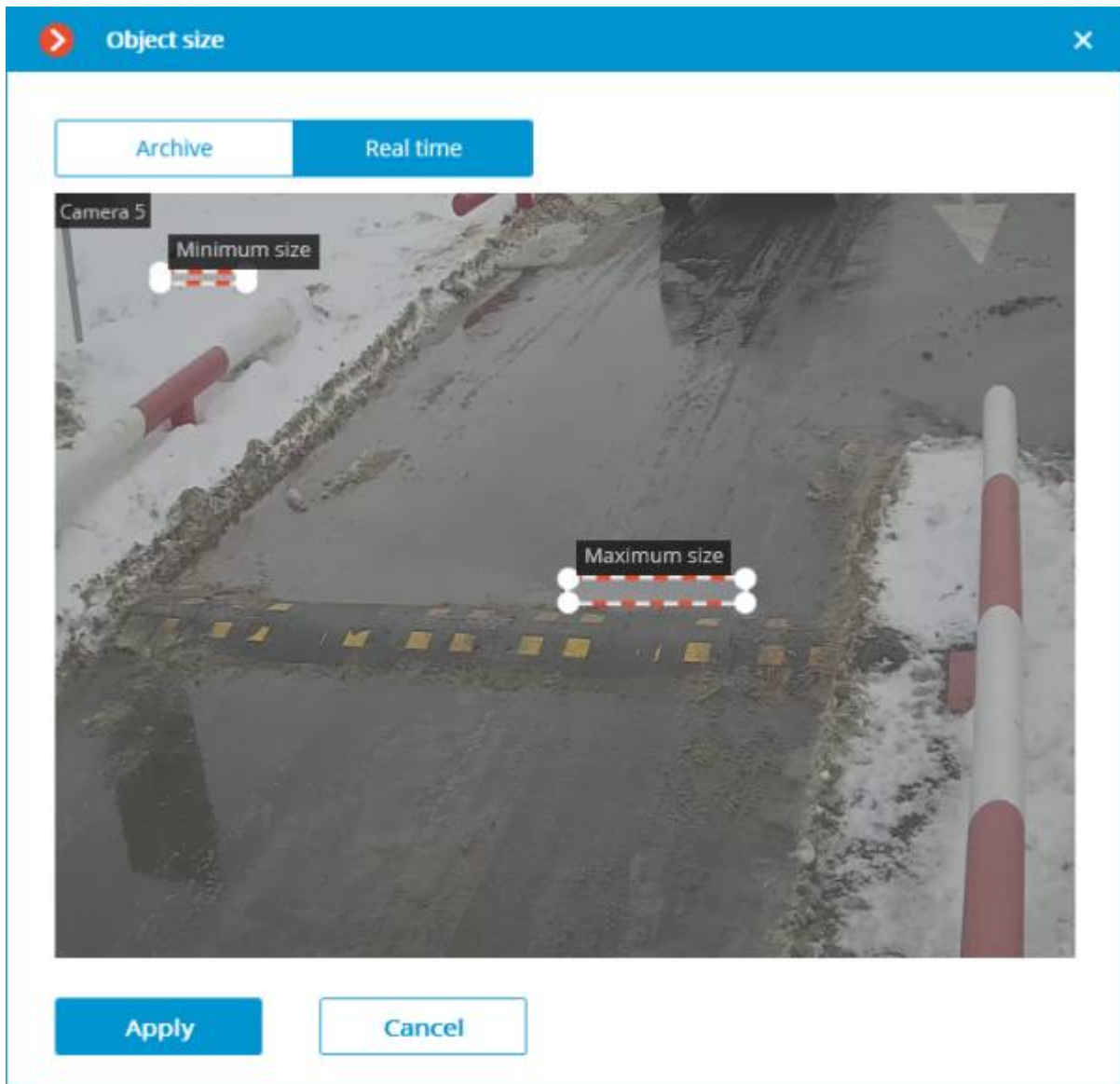


In the window that opens, mark the countries whose license plates should be recognized and select license plate templates for each selected country. Unmarked countries and templates will not be recognized.

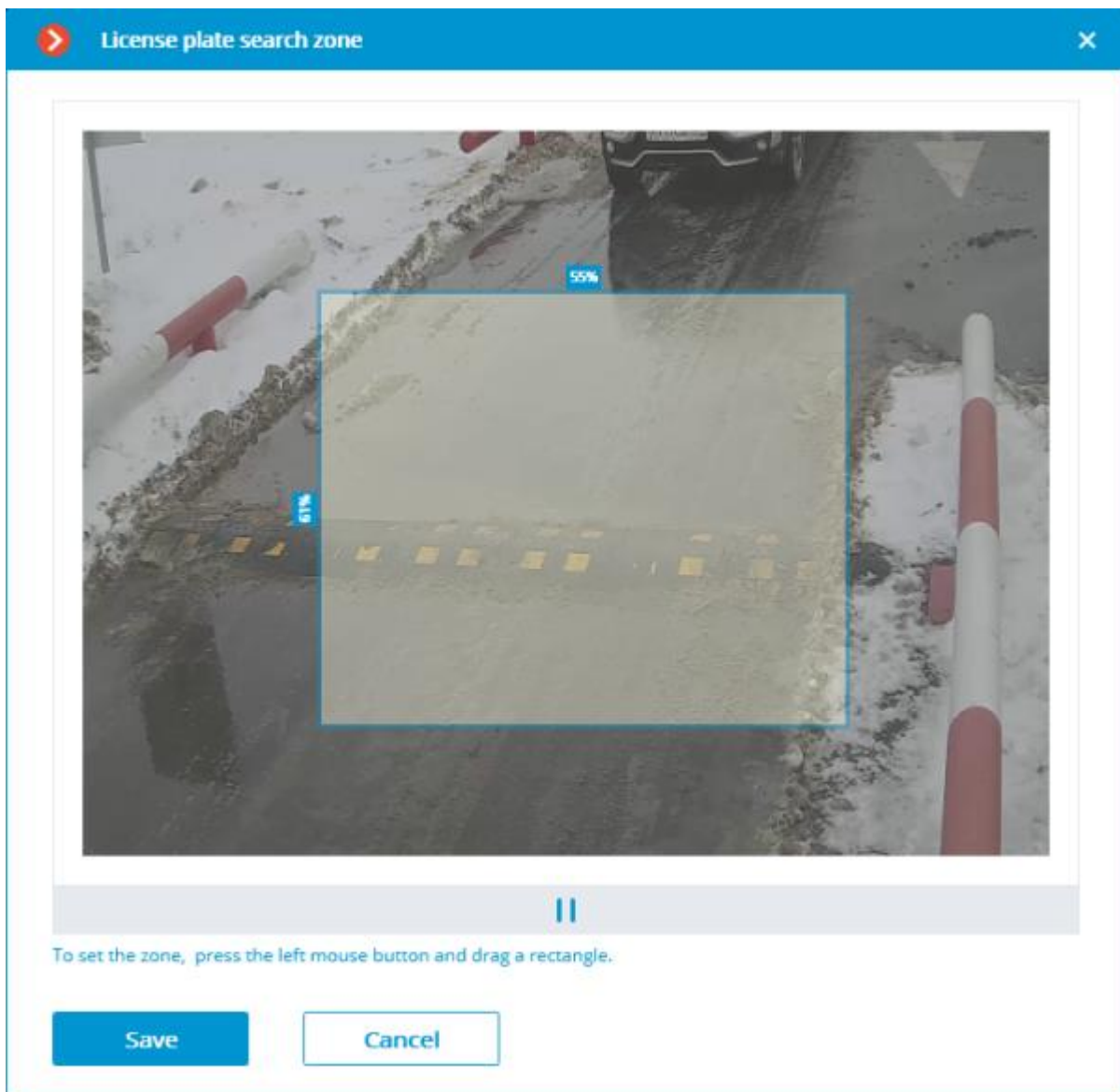
The empty list of countries means that the License Plate Recognition (Complete) module is not installed, or that errors occurred during its installation, or that there is no protection key, or its activation encountered problems.

The more countries and samples have been selected for recognition, the higher the computing load on the server. When the processor load exceeds 80%, the recognition quality may drop significantly.

Set the size range of a license plate opens the window of setting the minimum and maximum width of the license plates to be recognized



License plate search zone opens the window of setting up the zones of the frame where the license plate numbers to be recognized will appear.



For creating a new zone, it is required to press the left mouse button and, holding it, select a rectangular area. The total area uniting all the set zones will be used for recognition. To delete the zone, click on the close icon in the upper right corner of the zone.

Use neural network for searching for license plate numbers: Enabling this option allows to increase accuracy of searching for number plates. However, the server load from the given camera will increase 50% approx.

Use neural network for recognizing license plate numbers: Enabling this option will increase accuracy of license plate symbols' recognition. However, the load on the server from the given camera will increase 50% approx.

The minimum number of frames with recognized car plate: The license plate recognition event will be generated only after the preset number of frames, even if the number was recognized on the smaller number of frames. The larger this value, the higher the possibility to obtain the correctly recognized number.

The maximum number of unrecognized characters: this setting specifies the maximum permissible number of unrecognized characters when recognizing the license plate. If the quantity of the unrecognized characters exceeds the specified limit, the license plate recognition event is not generated.

Re-recognition lockout time, sec.: allows to avoid the repeated generation of the recognition event for the same number because the second recognition is only possible after the specified interval.

The minimum number of frames with unrecognized car plate: If it is not possible to recognize the license plate, the module generates a corresponding event. Using this setting, the number of frames in the analyzed sequence that the module will use in recognition attempts before deciding about the impossibility of recognizing can be adjusted. The higher this value, the higher the probability of obtaining a correctly recognized number.

Quality of recognition: the internal parameter of the module operation. It sets the filtering by the quality of recognition, meaning that the license plates the reliability of whose recognition is lower than a preset value will be automatically discarded. The value of this parameter shall be selected tentatively: when it is higher, the reliability of the recognized numbers will be higher, but the total quantity of the recognized numbers will be smaller; when it is lower, the quantity of the recognized numbers will be larger, but the number of recognition mistakes will increase.

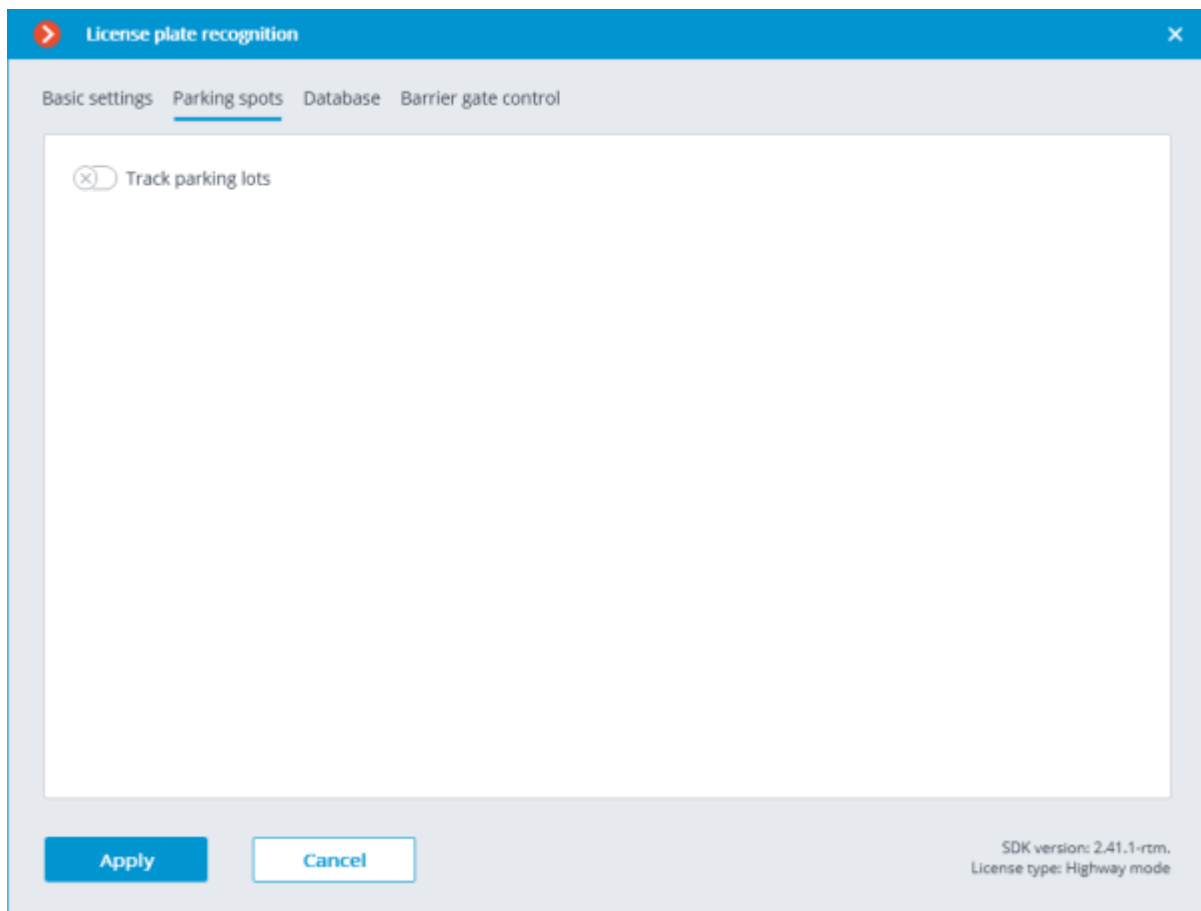
Use motion detector: Enabling this option allows detecting license plates only in case of movement on the frame.

Direction of movement: activation of this option allows to determine the direction of movement. From the drop-down menu, select which movement direction, relative to the camera position, will be assigned to license plates moving from top to bottom of the camera frame.

Additional: allows importing and exporting settings of the license plate recognition module.

Parking spots

On the **Parking spots** tab, settings for parking lots can be made.



To access the settings for parking lots, turn on the **Track parking lots** slider.

Parking lot settings are set for the entire system.

The following actions can be performed in the settings window:

create a new parking lot;

edit or delete an existing parking lot.

The following settings can be set for a parking lot:

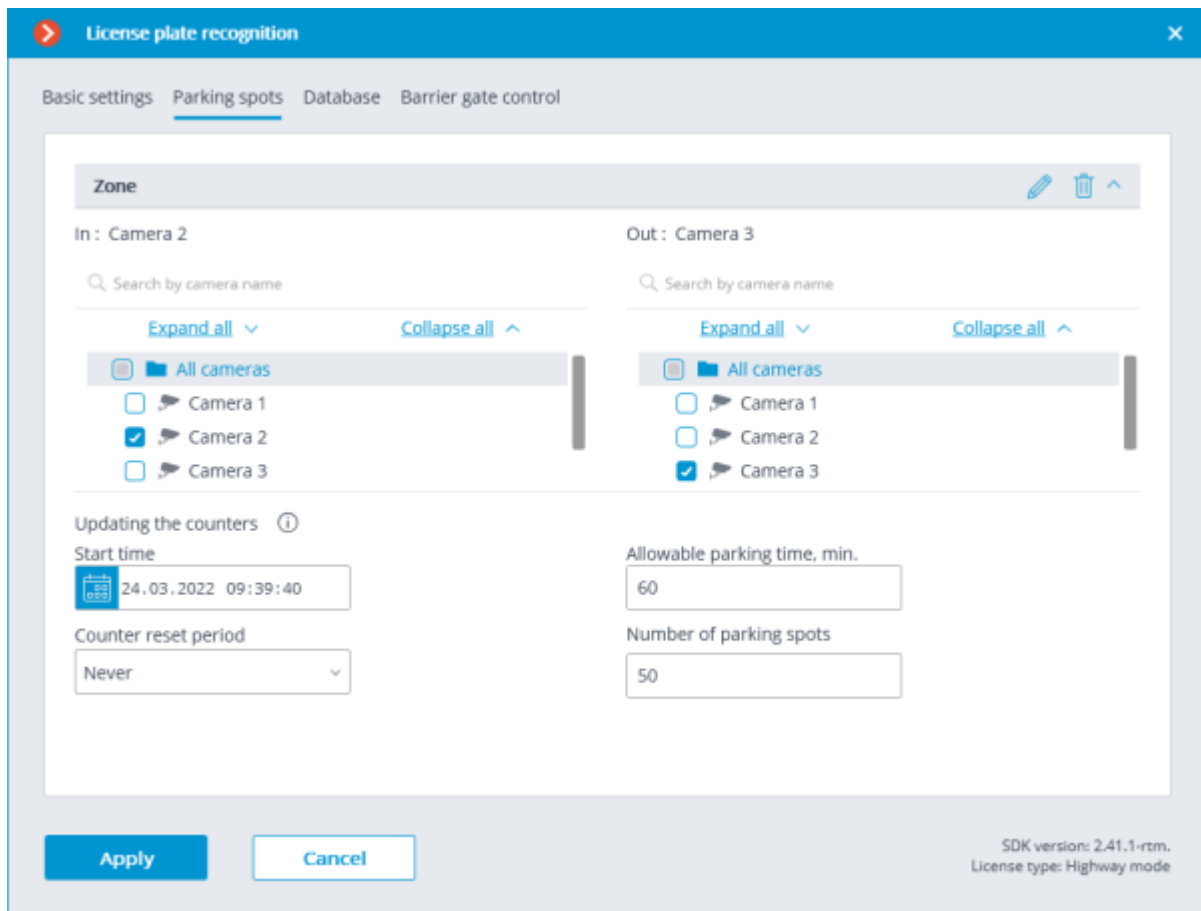
name;

one or more cameras working as entry and exit points;

permissible parking time;

number of parking spots;

period and time of resetting the counter.



The following events were added to the [Tasks by event](#) tab of the Automation section:

[Parking vehicle counter has been changed](#)

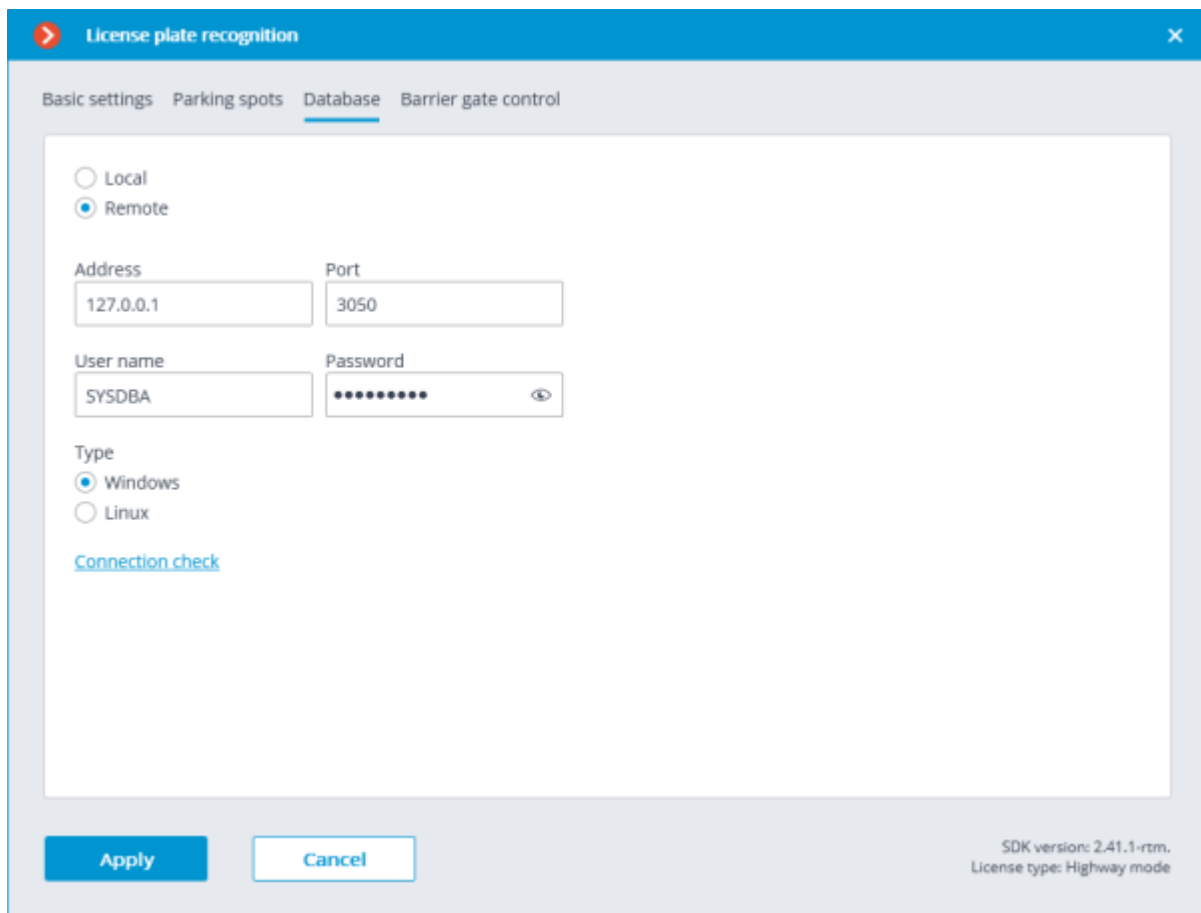
[Parking event](#)

[Parking lot occupancy has changed](#)

A new [user right](#), **Adjusting the number of occupied parking spots**, has been added to the Users section. This right allows the user to change the value of the occupied parking spots counter in the **Eocortex Client** application. By default, this right is enabled.

Database

The access to the license plate database can be set on the **Database** tab.



Two database deployment options are available: **Local** or **Remote**.

If the recognition process runs on only one server, it is recommended deploying the database on this server by selecting **Local**.

If the recognition process is running on several servers, the database should still be hosted only on one of them. For this purpose, select the **Remote** option for all cameras and specify the database connection parameters: server address, name and password of the database administrator. The same applies when the database of the module is deployed on one server, and the camera with the module enabled is attached to another one.

Eocortex version 3.6 and lower uses **Firebird** DBMS with the following default values:

- **Port:** 3050
- **Username:** SYSDBA
- **Password:** masterkey

Starting from version **Eocortex** 4.0, the module's database is handed over to the [PostgreSQL DBMS](#) with the following default values:

- **Port:** 5432
- **Username:**
 - For Windows: postgres
 - For Linux: eocortex
- **Password:** masterkey

Remote access to databases is not allowed by default in PostgreSQL and must be additionally configured if remote databases are used for analytics. All settings must be

done for the server where the database is stored. Settings are slightly different for [Windows](#) and [Linux](#) operating systems.

When the server is running for the first time after upgrading **Eocortex** to version 4.0 or higher, the existing module database will be automatically transformed to be compatible with **PostgreSQL**.

If connecting to a **Remote** database, use the DBMS **Username** and **Password** that are valid for the server storing the database.

Independent of the database location, the recognition events (date and time of recognition, coordinates of the object in the frame, binding of the recognized object to the database) will always be stored on the server to which the camera with the corresponding events is bound.

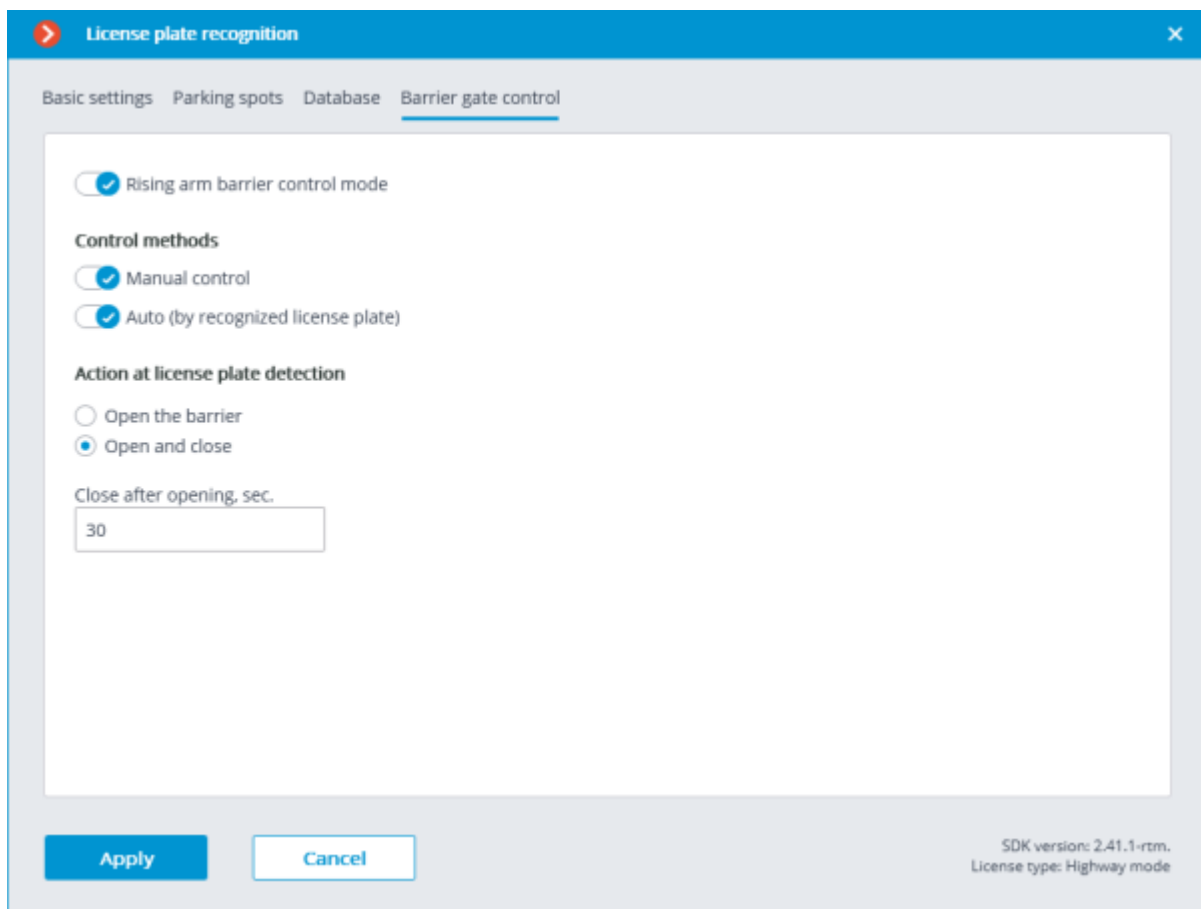
Synchronization with the database located on a remote server can take some time

When using a remote database, the [remote database replication mechanism](#) will be applied.

It is possible to check the availability of the database clicking the **Connection check** link. If the server is unavailable, the corresponding message will be displayed.

Barrier gate control

The settings of the module's interaction with a rising arm barrier can be made on the **Barrier gate control** tab.



The **Rising arm barrier control mode** must be activated to access the settings of the module's interaction with a rising arm barrier.

To use the module only for controlling a rising arm barrier, the **License Plate Recognition (Complete)** module license or protection key is not required. However, for ensuring the abovementioned functionality, it is necessary to have the **License Plate Recognition (Complete)** module support indicated in the **Eocortex** license file or software key for the corresponding quantity of cameras.

When the rising arm barrier control mode is activated, the following capabilities are available:

Control methods:

Manual control: allows the operator to open and close the barrier using the **Eocortex Client** application.

Auto (by recognized license plate): allows to open the rising arm barrier automatically if the recognized number is in the white list, i.e. is included in the group of vehicles for which the automatic opening of the barrier is envisioned.

In case the automatic rising arm barrier control is activated, the following options are available:

Open the barrier: if the recognized number is in the white list, the **Eocortex** server generates a command to open the barrier.

Open and close: if the recognized number is in the white list, the Eocortex server generates a command to open the barrier; then, in a number of seconds set in the **Close after opening in (sec)** field, a command for closing the barrier is generated.

Most of the modern rising arm barriers automatically close after the passing of one vehicle. For such barriers, the **Open the barrier** option shall be selected.

When the **Open and close** option is selected, it is imperative that the barrier itself has a feature of preventing its closing when a car is below the rising arm. It means that after generating the closing command the barrier's automatics must check if there is a vehicle or a person on the line of closing, and proceed with the closing only in the absence of the above.

Both in manual and in automatic barrier control mode, the opening or closing command is understood as the generation of the [Request to open rising arm barrier](#) or [Request to close rising arm barrier](#) event, correspondingly. To control the rising arm barrier, it is required to set the actions for these events depending on the control wiring diagram of the particular barrier.

For the **License Plate Recognition (Light)** module, the following types of [Automatic reports](#) can be configured: **License plate recognition, Entry/exit time recording, Vehicle counting.**

The module will start working only when [the settings are applied](#).

Related references

[Setting tasks by events](#)

[Setting automatic reports](#)

[Setting user rights](#)

Requirements and recommendations

The module works only with 64-bit version of **Eocortex**.

For correct operation of the module, it is imperative to properly choose, place and set up the camera, adjust the software motion detector and the module itself. When selecting the camera, it is necessary to take into consideration the image requirements, the controlled zone particularities, and the conditions of the installation and operation of the camera.

Requirements to the license plate image

The vehicle license plates (registration plates) to be recognized must conform to certain requirements. The **License Plate Recognition (Light)** module cannot guarantee the reliable recognition of a license plate if it is extremely dirty, low in contrast or significantly tilted or displaced. Below are the requirements to the license plates and their images (the vehicles whose license plates do not meet these requirements will not be identified).

No visible blurring of the license plate number on the image of the moving vehicle.

No sharp glare or shadows on the license plate.

The characters on the license plate must be in total accord with the applicable state standard as regards their font and size.

The license plate must meet the requirements concerning the cleanliness and legibility. All the characters shall be distinctly visible and not blocked by anything.

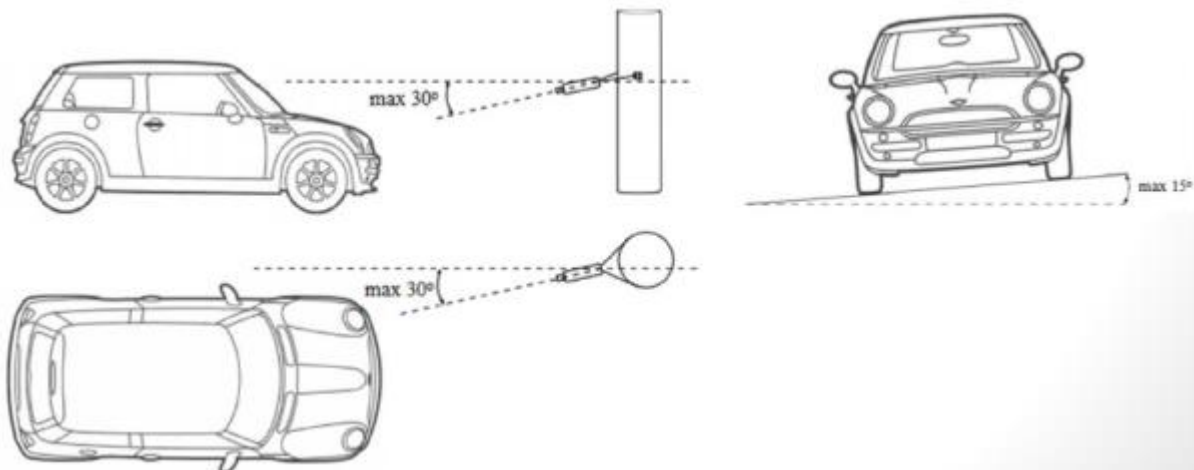
The images of the license plate numbers must be sharp. The contrast between the characters and the background must be at least 15%.

The height of the characters in the image must be at least 10 pixels.

The distortions of the perspective of the license plate image that occur due to the tilt and turn of the license plate's surface in relation to the camera axis shall not exceed 30°.

The horizontal deviation of the license plate must not be more than 15°.

The camera must have a straight part of the road in its field of view (without turns).



Recommendations on camera installation

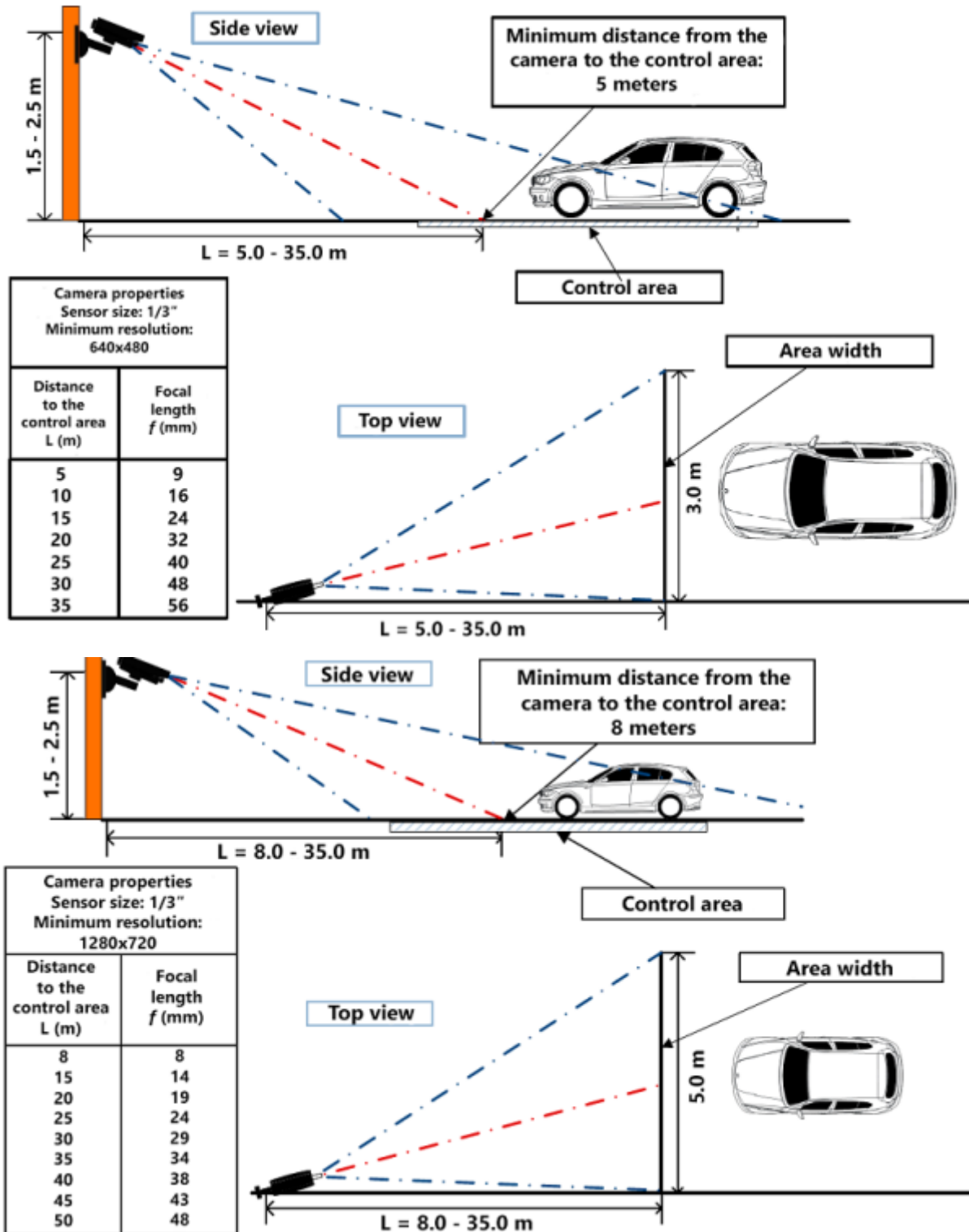
In this section you will find the recommendations on camera installation that need to be followed in order to ensure the reliable recognition of license plates in the control zone. Each installation location has its individual characteristics. This section contains the basic camera installation recommendations.

Installation of cameras on roads

For ensuring reliable recognition of the license plate numbers of the vehicles that travel in the stream, it is optimal to install the camera on a structure above the road in such a way that the camera is directed at the center of the recognition area. For example, if it is required to recognize

the plates of the vehicles travelling along a particular lane, the camera must be pointed at the center of that lane.

It is also possible to install the camera on a pole standing on the edge of the road. In this case it must be considered that when the recognition is to be performed on both lanes there may occur the situations when the farther lane will be blocked by the large vehicles such as a tractor-trailer unit, a truck, a bus etc. travelling on the lane close to the camera.



Installation of cameras indoors

Special considerations: low height; closeness to a license plate.

When installing the camera, it is required to avoid flaring from the vehicle headlights.

The camera must not face the outside because it will create flaring.

It is recommended to select one of the following installation arrangements:

Direct the camera toward the interior of the premises, at the rear license plate of a vehicle;

Install the camera at the height of 2 to 3 meters and direct it in such a way as to avoid flaring the camera lens by the light from the outside.

Recommendations on choosing and setting up a camera and lens

When choosing a camera for the license plate recognition purposes, be guided by the above requirements for the received image and recommendations for the camera mounting, as well as the following recommendations for the stream generation settings. Note that some features and settings may be not presented in the description and/or design of specific cameras.

Shutter speed (Exposure, electronic shutter)

To form a high-quality image of the license plate in motion, the camera should be able to set a fixed exposure time or limit the exposure value to avoid blurring caused by high movement speed. If the camera supports only the possibility to set a fixed exposure time, then it must additionally have a lens with automatic iris control (ALC) like **DC-Iris** or **P-Iris** to adjust the amount of light, coming to the sensor. At the same time, if the camera allows to set a limit on the maximum exposure time, then the lens without ALC can be used. In this case, the camera will automatically adjust the exposure depending on the illumination of the control area, but the exposure value will not be higher than the set value, which will help to eliminate high-speed blurring.

Some modern cameras may have both the ability to set a fixed exposure time and equipped with an ARD lens. It should be borne in mind that for such cameras, ARD does not work at a fixed shutter speed.

Recommended shutter speed (exposure) values depending on the speed of vehicles:

Maximum vehicle speed in the control area (kmph)	Recommended shutter speed (sec)
30	1/500
70	1/1000
150	1/2000

The actual shutter speed is not limited by these values and can be increased to get images of fast-moving vehicles sharp enough for license plate recognition.

Frame resolution

The minimum frame resolution depends on the size of the controlled area. For example, a camera resolution sufficient to control an area up to 5 meters wide should be at least 1280x720 pixels (1 Mpix), and for an area up to 7 meters wide, it is better to use at least 1920x1080 pixels (2 Mpix).

The actual resolution is not limited by these values and can be increased, but note that processing frames with higher resolution proportionally increases the load on CPU.

Frame rate (fps)

The minimum frame rate value depends on the speed of the vehicle crossing the control area. Recommended frame rates depending on vehicle speed are shown in the table below:

Maximum vehicle speed in the control area (kmph)	Recommended frame rate (fps)
30	6
70	15
150	25

The actual number of frames per second is not limited by these values and can be increased, but note that processing more frames proportionally increases the load on CPU.

Camera color mode

Cameras that only support color mode can only be used in areas with constant lighting. When using the camera in changing lighting conditions, a camera that works in monochrome or supports automatic Day/Night switching should be preferred.

Light sensitivity

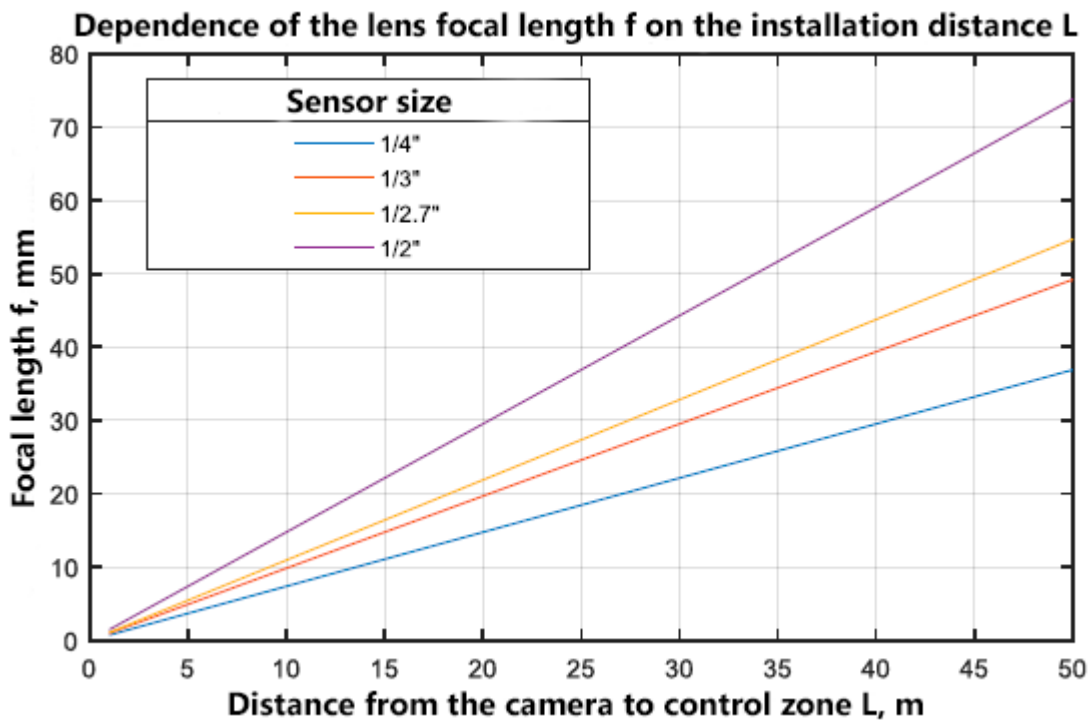
The sensitivity of a camera is important for creating high-quality images of a moving license plate. It is recommended to use cameras with a sensitivity of 0.01 lux or less (the lower the better). If the sensitivity of the camera is insufficient, then more powerful additional lighting of the control area is required.

WDR

Most modern cameras have a wide dynamic range (WDR) function that can be implemented both in software (digital WDR, HDR) and in hardware (optical WDR, true WDR). The use of WDR is most often necessary in conditions of unstable or non-uniform illumination of the controlled area, and when choosing a camera for such conditions, optical WDR should be preferred instead of digital WDR.

Focal length

The focal length of the lens determines the angle of view of the camera, which affects the size of the license plate in the image. For reliable recognition, the size of a single-line license plate in the image must be at least 120x20 pixels by width and height. The illustration below shows the dependence of the focal length of the lens on the installation distance of the camera and the size of its photosensitive sensor.



Module installation and update

Only one of the License Plate Recognition modules can be installed on the same server: either **License Plate Recognition (Complete)** or **License Plate Recognition (Light)**.

The module works only with 64-bit version of **Eocortex**.

This module is external; it is not included in the basic **Eocortex** distribution package and requires individual installation.

The module must be only installed on the computer with **Eocortex Server** or **Eocortex Standalone** application, to which the license plate recognition cameras are bound. The computers with just **Eocortex Client** application installed do not require installation of the module.

The module's version must match the version of **Eocortex** software installed on a particular computer.

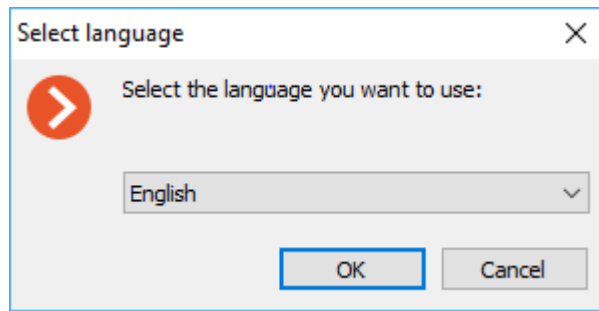
The installation files must be run under the administrator's account.

To update the module, it is required to perform the same steps as for the initial installation of the module. After selecting the installation language but prior to launching the installation wizard, the windows offering to uninstall the previous version will appear. It is required to confirm the uninstall. After the uninstall is complete, the module installation wizard will appear.

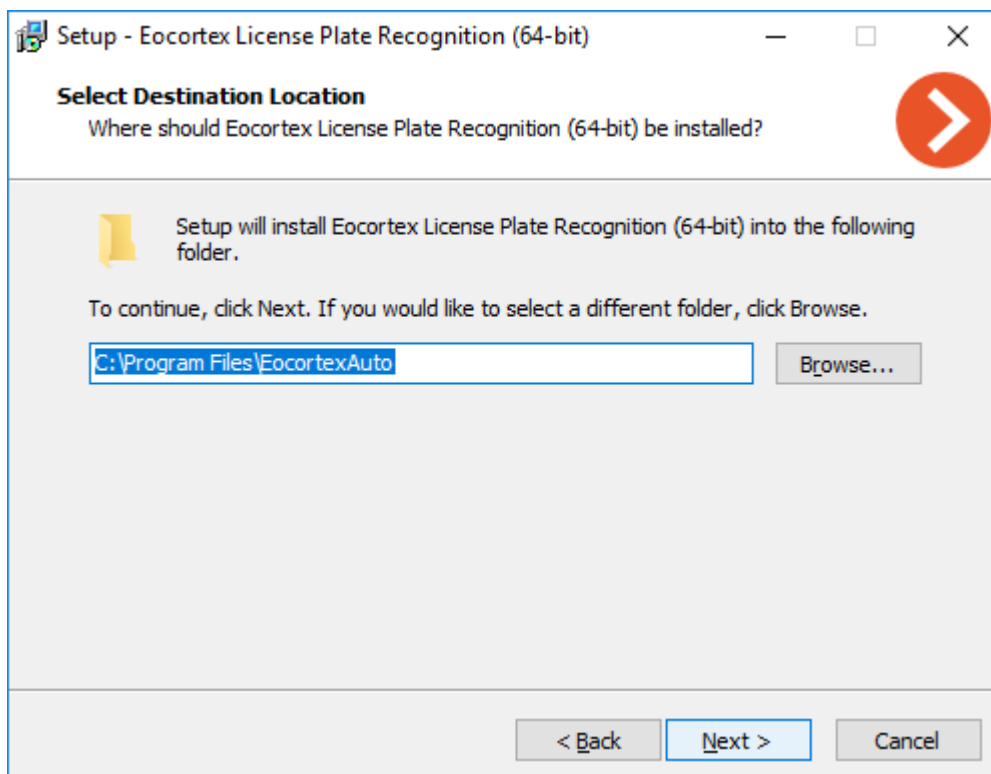
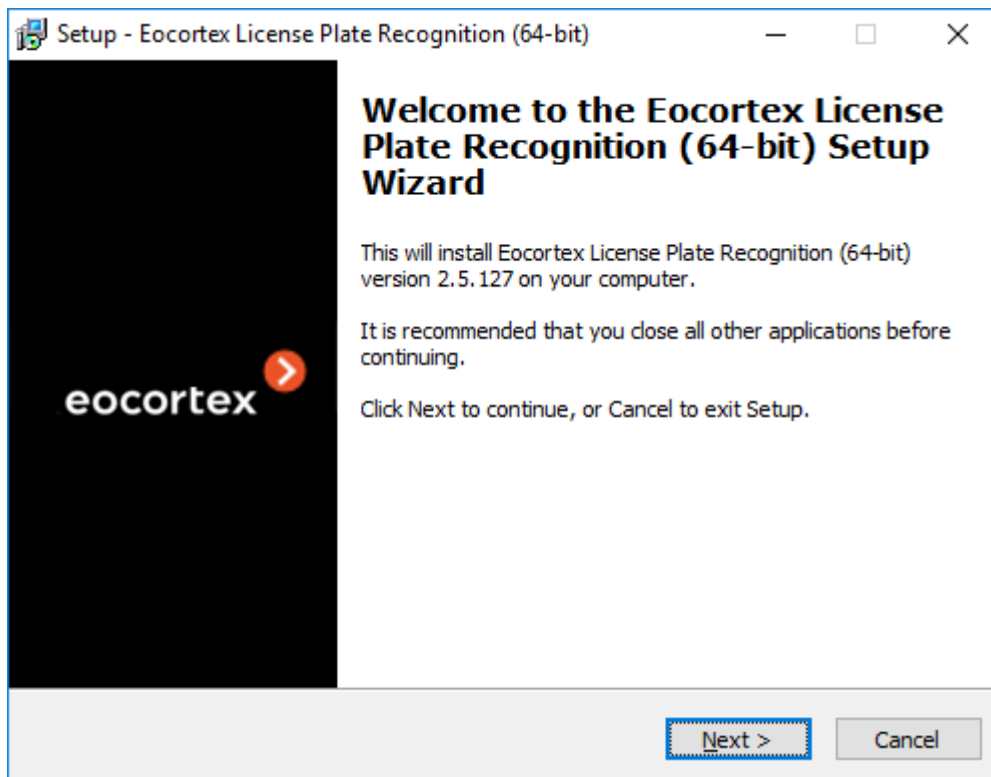
Before installing the module, it is required to stop all the **Eocortex** applications running on the computer, and to insert the module protection key in the USB port.

To install the module, it is required to run **EocortexAuto Installer_x64.exe** file.

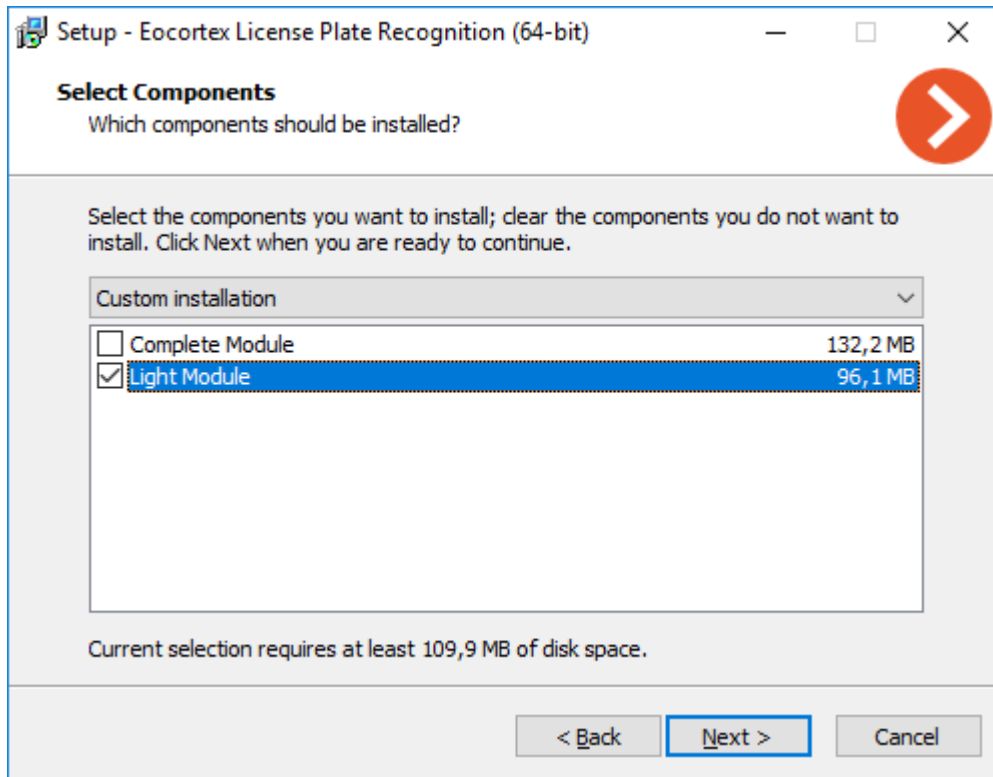
It is required to choose the installation language in the opened **Select language** window.



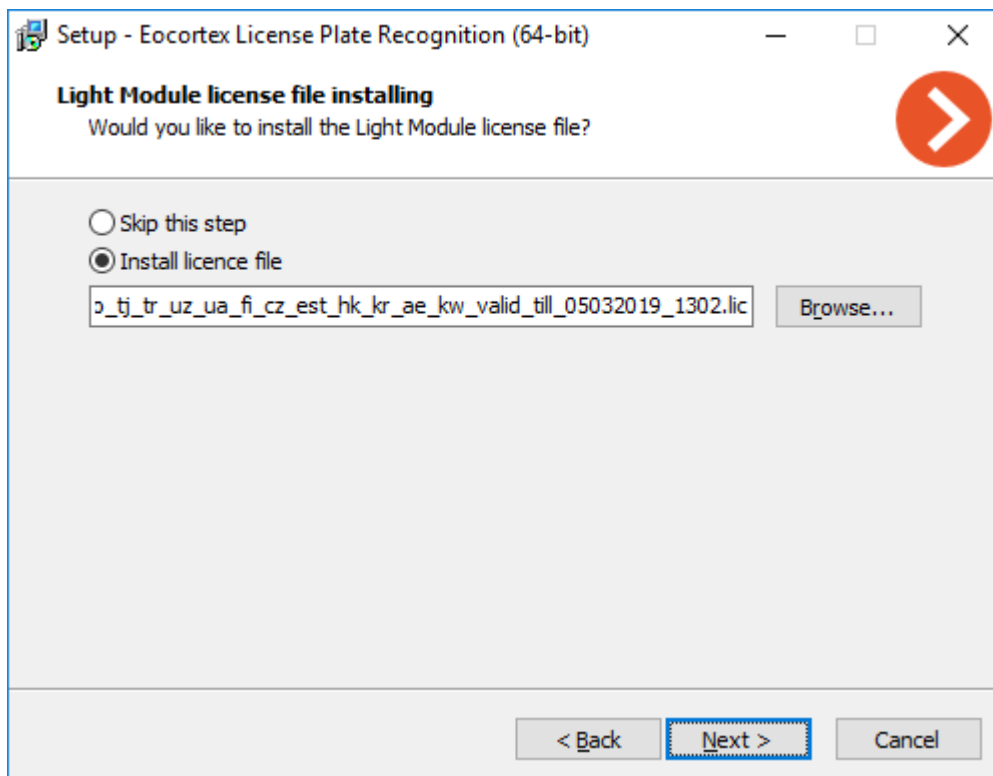
Then it is necessary to follow the steps of the installation wizard.

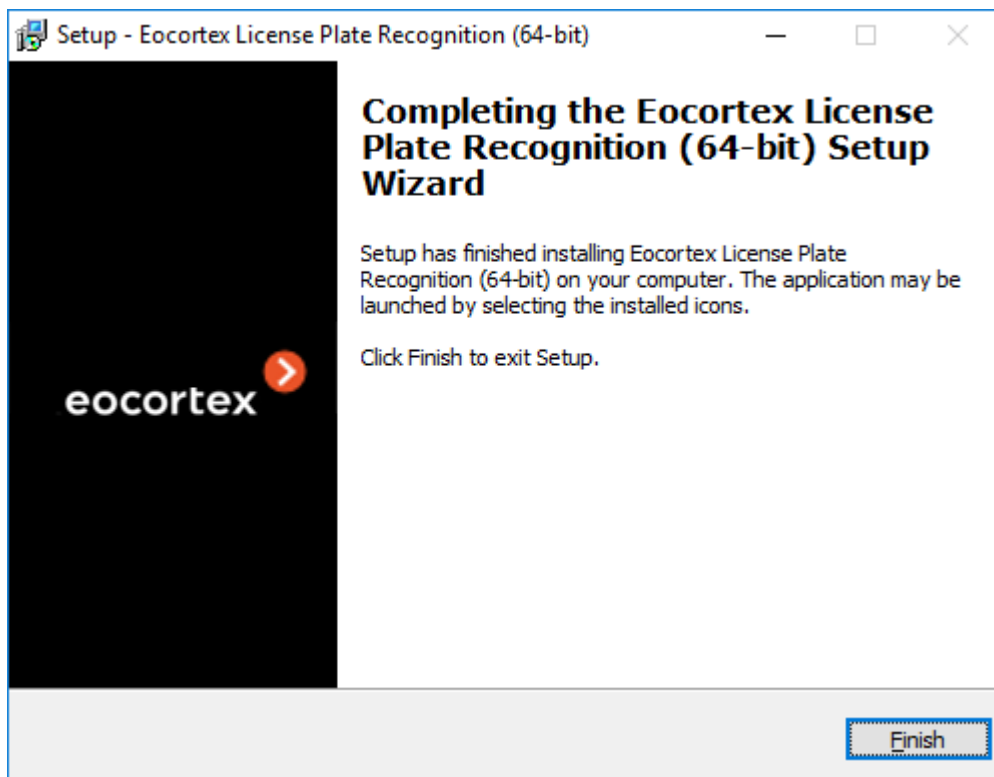
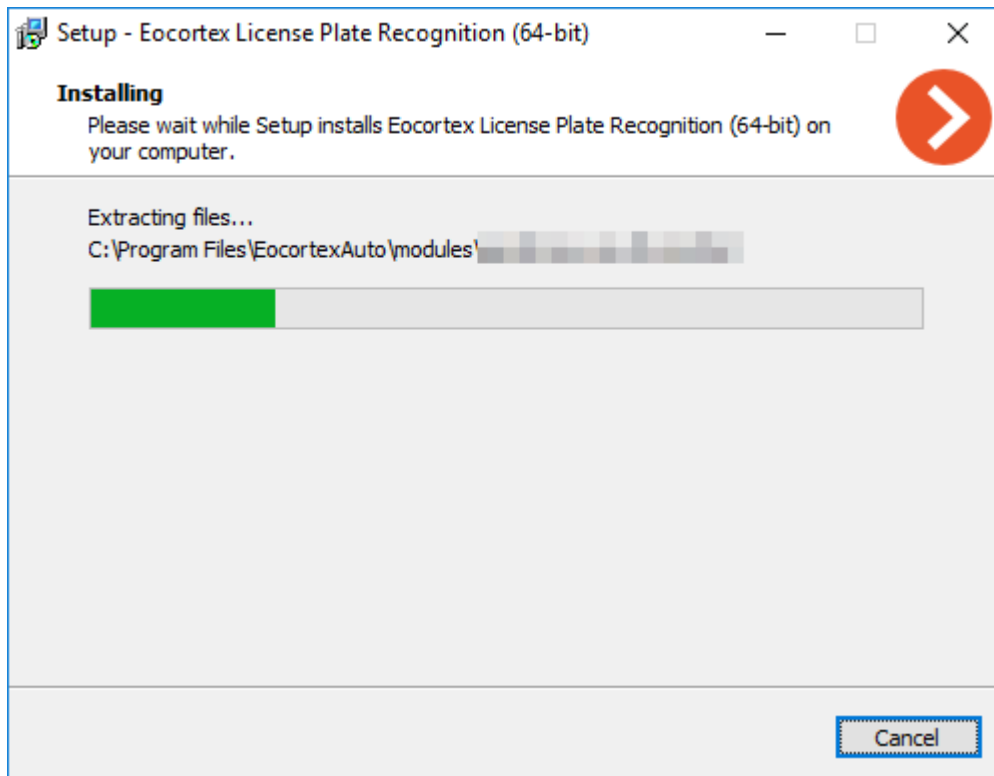


At the **Select component** step, choose the **License Plate Recognition (Light)** option.



At the next step it is required to indicate the path to the module license file.





By default, the module will be installed to **C:\Program Files\EocortexAuto** folder.

Licensing the module

Since the module uses the libraries developed by a third party that require separate licensing, two engineering elements are used for its license protection: the hardware protection key of the **License Plate Recognition (Light)** module and the license bound to the **Eocortex** protection key.

The presence of two license protection elements is just a technical particularity: only one license per server is to be paid for. The type of module (**Highway** or **Parking**) and the number of cameras for license plate recognition on the given server are indicated in the license.

The hardware protection key of the module is a Guardant USB key:



The **Eocortex** protection key may be a hardware or a software key.

The module is licensed according to the type of license and to the quantity of the recognition cameras. It is also required to specify the list of countries whose license plates it is planned to recognize.

Types of licenses:

- **Highway** is intended for the recognition of the license plates of the vehicles travelling at the speed of up to 150 km/h.
- **Parking** is designed for the recognition of the license plates of the vehicles travelling at the speed of up to 30 km/h.

List of all available countries (The license may include only a few countries from the list; therefore, for each specific license, the countries included in this license are indicated explicitly):

Azerbaijan (AZ), Armenia (AM), Belarus (BY), Belgium (BE), Bulgaria (BG), Czech Republic (CZ), Estonia (EE), Finland (FI), France (FR), Georgia (GE), Germany (DE), Great Britain (GB), Greece (GR), Hong Kong (HK), Hungary (HU), Ireland (IE), Italy (IT), Israel (IL), Kazakhstan (KZ), Kuwait (KW), Kyrgyzstan (KG), Latvia (LV), Lithuania (LT), Luxembourg (LU), Moldova (MD), Mongolia (MN), Montenegro (ME), Netherlands (NL), Poland (PL), Portugal (PT), Qatar (QA), Romania (RO), Russia (RU), South Korea (KR), Spain (ES), Sweden (SE), Tajikistan (TJ), Turkey (TR), Turkmenistan (TM), Ukraine (UA), United Arab Emirates (AE), Uzbekistan (UZ), Vietnam (VN).

For the operation of the **License Plate Recognition (Light)** module it is required that the module protection key with the activated license is inserted into the **Eocortex** server to which the cameras recognizing the license plates are bound. The **Eocortex** license with the specified support of the **License Plate Recognition (Light)** module must also be activated on the server.

One **Eocortex** server may have only one **License Plate Recognition (Light)** module protection key installed.

Only one of the modes (**Highway** or **Parking**) may be used on the same server.

The quantity of the cameras that recognize license plates on the server may be increased. To do it, it is required to purchase a license for the module, then, with the help of the **Eocortex Configurator** application, [update the Eocortex license](#) and activate the license of the module by launching the module installation software and selecting the corresponding key activation option.

The type of license may also be changed, but only from **Parking** to **Highway**. To do it, it is required to purchase a license for the module and activate the license of the module by launching the module installation software and selecting the corresponding key activation option.

In the multiserver system, it is possible to set up the license plate recognition on the cameras bound to different **Eocortex** servers, however:

- It is required to use a separate module protection key on each server, and the corresponding number of cameras that perform recognition must be indicated in the **Eocortex** licenses;
- The common database and the common archive of the recognized license plate numbers will be used for all cameras.

If third party software using Guardant protection keys is installed on the **Eocortex** server, the **License Plate Recognition (Light)** module operation on such server may be unstable.



Loud Sound Detection



The **Loud Sound Detection** module allows to register the situations when the sound received by the camera microphone exceeds the preset level. Additionally, it displays the current sound level in the Eocortex Client application.

Details

For the proper operation of the module, it is required to correctly aim the microphone and set up the module.

Compatibility with other modules

OS	Requires Eocortex motion detector		Neural network	Compatible with modules		Incompatible with modules
			Standard	Special		
√	√	–	–	–	Abandoned object detection module Auto Zoom Counting People in Queue Crowd Monitoring Emergency Vehicle Detection Face Detection Face Mask Detector Face Recognition (Complete) Face Recognition (Light) Fire and Smoke Detector FishEye Dewarping Frame Area Blurring License Plate Recognition (Complete)	–

OS	Requires Eocortex motion detector	Neural network	Compatible with modules	Incompatible with modules
		Standard	Special	
				License Plate Recognition (Light) Object Classification and Counting People Counting Personnel Activity Monitoring Sabotage Detector Search for Objects Shelf Fullness Check Tracking Traffic Density Heat Map Uniform Detector Unique Visitor Counting




- ✓ supported and required for the module to work
- + supported and provides additional features of the module
- not supported or not required for the module to work

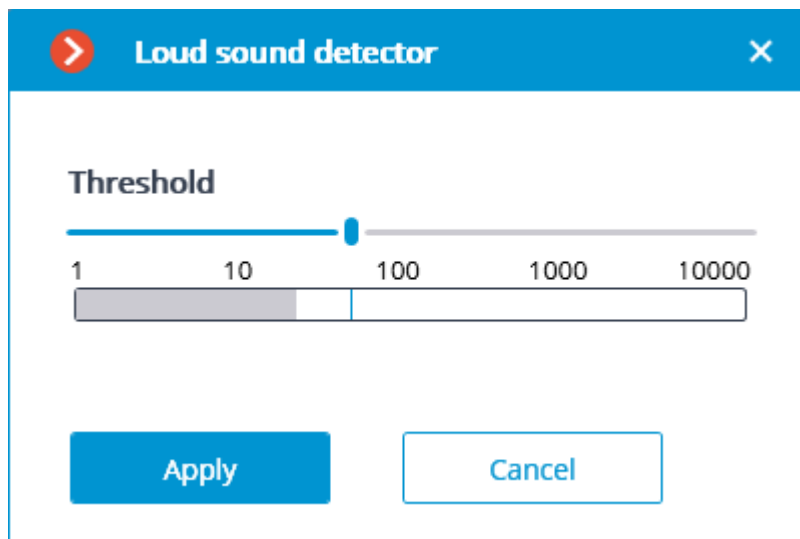
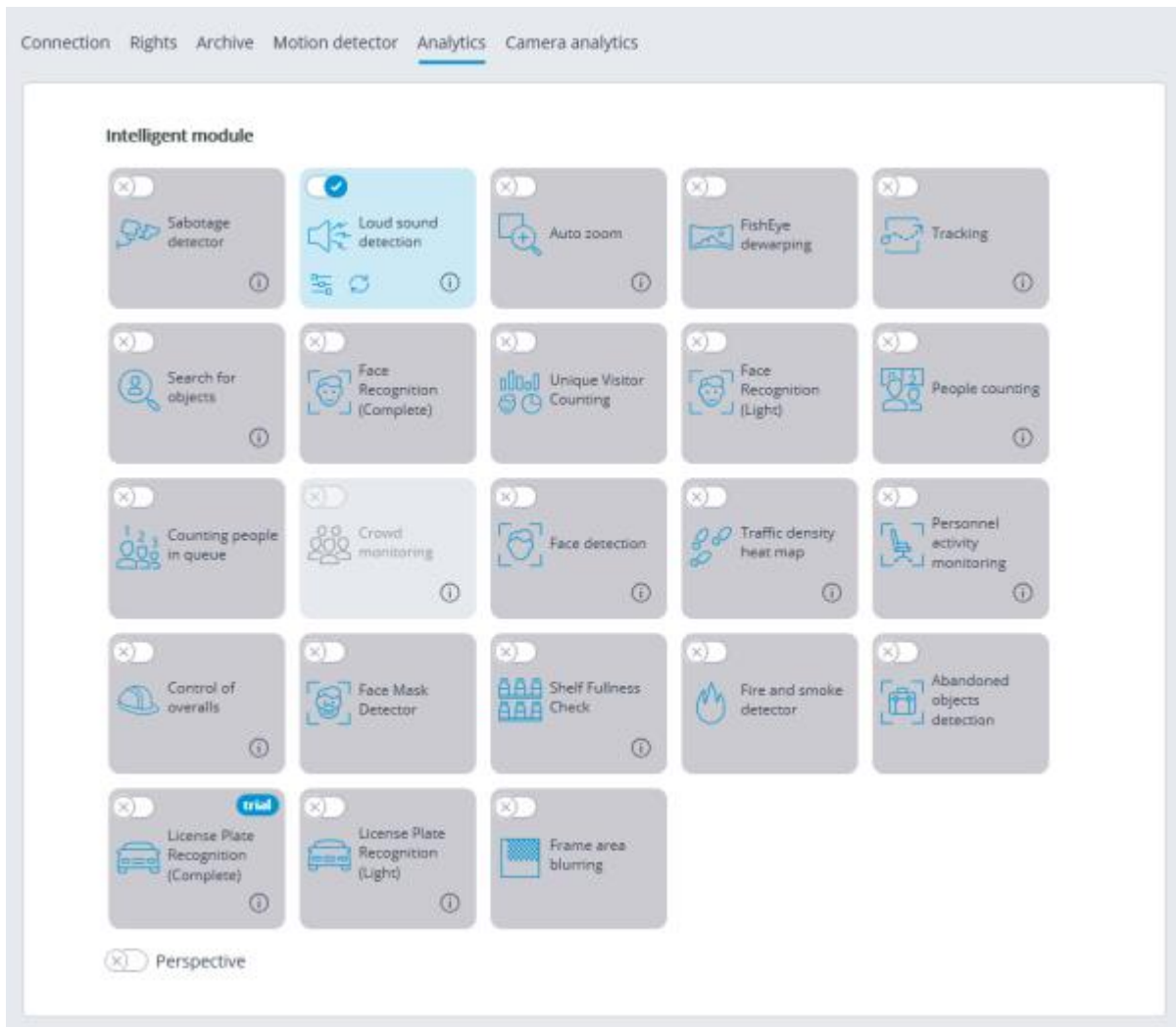
Use

The use of video analytics modules in **Eocortex Client** is described in the **User's guide**, in the **Eocortex Client / Video analytics** section.

Module setup

To use the module, enable and set it up.

To do that, [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list on the left side of the page, go to the [Analytics](#) tab, enable the module using the  switch and adjust it pressing the  button.



The sound level logarithmic scale will appear in the opened setup window, where the sound level entering the camera microphone will be displayed in real-time mode. Using the **Threshold** slider, you will be able to set the sound level that will trigger the detector.

The module will start working only when [the settings are applied](#).

Requirements and recommendations

It is required to take into consideration that the detector reacts only to the level of sound. For the detector, the sounds of various types differ only by their levels. The subjective perception of the sound level by a person and the evaluation of the level of a particular sound among the sounds of the camera's sound stream by the detector may differ; for example, the camera may be more sensitive to the sounds of a particular frequency, or it may subdue sounds according its own algorithms.

Another adverse factor is the high noise level that leads to the situation when some sounds that require a response (for example, shouts or banging of a door) become poorly perceivable against the sounds in the background, making the triggering of the detector unreliable.

Also, wind gusts perceived by a camera microphone not protected against the wind may lead to the false triggering of the loud sound detector.

The abovementioned factors are required to be taken into consideration at the stage of choosing a camera or a microphone as well as when setting up the detector.

Object Classification and Counting

The **Object Classification and Counting** counts objects that are crossing specified lines or contained in predefined areas of arbitrary shape, distinguishing them by categories.

Capabilities of the module

Counting of objects of a specified category:

People

Animals

Vehicles by type: Passenger cars, Buses, Trucks, Motorcycles.

Displaying of counter meters in the **Eocortex Client** application.

Generation of analytical reports.



Manual and automatic export of analytical reports, as well as automatic reports sending via email.

Details

For counting objects of specific categories, it is necessary to [install the Eocortex Neural Networks package](#). For the best performance it is recommended to use **Eocortex Neural Networks Special**.

The **Object Classification and Counting** is able to work on the same camera simultaneously only with the **License plate recognition** module.

Compatibility with other modules

OS	Requires Eocortex motion detector		Neural network	Compatible with modules	Incompatible with modules
			Standard	Special	
√	√	–	√	√	Abandoned object detection module Auto Zoom Counting People in Queue Crowd Monitoring Emergency Vehicle Detection Face Detection Face Mask Detector Fire and Smoke Detector Face Recognition (Complete) Face Recognition (Light) Frame Area Blurring FishEye Dewarping License Plate Recognition (Complete) ¹ License Plate Recognition (Light) ¹ Search for Objects Loud Sound Detection Tracking Uniform Detector People Counting ¹ Unique Visitor Counting Personnel Activity Monitoring Sabotage Detector Shelf Fullness Check Traffic Density Heat Map

¹ If used in combination, module selection is available to display the results of the analysis in the Eocortex Client application

- √ supported and required for the module to work
- + supported and provides additional features of the module
- not supported or not required for the module to work


Use



The use of video analytics modules in **Eocortex Client** is described in the **User's guide**, in the **Eocortex Client / Video analytics** section.

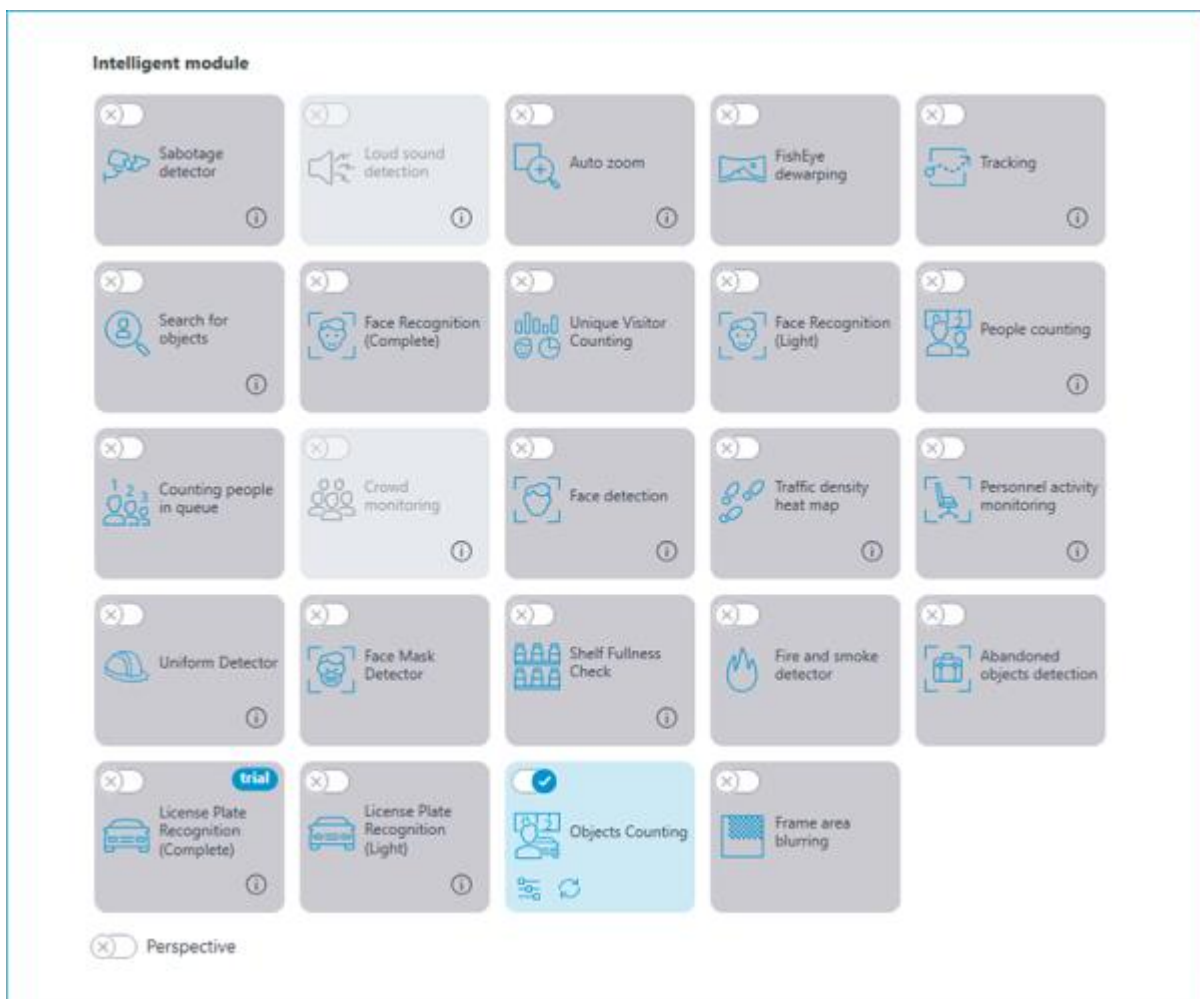
Module setup

Before using the module, it is required [to install the Eocortex Neural Networks package](#).

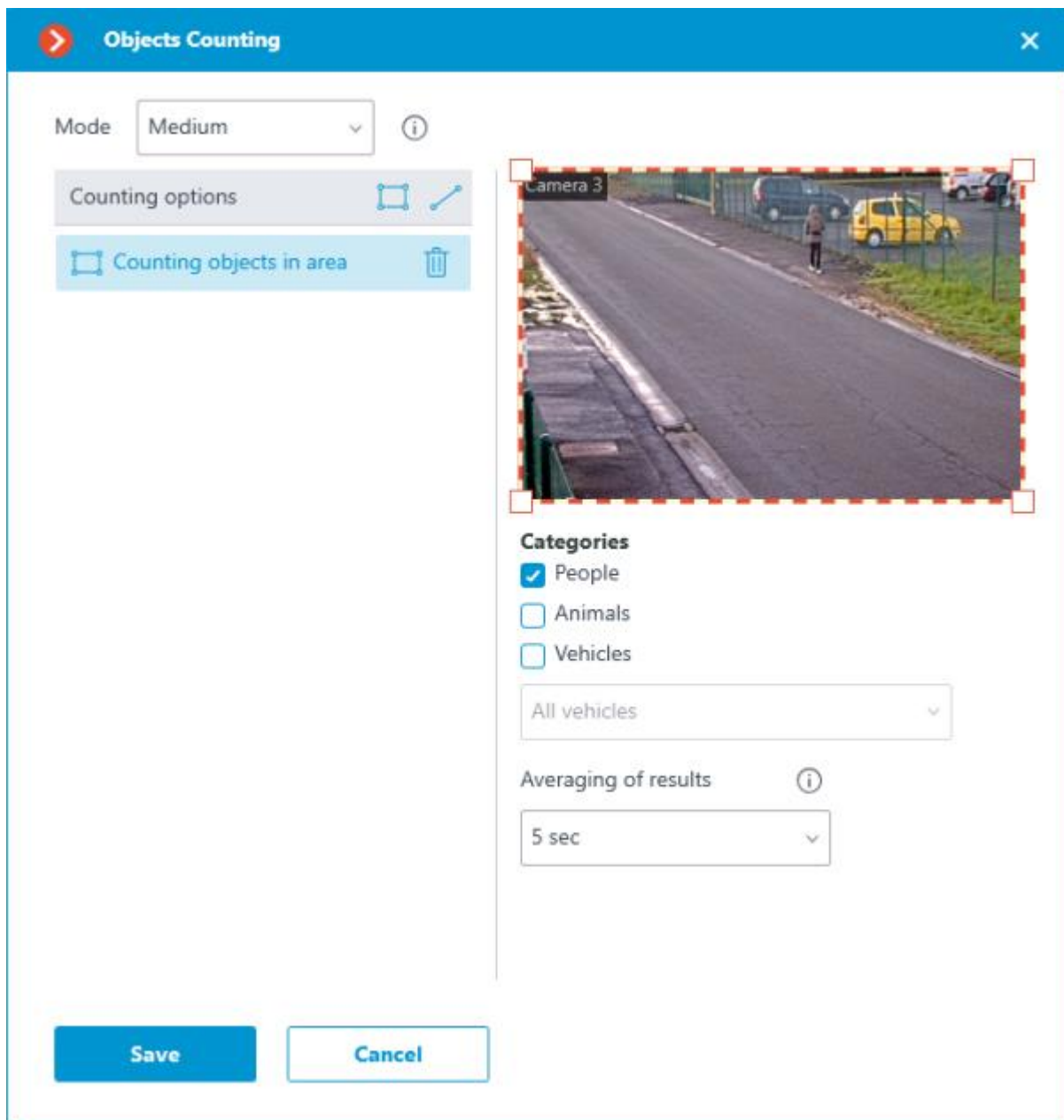
To use the module, enable and set up the software motion detector, then activate the module itself.

To do that, [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list, and set up the motion detector on the [Motion detector](#) tab on the right part of the page.

Then go to the [Analytics](#) tab and enable the module using the  switch, then adjust it pressing the  button.





Clicking the  button opens the module setup window.



When setting up the module, it is necessary to select the operating mode. The following modes are available:

- Slow mode: for standing or slowly moving objects. For example, parking lots, people in line, etc. Shift of objects on the frame in one second should not exceed 1/4 of their size in the direction of movement.
- Medium mode: for objects moving at an average speed. For example, walking people, slow-moving vehicles in a parking lot, etc. Shift of objects on the frame in one second should not exceed their size in the direction of movement.
- Fast mode: for counting objects that quickly come into the frame and leave the field of view. Vehicles on the highway, people running, etc. Shift of objects on the frame in one second should not exceed 2.5 object's sizes in the direction of movement.

In the **Counting options** list it is possible to set and configure counters. The following counter types are available:

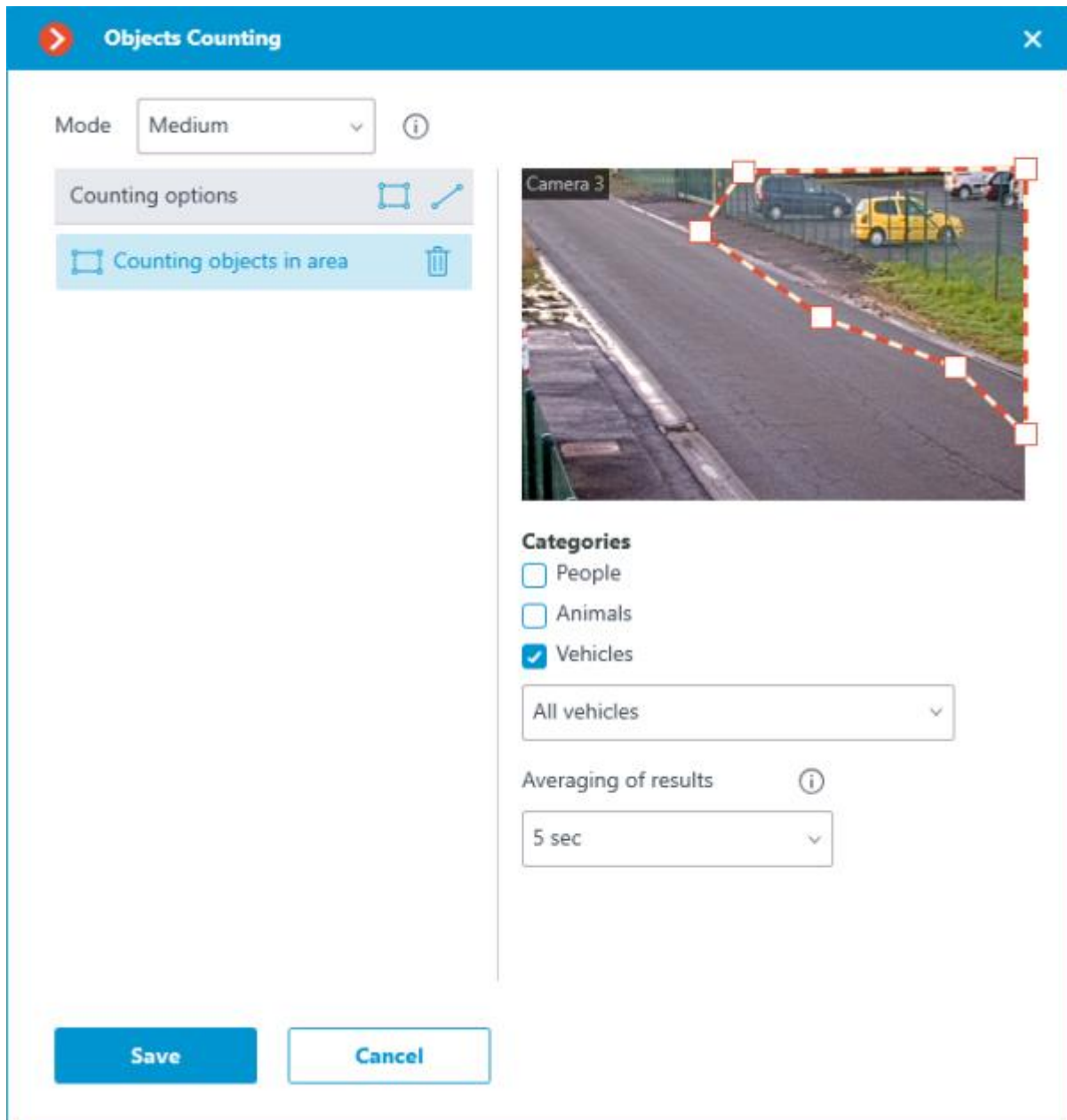
-  **Counting objects in area:** The count of objects within the area.
-  **Line intersection:** The count of objects that crossed the line in a specified direction.

Counting objects in area

To add an area, click • • . When doing this, a rectangular area will be created in the preview window.


The zone configuration can be changed by dragging the key points at the corners of the polygon. To add a key point, it is required to double-click the left mouse button on the line; to delete - right-click on the key point.

For counting objects in the area, it is necessary to set the interval of averaging results. Averaging makes counting more resistant to sudden changes in the number of objects. The longer the averaging period, the slower the result will change.

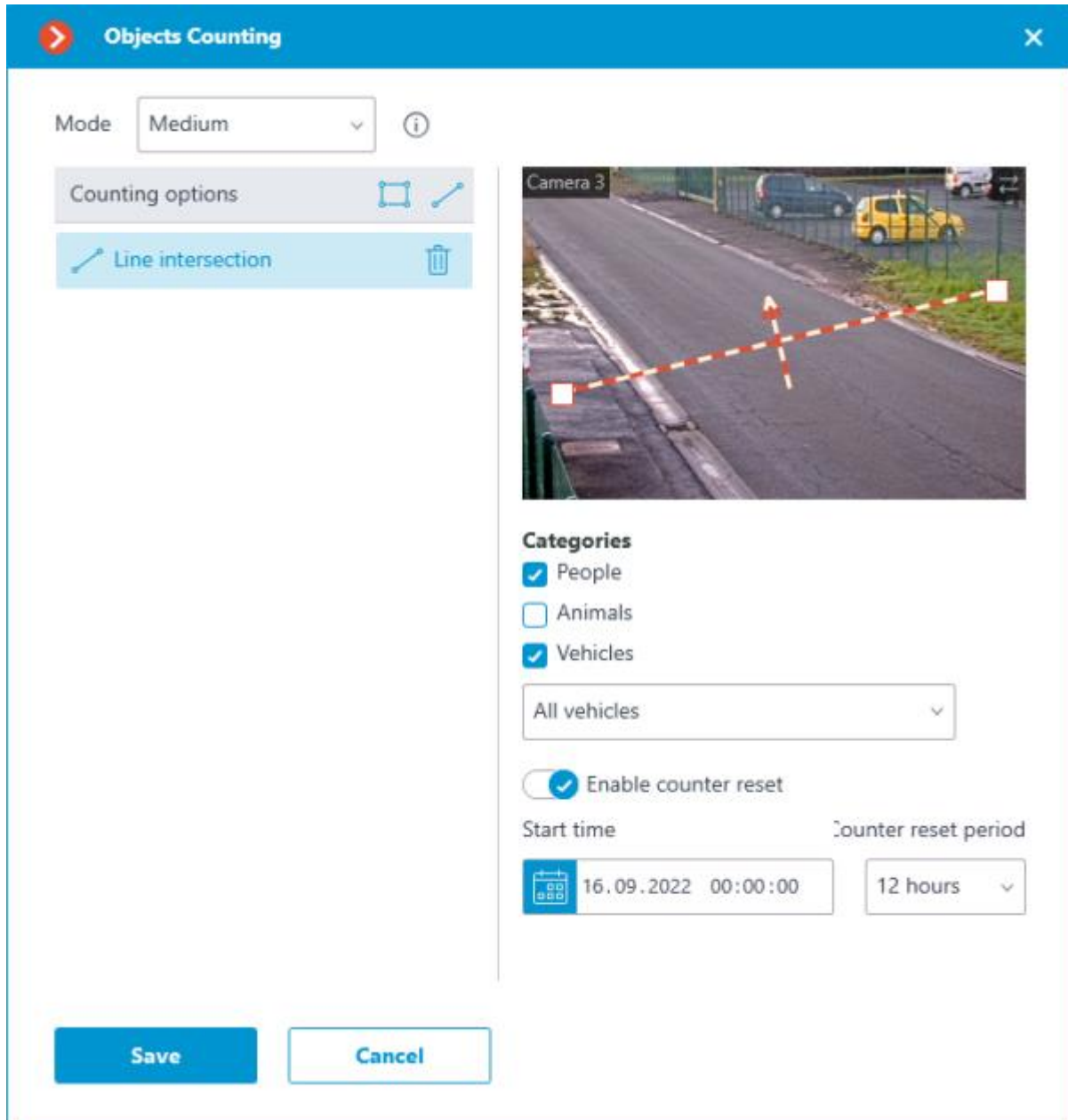


Line intersection

To add a line, click • • . When doing so, a straight line will be created in the preview window. Position of the line can be changed by dragging it by the waypoints on the tips.

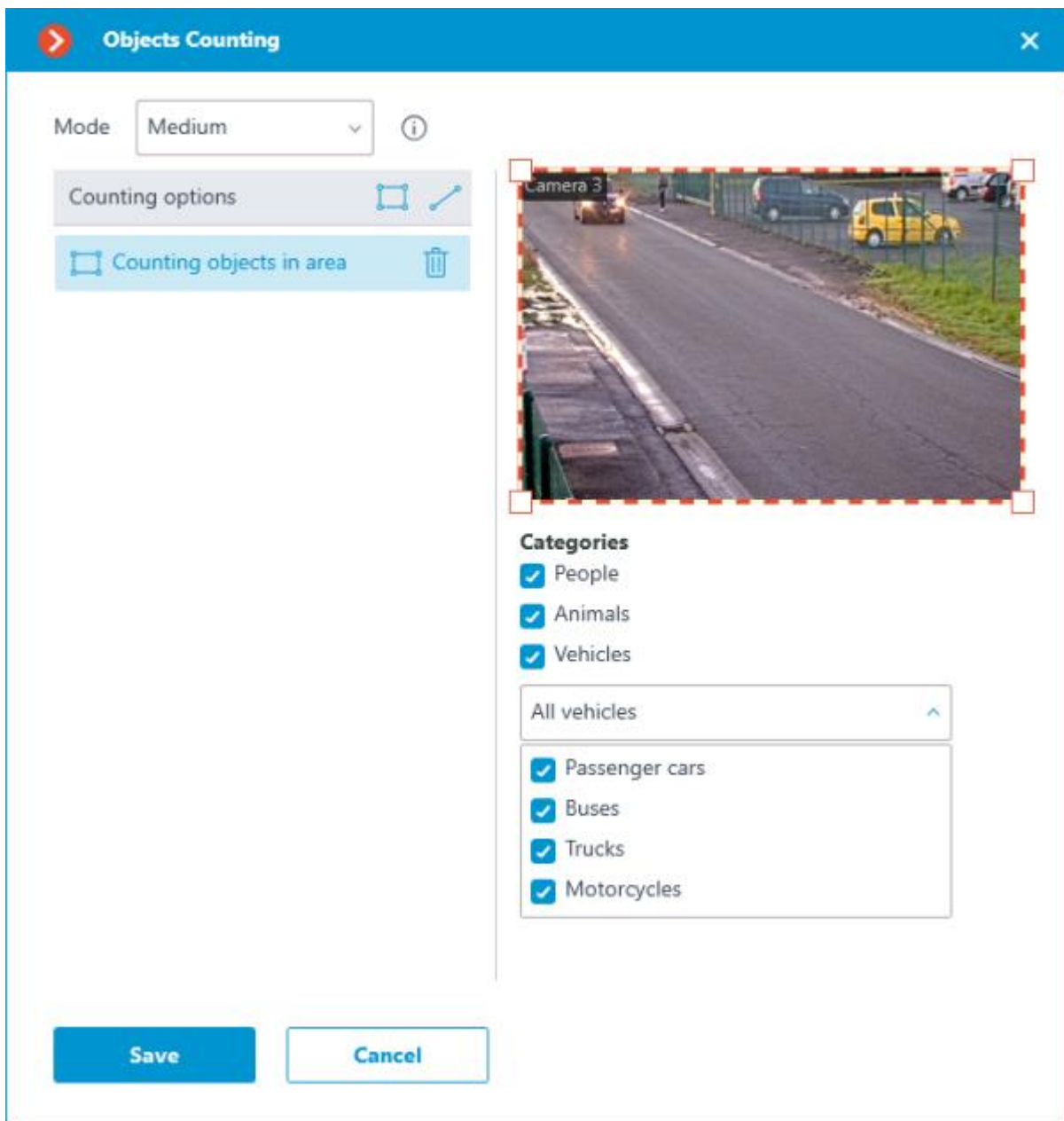
To reverse the direction of counting, click the  button in the upper-right corner of the preview window.

For counting objects crossing the line, resetting the counters can be enabled. It will require configuring the parameters for resetting the counters.



It is also necessary to select objects of which categories will be counted. The following categories are available:

- People
- Animals
- Vehicles by type: Passenger cars, Buses, Trucks, Motorcycles.



The module supports generation of [Automatic reports](#).
The module generates **Object Classification and Counting** events.

The module will start working only when [the settings are applied](#).

Related references

[Configuration of tasks by events](#)

[Configuration of automatic reports](#)

Requirements and recommendations

Hardware and software



For counting people, vehicles and animals it is necessary to install the **Ecortex Neural Networks** package.

The following equipment is required to use this neural network-based module:

- A processor with AVX instructions support;
- An **NVIDIA** video card (GPU) with the computation capacity index of at least 6.5 and with at least 4 Gb of memory; the parameters and performance of the video card must be similar or better than those of **NVIDIA GTX 1650 Super** model;
- version of the video card driver at least 460;
- swap file at least half of the total RAM size.

If the package will be installed on a virtual machine, it may additionally be required to:

- Enable support for AVX instructions in the guest machine settings;
- Use GRID drivers for GPU virtualization.



Eocortex must use video cards selected for running neural networks in monopoly mode. It is not allowed to use such card for other applications or tasks that consume GPU resources including for displaying video. Simultaneous use of a video card for several tasks may lead to incorrect system operation: from analytics performance degradation to server instability.



The neural network works with the 64-bit version of **Eocortex** only.



When upgrading Eocortex to another version, it is necessary to also upgrade the **Eocortex Neural Networks** package to the corresponding version.

Video stream

Frame frequency: no lower than 10 frames per second;

Determination of objects

The object should be clearly visible on the frame, not overlapped by other objects and not blend into the background.

The object should not be blurred.

Frame resolution should not be lower than HD (1280×720 px).

The minimum size of object: 40 pixels in height. Recommended: 80 pixels.

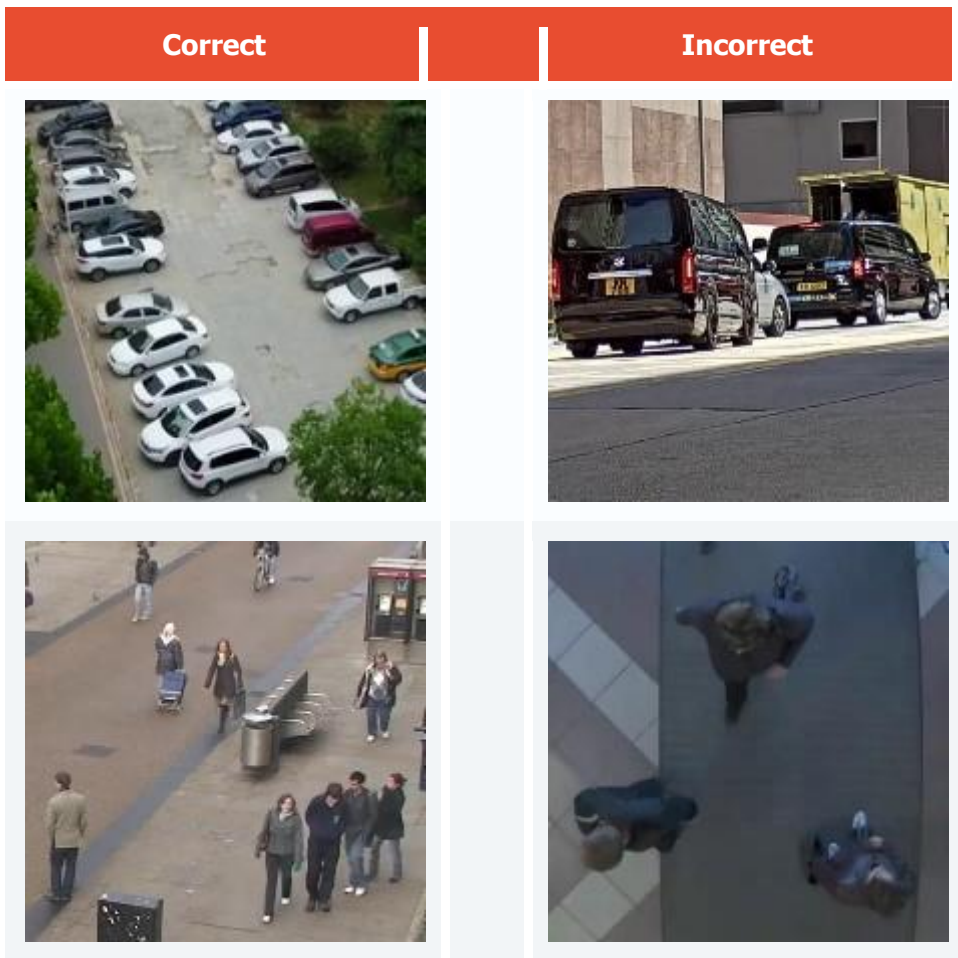
Counting by line crossing:

The greatest side of the object should not exceed $\frac{1}{4}$ of the size of the whole frame.

Movement speed of the object should be such that in $\frac{1}{10}$ seconds the object moves in frame by no more than $\frac{1}{4}$ of its size.

Examples

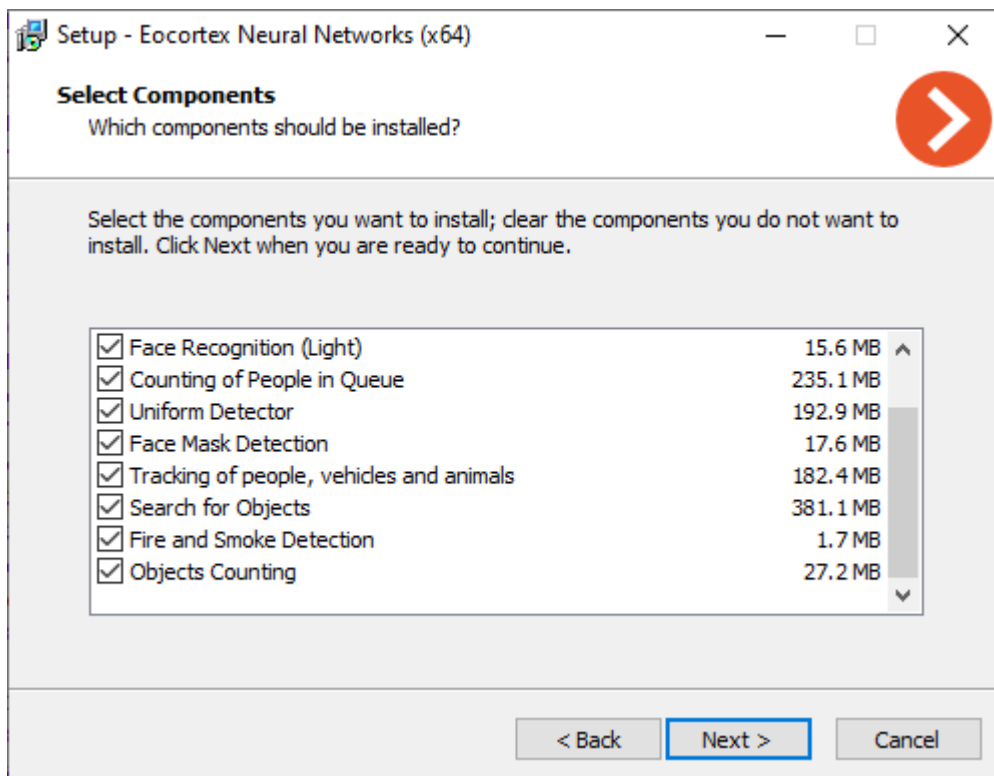
The following are examples of camera angles for determination of vehicle types.



Deployment of the module

For counting people, vehicles and animals it is necessary to install the **Eocortex Neural Networks** package.

To install the module, select the corresponding item when installing the **Eocortex Neural Networks** package:



It is recommended to run the module on graphics cards (GPUs).

People Counting

The **People Counting** is designed for counting people in the frame who cross a preset line, taking into account the direction of crossing.

Capabilities of the module

- Real-time counting of the entering and exiting visitors at one or more entrances (using several cameras).
- Displaying the readings of the counters in the **Eocortex Client** application.
- Creating the reports of the number of visitors who entered, exited and remain in the premises for different periods of time, and for one or several cameras.
- Automatic and manual download of the reports and the automatic sending of the reports by email.
- Automatic update and reset of the counters.

Additionally, the module allows to set the counting zones and, subsequently, determine the number of people in the zones in real time, providing the following capabilities:



- Setting several counting zones each of which can include an unlimited number of cameras with the active module, assigned to the same server.
- Displaying in real time the information regarding the current number of people in each zone where the camera being viewed is included.
- A possibility to set the current value of the number of people in a zone manually.
- Generating alarm events in case of the maximum allowable number of people in a zone is exceeded as well as in case of the return of this number to the allowable value.



The number of people in the zones comes into account only when the server is functioning. When the server is restarted, the values of the counters will be set to zero; in such a case, the values can be set manually.

Details

For the correct operation of the module, it is required to properly place and set up the camera, enable and adjust the software motion detector and the module itself.

Compatibility with other modules

OS	Requires Eocortex motion detector		Neural network	Compatible with modules		Incompatible with modules
			Standard	Special		
√	√	√	-	-	Abandoned object detection module Auto Zoom Counting People in Queue Crowd Monitoring Emergency Vehicle Detection Face Detection Face Mask Detector Face Recognition (Complete) ¹ Face Recognition (Light) ¹ Fire and Smoke Detector Frame Area Blurring Object Classification and Counting ¹ License Plate Recognition (Complete) ¹ License Plate Recognition (Light) ¹ Personnel Activity Monitoring Search for Objects	-

OS	Requires Eocortex motion detector	Neural network	Compatible with modules	Incompatible with modules
		Standard	Special	
				Shelf Fullness Check Loud Sound Detection Sabotage Detector Tracking Traffic Density Heat Map Uniform Detector ▲ FishEye Dewarping

¹ If used in combination, module selection is available to display the results of the analysis in the Eocortex Client application

- ✓ supported and required for the module to work
- + supported and provides additional features of the module
- not supported or not required for the module to work
- ▲ not recommended for use with the current module



Use

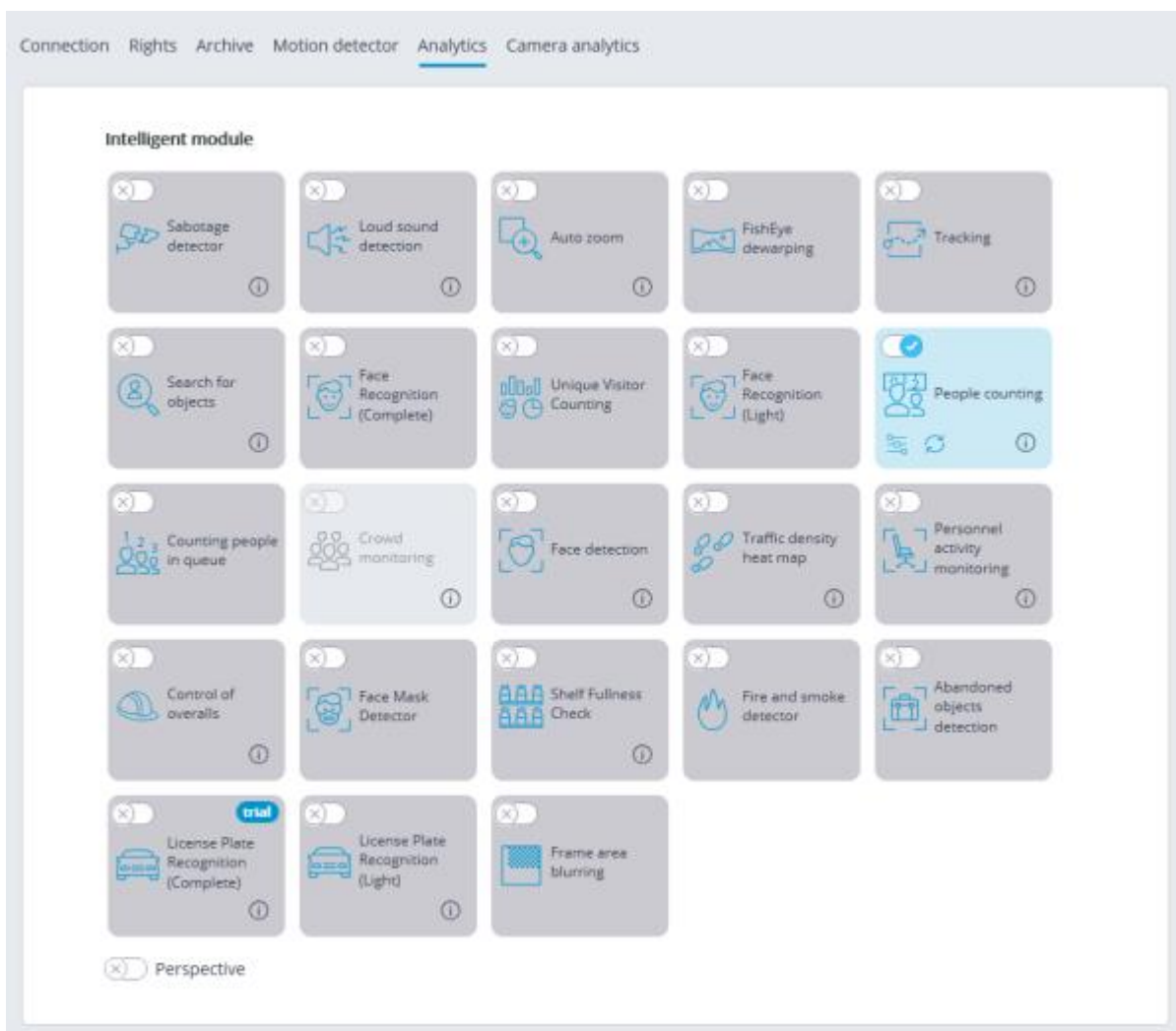
The use of video analytics modules in **Eocortex Client** is described in the **User's guide**, in the **Eocortex Client / Video analytics** section.


Module setup

To use the module, enable and set up the software motion detector, then activate the module itself.

To do that, [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list, and set up the motion detector on the [Motion detector](#) tab on the right part of the page.

Then go to the [Analytics](#) tab and enable the module using the  switch, then adjust it pressing the  button.



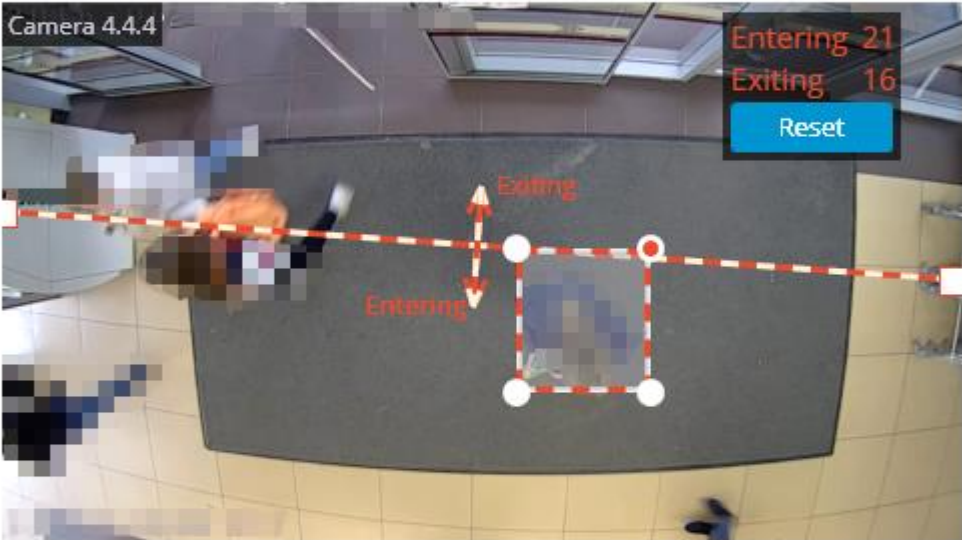
Clicking the  button opens the module setup window.

Visitor counting

Main settings Additional settings

Counting parameters (i)

Real time Archive



Camera 4.4.4

Entering 21
Exiting 16
Reset

Entering
Exiting

Entering
Exiting

[Change movement direction](#)

Counting method
Several people in a frame ▼

Show the suggested size of the object


Save and exit Exit without saving

Visitor counting

Main settings Additional settings

Counting parameters ⓘ

Real time Archive



Camera 4.4.4

Entering 168
Exiting 166
Reset

Change movement direction

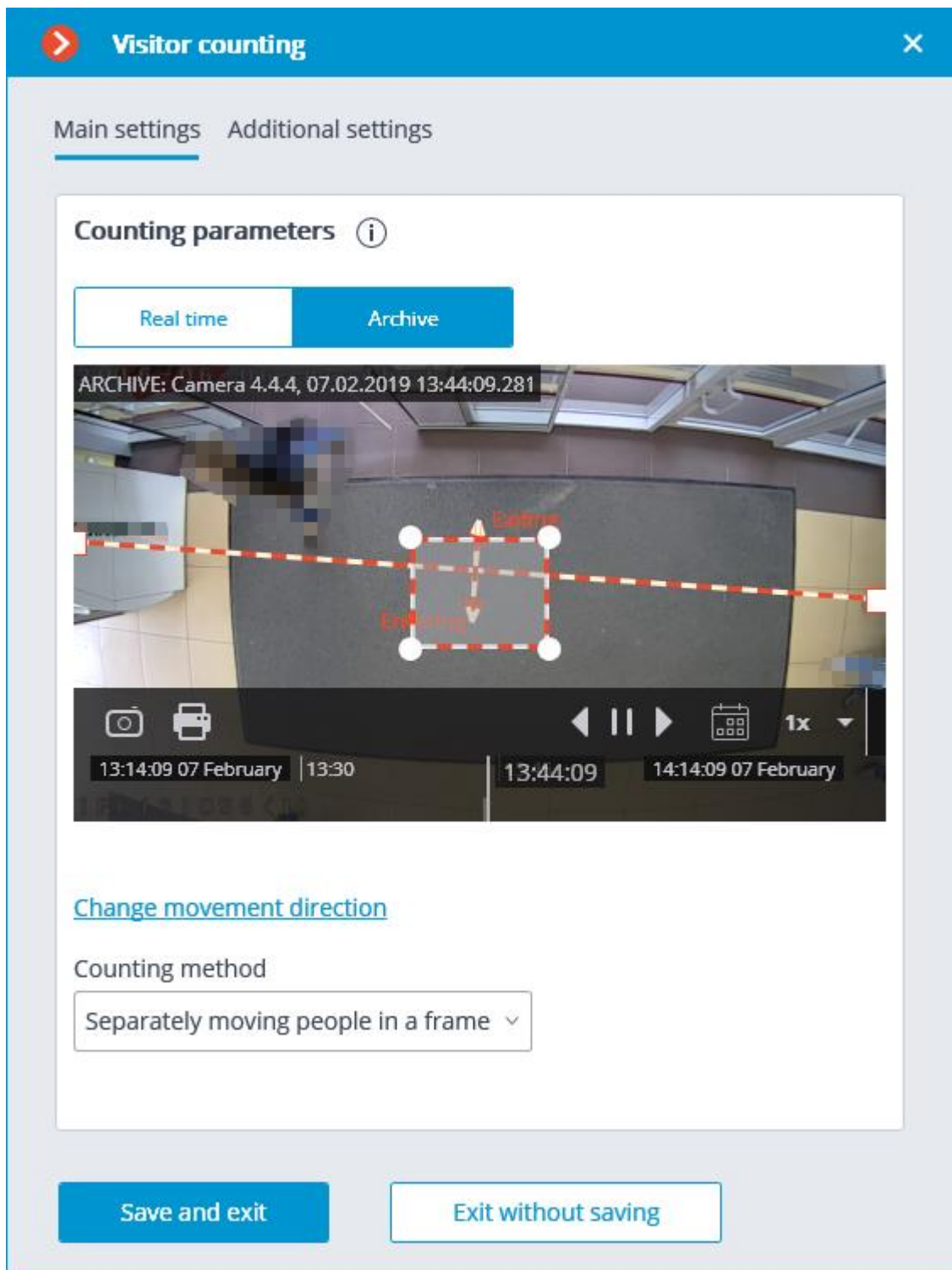
Counting method
Separately moving people in a frame ▾

Show the trajectory of the movement

Save and exit Exit without saving

The module settings are described below.

The **Real time** and **Archive** buttons permit to select the source of video for the preview window.



It is required to specify the crossline in the preview window by dragging the ends of the line with the mouse. This line must be crossed by all the entering and exiting visitors in order for the counting to be performed.

It is not recommended to place the crossline in the immediate proximity of doors or other moving objects.

Additionally, in the preview window, it is required to set up the average object size by dragging the corners of the rectangular frame with the mouse. The dimensions of the frame must enclose the counted object of the average size in the confluence with the line. This dimension is taken into account when counting: if the line is crossed by the object significantly bigger than the frame dimensions, it will

be counted as several objects (for example, if the object is three times larger than the frame, it will be counted as three separate objects).

It is recommended to use the video from the archive for the convenience of setting up the average size.

The rectangle of setting the average size may be located in any part of the frame, i.e. it is not required to place it on the crossline.

The **Change movement direction** link permits to change the direction in which the entering people will be counted. To designate the direction of entrance and exit, the ends of the arrows perpendicular to the counting line are provided with the corresponding legends.

The **Counting method** dropdown list allows to select the way of counting in accordance with the conditions of the module's operation. The following options are available:

- **Several people in frame** ensures the counting of both separately moving people and groups of people. This method is recommended to be used in the majority of cases when the conditions of the module operation are met.
- **Separately moving people in frame:** this method is recommended to be used only when it is not possible to provide all the conditions of the module's operation (for example, if the camera is installed in a low position, or when it is not installed vertically) and more than one moving person rarely enters the field of view of the camera.

The following settings are available on the **Additional settings** tab:

The screenshot shows a settings window titled "Visitor counting" with a close button (X) in the top right corner. Below the title bar are three tabs: "Main settings", "Additional settings" (which is selected and underlined), and "Counting in the premises".

The "Additional settings" tab contains several sections:

- Counting options** (with an information icon): A dropdown menu set to "Entering and exiting".
- Algorithm accuracy** (with an information icon): A dropdown menu set to "Average" and a checkbox for "Full frame analysis" which is currently unchecked.
- Automatically save data to csv-files** (with an information icon): A checkbox which is currently unchecked.
- People counting data period:** A dropdown menu set to "Minute".
- Unload data every:** A dropdown menu set to "Minute".
- Path to files:** An empty text input field with a "Select folder" link below it.
- Counter reset** (with an information icon): A toggle switch labeled "For specific camera" (with an information icon) which is currently turned off.
- Start time:** A date and time picker showing "02.08.2021 14:09:35".
- Counter reset period:** A dropdown menu set to "Never".

At the bottom of the window are two buttons: "Save and exit" (a solid blue button) and "Exit without saving" (a white button with a blue border).

Counting options is used to select the value that will be calculated, stored in the archive, and displayed in the client application.

Sensitivity: high sensitivity increases the chances of detecting objects but the probability of false triggering also increases; low sensitivity reduces the instances of false triggering but the counting accuracy may suffer.

Full frame analysis: activation of this option allows to increase the counting accuracy at the cost of the increased processor load.

Automatically save data to csv files enables automatic data saving to disc.

People Counting data period sets the interval for which the counter data of one report line are summed up.

Unload data every determines the interval of the creation and saving of the report.

Path to files allows to set the folder on the server where the report files will be stored.

The folder on the server to which the camera being set up is bound is specified for automatic saving.

The **Select folder** button may be used only when the **Eocortex Configurator** application is launched on the server to which the camera is bound.

The CSV filename format is as follows: **Counters_CameraName_DDMMYYYY#hhmm.csv**. For example, for the **Hour** period of autosaving for **Camera 1** camera the following files will be saved:

Counters_Camera 3_02022017#10.csv

Counters_Camera 3_02022017#11.csv

Counters_Camera 3_02022017#12.csv

The example of the CSV file contents:

time;in;out;inside;

02/02/2017 12:00:00;6;4;2;

02/02/2017 12:01:00;6;11;-5;

02/02/2017 12:02:00;10;6;4;

where **time** is the date/time of the beginning of the single counting interval;

in/out/inside is the quantity of the people who, correspondingly, entered, exited and remain inside for the given period of time.

Counter reset determines the reset to zero parameters of the counters in the **Eocortex Client** application.

Start time sets the date and time the reset intervals will be counted from.

Counter reset period sets the counter reset interval.

The switch **For specific camera** sets the counter reset settings for an individual camera or for all cameras.

If this switch is off, the counter reset settings will be applied to all cameras whose switches are off as well.

When the switch is on, the counter reset settings are set for an individual camera and do not change the counter reset settings for other cameras.

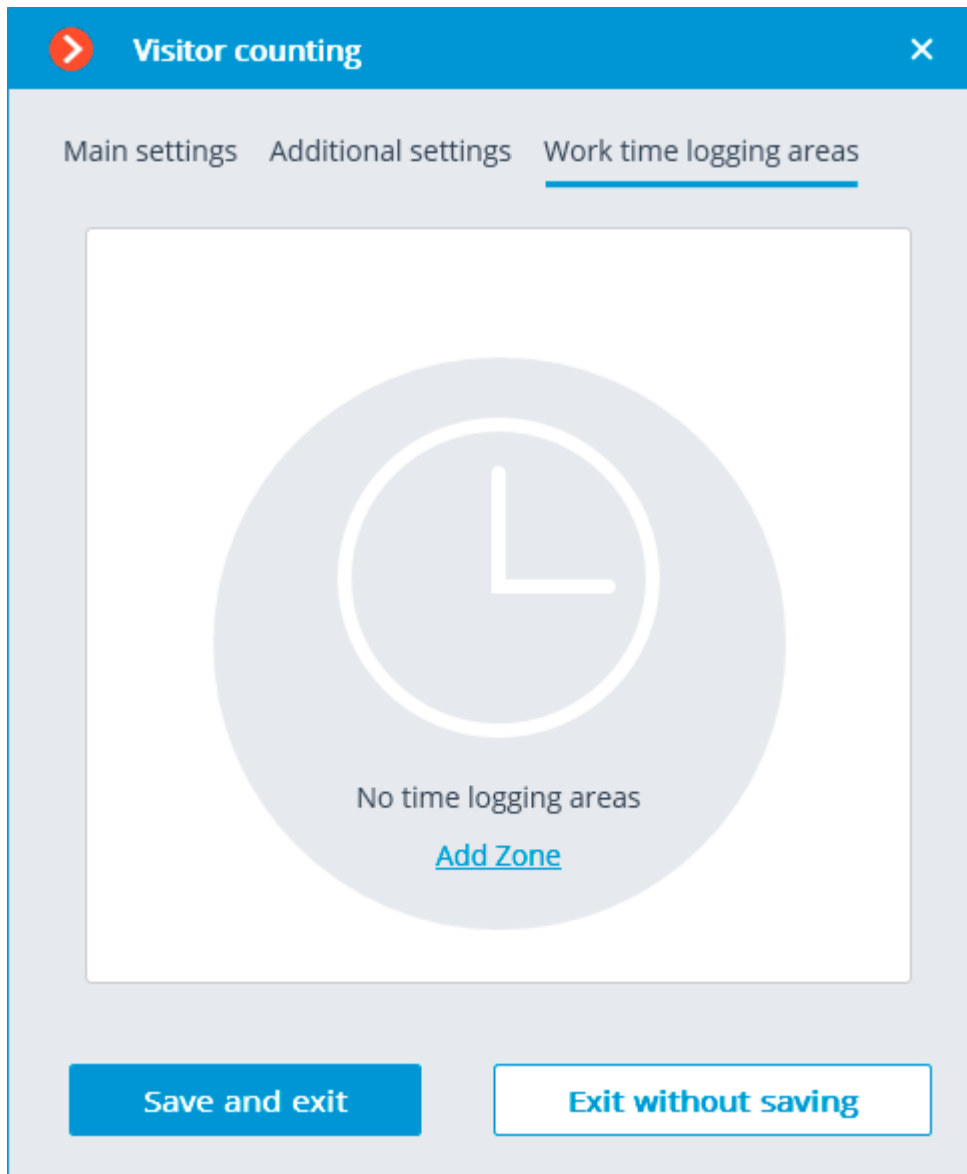
If the switch for an individual camera is off and the changes are made, the selected settings will be applied to all other cameras with the switch off upon saving the settings.

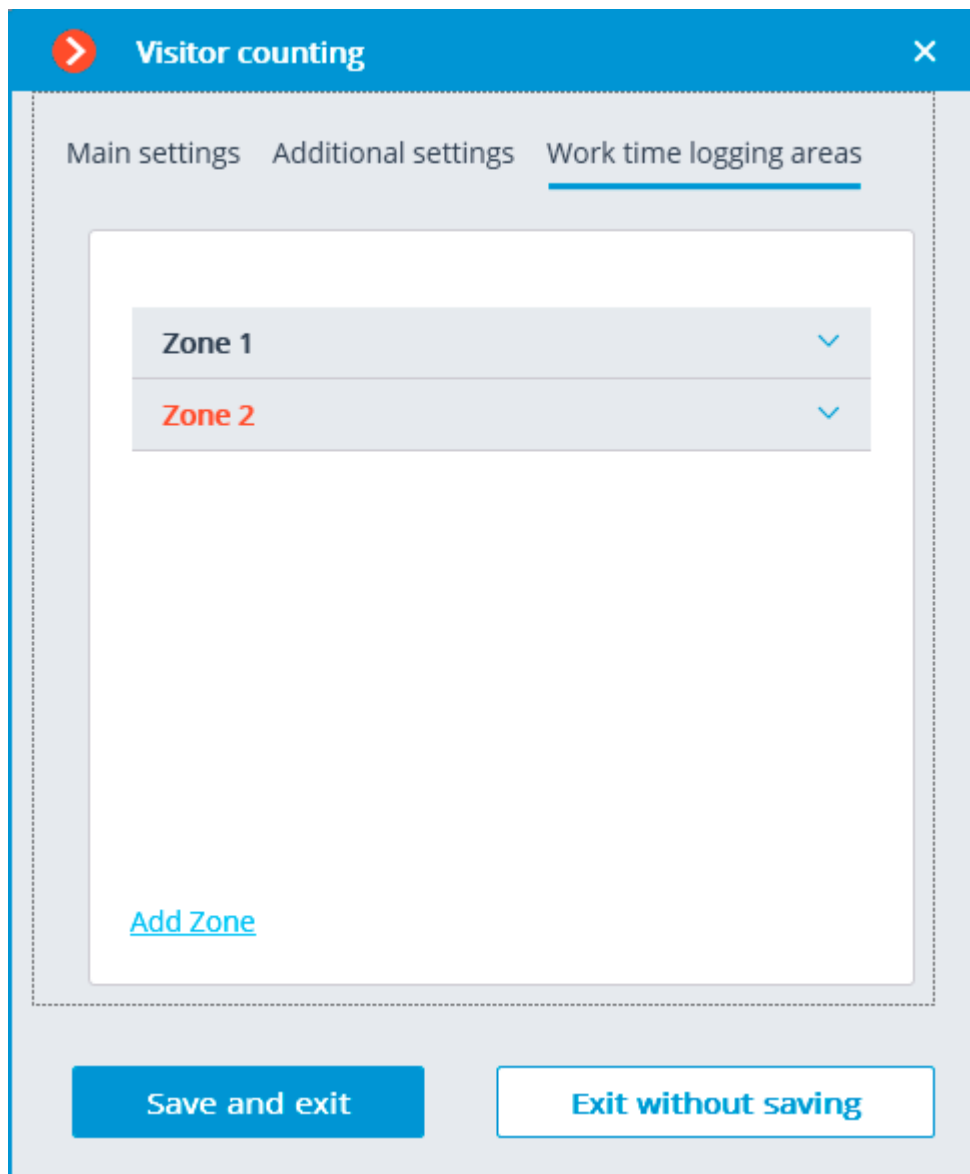
When the switch mode is changed, the following settings are made automatically:

- When switching to general settings: general settings
- When switching to unique settings: the most recent (saved) unique settings.

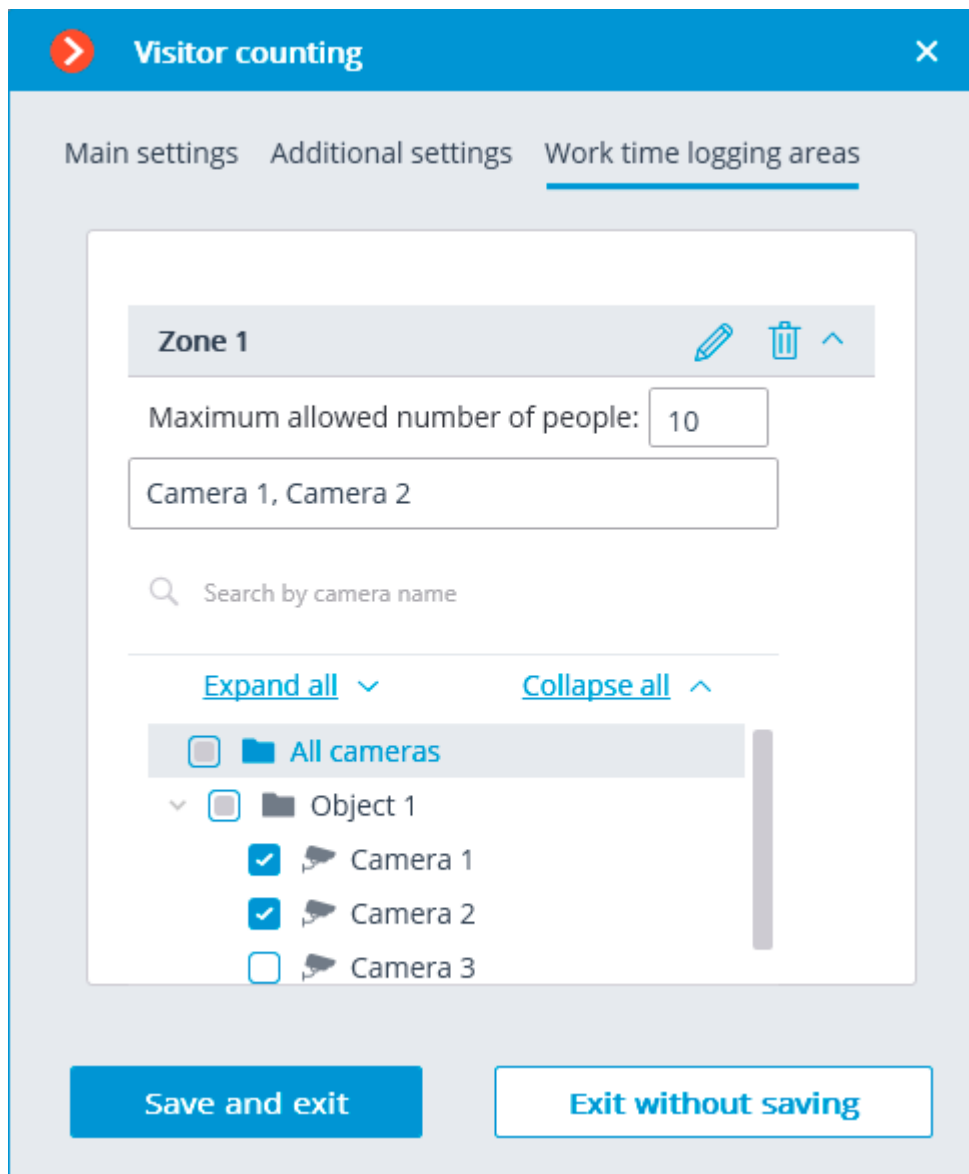
By default, the switch is off.

On the **Time logging areas** tab, it is possible to set the zones that will be used for counting visitors in the premises.





In order to set the maximum allowable quantity of visitors and to include the cameras into the zone, it is required to open the settings of the corresponding zone.



The module will start working only when [the settings are applied](#).

Within 10 to 15 seconds after the application of the settings the module will be in the process of "learning"; during this time the counting results will not be accurate. Since during "learning" the registering of the permanent background is performed, it is recommended to use this setting when there is a minimal number of moving and foreign objects in the frame in order to ensure the more accurate counting.

Requirements and recommendations

For the proper operation of the module, it is recommended to ensure that the following conditions are met:

The camera must be installed vertically. A different way of camera installation may adversely affect the counting accuracy.

The recommended minimum camera installation height is 3 meters above the ground.

The camera must be fixed.

Depending on the operation conditions, the framerate must be as follows:

- **Several people in frame:** at least 10 fps;

- **Separately moving people in frame:** at least 5 fps.

For reducing false triggering due to the changes of the background and lighting, it is required to ensure uniform illumination without flicker and sharp changes of brightness. The presence of moving foreign objects in the camera field of view is to be avoided because such objects may also be counted.

If the **Separately moving people in frame** option is used and there are moving foreign objects in the frame, including such objects as doors, escalators etc., it is recommended to specify the detection zone that does not include these objects in the software motion detector settings.



Personnel Activity Monitoring



The **Personnel Activity Monitoring** is designed for monitoring personnel activity at their workplaces. The activity in this context is the movement in the work zone, including minor movements.

Details

For the correct operation of the module, it is required to properly place and set up the camera, enable and adjust the software motion detector and the module itself.

Compatibility with other modules

OS	Requires Eocortex motion detector		Neural network	Compatible with modules		Incompatible with modules
			Standard	Special		
√	√	√	–	–	Abandoned object detection module Auto Zoom Counting People in Queue Crowd Monitoring Emergency Vehicle Detection Face Detection Face Mask Detector Face Recognition (Complete) Face Recognition (Light) Fire and Smoke Detector Frame Area Blurring	–

OS	Requires Eocortex motion detector	Neural network	Compatible with modules	Incompatible with modules
		Standard	Special	
				License Plate Recognition (Complete) License Plate Recognition (Light) Loud Sound Detection Object Classification and Counting People Counting Sabotage Detector Search for Objects Shelf Fullness Check Tracking Traffic Density Heat Map Uniform Detector ▲ FishEye Dewarping

- √ supported and required for the module to work
- + supported and provides additional features of the module
- not supported or not required for the module to work
- ▲ not recommended for use with the current module



Use

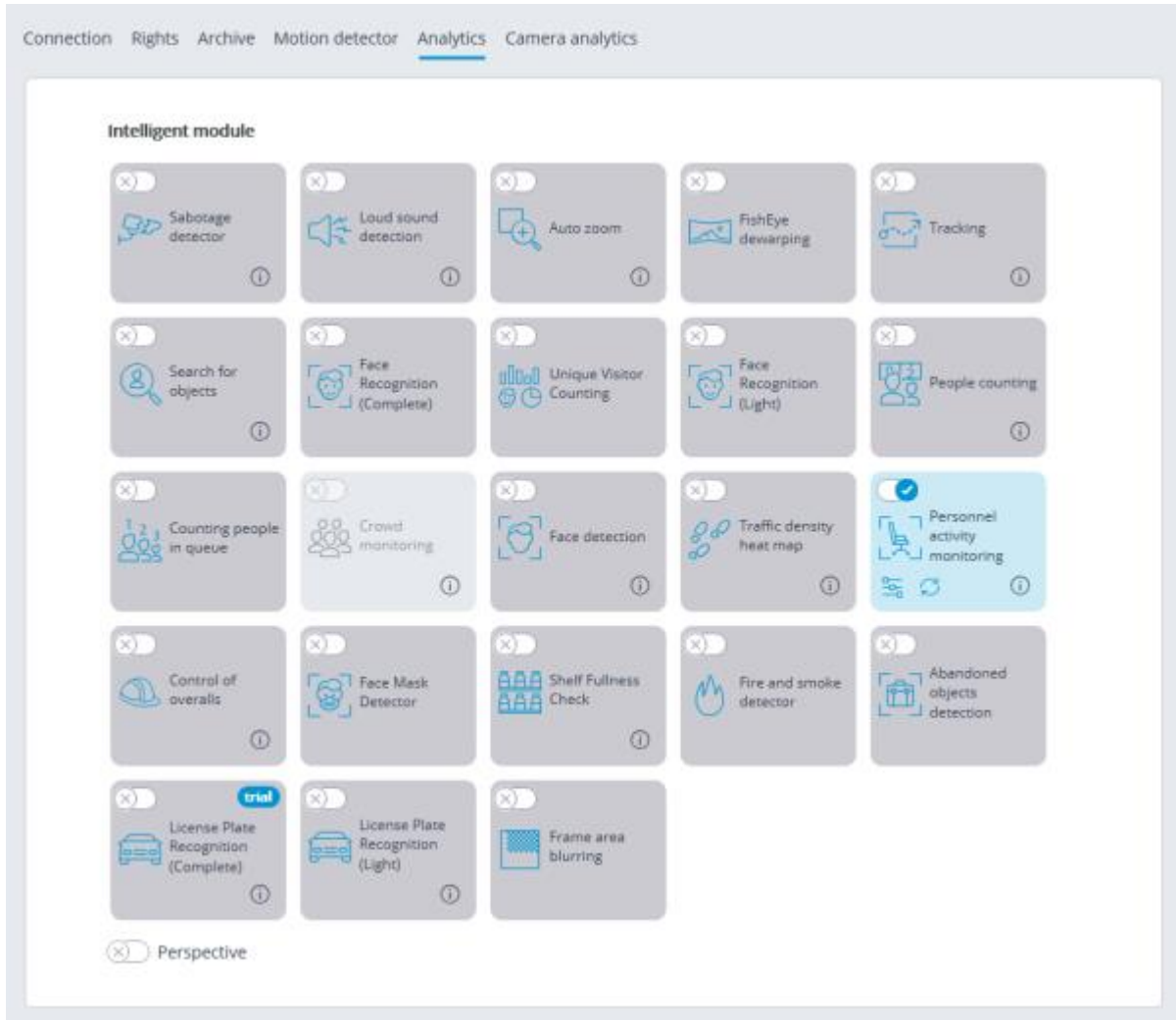
The use of video analytics modules in **Eocortex Client** is described in the **User's guide**, in the **Eocortex Client / Video analytics** section.

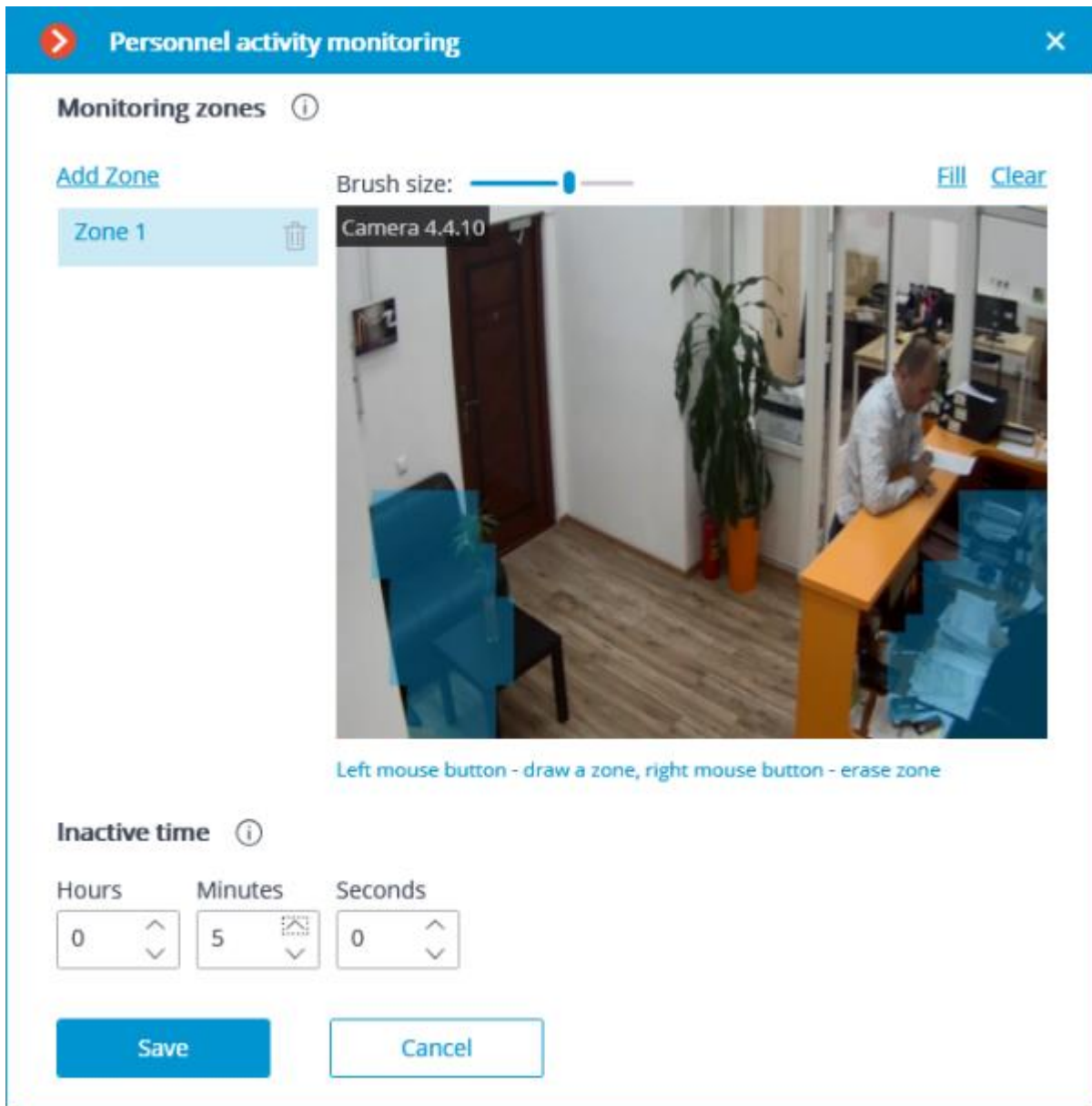
Module setup

To use the module, enable and set up the software motion detector, then activate the module itself.

To do that, [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list, and set up the motion detector on the [Motion detector](#) tab on the right part of the page.

Then go to the [Analytics](#) tab and enable the module using the  switch, then adjust it pressing the  button.





In the opened window it is required to specify up to six detection zones and the inactivity time.

Detection zones are the zones of the frame bounded by a closed polygon. The zone configuration can be changed by dragging the key points at the corners of the polygon. To add a key point, it is required to double-click the left mouse button on the line; to delete - right-click on the key point.

Zone setup requirements:

- The zones must not overlap;
- Only one employee must be present in the zone;
- The small movements of the personnel must be taken into consideration in the zone, such as sitting back, rolling back on the chair etc.;
- The zone must not contain any moving objects not depending on the activity of the personnel: fans, water tanks, moving parts of the equipment etc.;
- No computer displays, instrument panels, clock faces etc. shall be present in the zone.

Inactive time is the time interval upon the expiry of which the Inactive zone event will be generated in case of the absence of activity in the zone. The specified value is extended to all of the zones.

The inactivity in the zone does not mean that no employee is present: for example, a person may stay motionless or be asleep. The presence of the activity in the zone, in its turn, does not necessarily mean

that the employee is in his or her workplace – it may be caused by the presence of other persons in the given zone.

The module will start working only when [the settings are applied](#).

Requirements and recommendations

The camera must be fixed. It is preferable to mount the camera on the ceiling facing vertically down in order to isolate the workplace of each employee.

Sabotage Detector

The **Sabotage Detector** module is designed for detecting the actions deliberately aimed at the disturbance of the normal operation of the CCTV cameras by impairing the image quality or provoking the loss of visual information about the objects under surveillance.



Capabilities of the module





The module allows to detect the following events:

- Camera defocusing.
- Camera turnaway.
- Camera flaring.
- Camera's lens coverage.

Compatibility with other modules

OS	Requires Eocortex motion detector		Neural network	Compatible with modules		Incompatible with modules
			Standard	Special		
√	√	√	-	-	Abandoned object detection module Auto Zoom Counting People in Queue Crowd Monitoring Emergency Vehicle Detection Face Detection Face Mask Detector Face Recognition (Complete) Face Recognition (Light) Fire and Smoke Detector FishEye Dewarping Frame Area Blurring License Plate Recognition (Complete) License Plate Recognition (Light) Loud Sound Detection Object Classification and Counting People Counting Personnel Activity Monitoring Search for Objects	-

OS	Requires Eocortex motion detector	Neural network	Compatible with modules	Incompatible with modules
		Standard	Special	
				Shelf Fullness Check Tracking Traffic Density Heat Map Uniform Detector Unique Visitor Counting

- √ supported and required for the module to work
- + supported and provides additional features of the module
- not supported or not required for the module to work



Use

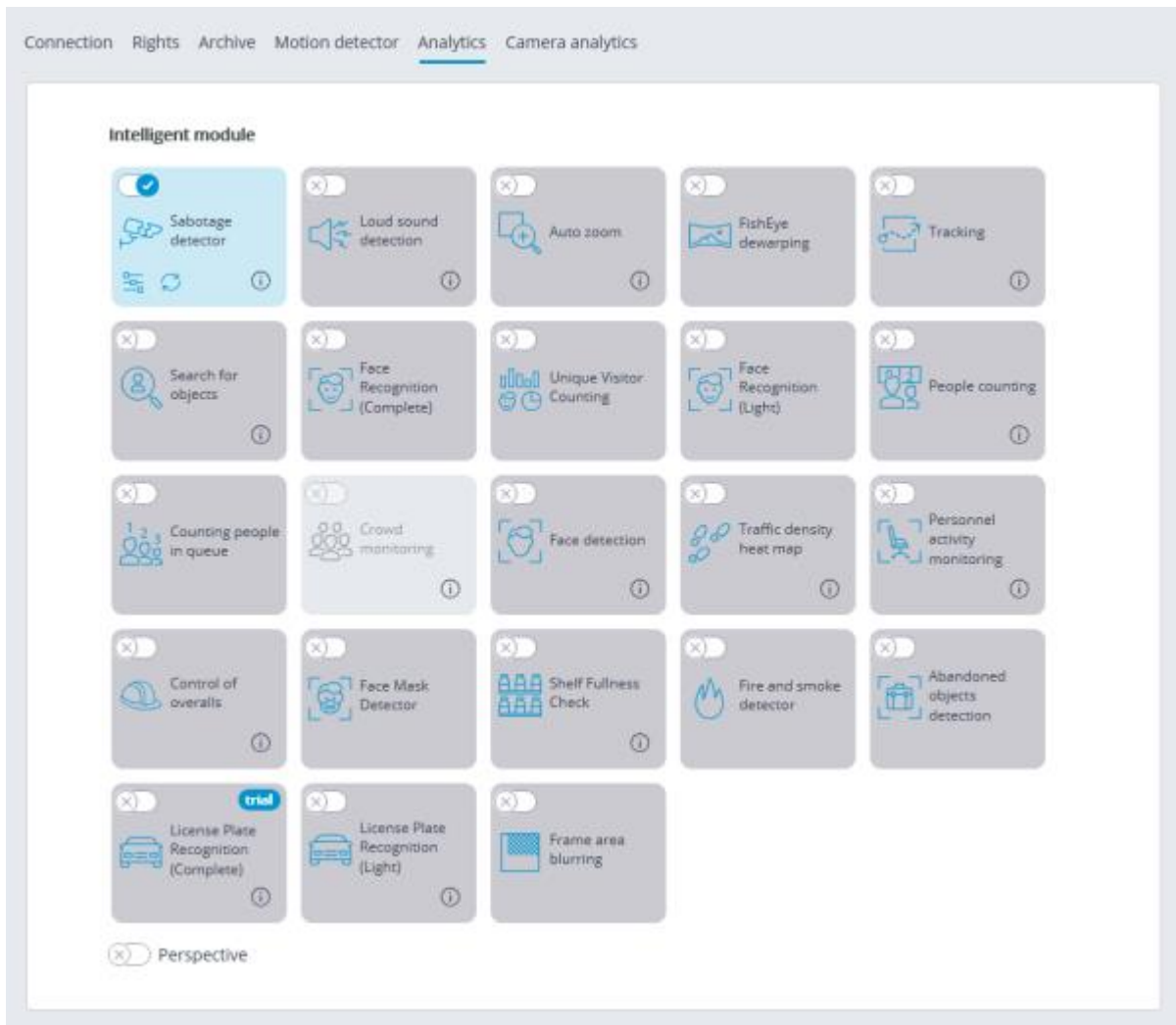
The use of video analytics modules in **Eocortex Client** is described in the **User's guide**, in the **Eocortex Client / Video analytics** section.


Module setup

To use the module, enable and set up the software motion detector, then activate the module itself.

To do that, [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list, and set up the motion detector on the [Motion detector](#) tab on the right part of the page.

Then go to the [Analytics](#) tab and enable the module using the  switch, then adjust it pressing the  button.

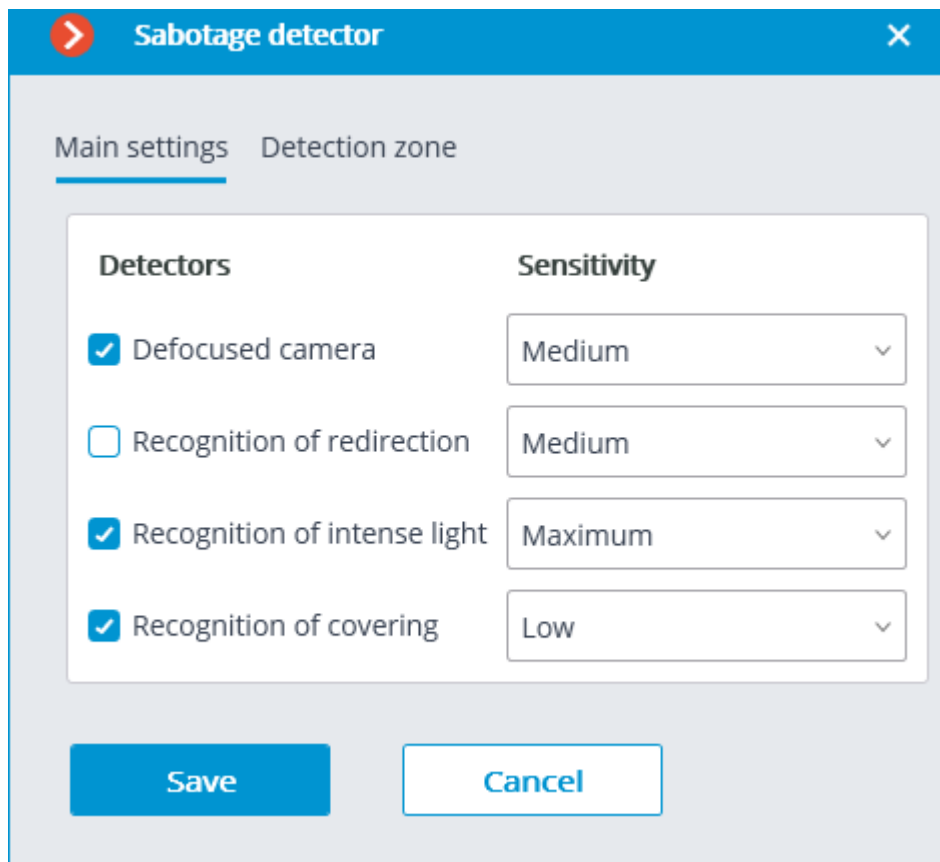


Clicking the  button opens the module setup window.

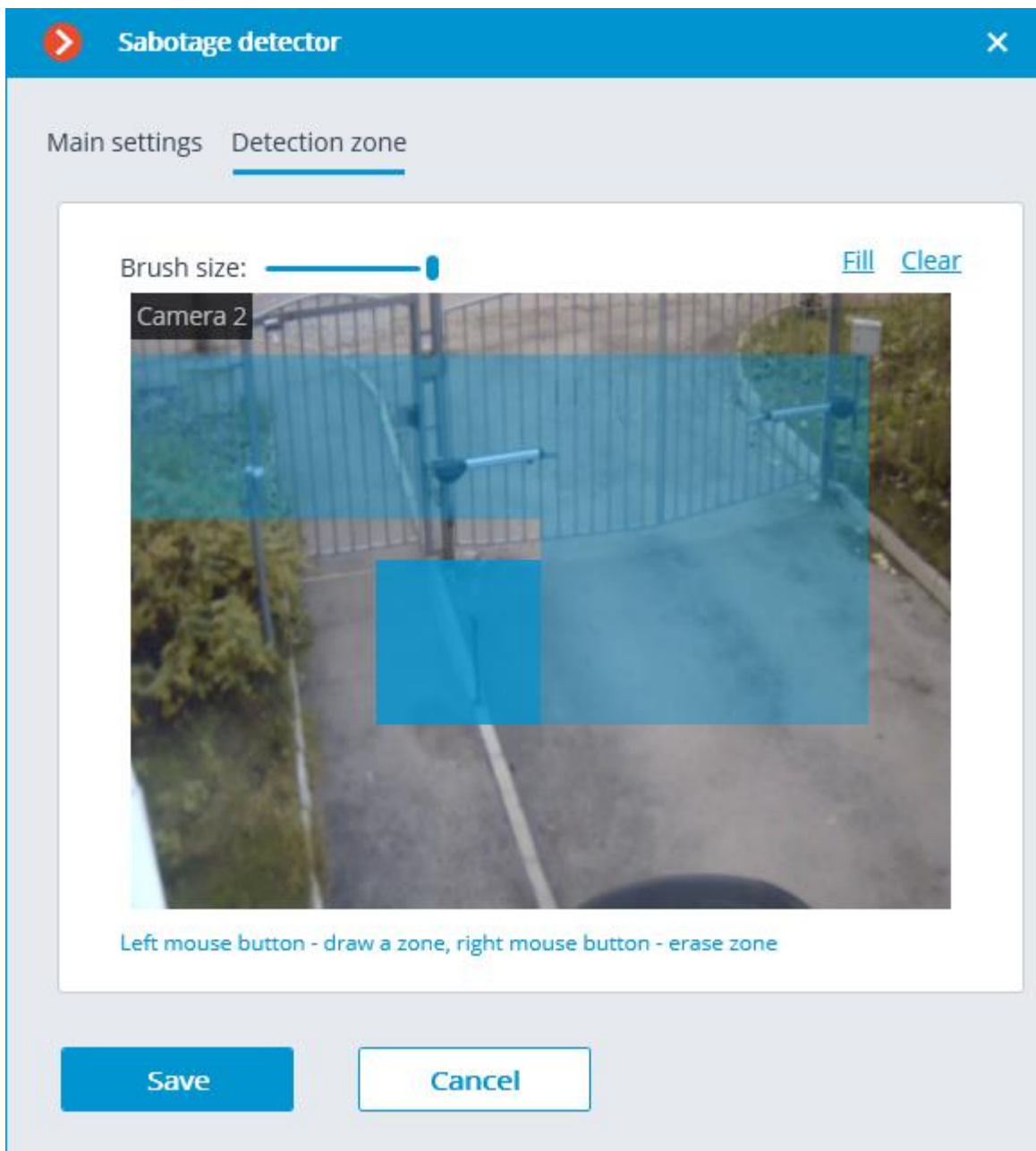
It is required to make the following settings on the appropriate tabs in the window that opens:

Main settings: enabling detectors and adjusting **Sensitivity** of any of them.

The higher the value of the **Sensitivity** parameter, the greater the likelihood of detecting a sabotage. If the detector raises false alarms, the value of this parameter needs to be decreased.



Detection zone is the zone of the frame filled with the semitransparent blue fill in the settings window. The mouse is used for modifying the zone: left mouse button serves for filling the zone, and the right one is used for clearing it. With the help of the **Fill** and **Clear** buttons you can fill or clear the whole area of the frame. The corresponding slider is used to modify the **Brush size**.



Do not turn on the module on the cameras that are equipped with the automatic focus or focal distance control, and on the PTZ cameras.

The module will start working only when [the settings are applied](#).

Requirements and recommendations

Camera requirements

The video resolution must be at least 0.3 MP; the framerate must be at least 5 frames per second; the image quality must not be reduced significantly by compression, because the high compression rate may negatively affect the work of the defocusing detector.

Aspects of operation

For the detector to trigger, it is required that the changes in the video stream that are indicative of the sabotage of the video surveillance last at least 5 seconds. The detector does not trip in case of

brief flashes, darkening, etc. Among other things, this is done to avoid triggering of the detector during the switching of the camera from the day mode to the night mode, because such switching may be accompanied by a significant short-term change of brightness in the frame.

It is allowed to use the detector round-the-clock on the cameras with night mode and on those cameras that switch to such mode. However, the switching to the night mode and back must not take more than 3 - 4 seconds.

The repeated generation of the event cannot happen earlier than in 2 minutes.

After the launch of the module, it is required to wait for 15 seconds for the initial automatic adjustment to be completed.

Aspects of individual detectors

Camera flaring detector

The camera flaring detector is designed for detecting the attempts of flaring a video camera by directing a bright beam of light (e.g. of a flashlight) at its lens. Normally, a camera tries to compensate for the local flaring by darkening the rest of the image. That leads to the indiscernibility of objects in the whole field of view of the camera. For the detector to trip, the specific brightness and area of the flaring spot are required.

Camera defocusing detector

This detector is triggered by an attempt to defocus the image.

Camera overlapping detector

This detector trips when the lens is covered by foreign objects.

The detector triggers with the following area of overlapping:

50% of the area of the frame is overlapped by a dark stationary object, or by an object placed very close to the lens;

78% of the area of the frame is overlapped by a light moving object, or by an object placed at some distance from the lens.

Detector of an attempt to turn the camera away from the pre-defined view

This detector trips when the camera is turned.

It triggers only when the turning angle exceeds 20 degrees and the turning rate is more than 6 degrees per second.

Search for Objects

The **Search for Objects** module allows to quickly find people and other objects in the archive.

Capabilities of the module

Search in the archive for

- any moving objects:
- in a set rectangular area;

- crossing a set line.
- people:
 - any people;
 - by the color of clothes;
 - by samples from the archive or an image file.
- vehicles:
 - by category: passenger cars and trucks, buses, two-wheel transport;
 - by color;
 - by samples from the video archive or an image file.
- hazardous items (firearms and baseball bats).
- animals (terrestrial animals and birds).
- bags (luggage, suitcases and backpacks).

Cross-camera Tracking:

- chronologically connected search among several cameras for the person found before using the interactive search;
- generating a video clip of the fragments found;
- displaying a trajectory on the plans (if the cameras with the found fragments were placed on the plans).



Details

Starting with version 3.5 of **Eocortex**, the **Tracking, Search for Objects** and **Uniform Detector** modules running on the same camera share the processor and video card resources. This reduces the load on the server.

For the most efficient sharing of resources, it is recommended to set the same operating mode for the camera in the settings of these modules: either using a video card or without using a video card.

For the correct operation of the module, it is required to properly place and set up the camera, enable and adjust the software motion detector and the module itself.

Compatibility with other modules

OS	Requires Eocortex motion detector		Neural network		Compatible with modules		Incompatible with modules	
			Standard	Special				
√	√	√	+	+	Abandoned object detection module	Auto Zoom	Counting People in Queue	Object Classification and Counting
					Crowd Monitoring			

OS	Requires Eocortex motion detector	Neural network	Compatible with modules	Incompatible with modules
		Standard	Special	
				Emergency Vehicle Detection Face Detection Face Mask Detector Face Recognition (Complete) Face Recognition (Light) Fire and Smoke Detector Frame Area Blurring License Plate Recognition (Complete) License Plate Recognition (Light) Loud Sound Detection People Counting Personnel Activity Monitoring Sabotage Detector Shelf Fullness Check Tracking Traffic Density Heat Map Uniform Detector  FishEye Dewarping

- ✓ supported and required for the module to work
- + supported and provides additional features of the module
- not supported or not required for the module to work
- ⚠ not recommended for use with the current module



Use

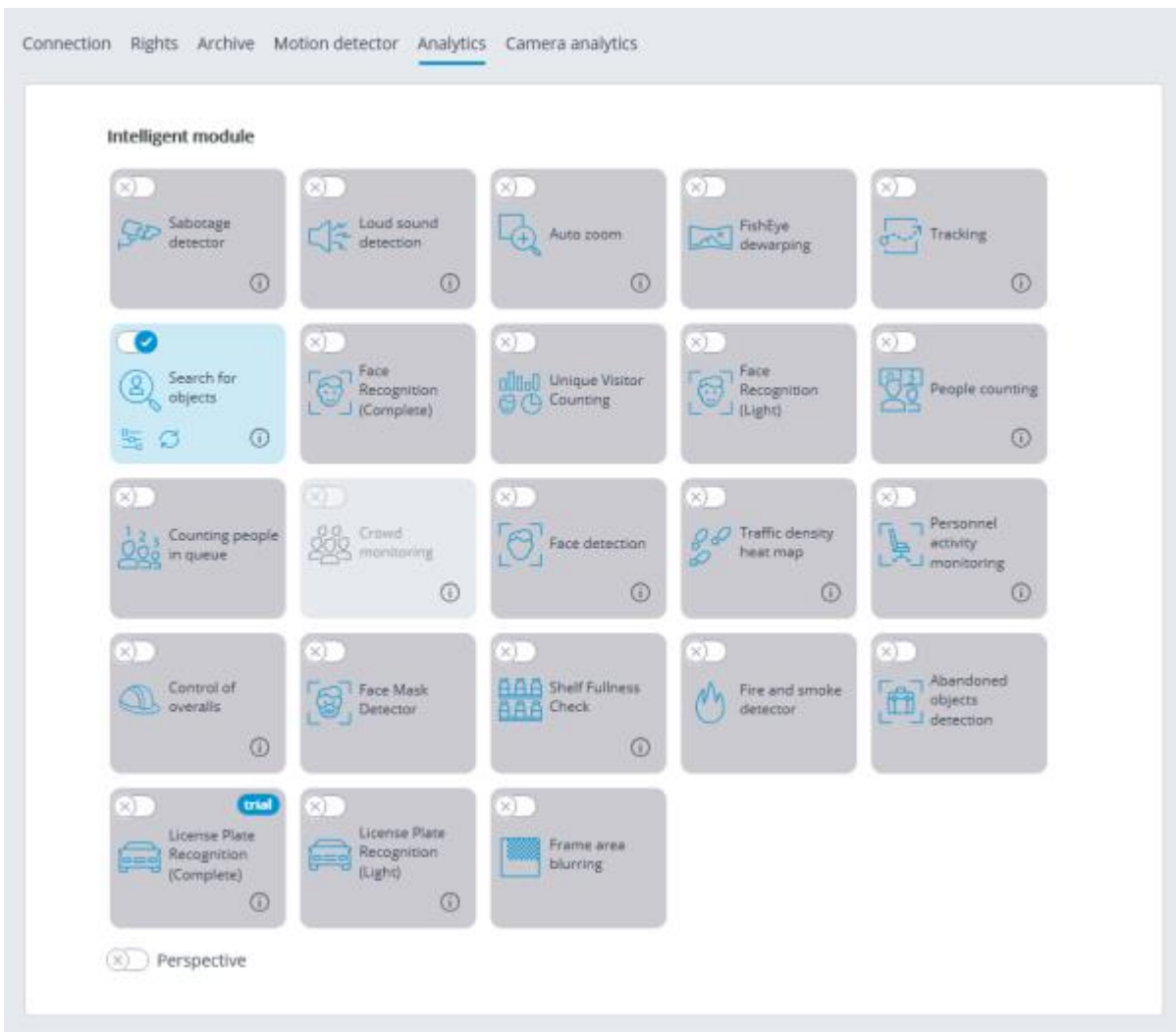
The use of video analytics modules in **Eocortex Client** is described in the **User's guide**, in the **Eocortex Client / Video analytics** section.


Module setup

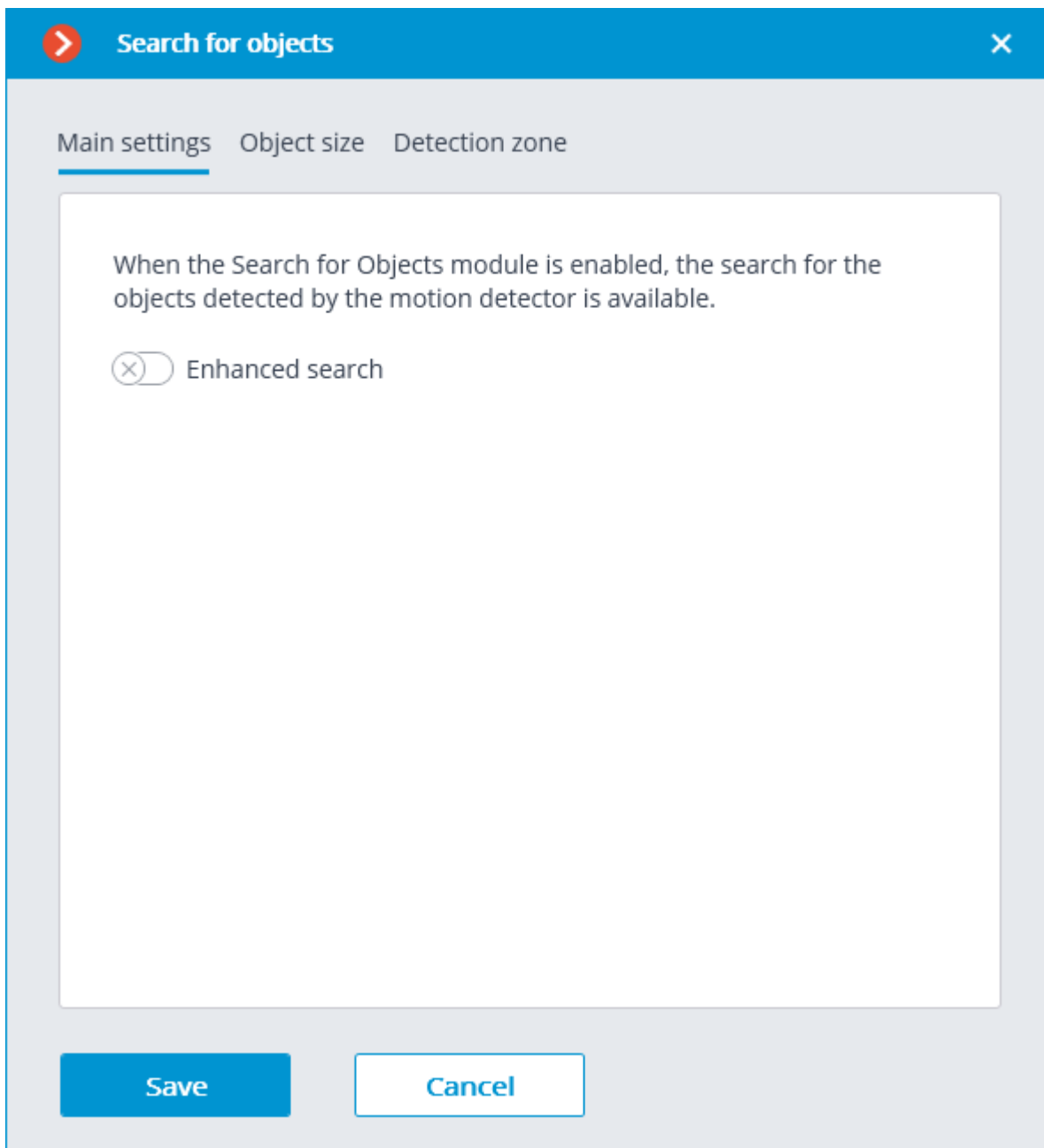
To use the module, enable and set up the software motion detector, then activate the module itself.


To do that, [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list, and set up the motion detector on the [Motion detector](#) tab on the right part of the page.

Then go to the [Analytics](#) tab and enable the module using the  switch, then adjust it pressing the  button.



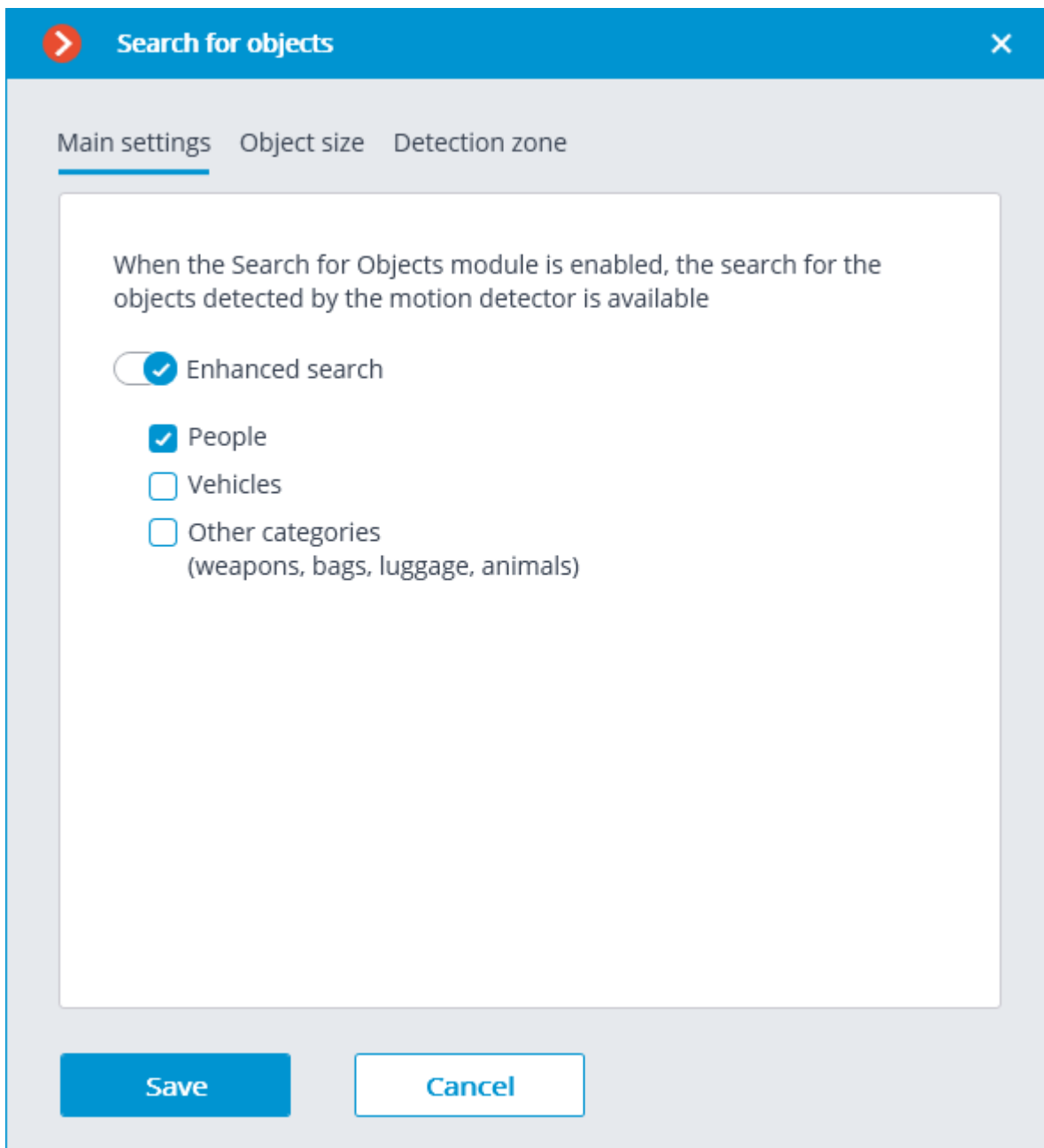
Clicking the  button opens the module setup window.



When the **Search for Objects** module is enabled on the camera for the first time, the search for moving objects only mode is enabled. This mode corresponds to the disabled **Enhanced search** switch .





The **Enhanced search** mode, when enabled, allows searching for objects of the following categories:

- People;
- Vehicles;
- Other categories.



Later, when receiving search results, objects from **Vehicles** and **Other categories** can be filtered by object type.

The **Vehicles** category includes objects of the following types:

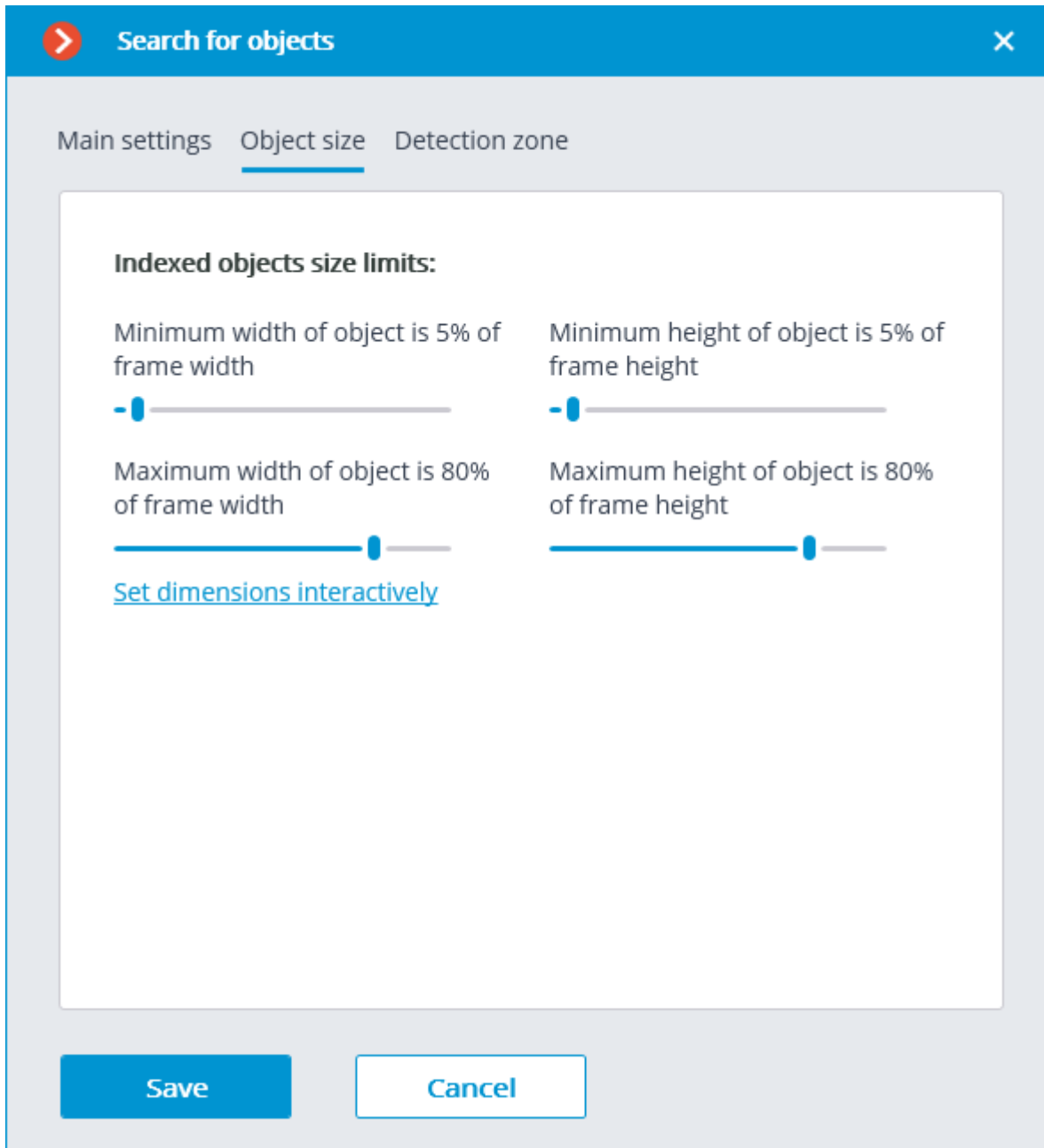
-  Passenger cars;
-  Trucks;
-  Buses;
-  Two-wheelers.

The **Other categories** includes objects of the following types:

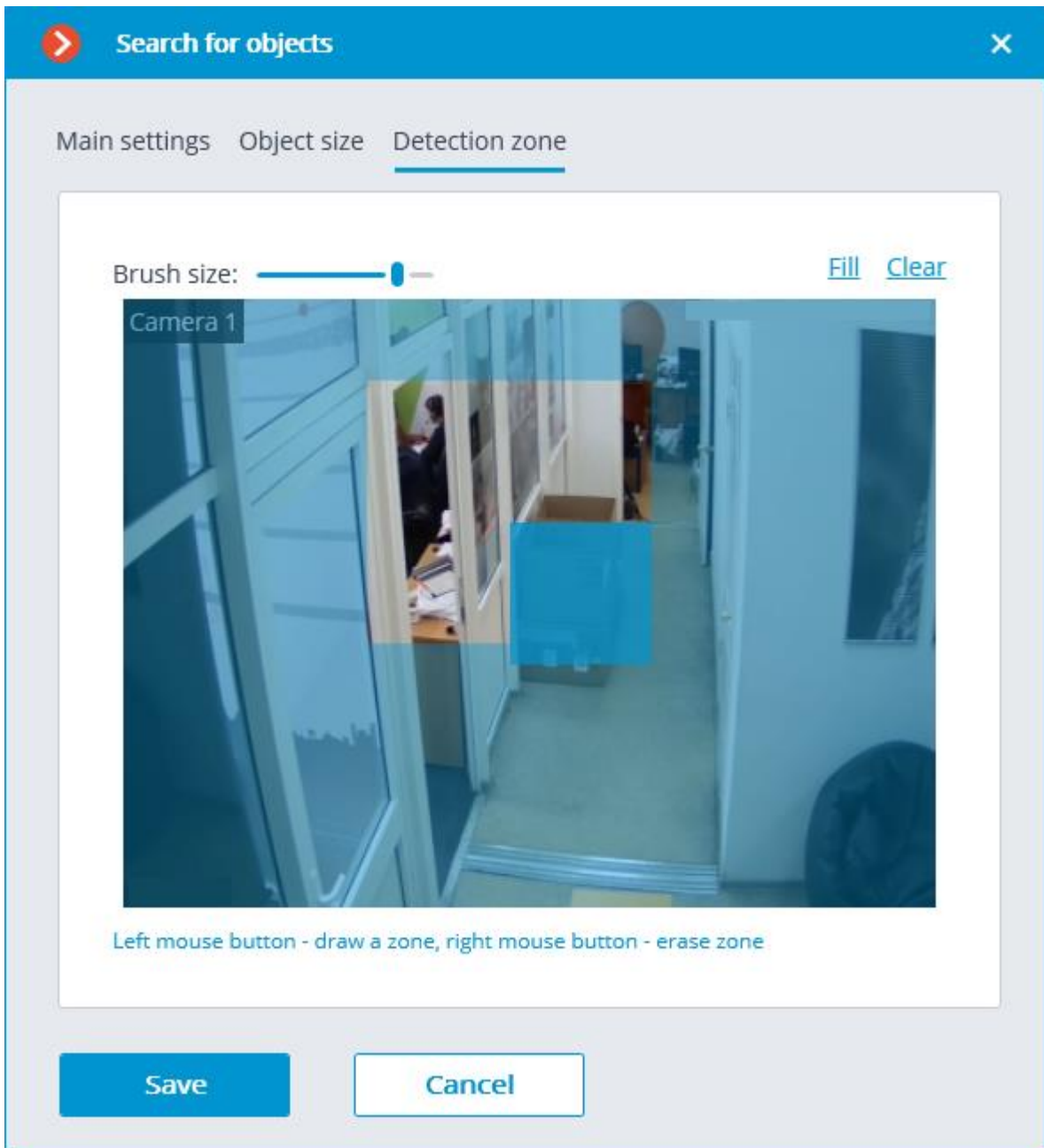
- Animals (terrestrial animals and birds);
- Bags (luggage, suitcases and backpacks);
- Hazardous items (firearms and baseball bats).

When searching for objects from the **Other categories**, the consumption of server resources increases significantly.

The **Object size** tab sets the minimum and maximum sizes of the detected objects.



Detection zone is the zone of the frame filled with the semitransparent blue fill in the settings window. The mouse is used for modifying the zone: left mouse button serves for filling the zone, and the right one is used for clearing it. With the help of the **Fill** and **Clear** buttons you can fill or clear the whole area of the frame. The corresponding slider is used to modify the **Brush size**.



The module will start working only when [the settings are applied](#).

Requirements and recommendations

Functionality limitations

After updating **Eocortex** from version 3.3 and lower to version 3.3 and higher, the **Search for Objects** module will not be able to Search for Objects for the period preceding the update. This is due to the database change in version 3.4.

Hardware and software



Eocortex Neural Networks package must be installed before it will be possible to use neural networks-based features of the module.

The following equipment is required to use this neural network-based module:

- A processor with AVX instructions support;

- An **NVIDIA** video card (GPU) with the computation capacity index of at least 6.5 and with at least 4 Gb of memory; the parameters and performance of the video card must be similar or better than those of **NVIDIA GTX 1650 Super** model;
- version of the video card driver at least 460;
- swap file at least half of the total RAM size.

If the package will be installed on a virtual machine, it may additionally be required to:

- Enable support for AVX instructions in the guest machine settings;
- Use GRID drivers for GPU virtualization.



Eocortex must use video cards selected for running neural networks in monopoly mode. It is not allowed to use such card for other applications or tasks that consume GPU resources, including for displaying video. Simultaneous use of a video card for several tasks may lead to incorrect system operation: from analytics performance degradation to server instability.



The neural network works with the 64-bit version of **Eocortex** only.



When upgrading Eocortex to another version, it is necessary to also upgrade the **Eocortex Neural Networks** package to the corresponding version.

For searching for moving objects only and for simplified search, the video card is not used.



When using a video card, the stable operation of the module is guaranteed on operating systems Windows 10, Windows Server 2016, Ubuntu versions 18.04 and 20.04 exclusively, as well as on the newer versions of these operating systems.

On other operating systems (Windows versions 7 and 8, Windows Server versions 2008 and 2012, CentOS, Debian), issues may arise when trying to use NVIDIA graphics cards. On Windows 8, this is due to the cessation of support for NVIDIA graphics card drivers. On CentOS and Debian, the problem is due to the high complexity of installing workable versions of video card drivers.



The **Eocortex Neural Networks** package must be installed on a video surveillance server even when a video analytics server is used. This is due to the fact that the module uses PostgreSQL DBMS that is installed together with the **Eocortex Neural Networks** package.

Performance

The tables below show the allowed number of cameras for different video streams and server configurations without displaying.

CPU	GPU	RAM, GB	Number of cameras
Stream: 2 Mpix, 25 fps			
Intel® Core™ i5-2400	NVIDIA GeForce GTX 1050 Ti	8	5
Intel® Core™ i7-2600	NVIDIA GeForce GTX 1060	8	9

CPU	GPU	RAM, GB	Number of cameras
Intel® Core™ i7-7700	NVIDIA GeForce RTX 2070	8	13
Intel® Core™ i9-9900	NVIDIA GeForce RTX 2080	12	20
Stream: 1 Mpix, 25 fps			
Intel® Core™ i5-2400	NVIDIA GeForce GTX 1050 Ti	8	8

Video stream

- The frame rate must not be lower than 10 frames per second;
- The optimal resolution is HD or FullHD.

Image

- Lighting in the frame should be uniform and constant.
- If the camera is installed in front of a bright light source (the sun behind an entrance door, etc.), it is required to adjust the exposure (or brightness) to ensure that the objects in the frame have a natural color (not overexposed or darkened). In this case, it is permissible for the background to be overexposed.
- The image must be in color.
- There must be no significant compression artefacts.
- The compression quality must not be lower than average.
- The object must be seen from a suitable angle, at which it will be clearly distinguishable from the background and plainly visible when observed by the human eye.

For searching for people:

- A strong lateral light source (sunlight from a window) is not permitted because in this case one half of the person will be overexposed and the other half will be too dark.

Scene and camera position

- The frame must not contain mirrored surfaces that give reflections: glasses, mirrors, etc.
- It is allowed to place the camera overhead. The tilt angle of the camera should not exceed 45 ° from the horizontal line.

For searching for people:

- People must be visible at full height.

For searching for vehicles:

- Installing the camera at an angle to the axis of movement of the vehicles provides the most advantageous perspective.

Module's performance

The accuracy of searching for people using colors is about 70%.

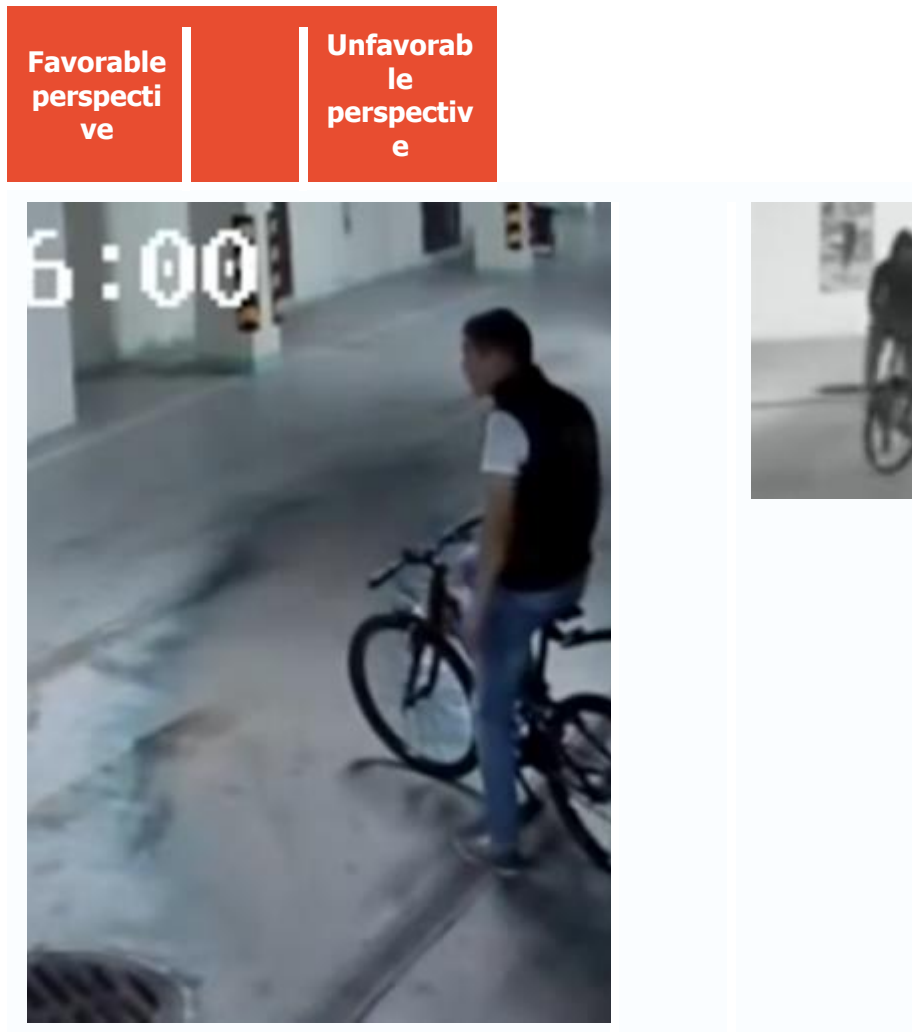
The accuracy of searching for people using samples is about 80%.

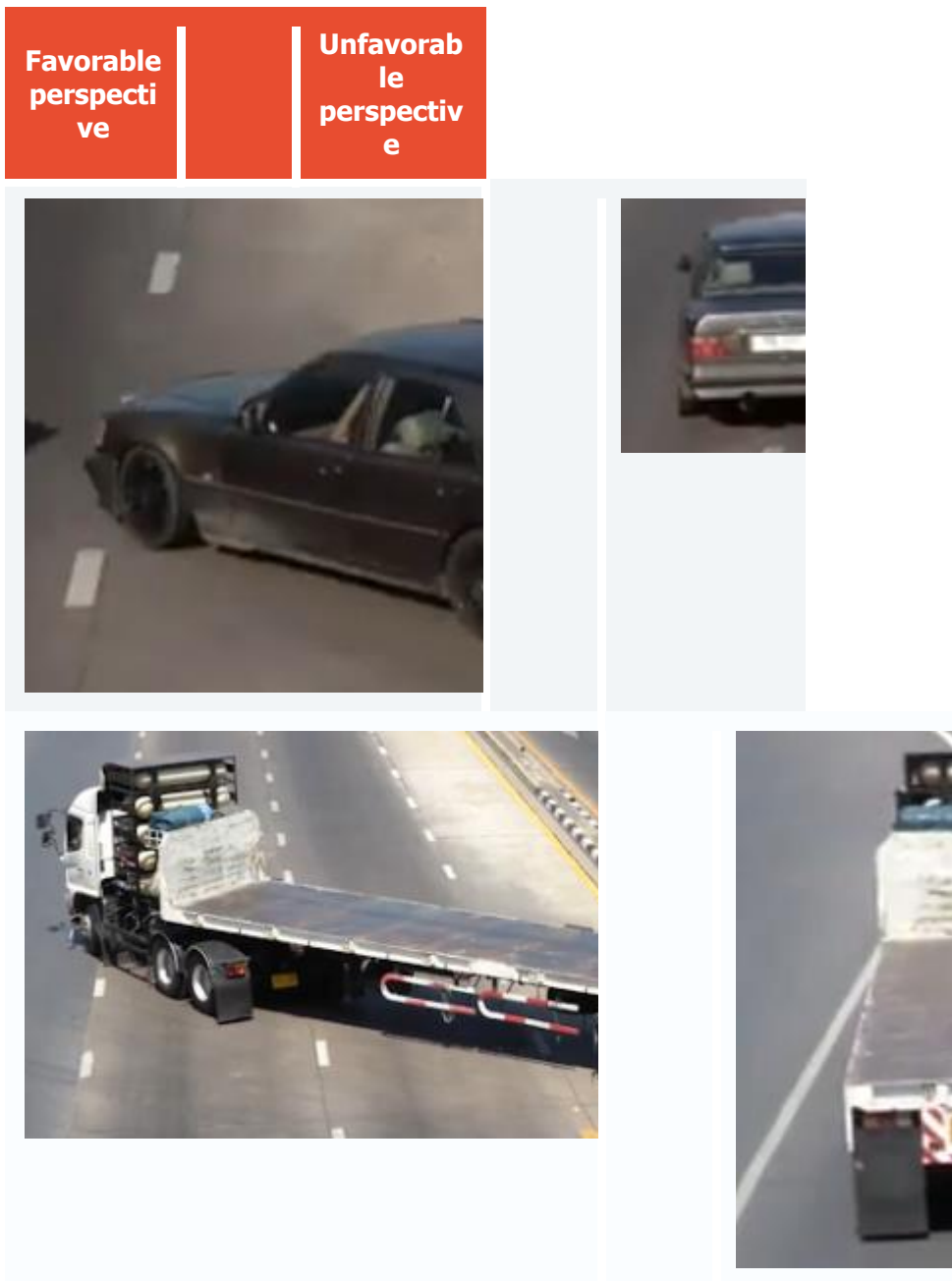
The accuracy of searching for vehicles using colors and samples is from 50 to 70%, depending on the perspective of the vehicle and lighting. Glare and flare from headlights significantly reduce the accuracy of color definition.

Minimum requirements for searching vehicles by color:

- The vehicle must be of single color, without multicolored stickers or the like.
- The vehicle must be captured during daylight hours and in good weather.
- The exposure and contrast on the camera must be adjusted in such a way that the color of the subject can be unambiguously determined by the human eye.
- The body of the vehicle must not be light-struck by headlights or other reflections of light, including sunlight.
- The angle at which the vehicle was captured must allow to correctly determine the dominant color of the object (for example, if the car is seen from behind, the bumper is painted in a dark color and the rear window is tinted, the color of the car may be detected as black).

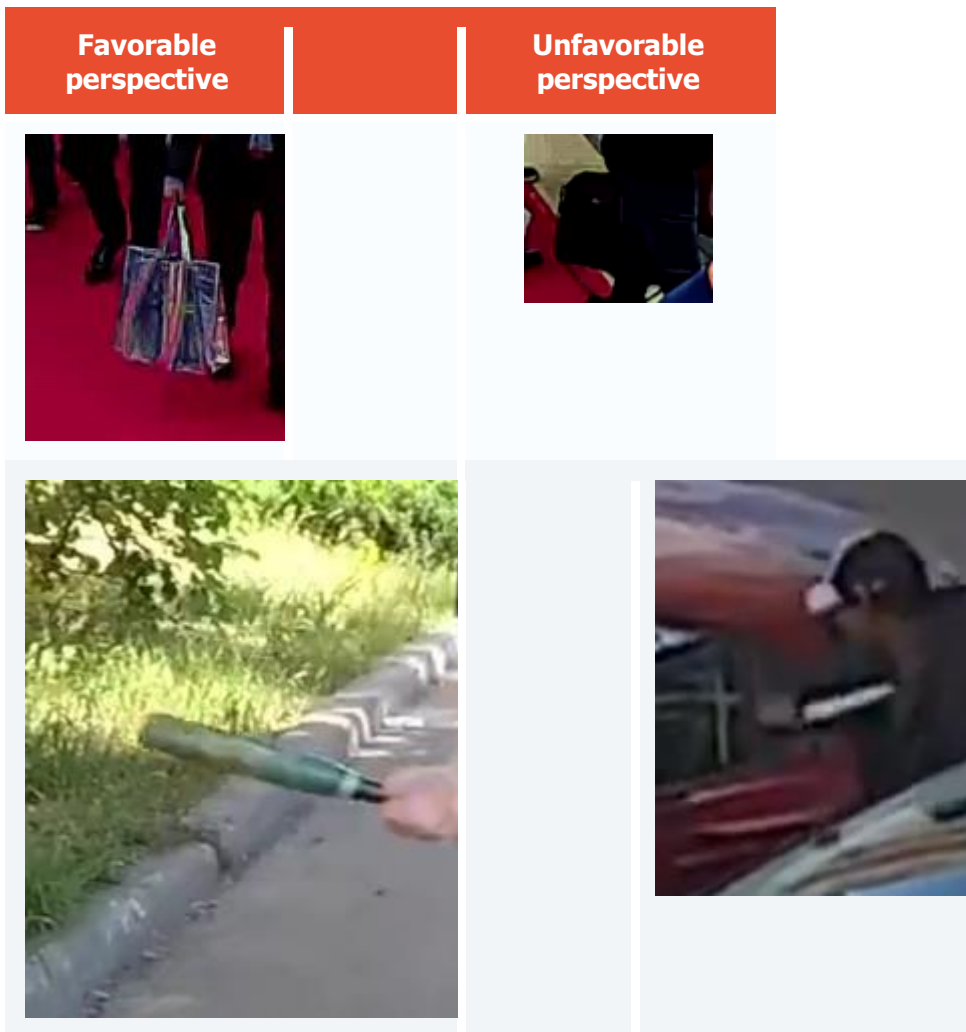
Below are the examples of favorable and unfavorable angles for determining the type of vehicle. The better the perspective, the higher the accuracy of determining the type of a passing vehicle. On average, under good conditions, the accuracy of determining the type of vehicle is about 80%.





The accuracy of searching for other objects significantly depends on the quality of the image, on the size of the object in the frame, as well as on the perspective from which this object is seen. Under suitable conditions, the accuracy of searching for other objects can reach 40% to 60%, depending on the degree of visibility of the object in the frame and its size (for example, a partially hidden weapon or a suitcase hidden behind a corner will be much less likely to be detected than clearly distinguishable objects of the same type). Moreover, this category of objects is characterized by a greater number of false triggerings than others.

Below are the examples of favorable and unfavorable angles for searching for other objects.



Deployment of the module

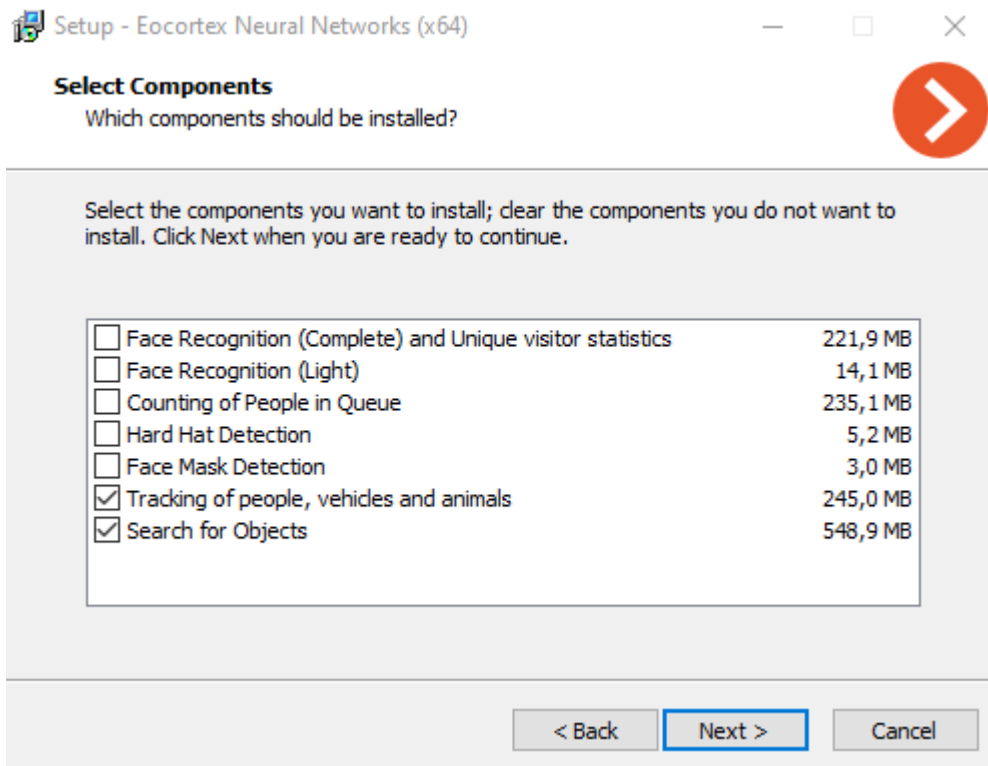
Before using the module, it is required [to install the Eocortex Neural Networks package](#).

The neural network works with the 64-bit version of **Eocortex** only.

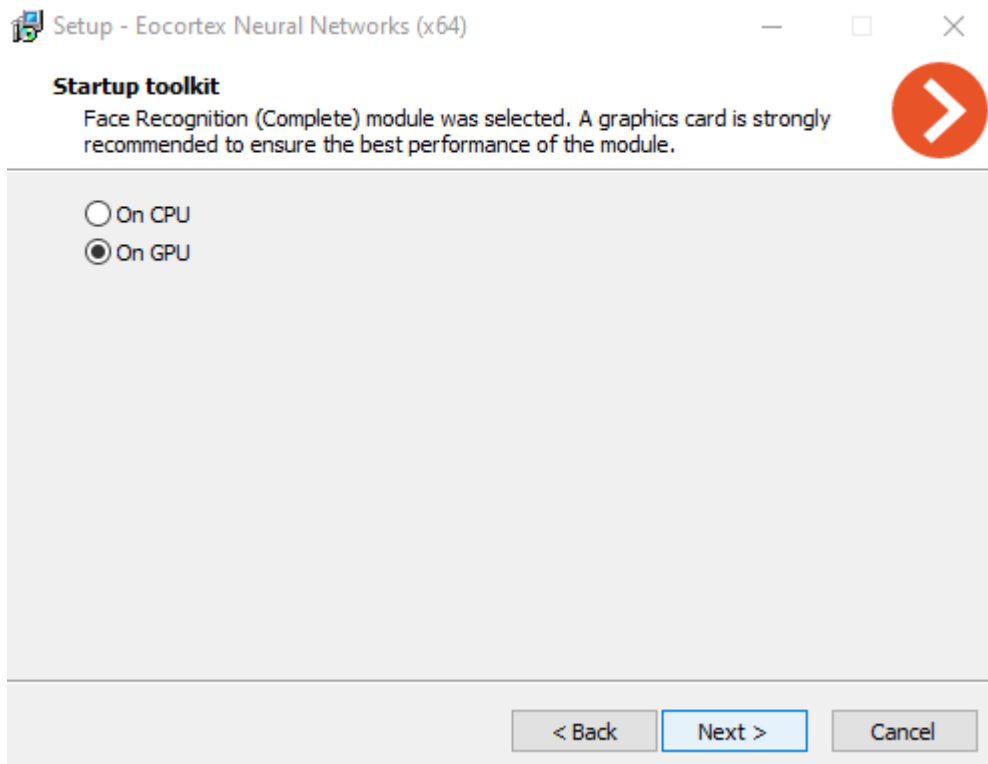
When updating **Eocortex** to a different version, it is also required to update the **Eocortex Neural Networks** package to the relevant version.

Starting with version 3.4 of **Eocortex**, the **Search for Objects** module uses version 11 or higher of PostgreSQL. In this respect, before installing version 3.4 and higher (as well as when upgrading from version 3.3 and lower to version 3.4 and higher), it is required to review the [PostgreSQL installation information](#).

When installing the **Eocortex Neural Networks** package, it is required to select the appropriate component.



For neural network-based search, at the stage of picking tools for launching, it is necessary to select the **On GPU** option. For searching for moving objects only and for simplified search, the video card is not used.





Shelf Fullness Check



The **Shelf Fullness Check** module is designed for monitor the fullness of shelves in a store in order to fill them with merchandize in time.

Details

For the correct operation of the module, it is required to properly place and set up the camera, enable and adjust the software motion detector and the module itself.

Compatibility with other modules

OS	Requires Eocortex motion detector		Neural network	Compatible with modules		Incompatible with modules
			Standard	Special		
√	√	√	–	–	Abandoned object detection module Auto Zoom Counting People in Queue Crowd Monitoring Emergency Vehicle Detection Face Detection Face Mask Detector Face Recognition (Complete) Face Recognition (Light) Fire and Smoke Detector Frame Area Blurring License Plate Recognition (Complete) License Plate Recognition (Light) Loud Sound Detection Object Classification and Counting People Counting	FishEye Dewarping

OS	Requires Eocortex motion detector	Neural network	Compatible with modules	Incompatible with modules
		Standard	Special	
				Personnel Activity Monitoring Sabotage Detector Search for Objects Tracking Traffic Density Heat Map Uniform Detector Unique Visitor Counting

- √ supported and required for the module to work
- + supported and provides additional features of the module
- not supported or not required for the module to work



Use

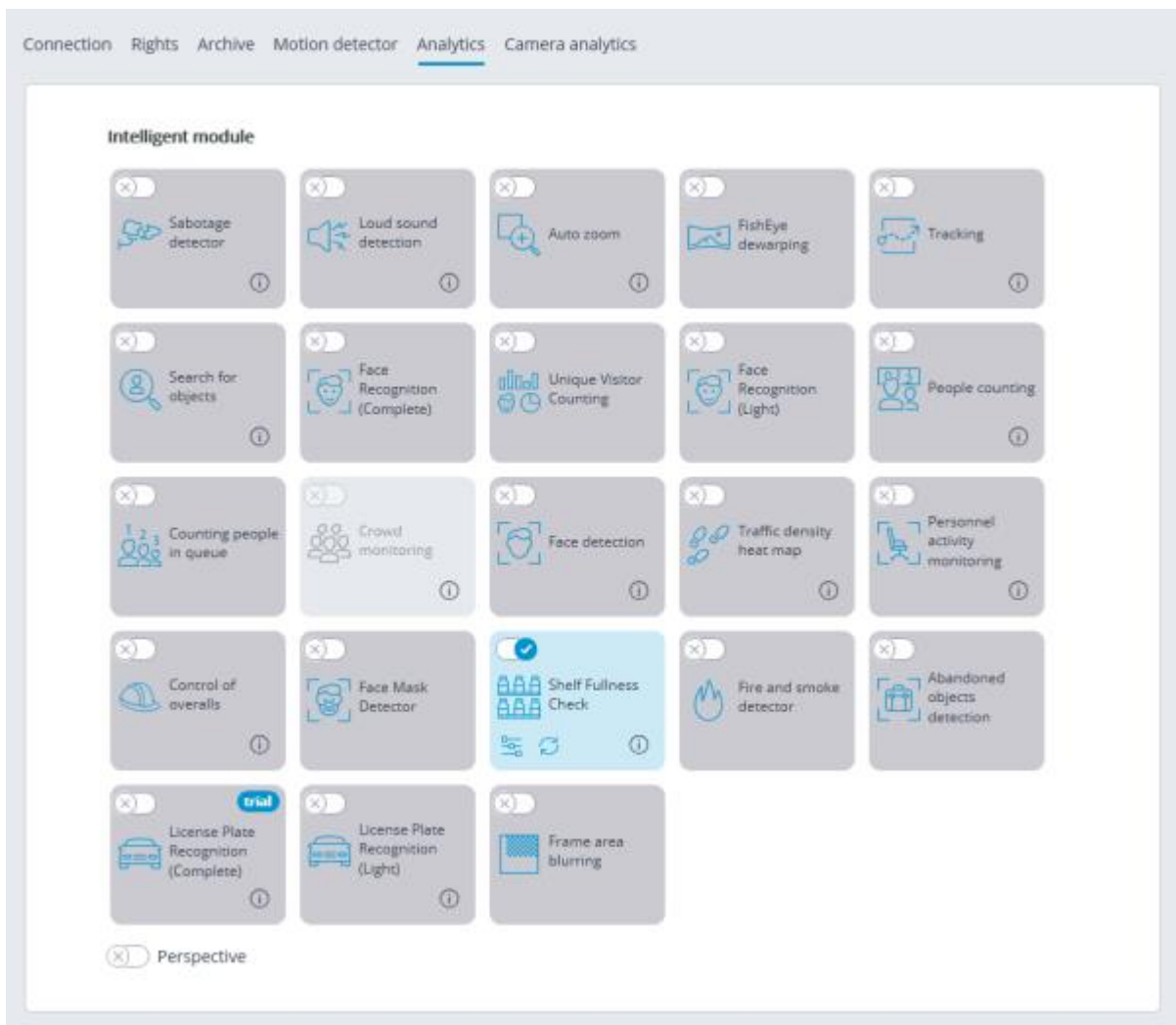
The use of video analytics modules in **Eocortex Client** is described in the **User's guide**, in the **Eocortex Client / Video analytics** section.


Module setup

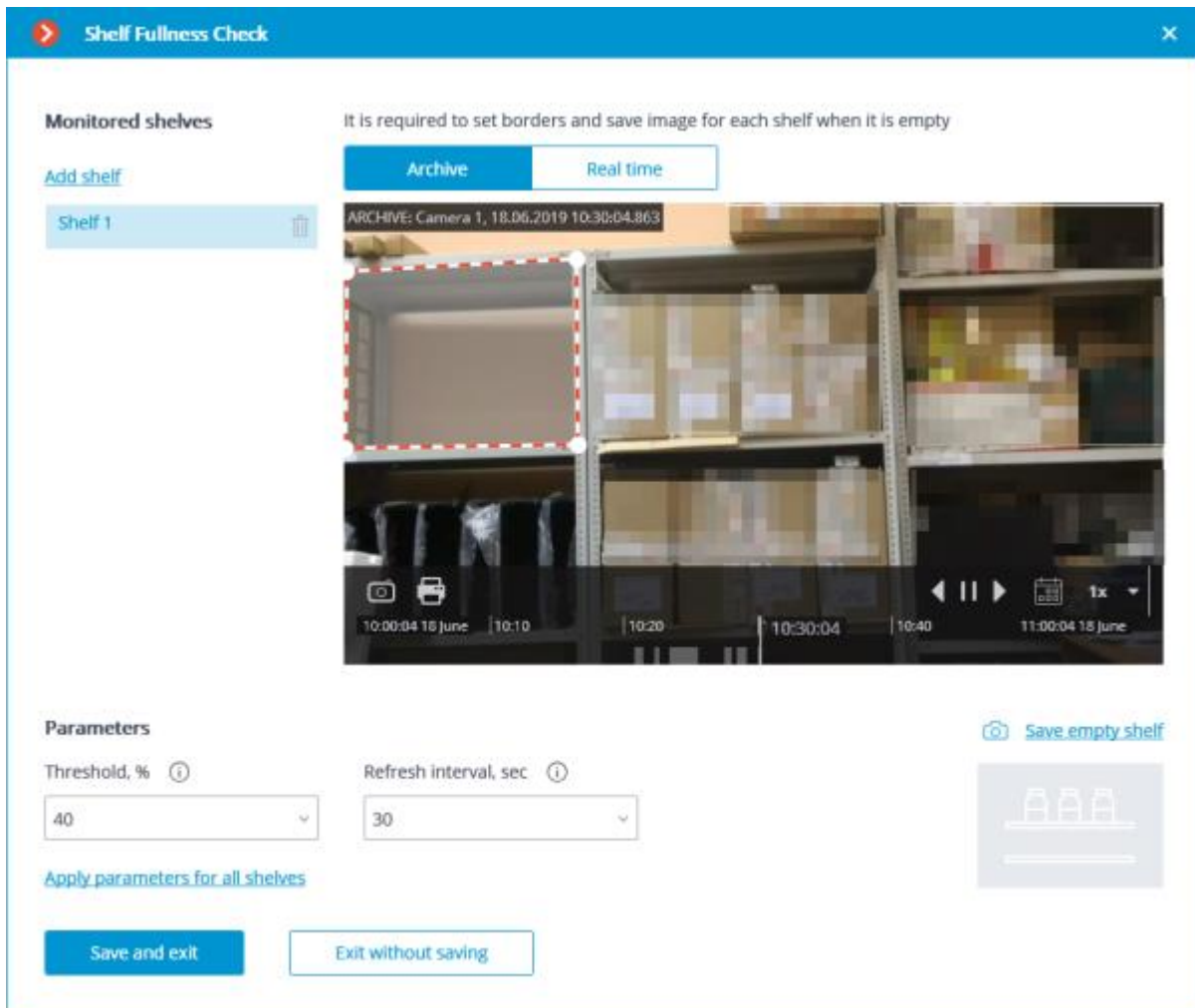
To use the module, enable and set up the software motion detector, then activate the module itself.

To do that, [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list, and set up the motion detector on the [Motion detector](#) tab on the right part of the page.

Then go to the [Analytics](#) tab and enable the module using the  switch, then adjust it pressing the  button.



Clicking the  button opens the module setup window.



The following controls are located in the opened window:

The cell that transmits the video from the camera both in real time and from the archive. The shelf outlines are displayed in the cell. The list of the shelves being monitored is located to the left of the cell.

You can specify up to 10 shelves for one camera.

The outline of the shelf must be set in such a way as to fully enframe the zone to be monitored.



The parameters chosen for the selected shelf are shown in the lower part of the window:

- **Threshold, %:** Shelf fullness percentage below which an alarm will be generated.
- **Refresh interval, sec:** Shelf condition refresh interval. When this value is smaller, the empty shelf will be detected earlier, but the processor load is larger.

Apply parameters for all shelves: Applies the selected parameters for all shelves.

Save empty shelf: An image of empty shelf.

It is obligatory to save the image of an empty shelf for all the shelves being monitored.

The module will start working only when [the settings are applied](#).

Requirements and recommendations

Only up to 10 shelves can be set up for a single camera.

The update of the values is made only within the intervals when there has been no motion within the shelf's boundaries for three seconds.

Requirements for video stream

The recommended optimal resolution of the image for the module to work: HD or FullHD.

The image must be in color.

The frame rate of the stream must be no lower than 1 frame per second.

If different video streams from a camera are used for analysis and display in the Client Application, the aspect ratio of the streams must match.

Requirements for lighting, color reproduction and quality of the image

The image must be of moderate contrast. The details of the objects must be clearly distinguishable in the image.

The quality of the image must be moderate to high, without significant compression artefacts.

Sample image with compression artifacts:



Glare and flare should be avoided in the shelf area, as they can obscure small details of the image.

Lighting conditions and image parameters must remain constant. Flickering of lighting, as well as changes in color reproduction and differences in brightness and contrast over time, should be avoided.

It is recommended to disable automatic white balance and auto exposure in the camera settings.

Requirements for installation and scene of the camera

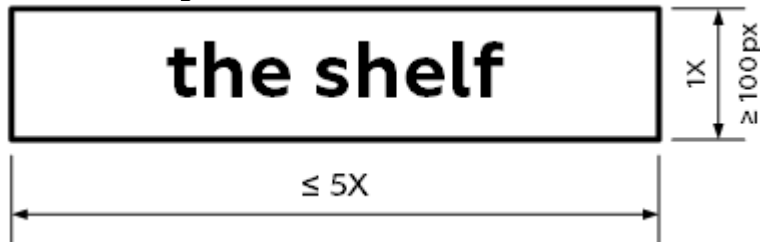
The camera angle should be set in such a way that individual goods or packages of goods are clearly visible on the filled shelf. In particular, the shelf must not be at an excessively sharp angle to the camera.

The image below shows examples of camera angles in relation to the shelf (highlighted in blue): both good (2, 3, 4) and bad (1).



The shelf area must not be too stretched. The maximum acceptable height to length ratio is 1/5.

The shelf image resolution in the smallest measurement must be at least 100 pixels.



The color and texture of the goods on the shelf must be visually different from those of the shelf itself. For example, it is not recommended to put goods in blue packaging on a blue shelf.

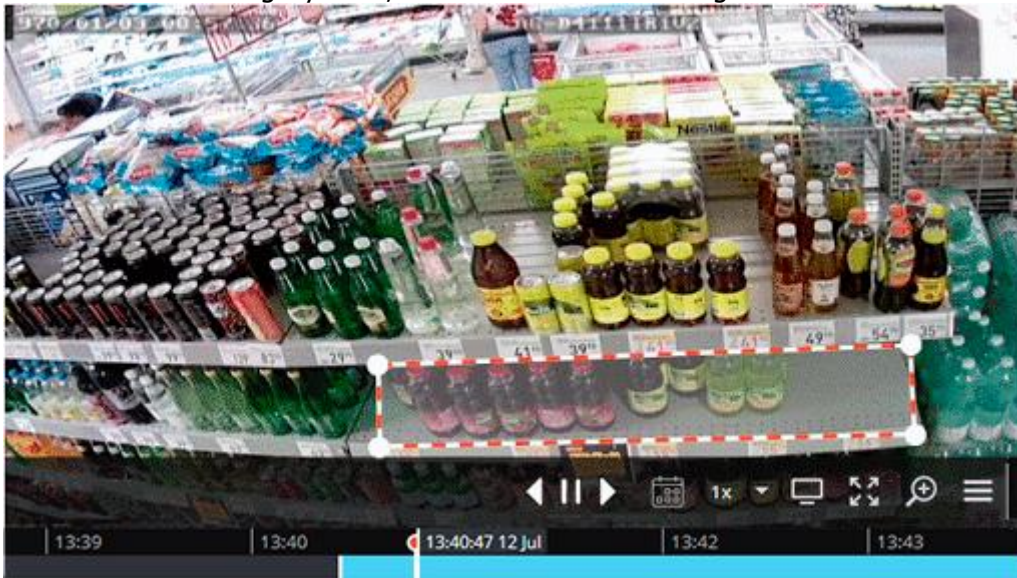
To ensure maximum accuracy, the perspective distortion must be kept to the minimum. In particular, the shelf area must not be affected by distortion from the FishEye lens.

The shelf on the camera image must remain strictly in the part of the frame where the model image of an empty shelf was set for it in the module settings. This means that the camera must be rigidly fixed, and even a slight shift in the camera's field of view is not allowed. The shelf must not physically change its position in space either.

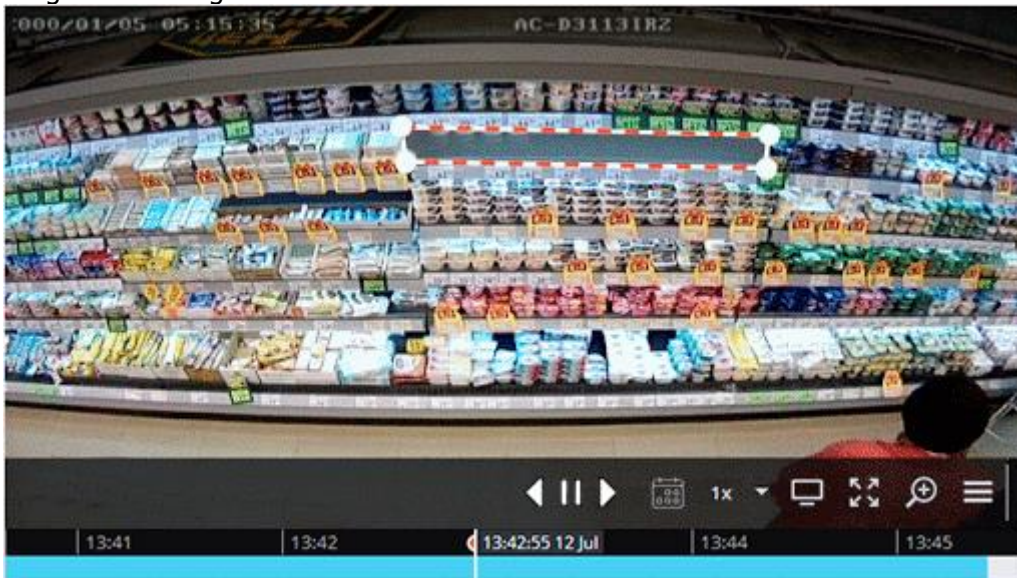
Shadows should be avoided in the shelf area.

Sample images with violated requirements

The camera is not rigidly fixed, the field of view is shifting:



Brightness changes in the shelf area:



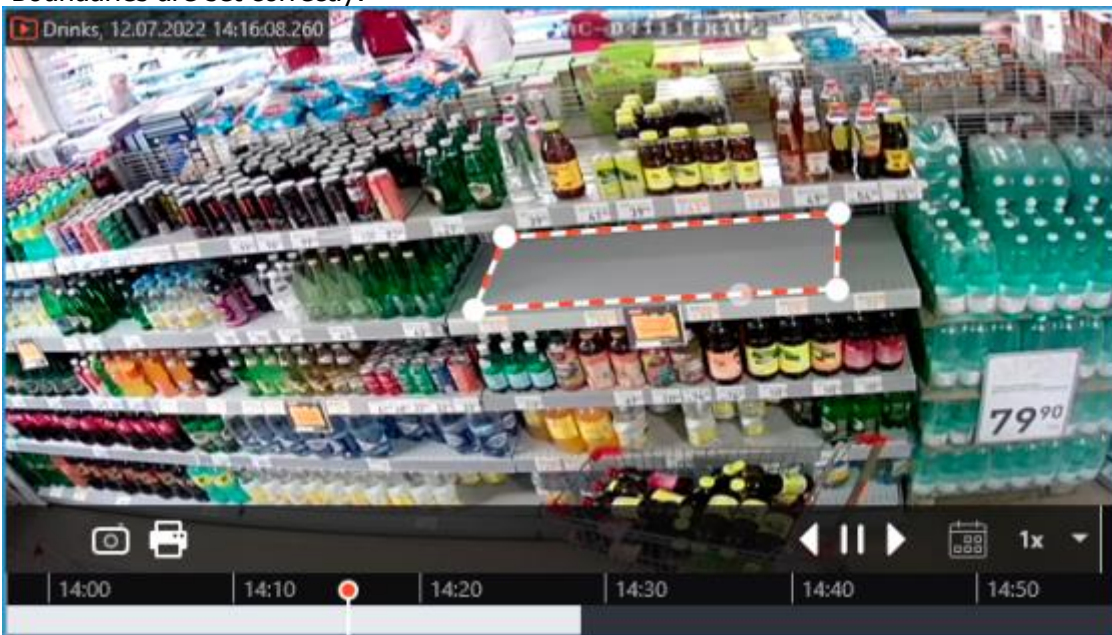
Overexposure of the shelf area:



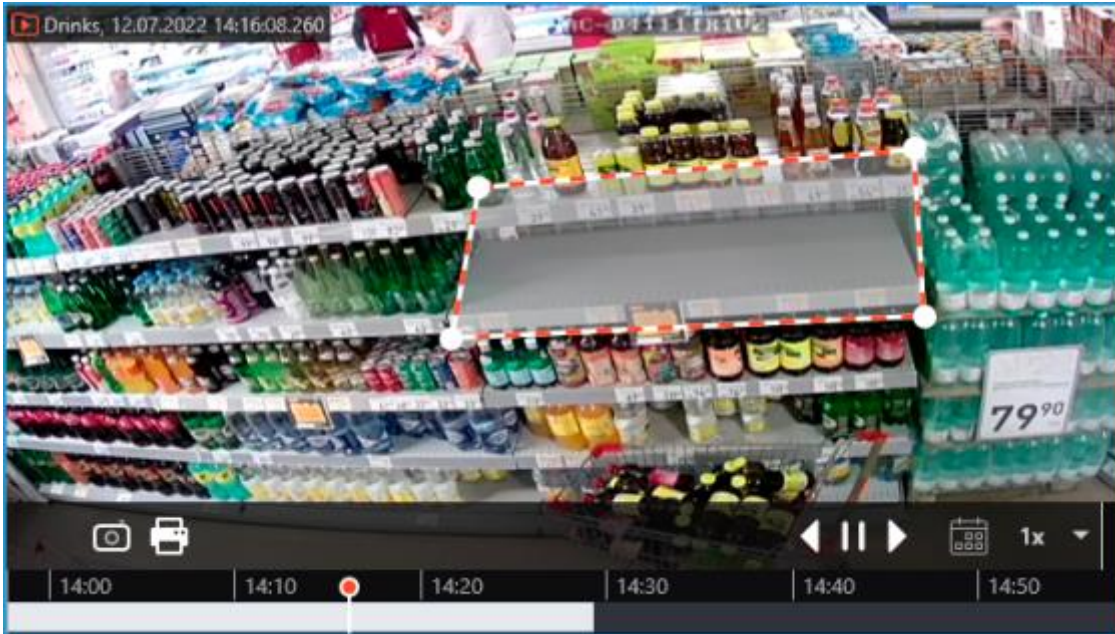
Examples for setting up the contours of the shelves

For the correct work of the module, it is necessary to set the contours of shelves in the module settings. It is important to set the boundaries of each contour so that they cover the area filled with goods as accurately as possible.

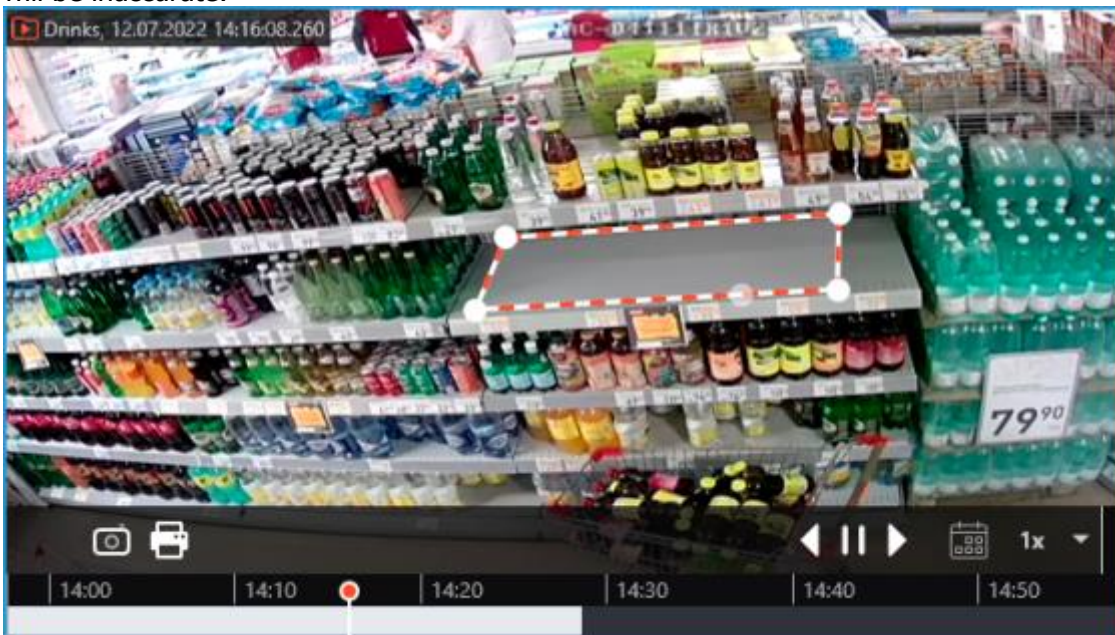
Boundaries are set correctly:



Incorrect setting of boundaries – the contour captures excessive areas, so the fullness values will be underestimated:



Incorrect setting of boundaries – the contour does not cover the entire shelf, so the fullness values will be inaccurate:



Performance

Since the central processor load becomes higher when the video resolution is increased, it is not recommended to use video with the resolution higher than FullHD.

Shelf images with a long side of more than 300 pixels will be additionally scaled during the processing. The longest time to process will take a square shelf with high original image resolution.

During shelf occupancy measurements, peak CPU load spikes may occur. To reduce the overall load on the server, it is recommended to increase the shelf status update intervals, which are set to 30 seconds by default, if possible.

Tracking

The **Tracking** module allows to build trajectories of the objects that move in the fields of view of the cameras, track the crossing of lines by these objects in one or both directions, monitor the presence of the objects in the zones of arbitrarily set shapes, and also filter alarm events by object type. At that, the monitored lines and zones as well as the objects' trajectories can be shown on the screen in real time, and the objects themselves can be highlighted by the rectangles of various colors. All the events of the module are recorded in the event log.

Capabilities of the module

Depending on the settings, the module can track:

any moving objects;

objects of certain categories:

People

Animals

Vehicles by type: Passenger cars, Buses, Trucks, Motorcycles.

Moreover, it is possible to set up the Tracking of objects of a certain range of dimensions.

Details

Starting with version 3.5 of **Eocortex**, the **Tracking**, **Search for Objects** and **Uniform Detector** modules running on the same camera share the processor and video card resources. This reduces the load on the server.

For the most efficient sharing of resources, it is recommended to set the same operating mode for the camera in the settings of these modules: either using a video card or without using a video card.

To track people, vehicles and animals, it is required [to install the Eocortex Neural Networks software package](#); a video card [with the parameters matching the module's requirements](#) is also necessary.

The approximate accuracy of determining the types of transport:

Passenger cars ~95%;




Buses ~80%;


Trucks ~70%;

Motorcycles ~90%.

Compatibility with other modules

OS	Requires Eocortex motion detector		Neural network	Compatible with modules		Incompatible with modules
			Standard	Special		
√	√	√	+	+	Abandoned object detection module Auto Zoom Counting People in Queue Crowd Monitoring Emergency Vehicle Detection Face Detection Face Mask Detector Face Recognition (Complete) Face Recognition (Light) Fire and Smoke Detector Frame Area Blurring License Plate Recognition (Complete) License Plate Recognition (Light) Loud Sound Detection People Counting Personnel Activity Monitoring Sabotage Detector	Object Classification and Counting

OS	Requires Eocortex motion detector	Neural network	Compatible with modules	Incompatible with modules
		Standard	Special	
				Search for Objects Shelf Fullness Check Traffic Density Heat Map  FishEye Dewarping


- ✓ supported and required for the module to work
- + supported and provides additional features of the module
- not supported or not required for the module to work
-  not recommended for use with the current module



Use

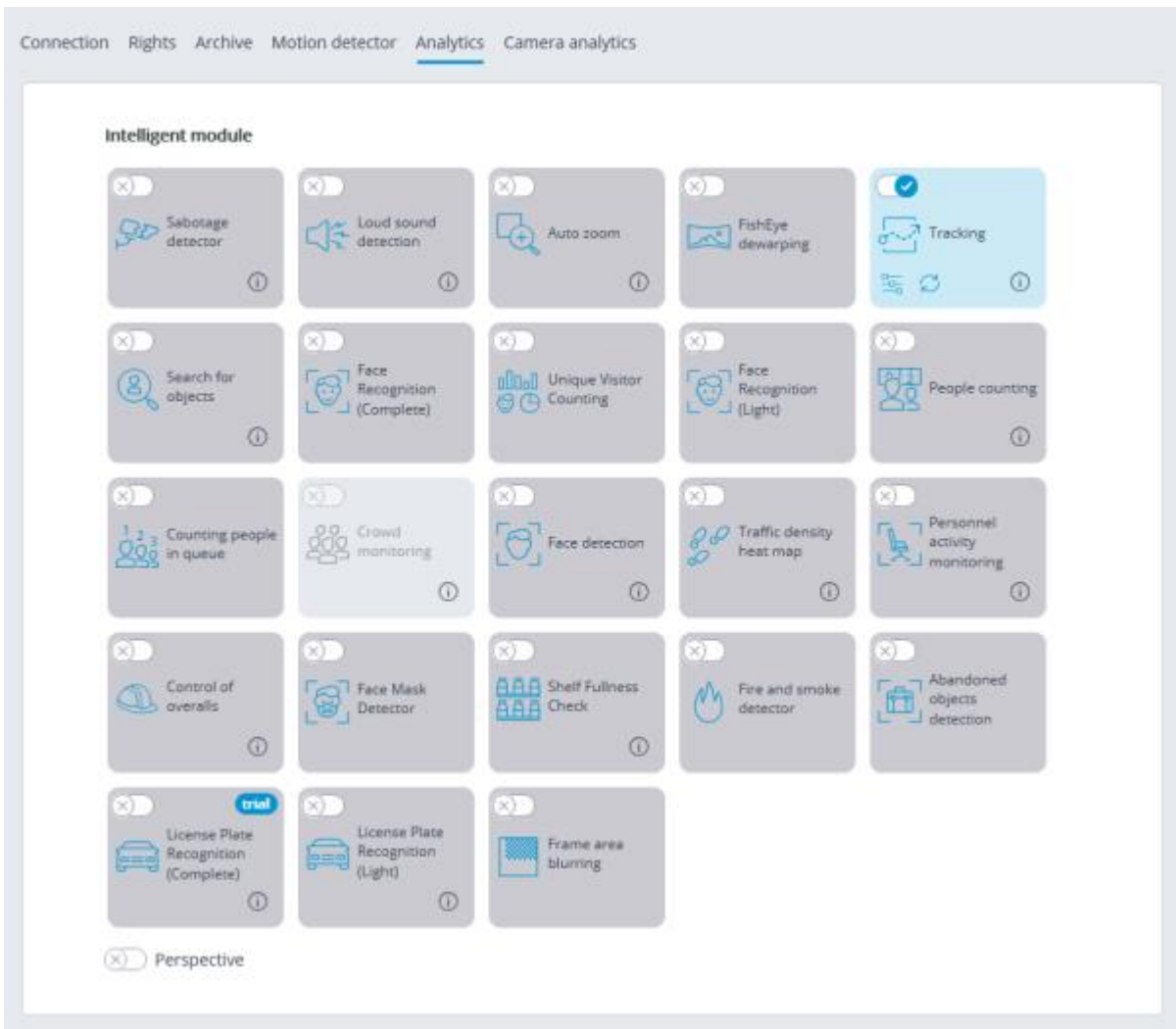
The use of video analytics modules in **Eocortex Client** is described in the **User's guide**, in the **Eocortex Client / Video analytics** section.


Module setup

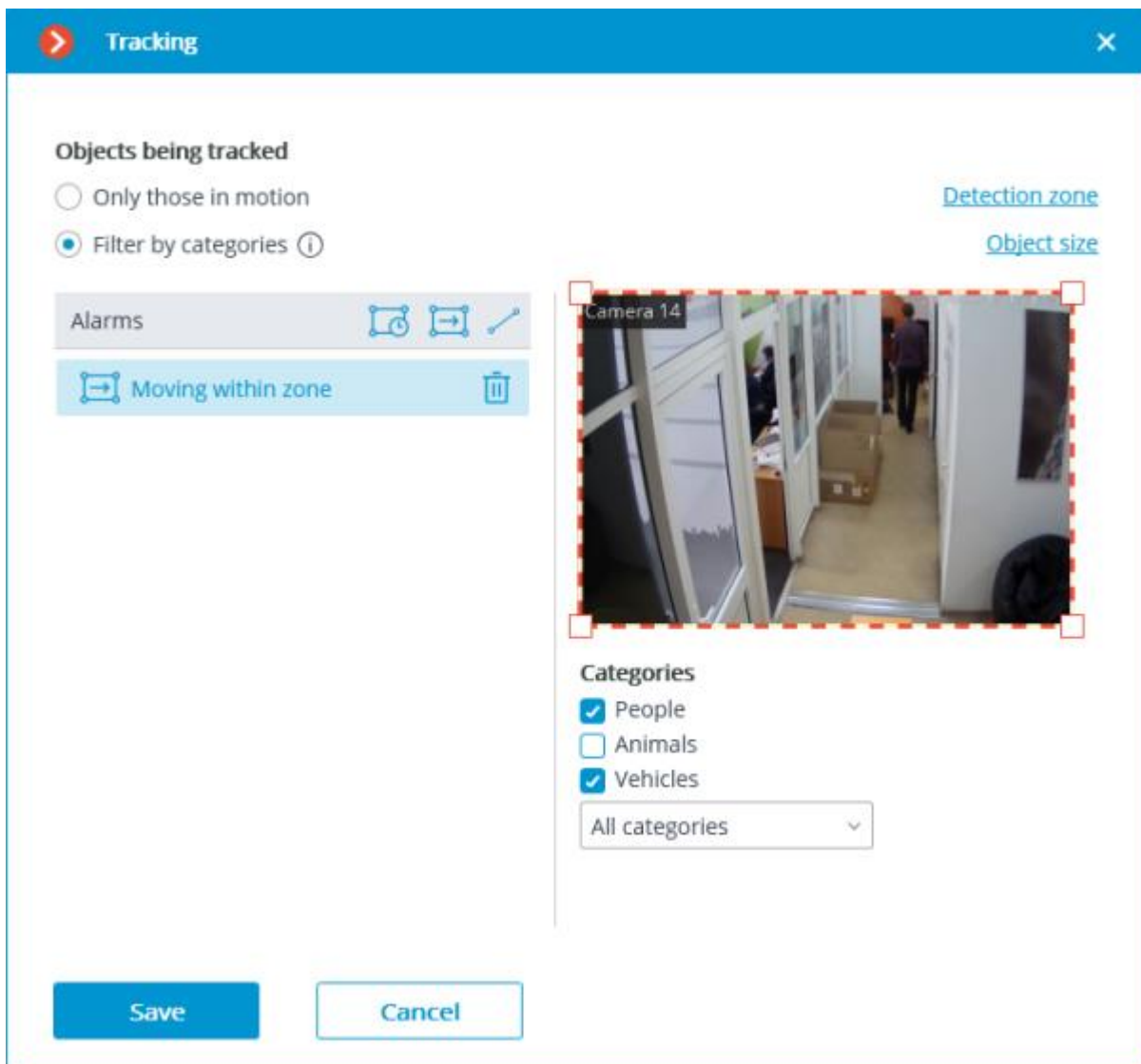
To use the module, enable and set up the software motion detector, then activate the module itself.

To do that, [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list, and set up the motion detector on the [Motion detector](#) tab on the right part of the page.

Then go to the [Analytics](#) tab and enable the module using the  switch, then adjust it pressing the  button.



Clicking the  button opens the module setup window.



In the **Objects being tracked** group of settings, the user can choose which objects to track: all the objects, or people, vehicles and animals only. At that, in case of selecting **Filter by categories**, it is possible to select, optionally, which types of objects exactly will be tracked.

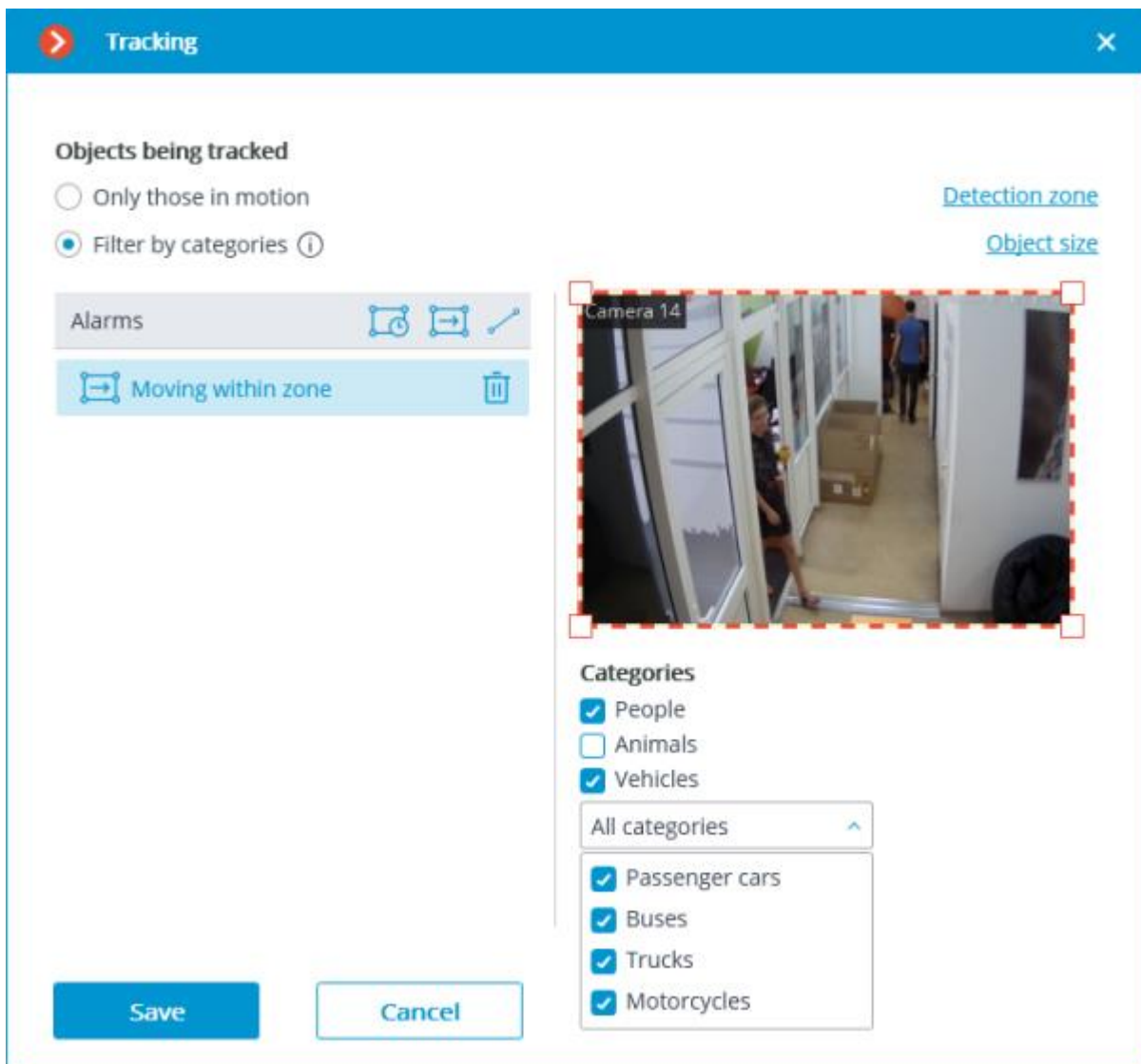
In the **Objects being tracked** group of settings, it is possible to select which objects will be tracked: either all moving objects or only objects of a specified category.

Selecting **Filter by categories** it is possible to optionally select which object categories will be tracked:




- People
- Animals
- Vehicles by type: Passenger cars, Buses, Trucks, Motorcycles.

By default, **People** and **Vehicles** of all modes of transportation are selected.

To track people, vehicles and animals, it is required [to install the Eocortex Neural Networks software package](#); a video card [with the parameters matching the module's requirements](#) is also necessary.



In the **Alarms** group of settings, it is possible to set the situations that will trigger alarms:

-  Long stay of an object in a preset area;
-  An object entering a preset area;
-  Crossing of a preset line.

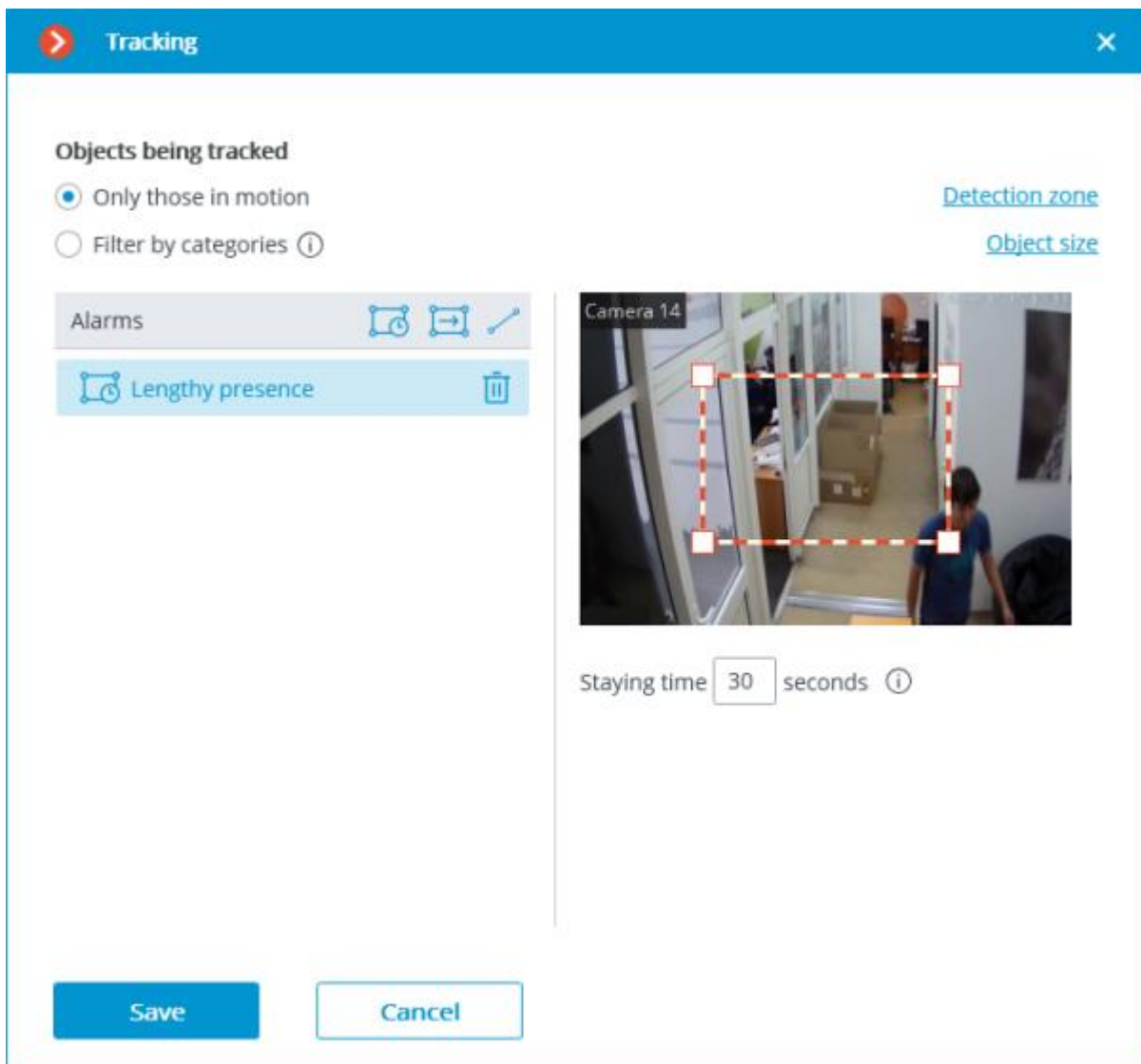
Long stay in the zone

To set the control zone, it is required to press the  button. A rectangular zone will appear in the preview window.


The zone configuration can be changed by dragging the key points at the corners of the polygon. To add a key point, it is required to double-click the left mouse button on the line; to delete - right-click on the key point.

For the **Long stay in the zone** alarm, the allowable duration of stay must be set. The default setting is 30 seconds. The maximum permissible value is 300 seconds.

Alarm will be generated only when the object has stayed in the zone for longer than the allowed time. The object may be out of the zone for a short time, but no more than 5 seconds.

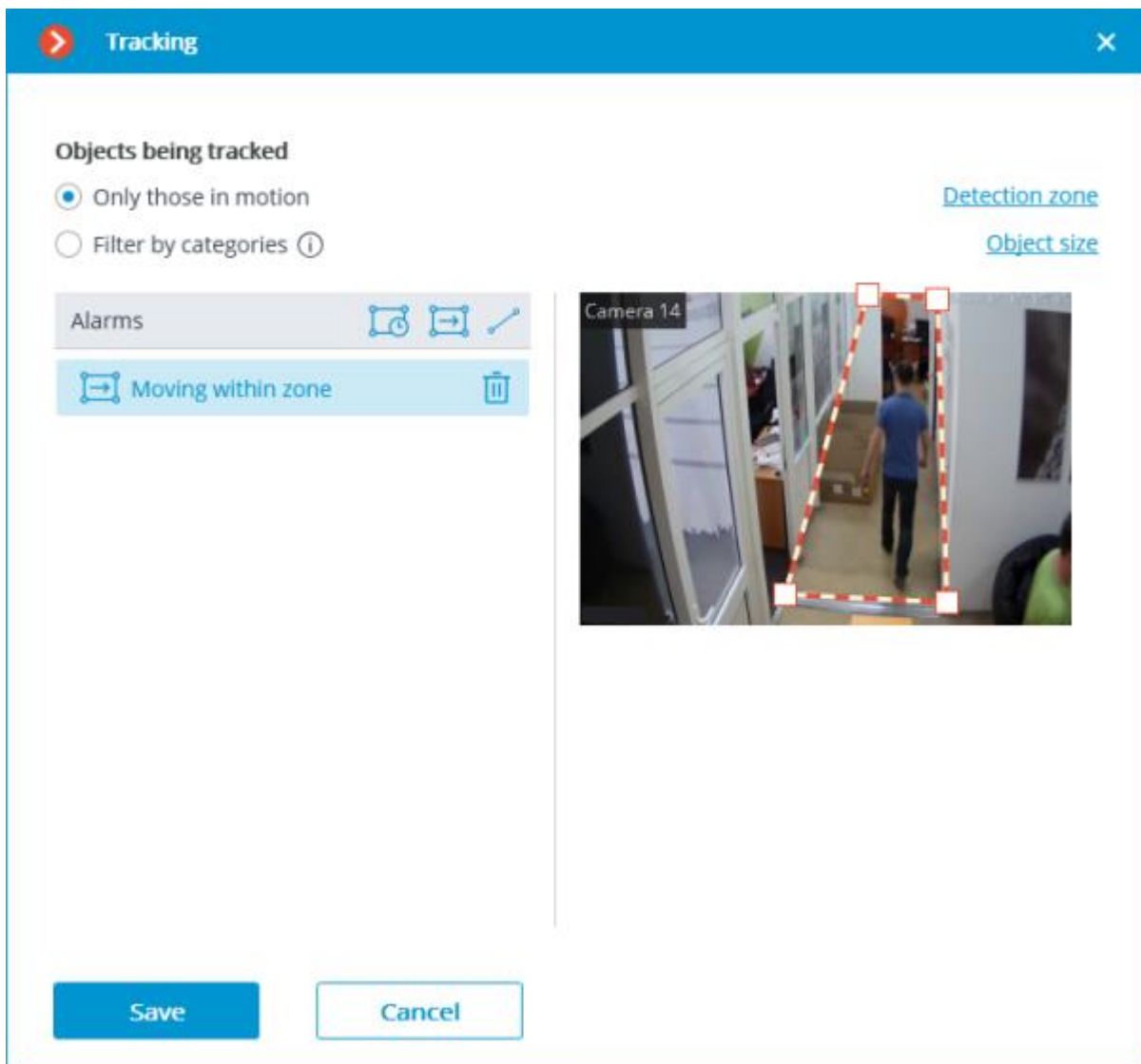


Movement in the area

To set the control zone, it is required to press the  button. A rectangular zone will appear in the preview window.

The zone configuration can be changed by dragging the key points at the corners of the polygon. To add a key point, it is required to double-click the left mouse button on the line; to delete - right-click on the key point.

The alarm will be generated when any object with the preset parameters enters the zone.




Crossing of the line

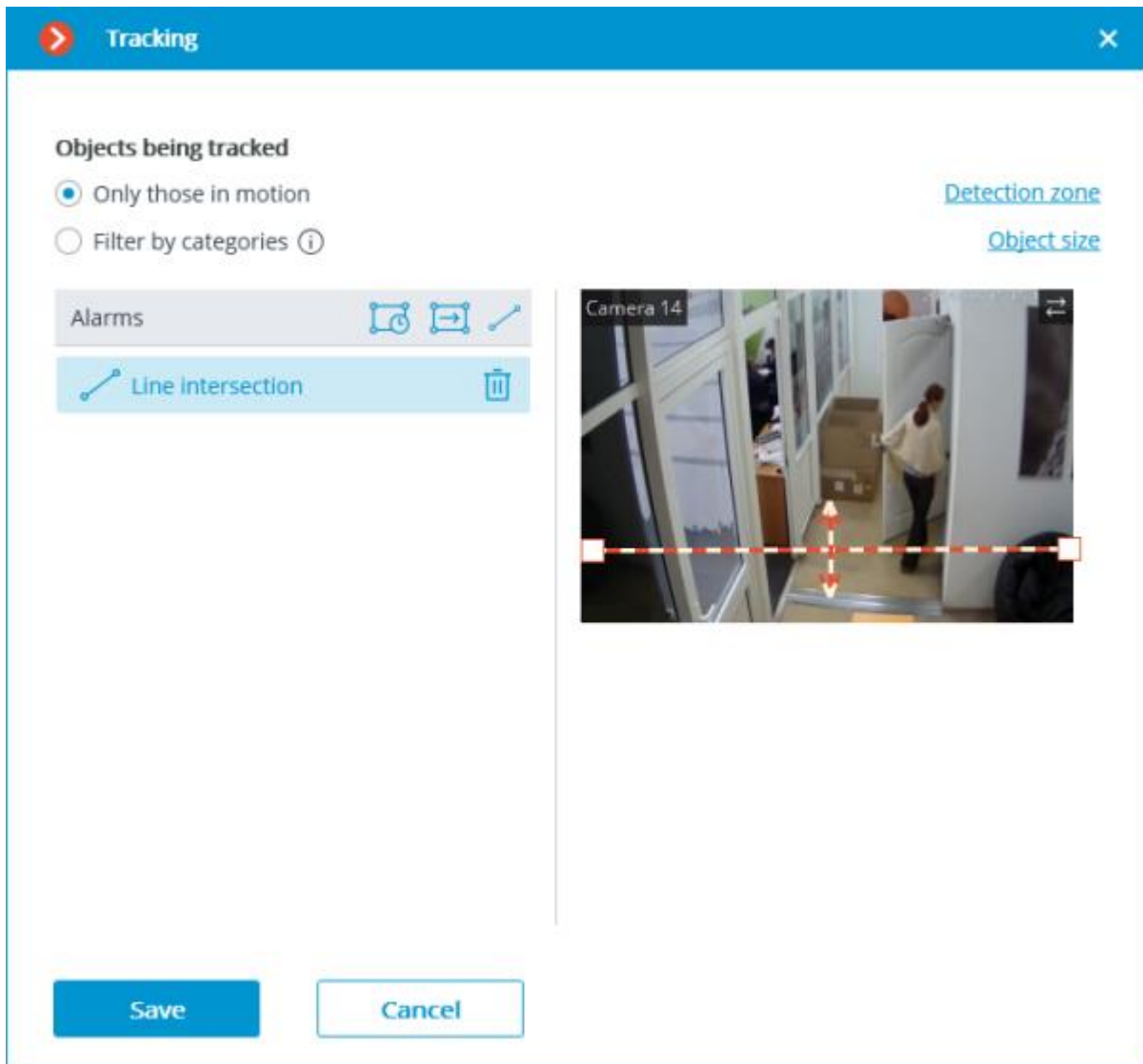
The position of the line can be changed by dragging the key points on its ends.

In order to indicate the direction of triggering, it is required to select the corresponding value in the **Moving direction** dropdown list. When only one direction is selected, an arrow showing the set direction will appear perpendicular to the line. In this case, an alarm will be generated only when the line is crossed in the preset direction.

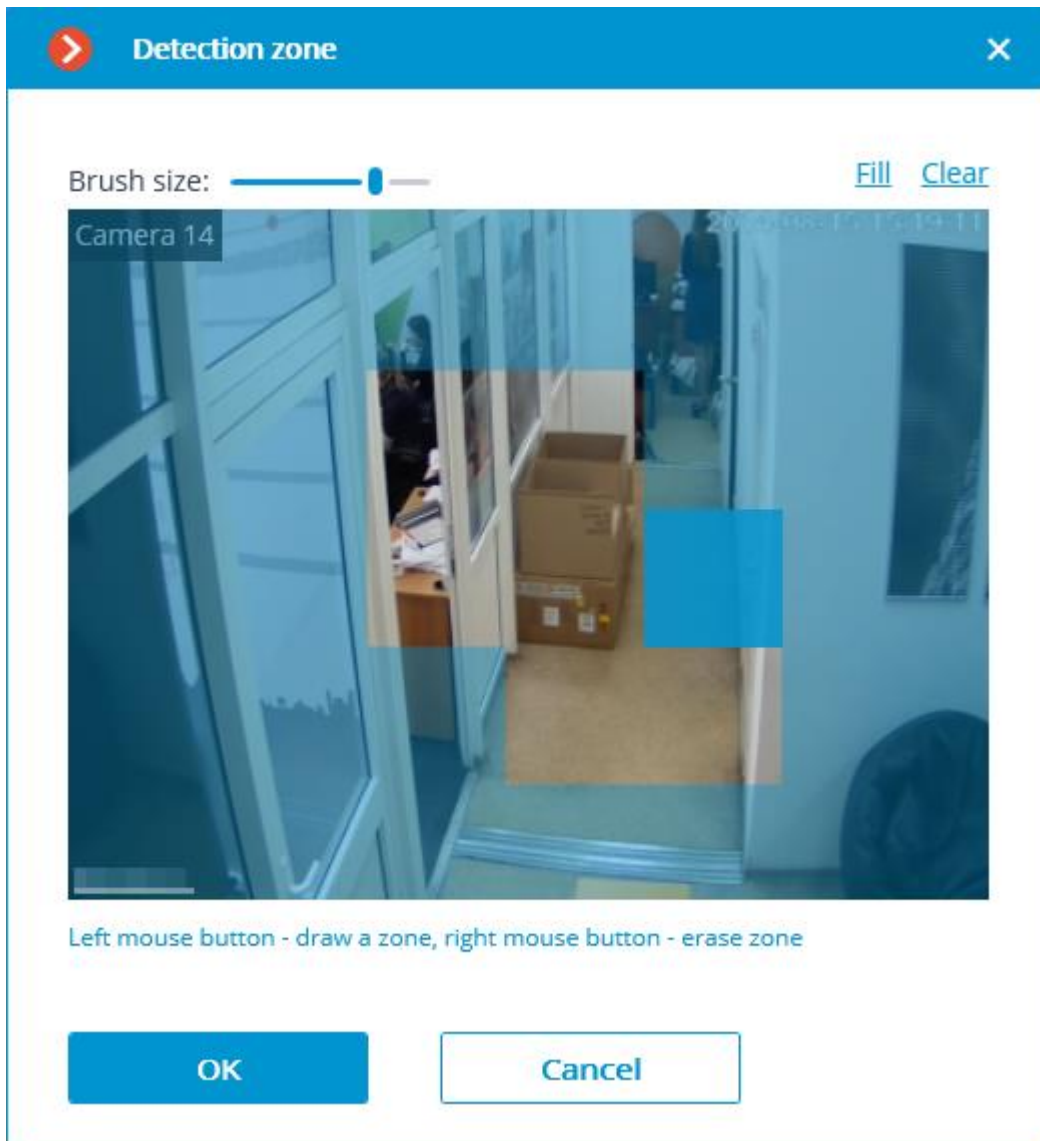
To set an intersection line, it is required to press the  button. A line will appear in the preview window.

The position of the line can be changed by dragging the key points on its ends.

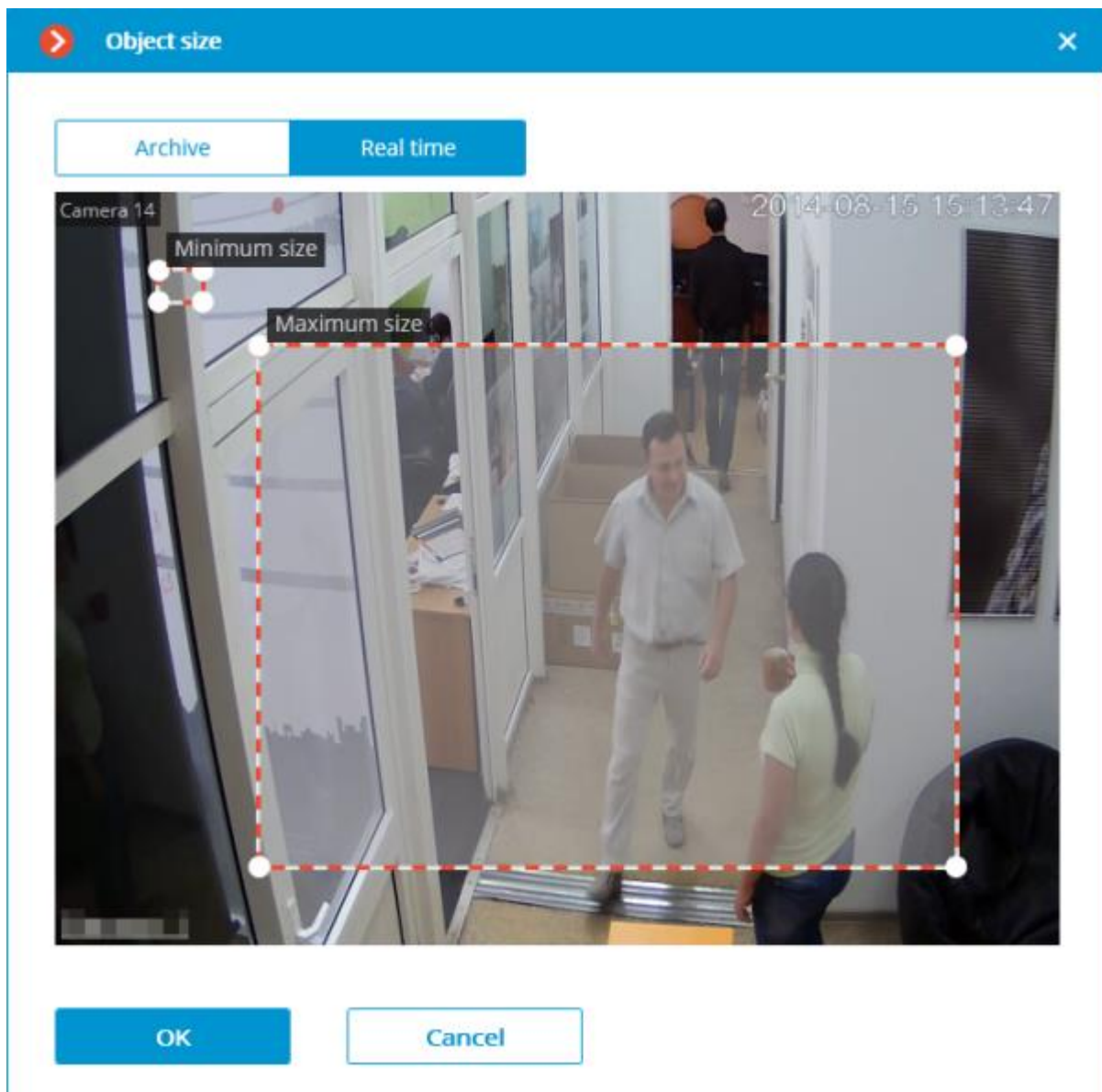
To indicate the direction of operation, click the button  located in the upper right corner of the preview window. If only one direction is selected, an arrow will be displayed to indicate the direction you set. In this case, the alarm will be generated only when the objects cross the line in the given direction.



Detection zone is the zone of the frame filled with the semitransparent blue fill in the settings window. The mouse is used for modifying the zone: left mouse button serves for filling the zone, and the right one is used for clearing it. With the help of the **Fill** and **Clear** buttons you can fill or clear the whole area of the frame. The corresponding slider is used to modify the **Brush size**.



The minimum and maximum sizes of the objects to be detected are set on the **Object size** tab.



The module will start working only when [the settings are applied](#).

Requirements and recommendations

Hardware and software



It is required to install the **Eocortex Neural Networks** package to track people, vehicles, and animals (if **Filter by categories** is enabled).

The following equipment is required to use this neural network-based module:

- A processor with AVX instructions support;
- An **NVIDIA** video card (GPU) with the computation capacity index of at least 6.5 and with at least 4 Gb of memory; the parameters and performance of the video card must be similar or better than those of **NVIDIA GTX 1650 Super** model;
- version of the video card driver at least 460;
- swap file at least half of the total RAM size.

If the package will be installed on a virtual machine, it may additionally be required to:

- Enable support for AVX instructions in the guest machine settings;
- Use GRID drivers for GPU virtualization.



Eocortex must use video cards selected for running neural networks in monopoly mode. It is not allowed to use such card for other applications or tasks that consume GPU resources, including for displaying video. Simultaneous use of a video card for several tasks may lead to incorrect system operation: from analytics performance degradation to server instability.



The neural network works with the 64-bit version of **Eocortex** only.



When upgrading Eocortex to another version, it is necessary to also upgrade the **Eocortex Neural Networks** package to the corresponding version.



When using a video card, the stable operation of the module is guaranteed on operating systems Windows 10, Windows Server 2016, Ubuntu versions 18.04 and 20.04 exclusively, as well as on the newer versions of these operating systems.

On other operating systems (Windows versions 7 and 8, Windows Server versions 2008 and 2012, CentOS, Debian), issues may arise when trying to use NVIDIA graphics cards. On Windows 8, this is due to the cessation of support for NVIDIA graphics card drivers. On CentOS and Debian, the problem is due to the high complexity of installing workable versions of video card drivers.

Performance

The tables below show the permitted quantity of cameras for various video stream options and server configurations without the display feature.

When using GPU (**Filter by categories** mode)

CPU	GPU	RAM, GB	Quantity of cameras
Video stream coming from cameras: 2 megapixels, 25 fps			
Intel® Core™ i5-2400	NVIDIA GeForce GTX-1050 Ti	8	5
Intel® Core™ i7-2600	NVIDIA GeForce GTX-1060	8	9
Intel® Core™ i7-7700	NVIDIA GeForce RTX-2070	8	13
Intel® Core™ i9-9900	NVIDIA GeForce RTX-2080	12	20
Video stream coming from cameras: 1 megapixel, 25 fps			
Intel® Core™ i5-2400	NVIDIA GeForce GTX-1050 Ti	8	8

Without using GPU (**Only those in motion** mode)

CPU	RAM, GB	Quantity of cameras
Video stream coming from cameras: 2 megapixel, 25 fps		
Intel® Core™ i3-8100	8	5
Intel® Core™ i5-8400	12	9
Intel® Core™ i5-9600	16	13
Intel® Core™ i9-9900	20	20
Video stream coming from cameras: 1 megapixel, 25 fps		
Intel® Core™ i3-8100	12	8

Video stream

Frame frequency: no lower than 10 frames per second;

Image resolution: no lower than HD (1280x720).

Image

Lighting in the frame should be uniform and constant.

If the camera is installed in front of a bright light source (the sun behind the entrance door, etc.), it is necessary to adjust the exposure (or brightness) so that the objects in the frame have a natural color (not overexposed or too dark). In this case, an overexposed background is acceptable.

The image must be in color.

Image quality should be at least average. There should be no significant compression artifacts.

Scene and camera position

The object should be seen from a suitable angle so that it is positively distinguishable from the background and clearly visible to the human eye.

The frame must not contain reflective surfaces: glass, mirrors, etc.

It is permitted to place the camera overhead. In this case, the angle of inclination of the camera in relation to the horizontal must not exceed 45°.

Recognition of vehicles

Minimum requirements to ensure the identification of vehicles are as follows:

The resolution must be at least HD (1280x720).

Detection of vehicles must be performed during daylight hours in good weather.

Exposure and contrast on the camera must be set so that the color of the object can be unambiguously detected by the human eye.

The body of a vehicle must not be light-struck by headlights or other light sources. There must not be any bright glare on the body.

The angle of view must provide correct identification of the type of vehicle (e.g., it is sometimes difficult to distinguish a bus from a truck when viewed from behind).

Installing the camera at an angle to the axis of movement of vehicles provides the most favorable perspective.

Examples

Below are the examples of angles for determining the mode of transport.

Correct

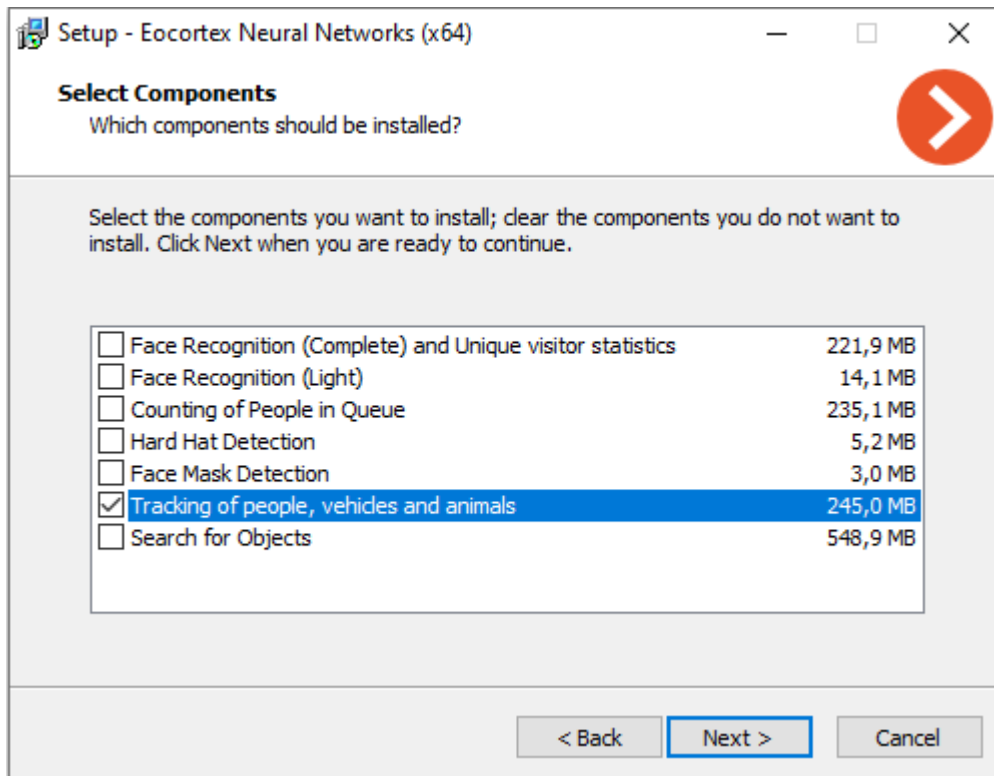
Incorrect



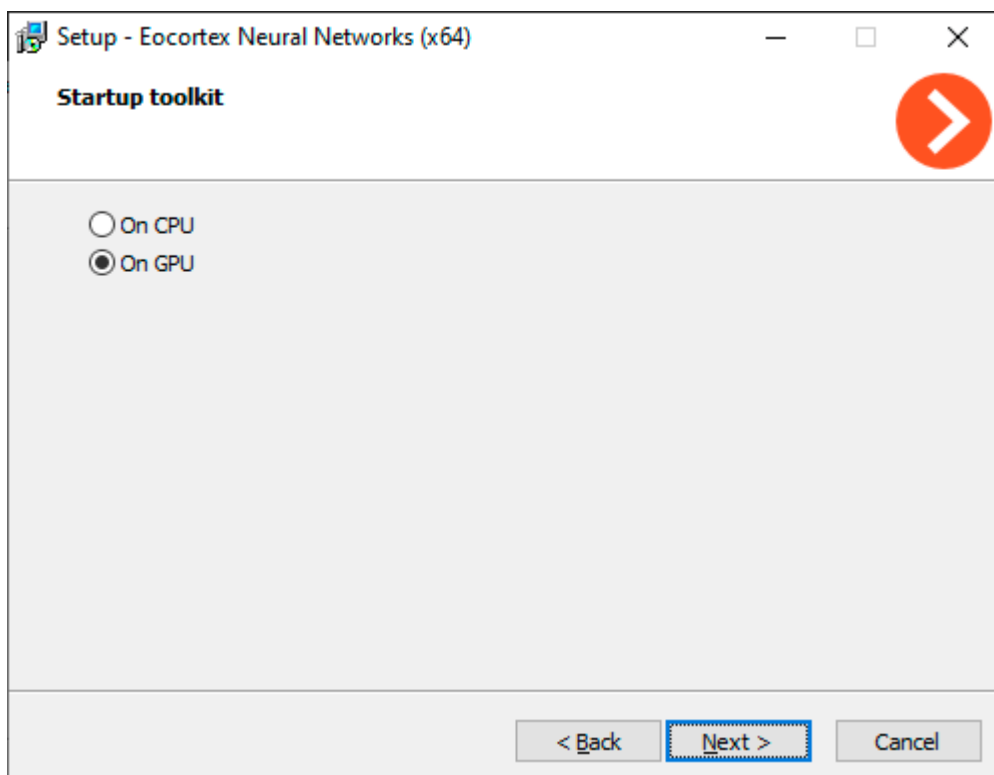
Deployment of the module

To track people, vehicles and animals, it is required [to install the Eocortex Neural Networks software package](#); a video card [with the parameters matching the module's requirements](#) is also necessary.

In the process of installation of **Eocortex Neural Networks**, it is required to select the **Tracking of people, vehicles and animals** component.



The module's operation requires a video card (GPU).



Uniform Detector

The **Uniform Detector** is designed to detect people both in workwear and without it. In live view, such people will be highlighted on the screen with a colored frame, and the incidents will be recorded in the event log.

The alarm event is the event of the absence of workwear, a common one is the presence of workwear. Depending on the event, the detection frame and the corresponding text will be highlighted in red or green.

The main use case for this module is to monitor compliance with occupational safety rules at manufacturing and construction sites.

Capabilities of the module

Depending on the corresponding settings, the module can determine **Presence**, **Absence** or both values of the following parameters:

Hard hat;

Safety vest;

Uniform.

If the **Uniform** parameter is selected, it is necessary to set a **color** for it.

Details



For the proper functioning of the module it is required to place the camera correctly and to set up the software motion detector and the module itself.

It is required to [install the Eocortex Neural Networks package](#) before using the module.

Starting with version 3.5 of **Eocortex**, the **Tracking**, **Search for Objects** and **Uniform Detector** modules running on the same camera share the processor and video card resources. This reduces the load on the server.

For the most efficient sharing of resources, it is recommended to set the same operating mode for the camera in the settings of these modules: either using a video card or without using a video card.

Compatibility with other modules

OS	Requires Eocortex motion detector		Neural network	Compatible with modules		Incompatible with modules	
			Standard	Special			
✓	✓	✓	–	–	Abandoned object detection module Auto Zoom	–	

OS	Requires Eocortex motion detector	Neural network	Compatible with modules	Incompatible with modules
		Standard	Special	
				Counting People in Queue Crowd Monitoring Emergency Vehicle Detection Face Detection Face Mask Detector Face Recognition (Complete) Face Recognition (Light) Fire and Smoke Detector Face Detection License Plate Recognition (Complete) Loud Sound Detection Object Classification and Counting People Counting Personnel Activity Monitoring Sabotage Detector Search for Objects Shelf Fullness Check Tracking Unique Visitor Counting ▲ FishEye Dewarping

√ supported and required for the module to work

- + supported and provides additional features of the module
- not supported or not required for the module to work
- ▲ not recommended for use with the current module

Use



The use of video analytics modules in **Eocortex Client** is described in the **User's guide**, in the **Eocortex Client / Video analytics** section.

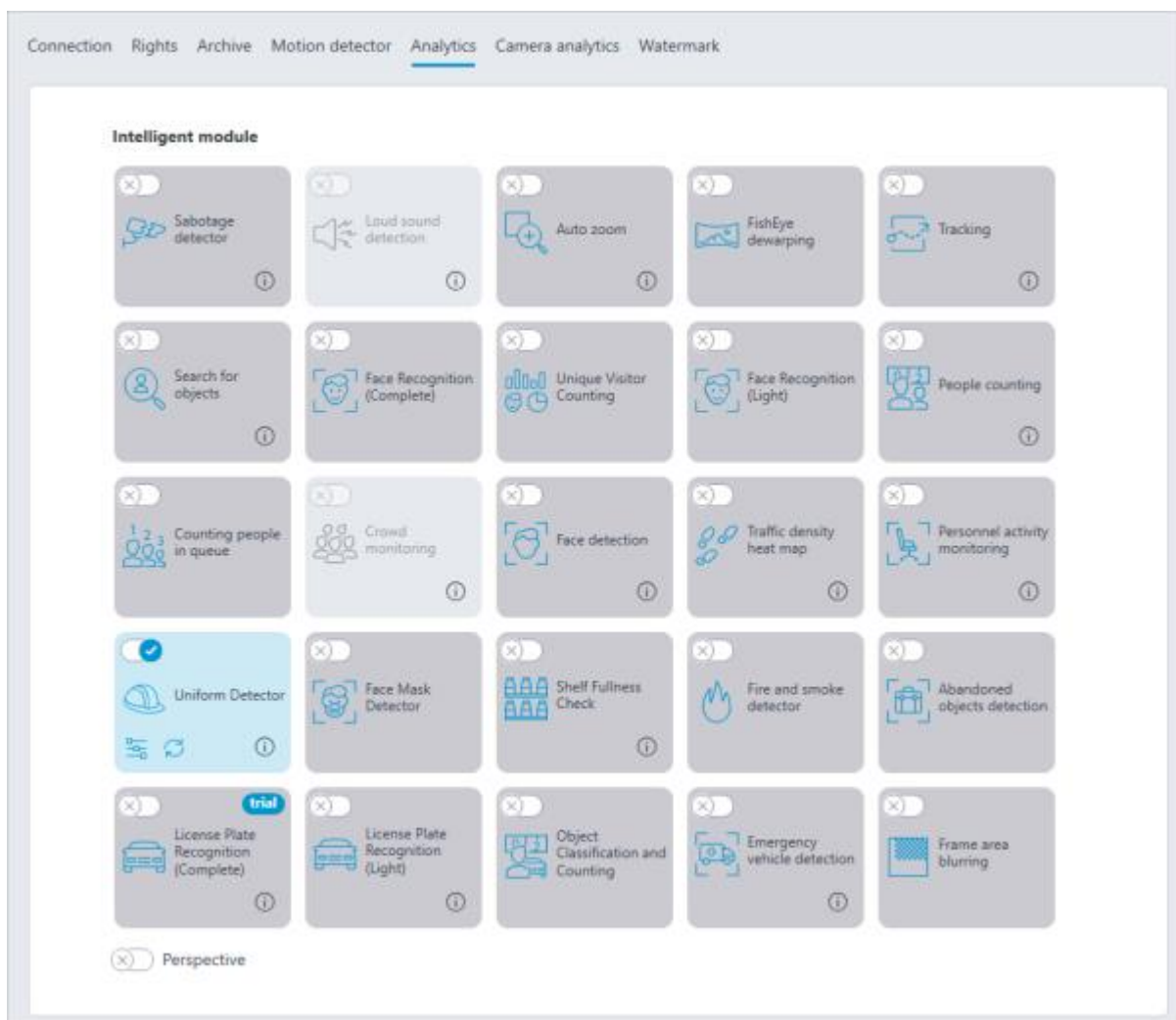
Module setup


Before using the module, it is required [to install the Eocortex Neural Networks package](#).

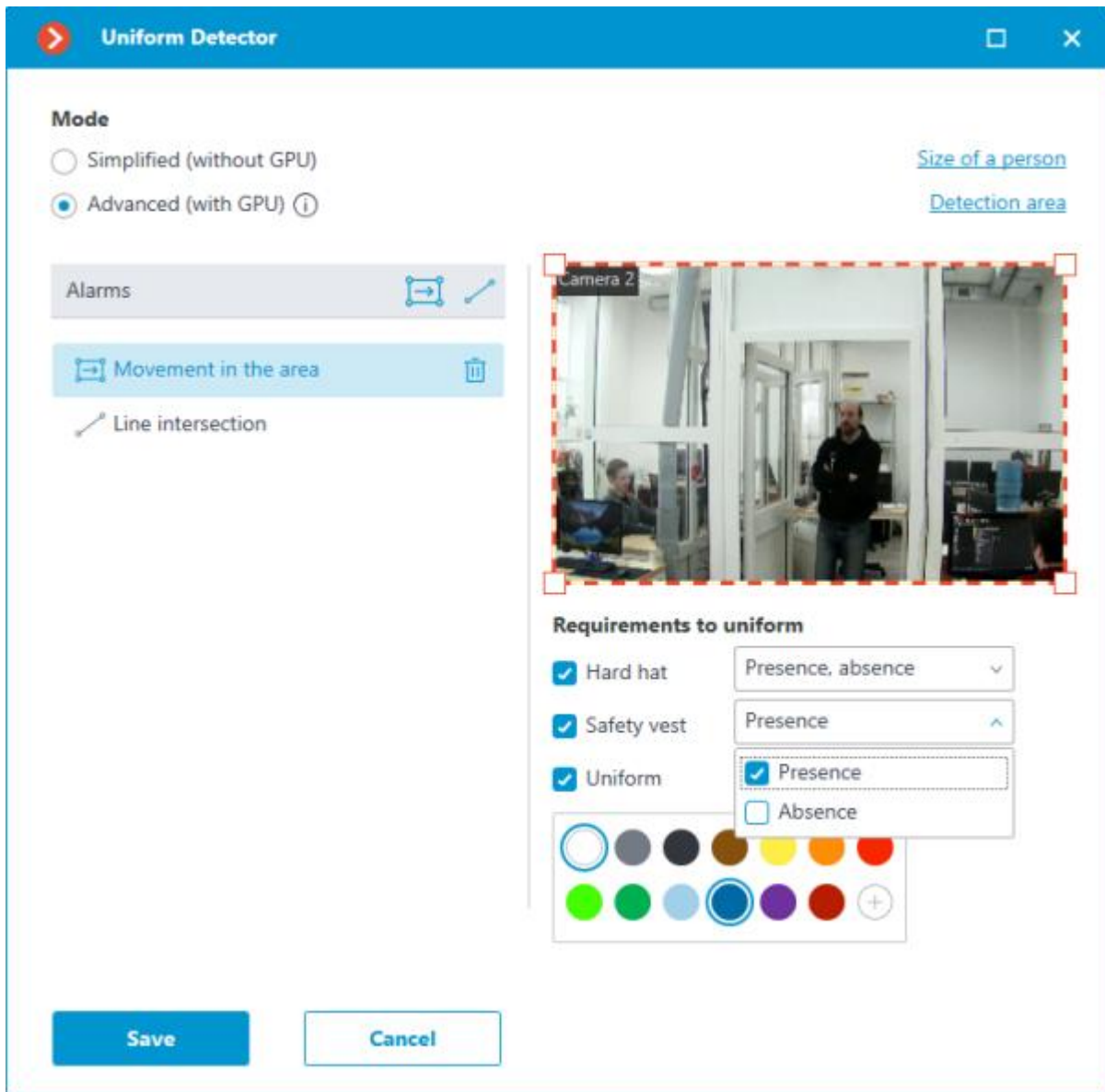
To use the module, enable and set up the software motion detector, then activate the module itself.

To do that, [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list, and set up the motion detector on the [Motion detector](#) tab on the right part of the page.

Then go to the [Analytics](#) tab and enable the module using the  switch, then adjust it pressing the  button.





Clicking the  button opens the module setup window.



Two operating modes are available in the window that opens:

- **Simplified (without GPU);**
- **Advanced (with GPU):** More precise neural network object detector. Video card required.

In the **Alarms** group of settings, situations are set when the alarms will be generated:

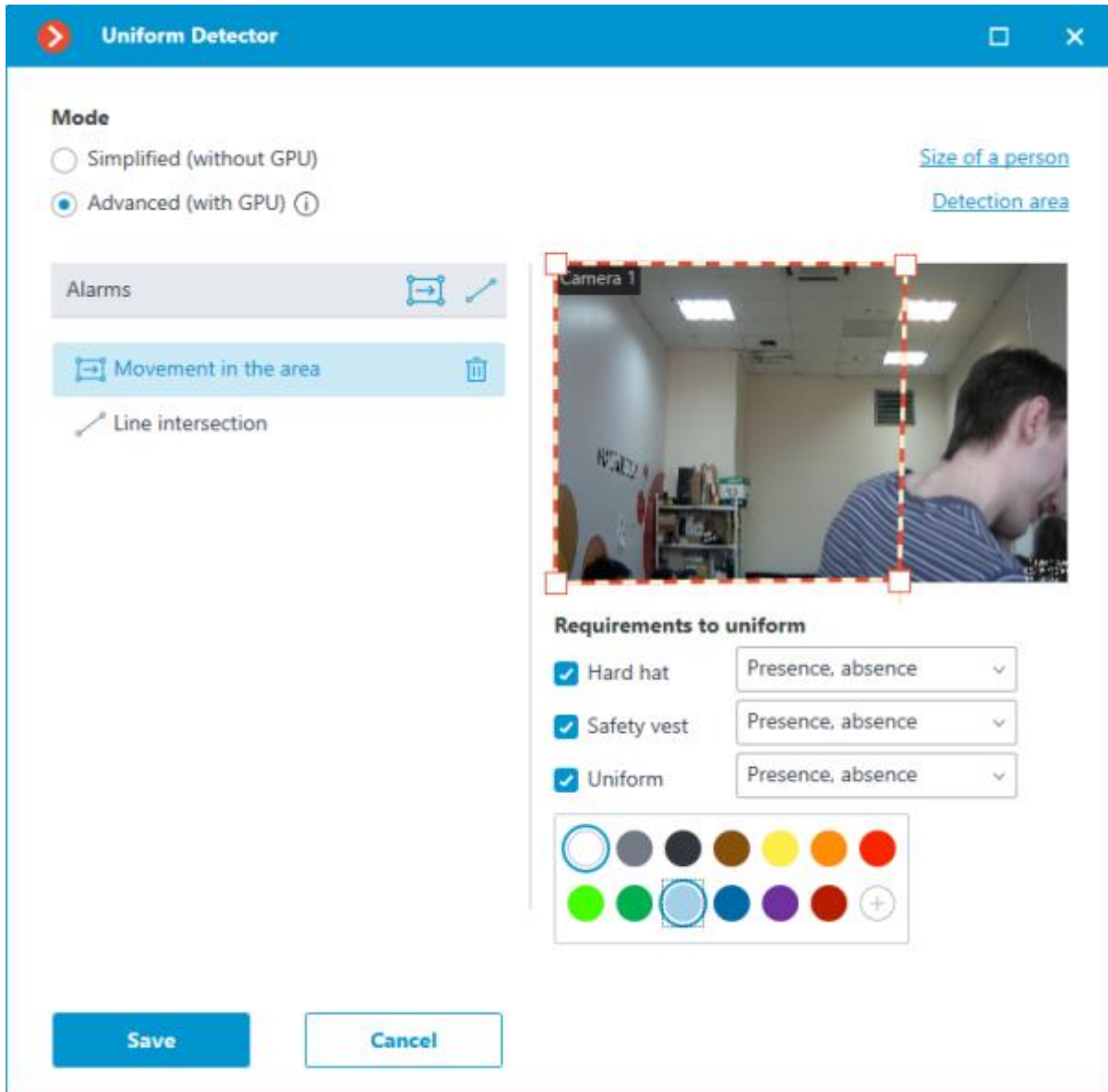
-  upon detection of movement in the zone;
-  when the preset line has been crossed.

Movement in the area


To set the zone, it is required to press the button . A square zone will appear in the preview window.

The zone configuration can be changed by dragging the key points at the corners of the polygon. To add a key point, it is required to double-click the left mouse button on the line; to delete - right-click on the key point.


An alarm will be generated when a person enters the zone without uniform, or in the uniform that does not meet the specified parameters.



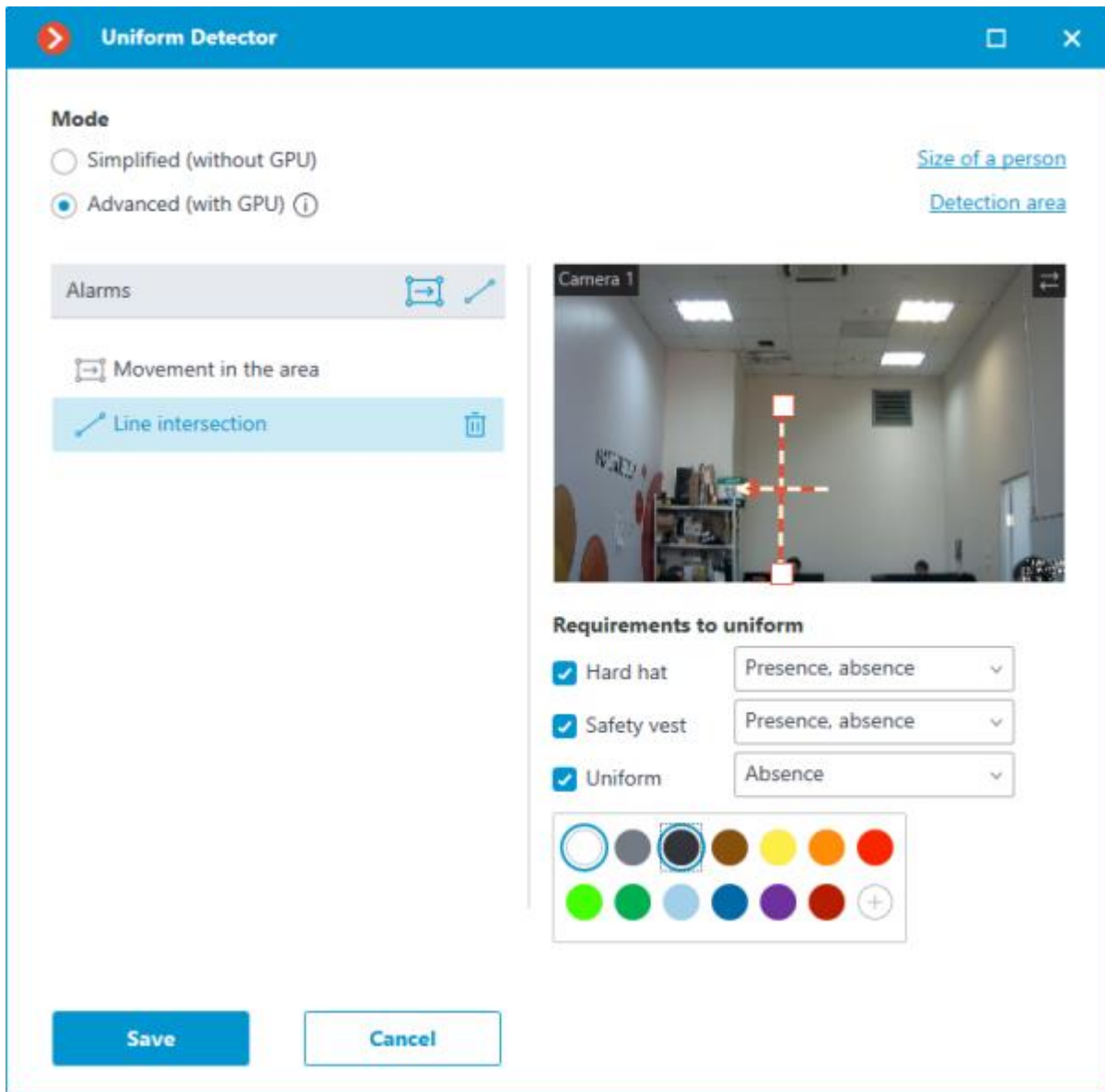
Crossing of the line

To set the line, press the button . The line will appear in the preview window.

The position of the line can be modified by dragging the key points at its ends.

To indicate the direction of triggering, it is required to click the button  located in the upper right corner of the preview window. If only one direction is selected, an arrow will appear indicating the direction set.


An alarm will be generated when a person without a uniform crosses the line, or when their uniform does not meet the specified parameters. If the direction has been specified, the alarm will be generated only when a person crosses the line in the specified direction.



It is possible to set specific requirements to workwear below the preview window. The following options can be set to **Presence**, **Absence** or both:

- Hard hat;
- Safety vest;
- Uniform.

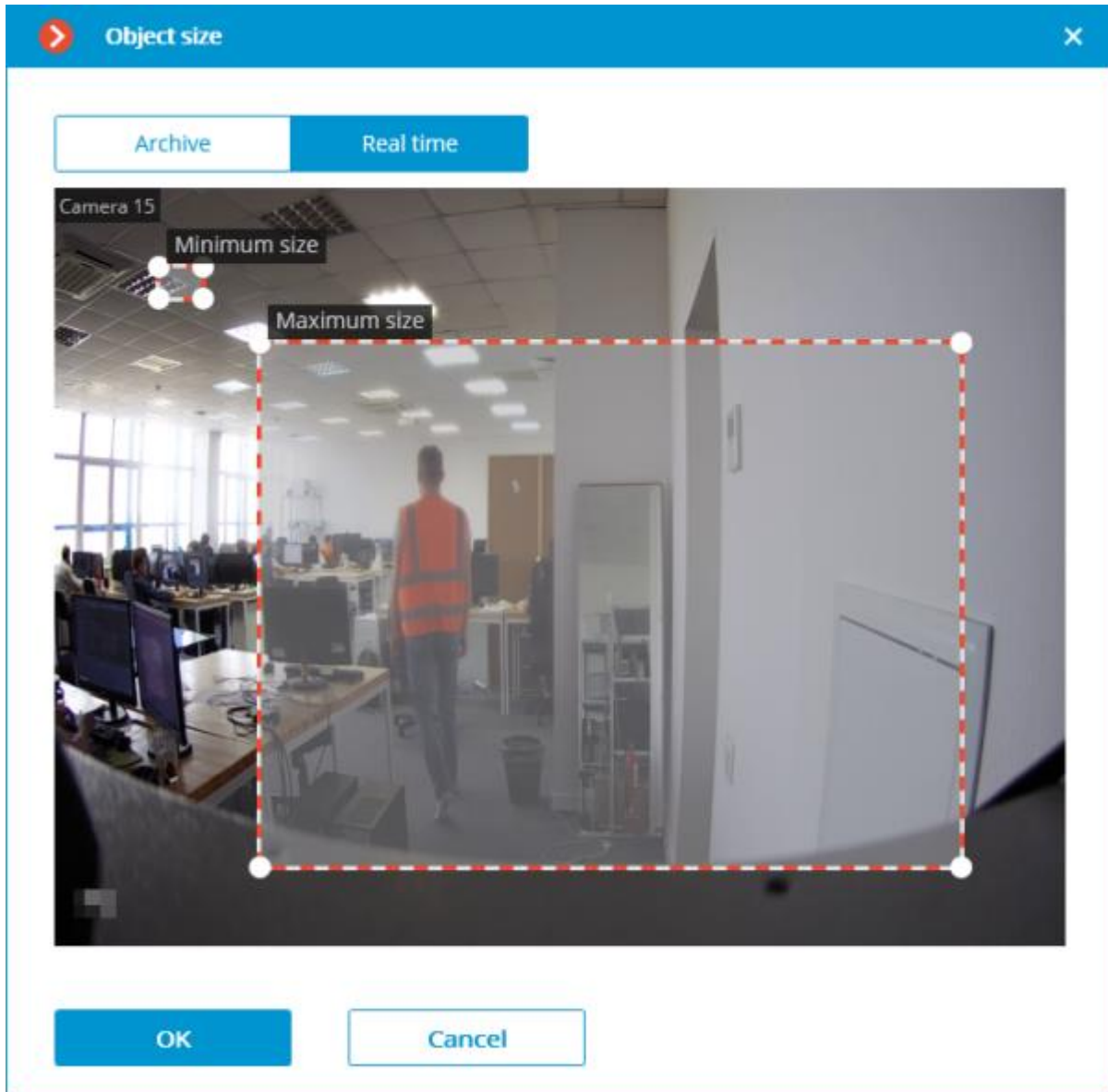
When selecting **Uniform**, it is possible to choose from 1 to 3 colors that will be considered as workwear colors.

If the desired color is not in the palette, it is possible to add it by opening the color selection window using the button .

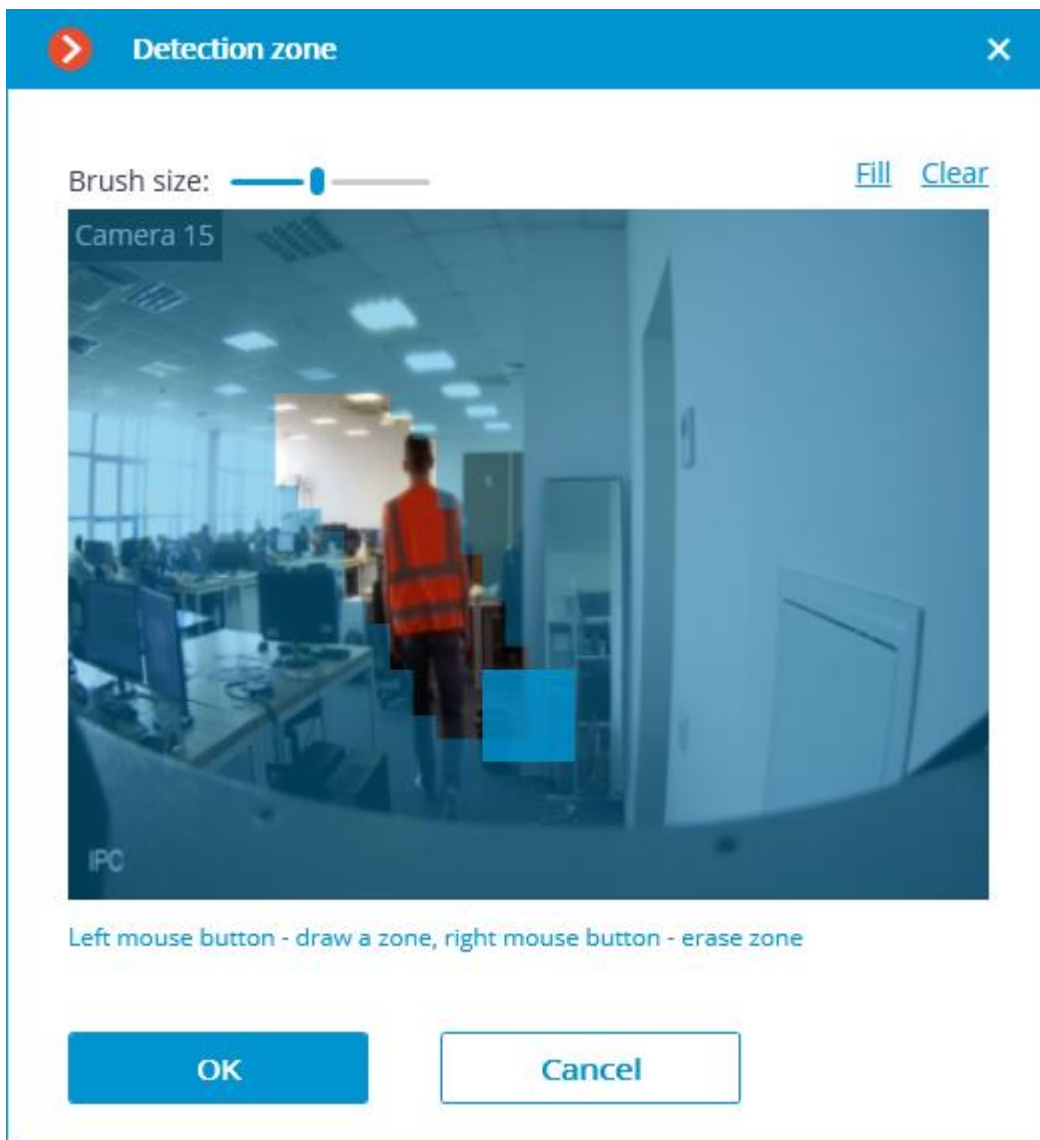
For a more accurate color definition, a slightly darkened shade of colors as compared with those recognized by the human eye when seeing clothes in real life should be set. In this case, possible shadows on the clothes will be compensated.

Also, when adjusting the color, it is required to take into account that when comparing colors, the module tries to compensate for possible changes in the brightness of the illumination. This affects the search for shades of gray to the greatest extent. For example, when 50% gray is selected in the settings, both white and dark gray clothes may appear as matching under certain lighting conditions.

On the **Size of a person** tab, it is possible to set the minimum and maximum sizes of people to be detected.



Detection zone is the zone of the frame filled with the semitransparent blue fill in the settings window. The mouse is used for modifying the zone: left mouse button serves for filling the zone, and the right one is used for clearing it. With the help of the **Fill** and **Clear** buttons you can fill or clear the whole area of the frame. The corresponding slider is used to modify the **Brush size**.



The module will start working only when [the settings are applied](#).

Requirements and recommendations

Hardware and software



Eocortex Neural Networks package must be installed before it will be possible to use neural networks-based features of the module.

The following is required for the **Advanced (with GPU)** mode:

- A processor with AVX instructions support;
- An **NVIDIA** video card (GPU) with the computation capacity index of at least 6.5 and with at least 4 Gb of memory; the parameters and performance of the video card must be similar or better than those of **NVIDIA GTX 1650 Super** model;
- version of the video card driver at least 460;
- swap file at least half of the total RAM size.

If the package will be installed on a virtual machine, it may additionally be required to:

- Enable support for AVX instructions in the guest machine settings;
- Use GRID drivers for GPU virtualization.



Eocortex must use video cards selected for running neural networks in monopoly mode. It is not allowed to use such card for other applications or tasks that consume GPU resources, including for displaying video. Simultaneous use of a video card for several tasks may lead to incorrect system operation: from analytics performance degradation to server instability.



The neural network works with the 64-bit version of **Eocortex** only.



When upgrading Eocortex to another version, it is necessary to also upgrade the **Eocortex Neural Networks** package to the corresponding version.



When using a video card, the stable operation of the module is guaranteed on operating systems Windows 10, Windows Server 2016, Ubuntu versions 18.04 and 20.04 exclusively, as well as on the newer versions of these operating systems.

On other operating systems (Windows versions 7 and 8, Windows Server versions 2008 and 2012, CentOS, Debian), issues may arise when trying to use NVIDIA graphics cards. On Windows 8, this is due to the cessation of support for NVIDIA graphics card drivers. On CentOS and Debian, the problem is due to the high complexity of installing workable versions of video card drivers.

Performance

The tables below show the permitted quantity of cameras for various video stream options and server configurations without the display feature.

Advanced (with GPU) mode

CPU	GPU	RAM, GB	Number of cameras
Video stream coming from cameras: 2 megapixels, 25 fps			
Intel® Core™ i5-2400	NVIDIA GeForce GTX-1050 Ti	8	5
Intel® Core™ i7-2600	NVIDIA GeForce GTX-1060	8	9
Intel® Core™ i7-7700	NVIDIA GeForce RTX-2070	8	13
Intel® Core™ i9-9900	NVIDIA GeForce RTX-2080	12	20
Video stream coming from cameras: 1 megapixel, 25 fps			
Intel® Core™ i5-2400	NVIDIA GeForce GTX-1050 Ti	8	8

Simplified (without GPU) mode

CPU	RAM, GB	Number of cameras
Video stream coming from cameras: 2 megapixels, 25 fps		
Intel® Core™ i3-8100	8	5
Intel® Core™ i5-8400	12	9
Intel® Core™ i5-9600	16	13
Intel® Core™ i9-9900	20	20
Video stream coming from cameras: 1 megapixel, 25 fps		
Intel® Core™ i3-8100	12	8

Video stream

Frame frequency: no lower than 10 frames per second;

Image resolution: no lower than HD (1280x720).

Image

- Lighting in the frame should be uniform and constant.
- If the camera is installed in front of a bright light source (the sun behind the entrance door, etc.), it is necessary to adjust the exposure (or brightness) so that the objects in the frame have a natural color (not overexposed or too dark). In this case, an overexposed background is acceptable.
- The image must be in color.
- Image quality should be at least average. There should be no significant compression artifacts.
- White balance must be adjusted correctly.
- People to be detected must be visible in the frame while standing, full-length, not overlapped by other objects.
- The exposure and contrast must be adjusted on the camera in such a way that the color of the uniform could be unambiguously recognized by the human eye.
- People must not be overexposed.

Scene and camera position

- In the **Simplified (without GPU)** mode, the people to be detected must be visible full-length, not overlapped by other objects.
- In **Advanced (with GPU)**, people may be overlapped by half; however, it may reduce the accuracy of the module.
- Strong lateral illumination (e.g., sunlight from a window) is unacceptable as it will overexpose parts of clothing.
- A scene that is too dark is unacceptable, since in this case the color of the clothes will always be close to black.
- The frame must not contain reflective surfaces: glass, mirrors, etc.

- It is permitted to place the camera overhead. In this case, the angle of inclination of the camera in relation to the horizontal must not exceed 35°.

Detecting

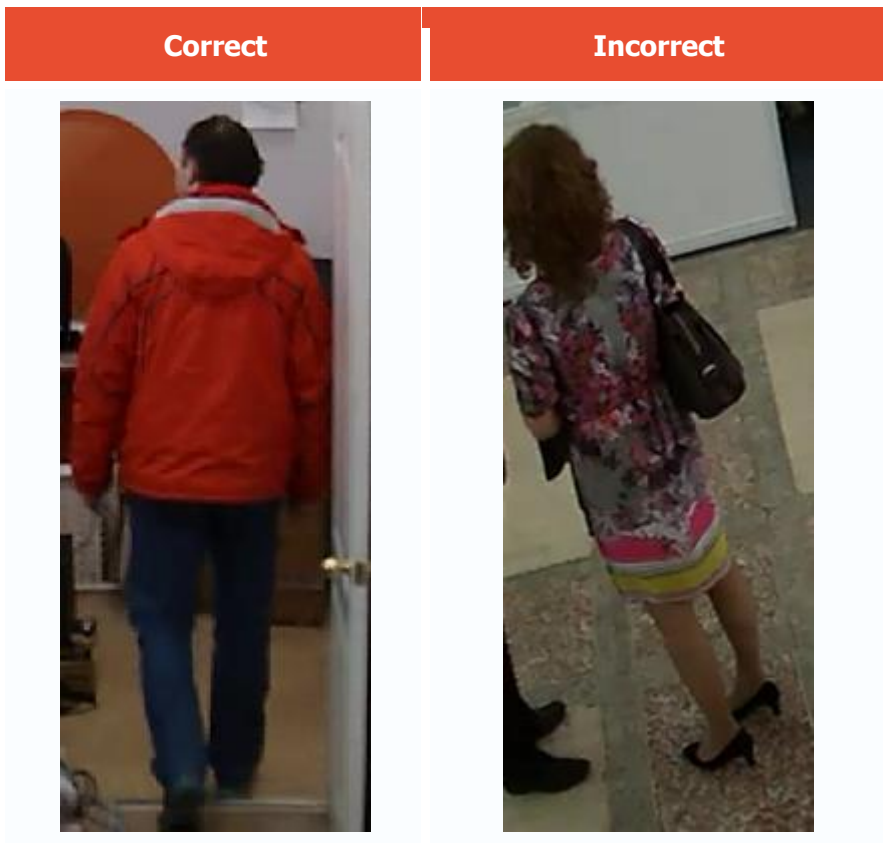
It is advisable to use one-color uniform.

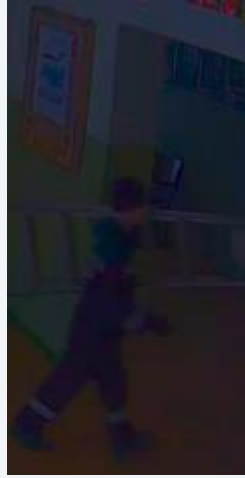
Uniform (workwear) color detection ensures around 90% accuracy on bright, distinctive colors. The accuracy drops when attempting to detect dark and gray colors. For example, dark blue uniform may appear dark green as well. Clothes in gray shades can also be confused with other shades. Issues can be caused by various non-single-colored clothes, whose color is not always distinguishable, and, as a result, tends to appear darker. The accuracy of defining colors under these conditions, when the color of clothes is not bright, is about 75%.

When detecting hard hats, it is required that the person's head is always above their shoulders in a normal position, with minimal inclinations.

Examples

Below are the examples of angles and shapes of people whose workwear is to be detected.







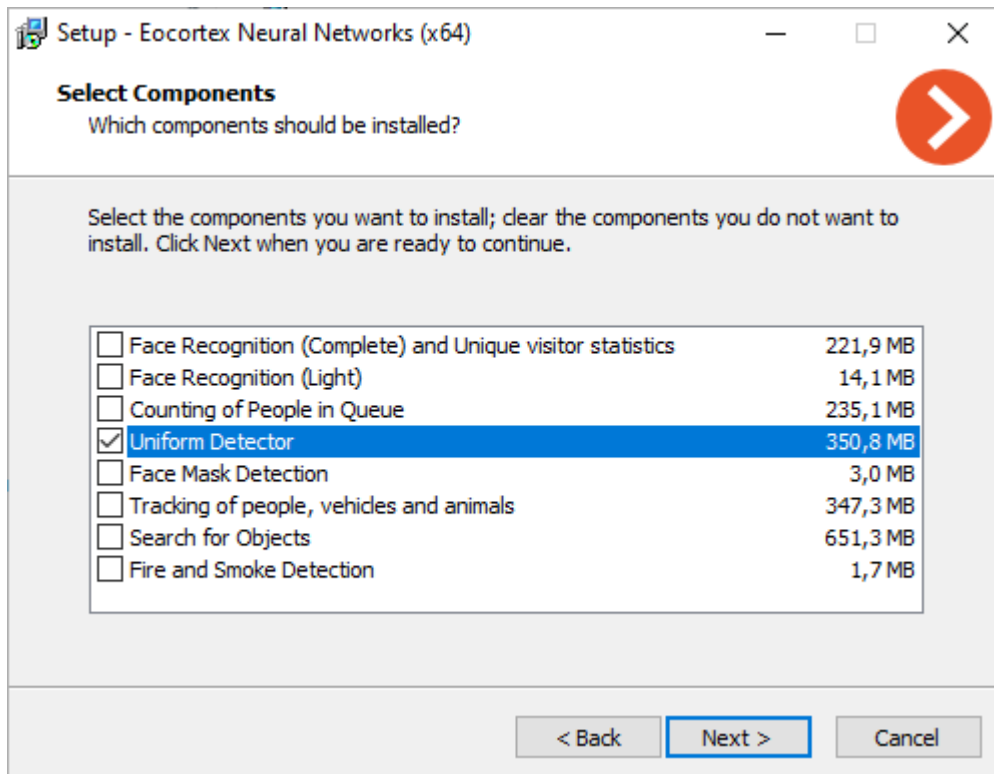
Deployment of the module

Before using the module, it is required [to install the **Eocortex Neural Networks** package](#).

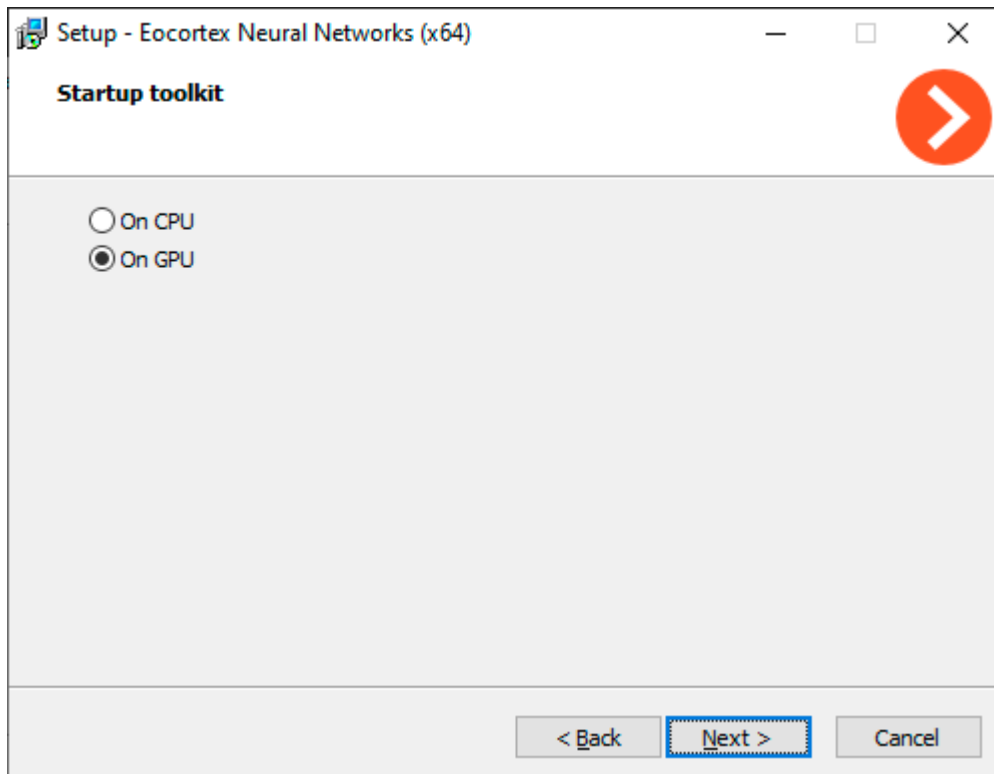
The neural network works with the 64-bit version of **Eocortex** only.

When updating **Eocortex** to a different version, it is also required to update the **Eocortex Neural Networks** package to the relevant version.

When installing the **Eocortex Neural Networks** package, it is required to select the appropriate component:



It is recommended to use video cards (GPUs) for the module to operate most efficiently.



Unique Visitor Counting



Unique Visitor Counting module is intended for generating Unique Visitor Counting reports based on detecting and recognizing faces. It is possible to exclude faces pertaining to certain groups from the counting, for example, to avoid counting employees.

Details

See [Face Recognition](#).

Compatibility with other modules

OS	Requires Eocortex motion detector		Neural network	Compatible with modules		Incompatible with modules
			Standard	Special		
√	√	–	√	√	Auto Zoom Loud Sound Detection Fire and Smoke Detector Abandoned object detection module Counting People in Queue Crowd Monitoring Face Detection Face Mask Detector Face Recognition (Complete) Frame Area Blurring People Counting Personnel Activity Monitoring Sabotage Detector Search for Objects Shelf Fullness Check Tracking Traffic Density Heat Map	Face Recognition (Light) FishEye Dewarping License Plate Recognition (Complete) License Plate Recognition (Light) Object Classification and Counting

OS	Requires Eocortex motion detector	Neural network	Compatible with modules	Incompatible with modules
		Standard	Special	
				Uniform Detector

- √ supported and required for the module to work
- + supported and provides additional features of the module
- not supported or not required for the module to work

Use

The use of video analytics modules in **Eocortex Client** is described in the **User's guide**, in the **Eocortex Client / Video analytics** section.

Integration with External Systems and Devices

Integration with messengers

Eocortex integration with messengers is a service that connects Eocortex servers and popular messenger platforms. This integration allows interaction with **Eocortex** video surveillance systems through messengers: receiving camera images, notifications about registered events, server status reports and other information. The communication between messenger users and the video surveillance systems is done through a special bot called **EocortexBot**.

Facebook Messenger, Telegram, and Viber are currently supported.


Licensing

By default, the number of messenger users that can be tied to a specific **Eocortex** video surveillance system is limited. To increase the number of messenger users, contact the organization that provided **Eocortex** licenses for this system or your personal **Eocortex** manager.

Setting

The messenger interaction subsystem is initially disabled in **Eocortex** video surveillance system.

To enable and configure interaction with messengers, you need to launch the **Eocortex**

Configurator application, go to the  **Users** tab, enable the **Users of messengers** button and [configure the messenger users](#).

Use

To start interacting with the **Eocortex** video surveillance system via messenger, the user must follow the link sent to them.

Access to the CCTV system via messengers

Eocortex <bot@eocortex.com>

Hello!

You now have access to EocortexBot.

To start working with the surveillance system via messenger, follow the appropriate link.

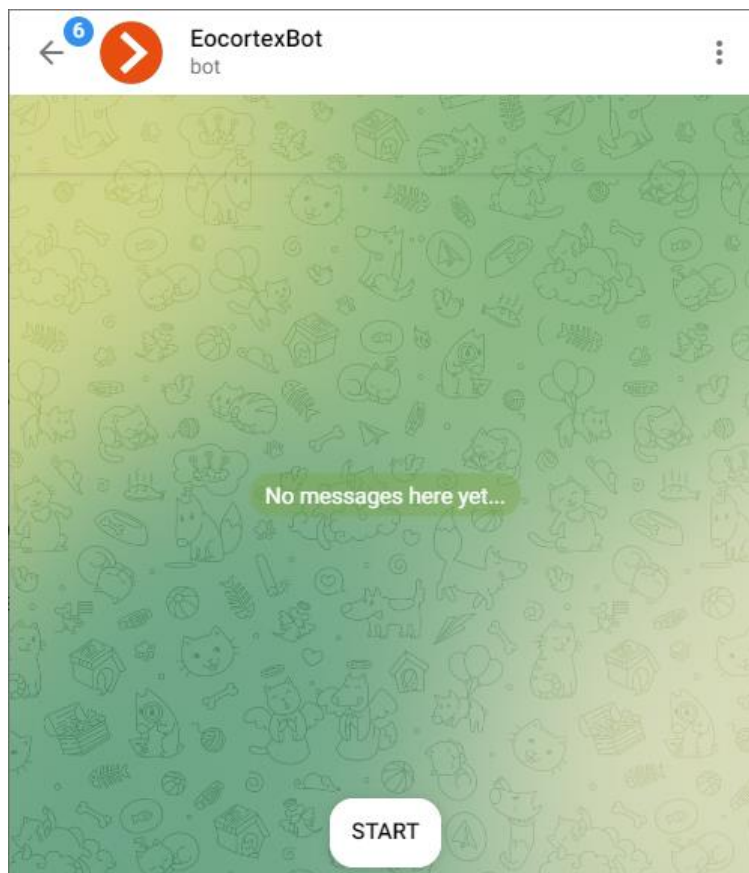
Make sure that you have the selected messenger installed, and also check that this messenger is not blocked by your internet provider.

- **Telegram**
http://t.me/Eocortex_bot?start=50af737a-bce9-4217-baf6-036bd209462b
- **Viber**
<http://bot.eocortex.com?a248186a-6e98-46b2-8c0f-813b02414021>
- **Facebook Messenger**
<http://m.me/1923167444589598?ref=2566afe5-5210-48ae-b859-a80f60b1893c>

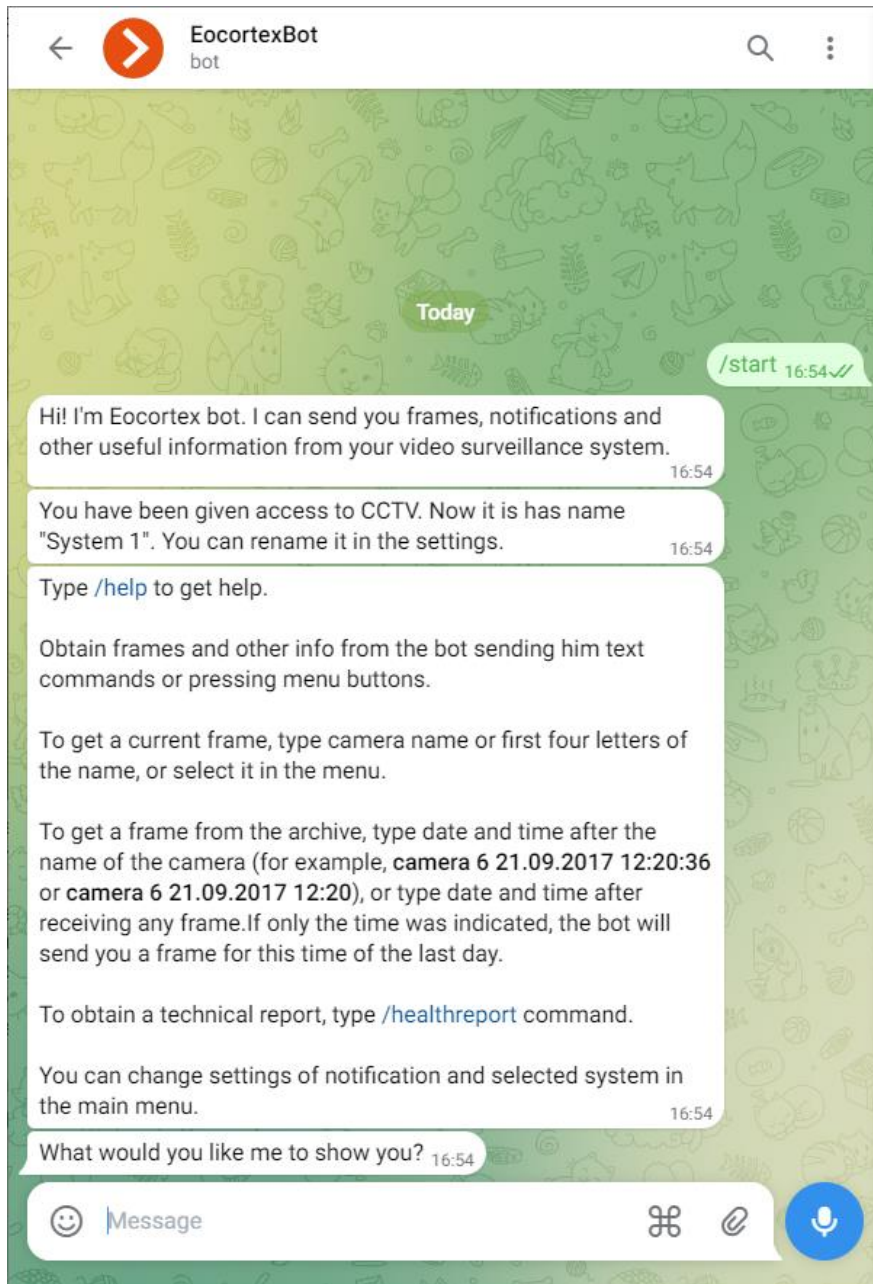
The process of adding a second and subsequent systems is no different from adding the first system. All that is required to be done in such a case is to follow the link received from the corresponding video surveillance system.

When you follow the link to the messenger, the start page will open. To start interaction with **EocortexBot**, press the **Start** button, after which the bot will send a welcome message.

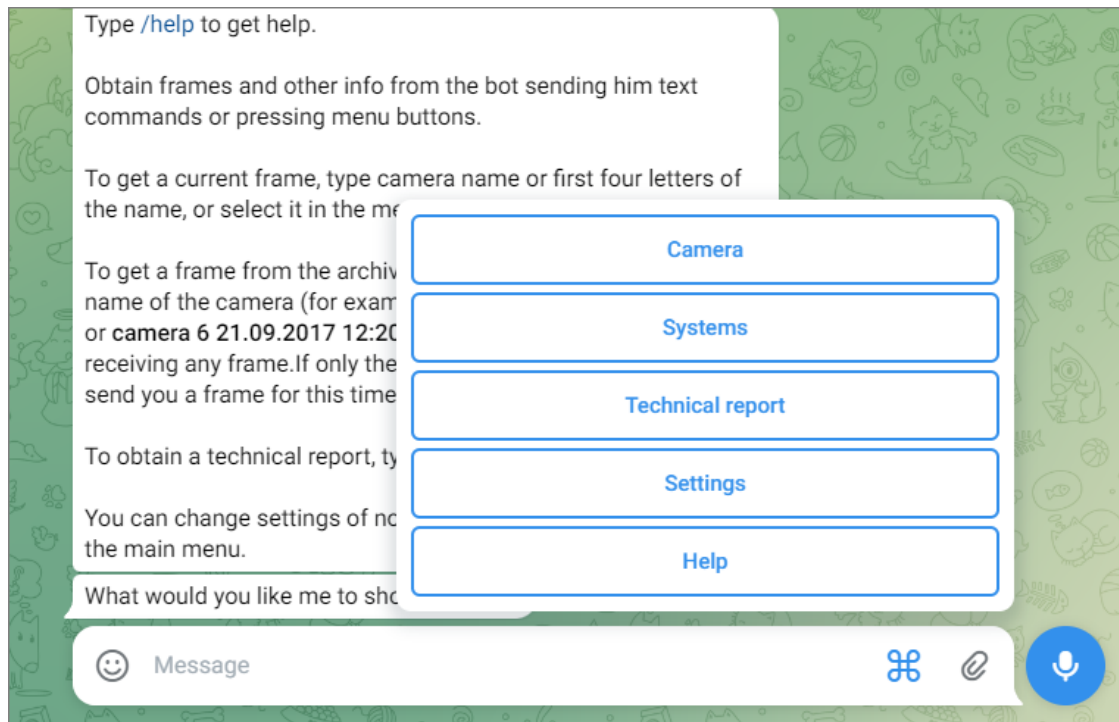
There is no start page in **Viber**, so **EocortexBot** directly sends a welcome message.



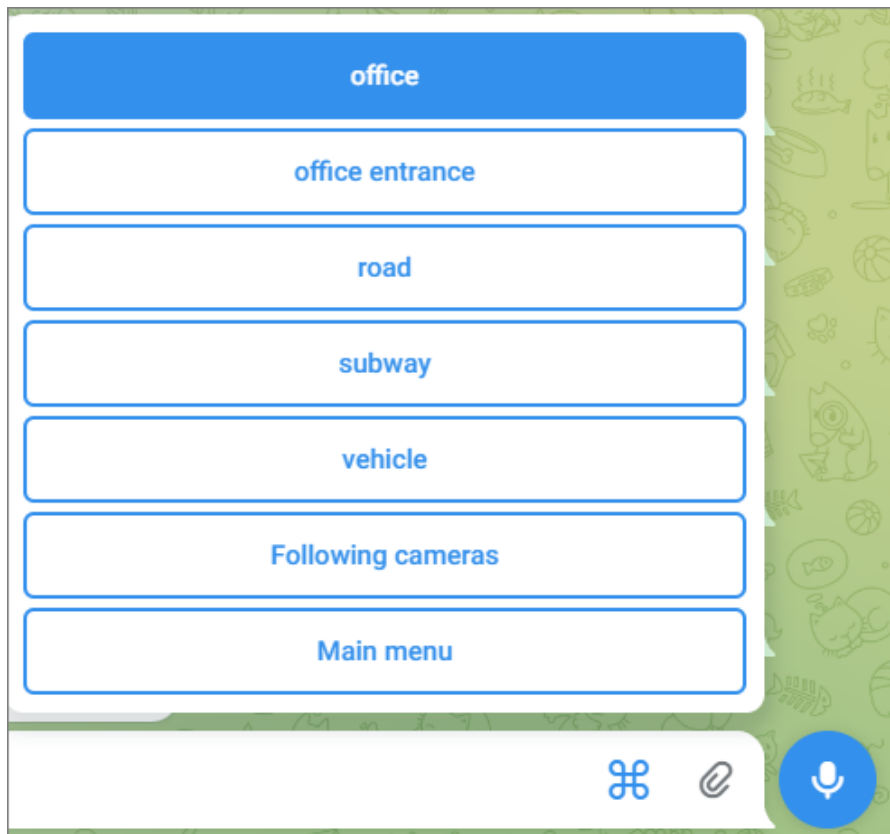
Next, the user is presented with information about the functionality of this bot: what it can do and how to interact with it. If more than one system is added, instructions on how to work with several systems will be provided.



Then the user goes to the main menu. From here it is possible to go to the cameras, change the current system, request a technical report, enter the settings or request help. Thus, the further scenario of bot operation is completely up to the user.



In the main menu, pressing the **Camera** button displays a list of cameras from which you can get a frame.



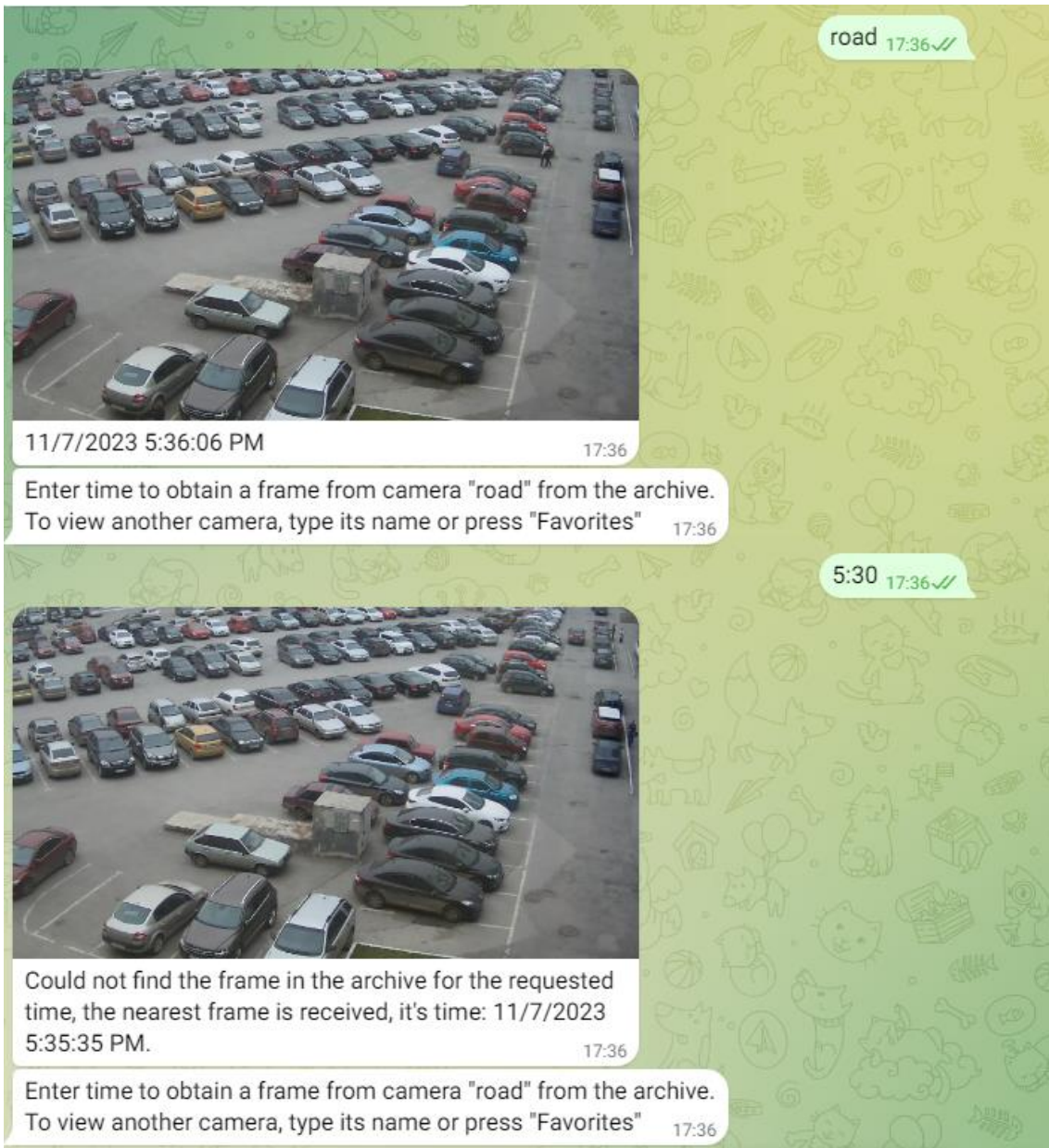
When a camera is selected, the closest frame to the current time is sent to the user.



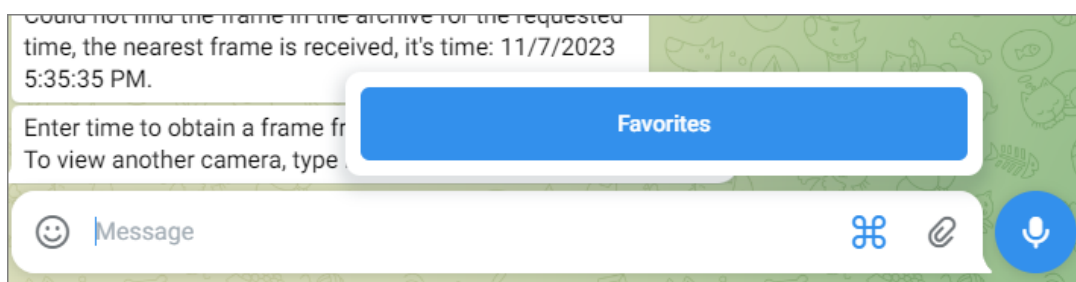
When requesting a frame from a camera with a high GOV and low FPS, it is possible to receive an error caused by the fact that due to the high GOV and low FPS it takes too long to wait for the frame, so the service cannot send the frame to the requested camera.



To receive a frame from the archive for the selected camera, you need to enter the time.



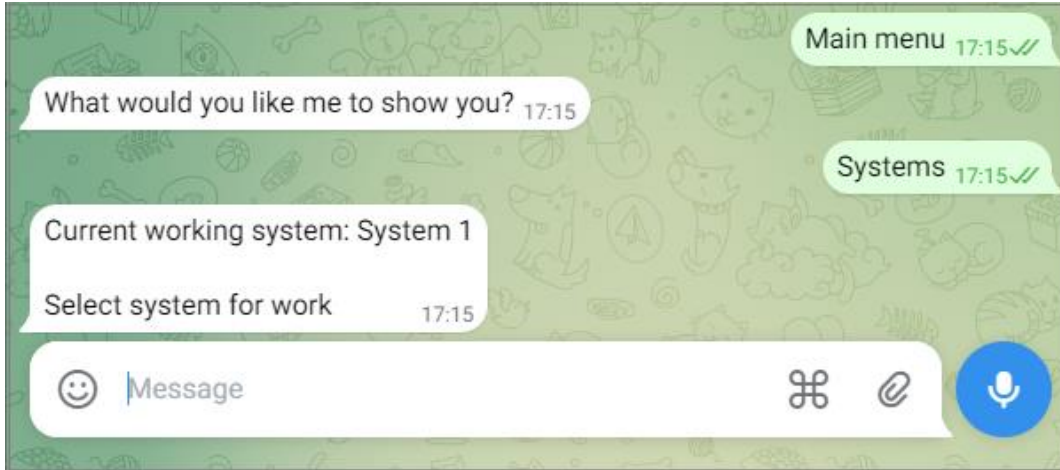
After receiving the frame, you can go to the **Favorites** section, where the cameras from which frames were recently requested are displayed. When you select a favorite camera, a frame from that camera will be sent.



In the main menu, pressing the **Systems** button will display a list of all systems to which the user has been invited. At the same time, interactive interaction is possible only with one system - the one

called **Current System**. To change the current system, select it from the list of the presented systems.

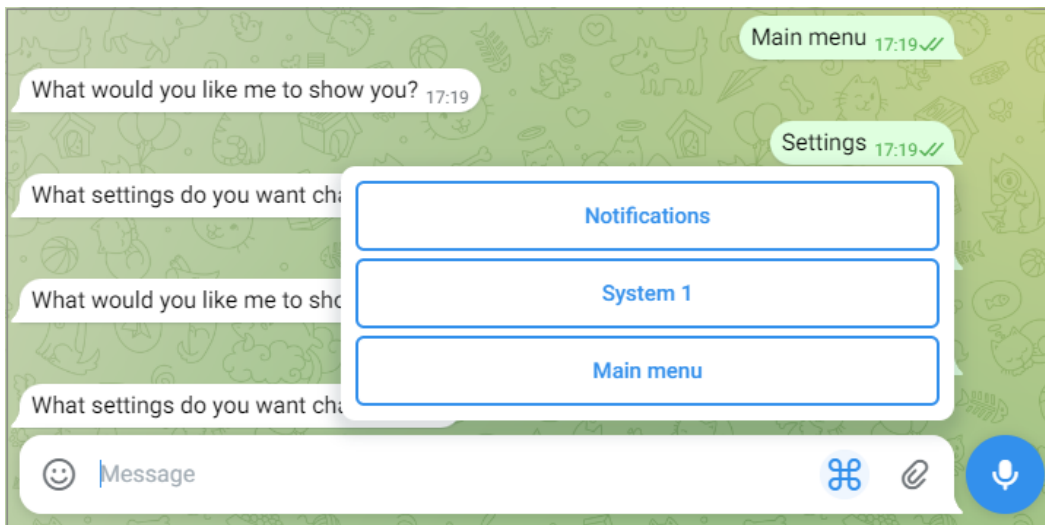
Regardless of which system is current at the moment, camera frames sent by the **Eocortex** server automation subsystem when performing scheduled or event-based actions will come from all systems available to the user.



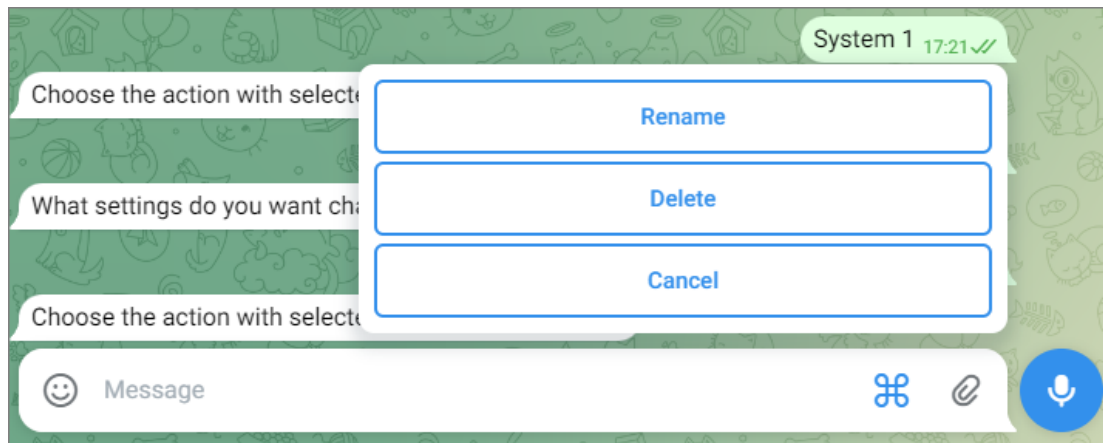
In the main menu, pressing the **Settings** button will display the list of parameters available for configuration.

Notifications — disable and enable notifications from systems, including frames sent by the automation subsystem.

Pressing the button with the name of the current system will display a menu of actions performed on the system.



The current system can be renamed or deleted. After deleting the system, receiving frames from the cameras of this system will become unavailable.



List of available commands:

/help or **/help** — get information about the bot's capabilities.

/healthreport or **/technical report** — obtain information about the state of the system.

/changesystem — change the active system. After entering the command, a list of available systems will open.

camera_name — get a frame from the specified camera.

camera_name time — get a frame from the archive from the specified camera at the specified time.

The **camera_name** can be specified with errors of several letters, including omitting them or adding extra ones. In this case, the more errors there are in the name, the higher the probability that the bot service will not be able to correctly recognize the correct name. If there are too many errors, the user will be sent a message **I haven't quite understood you.**

The **time** is specified in the format **MM/dd/YYYY hh:mm** (for example, 03/23/2018 16:56). The time should be specified in accordance with the local time of **Eocortex** server.

Integration with BioStar 2

Eocortex has the integration with the **Suprema BioStar 2** ACS. With this integration, **Eocortex** can receive and process events from **Suprema BioStar 2**, as well as send commands to the ACS to perform various actions.

Integration is available for servers running both Windows and Linux.

Description

The integration supports two-way interaction between **Eocortex** and **Suprema BioStar 2**, allowing to receive and process events from ACS in **Eocortex** applications, as well as to send control commands to the doors controlled by **Suprema BioStar 2**.

Receiving events

The event information can contain the following lines:

Type of event (code and description) (e.g.: Door opened by operator, Fire alarm, Access denied);

Information about the device (controller) (name and identifier). The controller can have relays and readers to which the doors can be connected. Information about them is not used in **Eocortex**;

Information about the door (name and identifier);

Information about the user (name and identifier);

Information about the user group (name and identifier).

Performing actions

As a command to the ACS, requests for one of the following actions can be sent:

Open — temporarily opens the door.

Release — removes the manual door lock/unlock.

Manual lock — manually locks the door. The door remains locked even if the user is successfully authorized.

Manual unlock — manually unlocks the door. The door remains open without the need for user authorization.

Clear alarm — removes the alarm state from the door.

Events log

Events received from the ACS or created by sending commands to it are displayed in the Event Log of the **Eocortex Client** application. These events are associated with the relevant camera.

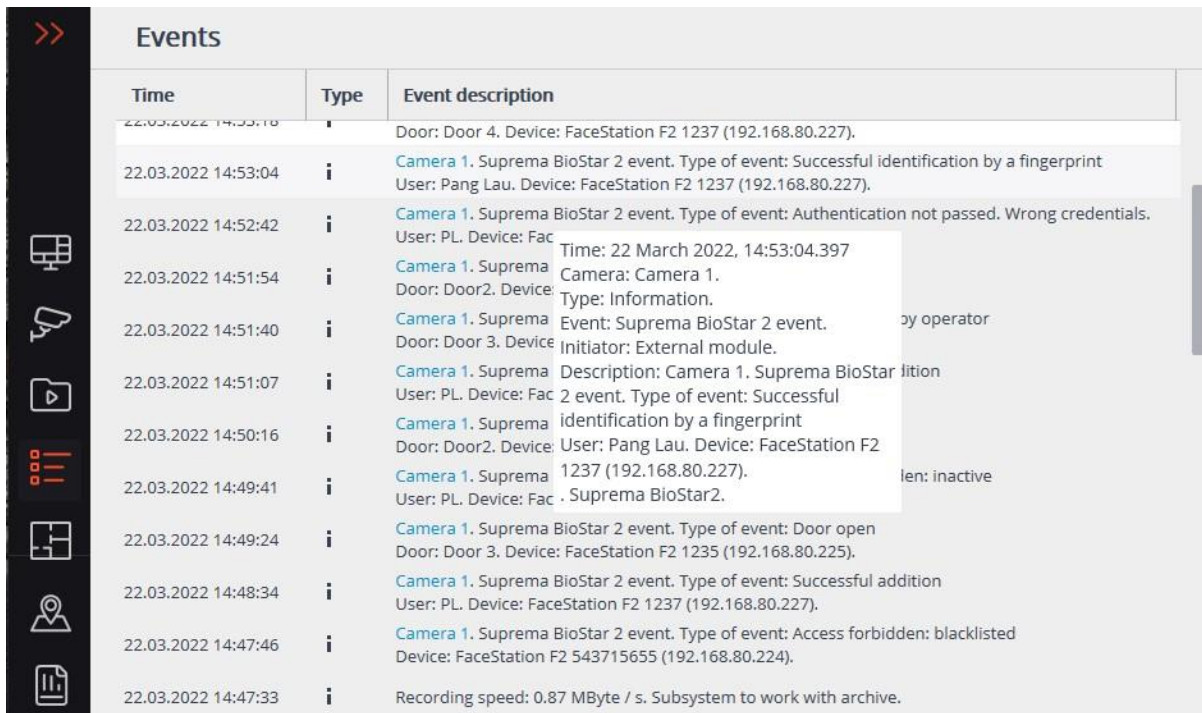
The following lines are displayed for the log entry, if available for this event type:

Type of event — the description of received event;

Name of device;

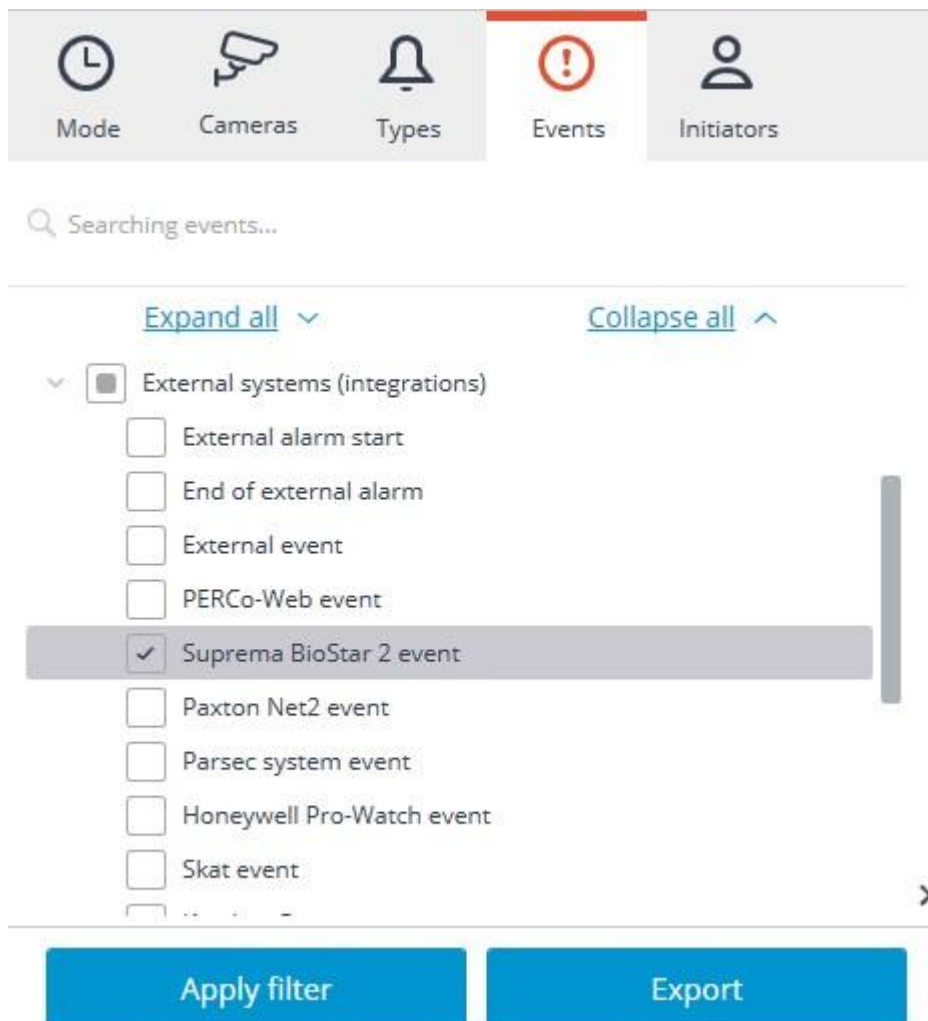
Name of door;

User name;



Time	Type	Event description
22.03.2022 14:53:10	i	Door: Door 4. Device: FaceStation F2 1237 (192.168.80.227).
22.03.2022 14:53:04	i	Camera 1. Suprema BioStar 2 event. Type of event: Successful identification by a fingerprint User: Pang Lau. Device: FaceStation F2 1237 (192.168.80.227).
22.03.2022 14:52:42	i	Camera 1. Suprema BioStar 2 event. Type of event: Authentication not passed. Wrong credentials. User: PL. Device: FaceStation F2 1237 (192.168.80.227). Time: 22 March 2022, 14:53:04.397
22.03.2022 14:51:54	i	Camera 1. Suprema BioStar 2 event. Type of event: Information. Door: Door2. Device: FaceStation F2 1235 (192.168.80.225).
22.03.2022 14:51:40	i	Camera 1. Suprema BioStar 2 event. Type of event: Information. Door: Door 3. Device: FaceStation F2 1237 (192.168.80.227). Event: Suprema BioStar 2 event. Initiator: External module.
22.03.2022 14:51:07	i	Camera 1. Suprema BioStar 2 event. Type of event: Successful identification by a fingerprint User: PL. Device: FaceStation F2 1237 (192.168.80.227).
22.03.2022 14:50:16	i	Camera 1. Suprema BioStar 2 event. Type of event: Successful identification by a fingerprint Door: Door2. Device: FaceStation F2 1237 (192.168.80.227).
22.03.2022 14:49:41	i	Camera 1. Suprema BioStar 2 event. Type of event: Successful identification by a fingerprint User: PL. Device: FaceStation F2 1237 (192.168.80.227). Initiator: External module. Status: Inactive
22.03.2022 14:49:24	i	Camera 1. Suprema BioStar 2 event. Type of event: Door open Door: Door 3. Device: FaceStation F2 1235 (192.168.80.225).
22.03.2022 14:48:34	i	Camera 1. Suprema BioStar 2 event. Type of event: Successful addition User: PL. Device: FaceStation F2 1237 (192.168.80.227).
22.03.2022 14:47:46	i	Camera 1. Suprema BioStar 2 event. Type of event: Access forbidden: blacklisted Device: FaceStation F2 543715655 (192.168.80.224).
22.03.2022 14:47:33	i	Recording speed: 0.87 MByte / s. Subsystem to work with archive.

The Events log can be filtered to display events only from **Suprema BioStar 2**.



Mode Cameras Types **Events** Initiators

Searching events...

[Expand all](#) [Collapse all](#)

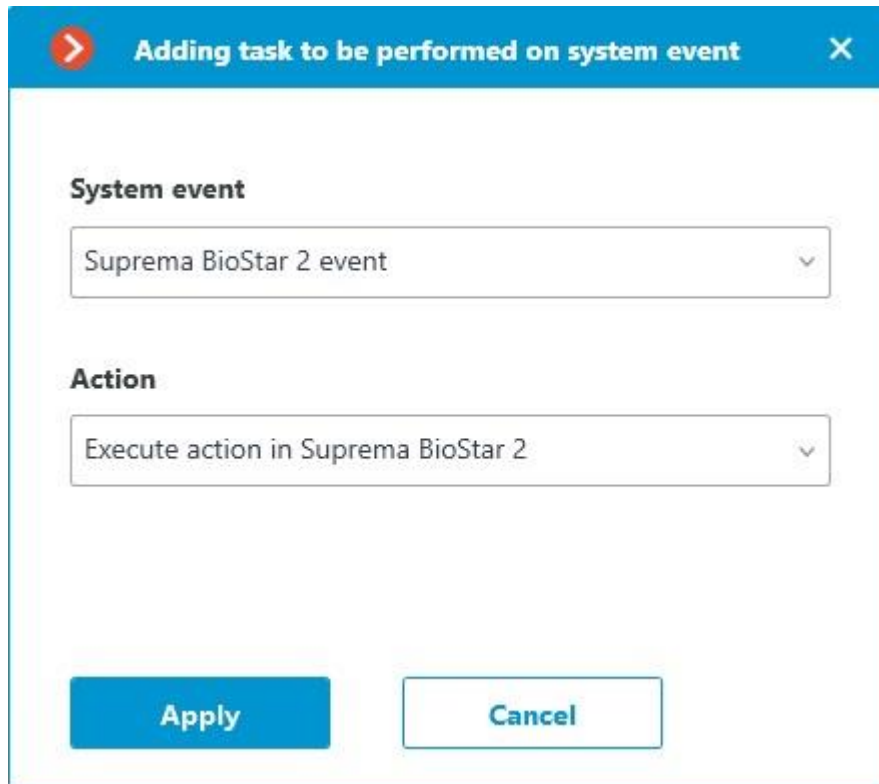
- External systems (integrations)
 - External alarm start
 - End of external alarm
 - External event
 - PERCo-Web event
 - Suprema BioStar 2 event**
 - Paxton Net2 event
 - Parsec system event
 - Honeywell Pro-Watch event
 - Skat event

[Apply filter](#) [Export](#)

Setting tasks by events

To set up the scenario executing as a response to the event received from the security platform, go to the **Automation** section of the **Eocortex Configurator** application. In the list of cameras, select a camera or a group of cameras and switch to the **Tasks by event** tab on the page that opens.

It is possible to configure any standard task for the **Suprema BioStar 2 event**:



The screenshot shows a dialog box titled "Adding task to be performed on system event". It features a blue header bar with a red arrow icon on the left and a close button (X) on the right. The main content area is white and contains two dropdown menus. The first dropdown is labeled "System event" and has "Suprema BioStar 2 event" selected. The second dropdown is labeled "Action" and has "Execute action in Suprema BioStar 2" selected. At the bottom of the dialog, there are two buttons: a blue "Apply" button and a white "Cancel" button with a blue border.

The following runtime conditions can be set for the scenario:

Event details:

- Type of event — selection from several popular event types, e.g. Door Opened by Operator, Access Denied: Blacklisted, etc. Not all **Suprema BioStar 2** event types are available in the list. If the type required to be used as the condition is unsupported, it is possible to use filtering by other fields: numeric Event code or string Description of ACS event.
- Event code — numeric code of the **Suprema BioStar 2** event.
- Description of ACS event — non-localized event description string, as it comes from **Suprema BioStar 2**;

Device details:

- Device identifier — usually a numeric permanent identifier of the device in **Suprema BioStar 2**.
- Name of device — string device name in **Suprema BioStar 2**, can be changed in the ACS settings in the future.

Door details:

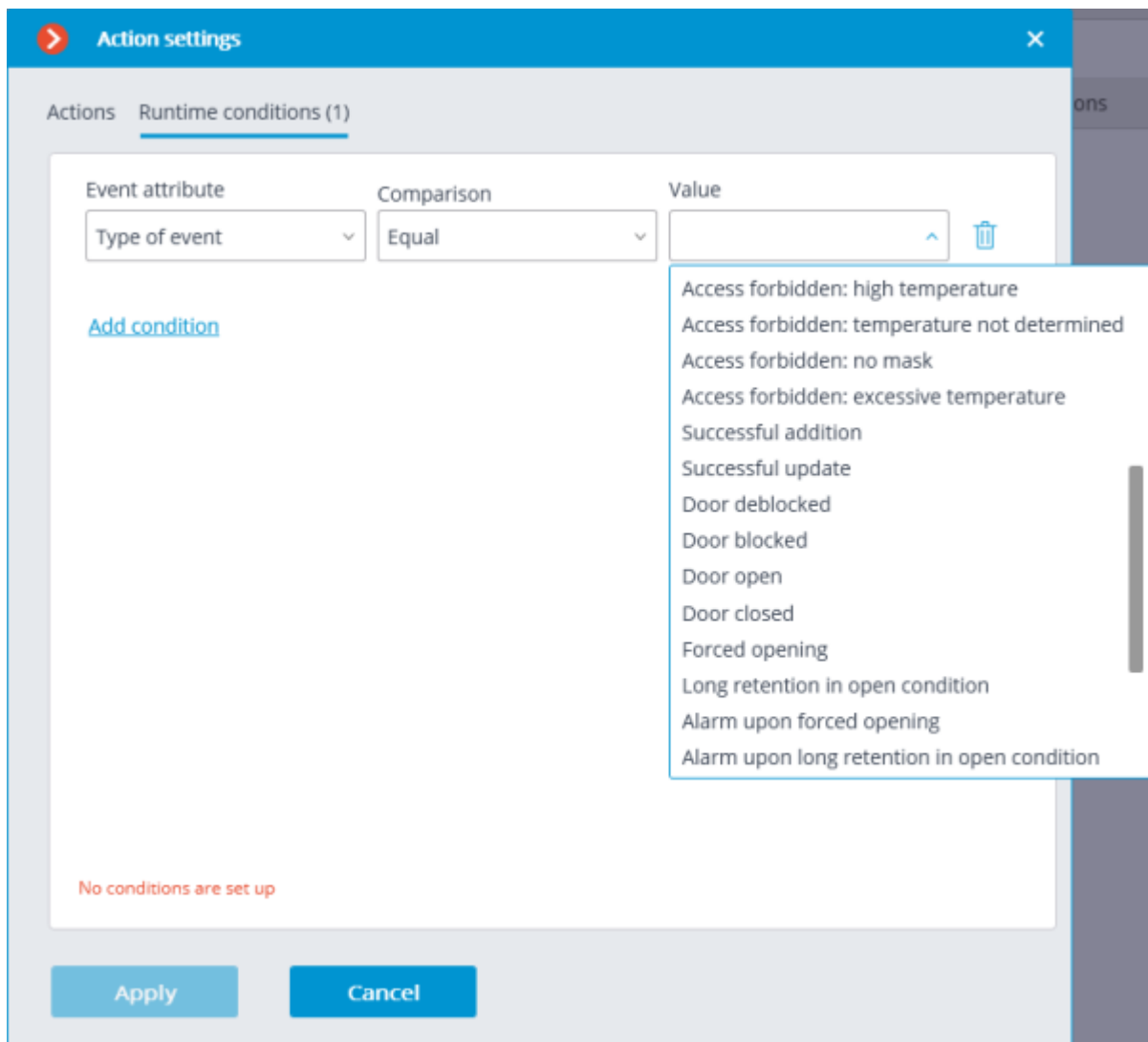
- Door identifier — usually a numeric permanent identifier of the door in **Suprema BioStar 2**.
- Name of door — string door name in **Suprema BioStar 2**, can be changed in the ACS settings in the future.

User details:

- User identifier — usually a numeric permanent ID of the user associated with the event in **Suprema BioStar 2**.

- Username — string name of the user in **Suprema BioStar 2**, can be changed in the ACS settings in the future.
- User group identifier — usually a numeric identifier of the group to which the user belongs.
- Name of user group — a name of the group to which the user belongs.

The screenshot shows a software window titled "Action settings" with a close button (X) in the top right corner. Below the title bar, there are two tabs: "Actions" and "Runtime conditions (1)". The "Runtime conditions (1)" tab is active. The main area contains a table with three columns: "Event attribute", "Comparison", and "Value". The "Event attribute" column has a dropdown menu open, showing a list of options: "Type of event", "Description of ACS event", "Device identifier", "Name of device", "Door identifier", "Name of door", "User identifier", "User name", "User group identifier", "Name of user group", and "Event code". The "Comparison" column has a dropdown menu with a downward arrow. The "Value" column is empty and has a trash icon to its right. At the bottom of the window, there are two buttons: "Apply" and "Cancel". A red text message at the bottom left of the table area reads "No conditions are set up".



Regarding the type of event, some lines may be not available in the received message.

Setting up scenario with Execute action in Suprema Biostar 2

Before this feature can be used, it must be [enabled and configured](#) for the selected camera on the **Integrations** tab of the **Eocortex Configurator** application.

To configure an **Execute action in Suprema Biostar 2** action, run the **Eocortex Configurator** application, go to the **Automation** tab, select an individual camera or a whole folder in the camera tree. Create a task with the needed execution method, selecting **Execute action in Suprema Biostar 2** as the action. **Scheduled tasks**, **Tasks by event** and **User tasks** are supported.

The image shows a dialog box with a blue header bar containing a red arrow icon on the left, the text "Adding task to be performed on system event", and a close button (X) on the right. The main content area is white and contains two sections. The first section is titled "System event" and features a dropdown menu with the text "Suprema BioStar 2 event" and a downward arrow. The second section is titled "Action" and features a dropdown menu with the text "Execute action in Suprema BioStar 2" and a downward arrow. At the bottom of the dialog, there are two buttons: a blue "Apply" button on the left and a white "Cancel" button with a blue border on the right.

In the window that opens by clicking **Apply**, the **Special settings** section allows selecting the door to interact with, and selecting the action to be performed when processing the scenario.


Action settings

Actions Runtime conditions (0)

Description


Execute action in Suprema BioStar 2

Limits

Limit by start time 

Do not perform more often than once per seconds

Special settings

Door 

Action

Actions not set up

If the settings for integration with **Suprema BioStar 2** ACS on the **Integrations** tab are not set, are incorrect or are inactive for the selected camera, the corresponding message will be displayed instead of the action settings in the **Special settings** section.

Action settings

Actions Runtime conditions (0)

Description

Execute action in Suprema BioStar 2

Limits

Limit by start time

Do not perform more often than once per 5 seconds

Special settings

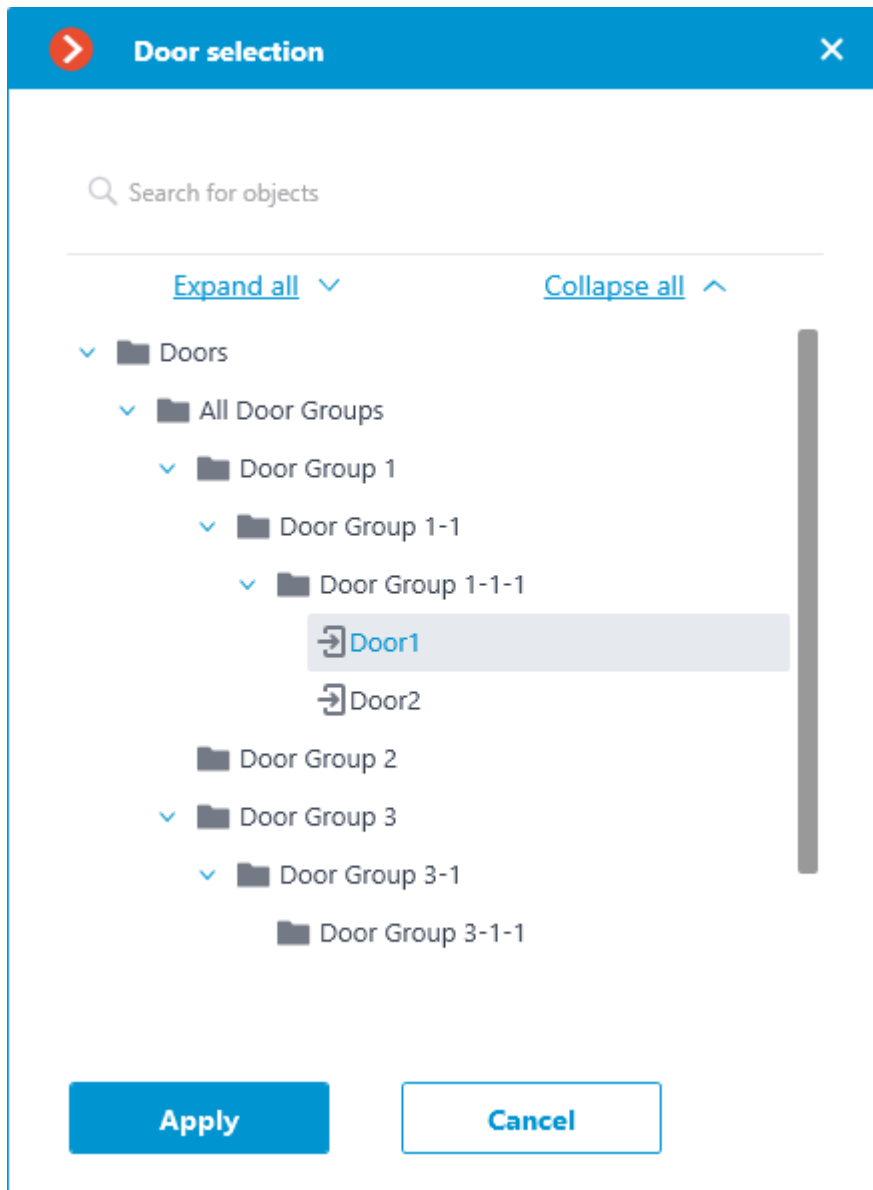
Integration is disabled

Actions not set up

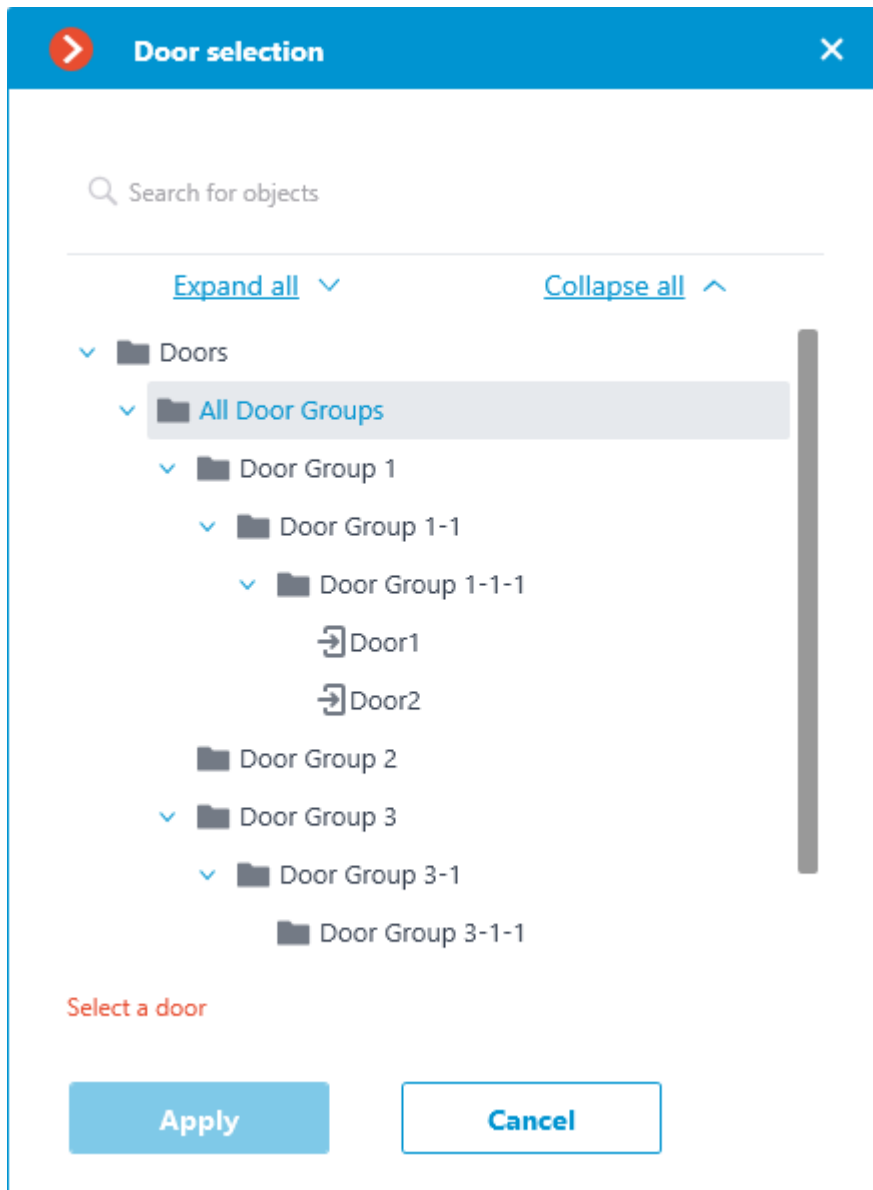
Apply Cancel

Door selection

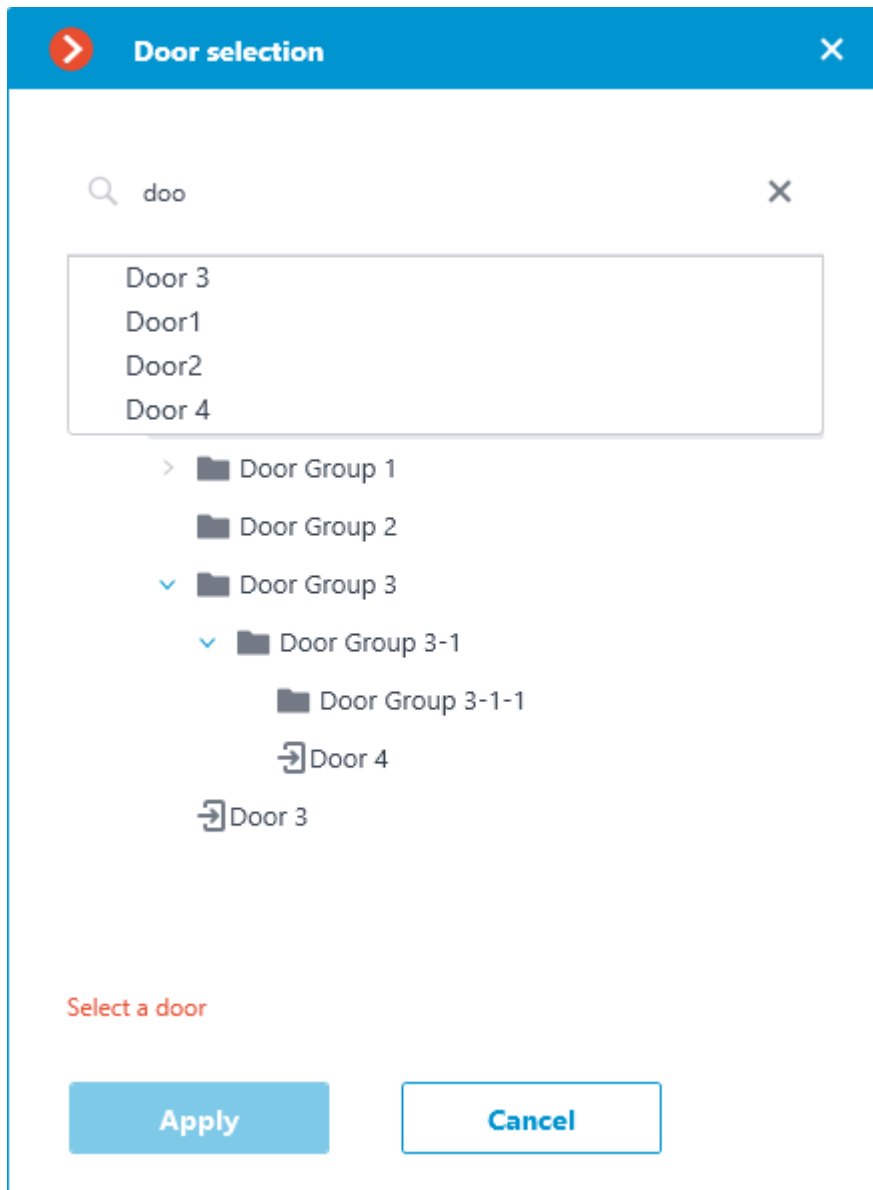
Clicking the **Select** button next to the **Door** field opens the device selection window. To load the list of doors available for interaction, the connection to **Suprema BioStar 2** ACS will be established with the credentials that were specified in the **Integrations** section.




The **Door selection** window allows selecting the door from the list, for which the action should be performed. It is necessary to select a specific door, selecting a group of doors at once is not possible.



For easy navigation to the right door, the text search by its name is available at the top of the window. Select the desired door and click **Apply** to confirm.



Once the door is selected, the previously inactive  **Copy** button, located in the **Door** field, becomes available. Clicking this button saves to the clipboard the name and ID of the selected door, which can be used later for diagnostic or automation tasks.

Action selection

The **Action** drop-down list provides a choice of actions to be performed on the selected door. The following options are available:

Open — temporarily opens the door.

Release — removes the manual door lock/unlock.

Manual lock — manually locks the door. The door remains locked even if the user is successfully authorized.

Manual unlock — manually unlocks the door. The door remains open without the need for user authorization.

Clear alarm — removes the alarm state from the door.

Action test

Once the door and the action to be performed are set, the previously hidden **Test action** link that triggers a test run of the settings becomes available.

Action settings

Actions Runtime conditions (0)

Description

Execute action in Suprema Biostar 2

Limits

Limit by start time

Do not perform more often than once per 5 seconds

Special settings

Door Door1 **Select**

Action Open

[Test action](#)

Status
Not tested

Apply **Cancel**

The current state will be displayed in the **Status** field as one of the following results:

Not tested — the settings were not checked, the functionality of the configured action is unknown.

Testing... — test run is performing according to the specified settings.

Connection succeeded — test run is successful, the settings are correct.

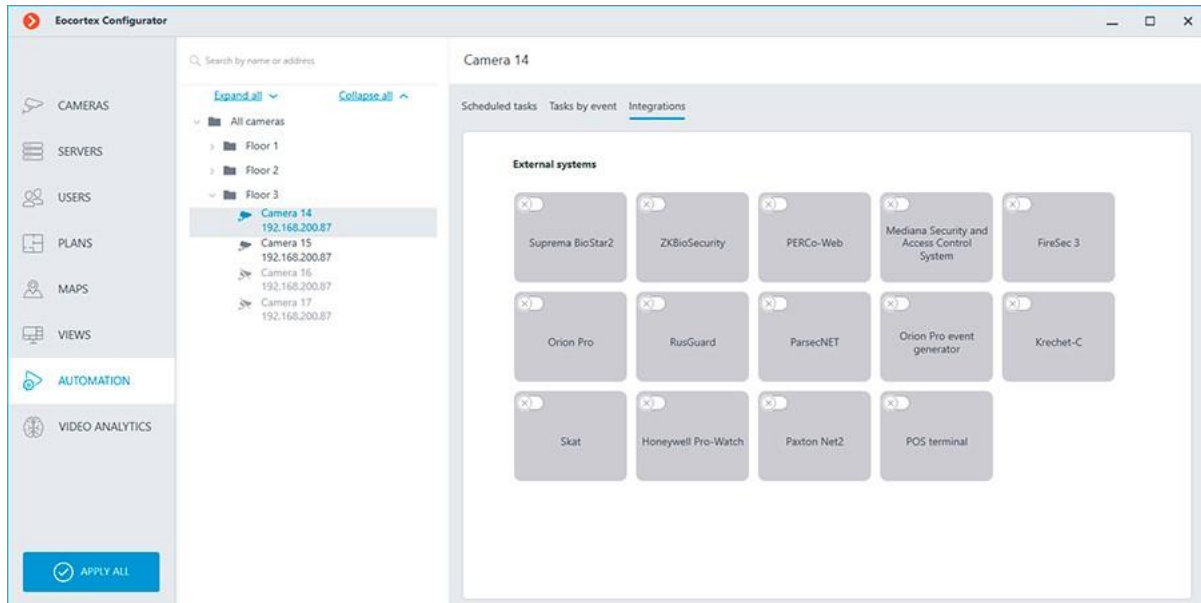
Request timeout — the command to run the action has not been sent to the ACS within the specified timeout period (by default, 100 seconds). Check if the integration settings are correct and if the Suprema BioStar 2 server is available.

Unknown error — test run of the action has failed for unknown reason. Detailed information about the error can be found in the **Ecortex Server** logs.

Under normal conditions, the connection to the ACS server is carried out by the **Ecortex** server, while the test connection in the settings window is made directly by the **Ecortex Configurator** application. When setting up the integration, it is recommended to make sure that all **Ecortex** components have access to the ACS server.

Setting the integration in Eocortex Configurator

Before the **Eocortex** server will be able to interact with the **Suprema BioStar 2** ACS, it is necessary to configure the integration. To set it up, go to the **Automation** section of the **Eocortex Configurator** application. In the list of cameras, select a camera and switch to the **Integrations** tab on the page that opens, then activate the slider for **Suprema BioStar 2** tile.



Two tabs are available in the settings window:


General settings;

Camera settings.

General settings

The **General settings** tab contains the settings for a network connection to the **Suprema BioStar 2** ACS for the whole system.

The following settings are available:

Server address: IP address or URL of the **Suprema BioStar 2** server. Prefixes, such as `http://`, are not required to be specified in this field. To enable a secured connection via HTTPS, click the  button.

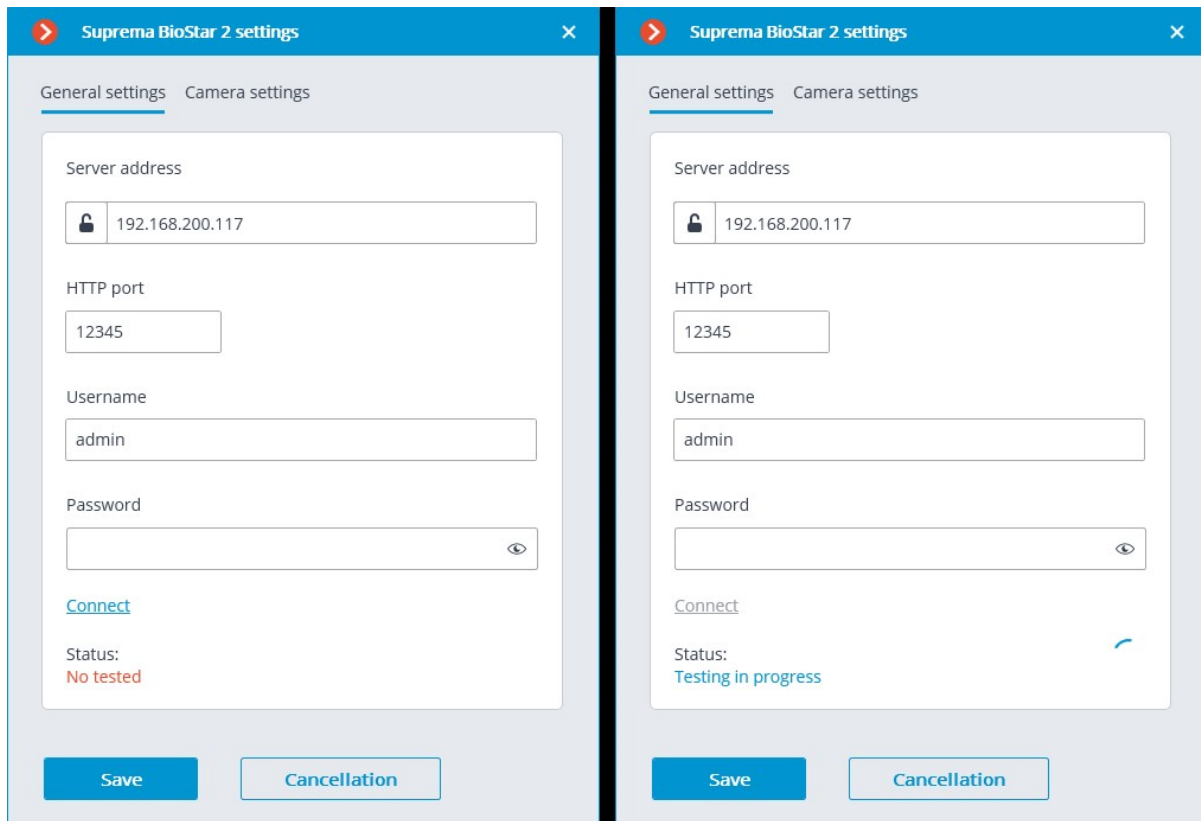
HTTP port: HTTP(S) port of the **Suprema BioStar 2** server. Interaction with the ACS utilizes the HTTP and WebSocket protocols, but both protocols use the same port. The WebSocket port can be configured individually in **Suprema BioStar 2** settings, but it is not necessary to set it in the integration settings.

Username.

Password.

When all settings are done, click the **Connect** button.

The connection test result will be displayed in the **Status:** field.




Camera settings


The **Camera settings** tab contains settings from which devices the system should receive events for this camera.

By default, all ACS events will be received from all devices.

If the integration is enabled on multiple cameras with the default settings, the events will be duplicated for all enabled cameras.

There are 2 types of **Suprema BioStar 2** objects available for configuration:

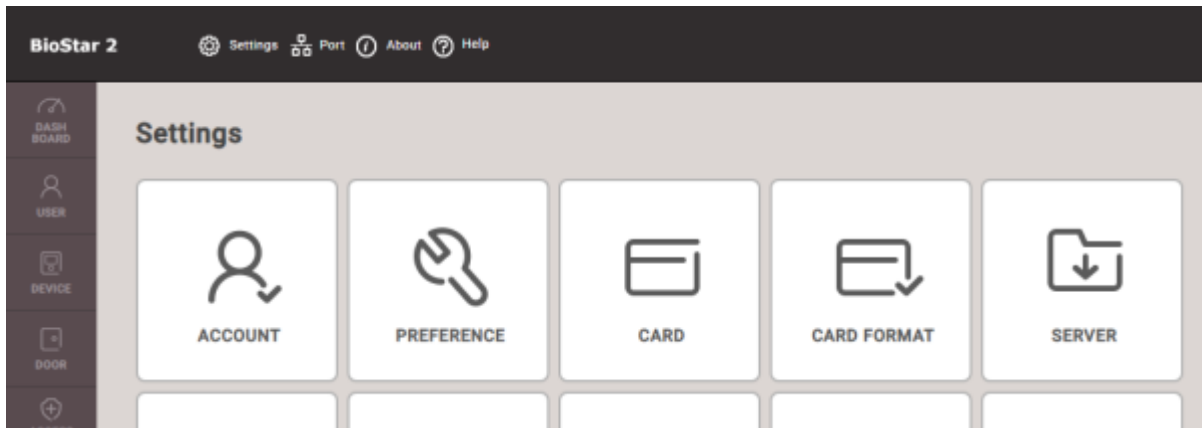
 **Doors.** A high-level object that is most often configured with rules in **Suprema BioStar 2**. Usually the door is connected to a relay and a sensor of other device. Receiving events from specific doors allows to configure the integration more precisely;

 **Devices.** A lower-level **Suprema BioStar 2** object. Setting up to receive events from the device allows configuring the integration more flexibly. For example, if **Suprema BioStar 2** is in the deployment phase, the list of doors and their properties will continuously change. When configuring to receive events from the specific door, it will be necessary to change the integration settings each time when something has changed. But when configuring to receive events from a device, when new doors are connected to the device, the integration settings would not need to be changed.

Setting up Suprema BioStar 2

To configure **Suprema BioStar 2** for this integration, use the ACS web interface, which is available on the same port that is specified in the integration settings.

The minimum version of **Suprema BioStar 2** must support control over the used protocol (BioStar 2 New Local API).

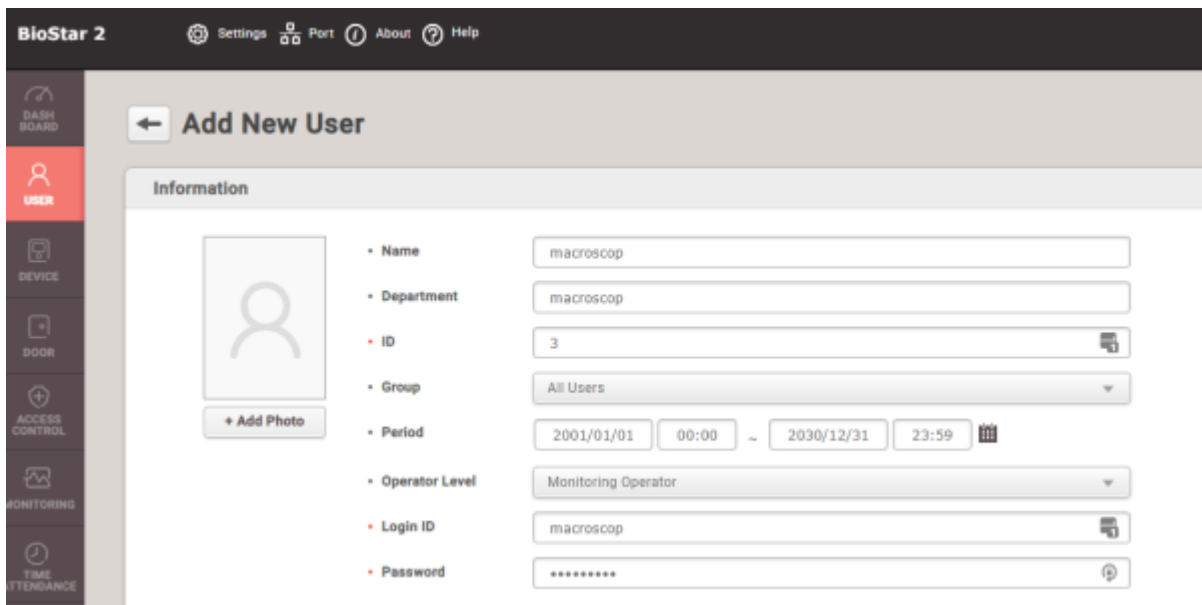


On the **Settings** tab of the **Server** section, the use of a secure connection can be configured. HTTPS is used by default.



On the **Port** tab, network ports for connection can be configured. **Ecortex** uses either HTTP (if insecure connection is selected) or HTTPS (if secure connection is selected) connection port.

The user under which **Ecortex** connects to the ACS must be provided with rights to read and monitor data (Monitoring Operator level), in case of problems it is recommended to provide administrative access.



Requirements and limitations

Integration is developed using **BioStar 2 New Local API**, available in **Suprema BioStar 2** since version 2.7.10. The possibility of enabling integration with earlier versions of ACS is not guaranteed.

Integration of the ability to receive events from Suprema BioStar 2 was carried out on ACS version 2.8.11.60. The functionality of this feature with earlier versions of the access control system is not guaranteed. The possibility of receiving events from **Suprema BioStar 2** was developed for the ACS version 2.8.11.60. The functionality of this feature with earlier versions of the ACS is not guaranteed.

The possibility of sending commands to **Suprema BioStar 2** was developed for the ACS version 2.9.0.80. The functionality of this feature with earlier versions of the ACS is not guaranteed.

The time and time zone settings on the **Eocortex** and **Suprema BioStar 2** servers must match.

One **Eocortex** system can be connected only to one **Suprema BioStar 2** server at a time.

Integration with Honeywell's Pro-Watch®

Eocortex is integrated with the **Honeywell's Pro-Watch®** comprehensive security platform. The integration makes it possible to receive and display the **Honeywell's Pro-Watch®** events, as well as to set up responses to such events.

The integration will work with versions 4.3.5 and later of **Honeywell's Pro-Watch®**.

For the integration to work, it is required to properly set up both **Honeywell's Pro-Watch®** and **Eocortex**.

Honeywell's Pro-Watch® Setup

The information regarding the setup of **Honeywell's Pro-Watch®** for integration purposes is found in the restricted API setup and operation documentation supplied together with the **Honeywell's Pro-Watch®** distribution kit. The brief list of conditions, requirements and actions aimed at ensuring the successful integration of **Honeywell's Pro-Watch®** is shown below.

The availability of the activated **Pro-Watch Database Transfer Utility** and **Pro-Watch Database Transfer Utility via API** licenses.

The **Pro-Watch API Service** is activated and launched by the user with the access to **Pro-Watch** database.

The **REST** and **SignalR** ports (**8734** and **8735** by default, correspondingly) of **Pro-Watch** servers are available.

There exists a **Pro-Watch** user for whom the **Web password** has been enabled in the user settings of the database. This password will be required to be indicated in the **Eocortex** settings.

The capability of transferring events between the **Pro-Watch** workstations is enabled.

Eocortex Setup

For setting up the response of the **Eocortex** server to the **Honeywell's Pro-Watch®** events, it is required to launch the **Eocortex Configurator** application, go to **Automation** tab, and select a camera in the list. Then, in the opened page, go to the **Integrations** tab and [set up the connection to the Honeywell's Pro-Watch® server](#). After that, it is required to go to the **Tasks by event** tab and [set up the responses](#) to the [Honeywell Pro-Watch event](#).

Integration with intercoms

Eocortex allows the interaction with video intercoms connected with the network via the IP protocol. The outdoor panel acts as an IP camera with additional functionality — the ability to unlock the door lock. For interaction with the intercom, a special interface is used in the **Eocortex Client** application.

Configuring TrueIP TI-6000WD Call Panel

To configure the **TrueIP TI-6000WD** Panel, log into the web interface of the panel (its default IP address is 10.5.22.89).

In the web interface, go to the LAN settings and set the Register to the MGT Centre flag.

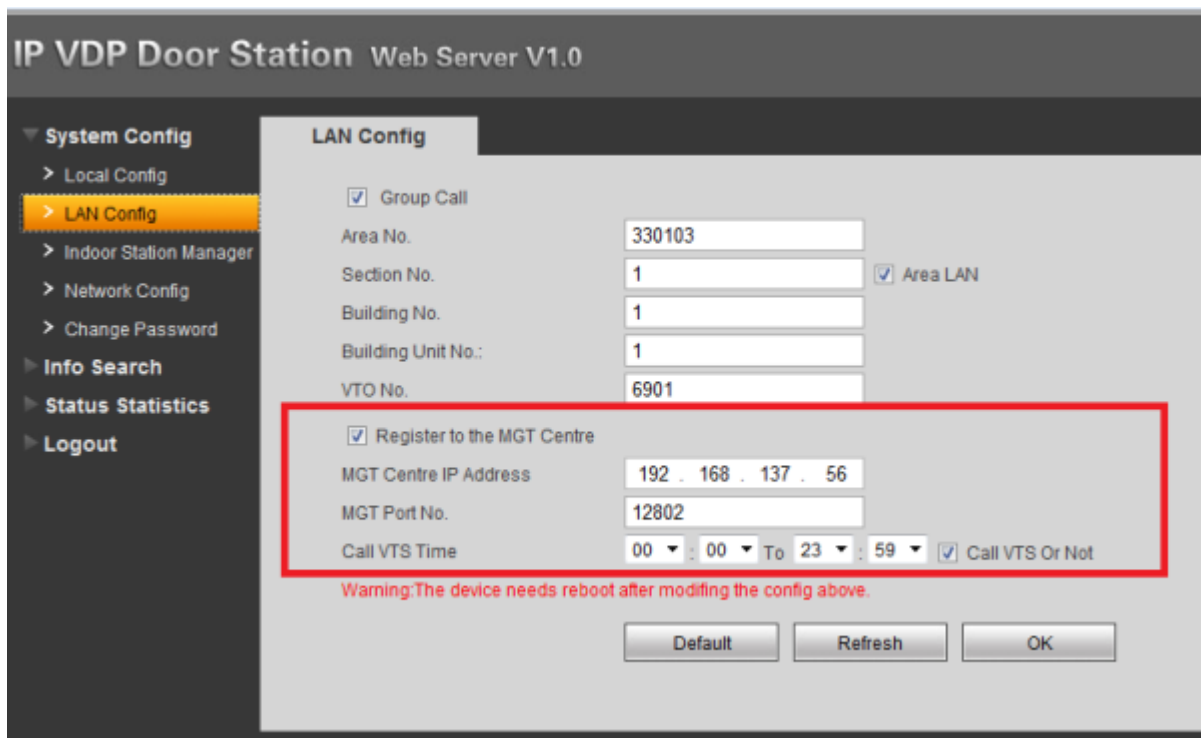
Then in the **MGTCentreIPAddress** field specify the IP address of the **Eocortex** server.

The IP address of the **Eocortex** server must be from the same subnet as the address of the call station.

In the **MGT Port** field, specify the UDP port that will be used for connecting the panel to the **Eocortex** server.

If there are several panels, the UDP ports for them must be different.

Also, set the flag **Call VTS Or Not** and set the **00:00 To 23:59** value to the **Call VTS Time** field.



Reboot the device for the settings to take effect.



Settings in Eocortex Configurator

To configure the intercom connection to the **Eocortex** server, start the **Eocortex Configurator** application and add the intercom in the **Cameras** tab, specifying the relevant connection parameters considering the specifics below.

Address (IP address or URL)

192.168.1.105

IPv4



[Set network ports](#)

Device

Brand

TrueIP

Device type

Door phone

Model

TI-6000WD

Authorization

Username

admin

Password

•••••



Servers

Main server

Server 1

Video streams

Main

Format

H264



Eocortex Client

Mobile and web clients

Stream for video analytics

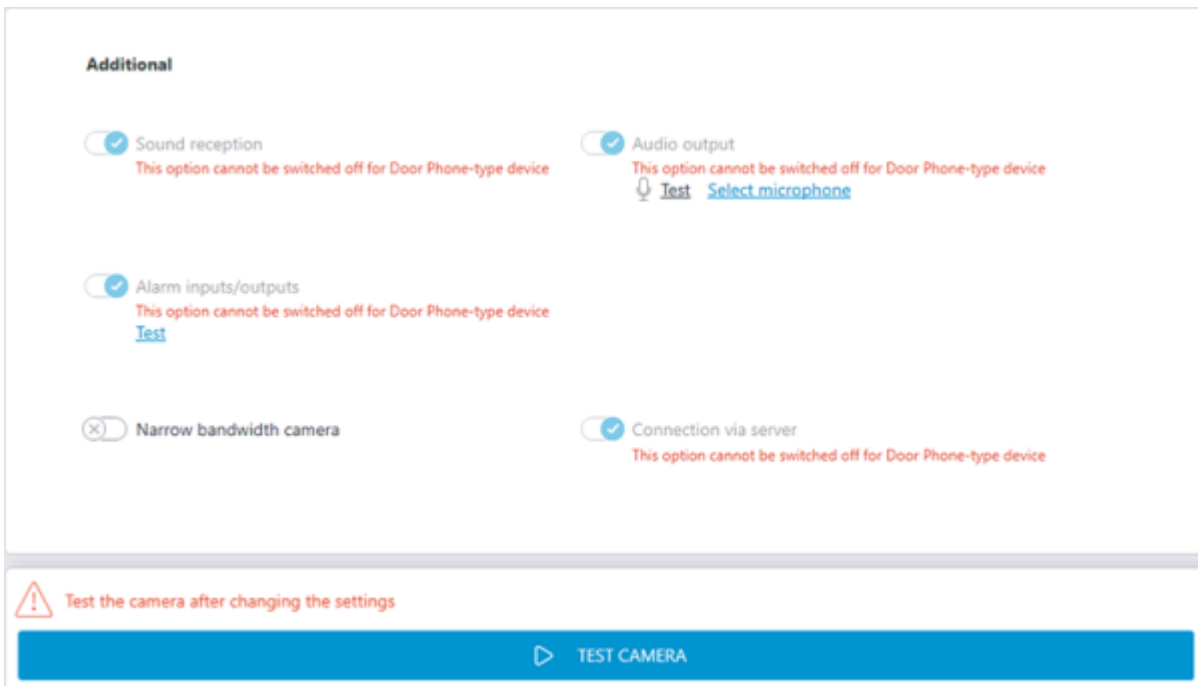
Main

Stream for recording to archive

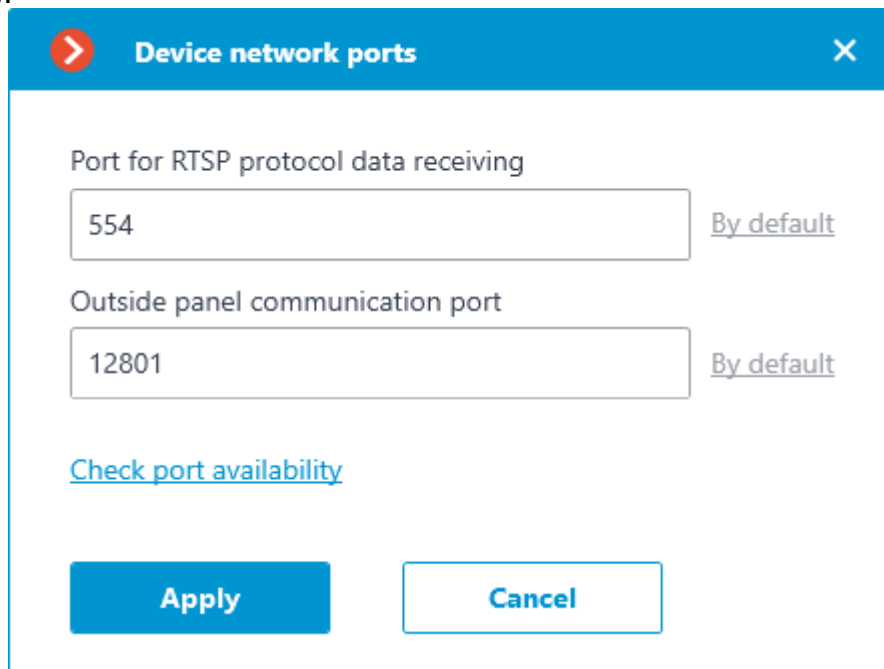
Main

Continuously receive all streams from camera





For the **TrueIP TI-6000WD** call panel, specify a value for the **Outside panel communication port** setting by clicking **Set Network Ports** to open the settings window.



To configure how the **Eocortex** server reacts to calls from the intercom, go to the **Automation** tab, select the intercom in the camera list, then, on the page that opens, go to the **Tasks by event** tab and [configure actions](#) in response to [Call over the intercom](#).

Settings in Eocortex Client

How to [configure interaction with intercoms](#) in Eocortex Client

Integration with Paxton Net2

Eocortex is integrated with **Paxton Net2** systems.

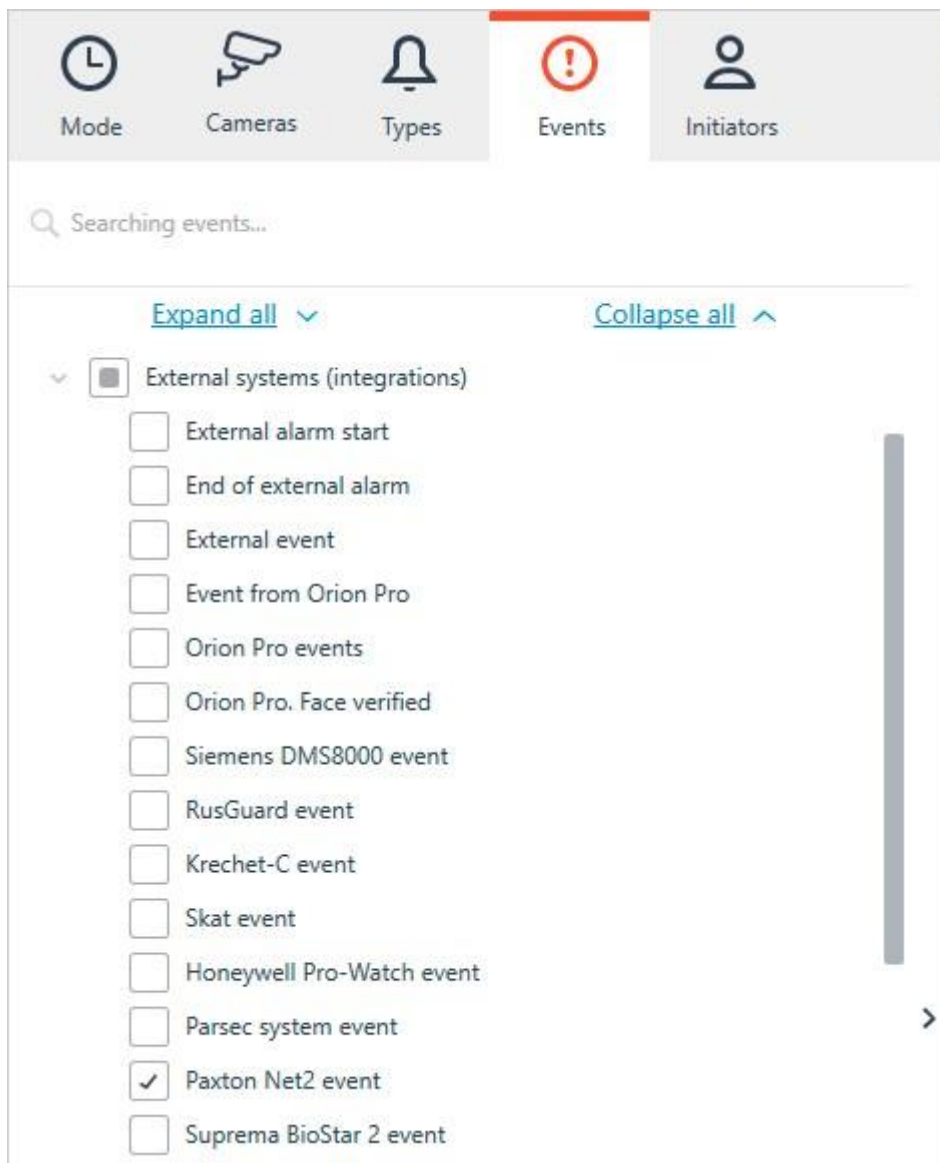
Eocortex allows obtaining **Paxton Net2** events and register them in the event log, as well as to set up a response to these events in **Eocortex**.

It is also possible to set sending of an **Eocortex** event that initiates the opening of a door to **Paxton Net2**.

Events log

All received events from **Paxton Net2** ACS can be viewed in the **Eocortex Client** Events Log.

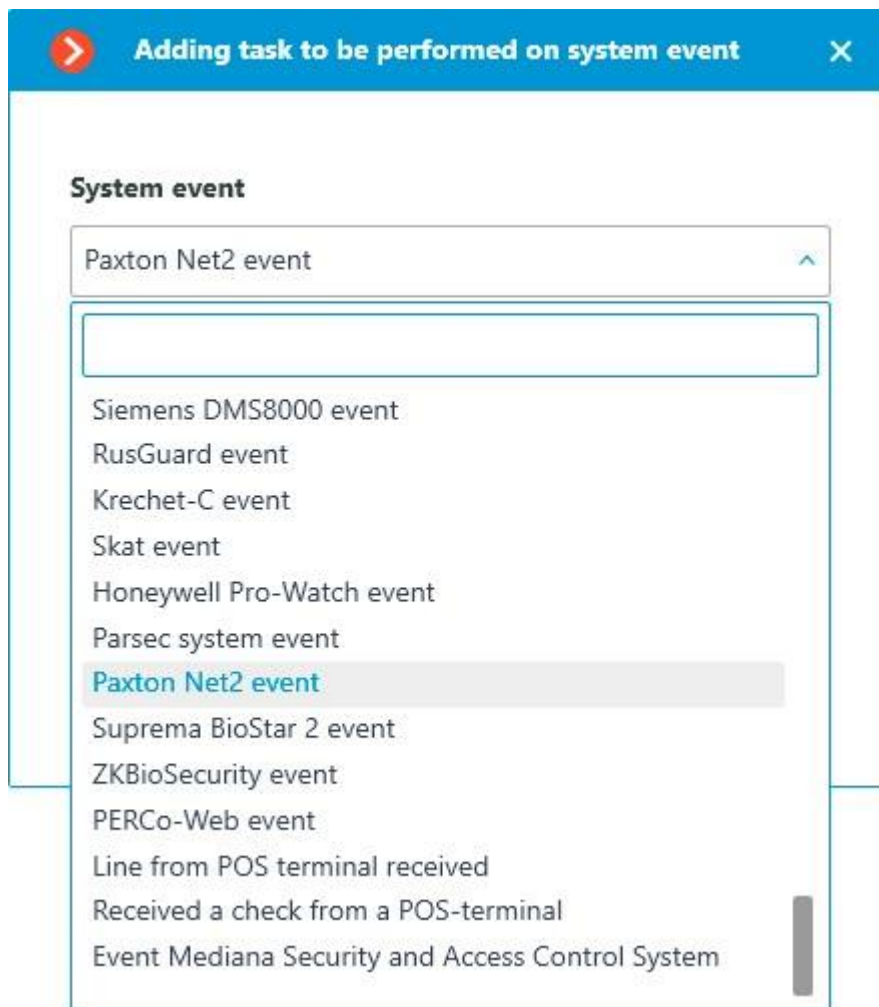
Additionally, **Paxton Net2** events can be filtered in the Events log.



Configuring tasks by events

To configure tasks performed in response to events occurred in the **Paxton Net2** ACS, open the **Eocortex Configurator** application and go to the **Automation** tab. Select an individual camera or entire folder in the camera tree and switch the **Tasks by event** tab on the page that opens.

Create a new task by event with the **Paxton Net2 event** selected in the top field.



All standard actions are supported for creation of tasks by **Paxton Net2 event**.

The event allows setting up various runtime conditions required to met for execution. If several conditions are set, the action will be performed only if all of them are met. If no conditions are set, the action will be performed when any event from **Paxton Net2** is received.

Event attribute	Comparison	Value	
Type of event	Equal	Door open	
Event subtype	Equal	Via door entrance syst...	
User ID	Equal	12345678	
User name	Equal	Smith	
Device ID	Equal	876543214	
Area name	Equal	WarehouseA1	

[Add condition](#)

Apply **Cancel**

The following attributes are available as runtime conditions:

Type of event: select from the listed types of events used by **Paxton Net2** ACS. The following types are available:

- Door open (user action)
- Door open
- Door closed
- Door did not open
- Door unblocked

Event subtype: select from the listed subtypes of events used by **Paxton Net2** ACS. The following types are available:

- Open
- Closed
- Via network instruction
- Via door entrance system

User ID: unique user identifier that is internal to the ACS;

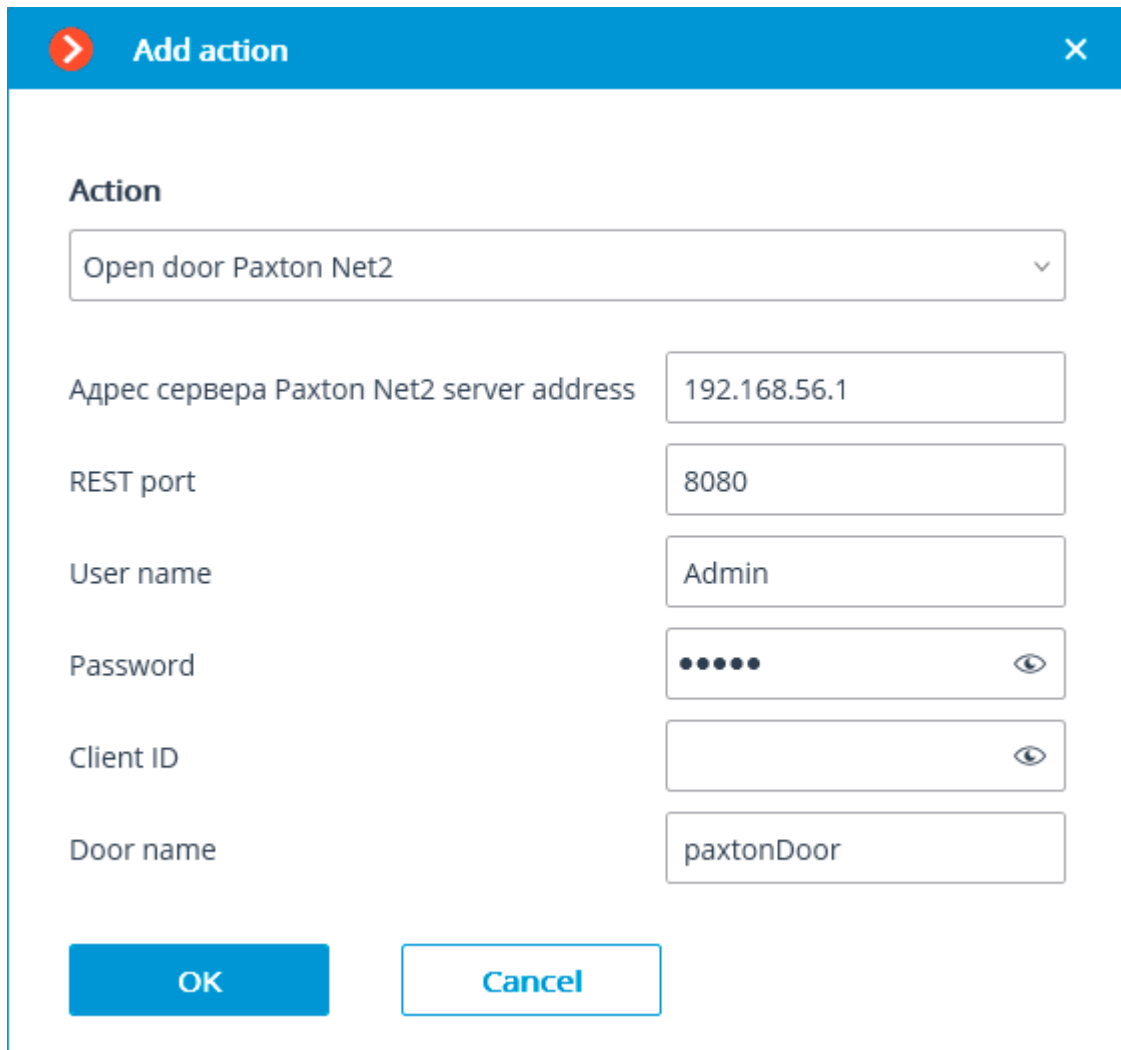
Username: the name of the employee or visitor as it is set in the **Paxton Net2** ACS;

Device ID: numeric identifier of the device as it is set in the **Paxton Net2 ACS**;

Area name: the string value of the zone name where the event has occurred as it is set in the **Paxton Net2 ACS**.

Configuring Open door Paxton Net2 action

To allow the **Eocortex** server sending commands to **Paxton Net2 ACS** to open doors, run the **Eocortex Configurator** application and go to the **Automation** tab. Select an individual camera or entire folder in the camera tree. On the page that opens, depending on the desired type of task, go to the tab **Sheduled tasks** or **Tasks by event** and create a new task with the **Open door Paxton Net2** action.



The screenshot shows a dialog box titled "Add action" with a blue header bar containing a red arrow icon and a close button (X). The main content area is white and contains the following elements:

- Action:** A dropdown menu with "Open door Paxton Net2" selected.
- Адрес сервера Paxton Net2 server address:** A text input field containing "192.168.56.1".
- REST port:** A text input field containing "8080".
- User name:** A text input field containing "Admin".
- Password:** A text input field with masked characters (dots) and an eye icon to toggle visibility.
- Client ID:** A text input field that is currently empty, with an eye icon to toggle visibility.
- Door name:** A text input field containing "paxtonDoor".

At the bottom of the dialog, there are two buttons: a blue "OK" button and a white "Cancel" button with a blue border.

When setting up the action, configure the following parameters:

Paxton Net2 server address: IP address or domain name of the Paxton Net2 server

REST port: Port for sending REST API requests to the Paxton Net2 server (usually the same as SignalR)

Username: Name of the Paxton Net2 account used for connection

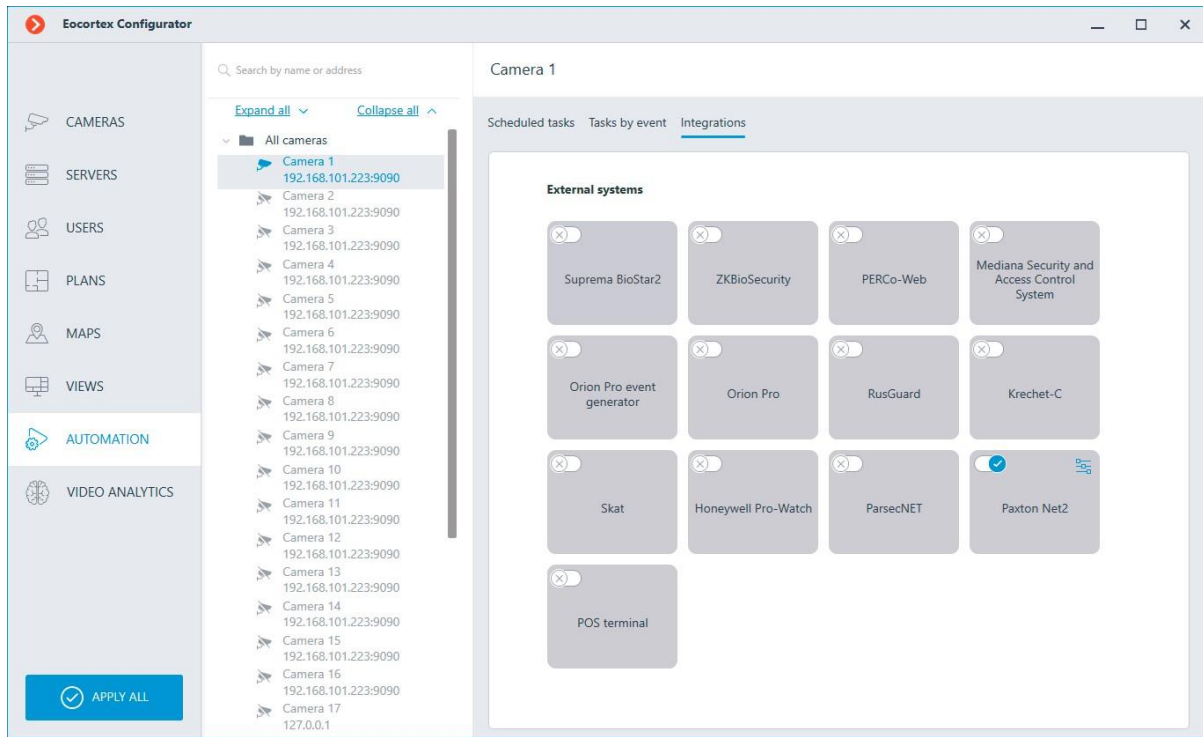
Password: Password of the Paxton Net2 account used for connection



Client ID: Identifier contained in the Paxton Net2 license filename

Door name: The door name as it is set in the Paxton Net2 ACS

Configuring events reception in the Eocortex Configurator application

To allow the **Eocortex** server responding to the **Paxton Net2** ACS events, run the **Eocortex Configurator** application and go to the **Automation** tab. Select the camera in the list and switch to the **Integrations** tabs on the page that opens.



On the **Integrations** tab, enable integration with Paxton using  switch, then configure the integration by clicking  button.

The following tabs are available in the integration settings:

General settings;

Camera settings.

General settings

The **General settings** tab is used for setting up the connection to the **Paxton Net2** ACS server.

Paxton Net2 settings

General settings Camera settings

Paxton Net2 server address

192.168.100.103

SignalR port REST port

8080 8080

Username Password

OEM Client

Client ID

[Connect](#)

Status: Successful connection.

Save Cancel

To configure the connection, specify the following parameters:

Paxton Net2 server address: IP address or domain name of the Paxton Net2 server

SignalR port: Paxton Net2 server connection port

REST port: Port for sending REST API requests to the Paxton Net2 server (usually the same as SignalR)

Username: Name of the Paxton Net2 account used for connection

Password: Password of the Paxton Net2 account used for connection

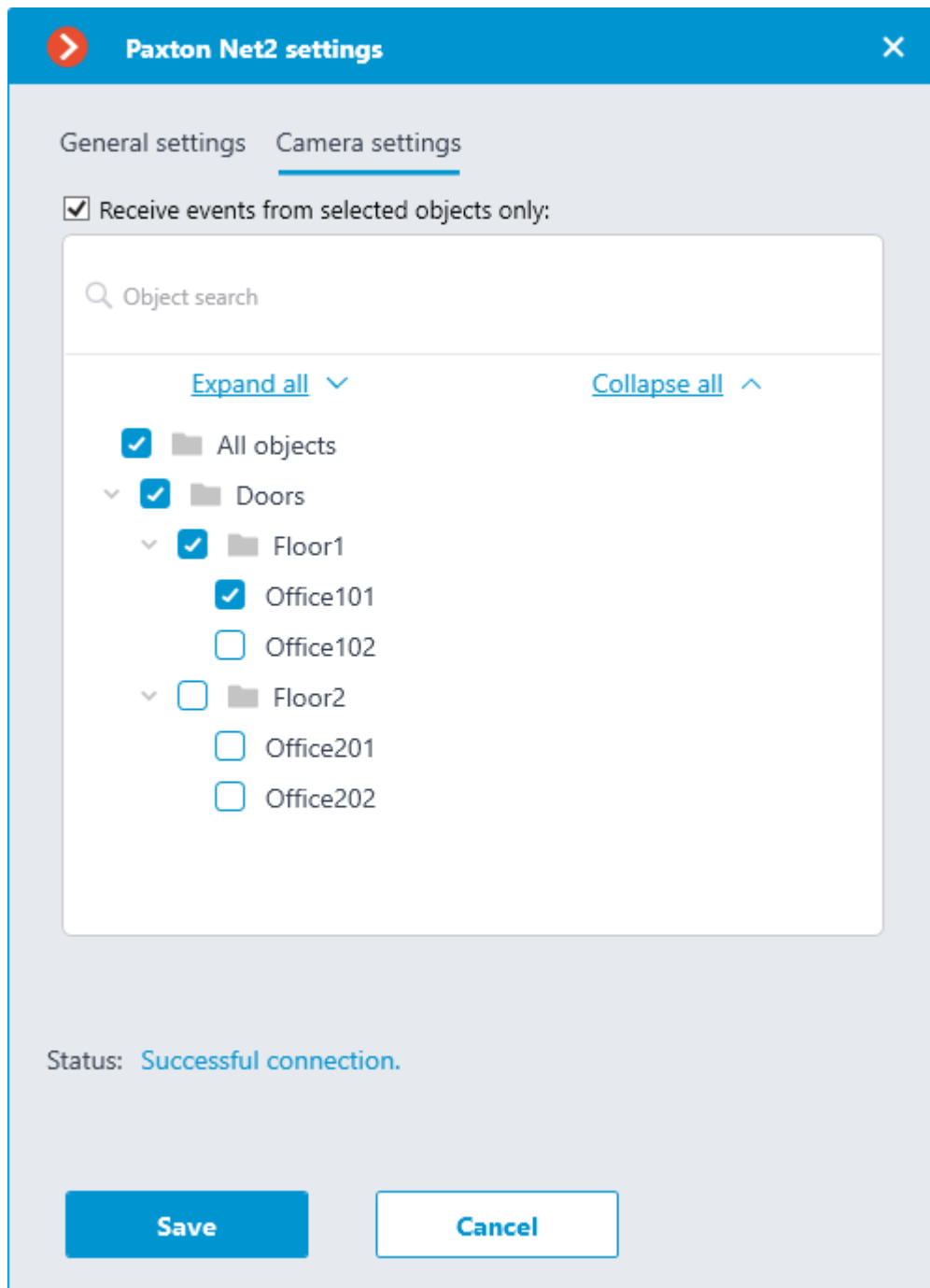
Client ID: Identifier contained in the Paxton Net2 license filename

To test the connection with the provided settings, click the **Connect** button. The **Status** section will display the result of the test.

If the connection is successful, further settings should be made on the **Camera settings** tab.

Camera settings

The **Camera settings** tab is used for setting up the registration of events from Paxton Net2 objects in **Eocortex**.



To receive events only from certain objects, enable the **Receive events from selected objects only:** option and check the selected objects.

If the **Receive events from selected objects only:** option is disabled, **Eocortex** will register all Paxton Net2 events as related to the selected camera.

Eocortex registers events for the camera independently of the settings of other cameras, so the same Paxton Net2 object can cause the reaction of the system and create an entry in the Events Log for multiple cameras simultaneously.

Integration with POS terminals

The integration with POS terminals that allows to receive and display receipts from POS terminals has been implemented in **Eocortex**. This feature makes it possible to search for transactions and archive fragments for different purposes, e.g., to determine at which checkout an item was purchased.

POS terminals are integrated as external devices, which means that they must be linked to cameras in **Eocortex** (one POS terminal per camera).

The integration is available only for servers running on Windows OS.

An additional license required to use the integration and connect a POS terminal.

The integration is available for **LS**, **ST**, **Enterprise** and **ULTRA** licenses only.

List of terms

POS (Point of sale) — the place where the purchase occurs. This place is equipped with POS terminal.

POS terminal — external device that sends text messages to the **Eocortex**. Such a device can be a cash register or any other that is capable of outputting text.

Receipt — text message sent from the POS terminal to the **Eocortex**.

Transaction — a sequence of data associated with an individual cash receipt. A transaction begins and ends with messages signaling the start and end of a receipt, respectively. If the message about the closure of the receipt is not received within the specified time, the transaction is terminated by a timeout. Also, the previous transaction may be terminated when a beginning message for a new receipt is received.

ESC/POS — receipt printer control language developed to control POS terminals.

POS terminal transaction log — log of all receipts received from POS terminals.

Advantages

Receive data from POS terminals about cash receipts.

Store received cash receipts.

View received cash receipts both in real time and in the archive.

Filter stored cash receipts by cameras and content.

Use data of cash receipts in Automation scenarios.

Watch the video related to the transaction both frame-by-frame and step-by-step.

Navigate through the archive on the timeline by data of received cash receipts.

Features


Service commands of the ESC/POS protocol are removed from the message without affecting its display.

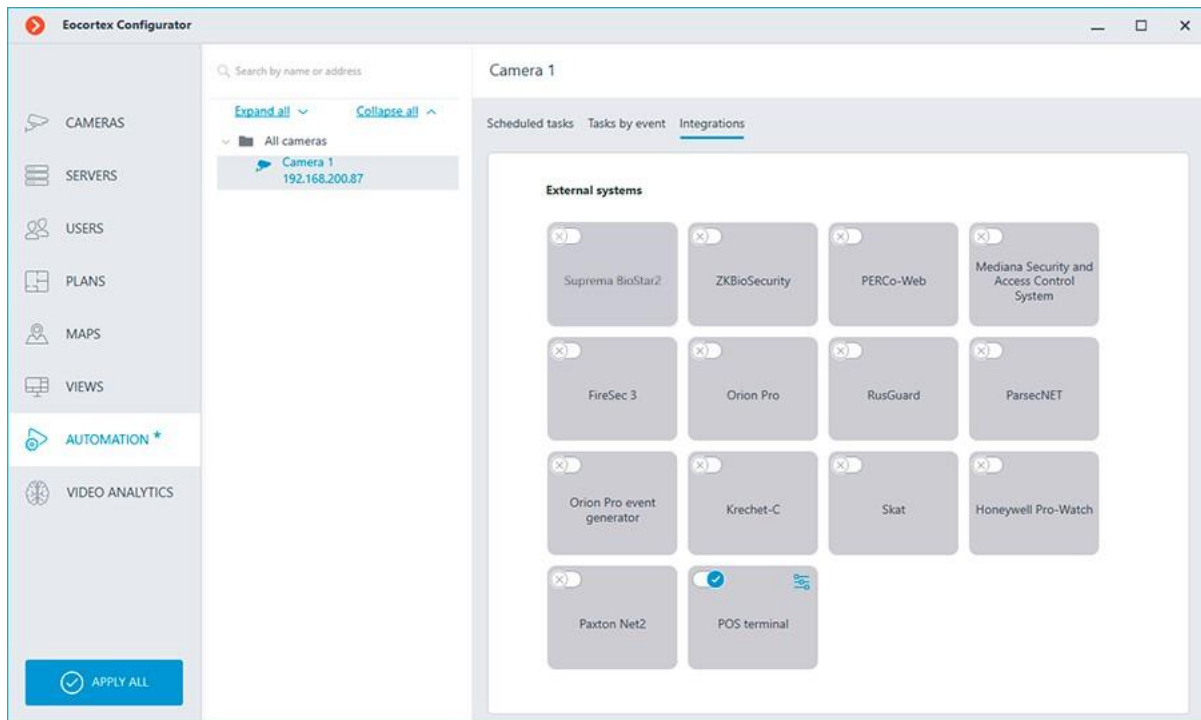
Cash receipts from POS terminals can be received only via TCP/IP.

POS terminal should operate in server mode. In other words, **Eocortex** initiates the connection.

Displaying of graphical images in the cash receipt is not supported.

Setting the integration in Eocortex Configurator

To set up integration with POS terminals, run the **Eocortex Configurator** application and go to the **Automation** section. Select the camera that will be associated with the terminal from the list, then switch to the **Integrations** tab on the page that opens and enable the slider for the **POS terminal** tile. To configure the integration, click the  button.



This will open the settings window for integration with the POS terminal, which is observed by the selected camera.

The **Connection** tab contains settings for connecting to the terminal.

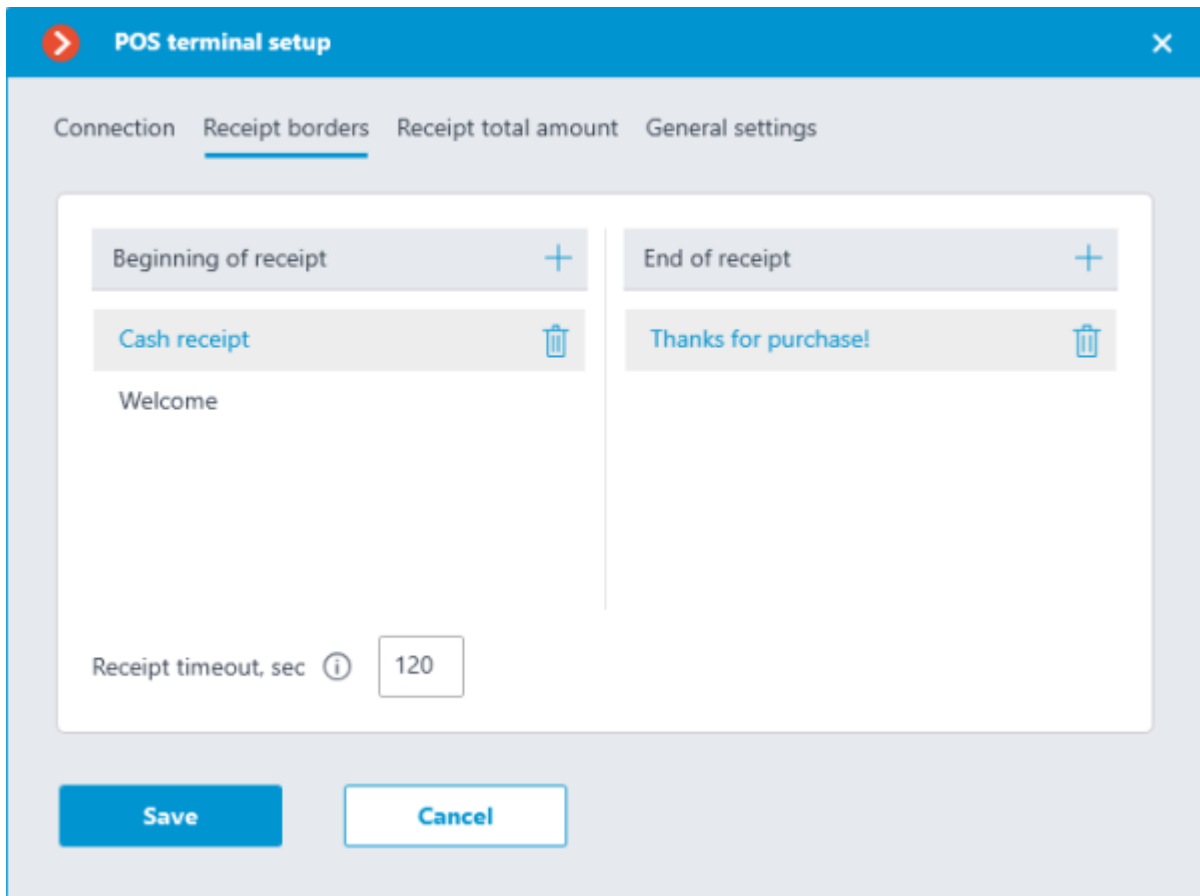
The screenshot shows a window titled "POS terminal setup" with a close button (X) in the top right corner. Below the title bar, there are four tabs: "Connection", "Receipt borders", "Receipt total amount", and "General settings". The "Connection" tab is selected and underlined. Inside the main content area, there are two input fields: "IP address" containing "127.0.0.1" and "Port" containing "12345". Below these is a "Message coding" dropdown menu showing "65001 Unicode (UTF-8)". Underneath the dropdown, there is a blue "Connect" button and a message "Connection test successful." At the bottom of the dialog, there are two buttons: a blue "Save" button and a white "Cancel" button with a blue border.

The POS terminal to be connected must operate in server mode.

The **Message coding** field requires to select the encoding in which the data comes from the POS terminal. Availability of encodings depends on the operating system of the computer where the **Eocortex Configurator** application is running. At the same time, it should be noted that the selected encoding must be supported by the server to which the camera is bound as well.

When the settings are defined, the connection can be tested by clicking on the **Connect** button.

The **Receipt borders** tab contains the rules for separating receipts from each other, since the data from the POS terminal comes as a continuous stream.



The **Beginning of receipt** and **End of receipt** lists allow specifying signal substrings indicating the opening (beginning) and closing (end) of a cash receipt, respectively. Each received line will be inspected for the presence of signal substrings. For the system, the check will start with a line containing any of the substrings specified in the **Beginning of receipt** list and will end with a line containing values from the **End of receipt** list.

The match between the text of the signal substring and the text in the received line of the cash receipt must be precise, including the case.

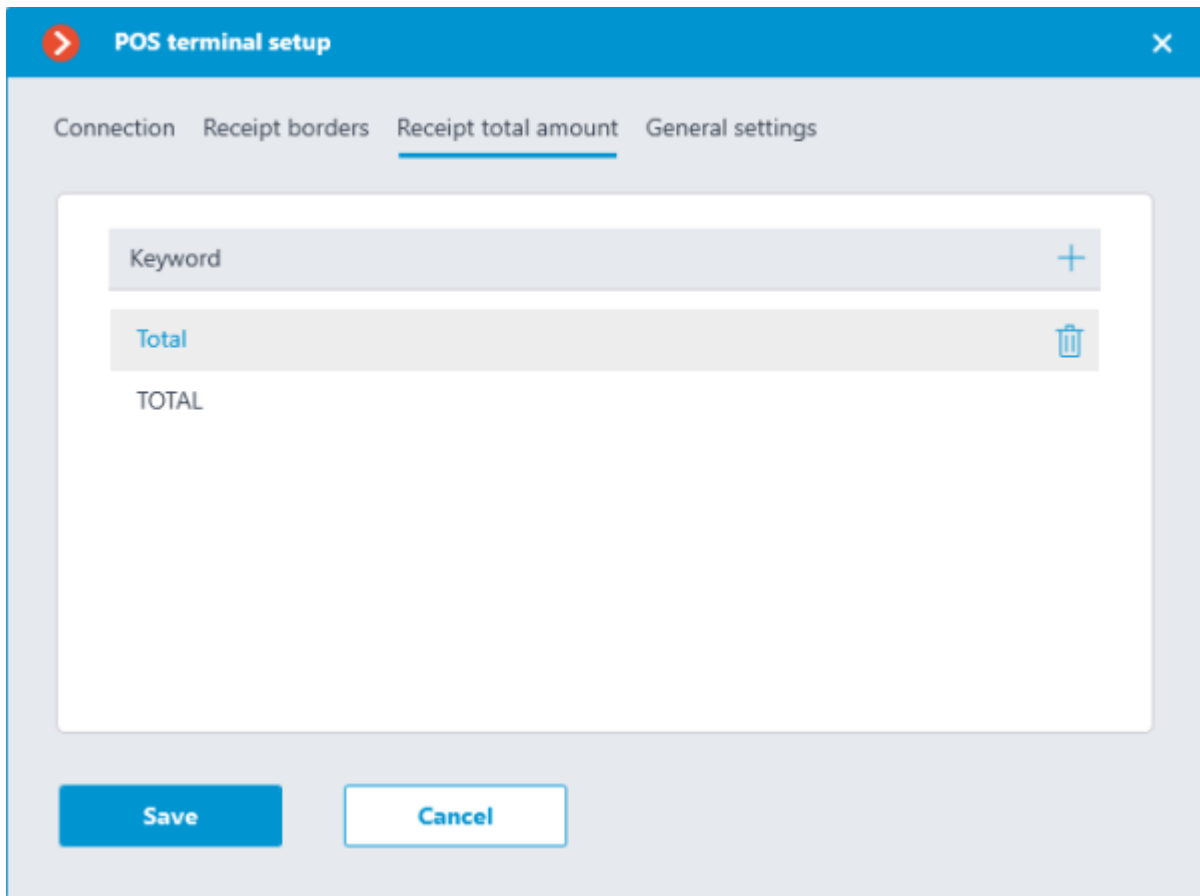
As a beginning of a cash receipt there can be, for example, the name of the store, captions like **Welcome** or **Receipt**, and so on. The end of a cash receipt is often the store's website address or the caption like **Thanks for purchase!**

The **Receipt timeout, sec** field allows specifying the time of waiting between opening and closing the receipt. The receipt will be closed if no new line has come since the last line was received within this time period.

A receipt will also be closed when one of the following commands is received from the POS terminal:

- Full cut (of paper).
- Partial cut (of paper).

The **Receipt total amount** tab allows specifying signal substrings that contain the total amount of a cash receipt.



As the total amount will be considered the value behind the specified signal substring.

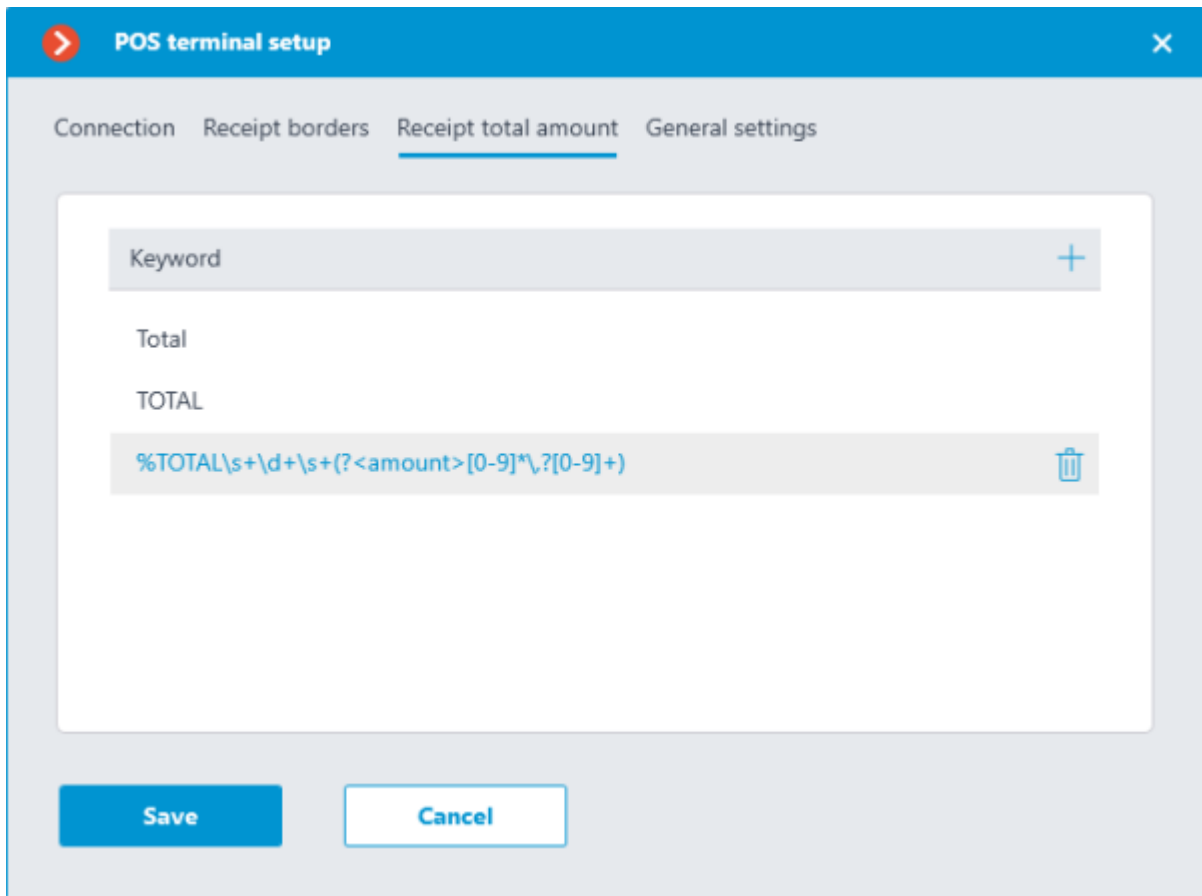
Signal substrings are case-sensitive. For example, the **Total** and **TOTAL** lines should be set as two different substrings.

For more flexible configuration for getting the total amount of the receipt, a regular expression can be used as a signal substring. Such line must start with the **%** sign and contain a named group with the **amount** name.

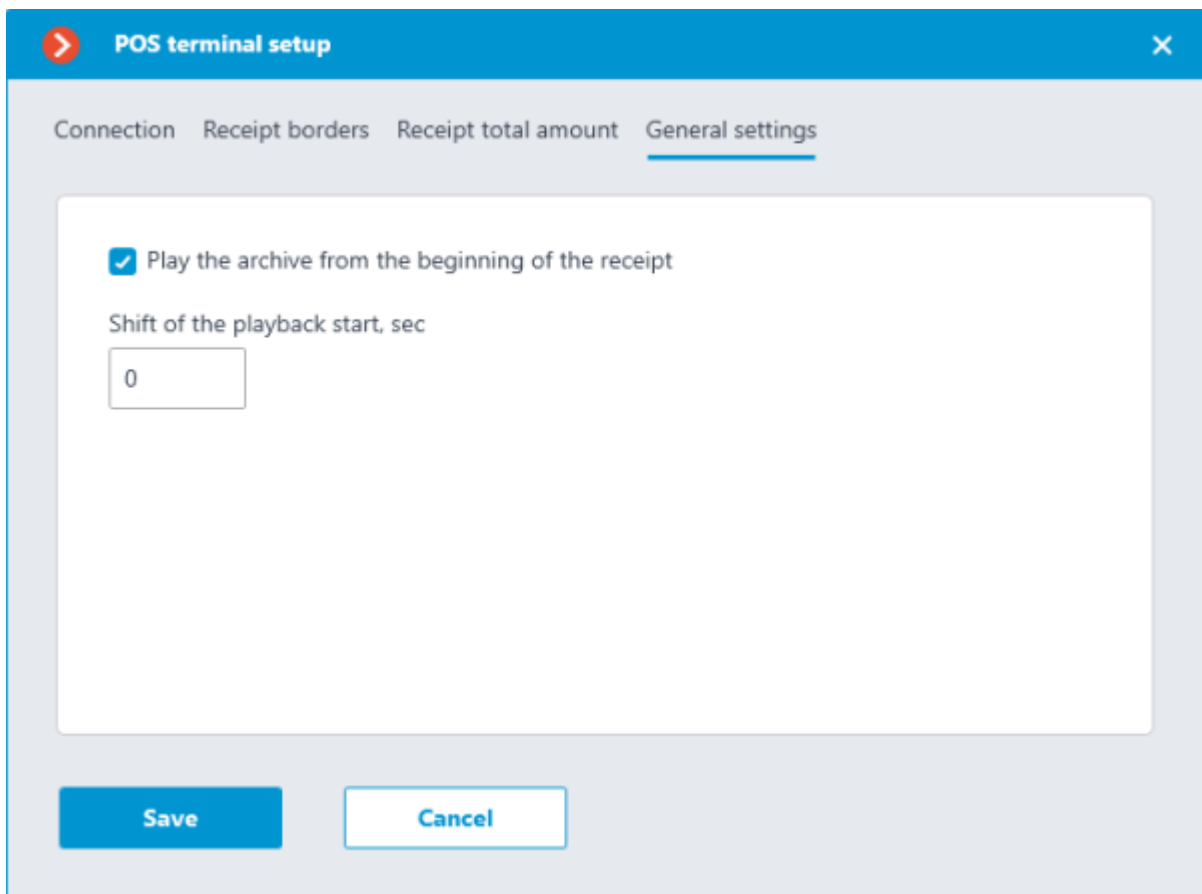
As an example, below is a receipt from which the value of the total amount can not be obtained using the signal string containing plain text — the value of the **TOTAL** line will be **164050**.

DENOMI.	PCS.	AMOUNT
500	5	2 500
200	5	1 000
100	5	500
50	1	50
TOTAL	16	4 050

In such case, to get the total amount as **4050**, the signal substring can be set as a regular expression as displayed below.

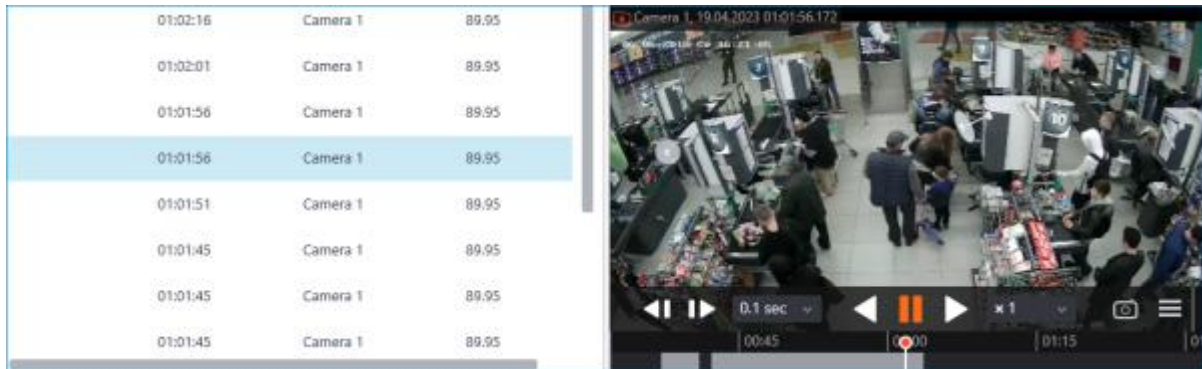


The **General settings** tab contains the settings for pointing on the timeline in the archive of the video associated with the received cash receipt.



If the **Play the archive from the beginning of the receipt** option is enabled, the pointer to the beginning of such video will be set on the timeline to the time of the receipt beginning, including the time shift specified in the **Play the archive from the beginning of the receipt** field. If this option is disabled, the pointer to the beginning of the video will be set to end of the receipt.

For example, below is the pointer to the video with the time shift of 10 seconds from the beginning of the receipt.

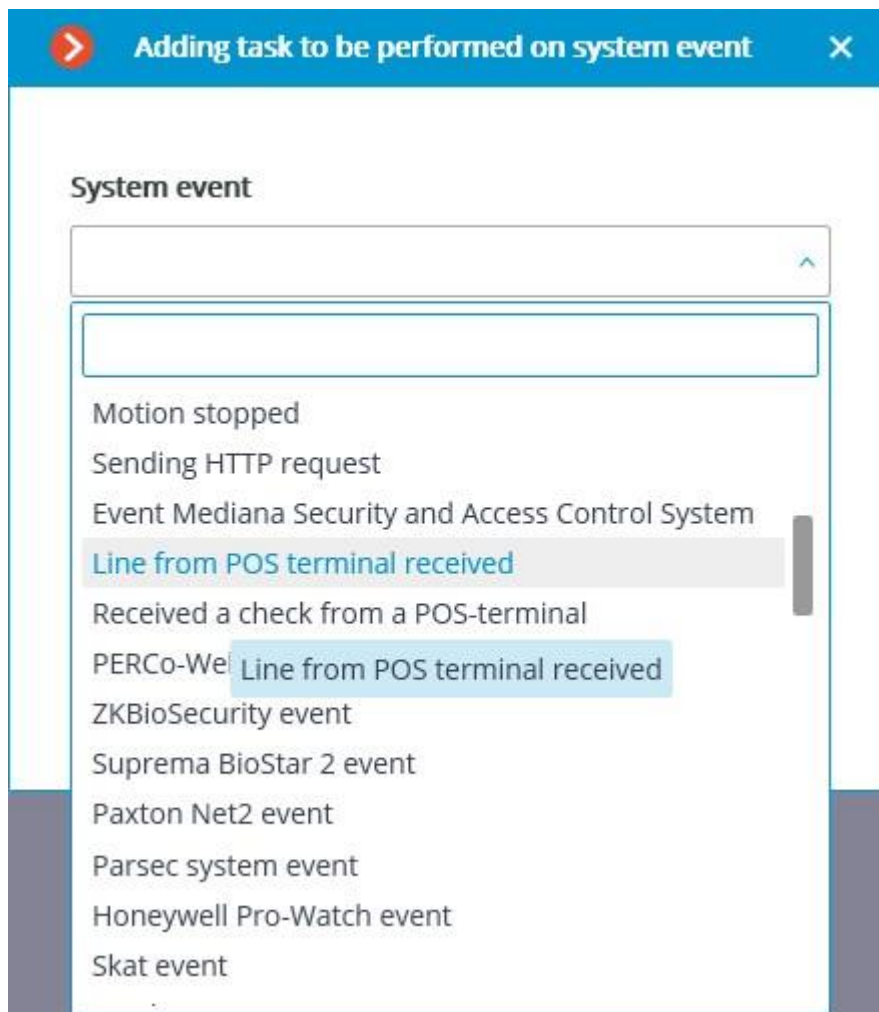


Position of the pointer on the timeline may have a slight inaccuracy.

Setting tasks by events


The system is able to perform actions in response to events occurring with Automation scenarios. To set up such a scenario, go to the **Automation** section of the **Ecortex Configurator** application. Select a specific camera or a group of cameras in the camera tree and on the page that opens, select the **Tasks by event** tab.

For the **Line from POS terminal received** event, it is possible to set up any standard task.



For the scenario, the runtime conditions based on the content of the line can be set:

The screenshot shows a dialog box titled "Action settings" with a close button (X) in the top right corner. Below the title bar, there are two tabs: "Actions" and "Runtime conditions (1)". The "Runtime conditions (1)" tab is selected and underlined. Inside the dialog, there is a table-like structure for defining conditions:

Event attribute	Comparison	Value	
Line of receipt	Equal	milk	

Below the table, there is a blue link labeled "Add condition". At the bottom of the dialog, there are two buttons: "Apply" and "Cancel".

By this way, it is possible to make the scenario executable only in the specific cases. For example, enable the archive recording if the cash receipt contains an item that has any restrictions on the sale.

Also, the scenario can be set up for the **Received a check from a POS-terminal** event.

> Adding task to be performed on system event **×**

System event

Received a check from a POS-terminal **▼**

Action


Alarm generation **▼**

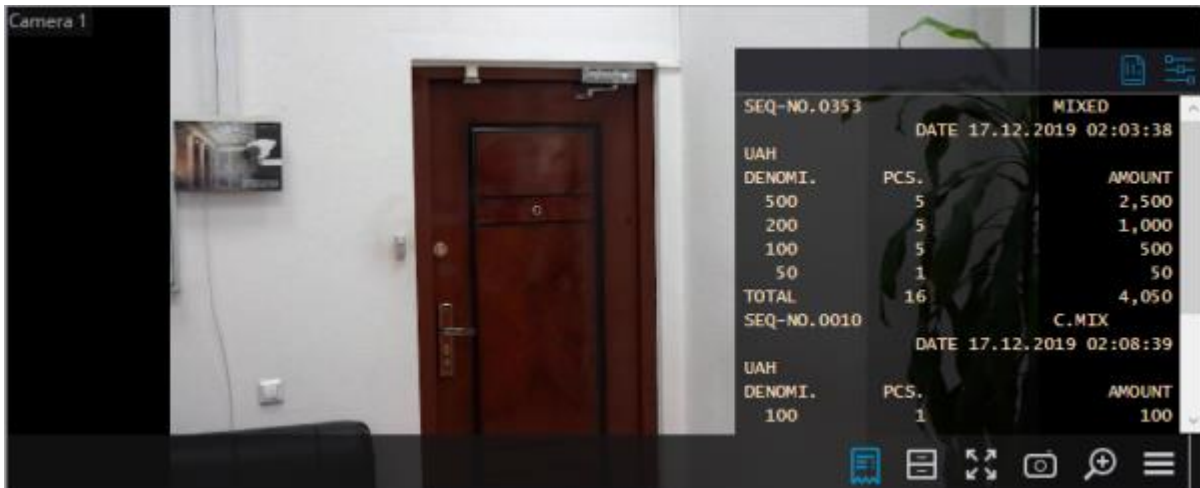
Apply **Cancel**


As a runtime condition for such task, the total amount value can be used.

The screenshot shows a dialog box titled "Action settings" with a close button (X) in the top right corner. Below the title bar, there are two tabs: "Actions" and "Runtime conditions (1)". The "Runtime conditions (1)" tab is active. Inside this tab, there is a table-like structure with three columns: "Event attribute", "Comparison", and "Value". The "Event attribute" column contains a dropdown menu with "Amount" selected. The "Comparison" column contains a dropdown menu with "Equal" selected. The "Value" column contains a text input field with "1000" entered. To the right of the "Value" field is a trash icon. Below the table, there is a blue link labeled "Add condition". At the bottom of the dialog box, there are two buttons: "Apply" and "Cancel".

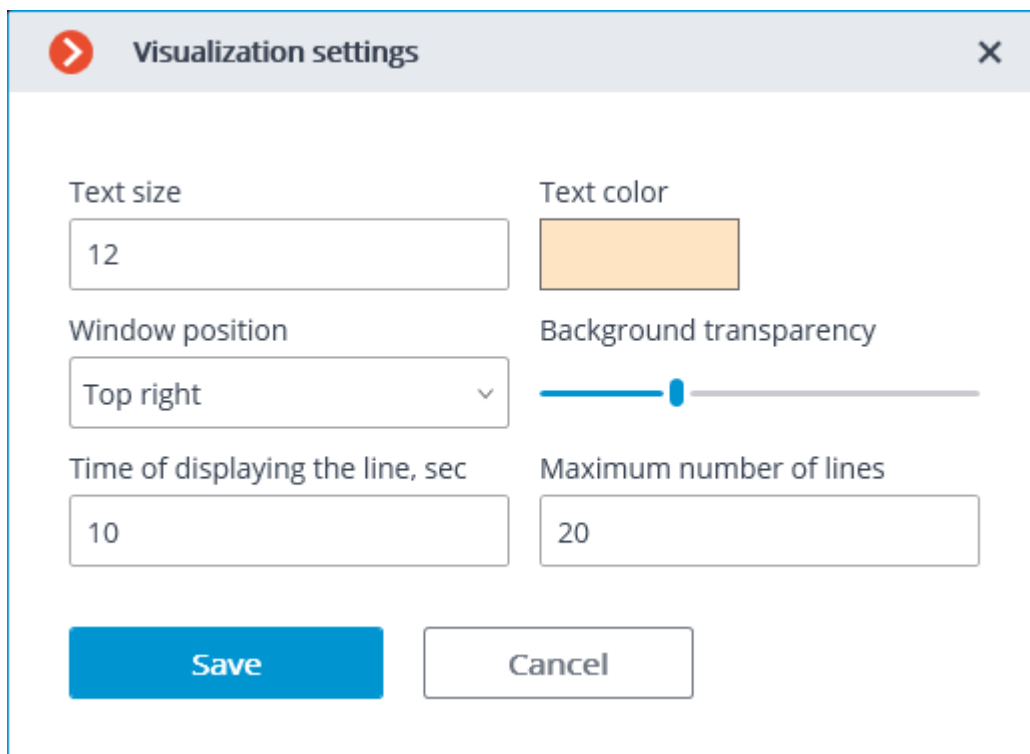
Eocortex Client

When the integration with POS terminal is enabled, the new button  will appear in the bottom part of the camera cell. This button enables and disables the panel for displaying cash receipts in the camera cell.



By default, the panel is located in the upper right corner of the cell. The panel itself has two additional buttons ; the first one opens the **POS terminal transaction log**, when the second opens the **Visualization settings** window.

Visualization settings

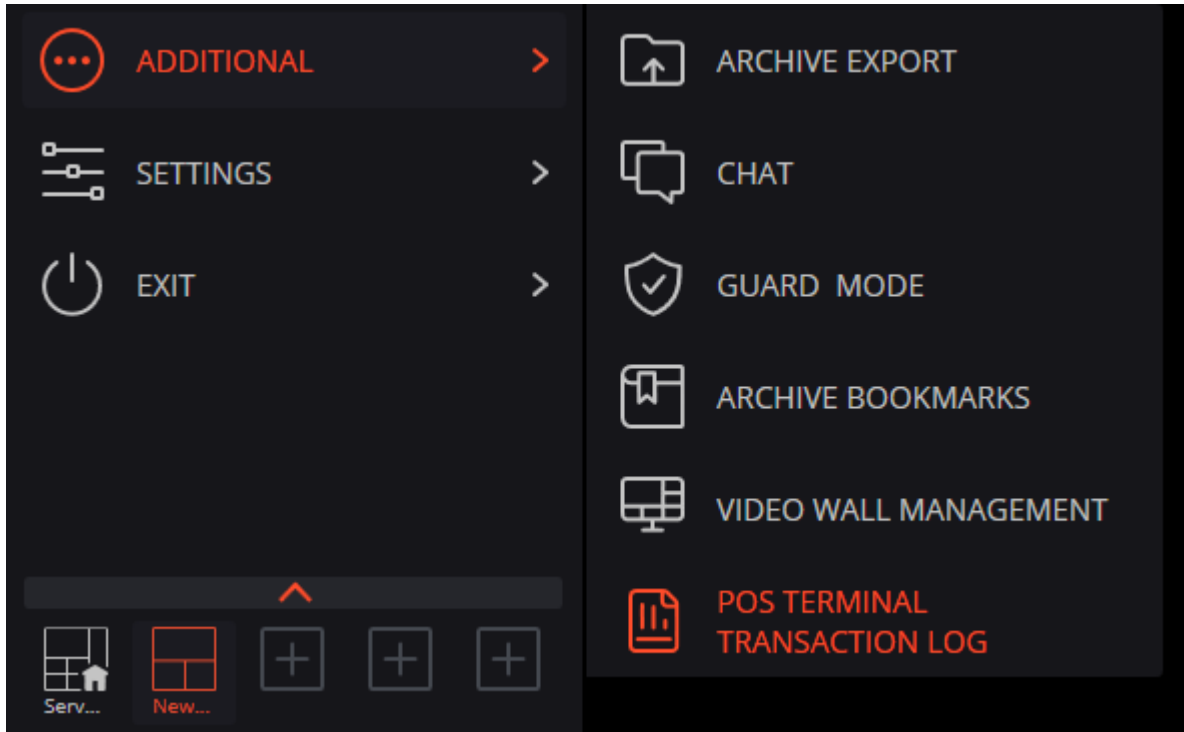


POS terminal transaction log

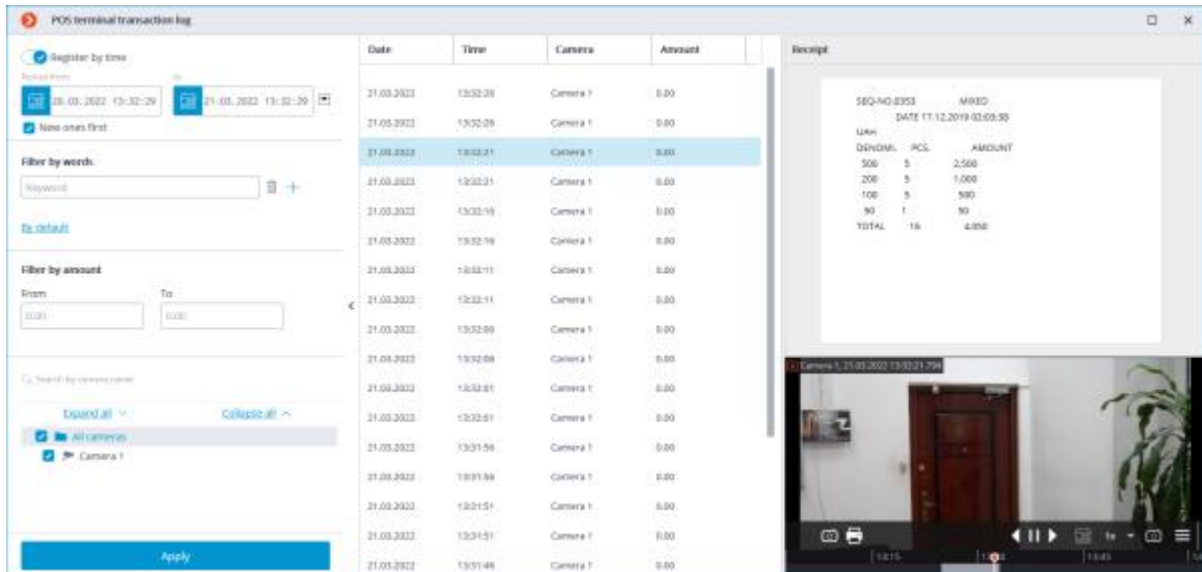
In the **POS terminal transaction log**, the user is able to view cash receipts stored in the **Eocortex** database, filter cash receipts by various parameters, view the archive for the moment of time the cash receipt was generated.



The transaction log can be opened by the corresponding button in the **Additional** section of menu or from the panel for displaying cash receipts.



The transaction log is divided into three work areas (left to right):
filtering area where search parameters for cash receipt are configured;
list of transactions;
display area of a cash receipt, which corresponds to the selected transaction.



Stored cash receipts can be filtered by various parameters:

POS terminal transaction log

Register by time

Period from to

New ones first

Filter by words

[By default](#)

Filter by amount

From To

[Expand all](#) [Collapse all](#)

- All cameras
- Camera 1

By filtering by keywords, only those cash receipts that contain the specified words will be displayed. The system will search for all the specified keywords in the cash receipt, and not just one of them.

With applying the filters, a search is carried out for cash receipts that match the filtering parameters. If the found cash receipt is related to any camera and previously was displayed in the camera cell, the list of transactions will contain this camera name. Each line in the list of transactions corresponds to a single cash receipt.

Date	Time	Camera	Amount
21.03.2022	13:32:26	Camera 1	0.00
21.03.2022	13:32:26	Camera 1	0.00
21.03.2022	13:32:21	Camera 1	0.00
21.03.2022	13:32:21	Camera 1	0.00
21.03.2022	13:32:16	Camera 1	0.00
21.03.2022	13:32:16	Camera 1	0.00

If the total amount of the receipt cannot be determined, the value in the **Amount** column will be displayed equal to 0.00.

The total amount for all receipts collected in versions before 3.6 will always be displayed as 0.00.

The total amount of the receipt in the hundreds of millions may be slightly rounded off.

The right side of the transaction log displays the receipt corresponding to the selected position in the list of transactions.

Receipt		
SEQ-NO.0353 MIXED		
DATE 17.12.2019 02:03:38		
UAH		
DENOMI.	PCS.	AMOUNT
500	5	2,500
200	5	1,000
100	5	500
50	1	50
TOTAL	16	4,050

Below the cash receipt, an archive fragment that corresponds to the selected receipt in **Eocortex** can be viewed.

Step-by-step transaction view

To view transactions step by step, select the view step length on the left side of the bottom cell panel.



When viewing in step-by-step mode, transaction event filters will be disabled.

Integration with ZKBioSecurity ACS

In **Eocortex**, it is possible to receive events from **ZKBioSecurity** ACS and configure the reaction to these events, as well as to view the received events in the **Events Log** of the **Eocortex Client** application.

The integration is available on both Windows and Linux-based servers.

Description

Information regarding an event may contain the following fields:

Time (Event Time);

Employee identifier (Pin);

Employee (Name + Last Name);

Name of department (Department Name);

Name of area (Area Name);

Card number (Card Number): number of the card swiped at the reader;

Serial number (Device Sn): serial number of the device;

Verification mode (Verify Mode Name) (e.g., Face, Other, Only Password);

Description of event (Event Name): textual description of a **ZKBioSecurity** event;

Event point (Event Point Name);

Name of reader (Reader Name);

Zone (Access Zone);

Name of device (Device Name);

Event identifier (LogId);

Type of event (Event Number) (e.g., Opening by verification, Opening using emergency password, Prohibition of double passing);

Level of event (Event Level). The following values are available: Normal (Normal), Error (Exception), Alarm (Alarm);

Name of door (DoorName).

Events log

The events received from the **ZKBioSecurity** ACS are displayed in the event log of the **Eocortex Client** application.

The following event log information fields are displayed (if available for the given event):

Type of event (EventNumber): as a description of the event (Door closed);

Area (Area);

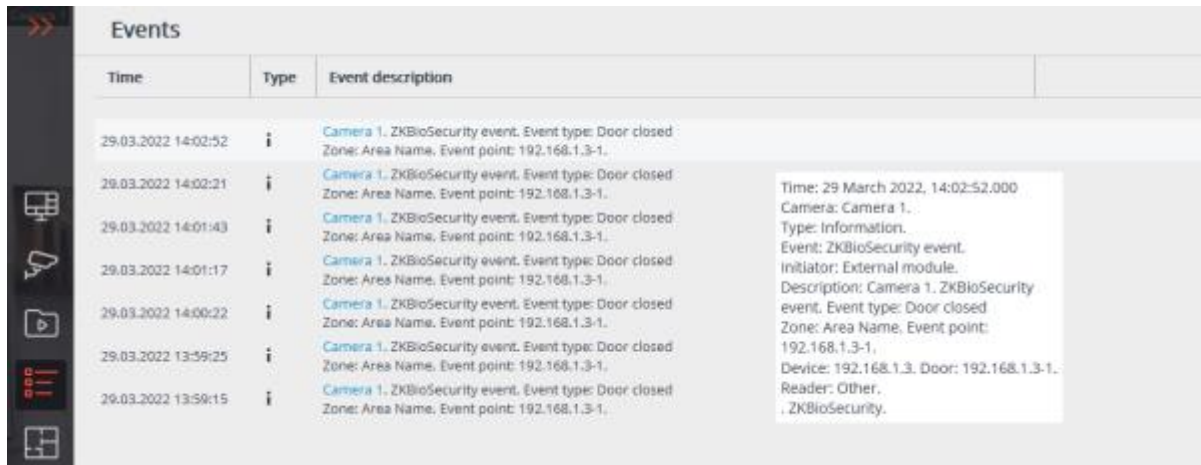
Point of event (Event Point);

Employee (Name + Last Name);

Device (Device);

Door (Door);

Reader (Reader).



The screenshot shows the 'Events' window in the Eocortex Client application. It features a table with columns for Time, Type, and Event description. The table lists several 'Door closed' events from Camera 1. A tooltip is displayed over one of the events, providing detailed information such as the event type, initiator, and device details.

Time	Type	Event description
29.03.2022 14:02:52	i	Camera 1. ZKBioSecurity event. Event type: Door closed Zone: Area Name, Event point: 192.168.1.3-1.
29.03.2022 14:02:21	i	Camera 1. ZKBioSecurity event. Event type: Door closed Zone: Area Name, Event point: 192.168.1.3-1.
29.03.2022 14:01:43	i	Camera 1. ZKBioSecurity event. Event type: Door closed Zone: Area Name, Event point: 192.168.1.3-1.
29.03.2022 14:01:17	i	Camera 1. ZKBioSecurity event. Event type: Door closed Zone: Area Name, Event point: 192.168.1.3-1.
29.03.2022 14:00:22	i	Camera 1. ZKBioSecurity event. Event type: Door closed Zone: Area Name, Event point: 192.168.1.3-1.
29.03.2022 13:59:25	i	Camera 1. ZKBioSecurity event. Event type: Door closed Zone: Area Name, Event point: 192.168.1.3-1.
29.03.2022 13:59:15	i	Camera 1. ZKBioSecurity event. Event type: Door closed Zone: Area Name, Event point: 192.168.1.3-1.

Time: 29 March 2022, 14:02:52.000
Camera: Camera 1.
Type: Information.
Event: ZKBioSecurity event.
Initiator: External module.
Description: Camera 1. ZKBioSecurity event. Event type: Door closed
Zone: Area Name, Event point: 192.168.1.3-1.
Device: 192.168.1.3. Door: 192.168.1.3-1.
Reader: Other.
. ZKBioSecurity.

Filtering **ZKBioSecurity** ACS events is available.

Mode Cameras Types **Events** Initiators

Searching events...

[Expand all](#) [Collapse all](#)

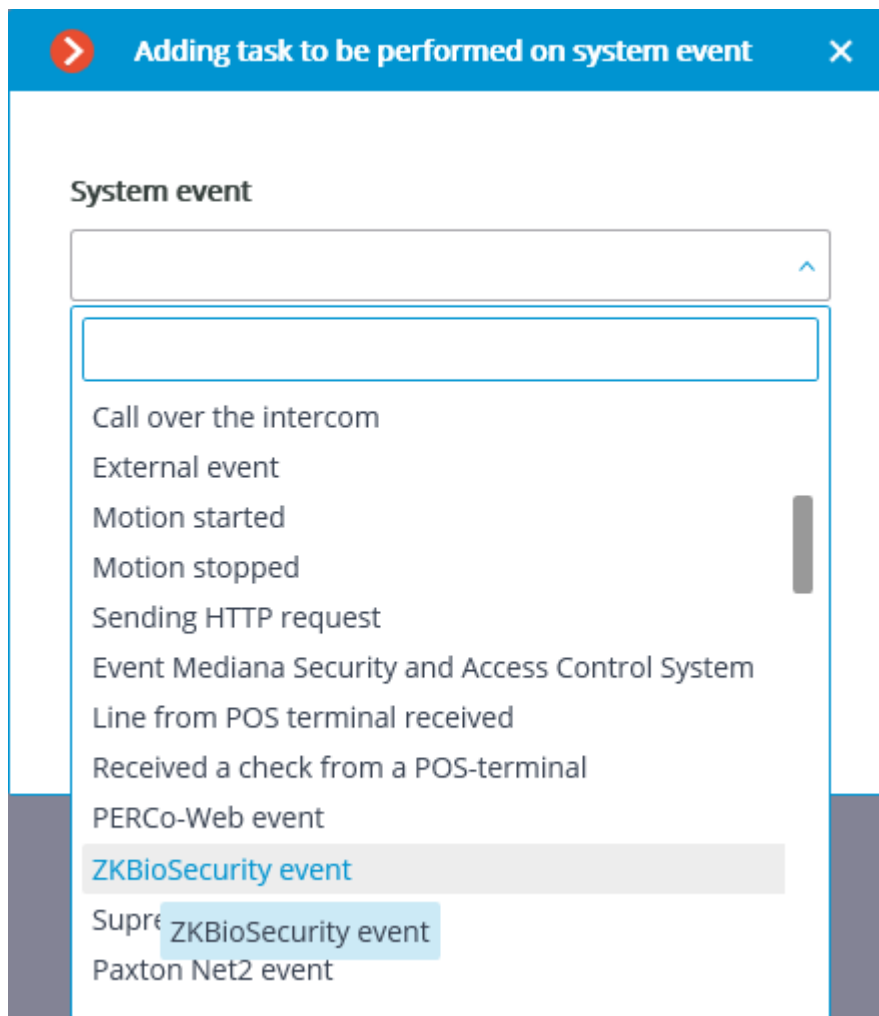
- Server
 - Actions
 - Archive
 - Events
 - SSL certificate reset
 - SSL certificate changed
 - SSL certificate expired
 - Start of backup
 - End of backup
 - Episode saved
 - Error while saving an episode
 - The user saved the archived episode
 - Motion started
 - Motion stopped
 - Error at sending command to watchdog timer
 - Computer reboot by watchdog timer
 - Event Mediana Security and Access Control System
 - ZKBioSecurity event**

[Apply filter](#) [Export](#)

Setting up tasks by events

To configure the actions to be performed in response to events occurring in the video surveillance system, it is required to go to the **Automation** tab in the **Eocortex Configurator** application, select an individual camera or folder in the camera tree, and then, on the page that opens, go to the **Tasks by event** tab.

Any standard **ZKBioSecurity event** tasks by event can be configured.



The following event fields are available as execution conditions:

Event information:

- Time (Event Time), string;
- Event description (Event Name), string: textual description of **ZKBioSecurity** event;
- Event point (Event Point Name), string;
- Event ID (LogId), string;
- Event type (EventNumber), enumeration: selecting out of several popular event types (e.g., Opening by verification, Opening using emergency password, Prohibition of double passing);
- Event code (EventNumber), numerical code of **ZKBioSecurity** event;
- Event level (Event Level), enumeration: selecting out of several defined levels (may adopt the following values: Normal (Normal), Error (Exception), Alarm (Alarm)).

Device data:

- Serial number (Device Sn), string: device serial number;
- Verification mode (Verify Mode Name), string: textual description (e.g., Face, Other, Only Password);
- Reader name (Reader Name), string: textual description (e.g., SysproDemo-1-In);
- Device name (Device Name), string.

Door data:

- Area name (Area Name), string;

- Area name (AccZone), string;
- Door name (Door Name), string.

User data:

- Employee ID (Pin), string;
- Employee (Name + Last Name), string;
- Department name (Department Name), string;
- Card number (Card Number), string: number of the card swiped at the reader (e.g., 2596802013, 9251205323699455112).

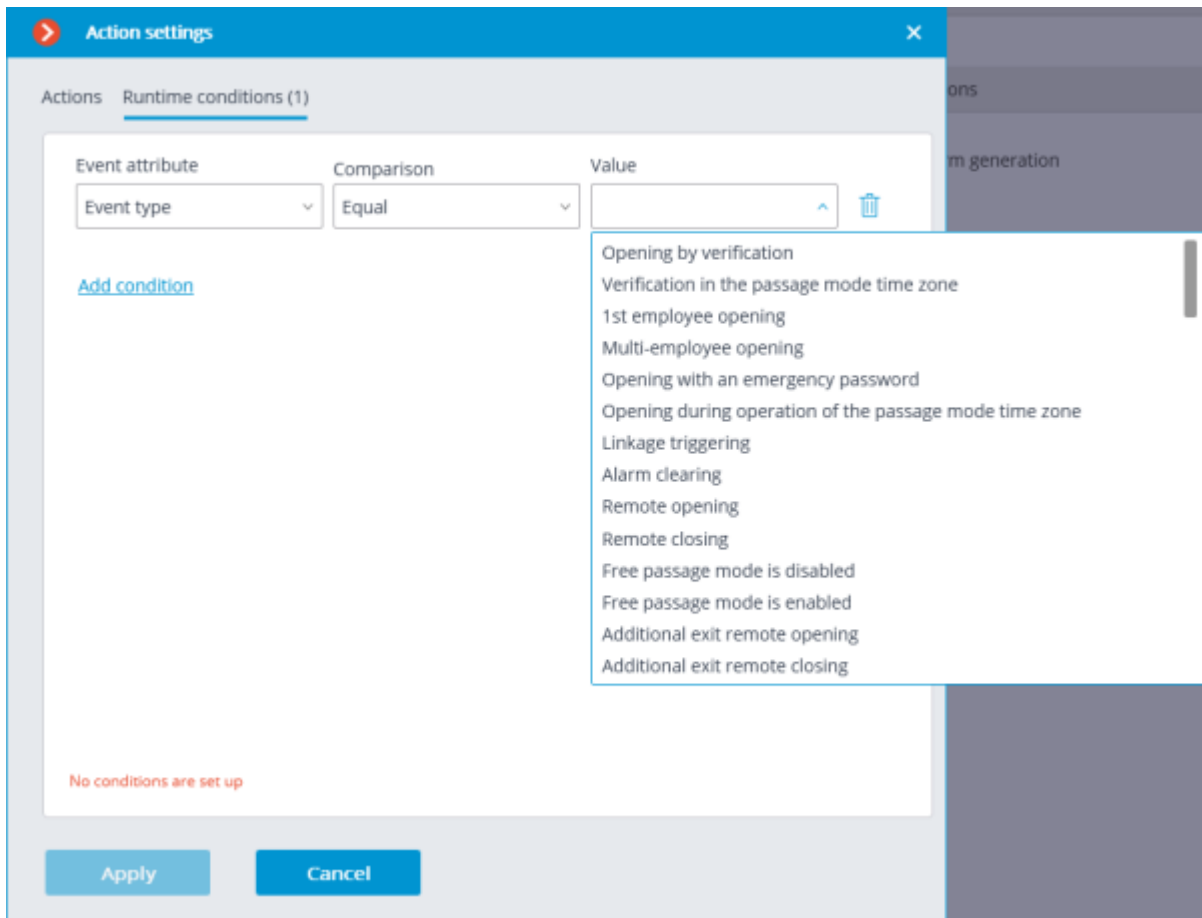
The screenshot shows a software interface for configuring action settings. The window title is "Action settings" with a close button (X) in the top right corner. Below the title bar, there are two tabs: "Actions" and "Runtime conditions (1)". The "Runtime conditions (1)" tab is active. The main area contains a table with three columns: "Event attribute", "Comparison", and "Value". The "Event attribute" column has a dropdown menu that is currently open, displaying a list of attributes: Event ID, Employee ID, Name, Last name, Department name, Zone name, Card number, Serial number, Verification mode, Event description, Event point, Reader name, Zone, and Device name. The "Comparison" column has a dropdown menu with a downward arrow. The "Value" column has an empty text input field and a trash icon to its right. At the bottom of the window, there are two buttons: "Apply" and "Cancel". A red text message at the bottom left of the main area reads "No conditions are set up".

Action settings ✕

Actions Runtime conditions (1)

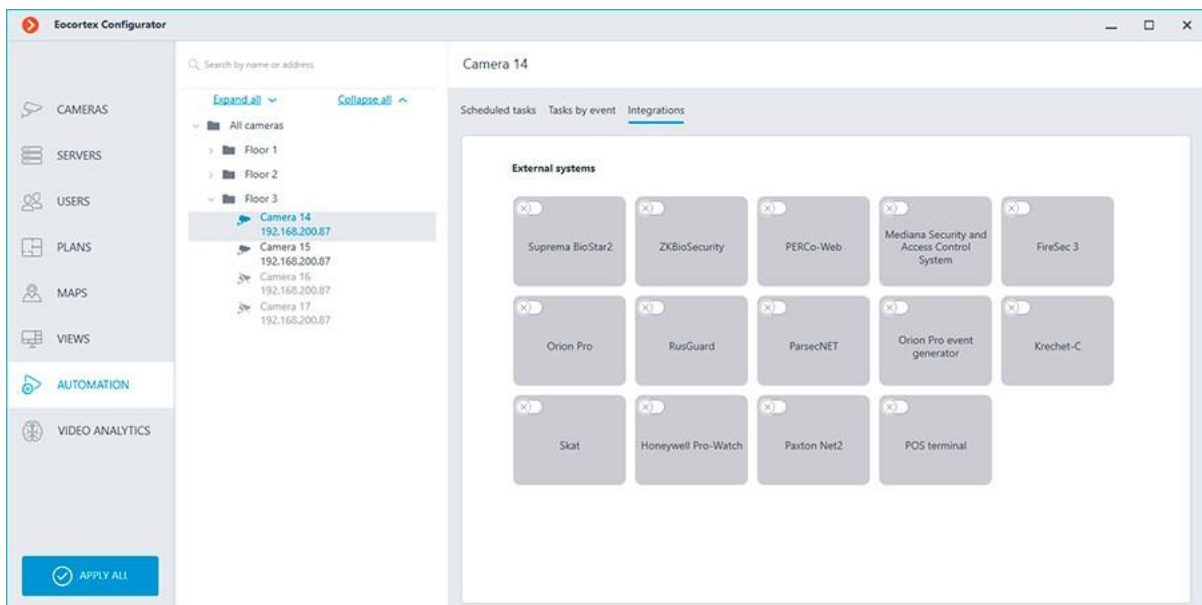
Event attribute	Comparison	Value	
Event level ▾	Equal ▾	<input type="text"/>	
Add condition		Normal	
		Error	
		Alarm	

No conditions are set up



Configuring in Ecortex Configurator application

In order for the **Ecortex** server to respond to events from the **ZKBioSecurity** access control system, it is required to start the **Ecortex Configurator** application, go to the **Automation** tab, select the camera in the list, then, on the page that opens, go to the **Integrations** tab and enable **ZKBioSecurity**.



Two tabs are available in the integration settings:

General settings;

Camera settings.

General settings

The **General settings** tab is used to configure the system-wide connection to **ZKBioSecurity**.

Setting up the connection to only one **ZKBioSecurity** server is available per one server system.

The following settings are available:

Server address (IP address or URL. Prefixes as http:// are not required to be specified in this field).

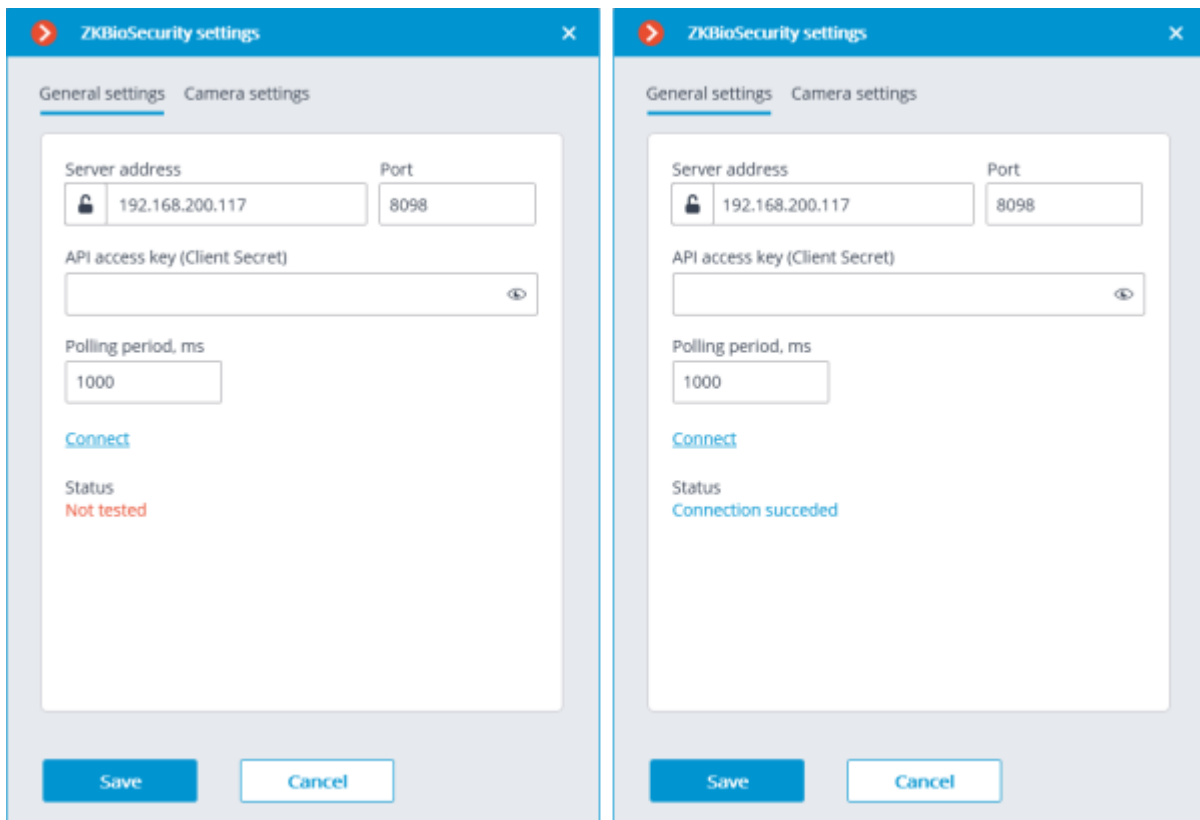
- Use of a secure connection can be set here.

Port. Interaction with **ZKBioSecurity** is performed via HTTP.

API access key (Client Secret).

After making the settings, it is required to press the **Connect** button.

The **Status** field will show the verification result.





Camera settings


On the **Camera settings** tab, it is possible to specify the devices whose events are to be received for the given camera.

By default, all the **ZKBioSecurity** events are received from all devices. Enabling integration on multiple cameras with the default setting will provide duplication of the events for all enabled cameras.

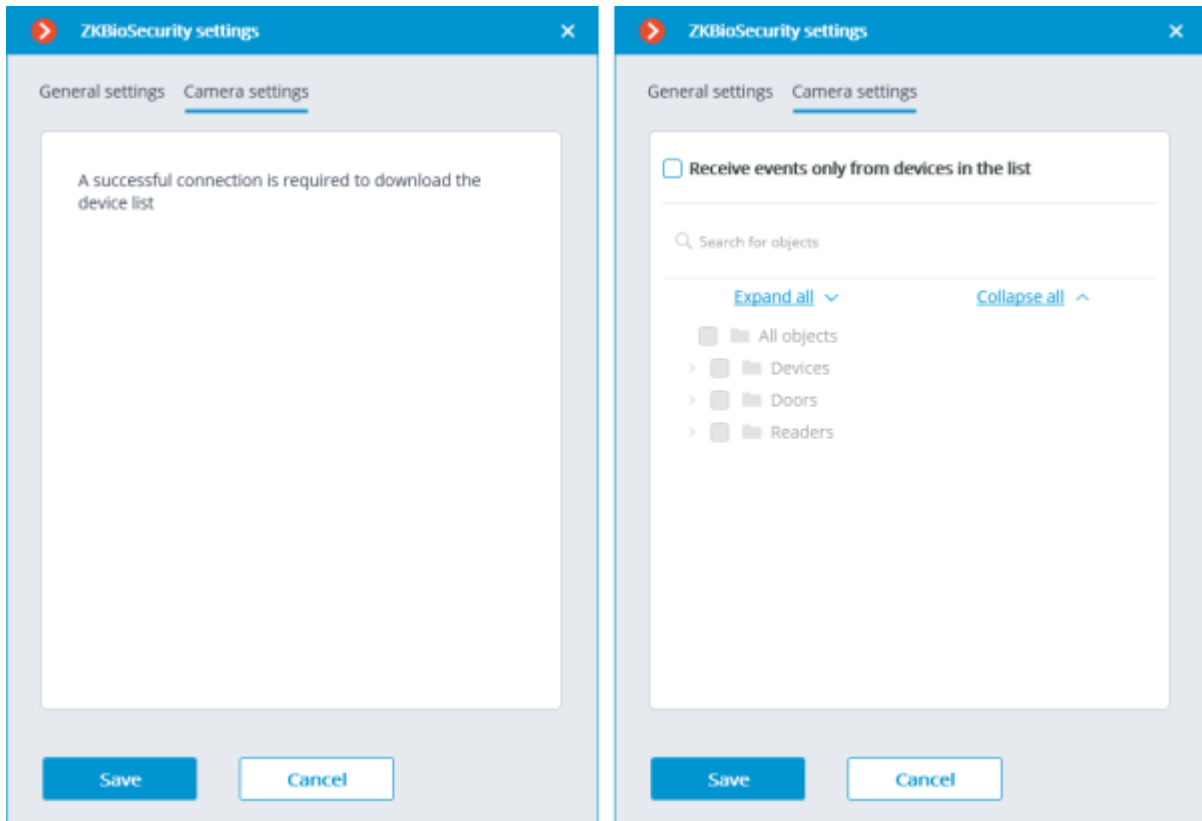
Three types of **ZKBioSecurity** objects are available for configuration (full text search is available):

Doors . A high-level object whose rules are usually configured in **ZKBioSecurity**. Usually, the door is connected to a relay and a sensor of some device. Receiving events from specific doors allows for a more precise integration.

Readers . A high-level object whose rules are usually configured in **ZKBioSecurity**. Typically, the reader is installed on doors, turnstiles and other access control points. Receiving events from specific readers allows to configure the integration more precisely.

Devices . A lower-level **ZKBioSecurity** object. Setting up the reception of events from the device permits to configure the integration more flexibly. For example, if multiple doors are connected to the same device and **ZKBioSecurity** is in the process of being set up, and the doors are being connected and disconnected, the integration settings will have to be changed frequently when setting up the reception of events from the specific doors. In the process of configuring the reception of events from a device, the integration settings do not need to be modified when new doors are being connected to the device.

Changing the names of **ZKBioSecurity** objects (devices, doors or readers) requires their manual reassignment in the device list every time. Otherwise, the events from the newly renamed object will not be registered.

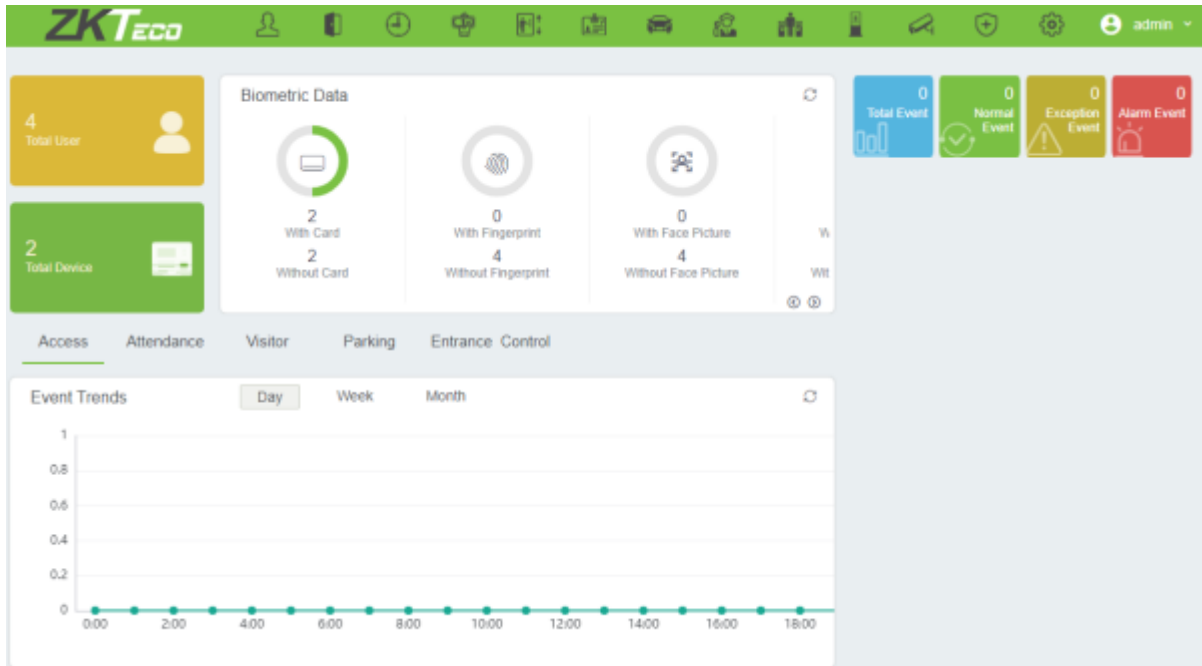


Configuring ZKBioSecurity



Configuring **ZKBioSecurity** for integration is performed via the web interface on the same port that is specified in the integration settings.

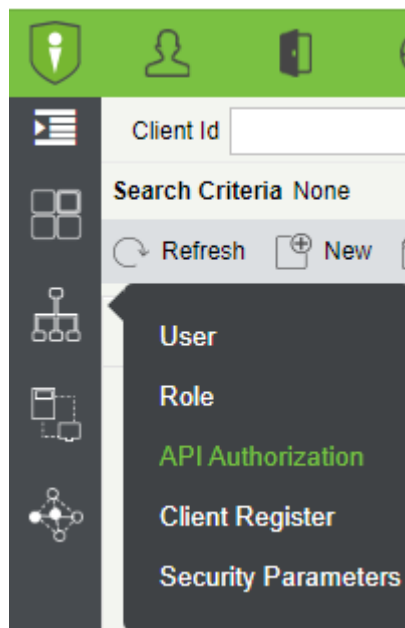
The time and the clock zone on the **Eocortex Server** and on the computer where **ZKBioSecurity** is installed must match.

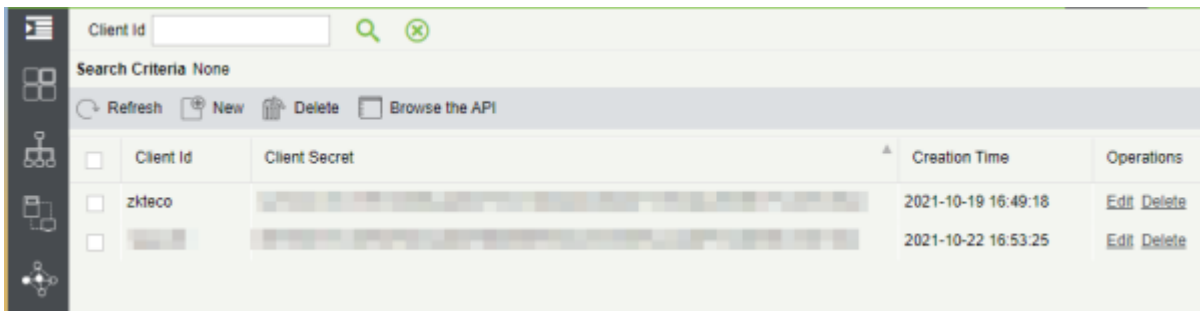
The lowest version of **ZKBioSecurity**: with the license activation on the API module.



To gain access via the API, it is necessary to create or use an existing **Client Secret**. To do this, it

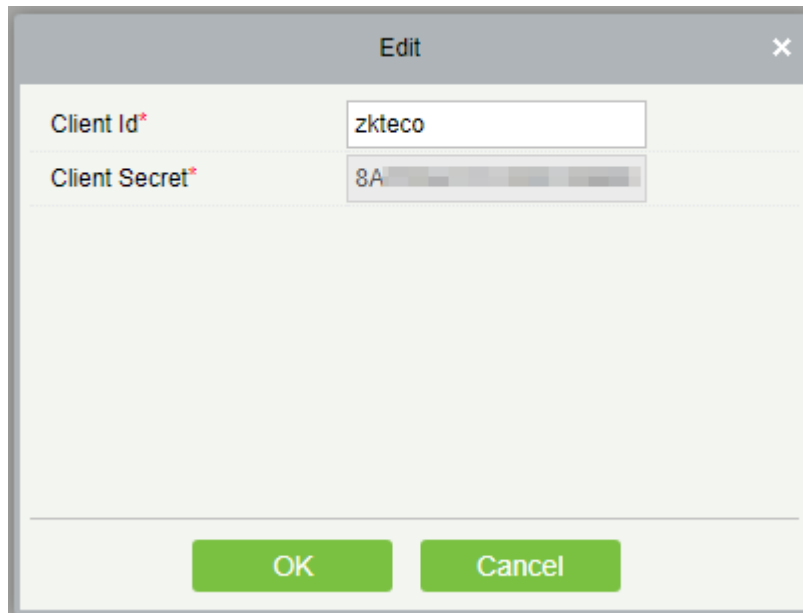
is required to go the **System**  tab, switch to the **Authority Management**  tab and select the **API Authorization** item.





<input type="checkbox"/>	Client Id	Client Secret	Creation Time	Operations
<input type="checkbox"/>	zkteco	[REDACTED]	2021-10-19 16:49:18	Edit Delete
<input type="checkbox"/>	[REDACTED]	[REDACTED]	2021-10-22 16:53:25	Edit Delete

Clicking the **Edit** button opens a window where the **Client Secret** field can be copied.



Dialog Box: Edit

Client Id* zkteco

Client Secret* 8A

OK Cancel

Eocortex Configurator

With the help of the **Eocortex Configurator** application, the **Eocortex** video surveillance system is set up, including license management, parameters of connected cameras, features used for the cameras, scenarios, schedules and intelligent modules, video server parameters, archive and redundancy settings, user authority, site plans, display profiles, archive bookmarks categories and other settings.

The **Eocortex Configurator** application is included in all the installation packages and is automatically installed with both server and client applications of **Eocortex**.

To work with the **Eocortex Configurator**, it is recommended to use the screen resolution of no less than 1024×768 since using the screens with lower resolution may lead to issues with displaying the application.

Below you will find the procedure to be followed after having installed **Eocortex Server** (or **Eocortex Standalone**), in order to start the full-scale work with the system.

- [Start the Eocortex Configurator application](#) stating the IP address and the network port (**8080** by default) of the server, as well as the username and password of the user with configuration privileges (by default, **root** user with the empty password).
- [Set up servers](#).
- [Set up cameras](#) (connection to cameras, archiving parameters, video analytics, etc).
- If required, [set up system user authority](#).
- [Apply settings](#) and close **Eocortex Configurator** application.
- [Install](#) and launch the **Eocortex Client** application, set up client workplace parameters, if required.

Launching Eocortex Configurator

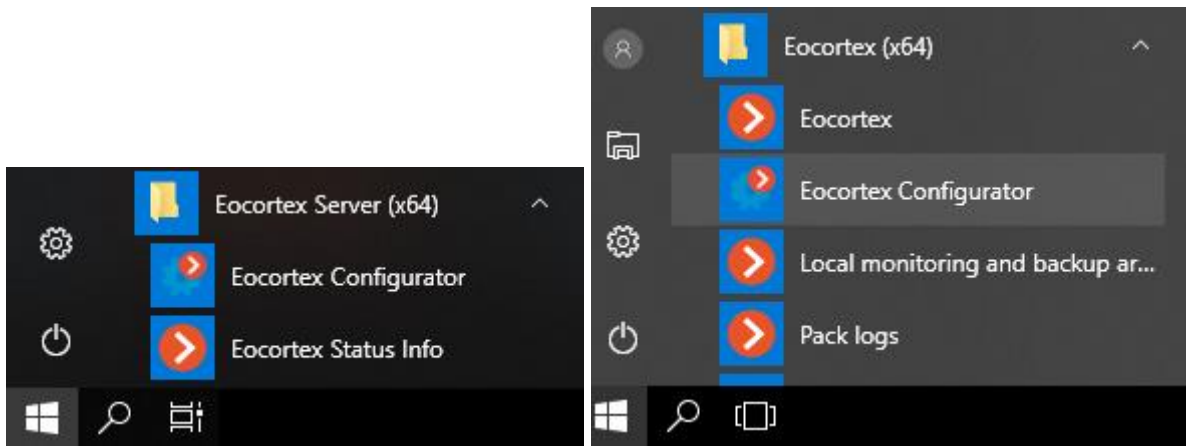
The video surveillance server (**Eocortex Server** or **Eocortex Standalone**) application to which the connection is being made must be operating at the moment of the connection.

In the course of setting up the server, the same version of the **Eocortex Configurator** application as the server version must be used.

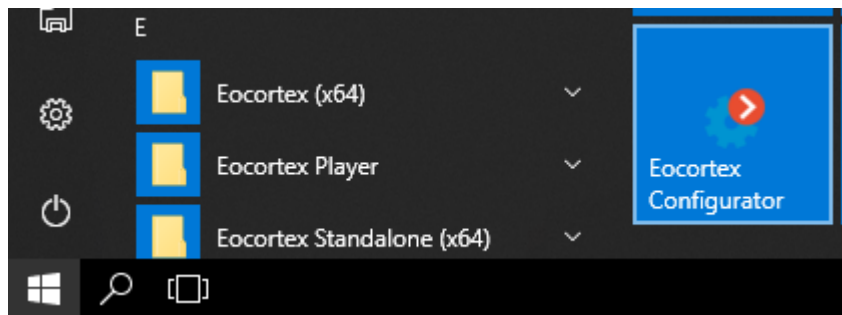
The active system configuration is stored on the **Main server**. In the event of making changes to the configuration, the **Eocortex Configurator** application automatically saves the configuration on the **Main server**, sending it afterwards to all the available member servers. Consequently, to avoid system conflicts, it is recommended to perform the connection via the **Eocortex Configurator** or directly connect to the **Main server**, or to the server that has access to the **Main server** at the moment.

There are several ways to launch the application:

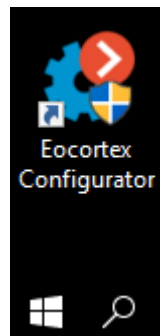
- From the Start menu  ;



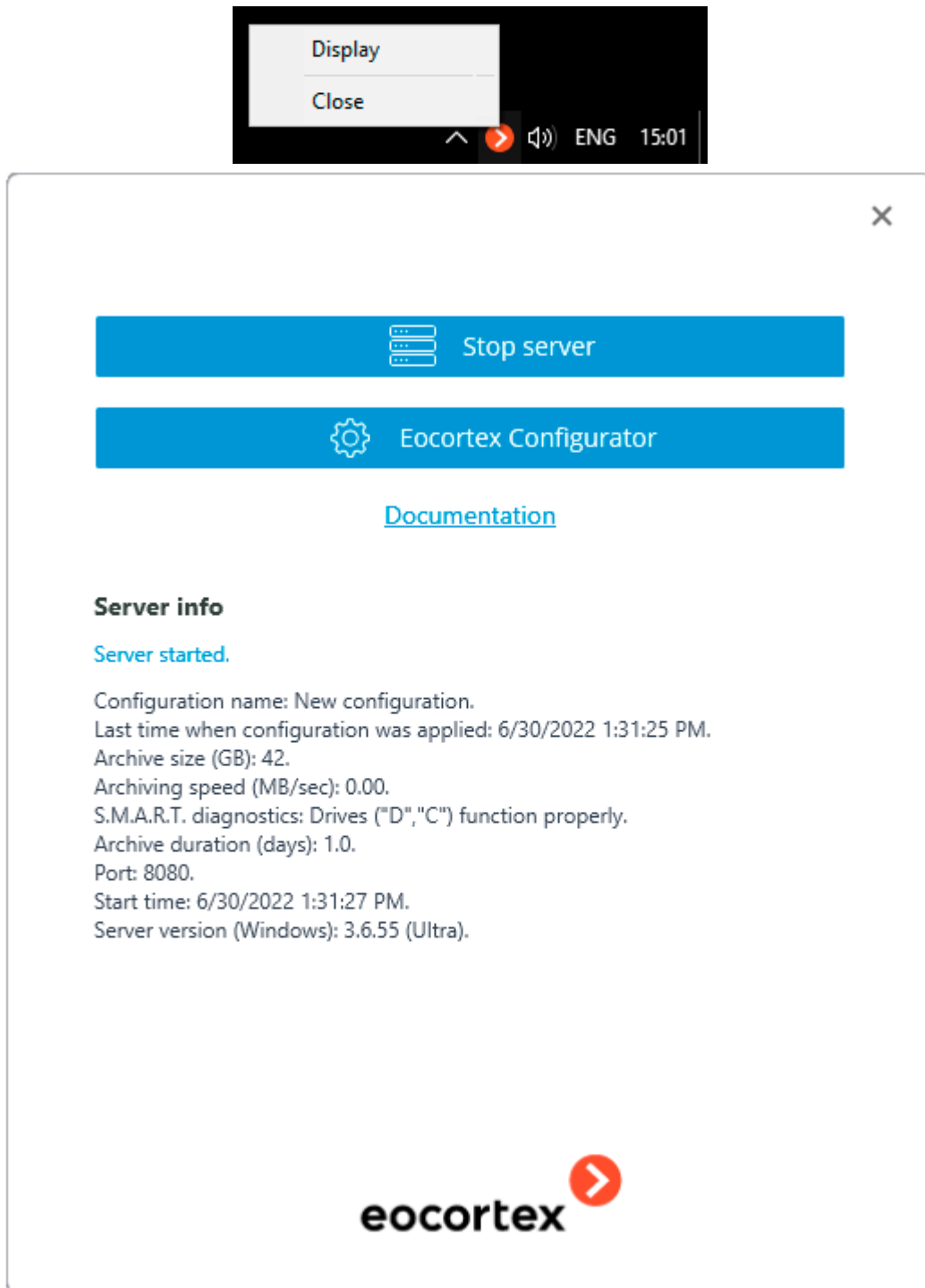
- From the Windows Start screen;



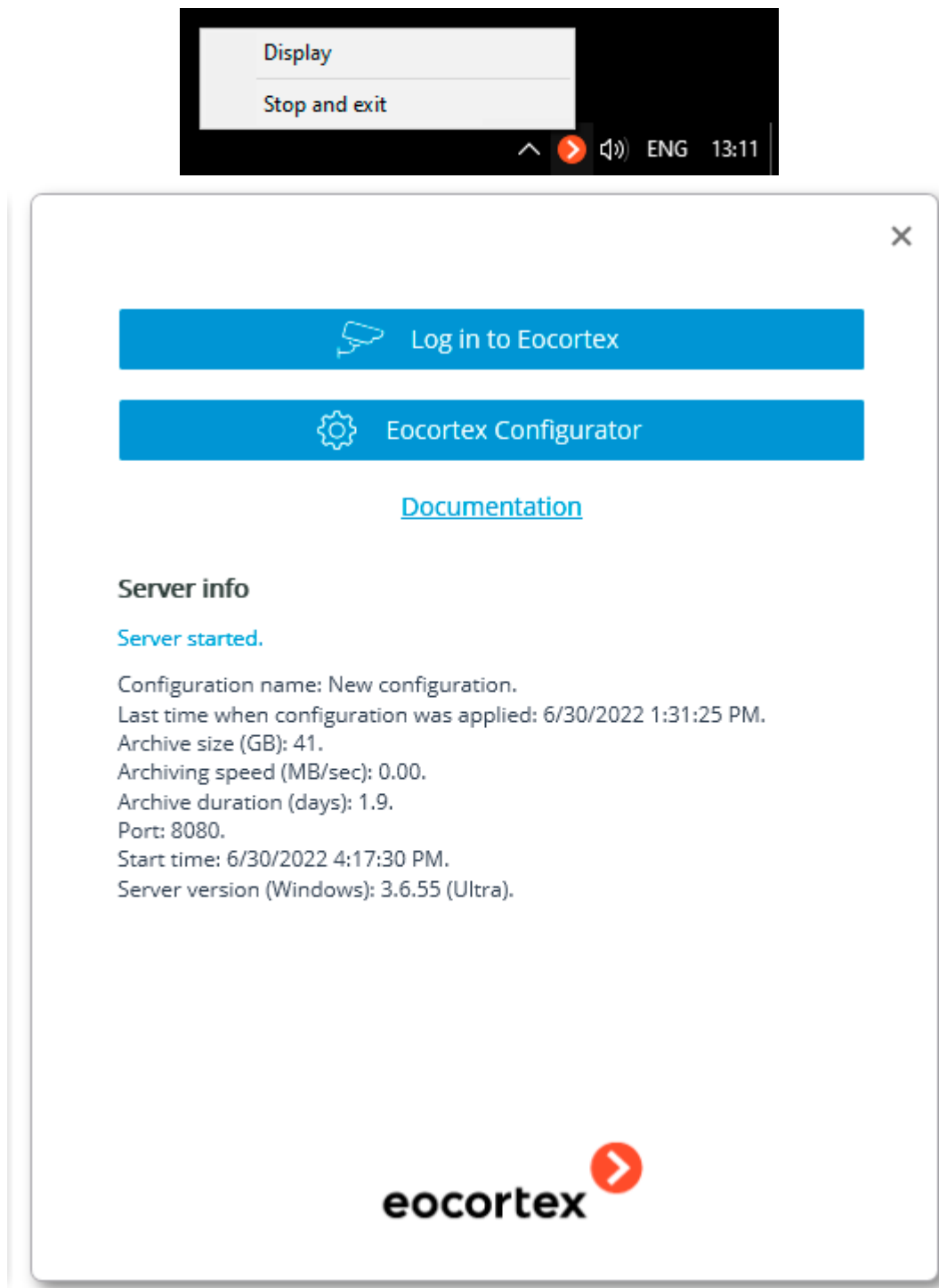
- Using the icon on the Desktop;



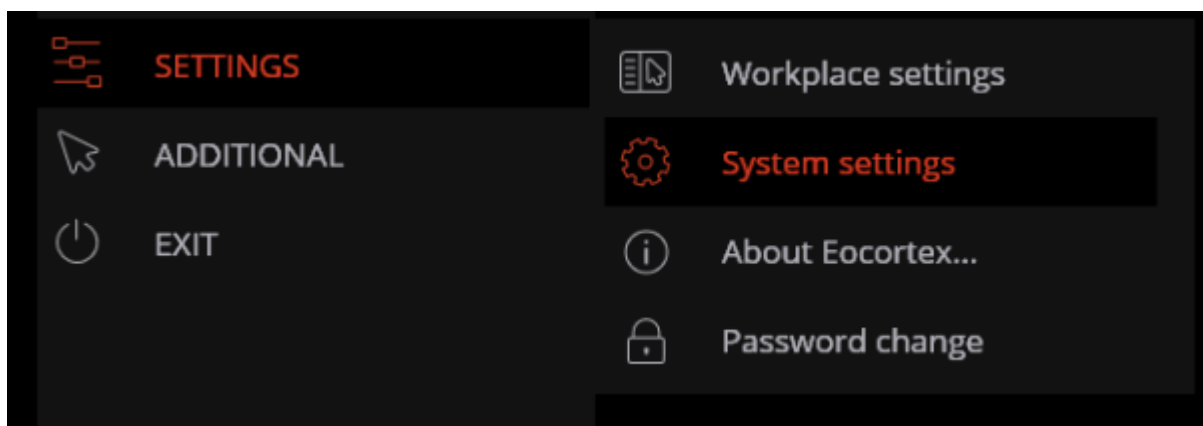
- From the **Eocortex Server Info** utility window;



- From the **Eocortex Standalone** application start window;



- From the **Eocortex Client** application.

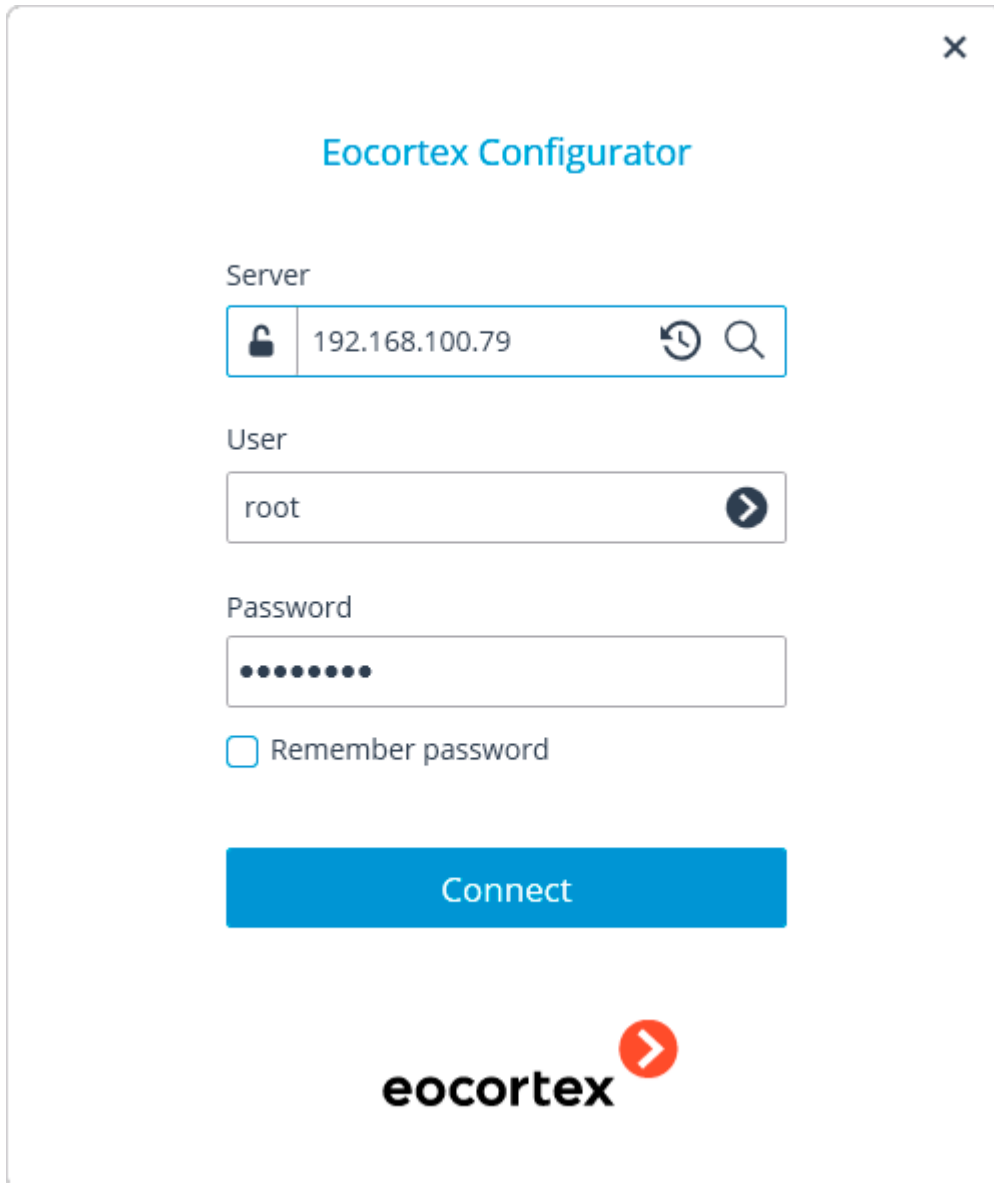


In the course of the launch, the authorization window will open. It is required to indicate the server address there in the **Server** field (or select the address in the dropdown list to the right of the input field) and the account type, username and password, then press the **Connect** button.

The authorization window will open. It is required to indicate the server address there in the **Server** field (or select the address in the dropdown list to the right of the input field) and the account type (only for **Enterprise** and **ULTRA**), username and password, then press the **Connect** button.

Account type:  **Eocortex;**  **Active Directory.**

For **Active Directory** accounts, the user name is specified as: **username@domain**; where **domain** is the domain name, **username** is the name of the user in the domain. Registration under an **Active Directory** account is available not for all types of licenses.



Eocortex Configurator

Server
192.168.100.79

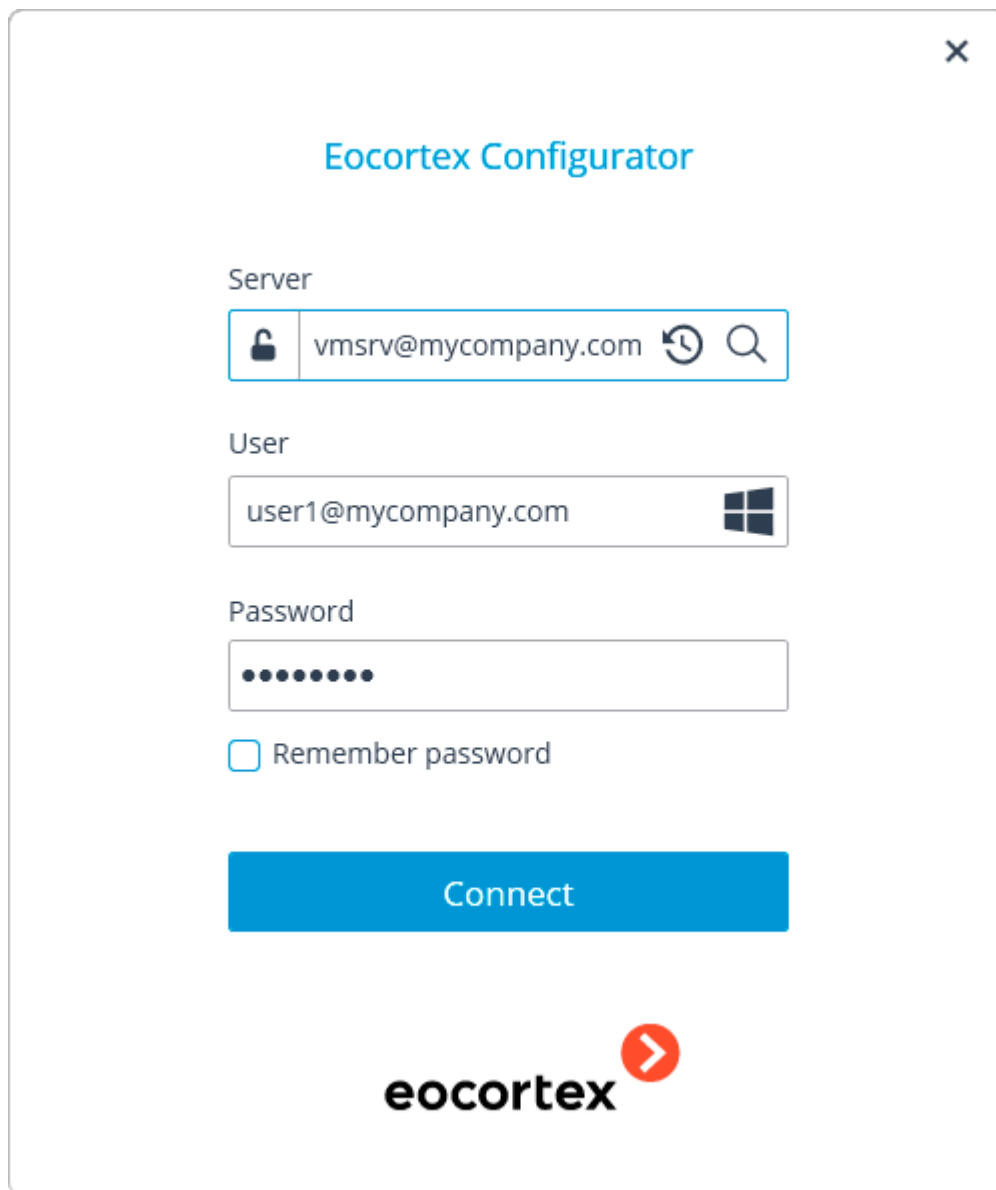
User
root


Password
.....

Remember password

Connect

eocortex



The secure connection to the server via HTTPS is enabled by pressing  button located in the left side of the field with the server's address.

Since the capability of a secure connection to the server is set up by the system administrator on the server itself, the parameters of such connection must be obtained from the administrator.

In the cases when it is impossible to obtain the secure connection parameters from the system administrator, it is important to keep in mind that the port explicitly indicated after the two-spot in the end of the connection address line is used for the secure connection. If no port is explicitly indicated, the port **18080** will be used for the secure connection.


The system administrator can forbid the connection to the server using the insecure protocol. Such servers will always require a secure connection.

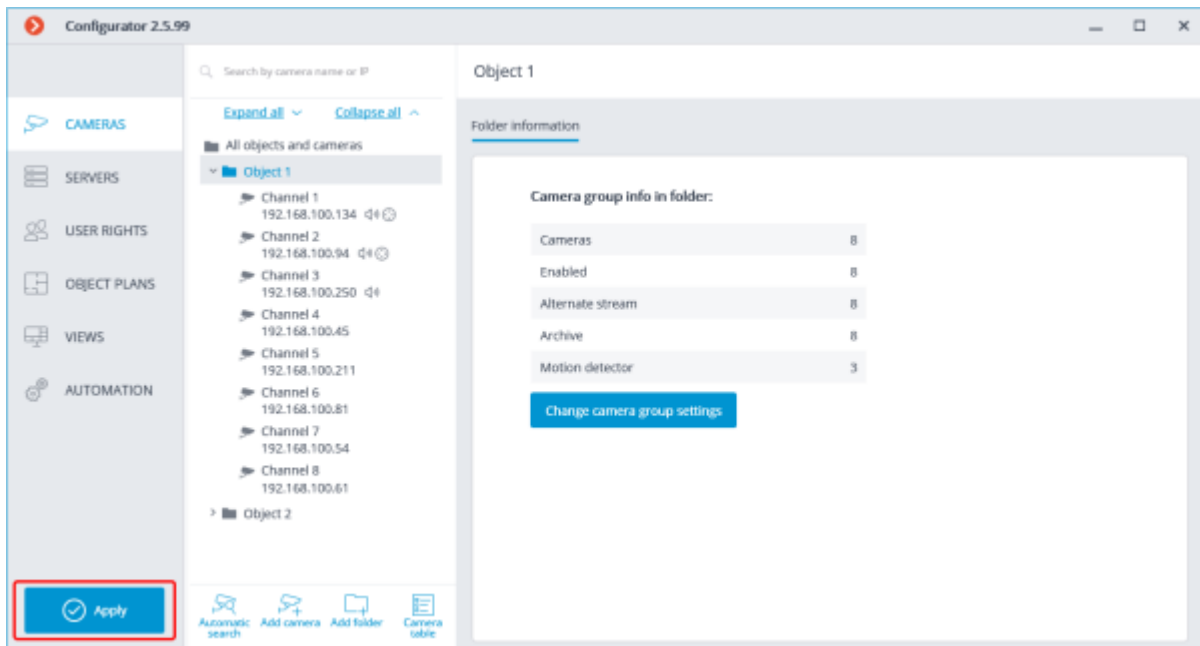
During the initial installation on the **Eocortex** server the **root** user with an empty password is created. This user has a full set of rights. In the course of setting up user authorities it is recommended to change the username and password of this user. Client connection port is **8080** by default; if required, it can be changed in the **Eocortex Configurator** application.


Following the successful authorization, the main window of the **Ecortex Configurator** application will open.

Applying settings

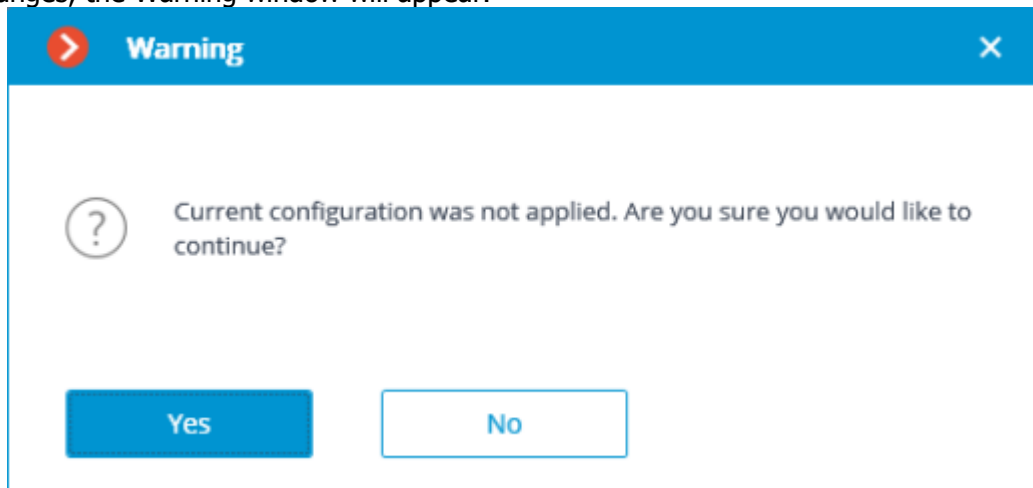
After making any changes to the settings, it is required to apply them. The new settings will be enabled only after their application.

In order to apply settings, press the  **Apply** button.



The  **Apply** button will be visible only in case there are unapplied changes in the configuration. Titles of the settings tabs with the unapplied changes are marked by an asterisk.

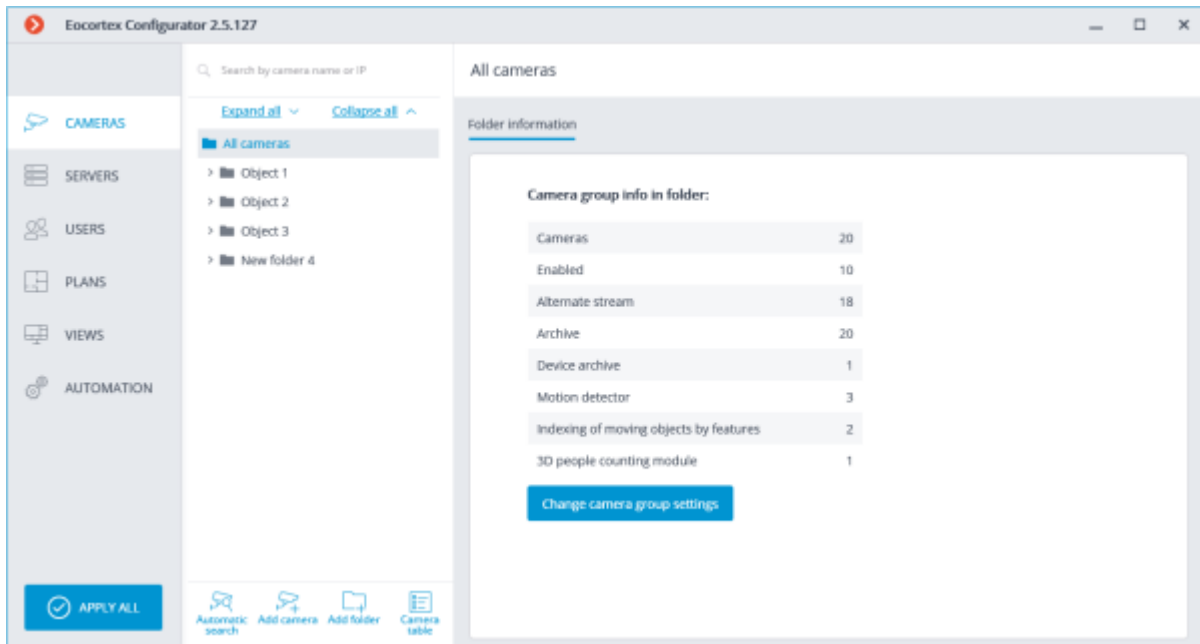
At an attempt of exiting the **Ecortex Configurator** application without applying the changes, the Warning window will appear.



In order to return and apply the changes, press the **No** button. To exit without applying settings, press **Yes**.

Cameras

For setting up cameras in the **Eocortex Configurator** application it is required to go to the **Cameras** tab. 



The **Camera** term in the **Eocortex** system has a wide meaning, because, apart from the cameras, one can connect video server and video encoder channels to the system, as well as video recorders, door phones, sound capture devices, thermal cameras, and digital to analog converters

Not all the features of the devices are supported by **Eocortex** even if such features are available in the **Eocortex Configurator** application.

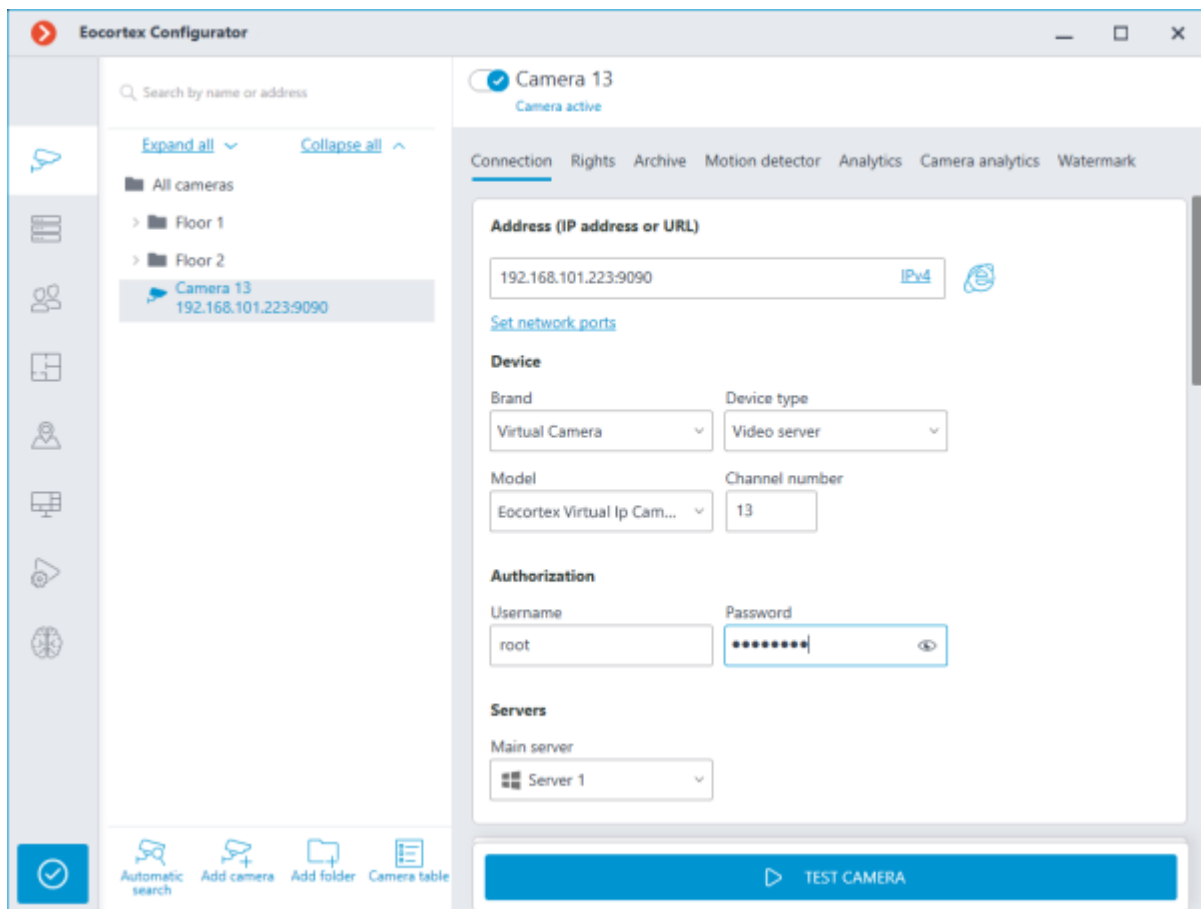
List of cameras

A list of supported cameras and devices can be found at eocortex.com, on the [Support / Supported Cameras](#) page. For information about support of additional camera functions (second stream, audio, PTZ, etc.), contact **Eocortex** technical support.

The list of cameras in the **Eocortex** system has a tree structure and uses **Folders** which may contain cameras or other folders. Such hierarchy is easy to use for both navigation thru the list and for grouping cameras by various characteristics.

In particular, it is possible to create a tree by the territorial principle; for example, **City / Building / Floor / Room**. Also, for convenience, on one of the levels of the tree one can group the cameras by type; for example, **Fixed, Controllable, Video recorders**. Moreover, it is possible to group the cameras based on security principles; for example, **Shared access** and **Restricted access**.

For setting up a particular camera it is required to highlight it in the tree. At that, the settings page of the camera will be displayed in the right part of the window.



In the upper part of the settings page there is a full name of the camera, including the path to it in the tree. To the left from the name there is a switch that allows to disconnect the camera from the system or reconnect a previously disconnected camera.

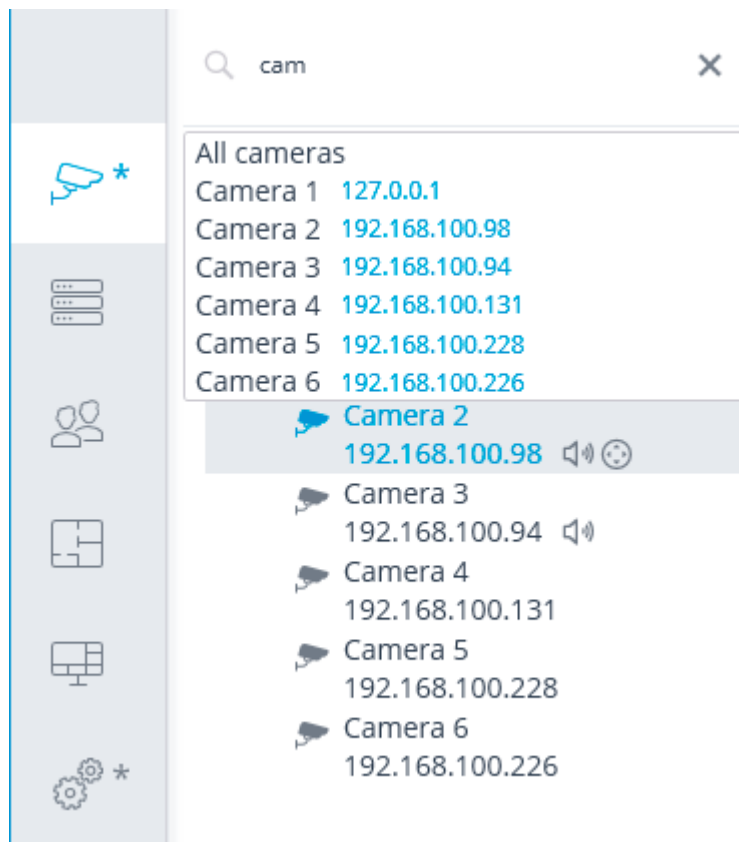
A disconnected camera, including the features used at its setup, are disregarded by the license protection.

For example, a single-server system has a license for 100 IP cameras and 2 channels with Face Recognition installed. At that, 100 cameras are connected to the server, and the Face Recognition operates on two of the channels. If 20 cameras are disconnected, including one Face Recognition channel, it will be possible to connect 20 cameras more, including one camera with Face Recognition feature.


Actions


For setting up a group of cameras located inside a folder and its subfolders it is required to select this folder in the tree and press the **Change camera group setting** button in the right side of the window on the **Folder information** tab. The [Camera group editing](#) window will open.

The search field located above the list serves for finding cameras and folders in the tree.



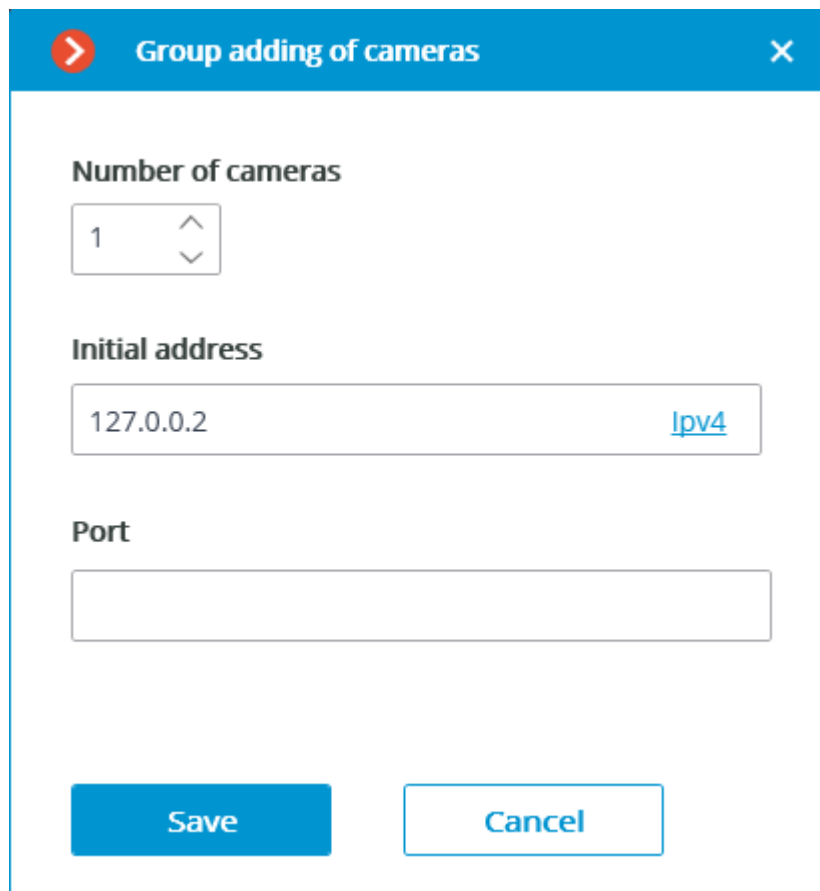
Listed below are the commands available during the camera hierarchy setup. All the commands are accessible from the context menu. Some commands are doubled by buttons and hotkeys.

Add folder (button ) adds a new folder to the selected current folder.

Add camera (button ) adds a new camera to the current selected folder.

Create new camera based on the highlighted one adds a new camera on the basis of the selected one.

Create a group of cameras based on the selected one: adds several new cameras in the specified range of IP addresses based on the highlighted camera.



The screenshot shows a dialog box titled "Group adding of cameras". It features a blue header bar with a back arrow on the left, the title in the center, and a close button on the right. The main content area is white and contains three input fields. The first is "Number of cameras", a spinner box currently showing "1". The second is "Initial address", a text box containing "127.0.0.2" and a blue "Ipv4" link. The third is "Port", an empty text box. At the bottom, there are two buttons: a blue "Save" button and a white "Cancel" button with a blue border.

The maximum number of cameras that can be added is 999.

In the **Initial address** field, the IP address values are automatically assigned: **IP address of the highlighted camera + 1**.

For example, if the IP address of the selected camera in IPv4 format is 192.168.10.12, the **Initial address** field will contain 192.168.10.13. It is possible to change the address if required.

The **Initial address** can be entered in two formats: IPv4 and IPv6.

If the values exceed 254, the boundary number counter is increased by 1. For example, if the specified initial address is 192.168.100.254 and the number of cameras is 2, their addresses will be 192.168.100.1 and 192.168.101.2. Addresses with 255 and 0 are ignored.

If the address of the selected camera is in IPv6 format, the next address will be specified in the initial address field, but in full format.

For example, if the address is [fe80::aecc:8eff:fe13:24f4], the settings window will show fe80:0000:0000:0000:aecc:8eff:fe13:24f5.

If the highlighted camera has a URL address, the **Initial address** field will be empty. The URL address is not copied.

Filling in the **Port** field is optional. When adding cameras, the default port will be used.

Rename (**F2** shortcut or double click on the name) allow to rename the selected folder or camera. To do so, it is required to type a new name and press **Enter**.

Ctrl-drag shortcut copies the selected folder or camera.

Delete (or **Delete** shortcut) removes the selected camera or folder.

Switch off camera disconnects a camera: removes it from the system but keeps it in the tree preserving all its settings.

Switch on camera enables a camera, adding it to the system.

Move up moves camera or folder up within the parent folder.

Move down moves camera or folder down within the parent folder.

Copy to clipboard copy camera or folder to the clipboard for its subsequent pasting.

Cut copy camera or folder to the clipboard for its subsequent moving.

Paste pastes camera or folder from the clipboard.

Expand folder expands the selected folder.

Collapse folder collapses the selected folder.

Camera configuration export saves the settings of a selected camera or all the cameras and folders within the selected folder to disk. The user sets the name and location of the destination file in the process of uploading.

Camera configuration import loads the previously saved camera and folder settings from the disk. The loading is performed to the selected folder.

The loading of the camera settings file from the disk does not cause the deletion of all the current folders and cameras. Thus, if the same settings file is imported to the same folder twice, the uploaded files and folders will be duplicated.



Automatic search button performs the [automatic search](#) of the available cameras in the local network and connects them to the system.



Camera table button opens the table with the information about all the cameras connected to the system. The table can be exported in **CSV** and **XPS** formats.

Camera	Address	Device	Format	Server	Motion d...	Face dete...	Index
Channel 11	192.168.150.201	3D People Counter	H.264	Server 1	✓		
Camera 10	win7x64disc4:9090	Eocortex Virtual Ip Camera	H.264	Server 1			
Channel 1	192.168.100.134	Compatible device	H.264	Server 1	✓		✓
Channel 2	192.168.100.94	Compatible device	H.264	Server 1	✓		✓
Channel 3	192.168.100.250	Compatible device	H.264	Server 1			
Channel 4	192.168.100.45	Mxxxx, Pxxxx, Qxxxx, Fxx	H.264	Server 1			
Channel 5	192.168.100.211	DS-2xxxxx, DS-N2xx	H.264	Server 1			
Channel 6	192.168.100.81	C1201L	H.264	Server 1			
Channel 7	192.168.100.54	C1201L	H.264	Server 1			
Channel 8	192.168.100.61	Mxxxx, Pxxxx, Qxxxx, Fxx	H.264	Server 1			
Channel 11	192.168.100.134	Compatible	H.264	Server 1			

Export

OK

Camera settings

The camera settings page contains several tabs:

[Connection](#): Camera connection settings.

[Rights](#): Camera access rights settings.

[Archive](#): Camera archive recording settings.

[Motion detector](#): Motion detector settings.

[Analytics](#): Video analytics settings.

[Camera analytics](#): Integration of camera-embedded analytics settings.

[Watermark](#): Watermark on video in a camera cell settings.

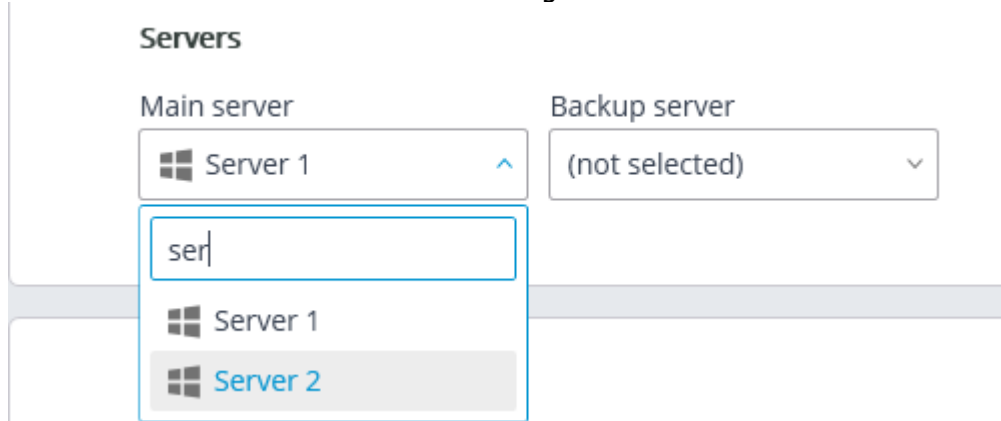
Connection setup

On the **Connection** tab, the connection to camera is set up as well as the parameters of the video streams received from the camera.

The screenshot shows the 'Connection' tab selected in a settings interface. The 'Address (IP address or URL)' field contains '192.168.100.98' with an 'IPv4' label and a refresh icon. Below it is a link for 'Set network ports'. The 'Device' section has three dropdown menus: 'Brand' (ONVIF), 'Device type' (Camera), and 'Model' (Compatible device). The 'Authorization' section has 'Username' (admin) and 'Password' (masked with dots and an eye icon). The 'Servers' section has 'Main server' (Server 1) and 'Backup server' (Server 2), both with refresh icons.

For the drop-down lists of camera manufacturers and models, as well as servers, the search for the specific list position is available.

The search in the drop-down list can be performed by any part of the searched word. The search is not case-sensitive of the text being entered.




In the drop-down list, the needed position can be selected either with the mouse or with the keyboard using the up/down arrows and the **Enter** key.

If the user switch to another control during the search, then the list position that was highlighted during the switch will be used as a search result.

Address (IP address or URL)

In order to connect to a camera, it is required to indicate its **Address (IP address or URL)**. Prefixes like **http://** are not required in this field). In some cases, it may be required to state a management port / data port of the device, for example, **192.168.1.55:8000**.

If a camera supports the secure connection via HTTPS, it can be enabled by clicking on  button.

This capability is available for selected cameras.

Address (IP address or URL)

	192.168.100.94	IPv4
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[Set network ports](#)

The port indicated in the connection address field is used for the secure connection. If no port has been explicitly indicated, the port **443** will be used for secure connection.

The operability of all the utilized camera features with the secure connection is checked before starting to use such connection. The camera features whose safety cannot be verified will not work when the secure connection is established.

With the majority of cameras, all the features will work via HTTPS port with the secure connection. However, some cameras may use different ports for different functions. That is why the availability of all camera ports is verified.

Due to the above reasons, when the secure connection is used, it is recommended to check the operability of all the required camera features, such as alarm inputs and outputs, before applying the settings.


The validation of the TLS/SSL certificates used for the secure connection with the cameras is not performed. Thus, it is possible to use any certificate for the above mentioned means.

In case of using the secure connection, the connection to the camera through the server is always used.

If the **DevicePack** or the server version earlier than 2.8 is used, the secure connection will be unavailable.

If a camera is connected using the IPv6 protocol, it is required to select this protocol in the dropdown list in the right part of the **Address (IP address or URL)** field.

Address (IP address or URL)

192.168.100.134 [IPv4](#) 

[Set network ports](#)

Device IPv4
IPv6

Set network ports link opens the **Device network ports** window allowing to specify ports that differ from those used by default.

This capability may be unavailable for certain cameras.

Device network ports ×

Port for ONVIF protocol connection


80 [By default](#)

Port for RTSP protocol data receiving

554 [By default](#)

[Check port availability](#)

[Apply](#) [Cancel](#)

Pressing the  button attempts to open the camera in a web browser.

Device

It is also necessary to set the manufacturer and the model of the camera.

The connection of cameras the manufacturers or model of which are not in the list is described in [Camera connection features](#) section.

Apart from the cameras, it is possible to connect video servers, video recorders and door phones selecting the appropriate device type.

For video servers, it is required to additionally indicate the number of a channel that the camera on this server is connected to.

Device

Brand	Device type	Model	Channel number
ONVIF	Video server	Compatible device	1

For video recorders, the special licenses approved by the video recorder manufacturers are used.

Device

Brand	Device type	Model
	Video recorder	

Video recorder licensing mode is enabled. Recording to archive and video analysis are not available in this mode.

Device

Brand	Device type	Model
	Door phone	

Authorization

If in order to connect to the camera it is required to log in, **Username** and **Password** must be set.

Specified user must have full access to the camera.

Servers

In the multi-server system, it is required to indicate which server will be assigned as main for the given camera. In case there are redundancy licenses, it is also possible to specify a backup server for the camera.

Main server is the server that connects to the camera and processes its video and audio data, including the analysis performed by the video analytics, recording to the archive and forwarding to the client applications.

Backup server is the server that connects to the camera and processes its video and audio data in case of a failure of the main server or all of its archive drives. Switching to the backup server means that all of the video analysis modules enabled on the camera will cease to operate.

Video analytics server is a server exclusively dedicated to launching video analysis modules that process video data sent from other servers. Having said that, the video analytics server does not perform archiving of the video data being analyzed nor its broadcasting to client workplaces; these actions are performed on the general servers of a video surveillance system. Thus, the Video analytics server allows to remove the load associated with video analysis from the rest of the servers.

[Description, features and limitations](#) of the video analytics server.

Time zone

Time zone

Server time zone

(UTC+01:00) Amsterdam, Berlin, Bern, Rome, Stockholm, Vienna

Camera time zone

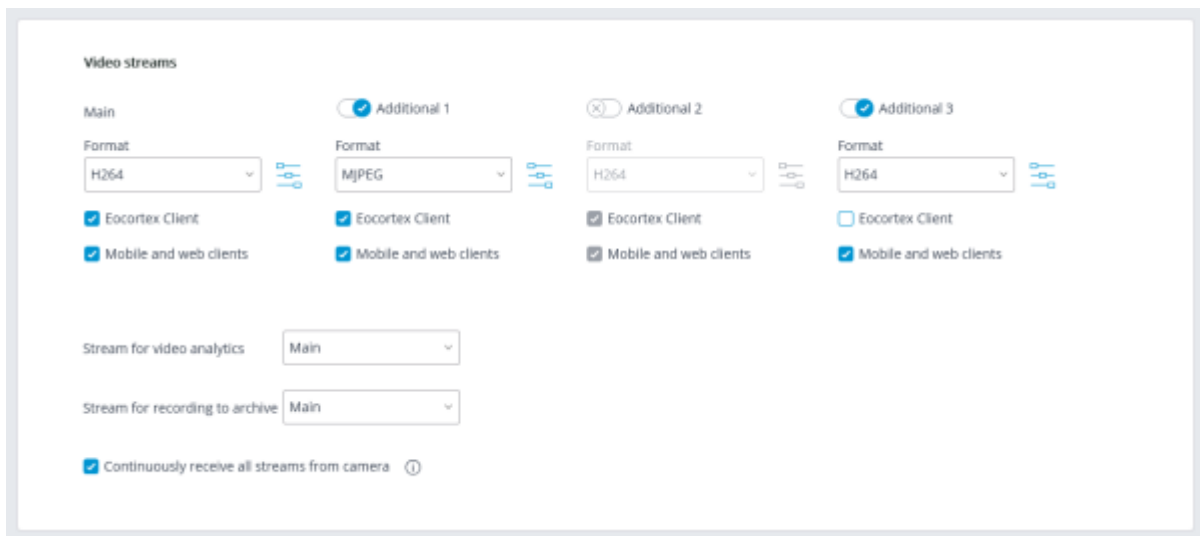
(UTC+01:00) Amsterdam, Berlin, Be... ▾

In the **Time zone** group of settings, the time zone that the camera will use in operations can be set:

Server time zone: the time zone of the server the camera is linked to will be used.

Camera time zone: the selected time zone will be used, regardless of what time zone has the server the camera is linked to.

Video streams



In the **Video streams** group of settings configuring the reception of video streams from the camera.


If the selected camera model supports additional video streams, it is possible to enable and configure them. It is required to select streams for archive recording and video analysis.

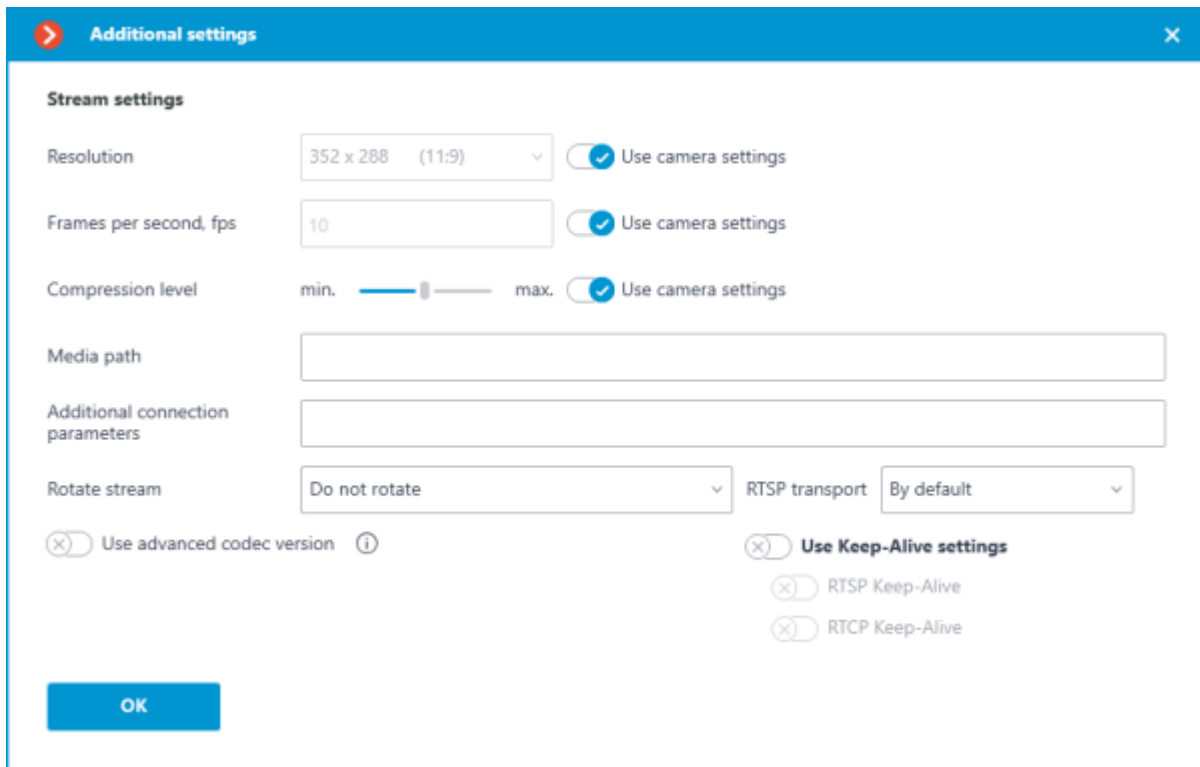
More details regarding the video streams can be found in the [Using multiple streams](#) section.

Support of three additional streams is not implemented for all the cameras: for many cameras, only one additional stream is supported; for some cameras, only the main stream can be received.

The number of additional channels that are implemented in **Eocortex** is shown in the settings, even if the camera itself supports a larger number of streams.

The streams are configured on the camera itself. In the **Eocortex Configurator**, only the reception of these streams and their use in **Eocortex** are configured.

For each video stream, a codec is specified; client applications where the stream will be used are also selected. Clicking the button  opens the window with additional video stream settings.



The parameters available in the **Eocortex Configurator** window may differ depending on the camera models.

Setting camera parameters from the **Eocortex Configurator** application is available for a limited number of camera models.

To display the **Use advanced codec version**, selected video stream must be of H.264 or H.265 codec.

There are [some requirements and limitations](#) in the use of advanced versions of codecs.

Eocortex Client option: allows you to broadcast this video stream for displaying it in the **Eocortex Client** application.

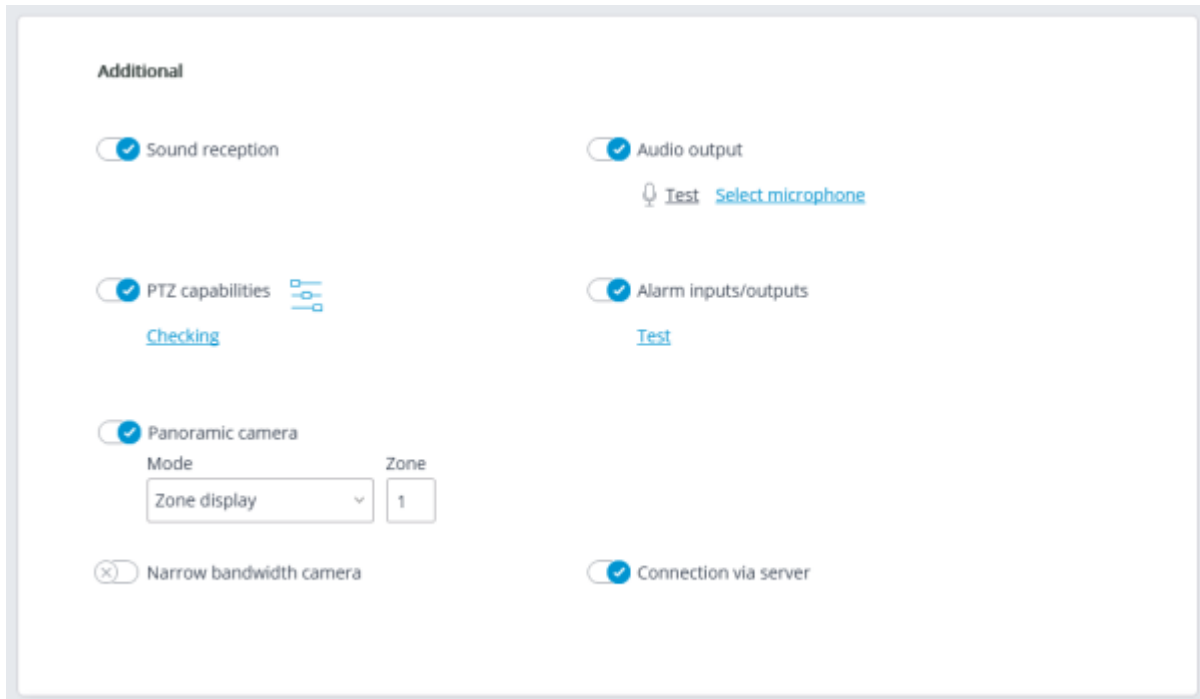
Mobile and web clients option: allows broadcasting the video stream for displaying it in the **Eocortex** mobile application and the **Eocortex Web-client**.

These options must be enabled for at least one video stream.

These options are enabled by default for all video streams.


Continuously receive all streams from camera: Constant receipt of all streams from the camera will improve the responsiveness of the interface in the clients at the expense of increasing the load on the server and network.

Additional



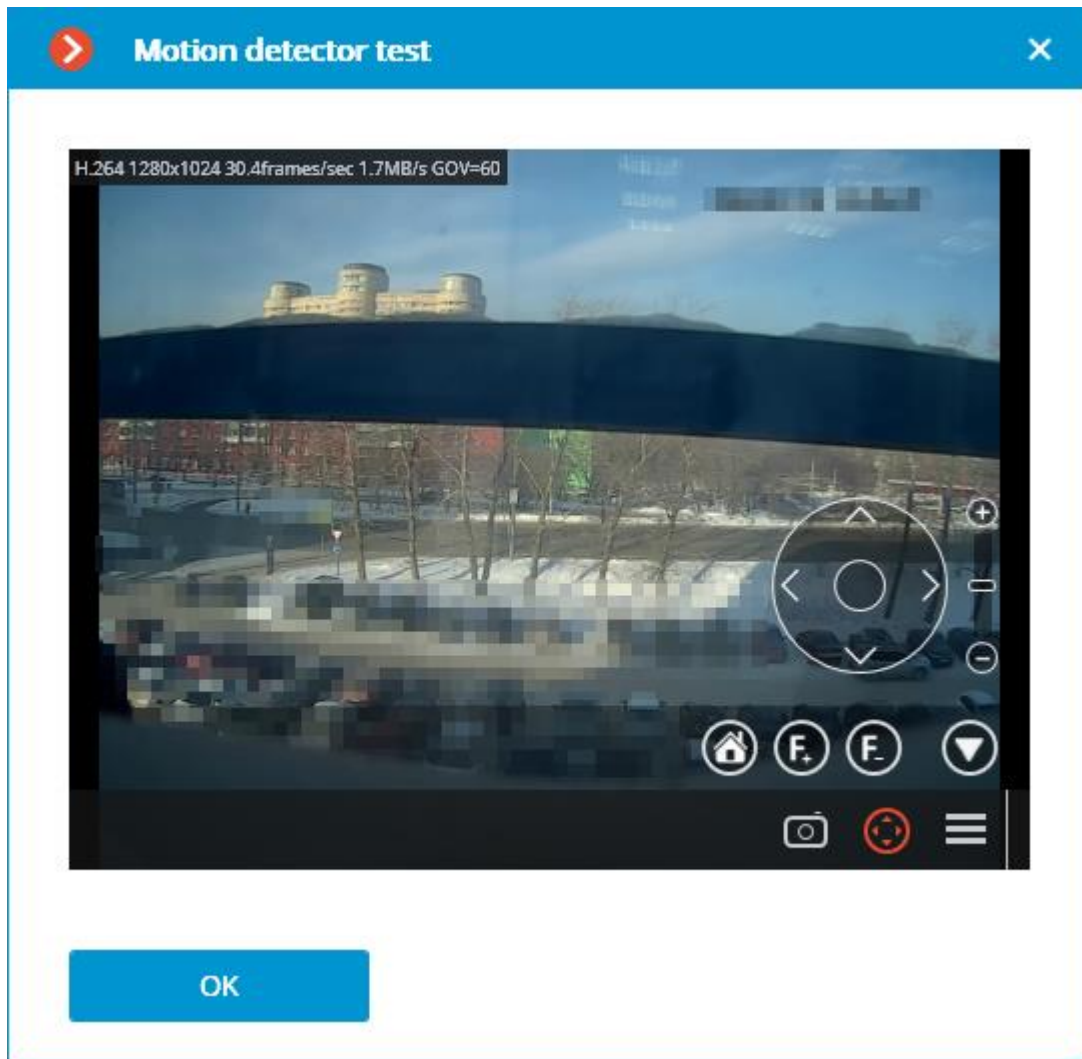
The following settings are available in the **Additional** group of settings.


Sound reception: enables the reception of sound from the camera.

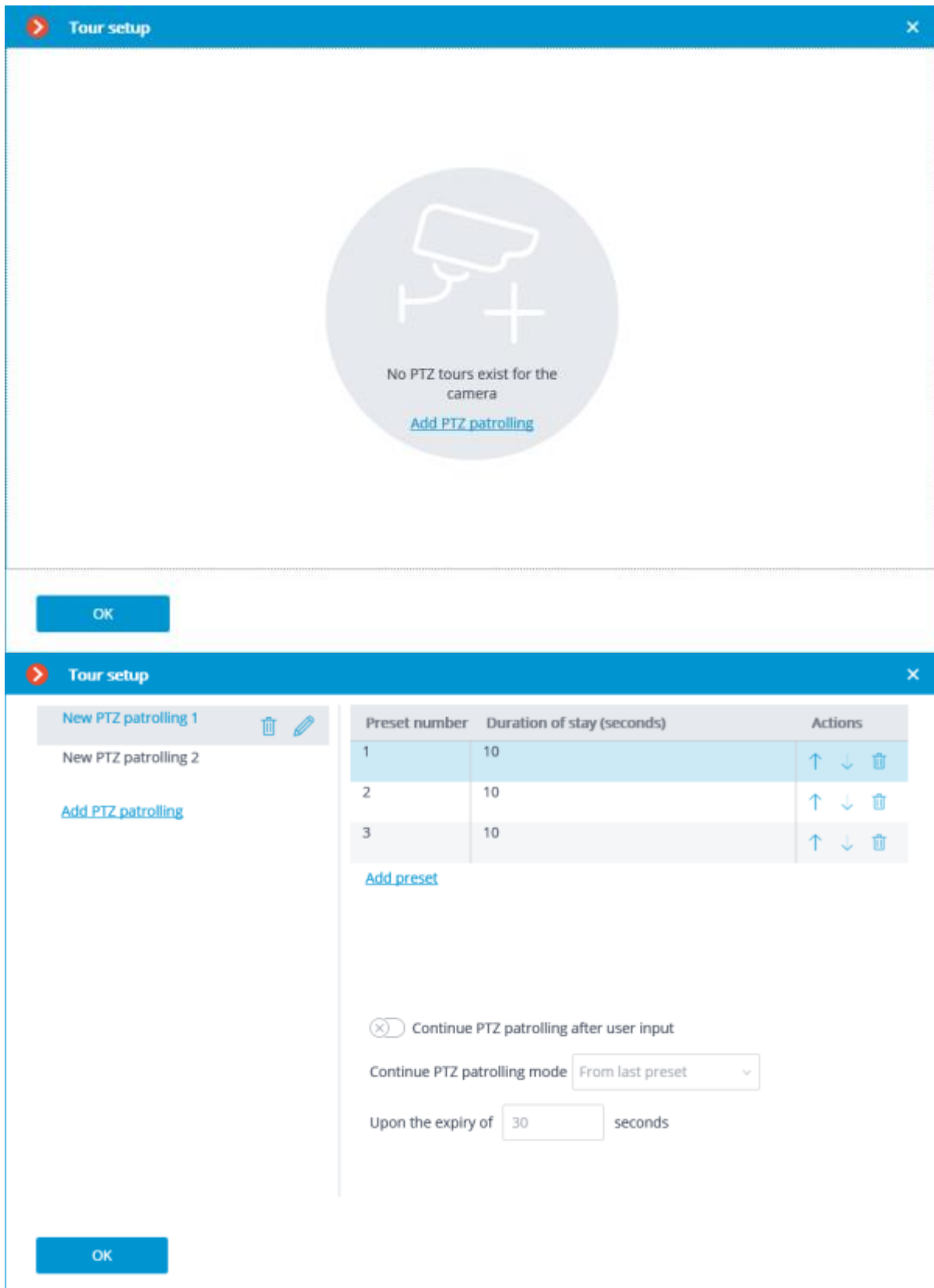
Audio output: it enables the transmission of sound to the camera. With the push of the  button, the microphone connected to a computer is switched on, allowing to test the sound transmission. The choice of a particular sound device (driver) is made following the Select microphone link.

PTZ capabilities enables the camera control features.

Test link opens the window with the test video broadcasting which contains PTZ controls.

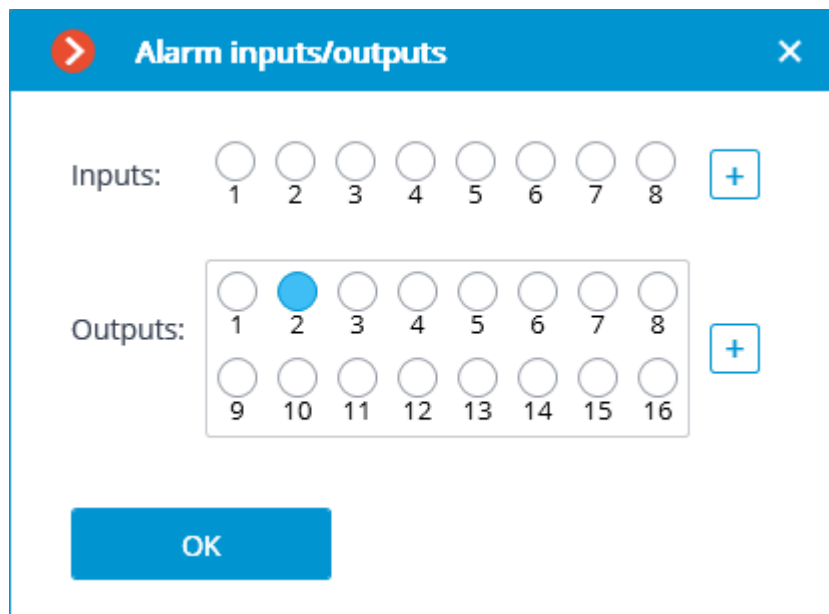


The  button opens the Tour setup (automatic patrolling) — the sequences of toggling camera presets.



Alarm inputs/outputs enables signal recording from the inputs and sending signals to the camera outputs.

The **Test** link opens the camera inputs and outputs window. When signals are sent to the inputs, the corresponding indicators will be highlighted in the **Inputs** line. For sending signals to the inputs it is required to click on the corresponding indicator in the **Outputs** line. By default, 8 input and output indicators are displayed; to have more inputs or outputs displayed, press **[+]** located to the right of the corresponding indicator block.



PTZ capabilities: allows to select the display modes available for the particular model.

If a position is selected in the **Model** field that corresponds not to a particular camera model but to a model range, the **PTZ capabilities** option will be available on the condition that the PTZ camera feature support is implemented for at least one model from the selected range. That is why the **PTZ capabilities** option is to be switched on only if the connected camera really is a PTZ one.

Narrow bandwidth camera: enabling this option will increase the time of waiting for the camera signal.

Connection via server: when this option is enabled, the video streams to the client workplaces will be transmitted through the server.

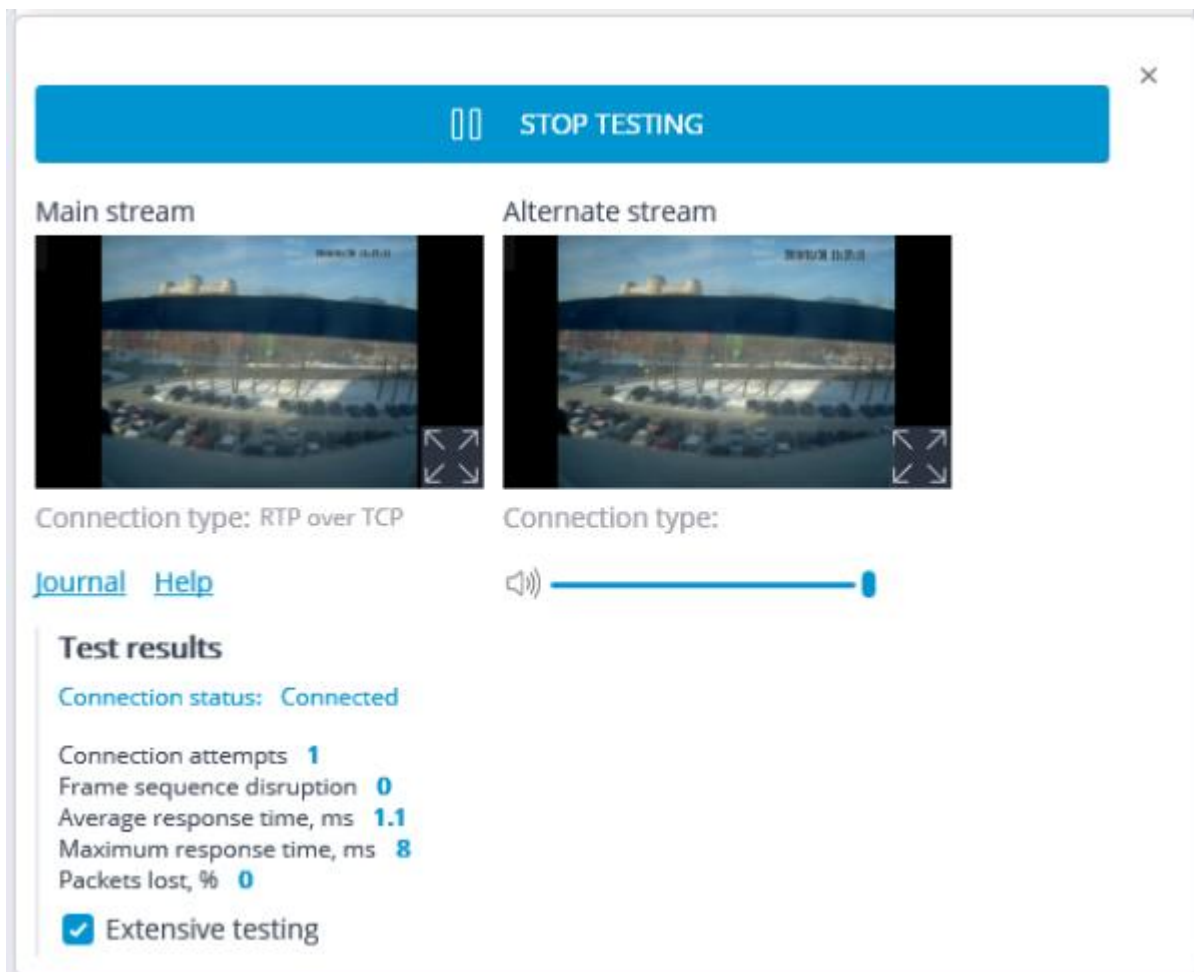
Some cameras have a limitation of the quantity of simultaneous connections, or they lower the frame transmission frequency when several simultaneous connections are in place. Thus, the connection through server ensures only one connection to the camera for any quantity of the client workplaces.

Test camera

Pressing the **Test camera** button initiates an attempt to connect to the camera with the current parameters.




The connection status will be displayed in the test window. The test connection events are available in the log at the corresponding link.




Camera connection features

The list of cameras supported by **Eocortex** grouped by their manufacturers can be found on [eocortex.com, Support / Supported Cameras](http://eocortex.com/Support/Supported%20Cameras) page.

The adjustments of the connection of cameras to the **Eocortex** server is made via **Eocortex Configurator** application, on the  **Cameras** / [Connection](#) tab.

If a camera manufacturer is not present in the **Brand** dropdown list, it is recommended to do the following:

Press the  **Automatic search** button. If the camera appears in the [list of detected cameras](#) and **ONVIF** is available for it, it is required to mark the camera, enable the **Automatic setup** option and press the **Add device** button. The camera will be added to the list and automatically set up. If after doing the above the image from the camera is not received, enter the login and the password and perform the setup manually.

If the camera has not been found by the automatic search, try to connect it using the standard protocols, selecting one of the standards in the **Brand** field (**Model** field will be filled in automatically).

- If the camera supports **ONVIF** or **PSIA** standards, it is required to manually indicate its address, login/password, select its manufacturer and set other parameters.
- If the camera supports **HTTP** connection for receiving **Motion JPEG**, or **RTSP/RTP** connection for receiving MJPEG, it is required to select **HTTP (MJPEG) device** or **RTSP/RTP device**, correspondingly, in the **Brand** field, and set a connection string in the **Address (IP address or URL)** field. The connection string depends on the camera model and is usually indicated in the documentation or on the manufacturer's web site. Login and password are set in the connection string

or in the corresponding fields (depending on the connection method implemented in the particular model).

If the manufacturer of the camera is in the **Brand** dropdown list, but the camera model is not in the **Model** dropdown list, try to connect to the camera using other models of the same manufacturer. For some manufacturers, the model ranges, series, or generations of cameras are indicated rather than camera models. For some manufacturers there is only one position in the list – that means that all the models use the same driver, or only a certain series/model of the manufacturer's devices is supported.

If the above connection method has failed, try to connect the camera choosing one of the standard protocols in the **Brand** field: **ONVIF**, **PSIA**, **HTTP (MJPEG) device** or **RTSP/RTP device**.

Using multiple streams

The majority of modern IP cameras support broadcasting two or more video streams simultaneously. This permits to record frames to the archive in high quality and display lower quality video in client applications, significantly reducing the load on the hardware.

In the **Eocortex** terminology, the first stream broadcast by the camera is called the **main stream**, and the rest are **additional streams**.

When using multiple streams the **Eocortex** server writes the main stream to the archive by default.

When displaying video from the camera broadcasting multiple streams in the client application, the stream with the resolution closest to the size of the window in which this stream will be shown is selected for displaying on the screen by default.

Using server and client settings, can to change the terms of use and display of streams.

When using a software motion detector, it is possible to choose which stream will be analyzed. If no other video analytics is used for the camera besides the software motion detector, it is recommended to use a lower resolution stream for analysis since this can significantly reduce the server load.

However, if other video analytics is used for the camera in addition to the software motion detector, in most cases it is recommended to use a high-resolution stream for analysis. This is primarily due to the fact that low resolution may not be sufficient for analysis.

For analysis and for recording to the archive the same stream should be used, otherwise in the archive will be incorrect the coordinates of the objects detected by video analytics.

Settings on camera

Despite the fact that **Eocortex** can work with one or multiple streams from cameras of any resolution, it should be borne in mind that the load on the **Eocortex** server largely depends on the parameters of the streams received from the cameras. It is also important to consider the specifics of setting up and functioning of **Eocortex** applications.

For most cameras, the parameters of the broadcast video and audio streams should be set on the camera itself, using the camera's web interface. An exception is made for certain brands and models of cameras, for which the parameters of video streams can be set in the **Eocortex Configurator** application.

The list of terms that can be found in camera settings can be found below.

Stream

Possible names of the option: Stream, Channel

Stream means the video data transmission channel from the camera.

Eocortex supports receiving up to four streams from one source at the same time, in the camera settings these streams can be identified as:

First, Main

Second, Sub, Additional, Additional 1, Alternative, Alternative 1

Third, Additional 2, Alternative 2

Fourth, Additional 3, Alternative 3

For most devices, the **Stream** option is used to enable and select a channel to configure other broadcast settings.

Codec

Possible names of the option: Codec, Format, Video format, Compression format, Coding format, Encoding mode

Codec means a compression and decoding algorithm used to reduce the amount of data to be transmitted and stored.

Eocortex supports the following codecs:

MJPEG (Motion JPEG) — the standard with the lowest compression rate among the supported ones. The stream is composed of a series of JPEG images containing the full frames of the scene. Compared to other standards, it has the lowest demands on the resources of the decoding device, while at the same time requiring the largest channel width and disk space for storing the archive.

MPEG-4 (MPEG-4 Part 2) — the standard that provides a moderate compression rate, i.e. for the same image quality the channel width and archive size will be much smaller than that of **MJPEG**, while the resource consumption during decoding will increase insignificantly. The stream is composed of the reference frames (I-frames), containing full image of the scene, separated by a sequence of intermediate frames (P- and B-frames), containing only the moving part of the frame and object motion compensation data for predicting future frames. The prediction method causes moving objects to be visually blurred when viewed in slow motion and on pause. Modern cameras rarely use **MPEG-4** — instead, they use the more advanced **H.264**.

H.264 (MPEG-4 Part 10, AVC) — the standard that can be called as a successor of **MPEG-4**. With improved stream conditioning and next-frame prediction algorithms, it provides higher compression ratio and better quality of intermediate frames than its predecessor. This reduces the amount of transmitted and stored data of the same image quality by increasing resource consumption during processing compared to **MPEG-4**.

H.265 (HEVC) - the standard that can be called as a successor of **H.264**. Because of its more efficient encoding algorithms compared to its predecessor, it provides an even greater reduction in the amount of transmitted and stored data at the cost of increased resource consumption during data processing compared to **H.264**.

MxPEG — proprietary standard developed and applied by Mobotix. It is a sort of combination of **MJPEG** and **H.264** standards: each frame of the stream is an independent frame, but only part of the frames contains the full image of the scene, while most of the frames contain only the changed fragments. This approach reduces motion blur on fragmented frames, while the resource requirements for transmission, storage and stream processing are in between of **MJPEG** and **H.264**.

H.264+, **H.265+**, **WiseStream**, **Zipstream**, **Smart Stream** — standards that are enhanced versions of **H.264** and **H.265** with improvements to various algorithms of the original codecs. Most often presented in the camera interface as an option of the original codec, rather than a standalone codec. They allow to reduce the bitrate without a noticeable loss of quality, reducing the load on the network and decreasing the size of the archive. The higher compression rate compared to the original codecs also implies higher resource requirements for decoding.

Requirements and limitations of extended codec versions usage:
Limitations have an impact when the GOV is greater than 350

- Periodic lags may occur when viewing the archive.
- When the number of cameras with a high GOV value is large, a lot of video data is kept in RAM. This can lead to high CPU resource consumption.
- Lags may occur when positioning in the archive.
- When viewing live video, the **Waiting** message before playback starts may be displayed longer than usual. This happens when the **Connect via server** option is enabled in the camera settings. If this option is disabled, the **Eocortex Client** application connects directly to the camera and the video is displayed almost without delay.
- The higher the GOV value and the lower the frame rate, the more the archive is being decimated. In some cases, applying the second decimation stage is pointless.
- When playing back a camera archive recorded with a high GOV value, it is necessary to have the **Use advanced codec version** option enabled in the additional stream settings even if the camera is currently set to a low GOV.

The higher compression of the video, the smaller the amount of data to be transmitted and stored, but the greater the resource consumption for video decoding when playing back and processing with video analytics modules.

Compression

Possible names of the option: Compression, Compression level, Quality, Quality level

All supported video formats provide the ability to adjust the balance between the quality of the frame and its bit rate. This setting can be represented in a camera settings as one of the following options:

Compression rate — the parameter that determines the degree of detail reduction of the frame.

Quality level — the opposite parameter to the compression rate, determining the remaining details of the frame.

The parameter values can be specified as a percentage of the source image (e.g., Quality=90%) or as levels predefined by the camera manufacturer (e.g., in the range from 0 to 12).

Both parameters are responsible for reducing the detail of the frame, the difference is in the method of applying the selected value: while the **Compression rate** indicates how much the detail is to be reduced, **Quality level** indicates how much the detail is to be preserved. For example, setting **Compression=30%** is the same as setting **Quality=70%**.

Depending on video surveillance conditions and camera hardware features, an acceptable compression level can be from 30 to 60%, although options from 0 (minimum compression) to 70% (high compression) are possible. The real compression rate should be set based on the visual evaluation of the resulting image quality.

Resolution

Possible names of the option: Resolution, Image size, Image quality

Resolution — the parameter that determines the detail of the frame by specifying the number of color dots (pixels) that form the image. Depending on the camera model, this setting can be expressed as a direct comparison of the number of dots in the horizontal and vertical direction (1920x1080), the absolute number of dots in the image (2 Mpix) or as a standard name (FullHD).

The higher the resolution, the greater the detail in the frame and the higher the resource consumption in transmitting, storing and processing it.

Eocortex has no limitations on this parameter except those imposed by the standard itself. However, a low resolution can make it impossible for video analytics modules to analyze the frame, while a high resolution may result in increased resource consumption when decoding an overly detailed frame.

Frame rate

Possible names of the option: Frame Rate, Frame frequency, Frames per second, FPS

Frame Rate — the parameter indicating the number of frames per one second of video.

The higher the value of this parameter, the smoother the motion in the video, but the higher the resource consumption in transmission, storage, and processing.

Eocortex has no limitations on this parameter except those imposed by the standard itself. However, a low frame rate can cause lags when playing video and make it impossible for video analytics modules to analyze the stream.

Profile

This option is mostly available only for the H.264 codec

Possible names of the option: Profile

Profile — a set of settings and restrictions in the codec algorithms application, providing compatibility of stream compression and decoding on different devices. The selected profile also determines the initial video compression rate, which determines resource consumption during transmission and decoding.

Eocortex supports the following profiles:

Baseline (BP) — profile that assumes minimum video compression. Compared to other profiles, it provides the lowest resource consumption during decoding at the expense of increasing the amount of data for transmission and storage.

Main (MP) — profile that assumes a balance between resource consumption in decoding, transmitting and storing data.

High (HP) — profile that assumes maximum video compression. Compared to other profiles, it provides the lowest load on the network and storage disks at the expense of increased resource consumption during decoding.

Bitrate

This option is mostly available only for the H.264 codec

Possible names of the option: Bitrate

Bitrate — the parameter that defines the amount of information transmitted by the camera per unit of time. Measured in bits per second (bits/c, bps), as well as derived values with kilo- (kbit/s, kbps), mega- (Mbit/s, Mbps), and similar prefixes.

Eocortex has no limitations on this parameter except those imposed by the standard itself. However, a low bitrate value can cause a significant degradation of image quality, especially in a high activity scene.

Bitrate type

This option is mostly available only for the H.264 codec

Possible names of the option: Bitrate type

Bitrate Type — the parameter that determines how to control the amount of data transmitted.

Variable Bit Rate (VBR) — type of bitrate with a dynamic amount of transmitted data. It provides the specified parameters of the video stream, while the used channel width can vary. This mode is recommended to use in most cases, if there are no problems with network bandwidth.

Constant Bit Rate (CBR) — type of bitrate with a static amount of transmitted data. It provides a specified channel width, at the same time, depending on the implementation in the given camera model, some parameters of the video stream can be changed and, as a result, the quality of the image may be reduced. This mode is recommended for use only when there are problems with network bandwidth.

GOV

This option is mostly available only for the H.264 codec

Possible names of the option: GOP, GOV, Group of Pictures, Group of Video, Group of VOP, I-frame

GOV — the parameter that defines the length of the group of frames (the distance between the reference frames).

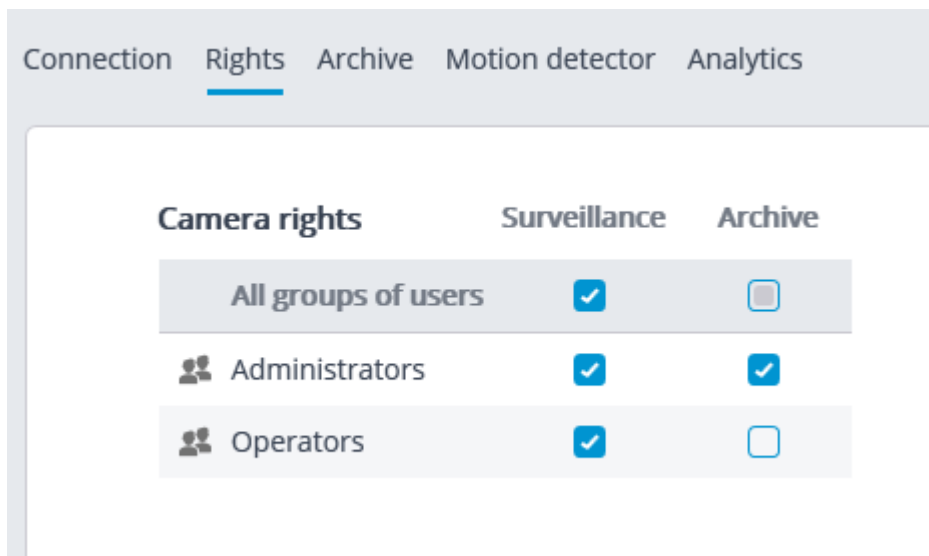
For example, with a GOV of 50, there will be one reference frame for every 50 frames transmitted (i.e., there will be 49 intermediate frames between the nearest reference frames); with a GOV of 25fps and a GOV of 50, there will be one reference frame every 2 seconds. The higher the GOV, the smaller the video stream bitrate, but the greater the memory and CPU consumption. The reason is that to decode each subsequent frame, the reference frame and all subsequent intermediate frames must be stored in memory until the next reference frame.

Eocortex has no limitations on this parameter except those imposed by the standard itself.

However, a high GOV value may cause video playback lags and inability to analyze the stream by analytics modules, while a low GOV value will increase the load on the network and the archive. For example, with a GOV of 1, **H.264** is no different than **MJPEG**.

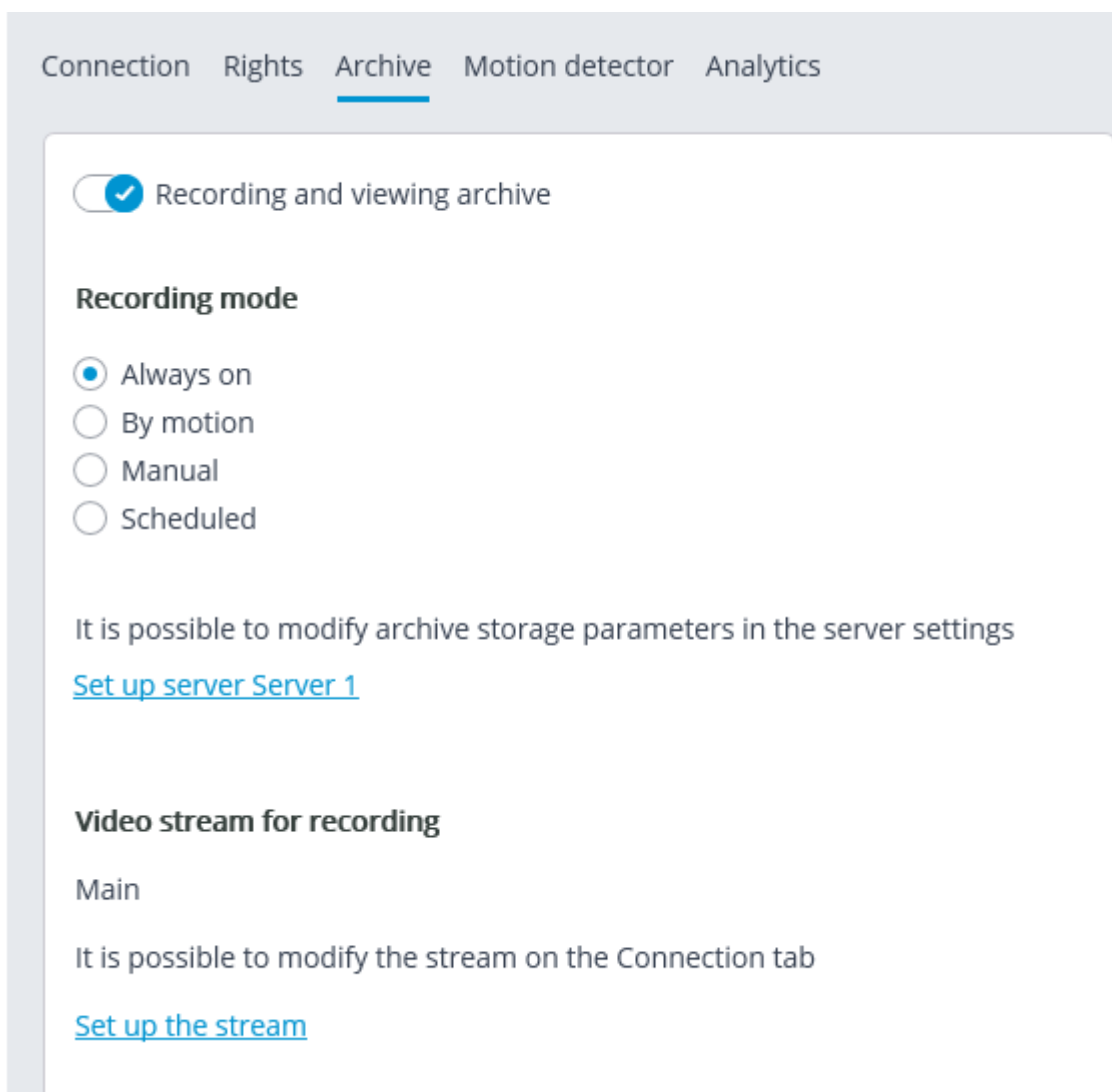
Access rights settings

The **Rights** tab allows to set up camera access rights.



Setting up the archive

On the **Archive** tab you can set up the parameters of writing camera audio and video to archive as well as the parameters of interaction with the archive located on camera.



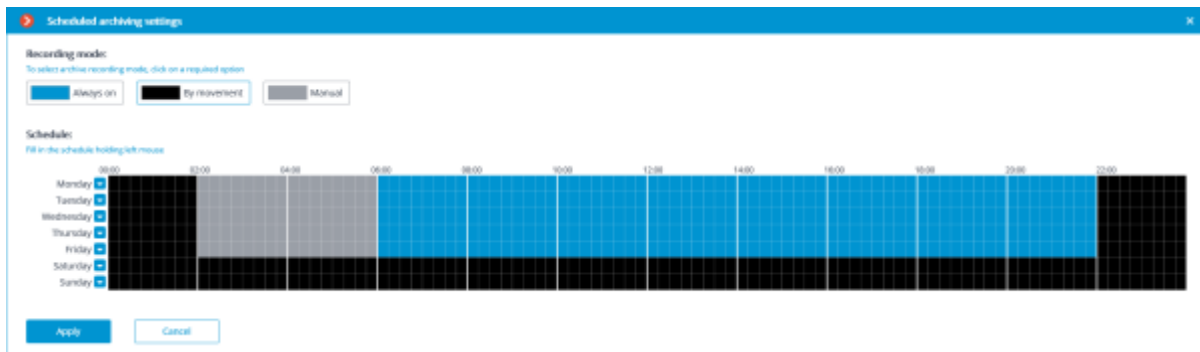
Below you will find a description of controls located on the tab.

Recording and viewing archive: enables recording the video and audio from a camera to archive.

Recording mode: allows to select one of the modes explained below.

- **Always on:** continuous recording to archive is performed.
- **By motion:** recording to archive is performed only when motion is detected in the frame (also when a set sound level is exceeded in case a sound detector is enabled). Moreover, the operator can start the recording to archive forcibly even if there is no motion in the frame.
- **Manual:** enabling and disabling recording to archive is done by the operator only.
- **Scheduled:** allows to flexibly set up modes of recording to archive.

Set schedule: opens the schedule.



In the Schedule window, select one of the modes by clicking the corresponding rectangle in the upper part of the window. Then by holding left mouse button select the periods when the chosen mode will be active. The corresponding periods will be colored accordingly.

For setting a mode for the whole day you can select it in the dropdown list located to the right of the day of the week.

Video stream for recording: allows to choose which stream will be recorded to archive. This setting is available only when receiving two streams from camera is enabled.

Additional

Recording only key frames to archive ⓘ

Record speed, frames/sec

Sound recording



Recorded archive fragments will contain:

- 1 seconds before event start;
- the whole period of time during which the event was being recorded
- 1 seconds after the event has ended.

Archive storage time

Minimum value, day

Maximum value, day

Archive on device

Usage of archive on data storage card

Synchronizing with main archive

Recording only key frames to archive: when this option is enabled for MPEG-4, H.264 and H.265 codecs, only the key frames will be recorded, but for MJPEG codec the required frame rate is stated in the **Record speed** field.

If for MJPEG codec the frame rate of the camera is lower than the one stated in the **Record speed** field, all frames will be recorded to archive.

For MJPEG codec, **Recording speed limitation** option is shown.

Additional

Recording speed limitation ⓘ

Record speed, frames/sec

Since the sound is not decimated during the recording to archive, it will be available only for the archive recorded without recording speed limitation.

Recording speed limitation influences the quality of video playback from archive and the archive volume: the decimated video recording played back from the archive will be less smooth, but the archive drive space will be saved.

Sometimes there appears a necessity to enable recording without speed limitation only during a specific period of time or as a response to a specific event, and record a decimated video at all other times. In this case, it is required to set up the **Scheduled tasks** or **Tasks by event** using **Disable frame skipping when recording to the archive**.

Sound recording: enables recording sound to archive.

In order to have sound recorded to archive, enable **Sound recording** on the **Connection** tab.

Prerecording and **Post recording:** using these sliders, you can set short periods of time during which the recording to archive will be performed before the start of the event that triggers the recording and after the start of the event that triggers stops the recording, accordingly. For example, **Prerecording** is performed when movement or exceeding of a preset sound level is detected, and **Post recording** is made after the motion has stopped and the sound level drops below the preset level.

Archive storage time: in this group of settings you can set minimum and maximum archive storage time.

Generally, the minimum and maximum set archive storage time for each camera assigned to server is analyzed, and an attempt is made to provide for the limitations indicated in the settings. In case it turns out to be impossible, the older recordings from all the cameras will be erased to make room for the archive.

If the archive decimation is configured in the system and there is not enough disk space for storing the undecimated archive, the decimation process will start. The values of the archive decimation settings will be used as the archive storage time. This setting can be disabled by turning off archive thinning.

Usage of archive on data storage card: enables access of **Eocortex** applications to the data storage card on the camera.

Synchronizing with main archive: if this option is enabled, the archive from camera will be downloaded to **Eocortex** server, but only of those periods when no connection with camera was available or the server was down.

The archive for a required period may be absent on the camera's memory card. It happens, for example, when there is no motion, if a motion detector on the camera is used for recording. In this case the archive on the server will be empty.

For **ULTRA** and **Enterprise** licenses, the Archive Decimation with Time Setting feature is available, which allows you to reduce the size of the archive after a specified interval.

The archive decimation operation can be executed in one or two stages: for example, recording is performed with an original frequency of 30 fps; in 7 days it is resampled down to 5 fps; and in 30 days - down to 0.5 fps (1 frame per 2 seconds).

Archive storage time

Storage time of undecimated archive, days

First stage of decimation

Recording frequency, fps

Storage time, days ⓘ

Second stage of decimation

Recording frequency, fps

Storage time, days ⓘ

When enabling archive decimation with time setting, all the archived recordings whose depth exceeds the depth of the undecimated archive specified in the settings will be deleted. The same will happen when the depth of the undecimated archive is modified.

E.g.: initially, the archive decimation with time setting is disabled; the specified maximum time of archive storage is 180 days.

If the first decimation stage is enabled and the time of storage of the undecimated archive is set to 30 days, the archive with the depth of more than 30 days will be deleted at the moment the settings are applied.

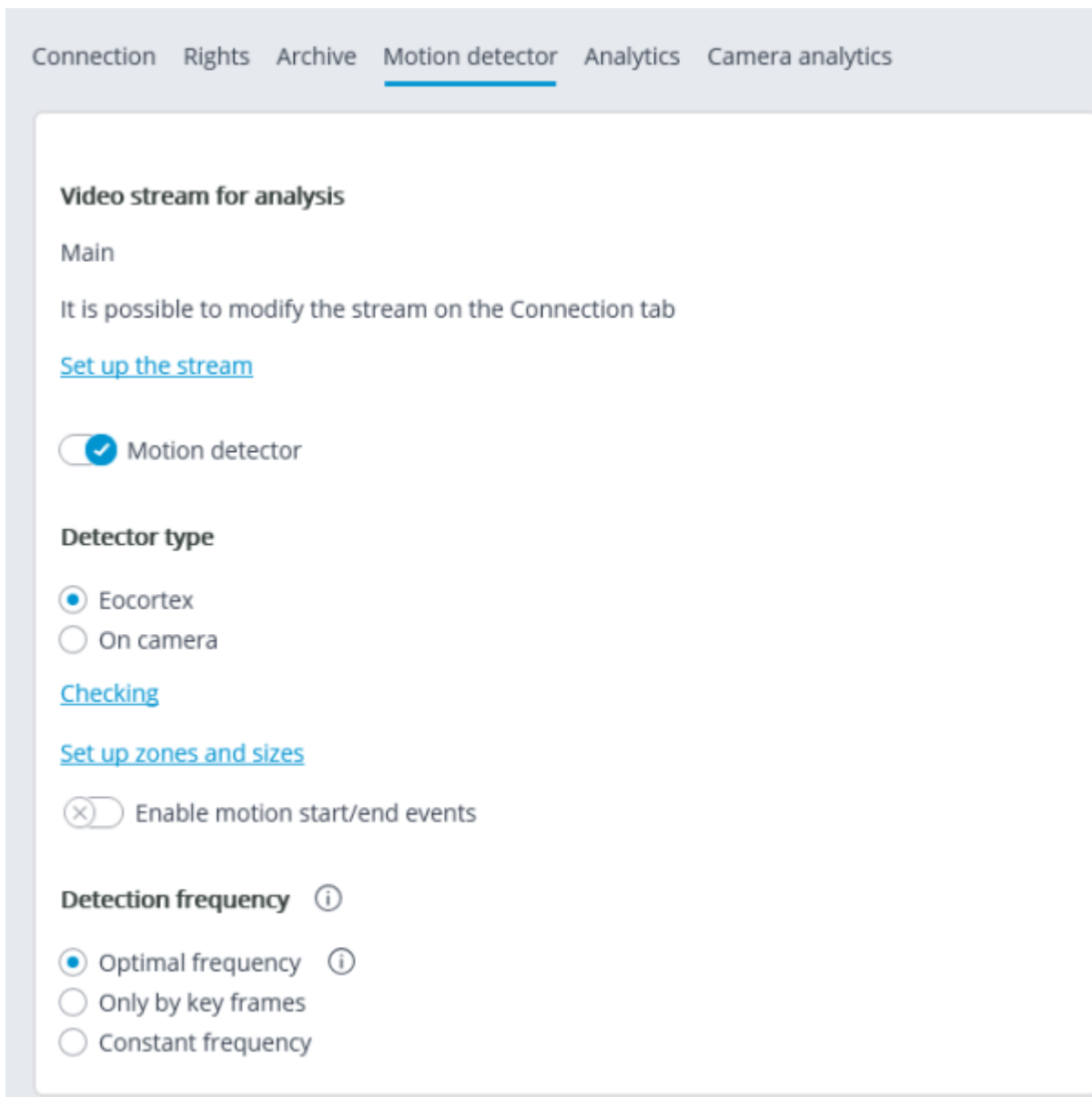
If subsequently the depth of the undecimated archive is set to 7 days, the archive with the depth of more than 7 days will be deleted at the moment the settings are applied.

For the MPEG-4, H.264 and H.265 codecs, only the reference frames will be recorded.

In case of playback of the archive in **Eocortex Client**, archive fragments, which have been decimated with time, will be displayed by the shaded area on the timeline.

Motion detector setup

Motion detector parameters can be set up on the **Motion detector** tab.



Below is the description of controls located on the tab.

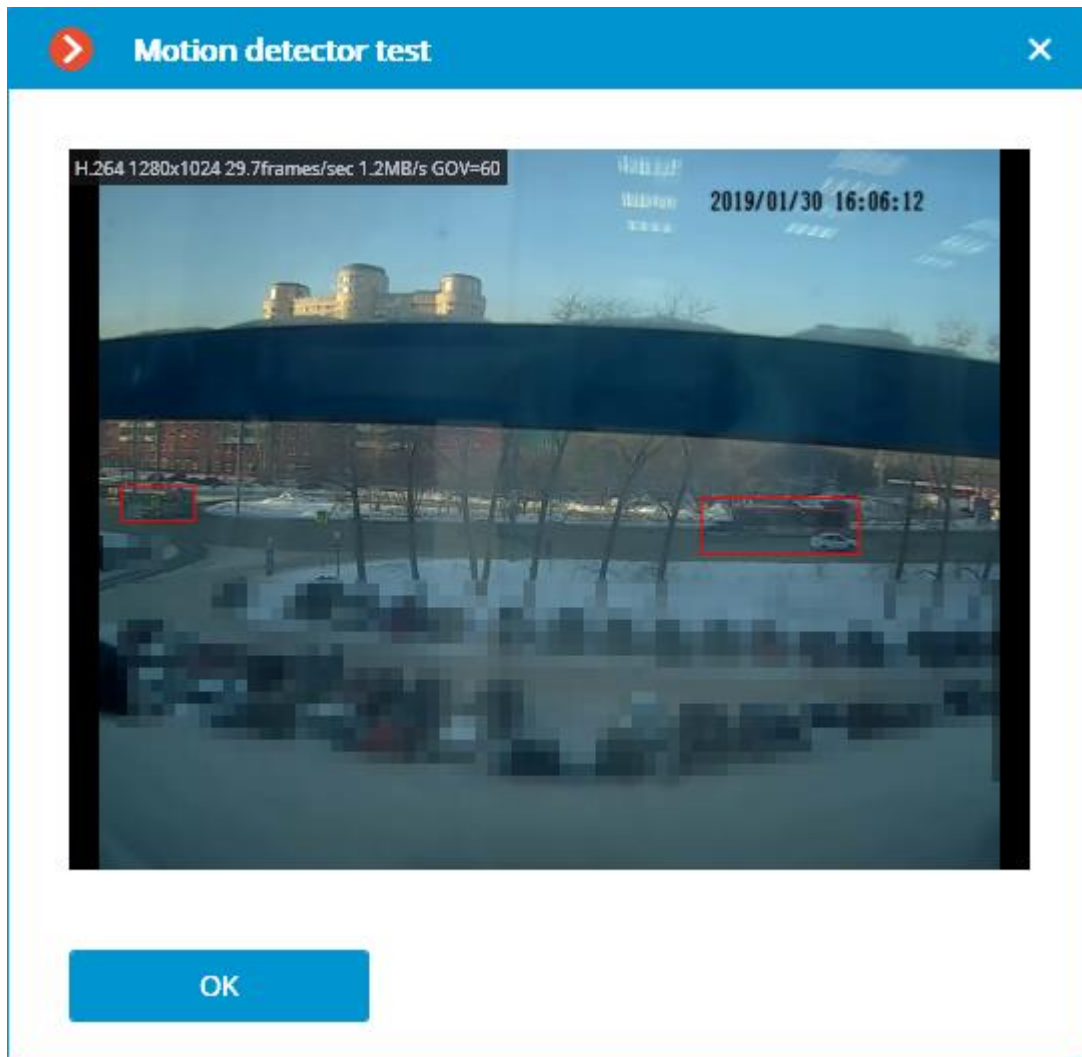
Motion detector: enables motion detector support.

Detector type: determines which motion detector will be used:

- **Eocortex:** software motion detector on **Eocortex** server.
- **On camera:** camera inbuilt motion detector.

When using the motion detector built into the camera, the **Eocortex** video analytics becomes unavailable.

The **Test** link opens the window of motion detector check.



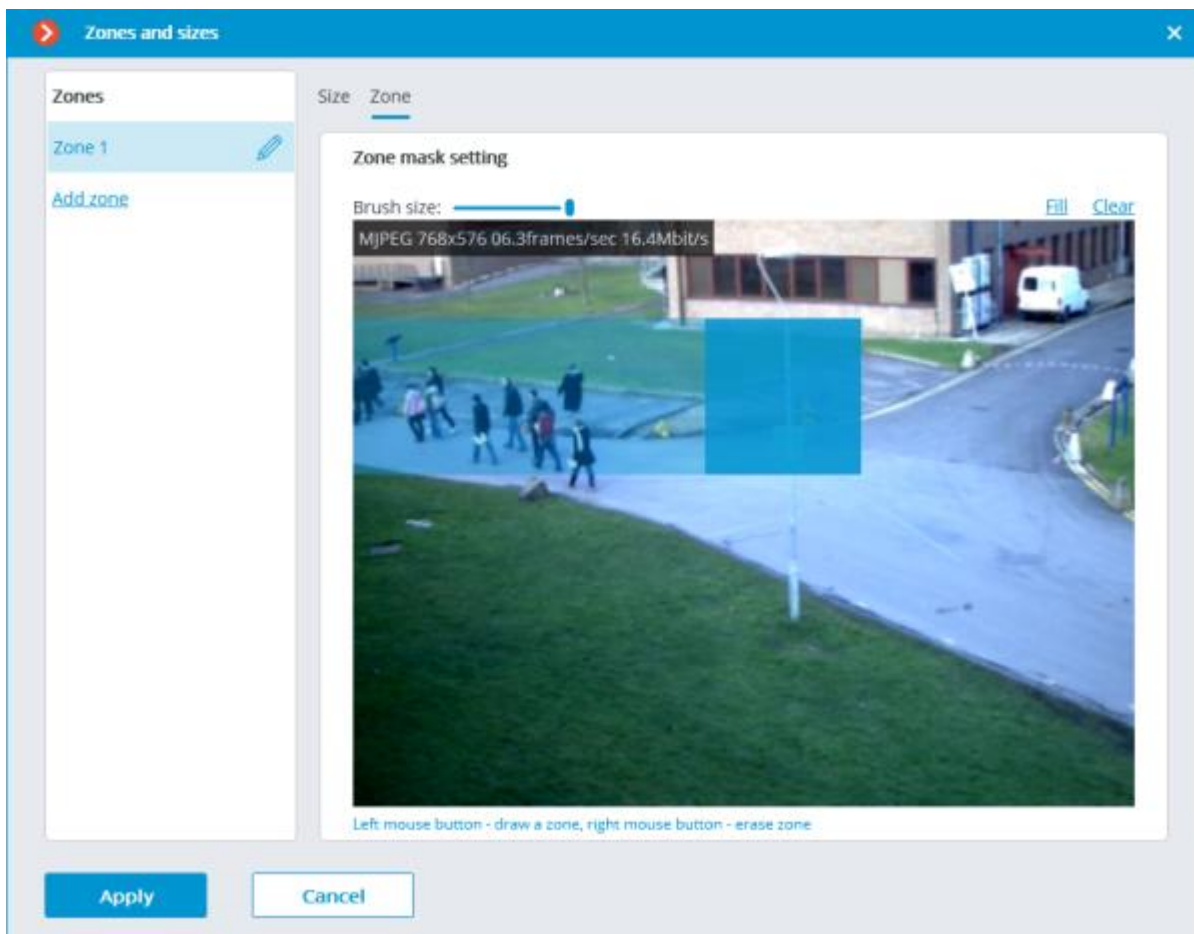
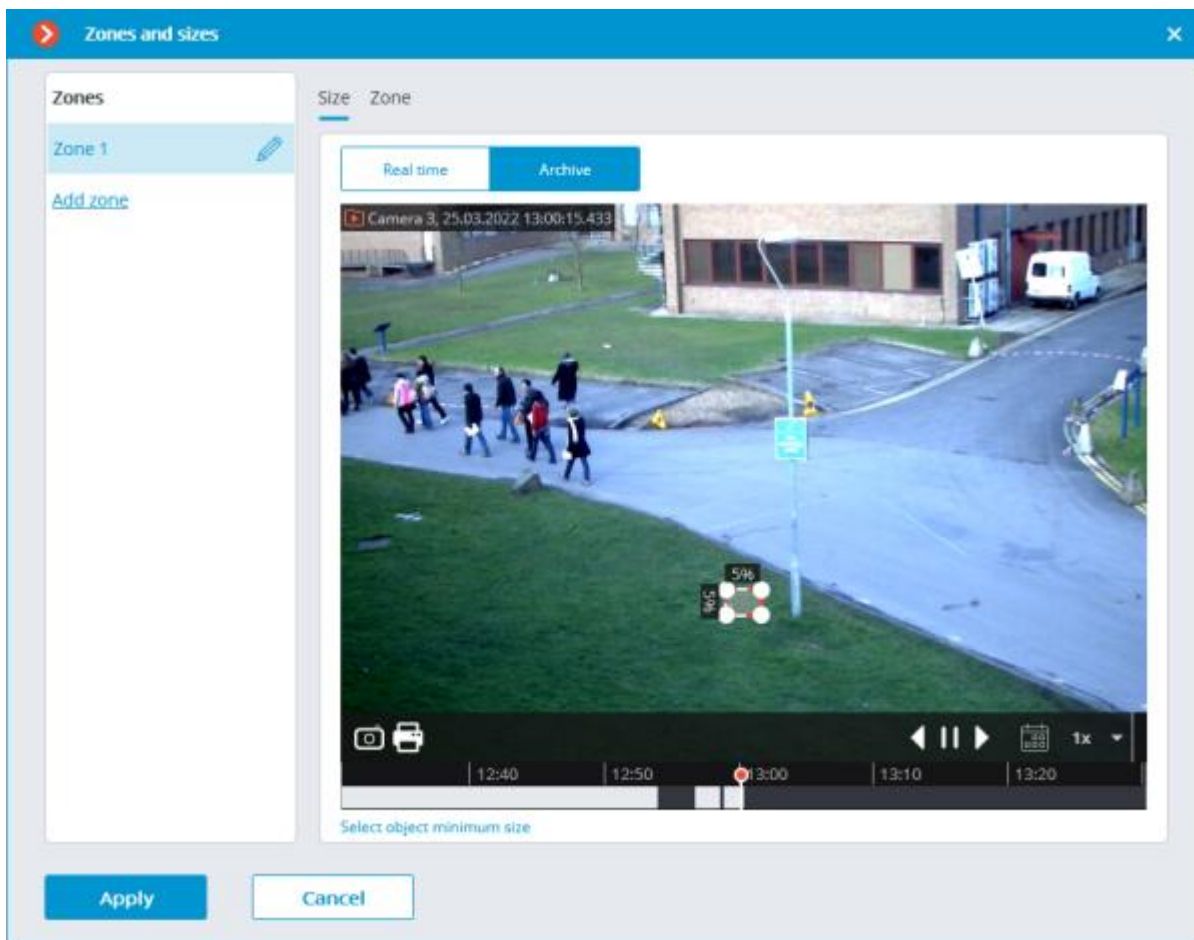
Video stream for analysis: determines which stream will be used for software motion detection on **Eocortex** server.

Recommendations for choosing a stream for analysis, on a condition that the main stream has higher resolution than the alternative one; for example, the resolution of the main one is 1920x1080, the alternative - 640x480:

Alternative: no intelligent modules are used apart from the **Eocortex** software detector.

Main: at least one additional video analytics module, including the external ones, is used in addition to the **Eocortex** software detector.

The **Set up zones and sizes** link will open the window of setting up detection zones and minimum sizes of the objects to be detected.



Generate motion start/end events: enables generation of the corresponding events, for example, for using them in scenarios.

Detection frequency: determines the frequency of video stream analysis for detecting motion in the frame:

- **Optimal frequency:** video stream analysis and motion detection will be performed with the frequency set automatically in accordance with the following rules:
- If at least one video analysis module is enabled on the camera, the analysis will be performed with the frequency of 10 fps;
- If no video analysis module is enabled on the camera, the analysis will be performed with the frequency of 5 fps for MJPEG, and for H.264, H.265 and MPEG-4 the frequency will be chosen automatically within the range of 0.4 - 5 fps.
- **Only by key frames:** only the key frames will be analyzed for H.264, H.265 and MPEG-4 codecs.
- **Constant frequency:** the analysis will be performed with the set frequency.

Motion detector setup recommendations

The software motion detector analyzes the video stream received from the camera and, in case of detecting motion, generates the corresponding system event, based on which, for example, a recording to archive is started.

The motion detector consumes certain system resources of the server: loads up the processor, uses the RAM memory. At that, it can be estimated that the consumption of system resources is proportional to the resolution and frame rate. For example, for a video stream with a resolution of 1920x1080 with the use of motion detector, the processor load is approximately 6 times higher than for the 640x480 video stream. Likewise, when the analysis is performed with the frequency of 25 fps, the consumption of system resources is 4 times higher than when the analysis is performed with the frequency of 6 fps.

At the same time, triggering the recording by the motion detector allows to reduce the archive volume because the recording is performed only when there is motion in the frame.

To avoid the situation when the software motion detector is triggered by such insignificant movements as those of leaves, birds etc. it is possible to set it up for detecting the movement of the objects bigger than the preset size.

The software motion detector must be enabled on the following analysis modules:

- **Sabotage Detector;**
- **Loud Sound Detection;**
- **Auto Zoom;**
- **Tracking;**
- **Search for Objects;**
- **People Counting;**
- **Crowd Monitoring;**
- **Face Detection;**
- **Traffic Density Heat Map;**
- **Personnel Activity Monitoring;**
- **Uniform Detector;**
- **Shelf Fullness Check;**
- **License Plate Recognition (Complete);**
- **License Plate Recognition (Light).**

Many cameras have their own, inbuilt motion detectors (in **Eocortex** terms – Camera motion detector). When the camera motion detector is used, the system resources of the server are practically not consumed.

If it is planned for the camera to perform continuous recording to archive and it is not planned to use video analytics modules, the use of the software motion detector is not recommended. Instead, it is sufficient to select the mode of continuous recording to archive. Such situation is possible when, for example, there is motion that happens 24/7: during the continuous manufacturing process, at a large railway station etc.

If the camera is equipped with the inbuilt motion detector and it is not planned to use video analysis modules, it is recommended to enable the camera motion detector. It allows to lower the server load and reduce disk space usage at the same time.

That said, in some situations it is preferable to use software motion detector, for example, when there are many cameras of the same type and when setting up a motion detector on each camera would be too time-consuming. In such a case it is easier and faster to enable the software motion detector for a group of cameras, or set up one camera and copy its settings many times, changing only the network address.

In **Eocortex**, it is also possible to set up the combined mode of recording to archive (in **Eocortex** terms, the **Scheduled mode**). For example, there is constant movement at the entrance of a shopping mall from 10:00 to 22:00, but at other times there should be no movement. In such a case, it is possible to set up the recording as follows: from 10:00 to 22:00 – continuous recording (this will reduce server load); from 22:00 to 10:00 – motion detection-triggered recording (this will save disk space).

By default, the frequency of checking video stream for the presence of motion in the frame, which is called detection frequency, does not match the frame rate of the video stream: most of the time, the detection frequency is lower than the video stream frame rate. It is done to reduce the consumption of resources by **Eocortex** server. This mode is called detection with optimal frequency.

At the same time, it is possible to set constant detection frequency in the software motion detector settings in the **Eocortex Configurator** application. It is advisable to use this mode when the optimal detection frequency is a priori lower or higher than the one required and sufficient for analysis, or when it is necessary to set the fixed frequency for H.264, H.265 or MPEG-4 formats. The analysis frequencies recommended for a particular video analytics module are stated in the documentation for each module.

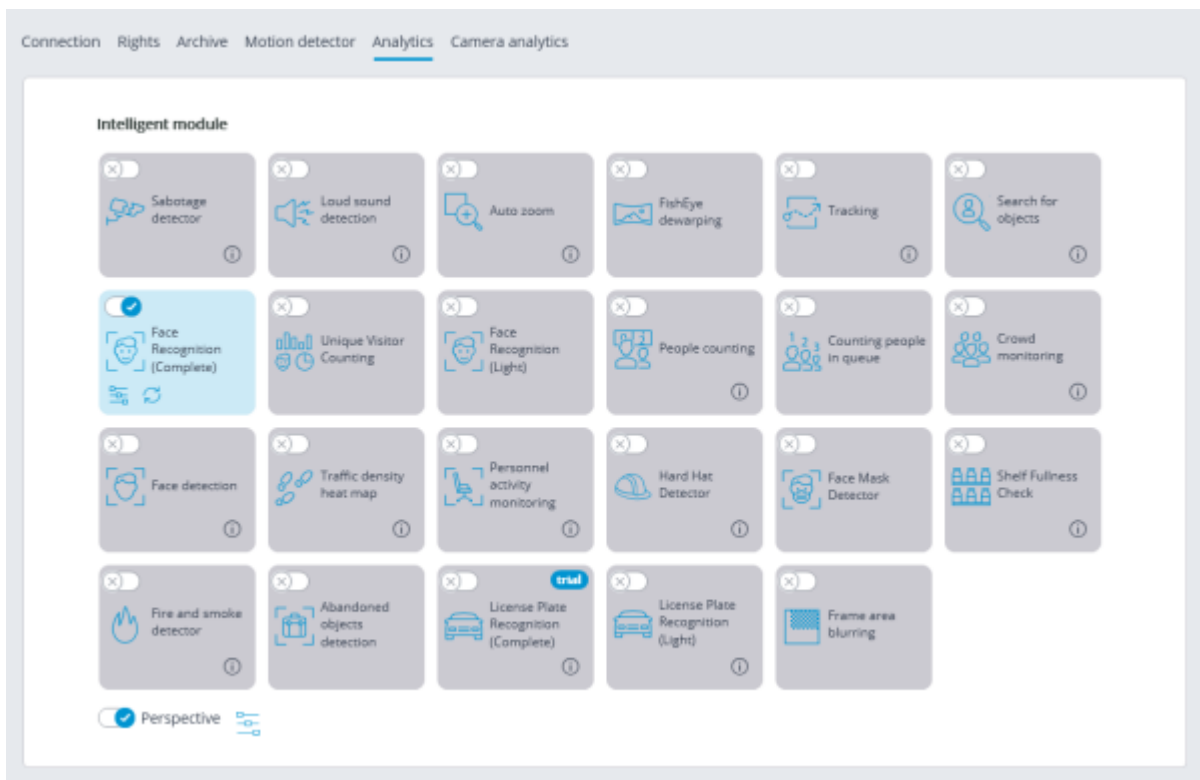
When multiple streams from a camera are used, the motion is by default detected on the first additional stream.

At the same time, in the software motion detector settings of **Eocortex Configurator** application it is possible to select which stream will be used for analysis on the camera.



If no other video analytics modules are used except for the software motion detector, it is recommended to use lower resolution stream for detection because it allows to decrease server load significantly.


Video analytics setup



On the **Analytics** tab the video analysis modules are set up.




On this tab, the settings of all the existing **Eocortex** video analysis modules are displayed, regardless of the presence of licenses for particular modules on the present server.

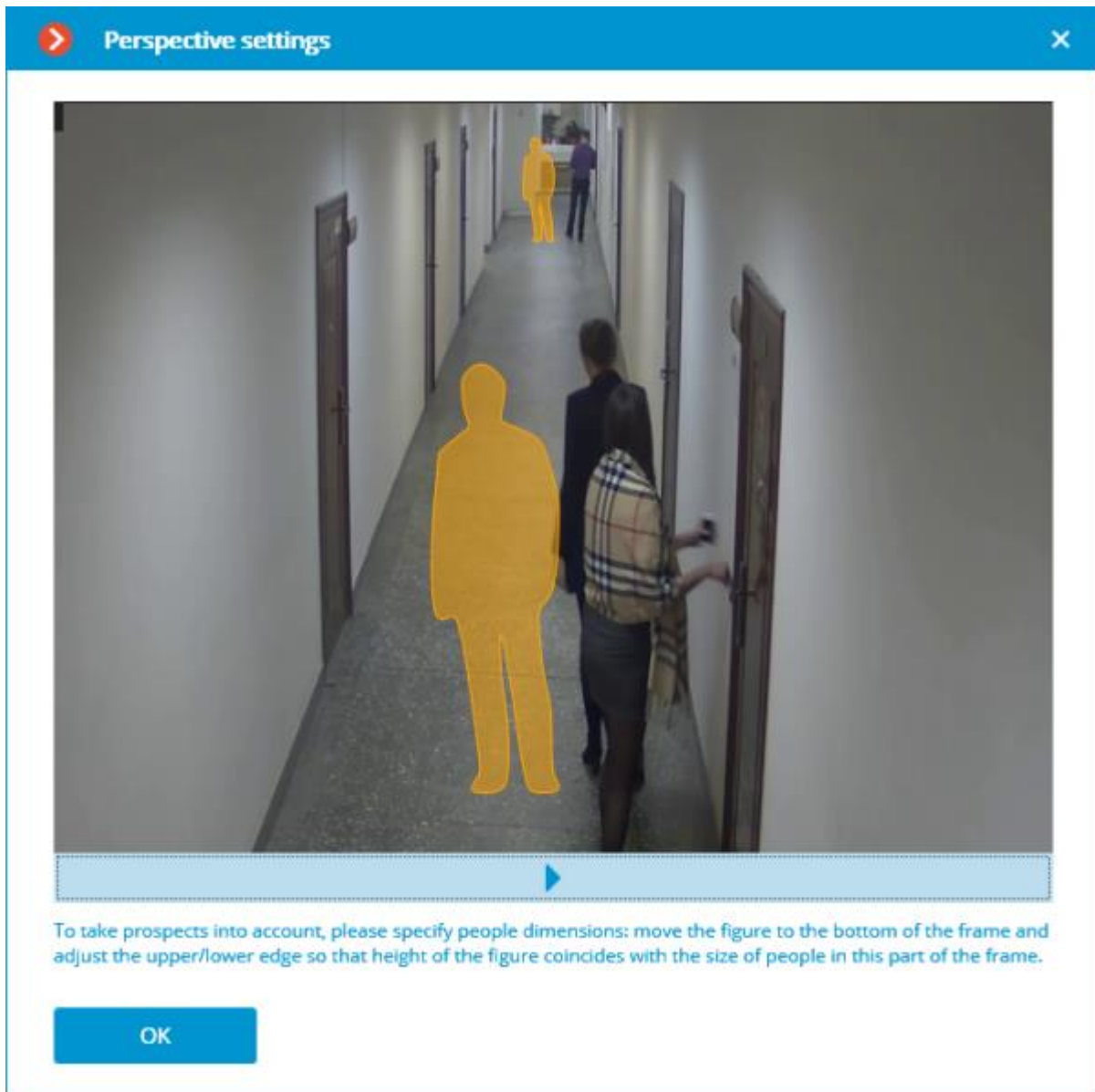
For enabling or disabling a video analytics module that analyzes the video stream set in the settings of the motion detector it is required to enable  or disable  the corresponding switch.


By the press of the  button the hint appears stating which capabilities must be enabled or disabled for activation and proper functioning of the module.

If the module is on, then by the press of the button  the module settings window is opened. The  button resets the settings to the default values. If these buttons are not displayed, the module requires no additional adjustment.

The settings of each module are described in the [Video analytics](#) section.

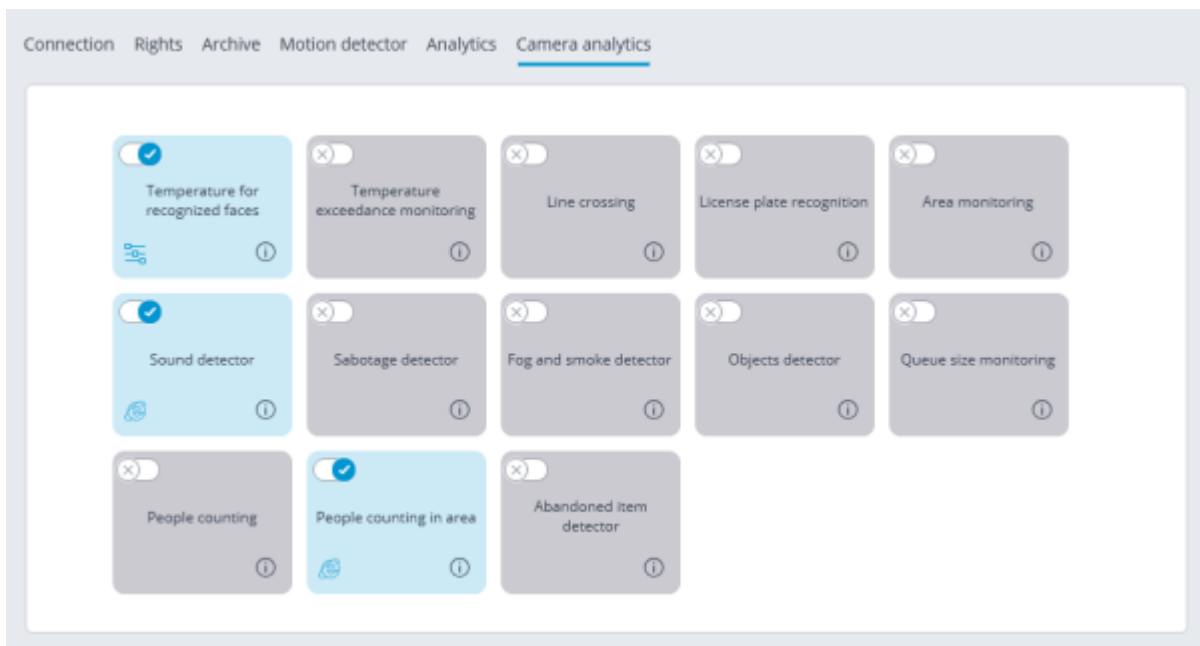
For the operation of some of the video analysis modules it is required to enable and set up the perspective first. The button  located to the right of the **Perspective** switch opens the perspective settings window.




The perspective is set using two scale forms  which are dragged with the mouse to the corresponding area of the frame and adjusted in a way that the height of the form matches the height of the persons in the given area of the frame. In order to change the size of the form it is necessary to click on the upper or lower edge of the form and, holding the mouse button, move the pointer up or down.


Camera analytics


The video analytics built into a camera can be set up on the **Camera analytics** tab.




This tab contains blocks of settings of all the video analytics built into the camera that is available in **Eocortex**.

The video analytics is enabled using the toggle switch .

The button  opens the prompt for video analytics.

If the analytics is set up in the **Eocortex Configurator** application, the settings window of this video analytics can be opened upon clicking on the button .

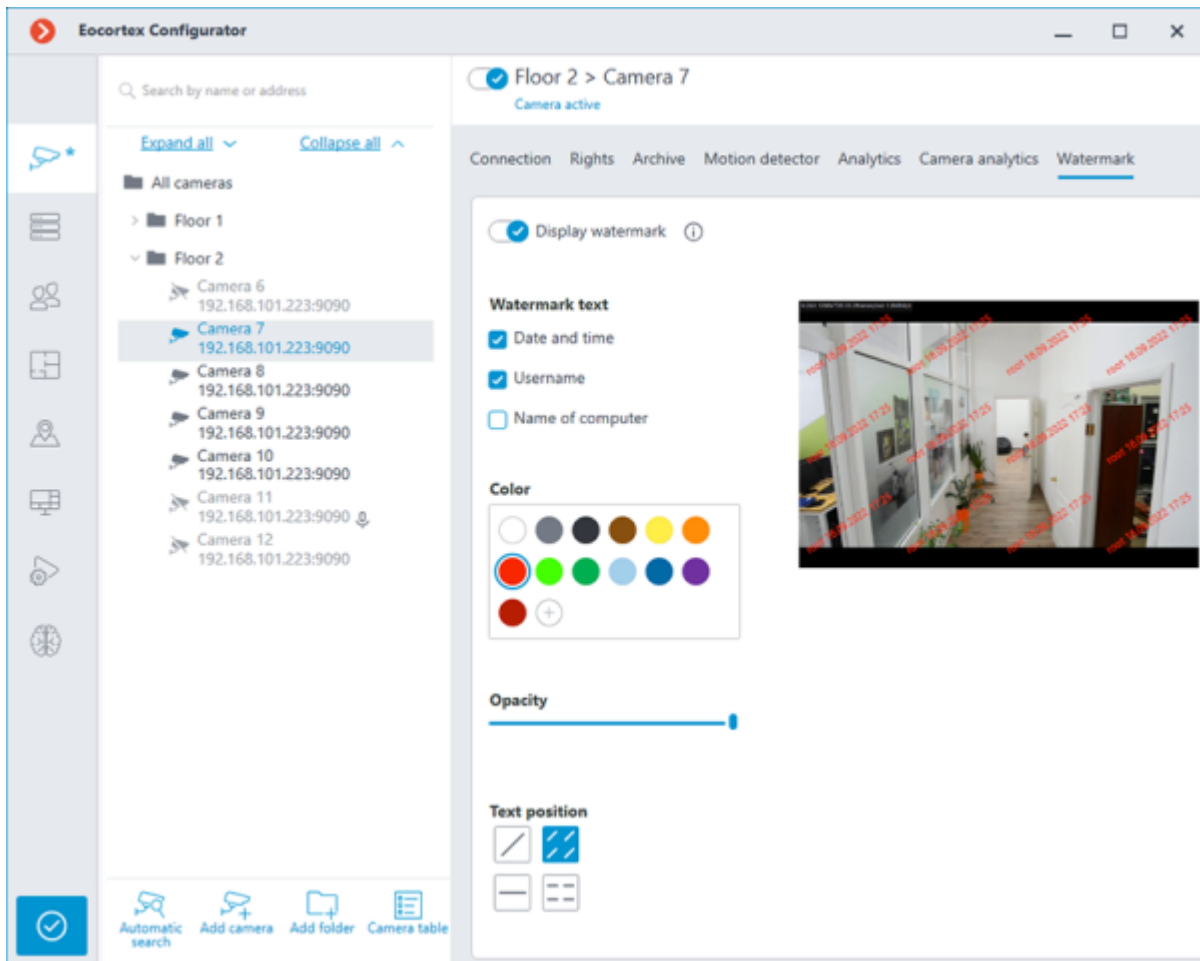
If the analytics is set up directly on the camera, the camera's web interface can be opened by clicking the button .

Settings and requirements:

[Temperature for recognized faces](#)

Watermark

The **Watermark** contains the settings of displaying watermarks on video in a camera cell.



Learn more about [setting up a watermark](#).

Modifying camera groups

To facilitate the setup of a large number of cameras with similar parameters there exists a possibility to set the parameters for all the cameras at once, or for the cameras contained in the same folder, including its subfolders and the cameras and folders in it.

To set the parameters of a group of channels, select the corresponding folder and press **Change camera group settings** button.

The screenshot shows a camera management interface. On the left is a navigation pane with a search bar and expand/collapse controls. The main area displays a tree view of camera folders. 'Object 1' is expanded, showing 'Group 1.1' with four cameras (Camera 1-4) and 'Group 1.2'. 'Object 2' and 'Object 3' are also visible. At the bottom of the navigation pane are icons for 'Automatic search', 'Add camera', 'Add folder', and 'Camera table'.

The right pane is titled 'Object 1' and shows 'Folder information'. Under 'Camera group info in folder:', there is a table of settings:

Setting	Value
Cameras	8
Enabled	8
Alternate stream	8
Archive	8
Device archive	1
Motion detector	2
Indexing of moving objects by features	1


Below the table is a blue button labeled 'Change camera group settings'.

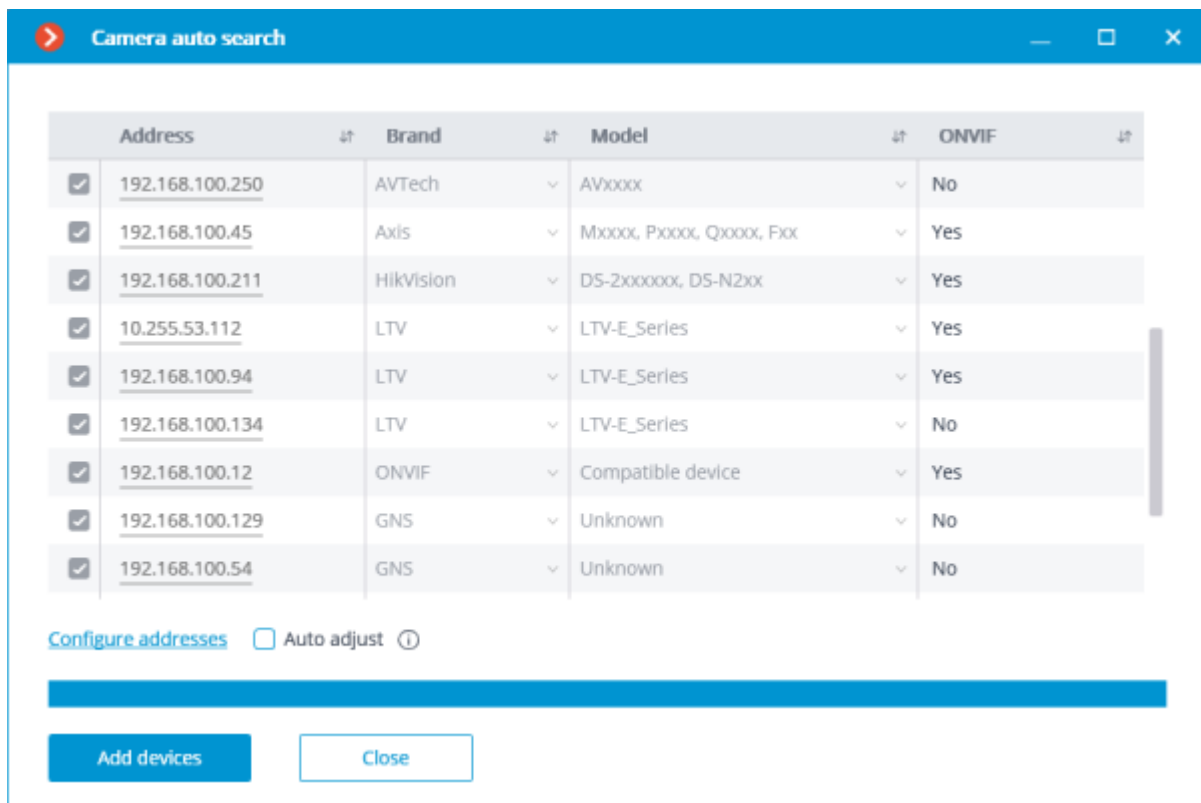
Set the required parameters similar to those of an individual camera in the opened editing window and click the **Apply** button.

The screenshot shows a 'Camera group editing' window for 'Object 1', with 8 cameras being edited. The window has tabs for 'Connection', 'Rights', 'Archive', and 'Motion detector'. A warning message states: 'The settings will be changed for all cameras in the folder. Only explicitly made settings will be modified; at that, only settings supported by the specific camera will be changed.' The 'Authorization' section includes fields for 'Username' and 'Password'. The 'Servers' section includes 'Main server' (set to 'Server 1') and 'Backup server'. The 'Video streams' section includes 'Main stream video format' (set to 'H264') and 'Alternative stream video format' (set to 'MJPEG'). A red note indicates 'Will be applied for camera 8'. There are 'Apply' and 'Cancel' buttons at the bottom.

To come into effect, the changes need [to be applied](#).

Automatic search and connection of cameras

For automatic searching for cameras in the local network and for adding them to the system it is required to press the  **Automatic search** button; after that, in the **Camera auto search** window, mark the cameras to be added and press the **Add devices** button.



In order to return to the main window of **Eocortex Configurator** press the **Close** button.

Not all of the cameras support features that allow to automatically locate them in the local network.

After automatically adding the cameras, in many cases it is necessary to manually enter the login and password of the camera administrator and select the video format in data stream settings.

In the course of the automatic adding, some cameras are defined as the cameras of other manufacturers or other models. In such a case it may be required to manually select the corresponding make or model after adding the cameras.

Configure addresses link opens the window of setting up the IP addresses of the cameras, which allows to modify the IP address from **Eocortex Configurator** without having to open the web interface of the camera. This feature is available for certain camera models only.

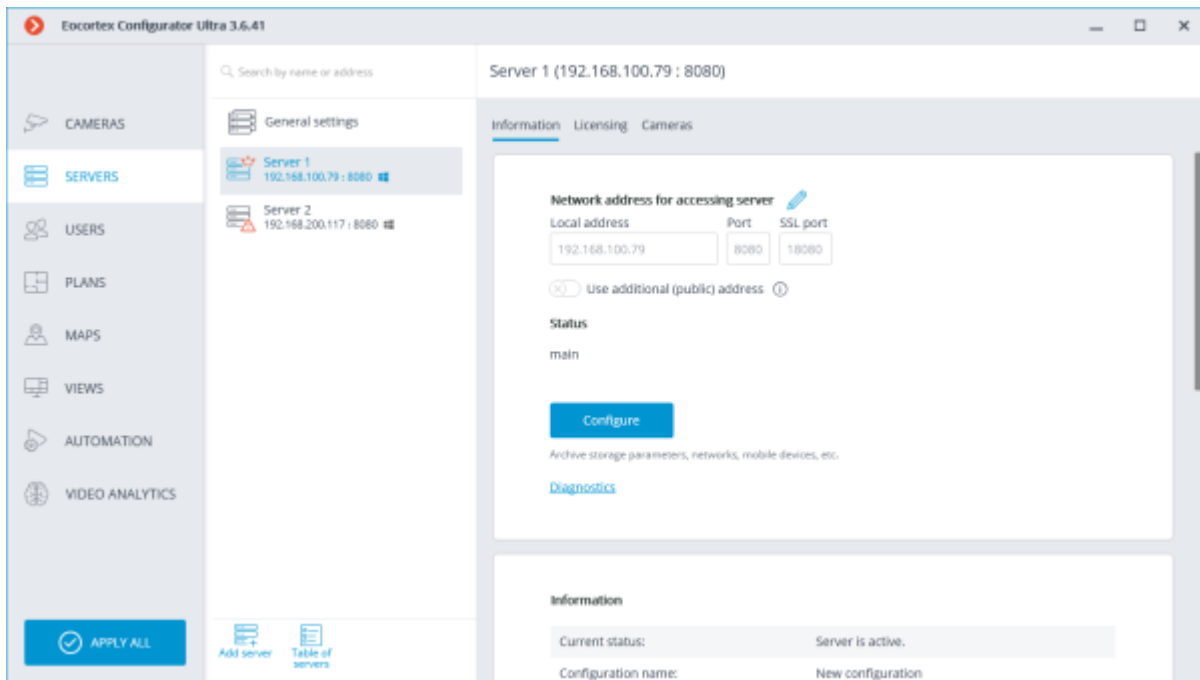
The **Automatic setup** option permits to automate the process of setting up channels, if the devices support the **ONVIF** standard (preferably, **ONVIF Profile S**). For the correct operation of this feature, it is recommended to disable the **ONVIF authorization** on the device, if it is provided in the camera's settings.


When using the automatic channel setup by **ONVIF**, do the following:

- If two streams are enabled on the camera, enable **Use two streams** option;
- If the camera supports PTZ, enable **PTZ camera** option;
- If the camera supports sound reception, enable **Sound reception** option.




Servers

For setting up servers in the **Eocortex Configurator** application, go to the  **Servers** tab



The list of servers is shown in the left part of the  **Servers** tab. At the top of this list, the search field that allows to find the server by name or IP address is available above. To the right of the list you can find the page with the tabs of settings related to the position selected in the list. Moreover, some settings for the selected position are called from the context menu.

The list of servers contains the records of three types marked by the corresponding icons:

-  **Main settings** contain the following settings tabs:
 - [Update](#): Server update settings.
 - **Services**: connection and operation settings for [Eocortex System Monitoring](#), [Episode archive](#), and [Long-term databases](#) services.
 - [Cameras](#): Settings of camera distribution among servers.
 - [Archive bookmarks](#) Setting of archive bookmarks' categories.
 - [Network settings](#): adjusting multicasting and interaction between servers.
 - [Security](#): Setting up secure connection to servers.
-  **Main server**: the main server of the multi-server system. In the single-server system the server is always "main".
-  **Subordinate server** is a subordinate server in a multi-server system.


For the main and subordinate servers, their names and addresses are stated to the right of the icons.

Server name is not a unique feature, that is why a system may contain various servers with the same name. To rename a server it is required to double click on its name or open a context menu and select **Rename**, then enter a new name and press **Enter**.

If the **Eocortex Configurator** application cannot access the server, such server is marked by the



icon.

The servers which encounter problems are marked by  icon.



The pages of the settings of the main and the subordinate servers contain the following tabs:

- [Information](#): main settings and server info.
- [Licensing](#): setup of server licenses.
- [Cameras](#): information regarding cameras connected to the server.


Server settings context menu items:

- **Rename**: renaming server.
- **Configure**: [special server settings](#).
- **Disconnect**: **disconnection of the server from system**.
- **Make main**: making the server main in the system.

Buttons under the list of servers:

-  **Add server**: connection of the server to system.
-  **Server table**: the list of all the servers in system.

Basic settings and server information

In the **Eocortex Configurator** application, on the  **Servers** tab on the page of server settings, in the **Information** tab the following settings and info can be found:

Information Licensing Cameras

Network address for accessing server ✓ ✕

Local address	Port	SSL port
127.0.0.1	8080	18080

Use additional (public) address ⓘ

Additional address	Port	SSL port
	8080	18080



Status

main

Configure

Archive storage parameters, networks, mobile devices, etc.

[Diagnostics](#)

Local address and **Additional address** display network addresses and ports for accessing the server. To modify a port or an address, it is required to press the button  , enter the required values and then press .

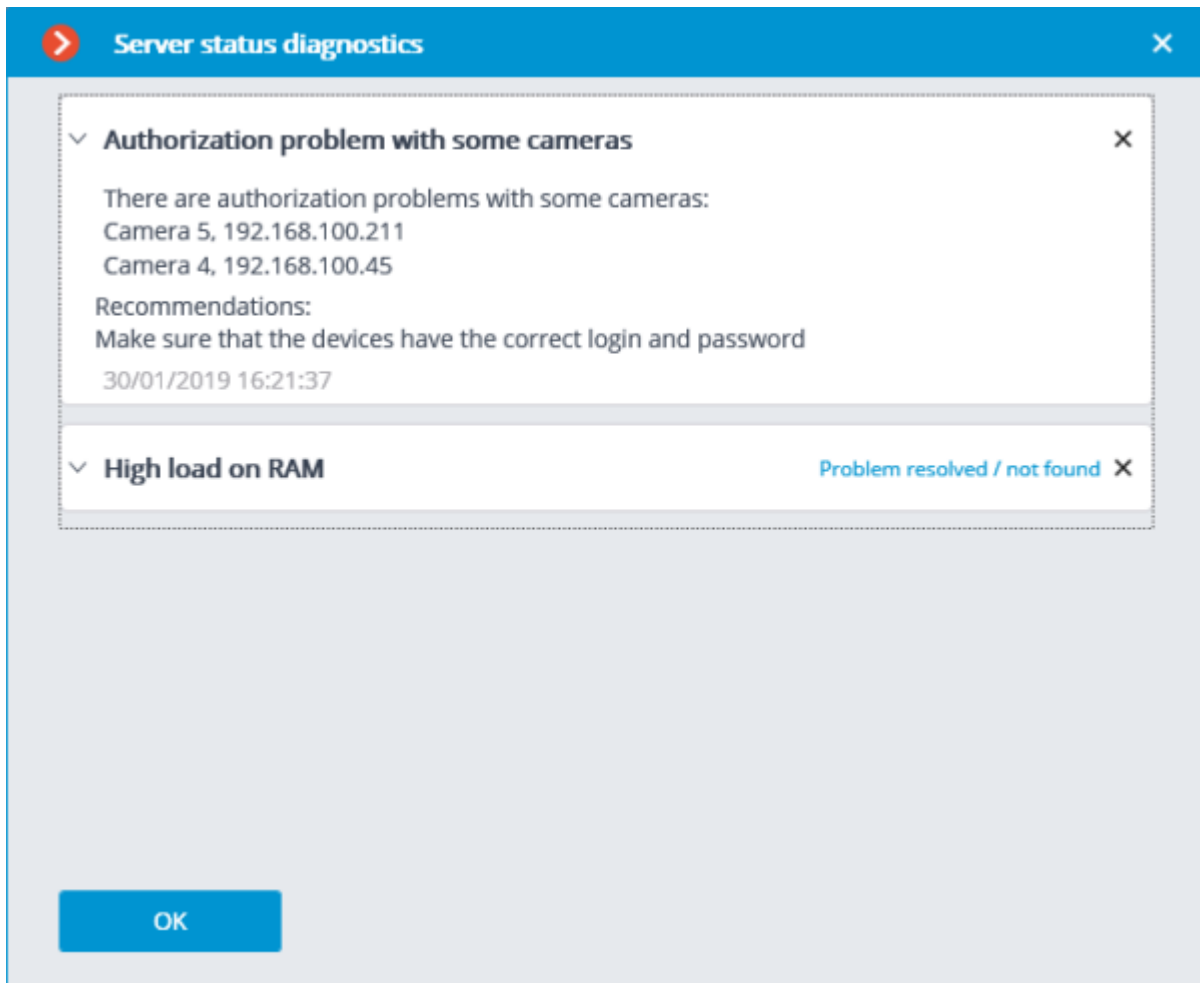
Changing the network address and port in the **Eocortex Configurator** application does not result in their actual change on the server. That is why it is recommended to first change the address and/or port using the operation system tools and then modify them in **Eocortex Configurator**.

In contrast, changing the network port in the **Eocortex Configurator** will result in its change on the server. In this case, depending on the state of the settings, the server will be restarted either immediately after changing the port in the application, or in the process of applying the settings.

Status: displays current server status.


Configure: opens [special server settings](#) window.

Diagnostics: opens server status diagnostics window.



In this window the list of detected problems is displayed, both current and those already resolved.

By clicking on the line with a problem you can obtain its detailed description and the recommendations on its solution.

To remove a line from the list, press the  button.

Information	
Current status:	Server is active.
Configuration name:	New configuration
Last time when configuration was applied:	12.03.2019 15:57:09
Archive size (GB):	2
Archiving speed (MB/sec):	0.06
Recording to archive is performed by disks:	Main
SMART diagnostics:	
Archive duration (days):	1.9
Port:	8080
Start time:	14.03.2019 11:08:07
Server version	2.5.127, Windows

Information: current information about the server.

Backup (redundancy)

- Sending email notifications [Setup](#)
- Fast redundancy ⓘ
- Constant redundancy ⓘ

Fast redundancy: when this option is on, fast redundancy will be applied to the main channels assigned to server, meaning that the redundancy will be activated not later than in 10 seconds after a loss of camera connection.

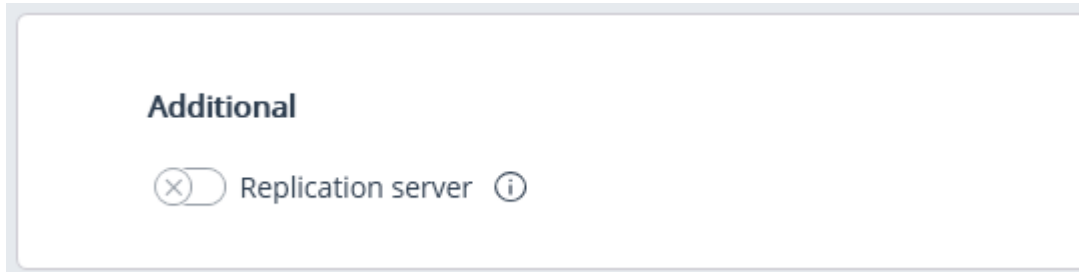
In the systems where periodical, including short-term, disruptions of camera connection are possible, enabling the fast redundancy may result in false redundancy responses.

Constant redundancy enables the constant redundancy mode. Redundancy of cameras for which this server will be assigned as the main one will work always, regardless of the status of the given server.

It is required to bear in mind that, in case of normal operation of the system, the cameras with constant redundancy will have two connections: one from the main and the



other from the redundant servers. Thus, depending on the design of the cameras, the bandwidth may increase and/or the framerate may decrease.

The **Fast redundancy** and **Constant redundancy** modes are mutually exclusive. Likewise, when the constant redundancy mode is on, notifications regarding the activation of redundancy (backup) will be switched off.




Replication server: when this option is enabled, the server is assigned as a [replication server](#). button is used to open the replication settings window.

Server licenses

The following settings are located on the  **Servers** tab on the page of server settings on the **Licensing** tab in the Eocortex Configurator application: The following settings are located on the page of  **Servers** on the **Licensing** tab in the **Eocortex Configurator** application:

Information Licensing Cameras

Key identifier 2B217205 

License parameters

Product type:	ST
License time limit:	01.03.2020
Language:	MULTI
IP camera licenses:	20 / 400
Cameras with enabled redundancy:	0 / 10
Video recorder cameras:	0 / 0
Audio stream processing modules:	4 / 10
PTZ camera control modules:	3 / 10
FishEye dewarping module:	0 / 10
Suspect search modules:	0 / 400
Face detection modules:	0 / 400
Face recognition modules:	0 / 10


[Update license](#)

Key identifier: the identifier of the active software or hardware **Eocortex** protection key.

License parameters: the parameters of the active **Eocortex** protection key license.

Update license: launching the [Install license](#) wizard.

Settings of the server's cameras

The following information regarding the cameras assigned to the server is located at the  **Servers** tab on the server settings page at the **Cameras** tab in the **Eocortex Configurator** application:

Information Licensing **Cameras**

Time zone


(UTC+01:00) Amsterdam, Berlin, Be... ▾

Cameras bound to server

Camera	IP address	Server role
office	127.0.0.1	Main
yard	127.0.0.1	Main
subway	127.0.0.1	Main
vehicle	127.0.0.1	Main
road	127.0.0.1	Main
sidewalk	127.0.0.1	Main
highway	127.0.0.1	Main
office entrance	127.0.0.1	Main
Camera 9	127.0.0.1	Main

Time zone: a setting that allows to set for the server the time zone that differs from the time zone specified in the operating system settings of the computer running the server software.

All cameras linked to this server will use this time zone by default.


The  button displayed to the right of the camera name when the camera is marked serves for jumping to camera settings.

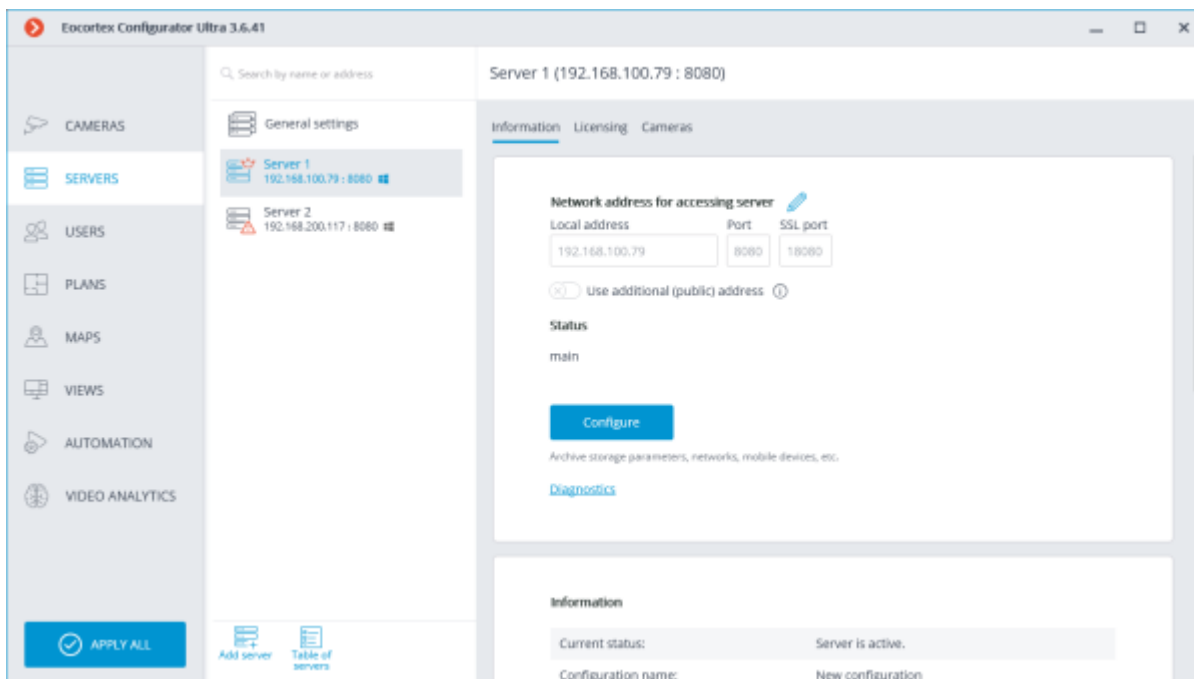
Additional server settings

The additional server settings are as follows:

- Archive allocation settings;
- Mobile and web connection settings;
- Settings of client application updates;
- Watchdog timer settings;
- Part of the network settings;
- Part of the archive replication settings (only for replication servers).

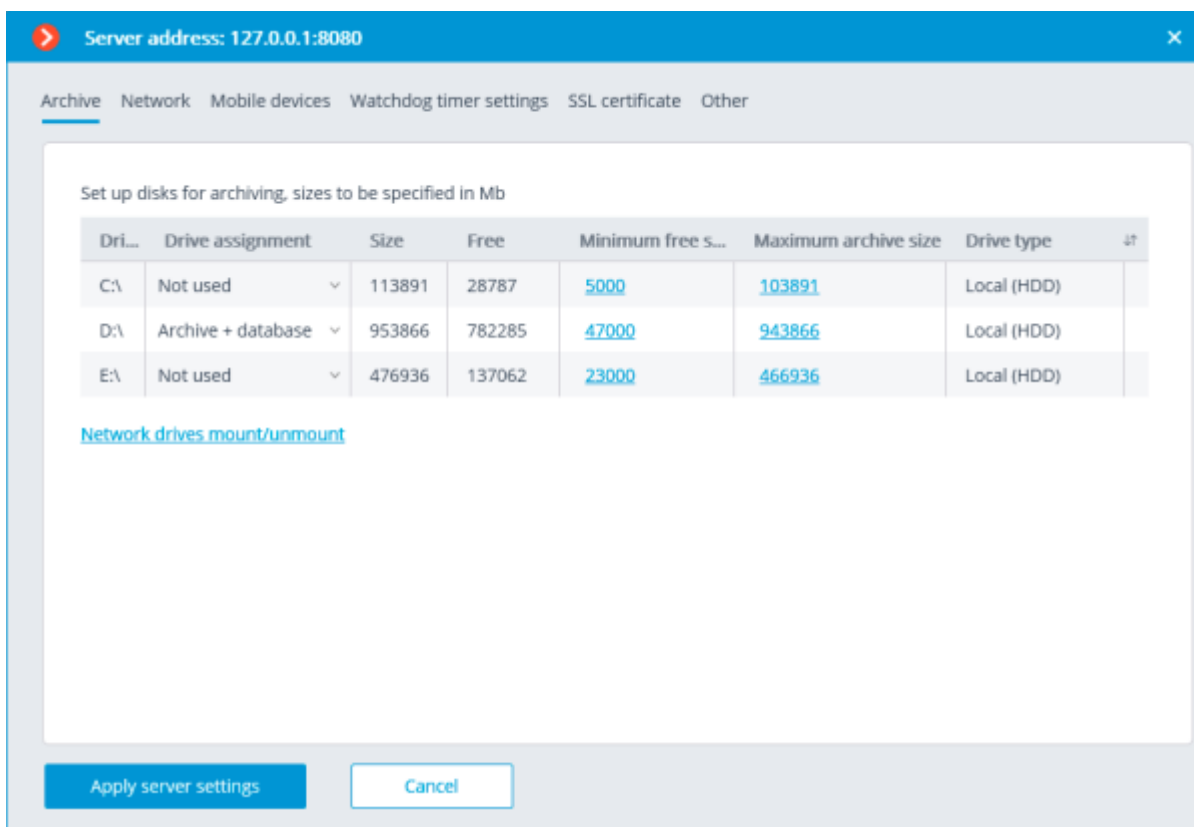
For opening the window of additional server settings, it is required to select the server in the list on

the  **Servers** tab in the **Eocortex Configurator** application, then select **Configure** in the context menu, or press **Configure** on the server settings page at the **Information** tab.



To save the changes made it is required to press the **Apply server settings** button.

Archive



Drive: logical name of a drive.

Drive assignment: indication of the usage of the drive. The following options are available:

Option	Main or redundant	Video archive	Event database
Not used	—	—	—
Archive only	main	yes	—
Archive + DB	main	yes	yes
Redundant archive	redundant	yes	—
Redundant archive + DB	redundant for archive; main for DB	yes	yes
Duplicate Archive (only for ULTRA and Enterprise)	Duplicate archive and database	yes	yes

Size: total drive size (Mb).

Free: currently remaining free space on drive (Mb).

Minimum free space: minimum drive space that is required to remain free when recording the archive (Mb). In order to set the value of this parameter, double click on the current value, enter the new one and press **Enter**.

Maximum archive size: maximum size of the archive in Mb. In order to set the value of this parameter, double-click on the current value, enter the new one and press **Enter**.

Drive type: information regarding the type of drive - **Local (HDD)** or **Network**.

Connecting network drives: this link opens network drive connection window.

Network drives mount/unmount

Attention!
Network disc will be connected only in case of a valid network path and account with non-blank password and full rights for network resource being connected (creation of folders, writing, deleting, reading). If this data is invalid, the connected disc will appear in Eocortex Configurator but will be unavailable. In such a case, it is required to disconnect the disc and connect it again with the correct parameters.

Z:\ (\server\shared) [Connect network drive](#)
[Disable network drive](#)

Unique network drive letter: Z:\ For example, letters Z, Y

Network drive path: \\server\shared For example, \\Server\Shared or \192.168.137.1\share

Username: mydomain/cctvuser For example, administrator or remote computer/user

Password: ●●●●●●

OK **Cancel**

To connect a network drive, select a letter that will be used to designate the network drive being added in the **Connecting/disconnecting network drives** window, indicate a path to the network drive in the corresponding fields, and enter the user name and password of the user who has access to reading, writing and creating files and folders on this path; then click on the **Connect network drive** link and press the **OK** button.

After pressing the **OK** button, the server will restart and all the network drives listed will be added to the list of drives displayed in the **Archive** tab. After that, you will be able to configure the network drives in the same way as the local drives.

For disconnecting a network drive it is required to select the drive to be disconnected in the list of drives in the **Connecting/disconnecting network drives** window, then press the **Disable network drive** link, and then the **OK** button.

After you press the **OK** button, the server will restart and all the network drives not in the list will be excluded from the list of drives displayed on the **Archive** tab.

At the first start of the server its default settings are created automatically. **C:** drive is connected to the archive. During the initial setup it is recommended to assign other drives for archive allocation, because the placement of the archive on the same physical drive with the **Windows** operating system may lead to the reduction of productivity or system errors.

It is not recommended allocating database on the network drives.

The archive is stored on the server with the indication of the **Coordinated Universal Time (UTC)**. At that, in the client applications the local time of the device used for viewing the archive is displayed (with account for the time zone).

Example:

On the server with the time zone settings of **(UTC+03:00) Moscow** a fragment of the archive from 12:00 to 12:05 Moscow time is recorded.

This fragment launched directly on server in the **Eocortex Client** will be displayed with the time of 12:00 12:05.

If this same fragment is displayed on the computer with the time zone settings of **(UTC+05:00) Ekaterinburg**, the fragment's time will be from 14:00 to 14:05.

If the fragment is displayed on the computer with the time zone settings of **(UTC+01:00) Paris**, its time will be from 10:00 to 10:05.

Archive data:

The archive of each server stores the video recordings of only those channels that are assigned to this particular server.

The archive has a cyclic structure. If the space designated for the archive is full, the new archive files begin to replace the oldest ones, taking into consideration the archive depth parameters set for each channel.

When several drives are used, the recording to archive is performed simultaneously to all the available drives. If one of the drives becomes unavailable, the recording to it stops and the data is redistributed to the available drives. Likewise, if the unavailable drive becomes available again, the recording of data to it resumes.

One or more drives may be assigned as redundant. The recording of the new data to the redundancy drives starts only when all the main drives become unavailable; when a main drive becomes available again, the recording to the redundancy drives stops.

The archive is located in the **EocortexArchive** folder in the root directory of each drive used for archive storage.

One or more disks can be assigned as duplicates. New data is recorded on the duplicating discs in parallel with the recording on the main or backup discs.

Network

Server address: 127.0.0.1:8080

Archive Network Mobile devices Watchdog timer settings SSL certificate Other

Allow server location according to UPnP protocol

Accept RTSP connections (to broadcast H.264)

RTSP/TCP port:

Allow Mjpeg broadcasting via RTSP ⓘ

Accept ONVIF connections ⓘ

User name: Password:

Allow multicasting

Realtek PCIe GbE Family Controller (rt640x64)

Apply server settings Cancel

Allow server location according to UPnP protocol: enables the **UPnP** protocol for the video surveillance server that allows to locate the server in the network using the stated protocol.

Accept RTSP connections (to broadcast H.264 and MJPEG): allows to receive video stream and operational information using direct requests to server via **RTSP** protocol.

RTSP port (for TCP or HTTP connections): port for client connections to server using **RTSP** protocol.

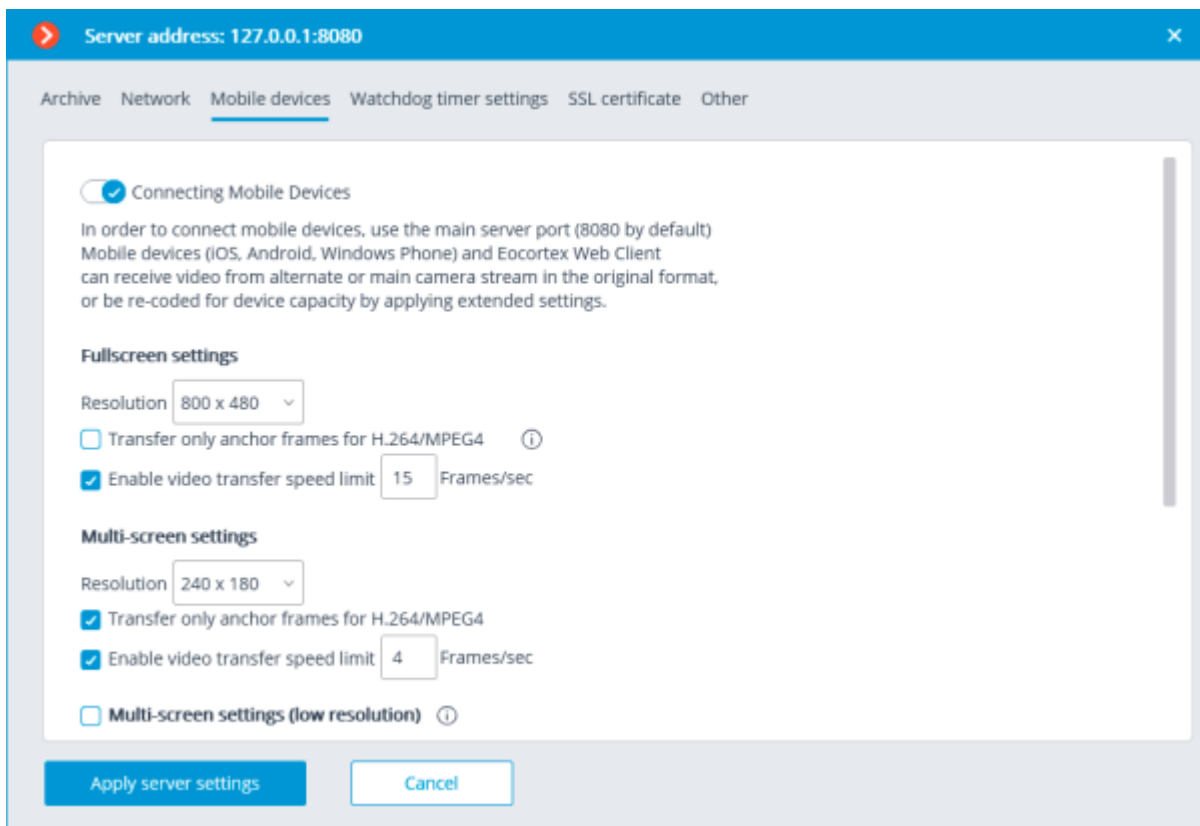
Allow MJPEG broadcasting via RTSP: enables **MJPEG** broadcasting via **RTSP** protocols.

Since **RTSP** protocol only supports **MJPEG** frames encoded in the base (**Baseline**) encoding mode, for broadcasting video streams encoded in other modes their recoding will be required. It will increase server load. Moreover, in the course of **MJPEG** recoding the framerate can be reduced (in comparison with the framerate transmitted directly by camera).

Accept ONVIF connections: enables client connections to video surveillance server via **ONVIF**. By default, username is **onvif**, password — **onvif**. It is recommended to change password when enabling this option. Username cannot be modified.

Allow multicasting: enables multicasting from the server for those channels that have this option on. If there is more than one network adapter installed on the computer, it will be possible to choose the adapter for multicasting in the dropdown list that appears upon enabling this option.

Mobile devices



Allow connecting mobile devices to server: activates the service of broadcasting video streams for mobile devices and web clients built in the **Eocortex** server application.

This service is also used for arranging broadcasting to site.

Depending on the resolution of the connected mobile device or web browser, the service can broadcast video streams in two or three modes:

Good quality (high resolution): used for full-screen mode.

Medium quality (medium resolution): used for multiscreen mode.

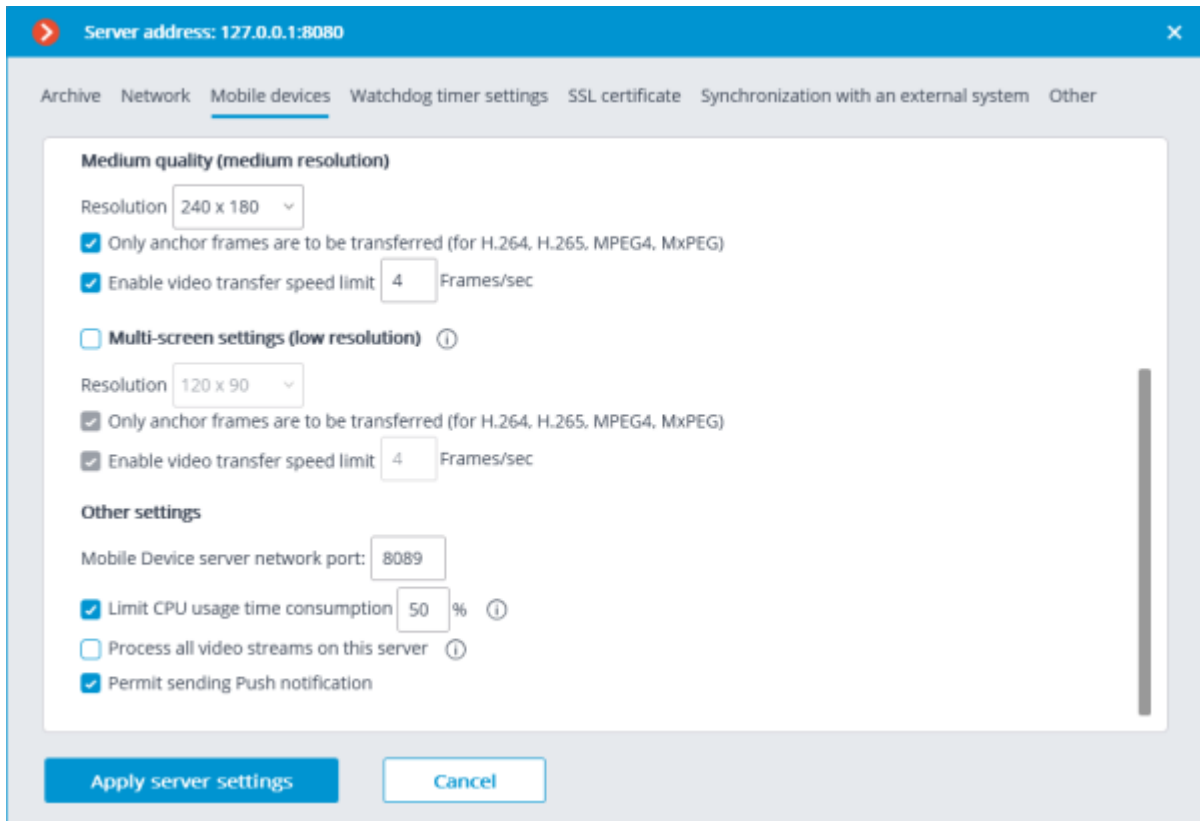
Low quality (low resolution): used for low resolution multiscreen mode. This mode is off by default.

It is possible to set the following for each of the modes:

Resolution that will be broadcast by default for each of the channels.

Transfer only anchor frames for H.264/MPEG-4: for these codecs, only anchor (key) frames will be broadcast; this setting allows to reduce the amount of data transferred in the networks with limited bandwidth.

Enable video transfer speed limit: the framerate of the frames being transferred will be limited to the set value; this setting permits to reduce the amount of data transferred in the networks with limited bandwidth.



Other settings:

Mobile device server network port: allows to set the port thru which the connection to the video stream broadcasting service will be available.

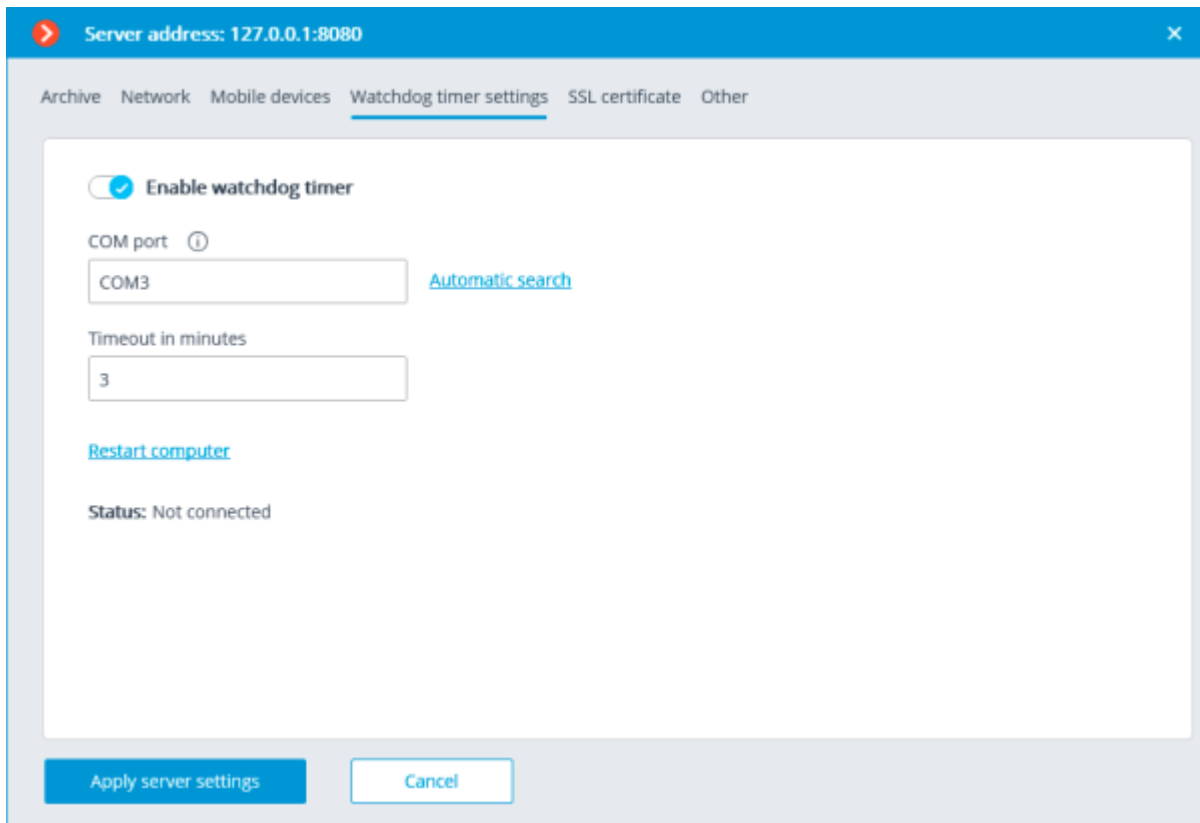
Limit CPU usage time consumption: allows to limit the consumption of CPU time by the mobile connections service.

Process all video streams on this server: when this option is enabled, all video streams sent from this server to mobile applications will be reencoded on this server; if the option is disabled, the streams will be reencoded on those servers to which the cameras are connected, and already reencoded streams will be sent to this server.

This feature appeared in **Ecocortex** version 3.4. The servers upgraded from earlier versions will have this option enabled. The option is disabled by default for new servers.

Permit sending Push notification: enables the possibility of sending various Push notifications from the server to mobile devices.

Watchdog timer settings



Enable watchdog timer: activates interaction with the watchdog timer.

COM port: assigns a COM port to which the watchdog timer is connected.

Automatic search: performs automatic search for a connected watchdog timer.

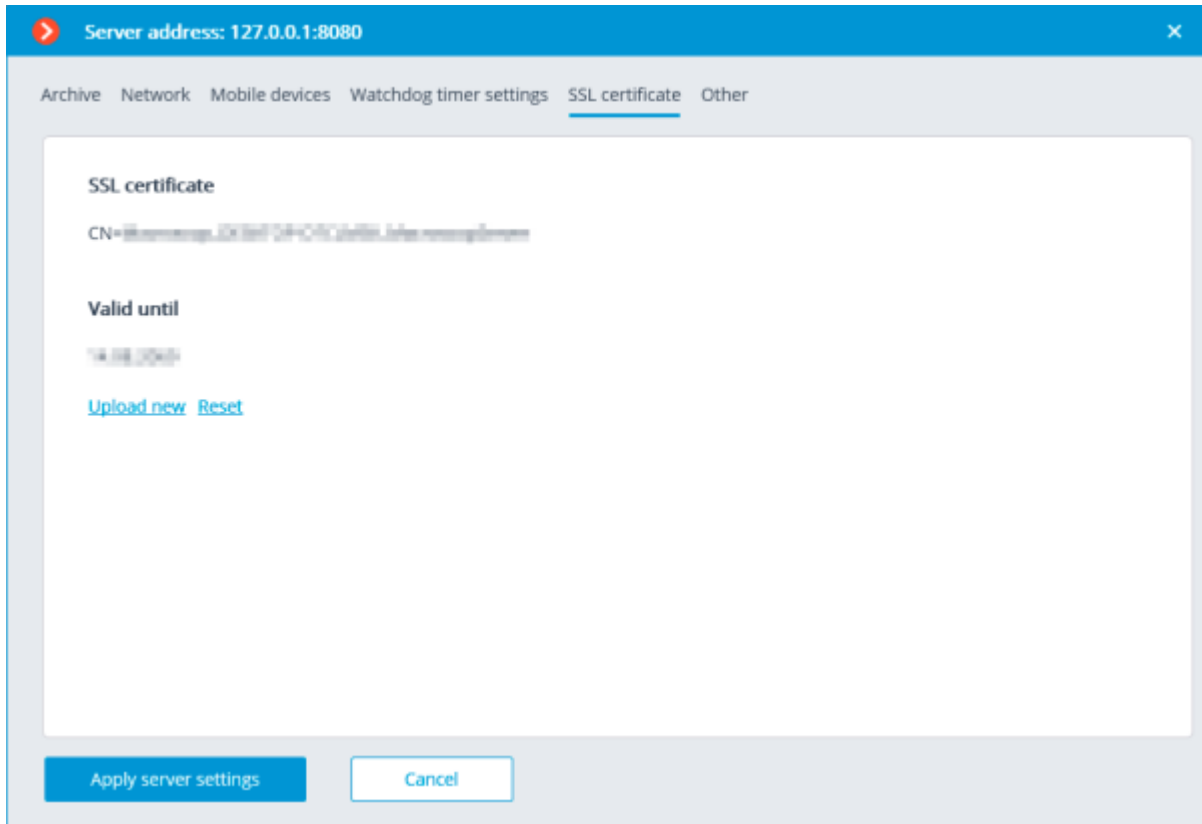
Timeout in minutes: sets a period after which the watchdog timer is triggered.

Restart computer: restarts the computer being set up.

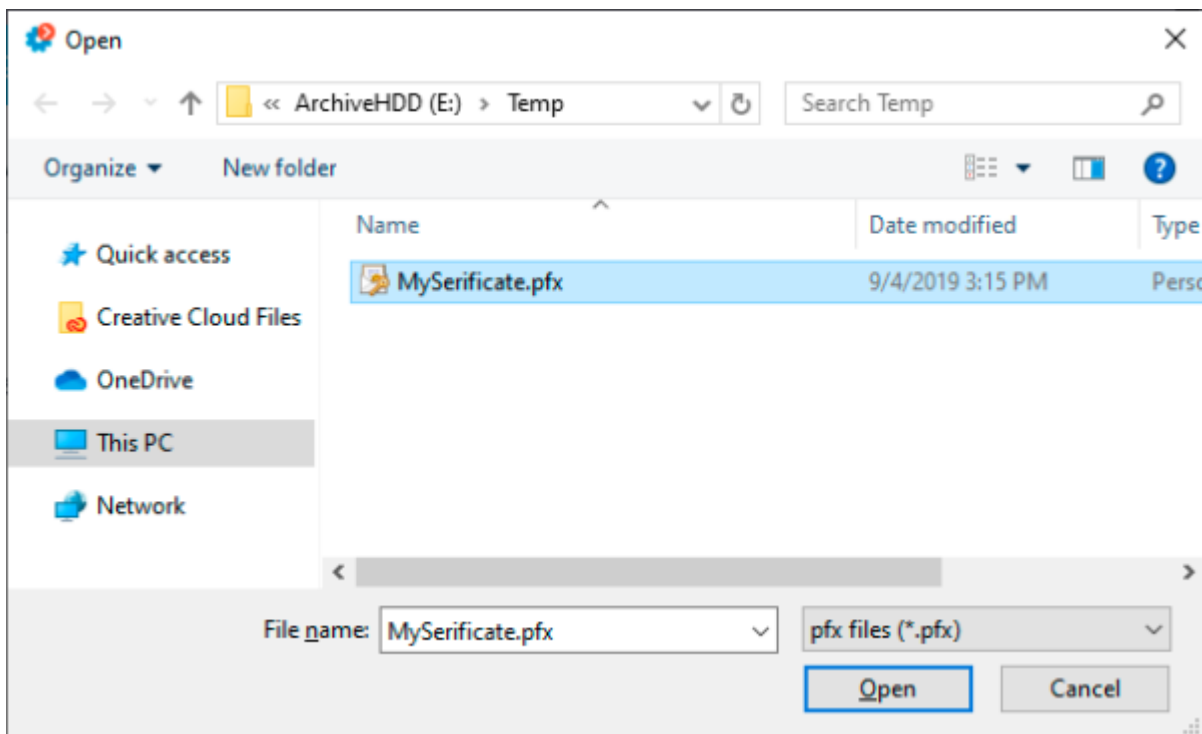
Status: displays the current watchdog status.

Firmware version: displays the current version of watchdog firmware.

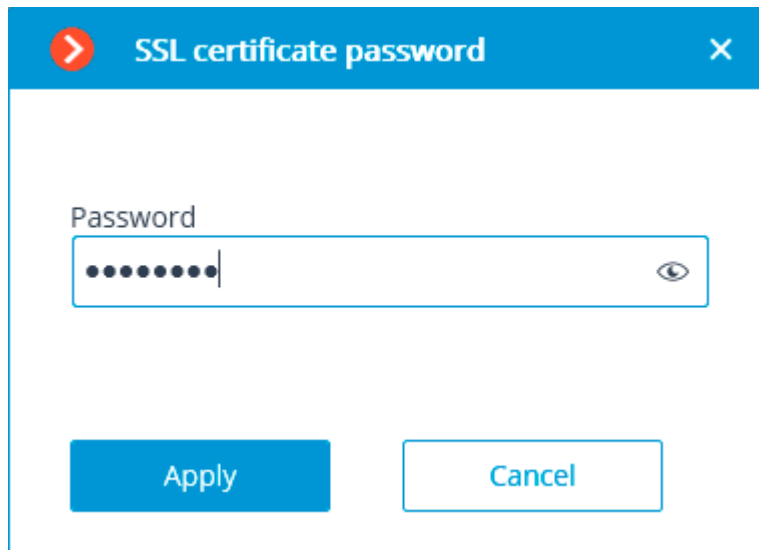
SSL certificate



This tab shows the parameters of the certificate installed on the server. Likewise, it is possible to install a new certificate instead of the current one using the **Upload new** link.



When installing the certificate, it could be required to enter the password assigned to the certificate.



The image shows a dialog box titled "SSL certificate password" with a blue header bar containing a red arrow icon and a close button (X). The main area is white and contains a "Password" label above a text input field. The input field contains ten black dots, indicating a masked password, and a small eye icon on the right side. Below the input field are two buttons: a solid blue "Apply" button and a white "Cancel" button with a blue border.

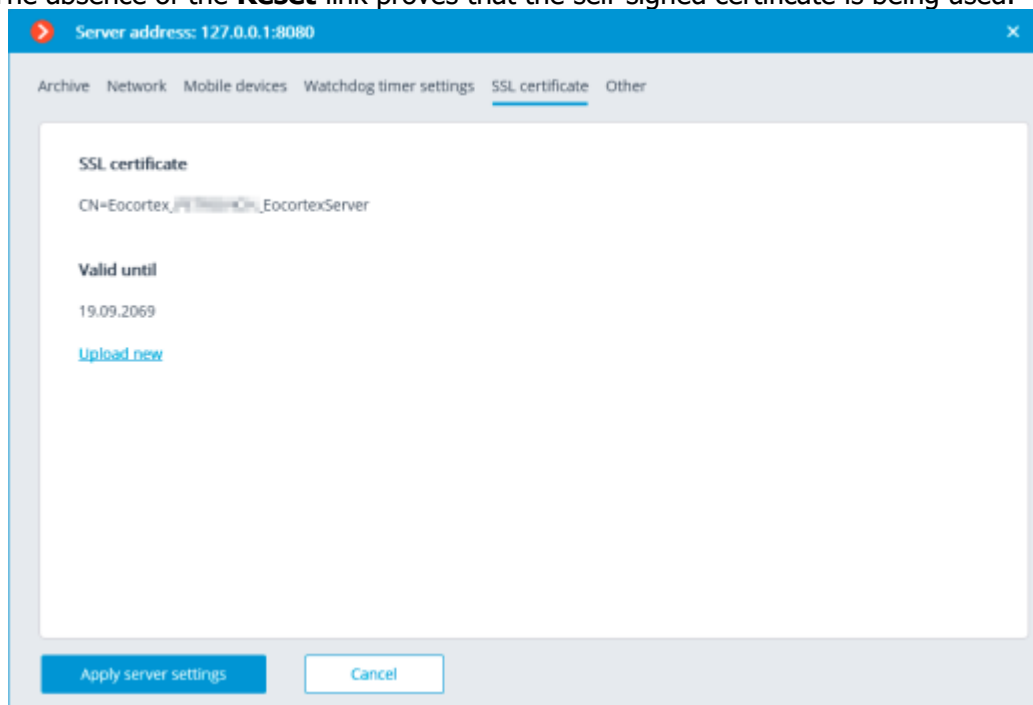
The uploaded certificate will be used for encrypting the secure connections only after the server settings are applied.

All the information regarding the modification and usage of the certificate is recorded in the event log.

If a third-party security certificate for the server is not installed or it has been impossible to load it during the launch of the server, the self-signed TLS certificate will be used for establishing secure connections with the server. Such certificate is generated on the server in the process of creating a new configuration of the video surveillance system. The self-signed TLS certificate has the following disadvantages:

- The certificate can be replaced by an insecure one within the network; the user may not even notice that, confirming the insecure connection.
- The users of the web application will have to confirm the insecure connection every time; it may lead to the distrust of the users.

The absence of the **Reset** link proves that the self-signed certificate is being used.



The image shows a screenshot of a web application interface. At the top, a blue header bar displays "Server address: 127.0.0.1:8080" and a close button (X). Below the header is a navigation menu with tabs: "Archive", "Network", "Mobile devices", "Watchdog timer settings", "SSL certificate" (which is underlined), and "Other". The main content area is titled "SSL certificate" and shows the following information: "CN=Eocortex, CN=EocortexServer". Below this, it says "Valid until" followed by the date "19.09.2069". There is a blue link labeled "Upload new". At the bottom of the page, there are two buttons: a solid blue "Apply server settings" button and a white "Cancel" button with a blue border.

Synchronization with an external system

On this tab, it is possible to enable and set up the import of a face database used by one of the **Eocortex** Face Recognition modules from files located in a folder on the drive.

Synchronization with an external system is available for Windows only.

The screenshot shows a configuration window for 'Synchronization with an external system'. The window title is 'Server address: 192.168.200.84:8080'. The 'Synchronization with an external system' toggle is checked. The 'External system' dropdown is set to 'File system'. Under 'Face database', the 'Module' dropdown is 'complete', 'Path to folder' is 'C:\FaceDB', 'Login' is 'root', and 'Password' is empty. 'Synchronization status' is 'Unknown'. 'Synchronization period' is '1' hour, and 'Size of synchronization unit' is '50'. Buttons for 'Apply server settings' and 'Cancel' are at the bottom.

To perform setup, it is required to select **File system** as a type of external system and indicate a folder on the drive where the data will be uploaded from. The periodicity and the size of a data block are also set here, as well as the current synchronization status.

Only those entries of employees that contain photos suitable for use by the **Eocortex** Face Recognition module will be imported from the file system.

The entries imported from the file system are rerecorded during each synchronization session. Thus, if such entry is modified in **Eocortex**, the modifications will be lost during the subsequent synchronization session.

The image files will be uploaded from the server folder specified in the settings, and the full names will be derived from the filename; for that end, the words in the filename must be separated by spaces.

The synchronization can be enabled only for one of the Face Recognition modules.

For the synchronization to work, it is required that at least one camera assigned to the server with the synchronization set up had a synchronized Face Recognition module enabled.

In a multiserver system, the synchronization can be enabled only on one **Eocortex** server.

To connect to the Eocortex server, it is required to have a login and a password of the user with the rights to edit face and license plate databases in the **Eocortex** system.

In the course of the first synchronization session, all the entries of employees that meet the requirements (those with photos suitable for recognition) will be imported into **Eocortex**. However, those entries that have been added to the **Eocortex** Face Recognition module's database manually will not be affected in any way by the process

of synchronization. During the subsequent synchronization sessions, only those entries that were modified, added or deleted in the file system after the previous synchronization session will be imported.

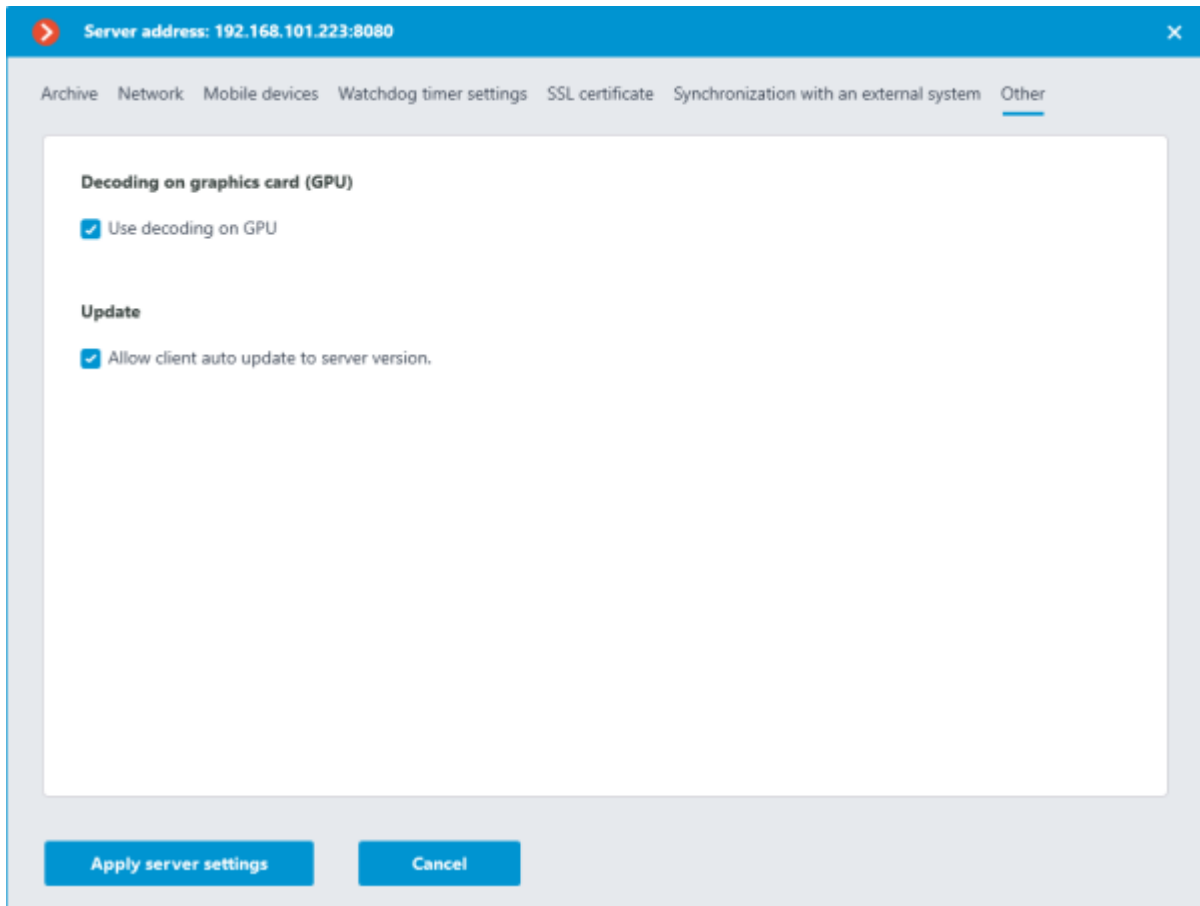
The synchronization period can be set in the range of 1 minute to 40 days.

Each entry of the **Eocortex** face database imported from the file system will have a corresponding note.


Other

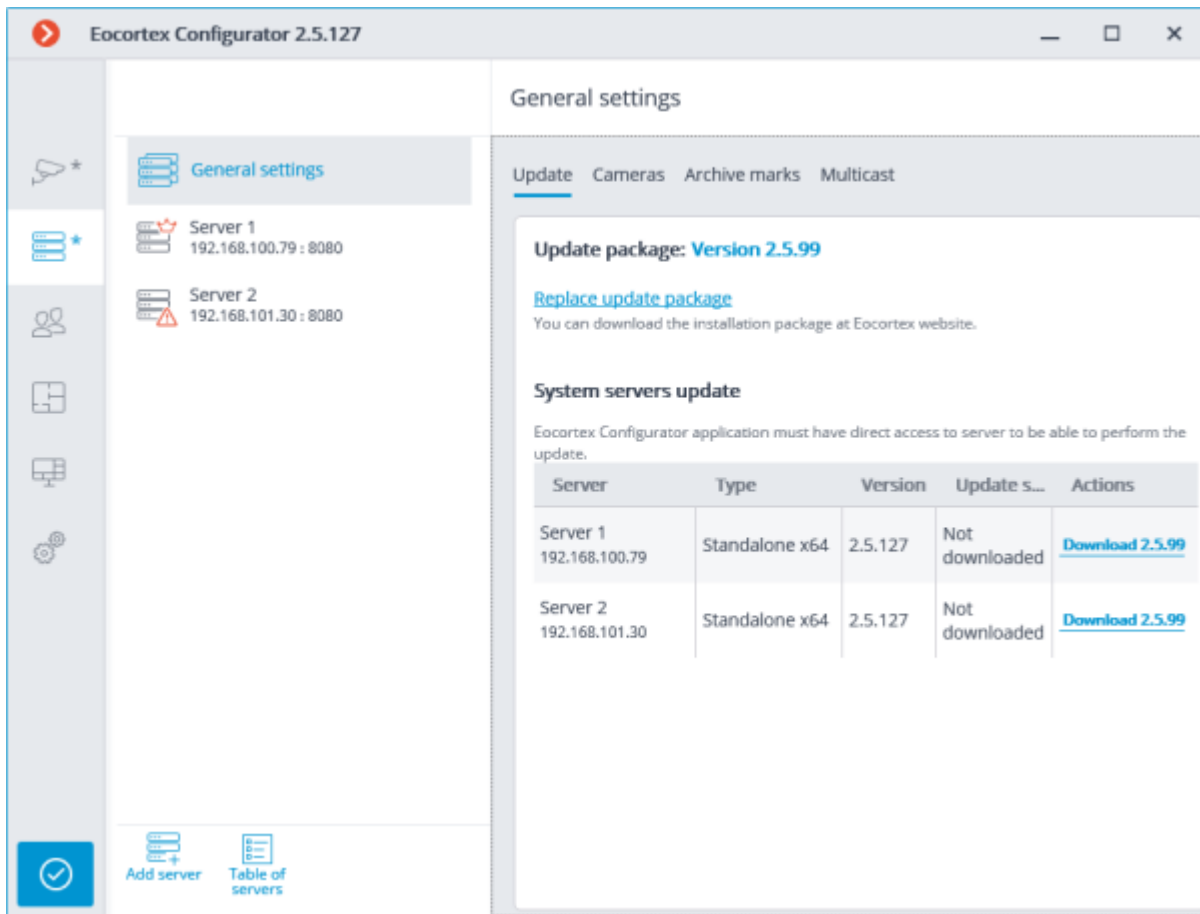
This tab allows optimizing the system load by enabling the **Use decoding on GPU** option.

Additionally, it is possible to enable the mechanism of automatic update of client applications built into the server application in the **Allow client auto update to server version.** option.



Centralized server update

In the **Eocortex Configurator** application, on the  **Servers** tab, under **General settings** item in the **Update** tab the centralized server update tools are located.



Before updating the server applications, it is required to upload the update package to the **Eocortex Configurator** application on the computer. The package can be downloaded following the **Load updates** link, or **Replace update package** in case the update package of another version has already been downloaded. It is required to download the file of the complete distribution package: **EocortexMainCommon Installer.exe**.

The most up-to-date version of **Eocortex** can be downloaded at eocortex.com: The distribution packages can be found at [Support / Software Installation Packages Supported](#).

To update the server, it is required to perform the following procedure on the server in the **System servers update** table:

- For the servers with the **Not downloaded** status: perform the **Download ...** action.
- For the servers with the **Loaded** status: perform the **↓ Install version ...** action.

Update package: **Version 2.5.99**

[Replace update package](#)

You can download the installation package at Eocortex website.

System servers update

Eocortex Configurator application must have direct access to server to be able to perform the update.

Server	Type	Version	Update status	Actions
Server 1 192.168.100.79	Standalone x64	2.5.127	Not downloaded	Download 2.5.99
Server 2 192.168.101.30	Standalone x64	2.5.127	Downloading: 18%	Break

Update package: **Version 2.5.99**

[Replace update package](#)

You can download the installation package at Eocortex website.

System servers update

Eocortex Configurator application must have direct access to server to be able to perform the update.

Server	Type	Version	Update status	Actions
Server 1 192.168.100.79	Standalone x64	2.5.127	Not downloaded	Download 2.5.99
Server 2 192.168.101.30	Standalone x64	2.5.127	Installation (2-10 minutes)...	

Update package: **Version 2.5.99**


[Replace update package](#)

You can download the installation package at Eocortex website.

System servers update

Eocortex Configurator application must have direct access to server to be able to perform the update.

Server	Type	Version	Update status	Actions
Server 1 192.168.100.79	Standalone x64	2.5.127	Not downloaded	Download 2.5.99
Server 2 192.168.101.30	Standalone x64	2.5.99	Already installed	↩ 2.5.127

For the server with the **Already installed** status the  **Roll back to ...** action is available, allowing to roll the server back to the previous version. In this case all the server settings go back to the values existing before the update.

If the server was updated using the centralized update procedure more than once, it is possible to roll back to any previous version in the opposite order, step by step.

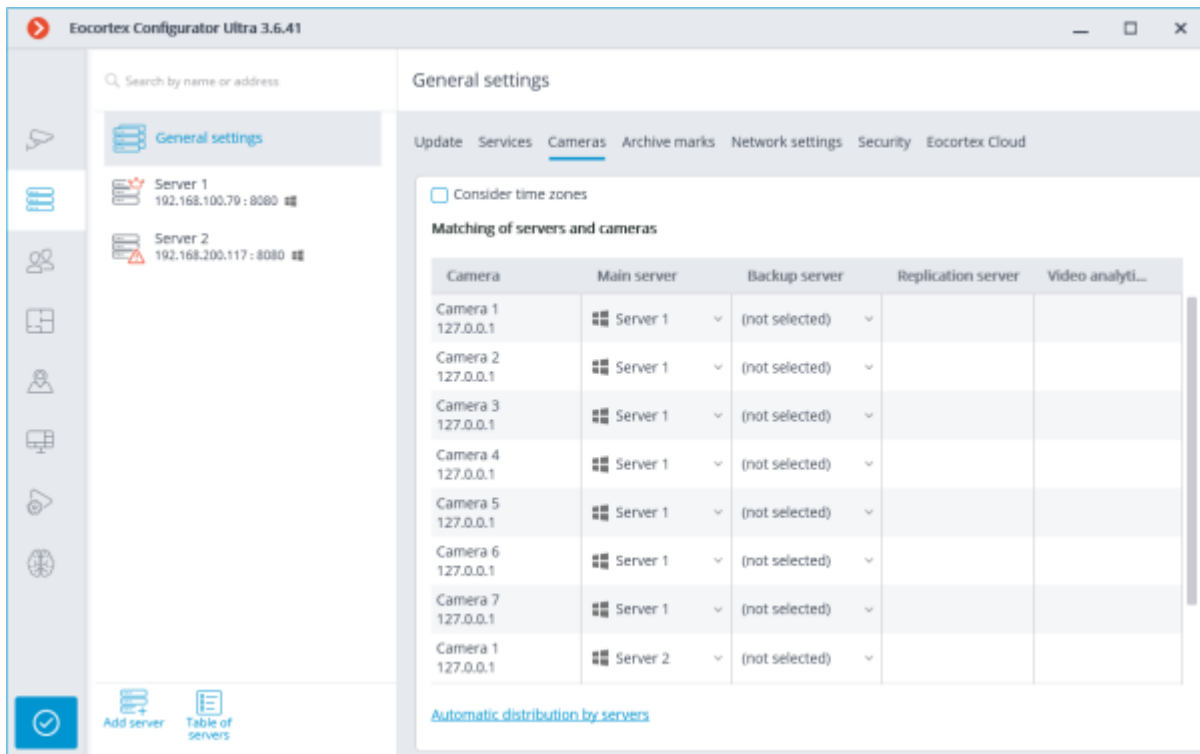
The centralized update is available only for the **Eocortex Server** and **Eocortex Standalone** applications. For the **Eocortex NVR** application the centralized update is not available.

The **Eocortex** server applications can be updated not only to the newer versions, but also to the older ones, provided that the first two digits of the version number are the same.

To upgrade servers to version 4.0 or higher, first upgrade those servers to version 3.6.57 or higher.

Distribution of cameras among servers

In the **Eocortex Configurator** application, on  **Servers** tab, the table of camera distribution among servers appears upon selecting the **General settings** item.




Consider time zones: this slider enables the ability to respect the selected time zones in applications.

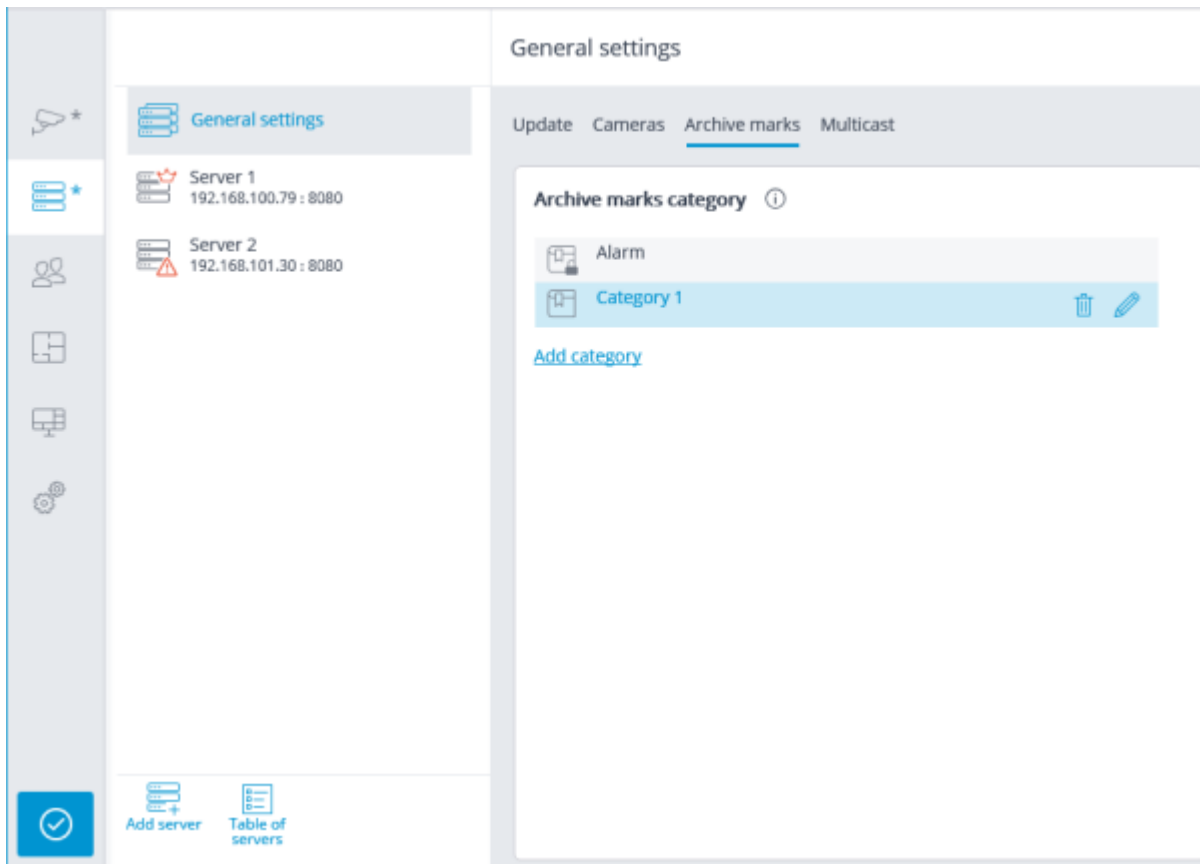
The changes made to the assignment of cameras to servers will take effect only after [the changes are saved](#).

The search in the drop-down menu during the server selection can be performed by any part of the searched word.

Camera	Main server	Backup server	Replication server	Video analyti...
Camera 1 127.0.0.1	Server 1	(not selected)		
Camera 2 127.0.0.1	2	(not selected)		
Camera 3 127.0.0.1	Server 1	(not selected)		

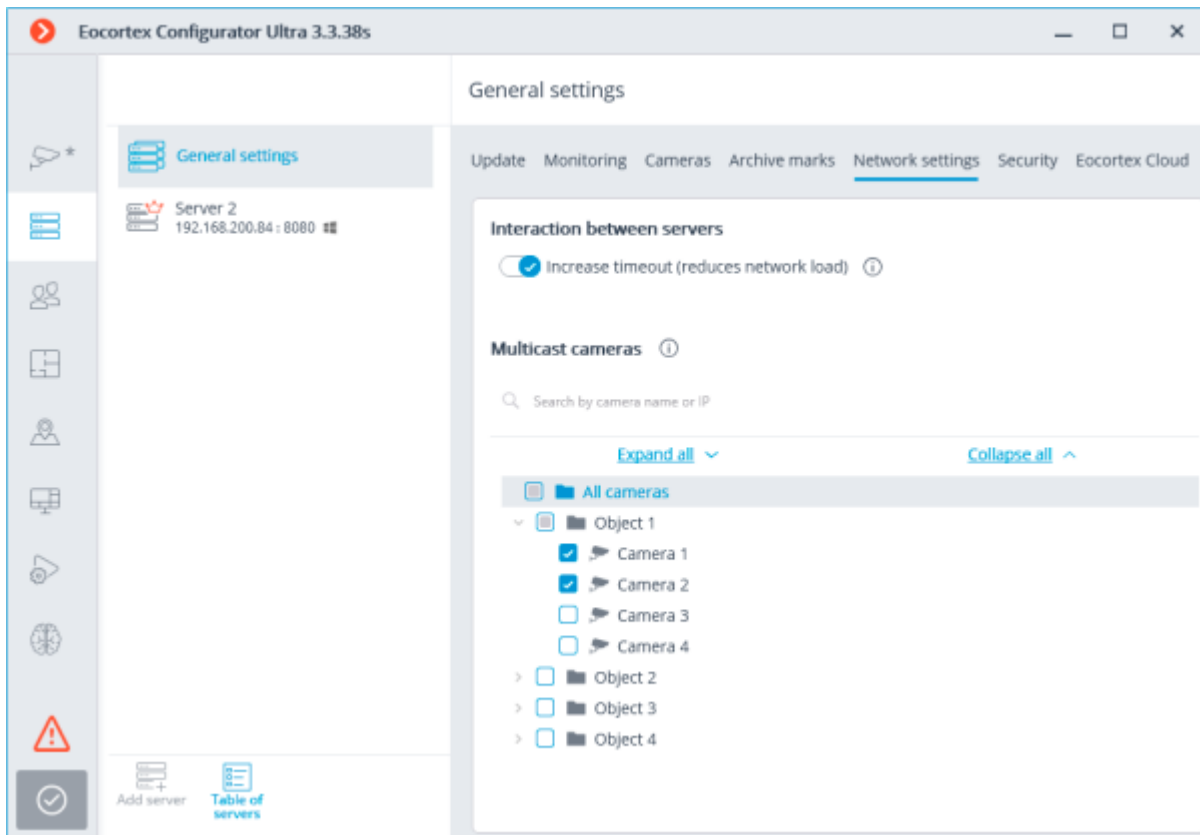
Archive bookmark category setup

In **Eocortex Configurator**, on the  **Servers** tab, the list of archive bookmark categories appears on the **Archive bookmarks** tab when selecting the **General settings** item.




General settings: Network settings

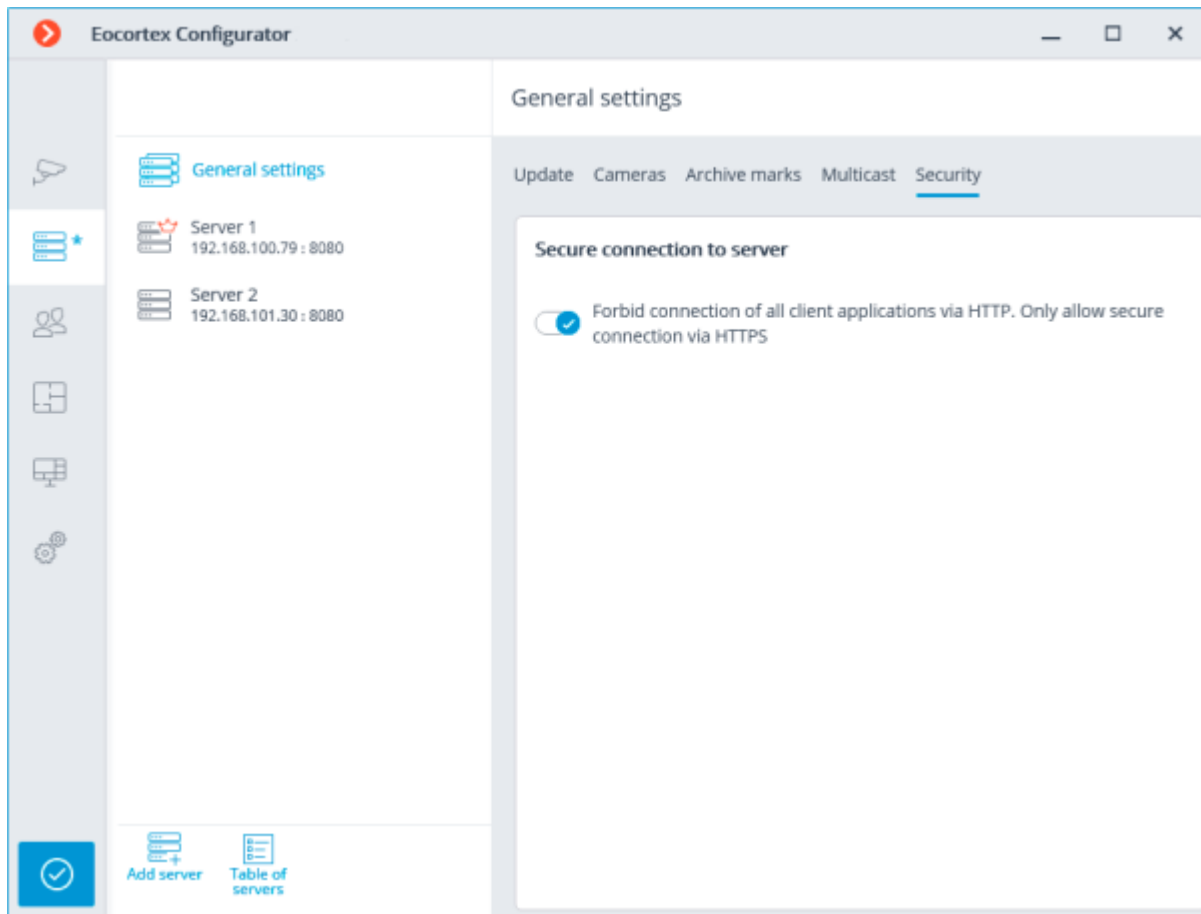
The settings of interaction between servers can be found in the **Eocortex Configurator** application, on the **Servers** page. The camera tree with the possibility to enable multicasting from a server appears on the **Multicast** tab upon selecting the **General settings** item.



When the **Increase timeout (reduces network load)** option is enabled, the period of data exchange between the main and the subordinate servers increases from several seconds to 1 minute.

General settings: Security

The insecure connections (via HTTP) will be forbidden when enabling the **Forbid connection of all client applications via HTTP. Only allow secure connection via HTTPS** option for all the system servers in the **Eocortex Configurator** application on the  **Servers** page, at highlighting the **General settings** item on the **Security** tab.



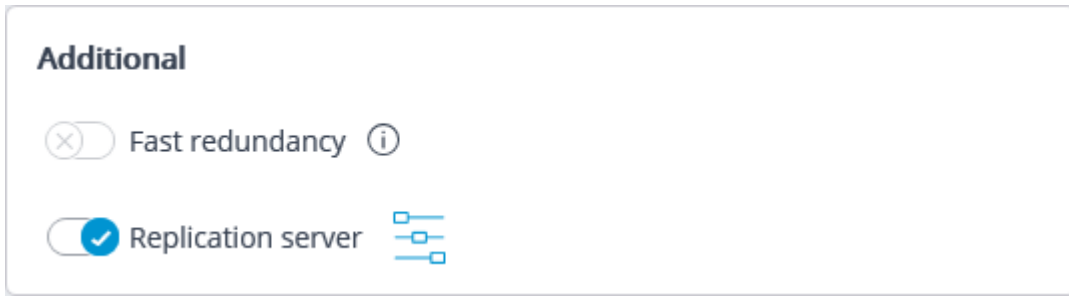
When applying the settings after enabling this option, the **Eocortex Client** and **Eocortex Web-client** applications connected to the servers will be automatically restarted using the secure connection. At the same time, the **Mobile client for Android** and **Mobile client for iOS** applications will not be restarted in this situation. Later on, the prohibition of the insecure connections to servers will be valid for all new connections from the **Eocortex Client**, **Eocortex Web-client**, **Mobile client for Android** and **Mobile client for iOS** applications. At that, the **Eocortex Client** application will be connected using the secure connection even in case of an attempt to use the insecure connection.


Replication server

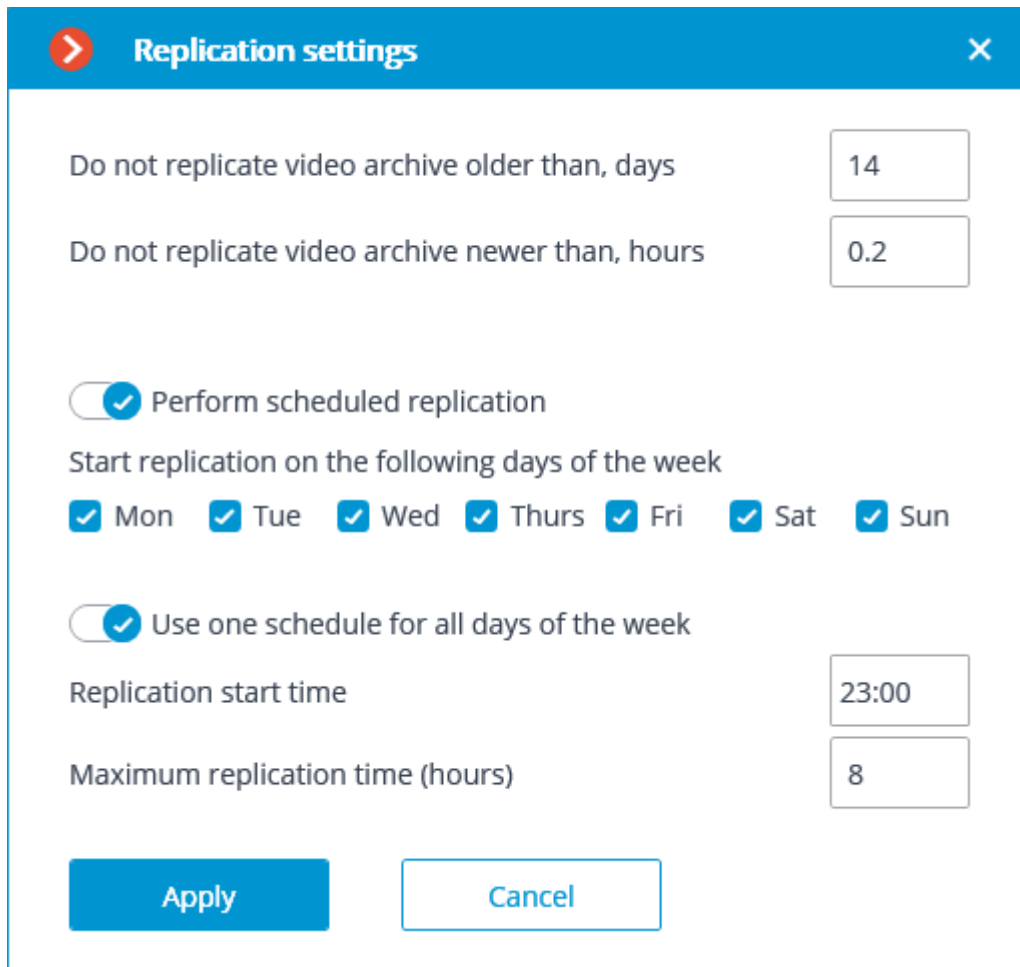
The **Replication server** is the server that stores backup copies of the archives from the other servers. The role of a replication server can be assigned to one or several servers in the system.

The replication server cannot be assigned as main or redundancy server for the cameras.

For using a server as the replication one, it is required to enable the **Replication server** option in the **Eocortex Configurator** application, on the  **Servers** tab, on the **Information** tab of the server settings page.



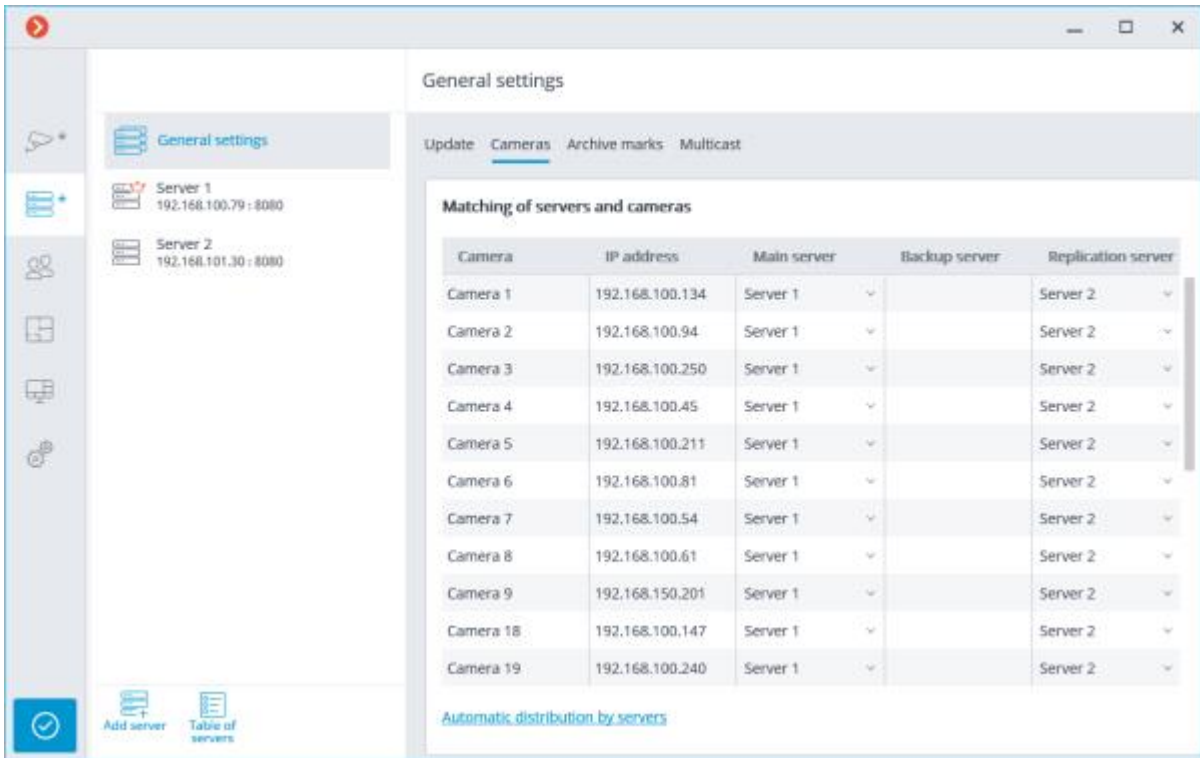
Then, by clicking the  button, open the **Replication settings** window, set the replication depth limits and schedule, and select channels that will be replicated on this server.



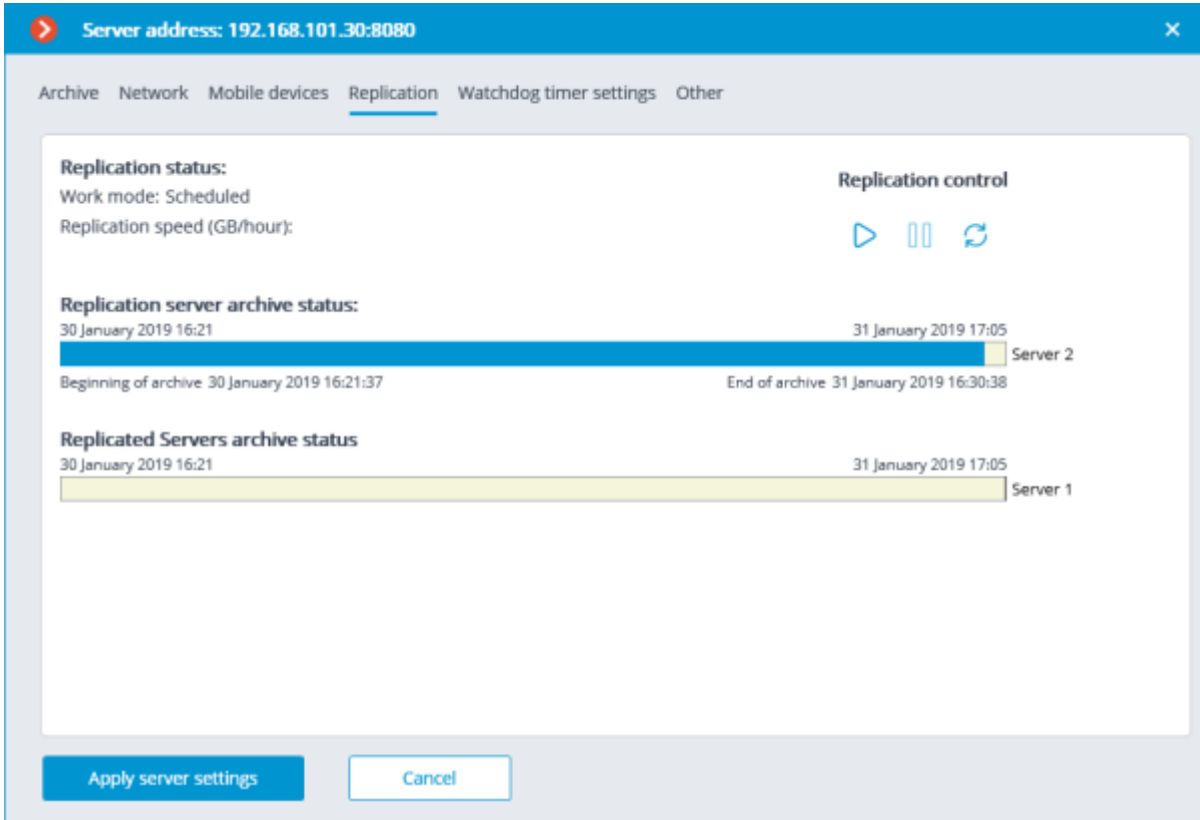
Then using one of the methods (thru camera settings, camera group settings, or camera distribution among servers settings) indicate the cameras the archives of which will be replicated.

The screenshot shows a web interface for configuring a camera. On the left is a navigation tree with a search bar and expand/collapse options. The tree shows a hierarchy: All cameras > Object 1 > Group 1.1 > Camera 1 (192.168.100.134). Below the tree are icons for Automatic search, Add camera, Add folder, and Camera table. The main area is titled 'Object 1 > Group 1.1 > Camera 1' and indicates the camera is active. It has tabs for Connection, Rights, Archive, Motion detector, and Analytics. The 'Connection' tab is active and contains sections for Device (Brand: ONVIF, Device type: Camera, Model: Compatible device), Authorization (Username: admin, Password: masked), Servers (Main server: Server 1, Replication server: Server 2), and Video streams (Alternative stream: checked). A 'TEST CAMERA' button is at the bottom.

The screenshot shows a 'Camera group editing' dialog box. It has a title bar with a close button. Below the title bar is a search bar and the text 'Cameras being edited: 21'. There are tabs for Connection, Rights, Archive, and Motion detector. A warning icon and message state: 'The settings will be changed for all cameras in the folder. Only explicitly made settings will be modified; at that, only settings supported by the specific camera will be changed.' The 'Authorization' section has fields for Username and Password. The 'Servers' section has dropdowns for Main server and Replication server (set to Server 2), with a note 'Will be applied for camera 21'. The 'Video streams' section has dropdowns for Main stream video format and Alternative stream video format, with a pencil icon and 'Alternative stream' text. At the bottom are 'Apply' and 'Cancel' buttons.




The current replication status is displayed on the  **Servers** tab of the **Eocortex Configurator** application, on the **Replication** tab of the server settings item. On this tab you can also manually start or stop the replication process.

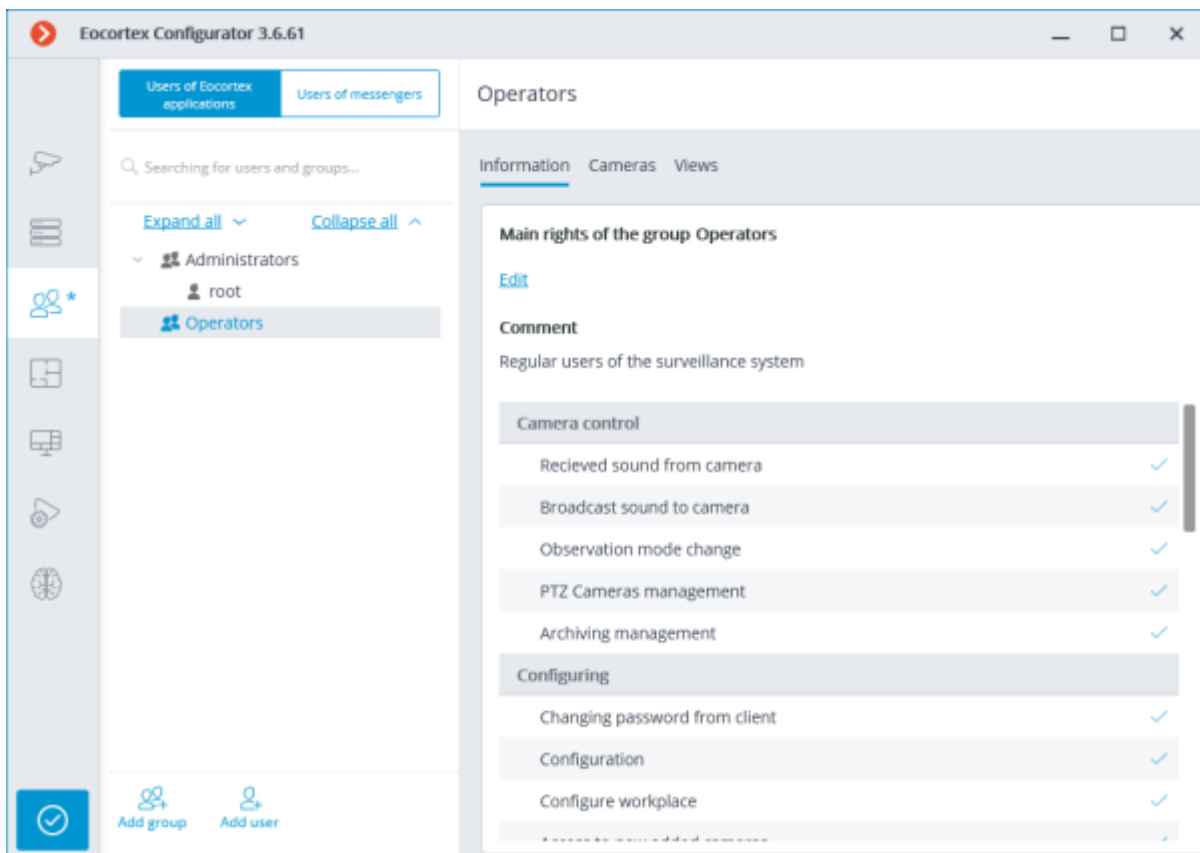


Users

The **Eocortex Configurator** application allows you to configure the rights of various categories of users of the video surveillance system.

Users of Eocortex applications (ML, LS and ST licenses)

To set up the rights of users of the Eocortex system running on **ML**, **LS** or **ST** license, run the **Eocortex Configurator**, open the  **Users** page and select the **Users of Eocortex applications** tab.



The tree of the groups and the users

The left part of the window contains a hierarchical tree of groups with the surveillance system users created in them. To configure an existing group or an individual user, select the required item in the list – the settings page of the selected group/user will be displayed in the right part of the window.

For the convenience of finding the necessary groups/users, the search field above the list can be used.

Particularities and limitations of user rights:

- The rights are provided only to the entire groups of users and are extended to all the users of the group. Individual users cannot be granted any rights that differ from the rights of the group.
- A single user can belong to only one group. A group may not contain users at all, but it is not possible to create a user which does not belong to any group.
- Every user is assigned a unique password.



- A user can be moved from one group to another, maintaining its password. The rights of the user in this case are modified according to those of the current group.

User groups in **Eocortex** running on **ML**, **LS** or **ST** licenses have two levels of rights:

- **Administrators:** System administrator access level. This is embedded group. Users of the group can configure the entire system, create, modify and delete other groups and users, view and listen to any cameras both in real time and from the archive. This group and its users can be deleted, provided that at least one user with configuration rights exists.
- **Operators:** Regular system user access level. The rights of group members with this level of access are limited to viewing cameras without access to the system configuration.

The ability to create user groups with partial system configuration rights is available only for **Eocortex** systems running on **Enterprise** and **ULTRA** licenses.

Below is the list of actions available when setting up users of the system. These actions can be performed either from the context menu of the group/user, or using the buttons below the list of users and groups, or via links on the group or user information page. Some actions can be performed in multiple ways, including using hotkeys.

-  **Add group:** Opens the window of adding a group.
-  **Add user:** Opens the window of adding a user to the selected group.
- **Add group based on the selected one:** Adds a new group with the rights identical to those of the selected group.
- **Edit:** Opens the editing window for the selected group or user.
- **Delete:** Removes the selected group or user from the configuration.

The settings will come into effect only after they are [applied](#).

Operator permissions tree

Operator

Below is a list of the access rights that can be set for the user group with the Operator privilege level.

Surveillance

Access rights settings section, which is responsible for interaction with **Eocortex** using [client applications](#).

Includes the following subsections:

- **Basic**
A subsection that determines the accessibility of sections and functions of the **Eocortex Client** application to users belonging to this group.
- **Camera control**
- **Audio streaming from camera**
Provides the ability to listen to the sound received from the camera microphone. To receive sound in the system, the camera must have the **Sound capturing** option enabled in the [connection settings](#).
- **Broadcast sound to camera**

Provides the ability to transmit sound from a microphone installed at a user's workplace to the camera speaker. To transmit sound from the system, the camera must have the **Sound transmission** option enabled in the [connection settings](#).

- **Observation mode change**

Provides the ability to arm one or more cameras with the [Guard mode](#) in the **Eocortex Client** application in order to receive notifications when alarm events occur.

- **PTZ Cameras management**

Provides the ability to use the [PTZ functionality of the camera](#) in the **Eocortex Client** application. To use the PTZ functionality, the camera must have the **PTZ capabilities** option enabled in the [connection settings](#).

- **Archiving management**

Provides the ability to manually enable recording of the camera stream to the **Eocortex** archive, if the recording option **Manual**, **On motion** or **Scheduled** is selected for this camera in the [Archive Recording Settings](#).

- **Configuring**

- **Changing password from client**

Gives a user the ability to change the password for his system account in the **Eocortex Client** application.

- **Configuring**

Gives a user the ability to open the **Eocortex Configurator** application.

- **Configure workplace**

Gives a user the ability to change the [Workplace Settings](#) in the **Eocortex Client** application.

- **Access to new added cameras**

If enabled, a user from this group will be automatically granted access rights to all cameras added to the system later. If security policies require strict restriction of camera accessibility for users, it is recommended to disable this option and grant access to the required cameras to each user group manually.

- **Editing face database and license plate database data**

Determines the possibility of adding, modifying and deleting entries in the databases of the **License Plate Recognition** and **Face Recognition** modules.

- **Eocortex client applications capabilities**

- **Log access**

Specifies whether the [Events Log](#) is available to a user. Access to the Log can be granted to a user with one of two levels:

- **Current user in log only**

For a user, in addition to general system events (loss of connection with the camera, analytics events, etc.), only those events that were caused by his actions (execution of a user task, archive export, etc.) will be displayed.

- **All system users in log**

A user will see all system messages will be displayed, including those caused by the actions of other users.

- **Access to reports**

Determines for a user the ability to build reports based on the data collected by the **Eocortex** system ([Archive depth](#), [Face Recognition Report](#), etc.).

- **Access to archive marks**

Determines for a user the ability to create and view [Archive Bookmarks](#).

- **Access to maps**

Determines the availability of the **Maps** section for a user.

- **Access to Search for Objects**

Determines for a user the ability to use data collected by the system using the [Search for Objects](#) module.

- **Access to plans**

Determines the availability of the **Plans** section for a user.

- **Close application**

Determines the ability for a user to close the window of the **Eocortex Client** application using standard methods.

- **Limitation of the number of connections**

Sets a [limit on the number of simultaneous connections](#) using the credentials of the same user.

- **Application launch delayed**

Prevents a user from being forced to immediately restart the application when changes are made to the system settings.

This right allows to delay the restart of the **Eocortex Client** application, but the user must still restart the application when appropriate for the changes to take effect.

- **User tasks launch**

Provides the ability to execute [User tasks](#).

- **Camera cell control**

Provides a user with the ability to interact with camera cells: drag and drop cameras between cells, use the context menu and cell interface elements.

- **Access to face and license plate databases**

Provides a user with the ability to view entries in the databases of the **License Plate Recognition** and **Face Recognition** modules.

Disabling this right will automatically disable the **Editing face database and license plate database data** right.

- **Adjusting the number of occupied parking spots**

Allows a user to make changes to the data displayed in the [Occupied Parking Spots counter](#) of the **License Plate Recognition** module.

- **Accept alarms without obligatory comments**

Allows a user to [confirm receipt of an alarm event](#) of the camera without having to add a comment about the received alarm. Upon deactivation of a right the automatic alarm acceptance will be disabled.

- **Archive export**

Provides the ability to [export fragments of the system archive](#) as **MCM**, **MP4** or **AVI** files.

- **Archive expert mode access**

Allows a user to interact with the archive in the mode of [simultaneous viewing of multiple cameras](#).

- **Editing views**

Allows a user to [create and edit views](#). Applies only to views created in the **Eocortex Client** application directly at a user's workplace. Does not affect [server views](#) created and edited in Eocortex Configurator.

- **Blurring disabled**

Allows a user to disable image blurring imposed by the **Frame Area Blurring** module.

- **Interaction with external components**

- **Receive push notifications**

Allows a user to receive Push notifications in **Eocortex** mobile applications (iOS, Android) authorized under his account.

- **Connection via mobile devices and Web-Client**

Allows using a user account for authorization in **Eocortex** mobile applications ([iOS](#), [Android](#)) and [Web Client](#).

- **Cameras**

Subsection defining the list of cameras available for [viewing in Eocortex client applications](#). Both full access to the camera, and partial access to only the archive or only to the live video of the camera can be provided.

One right for surveillance and archive

An option that speeds up the process of setting up access to cameras. If enabled, a user will be granted both access rights to the camera at the same time - to the live video and to the archive of the camera. Can be disabled for more fine-grained access customization with separate rights.

- **Surveillance**

The user has access to the camera's live video.

- **Archive**

The user has access to the camera's archive recordings.

- **Views**

Subsection defining the list of [views](#) available to a user in the **Eocortex Client** application.

Adding the Operator group

Operator permissions overview

Eocortex Configurator 3.6.61

Users of Eocortex applications | Users of messengers

Searching for users and groups...

Expand all | Collapse all

- Administrators
 - root
 - Operators**

Add group | Add user

Operators

Information | Cameras | Views

Main rights of the group Operators

[Edit](#)

Camera control	
Received sound from camera	✓
Broadcast sound to camera	✓
Observation mode change	✓
PTZ Cameras management	✓
Archiving management	✓

Configuring	
Changing password from client	✗
Configuration	✓
Configure workplace	✓
Access to new added cameras	✓

Eocortex Configurator 3.6.61

Users of Eocortex applications | Users of messengers

Searching for users and groups...

Expand all | Collapse all

- Administrators
 - root
 - Operators**

Add group | Add user

Operators

Information | **Cameras** | Views

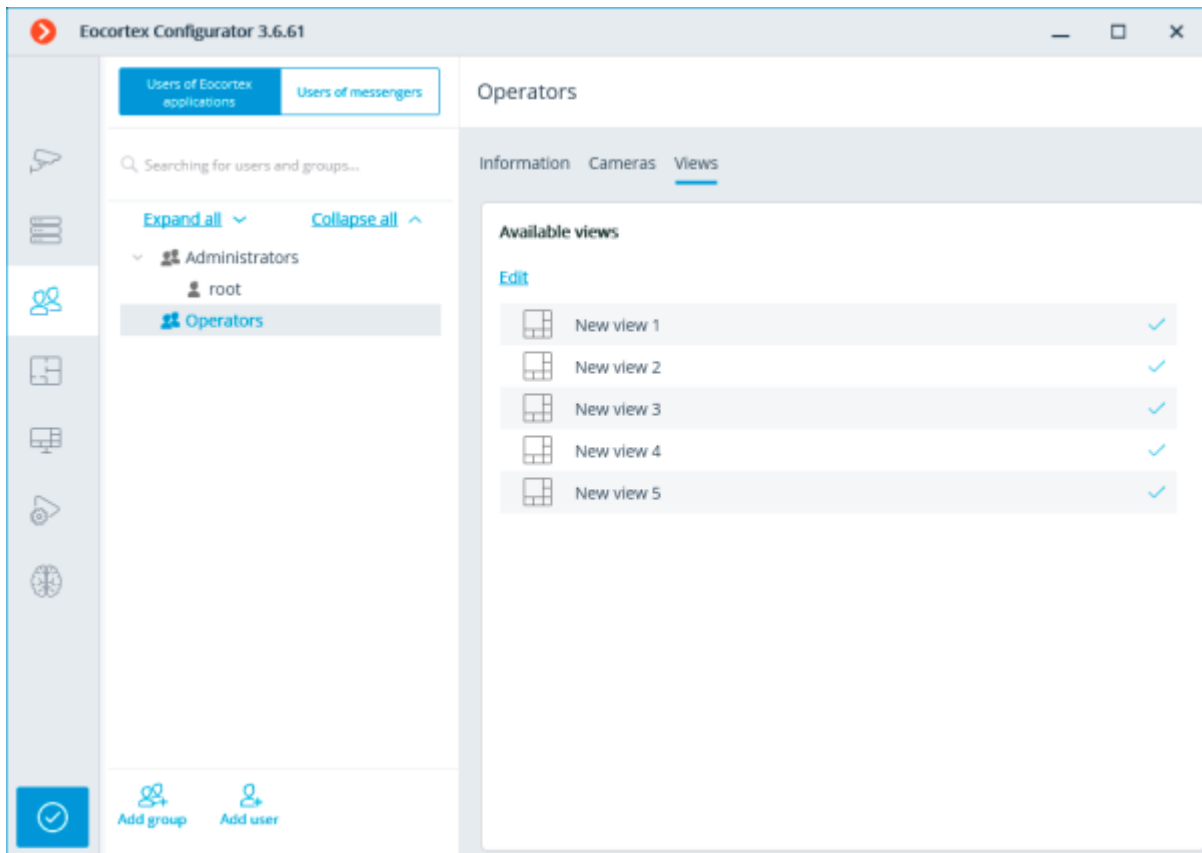
Available cameras

[Edit](#)

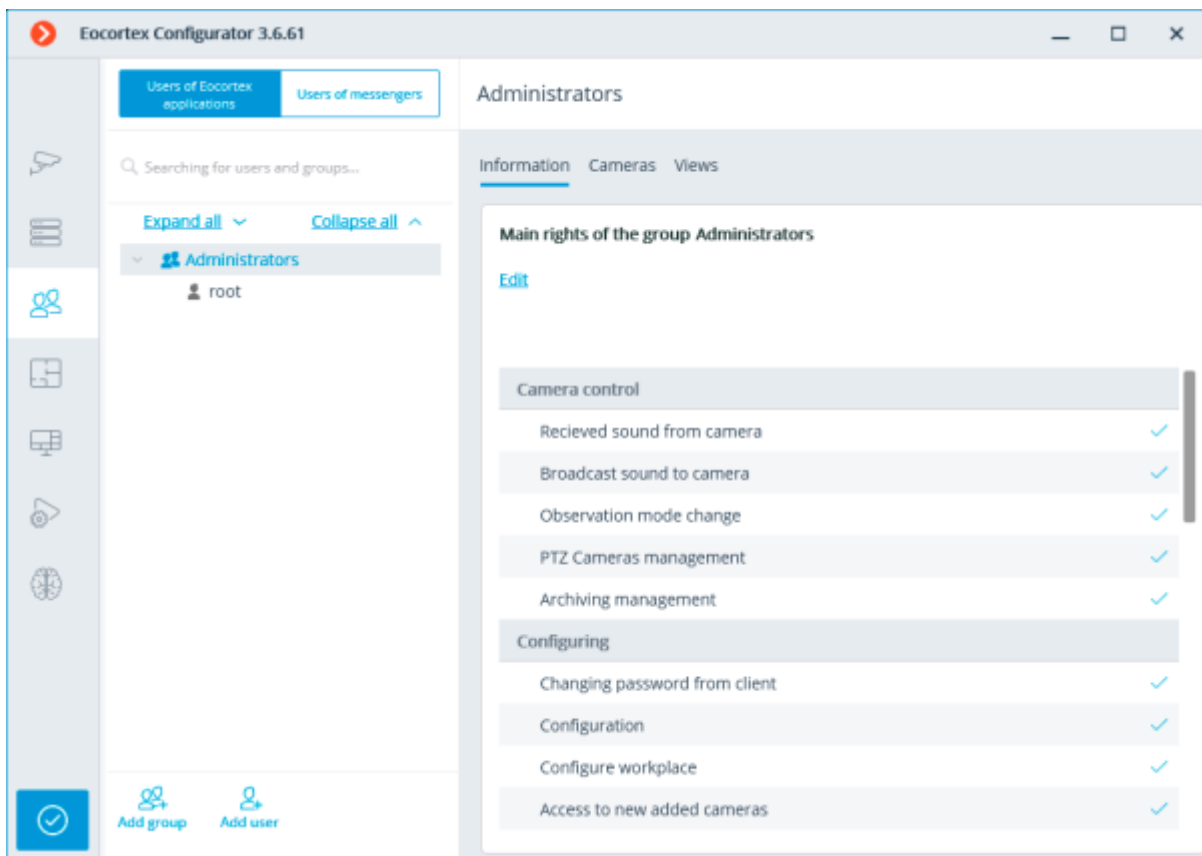
Search by name or address

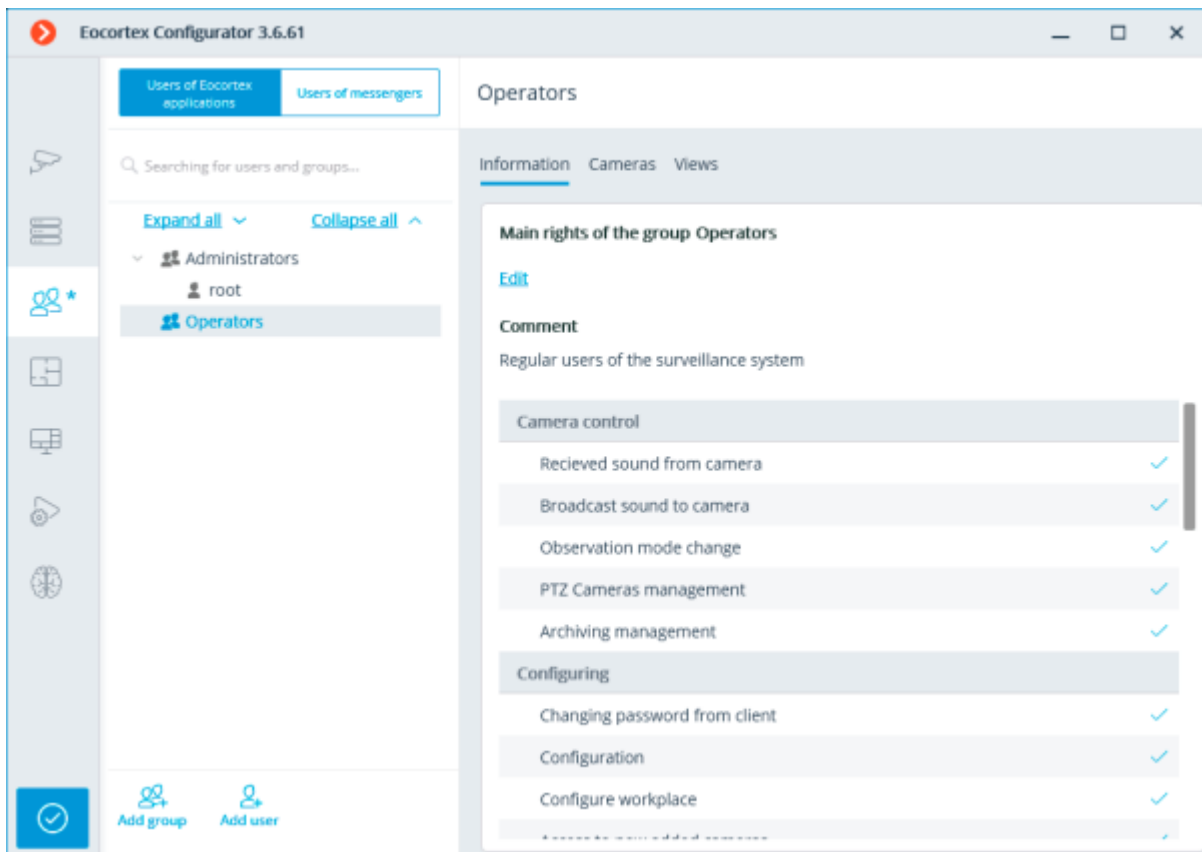
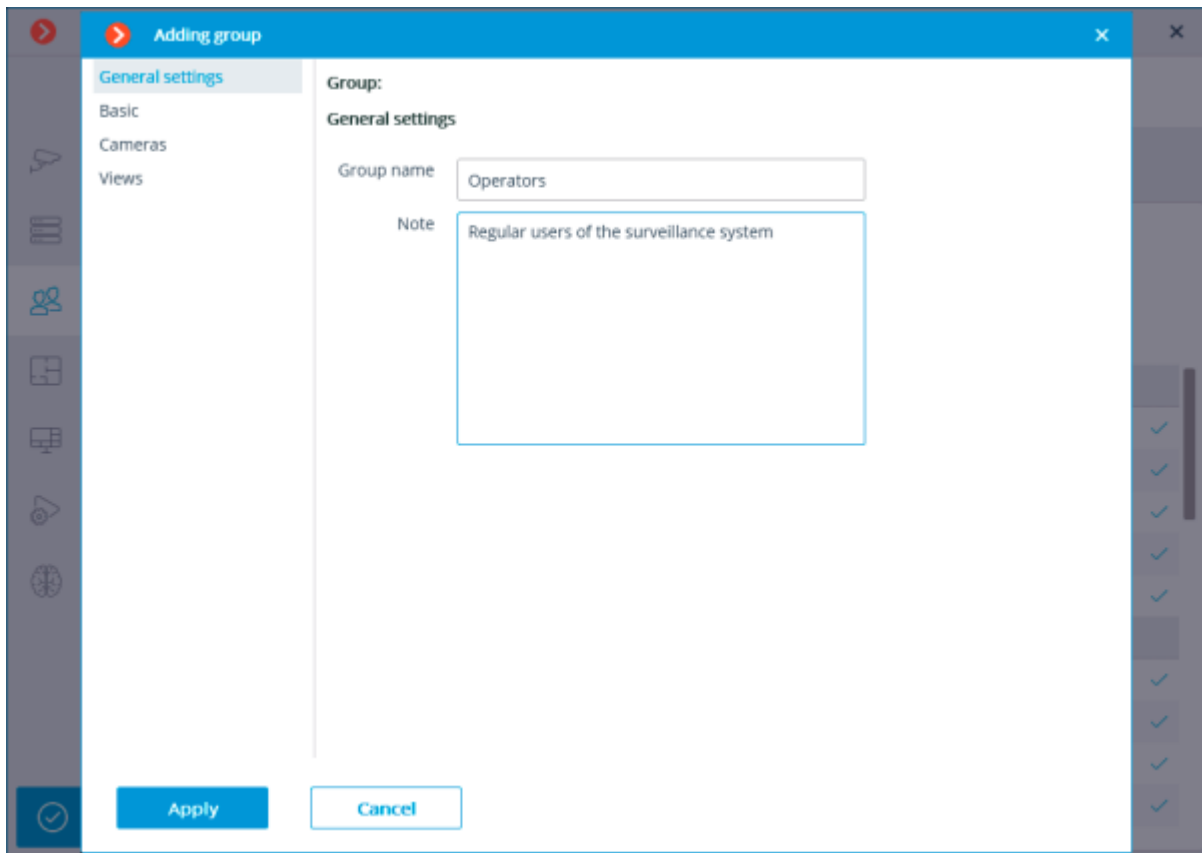
Expand all | Collapse all

Name	Surveillance and archive
Camera 1 192.168.101.223:9090	✓
Camera 2 192.168.101.224:9090	✓
Camera 3 192.168.101.225:9090	✓
Camera 4 192.168.101.226:9090	✓
Camera 5 192.168.101.227:9090	✓

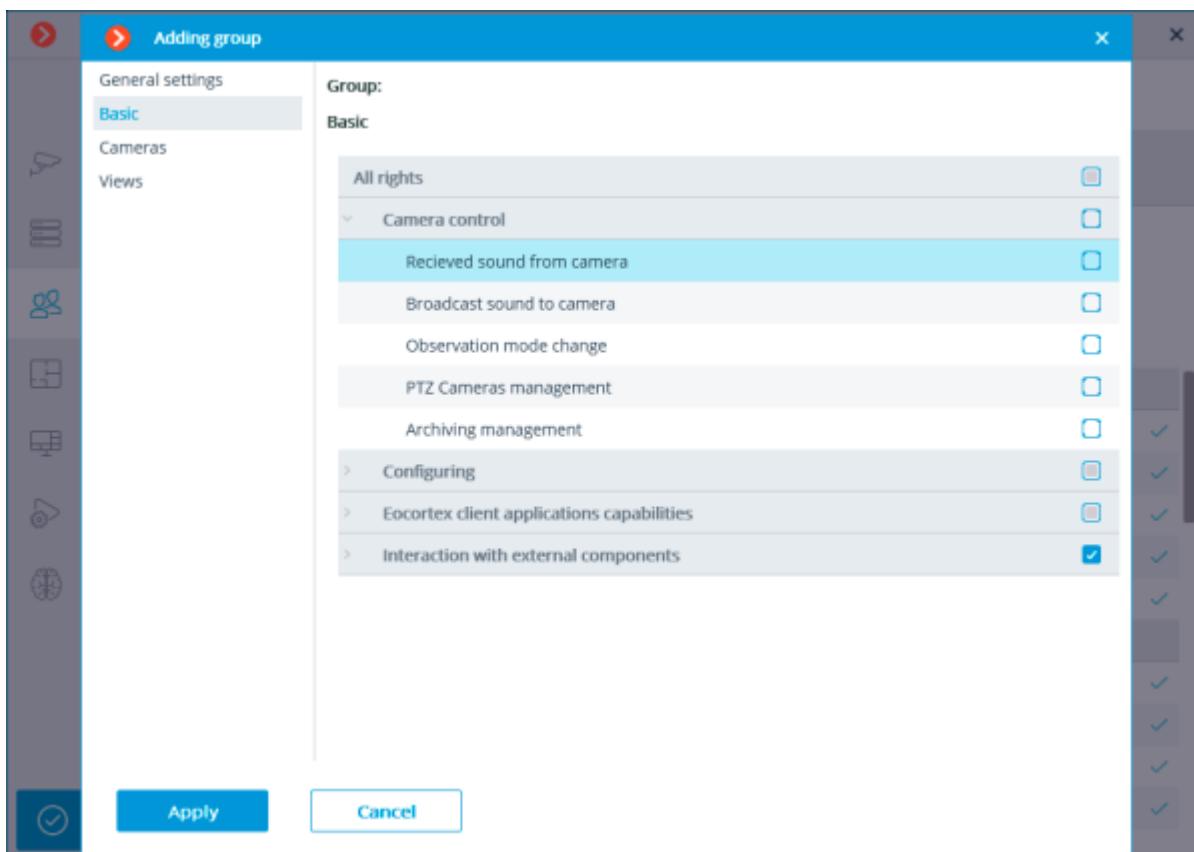
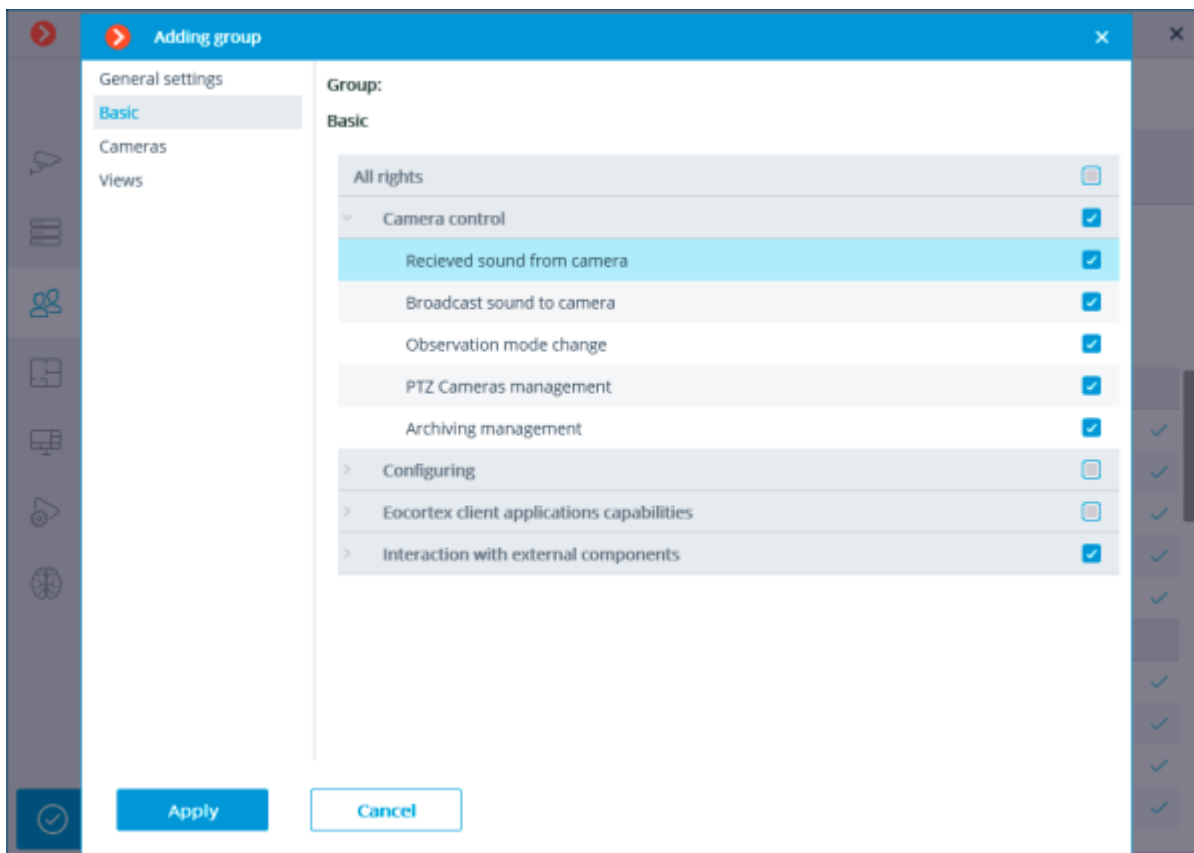


Adding the group

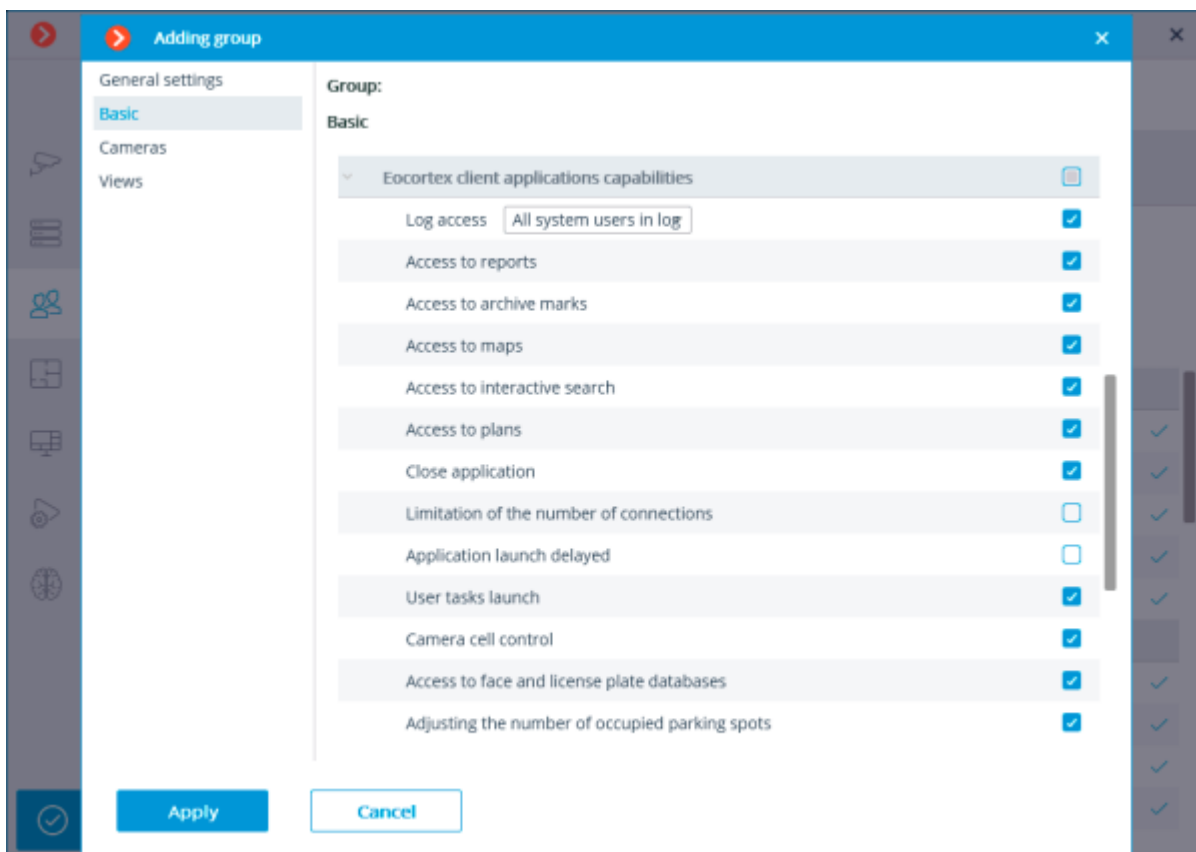
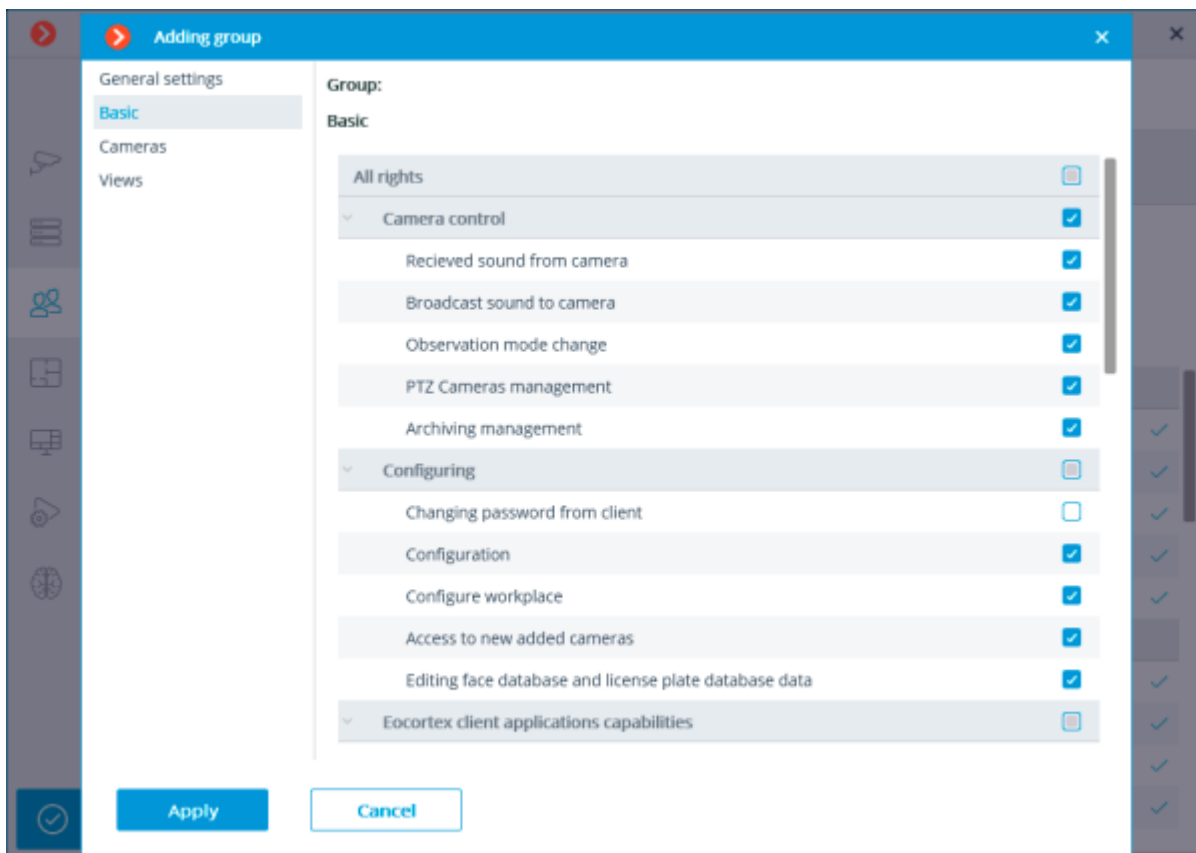


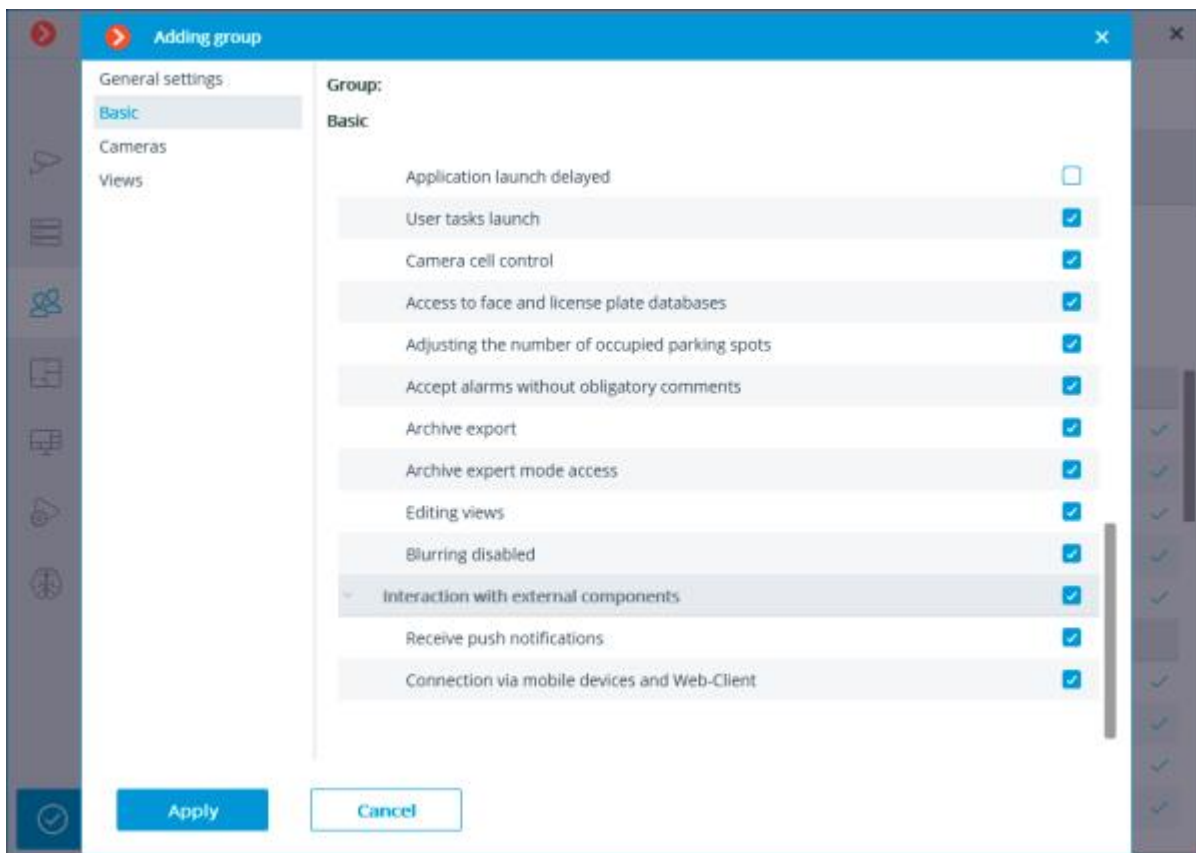


Granting basic rights

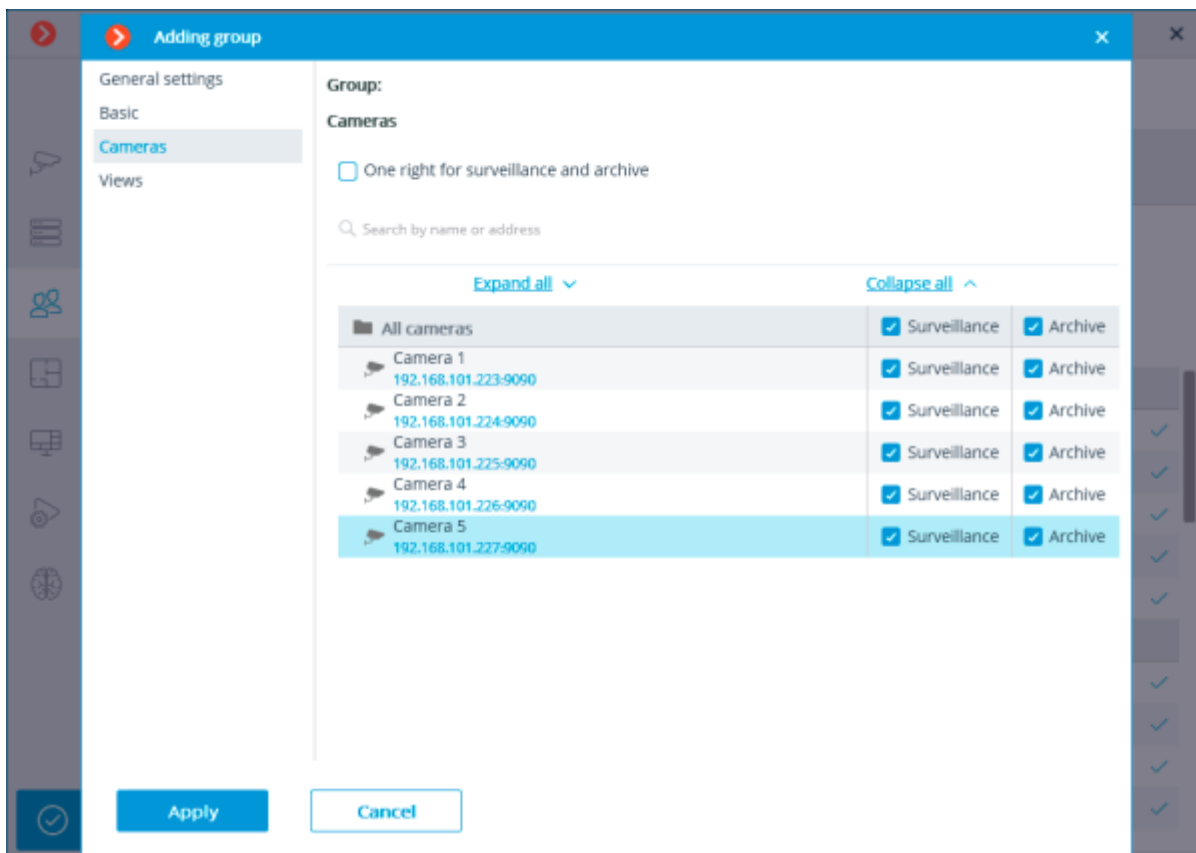


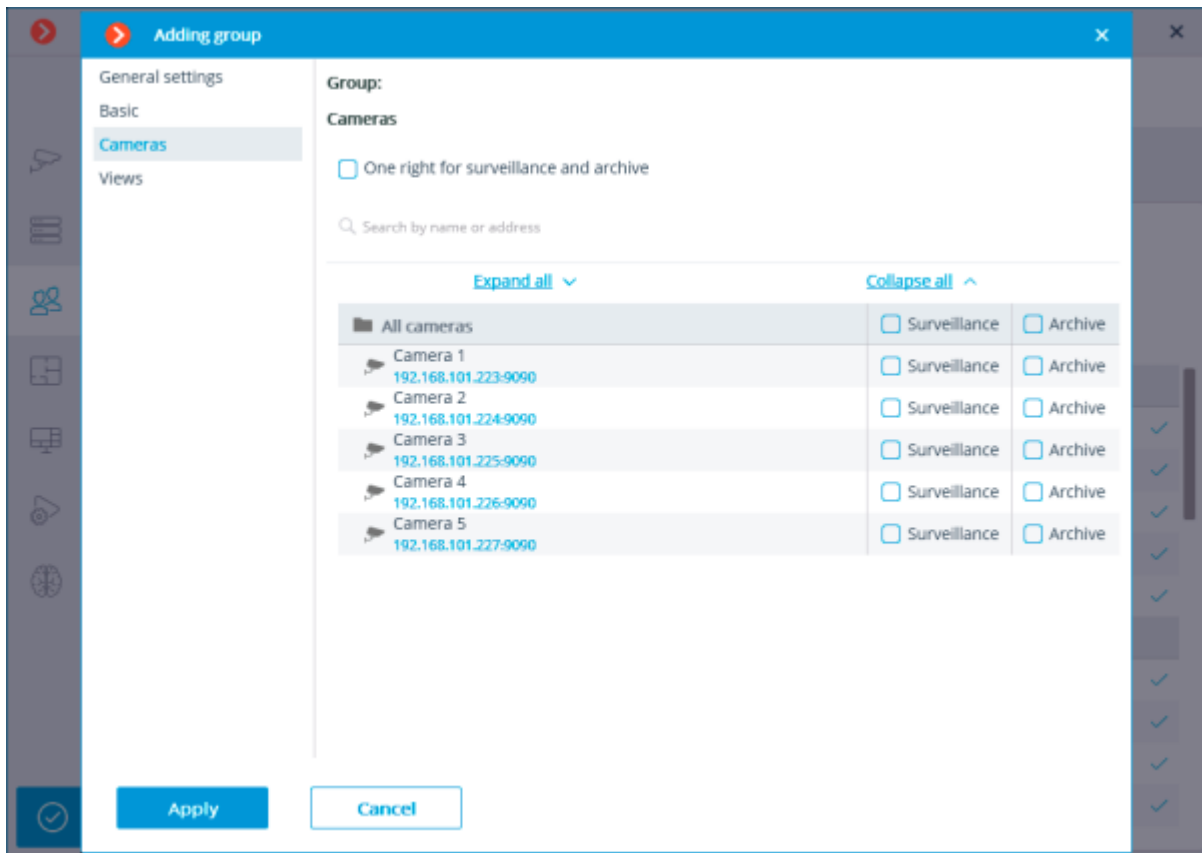
Basic rights overview



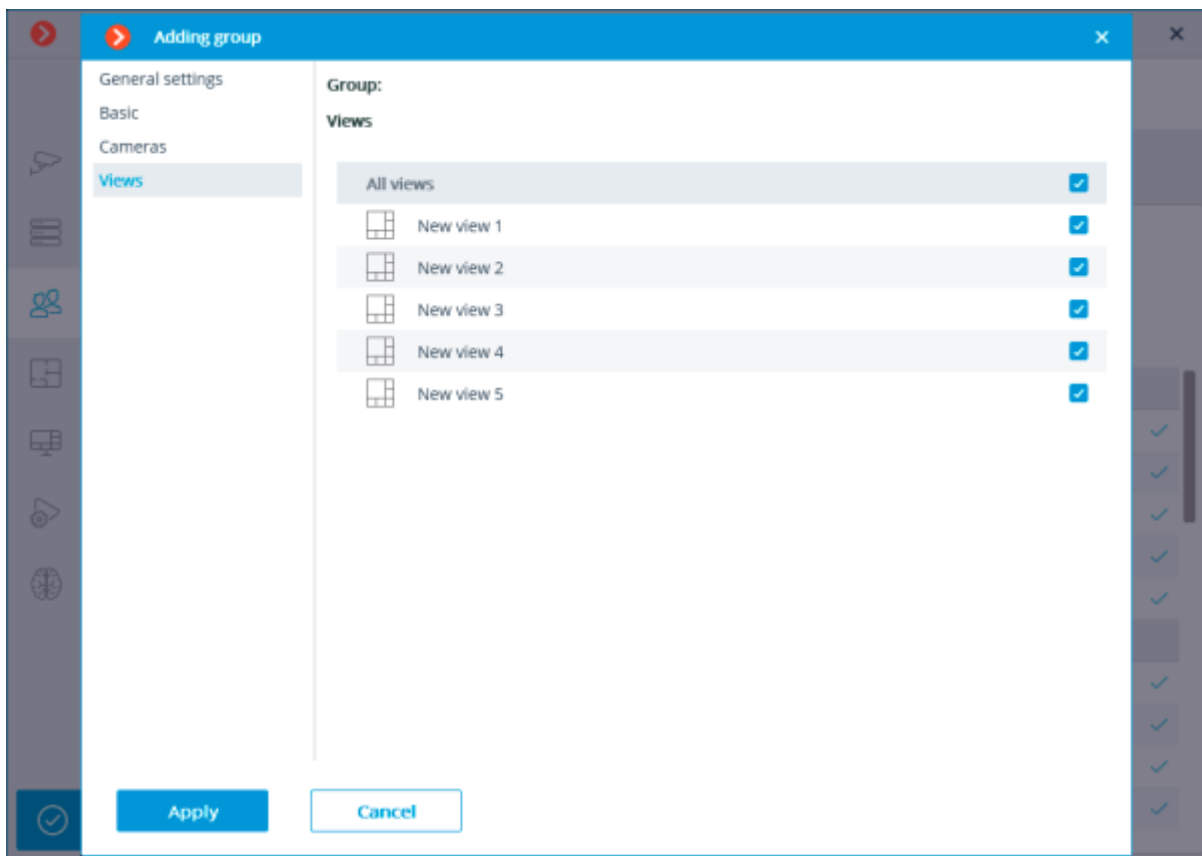


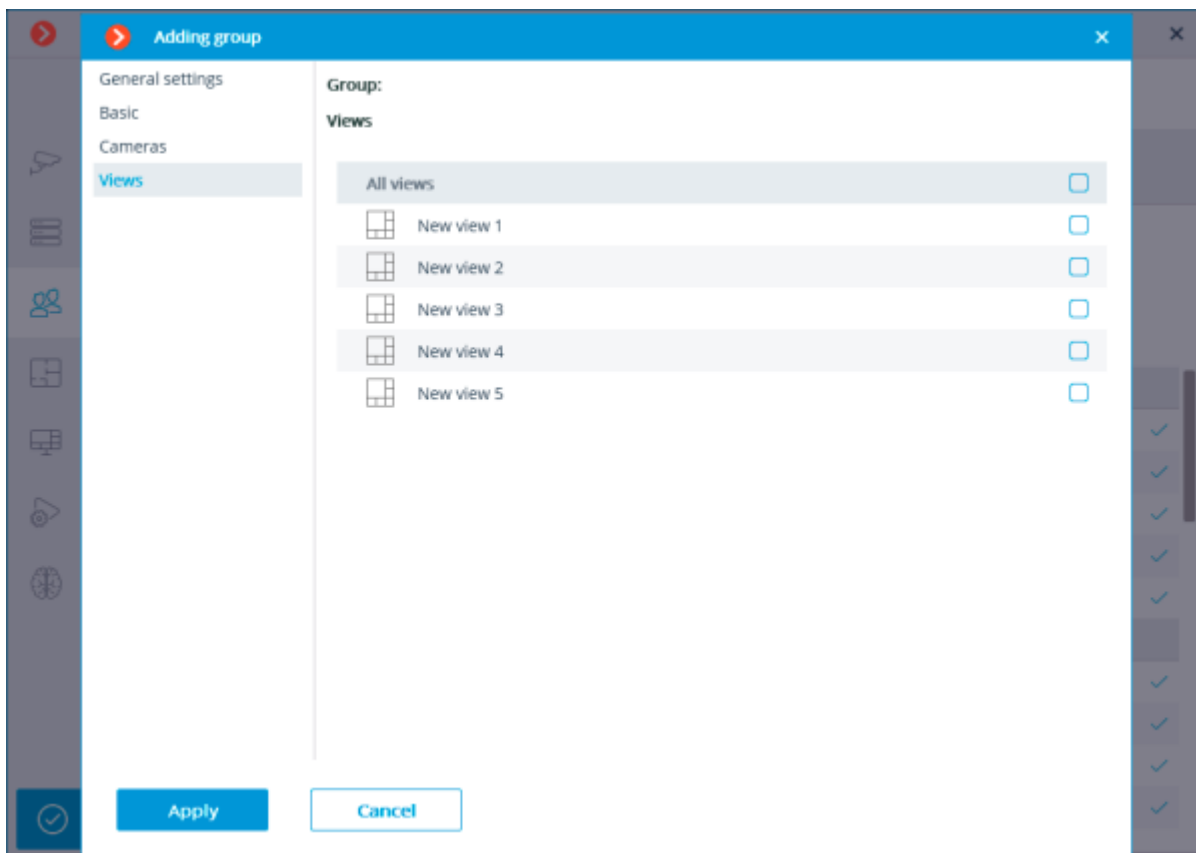
Granting rights to view cameras





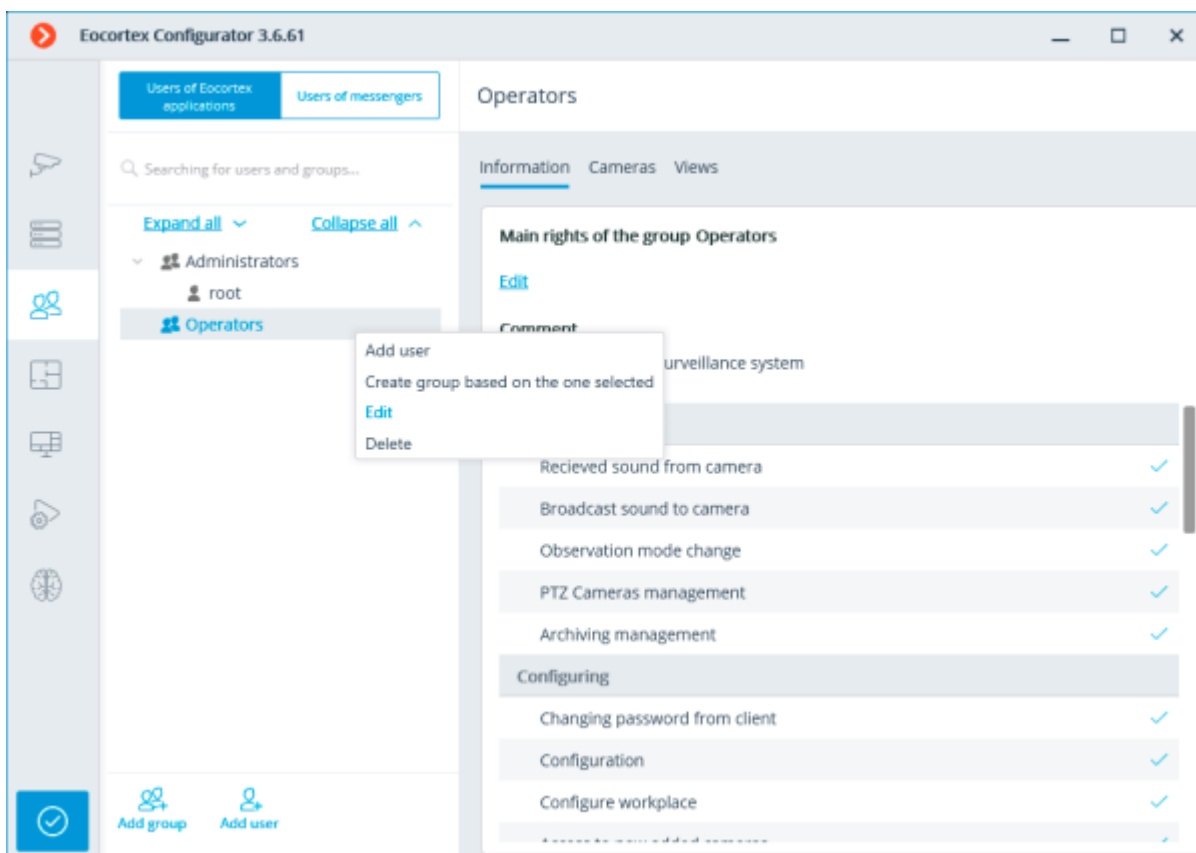
Granting rights to use views

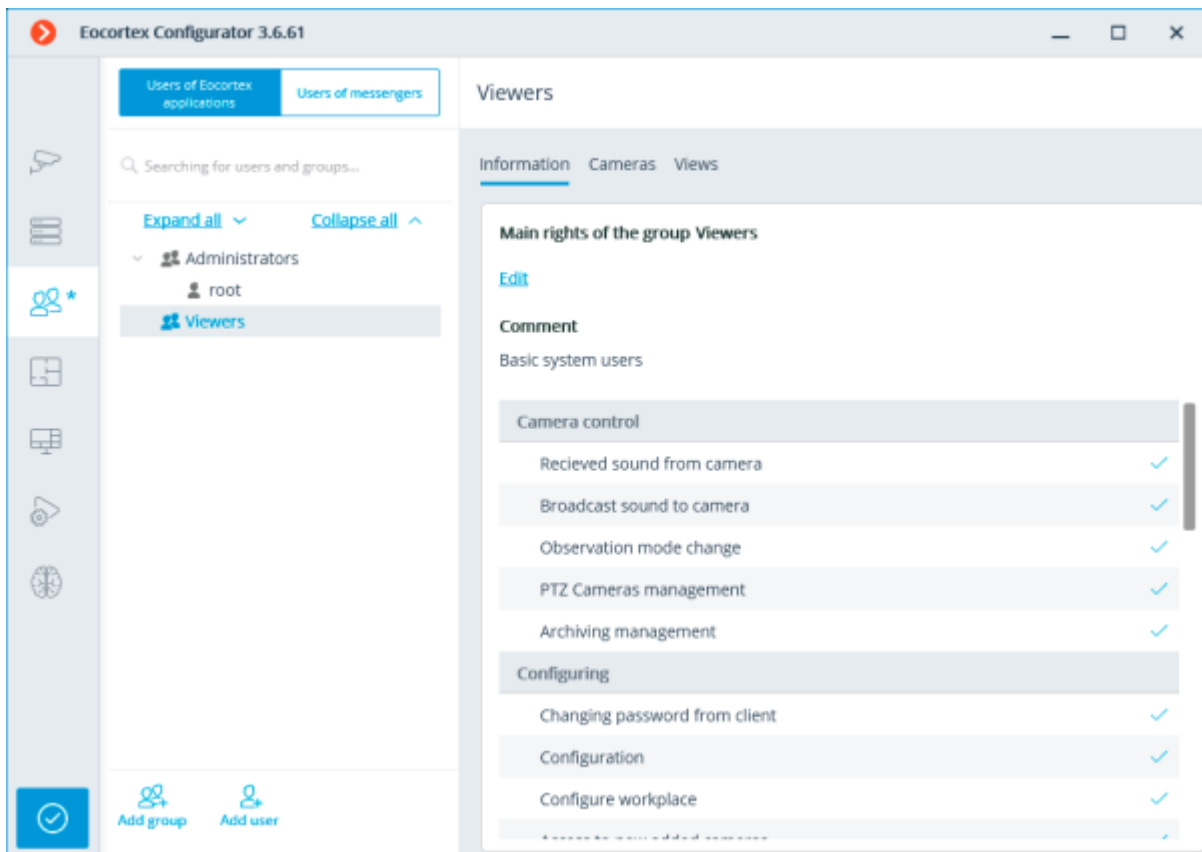
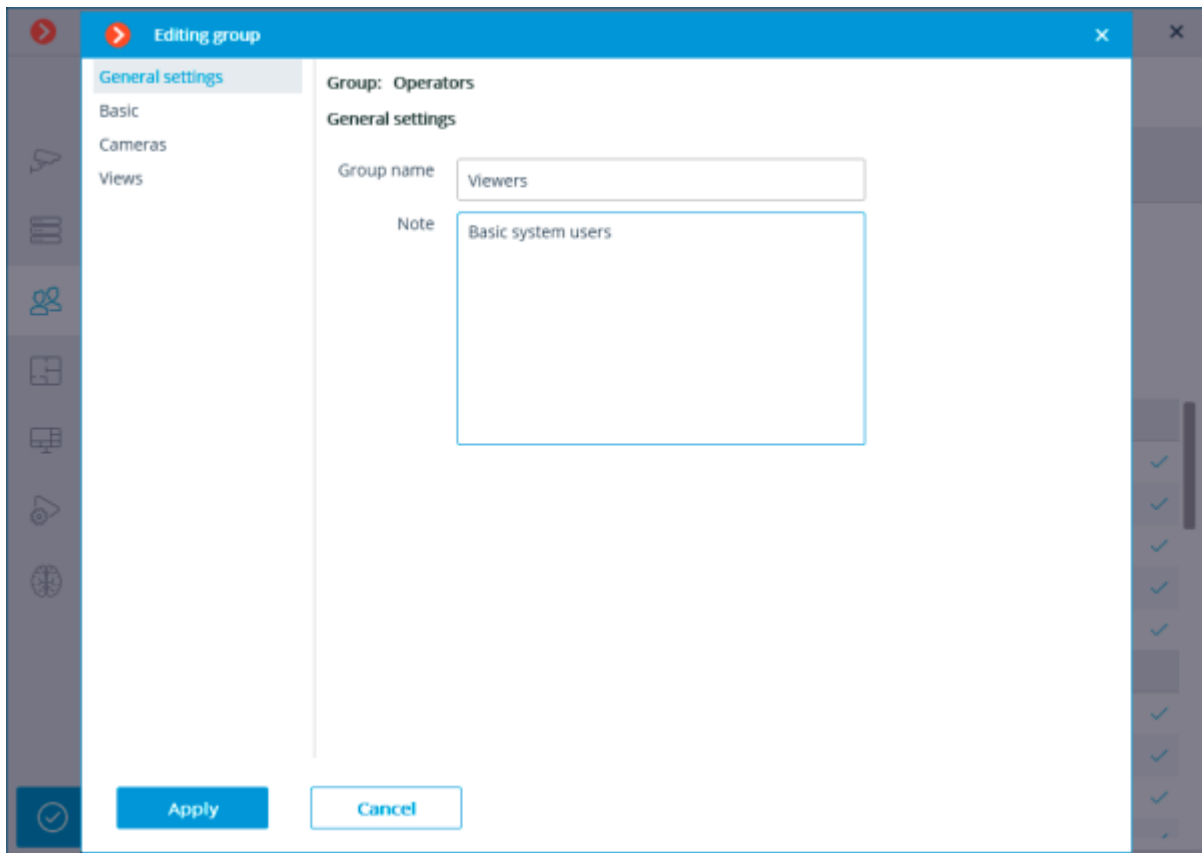




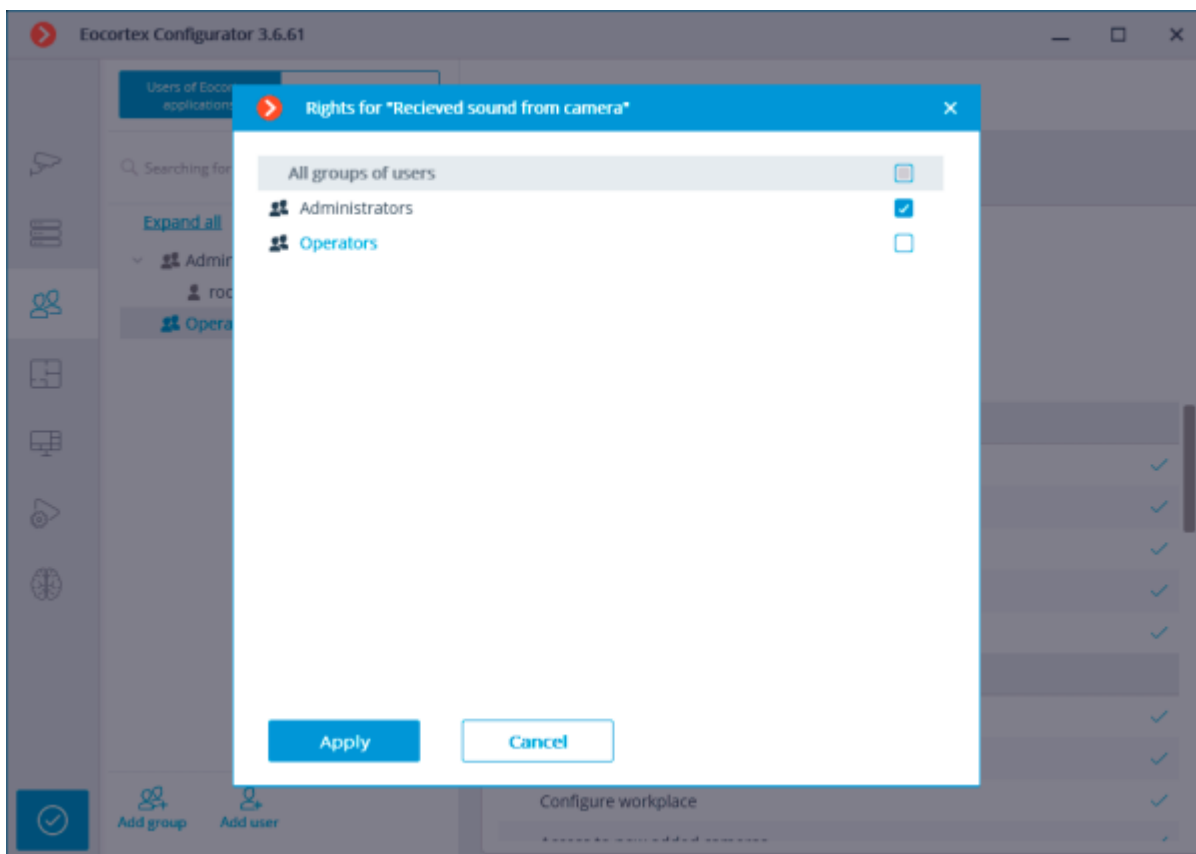
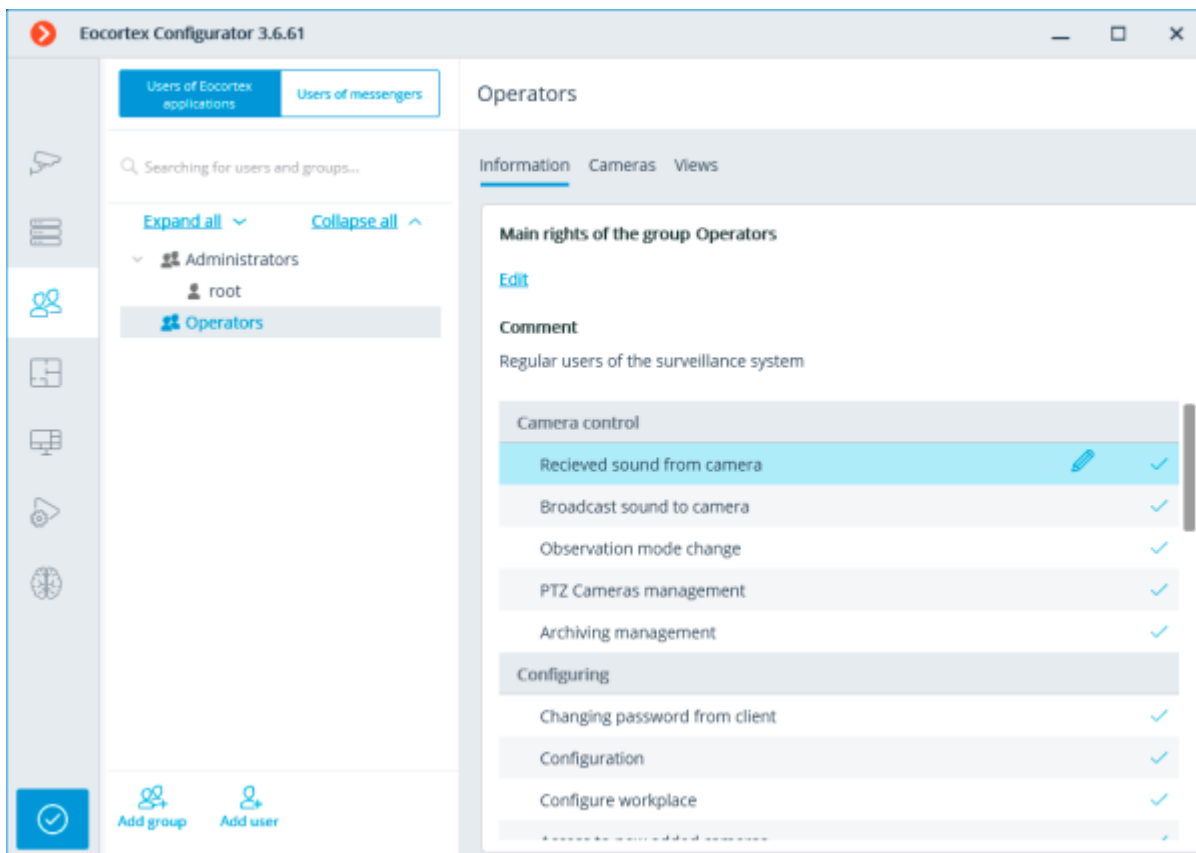
Editing the Operator group

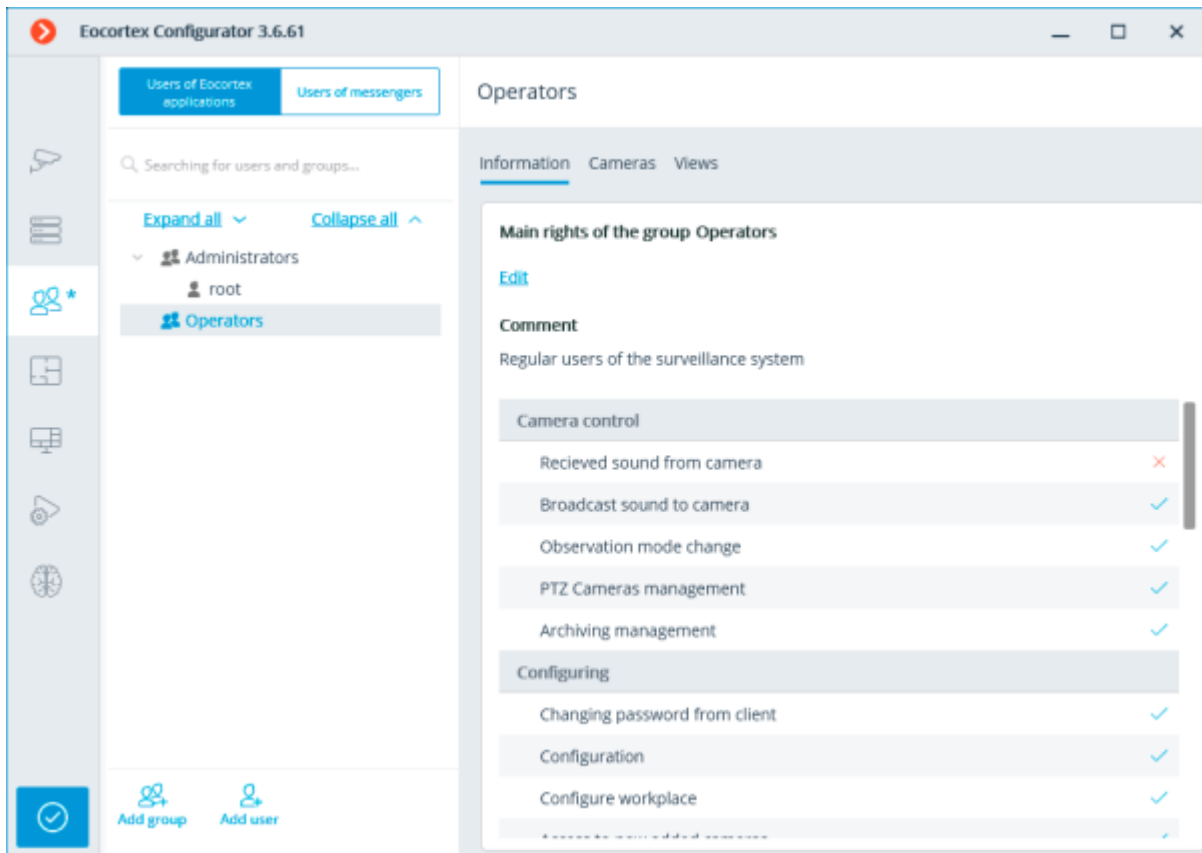
Renaming the group



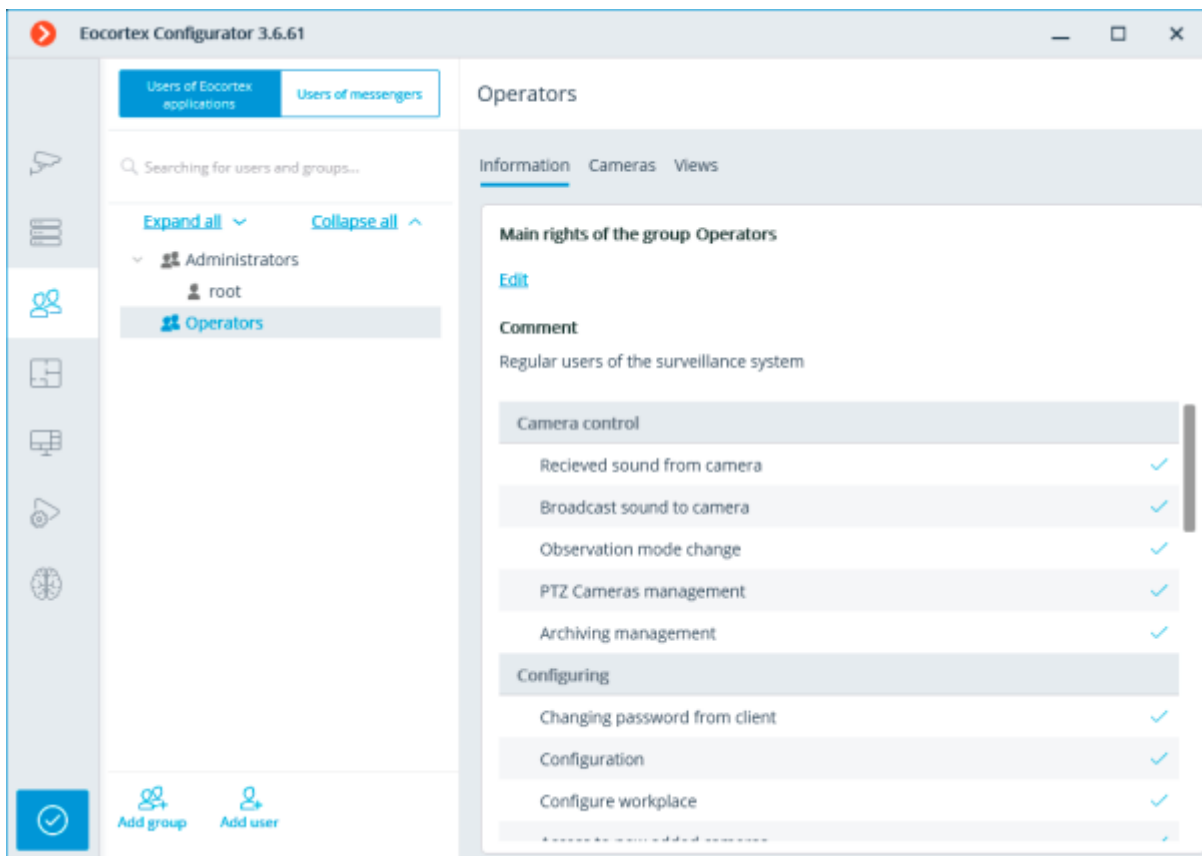


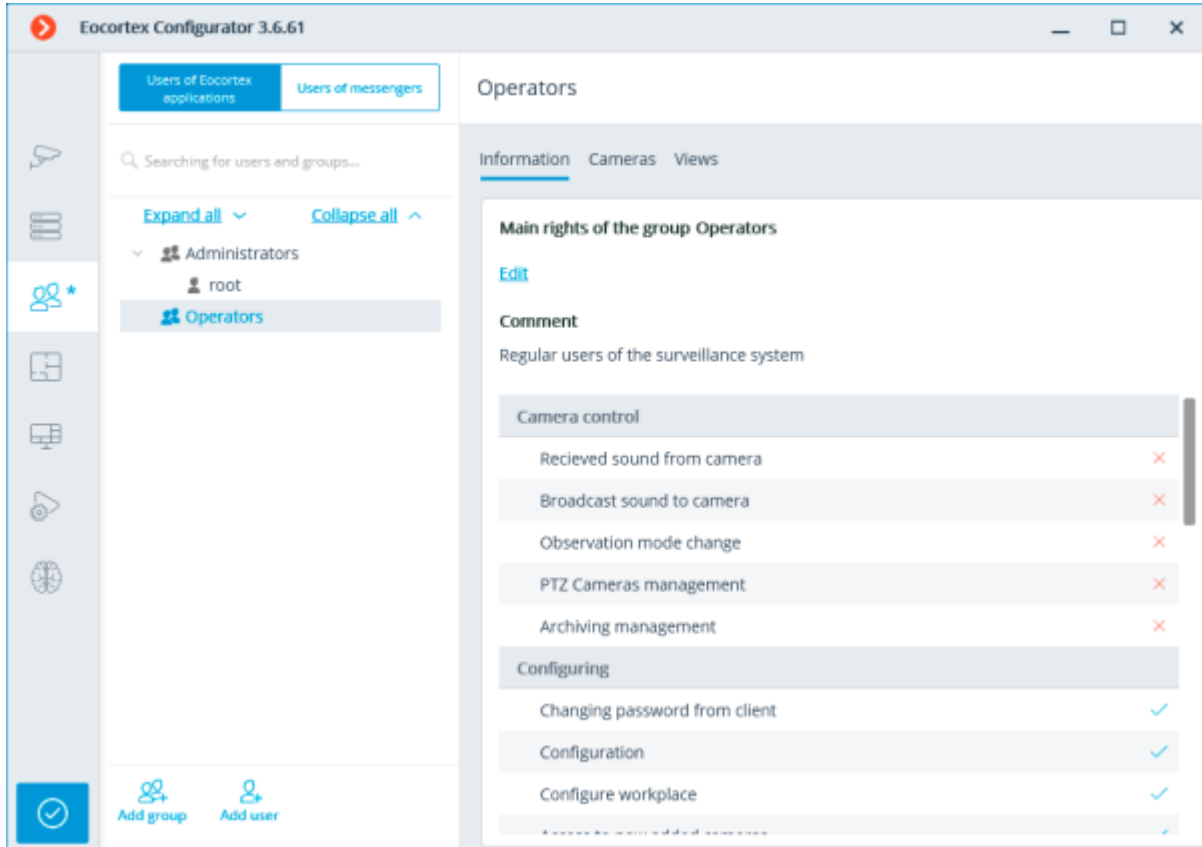
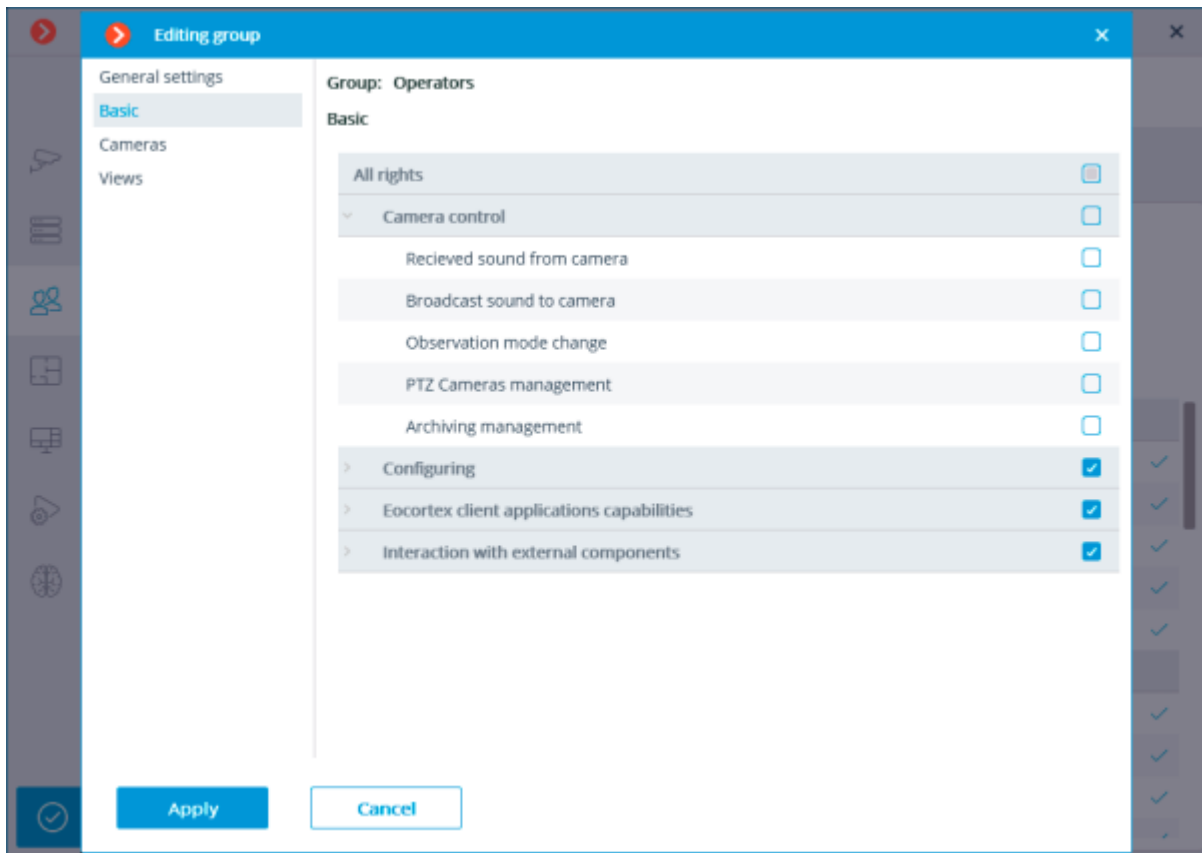
Editing individual basic right



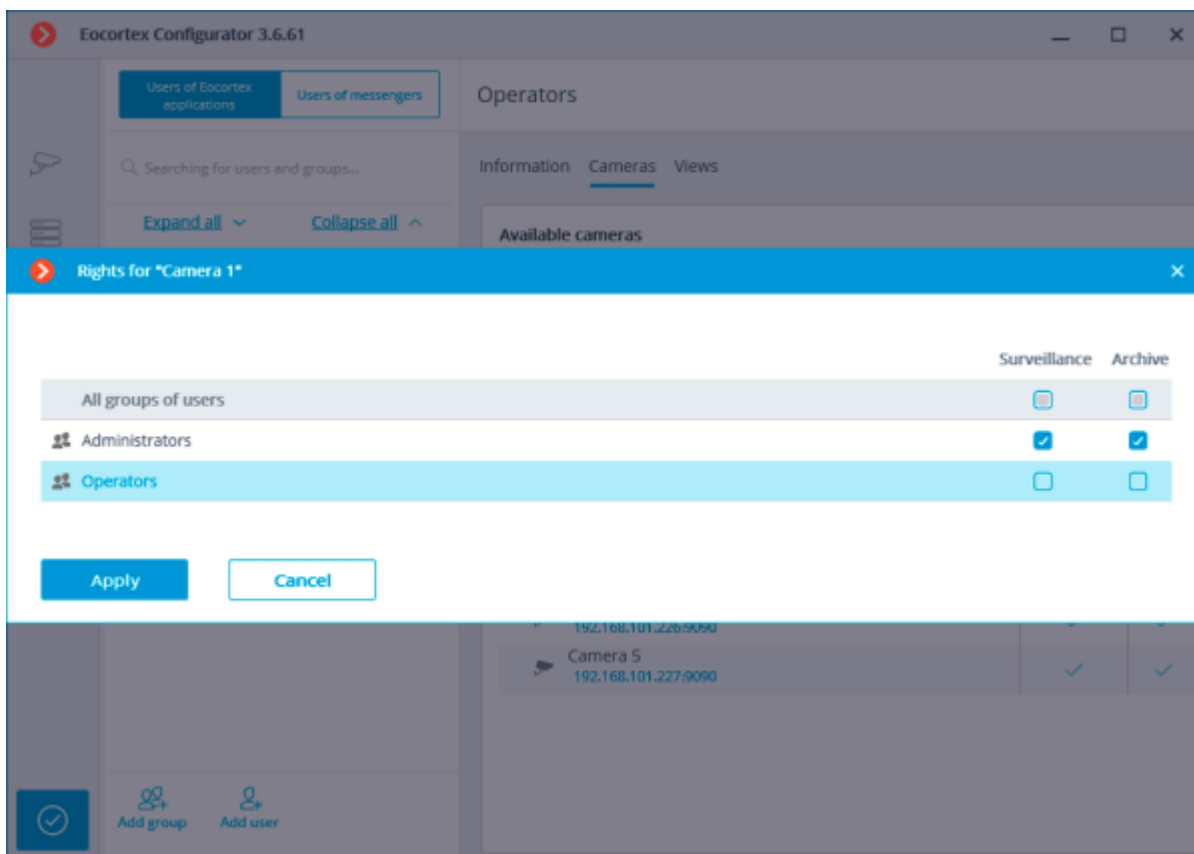
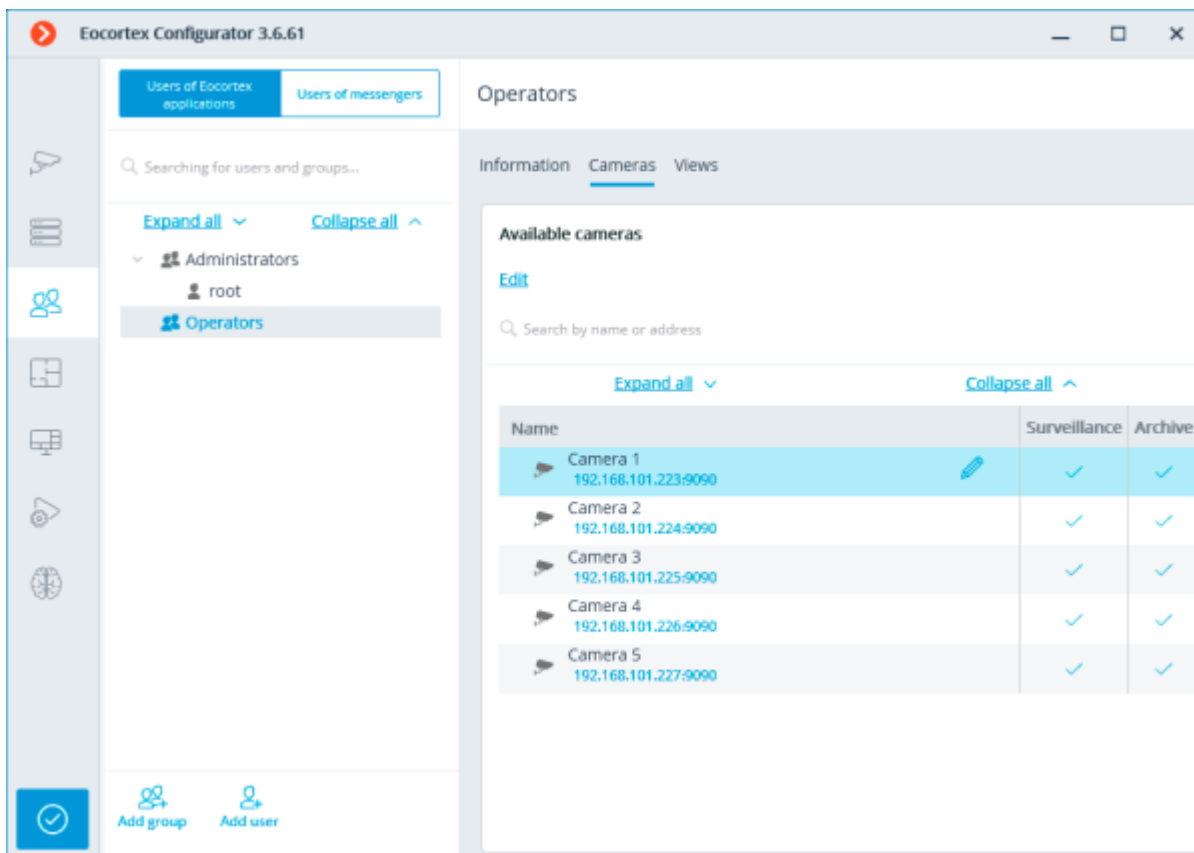


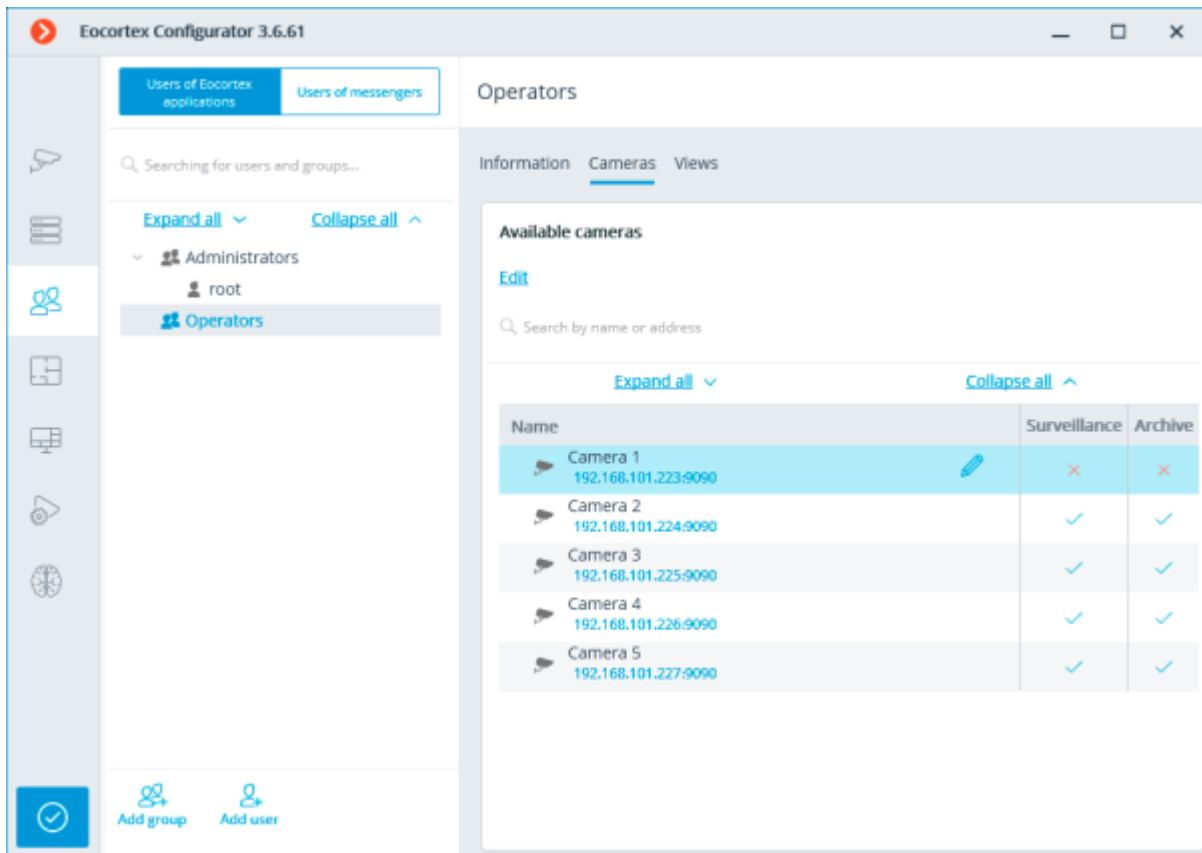
Editing group of basic rights



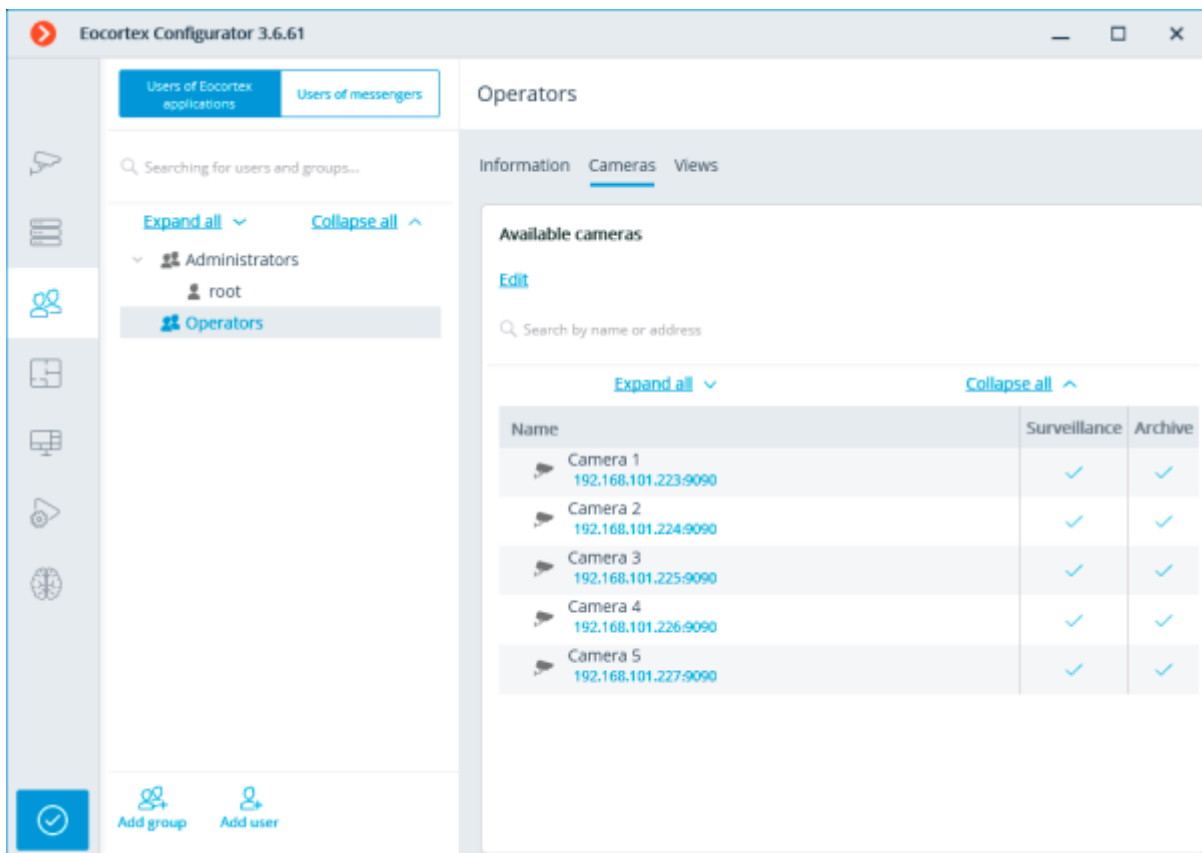


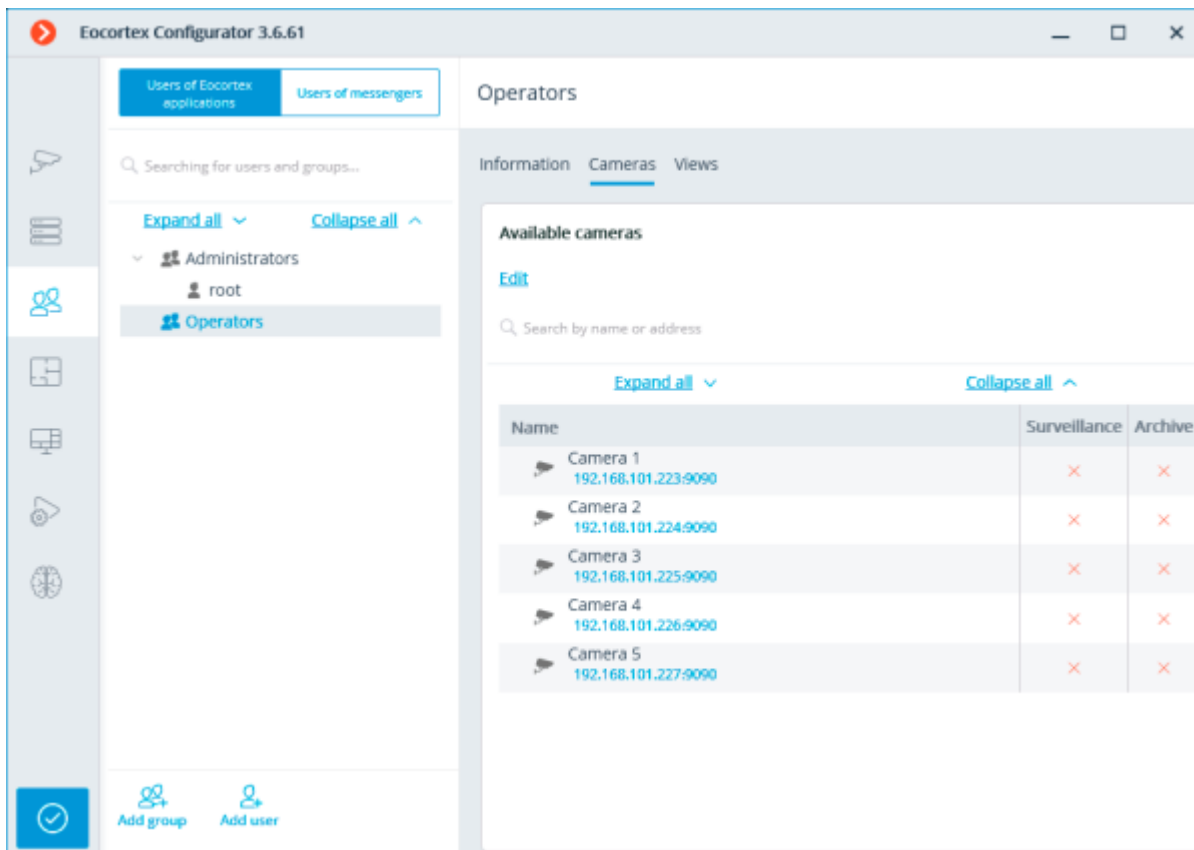
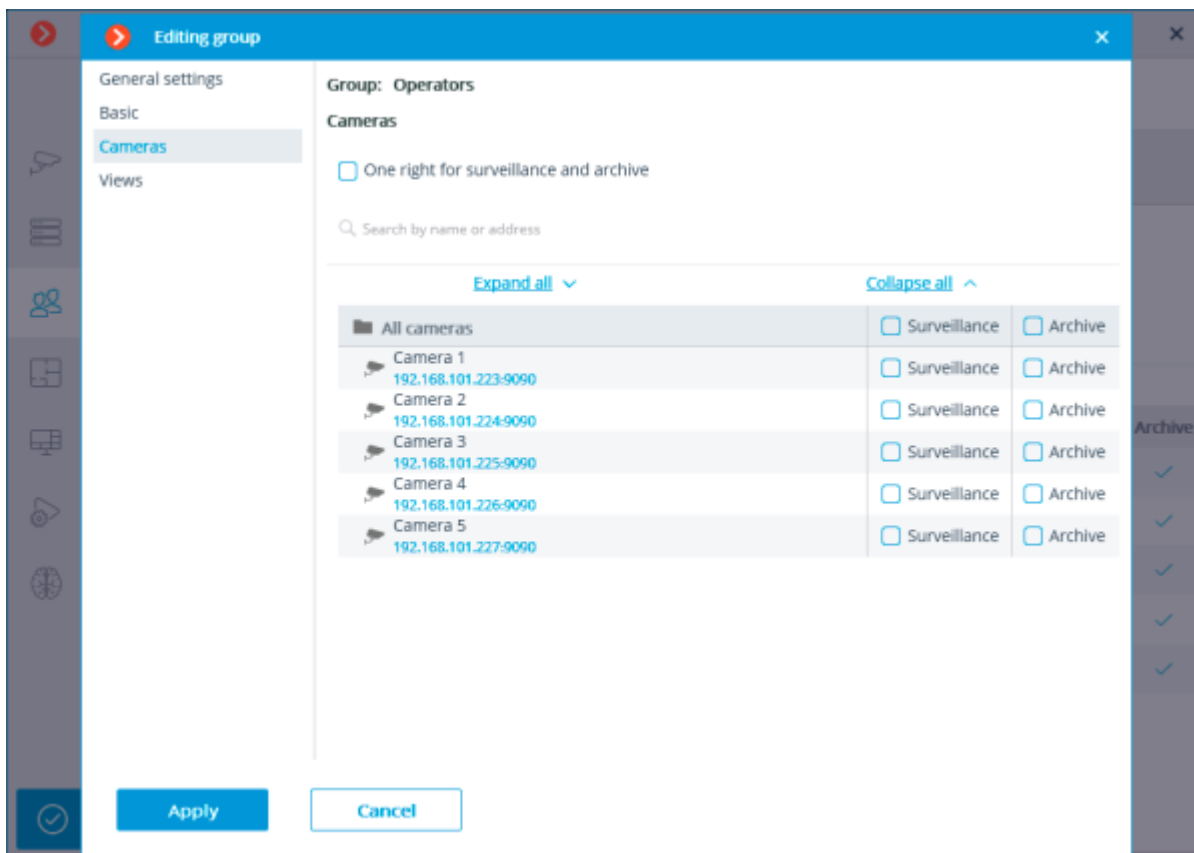
Editing individual right to view a camera



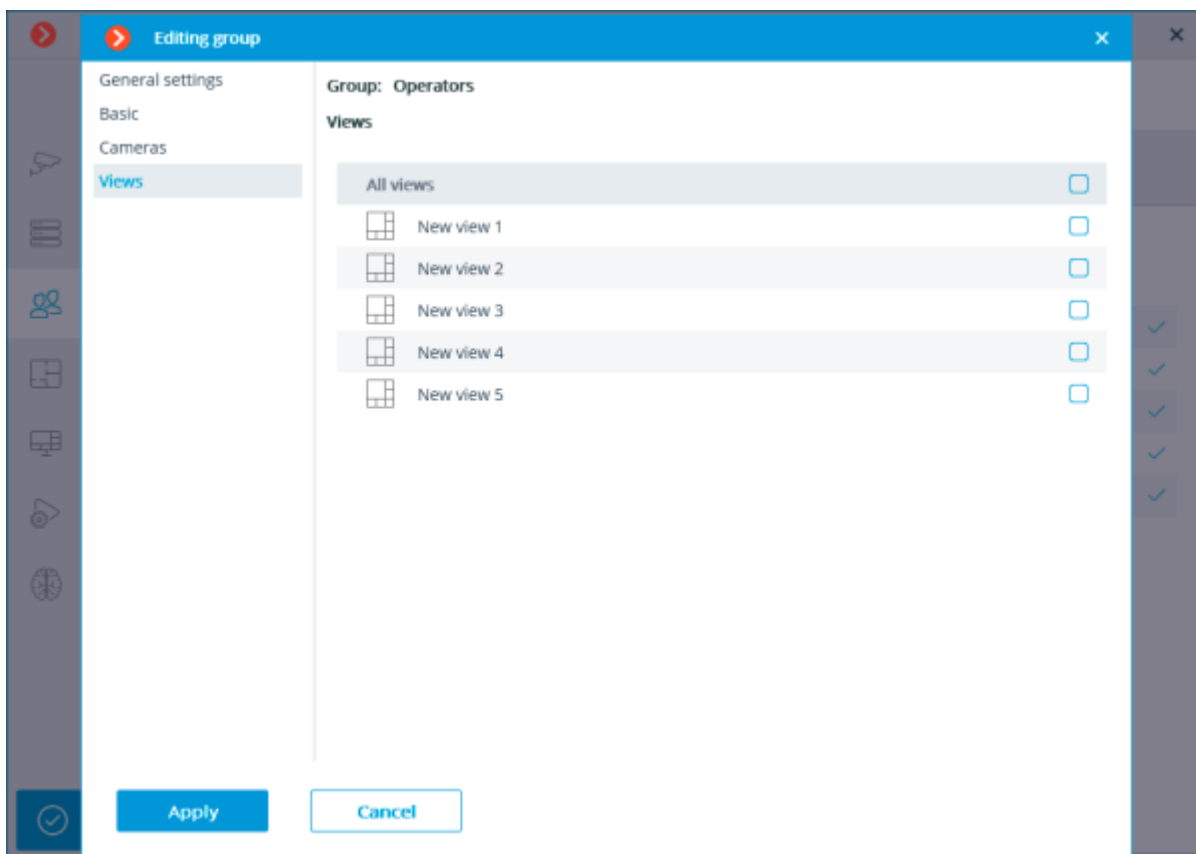
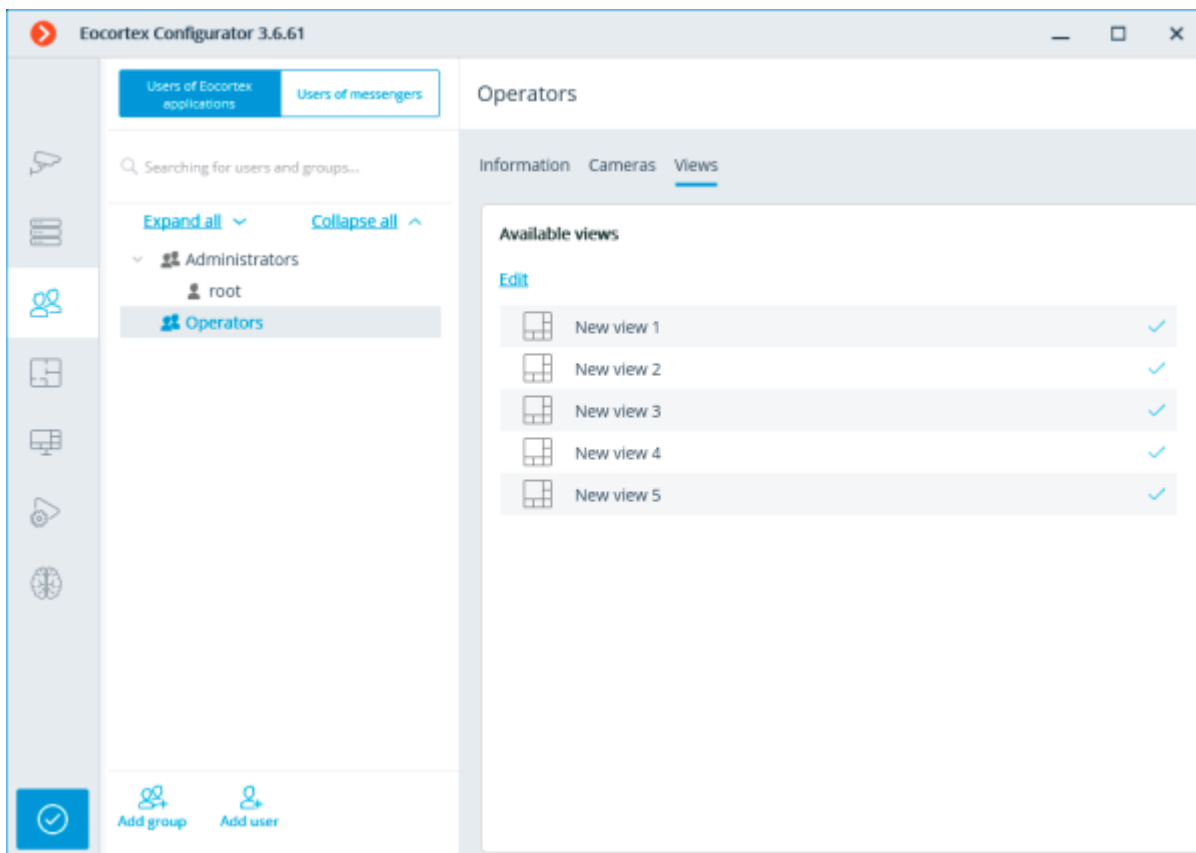


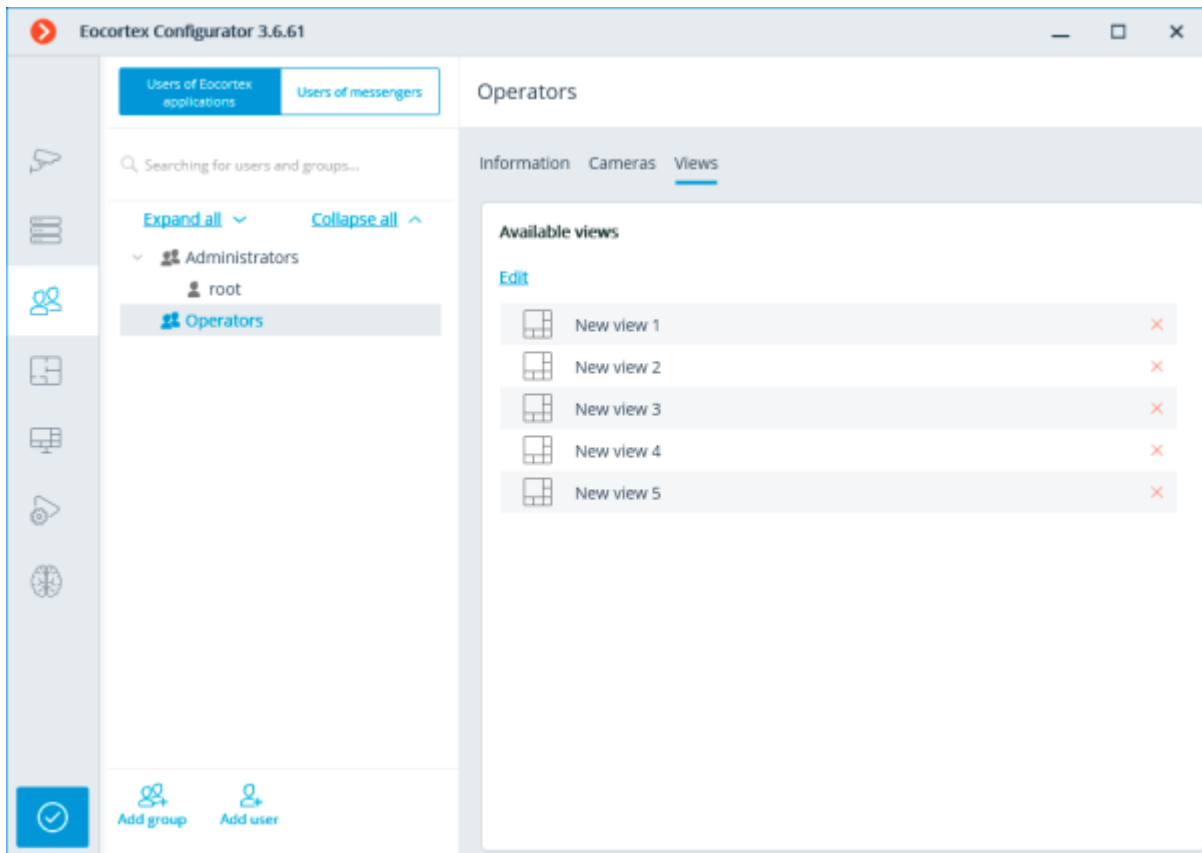
Editing right to view a group of cameras





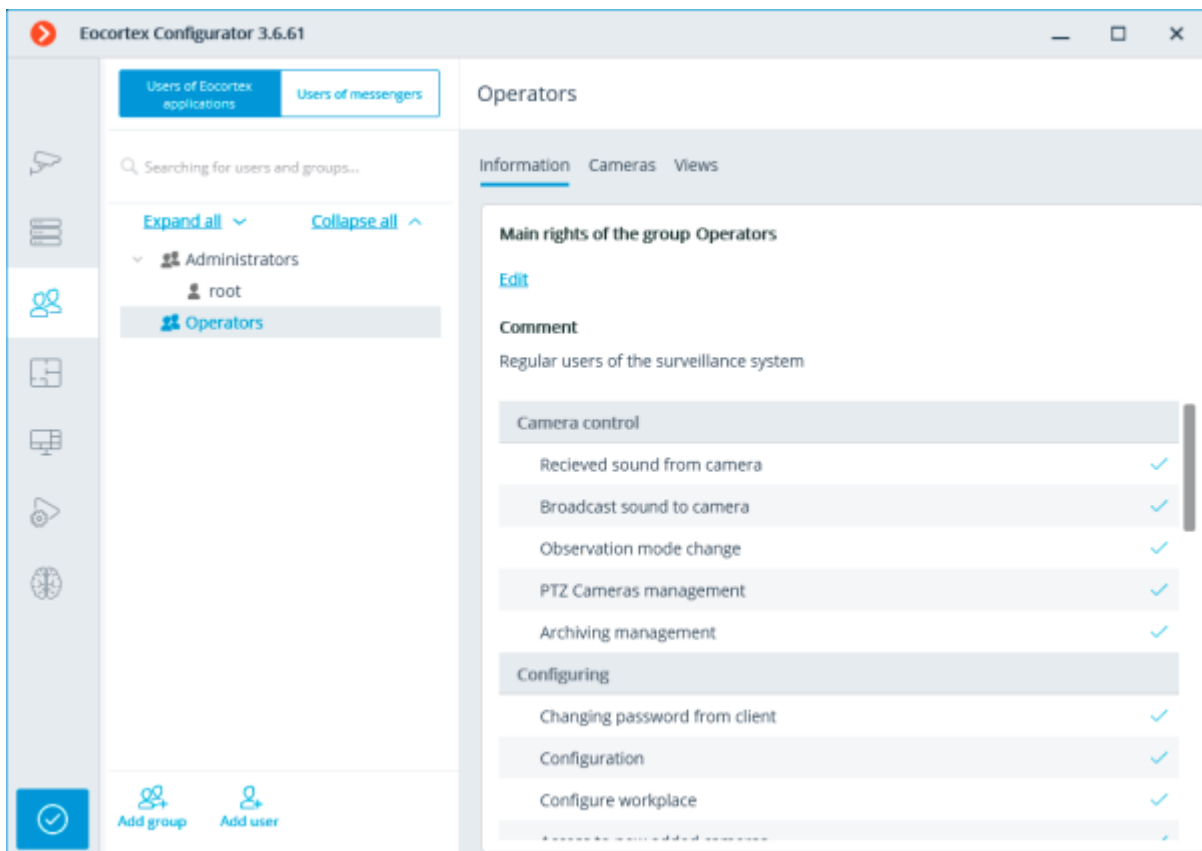
Editing rights to use views

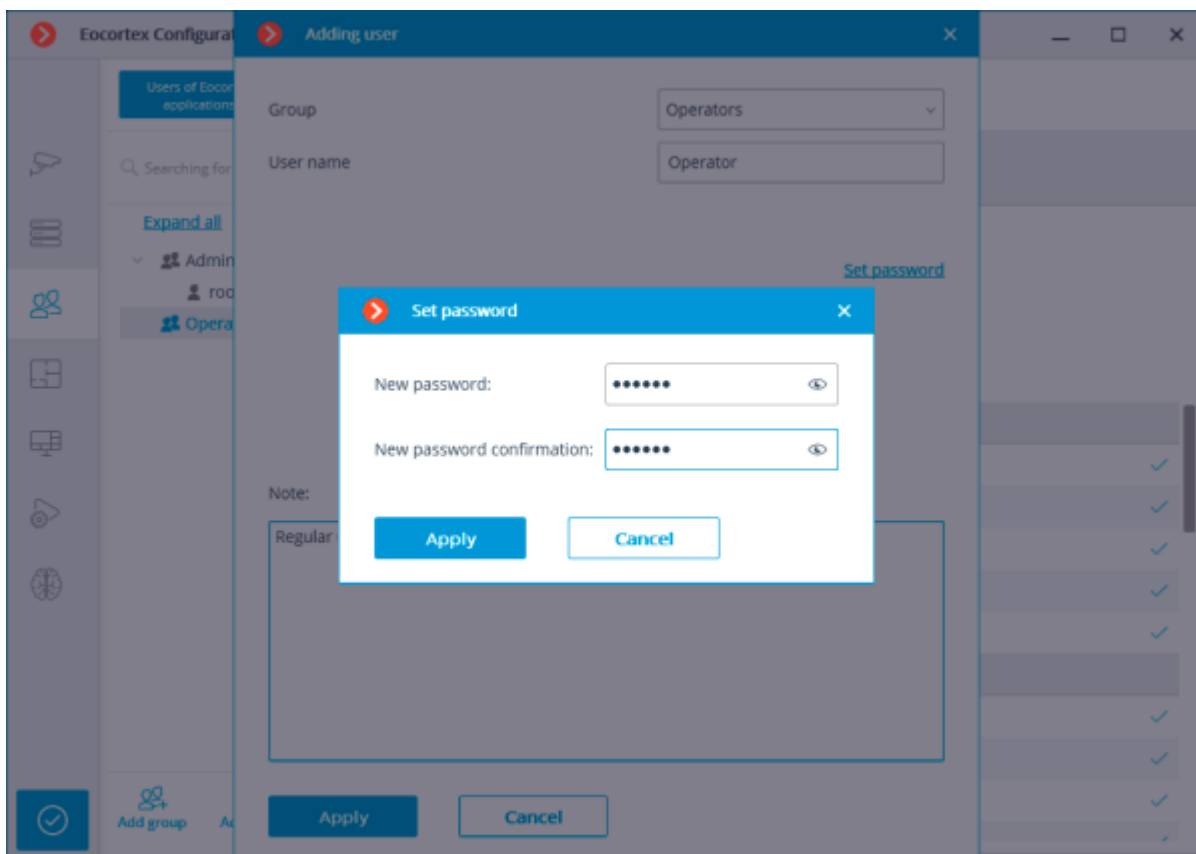
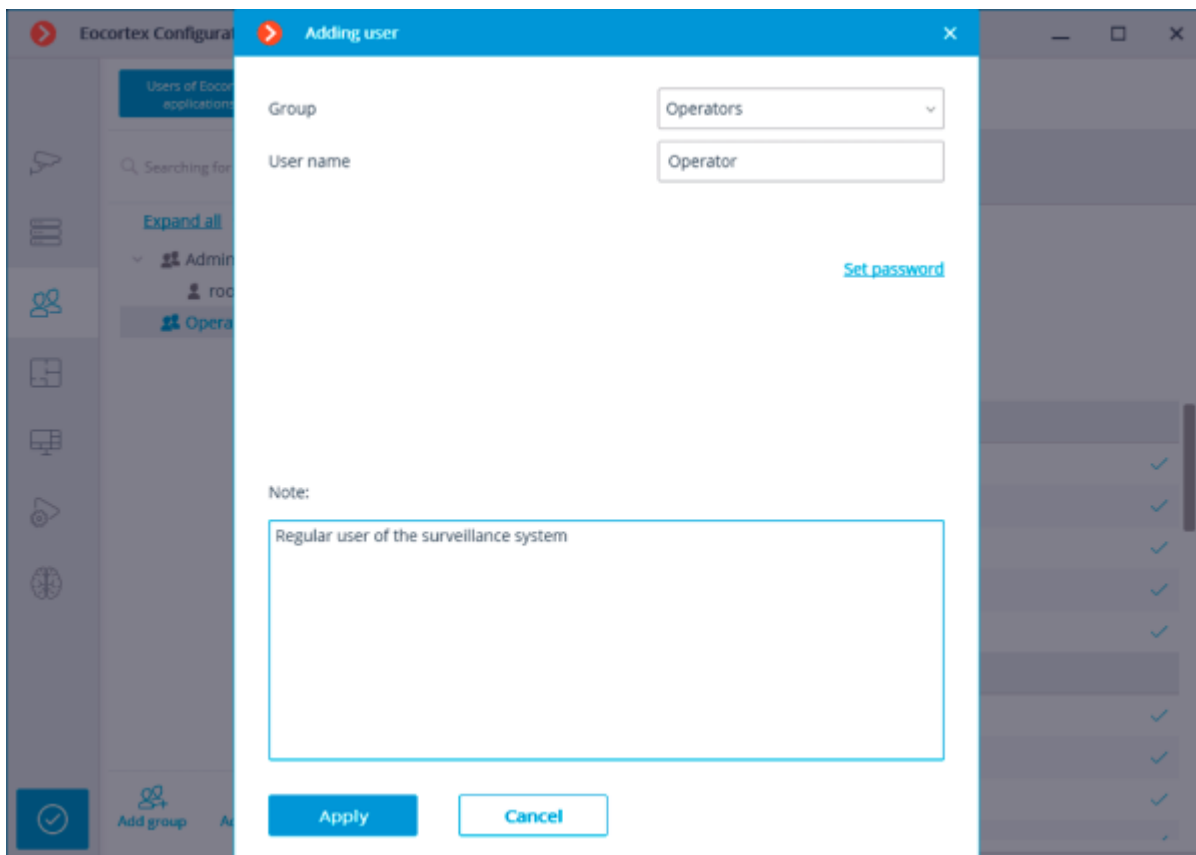


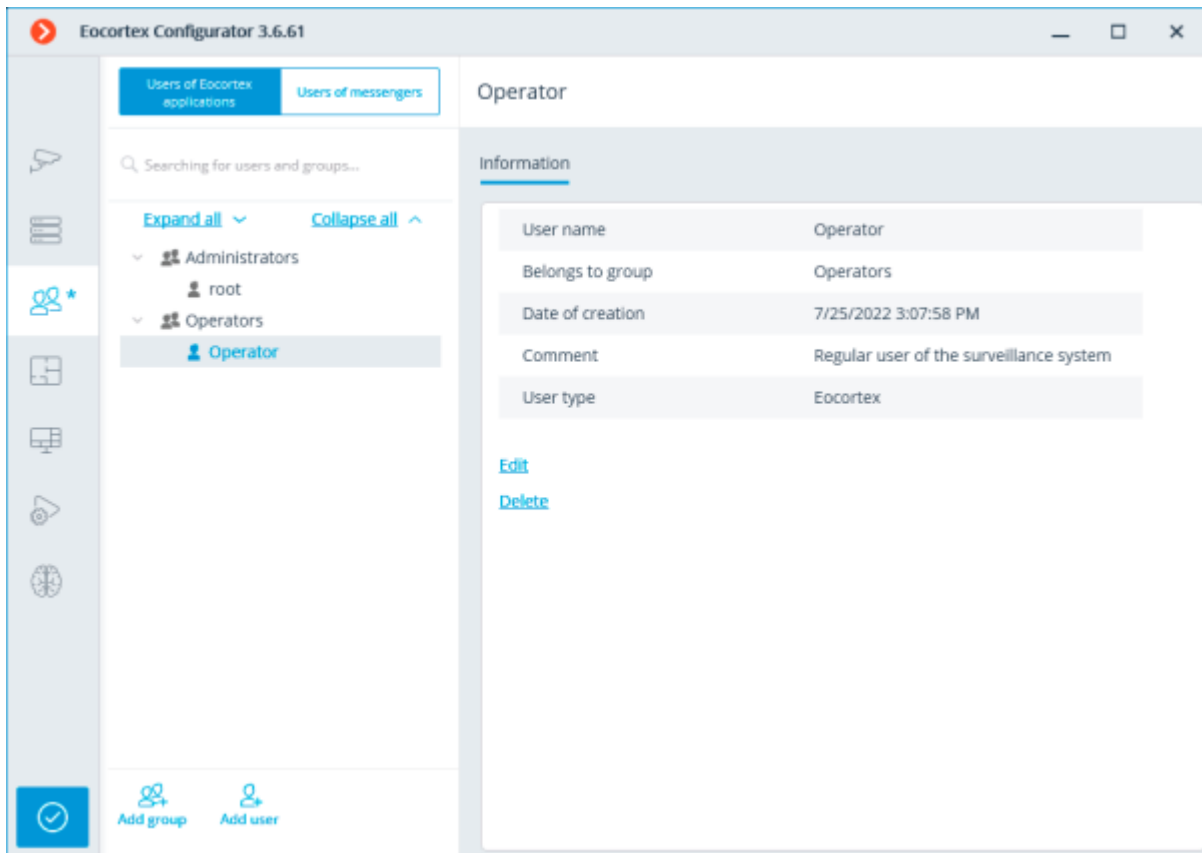


Adding and editing the Operator user

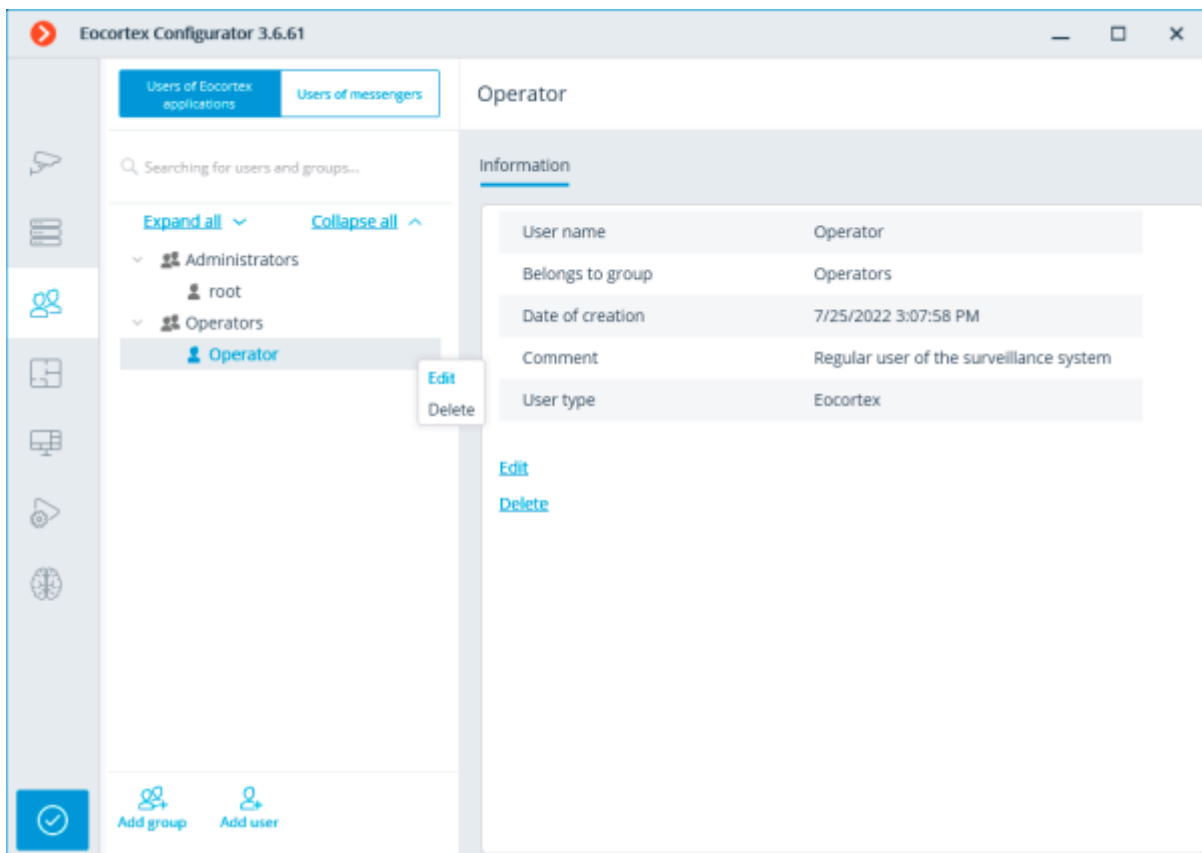
Adding the Operator user

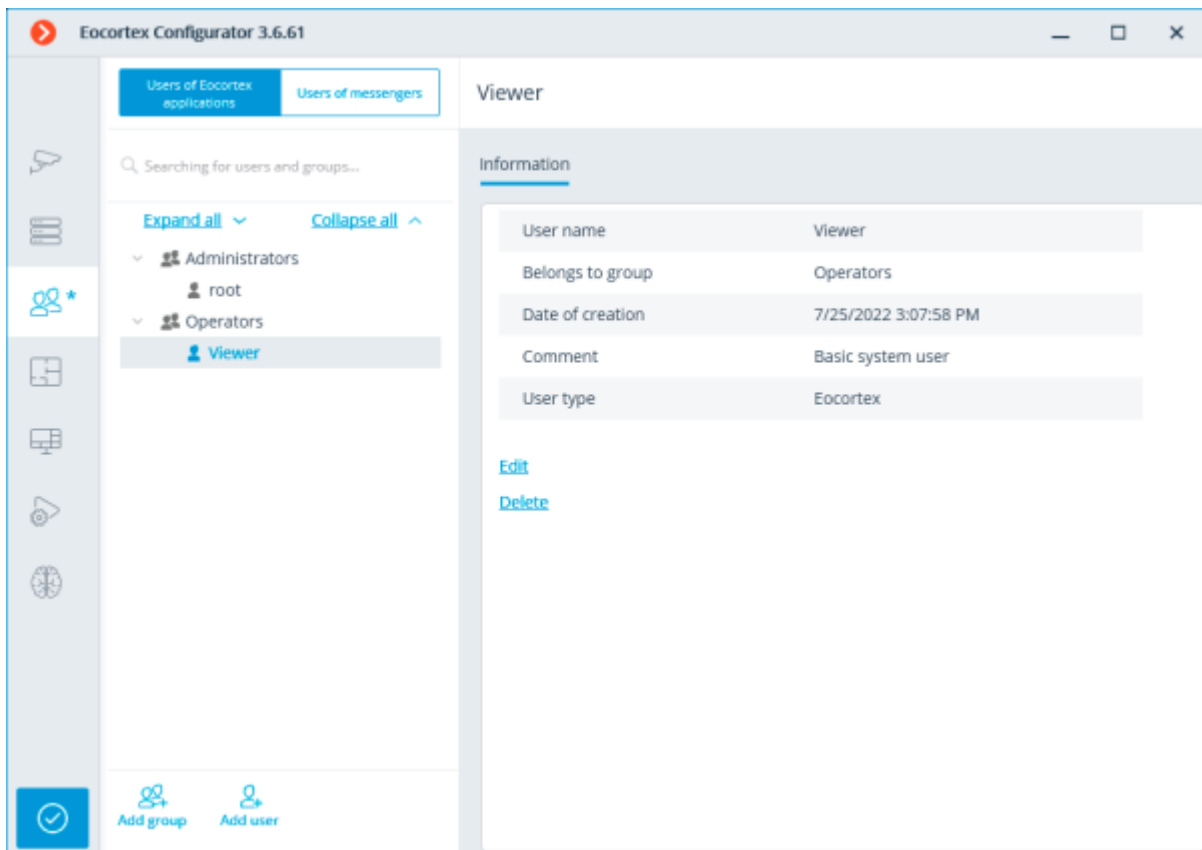
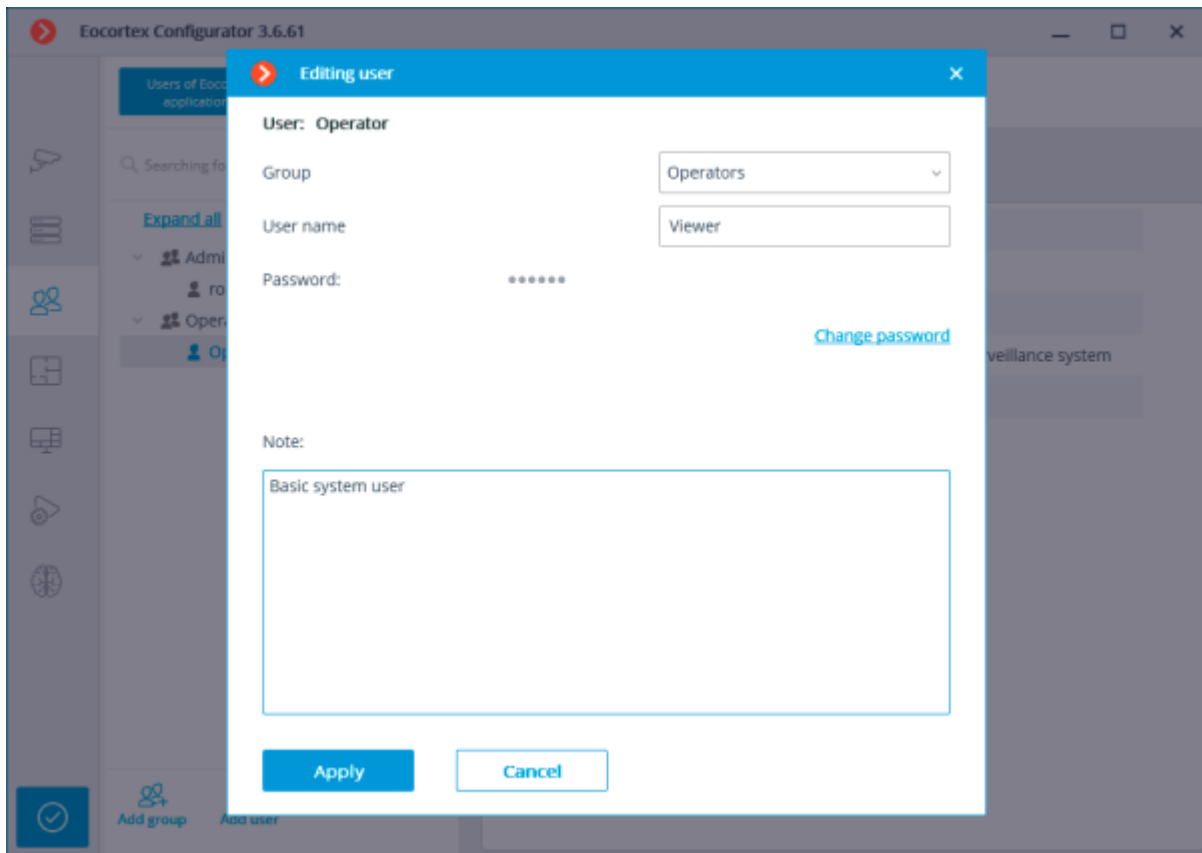







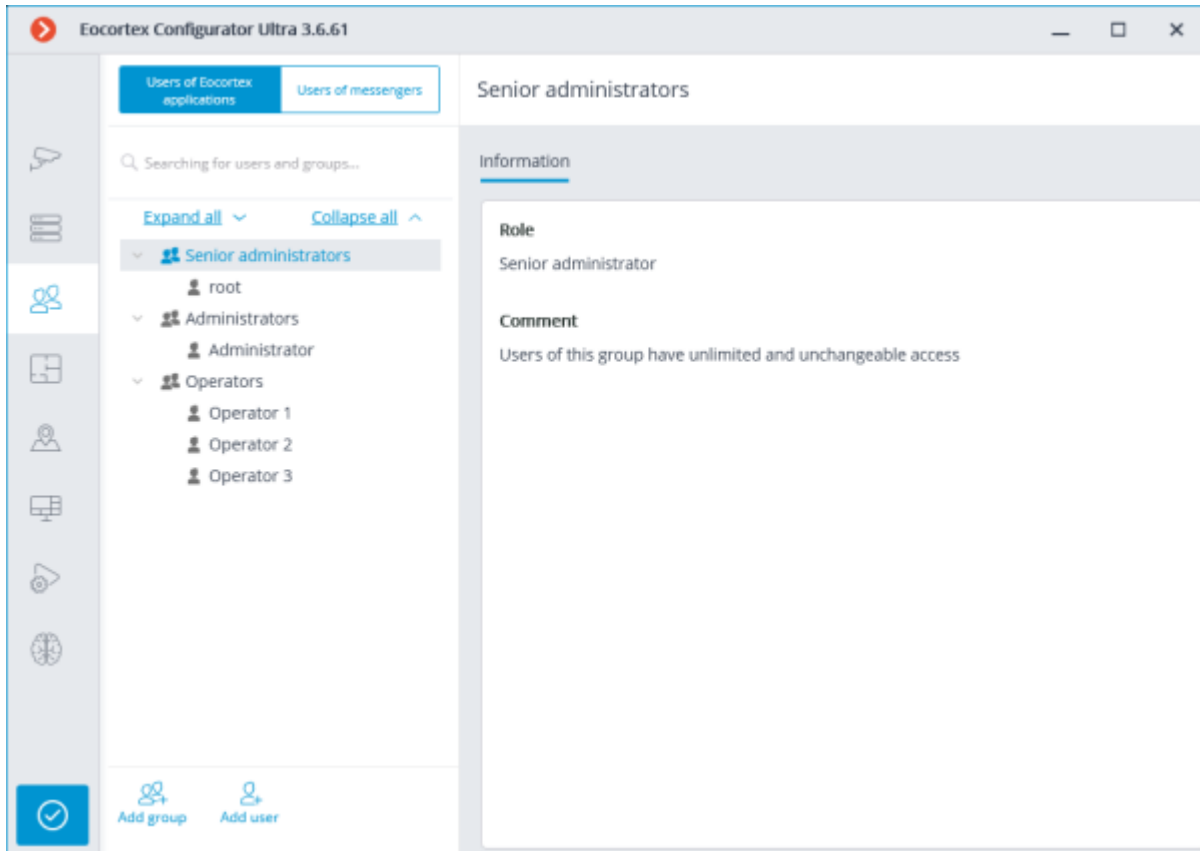
Editing the Operator user





Users of Eocortex applications (Enterprise and ULTRA licenses)

To set up the rights of users of the Eocortex system running on **Enterprise** or **ULTRA** license, run the **Eocortex Configurator**, open the  **Users** page and select the **Users of Eocortex applications** tab.



The tree of the groups and the users

The left part of the window contains a hierarchical tree of groups with the surveillance system users created in them. To configure an existing group or an individual user, select the required item in the list – the settings page of the selected group/user will be displayed in the right part of the window.

For the convenience of finding the necessary groups/users, the search field above the list can be used.

Particularities and limitations of user rights:

- The rights are provided only to the entire groups of users and are extended to all the users of the group. Individual users cannot be granted any rights that differ from the rights of the group.
- A single user can belong to only one group. A group may not contain users at all, but it is not possible to create a user which does not belong to any group.
- Every user is assigned a unique password.
- A user can be moved from one group to another, maintaining its password. The rights of the user in this case are modified according to those of the current group.

User groups in **Eocortex** running on **Enterprise** or **ULTRA** licenses have three levels of rights:

- **Senior administrators:** System administrator access level. An embedded group that cannot be deleted, and its rights cannot be modified. Only one group of users with such access level can exist in



the system. The users belonging to this group have unlimited configuration access: they are allowed to configure the whole system, create, modify and delete other groups and users, view and listen to any cameras, both in real time and from the archive. This group cannot be deprived of its rights. The configuration of the system must contain at least one member of this group (The default configuration of a system always contains an embedded user named root).

- **Junior administrators:** System administrator access level. Users of such group have also the ability to change the selection of the main server, as well as add new cameras and servers to the system. However, they are not allowed to configure the plans and users of the system. Removing a server from the system is available to the junior administrator only if no cameras that are unavailable for this user are bound to this server.
- **Operators:** Regular system user access level. The rights of group members with this level of access are limited to viewing cameras without access to the system configuration.

When updating the system running on **Eocortex ULTRA** version 1.4 or older to a later version, the following changes will be applied to user rights:

- **Senior administrators** group will be created. All the users with full system configuring rights will be transferred there.
- All groups which have the rights to partially configure the system become groups with junior administrator level.
- At rollback **Eocortex** to a version earlier than 1.4, all groups with junior administrator rights will have full access to perform configuring of the whole system.

Below is the list of actions available when setting up users of the system. These actions can be performed either from the context menu of the group/user, or using the buttons below the list of users and groups, or via links on the group or user information page. Some actions can be performed in multiple ways, including using hotkeys.

-  **Add group:** Opens the window of adding a group.
-  **Add user:** Opens the window of adding a user to the selected group.
- **Add group based on the selected one:** Adds a new group with the rights identical to those of the selected group.
- **Edit:** Opens the editing window for the selected group or user.
- **Delete:** Removes the selected group or user from the configuration.

The settings will come into effect only after they are [applied](#).

Junior administrator access level

Junior administrator permissions tree

Junior administrator

Below is a list of the access rights that can be set for the user group with the Junior administrator privilege level.

- **Configuring**
Section of access rights settings, which is responsible for the ability to configure the system by a user included in a group with these rights. Includes subsections:
- **Servers**

A subsection of access rights settings that defines the list of servers that a user from this group can [configure](#).

- **Cameras**

A subsection of access rights settings that defines the list of cameras that a user from this group can [configure](#). In addition to setting up the list of cameras available for editing, it is possible set the level of access to camera configuration, which determines a user's ability to change camera settings in the system.

Access levels for configuring cameras:

- **No access**

Complete prohibition on viewing and changing camera settings. The Cameras section of the Configurator application containing camera settings is not available to users with this access level.

- **Viewing settings and adding cameras**

Partial prohibition. Users with this access level can add new cameras and view the settings of cameras that already exist in the system, while at the same time not being able to delete or change the settings of existing cameras, even if they were added by this user.

- **Modifying settings**

Partial prohibition. Users with this access level can view and change the settings of existing cameras without having the right to add new cameras or delete existing cameras.

- **Changing settings and adding cameras**

Partial prohibition. Users with this access level can view and change the settings of existing cameras, as well as add new cameras to the system. Removal of cameras added to the system is not available.

- **Modifying settings, deleting and adding cameras**

No prohibition. Users with this access level can: view and change the settings of existing cameras, add new cameras, delete added cameras.

- **Surveillance**

Access rights settings section, which is responsible for interaction with **Eocortex** using [client applications](#).

Includes the following subsections:

- **Basic**

A subsection that determines the accessibility of sections and functions of the **Eocortex Client** application to users belonging to this group.

- **Camera control**

- **Audio streaming from camera**

Provides the ability to listen to the sound received from the camera microphone. To receive sound in the system, the camera must have the **Sound capturing** option enabled in the [connection settings](#).

- **Broadcast sound to camera**

Provides the ability to transmit sound from a microphone installed at a user's workplace to the camera speaker. To transmit sound from the system, the camera must have the **Sound transmission** option enabled in the [connection settings](#).

- **Observation mode change**

Provides the ability to arm one or more cameras with the [Guard mode](#) in the **Eocortex Client** application in order to receive notifications when alarm events occur.

- **PTZ Cameras management**

Provides the ability to use the [PTZ functionality of the camera](#) in the **Eocortex Client** application. To use the PTZ functionality, the camera must have the **PTZ capabilities** option enabled in the [connection settings](#). **Eocortex** systems with **Enterprise** and **ULTRA** allow the system administrator to

additionally prioritize user commands in case of simultaneous control of a single camera from multiple workplaces.

The following priority levels are available:

- Priority: minimum
- Priority: low
- Priority: medium
- Priority: high
- Priority: maximum

When using PTZ functionality by two users with equal priority, the commands of a user who started controlling the camera first will be executed.

- **Archiving management**

Provides the ability to manually enable recording of the camera stream to the **Eocortex** archive, if the recording option **Manual**, **On motion** or **Scheduled** is selected for this camera in the [Archive Recording Settings](#).

- **Configuring**

- **Changing password from client**

Gives a user the ability to change the password for his system account in the **Eocortex Client** application.

- **Configure workplace**

Gives a user the ability to change the [Workplace Settings](#) in the **Eocortex Client** application.

- **Editing face database and license plate database data**

Determines the possibility of adding, modifying and deleting entries in the databases of the **License Plate Recognition** and **Face Recognition** modules.

- **Eocortex client applications capabilities**

- **Log access**

Specifies whether the [Events Log](#) is available to a user. Access to the Log can be granted to a user with one of two levels:

- **Current user in log only**

For a user, in addition to general system events (loss of connection with the camera, analytics events, etc.), only those events that were caused by his actions (execution of a user task, archive export, etc.) will be displayed.

- **All system users in log**

A user will see all system messages will be displayed, including those caused by the actions of other users.

- **Videowall access**

Determines the availability of the [Video Wall](#) functionality for a user. Even if this right is disabled for a user, the monitor from his workplace still can be used to create a video wall controlled from another workplace.

- **Chat access**

Determines the availability of the [Internal chat](#) functionality for a user.

- **Access to reports**

Determines for a user the ability to build reports based on the data collected by the **Eocortex** system ([Archive depth](#), [Face Recognition Report](#), etc.).

- **Access to archive marks**

Determines for a user the ability to create and view [Archive Bookmarks](#).

- **Access to the episode archive**

Determines for a user the ability to create, view and delete archive episodes in the [Episode Archive](#).

This right has several access levels:

- Viewing (only your own)
- View (all)
- Creating and viewing (only your own)
- Creating and viewing (all)
- Creating, viewing, and deleting (only your own)
- Creating, viewing, and deleting (all)

- **Access to maps**

Determines the availability of the **Maps** section for a user.

- **Access to Search for Objects**

Determines for a user the ability to use data collected by the system using the [Search for Objects](#) module.

- **Close application**

Determines the ability for a user to close the window of the **Eocortex Client** application using standard methods.

- **Limitation of the number of connections**

Sets a [limit on the number of simultaneous connections](#) using the credentials of the same user.

- **Application launch delayed**

Prevents a user from being forced to immediately restart the application when changes are made to the system settings.

This right allows to delay the restart of the **Eocortex Client** application, but the user must still restart the application when appropriate for the changes to take effect.

- **User tasks launch**

Provides the ability to execute [User tasks](#).

- **Camera cell control**

Provides a user with the ability to interact with camera cells: drag and drop cameras between cells, use the context menu and cell interface elements.

- **Access to face and license plate databases**

Provides a user with the ability to view entries in the databases of the **License Plate Recognition** and **Face Recognition** modules.

Disabling this right will automatically disable the **Editing face database and license plate database data** right.

- **Adjusting the number of occupied parking spots**

Allows a user to make changes to the data displayed in the [Occupied Parking Spots counter](#) of the **License Plate Recognition** module.

- **Accept alarms without obligatory comments**

Allows a user to [confirm receipt of an alarm event](#) of the camera without having to add a comment about the received alarm. Upon deactivation of a right the automatic alarm acceptance will be disabled.

- **Archive export**

Provides the ability to [export fragments of the system archive](#) as **MCM**, **MP4** or **AVI** files.

- **Archive expert mode access**

Allows a user to interact with the archive in the mode of [simultaneous viewing of multiple cameras](#).

- **Editing views**

Allows a user to [create and edit views](#). Applies only to views created in the **Eocortex Client** application directly at a user's workplace. Does not affect [server views](#) created and edited in Eocortex Configurator.

- **Blurring disabled**

Allows a user to disable image blurring imposed by the **Frame Area Blurring** module.

- **Interaction with external components**

- **Receive push notifications**

Allows a user to receive Push notifications in **Eocortex** mobile applications (iOS, Android) authorized under his account.

- **Connection via mobile devices and Web-Client**

Allows using a user account for authorization in **Eocortex** mobile applications ([iOS](#), [Android](#)) and [Web Client](#).

- **Cameras**

Subsection defining the list of cameras available for [viewing in Eocortex client applications](#). Both full access to the camera, and partial access to only the archive or only to the live video of the camera can be provided.

- **One right for surveillance and archive**

An option that speeds up the process of setting up access to cameras. If enabled, a user will be granted both access rights to the camera at the same time - to the live video and to the archive of the camera. Can be disabled for more fine-grained access customization with separate rights.

- **Surveillance**

The user has access to the camera's live video.

- **Archive**

The user has access to the camera's archive recordings.

- **Views**

Subsection defining the list of [views](#) available to a user in the **Eocortex Client** application.

- **Modules**

Subsection defining the list of [video analytics modules](#) available to a user in the **Eocortex Client** application.

- **Plans**

Subsection defining the list of [plans](#) available to a user in the **Eocortex Client** application.

Adding a Junior administrator group

Junior administrator permissions overview

Eocortex Configurator Ultra 3.6.61

Users of Eocortex applications | Users of messengers

Administrators

Basic rights | Cameras | Servers | Views | Modules | Plans

Searching for users and groups...

Expand all | Collapse all

- Senior administrators
 - root
 - Administrators**

Add group | Add user

Main rights of the group Administrators

Edit

Role	Comment
Junior administrator	Local administrators of the surveillance system

Camera control

Received sound from camera	✓
Broadcast sound to camera	✓
Observation mode change	✓
PTZ Cameras management [Priority: minimum]	✓
Archiving management	✓

Configuring

Changing password from client	✓
Configure workplace	✓
Editing face database and license plate database data	✓

Eocortex Configurator Ultra 3.6.61

Users of Eocortex applications | Users of messengers

Administrators

Basic rights | Cameras | Servers | Views | Modules | Plans

Searching for users and groups...

Expand all | Collapse all

- Senior administrators
 - root
 - Administrators**

Add group | Add user

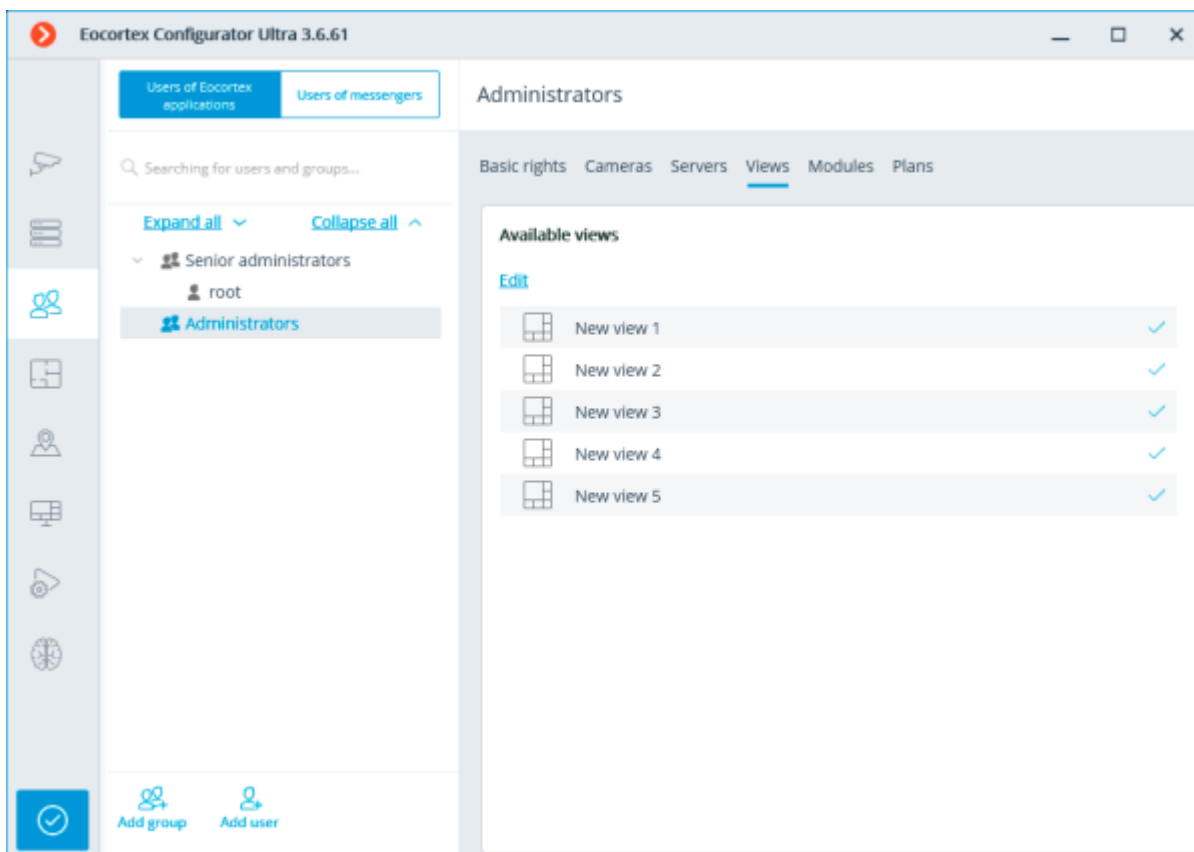
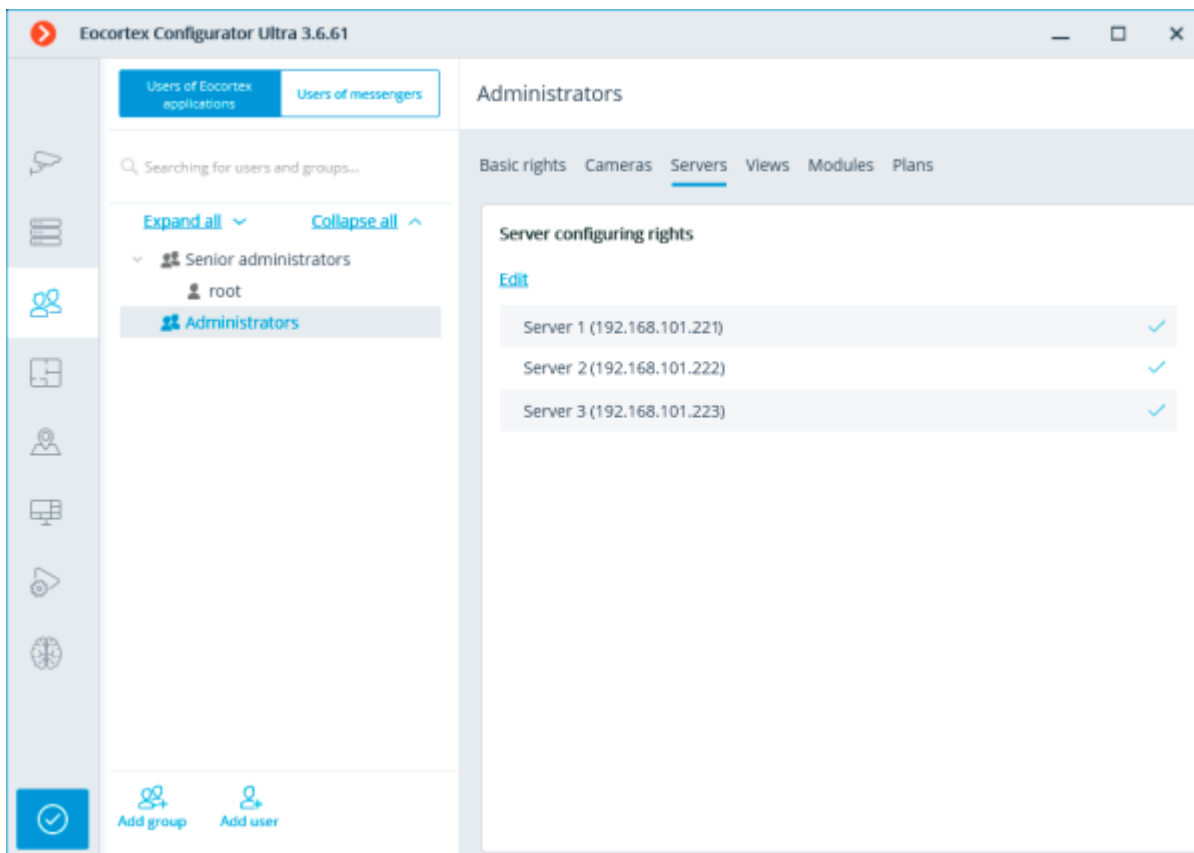
Available cameras

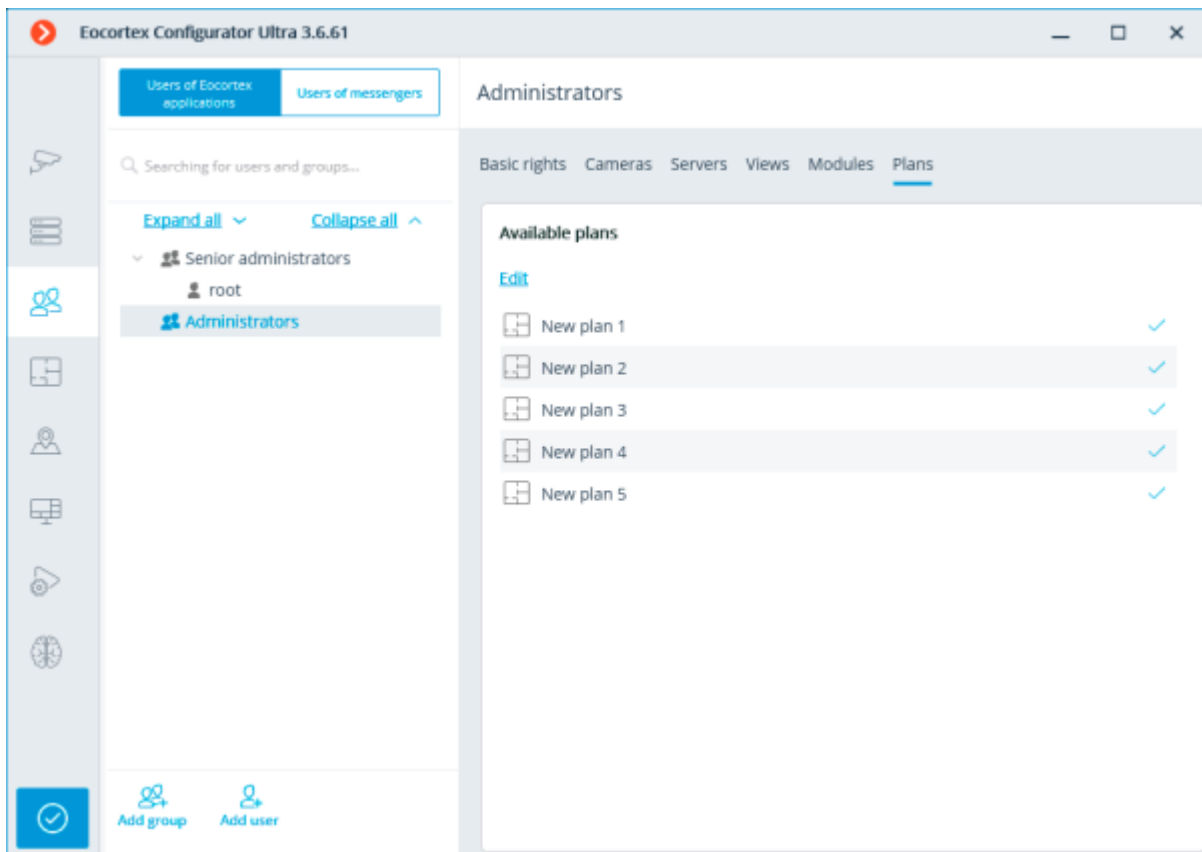
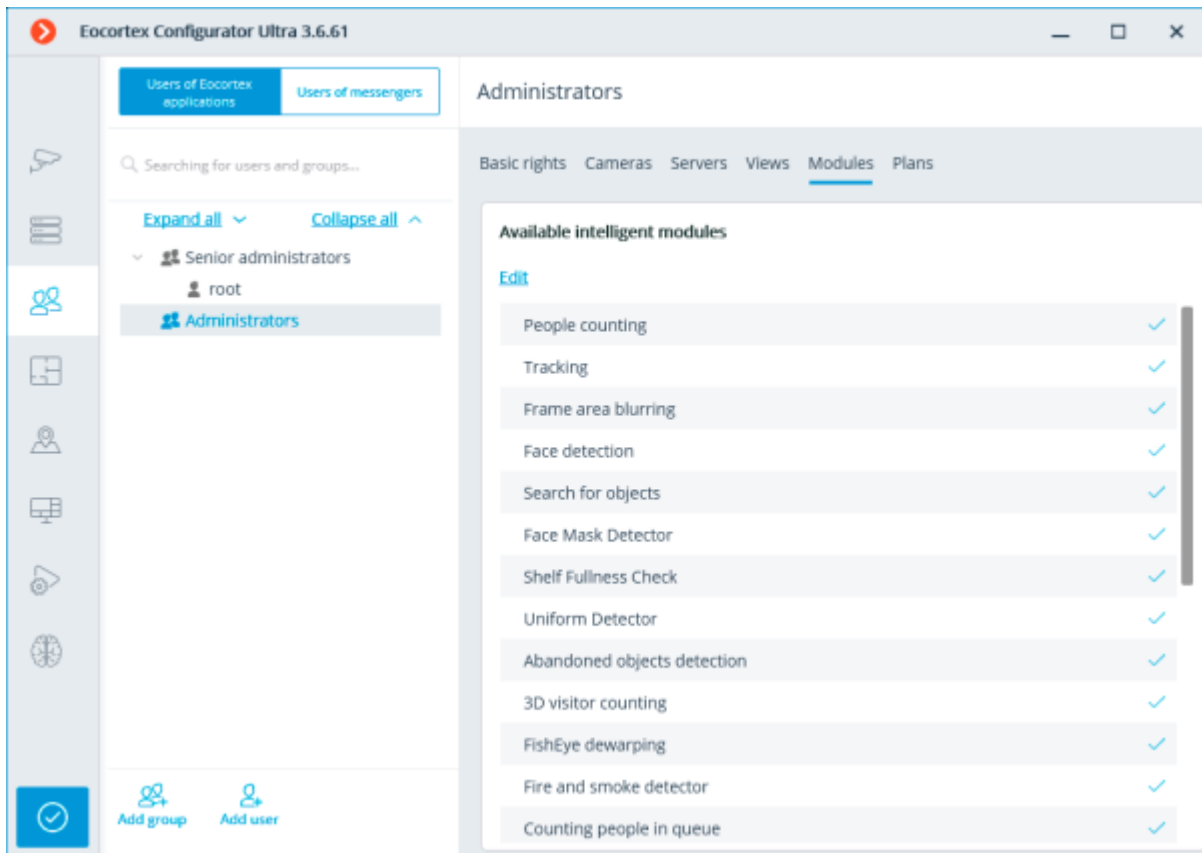
Edit

Search by name or address

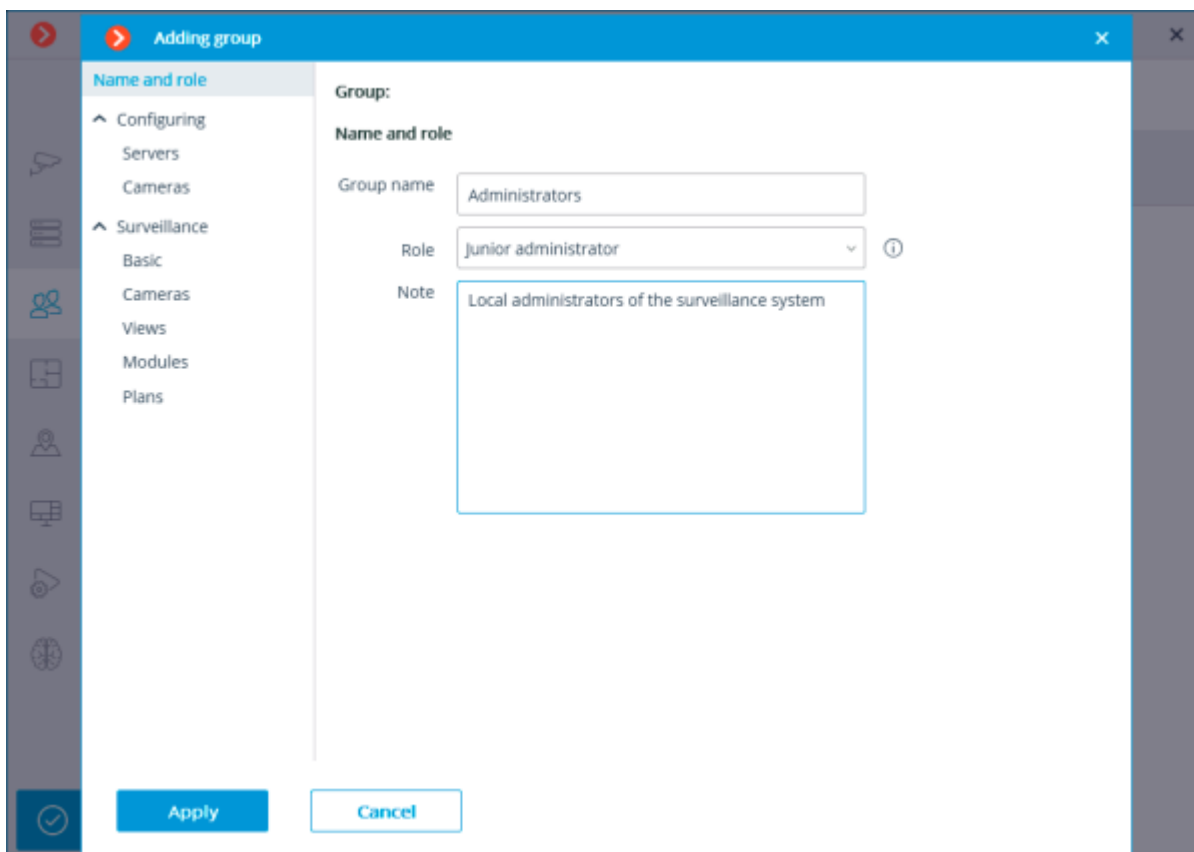
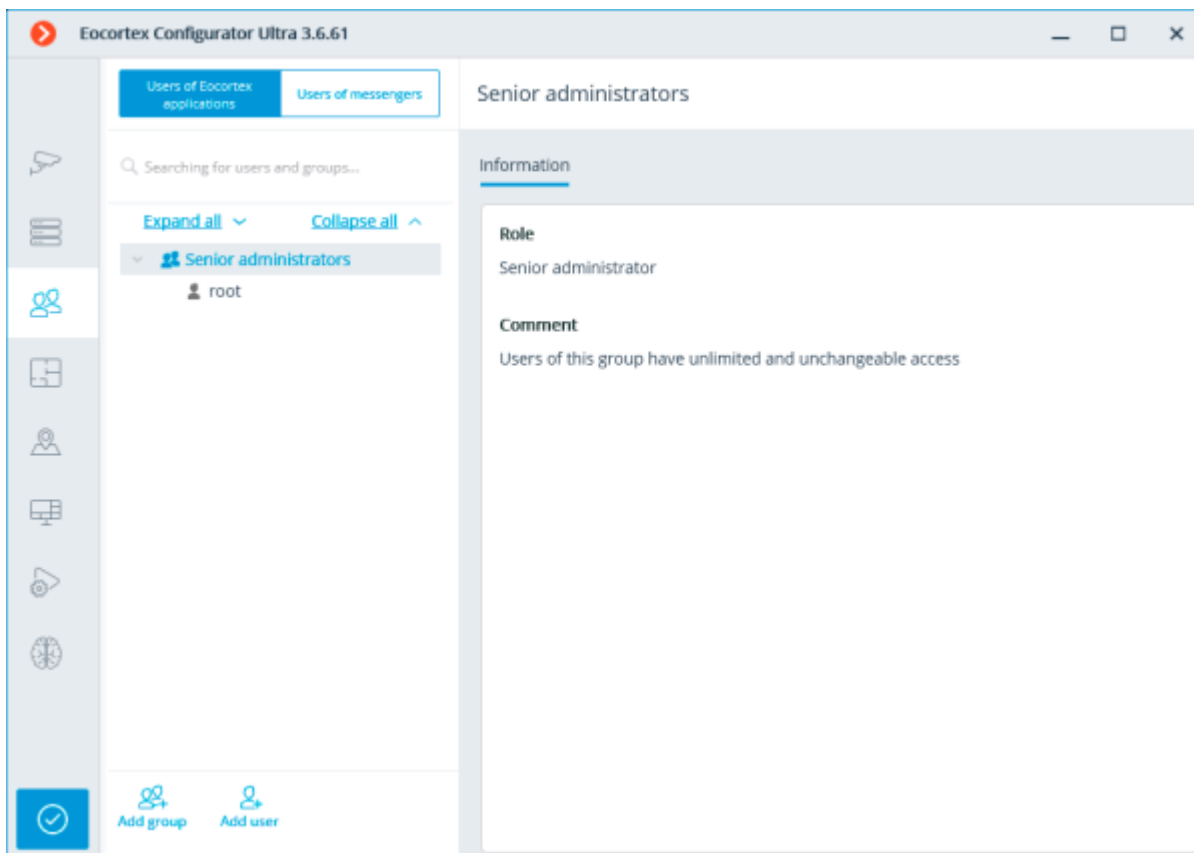
Expand all | Collapse all

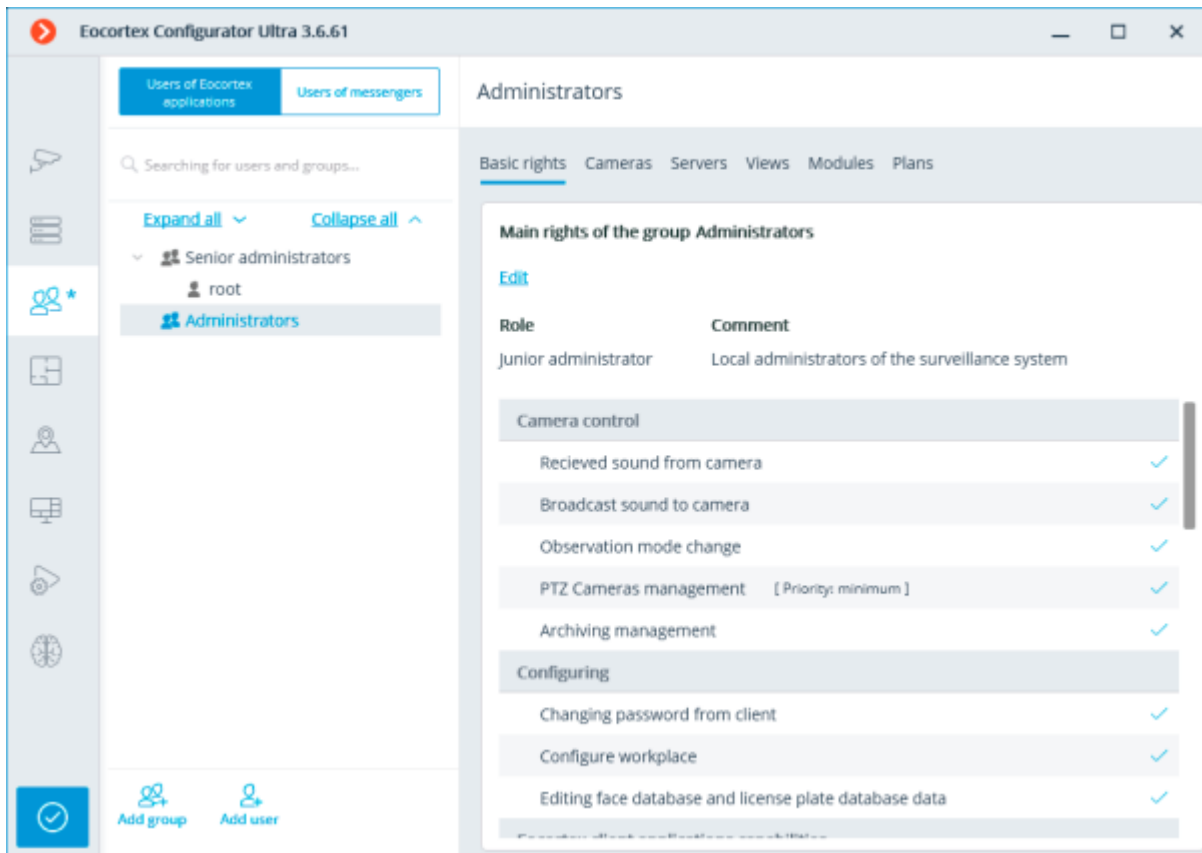
Name	Surveillance and archive	Configuring
Camera 1 192.168.101.223:9090	✓	✓
Camera 2 192.168.101.224:9090	✓	✓
Camera 3 192.168.101.225:9090	✓	✓
Camera 4 192.168.101.226:9090	✓	✓
Camera 5 192.168.101.227:9090	✓	✓



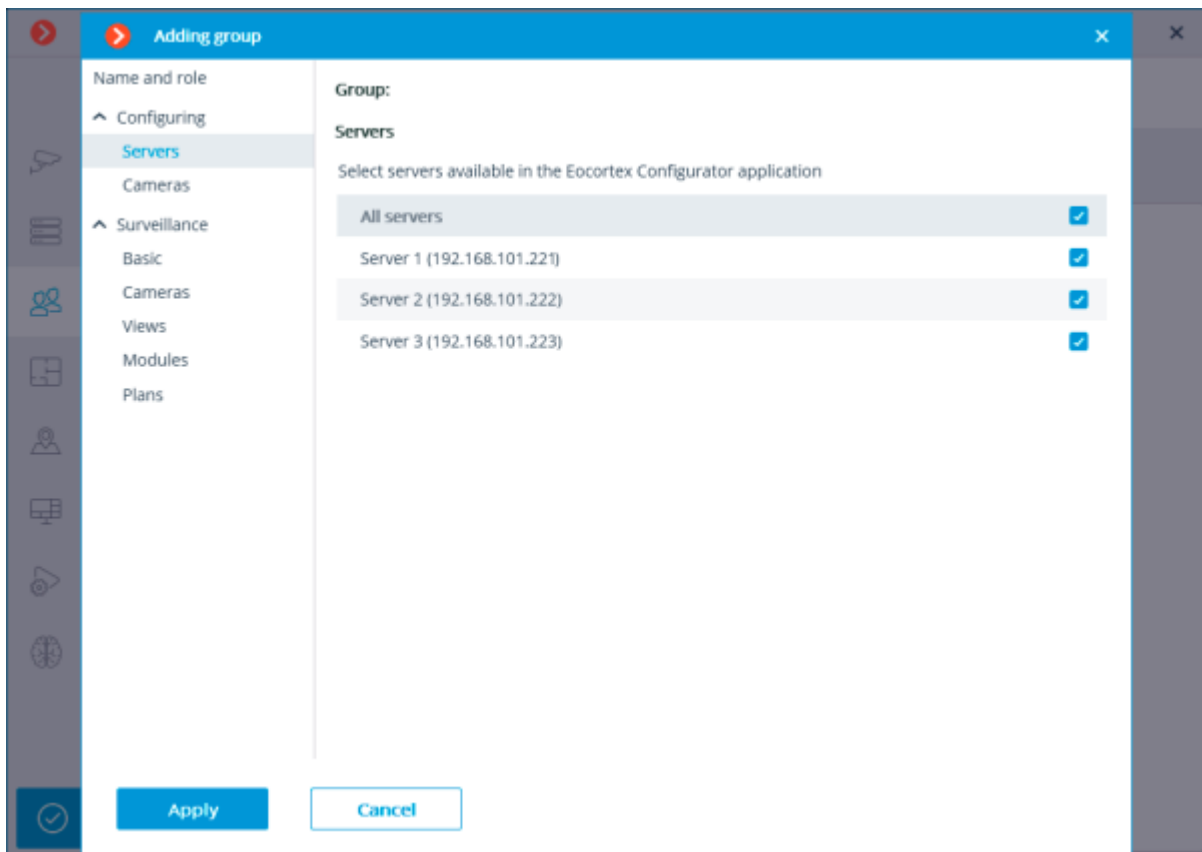


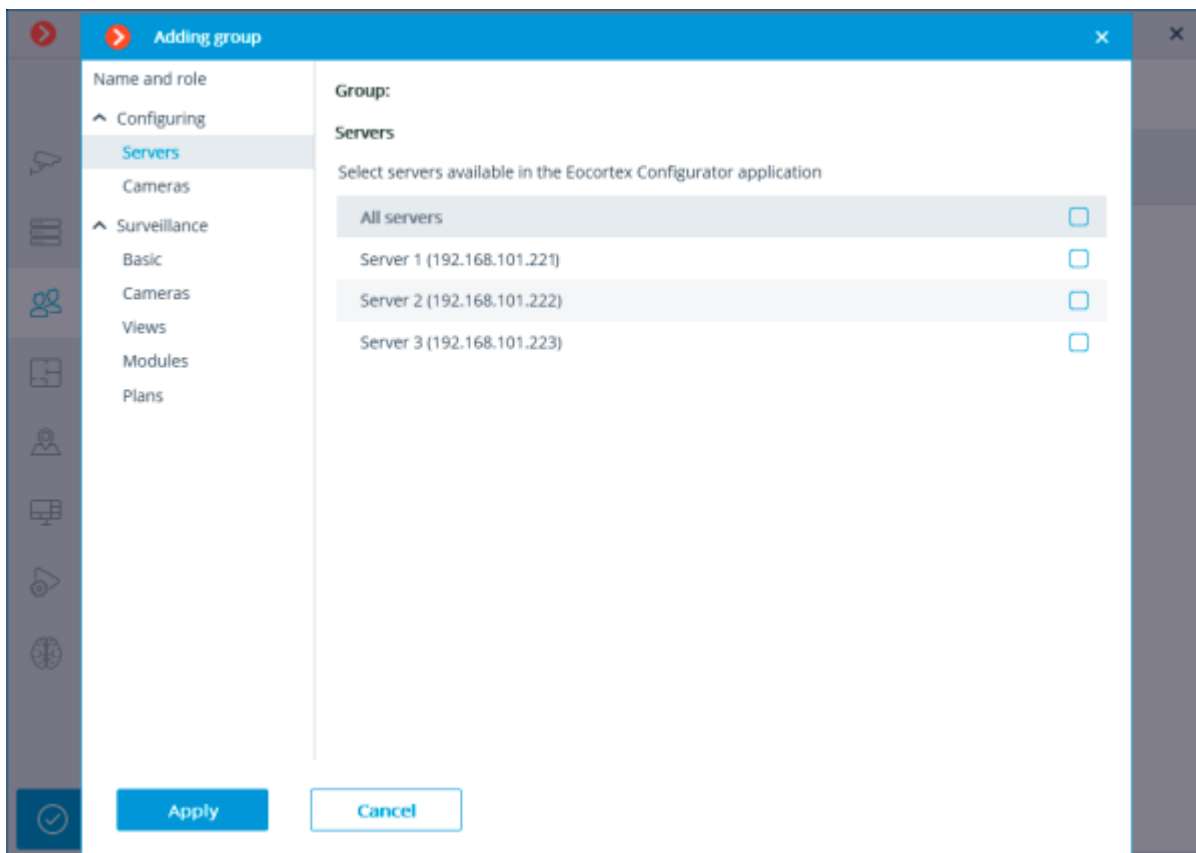
Adding the group



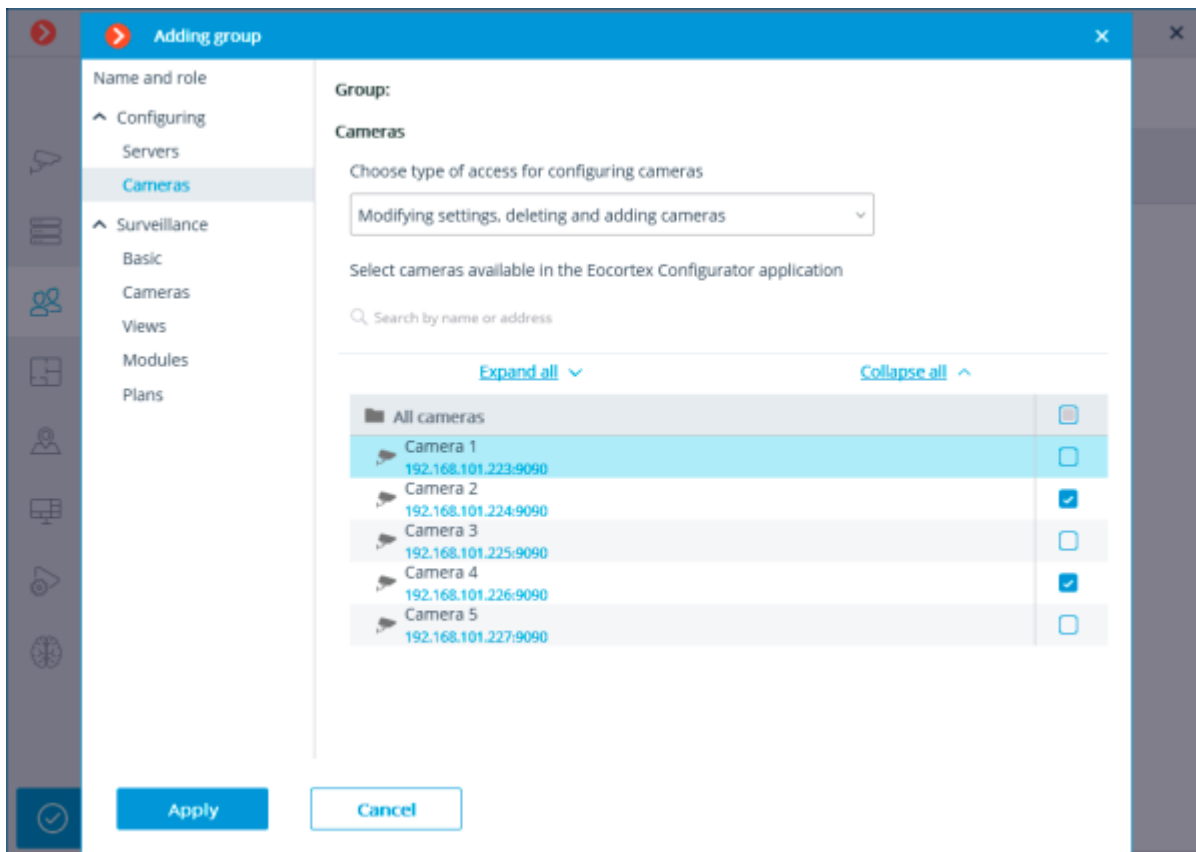


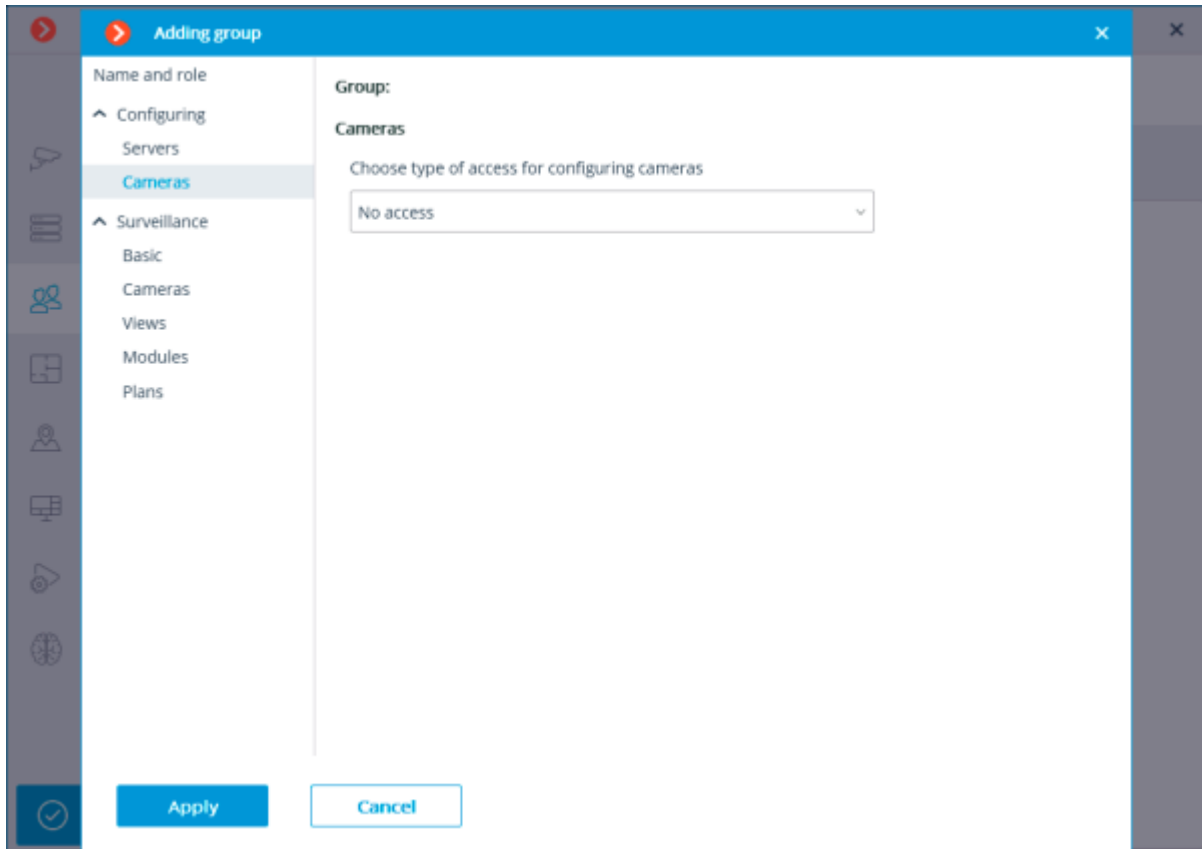
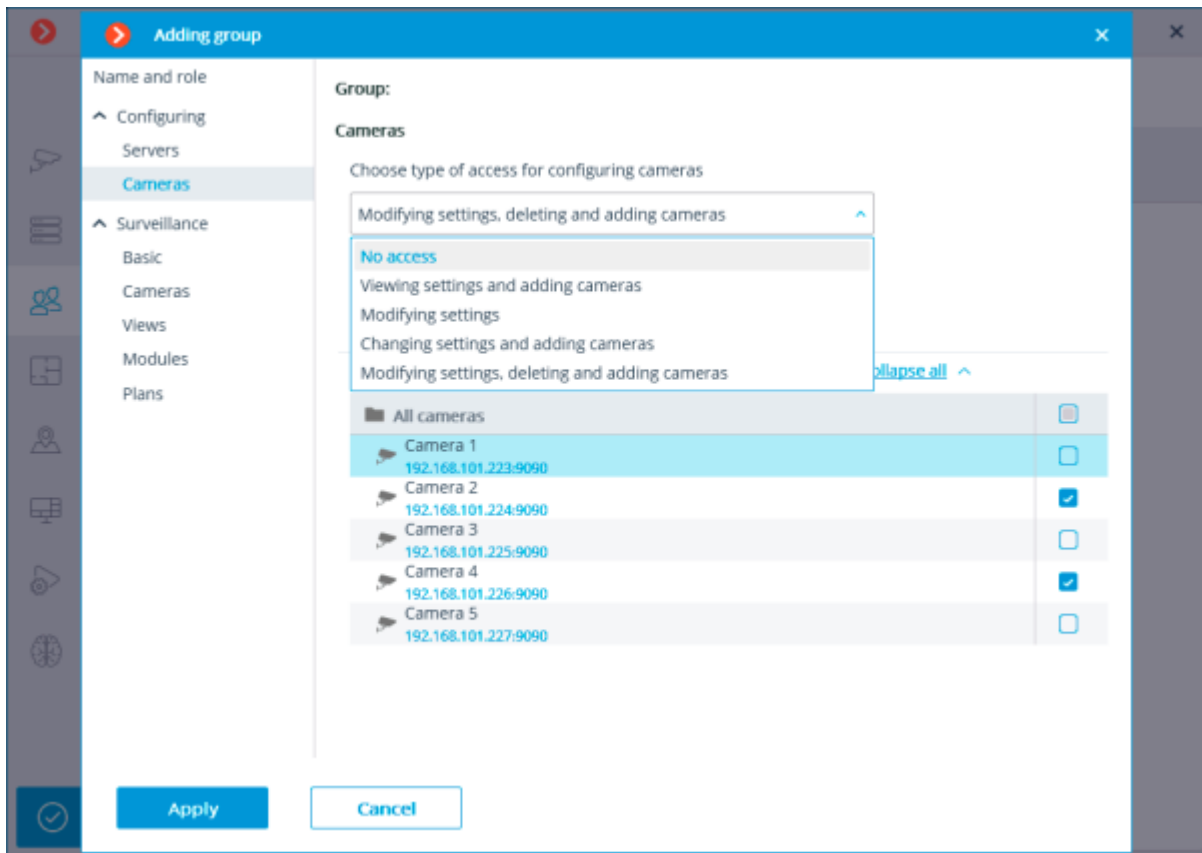
Granting rights to configure servers



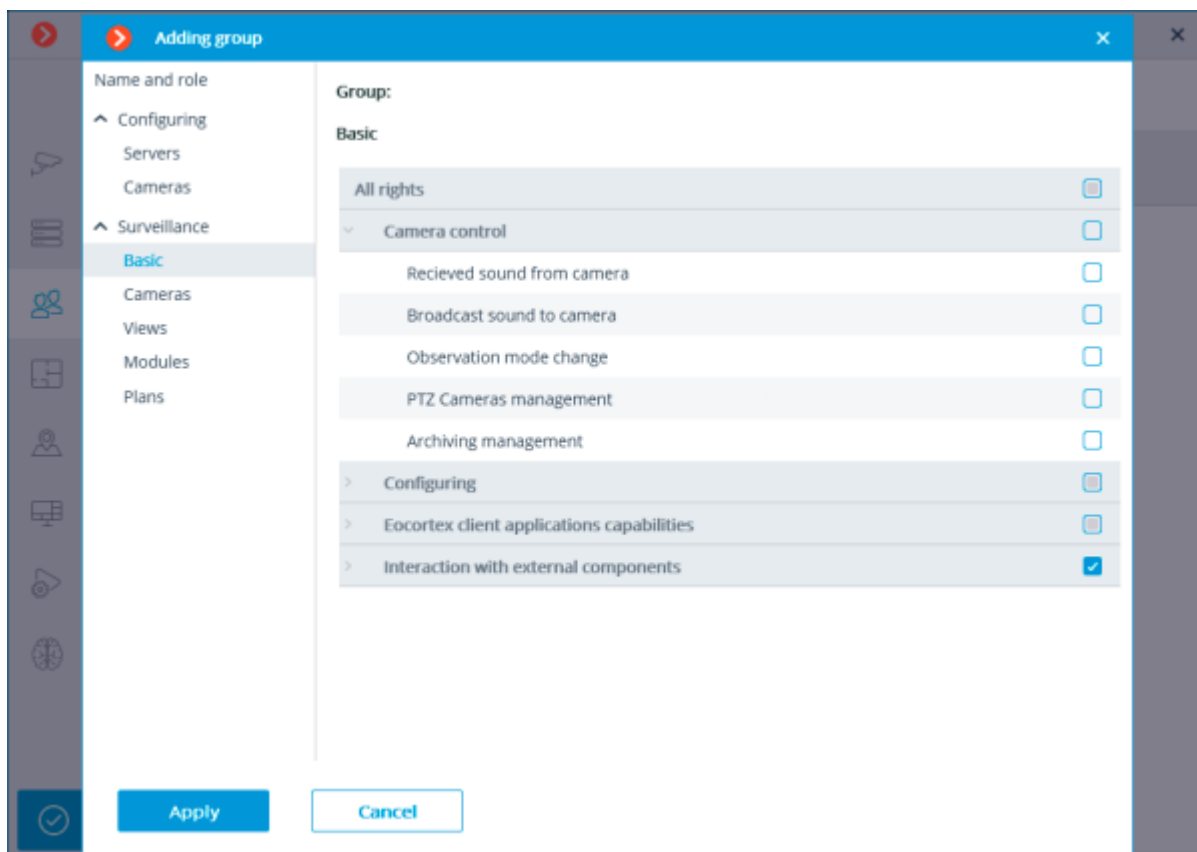
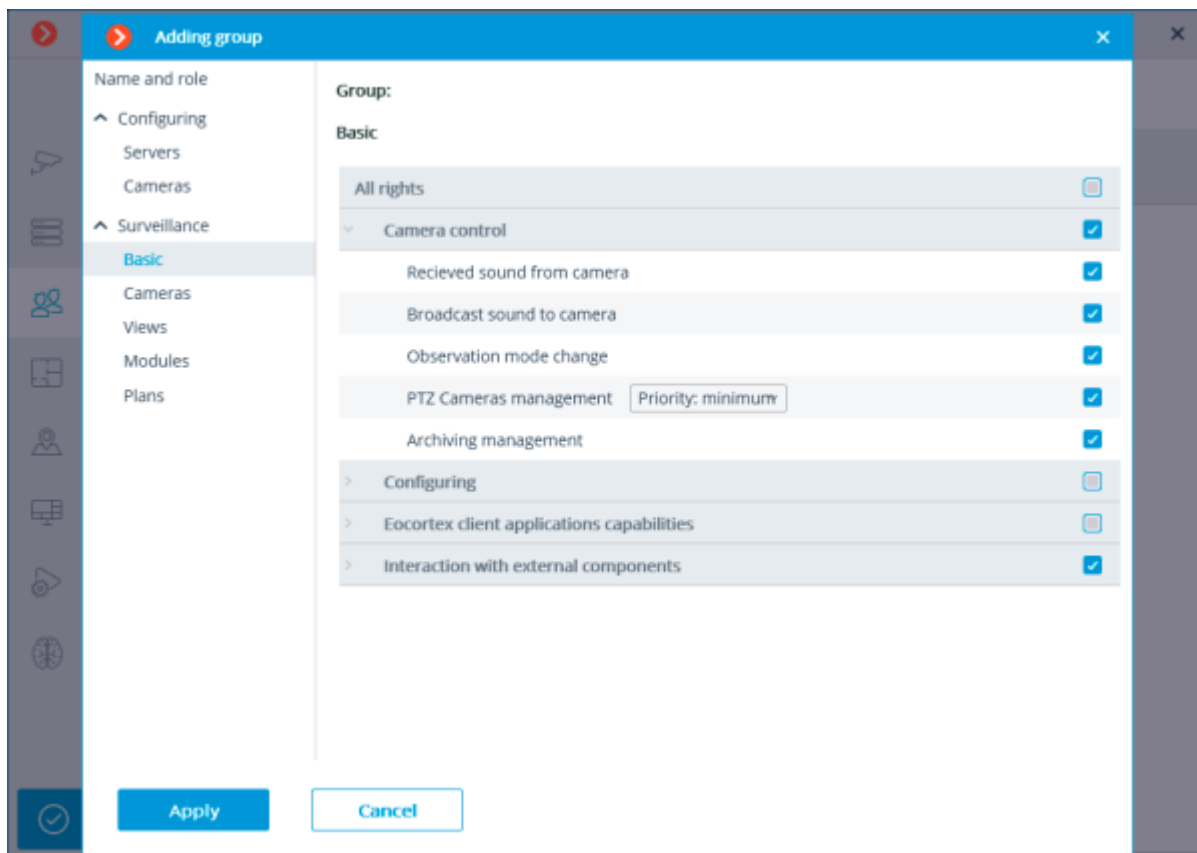


Granting rights to configure cameras

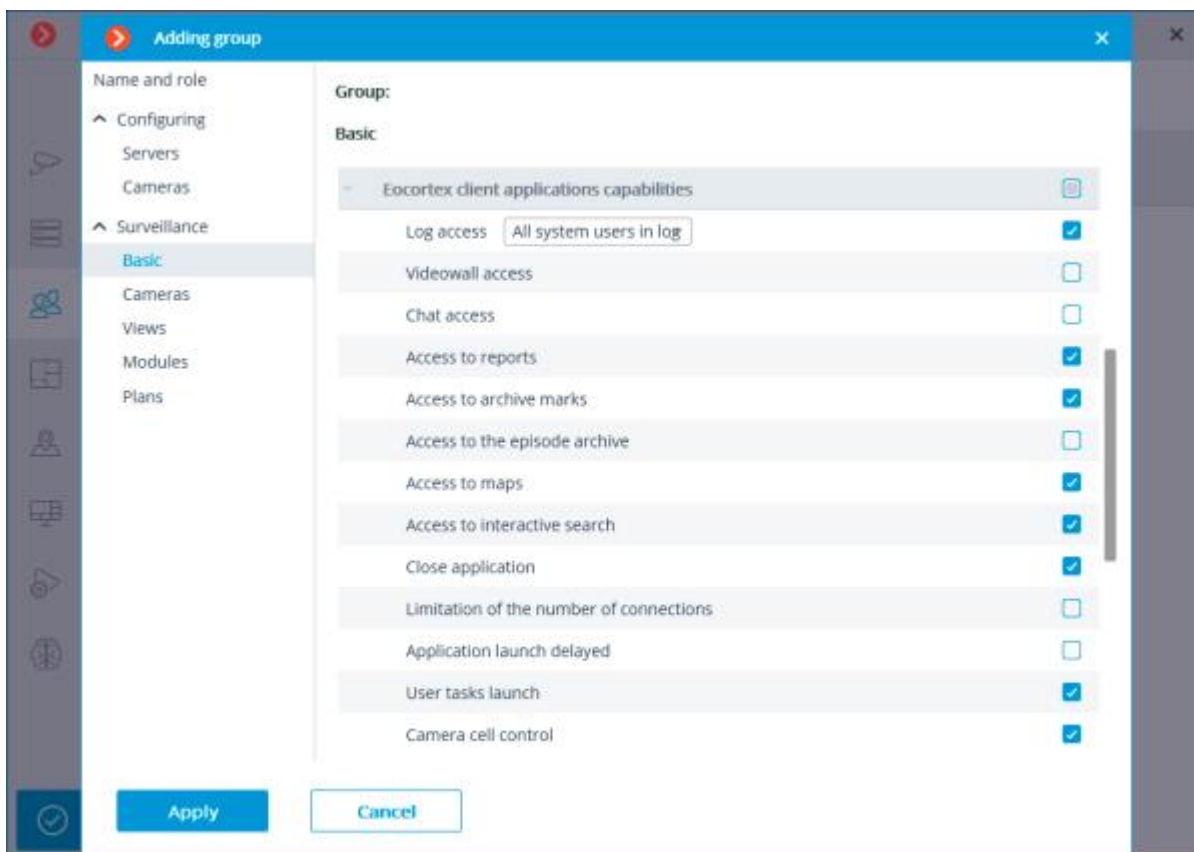
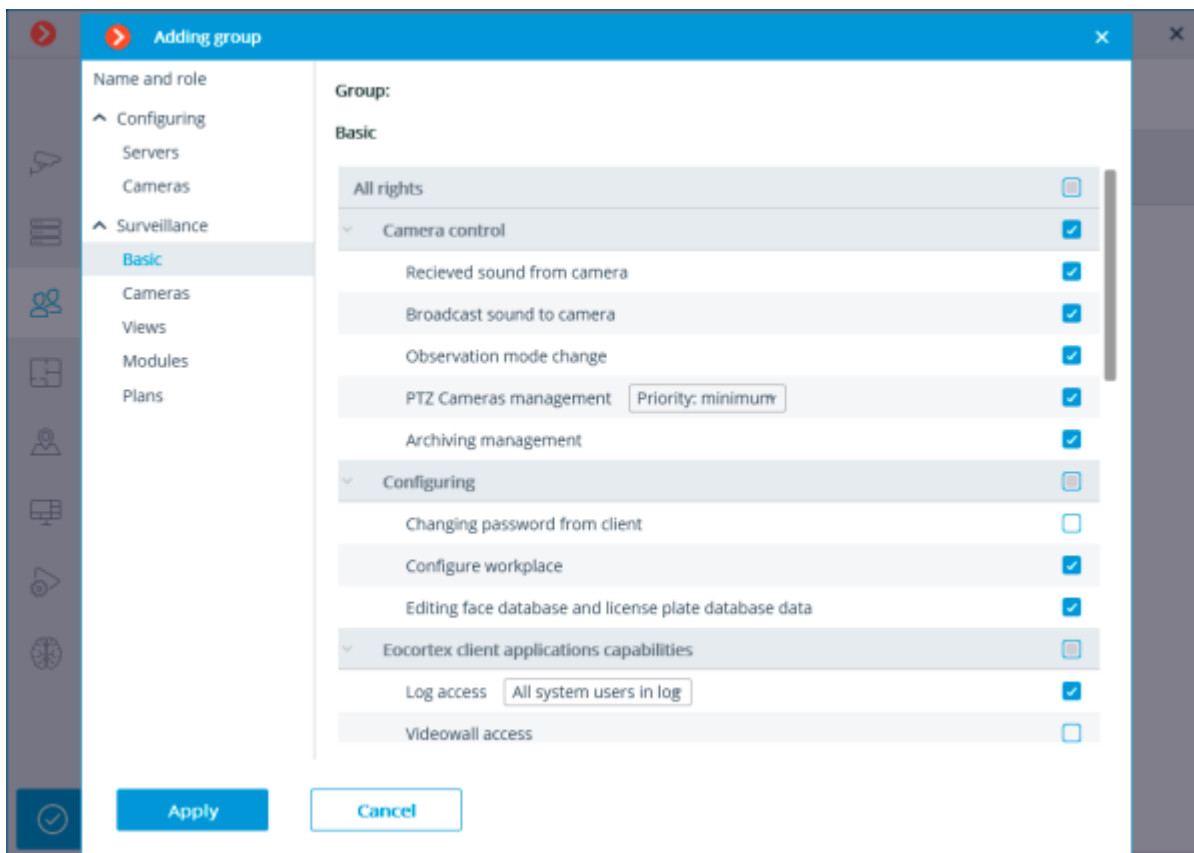


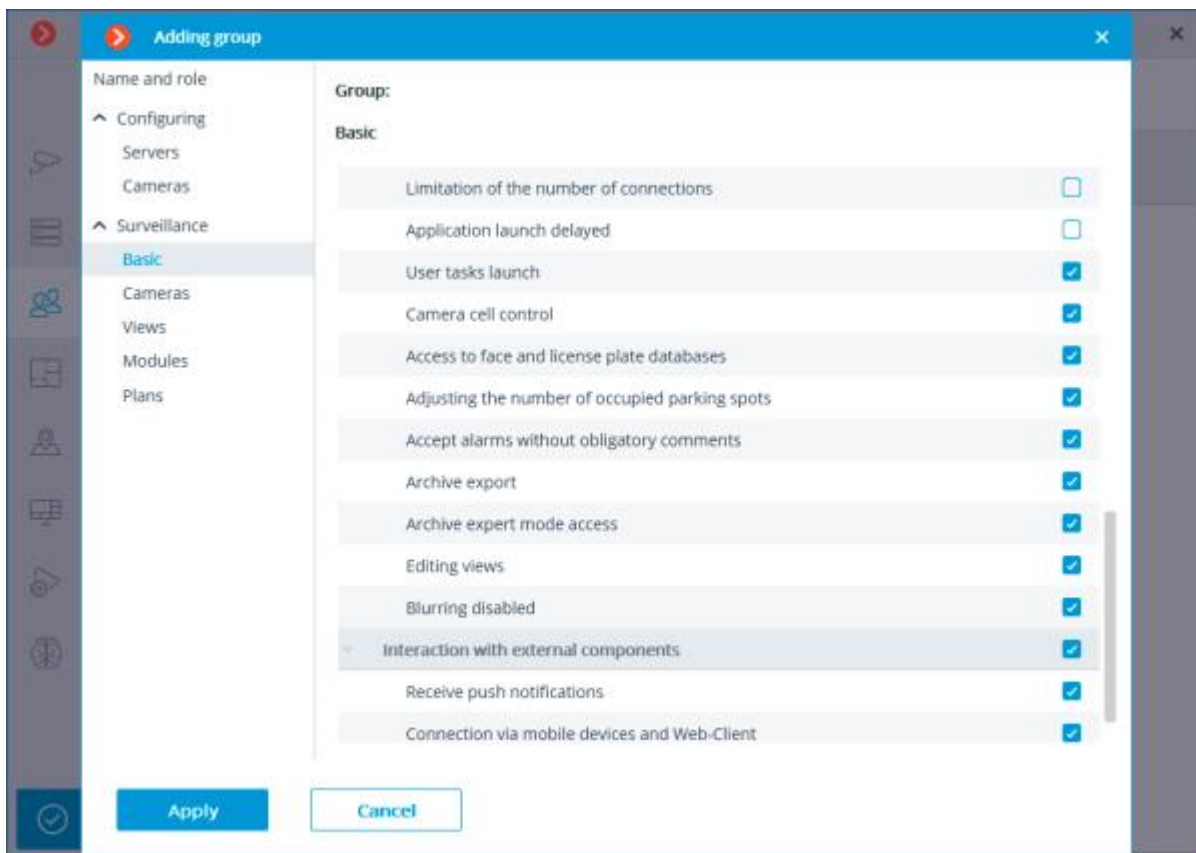


Granting basic rights

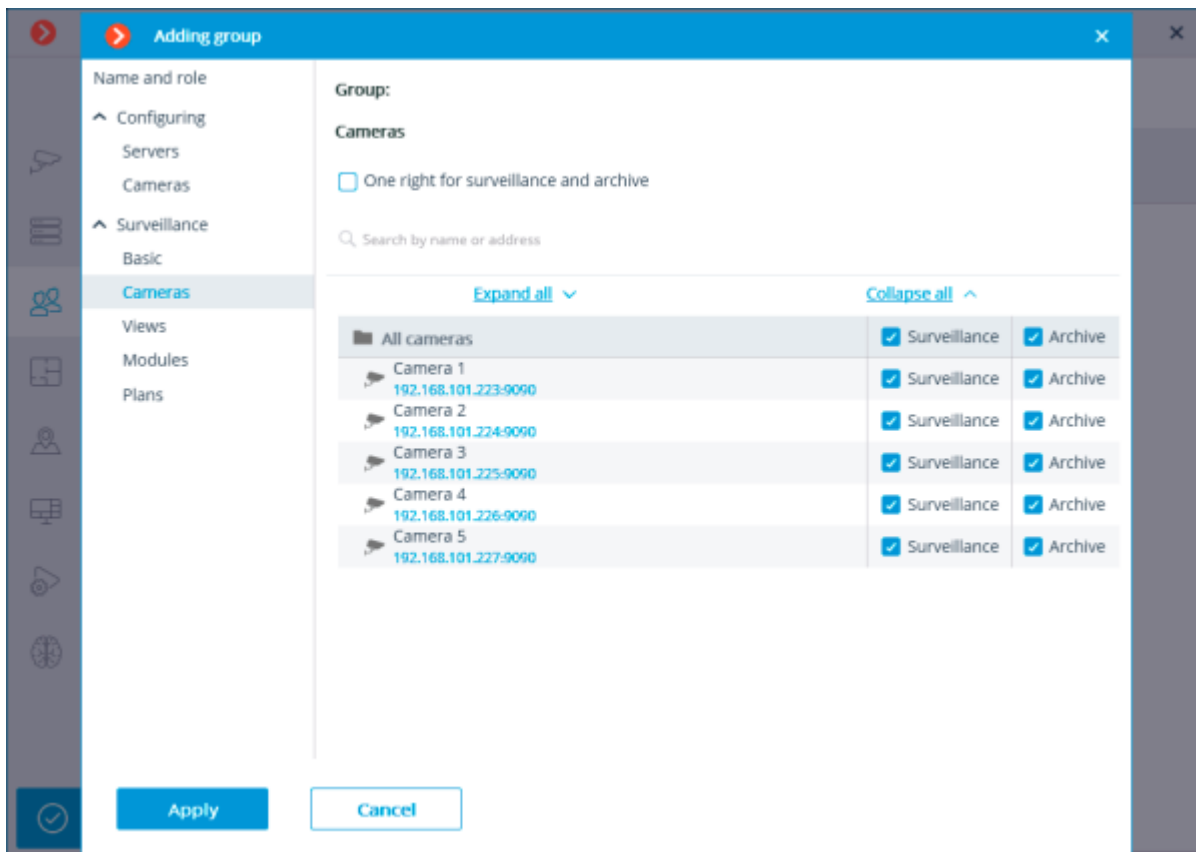


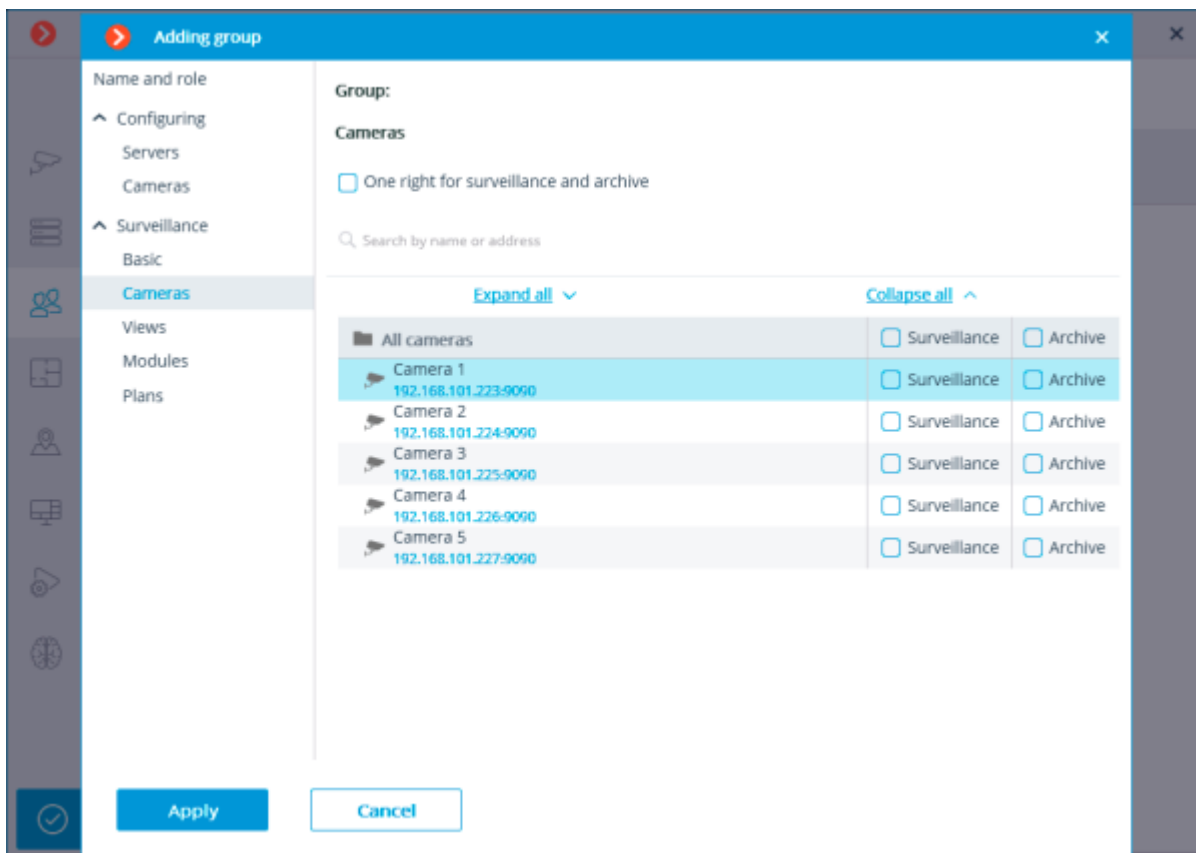
Basic rights overview



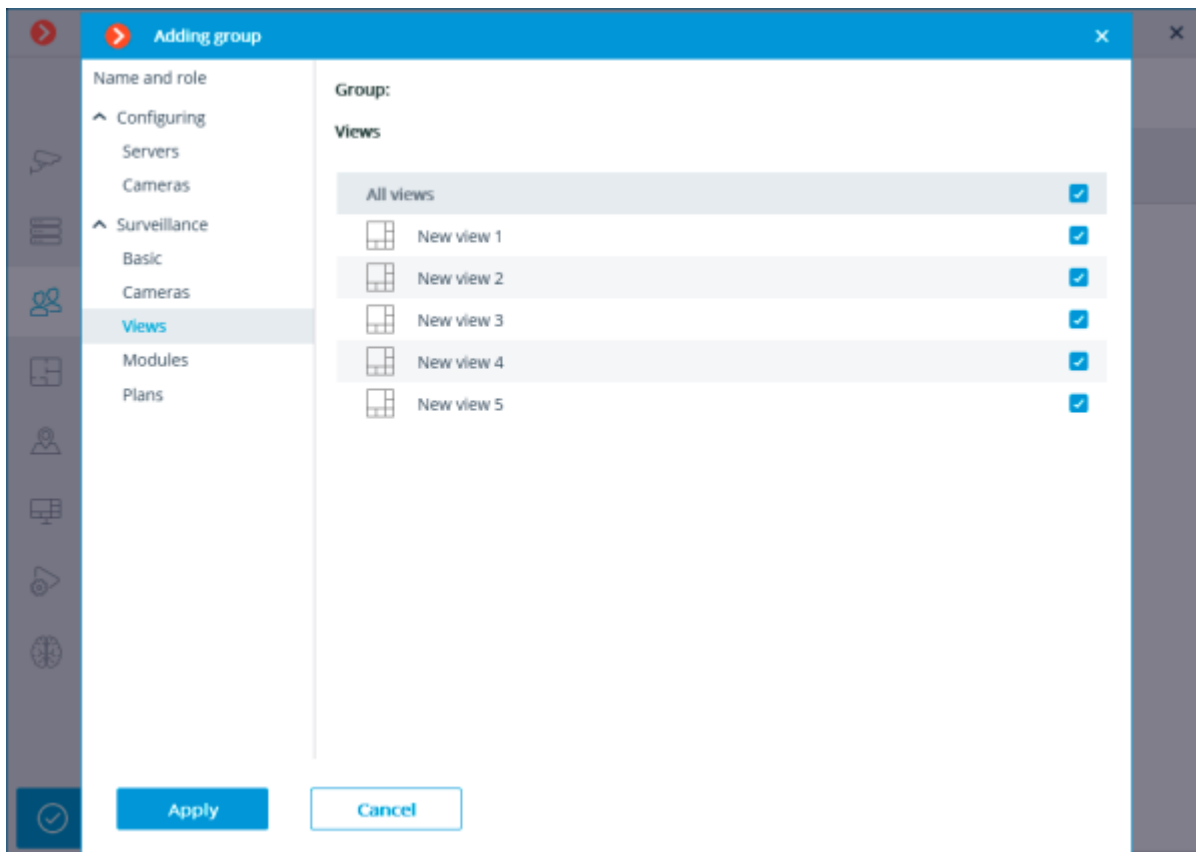


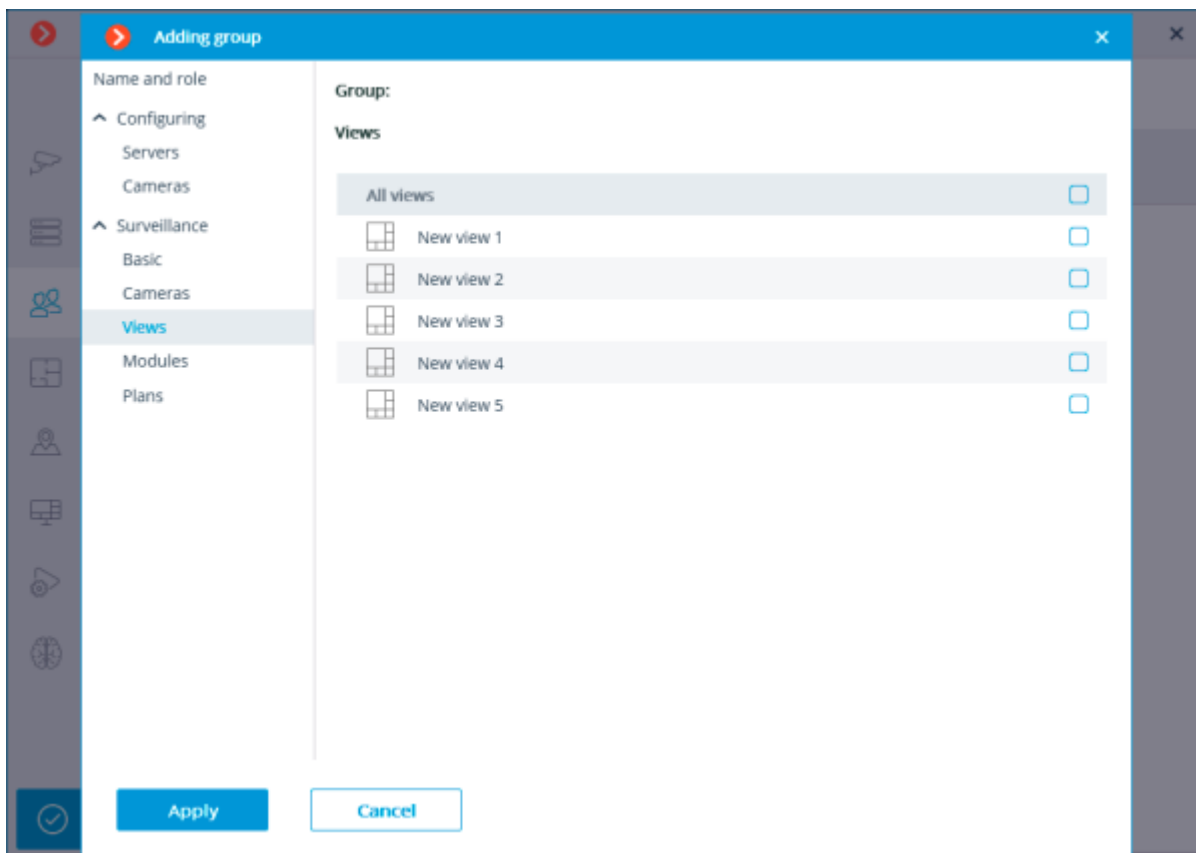
Granting rights to view cameras



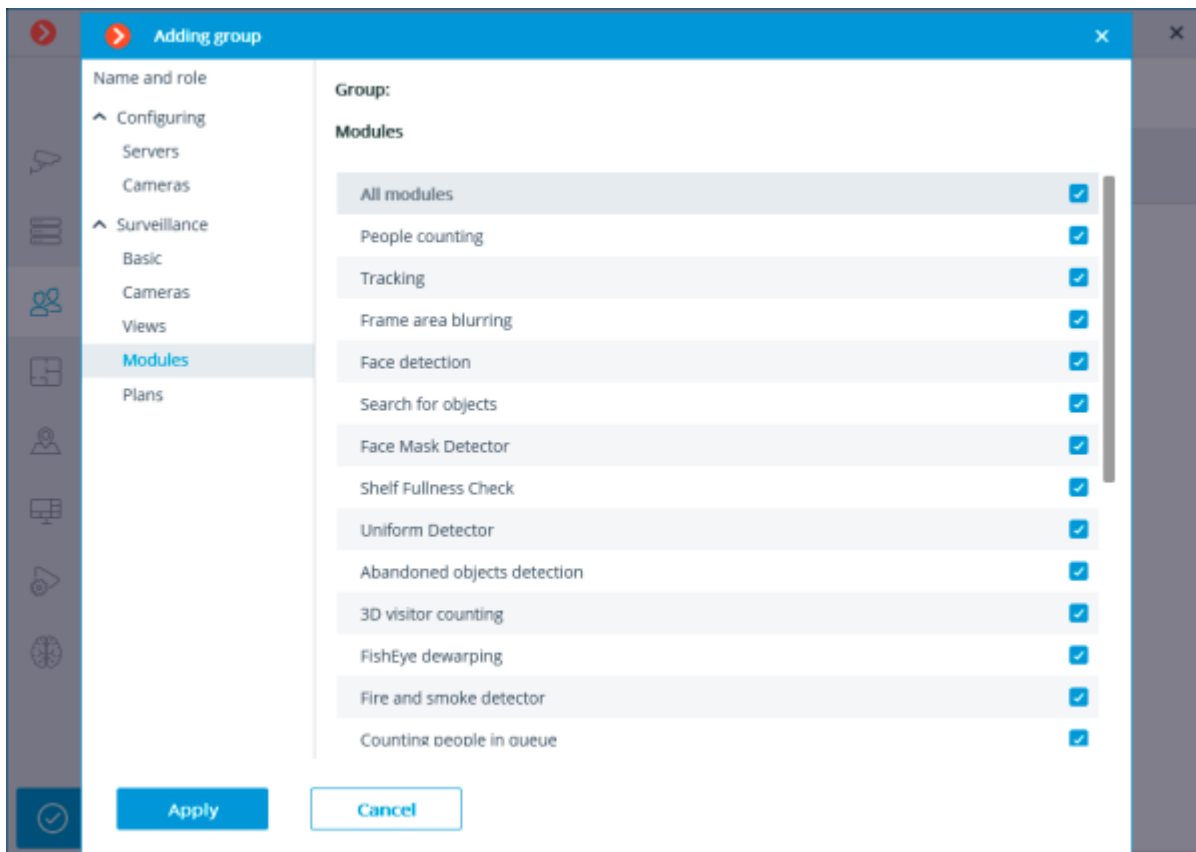


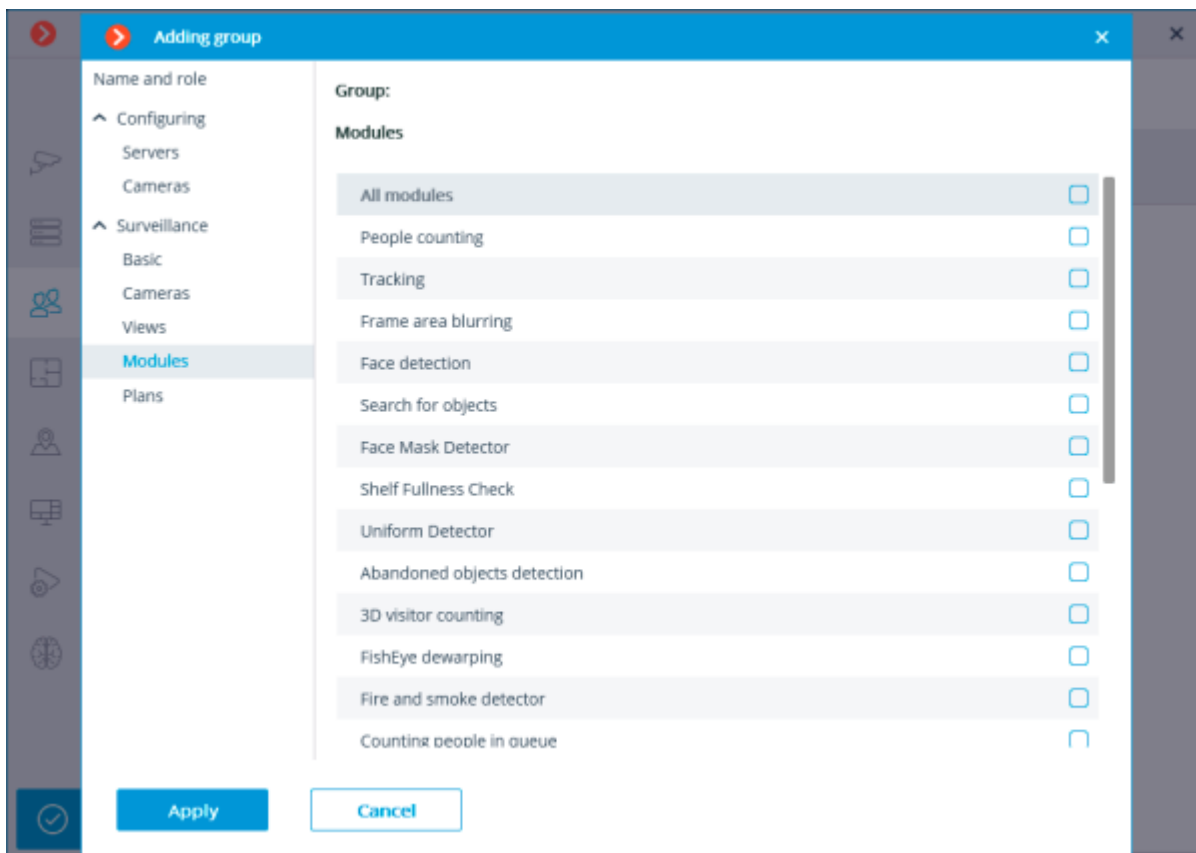
Granting rights to use views



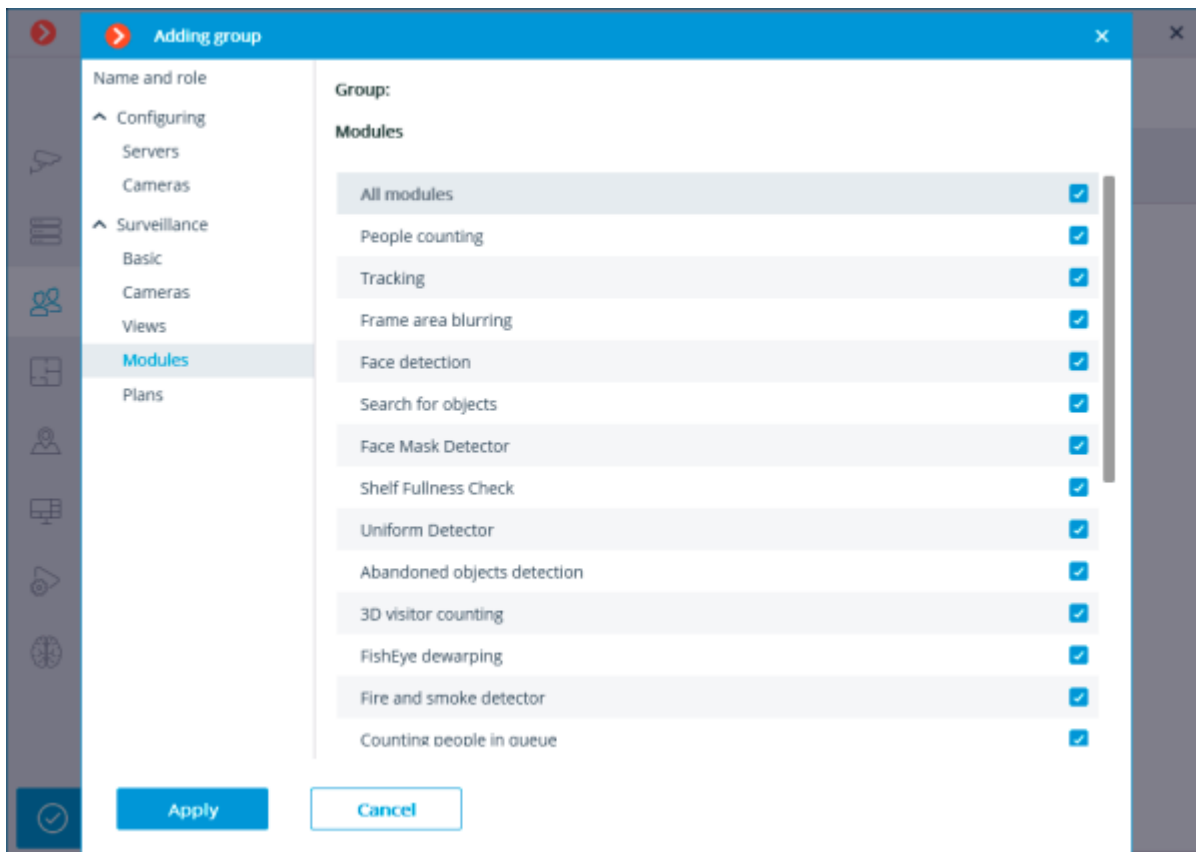


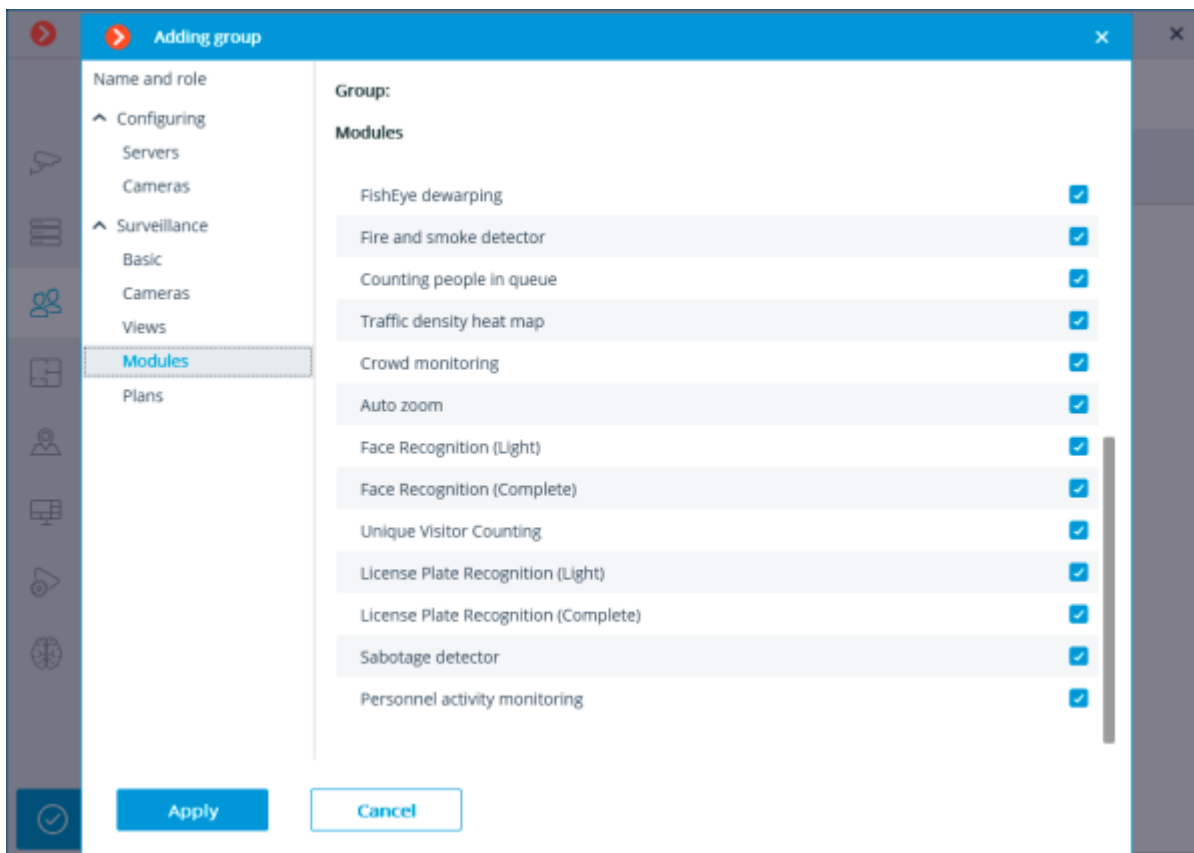
Granting rights to use analytics



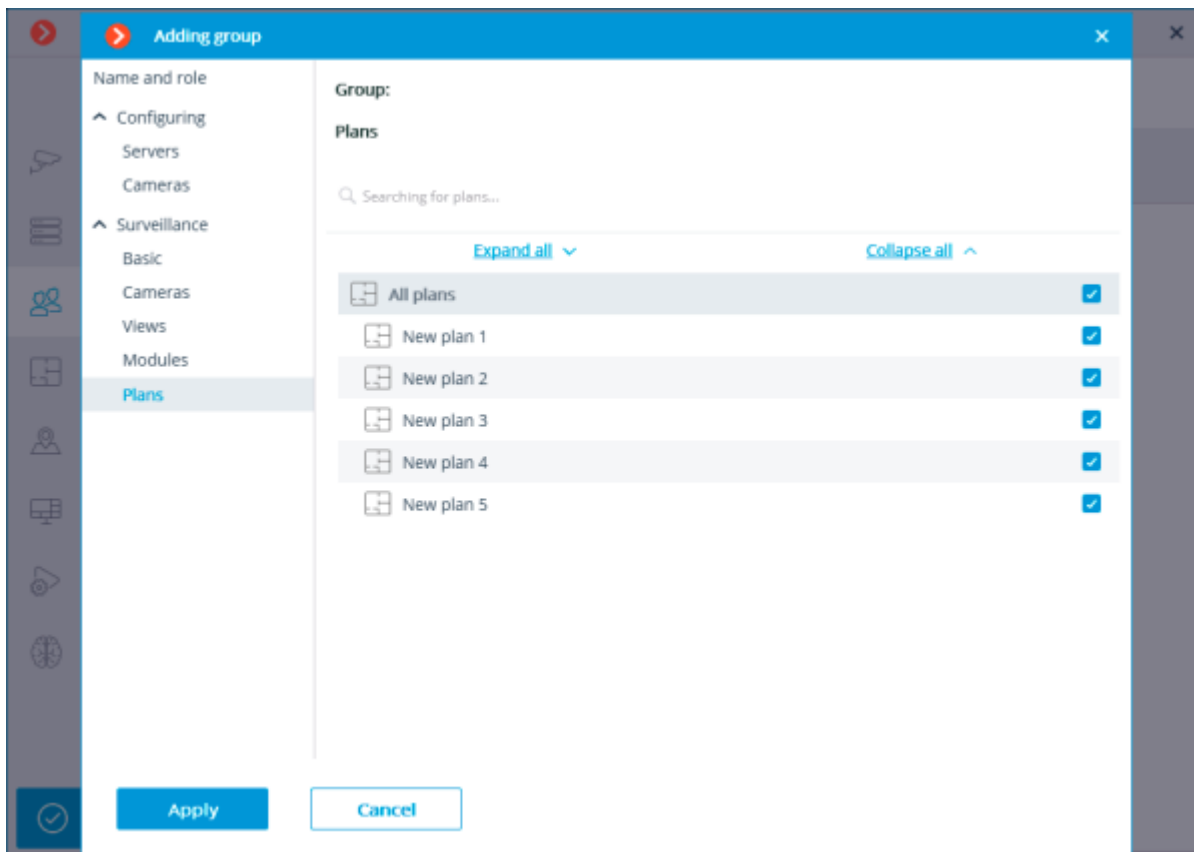


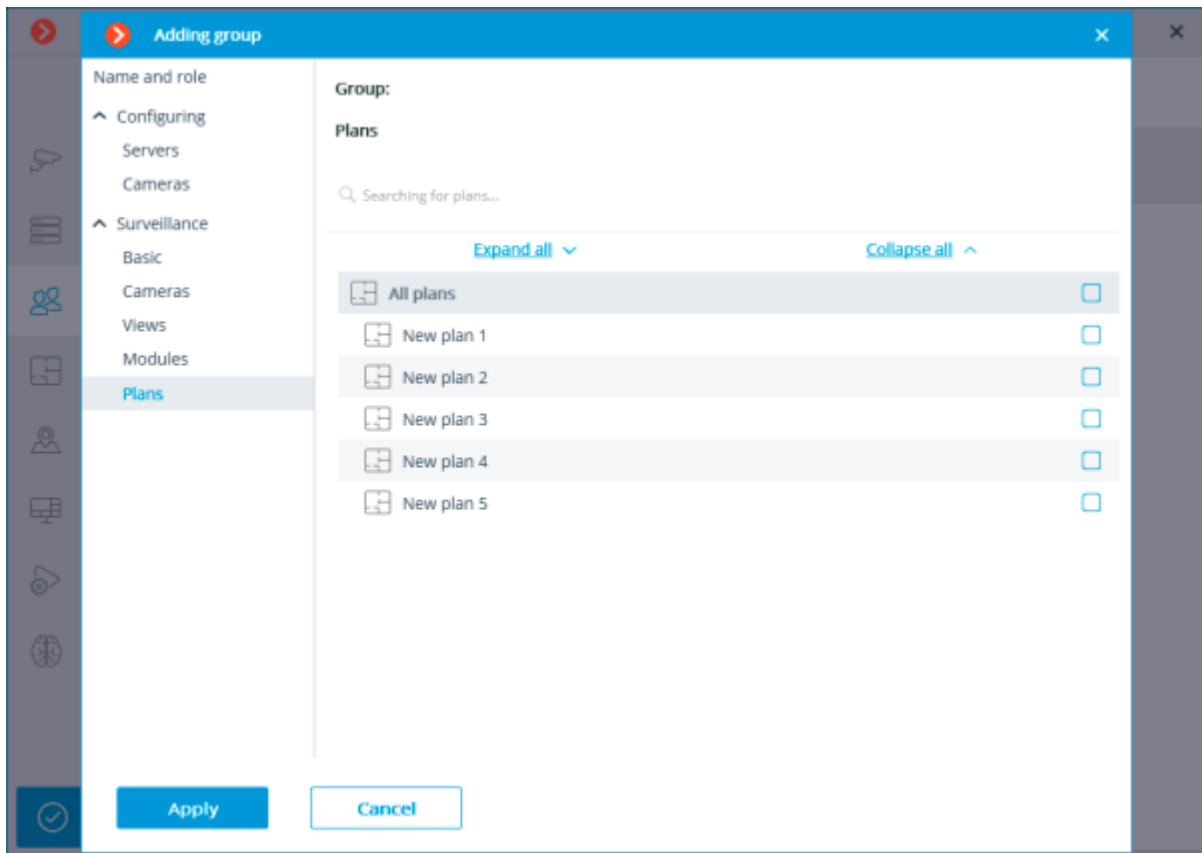
Available analytics overview





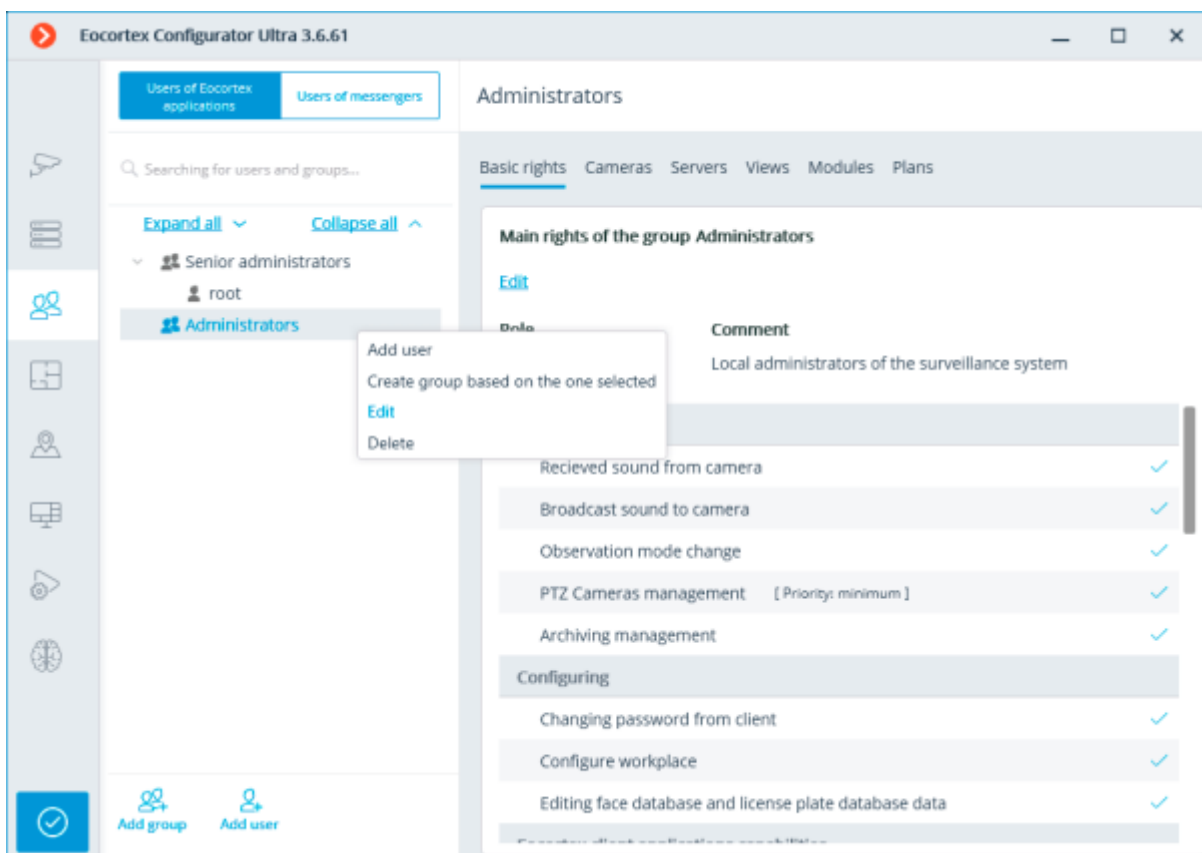
Granting rights to view plans

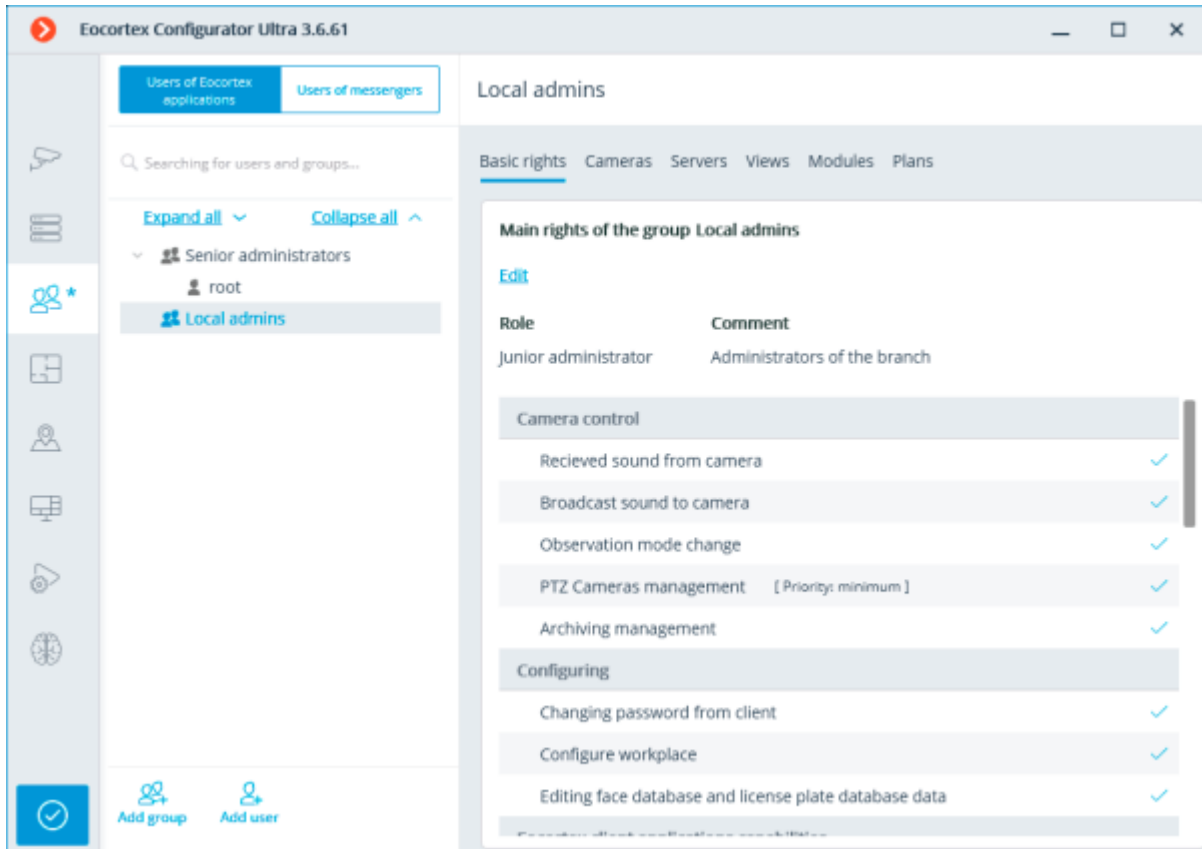
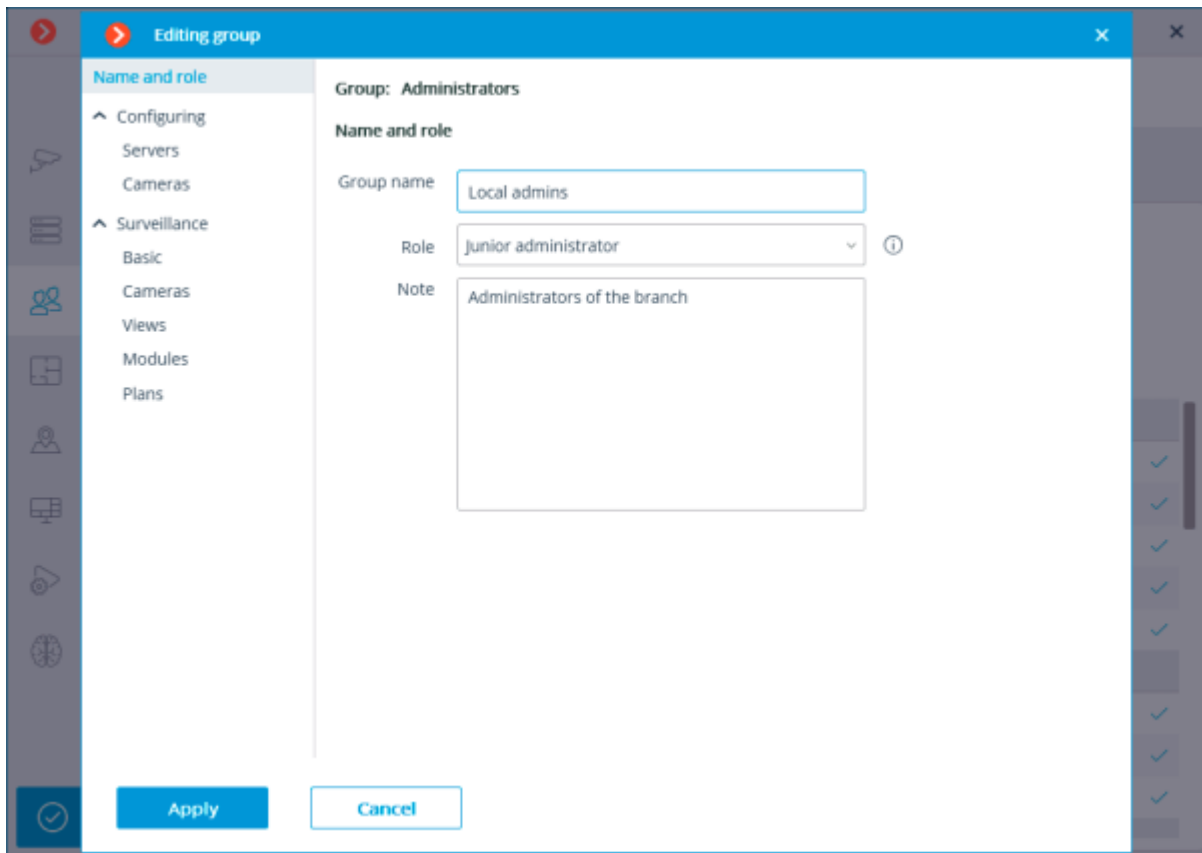




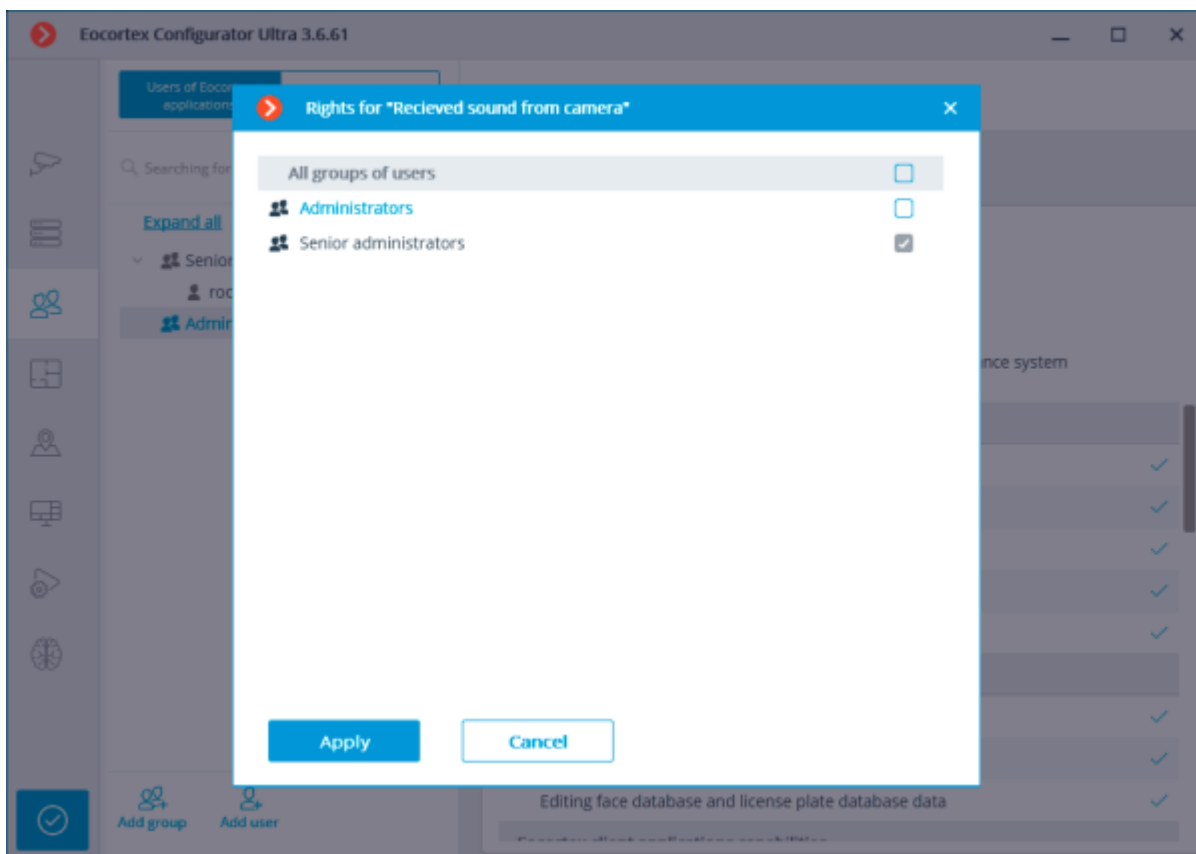
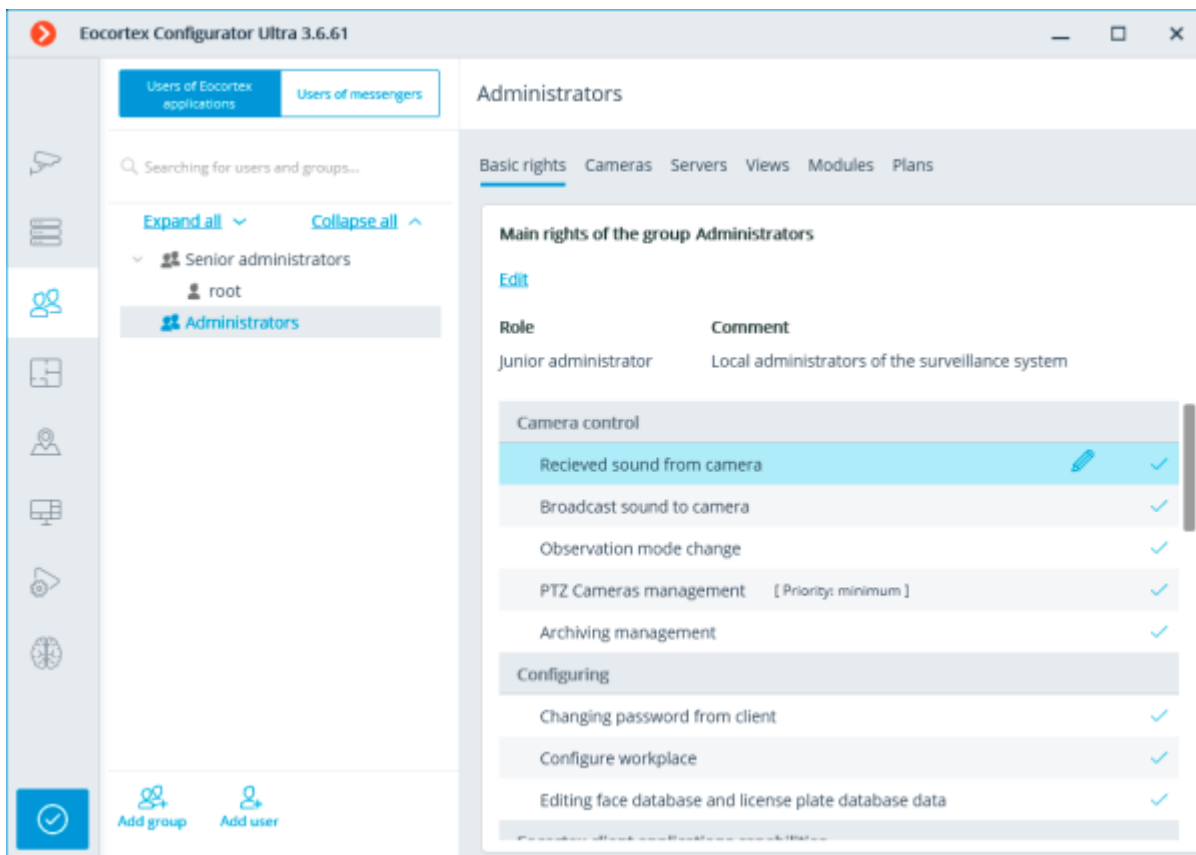
Editing the Junior administrator group

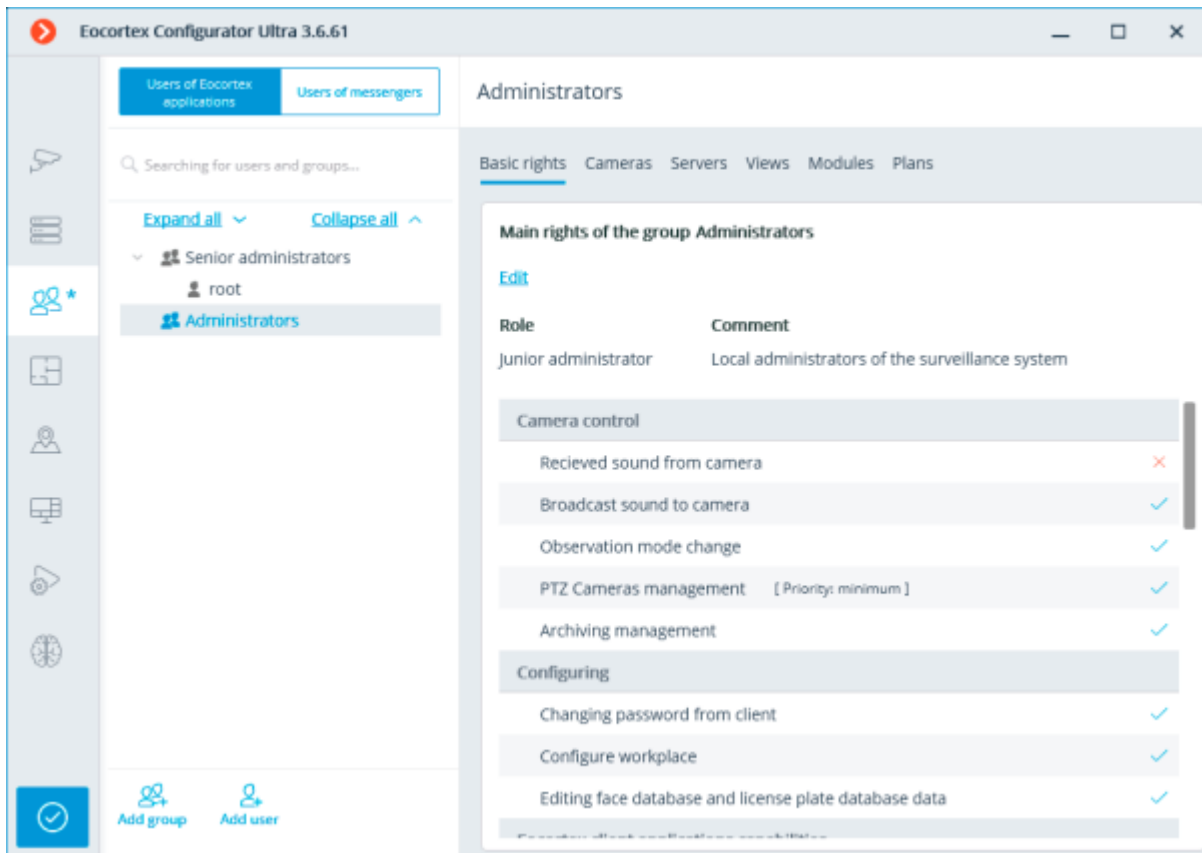
Renaming the group



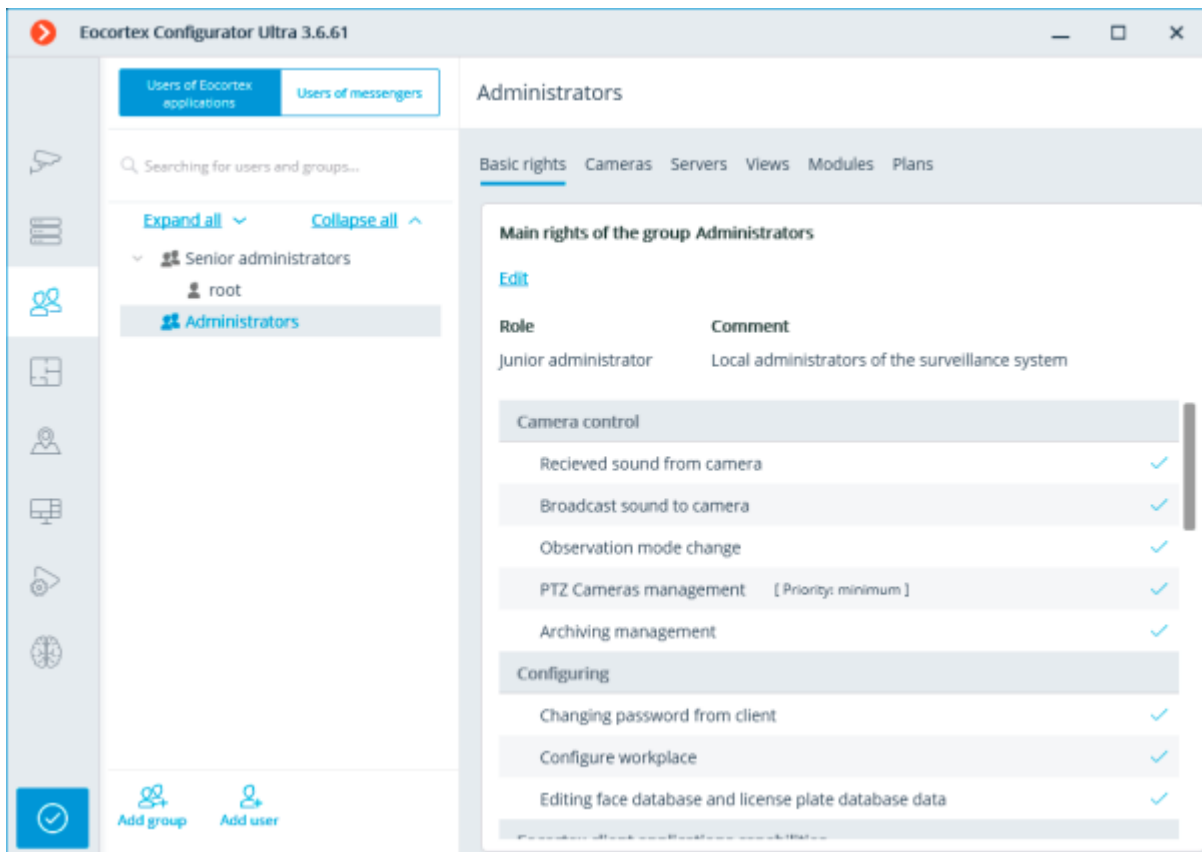


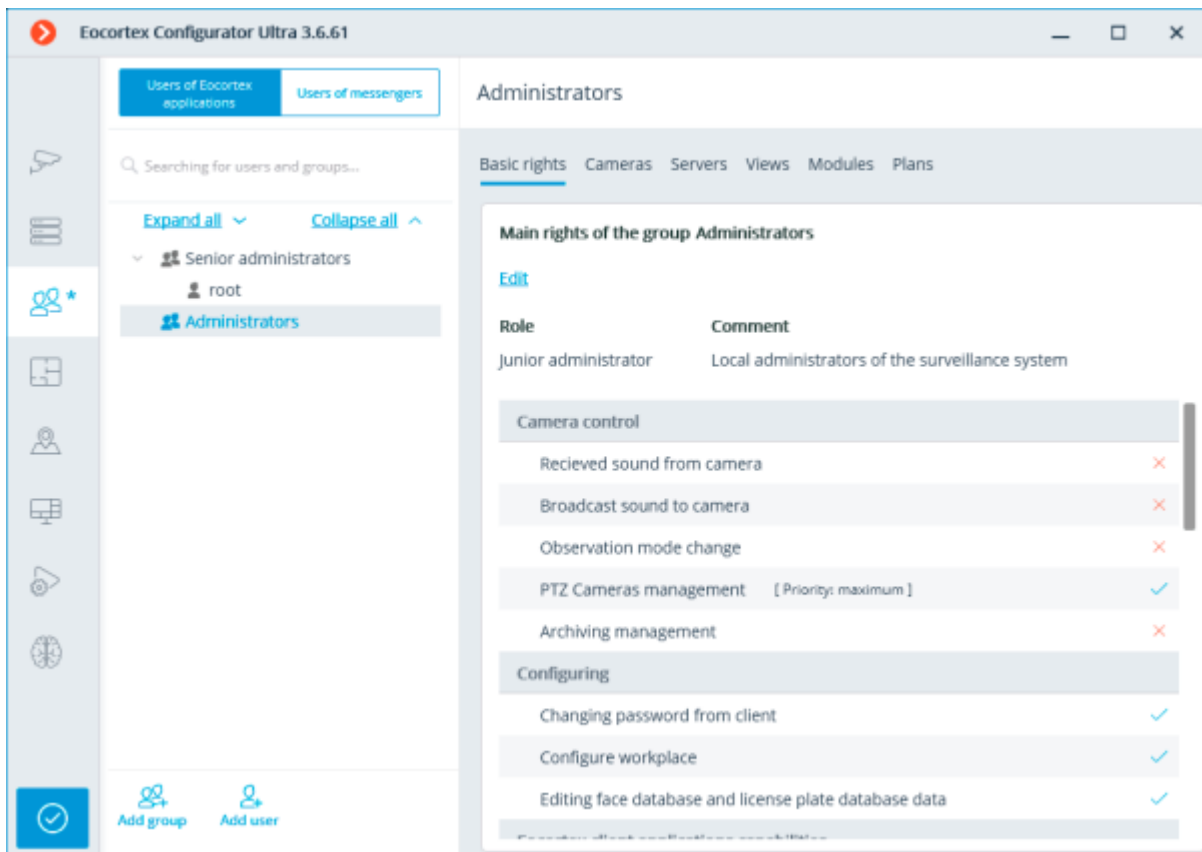
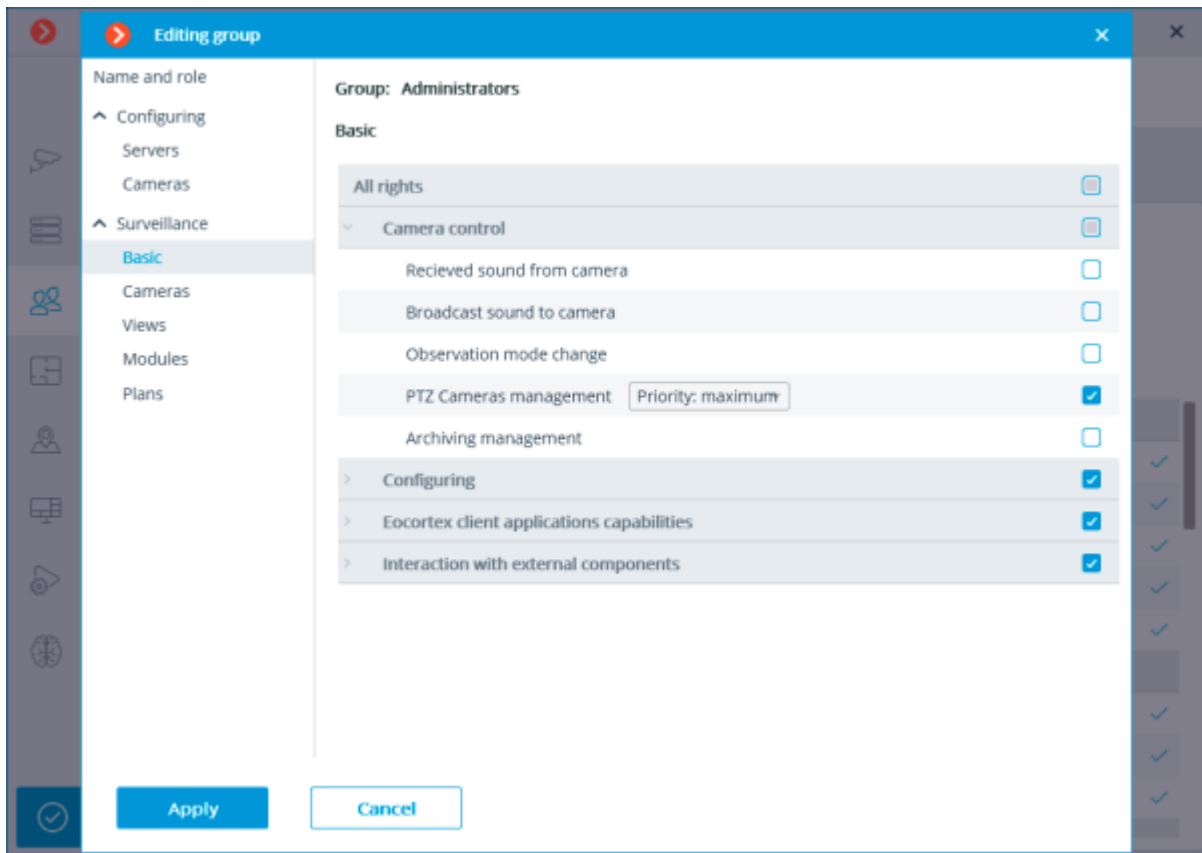
Editing an individual basic right



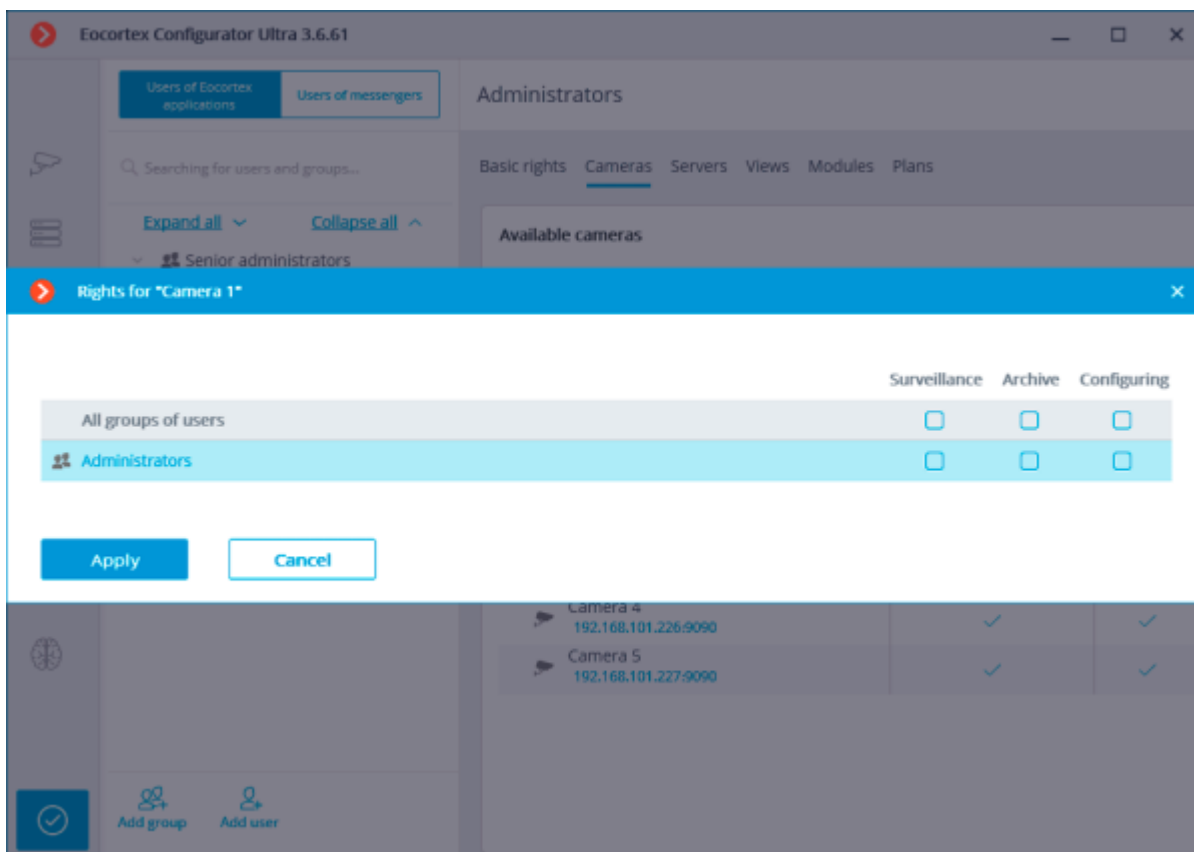
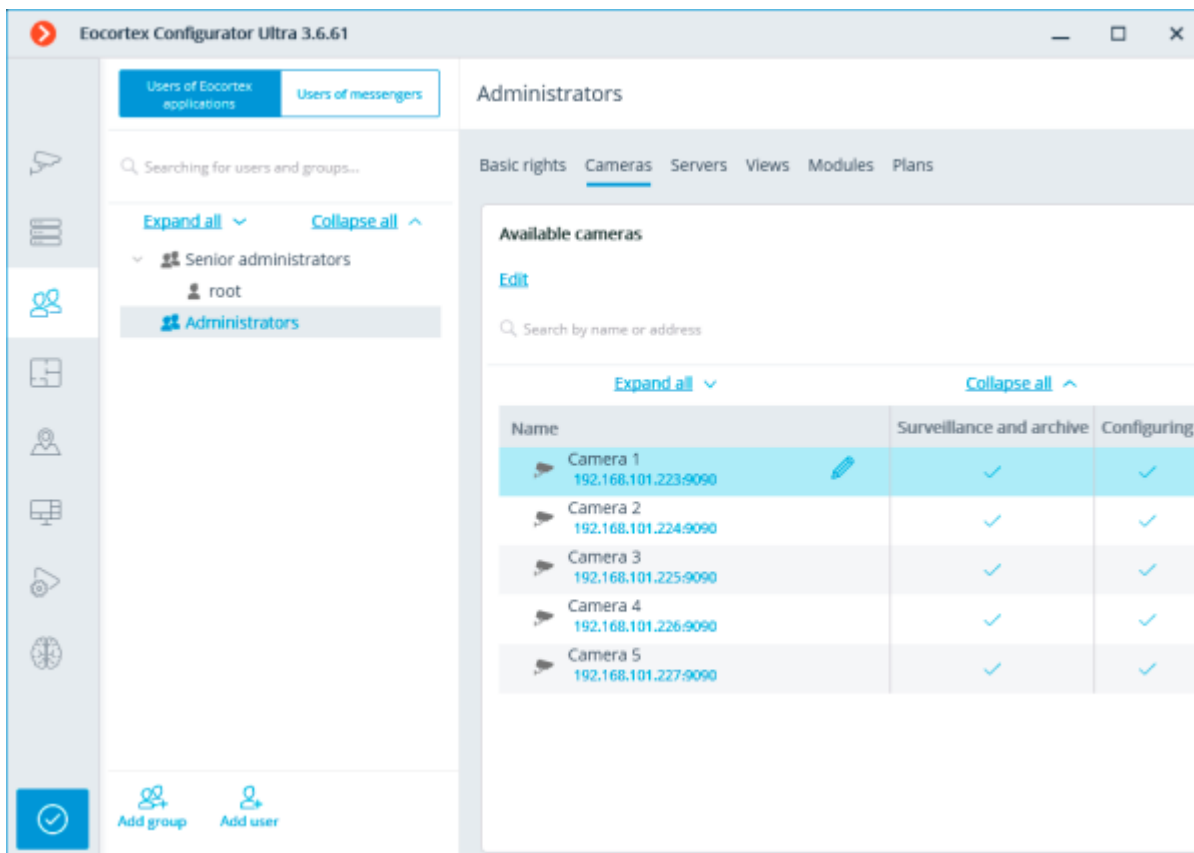


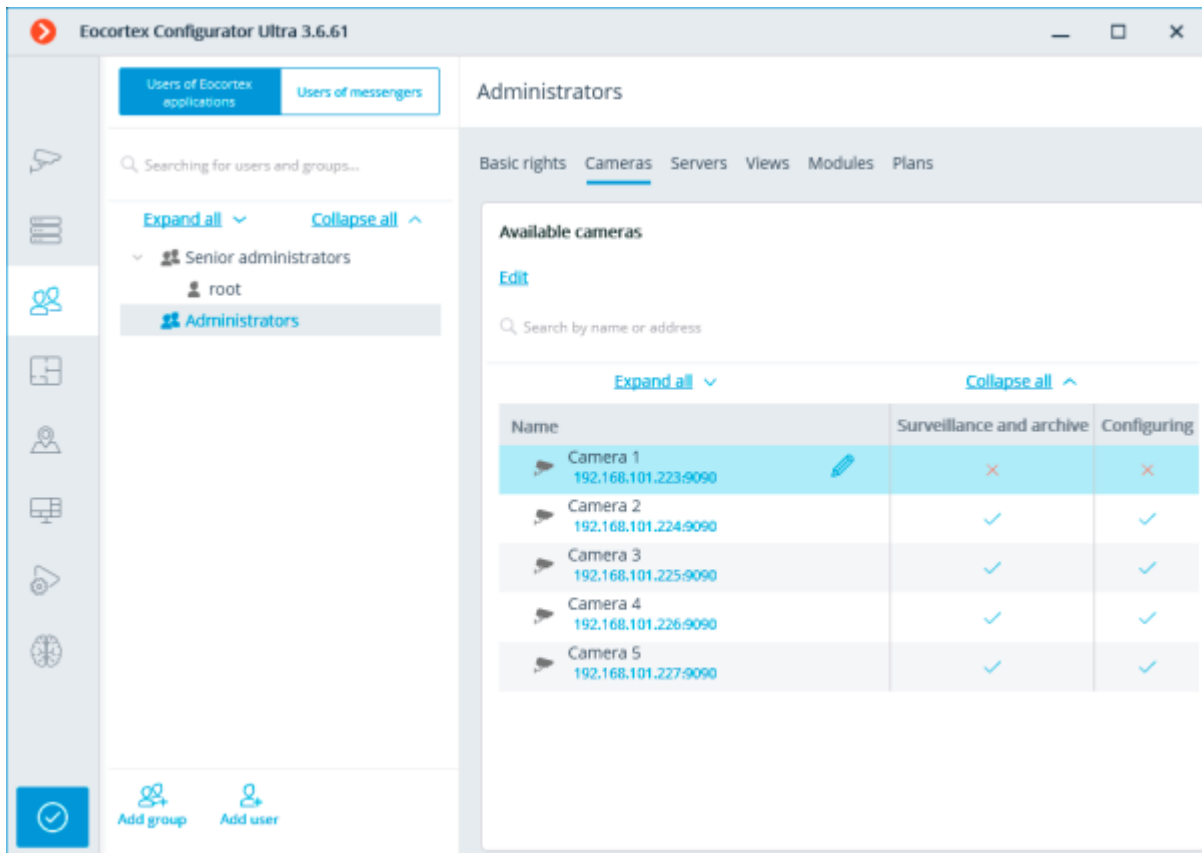
Editing a group of basic rights



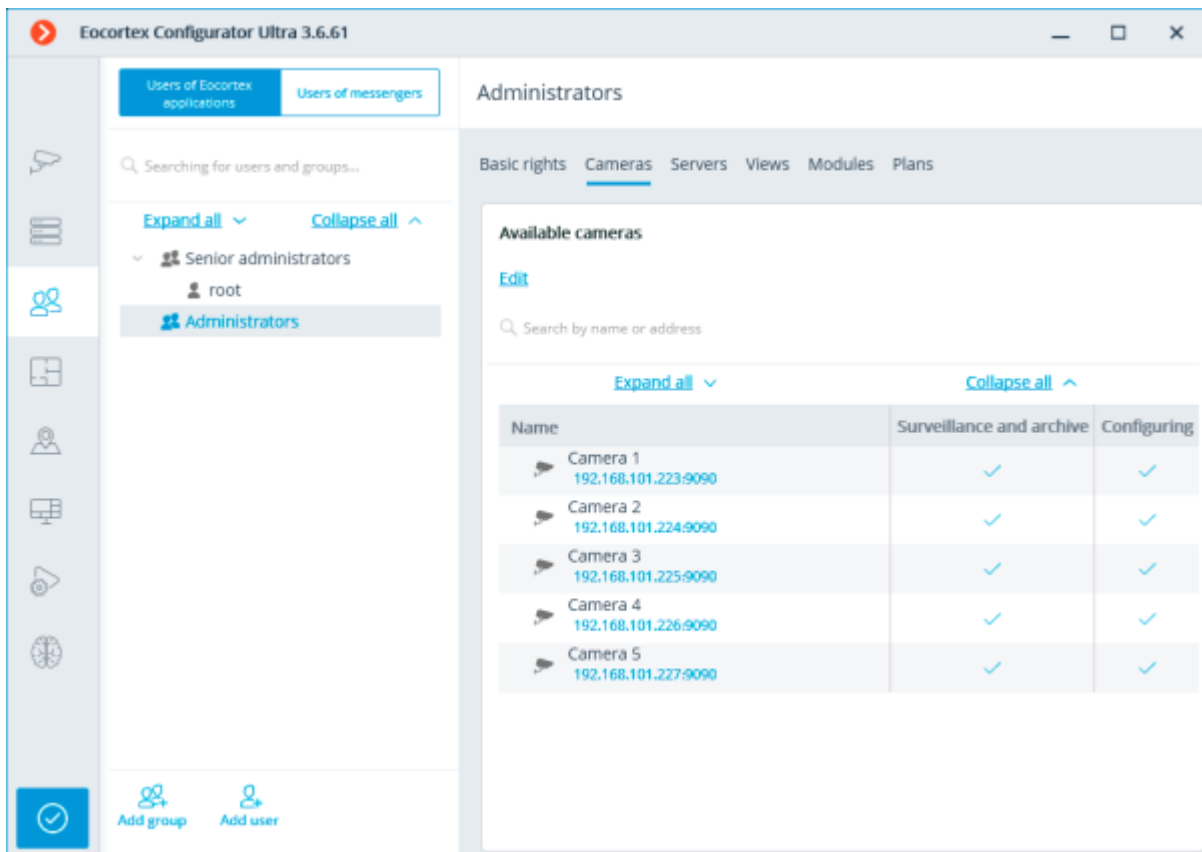


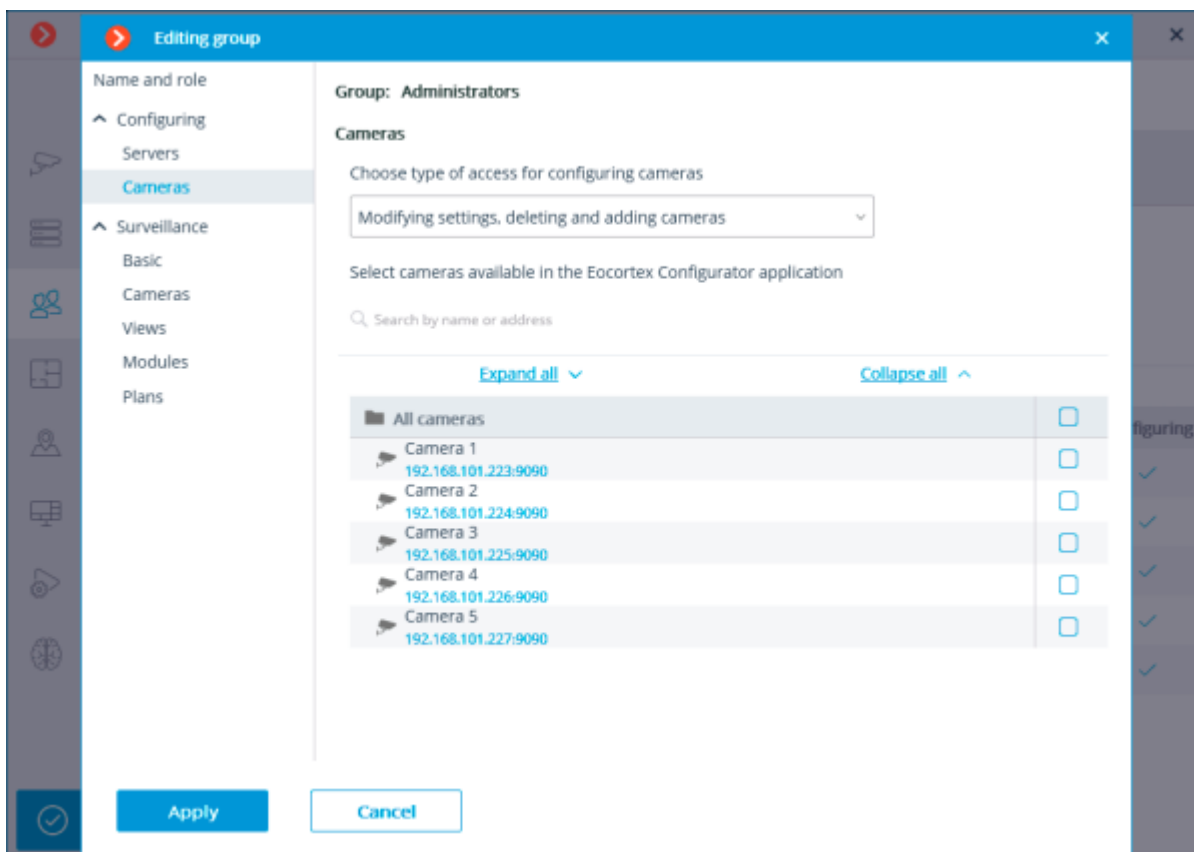
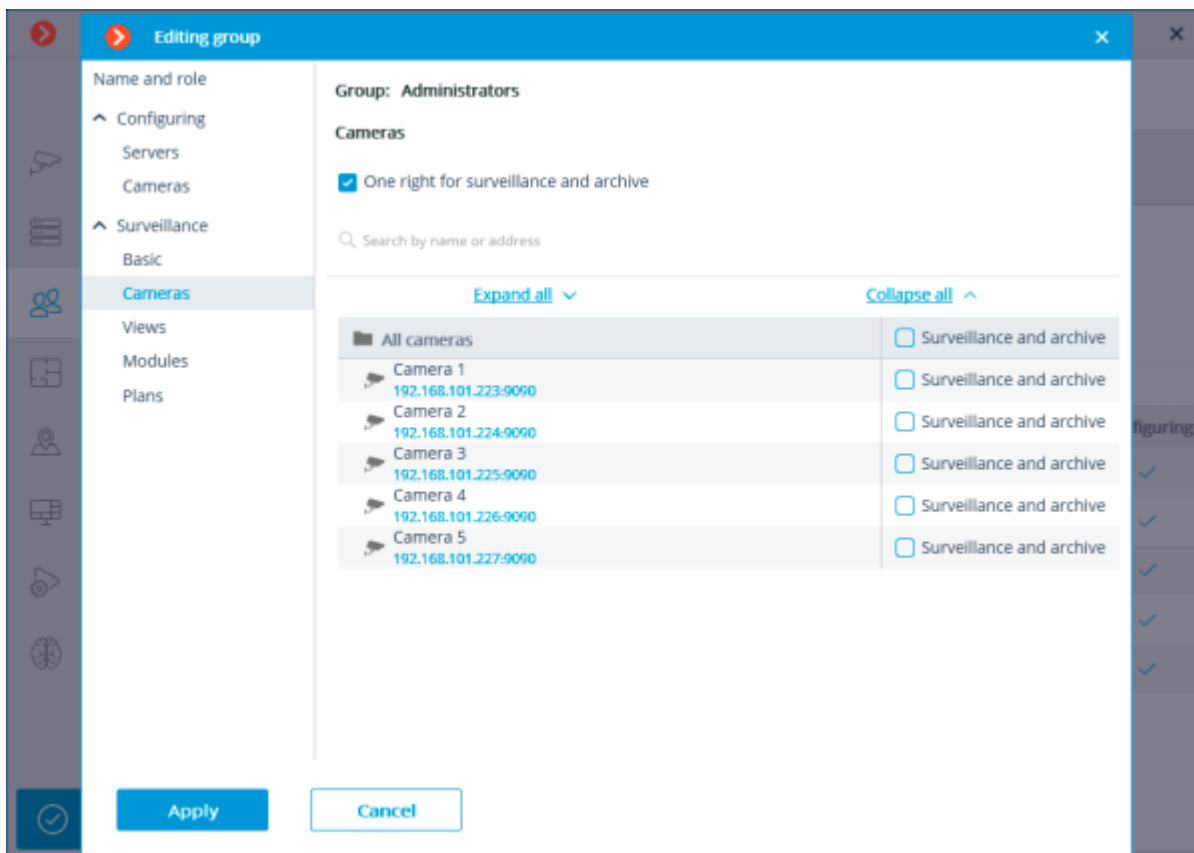
Editing an individual right to view and configure a camera

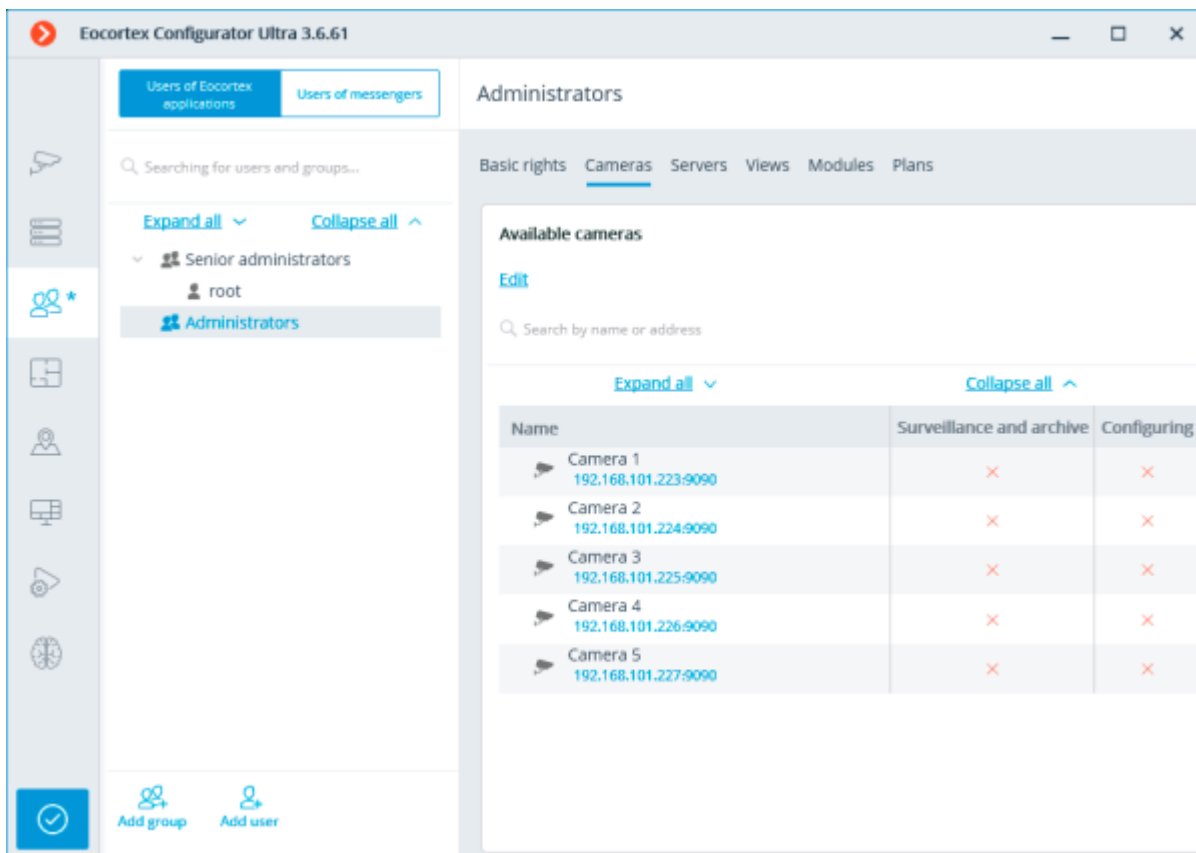




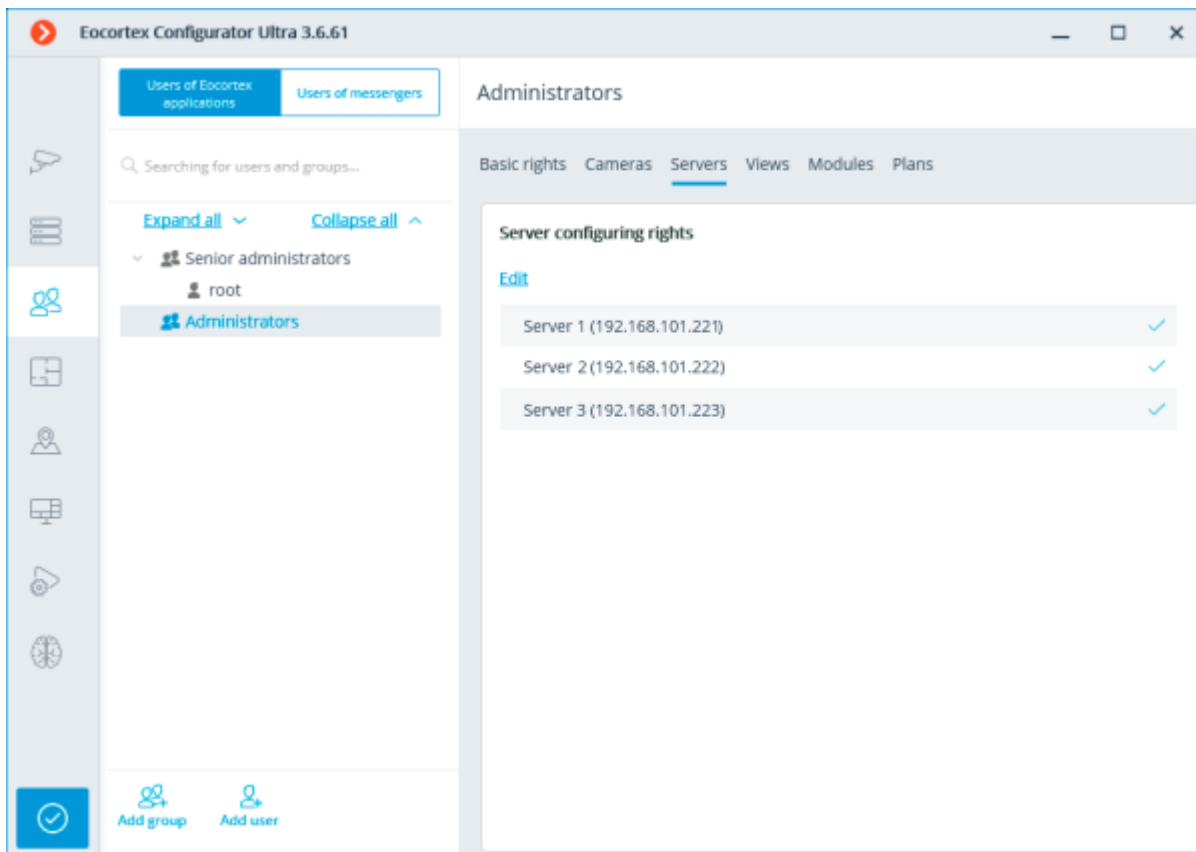
Editing a right to view and configure a group of cameras

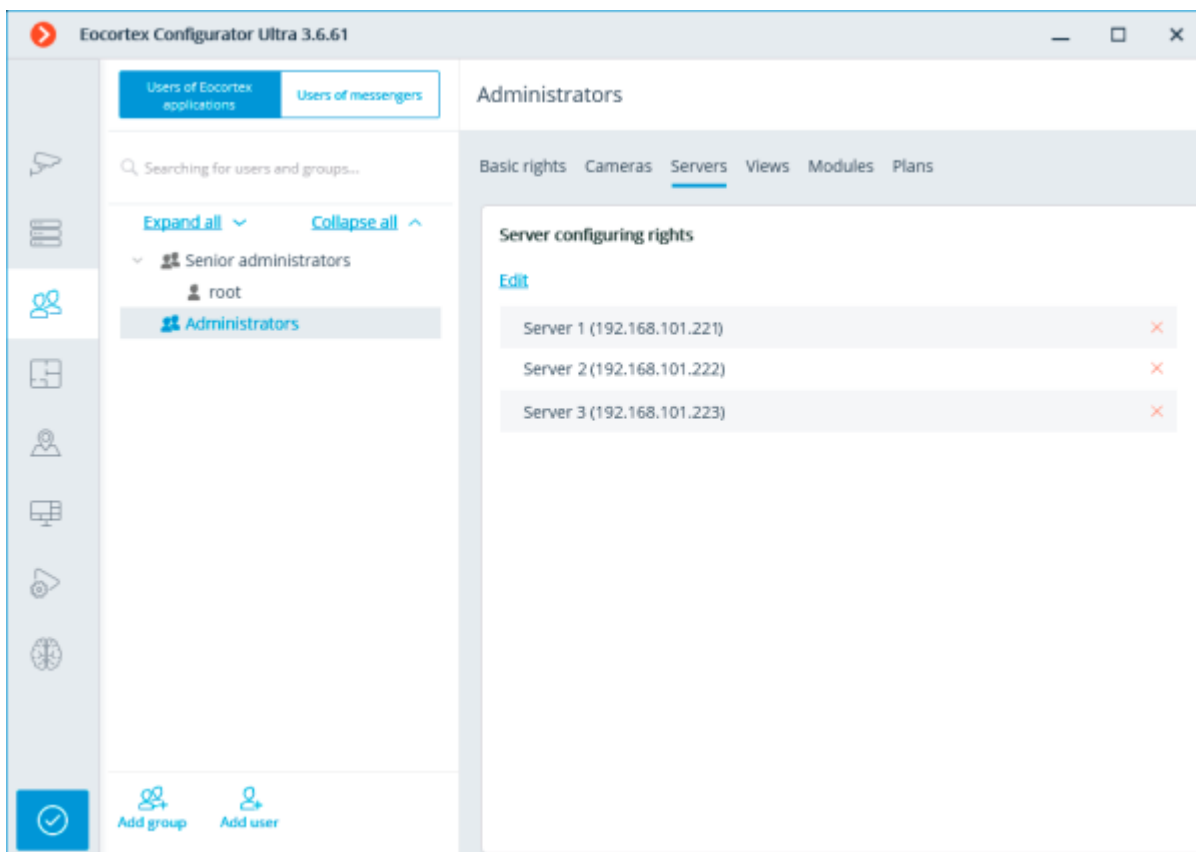
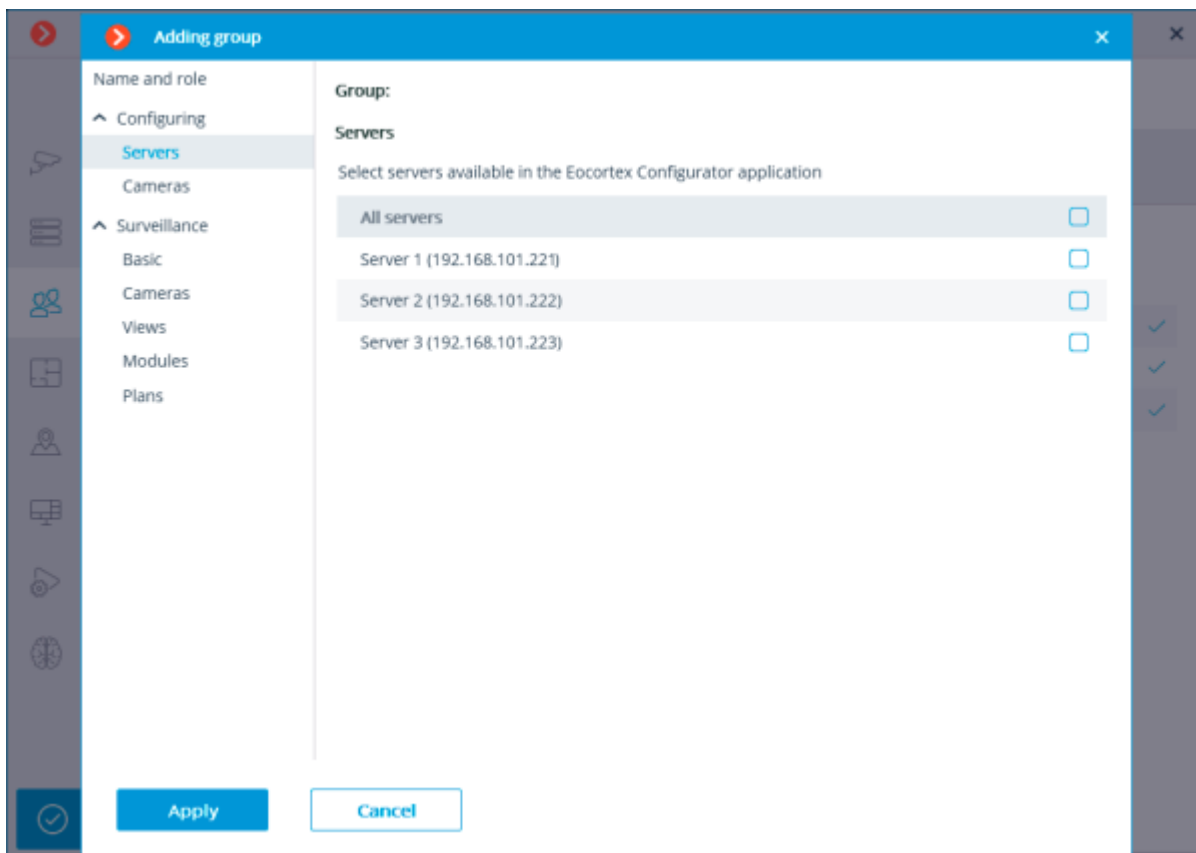




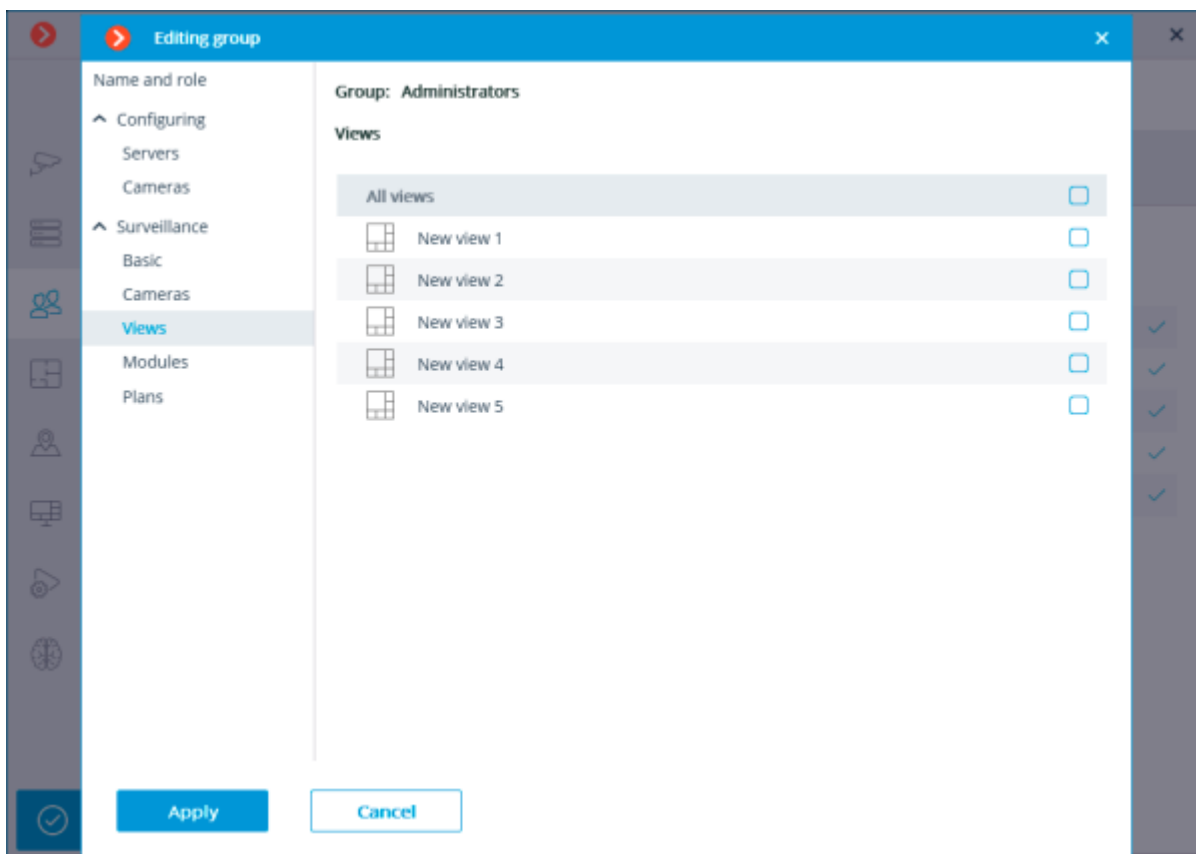
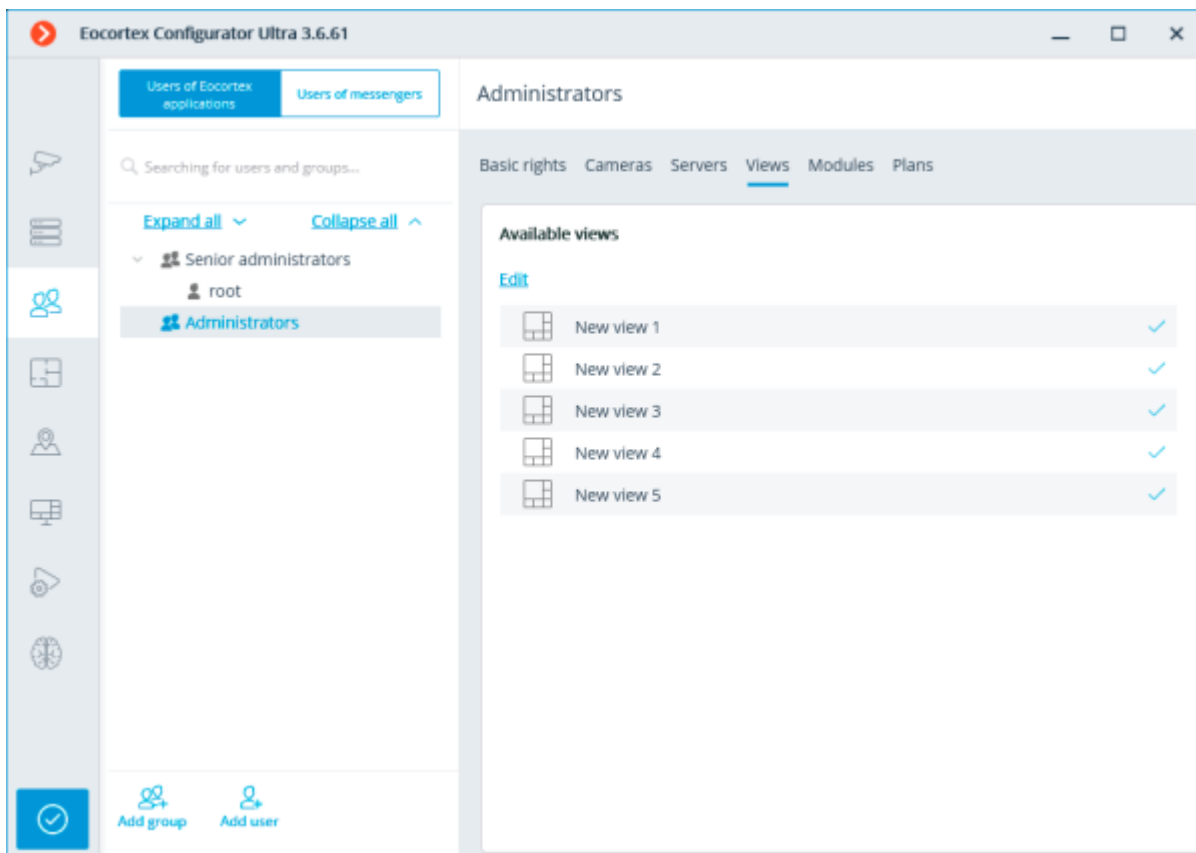


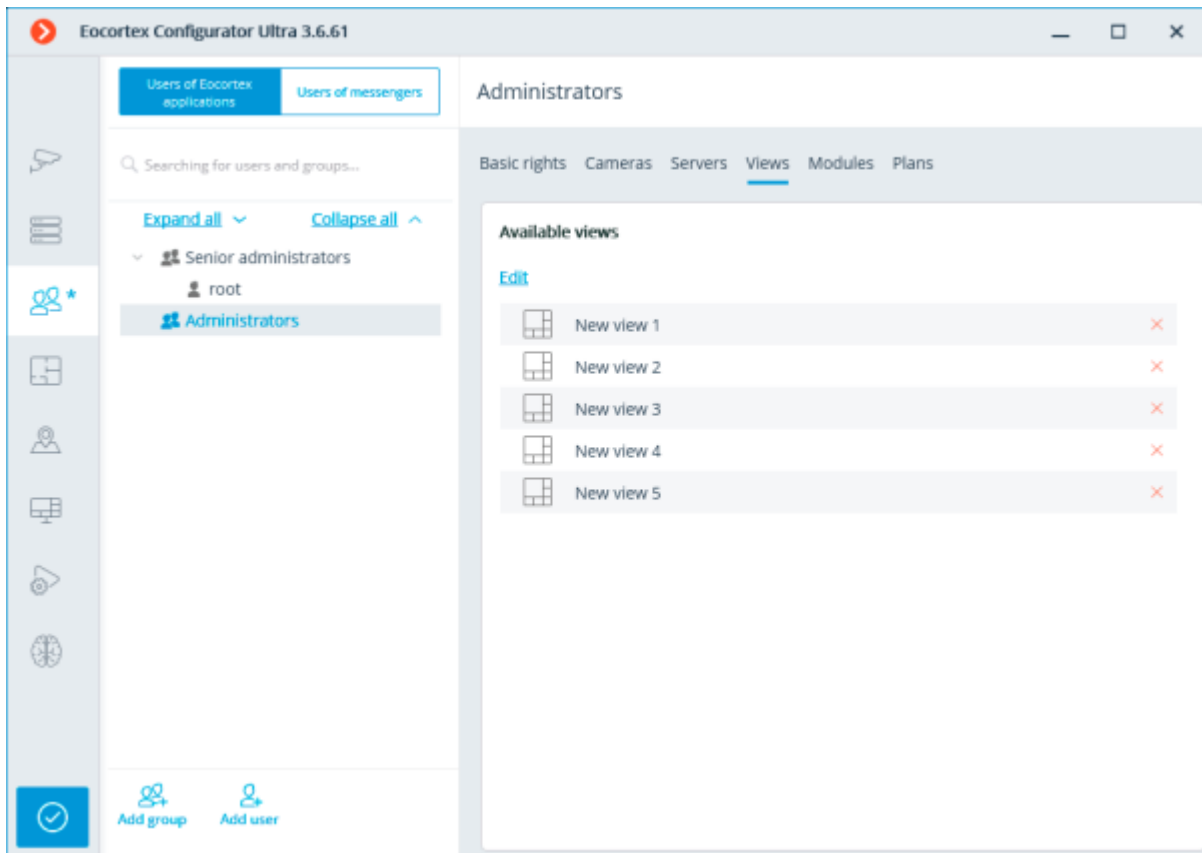
Editing a right to configure servers



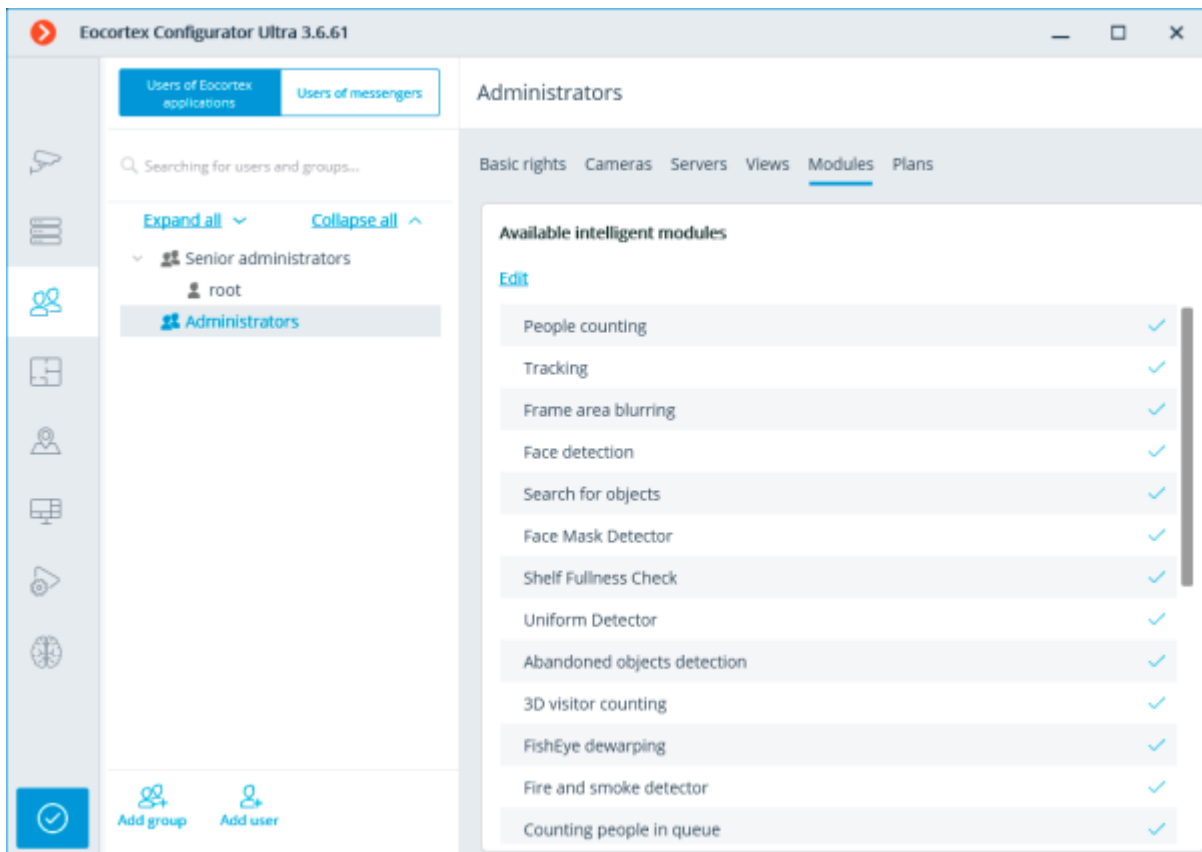


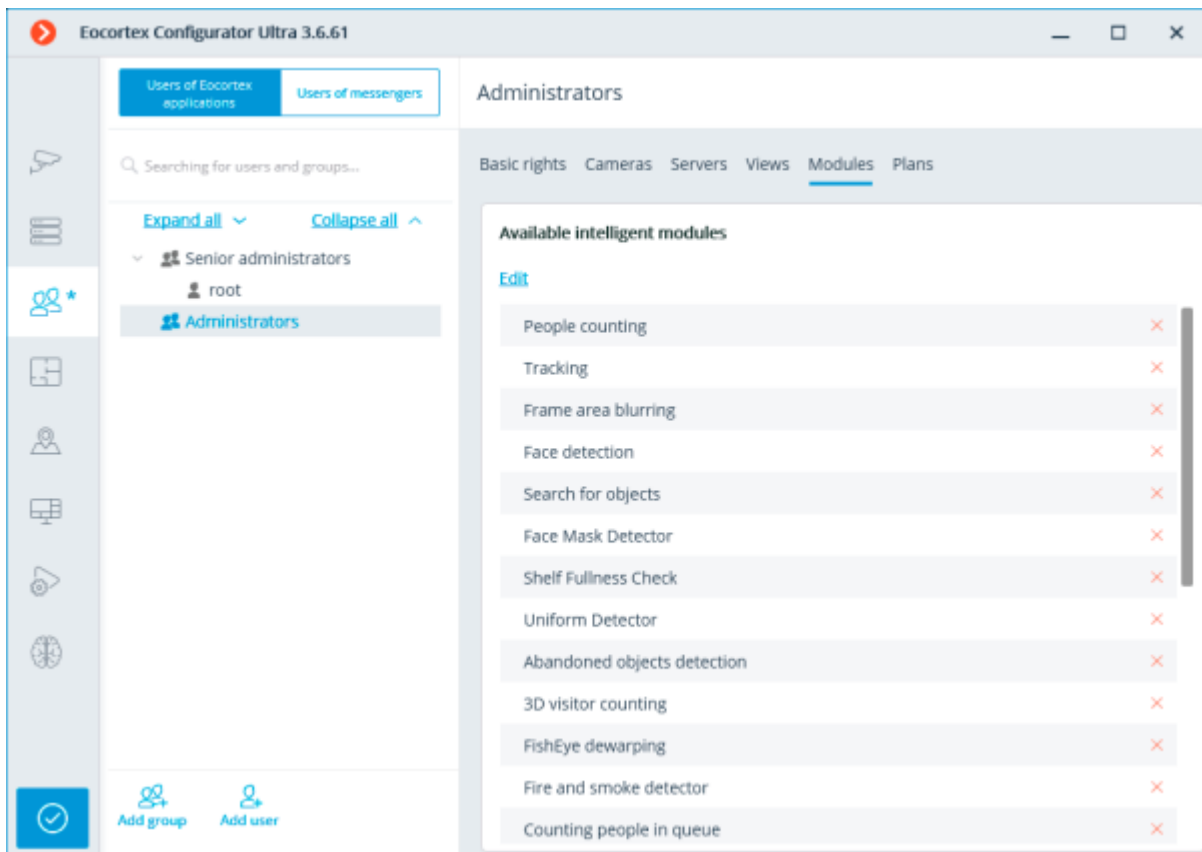
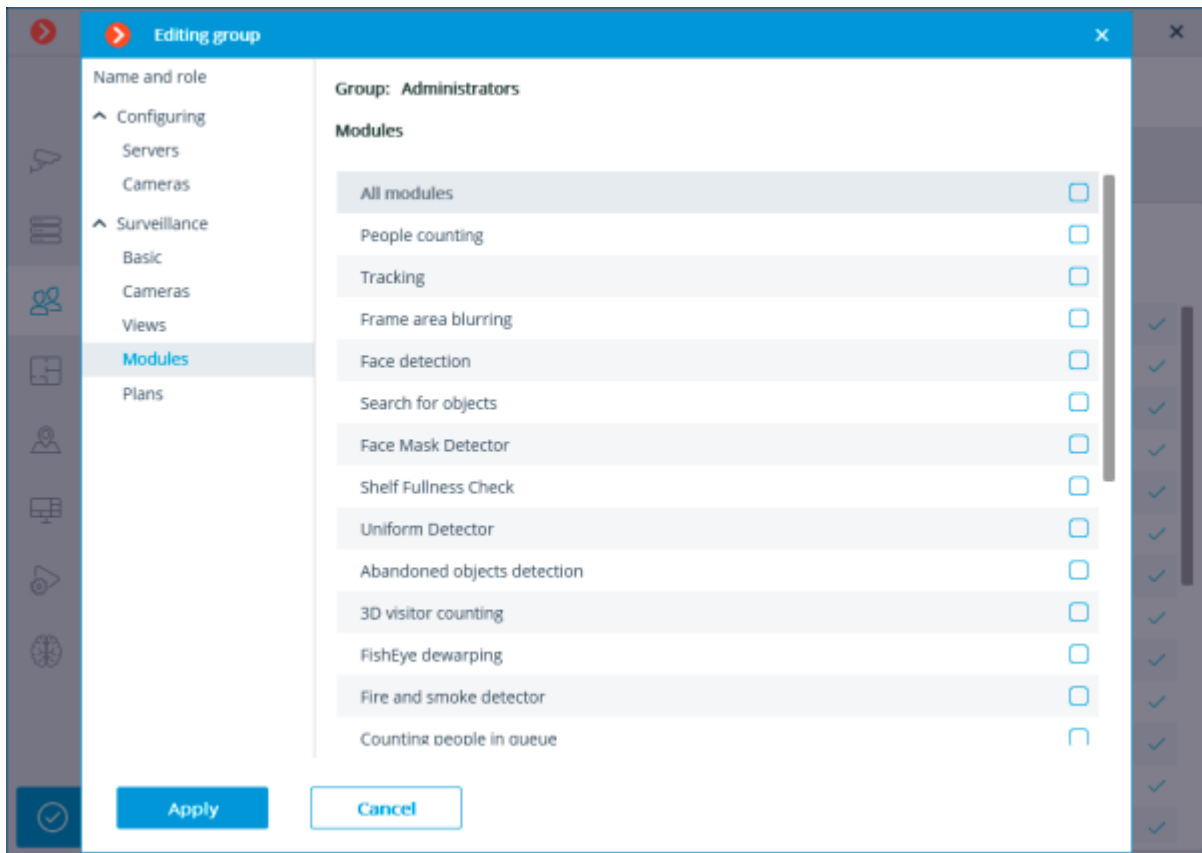
Editing rights to use views



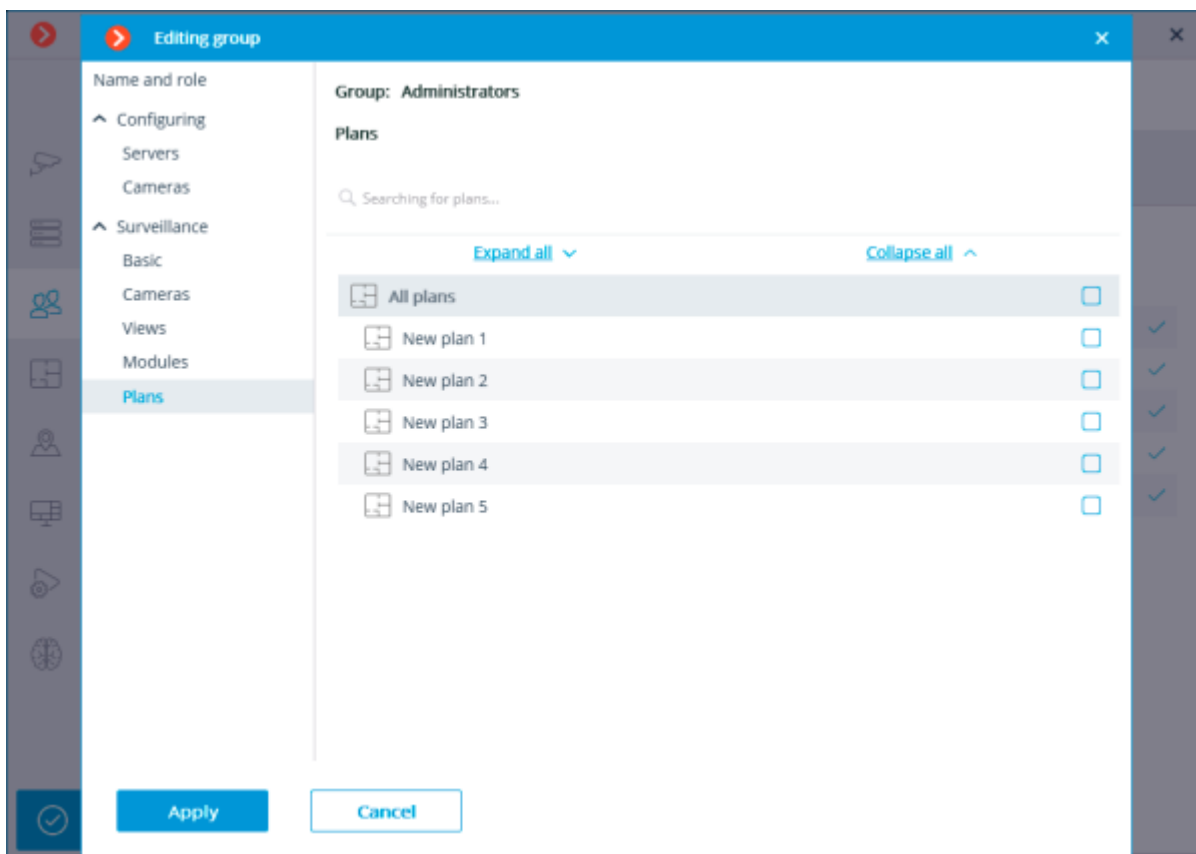
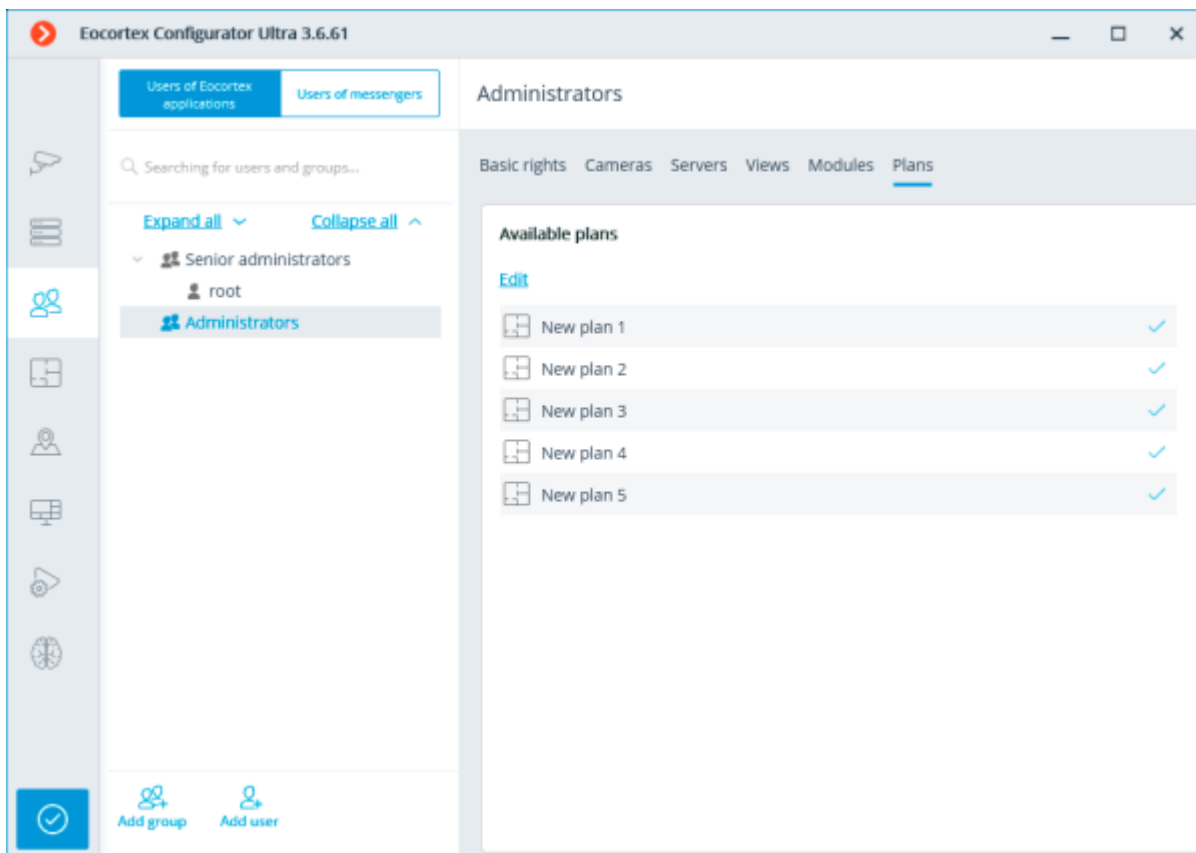


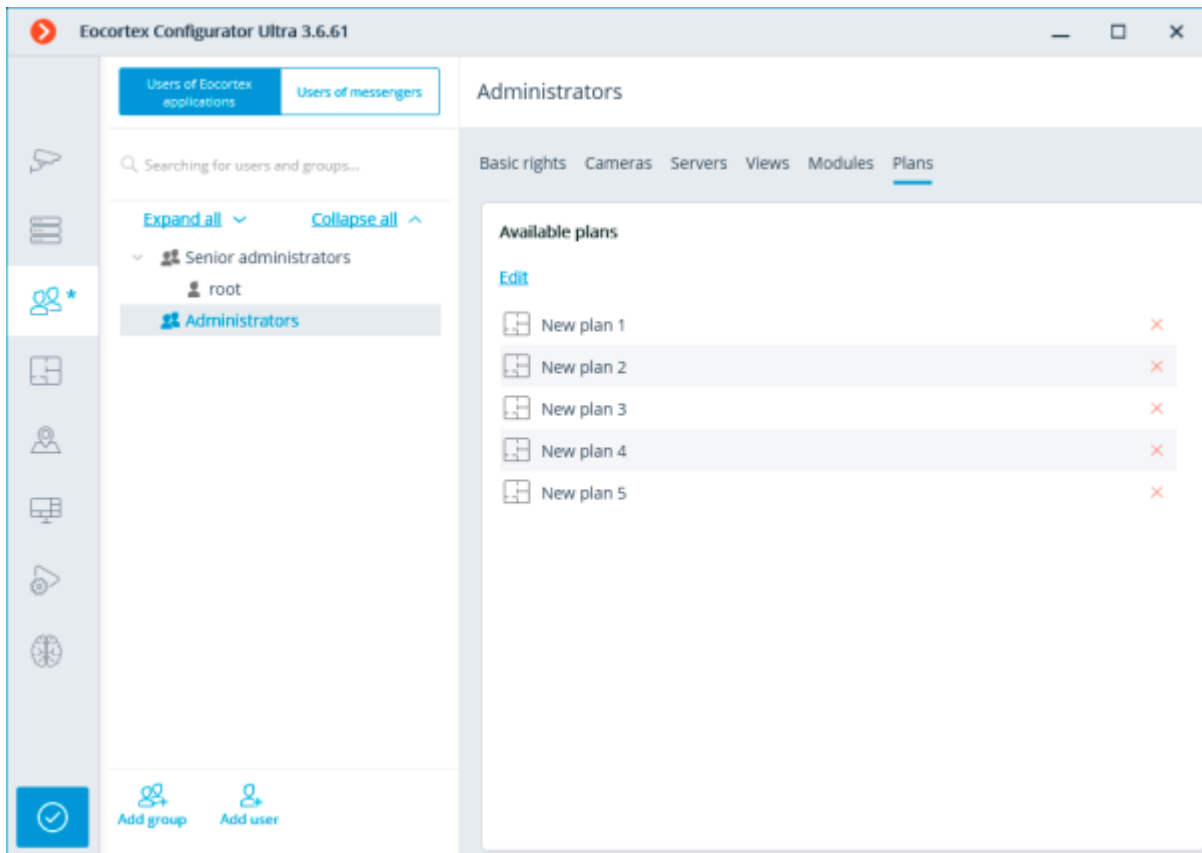
Editing rights to use analytics





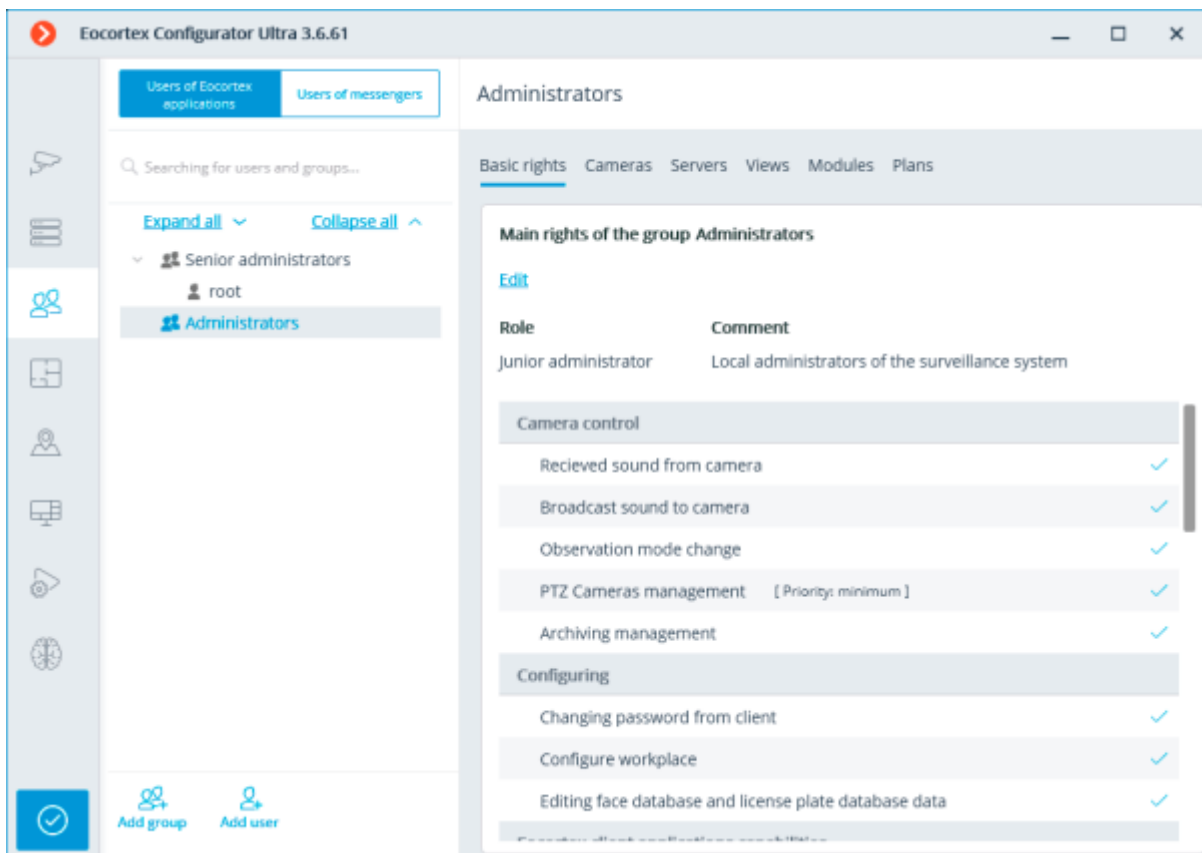
Editing rights to view plans

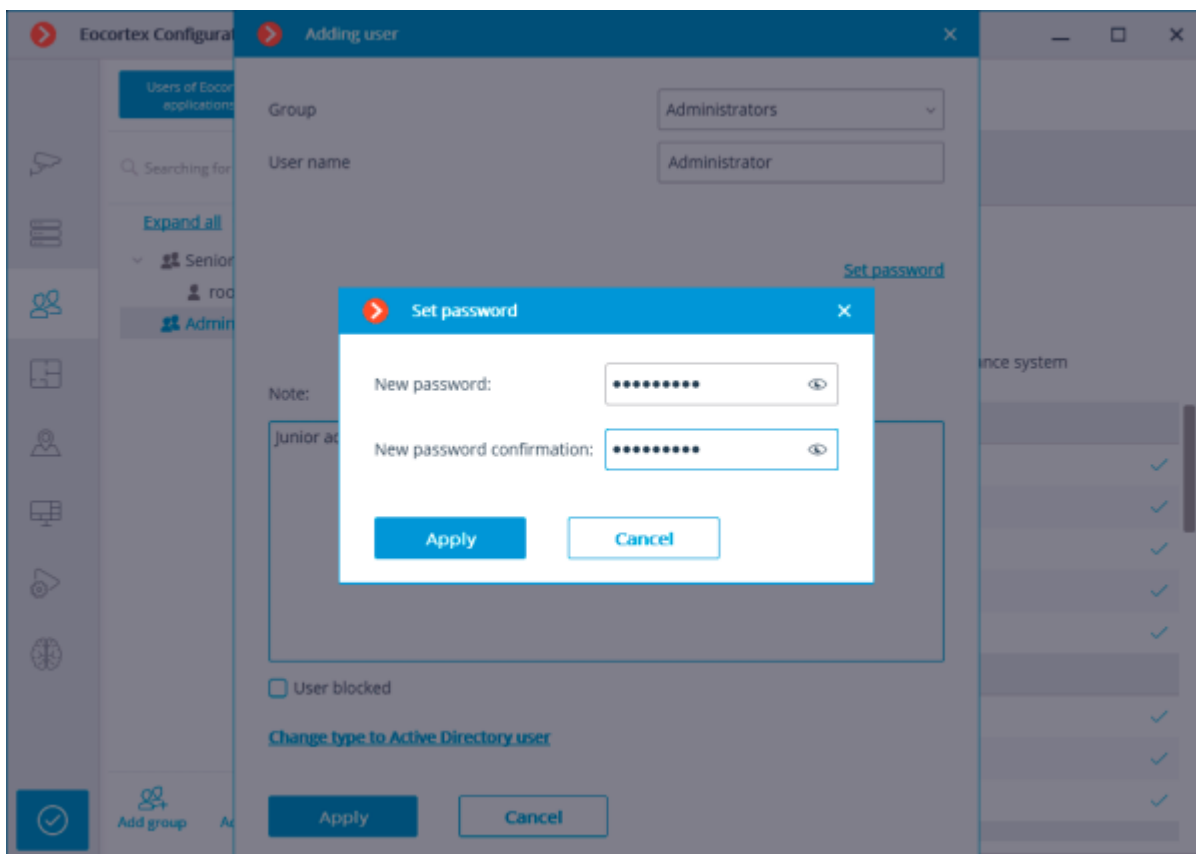
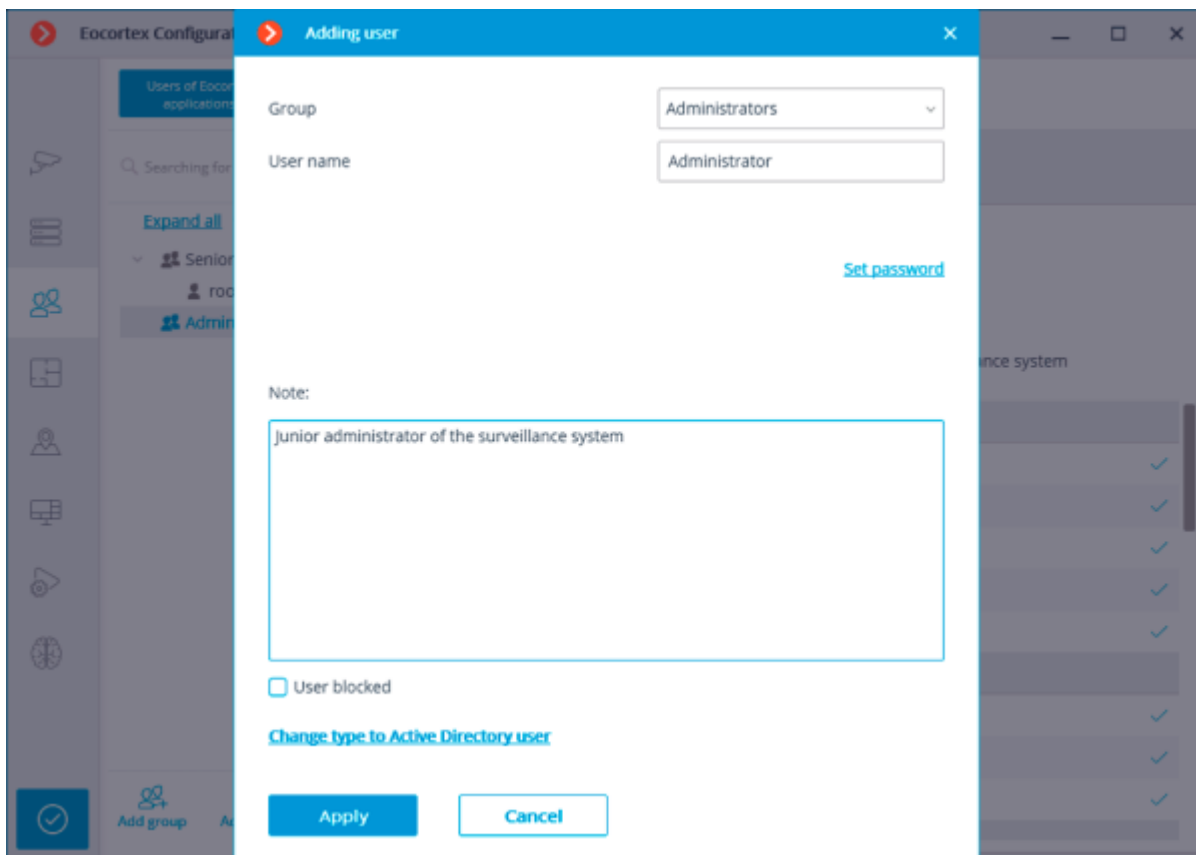


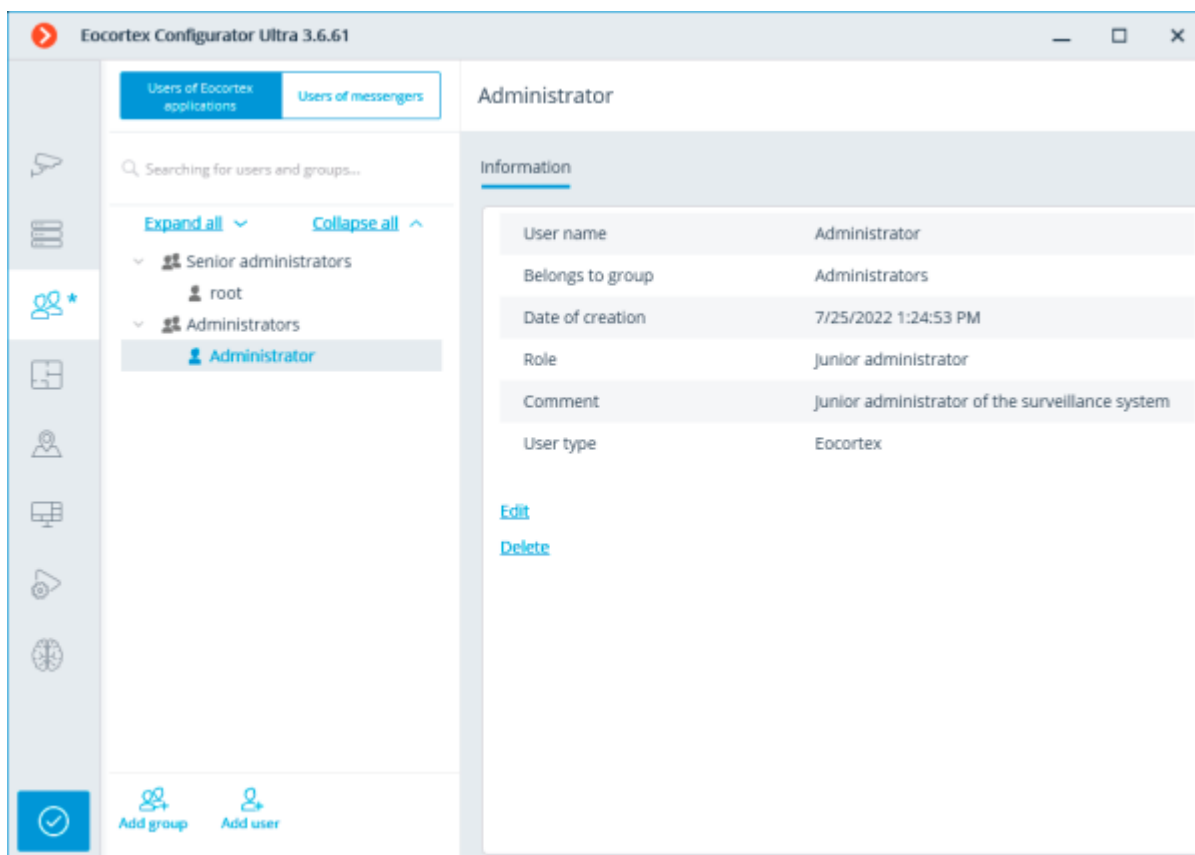


Adding and editing the Junior administrator user

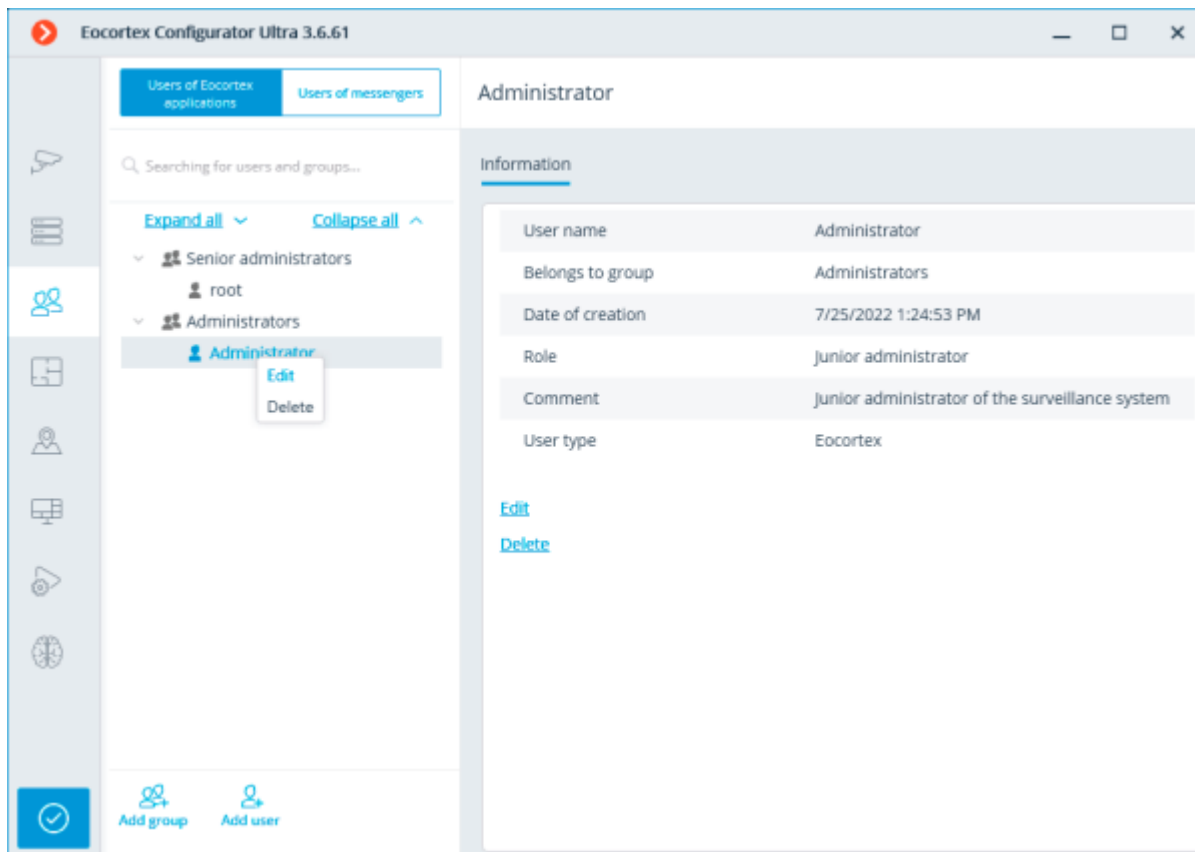
Adding the user

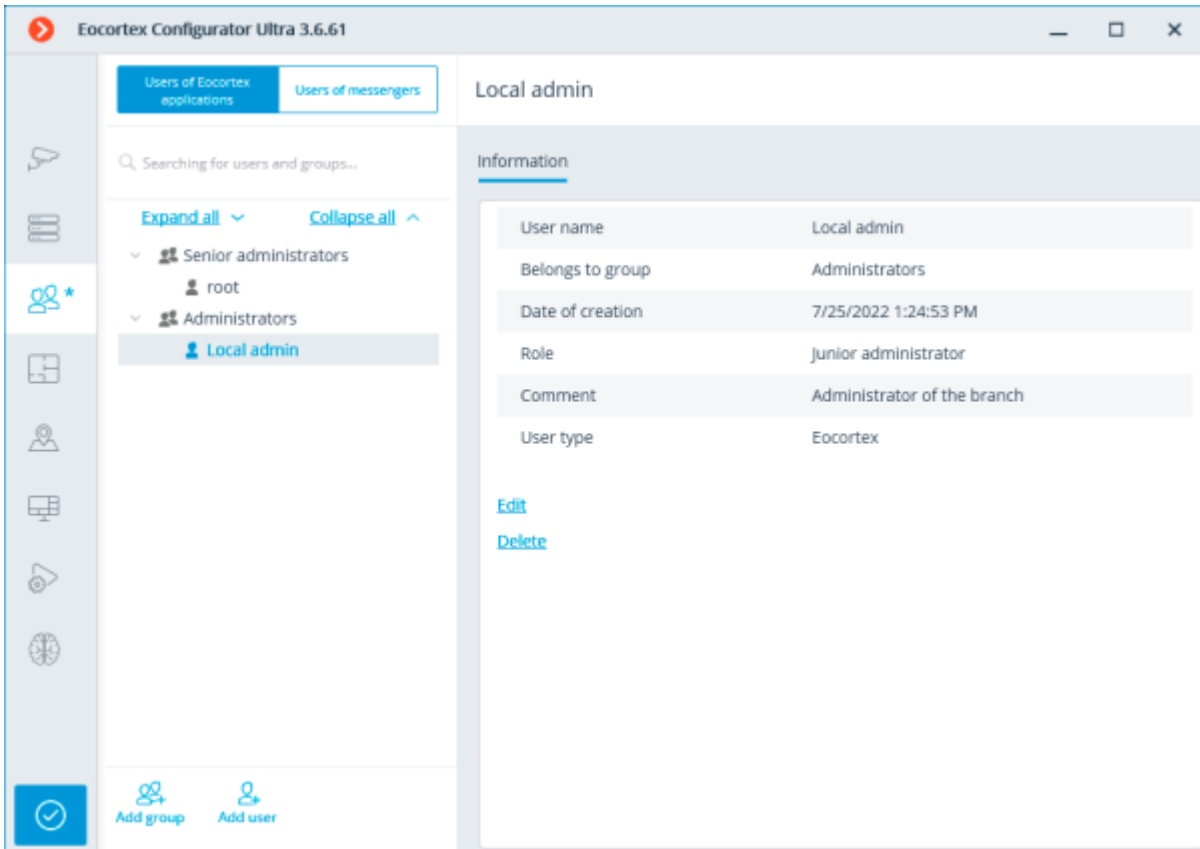
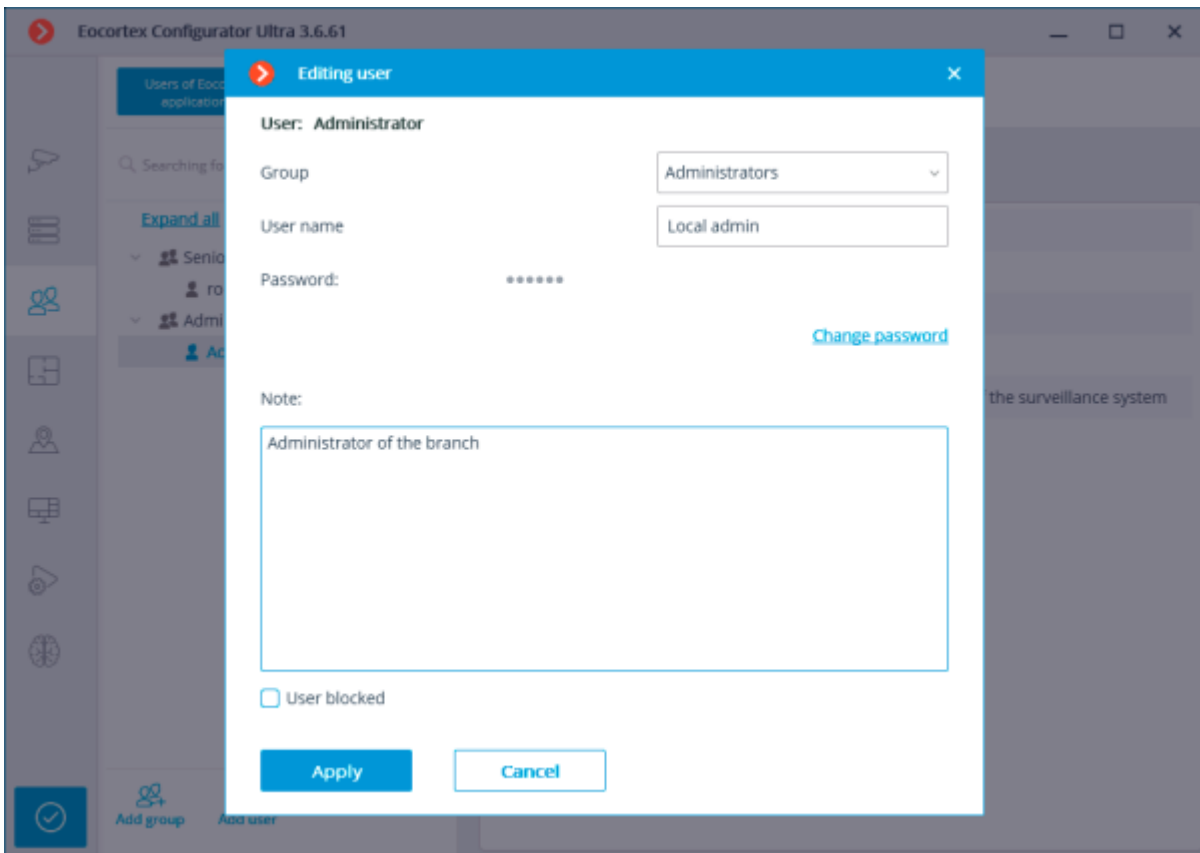






Editing the user





Operator access level

Operator permissions tree

Operator

Below is a list of the access rights that can be set for the user group with the Operator privilege level.

Surveillance

Access rights settings section, which is responsible for interaction with **Eocortex** using [client applications](#).

Includes the following subsections:

- **Basic**

A subsection that determines the accessibility of sections and functions of the **Eocortex Client** application to users belonging to this group.

- **Camera control**

- **Audio streaming from camera**

Provides the ability to listen to the sound received from the camera microphone. To receive sound in the system, the camera must have the **Sound capturing** option enabled in the [connection settings](#).

- **Broadcast sound to camera**

Provides the ability to transmit sound from a microphone installed at a user's workplace to the camera speaker. To transmit sound from the system, the camera must have the **Sound transmission** option enabled in the [connection settings](#).

- **Observation mode change**

Provides the ability to arm one or more cameras with the [Guard mode](#) in the **Eocortex Client** application in order to receive notifications when alarm events occur.

- **PTZ Cameras management**

Provides the ability to use the [PTZ functionality of the camera](#) in the **Eocortex Client** application. To use the PTZ functionality, the camera must have the **PTZ capabilities** option enabled in the [connection settings](#). **Eocortex** systems with **Enterprise** and **ULTRA** allow the system administrator to additionally prioritize user commands in case of simultaneous control of a single camera from multiple workplaces.

The following priority levels are available:

- Priority: minimum
- Priority: low
- Priority: medium
- Priority: high
- Priority: maximum

When using PTZ functionality by two users with equal priority, the commands of a user who started controlling the camera first will be executed.

- **Archiving management**

Provides the ability to manually enable recording of the camera stream to the **Eocortex** archive, if the recording option **Manual**, **On motion** or **Scheduled** is selected for this camera in the [Archive Recording Settings](#).

- **Configuring**

- **Changing password from client**

Gives a user the ability to change the password for his system account in the **Eocortex Client** application.

- **Configure workplace**

Gives a user the ability to change the [Workplace Settings](#) in the **Eocortex Client** application.

- **Access to new added cameras**

If enabled, a user from this group will be automatically granted access rights to all cameras added to the system later. If security policies require strict restriction of camera accessibility for users, it is recommended to disable this option and grant access to the required cameras to each user group manually.

- **Editing face database and license plate database data**

Determines the possibility of adding, modifying and deleting entries in the databases of the **License Plate Recognition** and **Face Recognition** modules.

- **Eocortex client applications capabilities**

- **Log access**

Specifies whether the [Events Log](#) is available to a user. Access to the Log can be granted to a user with one of two levels:

- **Current user in log only**

For a user, in addition to general system events (loss of connection with the camera, analytics events, etc.), only those events that were caused by his actions (execution of a user task, archive export, etc.) will be displayed.

- **All system users in log**

A user will see all system messages will be displayed, including those caused by the actions of other users.

- **Videowall access**

Determines the availability of the [Video Wall](#) functionality for a user. Even if this right is disabled for a user, the monitor from his workplace still can be used to create a video wall controlled from another workplace.

- **Chat access**

Determines the availability of the [Internal chat](#) functionality for a user.

- **Access to reports**

Determines for a user the ability to build reports based on the data collected by the **Eocortex** system ([Archive depth](#), [Face Recognition Report](#), etc.).

- **Access to archive marks**

Determines for a user the ability to create and view [Archive Bookmarks](#).

- **Access to the episode archive**

Determines for a user the ability to create, view and delete archive episodes in the [Episode Archive](#).

This right has several access levels:

- Viewing (only your own)
- View (all)
- Creating and viewing (only your own)
- Creating and viewing (all)
- Creating, viewing, and deleting (only your own)
- Creating, viewing, and deleting (all)
- **Access to maps**

Determines the availability of the **Maps** section for a user.

- **Access to Search for Objects**

Determines for a user the ability to use data collected by the system using the [Search for Objects](#) module.

- **Close application**

Determines the ability for a user to close the window of the **Eocortex Client** application using standard methods.

- **Limitation of the number of connections**

Sets a [limit on the number of simultaneous connections](#) using the credentials of the same user.

- **Application launch delayed**

Prevents a user from being forced to immediately restart the application when changes are made to the system settings.

This right allows to delay the restart of the **Eocortex Client** application, but the user must still restart the application when appropriate for the changes to take effect.

- **User tasks launch**

Provides the ability to execute [User tasks](#).

- **Camera cell control**

Provides a user with the ability to interact with camera cells: drag and drop cameras between cells, use the context menu and cell interface elements.

- **Access to face and license plate databases**

Provides a user with the ability to view entries in the databases of the **License Plate Recognition** and **Face Recognition** modules.

Disabling this right will automatically disable the **Editing face database and license plate database data** right.

- **Adjusting the number of occupied parking spots**

Allows a user to make changes to the data displayed in the [Occupied Parking Spots counter](#) of the **License Plate Recognition** module.

- **Accept alarms without obligatory comments**

Allows a user to [confirm receipt of an alarm event](#) of the camera without having to add a comment about the received alarm. Upon deactivation of a right the automatic alarm acceptance will be disabled.

- **Archive export**

Provides the ability to [export fragments of the system archive](#) as **MCM**, **MP4** or **AVI** files.

- **Archive expert mode access**

Allows a user to interact with the archive in the mode of [simultaneous viewing of multiple cameras](#).

- **Editing views**

Allows a user to [create and edit views](#). Applies only to views created in the **Eocortex Client** application directly at a user's workplace. Does not affect [server views](#) created and edited in Eocortex Configurator.

- **Blurring disabled**

Allows a user to disable image blurring imposed by the **Frame Area Blurring** module.

- **Interaction with external components**

- **Receive push notifications**

Allows a user to receive Push notifications in **Eocortex** mobile applications (iOS, Android) authorized under his account.

- **Connection via mobile devices and Web-Client**

Allows using a user account for authorization in **Eocortex** mobile applications ([iOS](#), [Android](#)) and [Web Client](#).

- **Cameras**

Subsection defining the list of cameras available for [viewing in Eocortex client applications](#). Both full access to the camera, and partial access to only the archive or only to the live video of the camera can be provided.

- **One right for surveillance and archive**

An option that speeds up the process of setting up access to cameras. If enabled, a user will be granted both access rights to the camera at the same time - to the live video and to the archive of the camera. Can be disabled for more fine-grained access customization with separate rights.

- **Surveillance**

The user has access to the camera's live video.

- **Archive**

The user has access to the camera's archive recordings.

- **Views**

Subsection defining the list of [views](#) available to a user in the **Eocortex Client** application.

- **Modules**

Subsection defining the list of [video analytics modules](#) available to a user in the **Eocortex Client** application.

- **Plans**

Subsection defining the list of [plans](#) available to a user in the **Eocortex Client** application.

Adding a Operator group

Operator permissions overview

Eocortex Configurator Ultra 3.6.61

Users of Eocortex applications | Users of messengers

Operator

Basic rights | Cameras | Views | Modules | Plans

Main rights of the group Operator

[Edit](#)

Role	Comment
Operator	Regular user of the surveillance system

Camera control

Received sound from camera	✓
Broadcast sound to camera	✓
Observation mode change	✓
PTZ Cameras management [Priority: minimum]	✓
Archiving management	✓

Configuring

Changing password from client	✓
Configure workplace	✓
Access to new added cameras	✓

Add group | Add user

Eocortex Configurator Ultra 3.6.61

Users of Eocortex applications | Users of messengers

Operator

Basic rights | **Cameras** | Views | Modules | Plans

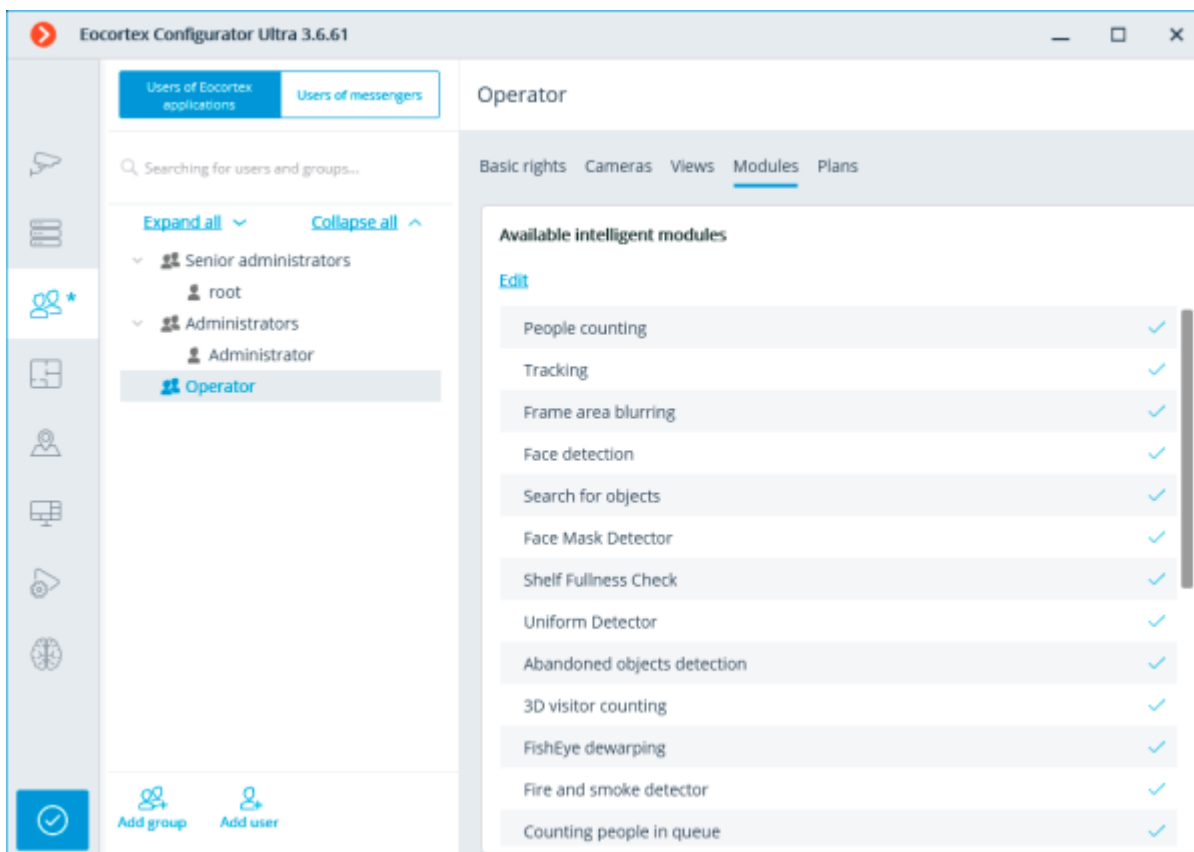
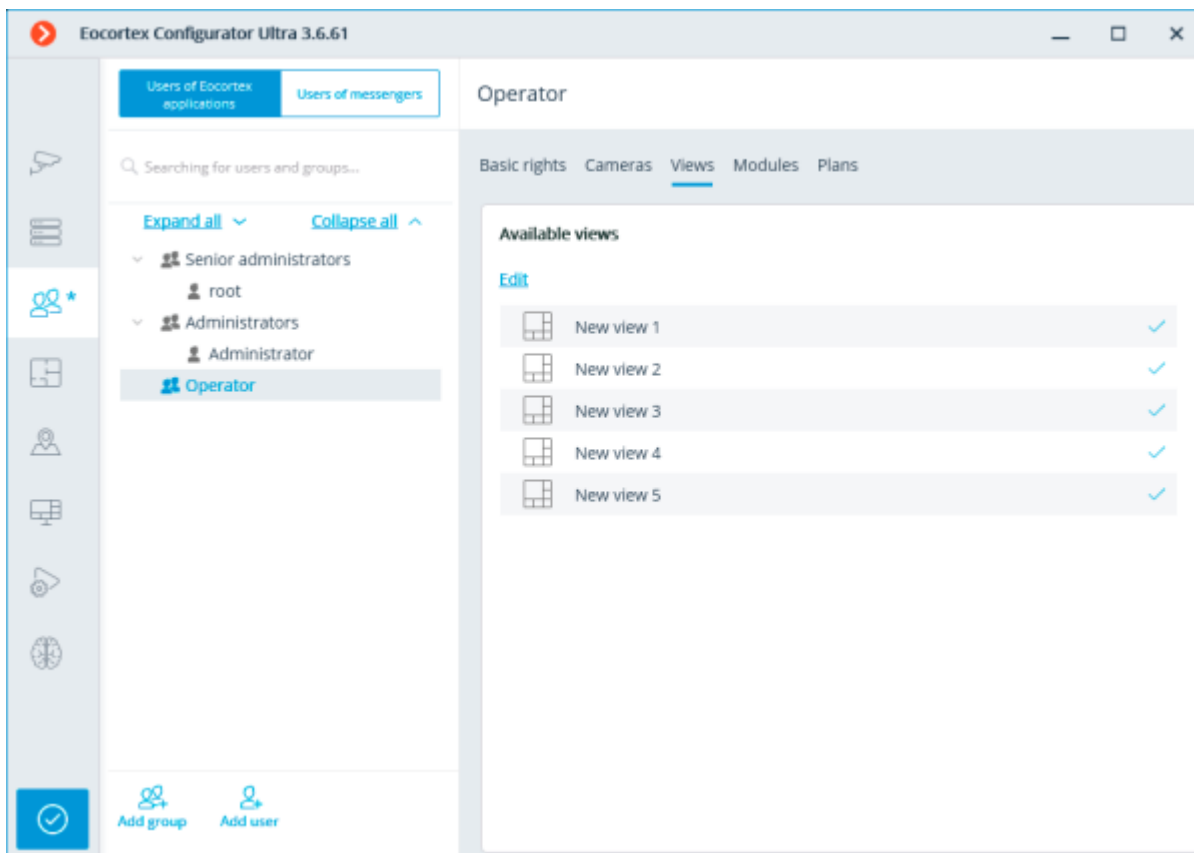
Available cameras

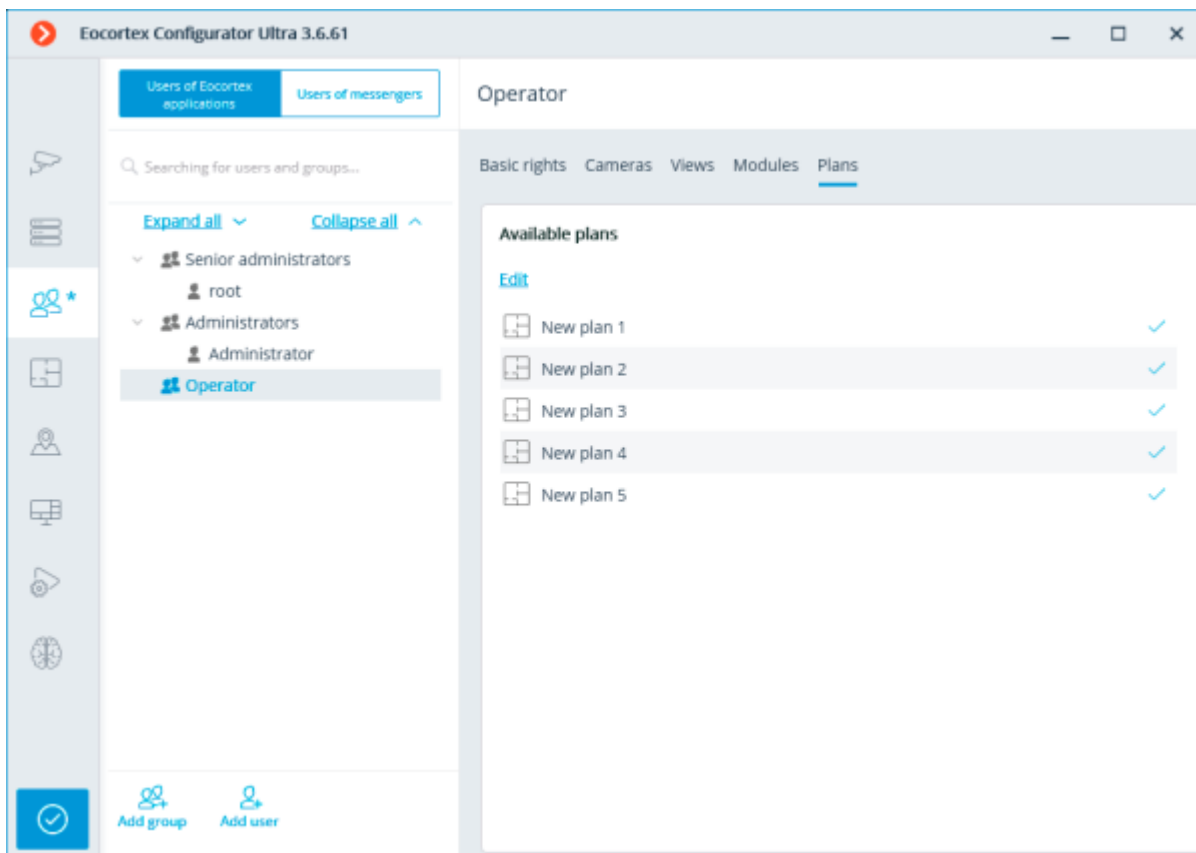
[Edit](#)

Search by name or address

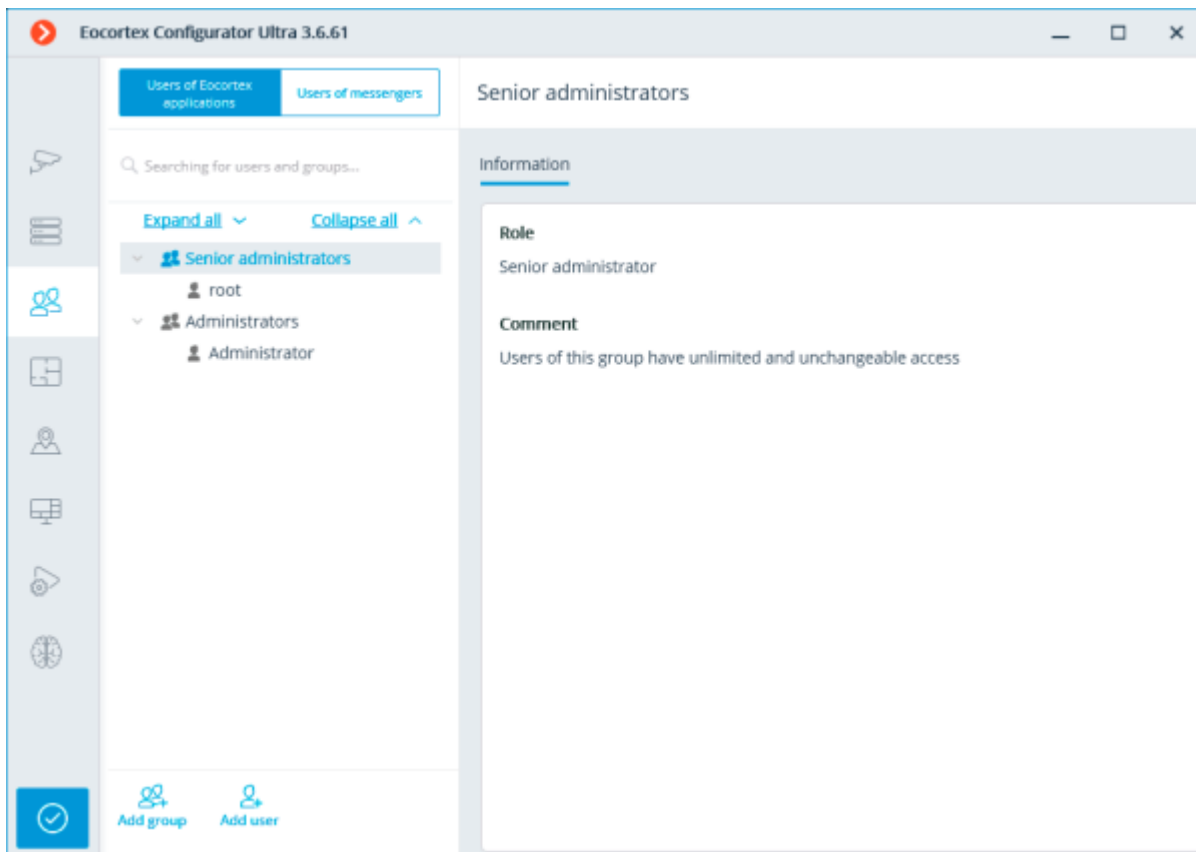
Name	Surveillance	Archive
Camera 1 192.168.101.223:9090	✓	✓
Camera 2 192.168.101.224:9090	✓	✓
Camera 3 192.168.101.225:9090	✓	✓
Camera 4 192.168.101.226:9090	✓	✓
Camera 5 192.168.101.227:9090	✓	✓

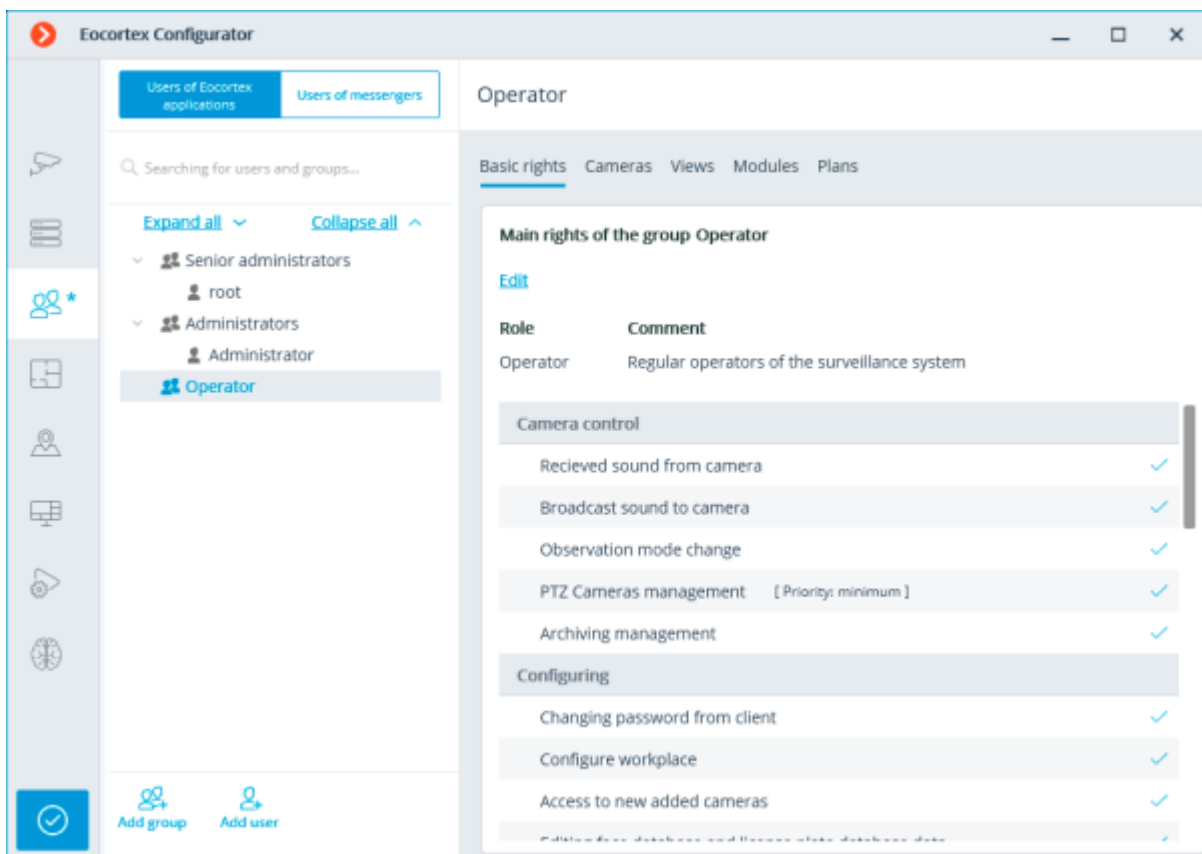
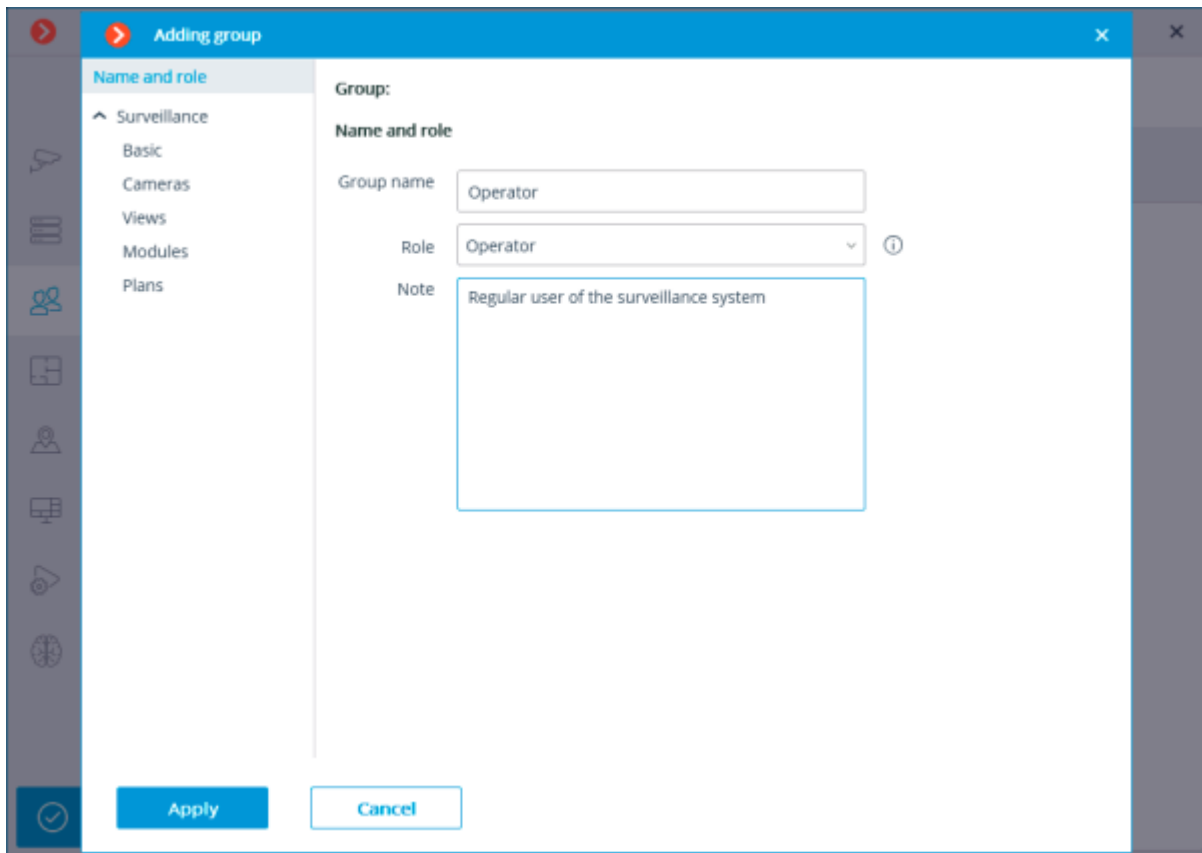
Add group | Add user



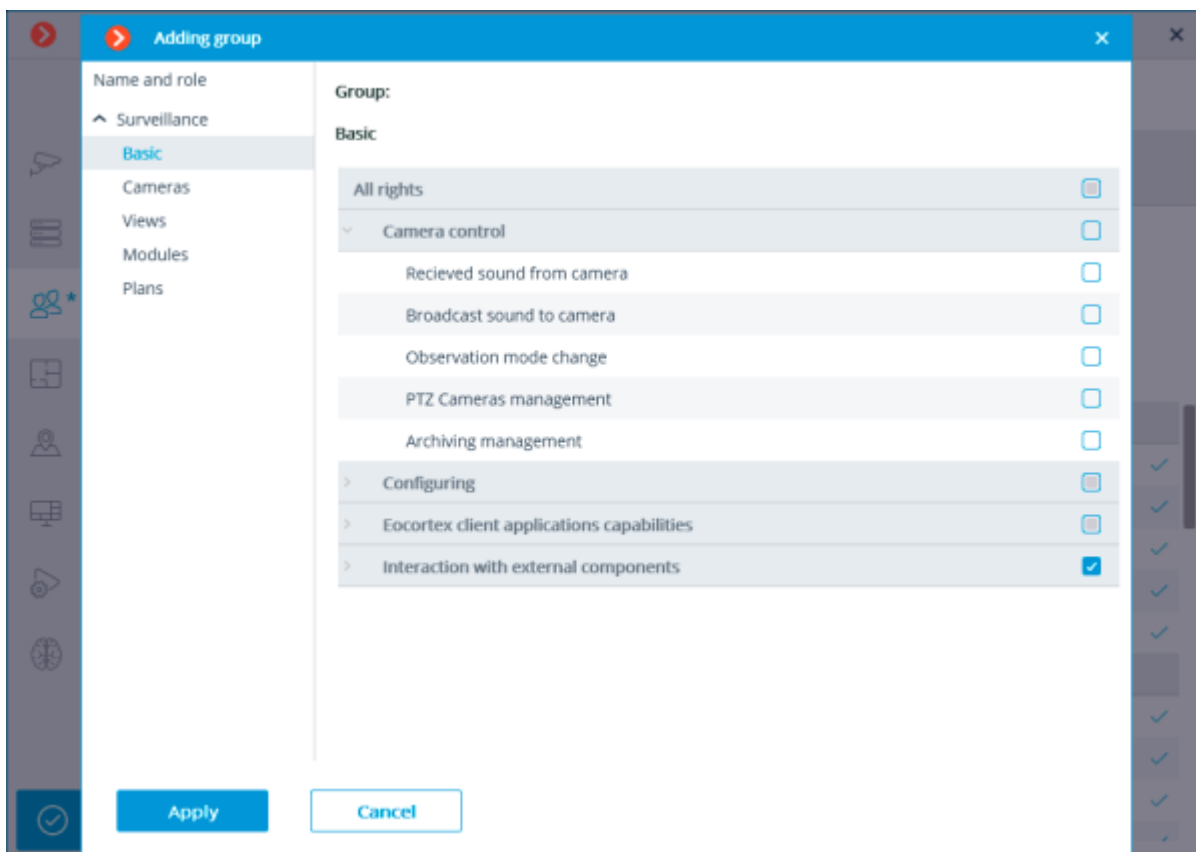
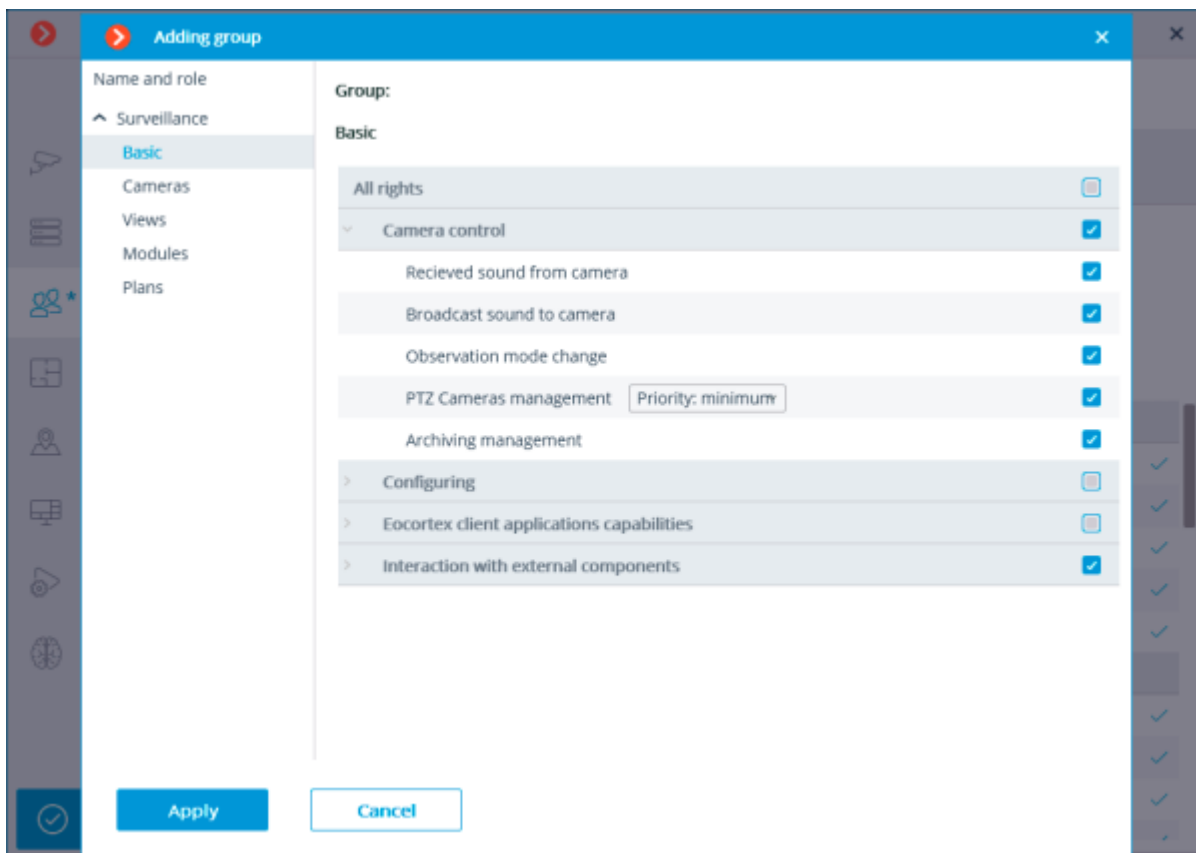


Adding a group





Granting basic rights



Basic rights overview

Adding group

Name and role

- Surveillance
 - Basic
 - Cameras
 - Views
 - Modules
 - Plans

Group:

Basic

- All rights
- Camera control
 - Received sound from camera
 - Broadcast sound to camera
 - Observation mode change
 - PTZ Cameras management Priority: minimum
 - Archiving management
- Configuring
 - Changing password from client
 - Configure workplace
 - Access to new added cameras
 - Editing face database and license plate database data
- Eocortex client applications capabilities
 - Log access All system users in log

Apply Cancel

Adding group

Name and role

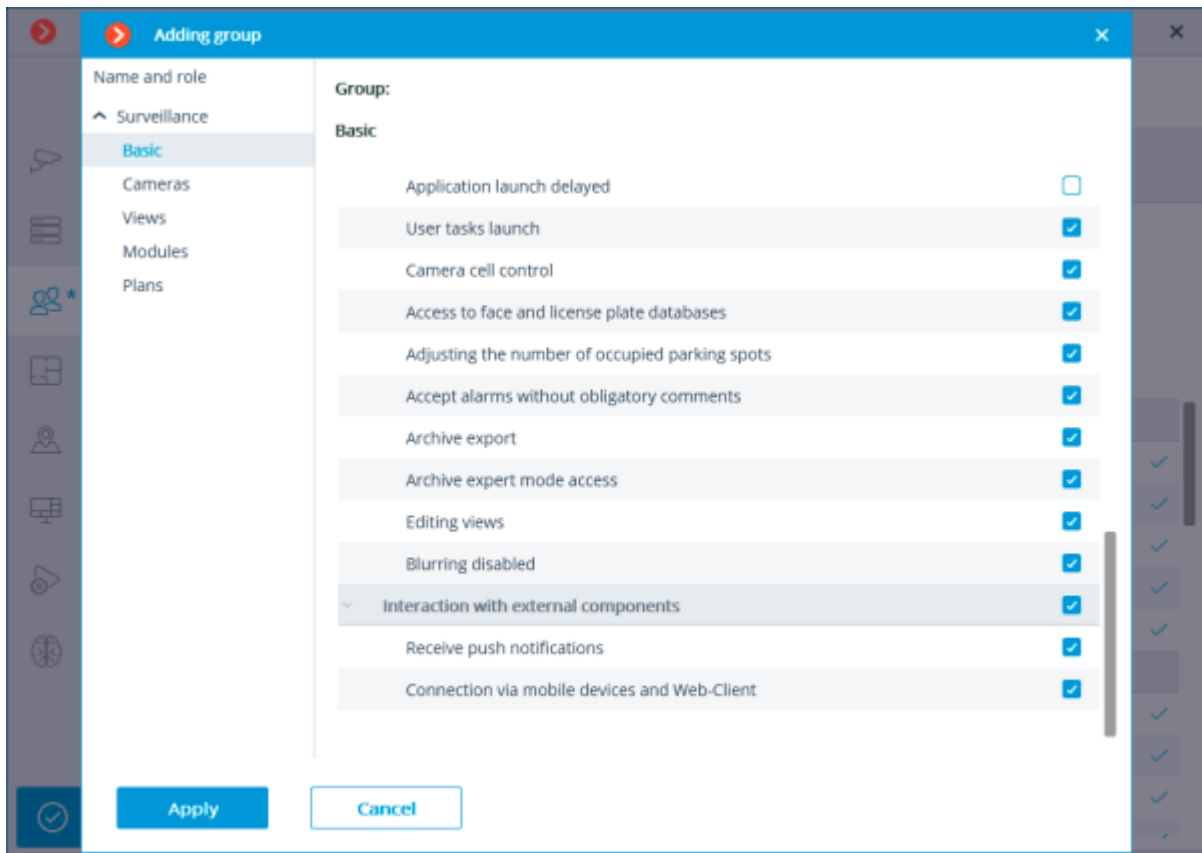
- Surveillance
 - Basic
 - Cameras
 - Views
 - Modules
 - Plans

Group:

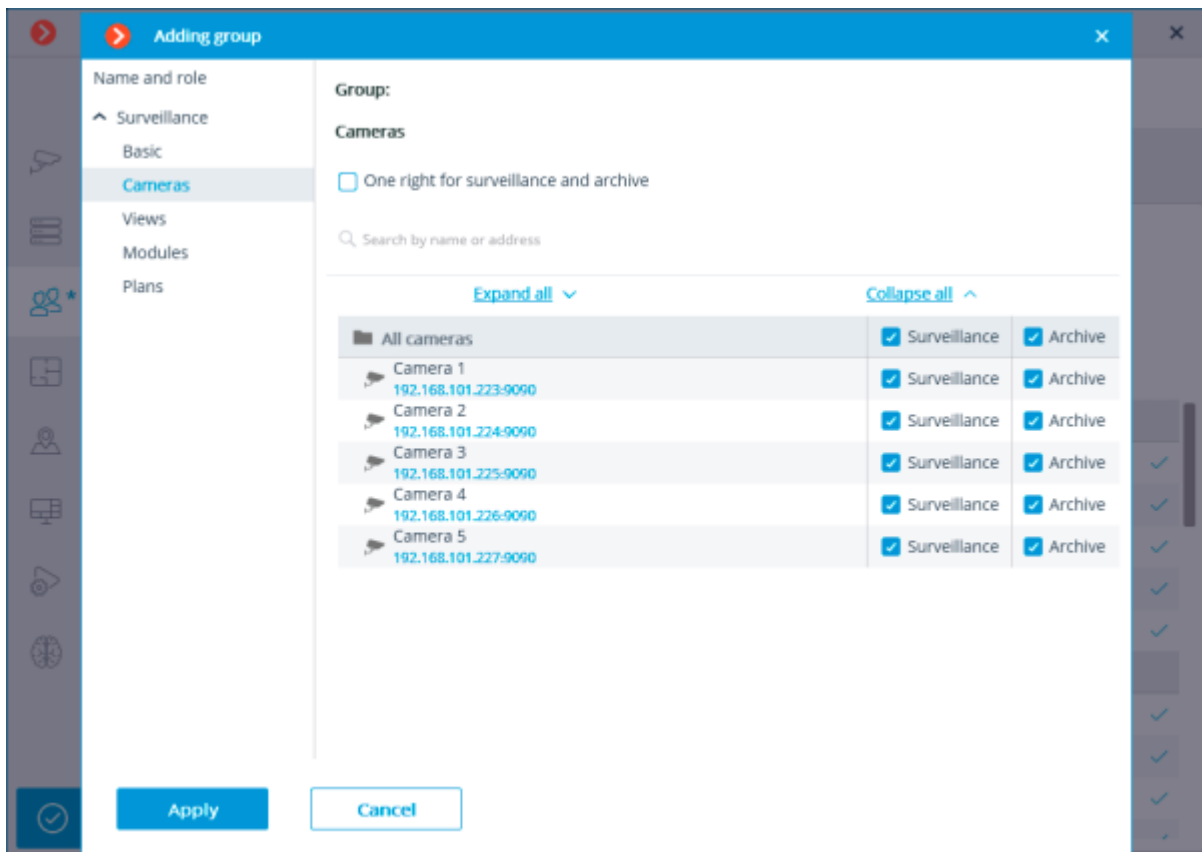
Basic

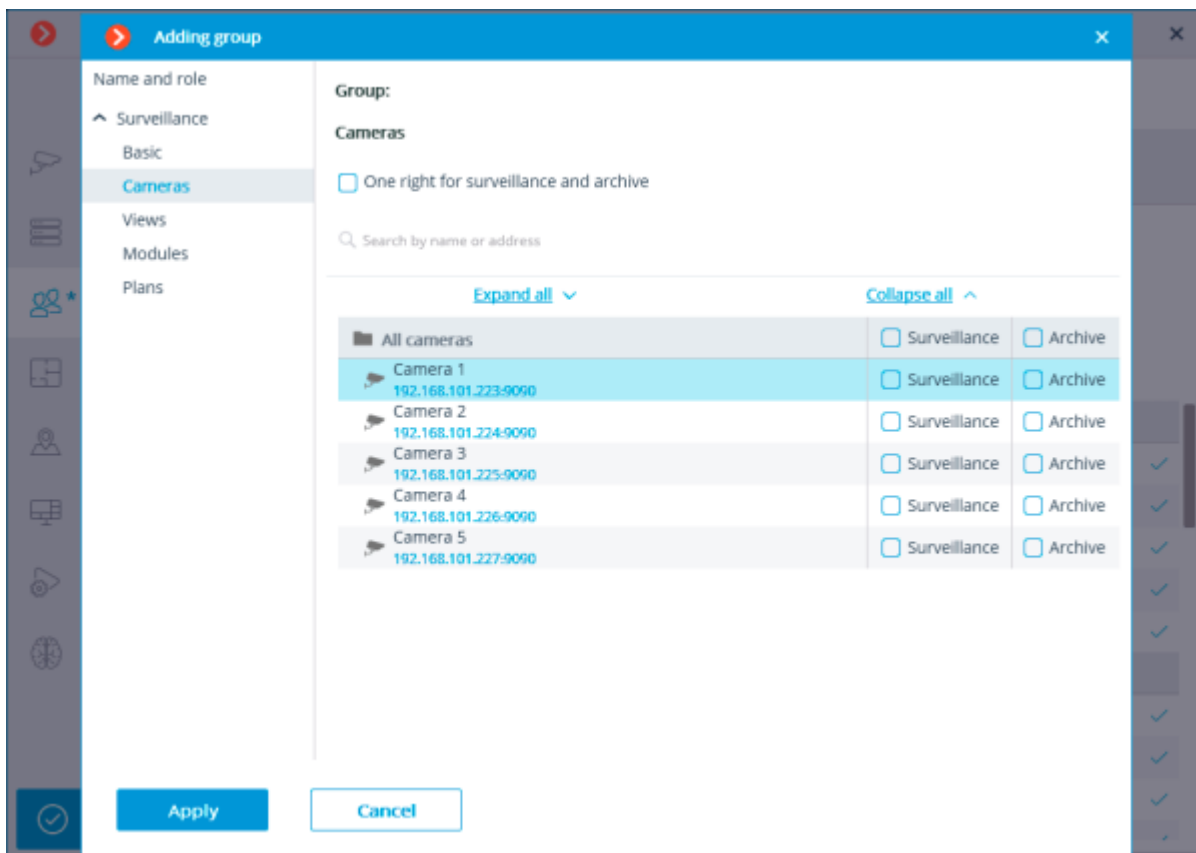
- Eocortex client applications capabilities
 - Log access All system users in log
- Videowall access
- Chat access
- Access to reports
- Access to archive marks
- Access to the episode archive
- Access to maps
- Access to interactive search
- Close application
- Limitation of the number of connections
- Application launch delayed
- User tasks launch
- Camera cell control

Apply Cancel

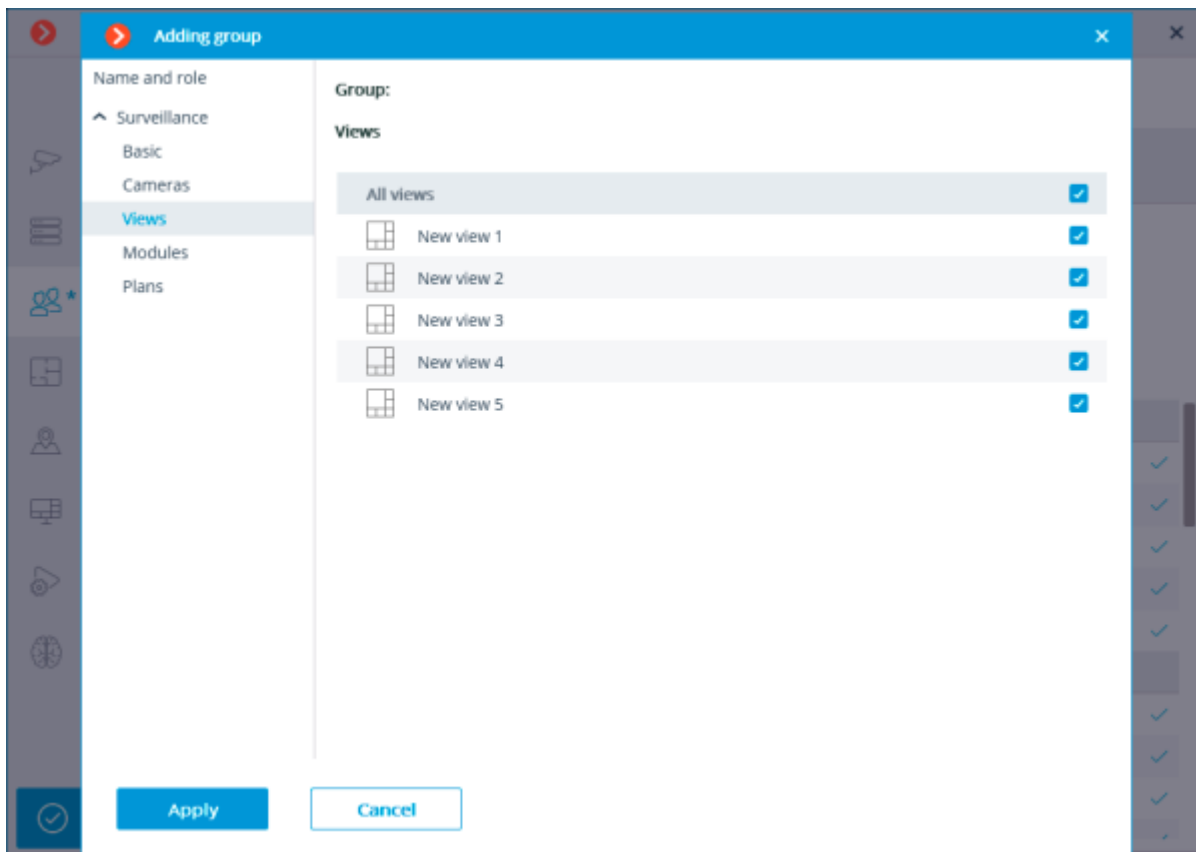


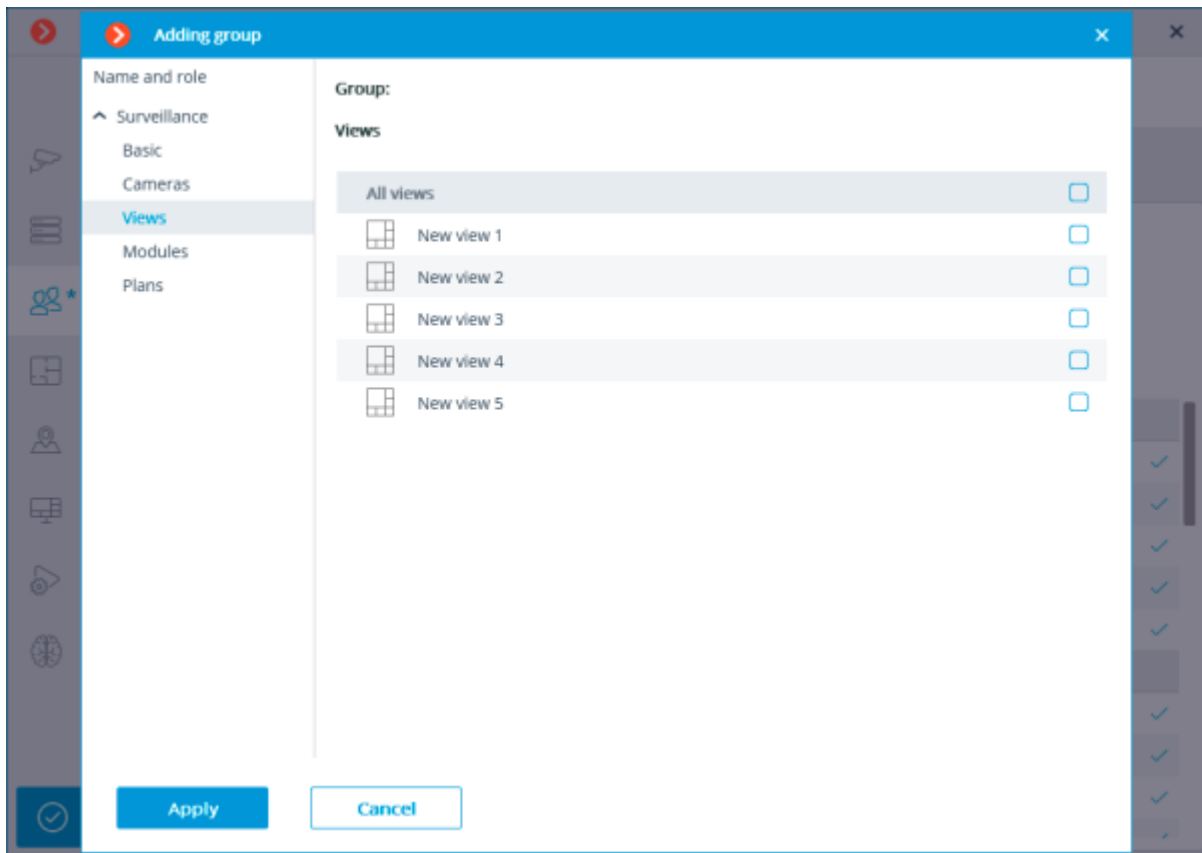
Granting rights to view cameras



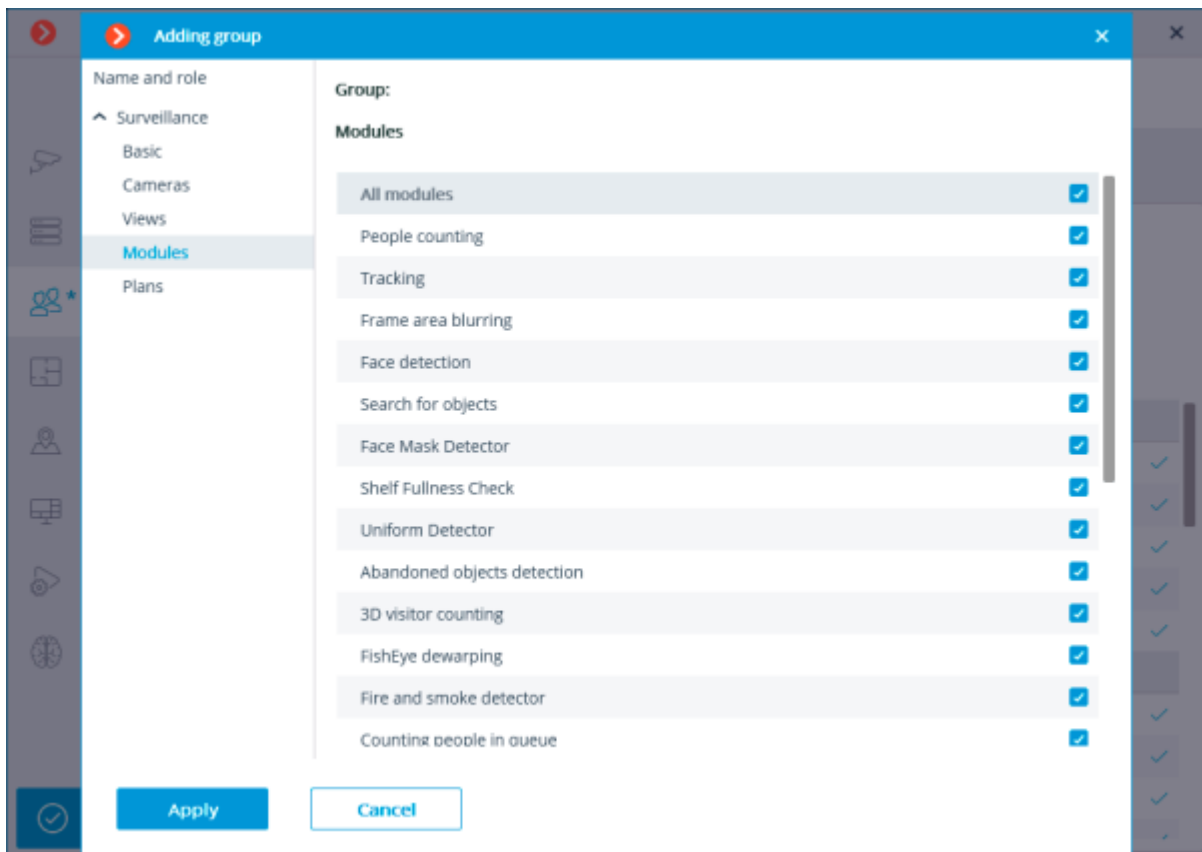


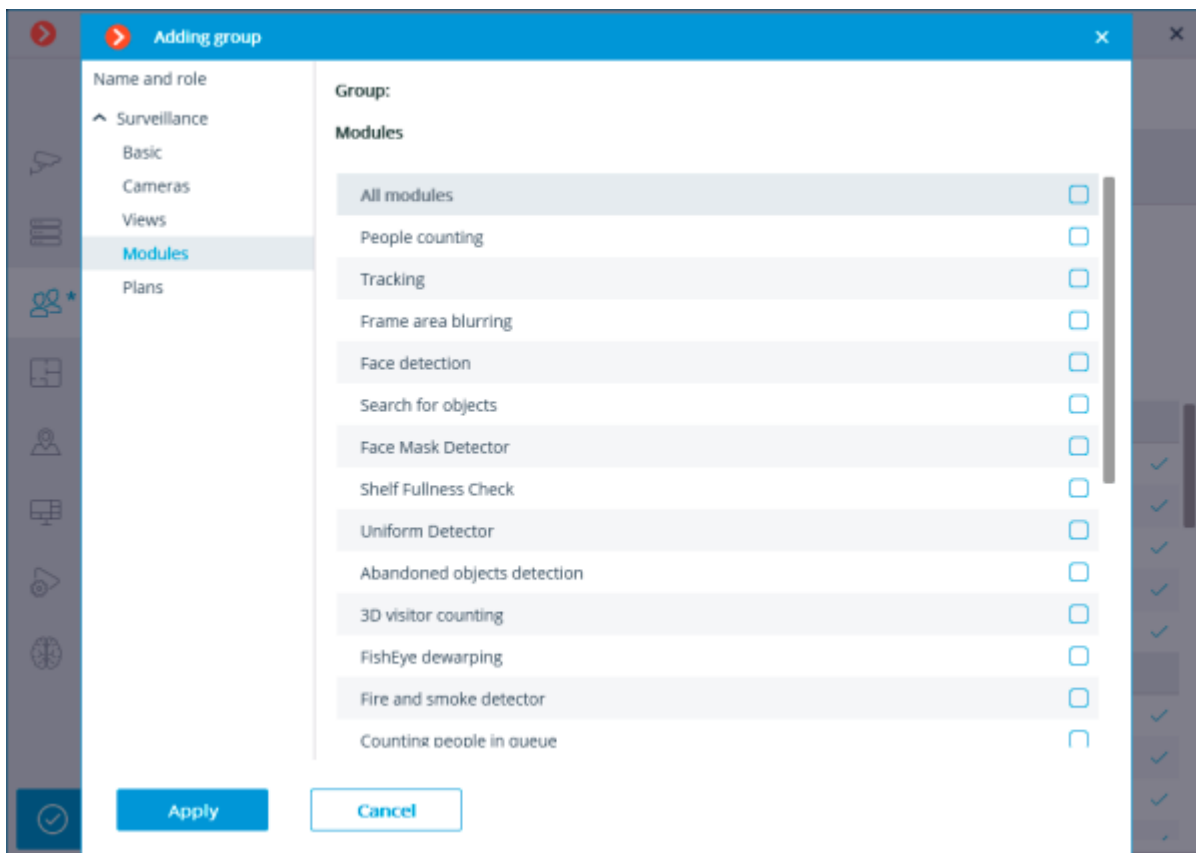
Granting rights to use views



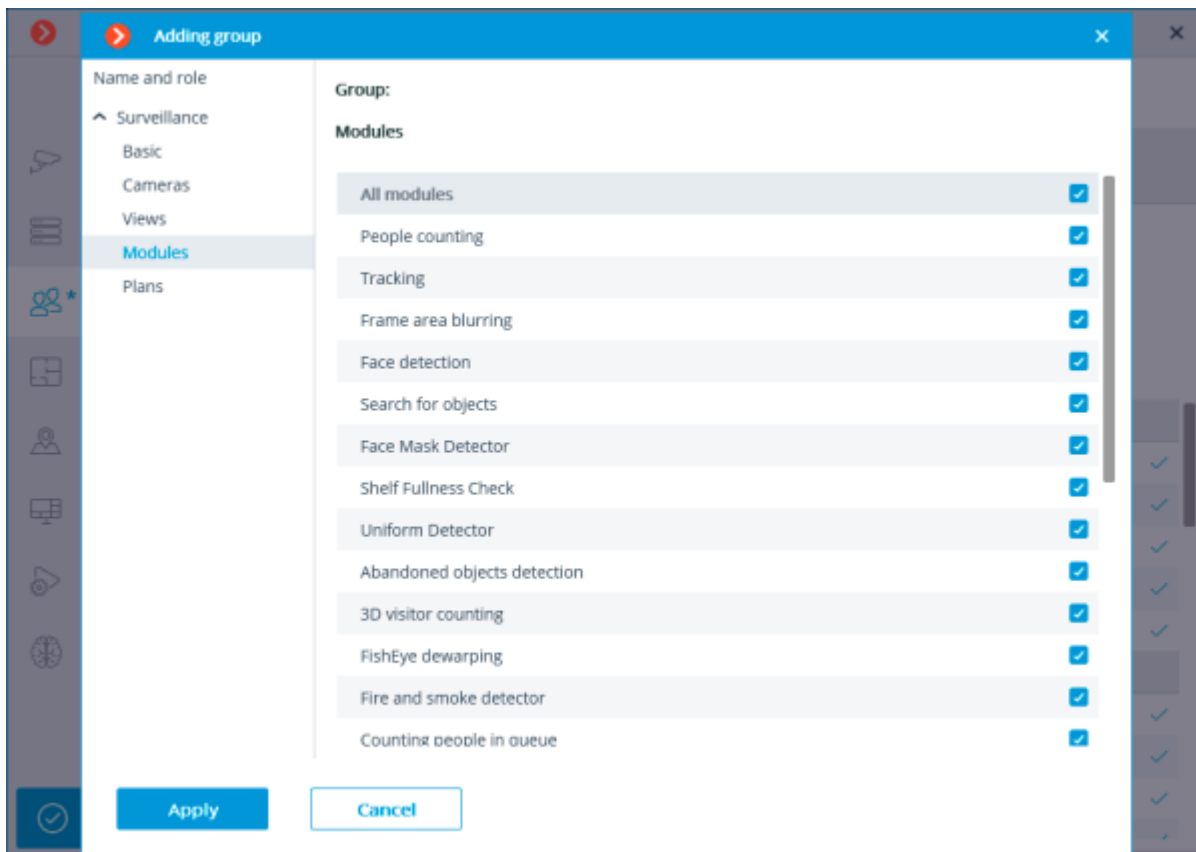


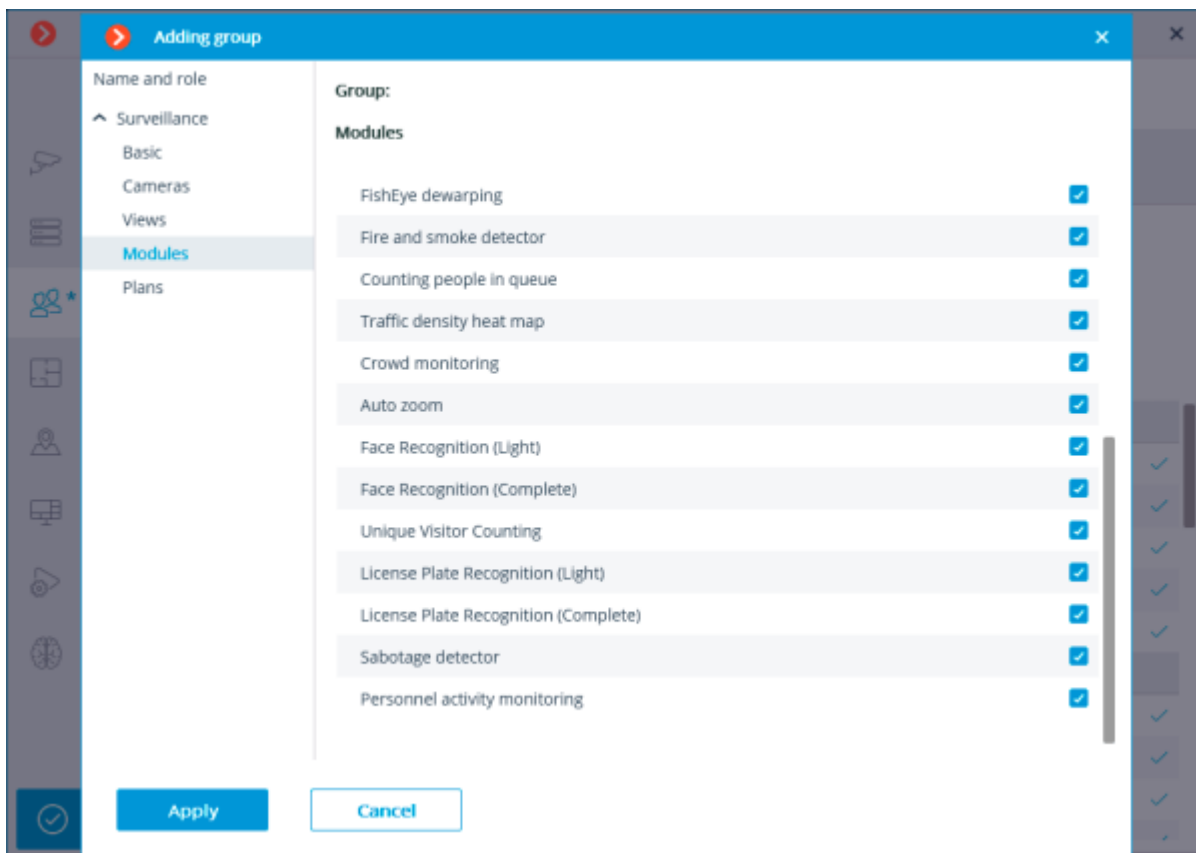
Granting rights to use analytics



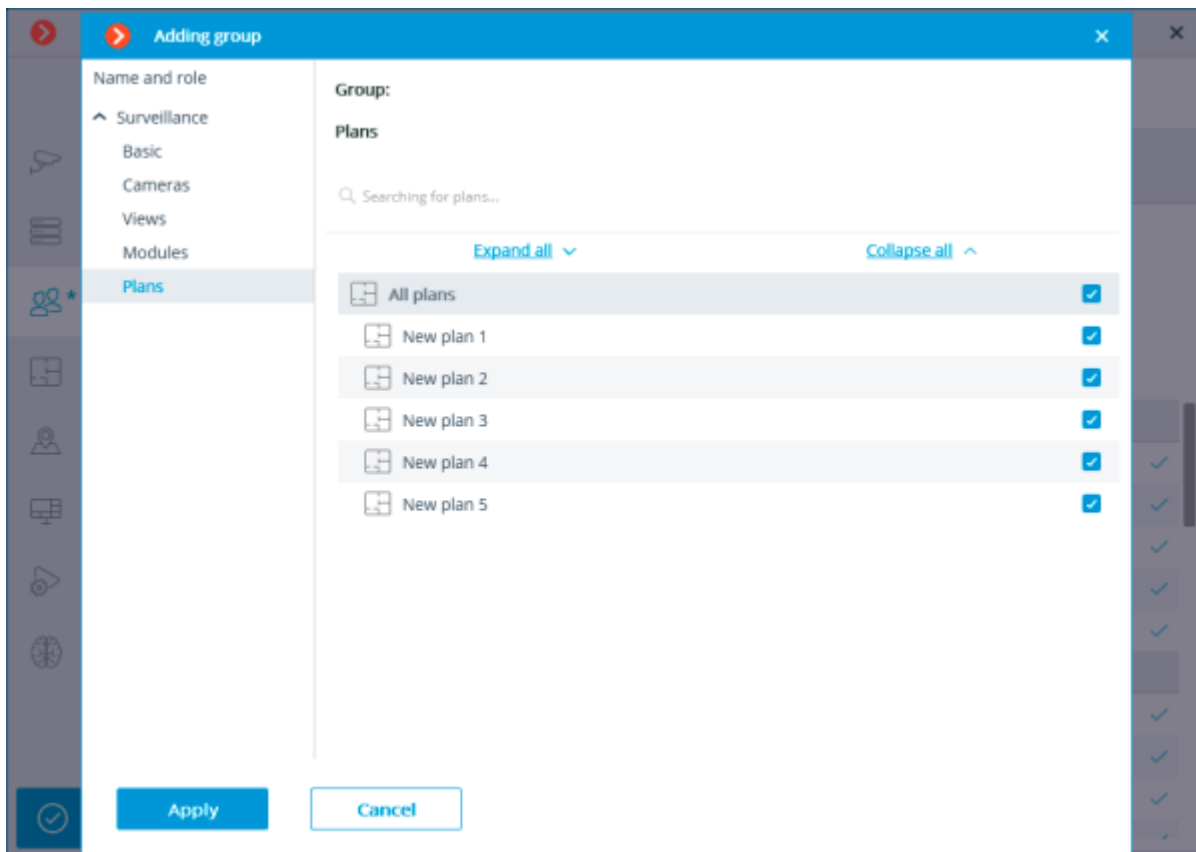


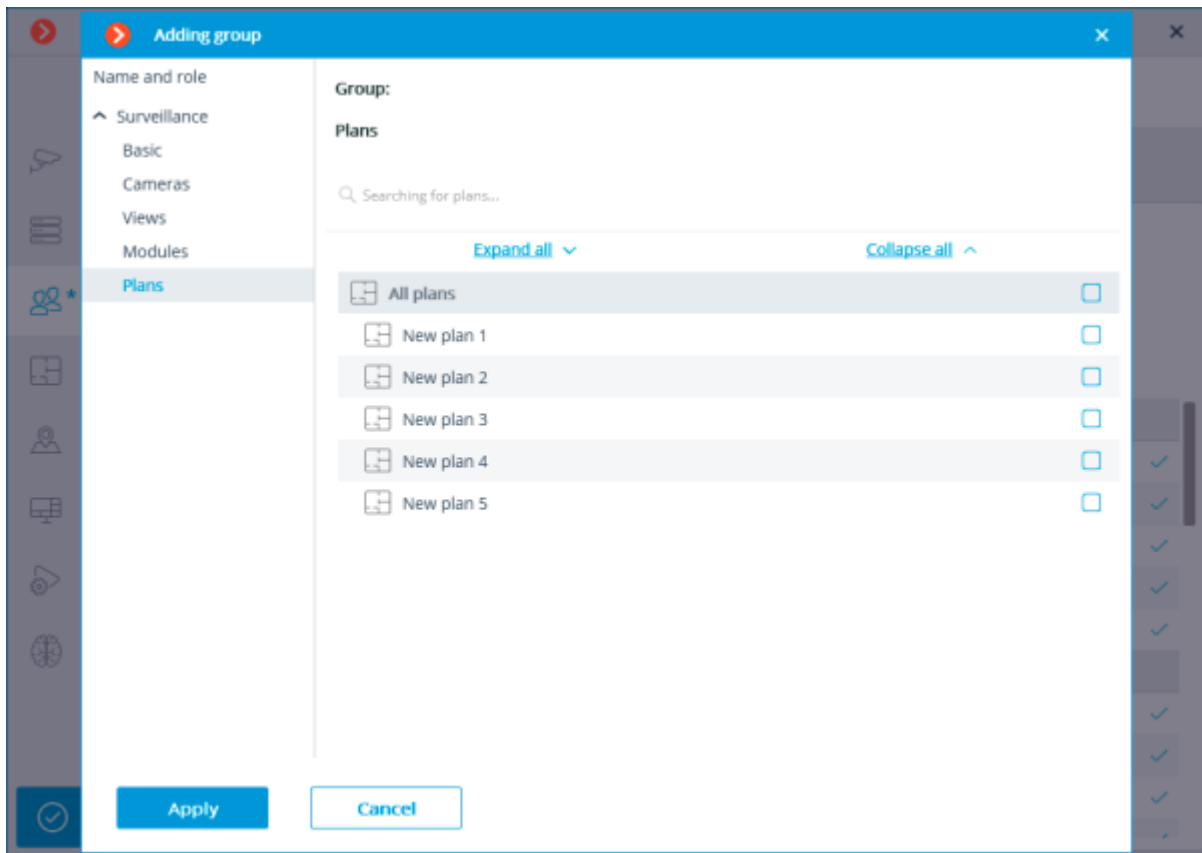
Available analytics overview





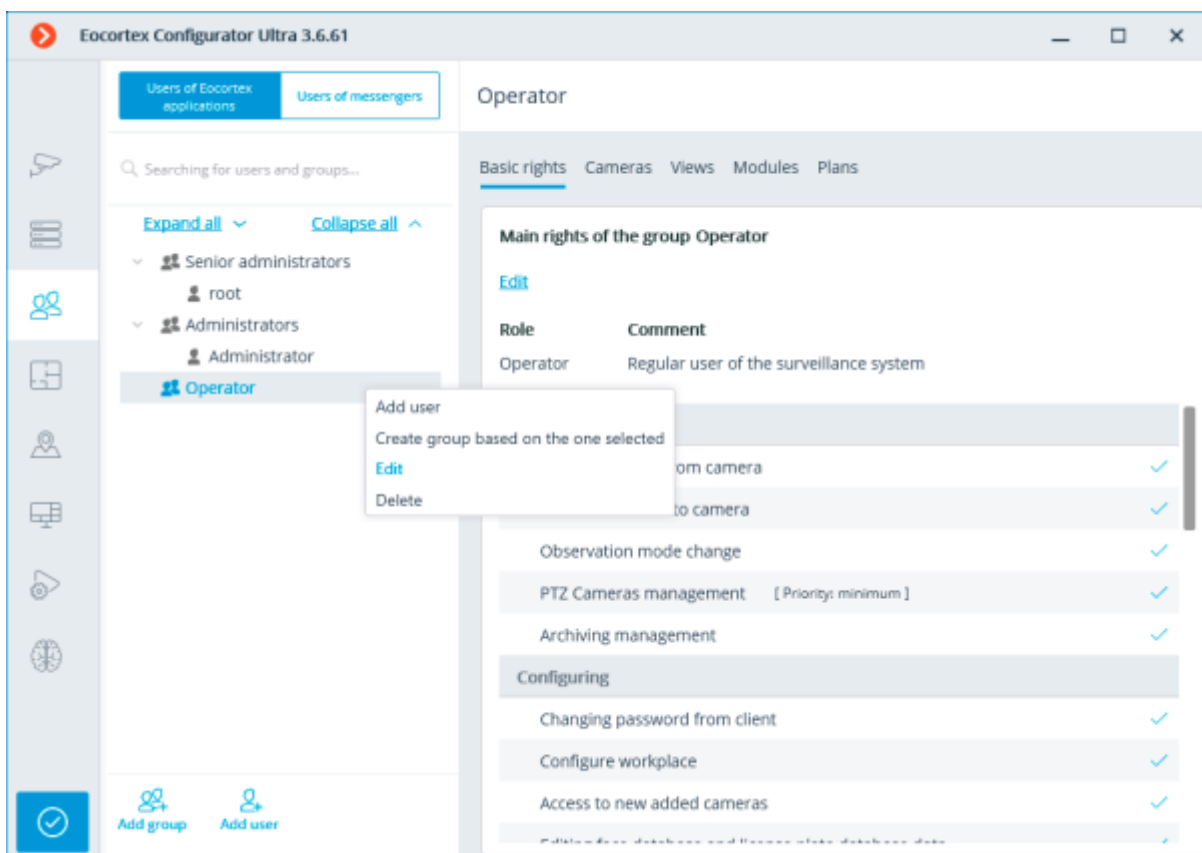
Granting rights to view plans

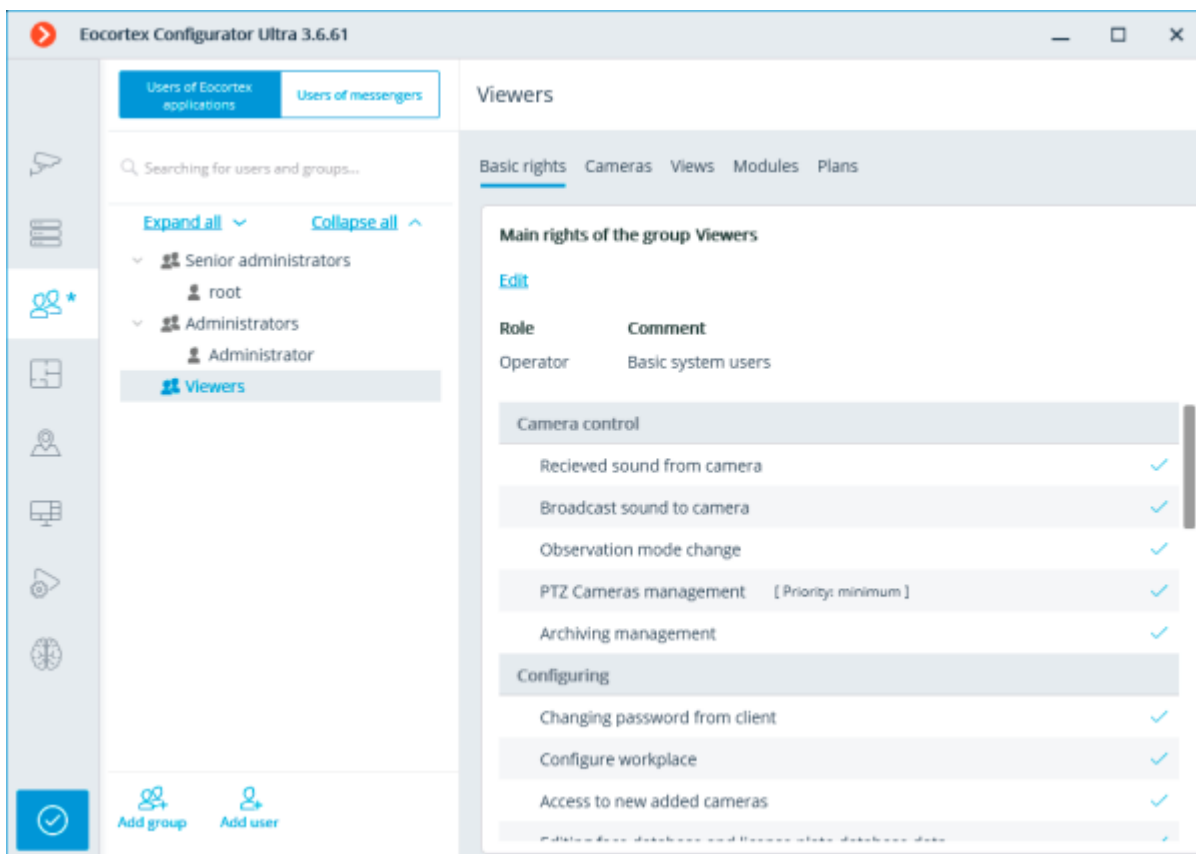
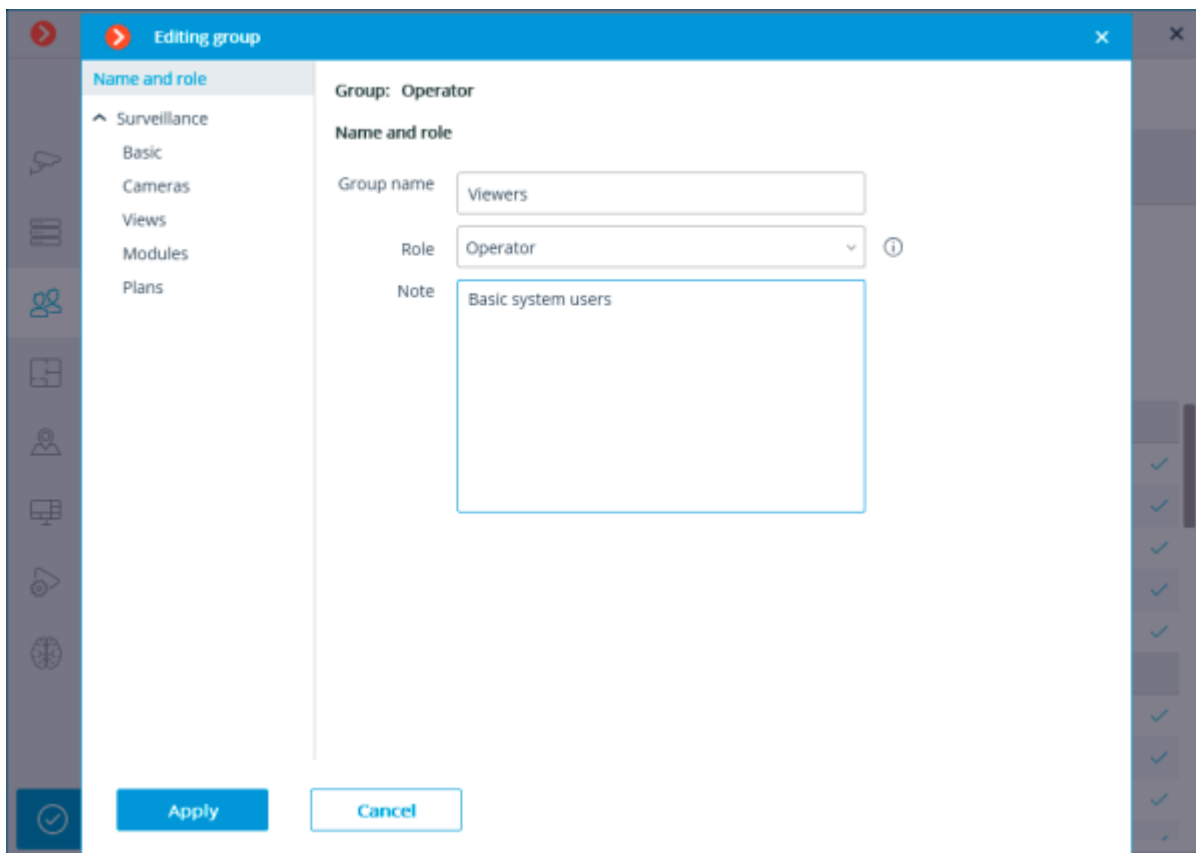




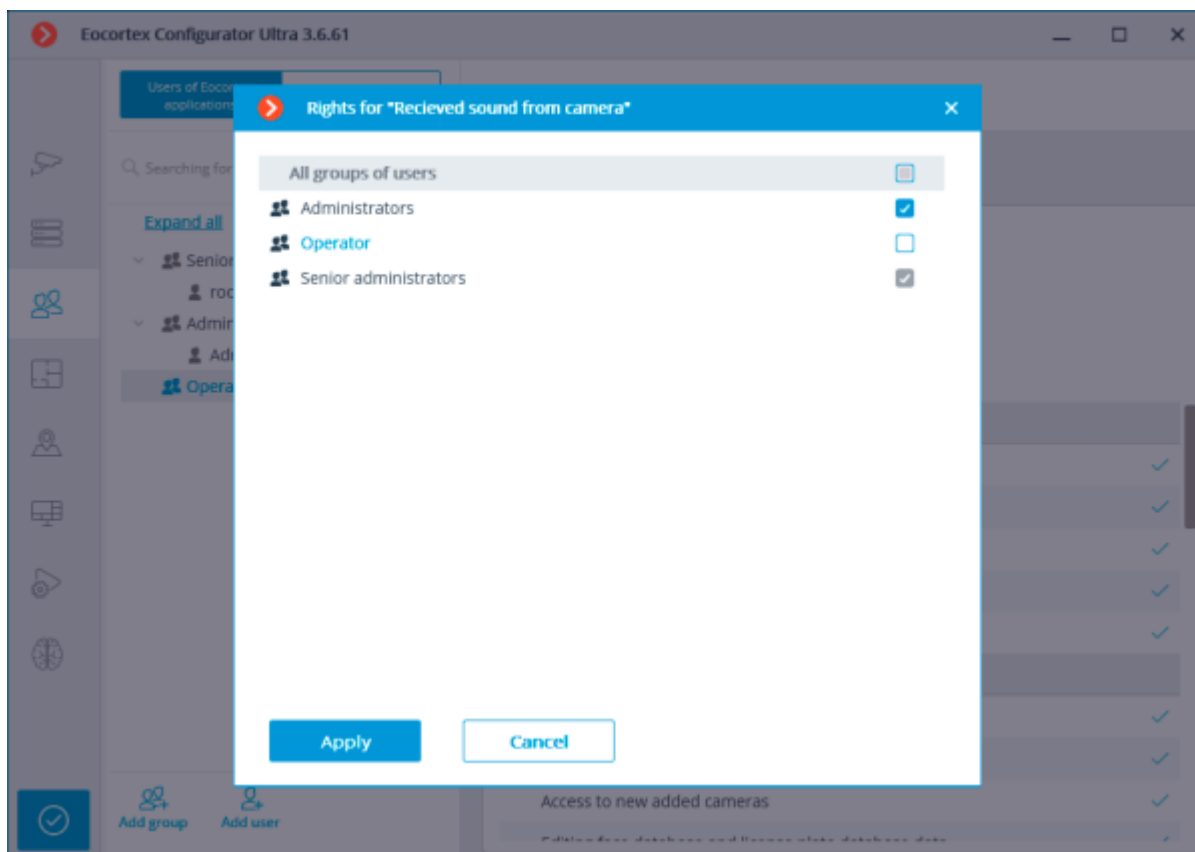
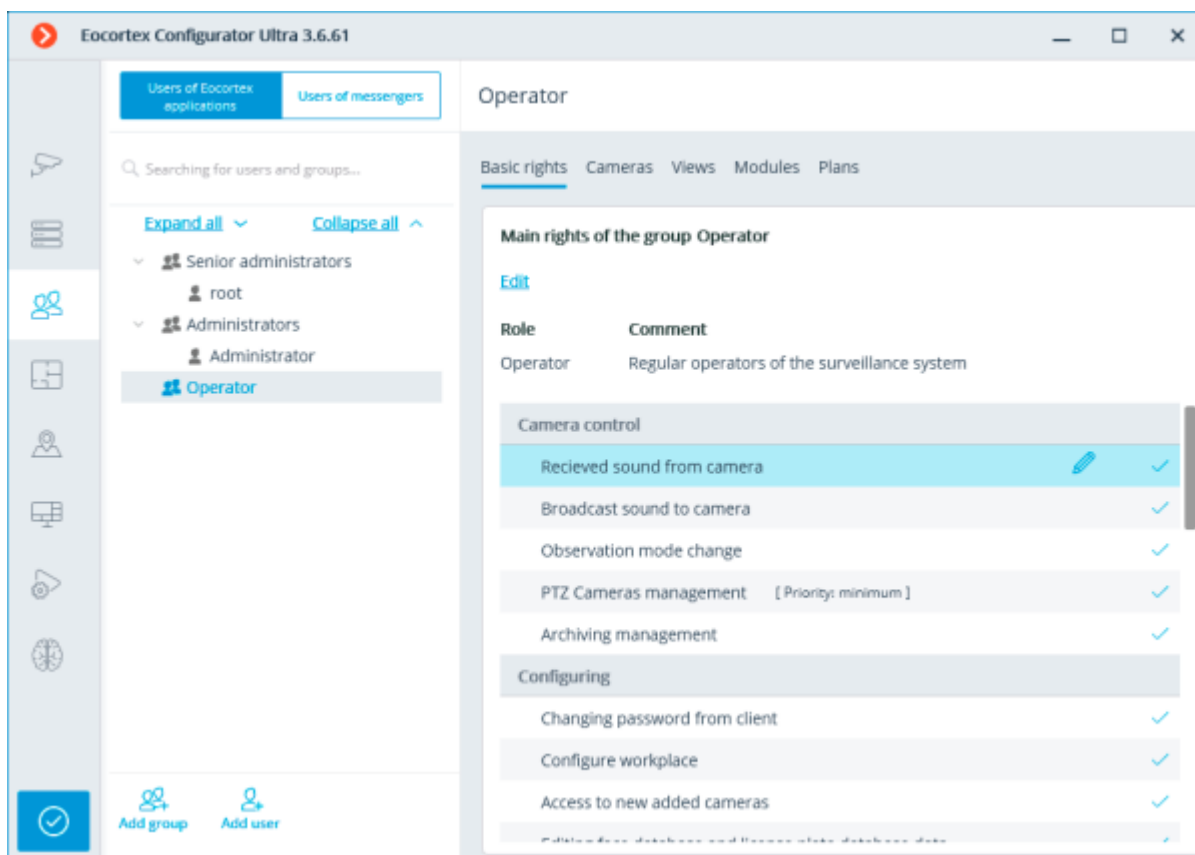
Editing the Operator group

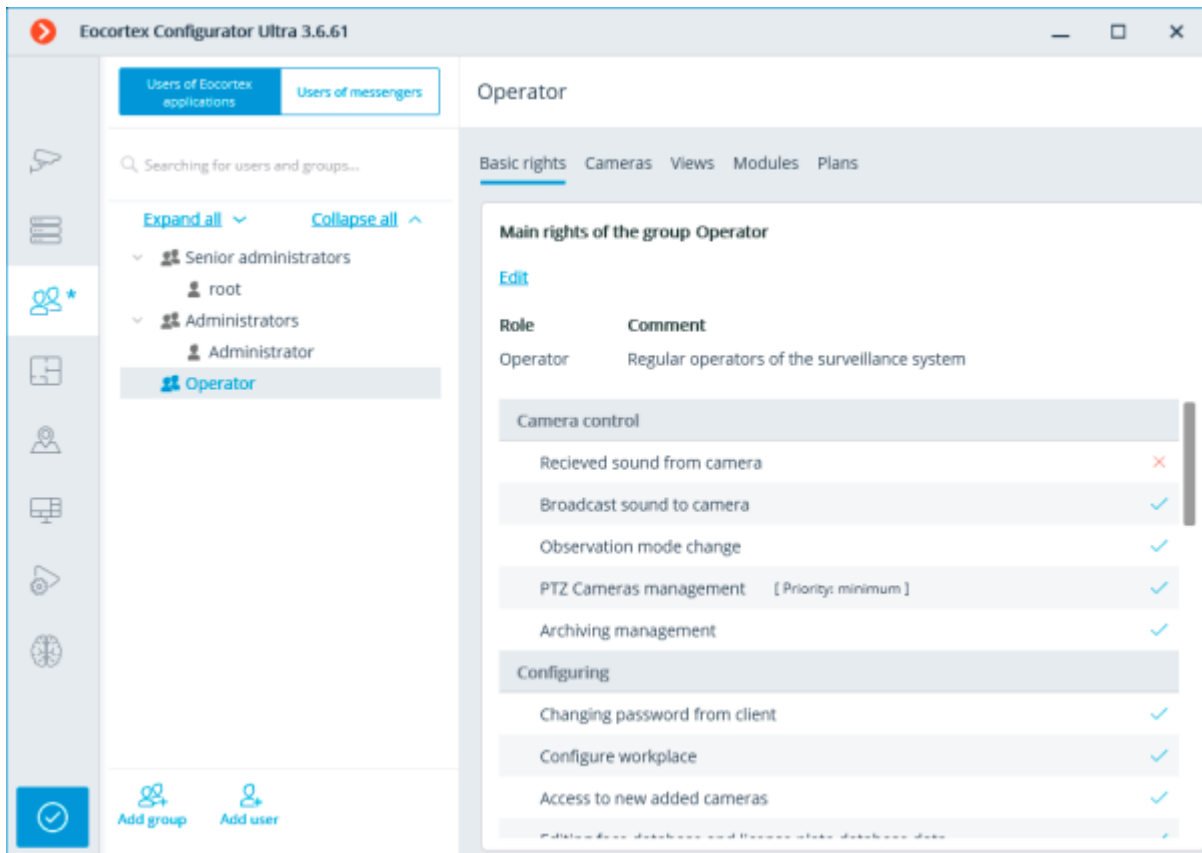
Renaming the group



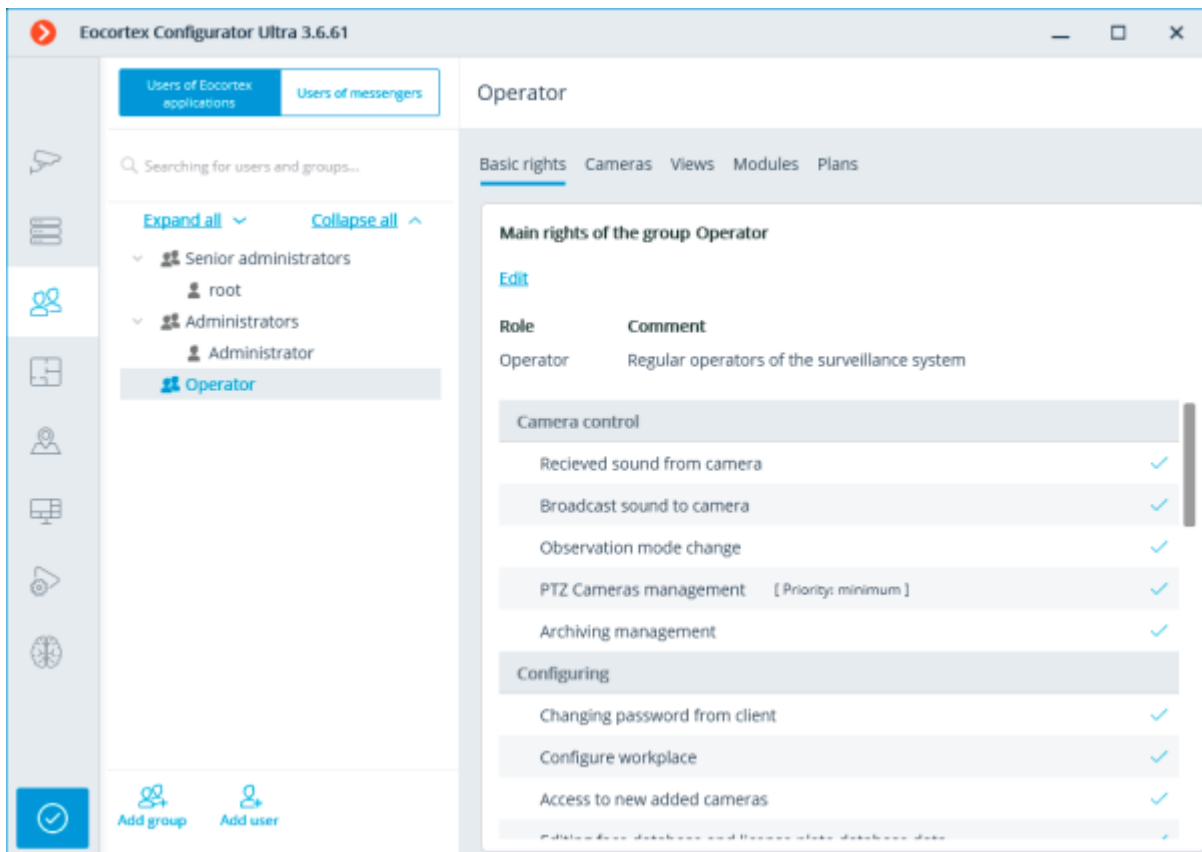


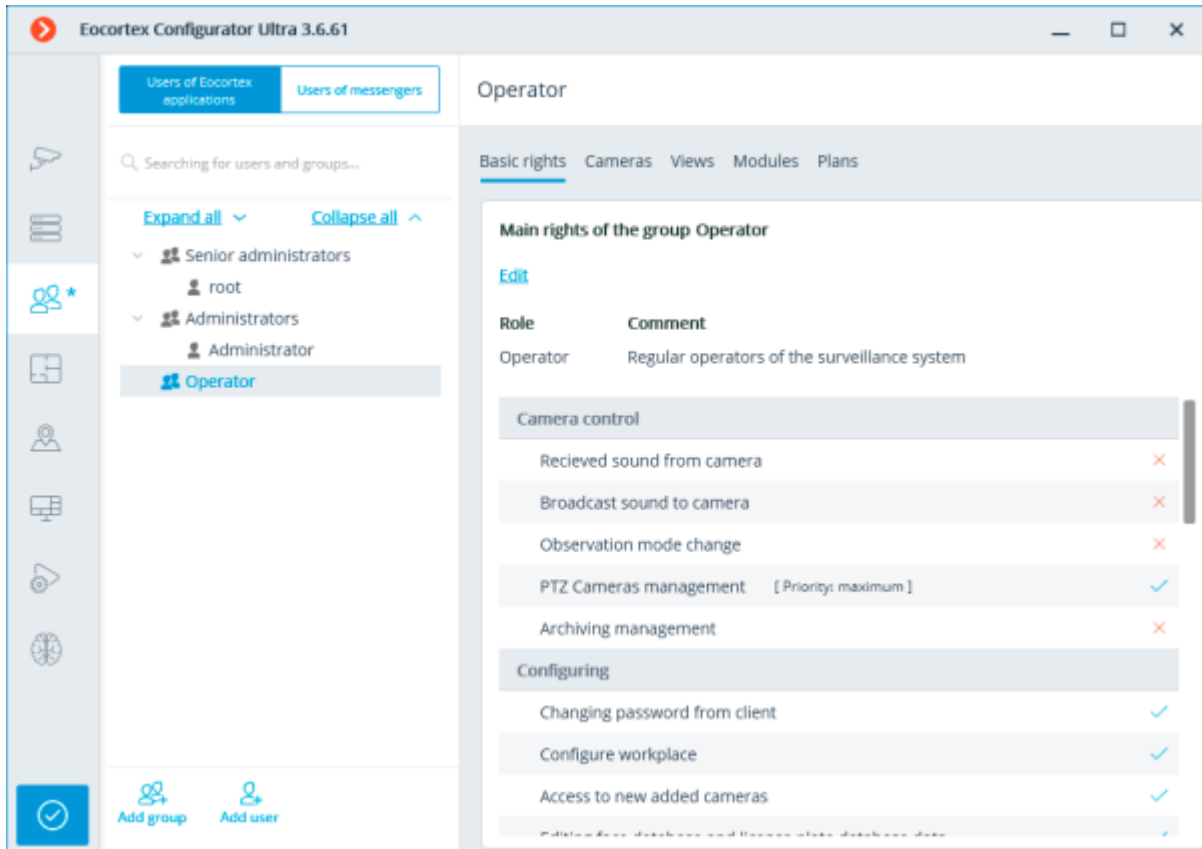
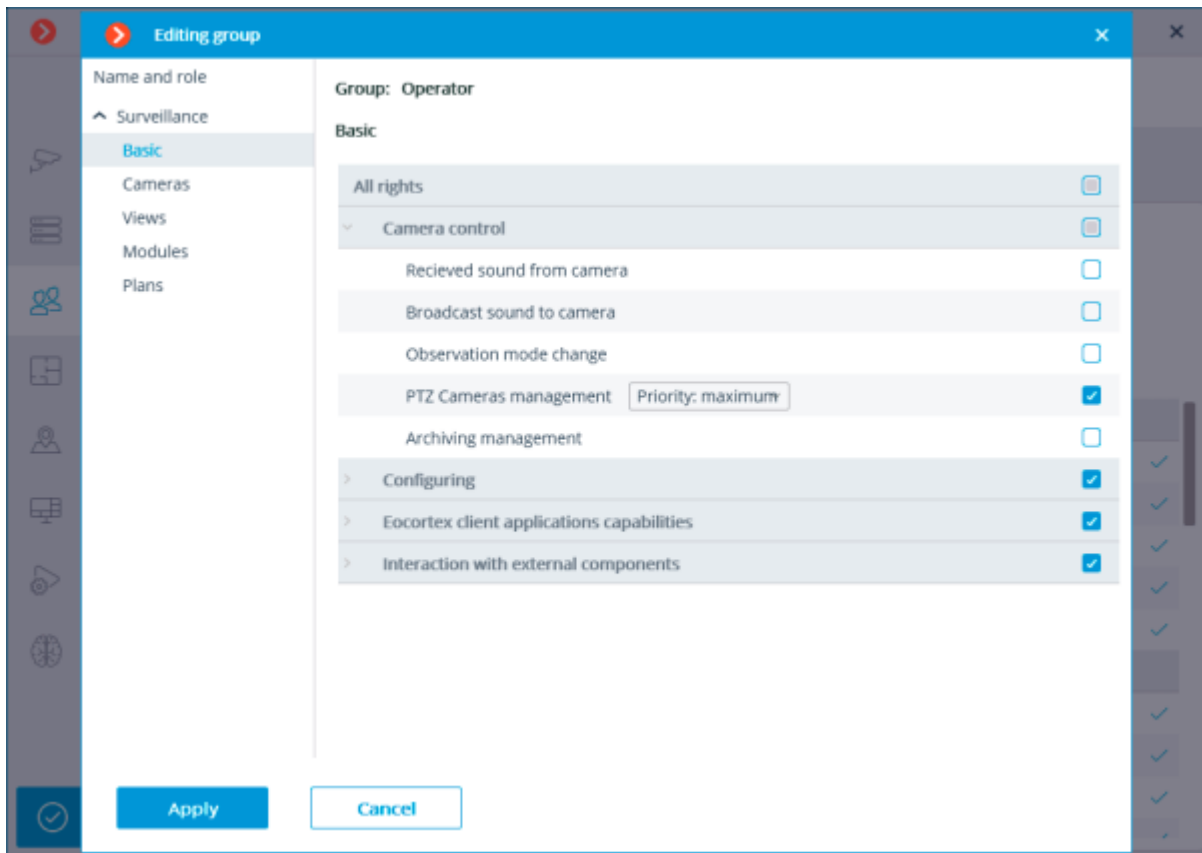
Editing an individual basic right



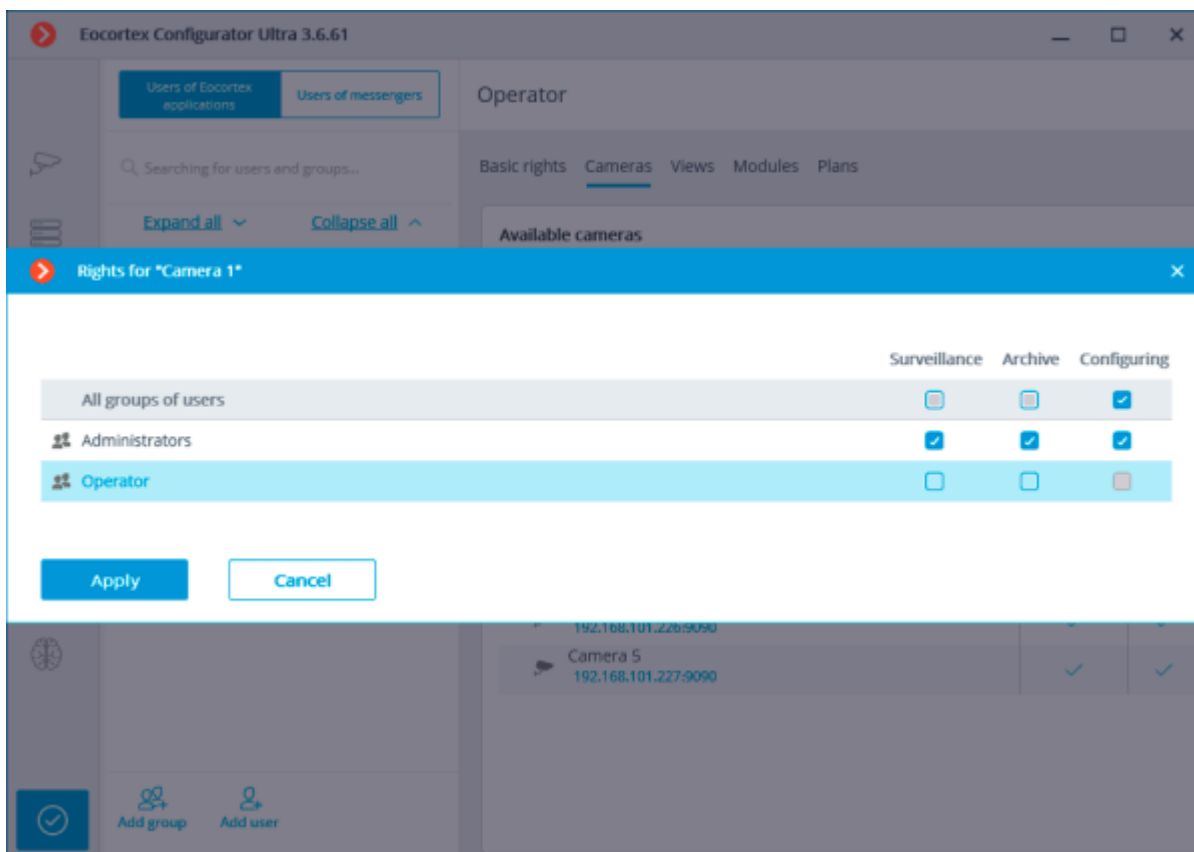
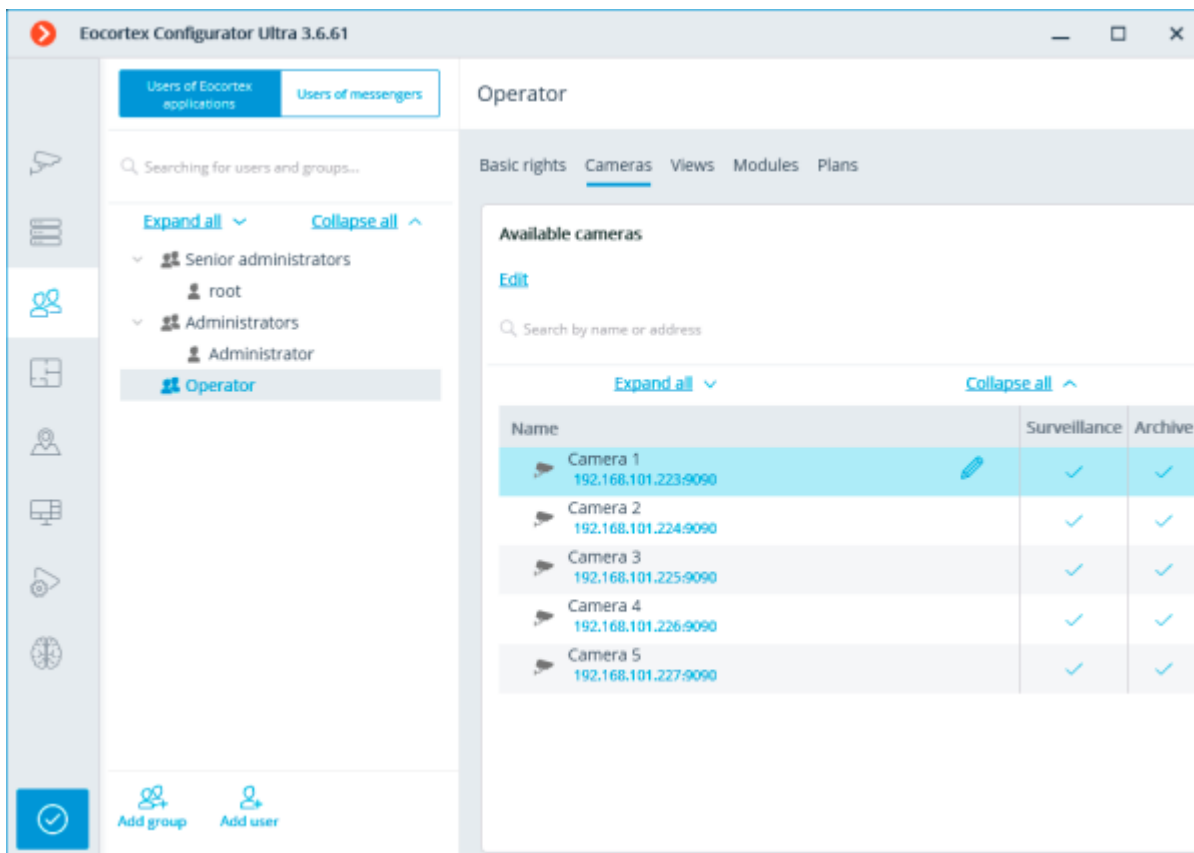


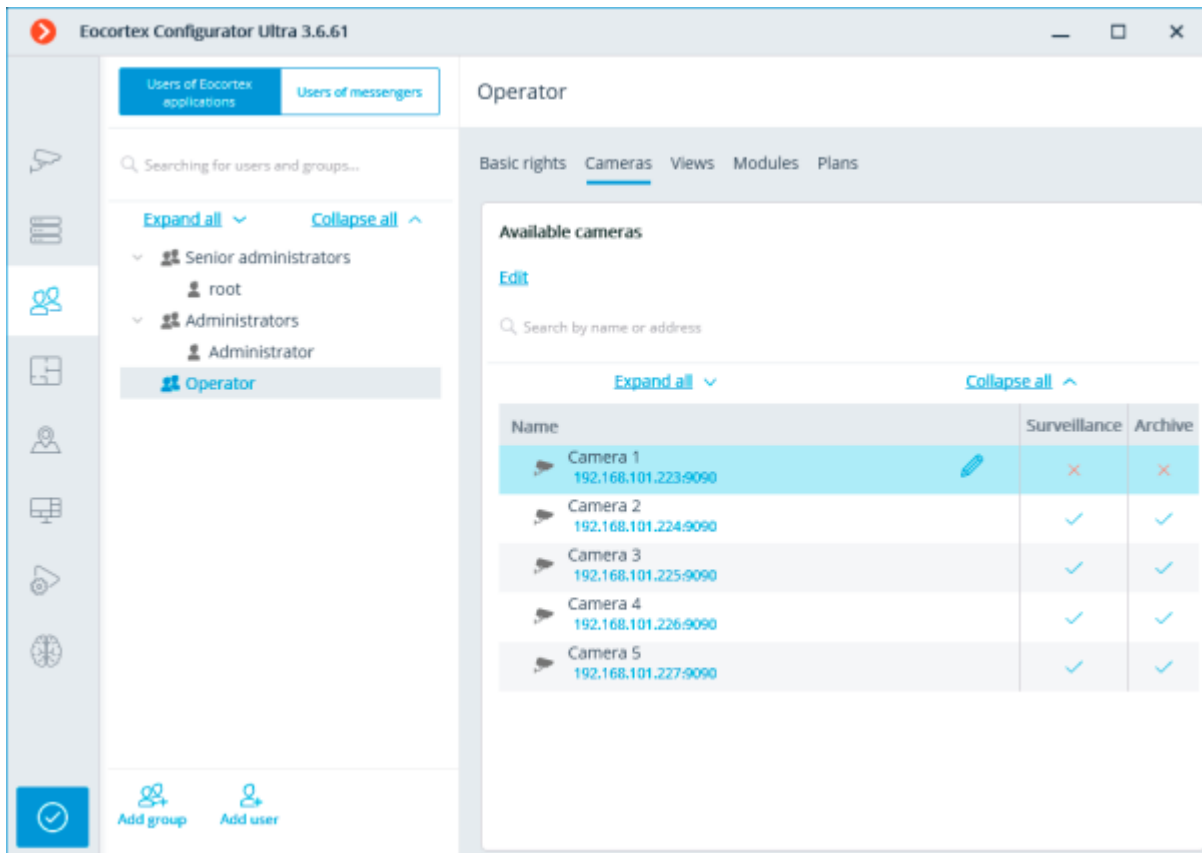
Editing a group of basic rights



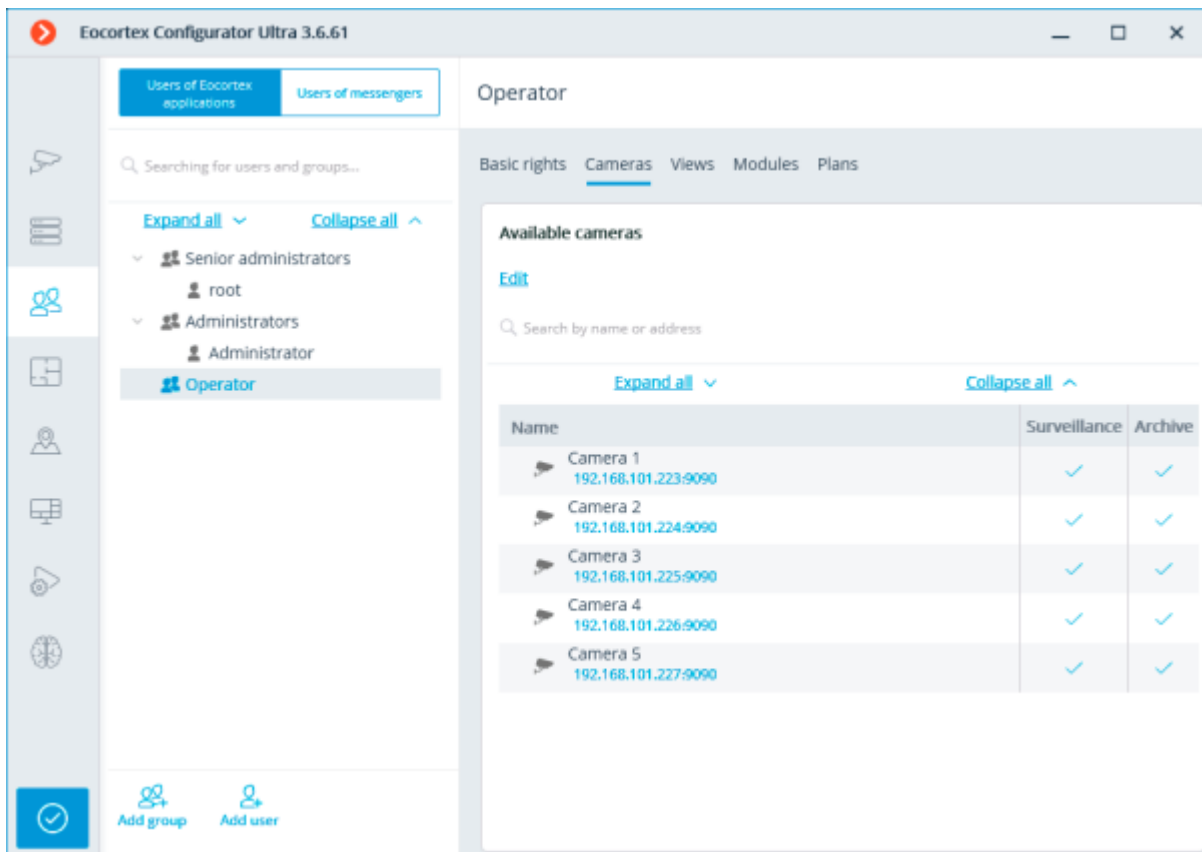


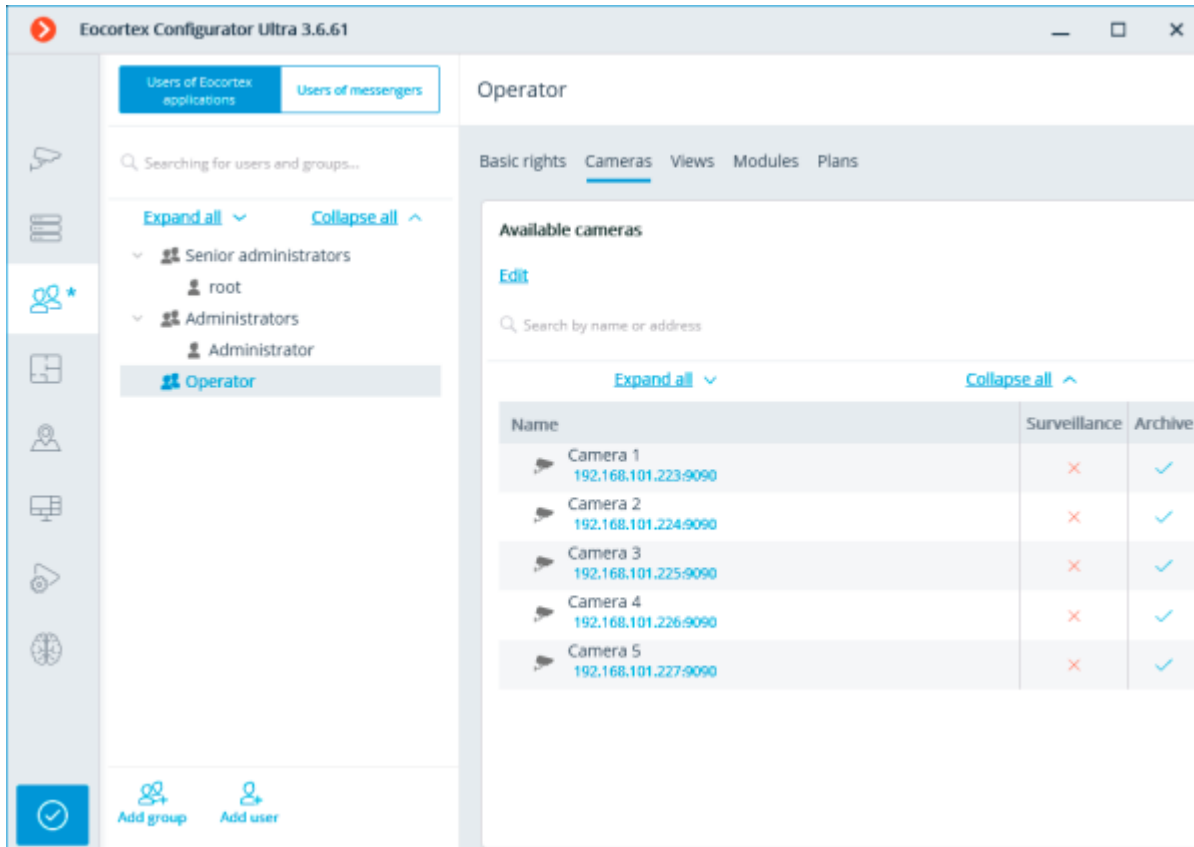
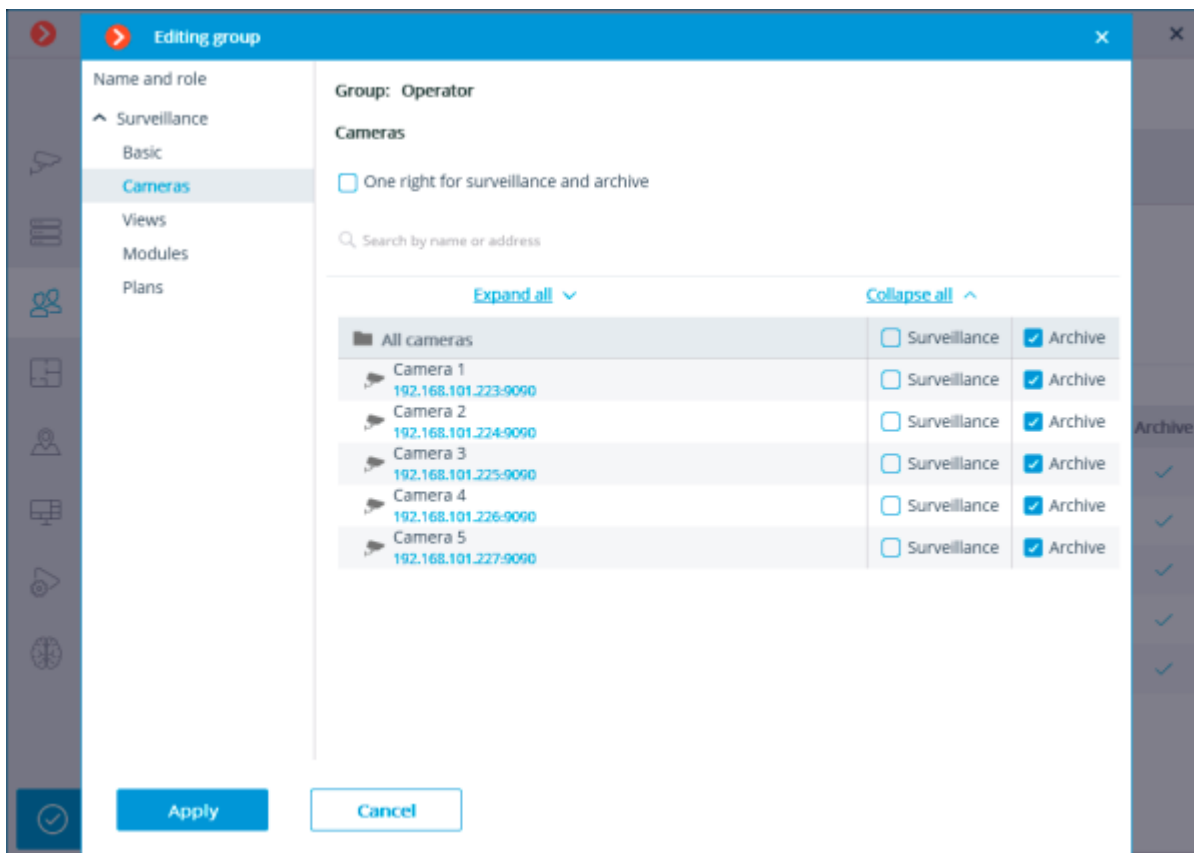
Editing an individual right to view a camera



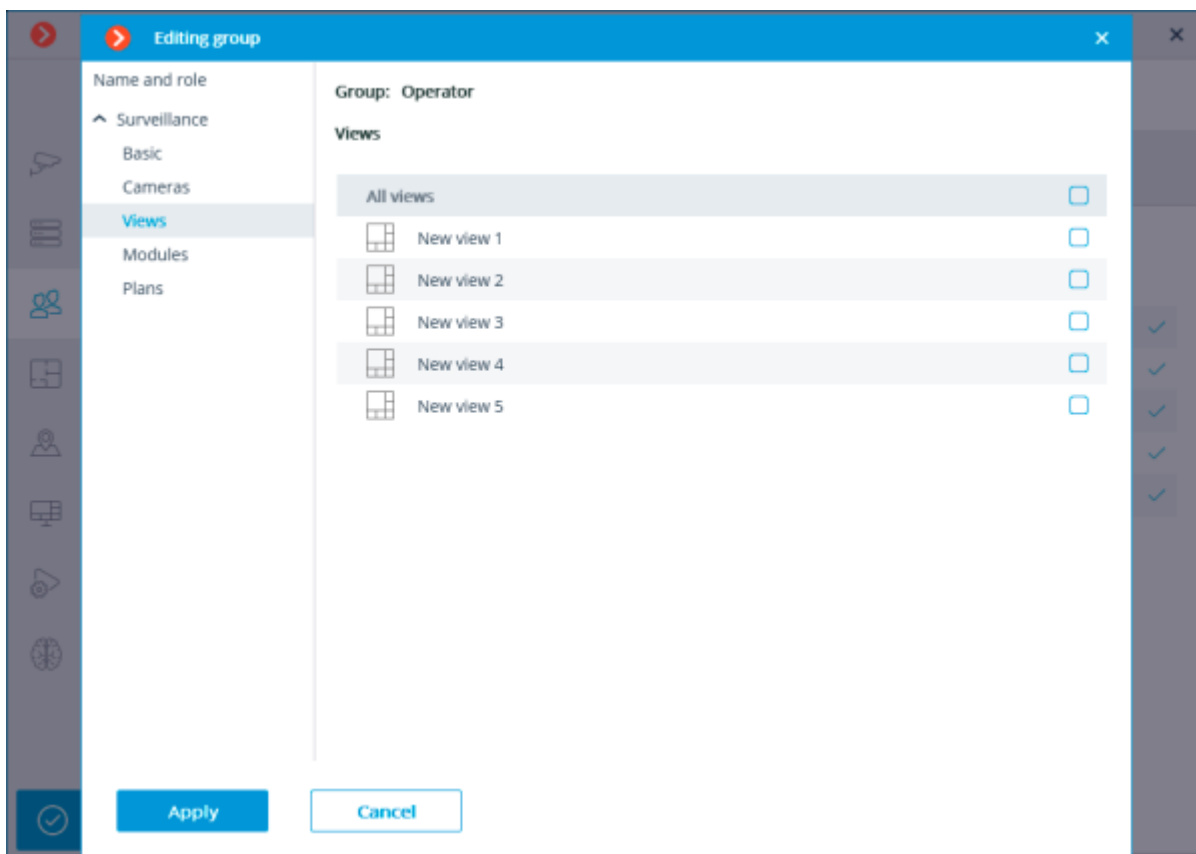
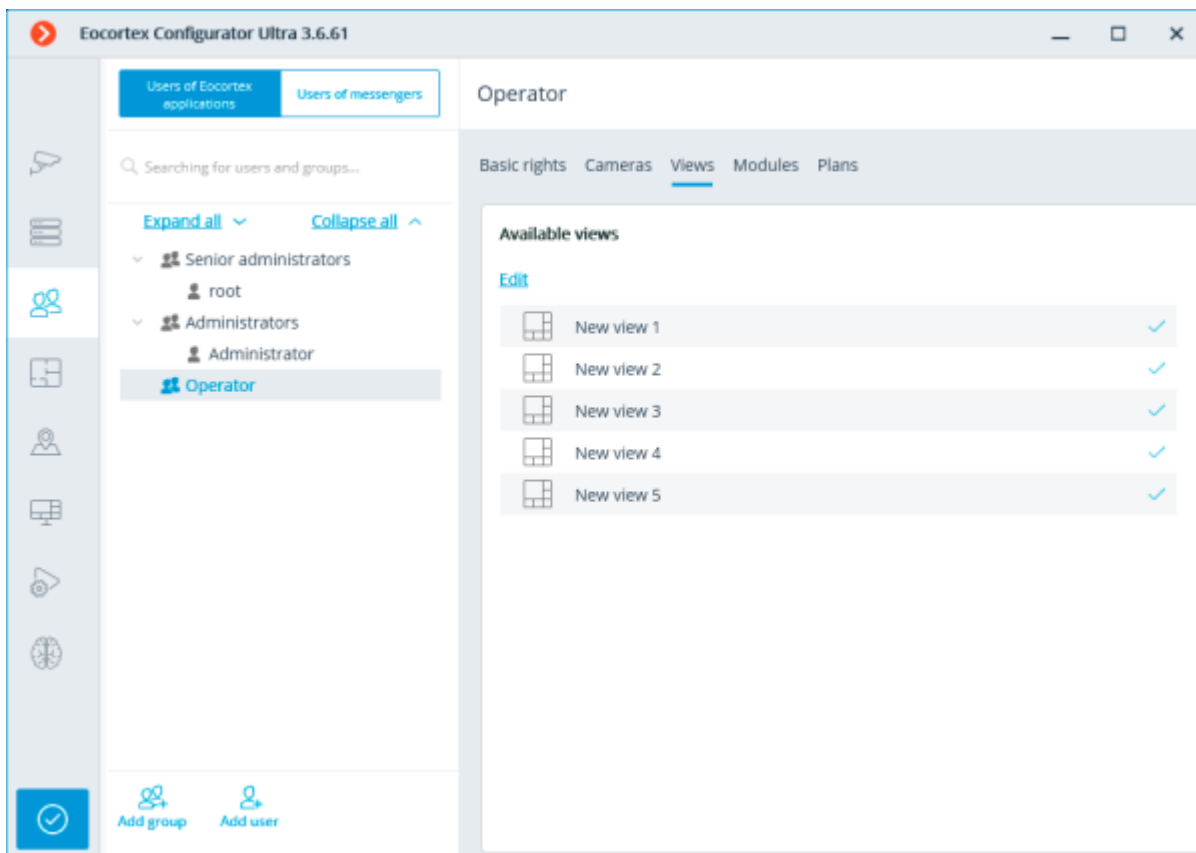


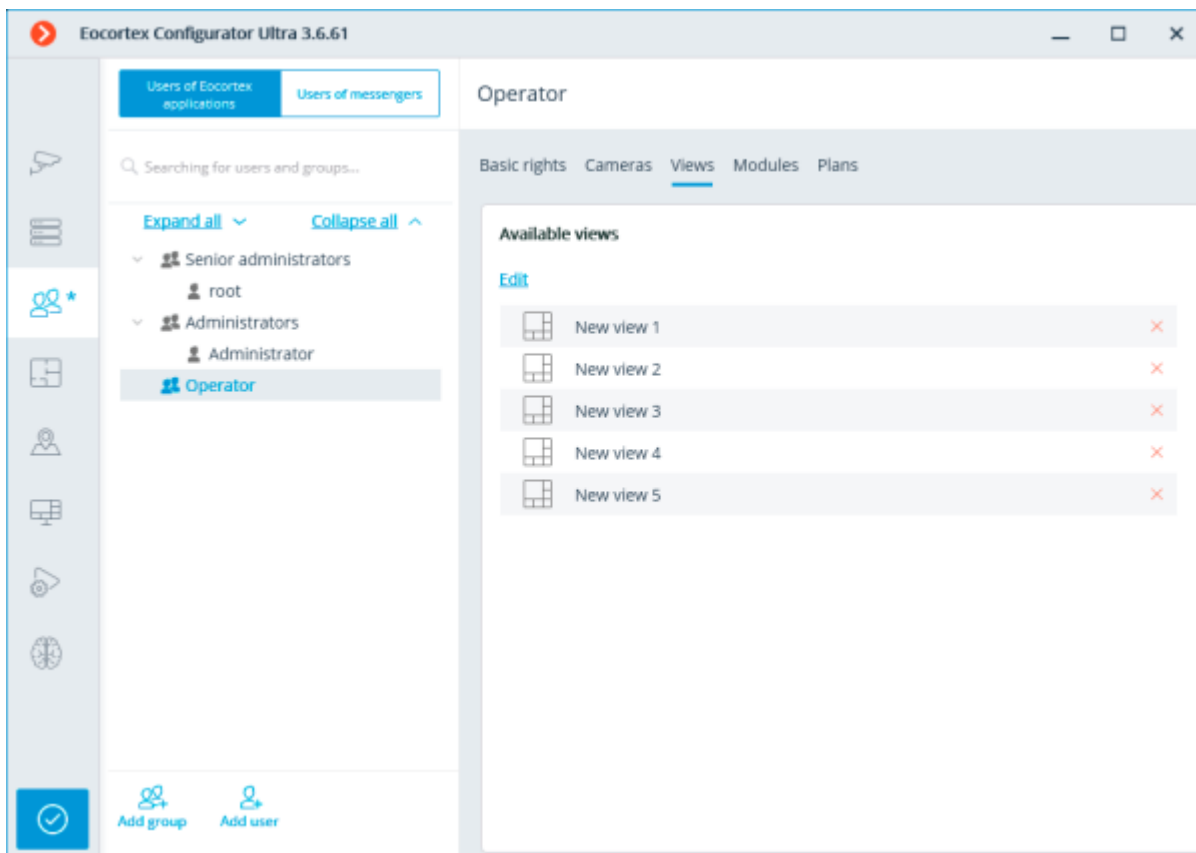
Editing the right to view a group of cameras



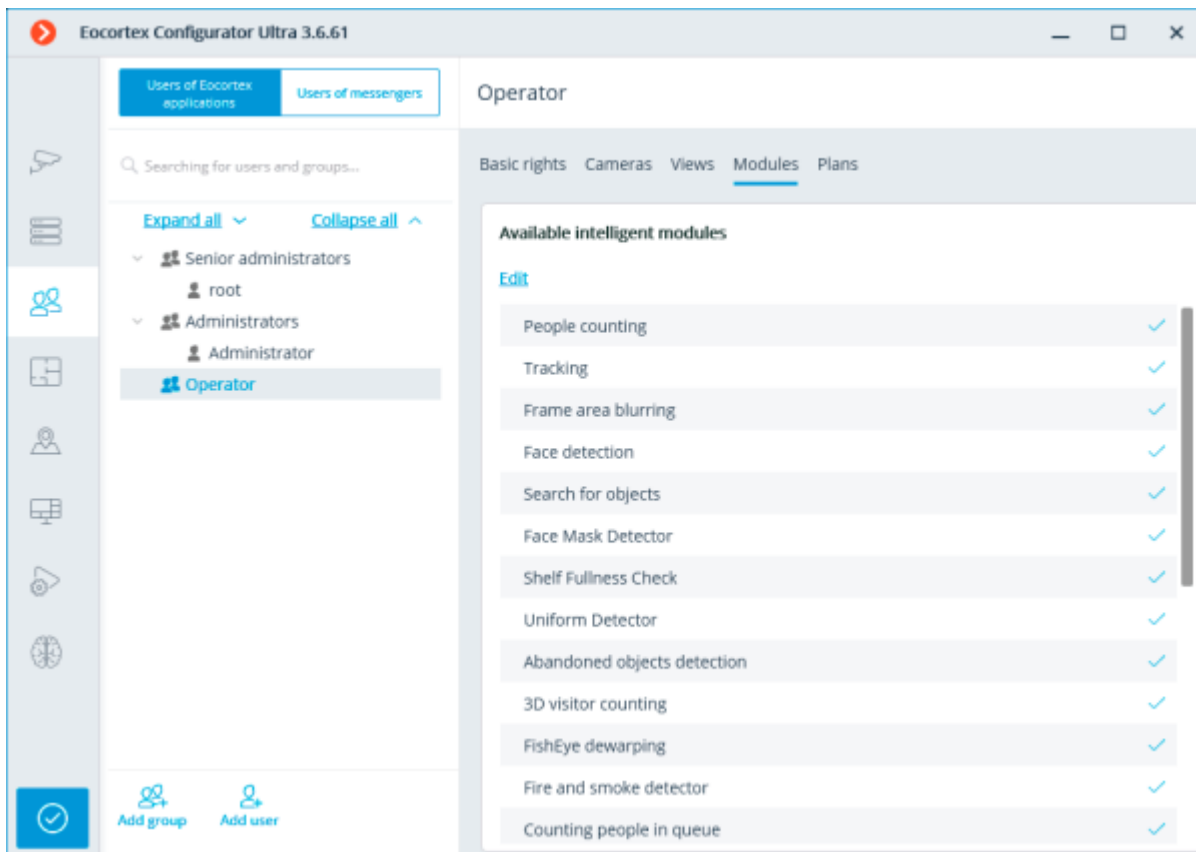


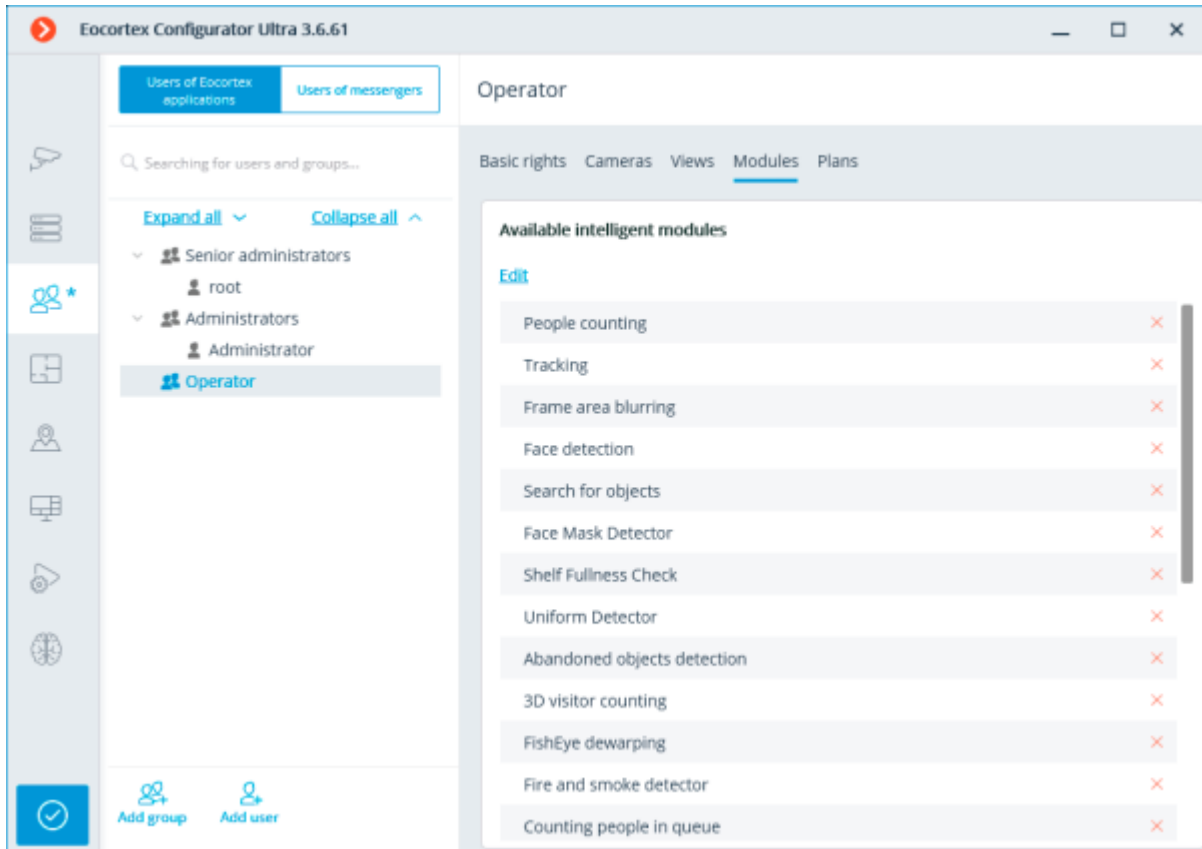
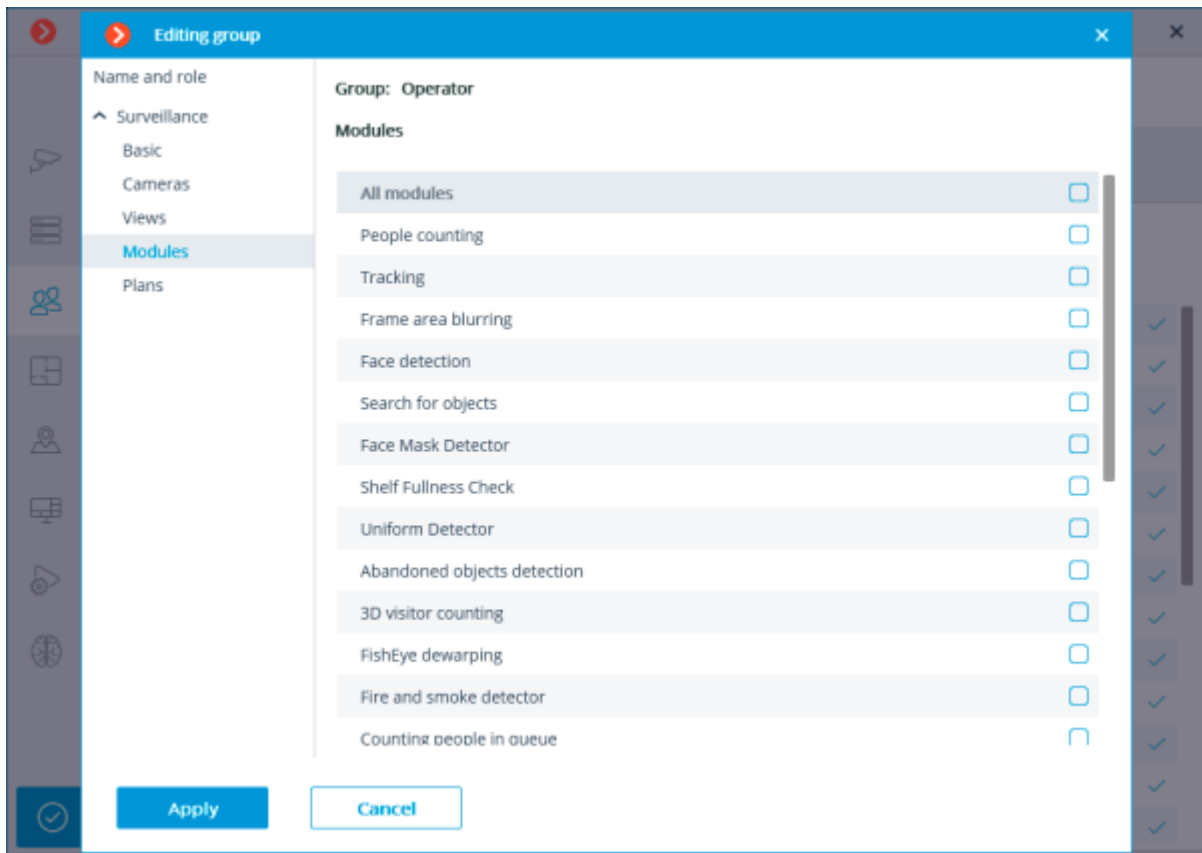
Editing rights to use views



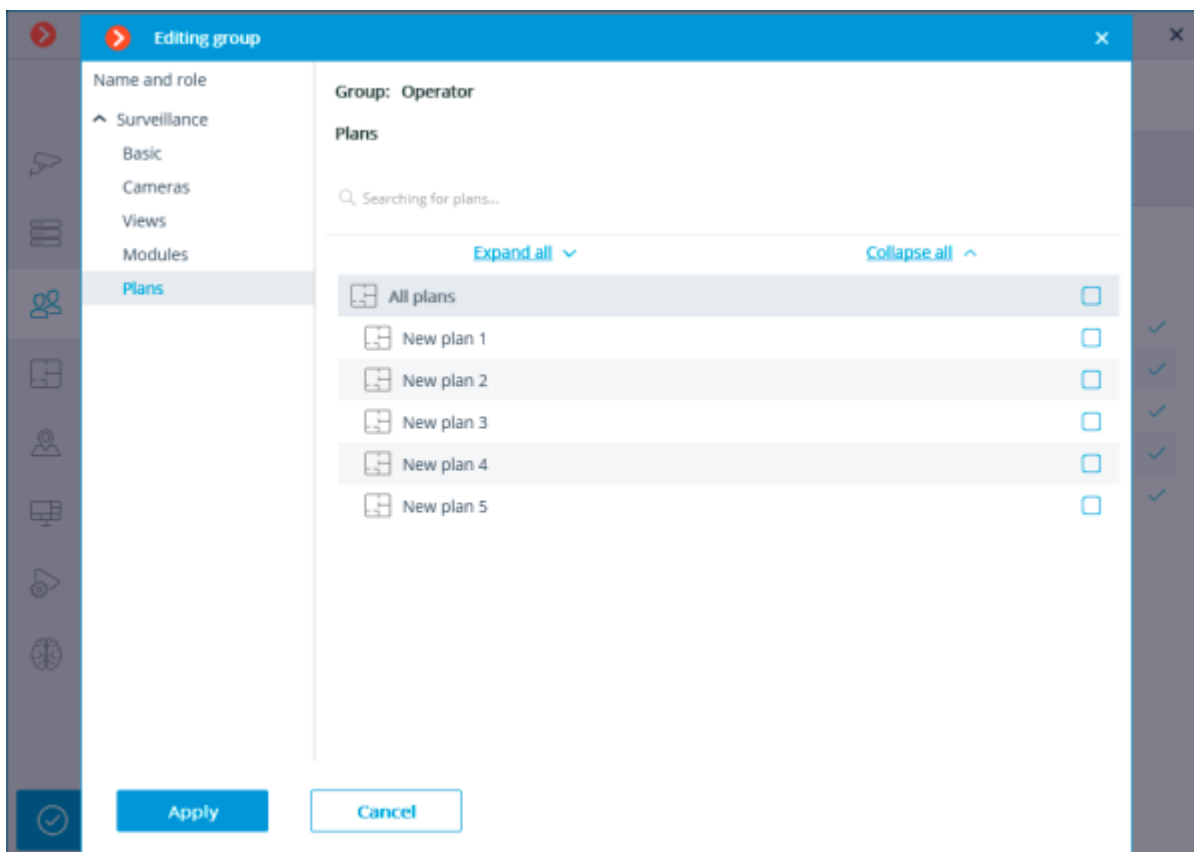
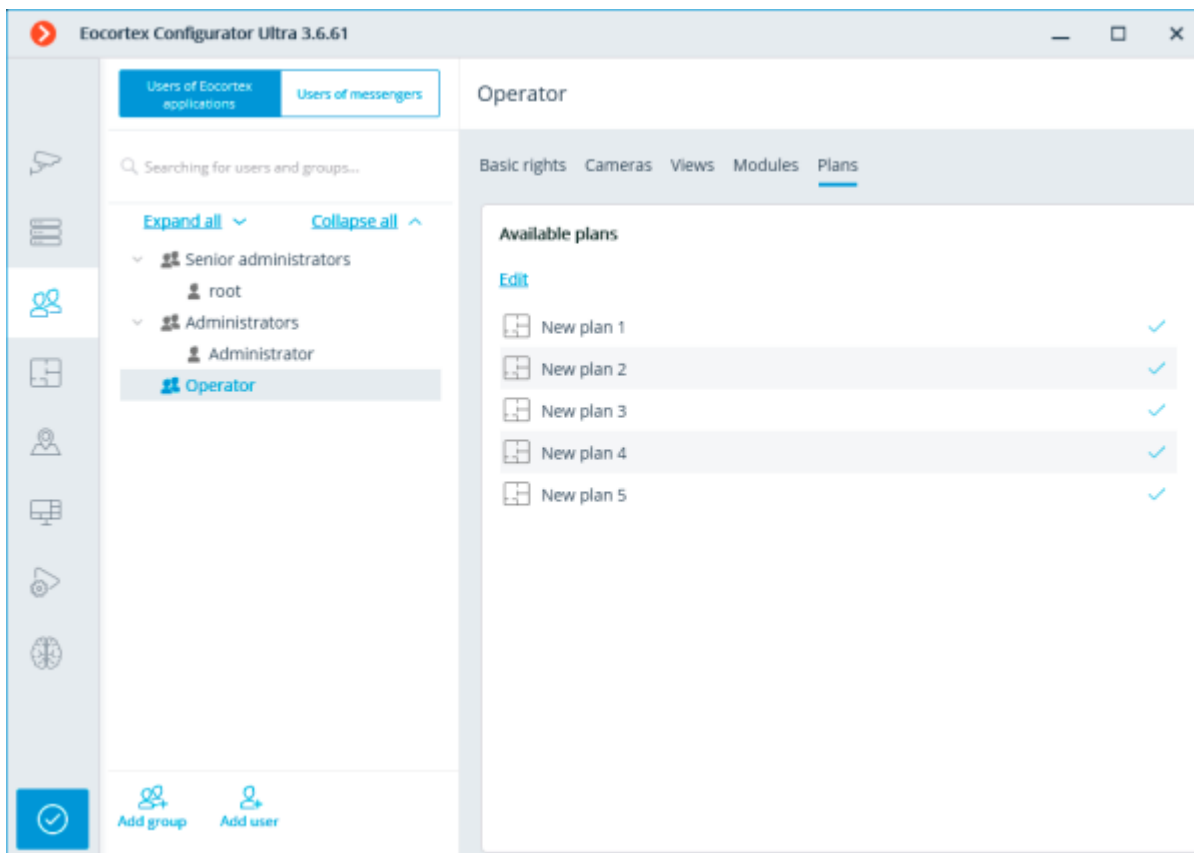


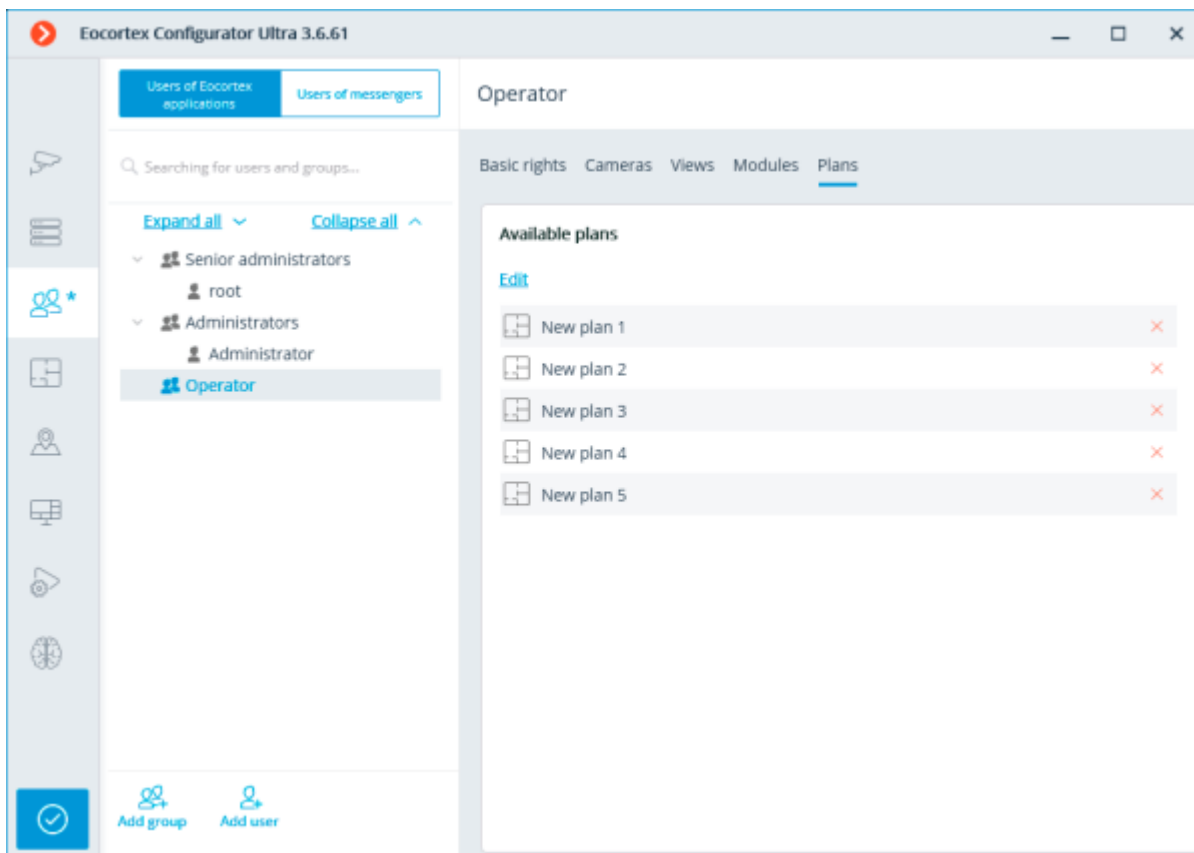
Editing rights to use analytics





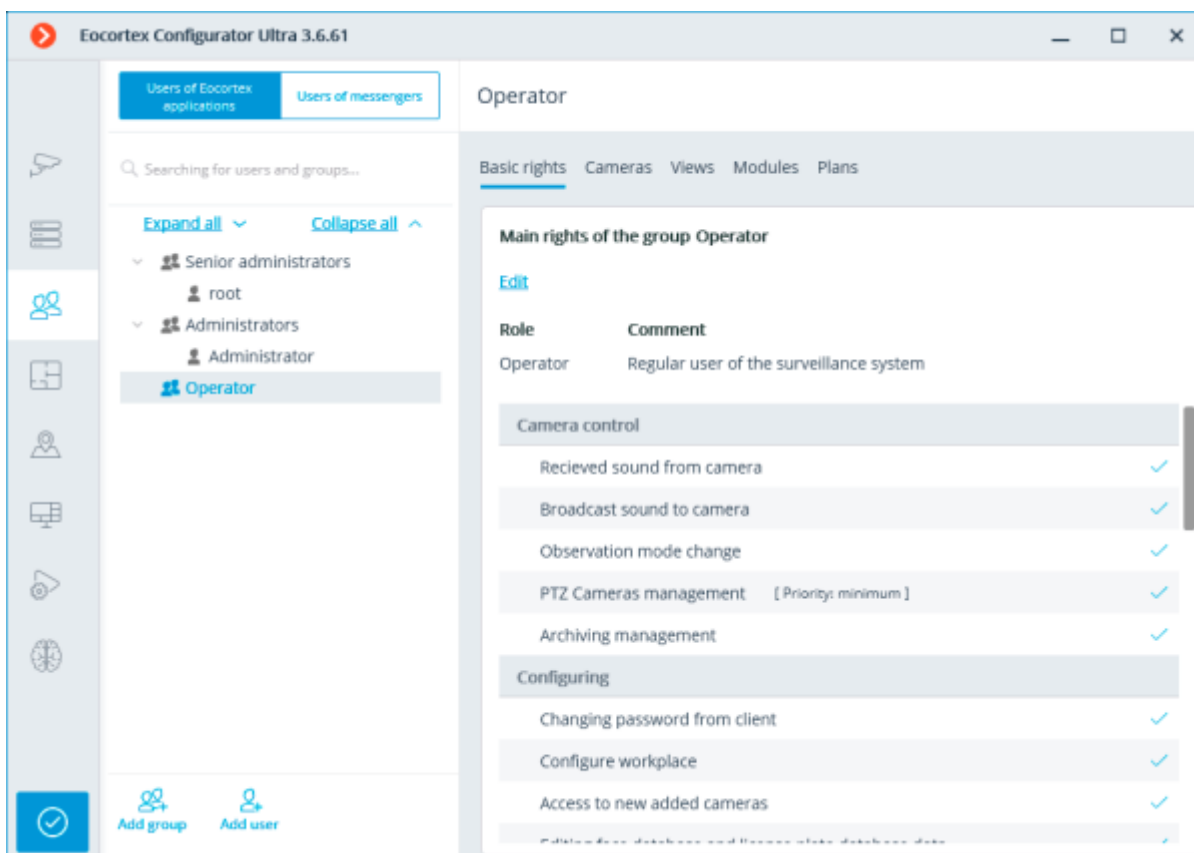
Editing rights to view plans

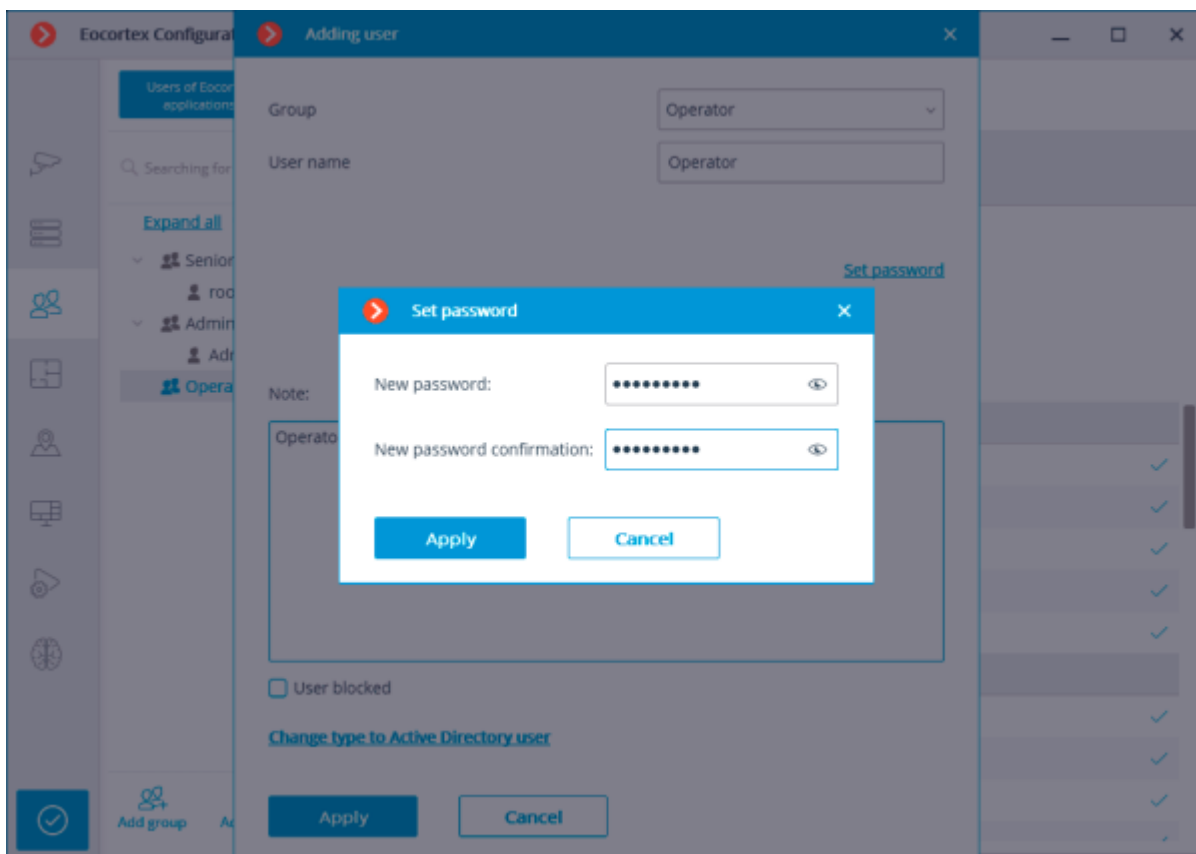
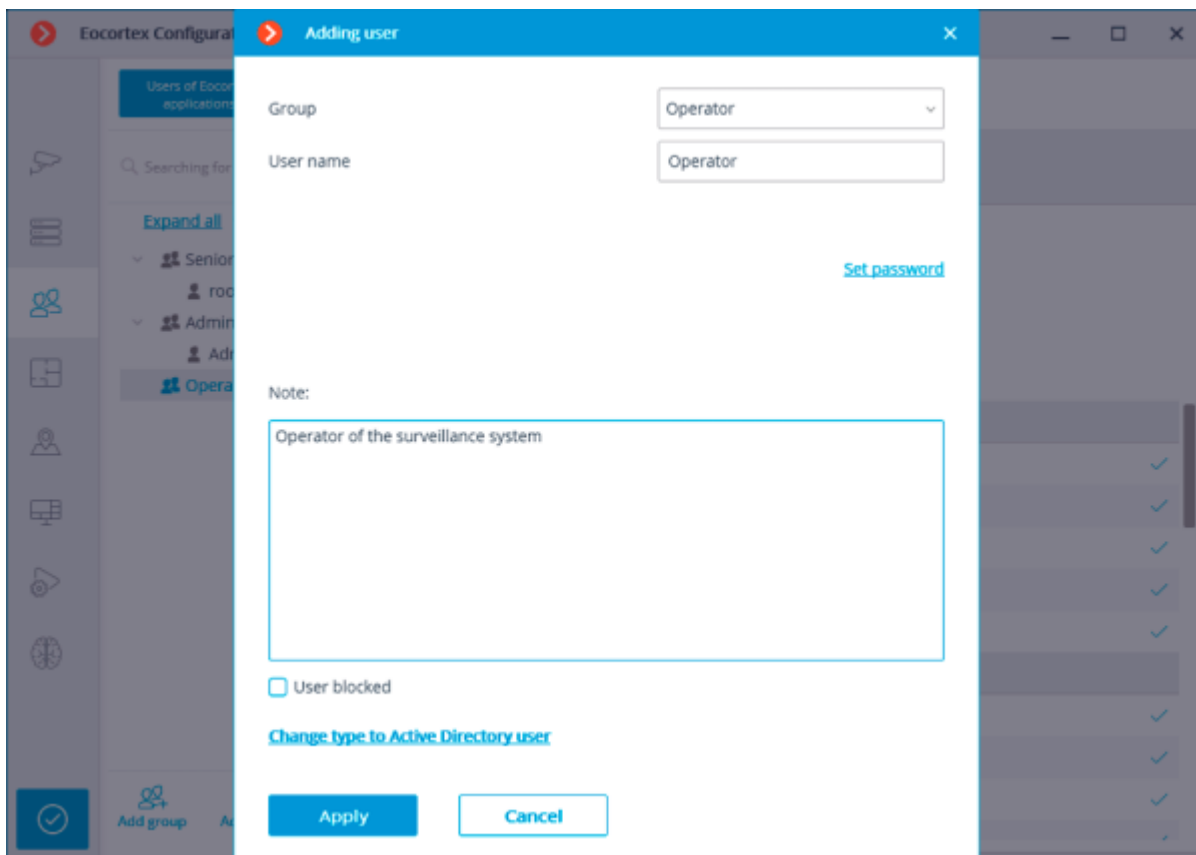


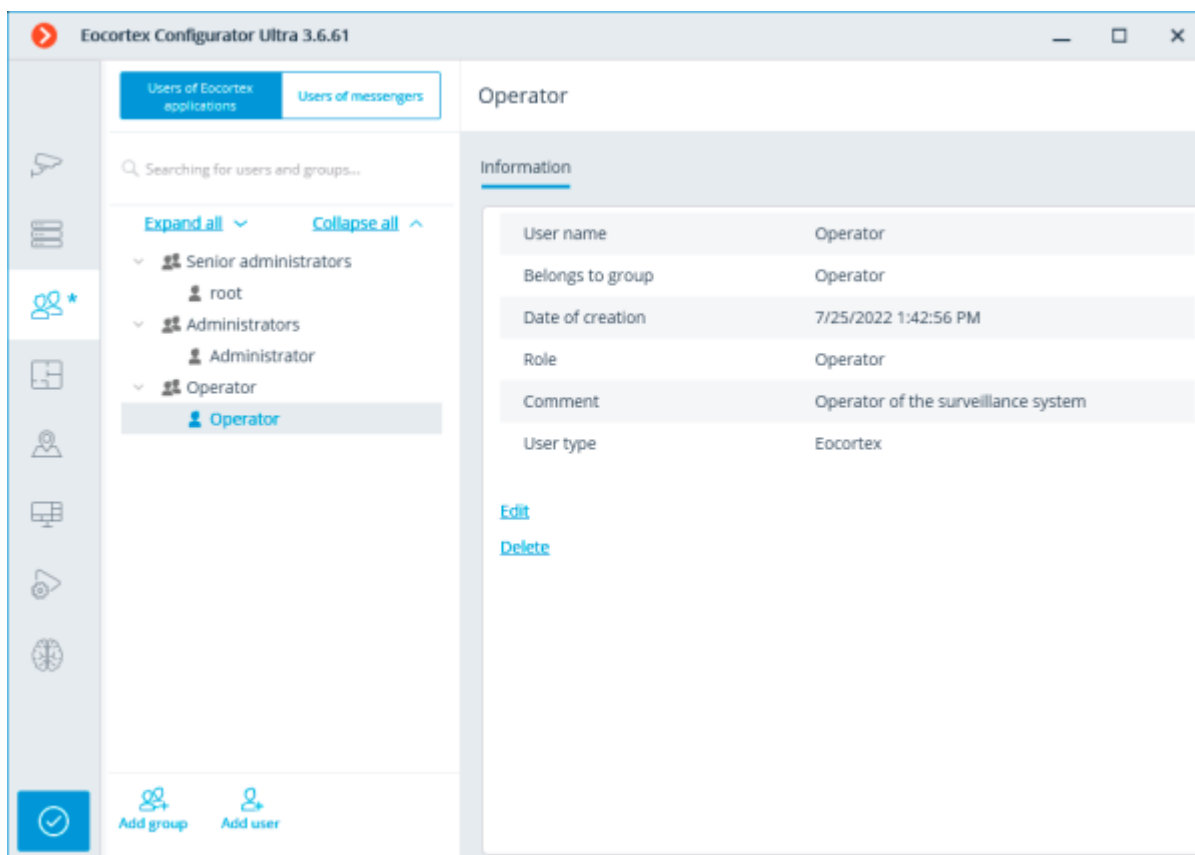


Adding and editing the Operator user

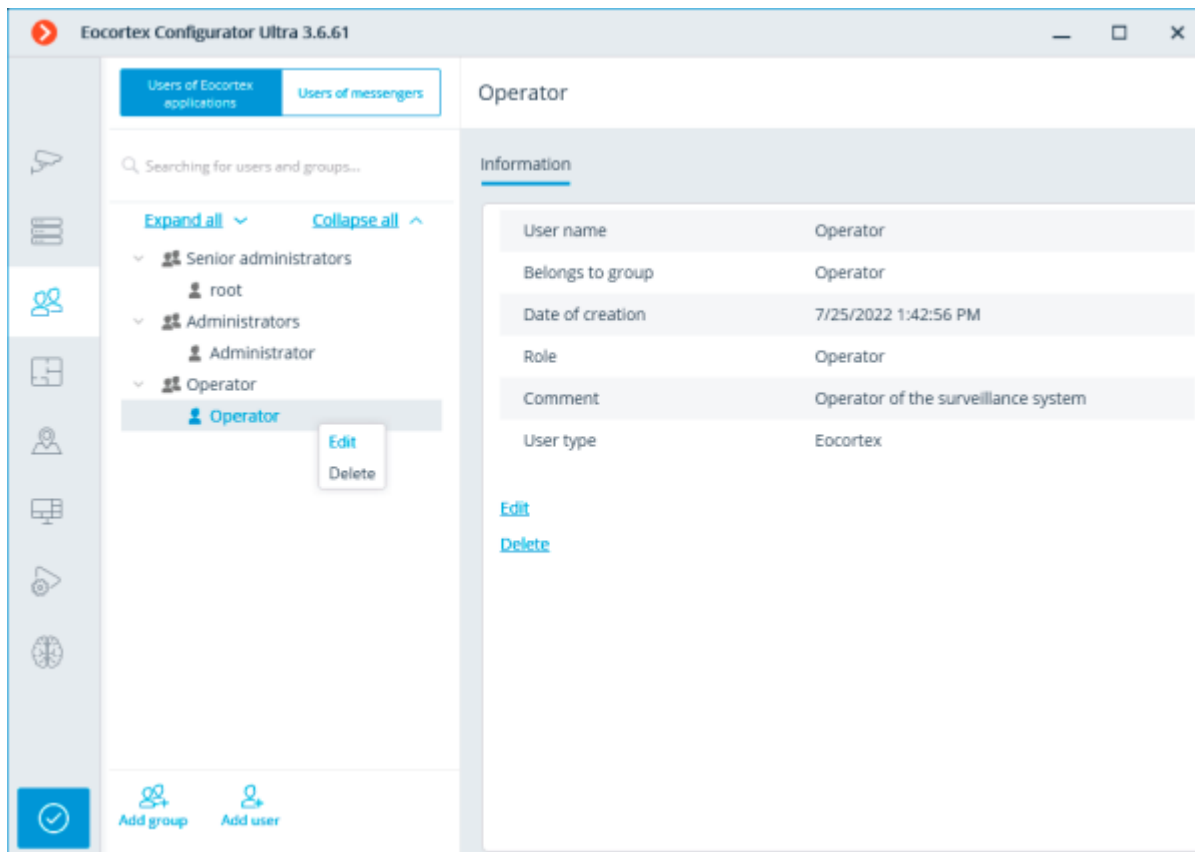
Adding the user

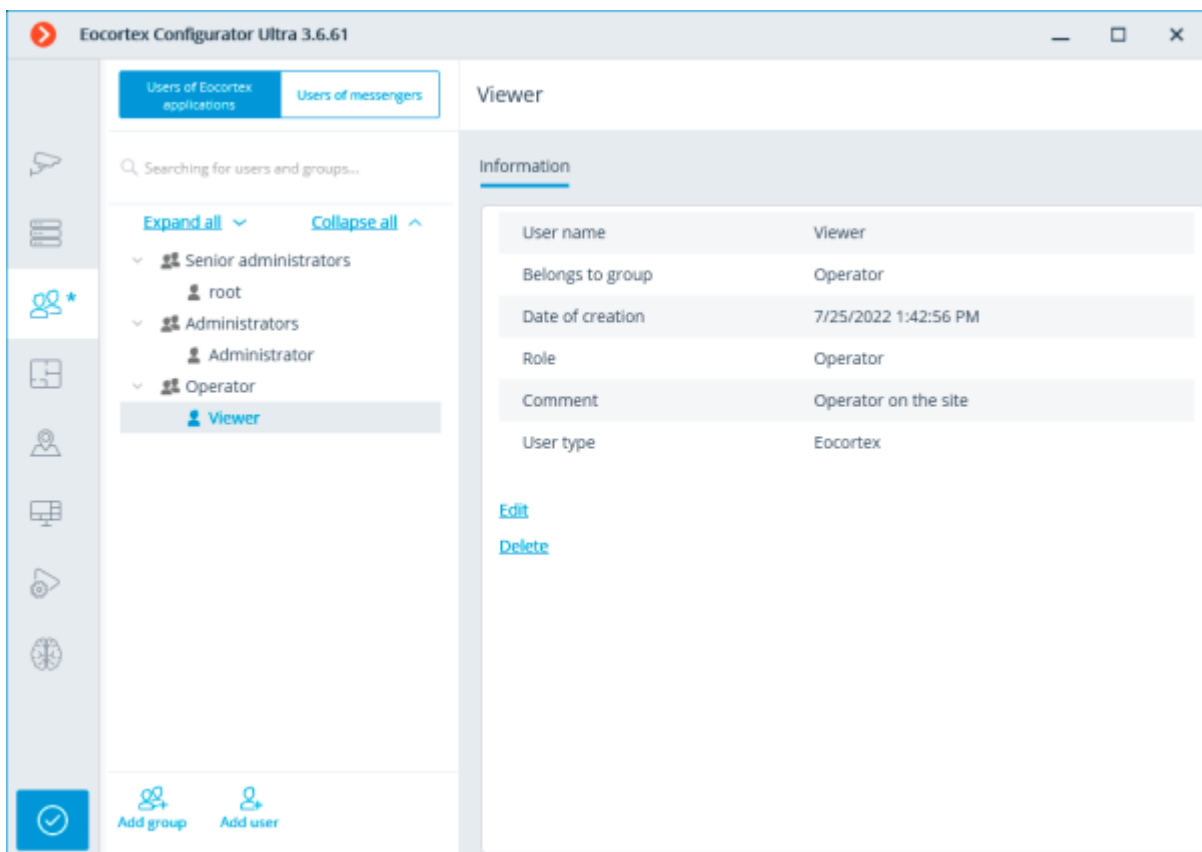
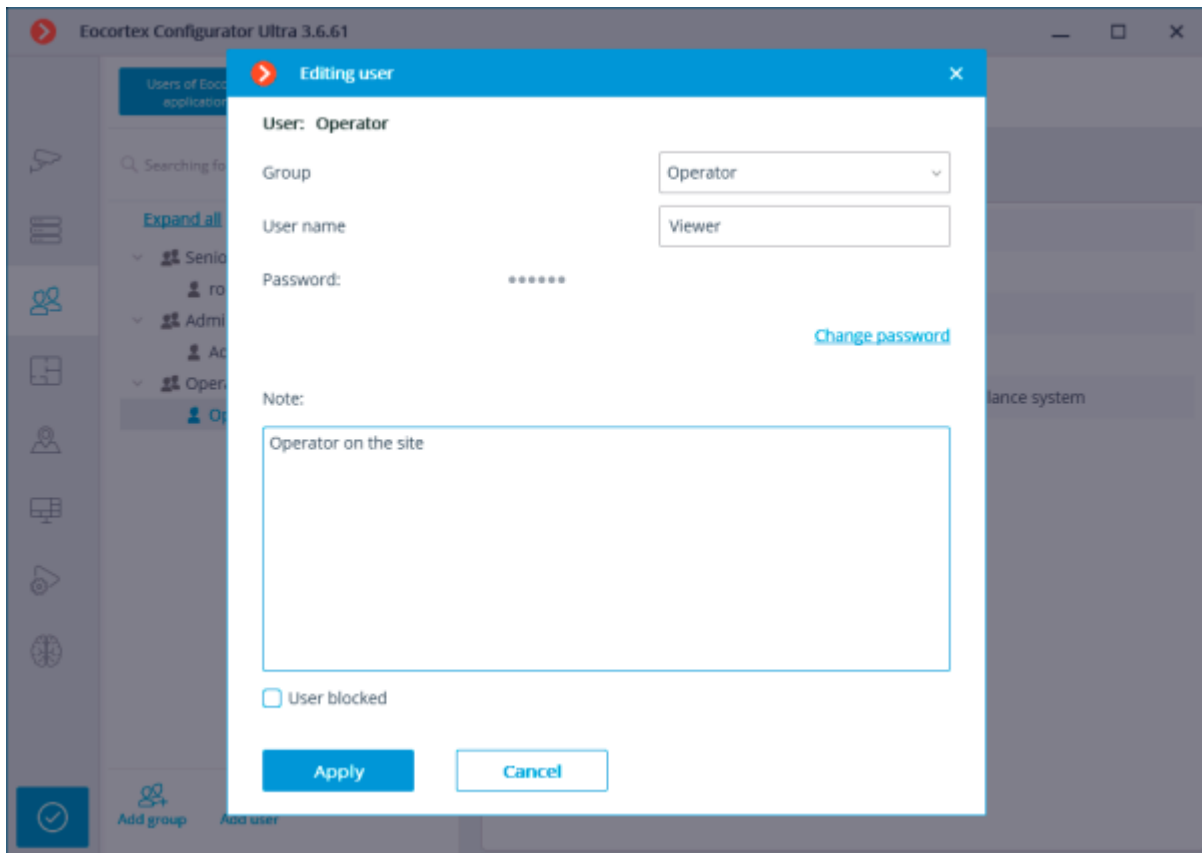






Editing the user

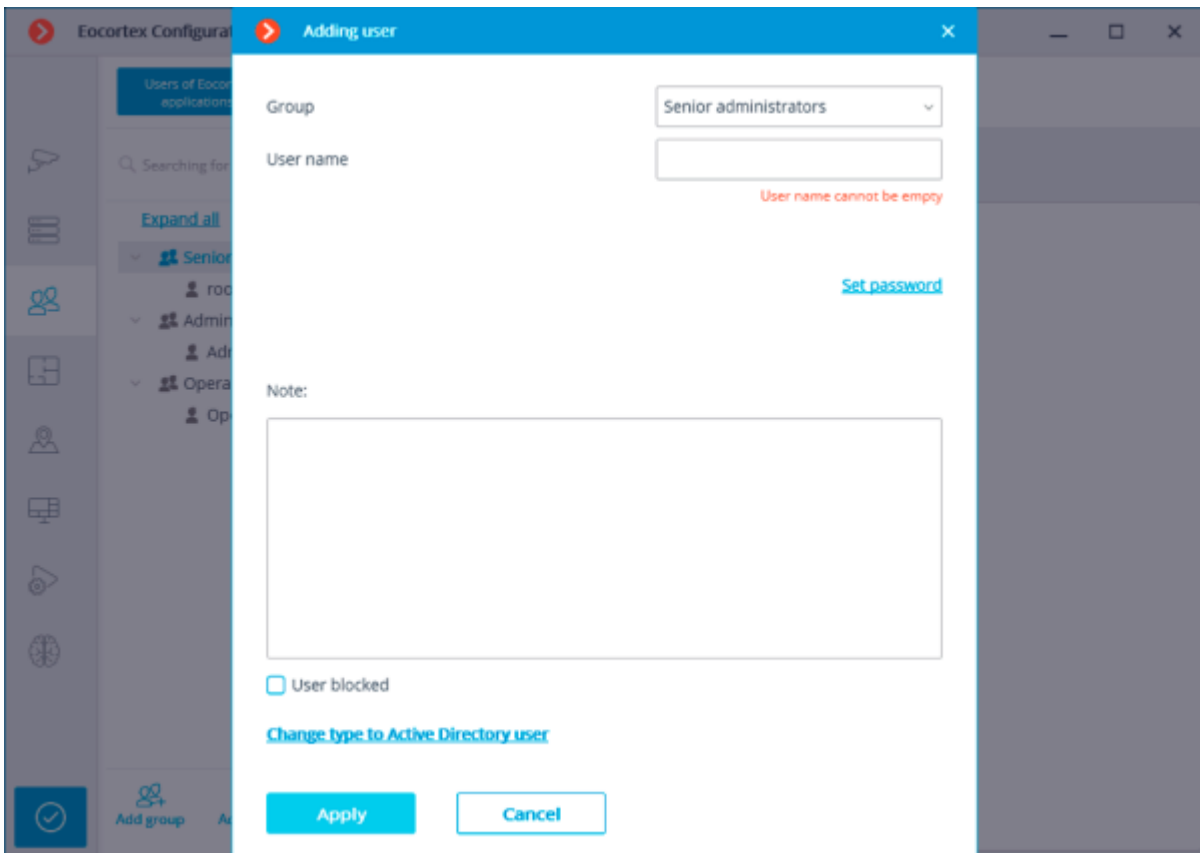




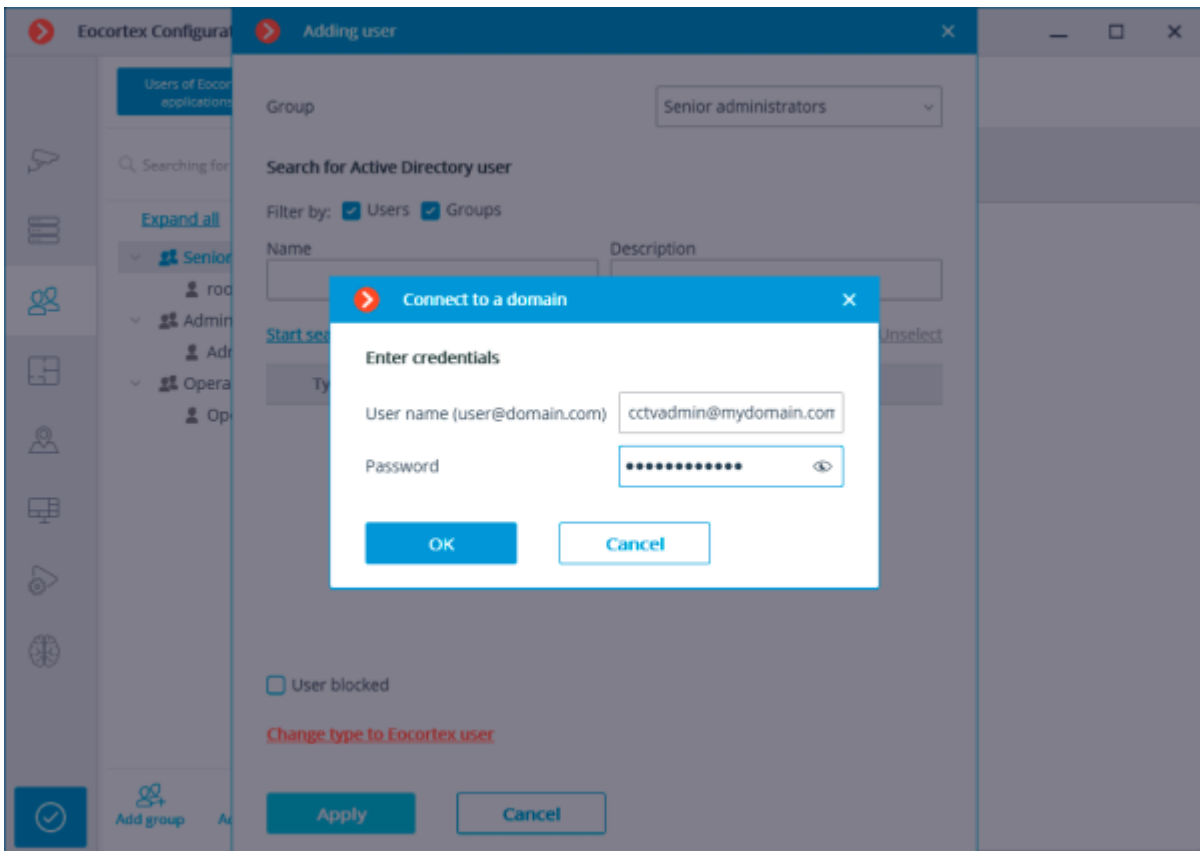
Operator

Adding Active Directory user

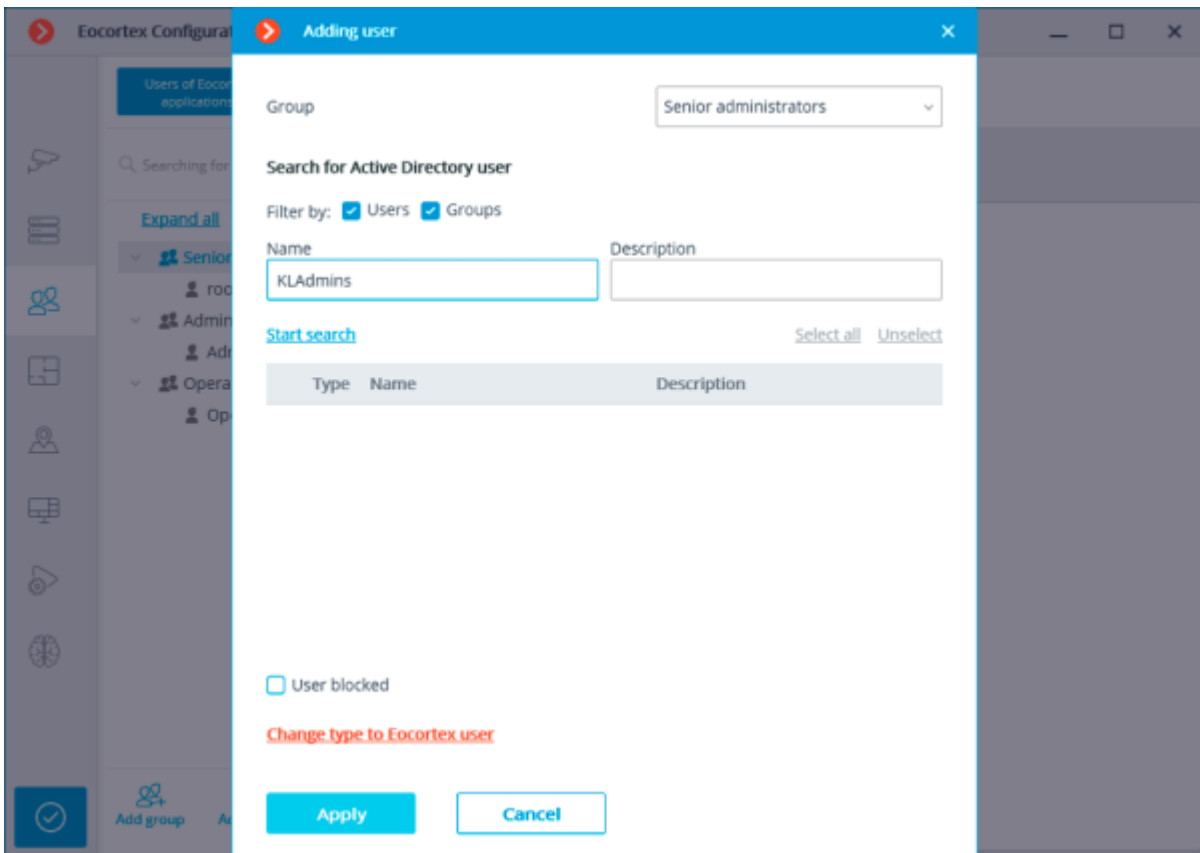
To add **Active Directory** group or user, press **Change type to Active Directory user** link.



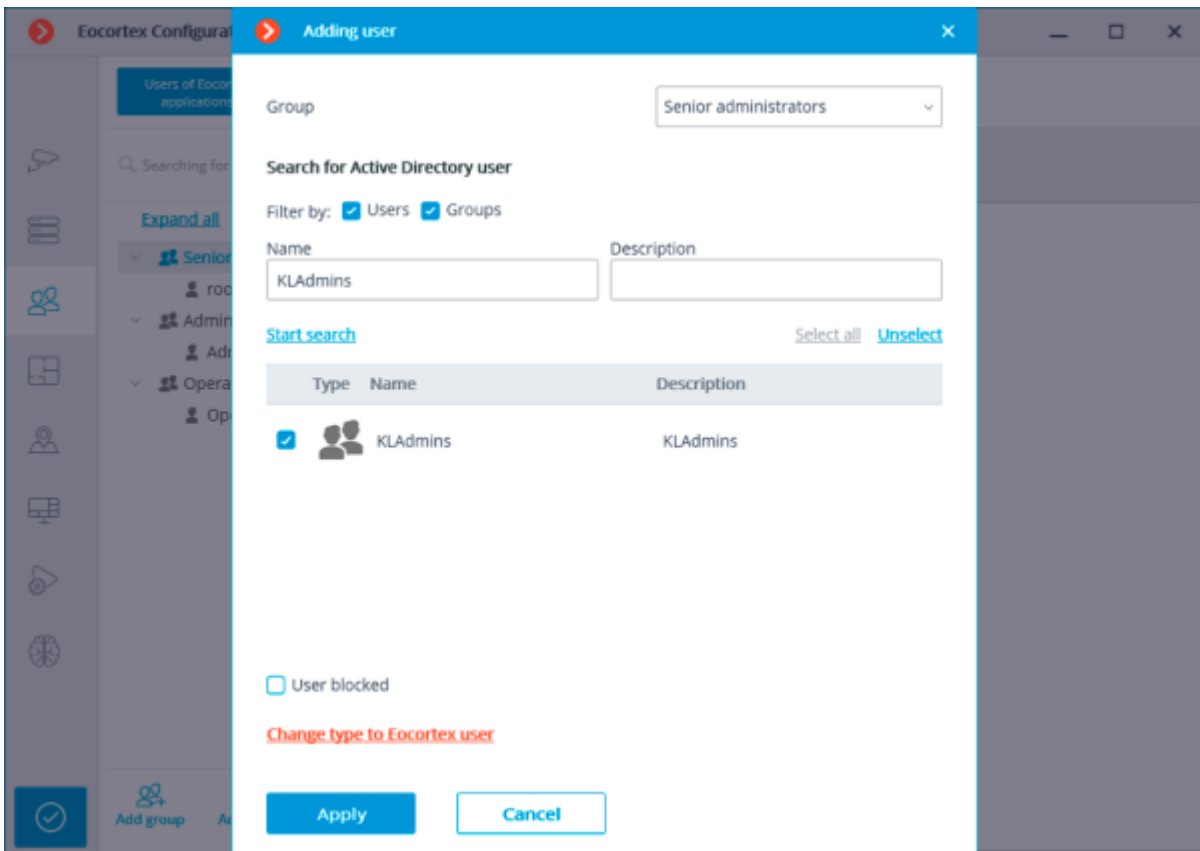
In the opened window type **Active Directory** name and password of the user who has rights to search **Active Directory** catalogue.



Then in the **Add User** window, in the filter section, enter part of the name or description which will be used for searching; mark the types of entries to be searched for (**Users** and/or **Groups**), then click **Start search**.




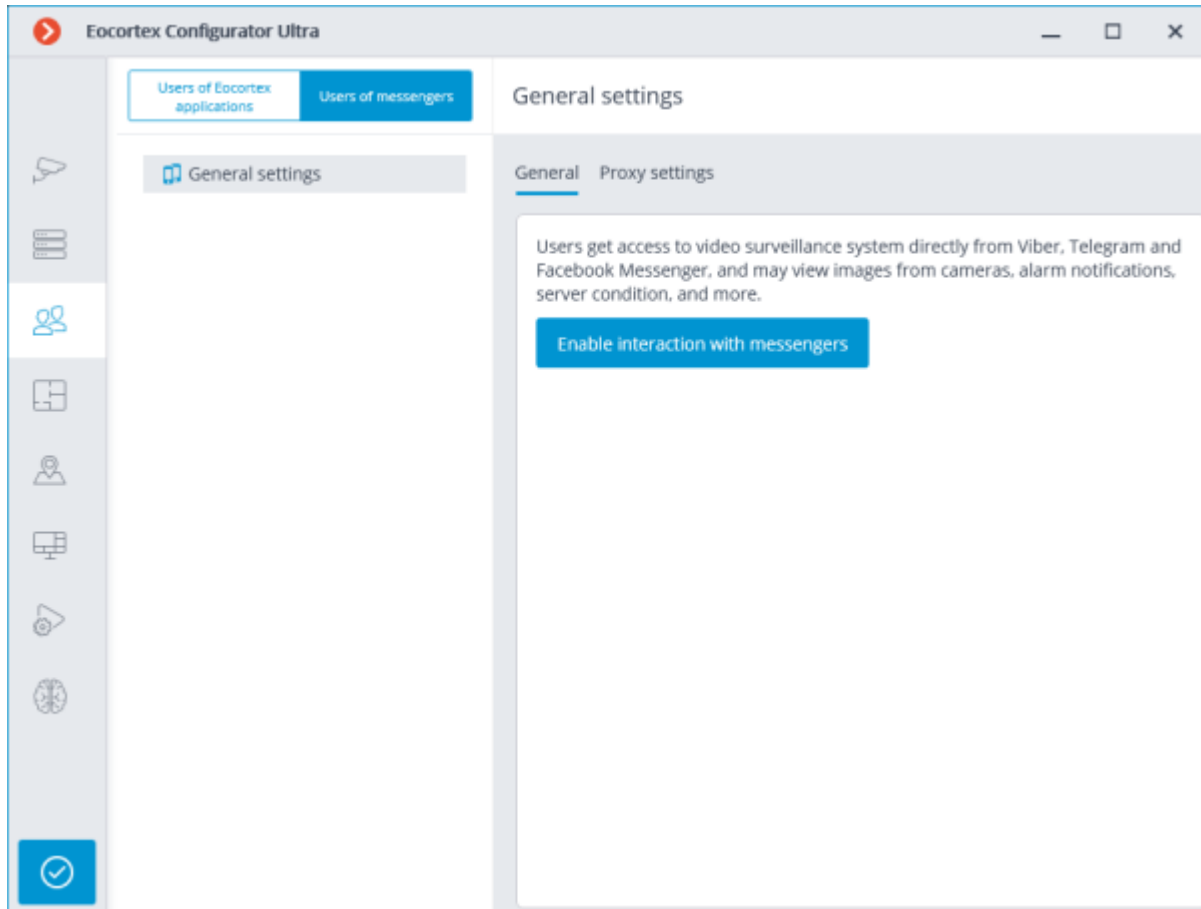
In the lower part of the window you will see a list of found users/groups. If **Name** and **Description** fields are left blank, the complete user/group list will be displayed.



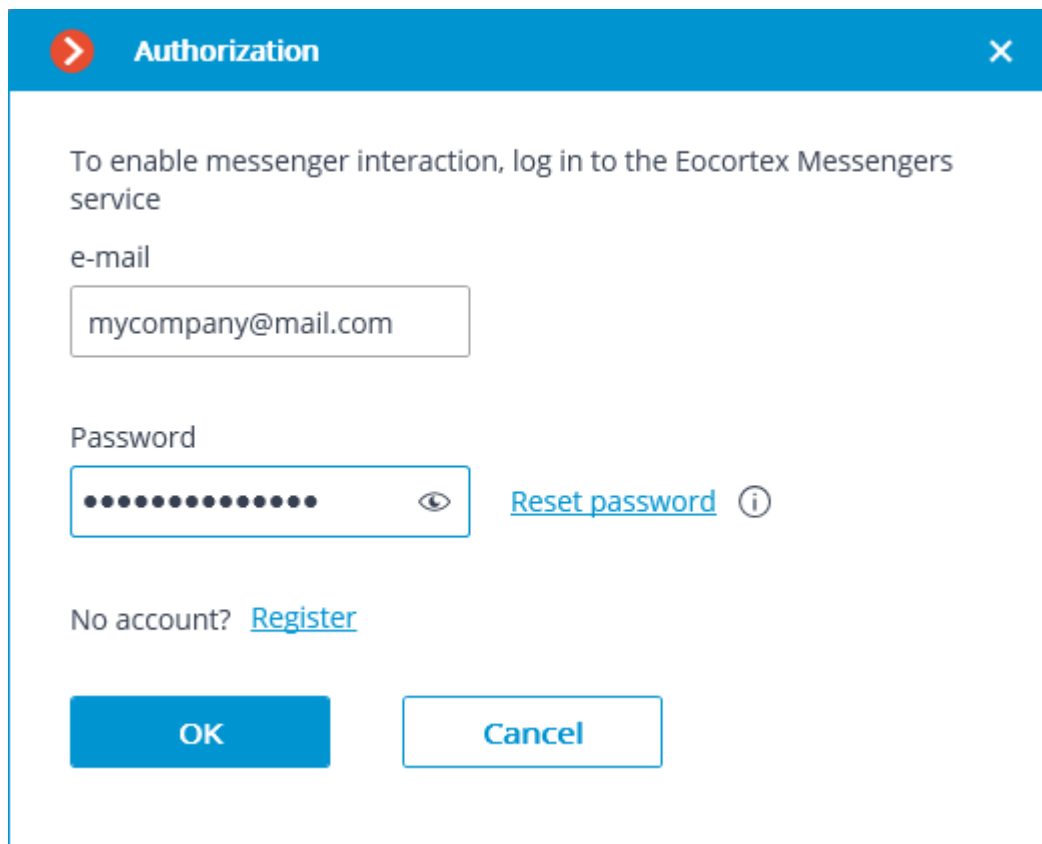
When **Active Directory** group is added to the list of users, the corresponding permissions will be extended to all users of this **Active Directory** group.

Users of messengers

To configure the rights of messengers that interact with the **Eocortex** video surveillance system, it is required to open the **Eocortex Configurator** application, go to the **Users**  tab and switch on the **Users of messengers** button.



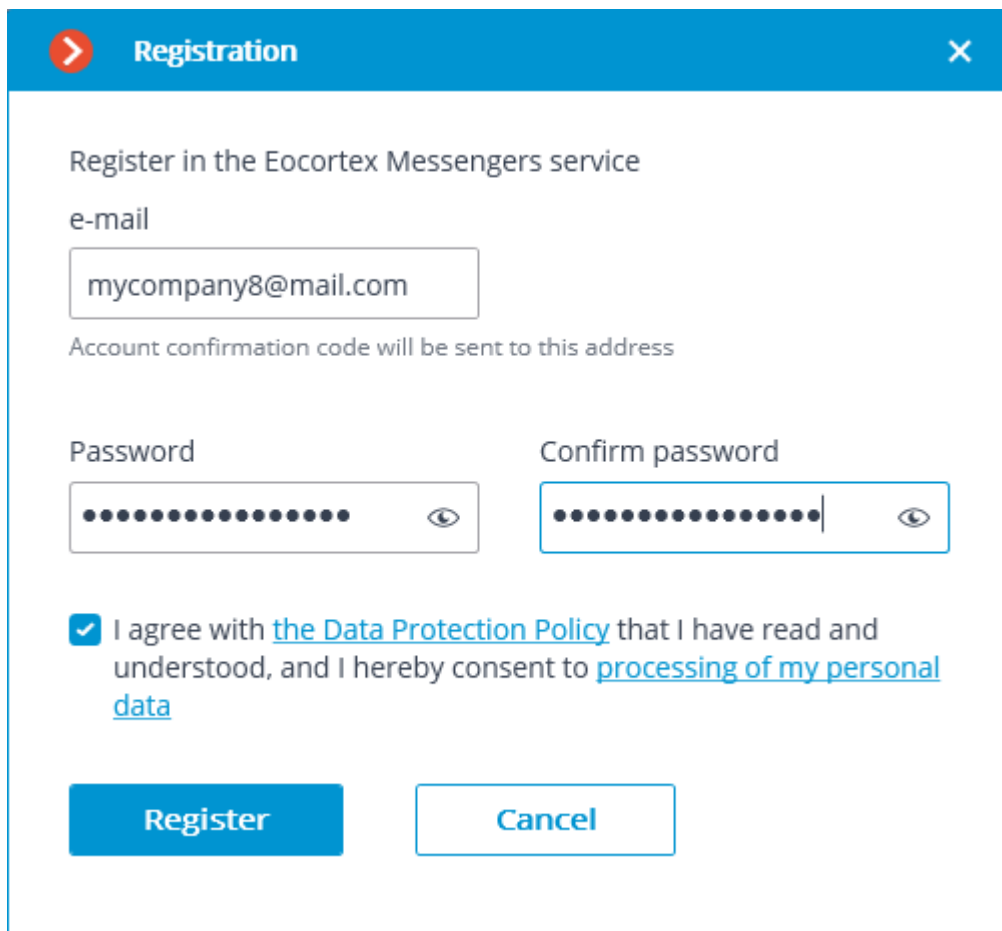
Initially, the subsystem of interaction with messengers is disabled, and the list of messenger users is empty. To enable interaction with messengers, it is required to press the **Enable interaction with messengers** button. The authorization window for the **Eocortex Messengers** service will open.



The image shows a dialog box titled "Authorization" with a red arrow icon on the left and a close button (X) on the right. The main text reads: "To enable messenger interaction, log in to the Eocortex Messengers service". Below this, there are two input fields: "e-mail" containing "mycompany@mail.com" and "Password" which is masked with dots and has an eye icon to its right. To the right of the password field is a blue link "Reset password" followed by an information icon (i). Below the input fields, there is a link "No account? Register". At the bottom, there are two buttons: a solid blue "OK" button and a white "Cancel" button with a blue border.

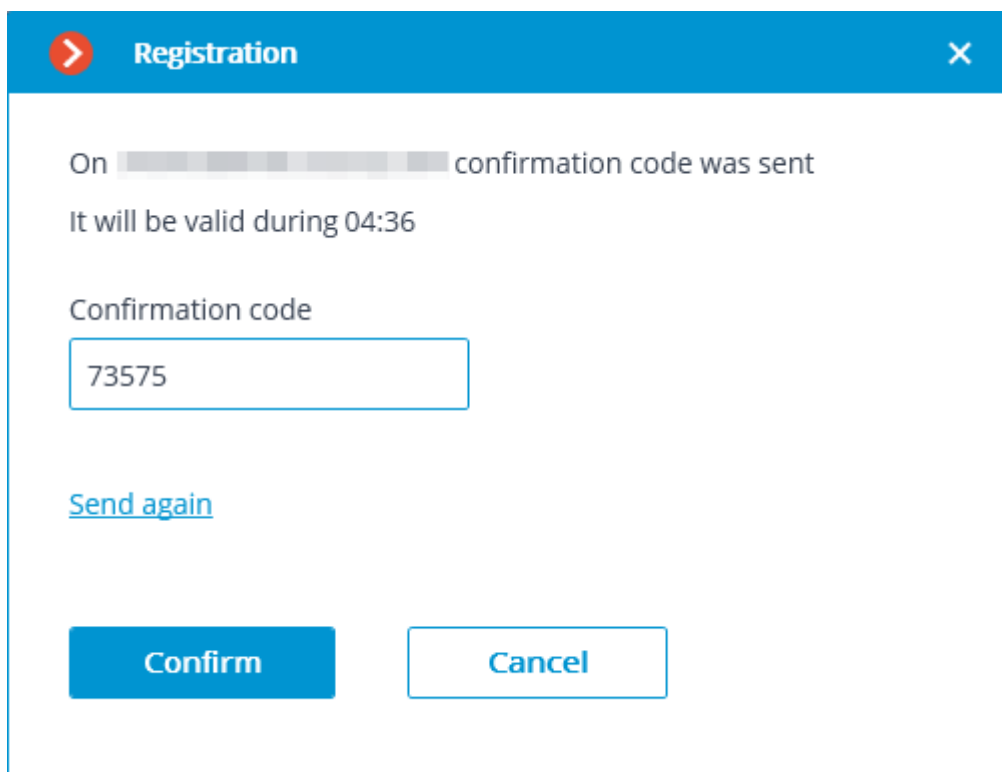
The e-mail address and password are used for authorization. Thus, in case of availability of an account with the **Eocortex Messengers** service, it is required to specify an e-mail address and a password in the corresponding fields, and then click **OK**. To restore the password, it is required to use the **Reset password** link.

When no account exists, it is required to create one using the **Register** link.



The registration window has a blue header with a red arrow icon, the text 'Registration', and a close button (X). The main content area is white. It starts with the heading 'Register in the Eocortex Messengers service'. Below this is the 'e-mail' label and a text input field containing 'mycompany8@mail.com'. A note states 'Account confirmation code will be sent to this address'. There are two password fields: 'Password' and 'Confirm password', both containing masked characters and an eye icon. A checkbox is checked, with the text 'I agree with [the Data Protection Policy](#) that I have read and understood, and I hereby consent to [processing of my personal data](#)'. At the bottom are two buttons: 'Register' (solid blue) and 'Cancel' (white with blue border).

In the registration window that opens, it is required to specify the e-mail address and password that will be used for authorization in the **Eocortex Messengers** service. Upon clicking on the **Register** button, an email with an activation code will be sent to the specified email address. The code is to be entered in the confirmation window that opens.

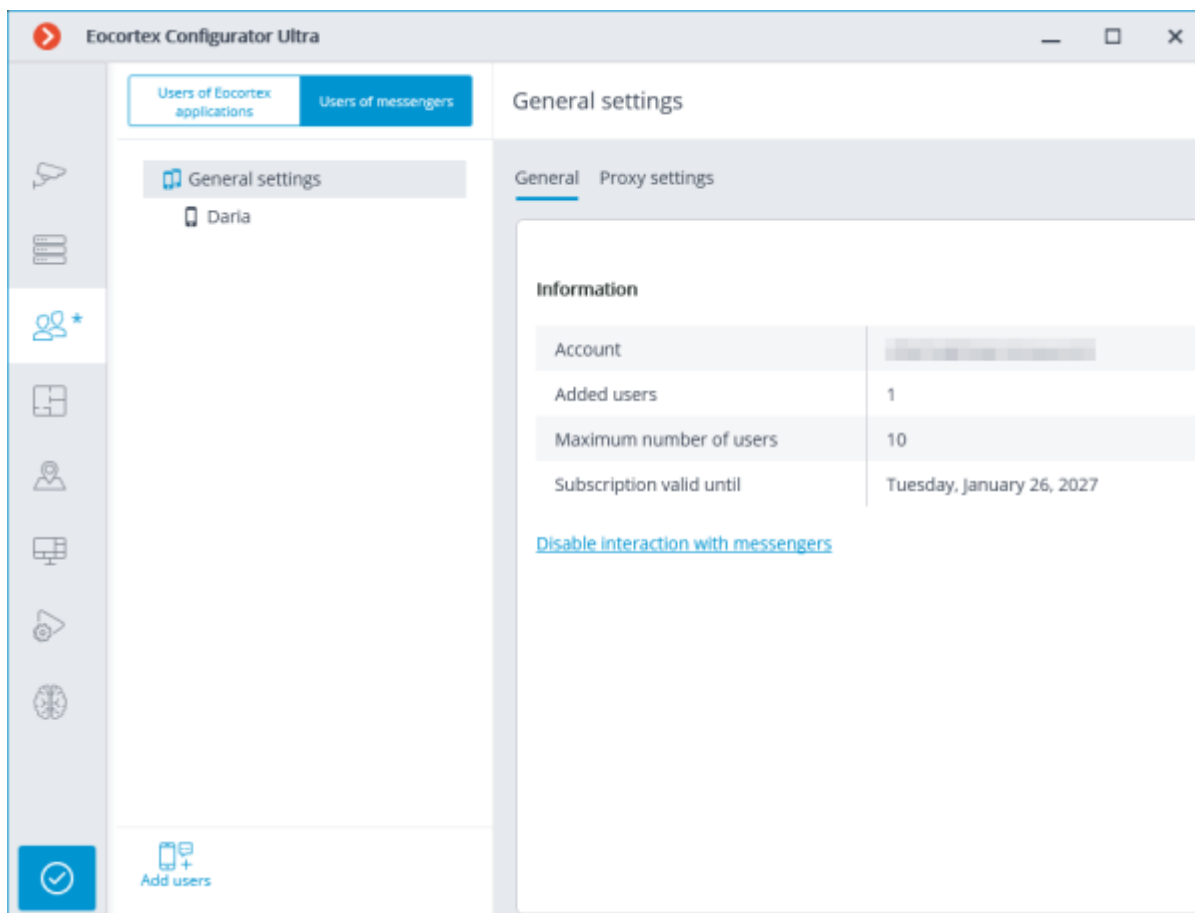


The confirmation window has a blue header with a red arrow icon, the text 'Registration', and a close button (X). The main content area is white. It starts with the text 'On [blurred] confirmation code was sent' and 'It will be valid during 04:36'. Below this is the 'Confirmation code' label and a text input field containing '73575'. A link '[Send again](#)' is present. At the bottom are two buttons: 'Confirm' (solid blue) and 'Cancel' (white with blue border).

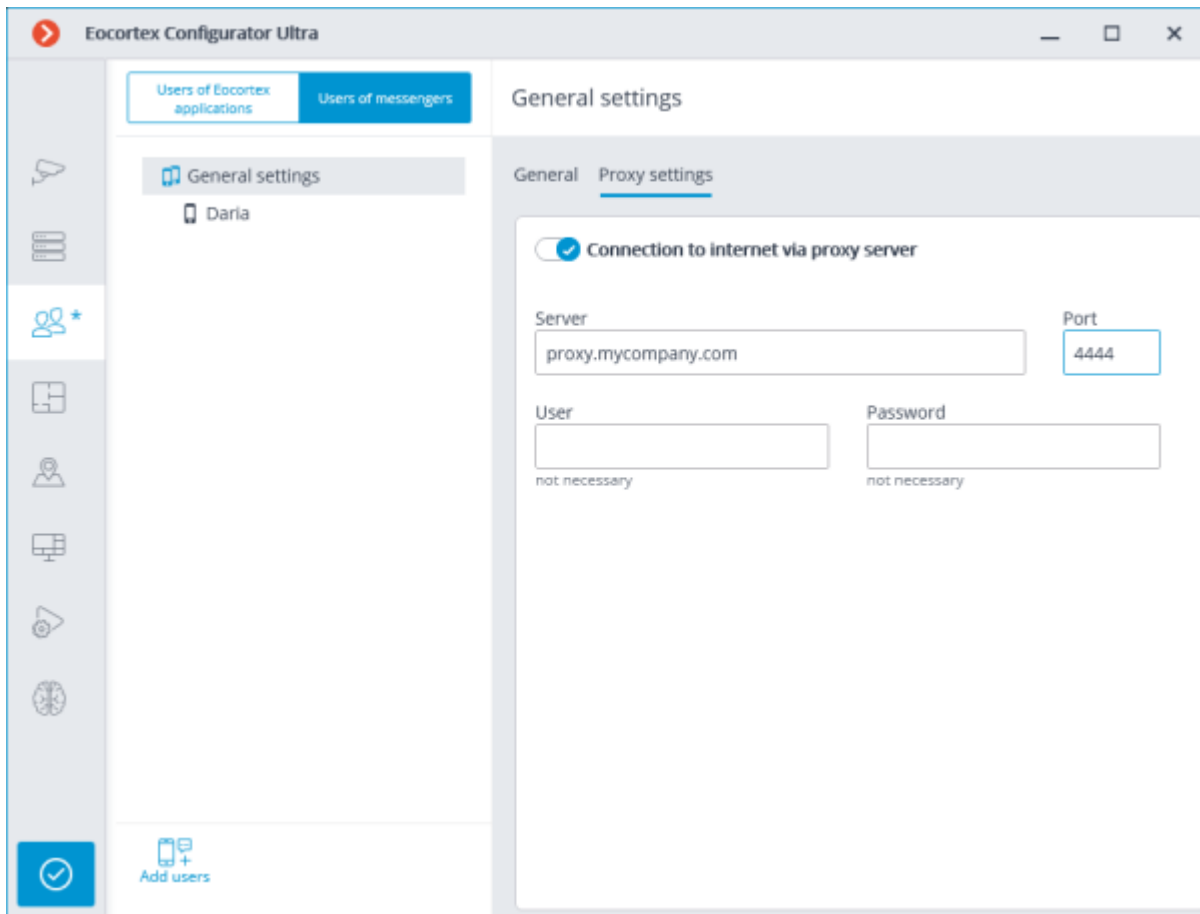
The interface and features available when interaction with messengers is enabled are described below.

When selecting the item **General settings** in the list of users, the **General** tab will display the account settings.

Disabling the interaction with messengers (using the corresponding link on the **General** tab) will lead to the deletion of all messenger user settings.

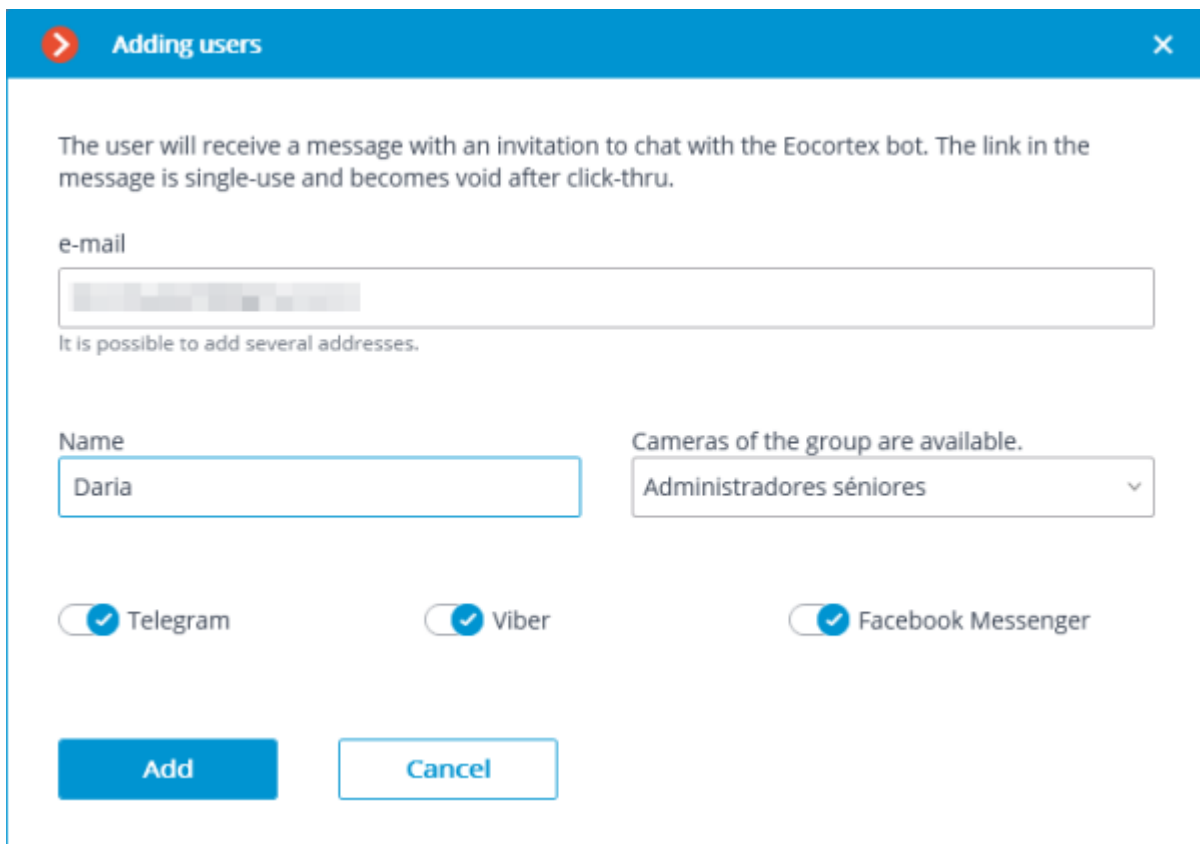


Selecting the **General settings** item in the list of users and proceeding to the **Proxy settings** tab allows to configure the settings for connecting to the **Eocortex Messengers** service via a proxy server.



To add a user, it is required to click the **Add users** button. In the window that opens, it is required to specify the user's e-mail address, the name under which the user will appear in the system, the **Eocortex** video surveillance system user group, and the messengers that are available to the user for interacting with **Eocortex**. In this case, the user will only have access to the cameras that are available to the specified **Eocortex** user group.

It is possible to add several users by specifying their addresses followed by a comma, semicolon or space.



Adding users

The user will receive a message with an invitation to chat with the Eocortex bot. The link in the message is single-use and becomes void after click-thru.

e-mail

It is possible to add several addresses.

Name: Daria

Cameras of the group are available: Administradores séniores

Telegram Viber Facebook Messenger

Add Cancel

After clicking on the button **Add**, the users are added to the list, and emails containing links for connection in the appropriate messengers are sent to their addresses. These links are single-use, and the period of their validity is limited.

Access to the CCTV system via messengers

Eocortex <bot@eocortex.com>

Hello!

You now have access to EocortexBot.

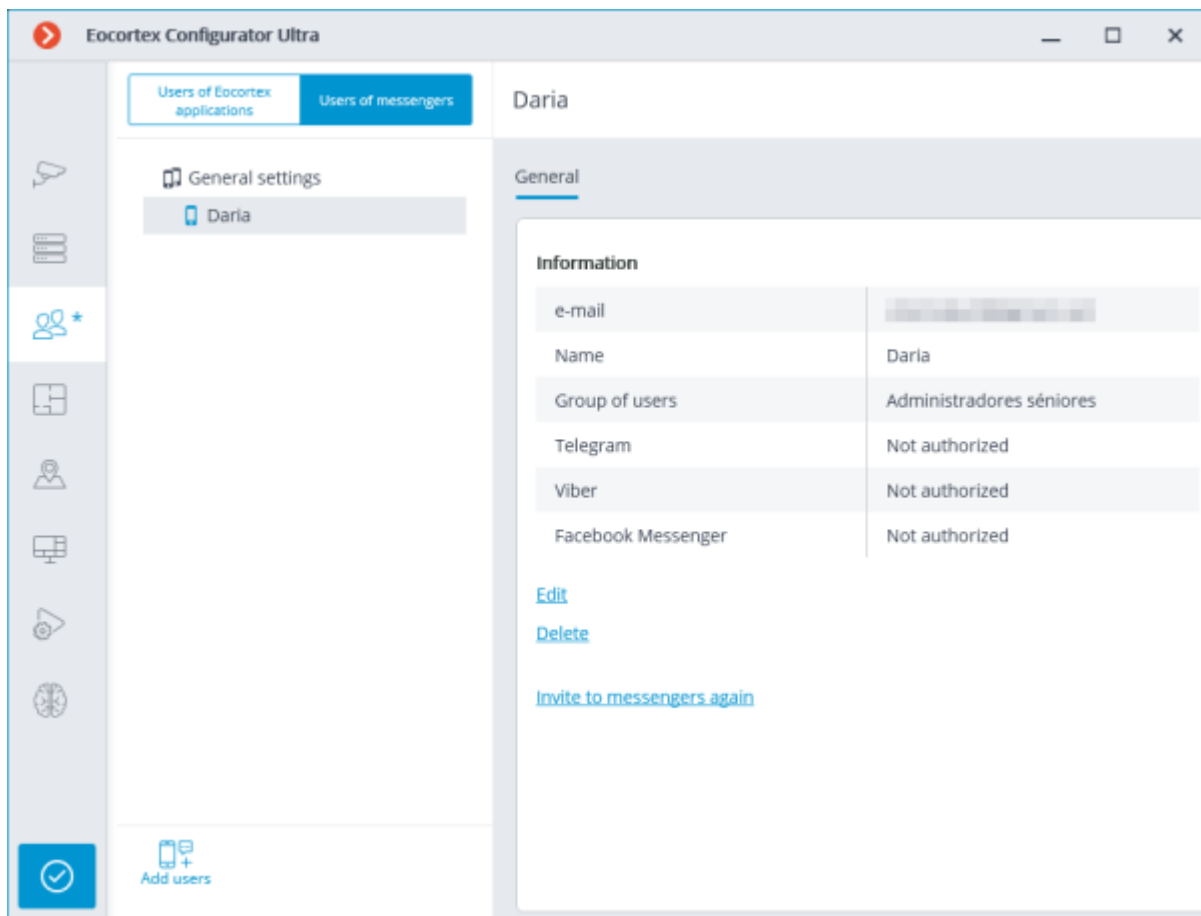
To start working with the surveillance system via messenger, follow the appropriate link.

Make sure that you have the selected messenger installed, and also check that this messenger is not blocked by your internet provider.

- **Telegram**
http://t.me/Eocortex_bot?start=50af737a-bce9-4217-baf6-036bd209462b
- **Viber**
<http://bot.eocortex.com?a248186a-6e98-46b2-8c0f-813b02414021>
- **Facebook Messenger**
<http://m.me/1923167444589598?ref=2566afe5-5210-48ae-b859-a80f60b1893c>

After the user clicks on the link in the appropriate messenger, a greeting will be sent to them.

When selecting a user in the list, the information about that user will be shown on the **General** tab. In addition, using the corresponding links, it is possible to delete a user, change their settings, and resend the links with invitations to their messengers.



The changes will only take effect after the [application of the settings](#).

Added users are bound to the system to which they have been added rather than to the account. If the same account is used to connect to another system, the list of users in that system will initially be empty. At the same time, if a different account is used to connect to the system, the users added to that system will be transferred to the new account.

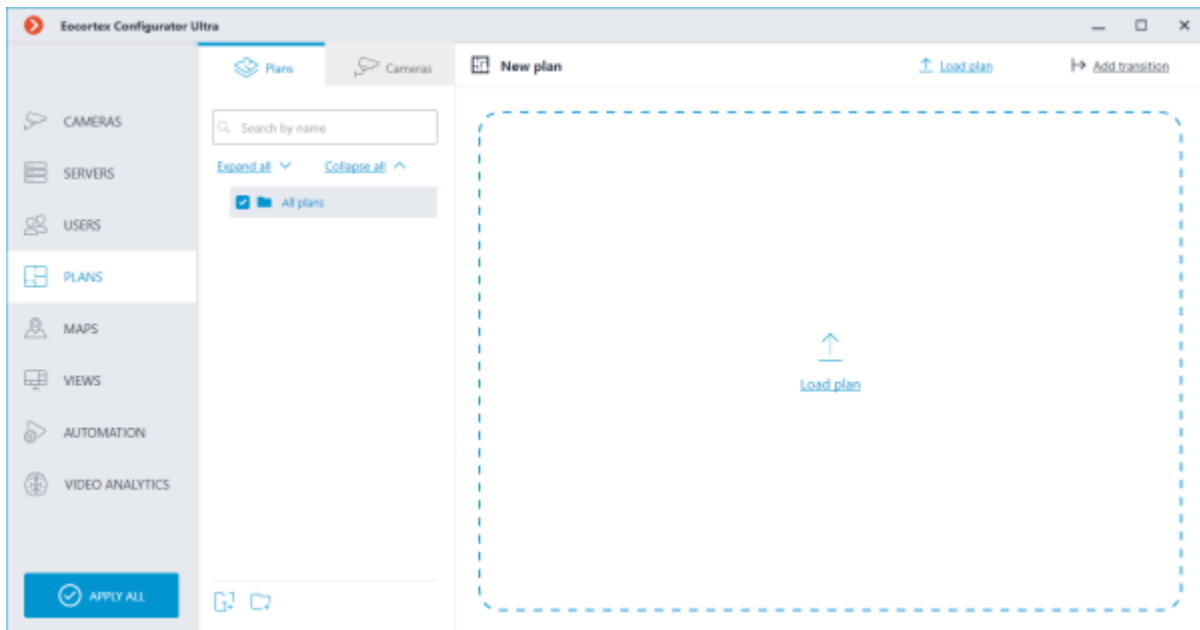
If the same account is used to connect to different systems, all added users in all systems will be added together. At the same time, the same user in different systems will be regarded as a different user. Thus, the current number of users bound to the account will correspond to the sum of all users in all systems.

The same user interacting with the same system through different messengers does not interact in different messengers with themselves. That is, the actions of this user in one messenger have no effect on the sessions of the same user in other messengers.

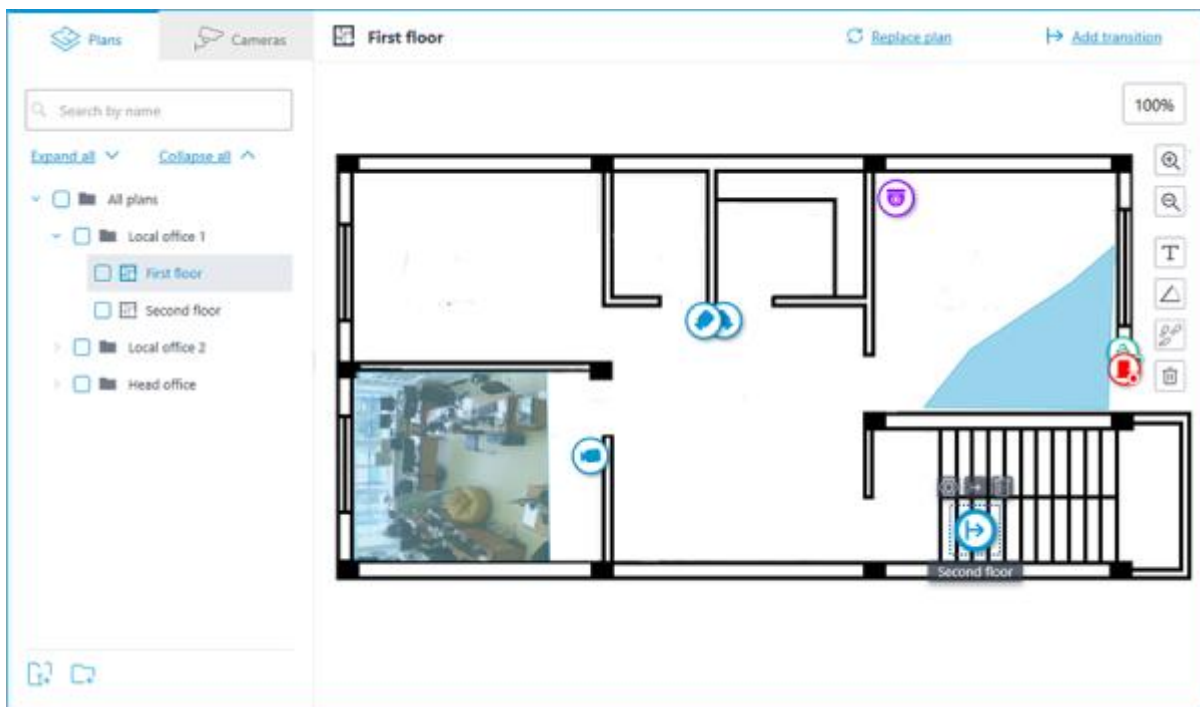
Plans

To set up camera layout in the **Eocortex Configurator** application, go to  **Plans** tab.

This tab contains site plans and the cameras, sensors, relays placed on these plans, as well as camera fields of view and transition points between the plans.



The left panel has two settings tabs: **Plans** and **Cameras**. Selecting a tab opens a tree with the relevant elements.



Plans

By default, the plans tree is empty. To add a plan, click the **Add plan** button in the middle of the screen, or find it in the context menu or on the bottom panel of the plan tree.

When selecting a plan, its image is displayed on the right side, with the name of the plan and two buttons at the top:

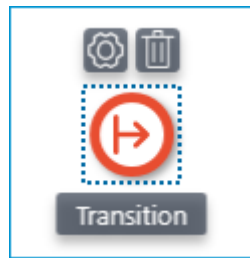
- ▲ **Load plan:** allows to upload an image from the device to be used as the plan's background.


Supported image formats: **svg, jpg, bmp, png, gif, tif.**

- 🔄 **Replace plan:** allows to upload a new background image to replace the previous one in the plan.

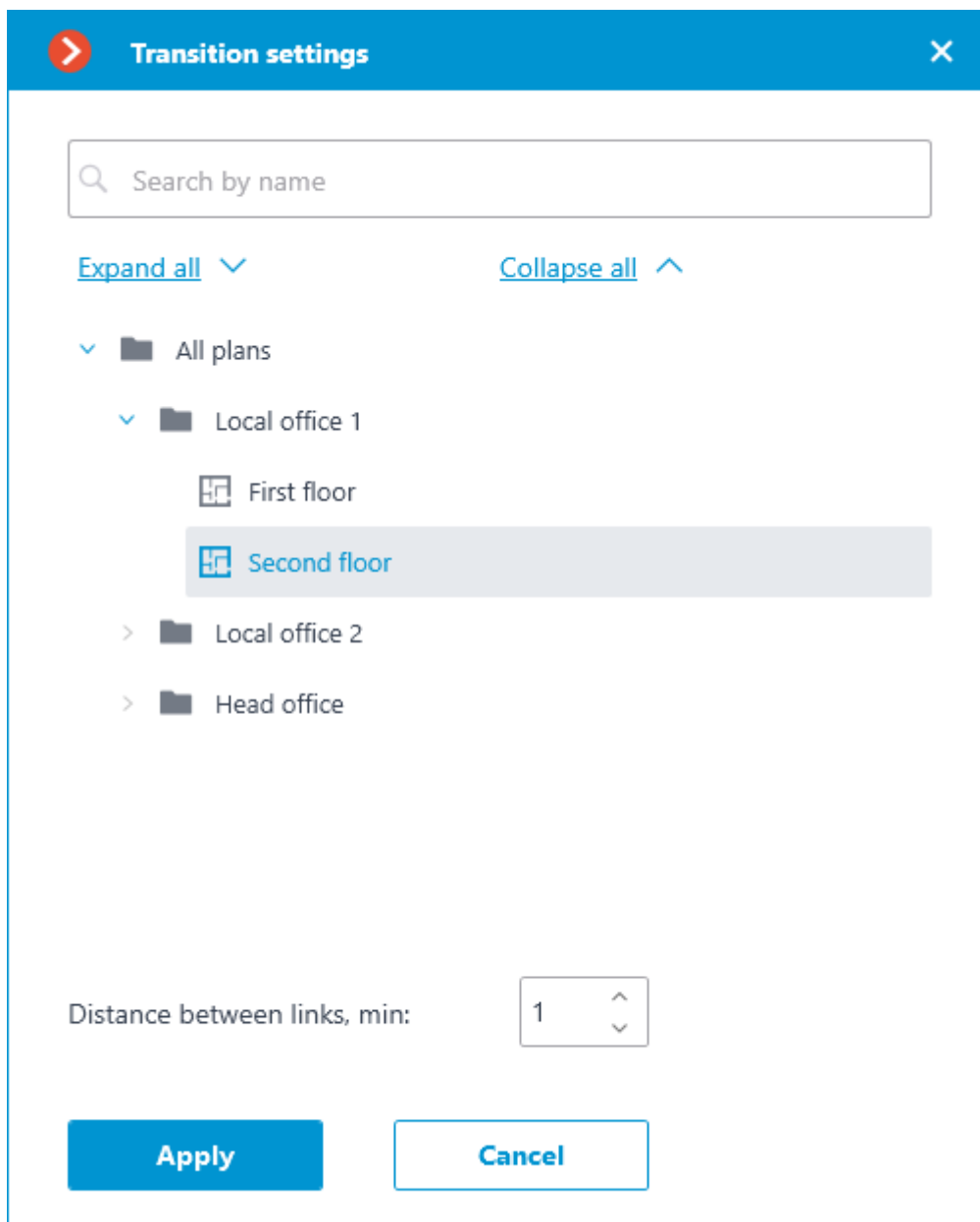
↳ **Add transition:** allows to add to the plan a transition point, by clicking which the user will be able to go to the plan associated with this point.

If a transition point is placed on the plan, but not configured, its icon will be red:

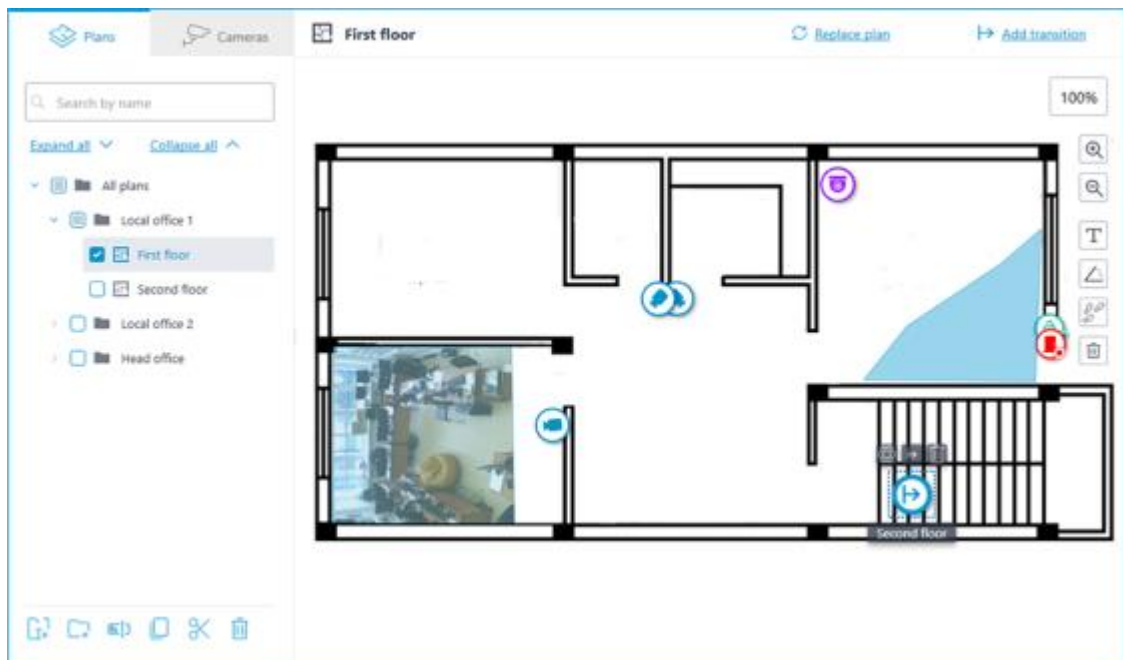



To set it up, place the transition point to the plan and click the  button.

In the **Transition settings** window that opens, select the plan to which the transition should guide to. In the **Distance between links, min:** field, set the time in minutes that a person would actually spend following this transition, and then click the **Apply** button.

A screenshot of a "Transition settings" dialog box. The title bar is blue with a red arrow icon on the left and a close "X" icon on the right. Below the title bar is a search input field with a magnifying glass icon and the text "Search by name". Underneath are two links: "Expand all" with a downward arrow and "Collapse all" with an upward arrow. A tree view shows a hierarchy of folders: "All plans" (expanded), "Local office 1" (expanded), "First floor", "Second floor" (selected and highlighted in grey), "Local office 2" (collapsed), and "Head office" (collapsed). At the bottom, there is a label "Distance between links, min:" followed by a numeric input field containing the value "1" and up/down arrow icons. At the very bottom are two buttons: a blue "Apply" button and a white "Cancel" button with a blue border.

The plans window will automatically switch to the specified plan, and a transition endpoint will be added in the center of the screen. Place it on the plan in a location that actually connects this plan to the previous one.



When selecting the icon of the configured transition on the map, the transition button  becomes available. It allows to quickly switch between the plans. When switching, the new plan will open in such a way that the transition endpoint icon will be located in the center of the screen.


A bar with the following buttons is available on the right side of the plan:

 **Zoom in:** Scales the plan up.

 **Zoom out:** Scales the plan down.

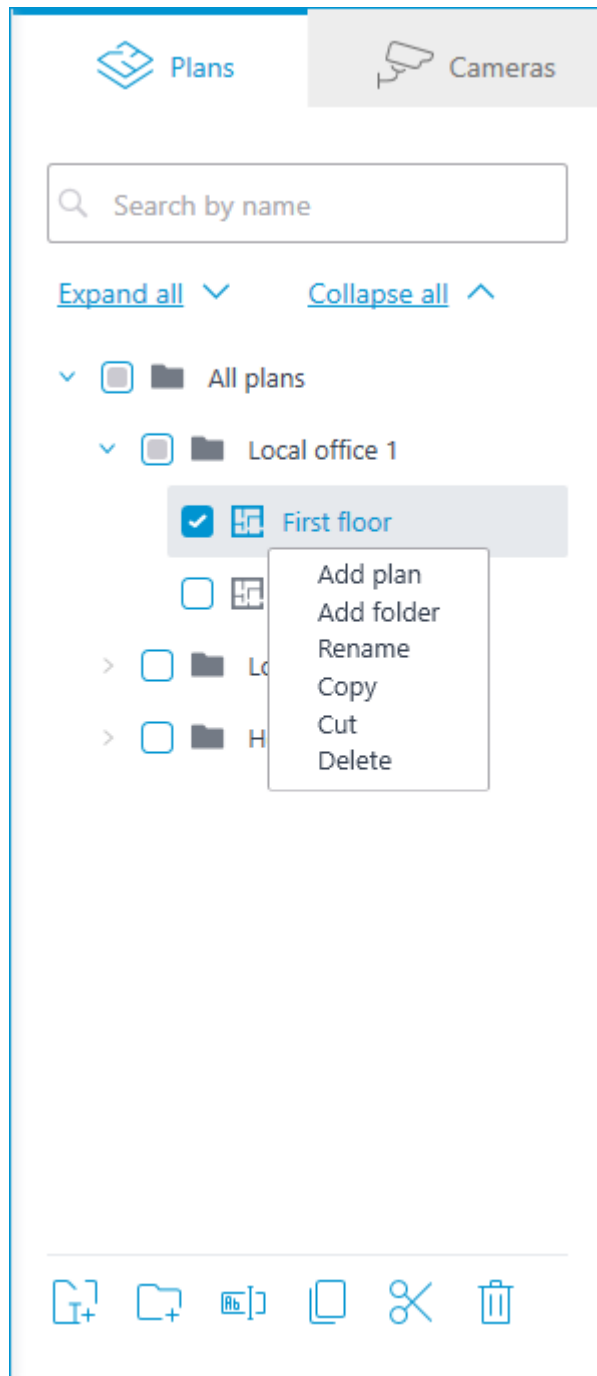
The scale can also be changed with the mouse wheel.

 **Show camera names:** Hides or displays the names of all cameras on the plan.

 **Show fields of view:** Hides or displays the field of view of all cameras on the plan. If no fields of view are configured, this button will not be displayed on the panel.

 **Show heat maps:** Overlays a heat map for the specified period on the video in the camera's field of view. If there are no cameras with the **Traffic Density Heat Map** module configured, this button will not be displayed on the panel.

The following actions become available in the context menu and on the bottom panel of the plans tree when selecting a folder or an individual plan on the left panel:



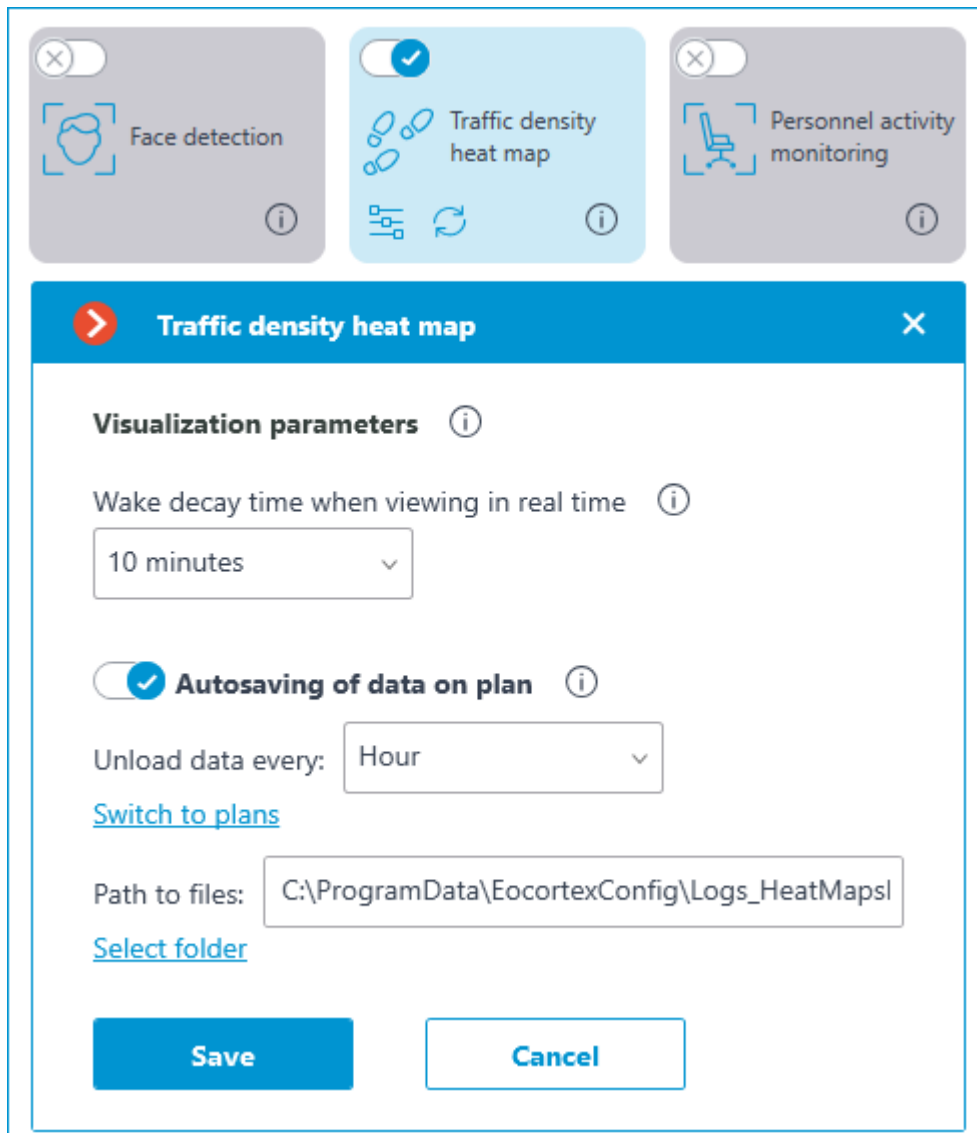
In addition to selecting a plan manually, it can also be found using the search field above the plans tree.

It is possible to move between folders both individual plans and even entire folders.

Plan, starting from **Eocortex 4.1**, is the lowest level element in the tree. When migrating settings from earlier versions, folders are used to keep the hierarchical structure. For an item with attachments, a folder with the same name is created at a higher level, in which the item itself and its attachments are placed in the same manner.

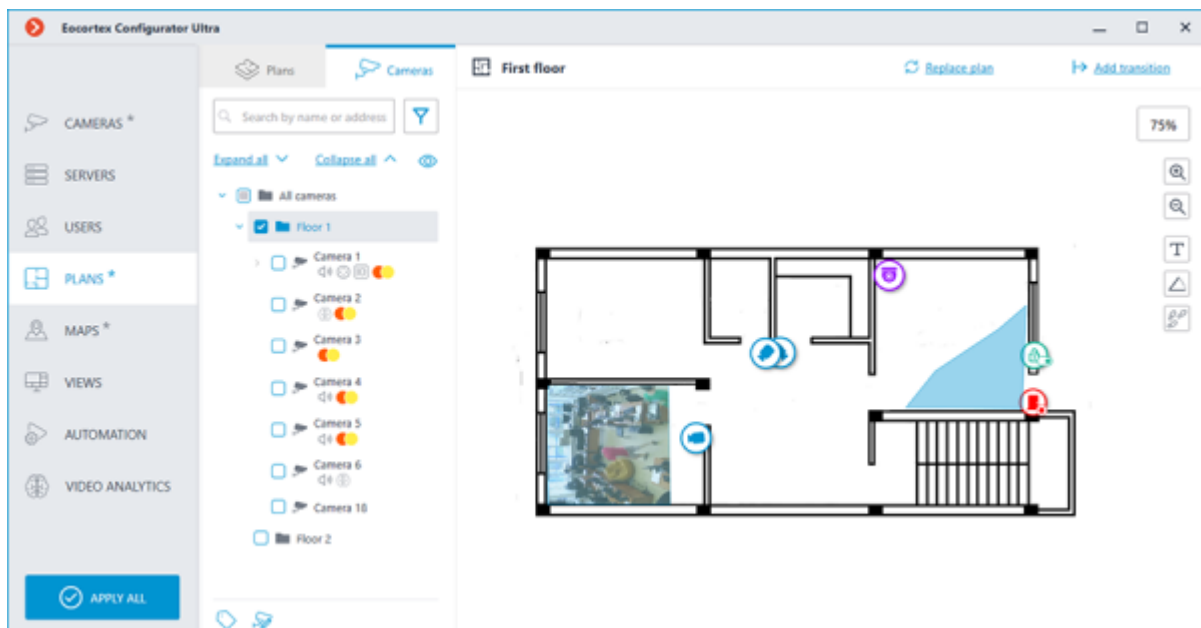
Heat maps

To use heat maps, enable and configure the **Traffic Density Heat Map** module in the [Analytics](#) section.

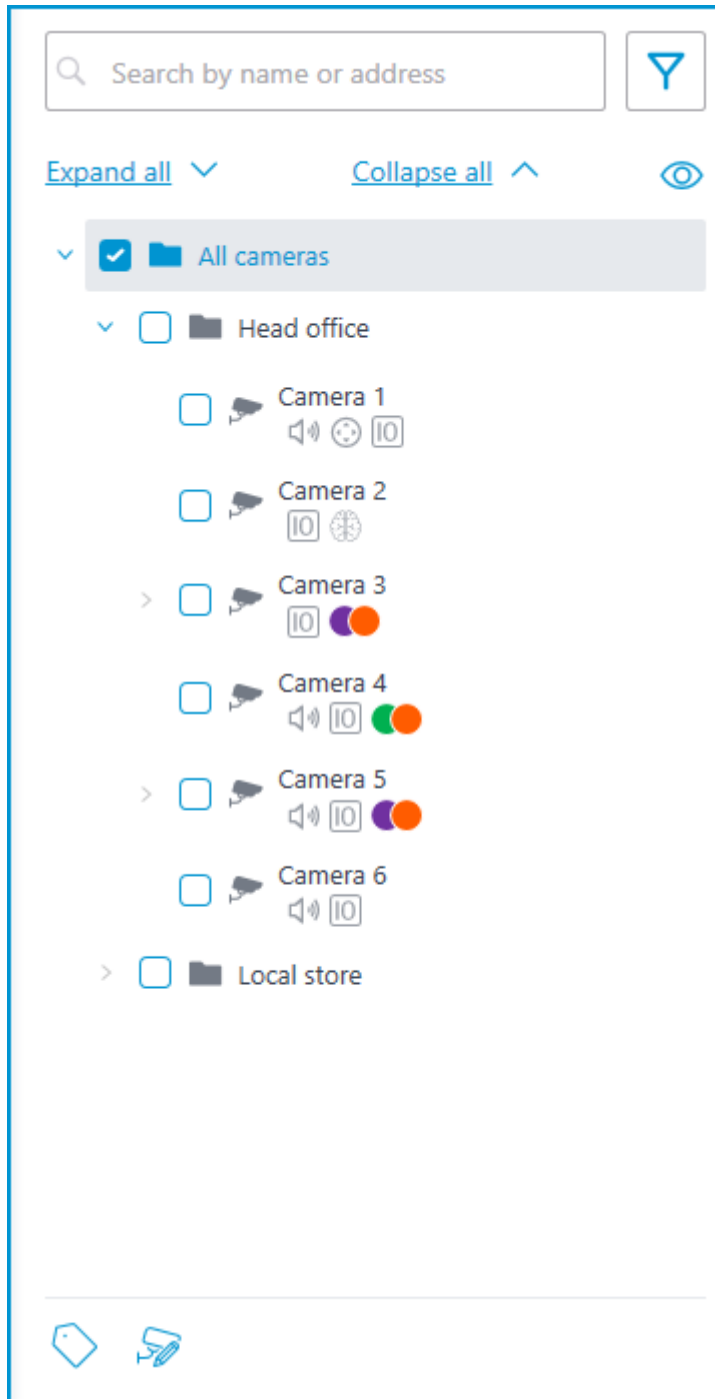


For the **Autosaving of data on plan** function of the **Traffic Density Heat Map** module to work, the [field of view](#) must be configured for the camera placed on the plan in the **Plans** section.





Cameras



This tab contains the cameras tree.

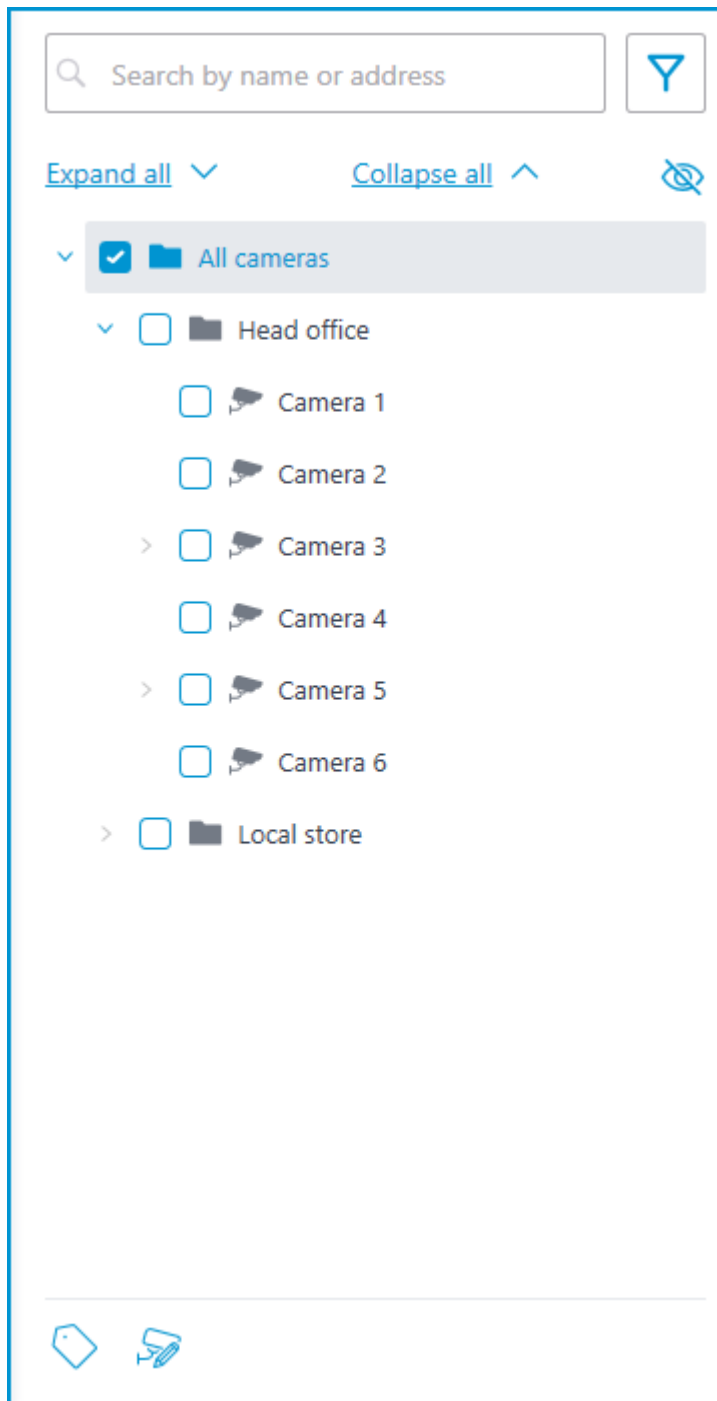


Cameras can have the following attributes:

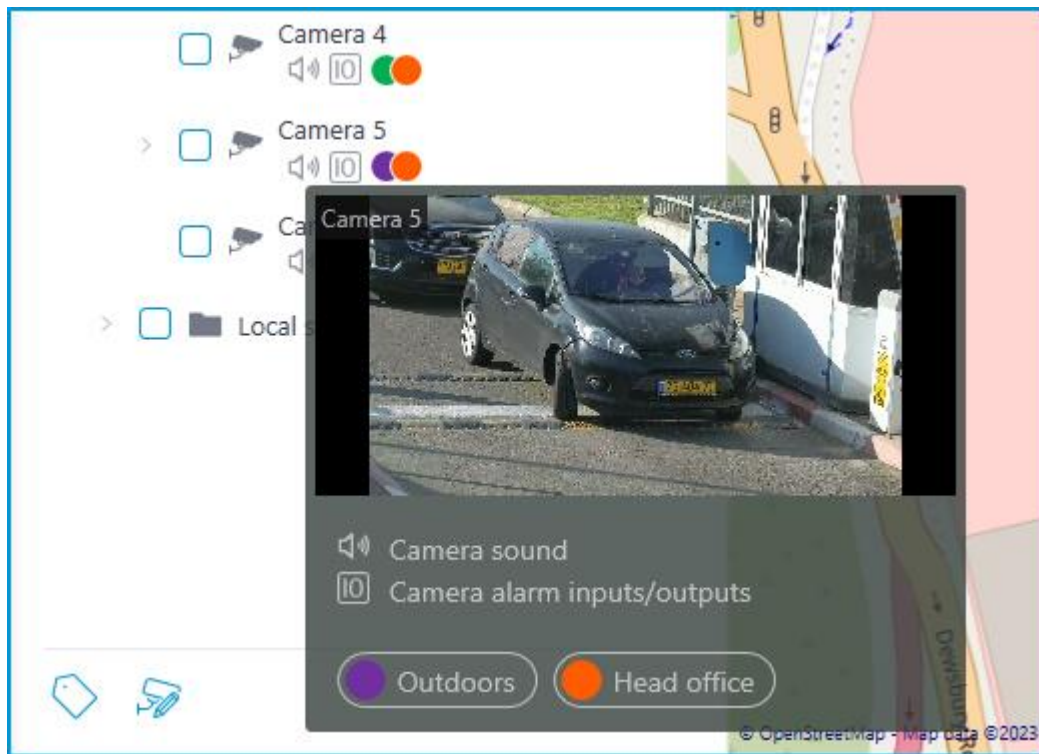
-  : the camera has enabled video analytics module;
-  : the camera has enabled sound receiving option;
-  : the camera has enabled PTZ;
-  : the camera has enabled alarm inputs/outputs.

Colored labels: the camera has tags with the displayed colors;

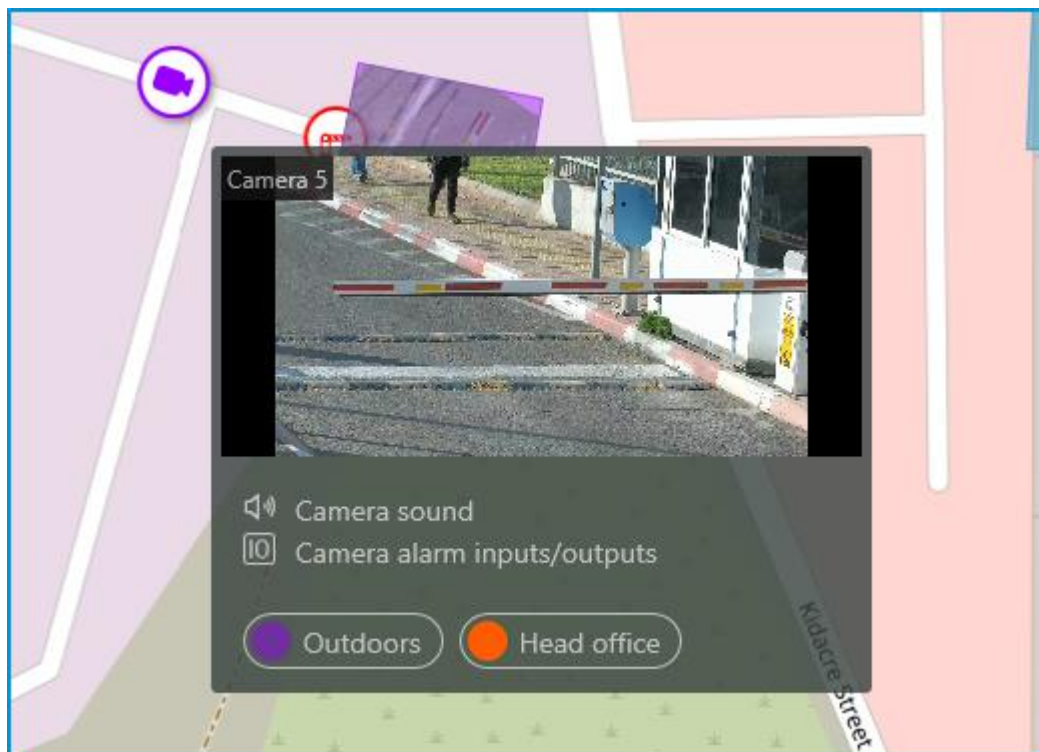
If necessary, the attributes can be hidden by clicking the  icon on the right side of the tree.



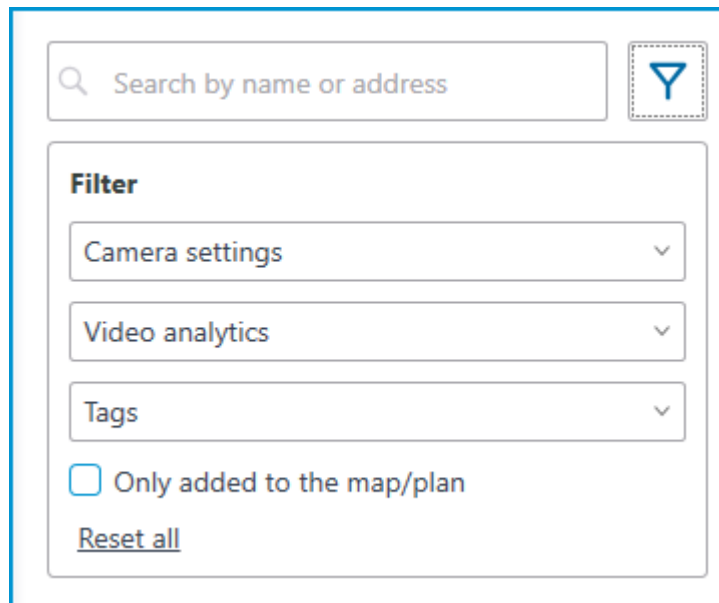
Hovering the cursor over the camera opens a preview window that contains video from the camera and a list of its attributes.



The same preview window opens when hovering the cursor over a camera located outside the cameras tree.





In addition to selecting a camera manually, it can also be found by **name** or **IP address** using the search field above the cameras tree.



Cameras can be filtered by clicking the  icon and customizing the following filter options:



Camera settings

Filter by the following attributes: , , .

Video analytics

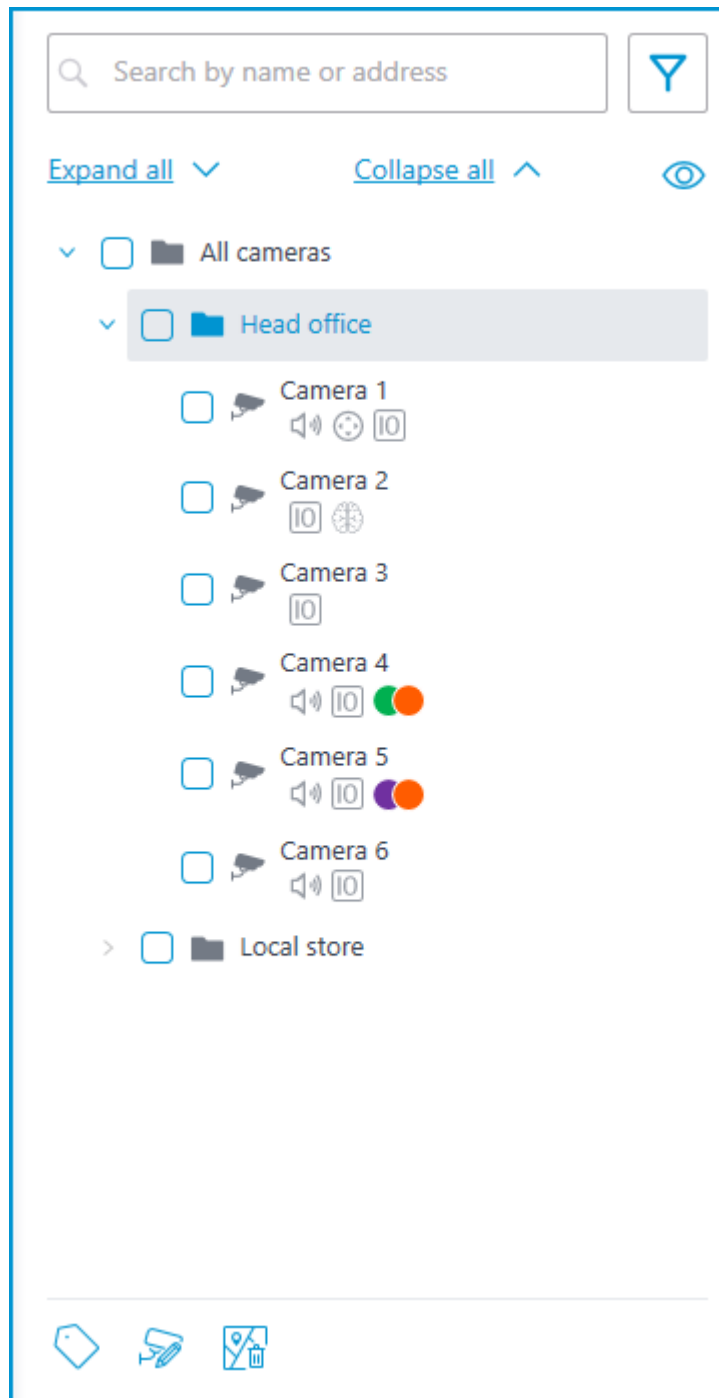
Tags

The availability of filtering options depends on the settings of the cameras. Filtering applies immediately after selecting an item.

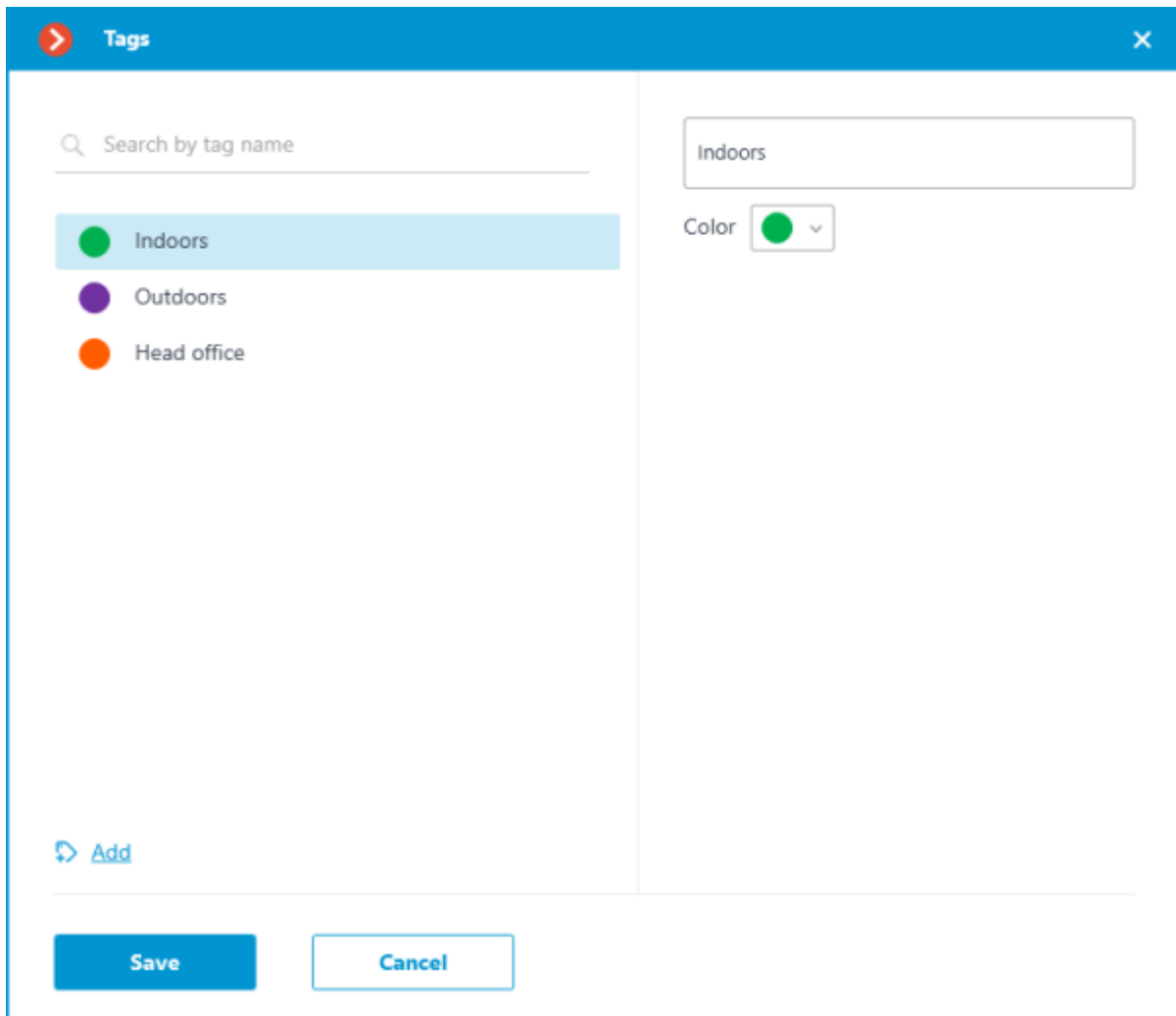
If necessary, the filtering can be collapsed by clicking the  filter button. When the filtering is applied and collapsed, the filter icon changes to .

Tags

For easy navigation in the cameras tree, tags can be added for each camera. The window for creating and editing tags opens by clicking the **Tags** button in the bottom of the cameras tree or by selecting the relevant item in the context menu of the camera.




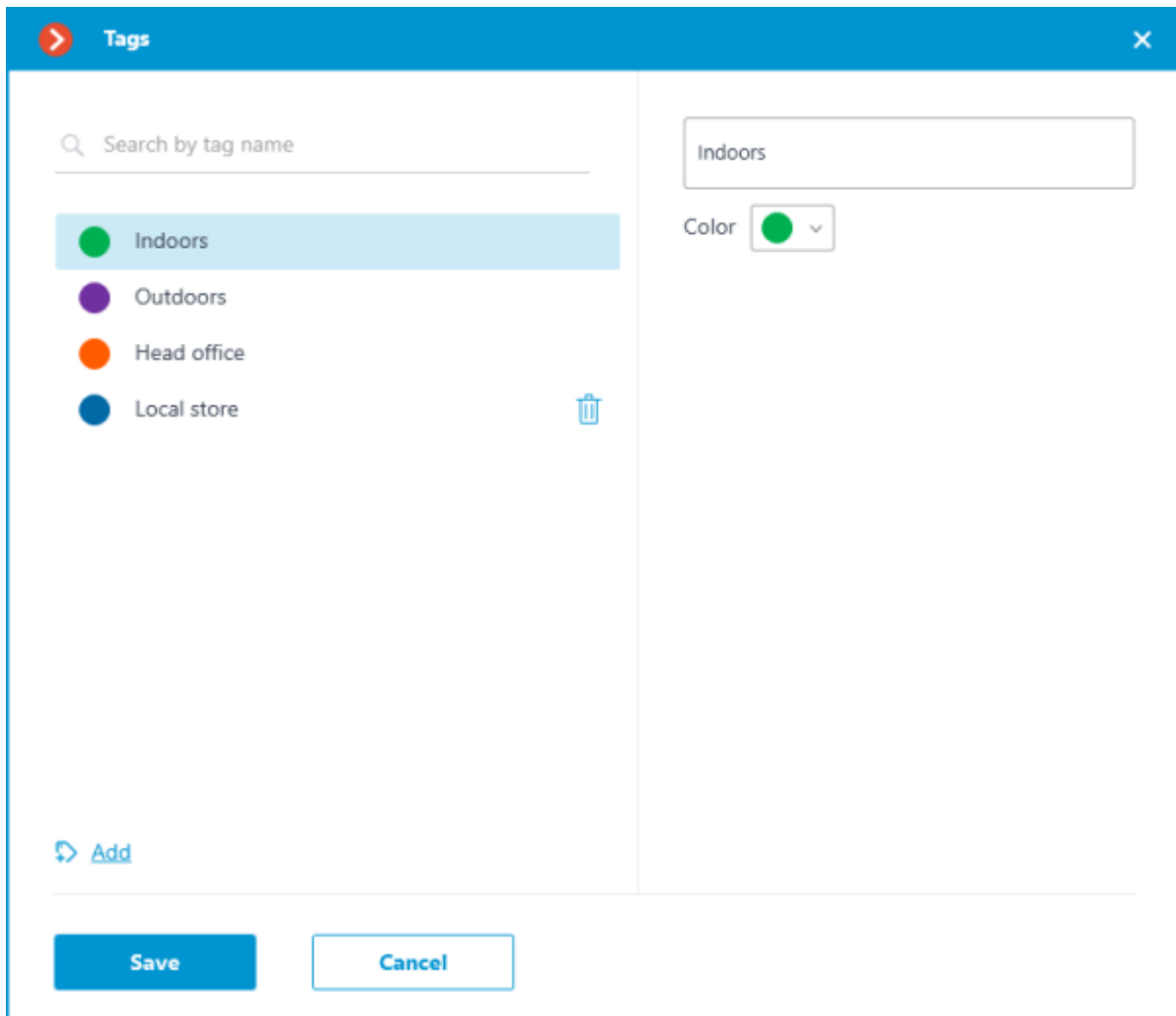
To add a new tag, click the **Add** button.



The tag can have a name and a color. The color can be both selected from the preset options and set an own from the palette.

It is not recommended choosing excessively light colors for tags, as they can blend in with the background.

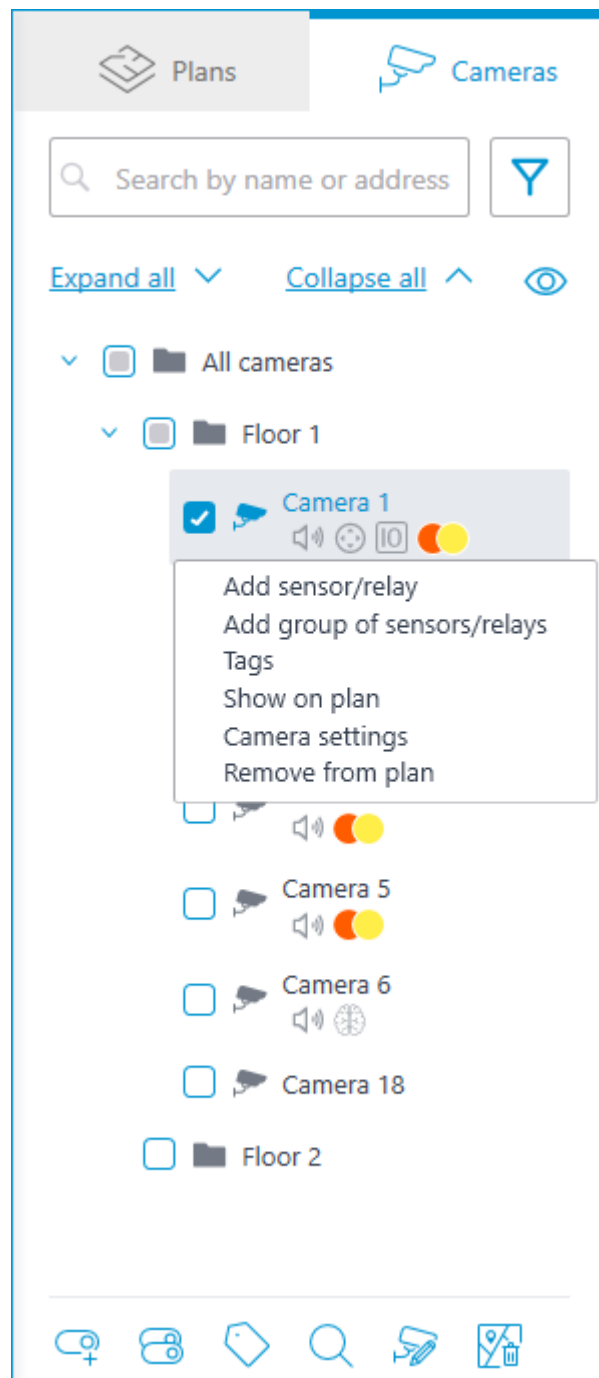
To delete a tag, hover the cursor over it and click the  button that appears.



Also, the settings window allows searching tags by their names.

Representation of the camera on the plan

To customize the camera representation, click **Camera settings** in the camera context menu or at the bottom of the camera tree.

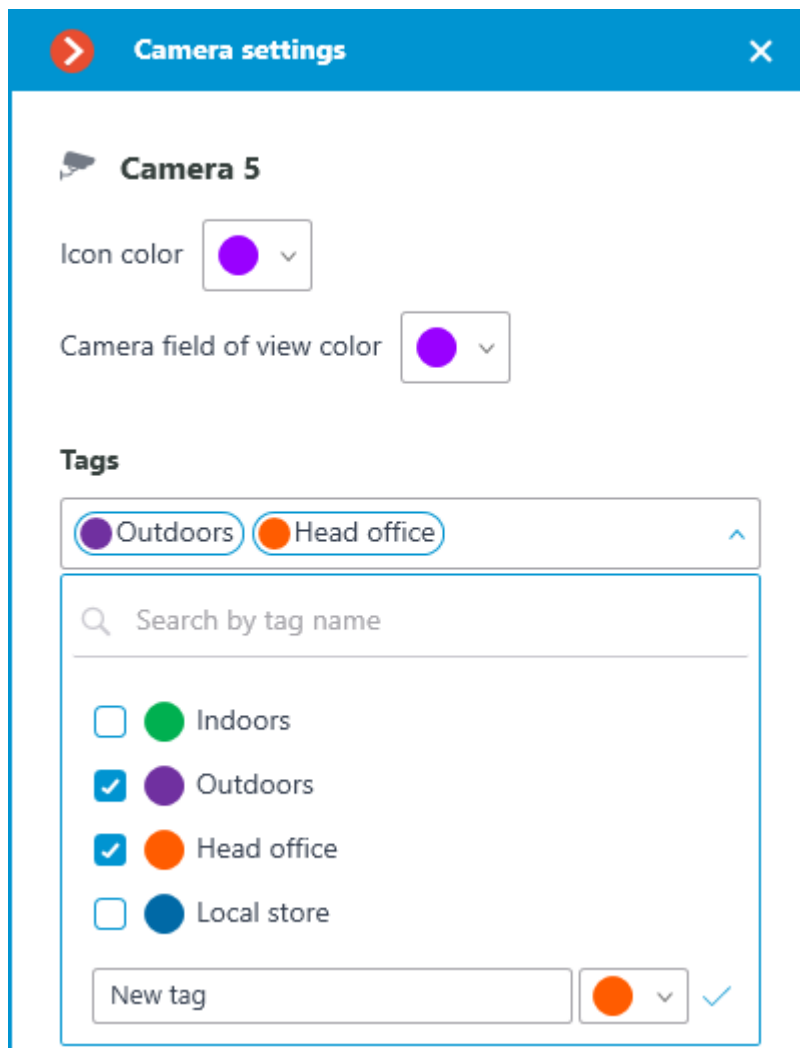


The following can be configured in the camera settings window:

Color of the camera icon

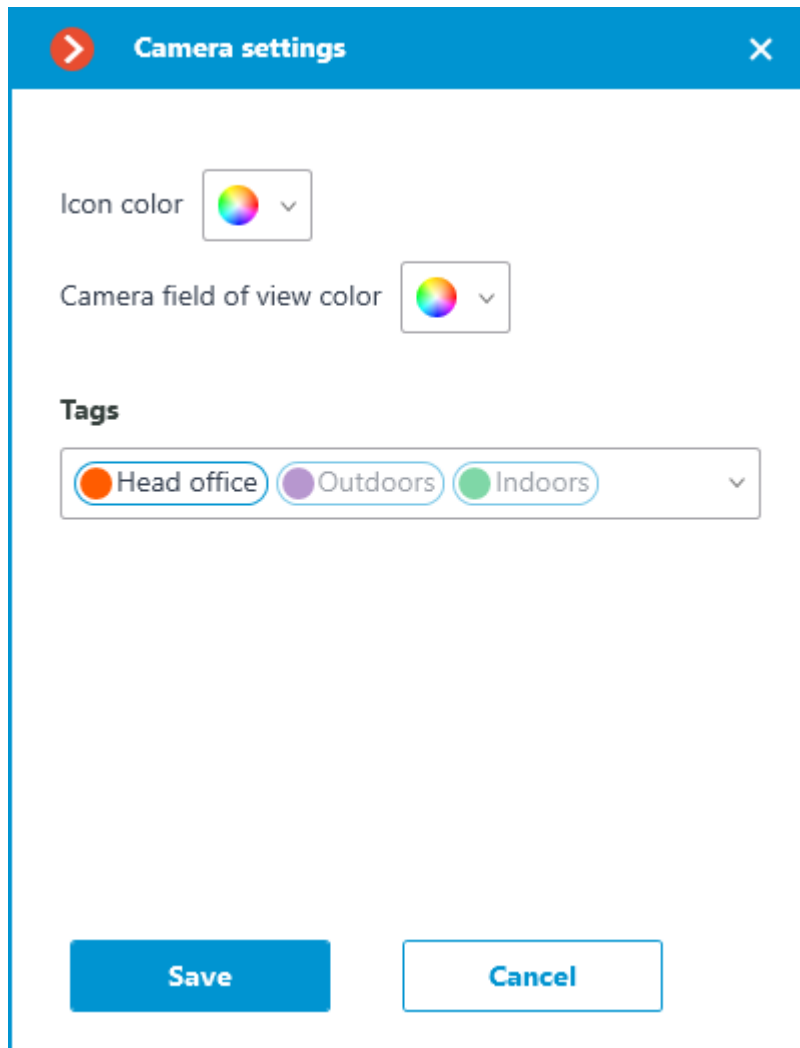
Color of the camera field of view

Tags



In the drop-down list, it is possible both to select from already available tags and to create a new one. To create a new tag, give it a name, select a color, and click the ✓ button. The created tag will appear in the list of tags.

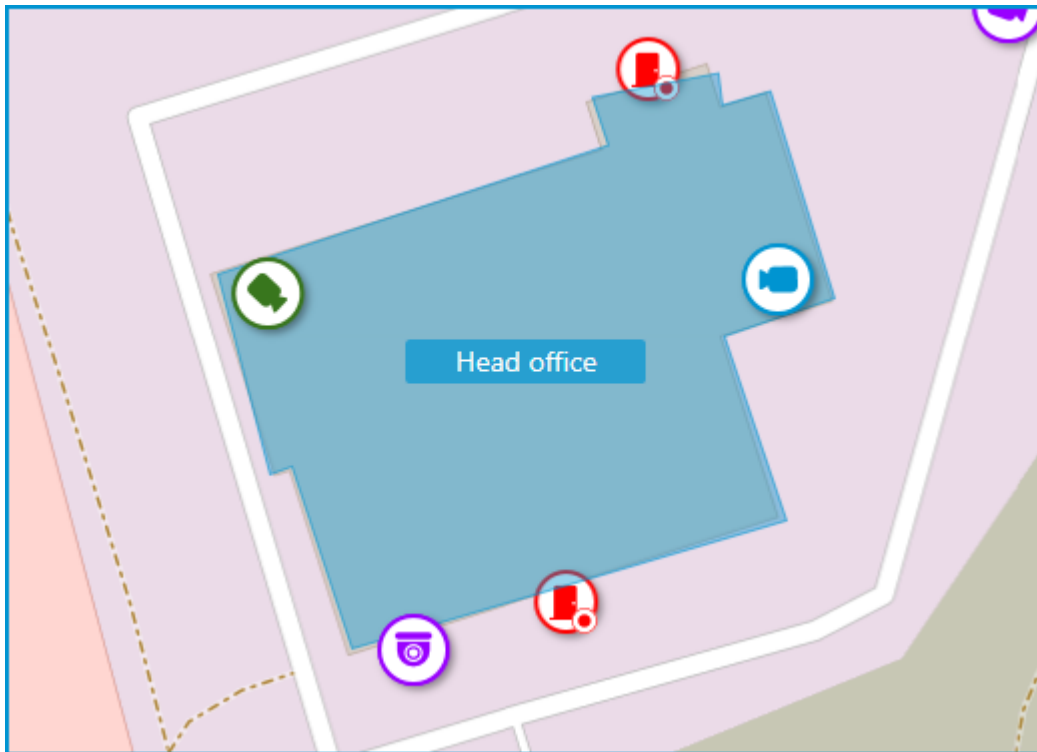
This settings window is available both for individual cameras and for entire groups. When opening the settings window for a group of cameras at once, the own settings of cameras are displayed in the combined view. If the camera settings are the same, the actual parameter values will be displayed for the group. Otherwise, merged information is displayed.









Placement of cameras on the plan

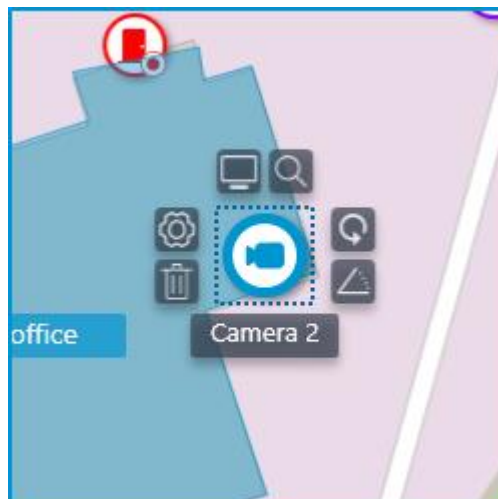
To add a camera to the plan, drag it from the camera tree to the needed point on the plan.

The camera icon depends on the settings you set in the **Cameras** section. If PTZ functionality is enabled for a camera, it will be displayed on the map with the corresponding icon. Other cameras are displayed with the usual icon.




When a camera is selected on the map, the following buttons appear around it:

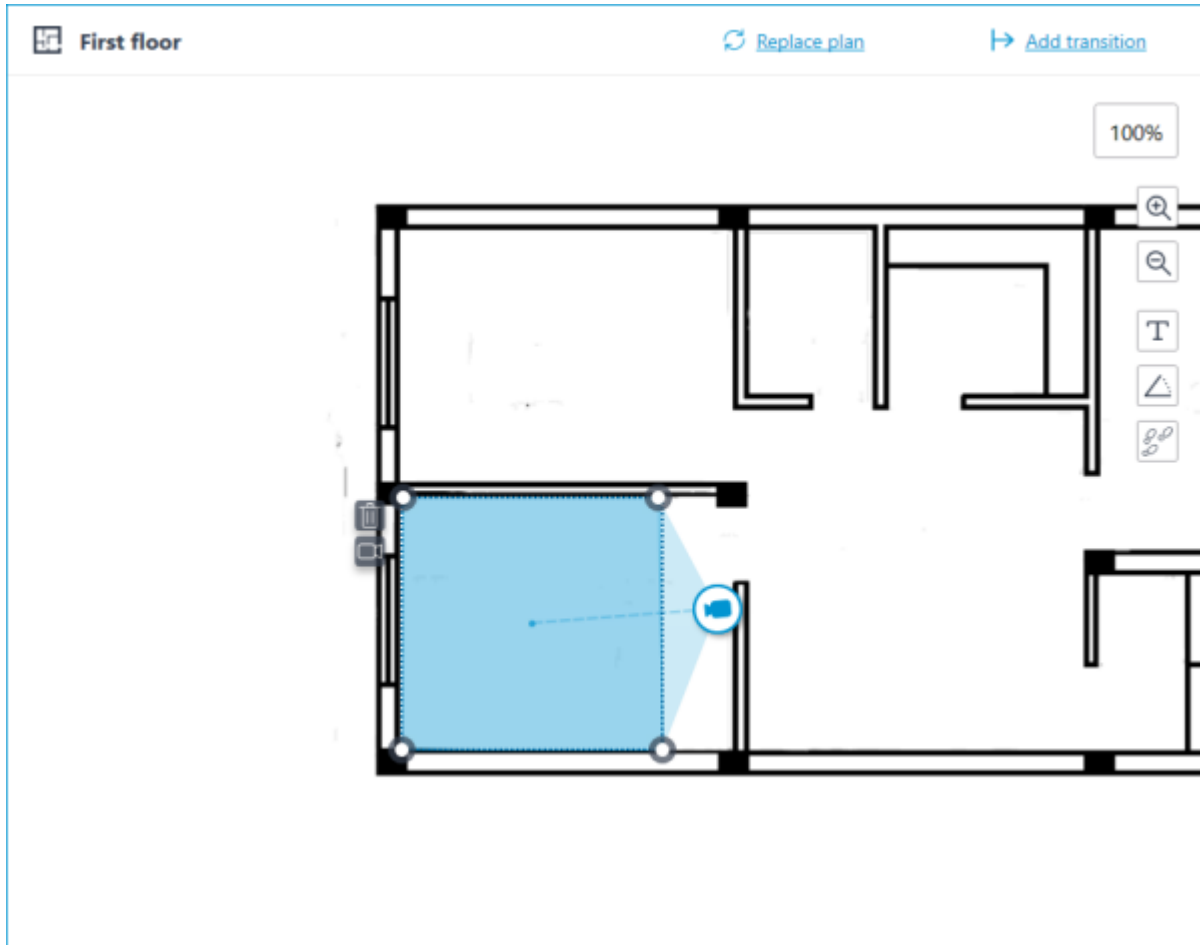
-  : view video from the camera in full-screen mode.
-  : edit camera settings.
-  : remove the camera from the map.
-  : rotate the camera.
-  : set up the field of view.
-  : jump to the camera position in the tree.




Also, when a camera is selected, its name will be displayed. By default, it is hidden.


Camera field of view

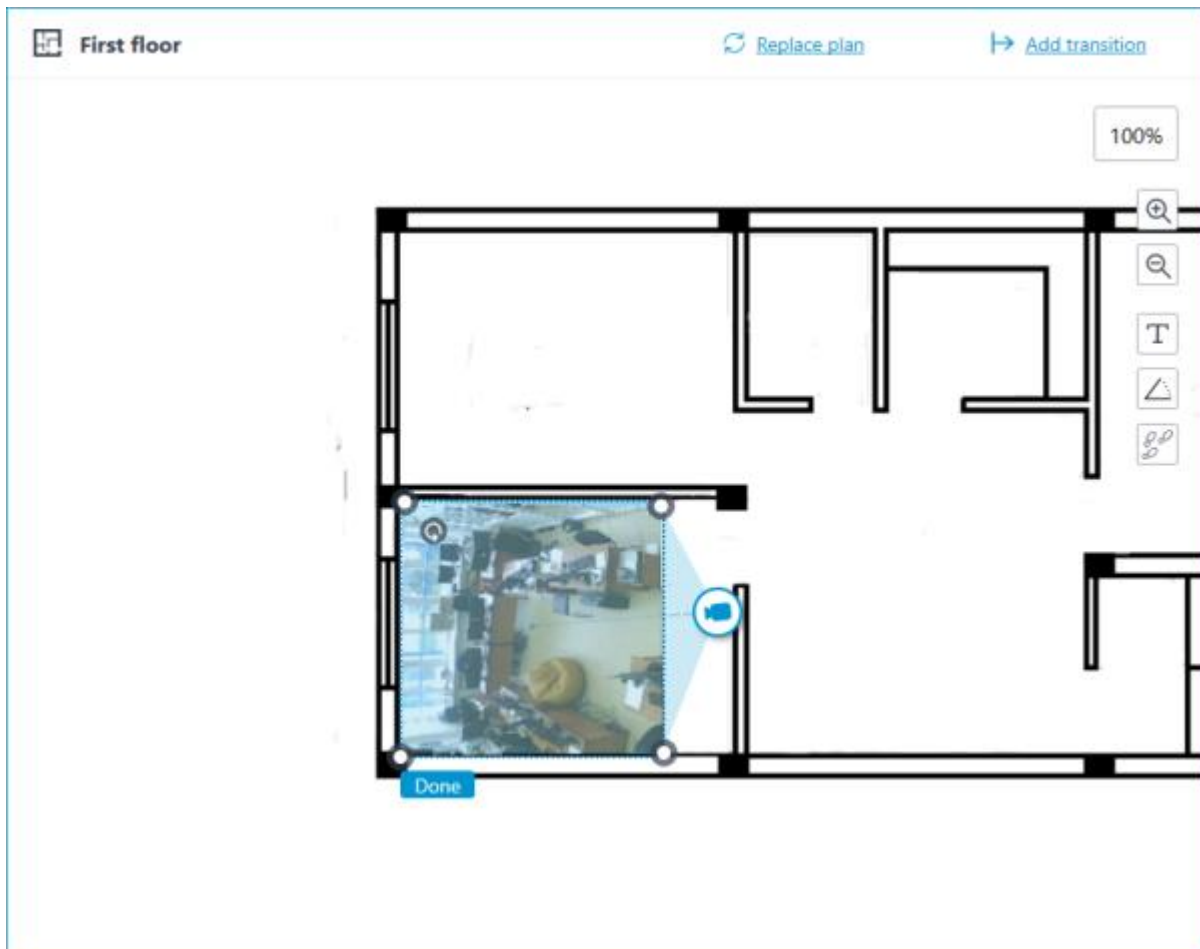
If necessary, a custom field of view can be created. To do this, click the  button. After that, an editable rectangle will appear, which can be used to adjust the needed viewing angle. The shape of the field of view can be changed indefinitely: add and delete nodes, move them along the plan or the map.




To delete a custom camera field of view, select it and click the  button. If the video displaying has been set in the field of view, deleting the FOV deletes this setting as well.

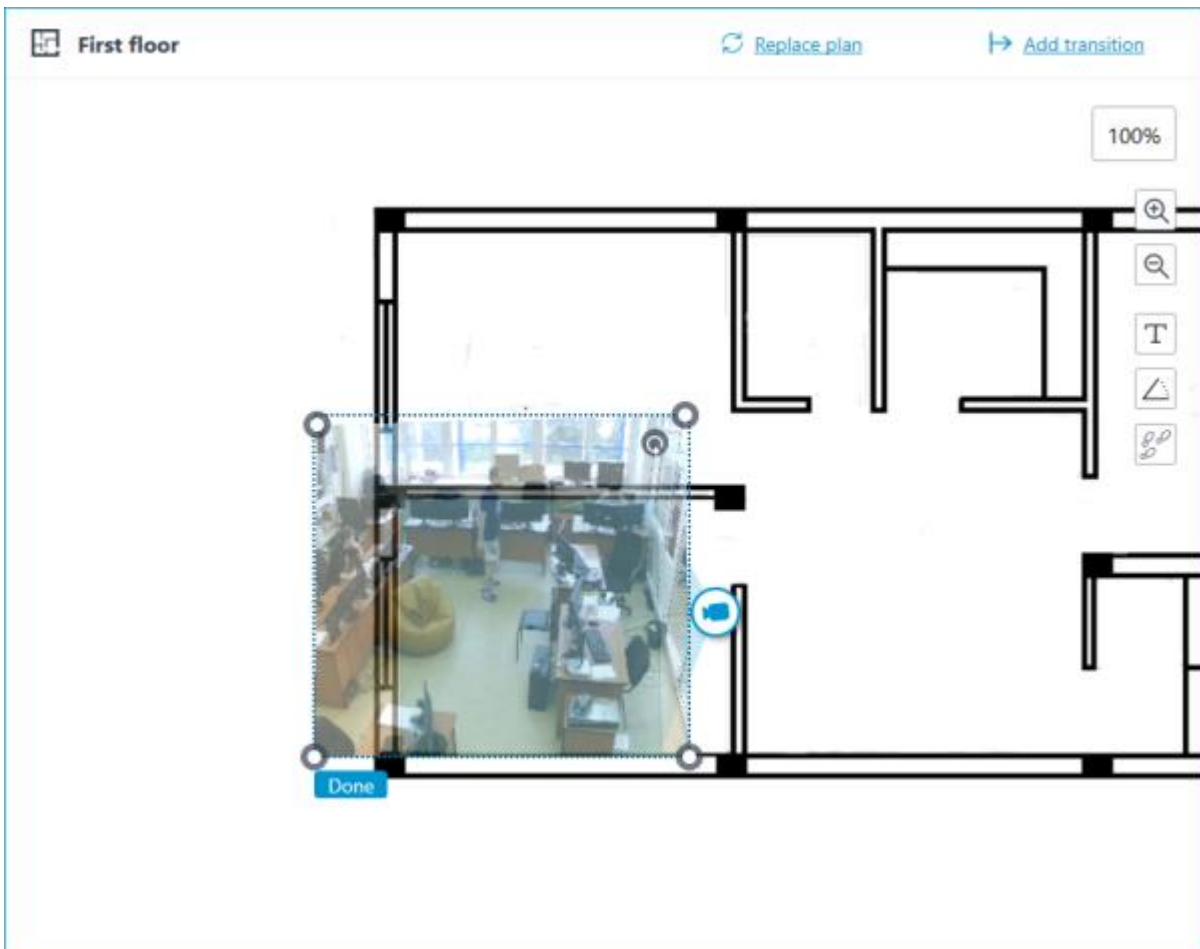
Video inside the field of view

The field of view can display video from the camera. To set it up, click the  button. This will create an editable rectangle in which the live video from the selected camera will be embedded. By default, video appears as the size of the dotted outline of the field of view.

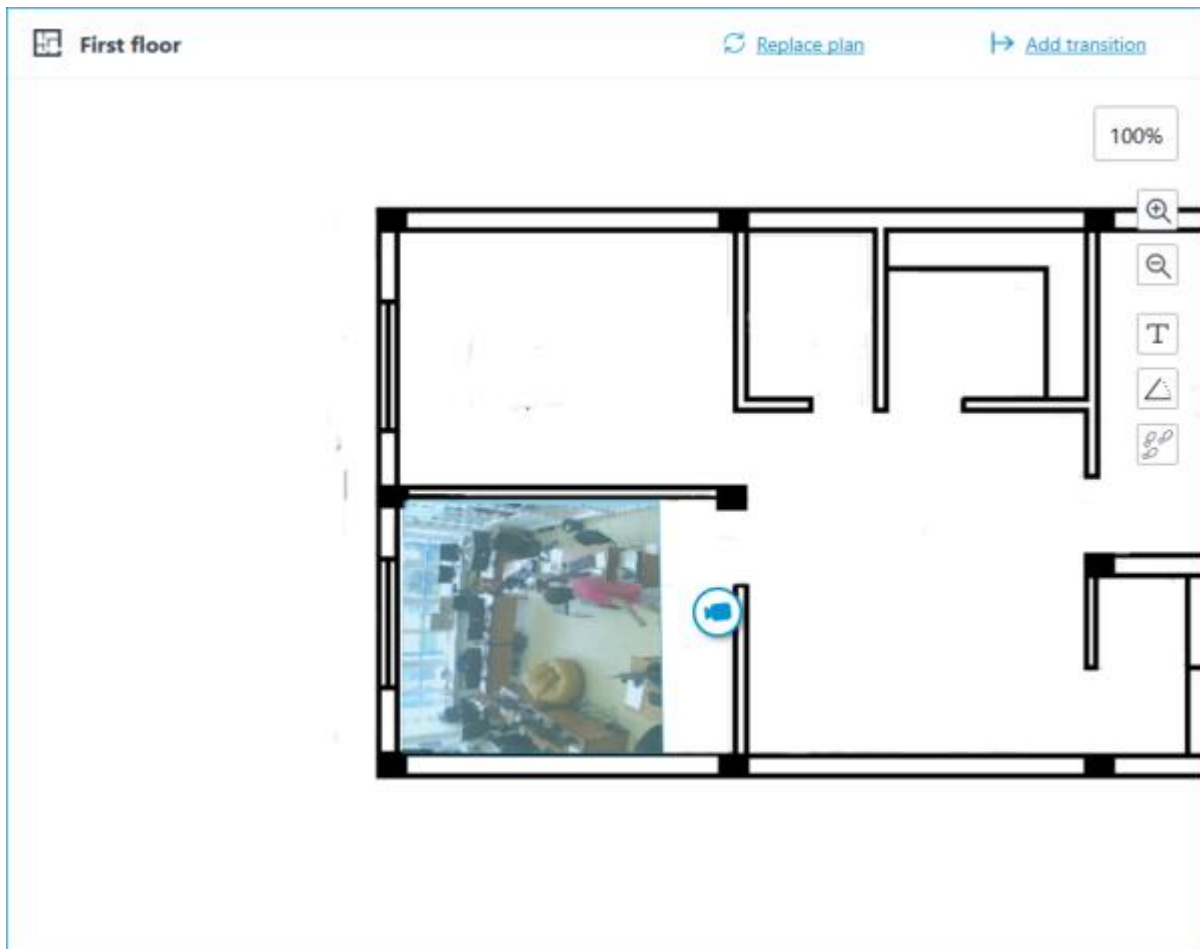


Adjust the shape and location of the displayed video so that the area visible in the frame matches its position on the map. Once ready, click the **Done** button.

To edit an already configured video displaying, click the  button. To reset the video displaying settings in the field of view, click the crossed-out camera button. Reconfiguration of the video displaying after resetting will be performed according to the current shape of the field of view.



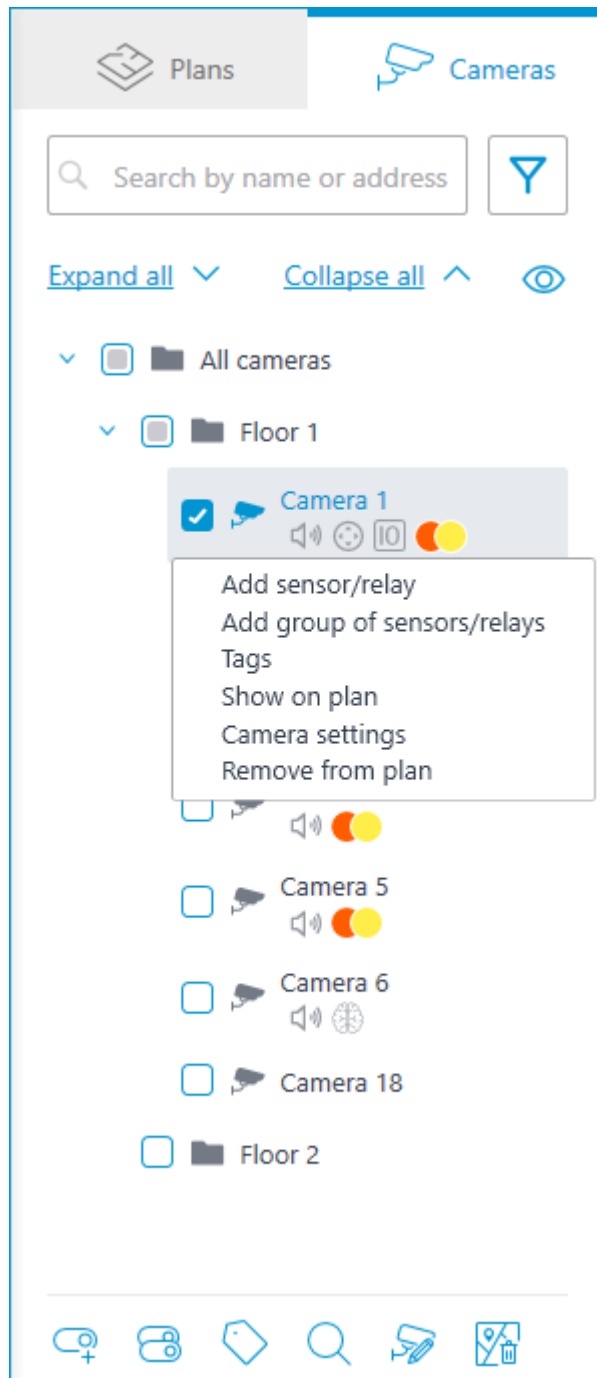
When the field of view editing mode is switched off, the video will be cropped according to the shape of the field of view:



Placement of sensors and relays

If the camera has alarm inputs/outputs enabled in the **Cameras** section, sensors and relays connected to it can be placed to the map.

To place a sensor or a relay, select the **Add sensor/relay** item in the camera context menu or click the corresponding button in the bottom panel of the cameras tree.



The following sensor parameters can be configured in the **Device settings** window:

Type

Sensor

Relay

Displayable icon

Default icon

Door

Barrier

Turnstile

Lock

Name


Number of input/output




Receiving signal status






























The screenshot shows a 'Device settings' dialog box with the following elements:




- Type:** A dropdown menu currently showing 'Sensor'.
- Icon:** A selection box with a dropdown arrow. Below it, a list of icons is displayed, with the first icon (a blue circle with a white center) highlighted.
- Name:** A text input field containing the text 'Entry point 1'.
- Number of input/output:** A numeric spinner set to the value '1'.
- Receiving signal status:** Two radio buttons are present. The first is red and the second is green. The green radio button is selected.
- Buttons:** 'Save' and 'Cancel' buttons are located at the bottom of the dialog.

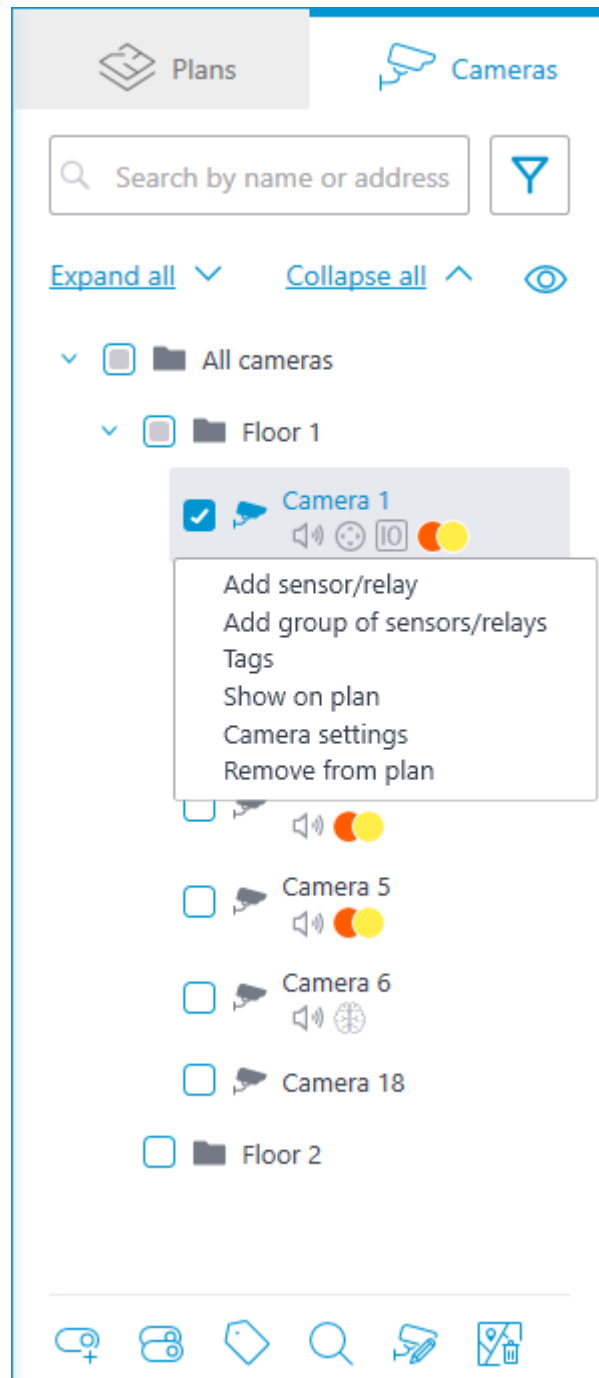
Sensors are displayed in the camera tree for those cameras to which they are connected. The device type and name of the sensor are also displayed there.



[Expand all](#)  [Collapse all](#)  

-  All cameras
 -  Head office
 -  Camera 1   
 -  Camera 2  
 -  Camera 3   
 -  Door sensor
 -  Electronic lock
 -  Camera 4    
 -  Camera 5    
 -  Camera 6  
 -  Local store



To create a sensor or relay group, click **Add group of sensors/relays** in the camera context menu or at the bottom of the camera tree.

In the **Add group of devices** window, all the same parameters can be selected that are available when setting up an individual sensor. But the difference is that in this case, several I/Os can be specified simultaneously.

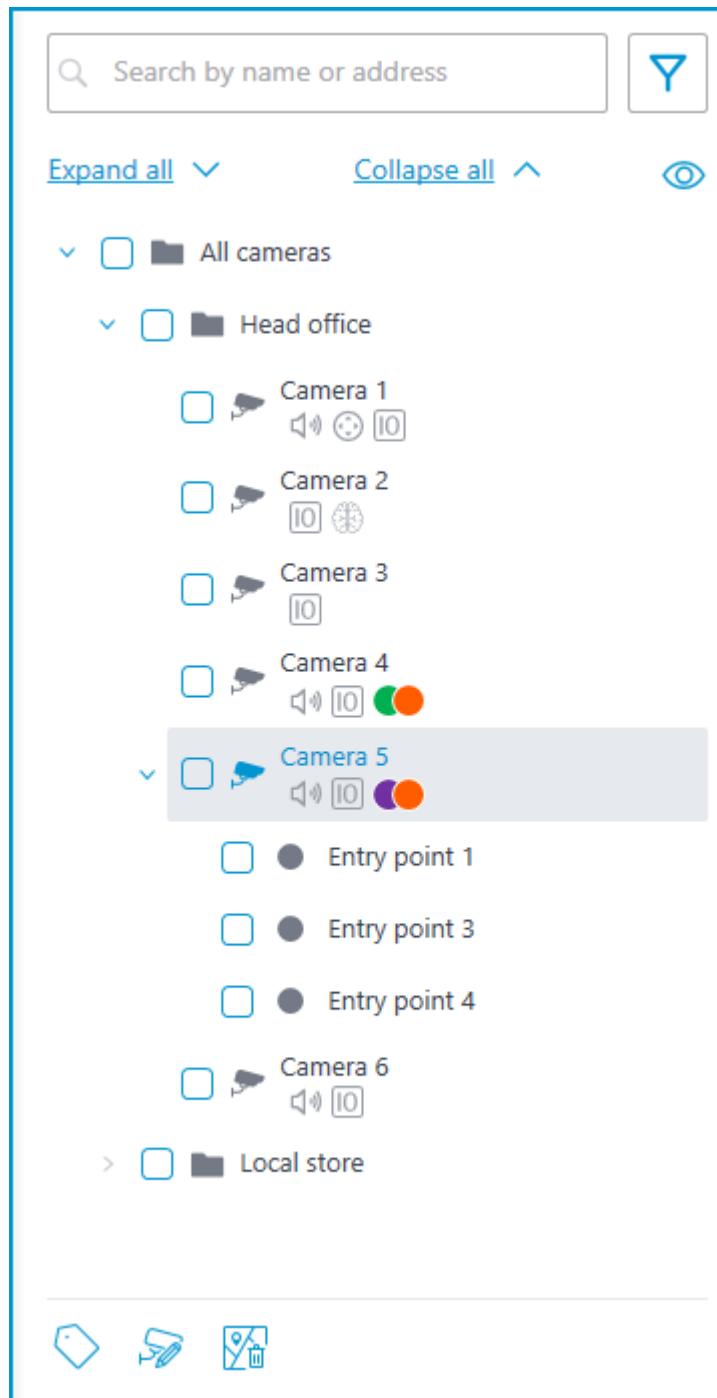
Add group of devices ×

Type: ▼ Icon: ▼ Name:

Numbers of inputs/outputs ⓘ: Receiving signal status:

Save **Cancel**

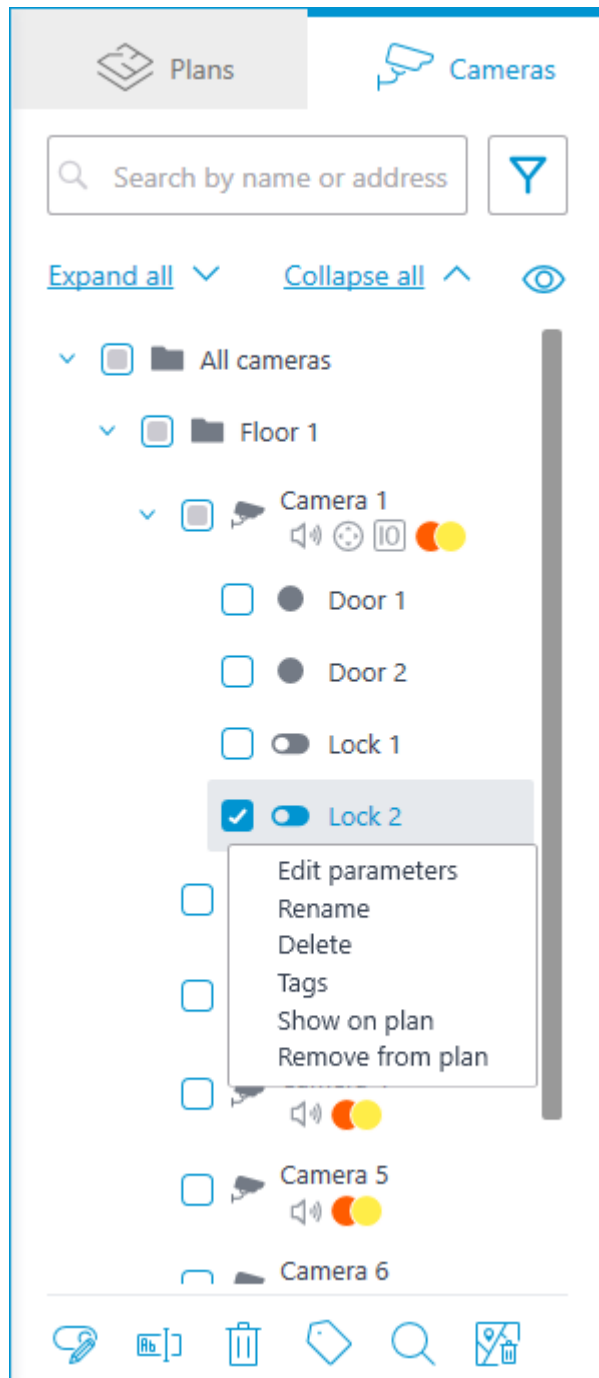
After clicking the **Save** button, all sensors/relays will be added to the associated camera. The device name will be generated from the sensor name and the input number.



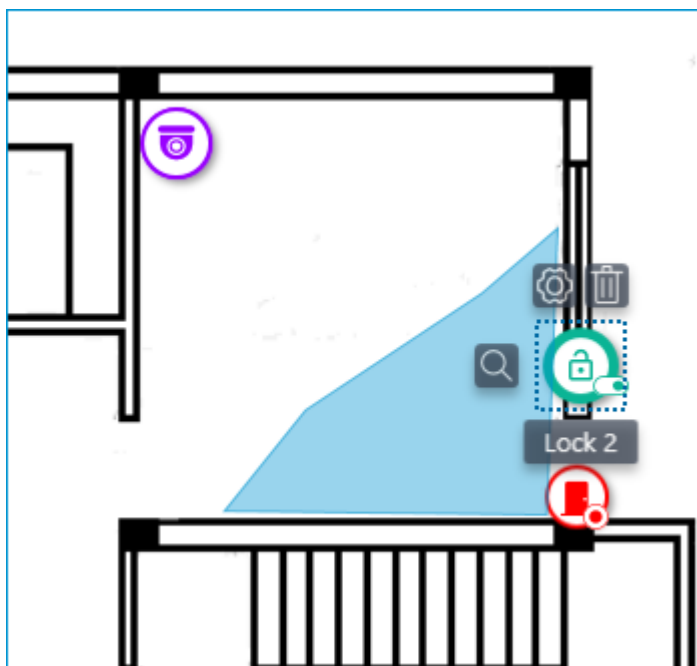
If the sensor is placed to the plan, the following additional items appear in its context menu:

Show on plan

Remove from plan



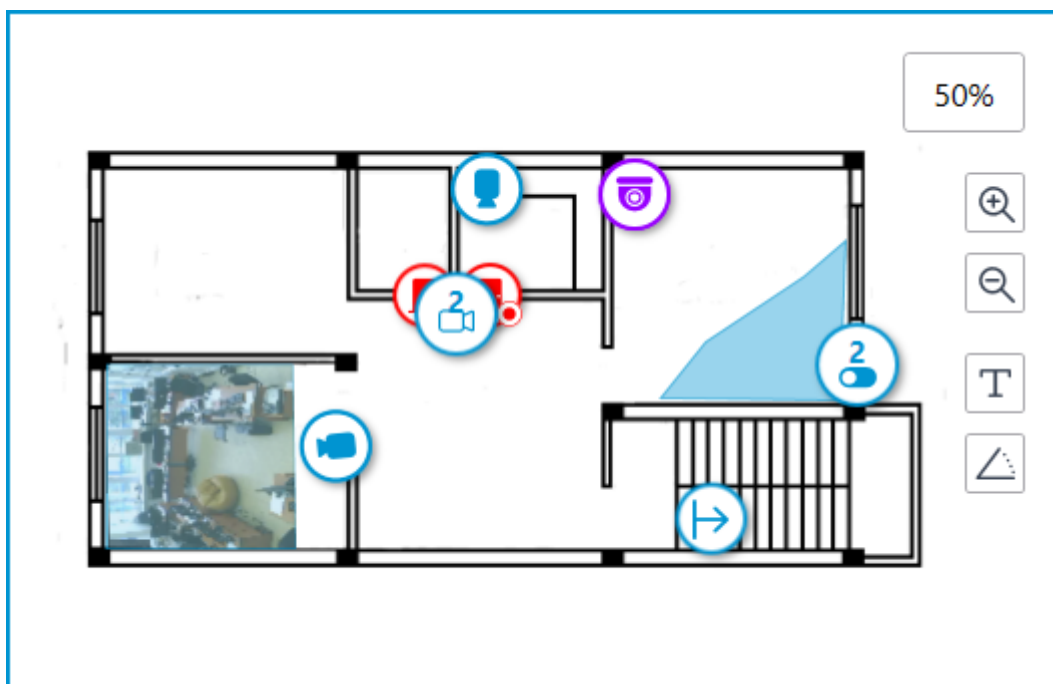
The sensor will be displayed on the map with the icon that was selected when it was created. The device type will also be displayed. The color of the sensor depends on the specified state when there is a signal and, consequently, on the current signal status for this sensor.



When the sensor is selected on the map, its name and the following buttons appear: **Edit parameters**, **Remove from map**, and **Show in tree**.

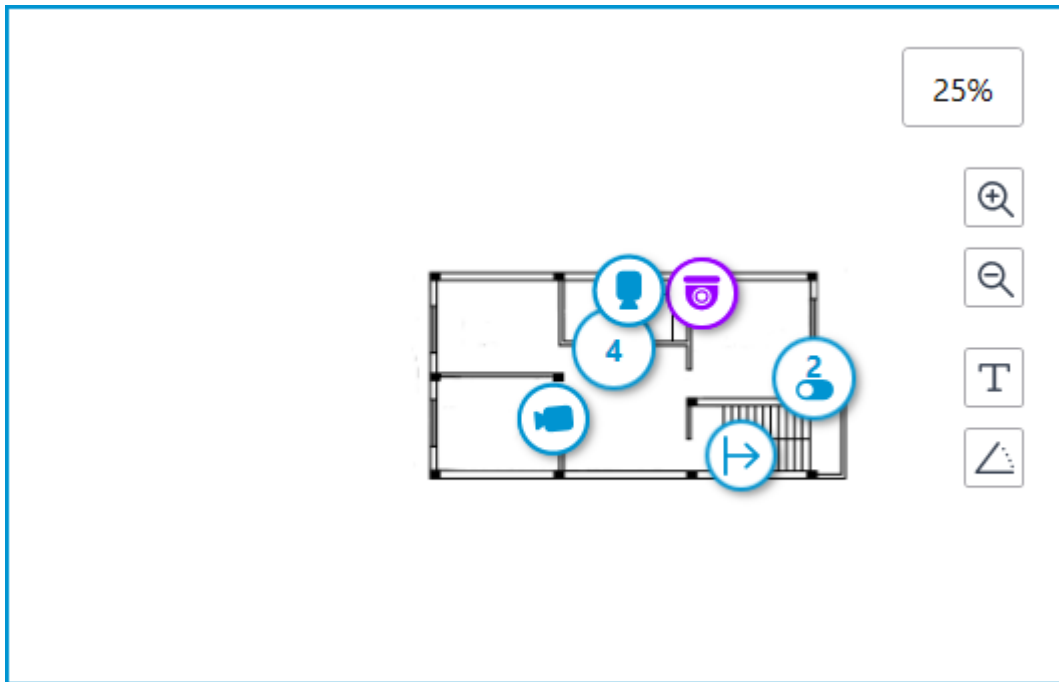
Grouping devices on the plan

When the scale of the plan is changing, cameras, sensors, relays, and transition points on the map can be clustered into the group markers.



Elements of the same type located close to each other on the plan are grouped into one marker with the number of devices and their type: camera, sensor, relay, or transition.

Elements of different types are grouped into one marker with the number of devices.

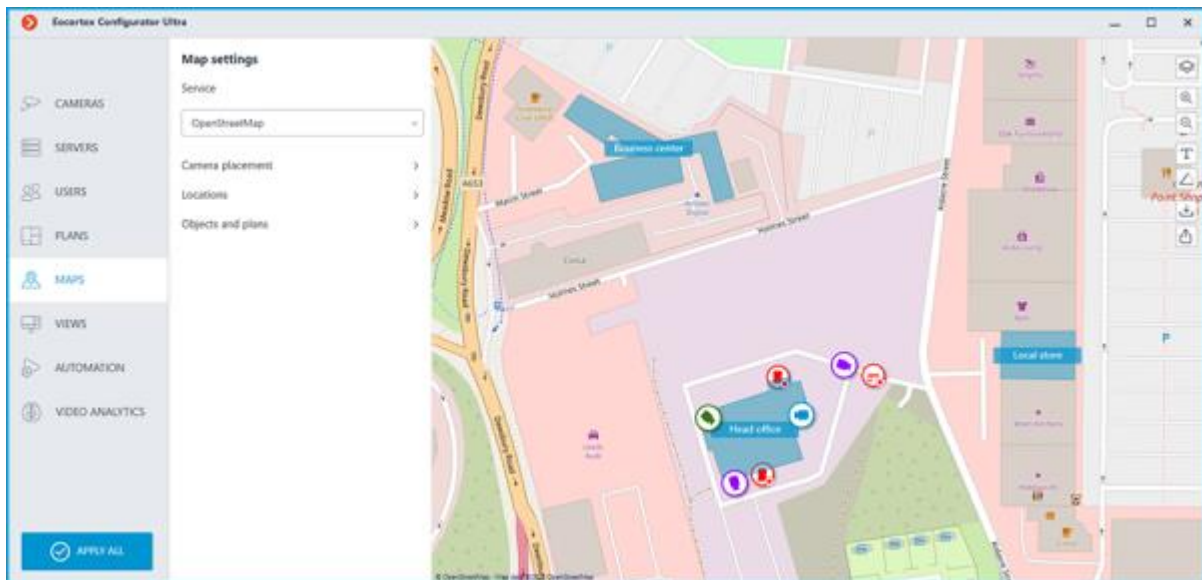


If the number of grouped elements is more than 99, the number on the marker will be displayed as **99+**.

Maps

This feature is available only for **Enterprise** and **ULTRA** licenses.

To place cameras on the geographical maps provided by the cartographic services, go to the **Maps** tab in the **Eocortex Configurator** application.



This tab displays a geographical map with the cameras, sensors, and relays placed on it.

A bar with the following buttons is available on the right side of the map:


 **Change layer:** Changes the current map layer.


 **Zoom in:** Scales the map up.

 **Zoom out:** Scales the map down.


The scale can also be changed with the mouse wheel.

 **Show camera names:** Hides or displays the names of all cameras on the map.


 **Show fields of view:** Hides or displays the field of view of all cameras on the map. If no fields of view are configured, this button will not be displayed on the panel.


 **Camera configuration export:** Exports the current map settings to the device. The export can be made to a CSV file, which contains:

1. Identifier of the camera.
2. Full camera path, including the camera name.
3. Coordinates of the camera on the map. If the camera is not placed to the map — the coordinates will not be added.

 **Camera configuration import:** Imports a map settings file. When imported, the camera is added to the map by the coordinates written in the file.

If the camera is already placed to the map, the imported settings will change its coordinates to the new ones. If the file does not contain the coordinates for this camera — it will be removed from the map. For those cameras that were not found in the current configuration of the system or whose coordinates are specified incorrectly, an error message will be displayed. The import of the remaining cameras will continue.

 **Edit camera settings:** Opens the camera settings window. This button will not appear in the panel if no object is selected.

 **Remove selected objects from map:** Deletes the selected objects from the map. This button will not appear in the panel if no object is selected.

In the **Service** section, the preferred GIS service can be selected.

Changing the GIS service does not change the current position.

The following GIS services are available:

- OpenStreetMap
- Google Maps
- Yandex

Layers of the map can be changed by clicking the  button on the panel located to the right of the map.

- **OpenStreetMap**

Available layers: **OpenStreetMap; OpenCycleMap; OpenCycleLandscapeMap.**

- **Google Maps**

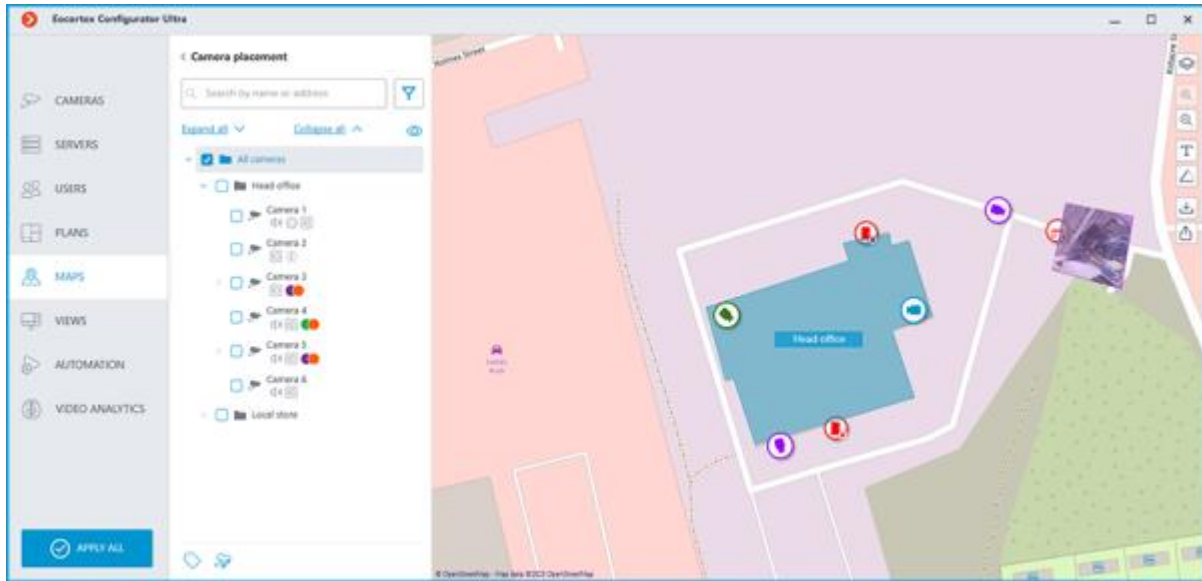
Available layers: **Map; Satellite.**

- **Yandex**

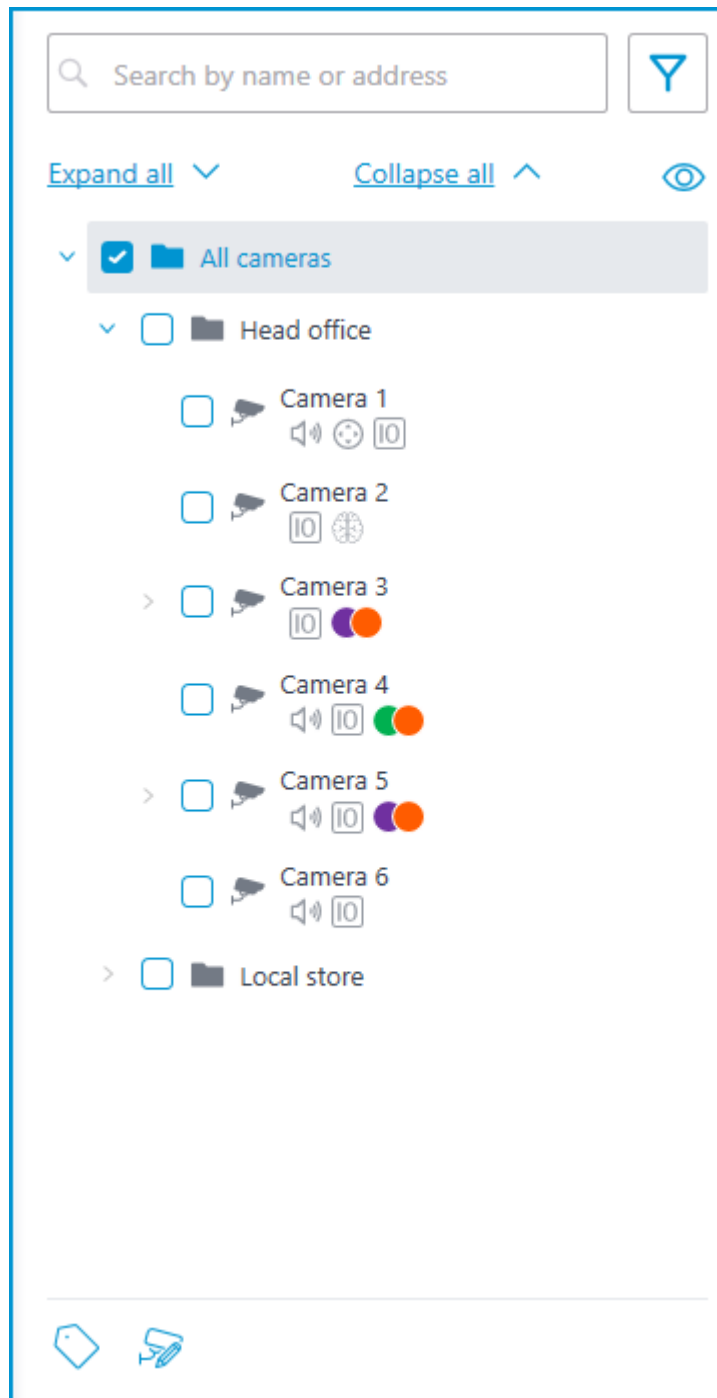
Available layers: **Map; Satellite.**

Below there are the **Camera placement**, **Locations**, and **Objects and plans** tabs. Clicking them opens the corresponding settings panel.





Camera placement



This tab contains the cameras tree.

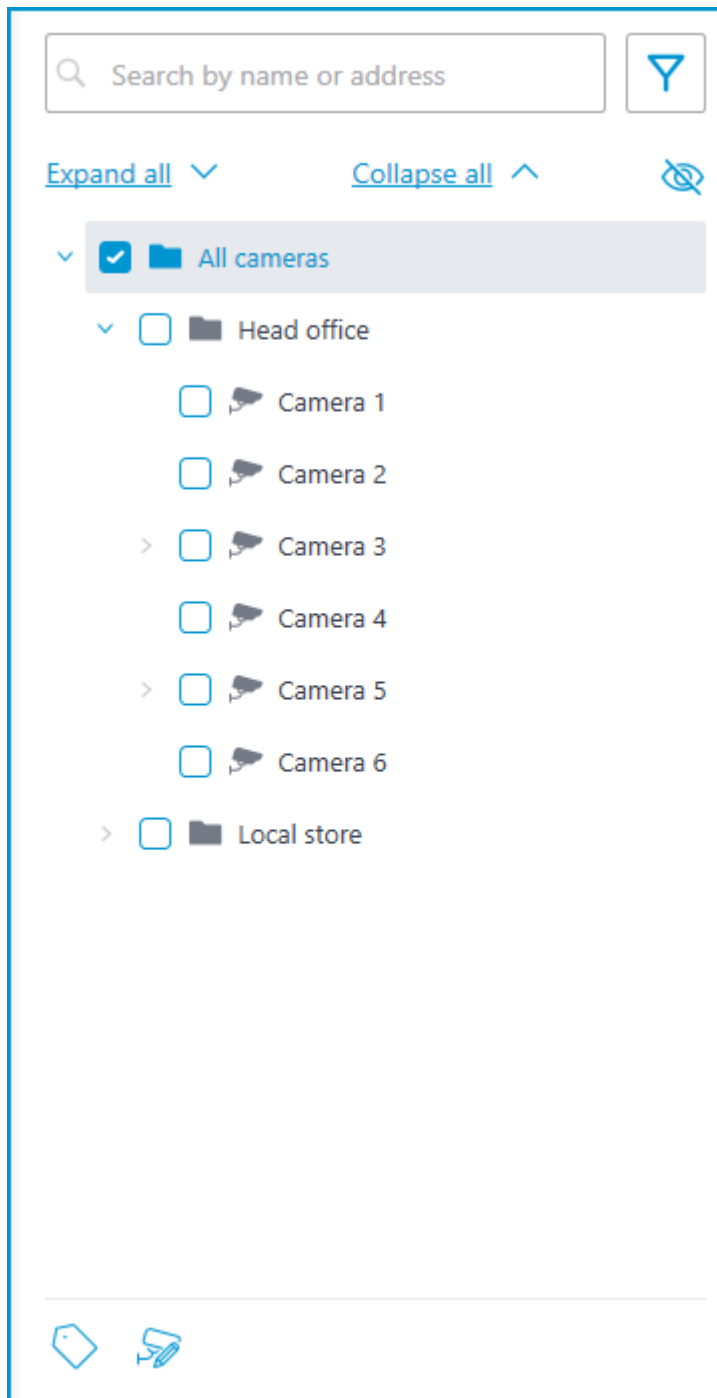


Cameras can have the following attributes:

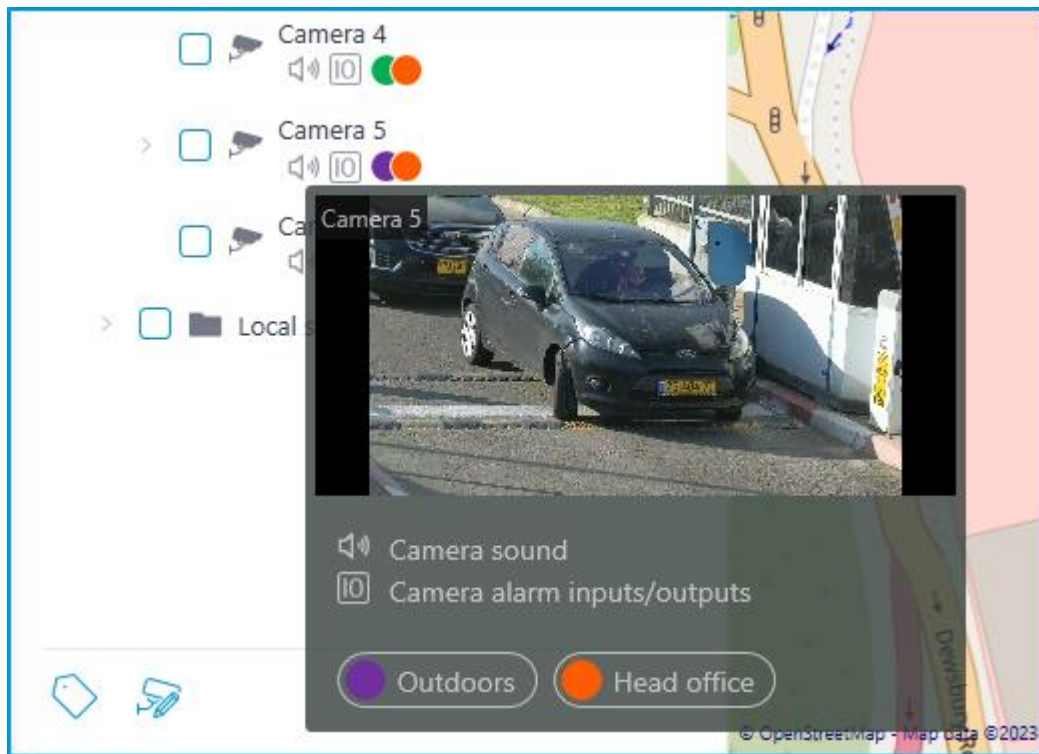
-  : the camera has enabled video analytics module;
-  : the camera has enabled sound receiving option;
-  : the camera has enabled PTZ;
-  : the camera has enabled alarm inputs/outputs.

Colored labels: the camera has tags with the displayed colors;

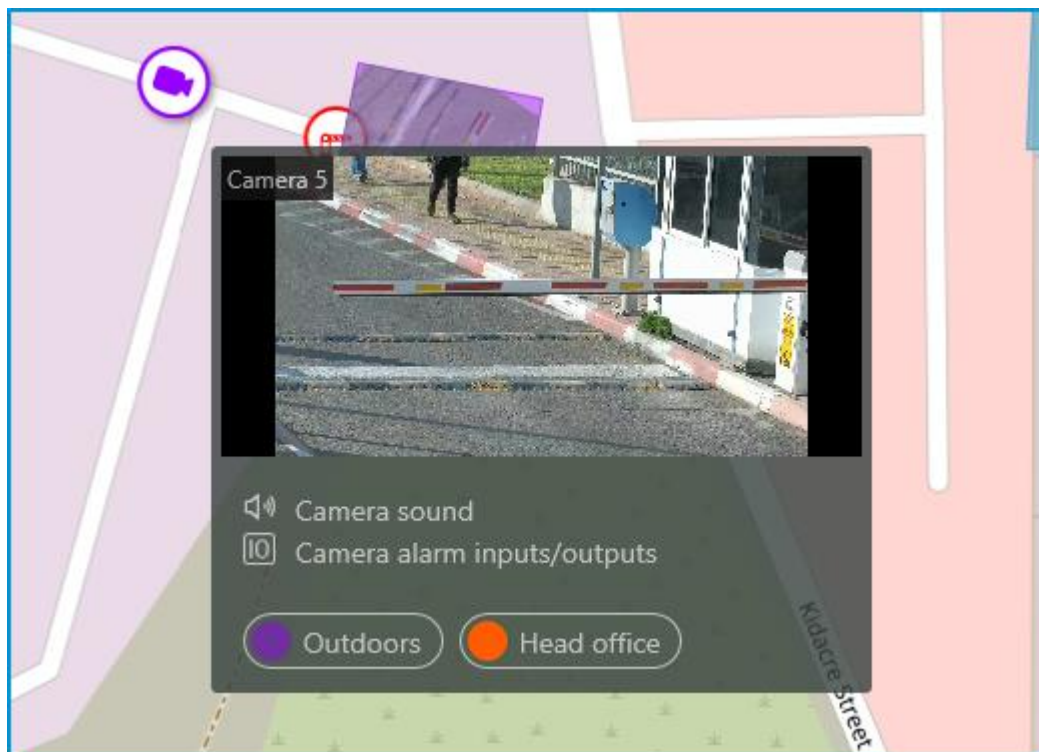
If necessary, the attributes can be hidden by clicking the  icon on the right side of the tree.



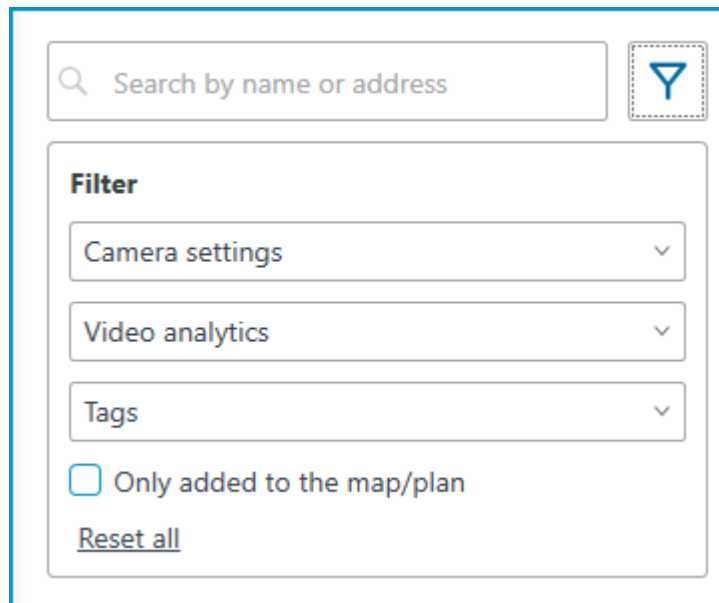
Hovering the cursor over the camera opens a preview window that contains video from the camera and a list of its attributes.



The same preview window opens when hovering the cursor over a camera located outside the cameras tree.






In addition to selecting a camera manually, it can also be found by **name** or **IP address** using the search field above the cameras tree.



Cameras can be filtered by clicking the  icon and customizing the following filter options:



Camera settings

Filter by the following attributes: , , .

Video analytics

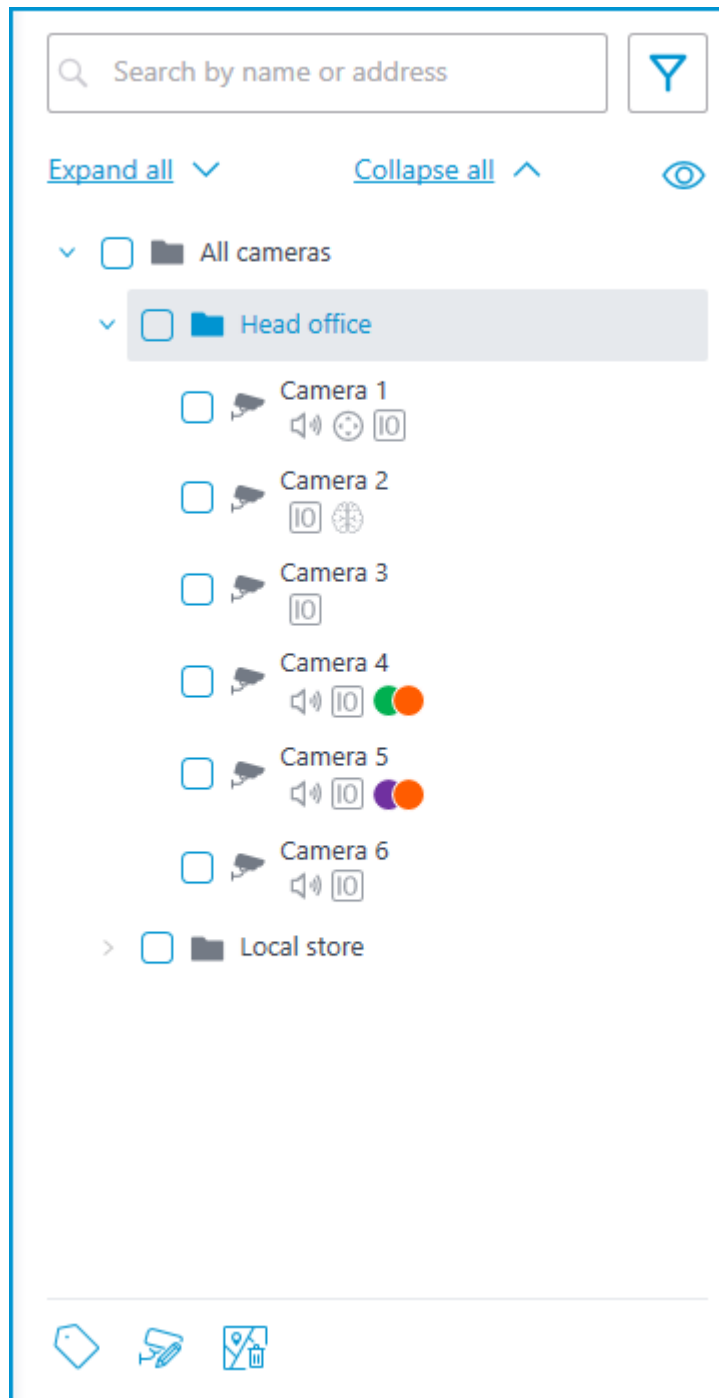
Tags

The availability of filtering options depends on the settings of the cameras. Filtering applies immediately after selecting an item.

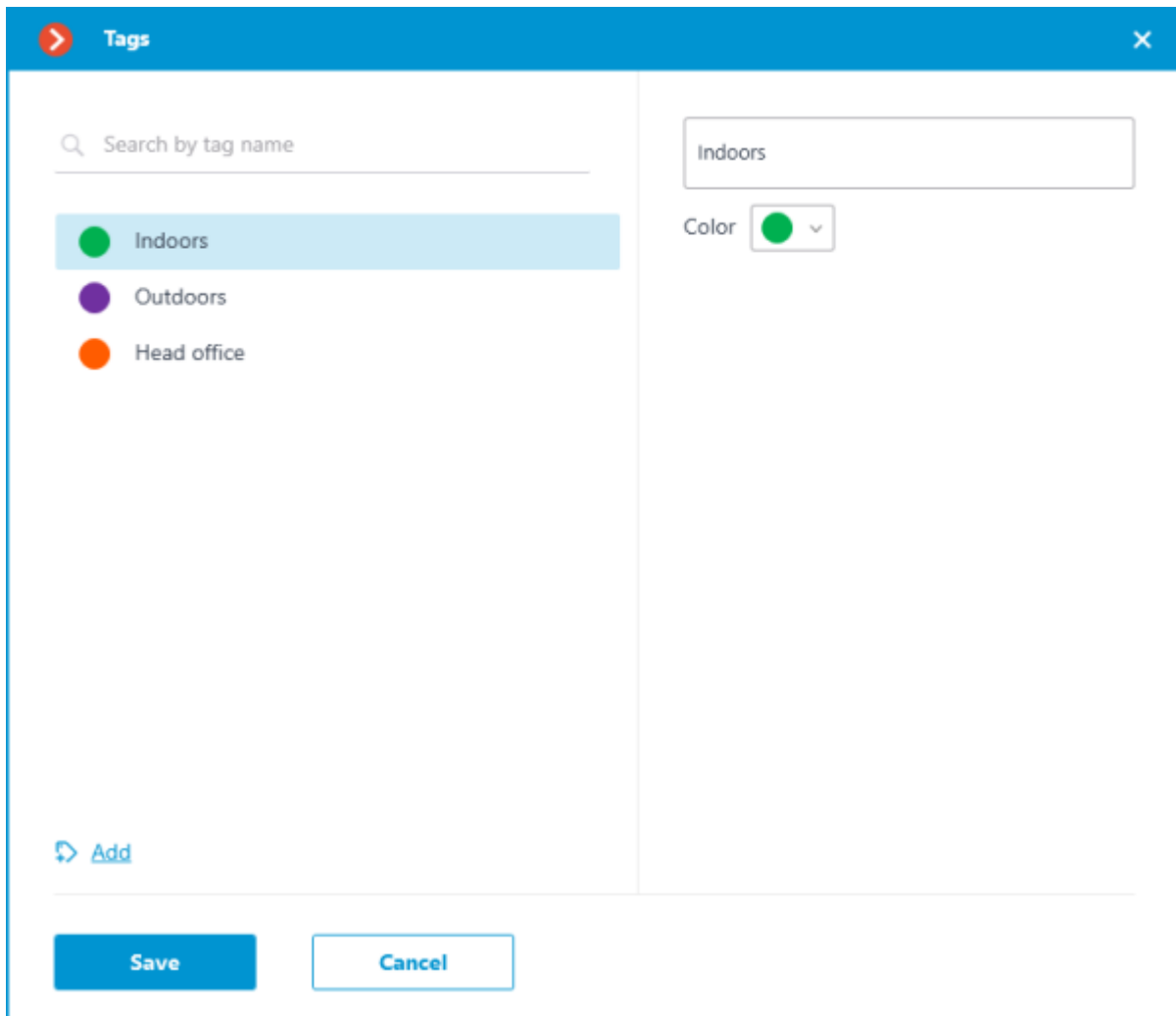
If necessary, the filtering can be collapsed by clicking the  filter button. When the filtering is applied and collapsed, the filter icon changes to .

Tags

For easy navigation in the cameras tree, tags can be added for each camera. The window for creating and editing tags opens by clicking the **Tags** button in the bottom of the cameras tree or by selecting the relevant item in the context menu of the camera.




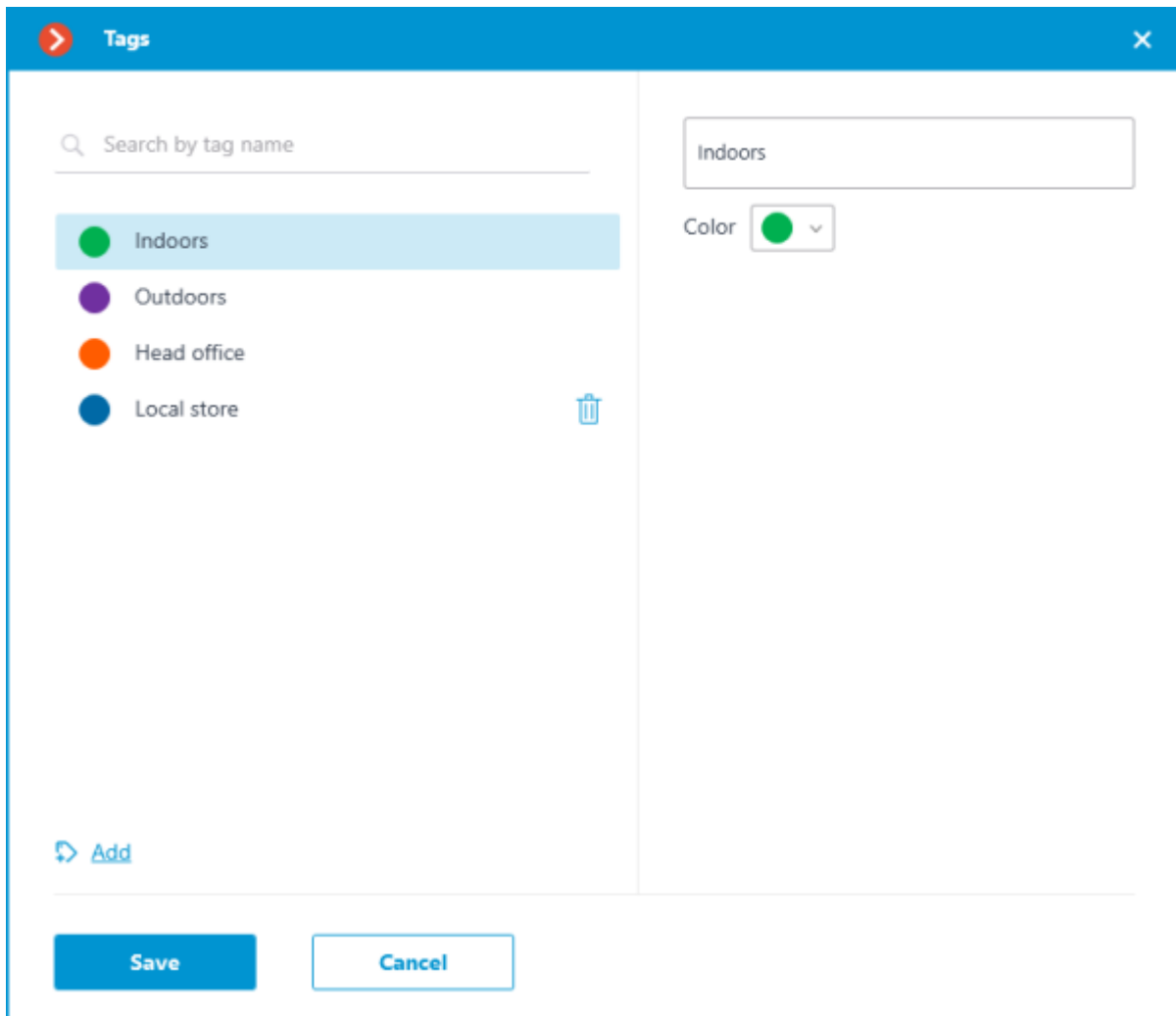
To add a new tag, click the **Add** button.



The tag can have a name and a color. The color can be both selected from the preset options and set an own from the palette.

It is not recommended choosing excessively light colors for tags, as they can blend in with the background.

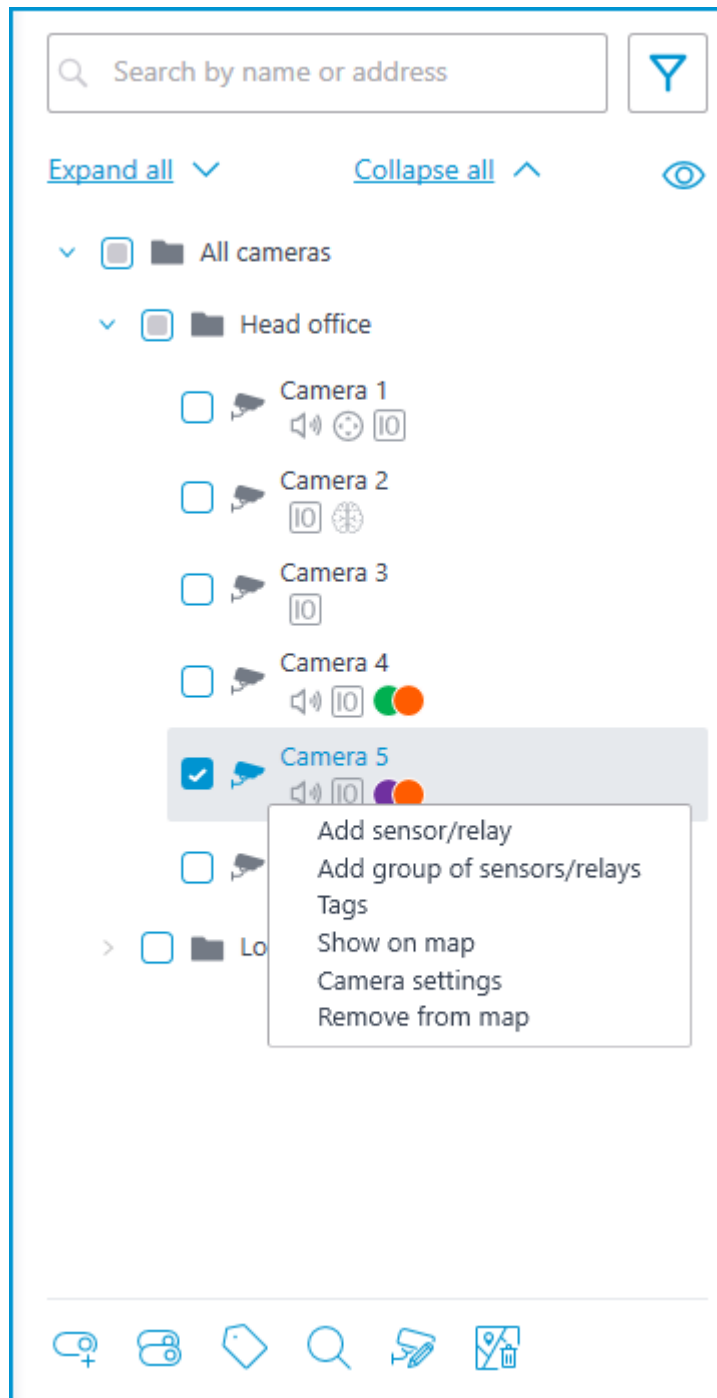
To delete a tag, hover the cursor over it and click the  button that appears.



Also, the settings window allows searching tags by their names.

Representation of the camera on the map

To customize the camera representation, click **Camera settings** in the camera context menu or at the bottom of the camera tree.

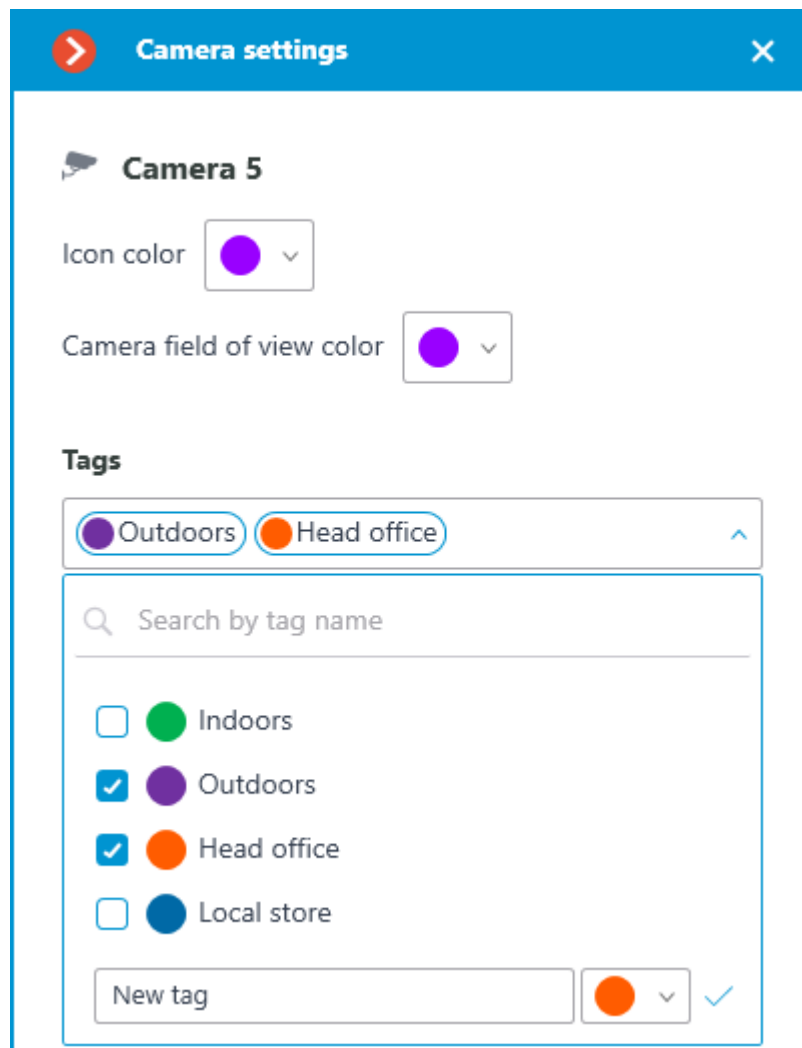


The following can be configured in the camera settings window:

Color of the camera icon

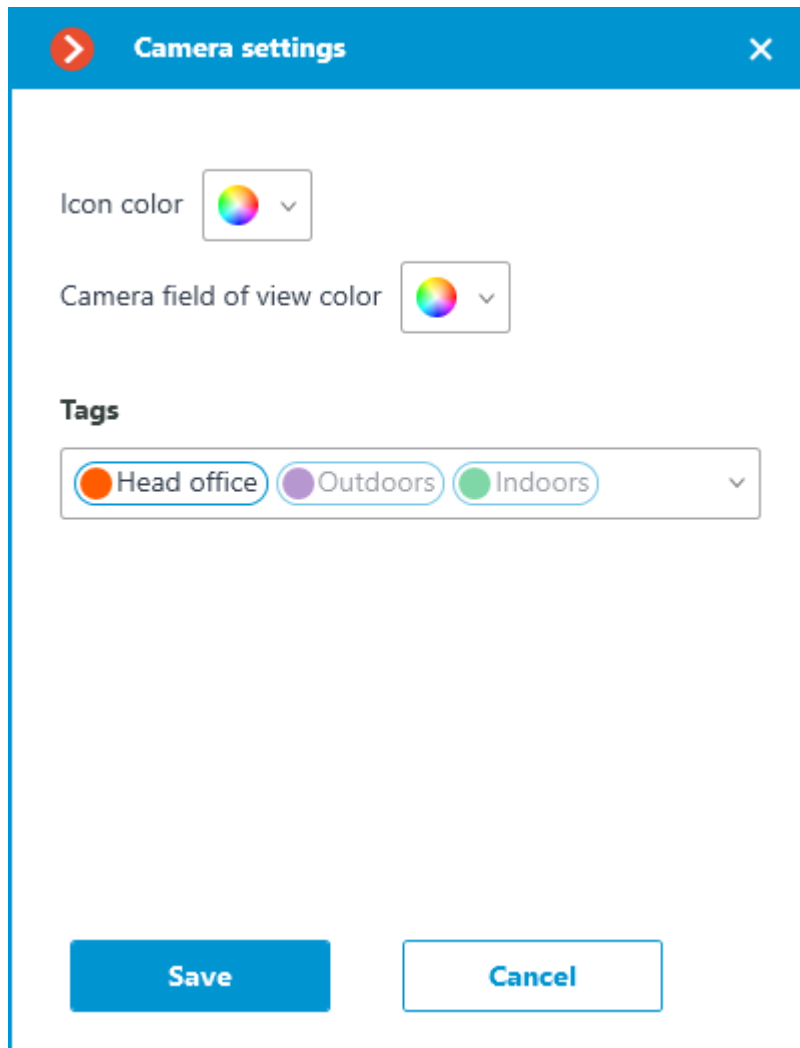
Color of the camera field of view

Tags



In the drop-down list, it is possible both to select from already available tags and to create a new one. To create a new tag, give it a name, select a color, and click the ✓ button. The created tag will appear in the list of tags.

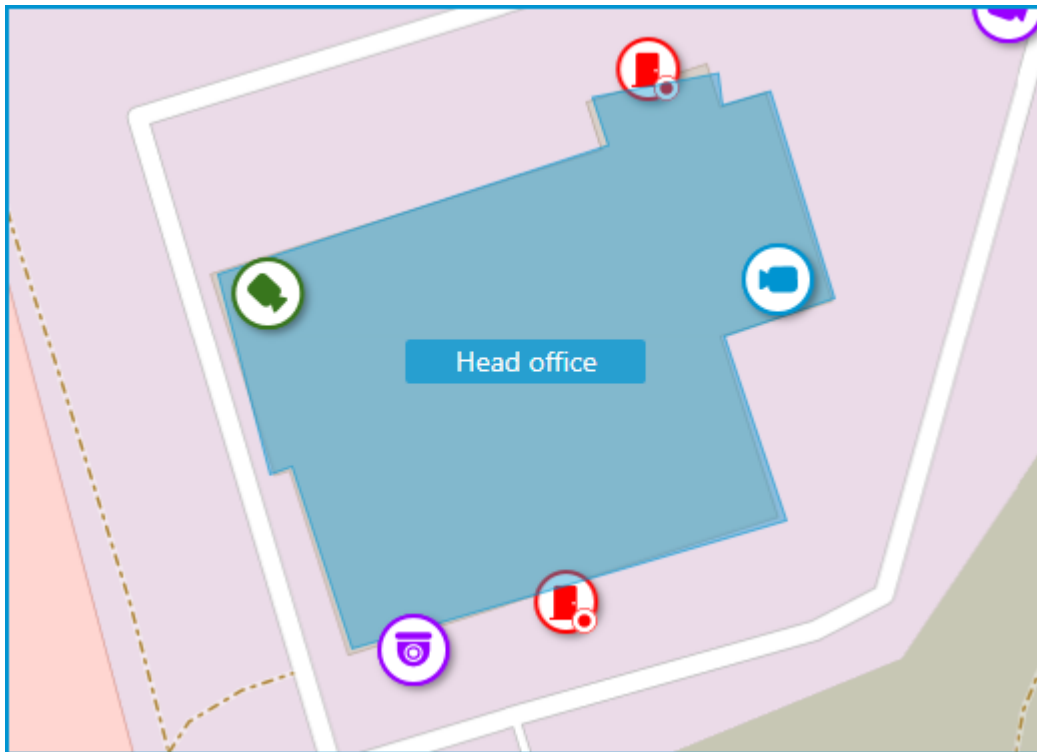
This settings window is available both for individual cameras and for entire groups. When opening the settings window for a group of cameras at once, the own settings of cameras are displayed in the combined view. If the camera settings are the same, the actual parameter values will be displayed for the group. Otherwise, merged information is displayed.









Placement of cameras on the map

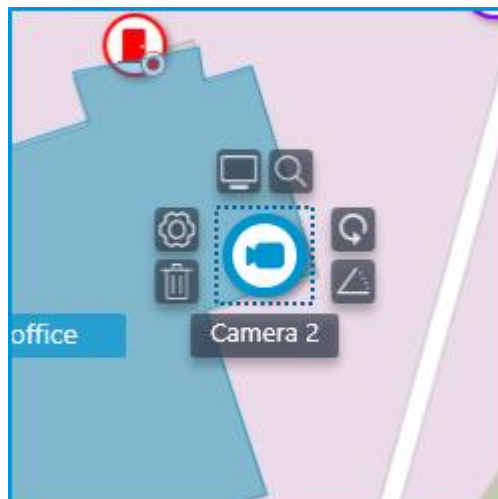
To add a camera to the map, drag it from the camera tree to the needed point on the map.

The camera icon depends on the settings you set in the **Cameras** section. If PTZ functionality is enabled for a camera, it will be displayed on the map with the corresponding icon. Other cameras are displayed with the usual icon.




When a camera is selected on the map, the following buttons appear around it:

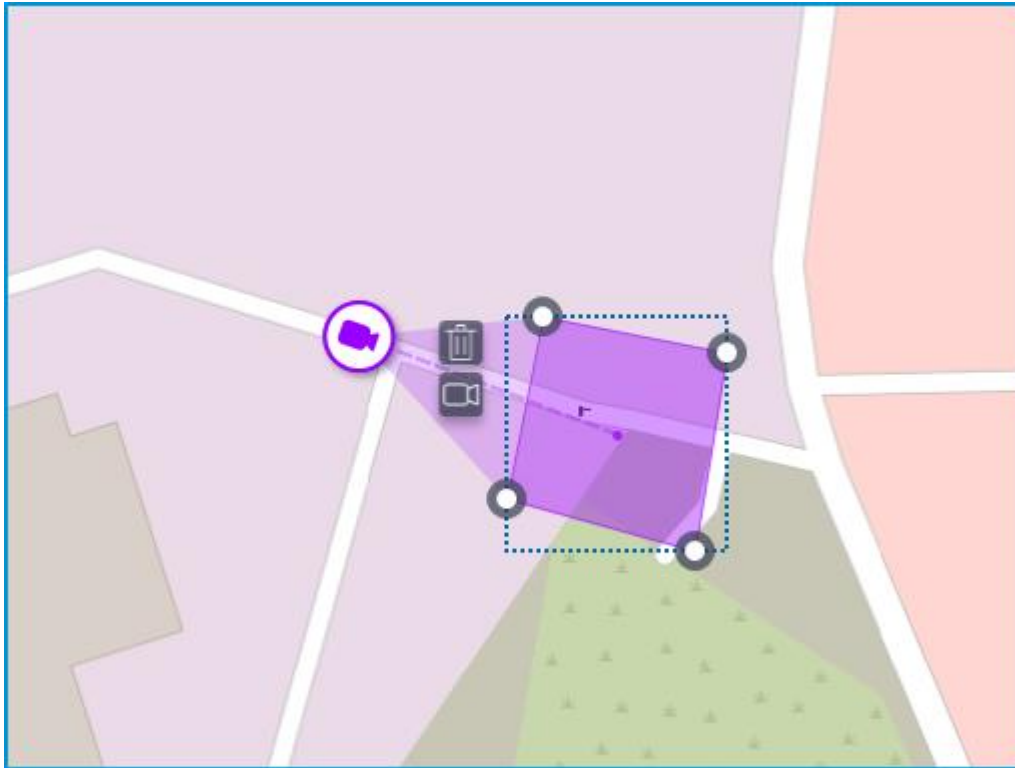
-  : view video from the camera in full-screen mode.
-  : edit camera settings.
-  : remove the camera from the map.
-  : rotate the camera.
-  : set up the field of view.
-  : jump to the camera position in the tree.




Also, when a camera is selected, its name will be displayed. By default, it is hidden.


Camera field of view

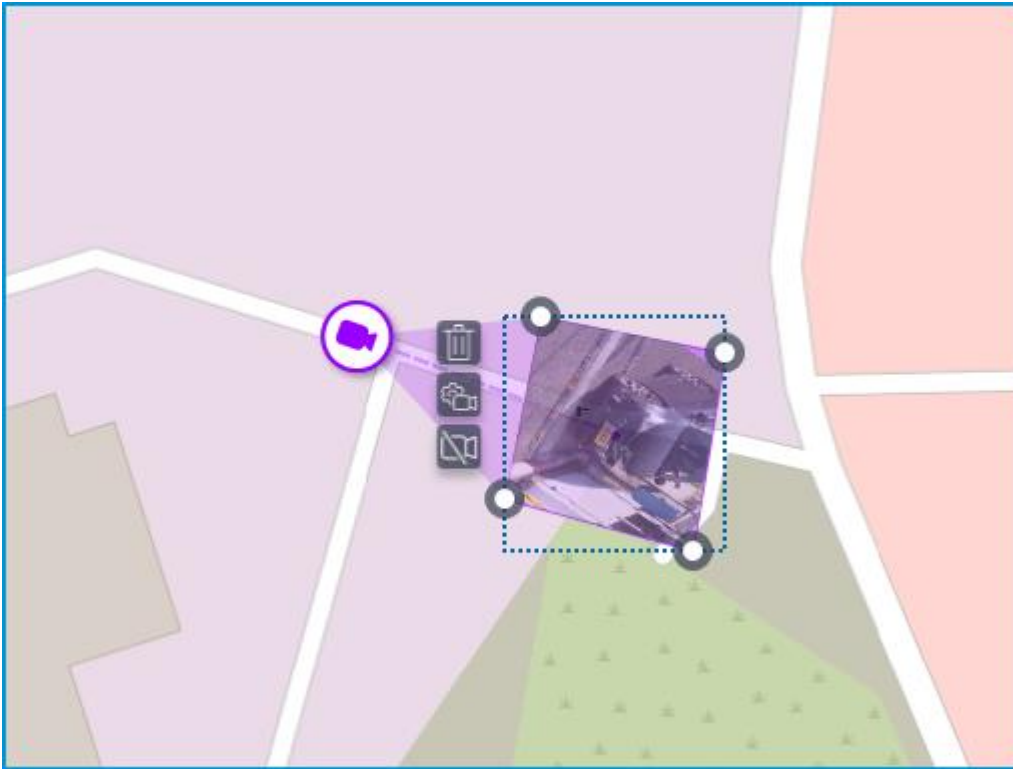
If necessary, a custom field of view can be created. To do this, click the  button. After that, an editable rectangle will appear, which can be used to adjust the needed viewing angle. The shape of the field of view can be changed indefinitely: add and delete nodes, move them along the plan or the map.




To delete a custom camera field of view, select it and click the  button. If the video displaying has been set in the field of view, deleting the FOV deletes this setting as well.

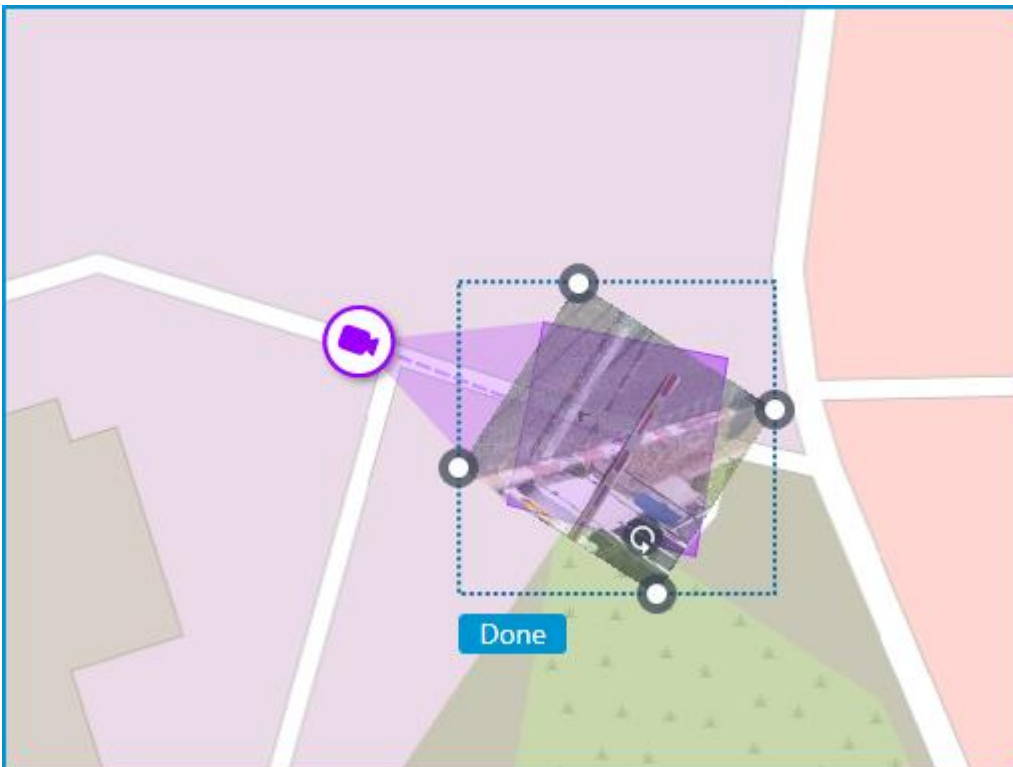
Video inside the field of view

The field of view can display video from the camera. To set it up, click the  button. This will create an editable rectangle in which the live video from the selected camera will be embedded. By default, video appears as the size of the dotted outline of the field of view.

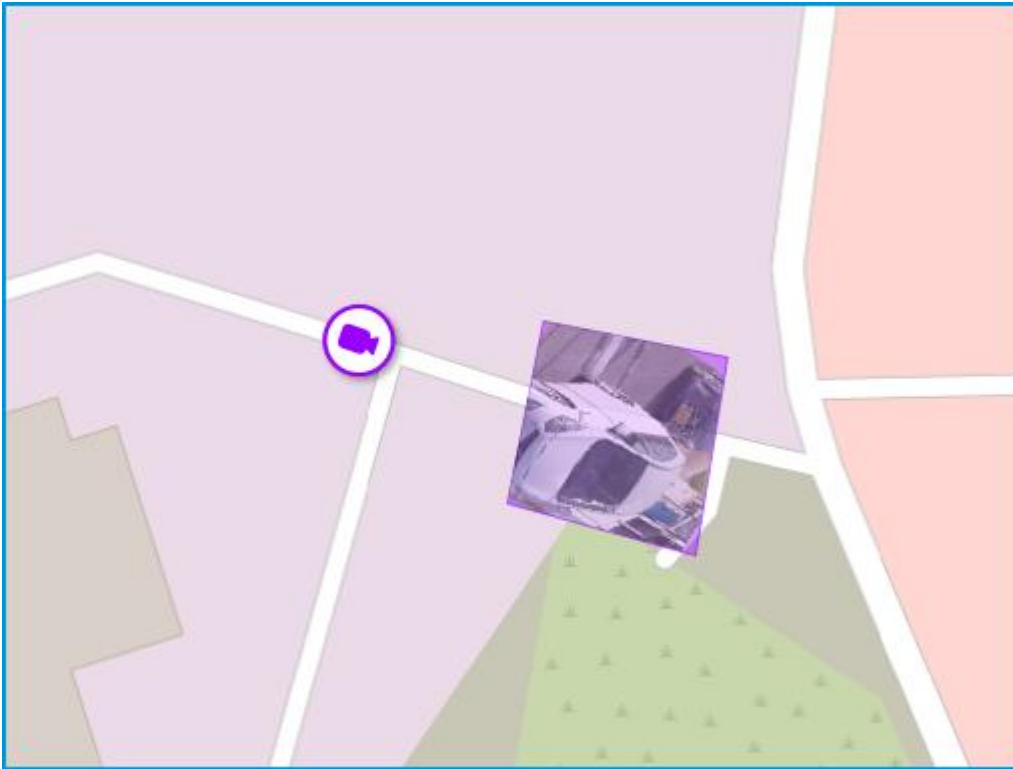


Adjust the shape and location of the displayed video so that the area visible in the frame matches its position on the map. Once ready, click the **Done** button.

To edit an already configured video displaying, click the  button. To reset the video displaying settings in the field of view, click the crossed-out camera button. Reconfiguration of the video displaying after resetting will be performed according to the current shape of the field of view.



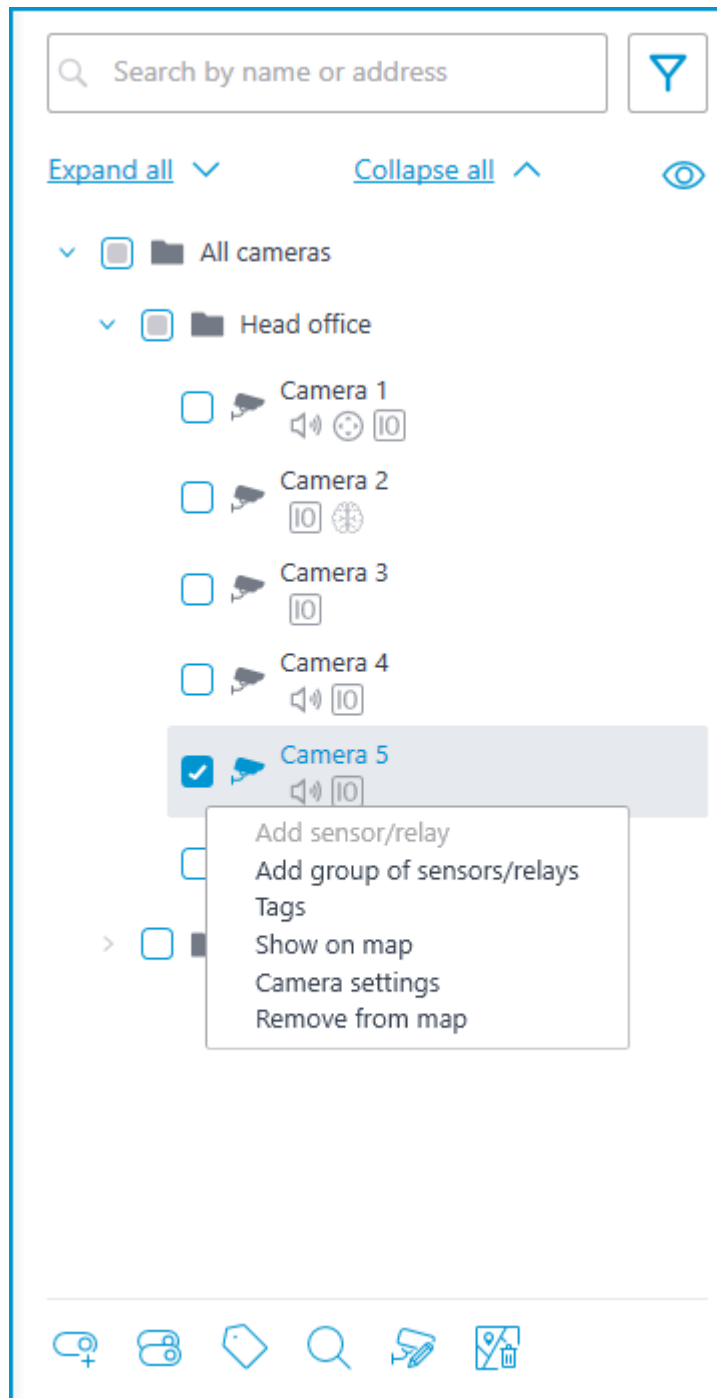
When the field of view editing mode is switched off, the video will be cropped according to the shape of the field of view:



Placement of sensors and relays

If the camera has alarm inputs/outputs enabled in the **Cameras** section, sensors and relays connected to it can be placed to the map.

To place a sensor or a relay, select the **Add sensor/relay** item in the camera context menu or click the corresponding button in the bottom panel of the cameras tree.



The following sensor parameters can be configured in the **Device settings** window:

Type

Sensor

Relay

Displayable icon

Default icon

Door

Barrier

Turnstile

Lock

Name

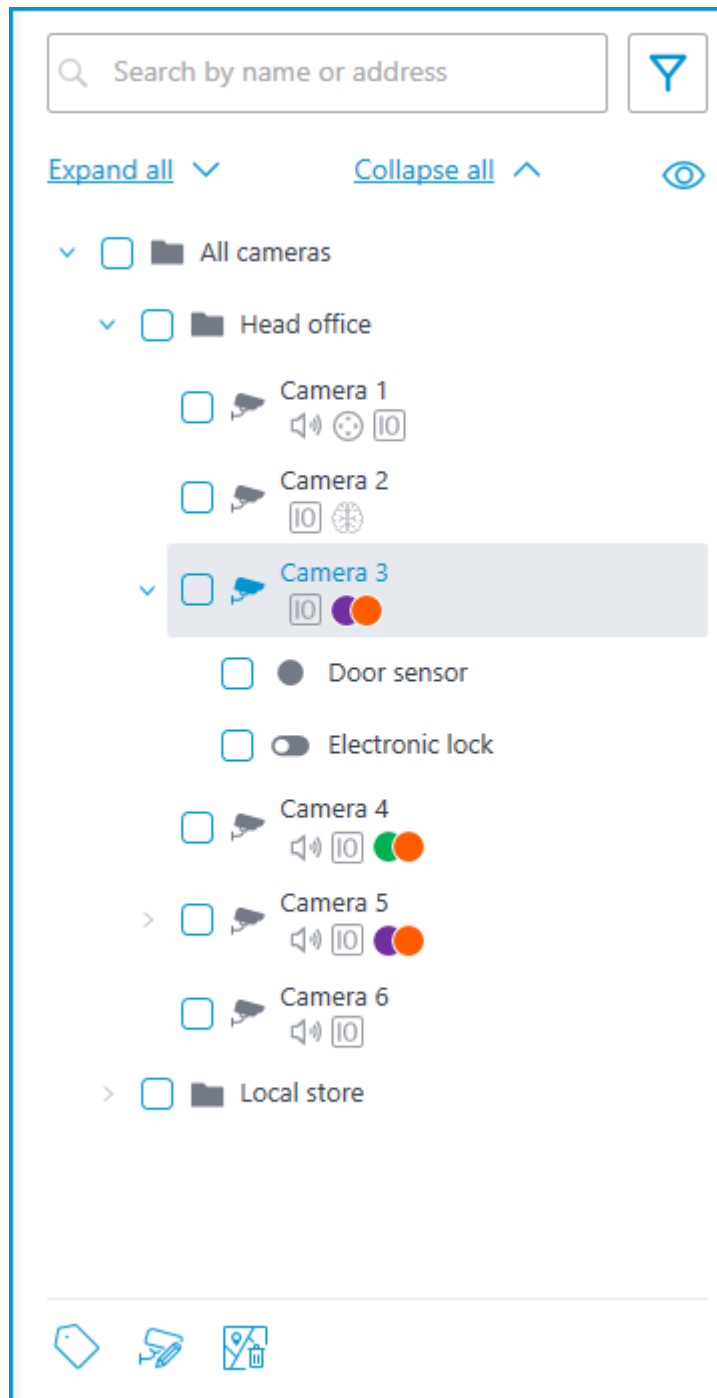
Number of input/output

Receiving signal status

The screenshot shows a 'Device settings' dialog box with the following elements:

- Type:** A dropdown menu currently showing 'Sensor'.
- Icon:** A selection box with a circular icon highlighted in a dropdown list.
- Name:** A text input field containing 'Entry point 1'.
- Number of input/output:** A numeric spinner set to '1'.
- Receiving signal status:** Two radio buttons, one red (selected) and one green.
- Buttons:** 'Save' and 'Cancel' buttons at the bottom.

Sensors are displayed in the camera tree for those cameras to which they are connected. The device type and name of the sensor are also displayed there.



To create a sensor or relay group, click **Add group of sensors/relays** in the camera context menu or at the bottom of the camera tree.

In the **Add group of devices** window, all the same parameters can be selected that are available when setting up an individual sensor. But the difference is that in this case, several I/Os can be specified simultaneously.

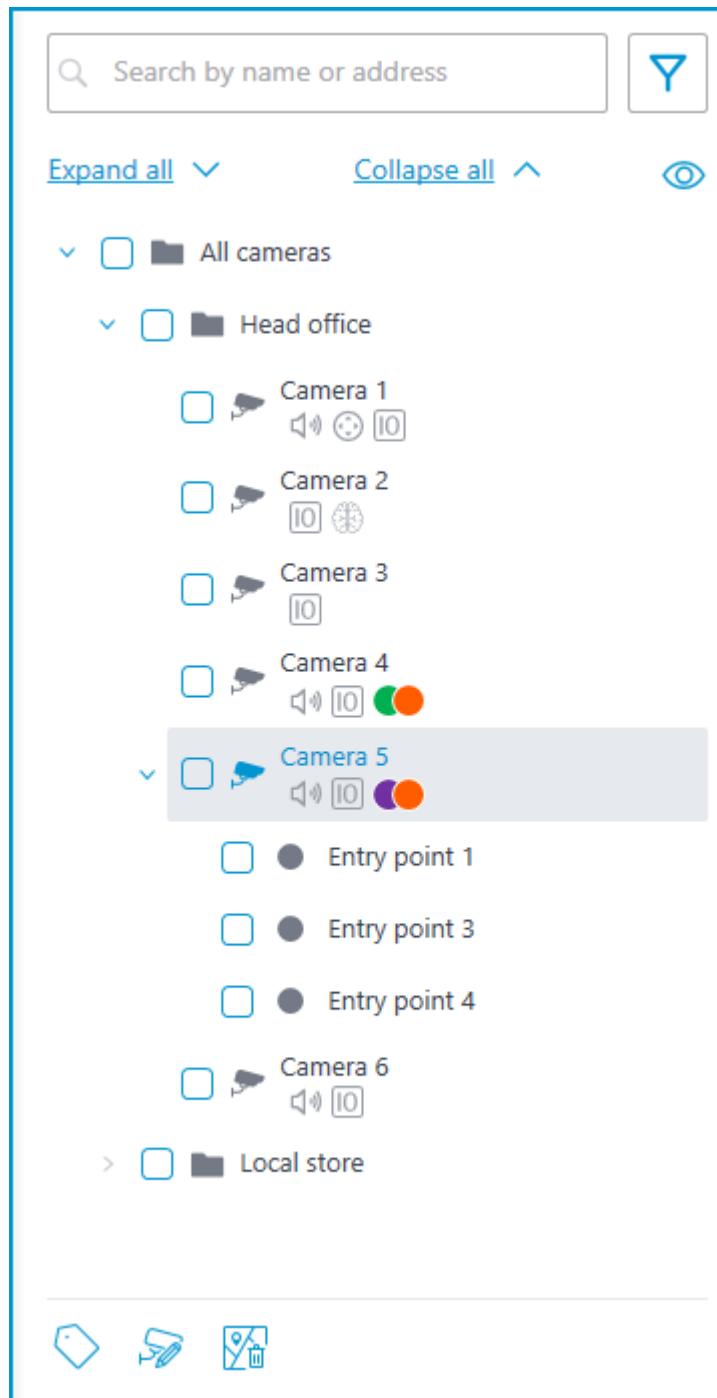
Add group of devices ×

Type: Icon: Name:

Numbers of inputs/outputs i: Receiving signal status:

Save

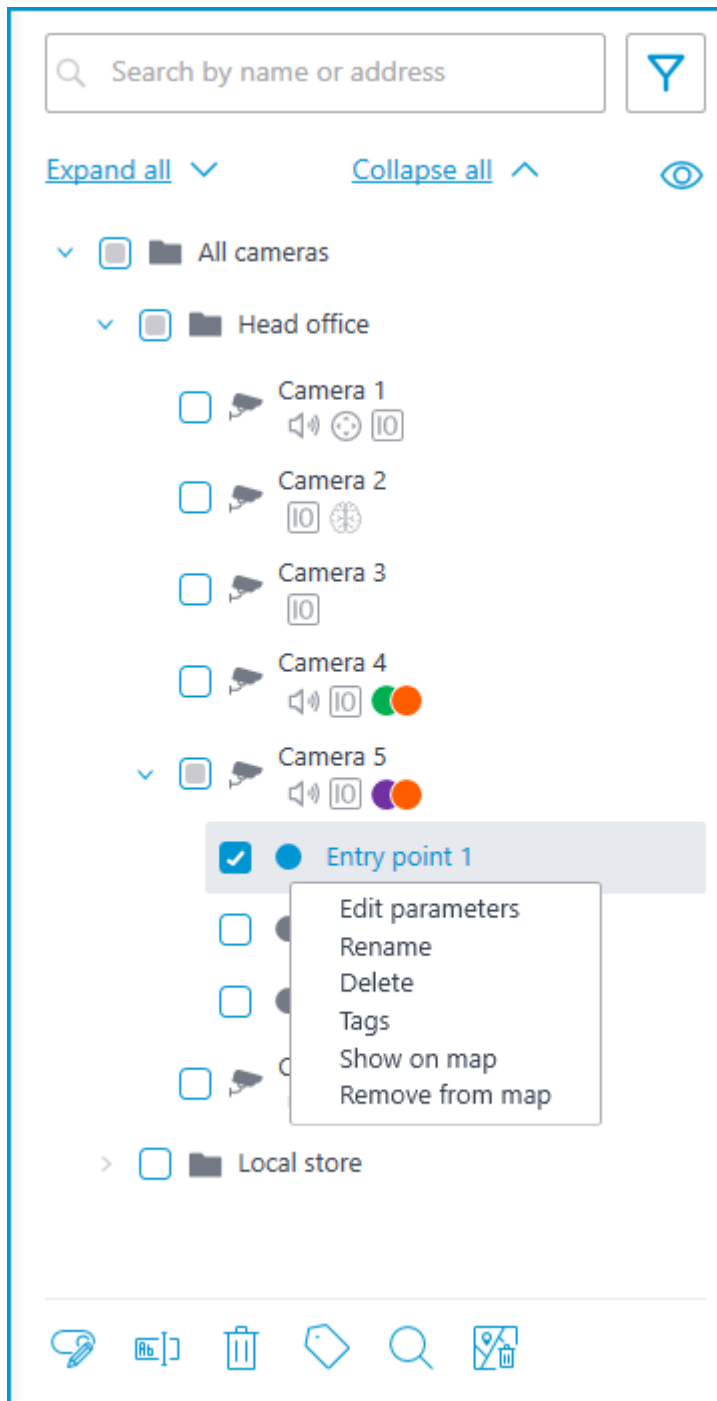
After clicking the **Save** button, all sensors/relays will be added to the associated camera. The device name will be generated from the sensor name and the input number.



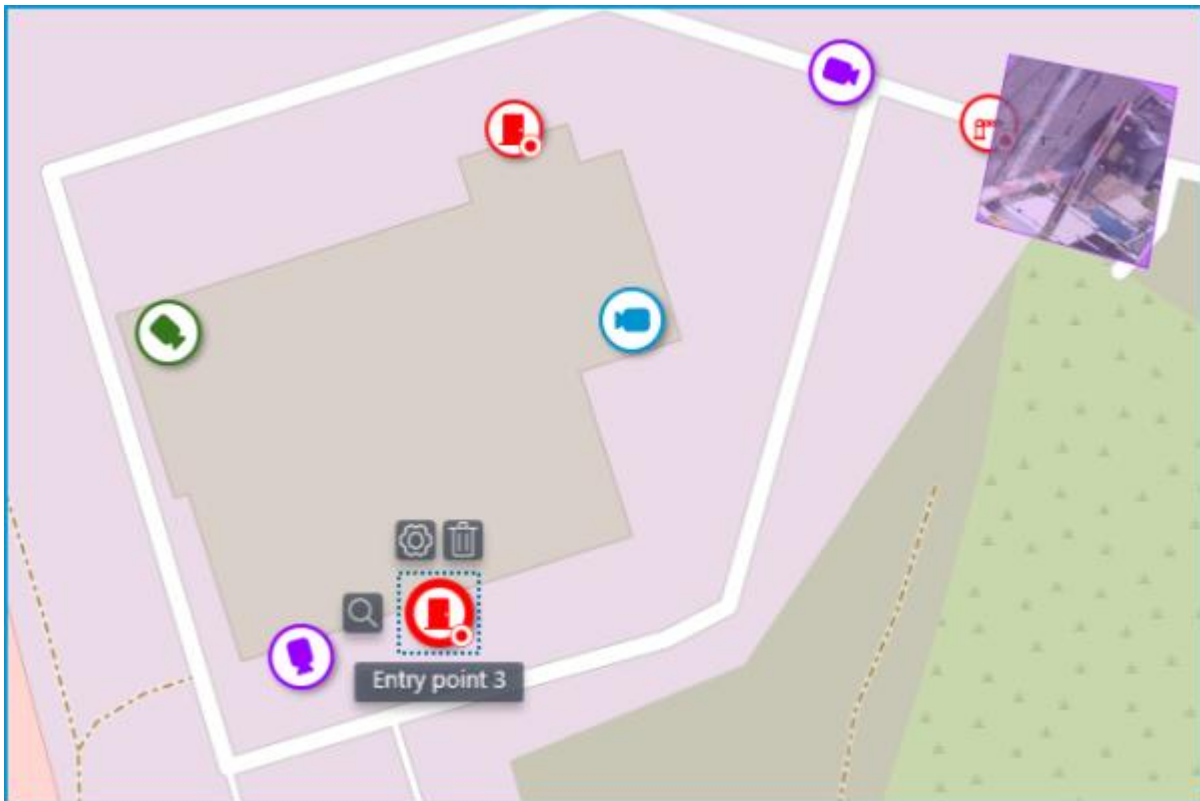
If the sensor is placed to the map, the following additional items appear in its context menu:

Show on map

Remove from map



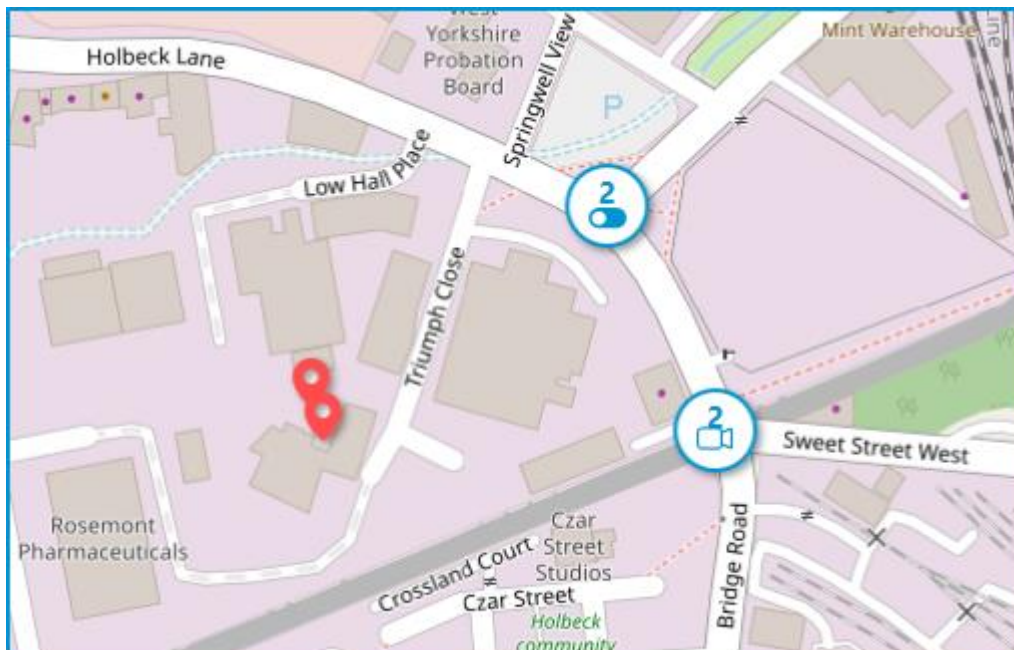
The sensor will be displayed on the map with the icon that was selected when it was created. The device type will also be displayed. The color of the sensor depends on the specified state when there is a signal and, consequently, on the current signal status for this sensor.



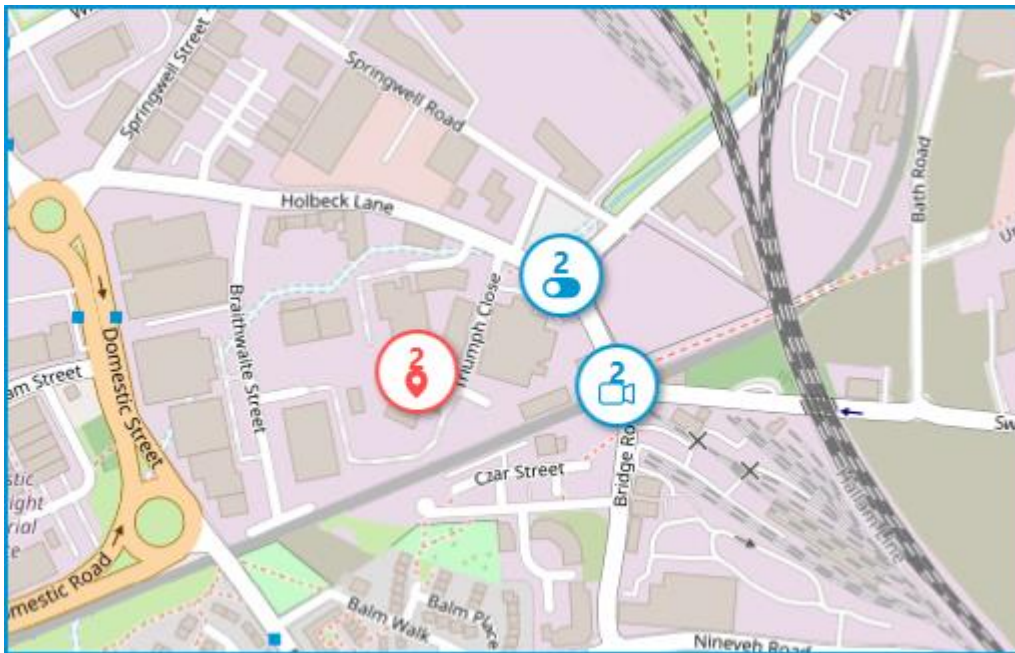
When the sensor is selected on the map, its name and the following buttons appear: **Edit parameters**, **Remove from map**, and **Show in tree**.

Grouping elements on the map

When the scale of the map is changing, cameras, sensors, relays, and objects on the map can be clustered into the group markers.



Elements of the same type located close to each other on the map are grouped into one marker with the number of grouped elements and their type: camera, sensor, relay, or object.



Elements of different types are grouped into one marker with the number of devices.



If the number of grouped elements is more than 99, the number on the marker will be displayed as **99+**.

Locations



On this tab, preset locations can be created on the map, using which users can quickly navigate to the required parts of the map with a given map scale.

To create a location, click the **Add location** option in the context menu or at the bottom of the locations tree.

If necessary, locations can be grouped by folders.

Location, starting from **Eocortex 4.1**, is the lowest level element in the tree. When migrating settings from earlier versions, folders are used to keep the hierarchical structure. For an item with attachments, a folder with the same name is created at a higher level, in which the item itself and its attachments are placed in the same manner.

The following actions are available in the context menu when selecting an individual location or an entire folder:



It is possible to move between folders both individual locations and even entire folders.

To define a location, select an area on the map. The bottom part of the area displays the coordinates of the selected area center and the map scale.

If necessary, the coordinates can be set manually. The following types of coordinates are allowed:

53.788007776832465, -1.541484296321869

S53.788007776832465, W-1.541484296321869

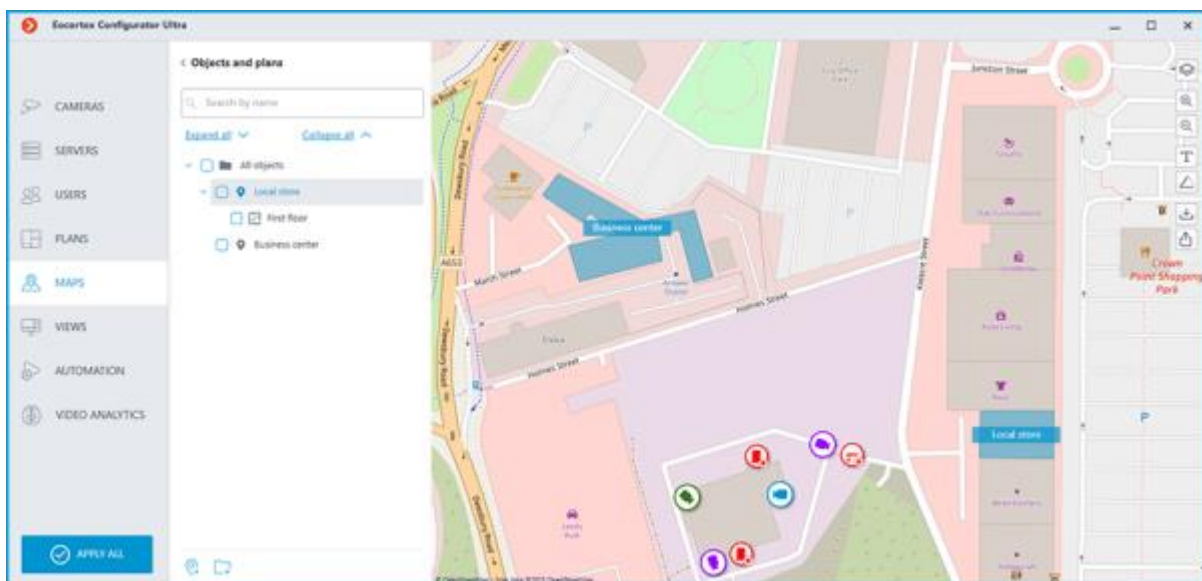
53.788007776832465S, -1.541484296321869W

A **comma** or **semicolon** can be used as the separator, and the decimal separator can be specified as either a **comma** or a **dot**.

The name of the location can be set by double-clicking both in the tree and on the box in the upper left corner of the object on the map.



Objects and plans



On this tab, Objects can be created. Object is an area on the map, such as a building or facility area, for which a more detailed plan should be set up.

The object can have several plans attached. This feature is useful if the building has several floors.



The following actions are available in the context menu when selecting an individual object or an entire folder:




The same actions can be performed using the buttons in the bottom panel of the objects tree.

It is possible to move between folders both individual objects and even entire folders.

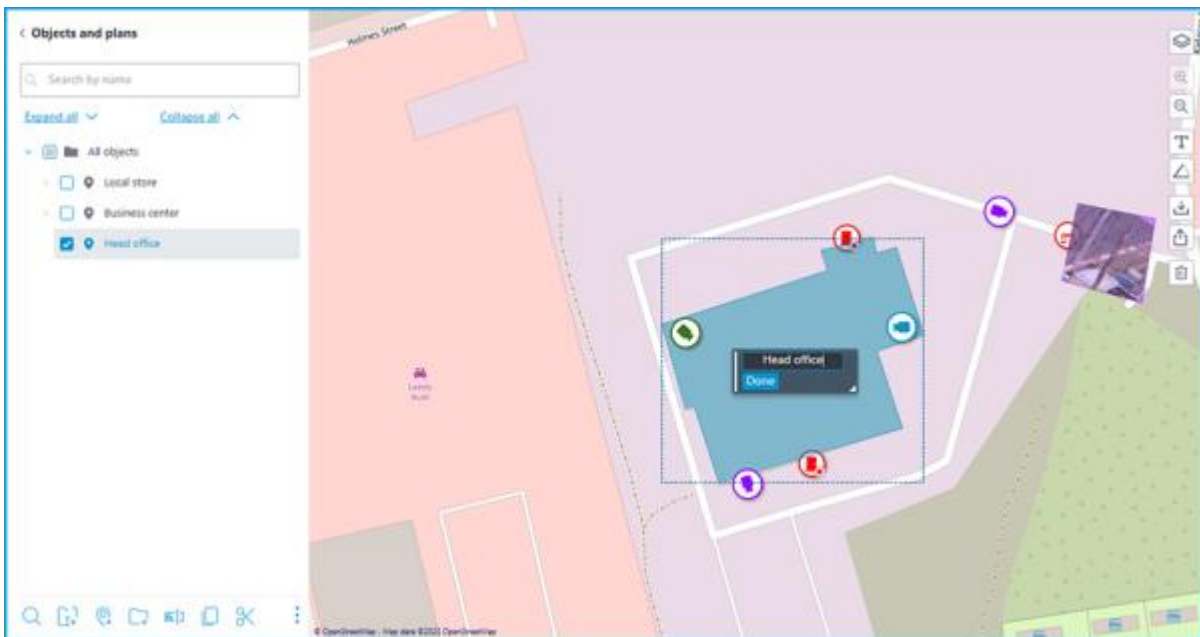
To create an object, click the **Add site** option in the context menu or at the bottom of the objects tree.

When creating a new object, a rectangular area appears on the map, which can be adjusted by dragging the nodes. A new node can be added by left-clicking on the object's boundary, and an unnecessary node can be removed by right-clicking on it.



You can name the object either by double-clicking on the object in the tree, or by clicking on the  button located in the interactive area of the object next to the current name.

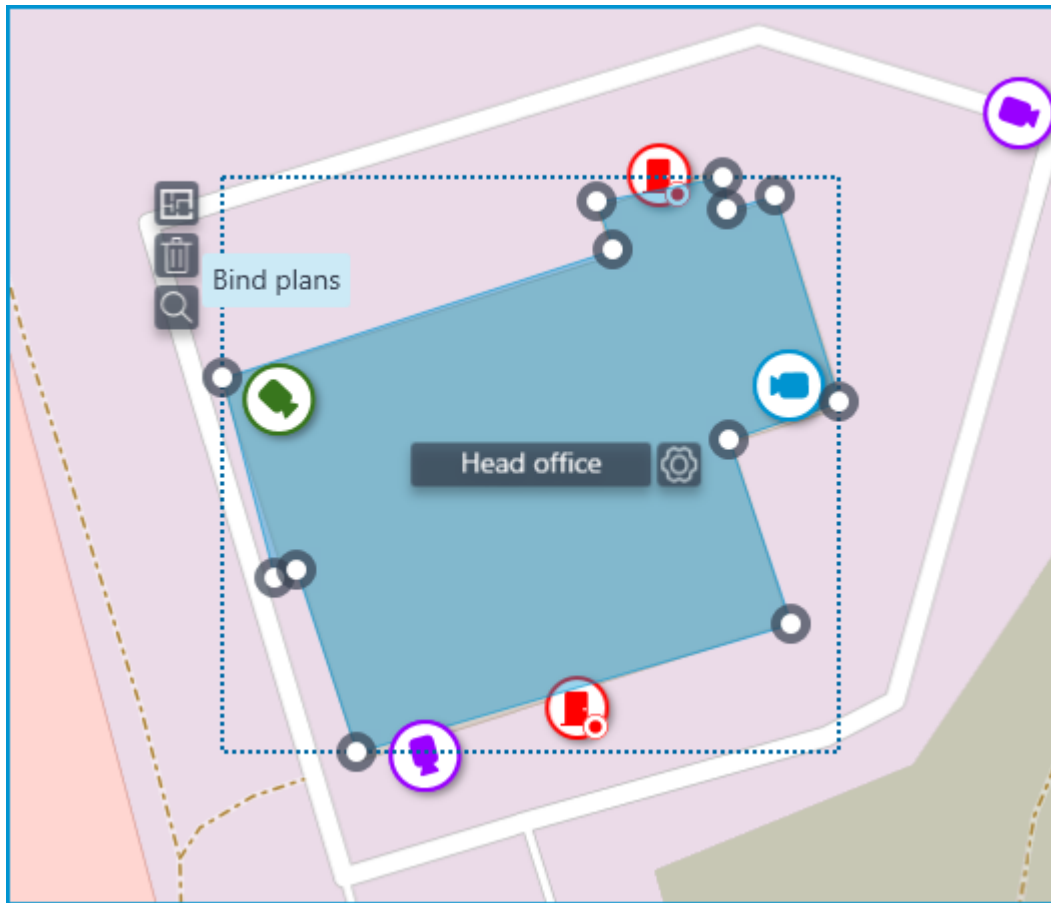
Clicking this button makes the name field interactive. In addition to changing its value, it is also possible to extend and reduce its size depending on the length of the name.



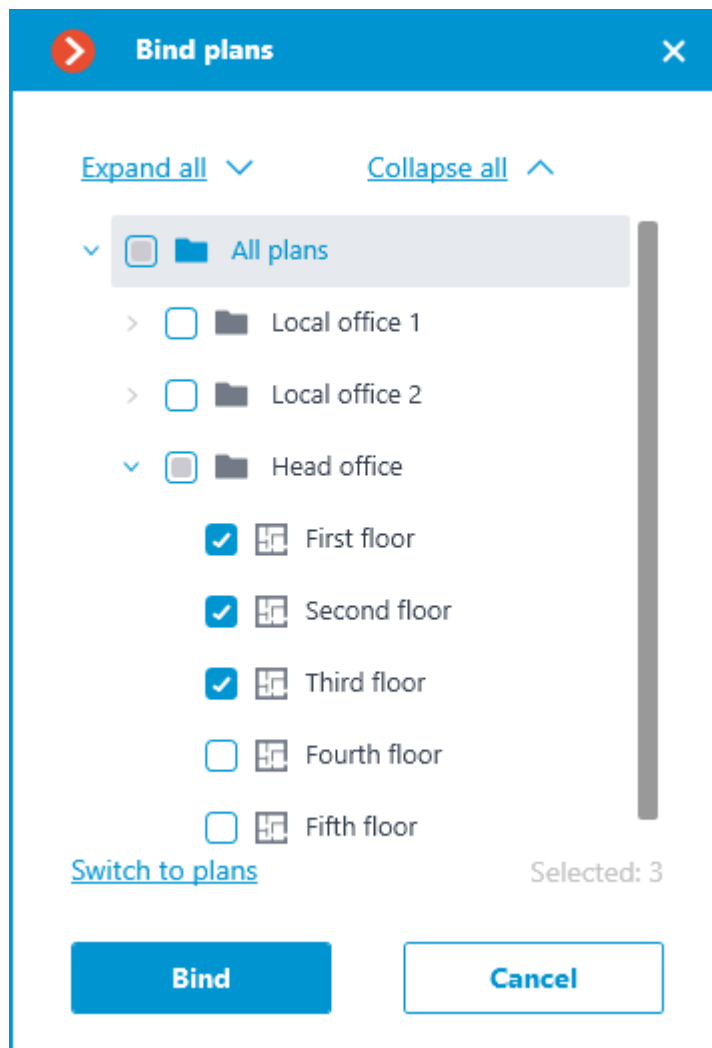
If the object name is too long to display, the name window can be resized by dragging the bottom right corner. Otherwise, the part of the name that does not fit into the rectangle will be replaced by an ellipsis when displayed.

If necessary, the name can be moved to the place where it should be displayed on the object. To do this, drag the rectangle by the left edge to the desired position and click the **Done** button. By default, the object name is displayed in the middle of the object.

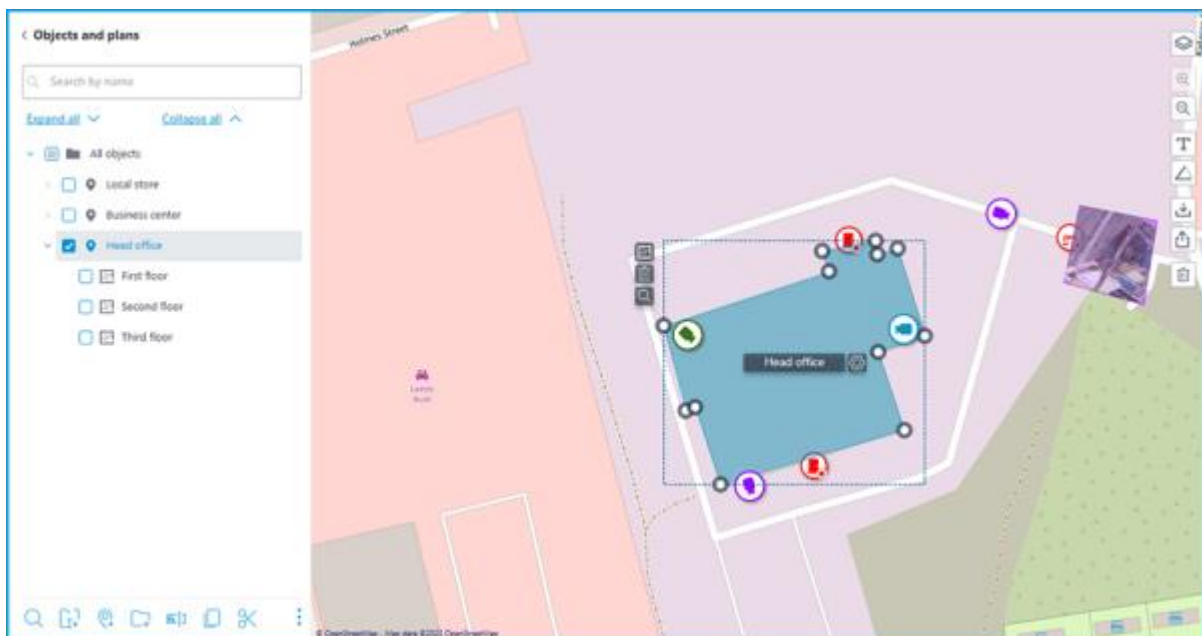
Plans can be attached to the object. Select the object in the tree and click the **Bind plans** option in the context menu or at the bottom of the objects tree. Also, the same button is available next to the object area on the map.



The window that opens displays all the plans available in the [Plans](#) section. Switching to plans can be performed by clicking **Switch to plans**.



Select the plans to be bound and click **Bind**. After that, all bound plans will be displayed in the tree for the relevant object.



Selected object can be deleted by clicking the  option in the context menu or at the bottom of the objects tree. Also, the same button is available next to the object area on the map.


Views

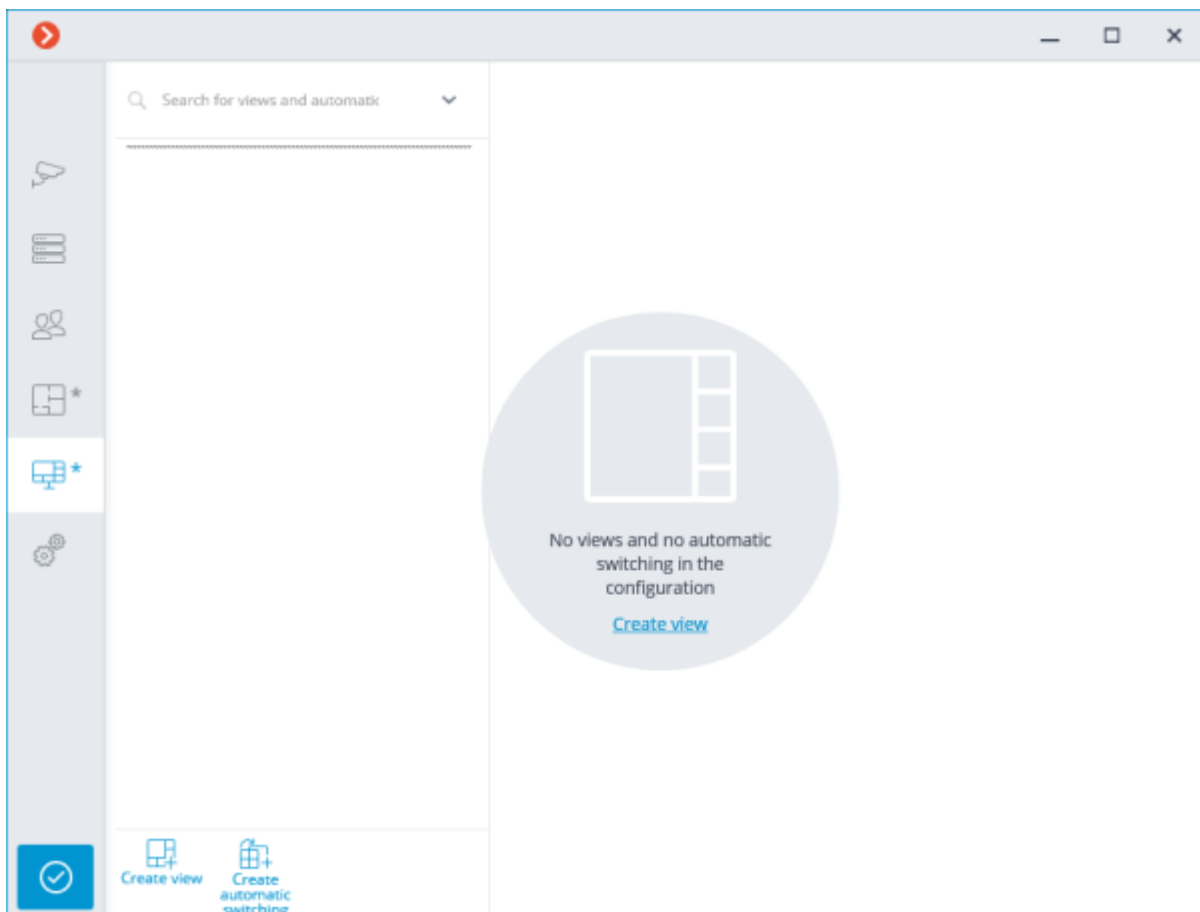
To display the images from the cameras on the screen in the client applications, **Eocortex** uses **Views** – grids with the images from the cameras shown in the cells. There are two types of views: Server and Client ones.

- **Server View** is a view created by a video surveillance system administrator in **Eocortex Configurator**. The server views are available in the **Eocortex Client** application as well as in the mobile client applications working under Android and iOS. In a multi-server system, the server views are available when connecting to any server of the system via the client application. At that, the server view is added to the client application at the moment of launching it. Thus, if you create or modify a server view, the changes will appear only after the restart of the application.
- **Client View** is a view created by a user in the client application. The client views are available only on a particular device or computer on which they were created, and only for the particular user who created them. Upon the termination of a session of working with the client application, all the client views that contain no cameras are deleted.



The server views that contain no cameras will not be added to the client application when it is launched.

In addition to views, automatic switching can be used. **Automatic switching** is a sequence of views that replace one another automatically. It is intended to change the views automatically with the preset periodicity so that the user would not have to do it manually.

To set up server views and automatic switching in the **Eocortex Configurator** application, go to the  **Views** tab.

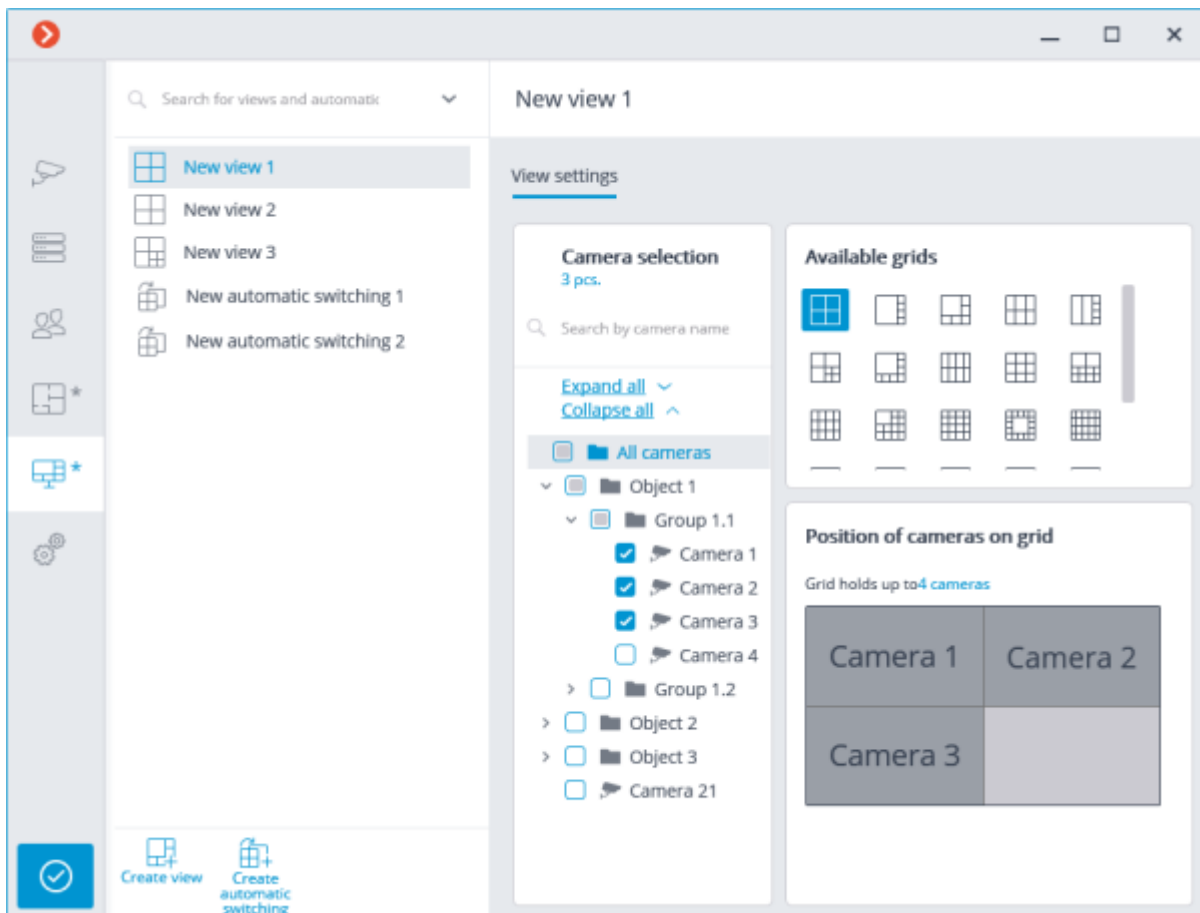


Below are the commands available in the course of setting up views and automatic switching. These commands can be opened from the context menu, by using the buttons at the bottom of the page, or by clicking the links on the page of the views and automatic switching. Some commands can be opened using various methods, including hot keys.

-  **Create view**
-  **Create automatic switching**
- **Rename**
- **Delete**

Selecting a view or a switching in the right part of the tab makes their settings available.

Server view settings



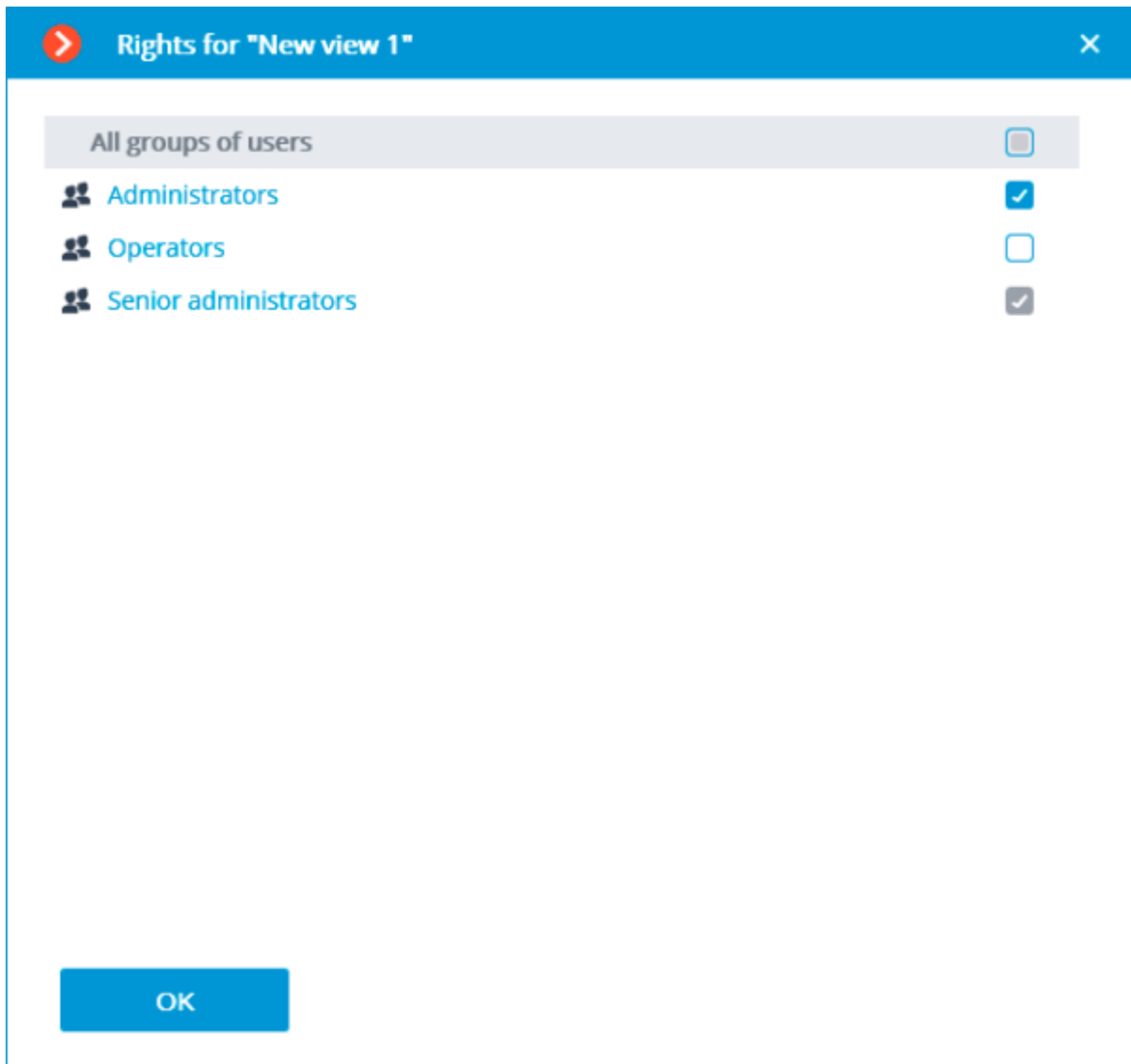
The view can be configured using various methods:

Mark cameras and folders in **Camera selection** tree, then choose one of the grids in the **Available grids** section. The cameras will be automatically placed in the grid cells.

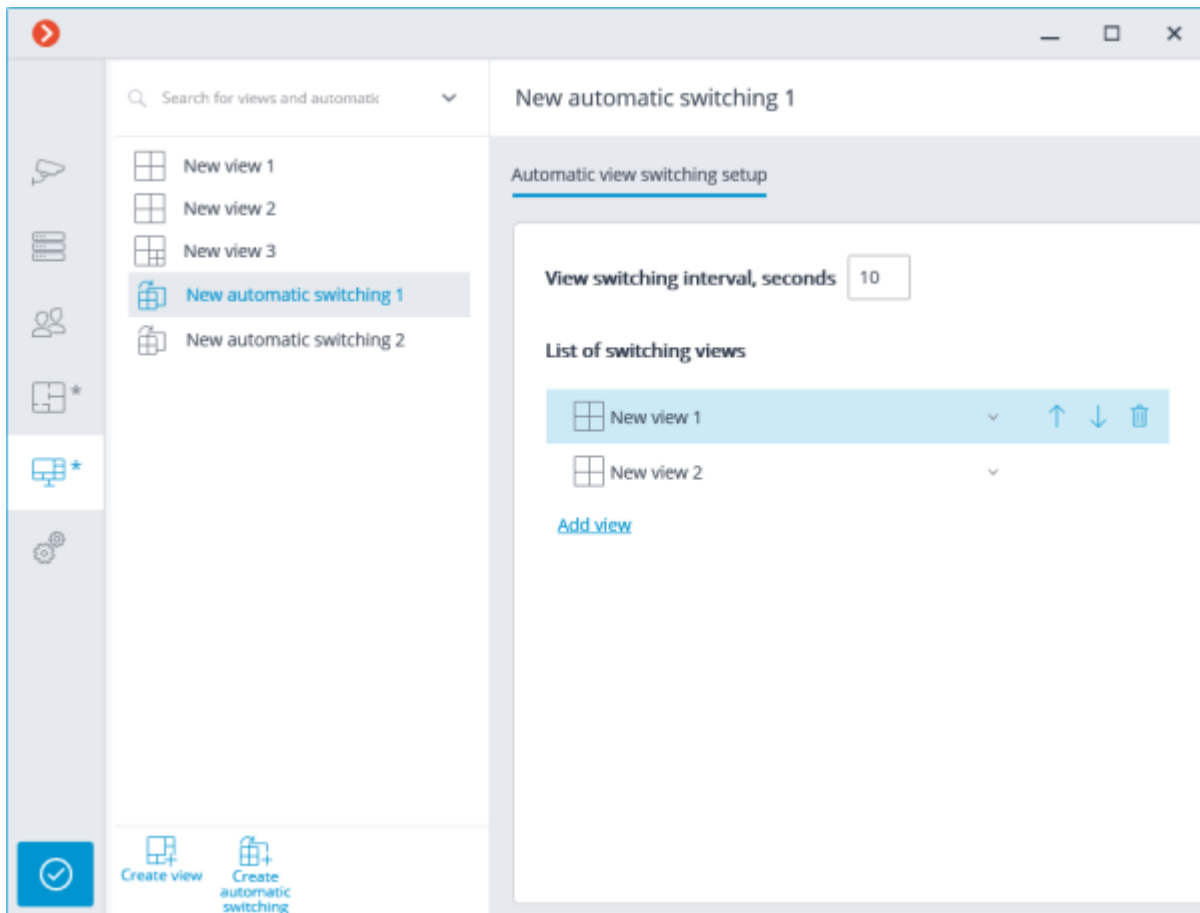
Select one of the available grids in the **Available grids** section, place cameras on the grid dragging them from the **Camera selection** tree to the grid.

You can modify the layout of cameras on the grid by dragging them between the cells with your mouse.

In certain types of licenses, the access rights are set for each view.







Automatic switching settings




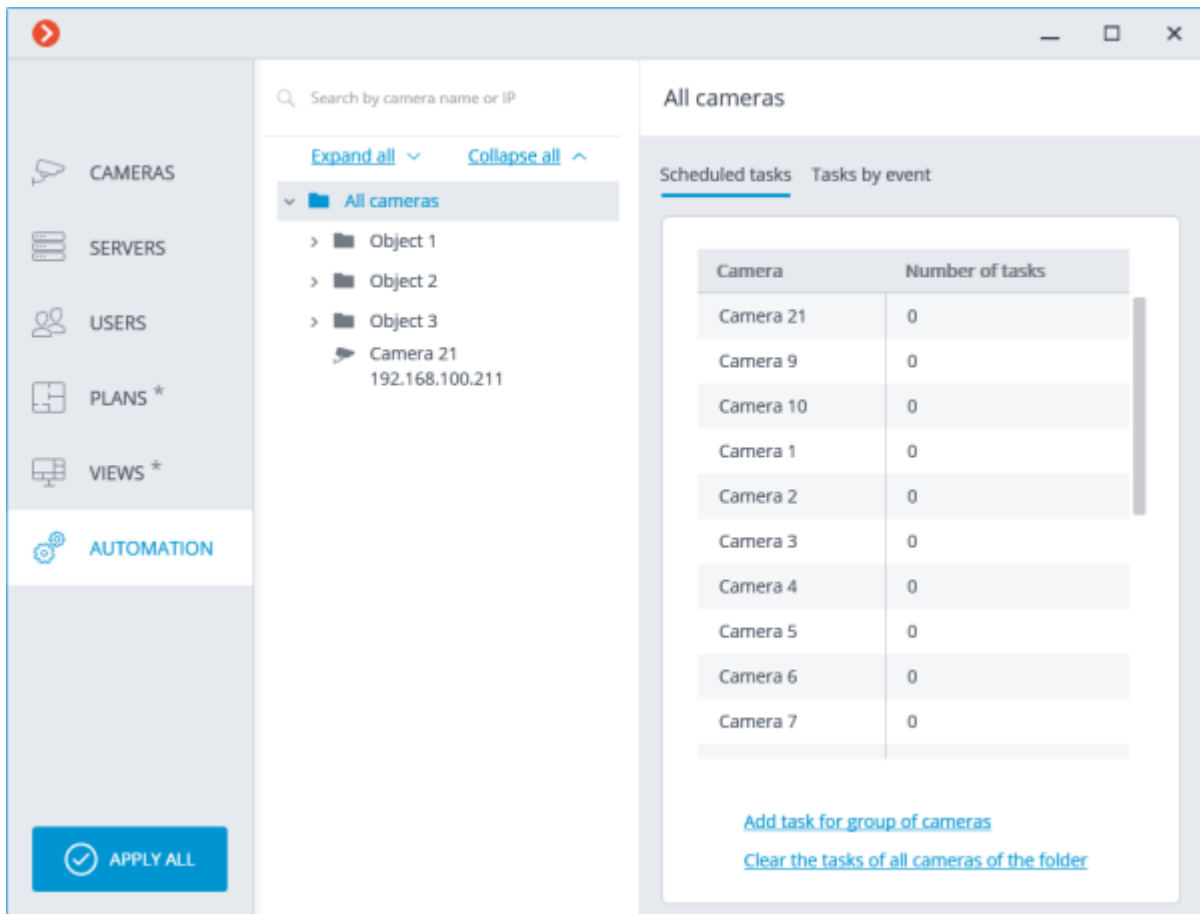
To set up the automatic switching, it is required to set the time of displaying each view in the **View switching interval, seconds** field and add the desired views to the **List of switching views** using the **Add view** command.

When adding a view to the list, the first available view is always added by default. To modify the added view, use the buttons located to the right of its name:

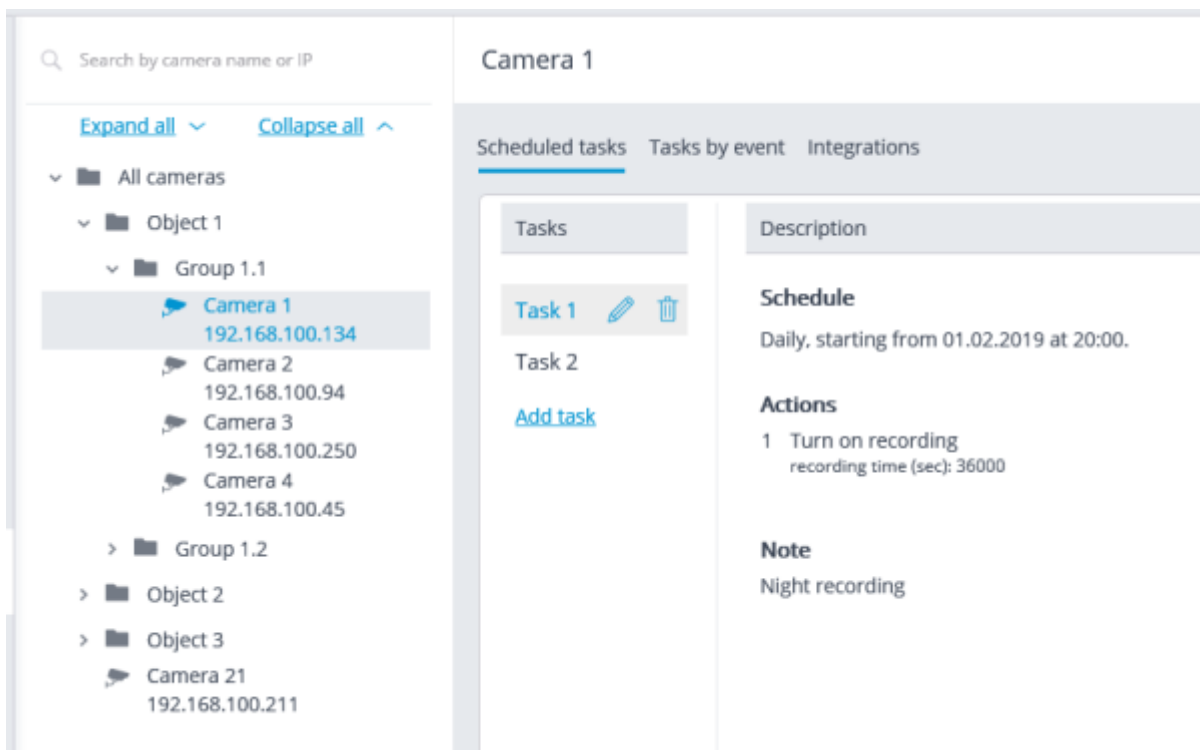
-  view selection/modification;
-  moving the view up the list;
-  moving the view down the list;
-  deleting the view.

Automation

To set up actions to be performed on schedule or in response to certain events, as well as for adjusting the interaction with the external systems, it is required to go to the  **Automation** tab in the **Eocortex Configurator** application.



In the left part of the tab there is a camera tree, and in the right one – a page of automation settings for the camera or folder currently selected. The tabs for cameras differ from the tabs for folders. On the [Scheduled tasks](#) tabs you can add, modify and delete scheduled tasks for the selected camera.



For a folder on the [Scheduled tasks](#) tab, it is possible to add scheduled tasks for all cameras contained in the selected folder, as well as to delete all the tasks of these cameras.

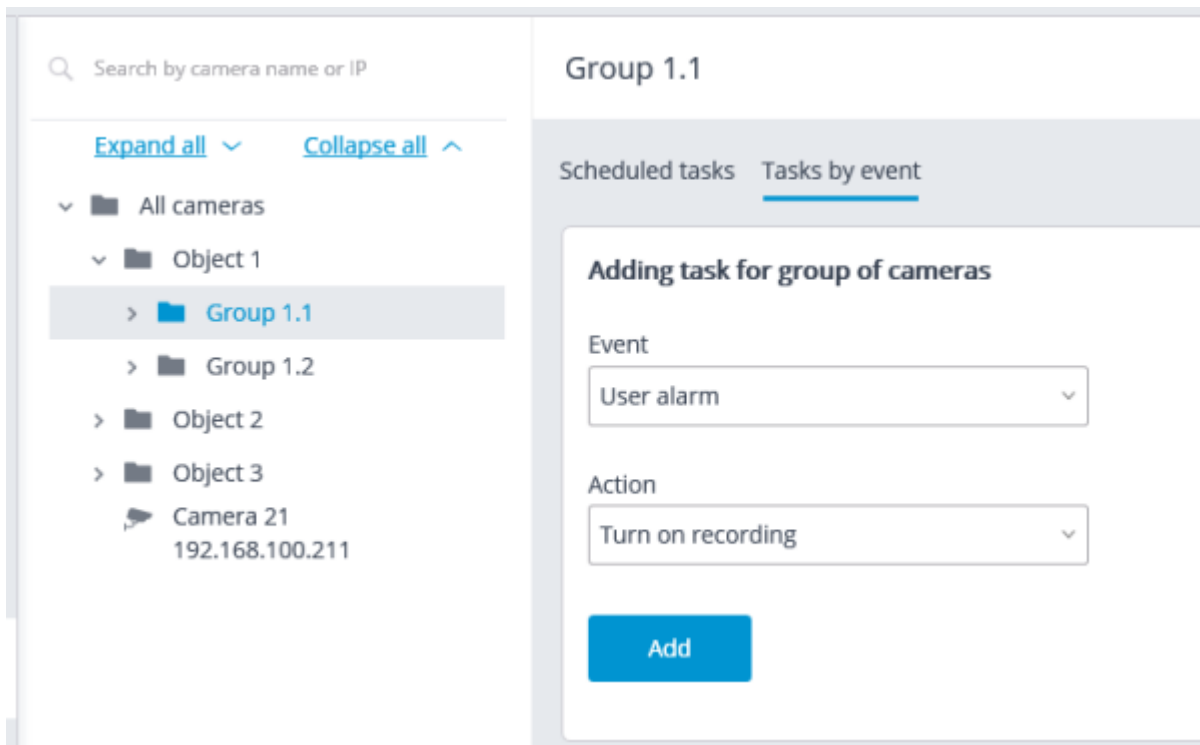
The screenshot shows the 'Object 1' configuration page. On the left, a tree view shows the hierarchy: All cameras > Object 1 > Group 1.1 > Camera 1 (192.168.100.134), Camera 2 (192.168.100.94), Camera 3 (192.168.100.250), Camera 4 (192.168.100.45), Group 1.2, Object 2, Object 3, and Camera 21 (192.168.100.211). The main content area is titled 'Object 1' and has two tabs: 'Scheduled tasks' (selected) and 'Tasks by event'. Below the tabs is a table with two columns: 'Camera' and 'Number of tasks'. The table lists cameras 1 through 8 with their respective task counts. Below the table are two links: 'Add task for group of cameras' and 'Clear the tasks of all cameras of the folder'.

Camera	Number of tasks
Camera 1	2
Camera 2	0
Camera 3	0
Camera 4	0
Camera 5	0
Camera 6	0
Camera 7	0
Camera 8	0

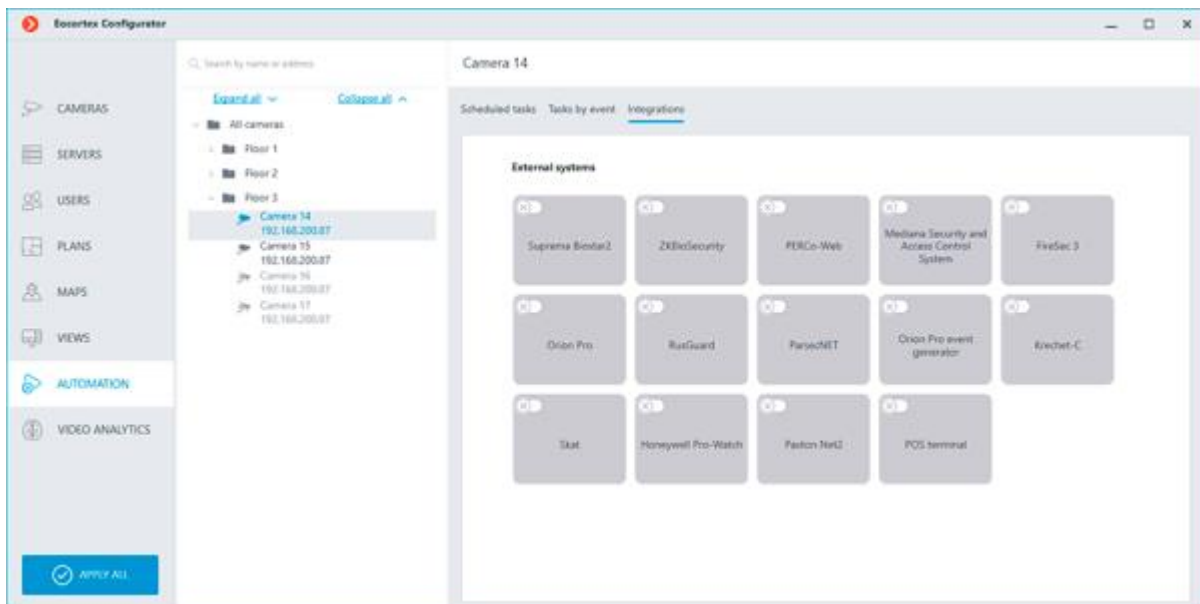
For the individual camera on the [Tasks by event](#) tab, it is possible to add, modify and delete event-based tasks and user tasks of the selected camera.

The screenshot shows the 'Camera 1' configuration page. The left tree view is the same as in the previous screenshot, but 'Camera 1' (192.168.100.134) is selected. The main content area is titled 'Camera 1' and has three tabs: 'Scheduled tasks', 'Tasks by event' (selected), and 'Integrations'. Below the tabs are two panels: 'Events' and 'Actions'. The 'Events' panel lists: Motion, No connected camera, User alarm (with a trash icon), External alarm start, End of external alarm, Call over the intercom, Moving objects tracking, and Video surveillance sabot... The 'Actions' panel lists: Alarm generation (with up/down arrows, trash, and edit icons), Turn on recording (with up/down arrows, trash, and edit icons), and an 'Add action' link. At the bottom of the page is an 'Add task' link.

For the folder on the [Tasks by event](#) tab, it is possible to add tasks by event for all cameras contained in the selected folder.



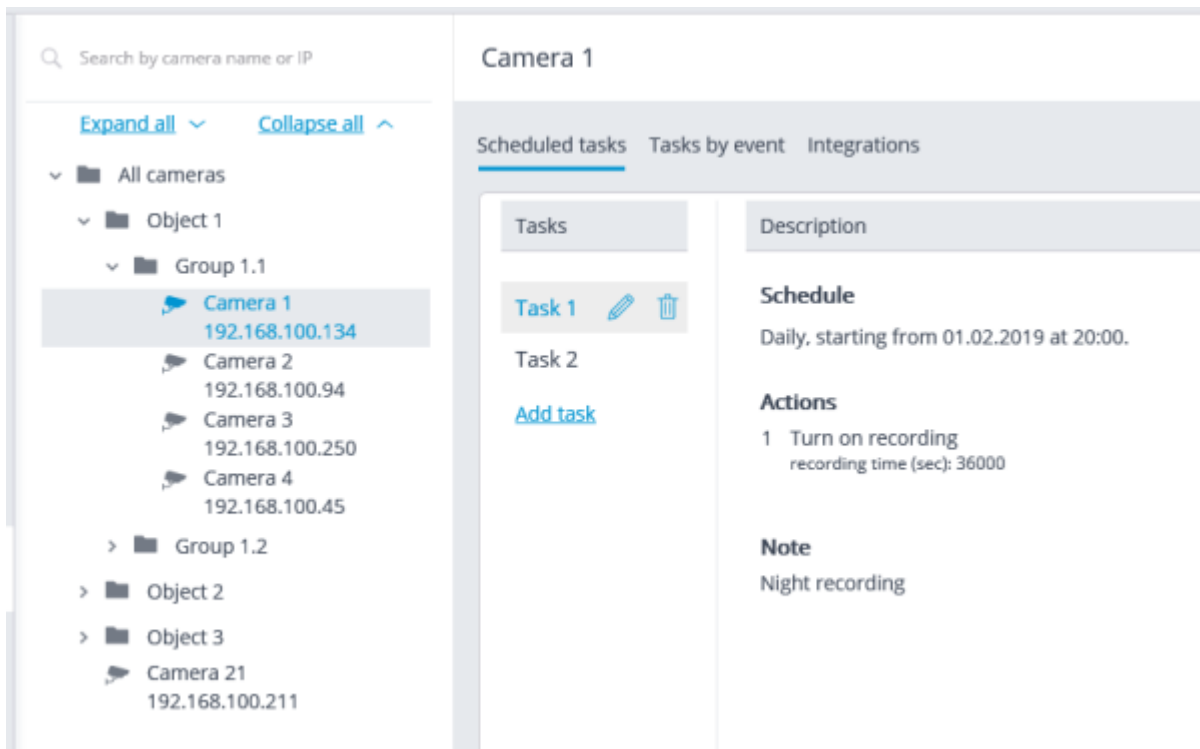
For the individual camera on the [Integrations](#) tab, it is possible to add, modify and delete the settings of the integration of the selected camera with the external systems.



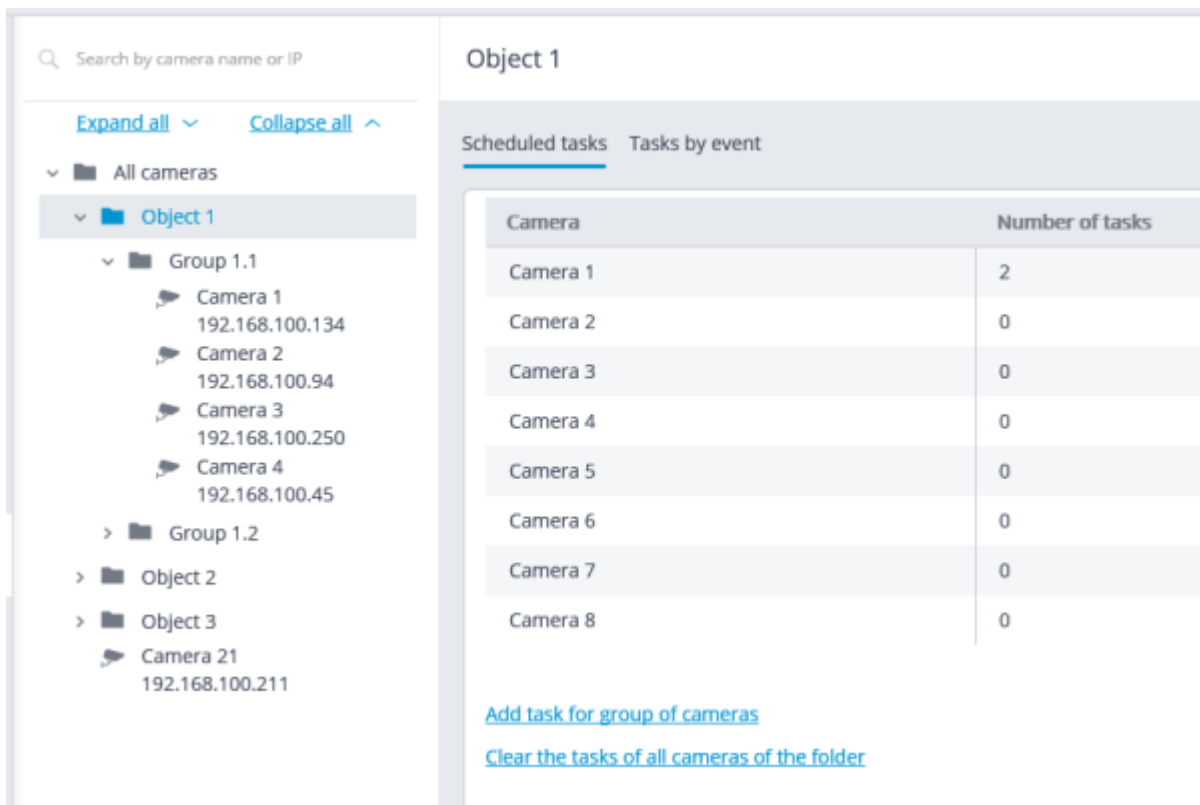
Scheduled tasks

To set up actions to be performed on schedule, it is required to go to the **Automation** tab in **Eocortex Configurator**, select a camera or a folder in the tree, then, on the opened page, go to the **Scheduled tasks** tab.

It is possible to add, modify and delete the scheduled tasks for the specific selected camera.



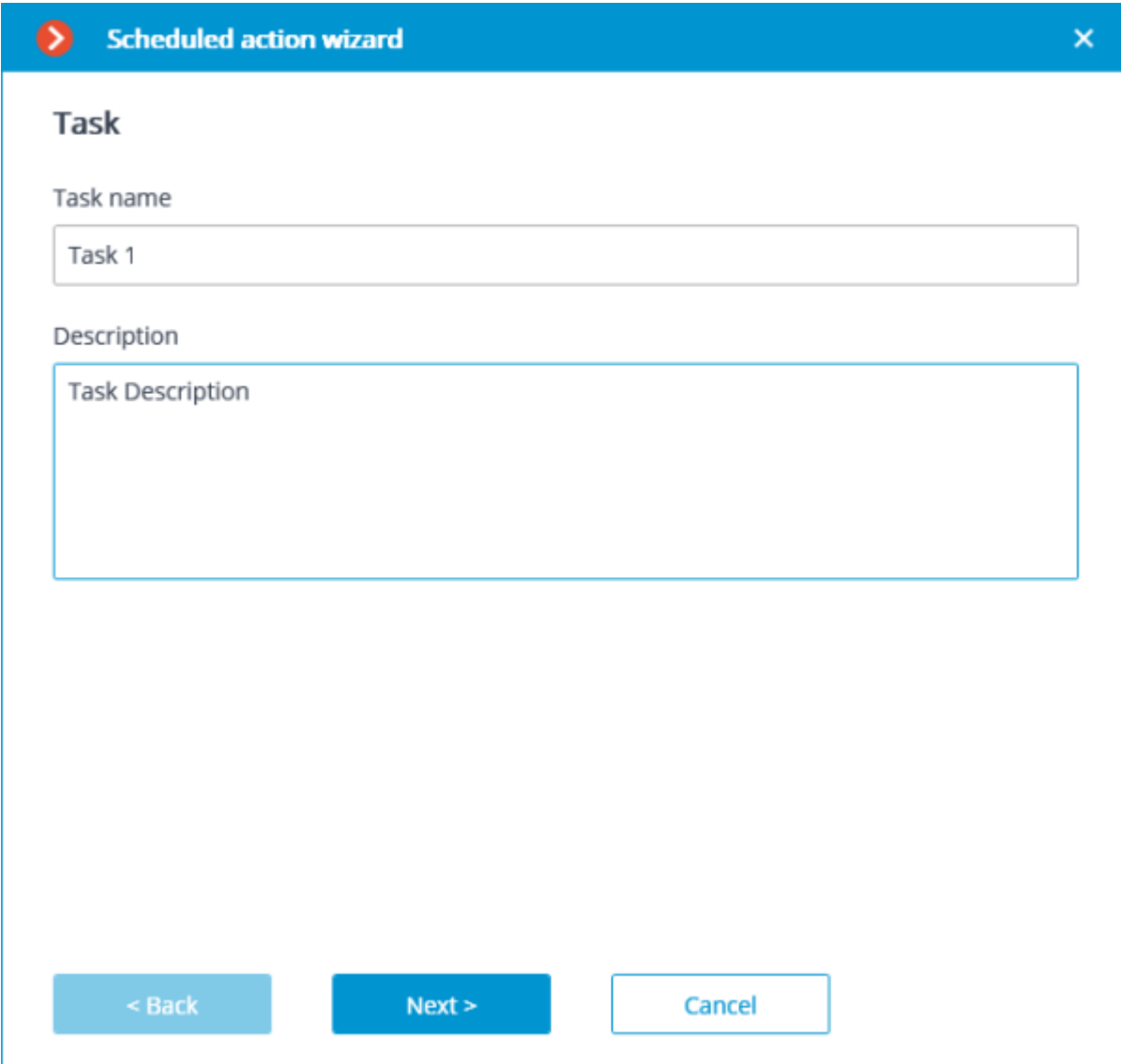
For the folder, it is possible to add tasks to be run on schedule for all cameras in the selected folder, as well as to delete all the tasks of these cameras.



In order to add tasks to be run on schedule it is required to click on the Add task link. The scheduled task wizard will open.

The adding procedures for the individual selected camera and for the folder are identical. The only difference is whether they will be applied to one or several cameras. The interface of the scheduled task modification wizard is identical to the interface of the wizard for adding such a task.

In the wizard's start screen it is required to set the **Task name** and, optionally, enter its Description, then press **Next**.



Scheduled action wizard

Task

Task name

Task 1

Description

Task Description


< Back Next > Cancel

At the following step the schedule is set. At that, the interface does not depend on the selected period set in the **Repeat** dropdown list.

Scheduled action wizard ×

Description

Schedule operation commencement

 01.02.2019 14:42:06

Repeat

do not repeat ▾

Run all day, if it is not run on time


Task was started 01.02.2019 in 14:42.

< Back Next > Cancel

Scheduled action wizard

Description

Schedule operation commencement

 01.02.2019 14:42:06

Repeat

by months

Of what month

Jan	Feb	Mar	Apr
May	Jun	Jul	Aug
Sep	Oct	Nov	Dec

all months

Of what date

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

all dates


Run all day, if it is not run on time

Task will be performed from 2/1/2019 2:42 PM. Daily, on the following dates: 1, 10, 26.

Scheduled action wizard ✕

Description

Schedule operation commencement

 01.02.2019 14:42:06

Repeat

by weeks ▾

Every week

Which days

Mon Tue Wed Thu Fri Sat Sun

all days


Run all day, if it is not run on time

Task will be performed from 2/1/2019 2:42 PM. Weekly on the following days: Monday, Wednesday, Friday.

Scheduled action wizard ×

Description

Schedule operation commencement

 01.02.2019 14:42:06

Repeat

by days ▾

Every day

Run all day, if it is not run on time


Task will be performed from 2/1/2019 2:42 PM. Each 2 day.

< Back Next > Cancel

Scheduled action wizard ×

Description

Schedule operation commencement

 01.02.2019 14:42:06

Repeat

by the hour ▾

Every h

Run all day, if it is not run on time


Task will be performed from 2/1/2019 2:42 PM. Each 8 hours.

[< Back](#) [Next >](#) [Cancel](#)

Scheduled action wizard ×

Description

Schedule operation commencement

 01.02.2019 14:42:06

Repeat

by the minute ▾

Every min.

Run all day, if it is not run on time


Task will be performed from 2/1/2019 2:42 PM. Each 15 minutes.

< Back Next > Cancel

Scheduled action wizard

Description

Schedule operation commencement

 01.02.2019 14:42:06

Repeat

by the second

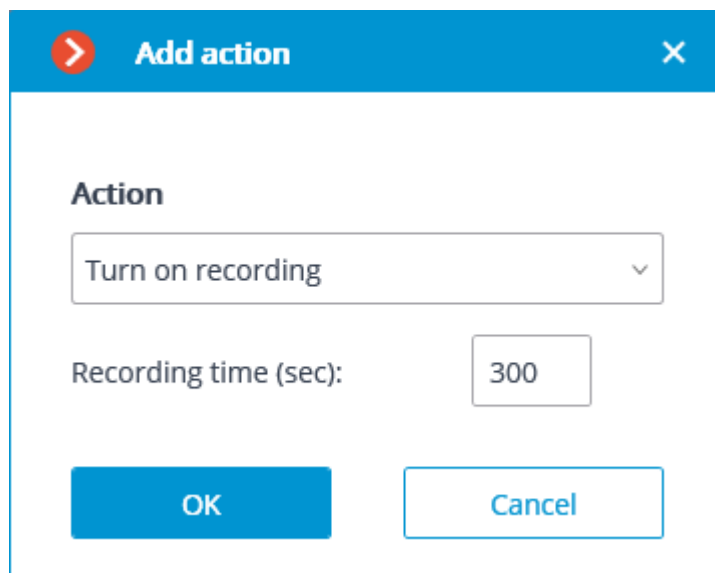
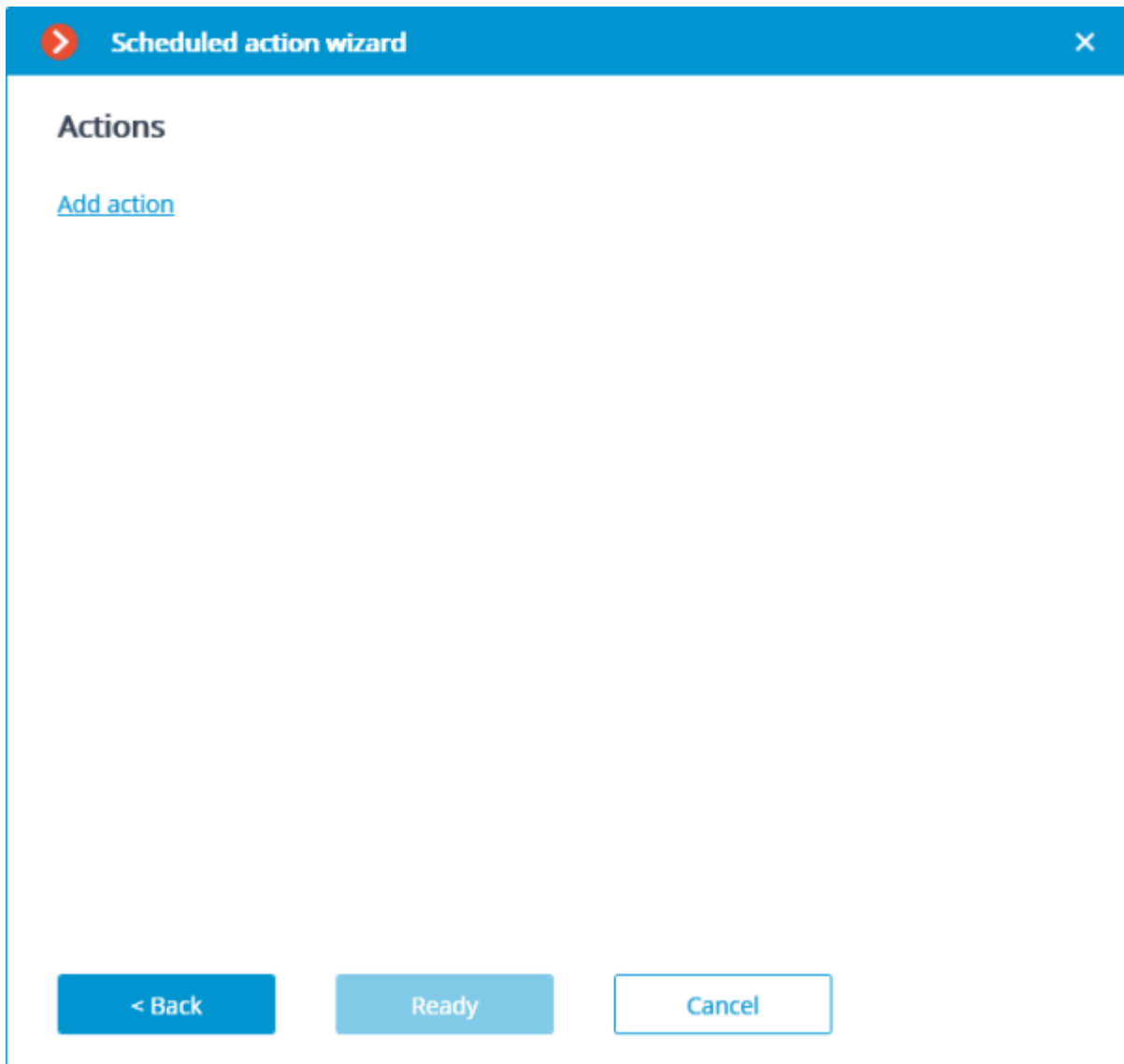
Every sec.

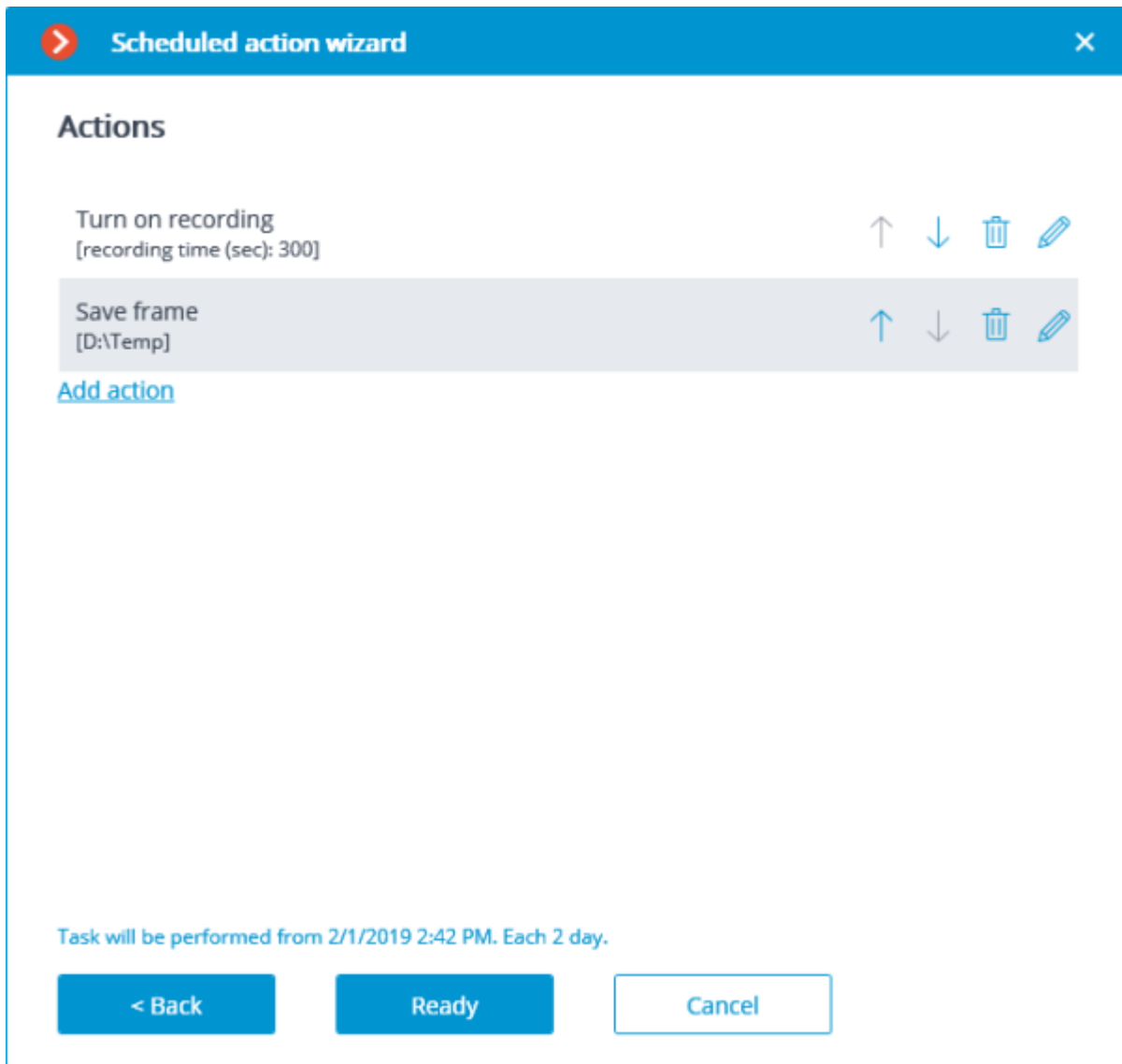
Run all day, if it is not run on time

Task will be performed from 2/1/2019 2:42 PM. Each 30 seconds.

[< Back](#) [Next >](#) [Cancel](#)

At the next step it is required to add and arrange the tasks that will be performed according to the set schedule in the corresponding order, then press **Ready**.



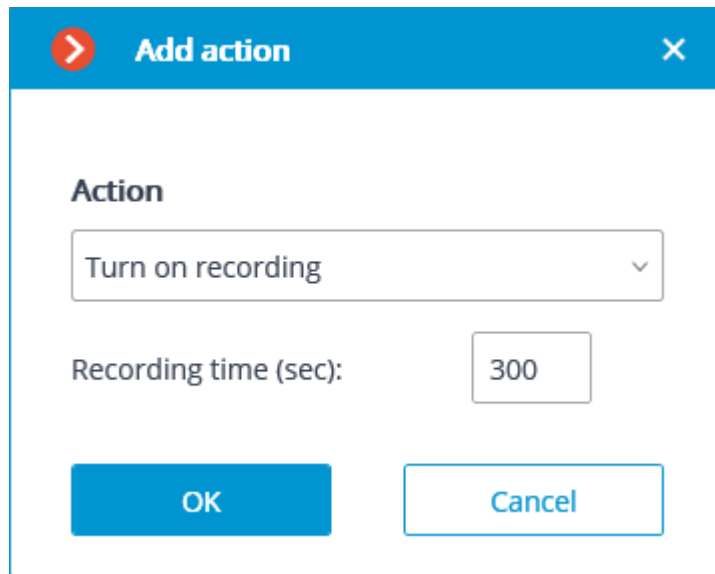


The list and description of the available actions can be found in the [Actions](#) section.

Actions

Turn on recording

Turns on the recording to archive.



The screenshot shows a dialog box titled "Add action" with a blue header bar containing a red arrow icon on the left and a close icon (X) on the right. Below the header, the word "Action" is displayed in bold. A dropdown menu is set to "Turn on recording". Below this, the text "Recording time (sec):" is followed by a text input field containing the number "300". At the bottom of the dialog, there are two buttons: a solid blue "OK" button and a white "Cancel" button with a blue border.

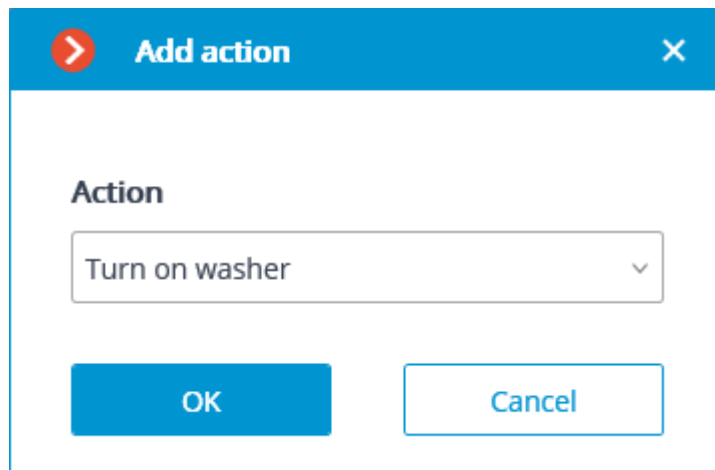
Action parameters:

Recording time (seconds): sets the recording time during which the recording to archive will be performed.

This action will not be performed if the continuous recording to archive is in progress on the channel, or if the continuous recording mode has been set.

Turn on washer

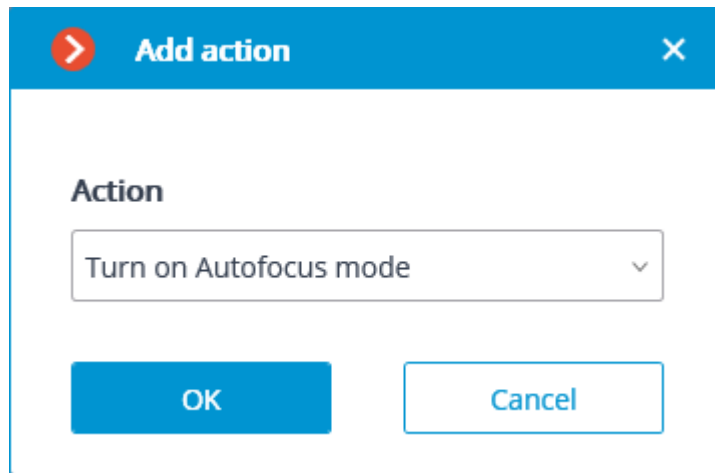
Activates camera washer.



The screenshot shows a dialog box titled "Add action" with a blue header bar containing a red arrow icon on the left and a close icon (X) on the right. Below the header, the word "Action" is displayed in bold. A dropdown menu is set to "Turn on washer". At the bottom of the dialog, there are two buttons: a solid blue "OK" button and a white "Cancel" button with a blue border.

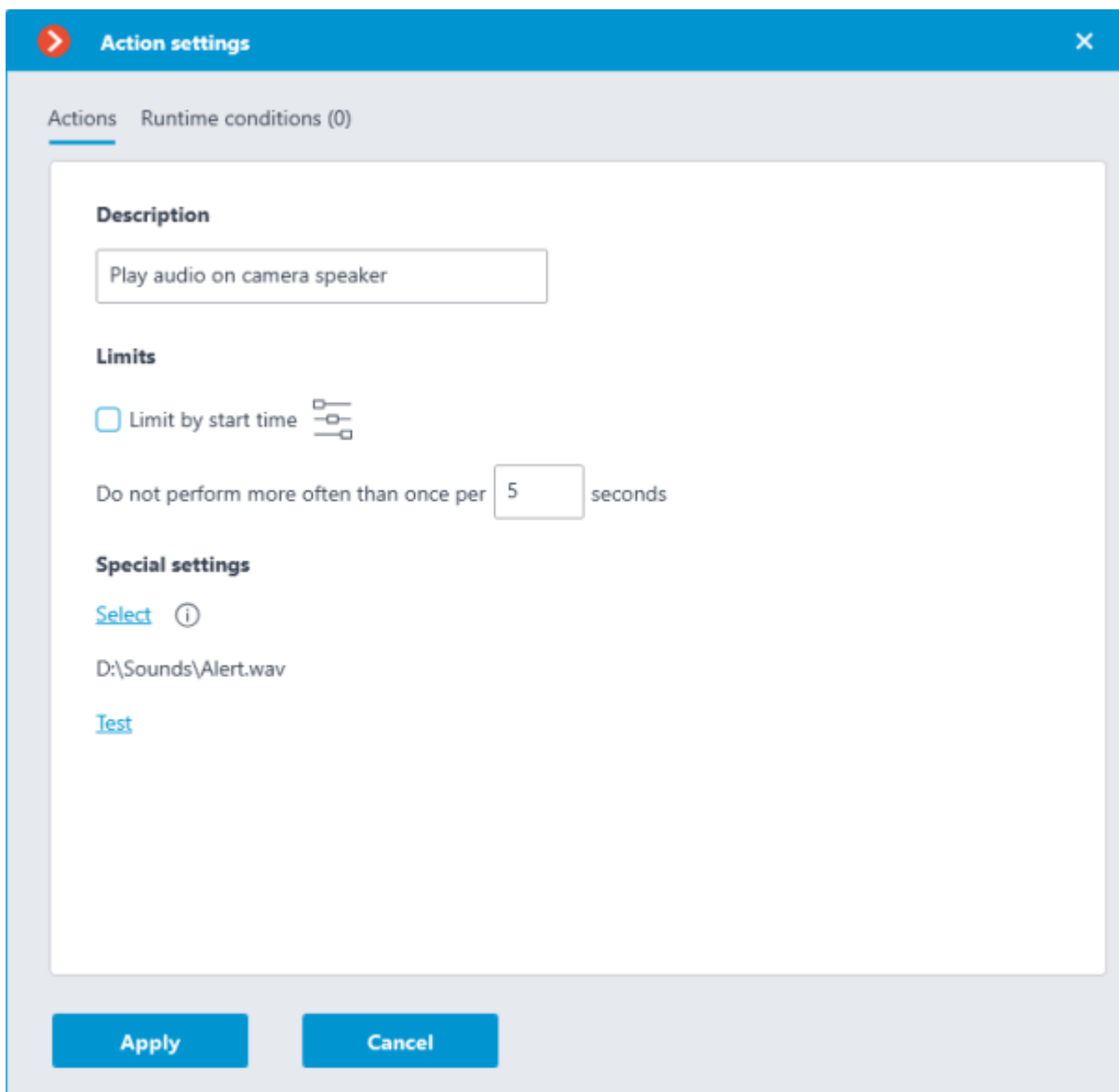
Turn on Autofocus mode

Activates camera autofocus.



Play audio on camera speaker

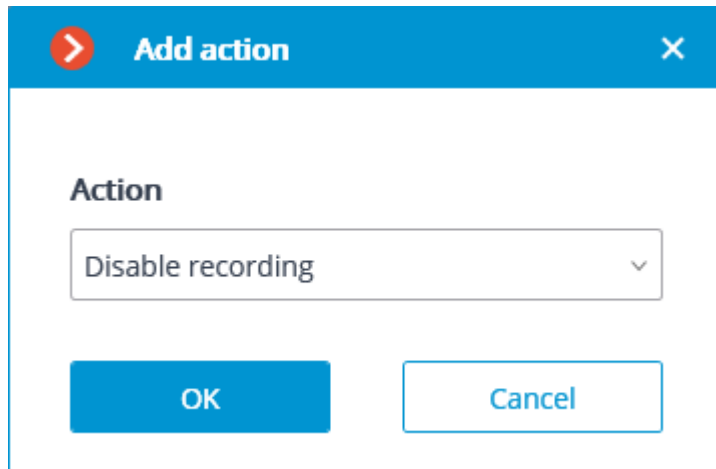
Transmits the audio file specified in the settings to the camera speaker.



See more information about [setting up this action](#).

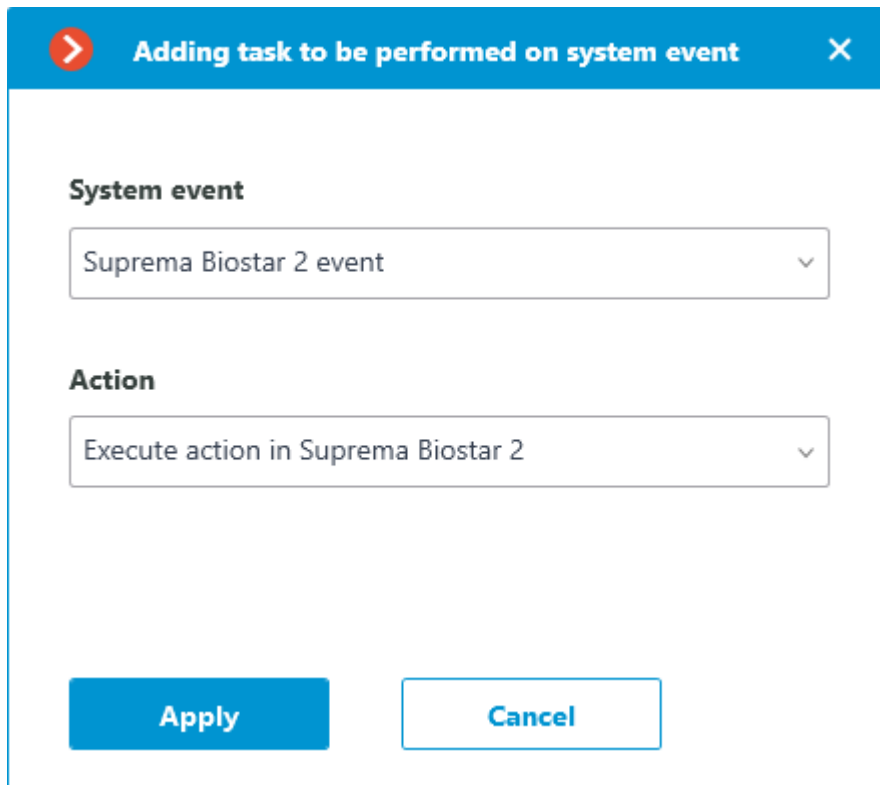
Disable recording

Disables recording to archive triggered by automation scenarios or user actions in the **Eocortex Client** application.



Execute action in Suprema Biostar 2

Sends a door control command to the **Suprema BioStar 2** ACS.



In the window that opens by clicking **Apply**, the **Special settings** section allows selecting the door to interact with, and selecting the action to be performed when processing the scenario.


Action settings

Actions Runtime conditions (0)

Description


Execute action in Suprema Biostar 2

Limits

Limit by start time 

Do not perform more often than once per seconds

Special settings

Door 

Action

Actions not set up

If the settings for integration with **Suprema BioStar 2** ACS on the **Integrations** tab are not set, are incorrect or are inactive for the selected camera, the corresponding message will be displayed instead of the action settings in the **Special settings** section.

Action settings

Actions Runtime conditions (0)

Description

Execute action in Suprema Biostar 2

Limits

Limit by start time

Do not perform more often than once per 5 seconds

Special settings

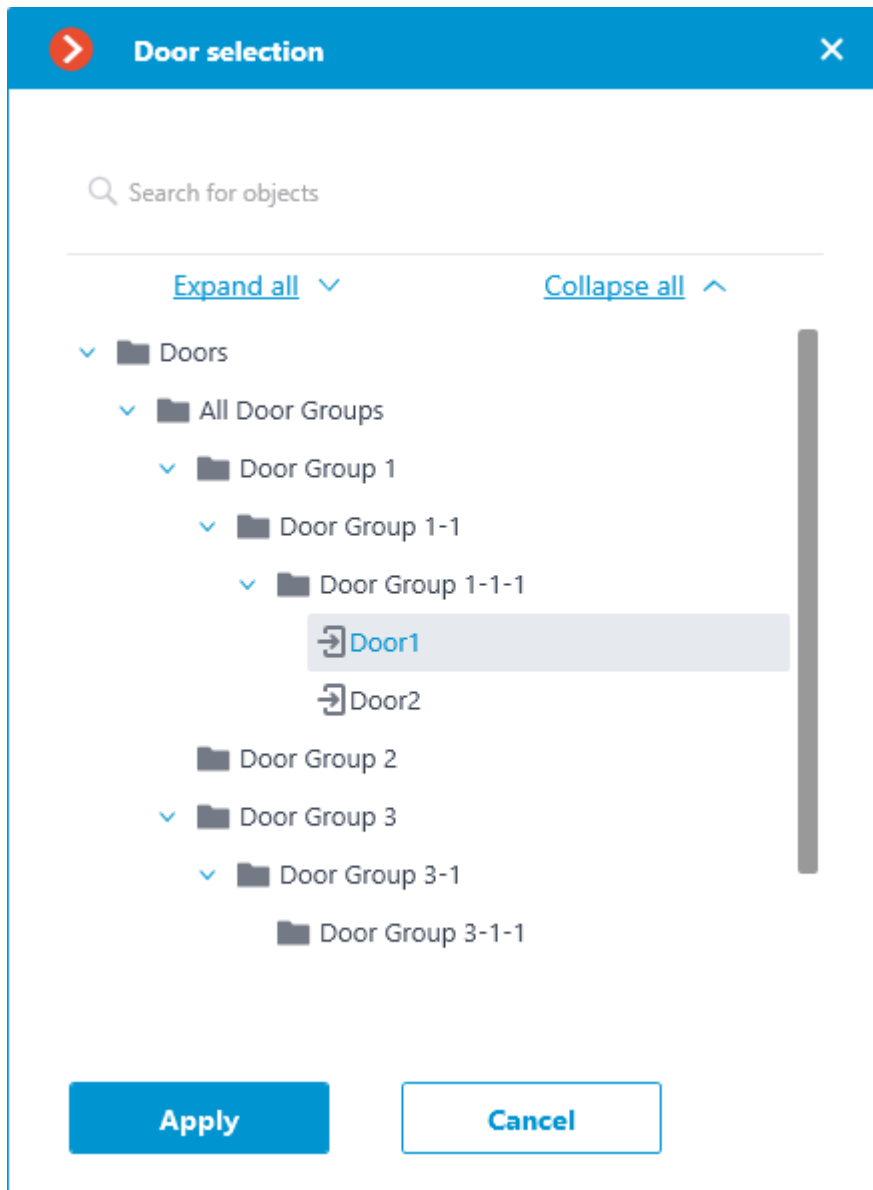
Integration is disabled

Actions not set up

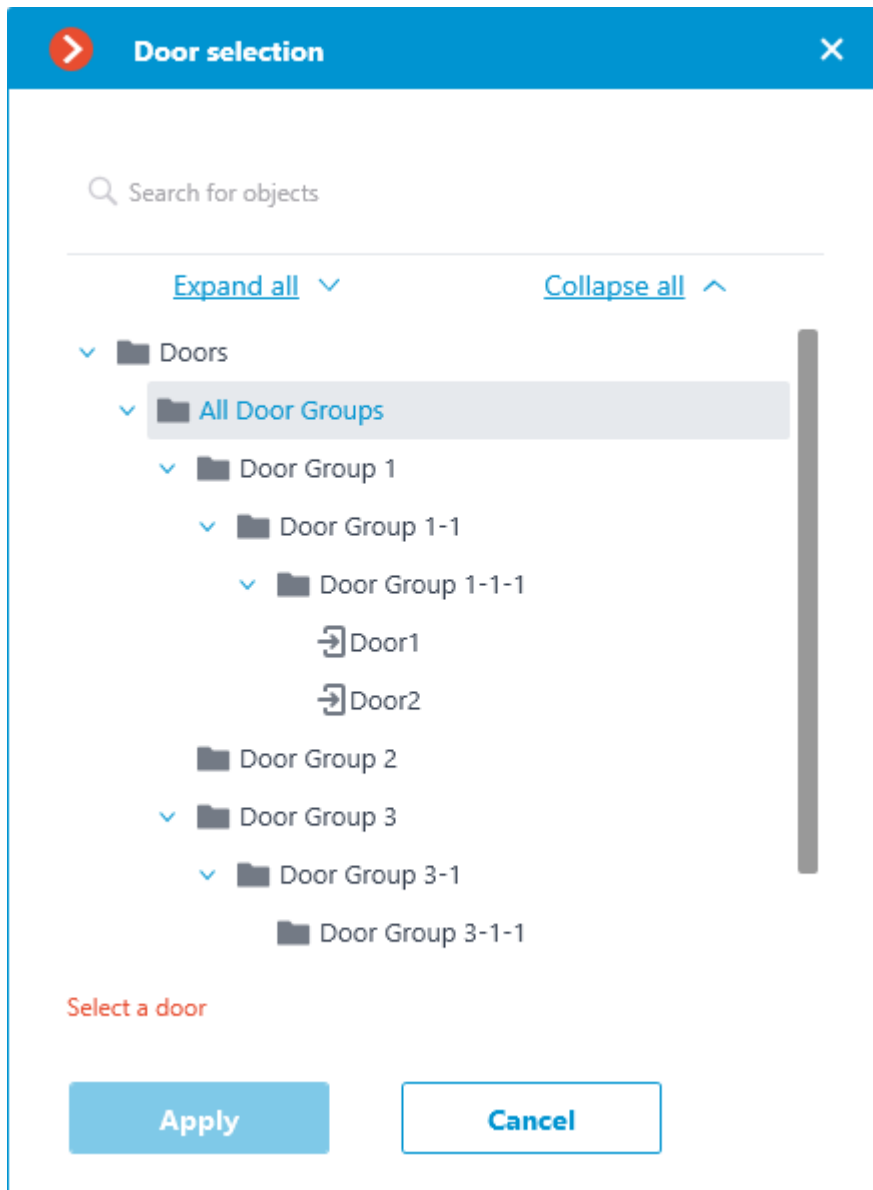
Apply Cancel

Door selection

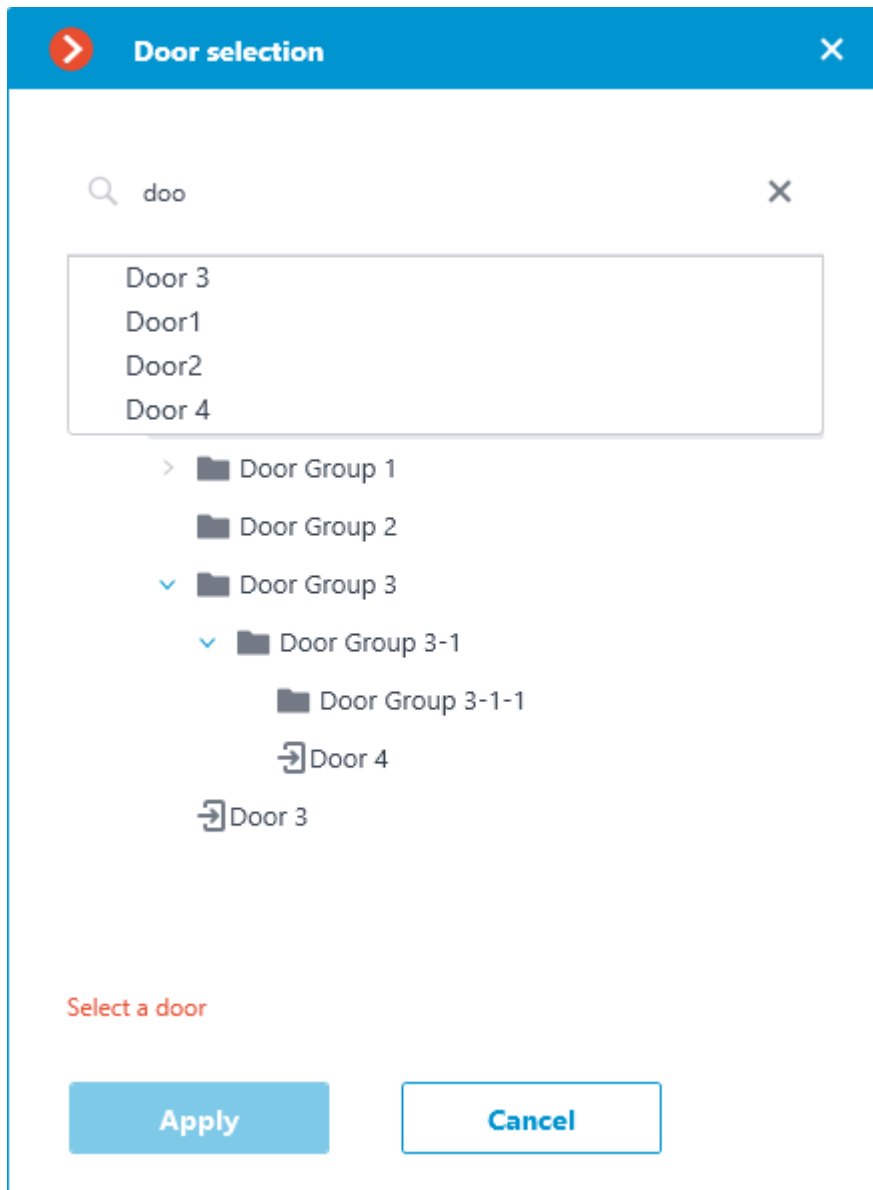
Clicking the **Select** button next to the **Door** field opens the device selection window. To load the list of doors available for interaction, the connection to **Suprema BioStar 2** ACS will be established with the credentials that were specified in the **Integrations** section.




The **Door selection** window allows selecting the door from the list, for which the action should be performed. It is necessary to select a specific door, selecting a group of doors at once is not possible.



For easy navigation to the right door, the text search by its name is available at the top of the window. Select the desired door and click **Apply** to confirm.



Once the door is selected, the previously inactive  **Copy** button, located in the **Door** field, becomes available. Clicking this button saves to the clipboard the name and ID of the selected door, which can be used later for diagnostic or automation tasks.

Action selection

The **Action** drop-down list provides a choice of actions to be performed on the selected door. The following options are available:

Open — temporarily opens the door.

Release — removes the manual door lock/unlock.

Manual lock — manually locks the door. The door remains locked even if the user is successfully authorized.

Manual unlock — manually unlocks the door. The door remains open without the need for user authorization.

Clear alarm — removes the alarm state from the door.

Action test

Once the door and the action to be performed are set, the previously hidden **Test action** link that triggers a test run of the settings becomes available.

Action settings

Actions Runtime conditions (0)

Description

Execute action in Suprema Biostar 2

Limits

Limit by start time

Do not perform more often than once per 5 seconds

Special settings

Door Door1 Select

Action Open

[Test action](#)

Status
Not tested

Apply Cancel

The current state will be displayed in the **Status** field as one of the following results:

Not tested — the settings were not checked, the functionality of the configured action is unknown.

Testing... — test run is performing according to the specified settings.

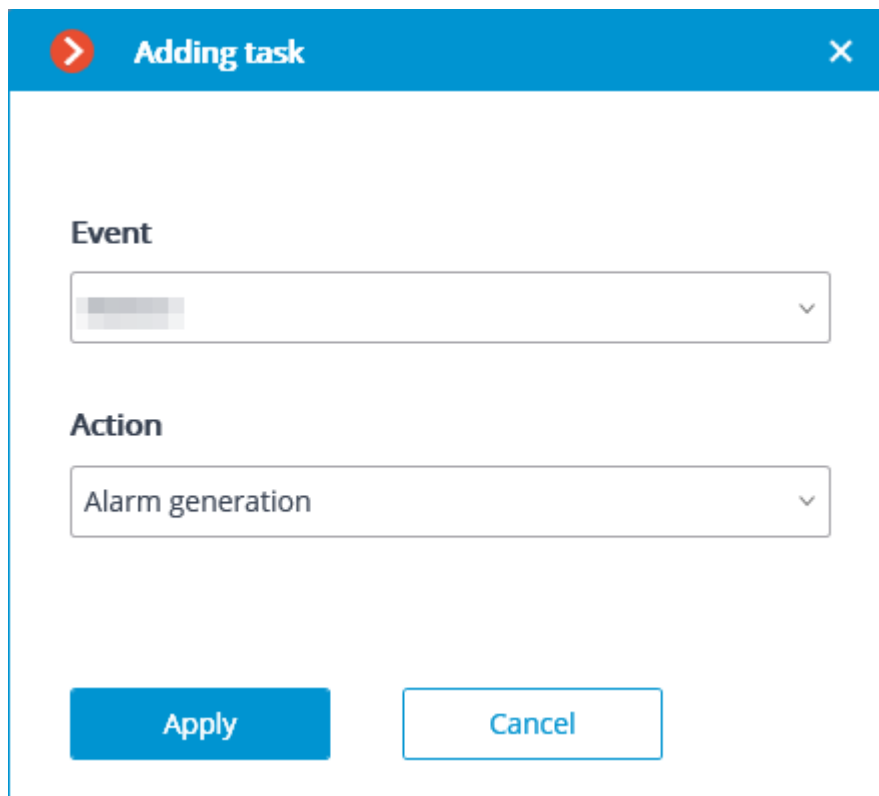
Connection succeeded — test run is successful, the settings are correct.

Request timeout — the command to run the action has not been sent to the ACS within the specified timeout period (by default, 100 seconds). Check if the integration settings are correct and if the Suprema BioStar 2 server is available.

Unknown error — test run of the action has failed for unknown reason. Detailed information about the error can be found in the **Eocortex Server** logs.

Alarm generation

Generates alarm for the camera.



The screenshot shows a dialog box titled "Adding task". It features a blue header bar with a red arrow icon on the left and a close button (X) on the right. Below the header, there are two sections: "Event" and "Action". Each section has a dropdown menu. The "Action" dropdown is currently set to "Alarm generation". At the bottom of the dialog, there are two buttons: "Apply" (a solid blue button) and "Cancel" (a white button with a blue border).

Action parameters:

Activate camera: if the camera is displayed on screen in the **Eocortex Client** application in the real time mode, the cell with the camera is active.

Open real time video: When a camera in the alarm monitor is opened, it will open in the real-time viewing mode.

Open archive: When the camera is opened in the alarm monitor, it will open in the archive playback mode. In this case, the video will be played from an earlier moment, with an offset specified by the **Time shift when opening archive, sec** parameter.


Action settings ✕

Actions

Execute on cameras
Action will be performed for the following cameras

Camera 1 (Current) ▾

Limits

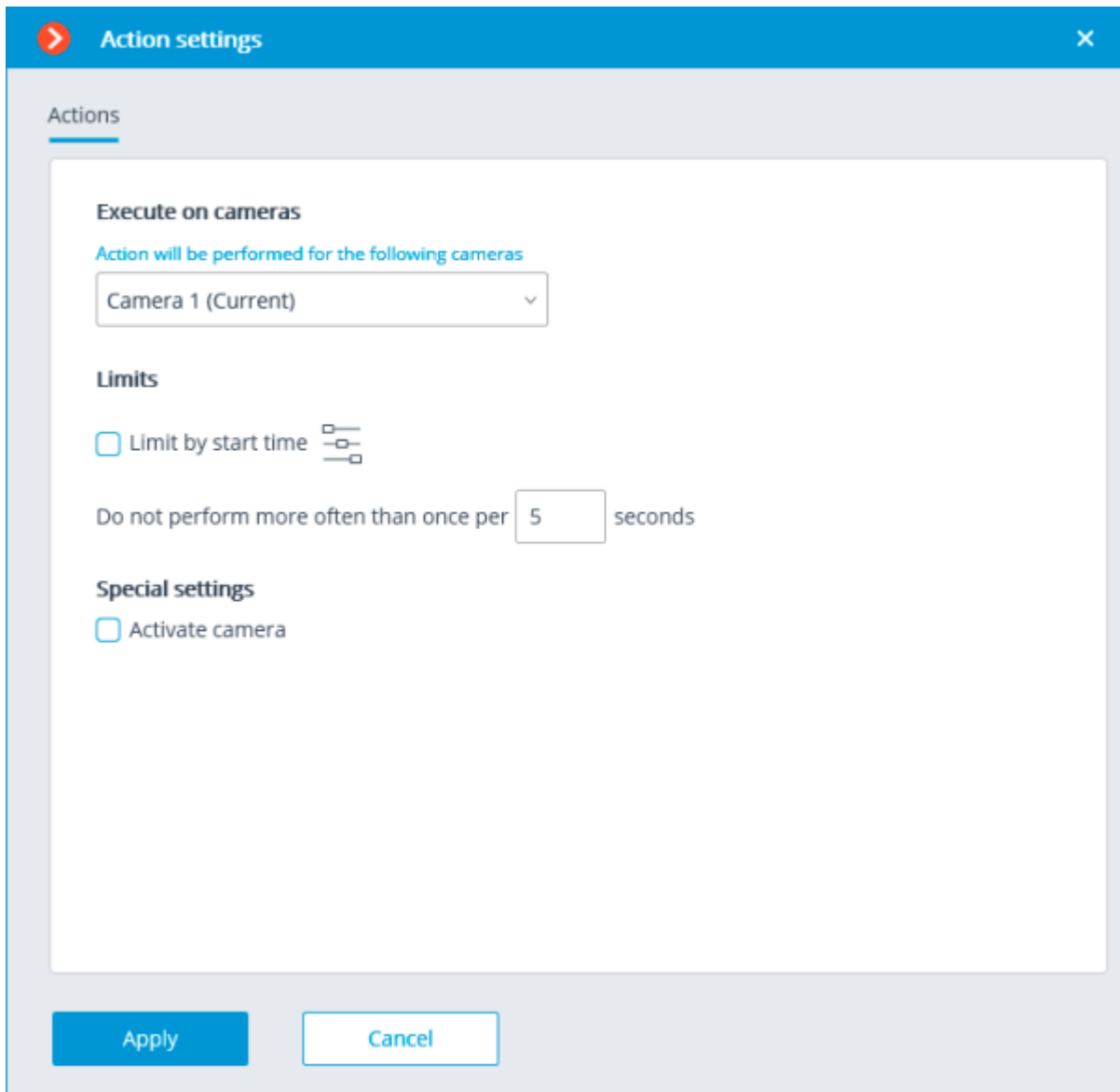
Limit by start time 

Do not perform more often than once per seconds

Special settings

Activate camera

Apply **Cancel**



Action settings

Actions

Execute on cameras

Action will be performed for the following cameras

Camera 1 (Current)

Limits

Limit by start time

Do not perform more often than once per 5 seconds

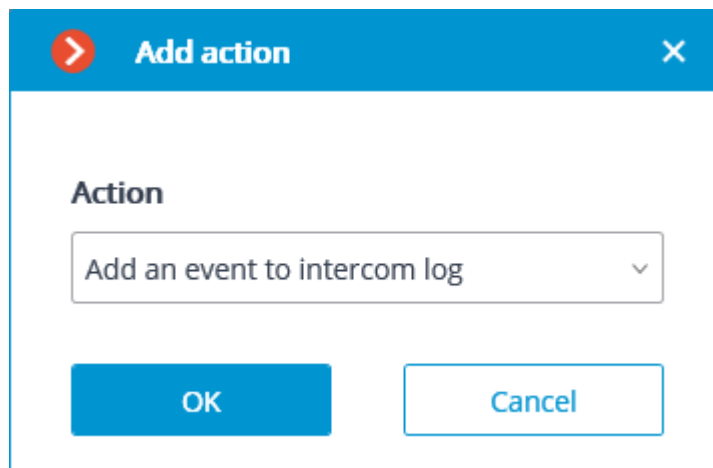
Special settings

Activate camera

Apply Cancel

Add an event to intercom log

Add the current door phone event to the **Event log**.



Add action

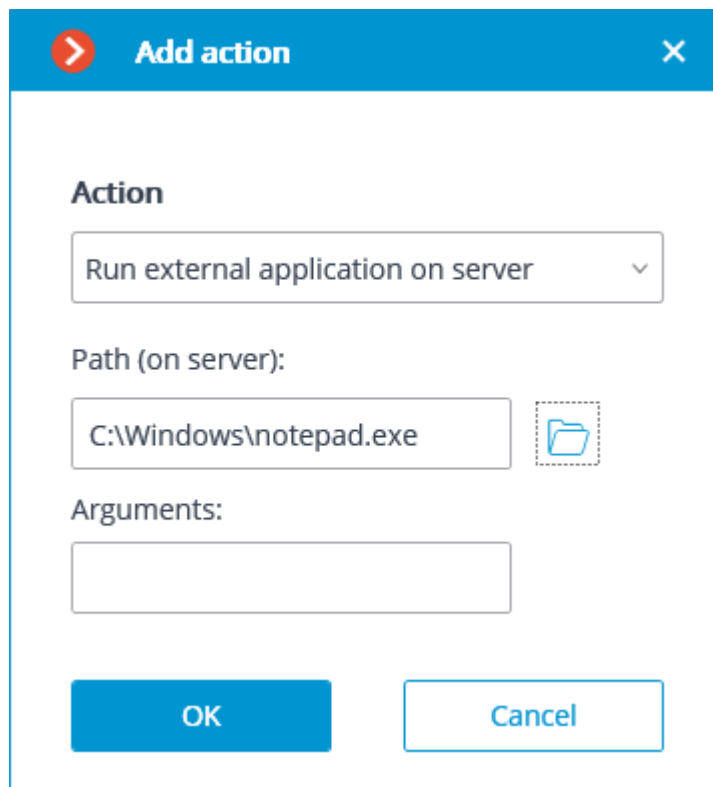
Action

Add an event to intercom log

OK Cancel

Run external application on server

Launches an external application on the server.



The Windows operating system does not allow the background services to launch the applications with graphical user interfaces. That is why such applications will not be launched from **Eocortex Server** using this action. At the same time, a record regarding the launch of the application will be made in the **Eocortex Server** event log, because the operating system prevents the independent execution of the application when attempted.

Action parameters:

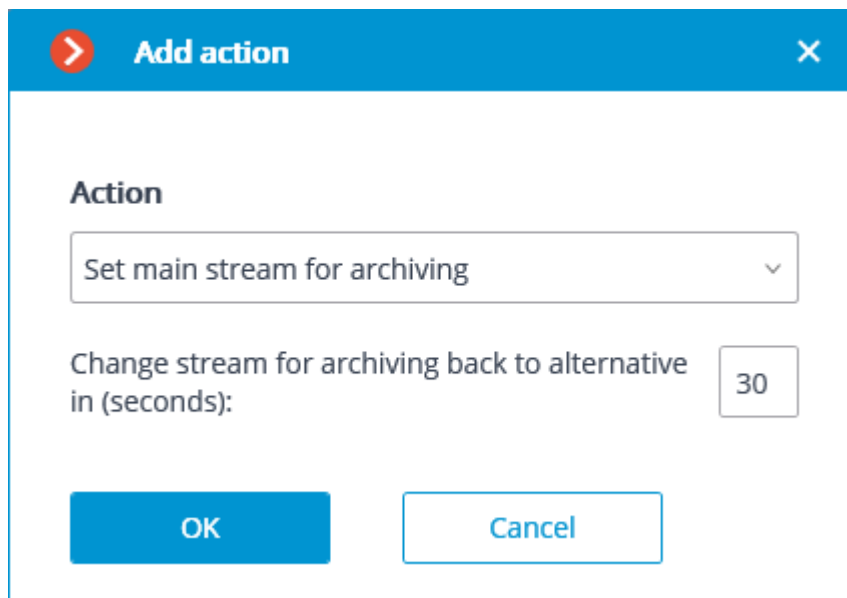
Path:: sets the path to the application located on server.

The application to be launched must be located in the **Scripts** subfolder in the startup folder of **Eocortex** application. The application will not start if located in any other folder.

Arguments: to launch an application with the command line arguments, these arguments are to be entered in this field.

Set main stream for archiving

Enables the mode of recording the main stream of the set time interval to archive. It is used in the case when the recording of alternative stream to archive has been set for the camera.

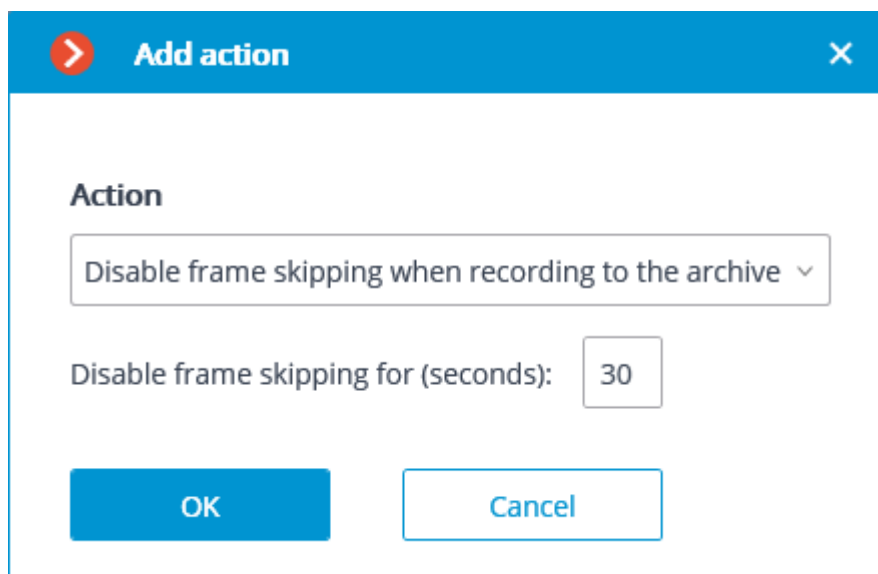


Action parameters:

Change stream for archiving back to alternative in (seconds): sets the period of time for which the recording of the main stream to archive will be enabled.

Disable frame skipping when recording to the archive

Disables frame skipping when performing the recording of the preset time interval to archive.



Action parameters:

Disable frame skipping for (seconds): sets a time interval for which the frame skipping will be disabled while recording to archive.

Open door Paxton Net2

Sends a door opening command to **Paxton Net2** access control system (ACS).

Action

Open door Paxton Net2

Адрес сервера Paxton Net2 server address 192.168.56.1

REST port 8080

User name Admin

Password ●●●●●

Client ID

Door name paxtonDoor

OK Cancel

When setting up the action, configure the following parameters:

Paxton Net2 server address: IP address or domain name of the Paxton Net2 server

REST port: Port for sending REST API requests to the Paxton Net2 server (usually the same as SignalR)

Username: Name of the Paxton Net2 account used for connection

Password: Password of the Paxton Net2 account used for connection

Client ID: Identifier contained in the Paxton Net2 license filename

Door name: The door name as it is set in the Paxton Net2 ACS

Send HTTP request

Sends an HTTP or HTTPS request to an external system with HTTP API.

Add action ✕

Action

Send HTTP request ▾

GET ▾ Test

Status: 200 OK

Authorization (Basic)

User name Password

OK Cancel

Action

Send HTTP request

POST **Test**

Status: 200 OK

Authorization (Basic)

User name: Password:

Request body Text **JSON** XML

```
[
  {
    "Name": "Camera 2",
    "ServerBindingsSettings": {
      "OwnerServerId": "efc87f33-f09f-4e0f-b865-1efccba25e8"
    }
  }
]
```

OK

Action parameters:

The dropdown list allowing to select a request type: **GET**, **POST**, **PUT** or **DELETE**.

The field for entering the text of a request.

The **Test** button sends a request. The status of implementation of the test request is shown under the field with the text of the request.

The activation of the **Authorization (Basic)** option allows to specify the username and password for sending the request using Basic authorization.

The field for entering the body of a request.

Send Push notifications to mobile devices

Sends Push notifications with the preset text to the mobile clients connected to servers.

Action

Send Push notifications to mobile devices

Message text: Camera 1: Sabotage!

Recipients: john.smith,robert.miller

root

john.smith

robert.miller

OK

Action parameters:

Message text: allows setting the text to be sent in the notification.

Recipients: allows setting the recipients of the notification.

Send to messenger

Sends a message through the connected messengers.

Action

Send to messenger

Message text

Camera 1: Sabotage!

Attach frame

Recipients

r.miller@mycompany.com

j.smith@mycompany.com

OK Cancel

Action parameters:

Message text: the text of the message to be sent via messengers.

Use of [template variables](#) is supported. **Attach frame:** attaches the current frame.

Use frame from archive: a frame from the archive is attached.

Attach link to the map — the option that allows to attach a link to the location of the camera on the map to the end of the message text. For this purpose, the camera must be located on the map in the [Maps](#) section. The link will be sent to the service (Google, OpenStreetmap, Yandex), which is configured in the system. **Recipients:** the list of messenger users in which it is required to mark the recipients of the message.

When sending messages created by the **Face recognized** event to the messengers, the image of a face from the archive at the moment of recognition will be attached to the message, and the reference image from the database will also be attached for comparison. Whereby, regardless of whether the **Use frame from archive** option is enabled or disabled, the archived image will be attached. At the same time, the message will not contain the image of the face if there was no corresponding image in the archive at the moment of recognition. Moreover, the message will be sent only in case the settings of the conditions of the execution of action by event contain **Identified | Equal | Yes** setting.

Send report by email

Draws up a report and sends it by email.

Add action ✕

Action

Send report by email ▾

Send from + 🗑️ ✎

To ℹ️


Type of report ▾

For the last ▾

Interval size ▾

Report format ▾

OK

Settings for this action have been moved to the  **Video analytics** section.

Send notification by email

Sends an email notification from the server to the indicated address.

Adding action ✕

Action

Send notification by email ▼

Mailing server: cctv@mycompany.com ▼ + ✎ 🗑

Send from: cctv@mycompany.com

To: user@mycompany.com ⓘ

Subject: Eocortex: Notification from camera "{{ CameraName }}" ✎

Message text: Check the camera! Something happened with it at {{ eventtime }}! ✎

Attach frame to email

Use frame from archive

Saved frame format: Jpeg ▼

Attach link to the map

[Send text message](#)

OK **Cancel**

Action parameters:

Mailing server — connection settings with the SMTP server that should be used for sending messages. Allows to perform authorization to **Google** mail service, as well as to connect a **custom SMTP server**.

Send from — email address to be used for sending messages. Most often the value will be the same as the user name in the mail server settings window.

To — email address to which the messages will be sent.

Subject: — e-mail header the recipient will see in the message right after the sender's name. Use of [template variables](#) is supported.

Message text: — text of the message to be sent to the specified address. Use of [template variables](#) is supported.

Attach frame to email — allows to add a frame from the channel taken at the moment of sending the message. The frame **file format** must be set: JPEG, PNG or BMP.

On the frame, a red frame will highlight the object when the message is sent in response to the following analytics events:

Face recognized

License plate recognized

Abandoned object

Inactive zone

Fire / Smoke

Checked for equipment



No face mask

Use frame from archive — frame from the archive will be used for sending instead of the real time frame. It allows to send more event-synchronized visual data, but causes additional server hardware load.

Attach link to the map — the option that allows to attach a link to the location of the camera on the map to the end of the message text. For this purpose, the camera must be located on the map in the [Maps](#) section. The link will be sent to the service (Google, OpenStreetmap, Yandex), which is configured in the system. Clicking the **Send text message** link will cause an attempt to send the message. Depending on the result, a window with a message confirming a successful transmission or an error will appear.



Below are the forms for adding a mail server and sender address, depending on the mail server type: **Set manually** or **Google**.

The forms of editing the mail server and sender address are similar to the forms used for adding.

 **Add Mail server** 

Mailing server

SMTP server address:

 **Add Mail server** 

Mailing server:


SMTP server address:

Port:


Use SSL

Data authentication (optional)


User Name:

Password: 



GmailOAUTH ✕

 Sign in with Google ^

Eocortex wants to access your Google Account

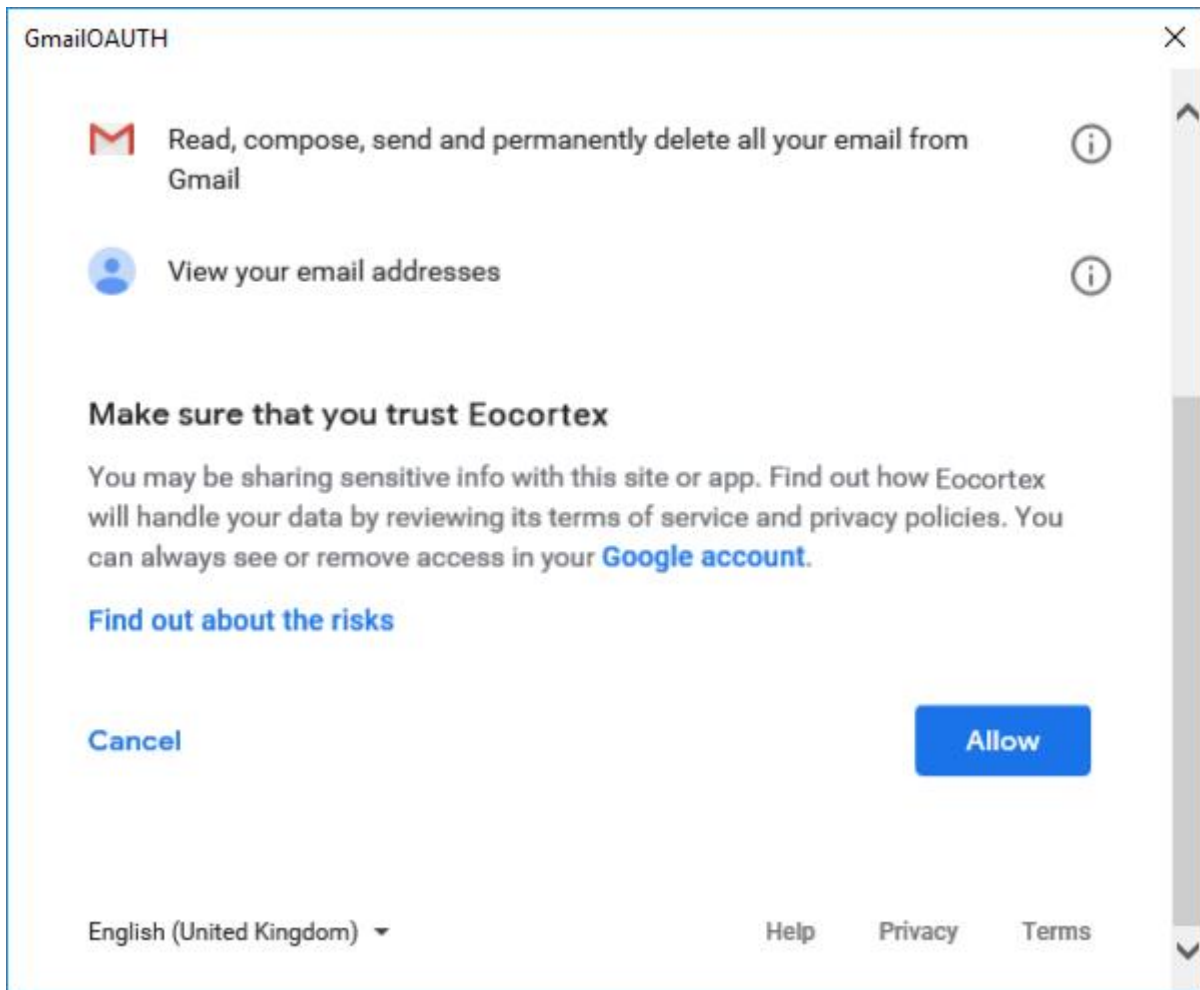
 cctv.mycompany2018@gmail.com

This will allow **Eocortex** to:

-  Read, compose, send and permanently delete all your email from Gmail ⓘ
-  View your email addresses ⓘ

Make sure that you trust Eocortex

You may be sharing sensitive info with this site or app. Find out how Eocortex will handle your data by reviewing its terms of service and privacy policies. You ∨



Send notification by SMS

Sends an SMS notification using the GSM modem plugged into a USB port of the server to the indicated address.

Adding action

Action

Send notification by SMS

GSM modem: GSM Modem + ✎ 🗑

Telephone number: +447800767690

Message text: Problem with camera {{ cameraname }} ✎

[Send message](#)

OK Cancel

Before using the GSM modem on the server, it is required to install the drivers supplied with the modem, then check the modem's operability by sending a test message either with the software provided with the modem or using the operating system's means. After checking the modem's operability, it is required to close or stop the software used for working with the modem — otherwise the modem may become unavailable for use with the CCTV system.

The number of the COM port to which the GSM is connected may be found in the Windows Device Manager or in the software provided with the modem.

Action parameters:

GSM modem: allows to set the modem to be used for sending SMS messages.

Below is the modem settings form. It is required to set relevant values there. These values are usually can be found or changed in the native software of a modem.

Add GSM modem

Modem name: GSM Modem

Port: COM5

Transfer speed: 9600 Bit/s

Parity check: Not in use

Modem data bits: 8

Stop bits: 1

OK Cancel

Telephone number: the number of the phone to which the SMS message will be sent.

Message text: the text of the message to be sent to the specified number.

Use of [template variables](#) is supported. Clicking on the **Send message** link will attempt to send the SMS message. Depending on the result, a window with a message confirming a successful transmission or an error will appear.

Pause

Allows to set a pause between the actions.

Add action

Action: Pause

Pause Interval (sec): 1

OK Cancel

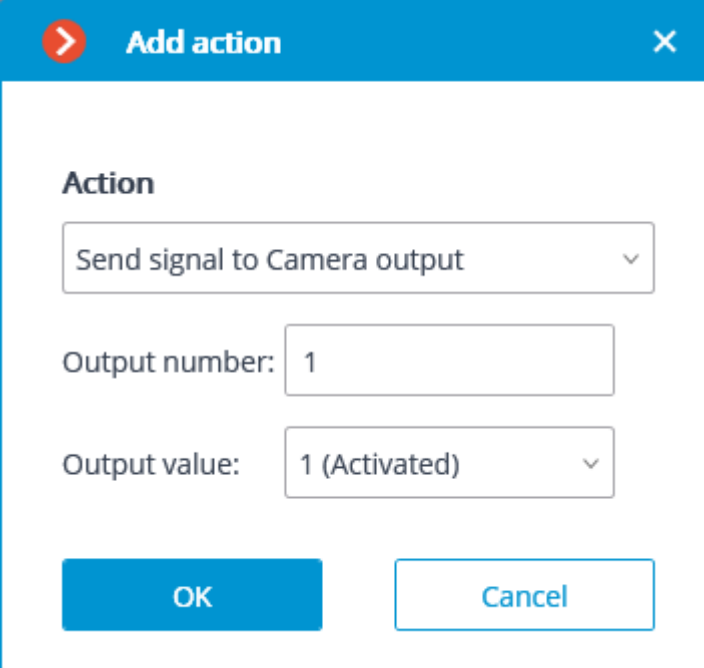
Action parameters:

Pause interval (sec) sets the pause duration.

Send signal to Camera output

The electrical signal is sent to the IP camera's signal output.

To perform this action, it is required that the support of the signal outputs for this particular IP camera model is implemented in the **Eocortex** software. Contact **Eocortex** technical support team for further details.



The screenshot shows a dialog box titled "Add action". It contains a dropdown menu for "Action" set to "Send signal to Camera output". Below this are two input fields: "Output number:" with the value "1" and "Output value:" with a dropdown menu set to "1 (Activated)". At the bottom, there are two buttons: "OK" and "Cancel".

Action parameters:

Output number: sets the number of camera signal output.

Value 0 or 1 is used for most cameras with one output.

Output value: sets the alarm output status: 1 (Activated) / 0 (Deactivated).

Depending on the circuitry employed, different physical statuses of the contacts may correspond to the activation/deactivation of the signal output: circuit closed or opened, voltage present or absent etc. As a rule, the information on the wiring can be found in the engineering documentation for the cameras.

Save frame

Saves a frame on the server.

Action

Save frame

Folder (on server):

C:\Program Files\Eocortex Server\{{ cameraname }}

File name template (it will be supplemented with the current time for uniqueness)

{{ eventtime }}{{ cameraname }}{{ cameraip }}

Saved frame format:

Jpeg

Restrict maximum size of the folder (MB):

100

Use frame from archive ⓘ

OK Cancel

Action parameters:

Folder (on server): sets the path to the folder where the frames will be stored. Use of [template variables](#) is supported.

File name template — the name of the saved frame, to the end of which will be added date and time in the format **_dd_MM_yyyy hh.mm.ss** to provide uniqueness. If the template name is not specified, it will be formed by default from the name of the camera and the time of the event. Use of [template variables](#) is supported. For example, if setting up a template using the **{{ cameraname }}** variable, the name of the resulting file would be **Office_01_11_2022 16.47.59.jpg**.

Saved frame format: image file format (JPEG or PNG).

Restrict maximum size of the folder (Mb): allows to set folder size limit. Old files will be deleted when the maximum folder size is reached. If template variables were used in specifying the folder path, then the maximum folder size limit will be applied to the specific folder, the name of which is obtained after the template evaluation.

Filenames will be formed as follows:

ChannelName DD_MM_YYYY hh.mm.ss.ttt.ext, where:

DD_MM_YYYY: day, month, year;

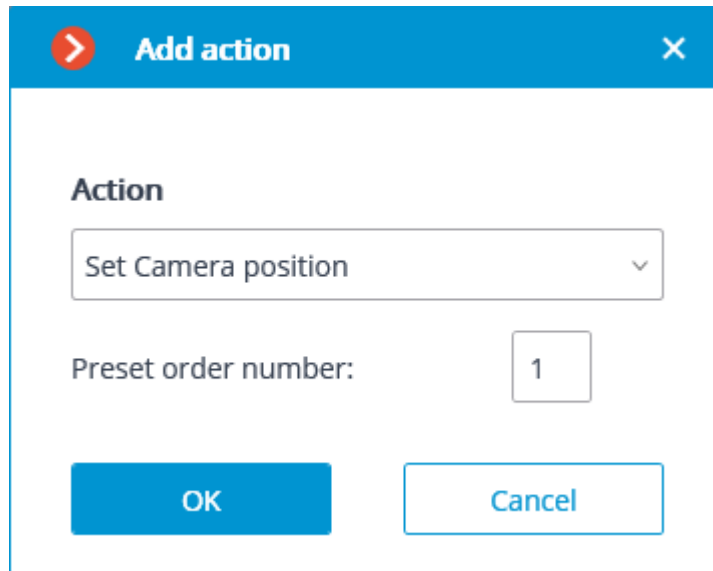
hh.mm.ss.ttt: hours, minutes, seconds, milliseconds

ext: jpg, png.

Use frame from archive — the frame saved in the archive will be used for sending. This allows sending visual information that is more synchronous with the event, but it leads to additional hardware resource consumption of the server.

Set camera position

Puts a PTZ camera into a preset position. The particular preset position must be preliminarily set in the camera own settings.

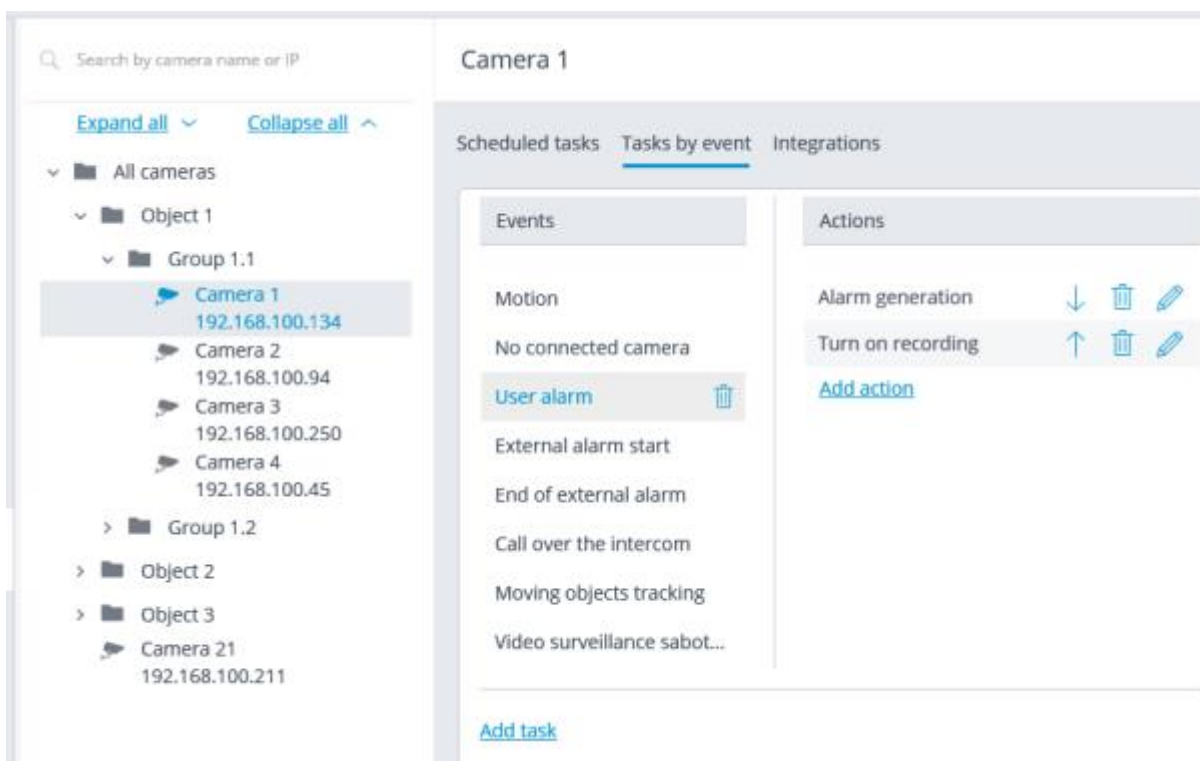


Action parameters:

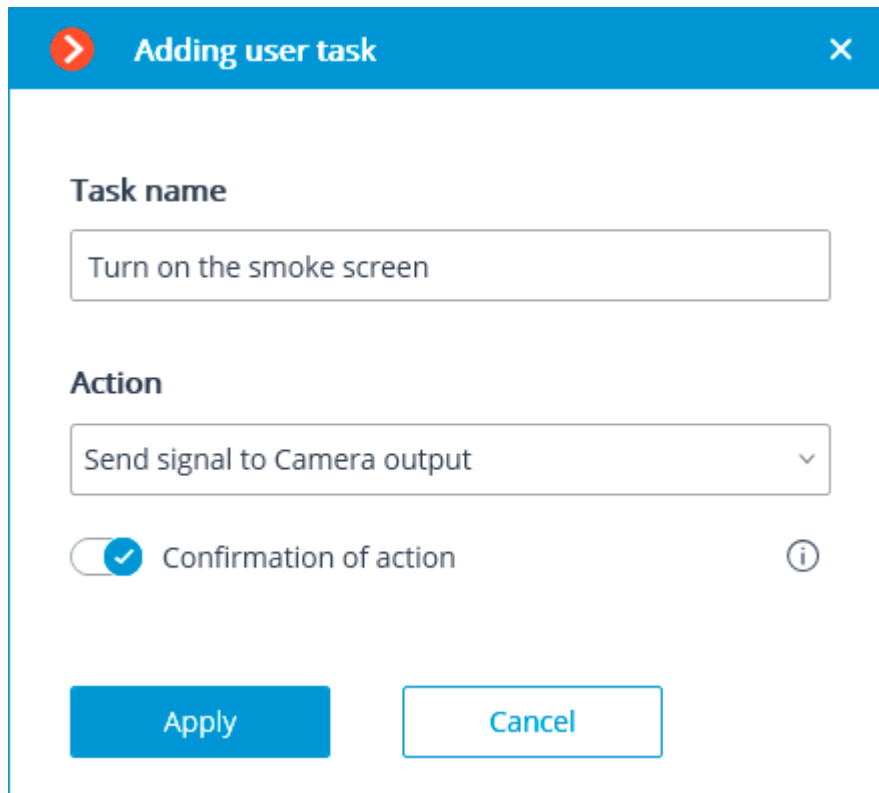
Preset order number: sequential number of a preset is set.

User tasks

For setting up actions to be performed by command of the user of the client application, go to the **Automation** tab in the **Ecortex Configurator** application, select an individual camera in the tree, then go to the **Tasks by event** tab in the opened window.



In order to add a user task, select the camera in the list and click the **+** button on the right of the **User tasks** header. The task by event wizard will open.




The screenshot shows a dialog box titled "Adding user task". It features a blue header bar with a red arrow icon on the left and a close button (X) on the right. The main content area is white and contains the following elements: a "Task name" label above a text input field containing "Turn on the smoke screen"; an "Action" label above a dropdown menu showing "Send signal to Camera output"; a "Confirmation of action" toggle switch which is currently turned on (indicated by a blue checkmark); and two buttons at the bottom: a solid blue "Apply" button and a white "Cancel" button with a blue border.

In the start screen of the wizard, it is required to enter the task name and to select an action in the dropdown list that will be executed when the task is launched. If the task launch confirmation is required, the **Confirmation of action** must be enabled.

The list and description of the available actions can be found in the [Actions](#).

At the next step, on the **Actions** tab, it is possible to set the cameras on which a task will be completed. The options are as follows: on a single camera, on all cameras, or on a user-defined list of cameras.

When performing actions on the group of cameras, these actions will be carried out only on the cameras bound to the same server to which the camera whose event has initiated the actions is bound. The actions on the initiating camera will be performed in all cases.

On this tab you can also set the limitations by execution time, including limitations on the schedule that opens when pressing the  button. Also, on this tab you may adjust the **Special settings** that depend upon a selected event.

Action settings

Actions

Execute on cameras

Action will be performed for the following cameras

Camera 1 (Current)

Limits

Limit by start time

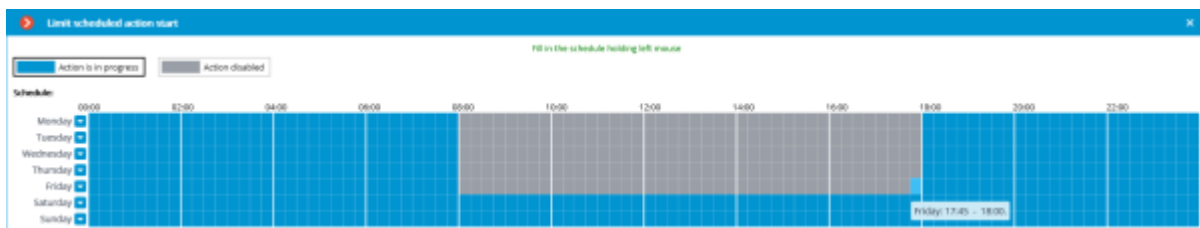
Do not perform more often than once per 0 seconds

Special settings

Output number: 1

Output value: 1 (Activated)

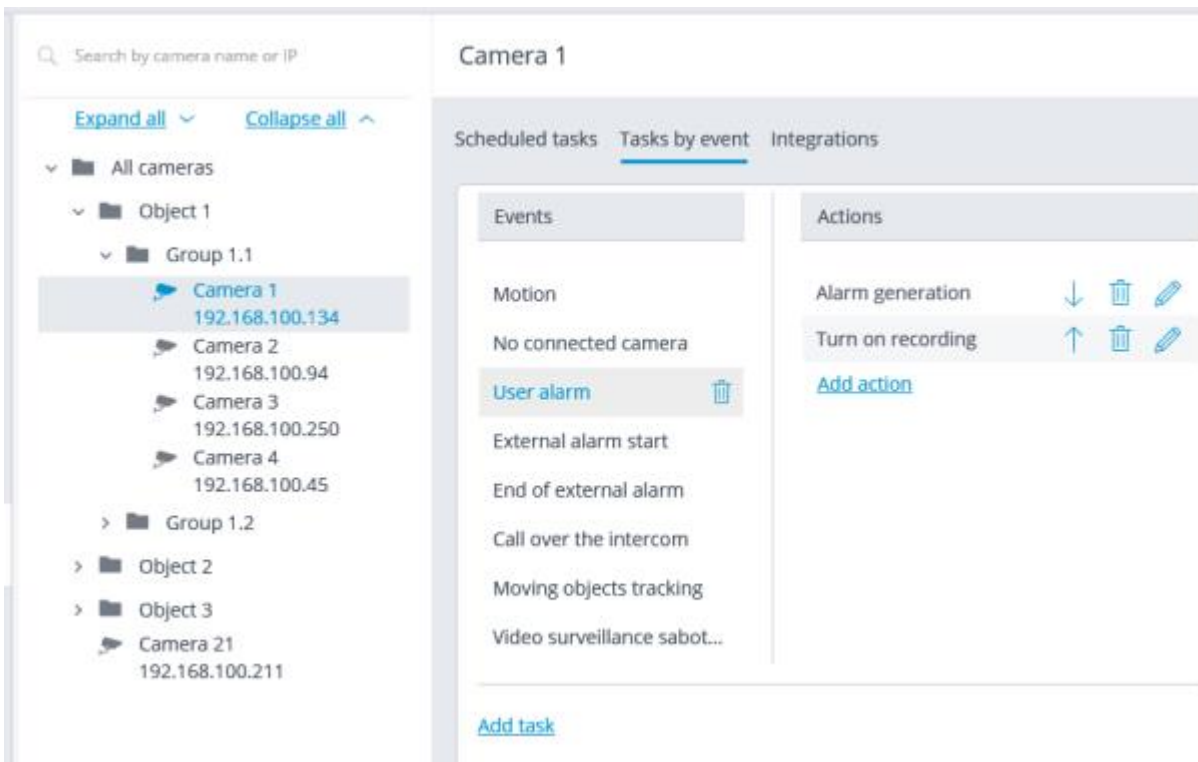
Apply Cancel



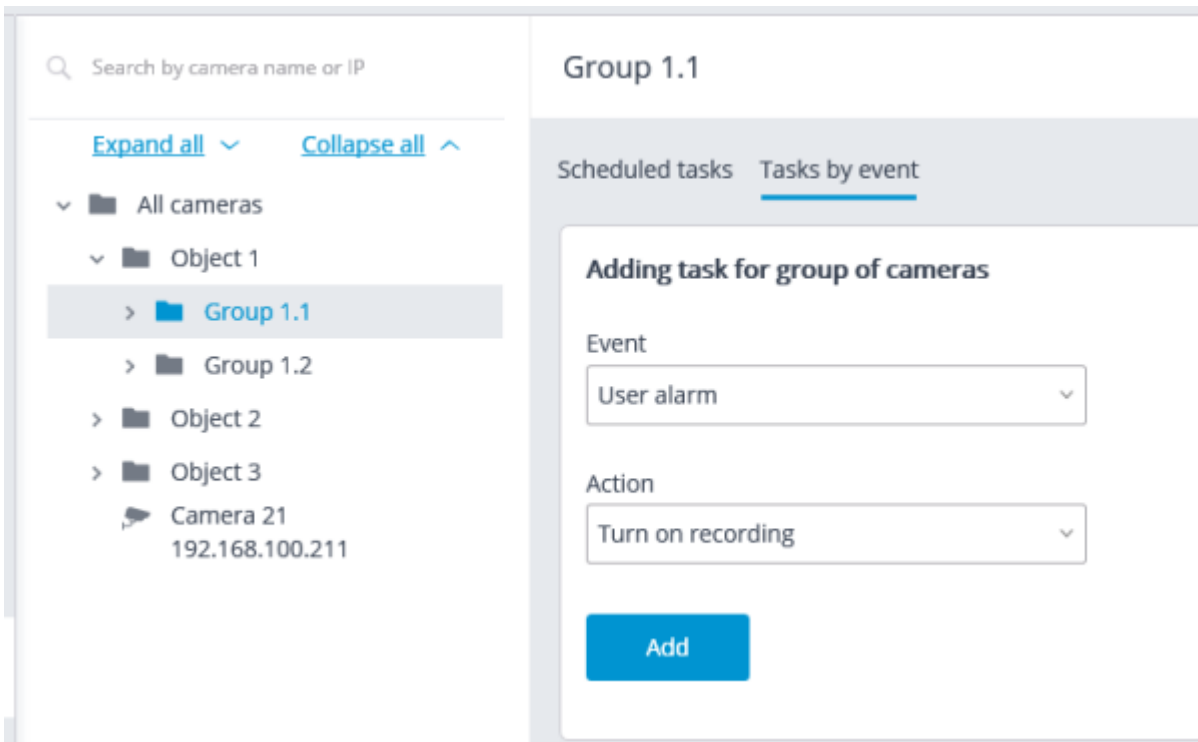
Tasks by event

For setting up actions to be performed in response to events happening in the CCTV system, go to the **Automation** tab in the **Eocortex Configurator** application, select an individual camera or folder in the tree, then go to the **Tasks by event** tab in the opened window.

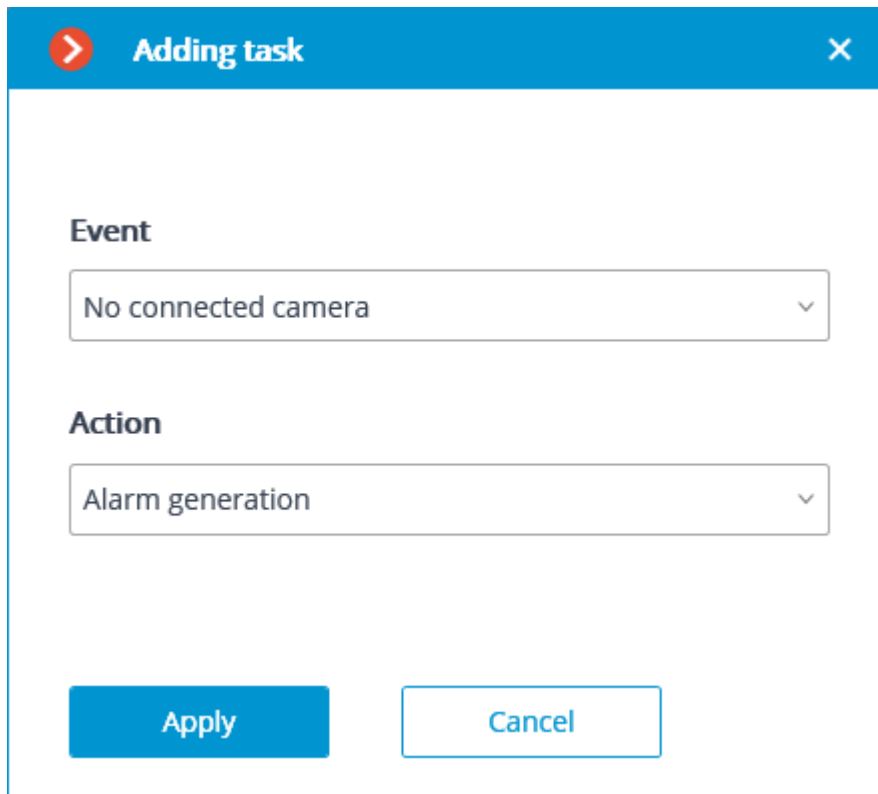
You can add, modify and delete the tasks to be performed by event.



It is possible to add only one action to be performed in response to an event for a folder or a user-defined list of cameras.



In order to add a task to be performed in response to an event, select the camera in the list and click the **Add task** link. The task by event wizard will open.



The screenshot shows a dialog box titled "Adding task". It features a blue header bar with a red arrow icon on the left and a close button (X) on the right. Below the header, there are two sections: "Event" and "Action". Each section has a dropdown menu. The "Event" dropdown is currently set to "No connected camera", and the "Action" dropdown is set to "Alarm generation". At the bottom of the dialog, there are two buttons: a blue "Apply" button and a white "Cancel" button with a blue border.


In the wizard launch screen, choose Event and Action that will be performed in response to the specified event, then click **Add**.

The list and description of the available events can be found in the [Events](#) section.

The list and description of the available actions can be found in the [Actions](#).

At the next step, on the **Actions** tab, it is possible to set the cameras on which a task will be completed. The options are as follows: on a single camera, on all cameras, or on a user-defined list of cameras.

When performing actions on the group of cameras, these actions will be carried out only on the cameras bound to the same server to which the camera whose event has initiated the actions is bound. The actions on the initiating camera will be performed in all cases.

On this tab you can also set the limitations by execution time, including limitations on the schedule that opens when pressing the  button. Also, on this tab you may adjust the **Special settings** that depend upon a selected event.


Action settings

Actions

Execute on cameras
Action will be performed for the following cameras

Camera 1 (Current) ▾

Limits

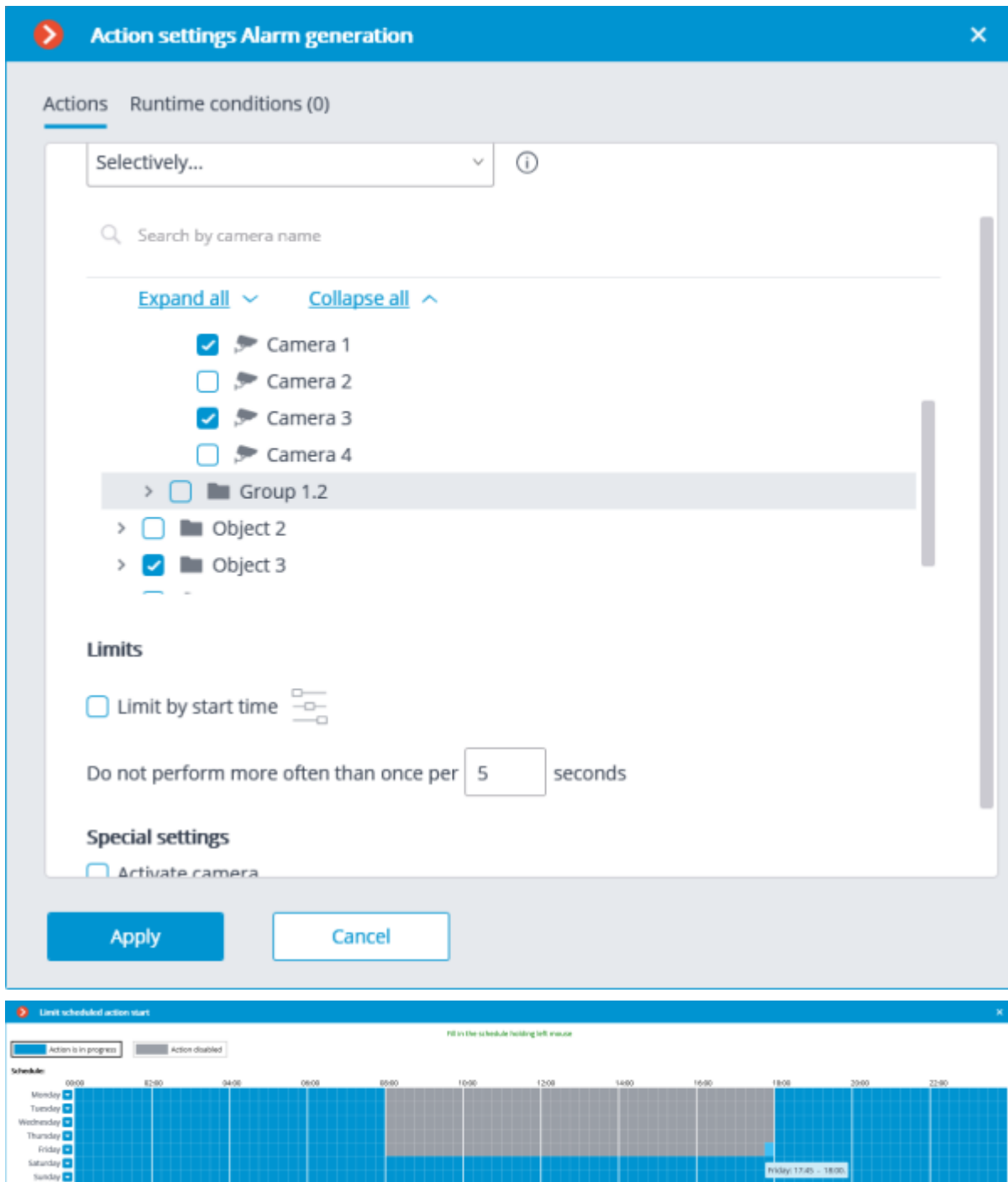
Limit by start time 

Do not perform more often than once per seconds

Special settings

Output number:

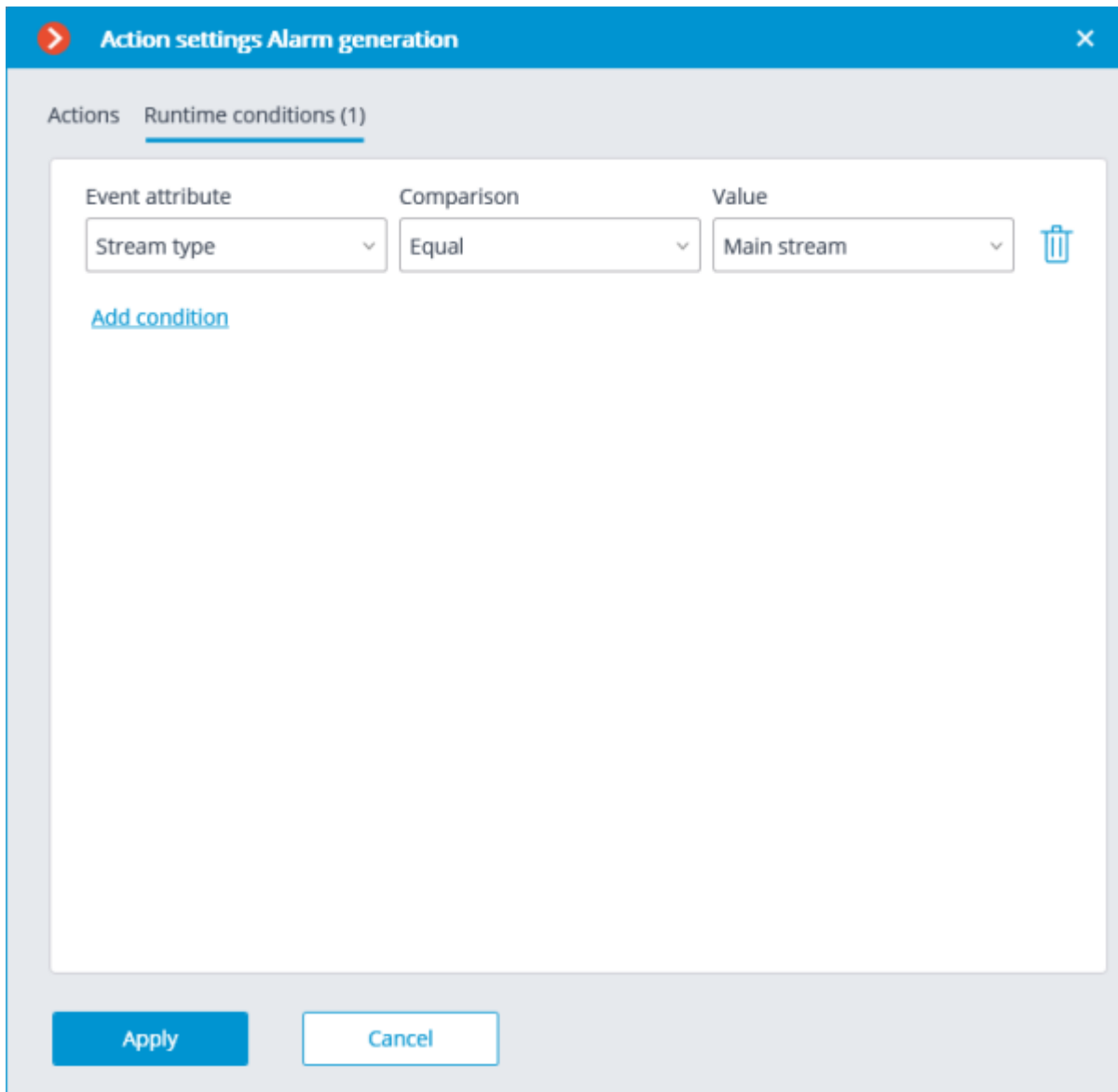
Output value: ▾



On the **Runtime conditions** tab, it is possible to set the conditions for an action to be performed.

When adding several conditions, it is required to take into consideration that all the conditions are combined by the AND logical operator. Consequently, there can be a situation when, with certain settings, the action will never be executed.

For example, if two different zones were set for the movement event in the conditions, the action will be performed only in case that the movement is registered in the part of the frame where these zones overlap. If the zones do not overlap, the action will never be performed.



The procedure of adding a task by event to a group of cameras is similar to the procedure for a single camera, with the exception that the adjustment of the attributes is not available.

Tasks for a group of cameras

Automation tasks (**Scheduled tasks** and **Tasks on system events**) can be configured not only for each camera separately, but also for all cameras in the folder and its subfolders.

When doing so:

Tasks configured for the parent folder will be added to task settings of each subfolder.

A new camera added to a folder will have applied all the tasks configured for this folder.

A camera that has been moved from one parent folder to another will update the task list, overriding the old folder's tasks and inheriting the new folder's tasks.

A subfolder that has been moved from one parent folder to another will update the task list, overriding the old folder's tasks and inheriting the new folder's tasks.

Only Scheduled tasks and Tasks by events can be configured for folders. Configuration of User tasks for folders is not available.

Creating Scheduled tasks

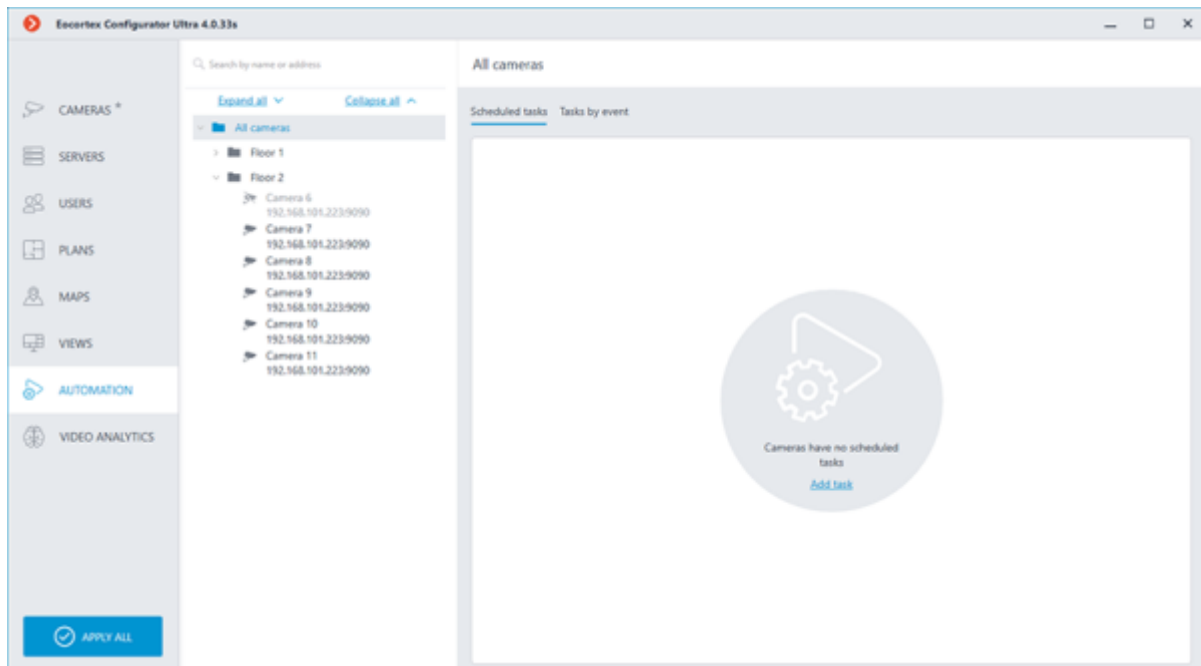
To set up a scheduled task for all cameras located in a specific folder and its subfolders, do the following:

Run the **Eocortex Configurator** application.

Switch to the **Automation** section.

Select the desired camera folder in the list.

Select the **Scheduled tasks** tab on the right side of the window.



Click the **Add task** button. In the **Scheduled action wizard** window that opens, configure the task parameters.

Scheduled action wizard

Task

Task name

Description

< Back Next > Cancel

[Scheduled task settings](#) for folders are the same as for individual cameras.

To set up another task to the folder settings, click the + button located above the list of tasks.

Evoctex Configurator Ultra 4.0.33s

Search by name or address

All cameras

Expand all Collapse all

- All cameras
 - Floor 1
 - Floor 2
 - Camera 6
192.168.101.223/0091
 - Camera 7
192.168.101.223/0090
 - Camera 8
192.168.101.223/0090
 - Camera 9
192.168.101.223/0090
 - Camera 10
192.168.101.223/0090
 - Camera 11
192.168.101.223/0090

Scheduled tasks - Tasks by event

Tasks +

Task for all cameras

Description

Schedule
Task was started 16.09.2022 in 16:17.

Actions

- 1 Turn on washer
- 2 Set Camera position preset order number: 1
- 3 Turn on recording recording time limit: 300

Note
Scheduled task for all cameras

Clear the tasks of all cameras of the folder

When editing or deleting a task configured for a folder, the changes will affect all subfolders and cameras located in this folder. Tasks configured individually for a camera will not be affected.

Creating Tasks by events

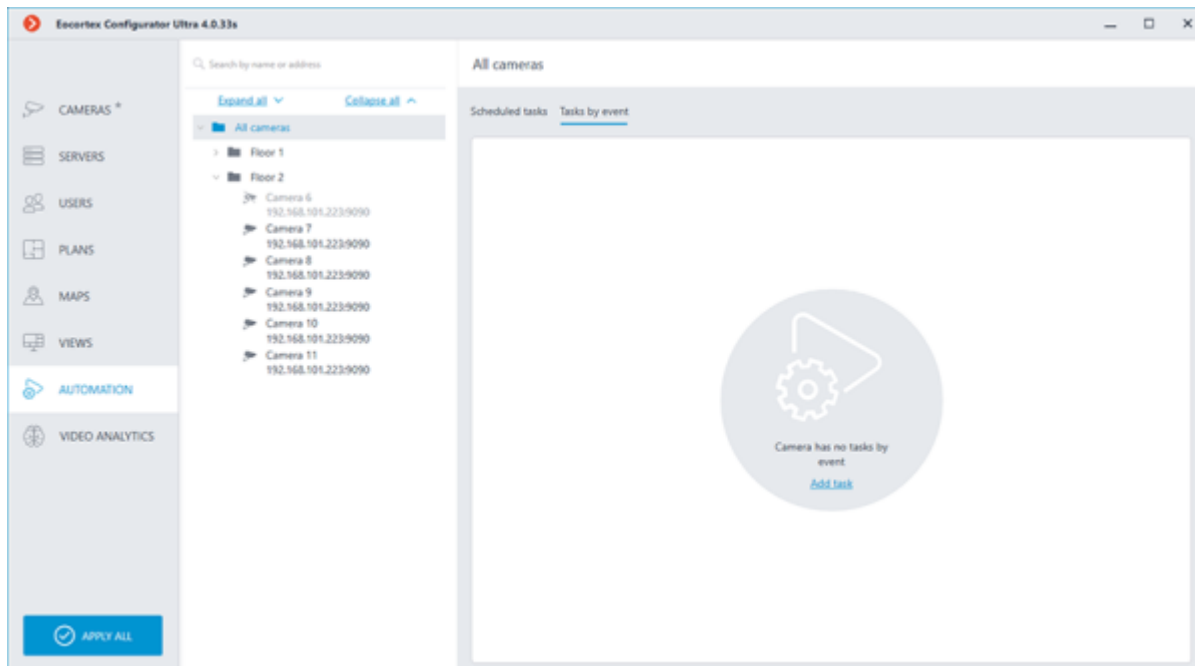
To set up a task by event for all cameras located in a specific folder and its subfolders, do the following:

Run the **Eocortex Configurator** application.

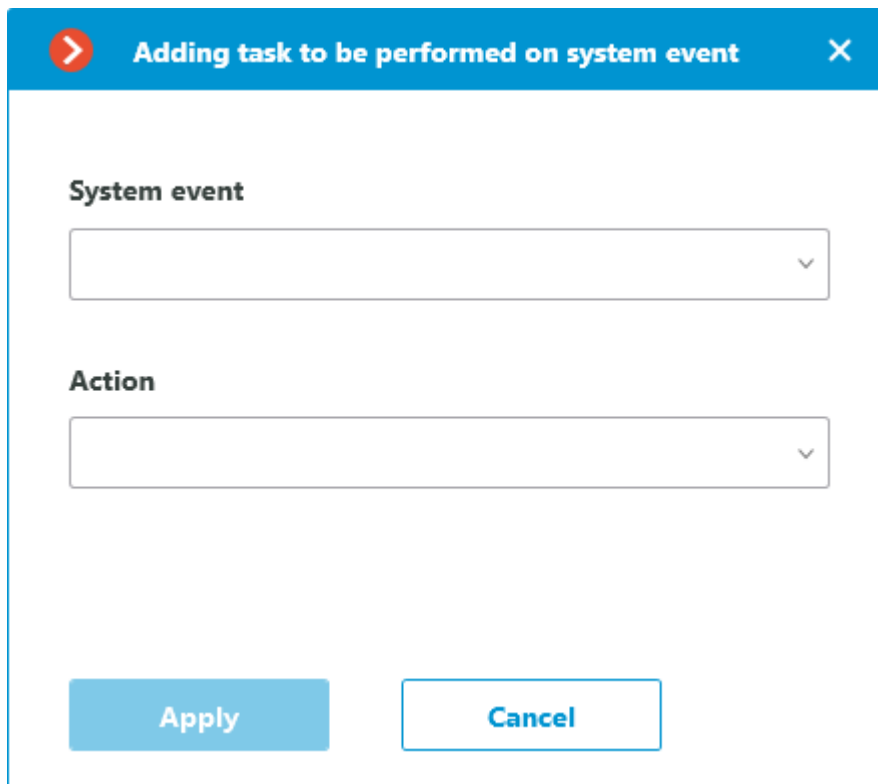
Switch to the **Automation** section.

Select the desired camera folder in the list.


Select the **Tasks by event** tab on the right side of the window.




Click the **Add task** button. In the **Adding task to be performed on system event** window that opens, configure the task parameters.

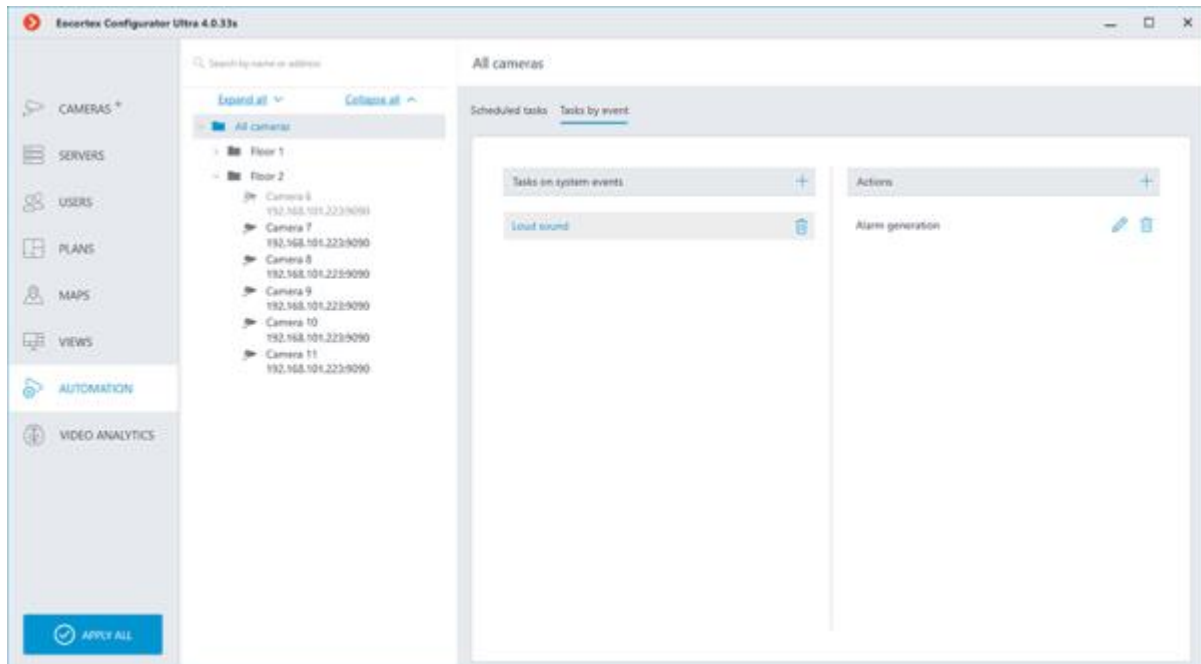




[Task by event settings](#) for folders are the same as for individual cameras.

To change the action selected as a response to the event, click the  button next to the action.

To set up another action to the task settings, select the task and click the  button located above the list of actions.


To set up another task to the folder settings, click the  button located above the list of tasks.



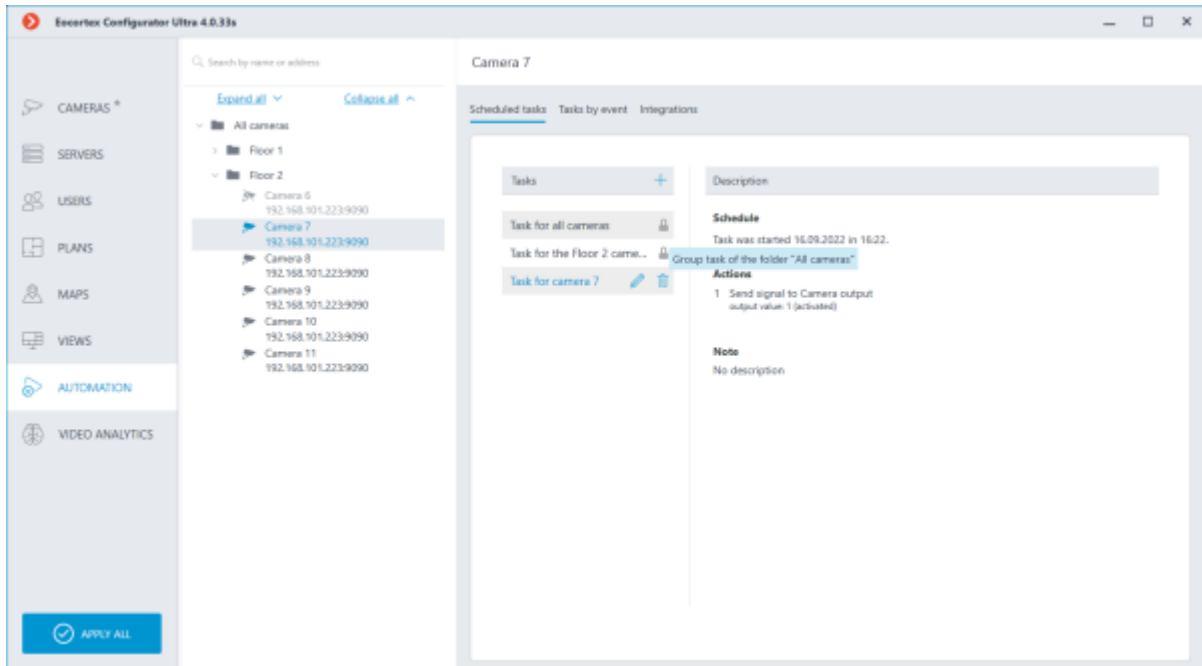
When  editing or  deleting a task configured for a folder, the changes will affect all subfolders and cameras located in this folder. Tasks configured individually for a camera will not be affected.

Viewing tasks

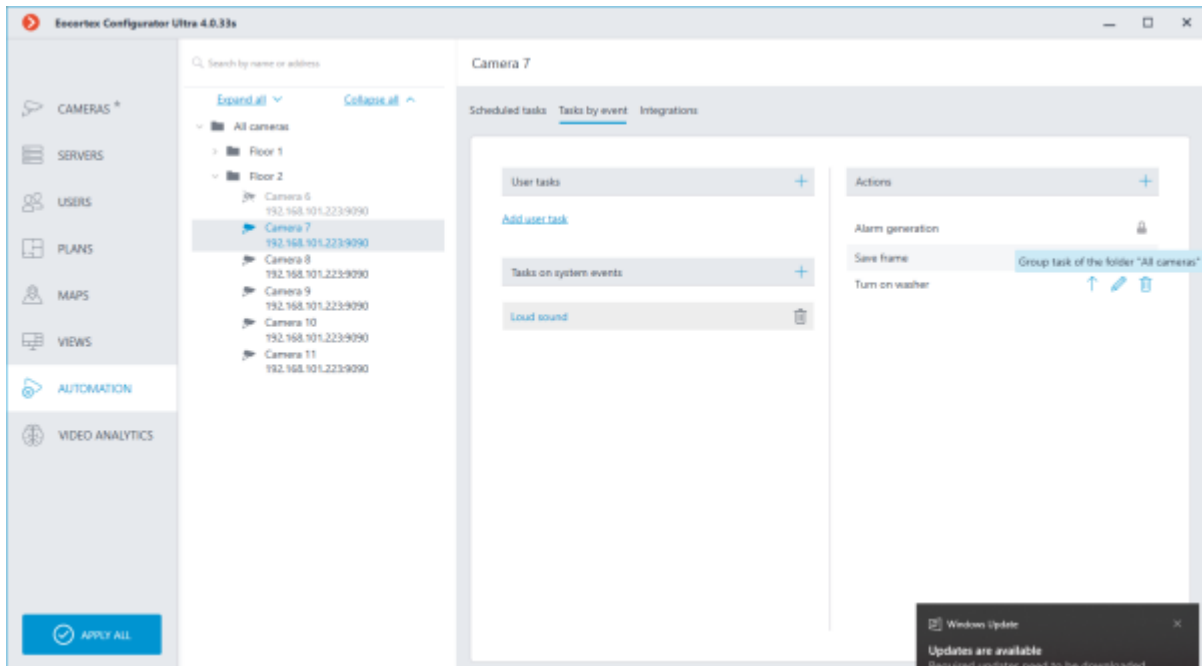
Tasks in the list are displayed for subfolders and cameras in a hierarchical order, from tasks created for the parent folder at the top of the list to tasks configured for the selected folder or camera at the bottom.

A task can be edited or deleted only when the folder for which this task was created is selected. When selecting a subfolder or camera, the task configured for the parent folder will be marked with the  icon and will be locked for any changes.

Hovering over the  icon will display a tooltip indicating which folder the task is set to.



The same applies to actions configured for folders as a response to events.



Related references

[Scheduled tasks](#)

[Tasks on system events](#)

[Events](#)

[Actions](#)

Events

The list of on-board camera analytics events has been moved to [a separate page](#).

The list of events of integrations with external systems has been moved to [a separate page](#).

Large number of people in the queue

This event is generated when the **Counting People in Queue** module is enabled on the camera in the event that the quantity of people in the queue has exceeded the preset limit.

The **Zone** condition can be set for this event, indicating the zone name from the module settings. If this condition is not set, the action will be performed for any zone, in accordance with the settings of that zone.

Event attribute	Comparison	Value	
Zone	Equal	Zone 1	

Large crowd of people

This event is generated when the **Crowd Monitoring** module is enabled on the camera, in case the number of people reached or exceeded the maximum set limit.

You can set the **Zone** attribute for the event, indicating the name of the zone using the module settings. If this attribute has not been set, the action will be performed for any zone in accordance with its settings.

Additionally, it is possible to set the **Number of people** attribute which surpasses the similar parameter in the module's settings.

Event attribute	Comparison	Value	
Zone	Equal	Zone 1	
Number of people	Larger	10	

Emergency vehicle detected

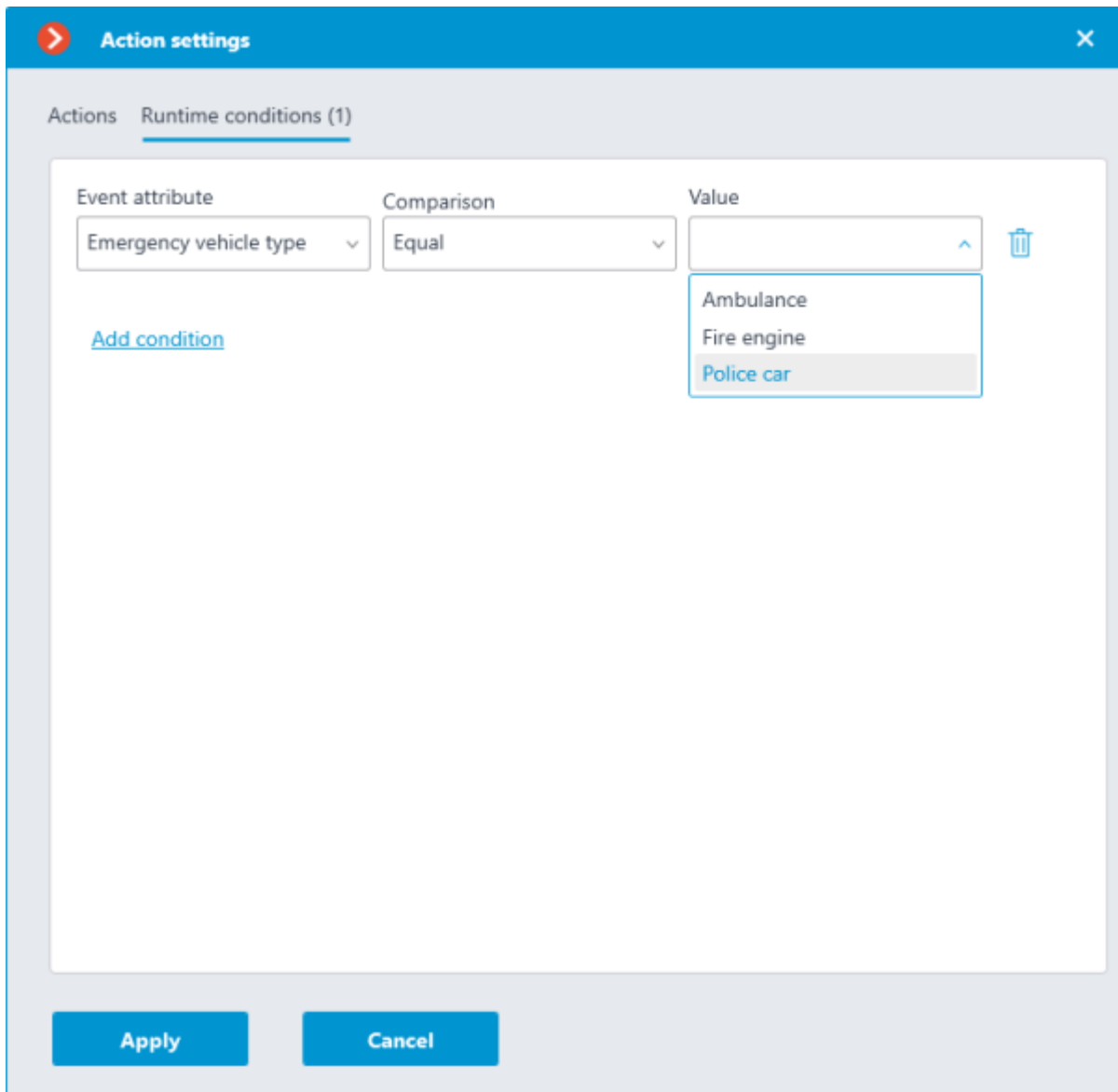
This event will be generated when the **Emergency Vehicle Detection** module is enabled on the camera and when an emergency vehicle stays in the control zone for a specified time. The **Area** condition can be set for the event by selecting a zone from the module settings.

The screenshot shows a dialog box titled "Action settings" with a close button (X) in the top right corner. Below the title bar, there are two tabs: "Actions" and "Runtime conditions (1)". The "Runtime conditions (1)" tab is active. Inside this tab, there is a configuration area for a condition. It consists of three columns: "Event attribute", "Comparison", and "Value".

- Event attribute:** A dropdown menu with "Area" selected.
- Comparison:** A dropdown menu with "Equal" selected.
- Value:** A dropdown menu with "Lengthy presence" selected. To the right of this dropdown is a trash icon. Below the dropdown, a search input field is open, showing a list of suggestions. The suggestion "Lengthy presence" is highlighted.

Below the configuration area, there is a link labeled "Add condition". At the bottom of the dialog box, there are two buttons: "Apply" and "Cancel".

Similarly, the **Emergency vehicle type** condition can be set up by selecting an emergency vehicle type from the drop-down menu.



Fire

This event is generated when the **Fire and Smoke Detector** module is enabled on the camera and a fire is detected.

Call over the intercom

This event is generated when a door phone (intercom) signal is received.

The event will be generated only for those door phone models that are supported by **Eocortex**.

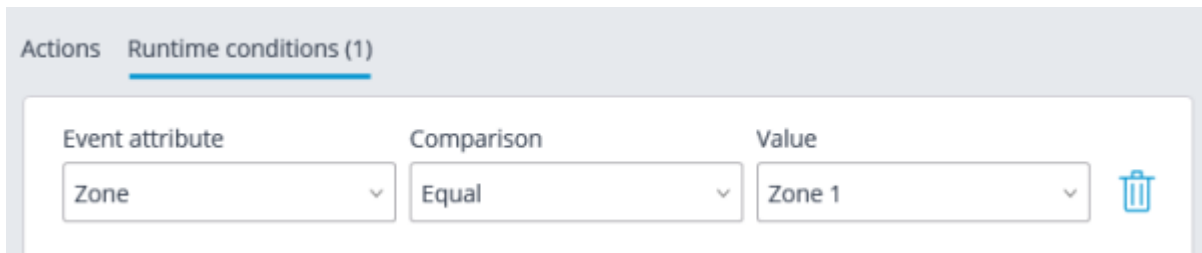
Loud sound

This event is generated when the **Loud Sound Detection** module registers the exceedance of the preset sound level by the sound picked up by the camera microphone.

Motion

This event is generated when the software motion detector registers a motion in the frame.

It is possible to set the **Zone** attribute for this event, selecting a zone set in the motion detector settings. If this attribute has not been set, the action will be performed for any zone.



Smoke

This event is generated when the **Fire and Smoke Detector** module is enabled on the camera and smoke is detected.

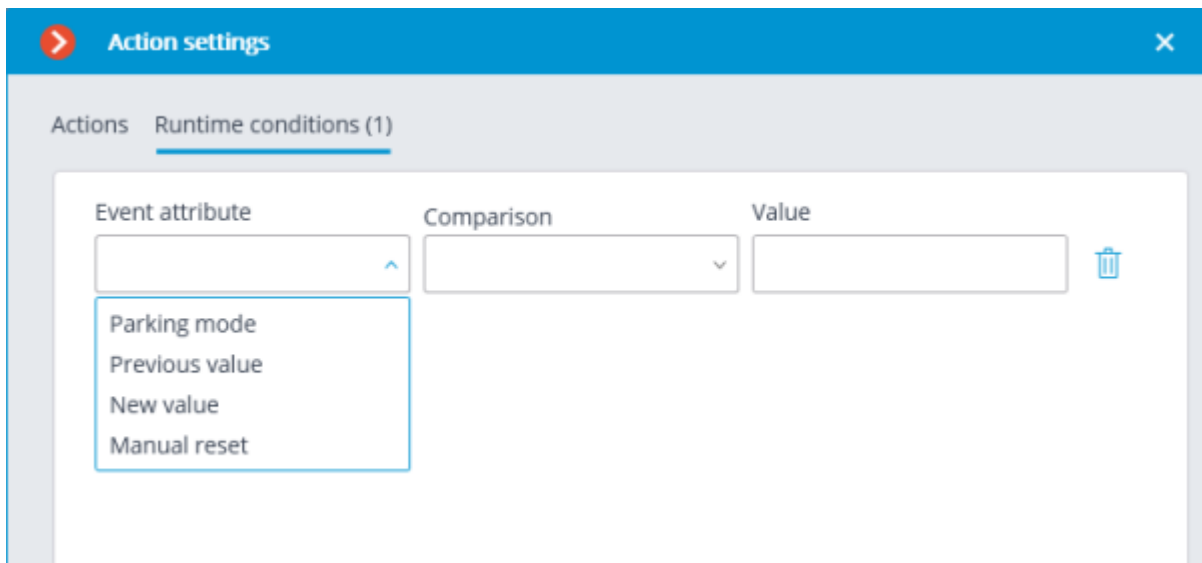
Parking vehicle counter has been changed

This event is generated when the **Licence plate recognition** module is enabled on the camera and parking lots are configured. The following counter changes will trigger the event:

Automatic reset of the counter of vehicles in the parking lot.

Manual change of the counter of vehicles in the parking lot in the **Eocortex Client** application.

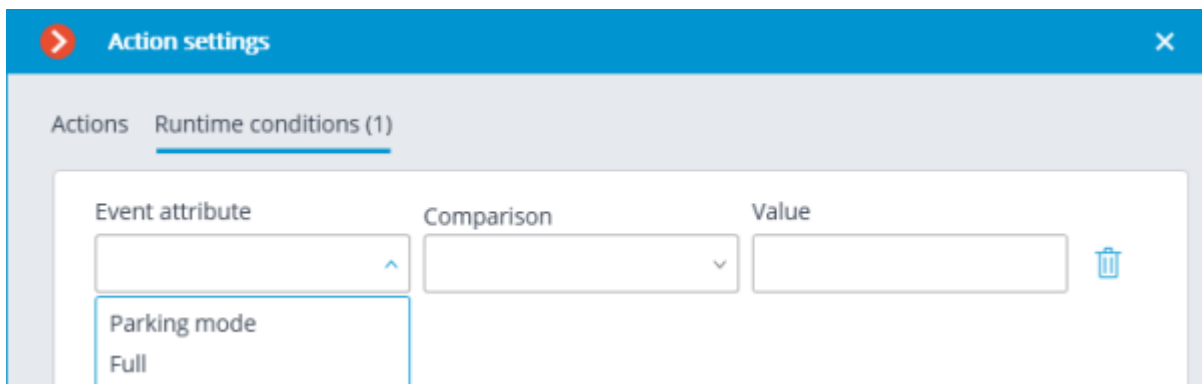
The following runtime conditions can be set for this event:



Parking lot occupancy has changed

This event is generated when the **Licence plate recognition** module is enabled on the camera and parking lots are configured.

The following runtime conditions can be set for this event:



Number of people in counting zone is back to allowed

This event is generated when the People Counting module is enabled on the camera with the Counting in the premises feature configured, and the current number of people in the zone returns to the allowed number set for that zone.

The **Zone** runtime condition can be set for the event by specifying the name of the zone from the module settings. If this condition is not set, the action will be performed for any zone according to its settings.

Event attribute	Comparison	Value
Zone	Equal	Zone 1

External alarm start

This event is generated when the **External alarm start** event comes from an external system. It is used for the integration of the external systems with **Eocortex**.

Motion started

This event is generated when the software motion detector registers the start of a motion in the frame. To do this, the option **Enable start/stop motion events** must be enabled in [the motion detector settings](#).

The **Zone** attribute can be set for this event by selecting a zone set in the motion detector settings. If this attribute is not set, the action will be performed for any zone.

Event attribute	Comparison	Value
Zone	Equal	Zone 1

Inactive zone

This event is generated when the **Personnel Activity Monitoring** module is enabled on the camera and there is no activity in the controlled zone.

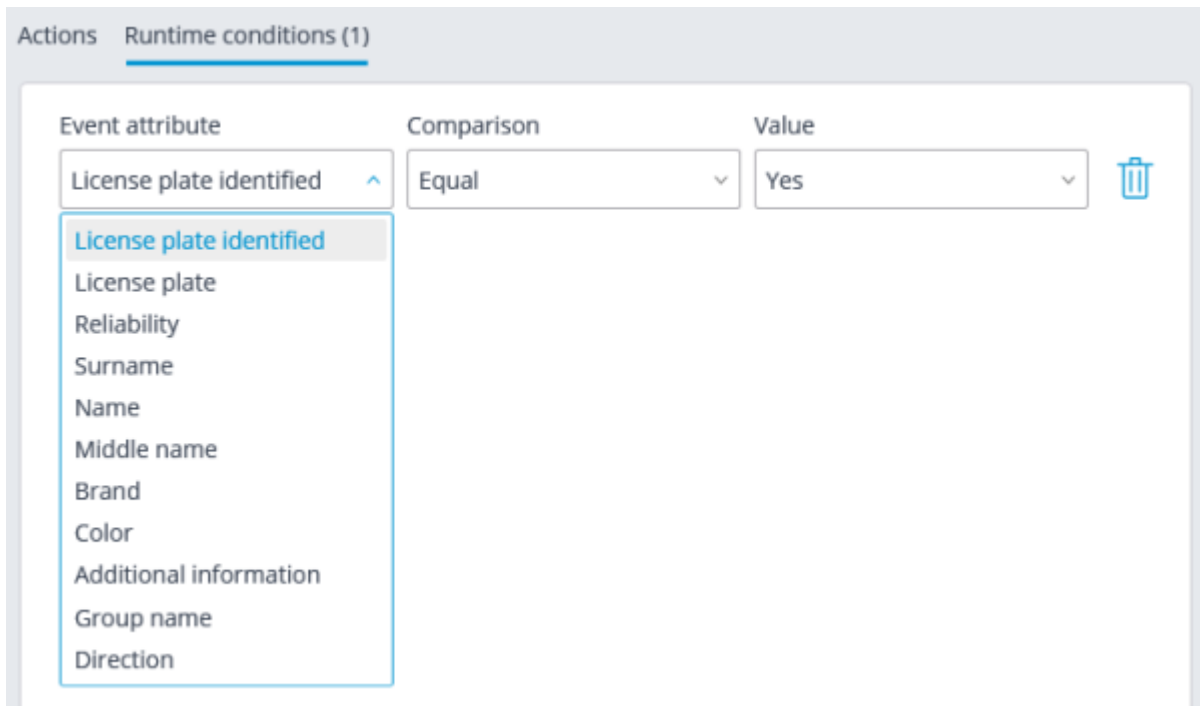
The **Zone** attribute can be set for this event by selecting a zone set in the motion detector settings. If this attribute is not set, the action will be performed for any zone.

Event attribute	Comparison	Value
Zone	Equal	Zone 1

Recognized license plates

This event is generated when the **Licence plate recognition** module is enabled on the camera and a vehicle license plate number is recognized.

Different attributes can be set for this event. For example, if the **License plate identified** attribute equals **Yes**, the action will be performed when any license plate that is in the database is recognized. If several attributes are set, the action will be performed only when all the attributes are fulfilled. If no attribute is set, the action will be performed when any number is recognized.



Face Detection

This event is generated when the **Face Detection** module is enabled on the camera and a face is detected in the frame.

Face recognized

This event is generated when the **Face Recognition** module is enabled on the camera and a face is recognized.

Various runtime conditions can be set for the event. For example, if the condition **Identified | Equal | Yes** is set, the action will be performed upon recognition of any face added to the database. If multiple conditions are set, then the action will be performed only if all conditions are met. If no conditions are set, then the action will be performed if any face is recognized.

Action settings

Actions Runtime conditions (3)

Event attribute	Comparison	Value	
Identified	Equal	Yes	🗑️
Face covered with mask	Equal	No	🗑️
			🗑️

Identified
Surname
Name
Patronymic
Group name
Additional information
Identification accuracy
Age
Gender
User ID
Temperature
Emotion
Face covered with mask
Face turned much

Apply Cancel

A person running a fever detected

This event is generated when the **Face Recognition** module is enabled on a camera that combines the functionality of video surveillance and thermal imaging, and the set temperature for a recognized face is exceeded.

Analog camera connection fail

This event is generated when the connection with the analog camera that is bound to this channel is lost on the channel of the hybrid video recorder or decoder.

Camera number attribute is obligatory for this event.

Action settings

Actions Runtime conditions (1)

Event attribute	Comparison	Value	
Camera number	Equal	1	🗑️

No connection with camera

This event is generated when there is a disruption of communication with the camera.

Instead of this event, it is recommended to use the **No connected camera** event, because due to such issues with the networks or network interfaces as their congestion, low throughput, or bad signal quality the short-term disruptions and reconnections of cameras may happen, leading to the generation of many **No connection with camera** events.

End of external alarm

This event is generated when the **End of external alarm** event comes from an external system. It is used for integration of **Eocortex** with the external systems.

Motion stopped

This event is generated when the software motion detector stops registering movement in the frame. To do this, the option **Enable start/stop motion events** must be enabled in [the motion detector settings](#).

It is possible to set the **Zone** attribute for this event, selecting a zone set in the motion detector settings. If this attribute is not set, the action will be performed for any zone.

Event attribute	Comparison	Value
Zone	Equal	Zone 1

Abandoned object

This event is generated when the **Abandoned Objects Detection** module is enabled on the camera and the abandoned object which has remained in the frame for a longer period of time than the one specified in the settings is detected.

Sending HTTP request

This event is generated when the **Send HTTP request** action is executed.

No connected camera

This event is generated when the communication with the camera the connection with which was lost has not resumed after the set time.

It is required to set the **Breakage duration (seconds)** obligatory attribute for this event.

It is also possible to set the **Stream type** attribute that may have one of the following values:

Main stream: no main video stream.

Alternate video: no alternate video stream.

Main sound: no main sound stream.

Alternate sound: no alternate sound stream.

Sound output: no channel for sound output to camera.

Motion detection: no channel for receiving information from camera motion detector



I/O: no channel for communication with signal inputs/outputs of the camera.

Archive video: no channel for communicating with camera video archive.

Archive audio: no channel for communicating with camera audio archive.

If no **Stream type** attribute is specified, the lack of communication will be registered on any of the stream types.

Actions Runtime conditions (2)

Event attribute	Value	
Breakage duration (secon	15	
Event attribute	Comparison	Value
Stream type	Equal	Main stream 

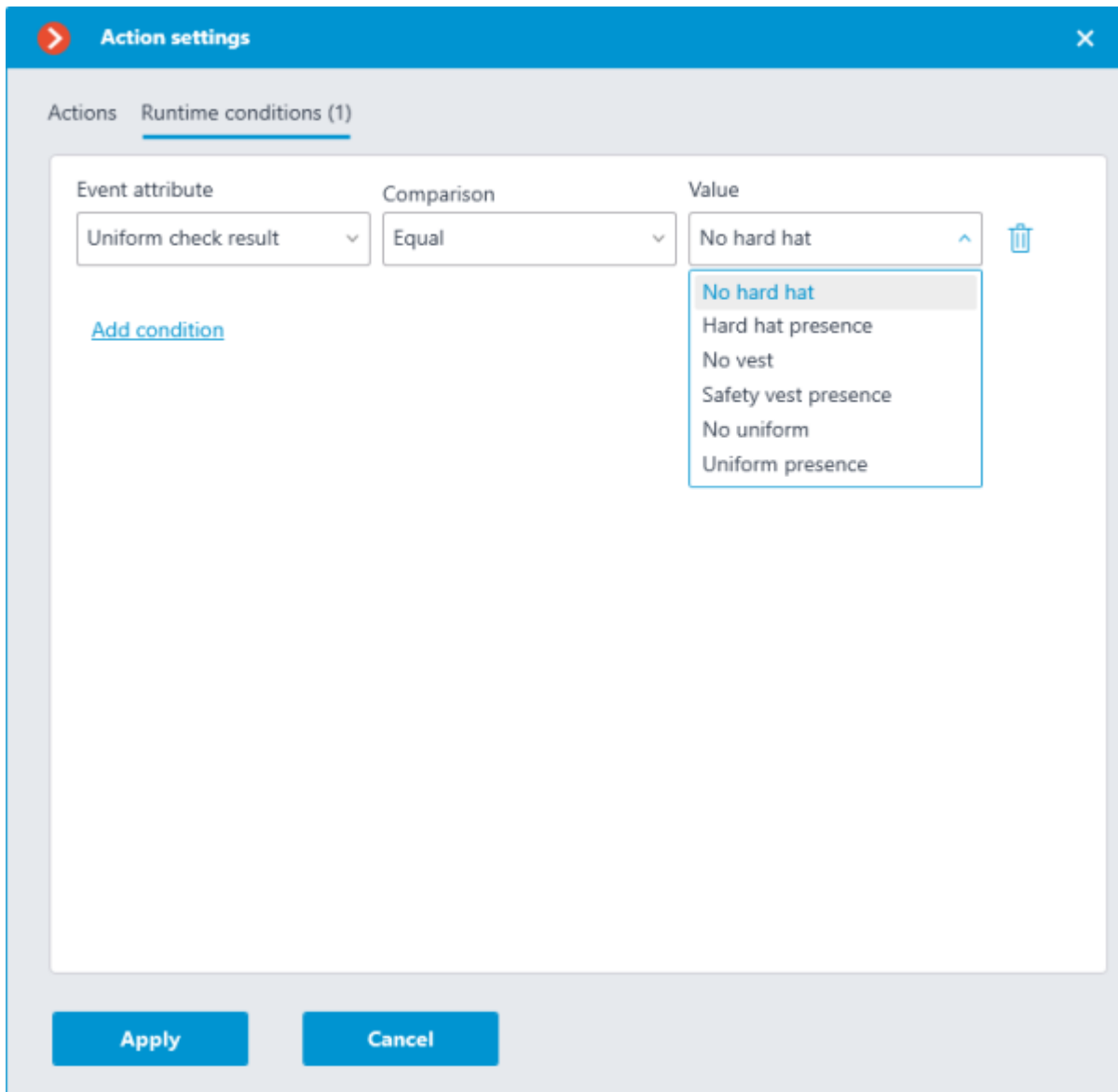
[Add condition](#)

- Main stream
- Alternate stream
- Main sound
- Alternate sound
- Sound output
- Motion detection
- I/O
- Archive video
- Archive audio

Checked for equipment

This event is generated when the **Uniform Detector** module is enabled and configured on the camera, and a person in a workwear or without it is detected in the frame.

The following runtime conditions can be set for this event:



No face mask

This event is generated when the **Face Mask Detector** module is enabled and configured on the camera, and a person without a face mask is detected in the frame.

Object Classification and Counting

This event is generated when the **Object Classification and Counting** module is enabled and configured on the camera.

The following runtime conditions can be set for this event:

The screenshot shows a dialog box titled "Action settings" with a close button (X) in the top right corner. Below the title bar, there are two tabs: "Actions" and "Runtime conditions (4)". The "Runtime conditions (4)" tab is active. The main area contains four rows of condition settings, each with a trash icon to its right:

Event attribute	Comparison	Value
Area or line	Equal	
Objects	Equal	
Type of vehicle	Equal	
Count of objects	Equal	0

Below the conditions, there is a blue link labeled "Add condition". At the bottom of the dialog, there are two buttons: "Apply" and "Cancel".

Shelf empty

This event occurs on a camera with the enabled **Shelf Fullness Check** module when a shelf becomes empty.

For this event, it is possible to set up the **Zone** condition by selecting a zone specified in the module's settings. If this condition is not specified, the action will be performed for any zone. Apart from the zone, it is possible to set up sending of the condition in dependence to the level of fullness of a shelf.

The screenshot shows a dialog box titled "Action settings" with a close button (X) in the top right corner. Below the title bar, there are two tabs: "Actions" and "Runtime conditions (2)". The "Runtime conditions (2)" tab is active and contains a list of two conditions. Each condition is represented by a row with three columns: "Event attribute", "Comparison", and "Value".

Event attribute	Comparison	Value	
Zone	Equal	Shelf 1	
Fullness	Smaller	30	

Below the conditions, there is a link labeled "Add condition". At the bottom of the dialog box, there are two buttons: "Apply" and "Cancel".

Users alarm

This event is generated when the user of the **Eocortex Client** application presses the **Alarm** button. The event is generated only for the cameras set on the **User alarm** tab in the **Application settings**.

Maximum number of people in counting zone exceeded

This event is generated when the People Counting module is enabled on the camera with the Counting in the premises feature configured, and the current number of people in the zone exceeds the allowed number set for that zone.

The **Zone** runtime condition can be set for the event by specifying the name of the zone from the module settings. If this condition is not set, the action will be performed for any zone according to its settings.

The screenshot shows a dialog box titled "Action settings" with a close button (X) in the top right corner. Below the title bar, there are two tabs: "Actions" and "Runtime conditions (1)". The "Runtime conditions (1)" tab is active and contains a list of one condition. Each condition is represented by a row with three columns: "Event attribute", "Comparison", and "Value".

Event attribute	Comparison	Value	
Zone	Equal	Zone 1	

Video surveillance sabotage

This event is generated when the **Sabotage Detector** module is enabled on the camera in one of the following cases:

- Video camera is defocused;
- Camera is turned away;
- Camera flaring;
- Camera blocking.

Camera input signal

This event is generated when an electrical signal is sent to the signal input of the camera.

It is also required that the signal input support is implemented in **Eocortex** for the particular IP camera model. Contact **Eocortex** technical support service for more information.

It is required to set the **Input number** and **Signal availability** obligatory attributes for this event.

The screenshot shows a configuration panel titled "Runtime conditions (2)". It contains two rows of conditions, each with a trash icon to its right. The first row has "Input number" as the event attribute, "Equal" as the comparison, and "1" as the value. The second row has "Alarm availability" as the event attribute, "Equal" as the comparison, and "Yes" as the value.

Event attribute	Comparison	Value	
Input number	Equal	1	🗑️
Alarm availability	Equal	Yes	🗑️

External event

This event is generated when an External system event comes from the external system. It is used to integrate the external systems with **Eocortex**.

The external system events are transmitted to the **Eocortex** server using **Eocortex API** HTTP requests.

Different attributes can be set for this event. If no attribute is used for generating the event, then it is not required to add such an attribute.

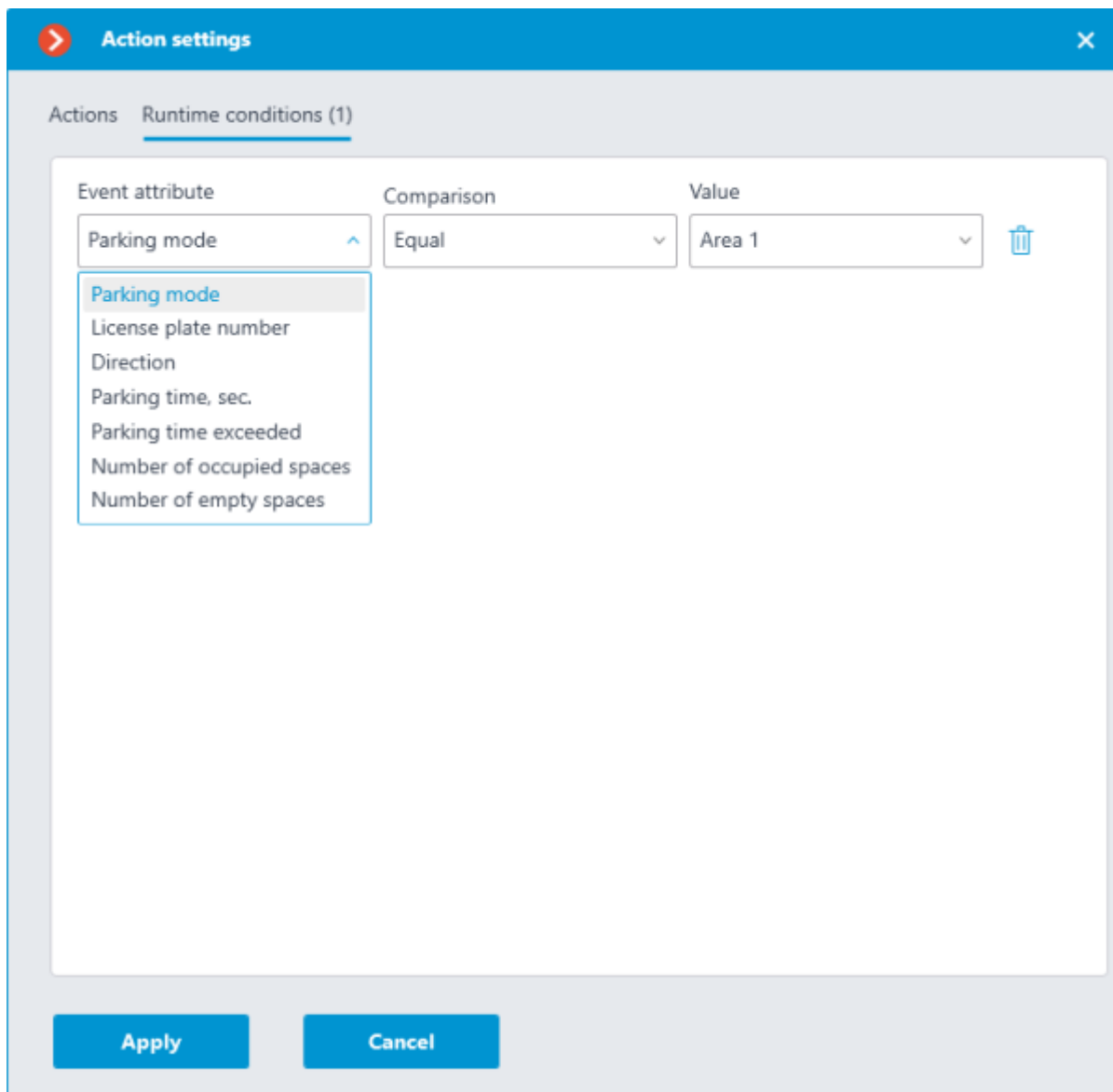
The screenshot shows a configuration panel titled "Runtime conditions (3)". It contains three rows of conditions, each with a trash icon to its right. The first row has "System name" as the event attribute, "Equal" as the comparison, and "MyLegacySystem" as the value. The second row has "Information" as the event attribute, "Equal" as the comparison, and "01" as the value. The third row has "Code of event" as the event attribute, "Equal" as the comparison, and "2345" as the value.

Event attribute	Comparison	Value	
System name	Equal	MyLegacySystem	🗑️
Information	Equal	01	🗑️
Code of event	Equal	2345	🗑️

Parking event

This event is generated when the **Licence plate recognition** module is enabled on the camera and parking lots are configured, and the vehicle enters and leaves the parking lot.

The following runtime conditions can be set for this event:



Tracking event

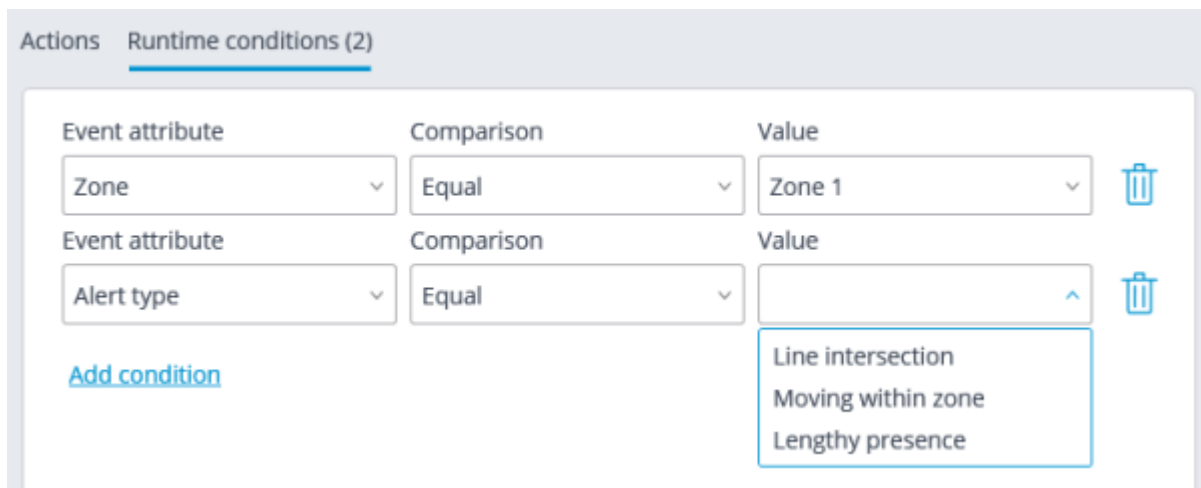
This event is generated when the **Tracking** module is enabled on the camera in the following cases:

Crossing of the preset line by an object;

Intrusion into the preset zone by an object;

Long term presence of an object in the preset zone.

It is possible to set the **Zone** and **Alert type** attributes for the event. If the attribute is not set, the action will be performed for any zone and any alert type correspondingly.



Request to close gate

This event is generated in the following situations:

The user pressed the Close rising arm barrier on-screen button in the **Eocortex Client** application.

The license plate number entered into the database and included into the group with the enabled **Close rising arm barrier** option is recognized, provided that in the module's settings in the **Rising arm barrier control** tab the **License plate recognition action: Open and close** action is selected.

Request to open gate

This event is generated in the following situations:

The user pressed the Open rising arm barrier on-screen button in the **Eocortex Client** application.

The license plate number entered into the database and included into the group with the enabled **Open rising arm barrier** option is recognized.

Connecting to analog camera

This event is generated when the communication with the analog camera bound to this channel is established on the hybrid video recorder or decoder channel.

It is required to set the **Camera number** attribute for this event.



Established connection with camera

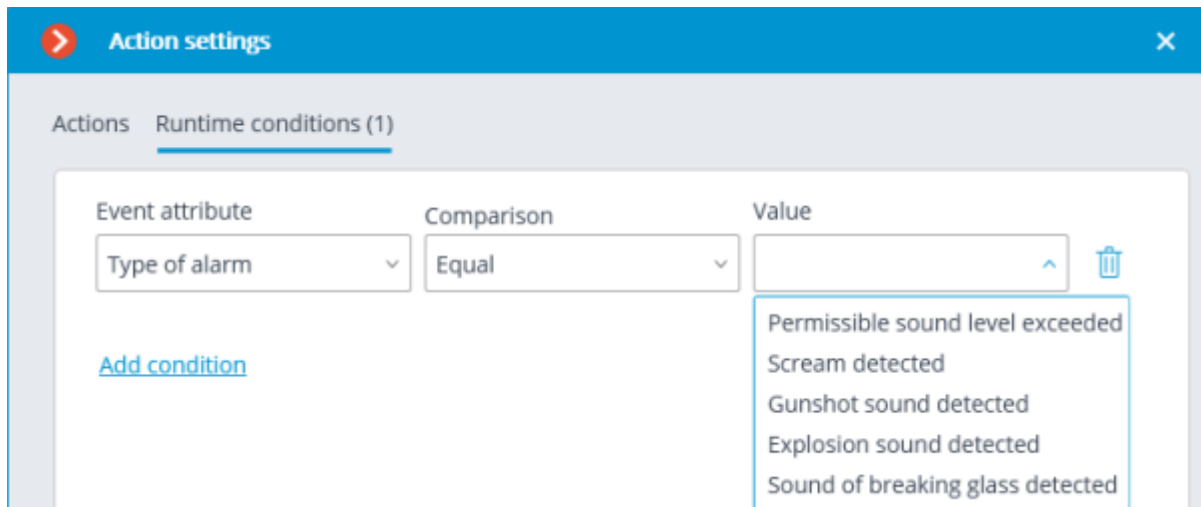
This event is generated when the communication with the camera is reestablished after a disruption.

Instead of this event, it is recommended to use the **No connected camera** event, because due to such issues with the networks or network interfaces as their congestion, low throughput, or bad signal quality the short-term disruptions and reconnections of cameras may happen, leading to the generation of many **Established connection with camera** events.

Camera-based analytics. Detection of sound

This event is generated when the **Sound detector** module is enabled and configured on the camera.

The following runtime conditions can be set for this event:



Camera-based analytics. Intrusion

This event is generated when the **Area monitoring** module is enabled and configured on the camera.

Camera-based analytics. Area entrance

This event is generated when the **Area monitoring** module is enabled and configured on the camera.

Camera-based analytics. Area exiting

This event is generated when the **Area monitoring** module is enabled and configured on the camera.

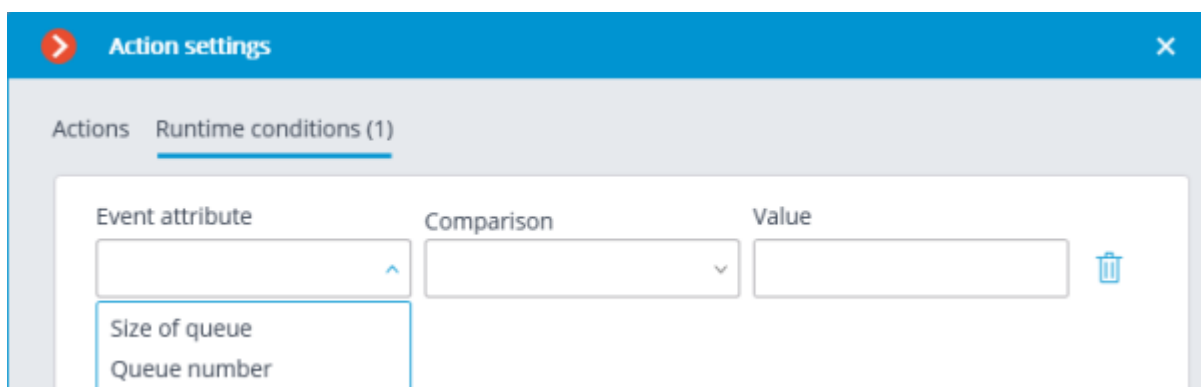
Camera-based analytics. Mist and smoke detection

This event is generated when the **Fog and smoke detector** module is enabled and configured on the camera.

Camera-based analytics. Size of queue

This event is generated when the **Queue size monitoring** module is enabled and configured on the camera.

The following runtime conditions can be set for this event:



Camera-based analytics. Loitering in area

This event is generated when the **Area monitoring** module is enabled and configured on the camera.

Camera-based analytics. Item disappeared

This event is generated when the **Abandoned item detector** module is enabled and configured on the camera.

Camera-based analytics. License plate detection

This event is generated when the **Objects detector** module is enabled and configured on the camera.

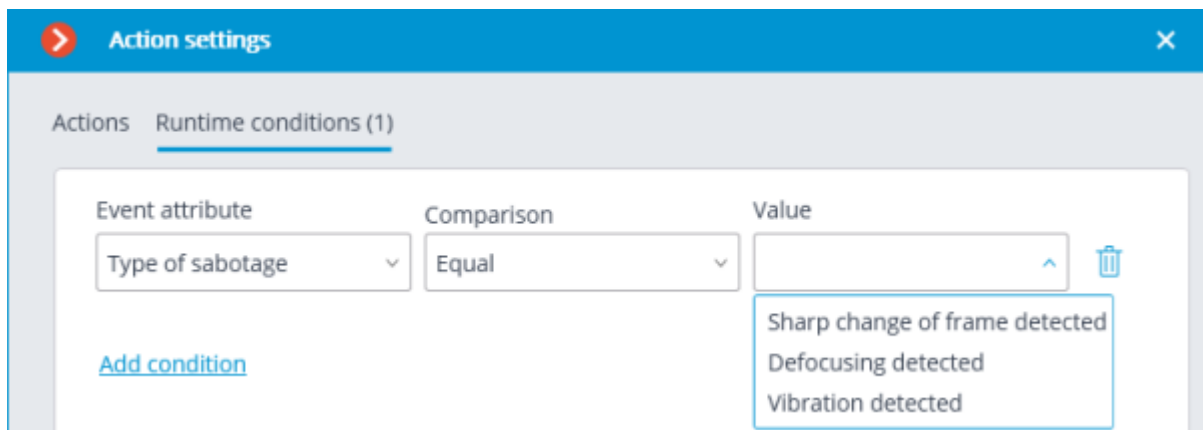
Camera-based analytics. Face Detection

This event is generated when the **Objects detector** module is enabled and configured on the camera.

Camera-based analytics. Sabotage detection

This event is generated when the **Sabotage Detector** module is enabled and configured on the camera.

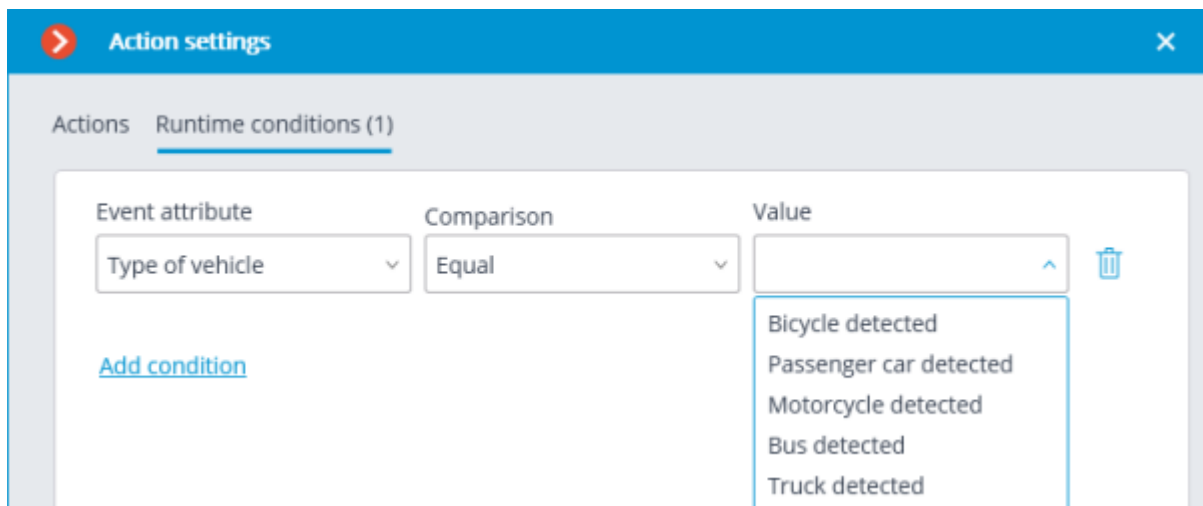
The following runtime conditions can be set for this event:



Camera-based analytics. Vehicle detection

This event is generated when the **Objects detector** module is enabled and configured on the camera.

The following runtime conditions can be set for this event:



Camera-based analytics. Person detected

This event is generated when the **Objects detector** module is enabled and configured on the camera.

Camera-based analytics. Abandoned item

This event is generated when the **Abandoned item detector** module is enabled and configured on the camera.

Camera-based analytics. Line crossing

This event is generated when the **Line crossing** module is enabled and configured on the camera. The following runtime conditions can be set for this event:

The screenshot shows the 'Action settings' dialog box with the 'Runtime conditions (2)' tab selected. It contains two conditions:

Event attribute	Comparison	Value
Line number	Equal	1
Active state	Equal	Yes

There is an 'Add condition' link at the bottom left of the conditions list.

Camera-based analytics. Appearance (disappearance) of object in area

This event is generated when the **Area monitoring** module is enabled and configured on the camera.

Camera-based analytics. Temperature exceedance

This event is generated when the **Temperature exceedance monitoring** module is enabled and configured on the camera.

The following runtime conditions can be set for this event:

The screenshot shows the 'Action settings' dialog box with the 'Runtime conditions (1)' tab selected. It contains one condition:

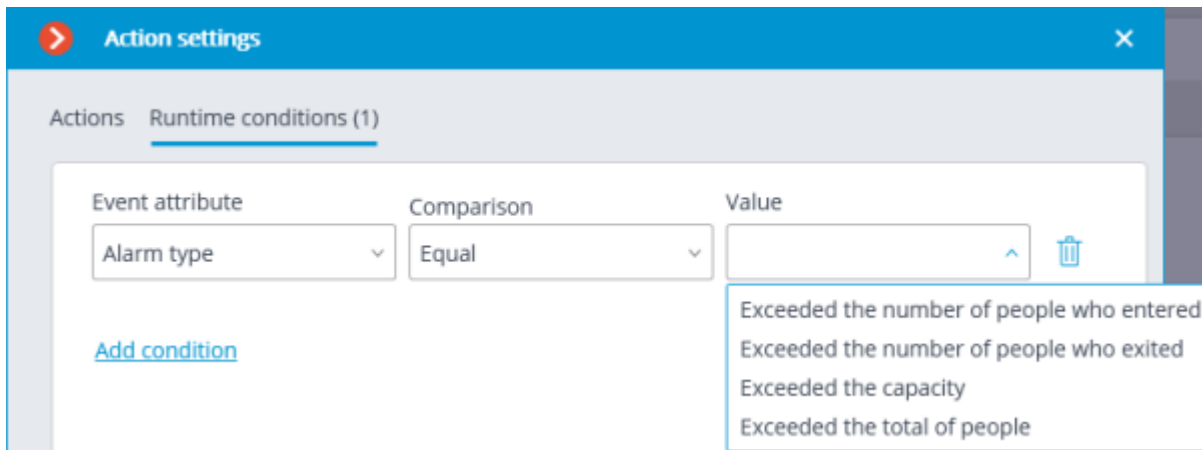
Event attribute	Comparison	Value
Current temperature	Larger or equal	37.0

There is an 'Add condition' link at the bottom left of the conditions list.

Camera-based analytics. Exceeded the number of people

This event is generated when the **People Counting** module is enabled and configured on the camera.

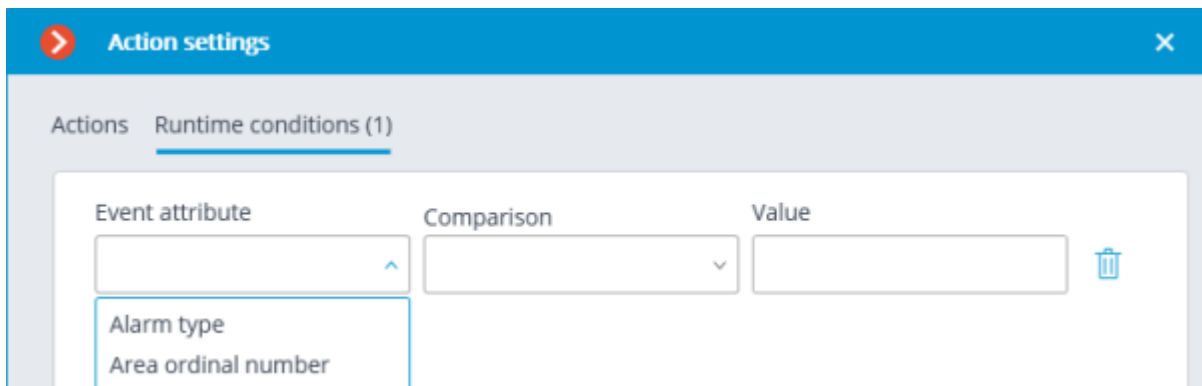
The following runtime conditions can be set for this event:



Camera-based analytics. Exceeded the number of people in area

This event is generated when the **People Counting in area** module is enabled and configured on the camera.

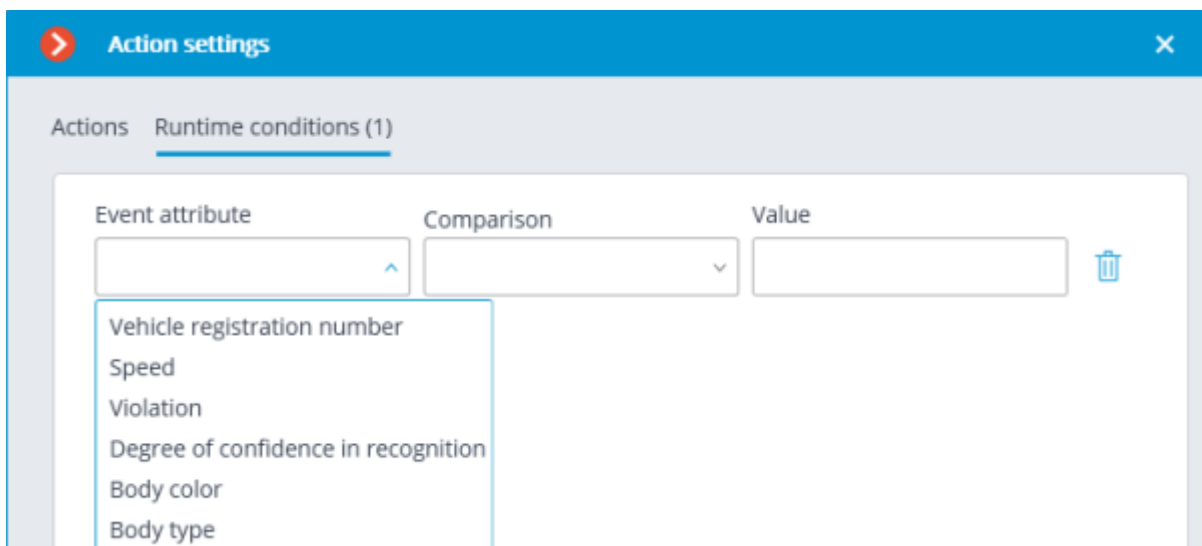
The following runtime conditions can be set for this event:



Camera-based analytics. License plate recognition

This event is generated when the **License plate recognition** module is enabled and configured on the camera.

The following runtime conditions can be set for this event:



Received a check from a POS-terminal

This event is generated when a receipt is received from a **POS terminal**.

The runtime condition by the total amount value can be set for the event.

The screenshot shows a dialog box titled "Action settings" with a close button (X) in the top right corner. Below the title bar, there are two tabs: "Actions" and "Runtime conditions (1)". The "Runtime conditions (1)" tab is active. Inside this tab, there is a table with three columns: "Event attribute", "Comparison", and "Value". The first row of the table contains the following values: "Amount" in the "Event attribute" column, "Equal" in the "Comparison" column, and "1000" in the "Value" column. To the right of the "Value" field is a trash icon. Below the table, there is a link labeled "Add condition". At the bottom of the dialog box, there are two buttons: "Apply" and "Cancel".

Event attribute	Comparison	Value
Amount	Equal	1000

[Add condition](#)

Apply Cancel

Line from POS terminal received

This event is generated when a line is received from a **POS terminal**.

The runtime condition by the line content can be set for the event.

The screenshot shows a software window titled "Action settings" with a close button (X) in the top right corner. Below the title bar, there are two tabs: "Actions" and "Runtime conditions (1)". The "Runtime conditions (1)" tab is active. Inside this tab, there is a table-like structure with three columns: "Event attribute", "Comparison", and "Value". The "Event attribute" column contains a dropdown menu with "Line of receipt" selected. The "Comparison" column contains a dropdown menu with "Equal" selected. The "Value" column contains a text input field with "milk" entered. To the right of the "Value" field is a trash icon. Below the table, there is a blue link labeled "Add condition". At the bottom of the dialog, there are two blue buttons: "Apply" and "Cancel".

By this way, it is possible to make the scenario executable only in the specific cases. For example, enable the archive recording if the cashier's receipt contains an item, the sale of which is subject to any restrictions.

Honeywell Pro-Watch event

This event is generated at receiving an event from the **Honeywell's Pro-Watch®** system. Various conditions can be set for the event. If a condition is not used for event generating, there is no need to add it.

Various conditions can be set for the event. When several conditions have been added, the action will be performed only if all of these conditions are fulfilled. If no condition is set, the action will be performed at receiving any **Honeywell's Pro-Watch®** event.

➤ Action settings Turn on recording
✕

Actions Runtime conditions (4)

Event attribute	Comparison	Value	
Device type	Equal	System	✕
Device ID	Equal	Network::05010105010801	✕
Alarm event	Equal	Yes	✕
Return to normal state	Equal	No	✕

[Add condition](#)

Apply
Cancel

Below are example conditions for this event.

Attribute		Values in real events	
Name	Description	Card reader event	Input
Event description	Description of a specific event used in the ACS. Content varies by localization and Pro-Watch version	Expired card attempt	Input point
Event type description	Description of the category of events used in the ACS. Content varies by localization and Pro-Watch version	Expired card attempt	Monitor input
Event code	Numeric event identifier	402	900
Device description	Textual description of the event source set by the Pro-	Readers_1	Input_1

	Watch administrator when configuring the ACS		
Device location	Textual description of the device placement set by the Pro-Watch administrator when configuring the ACS	Readers_1	Input_1
Device type	The type of event source, such as channel, panel, reader, etc.	Reader	Input point
Device ID	Unique device identifier in Pro-Watch	Network::05010105010801	Network::050101050109
Card holder name	Text value of the name of the cardholder set by the Pro-Watch administrator	Mike Wazowski	
Card number	The card number assigned by the ACS. The value is available to the Pro-Watch administrator	28564	
Card status	Card status set by the Pro-Watch administrator: Active, Stolen, Terminated, etc.	Expired	
Event message	Additional information about the event. Content varies by localization and Pro-Watch version	Local grant	
Alarm event	Whether the event is alarming for the ACS: Yes/No	Yes	No
Return to normal state	Whether the event is a return to normal: Yes/No. For example, closing a contact is an alarm, subsequent opening a contact is a return to normal	No	No

Paxton Net2 event

This event is generated upon receiving an event from **Paxton Net2** ACS.

Various conditions can be set for this event. If several conditions are set, the action will be performed only when all these conditions are fulfilled. If no condition is set, the action will be performed upon receiving any event from **Paxton Net2**.

Event attribute	Comparison	Value	
Type of event	Equal	Door open	
Event subtype	Equal	Via door entrance syst...	
User ID	Equal	12345678	
User name	Equal	Smith	
Device ID	Equal	876543214	
Area name	Equal	WarehouseA1	

[Add condition](#)

Apply **Cancel**

The following attributes are available as runtime conditions:

Type of event: select from the listed types of events used by **Paxton Net2** ACS. The following types are available:

- Door open (user action)
- Door open
- Door closed
- Door did not open
- Door unblocked

Event subtype: select from the listed subtypes of events used by **Paxton Net2** ACS. The following types are available:

- Open
- Closed
- Via network instruction
- Via door entrance system

User ID: unique user identifier that is internal to the ACS;

Username: the name of the employee or visitor as it is set in the **Paxton Net2** ACS;

Device ID: numeric identifier of the device as it is set in the **Paxton Net2** ACS;

Area name: the string value of the zone name where the event has occurred as it is set in the **Paxton Net2** ACS.

Suprema Biostar 2 event

This event is generated at receiving an event from the **Suprema BioStar 2** system.

Various runtime conditions can be set for this event. The following event lines are available as conditions:

Event details:

- Type of event — selection from several popular event types, e.g. Door Opened by Operator, Access Denied: Blacklisted, etc. Not all **Suprema BioStar 2** event types are available in the list. If the type required to be used as the condition is unsupported, it is possible to use filtering by other fields: numeric Event code or string Description of ACS event.
- Event code — numeric code of the **Suprema BioStar 2** event.
- Description of ACS event — non-localized event description string, as it comes from **Suprema BioStar 2**;

Device details:

- Device identifier — usually a numeric permanent identifier of the device in **Suprema BioStar 2**.
- Name of device — string device name in **Suprema BioStar 2**, can be changed in the ACS settings in the future.

Door details:


- Door identifier — usually a numeric permanent identifier of the door in **Suprema BioStar 2**.
- Name of door — string door name in **Suprema BioStar 2**, can be changed in the ACS settings in the future.

User details:

- User identifier — usually a numeric permanent ID of the user associated with the event in **Suprema BioStar 2**.
- Username — string name of the user in **Suprema BioStar 2**, can be changed in the ACS settings in the future.
- User group identifier — usually a numeric identifier of the group to which the user belongs.
- Name of user group — a name of the group to which the user belongs.

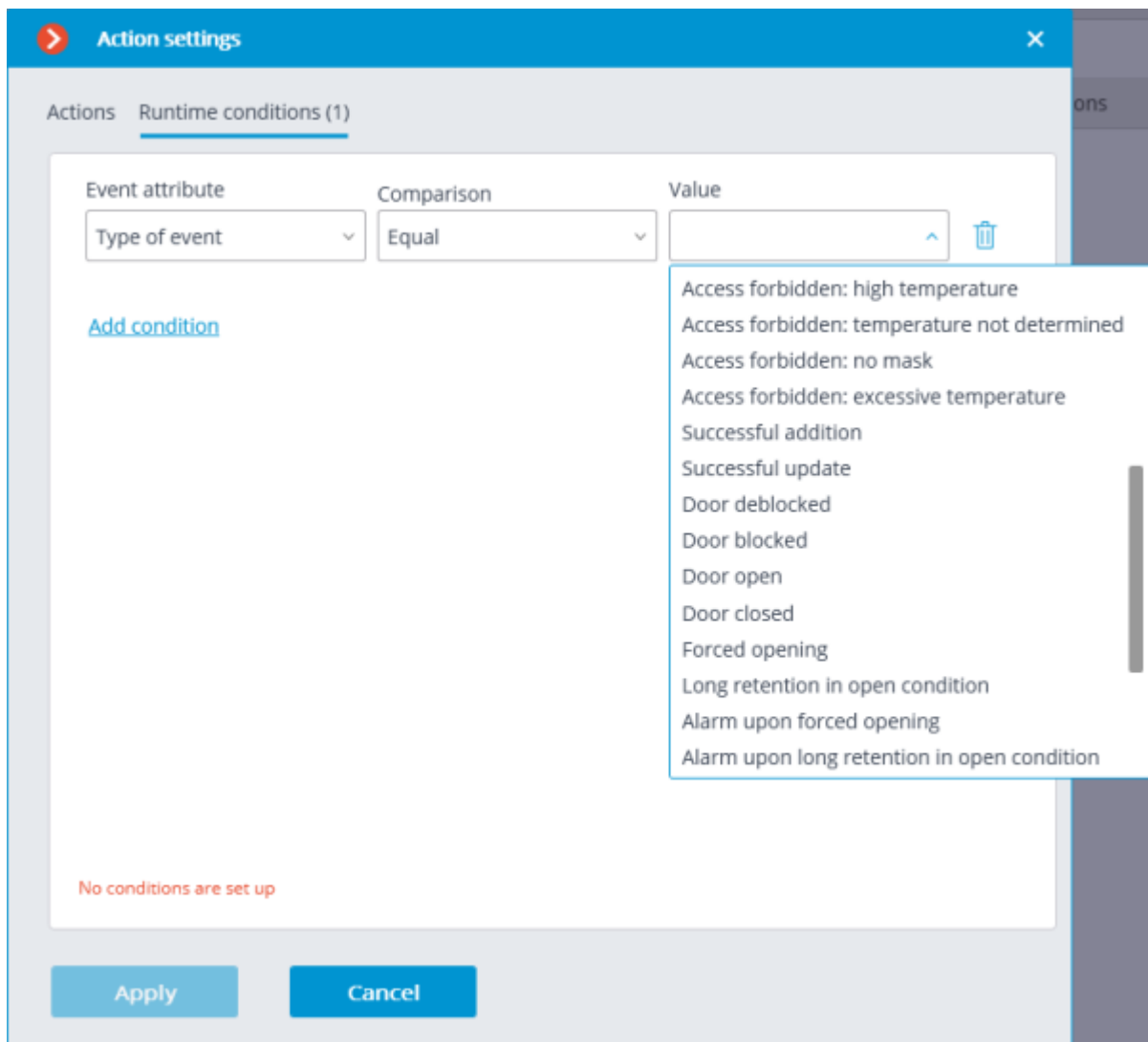
Action settings ✕

Actions Runtime conditions (1)

Event attribute	Comparison	Value	
<input type="text" value=""/>	<input type="text" value=""/>	<input type="text" value=""/>	

- Type of event
- Description of ACS event
- Device identifier
- Name of device
- Door identifier
- Name of door
- User identifier
- User name
- User group identifier
- Name of user group
- Event code

No conditions are set up



Regarding the type of event, some lines may be not available in the received message.

ZKBioSecurity event

This event is generated at receiving an event from the **ZKBioSecurity** access control system.

Various runtime conditions can be set for this event. The following event fields are available as conditions:

Information about the event:

- Time (Event Time), text field;
- Event description (Event Name), text field — textual description of the event used in **ZKBioSecurity**;
- Event point (Event Point Name), text field;
- Event ID (LogId), text field;
- Event type (EventNumber), drop-down list — selection from several popular event types (For example: Opening by verification, Opening with an emergency password, Double passage prohibition);
- Event code (EventNumber), numeric event code used in **ZKBioSecurity**;
- Event level (Event Level), drop-down list — selection from several defined options (Can take the following values: Normal (Normal), Error (Exception), Alarm (Alarm)).

Information about the device:

- Serial number (Device Sn), text field — serial number of the device;
- Verification mode (Verify Mode Name), text field — textual description (For example: Face, Other, Only Password);
- Reader name (Reader Name), text field — textual description (For example: SysproDemo-1-In);
- Device name (Device Name), text field.

Information about the door:

- Area name (Area Name), text field;
- Area name (AccZone), text field;
- Door name (Door Name), text field.


Information about the user:

- Employee ID (Pin), text field;
- Employee (Name + Last Name), text field;
- Department name (Department Name), text field;
- Card number ("Card Number"), text field — the number of the card presented to the reader (For example: 2596802013, 9251205323699455112).

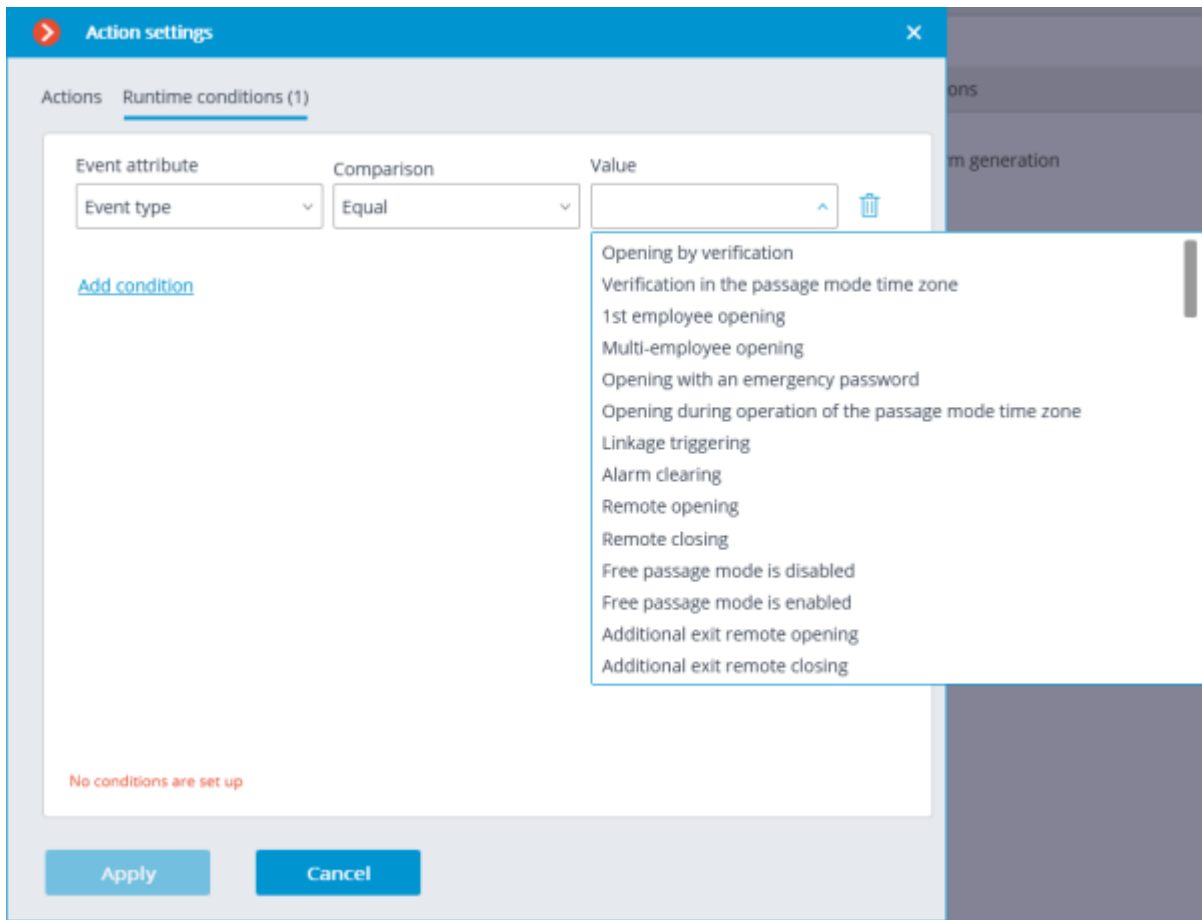
The screenshot shows a software interface for configuring action settings. The window title is "Action settings" with a close button (X) in the top right. Below the title bar, there are two tabs: "Actions" and "Runtime conditions (1)". The "Runtime conditions (1)" tab is active and contains a table for defining conditions. The table has three columns: "Event attribute", "Comparison", and "Value". The "Event attribute" column has a dropdown menu that is currently open, showing a list of attributes: Event ID, Employee ID, Name, Last name, Department name, Zone name, Card number, Serial number, Verification mode, Event description, Event point, Reader name, Zone, and Device name. The "Comparison" and "Value" columns are empty. To the right of the "Value" column is a trash icon. At the bottom of the table area, there is a red text message: "No conditions are set up". At the very bottom of the dialog, there are two buttons: "Apply" and "Cancel".

Action settings ✕

Actions Runtime conditions (1)

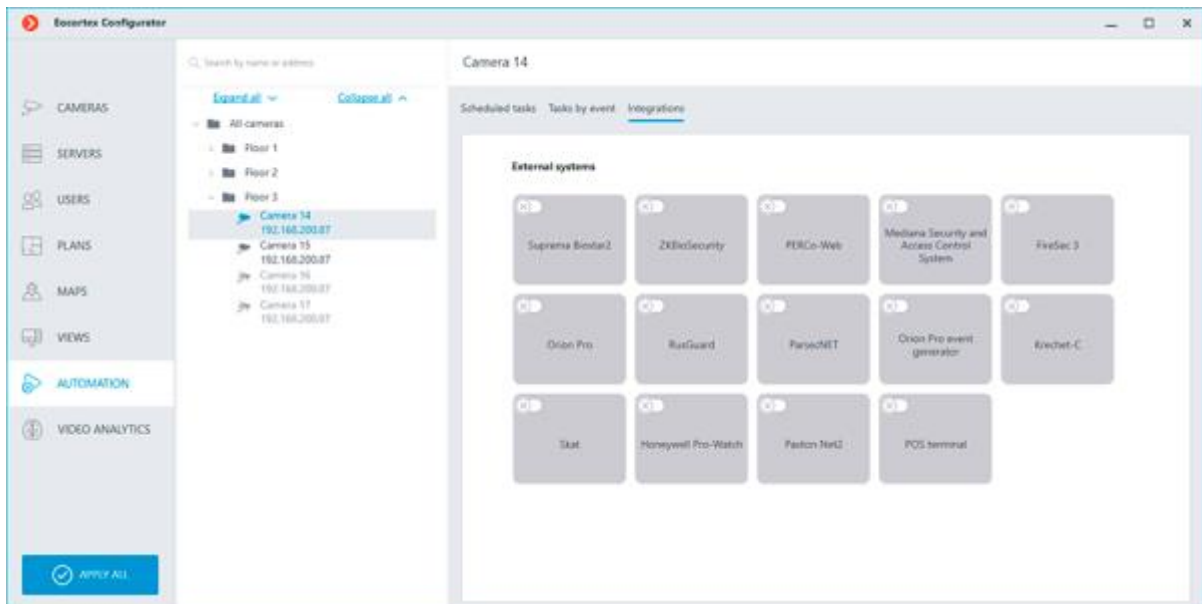
Event attribute	Comparison	Value	
Event level ▾	Equal ▾	<input type="text"/>	
Add condition		Normal	
		Error	
		Alarm	



No conditions are set up



Integrations

To set up the integration of **Eocortex** video surveillance system with the external systems, it is required to go to the **Automation** tab in the **Eocortex Configurator** application, select an individual camera in the camera tree, then, on the opened page, go to the **Integrations** tab.



On the tab, it is required to enable the integration with the required system using the  switch, then set up the integration by pressing the  button.

Paxton Net2

The following tabs are available in the integration settings:

General settings;

Camera settings.

General settings

The **General settings** tab is used for setting up the connection to the **Paxton Net2** ACS server.

The screenshot shows a dialog box titled "Paxton Net2 settings" with a close button (X) in the top right corner. Below the title bar, there are two tabs: "General settings" (which is selected and underlined) and "Camera settings". The main content area contains several input fields:

- Paxton Net2 server address:** A text input field with a lock icon on the left and the value "192.168.100.103".
- SignalR port:** A text input field with the value "8080".
- REST port:** A text input field with the value "8080".
- Username:** A text input field with the value "OEM Client".
- Password:** A password input field with three dots and a toggle eye icon on the right.
- Client ID:** A text input field with a series of dots and a toggle eye icon on the right.

Below the input fields, there is a blue "Connect" link. At the bottom of the dialog, the status is displayed as "Status: Successful connection." and there are two buttons: a blue "Save" button and a white "Cancel" button with a blue border.

To configure the connection, specify the following parameters:

Paxton Net2 server address: IP address or domain name of the Paxton Net2 server

SignalR port: Paxton Net2 server connection port

REST port: Port for sending REST API requests to the Paxton Net2 server (usually the same as SignalR)

Username: Name of the Paxton Net2 account used for connection

Password: Password of the Paxton Net2 account used for connection

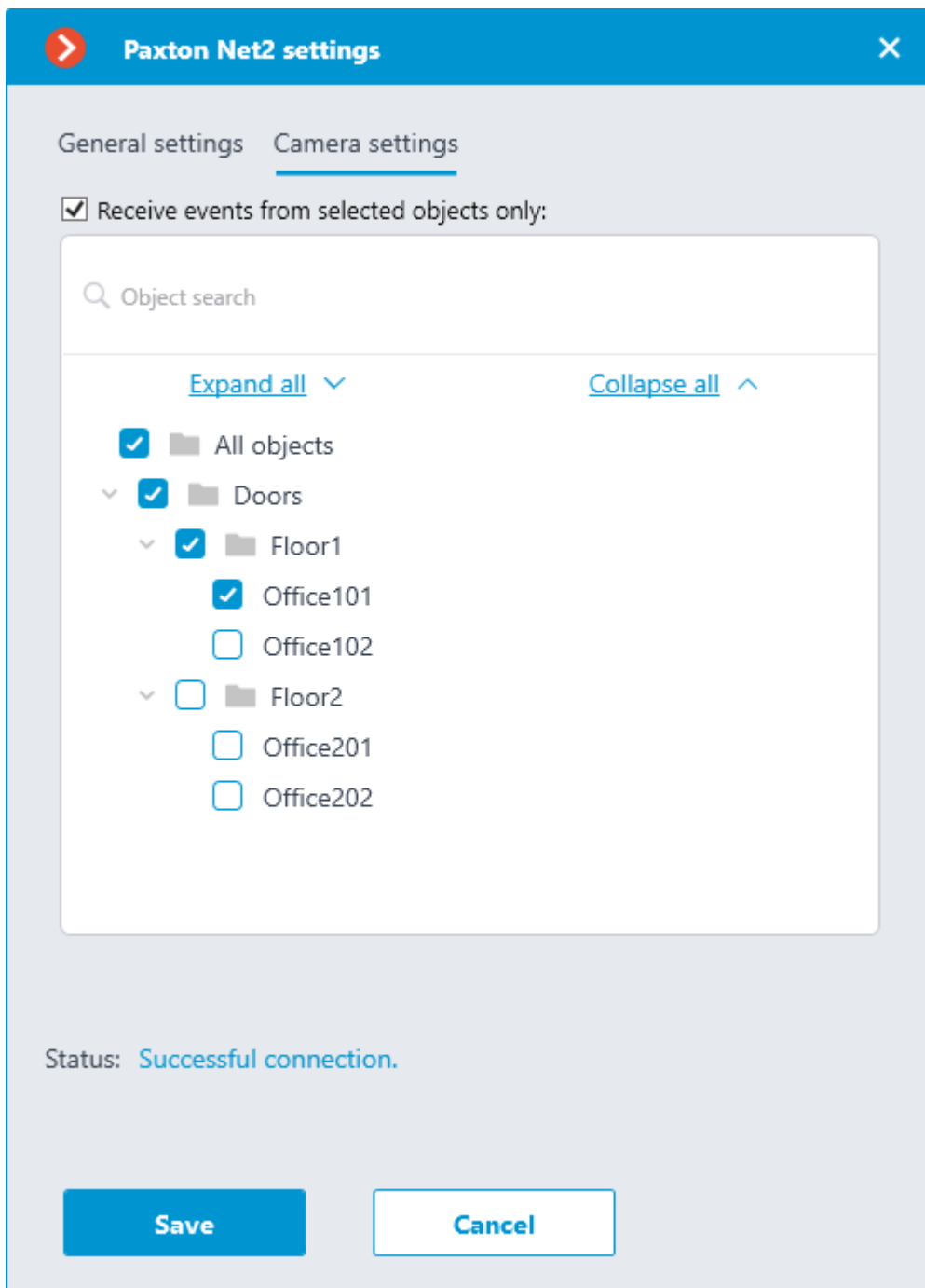
Client ID: Identifier contained in the Paxton Net2 license filename

To test the connection with the provided settings, click the **Connect** button. The **Status** section will display the result of the test.

If the connection is successful, further settings should be made on the **Camera settings** tab.

Camera settings

The **Camera settings** tab is used for setting up the registration of events from Paxton Net2 objects in **Eocortex**.



To receive events only from certain objects, enable the **Receive events from selected objects only:** option and check the selected objects.

If the **Receive events from selected objects only:** option is disabled, **Eocortex** will register all Paxton Net2 events as related to the selected camera.

Eocortex registers events for the camera independently of the settings of other cameras, so the same Paxton Net2 object can cause the reaction of the system and create an entry in the Events Log for multiple cameras simultaneously.

Suprema BioStar 2


The following tabs are available in the integration settings:

General settings;
Camera settings.

General settings

The **General settings** tab contains the settings for a network connection to the **Suprema BioStar 2** ACS for the whole system.

The following settings are available:

Server address: IP address or URL of the **Suprema BioStar 2** server. Prefixes, such as http://, are not required to be specified in this field. To enable a secured connection via HTTPS, click the  button.

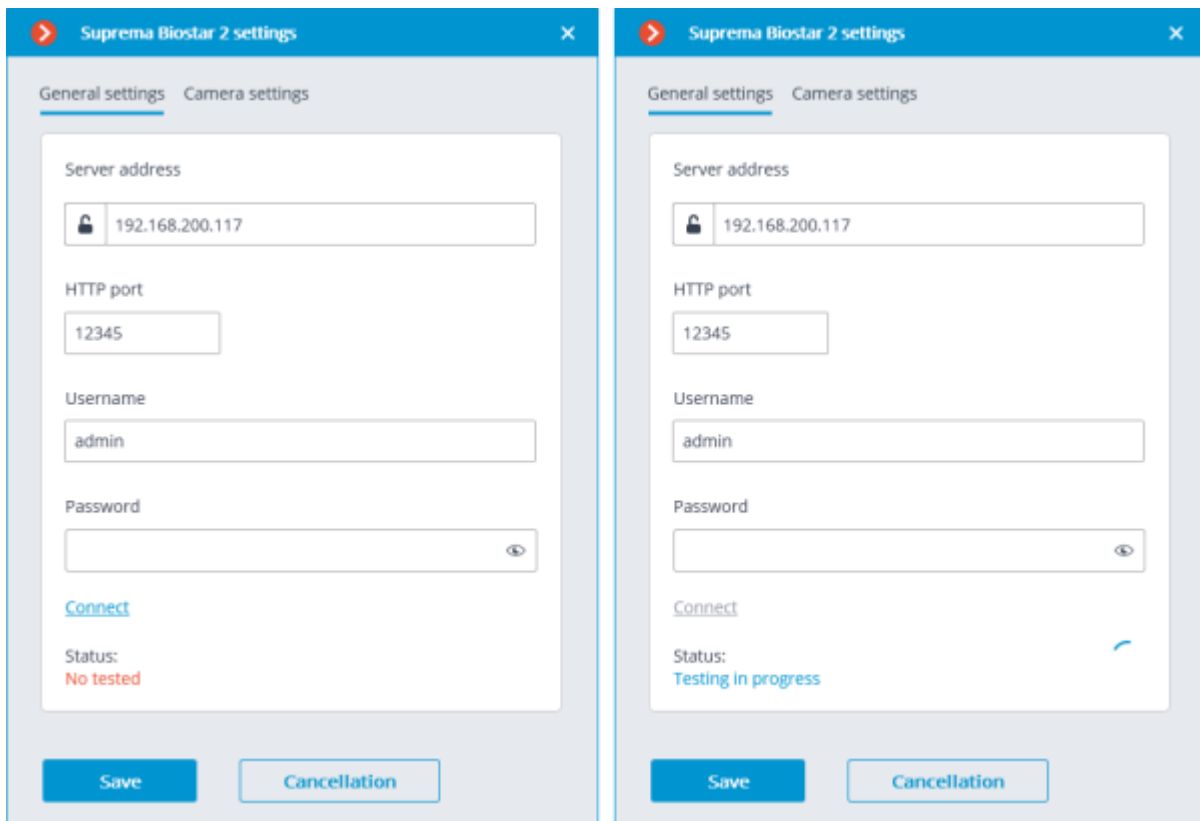
HTTP port: HTTP(S) port of the **Suprema BioStar 2** server. Interaction with the ACS utilizes the HTTP and WebSocket protocols, but both protocols use the same port. The WebSocket port can be configured individually in **Suprema BioStar 2** settings, but it is not necessary to set it in the integration settings.

Username.

Password.

When all settings are done, click the **Connect** button.

The connection test result will be displayed in the **Status:** field.



Camera settings

The **Camera settings** tab contains settings from which devices the system should receive events for this camera.

By default, all ACS events will be received from all devices.

If the integration is enabled on multiple cameras with the default settings, the events will be duplicated for all enabled cameras.

There are 2 types of **Suprema BioStar 2** objects available for configuration:



Doors. A high-level object that is most often configured with rules in **Suprema BioStar 2**. Usually the door is connected to a relay and a sensor of other device. Receiving events from specific doors allows to configure the integration more precisely;



Devices. A lower-level **Suprema BioStar 2** object. Setting up to receive events from the device allows configuring the integration more flexibly. For example, if **Suprema BioStar 2** is in the deployment phase, the list of doors and their properties will continuously change. When configuring to receive events from the specific door, it will be necessary to change the integration settings each time when something has changed. But when configuring to receive events from a device, when new doors are connected to the device, the integration settings would not need to be changed.

Honeywell Pro-Watch

The connection to the **Honeywell's Pro-Watch®** comprehensive security platform can be adjusted on the **Connection** tab.

Honeywell Pro-Watch settings

Connection Devices

Pro-Watch server address

192.168.0.15

SignalR port 8735

REST port 8734

Username admin

Password

[Connect](#)

Status: **Connection not tested.**

Save Cancel

The connection setup parameters:

Pro-Watch server address: the IP address of **Honeywell's Pro-Watch®** server.

SignalR port and **REST port** are the ports that are used to provide **Honeywell's Pro-Watch®** API. The default parameters of these ports correspond to the default parameters of **Honeywell's Pro-Watch®**.

Username and **Password** are the name and **Web password** of the **Honeywell's Pro-Watch®** user for whom the access to the **Honeywell's Pro-Watch®** API service has been set.

After setting up the connection, it is required to test it by clicking on the **Connect** link. In case of a successful test connection, the list of **Honeywell's Pro-Watch®** system devices will become available on the **Devices** tab.

In this list, it is required to mark the devices whose events will be displayed and registered in **Eocortex**.

Custom notifications and webhooks

Eocortex provides the option of sending extended and customizable information about the event to external users and automated systems. This is possible by adding special template variables when configuring [actions](#) in the **Automation** section.

Only certain **Actions** can be set up with template variables.

This feature can be used, for example, to send the name, group and ID of a recognized person to the ACS so that the ACS will open the door.

Description

The feature allows specifying **Template Variables** in editable text fields of actions to use context information from the received system event. Variables are specified in double curly braces like **{{ templateVariable }}**. When an action on an event or schedule is performed, the value of the variable will be substituted.

Below is a list of actions that support the variables.

Custom notifications:

[Send notification by SMS](#)

[Send notification by email](#)

[Run external application on server](#)

[Send to messenger](#)

[Send Push notifications to mobile devices](#)

[Save frame](#)

Outbound webhooks. Data transfer to third-party automated systems:

[Send HTTP request](#)

Actions



Send notification by SMS

This action supports variables in the **Message Text** field.

The screenshot shows a dialog box titled "Action settings" with a close button (X) in the top right corner. Below the title bar, there are two tabs: "Actions" (selected) and "Runtime conditions (0)". The main content area is divided into three sections:







- Description:** A text box containing "Send notification by SMS".
- Limits:** A checkbox labeled "Limit by start time" is unchecked. Below it, a text box says "Do not perform more often than once per" followed by a text box containing "5" and the word "seconds".
- Special settings:** This section contains three rows:
 - "GSM modem:" followed by a dropdown menu showing "GSM Modem" and icons for adding (+), editing (pencil), and deleting (trash).
 - "Telephone number:" followed by a text box containing "+447800767690".
 - "Message text:" followed by a text box containing "Problem with camera {{ cameraname }}" and an edit icon (pencil).

At the bottom of the dialog, there is a blue link labeled "Send message" and two buttons: "Apply" and "Cancel".

Clicking the  **Edit template** button opens a window with a list of all variables that can be inserted to the current cursor position in the text box. To add the selected variable, click the  **Add variable to the template** button.

Edit template ✕

Template variables available for use in editable action text fields

Variable name		Event property name
{{ cameraip }}		Camera IP address
{{ cameraname }}		Camera name
{{ comment }}		Comment
{{ description }}		Event description
{{ eventtime }}		Event time
{{ zoneid }}		Area

Problem with camera {{ cameraname }}

Apply Cancel

Send notification by email

This action supports variables in the **Email Subject** and **Message Text** fields.


Action settings

Actions Runtime conditions (0)

Description




Send notification by email

Limits


Limit by start time 

Do not perform more often than once per seconds


Special settings

Mailing server   

Send from

To 

Subject:



Message text:

Apply **Cancel**

Action settings

Actions Runtime conditions (0)

To: user@mycompany.com ⓘ

Subject: Eocortex: Notification from camera "{{ CameraName }}" ✎

Message text: Check the camera! Something happened with it at {{ eventtime }}! ✎

Attach frame to email



Use frame from archive

Saved frame format: Jpeg ▾

Attach link to the map







[Send text message](#)

Apply Cancel

Clicking the  **Edit template** button opens a window with a list of all variables that can be inserted to the current cursor position in the text box. To add the selected variable, click the  **Add variable to the template** button.

Edit template ✕

Template variables available for use in editable action text fields

Variable name		Event property name
{{ cameraip }}		Camera IP address
{{ cameraname }}		Camera name
{{ comment }}		Comment
{{ description }}		Event description
{{ eventtime }}		Event time
{{ zoneid }}		Area

Check the camera! Something happened with it at {{ eventtime }}!

Apply Cancel

Run external application on server

This action supports variables in the **Arguments** field.

Action settings

Actions Runtime conditions (0)

Description

Run external application on server

Limits

Limit by start time

Do not perform more often than once per 5 seconds

Special settings

Path: ⓘ



C:\Program Files\Eocortex Server\Scripts\MyApp.exe

Application must be located in the Scripts subfolder

Arguments:







{{ cameraname }} {{ eventtime }}

Apply Cancel

Clicking the  **Edit template** button opens a window with a list of all variables that can be inserted to the current cursor position in the text box. To add the selected variable, click the  **Add variable to the template** button.

Edit template ✕

Template variables available for use in editable action text fields

Variable name		Event property name
{{ cameraip }}		Camera IP address
{{ cameraname }}		Camera name
{{ comment }}		Comment
{{ description }}		Event description
{{ eventtime }}		Event time
{{ zoneid }}		Area

{{ cameraname }}{{ eventtime }}

Apply Cancel

Save frame

This action supports variables in the **Folder** and **File name template** fields.

Action settings

Actions Runtime conditions (0)

Save frame

Limits

Limit by start time

Do not perform more often than once per 5 seconds

Special settings

Folder (on server):

C:\Program Files\Eocortex Server\{{ cameraname }}

File name template (it will be supplemented with the current time for uniqueness)

{{ eventtime }}{{ cameraname }}{{ cameraip }}

Saved frame format:



Jpeg

Restrict maximum size of the folder (MB):

100







Use frame from archive

Apply Cancel

Clicking the  **Edit template** button opens a window with a list of all variables that can be inserted to the current cursor position in the text box. To add the selected variable, click the  **Add variable to the template** button.

Edit template ✕

Template variables available for use in editable action text fields

Variable name		Event property name
{{ cameraip }}		Camera IP address
{{ cameraname }}		Camera name
{{ comment }}		Comment
{{ description }}		Event description
{{ eventtime }}		Event time
{{ zoneid }}		Area

```
{{ eventtime }}{{ cameraname }}{{ cameraip }}
```

Apply Cancel

Send Push notifications to mobile devices

This action supports variables in the **Message Text** field.

Setting the action of sending Push notifications


Actions Runtime conditions (0)

Action settings ⓘ

Description


Send Push notifications to mobile devices

Limits

Limit by start time 



Do not perform more often than once per 60 seconds

Special settings

Message text 







Recipients

Apply Cancel

Clicking the  **Edit template** button opens a window with a list of all variables that can be inserted to the current cursor position in the text box. To add the selected variable, click the  **Add variable to the template** button.

Edit template ✕

Template variables available for use in editable action text fields

Variable name		Event property name
{{ cameraip }}		Camera IP address
{{ cameraname }}		Camera name
{{ comment }}		Comment
{{ description }}		Event description
{{ eventtime }}		Event time
{{ zoneid }}		Area

Fire detected on camera {{ cameraname }}.
Details:
{{ description }}

Apply Cancel

Send to messenger

This action supports variables in the **Message Text** field.

Action settings

Actions Runtime conditions (0)

Description

Send to messenger

Limits

Limit by start time

Do not perform more often than once per 5 seconds

Special settings

Message text



Motion on camera {{ cameraname }}

Attach frame

Use frame from archive







Attach link to the map

Apply Cancel

Clicking the  **Edit template** button opens a window with a list of all variables that can be inserted to the current cursor position in the text box. To add the selected variable, click the  **Add variable to the template** button.

Edit template ✕

Template variables available for use in editable action text fields

Variable name		Event property name
{{ cameraip }}		Camera IP address
{{ cameraname }}		Camera name
{{ comment }}		Comment
{{ description }}		Event description
{{ eventtime }}		Event time
{{ zoneid }}		Area

Motion detected on camera {{ cameraname }}

Apply Cancel

Send HTTP request

This action supports variables in the **URL** and **Request body** fields.


Action settings

Actions Runtime conditions (0)

Description


Send HTTP request

Limits

Limit by start time 

Do not perform more often than once per seconds

Special settings

POST 

Status:

Authorization (Basic)

HTTP headers

Request body

Event in query body

Custom text

Do not perform more often than once per seconds

Special settings

POST

Status:

Authorization (Basic)

HTTP headers



Request body

Event in query body

Custom text

Text JSON XML

Camera: {{ cameraname }}
Event time: {{ eventtime }}

Clicking the  **Edit template** button opens a window with a list of all variables that can be inserted to the current cursor position in the text box. To add the selected variable, click the  **Add variable to the template** button.

Edit template

Template variables available for use in editable action text fields

Variable name		Event property name
{{ cameraip }}		Camera IP address
{{ cameraname }}		Camera name
{{ comment }}		Comment
{{ description }}		Event description
{{ eventtime }}		Event time
{{ zoneid }}		Area

```
http://192.168.200.87:8080/configure/channels/cb23b6a8-4bd3-4cd4-a519-4942aa8e9663?  
cameraip={{ cameraip }}
```

Apply **Cancel**

Template variables

Template variables are declared in double curly braces like **{{ templateVariable }}**.

Requirements and recommendations

Double curly braces serve as the beginning and the end of the variable, their presence is mandatory.

Other combinations of braces, such as **{{{}}**, may cause errors or display the string without substituting the corresponding variable.

Combinations of **{%{}** and **}%}** braces serve as the start and end of a sequence within which the given template variables will be displayed as braced source text.

Spaces before and after double brackets are optional.

If there is no template variable in the event, the string will display it as source text in curly braces.

The case of a template variable does not matter. For example, the variable **{{ lastname }}** will find an event field named **{{ LastName }}**.

Use of variables

The set of available variables depends on the event for which the action is being configured.

The following variables are available for all events:

{{ cameraname }} — the name of the camera where the event happened.

{{ cameraip }} — camera IP address.

{{ description }} — localized description of basic information about the event.

{{ comment }} — event comment.

The list of event fields available as template variables can be viewed in the **Edit template** window or in the tooltip. This list includes event fields that are available as filters in **Runtime conditions** of action.

Custom insertions can also be used as template variables, if the module that generated the event supports them. The name of the attachment can also be specified in curly brackets. For example, when using **Eocortex** with the Face Recognition module and configured database synchronization with **Gate ACS**, Face recognized event contains a **Wiegand code** parameter, the value of which can be obtained using variable **{{ wiegand26 }}**.

Depending on the type of variable, the value may appear in the text as follows:


Strings are displayed as is.

Integral numeric types are displayed as numbers.


Nonintegral numeric types are displayed according to the server settings, depending on that the fractional part will be separated either by a comma or a dot.

Enumeration types are displayed as a string according to the server's language settings.

Date and Time types are displayed in as a string in the **dd.MM.yyyy HH:mm:ss.fff** format in the local time of the server, ignoring the camera time. For example, 29.09.2022 13:38:19.944.

To open the **Edit template** window, click the  button next to the text input field.

Variable name	Event property name
{{ cameraip }}	Camera IP address
{{ cameraname }}	Camera name
{{ comment }}	Comment
{{ description }}	Event description
{{ eventtime }}	Event time
{{ zoneid }}	Area

Clicking the  icon will insert the relevant variable at the current cursor position in the text field.

A tooltip with a list of variables is available in text fields that support templates. The tooltip opens in the following ways:

By pressing **Ctrl + Space**

By typing the `{` character

The tooltip can be closed by pressing **Escape**.

Message text:

cameraip	Camera IP address
cameraname	Camera name
comment	Comment
description	Event description
eventtime	Event time
zoneid	Area

Use frame from archive

Saved frame format:

When typing, a search is performed both by variable name and by variable description. The search results are displayed at the beginning of the list, and variables that do not match the search are displayed lower in alphabetical order.

Message text:

eventtime	Event time
cameraip	Camera IP address
cameraname	Camera name
comment	Comment
description	Event description
zoneid	Area

Attach frame to event

Use frame from archive

Saved frame format:

To select a variable in the list, use the **Up** and **Down Arrow** keys on a keyboard to move through the list. Inserting a variable into the field can be done by pressing **Enter** or by clicking on the line. The variable will be inserted to the text at the current cursor position to the previous unclosed opening curly bracket or space, if the unclosed bracket is not found.

Examples of task solutions

[Creating a task in Jira when the connection to the camera is lost.](#)

[Saving event data to a file.](#)


Related references

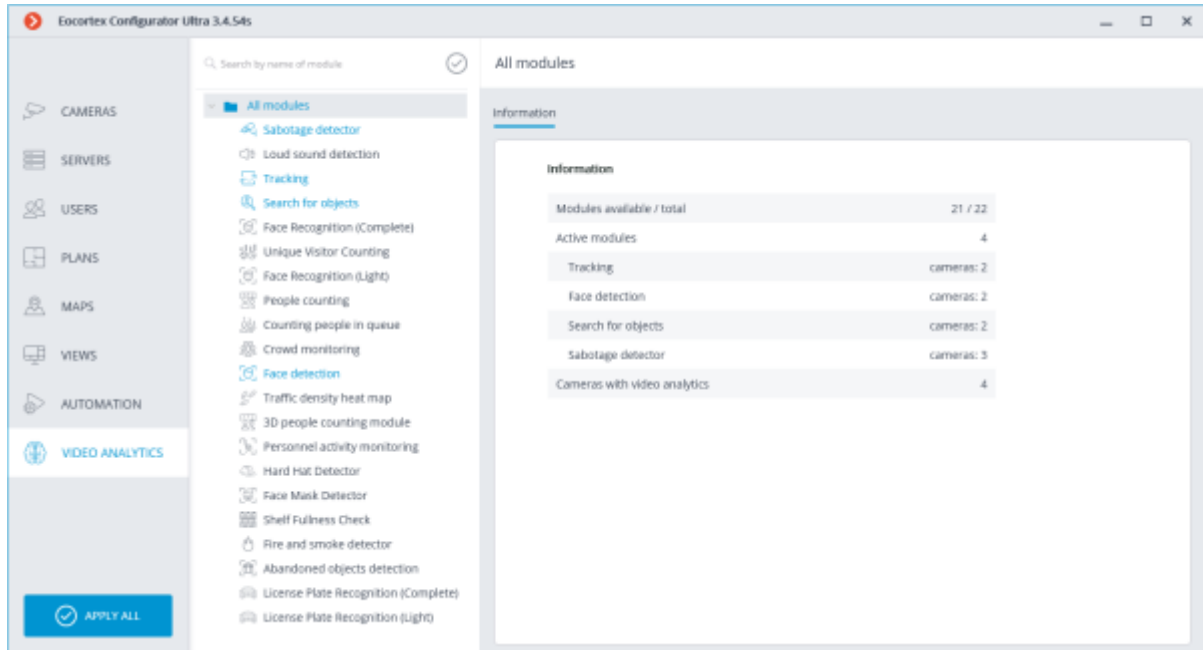
[Actions](#)


[Events](#)

Video analytics

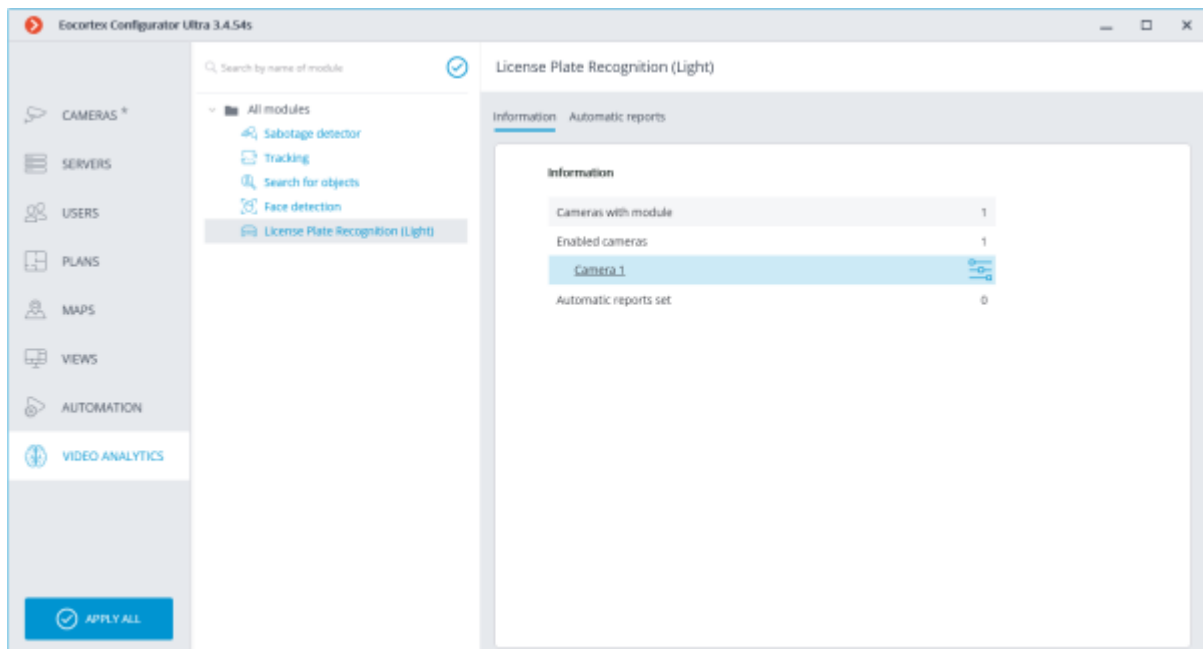
The information regarding the available and activated video analytics in the system is shown in the

Eocortex Configurator application, on the  **Video analytics** page. Also, it is possible to set up the video analysis modules already in use on the cameras as well as the automatic sending and saving of the reports for some of the modules.




The list of all the video analysis modules is shown on the left side of the page. Using the  button, it is possible to hide or display the unused modules.

The information regarding the use of the video analytics in the system is shown on the right side of the page, in the **Information** tab.



When a video analysis module is selected, the list of all cameras where this module is activated is displayed, among other things. When clicking on the line of a camera, the connection settings page of this camera appears.

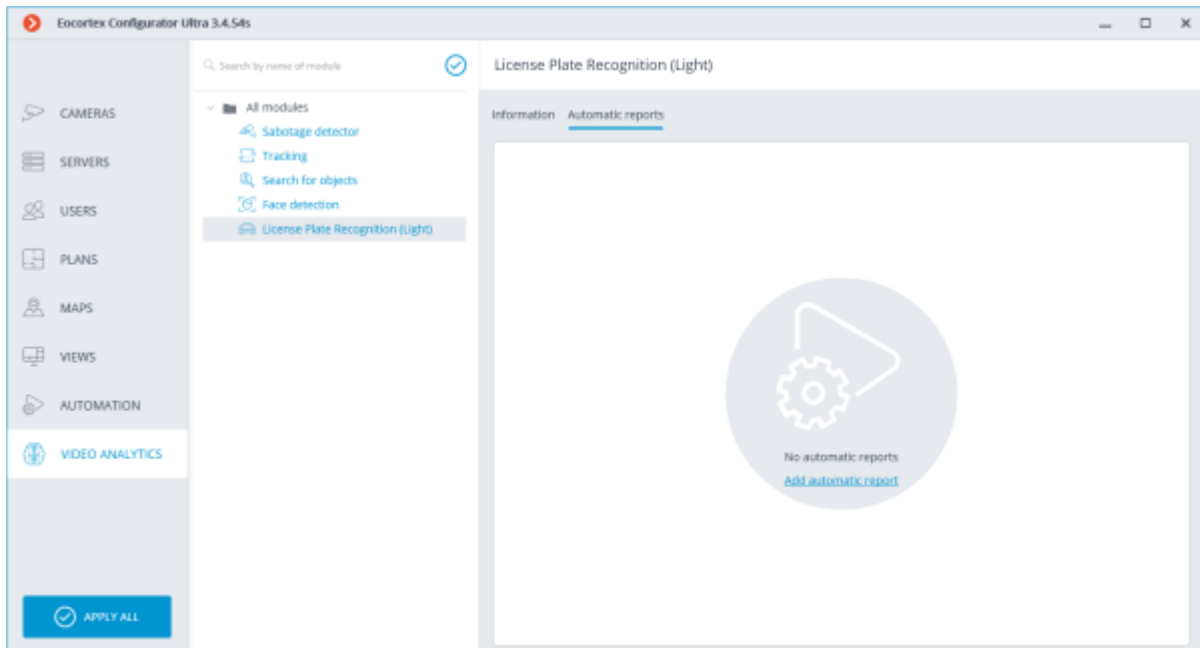
Hovering over the line of a camera in the right side of the line shows the  button. Pressing this button opens the pages of the module's settings for this camera.

For some video analysis modules, the **Automatic reports** tab is available. It allows to set up regular sending or saving the reports with the data generated by the module. Moreover, this tab displays the information about each report created.

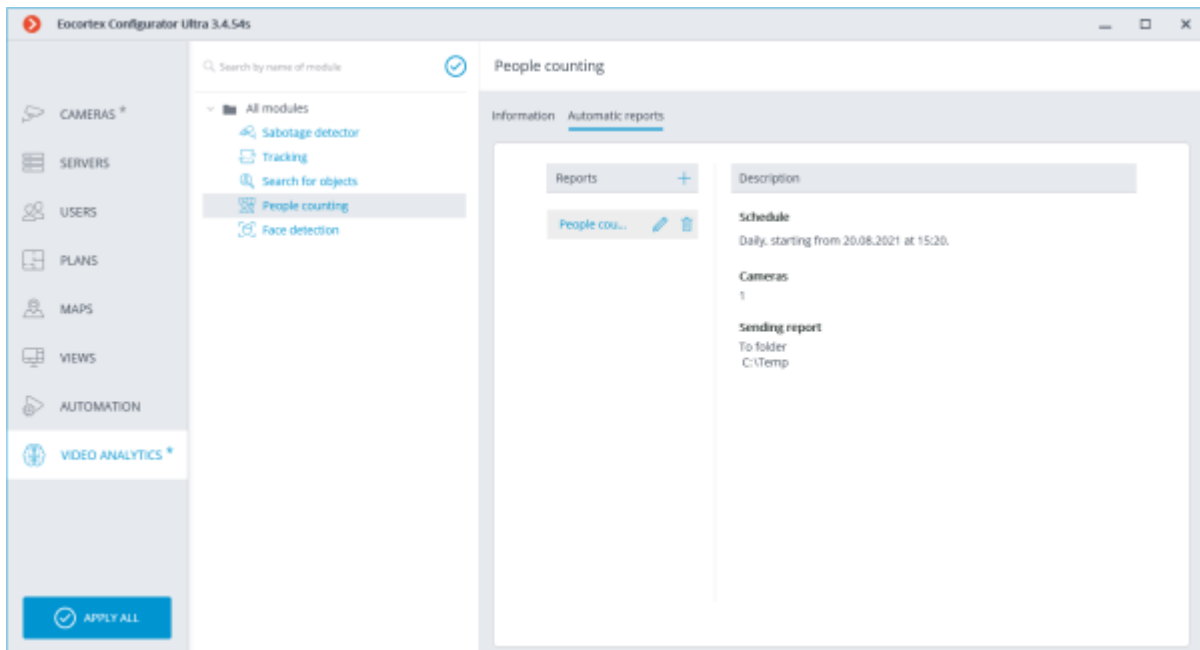
The automatic reports are available for the following video analysis modules:

- Personnel Activity Monitoring
- People Counting
- License Plate Recognition (Complete)
- License Plate Recognition (Light)
- Face Recognition (Complete)
- Face Recognition (Light)
- Object Classification and Counting

If no automatic report has been created, the tab will be empty. In such a case, it is required to use the **Add automatic report** link.

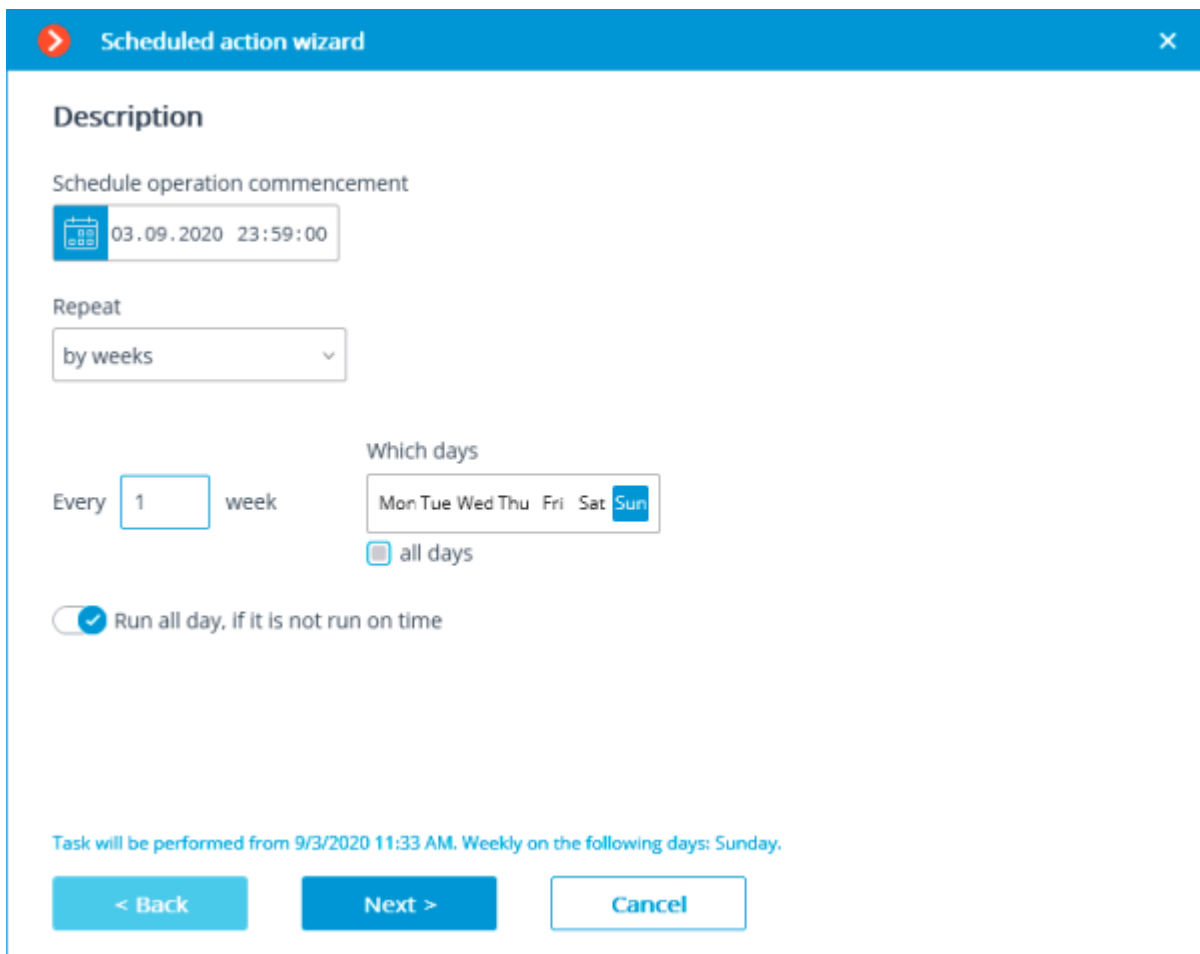


If at least one automatic report has been created, a list of all the automatic reports generated will be shown on the left side of the tab, and the right tab will contain the information regarding the report selected at the moment.

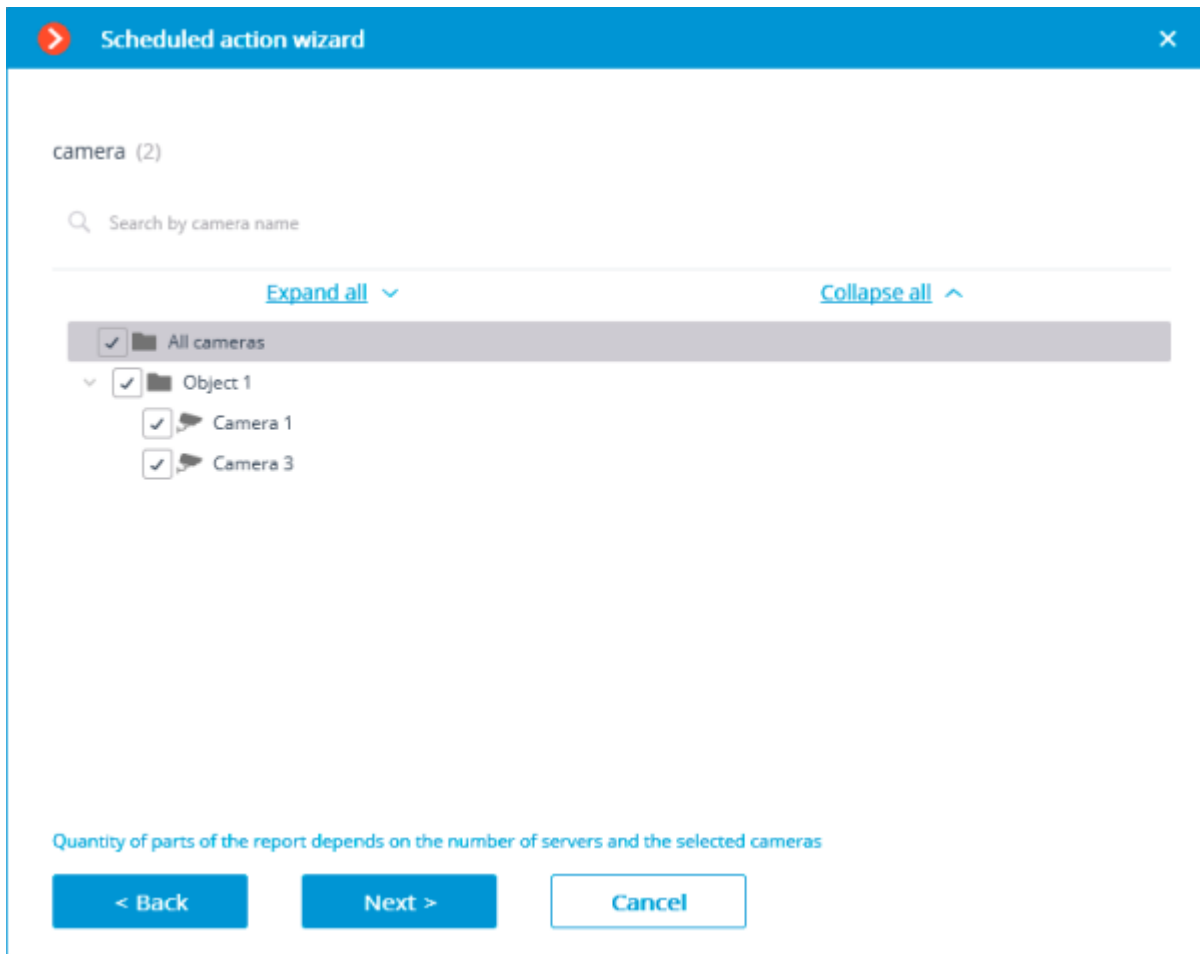


Renaming a report can be done by double clicking on its name in the list. Changing settings or deleting is performed by clicking a corresponding button to the right of the name of a report.

For adding a new automatic report, it is required to press the + button in the list header. It will open the first page of the task adding wizard where it is required to set the time and periodicity of the report's creation. This page is similar to the page of the wizard of adding the [scheduled tasks](#).



At the next step, it is required to choose the cameras for which the report will be generated.



At the final step, it is necessary to set the parameters of creating and sending the report. At that, some of the parameters are common for all the video analysis modules, and some are specific to each individual type of the modules.

Scheduled action wizard ✕

For last:

Reporting interval:

Report format:

Send to email Save to folder

From:

To: ⓘ
Task will be performed from 9/3/2020 5:17 PM. Weekly on the following days: Sunday.

Scheduled action wizard ✕

For last: Include in the report only recognized

Reporting interval:

Group filter:

Report format:

Send to email Save to folder

Task was started 03.09.2020 in 17:10.

Scheduled action wizard

For last
1 hours

Reporting interval
09:00 — 13:00
14:00 — 18:00

Report format
.xlsx file

Send to email Save to folder

Path to folder on server
D:\Temp

Task will be performed from 9/3/2020 6:08 PM. Weekly on the following days: Sunday.

< Back Ready Cancel

General parameters:

For last: the period for which the report will be created.

Reporting interval: the intervals within a twenty-four-hour period whose data will be used for creating the report. The intervals can be added and deleted.

Report format: allows to choose one of the formats available for the report. In general, the reports can be generated in the following formats: a Microsoft Excel spreadsheet; a CSV file with tabular data; an image file containing a chart.

Send to email: the parameters for sending the report by email. The forms of adding a mail server and a sender's address are shown in the description of the [Send notification by email](#) action.

Save to folder: the path to a folder on the server where the report will be stored.

To report on the number of visitors:

Interval size: the size of the unit interval in the report.

To report on recognized license plates:

Group filter: groups for which data will be displayed in the report.

Filter by direction: the direction of movement of vehicles, according to which the data will be displayed in the report.

For Face Recognition reports:

Include only recognized faces in the report: when this option is enabled, the report will only include those faces that were identified using a database; when this option is off, all the faces detected by the module will be included into the report.

Group filter: groups whose data will be included into the report.

Deployment

Guidelines for choosing and configuring hardware platform

You can calculate the minimum hardware platform requirements online on ecortex.com, on the [Software for IP Cameras / Calculator](#) page.

While selecting the hardware platform consider, if necessary, the potential increase (near future expansion plan) in the number of channels.

The drive subsystem must comply with the design load. It is recommended to use RAID to increase system speed and reliability; take into account the performance in case of drive failure. The server drive subsystem must also provide a certain reserve bandwidth (read rate) to allow convenient archive search.

It is recommended to install two network interface controllers (NIC); configure one of them for camera subnet and another for **Ecortex Client** requests. Benefits: camera isolation, reduces network traffic in a public network.

If network storages (NAS, SAN) are used to store archives, we recommend installing an additional NIC for these purposes.

Provide reserve computer resources in the amount of 3% of CPU load per connected client for fast client request serving. The server drive subsystem must also provide a certain reserve bandwidth (read rate) to allow convenient archive search.

When using the hot backup function consider that in case of failure of one of the servers, its load is distributed on the others. For example, if there are only 2 servers, they work together and "backup" each other; each must have a capacity sufficient to handle all video streams from all cameras.

To achieve maximum performance disable processor power-saving technologies before installing the OS: Cool'n'Quiet for AMD and SpeedStep or EIST for Intel (configured in BIOS, usually in Advanced / CPU.) If you use SATA-drives, do not forget to set AHCI value for SATA Mode (configured in BIOS, usually in Advanced / SATA; only for controllers that support this mode.)

Windows-based applications

Guidelines for Windows settings

The computer must use one of **Microsoft Windows** operating systems provided in specification:

- Windows 8
- Windows 8.1
- Windows 10
- Windows Server 2012
- Windows Server 2012 R2
- Windows Server 2016
- Windows Server Windows Embedded for Intel x64 with the full functionality of abovementioned Windows versions

Since **Eocortex** version **4.0**, support for **Windows 7** and **Windows Server 2008** operating systems, as well as **32-bit versions** of other operating systems, is no longer available. This should be considered when installing or upgrading **Eocortex** to version **4.0** or higher.

Before installing **Eocortex** applications, you must configure the operating system:

Install all Windows updates and then turn off Auto-update.

Select the time zone corresponding to the server location, then either specify the exact time that corresponds to this time zone, or synchronize the time of the computer with one of the time servers in the local network or on the Internet, then disable time synchronization on this computer.

Switch the power settings to high performance mode: **Control Panel / Power options: High performance**. Also in the power supply settings disable automatic disconnection of disks and USB-devices because for round-the-clock systems they should be on all the time and switching off during operation can cause malfunction of the **Eocortex** video server.

Disable Users Accounts Control (UAC): **Control Panel / User Accounts / Change User Account Control settings: Never Notify**.

Disable the firewall. If the security policies do not permit disabling the firewall, the network ports that allow the surveillance server to communicate with the cameras, client computers and applications must be open.

Particularly for most systems, it is sufficient to white-list the following ports:

Incoming TCP connections:

- 8080 — HTTP (unsecured connection) port to communicate with client computers and other servers;
- 18080 — HTTPS (secured connection) port to communicate with client computers and other servers;
- 8089 — communication port for mobile and web clients with proxying disabled. Proxying is enabled by default, but can be switched in the Server settings section of the **Eocortex Configurator** application.

Outgoing TCP connections:

- 8080 — HTTP (unsecured connection) port to communicate with the main server of the multiserver system;
- 80 — connection port for communications with cameras via HTTP or ONVIF protocols;
- 554 — connection port for communications with cameras via RTSP;
- 443 — connection port for communications with cameras via HTTPS.

Also, depending on the settings of the cameras used and the **Eocortex** features enabled, it may be necessary to open other ports for incoming and outgoing connections.

Installed antivirus should not scan HTTP and RTSP traffic, including input video streams from IP cameras, as this significantly reduces the system performance. Add Eocortex module executable files to the list of trusted applications of antivirus and firewall, as video stream checking requires significant computing resources.

Some antivirus software (such as NOD32) blocks video streams even when disabled, since they "embedding" their own components at the system drivers level when installed. Thus, to ensure correct operation and performance we recommend removing antivirus software from Eocortex video servers, if possible.

It is not recommended to install **Eocortex** applications on the same computer as other surveillance or screen capture software, even if the specified software is not started while **Eocortex** applications are running. This may cause the **Eocortex** software to malfunction or completely fail.

Installing Eocortex software from a common installer

The most up-to-date version of **Eocortex** can be downloaded at eocortex.com: The distribution packages can be found at [Support / Software Installation Packages Supported](#).

Eocortex applications are installed from a common installer (**EocortexMainCommon Installer.exe**). This installer allows installation of the following applications:

- **Eocortex Server** is server software for a network video surveillance system used to receive, analyze, process and archive video data from IP cameras. It is installed on a single machine, where the data is processed and the archive is stored. **Eocortex Server** is a Windows service; it is launched at computer startup and runs in the background.
- **Eocortex Client** is network client of a video surveillance system that allows viewing video in real time and from the archive, controlling cameras, audio and intelligent modules by using Configurator. It is installed on the computers of operators, security chief and other surveillance system users. Eocortex Client does not require a USB-key and a license file for operation.
- **Eocortex Standalone** is software that combines the functions of a video surveillance system server and client. It is installed on a single machine, where the data is processed, the archive is stored and real-time video streams are viewed. **Eocortex Standalone** is not a Windows service — it is separately launched software with window interface.
- **Eocortex System Monitoring** is a subsystem that permits to monitor the status of the video surveillance system components.

Within one installation procedure, you can install both separate applications and all included in the installer. **Eocortex Server** and **Eocortex Standalone** are mutually exclusive (you can install either **Eocortex Server** or **Eocortex Standalone**).

Before installing **Eocortex Server** or **Eocortex Standalone**, it may be required to fully delete the video server installed earlier because in case of a standard uninstallation of **Eocortex** the setup files are left uninstalled. Their presence may cause conflicts or errors (see [Removing Eocortex software](#)).

The complete uninstallation of the video server installed earlier is not required if the server of the same bitness was installed on the PC earlier. In this case, the installation will be considered by the system as updating (see [Updating Eocortex software](#)).

During the installation use the account that has full access rights to the local computer on which **Eocortex Server** and **Eocortex Standalone** software is installed.

If you use an **Eocortex** USB-key, plug it into a server USB-port.



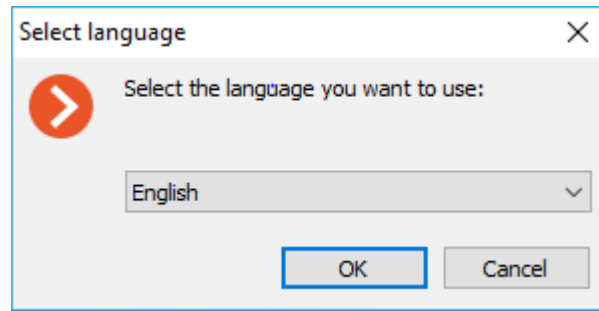
When using the multiserver configuration, the version numbers of merged servers must match.

The bitness of the applications being installed is determined automatically depending on the bitness of **Windows** OS. However, it is possible to choose the installation of 32-bit versions of **Eocortex** on a 64-bit version of **Windows**.

Since **Eocortex** version **4.0**, support for **Windows 7** and **Windows Server 2008** operating systems, as well as **32-bit versions** of other operating systems, is no longer available. This should be considered when installing or upgrading **Eocortex** to version **4.0** or higher.

Close all Windows applications before installing **Eocortex** software and run the **EocortexMainCommon Installer.exe** file.

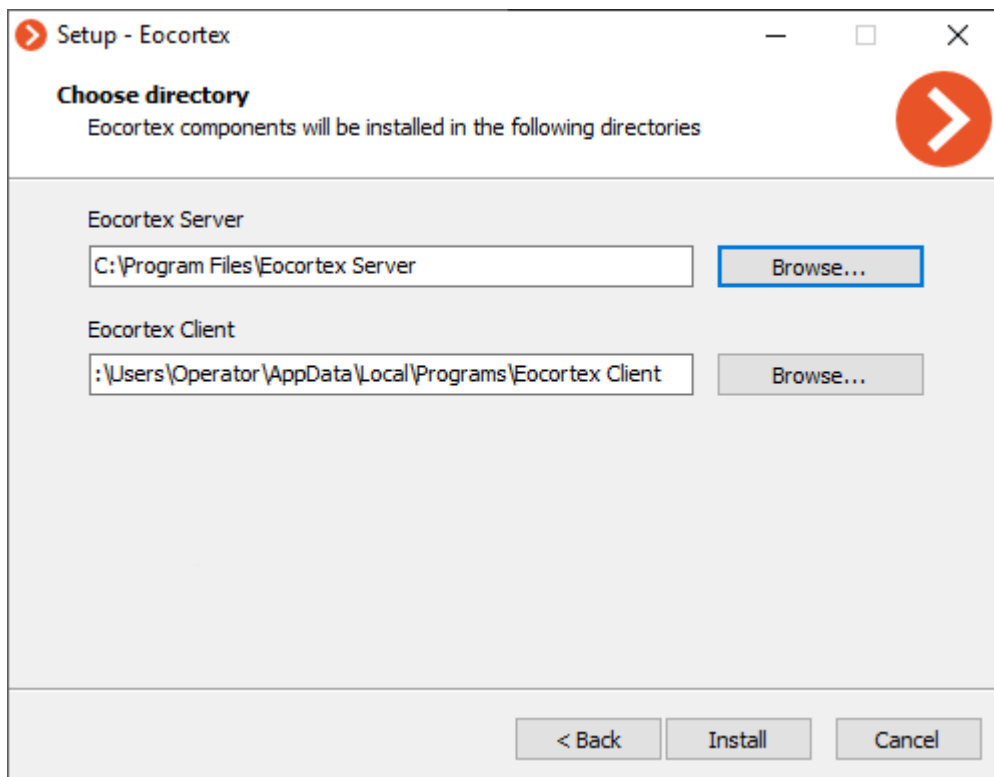
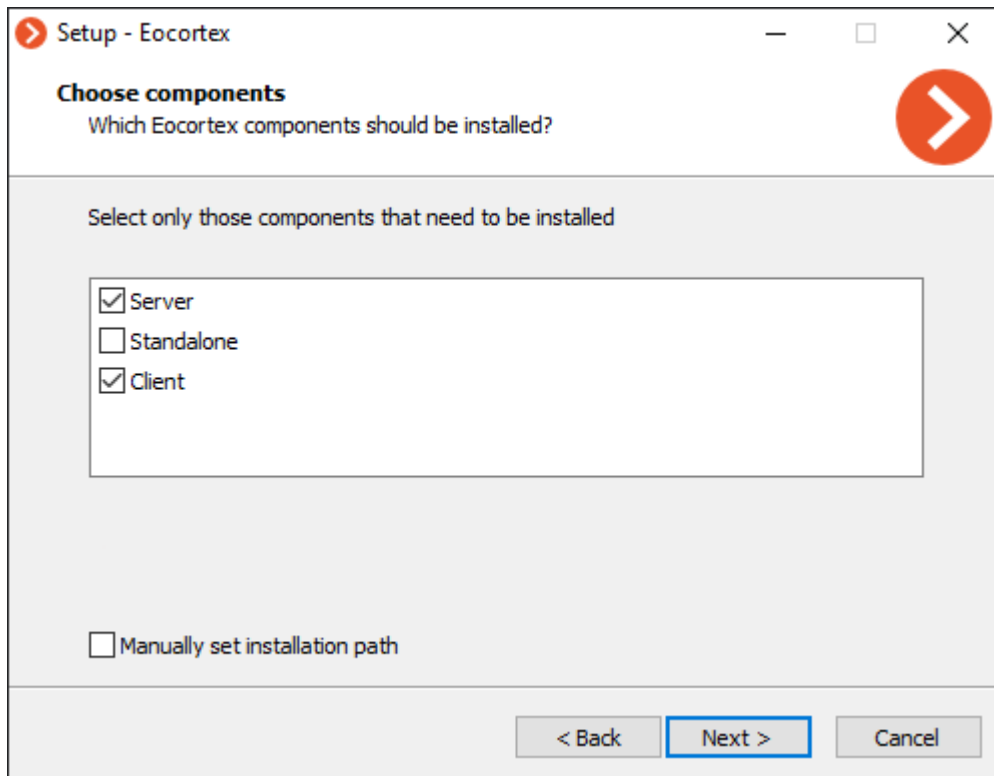
Select the installation language and click **OK**.

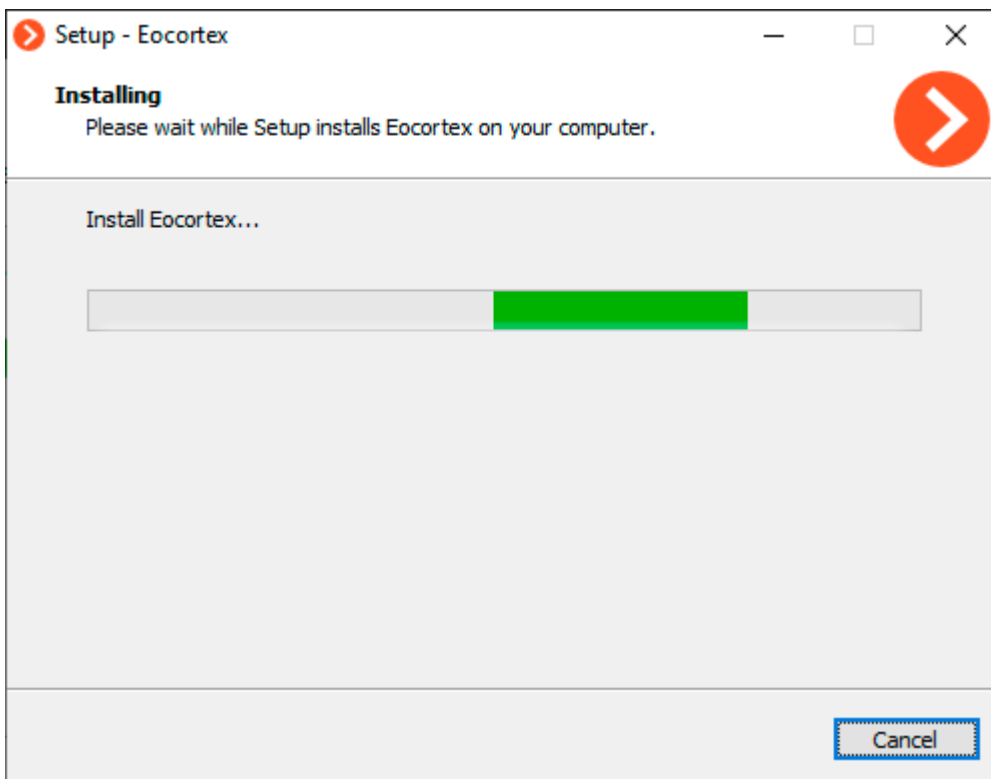
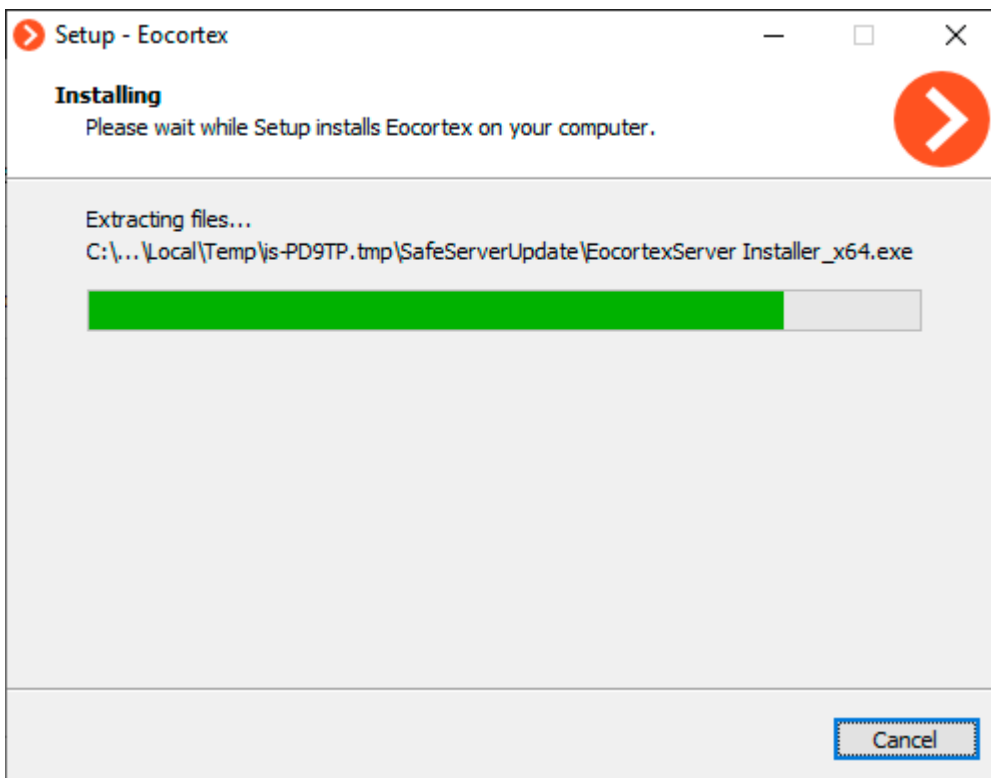


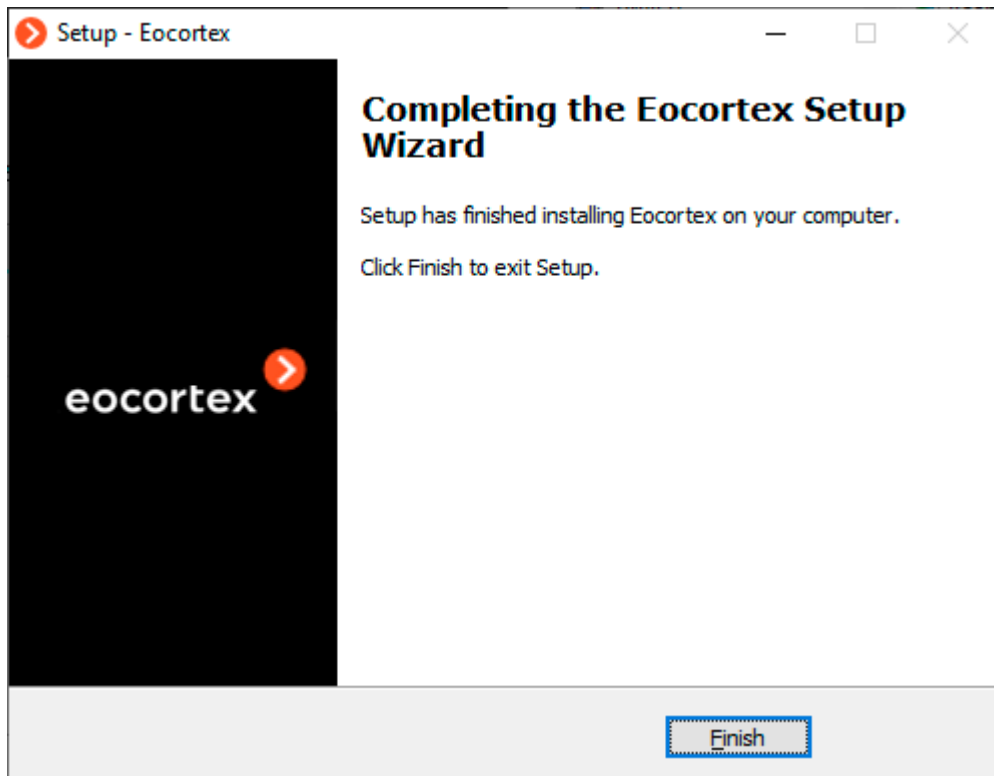
Setup wizard window will open. Follow the instructions:



Make the selection of application you want to install on the machine. Checking the option **Manually set installation path** allows defining absolute paths for each application that you may install.

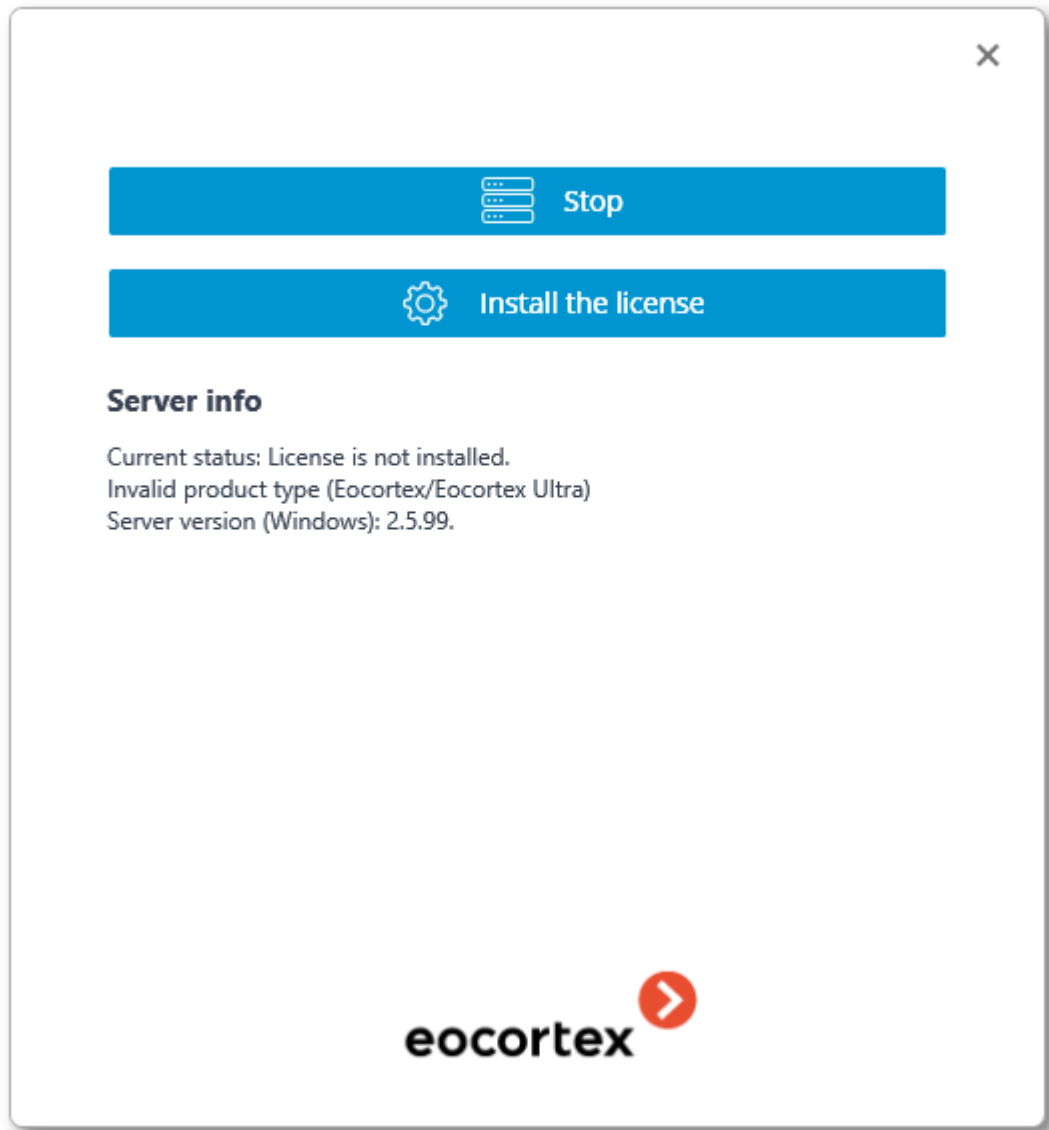






When installation of the video server is finished, the application will start automatically: **Eocortex Server** — as a Windows system service, **Eocortex Standalone** — as a console application. At that, a root user with a blank password is created (by default) with full rights (username and password are recommended to be changed).

When setup wizard is closed, **Eocortex Server Info** window opens. When clicking the button **Install the license**, you will be prompted to [Installing and updating the license](#).



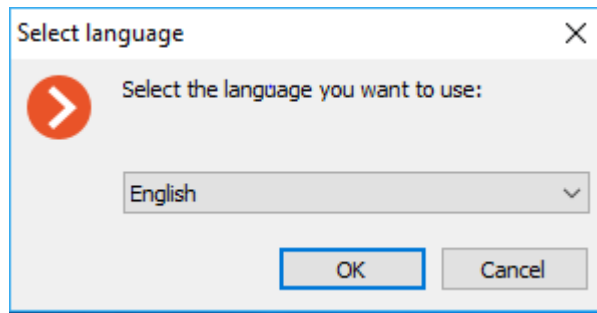
Installing Eocortex Client

The most up-to-date version of **Eocortex** can be downloaded at [eocortex.com](https://www.eocortex.com): The distribution packages can be found at [Support / Software Installation Packages Supported](#).

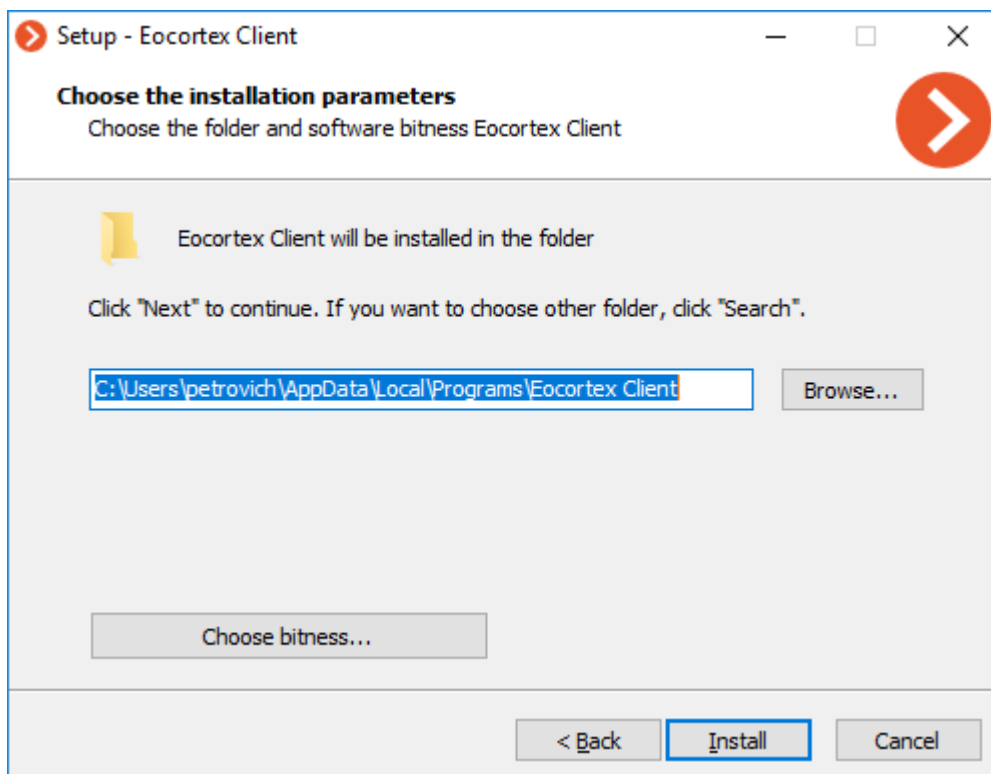
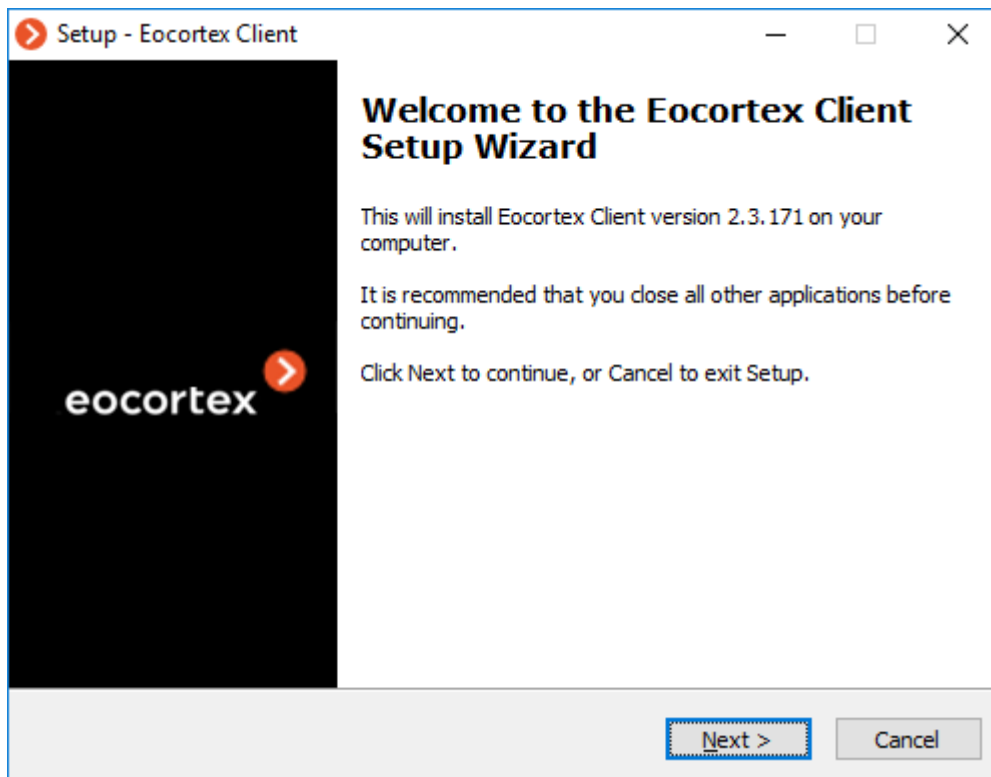
Installation of **Eocortex Client** should be performed via the account of the user by whom this application shall be used. If the application is to be used by several users with different accounts, you should install the application for each of such user.

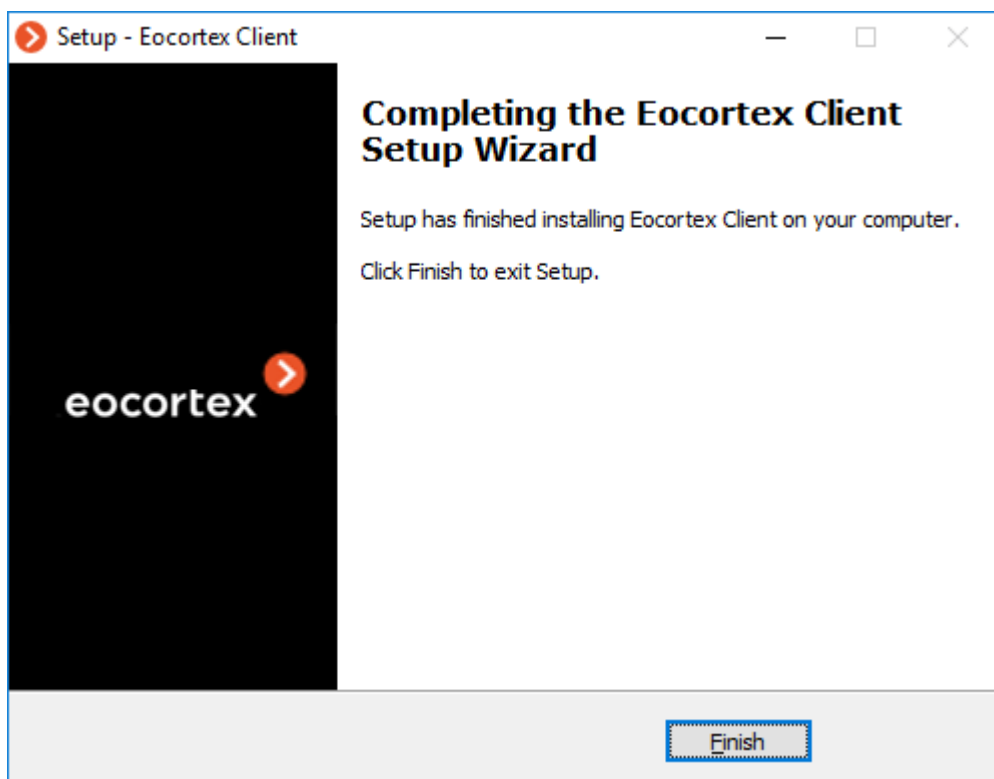
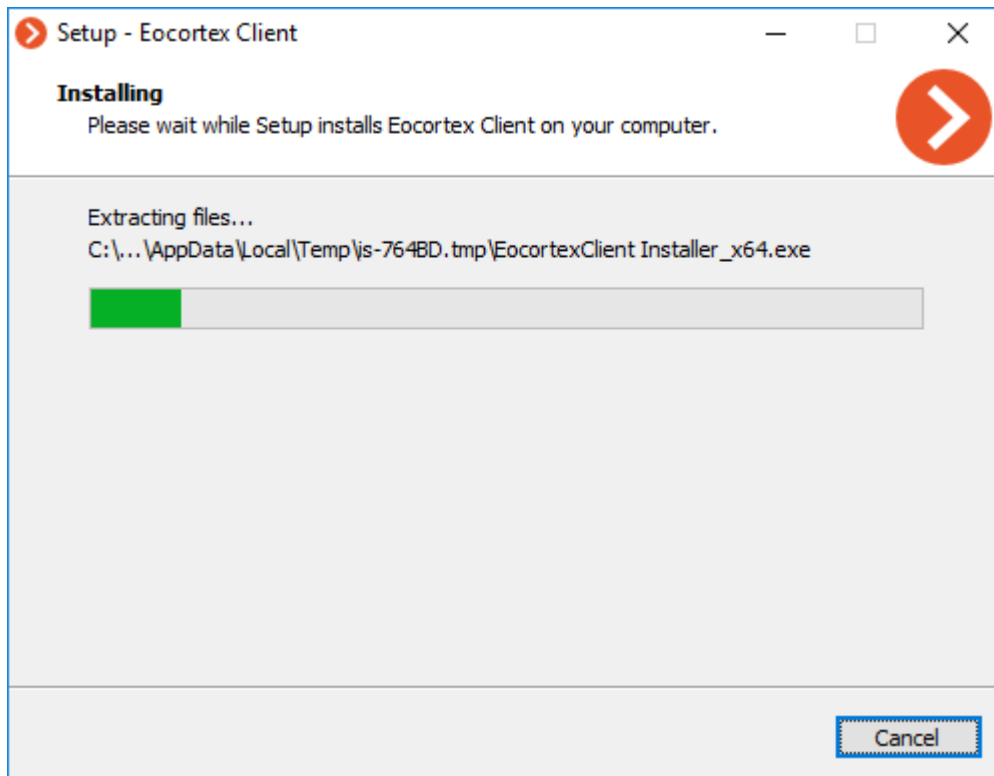
Close all Windows applications before installing **Eocortex Client**; run the **EocortexClientCommon Installer.exe** file located in the installer root folder.

Select the installation language and click **OK**.



Setup wizard window will open. Follow the instructions:





Updating Eocortex software

Updating **Eocortex** applications can be done by installing the latest version of the application "on top of" the older one (see [Installing Eocortex software from a common installer](#)). During installation, the program files of the previous version are deleted, but all settings as well as the archive and the license binding are retained. Thus, no additional settings are required after installing the new software version.

Starting from version 3.4 of **Eocortex**, certain components use PostgreSQL database management system of version 11 or later. In this respect, before installing version 3.4

and higher (as well as when upgrading from version 3.3 and lower to version 3.4 and higher), it is required to review the [PostgreSQL installation information](#).

When upgrading an application, the new version must be of the same bitness as the previously installed version. For example, if **Eocortex Server (32-bit)** was previously installed, then when updating it is necessary to select the same **Eocortex Server (32-bit)**. Please note that when installing with "default" values, the application bitness is determined automatically according to the digit capacity of the Windows operating system.

Since **Eocortex** version **4.0**, support for **Windows 7** and **Windows Server 2008** operating systems, as well as **32-bit versions** of other operating systems, is no longer available. This should be considered when installing or upgrading **Eocortex** to version **4.0** or higher.

It is recommended to enable [Eocortex Client automatic update in the server settings](#) to preserve compatibility between the server after the upgrade and the existing client computers. In addition, **Eocortex Client** can be installed from its own distribution package.

If there is a need to change the license without having to change the version or bitness of the server application, no update is required. Simply [update the license](#).

Versions of Eocortex

The version number of **Eocortex** applications consists of three parts: **M.N.R**, where **M** means a major version, **N** is for a minor version, and **R** is a release number.

The most up-to-date version of **Eocortex** can be downloaded at [eocortex.com](#): The distribution packages can be found at [Support / Software Installation Packages Supported](#).

When updating the **Eocortex** server application from an old version to the latest one, follow the recommendations below.

Depending on the version of the installed **Eocortex** server application:

- If the version of the currently installed server application differs from the recent one only by the release number, then you can update directly to the latest version.
- If the version of the currently installed server application differs from the recent one by the number of the major or minor version, then you need to successively update the server application.

Successive updating requires you to start the server at least once after upgrading to each subsequent version.

Successive update presumes keeping the system settings and the archive of cameras. However, there is a small chance of losing the settings or the archive.

Similarly, there is an upgrade from an older to a newer version that is not up to date.

Removing Eocortex software

Depending on the purpose, **Eocortex** software can be removed in one or two steps:

Step 1: Remove software and save the settings — only executable files and libraries are removed; all settings, the license and the archive are saved. This procedure is used only if it is planned to install **Eocortex** software with the same bit depth later (the same procedure is performed automatically when you update your **Eocortex** software.)

Step 2: Complete removal of Eocortex products — all settings and the license are removed. This procedure is used if it is planned to install **Eocortex** server software of another bit depth later or completely remove it from the computer.

Remove software and save the settings

Open the **Programs and Features** in **Control Panel** ( **Start** /  **Control Panel**.)

Select the **Eocortex** product to be removed and press **Uninstall** button.

Complete removal of Eocortex products

In order to permanently remove the **Eocortex** application, you should delete the installation folder from the disk, as well as all subfolders that start with **Eocortex**, in the **ProgramData** folder on the system disk.

In addition, **EocortexArchive** folders are created on archived disks. If you want to delete the archive, then these folders are deleted.

Installing, updating, and removing Episode archive

The **Episode archive** provides the possibility to keep individual archive fragments for an unlimited time. Using the **Episode archive**, you can be sure that important archive fragments will not be deleted due to loop recording or corruption of the main archive.

This feature is available only for **Enterprise** and **ULTRA** licenses.

The **Service** can be installed on any computer without installing the **Eocortex Server** on it.

Only one **Service** instance can be configured for the entire system.

Installation

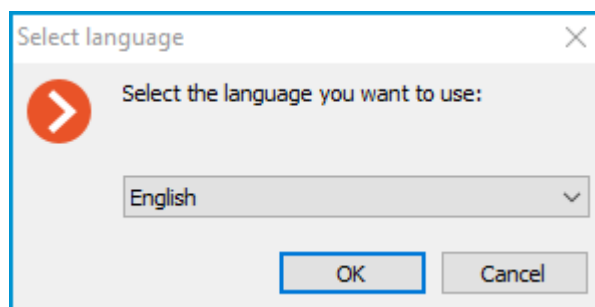
The Service uses **PostgreSQL 12** to manage the database. If the required DBMS version is not installed on the device, a prompt to install it will be given while the **Setup Wizard** is running.

Below are the steps to install the **Episode archive** Service:

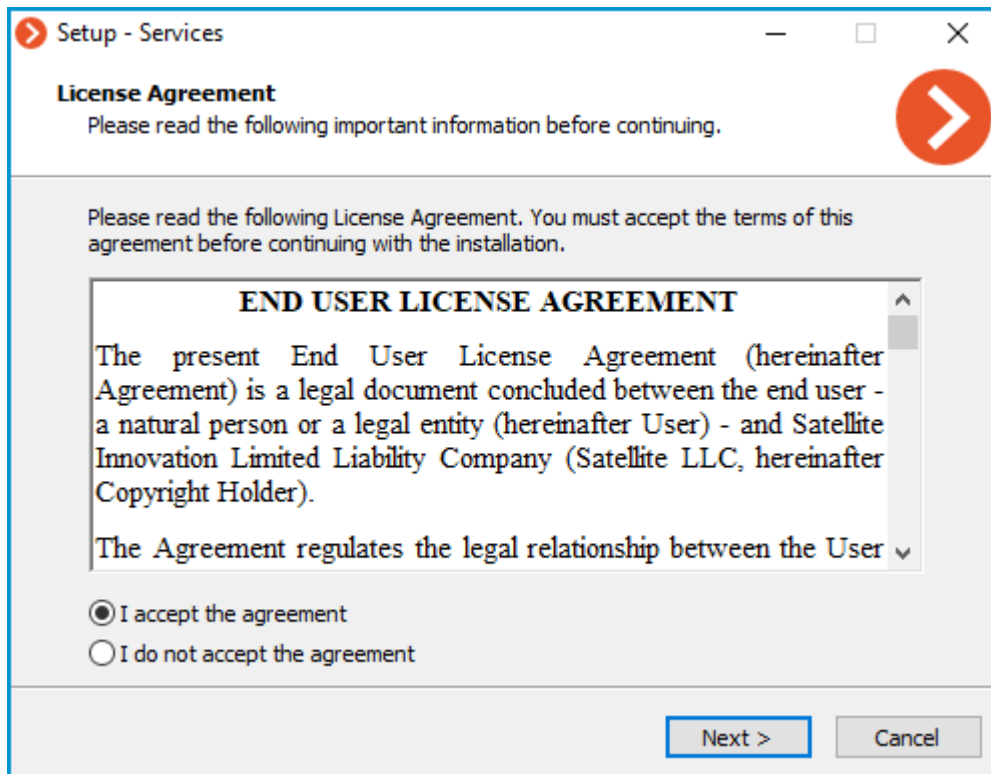
Download the [Eocortex Services installation package](#).

Run the **EocortexServices Installer.exe** file.

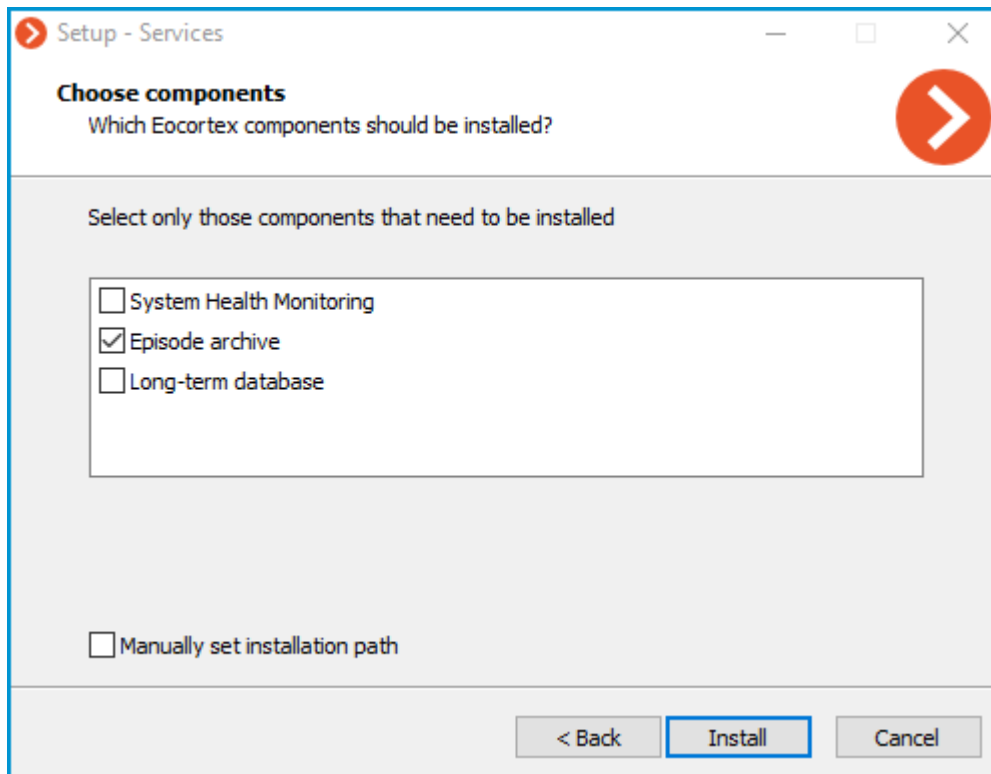
Select the installation language.



Read and accept the **License Agreement**.

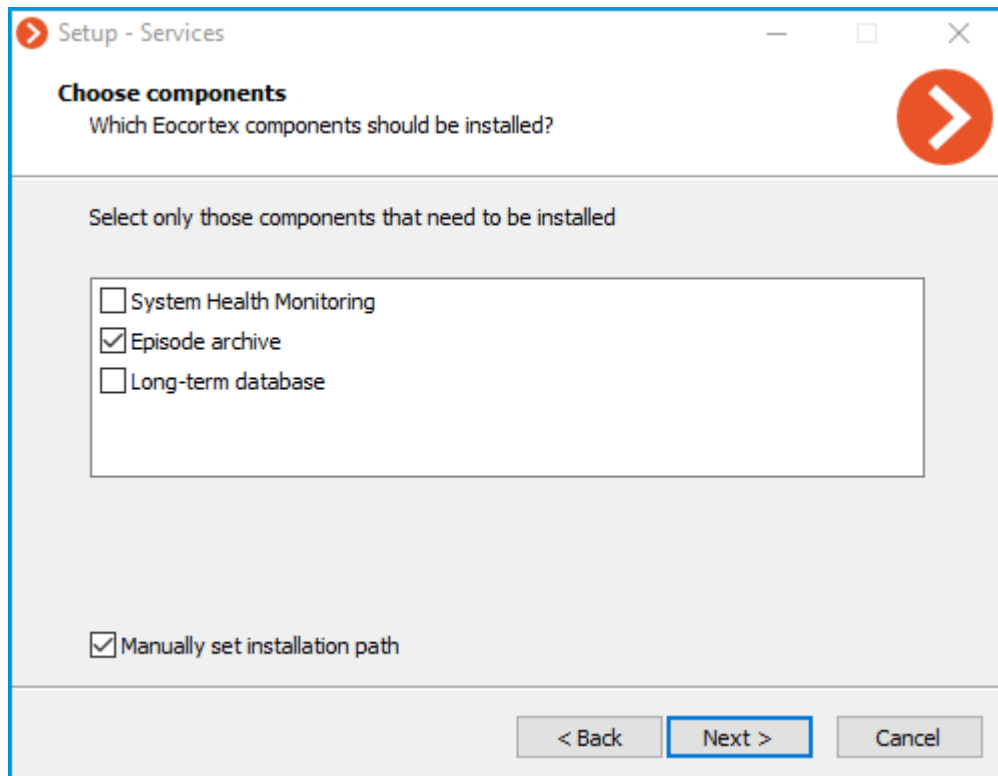


Select the Service on the **Choose components** page, and then follow the steps of the **Setup Wizard**.

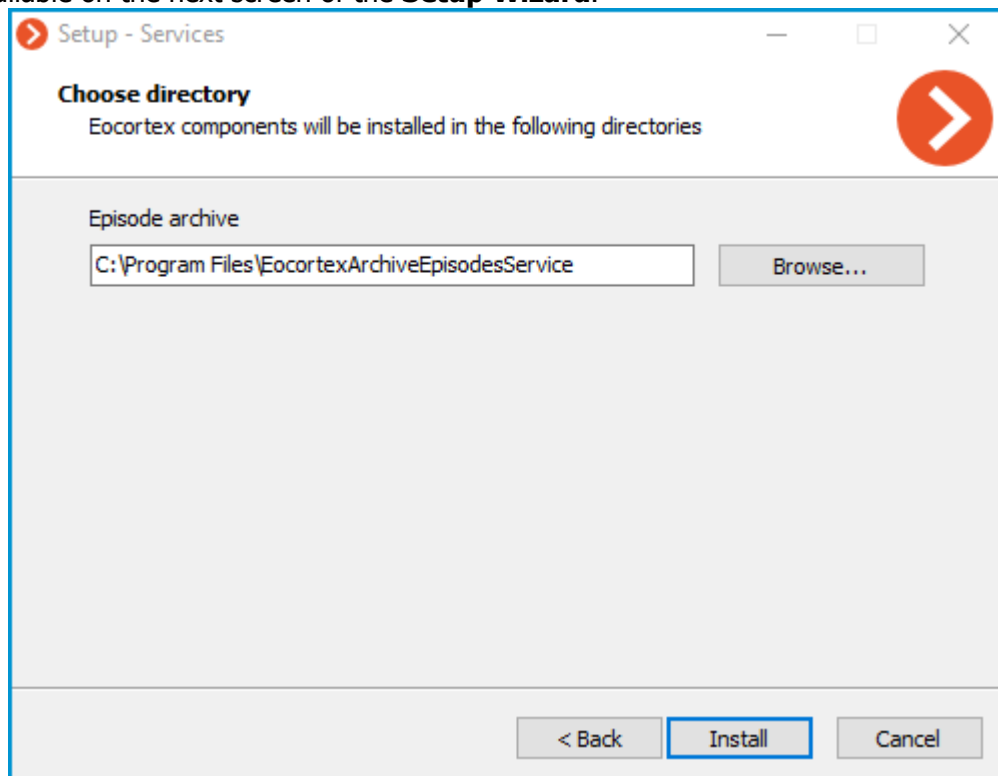


By default, the **Episode archive** Service installs to the **C:\Program Files\EocortexArchiveEpisodesService** directory.

In case if it is necessary to set a custom installation path, enable the **Manually set installation path** option in the **Choose components** screen.



With this option enabled, the possibility to set a custom installation path will be available on the next screen of the **Setup Wizard**.



The Service will register as a Windows service and will start automatically at OS startup.

Service name: **EocortexArchiveEpisodesService**

Update

The Service update can be performed similarly to the [installation process](#), just using a newer version of the installation package.

Uninstallation

The Service can be uninstalled using the standard **Apps and Features** snap-in from the **Windows Control Panel**.

Network settings of the Service

These settings should be made on the device where the Service is installed.

As part of the installation process, a configuration file **appsettings.json** containing network settings will be created in the root directory of the Service.

Default path:

C:\Program Files\EocortexArchiveEpisodesService\appsettings.json

Below is an example of default settings:

```
{  "ConnectionStrings": {    "DatabaseConnectionTemplateWithoutDbName":    "Host=localhost; Port=5432;Database={0};Username=postgres;Password=masterkey"  },  "Serilog": {    "MinimumLevel": {      "Default": "Debug",      "Override": {        "Default": "Information",        "Microsoft": "Warning",        "Microsoft.Hosting.Lifetime": "Information"      }    },    "WriteTo": [      {        "Name": "Logger",        "Args": {          "configureLogger": {            "Filter": [              {                "Name": "ByIncludingOnly",                "Args": {                  "expression": "(@Level = 'Error' or @Level = 'Fatal' or @Level = 'Warning')",                  "WriteTo": [                    {                      "Name": "File",                      "Args": {                        "path": "%LogsDir%/service.log",                        "rollOnFileSizeLimit": true,                        "fileSizeLimitBytes": "52428800",                        "retainedFileCountLimit": 10                      }                    ]                  }                }              ]            },            "Name": "Console",            "Args": {              "outputTemplate": "===> {Timestamp:HH:mm:ss.fff zzz} [{Level}] {Message}{NewLine}{Exception}"            }          }        ],        "Enrich": [ "FromLogContext", "WithMachineName", "WithThreadId" ],        "Properties": {          "Application": "LongTerArchiveService"        }      },      "AllowedHosts": "*",      "EpisodesDbRelativePath": "ArchiveServiceData/episodes-database",      "AlwaysRedirectToHttps": "false",      "Network": {        "Endpoints": {          "Http": {            "Url": "http://*:8899"          }        }      }    }  }
```

Editing the configuration file allows to:

[Change the Service network port.](#)

[Enable HTTPS connection support, add an SSL certificate and change the network port for secured connection.](#)

[Enable forced redirection of all requests to the Service to HTTPS.](#)

Change the HTTP port

To change the HTTP port, find the following section in the configuration file:

```
"Network": {  "Endpoints": {    "Http": {      "Url": "http://0.0.0.0:8899"    }  }},
```

And set a custom port in the **Url** line instead of the default **8899**.

Enable HTTPS connection

To add an SSL certificate to the Service configuration and enable HTTPS connection, change the Network section by one of the following ways:

```
"Network": {  "Endpoints": {    "Http": {      "Url": "http://0.0.0.0:8899"    },    "Https": {      "Url": "https://0.0.0.0:18899",      "Certificate": {        "Path": ".pfx file",        "Password": "cert_password"      }    }  } }
```

Where:

Path is the location of the PFX file of the certificate.

Password is the password of the certificate.

```
"Network": {  "Endpoints": {    "Http": {      "Url": "http://0.0.0.0:8899"    },    "HttpsInlineCertAndKeyFile": {      "Url": "https://0.0.0.0:18899",      "Certificate": {        "Path": ".pem/.cert file",        "KeyPath": ".key file",        "Password": "cert_password"      }    }  } }
```

Where:

Path is the location of the .pem/.cert file of the certificate.

KeyPath is the location of the .key file of the certificate.

Password is the password of the certificate.

```
"Network": {  "Endpoints": {    "Http": {      "Url": "http://0.0.0.0:8899"    },    "Https": {      "Url": "https://0.0.0.0:18899",      "Certificate": {        "Subject": "Subject",        "Store": "Store",        "Location": "Location",        "AllowInvalid": "true/false"      }    }  } }
```

Where:

Subject is the name of the certificate subject.

Store is the name of the certificate storage.

Location is the location of the certificate storage. By default, CurrentUser.

AllowInvalid is the state of the policy of using invalid (e.g. self-signed) certificates. By default, it's false.

Changing the HTTPS port can be done similarly to the HTTP protocol, but for the relevant section.

To enable forced redirection of all requests to the Service to a secured connection, find and change the value from **false** to **true** for the following line:

```
"AlwaysRedirectToHttps": false,
```

After saving the settings, the Service must be restarted via the **Services** snap-in to take all changes into effect.

Changing other settings provided in the configuration file may cause the Service to malfunction or fail. It is not recommended to change settings that are not described in the present documentation.

Related references

[Overview of the Service](#)

[Use in the **Eocortex Client** application](#)

[Setting in the **Eocortex Configurator** application](#)

[Installation of **Episode archive** on Linux](#)

Installing, updating, and removing Long-term database

The **Long-term database** Service ensures storing of selected types of events and access to them regardless of the archive storage settings. With this Service there is no need to be concerned that event data will be erased if the archive is deleted.

This feature is available only for **Enterprise** and **ULTRA** licenses.

The **Service** can be installed on any computer without installing the **Eocortex Server** on it.

Only one **Service** instance can be configured for the entire system.

Installation

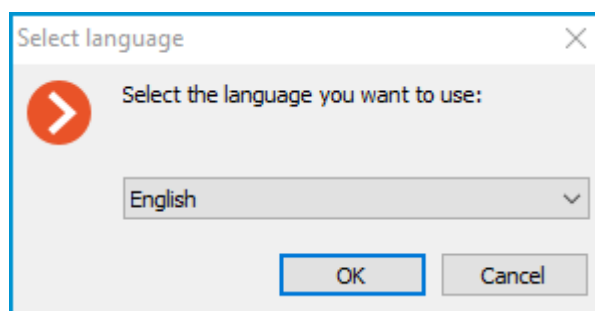
The Service uses **PostgreSQL 12** to manage the database. If the required DBMS version is not installed on the device, a prompt to install it will be given while the **Setup Wizard** is running.

Below are the steps to install the **Long-term database** Service:

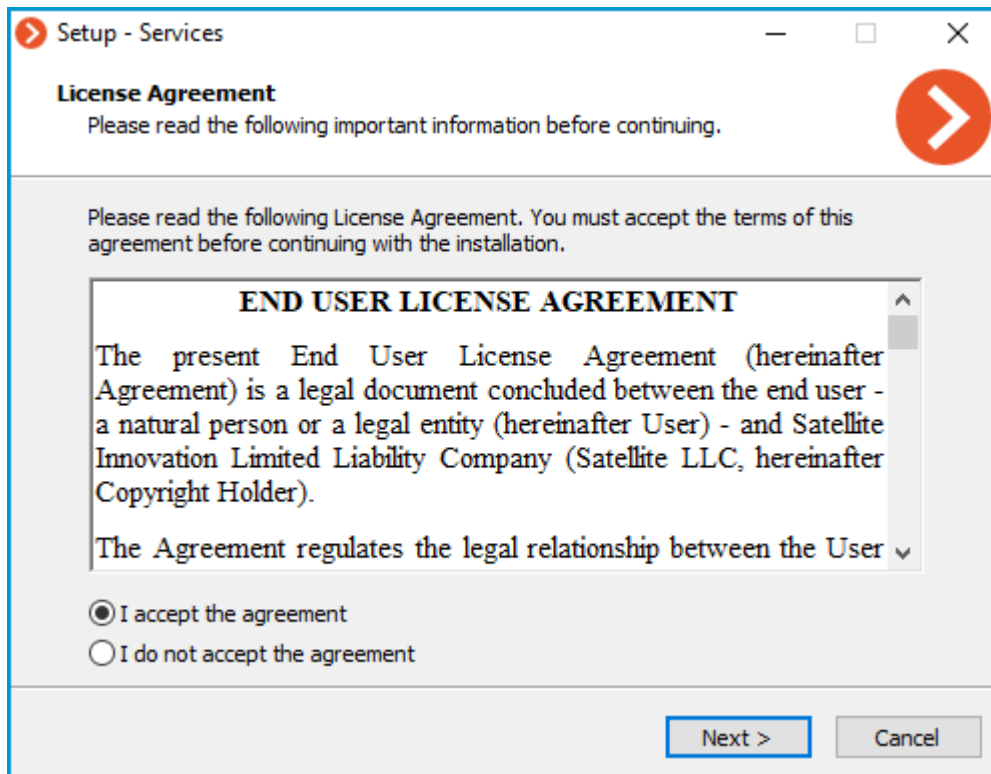
Download the [Eocortex Services installation package](#).

Run the **EocortexServices Installer.exe** file.

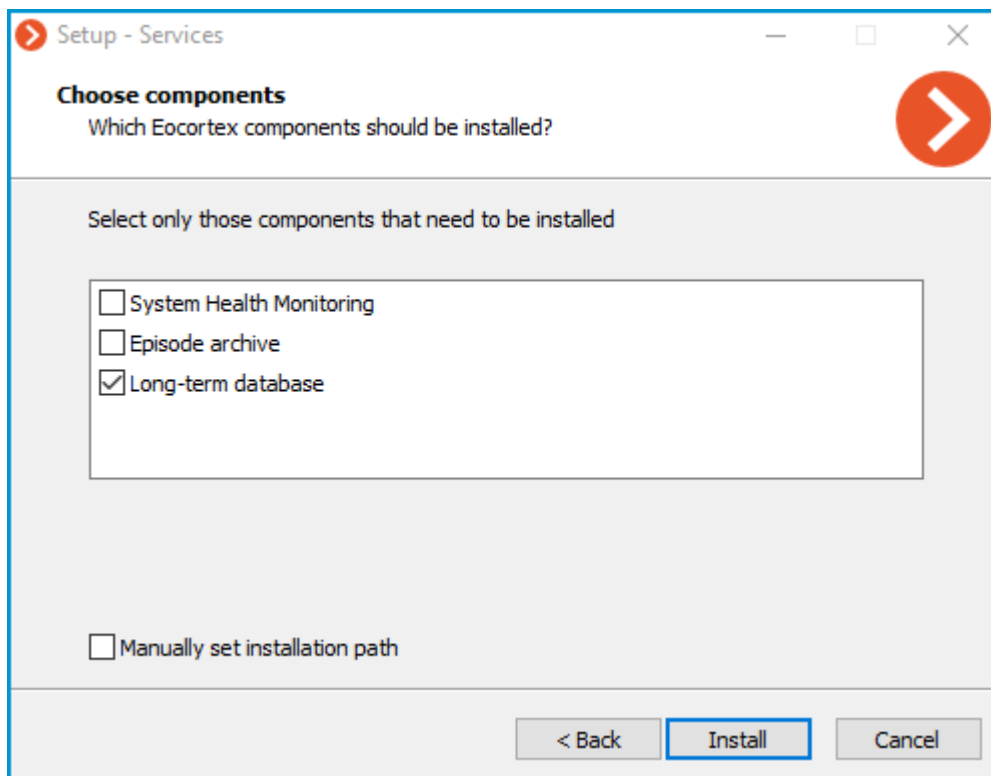
Select the installation language.



Read and accept the **License Agreement**.

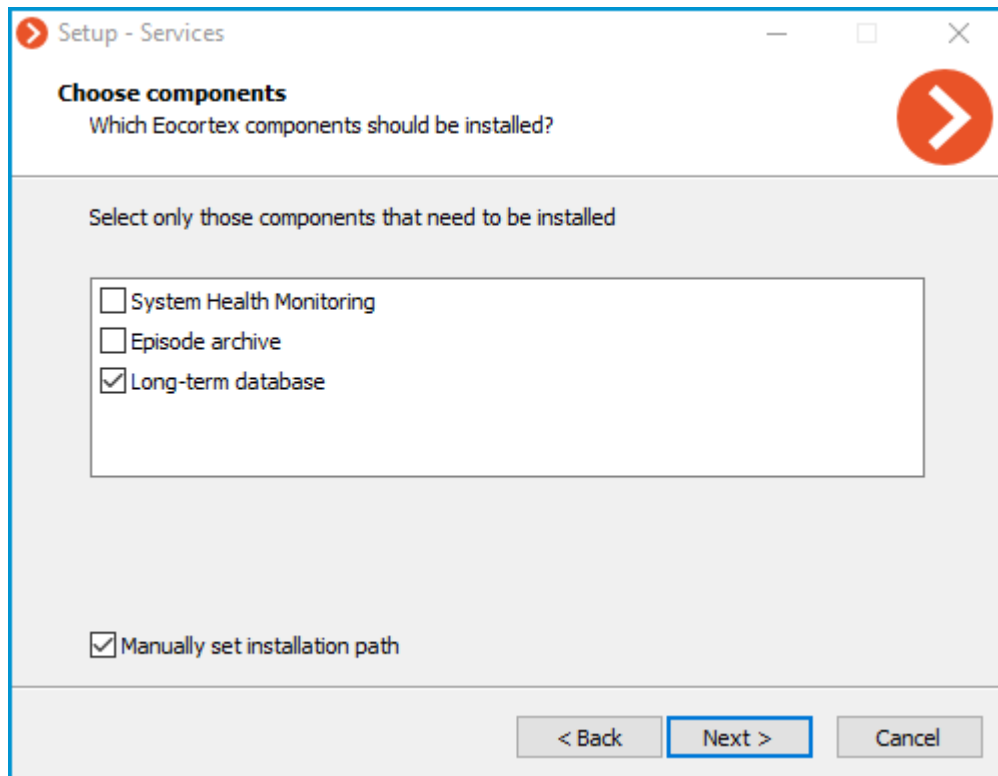


Select the Service on the **Choose components** page, and then follow the steps of the **Setup Wizard**.

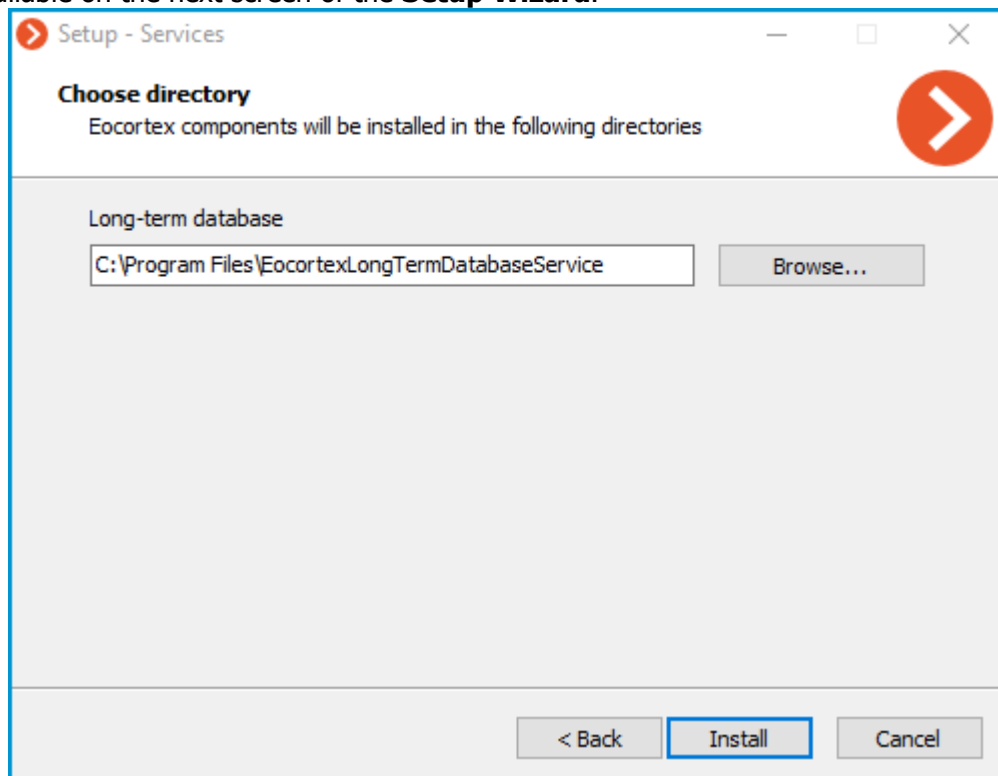


By default, the **Long-term database** Service installs to the **C:\Program Files\EocortexLongTermDatabaseService** directory.

In case if it is necessary to set a custom installation path, enable the **Manually set installation path** option in the **Choose components** screen.



With this option enabled, the possibility to set a custom installation path will be available on the next screen of the **Setup Wizard**.



The Service will register as a Windows service and will start automatically at OS startup.

Service name: **EocortexLongTermDatabase**

Update

The Service update can be performed similarly to the [installation process](#), just using a newer version of the installation package.

Uninstallation

The Service can be uninstalled using the standard **Apps and Features** snap-in from the **Windows Control Panel**.

Network settings of the Service

These settings should be made on the device where the Service is installed.

As part of the installation process, a configuration file **appsettings.json** containing network settings will be created in the root directory of the Service.

Default path:

C:\Program Files\EocortexLongTermDatabaseService\appsettings.json

Below is an example of default settings:

```
{  "Application": {    "Brand": "Eocortex",    "AppName": "LongTermDatabase"  },  "Logging": {    "LogLevel": {      "Default": "Information",      "Microsoft.AspNetCore": "Warning"    }  },  "AllowedHosts": "*",  "AlwaysRedirectToHttps": false,  "Network": {    "Endpoints": {      "Http": {        "Url": "http://*:8999"      }    },    "ConnectionStrings": {      "DefaultConnectionString": "Host=localhost;Port=5432;Database=longtermdatabase;Username=postgres;Password=masterkey;",      "ConnectionStringWithDatabasePlaceholder": "Host=localhost;Port=5432;Database={0};Username=postgres;Password=masterkey;"    }  }
```

Editing the configuration file allows to:

[Change the Service network port.](#)

[Enable HTTPS connection support, add an SSL certificate and change the network port for secured connection.](#)

[Enable forced redirection of all requests to the Service to HTTPS.](#)

Change the HTTP port

To change the HTTP port, find the following section in the configuration file:

```
"Network": {  "Endpoints": {    "Http": {      "Url": "http://*:8999"    }  } },
```

And set a custom port in the **Url** line instead of the default **8999**.

Enable HTTPS connection

To add an SSL certificate to the Service configuration and enable HTTPS connection, change the Network section as follows:

```
"Network": {  "Endpoints": {    "Http": {      "Url": "http://*:8999"    },    "Https": {      "Url": "https://*:18999",      "Certificate": {        "Path": "path_to_the_cert",        "Password": "cert_password"      }    }  } }
```


Where:

Path is the location of the PFX file of the certificate.

Password is the password of the certificate.

Changing the HTTPS port can be done similarly to the HTTP protocol, but for the **HttpsInlineCertFile** section.

To enable forced redirection of all requests to the Service to a secured connection, find and change the value from **false** to **true** for the following line:

```
"AlwaysRedirectToHttps": false,
```

After saving the settings, the Service must be restarted via the **Services** snap-in to take all changes into effect.

Changing other settings provided in the configuration file may cause the Service to malfunction or fail. It is not recommended to change settings that are not described in the present documentation.

Related references

[Overview of the Service](#)

[Usage of the Service in the **Eocortex Client** application](#)

[Configuration in the **Eocortex Configurator** application](#)

[Installation of **Long-term database on Linux**](#)

Installing, updating, and removing Monitoring

The **Monitoring** Service allows controlling the status of the video surveillance system components and receiving immediate notifications about problems occurring with them.

This feature is available only for **Enterprise** and **ULTRA** licenses.

The **Service** can be installed on any computer without installing the **Eocortex Server** on it.

Only one **Service** instance can be configured for the entire system.

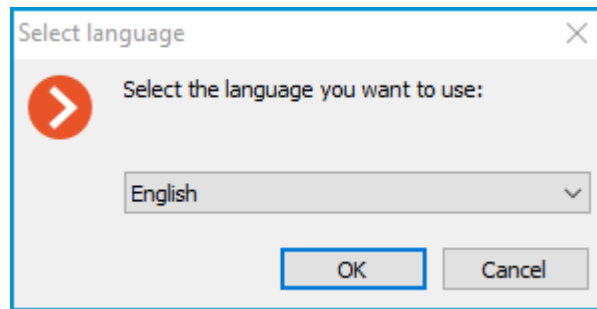
Installation

Below are the steps to install the **Monitoring** Service:

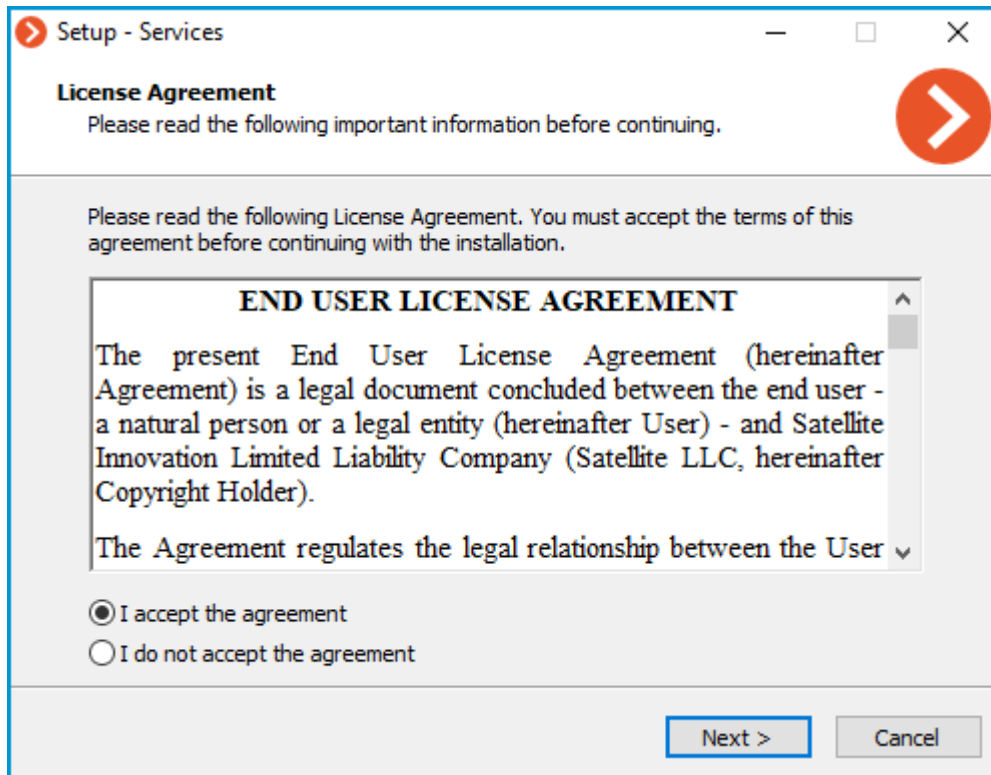
Download the [Eocortex Services installation package](#).

Run the **EocortexServices Installer.exe** file.

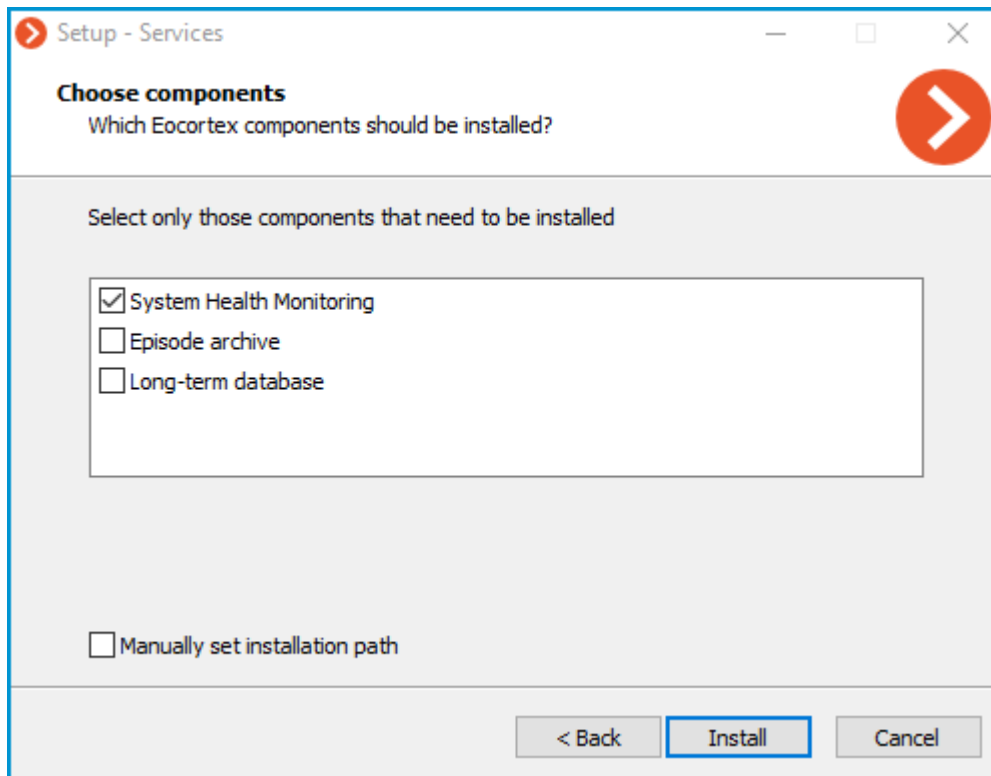
Select the installation language.



Read and accept the **License Agreement**.

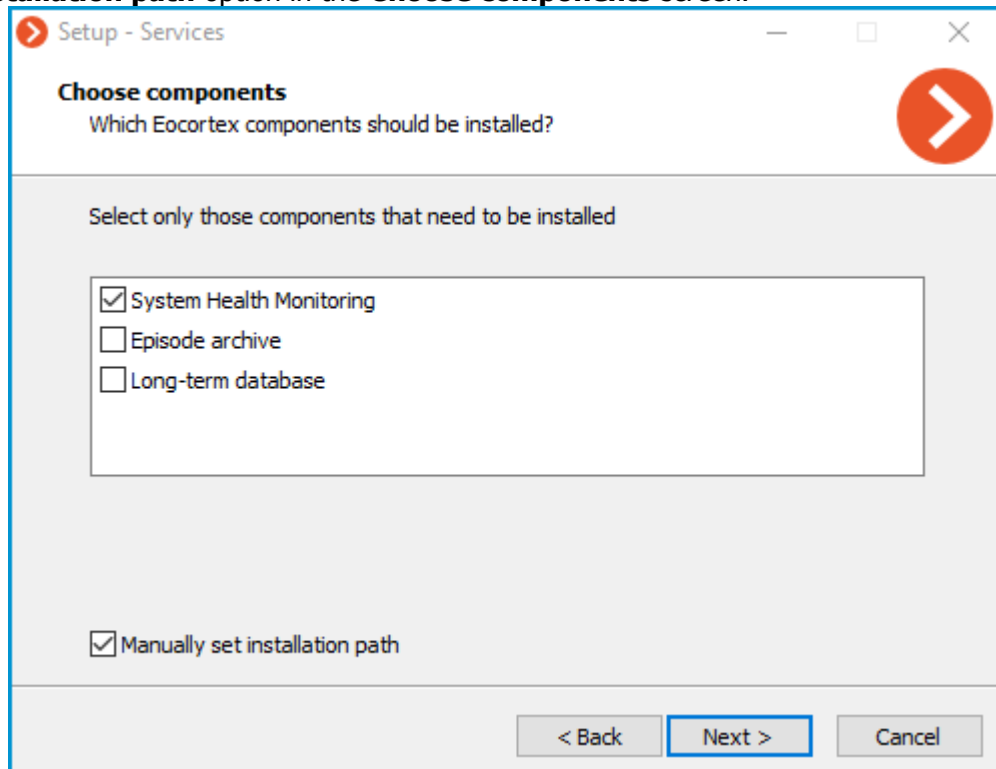


Select the Service on the **Choose components** page, and then follow the steps of the **Setup Wizard**.

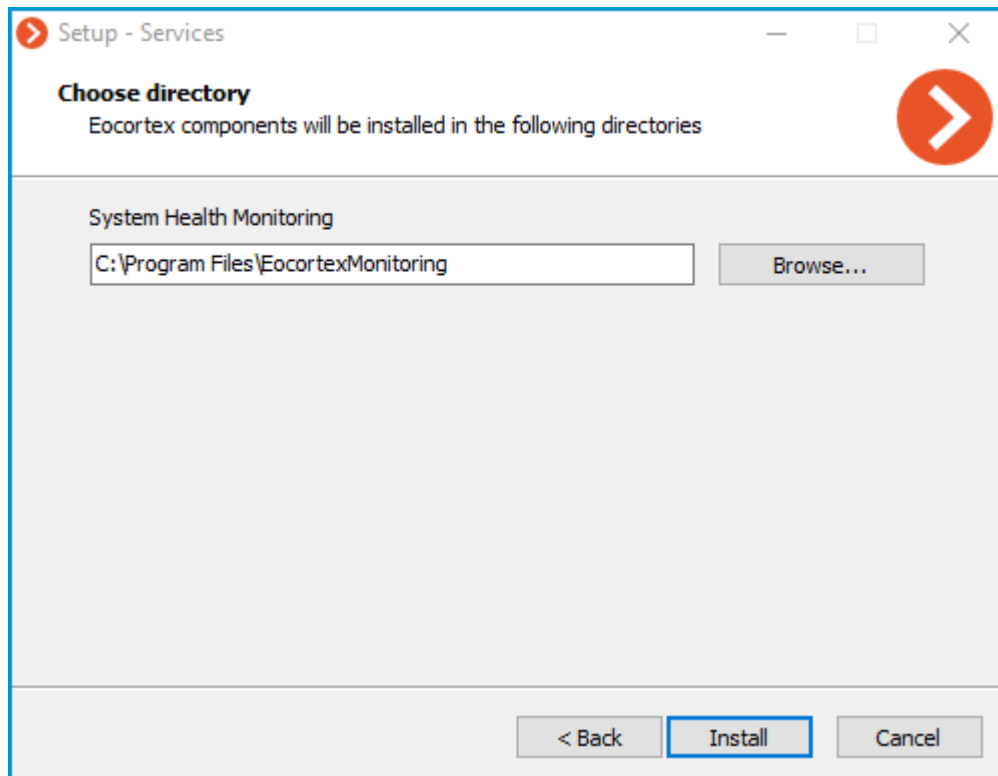


By default, the **Monitoring** Service installs to the **C:\Program Files\EocortexMonitoring** directory.

In case if it is necessary to set a custom installation path, enable the **Manually set installation path** option in the **Choose components** screen.



With this option enabled, the possibility to set a custom installation path will be available on the next screen of the **Setup Wizard**.



The Service will register as a Windows service and will start automatically at OS startup.

Service name: **EocortexMonitoring**

Update

The Service update can be performed similarly to the [installation process](#), just using a newer version of the installation package.

Uninstallation

The Service can be uninstalled using the standard **Apps and Features** snap-in from the **Windows Control Panel**.

Network settings of the Service

The **Monitoring** service does not provide any options to change the network connection settings.

Service uses HTTP port 8889 for connection without option to change it.

Monitoring Agent

To collect and transmit data about the state of the Eocortex server and cameras connected to it, an additional **Monitoring Agent** service is used.

The service is installed and updated at the same time as the **Eocortex Server** components are deployed, so there is no need to install the **Agent** individually.

The Service will register as a Windows service and will start automatically at OS startup.

Service name: **EocortexMonitoringAgent**

Related references

[Overview of the Service](#)

[Monitoring Web Client](#)

[Setting in the **Eocortex Configurator** application](#)

[Installation of **Monitoring** on Linux](#)

Linux-based applications

Eocortex Server can work under Linux operating system. However, some features will be unavailable. The differences in the functionality of **Eocortex Server** applications based on Windows and Linux are listed in the specification of **Eocortex**.

Compatible Linux distributions:

- Ubuntu 20.04
- Debian 10
- CentOS 7



Operability on other Linux distributions is not guaranteed.

It is also possible to install **Eocortex** on Debian 11 and Ubuntu 22.04, but operability on these operating systems has not been tested.



In the **Eocortex Client** application, when simultaneously playing back the archive hosted on a Linux server, in some situations, the archive may not play back when selecting a playback speed higher than x1.

However, the archive will be kept on archive disks in accordance with the archive storage parameters set in the system settings.

The problem described above may be caused by the specifics of the hardware used, the limitations of the data transmission network, and the peculiarities of the system software used on the server.

Guidelines for Linux settings

Recommended versions of related packages

Requirements to Ubuntu and Debian components

- Runtime .NET Core (ver. 6.0)
- PostgreSQL (ver. 12.0)
- Nginx (ver. 1.10)

- OpenSSL (ver. 1.1)
- GnuPG (ver. 2.1.18)
- Parted (ver. 3.2)
- libgdiplus (ver. 4.2)
- libvdpau-dev (ver. 1.1.1)
- libc6-dev (ver. 2.24)

Requirements to CentOS components

- Runtime .NET Core (ver. 6.0)
- PostgreSQL (ver. 12.0)
- Nginx (ver. 1.12)
- OpenSSL (ver. 1.1)
- GnuPG (ver. 2.0.22)
- Parted (ver. 3.1)
- libgdiplus (ver. 2.10)
- libvdpau-dev (ver. 1.1.1)
- libc6-dev (ver. 2.24)
- glibc-devel (ver. 2.17)
- policycoreutils-python (ver. 2.5)

In case of any issues with **Eocortex Server** stability, it is required to check that the installed versions correspond with those recommended:

In case of a significant discrepancy between the installed and the recommended versions, it is required to install the package dependency of the version indicated in the recommendations.

You can check what version is installed using the following command:

Ubuntu and Debian

```
sudo apt list --installed | grep package_name
```

CentOS

```
sudo yum list installed | grep package_name
```

Technical features of Linux version

Location of server files

The essential files of the **Eocortex** server are located on the following paths:

Server folder: **/opt/EocortexServer**

Server logs: **/opt/EocortexServer/Eocortex/Logs_EocortexServer**

Server configuration: **/opt/EocortexServer/EocortexServerConfigs**

Automatic drive mounting when launching a server

At startup, the **Eocortex** server automatically mounts all suitable drive partitions to the **/mnt/{uuid}**, folder, where **uuid** is the universal unique identifier of the drive partition. This is

done to ensure that when the system is rebooted, the **Eocortex** server can still write the archive even if the partitions have not been mounted by the user beforehand. It is not recommended to mount drive partitions and configure recording of the archive to them independently and without a particular need.

Automatic drive mounting is not performed for system drives, software RAID drives, etc. (that is, drives marked with the **boot, esp, bios_grub, legacy_boot, msftres,irst, root, swap, raid** flags; the list of flags for a partition can be obtained using the command **parted -l**).

The following file systems are supported: "ext2", "ext3", "ext4", "btrfs", "reiserfs", "ntfs".

To find out the file system, you can use the command:

```
df -Th | grep "^\s*/dev"
```

Adding new drives to the system

When manually adding a new disk to the system, it is required to physically connect the disk, format it and create a partition on it. After that, the **Eocortex** server will automatically mount this disk at startup, as described above.

Disks can be added manually with the **fdisk** utility:

1. Check the information about the disk:

```
sudo fdisk -l
```

```
eocortex@ubuntu:~$ sudo fdisk -l
Disk /dev/vda: 15 GiB, 16106127360 bytes, 31457280 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 4096 bytes
Disklabel type: gpt
Disk identifier: 25637092-3FEB-41CF-A2BB-20E068C29F21

Device      Start      End  Sectors  Size Type
/dev/vda1   2048      4095     2048    1M BIOS boot
/dev/vda2   4096 31457246 31453151   15G Linux filesystem

Disk /dev/vdb: 5 GiB, 5368709120 bytes, 10485760 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 4096 bytes
```

2. Create a partition on the disk:

```
sudo fdisk /dev/vbd
```

To further configure the default disk, enter the **n** character, then press **Enter** four times and enter the **w** character.

```
eocortex@ubuntu:~$ sudo fdisk /dev/vdb

Welcome to fdisk (util-linux 2.34).
Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Device does not contain a recognized partition table.
Created a new DOS disklabel with disk identifier 0x6e612c63.

Command (m for help): n
Partition type
   p   primary (0 primary, 0 extended, 4 free)
   e   extended (container for logical partitions)
Select (default p):

Using default response p.
Partition number (1-4, default 1):
First sector (2048-10485759, default 2048):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (2048-10485759, default 10485759):

Created a new partition 1 of type 'Linux' and of size 5 GiB.

Command (m for help): w
The partition table has been altered.
Calling ioctl() to re-read partition table.
Syncing disks.
```

3. Check if the partition was created correctly:

```
eocortex@ubuntu:~$ sudo fdisk -l
Disk /dev/vda: 15 GiB, 16106127360 bytes, 31457280 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 4096 bytes
Disklabel type: gpt
Disk identifier: 25637092-3FEB-41CF-A2BB-20E068C29F21

Device      Start      End  Sectors  Size Type
/dev/vda1   2048      4095     2048    1M BIOS boot
/dev/vda2   4096 31457246 31453151  15G Linux filesystem

Disk /dev/vdb: 5 GiB, 5368709120 bytes, 10485760 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 4096 bytes
I/O size (minimum/optimal): 4096 bytes / 4096 bytes
Disklabel type: dos
Disk identifier: 0x6e612c63

Device      Boot Start      End  Sectors  Size Id Type
/dev/vdb1             2048 10485759 10483712   5G 83 Linux
```

4. Create a file system **ext4** in the new partition:

```
sudo mkfs.ext4 /dev/vdb1
```



```
eocortex@ubuntu:~$ sudo mkfs.ext4 /dev/vdb1
mke2fs 1.45.5 (07-Jan-2020)
Creating filesystem with 1310464 4k blocks and 327680 inodes
Filesystem UUID: 993550a5-d63e-426a-bb4a-bed0e28dfa6a
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376, 294912, 819200, 884736

Allocating group tables: done
Writing inode tables: done
Creating journal (16384 blocks): done
Writing superblocks and filesystem accounting information: done
```

6. Restart Eocortex:

```
sudo systemctl restart eocortex
```

6. Once restarted, set up the archive in the **Eocortex Configurator** application.

[Description](#) of working with drives using **gnome-disk**.

When adding a drive with an existing partition to the system, no additional settings are required.

The **Eocortex** server only works with drives that have been partitioned. On drives with no partitions but with a file system the correct operation of the application and the archive is not guaranteed. To use such a drive, follow the steps described above, as when adding a new drive to the system. Note that in this case the data on the drive will be erased.

Operating aspects of Firebird database

After installing the **Eocortex** server, a situation may arise when writing to the archive is being performed but the database is absent (that is, the events are not saved in the log). This can happen after the drive for writing the archive to has been mounted in the user's folder. To solve this issue, it is necessary for the operating system user under whose credentials the database is accessed (the user **firebird**) to provide read access at the mounting point of the drive to which the archive is written.

This can be achieved using two methods described below.

Remounting the drive for writing to the archive in the system folder rather than in the folder of the current user.

Checking the path from the root (/) to the mounting point of the drive. The user **firebird** must have read access for every directory. It is possible to view directory permissions using the command **sudo ls -l** (the user **firebird** belongs to other users). To give the user **firebird** a permission to read the current directory, use the command **sudo chmod o+r**.

The second method should be used only when it is required to mount the drive in the selected folder, or when it is not permitted to change the mounting point.

Saving frames to drive

Saving frames (according to schedule, in response to a system event, or by user command) is allowed to any drive except the system one. If the frames are not being saved, it is required to make sure that the drive selected for saving is not the system one.

Access to cameras by domain names

By default, **Linux** prioritizes IPv6 addresses when resolving a domain name. Some camera plugins in **Eocortex** may not work with IPv6 addresses.

To solve this issue, it is required to add the following entry to the file **/etc/gai.conf**:

```
precedence ::ffff:0:0/96 100
```

As a result, when resolving all domain names, preference will be given to the IPv4 addresses.

If it is required to set an IPv4 address for a specific name, it is possible to add a corresponding entry to the file **/etc/hosts**. E.g.:

```
192.168.100.1 cam-1.mycompany.com
```

Server shutdown and restart

The commands that control the state of the **Eocortex** server are shown below.

Server shutdown:

```
systemctl stop eocortex.service
```

Server launch:

```
systemctl start eocortex.service
```

Server restart:

```
systemctl restart eocortex.service
```

Server status check (active/inactive):

```
systemctl status eocortex.service
```

Installation of Eocortex Server under Linux

Starting from version 3.4 of **Eocortex**, certain components use PostgreSQL database management system of version 11 or later. In this respect, before installing version 3.4 and higher (as well as when upgrading from version 3.3 and lower to version 3.4 and higher), it is required to review the [PostgreSQL installation information](#).

After completion of the installation, it is required to connect to the server using the **Eocortex Configurator** application launched on the Windows computer, and activate the license on the server.

The **Eocortex Configurator** application is installed on the Windows computer in the process of installing any of the following applications on the same computer: **Eocortex Client**, **Eocortex Server** or **Eocortex Standalone**.

Below are the sequences of commands used depending on the installation method and the Linux installation package used.

Installation of actual version via Internet

On **Ubuntu 20.04** and **Debian 10**

Add Eocortex repository:

```
wget -O - http://packages.eocortex.com/deb/install/eocortex-deps-debian.sh | bash
```

Install Eocortex:

```
sudo apt-get install eocortex
```

On **CentOS 7**

Add Eocortex repository:

```
wget -O - http://packages.eocortex.com/rpm/install/eocortex-deps-centos.sh | bash
```

Install Eocortex:

```
sudo yum install eocortex
```

Installation of version 3.6.84 via Internet

Version 3.6.84 is available only for the following operating systems:

- Debian 10
- Ubuntu 20.04
- CentOS 7

On **Ubuntu 20.04** and **Debian 10**

Add Eocortex repository:

```
wget -O - http://packages.eocortex.com/deb/install/eocortex-deps-debian.sh | bash
```

Install Eocortex:

```
sudo apt-get install eocortex=3.6.84
```

On **Centos 7**

Add Eocortex repository:

```
wget -O - http://packages.eocortex.com/rpm/install/eocortex-deps-centos.sh | bash
```

Install Eocortex:

```
sudo yum install eocortex-3.6.84
```

Installation without Internet access

For this installation method, you will need a computer with Internet access and the same operating system as the one on which you want to install Eocortex.

On **Debian 10** and **Ubuntu 20.04**

Clear local repository:

```
sudo apt-get clean
```

Add Eocortex repository:

```
wget -O - http://packages.eocortex.com/deb/install/eocortex-deps-debian.sh | bash
```

Install all required packages (dependencies):

```
sudo apt-get install -d -y eocortex
```

Create the EocortexPackages directory and transfer all downloaded packages to it:

```
mkdir ~/EocortexPackages/ && cp -R /var/cache/apt/archives/*.deb ~/EocortexPackages/
```

After that, copy the entire EocortexPackages directory to a USB drive and transfer the data to the server. Install Eocortex and all dependencies using the following command:

```
sudo dpkg -i /path/to/EocortexPackages/*.deb
```

On Centos 7

Add Eocortex repository:

```
wget -O - http://packages.eocortex.com/rpm/install/eocortex-deps-centos.sh | bash
```

Install yum extensions:

```
sudo yum install -y yum-utils
```

Install all required packages (dependencies):

```
sudo yumdownloader --downloadonly --downloaddir=~/.EocortexPackages eocortex --resolve
```

After that, copy the entire EocortexPackages directory to a USB drive and transfer the data to the server. Install Eocortex and all dependencies using the following command:

```
sudo rpm -ivh *.rpm
```

Silent setup of Eocortex Server under Linux

This feature is available starting from **Eocortex** version 3.4 and only for Debian and Ubuntu installation packages.

To avoid appearance of redundant questions during the installation, it is required to set up **debconf**. The following command is used for this purpose:

```
dpkg-reconfigure debconf
```

First, it will be suggested to select the interface for interacting with **debconf**.

Then, it will be required to choose the lowest permissible priority of the questions to be displayed.

Later, during the installation process, the system will automatically substitute answers to the lower priority questions, taking these answers from the **debconf** database. The rest of the questions (with the selected and higher priority) the user will have to answer on their own, in an interactive mode.

To select the priority "critical", it is required to execute the following command:

```
echo debconf debconf/priority select critical | debconf-set-selections
```

If it is necessary to turn off duplicate questions, it is possible to clearly tell the system not to ask a question since it has already been seen before. To do this, it is required to manually add the flag "seen" for the desired question in the **/var/cache/debconf/config.dat** file.

```
Name: eocortex/license-agreed
Template: eocortex/license-agreed
Value: true
Owners: eocortex
Flags: seen
```

To install Firebird without questions, it is required to add a database access password for **debconf** by running the following command, substituting **password_value** with an actual password:

```
echo firebird3.0-server shared/firebird/sysdba_password/first_install password
password_value | debconf-set-selections
```

The existing templates and their values can be viewed in the **/var/cache/debconf/config.dat** file.

Eocortex Server upgrade under Linux

Starting from version 3.4 of **Eocortex**, certain components use PostgreSQL database management system of version 11 or later. In this respect, before installing version 3.4 and higher (as well as when upgrading from version 3.3 and lower to version 3.4 and higher), it is required to review the [PostgreSQL installation information](#).

Below are the sequences of commands (depending on the method of installation and the Linux installation package used) allowing to update **Eocortex Server** to the latest version.

Update via Internet

For Ubuntu and Debian

Update the repository, then update the Eocortex application to the latest version:

```
sudo rm /etc/apt/sources.list.d/eocortex.list
wget -O - http://packages.eocortex.com/deb/install/eocortex-deps-debian.sh | bash
sudo apt-get install eocortex
```

For CentOS 7

Update the repository, then update the Eocortex application to the latest version:

```
sudo rm /etc/apt/sources.list.d/eocortex.list
wget -O - http://packages.eocortex.com/deb/install/eocortex-deps-debian.sh | bash
sudo yum update eocortex
```

Upgrade to a specific package without Internet access

For Ubuntu and Debian

```
sudo dpkg -i path_to_eocortex_package
```

For CentOS 7

```
sudo yum install path_to_eocortex_package
```

Uninstalling Eocortex Server under Linux

Below are the commands (depending on the method of installation and the Linux installation package used), allowing to remove **Eocortex Server** from the computer.

For Ubuntu and Debian

```
sudo apt-get remove eocortex
```

For CentOS 7

```
sudo yum remove eocortex
```

Usage of PostgreSQL on Linux

Regardless of the **Eocortex** version being installed, the installation of PostgreSQL on Linux can be done only in manual mode.

When installing the DBMS, it is recommended to follow the instructions for the desired OS distribution from the PostgreSQL official website.

As part of the installation process, a DBMS user with the name **eocortex** and the password **masterkey** will be automatically created.

Installation and update of PostgreSQL for Eocortex 3.4-3.6

Eocortex versions 3.4-3.6 require PostgreSQL version 11 to store **Search for Objects** module events. All other events and modules use Firebird.

PostgreSQL will not be installed automatically during the installation of **Eocortex** components, so it is necessary to install the required DBMS version manually before installing the **Eocortex Server** application.

Below are several sample instructions on how to manually install PostgreSQL 11 on Linux.

Option 1. If the server has Internet access.

Debian/Ubuntu:

Add the PostgreSQL file repository to the OS configuration:

```
sudo sh -c 'echo "deb http://apt.postgresql.org/pub/repos/apt $(lsb_release -cs)-pgdg main" > /etc/apt/sources.list.d/pgdg.list'
```

Download the repository signature key:

```
wget --quiet -O - https://www.postgresql.org/media/keys/ACCC4CF8.asc | sudo apt-key add -
```

Update the package list:

```
sudo apt-get update
```

Install PostgreSQL of the required version:

```
sudo apt-get -y install postgresql-11
```

CentOS 7:

Add the PostgreSQL file repository to the OS configuration:

```
sudo yum install -y https://download.postgresql.org/pub/repos/yum/reporepms/EL-7-x86_64/pgdg-redhat-repo-latest.noarch.rpm
```

Install PostgreSQL of the required version:

```
sudo yum install -y postgresql11-server
```

Option 2. If the server has no Internet access.

Debian/Ubuntu:

Download the PostgreSQL installation package of the required version and its dependencies from the [official PostgreSQL repository](#), using a device with Internet access.

Transfer the downloaded packages to the server **Eocortex**.

Install packages using the dpkg command with the -i parameter.

CentOS 7:

Download the PostgreSQL installation package of the required version and its dependencies from the [official PostgreSQL repository](#), using a device with Internet access.

Transfer the downloaded packages to the server **Eocortex**.

Install packages using the rpm command with the -i parameter.

Installation and update of PostgreSQL for Eocortex 4.0

Eocortex versions 4.0 and higher require PostgreSQL version 12 to store all internal databases.

PostgreSQL will not be installed automatically during the installation of **Eocortex** components, so it is necessary to install the required DBMS version manually before installing the **Eocortex Server** application.

Below are several sample instructions on how to manually install PostgreSQL 12 on Linux.

Option 1. If the server has Internet access.

Debian/Ubuntu:

Add the PostgreSQL file repository to the OS configuration:

```
sudo sh -c 'echo "deb http://apt.postgresql.org/pub/repos/apt $(lsb_release -cs) -pgdg main" > /etc/apt/sources.list.d/pgdg.list'
```

Download the repository signature key:

```
wget --quiet -O - https://www.postgresql.org/media/keys/ACCC4CF8.asc | sudo apt-key add -
```

Update the package list:

```
sudo apt-get update
```

Install PostgreSQL of the required version:

```
sudo apt-get -y install postgresql-12
```

CentOS 7:

Add the PostgreSQL file repository to the OS configuration:

```
sudo yum install -y https://download.postgresql.org/pub/repos/yum/reporgms/EL-7-x86_64/pgdg-redhat-repo-latest.noarch.rpm
```

Install PostgreSQL of the required version:

```
sudo yum install -y postgresql12-server
```

Option 2. If the server has no Internet access.

Debian/Ubuntu:

Download the PostgreSQL installation package of the required version and its dependencies from the [official PostgreSQL repository](#), using a device with Internet access.

Transfer the downloaded packages to the server **Eocortex**.

Install packages using the dpkg command with the -i parameter.

CentOS 7:

Download the PostgreSQL installation package of the required version and its dependencies from the [official PostgreSQL repository](#), using a device with Internet access.

Transfer the downloaded packages to the server **Eocortex**.

Install packages using the rpm command with the -i parameter.

Database setup for event recording

Due to the fact that this improvement does not provide any new features for users in terms of using **Eocortex**, using the PostgreSQL database does not require any additional settings other than the already existing database event recording settings. To start writing events to the system database:

Run the Eocortex Configurator application and go to the [Servers](#) page.

Select a server in the list.

Select the **Information** tab on the right part of the window and click **Configure**.

In the window that opens, select the **Archive** tab and set for one of available drives the **Archive + database** or **Database only** role.

Apply settings.

[Additional PostgreSQL configuration](#) is required if the system uses remote databases for the **Face Recognition** or **License Plate Recognition** modules.

Change of default user password

If the default **eocortex** DBMS user created during installation is used, but it is necessary to use a custom password, follow these steps:

All the following steps must be made directly on the server for which the changes are being made.

Stop **Eocortex** operation. To do this, use the following command in Terminal:

```
systemctl stop eocortex.service
```

Use the **psql** utility to set new password for **postgres** user. Launch the utility by running the following command in the Terminal:

```
psql -U eocortex -h 127.0.0.1 -d postgres
```

Input the current password to confirm the login (Default: **masterkey**).

Change the password with the command:

```
ALTER USER CURRENT_USER PASSWORD 'newPassword';
```

where **newPassword** is a new password for **eocortex** user.

Open the **/opt/EocortexServer/EocortexServerConfigs/** directory and edit the **ArchiveSystem.xml** configuration file with any text editor.

Find the **PostgreSqlConfig** section and edit **User** and **Password** lines according to new DBMS user credentials.

The following is an example of such settings:

```
<PostgreSqlConfig>
  <Ip>127.0.0.1</Ip>
  <Port>5432</Port>
  <User>postgres</User>
  <Password>newPassword</Password>
</PostgreSqlConfig>
```

To allow the system making backups of database files, make sure that new credentials are added to the DBMS password file. To do this, go to the home directory of the OS user and edit the **.pgpass** file with any text editor. Check that the selected user has access to the **Eocortex** database files.

Restore **Eocortex** operation. To do this, use the following command in Terminal:

```
systemctl start eocortex.service
```

Analytics modules databases

If the **Face Recognition** or **License Plate Recognition** modules are used in the system, the DBMS user editing will affect their bases as well.

If the **Local** Database is used, **Eocortex** will use the name and password specified in the **ArchiveSystem.xml** file to access the database.

If the **Remote** Database is used, changing the PostgreSQL credentials on the server storing the database will require a new name and password to be entered in the settings of all cameras that use the database.

Use case:

Server 1 hosts the face database.

Server 2 hosts a number of cameras that use the face database from Server 1.

Modifying the DBMS user on Server 2 will not affect access to the face database hosted on Server 1.

Modifying the DBMS user on Server 1 will require new data to be specified for all cameras on Server 2 that use the face database hosted on Server 1.

Remote access to databases is not allowed by default in PostgreSQL and must be additionally configured if remote databases are used for analytics.

The steps below must be performed directly on the server hosting the database of the module.

Go to the directory with the PostgreSQL configuration files.

Default path for **Debian/Ubuntu**:

```
/etc/postgresql/12/main/
```

Default path for **CentOS 7**:

```
/var/lib/pgsql/12/data/
```

Edit the file **postgresql.conf** with any text editor and add a line like the following:

```
listen_addresses = '*'
```

The specified example allows receiving requests to databases from all available network adapters of the server. If it is necessary to limit the list of adapters allowed to receive requests, replace the ***** symbol with the exact address of the network adapter. More details about this setting can be found in the [PostgreSQL 12 documentation](#).

Edit the file **pg_hba.conf** with any text editor and add a line like the following:

```
host all all 192.168.0.0/24 md5
```

The specified example allows remote connections to all databases stored on the server for all users who are connecting from the 192.168.0.XXX network address range. If other addressing is used in the system network, it is necessary to specify the appropriate address range instead of displayed. It is allowed to enter several lines with different address ranges. More details about this setting can be found in the [PostgreSQL 12 documentation](#).

Restart the service by running the following command in the Terminal:

```
sudo systemctl restart postgresql-12.service
```

Removal of PostgreSQL

Although PostgreSQL is used by **Eocortex**, a simple removal of **Eocortex** does not automatically delete PostgreSQL. To delete the system together with the DBMS, execute the following command in Terminal:

Partial removal

If it is necessary to remove the installed version of PostgreSQL together with **Eocortex** and save the settings, do the following command:

Debian/Ubuntu:

```
sudo apt-get --purge remove postgresql postgresql-* sudo apt-get autoremove eocortex
```

CentOS 7:

```
sudo yum remove postgresql* autoremove eocortex
```

Removal of PostgreSQL by this method does not automatically remove its settings. When reinstalling the DBMS on the same computer, PostgreSQL will retain the settings from the previously created configuration files.

Complete removal

If it is necessary to completely remove the installed version of PostgreSQL, use the following sequence of commands:

Debian/Ubuntu:

```
sudo apt-get --purge remove postgresql\*
sudo apt-get purge postgresql
sudo apt-get autoremove postgresql
sudo rm -r /etc/postgresql/
sudo rm -r /etc/postgresql-common/
sudo rm -r /var/lib/postgresql/
sudo userdel -r postgres
sudo groupdel postgres
```

CentOS 7:

```
sudo yum --purge remove postgresql\*
sudo yum purge postgresql
sudo yum autoremove postgresql
sudo rm -r /etc/postgresql/
sudo rm -r /etc/postgresql-common/
sudo rm -r /var/lib/postgresql/
sudo userdel -r postgres
sudo groupdel postgres
```

Installing, updating, and removing Episode archive

The **Episode archive** provides the possibility to keep individual archive fragments for an unlimited time. Using the **Episode archive**, you can be sure that important archive fragments will not be deleted due to loop recording or corruption of the main archive.

This feature is available only for **Enterprise** and **ULTRA** licenses.

The **Service** can be installed on any computer without installing the **Eocortex Server** on it.

Only one **Service** instance can be configured for the entire system.

The Service can be installed using the following two options:

- [Online](#), if the device has Internet access.
- [Offline](#), if the device does not have Internet access.

Online installation

Debian 10

Add Eocortex repository:

```
wget -O - http://packages.eocortex.com/deb/install/eocortex-deps-debian.sh | bash
```

Install the Service.

```
sudo apt-get install eocortex-archive-episodes-service
```

CentOS 7

Add Eocortex repository:

```
wget -O - http://packages.eocortex.com/rpm/install/eocortex-deps-centos.sh | bash
```

Install the Service.

```
sudo yum install eocortex-archive-episodes-service
```

Offline installation

For this installation method, you will need a computer with Internet access and the same operating system as the one on which you want to install the **Episode archive** Service.

Debian 10

Clear local repository:

```
sudo apt-get clean
```

Add Eocortex repository:

```
wget -O - http://packages.eocortex.com/deb/install/eocortex-deps-debian.sh | bash
```

Install all required packages (dependencies):

```
sudo apt-get install -d -y eocortex-archive-episodes-service
```

Create the ArchiveEpisodesPackages directory and transfer all downloaded packages to it:

```
mkdir ~/ArchiveEpisodesPackages/ && cp -R /var/cache/apt/archives/*.deb  
~/ArchiveEpisodesPackages/
```

After that, copy the entire ArchiveEpisodesPackages directory to a USB drive and transfer the data to the server. Install the **Episode archive** Service and all dependencies using the following command:

```
sudo dpkg -i /path_to_ArchiveEpisodesPackages/*.deb
```

CentOS 7

Add Eocortex repository:

```
wget -O - http://packages.eocortex.com/rpm/install/eocortex-deps-centos.sh | bash
```

Install yum extensions:

```
sudo yum install -y yum-utils
```

Install all required packages (dependencies):

```
sudo yumdownloader --downloadonly --downloaddir=~/.ArchiveEpisodesPackages eocortex-  
archive-episodes-service --resolve
```

After that, copy the entire ArchiveEpisodesPackages directory to a USB drive and transfer the data to the server. Install the **Episode archive** Service and all dependencies using the following command:

```
sudo rpm -ivh /path_to_ArchiveEpisodesPackages/*.rpm
```

Dependencies

The following dependency packages must be installed in the operating system for the Service to work:

Debian 10

aspnetcore-runtime-6.0 (>= 6.0)

debconf (>= 0.5)

postgresql-12

CentOS 7

aspnetcore-runtime-6.0 >= 6.0

policycoreutils-python >= 2.5

postgresql12-server

During the [online installation](#) the dependency packages will be installed automatically, while during the [offline installation](#) they may require to be installed manually.

To check if a package is installed and its version, use the command **dpkg -s %package_name%** on Ubuntu/Debian or **sudo rpm -qa | grep %package_name%** on CentOS.

Update

To update the Service, run the following commands:

Debian 10

```
sudo apt-get update
sudo apt-get install eocortex-archive-episodes-service
```

CentOS 7

```
sudo yum update eocortex-archive-episodes-service
```

Or download a new version package from the repository and install it manually using the **dpkg/rpm** command.

Uninstallation

Debian 10

```
sudo apt-get remove eocortex-archive-episodes-service
```

CentOS 7

```
sudo yum remove eocortex-archive-episodes-service
```

Network settings of the Service

These settings should be made on the device where the Service is installed.

As part of the installation process, a configuration file **appsettings.json** containing network settings will be created in the root directory of the Service.

Default path:

/opt/eocortexArchiveEpisodesService/appsettings.json

Below is an example of default settings:

```
{  "ConnectionStrings": {    "DatabaseConnectionTemplateWithoutDbName":      "Host=localhost; Port=5432;Database={0};Username=eocortex;Password=masterkey"  },  "Serilog": {    "MinimumLevel": {      "Default": "Debug",      "Override": {        "Microsoft": "Warning",        "Microsoft.Hosting.Lifetime": "Information"      }    },    "WriteTo": [      {        "Name": "Logger",        "Args": {          "configureLogger": {            "Filter": [              {                "Name": "ByIncludingOnly",                "Args": {                  "expression": "(@Level = 'Error' or @Level = 'Fatal' or @Level = 'Warning')"                }              }            ],            "WriteTo": [              {                "Name": "File",                "Args": {                  "path": "%LogsDir%/service.log",                  "rollOnFileSizeLimit": true,                  "rollOnFileSizeLimit": true,                  "fileSizeLimitBytes": "52428800",                  "retainedFileCountLimit": 10                }              }            ]          }        },        {          "Name": "Console",          "Args": {            "outputTemplate": "===> {Timestamp:HH:mm:ss.fff zzz} [{Level}] {Message}{NewLine}{Exception}"          }        }      ],    "Enrich": [ "FromLogContext", "WithMachineName", "WithThreadId" ],    "Properties": {      "Application": "LongTerArchiveService"    },    "AllowedHosts": "*",    "EpisodesDbRelativePath": "ArchiveServiceData/episodes-database",    "AlwaysRedirectToHttps": "false",    "Network": {      "Endpoints": {        "Http": {          "Url": "http://*:8899"        }      }    }  }
```

Editing the configuration file allows to:

[Change the Service network port.](#)

[Enable HTTPS connection support, add an SSL certificate and change the network port for secured connection.](#)

[Enable forced redirection of all requests to the Service to HTTPS.](#)

Change the HTTP port

To change the HTTP port, find the following section in the configuration file:

```
"Network": {  "Endpoints": {    "Http": {      "Url": "http://0.0.0.0:8899"    }  }  },
```

And set a custom port in the **Url** line instead of the default **8899**.

Enable HTTPS connection

To add an SSL certificate to the Service configuration and enable HTTPS connection, change the Network section by one of the following ways:

```
"Network": {  "Endpoints": {    "Http": {      "Url": "http://0.0.0.0:8899"    },    "Https": {      "Url": "https://0.0.0.0:18899",      "Certificate": {        "Path": ".pfx file",        "Password": "cert_password"      }    }  }  }
```

Where:

Path is the location of the PFX file of the certificate.

Password is the password of the certificate.

```
"Network": { "Endpoints": { "Http": { "Url": "http://0.0.0.0:8899" },
"HttpsInlineCertAndKeyFile": { "Url": "https://0.0.0.0:18899",
"Certificate": { "Path": ".pem/.crt file", "KeyPath": ".key file",
>Password": "cert_password" } } } }
```

Where:

Path is the location of the .pem/.crt file of the certificate.

KeyPath is the location of the .key file of the certificate.

Password is the password of the certificate.

```
"Network": { "Endpoints": { "Http": { "Url": "http://0.0.0.0:8899" },
"Https": { "Url": "https://0.0.0.0:18899", "Certificate": {
"Subject": "Subject", "Store": "Store", "Location": "Location",
"AllowInvalid": "true/false" } } } }
```

Where:

Subject is the name of the certificate subject.

Store is the name of the certificate storage.

Location is the location of the certificate storage. By default, CurrentUser.

AllowInvalid is the state of the policy of using invalid (e.g. self-signed) certificates. By default, it's false.

Changing the HTTPS port can be done similarly to the HTTP protocol, but for the relevant section.

To enable forced redirection of all requests to the Service to a secured connection, find and change the value from **false** to **true** for the following line:

```
"AlwaysRedirectToHttps": false,
```

After saving the settings, the Service must be restarted via the **Services** snap-in to take all changes into effect.

Changing other settings provided in the configuration file may cause the Service to malfunction or fail. It is not recommended to change settings that are not described in the present documentation.

Specifics of running the Service on CentOS

When hosting the Service on CentOS, specific problems may arise when the Service is trying to work with its database. To avoid them, change the PostgreSQL settings.

Open the file **pg_hba.conf** in any text editor.

Default path: `/var/lib/pgsql/12/data/pg_hba.conf`

Change the authentication method in the file from **ident** to **md5** for all types of connections.

Before:

```
# TYPE DATABASE USER ADDRESS METHOD # "local" is for Unix domain
socket connections only local all all ident # IPv4 local connections:
host all all 127.0.0.1/32 ident # IPv6 local connections: host
all all ::1/128 ident
```

After:

```
# TYPE DATABASE USER ADDRESS METHOD # "local" is for Unix domain
socket connections only local all all md5 # IPv4 local connections:
host all all 127.0.0.1/32 md5 # IPv6 local connections: host all
all ::1/128 md5
```

Related references

[Overview of the Service](#)

[Use in the **Eocortex Client** application](#)

[Setting in the **Eocortex Configurator** application](#)

[Installation of **Episode archive** on Windows](#)

Installing, updating, and removing Long-term database

The **Long-term database** Service ensures storing of selected types of events and access to them regardless of the archive storage settings. With this Service there is no need to be concerned that event data will be erased if the archive is deleted.

This feature is available only for **Enterprise** and **ULTRA** licenses.

The **Service** can be installed on any computer without installing the **Eocortex Server** on it.

Only one **Service** instance can be configured for the entire system.

The Service can be installed using the following two options:

- [Online](#), if the device has Internet access.
- [Offline](#), if the device does not have Internet access.

Online installation

Ubuntu 20.04 and Debian 10

Add Eocortex repository:

```
wget -O - http://packages.eocortex.com/deb/install/eocortex-deps-debian.sh | bash
```

Install the Service.

```
sudo apt-get install eocortex-long-term-database-service
```

CentOS 7

Add Eocortex repository:

```
wget -O - http://packages.eocortex.com/rpm/install/eocortex-deps-centos.sh | bash
```

Install the Service.

```
sudo yum install eocortex-long-term-database-service
```

Offline installation

For this installation method, you will need a computer with Internet access and the same operating system as the one on which you want to install the **Long-term database** Service.

Ubuntu 20.04 and Debian 10

Clear local repository:

```
sudo apt-get clean
```

Add Eocortex repository:

```
wget -O - http://packages.eocortex.com/deb/install/eocortex-deps-debian.sh | bash
```

Install all required packages (dependencies):

```
sudo apt-get install -d -y eocortex-long-term-database-service
```

Create the LongTermDatabasePackages directory and transfer all downloaded packages to it:

```
mkdir ~/LongTermDatabasePackages/ && cp -R /var/cache/apt/archives/*.deb  
~/LongTermDatabasePackages/
```

After that, copy the entire LongTermDatabasePackages directory to a USB drive and transfer the data to the server. Install the **Long-term database** Service and all dependencies using the following command:

```
sudo dpkg -i /path_to_LongTermDatabasePackages/*.deb
```

CentOS 7

Add Eocortex repository:

```
wget -O - http://packages.eocortex.com/rpm/install/eocortex-deps-centos.sh | bash
```

Install yum extensions:

```
sudo yum install -y yum-utils
```

Install all required packages (dependencies):

```
sudo yumdownloader --downloadonly --downloadaddir=~/.LongTermDatabasePackages eocortex-  
long-term-database-service --resolve
```

After that, copy the entire LongTermDatabasePackages directory to a USB drive and transfer the data to the server. Install the **Long-term database** service and all dependencies using the following command:

```
sudo rpm -ivh /path_to_LongTermDatabasePackages/*.rpm
```

Dependencies

The following dependency packages must be installed in the operating system for the Service to work:

Ubuntu 20.04 and Debian 10

aspnetcore-runtime-6.0 (>= 6.0)
debconf (>= 0.5)
postgresql-12

CentOS 7

aspnetcore-runtime-6.0 >= 6.0
policycoreutils-python >= 2.5
postgresql12-server

During the [online installation](#) the dependency packages will be installed automatically, while during the [offline installation](#) they may require to be installed manually.

To check if a package is installed and its version, use the command **dpkg -s %package_name%** on Ubuntu/Debian or **sudo rpm -qa | grep %package_name%** on CentOS.

Update

To update the Service, run the following commands:

Ubuntu 20.04 and Debian 10

```
sudo apt-get update
sudo apt-get install eocortex-long-term-database-service
```

CentOS 7

```
sudo yum update eocortex-long-term-database-service
```

Or download a new version package from the repository and install it manually using the **dpkg/rpm** command.

Uninstallation

Ubuntu 20.04 and Debian 10

```
sudo apt-get remove eocortex-long-term-database-service
```

CentOS 7

```
sudo yum remove eocortex-long-term-database-service
```

Network settings of the Service

These settings should be made on the device where the Service is installed.

As part of the installation process, a configuration file **appsettings.json** containing network settings will be created in the root directory of the Service.

Default path:

/opt/EocortexLongTermDatabaseService/appsettings.json

Below is an example of default settings:

```
{  "Application": {    "Brand": "Eocortex",    "AppName": "LongTermDatabase"  },  "Logging": {    "LogLevel": {      "Default": "Information",      "Microsoft.AspNetCore": "Warning"    }  },  "AllowedHosts": "*",  "AlwaysRedirectToHttps": false,  "Network": {    "Endpoints": {      "Http": {        "Url": "http://*:8999"      }    }  },  "ConnectionStrings": {    "DefaultConnectionString": "Host=localhost;Port=5432;Database=longtermdatabase;Username=eocortex;Password=masterkey;",    "ConnectionStringWithDatabasePlaceholder": "Host=localhost;Port=5432;Database={0};Username=eocortex;Password=masterkey;"  } }
```

Editing the configuration file allows to:

[Change the Service network port.](#)

[Enable HTTPS connection support, add an SSL certificate and change the network port for secured connection.](#)

[Enable forced redirection of all requests to the Service to HTTPS.](#)

Change the HTTP port

To change the HTTP port, find the following section in the configuration file:

```
"Network": {  "Endpoints": {    "Http": {      "Url": "http://*:8999"    }  } },
```

And set a custom port in the **Url** line instead of the default **8999**.

Enable HTTPS connection

To add an SSL certificate to the Service configuration and enable HTTPS connection, change the Network section as follows:

```
"Network": {  "Endpoints": {    "Http": {      "Url": "http://*:8999"    },    "HttpsInlineCertFile": {      "Url": "https://*:18999",      "Certificate": {        "Path": "path_to_the_cert",        "Password": "cert_password"      }    }  } }
```

Where:

Path is the location of the PFX file of the certificate.

Password is the password of the certificate.

Changing the HTTPS port can be done similarly to the HTTP protocol, but for the **HttpsInlineCertFile** section.

To enable forced redirection of all requests to the Service to a secured connection, find and change the value from **false** to **true** for the following line:

```
"AlwaysRedirectToHttps": false,
```

After saving the settings, the Service must be restarted via the **Services** snap-in to take all changes into effect.

Changing other settings provided in the configuration file may cause the Service to malfunction or fail. It is not recommended to change settings that are not described in the present documentation.

Related references

[Overview of the Service](#)

[Usage of the Service in the **Eocortex Client** application](#)

[Configuration in the **Eocortex Configurator** application](#)

[Installation of **Long-term database** on Windows](#)

Installing, updating, and removing Monitoring

The **Monitoring** Service allows controlling the status of the video surveillance system components and receiving immediate notifications about problems occurring with them.

This feature is available only for **Enterprise** and **ULTRA** licenses.

The **Service** can be installed on any computer without installing the **Eocortex Server** on it.

Only one **Service** instance can be configured for the entire system.

The Service can be installed using the following two options:

- [Online](#), if the device has Internet access.
- [Offline](#), if the device does not have Internet access.

Online installation

Debian 10

Add Eocortex repository:

```
wget -O - http://packages.eocortex.com/deb/install/eocortex-deps-debian.sh | bash
```

Install the Service.

```
sudo apt-get install eocortex-monitoring-server
```

CentOS 7

Add Eocortex repository:

```
wget -O - http://packages.eocortex.com/rpm/install/eocortex-deps-centos.sh | bash
```

Install the Service.

```
sudo yum install eocortex-monitoring-server
```

Once installed, the **Service** will start automatically.

Service name: **ecortexmonitoring.service**

Offline installation

For this installation method, you will need a computer with Internet access and the same operating system as the one on which you want to install the **Monitoring** Service.

Debian 10

Clear local repository:

```
sudo apt-get clean
```

Add Eocortex repository:

```
wget -O - http://packages.ecortex.com/deb/install/ecortex-deps-debian.sh | bash
```

Install all required packages (dependencies):

```
sudo apt-get install -d -y ecortex-monitoring-server
```

Create the MonitoringPackages directory and transfer all downloaded packages to it:

```
mkdir ~/MonitoringPackages/ && cp -R /var/cache/apt/archives/*.deb  
~/MonitoringPackages/
```

After that, copy the entire MonitoringPackages directory to a USB drive and transfer the data to the server. Install the **Monitoring** Service and all dependencies using the following command:

```
sudo dpkg -i /path_to_MonitoringPackages/*.deb
```

CentOS 7

Add Eocortex repository:

```
wget -O - http://packages.ecortex.com/rpm/install/ecortex-deps-centos.sh | bash
```

Install yum extensions:

```
sudo yum install -y yum-utils
```

Install all required packages (dependencies):

```
sudo yumdownloader --downloadonly --downloadaddir=~/.MonitoringPackages ecortex-  
monitoring-server --resolve
```

After that, copy the entire LongTermDatabasePackages directory to a USB drive and transfer the data to the server. Install the **Monitoring** service and all dependencies using the following command:

```
sudo rpm -ivh /path_to_MonitoringPackages/*.rpm
```

Dependencies

The following dependency packages must be installed in the operating system for the Service to work:

Debian 10

aspnetcore-runtime-6.0 (>= 6.0)

debconf (>= 0.5)

CentOS 7

aspnetcore-runtime-6.0 >= 6.0

policycoreutils-python >= 2.5

During the [online installation](#) the dependency packages will be installed automatically, while during the [offline installation](#) they may require to be installed manually.

To check if a package is installed and its version, use the command **dpkg -s %package_name%** on Debian or **sudo rpm -qa | grep %package_name%** on CentOS.

Update

To update the Service, run the following commands:

Debian 10

```
sudo apt-get update
sudo apt-get install eocortex-monitoring-server
```

CentOS 7

```
sudo yum update eocortex-monitoring-server
```

Or download a new version package from the repository and install it manually using the **dpkg/rpm** command.

Uninstallation

Debian 10

```
sudo apt-get remove eocortex-monitoring-server
```

CentOS 7

```
sudo yum remove eocortex-monitoring-server
```

Network settings of the Service

The **Monitoring** service does not provide any options to change the network connection settings.

Service uses HTTP port 8889 for connection without option to change it.

Monitoring Agent

To collect and transmit data about the state of the Eocortex server and cameras connected to it, an additional **Monitoring Agent** service is used.

The service is installed and updated at the same time as the **Eocortex Server** components are deployed, so there is no need to install the **Agent** individually.

Once installed, the **Service** will start automatically.

Service name: **eocortexmonitoringagent.service**

Related references

[Overview of the Service](#)

[Monitoring Web Client](#)

[Setting in the Eocortex Configurator application](#)

[Installation of Monitoring on Windows](#)

Licensing

Setting the license for the License Plate Recognition (Complete) module

Trial license for the module will be valid for **60 days** after activation.

Parking

On **Ubuntu 20.04** and **Debian 10**

Add Eocortex repository:

```
wget -O - http://packages.eocortex.com/misc/parkingdeb.sh | bash
```

On **Centos 7**

Add Eocortex repository:

```
wget -O - http://packages.eocortex.com/misc/parkingrpm.sh | bash
```

Highway

On **Ubuntu 20.04** and **Debian 10**

Add Eocortex repository:

```
wget -O - http://packages.eocortex.com/misc/highwaydeb.sh | bash
```

On **Centos 7**

Add Eocortex repository:

```
wget -O - - http://packages.eocortex.com/misc/highwayrpm.sh | bash
```

Installing neural networks

Part of the **Eocortex** video analysis modules uses neural networks.

Neural networks are presented as an additional installation package.

Starting from version 3.6 of **Eocortex**, two different packages can be used:

- The **Eocortex Neural Networks Standard** package
- The **Eocortex Neural Networks Special** package

[Comparison of neural networks packages](#)



Eocortex Neural Networks Standard and **Eocortex Neural Networks Special** packages support simultaneous use of multiple video cards for analyzing video streams. However, correct work of the analytics is possible only when using video cards that are identical to each other by their technical properties.

Installing Eocortex Neural Networks Standard package

If the **Face Recognition (Complete)** module is used, the face databases will be automatically updated at the first start after updating **Eocortex** and the **Eocortex Neural Networks** package from version 3.3 or lower to version 3.4 or higher. It will take some time.

Since version 4.0, **Eocortex** uses PostgreSQL for all internal databases. When upgrading from earlier versions, it is recommended also to read the [information about PostgreSQL installation](#).

Requirements and recommendations



Stable operation of the package is guaranteed only under the following operating systems:

- Windows 10
- Windows Server 2016
- Ubuntu 20.04
- Debian 10
- CentOS 7

Workability of the package, especially GPU analysis, is not guaranteed when using other operating systems.

Minimum hardware requirements:

- A processor with AVX instructions support;

- An **NVIDIA** video card (GPU) with the computation capacity index of at least 6.5 and with at least 4 Gb of memory; the parameters and performance of the video card must be similar or better than those of **NVIDIA GTX 1650 Super** model;
- version of the video card driver at least 460;
- swap file at least half of the total RAM size.

If the package will be installed on a virtual machine, it may additionally be required to:

- Enable support for AVX instructions in the guest machine settings;
- Use GRID drivers for GPU virtualization.



Simultaneous use of several video cards for analyzing camera streams is acceptable. However, correct work of the analytics is possible only when using video cards that are identical to each other by their technical properties.



Eocortex must use video cards selected for running neural networks in monopoly mode. It is not allowed to use such card for other applications or tasks that consume GPU resources, including for displaying video. Simultaneous use of a video card for several tasks may lead to incorrect system operation: from analytics performance degradation to server instability.



As an example, Simultaneous execution of tasks of video displaying and analysis with the **Face Recognition (Complete)** or **Unique Visitor Counting** modules working on the **Eocortex Neural Networks Standard** package can cause significant lags of Face Recognition processes when using graphics cards of **GTX 10XX** and **GTX 16XX** series with 4 GB of video memory or less. It is recommended to use dedicated graphics cards for these tasks.



The package must be installed only on the computer with the **Eocortex Server** application. Moreover, this server should be the main one for cameras using neural network modules.

Installation under Windows

Pre-install preparations

The **Eocortex Neural Networks Standard** package for Windows is not directly dependent on having the **Eocortex Server** application deployed on the computer at the installation moment. Applications can be installed in any order.

Eocortex Neural Networks Standard for Windows comes as a single installation package, containing neural networks for analysis both exclusively on the CPU and using the GPU. The choice of the analysis mode is made at the stage of the package installation.

If the analysis is to be performed only on the CPU, no additional preparation of the computer is required before installing the **Eocortex Neural Networks Standard** package.

If the analysis is to be performed using the GPU, the latest graphics card driver package must be installed from the [official NVIDIA website](#) before installing the **Eocortex Neural Networks Standard** package.

The graphics card drivers installed automatically with the OS have limited functionality and do not support GPU analysis.

The most up-to-date version of **Eocortex** can be downloaded at [Support / Software Installation Packages Supported](#).

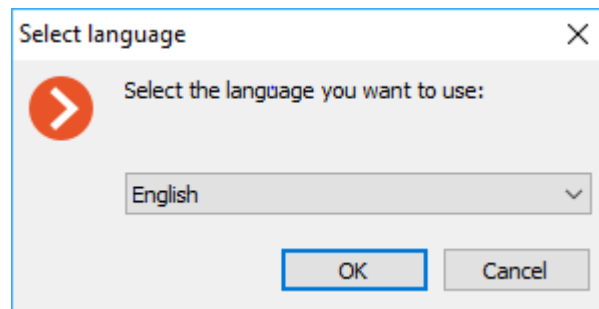
Regular installation of the package

The installation of the **Eocortex Neural Networks Standard** package shall be performed under the account of the same user who will operate the application. If the application is to be launched by multiple users with different accounts, the installation must be performed for each of these users under his/her account.

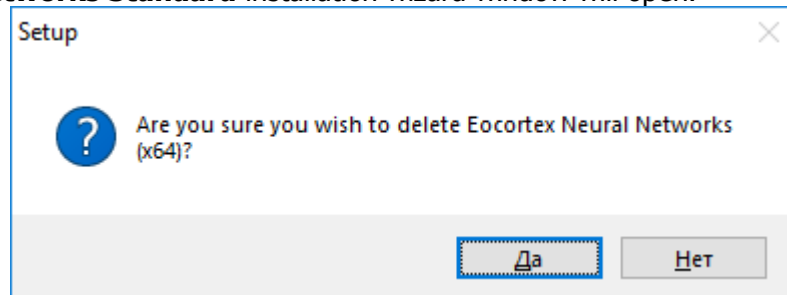
Before installing the **Eocortex Neural Networks Standard** package, close all **Eocortex** applications, including stopping the **Eocortex Server** application.

To install the **Eocortex Neural Networks Standard** package, run the **EocortexNeuralNetworksCommon Installer.exe** file, located in the root folder of the package.

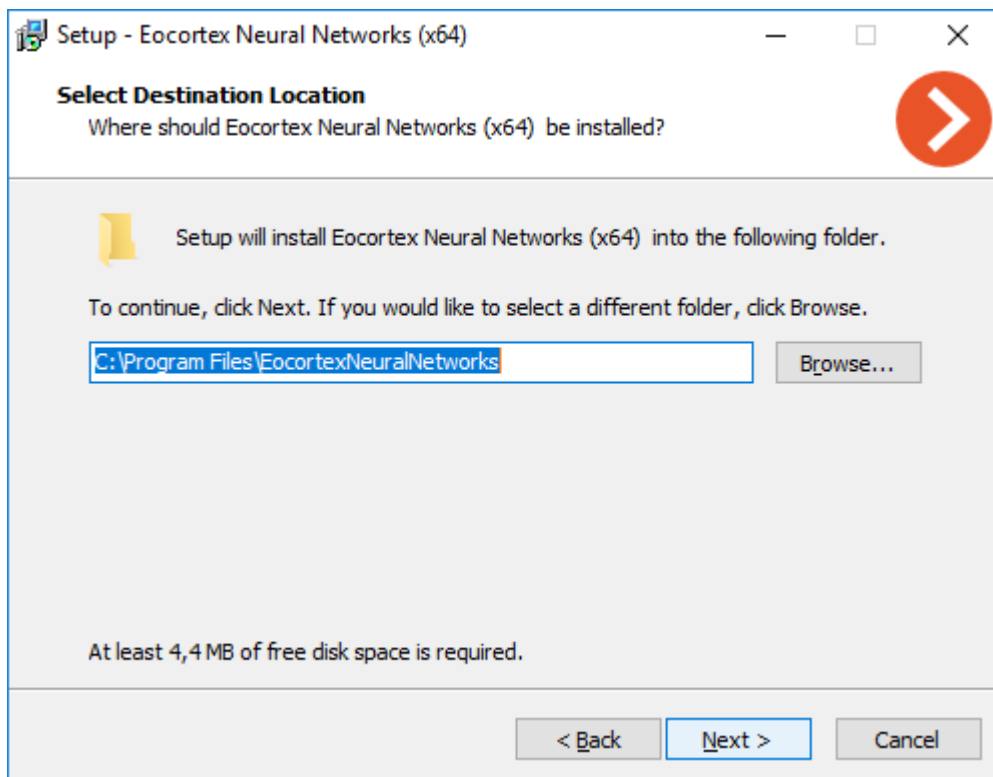
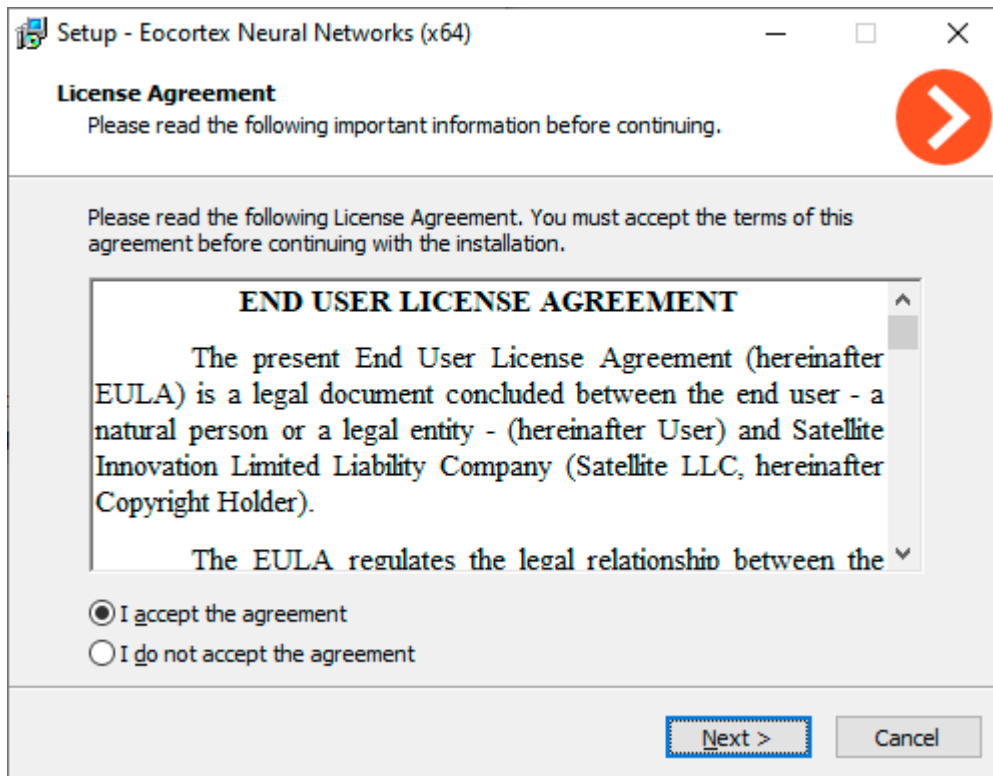
In the **Select language** window, choose the language that will be used during the installation and in the course of operating the software on the computer.

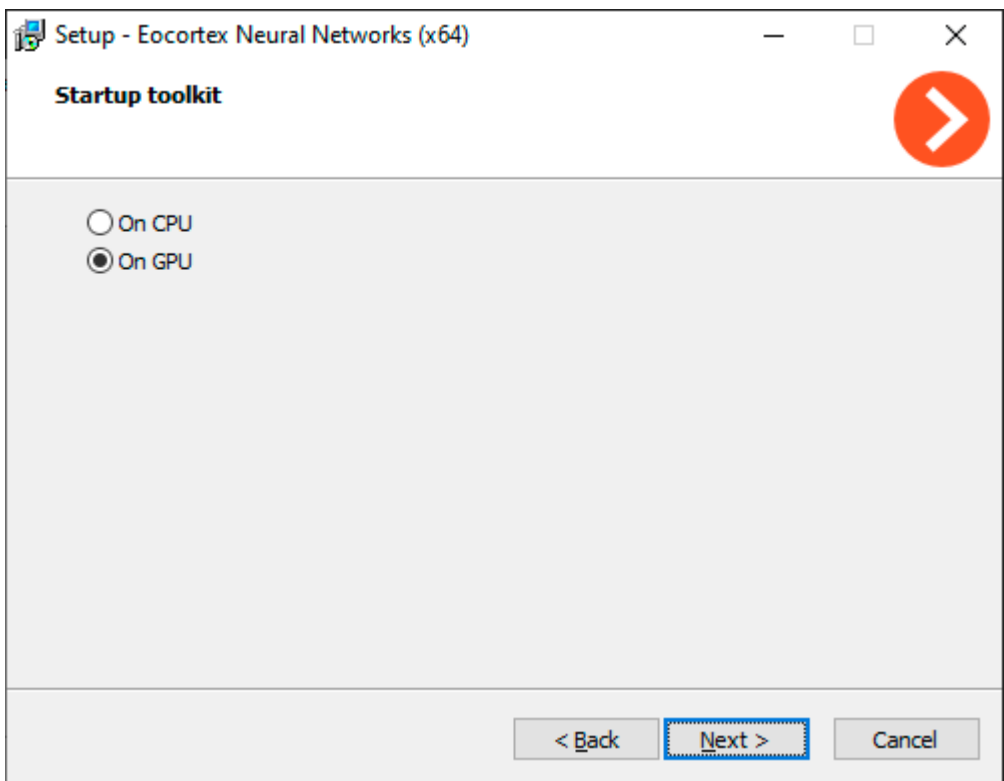
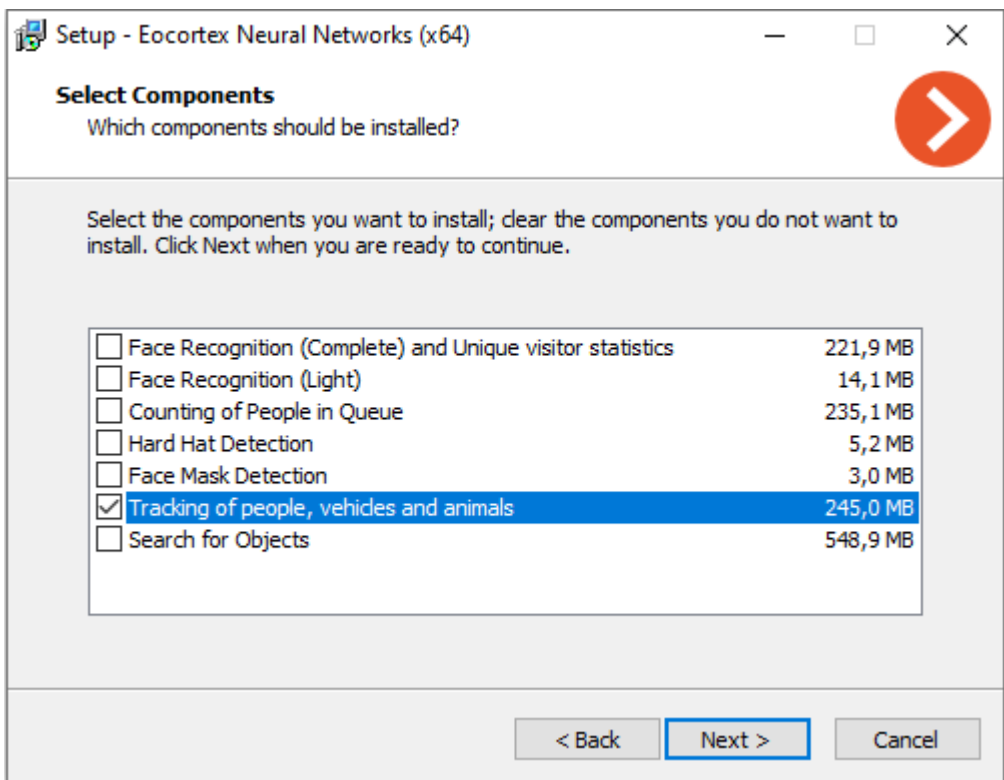


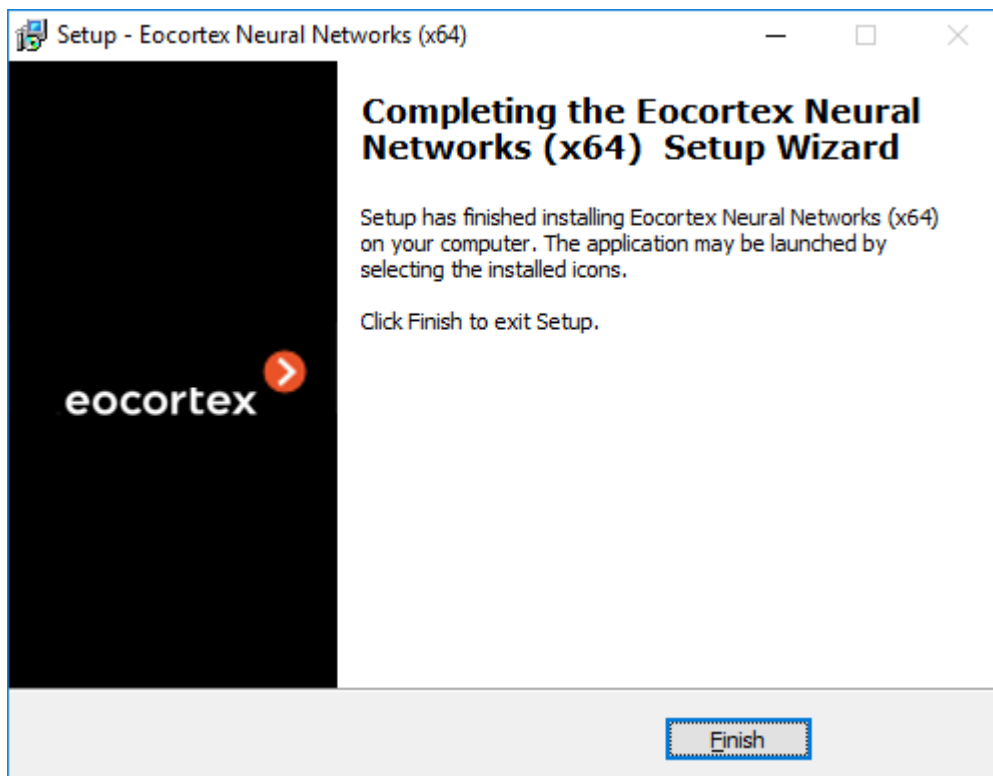
If the **Eocortex Neural Networks Standard** package has already been installed on this computer, the user will be recommended to remove the previous copy of the software. In case **No** is clicked, the installation will be aborted, and the previous copy will remain. If **Yes** is clicked, the previous copy will be deleted, and the **Eocortex Neural Networks Standard** installation wizard window will open.



If the **Eocortex Neural Networks Standard** suite is being installed on the computer for the first time, the **Eocortex Neural Networks Standard** installation wizard will open without interruptions. Follow the wizard steps to proceed.







Silent installation of the package

Starting from version 3.5, a silent installation of the **Eocortex Neural Networks** package is available.

The term *silent installation* refers to the installation of software in automatic mode that does not require active participation of the user.

The silent installation of the **Eocortex Neural Networks** package should be performed under the administrator account.

The silent installation of the **Eocortex Neural Networks** package is available only under Windows.

All the components of the **Eocortex Neural Networks** package will be installed during the silent installation.

Before installing the **Eocortex Neural Networks Standard** package, close all **Eocortex** applications, including stopping the **Eocortex Server** application.

To perform silent installation of the **Eocortex Neural Networks** package, run the **EocortexNeuralNetworksCommon Installer.exe** file with the **/VERYSILENT** key.

Example:

```
EocortexNeuralNetworksCommon Installer.exe /VERYSILENT
```

When the **/LOG** key is specified, information about the installation progress will be written to the file **%User%\AppData\Local\Temp\Setup Log% Installation_Date% #% Random_number%.txt** (for example, **C:\Users\User\AppData\Local\Temp\Setup Log 2021-07-15 # 012.txt**).

The **/PostgreDbPath** key can be used to specify the path to the PostgreSQL database.

Example:

```
EocortexNeuralNetworksCommon Installer.exe /VERYSILENT /PostgreDbPath="e:\int search"
```

By default, PostgreSQL is installed to the **C:\ProgramData\postgredb** directory.

Example of installation path logging (when launching with the key /LOG):

```
2021-07-16 14:59:05.447 Path to the Search for Objects database
PostgreSQL: C:\ProgramData\postgre
```

If PostgreSQL is already installed, it will be used for the **Eocortex Neural Networks** package components as well.

Example of installation path logging (when launching with the key /LOG):

```
2021-07-15 15:33:42.532 A PostgreSQL database has been found, which will
be used to store the data of the Search for Objects module. Path to
database: C:\Program Files\Eocortex Interactive Search\postgre
```

Installation under Linux

Pre-install preparations

The **Eocortex Neural Networks Standard** package for Linux is directly dependent on the **Eocortex Server** application being deployed on the computer at the moment of the package installation. It is necessary to install **Eocortex Server** before installing the **Eocortex Neural Networks Standard** package.

Eocortex Neural Networks Standard for Linux comes in two separate installation packages, containing neural networks for the required analysis mode — only on CPU or using GPU. The choice of analysis mode is made at the stage of downloading the installation package.

If the analysis is to be performed only on the CPU, no additional preparation of the computer is required before installing the **Eocortex Neural Networks Standard** package.

If the analysis is to be performed using the GPU, the latest graphics card driver package must be installed from the [official NVIDIA website](#) before installing the **Eocortex Neural Networks Standard** package.

The Nouveau kernel module, which provides graphics support for Linux, is not suitable for GPU analysis.

Installation of graphics card driver

The following steps are necessary if the analysis is to be performed using the GPU. If it is planned to perform analysis only on the CPU, this step [can be skipped](#).

The driver installation process may vary depending on your operating system. The instructions below are provided as an example, alternative installation methods can be found in the documentation for the selected operating system.

All actions must be performed as a user with administrator privileges.

Ubuntu

Find the appropriate driver package in the repository by running the command in the Terminal:

```
sudo ubuntu-drivers devices
```

Install the selected driver package:

```
sudo apt install nvidia-driver-[version]
```

Where **nvidia-driver-[version]** is the actual name of the package.

Reboot the OS:

```
sudo reboot
```

Check that the drivers have been installed successfully:

```
sudo lshw -c video
```

Check that the graphic card is successfully initialized by the OS:

```
sudo nvidia-smi
```

Debian

Download the appropriate driver package from the [NVIDIA official website](#).

Install kernel header files:

```
sudo apt-get install linux-headers-$(uname -r)
```

Install the **build-essentials** metapackage:

```
sudo apt-get install build-essential
```

Deactivate the Nouveau module. Open the **/etc/default/grub** file with a text editor and add the following to the **GRUB_CMDLINE_LINUX** line:

```
rd.driver.blacklist=nouveau nouveau.modeset=0
```

Put the Nouveau module into the blacklist. Edit (or create) the **/etc/modprobe.d/blacklist.conf** file with a text editor, and add the line below to the end of it:

```
blacklist nouveau
```

Update the bootloader configuration by running the following command in the Terminal:

```
sudo update-grub
```

Update the file system image by running the following command in the Terminal:

```
sudo update-initramfs -u
```

If X server is enabled, disable GUI startup after reboot:

```
sudo systemctl isolate multi-user.target
```

Reboot the OS:

```
sudo reboot
```

Browse to the directory with the previously downloaded driver package.

Grant the execution privileges to the previously downloaded package:

```
chmod a+x NVIDIA-Linux-x86_64-[version].run
```

Where **NVIDIA-Linux-x86_64-[version]** is the actual name of the package.

Install the driver package:

```
sudo ./NVIDIA-Linux-x86_64-[version].run
```

Where **NVIDIA-Linux-x86_64-[version]** is the actual name of the package.

Reboot the OS again:

```
sudo reboot
```

CentOS 7

Download the appropriate driver package from the [NVIDIA official website](#).

Install kernel header files:

```
sudo yum -y install kernel-devel
```

Install the **Development Tools** metapackage:

```
sudo yum -y groupinstall "Development Tools"
```

Deactivate the Nouveau module. Open the **/etc/default/grub** file with a text editor and add the following to the **GRUB_CMDLINE_LINUX** line:

```
rd.driver.blacklist=nouveau nouveau.modeset=0
```

Put the Nouveau module into the blacklist. Edit (or create) the **/etc/modprobe.d/blacklist.conf** file with a text editor, and add the line below to the end of it:

```
blacklist nouveau
```

Update the bootloader configuration by running the following command in the Terminal:

```
sudo grub2-mkconfig -o /boot/grub2/grub.cfg
```

Update the file system image by running the following command in the Terminal:

```
sudo mv /boot/initramfs-$(uname -r).img /boot/initramfs-$(uname -r)-nouveau.img
sudo dracut /boot/initramfs-$(uname -r).img $(uname -r)
```

If X server is enabled, disable GUI startup after reboot:

```
sudo systemctl isolate multi-user.target
```

Reboot the OS:

```
sudo reboot
```

Browse to the directory with the previously downloaded driver package.

Grant the execution privileges to the previously downloaded package:

```
chmod a+x NVIDIA-Linux-x86_64-[version].run
```

Where **NVIDIA-Linux-x86_64-[version]** is the actual name of the package.

Install the driver package:

```
sudo ./NVIDIA-Linux-x86_64-[version].run -kernel-source-
path=/usr/src/kernels/{kernel_version}
```

Where **NVIDIA-Linux-x86_64-[version]** is the actual name of the package and **{kernel_version}** is the actual OS kernel version.

Reboot the OS again:

```
sudo reboot
```

Installation of the package

Eocortex Neural Networks Standard for Linux comes in two separate installation packages:

- **eocortex-neural-networks-cpu** is a neural network package designed to perform analysis using only CPU.
- **eocortex-neural-networks-gpu** is a neural network package with the ability to use the GPU to perform analysis.

The **eocortex-neural-networks-gpu-optimized** package available in the repository belongs to the **Eocortex Neural Networks Special**. This is a separate neural network package, installation of which is not required when deploying the **Eocortex Neural Networks Standard** package.

Installation of the **Eocortex Neural Networks Standard** package on Linux can be performed in two ways:

- **Online**, when the installation package is fetched from the **Eocortex** repository along with all dependency packages. Requires Internet access on the computer.

- **Offline**, when the installation package must be pre-downloaded from the **Eocortex** repository, and all dependency packages must be installed manually. Does not require Internet access on the computer.

Before installing the **Eocortex Neural Networks Standard** package, ensure that the **Eocortex Server** application is installed on the computer.

Online installation

Stop the **Eocortex Server** application:

```
sudo systemctl stop eocortex
```

Run the installation of the selected neural network package with the corresponding command:

Ubuntu/Debian, analysis only on CPU:

```
sudo apt-get install eocortex-neural-networks-cpu
```

Ubuntu/Debian, analysis using GPU:

```
sudo apt-get install eocortex-neural-networks-gpu
```

CentOS 7, analysis only on CPU:

```
sudo yum install eocortex-neural-networks-cpu
```

CentOS 7, analysis using GPU:

```
sudo yum install eocortex-neural-networks-gpu
```

Wait until installation is complete.

Start the **Eocortex Server** application back:

```
sudo systemctl start eocortex
```

Offline installation

Make sure that all required dependency packages are installed on the computer:

- cuda-license-11-0
- cuda-cudart-11-0
- cuda-cublas-11-0
- cuda-cufft-11-0
- cuda-curand-11-0
- cuda-cusolver-11-0
- cuda-cuspars-11-0
- cuda-npp-11-0
- cuda-nvgraph-11-0
- cuda-nvjpeg-11-0
- cuda-nvrtc-11-0
- cuda-libraries-11-0

If a dependency package is missing or its version does not match, download and install the missing package from the repository.

Ubuntu/Debian:

```
http://packages.eocortex.com/deb/public/pool/main/c/  
http://packages.eocortex.com/deb/public/pool/main/libc/  
http://packages.eocortex.com/deb/public/pool/main/libn/
```

CentOS 7:

```
http://packages.eocortex.com/rpm/
```

Download the selected neural network package from the repository.

Ubuntu/Debian, analysis only on CPU:

```
http://packages.eocortex.com/deb/public/pool/main/e/eocortex-neural-networks-cpu/
```

Ubuntu/Debian, analysis using GPU:

```
http://packages.eocortex.com/deb/public/pool/main/e/eocortex-neural-networks-gpuu/
```

CentOS 7:

```
http://packages.eocortex.com/rpm/
```

Stop the **Eocortex Server** application:

```
sudo systemctl stop eocortex
```

Browse to the directory with the previously downloaded neural network package and run the installation.

Ubuntu/Debian:

```
dpkg -i eocortex-neural-networks-[type]_[version]_amd64.deb
```

CentOS 7:

```
yum install eocortex-neural-networks-[type]_[version]_amd64.deb
```

Where [type] is the analysis mode (cpu or gpu) and [version] is the actual version of the package.

Wait until installation is complete.

Start the **Eocortex Server** application back:

```
sudo systemctl start eocortex
```

Installing Eocortex Neural Networks Special package

If the **Face Recognition (Complete)** module is used, the face databases will be automatically updated at the first start after updating **Eocortex** and the **Eocortex Neural Networks** package from version 3.3 or lower to version 3.4 or higher. It will take some time.

Since version 4.0, **Eocortex** uses PostgreSQL for all internal databases. When upgrading from earlier versions, it is recommended also to read the [information about PostgreSQL installation](#).

Requirements and recommendations



Stable operation of the package is guaranteed only under the following operating systems:

- Windows 10
- Windows Server 2016
- Ubuntu 20.04
- Debian 10
- CentOS 7

Workability of the package, especially GPU analysis, is not guaranteed when using other operating systems.

Minimum hardware requirements:

- A processor with AVX instructions support;
- An **NVIDIA** graphics card (GPU) with an index of compute capability of at least 7.0 or higher and video memory capacity of at least 6 GB; herewith, other characteristics and performance

of the graphics card must be no lower than that of **NVIDIA RTX 3050** or **NVIDIA RTX 2060** model;

- version of the video card driver at least 460;
- swap file at least half of the total RAM size.

If the package will be installed on a virtual machine, it may additionally be required to:

- Enable support for AVX instructions in the guest machine settings;
- Use GRID drivers for GPU virtualization.



Simultaneous use of several video cards for analyzing camera streams is acceptable. However, correct work of the analytics is possible only when using video cards that are identical to each other by their technical properties.



Eocortex must use video cards selected for running neural networks in monopoly mode. It is not allowed to use such card for other applications or tasks that consume GPU resources, including for displaying video. Simultaneous use of a video card for several tasks may lead to incorrect system operation: from analytics performance degradation to server instability.



The package must be installed only on the computer with the **Eocortex Server** application. Moreover, this server should be the main one for cameras using neural network modules.

Installation under Windows

Pre-install preparations

The **Eocortex Neural Networks Special** package for Windows is not directly dependent on having the **Eocortex Server** application deployed on the computer at the installation moment. Applications can be installed in any order.

The **Eocortex Neural Networks Special** package does not have an analysis mode without using the GPU, so before installing the package, it is necessary to install the latest drivers for the graphics card from the [official NVIDIA website](#).

The graphics card drivers installed automatically with the OS have limited functionality and do not support GPU analysis.

The most up-to-date version of **Eocortex** can be downloaded at [Support / Software Installation Packages Supported](#).

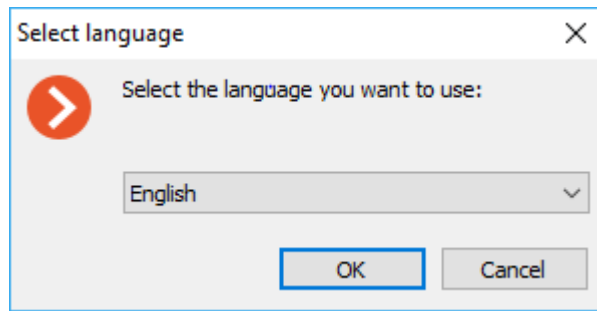
Installation of the package

The installation of the **Eocortex Neural Networks Standard** package shall be performed under the account of the same user who will operate the application. If the application is to be launched by multiple users with different accounts, the installation must be performed for each of these users under his/her account.

Before installing the **Eocortex Neural Networks Standard** package, close all **Eocortex** applications, including stopping the **Eocortex Server** application.

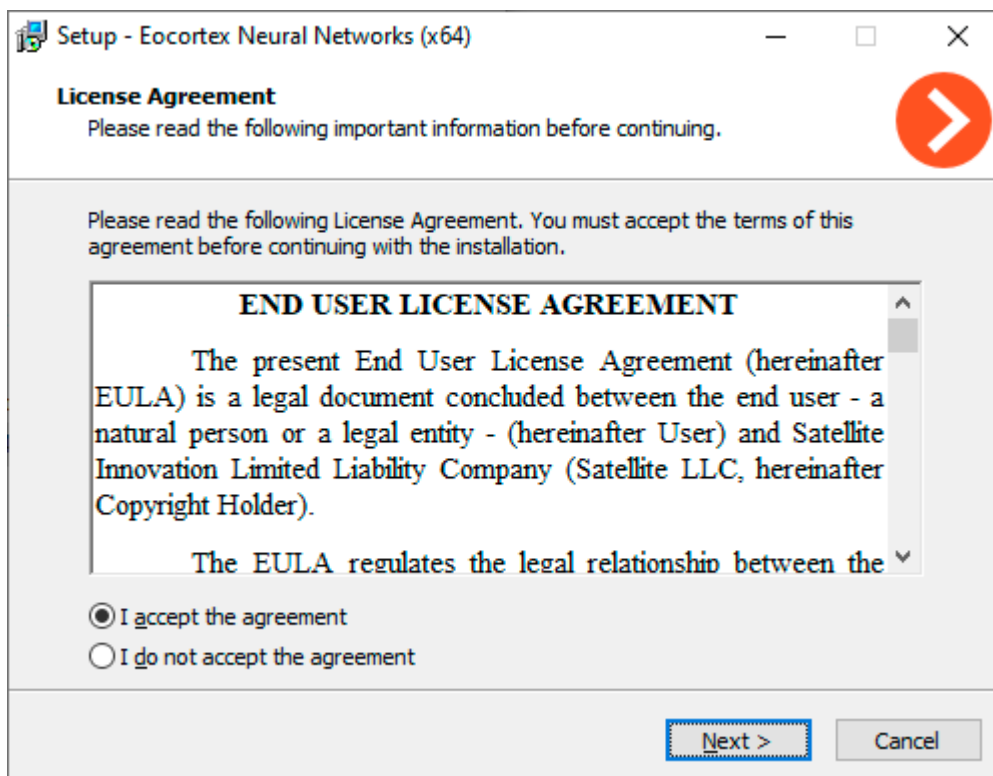
To install the **Eocortex Neural Networks Special** package, run the **EocortexNeuralNetworksOptimized Installer.exe** file, located in the root folder of the package.

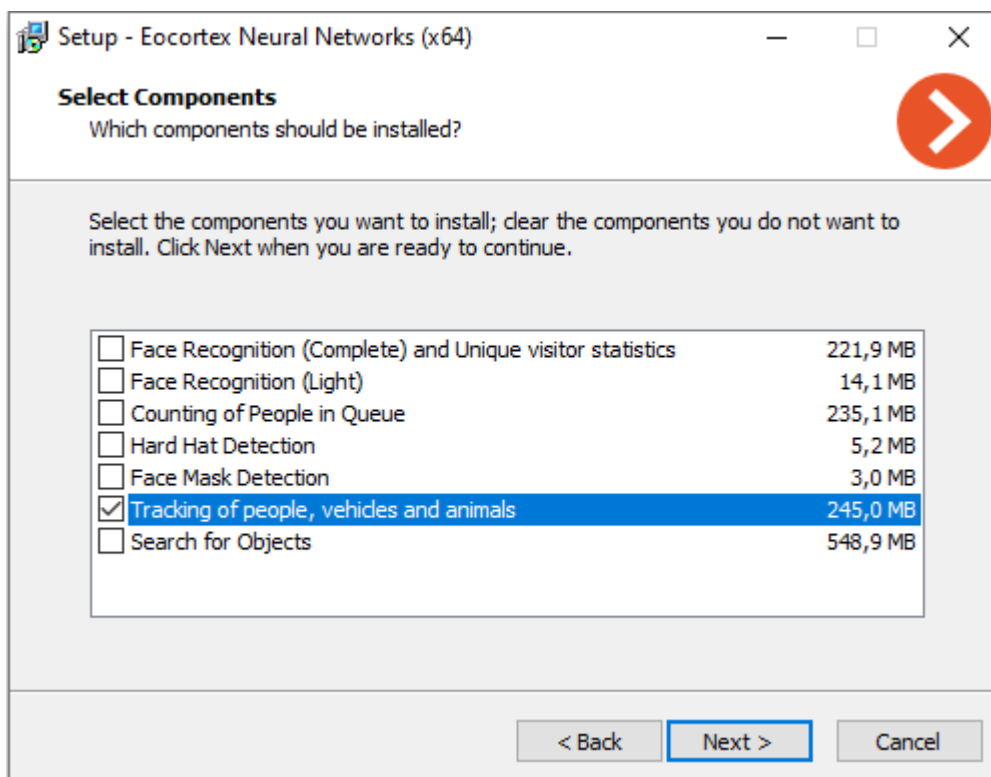
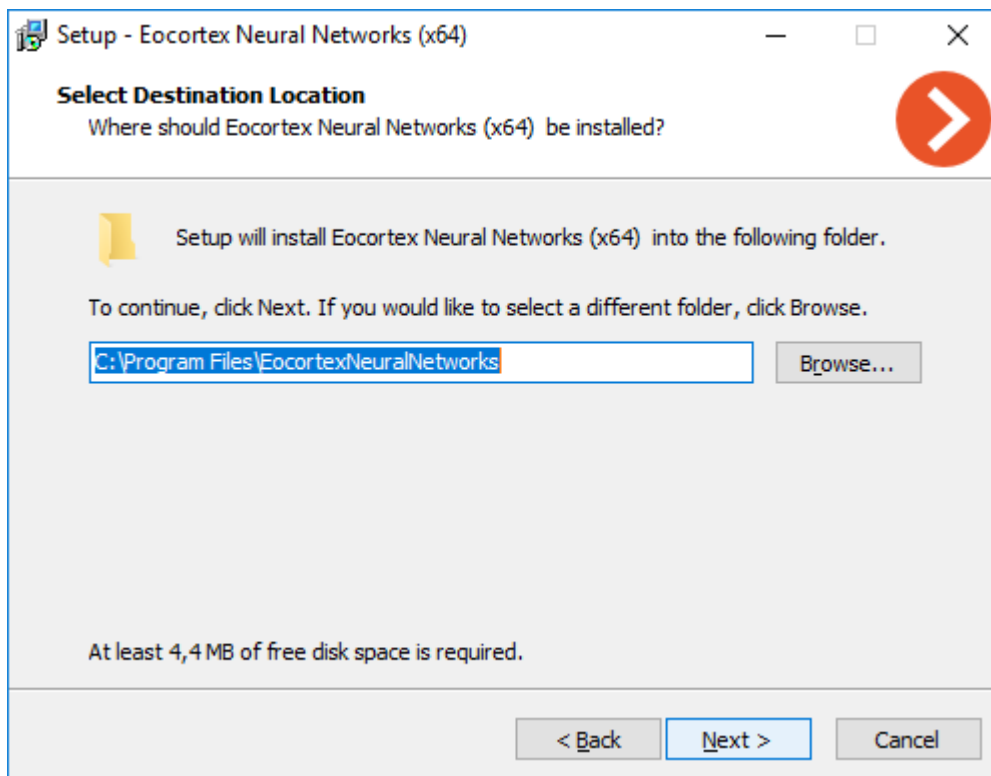
In the **Select language** window, choose the language that will be used during the installation and in the course of operating the software on the computer.



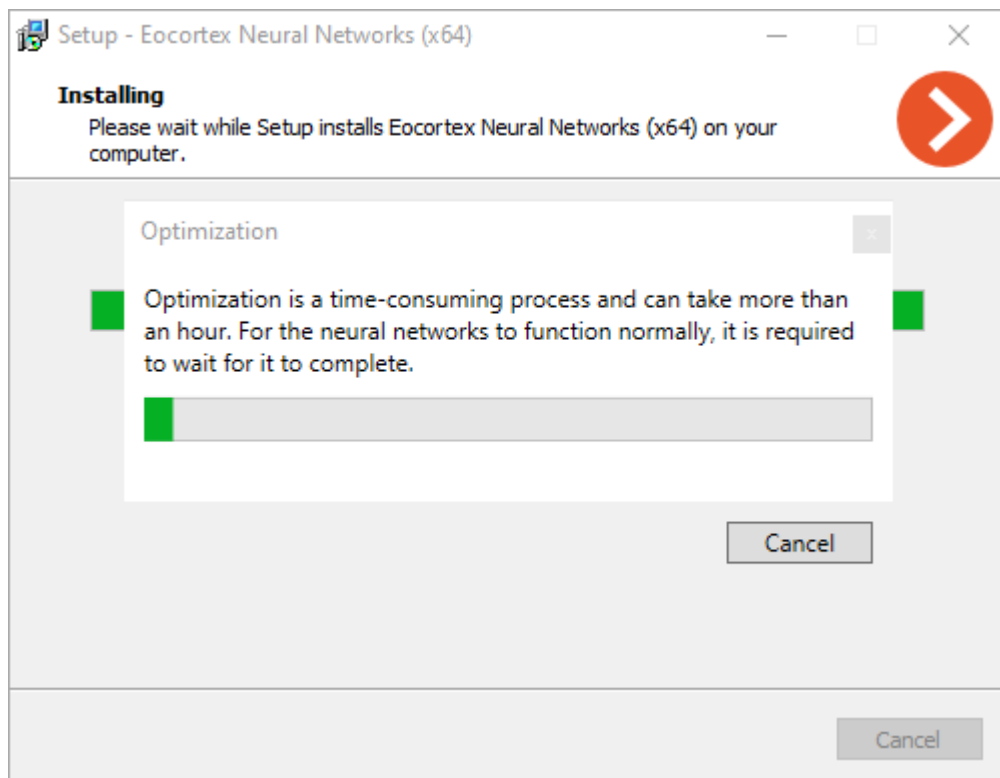
If the **Eocortex Neural Networks Special** package has already been installed on this computer, the user will be recommended to remove the previous copy of the software. In case **No** is clicked, the installation will be aborted, and the previous copy will remain. If **Yes** is clicked, the previous copy will be deleted, and the **Eocortex Neural Networks Special** installation wizard window will open.

If the **Eocortex Neural Networks Special** package is being installed on the computer for the first time, the **Eocortex Neural Networks Special** installation wizard will open without interruptions. Follow the wizard steps to proceed.

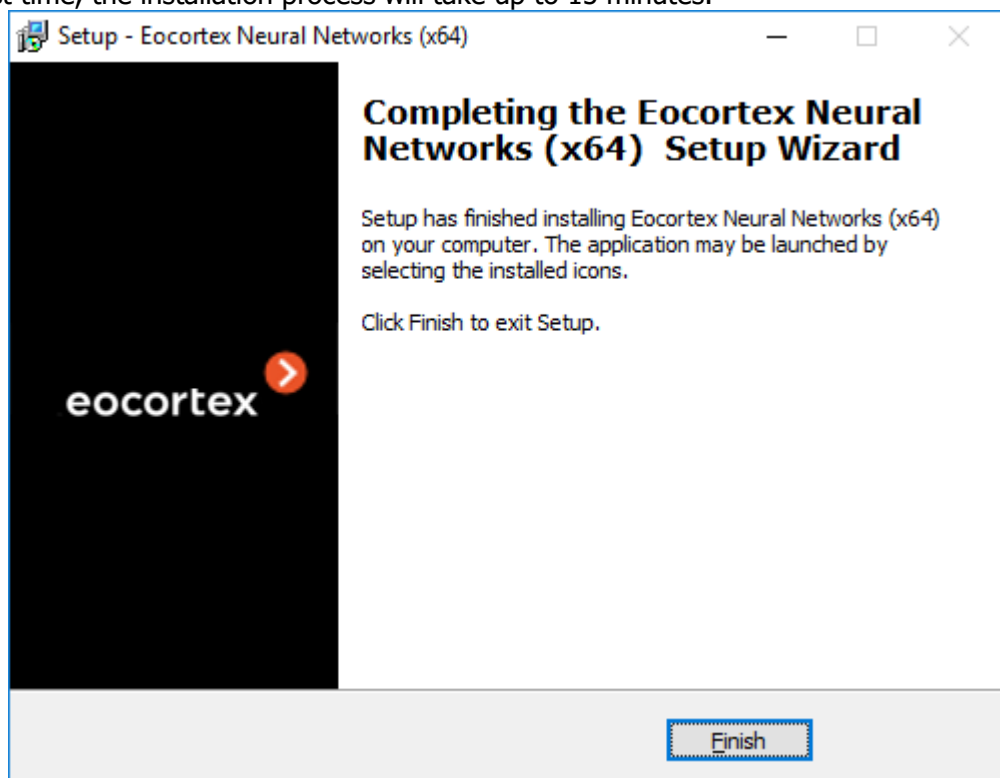




If the **Eocortex Neural Networks Standard** package was previously installed on the computer, the optimization of neural networks data will be performed during the installation process. This operation takes a significant amount of time and can take up to one hour.



If the **Eocortex Neural Networks Special** package is updating or installing for the first time, the installation process will take up to 15 minutes.



Installation under Linux

Pre-install preparations

The **Eocortex Neural Networks Special** package for Linux is directly dependent on the **Eocortex Server** application being deployed on the computer at the installation moment. It is necessary to install **Eocortex Server** before installing the **Eocortex Neural Networks Special** package.

The **Eocortex Neural Networks Special** package does not have an analysis mode without using the GPU, so before installing the package, it is necessary to install the latest drivers for the graphics card from the [official NVIDIA website](#).

The Nouveau kernel module, which provides graphics support for Linux, is not suitable for GPU analysis.

Installation of graphics card driver

The driver installation process may vary depending on your operating system. The instructions below are provided as an example, alternative installation methods can be found in the documentation for the selected operating system.

All actions must be performed as a user with administrator privileges.

Ubuntu

Find the appropriate driver package in the repository by running the command in the Terminal:

```
sudo ubuntu-drivers devices
```

Install the selected driver package:

```
sudo apt install nvidia-driver-[version]
```

Where **nvidia-driver-[version]** is the actual name of the package.

Reboot the OS:

```
sudo reboot
```

Check that the drivers have been installed successfully:

```
sudo lshw -c video
```

Check that the graphic card is successfully initialized by the OS:

```
sudo nvidia-smi
```

Debian

Download the appropriate driver package from the [NVIDIA official website](#).

Install kernel header files:

```
sudo apt-get install linux-headers-$(uname -r)
```

Install the **build-essentials** metapackage:

```
sudo apt-get install build-essential
```

Deactivate the Nouveau module. Open the **/etc/default/grub** file with a text editor and add the following to the **GRUB_CMDLINE_LINUX** line:

```
rd.driver.blacklist=nouveau nouveau.modeset=0
```

Put the Nouveau module into the blacklist. Edit (or create) the **/etc/modprobe.d/blacklist.conf** file with a text editor, and add the line below to the end of it:

```
blacklist nouveau
```

Update the bootloader configuration by running the following command in the Terminal:

```
sudo update-grub
```

Update the file system image by running the following command in the Terminal:

```
sudo update-initramfs -u
```

If X server is enabled, disable GUI startup after reboot:

```
sudo systemctl isolate multi-user.target
```

Reboot the OS:

```
sudo reboot
```

Browse to the directory with the previously downloaded driver package.

Grant the execution privileges to the previously downloaded package:

```
chmod a+x NVIDIA-Linux-x86_64-[version].run
```

Where **NVIDIA-Linux-x86_64-[version]** is the actual name of the package.

Install the driver package:

```
sudo ./NVIDIA-Linux-x86_64-[version].run
```

Where **NVIDIA-Linux-x86_64-[version]** is the actual name of the package.

Reboot the OS again:

```
sudo reboot
```

CentOS 7

Download the appropriate driver package from the [NVIDIA official website](#).

Install kernel header files:

```
sudo yum -y install kernel-devel
```

Install the **Development Tools** metapackage:

```
sudo yum -y groupinstall "Development Tools"
```

Deactivate the Nouveau module. Open the **/etc/default/grub** file with a text editor and add the following to the **GRUB_CMDLINE_LINUX** line:

```
rd.driver.blacklist=nouveau nouveau.modeset=0
```

Put the Nouveau module into the blacklist. Edit (or create) the **/etc/modprobe.d/blacklist.conf** file with a text editor, and add the line below to the end of it:

```
blacklist nouveau
```

Update the bootloader configuration by running the following command in the Terminal:

```
sudo grub2-mkconfig -o /boot/grub2/grub.cfg
```

Update the file system image by running the following command in the Terminal:

```
sudo mv /boot/initramfs-$(uname -r).img /boot/initramfs-$(uname -r)-nouveau.img
sudo dracut /boot/initramfs-$(uname -r).img $(uname -r)
```

If X server is enabled, disable GUI startup after reboot:

```
sudo systemctl isolate multi-user.target
```

Reboot the OS:

```
sudo reboot
```

Browse to the directory with the previously downloaded driver package.

Grant the execution privileges to the previously downloaded package:

```
chmod a+x NVIDIA-Linux-x86_64-[version].run
```

Where **NVIDIA-Linux-x86_64-[version]** is the actual name of the package.

Install the driver package:

```
sudo ./NVIDIA-Linux-x86_64-[version].run -kernel-source-
path=/usr/src/kernels/{kernel_version}
```


Where **NVIDIA-Linux-x86_64-[version]** is the actual name of the package and **{kernel_version}** is the actual OS kernel version.

Reboot the OS again:

```
sudo reboot
```

Installation of the package

Eocortex Neural Networks Special for Linux comes as a single installation package named **eocortex-neural-networks-gpu-optimized**.

The **eocortex-neural-networks-cpu** and **eocortex-neural-networks-gpu** packages available in the repository belong to the **Eocortex Neural Networks Standard**. This is a separate neural network package, installation of which is not required when deploying the **Eocortex Neural Networks Special** package.

If the **Eocortex Neural Networks Standard** package was previously installed on the computer, the optimization of neural networks data will be performed during the installation process. This operation takes a significant amount of time and can take up to one hour.

If the **Eocortex Neural Networks Special** package is updating or installing for the first time, the installation process will take up to 15 minutes.

Installation of the **Eocortex Neural Networks Standard** package on Linux can be performed in two ways:

- **Online**, when the installation package is fetched from the **Eocortex** repository along with all dependency packages. Requires Internet access on the computer.
- **Offline**, when the installation package must be pre-downloaded from the **Eocortex** repository, and all dependency packages must be installed manually. Does not require Internet access on the computer.

Before installing the **Eocortex Neural Networks Special** package, ensure that the **Eocortex Server** application is installed on the computer.

Online installation

Stop the **Eocortex Server** application:

```
sudo systemctl stop eocortex
```

Run the installation of the neural network package with the corresponding command:

Ubuntu/Debian:

```
sudo apt-get install eocortex-neural-networks-gpu-optimized
```

CentOS 7:

```
sudo yum install eocortex-neural-networks-gpu-optimized
```

Wait until the installation process including neural network data optimization is complete.

Start the **Eocortex Server** application back:

```
sudo systemctl start eocortex
```

Offline installation

Make sure that all required dependency packages are installed on the computer:

- cuda-license-11-0
- cuda-cudart-11-0

- cuda-cublas-11-0
- cuda-cufft-11-0
- cuda-curand-11-0
- cuda-cusolver-11-0
- cuda-cusparse-11-0
- cuda-npp-11-0
- cuda-nvgraph-11-0
- cuda-nvjpeg-11-0
- cuda-nvrtc-11-0
- cuda-libraries-11-0

If a dependency package is missing or its version does not match, download and install the missing package from the repository.

Ubuntu/Debian:

```
http://packages.eocortex.com/deb/public/pool/main/c/  
http://packages.eocortex.com/deb/public/pool/main/libc/  
http://packages.eocortex.com/deb/public/pool/main/libn/
```

CentOS 7:

```
http://packages.eocortex.com/rpm/
```

Download the **eocortex-neural-networks-gpu-optimized** package from the repository.

Ubuntu/Debian:

```
http://packages.eocortex.com/deb/public/pool/main/e/eocortex-neural-networks-gpu-  
optimized
```

CentOS 7:

```
http://packages.eocortex.com/rpm/
```

Stop the **Eocortex Server** application:

```
sudo systemctl stop eocortex
```

Browse to the directory with the previously downloaded neural network package and run the installation.

Ubuntu/Debian:

```
dpkg -i eocortex-neural-networks-gpu-optimized_[version]_amd64.deb
```

CentOS 7:

```
yum install eocortex-neural-networks-gpu-optimized_[version]_amd64.deb
```

Where [version] is the actual version of the package.

Wait until the installation process including neural network data optimization is complete.

Start the **Eocortex Server** application back:

```
sudo systemctl start eocortex
```

Installing and updating the license

To license an **Eocortex** server, it is required to activate a license bound to a software key or a USB key.

The license can be local or floating:

- A **local license** is bound to the local key installed directly on the computer with the licensed server application of **Eocortex**. The features specified in the license will be only available for the cameras bound to the given server.
- A **floating license** is bound to the network key installed on any of the servers accessible from the licensed computer in the local network. The network licenses provide [floating licensing](#).

To update the license of a previously activated key, activate the procedure for this key again.

When transferring USB key to another computer, install and activate the license on the new computer. For offline activation, use the existing license file for this key.

Several different types of keys may be installed on the server - both multiple hardware (USB) keys and one software key. Only one key can be activated. If you need to use a license for another key on the server, you should run the license installation procedure and activate that key.

When installing and upgrading the license, it's preferable to provide Internet connection to the server, as the most convenient way of key activation its automatic activation via the Internet. Generally, key installation and activation requires the performance of the sequence of steps, offered by the wizard, which are predefined by default.

The Sentinel (HASP) software key that is installed on a physical machine binds to the hard drive serial number, motherboard ID, and other hardware components, including processors and network cards. If the hard drive or motherboard fails, the license tied to this key will only be active if most of the other system components remain unchanged.

The Sentinel (HASP) software key that is installed on a virtual machine binds to the virtual MAC address, CPU properties, and UUID of the virtual machine. If any of specified components mismatches, the license bound to this key will become inactive.

The total number of cameras, modules and other licensed features are shown in the floating license. The administrator of a video surveillance system can distribute the cameras among servers at his/her discretion. However, it is not required to distribute the licenses among servers because the system core does it automatically. Whereby, upon binding the cameras to another server, the corresponding licenses will be moved accordingly.

Only one license can be activated on a single server, irrespective of whether this license is local or floating.

The network key must be installed on a computer where the **Eocortex** server is installed.

The network keys can only be used on the **Eocortex** servers of versions 3.1 and later. It is not possible to use the network keys on the earlier versions of the software, even as local keys.

In order to ensure access to a network key, it is required to allow the outgoing TCP and UDP traffic for the 1947 port both on the server where the key is installed and on the servers that use this key.

A single network key can be used in several **Eocortex** video surveillance systems. In such a case, the parameters of the key will not be shown correctly in the **Eocortex Configurator** application of each system because the systems have no information regarding the usage of licenses by other systems.

A network key is to be installed on any **Eocortex** server of the same local network or VLAN where the servers using that key are located.

Several network and local keys can be installed in the same **Eocortex** video surveillance system. However, the number of local keys is limited by the quantity of **Eocortex** servers, but the number of network keys is unlimited.

The floating licenses can be used on any Sentinel (HASP) keys, be it software or USB ones.

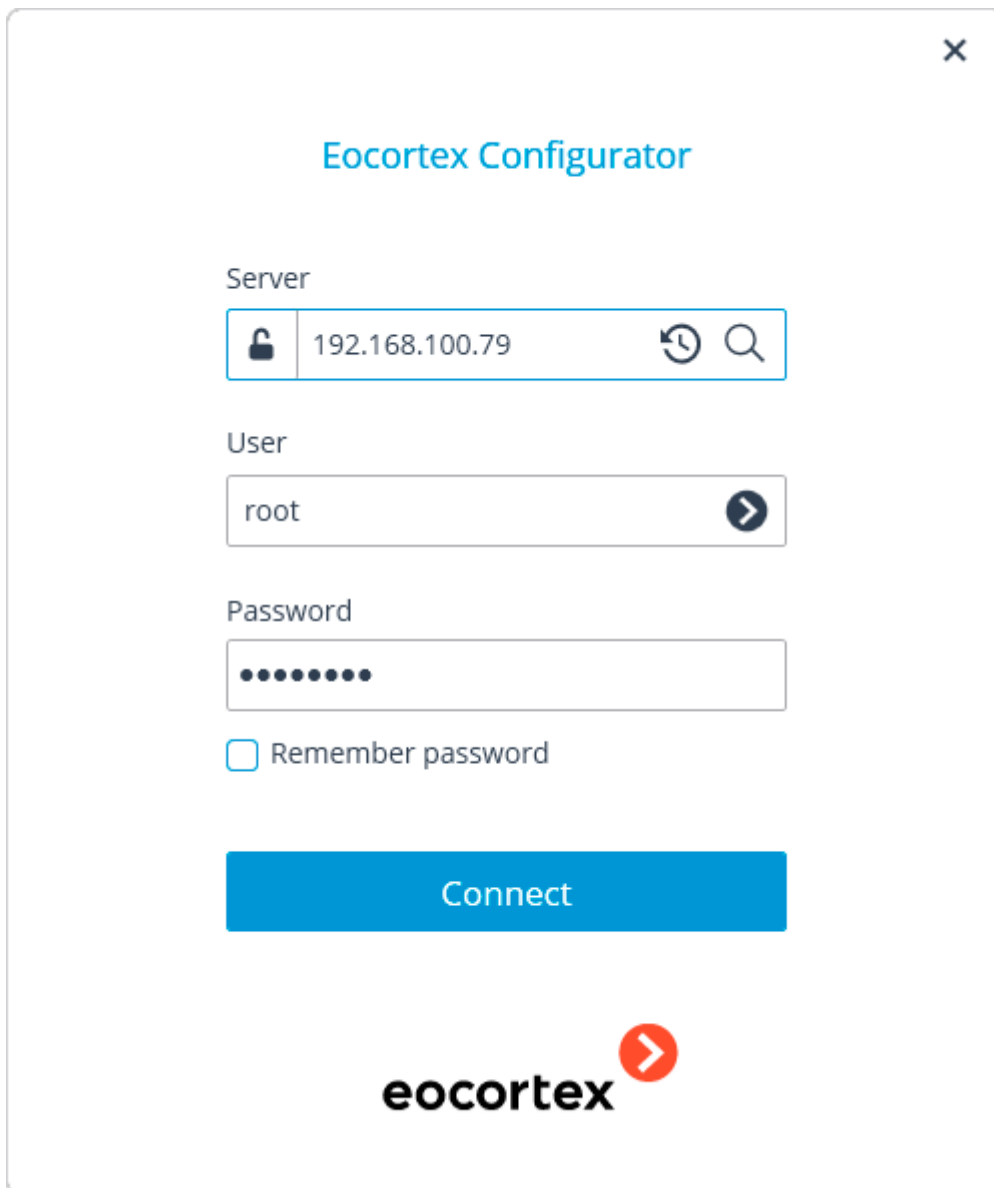
USB key online activation

In order to install and activate a key, the user has to obtain an activation code, which looks like **XXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX**, where **X** can be hex digit (i.e., 0123456789abcdef). Here's an example of the activation code: **a46a6d3e-17f6-416c-9da2-10cb4b80574e**.

In order to install and activate a USB key, the **Eocortex Configurator** has to be launched on the server where the **Eocortex Server** (or **Eocortex Standalone**) application is installed.

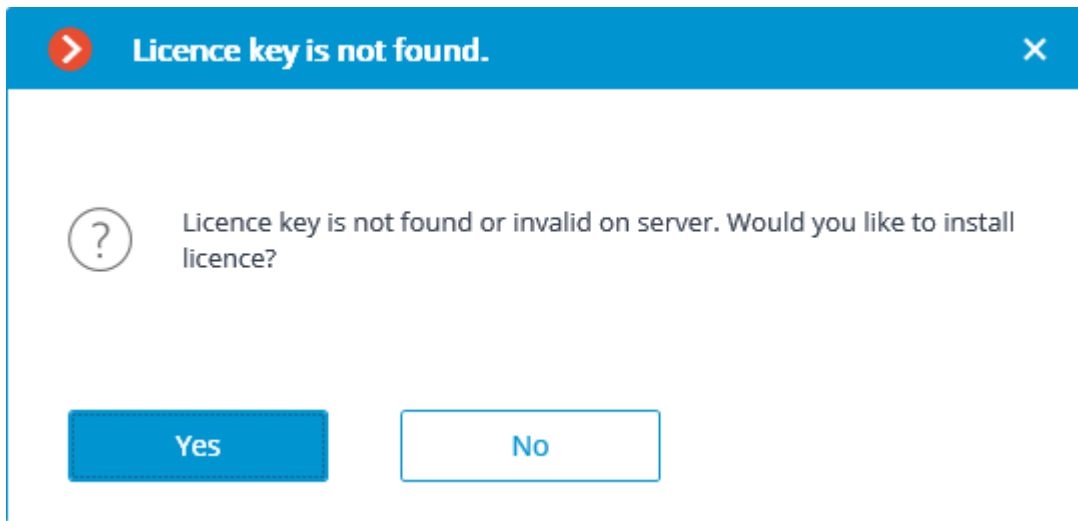
For online activation of the key installed on the server, it is required that this server has access to the Internet.

To install, activate, or update a license, you must run the **Eocortex Configurator**. In the opened authorization window, select the server, specify the account type, enter the user name and password with configuration rights, then click **Connect**.

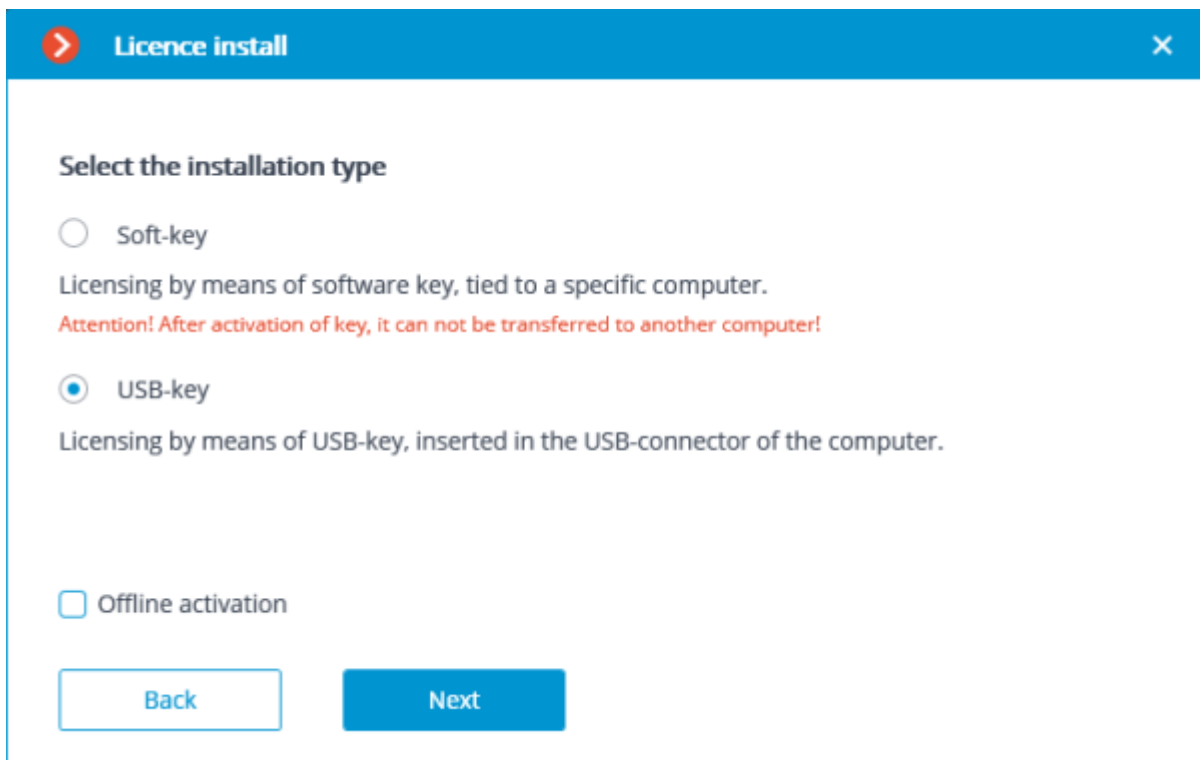


The image shows a screenshot of the Eocortex Configurator application window. The window has a title bar with a close button (X) in the top right corner. The main content area is titled "Eocortex Configurator" in blue text. Below the title, there are three input fields: "Server" with a lock icon and a search icon, "User" with a right arrow icon, and "Password" with a masked password (dots). Below the password field is a checkbox labeled "Remember password". At the bottom of the form is a large blue button labeled "Connect". At the very bottom of the window is the Eocortex logo, which consists of the word "eocortex" in black lowercase letters and a red circle with a white right-pointing arrow.

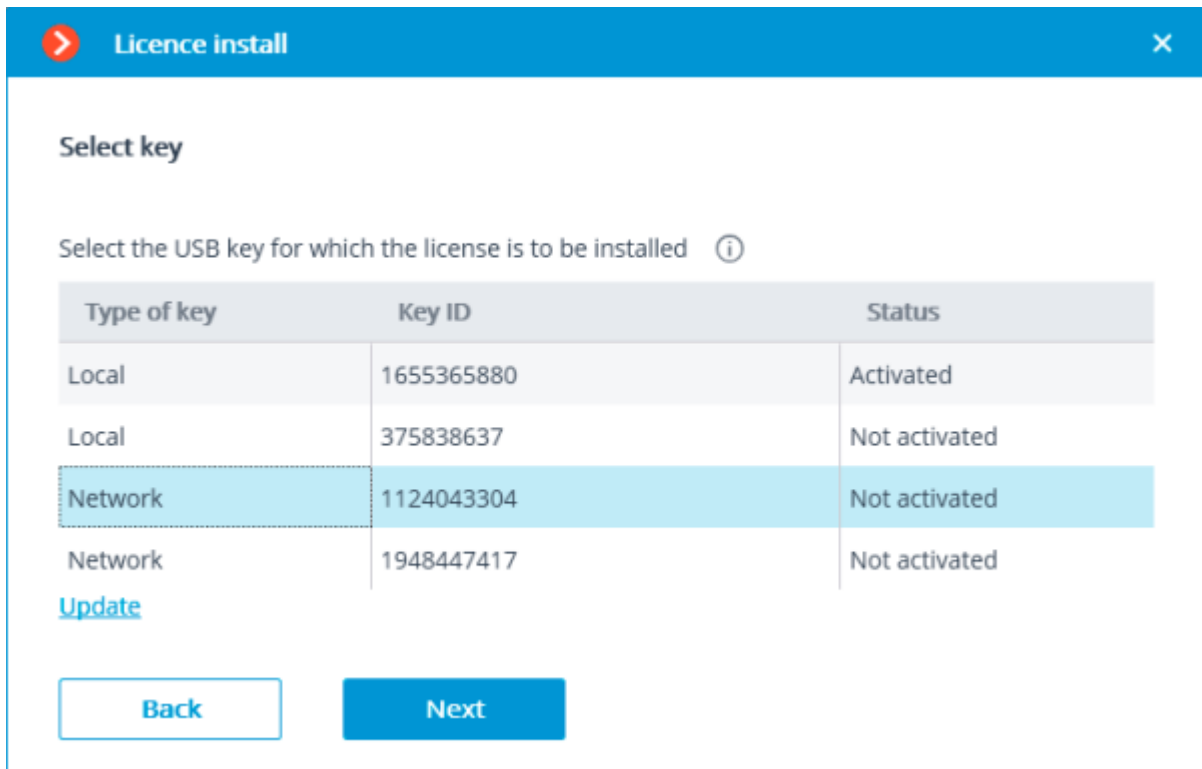
If no license is installed and activated on the server, you will be prompted to install the license. If accepted, the **License Installation** wizard will be launched.



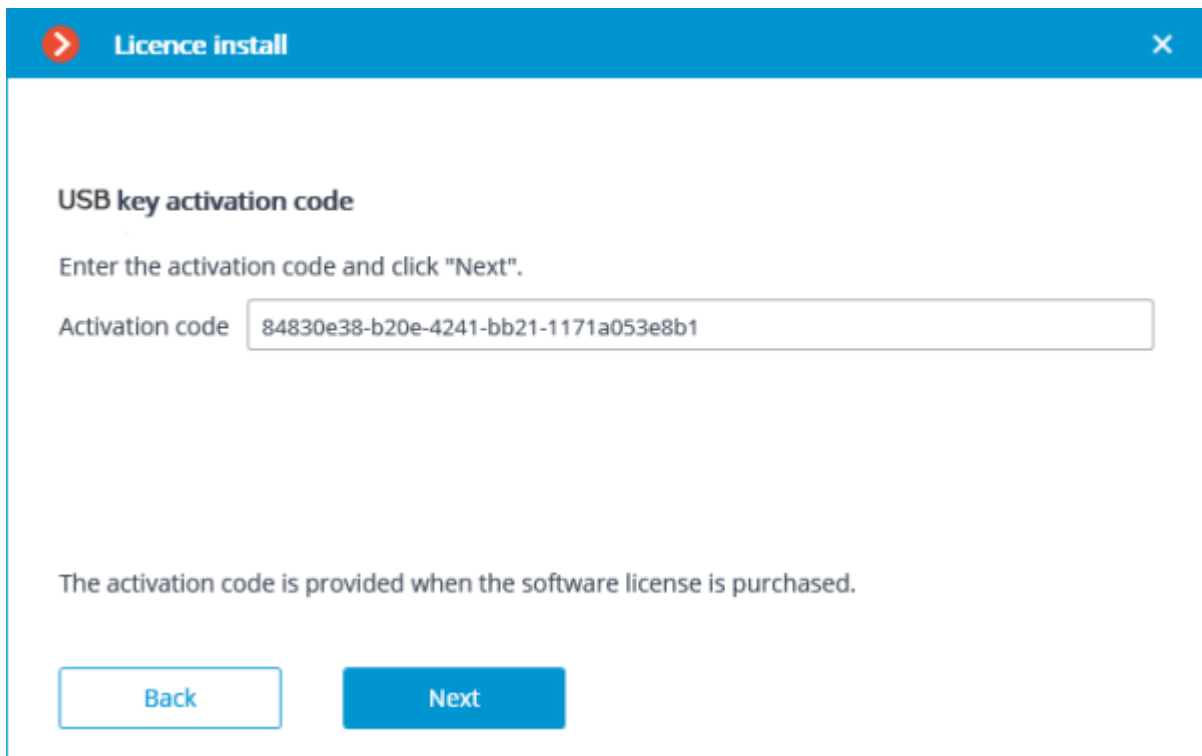
In order to install a USB key, it's required to choose the corresponding option on the **Select the installation type** page and press **Next**.



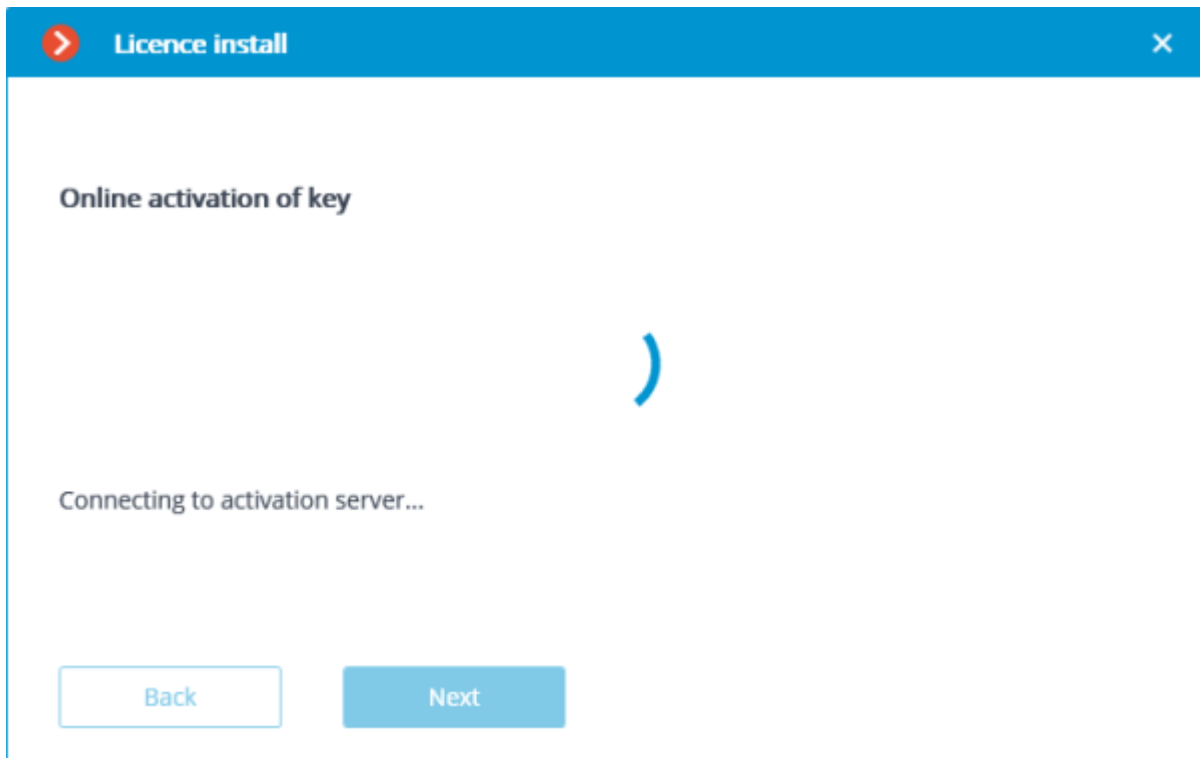
The **Select key** page will appear, showing the list of USB keys connected to the server and available network keys (network keys are available for some of the licenses only). To continue the installation process, the user has to choose the required key and press **Next**.



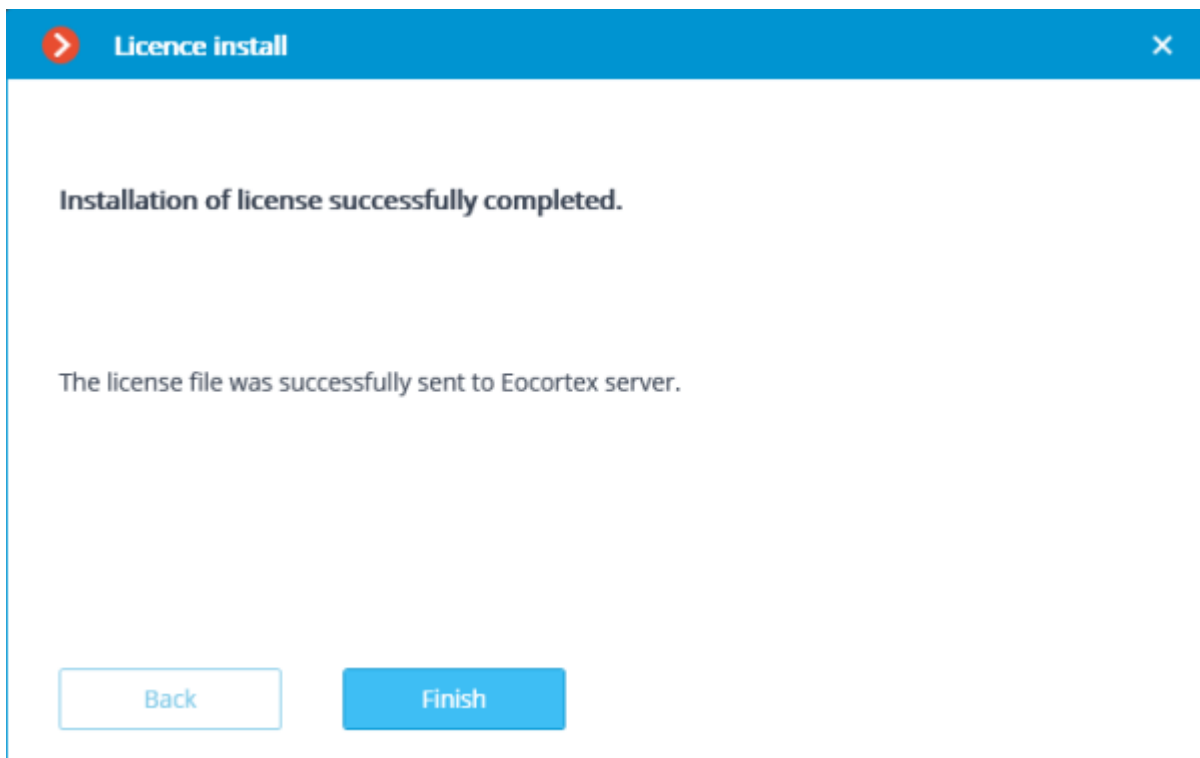
The following step, i.e. key activation, depends on the availability of the internet connection. If the connection is not available, please see the [USB key offline activation](#). If the internet connection is available, the Eocortex server will connect to a remote license activation server and try to activate the key in automatic mode in accordance with the licenses assigned to the key. If the key is being activated for the first time, the **USB key activation code** will be requested.



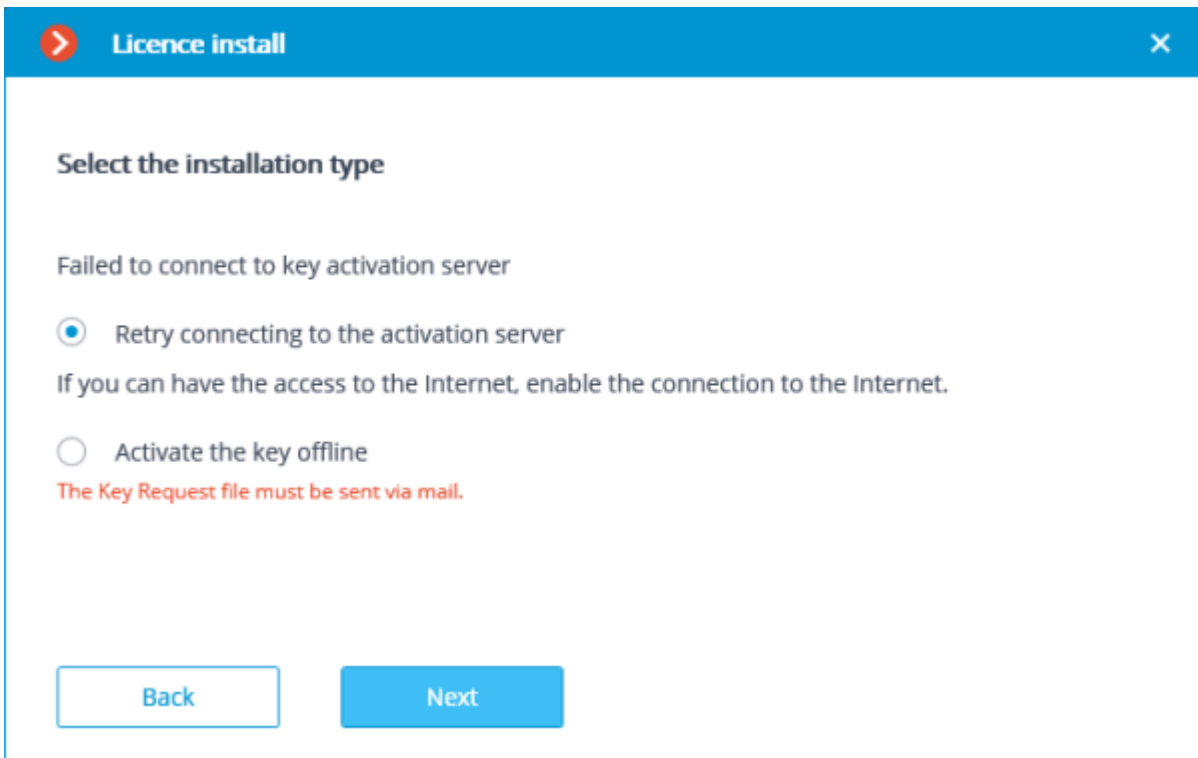
The online key activation page will be shown during the activation process.



In case of successful activation, the **License has been successfully installed** window will appear. In order to exit the license installation wizard, press **Finish**.



If an error occurs during activation, the user will see the **Failed to install the license** page. It will be required to finish the license installation process (press **Finish**), resolve the problem and start the license installation process from the beginning.



Possible online activation errors:

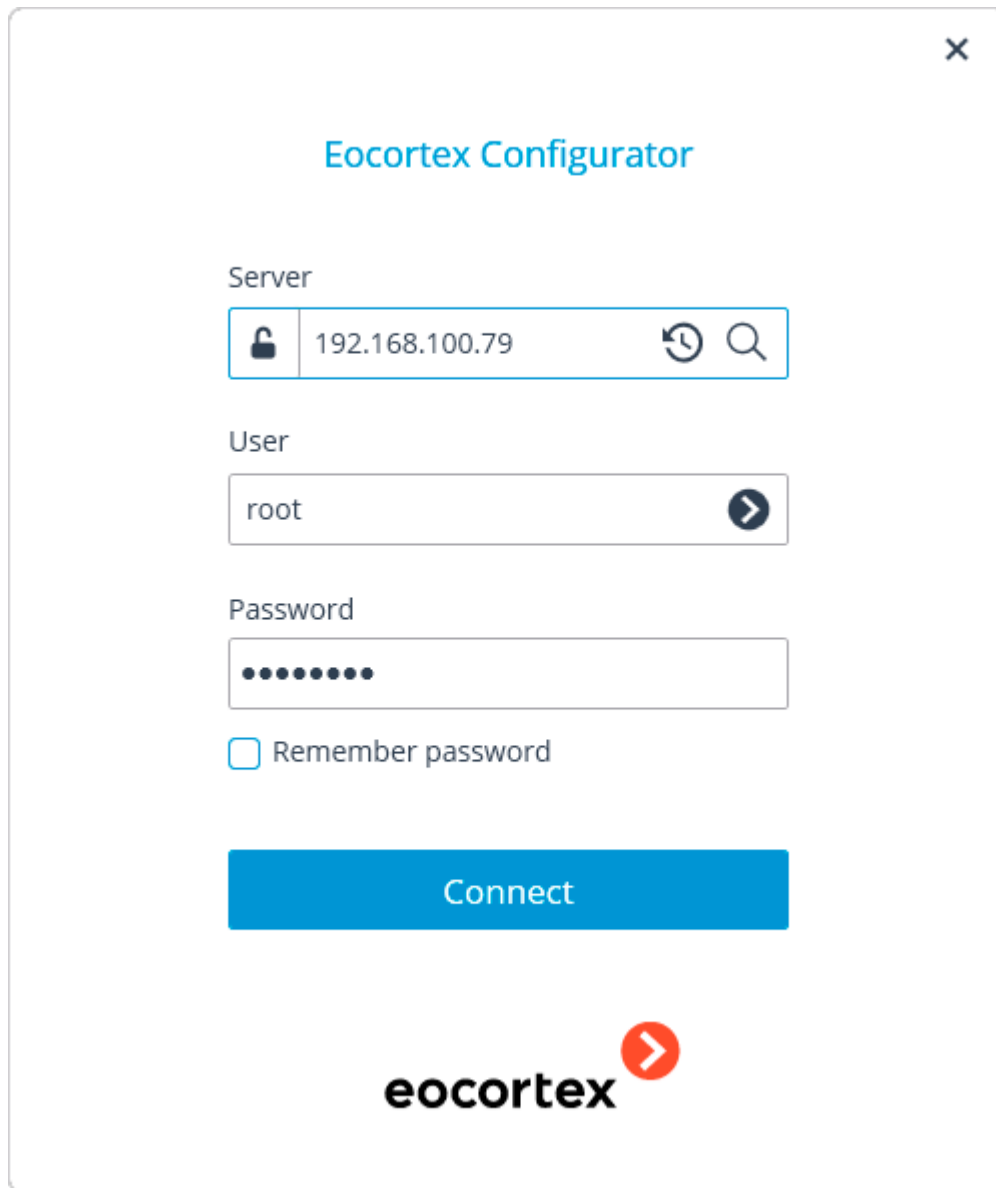
- connection with the activation server was interrupted during the activation process; e.g. due to a connection problem, low connection speed, or due to a problem with one of the route elements;
- the selected key has no assigned licenses. In such a situation, the user has to contact the license supplier (seller).

USB key offline activation

In order to install and activate a key, the user has to obtain an activation code, which looks like **XXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX**, where **X** can be hex digit (i.e., 0123456789abcdef). Here's an example of the activation code: **a46a6d3e-17f6-416c-9da2-10cb4b80574e**.

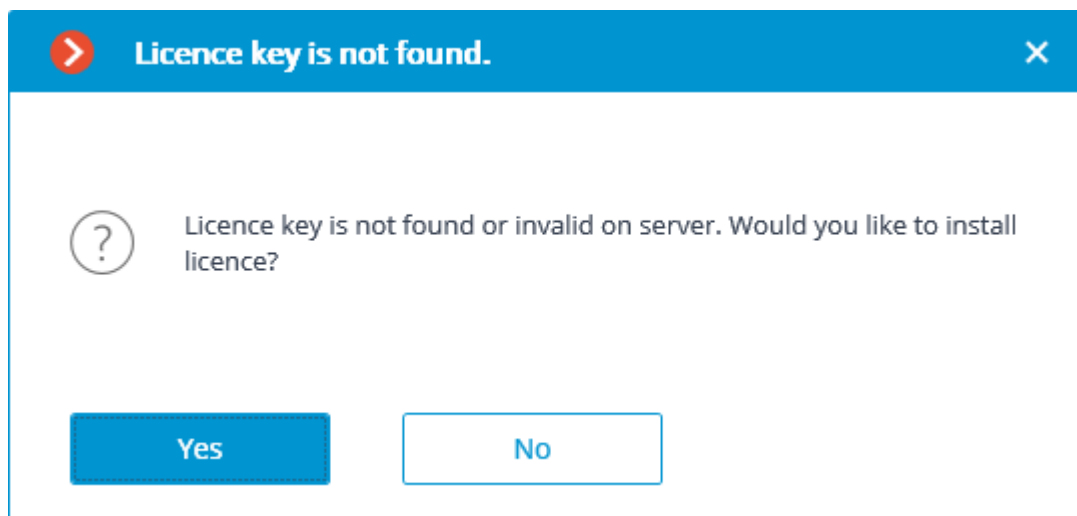
In order to install and activate a USB key, the **Eocortex Configurator** has to be launched on the server where the **Eocortex Server** (or **Eocortex Standalone**) application is installed.

To install, activate, or update a license, you must run the **Eocortex Configurator**. In the opened authorization window, select the server, specify the account type, enter the user name and password with configuration rights, then click **Connect**.



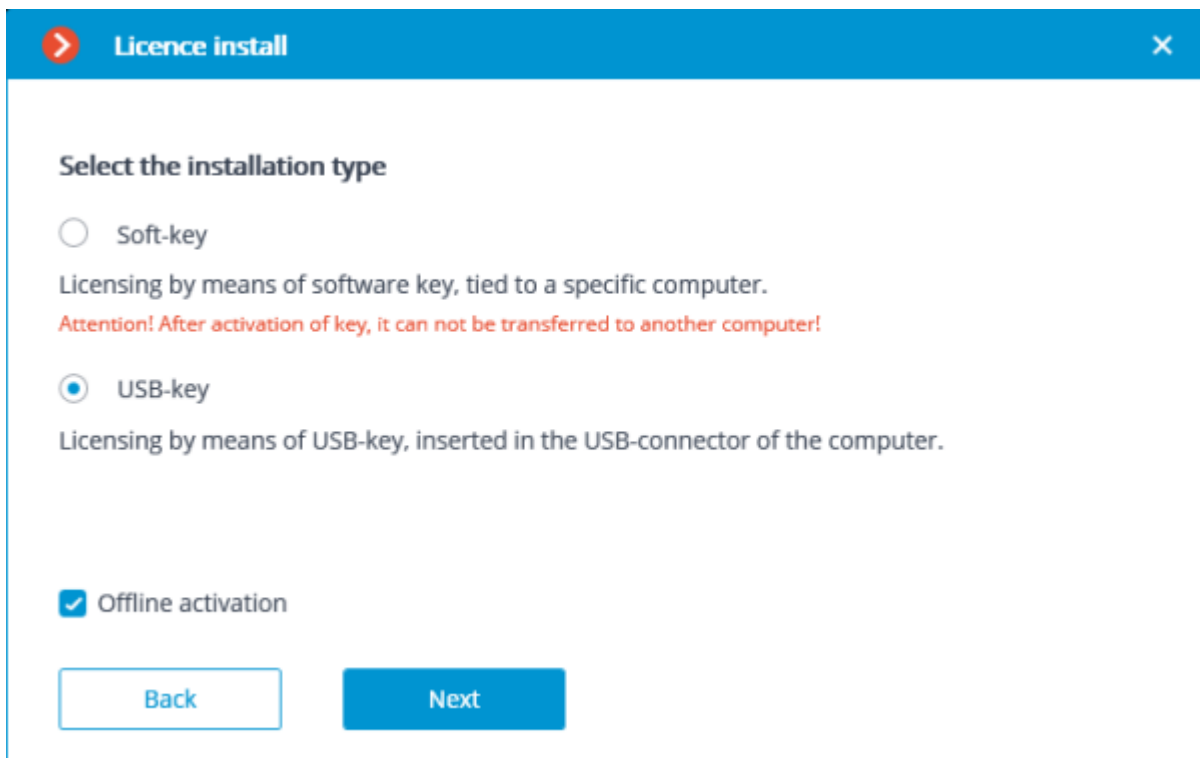
The image shows a dialog box titled "Eocortex Configurator" with a close button (X) in the top right corner. It contains three input fields: "Server" with a lock icon, a search icon, and a refresh icon, containing the IP address "192.168.100.79"; "User" containing "root" and a right arrow icon; and "Password" containing ten dots. Below the password field is a checkbox labeled "Remember password" which is unchecked. A large blue "Connect" button is centered below the inputs. At the bottom of the dialog is the "eocortex" logo, which consists of the word "eocortex" in black lowercase letters and a red circle with a white right-pointing arrow.

If no license is installed and activated on the server, you will be prompted to install the license. If accepted, the **License Installation** wizard will be launched.

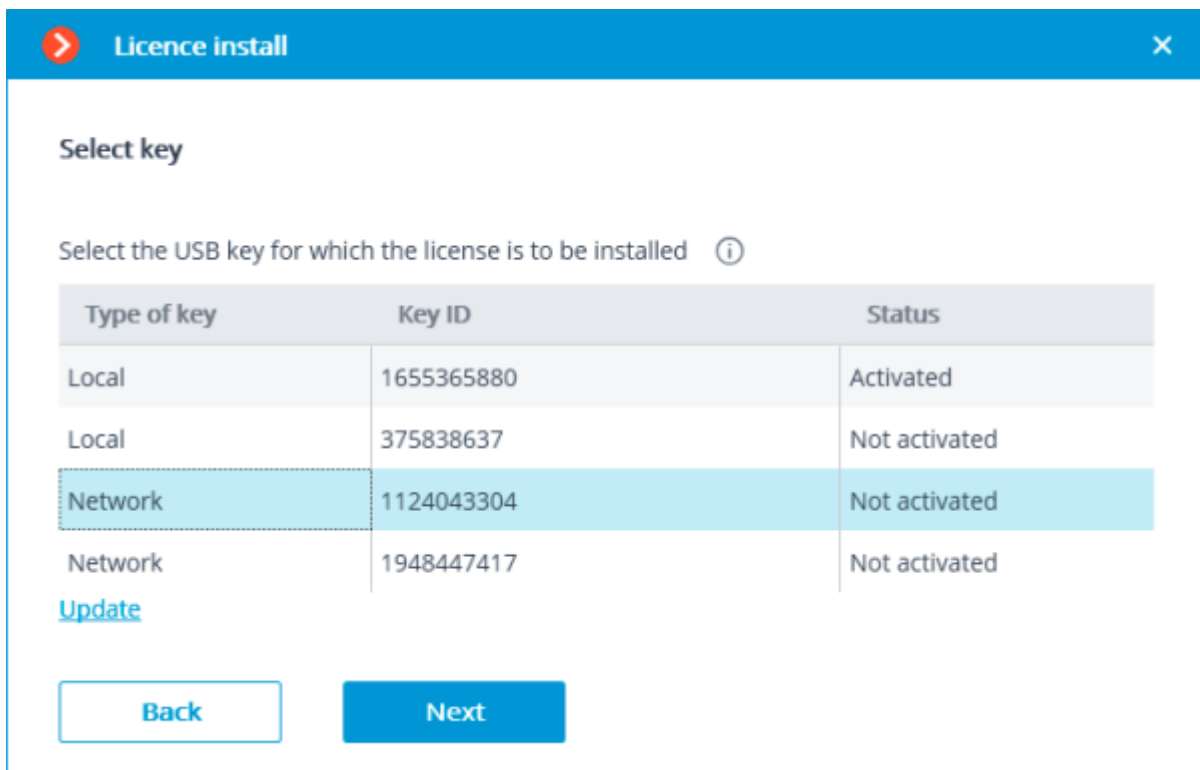


The image shows a dialog box with a blue header bar containing a red right arrow icon, the text "Licence key is not found.", and a close button (X). The main area has a question mark icon in a circle followed by the text "Licence key is not found or invalid on server. Would you like to install licence?". At the bottom, there are two buttons: a blue "Yes" button and a white "No" button with a blue border.

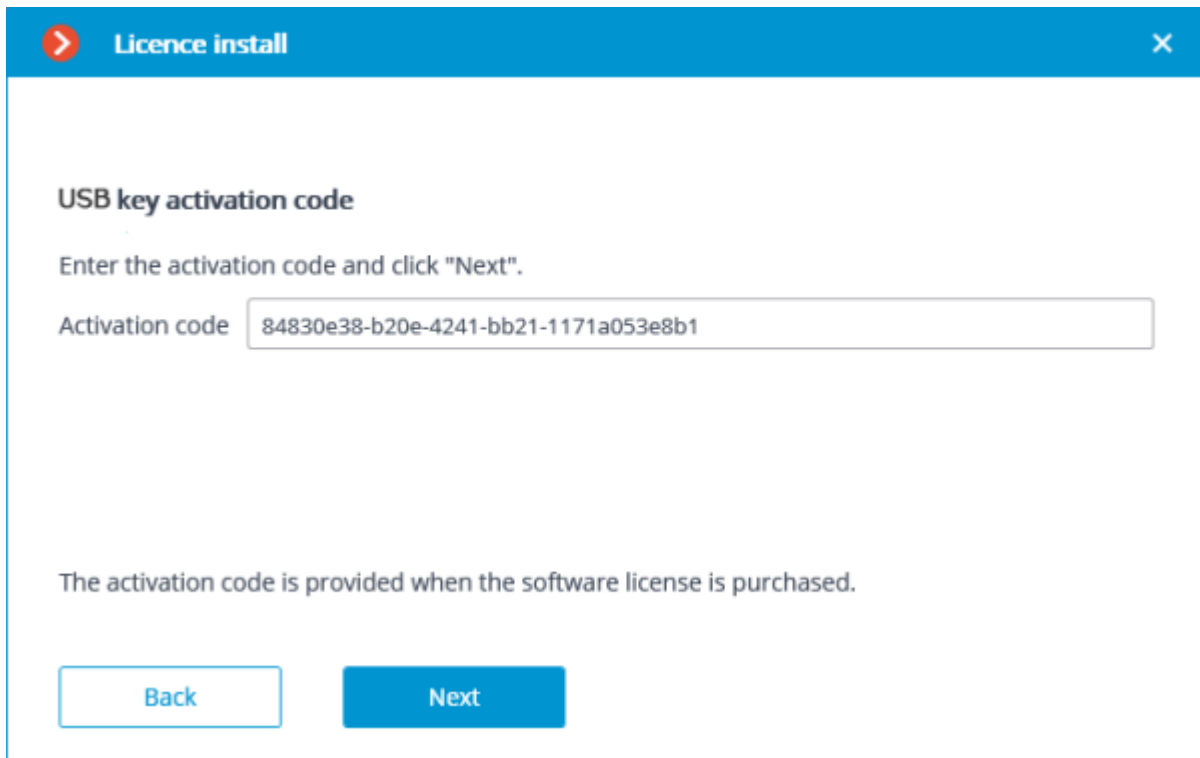
In order to install a USB key, it's required to choose the corresponding option on the **Select the installation type** page, tick the **Offline activation** checkbox and press **Next**.



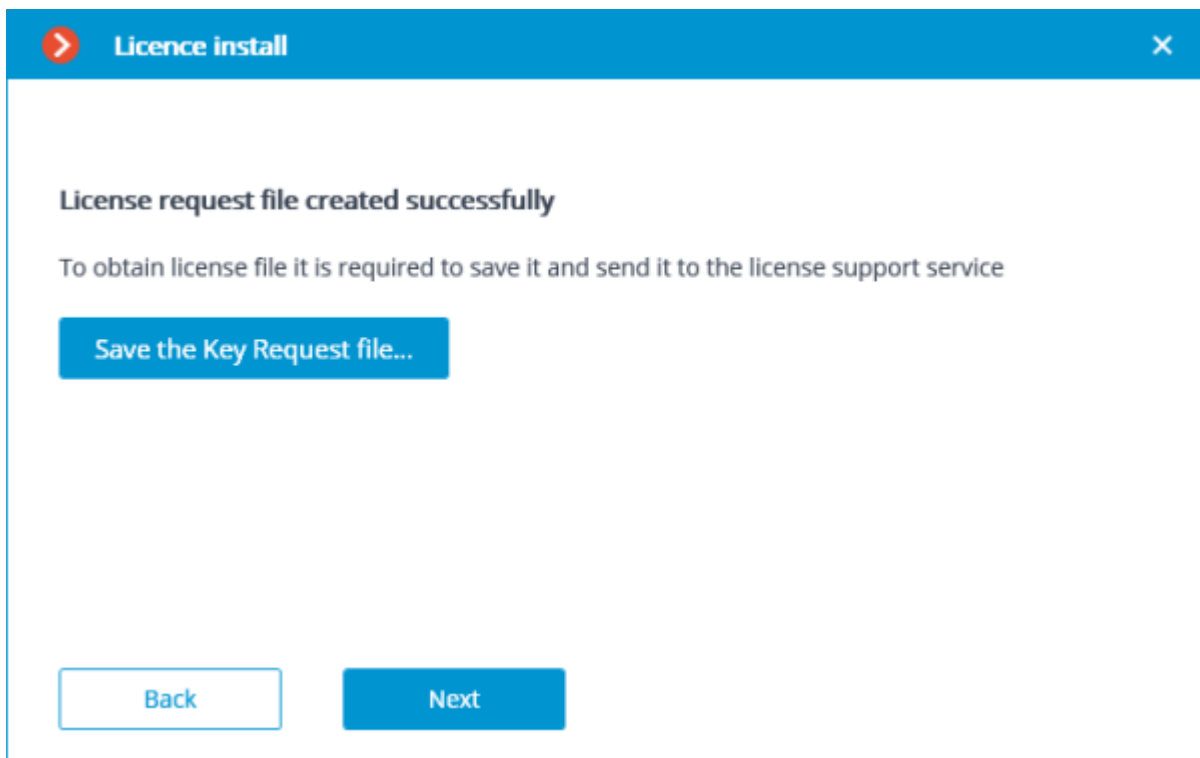
The **Select key** page will appear, showing the list of USB keys connected to the server and available network keys (network keys are available for some of the licenses only). To continue the installation process, the user has to choose the required key and press **Next**.



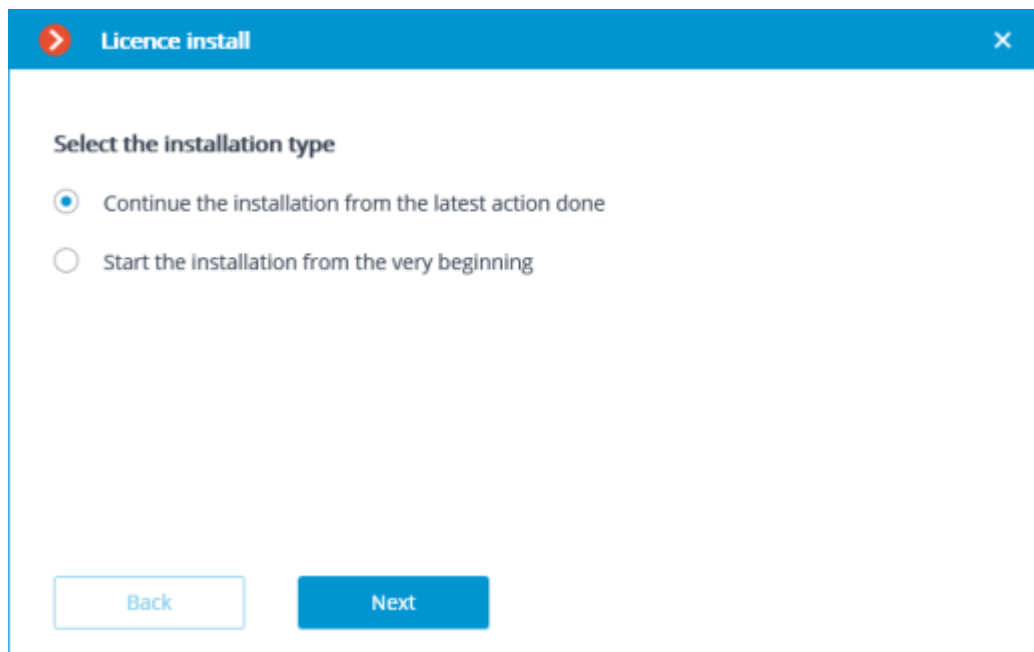
If the key is activated for the first time, the **USB key activation code** will be requested.



License request file created successfully window will be opened, where you should **Save the Key Request file...** and press **Next**.



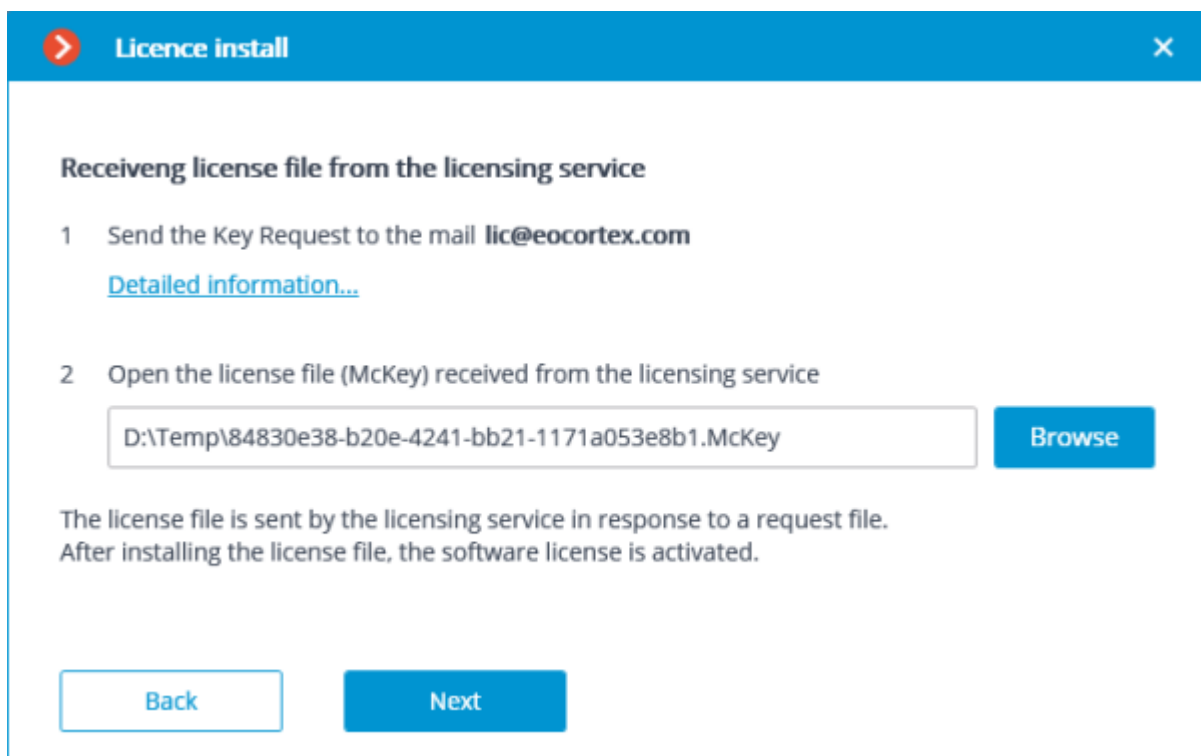
You may close the wizard after this step. At the next launch you will be prompted to continue the installation from the step at which it was interrupted.



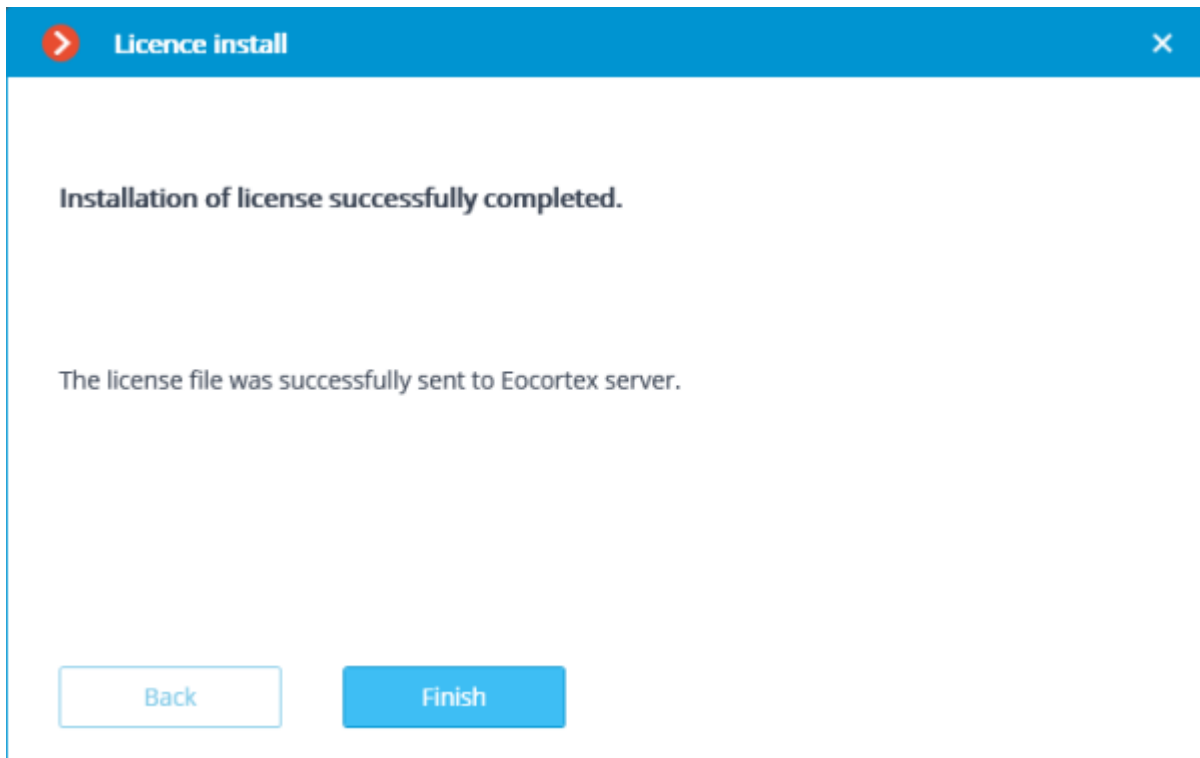
The created license request file (with ***.McKeyRequest** extension) has to be attached to an e-mail and sent to lic@eocortex.com. An e-mail with a ***.McKey** license file will be sent in response (keeping in mind that all answers are sent by the activation server in automatic mode, waiting after sending the license request file will take minimum time).

After receiving the license file, you must continue installation from the step at which the license file is installed (with the extension ***.McKey**). Select the license file the **Browse...** button, then press **Next**.

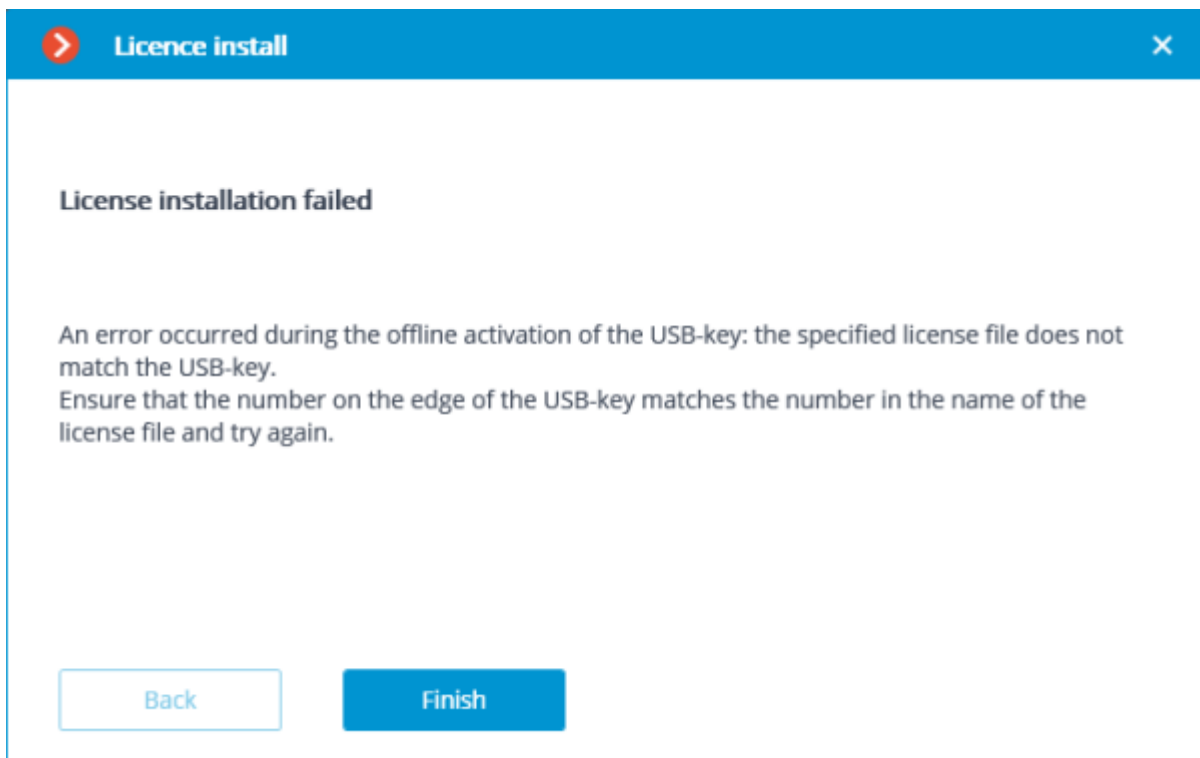
If the key has already been activated before, the license installation wizard will proceed to this step immediately after the key selection.



In case of successful activation the **Installation of license successfully completed** page will appear. Press **Finish** to exit the licensing wizard.



In case an error occurs during activation, the user will see the **Failed to install the license** page. It will be required to finish the license installation process (press **Finish**), resolve the problem and start the license installation process from the beginning.



The most probable cause of the offline activation error is the inconsistency between the license file and the USB key.

Software key online activation

In order to install and activate a key, the user has to obtain an activation code, which looks like **XXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX**, where **X** can be hex digit (i.e., 0123456789abcdef). Here's an example of the activation code: **a46a6d3e-17f6-416c-9da2-10cb4b80574e**.

It is prohibited to install more than one **Eocortex** software key on the server.

In order to install and activate a software key, the **Eocortex Configurator** has to be launched on the server, where the **Eocortex Server** (or **Eocortex Standalone**) application is installed.

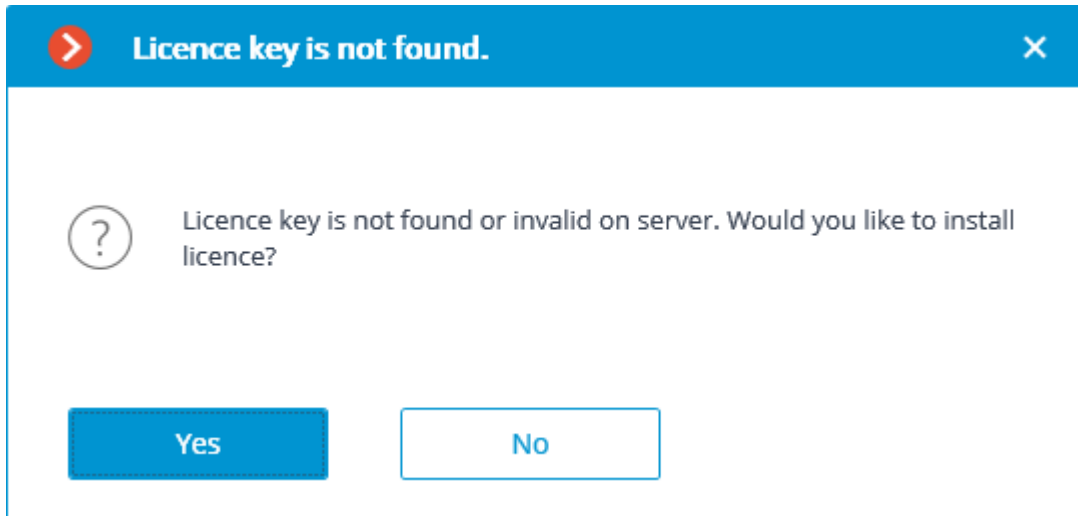
For online activation of the key installed on the server, it is necessary that this server has access to the Internet. If such connection is not available, please see the [Software key offline activation](#).

To install, activate, or update a license, you must run the **Eocortex Configurator**. In the opened authorization window, select the server, specify the account type, enter the user name and password with configuration rights, then click **Connect**.

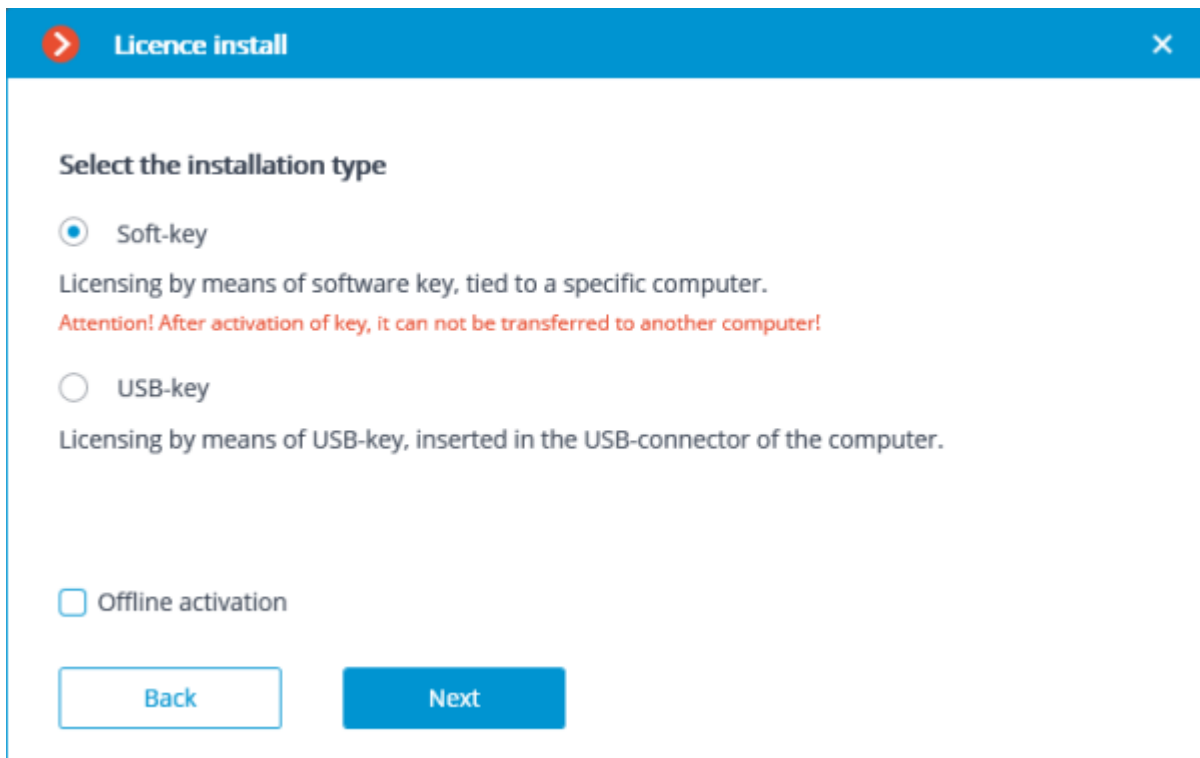
The screenshot shows a window titled "Eocortex Configurator" with a close button in the top right corner. The window contains the following elements:

- Server:** A text input field containing "192.168.100.79" with a lock icon on the left and refresh and search icons on the right.
- User:** A text input field containing "root" with a right-pointing arrow icon on the right.
- Password:** A text input field with masked characters represented by dots.
- Remember password:** An unchecked checkbox.
- Connect:** A large blue button with the text "Connect".
- Logo:** The "eocortex" logo with a red arrow icon to its right, located at the bottom center of the window.

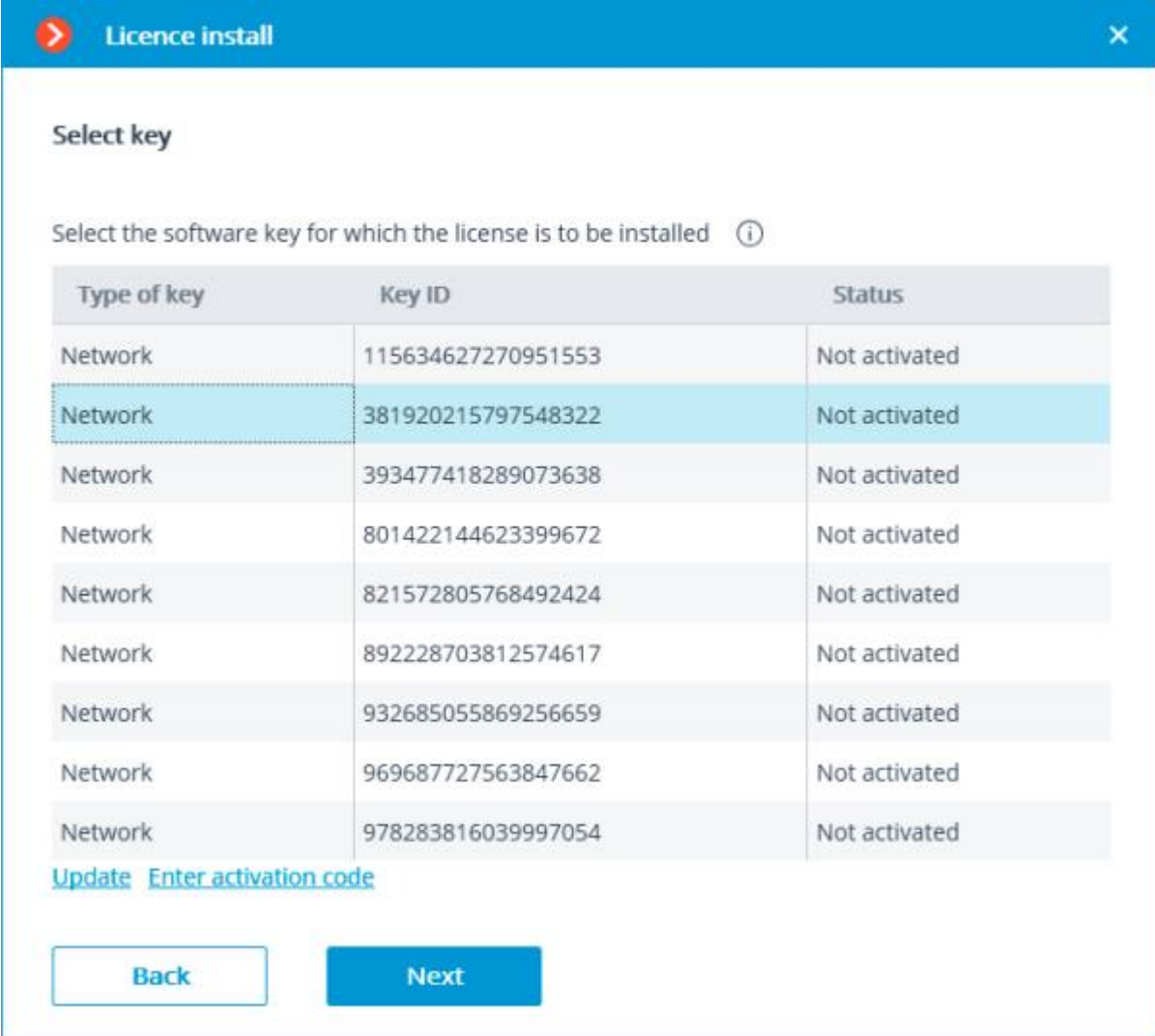
If no license is installed and activated on the server, you will be prompted to install the license. If accepted, the **License Installation** wizard will be launched.



In order to install the license software key, the user has to select the corresponding menu item on the **Select the installation type** page and press **Next**.



The **Select key** page will appear, showing the list of available software and network keys (network keys are available for some of the licenses only). To continue the installation process, the user has to choose the required key and press **Next**.



The screenshot shows a window titled "Licence install" with a close button in the top right corner. Below the title bar, the text "Select key" is displayed. A sub-instruction reads "Select the software key for which the license is to be installed" followed by an information icon. A table with three columns: "Type of key", "Key ID", and "Status" is shown. The second row of the table is highlighted in light blue. Below the table, there are two links: "Update" and "Enter activation code". At the bottom, there are two buttons: "Back" and "Next".

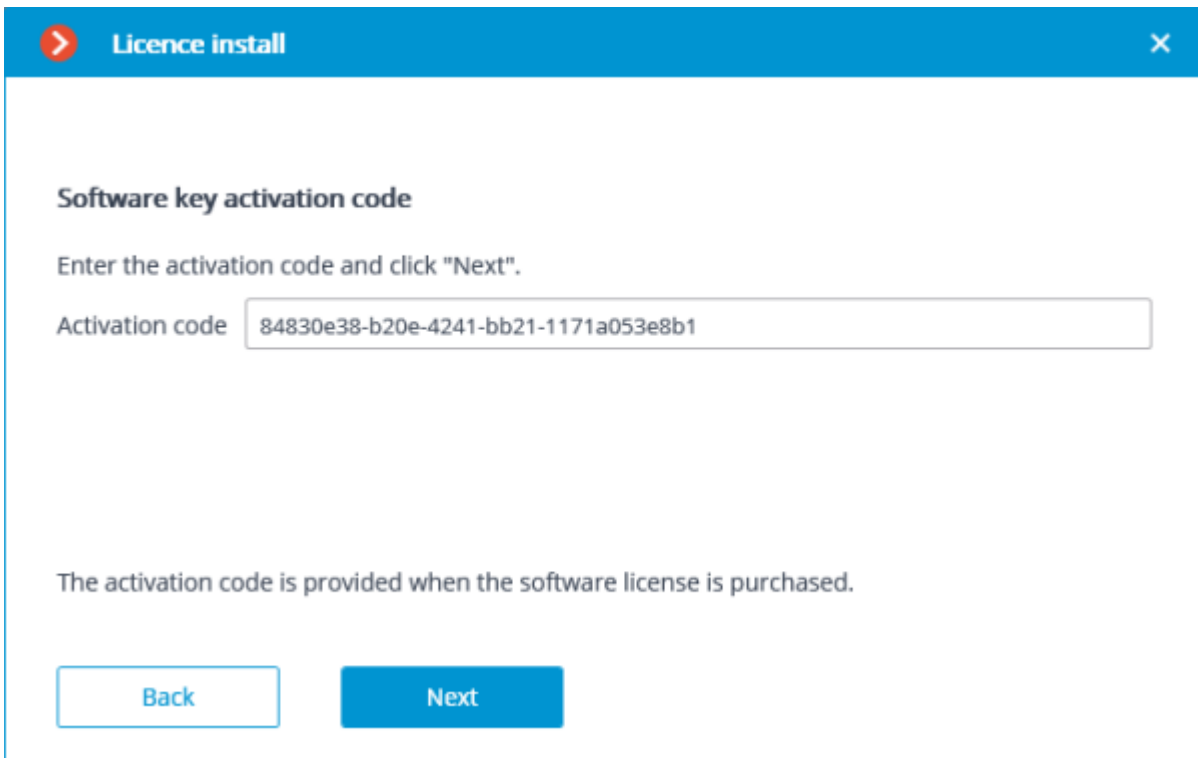
Type of key	Key ID	Status
Network	115634627270951553	Not activated
Network	381920215797548322	Not activated
Network	393477418289073638	Not activated
Network	801422144623399672	Not activated
Network	821572805768492424	Not activated
Network	892228703812574617	Not activated
Network	932685055869256659	Not activated
Network	969687727563847662	Not activated
Network	978283816039997054	Not activated

[Update](#) [Enter activation code](#)

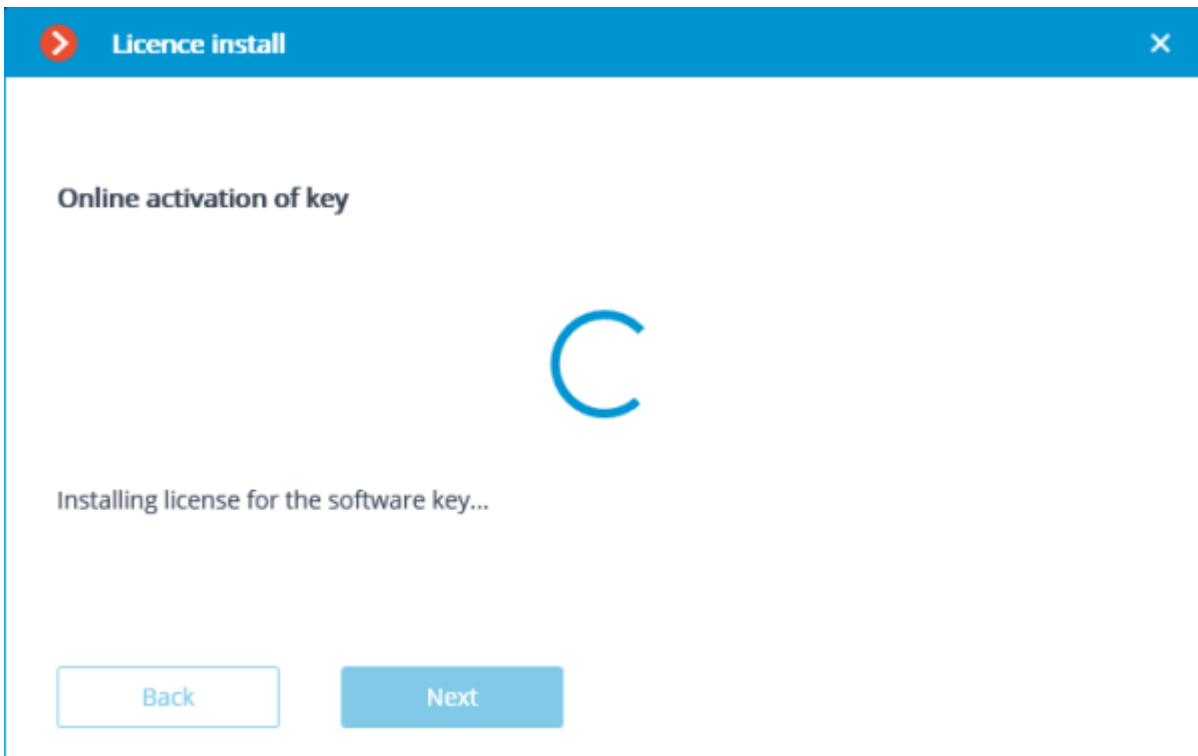
[Back](#) [Next](#)

After pressing **Next**, the software key is being linked to the computer, thus it's going to be impossible to transfer it to any other machine. If the activation process was launched mistakenly, the user has to press **Back** and close the **License installation** window.

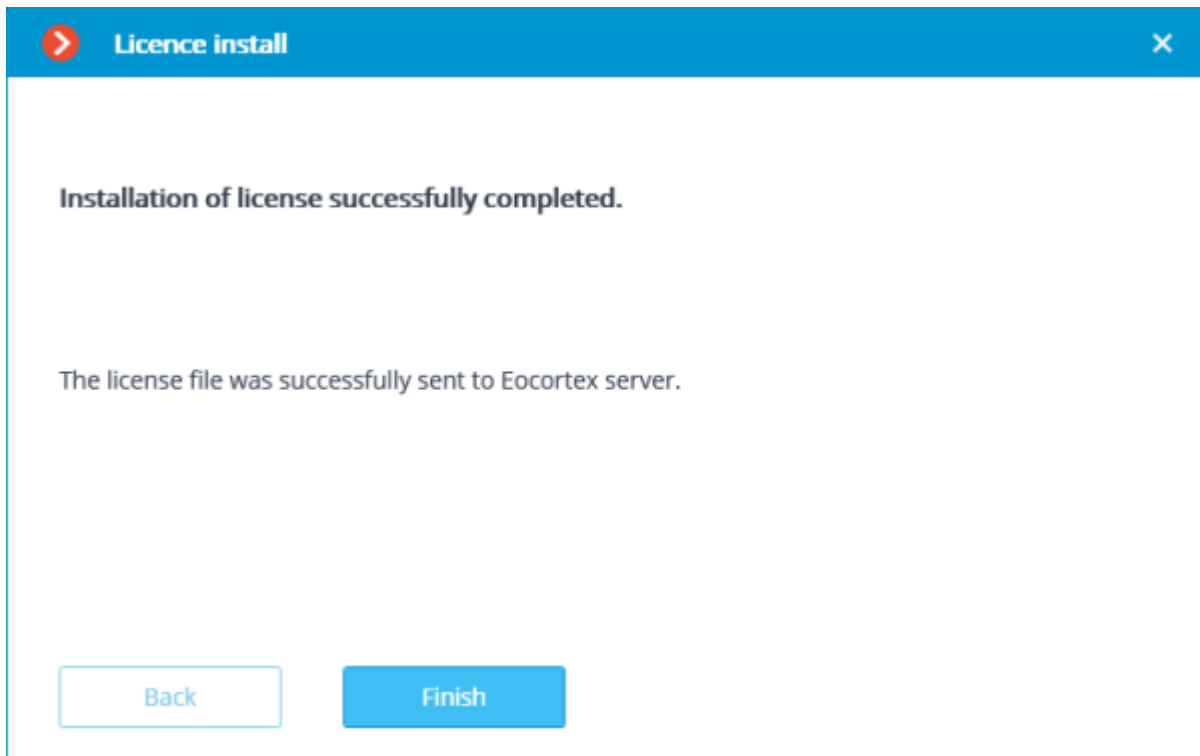
Next, the key activation code will be requested.



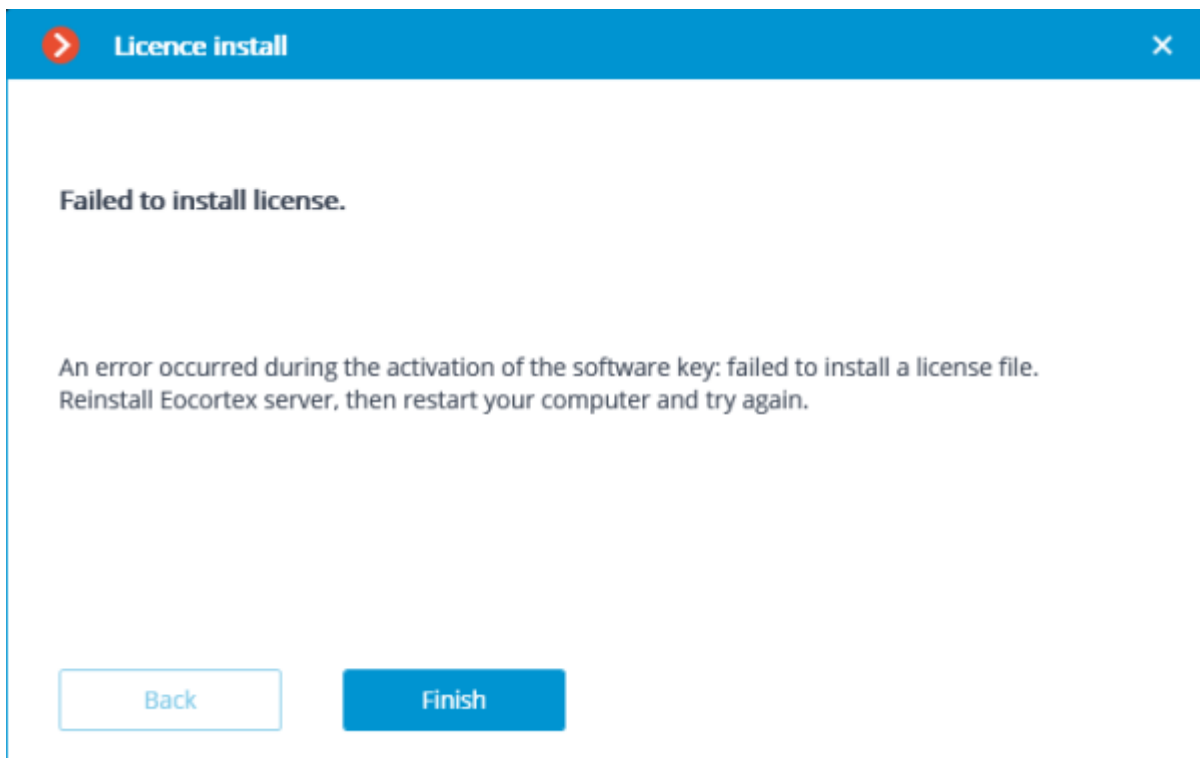
The next step is key activation. In case of an existing internet connection, after entering the code and pressing **Next**, the **Eocortex** server will connect to a remote license activation server and will try to perform automatic key activation in accordance with the licenses assigned to such key. The online activation of key page will be shown during the activation process.



In case of successful activation, the **Installation of license successfully completed** window will appear. In order to exit the licensing wizard, the user has to press **Finish**.



In case if an error occurs during activation, the user will see the **Failed to install license** page. It's required to finish the license installation process (press **Finish**), resolve the problem and start the license installation process from the very beginning.



Possible online activation errors:

- connection with the license activation server was interrupted during the activation process; e.g. due to a connection problem, low speed of connection or due to a problem with one of route elements
- the selected key has no assigned licenses. In such situation the user has to contact the license supplier (seller)

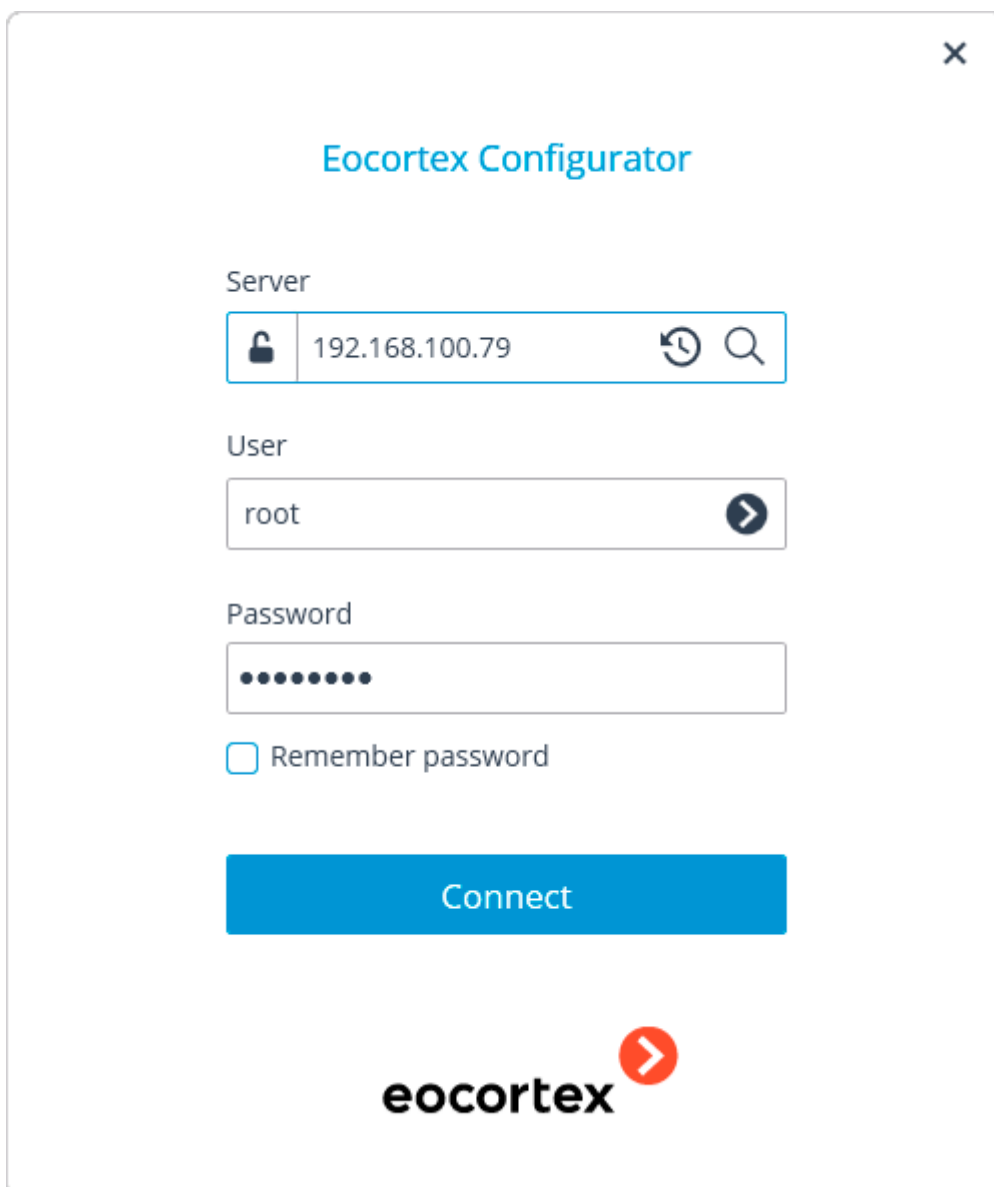
Software key offline activation

In order to install and activate a key, the user has to obtain an activation code, which looks like **XXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX**, where **X** can be hex digit (i.e., 0123456789abcdef). Here's an example of the activation code: **a46a6d3e-17f6-416c-9da2-10cb4b80574e**.

It is prohibited to install more than one **Eocortex** software key on the server.

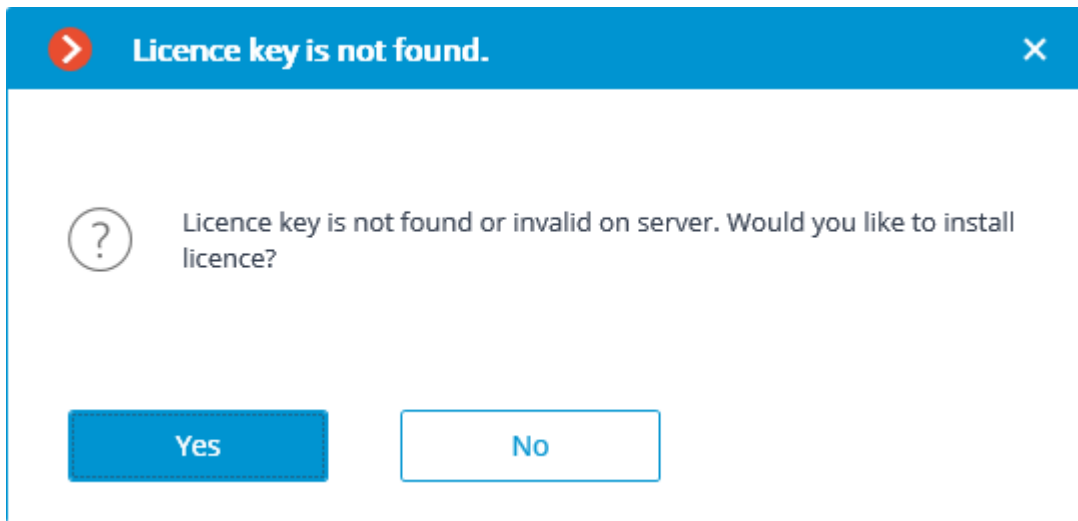
In order to install and activate a software key, the **Eocortex Configurator** has to be launched on the server, where the **Eocortex Server** (or **Eocortex Standalone**) application is installed.

To install, activate, or update a license, you must run the **Eocortex Configurator**. In the opened authorization window, select the server, specify the account type, enter the user name and password with configuration rights, then click **Connect**.

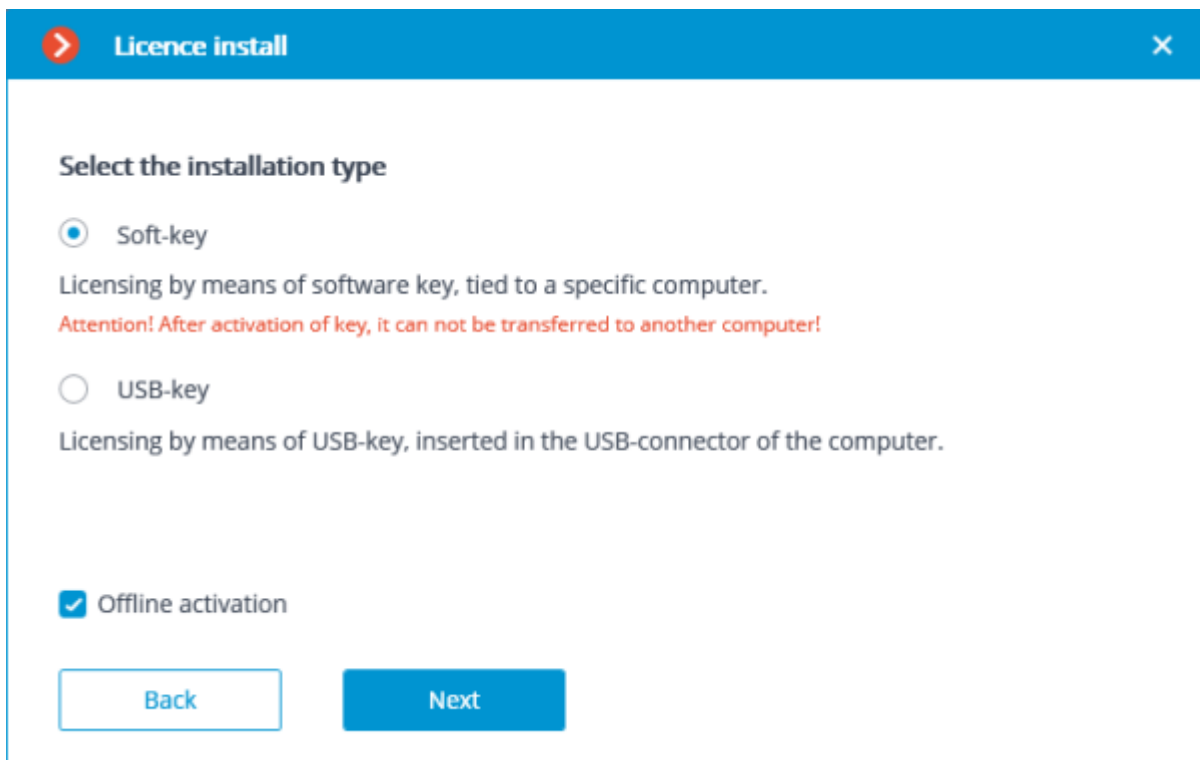


The image shows a screenshot of the Eocortex Configurator application window. The window has a title bar with a close button (X) in the top right corner. The main content area is titled "Eocortex Configurator" in blue text. Below the title, there are three input fields: "Server" with the value "192.168.100.79", "User" with the value "root", and "Password" with a masked password represented by seven dots. There is a "Remember password" checkbox which is currently unchecked. A large blue "Connect" button is positioned below the password field. At the bottom of the window, the "eocortex" logo is displayed, consisting of the word "eocortex" in black lowercase letters and a red circular icon with a white right-pointing arrow.

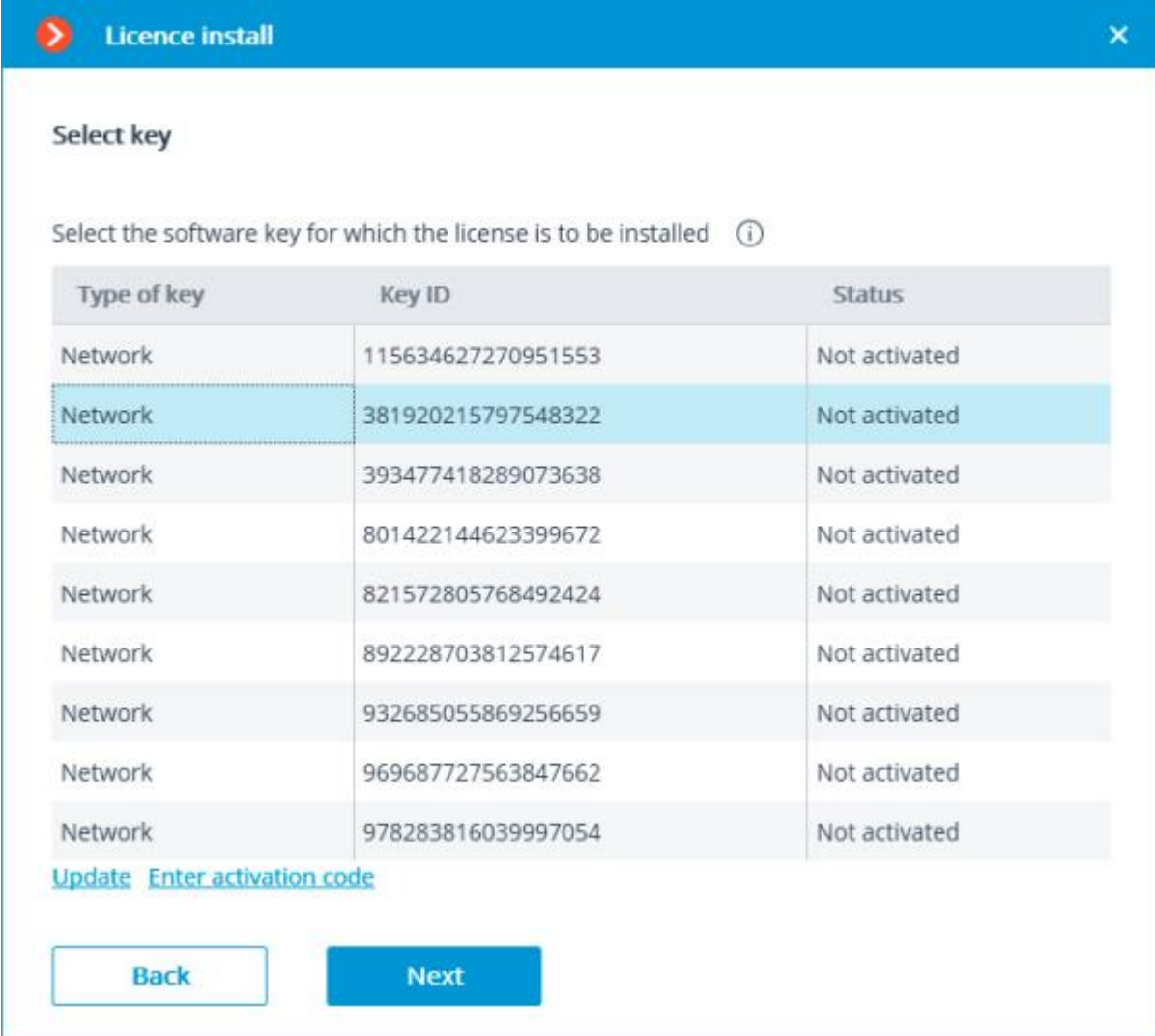
If no license is installed and activated on the server, you will be prompted to install the license. If accepted, the **License Installation** wizard will be launched.



In order to software key offline activation, it's required to choose the corresponding variant on the **Select the installation type** page, turn on the **Offline activation** checkbox and press **Next**.



The **Select key** page will appear, showing the list of available software and network keys (network keys are available for some of the licenses only). To continue the installation process, the user has to choose the required key and press **Next**.



The screenshot shows a window titled "Licence install" with a close button in the top right. Below the title bar, the text "Select key" is displayed. A sub-instruction reads "Select the software key for which the license is to be installed" followed by an information icon. A table with three columns: "Type of key", "Key ID", and "Status" is shown. The second row is highlighted in light blue. Below the table are two links: "Update" and "Enter activation code". At the bottom, there are two buttons: "Back" and "Next".

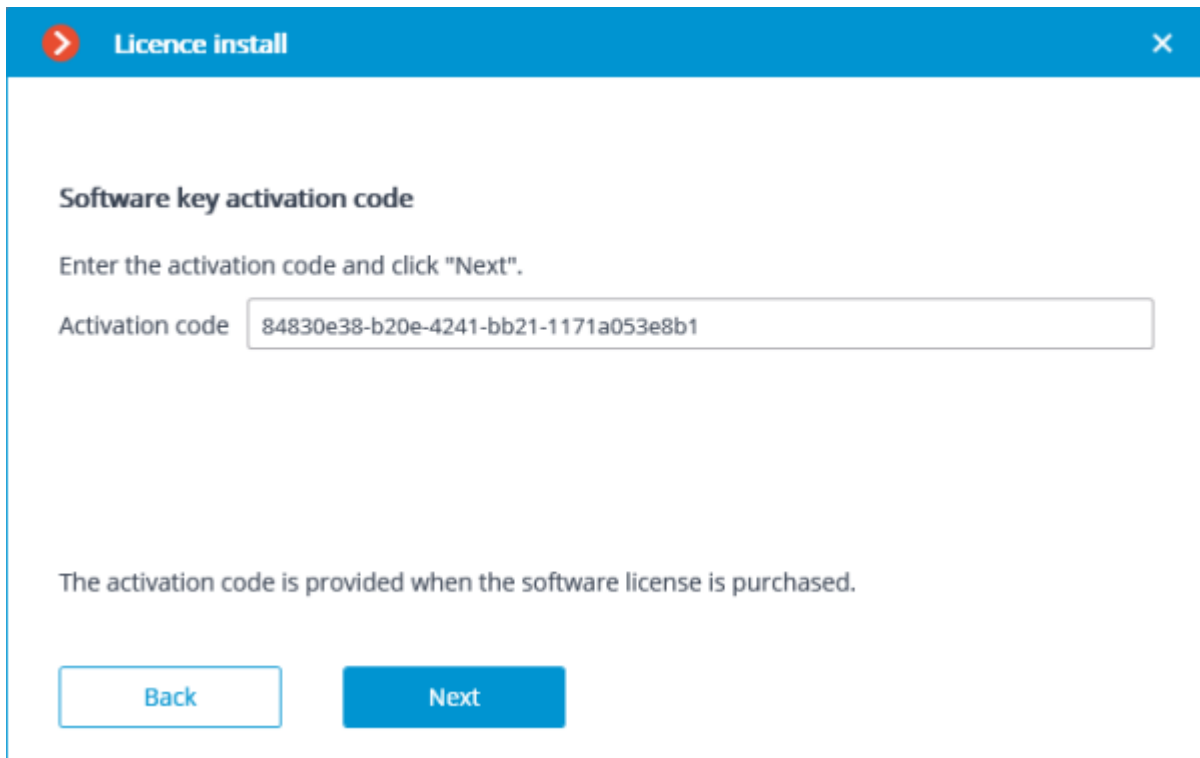
Type of key	Key ID	Status
Network	115634627270951553	Not activated
Network	381920215797548322	Not activated
Network	393477418289073638	Not activated
Network	801422144623399672	Not activated
Network	821572805768492424	Not activated
Network	892228703812574617	Not activated
Network	932685055869256659	Not activated
Network	969687727563847662	Not activated
Network	978283816039997054	Not activated

[Update](#) [Enter activation code](#)

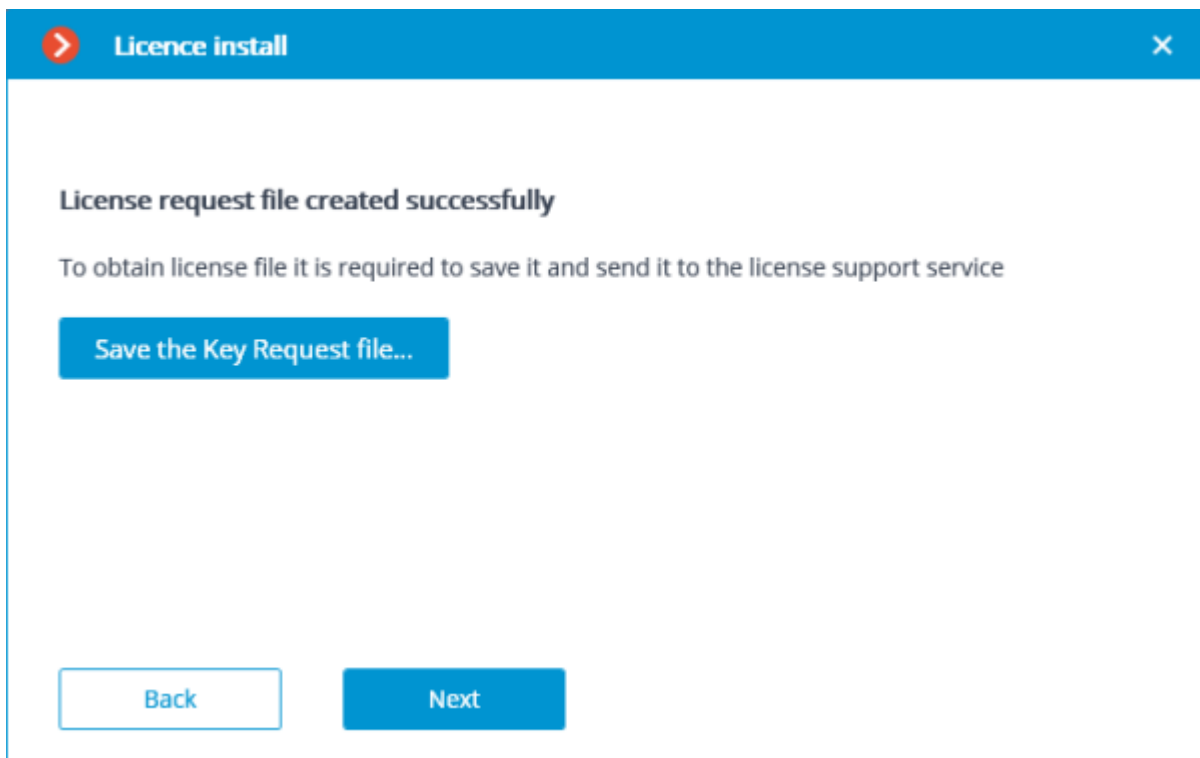
[Back](#) [Next](#)

After pressing **Next**, the software key is being linked to the computer, thus it's going to be impossible to transfer it to any other machine. If the activation process was launched mistakenly, the user has to press **Back** and close the **License installation** window.

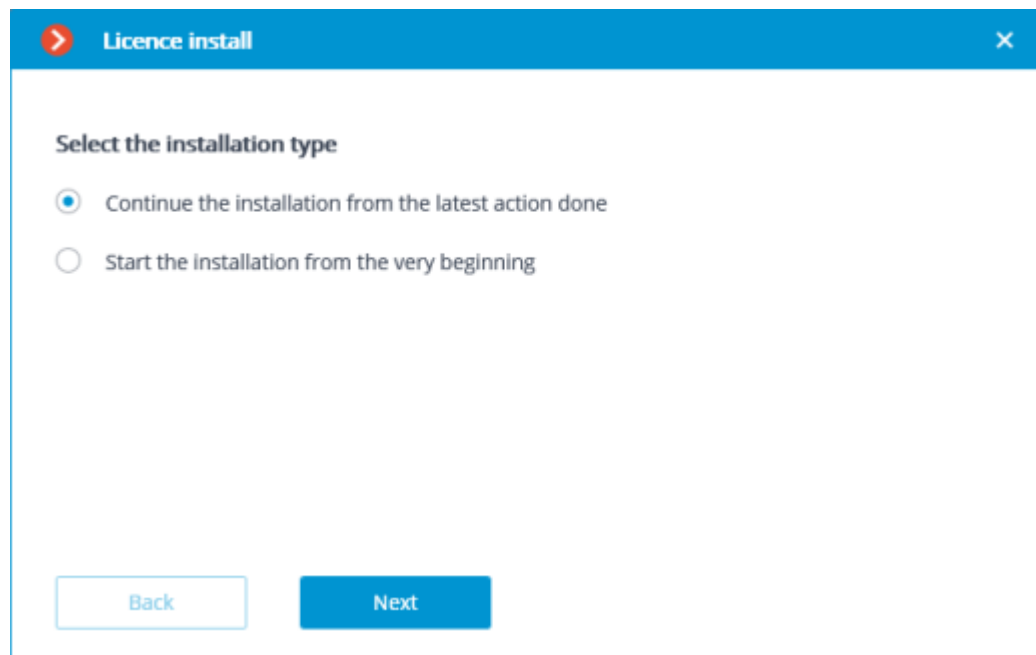
Next, the key activation code will be requested.



License request file created successfully window will be opened, where you should **Save the Key Request file...** and press **Next**.

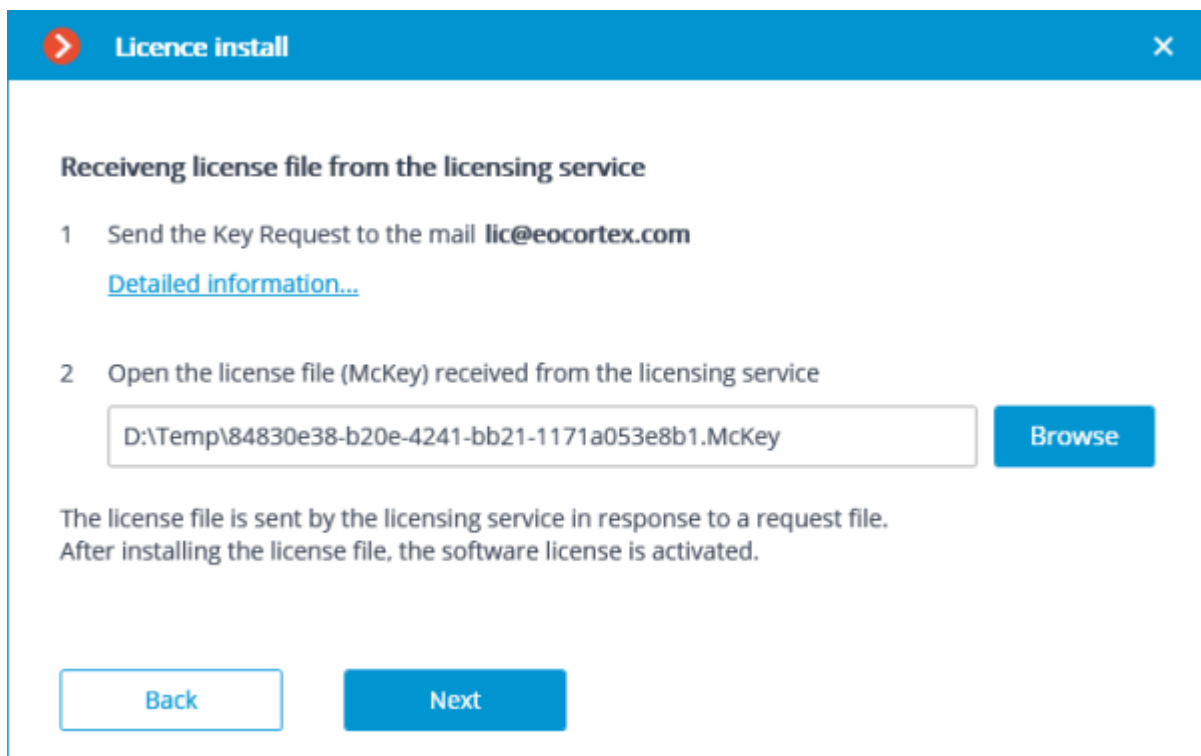


After this step, you can close the wizard. In the course of next running you shall be prompted to continue the installation from the step at which it was interrupted.

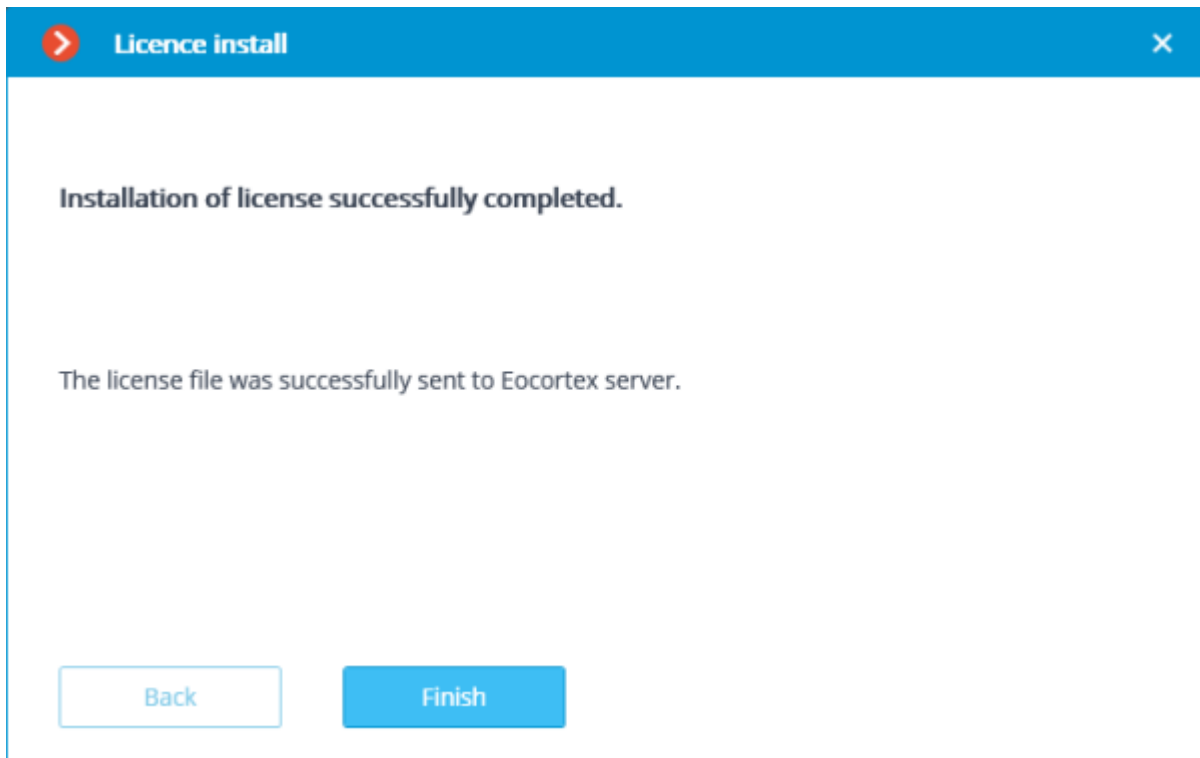


The created license request file (with *.**McKeyRequest** extension) has to be attached to an e-mail and sent to lic@eocortex.com. An e-mail with a *.**McKey** license file will be sent in response (keeping in mind that all answers are sent by the activation server in automatic mode, waiting after sending the license request file will take minimum time).

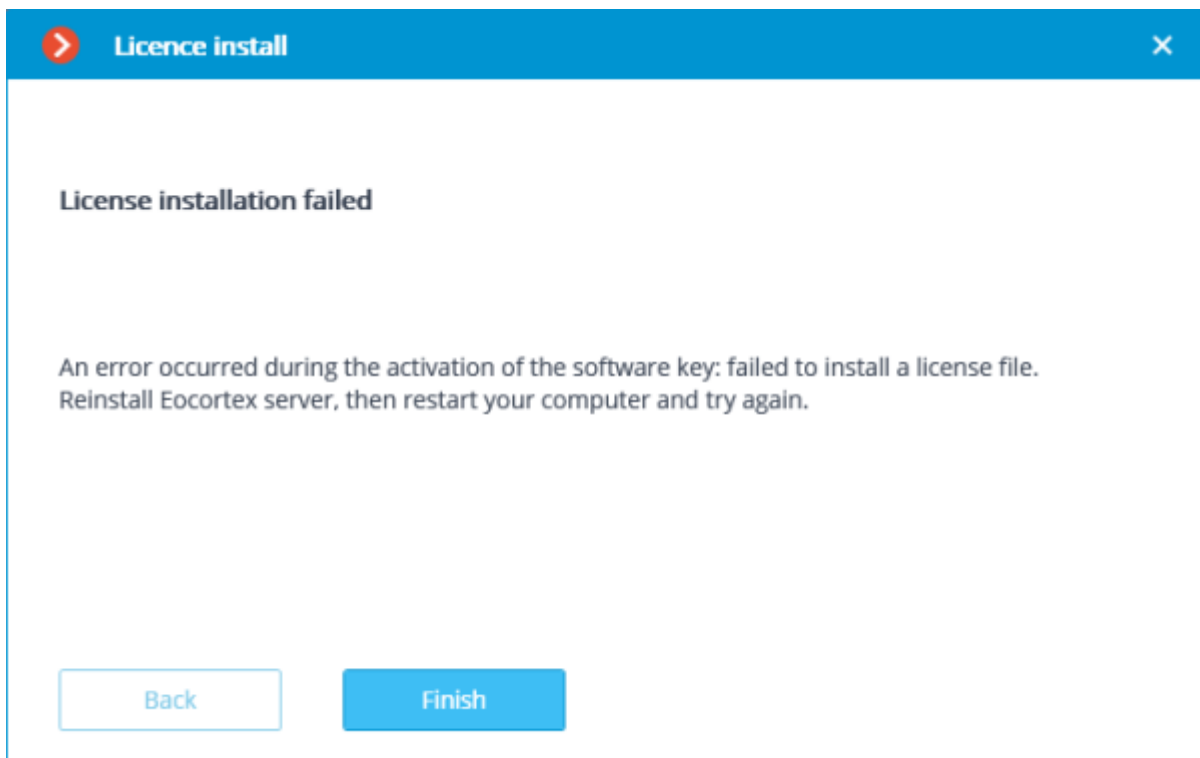
After receiving the license file, you should continue installation from the step, at which the license file is installed (with the extension *.**McKey**). License file is selected using **Browse...** button, and then you should press **Next**.



In case of successful activation, a new installation of **License successfully completed** window will appear. In order to exit the licensing wizard, the user has to press **Finish**.




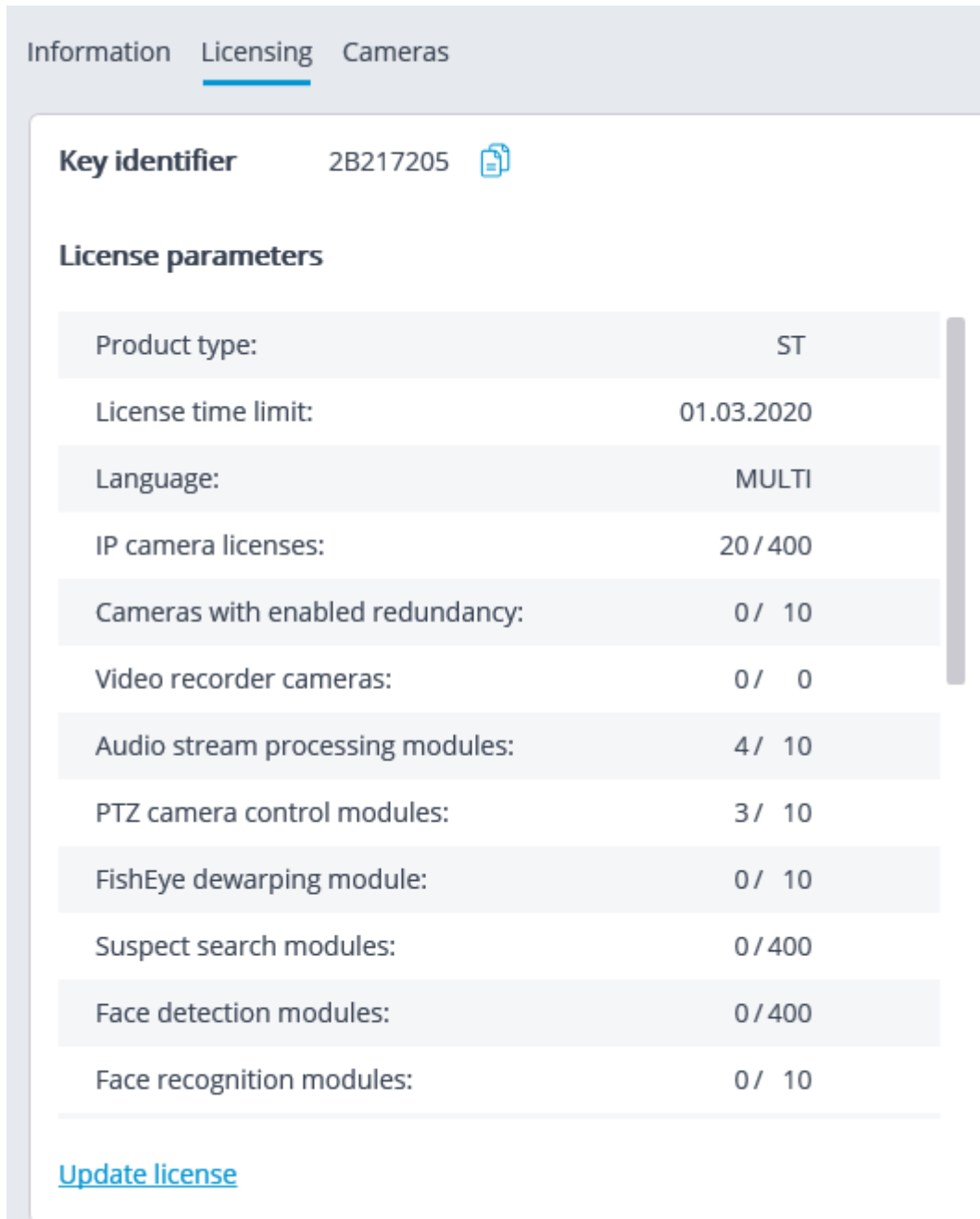
In case if an error occurs during activation, the user will see the **Failed to install the license** page. It's required to finish the license installation process (press Finish), resolve the problem and start the license installation process from the very beginning.




The most probable cause of the offline activation error is the inconsistency between the license file and the computer, which was used to create the request file (i.e. activation on different computer).

License update

If it is required to update the current license, or install and activate the license for a different key, need in Eocortex Configurator application go to the  Servers tab, select a server in the list on the left side of the page, and on the page of server settings, on the **Licensing** tab, press **Update license** button.



Information Licensing Cameras

Key identifier 2B217205 

License parameters

Product type:	ST
License time limit:	01.03.2020
Language:	MULTI
IP camera licenses:	20 / 400
Cameras with enabled redundancy:	0 / 10
Video recorder cameras:	0 / 0
Audio stream processing modules:	4 / 10
PTZ camera control modules:	3 / 10
FishEye dewarping module:	0 / 10
Suspect search modules:	0 / 400
Face detection modules:	0 / 400
Face recognition modules:	0 / 10

[Update license](#)

License install master window will open, in which, depending on the license used on the server, you shall be offered to update the software or USB key automatically. All actions are similar to those ones, which are used when [installing the license](#).

Licence install ×

Select the installation type

Activated USB-key is detected on this computer.

Automatic mode (recommended)
Installed USB key update 2B217205. Needs access to the Internet.

Manual mode

Licence install ×

Select the installation type

Activated software key is detected on this computer.

Automatic mode (recommended)
Installed Soft key update 163469458603841300. Needs access to the Internet.

Manual mode

Eocortex Union (Beta)

Eocortex Union is a platform that provides convenient access from the same point to several **Eocortex** video surveillance systems at the same time. The **Eocortex Union** includes client applications, configuration and system health monitoring tools.



This feature is available only for servers licensed with **ST**, **Enterprise** and **ULTRA** licenses.

Eocortex Union infrastructure is shown below.

Administrator personal area is a web application that permits to configure **Eocortex Union** and monitor system status.

User area is a web application that provides access to client applications.

Eocortex system: Eocortex server or several interconnected **Eocortex** servers with IP cameras connected to them.

Only systems based on the version 3.5 or higher of **Eocortex** can be connected to **Eocortex Union**.

Connection server is a server through which the system connects to **Eocortex Union**. In a single-server system, the connection server is the only server in that system. In multiserver systems, any of the servers can act as a connection server.

The **Connection server** must be in the same network as **Eocortex Union**.

Access control

Eocortex Union implements multilevel access with local users of **Eocortex** systems and the users of **Eocortex Union**.

The **Eocortex Union** administrator adds new **Eocortex** systems. The rights of such users are limited to a group pre-configured by the administrator on each of the systems.

An **Eocortex Union** user can install several client applications to view cameras of each system simultaneously.

Advantages

Prior to version 3.5, creating large-scale distributed video surveillance systems based on **Eocortex** was associated with a number of limitations and inconveniences:

If video surveillance was provided by several **Eocortex** systems, each of them had to be administered separately.

To ensure access of one employee to several systems, it was necessary to add and configure a new user on each of the systems.

The user had to connect to each of the systems separately.

Multiserver systems required a stable connection between servers, which was often difficult to achieve in large-scale and geographically distributed systems.

If the connection between the servers was unstable, transferring the settings of each of the servers took a long time.

The user could not recover their password without the participation of the administrator.

Eocortex Union solves the above-mentioned issues, eliminating the need to combine all servers into one large-scale multiserver system.

Licensing

To license **Eocortex Union**, it is required to activate the license bound to the software key or the USB key.

Only local keys installed directly on the **Eocortex Union** server are used for licensing **Eocortex Union**. Network keys are not used for **Eocortex Union**.

The **Eocortex Union** licensing key cannot be used to license the **Eocortex** server and vice versa.

Requirements and recommendations

Eocortex Union (Server):

- Operating system: Ubuntu 18.04, 20.04; Debian 9, 10, 11
- Hard drive space: 1 GB
- Processor: 2 GHz
- RAM: 4 GB
- Internet access: required for installing and activating the license

Administrator personal area/User area::

- Browsers: Chrome, Firefox, Edge, Safari, Opera
- Internet: common network with the **Eocortex Union** server

Web client of Eocortex Union:

- Browsers: Chrome, Firefox, Edge, Safari, Opera
- Internet: common network with the **Eocortex Union** server and the servers of the connected **Eocortex** systems

It is recommended to use the latest browser versions.

Getting started

Installing, updating and removing Eocortex Union

Installation

To install **Eocortex Union**, download the archive [eocortex-union.tar.gz](https://www.eocortex.com/eocortex-union.tar.gz) from the website and execute the following commands in the console:

```
tar -xf eocortex-union.tar.gz
cd eocortex-union
chmod +x ./install.sh
sudo ./install.sh
```

During the installation process, it will be required to enter the IP address or fully qualified domain name that will be used to access **Eocortex Union**. (Examples: **123.4.56.78**, **union-server.mycompany.com**)

Go to the specified address can after successful completion of the installation.

Update

To update **Eocortex Union**, it is required to download the archive eocortex-union.tar.gz with the current version of **Eocortex Union** and repeat the installation steps. In this case, there will be no need to enter the server address.

Removal

To remove **Eocortex Union**, execute the following command:

```
/opt/eocortex-union/service/uninstall.sh
```

Installing a license

In order to install and activate a key, the user has to obtain an activation code, which looks like **XXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX**, where **X** can be hex digit (i.e., 0123456789abcdef). Here's an example of the activation code: **a46a6d3e-17f6-416c-9da2-10cb4b80574e**.

To relocate the software key to another computer, contact the **Eocortex** technical support.

It is prohibited to install more than one **Eocortex** software key on the server.

During the installation of a license, it is necessary to provide Internet access for the server on which **Eocortex Union** is deployed. In the future, after successful installation of the license, Internet access will not be required for the key to work.

To install the license, follow these steps:

Go to the address **address_union/admin** (e.g., **123.4.56.78/admin** or **union.mycompany.com/admin**).

Enter the administrator credentials in the authorization window.

If this is the first time the installation is being performed and the administrator credentials have not yet been configured, the default values should be used:

- Email or username: root
- Password: (blank)


Sign in Eocortex Union

Email or username

Password

[Log in](#)

[Forgot your password?](#)



If no license is present on the server, the **License Installation** wizard will open, where it is required to select an installation option: licenses for a software key or for a USB key.

Licence key is not found

Licence key is not found or invalid on server

Select the installation type

Soft-key
Licensing with a software key is done with the key bound to the particular server
To install a license, it will be required to enter an activation code that looks as follows: XXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX

USB-key
Licensing with a USB key is done with the key connected to the particular server

[Back](#) [Next](#)

At the next step, the **Select Key** page with a list of available keys will open. Depending on the installation option, there will be either the software keys previously installed on the server or the USB keys connected to the server. To proceed with the installation, it is required to select a key and click **Next**.

Select key

Select the software key for which the license is to be installed

Key ID	Status
XXXXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX	Not activated

[Refresh](#) [Enter activation code](#)

[Back](#) [Next](#)

To activate a new key, it is required click the **Enter activation code** button and enter the activation code in the window that opens.

Software key activation code

Enter the activation code and click "Next"

ActivationCode


Attention! After activation of key, it can not be transferred to another computer!

The activation code is provided when the software license is purchased

[Back](#) [Next](#)

After selecting a key from the list or after activating a new key, license installation will start. At the end of the installation, a window with the result will open.


License install

 License installed successfully. Server is being restarted.

Finish

If the activation is successful, after clicking the **Finish** button, the authorization window will open. In case of an activation error, it is required to eliminate the cause of the error and repeat the license installation.

License install

 An unknown error occurred during the license installation process. Try installation again.

Start again

Finish

Possible reasons for installation and activation errors:

- the license is intended for another software product;
- an attempt to enter the activation code for the USB key when activating the software key and vice versa;
- an incorrect activation code has been entered;
- the software key has already been activated on another server.

In case you cannot identify the cause of the error on your own, please contact technical support.

Mandatory settings

When logging into the **Administrator personal area** for the first time, a wizard of initial settings will open. The initial settings must be specified before using **Eocortex Union**.

At the **Administrator personal area settings** step, it is required to specify an email and a password that will be used to enter the **Administrator personal area**.

Settings of administrator's account

Email

If the email has not been set it is impossible to reset the password and receive monitoring notifications

Password

The next step is to configure the SMTP server settings that will be used to send email notifications to administrators and users.

SMTP server settings

SMTP server address Port

Use SSL

Email

Username

Password

Description of settings:

- **Gmail:** Switch to using the Gmail SMTP server.
- **SMTP Server Address:** an address through which notifications will be sent (e.g. **smtp.gmail.com**).
- **SMTP Server Port:** SMTP port of the server (e.g., **587**).
- **Use SSL** when sending emails.
- **Email:** an address of the email account on behalf of which notifications will be sent.
- **Username** for authentication on the SMTP server.
- **Password** a password for the email account on behalf of which notifications will be sent.

Administering Eocortex Union

Administrator Personal Area

To enter the **Administrator personal area**, go to the address **address_union/admin** (e.g., **123.4.56.78/admin** or **union.mycompany.com/admin**). To log in, to have use the credentials of the **Eocortex Union** administrator.



The image shows a login form for Eocortex Union. At the top, the title "Sign in Eocortex Union" is displayed in blue. Below the title, there are two input fields: "Email or username" and "Password". A blue "Log in" button is positioned below the password field. A link for "Forgot your password?" is located below the button. At the bottom, the "union eocortex" logo is shown, with "union" in a smaller font above "eocortex" and a red circle containing a white right-pointing arrow to the right of the text.

Administrator personal area settings

The settings of the administrator's personal area are located on the **Settings** page in the **Administering** tab.

The screenshot shows the 'Settings' page for the Eocortex Union administrator. The page is divided into a sidebar and a main content area. The sidebar contains links for 'Monitoring', 'Administering' (which is highlighted in blue), 'SMTP settings', and 'Union settings'. The main content area is titled 'Settings' and contains two input fields: 'Email' and 'Password'. Below the 'Email' field is a warning message: 'If the email has not been set it is impossible to reset the password and receive monitoring notifications'. A 'Save' button is located at the bottom of the form.

During the initial deployment of the platform, one **Eocortex Union** administrator is created with the following credentials:

- username: **root**;
- password: blank password;
- Email: blank email.

When setting up the administrator personal area for the first time, it is recommended to change the username and password and enter valid email.

When setting up an administrator account for the first time, it is recommended that change their username and password and provide an Email.

If no administrator email is specified, it will not be possible to reset and recover the password. Also, in this case, the administrator will not receive notifications from the system health monitoring service (if the email of the recipient of monitoring notifications is not specified, all notifications are sent to the administrator).

Resetting administrator's password

To recover the password, it is required to click the button **Forgot your password?** in the authorization form.

Sign in Eocortex Union

Email or username

Password

Log in

[Forgot your password?](#)



It is required to specify the administrator's email in the password reset form that opens. Upon clicking the **Reset Password** button, a message with a password reset confirmation code will be sent to the specified email.

Reset password

Email

Reset password

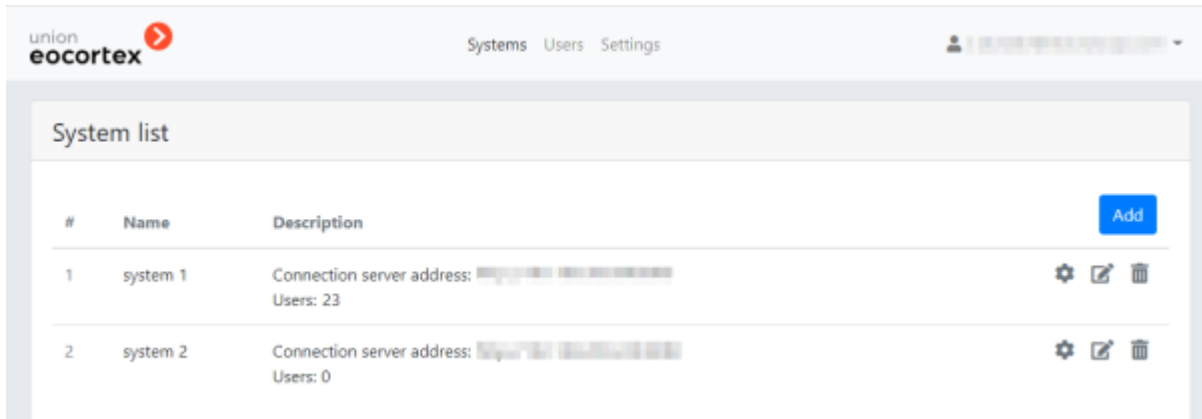
This code must be entered in the password recovery form. A new password must also be entered there.

Systems

Eocortex systems can be connected and set up using **Eocortex Union**.

Only systems based on the version 3.5 or higher of **Eocortex** can be connected to **Eocortex Union**.

To work with the **Eocortex** systems, it is required to go to the Systems tab in the administrator personal area. The tab displays a list of systems connected to **Eocortex Union**.



Connecting a system

Before connecting a system, it is required to make sure that **Eocortex Union** and the connection server have Internet access or direct access to each other over the network.

To connect a new **Eocortex** system to **Eocortex Union**, it is required to click the **Add** button on the **Systems** tab in the administrator personal area.


In the **Add system** form that opens, it is required to specify the name of the system to be connected and the parameters for connecting to the connection server of this system. In the future, the name of the system will be displayed in the list of connected systems.

The name is assigned to the system when it is connected to **Eocortex Union** and will only be available to users, administrators and **Eocortex Union** applications.

The screenshot shows the 'Adding a system' form. It has a title 'Adding a system' at the top. Below the title are several input fields: 'System name' with the value 'New system'; 'Connection server address' with a lock icon and the value 'servername.companyname.com'; 'Port' with the value '8080'; 'Administrator credentials' section with 'Username' (value 'root') and 'Password' (empty) fields. An 'Add' button is at the bottom left.

The connection server address can be specified both as a domain name (e.g., **vms-srrver.mycompany.com**) and in IPv4 (e.g., **127.0.0.1**) or IPv6 (e.g., **::: 1**) formats.

Only public IP addresses can be used to connect systems over IPv6. Private IP addresses that starts with fe80::* are not supported.

Secure connection to the server via HTTPS is enabled using the button  located on the left side of the field with the address of the connection server.

If the port has not been set clearly, the port 18080 will be used for a secure connection (HTTPS), and 8080 / for an insecure (HTTP) connection.


The username and password must match the credentials of the administrator of a system being connected.

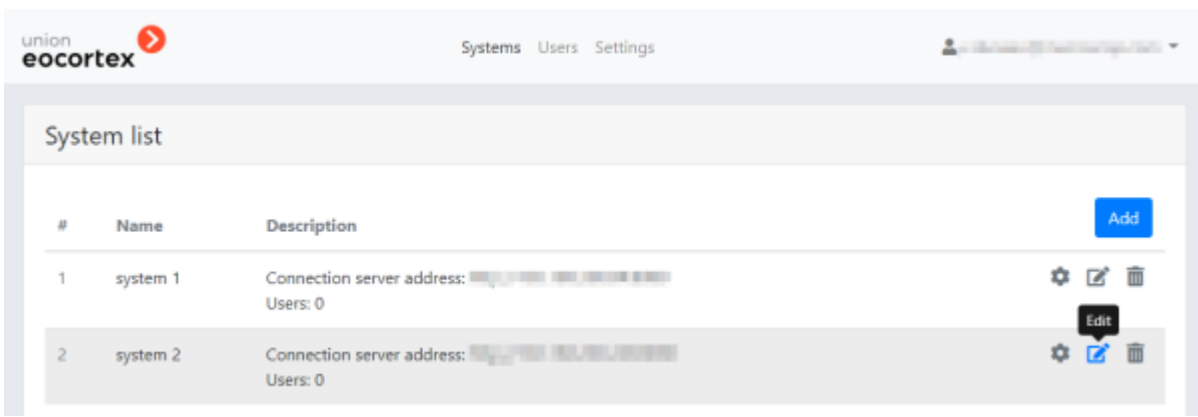
The administrator must not be added to the system via ActiveDirectory, in which case the addition will fail.

For the systems with an **Enterprise** or an **Ultra** license, the username and password of a user who is a member of the Senior System Administrators group are to be specified.

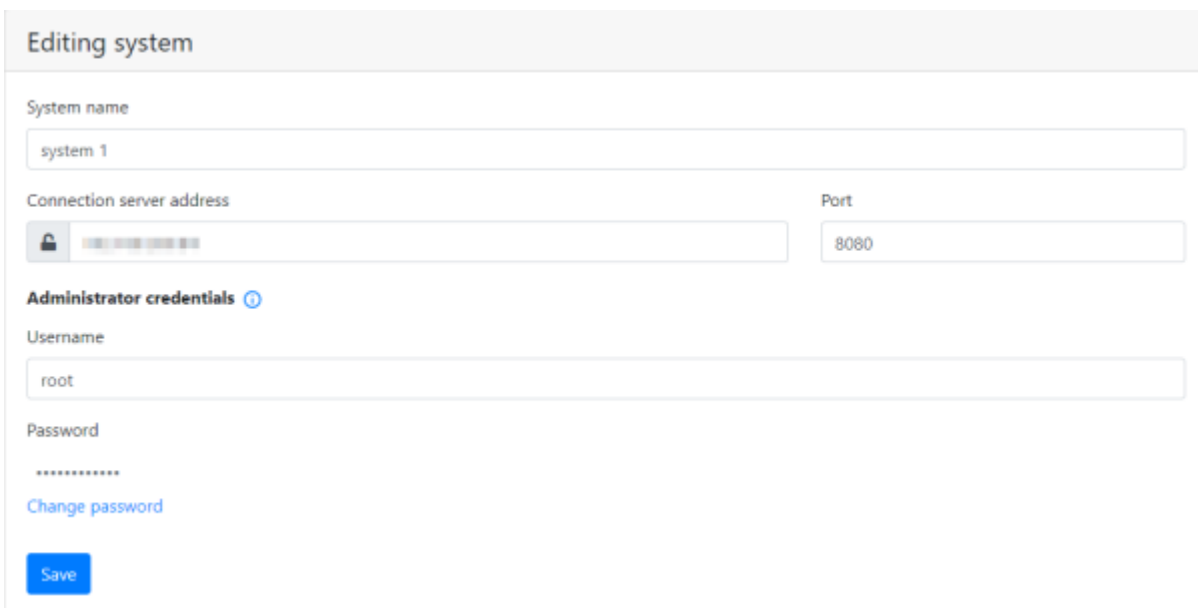
System modifications

The name and parameters of the connection to the system can be modified anytime. To do this, it is

required to click the **Modify**  button located to the right of the name of the corresponding system in the list of systems on the **Systems** tab.





The **System modification** form, similar to the system connection form, will be opened.

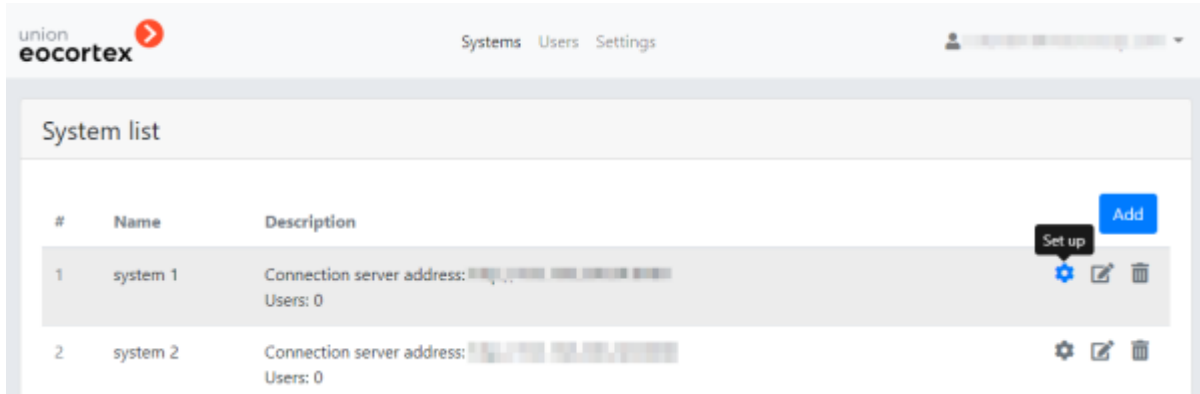


To change the system administrator password, it is required to click on the **Change password** button. After that, the **Administrator password** field will become available for editing.

System setup

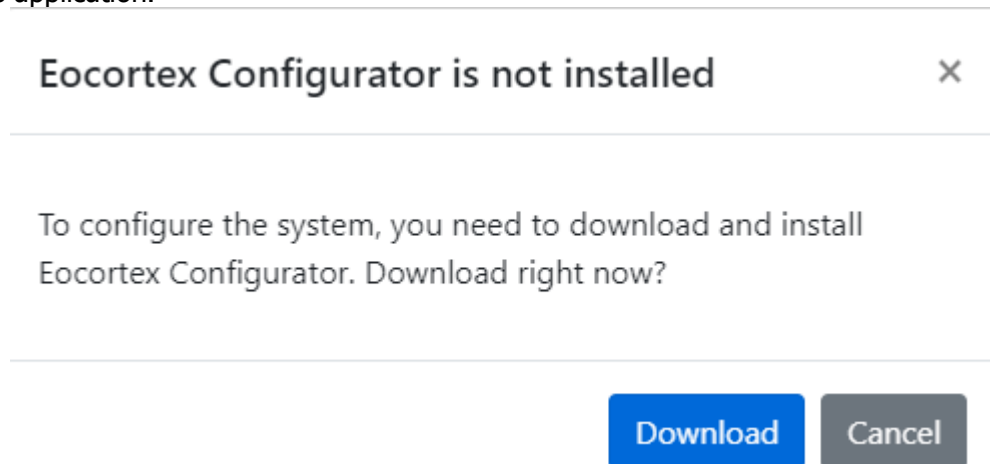
To configure the system, it is required to click on the **Setup**  button located to the right of the name of the system to be configured in the list of systems on the **Systems** tab.

The **Setup**  button is available only when logging into the administrator personal area from a computer with the Windows operating system.




This will launch the **Eocortex Configurator** application that will automatically connect to the selected system.

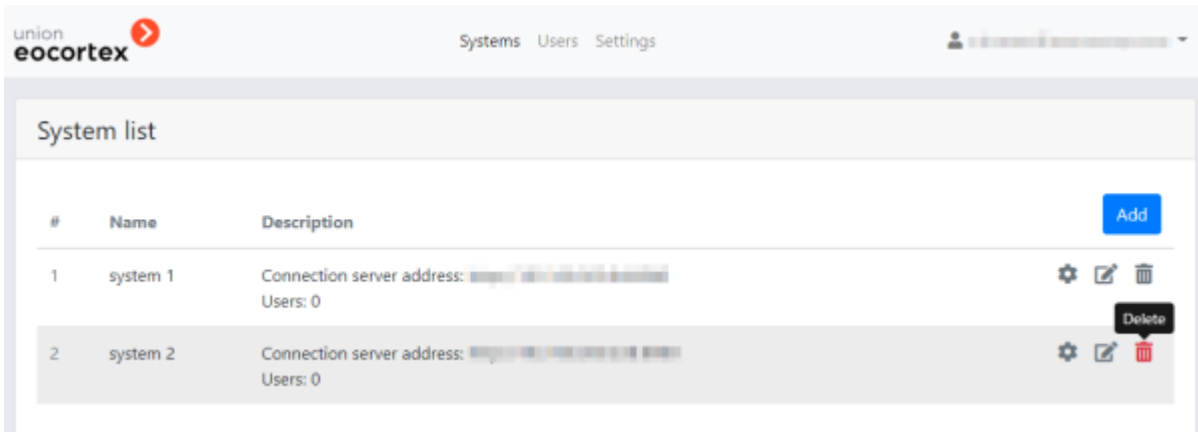
If the **Eocortex Configurator** is not installed on the computer that the administrator used to log into their personal area, a form will open offering to download and install this application.



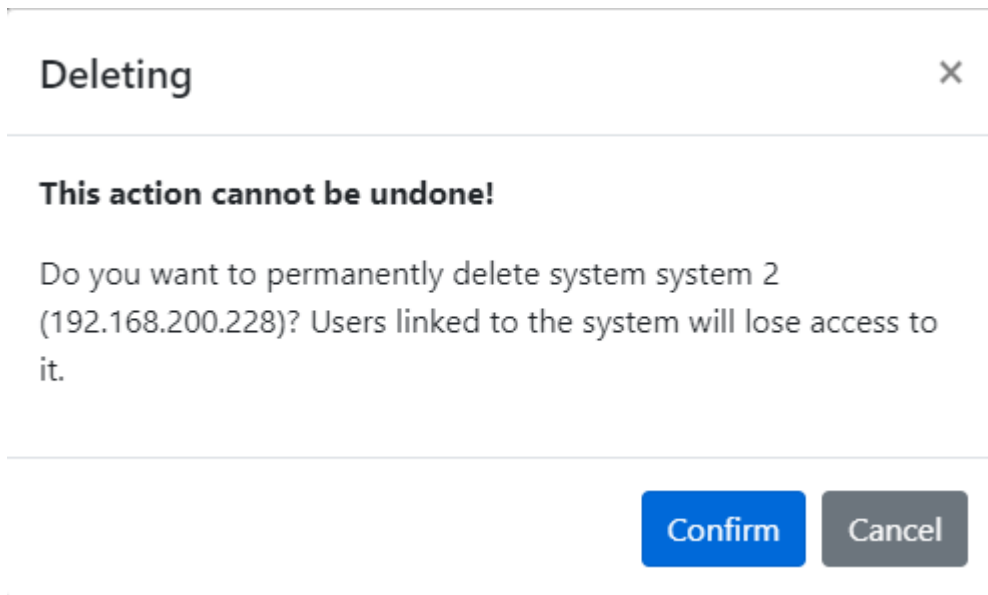
Removing a system

Removing a system from **Eocortex Union** does not stop this system's operation. After such removal, the system will become unavailable for **Eocortex Union** users and will continue to function as an autonomous **Eocortex** system.

To remove a system from **Eocortex Union**, it is required to go to the **Systems** tab and in the list of systems click on the **Remove**  button located to the right of the system to be removed.



The following warning window will open:



After clicking on the **Confirm** button, an attempt will be made to remove the system from **Eocortex Union**.

If, at the time of removal, the system connection server is available for **Eocortex Union**, this system will be safely removed from **Eocortex Union**. In this case, all users bound to the system will lose access to it.

If the system connection server is unavailable for **Eocortex Union** at the time of removal, the following window will open:

Error



System is unavailable

System deletion failed.

Make sure the system has network access or it is in the same local network with Eocortex Union and try again.

Click "Unsafe deletion" to remove the system from Eocortex Union. Attention, Union users attached to the system will not be removed from the system configuration.

Unsafe deletion

Cancel

By clicking on the **Insecure Removal** button, the system will be removed from **Eocortex Union**, but the remote **Eocortex** system will not be informed of such removal. As a result, previously added **Eocortex Union** users may remain in the system configuration.

The unsafe removal may only be used in exceptional cases when it is impossible to restore access to the system. In other situations, it is recommended to restore access to the system connection server and try to remove the system again.

Restriction on unifying the connected system

It is recommended to avoid unifying two systems already connected to **Eocortex Union**, since the information about all **Eocortex Union** users will be removed from the configuration of the system being connected, but in the personal area of the **Eocortex Union** administrator each of these users will be considered bound to the old system.

To avoid this conflict, it is required to remove the system being connected from **Eocortex Union** before unifying.

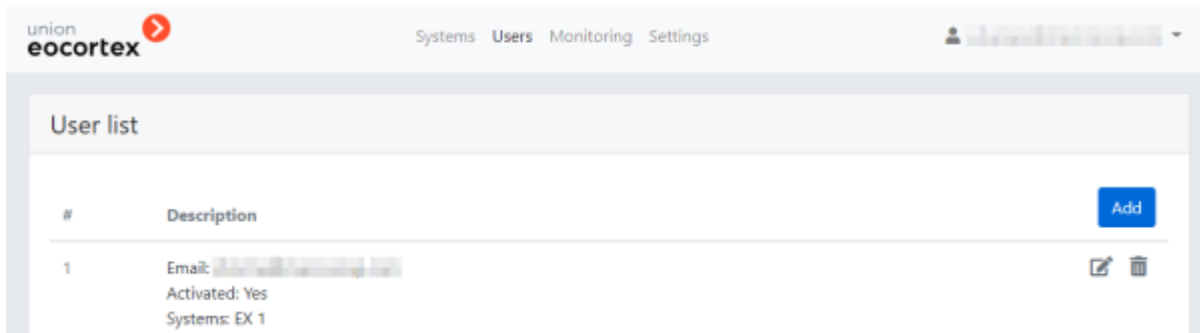
In a situation where two systems have been unified disregarding the recommendations, the old system should be removed from **Eocortex Union** using the unsafe removal.

Users

In **Eocortex Union**, only the **Administrator Personal Area** can be used to manage users in the systems.

Adding a user

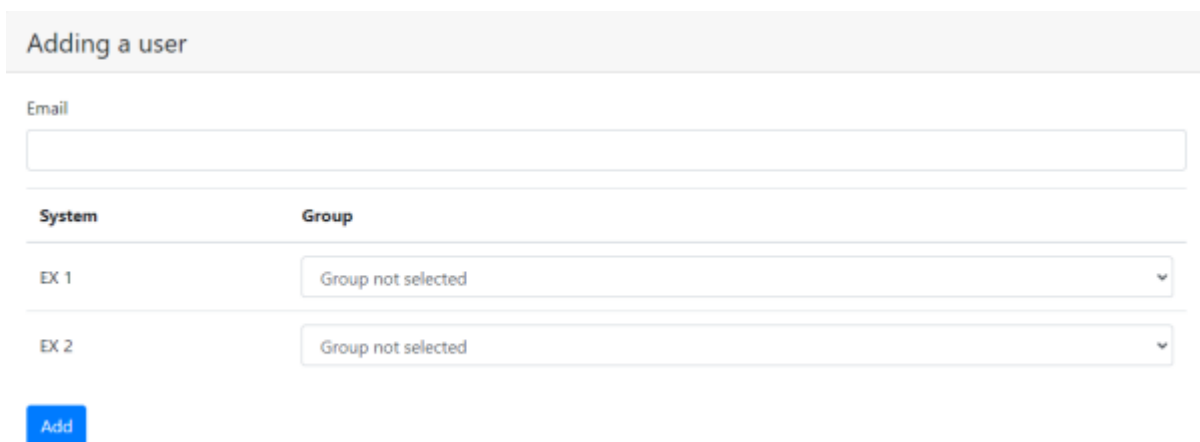
To add a **Eocortex Union** user to the system, it is required to click on the **Add** button on the **Users** tab in the **Administrator Personal Area**.



The **Add User** page will open, where it will be required to set the following parameters:

1. An email address of the **Eocortex Union** user.
2. A group whose cameras are available to the user in the system connected to **Eocortex Union** (the system is unavailable or does not respond).
3. A group whose cameras are available to the user in the system connected to **Eocortex Union** (the system is unavailable).


When specifying a group in a system connected to **Eocortex Union**, the user is added to the specified group in the given system and obtains all the rights of this group.

The screenshot shows the 'Adding a user' form. It has a title 'Adding a user' at the top. Below the title is an 'Email' input field. Underneath is a table with two columns: 'System' and 'Group'. There are two rows in the table. The first row has 'EX 1' in the 'System' column and a dropdown menu in the 'Group' column with the text 'Group not selected'. The second row has 'EX 2' in the 'System' column and another dropdown menu in the 'Group' column with the text 'Group not selected'. At the bottom left of the form is a blue 'Add' button.

A message to the specified email address with a link to complete the registration will be sent to the added **Eocortex Union** user.

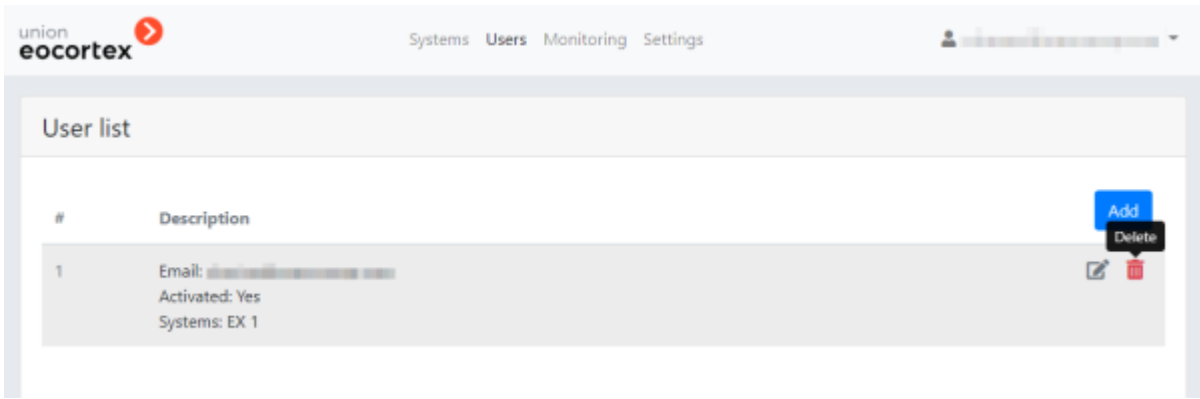
User access control

The rights of user access to the system can be modified. To do this, select the required user on the

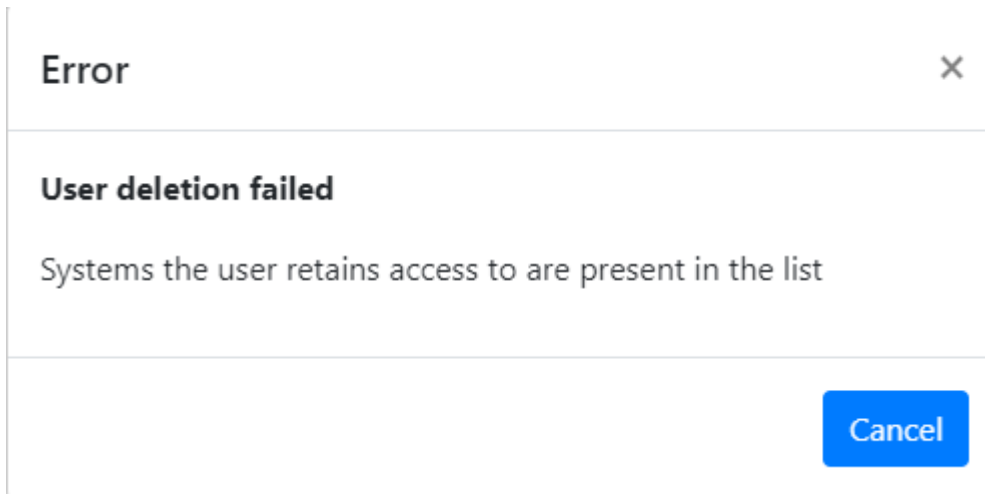
Users tab and click the **Edit**  button. Further, to remove the user from the selected system, select **Group is not selected**.

Removal of a user

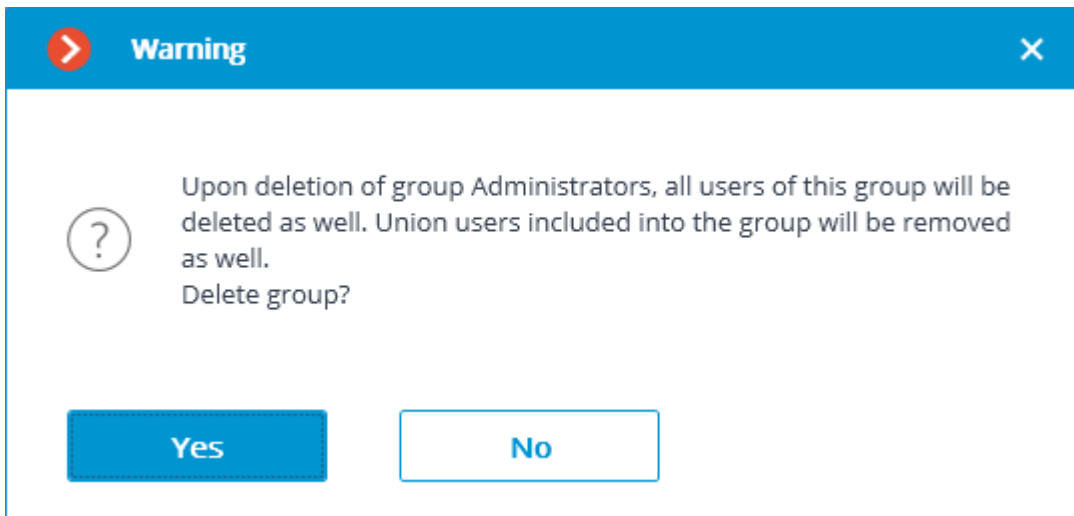
To remove a user, select the user on the **Users** tab and click the **Remove**  button.



If it is impossible to remove a user (e.g., in case the system is currently unavailable), the following window is displayed:



Eocortex Union users cannot be edited or removed via **Eocortex Configurator**. However, a user can be removed together with the group. When a group that includes a Union user is deleted, the following window is displayed:



Displaying users in the system

When connecting to a system added to **Eocortex Union** via **Eocortex Configurator**, the list of users will contain Union users who have been granted access to the given system. The information about the Union user will include the corresponding user type:

Information

User name	[REDACTED]
Belongs to group	Administrators
Date of creation	11/16/2021 5:45:20 PM
Role	Junior administrator
User type	Union

[Edit](#)

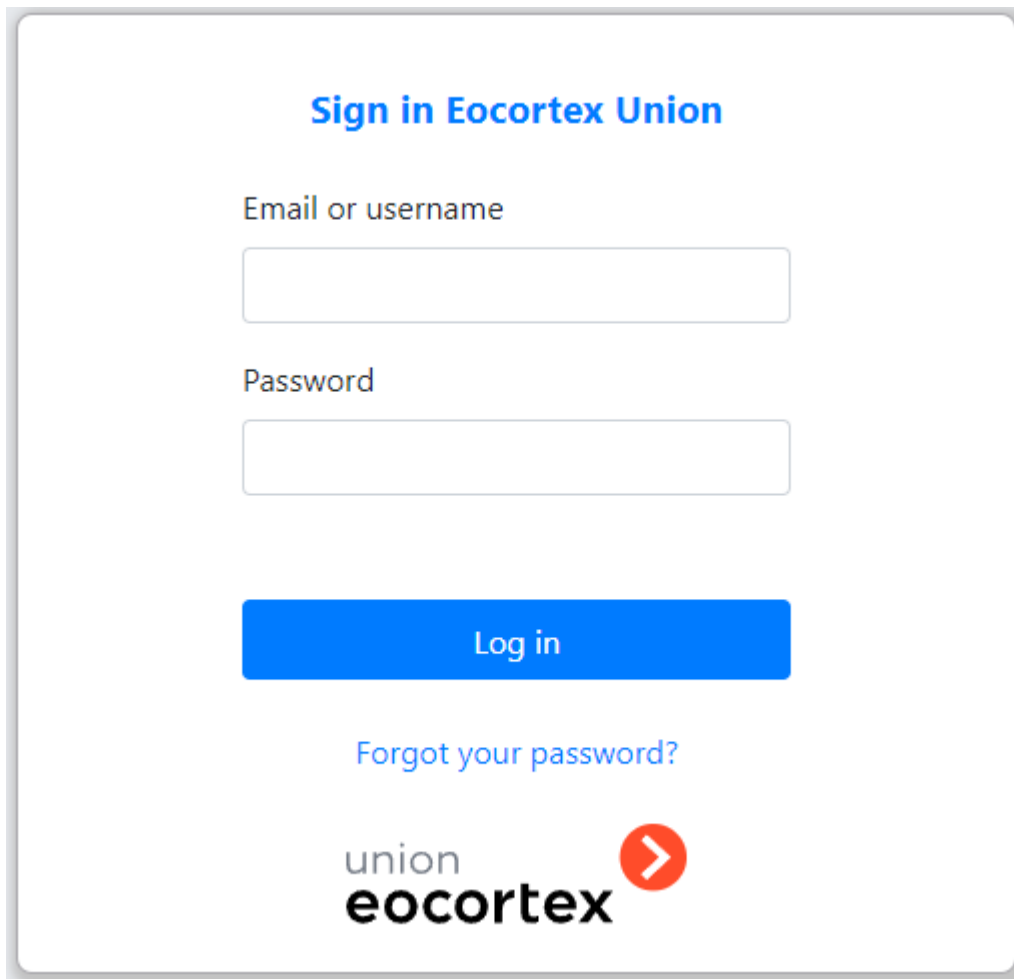
[Delete](#)

Client side of Eocortex Union

The **Eocortex Union client** side includes the Administrator Personal Area and User Area, as well as the **Eocortex Union Web Client** and **Eocortex Union Client**, available in the user area.

User area

The user area is located at the **Eocortex Union** address. To enter the user area, the user must log in.



The image shows a login form for Eocortex Union. At the top, the title "Sign in Eocortex Union" is displayed in blue. Below the title, there are two input fields: "Email or username" and "Password". A blue "Log in" button is positioned below the password field. A link for "Forgot your password?" is located below the button. At the bottom, the Eocortex Union logo is shown, consisting of the word "union" in a smaller font above "eocortex" in a larger, bold font, with a red circle containing a white right-pointing arrow to the right of the text.

When entering a user area, the user will obtain access to client applications.



The list of client applications available to the user is configured by the **Eocortex Union** administrator.

Work via Eocortex Client



Before starting to work with **Eocortex Union** via the **Eocortex Client** application, it is required to download this application in the user area and install it on the computer.

To connect to **Eocortex Union** from **Eocortex Client** it is required, at the start of the application, to specify the address and port of connection to **Eocortex Union** in the authorization window, as well as the email and password of the Eocortex Union user.




Eocortex Client  

Server

User



Password

Save

Connect



User rights

A **Eocortex Union** user can use cameras, server views, maps and site plans of all systems available to them in **Eocortex Union**.

Only those cameras, server views, maps and plans, the rights to which are granted to the **Eocortex Union** user by the system administrators, will be available to them in each of these systems.

Only those capabilities of client applications, the rights to use which are granted to the **Eocortex Union** user by system administrators, will be available to them in each of these systems.

If the **Eocortex Union** user has different rights for the same features in the client application for different systems, the lesser of the rights will be used.

Example:

Right	System 1	System 2	Right in Eocortex Client
Access to log	All users	Current user only	Current user only

PTZ camera control	Low priority	Maximum priority	Low priority
--------------------	--------------	------------------	--------------

In the **Eocortex Client** application, the video wall, internal chat, password modification, and the right to fetch the **Eocortex Configurator** application are not available for a **Eocortex Union** user.

When working with Face Recognition and license plate recognition modules, the user of **Eocortex Union** can choose the database to be used.

Event log

The **Event log** displays events from all available systems.

The filter Initiators allows to filter events depending on who initiated them - **Eocortex** users or **Eocortex Union** users.

Face Recognition and license plate recognition

When working with Face Recognition and license plate recognition modules, the **Eocortex Union** user has access to the databases of these modules in all systems. However, it is only possible to work with one of these databases at a time.

The user can select a database in the upper part of the window for working with the database, or in the filter panel on the reports page.

If the database is available for one of the systems only, the selection of the database will be unavailable.

In case one remote database is used for all systems, the choice of database will be available in the **Eocortex Client** application, but it will be the same database.

The rules for creating the database name are as follows:

{system_name}_{server_name}_{database_id (optional)}.

When a database is selected from the list, all data is updated, and all the filters on the reports page are reset.

Connection in proxy mode

Eocortex Union may have different connection servers for different systems.

When connecting to **Eocortex Union** for the first time, the option **Connection in proxy mode** is enabled by default.

Web Client of Eocortex Union

To launch the **Eocortex Union Web Client** application, it is required to click the button Go to viewing in the user area.

Eocortex Union web client

Online viewing of cameras directly from your browser



[Go to viewing](#)

There are no cameras you have access to

User rights

A **Eocortex Union** user can use cameras, server views, maps and site plans of all systems available to them in **Eocortex Union**.

Only those cameras, server views, maps and plans, the rights to which are granted to the **Eocortex Union** user by the system administrators, will be available to them in each of these systems.

Only those capabilities of client applications, the rights to use which are granted to the **Eocortex Union** user by system administrators, will be available to them in each of these systems.

If the **Eocortex Union** user has different rights for the same features in the client application for different systems, the lesser of the rights will be used.

Example:

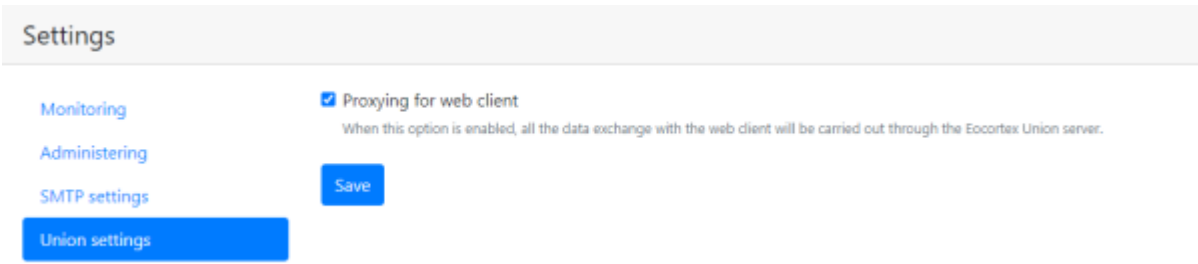
Right	System 1	System 2	Right in Eocortex Client
Access to log	All users	Current user only	Current user only
PTZ camera control	Low priority	Maximum priority	Low priority

Configuring Eocortex Union services

The settings of **Eocortex Union** services can be found on the **Settings** page in the administrator personal area.

General Settings of Union

There is only one option in the **Settings** page on the **Union Settings** tab of the administrator personal area: **Proxying for web client**.



Since systems can be connected to **Eocortex Union** using different protocols (HTTP and HTTPS), and browser protection does not allow HTTP connections to systems using untrusted certificates and HTTPS, the user may encounter issues when working in the **Eocortex Union Web Client** application.

Such problems can be resolved using one of the following methods:

METHOD 1

Connecting all systems to **Eocortex Union** via HTTPS with trusted certificates and connecting using the web client via HTTPS. In this case, the option **Proxying for web client** must be disabled.

This is a safe option.

This solution does not put load on **Eocortex Union**.

METHOD 2

Enabling the option **Proxying for web client**. The way the systems are connected to **Eocortex Union** does not matter.

This is a safe option.

This solution does put load on **Eocortex Union**.

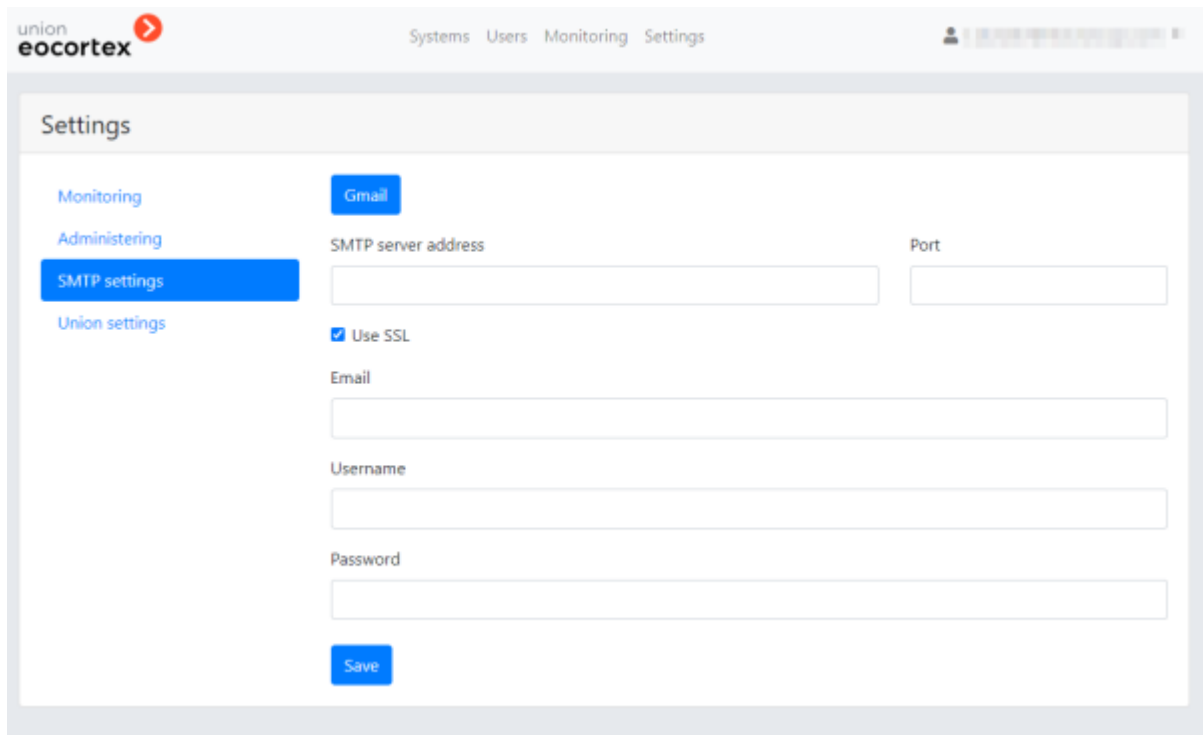
METHOD 3

Connecting all systems to **Eocortex Union** via HTTP and connecting using the web client via HTTP. It does not matter whether the option **Proxying for web client** is enabled or not, since it will not be used.

This option is not safe.

This solution does not put load on **Eocortex Union**.

SMTP server settings



Description of settings:

- **Gmail:** Switch to using the Gmail SMTP server.

- **SMTP Server Address:** an address through which notifications will be sent (e.g. **smtp.gmail.com**).
- **SMTP Server Port:** SMTP port of the server (e.g., **587**).
- **Use SSL** when sending emails.
- **Email:** an address of the email account on behalf of which notifications will be sent.
- **Username** for authentication on the SMTP server.
- **Password** a password for the email account on behalf of which notifications will be sent.

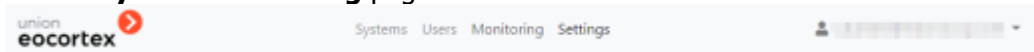
Eocortex System Monitoring

Eocortex System Monitoring is installed automatically together with **Eocortex Union**.

Eocortex System Monitoring is available for **Enterprise** and **Ultra** licenses only.

After installing **Eocortex Union** the **Eocortex System Monitoring** service will be available at **{address-union}: 8191**.

Eocortex System Monitoring is available from the administrator personal area on the **Eocortex System Monitoring** page.

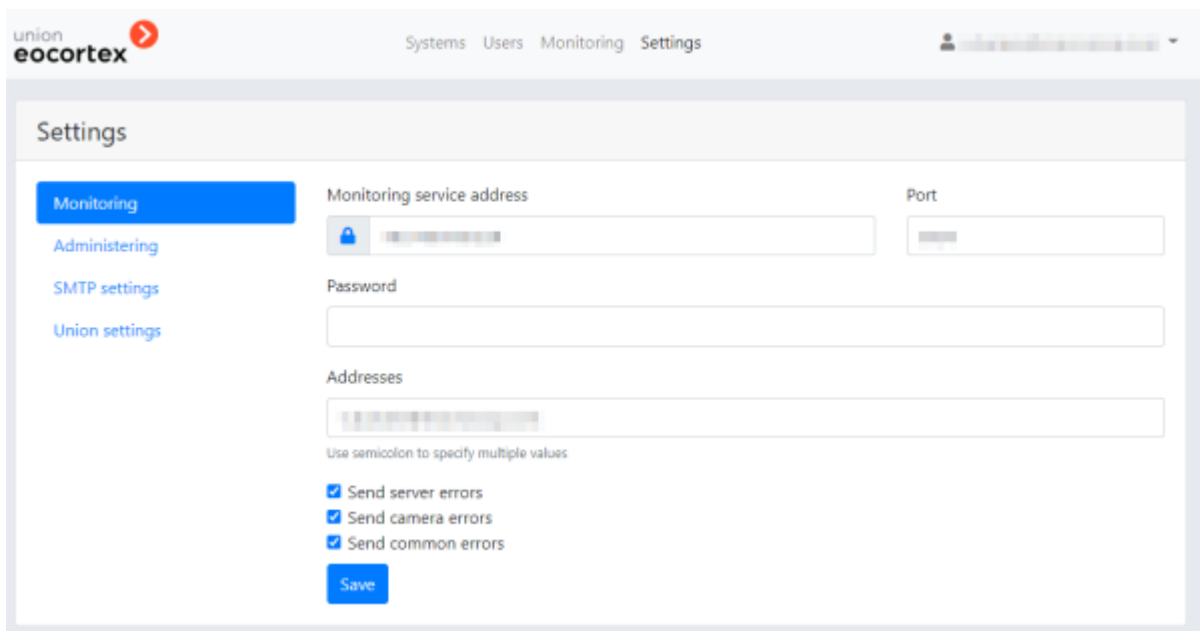


In systems connected to **Eocortex Union**, **Eocortex System Monitoring** is automatically enabled with **Eocortex Union** settings.

If the system being connected already has its own settings for **Eocortex System Monitoring**, then, when connected to **Eocortex Union**, a prompt to change them to the settings common for all the connected systems will appear. In case of failure, the Eocortex System Monitoring service of this system will not be connected to **Eocortex Union** and will remain with its own settings.

Connection and configuration of Eocortex System Monitoring

Configuring **Eocortex System Monitoring**, as well as connecting the **Eocortex System Monitoring** service to **Eocortex Union** deployed on another server, is carried out in the administrator personal area, on the **Settings** page of the **Eocortex System Monitoring** settings tab.



Settings:

- **Monitoring service address** (by default, **address_union**).
- **Port** (by default, 8891).

- **Password** (by default, blank).
- **List of recipients** to whom all monitoring notifications will be sent (by default, the notifications are sent to the **Eocortex Union**, administrator, if their email is indicated).
- **Error notifications:**
 - **Send server errors**
 - **Send camera errors**
 - **Send general errors**

Using own SMTP server

To use own SMTP server, in addition to changing the settings in the administrator personal area, it is possible to create or edit the file **MailSettings.json** in the folder **/opt/eocortex-union/service/Setting** folder of the **Eocortex Union** service.

Contents of the file:

```
{
  "MainSettings": {
    "ServerAddress": "SMTP server address", ← string
    "ServerPort": SMTP server port, ← numeral
    "SenderName": "name of sender", ← string
    "Email": "email for sending messages", ← string
    "UserName": "name of SMTP server user", ← string
    "Password": "password of SMTP server user", ← string
    "SslConnection": true ← boolean
  }
}
```

Example of using the Postfix SMTP server (with default settings):

```
{
  "MainSettings": {
    "ServerAddress": "127.0.0.1",
    "ServerPort": 25,
    "SenderName": "Eocortex Union",
    "Email": "noreply@union.eocortex.com",
    "UserName": "",
    "Password": ""
    "SslConnection": false
  }
}
```

Example of using Google SMTP server:

```
{
  "MainSettings": {
```

```
"ServerAddress": "smtp.google.com",
"ServerPort": 587,
"SenderName": "Eocortex Union",
"Email": "union.eocortex@gmail.com",
"UserName": "union.eocortex@gmail.com",
"Password": "qwerty123"
"SslConnection": true
}
}
```

The fields **Email** and **UserName** may or may not match, depending on the settings of the SMTP server.

Eocortex Union network settings

By default, **Eocortex Union** service has a number of following restrictions on interaction with other services connected to **Eocortex Union**, including **Eocortex** servers and **Eocortex System Monitoring** service:

- maximum request execution time (RequestTimeoutInSecodns): 3 seconds
- number of repeated attempts to execute requests (MaxRetryCount): 3
- waiting time between repeated execution of requests (RetryTimeoutInSeconds): 1 second.

To change these settings, it is required to modify the value of the parameter **HttpConnectionSettings** in the file **appsettings.json**.

```
{
...
"HttpConnectionSettings": {
  "MaxRetryCount": 3, ← numeral
  "RetryTimeoutInSeconds": 1, ← numeral
  "RequestTimeoutInSeconds": 3, ← numeral
}
...
}
```

Should the requests to the server connected to **Eocortex Union** take longer than the specified time, **Eocortex Union**, based on the current settings, will consider the system to be unavailable. To avoid this, it is required to modify the parameters; first of all, **RequestTimeoutInSeconds**, increasing the timeout of the response from the connected system.

Changing Eocortex Union port

By default, **Eocortex Union** uses the following ports:

- 80: http (nginx);
- 443: https (nginx);
- 5000: http (eocortex-union).

It is possible to change these ports

To change ports 80 and 443, it is required to do the following:

1. Open the service configuration file in nginx: **/etc/nginx/sites-available/eocortex-union.conf**
2. Change the ports in the following strings:

```
listen 80;
listen 443 ssl;
```

3. Restart nginx:

```
systemctl restart nginx
```

To change the port 5000, it is required to do the following:

1. Open the file of the service **/etc/systemd/system/eocortex-union.service**
2. Add the flag **--urls=http://0.0.0.0:5001/**, where 5001 is the new port, to the key **ExecStart=** and to its value. The resulting string should look as follows:

```
ExecStart=/usr/bin/dotnet /opt/eocortex-
union/service/UnionService.dll --
--urls=http://0.0.0.0:5001/
```

3. Restart the service **systemctl daemon**

```
systemctl daemon-reload
```

4. Restart the service **eocortex-union**

```
systemctl restart eocortex-union
```

5. Open the configuration file of the service in **nginx/etc/nginx/sites-available/eocortex-union.conf**
6. Specify the desired port in the block **>location /api** in the string **proxy_pass http://localhost:5000;** The resulting string should look as follows:

```
location /api {
    proxy_pass http://localhost:5001;
```

7. Restart **nginx**

```
systemctl restart nginx
```

PostgreSQL password change

By default, when installing **Eocortex Union** for PostgreSQL, a password that can be viewed in the configuration file of the **eocortex-union** service **/opt/eocortex-union/service/appsettings.json** generated. The password is located in the **Password=** parameter in the following string:

```
"ConnectionStrings": {
  "DbConnection":
    "Host=127.0.0.1;Port=5432;Database=union_db;Username=union_user;Password=80b8eb0a-
cc2e-499c-a500-d695eb3a0b6b;"
}
```

To change the password, it is required to do the following:

1. Enter the console as the user **postgres**:

```
cd /
su postgres
```

2. Change the password, specifying a new password instead of newpassword

```
psql -c "ALTER USER union_user WITH PASSWORD 'newpassword';"
```

3. Change the password in the configuration file of the service **/opt/eocortex-union/service/appsettings.json**. Specify a new password in the value **Password=**:

```
"ConnectionStrings": {
```

```
"DbConnection":  
  
"Host=127.0.0.1;Port=5432;Database=union_db;Username=union_user;Password=newpassword;"  
}
```

4. Restart the service eocortex-union:

```
systemctl restart eocortex-union
```

Installing own SSL certificate

By default, a self-signed SSL certificate is generated when installing **Eocortex Union**. To replace it with own SSL certificate, it is required to proceed as follows:

1. Open the service configuration file in nginx `/etc/nginx/sites-available/eocortex-union.conf`;
2. Find the following lines and change the paths to the files of own SSL certificates and a private key:

```
ssl_certificate /etc/ssl/certs/eocortex-union.cert.pem;  
ssl_certificate_key /etc/ssl/private/eocortex-union.key.pem;
```

3. Restart nginx:

```
systemctl restart nginx
```

The certificate and the key must be changed in two places, for configuring the eocortex-union SSL service and for configuring the monitoring server located on port 8191 by default.

Domain name change

To change the address or domain of the server that were entered during installation, it is required to do the following:

1. Open the service configuration file `/opt/eocortex-union/service/appsettings.json`;
2. Find the key `HostUrl` and modify its value:

```
"HostUrl": "https://union.com"
```

3. Restart the service eocortex-union:

```
systemctl restart eocortex-union
```

Episode archive

Keep important fragments of the archive without worrying that they will be deleted or overwritten using **Episode archive**.



This feature is available only for **Enterprise** and **ULTRA** licenses.

Description

The system automatically deletes video fragments in the main archive without notification in the following cases:

If the free disk space is not enough to write new data. The oldest recordings in such case will be overwritten with new ones.

If the maximum fragment storage period set in settings is exceeded.

If certain archive fragments must be kept unchanged for longer than allowed by the system, transfer them from the main archive to the **Episode archive**.

Episode archive:

stores only video and sound without associated events.

allows storing data without time limits.

works as a separate application and requires a separate installation.

Requirements and limitations

The **Episode archive** Service is a standalone application and must be installed individually.

The **Service** can be installed on any computer without installing the **Eocortex Server** on it.

Only one **Service** instance can be configured for the entire system.

The **Episode archive** Service can be used simultaneously with the **Long-term database** Service, but they do not communicate with each other.

Episodes are added to the **Episode archive** Service database by system users and can only be added manually.

Eocortex version 3.6 uses an additional service called **Episode Archive Agent** to connect servers to the Service. The Agent installs automatically during **Eocortex** Server deployment. In case of problems with saving episodes in the Service database, it is recommended to check the status of this service.

Name of the Agent depending on the operating system:

- Windows: EocortexArchiveEpisodesAgent
- Linux: eocortexarchiveepisodesagent.service

Starting with version 4.0, **Eocortex** servers connect to the Service directly without using the **Agent**.

Episodes stored in the Service database are bound to channels in the system configuration for access rights delimitation purposes. If a channel is deleted from the configuration or turned off in the **Eocortex Configurator** application, episodes associated with it will not be available for interactions. If it is necessary to delete a channel from the system, it is recommended to delete all episodes from the Service database beforehand.

Physical replacement of the camera within the existing channel, its transfer to another position or to another server within a multiserver system does not affect the availability of episodes.

If a channel has been turned off or deleted without prior deletion of saved episodes, they can be accessed by turning the channel on or restoring it from the settings backup.

Only one disk can be selected to store episodes in the Service database at a time.

The Service does not support network drives for storing episodes.

Episode archive is not available for the **Eocortex Client** application connected via **Eocortex Cloud** or **Eocortex Union**.

Related references

[Use in the **Eocortex Client** application](#)

[Setting in the **Eocortex Configurator** application](#)

[Installation of **Episode archive** on Windows](#)

[Installation of **Episode archive** on Linux](#)

Service installation

The **Episode archive** provides the possibility to keep individual archive fragments for an unlimited time. Using the **Episode archive**, you can be sure that important archive fragments will not be deleted due to loop recording or corruption of the main archive.

This feature is available only for **Enterprise** and **ULTRA** licenses.

The **Episode archive** service supports the following operating systems:

- Windows 10
- Debian 10
- CentOS 7

Work on other operating systems that are not listed is not guaranteed.

Depending on the selected operating system, the Service installation process will differ. For details on how to install the **Episode archive** Service on [Windows](#) or [Linux](#), see the corresponding instructions in the **Deployment** section.

Related references

[Overview of the Service](#)

[Use in the **Eocortex Client** application](#)

[Setting in the **Eocortex Configurator** application](#)

[Installation of **Episode archive** on Windows](#)

[Installation of **Episode archive** on Linux](#)

Service configuration

The **Episode archive** provides the possibility to keep individual archive fragments for an unlimited time. Using the **Episode archive**, you can be sure that important archive fragments will not be deleted due to loop recording or corruption of the main archive.

This feature is available only for **Enterprise** and **ULTRA** licenses.

To enable and configure the **Episode archive** Service, follow these steps:

Launch the **Eocortex Configurator** application.

Go to the  **Servers** page.

Select the  **General settings** item in the list of servers.

Switch to the **Services** tab.

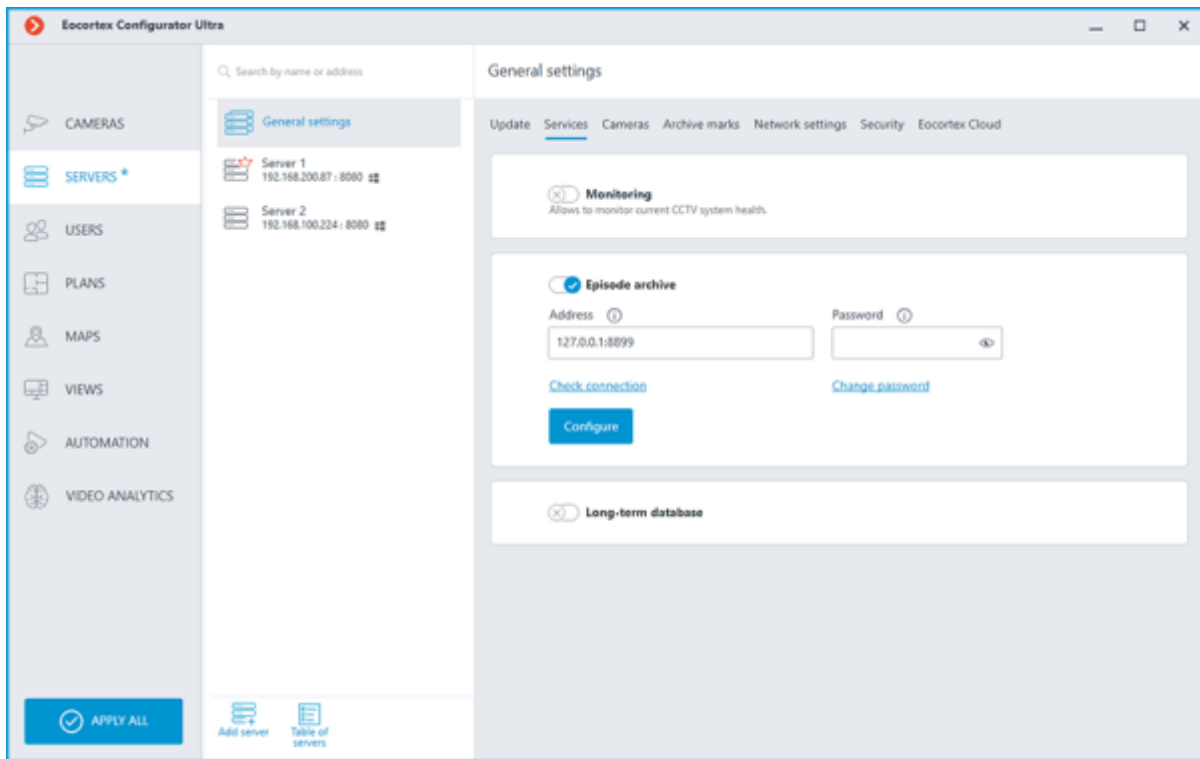
Enable the  **Episode archive** option.

Configure the interaction with the **Episode archive** Service, such as the following:

- Configure a [network connection](#) to the Service.
- [Change the password of the Service](#) if needed.

- Specify a [disk for storing](#) episodes.
- Assign [access rights](#) to the Service.

[Apply settings](#).



Connection settings

This setting can be changed on the **Services** tab, where the Service was enabled.

Network connection to the Service must be configured to make it possible to create and store archive episodes.

Below is a description of settings:

Address: Address of the Episode archive Service. This address must be accessible to all servers. If the connection port for the Service has been changed, the new port must be specified in the same field, with a colon after the address.

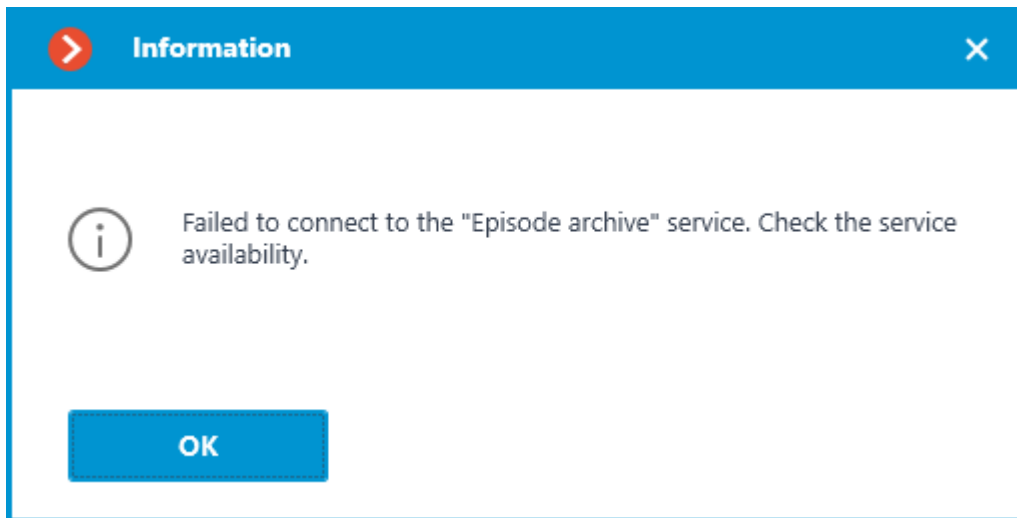
Password: Password of the Episode archive Service. The default password is blank.

Check connection: Clicking this link starts the test connection to the **Episode archive** Service.

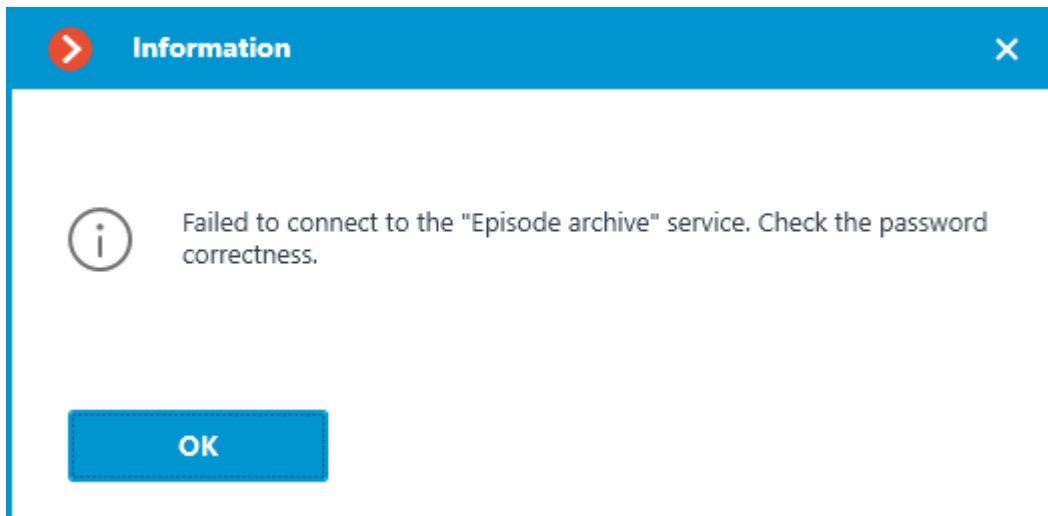
Change password: Clicking this link opens a window that allows to [change the password](#) of the **Episode archive** Service. It is recommended to change the password at the first Service setup.

Configure: Clicking this button opens the window with the disk selection for storing the content of the **Episode archive** Service.

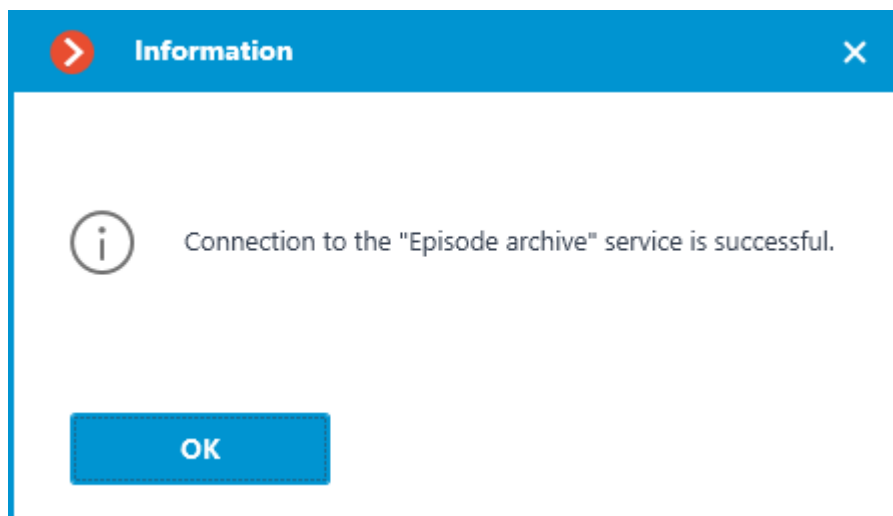
Once the **Address** and **Password** fields are filled in, it is recommended to test the connection to the Service by clicking the **Check connection** link. Depending on the validity of the settings and availability of the Service, the results may be as follows:



Failed to connect to the Service at the specified address and port during the connection test. Check the validity of the specified data and the network availability of the Service for the server and try again.



Connection to the Service was successfully established during the connection test, but the used password does not match the one saved in the Service settings. Check that the password you have entered is valid.



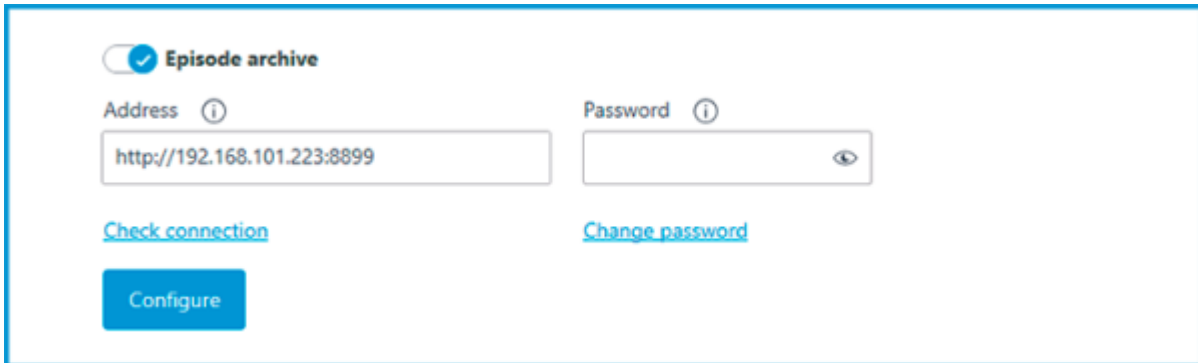
Connection test is successful, it is possible to proceed with further setup of interaction with the Service.

Changing Service password

Configuration can be made in a separate window that opens by clicking the **Change password** link on the **Services** tab.

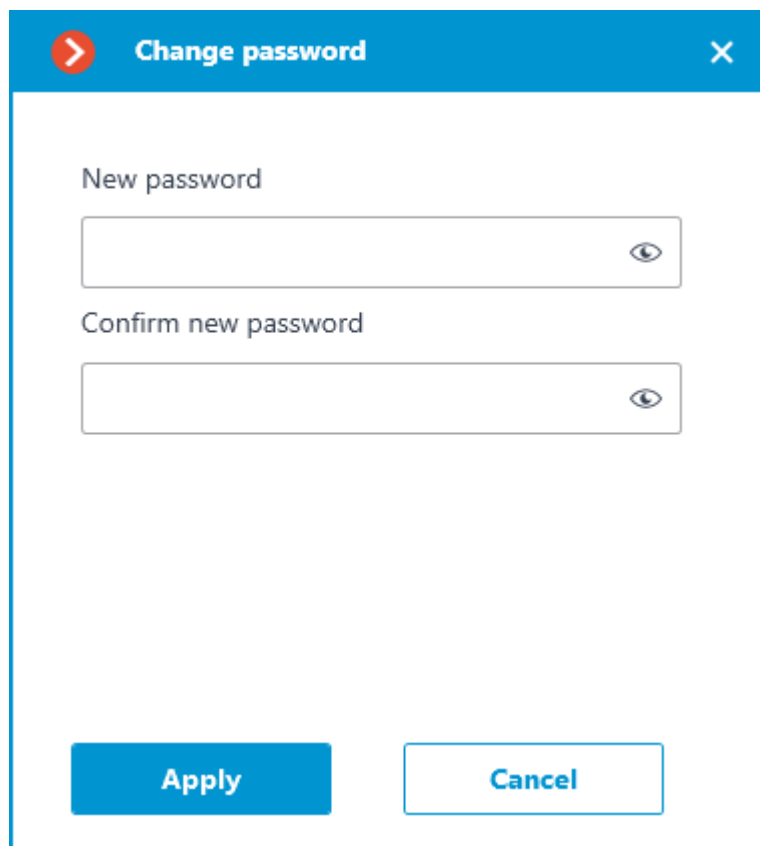
The **Episode archive** Service does not have a password by default and this may conflict with local security policies.

To set or change the password for the connection to the Service, click the **Change password** link under the **Password** field on the **Services** tab.



The screenshot shows the configuration window for the 'Episode archive' service. At the top left, there is a toggle switch for 'Episode archive' which is turned on. Below this, there are two input fields: 'Address' containing 'http://192.168.101.223:8899' and 'Password' which is currently empty. Under the 'Address' field is a blue link labeled 'Check connection'. Under the 'Password' field is a blue link labeled 'Change password'. At the bottom left, there is a blue button labeled 'Configure'.

In the window that opens, fill in the **New password** and **Confirm new password** fields with the password.



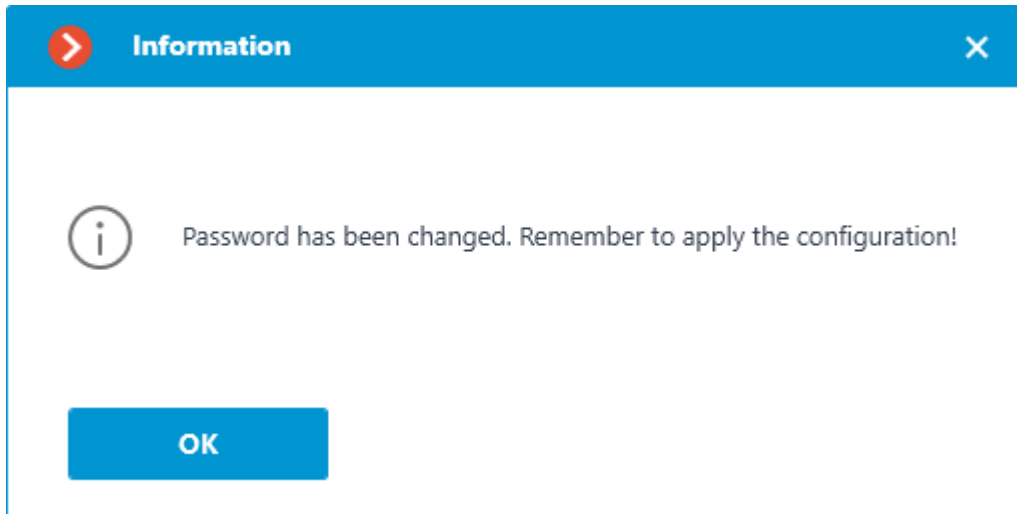
The screenshot shows a dialog box titled 'Change password'. It has a blue header bar with a red arrow icon on the left and a close 'X' icon on the right. The main area contains two password input fields: 'New password' and 'Confirm new password'. Both fields have a small eye icon to the right, indicating they are currently hidden. At the bottom of the dialog, there are two buttons: a blue 'Apply' button and a white 'Cancel' button with a blue border.

When setting or changing a password, there are a few requirements that must be met:

- Service must be available when changing the password.
- The password and its confirmation must match.
- The new password must not be identical to the old password when it is changed.

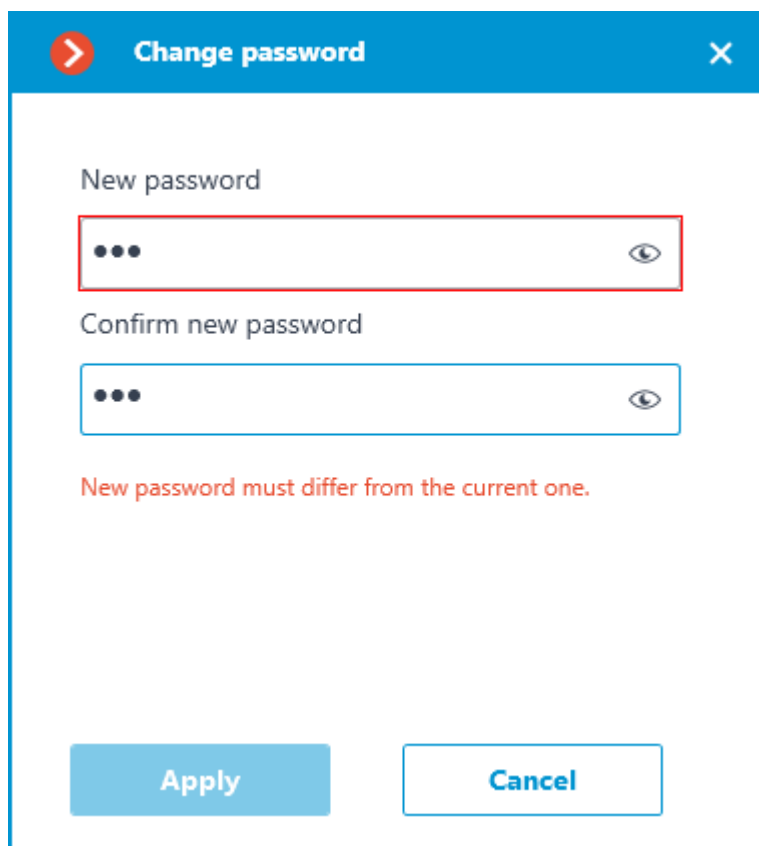
- The password can contain characters of the Latin and Cyrillic alphabet.
- The password may include numbers.
- Only the following special characters are allowed in the password: **!@#\$%&()_-**
- The password can be blank.

If all requirements have been met, clicking the **Apply** button will set a new password for the Service and display the corresponding message.



To save the settings and then synchronize them with the Service, [apply the settings](#).

If any requirement is violated when setting a new password, the window will show a warning and the **Apply** button will be blocked.



Change password

New password

Confirm new password

New password and confirmation do not match.

Apply **Cancel**

Change password

New password

Confirm new password

Password contains prohibited symbols. Only letters of the Latin and Cyrillic alphabet and the characters !@#\$%&()_ are allowed.

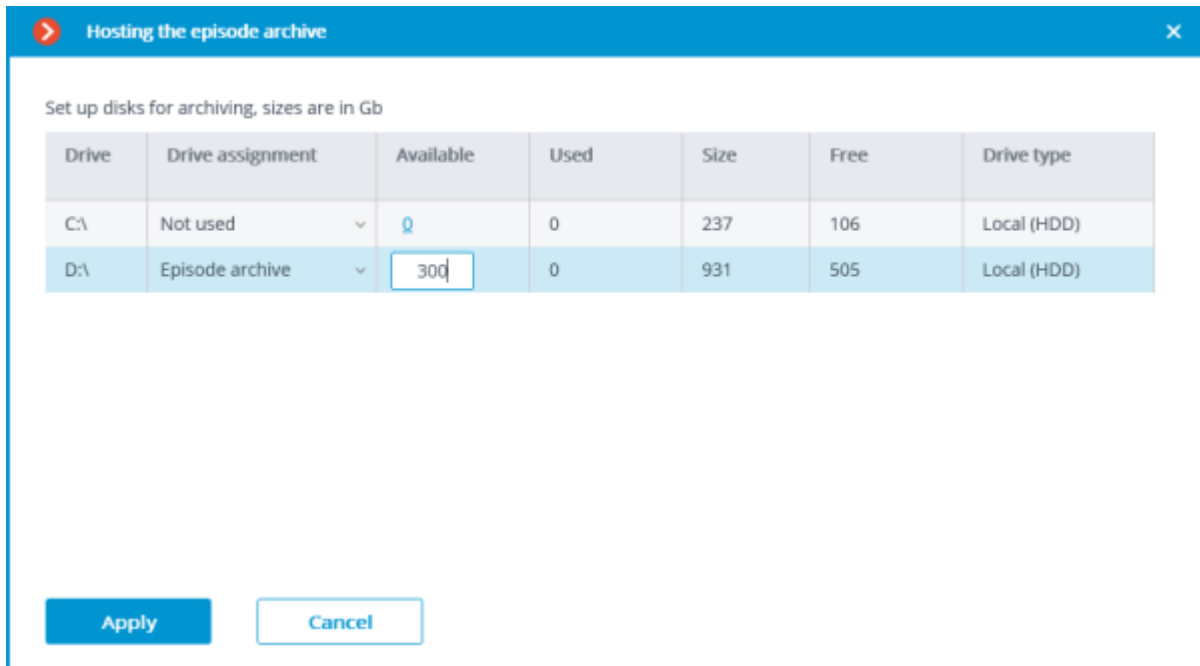
Apply **Cancel**

Storage disk settings

Configuration can be made in a separate window that opens by clicking the **Configure** link on the **Services** tab.

The **Hosting the episode archive** window contains settings for selecting a drive to store the content of the Service.

Disks are selected for the device on which the Service is installed.



Only one disk can be selected to store episodes in the Service database at a time. The minimum disk space allocated for the Service should be at least 1,000 MB. The Service does not support network drives for storing episodes.

If the selected drive has already been used before by the **Episode archive** Service, then users will have access to the episodes it already contains.

Access settings

This setting can be done on the  **Users** page of the **Eocortex Configurator** application.

The **Episode archive** Service allows granting users different access rights to the Service and its contents.

To configure user access to the Service, follow these steps:

Switch to the  **Users** page of the **Eocortex Configurator** application.

Make sure that the **Users of Eocortex applications** list type is selected. The list type selection is available directly above the list of users.

Select the user group and click the **Edit** button.

In the window that opens, switch to the **Basic** tab.

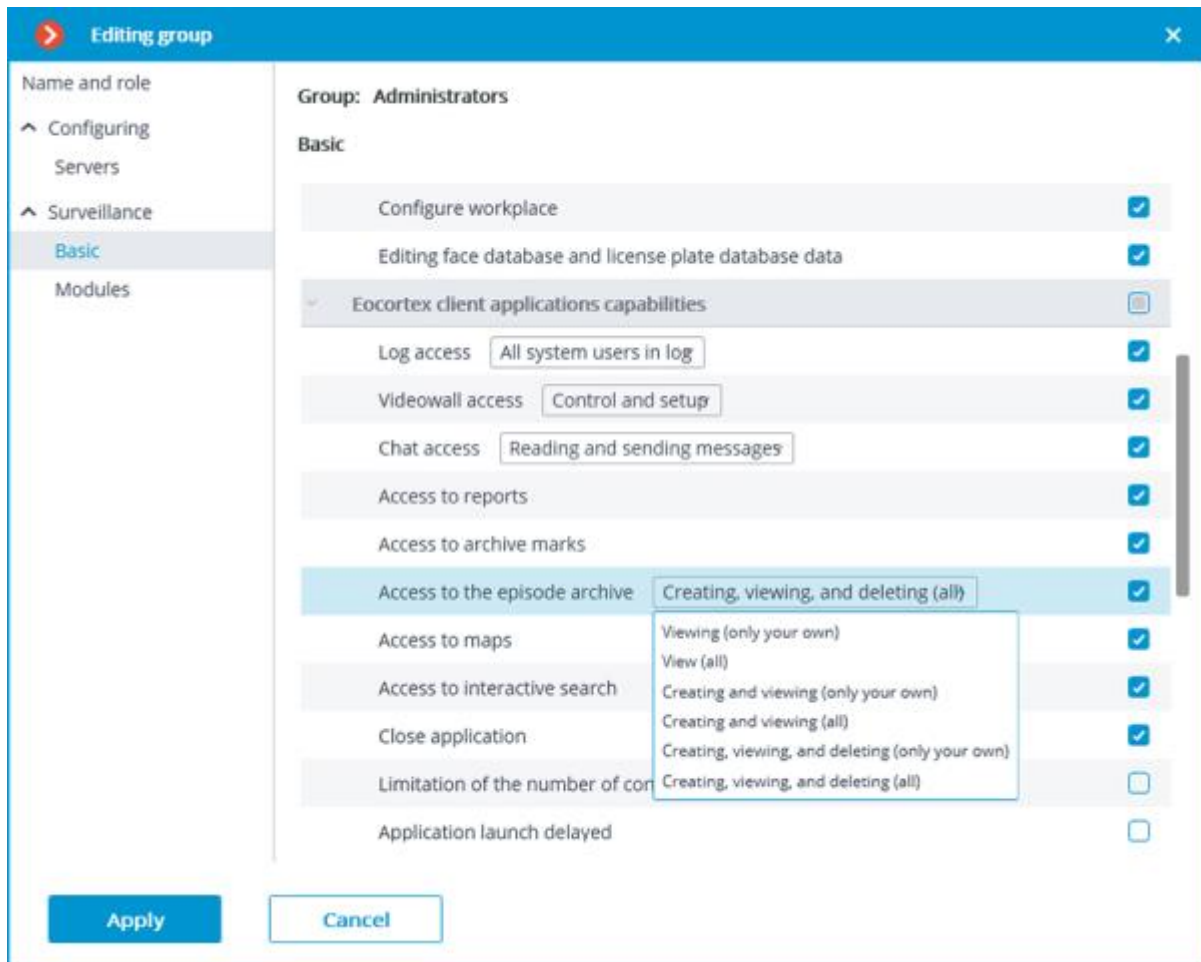
Enable the **Access to the episode archive** permission and set the needed type and level of the access.

Access types:

- **Viewing** — the user will be able to view episodes already created, but will not be able to delete existing episodes or create new ones.
- **Creating and viewing** — the user can create new episodes and view existing episodes, but cannot delete them.
- **Creating, viewing, and deleting** — the user will be able to create, view, and delete episodes.

Access levels:

- **(only your own)**: the user will only be able to interact with the episodes that were added by himself.
- **(all)**: the user will be able to interact with all episodes.



Events log

The following events have been added to the **Events log** to monitor actions related to episodes:

The user saved the episode: episode has been added to the saving queue;

Episode saved;

Error while saving an episode.

If a user has access to the **Events log** with the **Access to the episode archive** right granted, then he will be able to view all episode archive events, regardless of who added the episode

But at the same time, if access to the **Events log** is limited for a user to view only his own events, then he will be able to view events only for those episodes that were added by this user.

Use cases

Log access	Access to the episode archive	Availability of Service events in the log
All system users in log	View (all)	All Service events
All system users in log	Viewing (only your own)	All Service events
Current user in log only	All system users in log	Only those Service events that were created by this user
Current user in log only	Viewing (only your own)	Only those Service events that were created by this user

If none of these access rights have been granted to the user by the system administrator, the user will not be able to view any Service events at all.

Related references

[Overview of the Service](#)

[Use in the **Eocortex Client** application](#)

[Installation of **Episode archive** on Windows](#)

[Installation of **Episode archive** on Linux](#)

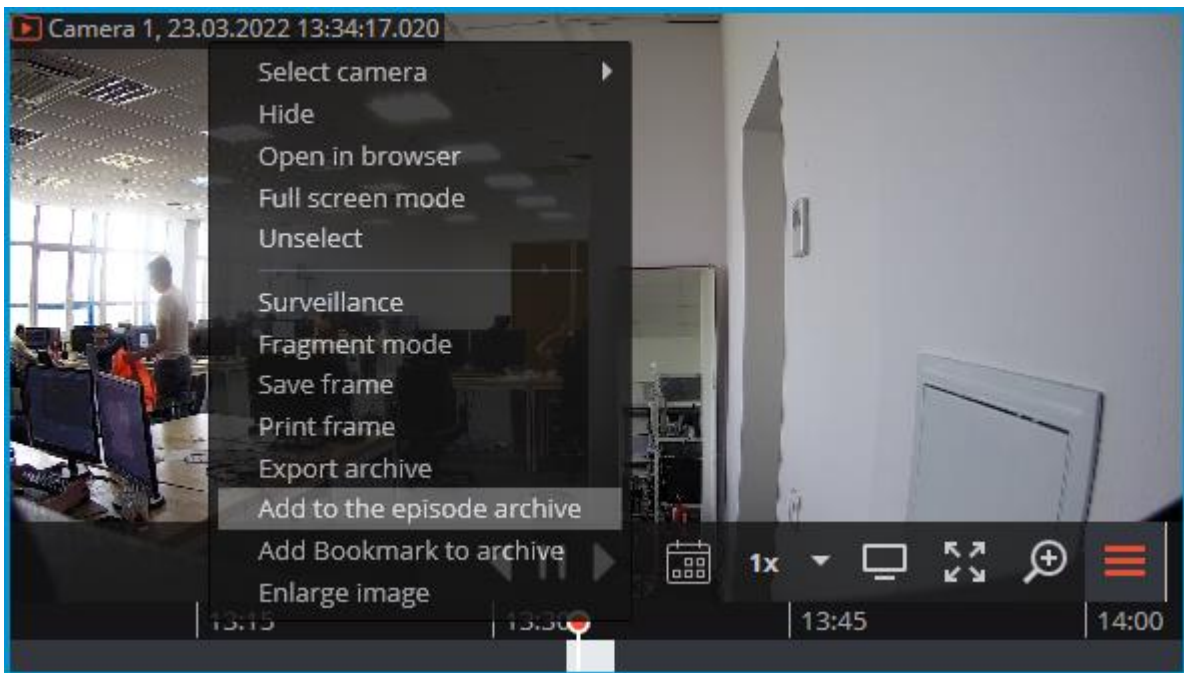
Service usage

The **Episode archive** provides the possibility to keep individual archive fragments for an unlimited time. Using the **Episode archive**, you can be sure that important archive fragments will not be deleted due to loop recording or corruption of the main archive.

The **Episode archive** is available only to users with the appropriate access rights. The ability to view, add and delete episodes is controlled by different levels of rights.

Adding the episode

To create an archive episode, switch the camera cell to [the viewing the single camera archive mode](#) in the **Eocortex Client** application and select the **Add to the episode archive** item in the context menu.



In the window that opens, it is needed to:

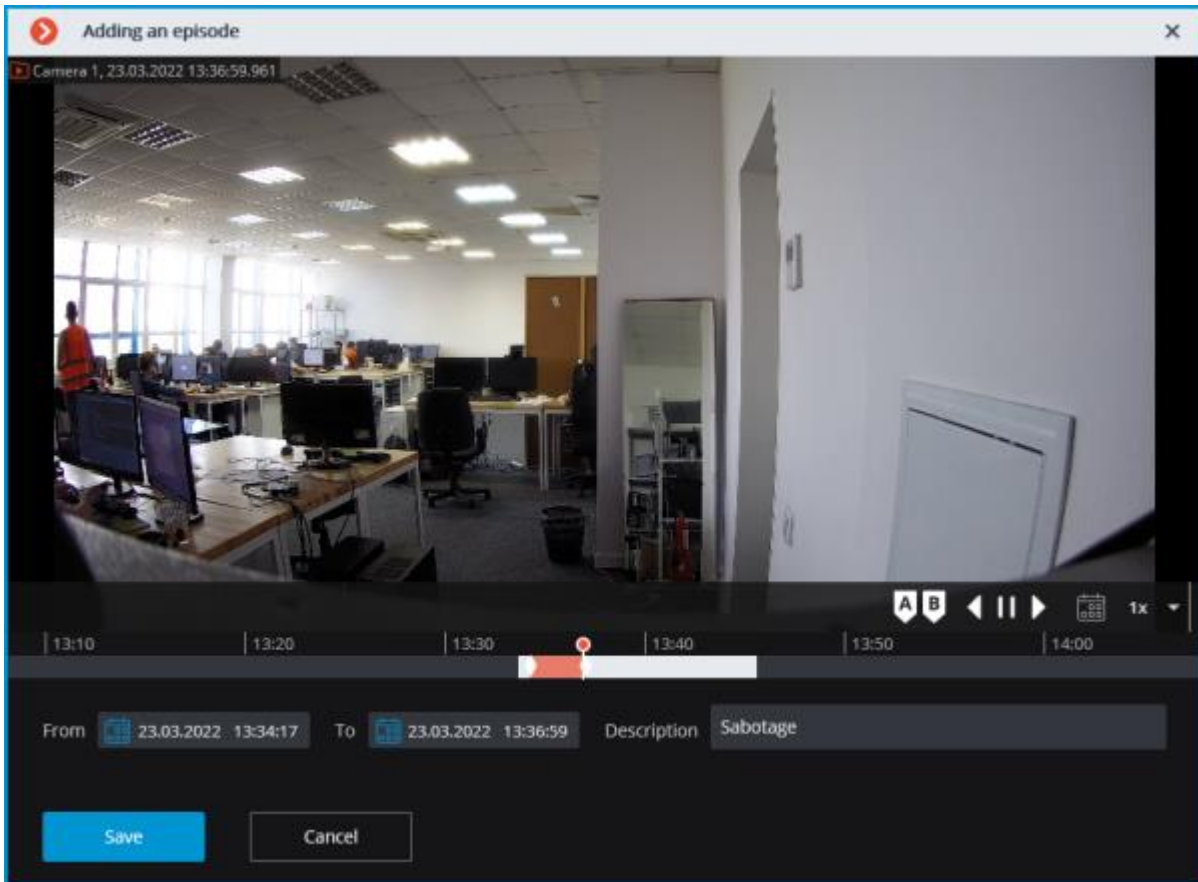
select the fragment of the main archive to create the archive episode with one of the following options:

- using markers on the timeline;
- by selecting the start and end date and time in the respective time selection menus;
- using **A** and **B** buttons, which correspond to the beginning and end of the episode.

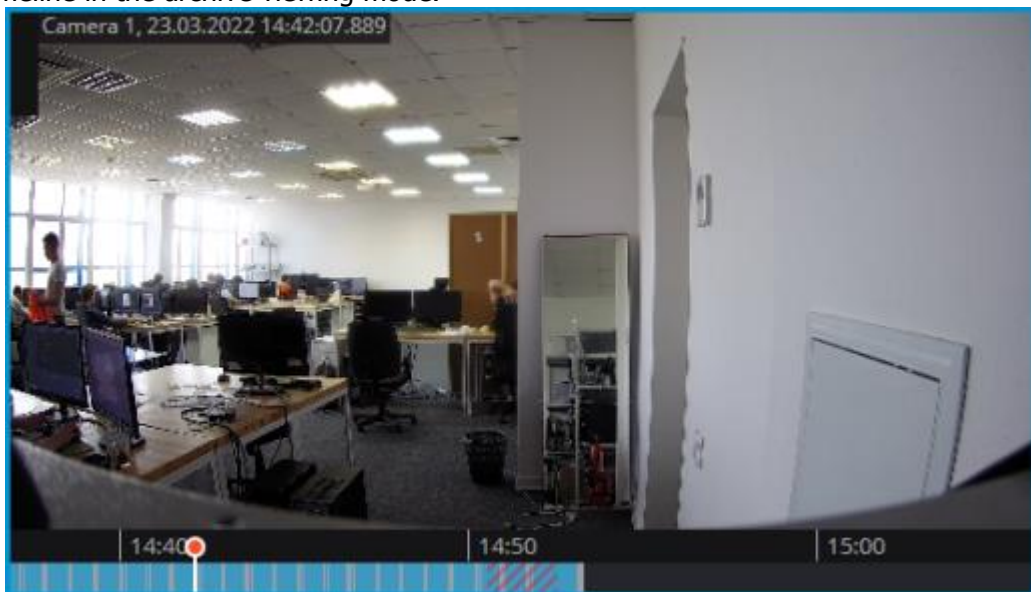
set the description of the archive episode;

click on the **Save** button.

The description and period of a fragment cannot be changed after saving the episode from the archive.



Successfully added archive episodes for the selected camera are displayed on the timeline in the archive viewing mode.



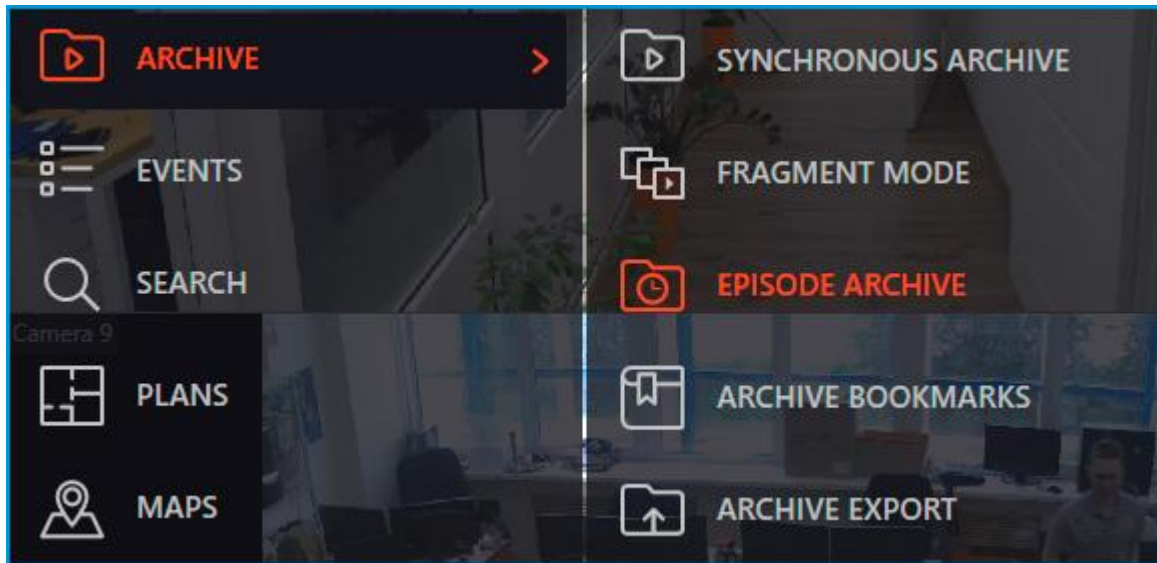
If a fragment used to create an archive episode has been deleted from the main archive, then the **Episode archive** should be used to play the episode.

Working with episodes

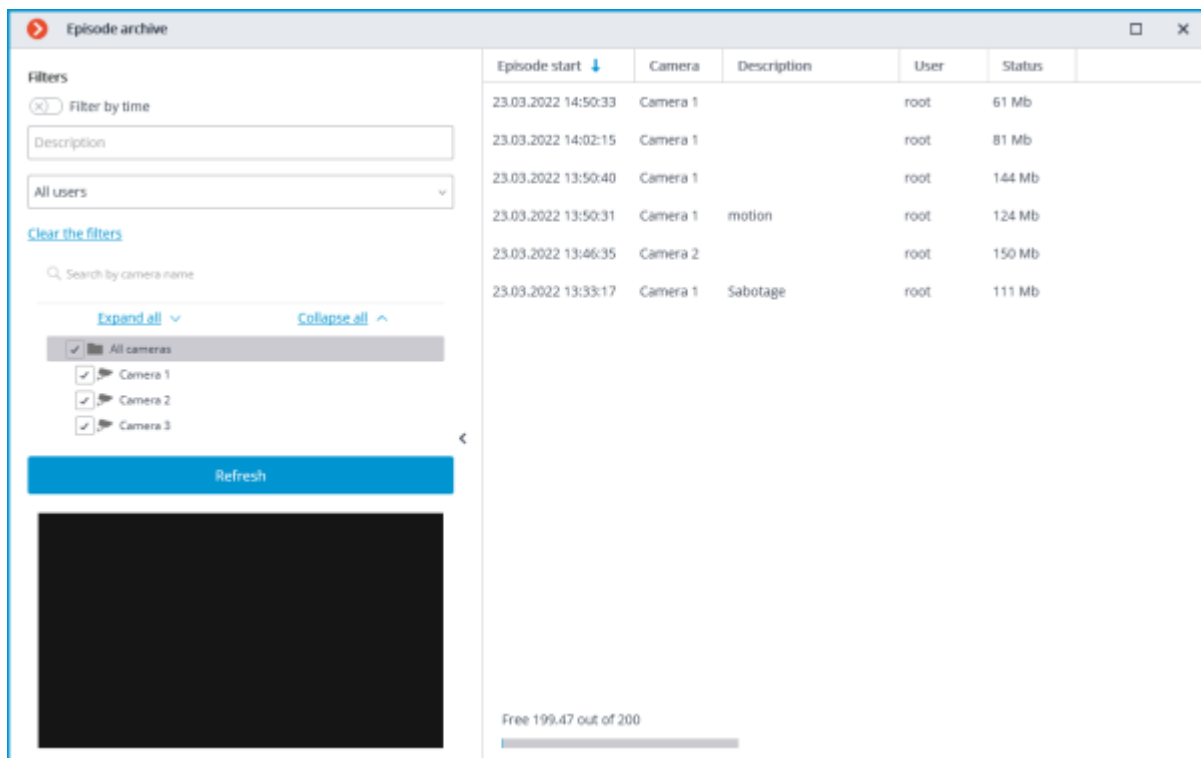
Episode archive allows to:
browse the list of episodes

- filter the list of episodes
- playback episodes
- delete episodes
- export episodes

To open the **Episode archive** window, select the **Episode archive** sub-item of the  **Archive** item on the control panel.



The Episode archive window consists of a filter panel (on the left) and a list of episodes (on the right).



The list of episodes is not updated automatically. To update the list, it is needed to click the **Update** button in the left part of the window, after which the server will update the list with the currently selected filters.

The upper left part of the window contains a list of filters by which the user can search for archive episodes. The following filters can be used:

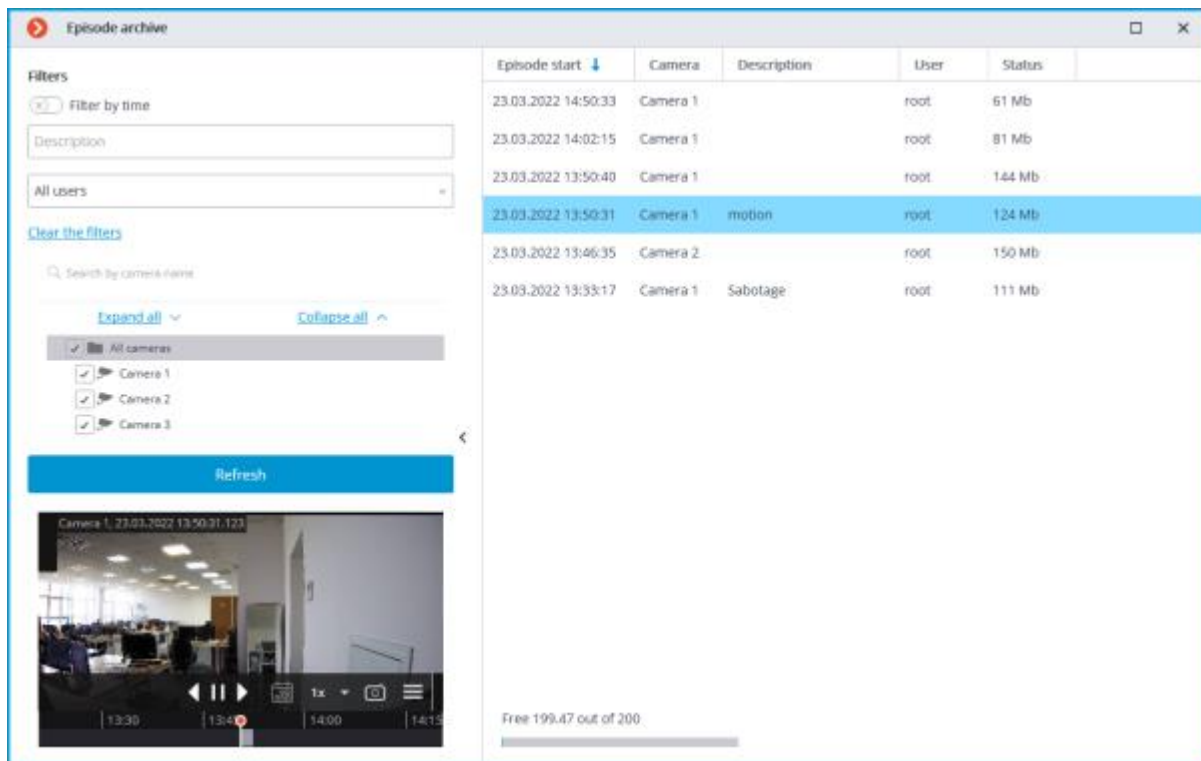
filter by time: episodes that start within the specified period of time will be displayed;


filter by description: episodes will be displayed, the description of which contains the searched text;

filter by user: episodes added by the specified user will be displayed;

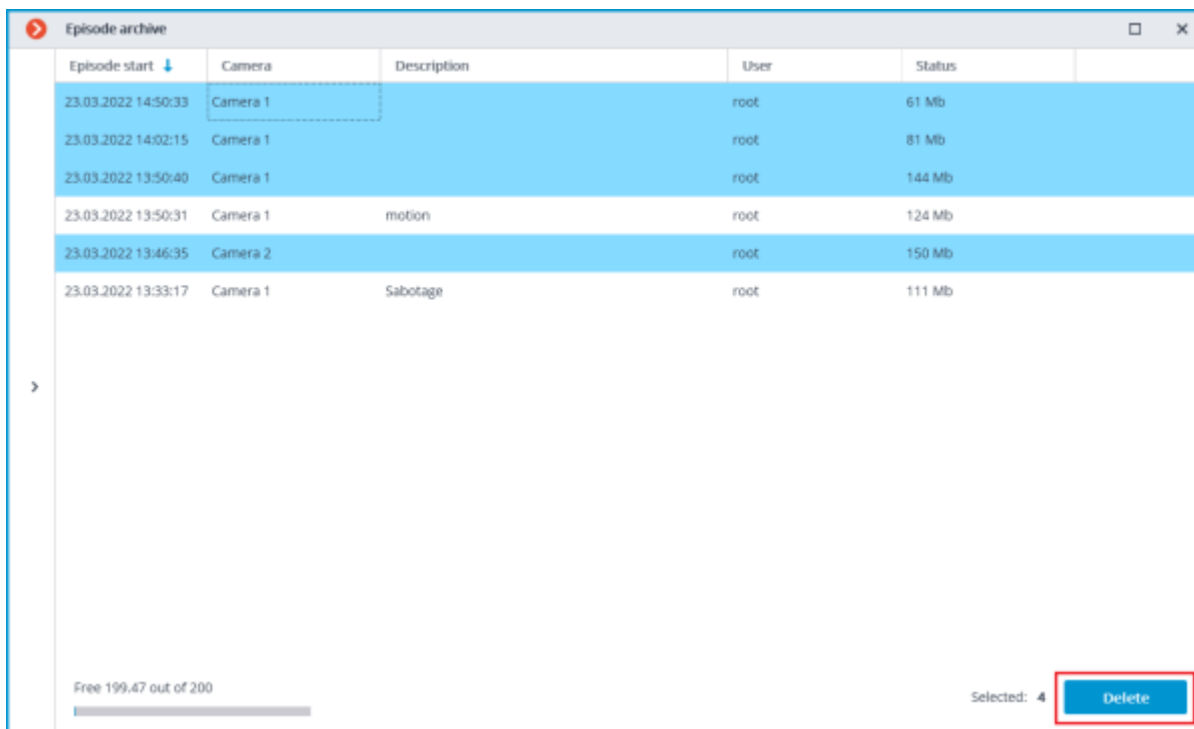
filter by cameras: episodes added from the archive of the specified cameras will be displayed.

To view the needed archive episode, the user needs to select it in the list, after which the episode will be displayed in the preview window.



To delete an archived episode, select it in the list and click the  button.


To delete multiple episodes at a time, select the needed episodes using the hot keys **Control/Shift + left mouse button**, then click the **Delete** button in the bottom right corner.

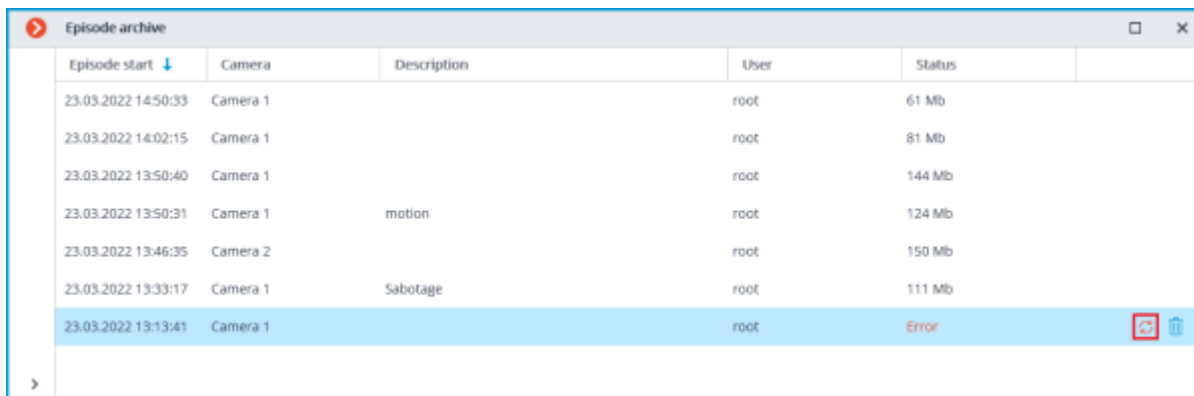




Episode start ↓	Camera	Description	User	Status	
23.03.2022 14:50:33	Camera 1		root	61 Mb	
23.03.2022 14:02:15	Camera 1		root	81 Mb	
23.03.2022 13:50:40	Camera 1		root	144 Mb	
23.03.2022 13:50:31	Camera 1	motion	root	124 Mb	
23.03.2022 13:46:35	Camera 2		root	150 Mb	
23.03.2022 13:33:17	Camera 1	Sabotage	root	111 Mb	

Free 199.47 out of 200

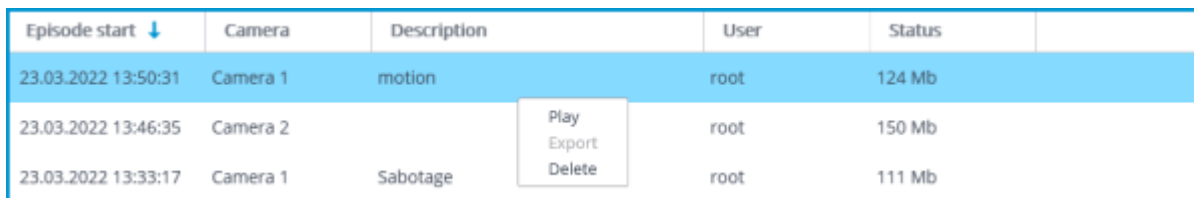
Selected: 4 Delete

If an error occurred during the creation of the episode, then the entry for that episode in the list will have a status indicating this. To repeat an attempt to create an episode, select the entry in the list and click the  button.



Episode start ↓	Camera	Description	User	Status	
23.03.2022 14:50:33	Camera 1		root	61 Mb	
23.03.2022 14:02:15	Camera 1		root	81 Mb	
23.03.2022 13:50:40	Camera 1		root	144 Mb	
23.03.2022 13:50:31	Camera 1	motion	root	124 Mb	
23.03.2022 13:46:35	Camera 2		root	150 Mb	
23.03.2022 13:33:17	Camera 1	Sabotage	root	111 Mb	
23.03.2022 13:13:41	Camera 1		root	Error	 

To export the episode, select it in the list, call the context menu and select the **Export** item.



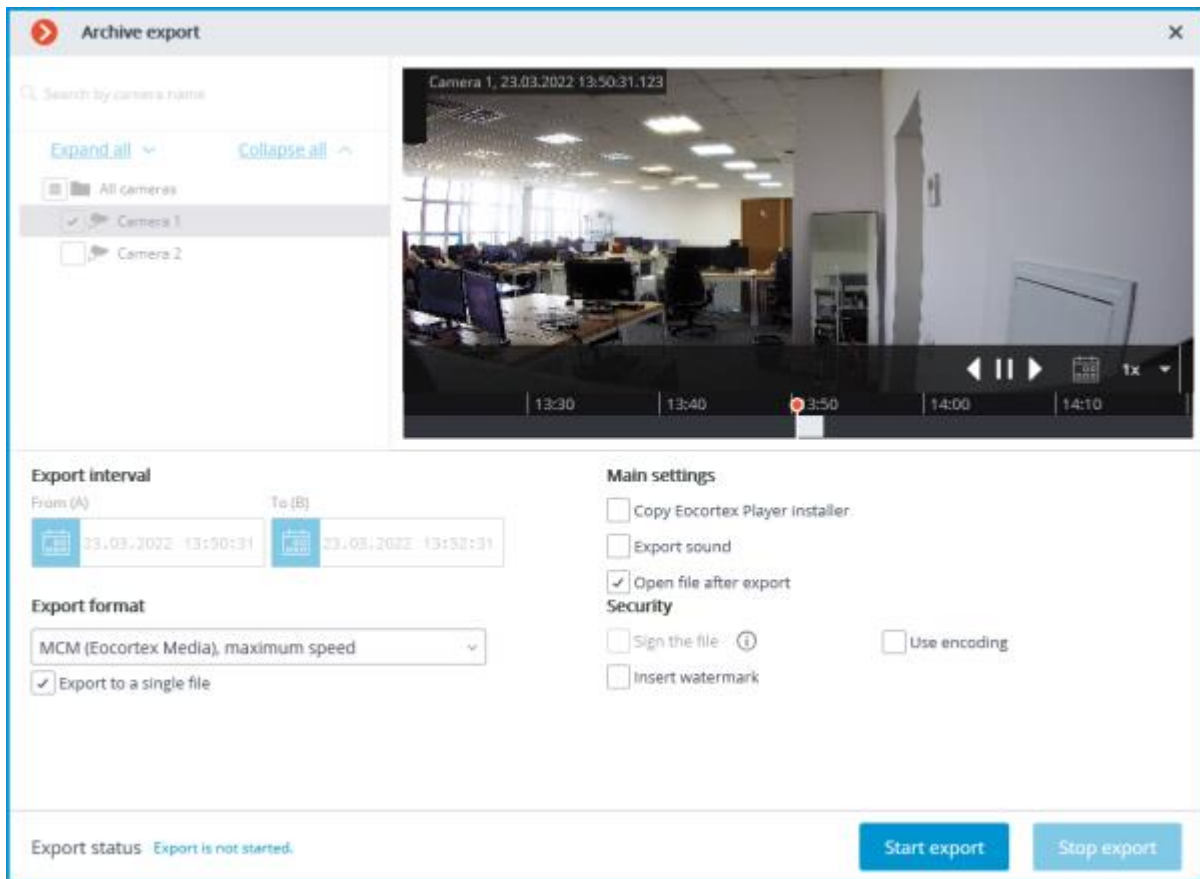
Episode start ↓	Camera	Description	User	Status	
23.03.2022 13:50:31	Camera 1	motion	root	124 Mb	
23.03.2022 13:46:35	Camera 2		root	150 Mb	
23.03.2022 13:33:17	Camera 1	Sabotage	root	111 Mb	

Play

Export

Delete

Only the entire episode can be exported.



Events log

The following events have been added to the **Events log** to monitor actions related to episodes:

The user saved the episode: episode has been added to the saving queue;

Episode saved;

Error while saving an episode.

Events		
Time	Type	Event description
23.03.2022 16:19:22	i	Camera 1. Episode saved. root.
23.03.2022 16:19:19	i	Event log opening. Client type: Desktop, user: root, IP-address: 127.0.0.1, computer: [redacted].
23.03.2022 16:19:16	i	Camera 1. The user saved the episode. Client type: Desktop, user: root, IP-address: 127.0.0.1, computer: [redacted].

The system administrator can restrict access to both the entire event log and specific event categories.

Related references

[Overview of the Service](#)

[Setting in the Eocortex Configurator application](#)

[Installation of Episode archive on Windows](#)

[Installation of Episode archive on Linux](#)

Long-term database

Store the events of selected categories in a dedicated **Long-term database** Service database without concern that they will be wiped out if the archive is deleted or overwritten.



This feature is available only for **Enterprise** and **ULTRA** licenses.

Description

The events stored in the main database of the **Eocortex** server are limited by the archive records and exist as long as the archive for the time of the event exists. If the archive storage time has expired or the disk space for the archive recording has reached the limit, both the archive and the main database events associated with it will be deleted.

The **Long-term database** Service allows to:

Synchronize events of selected categories from the main databases and store them independently of the main database settings.

Set up an individual lifetime for each category of events.

Store full text information about the event in the same manner as in the main database.

For some event categories, store frames associated with the event.

Seamlessly view events from the main and Service databases in the **Eocortex Client** application.

Use events from the Service database when building most of the reports in the **Eocortex Client** application.

Requirements and limitations

The **Long-term database** Service is a standalone application and must be installed individually.

The **Service** can be installed on any computer without installing the **Eocortex Server** on it.

Only one **Service** instance can be configured for the entire system.

A single Service instance can be connected to multiple **Eocortex** systems at the same time.

The **Long-term database** Service can be used simultaneously with the **Episode archive** Service, but they do not communicate with each other.

Only those events will be transferred to the Service database that happened after completing the Service setup in the **Eocortex Configurator** application.

Events from the Service database cannot be used to build a report for the **Search for Objects** module due to the fact that this module uses archive records in addition to the events when building a report.

If one of the servers is disconnected from a multiserver system that is connected to the Service, such a server will be treated by the Service as a new system and will require reconfiguration of the interaction in the **Eocortex Configurator** application.

Related references

[Usage of the Service in the **Eocortex Client** application](#)

[Configuration in the **Eocortex Configurator** application](#)

[Installation of **Long-term database** on Windows](#)

[Installation of **Long-term database** on Linux](#)

Service installation

The **Long-term database** Service ensures storing of selected types of events and access to them regardless of the archive storage settings. With this Service there is no need to be concerned that event data will be erased if the archive is deleted.

This feature is available only for **Enterprise** and **ULTRA** licenses.

The **Long-term database** service supports the following operating systems:

Running on other operating systems that are not listed is not guaranteed.

Depending on the selected operating system, the Service installation process will differ. For details on how to install the **Long-term database** Service on [Windows](#) or [Linux](#), see the corresponding instructions in the **Deployment** section.

Related references

[Overview of the Service](#)

[Use in the **Eocortex Client** application](#)

[Setting in the **Eocortex Configurator** application](#)

[Installation of **Long-term database** on Windows](#)

[Installation of **Long-term database** on Linux](#)

Service configuration

The **Long-term database** Service ensures storing of selected types of events and access to them regardless of the archive storage settings. With this Service there is no need to be concerned that event data will be erased if the archive is deleted.

This feature is available only for **Enterprise** and **ULTRA** licenses.

To enable and configure the **Long-term database** Service, follow these steps:

Launch the **Eocortex Configurator** application.

Go to the  **Servers** page.

Select the  **General settings** item in the list of servers.

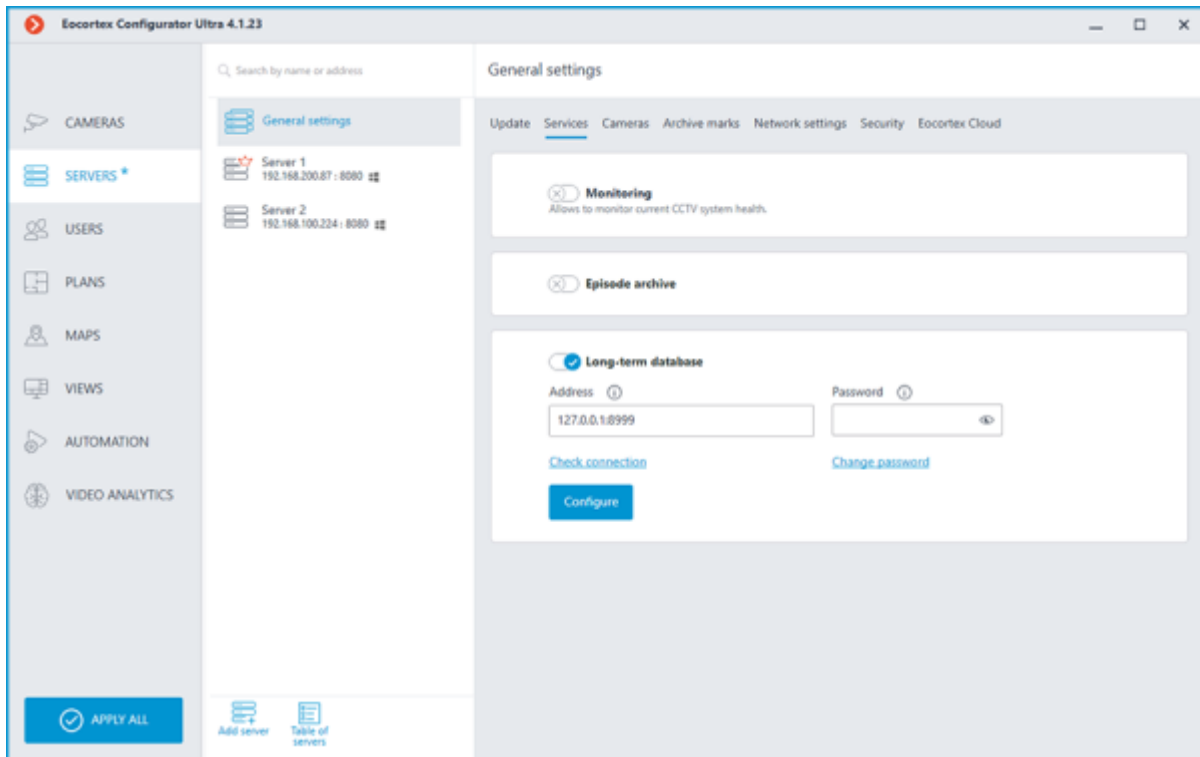
Switch to the **Services** tab.

Enable the  **Long-term database** option.

Configure the interaction with the **Long-term database** Service, such as the following:

- Configure a [network connection](#) to the Service.
- [Change the password of the Service](#) if needed.
- Select [disks for storing events](#).
- Configure the [synchronization schedule for events](#) between the servers and the Service.
- Select [types of events and their period of storage](#) in the Service database.

- Configure the sending of [service e-mail notifications](#).
[Apply settings](#).



Connection settings

This setting can be changed on the **Services** tab, where the Service was enabled.

Network connection to the Service must be configured to get access to the configuration of conditions for storing events in its database.

Below is a description of settings:

Address: Address of the long-term database service. This address must be accessible to all servers. If the connection port for the Service has been changed, the new port must be specified in the same field, with a colon after the address.

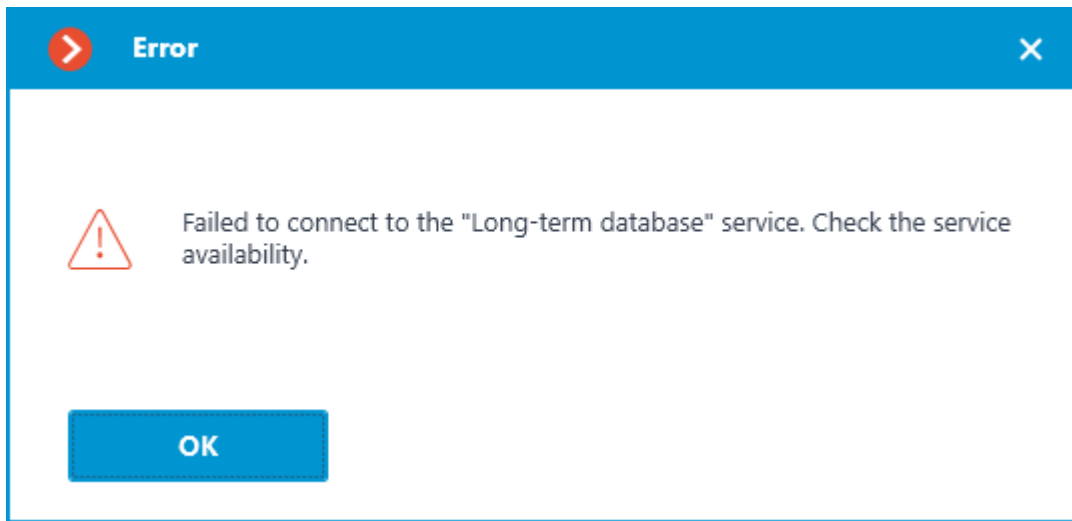
Password: Password of the long-term database service. The default password is blank.

Check connection: Clicking this link starts the test connection to the **Long-term database** Service.

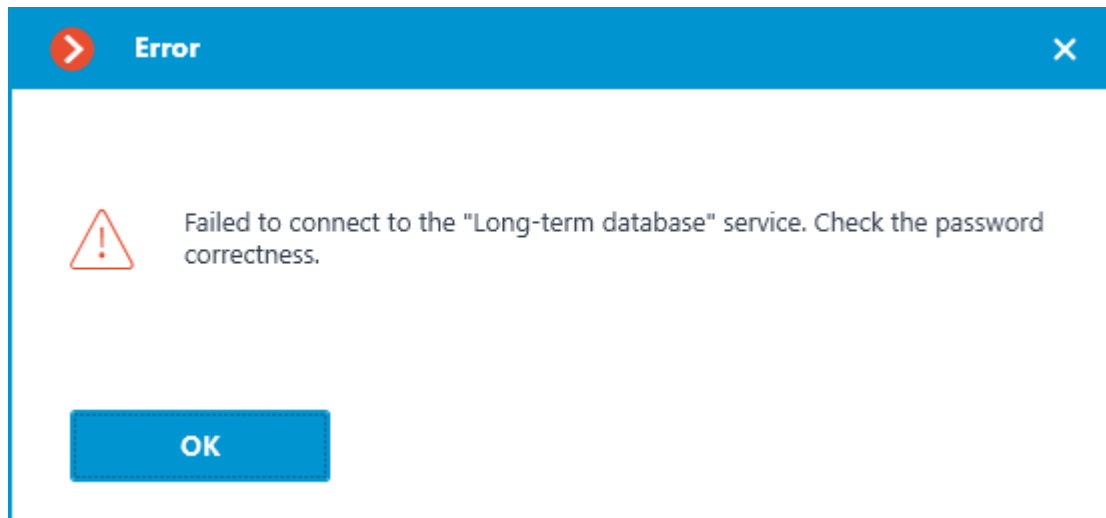
Change password: Clicking this link opens a window that allows to [change the password](#) of the **Long-term database** Service. It is recommended to change the password at the first Service setup.

Configure: Clicking this button opens the window with the **Long-term database** Service settings.

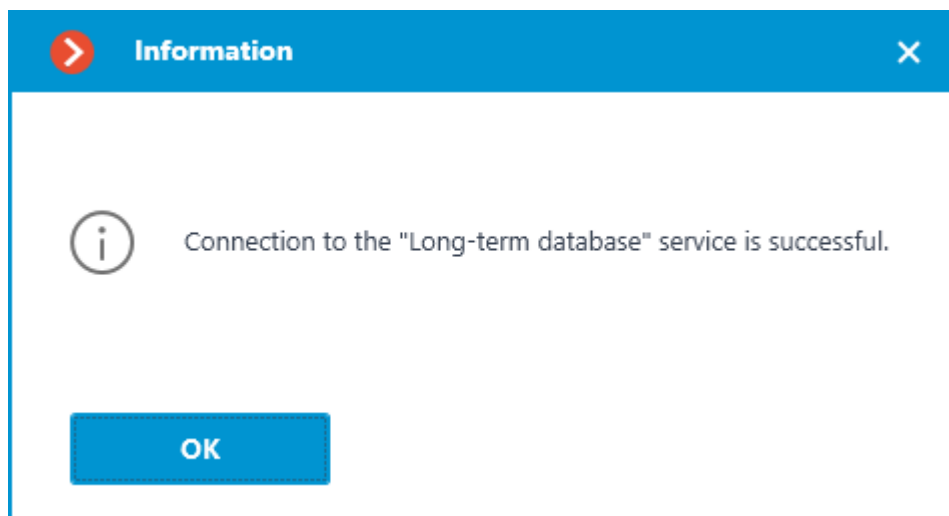
Once the **Address** and **Password** fields are filled in, it is recommended to test the connection to the Service by clicking the **Check connection** link. Depending on the validity of the settings and availability of the Service, the results may be as follows:



Failed to connect to the Service at the specified address and port during the connection test. Check the validity of the specified data and the network availability of the Service for the server and try again.



Connection to the Service was successfully established during the connection test, but the used password does not match the one saved in the Service settings. Check that the password you have entered is valid.



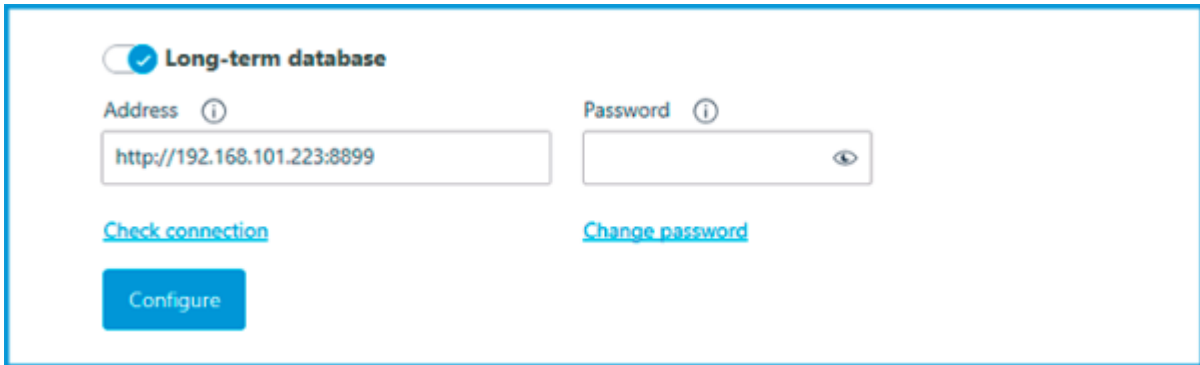
Connection test is successful, it is possible to proceed with further setup of interaction with the Service.

Changing Service password

Configuration can be made in a separate window that opens by clicking the **Change password** link on the **Services** tab.

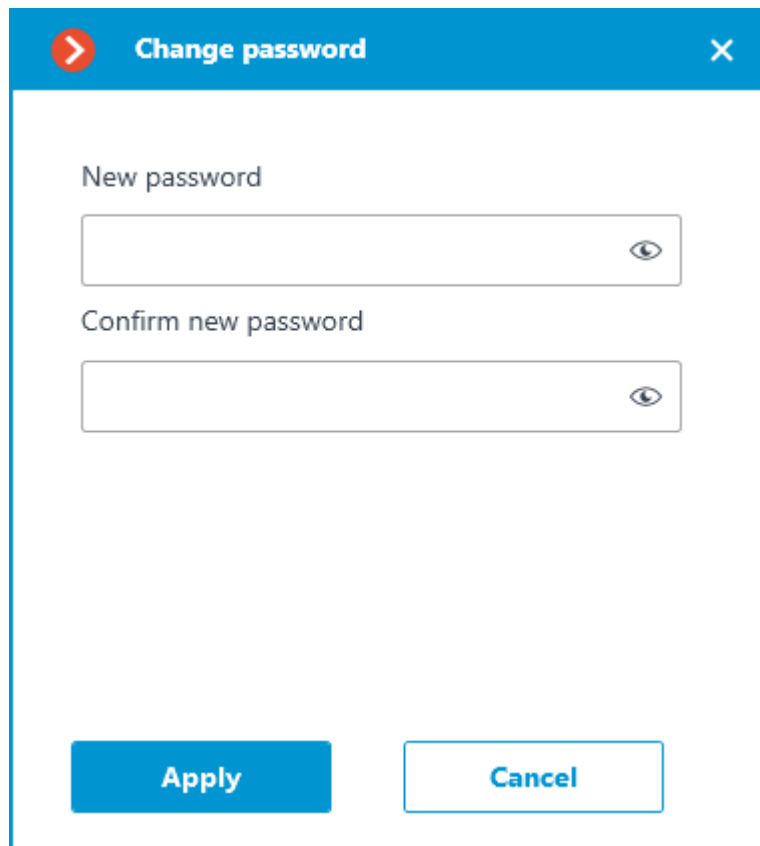
The **Long-term database** Service does not have a password by default and this may conflict with local security policies.

To set or change the password for the connection to the Service, click the **Change password** link under the **Password** field on the **Services** tab.



The screenshot shows a configuration window for the 'Long-term database' service. At the top, there is a toggle switch labeled 'Long-term database' which is turned on. Below this, there are two input fields: 'Address' containing 'http://192.168.101.223:8899' and 'Password' which is currently empty. Under the 'Address' field is a blue link labeled 'Check connection'. Under the 'Password' field is a blue link labeled 'Change password'. At the bottom left, there is a blue button labeled 'Configure'.

In the window that opens, fill in the **New password** and **Confirm new password** fields with the password.



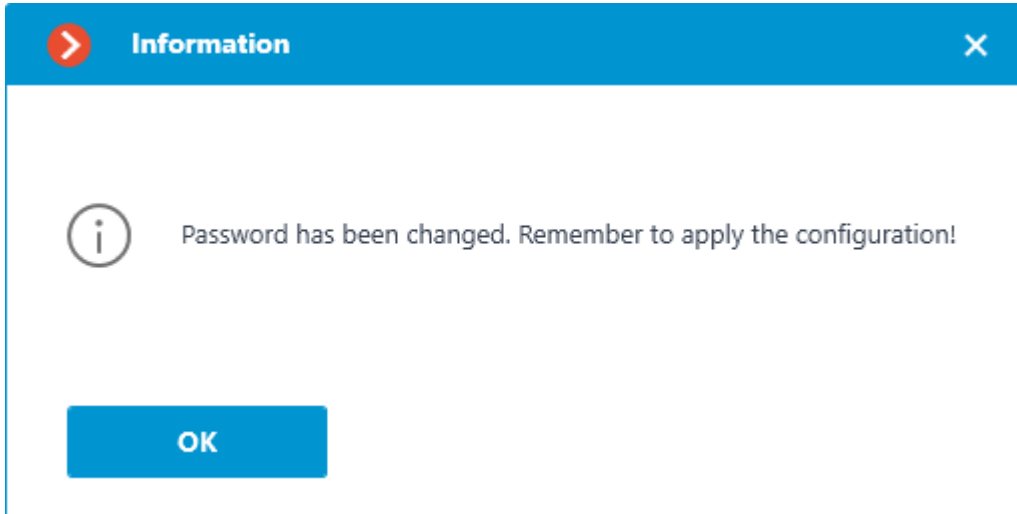
The screenshot shows a dialog box titled 'Change password'. It has a blue header bar with a red arrow icon on the left and a close 'X' icon on the right. The main area contains two password input fields: 'New password' and 'Confirm new password'. Both fields have a small eye icon to their right, indicating they are currently hidden. At the bottom of the dialog, there are two buttons: a blue 'Apply' button and a white 'Cancel' button with a blue border.

When setting or changing a password, there are a few requirements that must be met:

- Service must be available when changing the password.
- The password and its confirmation must match.
- The new password must not be identical to the old password when it is changed.

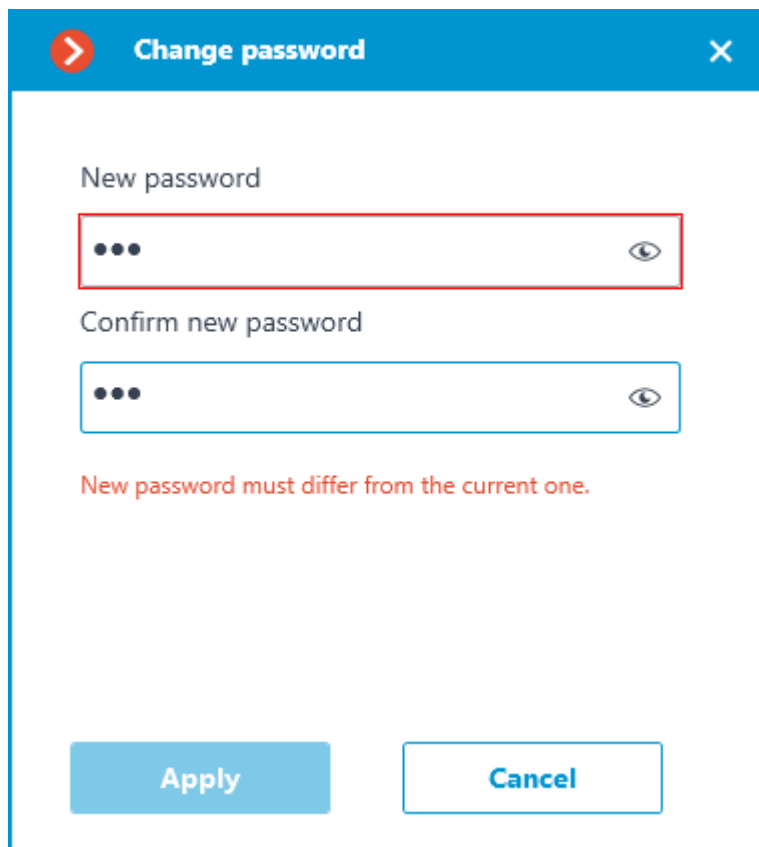
- The password can contain characters of the Latin and Cyrillic alphabet.
- The password may include numbers.
- Only the following special characters are allowed in the password: **!@#\$%&()_ -**
- The password can be blank.

If all requirements have been met, clicking the **Apply** button will set a new password for the Service and display the corresponding message.



To save the settings and then synchronize them with the Service, [apply the settings](#).

If any requirement is violated when setting a new password, the window will show a warning and the **Apply** button will be blocked.



Change password

New password

Confirm new password

New password and confirmation do not match.

Apply Cancel

Change password

New password

Confirm new password

Password contains prohibited symbols. Only letters of the Latin and Cyrillic alphabet and the characters !@#\$%&()_ are allowed.

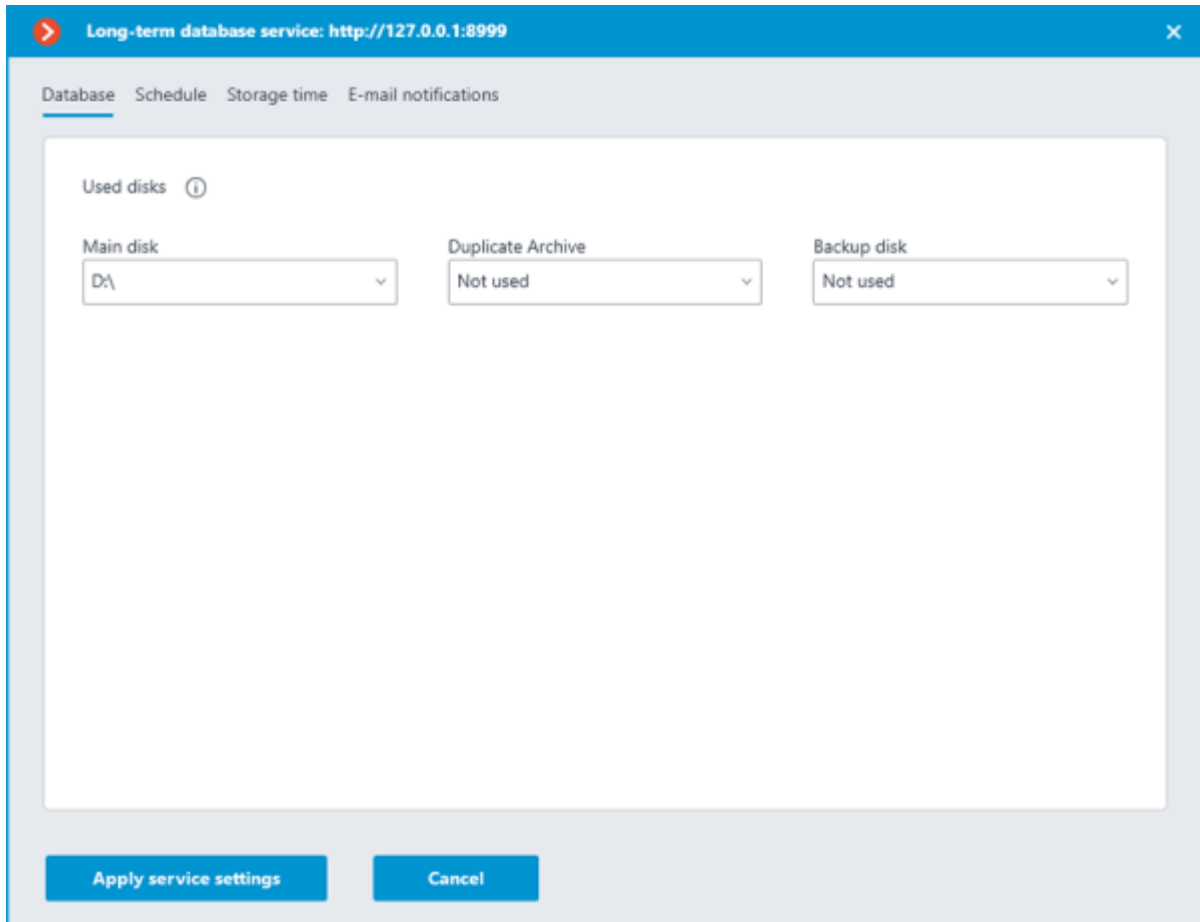
Apply Cancel

Storage disks settings

Configuration can be made in a separate window that opens by clicking the **Configure** link on the **Services** tab.

The **Database** tab contains settings for selecting drives to store events on the Service.

Disks are selected for the device on which the Service is installed.



One of the following roles can be assigned to the disk:

Main disk

Duplicate Archive

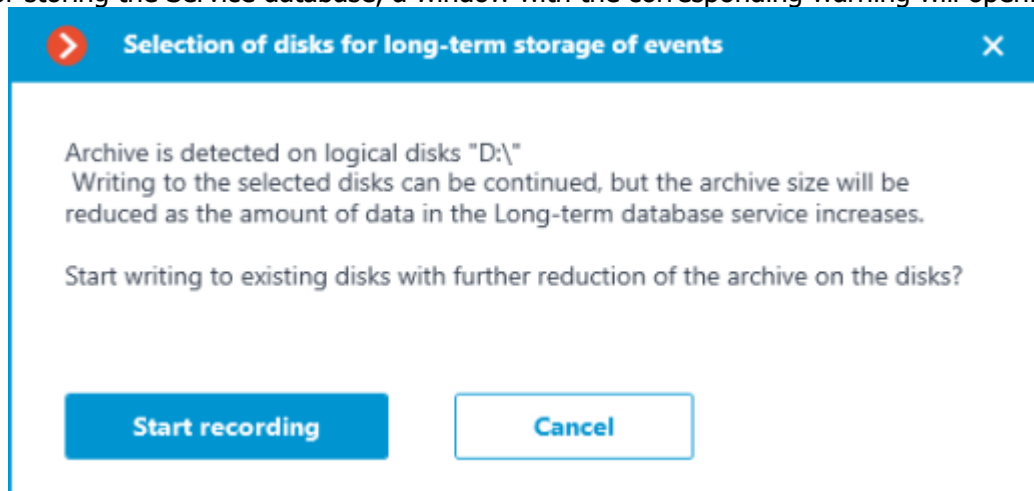
Backup disk

Main disk must be assigned in any case, duplicate and backup disks are assigned optionally. Events are recorded on the primary and backup disks all the time. The backup disk is to be used only when neither the primary nor the backup disk are available for recording. Events are being read simultaneously from all disks regardless of their role. Event duplicates are discarded from the display when reading disks. For example, if an event is detected on the Main disk, the same event from other disks will be discarded when displaying in the **Eocortex Client** application.

Events will not be synchronized between Service disks. For example, events recorded to the Backup disk while the Main disk was unavailable will not be transferred to it after recovery.

It is not recommended using for storage of the Service database disks that are already used for recording of the **Eocortex** archive. The archive can take up a large amount of disk memory and this may significantly reduce the number of events that can be saved to such disk. For correct Service work it is recommended to choose disks, which are not being used by other **Eocortex** applications for writing.

When applying the settings, the **Long-term database** Service checks the drives for the presence of archive records. If such records will be detected on the disk selected for storing the Service database, a window with the corresponding warning will open.

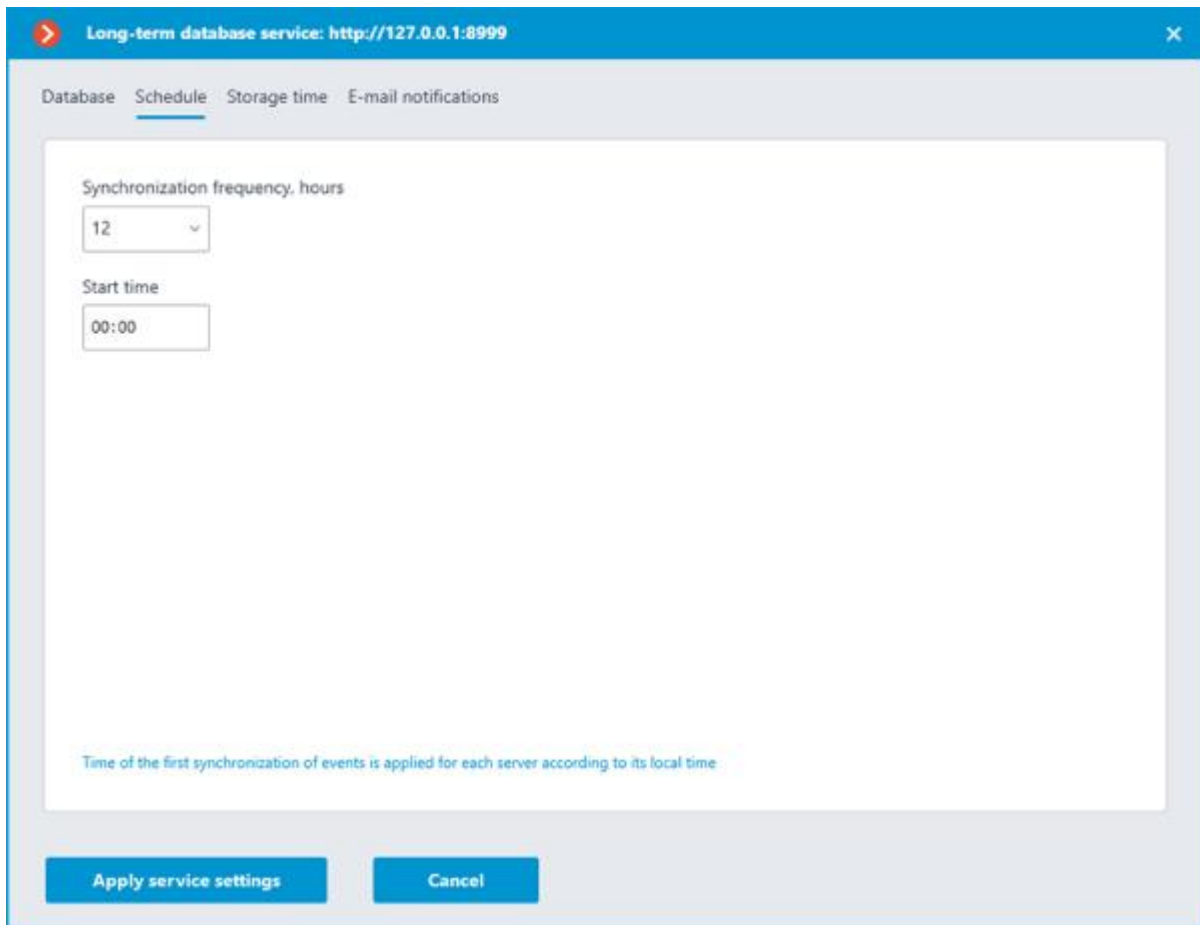


At this point it is possible to cancel applying the settings by clicking the **Cancel** button and return to the Service settings to select another disk, or start recording on the selected disks without changing the settings by clicking **Start recording**.

Event synchronization settings

Configuration can be made in a separate window that opens by clicking the **Configure** link on the **Services** tab.

The **Schedule** tab contains settings for event synchronization schedule between the databases of the Service and the **Eocortex** servers.



The synchronization schedule consists of the following settings:

Synchronization frequency, hours is how often the Service will synchronize events from the databases of servers.

Available intervals, hours: 1, 2, 3, 4, 6, 12, 24.

Start time is the time of first data synchronization between the Service and servers.

Once the settings are applied, the server will perform the first synchronization with the **Long-term database Service** at the time specified in the **Start time** field, and then continue performing synchronization according to the specified interval.

First synchronization of events for each server happens according to its local time. If servers of the same system are located in different time zones, they will perform the first synchronization with the Service at the time corresponding to the specified hour in their time zone.

For example:

Server 1 is in UTC+3 and Server 2 is in UTC+10. The setting is made at 16:00 UTC+3. If the first synchronization time is set to 20:00, Server 1 will start synchronization on the same day when the setting was applied, when Server 2 will wait for the next day to start — for the UTC+10 time zone it will already be 23:00 at the moment of applying settings.

The **Eocortex** server synchronizes the settings with the **Long-term database Service** every 10 minutes. **Start time** should be at least 10 minutes later than the current time. If synchronization of the settings happens after the time specified as **Start time**, event synchronization will be postponed to the next day.

For example:

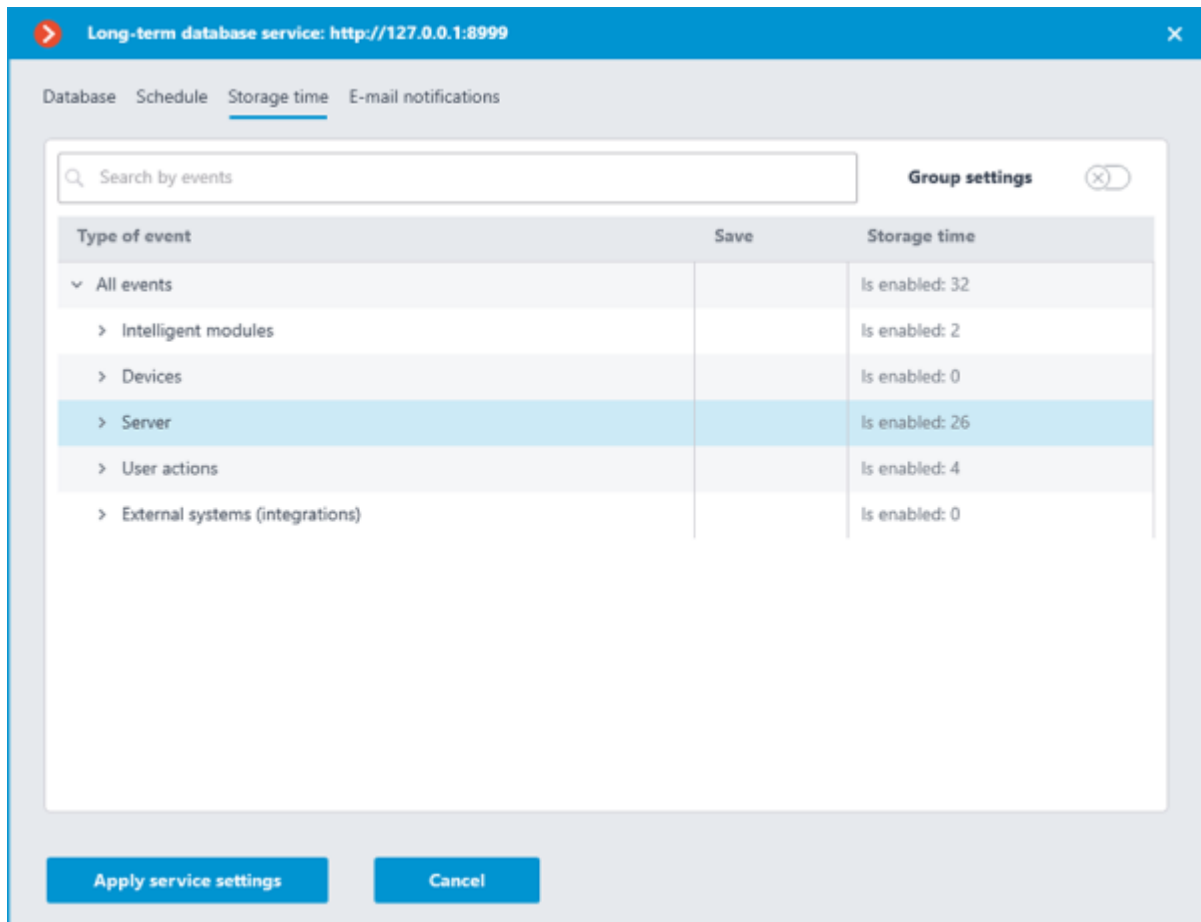
Service started at 14:40, the next synchronization of settings will be performed at 14:50. At 14:41 Service settings were changed, setting the first synchronization at 14:45. Synchronization will be performed at the specified time, but only on the next

day — the synchronization of settings occurred later than the specified time of event synchronization.

Event storage settings

Configuration can be made in a separate window that opens by clicking the **Configure** link on the **Services** tab.

The **Storage time** tab contains settings for selecting event types and time limits for storing them in the Service database.



This tab allows specifying the type of events to be stored in the **Long-term database** Service database, as well as the storage period for them.

Settings on the **Storage time** tab are represented as a table with the following columns:

Event type — the list of events available for synchronization with allocation by groups.

Whether an event group is collapsed or expanded in the **Event type** column determines the contents of the other columns.

Save — synchronization setting (enabled or disabled) for the selected event type.

The synchronization setting in the **Save** column is available only for individual event types. It is not possible to select in this column an entire group for saving — the space next to the group name will be empty.

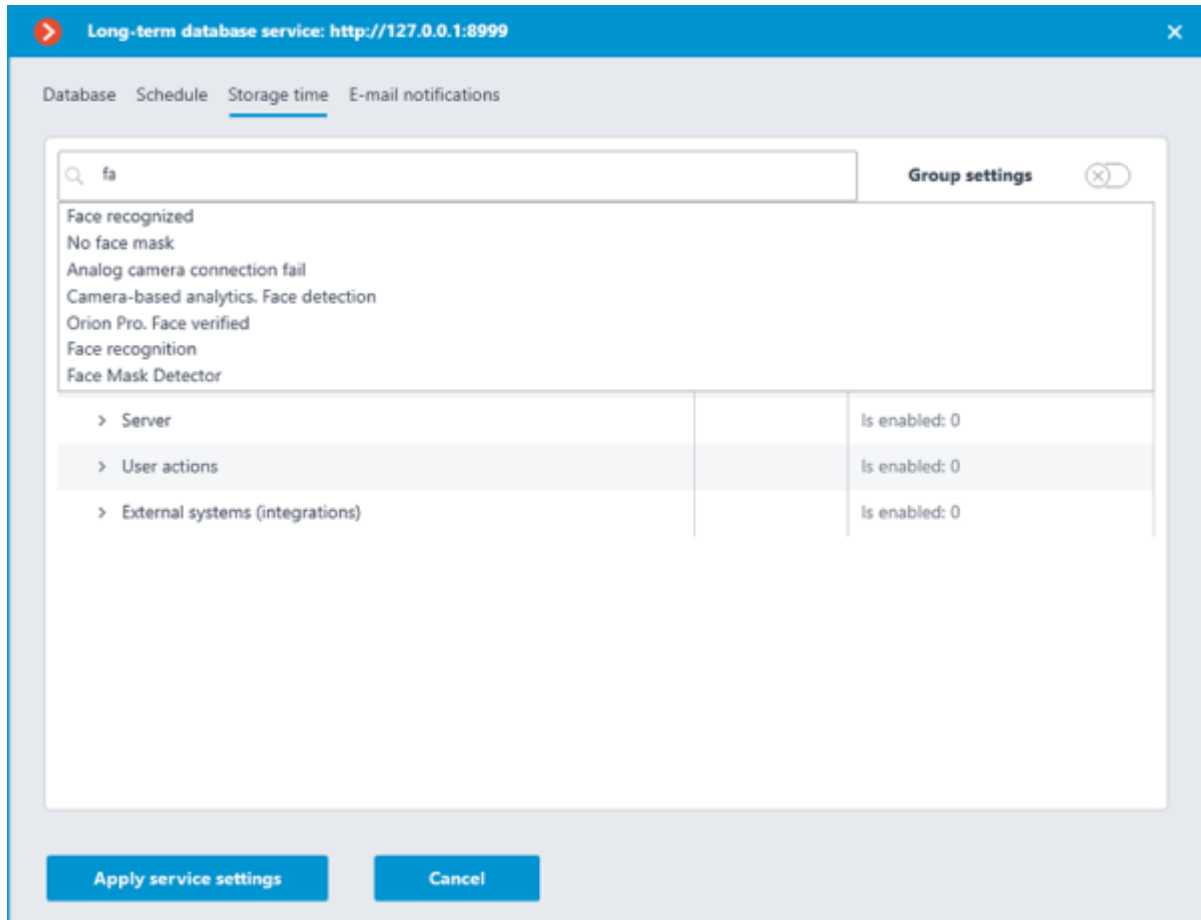
Storage time — the storage time of events of the selected type in the Service database.

The storage duration setting in this column is available only for individual event types. For a group of events, the number of event types enabled and configured for synchronization will be displayed at this position.

Storage time is set starting from the moment when the event was created in the **Eocortex** server database. So, for example, if the storage period is set as 1 week, the **Storage time** Service will delete the event from its database when it expires and will not synchronize it again even if the event will still exist in the **Eocortex** server database.

The maximum storage time of events in the **Storage time** Service database is 100 months.

For the convenience of configuration, there is the text search field available on the tab, allowing to quickly navigate to the needed type of events.



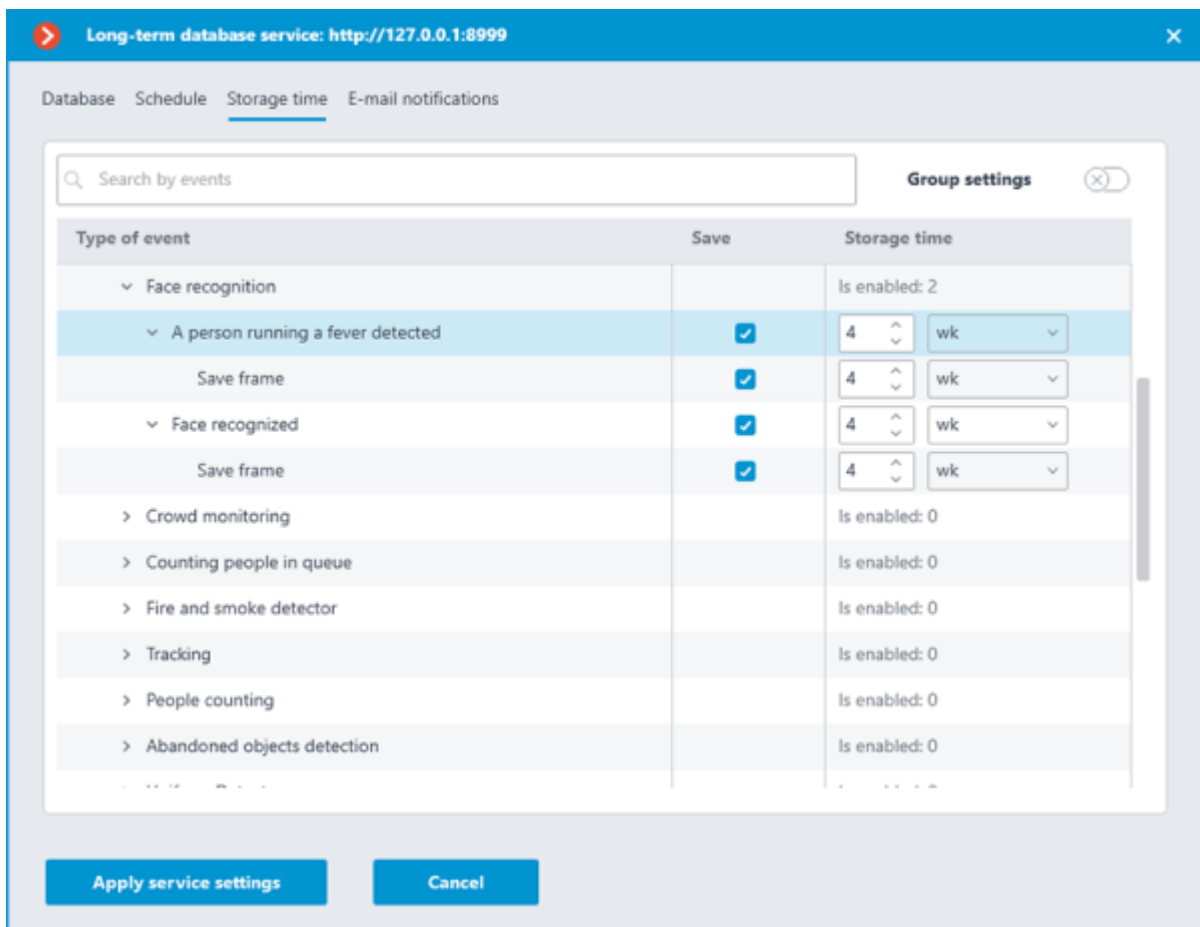
Storage time can be set in one of the two available modes:

[Individual setting](#)

[Group settings](#)

Individual setting

The individual setting is the default mode, which allows selecting the wanted types of events to be stored and setting individual storage time for each of them.



To set up event storage in the individual setting mode, follow these steps:

Find the needed event type in the **Save** column by using the search field or manually, by expanding the event groups.

Enable storing events of the selected type in the **Save** column.

If the selected event type has the option of saving a frame associated with the event, this option will be automatically enabled when the event type is selected. It can be deactivated in the same **Save** column.

Frame storage relies on the event being stored, so it is not possible to choose to store a frame without storing the event.

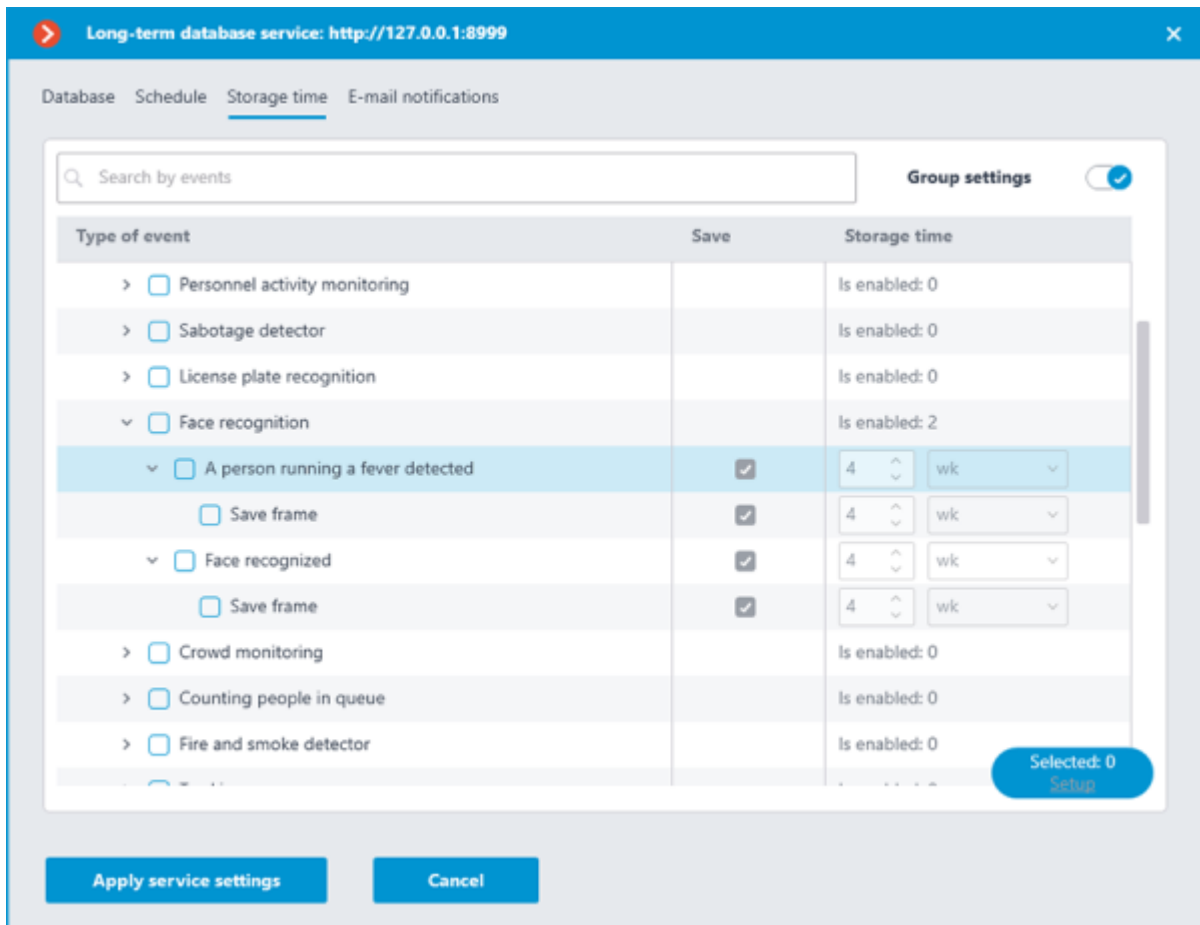
Specify the storage time for events of the selected type in the **Long-term database** Service database.

If the **Save frame** option is available and enabled for the event, it is also possible to set an individual storage time for the saved frames.

Storage time of a frame cannot exceed the storage time of the event to which it belongs.

Group settings

Group settings is an additional mode that allows setting the same storage time for multiple event types simultaneously.



This mode can be activated by clicking the  **Group settings** switch in the upper right corner of the tab.

When this setting mode is enabled, the configuration window changes: settings in the **Save** and **Storage time** columns are locked, in the **Event type** column checkboxes for selection of event types appear to the left of their names, and in the lower right corner the **Configure** button appears for configuring the selected event types.

To configure event storage in Group settings mode, follow these steps:

Enable the Group settings mode with the  switch in the upper right corner.

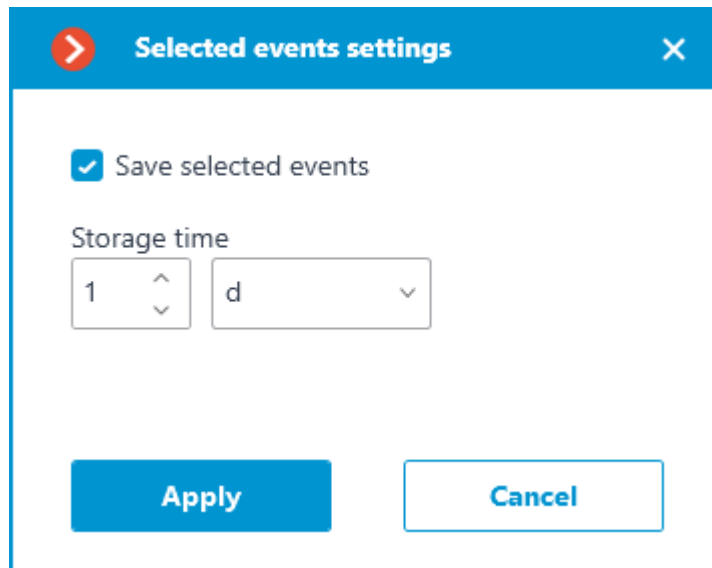
Use the checkboxes in the **Event type** column to select the needed event types.

It is possible to select not only individual event types, but also entire groups, including the **All events** root group.

If frame storage is available for the event, this option is also will be flagged as selected.

Click the **Configure** button in the lower right corner.

In the **Selected events settings** window, set the event storage time.



When configured as a group, the same storage time is set for all selected events.

The **Save selected events** option allows to quickly enable or disable storage of selected event types. This can be useful if it is necessary to override storage settings for multiple event types. This option is enabled by default.

Apply settings.

If it is necessary to customize any of the event types, the Group settings mode can be disabled with the same switch in the upper right corner.

Email notifications settings

Configuration can be made in a separate window that opens by clicking the **Configure** link on the **Services** tab.

The **Long-term database** service has the ability to notify a user about encountered problems using email.

Long-term database service: http://127.0.0.1:8999

Database Schedule Storage time E-mail notifications

E-mail address server
Google

E-mail of the sender
[Change](#)

E-mail of the recipient ⓘ

Notification types

Free disk space limit is reached % 10 ⓘ

Possible service malfunction

Notifications language ru

Apply service settings Cancel

To send notifications, an SMTP server must be specified. The following options are supported:

Google

Yandex

Set manually

When selecting the **Google** or **Yandex** options, clicking the **Change** link in the **E-mail of the sender** section will open the authorization window of the selected email service.

When selecting the **Set manually**, the SMTP server address and port, sender address and password must be set manually.

Long-term database service: http://127.0.0.1:8999

Database Schedule Storage time **E-mail notifications**

E-mail address server
Set manually

SMTP server address

Port of SMTP server

E-mail of the sender

Password

E-mail of the recipient ⓘ

Notification types

Free disk space limit is reached % 10 ⓘ

Possible service malfunction

Notifications language ru

Apply service settings Cancel

The **E-mail of the recipient** section allows specifying one or more recipients of the notification by separating the addresses from each other with a comma, semicolon or adding a new line for each recipient.

The **Notification types** section allows specifying the types of notifications that the Service should send to the recipients. The following notification types are supported:

Free disk space limit is reached — will be sent when one or more disks used by the Service have a percentage of free space less than the specified.

Possible service malfunction — will be sent when the Service has failed to save events to disk. Possible causes of the error:

- The disk has run out of space to write.
- PostgreSQL failed to add a record to the database. The database file may be corrupted.
- Other recording problems have occurred.

Details about the error can be found in the Service logs. It is also recommended attaching them to the message in case of contacting [technical support](#).

Access settings

The **Long-term database** Service does not imply additional settings limiting user access to the stored content. If a user is allowed to access a camera, it will also have access to the events for that camera stored in the Service database.

Related references

[Overview of the Service](#)

[Usage of the Service in the **Eocortex Client** application](#)


[Installation of Long-term database on Windows](#)

[Installation of Long-term database on Linux](#)

Service usage



The **Long-term database** Service ensures storing of selected types of events and access to them regardless of the archive storage settings. With this Service there is no need to be concerned that event data will be erased if the archive is deleted.


Records stored in the **Long-term database** Service can be used to build reports of video analytics modules and view the Events Log. Such records:

- Do not require additional settings from the user to be displayed.
- Displayed seamlessly to records from the databases of **Eocortex** servers.
- Marked with the  icon to determine whether the event belongs to the Service base.

Events

Events from the **Long-term database** Service database can be displayed in the Events Log of the **Eocortex Client** application.

27.04.2023 21:50:53	i	Camera 5. Camera analytics. License plate recognized: C333CC99. Direction: Not determined. Lane number: 3. Country: Not determined .
27.04.2023 21:50:50	i	Camera 5. Camera analytics. License plate recognized: B222B888. Direction: Backward. Lane number: 2. Country: TUR .
 27.04.2023 21:50:49	i	Camera 1. Signal from the input of the camera; input: 8, value: False.
 27.04.2023 21:50:49	i	Camera 1. Signal from the input of the camera; input: 1, value: True.

Records retrieved from the database of the Service are additionally marked with the  icon next to the date and time the event was created, which allows to identify their source.

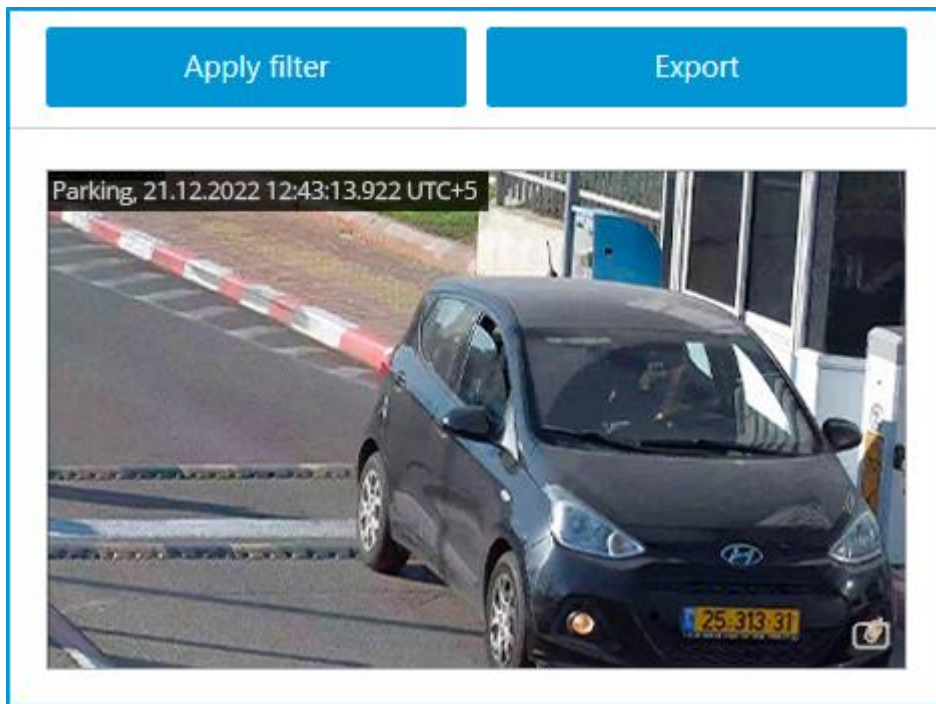
When displaying the Events Log, the **Eocortex Client** application gives priority to events from the servers' databases, loading records from the Service database only if the event does not exist in the own database of the **Eocortex** server.

The described logic prevents duplication of events when viewing the Events Log in the **Eocortex Client** application, at the same time allowing to view events outside the archive available on the server.

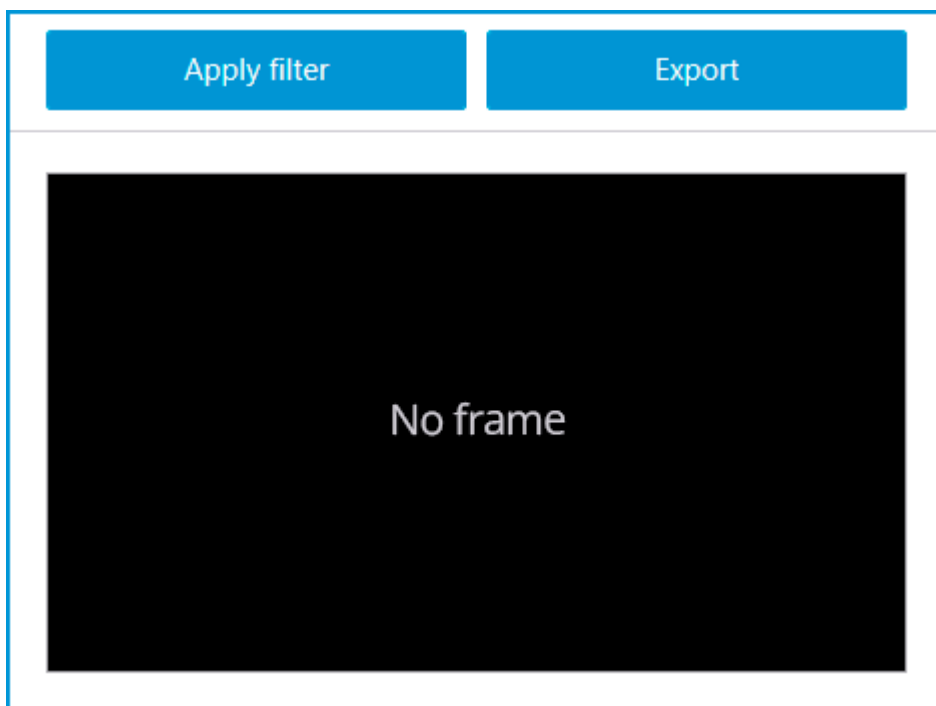
For certain types of events, the Service allows storing not only the events themselves, but also the frames associated with them.


At version 4.1, displaying of frames in the Events Log is available only for the **Recognized license plates** event type.

If an event has the option of saving an associated frame, it will be displayed in the preview window in the lower right corner when highlighting the event in the Events log.



Otherwise, the preview window will display the **No frame** message.



The retrieved frame can be displayed in full screen mode by double-clicking on it, or it can be saved to the device by clicking the  button in the lower right corner of the preview cell.

Reports











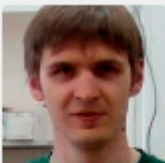
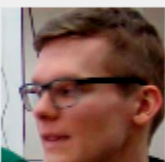



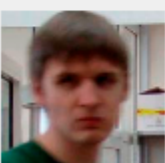
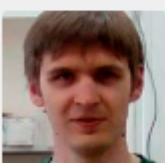

Events from the **Long-term database** Service database can be used to build reports in the **Eocortex Client** application.


When building reports of video analytics modules, the **Eocortex Client** application primarily uses records from the database of the server. Events are loaded from the Service database only if there are no events for the specified period in own databases of **Eocortex** servers.

The described logic prevents the possibility of multiple counting of the same event, while allowing to build reports for periods outside the existing archive.

For certain types of events the Service allows storing not only the events themselves, but also the frames associated with them. If this option is enabled and configured, the report will display not only the text data, but also the frames related to the events.

At version 4.1, displaying of frames in reports is available only for the **Recognized license plates** and **Face recognized** event types.

	Not in database Add  	21.12.2022 13:03:04	Face Rec Camera
	Not in database Add  	21.12.2022 13:01:49	Face Rec Camera
	Not in database Add  	21.12.2022 13:01:49	Face Rec Camera
		21.12.2022 13:01:49	Face Rec Camera
	Not in database Add  	 21.12.2022 12:43:18	Face Rec Camera
		 21.12.2022 12:43:23	Face Rec Camera

Records retrieved from the database of the Service are additionally marked with the  icon next to the date and time the event was created, which allows to identify their source.

Events from the Service database cannot be used to build a report for the **Search for Objects** module due to the fact that this module uses archive records in addition to the events when building a report.

The retrieved frame can be displayed in full screen mode by double-clicking on it.

Related references

[Overview of the Service](#)

[Configuration in the **Eocortex Configurator** application](#)

[Installation of **Long-term database** on Windows](#)

[Installation of **Long-term database** on Linux](#)

Monitoring

Control the status of the **Eocortex** servers and the cameras connected to them with the **Monitoring** service.



This feature is available only for **Enterprise** and **ULTRA** licenses.

Description

The **Eocortex Monitoring** Service allows to control:

Availability of **Eocortex** servers

Utilization rate of CPUs, RAM and network adapters of **Eocortex** servers

Availability of cameras connected to **Eocortex** servers

Status of **Eocortex** servers archive recording subsystem

Active client connections to **Eocortex** servers

All information collected by the Service from the servers is available for viewing in the [Web Client](#).

In addition to real-time monitoring, the Service is also able to send email notifications about problems that occur in the system, such as:

No connection with the server

Audio / video stream processing problem

Other server problems

- Issues with drives for writing the archive
- Errors when saving events of the log
- Errors when recording video to the archive
- Archive subsystem overload

Structure of the Service

The **Eocortex Monitoring** Service consists of the following components:

Eocortex Monitoring Server. The core of the Service. An OS service that processes and maintains received data about the state of the system, as well as sends out notifications when problems occur. Deployment performs as part of a [separate installation process](#).

Eocortex Monitoring Agent. Medium between the Eocortex Monitoring Server and Eocortex servers. Collects data about the system state and delivers it to the core of the Service. Deployment performs as part of the Eocortex Server installation process.

Eocortex Monitoring Web Client. User interface of the Service. Allows viewing real-time information about the current state of the system components. Being installed automatically together with the **Eocortex Monitoring** Server, it can be accessed at the address of the device where the server component of the Service is installed.

Requirements and limitations

The **Monitoring** Service is a standalone application and must be installed individually.

The **Service** can be installed on any computer without installing the **Eocortex Server** on it.

Only one **Service** instance can be configured for the entire system.

Only one system can be connected to the Service at a time.

The **Monitoring** service does not provide any options for transferring the received data to other monitoring systems.

Data transfer between the Servers and the Service is handled only by the **Eocortex Monitoring Agent** Service, which installs automatically together with the **Eocortex** Server from the full distribution package.

Related references

[Monitoring Web Client](#)

[Setting in the Eocortex Configurator application](#)

[Installation of Monitoring on Windows](#)

[Installation of Monitoring on Linux](#)

Service installation

The **Monitoring** Service allows controlling the status of the video surveillance system components and receiving immediate notifications about problems occurring with them.

This feature is available only for **Enterprise** and **ULTRA** licenses.

The **Monitoring** Service supports the following operating systems:

- Windows 10
- Debian 10
- CentOS 7

Work on other operating systems that are not listed is not guaranteed.

Depending on the selected operating system, the Service installation process will differ. For details on how to install the **Monitoring** Service on [Windows](#) or [Linux](#), see the corresponding instructions in the **Deployment** section.

Related references

[Overview of the Service](#)

[Monitoring Web Client](#)

[Setting in the Eocortex Configurator application](#)

[Installation of Monitoring on Windows](#)

[Installation of Monitoring on Linux](#)

Service configuration

The **Monitoring** Service allows controlling the status of the video surveillance system components and receiving immediate notifications about problems occurring with them.

This feature is available only for **Enterprise** and **ULTRA** licenses.

To enable and configure the **Monitoring** Service, follow these steps:

Launch the **Eocortex Configurator** application.

Go to the  **Servers** page.

Select the  **General settings** item in the list of servers.

Switch to the **Services** tab.

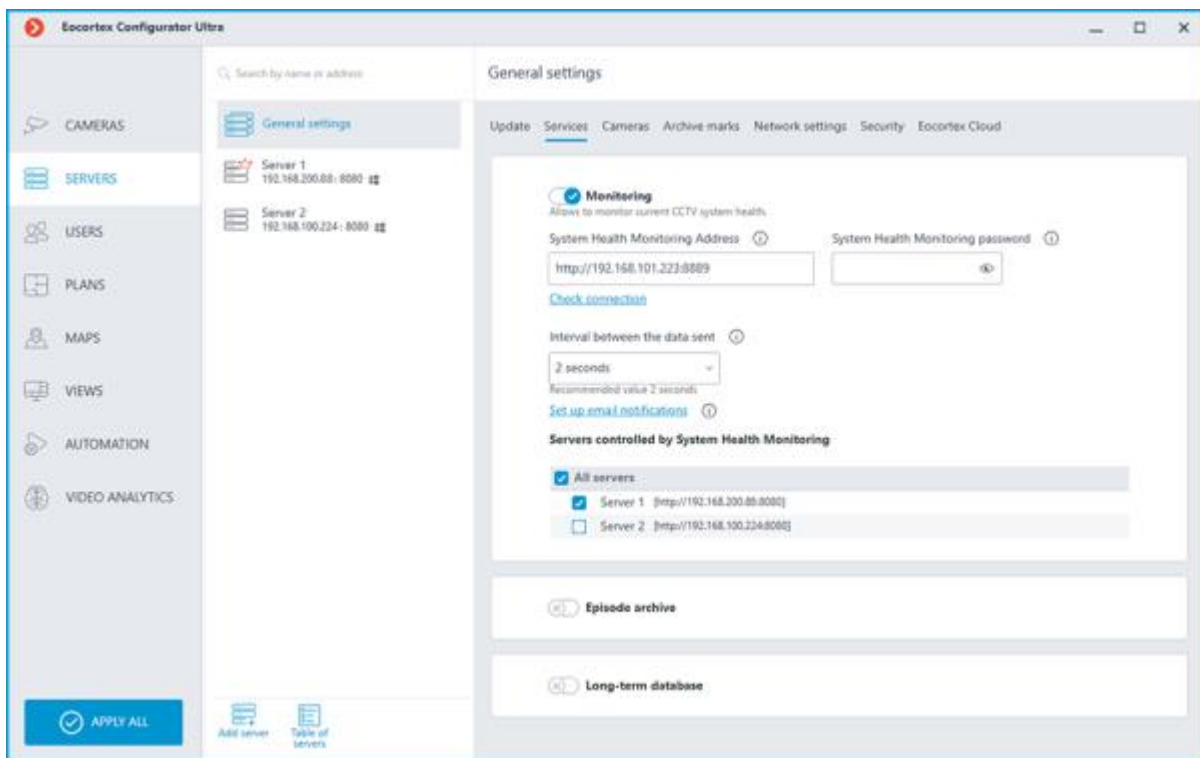
Enable the  **Monitoring** option.

Configure the interaction with the **Monitoring** Service, such as the following:

- Configure a [network connection](#) to the Service.
- Set the [rate of data transfer](#) to the Service.
- Set parameters for [sending Service notifications](#).
- Select [servers for monitoring](#).

[Apply settings](#).

Changing the password for the Service can be done through the **Monitoring Web Client**.



Connection settings

Configuration can be made on the **Services** tab, where the Service was enabled.

Network connection to the Service must be configured to get access to the configuration of conditions for storing events in its database.

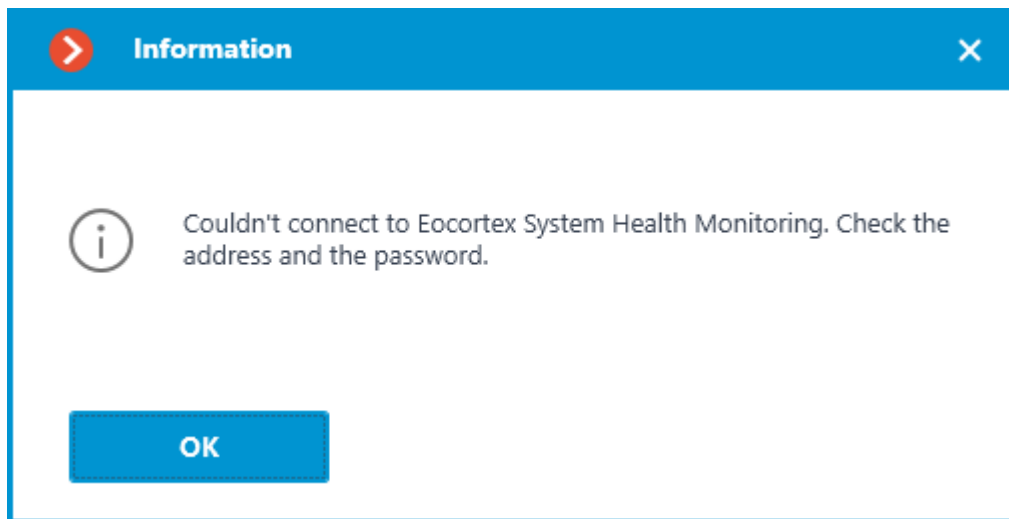
Below is a description of settings:

Address: Address of the Monitoring Service. The connection port for the Service must be specified in the same field, with a colon after the address.

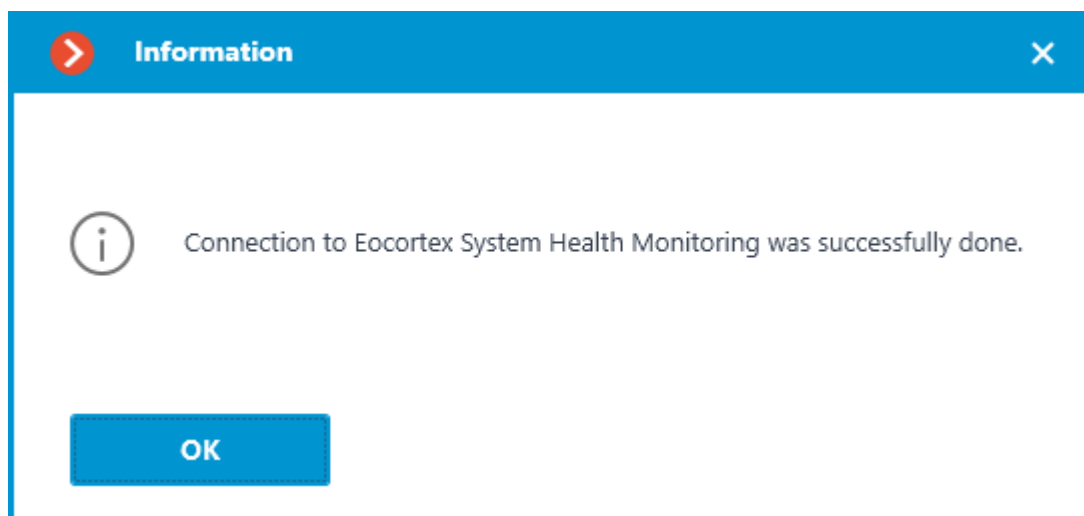
Password: Password of the Monitoring Service. The default password is blank.

Check connection: Clicking this link starts the test connection to the **Monitoring** Service.

Once the **Address** and **Password** fields are filled in, it is recommended to test the connection to the Service by clicking the **Check connection** link. Depending on the validity of the settings and availability of the Service, the results may be as follows:



Failed to connect to the Service using specified parameters during the connection test. Check the validity of the specified data and the network availability of the Service for the server and try again.



Connection test is successful, it is possible to proceed with further setup of interaction with the Service.

Interval between the data sent

Configuration can be made on the **Services** tab, where the Service was enabled.

The interval of status information sending affects the speed of parameters check as well as the frequency of data update in Web-interface of Eocortex System Health Monitoring. It is advisable to have the interval equal to 2 seconds. The following options are available as the value of this setting:

- 2 seconds
- 5 seconds
- 10 seconds
- 30 seconds
- 45 seconds

The smaller the interval value, the more accurate will be the visualization of the status of servers and cameras in the Web Client and the faster will be the reaction of the Service to possible problems.

However, more frequent sending of data leads to a slight increase in the network load, which can have a negative impact in conditions of low bandwidth between the servers and the Service.

Notifications

Configuration can be made in a separate window that opens by clicking the **Set up email notifications** link on the **Services** tab.

Clicking the **Set up email notifications** link opens the email notification settings window.

The following SMTP server options can be used to send notifications from the **Monitoring** service:

- **Google**

Notifications via e-mail settings

E-mail address server

Google Yandex User SMTP server

E-mail of the sender

cctvmonitoring@mycompany.com [Change](#) [Delete](#)

E-mail of the recipient ⓘ

techsupport@mycompany.com
admin@mycompany.com

Notification types

No connection with the server

Audio / video stream processing problem

Other server problems ⓘ

Notifications language en ▾

Apply **Cancel**

- **Yandex**

Notifications via e-mail settings

E-mail address server

Google Yandex User SMTP server

E-mail of the sender

cctvmonitoring@mycompany.com [Change](#) [Delete](#)

E-mail of the recipient ⓘ

techsupport@mycompany.com
admin@mycompany.com

Notification types

No connection with the server

Audio / video stream processing problem

Other server problems ⓘ

Notifications language

Apply **Cancel**

› **User SMTP server**

Notifications via e-mail settings

E-mail address server

Google Yandex User SMTP server

SMTP server address [Delete](#) Port of SMTP server

E-mail of the sender Password

E-mail of the recipient ⓘ

Notification types

No connection with the server

Audio / video stream processing problem

Other server problems ⓘ

Notifications language

If a **Google** or **Yandex** email account is used, clicking on the Change link will open a browser with an authorization form for the selected service. Use it to log in to the user account on whose behalf the notifications should be sent.

When using the **User SMTP server** option, the **SMTP server address** and **Port of SMTP server**, as well as the **E-mail of the sender** and **Password** must be specified.

In the **E-mail of the recipient** field, specify one or more addresses to which notifications should be sent. When specifying multiple addresses, separate them with commas, semicolons, or put each address on a separate line.

The **Notification types** section allows selecting the types of events about which the specified recipients will be notified, namely:

No connection with the server

Audio / video stream processing problem

Other server problems

- Issues with drives for writing the archive
- Errors when saving events of the log
- Errors when recording video to the archive
- Archive subsystem overload

Event types will be selected simultaneously for all servers and recipients. Individual configuration of notifications for different event types is not available.

If necessary, the language of notifications can be changed. Available options are:

- English
- Russian

Servers for monitoring

Configuration can be made on the **Services** tab, where the Service was enabled.

The **Servers controlled by System Health Monitoring** section allows selecting one or multiple servers of the system to be monitored by the Service.

The whole **Eocortex** system can only be connected to one **Monitoring** service at a time. The task of monitoring different system servers cannot be shared between separate instances of the Service.

Access settings

The **Monitoring** service provides access to all received data via a separate [Web Client](#), and therefore does not require any additional access settings.

Changing Service password

The password for the Service can be changed through the [Monitoring Web Client](#).

Related references

[Overview of the Service](#)

[Monitoring Web Client](#)

[Installation of Monitoring on Windows](#)

[Installation of Monitoring on Linux](#)

Monitoring Web Client

Data of the Service can be accessed using the **Eocortex Monitoring Web Client**.

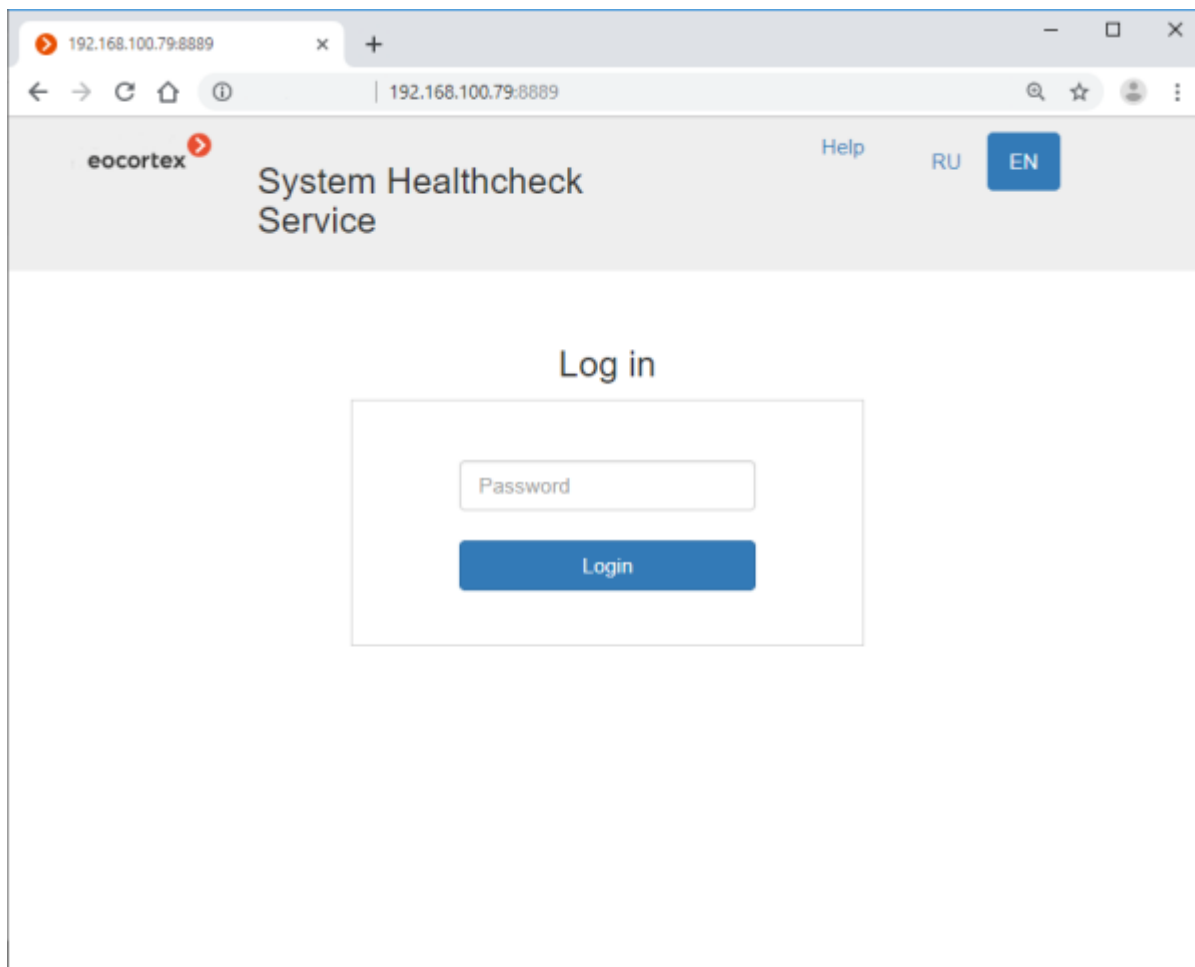
Launch

To open the **Eocortex Monitoring Web Client**, type the address as follows into the address bar of web browser: **http://address_or_name_of_monitoring_server:8889/**. For example, **http://192.168.200.161:8889/** or **http://cctv.mycompany.com:8889/**.

Specification of the port **8889** in the address is required. The port number cannot be changed.

In the authorization form that opens, fill in the **Eocortex Monitoring** Service password and click **Login**.

The **Eocortex Monitoring** Service does not have a password by default and this may conflict with local security policies. It is recommended to [change password](#) immediately after the first launch of the Web Client.

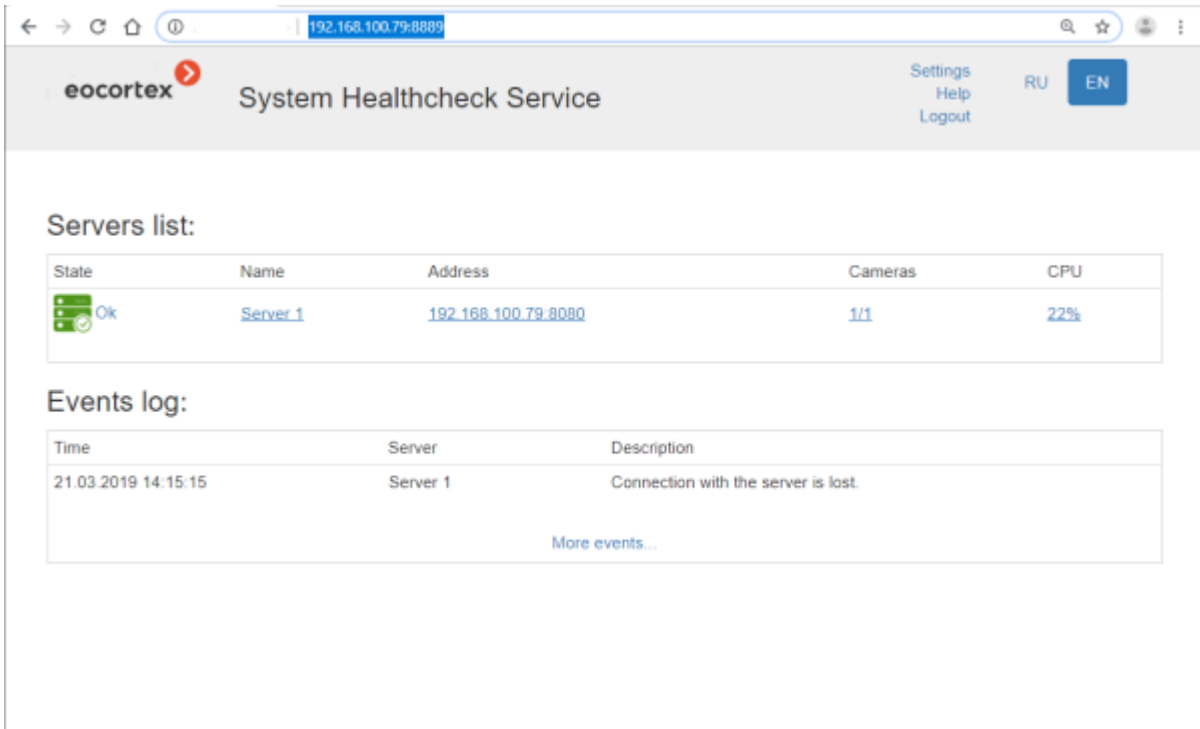


If any servers [are already connected](#) to the Service for monitoring, the [Home page](#) will open when successfully logged in.

If no connection to the **Eocortex Monitoring** Service is configured in the **Eocortex Configurator** application or no server is selected for monitoring, the **Help** page opens.

Home page

The top right corner of the page contains the **Settings**, **Help**, and **Logout** links, as well as language selection buttons. The working area of the page contains the List of Servers and the Events Log (digest).

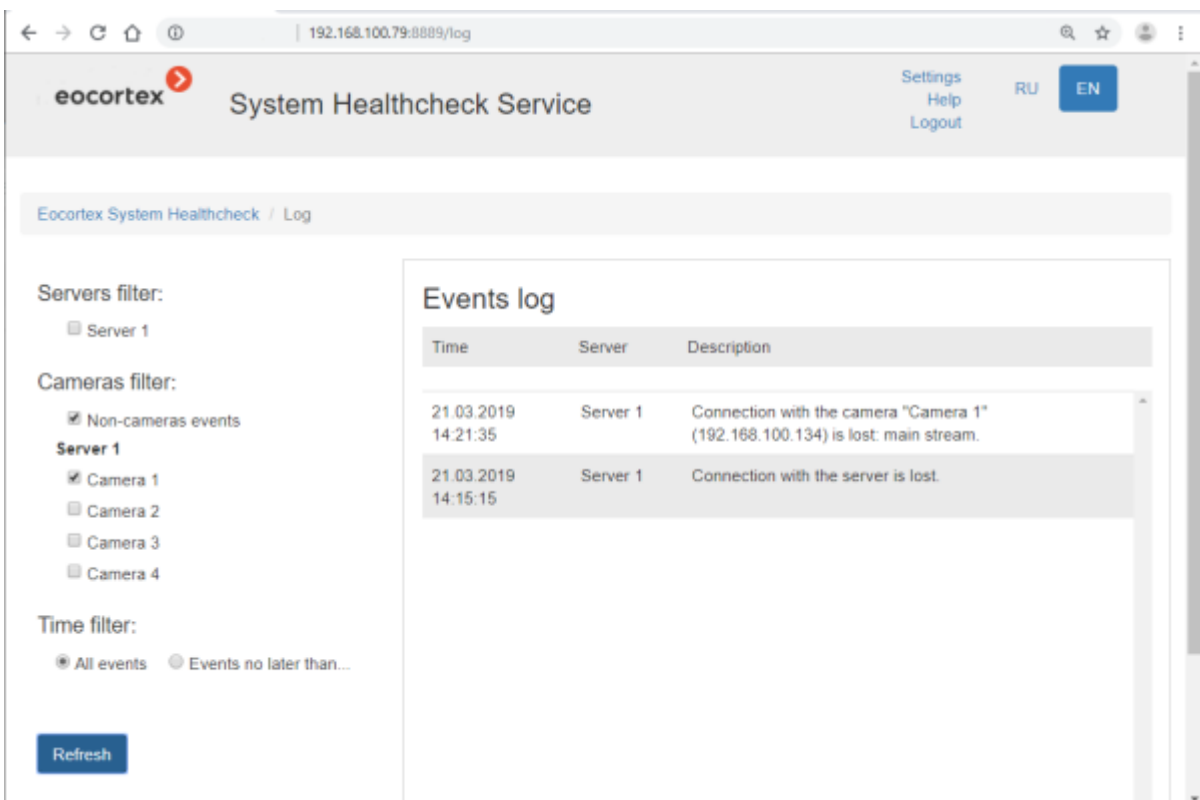


To go from any page back to the **Home page**, click on the Eocortex logo in the upper left corner.

List of Servers contains the servers of the video surveillance system with their names and network addresses, as well as the number of cameras attached to them and the CPU load level. Clicking on a server opens a [page with detailed information about it](#).

Events Log contains information about the last five critical events, including the date and time of the event, the server where the event was registered, and a description of the event itself. Clicking the **More Events...** link opens the detailed [Events Log](#).

Events Log

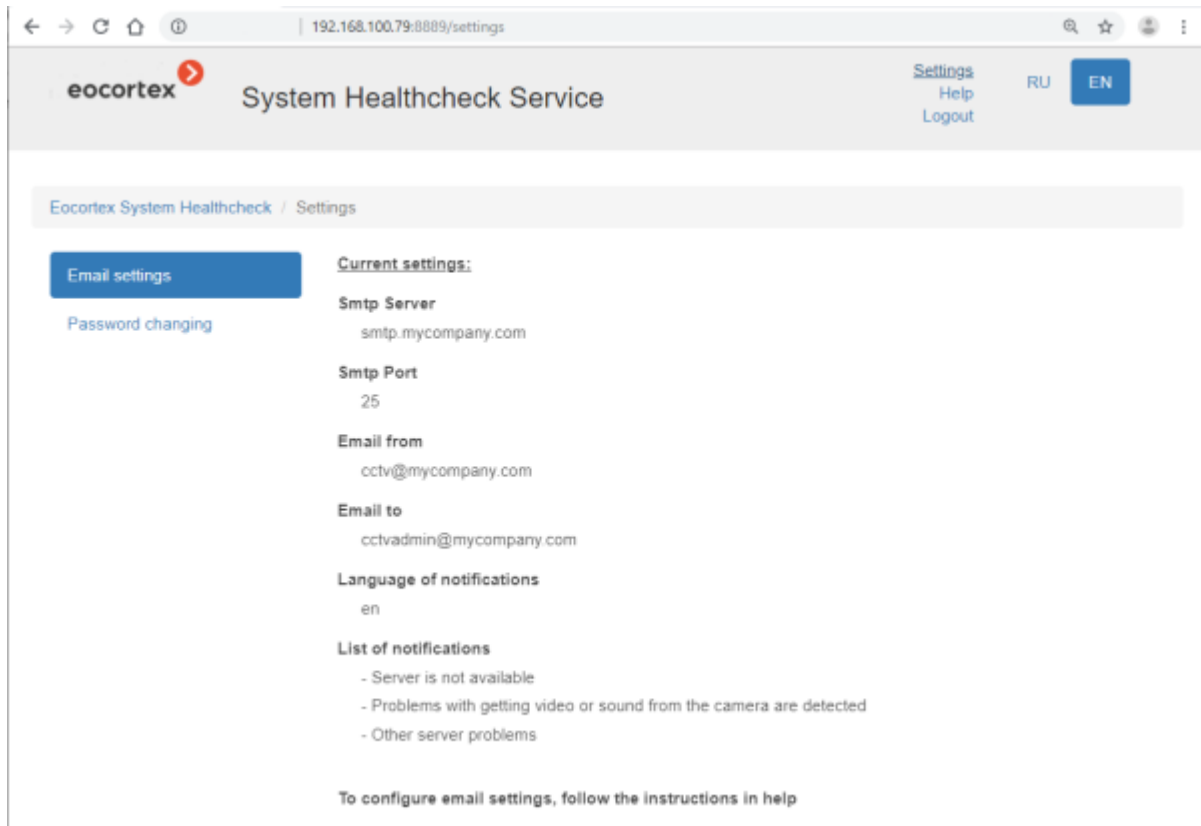


The right side of the page displays, in reverse chronological order, information containing the date and time of the event, the server where the event was registered, and a description of the event itself.

The left side of the page contains a panel that allows filtering events by various criteria. To display the filtered events, set the conditions, and then click the **Refresh** button.

Email settings

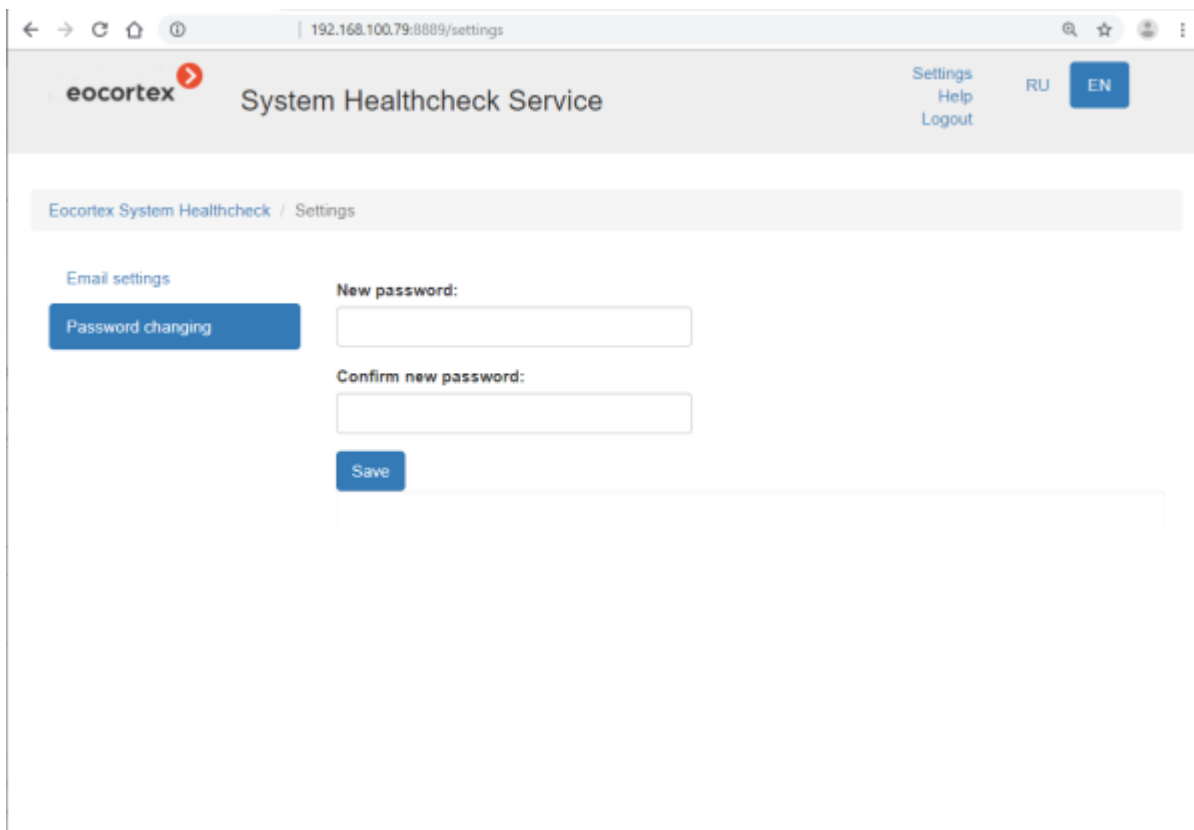
To view the current notification settings, click the **Settings** link and then select **Email settings** from the menu on the left.



To [change notification settings](#) use the **Eocortex Configurator** application.

Password changing

To change the password, click the **Settings** link and select the **Password changing** item in the menu on the left.

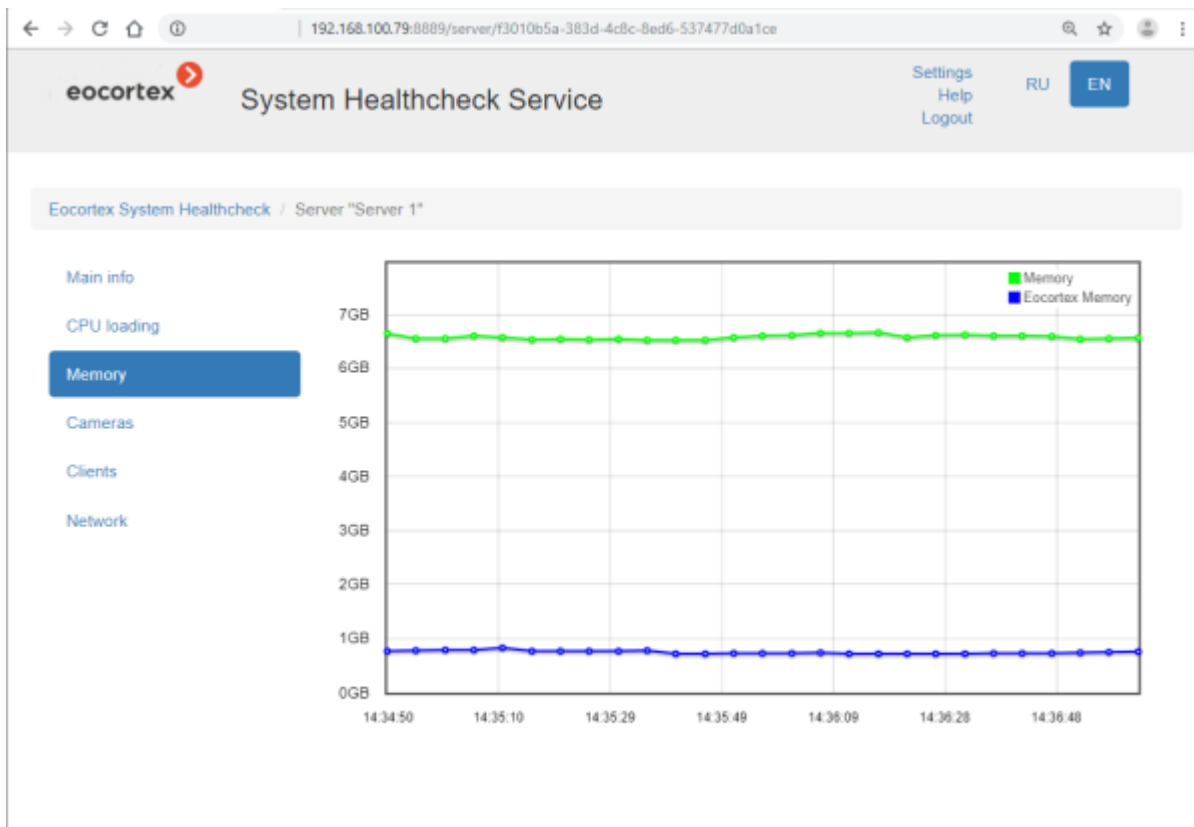
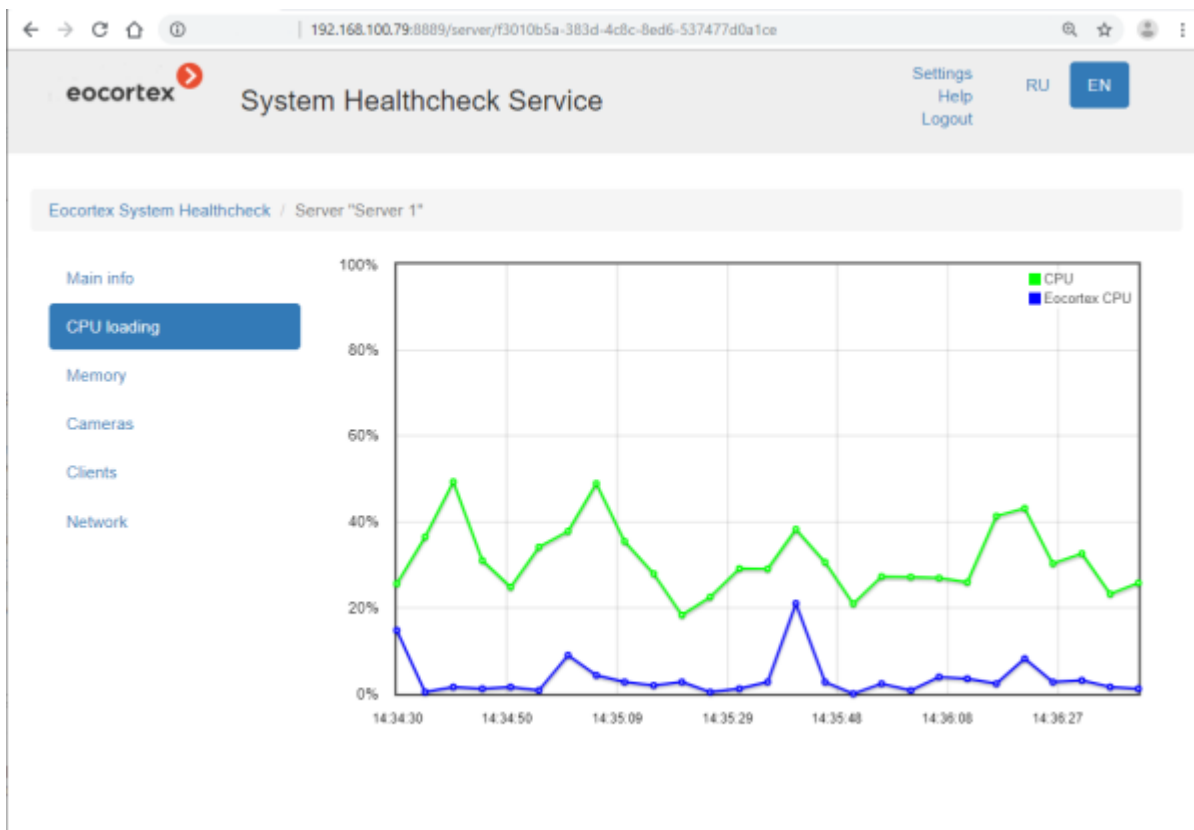


If the Service password has been changed, the new password must be specified in the Service [network connection settings](#) in the **Eocortex Configurator** application.

Server information

To view server information, click the line with this server on the **Home page**.





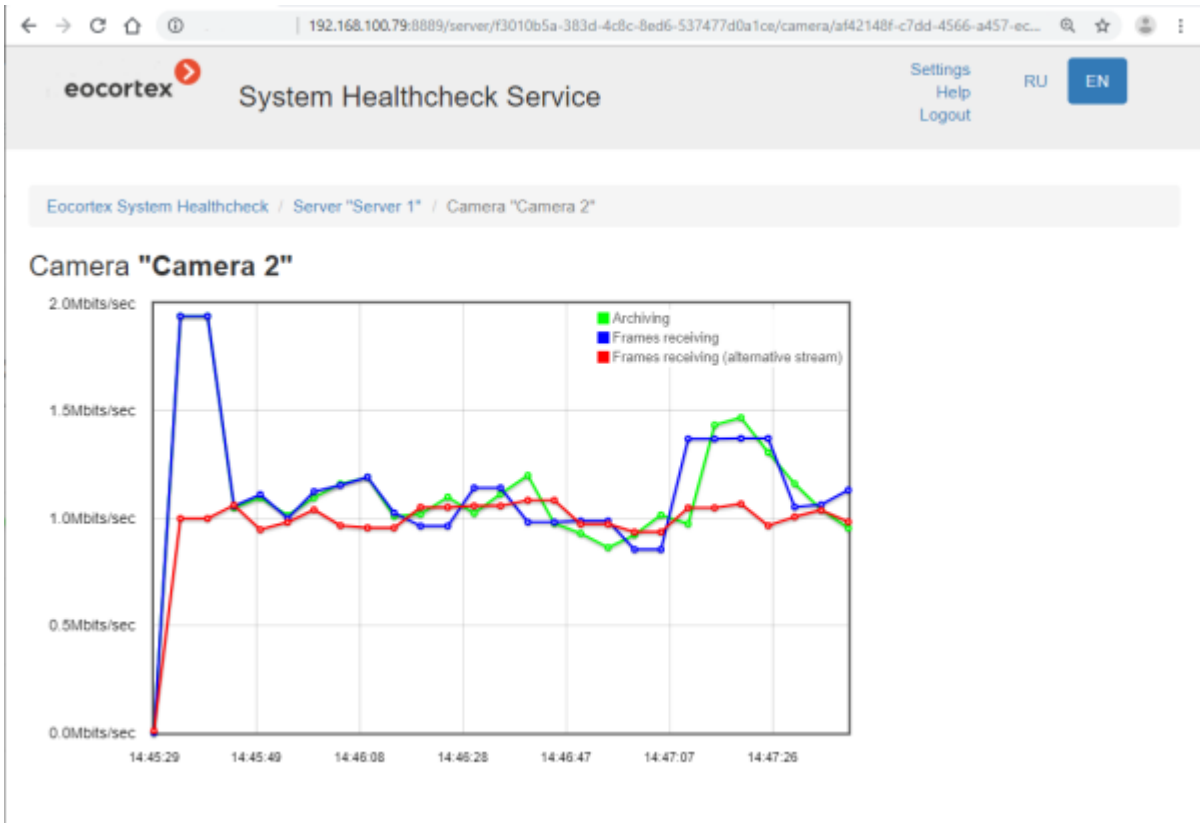
The screenshot shows the Eocortex System Healthcheck Service interface. The browser address bar displays the URL: 192.168.100.79:8889/server/f3010b5a-383d-4c8c-8ed6-537477d0a1ce. The page title is "System Healthcheck Service". In the top right corner, there are links for "Settings", "Help", and "Logout", along with language selection buttons for "RU" and "EN". The breadcrumb trail indicates the current location: "Eocortex System Healthcheck / Server 'Server 1'".

On the left side, there is a navigation menu with the following items: "Main info", "CPU loading", "Memory", "Cameras" (highlighted in blue), "Clients", and "Network".

The main content area is titled "Cameras:" and lists four cameras:

- Camera 1: There's a problem with getting the main stream (indicated by a red error message)
- Camera 2: OK (indicated by a green status box)
- Camera 3: OK (indicated by a green status box)
- Camera 4: There's a problem with getting the main stream (indicated by a red error message)

Clicking the camera opens the information page on this camera.

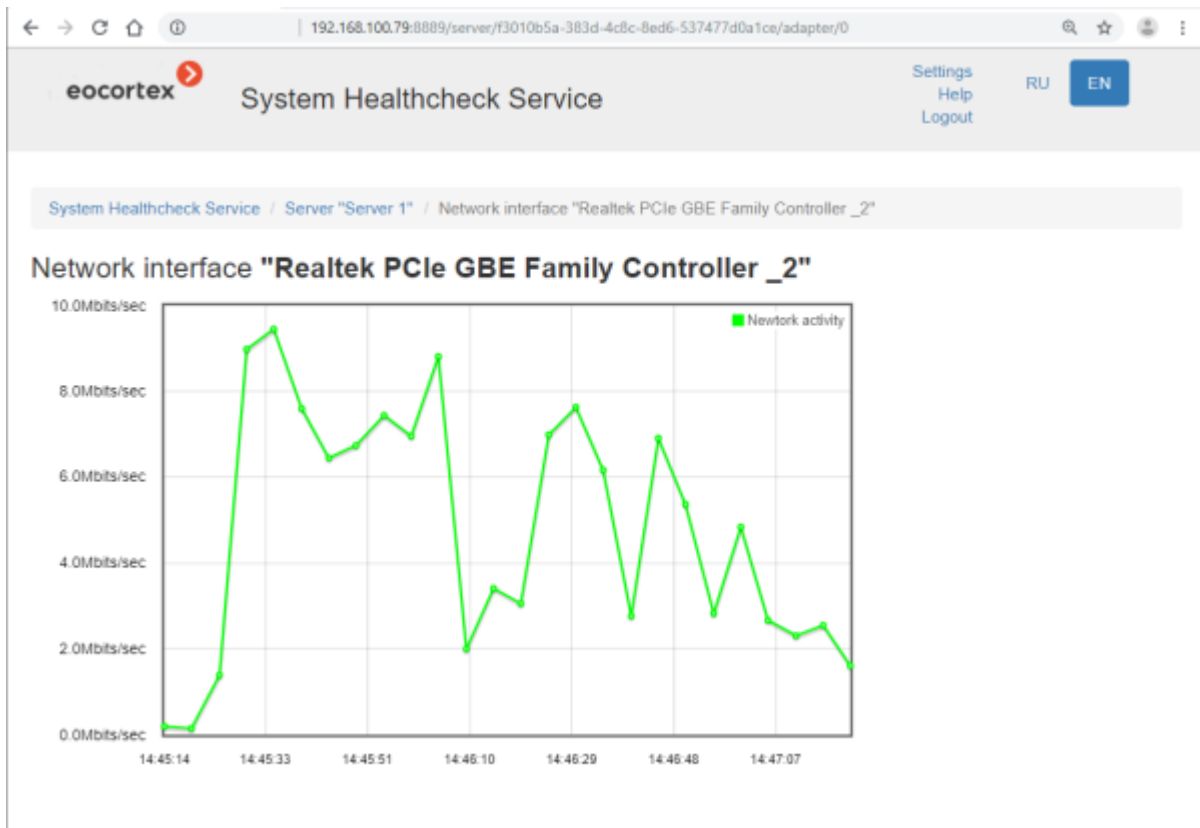


The screenshot shows the Eocortex System Healthcheck Service web interface. The browser address bar displays the URL: 192.168.100.79:8889/server/f3010b5a-383d-4c8c-8ed6-537477d0a1ce. The page header includes the Eocortex logo, the title "System Healthcheck Service", and navigation links for "Settings", "Help", "Logout", "RU", and "EN". The breadcrumb trail reads "Eocortex System Healthcheck / Server 'Server 1'". On the left sidebar, the "Clients" menu item is highlighted in blue. The main content area is titled "Connected clients:" and displays a single entry: "Login: root, Computer address:192.168.100.79".

The screenshot shows the Eocortex System Healthcheck Service web interface with the "Network" menu item highlighted in blue. The main content area is titled "Network:" and displays a list of network adapters with their current status and speed. The data is as follows:

Network Adapter	Status	Speed
Realtek PCIe GBE Family Controller _2	2.0/953.7 Mbits/sec	
Teredo Tunneling Pseudo-Interface	0.0/0.1 Mbits/sec	
VMware Virtual Ethernet Adapter for VMnet8	0.0/95.4 Mbits/sec	
VMware Virtual Ethernet Adapter for VMnet1	0.0/95.4 Mbits/sec	

Clicking the name of the network adapter opens the information page on this adapter.



Related references

[Overview of the Service](#)

[Setting in the **Eocortex Configurator** application](#)

[Installation of **Monitoring** on Windows](#)

[Installation of **Monitoring** on Linux](#)

Additions

Utilities and Autorun

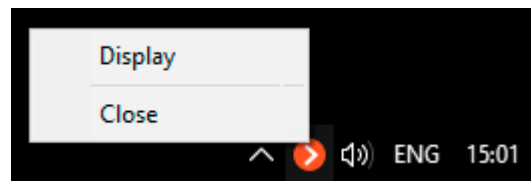
Eocortex Server Info

The **Eocortex Server Info** utility is used to manage and monitor the **Eocortex Server** service. The utility installs with the **Eocortex Server** and starts automatically at the startup of the operating system. Even if the utility window was minimized or closed, the utility can still be found in the notification area of the **Windows** taskbar.




To open the **Eocortex Server Info** window, click twice on its icon in the notification area by left mouse button or call the context menu by right mouse button and select the **Show** item.


Selecting the **Close** item in the context menu closes only the utility, while the **Eocortex Server** service will continue to work normally.



The **Eocortex Server Info** window contains the following controls:

✕

Stop server


Eocortex Configurator

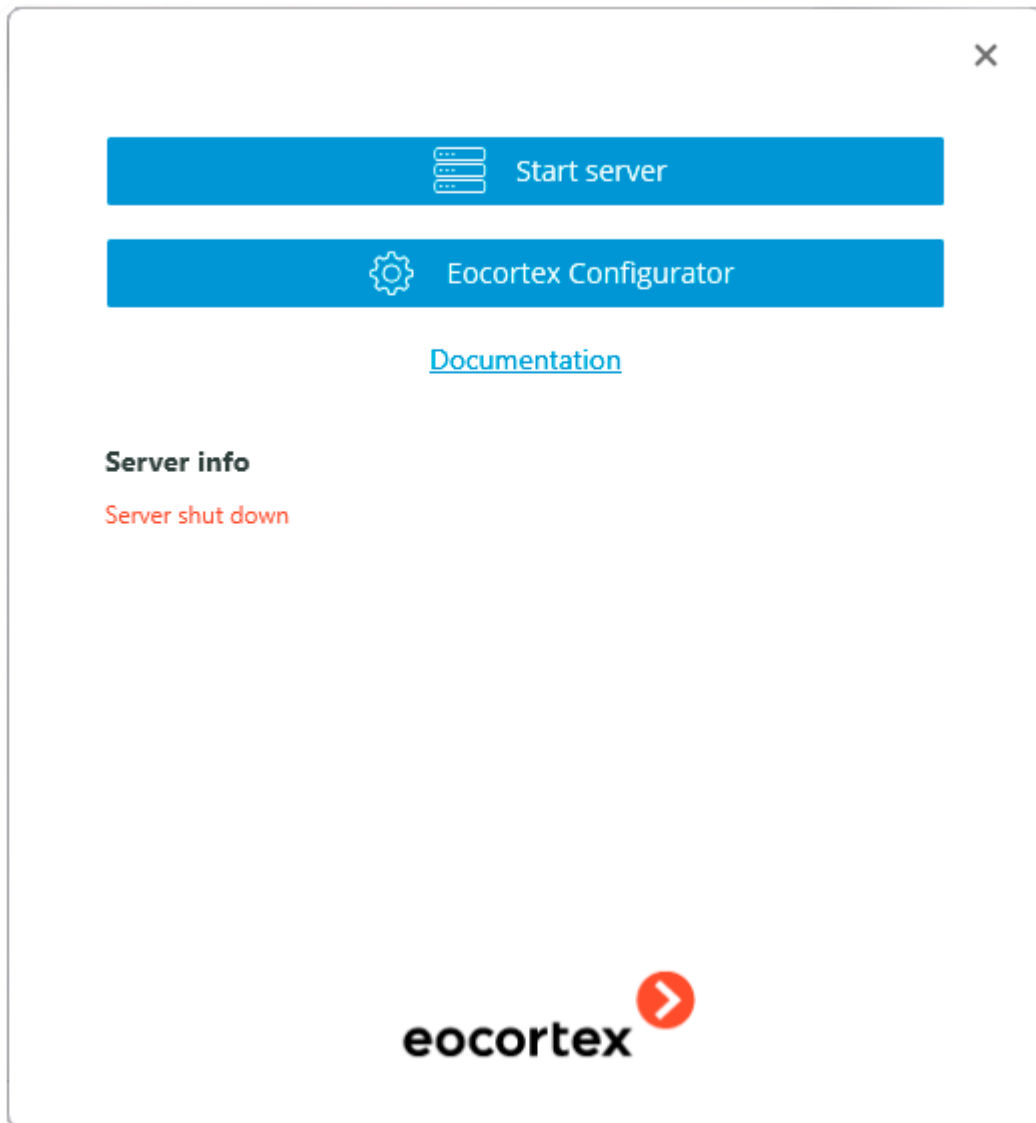
[Documentation](#)

Server info

[Server started.](#)

Configuration name: New configuration.
Last time when configuration was applied: 6/30/2022 1:31:25 PM.
Archive size (GB): 42.
Archiving speed (MB/sec): 0.00.
S.M.A.R.T. diagnostics: Drives ("D","C") function properly.
Archive duration (days): 1.0.
Port: 8080.
Start time: 6/30/2022 1:31:27 PM.
Server version (Windows): 3.6.55 (Ultra).





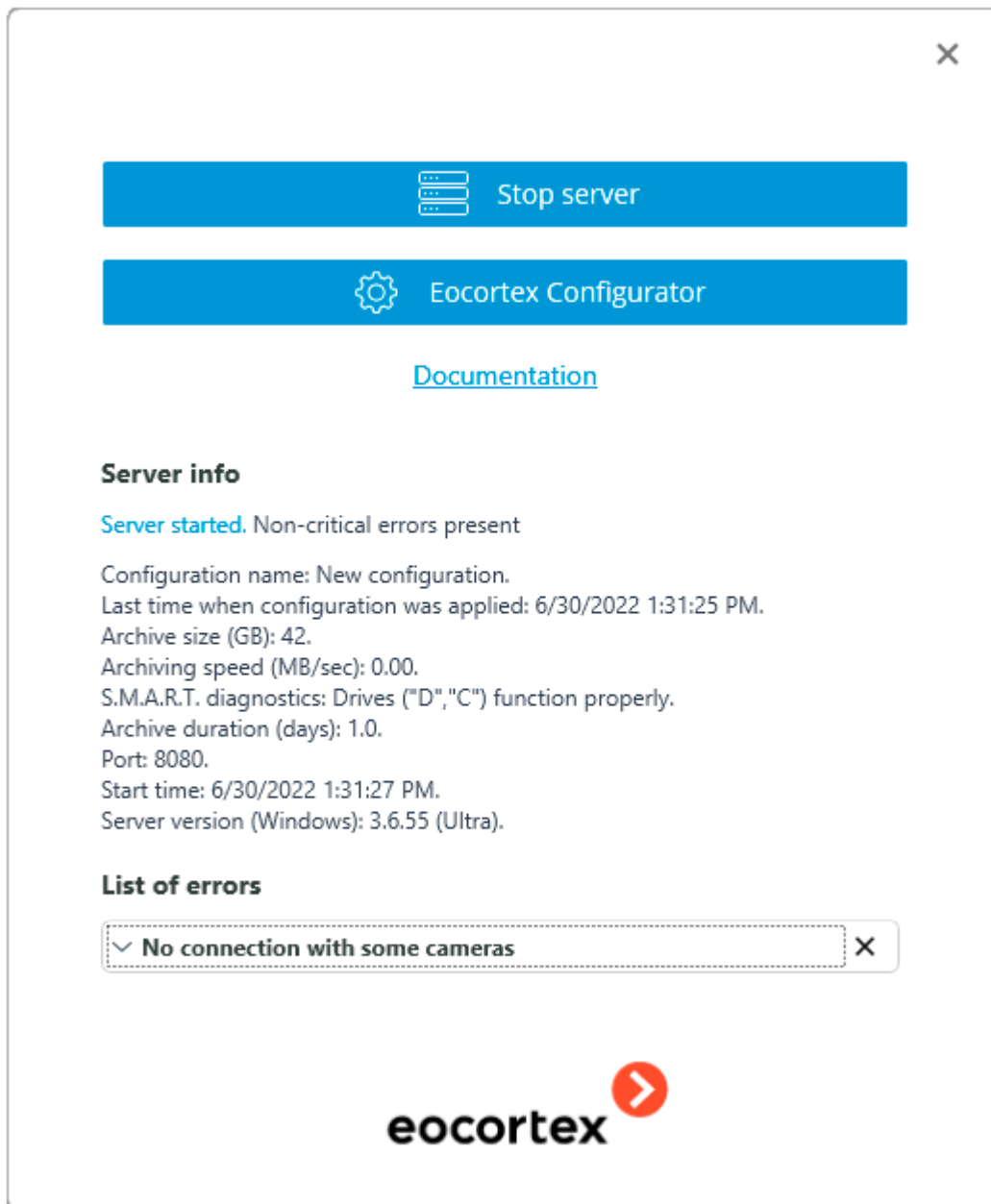
The **Stop server** button terminates the **Eocortex Server** service on the computer. This action requires confirmation by requesting the username and password of the user who has the right to stop the service.

The **Start server** button starts the **Eocortex Server** service on the computer.

The **Eocortex Configurator** starts the **Eocortex Configurator** application.

The **Documentation** link leads to the main page of this documentation.

The bottom part of the window displays the current server state. Notifications about server problems will be displayed there as well.



To get a detailed description of the problem and recommendations on how to fix it, click on the icon in the left upper corner of the notification. To remove a notification from the window, click on the icon in its right upper corner.

Eocortex Standalone

Unlike the **Eocortex Server**, the **Eocortex Standalone** is not a **Windows** service, but a stand-alone application with user interface.

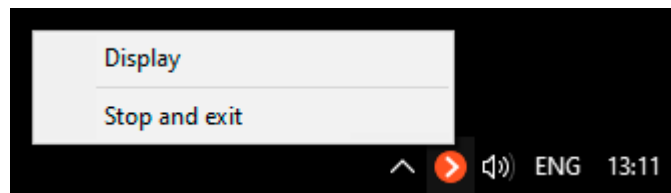
Eocortex can run on a computer in one of two forms - as a service or as an application. From the choice of installation type, either it will be **Eocortex Server** or **Eocortex Standalone**, the functionality of the **Eocortex** software will remain the same, while the **Windows** behavior will be different for each of the options selected. So, for example, when restarting the computer, **Eocortex Standalone** will wait for the user to log into the operating system before starting when **Eocortex Server** will run in the background without the need to log into the OS.

After launching the **Eocortex Standalone** application, the **Windows** notification area will display the application icon.

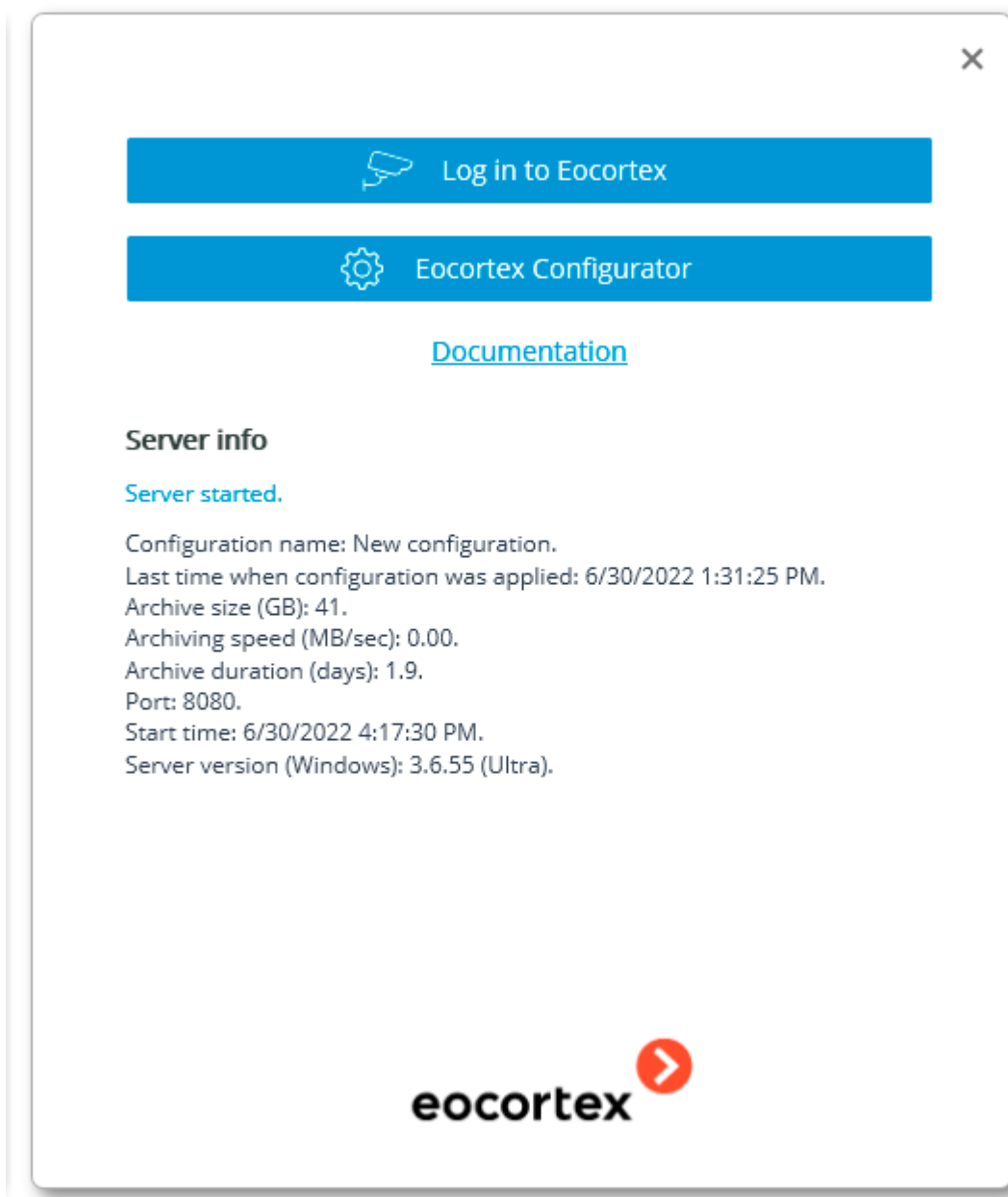


To open the **Eocortex Standalone** window, click twice on its icon in the notification area by left mouse button or call the context menu by right mouse button and select the **Show** item.

Selecting the **Stop and Close** item in the context menu closes the **Eocortex Standalone** application itself.



The **Eocortex Standalone** control window contains the following controls:

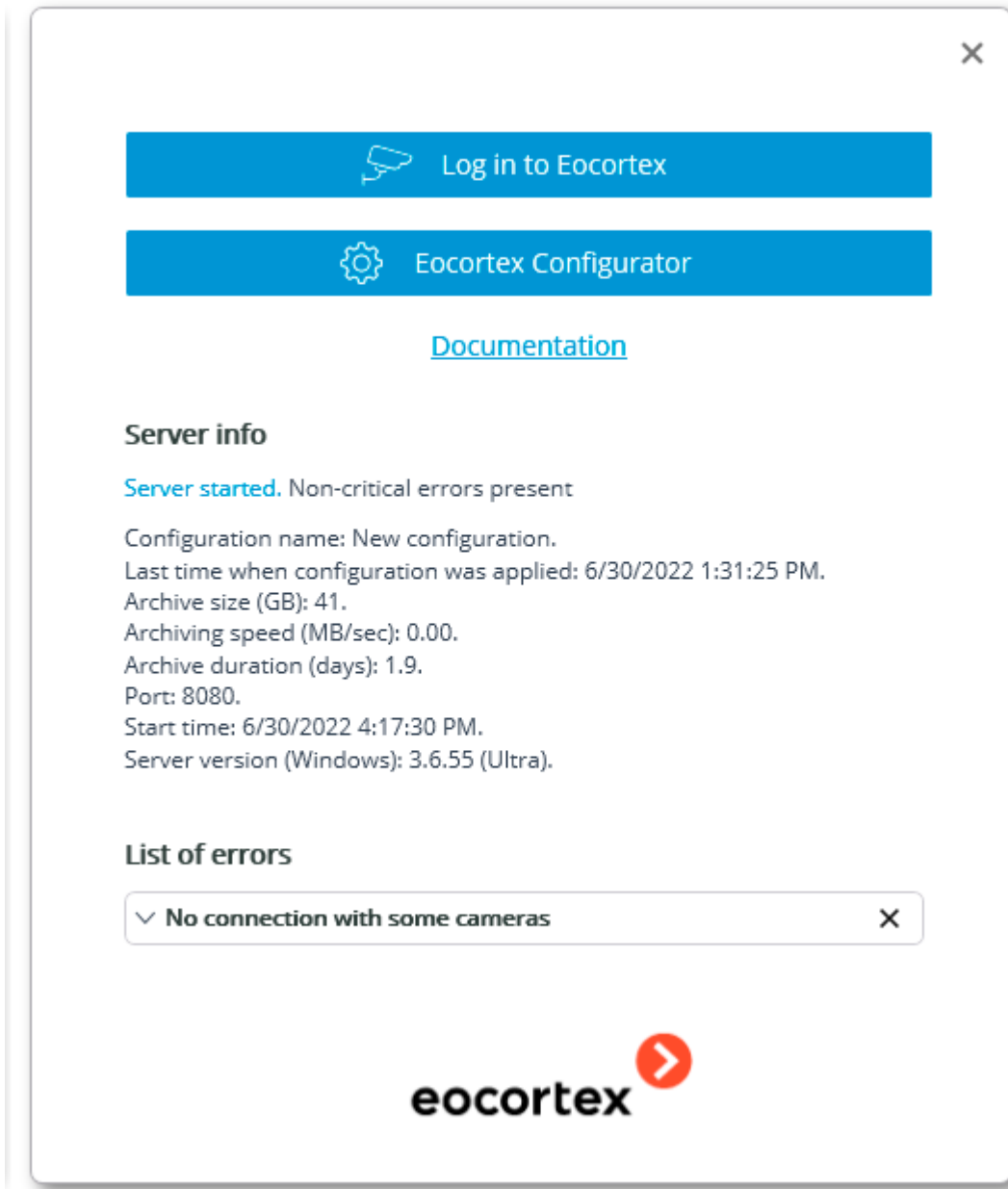


The **Enter the Eocortex** button starts the View window of the **Eocortex Standalone** application.

The **Eocortex Configurator** button starts the **Eocortex Configurator** application.

The **Documentation** link leads to the main page of this documentation.

The bottom part of the window displays the current server state. Notifications about server problems will be displayed there as well.



To get a detailed description of the problem and recommendations on how to fix it, click on the icon in the left upper corner of the notification. To remove a notification from the window, click on the icon in its right upper corner.

Autorun for Eocortex Client and Eocortex Standalone

Below are the examples of autorun settings that do not explicitly require a username and password to be entered in the authorization window:

- The **Eocortex Client** application autostart at computer startup.
- The **Eocortex Standalone** view window autostart at computer startup.

- Automatic login to the **Eocortex Client** application from a shortcut on the desktop.
- Automatic login to the **Eocortex Standalone** view window from a shortcut on the desktop.

As an example, the following values are taken for the required parameters:

The **Eocortex Client** installation folder:

C:\Users\UserName\AppData\Local\Programs\Eocortex Client

The **Eocortex Standalone** installation folder:

C:\Program Files\Eocortex Standalone

Server IP address:

192.168.0.100

Server connection port:

8081

Eocortex username:

operator

Eocortex user password:

qwerty77

Windows username:

UserName

Quotes when specifying the full path to the file are required.

To configure the **Eocortex Client** application autorun at computer startup, open the Windows system registry and find the

HKEY_CURRENT_USER\SOFTWARE\Microsoft\Windows\CurrentVersion\Run section.

Create a new String key with the **Eocortex Client** name and the value:

"C:\Users\UserName\AppData\Local\Programs\Eocortex Client\EocortexClient.exe" -server 192.168.0.100 -port 8081 -user operator -password qwerty77

To configure the **Eocortex Standalone** view window autorun at computer startup, open the Windows system registry and find the

HKEY_CURRENT_USER\SOFTWARE\Microsoft\Windows\CurrentVersion\Run section.

Create a new String key with the **Eocortex Standalone** name and the value:

"C:\Program Files\Eocortex Standalone\Eocortex.exe" -server 192.168.0.100 -port 8081 -user operator -password qwerty77

To configure automatic login to the **Eocortex Client** application using a desktop shortcut, right-click the shortcut and select the **Properties** item from the context menu. In the window that opens, set to the **Object** field on the **Shortcut** tab the line as shown below:

"C:\Users\UserName\AppData\Local\Programs\Eocortex Client\EocortexClient.exe" -server 192.168.0.100 -port 8081 -user operator -password qwerty77

To configure automatic login to the **Eocortex Standalone** view window using a desktop shortcut, right-click the shortcut and select the **Properties** item from the context menu. In the window that opens, set to the **Object** field on the **Shortcut** tab the line as shown below:

"C:\Program Files\Eocortex Standalone\Eocortex.exe" -server 192.168.0.100 -port 8081 -user operator -password qwerty77

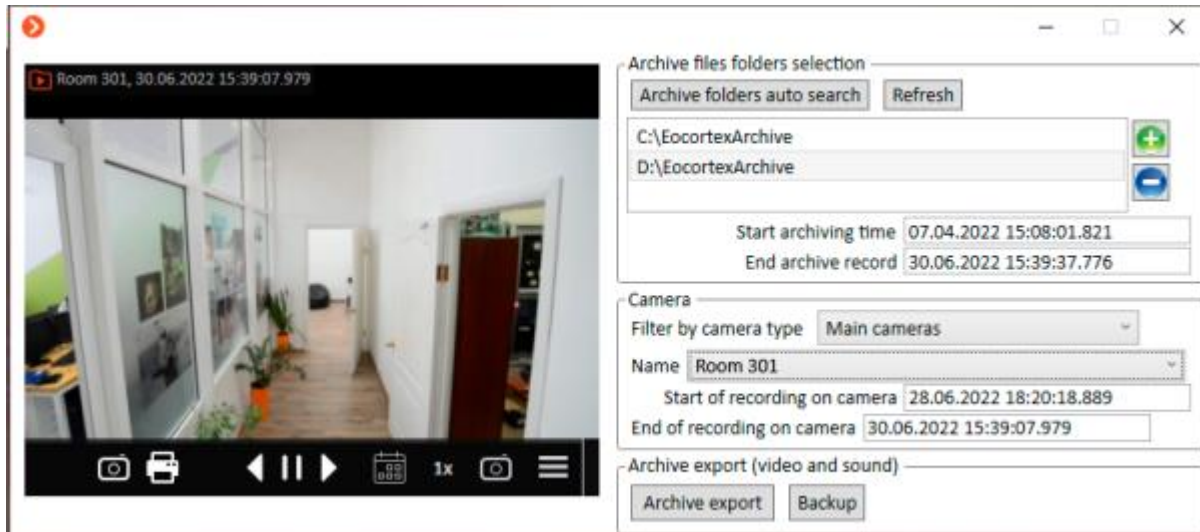
To establish a secure connection over HTTPS, use the **-sslport** parameter instead of the **-port**. The port number is mandatory even if the standard SSL port **18080** is not changed.

To disable validation of security certificates in use, add the **-disablesslcertificatesvalidation** parameter.

Local monitoring and backup archive utility

In order to view the archive recordings with the terminated **Eocortex** Server, as well as recordings that are not linked to the deployed server (for example, copied from the server to any external media), the **Local monitoring and backup archive** utility can be used.

To run the utility, use the shortcut by the path: **Start menu / All Applications / Eocortex Server (Client, Standalone) / Local monitoring and backup archive**.




The utility window contains the following controls:

The **Archive files folders selection** settings section contains a list of folders used by the utility for viewing and exporting archive recordings.

Clicking the **Archive folders auto search** button starts the operating system scan in order to automatically search for all folders in which the archive is stored. All found folders are included in the list.

Clicking the  button allows specifying the archive folder manually in the Explorer window that opens.

Clicking the  button with a folder selected removes this folder from the list. The folder will only be excluded from the list, but it will remain on the disk and can be added to the list again at any time if necessary.

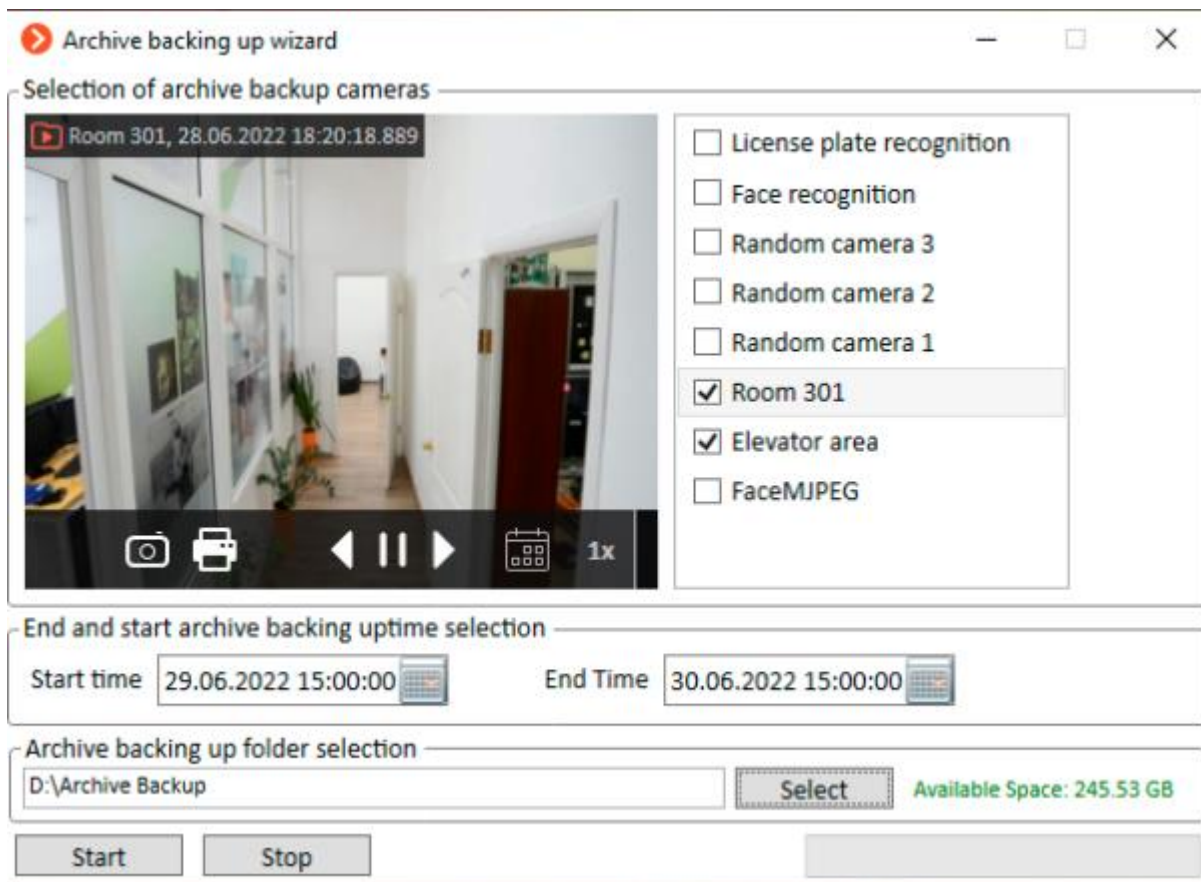
Below the list of folders, information is displayed about the date and time of the beginning and end of the records available for viewing, also known as the archive depth. This information covers all folders added to the list.

Clicking the **Refresh** button updates the information about available folders and cameras. For example, if after launching the utility one of the folders in the list was deleted in **Windows Explorer**, it still will be displayed in the utility as available until the **Refresh** button is clicked.

The **Camera** settings section allows getting information about cameras available in selected folders, as well as select a camera and view its recordings in the preview cell in the left part of the utility window.

The **Archive export** button allows exporting the recordings to AVI, MP4 and MCM files.

Clicking the **Backup** button opens the Archive backing up wizard window:



To create a backup of archive recordings, select the cameras for which a backup must be created, set the time interval for which the archive will be copied, and select a folder for storing the created copy. When all the settings are configured as needed, click the **Start** button.

The backup process will be displayed as a progress bar in the lower right part of the window:



Complementary Pack of Drivers for Cameras and Devices (DevicePack)

Along with new versions of **Ecortex** Server and Client software, an additional separately distributed pack of drivers for cameras and devices (**DevicePack**) is provided. This package is primarily intended to ensure backward compatibility with previous versions of the **Ecortex** Server software. Using the package to get support for new cameras and devices without updating the **Ecortex Server / Client / Standalone** applications is not recommended.

DevicePack is installed in a separate directory (default: **C:\Program Files\Ecortex IP Device Pack**), so it can always be uninstalled without affecting other **Ecortex** packages.

DevicePack must be installed on the computer with **Ecortex** Server. In case of installation on a multiserver system, the package should be installed on each server. If the **Connect via server** option is disabled for individual cameras in the **Configurator** application, then **DevicePack** must also be installed on all computers where these cameras are viewed using the **Ecortex Client**.

Ecortex Server / Client / Standalone interacts with the **DevicePack** as follows – it checks at startup whether the **DevicePack** is installed on this computer and then:

- **If installed:** drivers and native settings for cameras and devices from the **DevicePack** folder will be used to interact with cameras and devices.
- **If not installed:** drivers and native settings for cameras and devices from the **Eocortex Server / Client / Standalone** installation folder will be used.

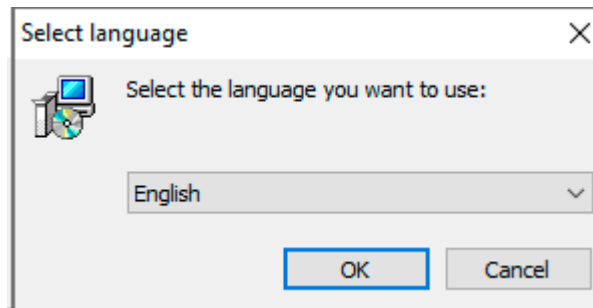
Installing and uninstalling DevicePack

The **Eocortex** server must be stopped before installing or uninstalling the **DevicePack**.

Installing DevicePack

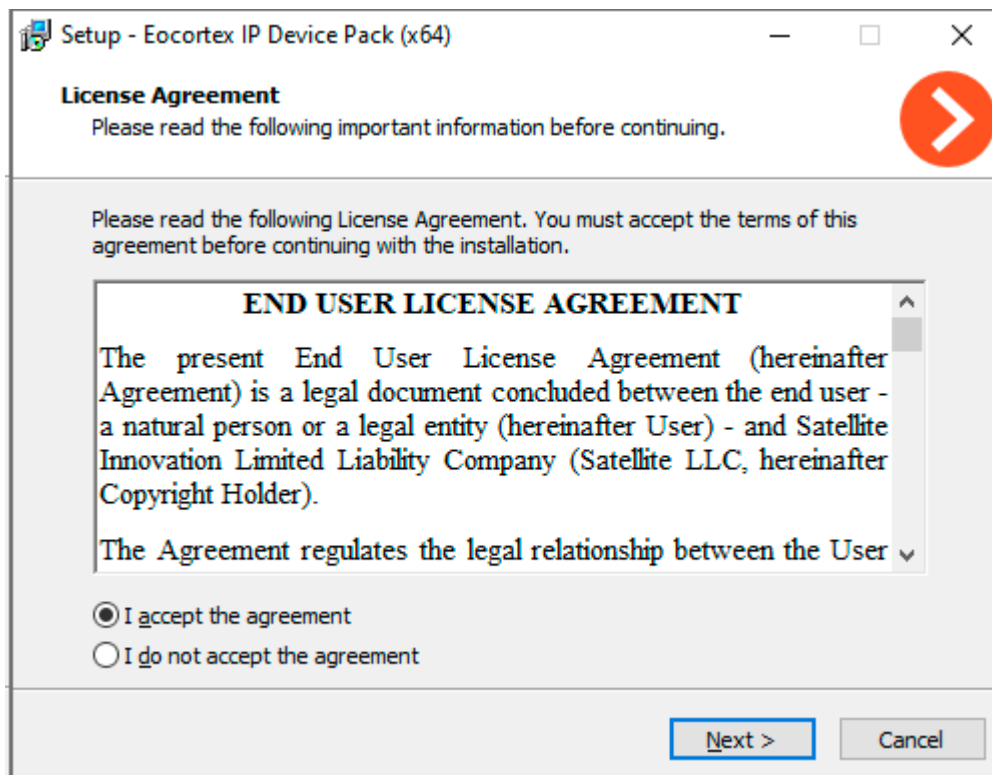
To install the **DevicePack**, run the installation file with the name **EocortexIPDevicePackInstaller_x.x.xx.exe** or **EocortexIPDevicePackInstaller_x.x.xx_x64.exe** depending on the bitness and version of the **Eocortex Server** (where **x.x.xx** in the file name is the version number).

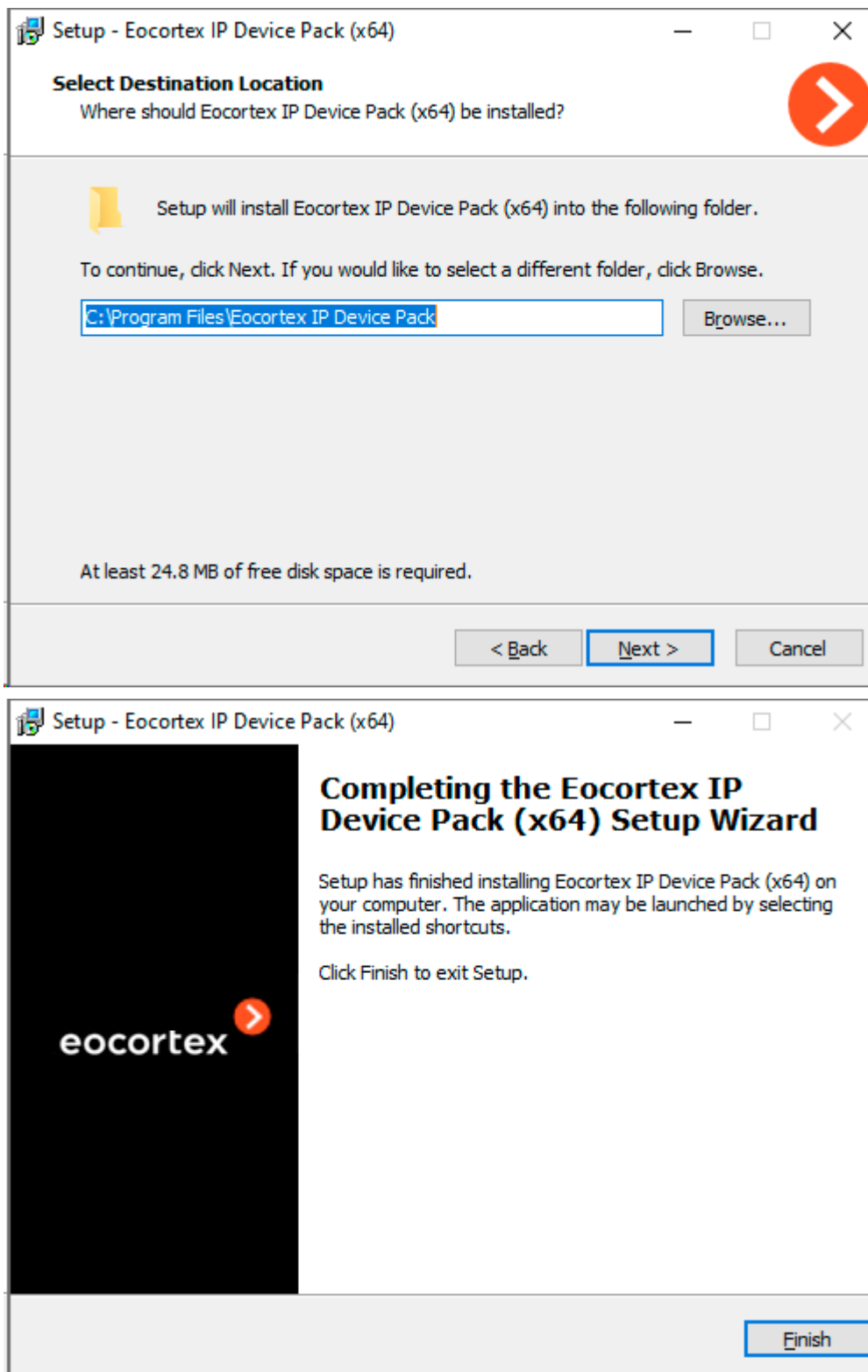
Select the installation language in the window that opens.



If another version of the **DevicePack** is already installed on the computer, a proposal to remove the previous copy before installing the new version will be displayed.

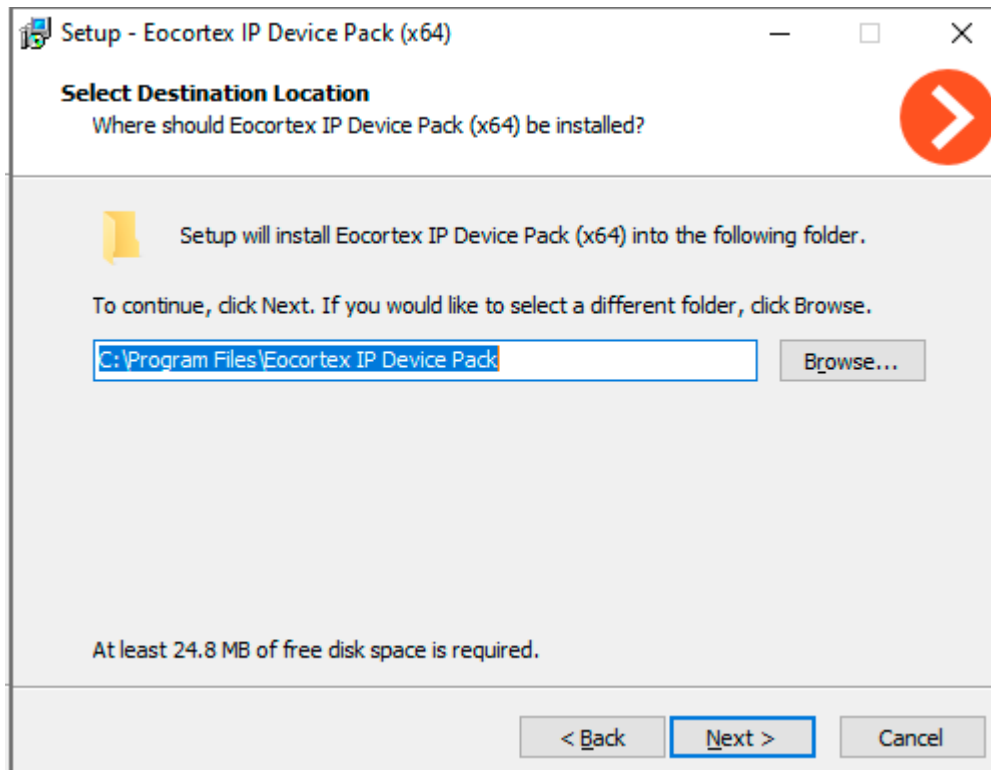
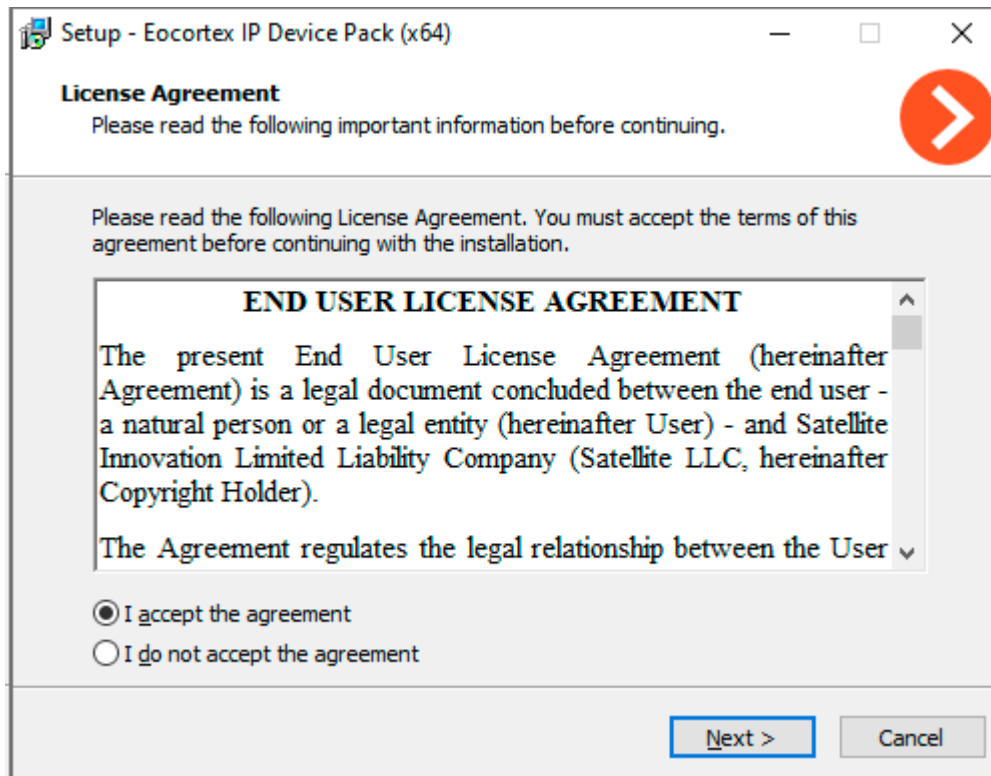
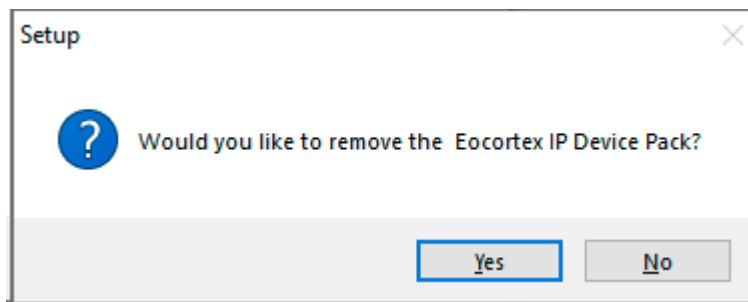
When the installation wizard window will open, follow the wizard steps.





Uninstalling DevicePack

To uninstall **DevicePack**, run the Uninstaller via **Start Menu / All Applications / Eocortex IP Device Pack / Uninstall Device Pack** or use the standard **Applications and Features** snap-in from the **Windows Control Panel**.



Eocortex Virtual IP Camera

Among the additional tools, **Eocortex** provides the **Eocortex Virtual IP Camera** utility for creating RTSP streams based on frame sources not supported directly by **Eocortex** Server.

The **Eocortex Virtual IP Camera** is able to:

- Restream frames received from the webcam to the **Eocortex** Server.
- Create and transmit to the **Eocortex** virtual IP cameras based on previously created videos.

The utility can work in two modes - both active as an application and background as a **Windows** service.

The **Eocortex Virtual IP Camera** utility does not require the **Eocortex** license protection key to operate.

Installing and uninstalling Eocortex Virtual IP Camera

The **Eocortex Virtual IP Camera** utility is distributed as a separate application and has its own installer. The utility can be installed both on a computer with **Eocortex** components already installed, or on a separate computer without other **Eocortex** applications.

Installation and removal of the **Eocortex Virtual IP Camera** utility can be done without the need to stop or restart the **Eocortex** Server.

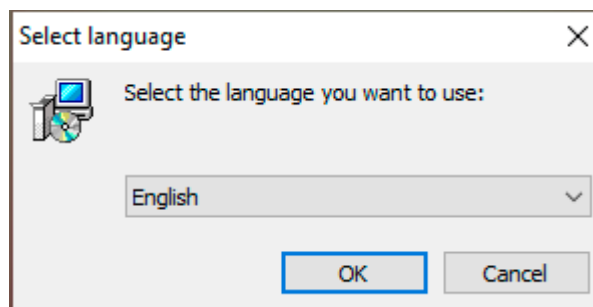
The **Eocortex Virtual IP Camera** utility is backward compatible with other **Eocortex** applications, so regular updating of the utility to newer versions is recommended, but not required.

Installing Eocortex Virtual IP Camera

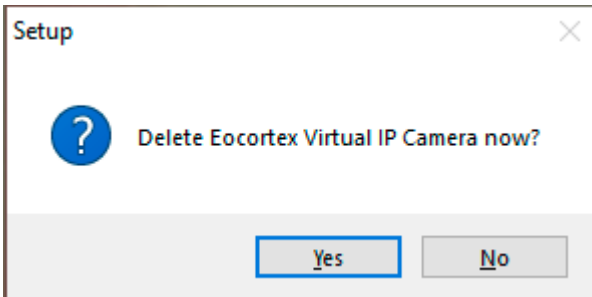
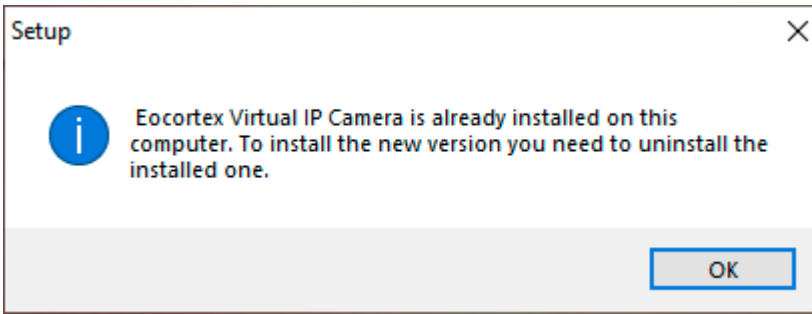
The actual installation files of the **Eocortex Virtual IP Camera** utility are available at the website eocortex.com, in the [Support / Software Installation Packages Supported](#) section.

To install the **Eocortex Virtual IP Camera** utility, run the downloaded installation file with the name **Eocortex Virtual IP CameraInstaller_X.X.exe**, where X.X is the version number of the utility.

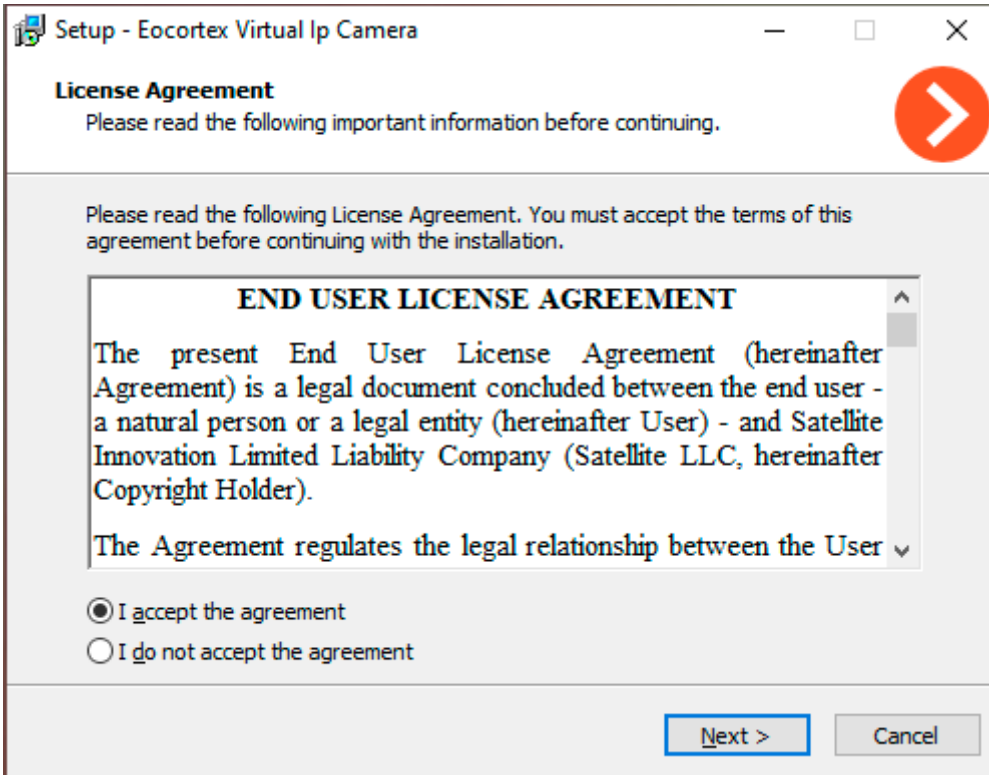
Select the installation language in the window that opens.

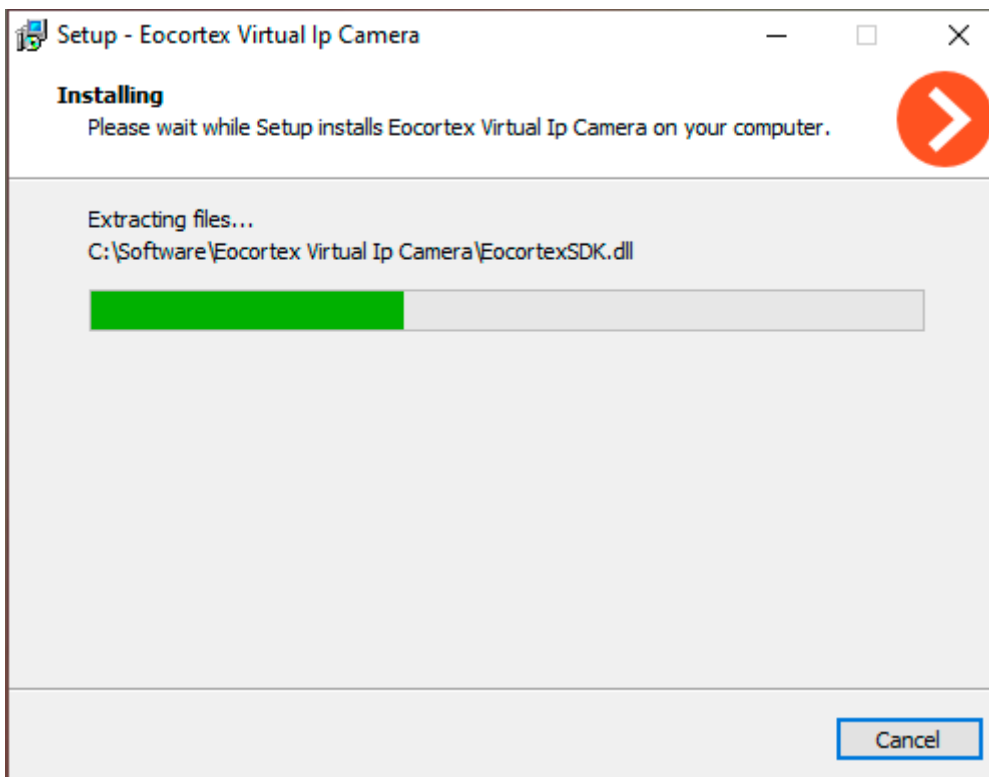
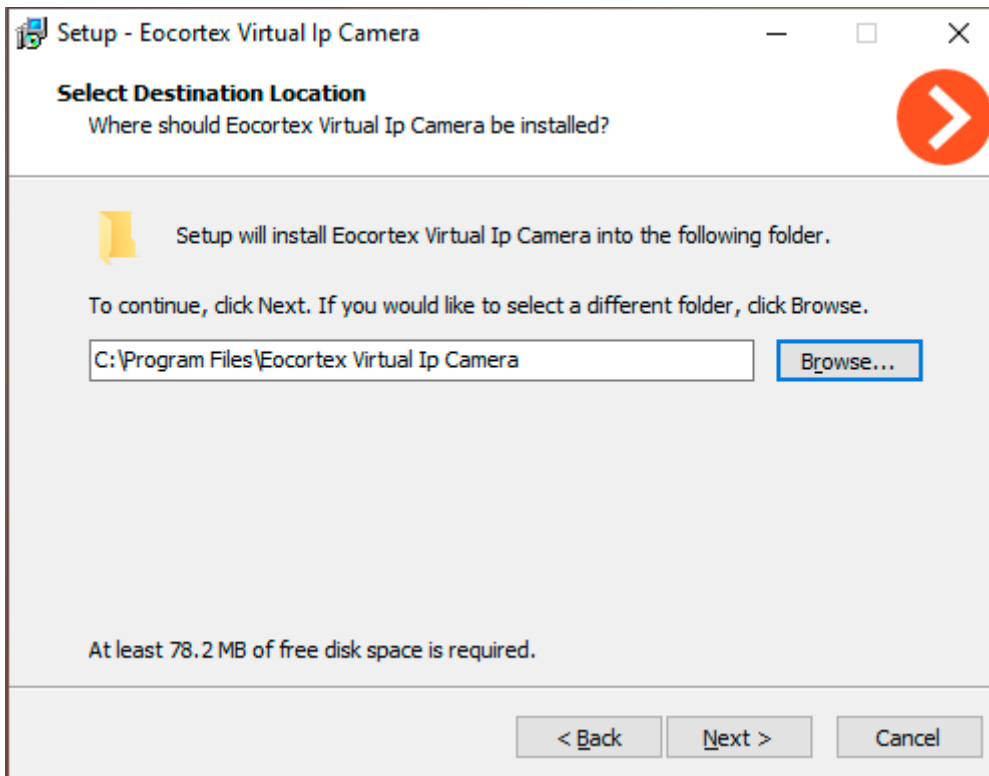


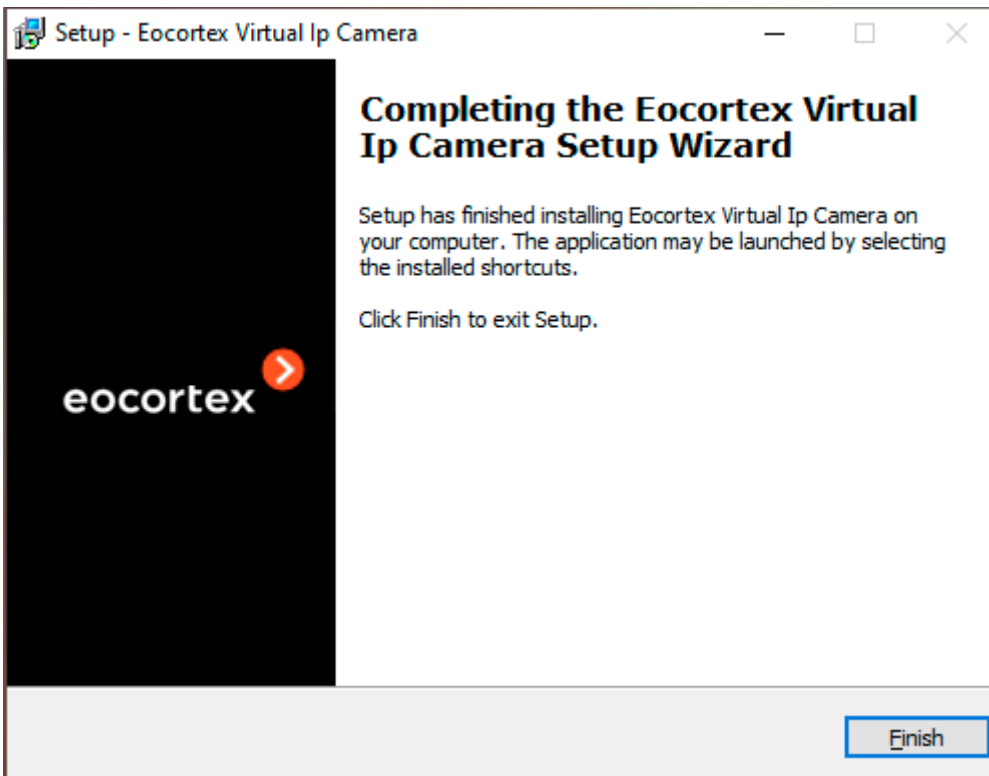
If another version of the **Eocortex Virtual IP Camera** is already installed on the computer, a proposal to remove the previous copy before installing the new version will be displayed.



The installation wizard window will open. Follow the installation wizard steps, changing the path for the **Eocortex Virtual IP Camera** utility installation directory, if necessary.



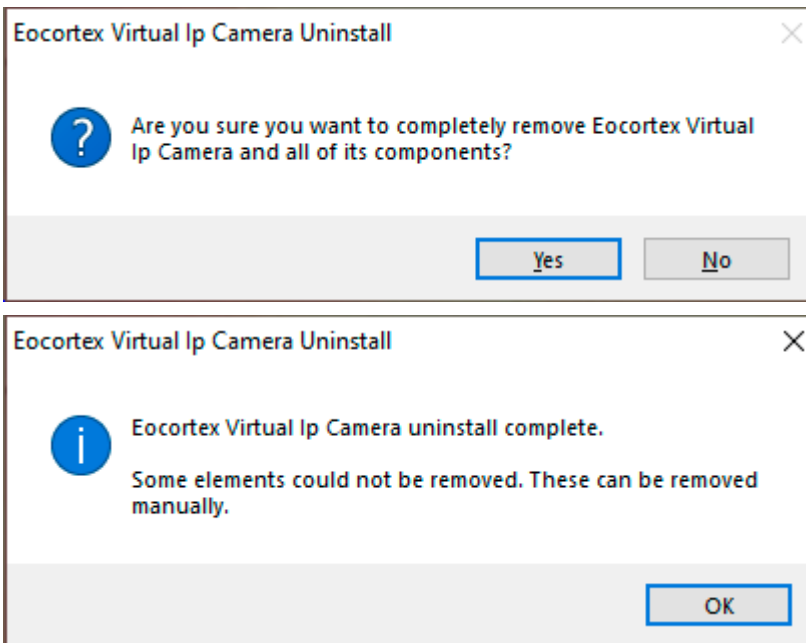




Once the installation is complete, the utility is ready for [setup](#) and [further use](#).

Uninstalling Eocortex Virtual IP Camera

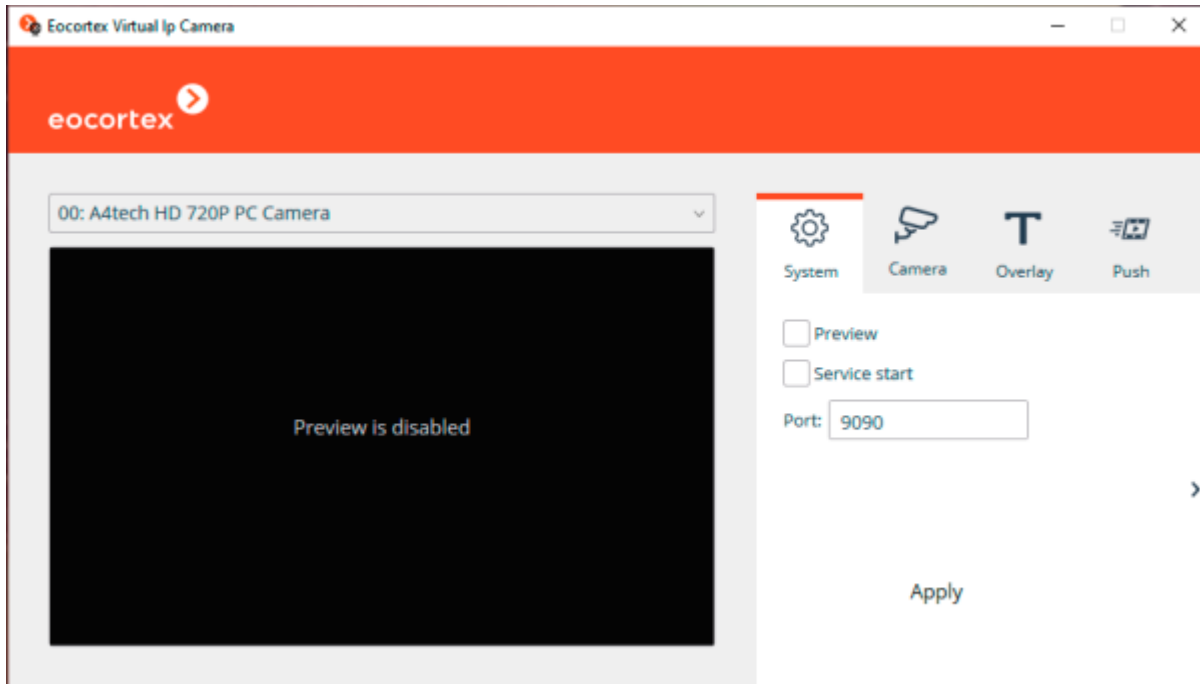
To uninstall **Eocortex Virtual IP Camera**, use the standard **Applications and Features** snap-in from the **Windows Control Panel** or run the uninstaller in the utility root folder.



When the **Eocortex Virtual IP Camera** utility is uninstalled from the computer, the Videos folder, which stores all [video clips added](#) for creating video streams, remains unchanged. Thus, removing or updating the utility allows to keep video clips unchanged without having to transfer or copy them.

Configuring the utility

Run the utility by clicking the **Eocortex Virtual IP Camera** on the desktop or via **Start / All Applications / Eocortex Virtual IP Camera / Eocortex Virtual IP Camera**. The utility window will open.



In the upper part of the window is a drop-down list for **selecting utility channels**. To configure a channel, select it in this list. The name of each channel is separated by a colon and consists of a numeric prefix before and the file or webcam name after the colon. The numeric index displays the number of each frame source in the utility in the order they were added and will be needed when configuring the channel in the **Eocortex Configurator** application.

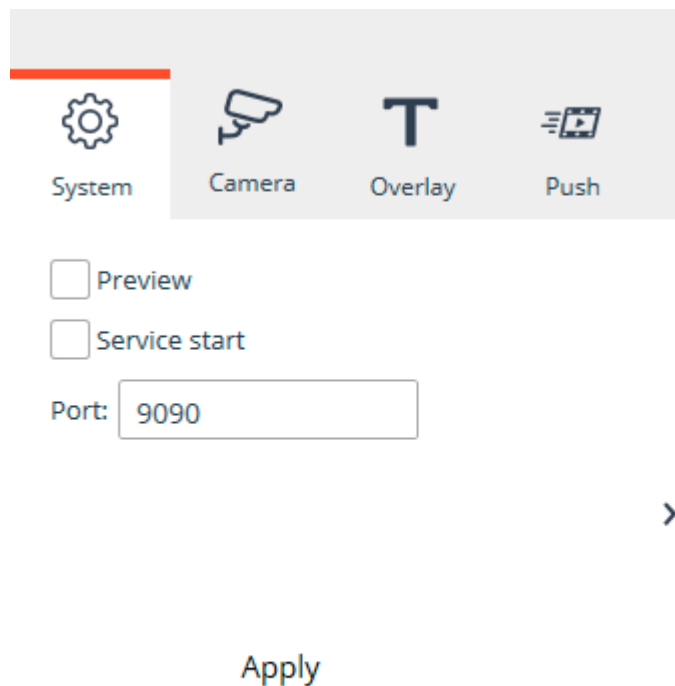
Under the channel selection menu is the **preview window** of the selected channel. If the image is not displayed, turn on the **Preview option** (see below).

In the right part of the window there is the **Settings** panel. If the panel is hidden, it can be opened by clicking the arrow at the right edge of the window.

Below are the setting options.

System

The **System** tab contains the general settings of the utility.



Preview: The utility will display the video of the selected channel in the preview window.

Service start: The utility will start as a **Windows** service. If this option is enabled, the **Eocortex Virtual IP Camera** service will be started after closing the utility window to keep the created channels running.

Port: The network port of the utility, which, along with the IP or URL of this computer, will be used when setting up channels in the **Eocortex Configurator** application. By default, the **Eocortex Virtual IP Camera** utility uses port **9090**.

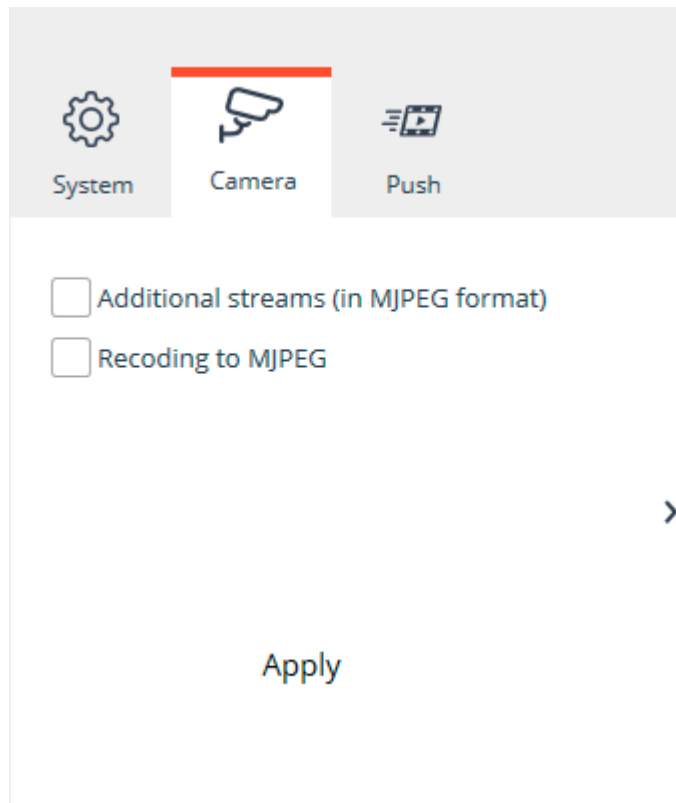
The **Eocortex Virtual IP Camera** service can be managed as any other service using the standard Windows **Services** snap-on (**Start / All Applications / Administration tools / Services**)

Camera

The **Camera** tab contains settings for the selected channel.

The list of available options depends on the frame source used to create the channel.

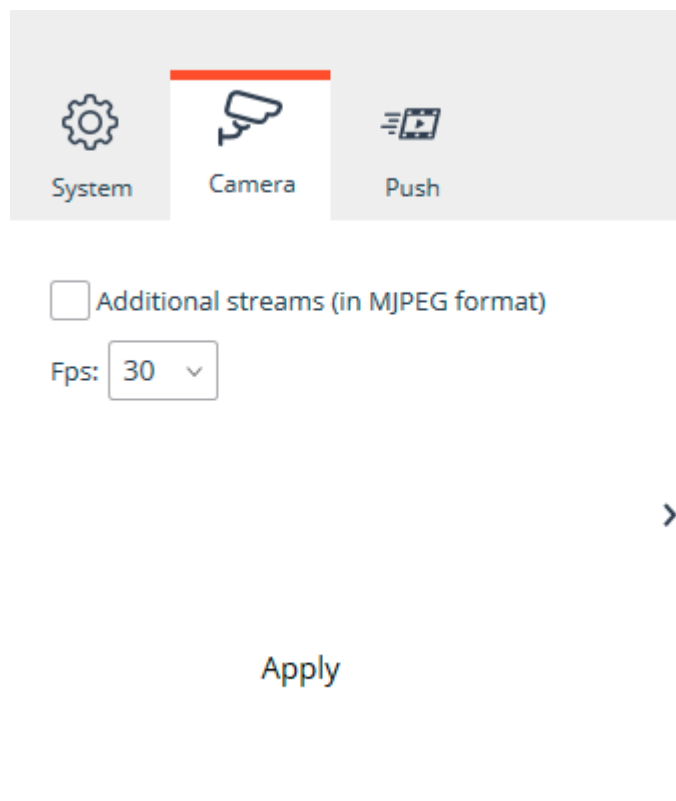
For pre-recorded videos in **H.264** codec:



Additional streams (in MJPEG format): The utility will additionally generate lower resolution alternative streams based on the original video.

Recoding to MJPEG: The utility will transcode the main stream from **H.264** to **MJPEG**. The image resolution and frame rate of the original video will remain for the transcoded stream.

For pre-recorded videos in the **MJPEG** codec:

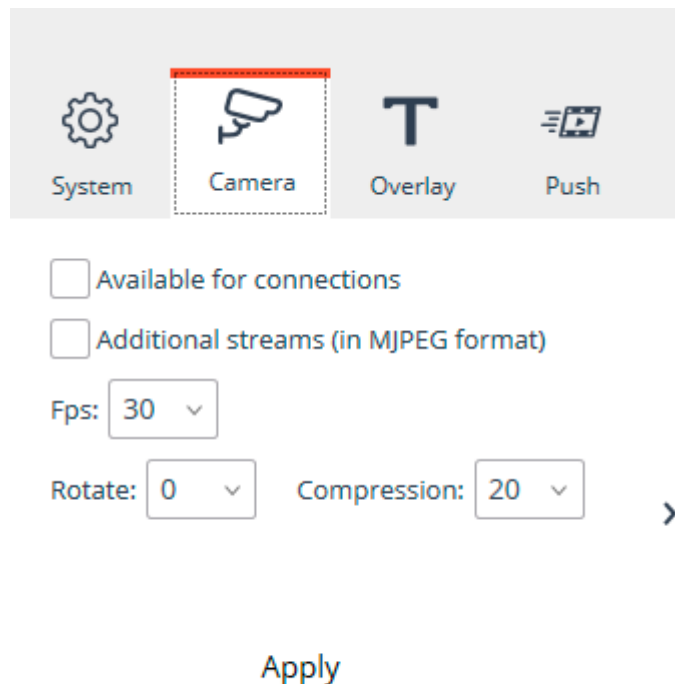


Additional streams (in MJPEG format): The utility will additionally generate lower resolution alternative streams based on the original video.

Recoding to H.264: The utility will transcode the main stream from **MJPEG** to **H.264**. The image resolution and frame rate of the original video will remain for the transcoded stream.

Fps: The utility will set the frame per second rate for the generated stream according to the set value.

For **webcam:**



System Camera Overlay Push

Available for connections

Additional streams (in MJPEG format)

Fps: 30 ▾

Rotate: 0 ▾ Compression: 20 ▾ >

Apply

Available for connections: The utility determines the possibility of connecting the camera to the **Eocortex** server. Disabling this option may be useful to ensure the privacy of the user of the computer running **Eocortex Virtual IP Camera**.

Additional streams (in MJPEG format): The utility will additionally generate lower resolution alternative streams based on the original video.

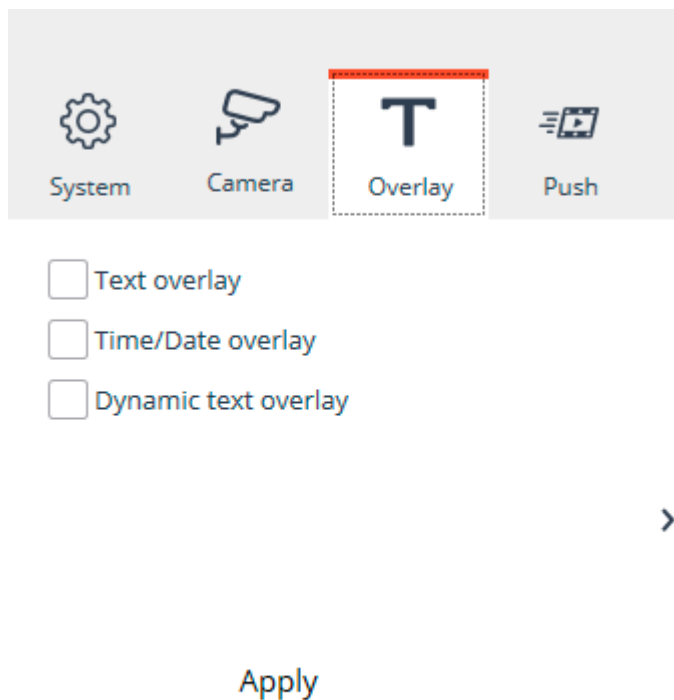
Fps: The utility will set the frame per second rate for the generated stream according to the set value.

Rotate: The utility in the created stream will rotate the frames received from the webcam clockwise by the specified number of degrees.

Compression: The utility will set the compression ratio for the created stream according to the specified value. The higher the compression ratio, the smaller the stream size and the lower the image quality.

Overlay

The **Overlay** tab contains settings for overlaying text on the stream of the selected channel.

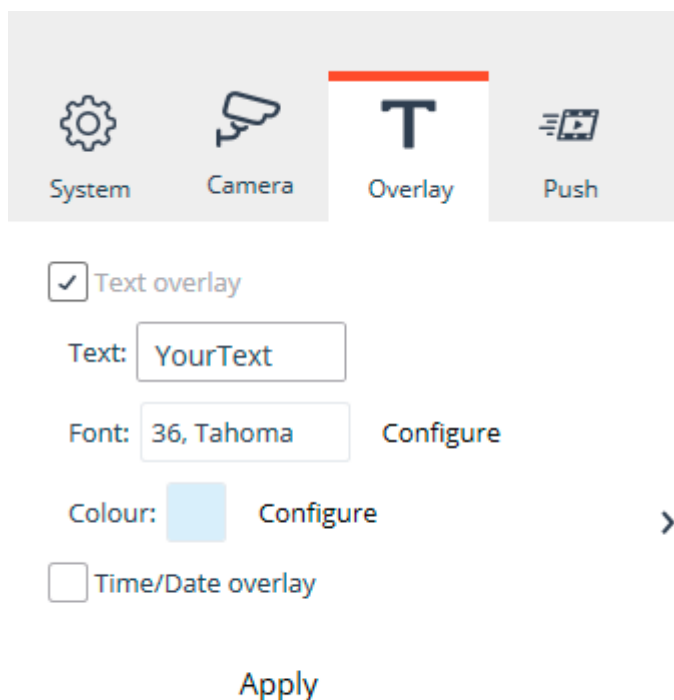


Text overlay: The utility will overlay the specified text on the stream frames.

Time/Date overlay: The utility will overlay on the frames the date and time of the computer running **Eocortex Virtual IP Camera**.

Dynamic text overlay: The utility will overlay time-varying text on the frames.

When the options are enabled, additional settings become available:



System Camera **Overlay** Push

Text overlay

Time/Date overlay

Font: Configure

Colour: Configure >

Dynamic text overlay

Apply

System Camera **Overlay** Push

Time/Date overlay

Dynamic text overlay

The sender address:

Font: Configure >

Colour: Configure

Apply

Font: Allows to select a font of the overlay text.

Color: Allows to select a color of the overlay text.

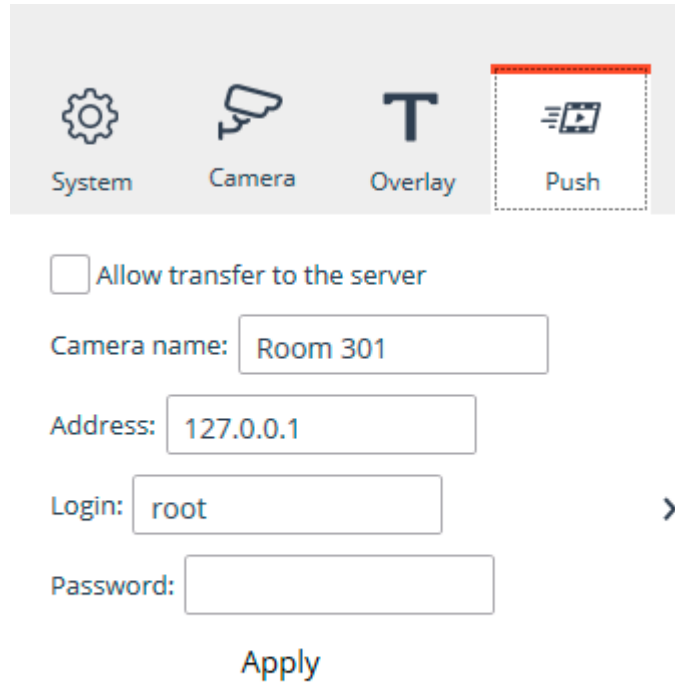
Text: The field to specify the overlay text.

The sender address: The IP address or URL and connection port of the dynamic text source.

Push

Push

The **Push** tab contains settings for the obsolete feature to force push streams of the created channels to the **Eocortex** server. This feature has no use in **Eocortex** newer than version 2.2.



Allow transfer to the server

Camera name:

Address:

Login: >

Password:

Apply

Creating a stream in Eocortex Virtual IP Camera

The **Eocortex Virtual IP Camera** utility is designed to create video streams and then transfer them to the server **Eocortex** for further processing. Stream virtualization in the utility is possible on the basis of pre-recorded videos or an image provided by a webcam.

Streaming video clips

Before using a video clip in the **Eocortex Virtual IP Camera** utility, make sure it meets certain file and video format requirements.

The **Eocortex Virtual IP Camera** utility has the support of streaming to the **Eocortex** for the following file formats:

MCM: The **Eocortex** internal video file format.

MP4: Commonly used media container, also known as MPEG-4 Part 14.

In addition to the media container format, it's also important to follow the requirements for video compression methods. The utility supports the following video codecs:

H.264/MPEG-4 Part 10

H.265/HEVC

MJPEG

To successfully stream the video to the server using the **Eocortex Virtual IP Camera**, both requirements must be met simultaneously for the uploaded video. So, for example, a file of AVI

format or with MPEG-4 Part 2 video codec will not be transmitted by the utility as it does not meet the minimum requirements.

In order to use a video in MCM or MP4 format in the utility, follow these steps:

[Install the Eocortex Virtual IP Camera](#) utility to a computer.

Place the video files to the **Videos** subfolder of the **Eocortex Virtual IP Camera** installation folder.

Run the **Eocortex Virtual IP Camera**.

In the main window, find a channel with the video file name in the channel list menu to make sure that the video is detected and recognized by the utility.

Run the **Eocortex Configurator** application and [configure the connection](#) of the desired **Eocortex Virtual IP Camera** utility channel to the **Eocortex** server.

In case of need to add new clips to list while the utility is already running, repeat step 2 and restart the utility. If the utility works as **Windows** service, just open its main window. The numbering of channels created from new clips will continue taking into account the channels already available in the utility.

Streaming web camera

In order to use a webcam (built-in or external) connected to a computer, follow these steps:

[Install the Eocortex Virtual IP Camera](#) utility to a computer.

Make sure that the web camera is connected to the computer, configured and turned on. Check that the camera image is available using the operating system tools or proprietary software that came with the webcam.

Run the **Eocortex Virtual IP Camera**.

In the main window, find a channel with the web camera name in the channel list menu to make sure that the camera is detected and recognized by the utility.

Run the **Eocortex Configurator** application and [configure the connection](#) of the desired **Eocortex Virtual IP Camera** utility channel to the **Eocortex** server.

In case of need to add streams from new web cameras to list while the utility is already running, repeat step 2 and restart the utility. If the utility works as **Windows** service, just open its main window. The numbering of channels created from new clips will continue taking into account the channels already available in the utility.

To make checking the video in the main window of the utility more convenient, enable the **Preview** option to display the video in the preview window.

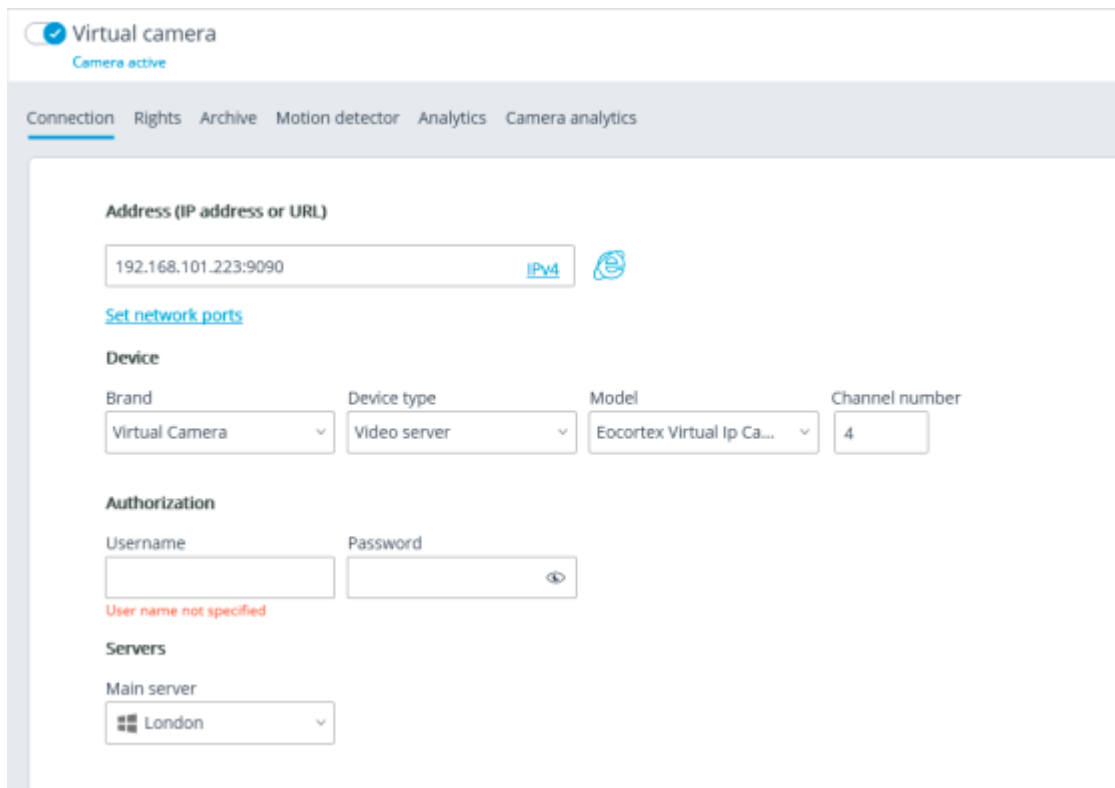
By default, the utility runs as an application, and therefore it is necessary to keep the main window open throughout the entire time it is used. If the utility is to be used for a long period of time, it is recommended to enable the **Start service** option to change the utility's operation mode. When this option is enabled, **Eocortex Virtual IP Camera** will be launched as a **Windows** service, which will allow the main window of the utility to be closed after the settings are completed without shutting down the utility.

Receiving streams in Eocortex server

To receive the stream [transmitted by the Eocortex Virtual IP Camera](#) utility in the **Eocortex** Server, follow the steps below:

1. Run the [Eocortex Configurator](#) application and switch to the  [Cameras](#) section.

2. [Add a camera](#) and switch to the [Connection](#) tab.
3. In the **Address** field, set the IP address or domain name of the computer on which the **Eocortex Virtual IP Camera** utility is running.
4. In the **Brand** menu, select the **Virtual Camera** item.
5. In the **Device type** menu, select the **Video server** item.
6. In the **Model** menu, select the **Eocortex Virtual IP Camera** item.
7. In the **Channel number** field, set the number under which the selected channel exists in the **Eocortex Virtual IP Camera** utility.



The screenshot shows the 'Virtual camera' configuration page with the 'Connection' tab selected. The page title is 'Virtual camera' with a status indicator 'Camera active'. The navigation menu includes 'Connection', 'Rights', 'Archive', 'Motion detector', 'Analytics', and 'Camera analytics'. The main configuration area contains the following sections:

- Address (IP address or URL)**: A text input field containing '192.168.101.223:9090' with an 'IPv4' icon and a globe icon to its right.
- Set network ports**: A link below the address field.
- Device**: A section with four dropdown menus: 'Brand' (Virtual Camera), 'Device type' (Video server), 'Model' (Eocortex Virtual Ip Ca...), and 'Channel number' (4).
- Authorization**: A section with 'Username' and 'Password' input fields. A red error message 'User name not specified' is displayed below the Username field.
- Servers**: A section with a 'Main server' dropdown menu set to 'London'.

8. In the **Video streams** section, set the settings according to the number of streams and their codecs of the received channel.

Video streams

Main Additional 1

Format: H264 Eocortex Client Mobile and web clients

Format: MJPEG Eocortex Client Mobile and web clients

Additional 2 Additional 3

Format: H264 Eocortex Client Mobile and web clients

Format: H264 Eocortex Client Mobile and web clients

Stream for video analytics: Additional 1

Stream for recording to archive: Additional 1

Continuously receive all streams from camera ⓘ

9. In the **Additional** section, enable the **Connect via server** option.

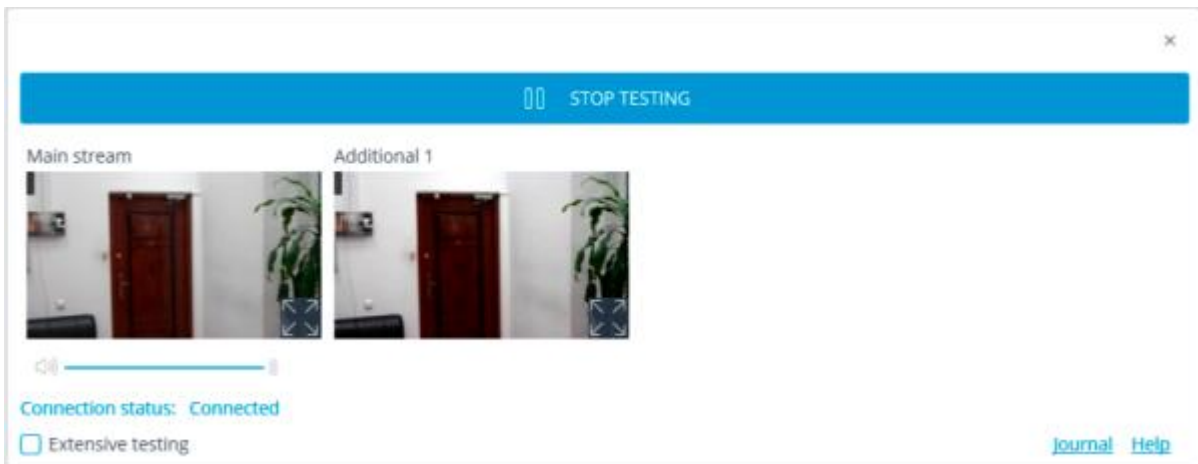
Additional

Sound reception PTZ capabilities

Alarm inputs/outputs

Narrow bandwidth camera Connection via server

After setting the connection settings, test the connection with the utility by clicking the **Test camera** button. If all settings are correct and connection is successful, the video from the selected channel will be displayed in the preview window.



If necessary, configure other processing parameters for this channel on the corresponding tabs.

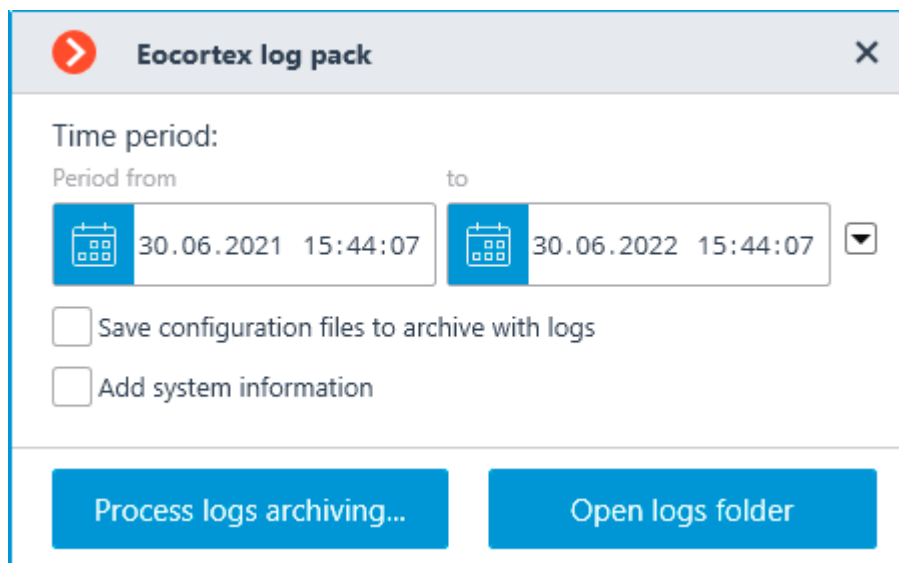
Reception of video streams by the **Eocortex** server will start only after [applying the settings](#).

System log files

In order to speed up the solution of any issue, it is recommended to send requests to the technical support team along with the system log files. To collect and prepare the log files, use the **Pack logs** utility and follow the steps below.

Run the **Pack logs** shortcut in the Eocortex application folder of the **Start** menu.

In the window that opens, set the time interval for which the log files must be collected. To add system configuration files or basic system information to the archive with logs, enable the corresponding options.



Clicking the **Process logs archiving...** button will create a zip file with packed logs, configuration files and system information. But before that, a dialog box will open asking to specify the location where to save the generated file.

Clicking the **Open logs folder** will open the folder in **Windows Explorer** where **Eocortex** logs are stored.

In order to collect logs of a specific **Eocortex** application, the **Pack logs** tool must be run exactly on the computer where the application is installed.

Eocortex API, SDK and REST API

Eocortex provides open and free-to-use **API**, **SDK**, and **REST API**, which allows third-party developers to expand the functionality of **Eocortex**, as well as provide one-way or two-way communications between **Eocortex** applications and third-party software.

Eocortex API

Eocortex API is the basic set of application programming interfaces provided by **Eocortex** that allows to build one- or two-way interactions between **Eocortex** applications and third-party applications. **Eocortex API** supports and uses various types of requests and responses: HTTP, RTSP, XML, JSON. **Eocortex API** allows external applications to interact with the **Eocortex** Server or Client to perform the following tasks, such as:

Receiving live view and archive recordings of cameras connected to the system.

Receiving various information from the **Eocortex** Server, including system configuration and entries of Events log.

Sending various commands for execution by **Eocortex** Server or Client.

Eocortex SDK

Eocortex SDK is the set of materials useful in development of external plugins and modules for expanding the existing functionality of **Eocortex** applications. This development kit is intended for .NET developers and contains the list of core classes and interfaces, as well as several code samples that demonstrate the implementation of external plugins. All source files are written in C#. It is recommended to use **Microsoft Visual Studio** as a plugin development environment.

Eocortex REST API

Eocortex REST API is the set of advanced application programming interfaces provided by **Eocortex** that allows to build a deeper interaction with **Eocortex** than **Eocortex API**.

Eocortex REST API allows to:

Configure cameras, users, groups, views, automation scenarios and some intelligent modules.

View the information about statuses and current configuration of servers and cameras.

View the list of integrated cameras supported in the system.

Manage databases of intelligent modules: add, modify, delete groups and entries for faces and license plates.

Eocortex REST API can be used for system configuration without the need to use **Eocortex Configurator** and **Eocortex Client** applications.

The **configure/** set of commands is available only for **Eocortex** systems with **Enterprise** and **ULTRA** licenses. Only the user with the highest level of access rights, i.e., belonging to the Senior administrators group, can configure the system using **Eocortex REST API**.

The **api/** set of commands available for all users and for all types of **Eocortex** licenses.

Detailed descriptions for **Eocortex API, SDK and REST API** are available at the website eocortex.com, on the [Support / Documentation](#) page.

Eocortex Software Development Kit (plugin samples written in C#) can be downloaded at the [Download](#) page of the eocortex.com website. Specific plugin samples can be provided by request. **Eocortex SDK** is not required to use **Eocortex APIs** resources.

Typical use cases

Shelf Fullness Check: Example of usage

One of the reasons for lost profits in retail is the untimely display of goods on the shelves. According to a number of studies, the total loss from the lack of goods on the shelves can reach up to 4% of the store's turnover. The **Eocortex** company has developed the **Shelf Fullness Check** module to promptly notify shop assistants about empty shelves in stores. An example of using this module is described below.

Solution overview

There is a supermarket with a high turnover due to the high flow of visitors. The task is to reduce losses from untimely display of goods on the shelves in the sales area.

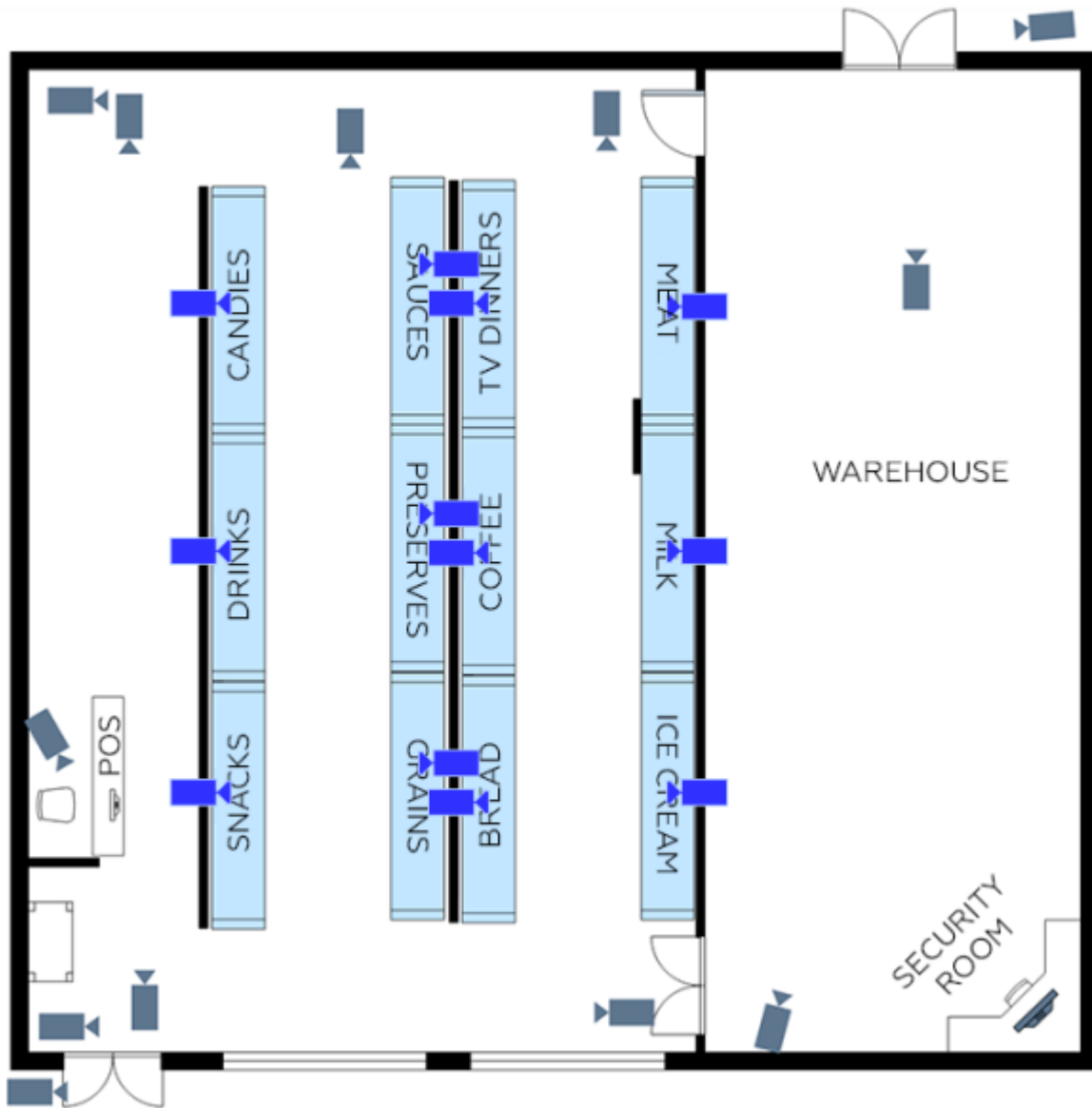
To solve this task, a video surveillance system built on IP cameras and **Eocortex** software will be used. Moreover, this system will also be used to ensure the security of the supermarket, prevent theft and suppress staff abuses.

Below is the map of the supermarket. The cameras that monitor the fullness of the shelves are highlighted in blue.

The number of cameras that monitor the fullness of the shelves is based on the number of controlled shelves and their positions, the room configuration, the expected parameters of the cameras, and also taking into account [restrictions, requirements and recommendations of the module](#). As a result, 10 cameras were obtained, each of which monitors the status of 10 shelves, for a total of 100 shelves.

To ensure the security of the supermarket and prevent theft, 11 more cameras will be used around the perimeter. Another camera with sound recording function will be placed above the point of sale.

Monitoring of the general situation at the facility is carried out by displaying streams from the cameras on the computer screen located at the guard post.



Shelf fullness control is organized as follows:

The merchandiser responsible for filling the shelves is equipped with a smartphone or tablet with the **Eocortex** mobile application installed.

The **Eocortex** server, having detected a shelf fullness level lower than the specified value, sends a push notification to the merchandiser's device indicating which shelf needs to be filled.

The merchandiser, having received a notification, picks up the corresponding goods in the warehouse and fills the shelf. In addition, he can first open the corresponding camera in the **Eocortex** mobile application to confirm the status of the shelf and take notes or check the plan for laying out goods on the shelves in a third-party application, if one is installed on the device.

Sales area administrators and other authorized supermarket staff can monitor the overall situation, the state of the shelves, and generate reports on empty shelves for various periods using the **Eocortex Client** application installed on their computers and laptops.

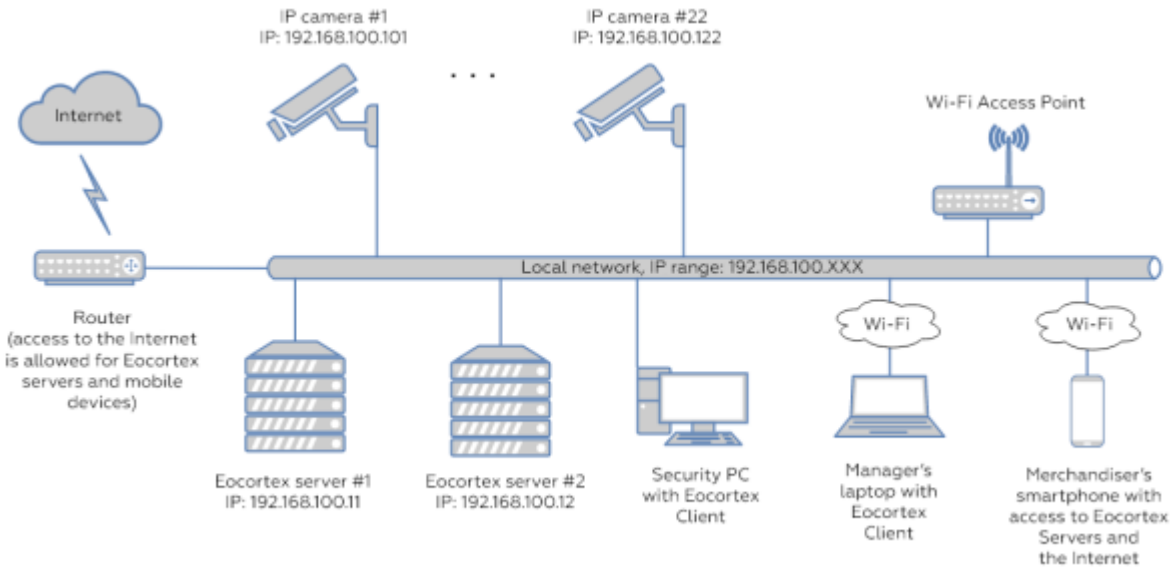
Deploying a video surveillance system

The [Software for IP Cameras / Calculator](#) was used to calculate servers and client computers, as well as to estimate the required network bandwidth. All calculations were performed with the following camera parameters: two H.264 streams with a resolution of 2 megapixels (Main) and 0.3 megapixels (Additional 1); for the Shelf Fullness Check module, the frame rate is 10 fps and analysis

on the Main stream; for other cameras, the frame rate is 25 fps and analysis on the Additional 1 stream.

Based on the calculations, a video surveillance system will be deployed with two **Eocortex** video servers, on which the **Eocortex LS** license is installed: on the first one will be 17 licenses to work with IP cameras, 1 license for sound reception feature and 5 licenses for **Shelf Fullness Check for 4-10 shelves** module; On the second one – 5 licenses for IP cameras and 5 licenses for **Shelf Fullness Check for 4-10 shelves** module.

Below is a map of the system network topology.



When installing and configuring cameras, follow the [module requirements and recommendations](#).

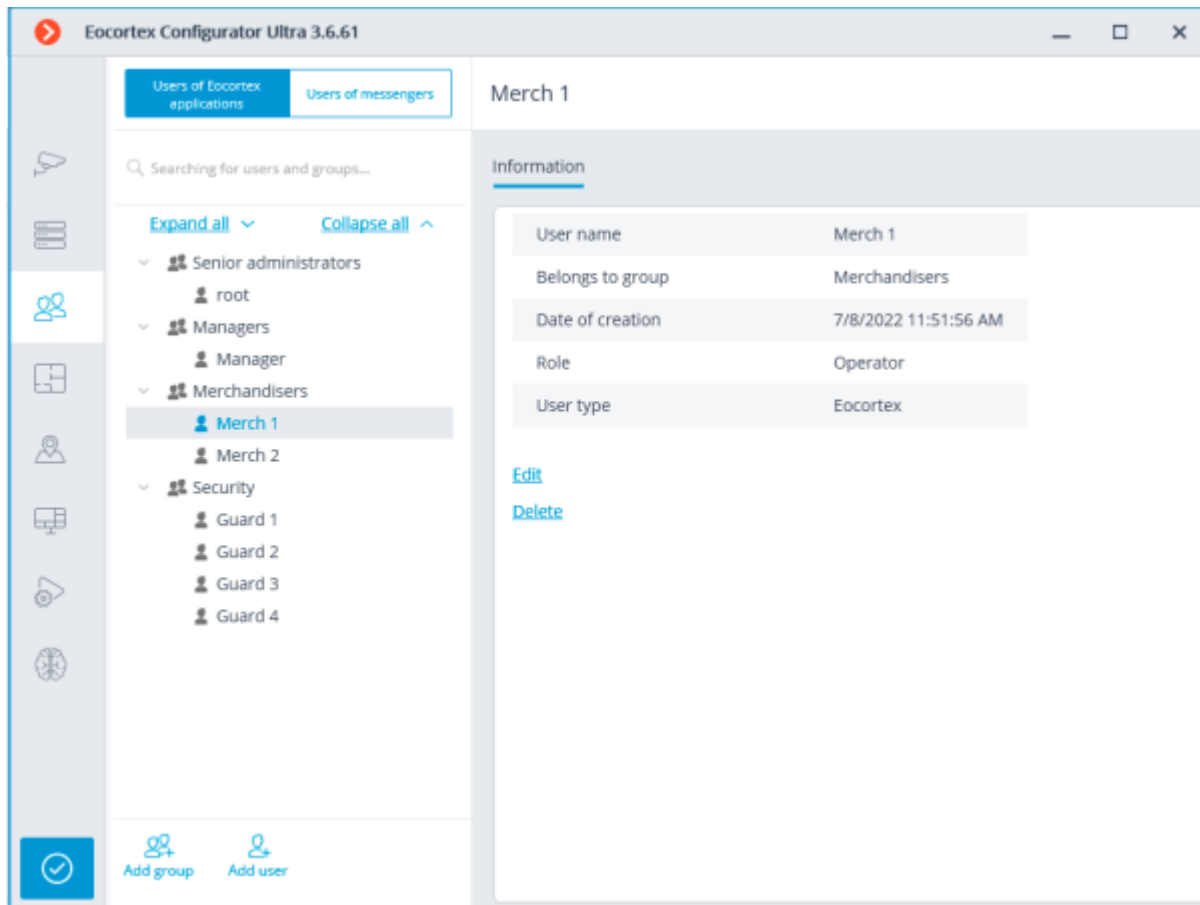
When deploying video surveillance servers, prepare the [hardware](#) and [operating system](#) first, then [install the Eocortex Server service, followed by license activation](#).

[Install the Eocortex Client application](#) on the computers of managers and security guards, and mobile applications (for [Android](#) or [iOS](#)) on smartphones and tablets.

Configuring a video surveillance system

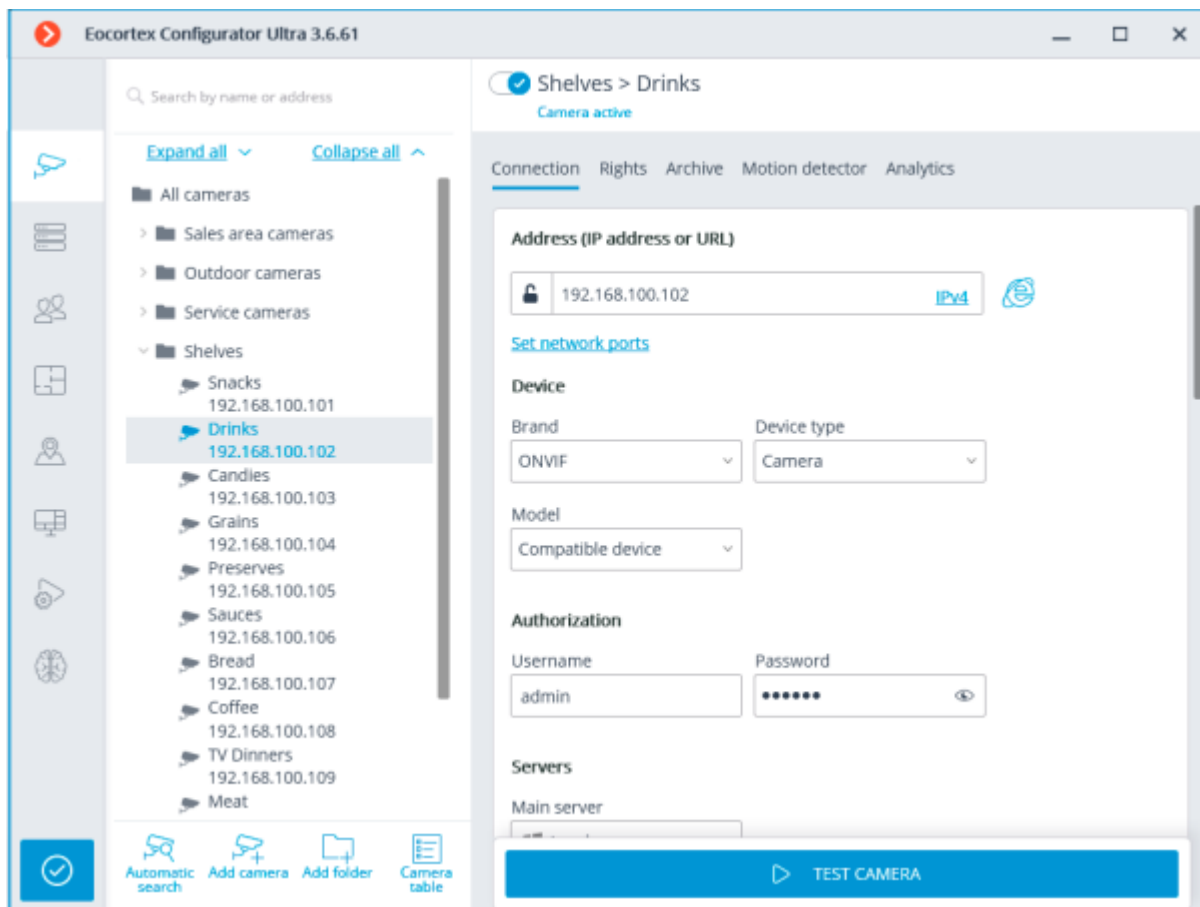
After deploying and activating the license of both servers, [combine them into a single system and configure them](#).

Next, [set up user rights](#) for system users: create the appropriate user groups (Administrators, Managers, Merchandisers, Guards, etc.), assign permissions to groups and add users.





Then [connect and configure the cameras](#), having previously created groups of cameras: Sales area, Outdoor, Service, Shelves.

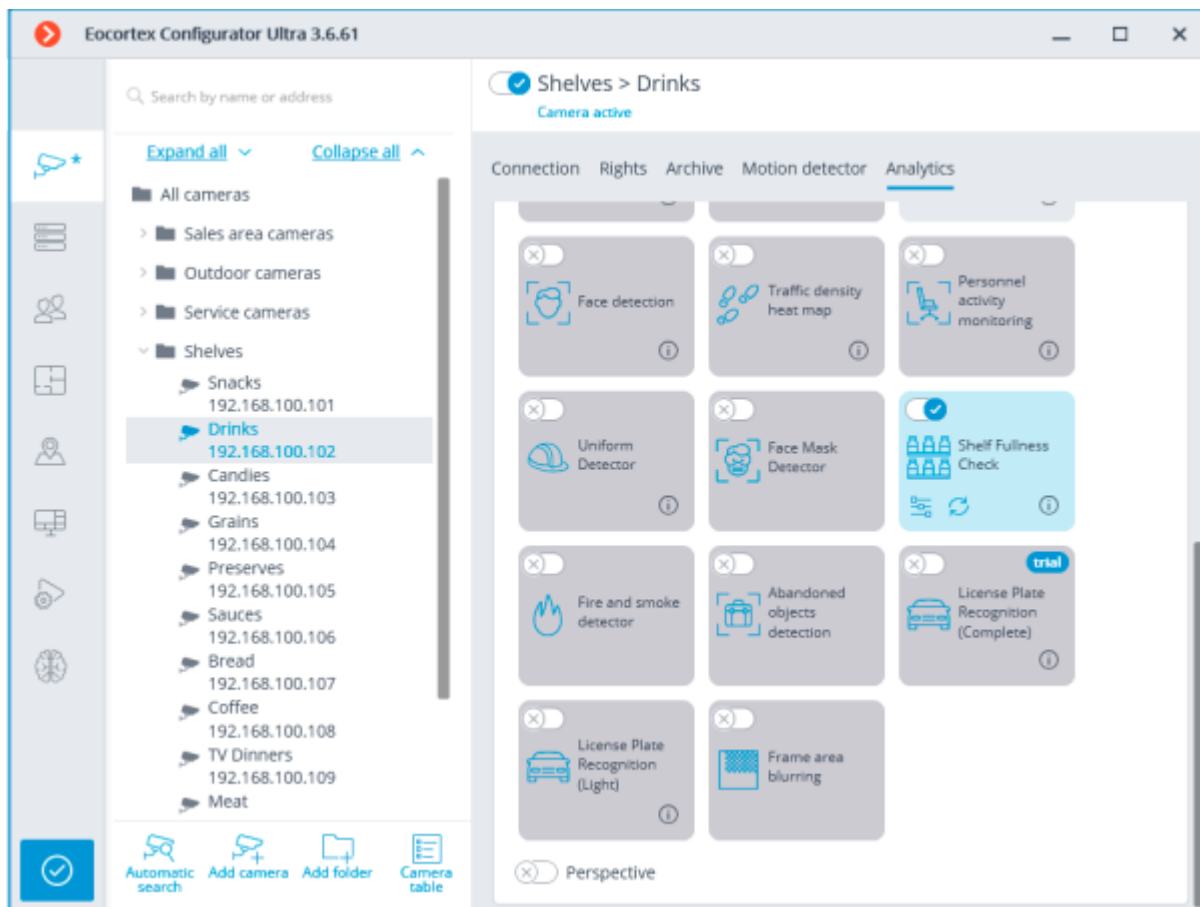
To make adding cameras with similar settings more convenient, it is recommended to add and configure one camera, then right-click it and in the context menu that opens, select **Create new camera based on the highlighted one** or **Create a group of cameras based on the selected one**: in this case, all settings of the original camera will be copied.



For cameras intended to monitor the fullness of the shelves, after completing all general camera settings (connection, archive, software motion detector), enable and configure the **Shelf Fullness Check** module. Below is an example of module configuration.

Configuring video analytics

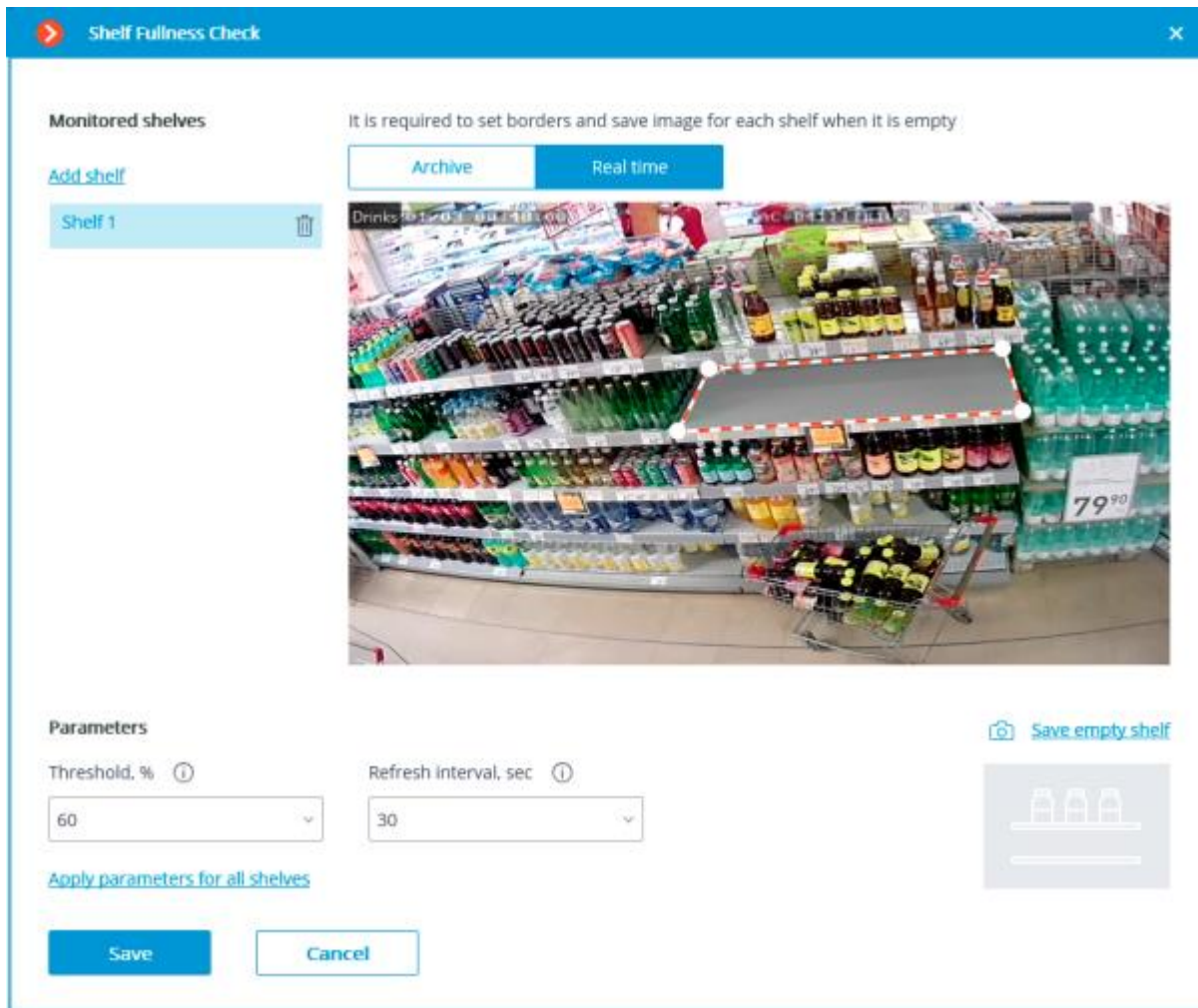
The settings of the **Shelf Fullness Check** module for the camera are carried out on the [Cameras](#) page of the **Eocortex Configurator** application. To configure the module, after adding a camera to the system, configuring its connection to the server and enabling software motion detector, switch to the **Analytics** tab, enable the module using the  switch and open the module settings window using the  button.



In the module settings window, add the shelves (no more than 10) and set their contours.

Nodal points of the shelf borders are dragged with the mouse. To add a new point, left-click on the borderline. To remove an existing point, right-click on it.

The contour of the shelf must be defined in such a way as to exactly cover the controlled area to be filled.



For each shelf, use the **Save empty shelf** button to specify an image of an empty shelf. For these purposes, it may be more convenient to switch to the **Archive** tab and select the moment when the currently configured shelf was empty.

Set the **Threshold, %** and **Refresh interval, sec** for each shelf. If the same settings are used for all shelves, it will be more convenient to set these parameters after adding all the shelves by clicking the **Apply parameters for all shelves** link.

After completing the module settings for the camera, click **Save**.

Shelf Fullness Check

Monitored shelves

It is required to set borders and save image for each shelf when it is empty

Archive Real time

Drinks, 08.07.2022 17:09:23.542

Shelf	Fullness	Refresh Interval
Drinks Left 1	20%	60sec
Drinks Left 2	20%	15sec
Drinks Left 3	60%	30sec
Drinks Left 4	80%	10sec
Drinks Left 5	60%	5sec
Drinks Right 1	60%	60sec
Drinks Right 2	60%	60sec
Drinks Right 3	40%	30sec
Drinks Right 4	80%	30sec
Drinks Right 5	60%	30sec

Parameters

Threshold, %

Refresh interval, sec

[Apply parameters for all Shelves](#)

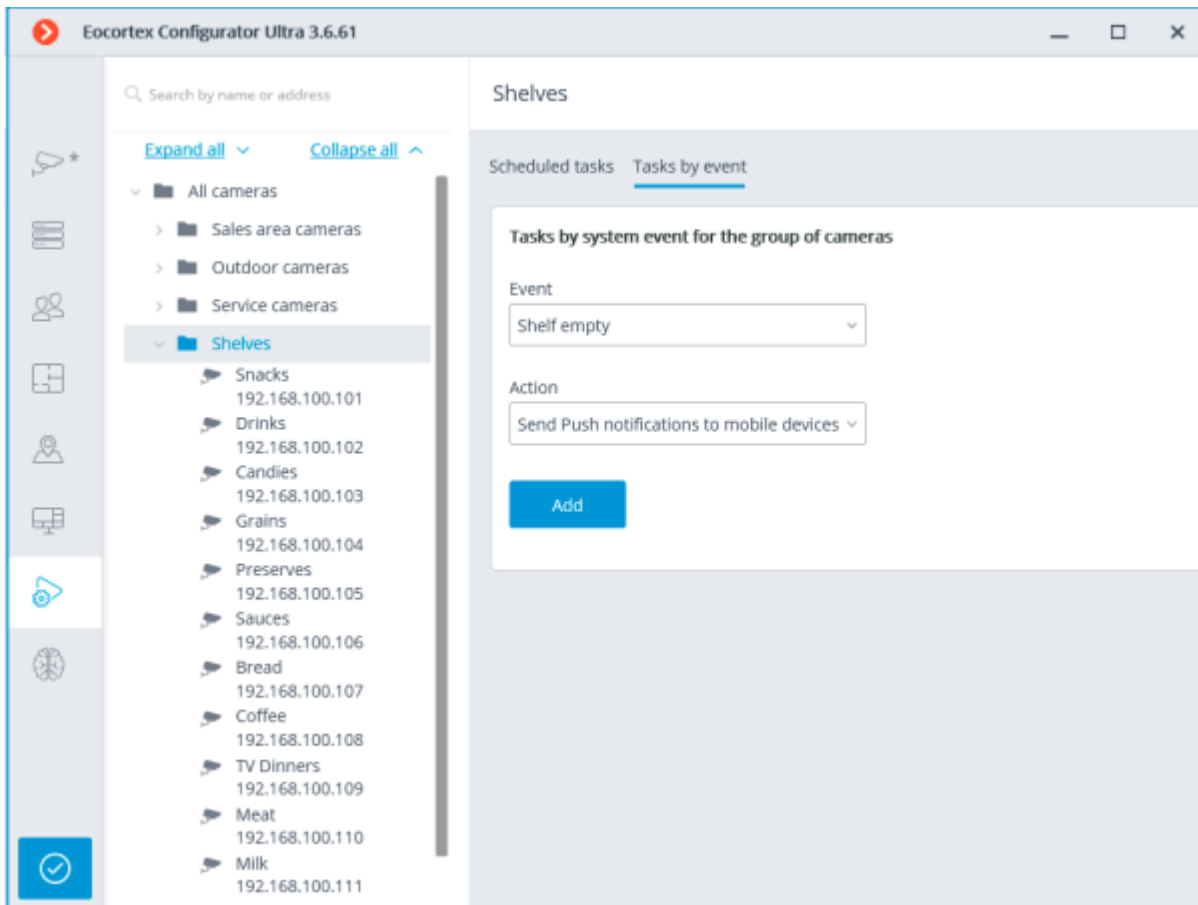
[Save empty shelf](#)

Save Cancel

The next step, after adding and configuring cameras, is to set up scenarios for sending Push notifications to users of mobile applications when the shelf fullness falls below a specified level.

To do this, go to the **Automation** tab, select the **Shelves** folder in the cameras tree, and then, on the opened page, go to the **Tasks by event** tab.

In the **Event** drop-down list, select **Shelf empty**, in the **Action** drop-down list — **Send Push notifications to mobile devices**, then click the **Apply** button.




On the **Actions** tab of the window that opens, set the appropriate text in the **Message text** field, taking into account that the message will automatically contain the name of the camera. In the **Recipients** drop-down list, mark the users that will be used for authorization in mobile applications and should receive notifications. After clicking the **Apply** button, all cameras in the group will have the same scenario: sending a push notification when the fullness level of the shelves monitored by this camera is below the allowable level.

Setting the action of sending Push notifications

Actions Runtime conditions (0)

Action settings ⓘ

Limits

Limit by start time 

Do not perform more often than once per seconds

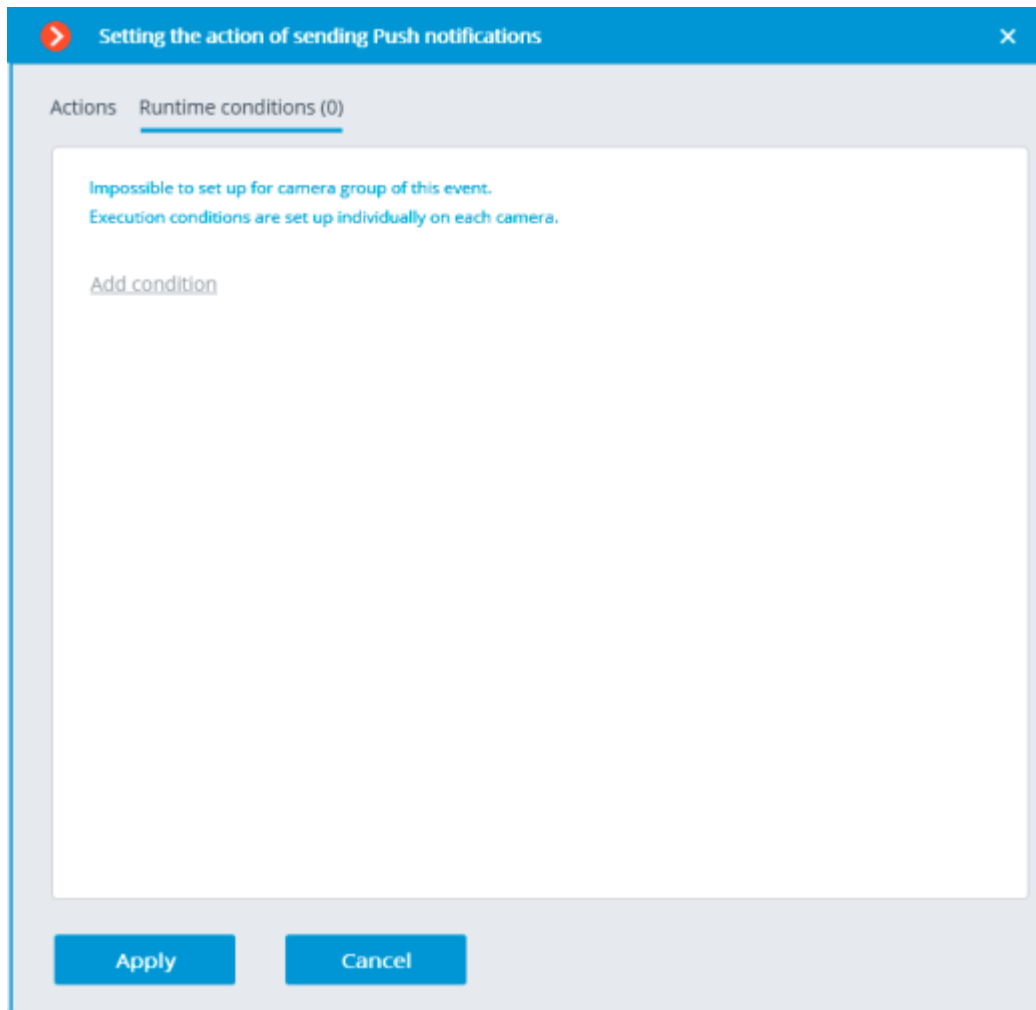
Special settings

Message text

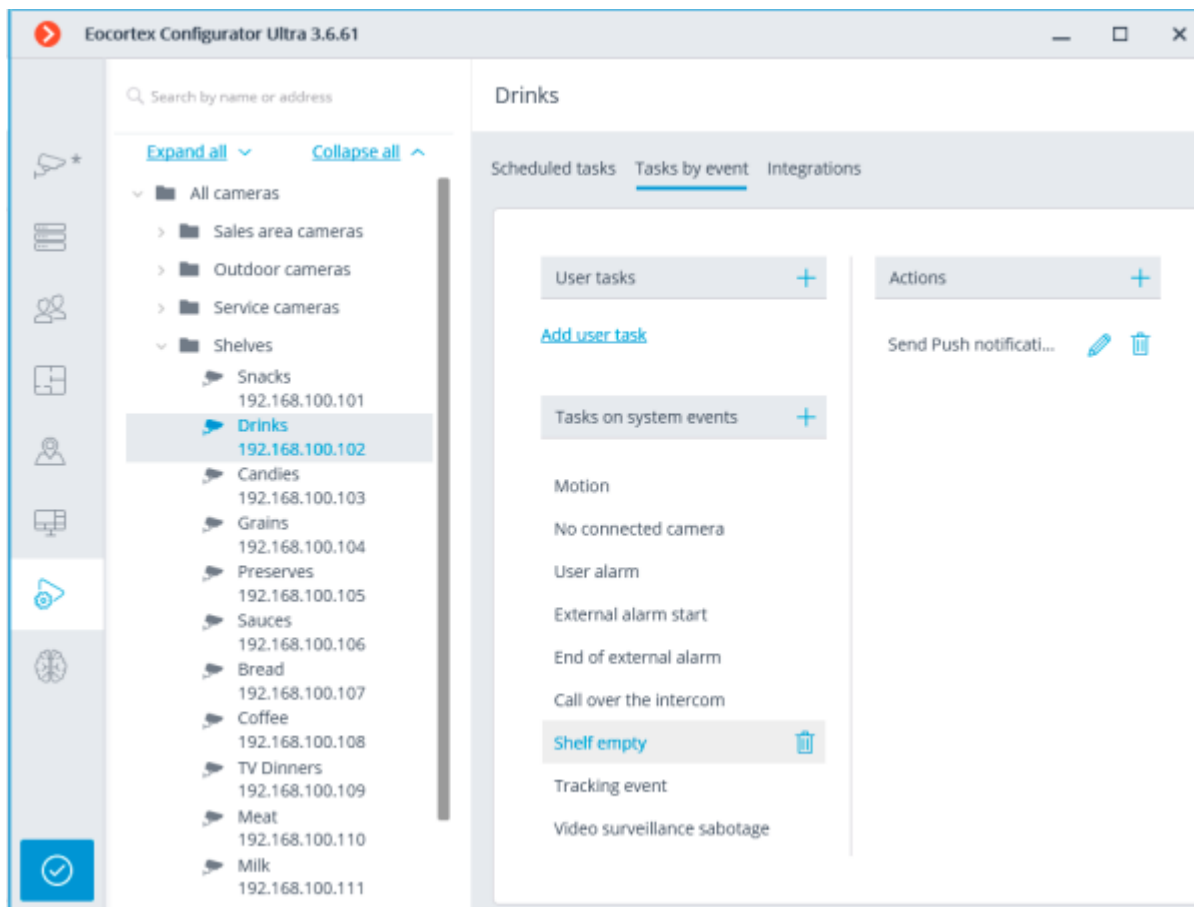
Recipients

- root
- Guard 1
- Guard 2
- Guard 3
- Guard 4
- Merch 1
- Merch 2
- Manager

When adding an action to a group of cameras, the ability to specify additional conditions for sending notifications is not available.



If it is necessary to indicate the names of shelves in messages, then additional conditions must be added for each shelf in the automation settings of each camera separately.



Setting the action of sending Push notifications

Actions Runtime conditions (0)

Action settings ⓘ

Limits

Limit by start time

Do not perform more often than once per seconds

Special settings


Message text

Recipients

- root
- Guard 1
- Guard 2
- Guard 3
- Guard 4
- Merch 1
- Merch 2
- Manager

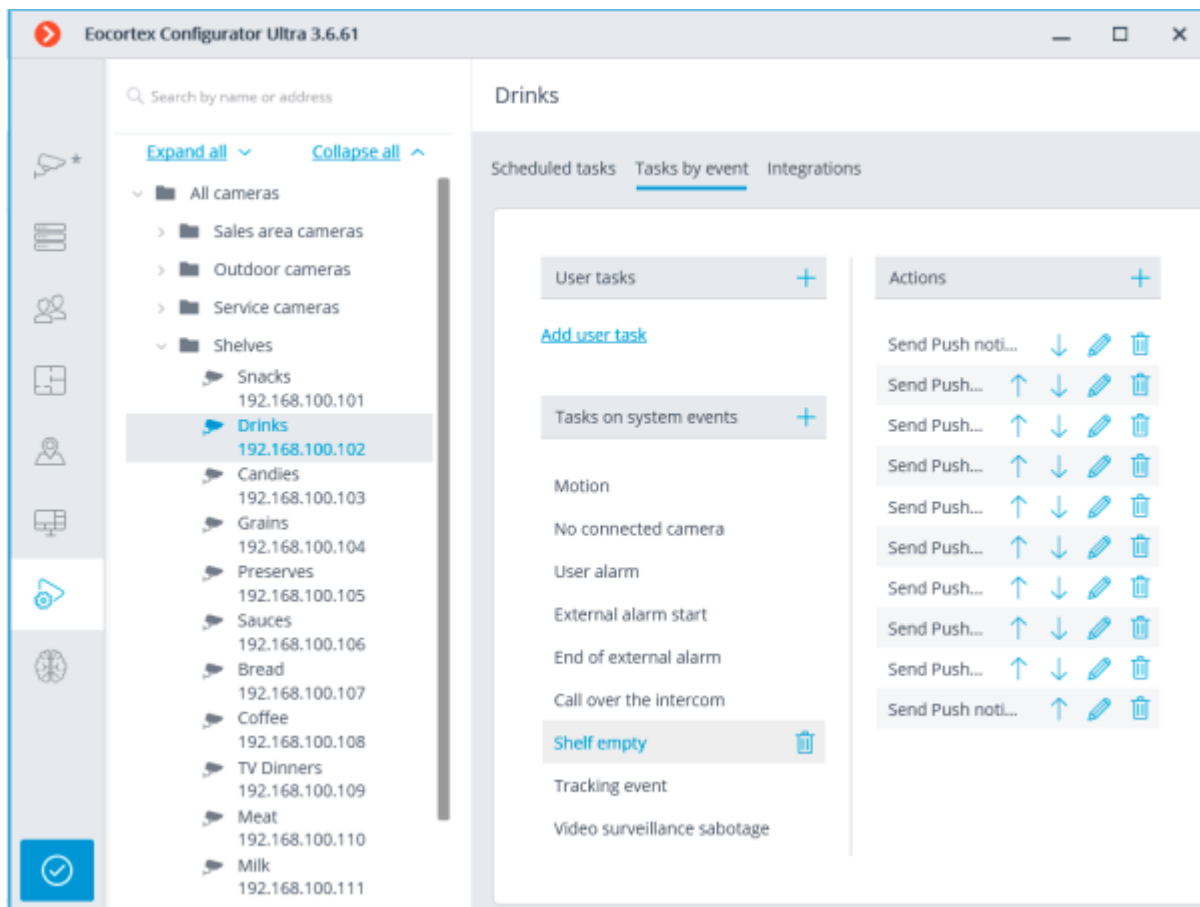
Setting the action of sending Push notifications ✕


Actions Runtime conditions (1)

Event attribute	Comparison	Value	
Zone	Equal	Drinks Right 2	

[Add condition](#)

Apply **Cancel**

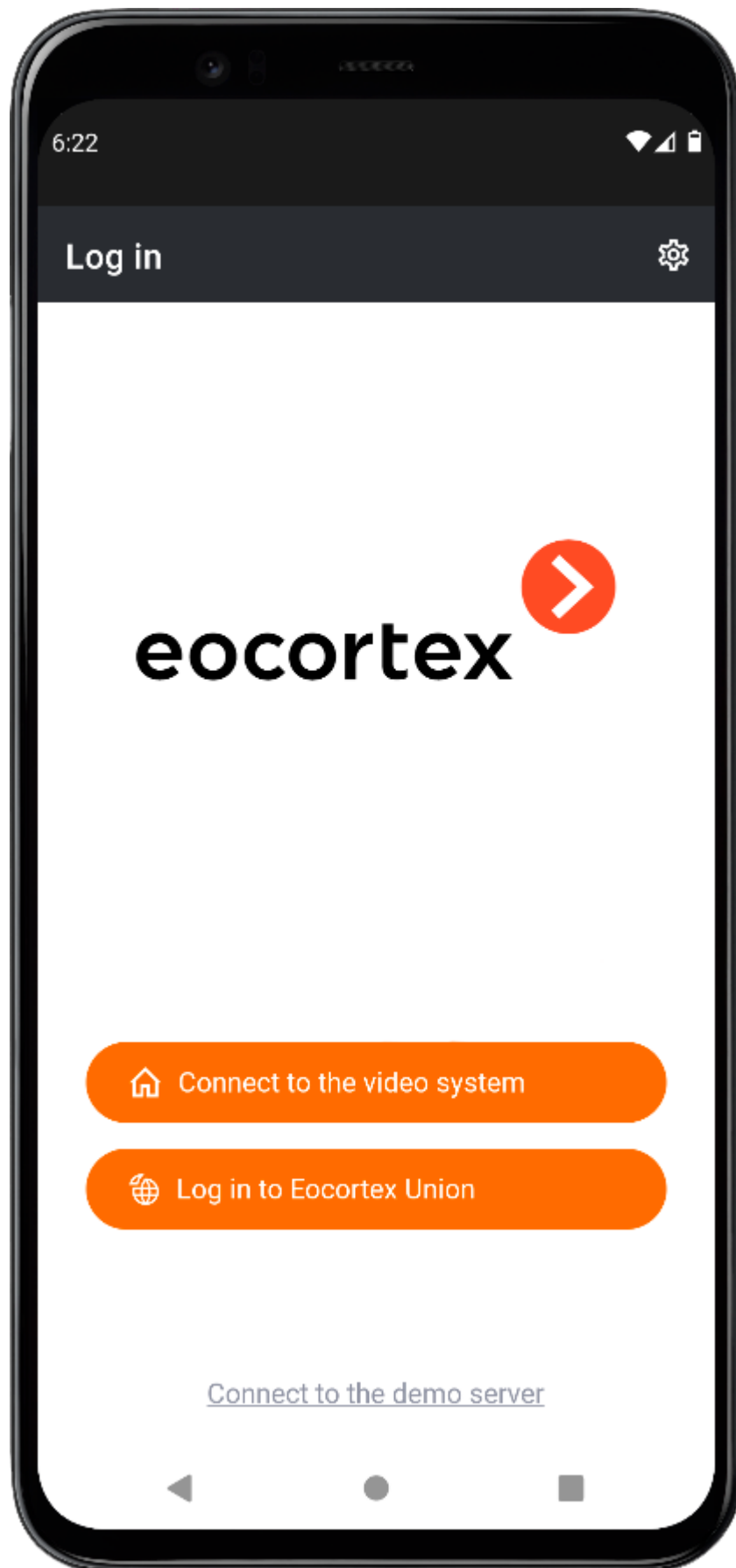


To confirm the settings changes, click the  **Apply** button.

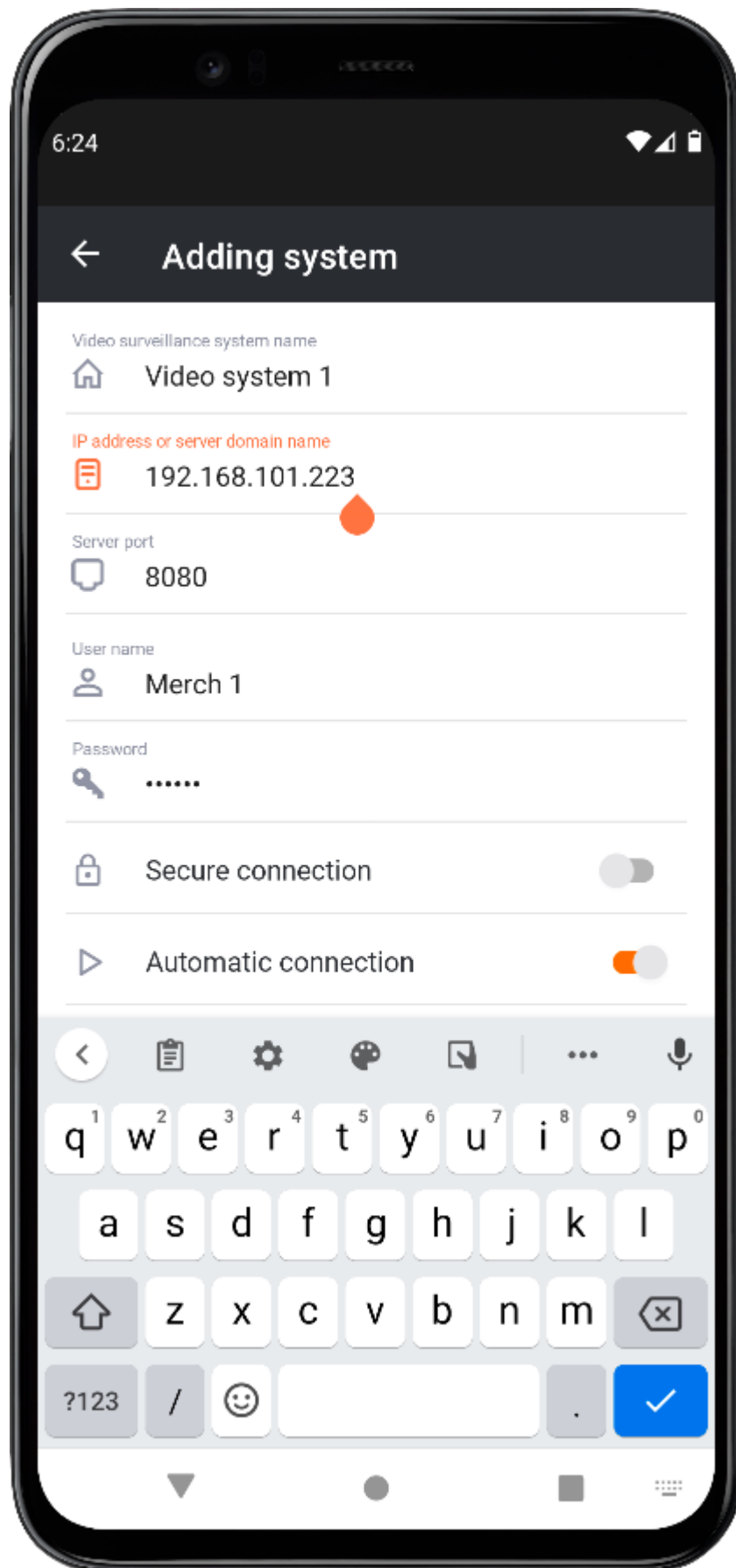
Using video analysis results

Using video analysis results

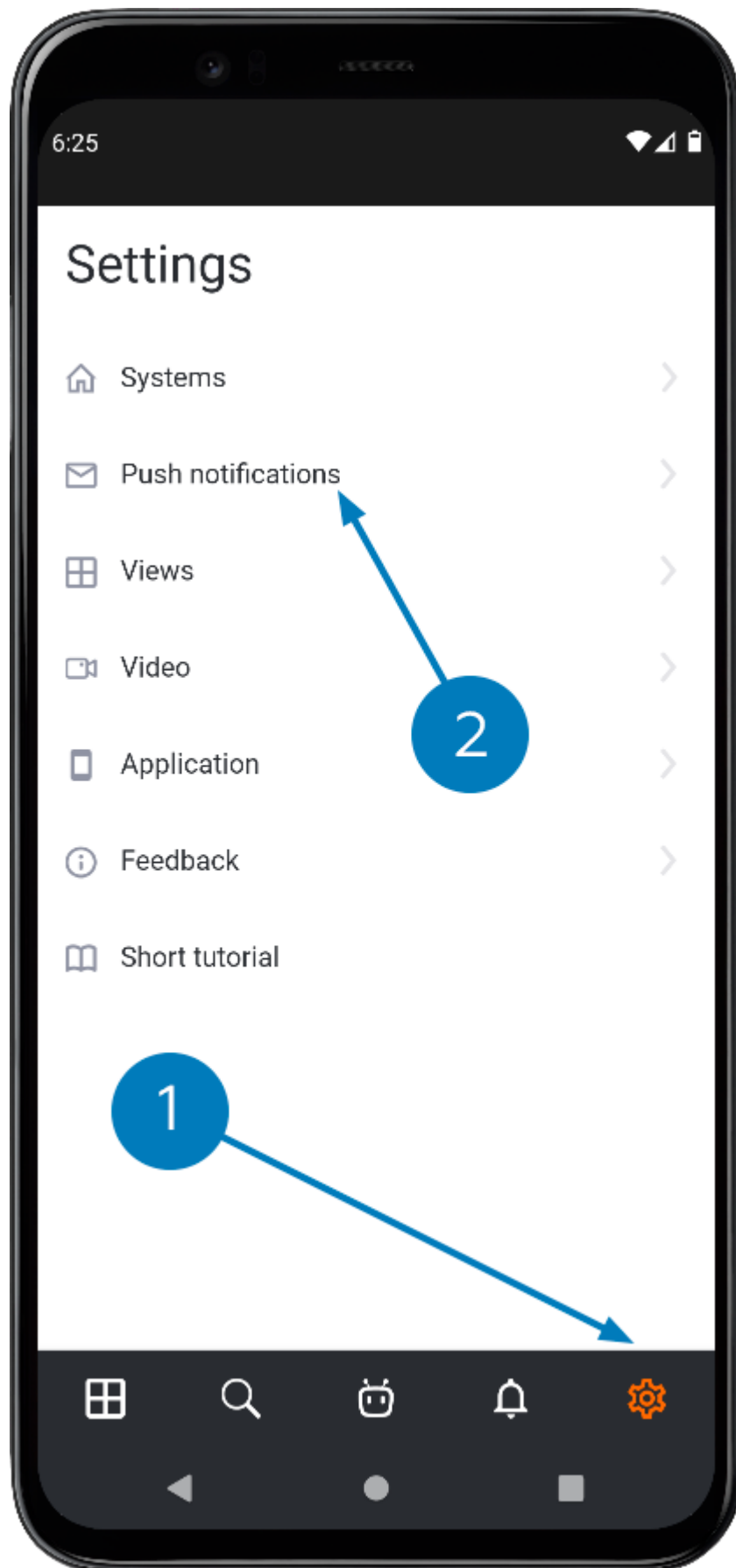
After installing the **Eocortex** mobile application on the device, connect it to the system with which it should work by tapping the **Connect to the video system**.



Specify the IP address of one of the servers in the system settings, enable the **Connect automatically** option, set the name and password of the user who should receive notifications about empty shelves. The System Name field may contain any name.

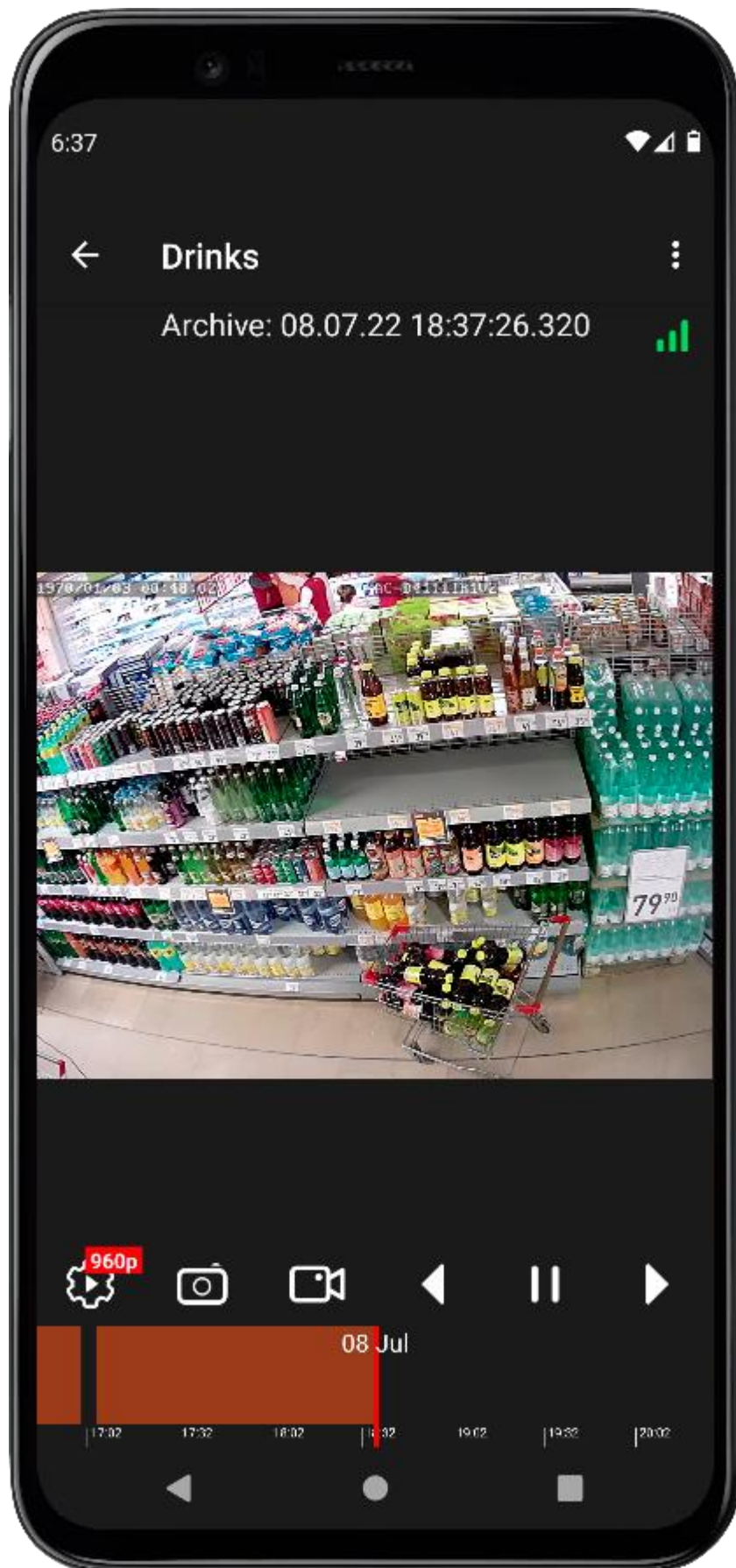


The function of receiving **Push notifications** is enabled by default, but you can check its status in the settings to be sure.

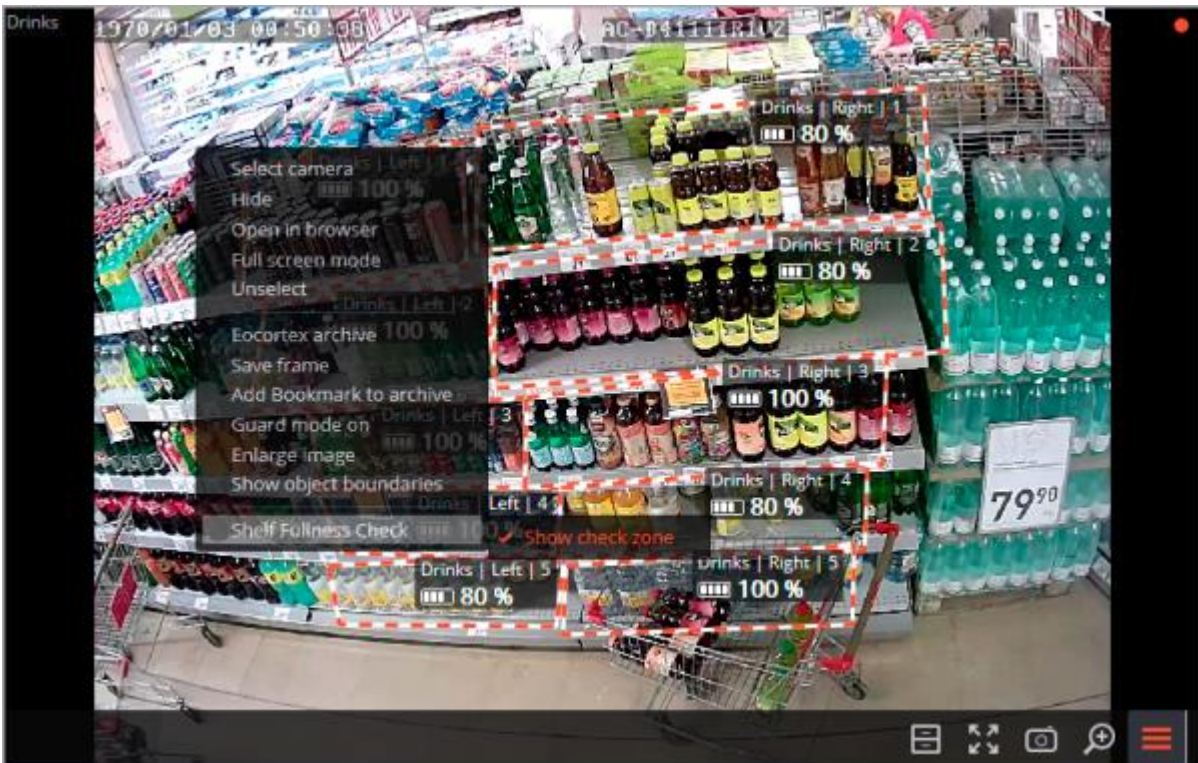


After connecting to the system for the first time, the device will be ready to receive notifications of empty shelves. Tapping the notification will open the camera with the related shelf on the screen.



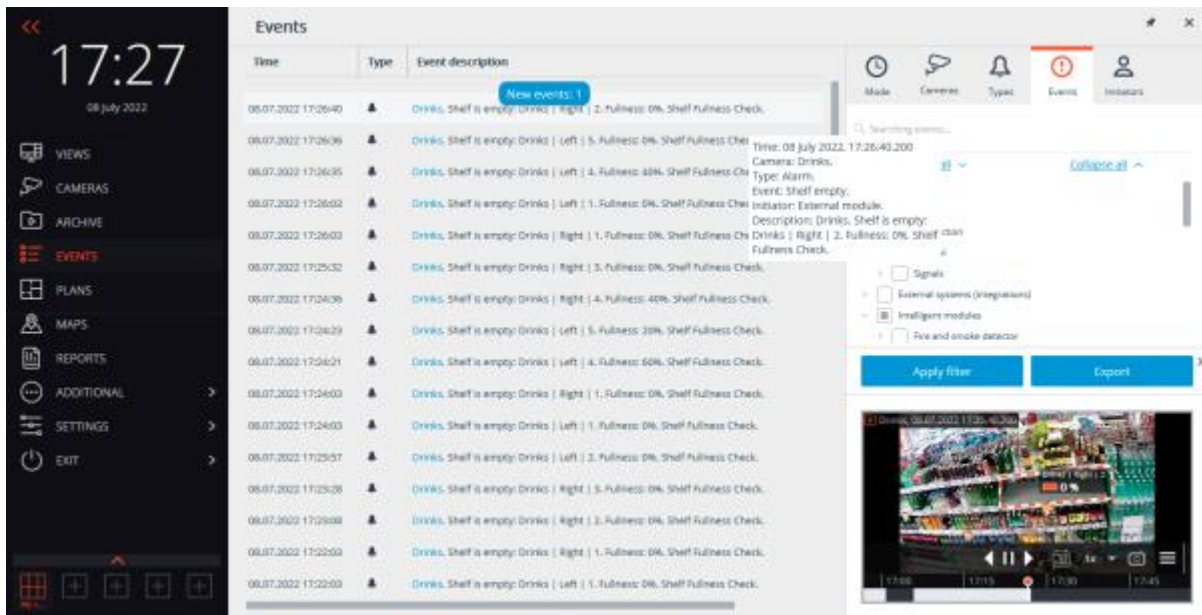


In the **Eocortex Client** application, displaying the contours of the shelves and their current fullness can be enabled. To do this, call the context menu in the camera cell and, in the **Shelf fullness** item, enable the **Display control zones** sub-item.

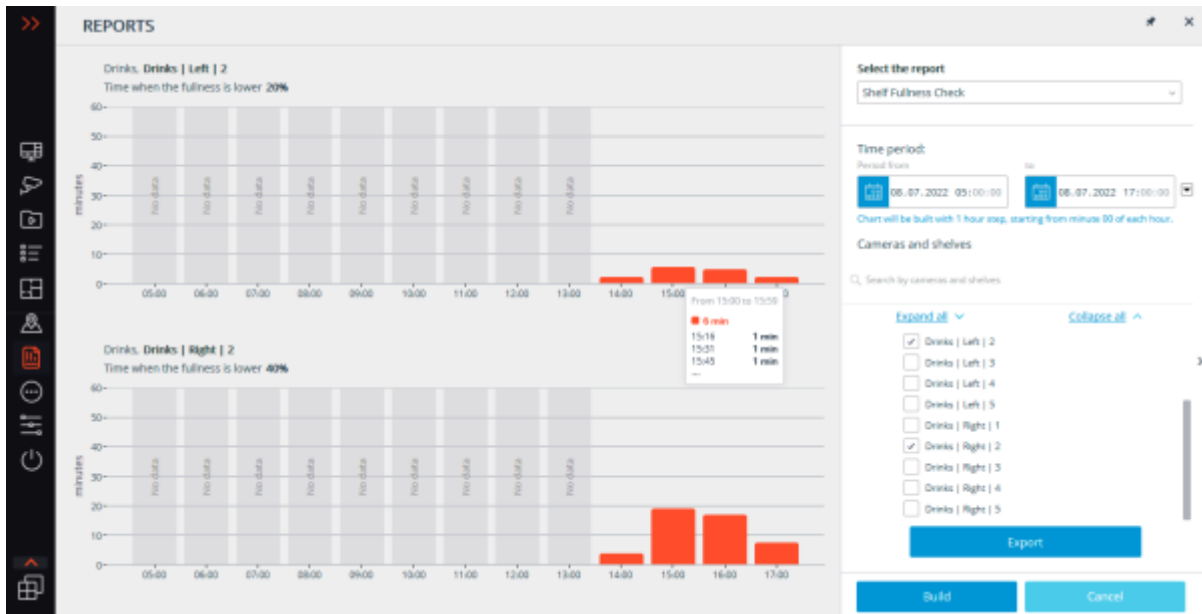


It is also possible to view the log of events related to the decrease in the filling level of the shelves below the allowable values.

Time	Type	Event description
08.07.2022 17:38:25	▲	Drinks, Shelf is empty: Drinks Left 5, Fullness: 20%, Shelf Fullness Check.
08.07.2022 17:38:27	▲	Drinks, Shelf is empty: Drinks Left 4, Fullness: 80%, Shelf Fullness Check.
08.07.2022 17:38:04	▲	Drinks, Shelf is empty: Drinks Right 1, Fullness: 0%, Shelf Fullness Check.
08.07.2022 17:38:04	▲	Drinks, Shelf is empty: Drinks Left 1, Fullness: 0%, Shelf Fullness Check.
08.07.2022 17:37:41	▲	Drinks, Shelf is empty: Drinks Right 4, Fullness: 40%, Shelf Fullness Check.
08.07.2022 17:37:35	▲	Drinks, Shelf is empty: Drinks Right 3, Fullness: 0%, Shelf Fullness Check.
08.07.2022 17:37:18	▲	Drinks, Shelf is empty: Drinks Left 2, Fullness: 0%, Shelf Fullness Check.
08.07.2022 17:37:15	▲	Drinks, Shelf is empty: Drinks Right 2, Fullness: 0%, Shelf Fullness Check.
08.07.2022 17:36:08	▲	Drinks, Shelf is empty: Drinks Left 4, Fullness: 60%, Shelf Fullness Check.
08.07.2022 17:36:08	▲	Drinks, Shelf is empty: Drinks Left 5, Fullness: 20%, Shelf Fullness Check.
08.07.2022 17:36:04	▲	Drinks, Shelf is empty: Drinks Left 1, Fullness: 0%, Shelf Fullness Check.
08.07.2022 17:36:04	▲	Drinks, Shelf is empty: Drinks Right 1, Fullness: 0%, Shelf Fullness Check.
08.07.2022 17:35:14	▲	Drinks, Shelf is empty: Drinks Right 4, Fullness: 20%, Shelf Fullness Check.
08.07.2022 17:35:11	▲	Drinks, Shelf is empty: Drinks Right 3, Fullness: 0%, Shelf Fullness Check.
08.07.2022 17:34:04	▲	Drinks, Shelf is empty: Drinks Right 1, Fullness: 0%, Shelf Fullness Check.
08.07.2022 17:34:04	▲	Drinks, Shelf is empty: Drinks Left 1, Fullness: 0%, Shelf Fullness Check.



In addition, it is possible to generate a report showing how long the shelf fullness level has been below the allowable value.



Webhooks: Saving event details to a file

It is possible to use the [Run external application on server](#) action to save event details to a text file.

Action settings

Actions Runtime conditions (0)

Description

Run external application on server

Limits

Limit by start time

Do not perform more often than once per seconds

Special settings

Path:

Application must be located in the Scripts subfolder

Arguments:

Apply **Cancel**

To do this, create a **bat file** with content similar to the one below:

```
echo %* >> events.txt
```

And state its location in the **Path** field with the required [variables](#) in the **Arguments** field. When the action is performed, the values of the specified variables will be written in string form to the **events.txt** file.

Check the [specifics of the Run external application on server action](#) before setting up tasks with it.

Related references

[Actions](#)

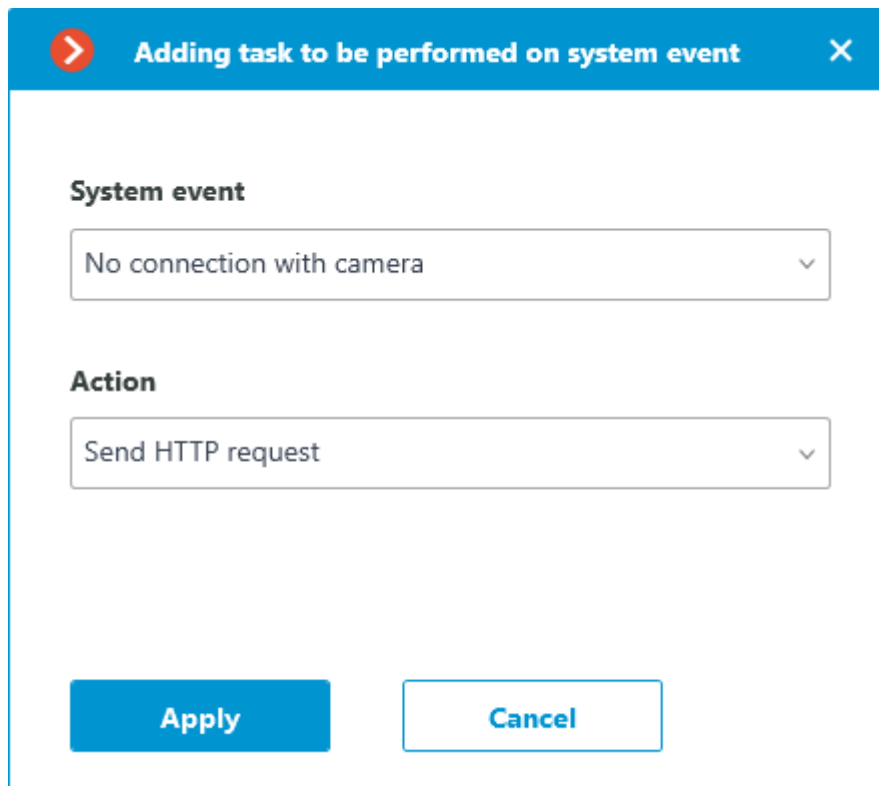
[Custom notifications and webhooks](#)

Webhooks: Creating a task in Jira when the camera connection is lost

Below is an example of automatic creation of a task in **Jira** task Tracking software in case of camera connection loss with sending details of the event.

Setting up HTTP query sending

1. Create a new task in the **Automation** section of the **Eocortex Configurator** application. Select the [Send HTTP request](#) action as a response to the **No connection with camera** event.



The screenshot shows a dialog box titled "Adding task to be performed on system event" with a close button (X) in the top right corner. Inside the dialog, there are two dropdown menus. The first is labeled "System event" and has "No connection with camera" selected. The second is labeled "Action" and has "Send HTTP request" selected. At the bottom of the dialog, there are two buttons: "Apply" (a solid blue button) and "Cancel" (a white button with a blue border).

2. Select the **POST** as the request method in the action settings.

Action settings

Actions Runtime conditions (0)

Description

One way ticket to Jira

Limits

Limit by start time

Do not perform more often than once per 5 seconds

Special settings

POST http://mycompany.atlassian.net/rest/api/2/issue

Status:

Authorization (Basic)

HTTP headers

Request body

Event in query body

Apply Cancel Test

3. Provide data for **Basic authentication**.

The Username field must contain the login of the Jira user. The Password field must contain the Jira API token. Details about creating such a token can be found in the [Creating a Jira API token for Basic Authentication](#) section.

Action settings

Actions Runtime conditions (0)

Limits

Limit by start time

Do not perform more often than once per seconds

Special settings

POST

Status:

Authorization (Basic)

Username Password

HTTP headers

Request body

Event in query body
 Custom text

4. Fill out the request body.

The request body is a JSON-formatted object composed according to the [Jira REST API](#). The action supports the use of [Template Variables](#), which are wrapped in double curly braces and which allow adding the necessary information from a system event to the message.

Action settings

Actions Runtime conditions (0)

Special settings

POST

Status:

Authorization (Basic)

Username Password

HTTP headers

Request body

Event in query body
 Custom text

Text **JSON** XML

```
"description": "{{ eventtime }} {{ cameraip }} Connection loss duration
{{ durationinseconds }} sec",
"issuetype":
{
    "name": "Task"
}
```

Request body sample:

```
{
  "fields":
  {
    "project":
    {
      "key": "PROJ"
    },
    "parent":
    {
      "key": "PROJ-6594"
    },
    "summary": "Connection is lost with the camera: {{ cameraname }}",
    "description": "{{ eventtime }} {{ cameraip }} Connection loss duration {{
durationinseconds }} sec",
    "issuetype":
    {
      "name": "Task"
    },
  }
}
```

As a result of running the Action with the specified settings, a new ticket of the Task type will be created in the PROJ project with PROJ-6594 as the parent task.

Project and parent task names are listed for illustrative purposes and may be different in the real systems. Valid names must be specified in the relevant keys.

Creating a Jira API token for Basic Authentication

Go to the [Atlassian account](#) page and click the **Create API token** button.

Give an abstract name for the token and click **Create**.

Copy the generated token. For example, by clicking **Copy**.

Related references

[Actions](#)

[Custom notifications and webhooks](#)

Additional instructions

Generating SSL Certificate for Episode archive

Self-signed SSL certificates for the **Episode archive service** can be created with the [OpenSSL](#) application.

Install the OpenSSL v1.1.1n Light distribution package, which corresponds to the bitness of the operating system used.

Generation on Windows OS

The steps below are a sequence of commands that should be executed on the command line.

Step 1. Add the OpenSSL folder to the PATH environment variable.

For **Win64** OpenSSL v1.1.1s Light use:

```
path=%path%C:\Program Files\OpenSSL-Win64\bin\;
```

For **Win32** OpenSSL v1.1.1s Light use:

```
path=%path%C:\Program Files\OpenSSL-Win32\bin\;
```

Step 2. Create a directory that will contain the generated certificates. On the command line, navigate to the created directory.

Step 3. Create the root certificate private key file:

```
openssl genrsa -out *rootCertKeyName*.key 2048
```

Step 4. Create the root certificate:

```
openssl req -x509 -new -key *rootCertKeyName*.key -days 10000 -out *rootCertName*.cert
```

The command will prompt for the certificate details.

Step 5. Create the service private key:

```
openssl genrsa -out *serviceCertKeyName*.key 2048
```

Step 6. Create the Certificate Signing Request (CSR):

```
openssl req -new -key *serviceCertKeyName*.key -out *serviceCertRequestName*.csr
```

The command will prompt for the certificate details.
An important point is to fill in information about the **Common Name (e.g. server FQDN or YOUR name)** with the IP address of the service.

Step 7. Create the service certificate by signing the CSR with the root certificate:

```
openssl x509 -req -in *serviceCertRequestName*.csr -CA *rootCertName.crt -CAkey *rootCertKeyName*.key -CAcreateserial -out *serviceCertName*.crt -days 5000
```

Step 8. Export the certificate and private key into a single file:

```
openssl pkcs12 -export -out *serviceCertFileName*.pfx -inkey *serviceCertKeyName*.key -in *serviceCertName*.crt -certfile *rootCertName*.crt
```

Created **.pfx** files should be transferred to the server running the Episode archive service and [added to the Episode archive service configuration](#). The root certificate ***rootCertName*.crt** must be imported into the operating system on all servers that will work with the **Episode archive service**.

Generation on Linux OS

Step 1. Run a terminal.

Step 2. Create a directory that will contain the generated certificates. On the command line, navigate to the created directory.

Step 3. Create the root certificate private key file:

```
openssl genrsa -out *rootCertKeyName*.key 2048
```

Step 4. Create the root certificate:

```
openssl req -x509 -new -key *rootCertKeyName*.key -days 10000 -out *rootCertName*.crt
```

The command will prompt for the certificate details.

Step 5. Create the service private key:

```
openssl genrsa -out *serviceCertKeyName*.key 2048
```

Step 6. Create the Certificate Signing Request (CSR):

```
openssl req -new -key *serviceCertKeyName*.key -out *serviceCertRequestName*.csr
```

The command will prompt for the certificate details.
An important point is to fill in information about the **Common Name (e.g. server FQDN or YOUR name)** with the IP address of the service.

Step 7. Create the service certificate by signing the CSR with the root certificate:

```
openssl x509 -req -in *serviceCertRequestName*.csr -CA *rootCertName.crt -CAkey *rootCertKeyName*.key -CAcreateserial -out *serviceCertName*.crt -days 5000
```

Step 8. Export the certificate and private key into a single file.

```
openssl pkcs12 -export -out *serviceCertFileName*.pfx -inkey *serviceCertKeyName*.key -in *serviceCertName*.crt -certfile *rootCertName*.crt
```

To import into Ubuntu, Debian

Copy the root certificate to the certificates' directory:

```
sudo cp *rootCertName*.cert /usr/local/share/ca-certificates/*rootCertName*.cert
```

Update the certificates list:

```
sudo update-ca-certificates
```

To import into CentOS

Install the certificates vault package:

```
yum install ca-certificates
```

Allow vault dynamic configuration:

```
update-ca-trust force-enable
```

Copy the root certificate to the certificates' directory:

```
cp *rootCertName*.cert /etc/pki/ca-trust/source/anchors/
```

Update the certificates list:

```
update-ca-trust extract
```