



# Administrator's Guide

## Eocortex

### Version 2.8

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[eocortex.com](http://eocortex.com)

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# Video surveillance system summary

## What's new

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 [Licence 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.

## Secure Connections

To ensure proper data protection, **Eocortex** permits to use SSL/TLS security certificates for encrypting data being transferred between the system components.

It is possible to set secure connections using the SSL/TLS security certificates for the following:

- Connecting **Eocortex** server to IP cameras;
- Connecting **Eocortex Configurator** application to **Eocortex** server;
- Connecting **Eocortex Client**, **Eocortex Web-client**, **Mobile client for Android**, **Mobile client for iOS** client applications to **Eocortex** server.

At the same time, the insecure connection is used for the following connections:

- Data transfer between **Eocortex** servers in a multiserver system;
- Data transfer between **Eocortex** components and third-party systems, if the secure connection feature has not been implemented specifically during the process of integration with such systems;
- Multicasting of streaming video by **Eocortex** server for its use in **Eocortex Client** application.

Particularities of the secure connection of **Eocortex** server to cameras:

- Any SSL/TLS certificates are accepted, i.e. **Eocortex** does not check whether these certificates are trusted or not.
- The secure connection capability is available for the limited list of models. However, certain features may not be available when using secure connection with some models of cameras that support secure connection.

- The upgrade of **Eocortex** software to provide a capability of secure connection to certain camera models is performed per special request in accordance with the existing procedures.

Should the **Eocortex Configurator** application fail to establish the secure connection to the **Eocortex** servers, such servers will be marked as unavailable in the list of servers. A situation can also occur when in the course of adding a new server using the secure connection it is not possible to properly finalize the addition procedure. This issue may appear due to the inability of the server to launch using a secure port – it may be occupied by another application or made unavailable in the settings of the environment. In this case, it is required to free the corresponding port and ensure network access to it.

If the server's secure port is not available from the client application, the broadcasting from the cameras assigned to this server will stop, the archive of these cameras will not be played back, no reports on these cameras will be created in the client application, etc.

If the insecure connection to server is prohibited, the **Eocortex Client** and **Eocortex Web-client** applications connected to it will be automatically restarted using the secure connection. At the same time, the **Mobile client for Android** and **Mobile client for iOS** will not be restarted in this situation. The **Eocortex Configurator** application will not be restarted either (otherwise, the control over the server could be lost). When prohibiting the insecure connection to the server, such prohibition will become valid for all the 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 use a secure connection in a compulsory manner even in case of an attempt to establish an insecure connection.

The particularities of the SSL/TLS certificates being installed on the server are as follows:

- The confirmation of a certificate is required for each individual user of the operating system on each device that uses the certificate.
- The reliable (trusted) certificate is the one that is issued by a well-recognized (trusted) certification authority.
- For each secure connection to the server from the **Eocortex Web-client** application, the verification of reliability of the certificate used for the encryption of the session is performed in the web browser. If it is not possible to confirm the certificate's reliability, the user gets an insecure connection warning.
- In case that in the course of establishing a secure connection to server from the **Eocortex Configurator** and **Eocortex Client** applications it will be detected that the certificate being used is not a trusted one, the dialog box with a question regarding the trustworthiness of this certificate will appear. In this dialog box, the user will be able to forbid the connection or allow one-time or permanent use of the certificate. If the permission to use the certificate is permanent, the warning will not appear again.
- The verification of the certificate's authenticity is performed every time when a secure connection to server is established from the **Eocortex Configurator** and **Eocortex Client** applications. If the certificate is not trusted, the user will see a dialog box with the information about the certificate and with the possibility to reject the connection or confirm the use of the certificate. In case of the latter choice, the certificate will be considered trusted and its further confirmation will not be required. However, after the expiration of the certificate's validity period the confirmation to use it will be required for each new session.



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 particularities of the use of certificates in the **Eocortex Client** application are as follows:

- During the use of the **Eocortex Client** application in a multiserver system, the verification of the security certificate may be performed in the course of operation. At that, when the untrusted certificates are detected, the corresponding notifications are shown in the lower right corner of the screen, and the connection with the servers using such certificates is blocked until the user makes a corresponding decision.
- All the events of accepting the security certificates are registered in the event log of a video surveillance system.
- In case of using the **Eocortex Client** application in the multi-display mode, the notification regarding the insecure connection will appear on the main display only.
- It is possible to disable the verification of the security certificates for the **Eocortex Client** application using the special launch parameter.

Related references:

- [Secure connection using Eocortex Configurator application](#)
- [Secure connection to camera](#)
- [Prohibition of insecure connections to servers](#)
- [Installation of a security certificate](#)



# Installation and update of applications and licenses

## Guidelines for choosing and configuring hardware platform

You can calculate the minimum hardware platform requirements online on [eocortex.com](http://eocortex.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 **Eocortex 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.)

## Guidelines for Windows settings

The computer must use one of **Microsoft Windows** operating systems provided in specification:

- Windows 7 ServicePack 1
- Windows 8
- Windows 8.1
- Windows 10
- Windows Server 2008 R2 SP1

- Windows Server 2012
- Windows Server 2012 R2
- Windows Server 2016
- Windows Server Windows Embedded for Intel x86 and x64 with the full functionality of abovementioned Windows versions

It is recommended to install a 64-bit version of the operating system, since this version allows you to fully and effectively use the capabilities of modern hardware platforms.



Some intelligent modules are not designed to work in a 32-bit operating system or with 32-bit versions of **Eocortex** applications.

Before installing **Eocortex** applications, you must configure the operating system:

Install all Windows updates and then turn off Auto-update.

Select the appropriate server time zone, specify the exact time in this time zone.

Guidelines on Windows settings (for Windows 7):

Control Panel / Power Options: High Performance.

Control Panel / User Accounts / User Account Control Settings: Never notify.

Control Panel / Network / Web → Networking / Adapter Properties: Disable IPv6 (This recommendation for earlier versions.

We recommend disabling the firewall on your computer. If the security policy does not allow disabling the firewall, open a network port 8080 and — for camera connection — 80 (if RTSP video stream is used — open port 554.)




Some cameras can receive control commands and transmit video streams using other ports — in this case open the appropriate ports.

Installed anti-virus 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 anti-virus and firewall, as video stream checking requires significant computing resources.



Some anti-virus software (such as NOD32) blocks video streams even when disabled, since they "embed" their own components at the level of system drivers when installed. Thus, to ensure correct operation and performance we recommend removing anti-virus software from Eocortex video servers, if possible.

# Installing Eocortex software from a common installer

-  The most up-to-date version of **Eocortex** and its documentation can be downloaded at [eocortex.com](http://eocortex.com): The distribution packages can be found at [Support / Software Installation Packages Supported](#); the documentation can be downloaded at [Support / Documentation](#).

**Eocortex** applications are installed from a common installer (**EocortexMainCommon Installer.exe**). This installer allows installation of the following applications:


- **Eocortex Server** — 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** — 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** — 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.

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**).

-  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.

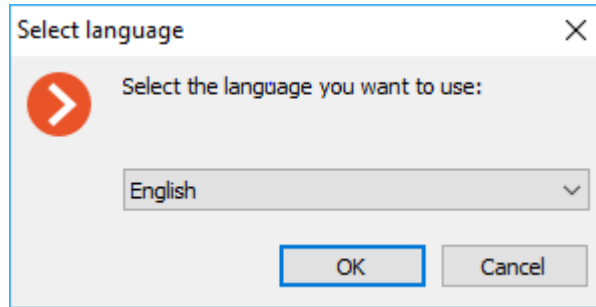
-  If you use a Eocortex USB-key, plug it into a server USB-port.



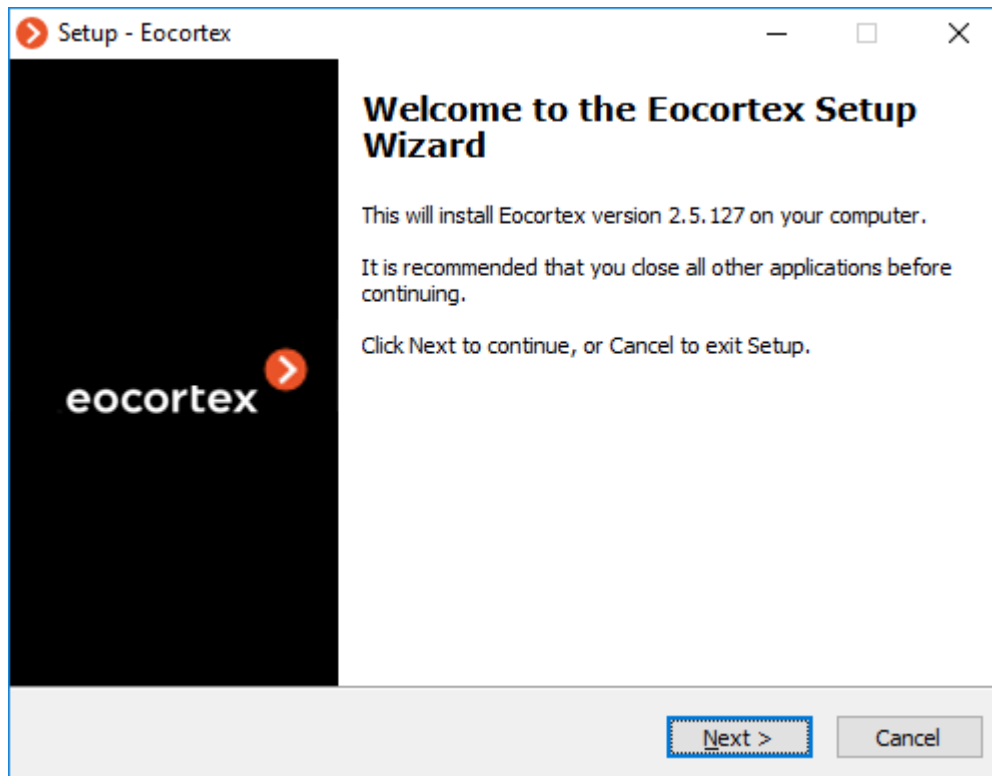
-  When using the multiserver configuration the version numbers of merged servers must match.

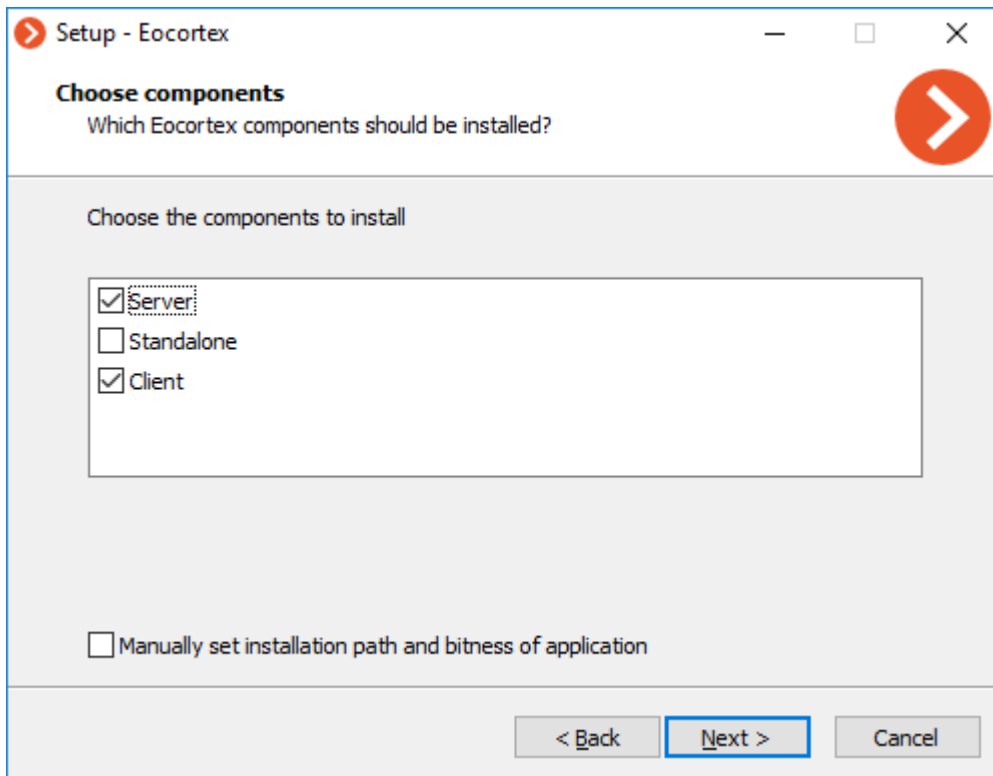
Close all Windows applications before installing **Eocortex** software; insert the disk with **Eocortex** software suite in a CD/DVD-ROM — an installation package should run automatically. If it does not or the installation package was downloaded via the Internet, run the **EocortexMainCommon Installer.exe** file located in the root directory of the package.

Select the installation language and click **OK**.

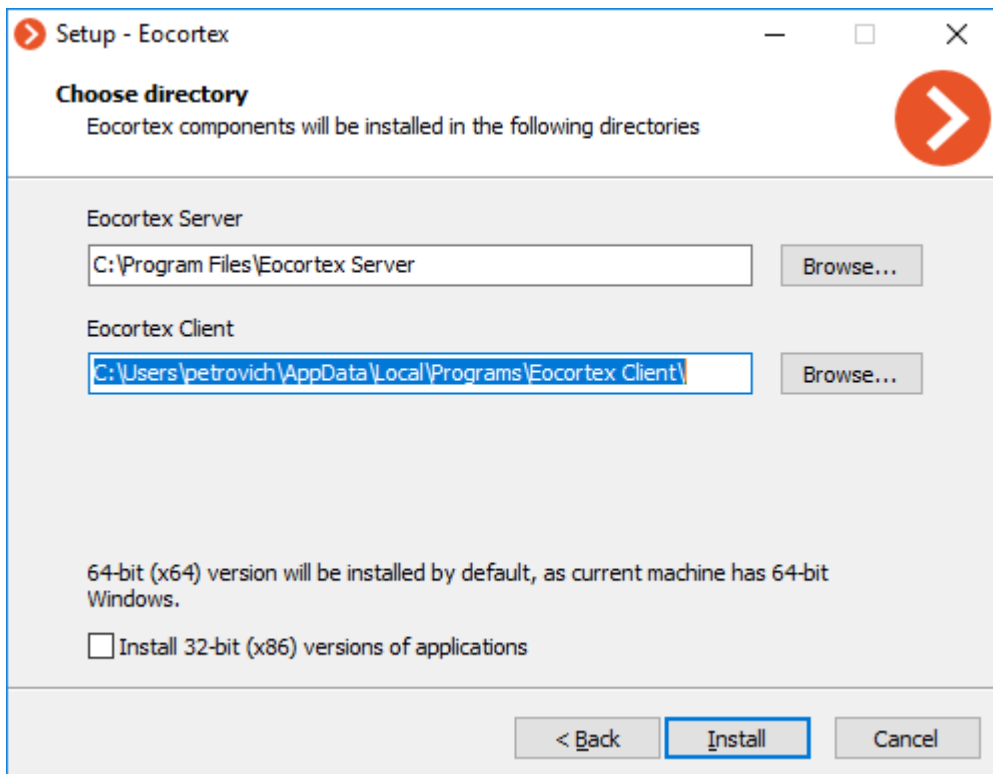


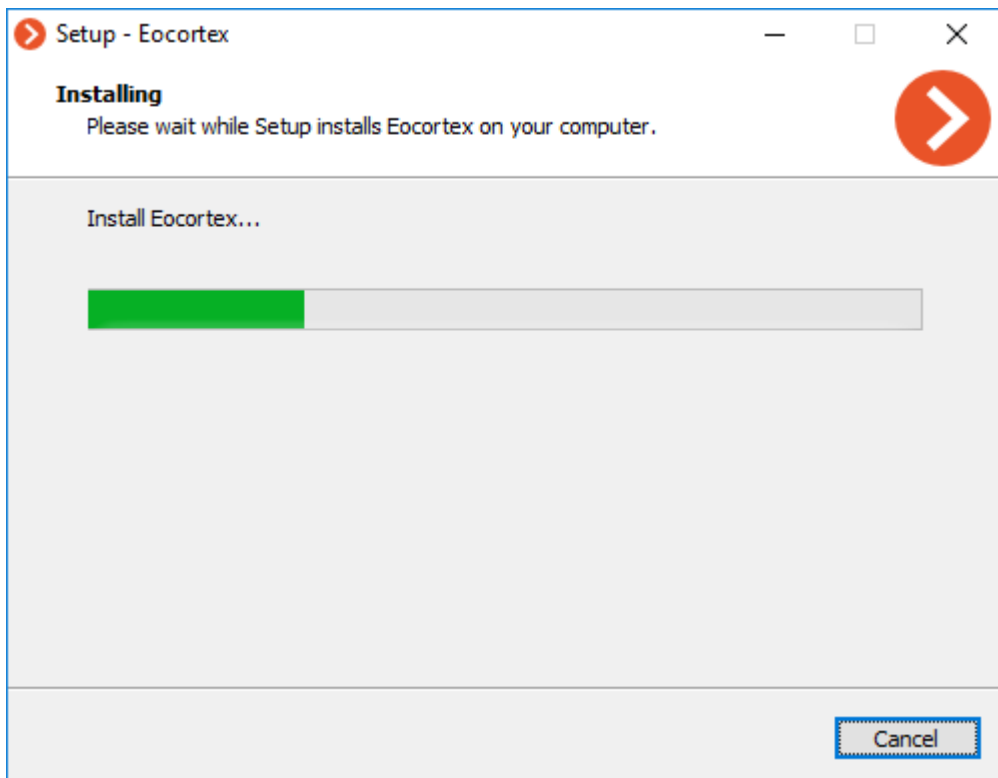
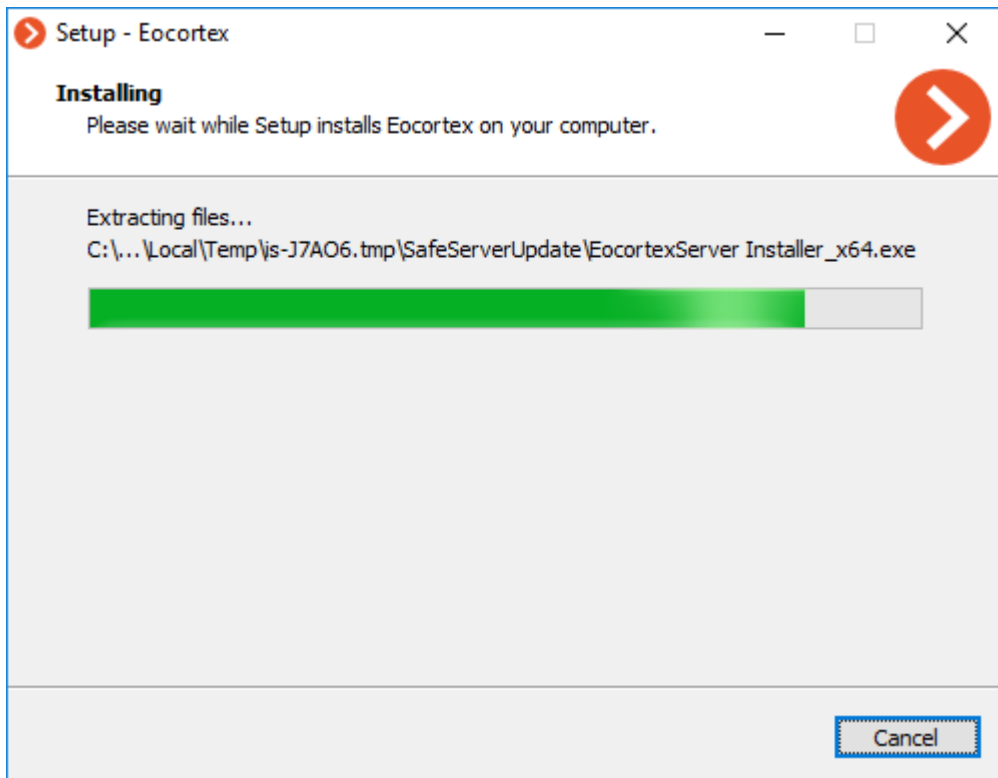
Setup wizard window will open. Follow the instructions:



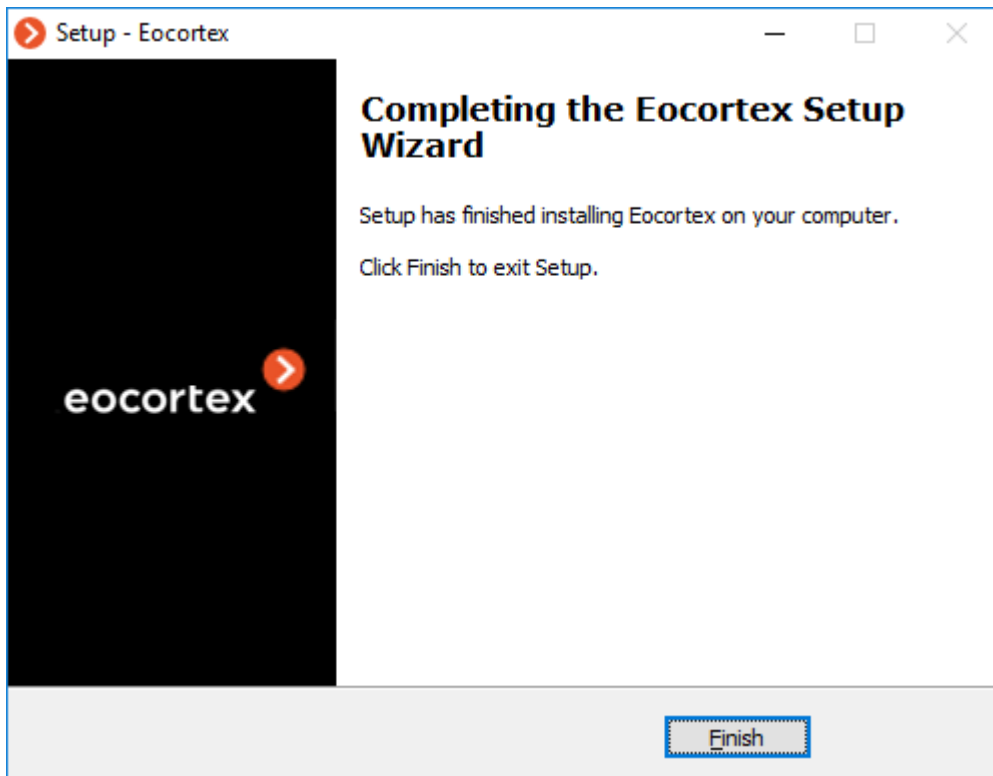


- ① Make the selection of application you want to install on the machine. Checking the option **Manually set installation path and bitness of application** will allow you to define absolute paths for each application and bit version that you may install.











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 (for **Eocortex Server**) or the **Eocortex Standalone** main window opens. When clicking the button Configure or Install the license, **Eocortex Configurator** application will be launched (after installation of the server application, you will be prompted to [Installing and updating the license](#)).


×

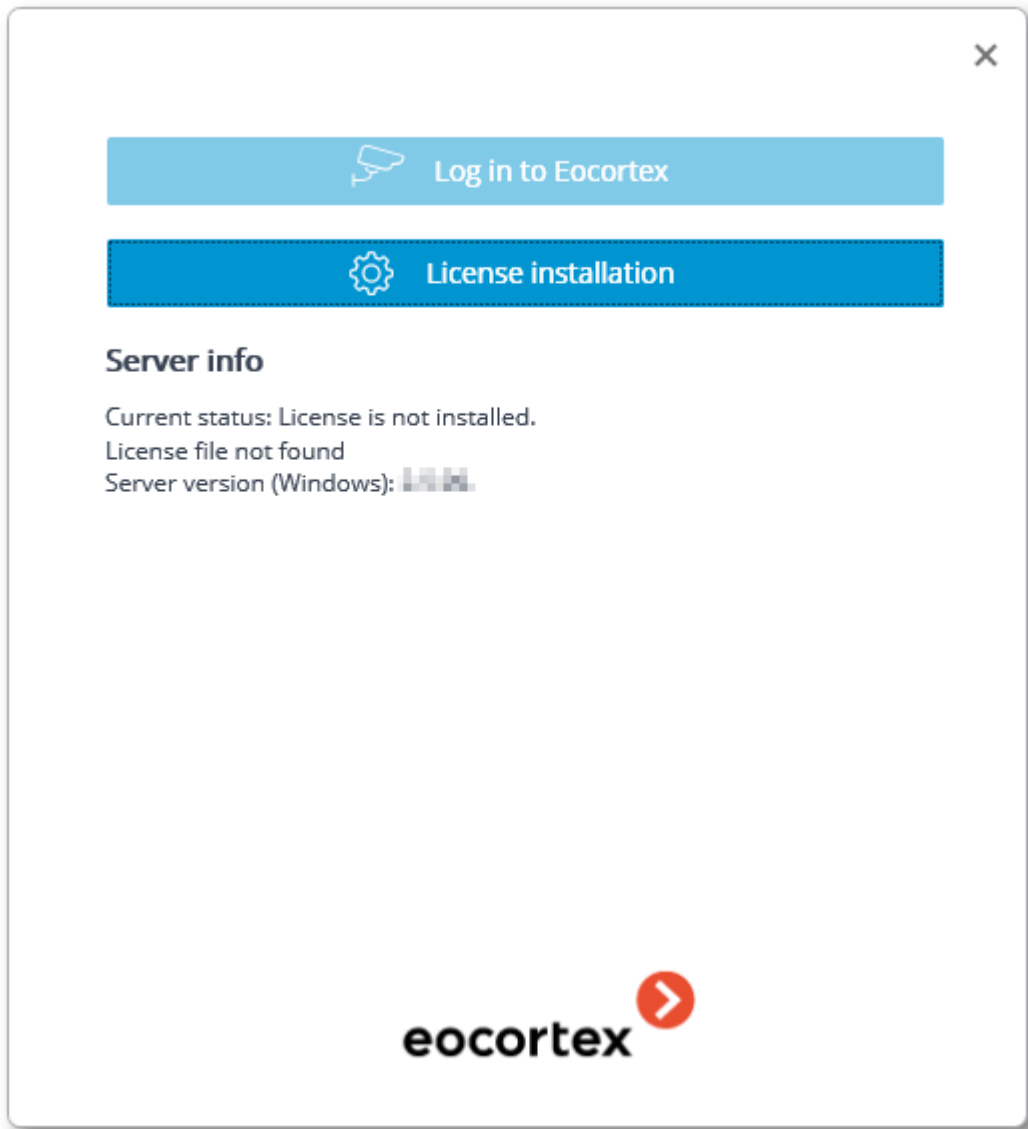
Stop

Install the license



**Server info**

Current status: License is not installed.  
Invalid product type (Eocortex/Eocortex Ultra)  
Server version (Windows): 2.5.99.



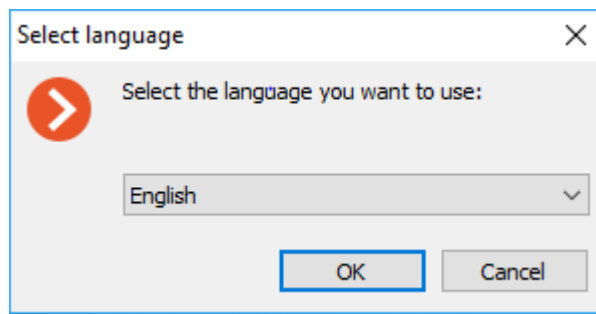


## Installation of Eocortex Neural Networks suite

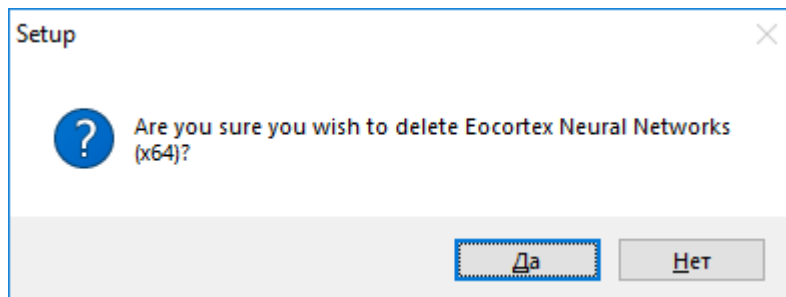
-  The most up-to-date version of **Eocortex** and its documentation can be downloaded at [eocortex.com](http://eocortex.com): The distribution packages can be found at [Support / Software Installation Packages Supported](#); the documentation can be downloaded at [Support / Documentation](#).
-  The installation of the **Eocortex Neural Networks** suite shall be performed under the account of the same user who will operate the application. If the application is to be launched by various users with different accounts, the installation must be performed for each of these users under his/her account.

Before installing the **Eocortex Neural Networks** suite, please close all **Windows** applications, then launch the **EocortexNeuralNetworksCommon Installer.exe** file that is located in the root folder of the distribution package.

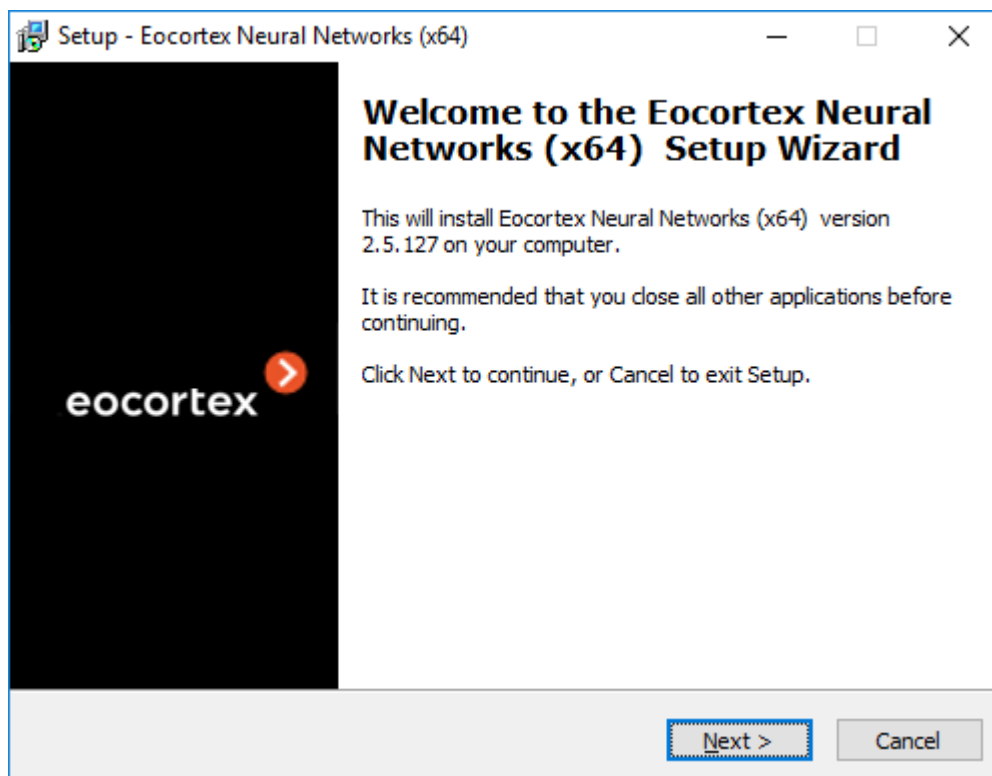
In the **Select language** window, choose the language that will be used during the installation and in the course of operating the software suite on the computer.

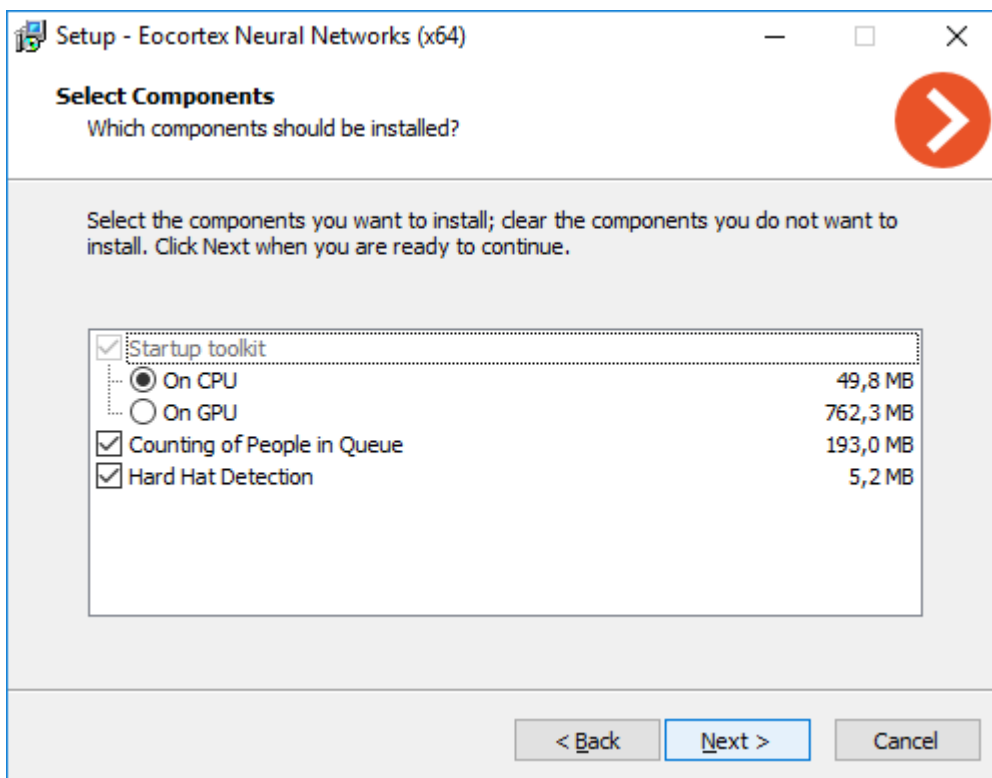
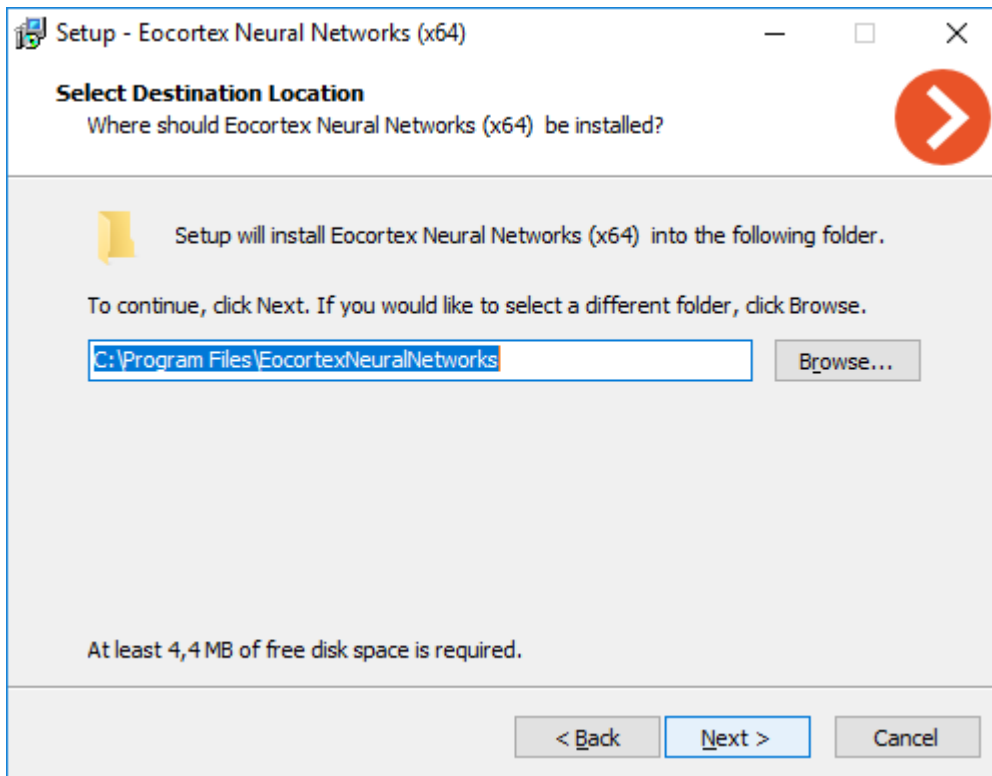


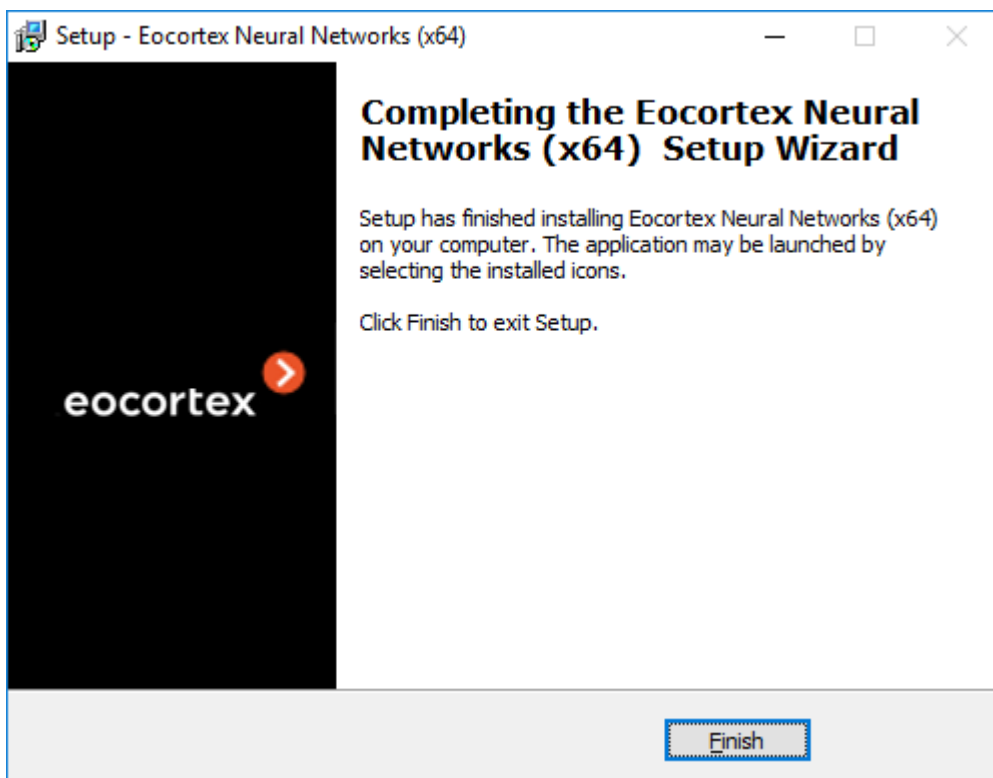
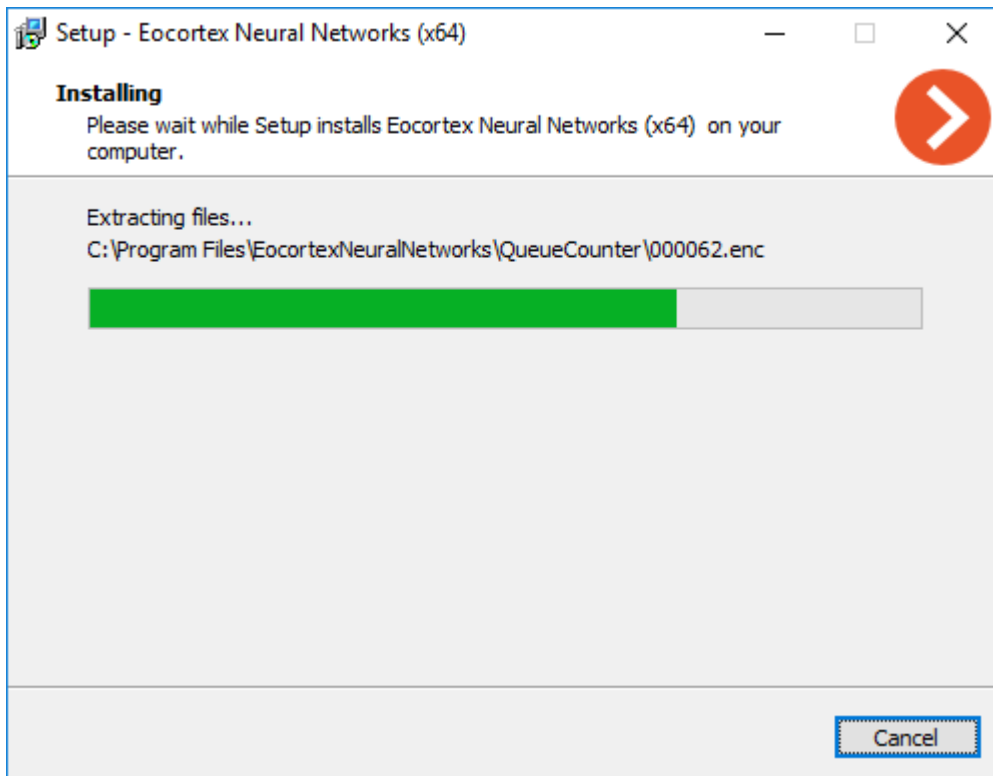
If the **Eocortex Neural Networks** suite has already been installed on this computer, the user will be recommended to remove the previous copy of the software. In case No is pressed, the installation will be aborted and the previous copy will remain. If **Yes** is pressed, the previous copy will be deleted, and the **Eocortex Neural Networks** installation wizard window will open.



In case the **Eocortex Neural Networks** suite is being installed on the computer for the first time, the **Eocortex Neural Networks** installation wizard will open immediately. The user will need to follow the instructions of the wizard.







## Installing Eocortex Client



The most up-to-date version of **Eocortex** and its documentation can be downloaded at [eocortex.com](http://eocortex.com): The distribution packages can be found at [Support / Software Installation](#)

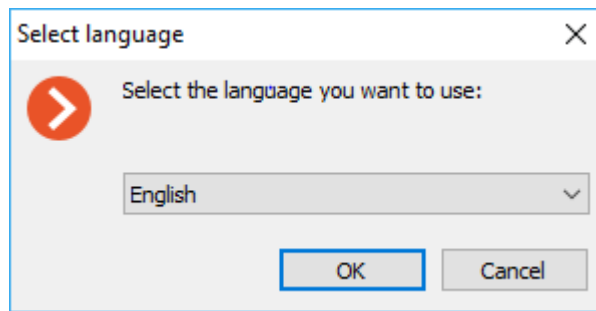
[Packages Supported](#); the documentation can be downloaded at [Support / Documentation](#).



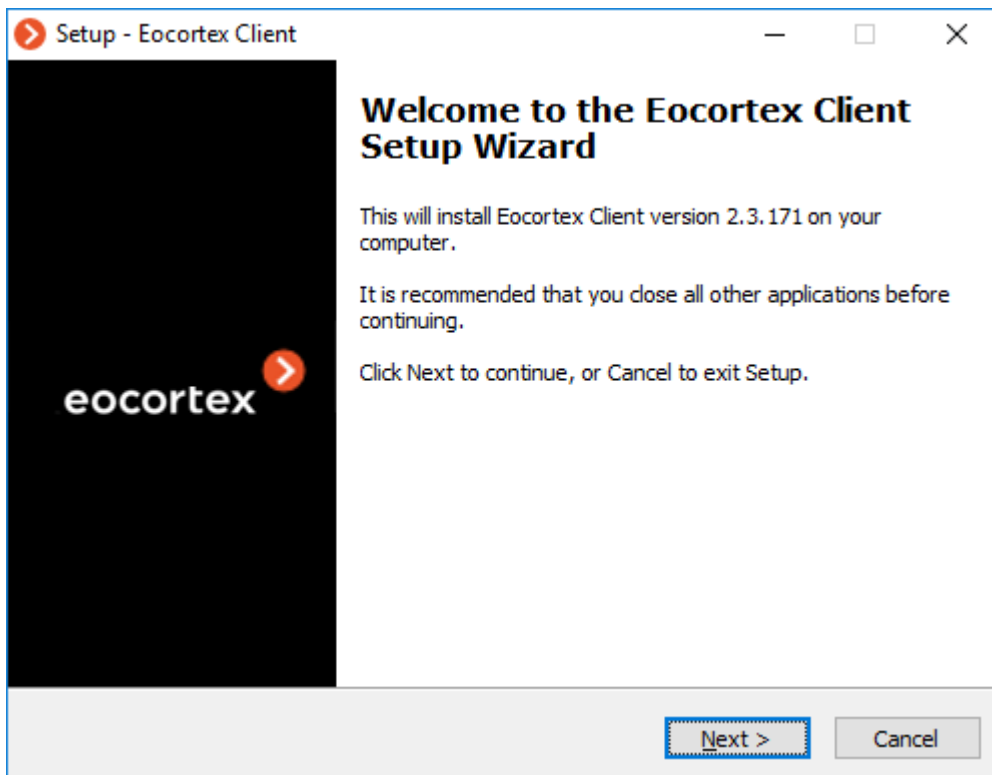
Installation of **Eocortex Client** should be performed via the account of the user by whom this application shall be used. If the application is to be used by several users with different accounts, you should install the application for each of such user.

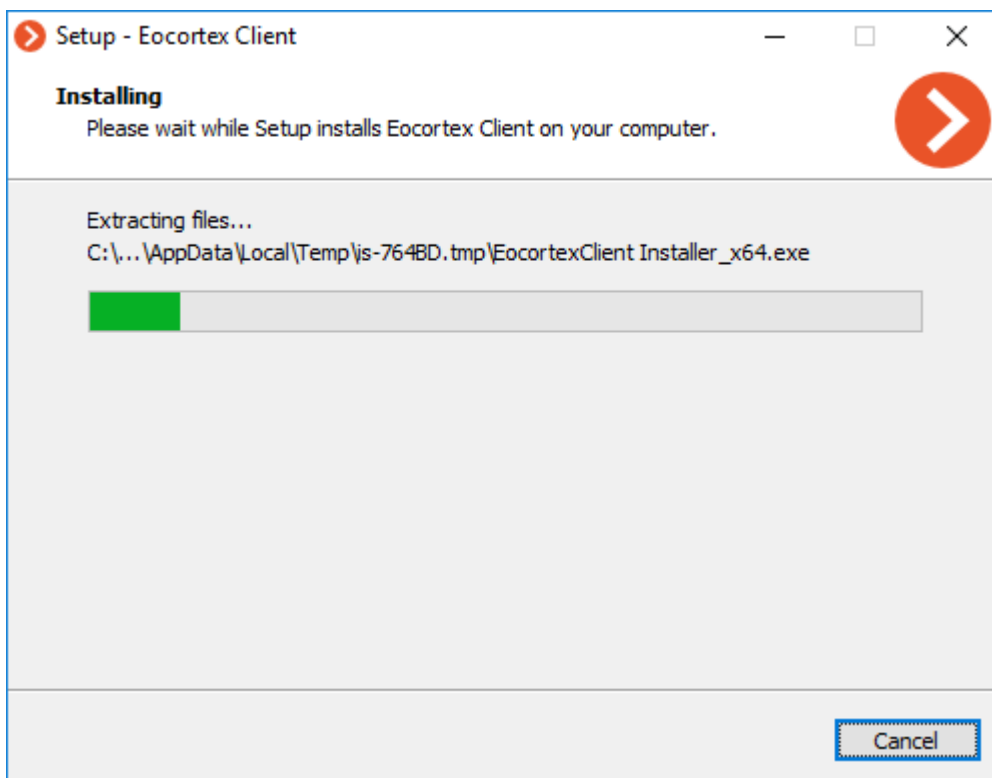
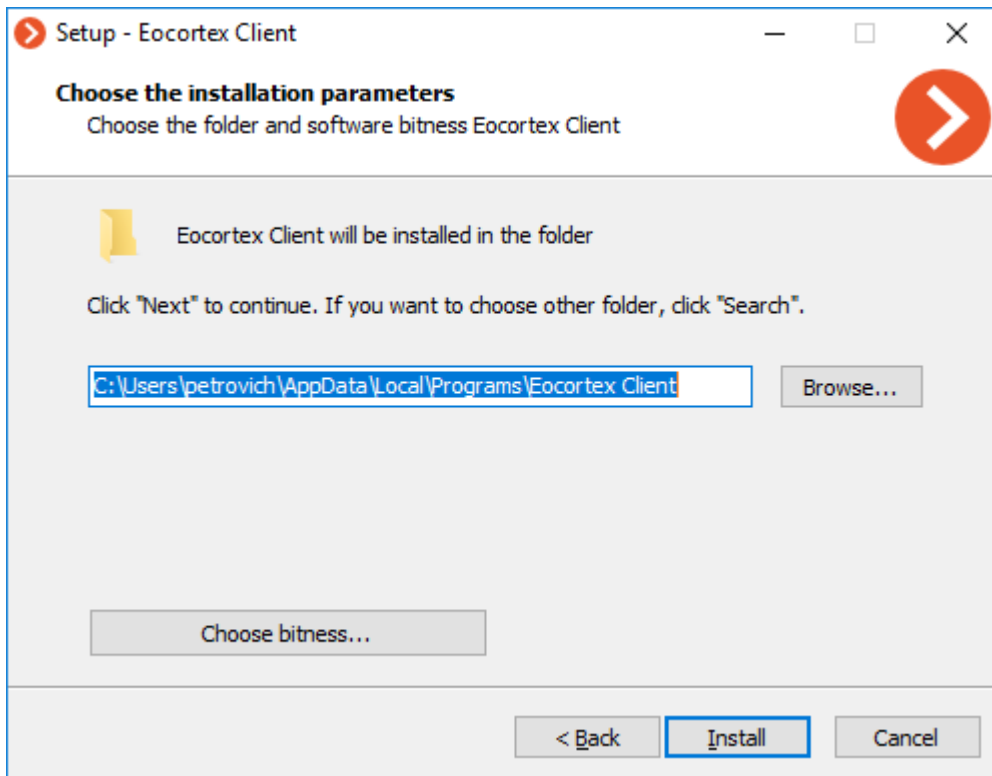
Close all Windows applications before installing **Eocortex Client**; run the **EocortexClientCommon Installer.exe** file located in the installer root folder.

Select the installation language and click **OK**.

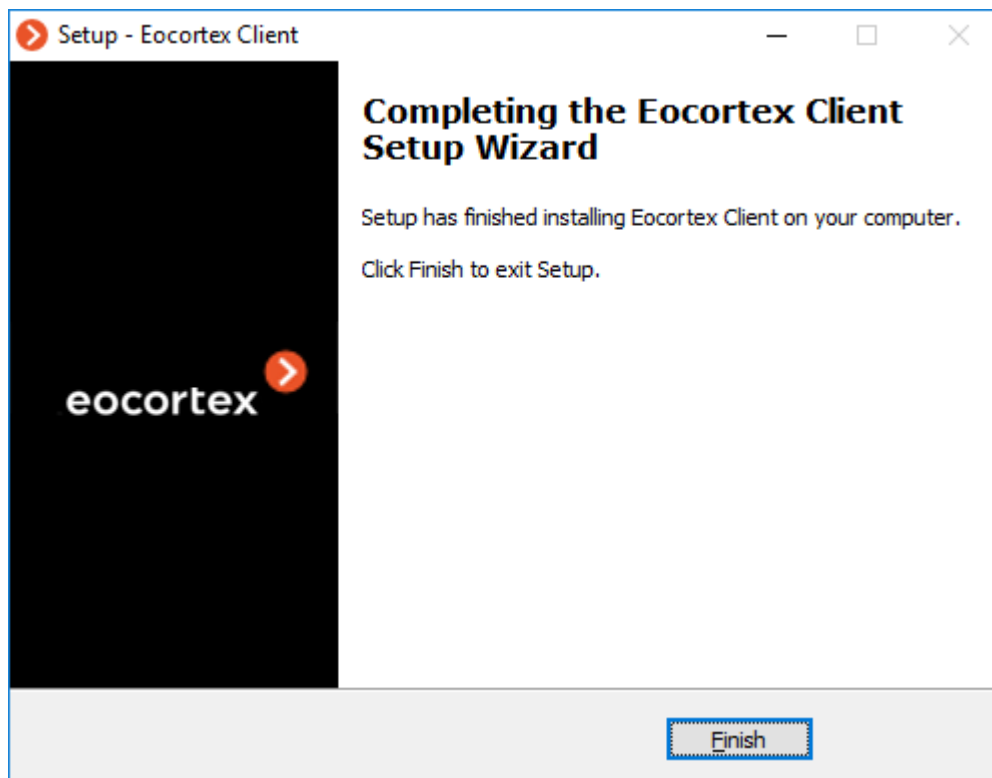


Setup wizard window will open. Follow the instructions:













## Updating Eocortex software

**Eocortex** software is updated by installing the newest version of the product "on top" of an existing one. During the installation program files of the previous version are removed but all settings, the archive and the license are saved. Thus, no additional setup is required after update.

-  Only software with the same name and bit depth can be updated. For example, if you previously installed **Eocortex Server (32 bit)**, choose **Eocortex Server (32 bit)** for update.
-  You can configure automatic update for **Eocortex Client** (see [Eocortex Configurator / Server setup / Additional server settings / Other settings](#)).
-  The most up-to-date version of **Eocortex** and its documentation can be downloaded at [eocortex.com](http://eocortex.com): The distribution packages can be found at [Support / Software Installation Packages Supported](#); the documentation can be downloaded at [Support / Documentation](#).
-  If you change the license but the product version and bit depth remain the same, software update is not needed — just install a new license file or software key.

## 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 name and 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 name or 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 and updating the license

Licensing of a **Eocortex** server requires installation of a software-key or USB-key and its license file on the server.

-  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 off-line 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.

## USB key online activation



In order to install and activate a USB 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, enter the user name and password with configuration rights, then click **Connect**.

Eocortex Configurator

Server

192.168.100.79

User

root

Password

.....

Remember password

Connect

eocortex

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.

Licence key is not found.

Licence key is not found or invalid on server. Would you like to install licence?

Yes No

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**.

**Licence install**

### Select the installation type

Soft-key  
Licensing by means of software key, tied to a specific computer.  
**Attention! After activation of key, it can not be transferred to another computer!**

USB-key  
Licensing by means of USB-key, inserted in the USB-connector of the computer.

Offline activation

[Back](#) [Next](#)

The **Select key** page will appear, showing the list of keys connected to the server. The **Key ID** column of the list indicates the number on a side of the USB key. If the user cannot find the required key in the list, such key is not connected to a USB port of the server; in this case the user has to connect the required key to the server and press **Update**, in a couple of seconds the list will be updated. To continue the installation process the user has to choose the required USB key and press **Next**.

**Licence install**

### Select key

Select the USB-key for license installation. ⓘ

Key ID	Status
2B217205	Not activated

[Update](#)

[Back](#) [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.

**Licence install**

### USB key activation code

Enter the activation code and click "Next".

Activation code

The activation code is provided when the software license is purchased.

[Back](#) [Next](#)

The online key activation page will be shown during the activation process.

**Licence install**

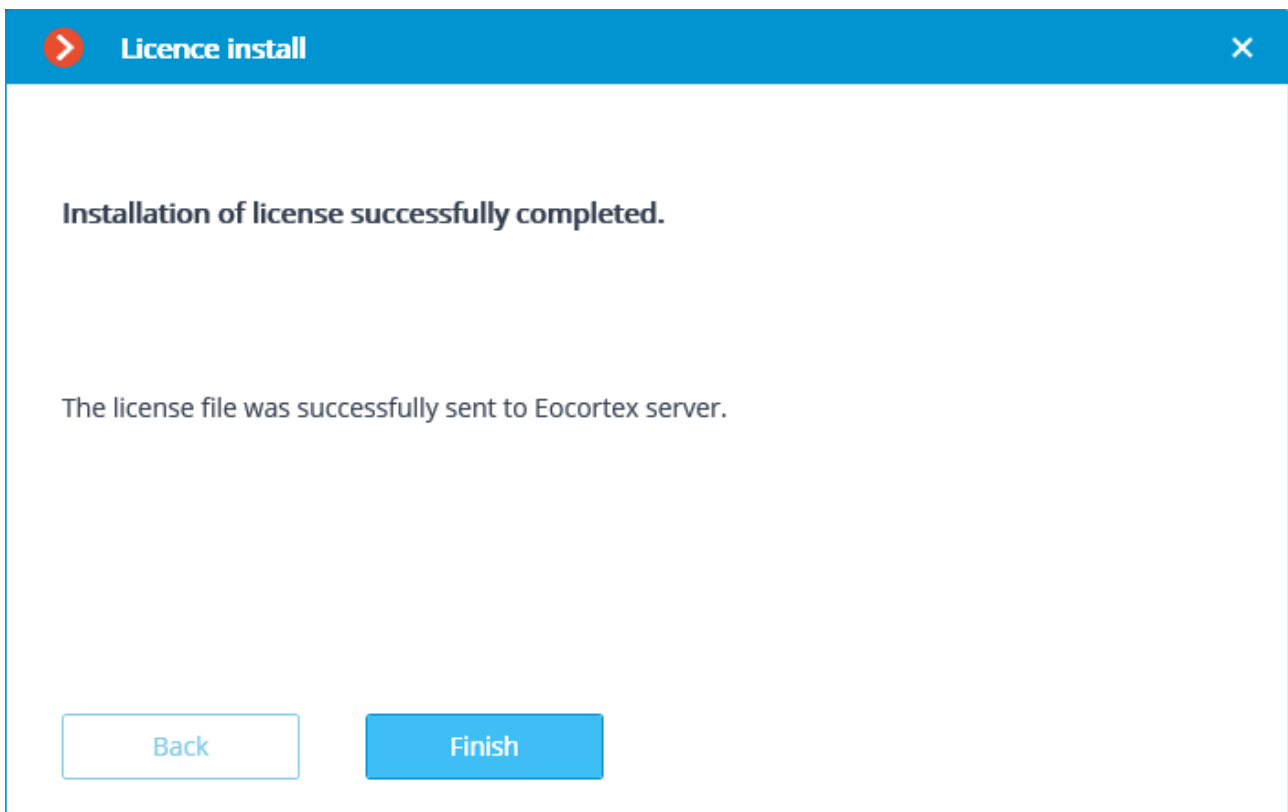
### Online activation of key

)

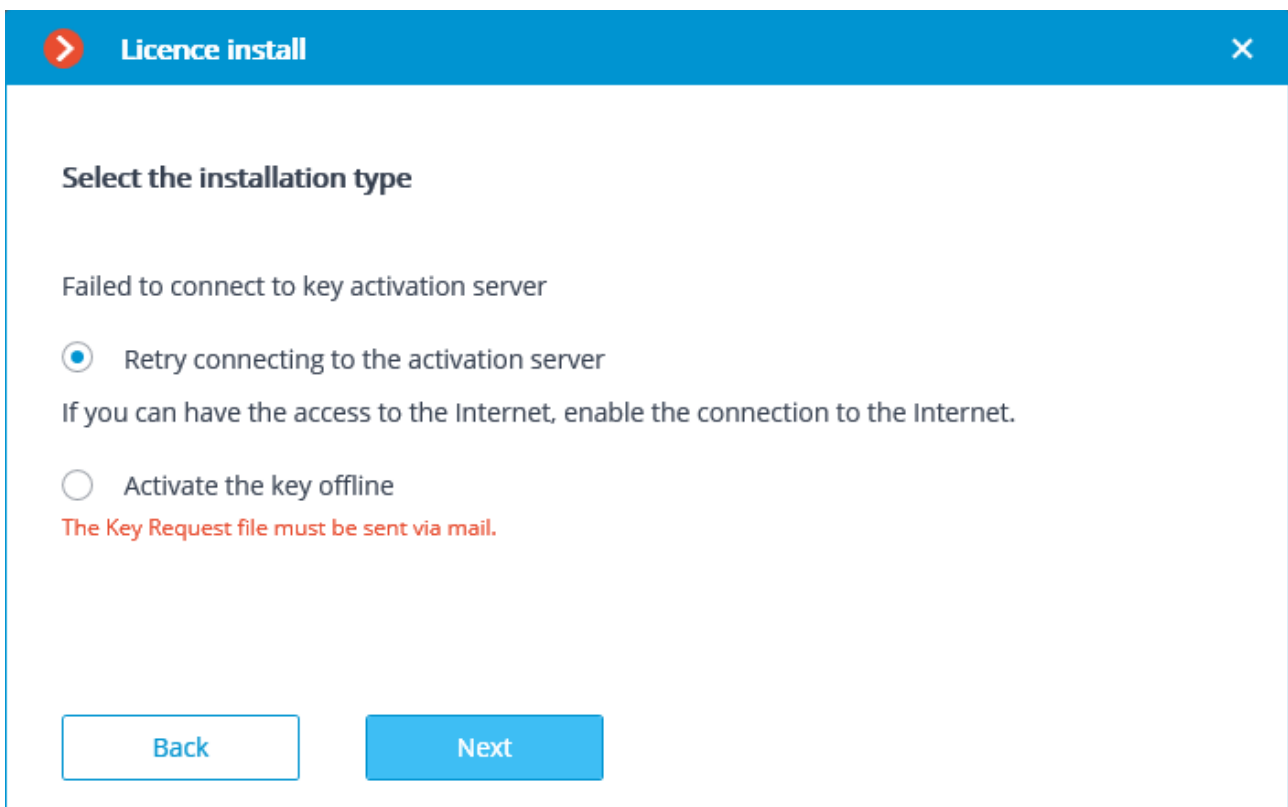
Connecting to activation server...

[Back](#) [Next](#)

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 USB 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, enter the user name and password with configuration rights, then click **Connect**.



Eocortex Configurator

Server

192.168.100.79

User

root

Password

.....

Remember password

Connect

eocortex

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.

Licence key is not found.

Licence key is not found or invalid on server. Would you like to install licence?

Yes No

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**.

**Licence install**

### Select the installation type

Soft-key  
Licensing by means of software key, tied to a specific computer.  
*Attention! After activation of key, it can not be transferred to another computer!*

USB-key  
Licensing by means of USB-key, inserted in the USB-connector of the computer.

Offline activation

[Back](#) [Next](#)

The **Select key** page will appear, showing the list of keys connected to the server. The **Key ID** column of the list indicates the number on the side of the USB key. If the user can't find the required key in the list, such key is not connected to a USB port of the server; if this occurs, the user has to connect the required key to the server and press **Update**, in a couple of seconds the list will be updated. To continue the installation process the user has to choose the required USB key and press **Next**.

**Licence install**

### Select key

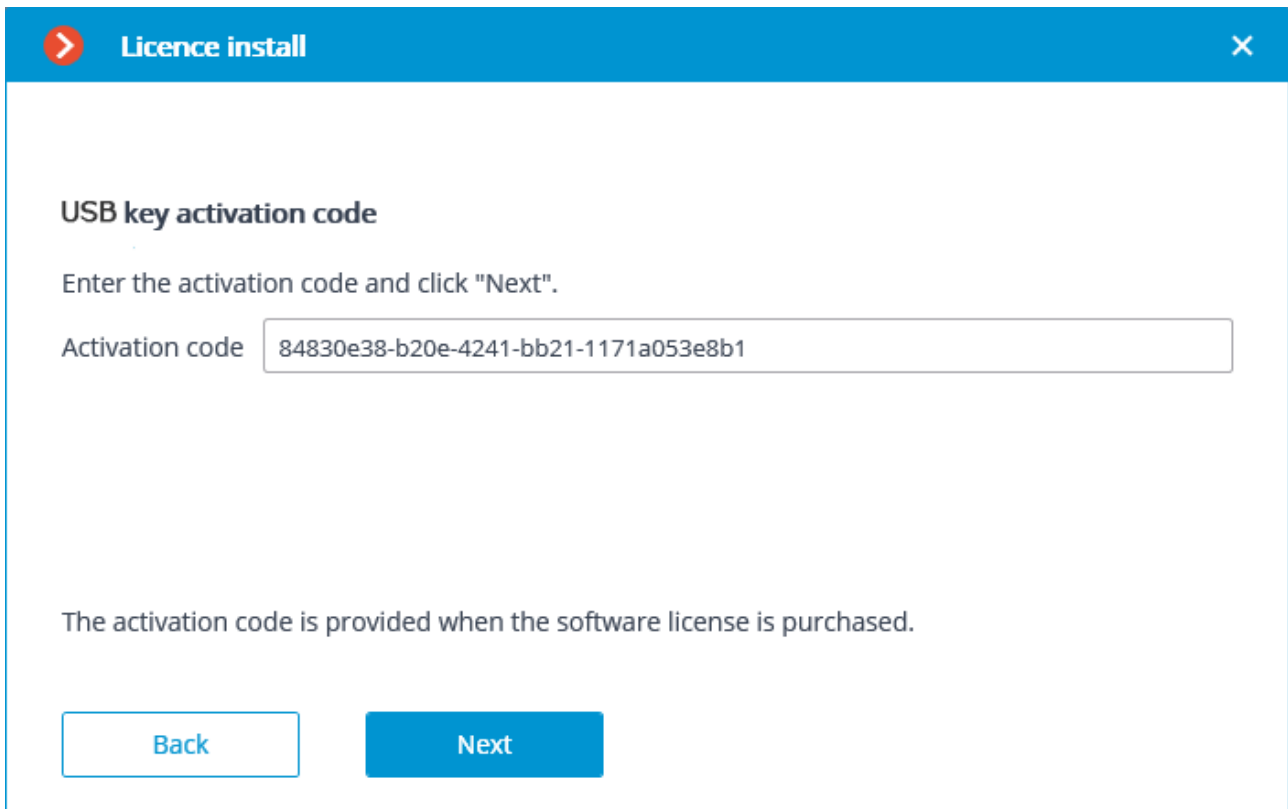
Select the USB-key for license installation. ⓘ

Key ID	Status
2B217205	Not activated

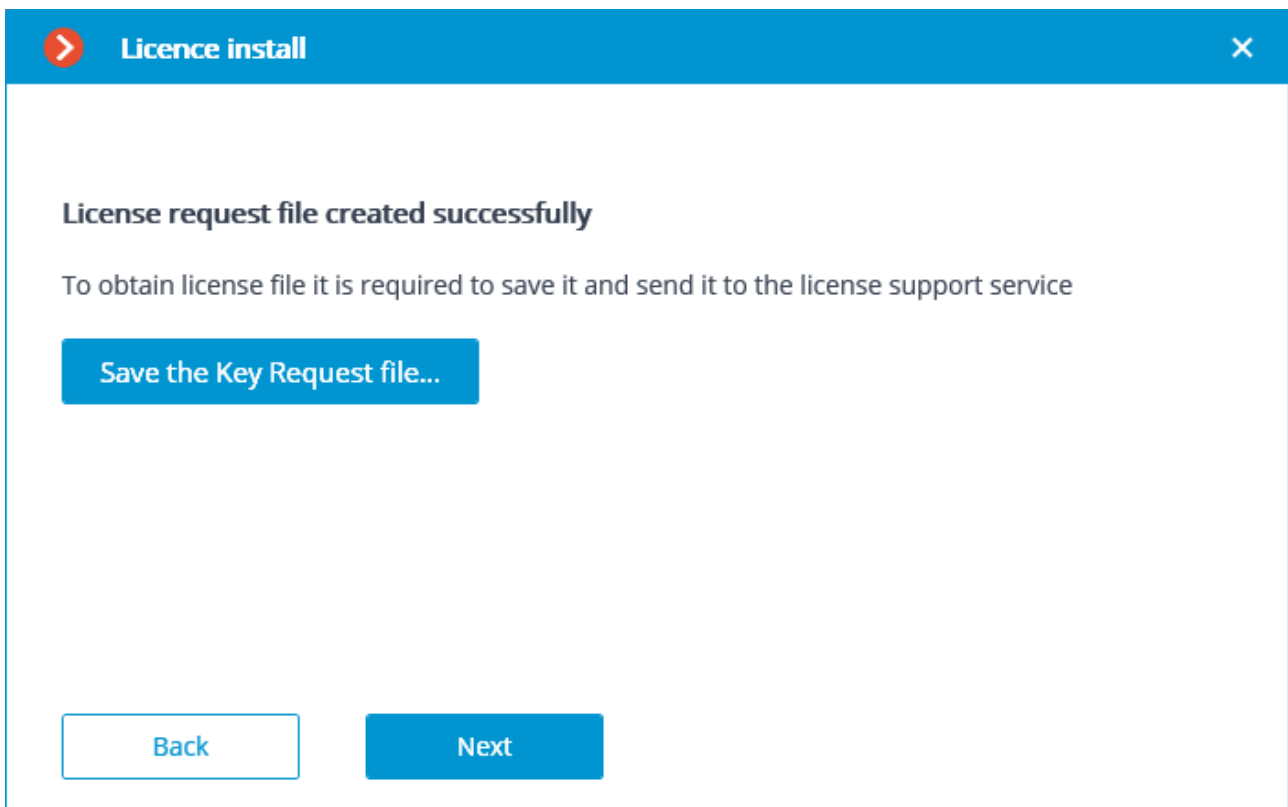
[Update](#)

[Back](#) [Next](#)


If the key is activated for the first time, the **USB key activation code** will be requested.

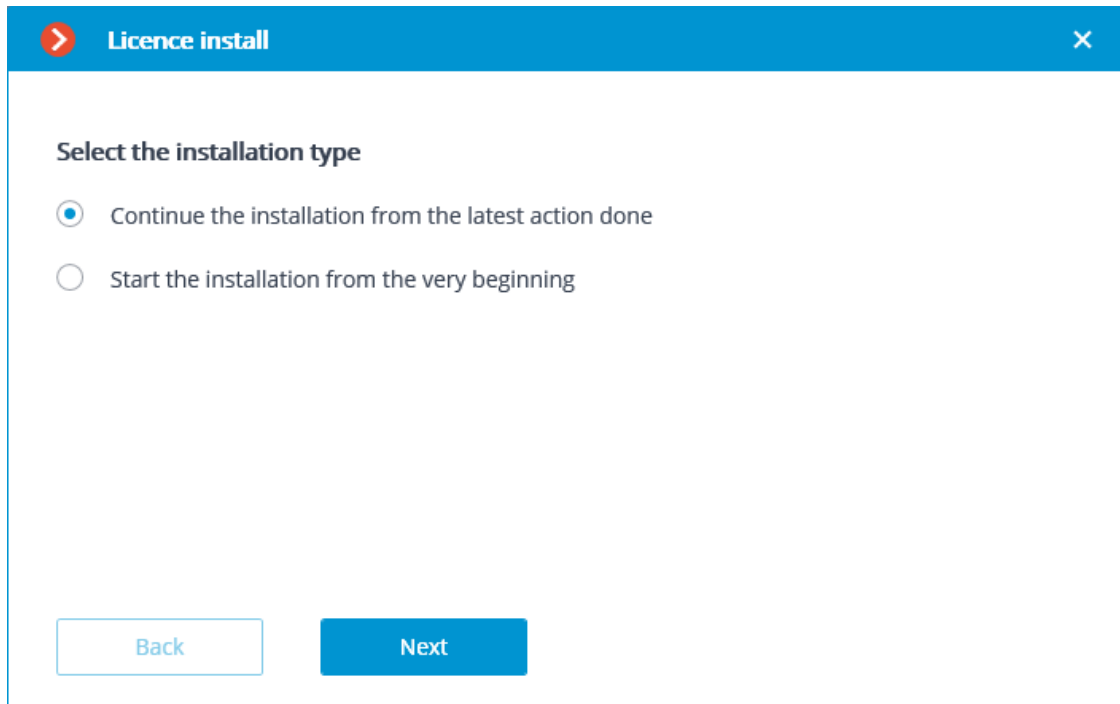


**License request file created successfully** window will be opened, where you should **Save the Key Request file...** and press **Next**.




You may close the wizard after this step. At the next launch you will be prompted to

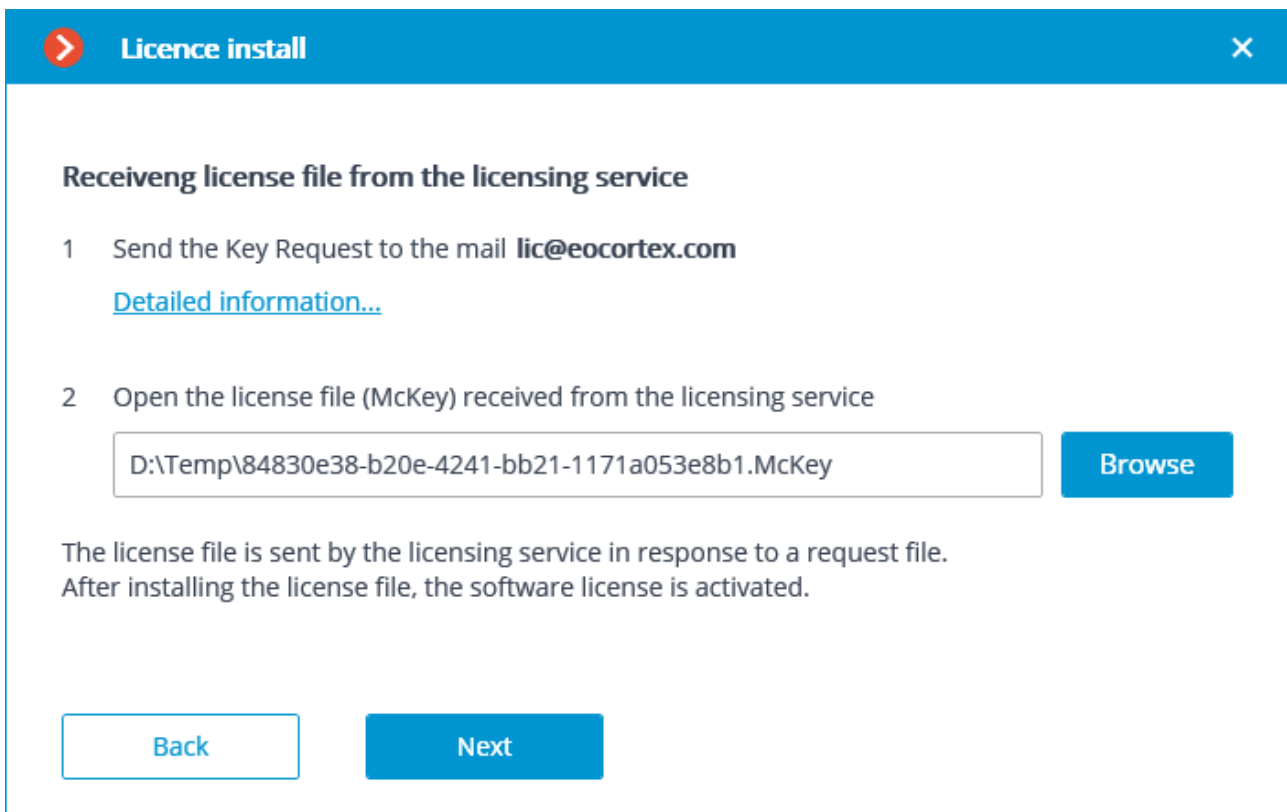
-  continue the installation from the step at which it was interrupted.



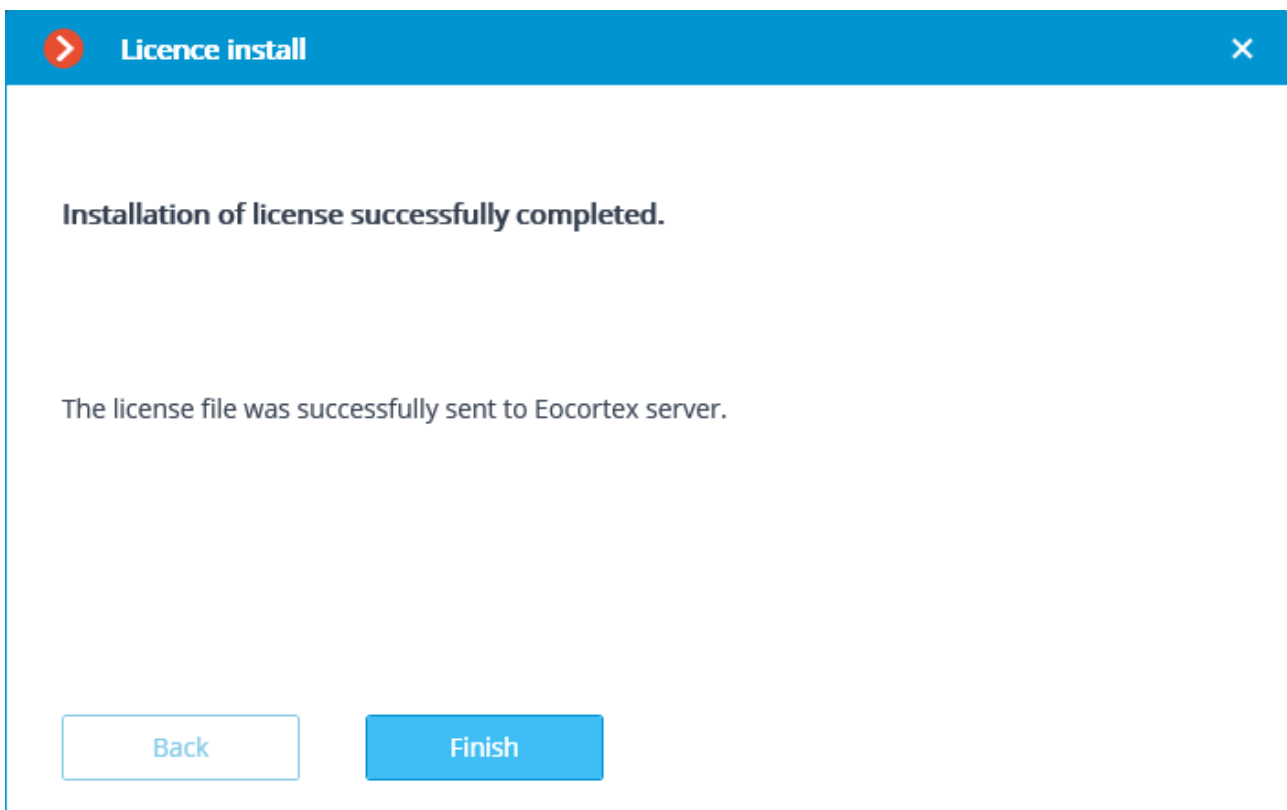
The created license request file (with **\*.McKeyRequest** extension) has to be attached to an e-mail and sent to [lic@macroscop.com](mailto:lic@macroscop.com). An e-mail with a **\*.McKey** license file will be sent in response (keeping in mind that all answers are sent by the activation server in automatic 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**.

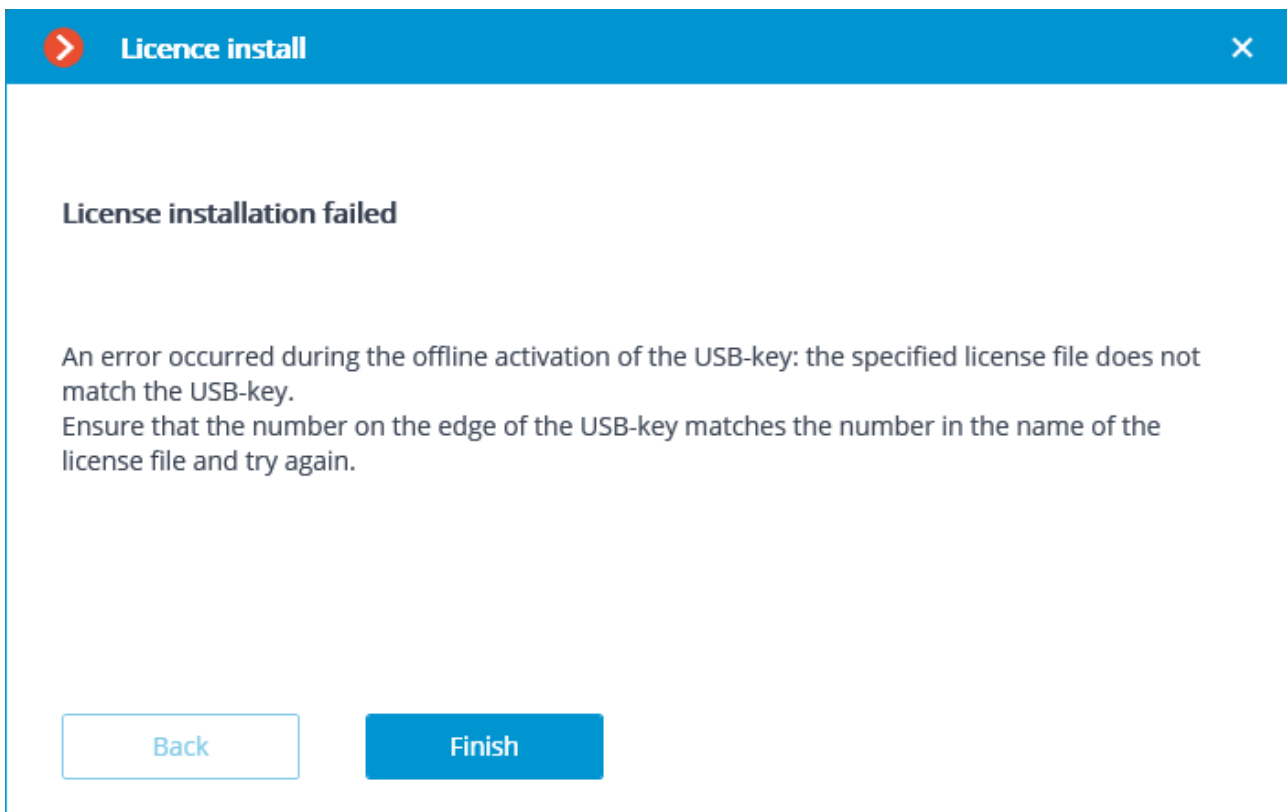
-  If the key has already been activated before, the license installation wizard will proceed to this step immediately after the key selection.




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 software 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.**
-  The license software key can't be transferred to any other computer, because it's linked to the computer during the activation process.
-  It is prohibited to install more than one **Eocortex** software key on the server!  
If you have installed another **Eocortex** software key on the server previously, you should delete its certificate and restart Windows before installation.
-  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.

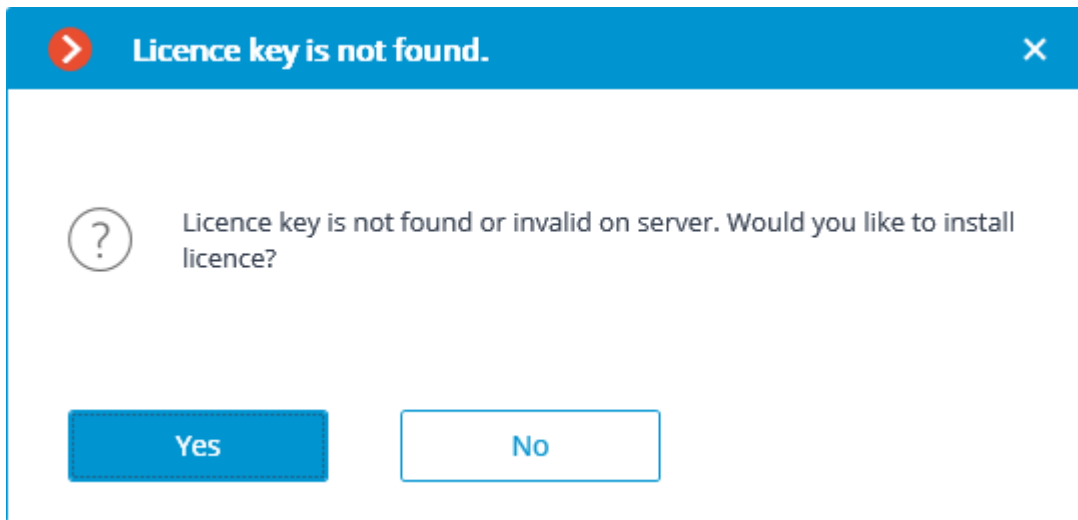


For online activation of the key installed on the server, it is necessary that this server has access to the Internet. If such connection is not available, please see the [Software key offline activation](#).


To install, activate, or update a license, you must run the **Eocortex Configurator**. In the opened authorization window, select the server, enter the user name and password with configuration rights, then click **Connect**.

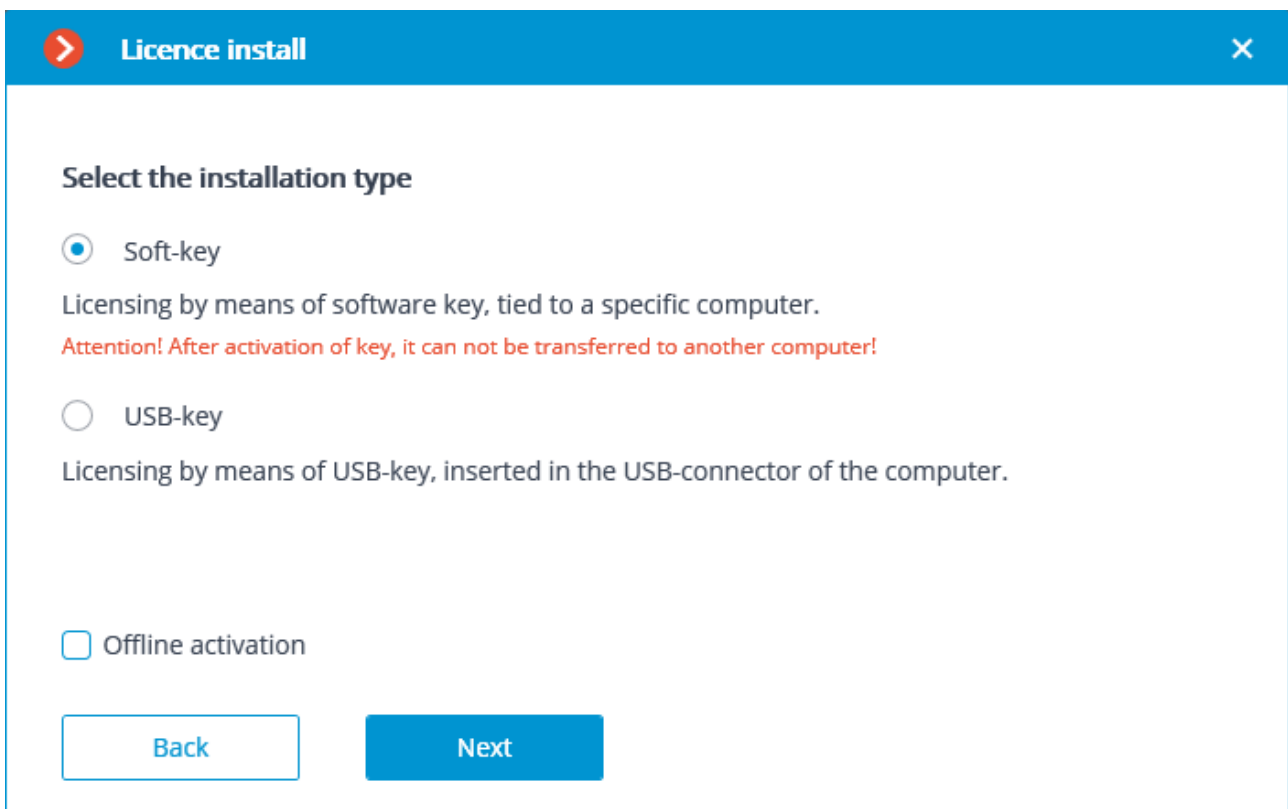
The screenshot shows the Eocortex Configurator interface. At the top, the title 'Eocortex Configurator' is displayed in blue. Below the title, there are three input fields: 'Server' containing '192.168.100.79', 'User' containing 'root', and 'Password' with masked characters. A 'Remember password' checkbox is present and unchecked. A large blue 'Connect' button is centered at the bottom. The Eocortex logo, consisting of the word 'eocortex' and a red circle with a white arrow pointing right, is located at the bottom right 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.



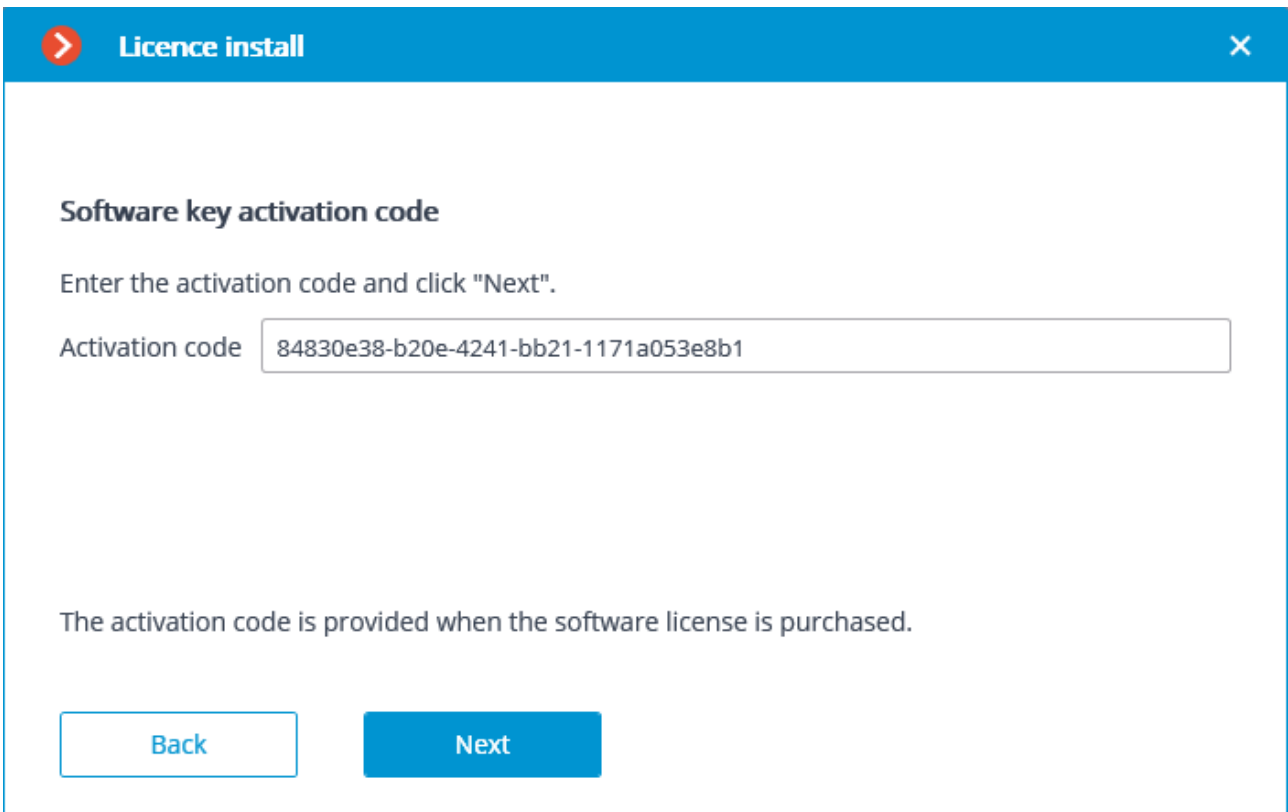
In order to install the license software key, the user has to select the corresponding menu item on the **Select the installation type** page and press **Next**.

 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.

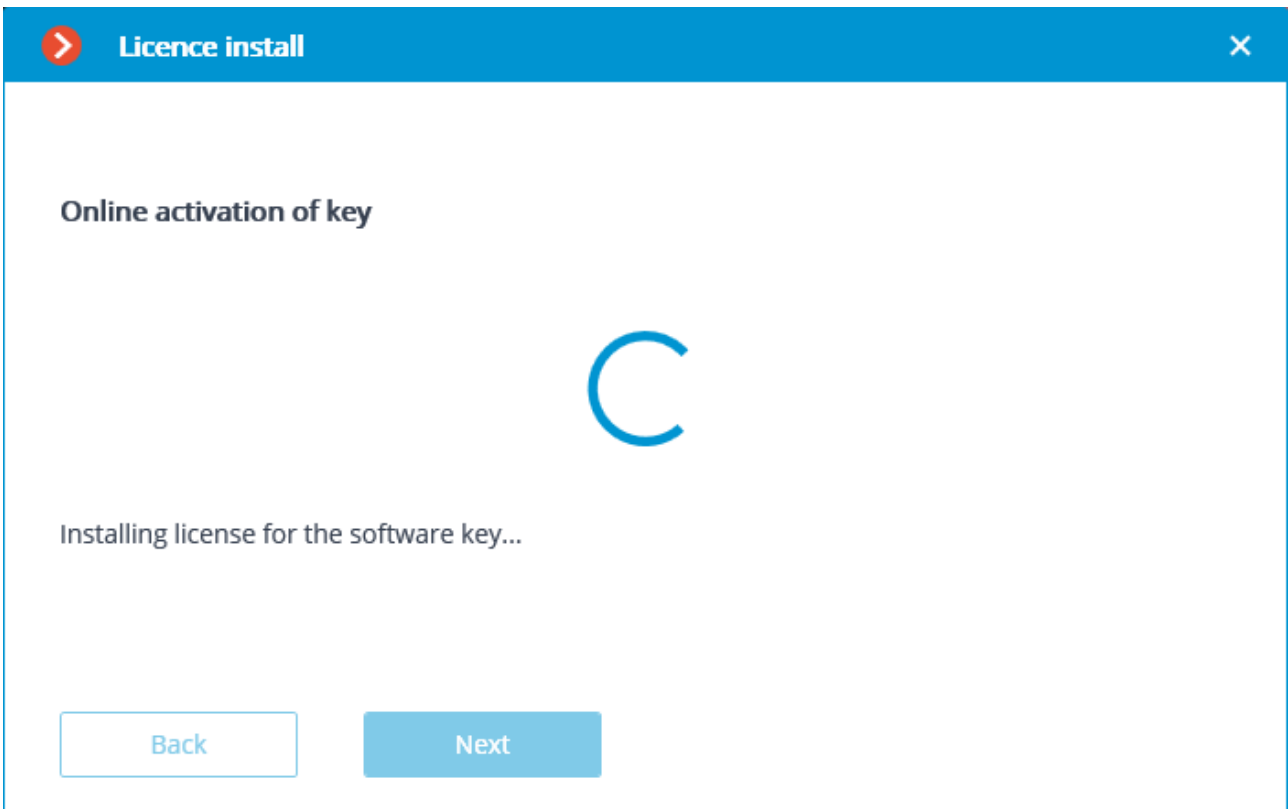


Next, the key activation code will be requested.

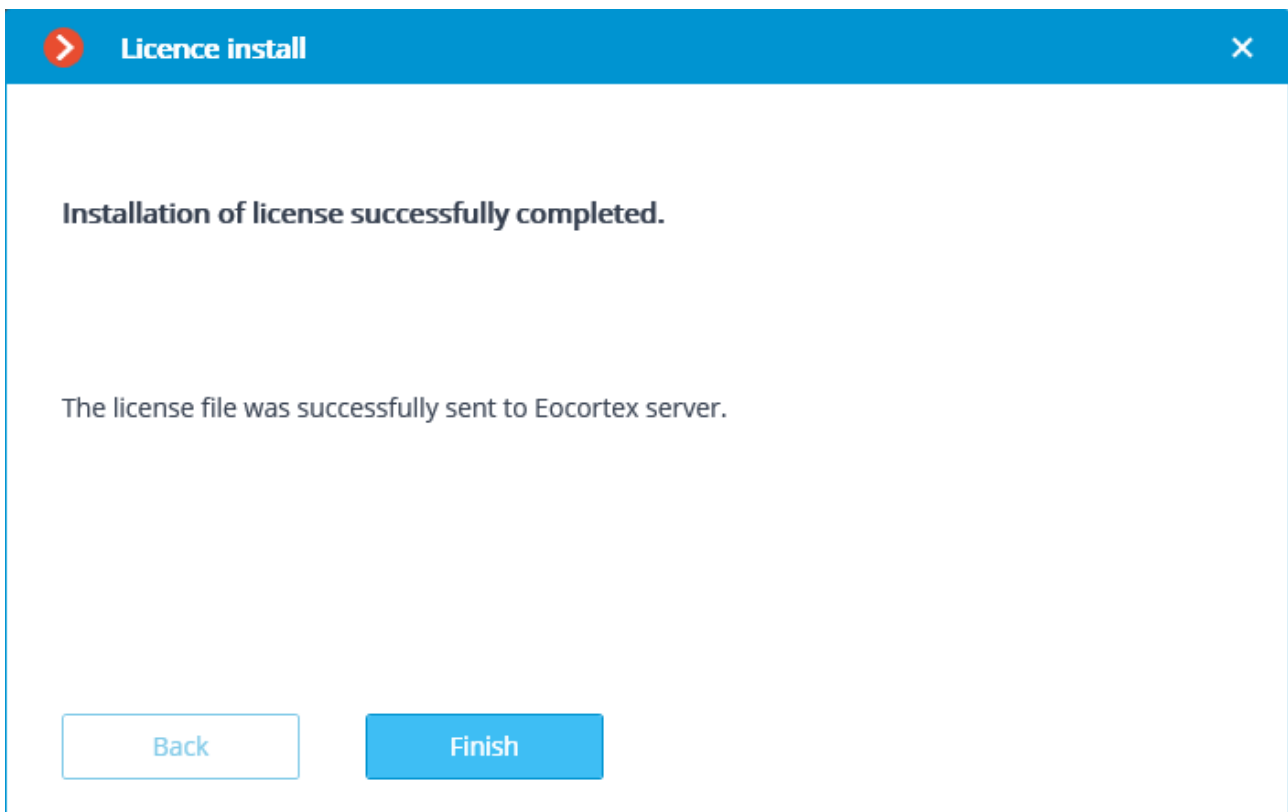




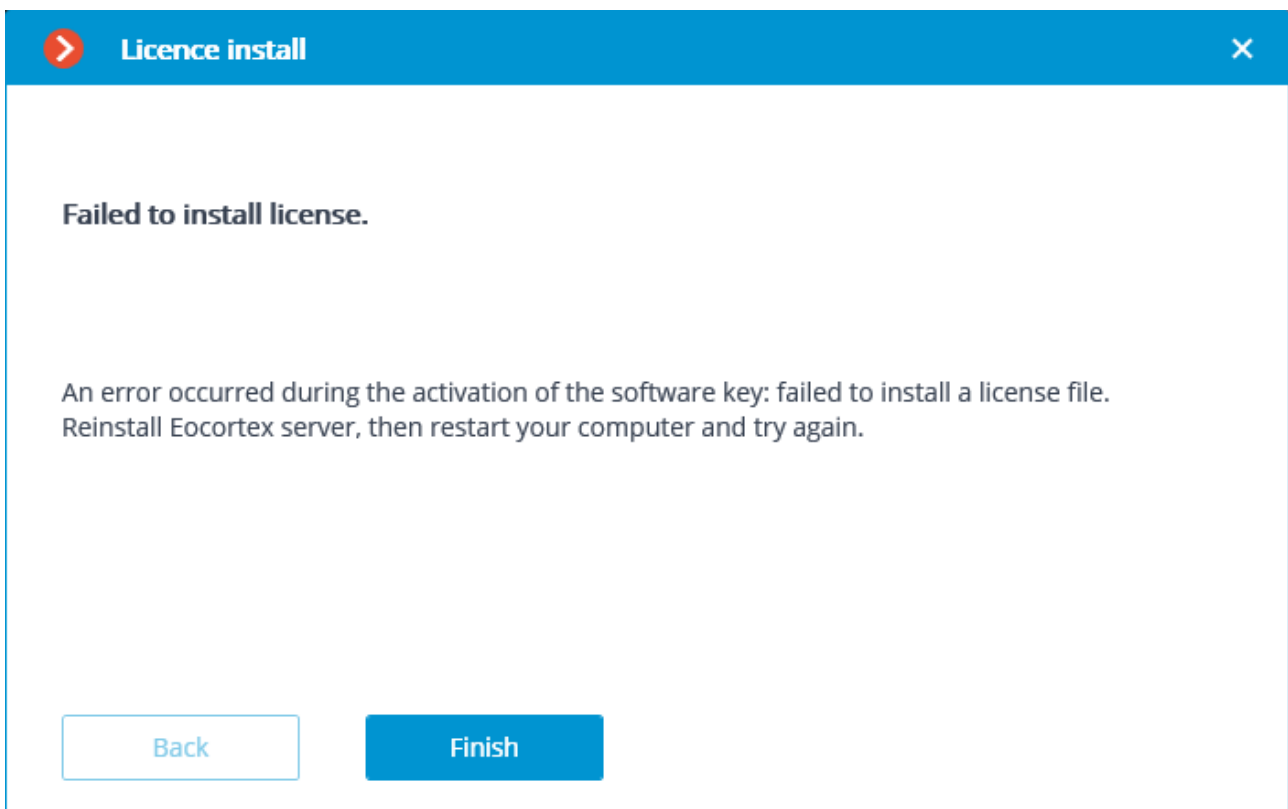
The next step is key activation. In case of an existing internet connection, after entering the code and pressing **Next**, the **Eocortex** server will connect to a remote license activation server and will try to perform automatic key activation in accordance with the licenses assigned to such key. 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

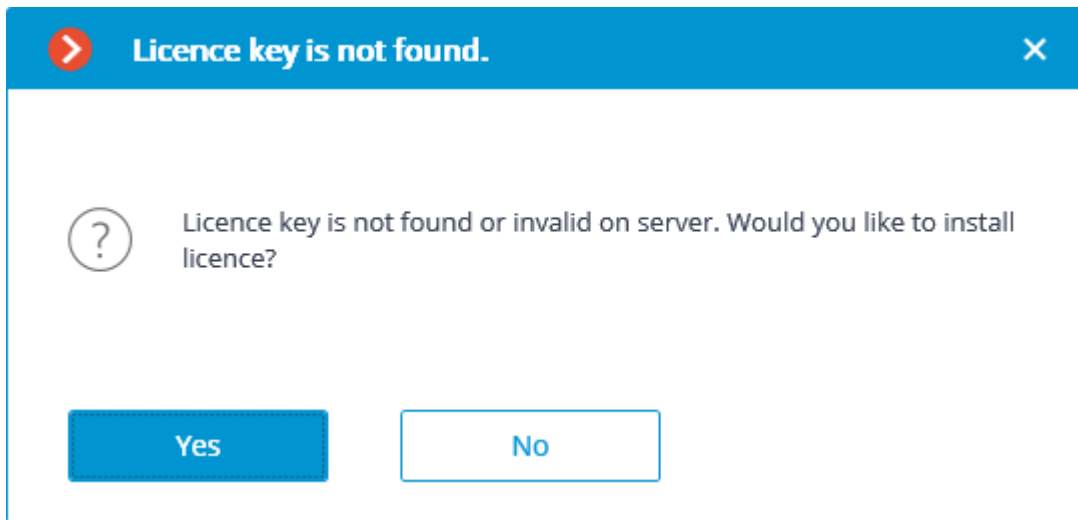
(missing or bad snippet)

To install, activate, or update a license, you must run the **Eocortex Configurator**. In the opened authorization window, select the server, 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:

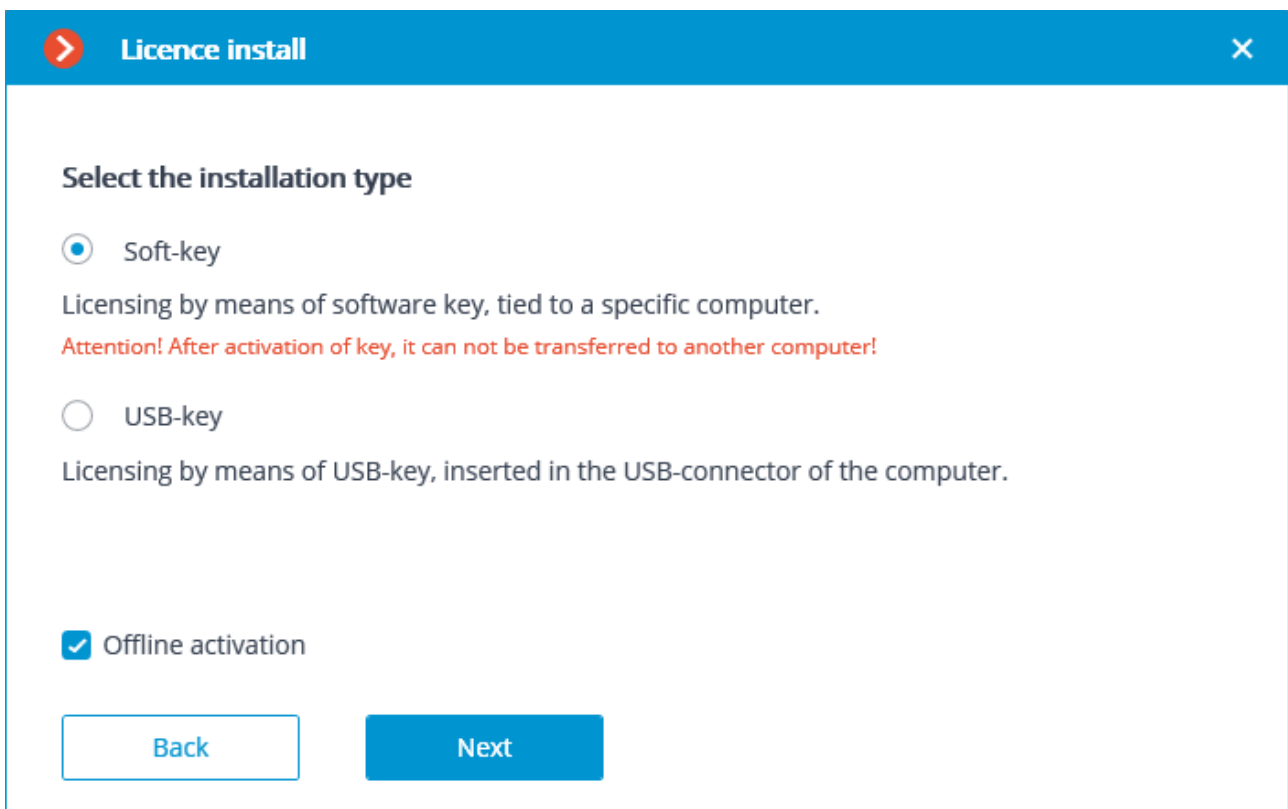
- Server:** A text input field containing "192.168.100.79". To the left of the input is a lock icon, and to the right are refresh and search icons.
- User:** A text input field containing "root".
- Password:** A text input field with masked characters represented by dots.
- Remember password:** An unchecked 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.

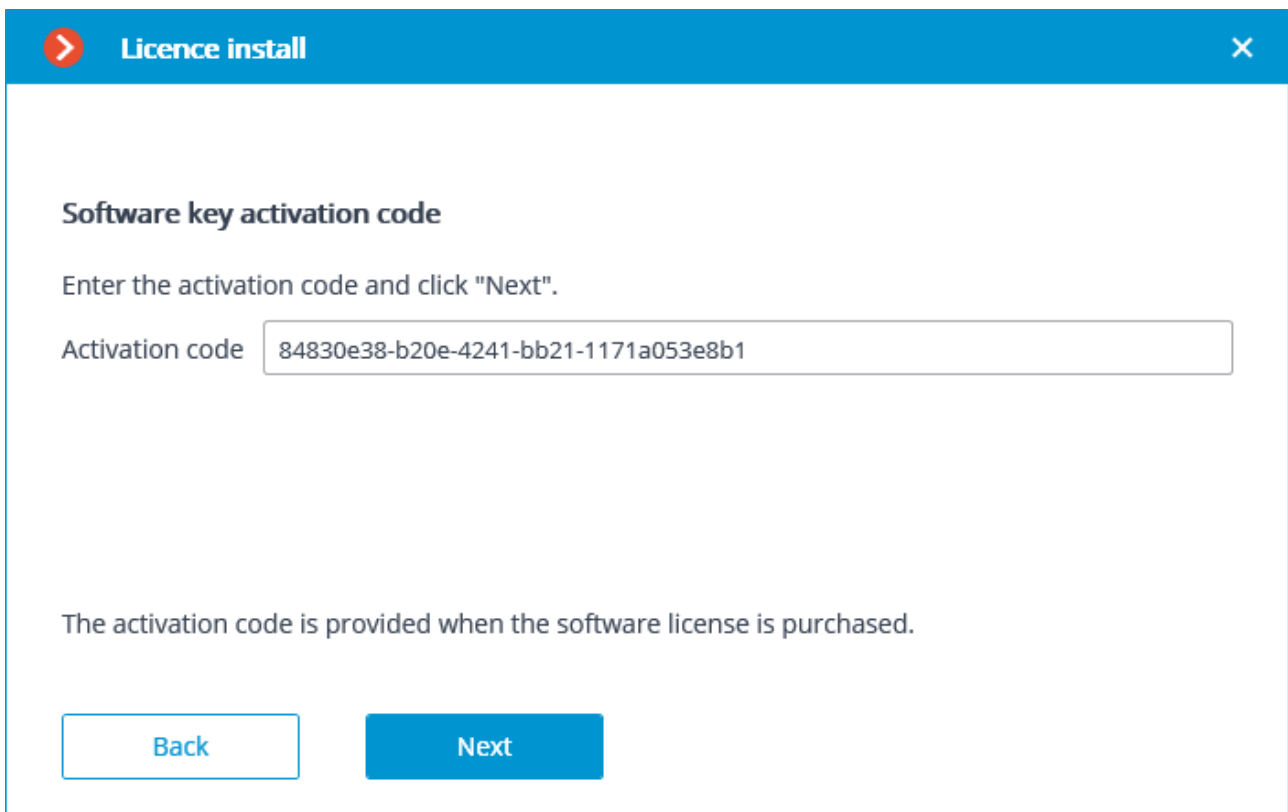


In order to software key offline activation, it's required to choose the corresponding variant on the **Select the installation type** page, turn on the **Offline activation** checkbox and press **Next**.

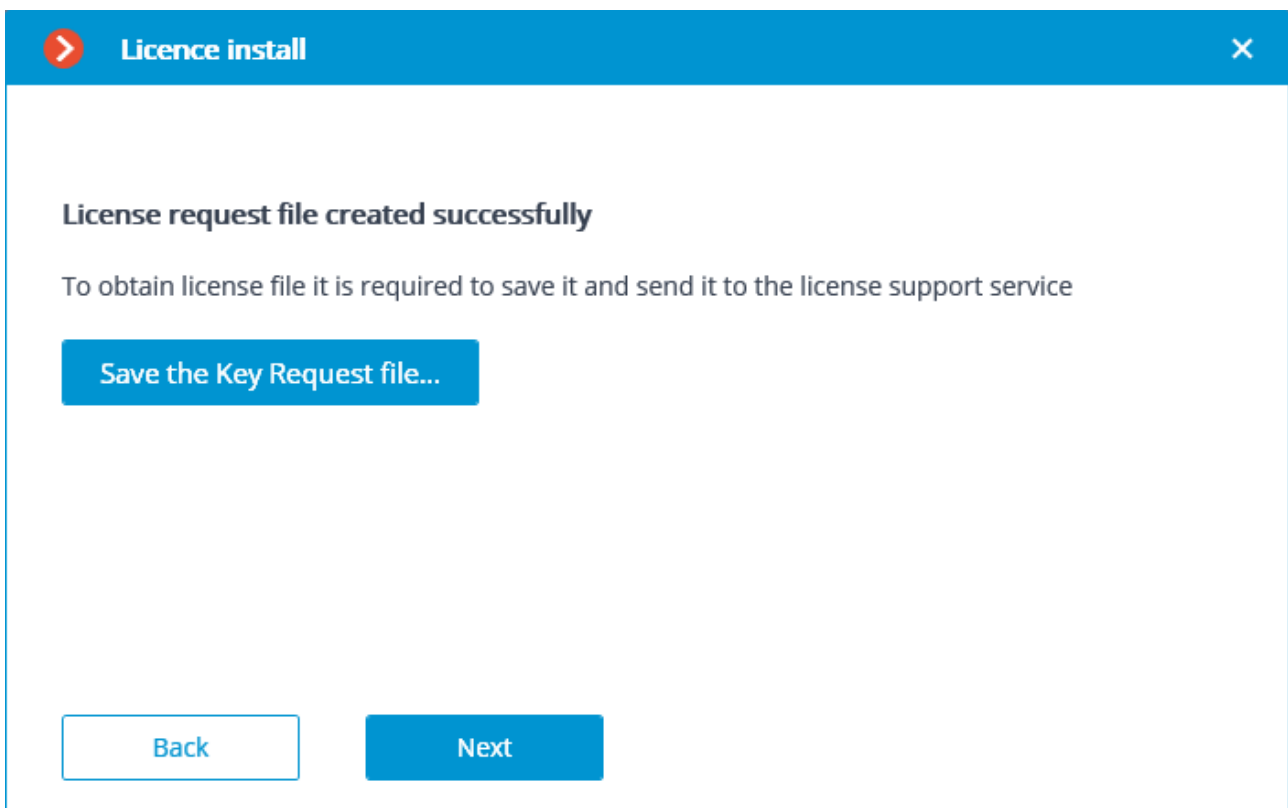
 After pressing **Next**, the software key is being linked to the computer, thus it's going to be impossible to transfer it to any other machine. If the activation process was launched mistakenly, the user has to press **Back** and close the **License installation** window.



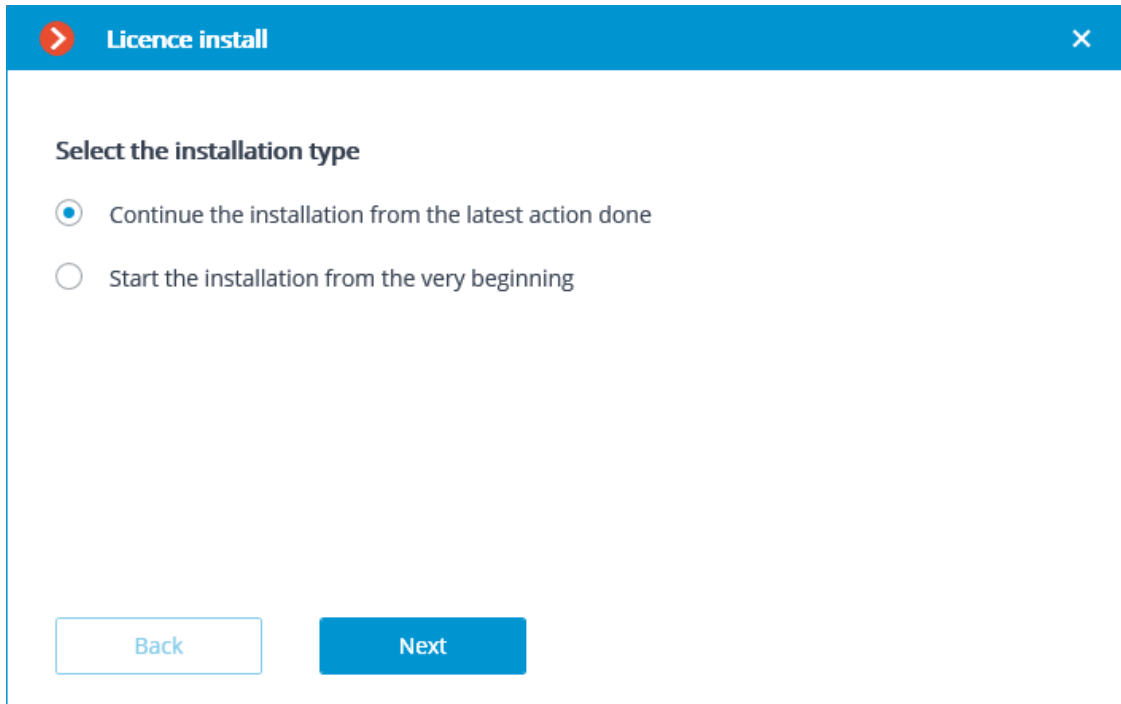
Next, the key activation code will be requested.



**License request file created successfully** window will be opened, where you should **Save the Key Request file...** and press **Next**.

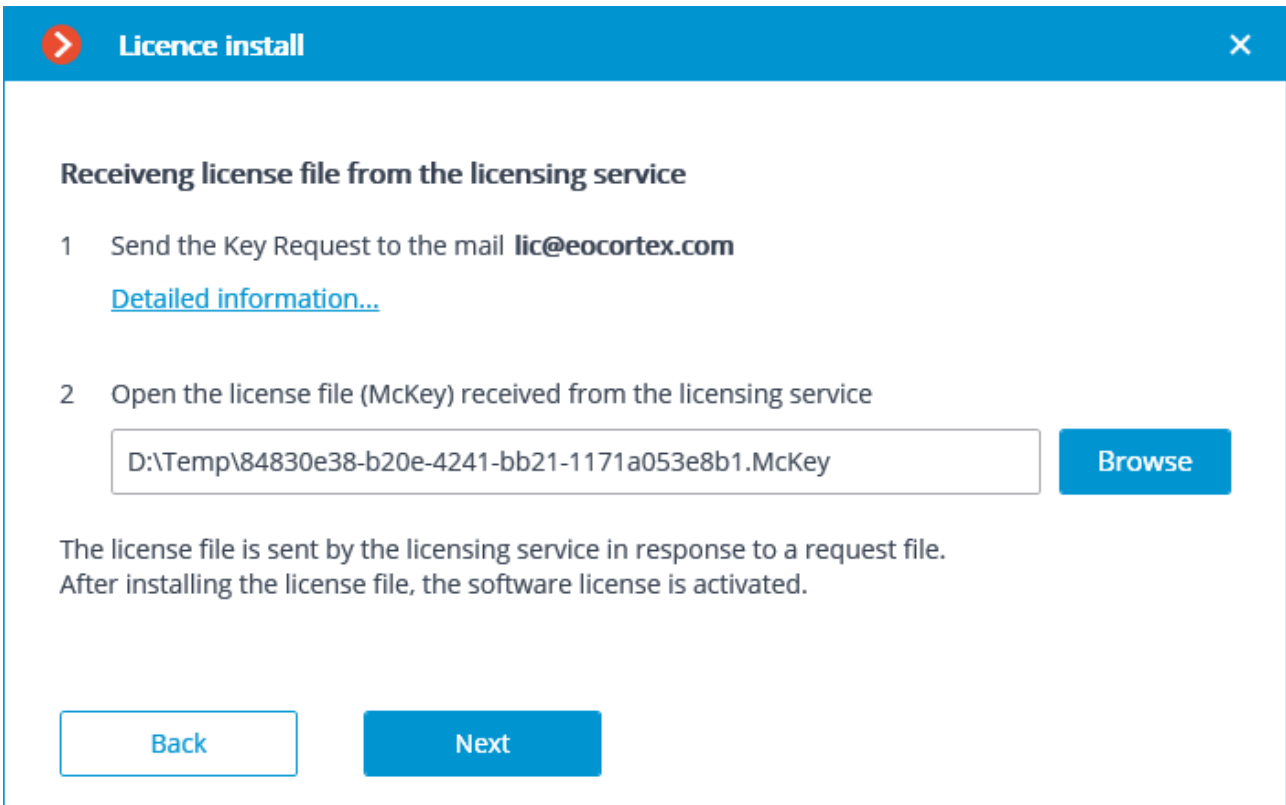


**i** After this step, you can close the wizard. In the course of next running you shall be prompted to continue the installation from the step at which it was interrupted.

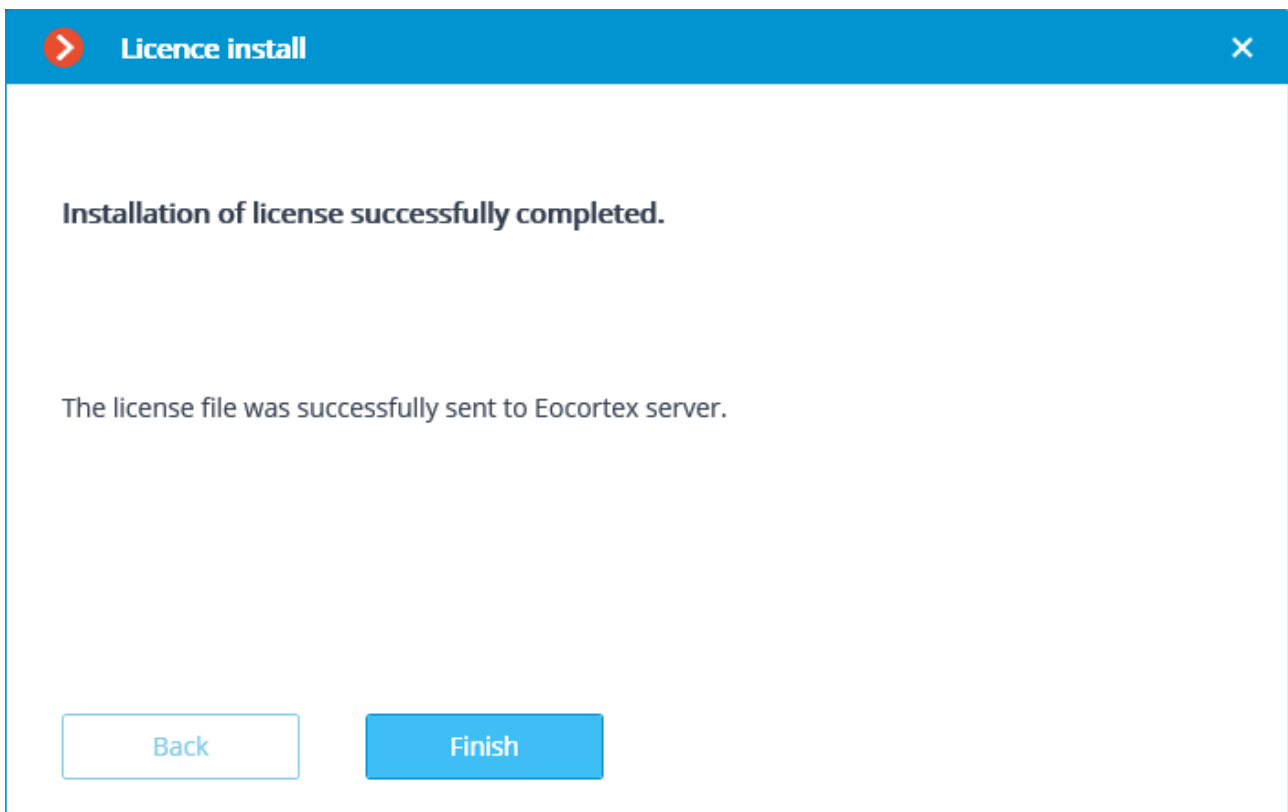


The created license request file (with **\*.McKeyRequest** extension) has to be attached to an e-mail and sent to [lic@macroscop.com](mailto:lic@macroscop.com). An e-mail with a **\*.McKey** license file will be sent in response (keeping in mind that all answers are sent by the activation server in automatic mode, waiting after sending the license request file will take minimum time).

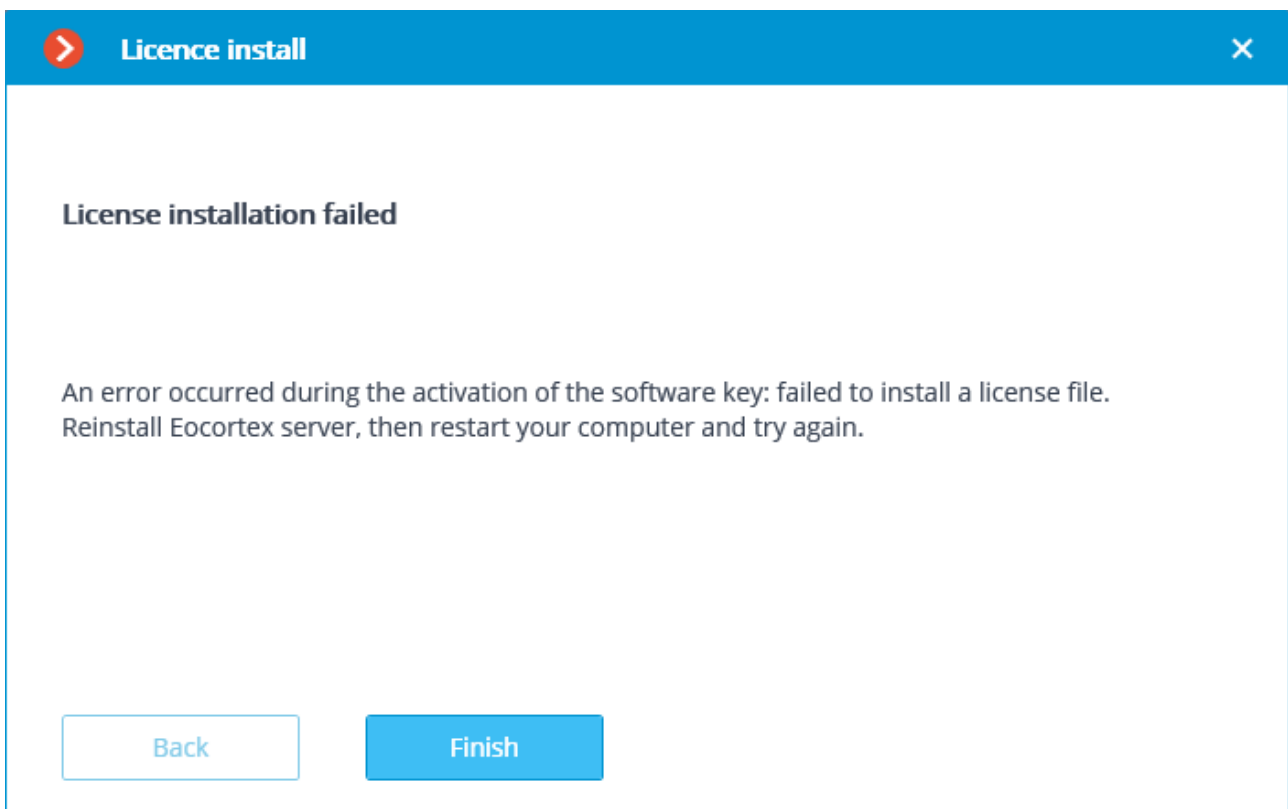
After receiving the license file, you should continue installation from the step, at which the license file is installed (with the extension **\*.McKey**). License file is selected using **Browse...** button, and then you should press **Next**.



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.

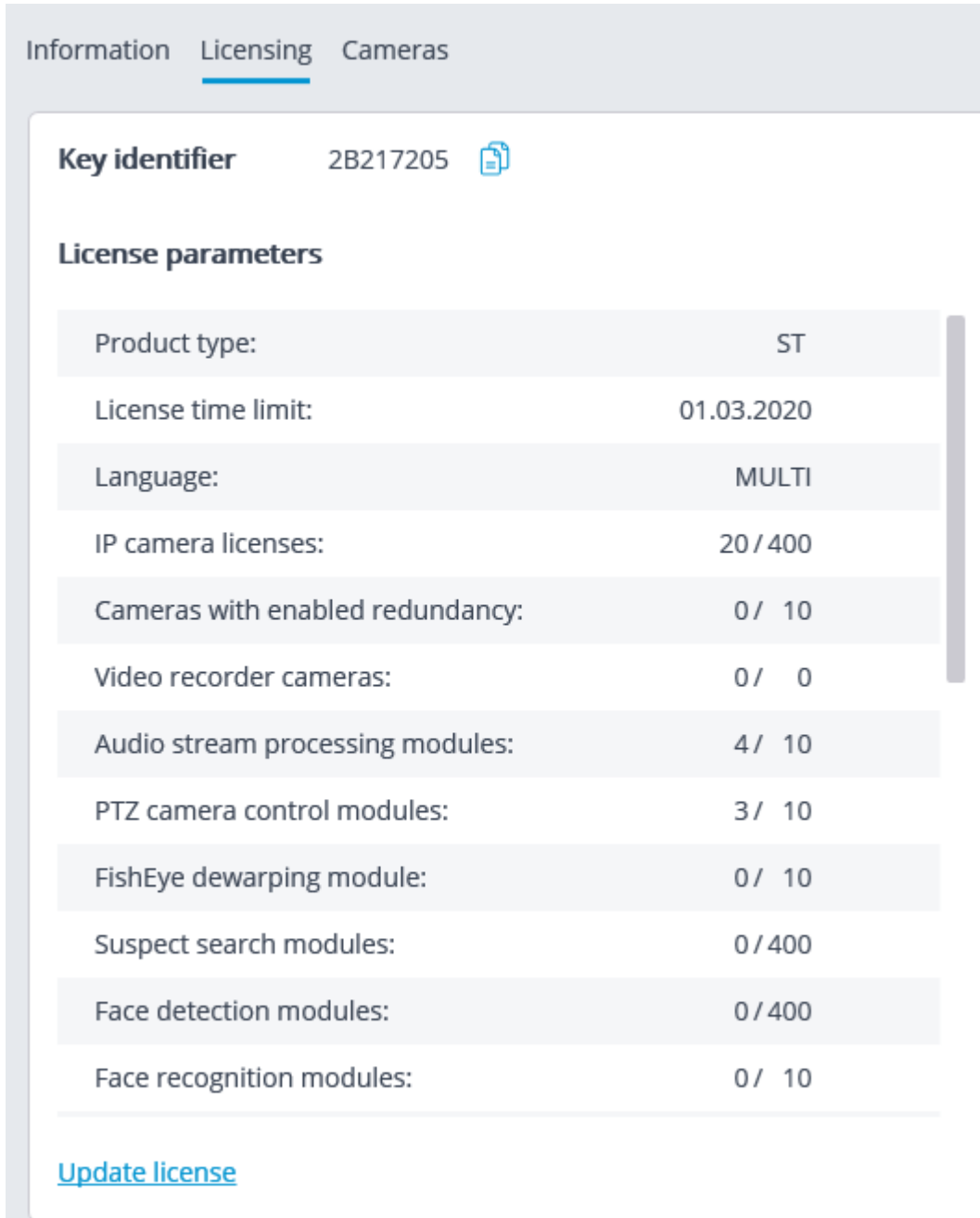





The most probable cause of the offline activation error is the inconsistency between the license file and the computer, which was used to create the request file (i.e. activation on different computer).

## 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

[Back](#) [Next](#)

**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

[Back](#) [Next](#)



# 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.

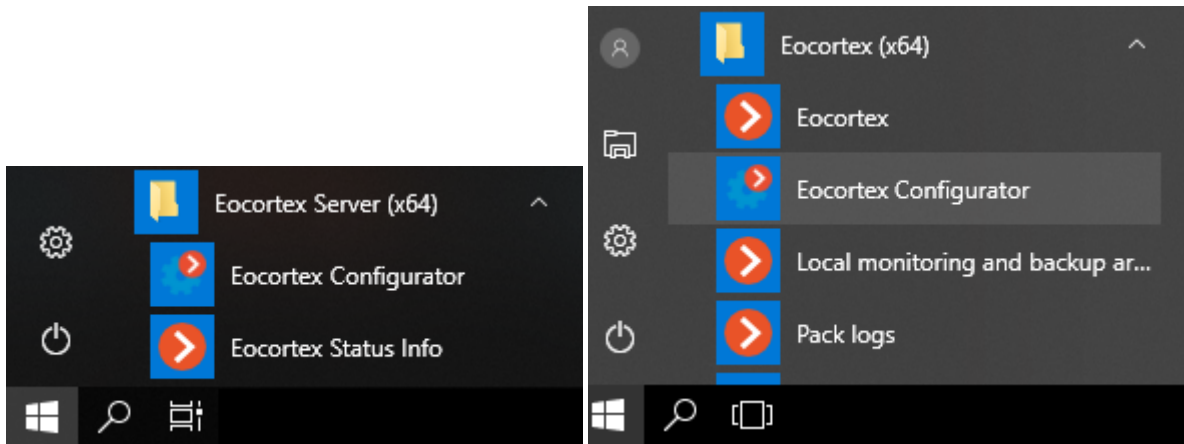
## Launching Eocortex Configurator

-  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

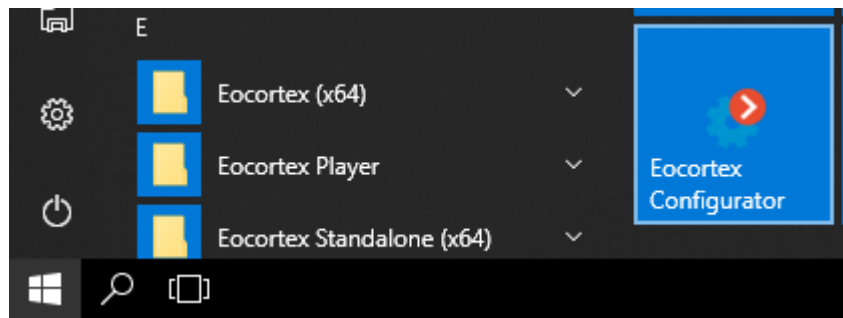
- ① the connection via the **Eocortex Configurator** or directly connect to the **Main server**, or to the server that has access to the **Main server** at the moment.

There are several ways to launch the application:

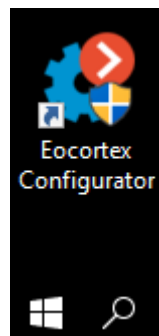
- From the Start menu  ;



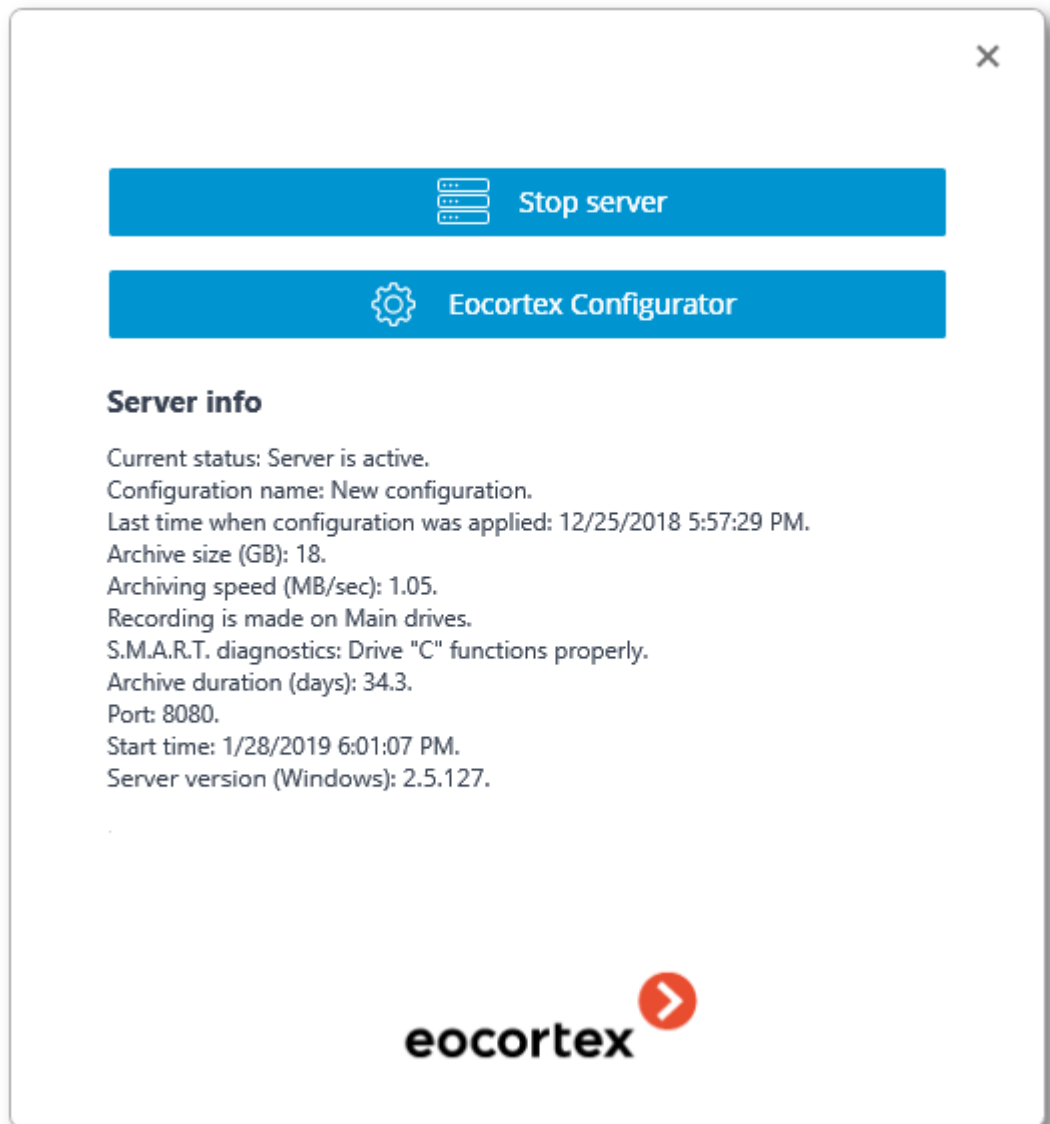
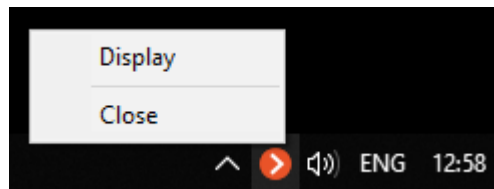
- From the Windows Start screen;



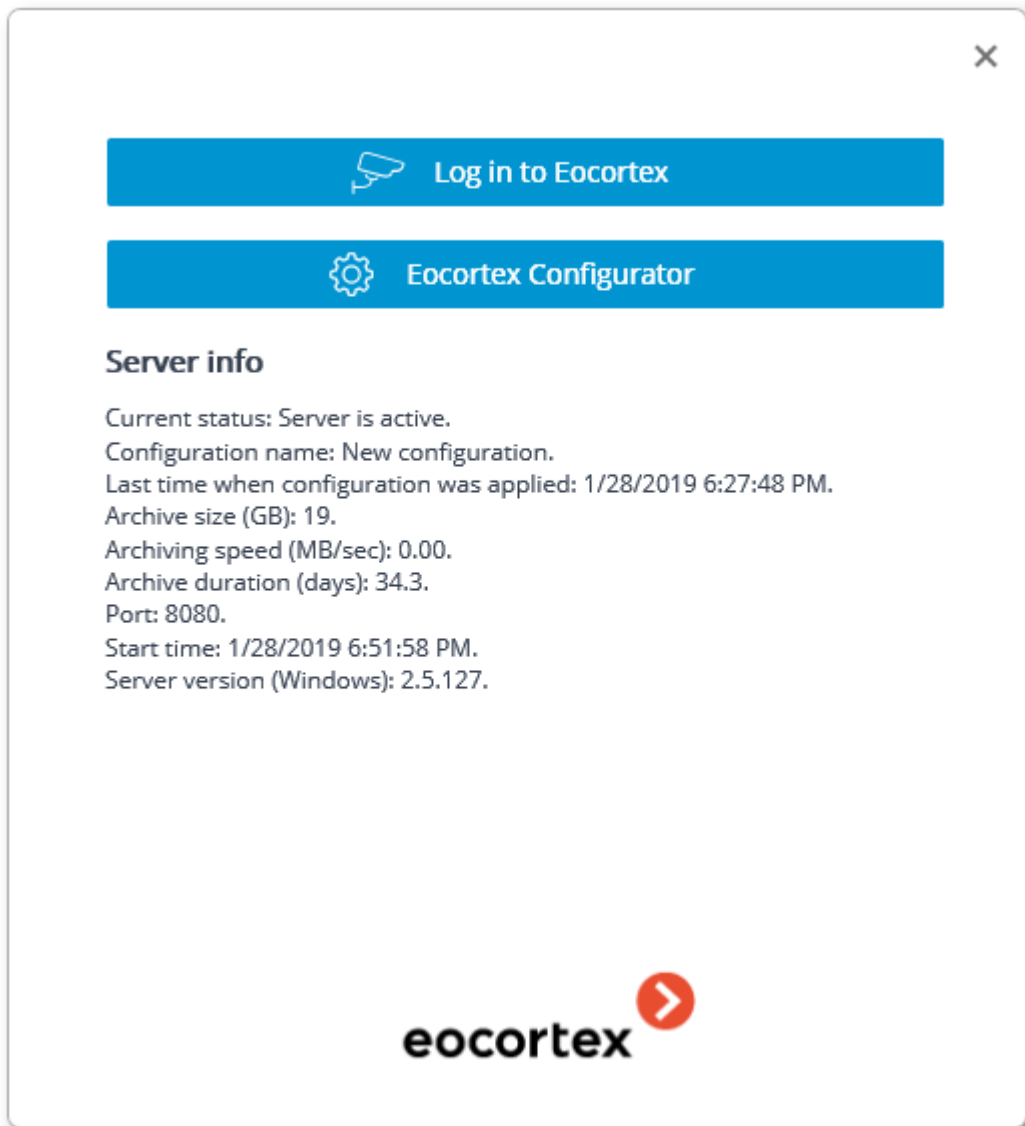
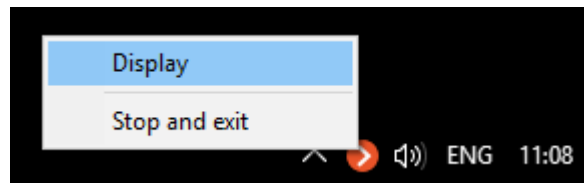
- Using the icon on the Desktop;



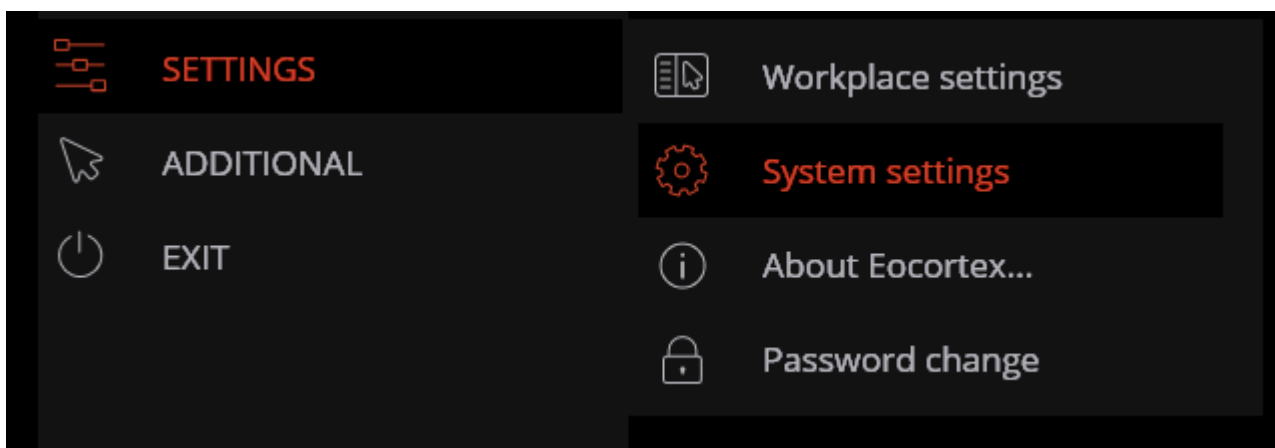
- From the **Eocortex Server Info** utility window;



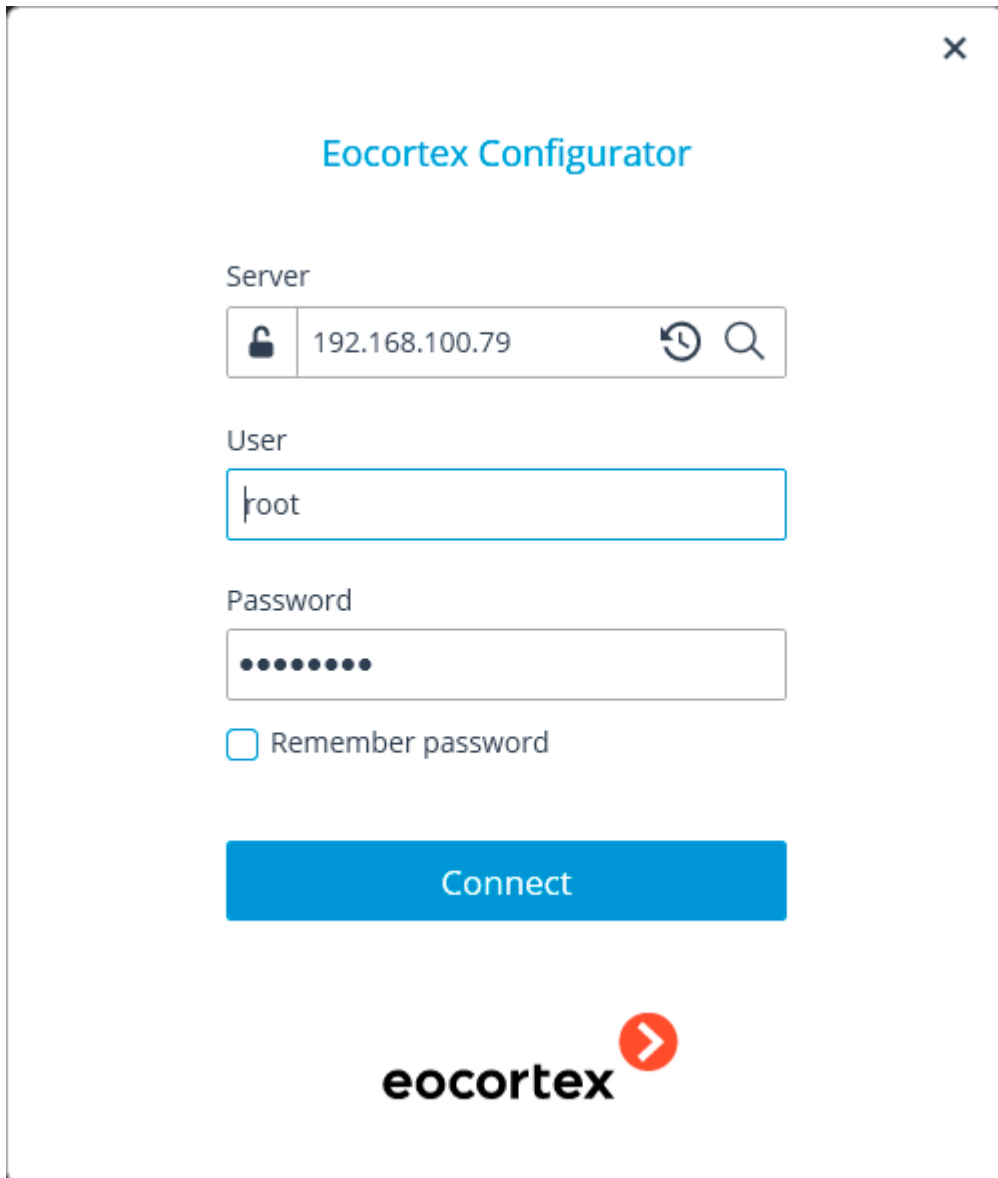
- From the **Eocortex Standalone** application start window;





- 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 username and password, then press the **Connect** button.




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.

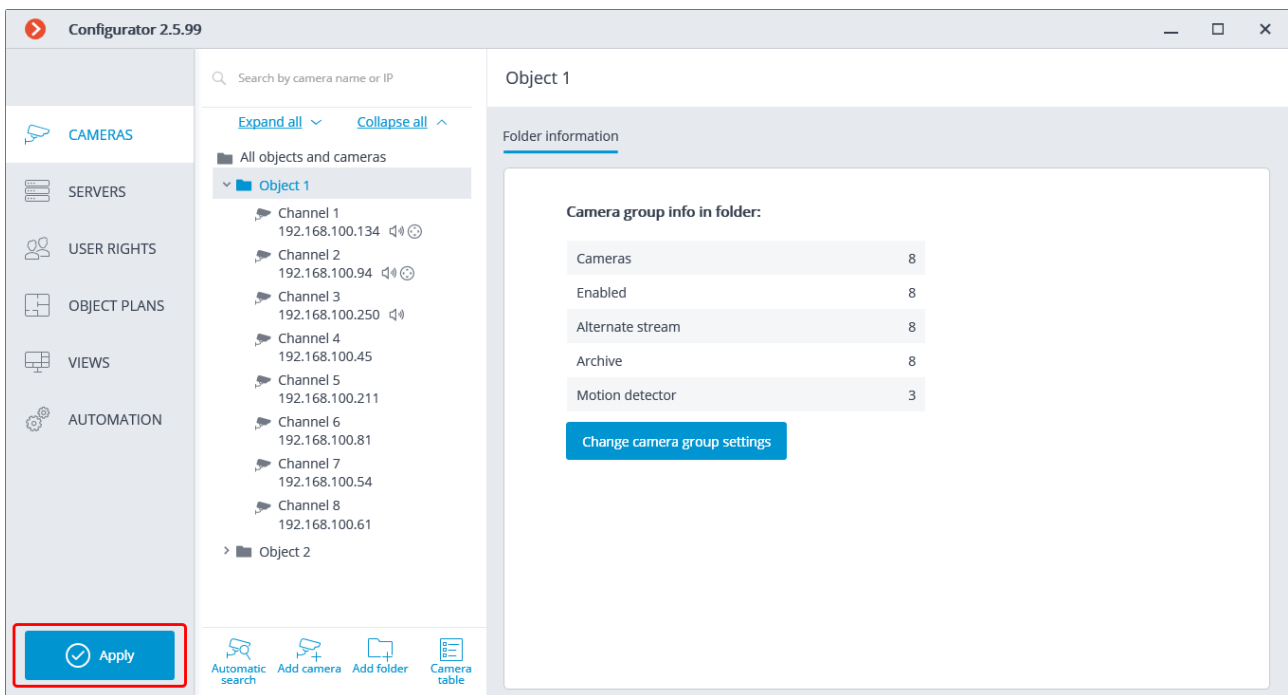
 During the initial installation on the **Eocortex** server the **root** user with an empty password is created. This user has a full set of rights. In the course of setting up user authorities it is recommended to change the username and password of this user. Client connection port is **8080** by default; if required, it can be changed in the **Eocortex Configurator** application.



Following the successful authorization, the main window of the **Eocortex 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.

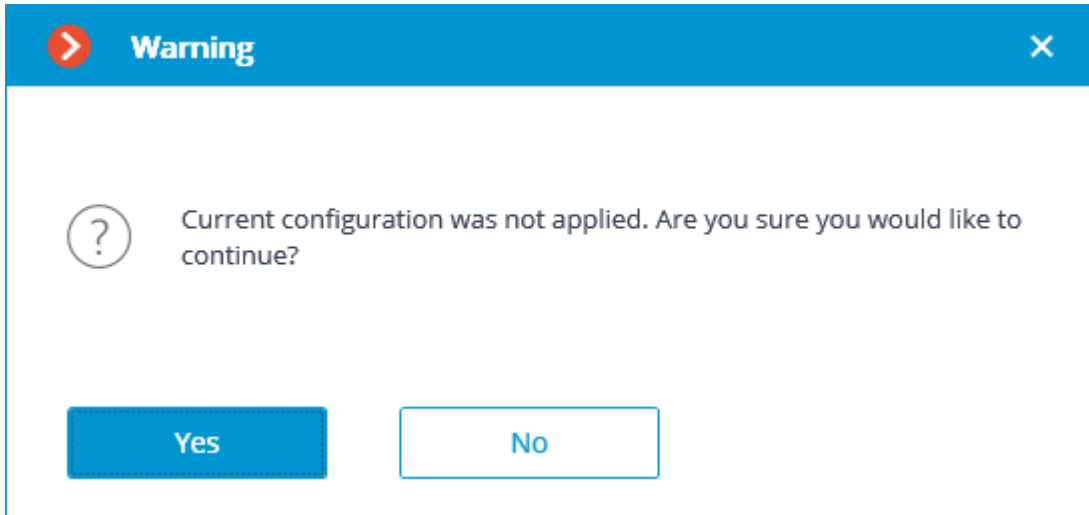


 The  **Apply** button will be visible only in case there are unapplied changes in the configuration. Titles of the settings tabs with the unapplied changes are marked by an asterisk.

 At an attempt of exiting the **Eocortex Configurator** application without applying the



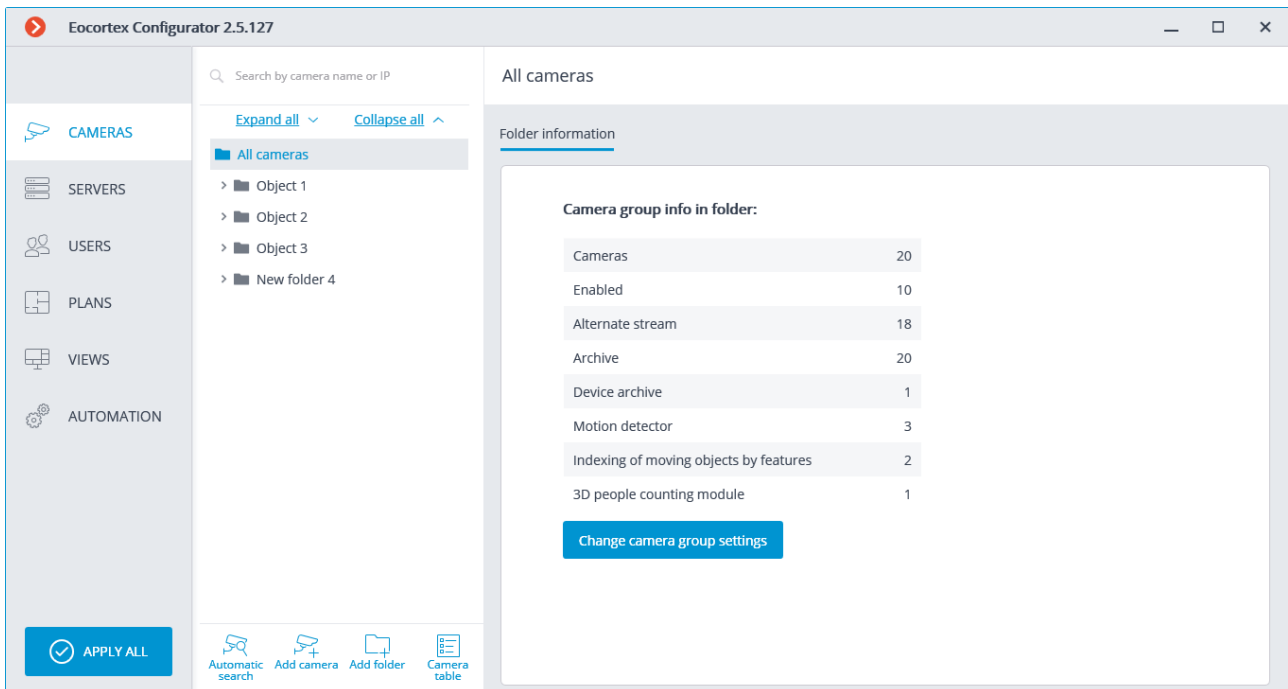
 changes, the Warning window will appear.




In order to return and apply the changes, press the **No** button. To exit without applying settings, press **Yes**.


## Camera settings

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,

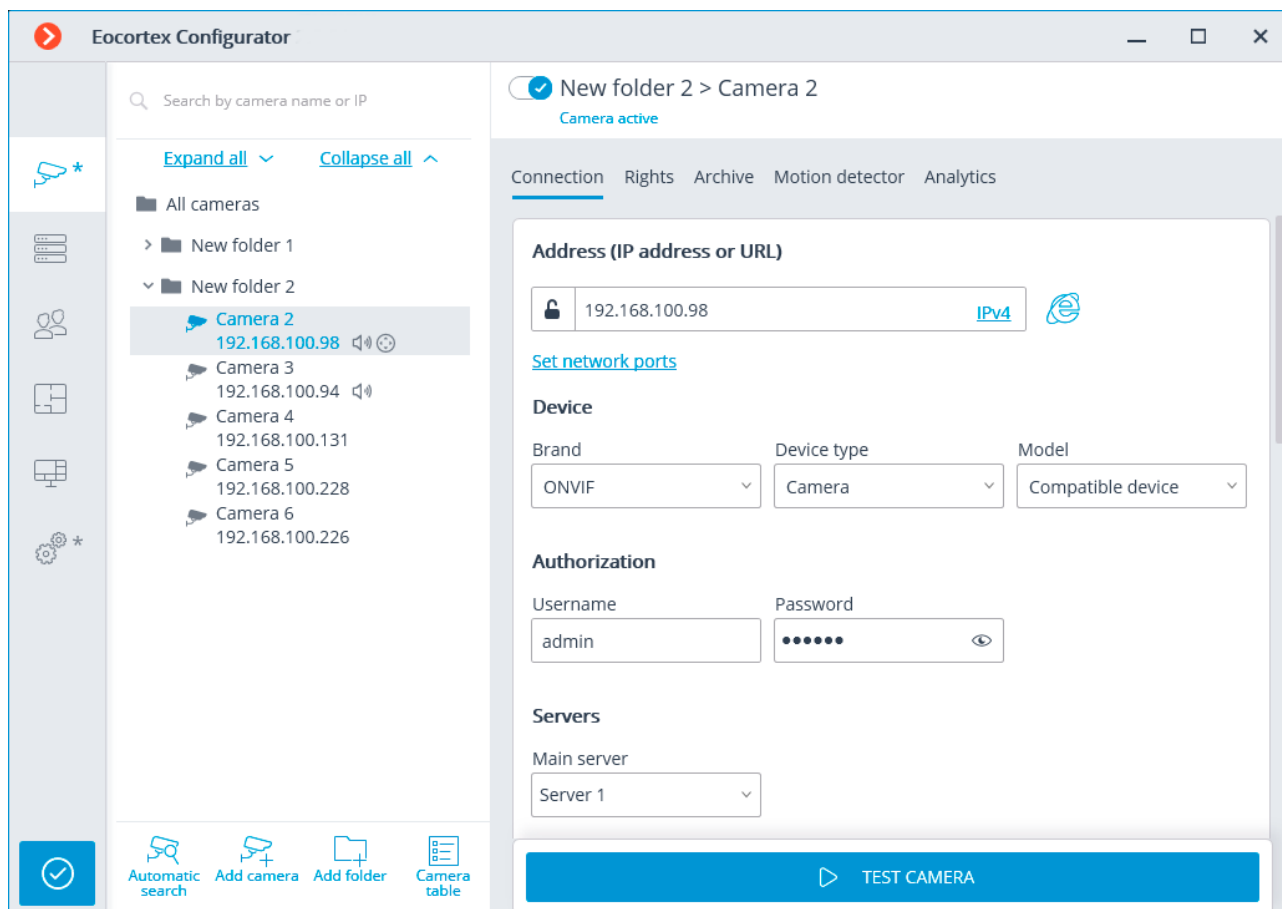
as well as video recorders, door phones, sound capture devices, thermal cameras, and digital to analog converters

 Not all the features of the devices are supported by **Eocortex** even if such features are available in the **Eocortex Configurator** application.


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.

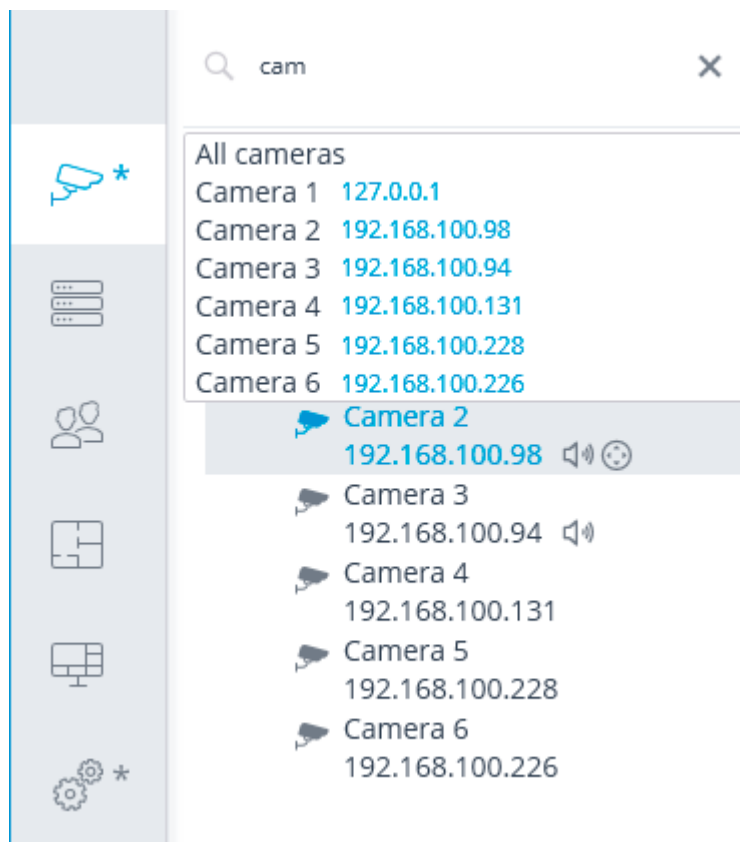
For example, a single-server system has a license for 100 IP cameras and 2 channels with face recognition installed. At that, 100 cameras are connected to the server, and the face recognition operates on two of the channels. If 20 cameras are disconnected, including one face recognition channel, it will be possible to connect 20 cameras more, including one camera with face recognition feature.

The camera settings page contains several tabs:



- [Connection](#) — camera connection parameters.
- [Rights](#) — camera access rights.
- [Archive](#) — camera archive settings.
- [Motion detector](#) — motion detector settings.
- [Analytics](#) — video analytics settings.

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.
- **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**.
- **Delete** 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** (**Ctrl + C** shortcut) copy camera or folder to the clipboard for its subsequent pasting.
- **Cut** (**Ctrl + X** shortcut) copy camera or folder to the clipboard for its subsequent moving.
- **Paste** (**Ctrl + V** shortcut) 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-2xxxxxx, 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			
Camera 11	192.168.100.13	Compatible	H.264				

[Export](#)


OK

## 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.

Connection Rights Archive Motion detector Analytics

**Address (IP address or URL)**


192.168.100.98 [IPv4](#) 

[Set network ports](#)

**Device**

Brand: ONVIF Device type: Camera Model: Compatible device

**Authorization**


Username: admin Password: ●●●●●● 

**Servers**

Main server: Server 1

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](#)


[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 thru 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.

It is also necessary to set the manufacturer and the model of the camera.

- ① The connection of cameras the manufacturers or model of which are not in the list is described in [Camera connection features](#) section.
- ① 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
[blurred]	Video recorder	[blurred]

Video recorder licensing mode is enabled. Recording to archive and video analysis are not available in this mode.




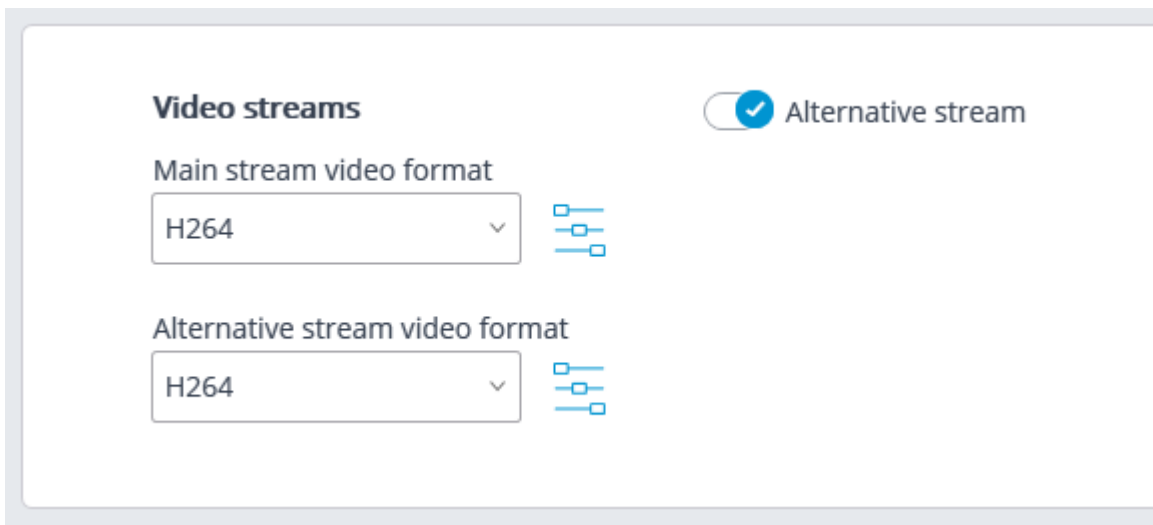



### Device

Brand	Device type	Model
<input type="text" value=""/>	<input type="text" value="Door phone"/>	<input type="text" value=""/>

If in order to connect to the camera it is required to log in, **Username** and **Password** must be set. In the multi-server system, it is required to indicate which server will be the main one for the camera. In case of the availability of the redundancy licenses it is also possible to set the redundancy server for the camera.

Pressing the  button attempts to open the camera in a web browser.



In the **Video streams** group of settings, the reception of the alternative video stream is enabled in case it is required, as well as the parameters of each video stream are set: the codec is indicated in the dropdown list, and the additional video stream settings window is opened by pressing the  button.



More details regarding the video streams can be found in the [Using two streams](#) section.



The parameters available in the **Additional** window may differ depending on the camera models.



Setting camera parameters from the **Eocortex Configurator** application is available for a limited list of camera models.

### Additional settings

**Stream settings**

Resolution: 1280 x 1024 (5:4)  Use camera settings

Frames per second, fps: 30  Use camera settings

Compression level: min.  max.  Use camera settings

Profile: profile1  Use camera settings

Media path:

Additional connection parameters:

Rotate stream: Do not rotate RTSP transport: By default

**Shared settings**  Use Keep-Alive settings

Use alternate decoder H.264/MPEG4  RTSP Keep-Alive

Use H.264 decoding on video card  RTCP Keep-Alive

### Additional

Sound reception  Audio output


PTZ capabilities  Alarm inputs/outputs

Narrow bandwidth camera  Connection via server

[Checking](#) [Test](#) [Select microphone](#) [Test](#)

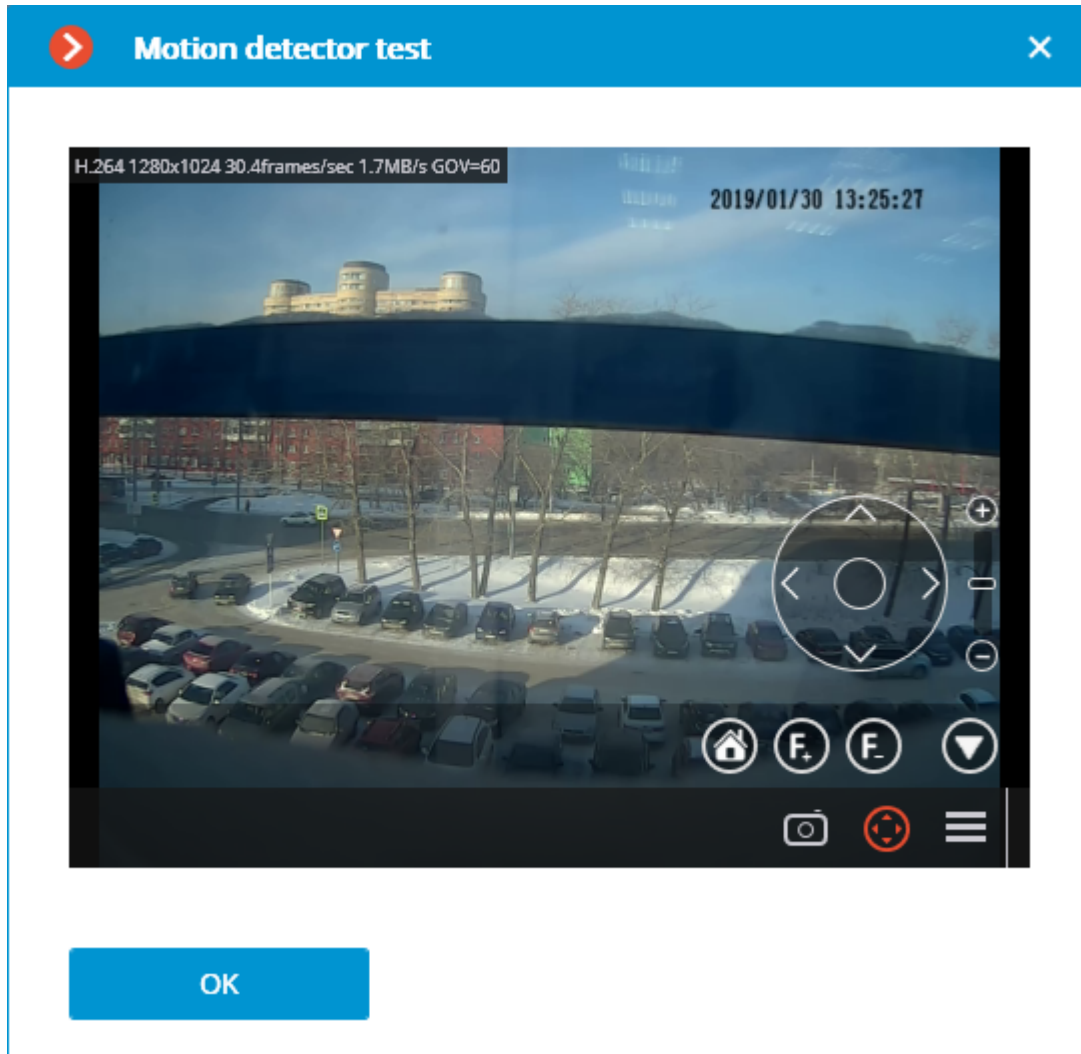
The following settings are available in the **Additional** group of settings.


**Sound reception:** enables the reception of sound from the camera.

**Sound transmission:** 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.

**Tour setup** ✕



No PTZ tours exist for the camera

[Add PTZ patrolling](#)

**OK**

**Tour setup** ✕

New PTZ patrolling 1 ✕ ✎

New PTZ patrolling 2

[Add PTZ patrolling](#)

Preset number	Duration of stay (seconds)	Actions
1	10	↑ ↓ ✕
2	10	↑ ↓ ✕
3	10	↑ ↓ ✕

[Add preset](#)

Continue PTZ patrolling after user input

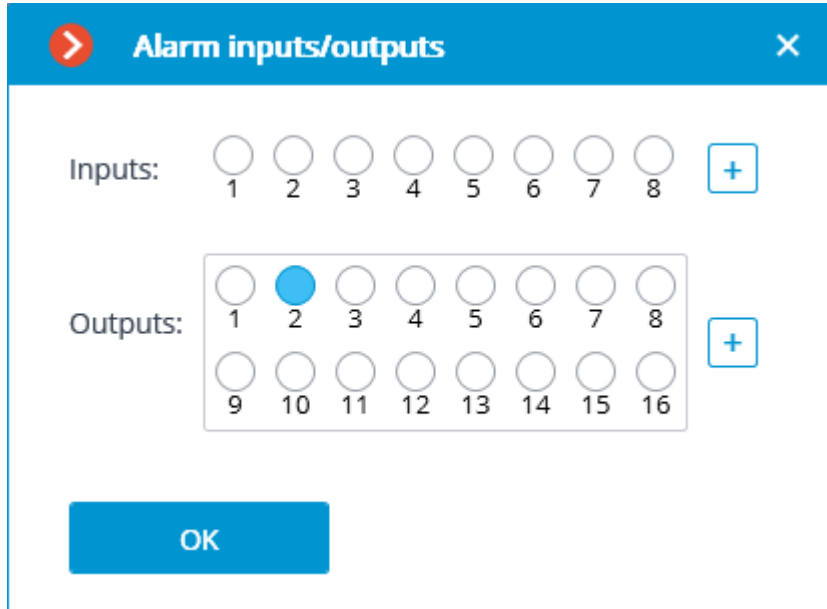
Continue PTZ patrolling mode From last preset ▼

Upon the expiry of  seconds

**OK**

**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.

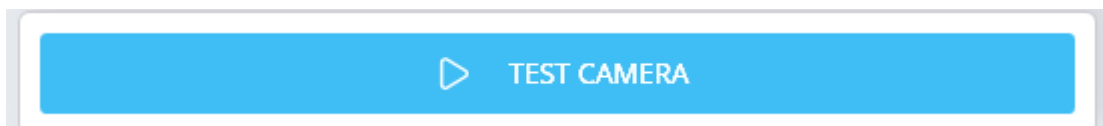
- ⓘ If a position is selected in the **Model** field that corresponds not to a particular camera model but to a model range, the **PTZ capabilities** option will be available on the condition that the PTZ camera feature support is implemented for at least one model from the selected range. That is why 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.

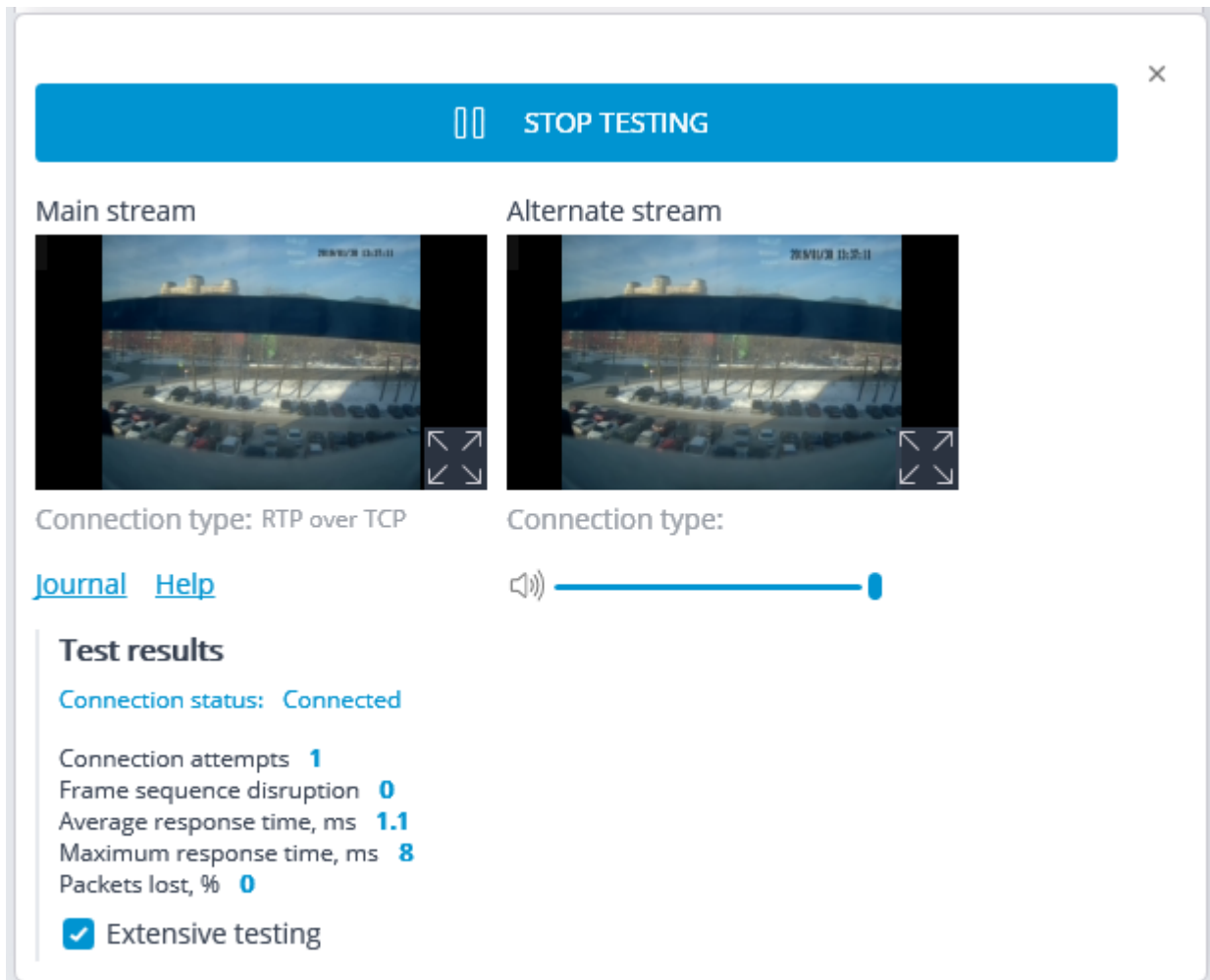
**Connection via server:** when this option is enabled, the video streams to the client workplaces will be transmitted thru the server.

- ⓘ 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 thru server ensures only one connection to the camera for any quantity of the client workplaces.

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/SupportedCameras) 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).

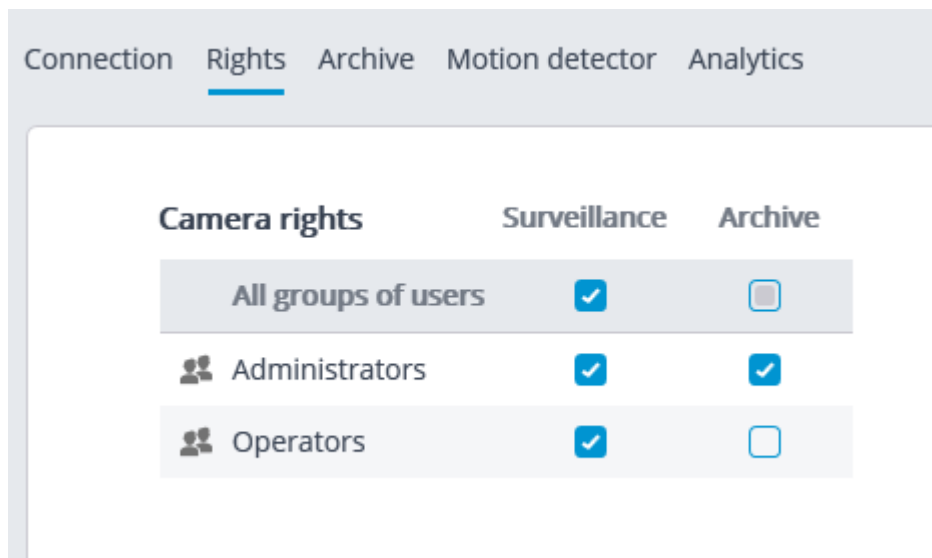
- If the camera supports **ONVIF** or **PSIA** standards, it is required to manually indicate its address, login/password, select its manufacturer and set other parameters.
- If the camera supports **HTTP** connection for receiving **Motion JPEG**, or **RTSP/RTP** connection for receiving MJPEG, it is 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**.

## Access rights settings

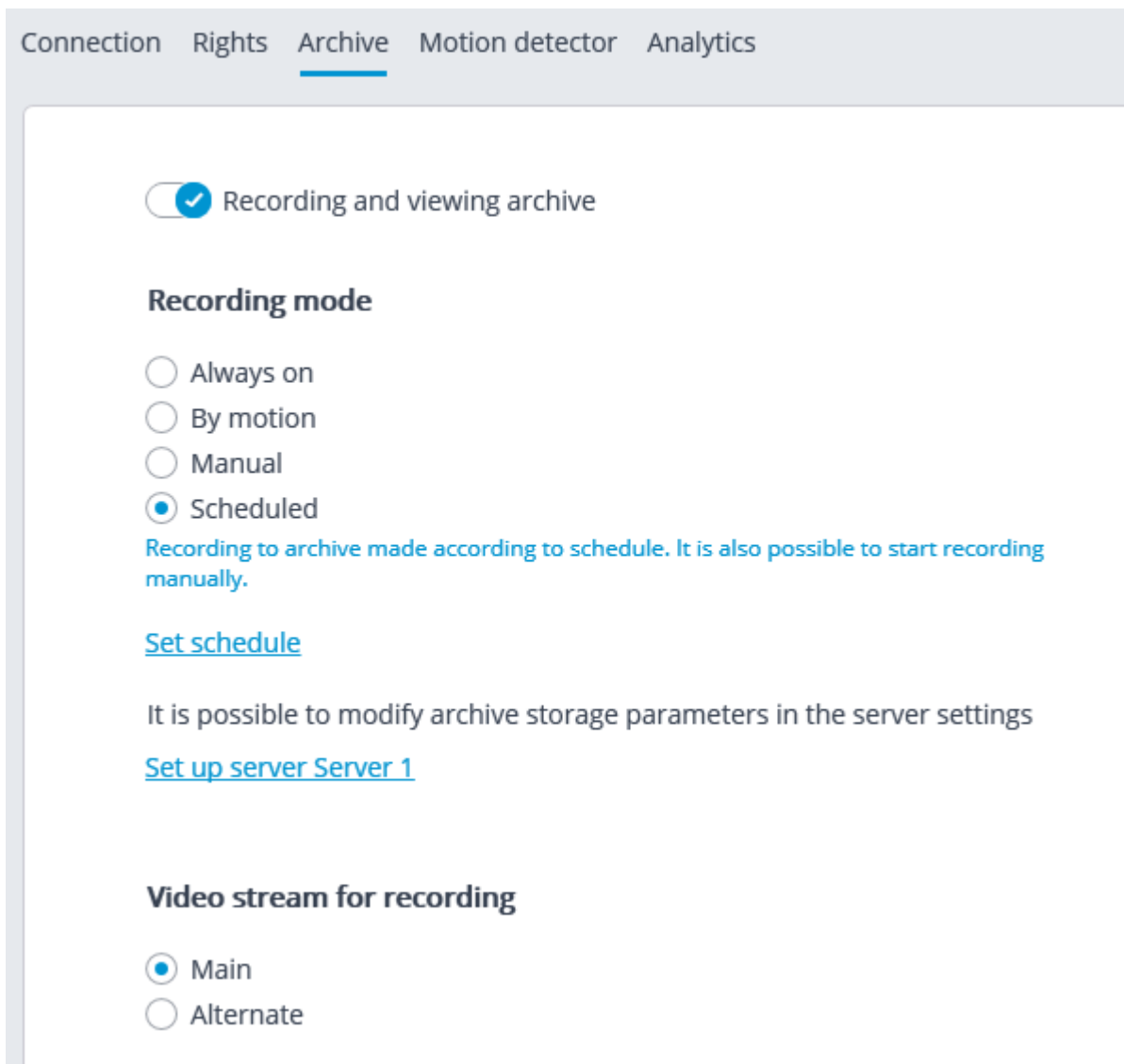
The **Rights** tab allows to set up camera access rights.



Camera rights	Surveillance	Archive
All groups of users	<input checked="" type="checkbox"/>	<input type="checkbox"/>
 Administrators	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
 Operators	<input checked="" type="checkbox"/>	<input type="checkbox"/>

## 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.

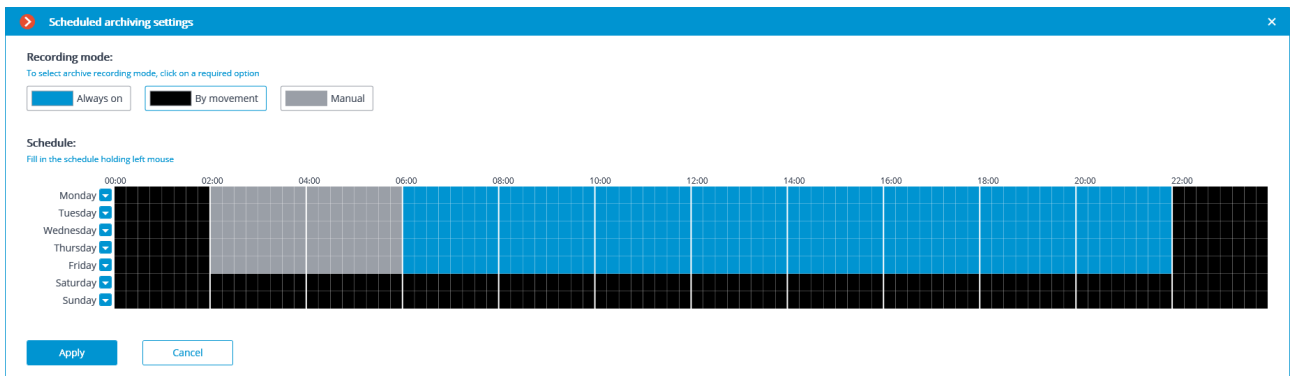
**Recording and viewing archive:** enables recording the video and audio from a camera to archive.

**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 (i)

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 archiv.**

**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.

**Usage of archive on data storage card:** enables access of **Eocortex** applications to the data storage card on the camera.

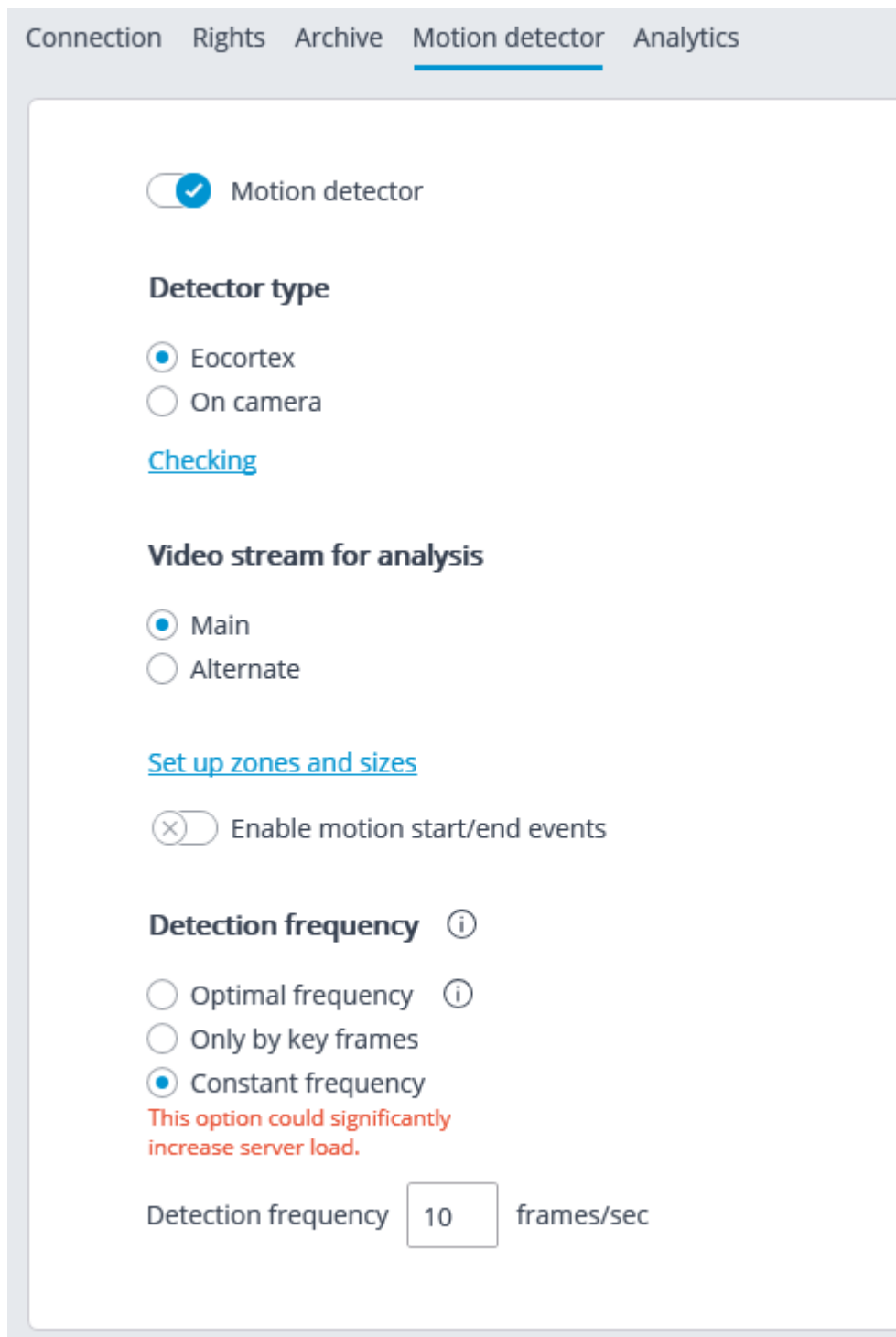
**Synchronizing with main archive:** if this option is enabled, the archive from camera will be downloaded to **Eocortex** server, but only of those periods when no connection with camera was available or the server was down.



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.

## 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.

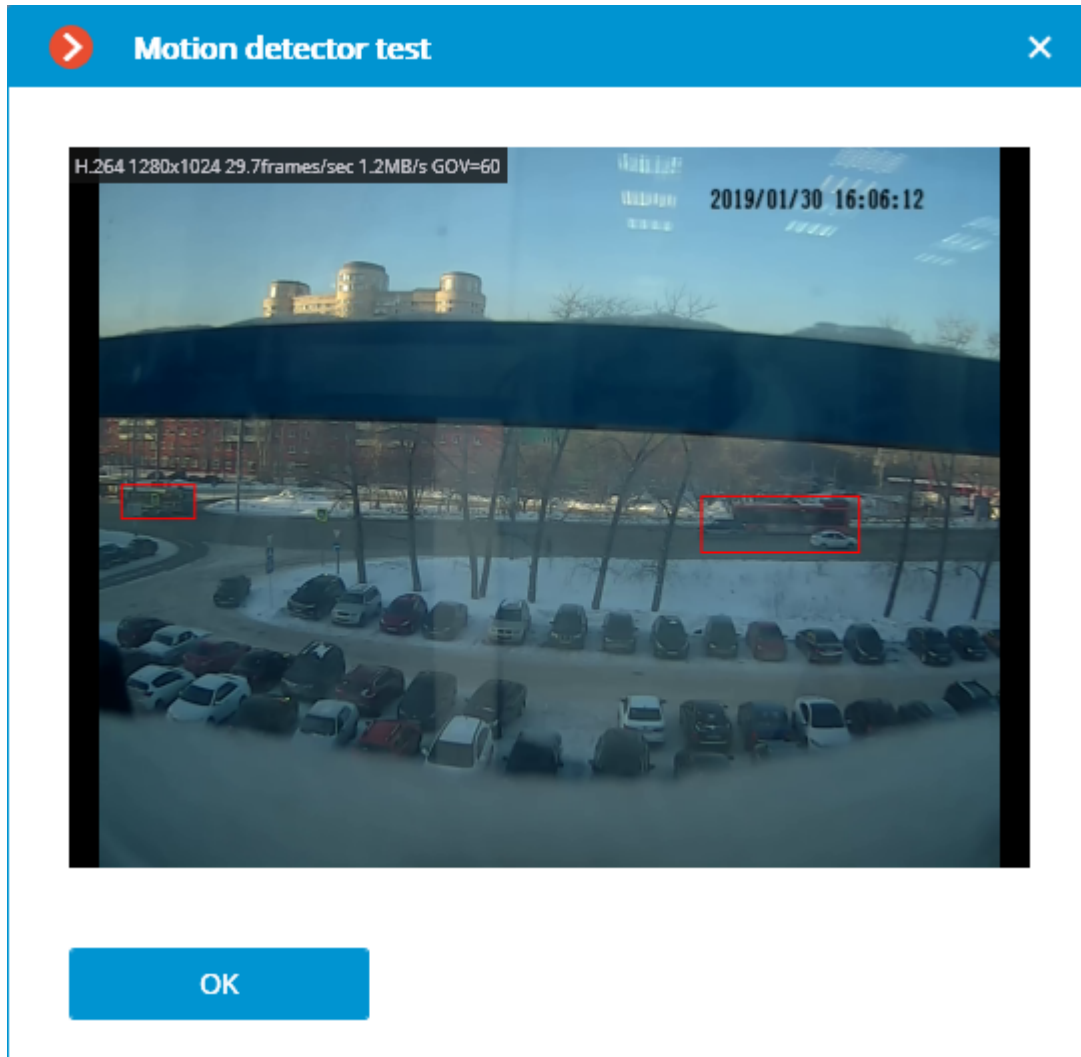
**Detector type:** determines which motion detector will be used:

- **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.

**Zones and sizes** ✕

**Zones**

Zone 1 ✎


[Add zone](#)

Size Zone

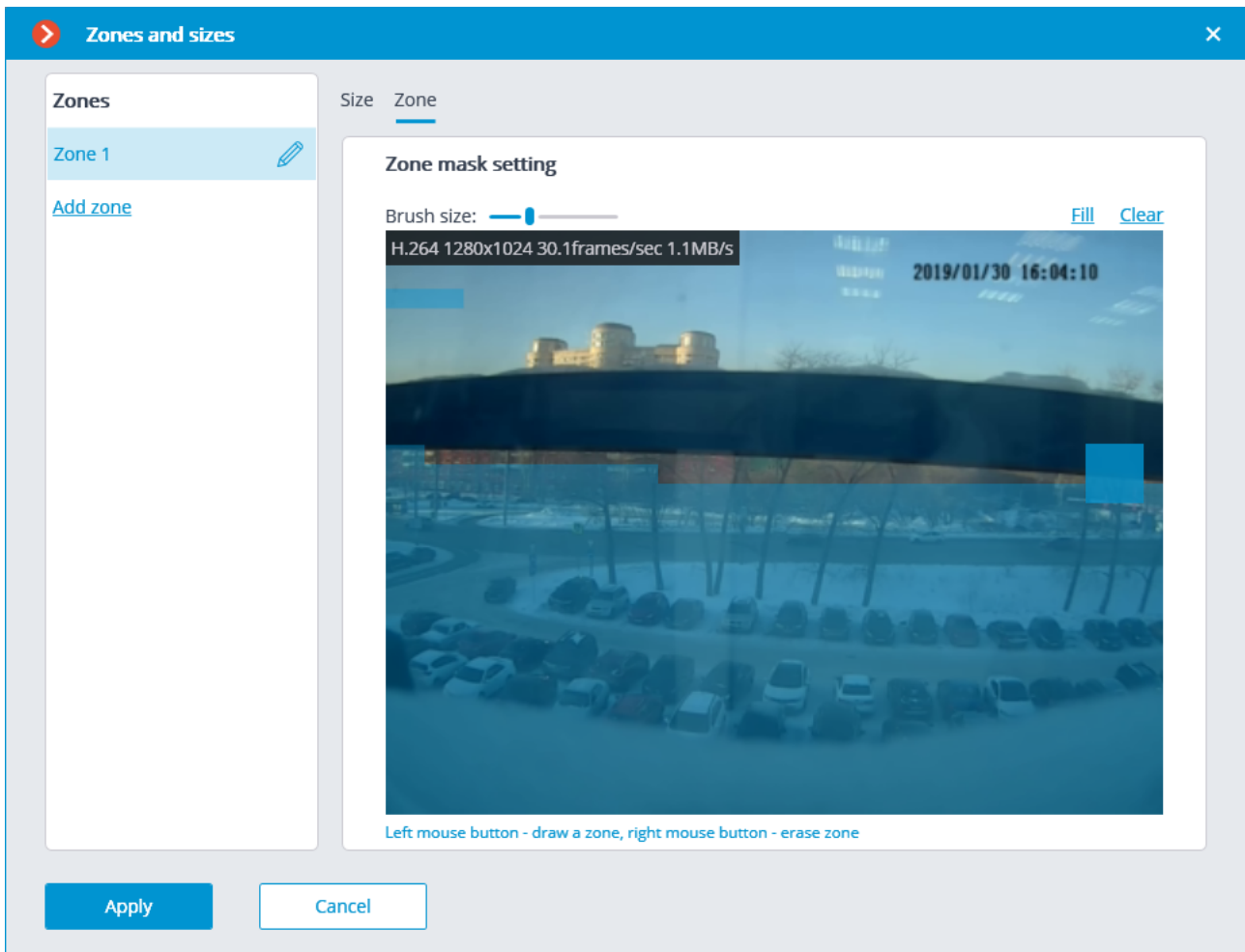
Real timeArchive

41280x1024 29.9frames/sec 1.1MB/s

2019/01/30 16:03:18



ApplyCancel



**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.

Since the software motion detector is used in the operation of all video analysis modules, it must be enabled always when the modules are used.

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.

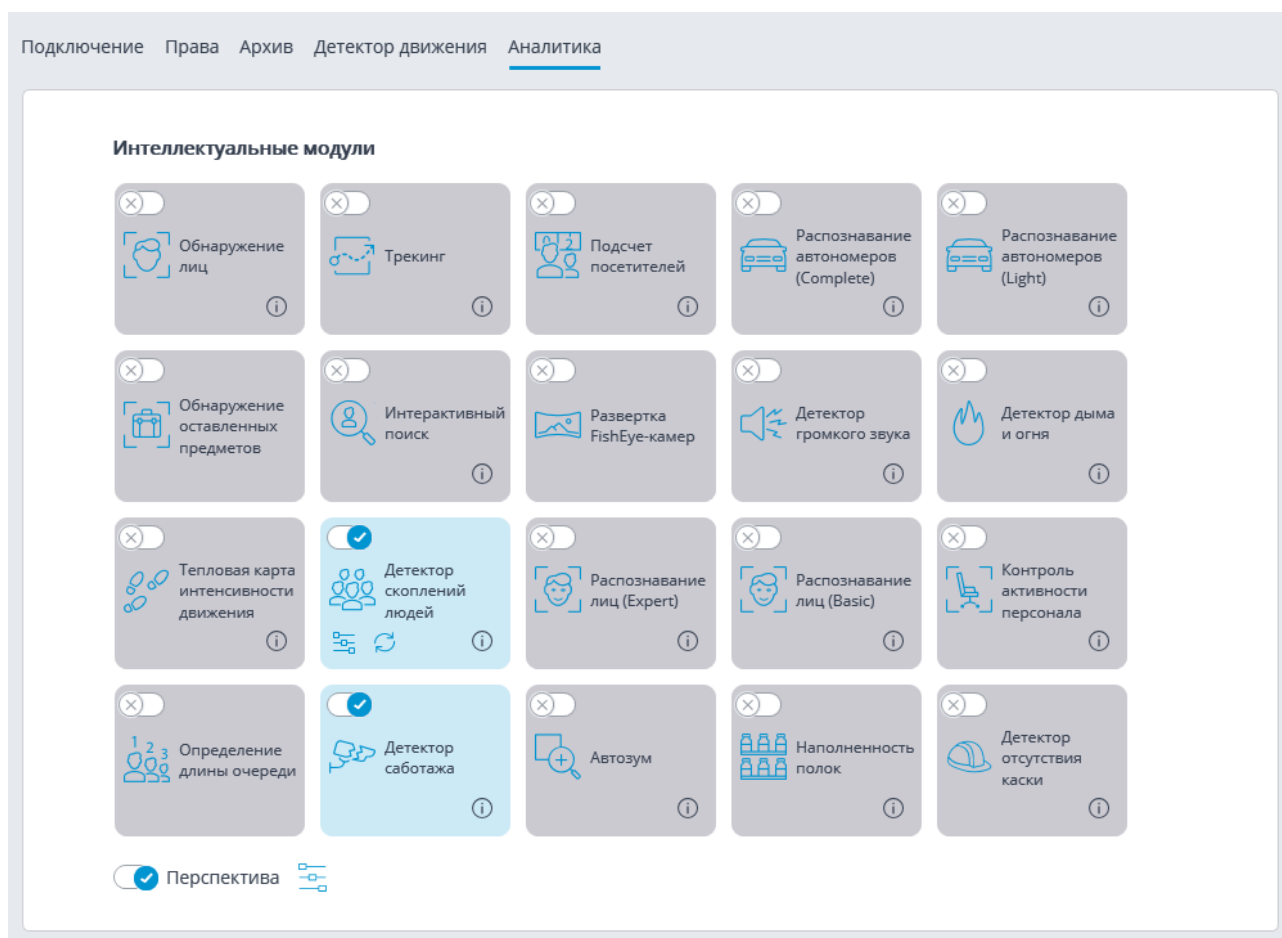
At the same time, it is possible to set constant detection frequency in the software motion detector settings in the **Eocortex Configurator** application. It is advisable to use this mode when the optimal

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 two streams from a camera are used, the motion is by default detected on the alternative 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.

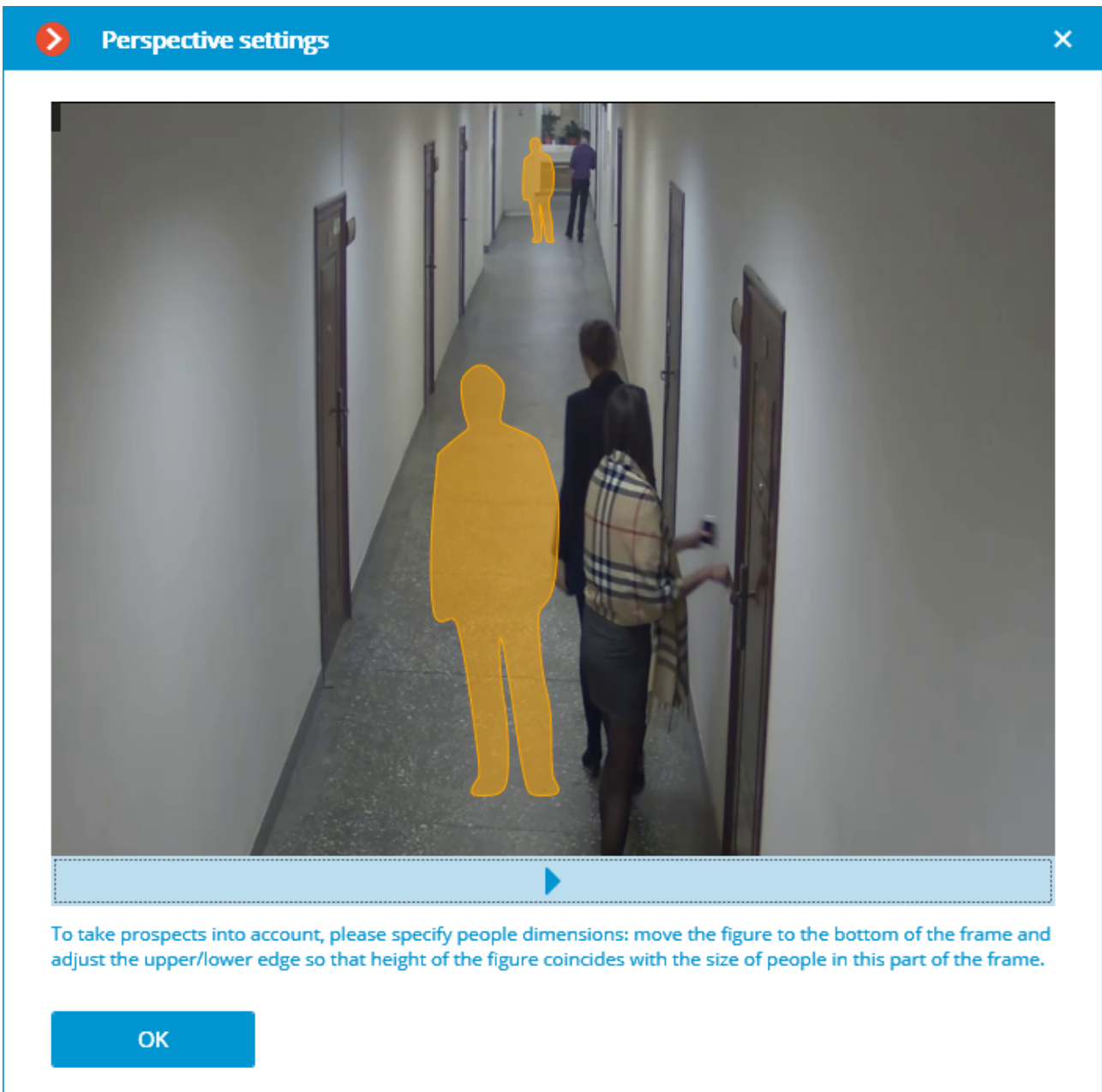
For enabling or disabling a video analytics module that analyzes the video stream set in the settings of the motion detector it is required to enable  or disable  the corresponding switch.


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.

## 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 displays a camera management interface. On the left, a search bar is at the top with the text 'Search by camera name or IP'. Below it are 'Expand all' and 'Collapse all' buttons. The folder tree shows 'All cameras' expanded to 'Object 1', which contains 'Group 1.1' (with four cameras: Camera 1, Camera 2, Camera 3, and Camera 4) and 'Group 1.2'. 'Object 2' and 'Object 3' are also visible, with 'Object 3' containing 'Camera 21'. At the bottom of the left panel are icons for 'Automatic search', 'Add camera', 'Add folder', and 'Camera table'.

The right panel is titled 'Object 1' and shows 'Folder information'. Under 'Camera group info in folder:', there is a table with the following data:

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 press **Apply**.

**Camera group editing**

Object 1  
Cameras being edited: 8

Connection Rights Archive Motion detector

**i** 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.

**Authorization**

Username Password

**Servers**

Main server Backup server

Server 1

**Video streams** Alternative stream

Main stream video format

H264

Will be applied for camera 8


Alternative stream video format

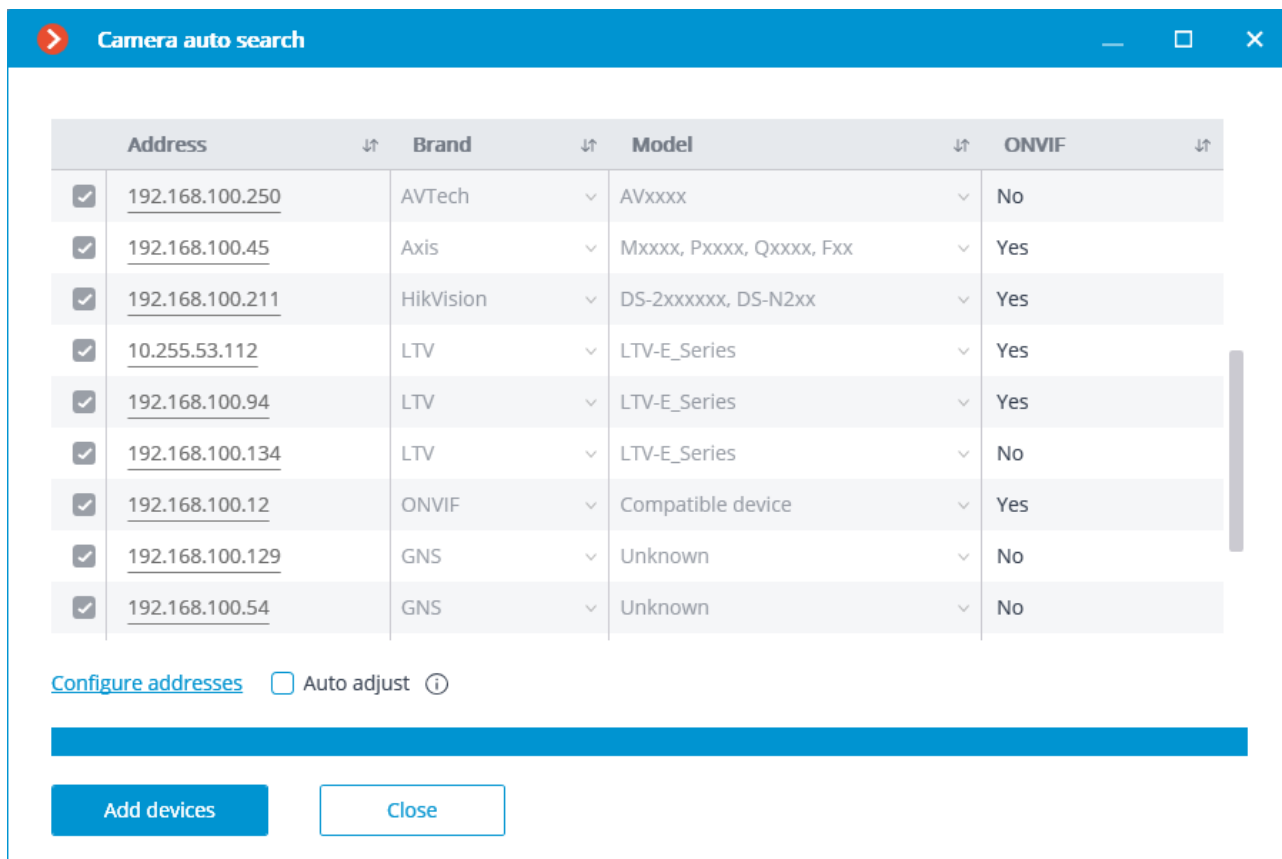
MIPEG

Apply Cancel

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.

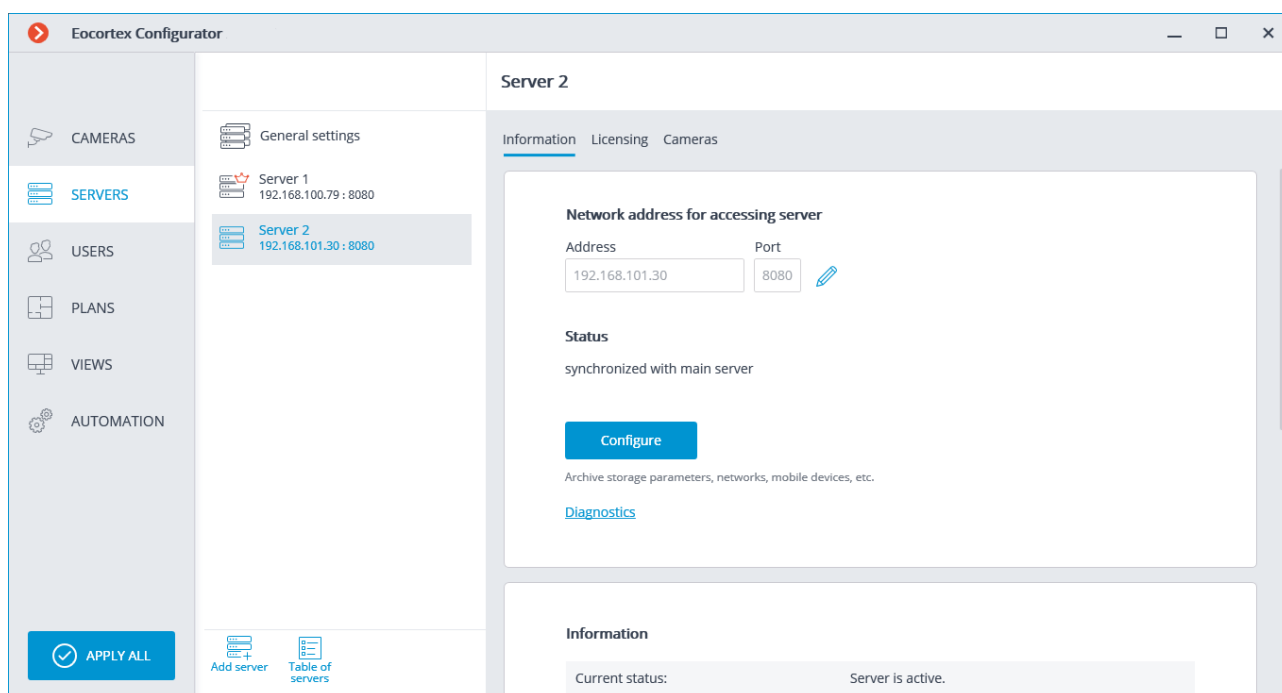


When using the automatic channel setup by **ONVIF**, do the following:


- 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.

## Server setup

For setting up servers in the **Eocortex Configurator** application, go to the  **Servers** tab



Before creating a system consisting of several video servers, it is recommended to read [the description of multi-server system features](#).

The list of servers is shown in the left part of the  **Servers** tab. 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.
  - [Cameras](#): Settings of camera distribution among servers.

- [Archive bookmarks](#) Setting of archive bookmarks' categories.
- [Multicast](#): Multicast transmission setting.



- **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.

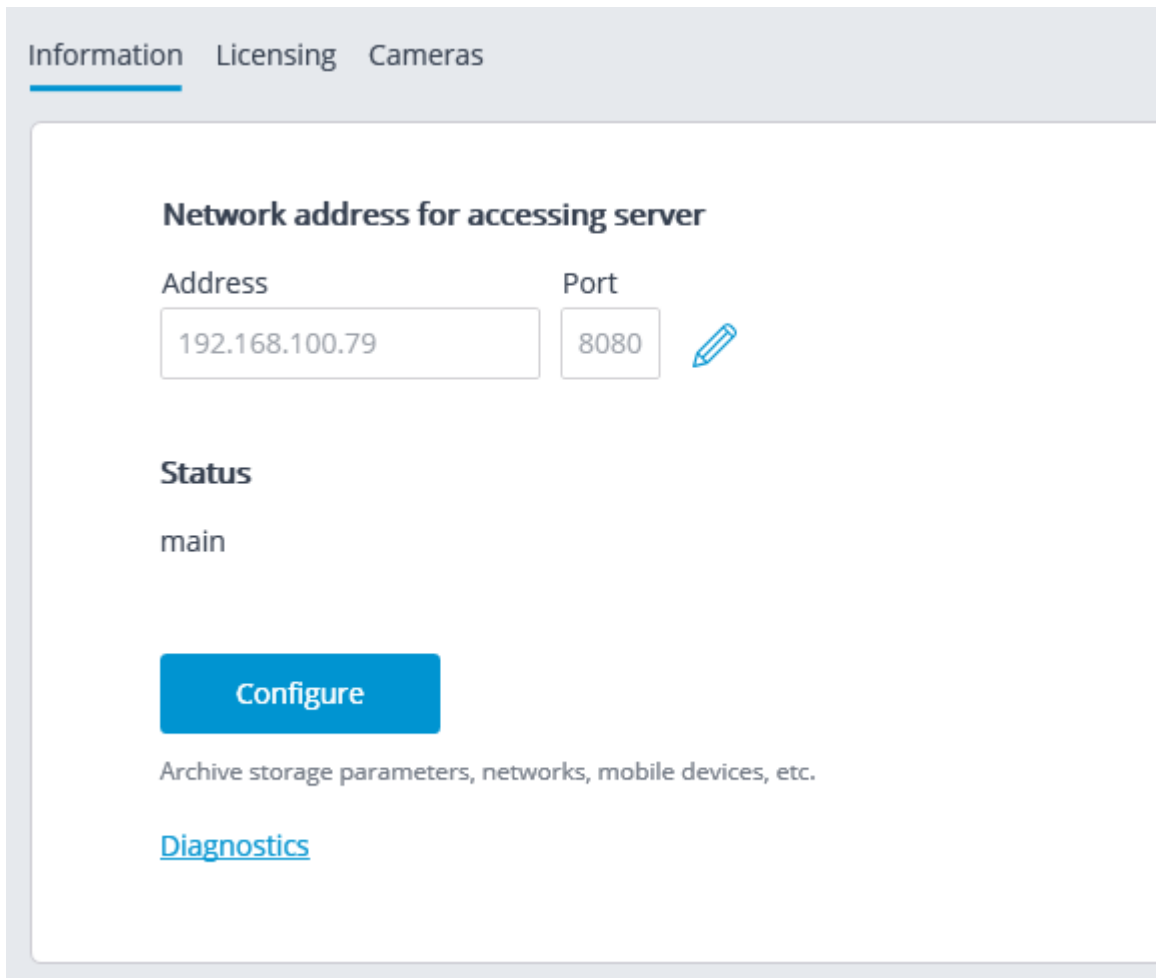




- **Server table**: the list of all the servers in system.


## Main settings and server info

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:





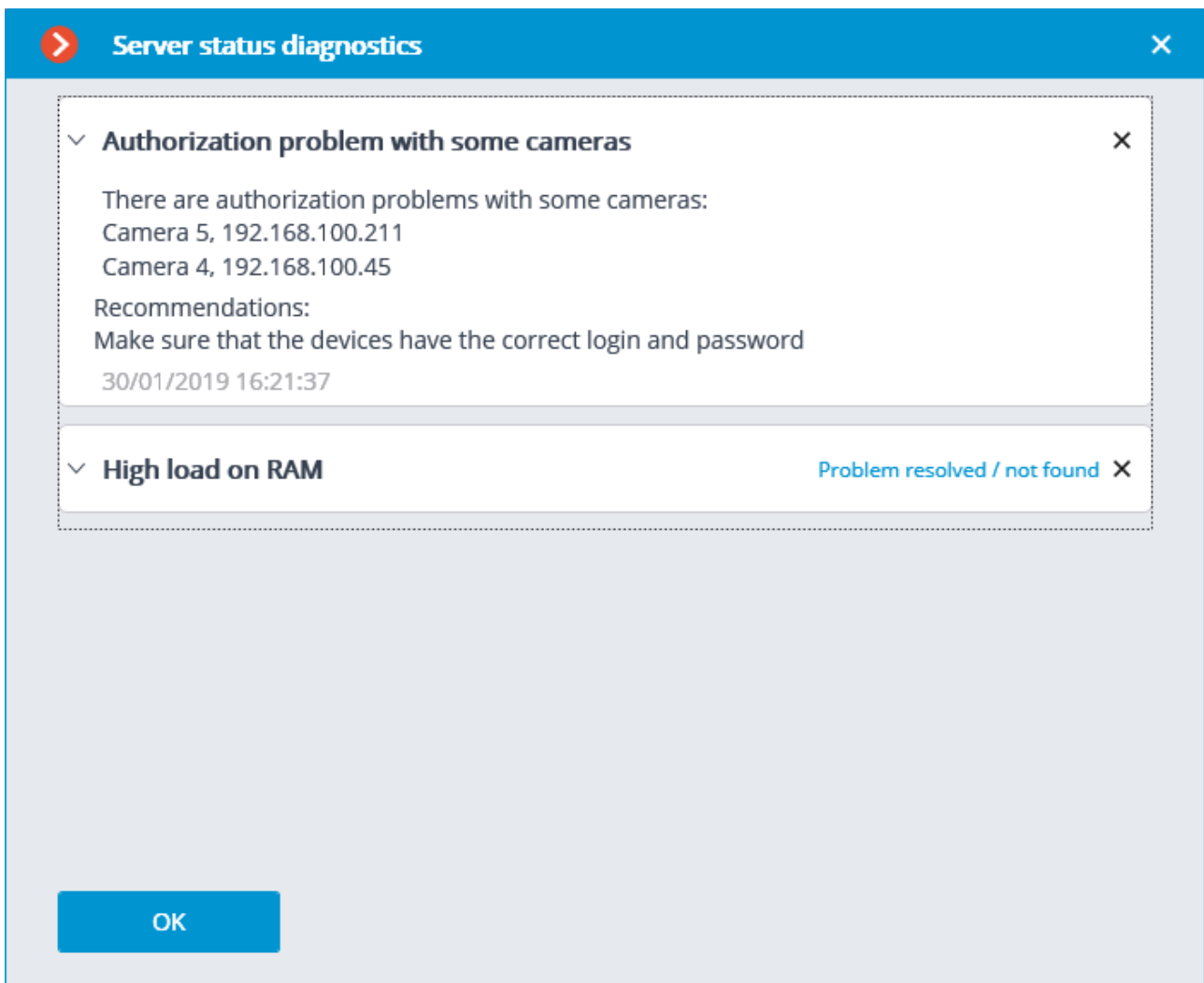
**Network address for accessing server:** network address and server access port are displayed here. To modify the address or port it is required to press the  button, enter the required values, then press the  button.

 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**.

**Status:** displays current server status.

**Configure:** opens [special server settings](#) window.

**Diagnostics:** opens server status diagnostics window.



**i** 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 **X** 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.

Additional	
<input type="checkbox"/>	Fast redundancy ⓘ
<input type="checkbox"/>	Replication server



**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.

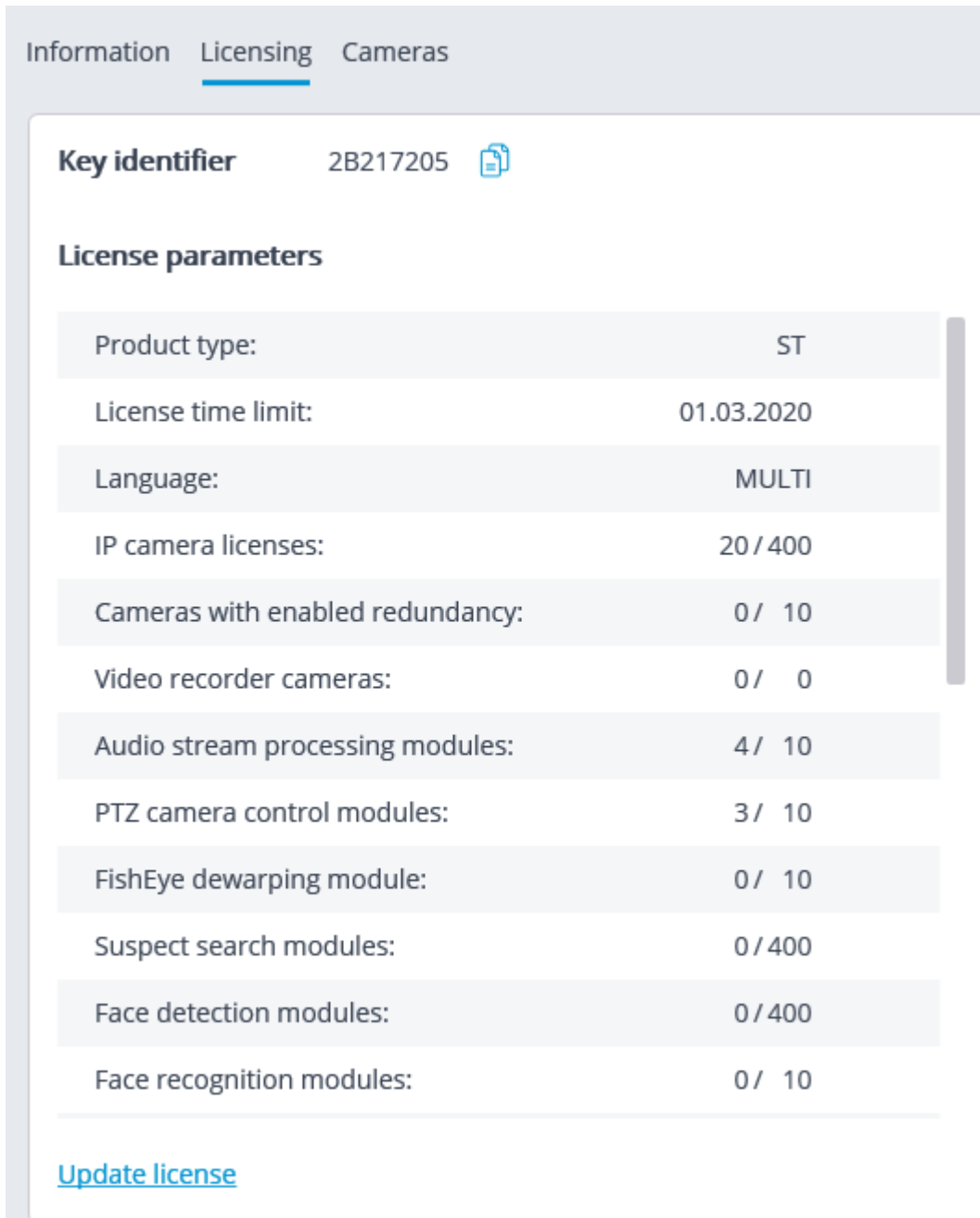


In the systems where periodical, including short-term, disruptions of camera connection are possible, enabling the fast redundancy may result in false redundancy responses.


**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](#)

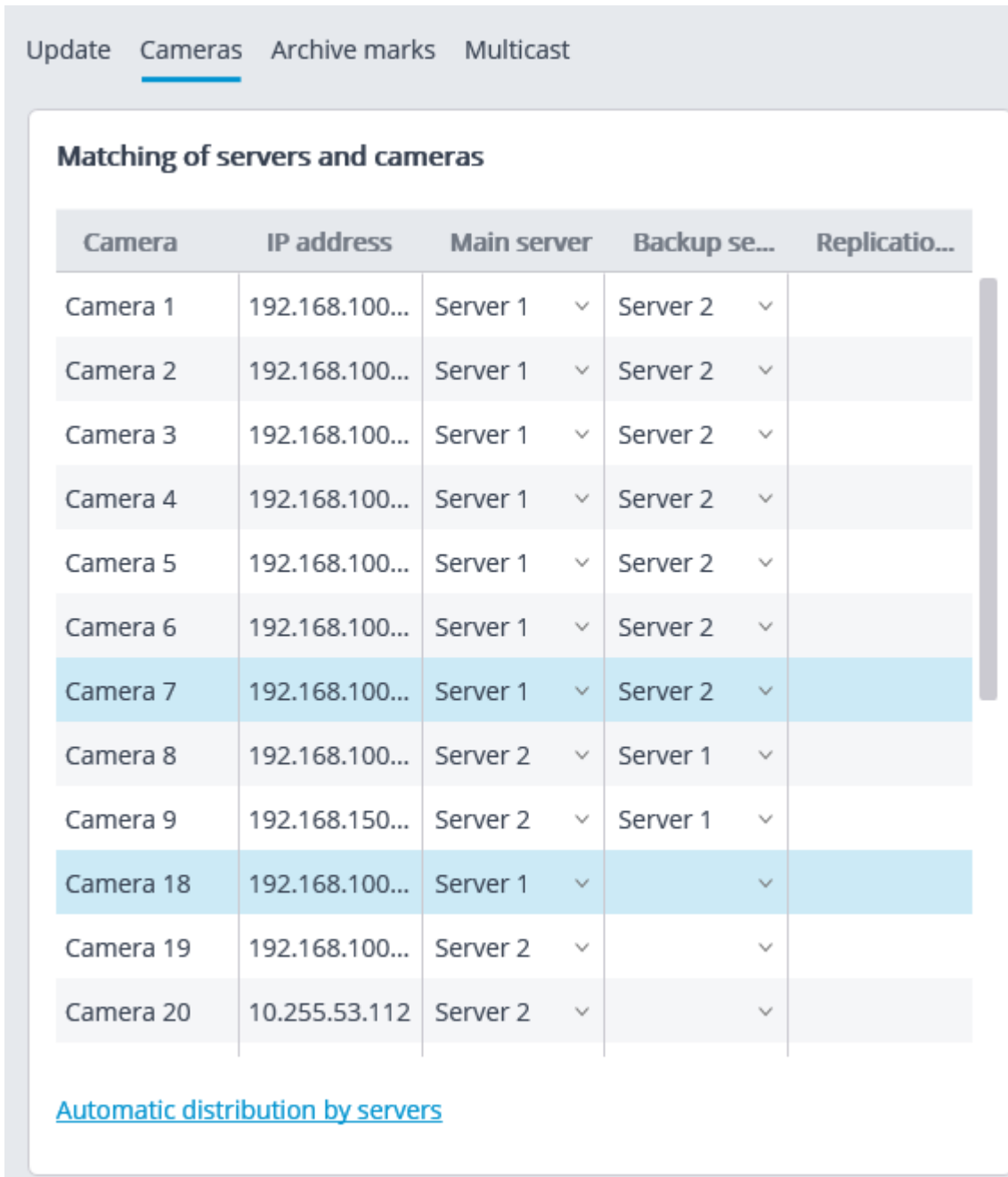
**Key identifier:** the identifier of the active software or hardware **Eocortex** protection key.

**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:



Camera	IP address	Main server	Backup se...	Replicatio...
Camera 1	192.168.100...	Server 1	Server 2	
Camera 2	192.168.100...	Server 1	Server 2	
Camera 3	192.168.100...	Server 1	Server 2	
Camera 4	192.168.100...	Server 1	Server 2	
Camera 5	192.168.100...	Server 1	Server 2	
Camera 6	192.168.100...	Server 1	Server 2	
Camera 7	192.168.100...	Server 1	Server 2	
Camera 8	192.168.100...	Server 2	Server 1	
Camera 9	192.168.150...	Server 2	Server 1	
Camera 18	192.168.100...	Server 1		
Camera 19	192.168.100...	Server 2		
Camera 20	10.255.53.112	Server 2		


[Automatic distribution by servers](#)

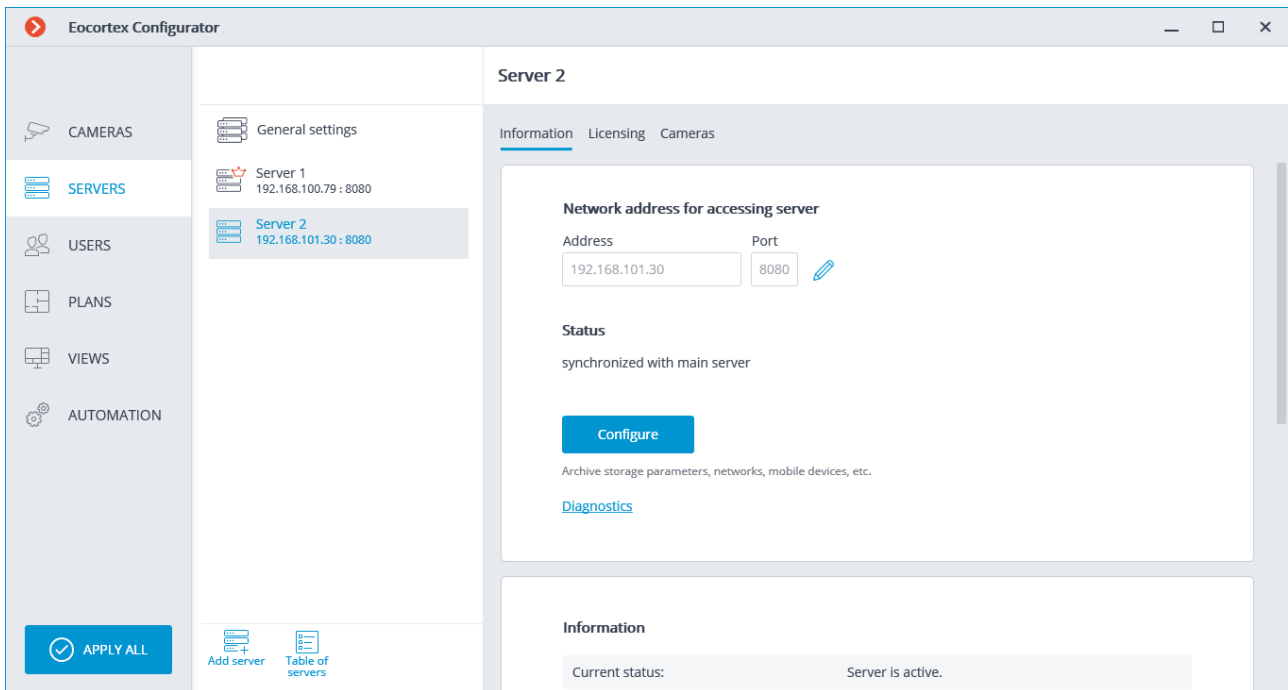
The  button displayed to the right of the camera name when the camera is marked serves for jumping to camera settings.

## 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.



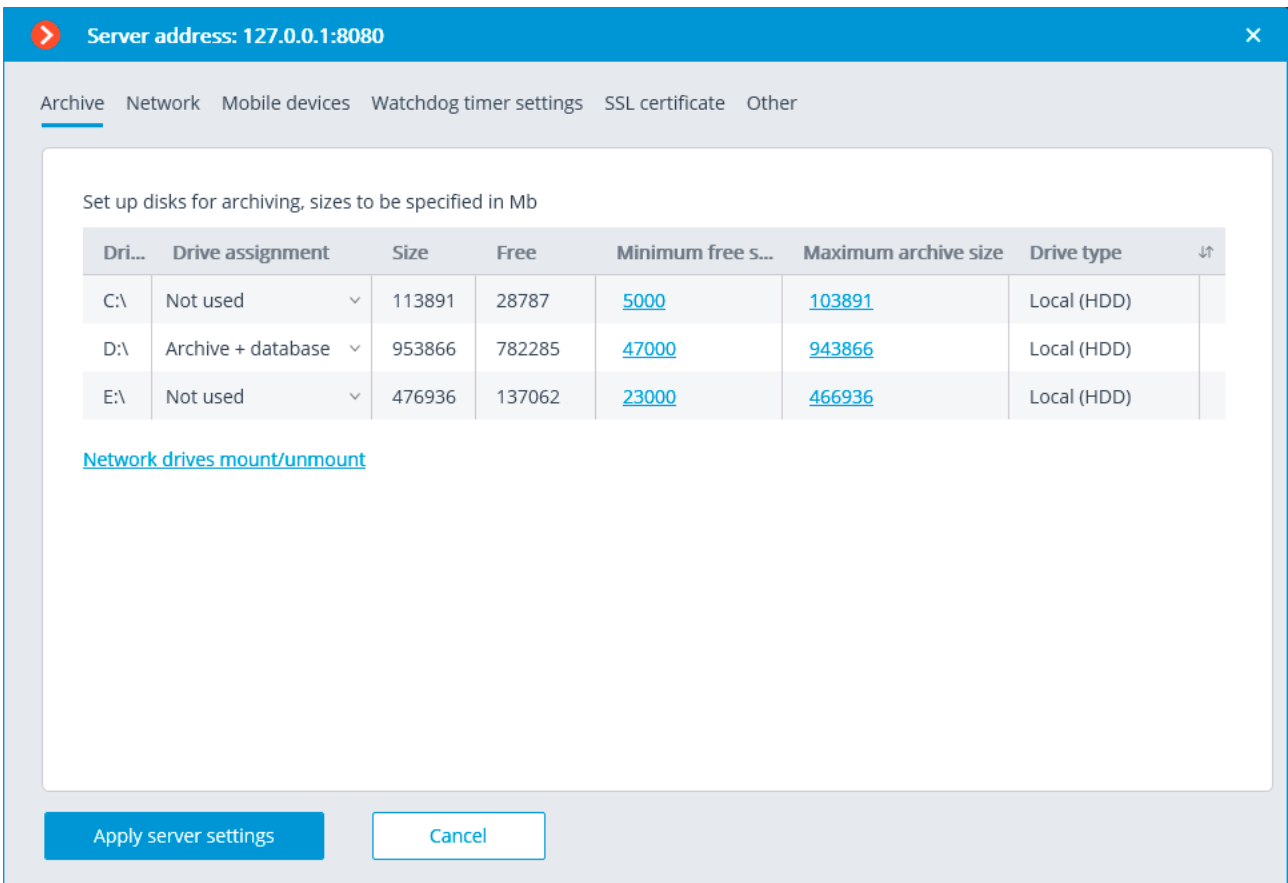
The additional settings window contains the following tabs:

- [Archive](#)
- [Network](#)
- [Mobile devices](#)
- [Watchdog timer settings](#)
- [SSL certificate](#)
- [Other](#)
- [Replication](#)



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

**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.

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.

[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: [masked]


OK Cancel


**i** 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** operation system may lead to the reduction of productivity or system errors.

 It is not recommended to allocate 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.

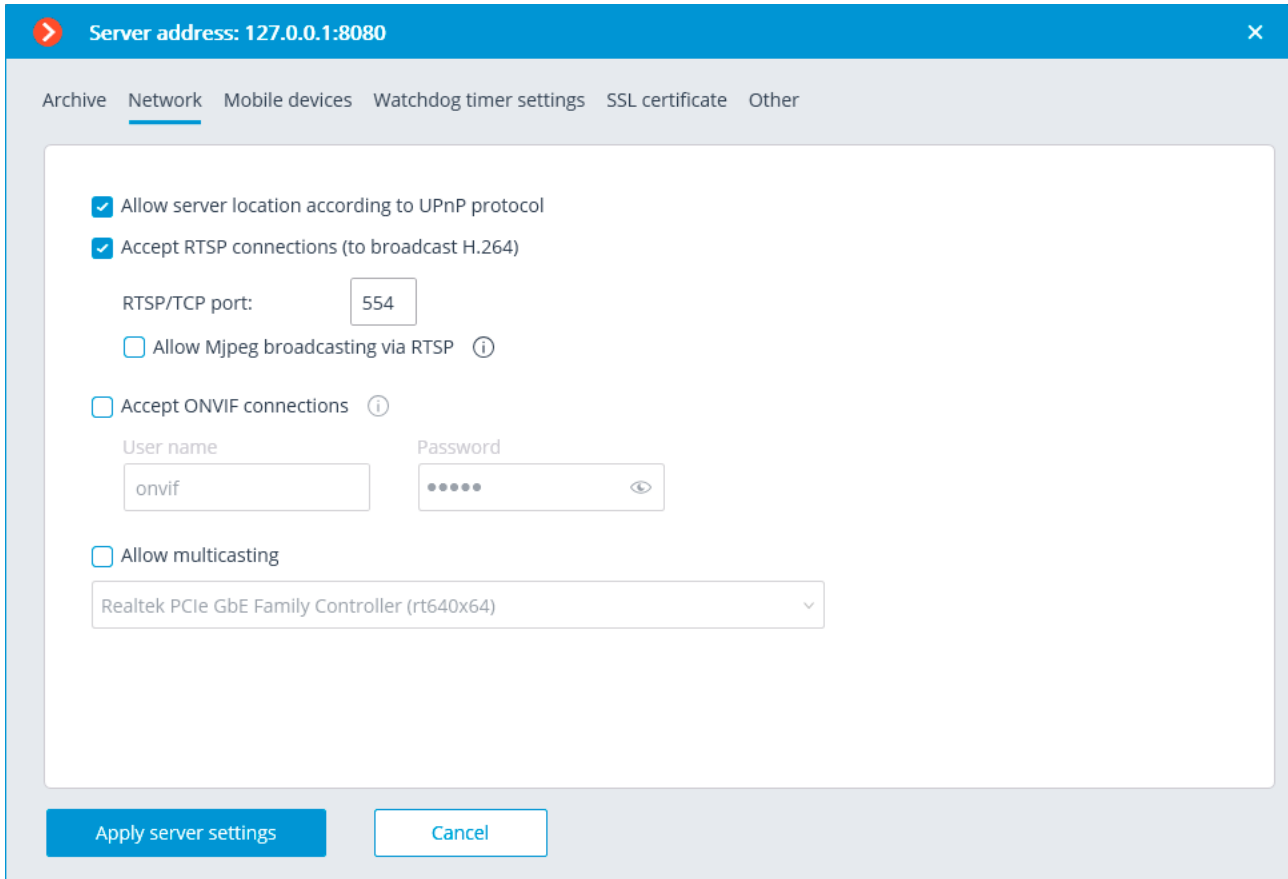
The archive has a cyclic structure. If the space designated for the archive is full, the new archive files begin to replace the oldest ones, taking into consideration the archive depth parameters set for each channel.

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.

## Network




**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

Server address: 127.0.0.1:8080

Archive Network **Mobile devices** Watchdog timer settings SSL certificate Other

Connecting Mobile Devices

In order to connect mobile devices, use the main server port (8080 by default) Mobile devices (iOS, Android, Windows Phone) and Eocortex Web Client can receive video from alternate or main camera stream in the original format, or be re-coded for device capacity by applying extended settings.

**Fullscreen settings**

Resolution

Transfer only anchor frames for H.264/MPEG4 ⓘ

Enable video transfer speed limit  Frames/sec

**Multi-screen settings**

Resolution

Transfer only anchor frames for H.264/MPEG4

Enable video transfer speed limit  Frames/sec

Multi-screen settings (low resolution) ⓘ

**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.

Server address: 127.0.0.1:8080

Archive Network **Mobile devices** Watchdog timer settings SSL certificate Other

**Multi-screen settings**

Resolution 240 x 180

Transfer only anchor frames for H.264/MPEG4

Enable video transfer speed limit 4 Frames/sec

Multi-screen settings (low resolution) ⓘ

Resolution 120 x 90

Transfer only anchor frames for H.264/MPEG4

Enable video transfer speed limit 4 Frames/sec

**Other settings**

Mobile Device server network port: 8089

Connect in proxy mode ⓘ

Limit CPU usage time consumption 50 % ⓘ

Permit sending Push notification

Apply server settings Cancel

### 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.

**Connect in proxy mode:** enables broadcasting in proxy mode. When the proxy mode is activated in multi-server configurations, the broadcasting of video streams from all the servers to the mobile devices connected to the server will be performed thru this server. When the proxy mode is disabled in multi-server configurations, the mobile device will automatically connect to the servers to which the requested cameras are assigned.

**Limit CPU usage time consumption:** allows to limit the consumption of CPU time by the mobile connections service.

**Permit sending Push notification:** enables the possibility of sending various Push notifications from the server to mobile devices.

## Watchdog timer settings

Server address: 127.0.0.1:8080

Archive Network Mobile devices Watchdog timer settings SSL certificate Other

Enable watchdog timer

COM port ⓘ

COM3 [Automatic search](#)

Timeout in minutes

3

[Restart computer](#)

Status: Not connected

Apply server settings Cancel

**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.

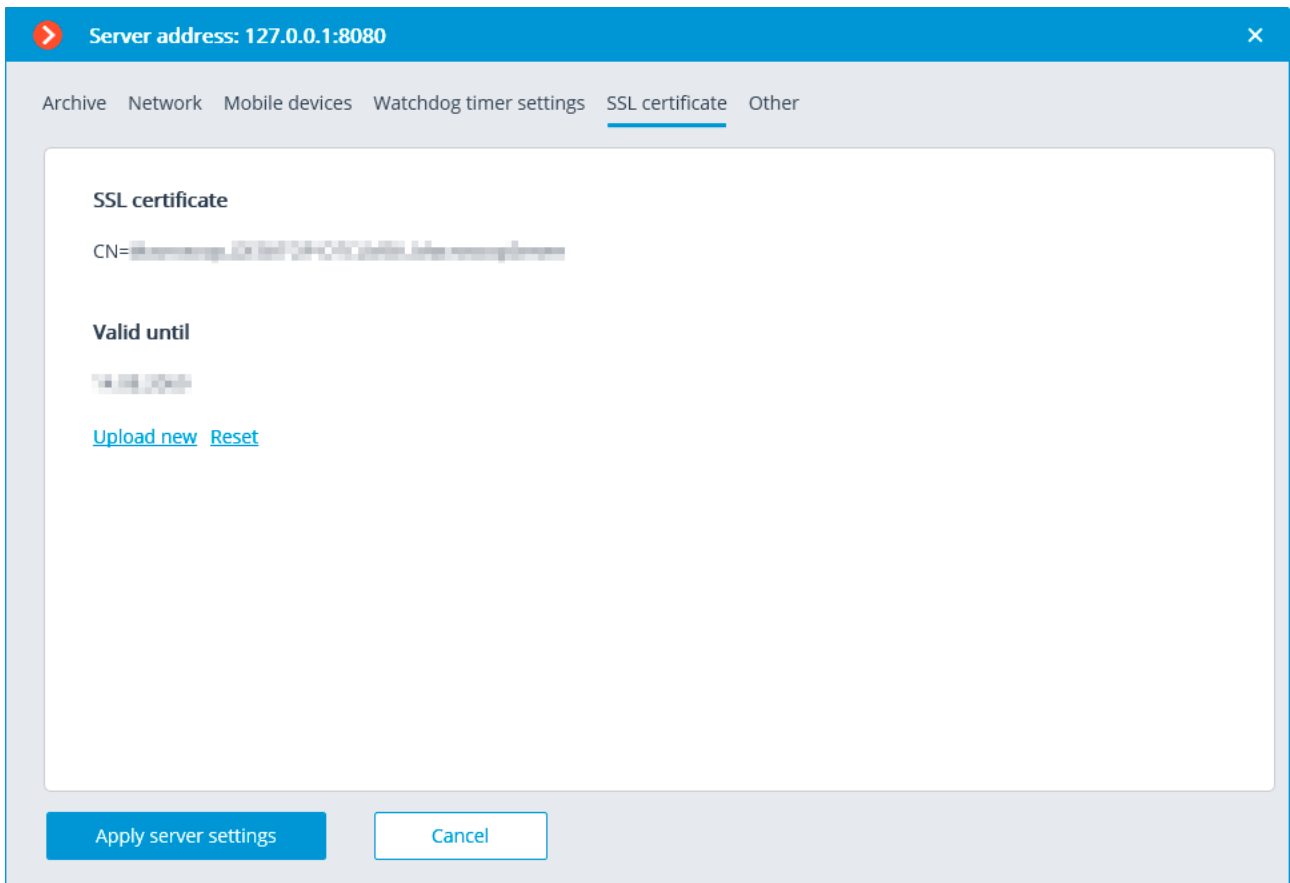
**Timeout in minutes:** sets a period after which the watchdog timer is triggered.

**Restart computer:** restarts the computer being set up.

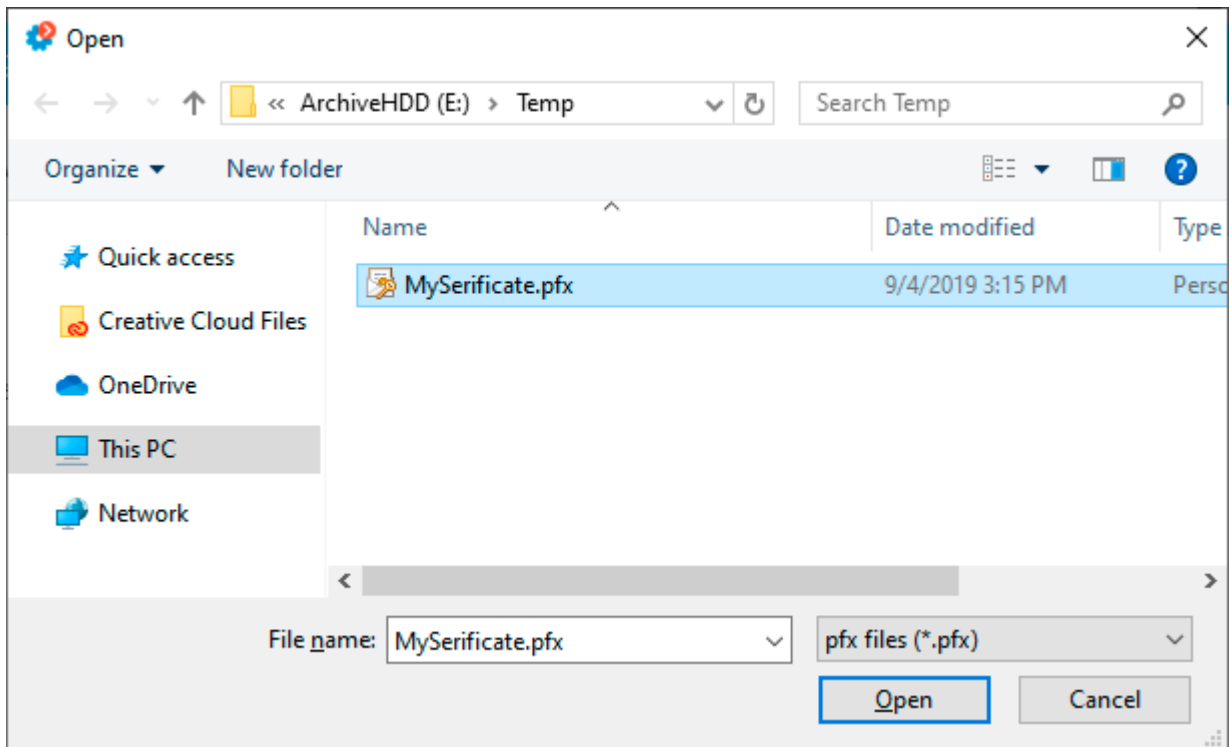
**Status:** displays the current watchdog status.

**Firmware version:** displays the current version of watchdog firmware.

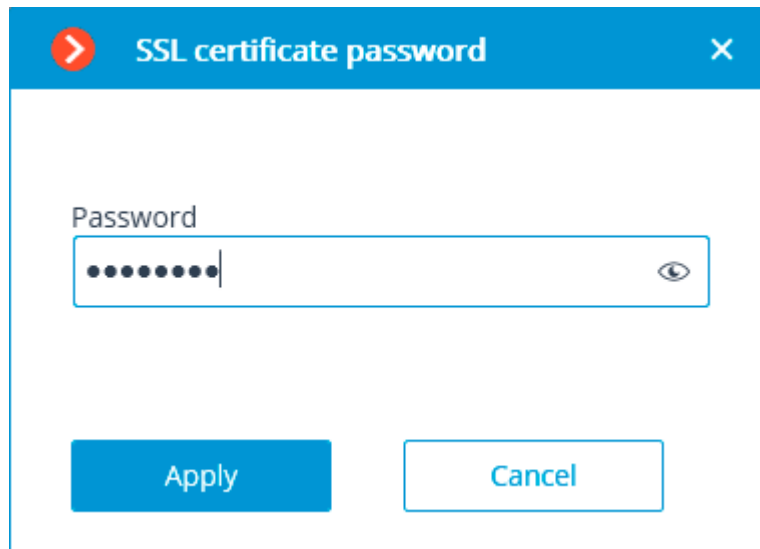
## SSL certificate



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.



- ① The uploaded certificate will be used for encrypting the secure connections only after the server settings are applied.
- ① All the information regarding the modification and usage of the certificate is recorded in the event log.
- ① 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.



Server address: 127.0.0.1:8080

Archive Network Mobile devices Watchdog timer settings SSL certificate Other

**SSL certificate**

CN=Eocortex\_XXXXXXXXXX\_EocortexServer

**Valid until**

19.09.2069

[Upload new](#)

Apply server settings Cancel

## Other

Server address: 127.0.0.1:8080

Archive Network Mobile devices Watchdog timer settings SSL certificate Other


Client update available (Eocortex).  
Update package version: 2.8.21.

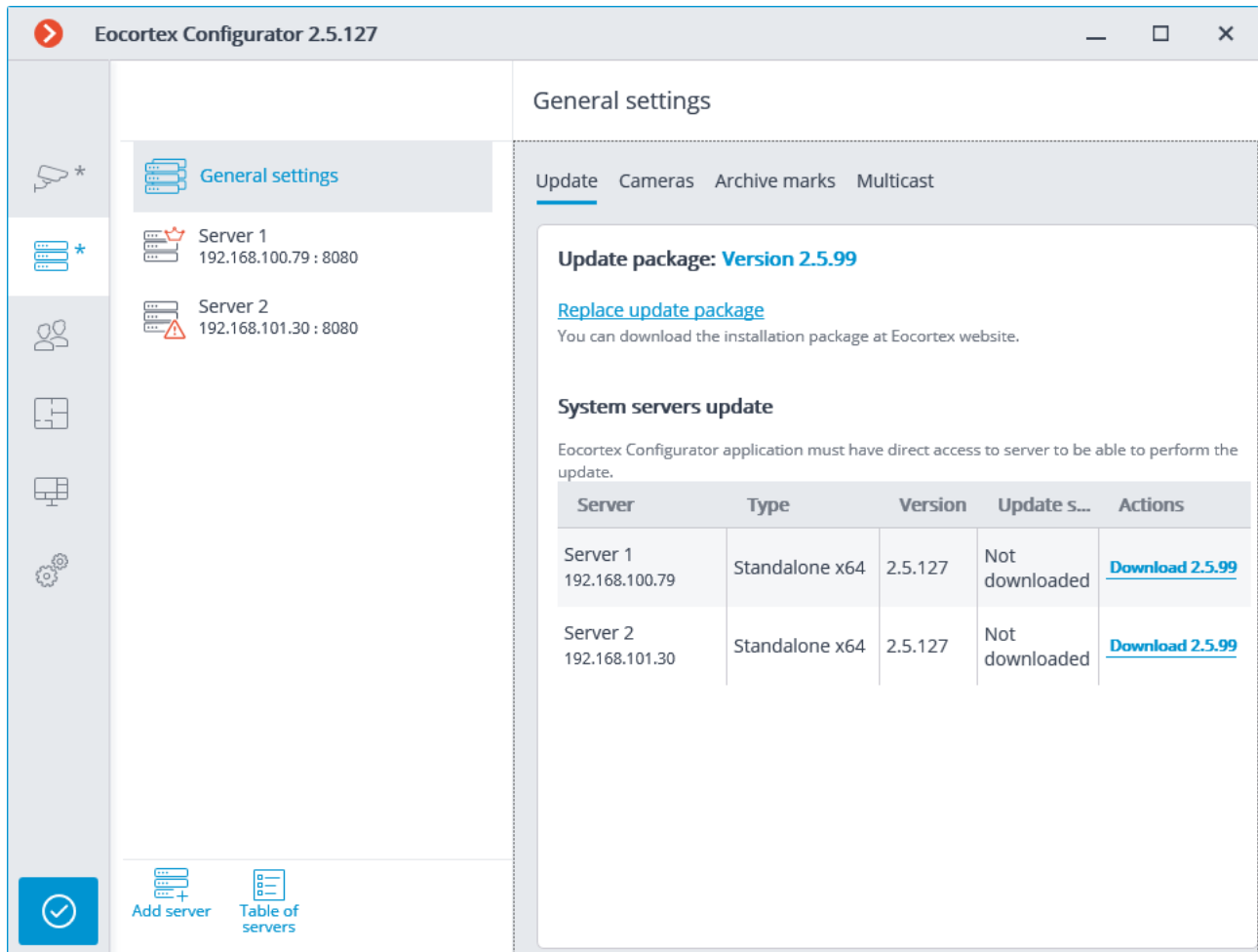
Allow client auto update.

Apply server settings Cancel



# 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 **Download update package** 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** and its documentation can be downloaded at [eocortex.com](http://eocortex.com): The distribution packages can be found at [Support / Software Installation Packages Supported](#); the documentation can be downloaded at [Support / Documentation](#).

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 **Downloaded** status: perform the  **Install** 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	<a href="#">Download 2.5.99</a>
Server 2 192.168.101.30	Standalone x64	2.5.127	Downloading: 18%	<a href="#">Break</a>

## 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	<a href="#">Download 2.5.99</a>
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.

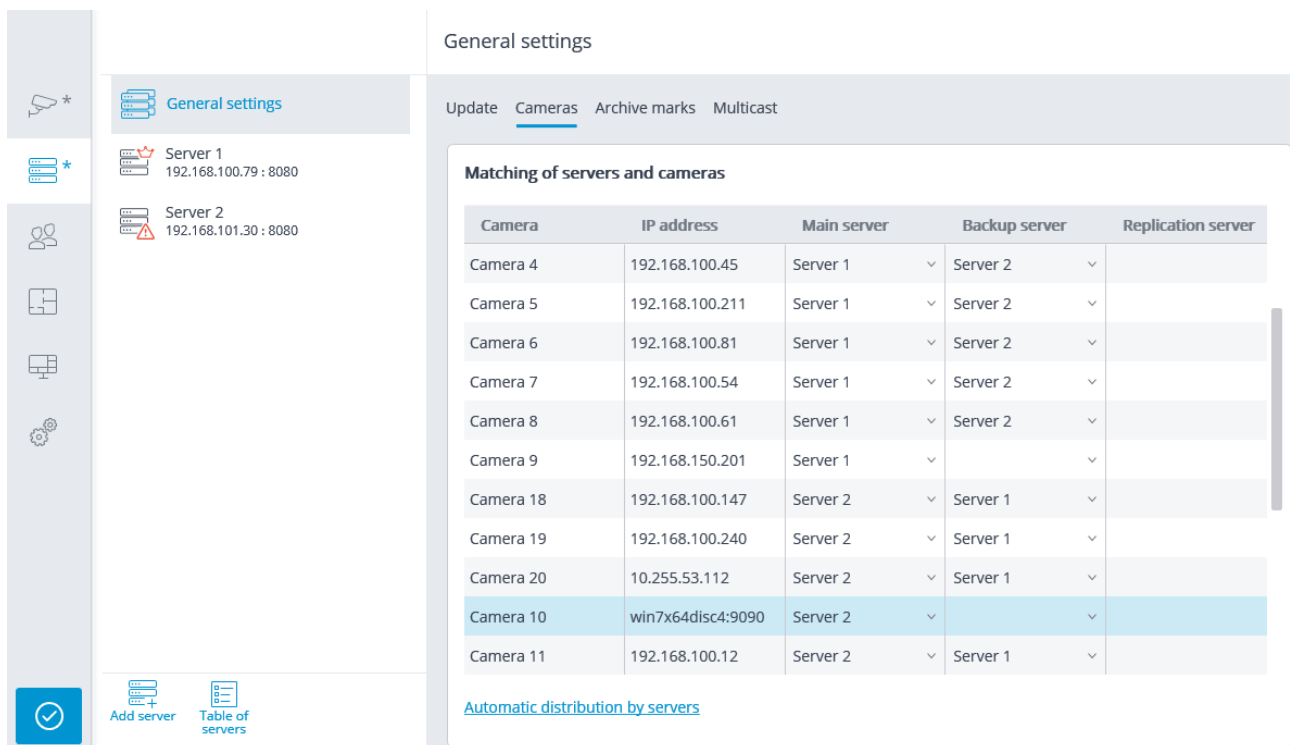
Server	Type	Version	Update status	Actions
Server 1 192.168.100.79	Standalone x64	2.5.127	Not downloaded	<a href="#">Download 2.5.99</a>

For the server with the **Installed** status the **Roll back** 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.


## 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.




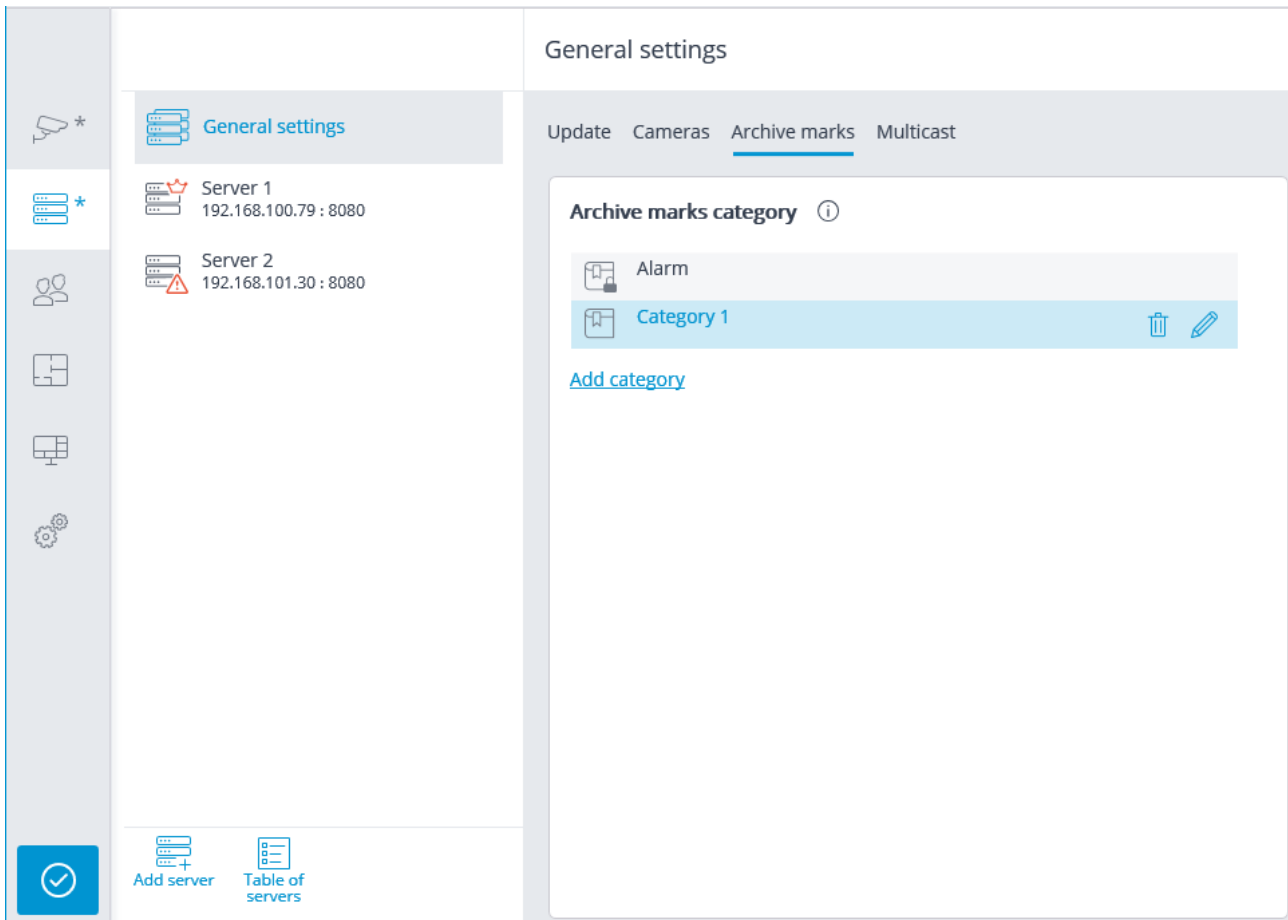
Camera	IP address	Main server	Backup server	Replication server
Camera 4	192.168.100.45	Server 1	Server 2	
Camera 5	192.168.100.211	Server 1	Server 2	
Camera 6	192.168.100.81	Server 1	Server 2	
Camera 7	192.168.100.54	Server 1	Server 2	
Camera 8	192.168.100.61	Server 1	Server 2	
Camera 9	192.168.150.201	Server 1		
Camera 18	192.168.100.147	Server 2	Server 1	
Camera 19	192.168.100.240	Server 2	Server 1	
Camera 20	10.255.53.112	Server 2	Server 1	
Camera 10	win7x64disc4:9090	Server 2		
Camera 11	192.168.100.12	Server 2	Server 1	

[Automatic distribution by servers](#)


-  The changes made to the assignment of cameras to servers will take effect only after [the changes are saved](#).

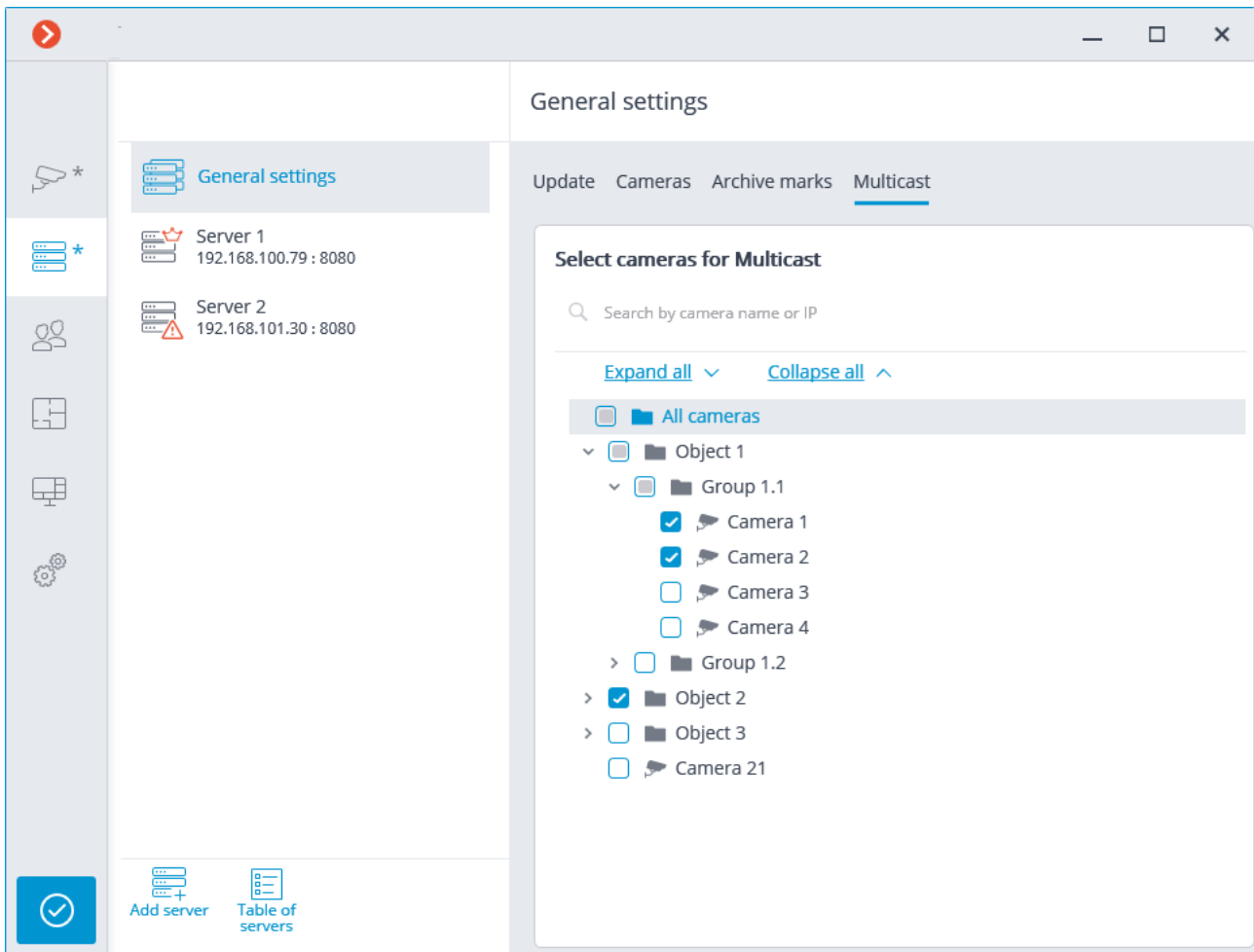
# Archive bookmark category setup

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.




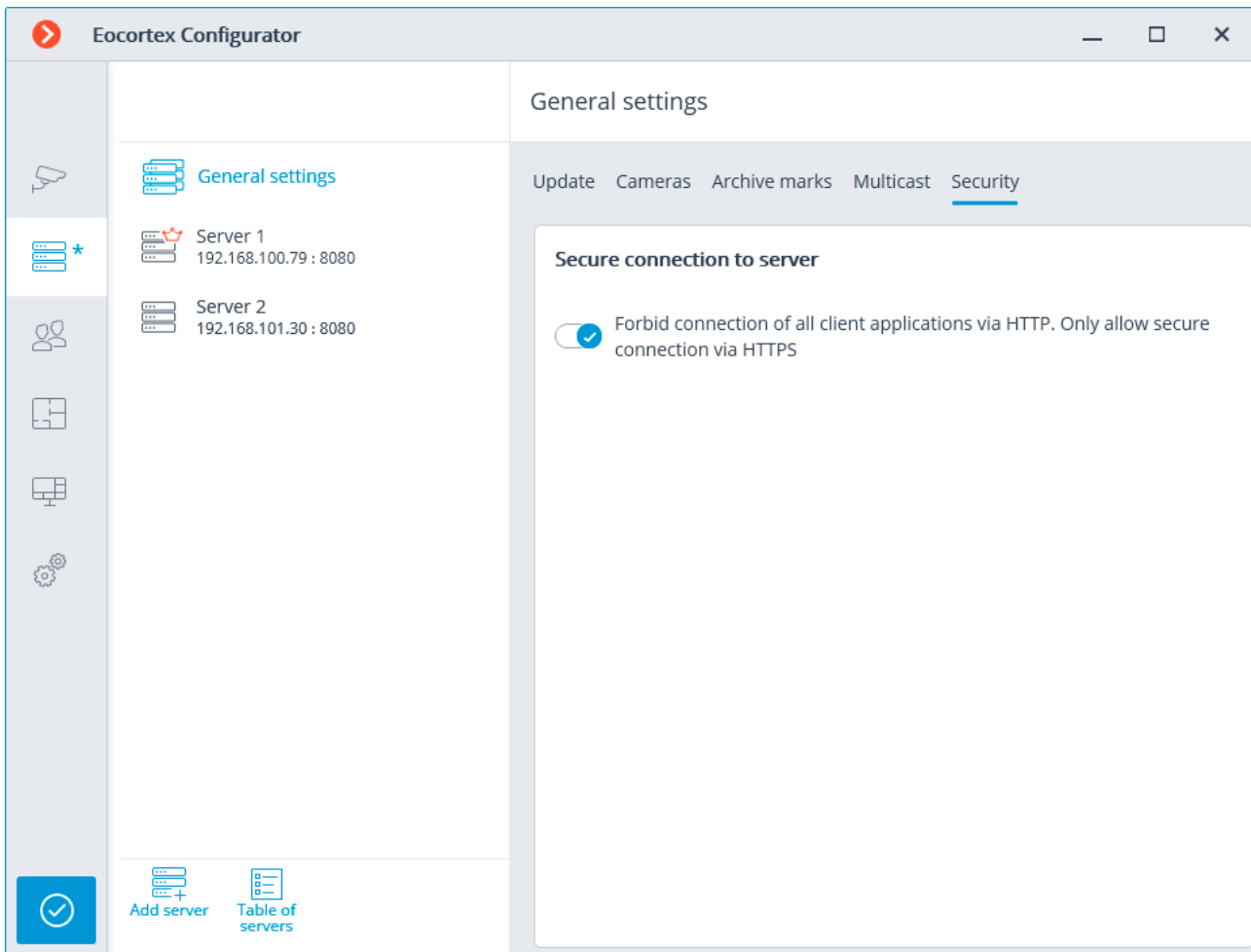
# Multicast settings

In the **Eocortex Configurator** application, on the  **Servers** tab, the camera tree with the possibility to enable multicasting from server appears on the **Multicast** tab when selecting the **General settings** item.



## Security Settings

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** tab, at highlighting the **General settings** item on the **Security** tab.



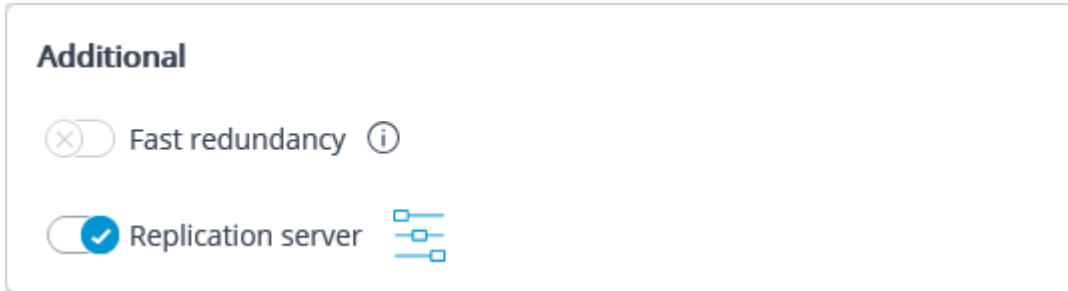
- i** When applying the settings after enabling this option, the **Eocortex Client** and **Eocortex Web-client** applications connected to the servers will be automatically restarted using the secure connection. At the same time, the **Mobile client for Android** and **Mobile client for iOS** applications 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

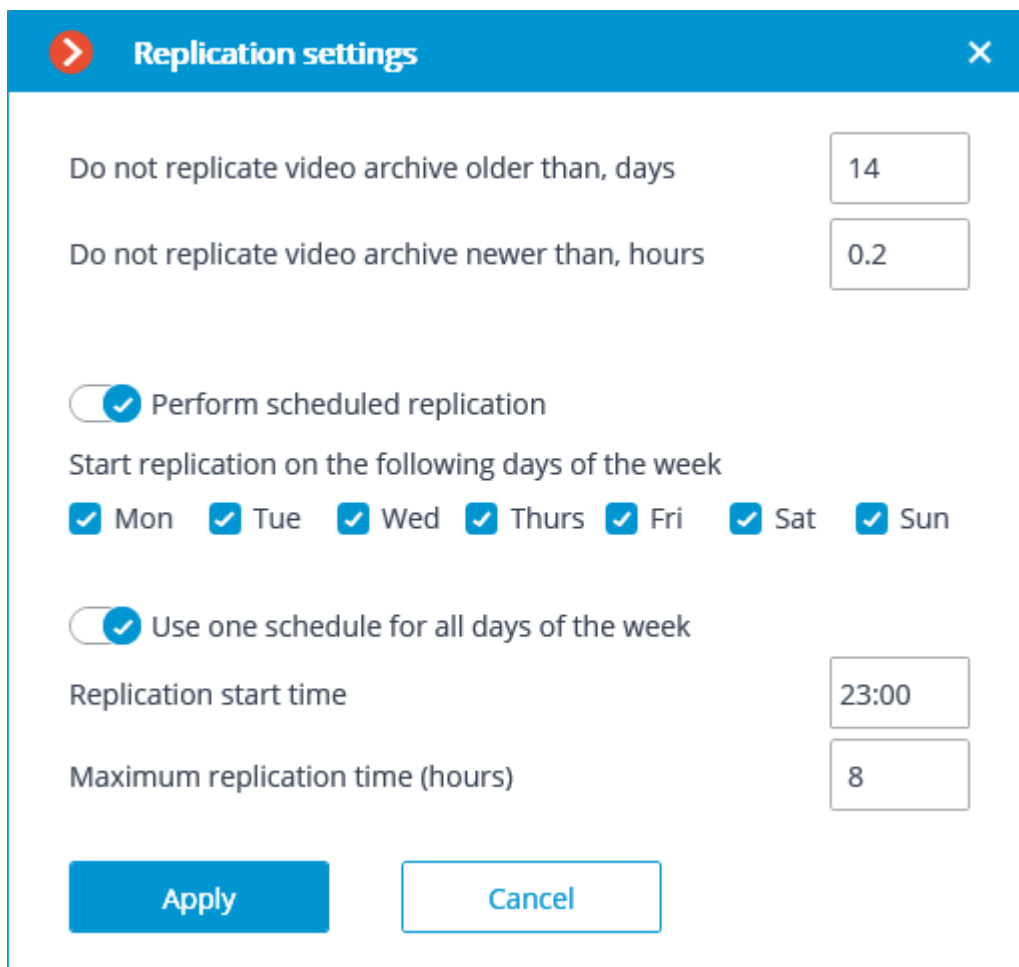
The **Replication server** is the server that stores backup copies of the archives from the other servers. The role of a replication server can be assigned to one or several servers in the system.

- i** 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 displays a camera management application interface. On the left, a sidebar contains navigation icons for search, camera management, user management, layout, and settings. The main area is divided into a left-hand tree view and a right-hand configuration panel.

**Tree View:**

- Search by camera name or IP
- Expand all / Collapse all
- All cameras
  - Object 1
    - Group 1.1
      - Camera 1** (192.168.100.134) - Active
      - 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
    - Camera 21 (192.168.100.211)

**Configuration Panel (Object 1 > Group 1.1 > Camera 1):**

Camera active

Connection | Rights | Archive | Motion detector | Analytics

**Device**

- Brand: ONVIF
- Device type: Camera
- Model: Compatible device

**Authorization**

- Username: admin
- Password: [masked]

**Servers**

- Main server: Server 1
- Replication server: Server 2

**Video streams**  Alternative stream

Main stream video format

**TEST CAMERA**

**Bottom Bar:** Automatic search, Add camera, Add folder, Camera table



### Camera group editing

All cameras  
Cameras being edited: 21

Connection Rights Archive Motion detector

**i** 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.

#### Authorization

Username  Password

#### Servers

Main server  Replication server   
*Will be applied for camera 21*

#### Video streams

Main stream video format

Alternative stream video format  [Alternative stream](#)

**Apply** **Cancel**

### General settings

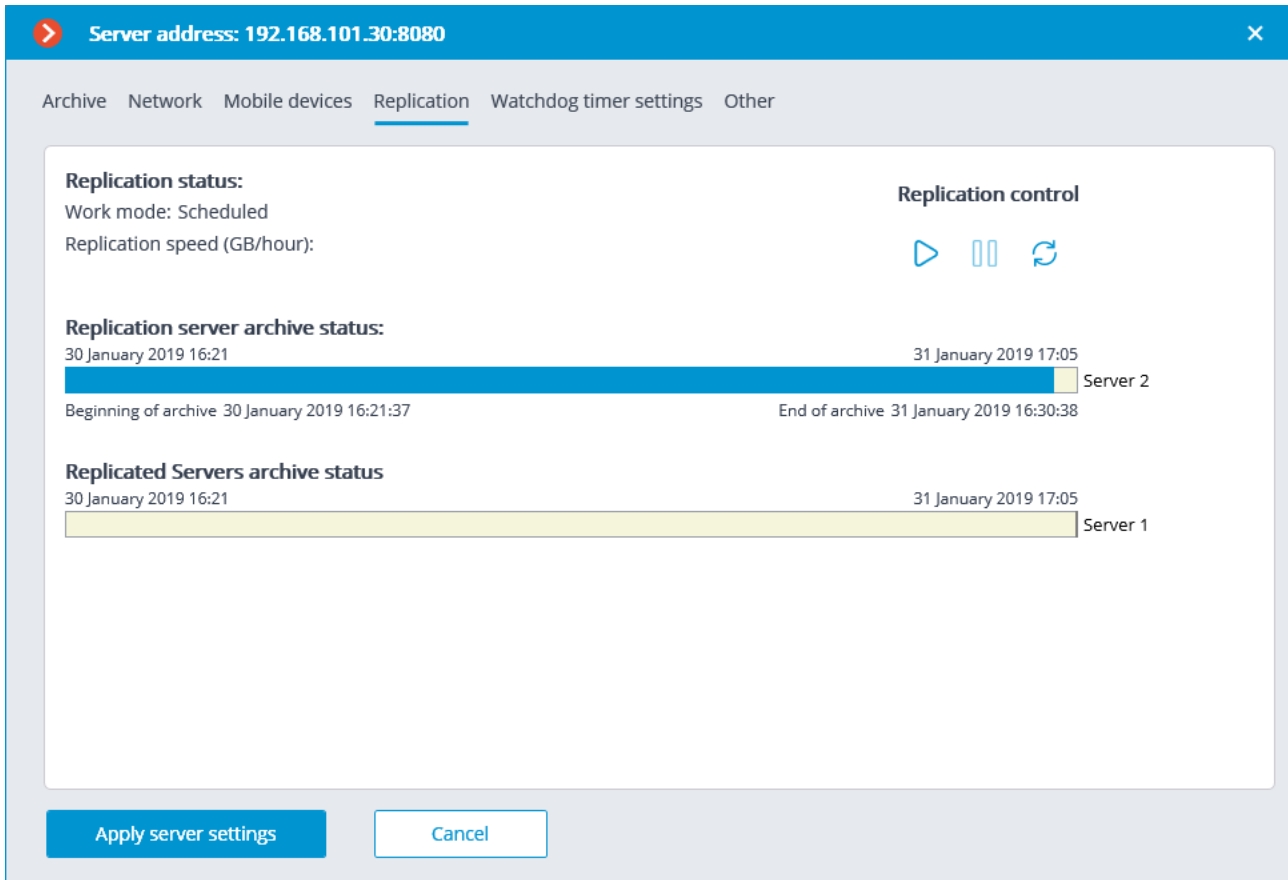
Update Cameras Archive marks Multicast

#### Matching of servers and cameras

Camera	IP address	Main server	Backup server	Replication server
Camera 1	192.168.100.134	Server 1		Server 2
Camera 2	192.168.100.94	Server 1		Server 2
Camera 3	192.168.100.250	Server 1		Server 2
Camera 4	192.168.100.45	Server 1		Server 2
Camera 5	192.168.100.211	Server 1		Server 2
Camera 6	192.168.100.81	Server 1		Server 2
Camera 7	192.168.100.54	Server 1		Server 2
Camera 8	192.168.100.61	Server 1		Server 2
Camera 9	192.168.150.201	Server 1		Server 2
Camera 18	192.168.100.147	Server 1		Server 2
Camera 19	192.168.100.240	Server 1		Server 2

[Automatic distribution by servers](#)

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.



The screenshot shows the 'Replication' tab of the Eocortex Configurator application. The window title is 'Server address: 192.168.101.30:8080'. The navigation menu includes 'Archive', 'Network', 'Mobile devices', 'Replication', 'Watchdog timer settings', and 'Other'. The 'Replication' section displays the following information:

- Replication status:**
  - Work mode: Scheduled
  - Replication speed (GB/hour):
- Replication control:** Play, Pause, and Refresh icons.
- Replication server archive status:** A progress bar for 'Server 2' showing the beginning of archive at 30 January 2019 16:21:37 and the end of archive at 31 January 2019 16:30:38.
- Replicated Servers archive status:** A progress bar for 'Server 1' showing the beginning of archive at 30 January 2019 16:21 and the end of archive at 31 January 2019 17:05.

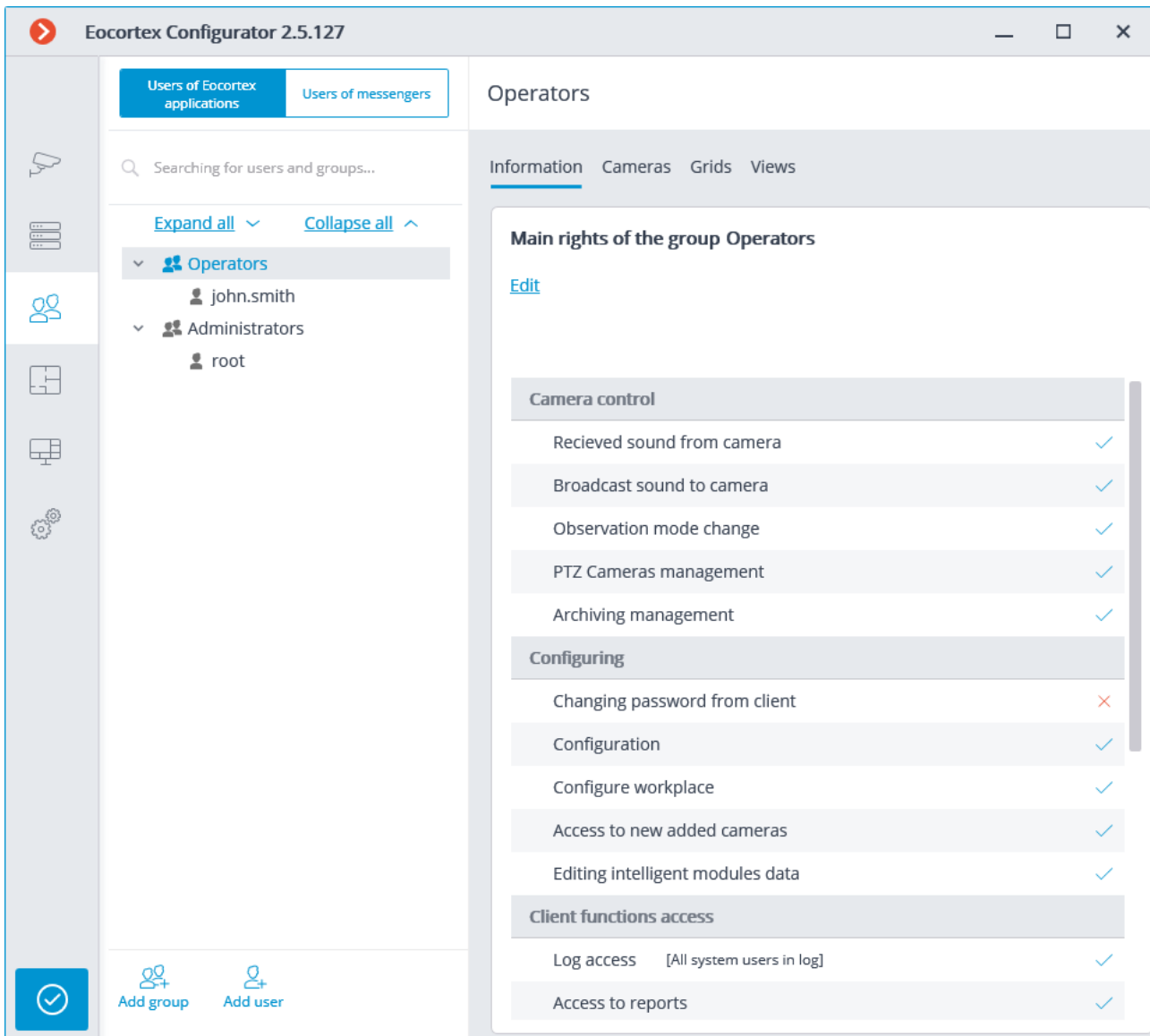
At the bottom, there are two buttons: 'Apply server settings' and 'Cancel'.

## User right settings

The **Eocortex Configurator** application allows you to configure the rights of various categories of users of the video surveillance system.

## Users of Eocortex applications

To set up the user rights of **Eocortex** in the **Eocortex Configurator** application it is required to go to the  **Users** tab and press **Users of Eocortex applications**.



[The tree of the groups and the users](#)

[Adding, viewing and modifying user group](#)

[Adding, viewing and modifying user](#)

## The tree of the groups and the users

In the left part of the tab will display the tree of the groups and the users of the CCTV system who belong to them. In order to set up a particular group or user, it is required to select it in the list. At that, the page with the settings of the selected user or group will appear in the right part of the window.

To search for cameras and folders in the tree, use the search field located above the list.

**i** Particularities and limitations of user rights:



- The rights are provided only to the 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. There can be no users who do 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, and its rights are modified according to those of its current group.

Below you will find the commands available when setting up user rights. These commands can be opened from the context menu, using buttons under the list of groups and users, or by clicking on the links on the group or user information page. Individual commands can be opened using several means, including hot keys.

To search for cameras and folders in the tree, use the search field located above the list.

- 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.



To come into effect, the changes need [to be applied](#).

## Adding, viewing and modifying user group

Adding:

**Adding group** ✕

**General settings**

- Basic
- Cameras
- Grids
- Views

**Group:**

**General settings**

Group name

Note

**Apply**

**Adding group** ✕

General settings  
Basic  
Cameras  
Grids  
Views

**Group:**  
**Basic**

All rights	<input type="checkbox"/>
Camera control	<input checked="" type="checkbox"/>
Received sound from camera	<input checked="" type="checkbox"/>
Broadcast sound to camera	<input checked="" type="checkbox"/>
Observation mode change	<input checked="" type="checkbox"/>
PTZ Cameras management	<input checked="" type="checkbox"/>
Archiving management	<input checked="" type="checkbox"/>
Configuring	<input type="checkbox"/>
Changing password from client	<input type="checkbox"/>
Configuration	<input checked="" type="checkbox"/>
Configure workplace	<input checked="" type="checkbox"/>
Access to new added cameras	<input checked="" type="checkbox"/>
Editing intelligent modules data	<input checked="" type="checkbox"/>
Client functions access	<input checked="" type="checkbox"/>

**Apply**

### Adding group

General settings

Basic

**Cameras**

Grids

Views

**Group:**

**Cameras**

One right for surveillance and archive

🔍

[Expand all](#) ▾ [Collapse all](#) ▲

📁 All cameras	<input checked="" type="checkbox"/> Surveillance and archive
▾ 📁 Object 1	<input checked="" type="checkbox"/> Surveillance and archive
▾ 📁 Group 1.1	<input checked="" type="checkbox"/> Surveillance and archive
📷 Camera 1 192.168.100.134	<input checked="" type="checkbox"/> Surveillance and archive
📷 Camera 2 192.168.100.94	<input checked="" type="checkbox"/> Surveillance and archive
📷 Camera 3 192.168.100.250	<input checked="" type="checkbox"/> Surveillance and archive
📷 Camera 4 192.168.100.45	<input checked="" type="checkbox"/> Surveillance and archive
▾ 📁 Group 1.2	<input checked="" type="checkbox"/> Surveillance and archive
📷 Camera 5 192.168.100.211	<input checked="" type="checkbox"/> Surveillance and archive
📷 Camera 6 192.168.100.81	<input checked="" type="checkbox"/> Surveillance and archive
- Camera 7	<input type="checkbox"/>

**Apply**

**Adding group** [Close]

General settings  
Basic  
Cameras  
**Grids**  
Views

**Group:**  
**Grids**

<input checked="" type="checkbox"/>	All grids	<input checked="" type="checkbox"/>
<input type="checkbox"/>	1 camera	<input checked="" type="checkbox"/>
<input type="checkbox"/>	2 cameras	<input checked="" type="checkbox"/>
<input type="checkbox"/>	4 cameras	<input checked="" type="checkbox"/>
<input type="checkbox"/>	5 cameras	<input checked="" type="checkbox"/>
<input type="checkbox"/>	6 cameras	<input checked="" type="checkbox"/>
<input type="checkbox"/>	6 cameras	<input checked="" type="checkbox"/>
<input type="checkbox"/>	6 cameras	<input checked="" type="checkbox"/>
<input type="checkbox"/>	7 cameras	<input checked="" type="checkbox"/>
<input type="checkbox"/>	8 cameras	<input checked="" type="checkbox"/>
<input type="checkbox"/>	8 cameras	<input checked="" type="checkbox"/>
<input type="checkbox"/>	9 cameras	<input checked="" type="checkbox"/>
<input type="checkbox"/>	10 cameras	<input checked="" type="checkbox"/>
<input type="checkbox"/>	12 cameras	<input checked="" type="checkbox"/>

**Apply** **Cancel**

Viewing and modifying:



The screenshot displays the Eocortex Configurator 2.5.127 interface. The window title is "Eocortex Configurator 2.5.127". At the top, there are two tabs: "Users of Eocortex applications" (selected) and "Users of messengers". Below the tabs is a search bar with the text "Searching for users and groups...".

The left sidebar contains several icons: a megaphone, a list of three items, a group of three people with a plus sign, a grid, a monitor, and a gear. At the bottom of the sidebar are two buttons: "Add group" and "Add user".

The main content area is titled "Operators". It has a sub-header with tabs: "Information" (selected), "Cameras", "Grids", and "Views".

The "Main rights of the group Operators" section includes an "Edit" link and a "Comment" field with the text "CCTV operators". Below this is a list of permissions, each with a checkmark:

- Access to new added cameras ✓
- Editing intelligent modules data ✓
- Client functions access**
- Log access [All system users in log] ✓
- Access to reports ✓
- Access to archive marks ✓
- Access to interactive search ✓
- Access to plans ✓
- Close application ✓
- Archive export ✓
- Archive expert mode access ✓
- Interaction with external components**
- Receive push notifications ✓
- Connection via mobile devices and Web-Client ✓

**Editing group** ✕

**General settings**

Basic  
Cameras  
Grids  
Views

**Group: Operators**

**General settings**

Group name

Note

**Apply**

The screenshot shows the Eocortex Configurator 2.5.127 interface. On the left, there is a sidebar with navigation icons and a search bar for users and groups. The main area is titled "Operators" and contains tabs for "Information", "Cameras", "Grids", and "Views". The "Cameras" tab is active, displaying a table of available cameras. The table has columns for "Name", "Surveillance", and "Archive". Camera 2 (192.168.100.94) is highlighted in blue. Below the table, there are "Add group" and "Add user" buttons.

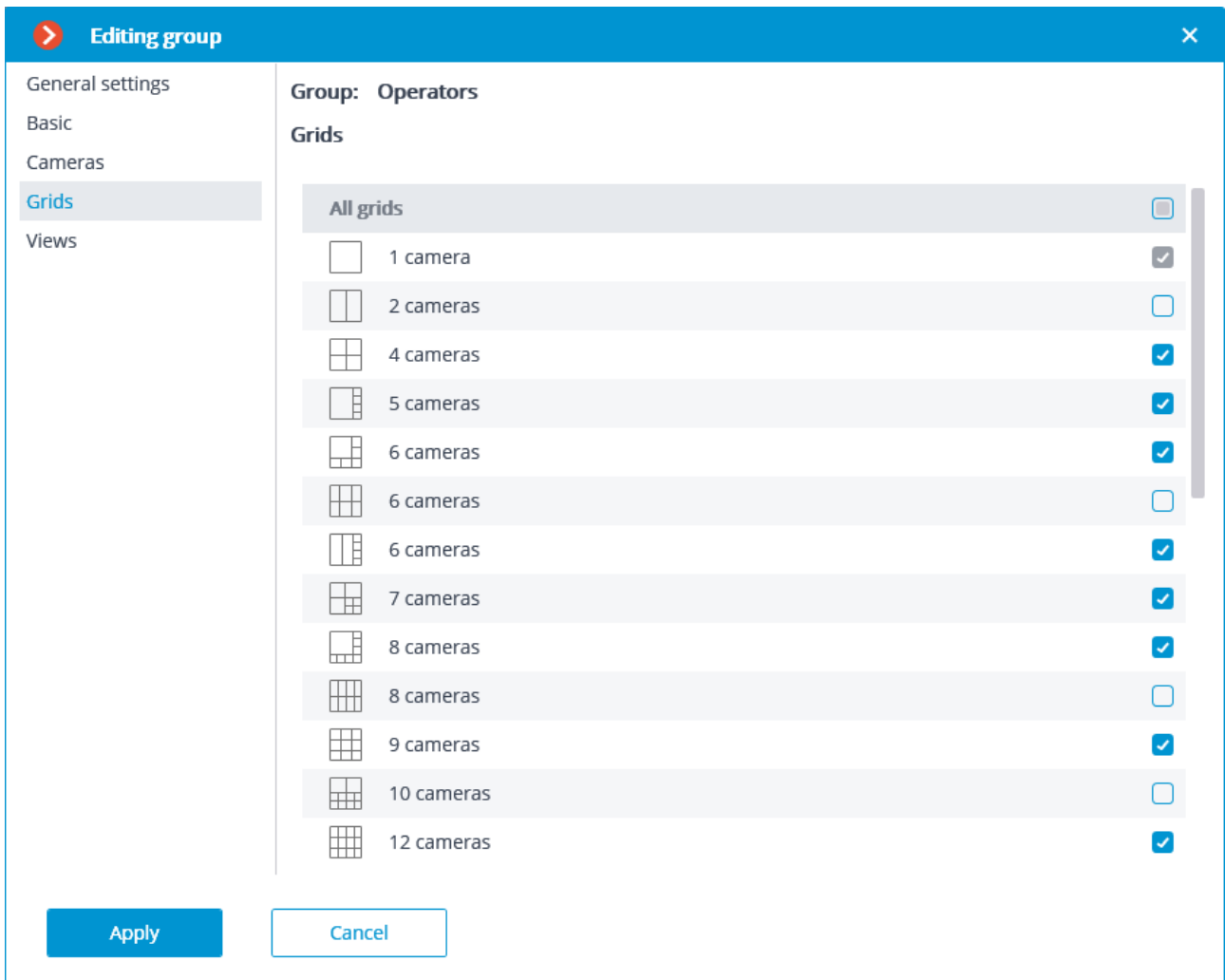
Name	Surveillance	Archive
Object 1		
Group 1.1		
Camera 1 192.168.100.134	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Camera 2 192.168.100.94	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Camera 3 192.168.100.250	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Camera 4 192.168.100.45	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Group 1.2		
Camera 5 192.168.100.211	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Camera 6 192.168.100.81	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Camera 7 192.168.100.54	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Camera 8 192.168.100.61	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

The "Rights for Camera 2" dialog box shows a table of permissions for different user groups. The table has columns for "Surveillance" and "Archive". The "Operators" group is highlighted in blue. At the bottom, there are "Apply" and "Cancel" buttons.

	Surveillance	Archive
All groups of users	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Administrators	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Operators	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Supervisors	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

The screenshot displays the Eocortex Configurator 2.5.127 interface. The window title is "Eocortex Configurator 2.5.127". The interface is divided into several sections:

- Top Bar:** Contains a red arrow icon, the title "Eocortex Configurator 2.5.127", and standard window controls (minimize, maximize, close).
- Left Sidebar:** A vertical navigation menu with icons for a megaphone, a list, a group of people, a camera, a monitor, and a gear.
- Top Navigation:** Two tabs: "Users of Eocortex applications" (active) and "Users of messengers".
- Search and Action Bar:** A search input field with the placeholder "Searching for users and groups...". Below it are "Expand all" and "Collapse all" links.
- User List:** A tree view showing user groups:
  - Supervisors
    - robert.miller
  - Operators** (highlighted)
    - john.smith
  - Administrators
    - root
- Bottom Left:** A blue button with a checkmark icon, and two buttons: "Add group" and "Add user".
- Main Content Area:** Titled "Operators", it has sub-tabs: "Information", "Cameras", "Grids" (active), and "Views".
  - Available grids:** A list of grid configurations, each with a grid icon and a label:
    - 1 camera
    - 2 cameras
    - 4 cameras
    - 5 cameras
    - 6 cameras
    - 6 cameras
    - 6 cameras
    - 7 cameras
    - 8 cameras
    - 8 cameras
    - 9 cameras
    - 10 cameras
    - 12 cameras
    - 13 cameras
    - 16 cameras
    - 17 cameras
    - 20 cameras
  - Edit:** A link above the grid list.



## Adding, viewing and modifying user

Adding:

**Adding user** ✕

Group

User name

[Set password](#)

Note:

### Set password

New password:

New password confirmation:

Viewing and modifying:

#### Eocortex Configurator 2.5.127

john.smith

Users of Eocortex applications | Users of messengers

Searching for users and groups...

[Expand all](#) | [Collapse all](#)

- Supervisors
  - robert.miller
- Operators
  - john.smith**
- Administrators
  - root

[Add group](#) [Add user](#)

#### Information

User name	john.smith
Belongs to group	Operators
Date of creation	1/28/2019 7:22:16 PM

[Edit](#)  
[Delete](#)

**Editing user** ✕

**User:** john.smith

Group

User name

Password:

[Change password](#)

Note:

**Change password** ✕

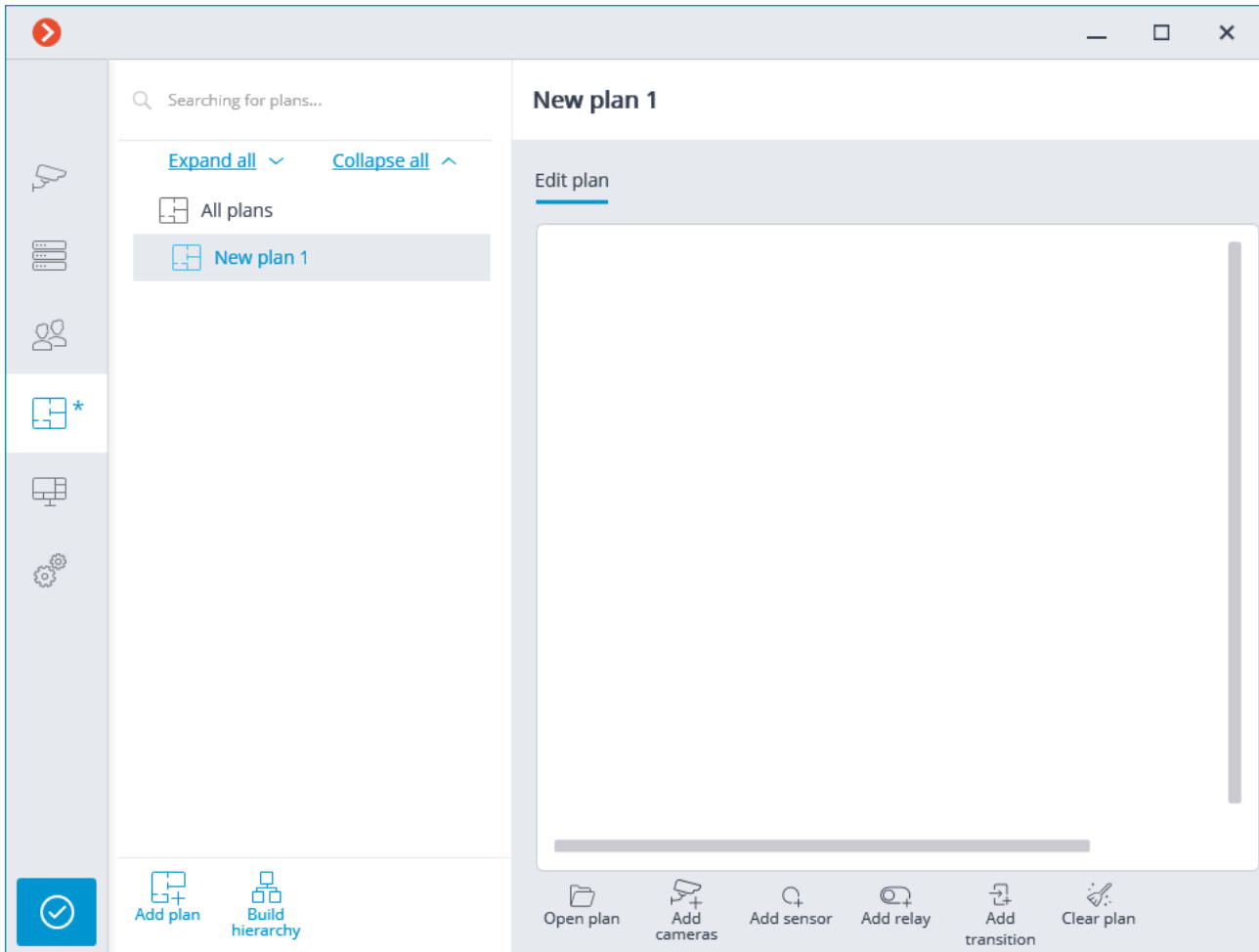
New password:

New password confirmation:



# Camera layout setup



To set up camera layout in the **Eocortex Configurator** application, go to  **Plans** tab.




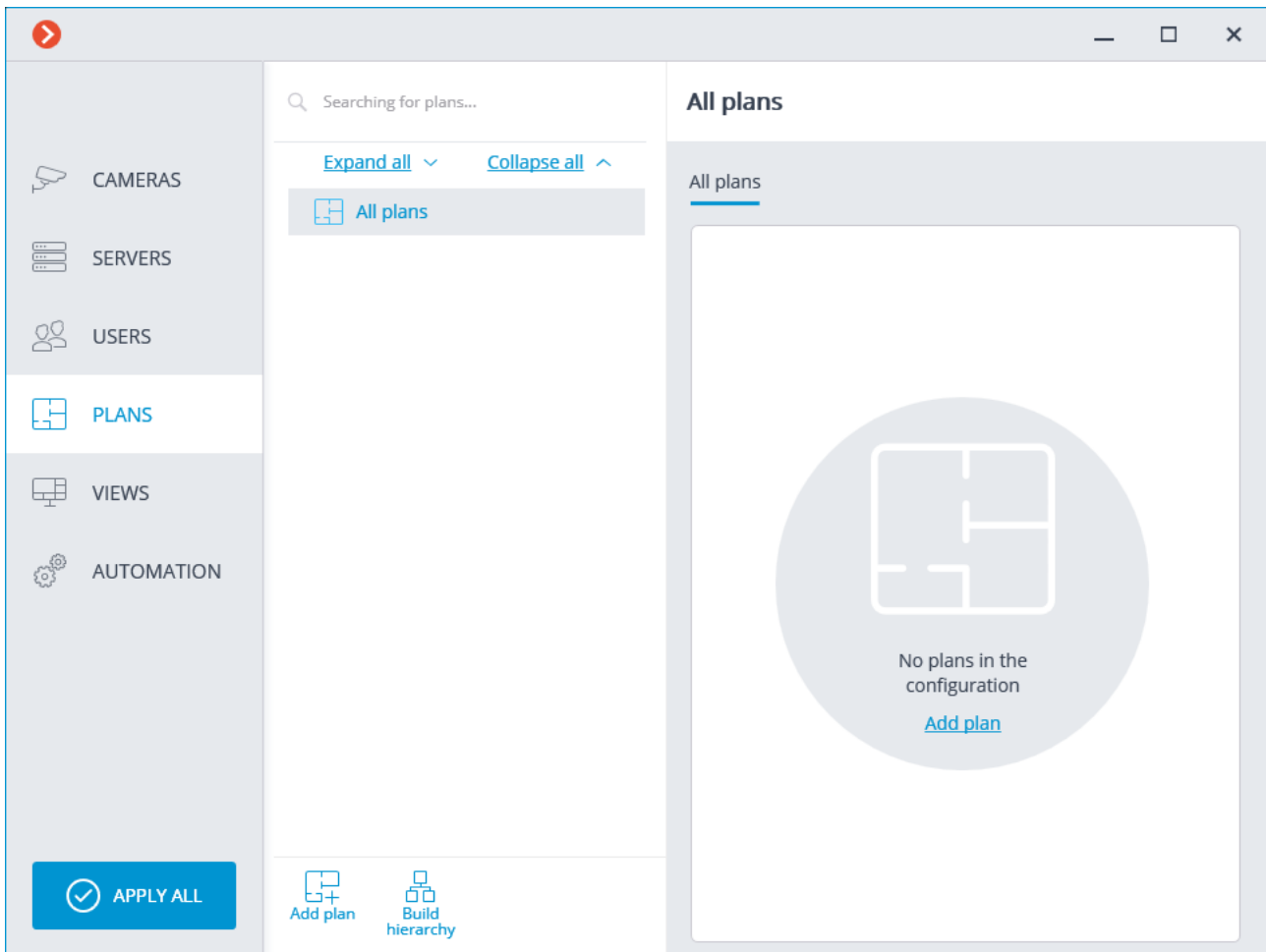
Site plans and cameras, sensors, relays, as well as camera fields of view and transition points between the plans located on them are shown on this tab.



Plan tree can be found on the left part of the tab. To set up a plan it is required to select it in the list. The downloaded plan will appear on the right part of the window. The empty page will appear if the plan has not been downloaded.

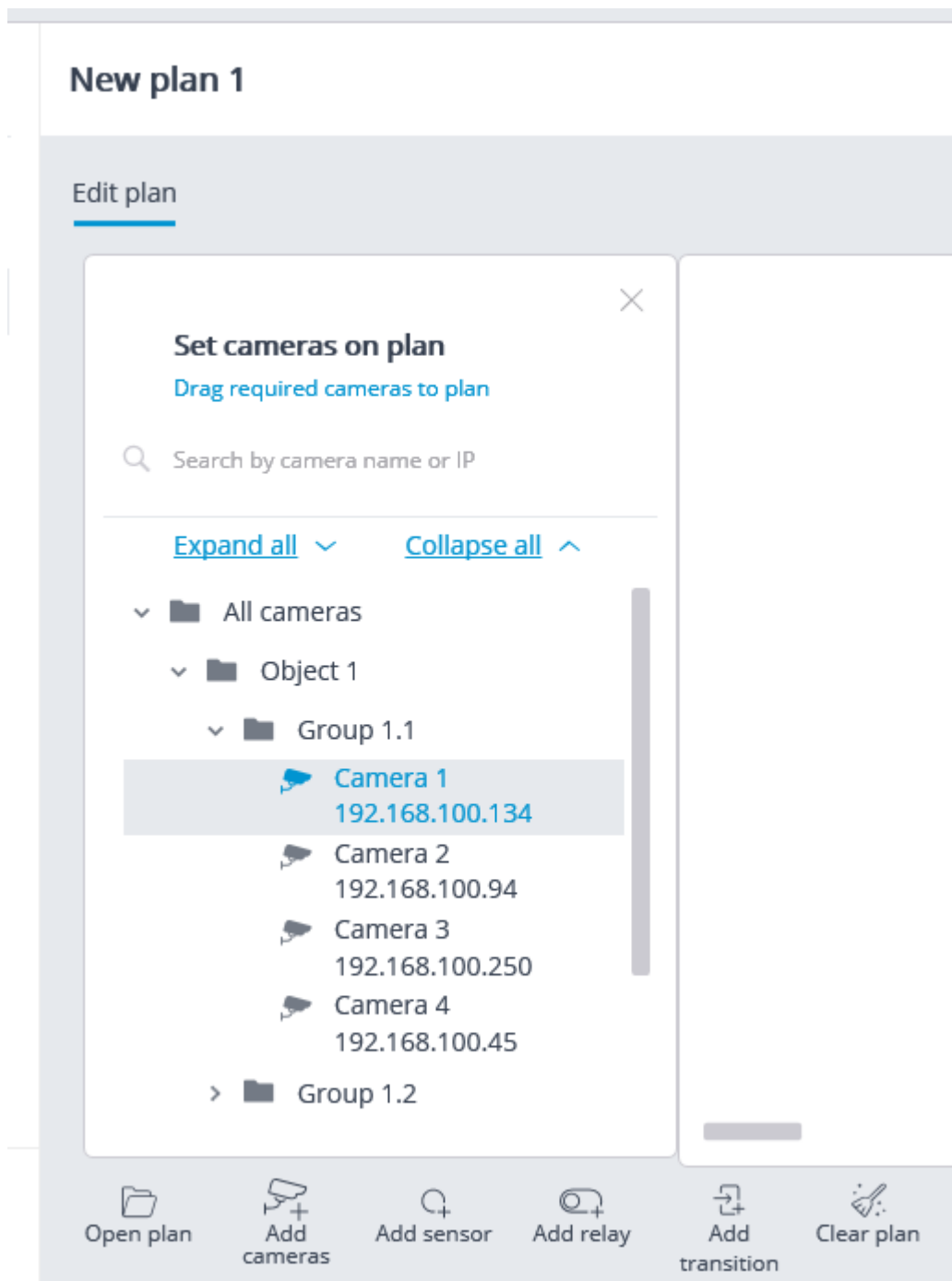
Listed below are the commands available when setting up camera layouts. These commands can be opened from the context menu or using the links on the empty page of the plan. Individual commands can be opened using various means, including hot keys.


-  **Add plan** adds a new plan subordinate to the one currently selected.
-  **Create tree** builds a hierarchy of plans based on the tree of folders with cameras.

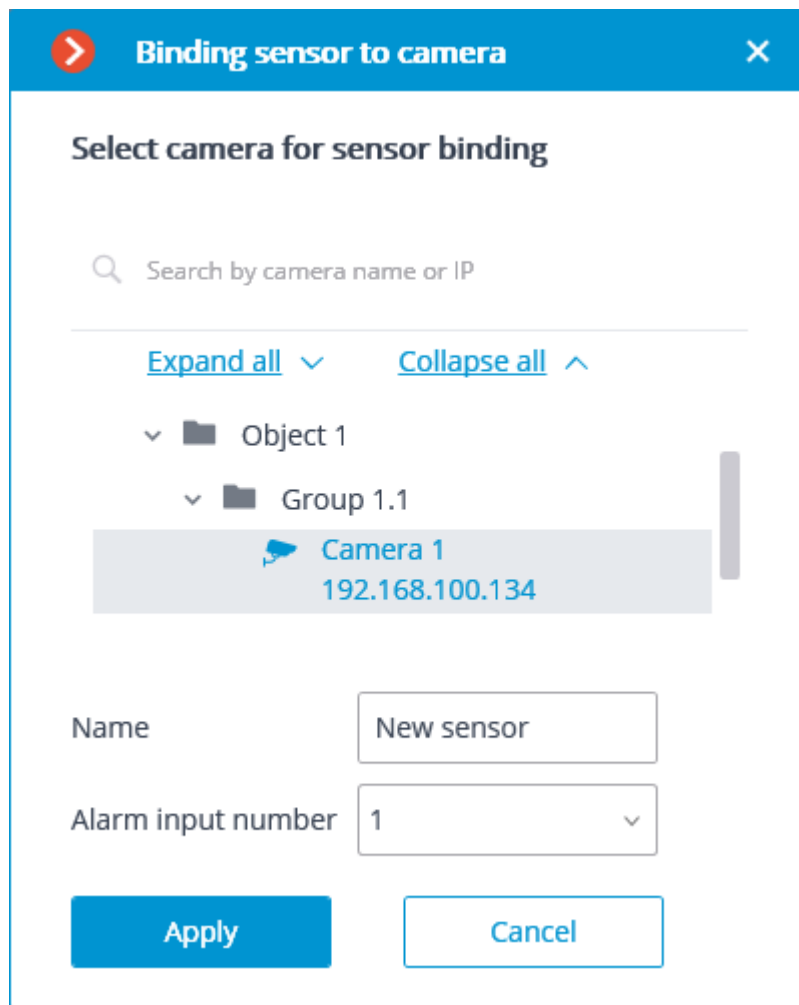
 After adding a new plan including the one made as a result of creating a hierarchy, the image of the plan itself is not yet uploaded.



-  **Open plan** uploads an image file in PNG, JPEG, BMP format. If there already is an image uploaded to the plan and it contains cameras, sensors, relays and transition points, they will be cleared before uploading the new image.
-  **Add cameras** opens the camera tree. To add cameras to the plan it is required to drag it to the image in the right part of the page.



-  **Add sensor** adds a sensor. When adding a sensor, it is required to indicate a camera and the number of its signal input to which the sensor is connected.



**Binding sensor to camera**

Select camera for sensor binding

Search by camera name or IP

[Expand all](#) [Collapse all](#)

Object 1


Group 1.1

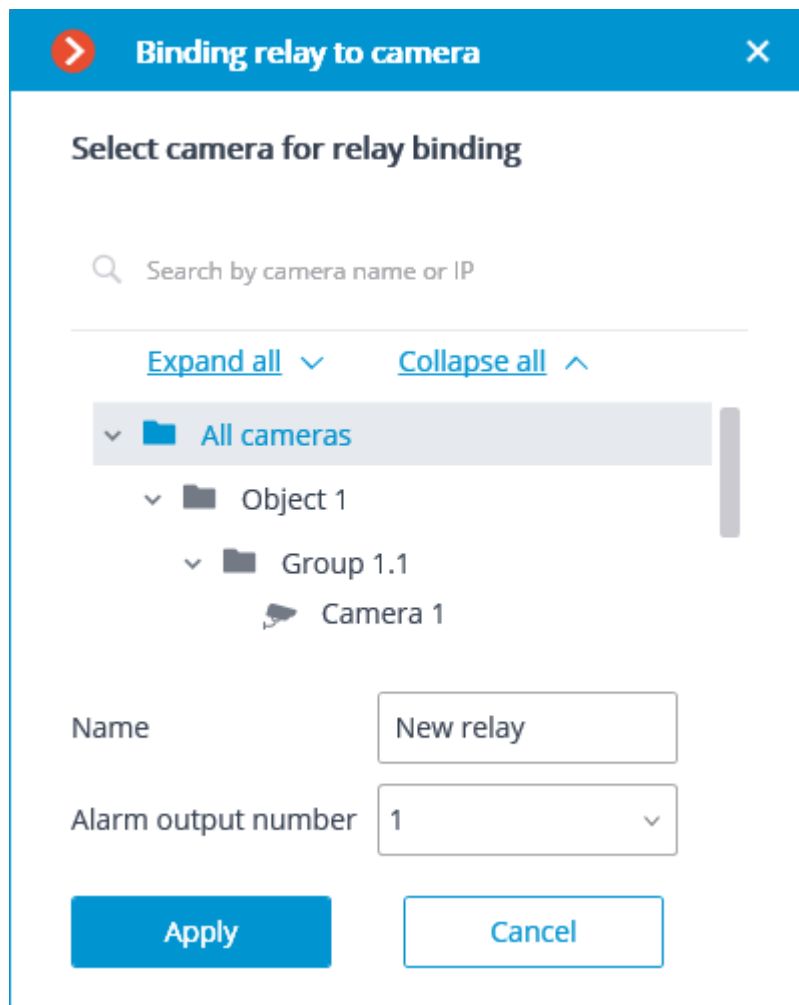
Camera 1  
192.168.100.134


Name: New sensor

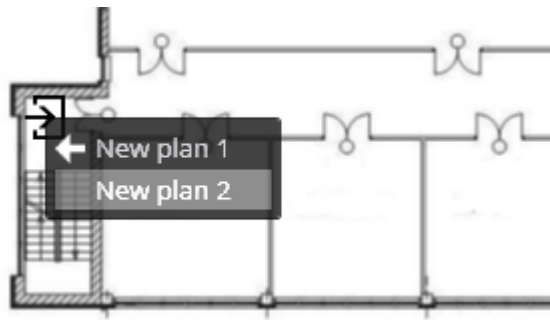
Alarm input number: 1

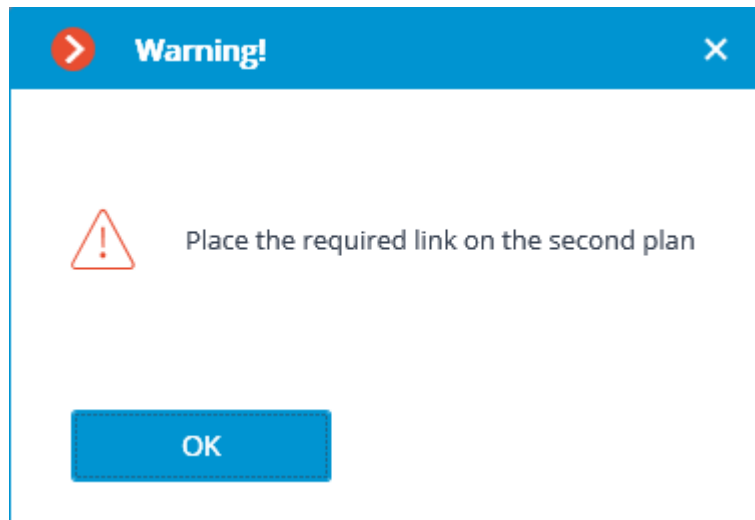
Apply Cancel

-  **Add relay** adds a relay. When adding a relay, it is required to indicate a camera and the number of its signal input to which the sensor is connected.

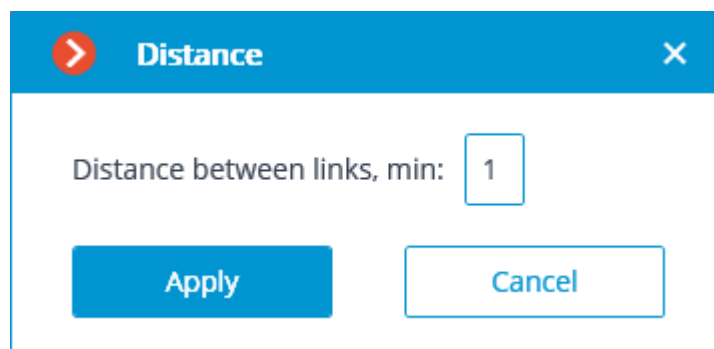


-  **Add transition** adds a point of transition between the plans. When adding a transition, it is required to indicate the plan to which the transition will be made, then indicate the transition point on the target plan, as well as the minimum time of movement of the objects between these two points.





### New plan 2



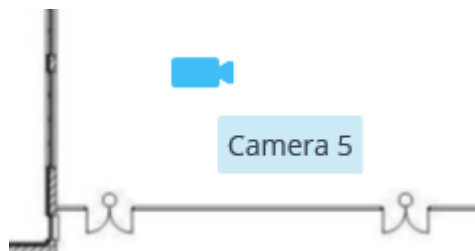
-  **Clear plan** removes all the cameras, sensors, relays and transition points from the plan.

When selecting a plan in the tree, the context menu becomes available with the following commands:

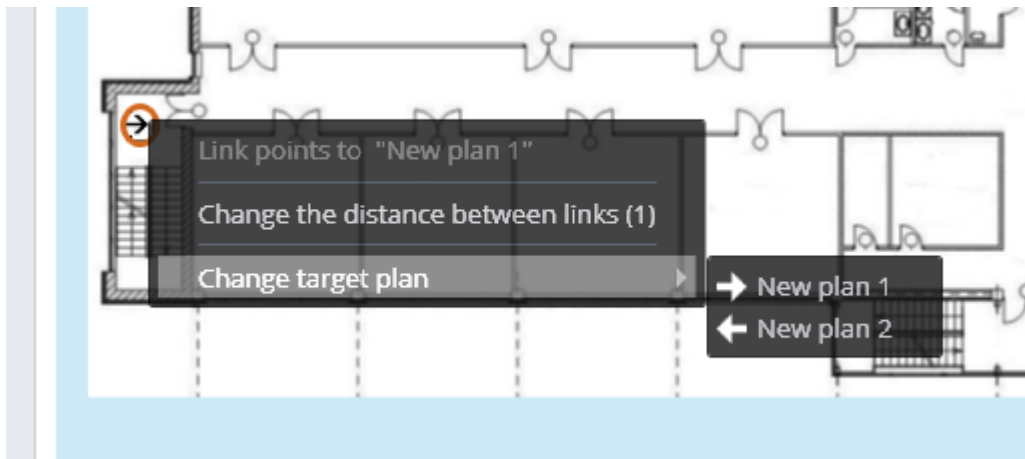
- **Rename** modifies the name of a plan.
- **Save image** saves the image file with a plan with the cameras, sensors, relays and transition points located on it.
- **Delete** removes a plan.



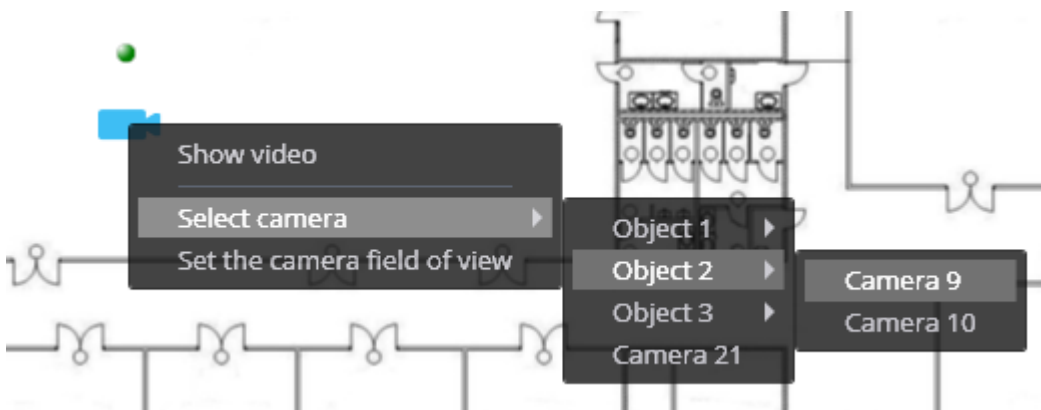
When a mouse pointer hovers above the camera, its name is displayed.



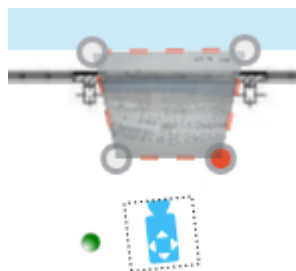
You can move the cameras, sensors, relays and transition points on the plan using the mouse; the cameras can also be rotated on a plane. You can delete an object by selecting it on the plan and pressing **Del**. You can also modify the settings using the context menu.



For a camera, it is possible to open a pop-up window of real-time video broadcasting, set the field of view, modify the camera's binding to the selected icon.



- ① **Camera field of view** is a free-form rectangle. In the **Eocortex Client** application, when viewing a plan with the set fields of view, the image from the camera stretched to fit the rectangle is displayed in these fields; also, video analysis data superimposed on the field of view is shown subject to the appropriate settings.



- ① **Sensors** are the devices connected to the signal inputs of cameras. When a sensor is triggered, the CCTV system receives a signal from the camera connected to this sensor.

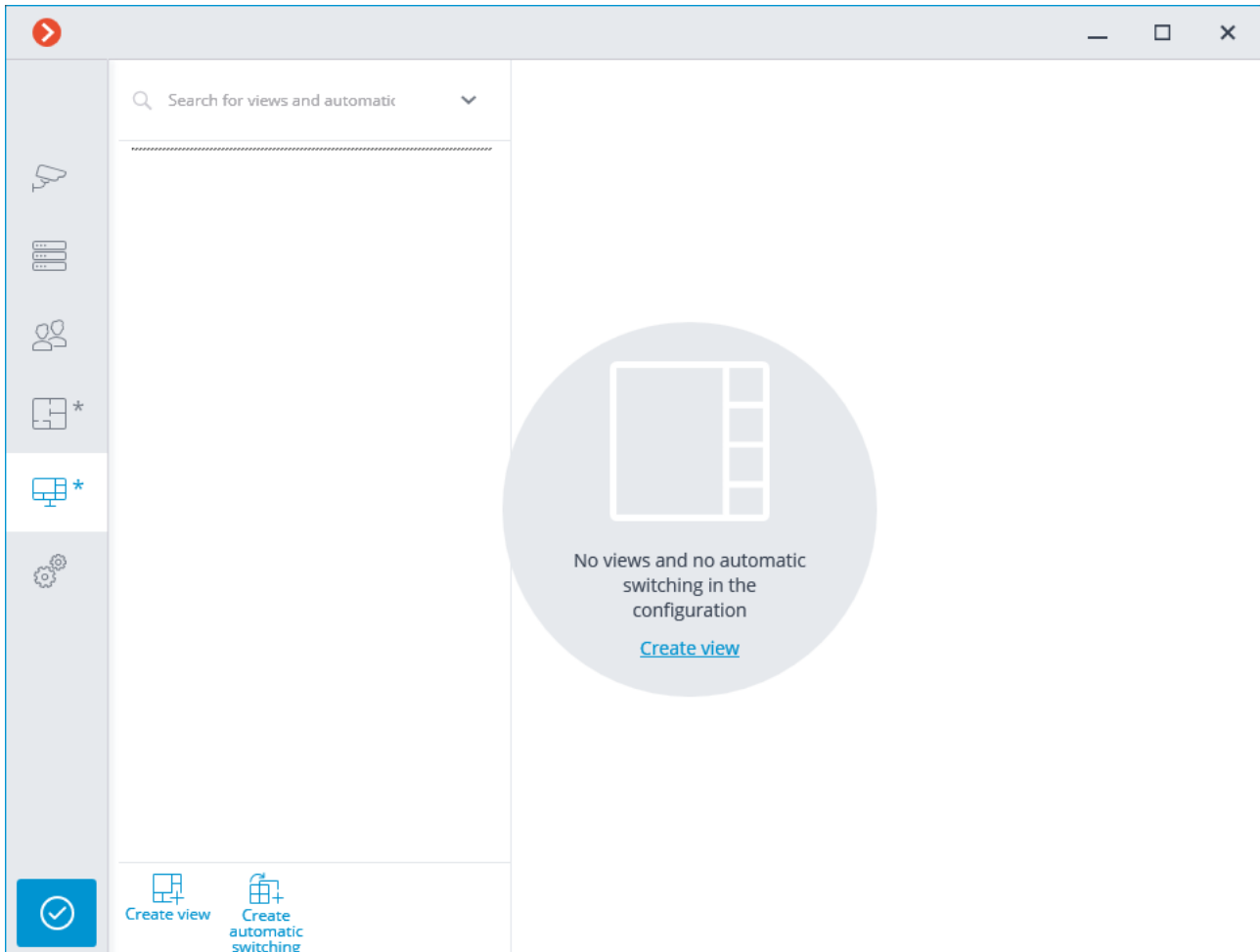
- ① **Relays** are the devices connected to the signal outputs of cameras. The relays allow operator to send signals to the external devices connected to these relays.



- ❗ Only those cameras that have the **Event processing (I/O)** option enabled in the settings are available for connection with sensors and relays.

## Setup of views and automatic switching



To set up views and automatic switching in the **Eocortex Configurator** application, go to the  **Views** tab.



### Terms

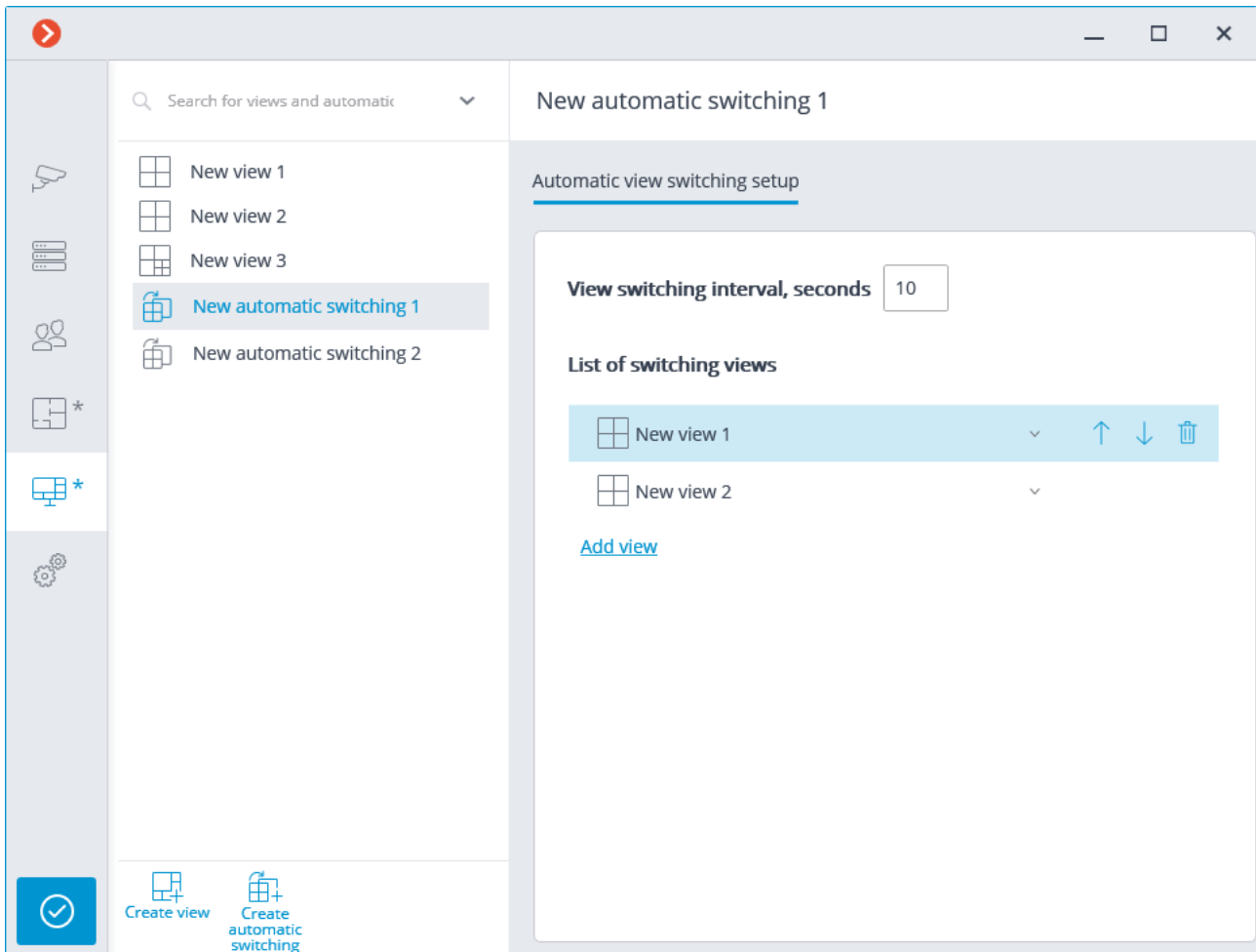
- **View** is a screen grid with the cameras bound to the cells. It serves to enable the user to choose a pre-configured layout instead of having to place cameras in the cells manually.
- **Automatic switching** is a sequence of views that replace one another automatically. It is intended to change the views automatically with the preset periodicity so that the user would not have to do it manually.

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.

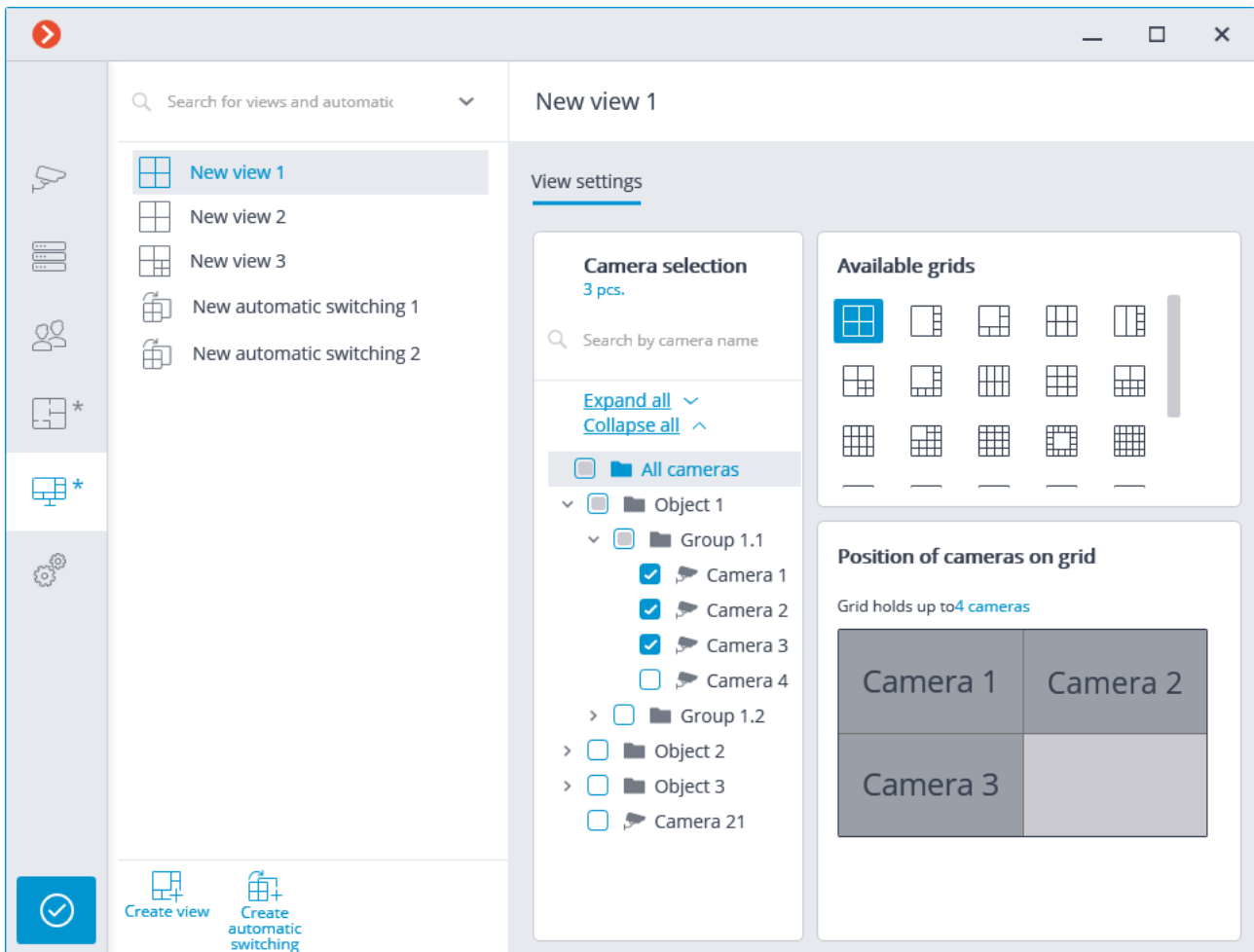
## View settings




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 in the **Position of cameras on grid** section. You can modify the layout of cameras on the grid by dragging them between the cells with your mouse.

## 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 setup

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.

The screenshot shows a software interface with a sidebar on the left containing navigation options: CAMERAS, SERVERS, USERS, PLANS \*, and VIEWS \*. Below these is an 'AUTOMATION' section with a gear icon. At the bottom of the sidebar is a blue button with a checkmark and the text 'APPLY ALL'. The main area is divided into two panels. The left panel has a search bar 'Search by camera name or IP' and two links: 'Expand all' and 'Collapse all'. Below is a tree view under 'All cameras' with folders 'Object 1', 'Object 2', and 'Object 3', and a camera entry 'Camera 21' with IP '192.168.100.211'. The right panel is titled 'All cameras' and has two tabs: 'Scheduled tasks' (selected) and 'Tasks by event'. It contains a table with the following data:

Camera	Number of tasks
Camera 21	0
Camera 9	0
Camera 10	0
Camera 1	0
Camera 2	0
Camera 3	0
Camera 4	0
Camera 5	0
Camera 6	0
Camera 7	0

Below the table are two links: 'Add task for group of cameras' and 'Clear the tasks of all cameras of the folder'.

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.

Search by camera name or IP

[Expand all](#) [Collapse all](#)

- 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
      - Camera 21  
192.168.100.211

### Camera 1

Scheduled tasks | Tasks by event | Integrations

**Tasks**

- Task 1
- Task 2

[Add task](#)

**Description**

**Schedule**  
Daily, starting from 01.02.2019 at 20:00.

**Actions**  
1 Turn on recording  
recording time (sec): 36000

**Note**  
Night recording

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.

Search by camera name or IP

[Expand all](#) [Collapse all](#)

- 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
      - Camera 21  
192.168.100.211

### Object 1

Scheduled tasks | Tasks by event

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

[Add task for group of cameras](#)

[Clear the tasks of all cameras of the folder](#)

For the individual camera on the [Tasks by event](#) tab, it is possible to add, modify and delete event-based tasks of the selected camera.

The screenshot shows the 'Camera 1' configuration page. On the left is a navigation tree with a search bar 'Search by camera name or IP' and buttons for 'Expand all' and 'Collapse all'. The tree is expanded to show 'All cameras' > 'Object 1' > 'Group 1.1', with 'Camera 1' (IP: 192.168.100.134) selected. The main panel has tabs for 'Scheduled tasks', 'Tasks by event' (active), and 'Integrations'. Under 'Tasks by event', there are two columns: 'Events' and 'Actions'. The 'Events' column 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' column lists: Alarm generation (with down, trash, and edit icons), Turn on recording (with up, trash, and edit icons), and an 'Add action' link. An 'Add task' link is at the bottom left of the main panel.

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.

The screenshot shows the 'Group 1.1' configuration page. The navigation tree on the left is expanded to 'Group 1.1'. The main panel has tabs for 'Scheduled tasks' and 'Tasks by event' (active). A section titled 'Adding task for group of cameras' contains two dropdown menus: 'Event' with 'User alarm' selected, and 'Action' with 'Turn on recording' selected. A blue 'Add' button is at the bottom.

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.

Search by camera name or IP

[Expand all](#) [Collapse all](#)

- 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
      - Camera 21  
192.168.100.211


### Camera 1

Scheduled tasks | Tasks by event | Integrations

#### External systems

- Skat
- Krechet-C
- RusGuard
- Orion Pro event generator

## 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.



Search by camera name or IP

[Expand all](#) [Collapse all](#)

- 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
      - Camera 21  
192.168.100.211

### Camera 1

Scheduled tasks | Tasks by event | Integrations

Tasks	Description
Task 1  	<b>Schedule</b> Daily, starting from 01.02.2019 at 20:00.
Task 2	
<a href="#">Add task</a>	<b>Actions</b> 1 Turn on recording recording time (sec): 36000
	<b>Note</b> Night recording

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. .

The screenshot shows a software interface with a left sidebar and a main content area. The sidebar contains a search bar and a tree view of folders. The main content area is titled 'Object 1' and shows a table of scheduled tasks.

**Object 1**

Scheduled tasks | Tasks by event

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

[Add task for group of cameras](#)  
[Clear the tasks of all cameras of the folder](#)

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.

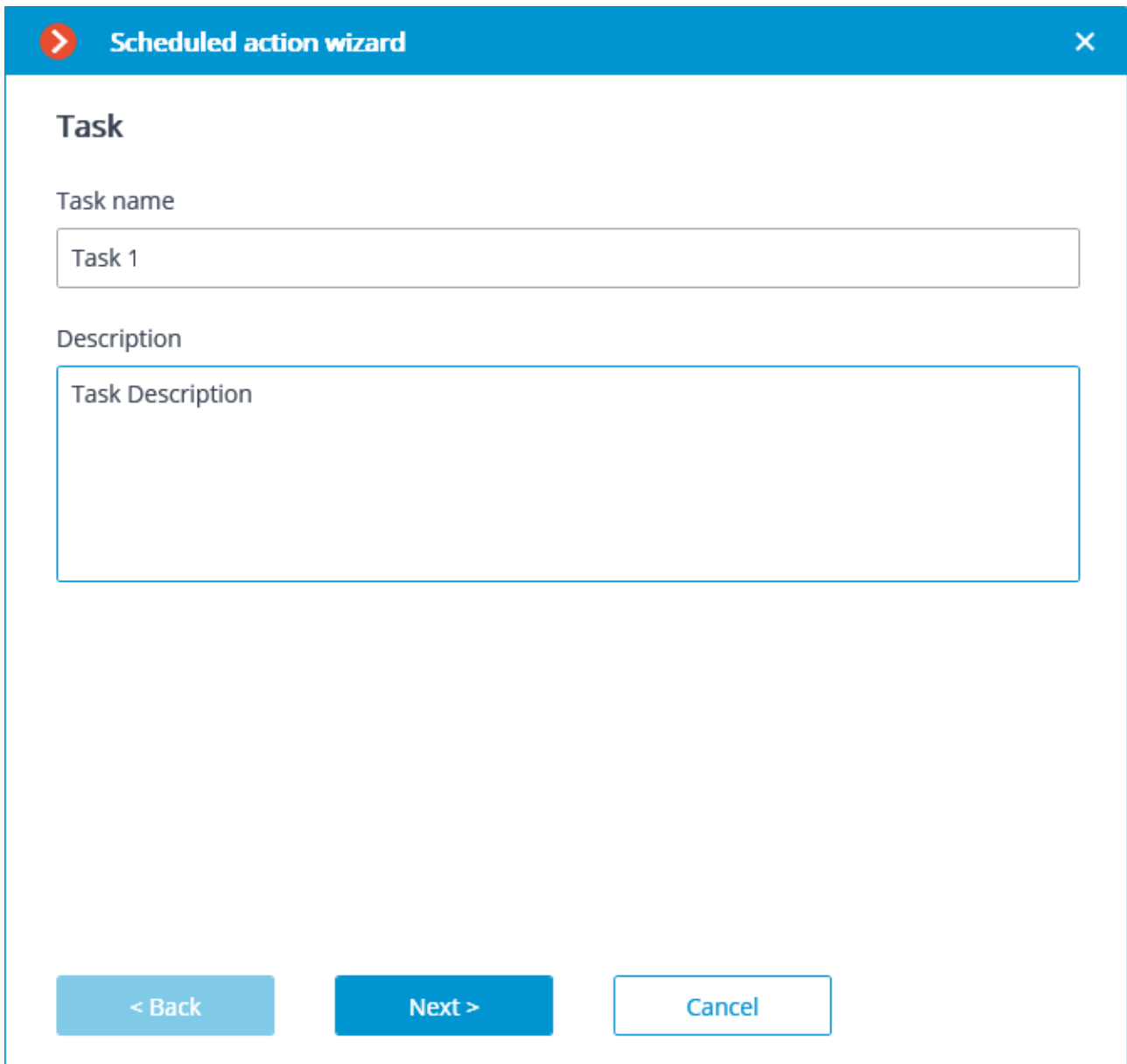


The adding procedures for the individual selected camera and for the folder are identical. The only difference is whether they will be applied to one or several cameras.

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 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

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

Which days

Every  week

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.

**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.

**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.

### Scheduled action wizard

#### Description

Schedule operation commencement

 01.02.2019 14:42:06

Repeat

by the second

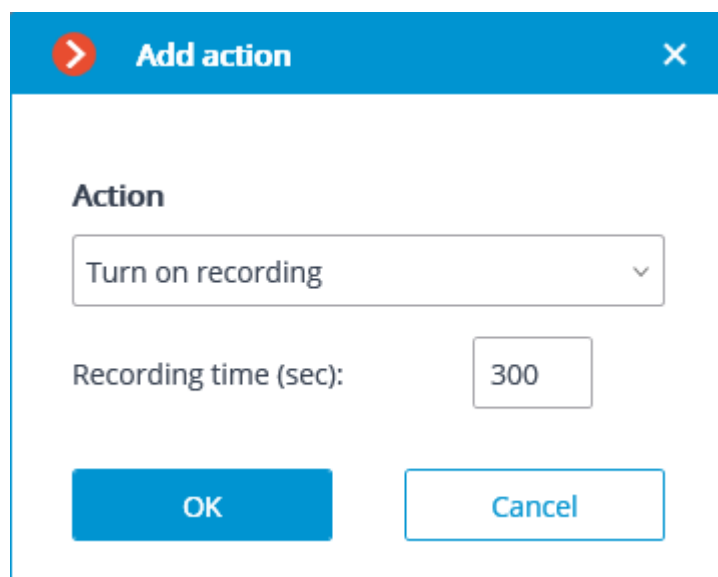
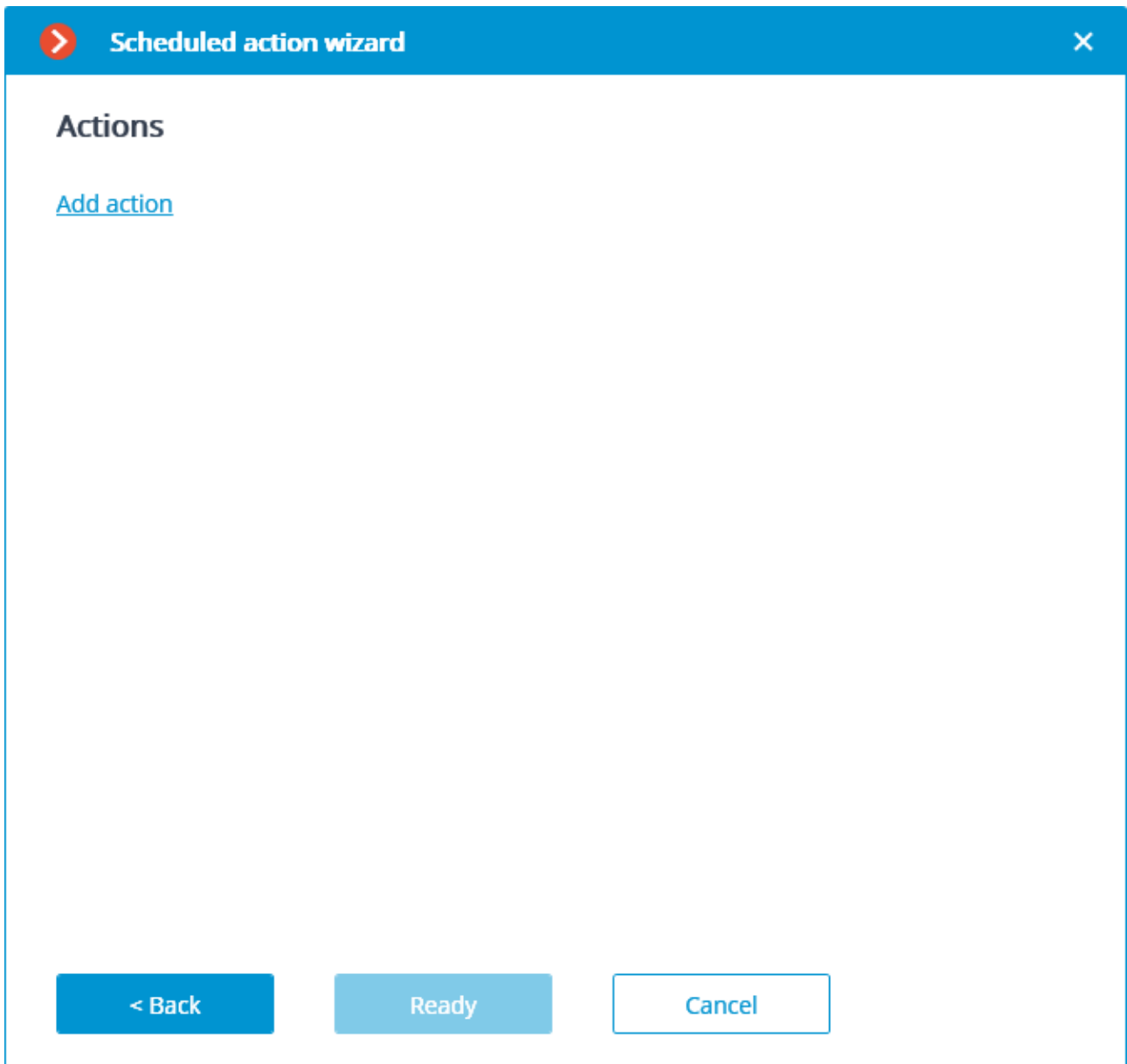
Every  sec.

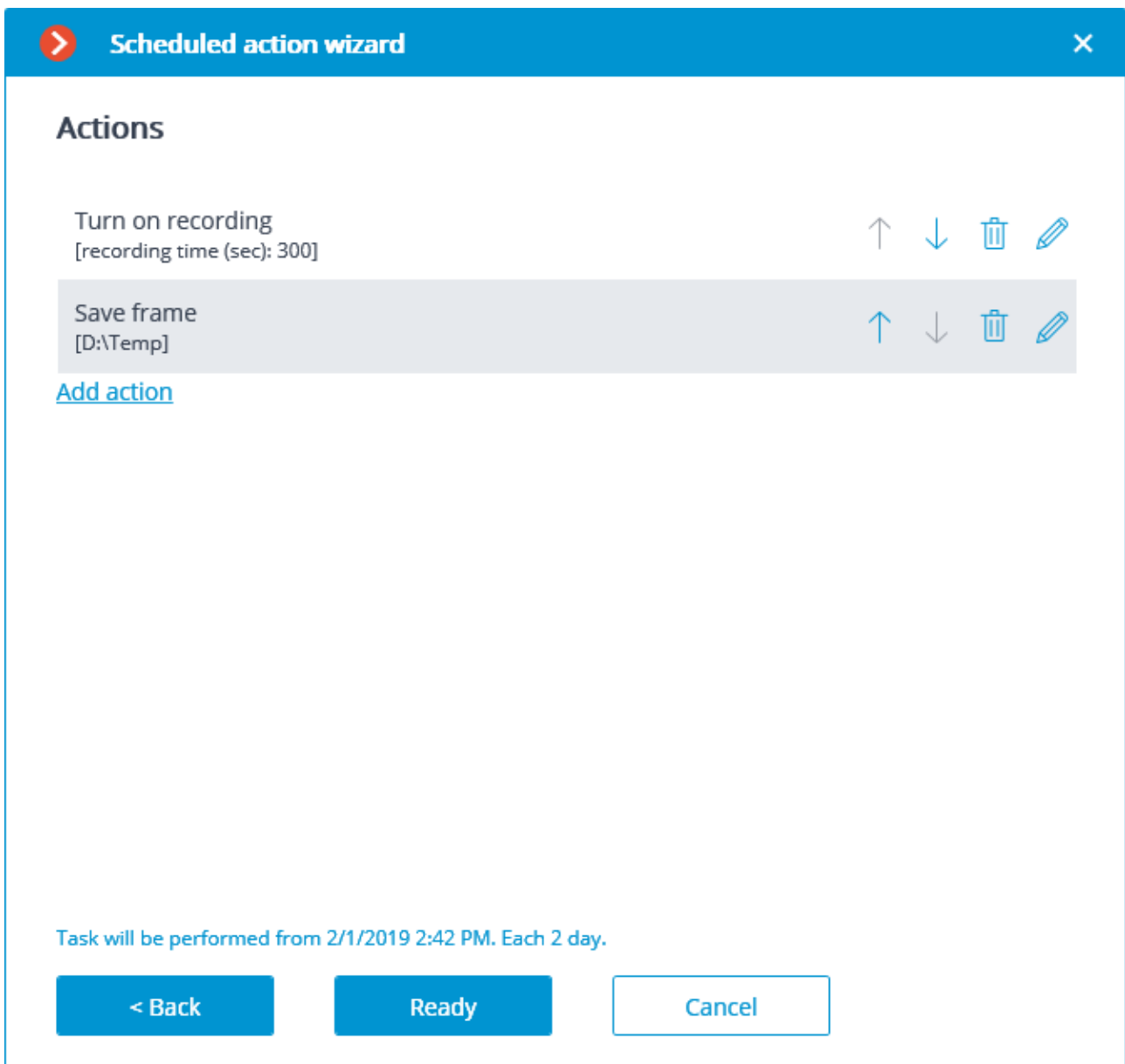
Run all day, if it is not run on time

Task will be performed from 2/1/2019 2:42 PM. Each 30 seconds.

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](#)

[Turn on washer](#)

[Turn on Autofocus mode](#)

[Disable recording](#)

[Alarm generation](#)

[Add an event to intercom log](#)

[Run external application on server](#)

[Set main stream for archiving](#)

[Disable frame skipping when recording to the archiv](#)

[Send Push notifications to mobile devices](#)

[Send to messenger](#)

[Send report by email](#)

[Send notification by email](#)

[Send notification by SMS](#)

[Pause](#)

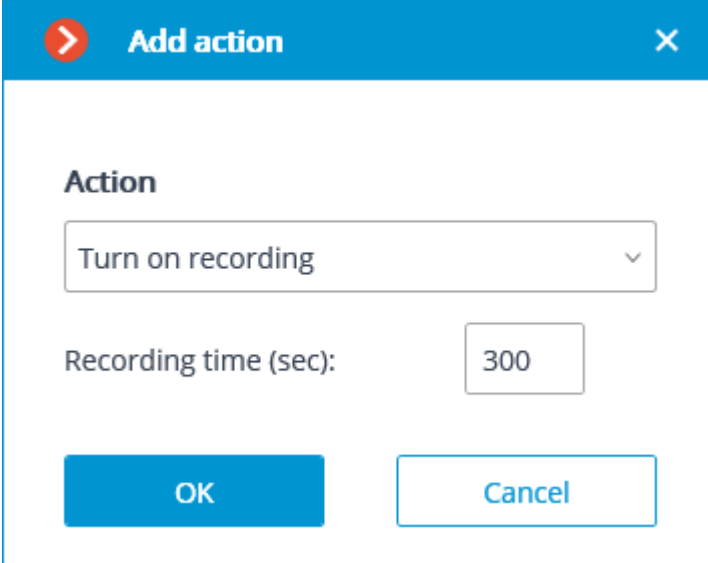
[Send signal to Camera output](#)

[Save frame](#)

[Set camera position](#)

## Turn on recording

Turns on the recording to archive.



The screenshot shows a dialog box titled "Add action" with a blue header. Inside the dialog, there is a section labeled "Action" with a dropdown menu currently set to "Turn on recording". Below this, there is a label "Recording time (sec):" and a text input field containing the value "300". At the bottom of the dialog, there are two buttons: "OK" and "Cancel".

Action parameters:

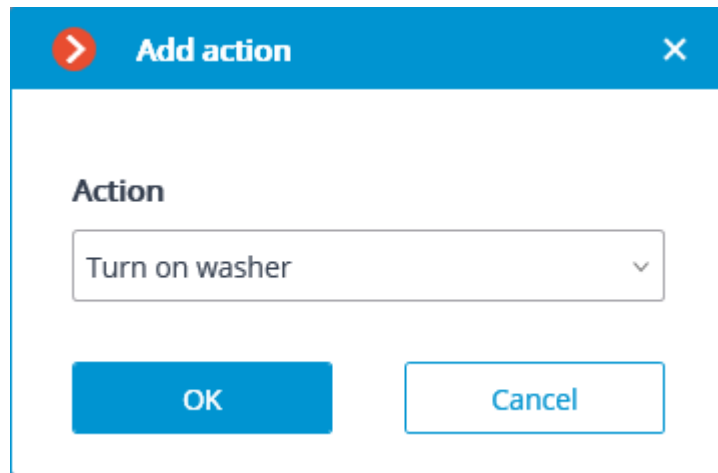
**Recording time (seconds):** sets the recording time during which the recording to archive will be performed.



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.

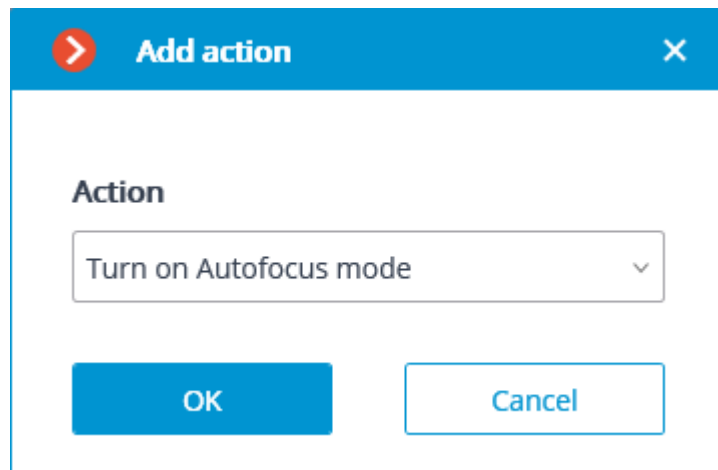
## Turn on washer

Activates camera washer.



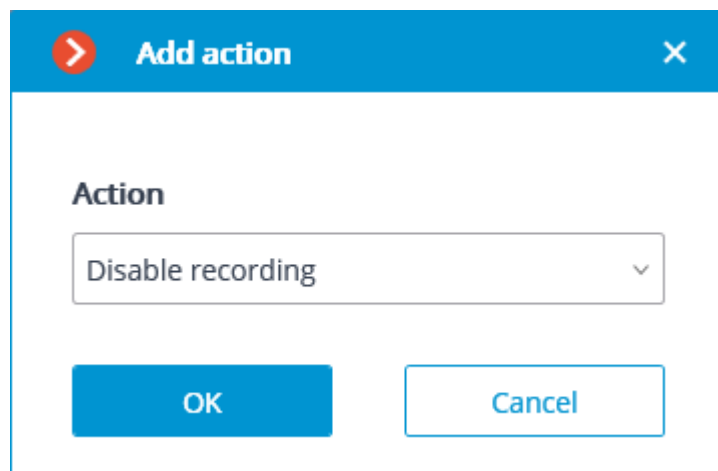
## Turn on Autofocus mode

Activates camera autofocus.



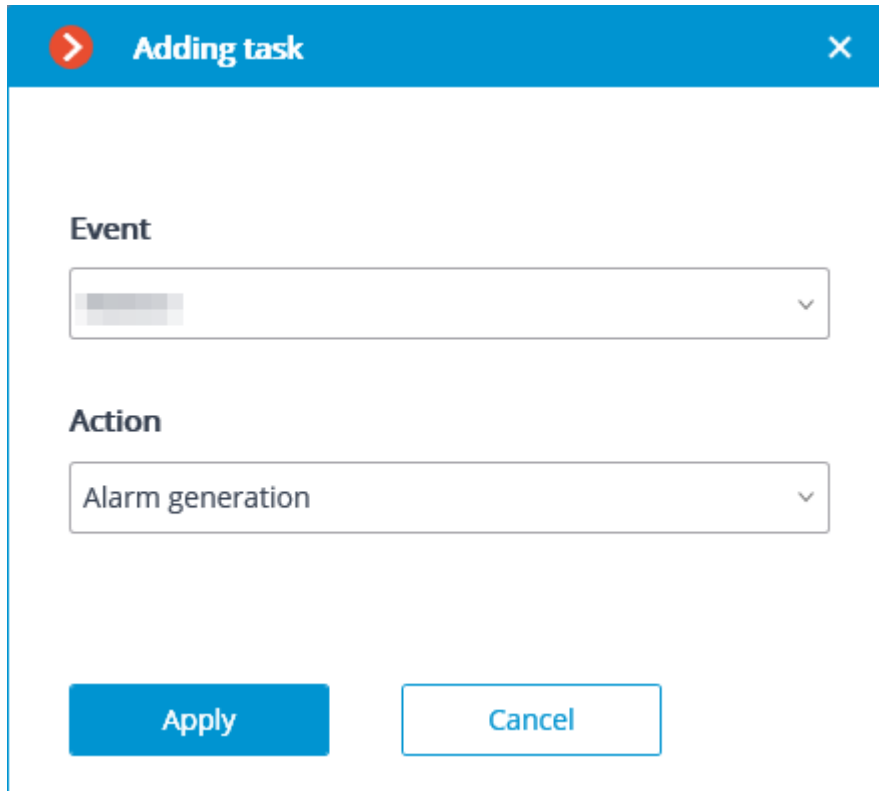
## Disable recording

Disables recording to archive.



## Alarm generation

Generates alarm for the camera.



The image shows a dialog box titled "Adding task" with a blue header bar containing a red arrow icon and a close button. The main content area is white and contains two dropdown menus. The first dropdown is labeled "Event" and is currently blank. The second dropdown is labeled "Action" and has "Alarm generation" selected. At the bottom of the dialog, there are two buttons: "Apply" (solid blue) and "Cancel" (white with 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.

**Настройка действия Генерация тревоги**

Действия    Условия выполнения (0)

**Выполнять на камерах**  
Действие будет выполняться для следующих камер

Камера 1 (Текущая)

**Ограничения**

Ограничить по времени запуска

Выполнять не чаще, чем раз в  секунд

**Особые настройки**

Активировать камеру

Применить    Отмена

## Add an event to intercom log

Add the current door phone event to the **Event log**.

**Add action**

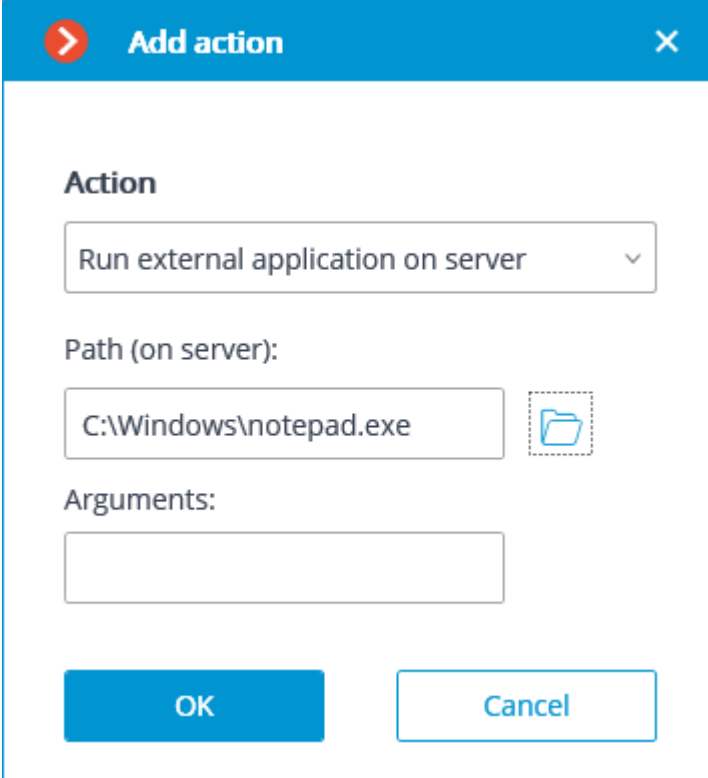
**Action**

Add an event to intercom log

OK    Cancel

## Run external application on server

Launches an external application on the server.



The screenshot shows a dialog box titled "Add action" with a blue header bar containing a red arrow icon and a close button. The main content area is white and contains the following elements:

- Action:** A dropdown menu with the selected option "Run external application on server".
- Path (on server):** A text input field containing "C:\Windows\notepad.exe" and a folder icon button to the right.
- Arguments:** An empty text input field.
- Buttons:** "OK" and "Cancel" buttons at the bottom.

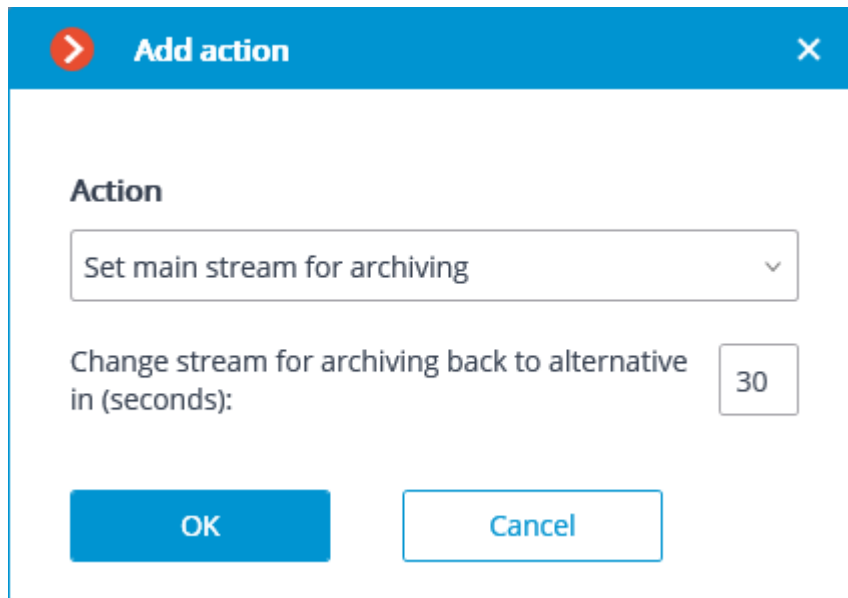
Action parameters:

**Path (on server):** sets the path to the application located on server.

**Arguments: if it is required** 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.

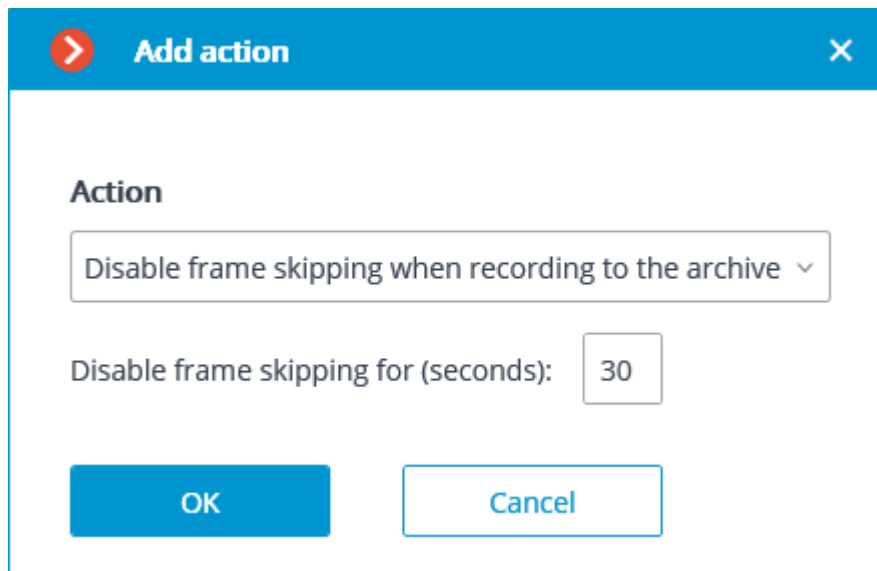


Action parameters:

**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 archiv

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.

## Send Push notifications to mobile devices

Sends Push notifications with the preset text to the mobile clients connected to servers.



**Add action**

**Action**

Send Push notifications to mobile devices

Message text: Camera 1: Sabotage!

Recipients: john.smith,robert.miller

root

john.smith

robert.miller

OK

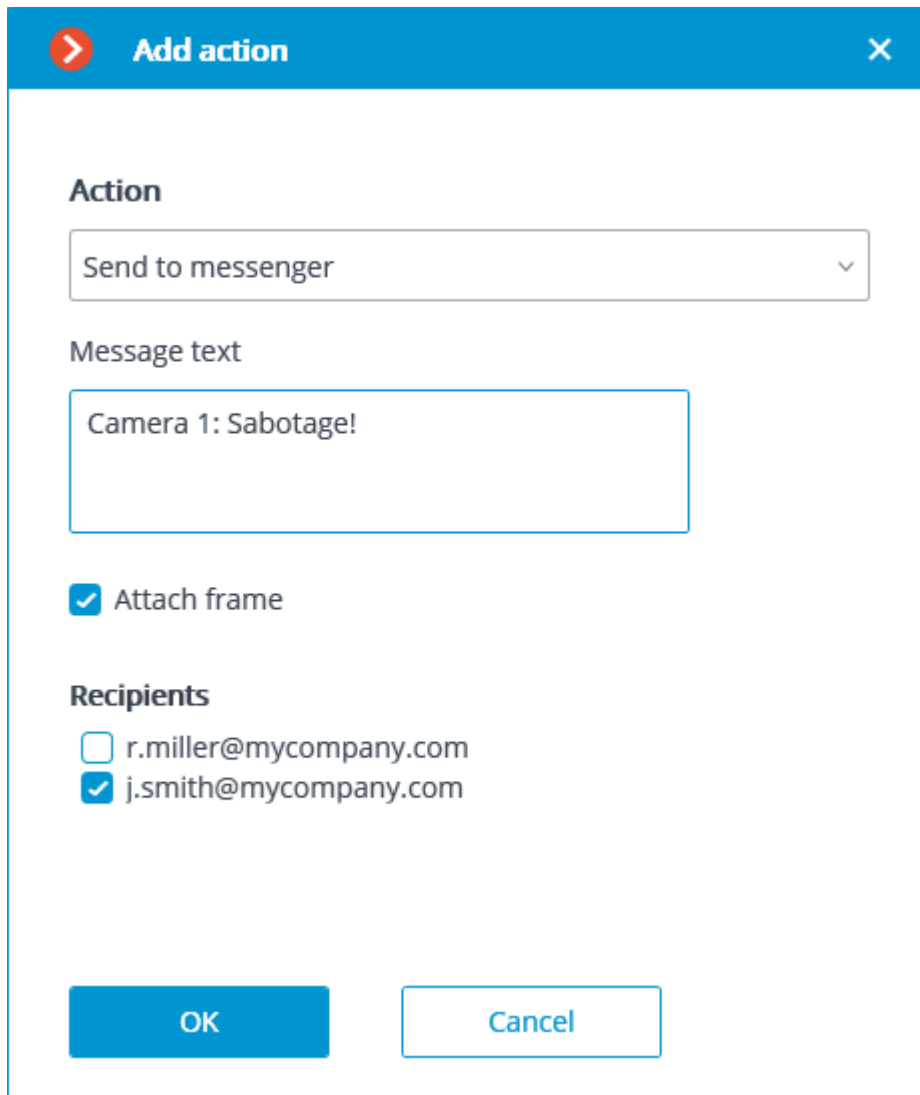
Action parameters:

Message text: sets the text of a message to be sent.

Recipients: the recipients of the message are set.

## Send to messenger

Sends a message thru 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.

**Attach frame:** attaches the current frame.

**Recipients:** the list of messenger users in which it is required to mark the recipients of the message.

## 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**

**> Add action** ×

**Action**

Send report by email ▼

Send from  ▼ + 🗑️ ✎️

To  ℹ️

Type of report  ▼

For the last   ▼

Group filter  ▼

Filter by direction  ▼

Report format  ▼

**Action**

Send report by email

Send from: cctv@mycompany.com

To: security@mycompany.com

Type of report: Face Recognition (Expert)

For the last: 1 Days

Include in the report only recognized

Report format: Table

OK Cancel

Action parameters:

**Send from:** email address from which the messages will be sent. The forms of adding the email server and sender address can be found in the description of [Send notification by email](#) action.

**To:** email address to which the messages will be sent.

**Type of report:** a report is selected on one of the following analysis modules:

- 3D people counting module;
- People counting module;
- Licence plate recognition (Complete);
- Licence plate recognition (Light);
- Face recognition module (Basic);
- Face recognition module (Expert).

**For the last (...) days:** the period for which the report is required to be drawn up.

**Report format:** one of the formats available for the report is chosen. In the general cases the reports will be drawn up in the following formats:

- **Table:** Microsoft Excel spreadsheet.
- **.csv file:** CSV file with tabular data

- **Graph:** image file with graph.

Additionally, the parameters depending on the type of report are used for generating reports.

For the report regarding visitor quantity:

**Size of interval:** individual interval value is set.

For the report regarding the recognized vehicle license plate numbers:

**Filter by groups:** the groups are indicated whose data will be shown in the report.

**Filter by direction:** the direction of travel of the vehicles whose data will be shown in the report is indicated.

For the report regarding the recognized persons:

**Include only those recognized:** when this option is on, only those persons who have been recognized using the database will be included into the report; of this option is off, all the persons detected by the module will be included in to the report.

## Send notification by email

Sends an email notification from the server to the indicated address.

**Action**

Send notification by email

Send from: cctv@mycompany.com

To: security@mycompany.com

Message text:  
Camera 1: Sabotage!

Attach frame to email

Use frame from archive

Saved frame format: jpeg

[Send text message](#)

OK Cancel

Action parameters:

**Send from:** email address to be used for sending messages. In a general case, it will be the same as the user name in the mail server settings window.

**To:** email address to which the messages will be sent

**Message text:** the text of the message to be sent to the indicated address.

**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**.

**Use frame from archive:** the frame saved in the archive is used for sending. It allows to send more event-synchronized visual data, but leads to additional server hardware load.

Clicking on the **Send text message** link will 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 **Gmail**.

- ① The forms of editing the mail server and sender address are similar to the forms used for adding.

The screenshot shows a dialog box titled "Add Mail server". The title bar is blue and contains a right-pointing arrow icon, the text "Add Mail server", and a close "X" icon. The main area of the dialog is white and contains two input fields. The first field is labeled "Mailing server" and has a dropdown menu with "Gmail" selected. The second field is labeled "SMTP server address:" and has a text box containing "smtp.gmail.com". At the bottom of the dialog are two buttons: "OK" and "Cancel".



 **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

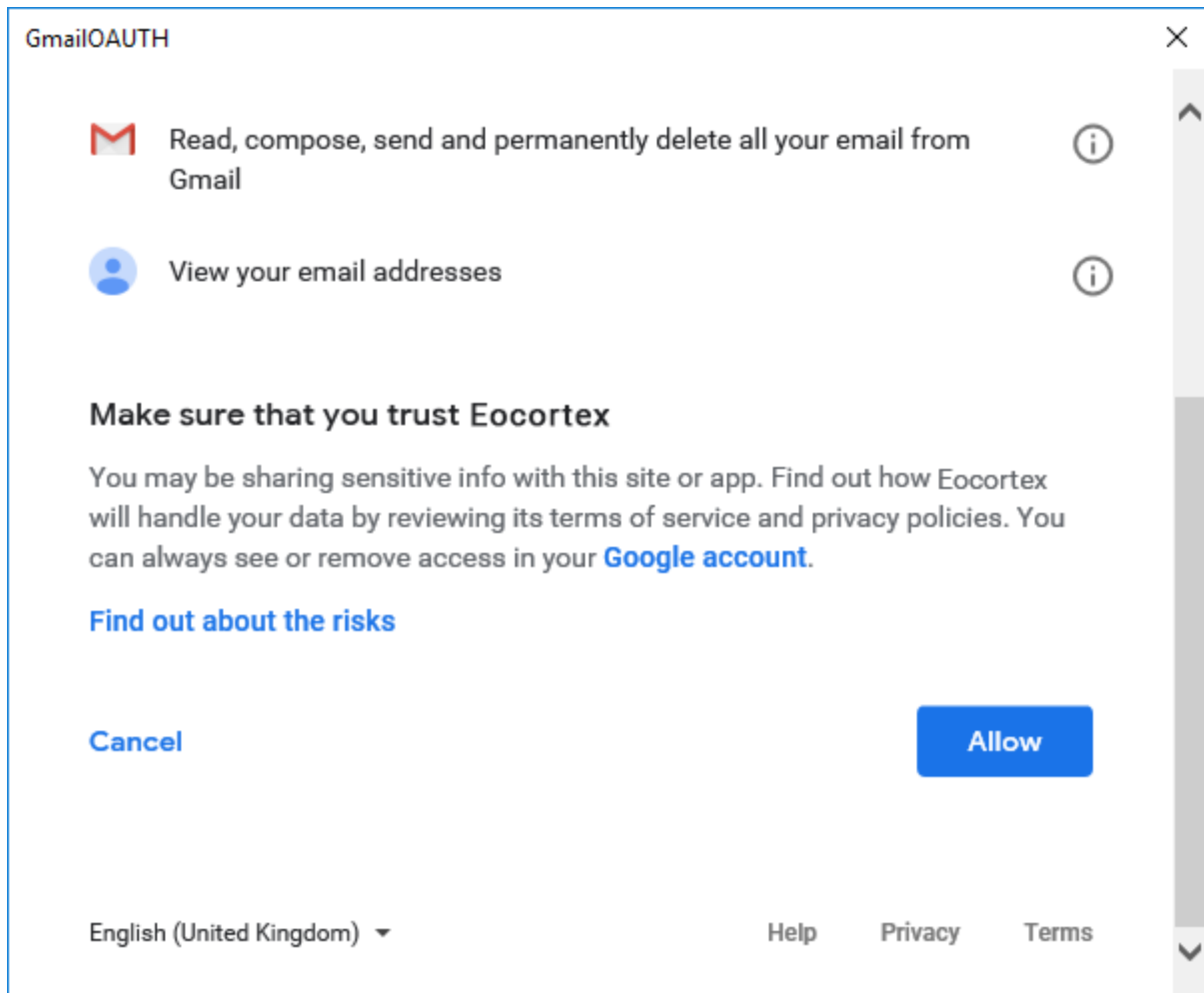
 cctv.mycompany2018@gmail.com

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.

**Action**

Send notification by SMS

GSM modem: GSM Modem +

Telephone number: +12345678901

Message text:

Camera 1: Sabotage!

[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:** sets the modem to be used for sending SMS messages.

Below you will find the form with the modem's settings. It is required to indicate actual values there. These values are usually set 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 messages will be sent.

**Message text:** the text of the message to be sent to the specified number.

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

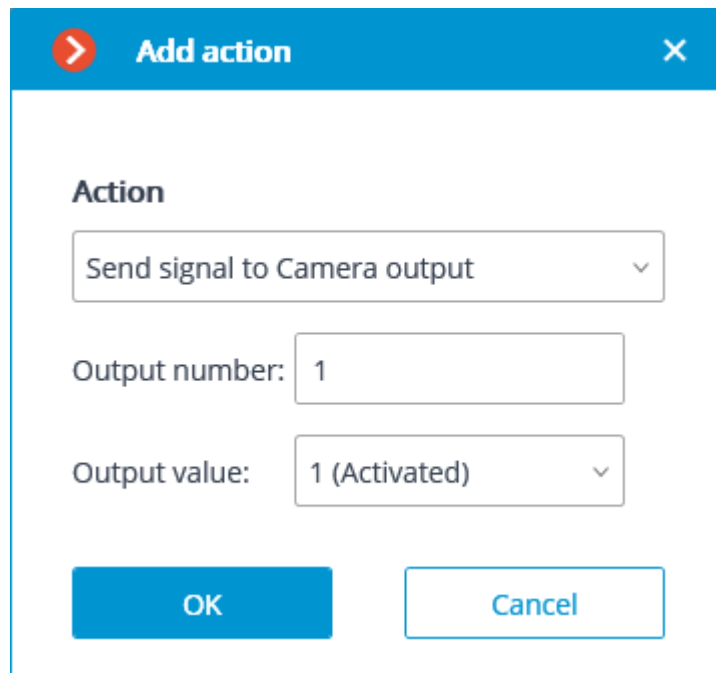
Action parameters:

**Pause interval (sec)** sets the pause duration.

## Send signal to Camera output

The electrical signal is sent to the IP camera's signal output.

- i 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.



**Action**

Send signal to Camera output

Output number: 1

Output value: 1 (Activated)

OK Cancel

Action parameters:

**Output number:** sets the number of camera signal output.

- i Value 0 or 1 is used for most cameras with one output.

**Output value:** sets the alarm output status: 1 (Activated) / 0 (Deactivated).

- i 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):

D:\Temp

Saved frame format:

JPEG

Restrict maximum size of the folder (MB):

Use frame from archive ⓘ

OK Cancel

Action parameters:

**Folder (on server):** sets the path to the folder where the frames will be stored.

**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.



Filenames will be formed as follows:

ChannelName DD\_MM\_YYYY hh.mm.ss.ttt.ext, where:

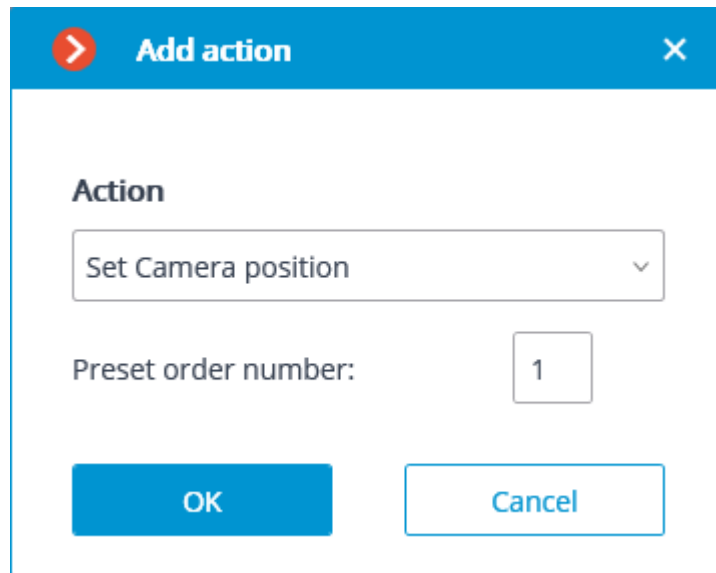
DD\_MM\_YYYY: day, month, year;

hh.mm.ss.ttt: hours, minutes, seconds, milliseconds

ext: jpg, png.

## 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.

## 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.

Search by camera name or IP

[Expand all](#) [Collapse all](#)

- 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
      - Camera 21 192.168.100.211

### Camera 1

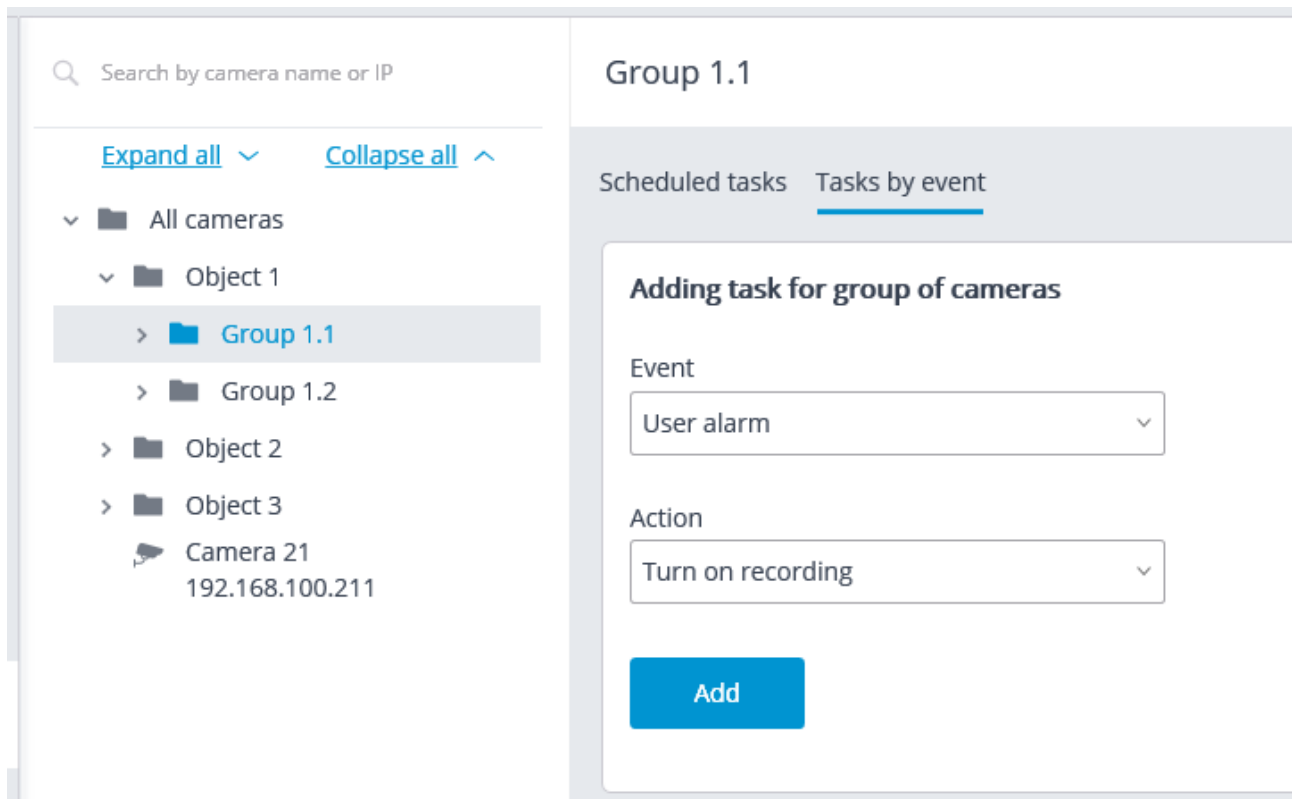
Scheduled tasks **Tasks by event** Integrations

Events	Actions
Motion	Alarm generation ↓ 🗑️ ✎
No connected camera	Turn on recording ↑ 🗑️ ✎
<b>User alarm</b> 🗑️	<a href="#">Add action</a>
External alarm start	
End of external alarm	
Call over the intercom	
Moving objects tracking	
Video surveillance sabot...	

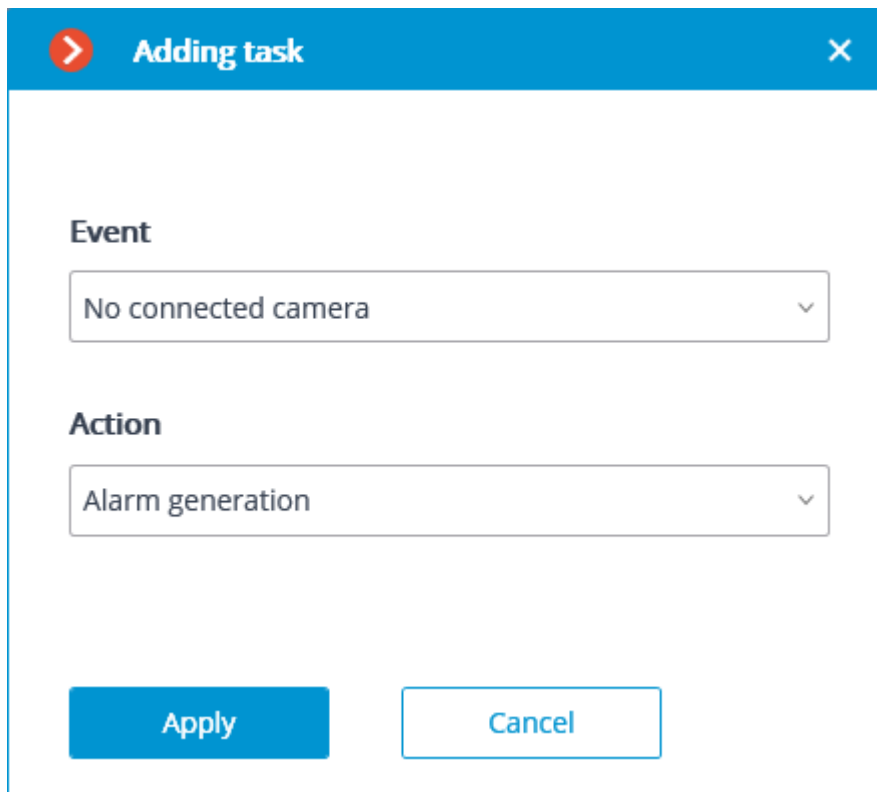
[Add task](#)



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.




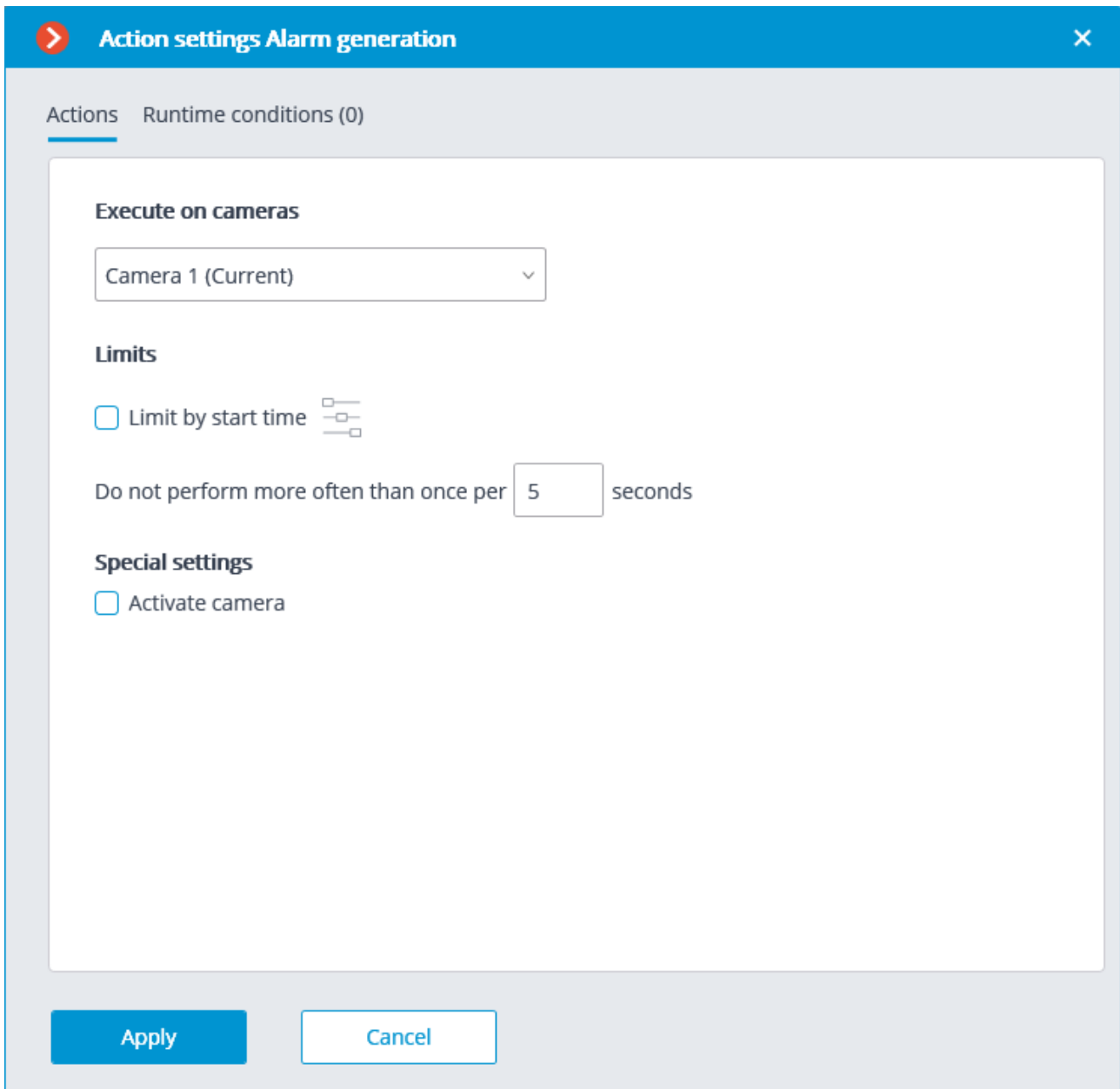
In order to add a task to be performed in response to an event, select the camera in the list and click the **Add task** link. The task by event wizard will open.



In the wizard launch screen, choose Event and Action that will be performed in response to the specified event, then click **Add**.

- ① 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. 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 Alarm generation**

Actions Runtime conditions (0)

**Execute on 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

### Action settings Alarm generation

Actions Runtime conditions (0)

Selectively... ⓘ

Search by camera name

[Expand all](#) ∨ [Collapse all](#) ∧

- Camera 1
- Camera 2
- Camera 3
- Camera 4

>  Group 1.2

- >  Object 2
- >  Object 3

**Limits**

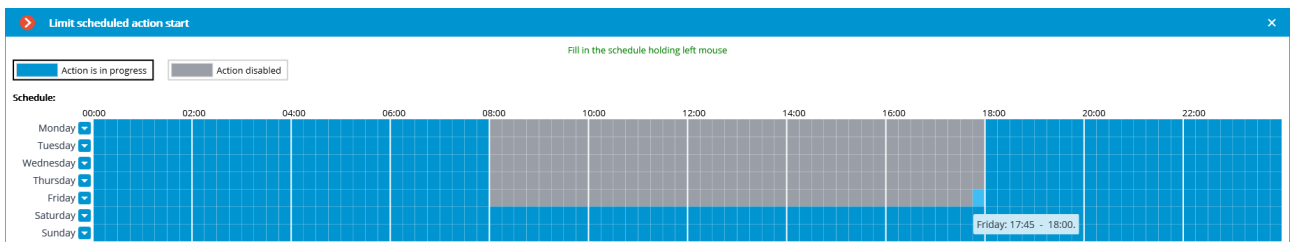
Limit by start time ⏏

Do not perform more often than once per  seconds

**Special settings**

Activate camera


**Apply** **Cancel**



On the **Runtime conditions** tab, it is possible to set the conditions for an action to be performed.

### Action settings Alarm generation

Actions Runtime conditions (1)

Event attribute	Comparison	Value	
Stream type	Equal	Main stream	

[Add condition](#)

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.

## Events

[Large number of people in the queue](#)

[Large crowd of people](#)

[Fire](#)

[Call over the intercom](#)

[Loud sound](#)

[Motion](#)

[Smoke](#)

[External alarm start](#)

- [Motion started](#)
- [Inactive zone](#)
- [Recognized license plates](#)
- [Face Detection](#)
- [Face recognized](#)
- [Analog camera connection fail](#)
- [No connection with camera](#)
- [End of external alarm](#)
- [Motion stopped](#)
- [Abandoned object](#)
- [Moving objects tracking](#)
- [No connected camera](#)
- [No hat](#)
- [Users alarm](#)
- [Video surveillance sabotage](#)
- [Camera input signal](#)
- [Honeywell Pro-Watch event](#)
- [Siemens DMS8000 event](#)
- [External event](#)
- [Request to close gate](#)
- [Request to open gate](#)
- [Connecting to analog camera](#)
- [Established connection with camera](#)

## Large number of people in the queue

This event is generated when the **People counting 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.

The screenshot shows a configuration window with two tabs: 'Actions' and 'Runtime conditions (1)'. The 'Runtime conditions (1)' tab is active. Below the tabs, there is a table with three columns: 'Event attribute', 'Comparison', and 'Value'. The 'Event attribute' column contains a dropdown menu with 'Zone' selected. The 'Comparison' column contains a dropdown menu with 'Equal' selected. The 'Value' column contains a text input field with 'Zone 1' entered. To the right of the 'Value' field is a trash icon.

Event attribute	Comparison	Value
Zone	Equal	Zone 1

## Large crowd of people

This event is generated when the **Crowd counting module** 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	

## Fire

This event is generated when the **Fire and smoke detection** 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

Actions Runtime conditions (1)

Event attribute	Comparison	Value	
Zone	Equal	Zone 1	

## Smoke

This event is generated when the **Fire and smoke detection** module is enabled on the camera and smoke is detected.


## 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. 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.

Actions Runtime conditions (1)


Event attribute	Comparison	Value	
Zone	Equal	Zone 1	

## Inactive zone

This event is generated when the Personnel 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.

Actions Runtime conditions (1)

Event attribute	Comparison	Value	
Zone	Equal	Zone 1	

# Recognized license plates

This event is generated when the **License 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.

Event attribute	Comparison	Value	
License plate identified ^	Equal v	Yes v	
License plate identified			
License plate			
Reliability			
Surname			
Name			
Middle name			
Brand			
Color			
Additional information			
Group name			
Direction			

# Face Detection

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.

Different attributes can be set for this event. For example, if the **Identified** attribute = **Yes** is set, the action will be performed when any face that exists in the database is recognized. If several attributes have been 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 face is recognized.



Actions Runtime conditions (1)


Event attribute	Comparison	Value	
Identified	Equal	Yes	
<ul style="list-style-type: none"><li>Identified</li><li>Surname</li><li>Name</li><li>Patronymic</li><li>Group name</li><li>Additional information</li></ul>			

## 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.

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.

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.

Actions Runtime conditions (1)

Event attribute	Comparison	Value	
Zone	Equal	Zone 1	

## Abandoned object

This event is generated when the **Abandoned object detection module** 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.



## Moving objects tracking

This event is generated when the **Abandoned object detection module** 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.

Actions Runtime conditions (2)

Event attribute	Comparison	Value	
Zone	Equal	Zone 1	
Alert type	Equal		

[Add condition](#)

Line intersection

Moving within zone

Lengthy presence

## 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.

The screenshot shows a configuration window titled "Runtime conditions (2)". It contains two conditions. The first condition has the event attribute "Breakage duration (second)" and a value of "15". The second condition has the event attribute "Stream type", a comparison of "Equal", and a value of "Main stream". A dropdown menu is open for the "Stream type" value, showing a list of options: "Main stream", "Alternate stream", "Main sound", "Alternate sound", "Sound output", "Motion detection", "I/O", "Archive video", and "Archive audio". There is an "Add condition" link below the conditions.

## No hat

This event is generated when the **Hard Hat detector** module is enabled on the camera and a person not wearing a hat is detected in the frame.

## 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**.


## 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.

Actions Runtime conditions (2)

Event attribute	Comparison	Value	
<input type="text" value="Input number"/>	<input type="text" value="Equal"/>	<input type="text" value="1"/>	
<input type="text" value="Alarm availability"/>	<input type="text" value="Equal"/>	<input type="text" value="Yes"/>	





## 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**

## Siemens DMS8000 event

This event is generated when an event comes from the **Siemens DMS8000** system.

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.

Actions Runtime conditions (1)

Event attribute	Comparison	Value	
EventId	Equal	AlarmUnAck	

EventId

ItemFullPath

Description

TechnicalText

ItemName

EventCode

ObjectType

## 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.

Actions Runtime conditions (3)

Event attribute	Comparison	Value	
System name	Equal	MyLegacySystem	
Information	Equal	01	
Code of event	Equal	2345	

## 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 **Open 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.

Event attribute	Comparison	Value	
Camera number	Equal	1	

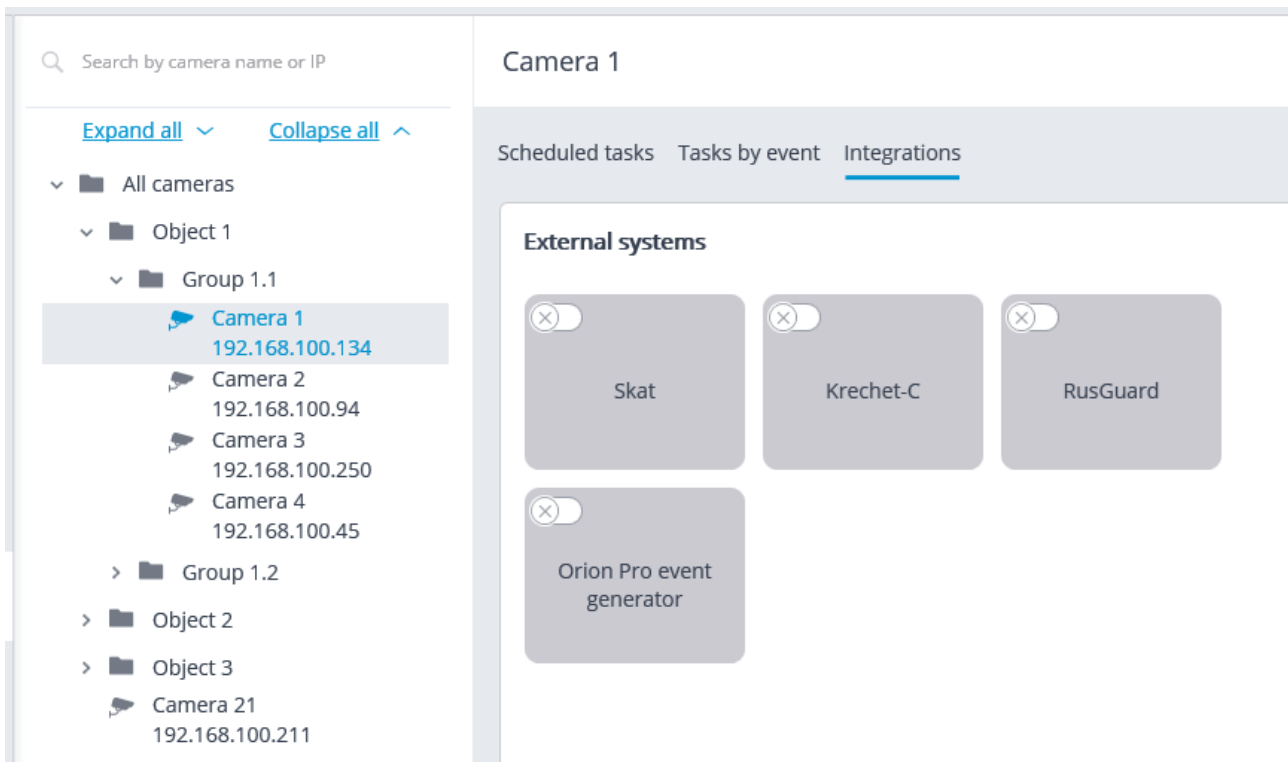
## Established connection with camera



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.

## 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.

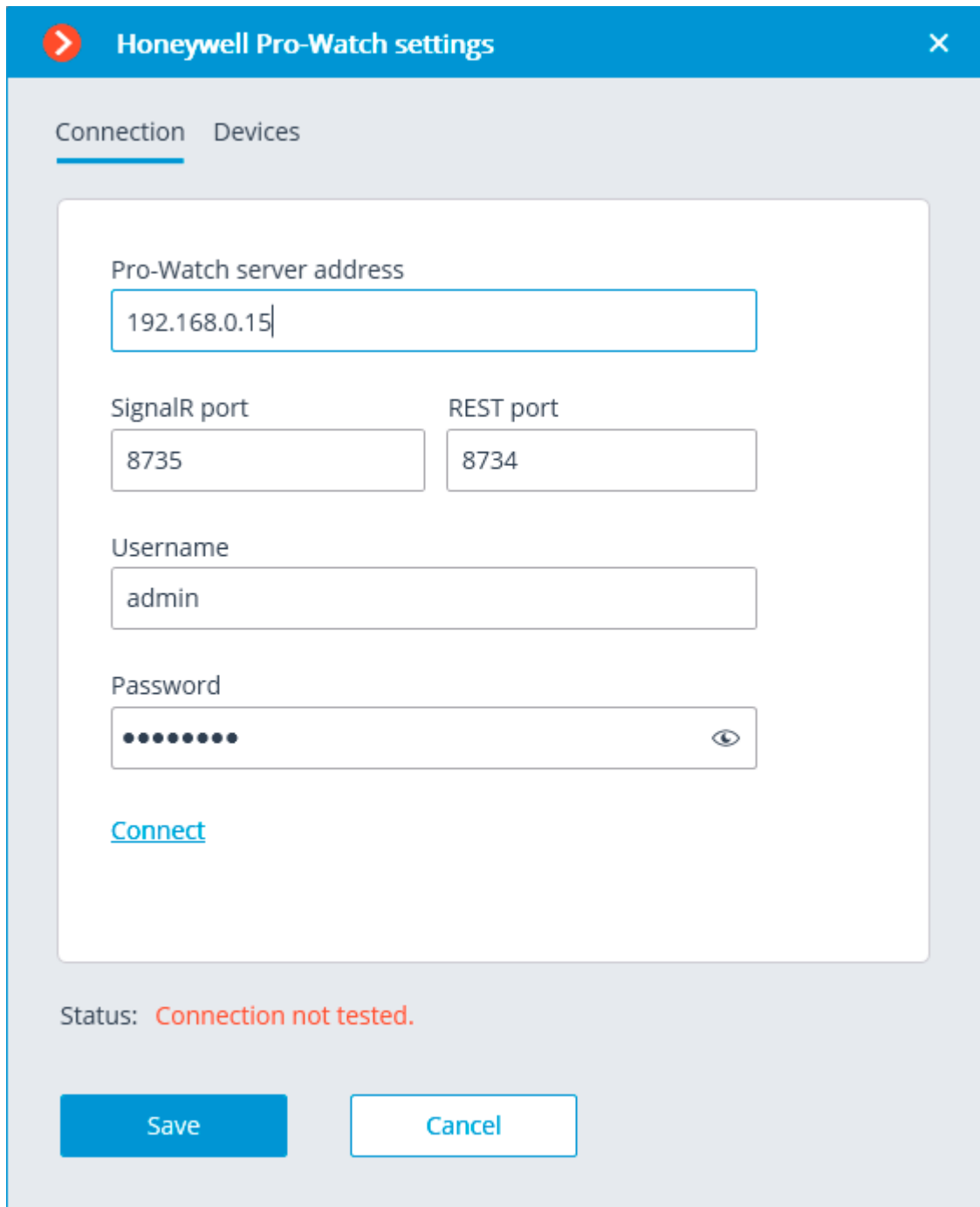
The integration settings are available for the following systems:

[Honeywell Pro-Watch](#)

## 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**.

## Video analytics

### Abandoned object detection module



The **Abandoned object detection module** 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.

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.

### Module setup



In order to use the module, it is required to enable and set up the software motion detector, then activate the module itself. To do it, it is required to [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list on the left side of the page, 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

### Intelligent module

<input type="checkbox"/> Face detection	<input type="checkbox"/> Tracking	<input type="checkbox"/> People counting	<input type="checkbox"/> License Plate Recognition (Complete)	<input type="checkbox"/> License Plate Recognition (Light)
<input checked="" type="checkbox"/> Abandoned objects detection	<input type="checkbox"/> Interactive search	<input type="checkbox"/> FishEye dewarping	<input type="checkbox"/> Loud sound detection	<input type="checkbox"/> Fire and smoke detector
<input type="checkbox"/> Traffic density heat map	<input type="checkbox"/> Crowd monitoring	<input type="checkbox"/> Face Recognition (Expert)	<input type="checkbox"/> Face Recognition (Basic)	<input type="checkbox"/> Personnel activity monitoring
<input type="checkbox"/> Counting people in queue	<input type="checkbox"/> Sabotage detector	<input type="checkbox"/> Auto zoom	<input type="checkbox"/> Hard Hat Detector	

Perspective

### Abandoned objects detection

**Detection parameters**

Detection time: 1 minute

[Set object size limits](#)

[Set detection zone](#)

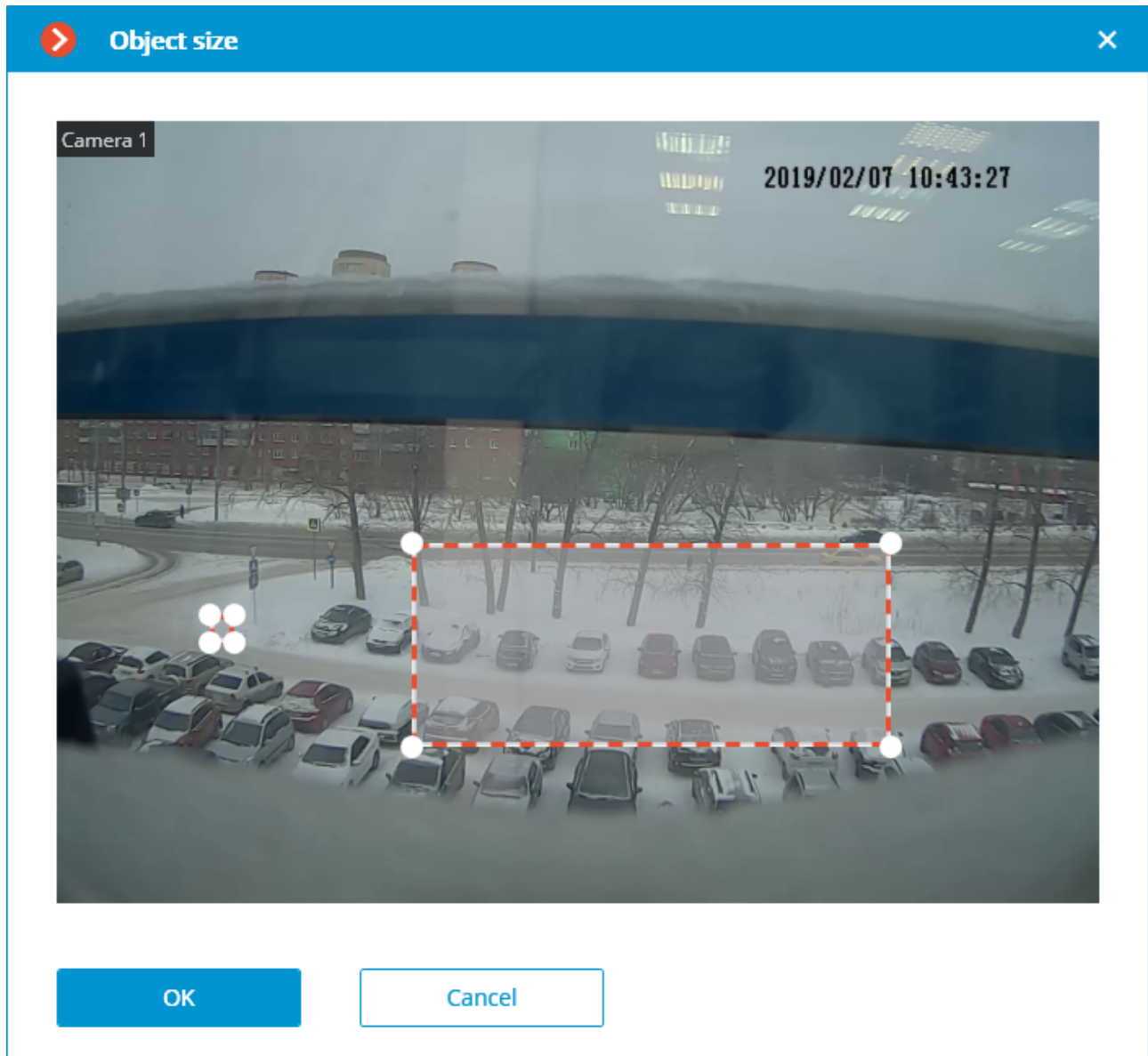
**Algorithm settings**

Sensitivity: Medium

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

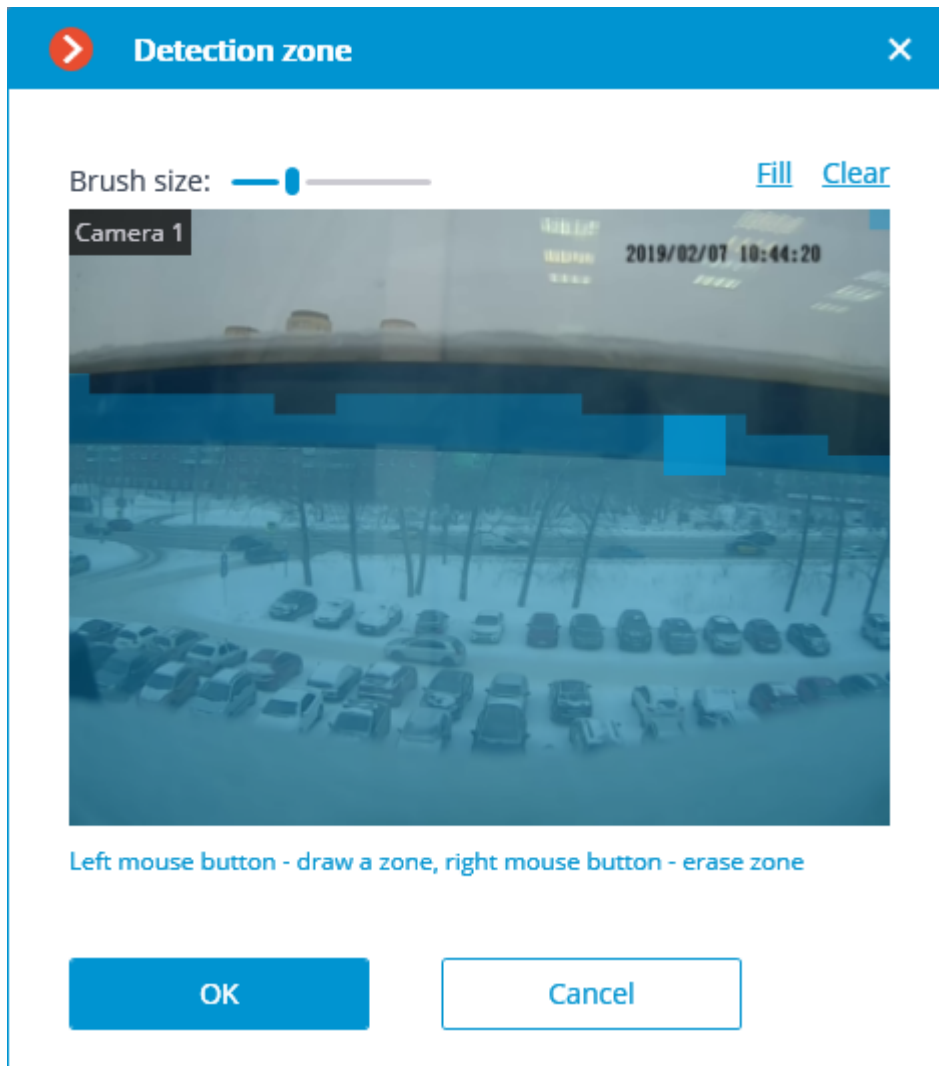
**Detection time:** the objects that do not move during the time that exceeds the time preset in this window will be considered abandoned. The time from 30 seconds to 10 minutes can be set.

**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.

**Control 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 use of the module will start only after [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



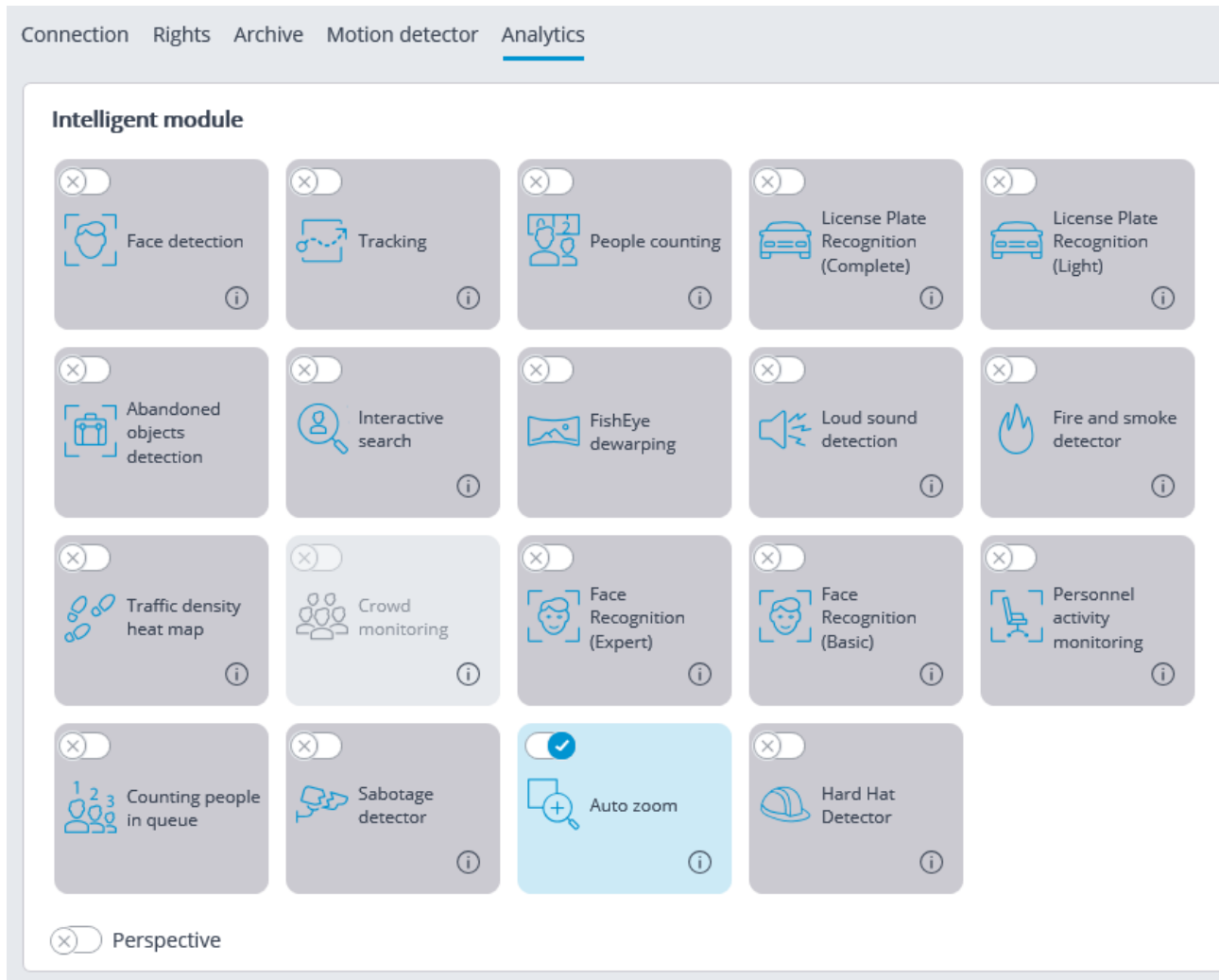
The **Auto zoom** module serves to display a separate zoomed-in area of the frame with the moving objects in the **Eocortex Client** application.

# Module setup



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

After that, it is required to switch to the [Analytics](#) tab and enable the module using the  toggle.



(missing or bad snippet)

# Crowd counting module




The **Crowd counting module** is intended to count people in crowds and alert the operator in case of the preset limits are exceeded. The module offers the following capabilities:

- Setting up to sex zones in the frame and setting two quantitative criteria (levels) for each zone: the level that demands attention and the maximum allowable level.




- Counting of the number of people in each zone.
- Alarm generation in case of exceedance of each 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.




 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.

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.

## Module setup



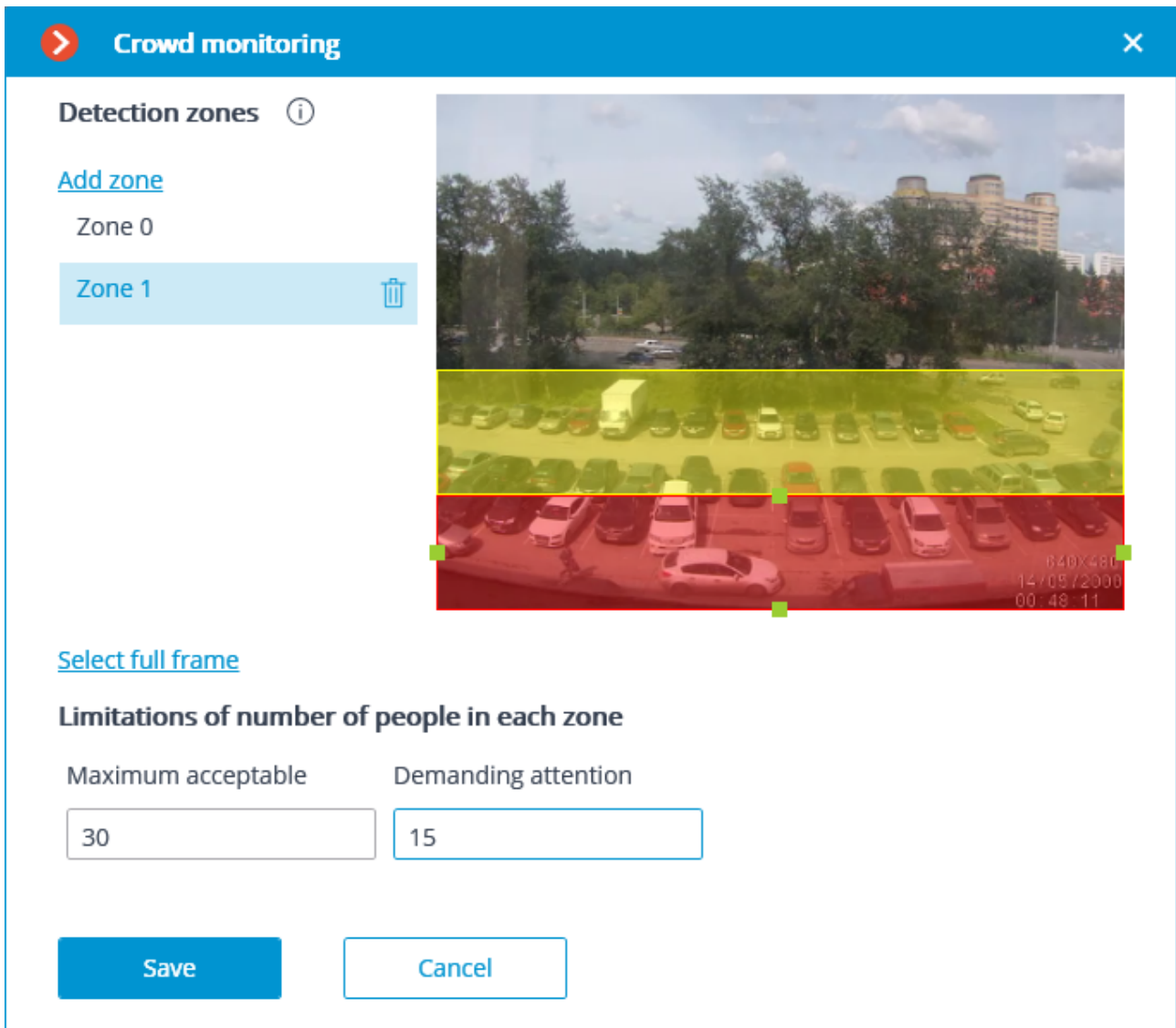
 Before using the module, it is required to [enable and set up the perspective](#).

In order to use the module, it is required to enable and set up the software motion detector, then activate the module itself. To do it, it is required to [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list on the left side of the page, 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"/> Face detection  <span>(i)</span>	<input type="checkbox"/> Tracking  <span>(i)</span>	<input type="checkbox"/> People counting  <span>(i)</span>	<input type="checkbox"/> License Plate Recognition (Complete)  <span>(i)</span>	<input type="checkbox"/> License Plate Recognition (Light)  <span>(i)</span>
<input type="checkbox"/> Abandoned objects detection  <span>(i)</span>	<input type="checkbox"/> Interactive search  <span>(i)</span>	<input type="checkbox"/> FishEye dewarping  <span>(i)</span>	<input type="checkbox"/> Loud sound detection  <span>(i)</span>	<input type="checkbox"/> Fire and smoke detector  <span>(i)</span>
<input type="checkbox"/> Traffic density heat map  <span>(i)</span>	<input checked="" type="checkbox"/> Crowd monitoring  <span>(i)</span>	<input type="checkbox"/> Face Recognition (Expert)  <span>(i)</span>	<input type="checkbox"/> Face Recognition (Basic)  <span>(i)</span>	<input type="checkbox"/> Personnel activity monitoring  <span>(i)</span>
<input type="checkbox"/> Counting people in queue  <span>(i)</span>	<input type="checkbox"/> Sabotage detector  <span>(i)</span>	<input type="checkbox"/> Auto zoom  <span>(i)</span>	<input type="checkbox"/> Hard Hat Detector  <span>(i)</span>	

Perspective 



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

**Control 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**.



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 permissible** and **Demanding attention**.



The use of the module will start only after [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.

## 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.

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.

## Module setup



In order to use the module, it is required to enable and set up the software motion detector, then activate the module itself. To do it, it is required to [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list on the left side of the page, 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

### Intelligent module

<input checked="" type="checkbox"/> Face detection	<input type="checkbox"/> Tracking	<input type="checkbox"/> People counting	<input type="checkbox"/> License Plate Recognition (Complete)	<input type="checkbox"/> License Plate Recognition (Light)
<input type="checkbox"/> Abandoned objects detection	<input type="checkbox"/> Interactive search	<input type="checkbox"/> FishEye dewarping	<input type="checkbox"/> Loud sound detection	<input type="checkbox"/> Fire and smoke detector
<input type="checkbox"/> Traffic density heat map	<input type="checkbox"/> Crowd monitoring	<input type="checkbox"/> Face Recognition (Expert)	<input type="checkbox"/> Face Recognition (Basic)	<input type="checkbox"/> Personnel activity monitoring
<input type="checkbox"/> Counting people in queue	<input type="checkbox"/> Sabotage detector	<input type="checkbox"/> Auto zoom	<input type="checkbox"/> Hard Hat Detector	

Perspective

### Face detection

**Quality:**

Average

High

**Apply** **Cancel**

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 that the medium efficiency.  
(missing or bad snippet)

# Face recognition

**Eocortex** allows to use several modules that perform face recognition using a database: **Face Recognition (Complete)**, **Face Recognition (Light)** and **Face Recognition (Basic)**.

However, it is not possible to use several 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.

Below you will find a comparison table that describes the capabilities of the modules that employ the face recognition technology.

Capabilities	Versions			
	Face Recognition (Basic)	Face Recognition (Light)	Face Recognition (Complete)	Unique Visitor Counting
Identification of faces contained in a database	✓	✓	✓	—
Identification of people wearing sunglasses, headgear, etc.	—	—	✓	✓
Relative recognition accuracy	Medium	Medium	High	—
Number of people in database	Up to 2000	Up to 500	Unlimited	—
Determination of sex and age	—	—	✓	✓
Recognition of faces in archive	—	—	✓	—

Capabilities	Versions			
	Face Recognition (Basic)	Face Recognition (Light)	Face Recognition (Complete)	Unique Visitor Counting
Reports regarding faces	✓	✓	✓	Detection only
Reports regarding unique visitors	—	—	—	✓
Receiving reports via API	✓	✓	✓	✓
Usage of high-performance video card (GPU)	—	+	✓	✓

Legend: ✓ Yes; — No; + Optionally.

**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 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.


- ① The use of video analytics modules in **Eocortex Client** is described in the [\[\[\[Undefined variable Document.UserGuide\]\]\]](#), in the **Eocortex Client / Video analytics (intelligent modules)** section.

## Module setup



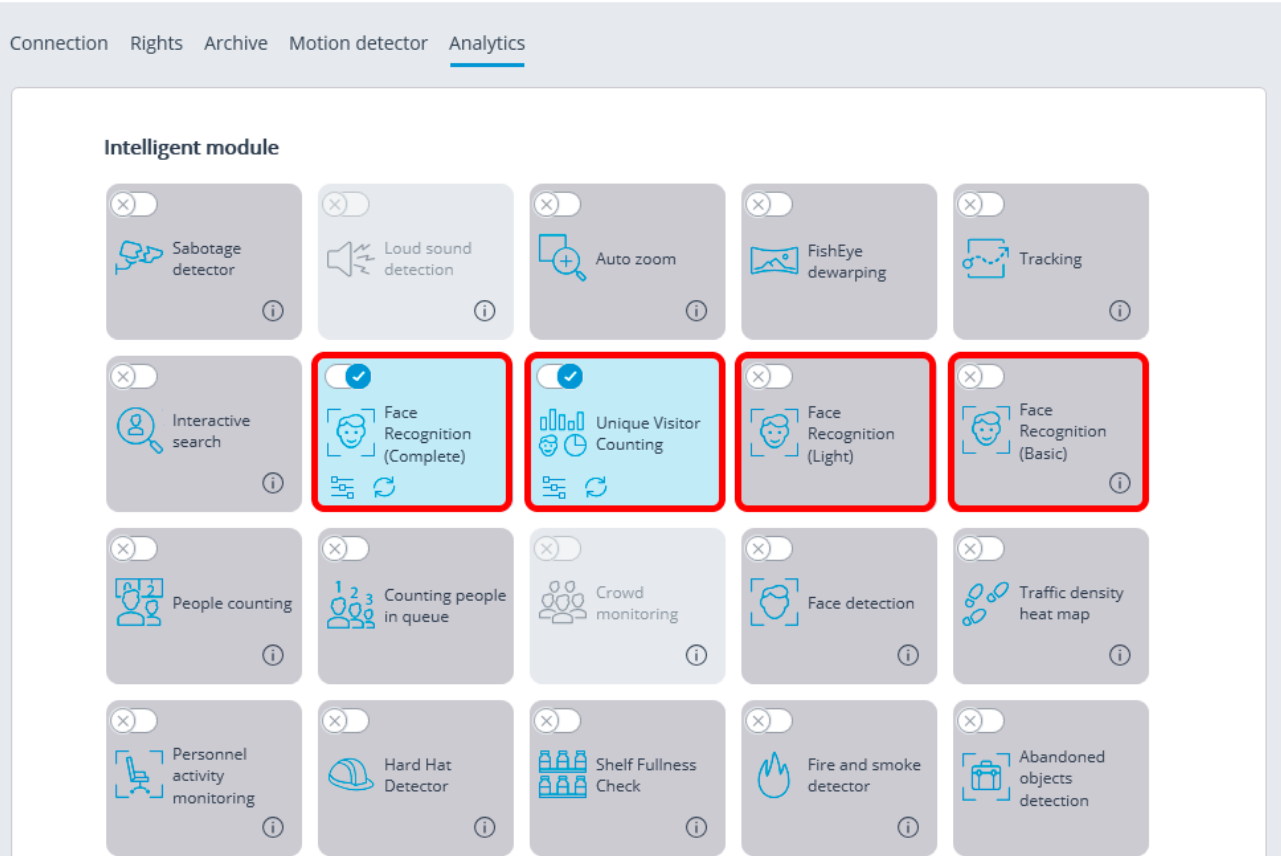
- ⚠ Before using the face recognition or unique visitor counting modules, it is required [to install the additional components on the server](#).


To use the module, it is required to enable and set up the software motion detector, then enable and set up the module itself.

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

After that, it is required to switch to the [Analytics](#) tab and enable the module using the  toggle.





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..

[Face Recognition \(Light\), Face Recognition \(Complete\) and Unique Visitor Counting Module Setup](#)

[Face Recognition \(Basic\) Module Setup](#)

## Face Recognition (Light), Face Recognition (Complete) and Unique Visitor Counting Module Setup


Some of the settings of the modules are the same; others are unique for each one. The module settings are described below.

**Face Recognition (Light)** ✕

Main settings | Detection zone | Face Database (for all cameras)

### Face size

Camera 17



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 ▾

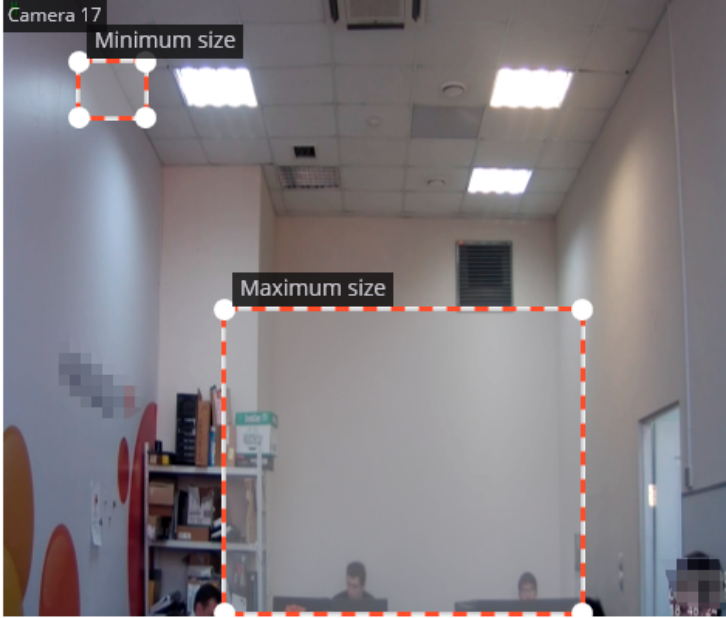
SaveCancel

**Face Recognition (Complete)** ×

Main settings | Detection zone | Face Database (for all cameras)

### Face size

Camera 17



Minimum size

Maximum size

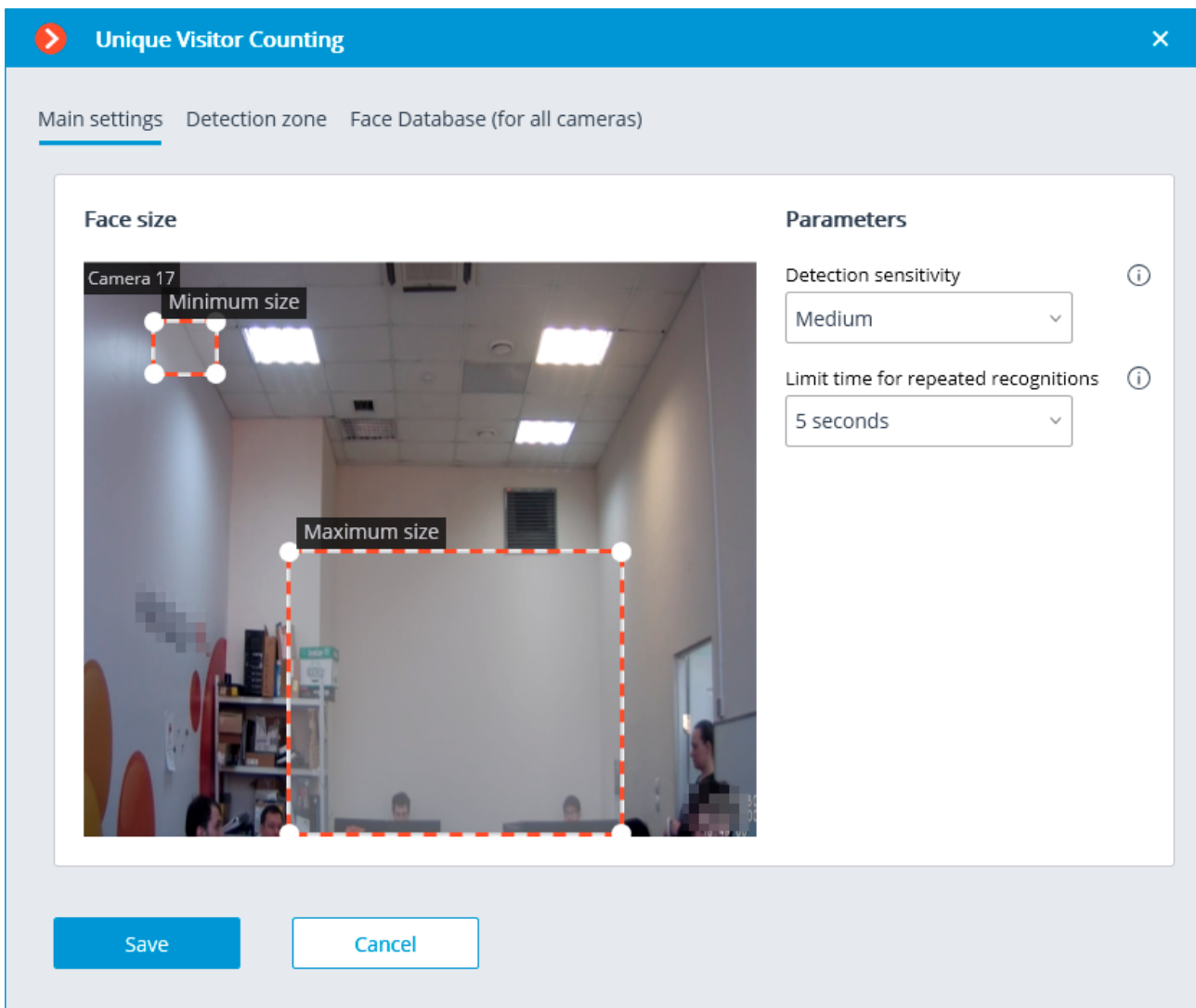
### Parameters

Minimum recognition positiveness: 80 % ⓘ

Detection sensitivity ⓘ

Limit time for repeated recognitions ⓘ

**Save** **Cancel**



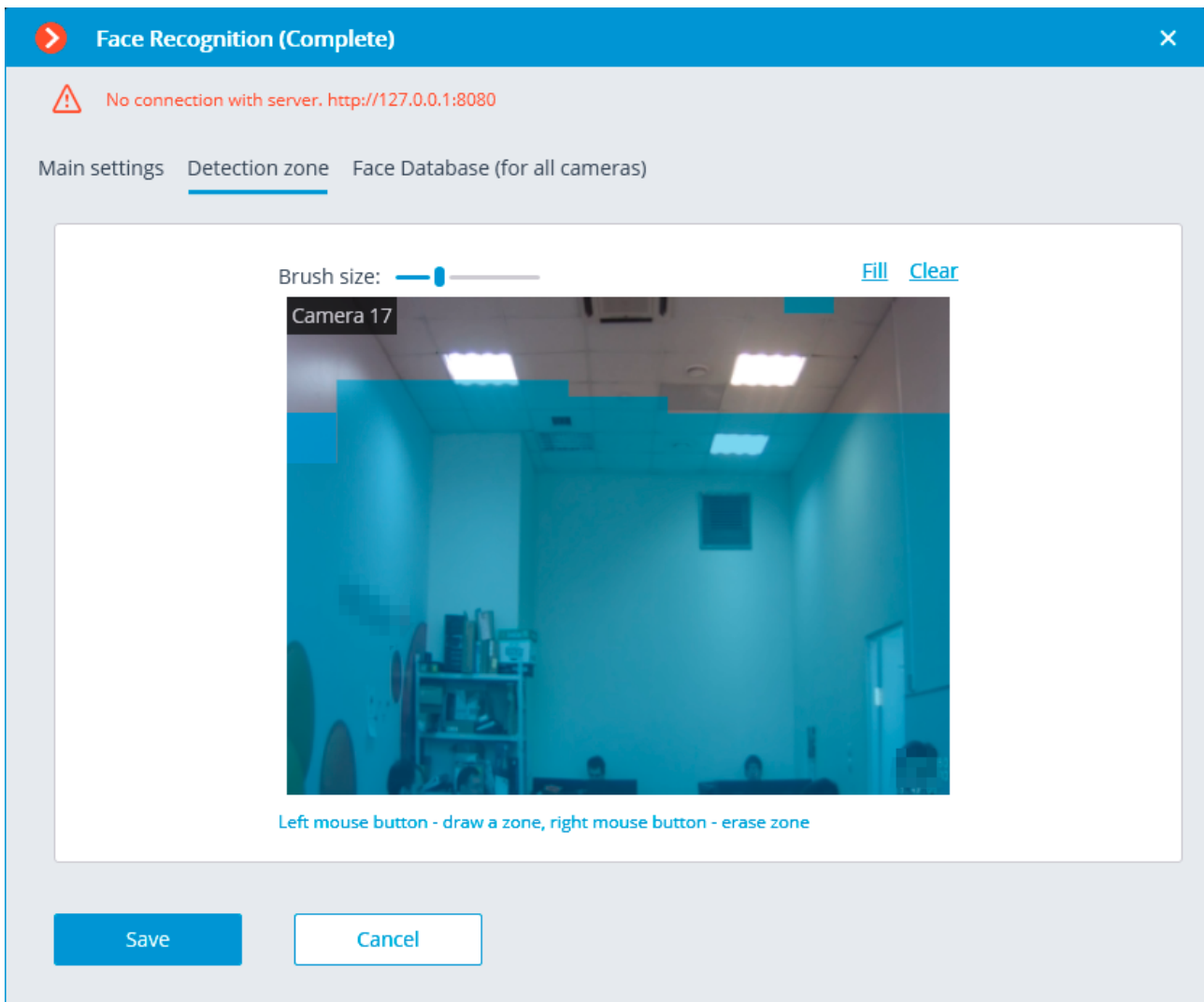
**Minimum recognition positiveness:** the cases of recognition with the similarity value lower than the specified threshold will not count. Lowering the value will allow to better recognize people wearing sunglasses, with partially covered faces, etc., but, at the same time, may lead to false recognitions. 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.

**Minimum size of the face** and **Maximum size of the face**: 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.



On the **Detection zone** tab, the user can specify the area where the system will search for faces. By default, the detection zone occupies the whole frame.

Face Recognition (Complete) ×

⚠ No connection with server. <http://127.0.0.1:8080>

Main settings Detection zone Face Database (for all cameras)

Local  
 Remote

IP-address: 192.168.0.1 Port: 3050

Name: SYSDBA Password: ●●●●●●●●

[Connection check](#)

Save Cancel

On the **Face Database (for all cameras)** tab, the parameters of connection to the face database are set.

**Local** and **Remote** options are available.

If the recognition is performed on one server only, it is recommended to select **Local**.

If the recognition is performed on several servers, it is recommended to store the database on one server only. In that case, it is required to select **Remote** for all cameras and set the following parameters of connection to the database: server address, user name and password. By default, the port of connection to the database is **3050**, the user name is **SYSDBA**, and the password is **masterkey**.

⚠ 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.

⚠ In the multiserver system, the uploading of data from the database located on the remote server may take a long time.

It is possible to check the availability of the database clicking on the **Connection check** link. If the server is unavailable, the corresponding message will be displayed.



The use of the module will start only after [the settings are applied](#).

## Face Recognition (Basic) 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.

**Face Recognition (Basic)**

### Indexing parameters

Minimum size of the face  
6% of the frame size

Maximum size of the face  
80% of the frame size

[Set interactively](#)

### Recognition parameters

Confidence coefficient 90%

### Card-file settings

Local  
 Remote

IP-address: 127.0.0.1      Port: 3050

Name: SYSDBA      Password: .....

**Apply**      **Cancel**      **Reset to default**

**Minimum size of the face** and **Maximum size of the face** set the limits for the dimensions of faces to be recognized. These limitations allow to exclude from the recognition those faces that are too far or too close to the camera. These parameters can also be set interactively.

**Confidence coefficient** is the internal parameter of the module used for determining the attributability of a face to the database: the lower the value of the coefficient, the higher the

probability that the faces will be recognized as belonging to the face database entries, but the probability of false correlation will also be higher. During the setup process, this parameter will have to be selected tentatively.

**Card-file settings** indicates the location of the database of the faces.

**Local** and **Remote** options are available.

If the recognition is performed on one server only, it is recommended to select **Local**.

If the recognition is performed on several servers, it is recommended to store the database on one server only. In that case, it is required to select **Remote** for all cameras and set the following parameters of connection to the database: server address, user name and password. By default, the port of connection to the database is **3050**, the user name is **SYSDBA**, and the password is **masterkey**.



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.



In the multiserver system, the uploading of data from the database located on the remote server may take a long time.



The server where the face database is stored must be assigned as the main server for at least one camera with the enabled face recognition module.



The use of the module will start only after [the settings are applied](#).

## Requirements and recommendations



### Face Recognition (Light)

## Server

Processor (CPU): Intel Core i5 2400 or better, with AVX instructions support.

RAM: at least 8 GB.

Video card (GPU): GeForce with CUDA with Compute Capability of 5.0 or better.

The following video cards have been tested to support operation of the module:

- GeForce GTX 1050;
- GeForce GTX 1050 Ti;
- GeForce GTX 1060;



- GeForce GTX 1070;
- GeForce GTX 1080 Ti.

## 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 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.).

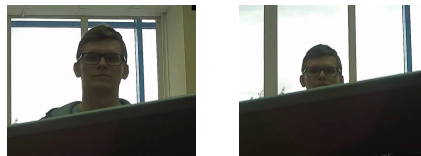
Strong lateral illumination (e.g. sunlight from the window) resulting in the overexposure of one part of the face is not acceptable.

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°.

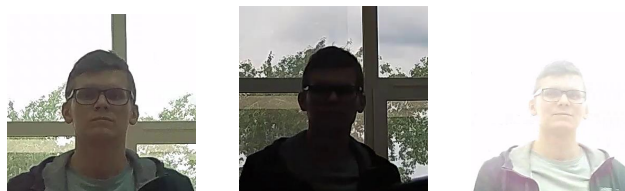
The distance between the pupils of a face to be recognized must be at least 30 pixels.

## Examples of non-compliance with the requirements

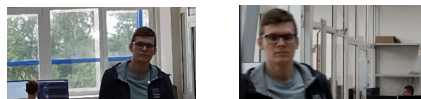
Covering (overlapping):



Face illumination:



Blurring of face in motion:



Unacceptable distance between pupils:



30 pixels

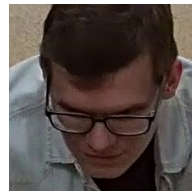
15 pixels



Video stream quality:



Camera tilt:



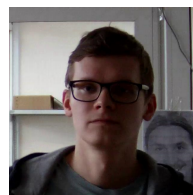
35°

50°

70°



Lateral light source:





Reflecting surfaces:



Horizontal turn of camera from face plane:



0°

15°

30°

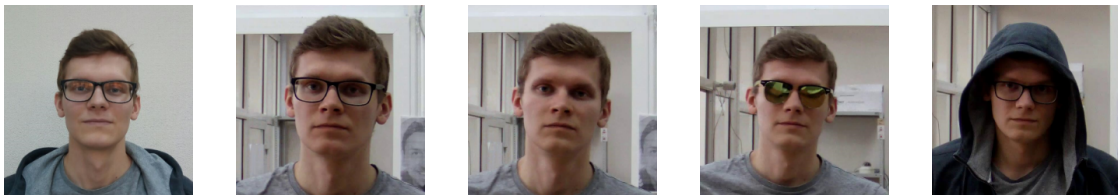
45°

60°

90°



Modified appearance:



DB



## 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	RAM	No. of cameras
Intel Core i5-2400	8 ГБ	1
Intel Core i5-2600	8 ГБ	2

For video stream from camera: 1 MP, 25 fps:

Processor	RAM	No. of cameras
Intel Core i5-2300	8 ГБ	1
Intel Core i5-2400	8 ГБ	2
Intel Core i5-3570	8 ГБ	3
Intel Core i5-2600	8 ГБ	4

### Face Recognition (Complete)

## Server

Processor (CPU): Intel Core i5 2400 or better, with AVX instructions support.

RAM: at least 8 GB.

Video card (GPU): GeForce with CUDA with Compute Capability of 5.0 or better.

The following video cards have been tested to support operation of the module:

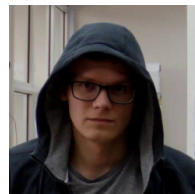
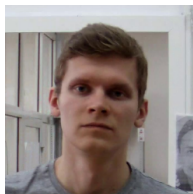
- GeForce GTX 1050;
- GeForce GTX 1050 Ti;
- GeForce GTX 1060;
- GeForce GTX 1070;
- GeForce GTX 1080 Ti.

## 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.

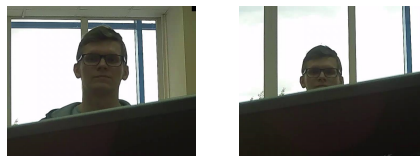
The camera may be placed above the face level, directly facing the people to be recognized. In such a case, the camera elevation angle must not exceed 35°.

The distance between the pupils of a face to be recognized must be at least 30 pixels.

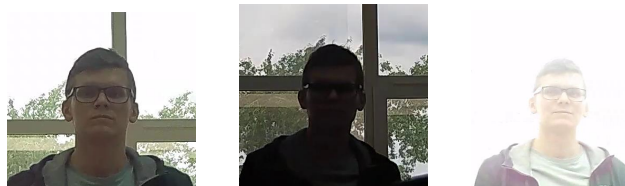
The camera must directly face the people to be recognized. The camera angle between the face direction and the lens axis must not exceed 30°.

## Examples of non-compliance with the requirements

Covering (overlapping):

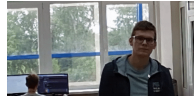


Face illumination:





Blurring of face in motion:



Unacceptable distance between pupils:



30 pixels

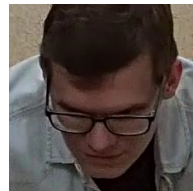
15 pixels



Video stream quality:



Camera tilt:





35°

50°

70°

✓

X

Lateral light source:



✓

X

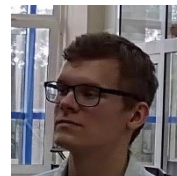
Reflecting surfaces:



✓

X

Horizontal turn of camera from face plane:



0°

15°

30°

45°

60°

90°

✓

✓

✓

X

X

Black and white image (night mode):



## 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 ГБ	5
Intel Core i7-2600	NVIDIA GeForce GTX-1060	8 ГБ	9

Processor	GPU	RAM	No. of cameras
Intel Core i7-7700	NVIDIA GeForce RTX-2070	8 ГБ	13
Intel Core i9-9900K	NVIDIA GeForce RTX-2080	16 ГБ	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 ГБ	8

### Unique Visitor Counting

## Server

Processor (CPU): Intel Core i5 2400 or better, with AVX instructions support.

RAM: at least 8 GB.

Video card (GPU): GeForce with CUDA with Compute Capability of 5.0 or better.

The following video cards have been tested to support operation of the module:

- GeForce GTX 1050;
- GeForce GTX 1050 Ti;
- GeForce GTX 1060;
- GeForce GTX 1070;
- GeForce GTX 1080 Ti.

## 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.

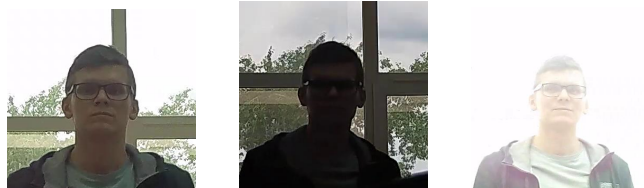
The camera must directly face the people to be recognized. The camera angle between the face direction and the lens axis must not exceed 30°.

## Examples of non-compliance with the requirements

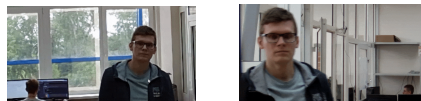
Covering (overlapping):



Face illumination:



Blurring of face in motion:



Unacceptable distance between pupils:



30 pixels

15 pixels



Video stream quality:



✓

X

Camera tilt:



35°

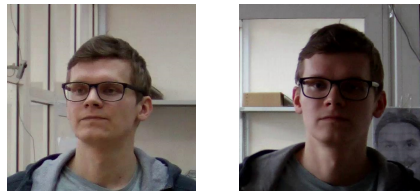
50°

70°

✓

X

Lateral light source:



✓

X

Reflecting surfaces:



✓

X

Horizontal turn of camera from face plane:



0°

15°

30°

45°

60°

90°



Black and white image (night mode):



## 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 ГБ	5
Intel Core i7-2600	NVIDIA GeForce GTX-1060	8 ГБ	9
Intel Core i7-7700	NVIDIA GeForce RTX-2070	8 ГБ	13
Intel Core i9-9900K	NVIDIA GeForce RTX-2080	16 ГБ	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 ГБ	8

### Face Recognition (Basic)



When choosing a camera, it is recommended to be guided by the requirements applicable to the image to be received, control zone specifics, and the conditions of camera installation and operation.

The standard camera placement is at an entrance checkpoint or at a doorway. The camera must be installed on the face level or at a small angle in order to ensure the best view of the faces of the entering people.

Changes in lighting and expressions on the faces in comparison with the reference sample may significantly lower the recognition probability. Consequently, it is necessary to ensure fulfillment of the following recommendations:

- Uniform and constant illumination of the faces to be recognized;
- At the moment of recognition, a person must maintain a neutral facial expression.

The camera definition and the lens must ensure the presence of a face in the frame with the distance between the eyes of no less than 30 pixels on the far end (for example at an entrance) and no less than 50 pixels on the near end (when the person is passing by the camera and the face is already leaving the frame).

The camera frame rate must be no less than 10 frames per second.



The camera must have a capability of exposure adjustment to avoid getting blurry images of the passing people. The priority between the shutter speed and the aperture must be given to the shutter speed. That means that it is preferable to get a darker image than a blurred one. In particular, on the cameras there sometimes are such settings as "Allow low shutter" or the limitation of the "maximum exposure" (for example, 1/25, 1/50). The cameras without such settings are intended for video, for example, a moving car or a person are viewed better (softer) when they are somewhat "blurred" in their motion (as compared with the "jerks" from frame to frame). The face recognition application, on the contrary, requires a sharp image. Thus, the sharpness of an individual frame and a "pleasant" perception of the video by a person are at cross purposes.

The camera shall be located in such a way that a face in the frame is in alignment with the lens (the best position would be at the head level); meaning that it must not be from above, from below, or from the side.

There must be no strong light sources shining from above, from below, or from the side, creating the sharp shadows and change of lighting on the different parts of a face.

The installation of the camera against the light sources, a bright object of a background (for example, the Sun behind the entrance door) will result in the face in the frame being dark. In this case the camera exposure (or brightness) shall be selected to be above the default (automatic) value; that means that the overexposure of the background is acceptable on a condition that the face in the frame becomes lighter. At that, it must be considered that the corresponding features of the cameras (WDR, Backlight compensation, Highlight compensation, etc.), as a rule, operate by means of increasing the exposure that results in blurring of the frames; so it is recommended to disable these features.

The increased sharpness on the camera leads to the significant visual noise, that results in false triggering of the detector.

Usage of the H.264 codec with high compression or large interval between the key frames may lead to the "crumbling" of the moving objects in the resulting image. In such a case it is required to set a higher bitrate in the camera settings and reduce the interval between the key frames.

[Installation of Face Recognition \(Light\), Face Recognition \(Complete\) and Unique Visitor Counting modules](#)

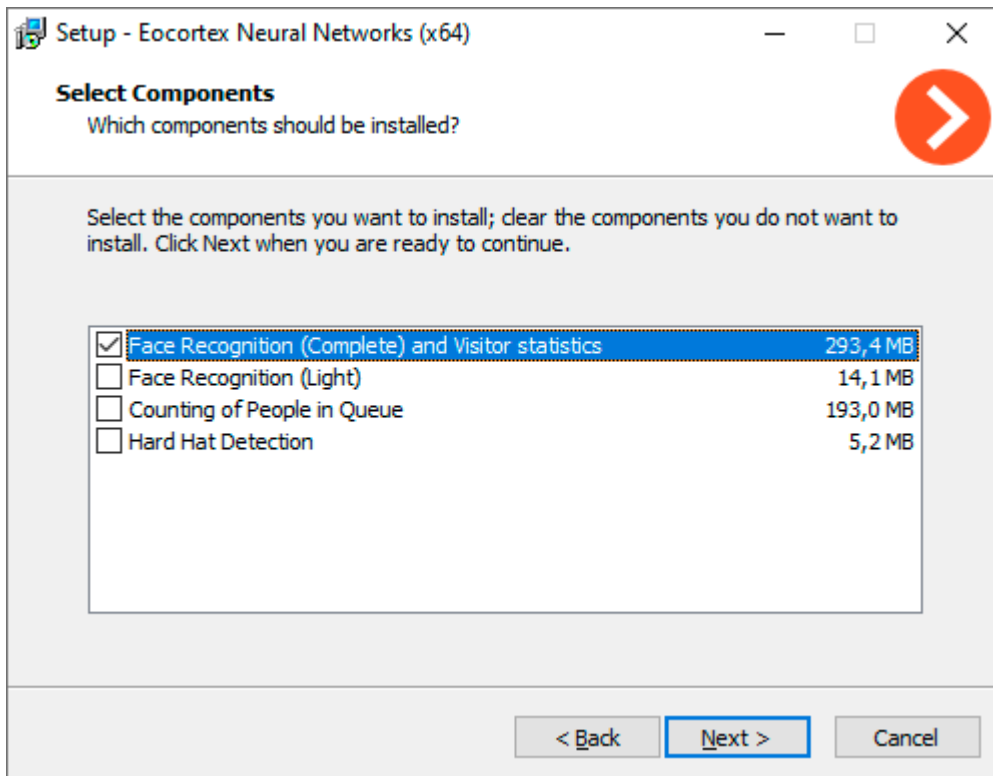
[Installation of Face Recognition \(Basic\) module](#)

## Installation of Face Recognition (Light), Face Recognition (Complete) and Unique Visitor Counting modules

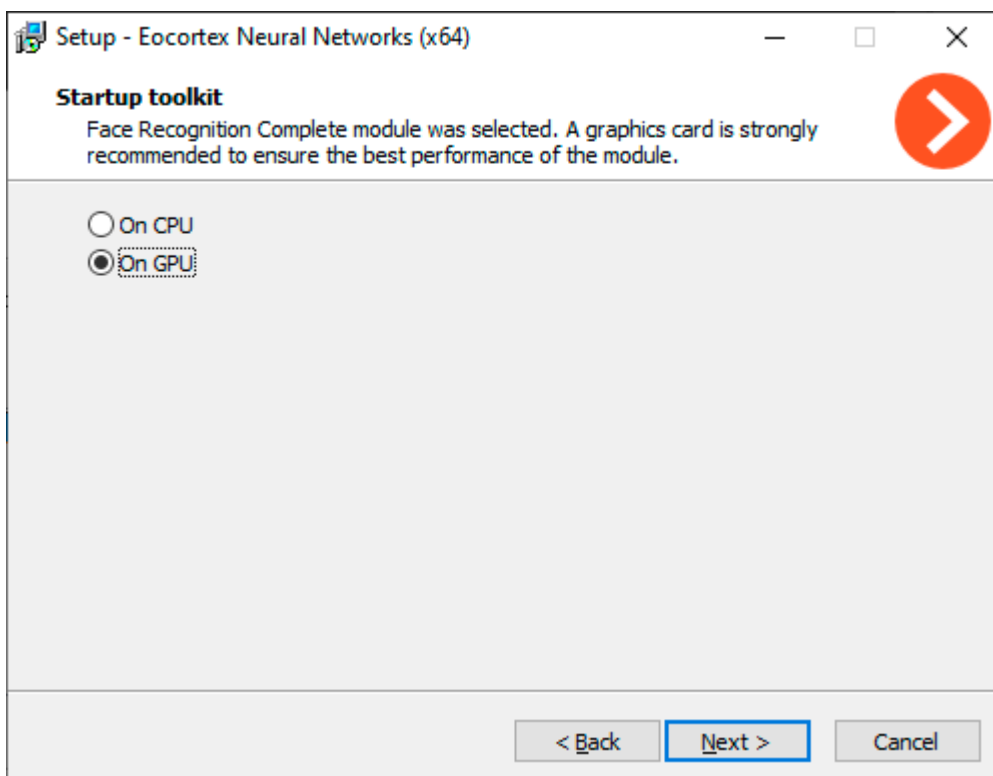


Before using the module, it is required to [install the Eocortex Neural Networks software package](#).


In the process of installation of **Eocortex Neural Networks** it is required to select the 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.



## Installation of Face Recognition (Basic) module


 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.


 This component must be installed on the same computer where the **Eocortex** server application (**Eocortex Server** or **Eocortex Standalone**) has been installed. The cameras using the module must be bound to this server application. It is not required to install this component on the computers with **Eocortex Client** application only.


 The license of the software key is bound to the hardware components of a particular computer and cannot be reinstalled on another computer later.


The module license is sensitive to the modification of the computer's configuration. In particular, the connection and disconnection of a flash drive, disc drive or other portable devices may lead to the activation of the protection and the module may cease to operate.

Thus, all the installation and license activation activities must be performed on a server configuration that will not be modified later.

 The module requires no less than 2,6 Gb of memory.

 The module's version must match the version of **Eocortex** software installed on a particular computer.

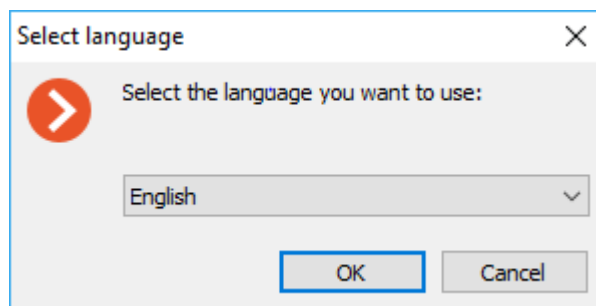
 The installation files must be run under the administrator's account.

 To update the module, it is required to perform the same steps as for the initial installation of the module.

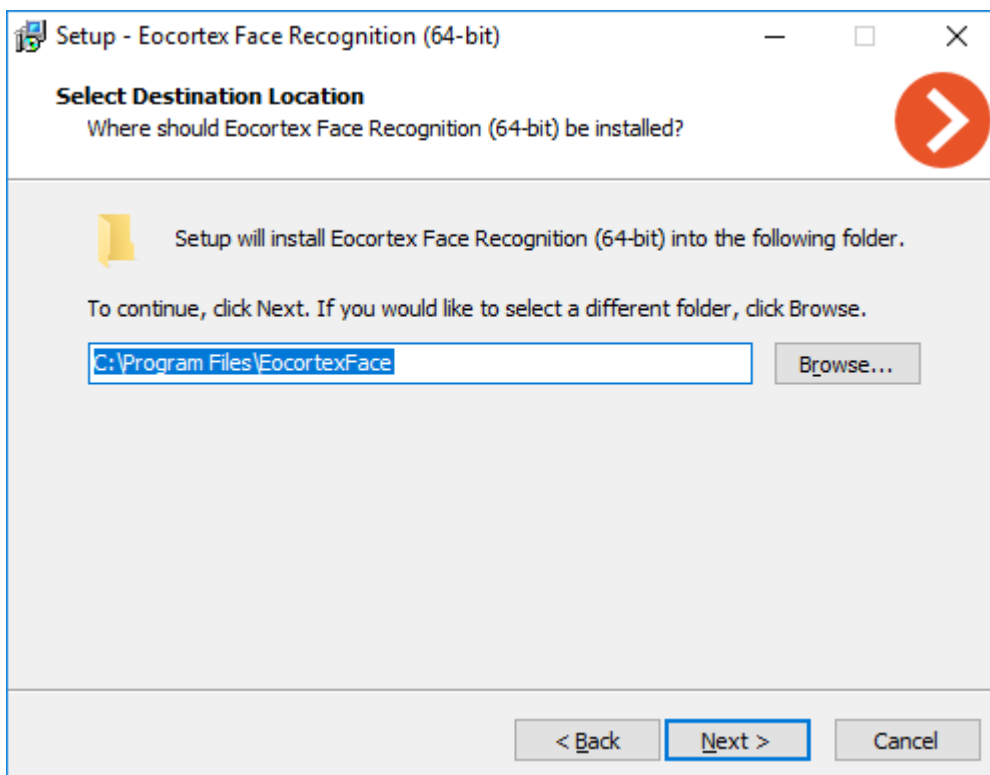
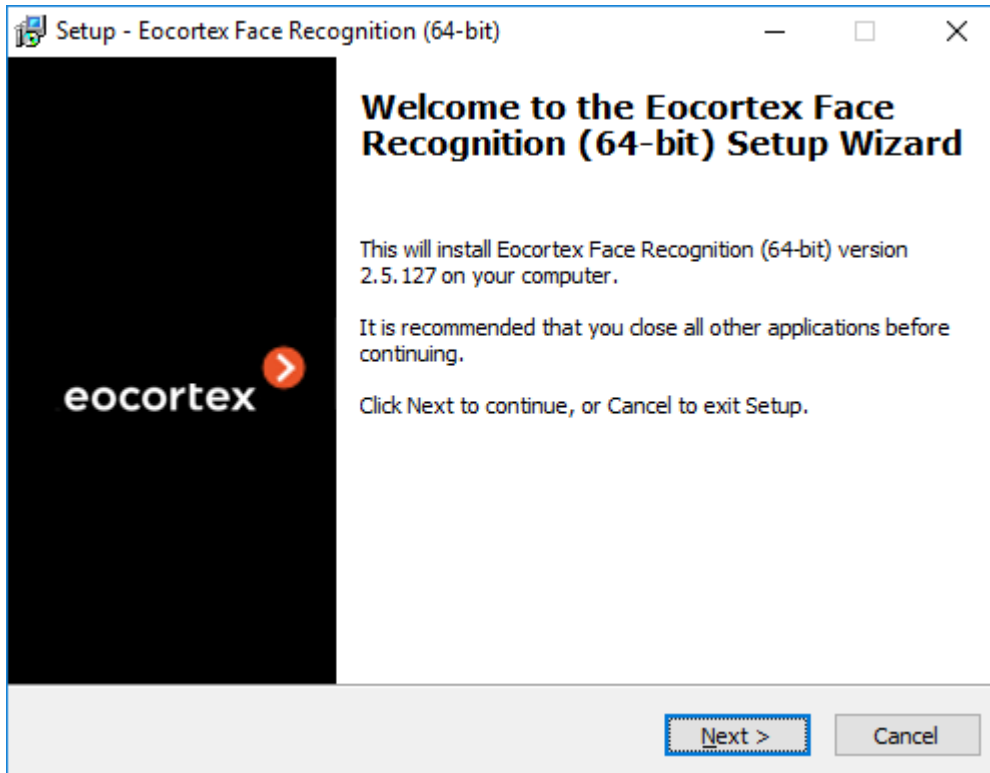
Before installing the module, all the **Eocortex** applications running on the computer must be stopped. Then the USB module protection key shall be inserted into the corresponding port (if applicable).

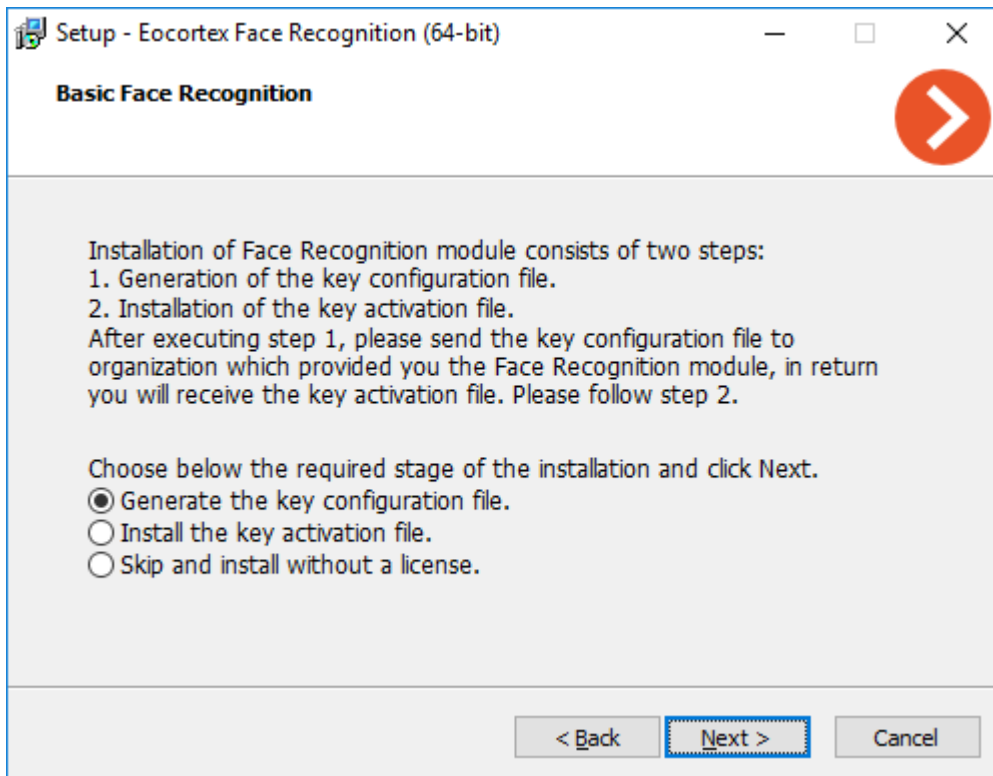
To install the module, it is required to run the following installation file: **EocortexFace Installer\_x64.exe**.

Choose the installation language in the opened **Select language** window.

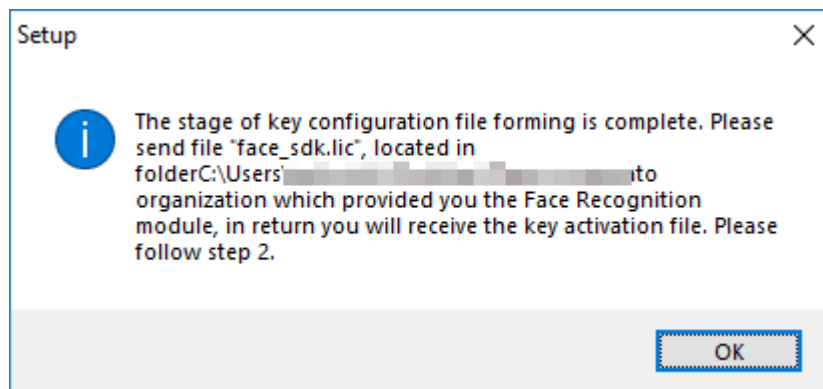


Follow the steps of the installation wizard.



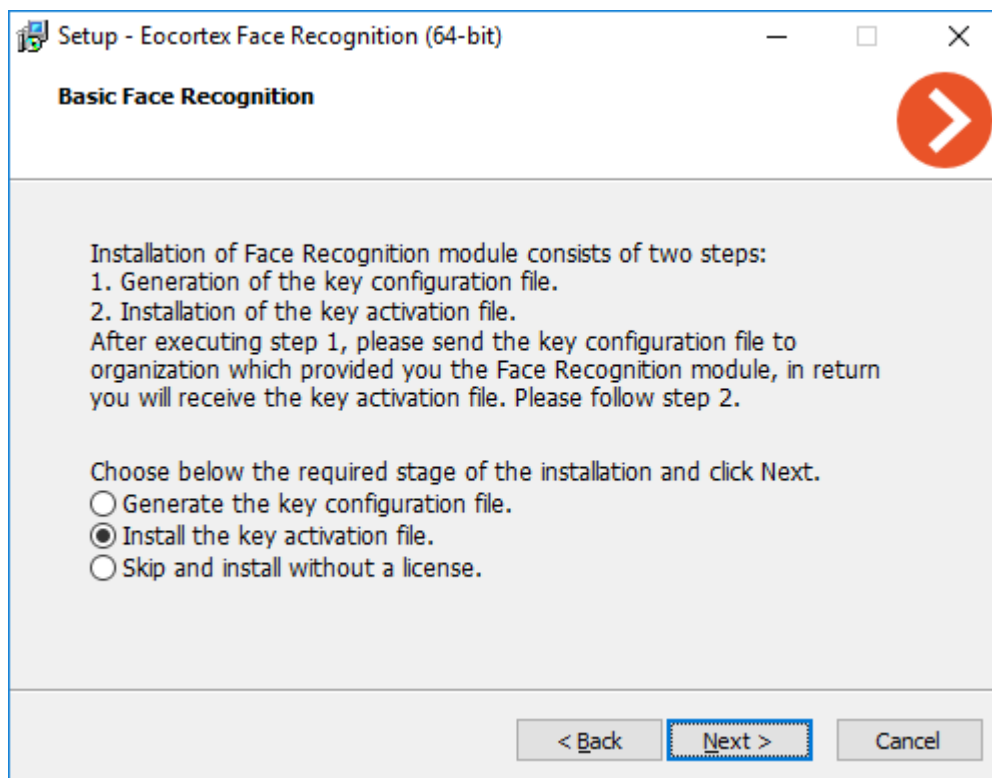
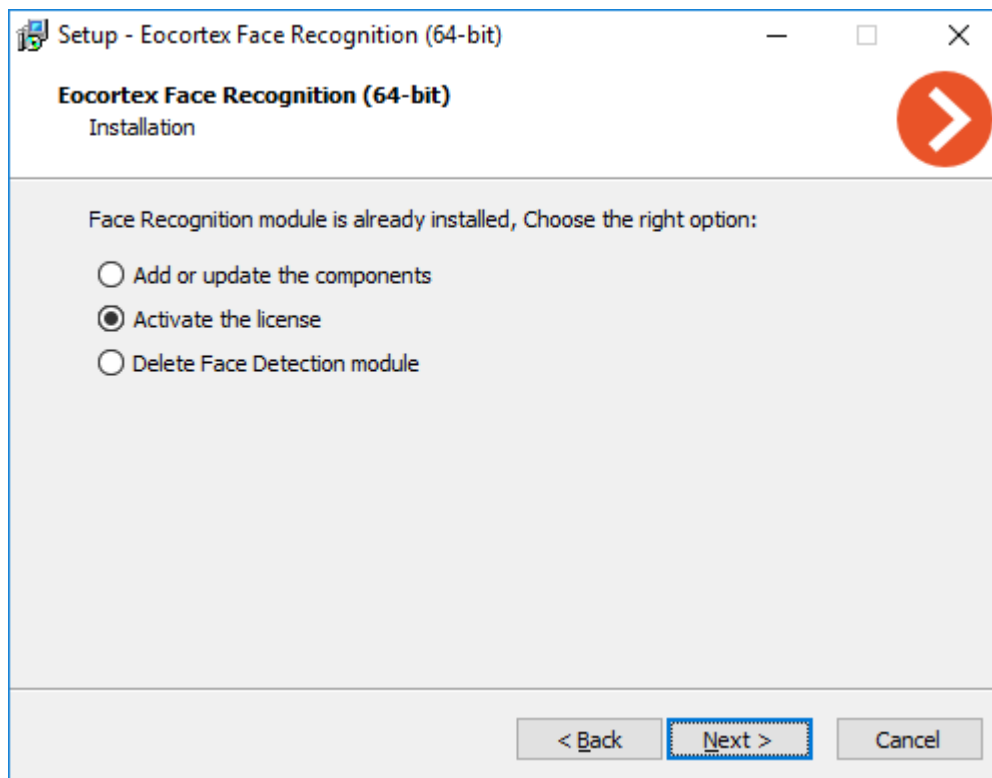


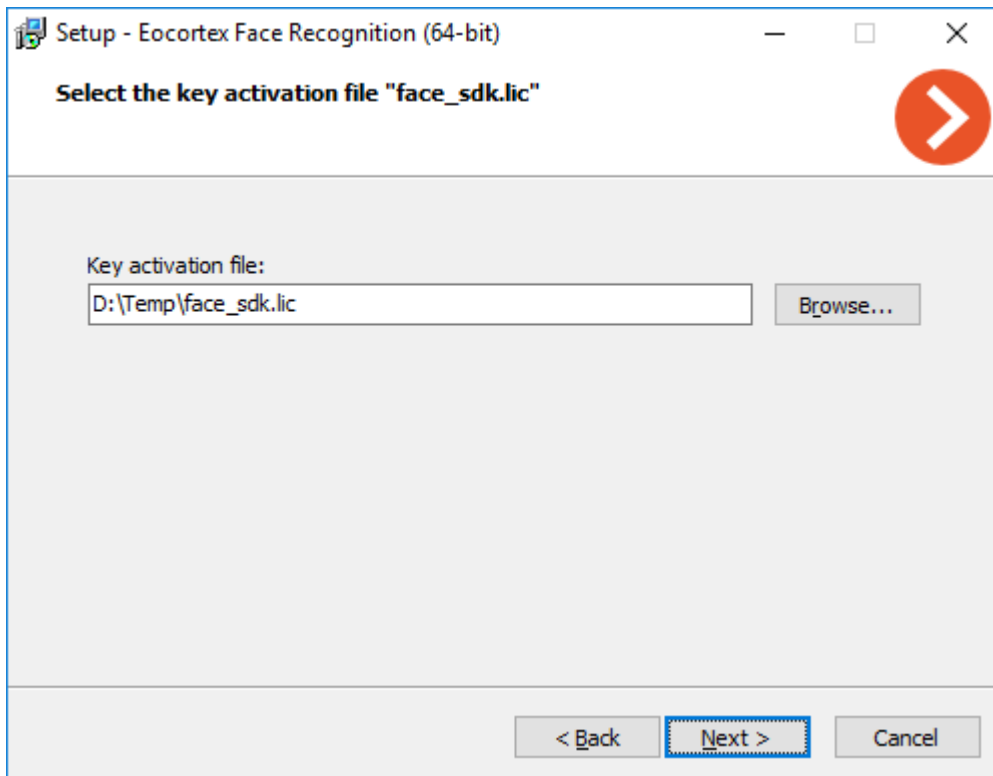
After ticking the **Generate the key configuration file** and pressing **Next**, the folder view window will open where you need to select the folder to be used for saving the **face\_sdk.lic** key configuration file. After generating and saving this file the window with the information regarding the further actions will appear.



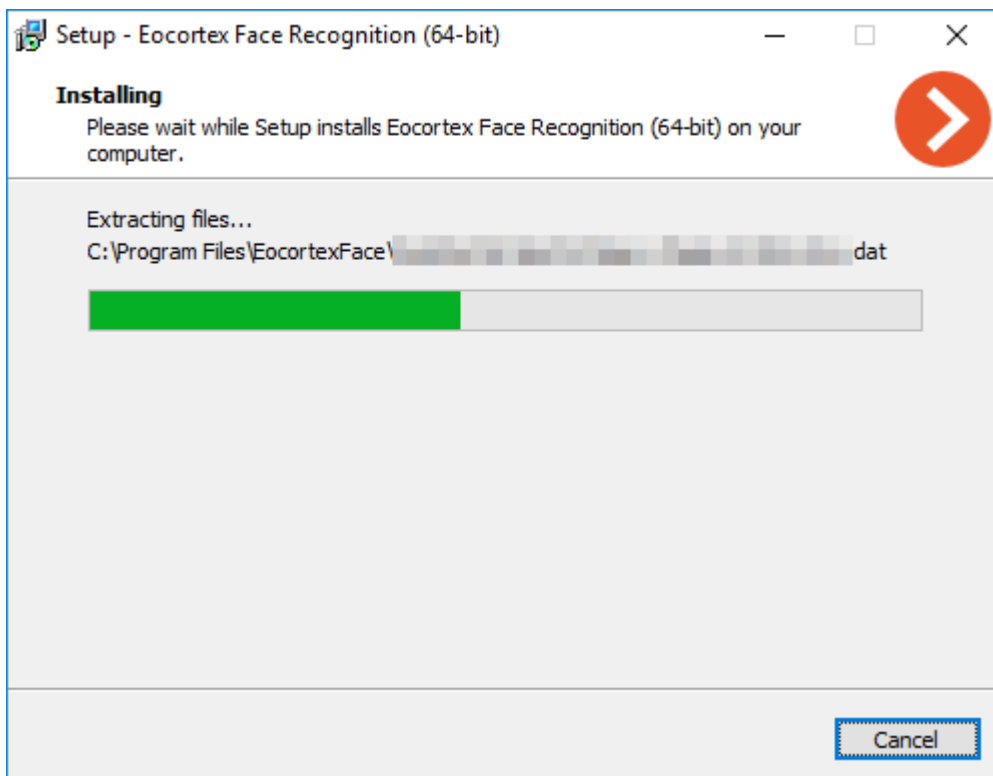
The key configuration file needs to be sent to the company that sold the module. In the reply message you will receive the **face\_sdk.lic** key activation file.

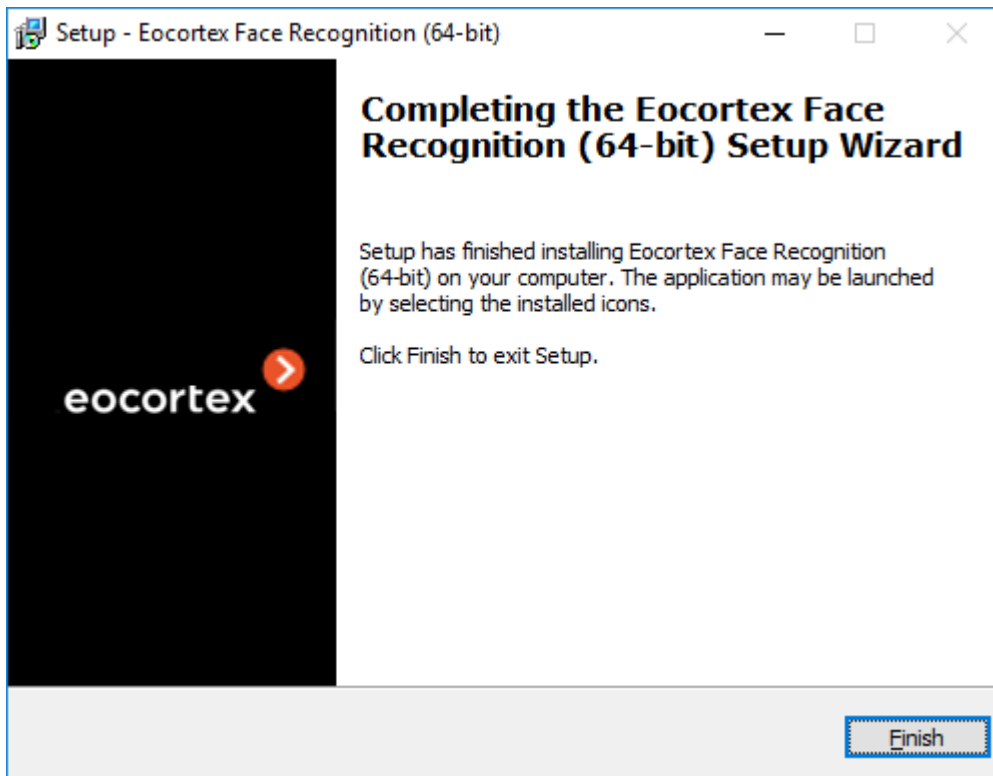
After receiving the key activation file, you will need to launch the module installation wizard, select the **Activate the license** option, at the next step select the file and press **Next**.





- ① The components of the module will be installed on the server in the course of the first launch of the installer of the selected version of the module.








## Fire and smoke detection

The **Fire and smoke detection** module is intended for detecting smoke and open flame in the frame.

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.

## Module setup

In order to use the module, it is required to enable and set up the software motion detector, then activate the module itself. To do it, it is required to [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list on the left side of the page, 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

Face detection i

Tracking i

People counting i

License Plate Recognition (Complete) i

License Plate Recognition (Light) i

Abandoned objects detection

Interactive search i

FishEye dewarping

Loud sound detection i

Fire and smoke detector i

Traffic density heat map i

Crowd monitoring i

Face Recognition (Expert) i

Face Recognition (Basic) i

Personnel activity monitoring i

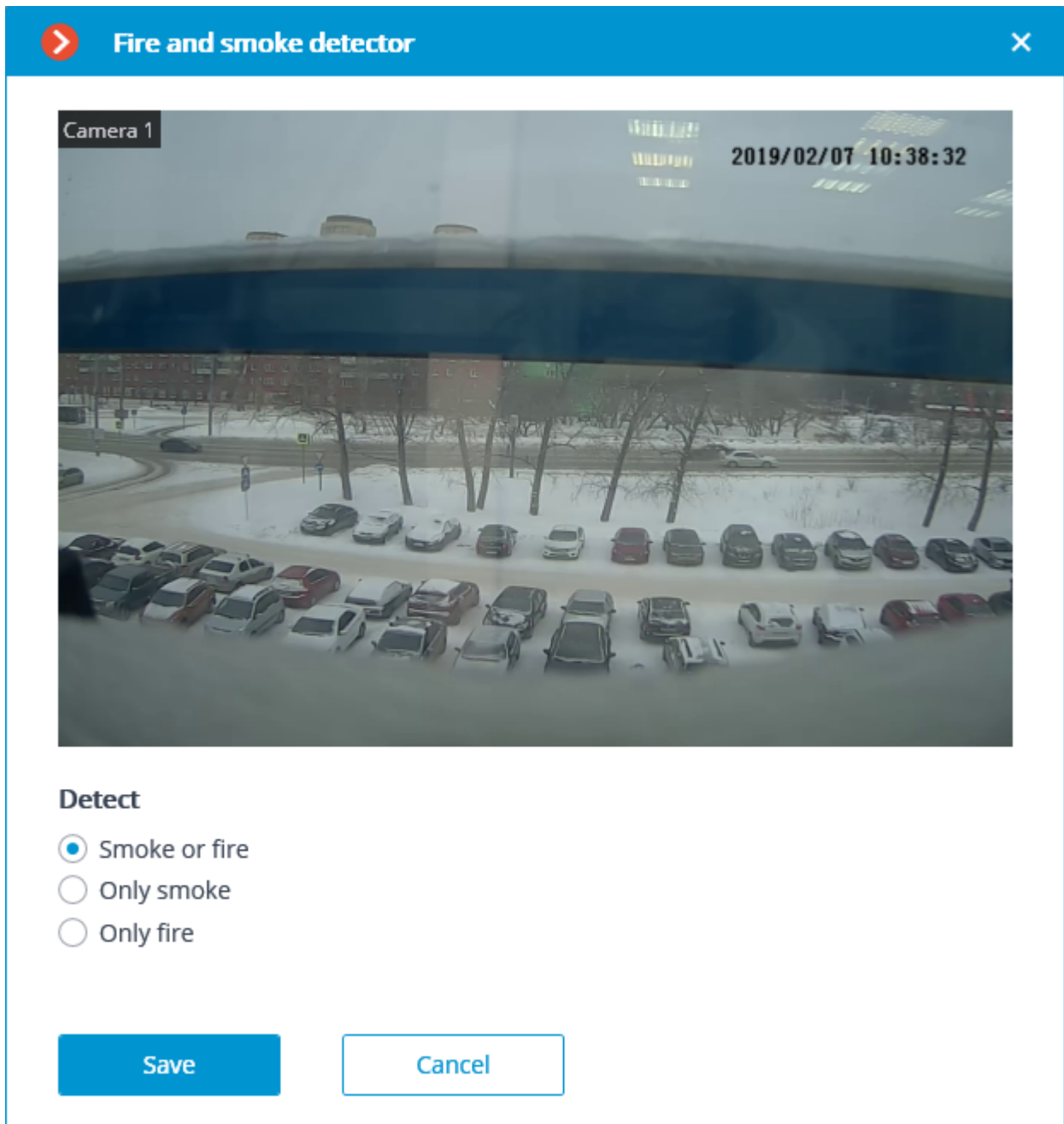
Counting people in queue

Sabotage detector i

Auto zoom i

Hard Hat Detector i

Perspective



In the opened settings window, select one of the detection options: **Smoke or fire**, **Only smoke**, or **Only fire**.

 The use of the module will start only after [the settings are applied](#).

## Requirements and recommendations

Image and background must be static: the camera shall be rigidly fixed, there shall be no constantly moving objects in the frame.

The camera shall be placed at the angle of 0 - 70 degrees in reference to the level surface.

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.

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.

Minimum permissible resolution of the frame is 400x300 pixels.

Minimum permissible framerate is 15 and 5 frames per second for smoke detection and fire detection modes respectively.

## Fisheye dewarping module






The **Fisheye dewarping module** module is designed to perform software dewarping (converting) the images obtained from the panoramic cameras.

## Module setup



In order to use the module, it is required to enable and set up the software motion detector, then activate the module itself. To do it, it is required to [launch the Eocortex Configurator application](#), go to

the  [Cameras](#) tab, select a camera in the list on the left side of the page, 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

Face detection i

Tracking i

People counting i

License Plate Recognition (Complete) i

License Plate Recognition (Light) i

Abandoned objects detection i

Interactive search i

FishEye dewarping i

Loud sound detection i

Fire and smoke detector i

Traffic density heat map i

Crowd monitoring i

Face Recognition (Expert) i

Face Recognition (Basic) i

Personnel activity monitoring i

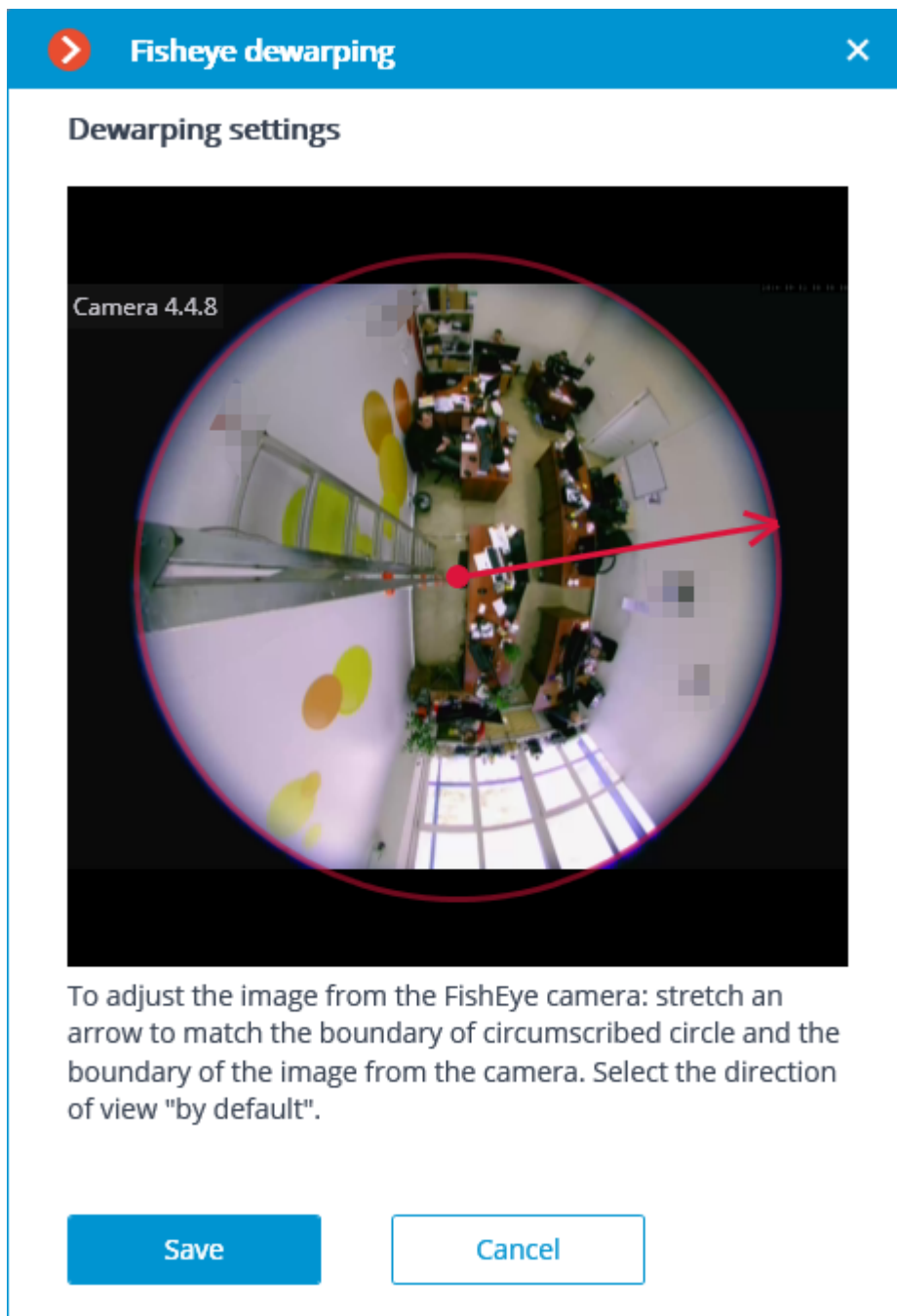
Counting people in queue i

Sabotage detector i

Auto zoom i

Hard Hat Detector i

Perspective



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 use of the module will start only after [the settings are applied](#).

## Hard Hat detector

The **Hard Hat detector** module is intended for detecting people not wearing hard hats. When such persons are detected in real time, the module frames them and registers the event in the log.

The main purpose of the module is to monitor the observance of the labor safety regulations at the industrial and construction sites.

At the present moment, the hard hats of the following colors are supported:

- white;
- orange;
- red;
- green;
- yellow;
- blue.


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.



## Module setup



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

In order to use the module, it is required to enable and set up the software motion detector, then activate the module itself. To do it, it is required to [launch the Eocortex Configurator application](#), go to

the  [Cameras](#) tab, select a camera in the list on the left side of the page, 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

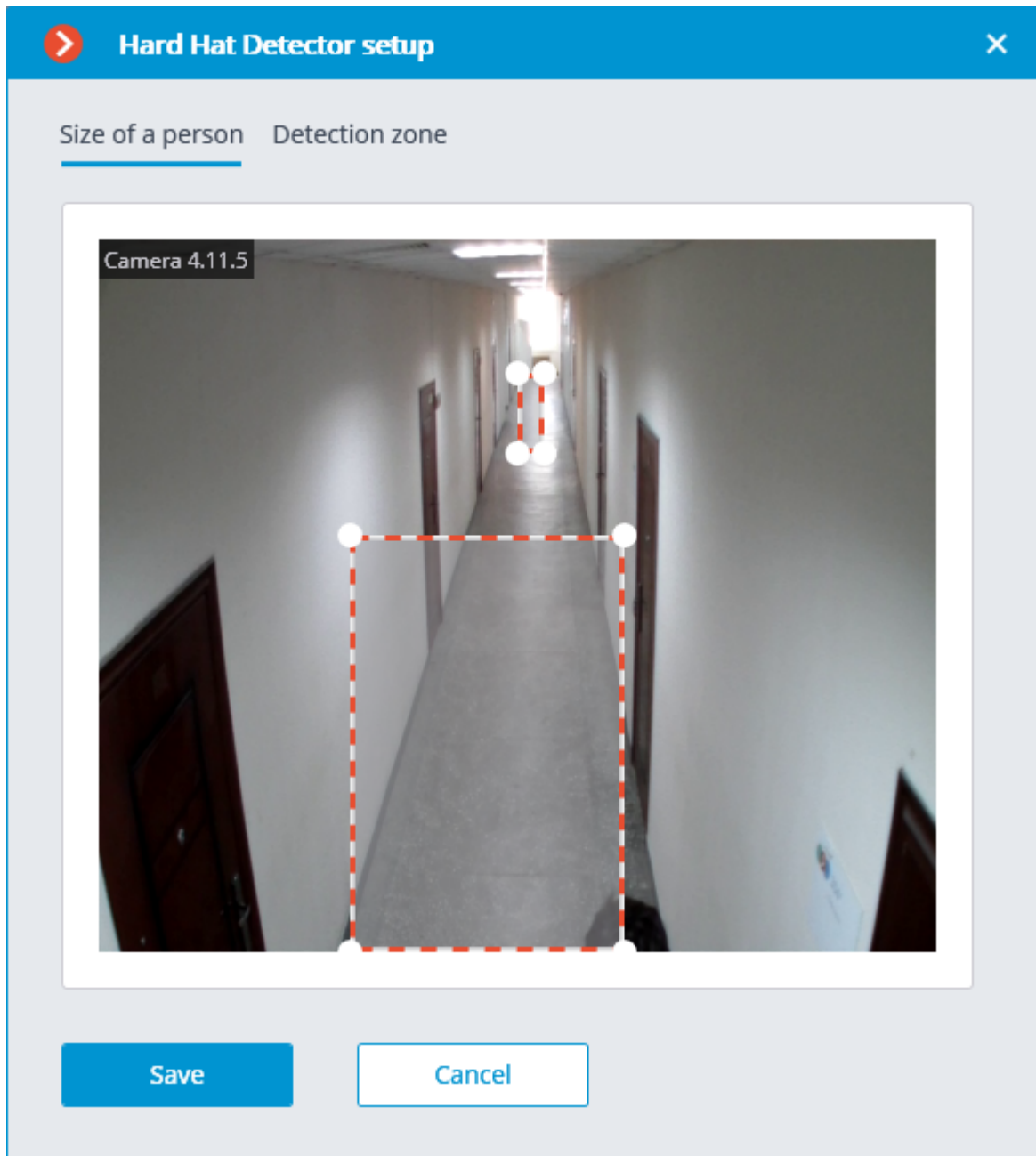
### Intelligent module

<input type="checkbox"/> Face detection	<input type="checkbox"/> Tracking	<input type="checkbox"/> People counting	<input type="checkbox"/> License Plate Recognition (Complete)	<input type="checkbox"/> License Plate Recognition (Light)
<input type="checkbox"/> Abandoned objects detection	<input type="checkbox"/> Interactive search	<input type="checkbox"/> FishEye dewarping	<input type="checkbox"/> Loud sound detection	<input type="checkbox"/> Fire and smoke detector
<input type="checkbox"/> Traffic density heat map	<input type="checkbox"/> Crowd monitoring	<input type="checkbox"/> Face Recognition (Expert)	<input type="checkbox"/> Face Recognition (Basic)	<input type="checkbox"/> Personnel activity monitoring
<input type="checkbox"/> Counting people in queue	<input type="checkbox"/> Sabotage detector	<input type="checkbox"/> Auto zoom	<input checked="" type="checkbox"/> Hard Hat Detector	

Perspective

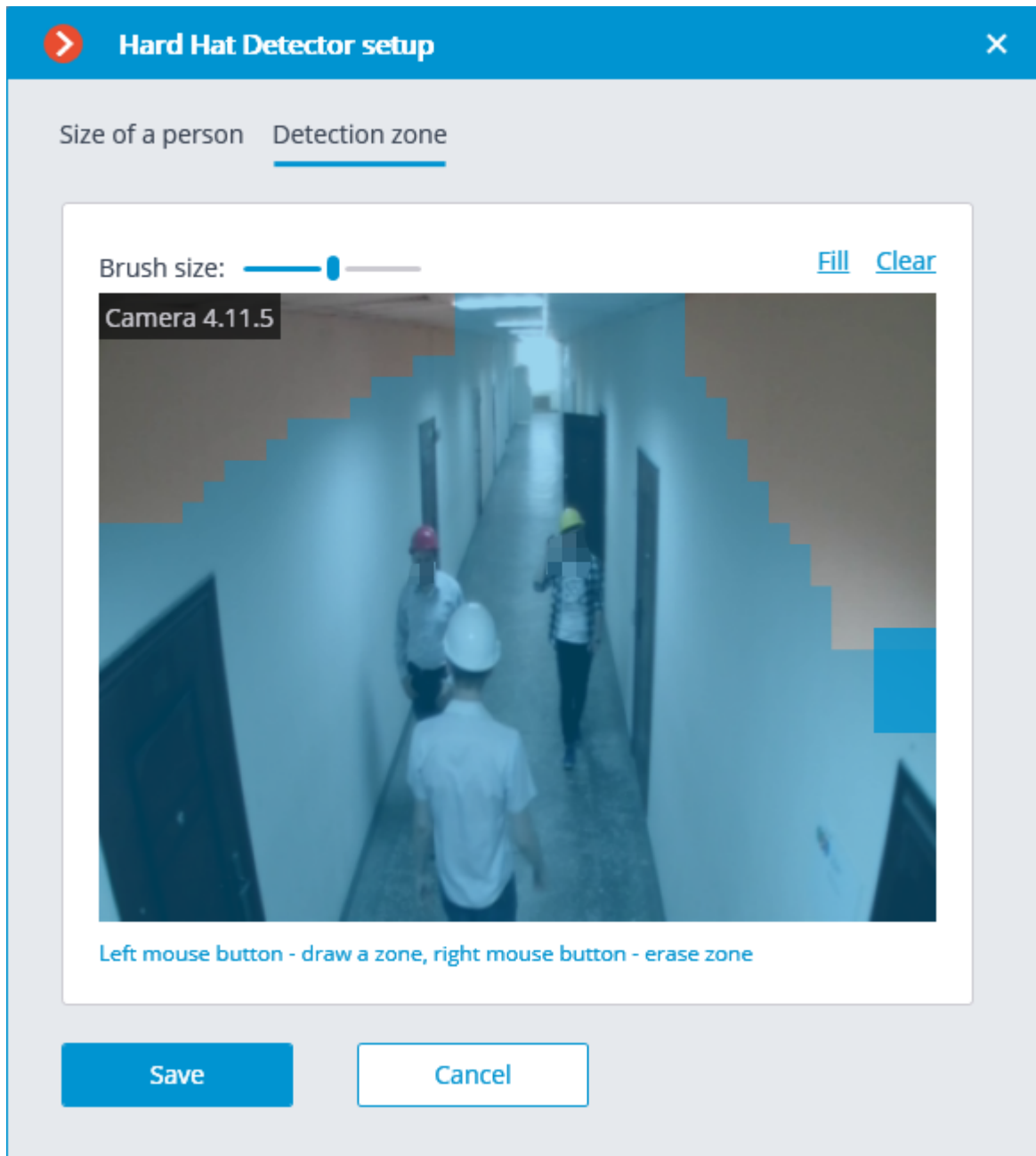
In the opened window, make the settings in the following tabs:

**Size of a person:** the minimum and maximum sizes of the persons to be detected.



**Control 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 use of the module will start only after [the settings are applied](#).

## Requirements and recommendations

### Requirements to hardware and software

This module operates on the 64-bit version of **Eocortex** only.

Since this module places heavy demands on the computing resources, high performance processors must be used for its operation with several cameras bound to the same server. The recommended processor is Intel Core i7 or similar, including those of different manufacturers.

It should be pointed out that the resolution of the analyzed video has no significant impact on the module's performance.

## Requirements to images and video stream

The people being detected must appear in the frame standing, at full length, not blocked by other objects.

The height in the frame of the persons to be detected must be not less than 120 pixels.

The tilt of the persons in the frame in relation to the vertical axis of the camera must not exceed 15 degrees.

The camera deviation in relation to the horizontal axis must not exceed 45 degrees.

The uniform illumination of the area is required. The people must not stay in the badly illuminated zones against the brightly lighted area. Moreover, glare of the bright light sources on the hard hats and heads, Sun and light fixtures-related flaring, high-luminance areas on the dark background (for example, opened doors and windows in a dark room) are unacceptable.

The image must be high quality, with low or medium compression rate.

It is recommended to use low noise color image due to the fact that using black and white image may lead to significant reduction of the recognition precision.

The outlines of the moving objects must not be blurred.

The hard hat must be properly worn. Foreign objects (ear muffles, hoods, etc.) must cover as small area of the hat as possible.

The camera shall transmit the video stream with the constant frame rate that must be at least 9 fps.

In case the abovementioned conditions are met, the module is capable of ensuring average sensitivity of 65% with the false triggering rate of around 1-3%. The time of triggering will be between 1 and 3 seconds from the moment of appearance of a person without a hard hat in the frame to the moment of registering the infraction.

Below are the examples of images that do not conform with the requirements:



*Tilt of persons in reference to the camera vertical axis is 20 degrees.*



*Non-uniform illumination of the scene.*



*Insufficient contrast, badly distinguishable boundaries of objects, flaring, image compression too high.*



*Outlines of the moving people are blurred.*



*Ear muffs cover too much of the hard hat.*



*Hard hat not worn correctly.*

# Heat map module



The **Heat map module** 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.

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.

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.

## Module setup



In order to use the module, it is required to enable and set up the software motion detector, then activate the module itself. To do it, it is required to [launch the Eocortex Configurator application](#), go to

the  [Cameras](#) tab, select a camera in the list on the left side of the page, 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

Face detection i

Tracking i

People counting i

License Plate Recognition (Complete) i

License Plate Recognition (Light) i

Abandoned objects detection i

Interactive search i

FishEye dewarping i

Loud sound detection i

Fire and smoke detector i

Traffic density heat map i

Crowd monitoring i

Face Recognition (Expert) i

Face Recognition (Basic) i

Personnel activity monitoring i

Counting people in queue i

Sabotage detector i

Auto zoom i

Hard Hat Detector i

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](#)

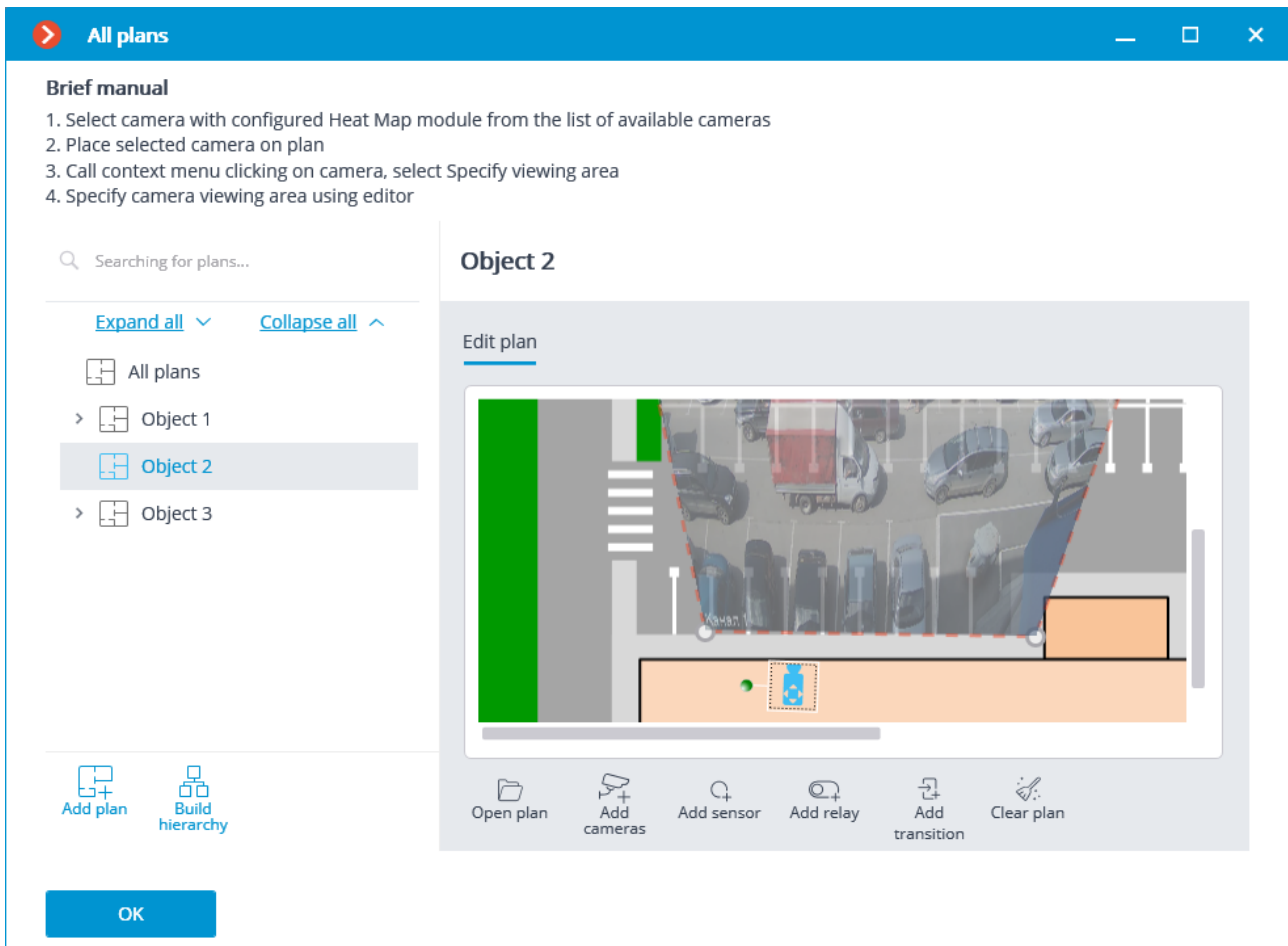
Save Cancel

The following settings are to be made in the opened window:

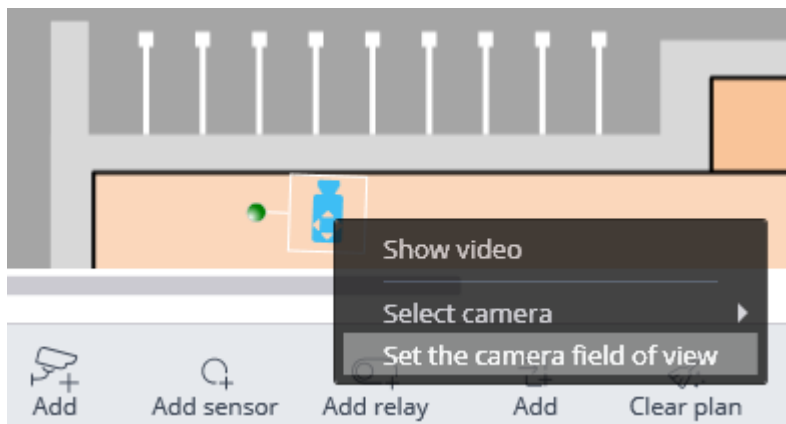
**Wake decay time when viewing in real time:** sets the time during which the wake of the moving object in the frame disappears completely.

**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 **Ecocortex 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 use of the module will start only after [the settings are applied](#).

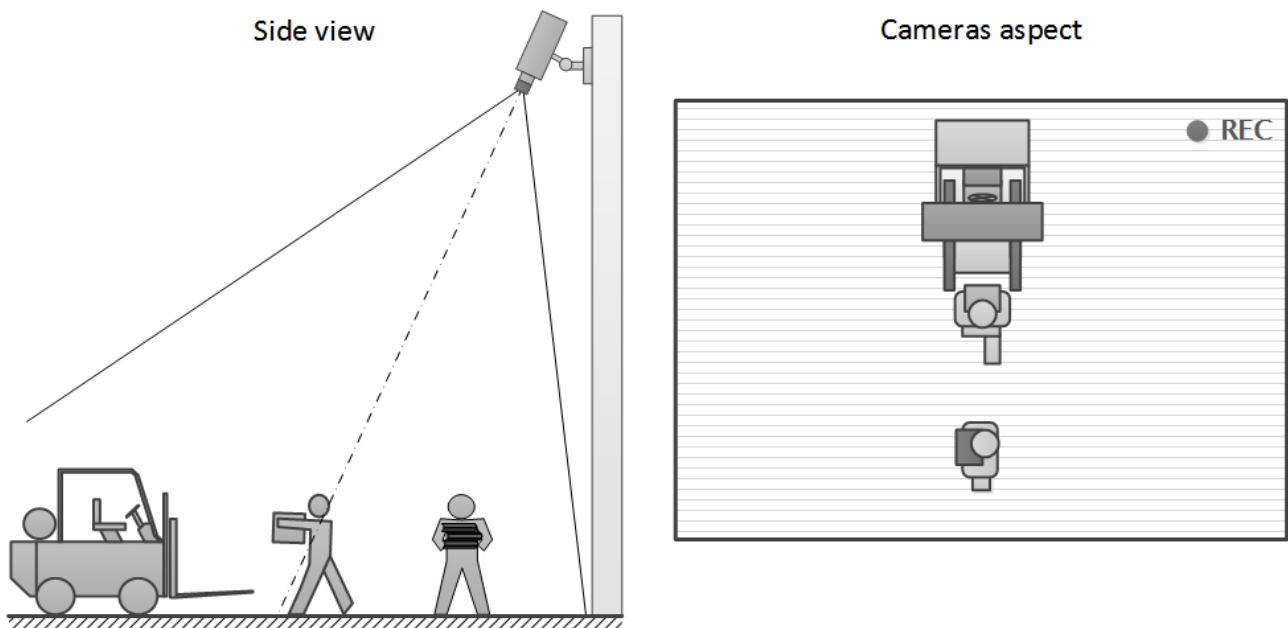
## Requirements and recommendations



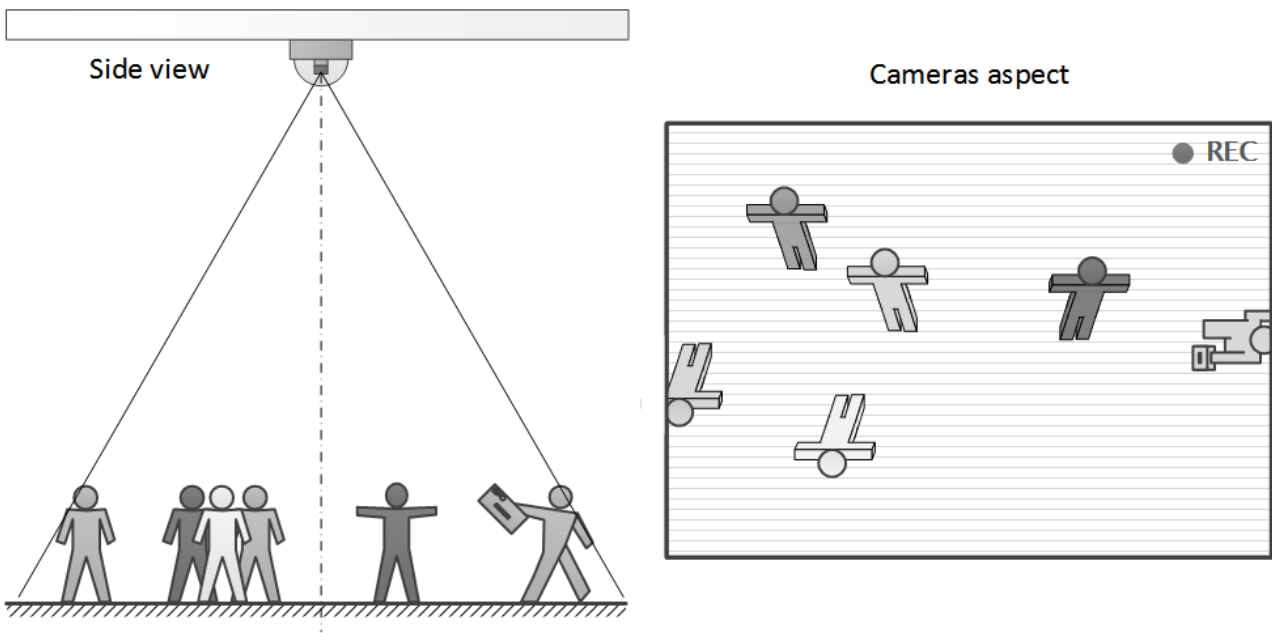
For the proper operation of the module, it is required to install the camera as high as possible to minimize the influence of the perspective and avoid the superimposing of the objects of the foreground on the remote areas. The ideal position of the camera is from above, at right angle to the horizontal plane.

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

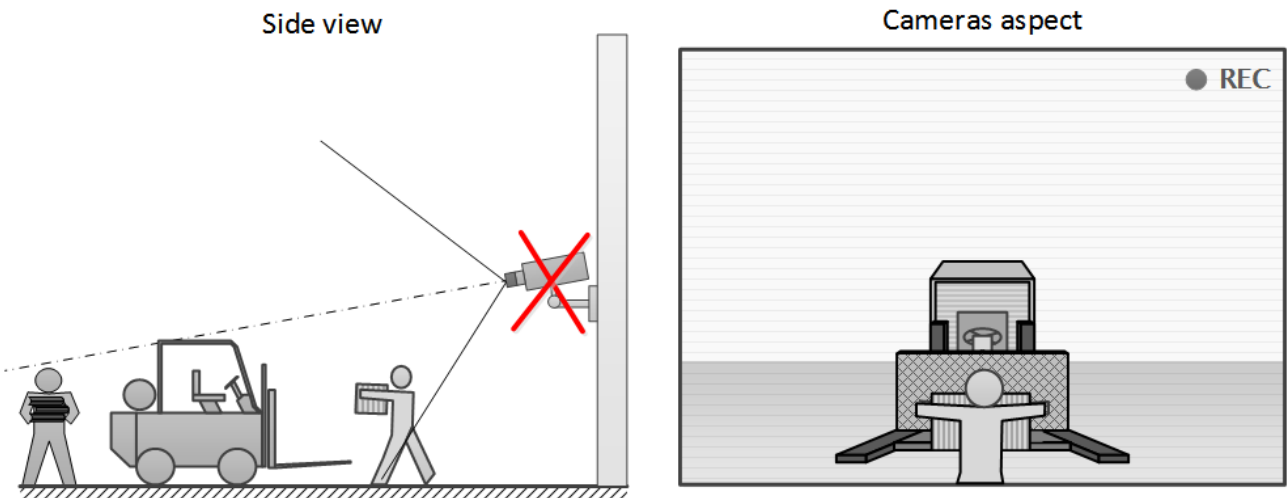
### Correct installation



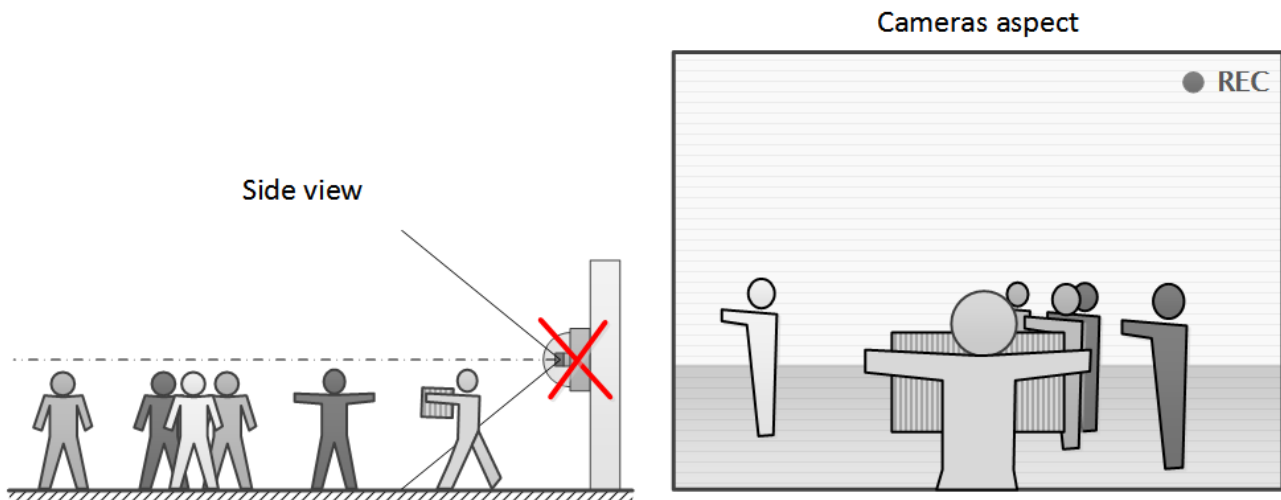
### Correct installation



### Wrong installation



## Wrong installation



## Interactive search and Suspect tracking






The **Interactive search and Suspect tracking** module facilitates the search for people and moving objects in the video archive, providing the user with the following features:

- Interactive search in the archive for the moving objects:
  - that are found in the user-defined rectangular area of the frame;
  - the dimensions of which are within the predefined minimum and maximum limits;
  - of the preset proportions – vertical, horizontal or square;
  - of the predetermined color or color combination.
- The interactive search for people in the archive:
  - any people;
  - by the color of clothes;
  - by samples from a video archive or an image.
- Cross-camera tracking:
  - chronologically connected search among several cameras for the person preliminarily found 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).

To ensure proper functioning of the module, it is required to correctly place the camera and adjust the software motion detector and the module itself.

# Module setup



In order to use the module, it is required to enable and set up the software motion detector, then activate the module itself. To do it, it is required to [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list on the left side of the page, 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 screenshot shows the 'Analytics' tab in the Eocortex Configurator. At the top, there are navigation tabs: 'Connection', 'Rights', 'Archive', 'Motion detector', and 'Analytics' (which is selected and underlined). Below the tabs is a section titled 'Intelligent module' containing a grid of 20 module cards. Each card has a toggle switch at the top left, an icon, a title, and an information icon at the bottom right. The 'Interactive search' card is highlighted in light blue and has its toggle switch turned on. At the bottom left of the grid, there is a 'Perspective' toggle switch, which is currently turned off.

Module Name	Toggle Status
Face detection	Off
Tracking	Off
People counting	Off
License Plate Recognition (Complete)	Off
License Plate Recognition (Light)	Off
Abandoned objects detection	Off
Interactive search	On
FishEye dewarping	Off
Loud sound detection	Off
Fire and smoke detector	Off
Traffic density heat map	Off
Crowd monitoring	Off
Face Recognition (Expert)	Off
Face Recognition (Basic)	Off
Personnel activity monitoring	Off
Counting people in queue	Off
Sabotage detector	Off
Auto zoom	Off
Hard Hat Detector	Off
Perspective	Off

**Interactive search and cross-camera tracking**

Indexing of moving objects by features

**Indexed objects size limits:**

Object min. width  
5% of frame width

Object min. height  
5% of frame height

[Set interactively](#)

Object max. width  
100% of frame width

Object max. height  
100% of frame height

[Set interactively](#)

Enable proportion classification

Camera location  
Indoor camera

Apply Cancel

It is required to make the following settings in the opened window:


**Indexing of moving objects by features** enables the interactive search capabilities.

**Indexed objects' size limits** sets the minimum and maximum dimensions of the objects that will be indexed for the subsequent interactive search and cross-camera tracking. Apart from setting the limiting dimensions using the corresponding sliders as the percentage of the frame size, it is possible to set the dimensions in the corresponding setup windows that open by pressing the **Set interactively** links.

**Minimum object size** ✕

Real time Archive

Camera 4.11.5




OK Cancel

Detailed description: This screenshot shows a software interface for adjusting object size detection. The title bar is blue with a red arrow icon and the text 'Minimum object size'. Below the title bar are two tabs: 'Real time' (active) and 'Archive'. The main area displays a camera feed from 'Camera 4.11.5' showing a long, narrow hallway with a person in the distance. A bounding box around the person is labeled '29%'. At the bottom, there are 'OK' and 'Cancel' buttons.

**Maximum object size** ✕

Real time Archive

Camera 4.11.5



OK Cancel

Detailed description: This screenshot shows the same software interface as above, but for adjusting the maximum object size. The title bar is blue with a red arrow icon and the text 'Maximum object size'. Below the title bar are two tabs: 'Real time' (active) and 'Archive'. The main area displays the same camera feed from 'Camera 4.11.5'. Two bounding boxes are visible: one around a door on the left labeled '75%' and one around a person in the distance labeled '37%'. At the bottom, there are 'OK' and 'Cancel' buttons.

**Enable proportion classification** activates the object classification by proportions.

For using the cross-camera tracking, the **Enable proportion classification** option must be enabled.

**Camera location:** the appropriate option shall be chosen between **Indoor camera** and **Outdoor camera**. The correctly selected variant will aid in making allowance for several significant factors, such as the influence of the lighting.



The use of the module will start only after [the settings are applied](#).

## Requirements and recommendations



This module performs search only in those parts of the frame where the motion detector has registered movement. At that, the module is capable of telling apart moving persons and other objects in motion.

The people in the frame can be detected with two methods that may be figuratively called "precise" and "simplified". The precise method is used always. It is enabled in the module's settings when the **Indexing of moving objects by their characteristics** option is on. The simplified method is enabled if the **Enable classification by proportions** option is activated, and is used when the shooting conditions do not allow using the precise method. The search for people using the simplified method is less accurate and produces more false activations.

## Requirements to video stream parameters

### General

- The framerate must be no less than 10 frames per second.
- Compression quality must be at least medium.
- The frame proportions must be preserved: the people will not be detected on the frame stretched by the camera during encoding.

For using precise search:

- The frame resolution must equal or exceed 480x384 pixels. The recommended frame resolutions are 1280x960 and 1920x1080. At that, the optimum relative height of a person is around 33 to 50% of the frame height.

## Requirements to illumination, color reproduction and image quality

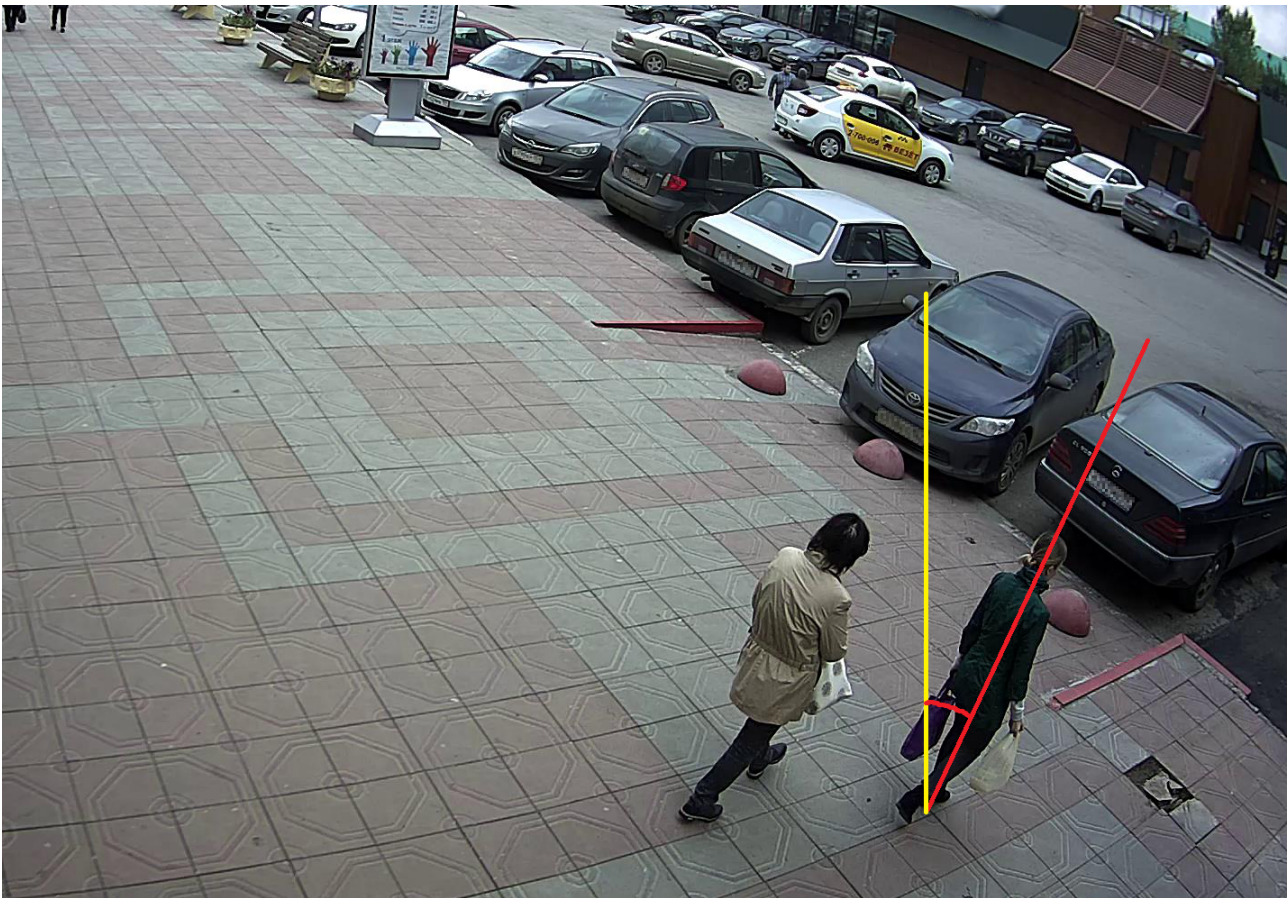
- The requirements are as follows: good and uniform scene illumination, absence of flare and flashing; however, the flare and flashing are acceptable on the background objects.
- The camera must have correct color reproduction. If there are several cameras with interactive search in the system, their color reproduction must be as close as possible.

- The illumination must not distort the color of the objects, if possible. The illuminating devices with color temperature that differs from the daylight frequently distort the color of objects.
- The image must not be blurry and must not contain compression artefacts.

## Camera placement requirements

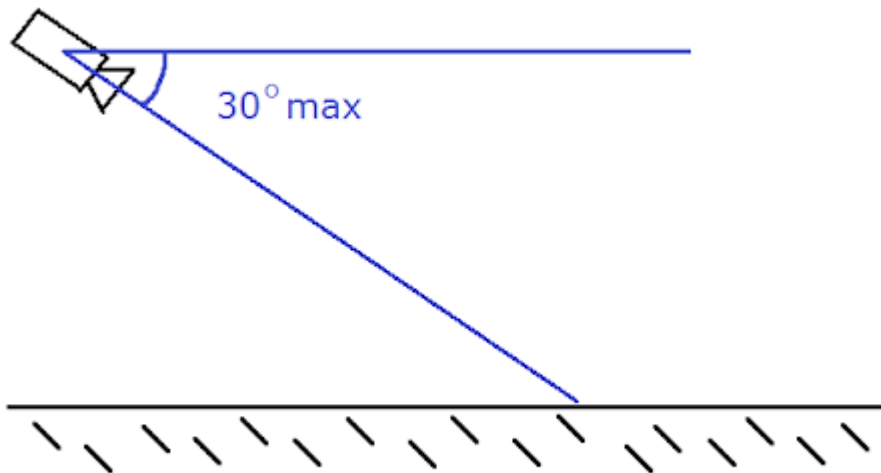
For searching for people using the precise method:

- The people in the frame must be in a vertical position. The angle of deviation from the vertical must not exceed 20 degrees; to achieve that, it is required, if possible, to avoid lateral tilt of the camera and the perspective distortion of the lens. Below you see an example of the deviation of the position of a person from the vertical due to the perspective distortion and the angle of the camera tilt in relation to the horizon.



- The camera must be placed almost horizontally: the tilt angle of the camera in relation to the ground must not exceed 30 degrees.





## Scene requirements

### General

- The proper and accurate operation of the motion detector is required.
- The static and uniform background of nonsaturated color will be optimal. A multi-color, bright background may result in wrong detection of the colors of the objects.

To search for people using the precise method:

- A person must not be covered by other people and things (the overlap must not exceed 30% of the person's area).
- The full length of a person must be visible in the frame.
- The distance between the upper limit of the frame and the person's figure must be more than 50% of the height of the figure. For example, if a person's figure has a height of 100 pixels, the distance between the figure and the upper limit of the frame must be at least 50 pixels.
- The minimum height of a person detected by the module is as follows:
- With the frame aspect ratio of 4:3 — 20% of the frame's height;
- With the frame aspect ratio of 16:9 — 25% of the frame's height\*.
- A complex background may lead to the increase of false detection of people.

To search for people using the simplified method:

- The people must move separately from one another to enable the motion detector to distinguish between them.
- It is preferable that the people are at full height in the frame.
- The size of a person must be enough for the motion detector to work: no less than 2% of the dimension of the side of a frame and no less than 8 pixels.

- The minimum height of the persons will be limited by the corresponding settings of the motion detector and of the interactive search module. At that, the larger dimensions will be used. For example, if the minimum height of the object to be detected is set to be 5% in the motion detector's settings, and in the interactive search module the minimum height of the object to be detected is 10% of the frame's height, the people with the height of not less than 10% of the frame's height will be detected.

## Examples

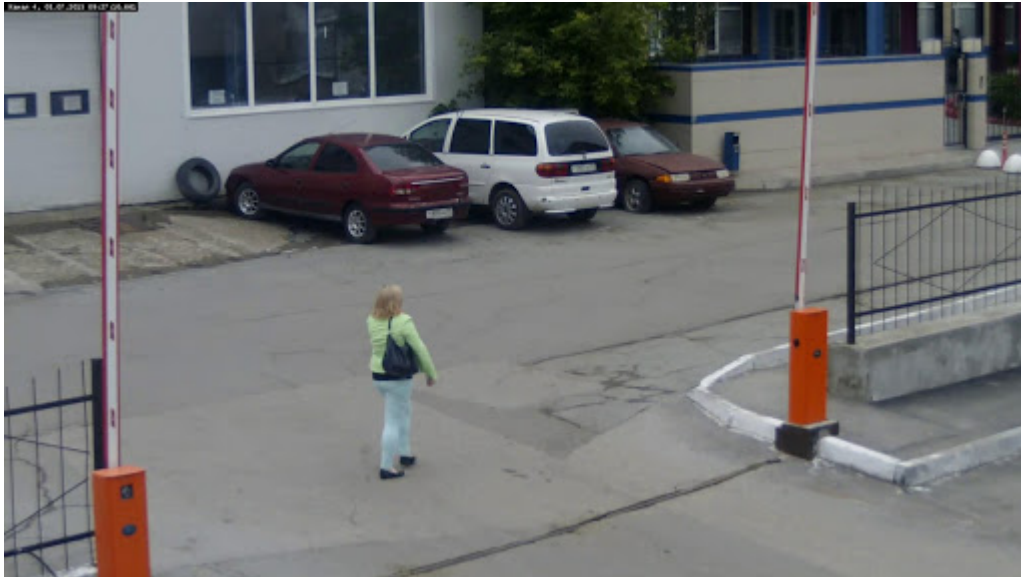
The unfavorable conditions: flare, blurred image, complex background



The unfavorable conditions: significant perspective distortions of a wide angle lens lead to the tilting of the persons in the frame (the tilt of a person is 22 degrees that exceeds the permissible value of 20 degrees)



Favorable conditions:



## Comparison of colors and search by distinguishing characteristics

The search by colors work well with the people wearing clothes of bright and rich colors such as red, green, blue, yellow, violet, etc. The work of the module is less precise with white, black and gray clothes.

When searching using a drawn sample, it is imperative to pick the matching hue with utmost precision. At that, it is important to bear in mind that the colors of clothes are perceived by the human eye to be more intense than the colors registered by the camera.

## Cross-camera tracking

The cross-camera tracking will be performed only on the channels where the Indexing of moving objects by their characteristics is enabled.

The resolution of at least 1920x1080 pixels and the framerate of 25 fps are recommended for the cross-camera tracking to work properly.

To achieve maximum performance of the cross-camera tracking, it is recommended to set up the perspective on each channel.

For creating the visual trajectory of the object's movements, it is required to place the cameras on the site plans. At that, if the cameras are placed on several plans, it is required to add transitions between these plans.

## Performance

During the module's operation, the CPU load increases together with the increase of resolution and the intensity of movement in the frame.

Since the search process leads to the increase of accessing the database located on the server, the read rate of the drive where the database and the archive are stored is of importance.

# Accuracy

The given information is estimated based on the internal test results. The real-life accuracy may differ.

Searching with the use of samples from the archive: it was possible to find people looking like the specified sample on the first try in 79-89% of the cases; the percentage of the false positives amounted to 23-33%.

Searching with the use of drawn samples: it was possible to find people looking like the specified sample on the first try in 63-73% of the cases; the percentage of the false positives amounted to 20-30%





## Licence plate recognition (Complete)



The **Licence 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.

The module's features are listed below.

- Real-time recognition of the license plate numbers of moving vehicles.
- Recognition of the license plate numbers of the vehicles of 150 countries.
- Recognition of the license plate numbers of vehicles travelling with the following velocities:
  - up to 150 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.

-  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.




The description of the module contains the following sections:

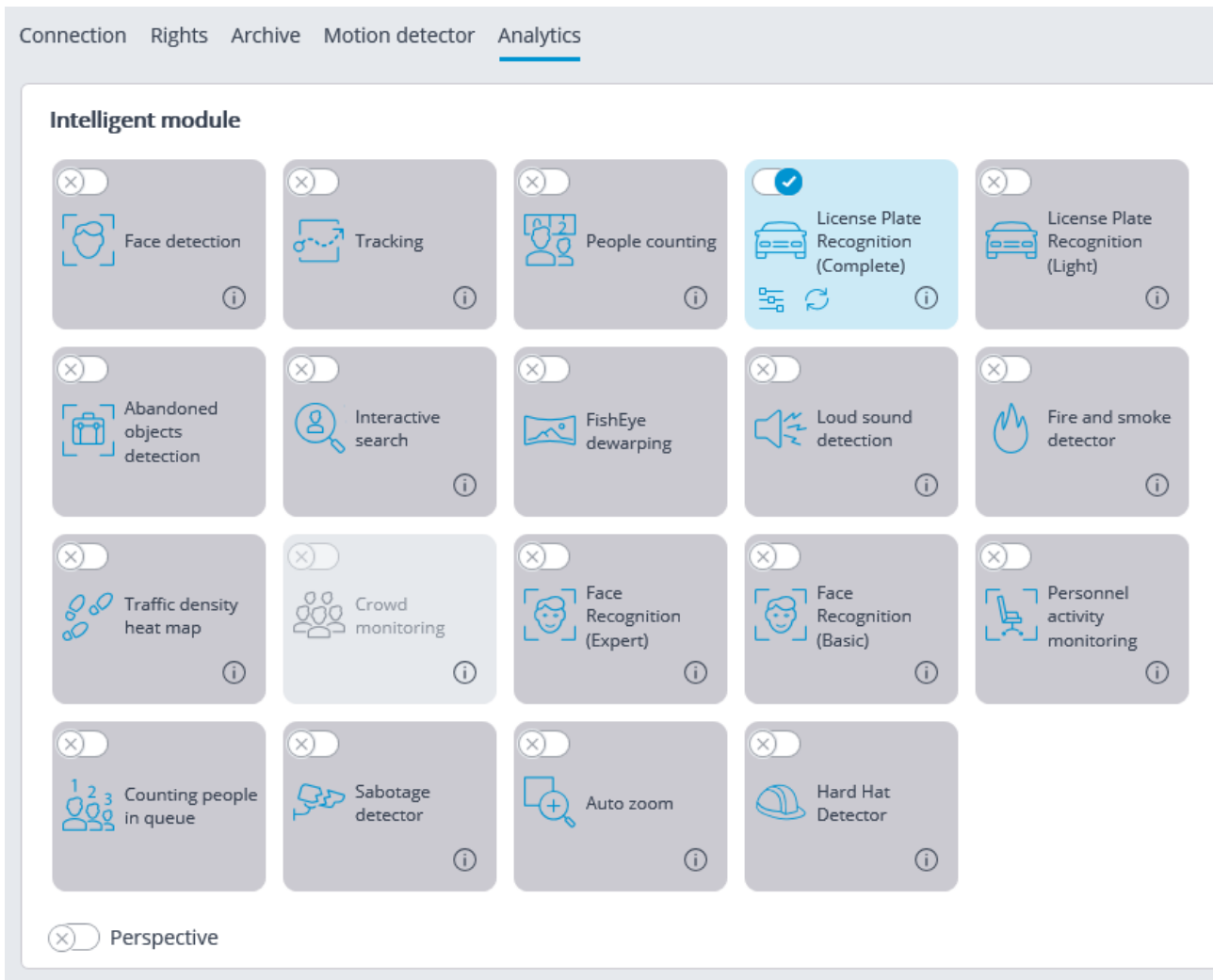
## Module setup




Since this module is external and is not included into the basic **Eocortex** package, before setting it up and using it, install it on the computer to which the cameras that will use this module are connected.

In order to use the module, it is required to enable and set up the software motion detector, then activate the module itself. To do it, it is required to [launch the Eocortex Configurator application](#), go to

the  [Cameras](#) tab, select a camera in the list on the left side of the page, 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.



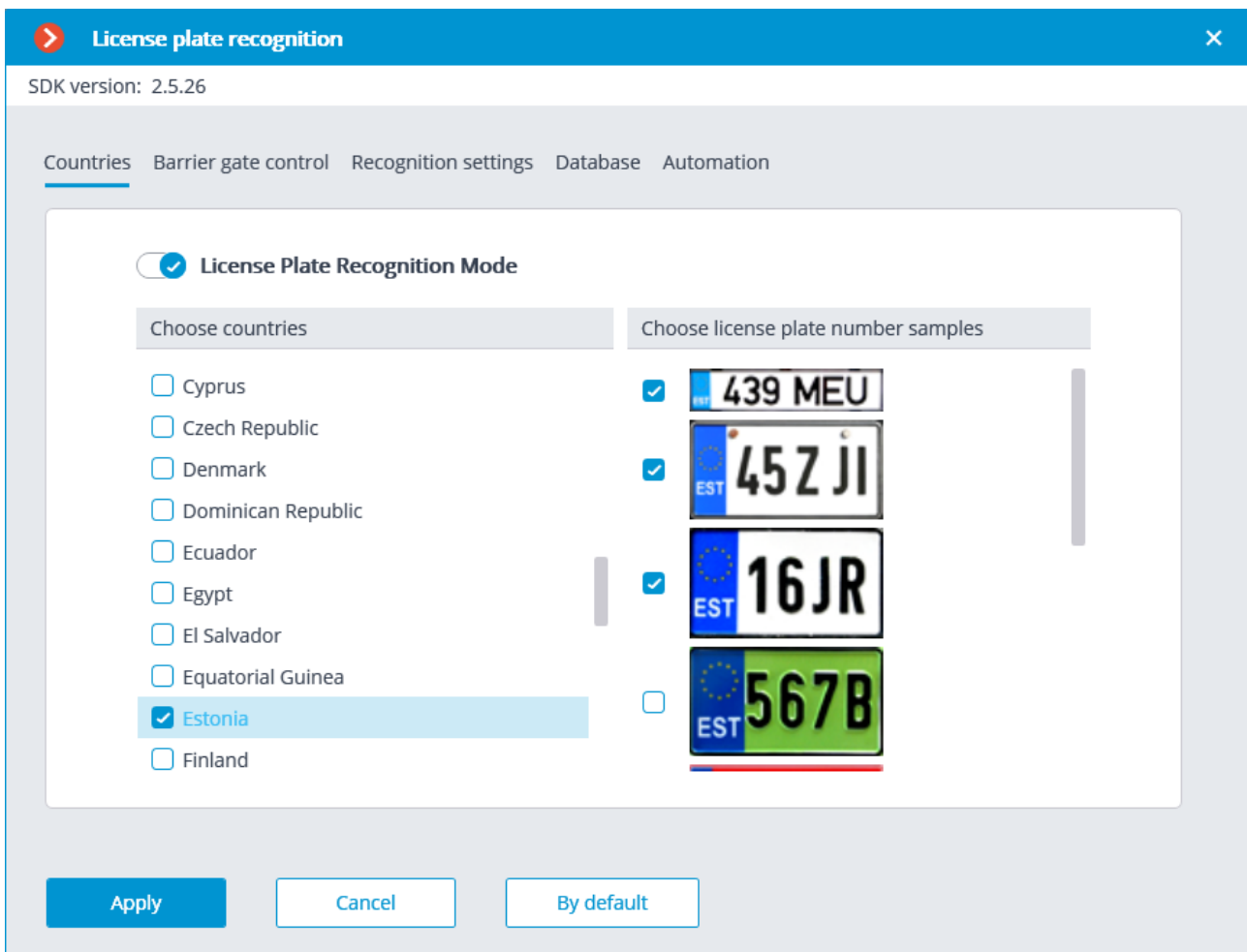
 It is only possible to use one of the two versions of the module on the same camera: **License plate recognition (Complete)** or **License plate recognition (Light)**.

 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 subheader of the module settings window you can see the version of the SDK libraries used by the module for recognizing license plates.


The module settings description is given below.




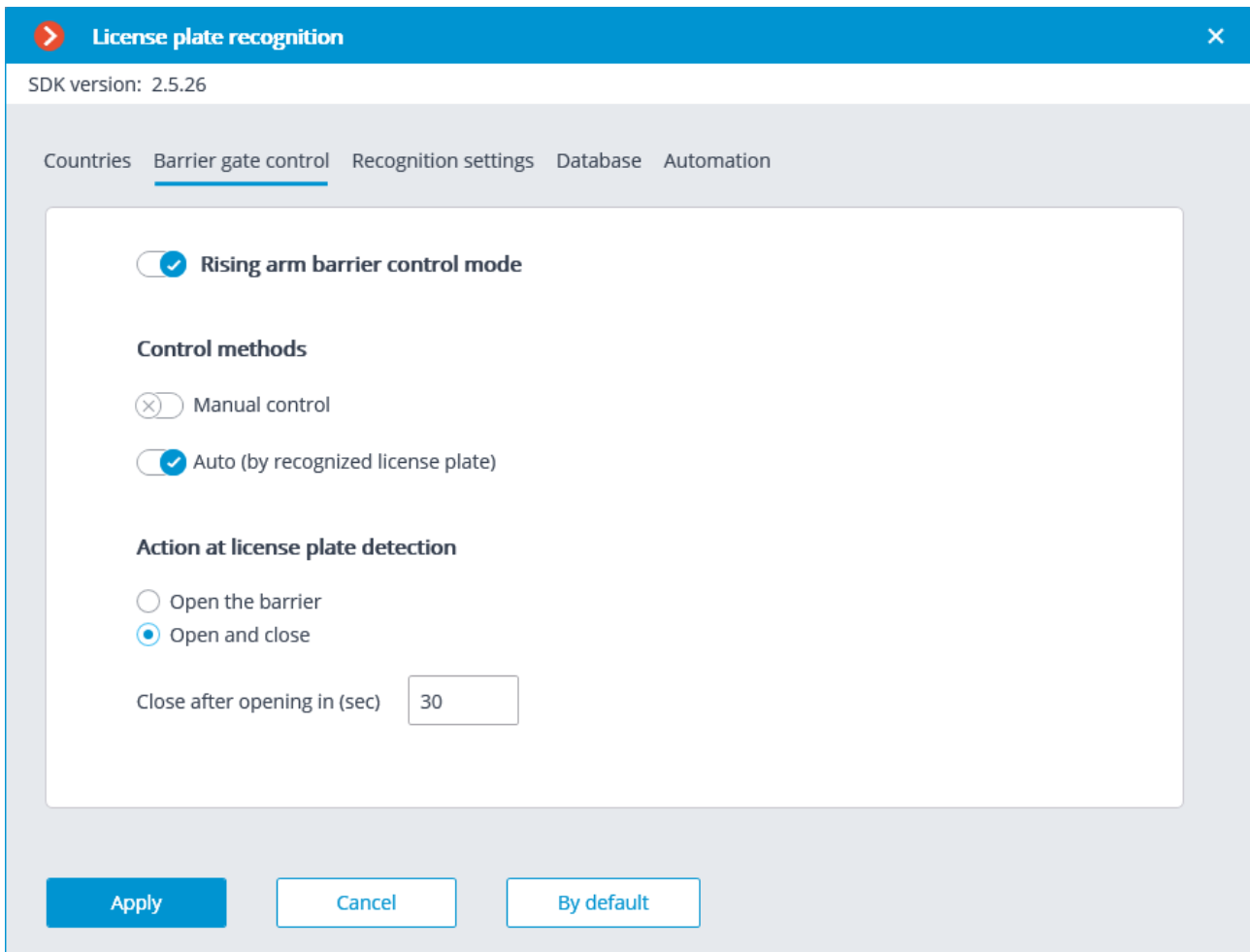
The countries and samples of the license plate numbers to be recognized are set on the **Countries** tab.

In order to gain access to the settings of the countries and samples, it is required to activate the **License plate Recognition Mode** switch. If this option is disabled, the recognition will not be performed; this mode can be used when the module is only utilized to control the rising arm barrier.

With the license plate recognition module enabled, it is required to tick the countries the license plates of which will be recognized by the module, and the corresponding samples of the license plates for each selected country. The countries and samples not ticked will not be recognized.


 The empty list of countries means that the **Licence 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.



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 **Licence plate recognition (Complete)** module license or protection key is not required. However, for ensuring the abovementioned functionality, it is necessary to have the **Licence 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.

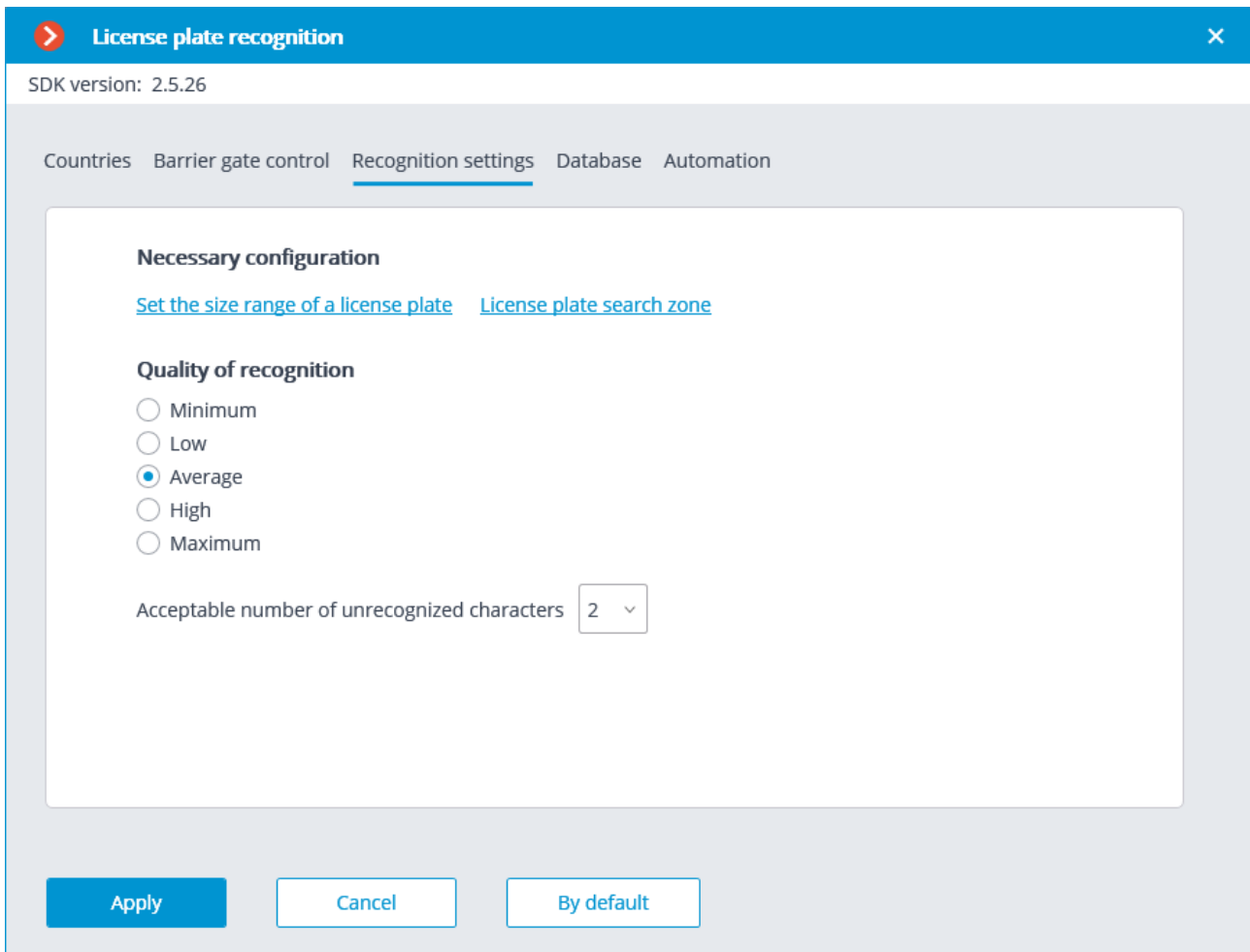


When the **Open and close** option is selected, it is imperative that the barrier itself has a feature of preventing its closing when a car is below the rising arm. It means that after generating the closing command the barrier's automatics must check if there is a vehicle or a person on the line of 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.

The recognition algorithm settings are made on the **Recognition settings** tab.



**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.

**Set the license plate dimensions** opens the window of setting the minimum and maximum width of the license plates to be recognized.

**License plate size** ×

Real time Archive



Set the minimum and maximum width of the license plate. Note that width set for all the templates is important for the proper work of this module


**Save** Cancel

It is required to specify the minimum and maximum width of the plates to be recognized with the help of the adjustment scales. The scales can be moved by dragging them by the left round marker. The stretching and the contraction of the scales is performed by moving the right round marker.

### License plate size

Real time Archive

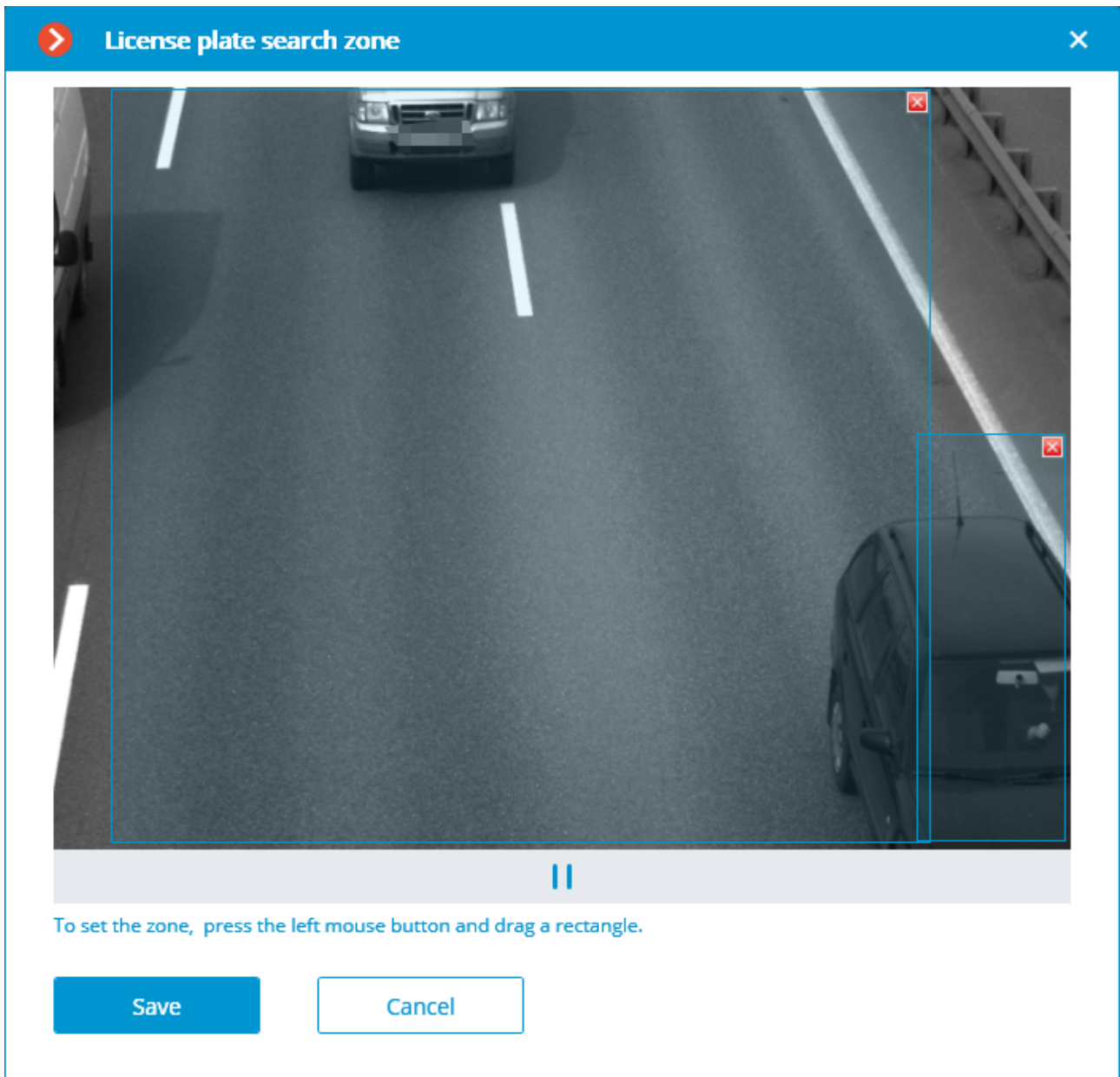
ARCHIVE: Camera 4.7.9, 08.02.2019 11:27:13.531



Set the minimum and maximum width of the license plate. Note that width set for all the templates is important for the proper work of this module

Save Cancel

**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.

The screenshot shows a configuration window titled "License plate recognition" with a close button (X) in the top right corner. Below the title bar, it indicates "SDK version: 2.5.26". The window has several tabs: "Countries", "Barrier gate control", "Recognition settings", "Database" (which is selected and underlined), and "Automation".

Inside the "Database" tab, there are two radio buttons: "Local" (unselected) and "Remote" (selected). Below these is a text instruction: "Enter IP address and port of server with vehicle license plate database (for multi-server configuration)".

There are four input fields:

- "IP-address" with the value "127.0.0.1"
- "Port" with the value "3050"
- "User name" with the value "SYSDBA"
- "Password" with a masked value represented by seven dots.

At the bottom of the window, there are three buttons: "Apply" (highlighted in blue), "Cancel", and "By default".

The access to the license plate database can be set on the **Database** tab.

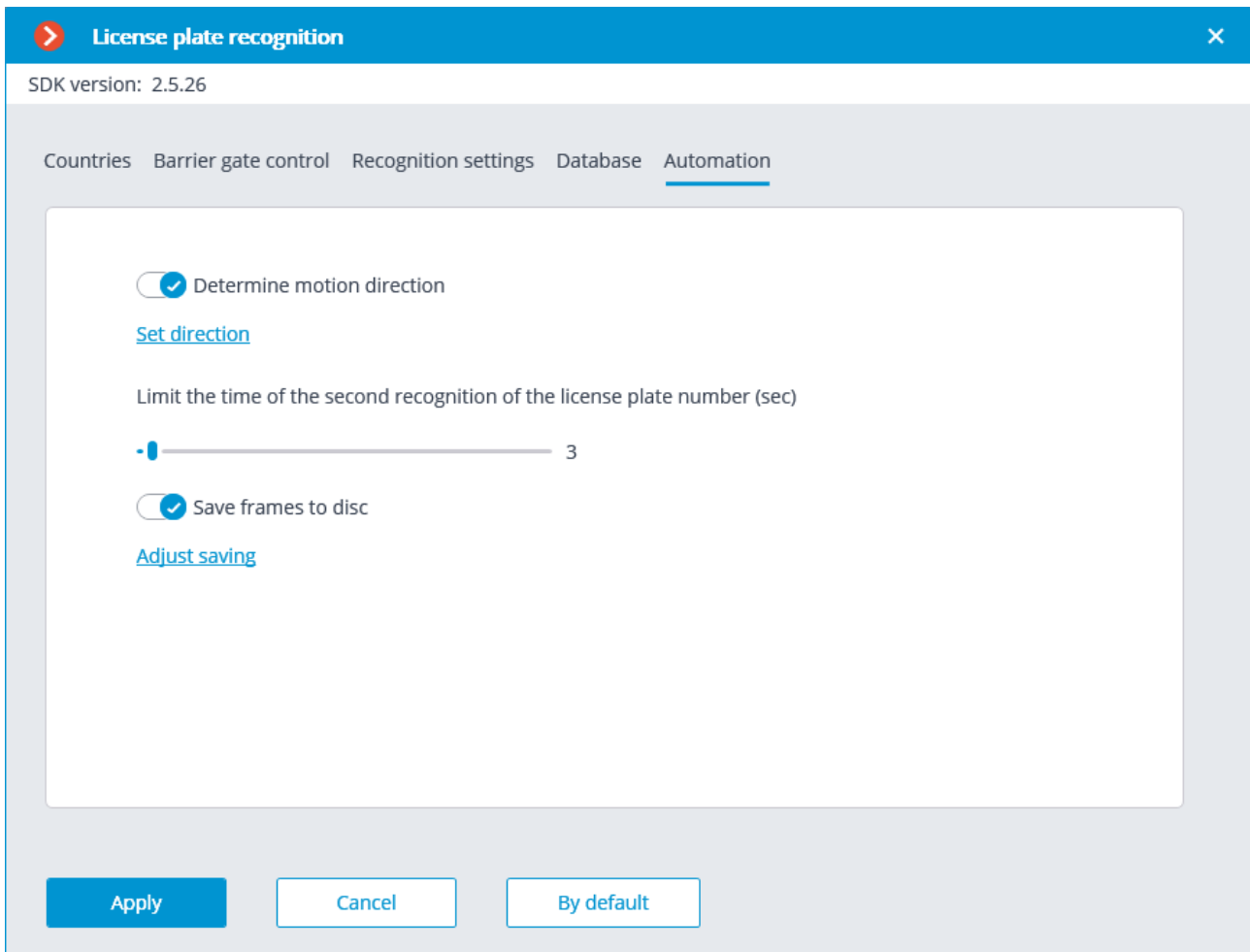
If the license plate recognition is performed only on one server, it is recommended to set the value to **Local**.

In the multiserver system, the database can be stored on one server only. In this case it is required to select **Remote** and indicate the **IP address** and the **Port** of the server, as well as the **User name** and **Password** of the database administrator.

**Eocortex** uses **Firebird** database management system with the following default values: database connection **Port** – **3050**, **User name** – **SYSDBA**, **Password** – **masterkey**.




The server where the license plate database is stored must be assigned as the main server for at least one camera that uses the **Licence plate recognition (Complete)** module.

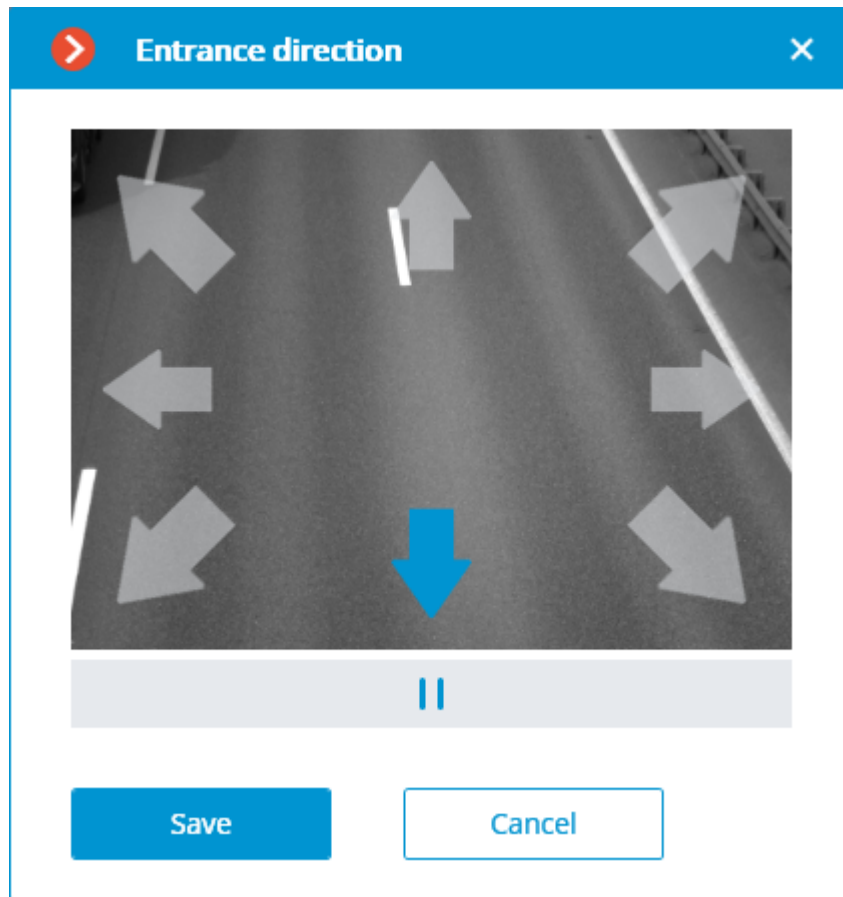


The following settings are available on the **Automation** tab:

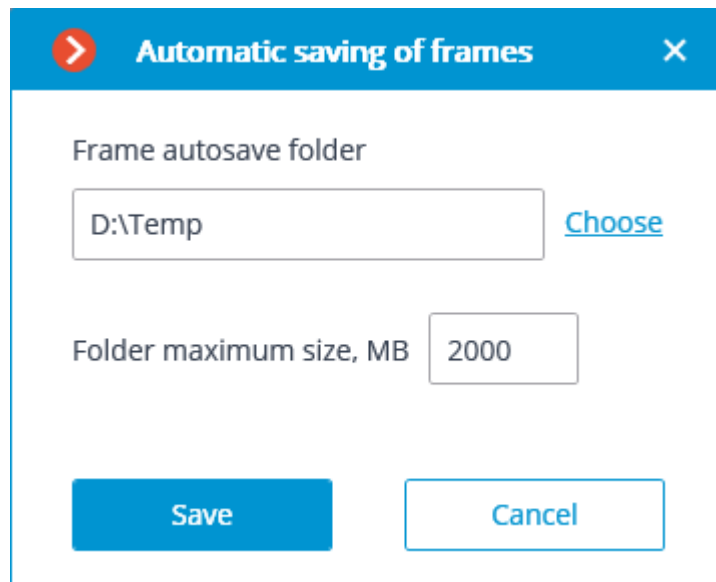
**Limit the time of the second recognition of the license plate number** is used for setting the period of time starting from the initial recognition of the license plate number during which no attempts to recognize the same number will be made.

-  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.

**Determine motion direction** enables the mode of determining the travel direction. After activating this mode, it is required to click on the **Set direction** link and select the arrow that specifies the entrance direction in the opened window. In this case the vehicles travelling in the opposite direction will be considered as the ones leaving the area.



**Save frames to disc** activates the mode of automatic saving the frames with the recognized license plate numbers to disc. After enabling this mode, click the **Adjust saving** link, and in the opened window indicate the folder where the image files with the recognized license plates will be stored, then specify the **Maximum folder size, Mb**.



If the size of the saved files exceeds the maximum preset limit, the saving of the frames will continue, but the oldest files will be deleted to uphold size restrictions.





If **0** is specified in the **Maximum folder size, Mb** field, the folder size will not be limited.



It is only advisable to select the folder interactively using the Choose link 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 use of the module will start only after [the settings are applied](#).

## Requirements and recommendations



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 distance).



- i** 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.).

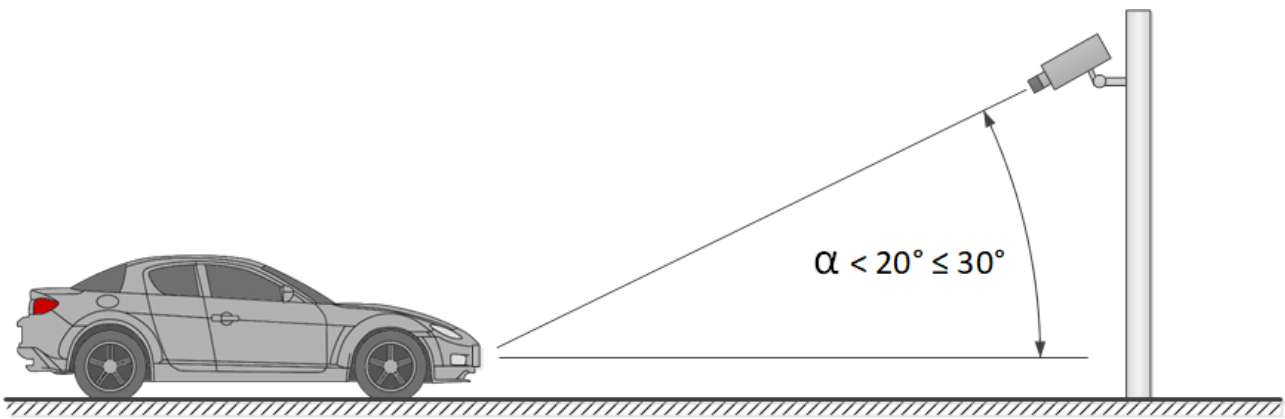
In order to avoid camera flaring, it shall not be directed at the light sources (the Sun, streetlamps) and at the highly reflective objects.

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°



## Example of camera installation on the road with a grade

### Horizontal camera installation angle

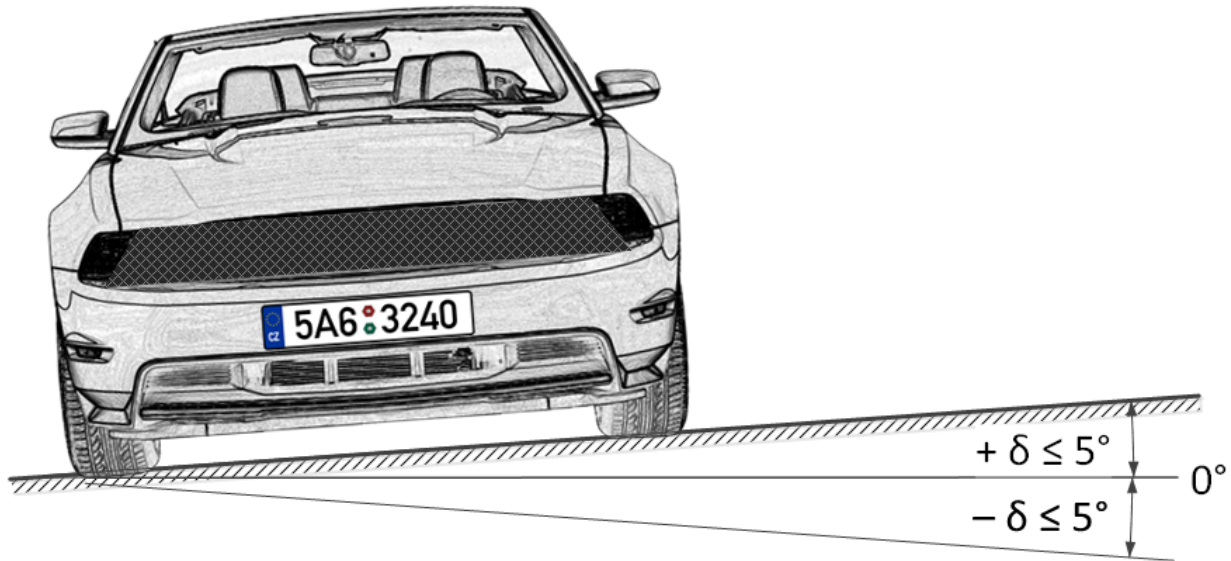
Recommended: up to 5–10°

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.

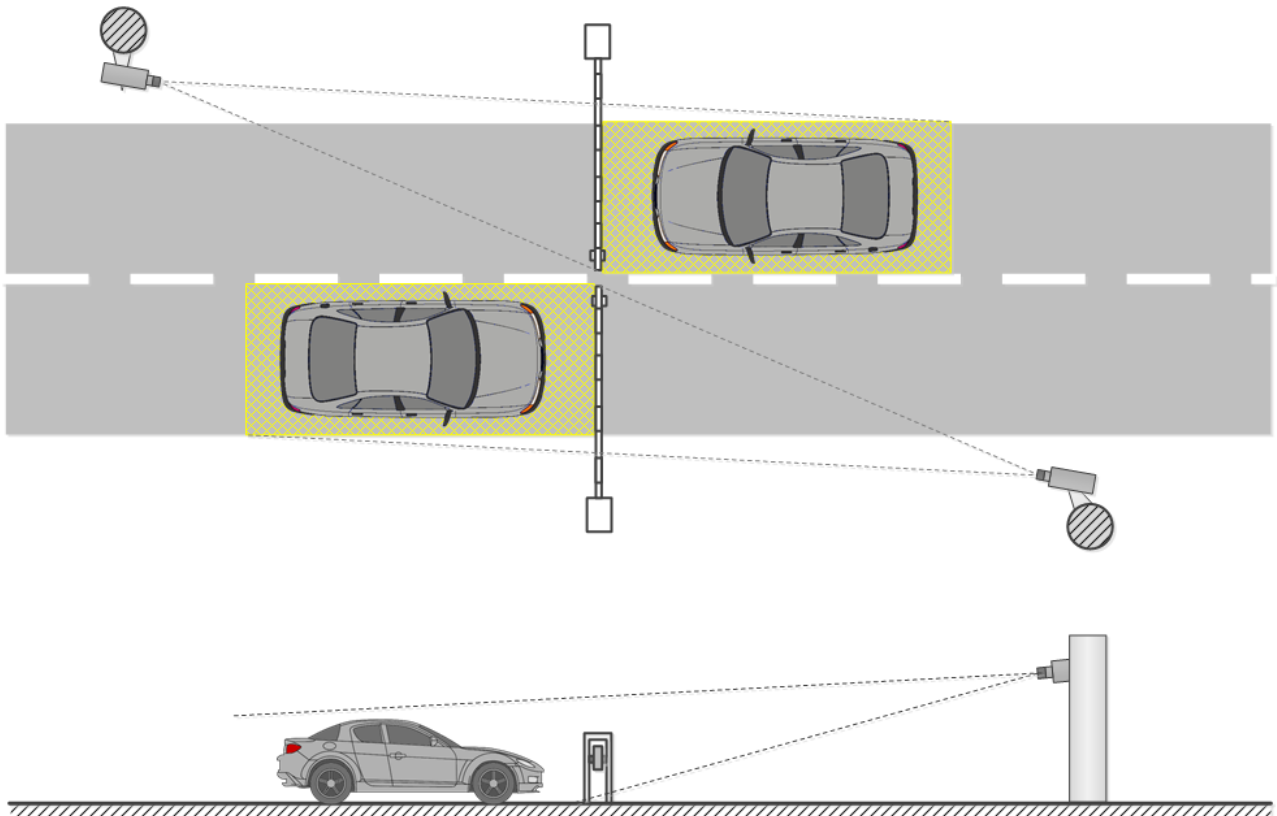
- The camera installation height shall be above the level of the headlights of the vehicles.
- The distance between the place of installation and the focus area must be at least 3 meters.

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.

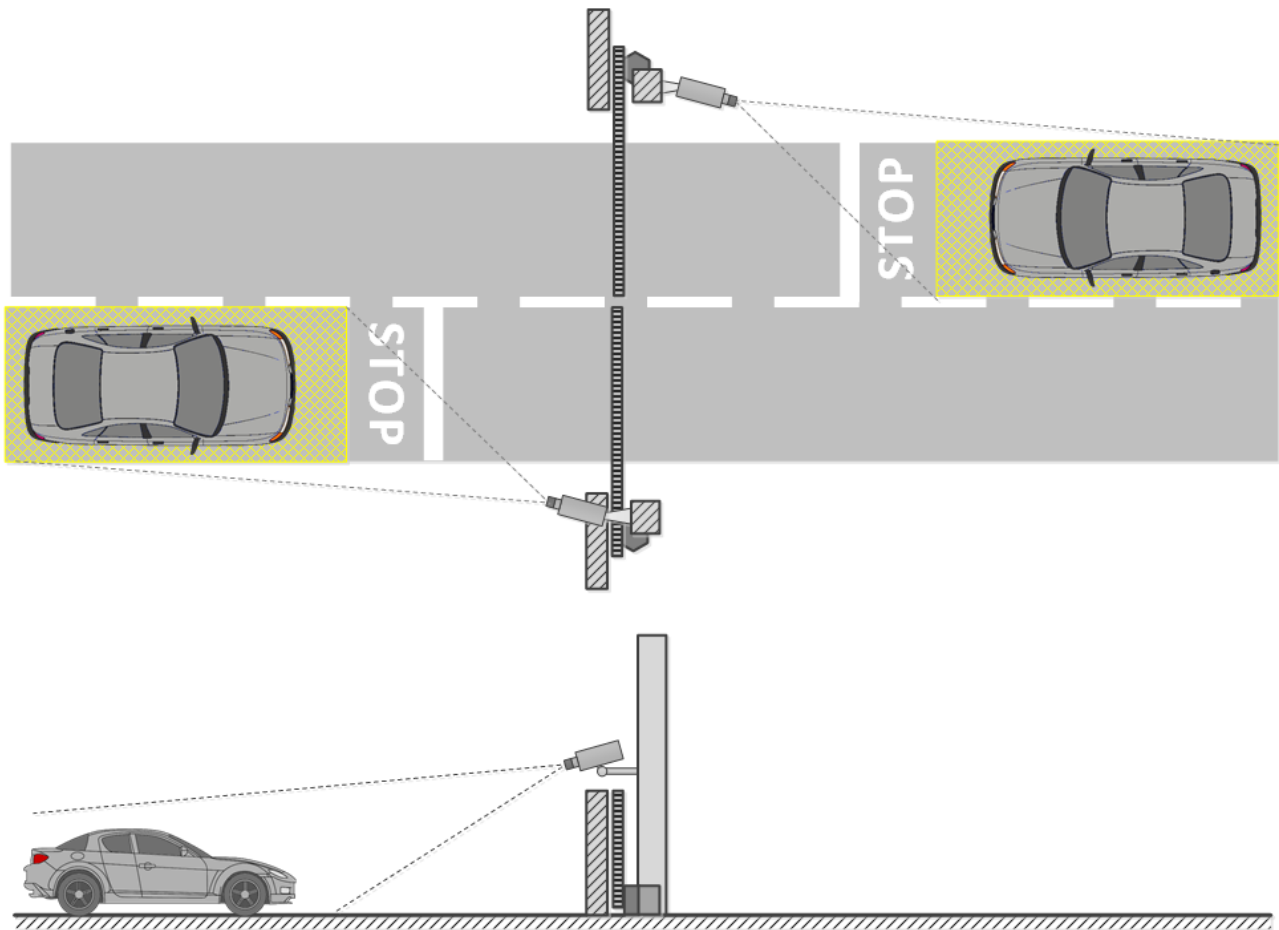
When using the rising arm barrier, the controlled area may start immediately before it. In this case the camera is to be installed at a distance from the barrier line.

## Controlled areas with separate lanes and a rising arm barrier



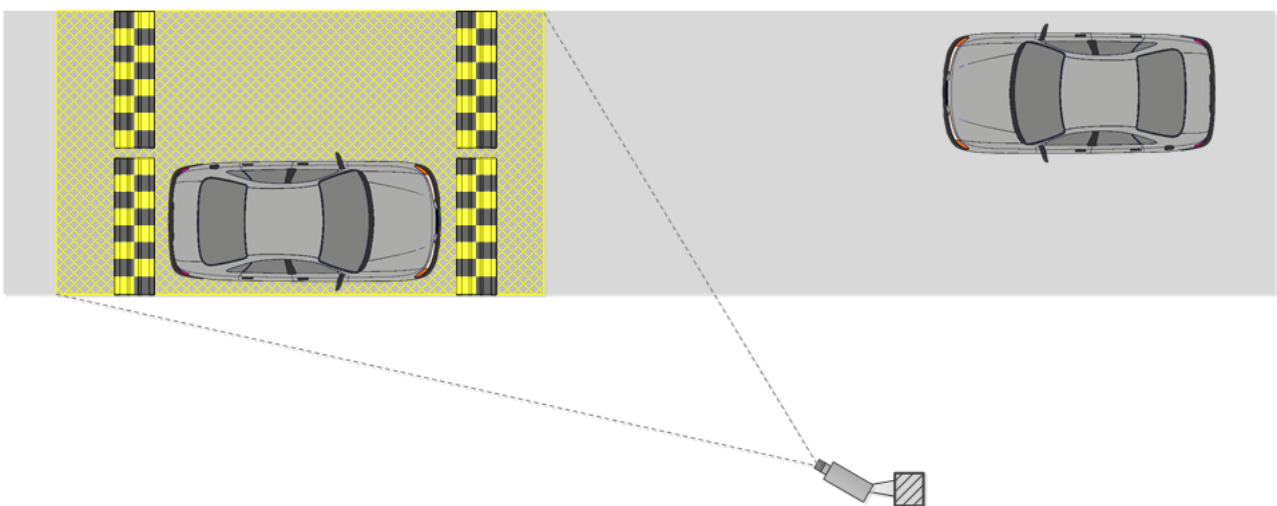
When using the gates, the controlled area must not start immediately before the gates, because the camera is usually installed at the level of the gates. In such a case a stop line, a mandatory stop sign or a traffic light is used for stopping the vehicle in the controlled area.

## 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), 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

**i** 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 distance 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 distance 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.

<b>Sensor size: 1/3"</b>					
<b>Installation height (m)</b>	<b>4</b>	<b>6</b>	<b>10</b>	<b>15</b>	<b>20</b>
<b>Area width: 3 m</b>					
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)
<b>Area width: 6 m</b>					
Vertical angle, °	30	30	30	30	30
Focal distance (mm)	6	8	14	21	28







Sensor size: 1/3"					
Installation height (m)	4	6	10	15	20
Area width: 3 m					
Area width: 6 m					
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.

## Module installation and update



This module is external; it is not included in the basic **Eocortex** distribution package and requires individual installation.

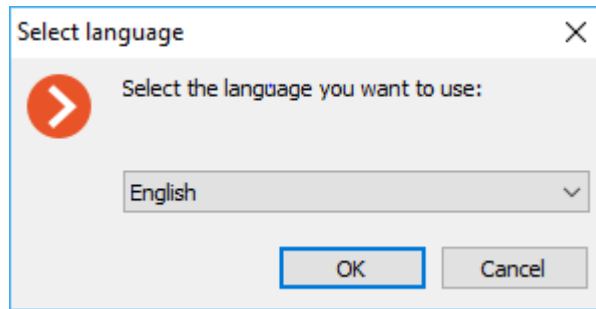
-  The module must be only installed on the computer with **Eocortex Server** or **Eocortex Standalone** application, to which the license plate recognition cameras are bound. The computers with just **Eocortex Client** application installed do not require installation of the module.
-  The module's 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.

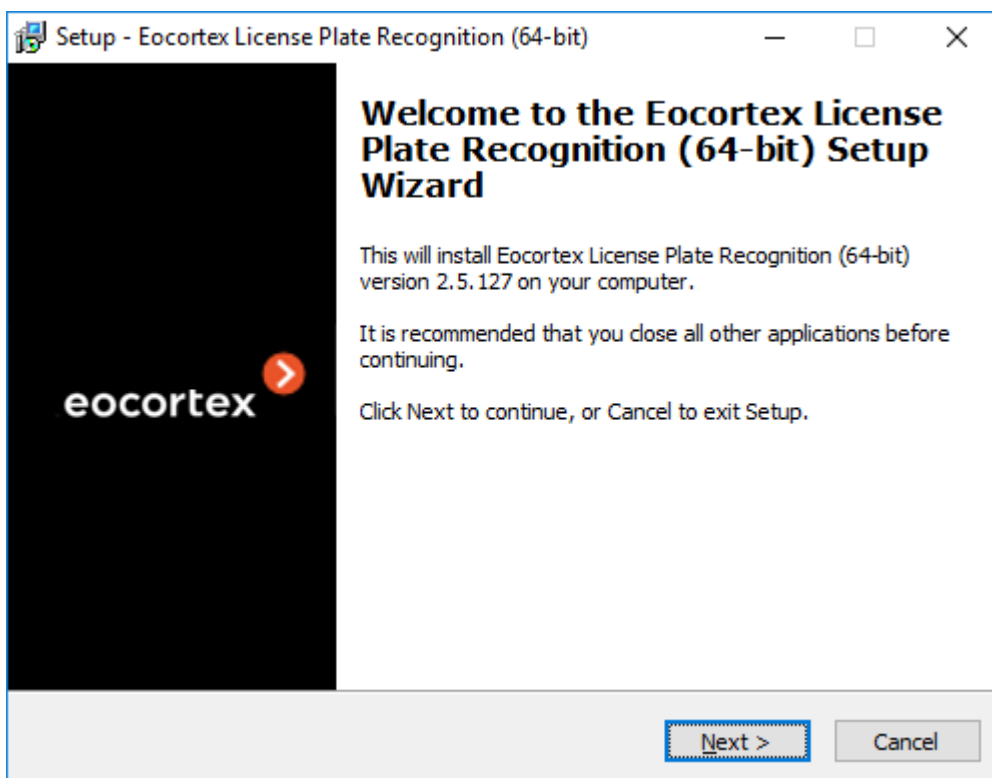
Before installing the module, it is required to stop all the **Eocortex** applications running on the computer, and to insert the module protection key in the USB port.

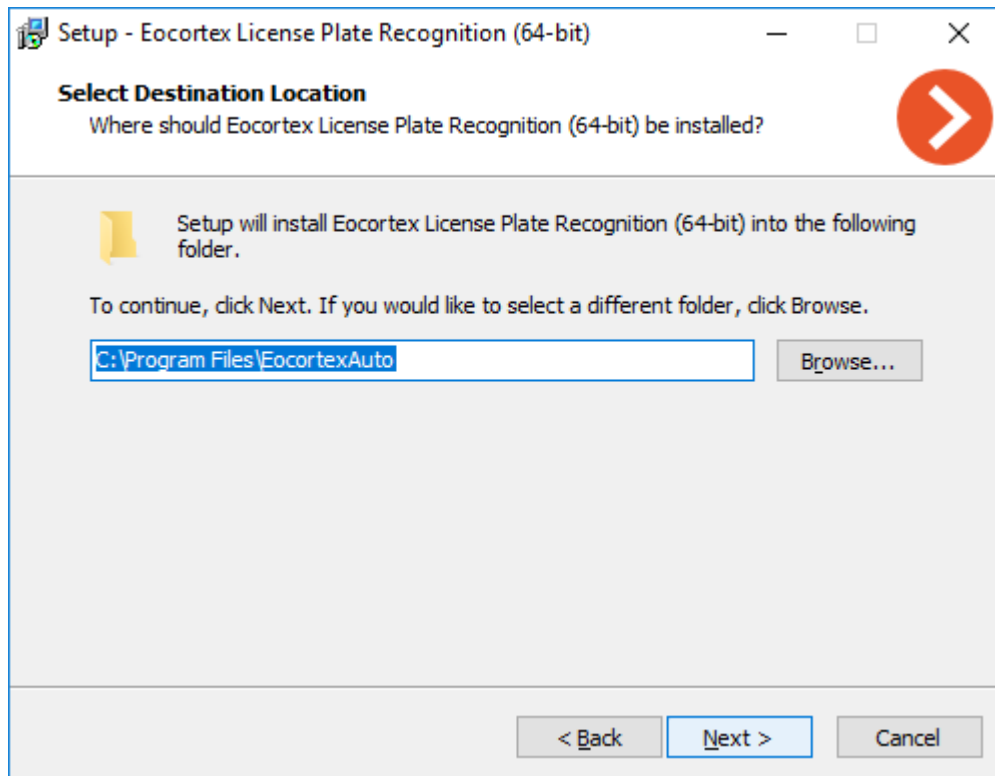
To install the module, it is required to run **EocortexAuto Installer\_x64.exe** file for a 64 bit version of **Eocortex** or **EocortexAuto Installer.exe** for a 32 bit version.

It is required to choose the installation language in the opened **Select language** window.

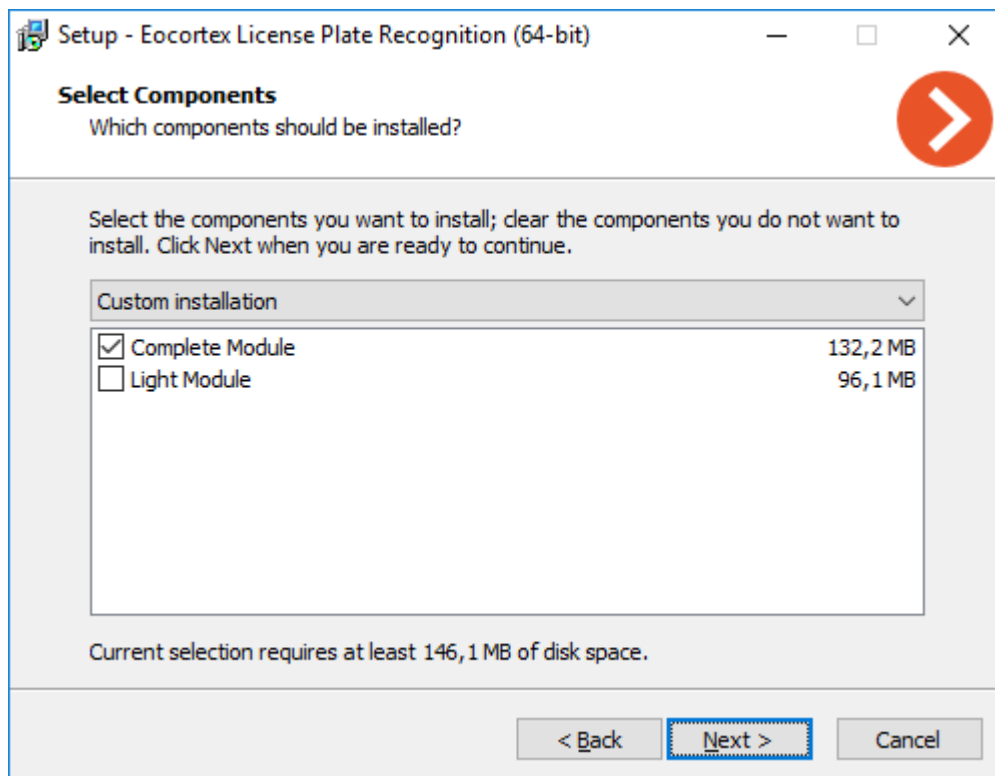


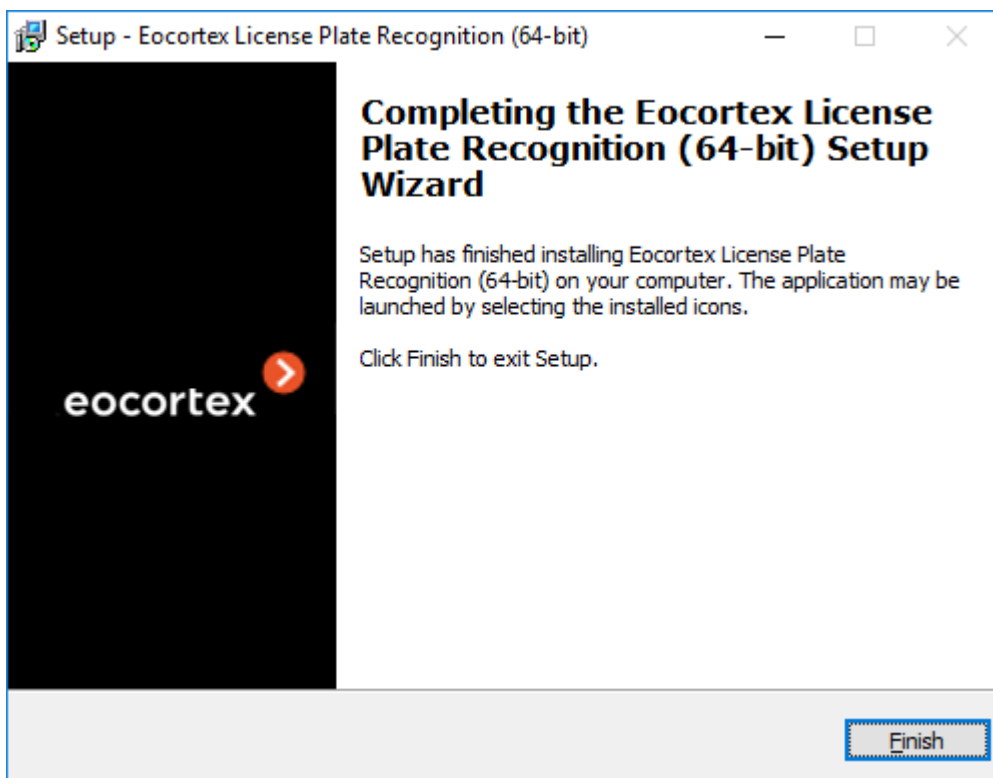
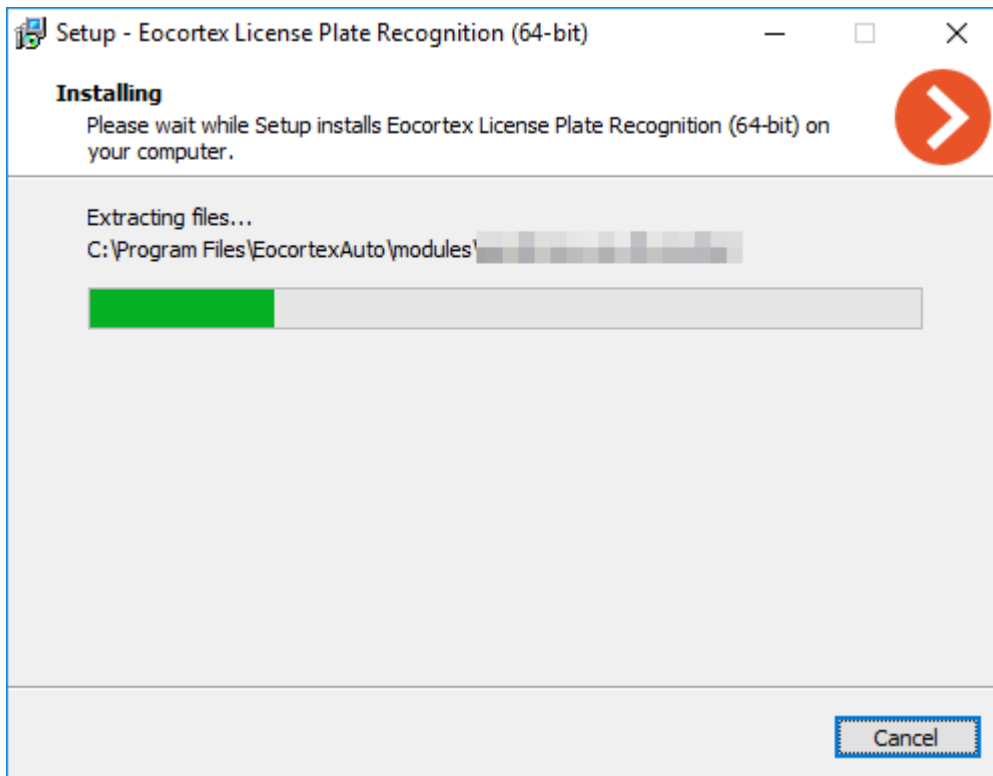
Then it is necessary to follow the steps of the installation wizard.






At the **Select component** step, choose the **Licence plate recognition (Complete)** option.





 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 **Licence plate recognition (Complete)** module and the license bound to the **Eocortex** protection key.

- i** 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 USB HASP key.



The [Eocortex protection key](#) may be a hardware or a software key.

The module is licensed according to the type of license, to the groups of countries whose license plates will be recognized, and by the quantity of the recognition channels.

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. The analysis of the video stream is performed with the actual framerate of the stream received from the camera, or in accordance with the analysis frequency indicated in the settings of the software motion detector.
- **Parking** is designed for the recognition of the license plates of the vehicles travelling at the speed of up to 20 km/h. The analysis of the video stream is performed with the framerate of no more than 6 fps, irrespective of the actual framerate of the stream received from the camera.

Groups of countries:

- **All countries.**
- **All the European countries:** Austria, Albania, Andorra, Belarus, Belgium, Bulgaria, the Vatican, Great Britain, Hungary, Germany, Greece, Georgia, Denmark, Ireland, Iceland, Spain, Italy, Latvia, Lithuania, Liechtenstein, Luxembourg, Macedonia, Malta, Moldova, Monaco, the Netherlands (Holland), Norway, Poland, Russia, Romania, San Marino, Serbia, Slovakia, Slovenia, Turkey, Ukraine, Finland, France, Croatia, Montenegro, Czech Republic, Switzerland, Sweden, Estonia.
- **Eastern Europe:** Belarus, Bulgaria, Hungary, Georgia, Moldova, Poland, Russia, Romania, Slovakia, Turkey, Ukraine, Czech Republic.
- **All the Asian countries:** Azerbaijan, Armenia, Afghanistan, Bangladesh, Bahrain, Brunei, Bhutan, East Timor (Timor-Leste), Vietnam, Georgia, Egypt, Israel, India, Indonesia, Bali, Jordan, Iraq, Iran, Yemen, Kazakhstan, Cambodia, Qatar, Cyprus, Kyrgyzstan, China, North Korea, Korea, Kuwait, Laos, Lebanon, Malaysia, Maldives, Mongolia, Myanmar (Burma), Nepal, UAE, Oman, Pakistan, Russia, Saudi Arabia, Singapore, Syria, Tajikistan, Thailand, Taiwan, Turkmenistan, Turkey, Uzbekistan, Philippines, Sri Lanka (Ceylon), Japan.
- **Central Asia:** Iran, Kazakhstan, Kyrgyzstan, Mongolia, Russia, Tajikistan, Turkmenistan, Uzbekistan.

- **Arab countries:** Azerbaijan, Armenia, Afghanistan, Bahrain, Georgia, Egypt, Israel, Jordan, Iraq, Iran, Yemen, Qatar, Cyprus, Kuwait, Lebanon, United Arab Emirates, Oman, Saudi Arabia, Syria, Turkey.
- **Hindustan:** Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka (Ceylon).
- **Indochina:** Brunei, East Timor (Timor-Leste), Vietnam, Indonesia, Bali, Cambodia, Laos, Malaysia, Myanmar (Burma), Singapore, Thailand, Taiwan, Philippines.
- **Southeast Asia:** China, North Korea, Korea, Mongolia, Taiwan, Japan.
- **North Africa:** Algeria, Egypt, Western Sahara (Sahara Arab Democratic Republic), Libya, Morocco, Sudan, Tunisia.
- **All of Africa:** Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Democratic Republic of Congo, Djibouti, Egypt, Zambia, Western Sahara (Saharan Arab Democratic Republic), Cape Verde, Zimbabwe (Cape Verde Islands), Cameroon, Kenya, Comoros, Cote d'Ivoire (Ivory Coast), Lesotho, Liberia, Libya, Mauritius, Mauritania, Madagascar, Malawi, Mali, Morocco, Mozambique, Namibia, Niger, Nigeria, Republic of Congo, Rwanda, San -Tome and Principe, Swaziland, Seychelles, Senegal, Somalia, Sudan, Sierra Leone, Tanzania, Togo, Tunisia, Uganda, Central African Republic, Chad, Equatorial Guinea, Eritrea, Ethiopia, South Africa.
- **North America:** Canada, Costa Rica, USA.
- **Latin America:** Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Venezuela, Haiti, Guyana, Guatemala, Honduras, Grenada, Dominican Republic, Colombia, Cuba, Mexico, Nicaragua, Panama, Paraguay, Peru, El Salvador, Saint Vincent and the Grenadines, Saint Kitts and Nevis, Saint Lucia, Suriname, Trinidad and Tobago, Uruguay, Chile, Fr. Easter, Ecuador, Galapagos, Jamaica.
- **Australia and Oceania:** Australia, Vanuatu, Kiribati, Marshall Islands, Nauru, New Zealand, Palau, Papua, Samoa, Solomon Islands, Tonga, Tuvalu, Federated States of Micronesia, Fiji.
- **Former USSR:** Azerbaijan, Armenia, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldavia, Mongolia, Russia, Tajikistan, Turkmenistan, Uzbekistan, Ukraine, Estonia.

For the operation of the **Licence plate recognition (Complete)** module it is required that the module protection key 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 **Licence plate recognition (Complete)** module must also be activated on the server.



One **Eocortex** server may have only one **Licence plate recognition (Complete)** 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 [upgrade the firmware of the module protection key](#).

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 [upgrade the firmware of the module protection key](#). If the quantity of the cameras that perform recognition stays the same, the **Eocortex** license does not need to be updated.

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 **HASP** software protection keys is installed on the **Eocortex** server, the **Licence plate recognition (Complete)** module operation on such server may be unstable.

## Licence plate recognition (Light)



The **Licence 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.

The module's features are listed below.

- Real-time recognition of the license plate numbers of moving vehicles.
- Recognition of the license plate numbers of the vehicles of 34 countries.
- 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.



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.

The description of the module contains the following sections:

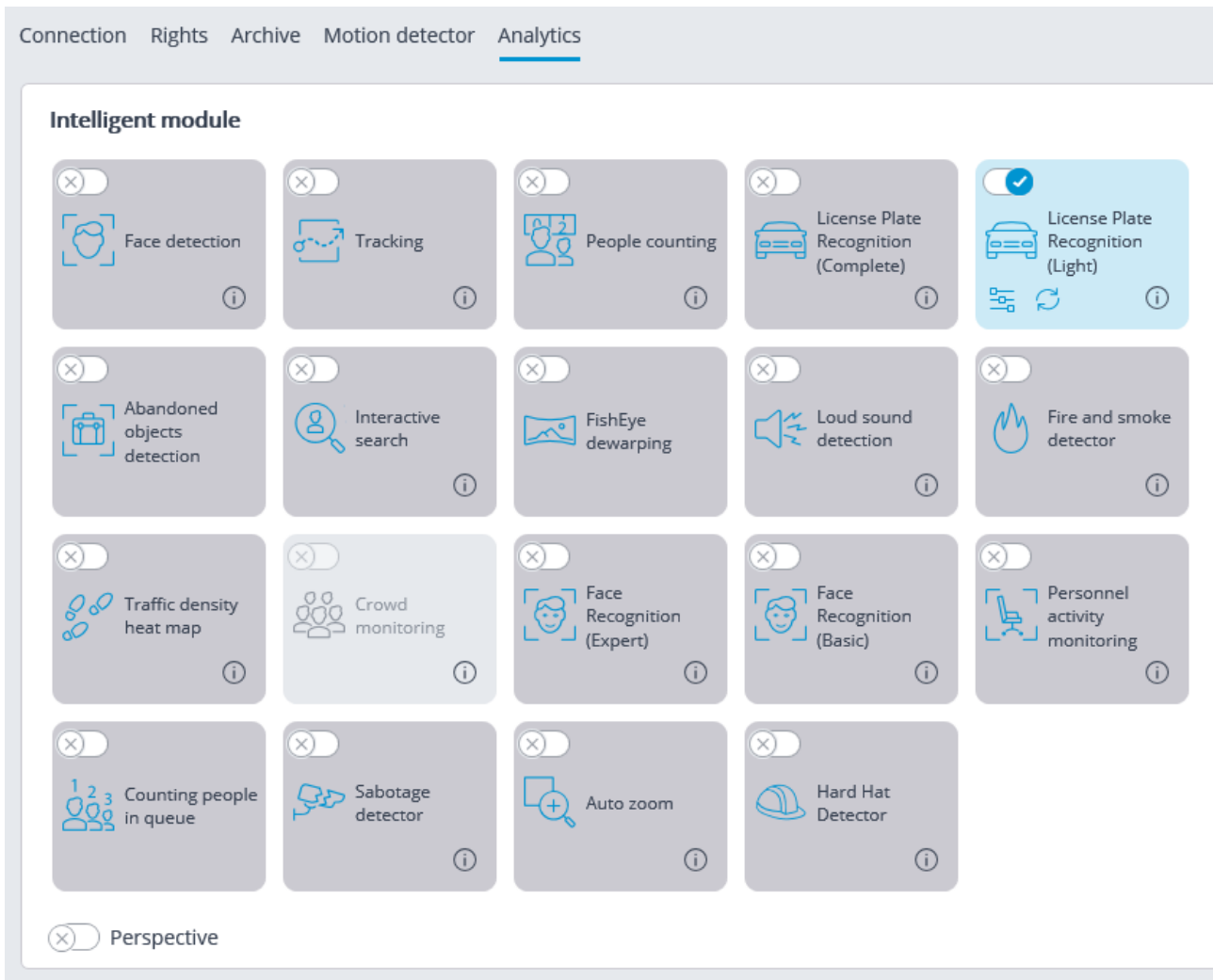
## Module setup




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.

In order to use the module, it is required to enable and set up the software motion detector, then activate the module itself. To do it, it is required to [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list on the left side of the page, 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.





 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)**.

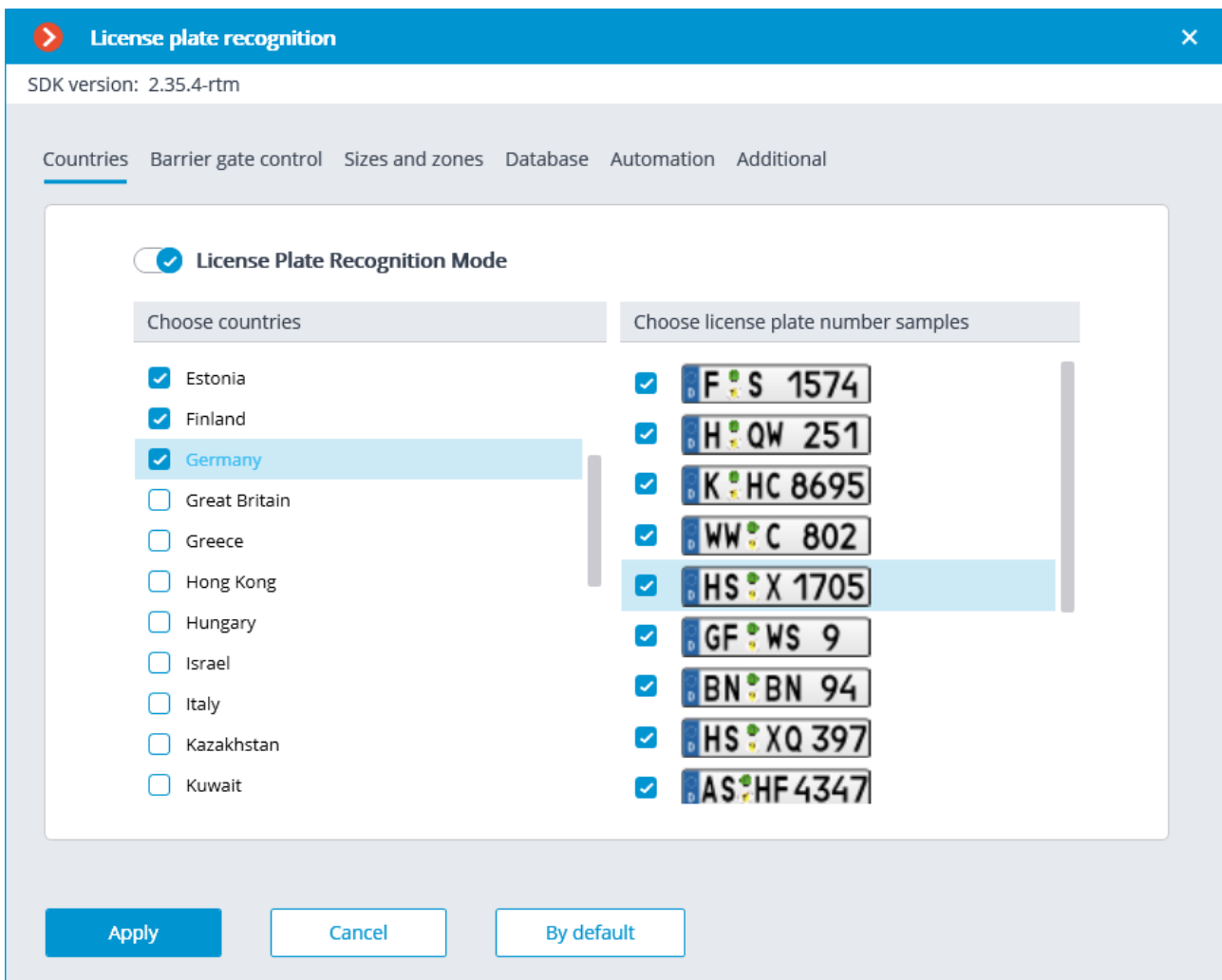
 In the software motion detector settings, the minimum width and height of the object must be smaller than the dimensions of a vehicle.

Additionally, it is recommended to set the whole frame as the detection area for the software motion detector to ensure reliable recognition.

In the subheader of the module settings window you can see the version of the SDK libraries used by the module for recognizing the license plates.

The module settings description is given below.


The countries and samples of the license plate numbers to be recognized are set on the **Countries** tab.




It is required to enable the **License Plate Recognition Mode** using the corresponding switch in order to gain access to the settings of countries and samples. If this option is not on, the license plates recognition will not be performed. This option is to be activated only if the module is used just for controlling the rising arm barrier.

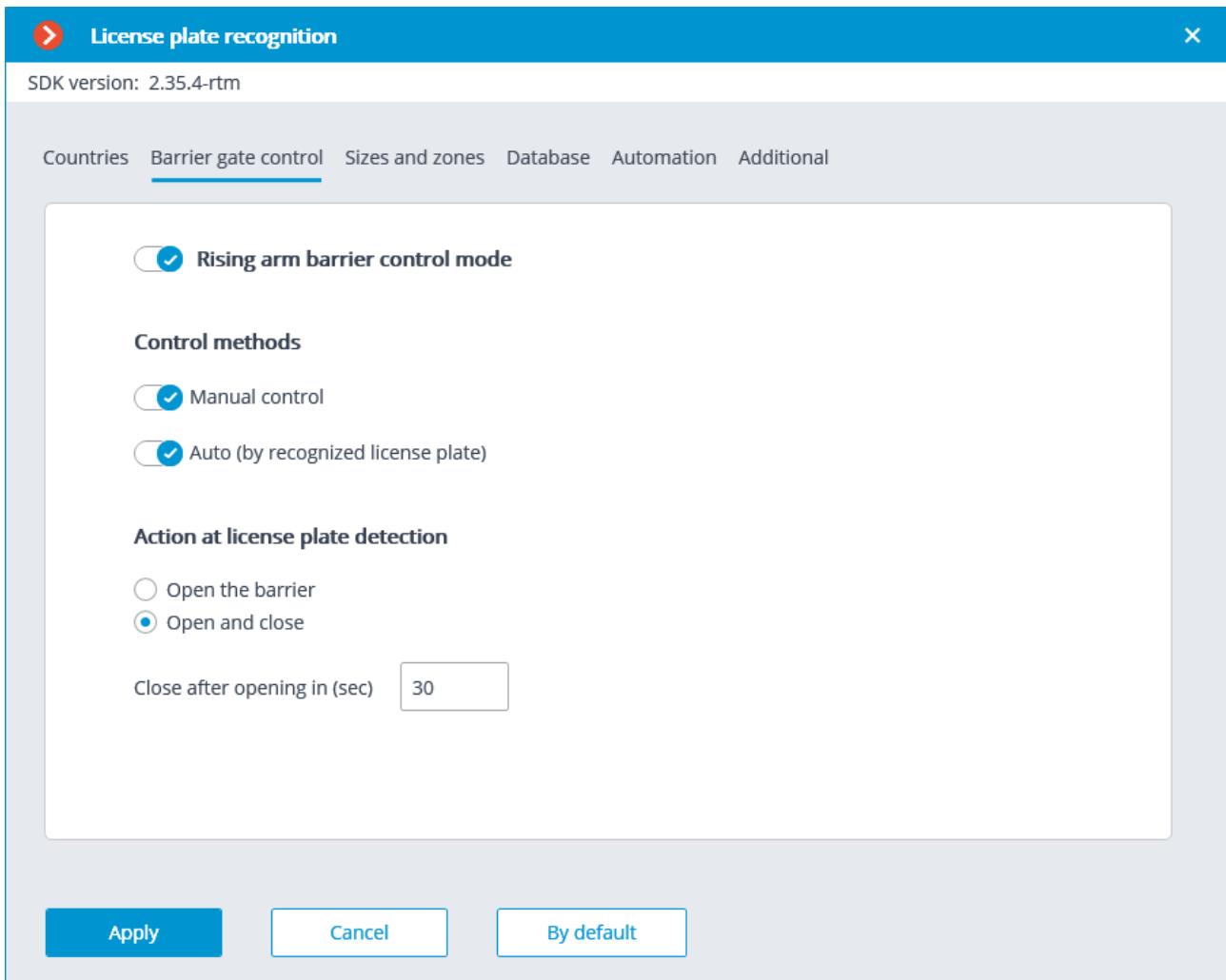
When the license plate mode is activated, select the countries whose license plates are to be recognized, as well as the samples of the license plates to be recognized for each chosen country.

**Countries** and samples not selected will not be recognized.

 The empty list of countries means that the **Licence plate recognition (Light)** 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 larger the computing load on the server. When the processor load exceeds 80%, the recognition quality may drop significantly.

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.

**i** To use the module only for controlling a rising arm barrier, the **Licence plate recognition (Light)** module license or protection key is not required. However, for ensuring the abovementioned functionality, it is necessary to have the **Licence plate recognition (Light)** 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.



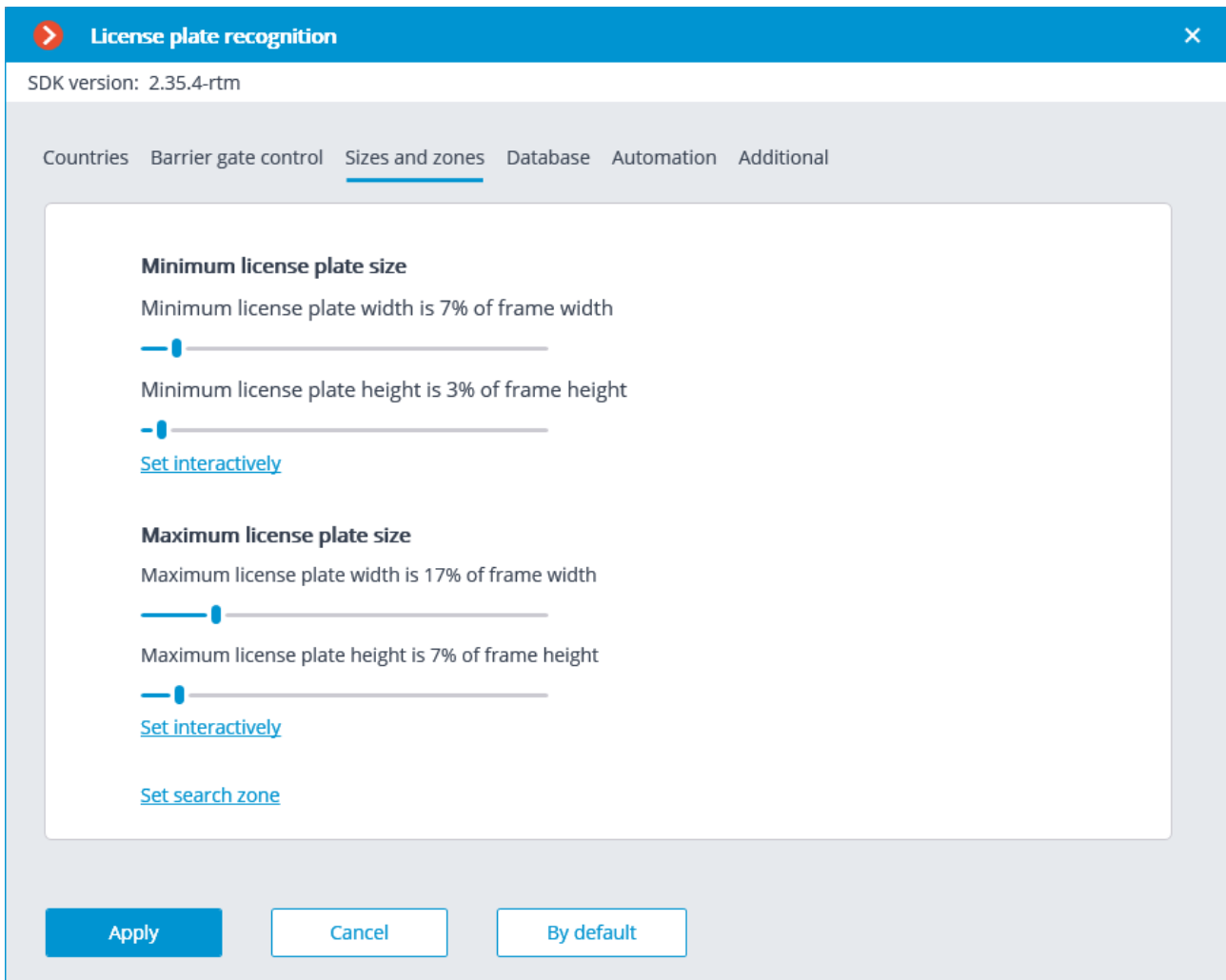
Most of the modern rising arm barriers automatically close after the passing of one vehicle. For such barriers, the Open the barrier option shall be chosen.



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.

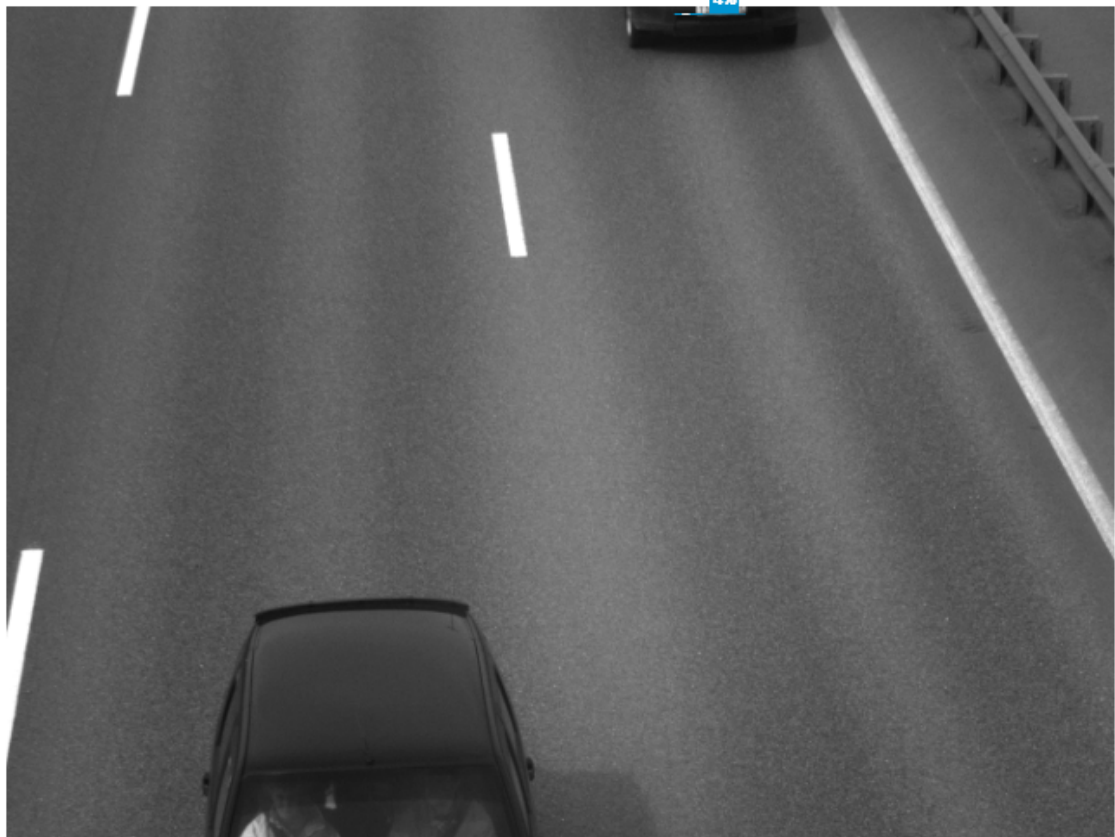


Both in manual and in automatic barrier control mode, the opening or closing command is understood as the generation of the [Request to open rising arm barrier](#) or [Request to close rising arm barrier](#) event, correspondingly. To control the rising arm barrier, it is required to set the actions for these events depending on the control wiring diagram of the particular barrier.



**Minimum license plate size** and **Maximum license plate size** sliders specify the limiting dimensions of the plates to be recognized. These sizes can be set with the sliders or interactively by opening the size setting window clicking on **the Set interactively** link.

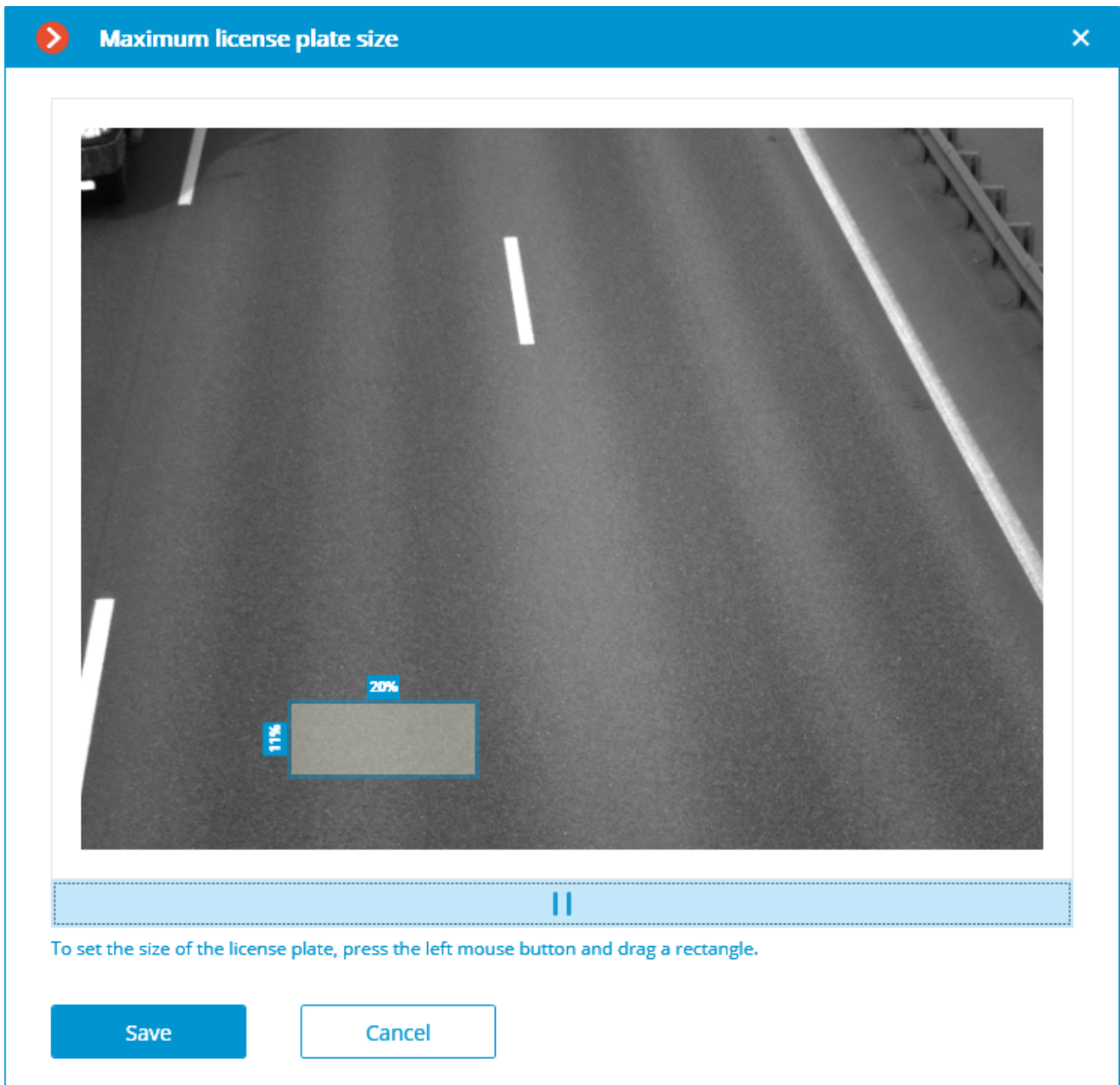
**Minimum license plate size** ✕



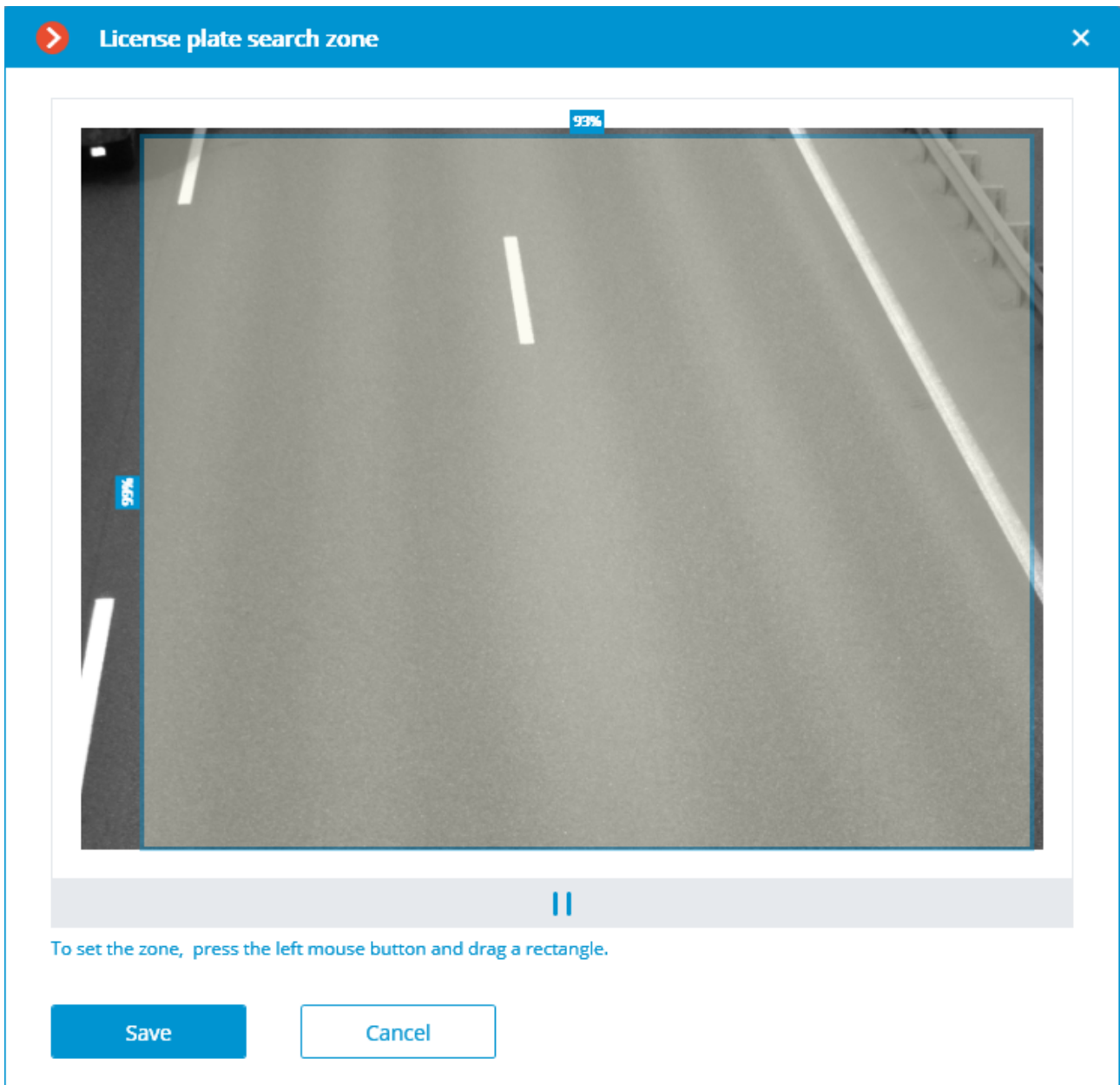
4%

To set the size of the license plate, press the left mouse button and drag a rectangle.

**Save**



**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.



The access to the license plate database can be set on the **Database** tab.



License plate recognition

SDK version: 2.35.4-rtm

Countries Barrier gate control Sizes and zones Database Automation Additional

Local  
 Remote

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

IP-address: 127.0.0.1 Port: 3050

User name: SYSDBA

Password: .....

Apply Cancel By default

If the license plate recognition is performed only on one server, it is recommended to set the value to **Local**.

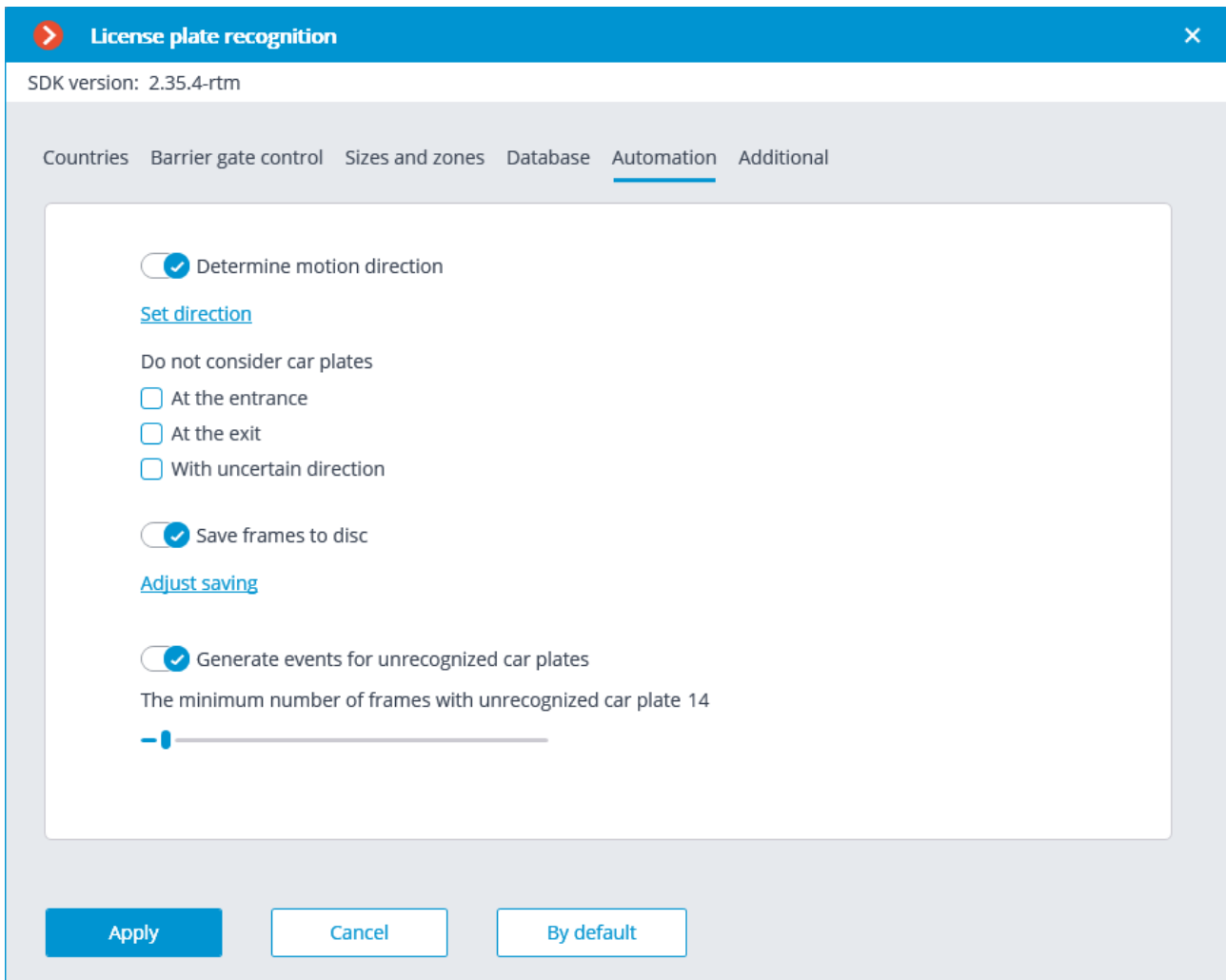
In the multiserver system, the database can be stored on one server only. In this case it is required to select **Remote** and indicate the **IP address** and the **Port** of the server, as well as the **User name** and **Password** of the database administrator.

**Eocortex** uses **Firebird** database management system with the following default values: database connection **Port** – **3050**, **User name** – **SYSDBA**, **Password** – **masterkey**.

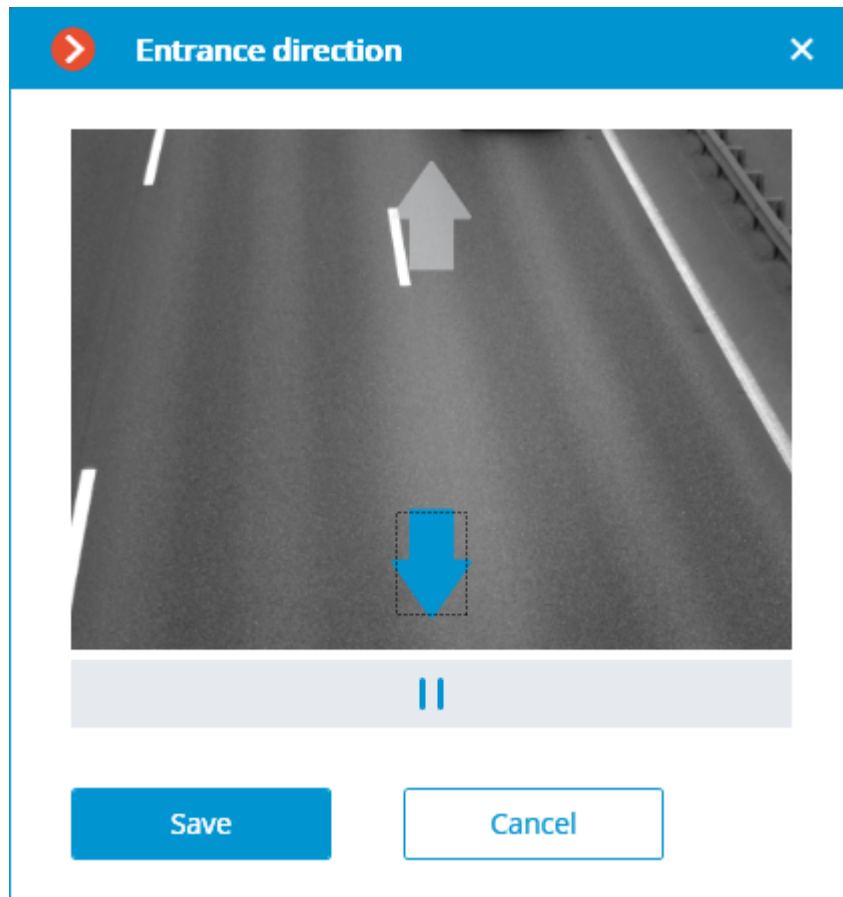


The server where the license plate database is stored must be assigned as the main server for at least one camera that uses the **Licence plate recognition (Light)** module.

The following settings are available on the **Automation** tab:

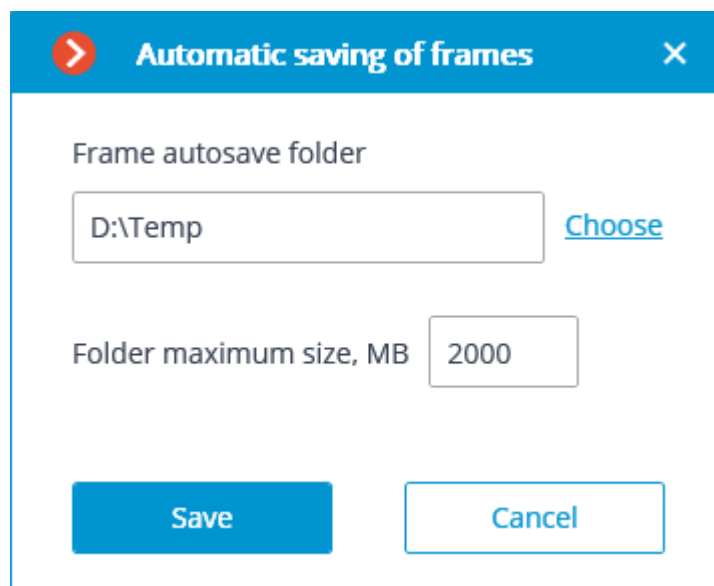





**Determine motion direction** enables the mode of determining the travel direction. After activating this mode, it is required to click on the **Set direction** link, and in the opened window select the arrow that specifies the entrance direction. In this case the vehicles travelling in the opposite direction will be considered as the ones leaving the area.



Additionally, in the mode of determining motion direction, it is possible to exclude from the recognition the license plates of the vehicles travelling in a particular direction. For that end, the **Do not consider car plates** group of settings is used. This group has the following options: **At the entrance**, **At the exit**, and **With uncertain direction**.

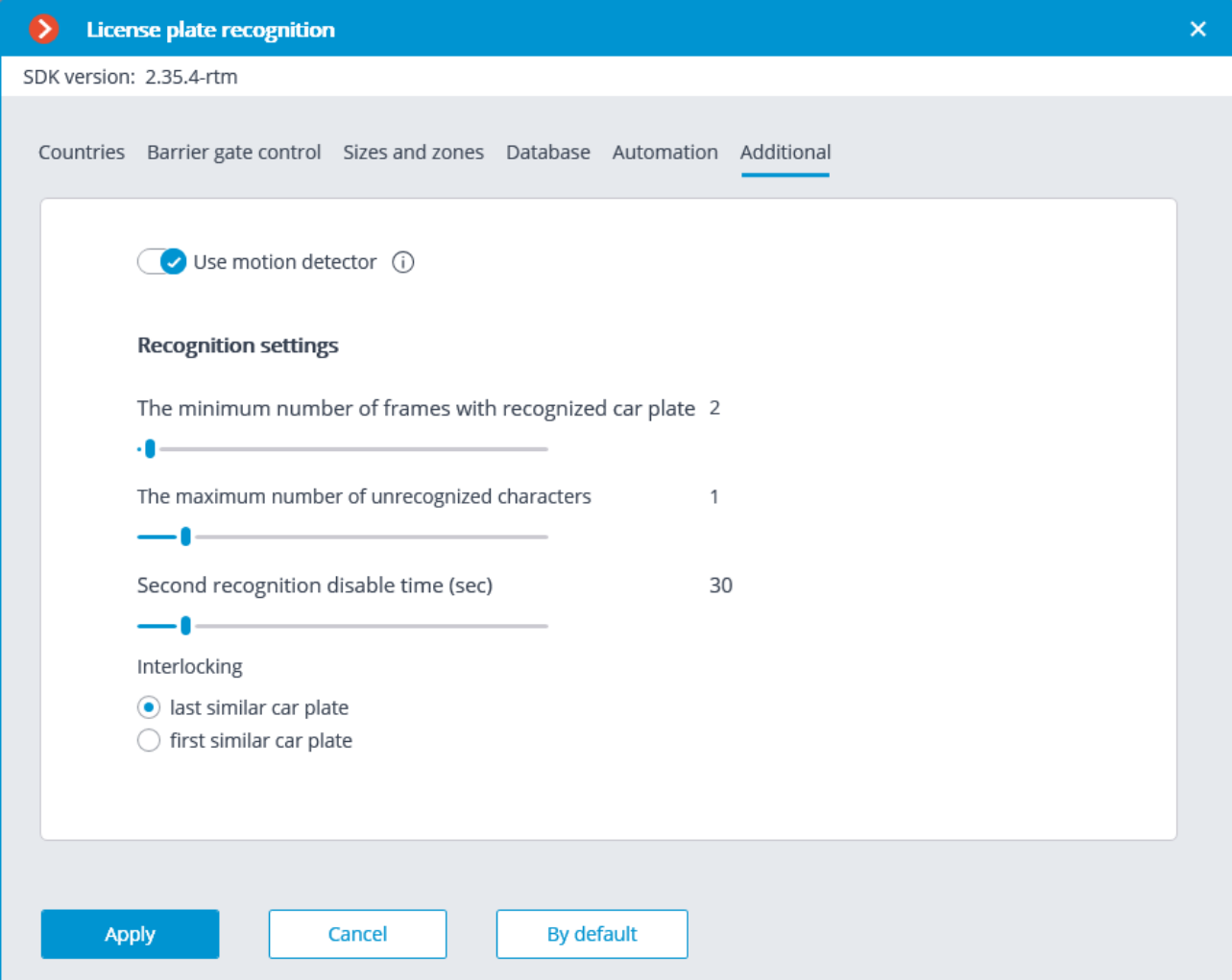
**Save frames to disc** enables the mode of automatic saving the frames with the recognized license plate numbers to the specified drive. Upon enabling this mode, it is required to click on the **Adjust saving** link and specify the folder where the image files with the recognized license plate numbers will be stored. It is also required to set **the Maximum folder size, Mb**.



-  If the size of the saved files exceeds the maximum preset limit, the saving of the frames will continue, but the oldest files will be deleted to uphold size restrictions.
-  If **0** is specified in the **Maximum folder size, Mb** field, the folder size will not be limited.
-  It is only advisable to select the folder interactively using the Choose link 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.

**Generate unrecognized license plate events** enables the mode of event generation in case a license plate was not recognized in the number of frames set with the **Minimum number of frames with unrecognized car plate**.

The following settings can be made on the **Additional** tab:



The screenshot shows a configuration window titled "License plate recognition" with a close button (X) in the top right corner. Below the title bar, it displays "SDK version: 2.35.4-rtm". The main content area has a tabbed interface with "Additional" selected. Under the "Additional" tab, there is a toggle switch for "Use motion detector" which is turned on. Below this, the "Recognition settings" section includes three sliders: "The minimum number of frames with recognized car plate" set to 2, "The maximum number of unrecognized characters" set to 1, and "Second recognition disable time (sec)" set to 30. At the bottom of the settings area, there is an "Interlocking" section with two radio button options: "last similar car plate" (selected) and "first similar car plate". At the bottom of the window, there are three buttons: "Apply", "Cancel", and "By default".

If the **Use motion detector** option is activated, only those frames and zones where motion is present will be analyzed. This option allows to reduce the computational load of the processor and RAM. In this case the motion detector built into the module will be used.

**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.

**Second recognition disable time** 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 interlocking modes are as follows:

- **Last similar car plate:** the counting starts only after the license plate disappears from the frame. This mode is recommended for use when there are static license plates (parked vehicles) in the frame in order to avoid the second recognition of such numbers.
- **First similar car plate:** the counting starts immediately after the initial recognition of the license plate. If after the expiry of the set period of time the license plate is still in the frame, it will be recognized again.



The use of the module will start only after [the settings are applied](#).

## Requirements and recommendations



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.

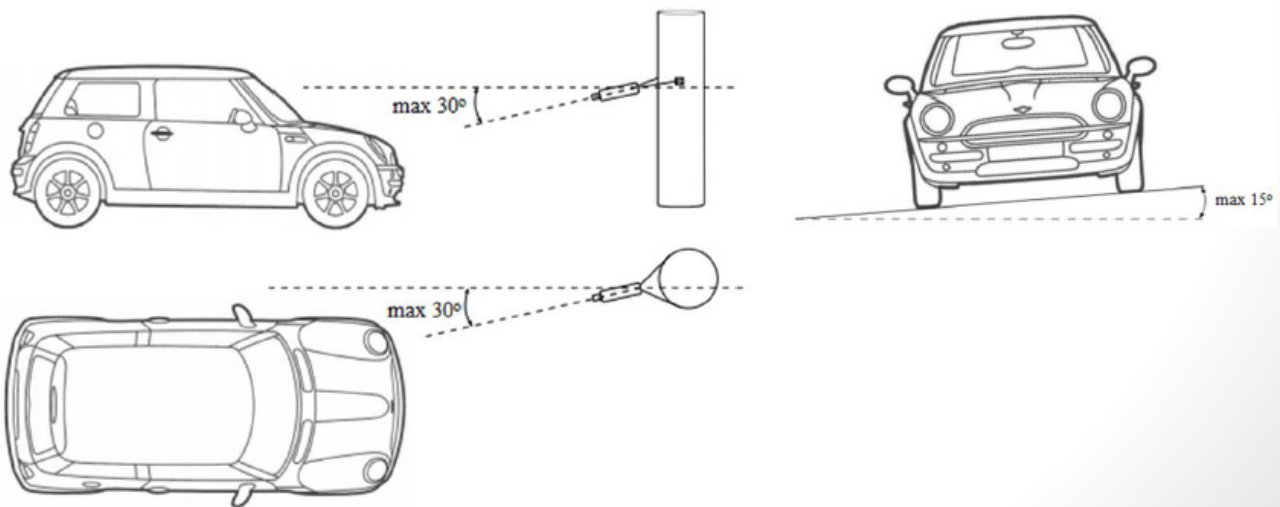
### Requirements to the license plate image



The vehicle license plates (registration plates) to be recognized must conform to certain requirements. The **Licence 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.

## Module installation and update



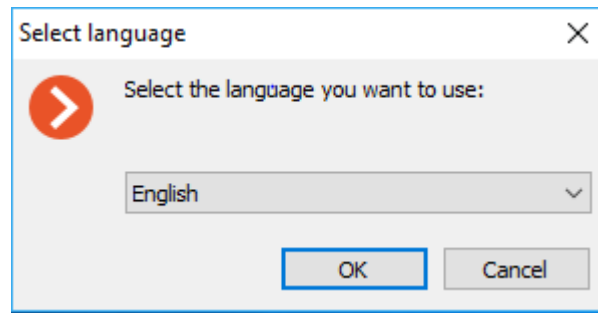
This module is external; it is not included in the basic **Eocortex** distribution package and requires individual installation.

-  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.

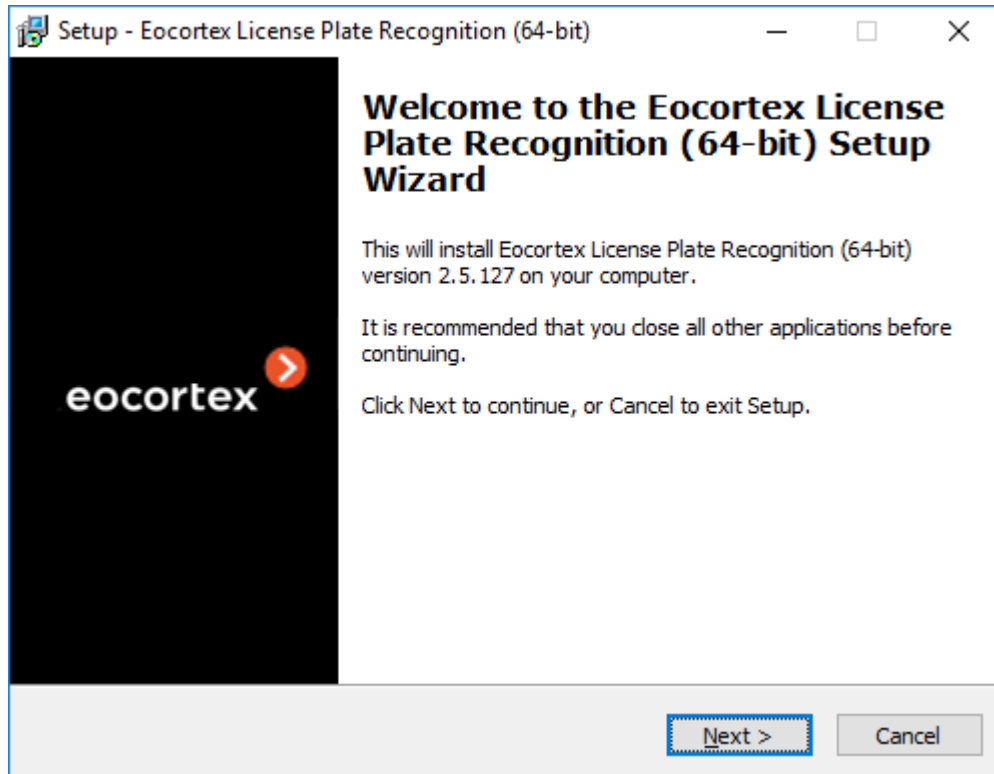
Before installing the module, it is required to stop all the **Eocortex** applications running on the computer, and to insert the module protection key in the USB port.

To install the module, it is required to run **EocortexAuto Installer\_x64.exe** file for a 64 bit version of **Eocortex** or **EocortexAuto Installer.exe** for a 32 bit version.

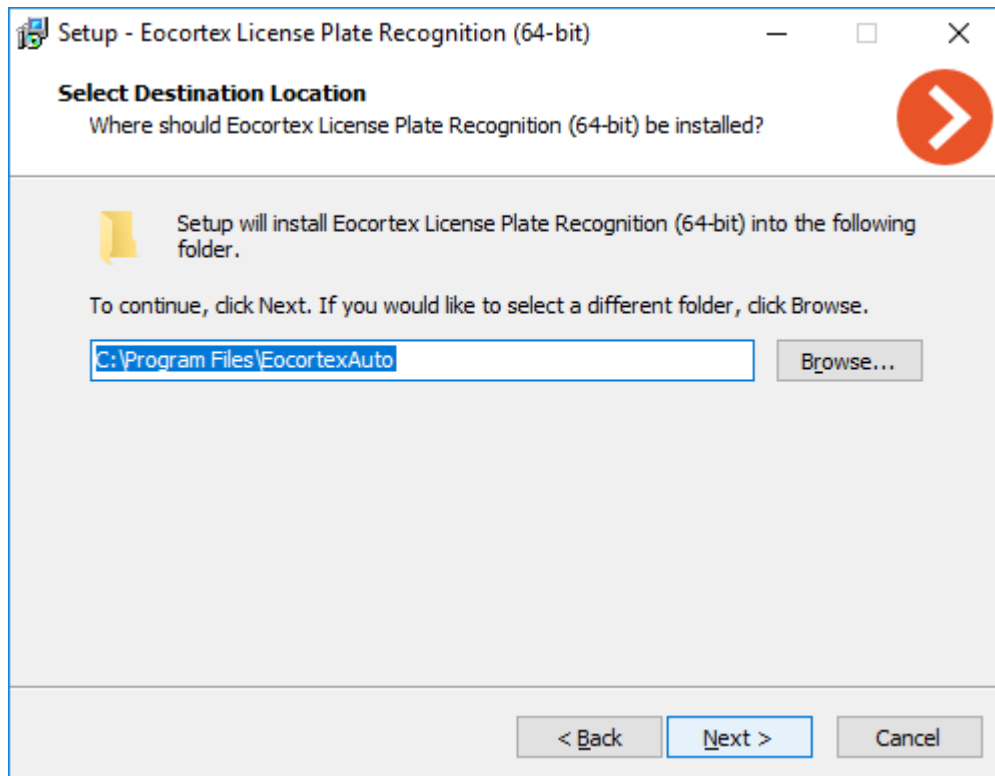
It is required to choose the installation language in the opened **Select language** window.




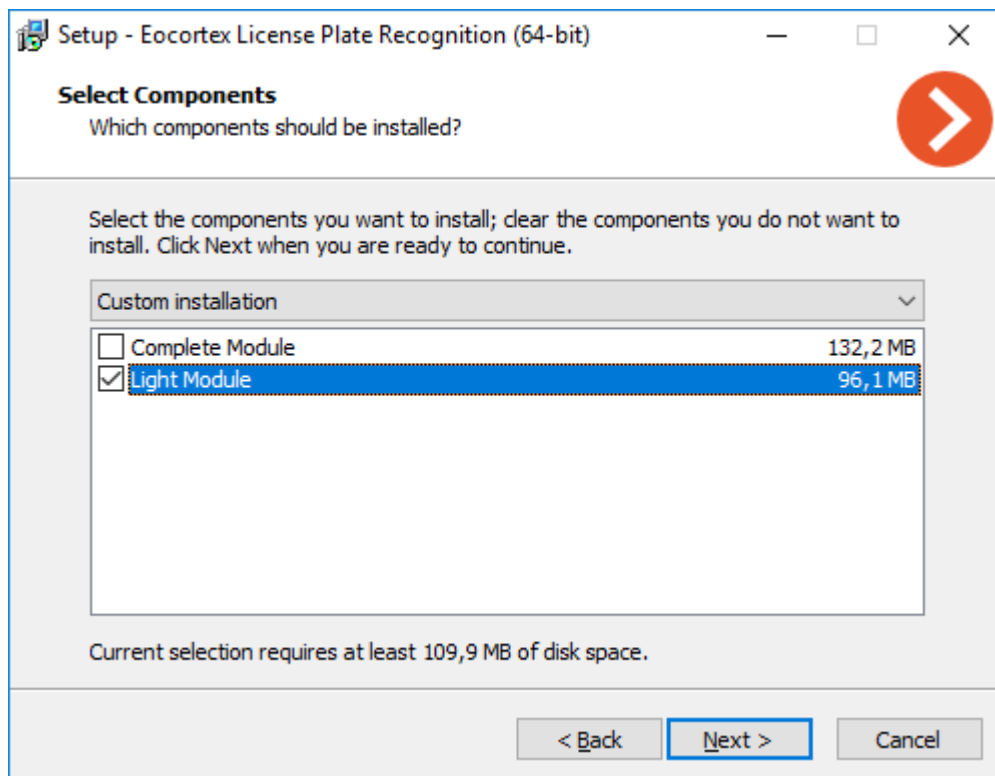
Then it is necessary to follow the steps of the installation wizard.




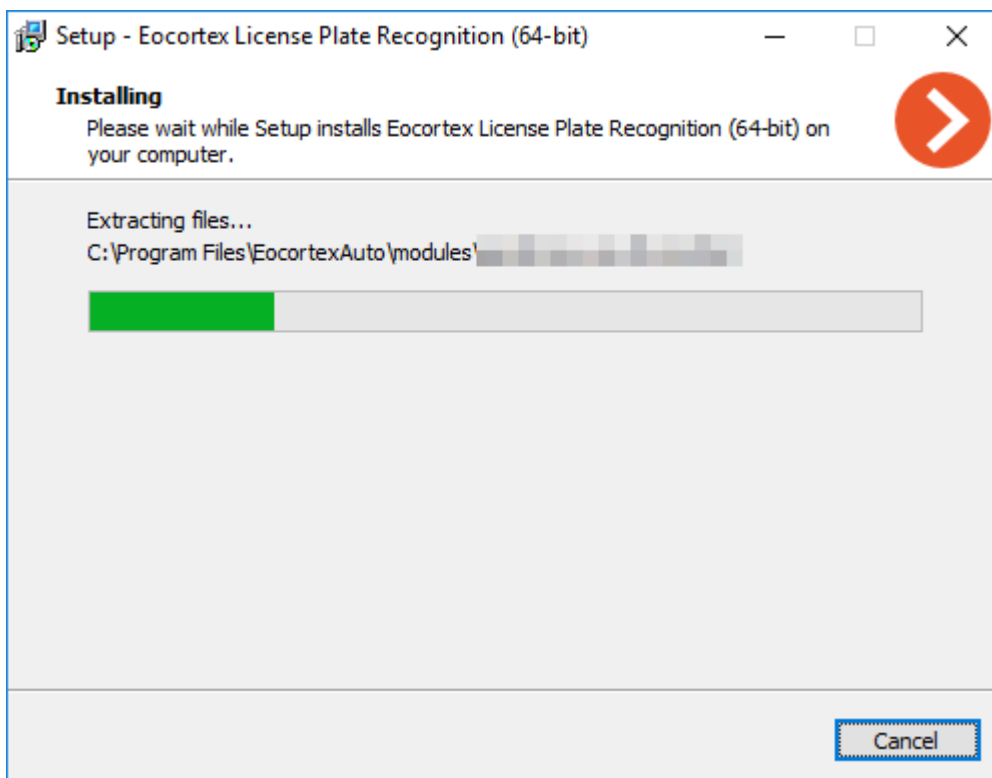
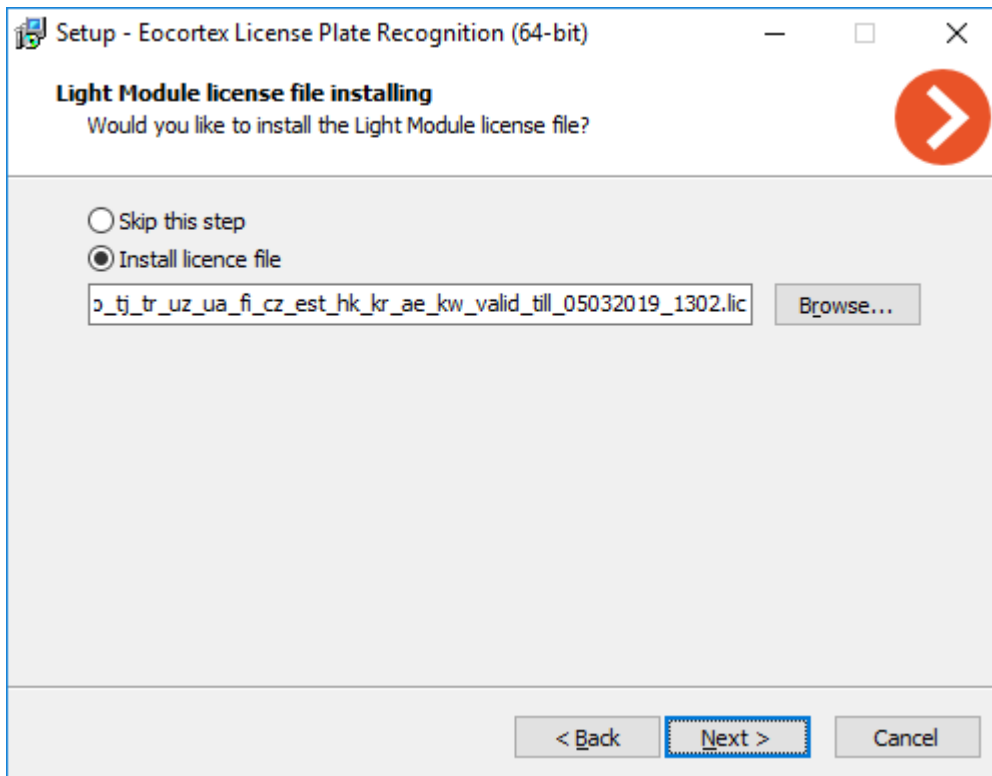


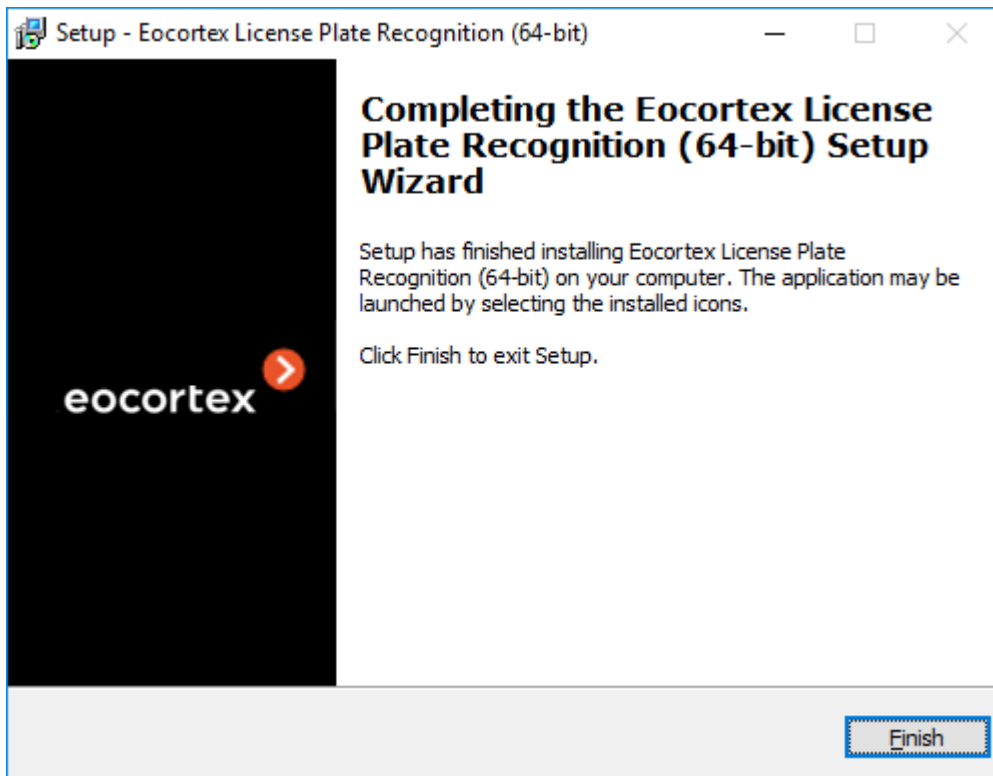


 At the **Select component** step, choose the **Licence plate recognition (Light)** option.



 At the next step it is required to indicate the path to the module license file.





**i** 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 **Licence plate recognition (Light)** module and the license bound to the **Eocortex** protection key.

**i** 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:



 recar\_34928187\_30.06.lic

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 channels. 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.

The license plates meeting the standards of the following countries will be recognized:

Abkhazia, Armenia, Azerbaijan, Belarus, Belgium, Bulgaria, Czech Republic, Estonia, Georgia, Germany, Greece, Hong Kong, Hungary, Ireland, Israel, Italy, Kazakhstan, Korea, Kuwait, Kyrgyzstan, Latvia, Lithuania, Moldova, Mongolia, the Netherlands, Poland, Portugal, Romania, Russia, South Korea, Spain, Tajikistan, Turkey, Ukraine, United Arab Emirates, United Kingdom, Uzbekistan, Finland, France.

For the operation of the **Licence 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 **Licence plate recognition (Light)** module must also be activated on the server.

One **Eocortex** server may have only one **Licence 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 **Licence plate recognition (Light)** module operation on such server may be unstable.

## Loud sound detection






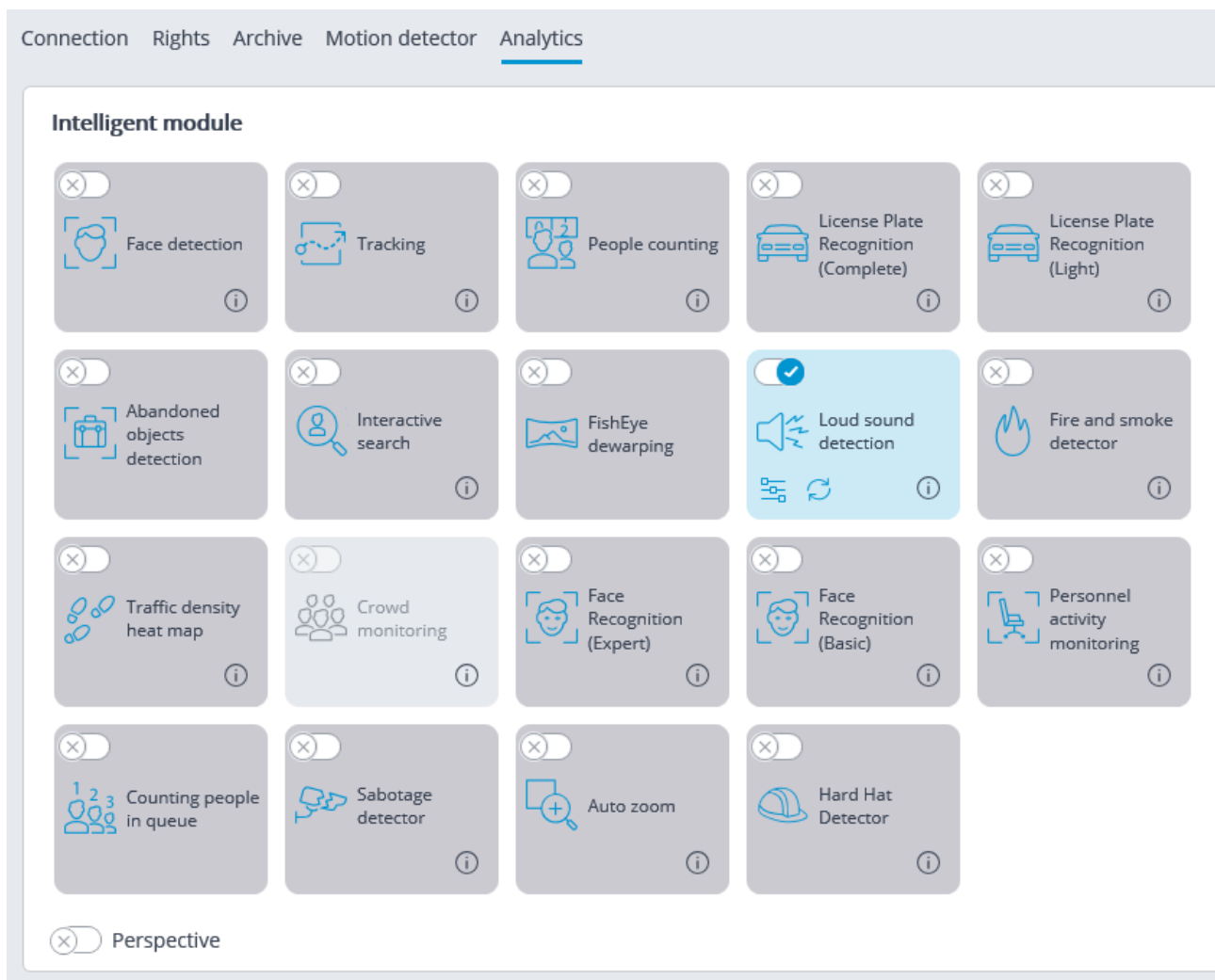
The **Loud sound detection** module allows to register the situations when the sound received by the camera microphone exceeds the preset level. Additionally, it displays the current sound level in the Eocortex Client application.

For the proper operation of the module, it is required to correctly aim the microphone and set up the module.

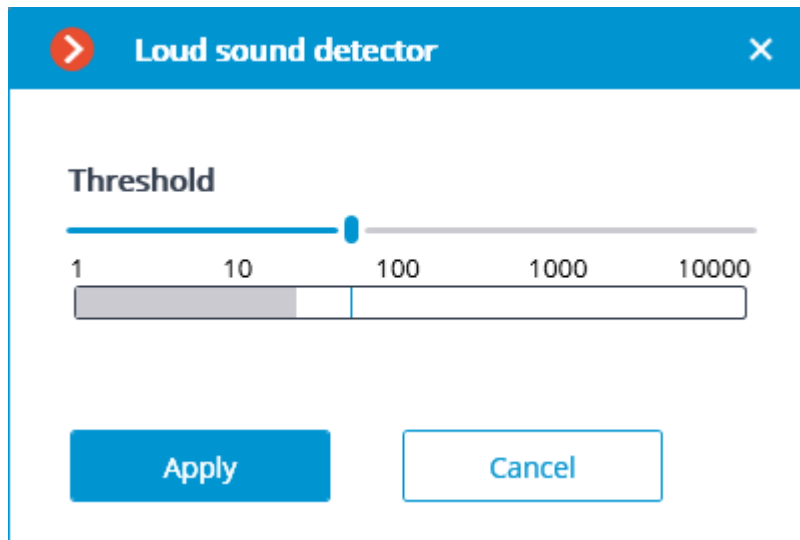
## Module setup



In order to use the module, it is required to enable and set up the software motion detector, then activate the module itself. To do it, it is required to [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list on the left side of the page, 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 screenshot shows the 'Analytics' tab in the Eocortex Configurator application. At the top, there are navigation tabs: 'Connection', 'Rights', 'Archive', 'Motion detector', and 'Analytics' (which is selected). Below the tabs is a section titled 'Intelligent module' containing a grid of 20 modules. Each module has a toggle switch and an information icon (i). The 'Loud sound detection' module is highlighted in blue, indicating it is active. Other modules include Face detection, Tracking, People counting, License Plate Recognition (Complete), License Plate Recognition (Light), Abandoned objects detection, Interactive search, FishEye dewarping, Fire and smoke detector, Traffic density heat map, Crowd monitoring, Face Recognition (Expert), Face Recognition (Basic), Personnel activity monitoring, Counting people in queue, Sabotage detector, Auto zoom, and Hard Hat Detector. At the bottom left, there is a 'Perspective' toggle switch.



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 use of the module will start only after [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.

## People counting in queue module



The **People counting in queue module** module is intended for counting people in lines and warning the operator about the exceedance of the preset threshold. The module offers the following capabilities:

- 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.

It is required to place the camera correctly and set up the software motion detector and the module itself to ensure the proper operation of the module.

## Module setup



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

In order to use the module, it is required to enable and set up the software motion detector, then activate the module itself. To do it, it is required to [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list on the left side of the page, 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

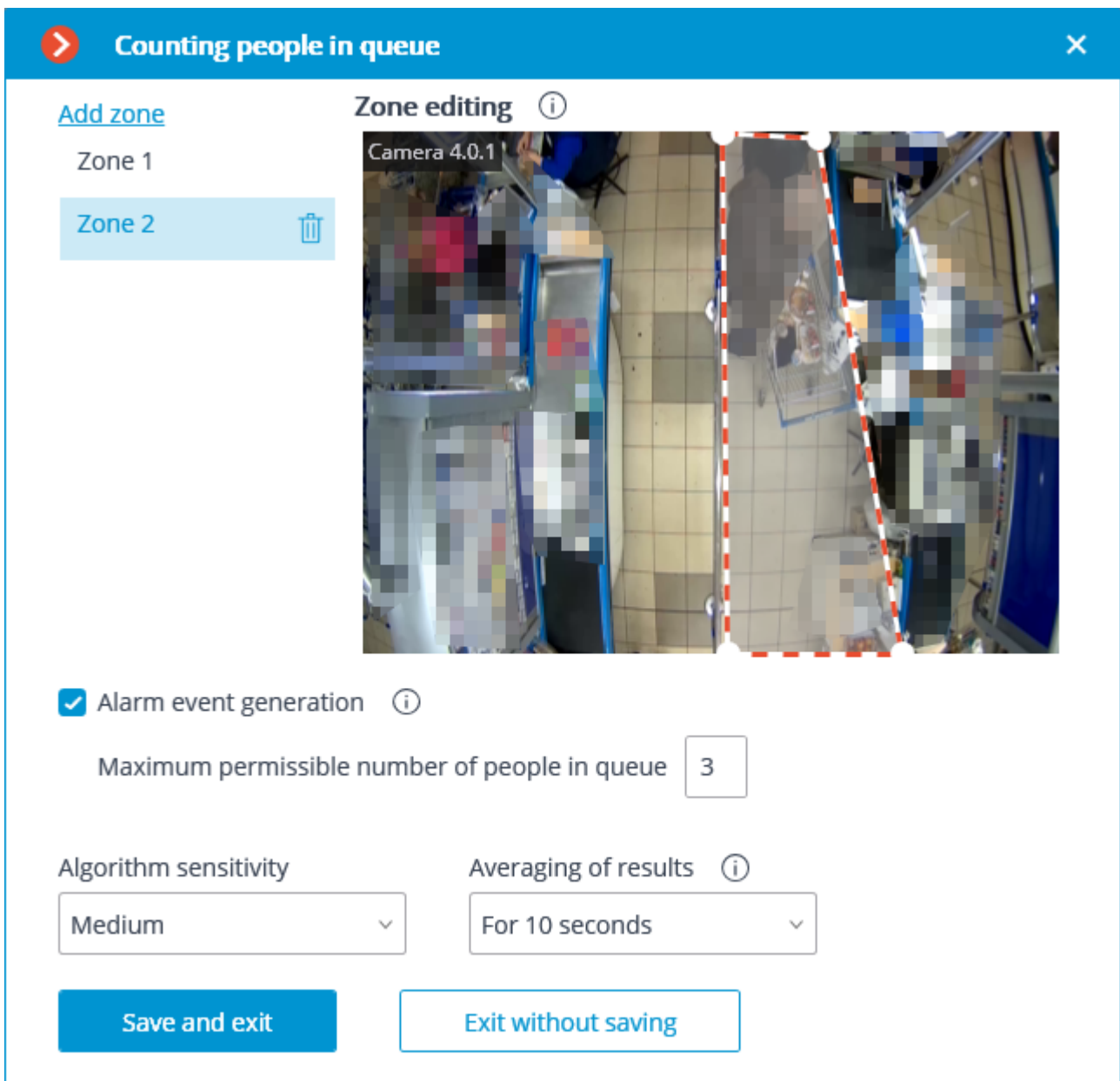
### Intelligent module

<input type="checkbox"/> Face detection	<input type="checkbox"/> Tracking	<input type="checkbox"/> People counting	<input type="checkbox"/> License Plate Recognition (Complete)	<input type="checkbox"/> License Plate Recognition (Light)
<input type="checkbox"/> Abandoned objects detection	<input type="checkbox"/> Interactive search	<input type="checkbox"/> FishEye dewarping	<input type="checkbox"/> Loud sound detection	<input type="checkbox"/> Fire and smoke detector
<input type="checkbox"/> Traffic density heat map	<input type="checkbox"/> Crowd monitoring	<input type="checkbox"/> Face Recognition (Expert)	<input type="checkbox"/> Face Recognition (Basic)	<input type="checkbox"/> Personnel activity monitoring
<input checked="" type="checkbox"/> Counting people in queue	<input type="checkbox"/> Sabotage detector	<input type="checkbox"/> Auto zoom	<input type="checkbox"/> Hard Hat Detector	

Perspective

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.





**Control 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**.

**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 use of the module will start only after [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

This module operates on the 64-bit platforms only.

The module supports the operation not only on a CPU (central processing unit), but also on a GPU (Graphics Processing Unit). In any case, the module imposes heavy demands on the computing resources.

In order to launch the module on the GPU, it is required to have an NVidia video card with CUDA support with Compute Capability index of at least 5.0.

### 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.

## People counting module



The **People counting module** is designed for counting people in the frame who cross a preset line, taking into account the direction of crossing. The module offers the following capabilities:

- 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.



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.



## Module setup







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.



Intelligent module

Face detection  



Tracking  

People counting  



License Plate Recognition (Complete)  



License Plate Recognition (Light)  



Abandoned objects detection  



Interactive search  



FishEye dewarping  



Loud sound detection  



Fire and smoke detector  



Traffic density heat map  



Crowd monitoring  



Face Recognition (Expert)  


Face Recognition (Basic)  

Personnel activity monitoring  

Counting people in queue  

Sabotage detector  

Auto zoom  

Hard Hat Detector  

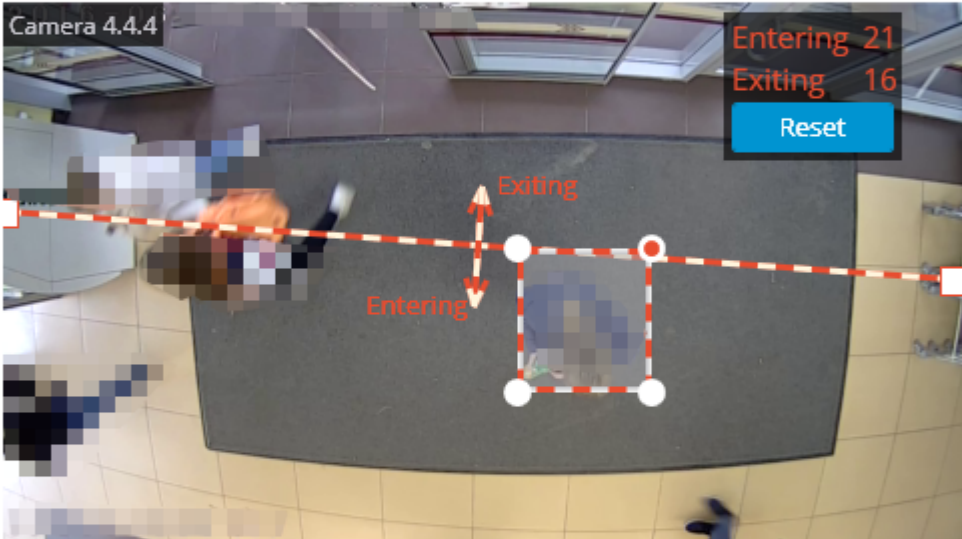
Perspective

## Visitor counting

Main settings Additional settings

### Counting parameters ⓘ

Real time Archive



Camera 4.4.4

Entering 21  
Exiting 16  
Reset

Entering  
Exiting

[Change movement direction](#)

Counting method  
Several people in a frame ▾

Show the suggested size of the object

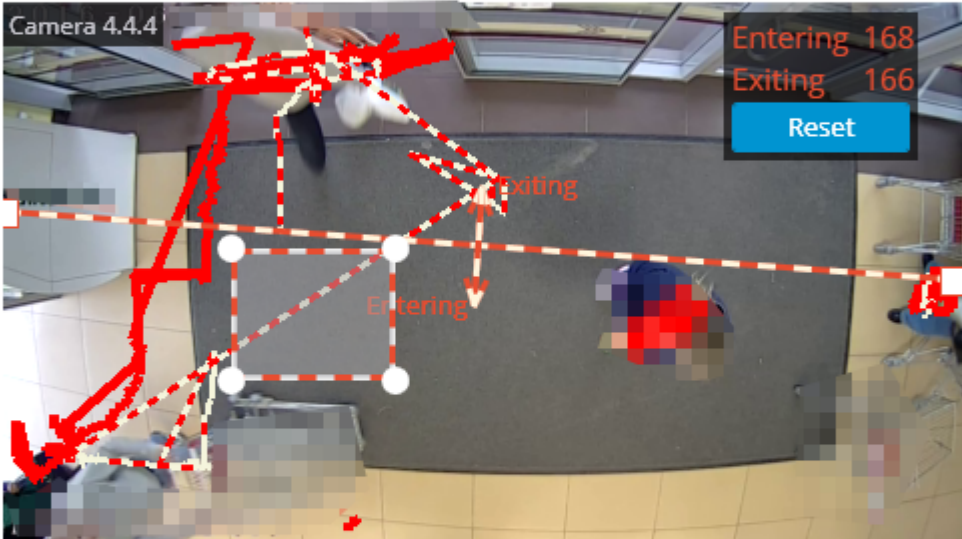
Save and exit Exit without saving

## Visitor counting

Main settings Additional settings

### Counting parameters ⓘ

Real time Archive



Camera 4.4.4

Entering 168  
Exiting 166  
Reset

Entering

Exiting

[Change movement direction](#)

Counting method

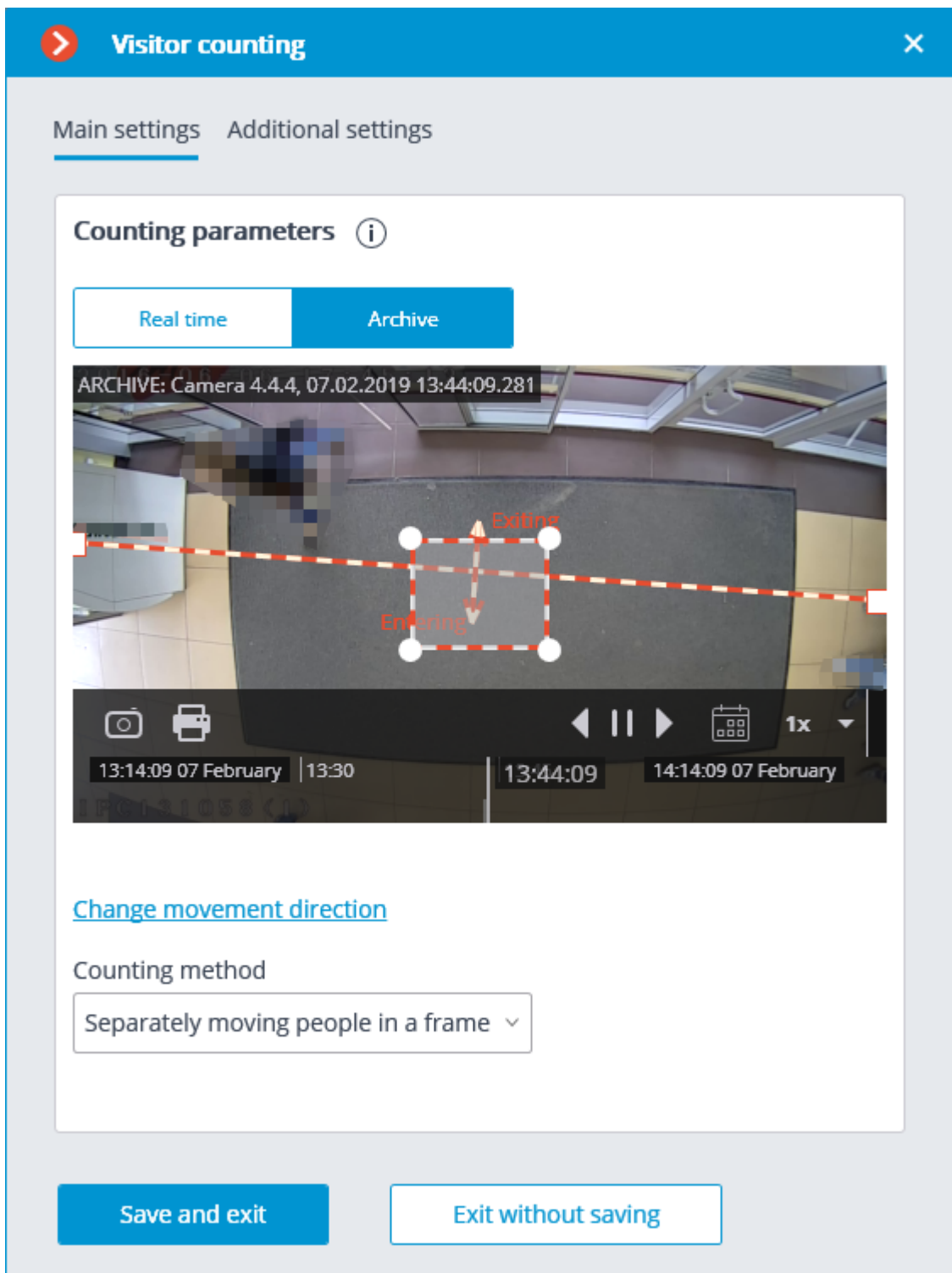
Separately moving people in a frame ▾

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).

- ① It is recommended to use the video from the archive for the convenience of setting up the average size.
- ① 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 software window titled "Visitor counting" with a close button (X) in the top right corner. Below the title bar, there are two tabs: "Main settings" and "Additional settings", with "Additional settings" being the active tab. The main content area is divided into two sections: "Counting options" and "Counter reset (for all cameras)".

**Counting options** (with an information icon 'i') includes:

- A dropdown menu set to "Entering and exiting".
- A checked checkbox labeled "Automatically save data to csv-files" (with an information icon 'i').
- A label "People counting data period:" followed by a dropdown menu set to "Minute".
- A label "Unload data every:" followed by a dropdown menu set to "Hour".
- A label "Path to files:" followed by a text input field containing "D:\Temp" and a blue link labeled "Select folder".

**Counter reset (for all cameras)** (with an information icon 'i') includes:

- A label "Start time" followed by a date and time picker showing "07.02.2019 13:18:34".
- A label "Counter reset period" followed by a dropdown menu set to "1 day".

At the bottom of the window, there 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.

**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 screenshot shows a software window titled "Visitor counting" with a close button (X) in the top right corner. Below the title bar, there are two tabs: "Main settings" and "Additional settings", with the latter being selected and underlined. The main content area is a white box with a light blue border, containing several settings sections:

- Counting options** (with an information icon): A dropdown menu set to "Entering and exiting".
- Algorithm accuracy** (with an information icon): A "Sensitivity" dropdown menu set to "Average" and an unchecked checkbox for "Full frame analysis".
- Automatically save data to csv-files** (checked checkbox, with an information icon):
  - "People counting data period": A dropdown menu set to "Minute".
  - "Unload data every": A dropdown menu set to "Hour".
  - "Path to files": A text input field containing "D:\Temp" and a blue link labeled "Select folder" below it.
- Counter reset (for all cameras)** (with an information icon):
  - "Start time": A date and time picker showing "07.02.2019 13:18:34".
  - "Counter reset period": A dropdown menu set to "1 day".

At the bottom of the window, there are two buttons: a solid blue "Save and exit" button and a white "Exit without saving" button with a blue border.

The settings that depend upon the conditions of the module's operation are shown below.

The settings for the **Several people in a frame**

**Show the suggested size of the object:** the object size automatically calculated by the counting algorithm is shown in the preview window.

**Algorithm accuracy:**

**Full frame analysis:** enabling this option allows to improve counting accuracy at the expense of increasing the processor load.

**Sensitivity:** high sensitivity improves the chances of detecting objects, but the probability of false triggering increases; low sensitivity improves noise tolerance but the counting accuracy may suffer.

The settings for **Separately moving people in a frame:**

**Show the trajectory of the movement:** the trajectory of the counted object is shown in the preview window.



The use of the module will start only after [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 monitoring module






The **Personnel monitoring module** module is designed for monitoring personnel activity at their workplaces. The activity in this context is the movement in the work zone, including minor movements.

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.

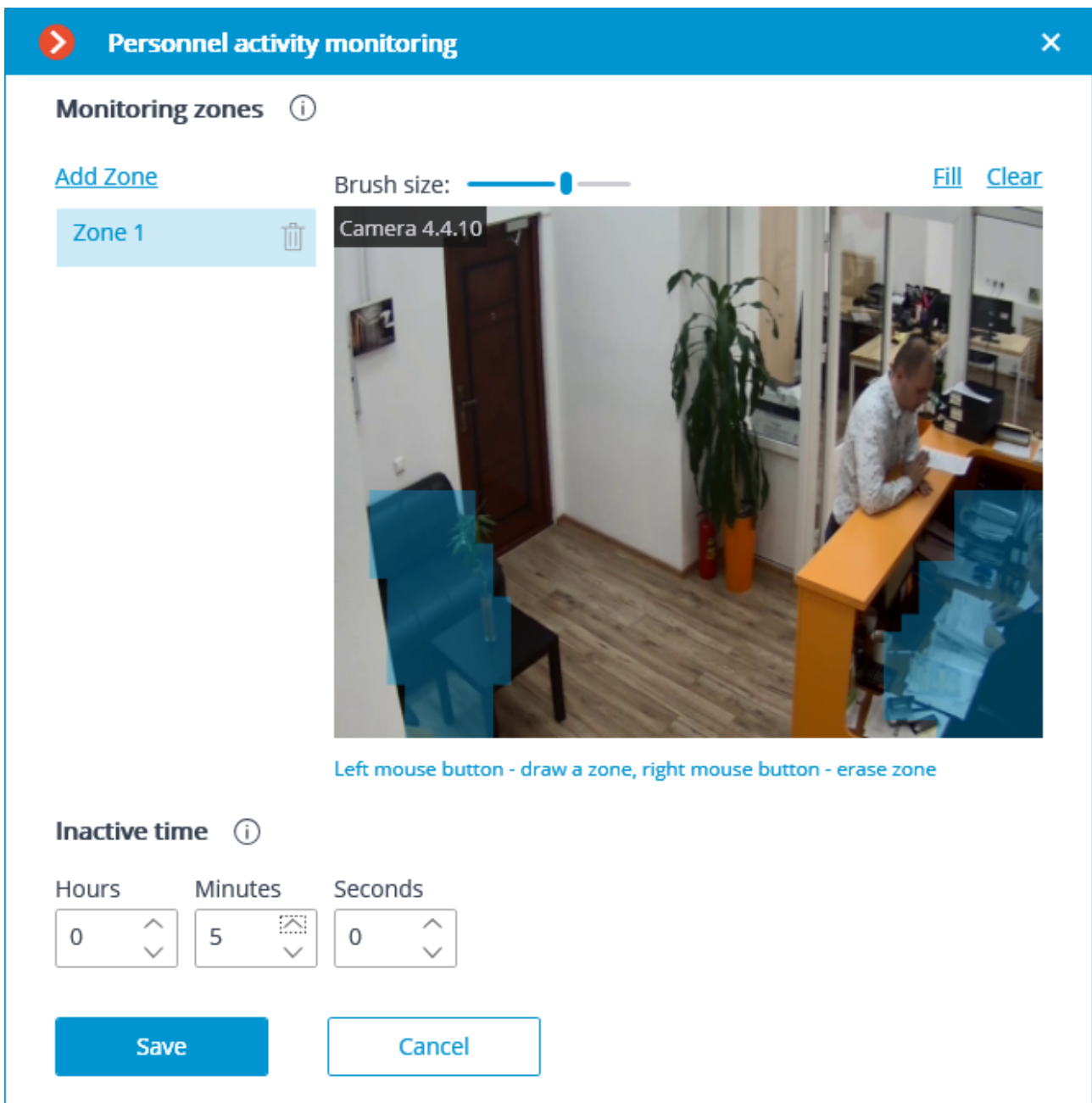
# Module setup



In order to use the module, it is required to enable and set up the software motion detector, then activate the module itself. To do it, it is required to [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list on the left side of the page, 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 screenshot shows the 'Analytics' tab in the Eocortex Configurator. At the top, there are navigation tabs: 'Connection', 'Rights', 'Archive', 'Motion detector', and 'Analytics' (which is selected). Below the tabs is the 'Intelligent module' section, which contains a grid of 20 modules. Each module has a toggle switch and an information icon. The 'Personnel activity monitoring' module is highlighted in blue and has its toggle switch turned on. At the bottom left, there is a 'Perspective' toggle switch.

Module Name	Toggle Status
Face detection	Off
Tracking	Off
People counting	Off
License Plate Recognition (Complete)	Off
License Plate Recognition (Light)	Off
Abandoned objects detection	Off
Interactive search	Off
FishEye dewarping	Off
Loud sound detection	Off
Fire and smoke detector	Off
Traffic density heat map	Off
Crowd monitoring	Off
Face Recognition (Expert)	Off
Face Recognition (Basic)	Off
Personnel activity monitoring	On
Counting people in queue	Off
Sabotage detector	Off
Auto zoom	Off
Hard Hat Detector	Off
Perspective	Off



In the opened window it is required to specify up to six detection zones and the inactivity time.

**Control 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**.


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 use of the module will start only after [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. The module allows to detect the following events:

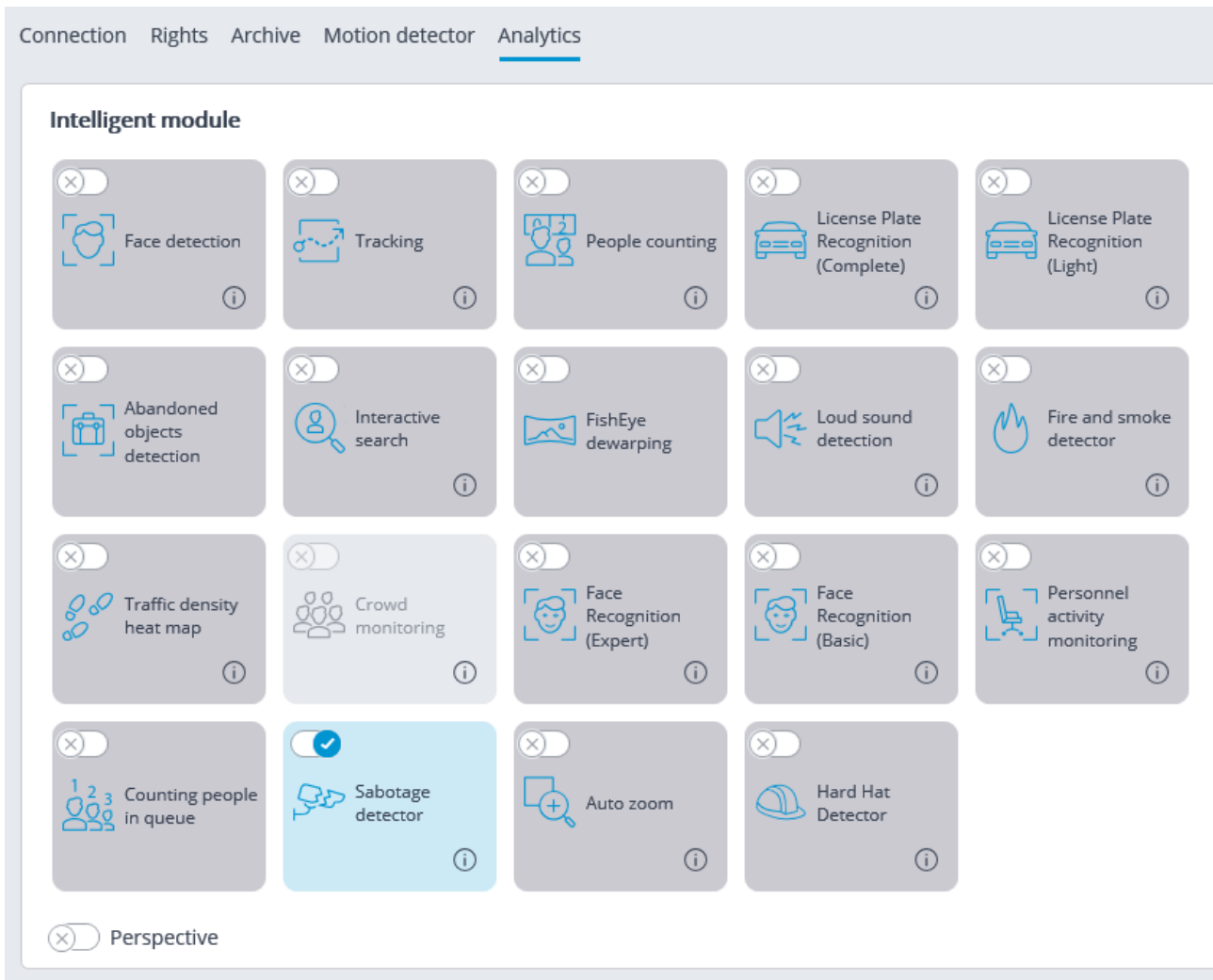
- Defocusing the camera.
- Camera turnaway.
- Camera flaring.
- Blocking the field of view of the camera.

## Module setup




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

After that, it is required to switch to the [Analytics](#) tab and enable the module using the  toggle.



It is necessary to select the situations to be detected in the opened window.

 It is not advisable to try to detect the **Camera defocusing** situation on the cameras that are equipped with the automatic focus or focal distance control, and on the PTZ cameras.

Do not try to detect the **Camera turnaway** on the turning cameras.

 The use of the module will start only after [the settings are applied](#).

## 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.


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.



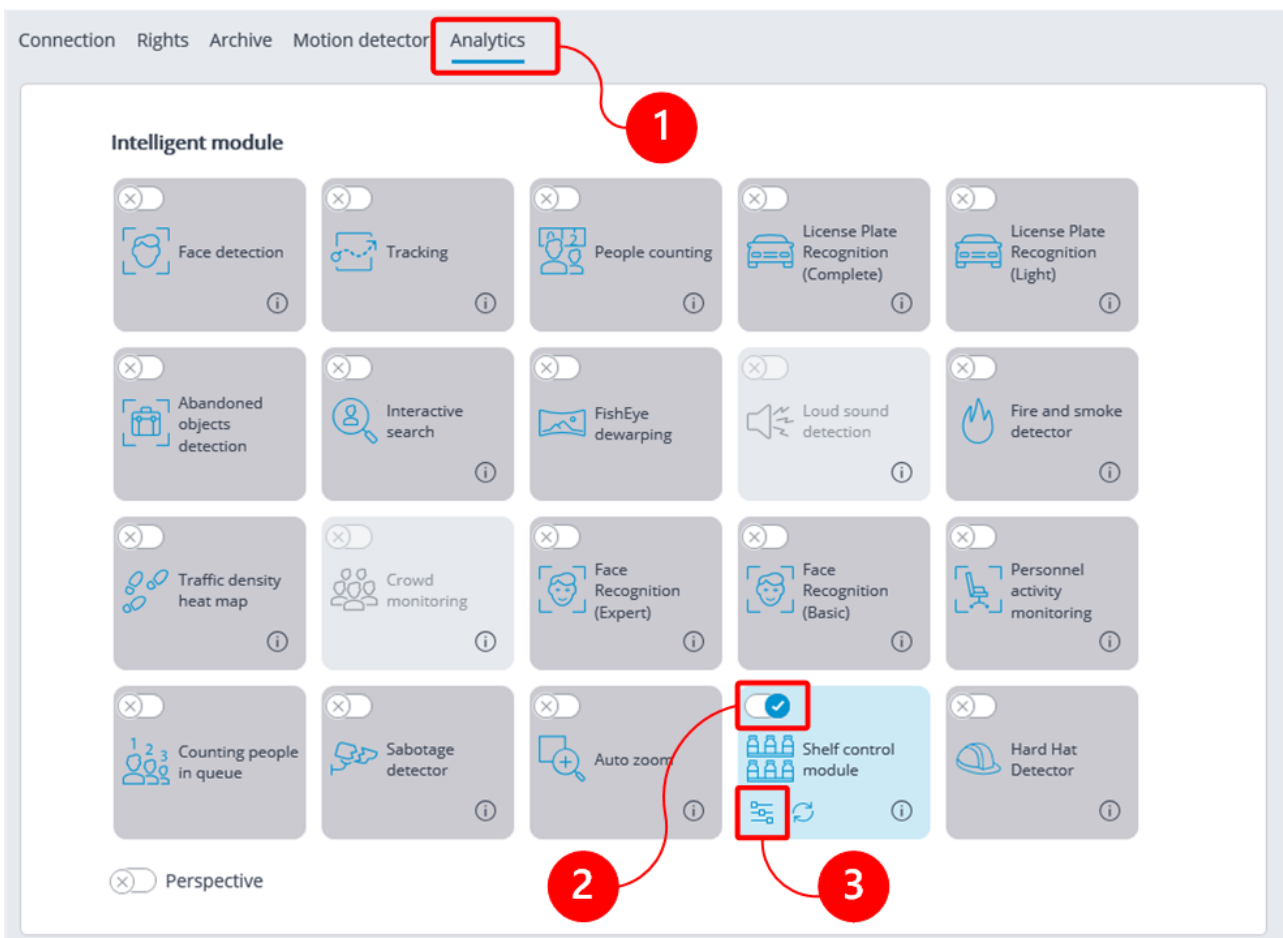
# Module setup




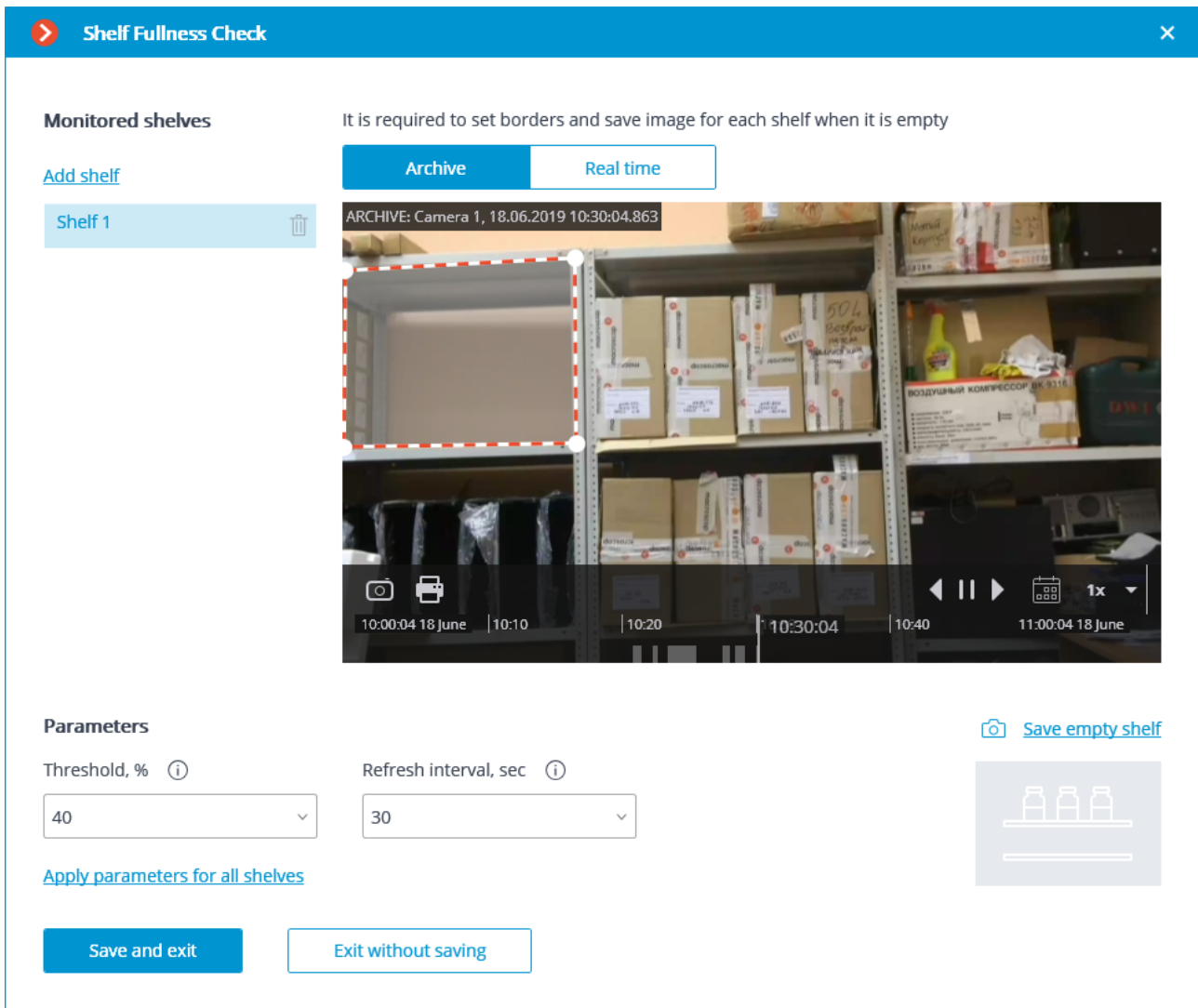
To use the module, it is required to enable and set up the software motion detector, then enable and set up the module itself.

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

After that, it is required to switch to the [Analytics](#) tab and enable the module using the  toggle.





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 use of the module will start only after [the settings are applied](#).

## Requirements and recommendations



The update of the values is made only within the intervals when there has been no motion in the shelf's outline for three seconds.

## Camera installation and zone assignment requirements

The camera installation angle in relation to the shelf must not be too acute.

The image must be in color.

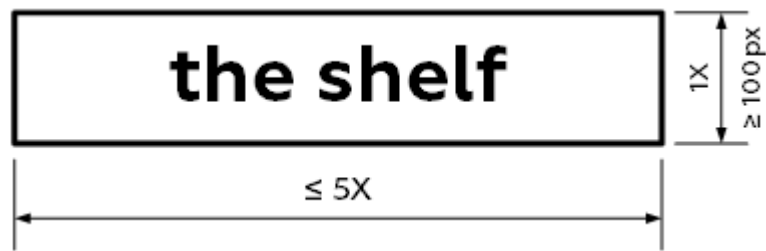
The image must be of moderate contrast.

The quality of the image must be moderate to high, without significant compression artefacts.

The optimal resolution for the module operation is HD or FullHD.

The shelf zone must not be too stretched. The maximum acceptable length to height ratio is 1/5.

The shelf image resolution in the lowest 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.

There must be no jumps in brightness and contrast, no illumination flickering, no glare or flaring in the shelf area. It is also advisable to disable automatic white balance and exposure in the camera settings.

It is not advisable to use cameras with different aspect ratio for the main and alternative streams.

## 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.

A square shelf with high original resolution will take the longest time to process.

In order to reduce the overall server load, it is recommended to increase the intervals of updating the shelf condition.

## Tracking module






The **Tracking module** permits to ensure the perimeter control by implementing the following functions:

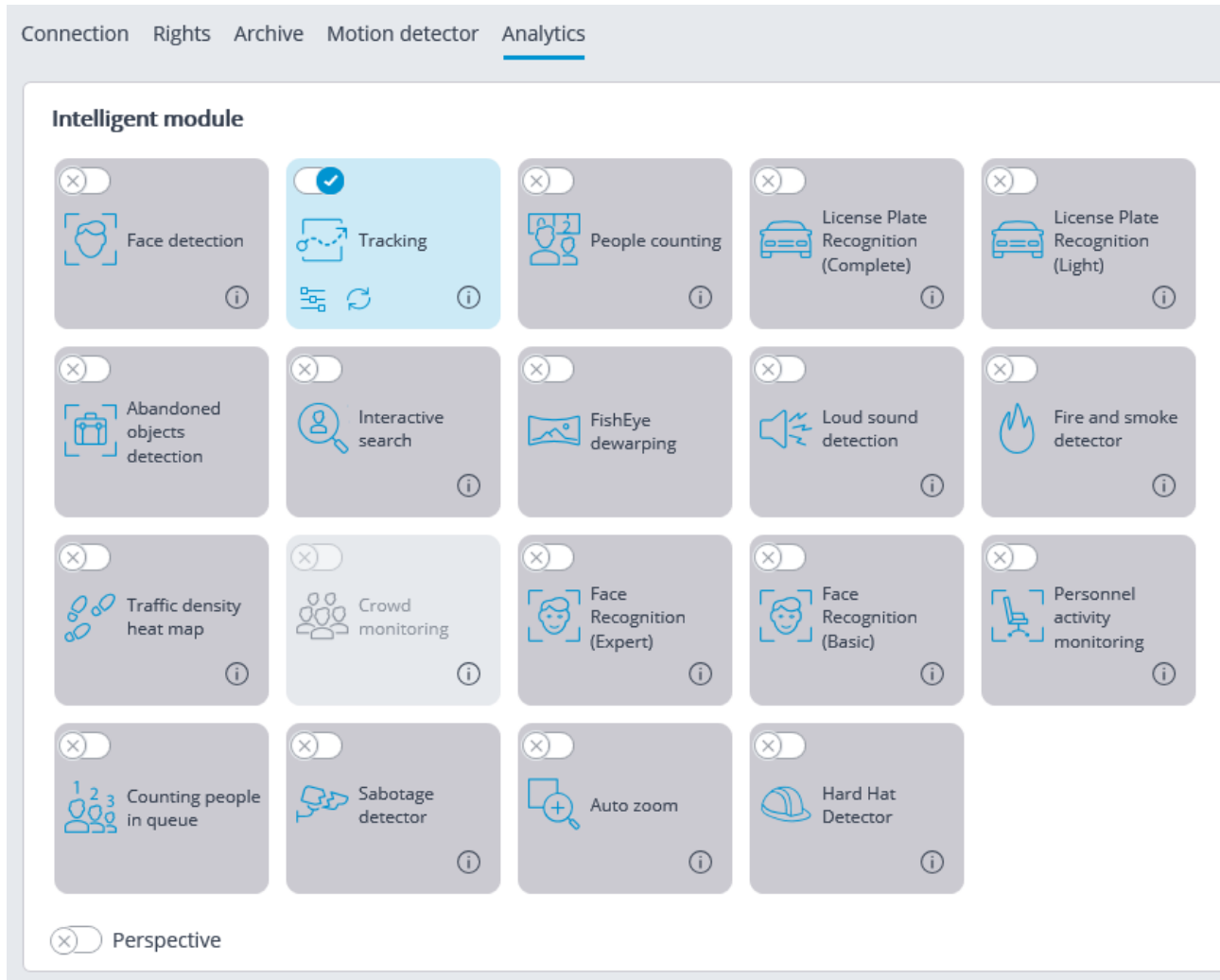
- Tracking the moving objects in the field of view of the camera.
- Specifying the minimum and maximum dimensions of the tracked objects.
- Generation of the alarms in case of the following actions of the tracked object:
  - Crossing of the control line in one or both directions;
  - Entering the controlled zone;
  - Remaining in the controlled zone beyond the preset time interval.
- Registering of the generated alarms in the event log and searching for the related video fragments in the archive.
- Interactive search in the archive for the crossings by the moving objects of the operator-specified line.
- Highlighting of the moving objects, their trajectories, and the controlled zones on the screen.

For the proper operation of the module, it is imperative to place the camera correctly and set up the software motion detector and the module itself.

# Module setup



In order to use the module, it is required to enable and set up the software motion detector, then activate the module itself. To do it, it is required to [launch the Eocortex Configurator application](#), go to the  [Cameras](#) tab, select a camera in the list on the left side of the page, 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.




On the **Detector settings** page, it is required to set the minimum dimensions of the objects detected by the module. The objects smaller than the minimum specified will be combined by the module into the bigger ones.

**Tracking**

Detector settings Alarm settings

**Object sizes settings** ⓘ



**Object sizes**

Min. width 10%


Min. height 10%

[Set](#)  
(percentage of frame height or width)


Save and exit Exit without saving

On the **Alarm settings** page, the situations triggering the alarm generation are to be specified.

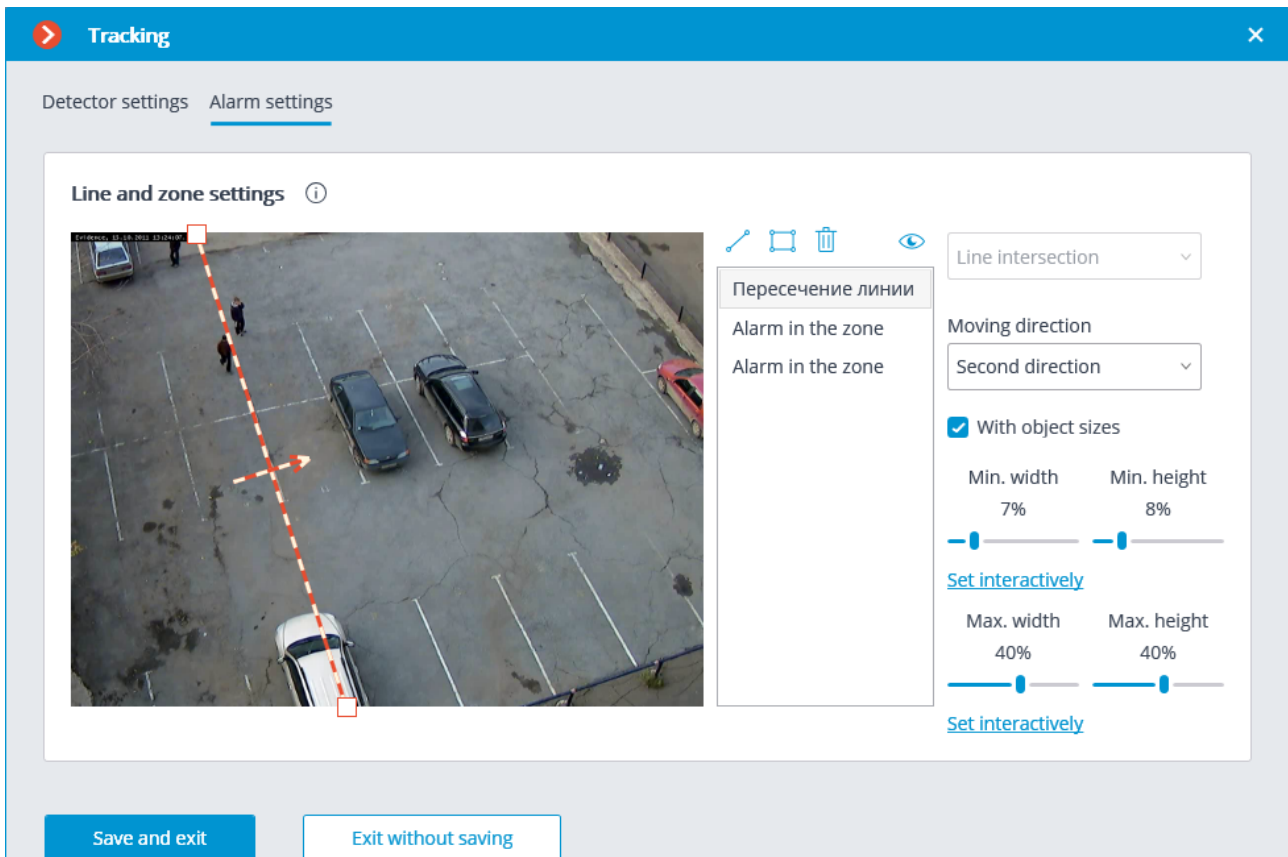
- The preset line is crossed;
- An object enters the preset zone;
- An object has remained in the preset zone for a long time.


To delete a line or a zone, select it in the list, then press the  button.

To specify the minimum and maximum dimensions of the objects that generate the alarm selected in the list, it is required to enable the *With object sizes* option and indicate the corresponding dimensions.

The  button enables/disables the displaying of all the added lines and zones in the preview window.

## Line crossing




It is required to press the  button to specify a crossline. A line will appear in the preview window. The position of the line can be changed by dragging the key points on its ends.

In order to specify the triggering direction it is needed to select the corresponding value in the **Moving direction** dropdown list. The following options are available: **Both directions**, **First direction** and **Second direction**. When selecting the first or the second direction, the arrows will be shown perpendicular to the line; the alarm will be generated only when the objects cross the line in the direction matching the direction of the arrow.

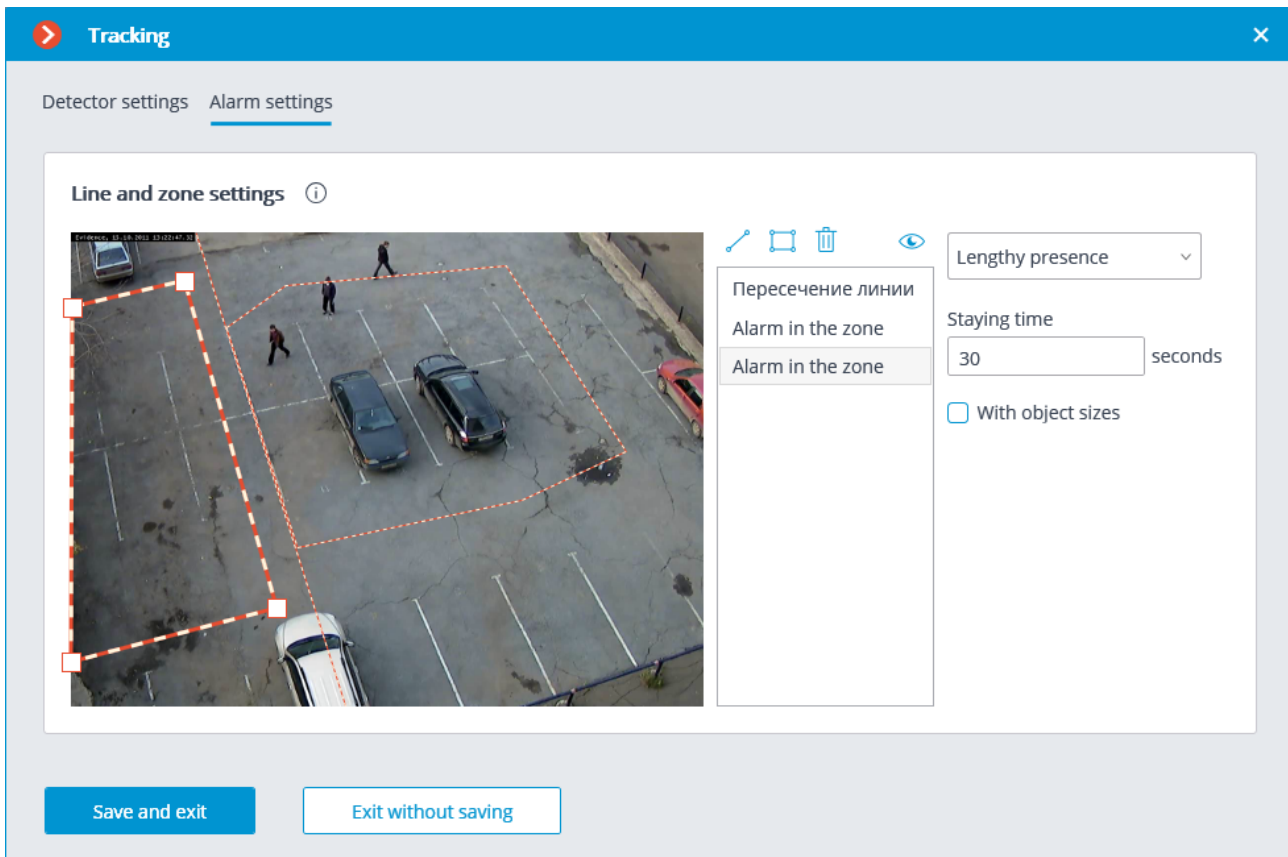
## Alarm in the zone

The screenshot displays the 'Tracking' application interface. At the top, there's a blue header with a red arrow icon and the text 'Tracking'. Below the header, there are two tabs: 'Detector settings' and 'Alarm settings', with 'Alarm settings' being the active one. The main content area is titled 'Line and zone settings' and contains a live video feed of a parking lot. A red dashed polygon is drawn over the video, defining a control zone. To the right of the video feed, there are several icons: a link icon, a rectangle icon, a trash icon, and an eye icon. Below these icons is a settings panel. The settings panel has a dropdown menu set to 'Moving within zone'. Below the dropdown, there is a checked checkbox labeled 'With object sizes'. Underneath, there are four sliders: 'Min. width' (set to 5%), 'Min. height' (set to 5%), 'Max. width' (set to 40%), and 'Max. height' (set to 40%). Each slider has a 'Set interactively' link below it. At the bottom of the window, there are two buttons: 'Save and exit' and 'Exit without saving'.

It is required to press the  button to specify a control zone. The rectangular zone will appear in the preview window. The configuration of the zone can be changed by dragging the key points in the corners of the polygon. It is required to double-click on the line to add a key point; clicking on the key point with the right mouse button deletes it.

If you select **Moving within zone** in the dropdown list, the alarm will be generated in case any object enters the zone; in case of selecting **Lengthy presence**, the alarm will be generated only if the object stays in the zone for more time that preset in the **Staying time** field.





The use of the module will start only after [the settings are applied](#).

## Requirements and recommendations

The module is intended for the surveillance of areas without the dense stream of moving objects. The proper functioning of the module depends on the quantity and the relative position of the objects in the frame: the smaller the number of objects and the less overlapping occurs between them, the more accurate the module operation is.

The camera shall be positioned in such a way that the objects in the frame overlap each other as little as possible. To achieve this, it is advisable to install it as high as possible and direct it at the ground under the sharpest angle possible: the recommended vertical deviation is no more than 30 - 40°. It is also advisable to avoid the distortions of the perspective of the controlled zones.

The frame resolution must be at least 480x384 pixels.

## 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.

See [Face recognition](#).



# Integration with External Systems and Devices

## 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](#)


[Eocortex Setup](#)

## 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](#).