Eocortex 4.4

Technical Specification

Contents

About Eocortex

Eocortex is a global provider of the open platform software with smart video analytics for creating video surveillance systems.

Eocortex systems not only receive, store and broadcast video from surveillance cameras, but also provide a rich set of video analytics, while remaining simple to design, easy to install, easy to configure and easy to operate. Regular updates and technical support are provided free of charge.

Open API and SDK make it easy to integrate **Eocortex** video management software with external systems.

The present specification contains the overview and the comparison of the capabilities provided by each type of **Eocortex** licenses.

You can find more details on the capabilities of **Eocortex** in the documentation posted on eocortex.com.

Licensing

A single **Eocortex** license permits the connection of one IP camera with the capabilities listed in the license documentation.

Client software, including mobile applications and Web client are provided free of charge.

The following types of the **Eocortex** licenses are available:

- **Eocortex LS** is suitable for creating a video surveillance system with up to 400 IP cameras. It allows combining up to 5 servers and 10 client workstations in a single system. It is possible to connect no more than 80 cameras to one server. It supports the video analysis modules. All modules for the LS version are available at an additional cost. If necessary, this version can be upgraded to **Eocortex ST**.
- **Eocortex ST** is designed for building scalable video surveillance systems with an unlimited number of IP cameras, servers, and client workstations. This version is compatible with all video analysis modules. Several modules are included free of charge; others are available at an additional cost.
- **Eocortex Enterprise** is designed for building large, scalable video surveillance systems with a wide range of features and an unlimited number of IP cameras, servers, and client workstations. The Enterprise license includes several additional features useful for large-scale systems, and it supports video analytics. Some of the video analysis modules are provided free of additional charge, others are to be paid for. It is also possible to add several enhanced features for additional charge.
- **Eocortex ULTRA** is intended for creating large, scalable video surveillance systems with the enhanced list of features and an unlimited number of IP cameras, servers, and client workstations. The software package supports the video analysis modules, 16 of which are supplied free of additional charge, others are available at a cost.

The following features are not available on Linux servers for all licenses:

- License Plate Recognition Light module.
- Centralized Server Upgrade.
- Standalone Driver Packages (IP Device Packs).

Only the servers with the same type of licenses (**Eocortex LS**, **Eocortex ST**, **Eocortex ULTRA**, **Eocortex Enterprise**), taking into consideration the limitations of such licenses, can be united in a common multiserver system.

Apart from the license types listed above, other license types containing other sets of licensed features and license restrictions may be used.

License protection methods:

- **Hardware USB key:** The hardware key that must be connected to the USB port of the video surveillance server. The hardware key can be reinstalled on another server if required.
- **Software key:** On activation, it binds to a specific computer.

The HASP software key that is installed on a physical machine bind to the hard drive serial number, motherboard ID, and other hardware components, including processors and network cards. If the hard drive or motherboard fails, the license tied to this key will only be active if most of the other system components remain unchanged.

The HASP software key that is installed on a virtual machine bind to the virtual MAC address, CPU properties, and UUID of the virtual machine. If any of specified component's mismatches, the license bound to this key will become inactive.

The quantity of each of the licensing parameters within one license protection key cannot exceed 4000. For example, one license protection key can contain:

- 4000 licenses to work with 1 IP camera;
- 4000 licenses for the Face Recognition Complete module;
- 4000 licenses for the License Plate Recognition Complete module;
- 4000 licenses for the FishEye Dewarping module.

Multiple license keys can be used simultaneously within one system.

Floating licensing is available in certain types of licenses. It allows using a single license key on several **Eocortex** servers.

The floating licenses can be used on any license protection keys, be it USB or software ones.

In a floating license, the total number of cameras, modules and other licensed features is shown. The video surveillance system administrator distributes the cameras among servers at his/her discretion; the system core automatically distributes the corresponding licenses among the servers.

The floating license key is called network key and is installed on any **Eocortex** server located in the same local area network (or VLAN) with the servers that use this key.

Several network and local keys can be installed within the same **Eocortex** video surveillance system. However, on each individual server, it is possible to use only one key for licensing the cameras bound to this server.

Main features

Feature	Description	Value
Windows OS	Windows operating systems that can be used to run server and desktop surveillance applications	64bit operating systems: • Windows 8 / 8.1 / 10 / 11 • Windows Server 2012 / 2012 R2 / 2016 / 2019 / 2022
GNU/Linux OS	Range of features of server applications launched under GNU/Linux is limited (see description of limitations below)	64bit operating systems: • Debian 10, 11, 12 • Ubuntu 20.04, 22.04, 24.04
Archive	Archive data structure and format	The video and audio archive has a structure and format of its own design
Database	DBMS used to store events, video analytics module data and other information	PostgreSQL 12
Video codecs	List of supported video codecs	MJPEG[1], MPEG-4, H.264, H.264+, H.265, H.265+, MxPEG, Smart Stream, Wisestream, Zipstream
Audio codecs	List of supported audio codecs	PCM, G.711U, G.711A, G.722.1, G.726, G.729A, GSM-AMR, AAC
Standards	List of supported video surveillance standards	ONVIF (Profile S, Profile T, Profile G, Profile A, Profile C), PSIA (ver. 1.2), RTSP
Cameras and devices	List of supported cameras and devices	Over 7800 models, over 180 manufacturers. A detailed list is available on the website
Resolution	Resolution of the image received from the cameras	Limited only by the capabilities of the cameras
FPS	Video stream frame rate received from cameras	Limited only by the capabilities of the cameras
Interface language	Languages used in system settings and client applications	English, Dutch, French, Russian, Spanish, Traditional Chinese

[1] Supports resolutions up to 2 MP (1920x1080).

OS limitations

Limitations depending on the used operating systems

Feature	Description
The following features do not work in the GNU/Linux OS	• Support of Microsoft® Active Directory pass-through authentication • Electronic signature • Integration with ONVIF Profile A/C • Integration with Honeywell's Pro-Watch® comprehensive security platform • Integration with Paxton Net2 systems • Integration with Siemens DMS8000 access control and security and fire alarm system • Integration with POS terminals • H.264 decoding on the video card in the Eocortex Client • Automatic Eocortex Client application update • Displaying heat maps on plans[1] • Eocortex Server Info • Auto-save data on plans[2] • Displaying video in the camera's field of view on plans[2] • Self-sufficient driver packages

[1] Not supported in Eocortex Client application running under GNU/Linux family operating systems

[2] Not supported in the Eocortex Configurator application running under a GNU/Linux family operating system

License limitations

Main features depending on the used licenses

Feature	Description	License			
		LS	ST	Enterprise	ULTRA
Servers per system	Maximum number of servers per system	5	Not limited		
Cameras per server	Maximum number of cameras per server	80	Not limited		
Workstations	Maximum number of client workstations per system	10	Not limited		
Floating licensing	Allows using same license key on multiple servers	–	–	√	√

√ available, included with the base license; – not available

Basic functional capabilities

This section lists features that are included in the base licenses of all license types and do not require additional licenses.

Basic video analytics

Feature	Description
Software motion detector	Motion detection in the frame by analyzing the video stream in real time. It is possible to set several detection zones and limit the size of the objects to be detected for each zone. Frequency of analysis can be limited in order to reduce the server load
Server decoding on video cards	Decoding of the stream under analysis on the GPU to reduce the CPU load on the server. NVIDIA video cards with support for decoding of the selected codec are required. Decoding on several video cards with load balancing
Auto Zoom	Displaying a separate zoomed-in area of the frame where moving objects are present
Sabotage Detection	Detecting camera defocusing, turning the camera away from the pre-determined direction, flaring and overlapping

Integration facilities

Feature	Description
Open SDK	The set of libraries and code samples in C# not only ensure seamless integration of third-party products with Eocortex, but also allow to develop proprietary video surveillance system components
Open API	Contains a set of documented API, JSON and XML requests, ensuring interaction with the components of the Eocortex video surveillance system
RTSP server	Connection to the server via RTSP to receive video streams in H.264, H.265 and MJPEG formats

Feature	Description
ONVIF server	Connection to the server via the ONVIF protocol. Available options: • receiving video streams (with sound) in H.264, H.265 and MJPEG formats; • lists of available cameras and enabled video analysis modules; • connection via HTTP and HTTPS; • receiving several system events; • getting links for connection to cameras via the RTSP server
Modbus protocol support	Connecting devices that support the Modbus protocol. Transferring events from these devices to Eocortex for use in automation scenarios. Sending signals from Eocortex to these devices
Embedding video on a website	Integrating video from cameras on a website with the following features: • switching between live viewing and archive playback; • selecting streams; • switching to full screen mode
Integration with ONVIF Profile A/C systems[1]	Interaction with external systems that support ONVIF Profile A and Profile C specifications, without the need to integration of these systems directly with Eocortex. The following features are available: • Synchronization of the Eocortex face database with the face database of the external system; • Two-factor access verification through interaction between Eocortex and the external system

[1] Not supported on GNU/Linux family operating systems

Integration

Integration of the Eocortex with external systems

Feature	Description
Integration with Honeywell's Pro-Watch® comprehensive security platform[1]	Receiving events from Honeywell's Pro-Watch®, setting response to these events, and viewing the received events in the Events Log of the Eocortex Client application
Integration with the Paxton Net2 systems[1]	Receiving Paxton Net2 events, setting up responses to such events as well as viewing the received events in the Events Log of the Eocortex Client application; sending the event that initiates opening of a door from Eocortex to Paxton Net2
Integration with Siemens DMS8000 ACS and FAS[1]	Receiving events from Siemens DMS8000, setting response to these events, and viewing the received events in the Events Log of the Eocortex Client application
Integration with BioStar 2	Receiving events from BioStar 2 in the real-time mode, storing them in the archive and using them in automation scenarios. Sending commands to the ACS to control the door state
Integration with ZKBioSecurity ACS	Receiving events from the ZKBioSecurity ACS, configuring automatic actions in response to received events, viewing received events in the Events log of the Eocortex Client application

[1] Not supported on GNU/Linux family operating systems

Cameras and devices

Feature	Description
Connection to IP cameras and devices	Network connection to IP video cameras, network video recorders, video servers, encoders
IPv4 support	Connecting cameras using IPv4 addresses, including auto search for such cameras in the network
IPv6 support	Connecting cameras using IPv6 addresses, including auto search for such cameras in the network

Feature	Description
PTZ cameras	Support of PTZ camera features
Audio stream reception	Reception of sound from cameras
Duplex audio mode	Transmission of sound from the operator's workstation to the loudspeaker or audio output of the camera
Sending audio to a camera	Transmits audio from the server to the loudspeaker or audio output of the camera. Can be performed both by scenario and by user command
Decoding of B-frames	Decoding of B-frames of video streams encoded in H.264 and H.265
ONVIF™	ONVIF™ Profile S, Profile T, Profile G support
PSIA	PSIA version 1.2 support
Auto search for IP cameras	Automatic search for cameras that support ONVIF or UPnP in the local network
Remote configuring of IP cameras	Configuring cameras from the Eocortex Configurator application without getting access to the camera web interface. Available for a limited list of cameras. Depending on the model, the following settings may be available: IP address, codec, resolution, frame rate, compression rate
Utilization of custom ports	Possibility to use non-standard network ports of cameras and devices that are used by the specific models of such devices
Support for multiple video streams from the camera	Possibility to receive up to four video streams from an IP camera, each with its parameters: codec, frame rate, and resolution
Camera in-built motion detector	Use of built-in motion detector of the IP camera
Camera archive	Access to the archives located on the memory cards of the cameras, including the possibility of simultaneous viewing of the archives of several cameras and synchronization of the Eocortex archive with the camera archive (e.g. if the camera was working without connection with the Eocortex server for some time)
Signal I/O ports	Support of camera signal I/O ports

Feature	Description
Service PTZ functions	Support of service features of PTZ cameras: lens washing, wiper
Video from video recorders, servers, and encoders	Reception of real-time video from analog and IP cameras connected to video recorders, servers and encoders
Archive of video recorders and servers	Access to the internal archives of the video recorders and video servers, including the possibility of simultaneous viewing of the archives of several channels of the video recorders and servers and synchronization of the Eocortex archive with the archive of a video recorder or a server (e.g. if the video recorder or server worked for some time without connection with the Eocortex server)
Sound from video recorders, servers, and encoders	Reception of live audio from analog and IP cameras connected to the video recorders, servers, and encoders, as well as recording the sound captured by these devices
PTZ via video recorders, servers, and encoders	Control of analog and IP PTZ cameras connected to video recorders, servers, and encoders
Panoramic and multi-lens cameras	Support of various modes used in panoramic and multi-lens cameras
Thermal cameras	Obtaining images from thermal cameras
Audio devices	Support of sound transmitting IP devices (for a limited list of devices)
Door phone support	Interaction with call panels of door phones connected via IP: video reception, reception, and transmission of sound, unlocking door locks (for a limited list of devices)
Self-sufficient driver packages[1]	Self-sufficient driver packages (DevicePack) for ensuring backwards compatibility of IP cameras and devices after updating the server application
Camera diagnostics	Diagnostics of cameras from Eocortex Configurator application to identify issues with their connection and functioning

[1] Not supported on GNU/Linux family operating systems

Eocortex Client application

Feature	Description
Eocortex Client application	The Eocortex Client application is a full-featured application with an intuitive user interface that provides access to all video surveillance functions in a few clicks: live video viewing, archive playback, PTZ camera control, event viewing, video analytics, system configuration
Keyboard shortcuts	Configuring keyboard shortcuts that will be used to perform various actions in the application
Direct connection to cameras	Direct connection to cameras from the operator's computer
Connecting to cameras via server	Connection from the operator's computer to the servers to which the cameras are bound
Connecting to cameras via proxy server	Connection from the operator's computer to one proxy server that, in its turn, is connected to the servers to which the cameras are bound
System event log	Events Log contains information about all events registered in the system, including starting and stopping server applications, information about connections to cameras, changes of settings, user actions, alarms, video analytics results and other events. To make it easier to find events in the log, it is possible to filter and sort them by various criteria
Displaying time zones	In the application, the camera time can be displayed in two modes: • in the time zone of the operating system in which the Client is running • in the time zone of the camera itself
Watermarking	Display watermark in the camera cell: both in live view and archive playback. Watermark overlay when printing and saving a frame, and exporting timestamped AVI and MP4 videos
Opening cameras in the browser	Option to open HTML pages of cameras in the browser
Automatic Eocortex Client application update[1]	Automatic Eocortex Client application update when connecting to the Eocortex server

Feature	Description
P2P connection to server	P2P connection to servers registered in Eocortex Cloud
Display modes	Variety of display modes: both full-screen mode and many screen grids with different number of cells (up to 262). Some screen grids have cells with vertical orientation
Camera drag-and-dropping	Dragging and dropping cameras from one screen grid to another using a mouse or a touch screen
Digital zoom	Zooming in real-time and archived video to the whole cell of a grid or to full screen
Frame aspect ratio control	Choosing various ways of displaying video in a screen grid cell: keeping proportions of the video transmitted by the camera; stretching the image to the cell size; with automatic selection of optimal display mode. In addition to the default mode for all cells, it is possible to set a separate display mode for each cell
Video stream buffering	Increasing the smoothness of the image due to frame buffering
Views	Pre-configured screen grids with cameras placed in the cells. Views simplify video surveillance by selecting ready-made views and switching between them instead of manually configuring each cell. Views can be set up either centrally or on an individual workstation. Centrally defined views are available from any workstation for all users who have the rights to view the cameras included in the view. Views configured on an individual workstation are available only on that workstation and only to the user who created them. You can create an unlimited number of views of any type. The list of views is presented in the form of a tree
Automatic view change	Automate the video surveillance process due to the process of automatically changing views on the monitor. Sequences of auto-change views are set up centrally. An unlimited number of such sequences can be configured
Multiple displays	Support for multiple monitors within a single workstation
Overview monitor	Using one of the displays to view in full screen any camera selected on the other display in grid mode

Feature	Description
Frame saving	Saving a frame or its fragment on a disk as a JPEG, PNG, or BMP file Overlaying the watermark on the image. Saving files with electronic signature
Frame printing	Printing out a frame or its fragment. Overlaying the watermark on the image
Video archive export	Exporting a video archive fragment to AVI, MP4 and Eocortex proprietary format. Export to MP4 can be performed with or without time stamps. Eocortex proprietary format supports the possibility to export multiple cameras to a single file for simultaneous playback. Adding a watermark to the downloaded archive. Encoding the downloaded archive using a password

[1] Not supported on GNU/Linux family operating systems

Archive playback

Feature	Description
Archive playback in a separate cell	Playing back the archived videos in a selected screen cell simultaneously with real-time video broadcasting in other cells
Simultaneous playback of the archives of several cameras	Starting simultaneous playback of video from several cameras on the same screen. It is possible to simultaneously play back video from up to 25 cameras

Feature	Description
Playback speed selection	Archive playback at different speeds. Options in the single camera playback mode: ×0.1, ×0.2, ×0.5, ×1, ×2, ×5, ×10, ×20, ×60, ×120. Options in the simultaneous archive playback mode are: ×0.5, ×1, ×2, ×5, ×10, ×20, ×40, ×60, ×120
Frame-by-Frame archive playback	Step by step playback by clicking the button. Available only in the simultaneous archive playback mode. Single step size options: frame, 0.1s, 0.5s, 1s, 5s, 10s, 30s
Viewing archive fragments	Fragments of the video archive are displayed and played
Archive playback tools	Availability of various video archive playback control tools: interactive timeline showing the presence of an archive; a calendar showing days for which the archived videos are available; selection of speed (from 0,1x to 120x) and archive playback direction
Playback of combined archives	Automatic switching between playing back the archives stored on server and on camera in cases when the archive is only available on camera
Archive bookmarks	Marking archive fragments with bookmarks. Creating user categories of archive bookmarks. Filtering archive bookmarks using various criteria
Timeline	Viewing of the archive, events, and archive bookmarks on the timeline

Alarms

Feature	Description
Guard mode	Using special mode of camera operation that implies generation of an alarm as a reaction to certain events. The camera may be set to the guard mode both manually and automatically, by schedule
Alarm generation	Setting up automatic alarm generation when certain events occur on cameras put on guard. Generating alarms by operators. Developing customer alarm generation mechanisms using Eocortex API and SDK

Feature	Description
Registering and processing of alarms	Registering alarms in an event log. Set the time allotted for alarm processing. Various alarm processing options: accept, mark as false, ignore. Configuration of mandatory alarm commenting. Quick access to the moment of alarm in the archive
Alarm notifications	Immediate visual and audible notification of video surveillance operators about registered alarms
Cameras nearby the alarm camera	Quick view of video from cameras located near the alarm camera
Alarm monitor	Utilizing one of the monitors to display images from the cameras where an alarm has occurred. Possibility to automatically exclude the camera from the alarm monitor screen after a specified time interval since the alarm occurred. Possibility to display alarms on the alarm monitor only. Delayed video play. Cell pinning
Alarm cells	Utilizing part of the regular monitor's cells to display images from the cameras on which the alarm occurred
User alarm on-screen button	Switching on and off the user alarm on selected cameras by the operator using the on-screen alarm button

PTZ

Feature	Description
Basic PTZ functions	Support of basic PTZ camera features: turning and tilting with adjustable speed of movement, zoom in/out (optical zoom), manual and automatic focusing
Presets	Transition between preset PTZ camera positions
Autopatrolling (tours)	Creating customized transition sequences (tours). Launching tours from automation scenarios

Feature	Description
AreaZoom	Support of AreaZoom feature implemented on some of the cameras: camera positioning and optical zoom of the area selected by the user on the screen using a mouse or touch-based
Virtual PTZ for panoramic cameras	Simulation of PTZ control for panoramic cameras
Interactive control of PTZ cameras	Manual PTZ camera control using a mouse, a touch screen, a keyboard, a game joystick, as well as the specialized PTZ consoles and joysticks
Virtual PTZ Joystick	Pan and tilt control of the camera using virtual joystick displayed on screen allows changing rotation speed and return camera to home position
Automatic PTZ camera control	Control of PTZ cameras according to schedule and upon occurrence of a certain event
User setup of joystick and PTZ console	Assigning joystick axes and user actions to joystick and PTZ console buttons

Site plans

Feature	Description
Site plans	Displaying of two-dimensional site plans with devices placed on them
Consistency of plans	Creating site plans consistency by placing points of transition between the plans

Feature	Description
Cameras on site plans	Displaying cameras on site plans with the possibility to indicate their fields of view. Detailed camera display configuration with the ability to change the color of the icon and its viewing angle. Assigning tags to cameras for convenient search. Viewing of video from the camera on the plan: • By overlaying the image onto a field of view specified on the plan[1] • By jumping to the camera view on the main screen of the Eocortex Client application • In the preview window that opens when hovering the cursor over the camera • In the additional camera cells available on the same screen with the plan Creating views from the cameras placed on site plans
Sensors and relays on site plans	Displaying sensors and relays connected to signal inputs and outputs of the cameras on the site plans. Assigning for sensors and relays icons corresponding to the type of connected device: sensor/relay, door, barrier, turnstile, lock. Visualizing the status of sensors and relays placed on the site plans. Switching of relay states
Notifications on site plans	Displaying alarm indicators and changes of camera status on a plan, displaying current alarms on the related tab

[1] Not supported in Eocortex Client application running under GNU/Linux family operating systems

Mobility

Feature	Description
Eocortex Web Client	View real-time video and archive playback in any HTML5-enabled browser. Change the archive playback speed. Ability to authorize under an Active Directory account (if the corresponding license is available). Adaptation for screens of different sizes and resolutions: desktops and laptops, tablets, smartphones. Browse system events in the event log with dynamic updates. When using video analytics, real-time displays are available for face recognition and visitor counting modules, object counting, and license plate recognition. Archive export. Browse the server views and create your own views (max. 16 cells). The list of views is visually represented as a tree. PTZ control, including switching through presets and launching tours (monitoring). Activation of the manual archive recording mode. Launching user task. Watermark display in the camera cell

Feature	Description
Mobile Android client Eocortex	Liveview video. Archive playback, including fast rewind. Listening to sound from cameras. Controlling PTZ cameras. Quickly receive changes from the server, including access rights and camera settings. An authorization service that facilitates user authorization from different devices. Dark and light themes. Digital zooming with gestures. Launching user tasks. Downloading videos with archive fragments from server to the device. Push notifications about system events. Adaptive grid that adjusts the size of camera cells for efficient use of screen space. Server connections and adding servers by QR code
Mobile Client for Android Eocortex Video Surveillance	Viewing live and archive video on mobile devices, including listening to audio from cameras and controlling PTZ cameras. A smart assistant that allows to interact with the application through voice and text commands. Viewing the cameras' placement on online maps. Displaying on cameras both the device time and the time of the cameras. Receiving Push notifications of system events. Dark and light design themes. Saving a video clip containing a fragment of the video archive to the device. Events log, including video analytics modules events. Filtering and searching for events in the log. When using video analytics, live data display is available for the People counting and Object classification and counting modules

Feature	Description
Mobile Client for iOS Eocortex Video Surveillance	Viewing live and archive video on mobile devices, including listening to audio from cameras and controlling PTZ cameras. A smart assistant that allows to interact with the application through voice and text commands. Viewing the cameras' placement on online maps. Displaying on cameras both the device time and the time of the cameras. Receiving Push notifications of system events. Dark and light design themes. Saving a video clip containing a fragment of the video archive to the device. Events log, including video analytics modules events. Filtering and searching for events in the log. When using video analytics, live data display is available for the People counting and Object classification and counting modules
Messengers	The service that connects the Eocortex video surveillance systems with the popular messengers, allowing to receive the images from the cameras, event notifications, server status reports and other information via the messengers

Configuration and operation

Feature	Description
System setup tools	All system settings are made in the Eocortex Configurator application with remote or local connection to one of the Eocortex servers
Eocortex Status Info utility	Eocortex Server Info utility is designed for launching and stopping Eocortex Server application, as well as for setting up and performing diagnostics of Eocortex video surveillance system. The utility is launched automatically at the start of the operating system and is displayed in the task bar on the computer where the Eocortex Server is running. The system status and diagnostic notifications are displayed in the utility's window
Preview without saving changes	Watching video stream from camera with the preset configuration

Feature	Description
Adding cameras with the same parameters	Possibility to add cameras with the settings similar to those of the already connected cameras to the system
Group setup of cameras	Possibility to simultaneously set up common parameters for a group of cameras
Group creation of cameras	Adding multiple cameras within a given network address range. The settings of one of the cameras already existing in the system are used for the added cameras
Automatic starting of applications	Possibility to automatically start Eocortex applications after the start of the operating system. Configuring automatic authentication after an application has started
Compatibility of versions	Compatibility of client software with server software of earlier versions

Archive management

Feature	Description
Archive recording modes	Recording to the archive can be made continuously, by the operator's command, by the camera motion detector, by Eocortex software motion detector, by any video surveillance system event, as well as on schedule, including the possibility to combine other recording modes with the scheduled one

Feature	Description
Archive arrangement	The archive of each server stores the recordings of only those cameras that were bound to it at the moment of the recording. The archive is stored on the server's logical drives that are determined by the operating system. It is possible to use any acceptable devices as storage media: HDD, SSD, RAID, external storage drives, network drives, as well as their combinations. Video and audio data are stored in the archive in the format received from an IP camera. The rate of recording and playback of the archive is only restricted by the hardware. To increase performance while using several logical drives, the recording is made to all the available drives simultaneously. If one of the drives becomes unavailable, the recording of new data to it stops and is redistributed to the available drives. Reciprocally, when the drive becomes available, the recording to it resumes. The archive has a circular structure: when the space allocated for it becomes fully used up, new archive files start to replace the oldest ones, overwriting them, considering the archive depth parameters set for each camera
Archive size optimization	The size of the archive is limited only by the drive capacity and the operating system. Storage limits can be set for each logical drive: maximum size of archive, minimum allowable free space. Various archive size limits can be set for an individual IP camera and for all of them at once. Additional options allowing to reduce the size of the archive are available: skipping of frames without motion, storing key frames only, switching archive recording between low and high-resolution streams
Pre-recording and post-recording	Possibility to set the short intervals of time within which the recording to the archive will be performed before the start of an event that triggers the recording (prerecording) and after the start of an event that triggers the stop of the recording (post-recording). The duration of the intervals can be set in the range of 1 to 10 seconds.
Adding of drives	Scalable drive space for video archive storage
Archive replication	Copying an archive to a selected replication server. You can copy archives from several servers connected to a single video system to one replication server. The archive depth on the replication server may differ from the archive depth of the source servers.
Archive depth report	Creating reports regarding the archive depth allowing to monitor the availability of the archive per camera and per date

Automation

Feature	Description
Scheduled actions	Executing actions or sequences of actions on schedule. Creating flexible schedules ranging from a single run to regular runs, with various periods: in set number of seconds, minutes, hours, days; at the preset time, week days, dates of a month, and using some other parameters. Scheduled actions can be set either for an individual camera or for several cameras at the same time
Actions by events	Executing actions or sequences of actions by occurrence of the preset events. It is possible to set flexible conditions of the execution of actions. Event actions can be set either for an individual camera or for several cameras at the same time
Actions performed by user command	Performing actions or sequences of actions by a client application's user command. Available for users of client applications for Android, iOS and Windows
Automation actions	Available automation actions: Turn on recording; Turn on washer; Turn on autofocus mode; Play audio on camera speaker; Disable recording; Perform action in BioStar 2; 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 archive; Open door Paxton Net2; Send HTTP or HTTPS request to an external system with HTTP API; 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
Automation events	Available automation events: Large number of people in queue; Large crowd of people; Fire; Call over the door phone; Loud sound; Motion; Smoke; Parking vehicle counter has been changed; Parking lot occupancy has changed; External alarm start; Motion started; Inactive zone; License plate detected; Emergency vehicle detected; Face detected; Face detected (Face Recognition module); A person running a fever detected; Loss of connection with analog camera; Loss of connection with camera; End of external alarm; Motion stopped; Abandoned object; Tracking of moving objects; No connection with camera; No face mask; Object Classification and Counting; Shelf empty; Received a check from a POS terminal; Line from POS terminal received; User alarm; Maximum number of people in counting zone exceeded; Video surveillance sabotage; Signal to camera input; Honeywell Pro-Watch event; Paxton Net2 event; Siemens DMS8000 event; ZKBioSecurity event; External system event; Parking event; Tracking event; Request to close gate; Request to open gate; Connecting to analog camera; Establishing connection with camera; Number of people in counting zone is back to allowed; Transition to the home position; Starting PTZ control

Feature	Description
User notifications and webhooks	Possibility to use custom texts, as well as unique information about the event in the form of an outgoing webhook as: • Text of the message sent by Send notification by SMS, Send to messenger and Send Push notifications to mobile devices actions • Text and subject of the message sent by Send notification by email action • Name and path of the file saved by Save frame action • Command line arguments for Run external application on server action • Address and query body for Send HTTP request action

Security

Feature	Description
Access management	Flexible system of user rights to access objects and features of the system, including the limitation of access to the specific cameras and differentiation of rights for viewing real-time video and playing back the archive. The rights are assigned to the security groups. The authorization is made on the level of specific users with their individual passwords; each of these users in included into one of the security groups. The users and the security groups are the integral elements of the video surveillance systems
Archive depth limitation	Archive depth limitation for different groups of users
Secure connections	Using TLS and SSL security certificates for encoding data transmitted between cameras and Eocortex servers, as well as between the servers and client applications, including mobile and web ones, and also the Eocortex Configurator application
Electronic signature	Using safety certificates for signing frames being saved and video clips being downloaded
Limitation of client connections	Limiting the number of simultaneous client connections to the system under the same account

Centralization and scaling

Feature	Description
Multiserver architecture	Provides high flexibility of the system and resiliency of its components
Main and subordinate servers	By default, one server in the system is assigned as the main server, and the others as subordinate. The system parameters are stored on the main server. Each subordinate server stores a backup copy of the system parameters. Such architecture ensures the integrity of the system, providing, at the same time, the fault tolerance in cases when the subordinate servers lose connection with the main server. Moreover, in case of a failure of the main server, any subordinate server can be assigned as the main one without losing the system settings
System integration	To connect another multiserver system to the current video surveillance system, it is sufficient to connect one of the servers of this system; the other servers will be connected automatically
Disconnection of servers	When a server is disconnected from the multiserver system, all the cameras bound to it are disconnected as well; the camera settings are preserved. Thus, the simple and trouble-free migration of servers between multiserver systems is ensured

Reliability and failover

Feature	Description
Spare disks	One or multiple disks can be designated as backup. Recording will only occur on them if all primary disks fail. As soon as at least one primary disk becomes available again, recording to backup disks will stop.
Self-diagnostics	During operation, the video surveillance system components perform automatic self-diagnostics, informing the users about the issues encountered and giving recommendations regarding their rectification
Increased database reliability	Automatic creation of backup copies of the database and automatic restoration of the database after failures

Further features

This section lists features that depend on the type of licenses used or require additional licenses.

Advanced video analytics

Feature	Description	License			
		LS	ST	Enterprise	ULTRA
Video analytics server[1]	One of the servers can be assigned as a video analytics server. Video analysis modules will operate on this server, processing video sent to the video analytics server from other servers. Archiving and broadcasting data to client workplaces will be performed by general video surveillance servers. The video analytics server allows to take the load connected with video analytics off the general servers	+	+	+	+
Camera analytics	Support of in-camera video analytics. The following video analysis features are available (only for cameras for which these features are integrated): • Monitoring the temperature of recognized persons • Line crossing • License plate recognition • Area monitoring • Sabotage Detector • Queue size monitoring • Fog and smoke detection • Objects detector • Sound detector • People Counting • People Counting in area • Abandoned items detector	+	+	+	√
Abandoned Objects Detection	Detection of objects that have been abandoned for more than the specified time, as well as missing objects. It is also available to detect abandoned and missing objects of separate categories: Bag, Jerry can, Box.	+	√	√	√

√ available, included with the base license; + available at additional cost; – not available

Feature	Description	License			
		LS	ST	Enterprise	ULTRA
Counting people in queue	Allows specifying up to six control zones with individual threshold values for each zone. Creating reports with a possibility of sending them according to a time schedule	+	+	+	√
Cross-camera Tracking	Chronologically based search on several cameras for a person previously found with the Search for Objects module with the ability to create a video clip from the found fragments, as well as with the building of a route on the plans, if the cameras with the found fragments are positioned on them	+	√	√	√
Crowd Monitoring	Calculating the quantity of people in crowds, notifying the operator about the exceedance of the preset threshold values. It is possible to set up to 6 control zones with individual threshold values for each zone. Reports creation is available	+	+	+	√
Emergency Vehicle Detection	Detection of emergency vehicles staying in the detection area on the frame for a specified period. Display of boundaries for detected emergency vehicles in the Eocortex Client application, depending on their type: ambulance, fire engine, police. Use of detection results in automation scenarios, including setting the automatic barrier control	+	+	+	√
Face detection	Detecting faces in the frame	+	√	√	√

√ available, included with the base license; + available at additional cost; – not available

Feature	Description	License			
		LS	ST	Enterprise	ULTRA
Face Recognition (Complete)	Face recognition. Recognition of turned and masked faces. Determining sex, age, and emotions of recognized persons. Recognizing faces using an archive. Creating reports. High performance video cards (GPUs) are always used for recognition; at that, all the appropriate video cards installed on the server will be used. Search for persons in the database by image. A possibility to set up own database for individual cameras or groups of cameras. Replication of a remote database allowing to perform recognition even in case of temporary absence of connection with the server where the main database is stored. Additional report allowing to monitor the presence of people on the specified territory, including work time logging, is available Exporting reports to XLS, CSV, PDF. Displaying the temperature received from video cameras with thermal sensors. Highlighting the faces of people running a fever. Importing data from external files to face database	+	+	+	√[5]
Face Recognition (Light)	Face recognition. Creating reports. It is possible to use a high-performance video card (GPU) for recognition. Replication of a remote database allowing to perform recognition even in case of temporary absence of connection with the server where the main database is stored. Displaying the temperature received from video cameras with thermal sensors. Highlighting the faces of people running a fever. Importing data from external files to face database.	+	+	+	√[5]

√ available, included with the base license; + available at additional cost; – not available

Feature	Description	License			
		LS	ST	Enterprise	ULTRA
Fire and Smoke Detection	Detecting the presence of smoke and open fire	+	+	+	√
Fall Detection	People fall detection in the frame	+	+	+	√
Fisheye dewarping module	Software dewarping of Fisheye camera images	+	+	+	√
Frame Area Blurring	Blurring areas of a frame of archived real-time video and freeze frames in the Eocortex Client application	√	√	√	√
Traffic density heat map	Visualizing traffic intensity in different areas of the frame, both in real time and during a specified interval. It is possible to superimpose the heat map on the field of view of the camera placed on a site plan[6]. Creating reports	+	+	+	√

√ available, included with the base license; + available at additional cost; – not available

Feature	Description	License			
		LS	ST	Enterprise	ULTRA
License Plate Recognition[2]	Recognition of license plates of vehicles travelling at the speeds of up to 120 km/h. License plate recognition of the following countries: Azerbaijan (AZ), Armenia (AM), Belarus (BY), Great Britain (GB), India (IN), Indonesia (ID), Kazakhstan (KZ), Russia (RU), Uzbekistan (UZ). License plate color recognition. Maintaining a license plate database. Possibility to load license plates into the database from external files. Replication of a remote database allowing to perform recognition even in case of temporary absence of connection with the server where the main database is stored. Creation of license plate groups, including for the purposes of interception and automatic opening of a rising arm barrier. Downloading recognized license plates into external files. Manual and automatic rising arm barrier control. Counting the number of vehicles in parking lots. Counting the time spent by vehicle in the parking lot.	+	+	+	+

√ available, included with the base license; + available at additional cost; – not available

Feature	Description	License			
		LS	ST	Enterprise	ULTRA
License Plate Recognition (Complete)[3]	Recognition of license plates of vehicles travelling at the speeds of up to 250 kmph (or up to 20 kmph for the Parking license). Recognition of license plates of 195 countries. Recognition of up to 10 license plates in a frame. Maintaining a license plate database. Possibility to load license plates into the database from external files. Replication of a remote database allowing to perform recognition even in case of temporary absence of connection with the server where the main database is stored. Creation of license plate groups, including for the purposes of interception and automatic opening of a rising arm barrier. Downloading recognized license plates into external files. Manual and automatic rising arm barrier control. Counting the number of vehicles in parking lots. Counting the time spent by vehicle in the parking lot	+	+	+	+
Loud sound detection	Registering the sound whose level is more than the limit preset by the user	+	+	+	√
Object Classification and Counting	Counting the number of objects crossing defined lines or residing in preset free-form areas, and differentiating objects by category. Both all moving objects and only objects of a selected category can be counted: people; animals; vehicles. Vehicles can be counted by type: cars, buses, trucks, motorcycles. In the client application it is possible to enable the display of object boundaries depending on the category	+	+	+	√

√ available, included with the base license; + available at additional cost; – not available

Feature	Description	License			
		LS	ST	Enterprise	ULTRA
People Counting	Counting the number of visitors entering and exiting — both through one and several entrances. Setting up counting zones allowing to determine the number of people in the zones in real time. Creating reports with a possibility of sending them according to a time schedule	+	+	+	√
Personnel activity monitoring	Monitoring personnel activity on the selected workplaces. Allows to set up to six control zones with individual threshold values for each zone. Reports creation is available	+	+	+	√
Shelf Fullness Check	Shelf fullness detection. Helps to timely fill the shelves in case they are empty	+	+	+	√

√ available, included with the base license; + available at additional cost; – not available

Feature	Description	License			
		LS	ST	Enterprise	ULTRA

Search for Objects	Search in the archive for:
	• any moving objects:
	  ○ in a set rectangular area;
	  ○ crossing a set line.
	• people:
	  ○ any people;
	  ○ by the color of clothes;
	  ○ by samples from the archive or an image file.
	• vehicles:
	  ○ by category: passenger cars and trucks, buses, two-wheel transport;
	  ○ by color;
	  ○ by samples from the video archive or an image file.
	• dangerous objects.
	• animals.
		+	√	√	√

Fall Detection	People fall detection in the frame	√	√	√	√
Uniform Detection	Detection of people both with and without uniform and personal protective equipment. Depending on the settings, the absence or presence of uniform and personal protective equipment can be detected. The following personal protective equipment and uniform can be tracked: Hard hat, Safety vest, Respirator, Glasses, Face shield, Hearing protection, Gloves and mittens, Clothing of set color	+	+	+	√

√ available, included with the base license; + available at additional cost; – not available

Feature	Description	License			
		LS	ST	Enterprise	ULTRA
Tracking	Tracking moving objects in the camera's field of view. Generating alerts on intersecting lines and borders, entering the dedicated zone, prolonged stay in the zone. Interactive search in the archive for an event of crossing the line set by the operator. It is possible to track all moving objects as well as the ones of a preset type: people, vehicles, animals. Vehicles can be tracked by type: cars, buses, trucks, motorcycles. In the client application, you can enable the display of object frames depending on the category. It is possible to set up the tracking of objects whose dimensions are within the preset range	+	√	√	√
Unique Visitor Counting	Creating the Unique Visitor Counting reports based on Face Detection and recognition, including information regarding age, sex and emotions of visitors. It is possible to exclude certain groups from the calculation to avoid, for example, counting employees. Automatic report generation. High performance video cards (GPUs) are always used for recognition; at that, all the appropriate video cards installed on the server will be used.	+	+	+	√[4]

[1] The Video analytics server license does not require other licenses and does not impose a limit on the number of cameras processed by this server.

[2] When using Windows OS, the License Plate Recognition module only works on Windows 10 and newer, Windows Server 2016 and newer.

[3] The License Plate Recognition (Complete) is not supported by Astra Linux Special Edition.

[4] Not supported on GNU/Linux family operating systems

[5] For Eocortex ULTRA licenses, face recognition modules are only available in systems with at least 50 licenses for 1 IP camera in total.

[6] Not supported in Eocortex Client application running under GNU/Linux family operating systems

Extended integration tools

Feature	Description	License			
		LS	ST	Enterprise	ULTRA
REST API for configuration	REST API used for configuring the video surveillance system.	–	–	√	√

Extended integration facilities

Feature	Description	License			
		LS	ST	Enterprise	ULTRA
Integration with POS terminals[1]	Receiving real-time information about cash transactions from POS terminals, displaying this information on the screen, storing it in the archive and using it in automation scenarios and when viewing the archive. Information from POS terminals is received via TCP/IP in the format of ESC/POS® commands	+	+	+	√
Advanced integration with the BioStar 2[2]	Extended integration with the BioStar 2 security platform, allowing you to place **Suprema** devices in the Eocortex on maps and plans, display the status of these devices, and change the status of a number of devices	–	–	+	+

[1] Not supported on GNU/Linux family operating systems

[2] One license on the server applies to all devices connected to the Eocortex video surveillance system

Advanced settings

Feature	Description	License			
		LS	ST	Enterprise	ULTRA
Eocortex Union (Beta)[1]	Eocortex Union is a platform that provides convenient access from the same point to several Eocortex video surveillance systems at the same time. Eocortex Union includes client applications, configuration and system state monitoring tools	–	–	√	√
Relocating cameras between servers	Reconnecting a camera from one server to another in a few clicks	√	√	√	√
Multiserver systems	Unifying several servers, including those geographically distributed, in a common system via local and global TCP/IP networks	√	√	√	√
Centralized setup of distributed video surveillance systems	To set up a multiserver system, it is sufficient to connect to one of the servers of the system	√	√	√	√
Centralized server update	Capability to remotely update all the system's servers from one application; it is also possible to roll back to the previous version remotely	√	√	√	√

[1] Installation on GNU/Linux OS family only, connection of servers with any OS

Advanced archive features

Feature	Description	License			
		LS	ST	Enterprise	ULTRA
Archive decimation after the preset period	Reducing the number of frames in the archive after the preset time interval. It is possible to set up the decimation in two stages: after the first interval, the number of frames in the archive is reduced to one preset value, and after the second interval the additional reduction of the number of frames takes place	–	–	√	√

Feature	Description	License			
		LS	ST	Enterprise	ULTRA
Episode archive	Storing individual archive fragments separately from the main archive without time limit	–	–	√	√
Long-term database	Storing selected types of events in a dedicated database regardless of the archive retention period. Possibility of storing frames in the service database for events of the Face recognition and License plate recognition modules	–	–	√	√
Saving the archive when moving a camera to another server	In a multiserver system, moving a camera to another server is performed without losing its archive, provided that the moving is done with the built-in setting tools of the video surveillance system	√	√	√	√

Maps and plans

Feature	Description	License			
		LS	ST	Enterprise	ULTRA
Video analytics on site plans[1]	Visualizing data of individual video analysis modules on the fields of view of the cameras placed on site plans	–	–	√	√
Integration with cartographic services	Display geographic maps provided by OpenStreetMap and Google Maps map services with the ability to change the display mode	–	–	√	√

Feature	Description	License			
		LS	ST	Enterprise	ULTRA
Cameras on maps	Displaying cameras on maps with the possibility to indicate their fields of view. Detailed camera display configuration with the ability to change the color of the icon and its viewing angle. Assigning tags to cameras for convenient search. Viewing of video from the camera on the plan: • By overlaying the image onto a field of view specified on the plan • By jumping to the camera view on the main screen of the Eocortex Client application • In the preview window that opens when hovering the cursor over the camera Creating views from the cameras placed on site plans	–	–	√	√
Sensors and relays on maps	Displaying sensors and relays connected to signal inputs and outputs of the cameras on maps. Assigning for sensors and relays icons corresponding to the type of connected device: sensor/relay, door, barrier, turnstile, lock. Visualizing the status of sensors and relays placed on maps. Switching of relay states	–	–	√	√
Locations on maps	Saving the position on the map in the list of locations for quick navigation	–	–	√	√
Objects on maps	Indicating objects on maps with the possibility of linking plans for a quick transition to a detailed plan of the area and back	–	–	√	√
Notifications on maps	Displaying alarm indicators and changes of camera status on the map, displaying current alarms on the related tab	–	–	√	√
Alarms on plans and maps	Displaying alarm indication on maps and plans	–	–	√	√

[1] Not supported in Eocortex Client application running under GNU/Linux family operating systems

√ available, included with the base license; + available at additional cost; – not available

Advanced security

Feature	Description	License			
		LS	ST	Enterprise	ULTRA
Control of access to system settings	Limitation of access of different user groups to the individual system settings, including the access to the settings of certain servers and cameras. At that, it is possible to deny access to all settings for certain user groups on all types of licenses	–	–	√	√
Microsoft® Active Directory support	Supporting authorization using Microsoft® Windows or Microsoft® Active Directory accounts. Using Microsoft® Windows or Microsoft® Active Directory groups as security groups	–	–	√	√
Microsoft® Active Directory pass-through authentication support	Possibility to quickly log into the system using the same Active Directory account that was used to log into the operating system	–	–	√	√
Priorities for interactive PTZ camera control	Assignment of priorities for interactive PTZ camera control: user with higher priority can override the user with lower priority	–	–	√	√

Advanced reliability and failover

Feature	Description	License			
		LS	ST	Enterprise	ULTRA
Duplicate disks	Simultaneous recording of the video archive and database to the main and backup drives installed on the same server	–	–	√	√
Constant redundancy of connection to cameras	The cameras are constantly connected to two servers that process and archive video from these cameras. If one of the servers fails, video and archive will be available when connecting to the other server	+	+	√	√

√ available, included with the base license; + available at additional cost; – not available

Feature	Description	License			
		LS	ST	Enterprise	ULTRA
Hot redundancy of camera connection	In case of a failure of the server itself or all of its drives, the cameras assigned to it will be processed by other servers, including the broadcasting of the real-time video and the recording to the archive. In case of the fast backing up, the switching to the redundancy server happens within 10 seconds from the moment of losing the connection with the main server	+	+	√	√
System monitoring	Monitoring the current state of the video surveillance system components: status of servers, including their accessibility, CPU and memory load, operability of video analytics and archiving subsystems, network and HDD state, camera connection status as well as monitoring certain other parameters. The monitoring subsystem allows to send notifications regarding critical events via email in accordance with the list and levels of control parameters set by the user	–	–	√	√

Video wall

Feature	Description	License			
		LS	ST	Enterprise	ULTRA
Video wall	Capability of creating a videowall using the software controller. The videowall can consist of any number of monitors connected to a computer with the Eocortex Client application running	–	–	√	√