



User Guide | Arkiv 5.0

1 User Guide. Introduction

1.1 General Information

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1.2 Purpose of the Document

This document, titled [User guide](#)(see page 1) contains the information necessary for building, implementing, and operating a security system based on *Arkiv*.

The structure of this document enables the user to get acquainted with the software package and then, depending on the user's level of training, choose sections of interest for more detailed study. The chapters in this guide, whether they are informative or serve as a reference, have their own internal structure.

The chapters [Introduction](#)(see page 1) and [Description of the Software Package](#)(see page 5) are intended to generally acquaint the user with the technical features and functionality of the *Arkiv* software package, as well as with the key stages of building a security system based on the software package.

Recommendations to the user/administrator for installing the software and configuring equipment are presented in detail in the chapter [Installing the Arkiv Software Package](#)(see page 32). The chapter [Licensing of the software product](#)(see page 66) contains instructions on how to register a license to use the *Arkiv* software package.

Startup and shutdown of the software package are described in the chapter [Launching and Closing the Arkiv Software Package](#)(see page 76).

The chapter [Configuration of the Arkiv Software Package](#)(see page 87) presents step-by-step instructions on configuring user-specific settings and activating the required functionality. This information is useful for system administrators as well as for operators with permissions to manage system settings.

Recommendations on configuring the user interface, working in various video surveillance modes, and utilizing the functional capabilities of the *Arkiv* software package are presented in chapter [Working with the Arkiv Software Package](#)(see page 593).

Chapter [Description of utilities](#)(see page 824) contains a description of additional software utilities employed when working with the software package.

The [Appendices](#)(see page 867) contains a glossary of the product's basic terms and definitions. It also lists all known issues that you may encounter while using *Arkiv*.

1.3 Purpose and functionality of Arkiv

The *Arkiv* software package is a next-generation open-platform video management software (VMS). Security systems based on *Arkiv* range from home security systems (for an apartment or house) to Professional large-scale distributed security systems for small and mid-size businesses (hotels, automotive service centers, shops, parking structures, etc.).

Video and audio surveillance of guarded locations, video analysis, and rapid response to suspicious situations without operator involvement, and storage and export of obtained data are just a few of *Arkiv*'s many functions. The *Arkiv* software package enables the user to accomplish a wide spectrum of tasks, as it works both with digital equipment and with analog video cameras (through video capture cards), and also makes it possible to create a hybrid security system containing both kinds of equipment.



The modern and constantly expanding feature set of *Arkiv* allows implementing new video surveillance functionality that increases the convenience and precision of protection at end-user sites.

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- [General Information](#)(see page 1)
- [Purpose of the Document](#)(see page 1)
- [Purpose and functionality of Arkiv](#)(see page 1)

2 Software Lifecycle Policy

2.1 Software Lifecycle Phases

The software source code repository is divided into 3 branches:

- **trunk** - current changes;
- **stabilization** - preparation of a new release;
- **release** - the latest official release.

During the development process, all new software features are added to the **trunk** branch.

After reaching *Feature Complete* status, all changes from the **trunk** branch are moved to the **stabilization** branch.


From that time on, only software fixes that are critical for this version are added to the **stabilization** branch. These fixes are also duplicated in the **trunk** branch.

After the version stabilization is completed, all changes are moved from the **stabilization** branch to the **release** branch, and a new development phase begins.

2.2 Software Technical Support

After purchasing a license key, the Customer can receive full technical support throughout the key's validity period or until the end of the software lifecycle if the license is unlimited in time.

2.3 Standard Period for Release of Software Updates

Release	Standard period
Major release	1 – 1.5 years
Minor release	3 – 5 months
Bug and security fixes 	3 – 5 weeks

Major and minor releases are available on the [company's official website](#)¹. Releases with bug and security fixes can be requested from [technical support](#)².

Software bugs can only be fixed in the latest official release.

2.4 Licensing Policy with Regard to Software Updates

- New software versions are fully compatible with the license keys of previous versions.
- After the software has been updated, all the features previously specified in the license key will be available in the new version.

¹ <https://www.inaxsys.com/>

² mail to support@inaxsys.com

- New software features that are subject to licensing will not be available until the license key is updated.

On page:

- [Software Lifecycle Phases](#)(see page 3)
- [Software Technical Support](#)(see page 3)
- [Standard Period for Release of Software Updates](#)(see page 3)
- [Licensing Policy with Regard to Software Updates](#)(see page 3)

3 Description of the Software Package

3.1 Basic principles of building a security system based on the Arkiv software package

Building a security system based on the *Arkiv* software package includes the following recommended stages:

1. Selecting a configuration for the security system (with the help of professionals)
2. Building a separate local area network with restricted access
3. Calculating the sufficient bandwidth required for each segment of the local area network
4. Selecting and configuring the software and hardware platform on which the selected security system configuration will be implemented (selecting and configuring personal computers to act as servers and clients in accordance with the requirements, as referenced in the section titled [Implementation Requirements for the Arkiv Software Package](#)(see page 13), [Operating system requirements](#)(see page 14))
5. Selecting and connecting reliable equipment that is optimally suited for a specific security system (with the help of professionals)
6. Training personnel to work with the *Arkiv* software package in accordance with the requirements (see the section titled [Requirements for Personnel Quantity and Qualifications](#)(see page 30)).

3.2 Arkiv features: reference information

The advanced features available in *Arkiv* are continuously updated and extended.

Arkiv offers virtually unlimited opportunities for system scaling, task-based customization, and reallocation of resources (based on changes in the number or quality of video and audio monitoring tasks) at end-user sites.

Video surveillance systems based on *Arkiv* can scale infinitely: there are no restrictions on the number of video Servers, workstations or video cameras.

Support for over 1500 models of IP cameras is included, as well as remote access from mobile devices and a web interface. The *Arkiv* software package supports touchscreens.

3.2.1 Micromodule architecture

The micromodule architecture of *Arkiv* video management software allows implementing different video management system functions as different operating system processes. Each function is the responsibility of a different micromodule; a dispatcher module monitors the functioning of the micromodules. If a function encounters an error and a process is quit unexpectedly, the dispatcher module automatically relaunches the corresponding micromodule. This does not affect the performance of other processes or the functioning of the VMS overall.

3.2.2 Support for IP cameras

Drivers Pack

IP camera support in *Arkiv* is provided through the *Drivers Pack* Module specially developed by Inaxsys and regularly updated to support new IP devices.

Drivers Pack allows adding support for new IP devices without having to wait for the release of new versions of *Arkiv* and without reinstalling the entire system.

Multistreaming

Many of today's IP cameras can transmit two video streams with different video parameters and compressed in different codecs. *Arkiv* supports Multistreaming i.e. receiving two streams from a camera simultaneously: high-quality and low-quality, which allows taking advantage of this feature of IP equipment to optimize the CPU load on the video Server and the Client workstation.

GreenStream

The GreenStream feature saves bandwidth and Client CPU resources. It automatically chooses a video stream from a camera to the Server, and then to the Client, depending on the resolution at which the video is currently displayed on the Client.

Embedded video camera analytics

Arkiv supports on-board detection embedded in video cameras. This means that when on-board detection tools are triggered, *Arkiv* is notified and can use these events to drive system reactions. On-board detection does not burden the CPU of the video Server and makes use of uncompressed video (completely bypassing the compressing/decompression process), and therefore provide extra stability in difficult conditions such as poor visibility.

360 degree camera support

360 degree camera support allows dewarping video from a fish-eye camera or camera with an ImmerVision panomorphonic lens to obtain several "normal" flat images with different frame aspect ratios for display on the Client screen. One of the resulting virtual cameras can be a virtual PTZ unit.

ONVIF

Inaxsys is a member of [ONVIF](http://www.onvif.org/)³ (the Open Network Video Interface Forum), which work toward the development and promotion of international standards for network security and video surveillance system interfaces. ONVIF is supported in *Drivers Pack*.

RTSP support

Many IP cameras support multimedia streaming via RTSP. *Arkiv* supports receiving such streams without requiring integration of the relevant camera via *Drivers Pack*.

3.2.3 Support for analog cameras in Arkiv

Alongside IP cameras, *Arkiv* allows you to use analog cameras in your video surveillance system. Analog cameras are more affordable and are well-suited for many installations without high video resolution requirements. In addition, *Arkiv* allows creating hybrid systems that combine both analog and IP cameras.

³ <http://www.onvif.org/>

3.2.4 Video and Audio Detection Tools

Arkiv video management software incorporates a powerful system for analysis of video images. It includes the following video detection tools:

1. Motion detection.
2. Background change detection.
3. Detection for loss of video quality.
4. Abandoned objects detection.
5. Detection of crossing a line in a given direction.
6. Motion start detection.
7. Motion stop detection.
8. Loitering detection.
9. Object appearance detection.
10. Object disappearance detection.

In addition to the video detection tools, *Arkiv* has two audio detectors:

1. Noise detection — is triggered by exceeding a certain threshold volume level.
2. Silence detection — is triggered when the microphone signal disappears completely.

Macros can be set to automatically run when a detection tool is triggered (on a per-detector basis). Multiple detection tools can be combined into complex conditional rules.

3.2.5 Video archive

SolidStore

SolidStore is a file new system for reliable video storage developed by Inaxsys especially for storing video archives. By optimizing the reading/writing process we managed to achieve three important advantages:

- Enable high read/write speeds, approaching the physical access speed limit of the hard disk.
- Increase the service life of the hard disk.
- Solve the problem of data fragmentation.

Timelapse Compressor

Timelapse Compressor allows the user to set a time range for video footage and get a short video clip of all moving objects in the scene. Objects and events captured at different times are displayed simultaneously in a condensed "video synopsis". Timelapse Compressor is especially convenient for viewing large archives that feature a relatively small number of active objects.

Forensic Search in Archive

The *Arkiv* video management software (VMS) utilizes VMDA — a database developed by Inaxsys for indexing and storing descriptions of observed scenes. Along with video recording, this database allows archiving characteristics of all moving objects in the scene, and then uses these characteristics to perform quick searches of the video recordings (Post-Analytics2 technology).

3.2.6 Interactive 3D Map

Interactive 3D Map superimposes camera locations on a site map and displays camera views in the same window. Cameras in the current layout are color-coded by current status. Operators can instantly pinpoint where a selected camera is located on the map and identify the corresponding location of interest.

Immersion Mode

When enabled, this mode overlays a translucent video viewing tile on the map; fixed objects in the field of view (furniture, doors, etc.) are combined with their depictions on the map. This allows easily seeing where a person or car is located and where it is going.

OpenStreetMap

OpenStreetMap support is available in *Arkiv*. The site map is downloaded from the Internet and the user selects the necessary area and scale. Additional map data is downloaded in real time, if needed, when zooming in/ out or scrolling.

Note

To work with OpenStreetMap maps in *Arkiv*, you need to purchase an [OpenStreetMap](https://www.openstreetmap.org/copyright/en)⁴ license.

Virtual PTZ cameras on the map

The Virtual PTZ Camera function becomes available when the map contains at least one fish-eye camera. This function allows viewing video from a fish-eye camera directly on the map. Click anywhere in the fish-eye video shown in a layout cell to dewarp the source video, with digital zoom and click-to-focus.

3.2.7 User Interface

Editable camera layouts

Arkiv allows you to create custom camera layouts. Layouts can be configured in any way the user wants and the aspect ratios of viewing tiles can be fine-tuned. Editable layouts efficiently fit different cameras with different aspect ratios on the same screen, as well as support display of dewarped fish-eye camera footage.

Autozoom

Autozoom helps to monitor moving objects by automatically adjusting the level of digital zoom. Autozoom shows close-in video for parts of the frame that contain a moving object or objects and follows them as they move, just as a movie camera does when taking a close-up shot.

⁴ <https://www.openstreetmap.org/copyright/en>

3.2.8 Face Recognition

Arkiv includes an algorithm for recognizing human faces in a video frame and subsequent search for them in a video archive of several cameras. You can search by an uploaded photo or by an image of a person's face selected in a video archive frame. The system will return the video fragments from the archive where the searched person is present as search results.

3.2.9 Number Plate Recognition

Arkiv also includes an algorithm for recognizing vehicle number plates. The recognized number plates are saved to a database and matched with a video archive of several cameras. If a number plate contains similar characters, the system generates several hypotheses during the recognition. This increases the probability of a successful search for a particular number in a generated database.

3.2.10 Receiving Events from External Systems

Arkiv includes a new feature set that is capable of receiving events from various external devices and systems – POS terminals, access control units, external software, etc.

On page:

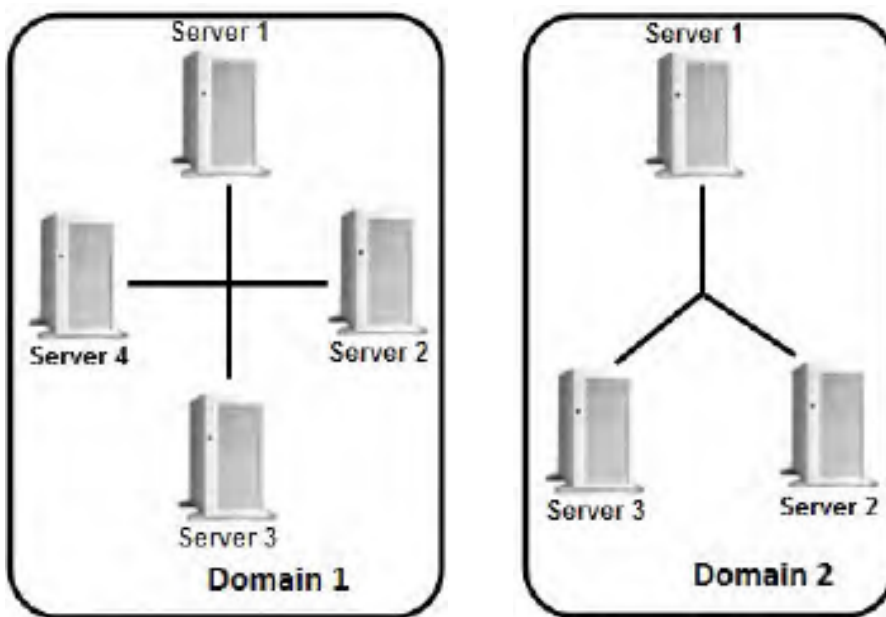
- [Micromodule architecture](#)(see page 5)
- [Support for IP cameras](#)(see page 5)
 - [Drivers Pack](#)(see page 5)
 - [Multistreaming](#)(see page 6)
 - [GreenStream](#)(see page 6)
 - [Embedded video camera analytics](#)(see page 6)
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 - [ONVIF](#)(see page 6)
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- [Video and Audio Detection Tools](#)(see page 7)
- [Video archive](#)(see page 7)
 - [SolidStore](#)(see page 7)
 - [Timelapse Compressor](#)(see page 7)
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- [Interactive 3D Map](#)(see page 8)
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 - [Virtual PTZ cameras on the map](#)(see page 8)
- [User Interface](#)(see page 8)
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 - [Autozoom](#)(see page 8)
- [Face Recognition](#)(see page 9)
- [Number Plate Recognition](#)(see page 9)
- [Receiving Events from External Systems](#)(see page 9)

3.3 Functions of the Distributed Security System

You can create a distributed system within an Arkiv Domain on *Arkiv*.

Arkiv Domain – a selected group of computers on which the server configuration of the *Arkiv* software package is installed. Linking the servers in a group makes it possible to set up interaction between them, thus organizing a distributed system.

Servers are interoperable only if they belong to the same Arkiv domain. At the same time, each Server of the domain operates independently and has its own DB.



A distributed security system based on the *Arkiv* software package offers the user the following functional capabilities:

1. Viewing and manual processing of video and audio data from several servers on one client;
2. Controlling video cameras connected to various servers from one client;
3. Configuring all servers of the distributed system on one client;
4. Execution of automatic responses when detection tools are triggered (audio notification, triggering of relays, SMS and e-mail notification, etc.) within the distributed system.

Note

If a Server is not accessible by NetBiosName or some TCP and UDP ports are closed, it is possible to build a distributed security system on a virtual private network (VPN). For example, with the help of [OpenVPN](http://openvpn.net/)⁵. Detailed information on OpenVPN and examples of virtual private network configuration are given in the [official documentation](#)⁶.

Suppose, the Server relies on a defined port range (see [Installation](#)(see page 36)), and you want to set up a surveillance system based on several networks. You do not have to use VPN in that case. Use port forwarding instead.

⁵ <http://openvpn.net/>

⁶ <http://openvpn.net/index.php/access-server/docs.html>

Arkiv Domain configuration is described in detail in the section titled [Configuring Arkiv domains](#)(see page 91).

3.4 Network Topologies of the Arkiv Software Package

Arkiv supports both decentralized and star network topologies. The decentralized architecture better suits smaller systems.

The star architecture is more practical for creating large centrally monitored distributed systems where no local monitoring is required on remote sites.

❏ Attention!

If your system is based on star topology, please take into account the following:

1. In a failover (see [General information about a failover system](#)(see page 562)) and non-failover systems, the Client must have access to all Servers (located centrally).
2. In a failover system, all Manager Servers must have access to each other (located centrally).

3.5 Specifications of the Arkiv Software Package

Security systems based on the *Arkiv* software package have the following primary characteristics.

Characteristics	Value
Number of servers in the distributed system	Unlimited
Number of clients which support simultaneous connection to the server	Unlimited
Number of servers which simultaneously transmit video images to a client	Unlimited
Number of video capture channels for "live video" processing on one Server	Unlimited
Number of detection tools per camera	Unlimited
Number of simultaneously processed signals coming from microphones	Unlimited
Number of audio output channels (to speakers, headphones, etc.)	depends on the sound card used for playback
Number of PTZ devices used	Unlimited

Characteristics	Value
Number of event sources (POS devices)	Unlimited
Number of user roles and users	Unlimited
Number of objects simultaneously tracked by the Object tracker (see page 239)	up to 25
Number of license plate recognition channels	Is determined by the license; there is no upper limit
Number of face recognition channels	Is determined by the license; there is no upper limit
Number of mobile clients or Web clients connections	Unlimited
Number of video walls	Unlimited
Number of maps	Unlimited
Analog video camera support	yes (through video capture cards)
IP device support	IP cameras and IP video servers This list is continuously expanding: support for new hardware is added through updates to Arkiv Driver Pack
CPU support	32-bit (x86), 64-bit (x64)
Number of archives in the system	Unlimited
Maximum archive size	Unlimited
Video compression algorithms	MJPEG, MPEG-2, MPEG-4, MxPEG, H.264, H.264+, H.265, H.265+, Hik264 (only for x86)
Audio compression algorithms	PCM , ADPCM , g711 , g726 , aac , mp2
Available video image resolutions	resolutions supported by video cameras
Support for embedded video camera analytics	yes
Support for touchscreens	yes

3.6 Implementation Requirements for the Arkiv Software Package

3.6.1 Limitations of the Arkiv Software Package

When working with *Arkiv*, the user must keep in mind the limitations that the developer has imposed on the system in order to ensure its operability.

No.	Limitation
1	<p>To work with <i>Arkiv</i> software the following requirements for OpenGL are to be fulfilled:</p> <ol style="list-style-type: none"> 1. Version 2.0 and higher. 2. Availability the ARB_vertex_program, GL_EXT_blend_func_separate, GL_ARB_framebuffer_object extensions. <p>Extensions availability can be checked using the OpenGL Extension Viewer program (download⁷).</p> <p>This program also contains a large database of data on OpenGL support in video cards of various vendors.</p>
2	<p><i>Arkiv</i> Client cannot be started if the scale of all items on the screen (DPI) is over 100%.</p> <p>You may have issues with <i>Arkiv</i> VMS if the screen resolution is set lower than 1280*960 pixels.</p>
3	<p>The Server and Client must be of the same version. If not, <i>Arkiv</i> VMS may have issues.</p>
4	<p>For correct operation of <i>Arkiv</i> VMS, the OS should use the UTF-8 locale.</p>
5	<p>In one LAN, two Servers with the same name are not allowed, even if they belong to different Arkiv-domains.</p>
6	<p>Maximum video frame rate in the Client is 50 fps.</p>
7	<p>To install <i>Arkiv</i>, you must log in to Windows as an administrator.</p>
8	<p>For proper installation of <i>Arkiv</i>, there should be no spaces at the beginning of the name of the folder which contains the installer.</p>
9	<p>For correct and full-feature operation of <i>Arkiv</i> software, the system must not limit network activity between all Servers and Clients.</p> <p>TCP and UDP access to these ports should be enabled. Otherwise, access to all ports should be allowed in the system.</p>

⁷ <http://realtech-vr.com/home/glview>

No.	Limitation
10	Time must be synchronized among all computers in the system (to be configured by the user).
11	If you have edge storage enabled in the system, synchronization between the Server and the IP device is necessary (see The Embedded storage object (see page 161)). Lack of synchronization may lead to bad DB entries of events detected on the edge device.
12	Before installing <i>Arkiv</i> , make sure the video card drivers on the computer are fully up to date.
13	NetBIOS name of a PC must match the following requirements: <ul style="list-style-type: none"> • contains only Latin, numerical and "-" characters; • does not exceed 15 characters in length.
14	The face detection tool requires a CPU supporting SSE4.2, FMA3 or AVX2.0 instruction set.
15	The Client cannot be started on a remote desktop through the Remote Desktop Connection utility built into Windows.
16	If a computer is linked to an Active Directory domain, one of the following conditions must be met to enable disk access: <ol style="list-style-type: none"> 1. Access control lists must contain only local or built-in groups and users. 2. Create an ArkivFileBrowser user in the domain and add it to the Users group (see Installation(see page 36)). This behavior is typical only of file systems that have access permissions (for example, NTFS).

3.6.2 Operating system requirements

Arkiv VMS operates properly when the operating system is up-to-date.

OS version	Supported edition	Note
Windows 7 SP1 (x86, x64)	Starter	Neural analytics not applicable (see Hardware requirements for neural analytics operation (see page 23)). Restrictions, posed by OS edition (2GB of main memory, 1 physical processor, 1 monitor) – see https://www.microsoft.com ⁸ .
	Home Basic	Neural analytics not applicable (see Hardware requirements for neural analytics operation (see page 23)). Restrictions, posed by OS edition (1 physical processor) – see http://www.microsoft.com ⁹ .
	Home Premium	Neural analytics not applicable (see Hardware requirements for neural analytics operation (see page 23)). Restrictions, posed by OS edition (1 physical processor) – see http://www.microsoft.com ¹⁰ .
	Professional	Neural analytics not applicable (see Hardware requirements for neural analytics operation (see page 23)).
	Enterprise	Neural analytics not applicable (see Hardware requirements for neural analytics operation (see page 23)).
	Ultimate	Neural analytics not applicable (see Hardware requirements for neural analytics operation (see page 23)).
Windows 8 (x86, x64)	Core	Neural analytics not applicable (see Hardware requirements for neural analytics operation (see page 23)).
	Pro	Neural analytics not applicable (see Hardware requirements for neural analytics operation (see page 23)).
	Enterprise	Neural analytics not applicable (see Hardware requirements for neural analytics operation (see page 23)).

⁸ <https://www.microsoft.com/en-gb/>

⁹ <https://www.microsoft.com/en-gb/>

¹⁰ <https://www.microsoft.com/en-gb/>

OS version	Supported edition	Note	
Windows Server 2012 (x64)	Foundation	Neural analytics not applicable (see Hardware requirements for neural analytics operation (see page 23)). Restrictions, posed by OS edition (1 physical processor).	Full Installation type is supported. Server Core Installation type is not supported.
	Essentials	Neural analytics not applicable (see Hardware requirements for neural analytics operation (see page 23)). Restrictions, posed by OS edition (2 physical processors).	
	Standard	Neural analytics not applicable (see Hardware requirements for neural analytics operation (see page 23)).	
	Datacenter	Neural analytics not applicable (see Hardware requirements for neural analytics operation (see page 23)).	
Windows Server 2012 R2 (x64)	Essentials	Neural analytics not applicable (see Hardware requirements for neural analytics operation (see page 23)). Restrictions, posed by OS edition (2 physical processors).	Full Installation type is supported. Server Core Installation type is not supported.
	Standard	Neural analytics not applicable (see Hardware requirements for neural analytics operation (see page 23)).	
	Datacenter	Neural analytics not applicable (see Hardware requirements for neural analytics operation (see page 23)).	
Windows Server 2016 (x64)	Essentials	Neural analytics not applicable (see Hardware requirements for neural analytics operation (see page 23)). Restrictions, posed by OS edition (2 physical processors).	Full Installation type is supported. Server Core Installation type is not supported.
	Standard	Neural analytics not applicable (see Hardware requirements for neural analytics operation (see page 23)).	

OS version	Supported edition	Note	
	Datacenter	Neural analytics not applicable (see Hardware requirements for neural analytics operation (see page 23)).	
Windows 10 (x86, x64)	Pro	OS edition, enabling to use all realized product features.	
	Enterprise	OS edition, enabling to use all realized product features.	
	Education	OS edition, enabling to use all realized product features.	
	Home Edition	OS edition, enabling to use all realized product features.	
Windows 10 IoT (x86, x64)	Enterprise	OS edition, enabling to use all realized product features.	Server Core Installation type is not supported.
	Enterprise LTSC 2016	OS edition, enabling to use all realized product features.	
	Enterprise LTSC 2019	OS edition, enabling to use all realized product features.	
Windows Server 2019 (x64)	Essentials	Restrictions, posed by OS edition (2 physical processors).	Full Installation type is supported. Server Core Installation type is not supported.
	Standard	OS edition, enabling to use all realized product features.	
	Datacenter	OS edition, enabling to use all realized product features.	
Windows 11 (x86, x64)	Home	OS edition, enabling to use all realized product features.	Full Installation type is supported. Server Core Installation type is not supported.
	Pro	OS edition, enabling to use all realized product features.	
	Education	OS edition, enabling to use all realized product features.	
	Pro Education	OS edition, enabling to use all realized product features.	

OS version	Supported edition	Note	
	Pro for Workstations	OS edition, enabling to use all realized product features.	
	Enterprise	OS edition, enabling to use all realized product features.	
Windows Server 2022 (x64)	Standard	OS edition, enabling to use all realized product features.	Full Installation type is supported. Server Core Installation type is not supported.
	Essentials	OS edition, enabling to use all realized product features.	
	Datacenter	OS edition, enabling to use all realized product features.	
	Azure Datacenter	OS edition, enabling to use all realized product features.	
Debian 9 (x64) Debian 10 (x64) Debian 11 (x64) Ubuntu 18 (x64) Ubuntu 19 (x64) Ubuntu 20 (x64)		Appendix 8. Configuring and operating the Arkiv in Linux OS (see page 885).	

3.6.3 Disk storage subsystem requirements

General requirements

For *Arkiv* VMS operation, the disk subsystem should match the following requirements:

1. The number of input/output operations (IOPS) of the device should not be less than the IOPS of *Arkiv* VMS.

Arkiv records the archive in blocks of 4 MB every 10 seconds. However, if the block is not filled in 10 seconds, a smaller fragment of the block will be recorded, which will be added to later.

Archive playback is also performed in blocks (except when reindexing, see [Console utility for working with archives](#)(see page 862)).

Below you can see how you can estimate the IOPS for *Arkiv* VMS.

	If the average bitrate per camera is less than ~3.6 Mbps	If the average bitrate per camera exceeds ~3.6 Mbps
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IOPS during archive recording Archive recording includes both data input (recording) and output (reading) operations	IOPS (recording) = $0.29 * N$ IOPS (reading) = $0.035 * M$	IOPS (recording) = $0.065 * M$ IOPS (reading) = $0.035 * M$
IOPS during archive playback Archive playback includes only output (reading) operations	IOPS (reading) = $0.035 * R * S$	
IOPS during simultaneous recording and playback	IOPS (recording) = $0.29 * N$ IOPS (reading) = $0.035 * M + 0.035 * R * S$	IOPS (recording) = $0.065 * M$ IOPS (reading) = $0.035 * M + 0.035 * R * S$
where <ul style="list-style-type: none"> • N is the number of cameras being recorded; • M is the cumulative bitrate of all cameras being recorded, in Mbps; • R is the cumulative bitrate of all cameras being played back from the archive at normal speed (1x), in Mbps; • S is the playback speed. 		

- If you use RAID storage, specify the write-back policy for recording to cash memory.

Storage requirements

The disk subsystem capacity of *Arkiv Server* should be estimated taking into account the resolution, the compression algorithm, the frame rate of the recorded video signal, the number of video cameras from which the recording to disk(s) takes place and other recording parameters. In addition, the size of the system log and metadata databases should be considered.

Minimum requirements

You need at least 10 GB of free disk space on Windows OS and 5 GB on Linux OS to install the *Arkiv VMS* package in the **Server and Client** configuration.

See the storage calculations below, taking into account the size of the archive, the size of the database and the size of the archive of the system logs.

Size of the archive

The capacity of the disk subsystem can be calculated by the formula:

Capacity of disk subsystem (MB) = Time of storing archive (days) * Cameras number * Rate of recording (FPS) * 3.51 * Time of guaranteed recording from a camera (h/day) * Average frame size (KB),

where

Time of storing archive is the required time for storing an archive from one camera, days;

Cameras number is the number of cameras from which recording to the archive takes place;

Rate of recording is the frame rate of recording to the archive, frames per second;

3.51 = (60 sec in min * 60 min in hour) / (1024 KB in MB) is the factor used for KB/s in MB/h conversion;

Time of guaranteed recording from a camera is the number of hours of guaranteed recording from one camera per day;

Average frame size is the average size of the camera frame in KB.

Note

Average frame size of 640x480 resolution is:

Video codec	Average frame size
H.264	from 8 KB to 17 KB
MPEG4	from 8 KB to 35 KB
MJPEG	from 23 KB to 60 KB

Average frame size may vary over a wide range depending on the vendor, the model and the settings of the camera and video image complexity.

Note

To calculate the frame size you can use the ratio, that when increasing the vertical or horizontal resolution two times, the average frame size will be increased four times (this rule is a relative and can be applied only to some camera models).

Examples of calculating the capacity of the disk subsystem (without the capacity of the system log and metadata databases) are presented below.

Recording parameters	Calculating results
4 cameras with 25 FPS and 640x480 resolution, guaranteed recording of 24 hours per day during one week	H.264: from 500 GB to 1 TB MPEG4: from 500 GB to 2 TB MJPEG: from 1.3 TB to 3.5 TB
16 cameras with 12 FPS and 640x480 resolution, guaranteed recording of 12 hours per day during one week	H.264: from 500 GB to 1 TB MPEG4: from 500 GB to 2 TB MJPEG: from 1.3 TB to 3.5 TB
4 cameras with 25 FPS and 1280x960 resolution, guaranteed recording of 24 hours per day during one week	H.264: from 2 TB to 4 TB MPEG4: from 2 TB to 8 TB MJPEG: from 5.3 TB to 14 TB

System log database

The capacity of the system log database should be taken into account when the capacity of the disk subsystem is calculated. The estimated capacity of the system log database is calculated by the formulas:

Capacity of system log database (low detection tools activity) = $D * T * (0.04 \text{ GB / day})$;

Capacity of system log database (average detection tools activity) = $D * T * (0.12 \text{ GB / day})$;

Capacity of system log database (high detection tools activity) = $D * T * (0.48 \text{ GB / day})$;

where

D is the total number of detection tools created in the system,

T is the estimated duration of system log storage, days.

Metadata database

The following formulas can be used to determine the required disk size for the metadata database:

Size of metadata database = $N * T * (0.5 \text{ GB / day})$ – sufficient disk size;

Size of metadata database = $N * T * (1 \text{ GB / day})$ – sufficient disk size plus reserve space;

Size of metadata database = $N * T * (5 \text{ GB / day})$ – sufficient disk size plus a large reserve,

where

N is the number of detection tools in the system actively recording metadata. One video camera can have several detection tools with metadata (see [General information on metadata](#)(see page 224)),

T is the period of time (number of days) that metadata will be stored. By default, $T = 30$ days.

If you have less than 15 GB of free disk space, the metadata database is overwritten - the new data is written over the oldest data.

The system logs

When calculating the disk subsystem capacity, it is necessary to include at least 1 GB for the system logs archive.

Self-diagnostics service

When calculating disk subsystem capacity, note that self-diagnostics service may generate up to 100 MB of data per day.

The depth of the service internal database is limited to 7 days and 512 MB.

On the page:

- [General requirements](#)(see page 18)
- [Storage requirements](#)(see page 19)
 - [Minimum requirements](#)(see page 19)
 - [Size of the archive](#)(see page 19)
 - [System log database](#)(see page 20)
 - [Metadata database](#)(see page 21)
 - [The system logs](#)(see page 21)
 - [Self-diagnostics service](#)(see page 21)

3.6.4 Hardware requirements

General hardware requirements

Arkiv software package is designed for use on computers.

The required hardware configuration (RAM, CPU, and hard disk) can be determined using the [Inaxsys calculator](#).

- [Disk storage subsystem requirements](#)(see page 18)
- [TCP/IP Network Bandwidth Requirements](#)(see page 26)
- [Hardware requirements for neural analytics operation](#)(see page 23)
- [Hardware requirements for face detection](#)(see page 26)
- [Hardware requirements for GPU based video decoding](#)

□ **Attention!**

If Arkiv is installed on a computer with two processors, it is recommended to disable the Hyper-threading.

Minimum RAM requirements

At least 8 GB of RAM is recommended. For a specific calculation, use the [platform calculator](#). If you increase RAM speed by using the memory at a higher frequency or using the memory in dual-channel (or more) mode, it will reduce CPU usage and boost the performance of Arkiv.

Minimum and recommended requirements for graphics cards

Minimum and recommended requirements for graphics cards are given below.

Recommended requirements	Discrete NVIDIA GPU: GeForce 1030 1GB or higher Integrated GPU: Intel UHD Graphics 630 or higher
---------------------------------	---

Minimum requirements	<p>Discrete NVIDIA GPU: GeForce 7300LE / GeForce 200 or higher (512MB)</p> <p>AMD GPU: Radeon HD 5000, Radeon HD 6000 or higher.</p> <p>Integrated GPU: Intel HD Graphics 530</p> <p>OpenGL version 2.0 or higher</p> <p>Availability of the ARB_vertex_program, GL_EXT_blend_func_separate, GL_ARB_framebuffer_object extensions for OpenGL</p> <p>Extensions availability can be checked using the OpenGL Extension Viewer program (download¹⁴).</p>
-----------------------------	--

It is recommended to use the latest drivers for both integrated and discrete graphics cards.

Hardware requirements for neural analytics operation

The hardware requirements for the neural analytics (see [General information on Neural Analytics](#)(see page 226)) are:

1. Some NVIDIA SDK specific features allow the neural analytics to work only on Windows Server 2019 or Windows 10.
2. For neural analytics operation, you may use CPU, GPU NVIDIA, VPU ([Intel NCS](#)¹⁵, Intel HDDL).

Note

To connect [Intel NCS](#)¹⁶, insert the device into a USB port and make sure that it is recognized by Windows OS as a USB device with one of the following names: Movidius, Myriad X, or VSC Loopback Device.
[Intel NCS](#)¹⁷ may be used with any PC that meets *Arkiv* hardware requirements (see [Hardware requirements](#)(see page 22)).

Attention!

We do not recommend using more than one [Intel NCS](#)¹⁸ device per Server.
 You can use several Intel HDDL devices on the Server if they have the same revisions.

Attention!

For Intel HDDL to work correctly with AMD processors, pre-install the OpenVINO™ toolkit version 2019.3.379 (see [Installing opencvino windows](#)¹⁹).

3. If the detection tool uses CPU or Intel GPU resources, the following requirements should be met:

¹⁴ <http://realtech-vr.com/home/glview>

¹⁵ <https://software.intel.com/en-us/neural-compute-stick>

¹⁶ <https://software.intel.com/en-us/neural-compute-stick>

¹⁷ <https://software.intel.com/en-us/neural-compute-stick>

¹⁸ <https://software.intel.com/en-us/neural-compute-stick>

¹⁹ https://docs.opencvino.com/latest/opencvino_docs_install_guides_installing_opencvino_windows.html

- a. Supported CPUs:
 - i. 6th-10th Generation Intel® Core™ processors;

❏ Attention!

When using a CPU lower than 6th Generation Intel® Core™ processors, the operation of the detection tool is not guaranteed.
 - ii. Intel® Xeon® v5 family;
 - iii. Intel® Xeon® v6 family;
 - iv. Intel® Movidius™ Neural Compute Stick;
 - v. Intel® Neural Compute Stick 2;
 - vi. Intel® Vision Accelerator Design with Intel® Movidius™ VPUs.
 - b. OpenVino should support the Intel CPU in use (see <https://software.intel.com/content/www/us/en/develop/tools/openvino-toolkit/system-requirements.html>).
 - c. CPU should support the AVX2 or AVX512 instruction set (see https://ark.intel.com/content/www/us/en/ark/search/featurefilter.html?productType=873&1_Filter-InstructionSetExtensions=3533&1_Filter-Family=595).
4. Video card: NVIDIA GeForce 1050 Ti or higher. Requirements:
 - a. At least 2 GB of memory;
 - b. CUDA 11.1 – 11.4;
 - c. Compute Capability 3.5 – 8.6.

❏ Attention!

CUDA is compatible with generations of computers with the following architectures: Kepler (partially), Maxwell, Pascal, Volta, Turing, Ampere (partially) (see [CUDA²⁰](#)).

❏ Note

You can check Compute Capability GPU version on the [manufacturer's²¹](#) website.

❏ Attention!

If you use NVIDIA graphics cards, make sure to download the latest drivers from the [manufacturer's website²²](#).

When using a video card, a single neural network requires 500 MB of video memory, except for the neural network for face detection (see [Hardware requirements for face detection](#)(see page 26)) and license plate recognition (RR) (see [Hardware requirements for License plate recognition \(RR\)](#)(see page 25)). For example: a neural fire detection tool and a neural smoke detection tool, both with unlimited number of channels, require a 1 GB graphics card or higher. You can use multiple video cards in your system.

❏ Attention!

For correct operation of each detection tool, video image should match a specified set of requirements. Requirements for each detection tool are listed in corresponding sections (see [Configuring detection tools](#)(see page 221)).

²⁰ <https://en.wikipedia.org/wiki/CUDA>

²¹ <https://developer.nvidia.com/cuda-gpus>

²² <https://www.nvidia.com/Download/index.aspx?lang=en-us>

Hardware requirements for GPU based video decoding

If detection tools use GPU for video decoding (see [Configuring detection tools](#)(see page 221)), make sure the following hardware requirements are met:

1. For NVIDIA graphics cards:
 - a. CUDA 11.1 – 11.4.
 - b. Compute Capability 3.5 – 8.6.

⚠ Attention!

CUDA is compatible with generations of computers with the following architectures: Kepler (partially), Maxwell, Pascal, Volta, Turing, Ampere (partially) (see [CUDA](#)²³).

📌 Note

You can check Compute Capability GPU version on the [manufacturer's](#)²⁴ website.

⚠ Attention!

When using NVIDIA graphics cards, it is recommended to install the latest driver from the [official website](#)²⁵.

- c. Support for the required codec in NVDEC (see [here](#)²⁶).

⚠ Attention!

Video can be decoded on two NVIDIA GPUs at a time.

2. For the integrated Intel GPUs:
 - a. 6th generation CPU or higher.
 - b. Support for the required codec in Quick Sync Video.

Hardware requirements for License plate recognition (RR)

If license plate recognition (RR) runs on GPU, make sure the following hardware requirements are met:

1. The GPU is an NVIDIA with at least 1.4 GB of video memory.
2. Compute Capability from 3.5 to 7.5 inclusive.

📌 Note

You can check Compute Capability GPU version on the [manufacturer's](#)²⁷ website.

3. NVIDIA driver version 450.36.06 or higher.
4. CPUs with the AVX2 instruction set support, which are listed [here](#)²⁸.

²³ <https://en.wikipedia.org/wiki/CUDA>

²⁴ <https://developer.nvidia.com/cuda-gpus>

²⁵ <https://www.nvidia.com/Download/index.aspx?lang=en-us>

²⁶ <https://developer.nvidia.com/video-encode-and-decode-gpu-support-matrix-new>

²⁷ <https://developer.nvidia.com/cuda-gpus>

²⁸ https://ark.intel.com/content/www/us/en/ark/search/featurefilter.html?productType=873&1_Filter-InstructionSetExtensions=3532

Hardware requirements for face detection

The face detection tool requires a CPU supporting SSE4.2, FMA3 or AVX2.0 instruction set.

If face recognition runs on GPU, make sure the following hardware requirements are met:

1. The GPU is an NVIDIA with at least 6 GB of video memory.
2. Compute Capability 6.0 or higher.

Note

You can check Compute Capability GPU version on the [manufacturer's](#)²⁹ website.

3. NVIDIA driver version is 418.39 or higher.

Hardware requirements for License plate recognition (VT)

The VT automatic number plate recognition tool runs on the following processors: CPU, Intel GPU, VPU (IntelNCS).

For NVIDIA GPUs:

Attention!

GPUs with NVIDIA Ampere architecture are not supported.

1. Compute Capability 3.5 and higher.

Note

You can check Compute Capability GPU version on the [manufacturer's](#)³⁰ website.

2. Support for CUDA 10.2 or higher.

You can find the list of supported devices on the [OpenVINO™ toolkit](#)³¹ page.

3.6.5 TCP/IP Network Bandwidth Requirements

Network bandwidth is a limiting factor in distributed system performance. The bulk of the information streamed over the network is video data. For example, the data flow (video stream) from remote cameras, such as used to monitor ATMs, is sent via communication channels.

Attention!

The minimum bit rate through the communication channel (network bandwidth consumption / goodput) for the Arkiv VMS, should be at least **2 Mbit/s**.

To determine the required TCP/IP network bandwidth for video transmission from IP devices and some video capture cards, we recommend you to use [Arkiv Platform Calculator](#) (check the **Total bitrate from ip devices (Mbit/s)** parameter).

²⁹ <https://developer.nvidia.com/cuda-gpus>

³⁰ <https://developer.nvidia.com/cuda-gpus>

³¹ https://docs.openvino.ai/latest/openvino_docs_OV_UG_supported_plugins_Supported_Devices.html

3.6.6 BIOS configuration requirements

Arkiv suite performance (namely, video decoding) is sensitive to CPU frequency. The higher the frequency, the better will be *Arkiv* performance on this platform.

Modern computers have the power saving mode enabled in BIOS by default. Using this mode in multiprocessor systems results in incomplete CPU core utilization and decreases the performance of an input/output subsystem.

To increase *Arkiv* suite performance, configure the computer BIOS as follows:

1. Disable all Enhanced Intel SpeedStep (EIST) technologies.
2. Disable power saving modes: select options providing maximum performance.
3. Disable green technologies such as Energy Saving, Turbo Boost, SmartThrottling.

Attention!

Different motherboard manufacturers use different names for these technologies. Therefore, for every particular motherboard model you **must** find the technology name in the documentation for this model.

3.6.7 Running Arkiv VMS in Virtual Machines

The *Arkiv* VMS can be run in the following virtual machines:

- VirtualBox (all versions);
- VMware (all versions);
- Hyper-V (all versions).



Attention!

To run the Client, 3D acceleration must be enabled.

Note

The operating system in a virtual machine must meet the general requirements.
If you use VirtualBox on Windows 7 SP1 and in Hyper-V, you won't be able to access a Guardant USB key from the guest system.
In Hyper-V, you can use third-party utilities (for example, [USB Network Gate³³](http://www.net-usb.com/downloads/)) instead.


3.7 Interface of the Arkiv Software Package

Arkiv Client has 2 basic interfaces: Layouts  and Settings .

To switch the two, click the tabs at the top of the screen.

Note

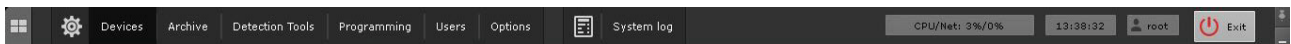
³³ <http://www.net-usb.com/downloads/>

If there are no cameras in VMS, the  tab is not available.

Attention!

You can configure access to any given tab and buttons in the top panel individually for each user role (see [Configuring user permissions](#)(see page 430)).

When you are configuring VMS, the top panel shows tabs with different groups of settings, the button for switching to the system log, current user name and the **Exit** button.




When you select **Server** or any child object in the **Hardware**, **Archive** or **Detection Tools** tabs, the upper panel shows the current CPU and network load.



In the Layouts interface in the upper pane, you see the following elements:


1. [Camera search panel](#)(see page 612).
2. System time.
3. Context menu.
4. Video surveillance mode selection tabs.
5. [Video wall management panel](#).(see page 610)
6. [Monitor management panel](#)(see page 610).
7. [Layouts panel](#)(see page 611).
8. [Macro menu](#)(see page 786).
9. [Layout scaling buttons](#)(see page 622).



In the Layouts and Search interface, you can hide the top panel. To do this, click the  button in the top right corner. To show the top panel, hover over it with the pointer.

Note

To pin the top panel, click the  button.

In Full Screen (see [Configuring the Client screen mode \(full screen or window\)](#)(see page 529)), to collapse the client window, click the  button.

3.8 Ports used by the Arkiv Software Package

[Appendix 9. Using Arkiv with NAT](#)(see page 918)

Ports	Changeable	Installation type	Process	Open the port*
20040 20041 20108	No	Server and Client Failover Server and Client	Self-diagnostics service(see page 587)	Not required
20109	Yes	Server and Client Failover Server and Client	gRPC API (see Configuring the Server ports (see page 521))	Required
20110	Yes	Server and Client Failover Server and Client	PostgreSQL database (see Configuring the Server ports (see page 521))	Required
20111–20210	Yes	Server and Client Failover Server and Client	Server (see Installation (see page 36), Network settings utility (see page 865))	Required
80 (Windows) 8000 (Linux)	Yes	Server and Client Failover Server and Client	Web server (see Configuring the Web-Server (see page 105))	If necessary + HTTPS port 443
554 (Windows) 50554 (Linux)	Yes	Server and Client Failover Server and Client	RTSP server (see Configuring an RTSP Server (see page 106))	Not required
8080	Yes	Server and Client Failover Server and Client	Virtual input (see Configure virtual inputs (see page 154))	Required
8888	No	Server and Client Failover Server and Client Client	Client HTTP API	Not required

Ports	Chang eable	Installation type	Process	Open the port*
4000 4646–4648 8300–8302 8500 8600	No	Failover Server and Client	Failover (see Ports used by the failover system (see page 563))	Required
57000–65000	No	Server and Client Failover Server and Client	Server (see Installation (see page 36), Network settings utility (see page 865))	Firewall is required, but port forwarding under NAT is not required (see Connecting the Client to the Server behind NAT (see page 921))

* In a configuration including several Servers in firewalled LANs, or port forwarding on the router under NAT environment.

3.9 Requirements for Personnel Quantity and Qualifications

The following roles have been defined for operating the Arkiv software package:

1. Security system administrator.
2. Security system operator.

In special cases, one person can perform the functions of both the administrator and the operator.

The main duties of the administrator are to:

1. Update, configure, and monitor the operability of the security system's hardware.
2. Install, update, configure, and monitor the operability of basic and system software.
3. Install, configure, and monitor software applications.
4. Manage user accounts (this duty can be carried out by a user entrusted with system administrator permissions).

The administrator must have the skills necessary for network configuration, including routing and firewall, as well as NetBIOS, DNS, and NTP network services.

Besides, the administrator must have high qualifications and practical experience installing, configuring, and administering the software and hardware employed in the software package.

The software package is structured so that all accessible functionality can be managed by one administrator or administration responsibilities can be divided among several users.

The main duties of an operator are to:

1. Work with the software's GUI (graphical user interface).
2. Optimize the performance of the personal computer to carry out tasks using the functionality provided in the software package.
3. Create roles and users in the system (if the user has been granted the appropriate permissions).

The system operator must have experience with, and be a qualified user of, PCs running Microsoft Windows and must be able to easily perform basic operations.

4 Installing the Arkiv Software Package

4.1 Installing equipment

4.1.1 Types of Devices Used

An IP device is the source of the video signal (video data) for the *Arkiv* software.

Note

You can connect analog video cameras to *Arkiv* via video capture cards, which the software defines as IP devices.

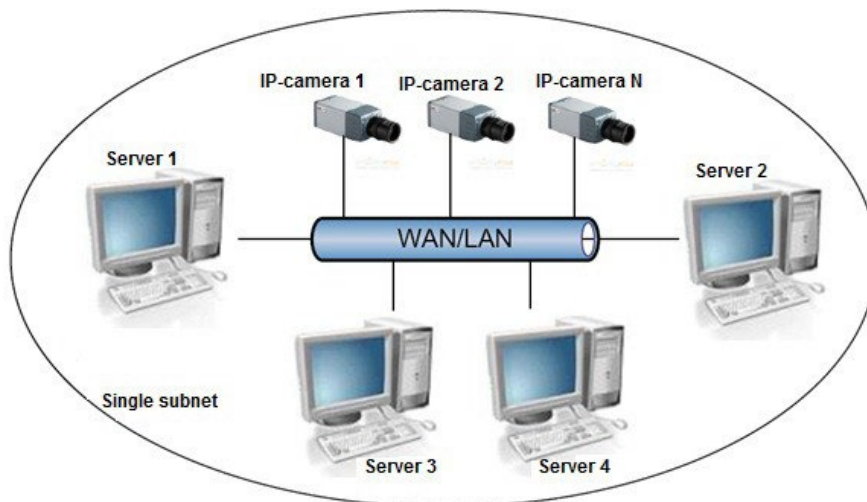
The following types of equipment are IP video and audio surveillance devices:

1. IP video cameras.
2. Various types of IP video servers.

IP video servers which use analog video cameras directly connected to them, digitize the analog video signal, and transmit it to users via TCP/IP. When working with analog video cameras connected to IP video servers, users can utilize the same video image viewing and transmission functions as with IP video cameras.

4.1.2 Connecting IP Devices

To work with IP devices, you need to connect the *Arkiv* server to the local network where the required IP devices are enabled.



To ensure support for IP devices on an external network:

- The IP devices must have an external static IP address.
- The necessary ports on the network equipment must be opened.

❑ Attention!

If these requirements are met, IP devices should be properly handled. However, correct functioning is not guaranteed.

Based on the video signal coming in from the IP device, an assessment is made of the guarded location and the system responds to events registered for that location. The content and quality of the obtained video information depends on how the IP device is installed and configured. There are a number of rules that must be followed to obtain a high-quality video signal. In particular, high-quality peripheral equipment (hubs/routers) must be used; we advise against use of Home and Office-class devices, which are not intended for use in such security systems.

❑ Note

IP devices connected to such equipment will transmit a video stream with an unacceptably long delay (from 1.5 to 3 seconds per frame)

Detailed information about creating a local network and connecting IP equipment to it is presented in the corresponding reference documents.

4.1.3 Configuring IP Devices in Windows

IP devices can be configured in Windows by using the following software:

1. Software included with the IP device. This software is used to accomplish the following tasks:
 - a. Searching for network devices connected to the local network.
 - b. Preliminary IP address assignment (without account of routing).

❑ Attention!

Without assigning preliminary IP addresses to the devices, it is not possible to access their Web interface.

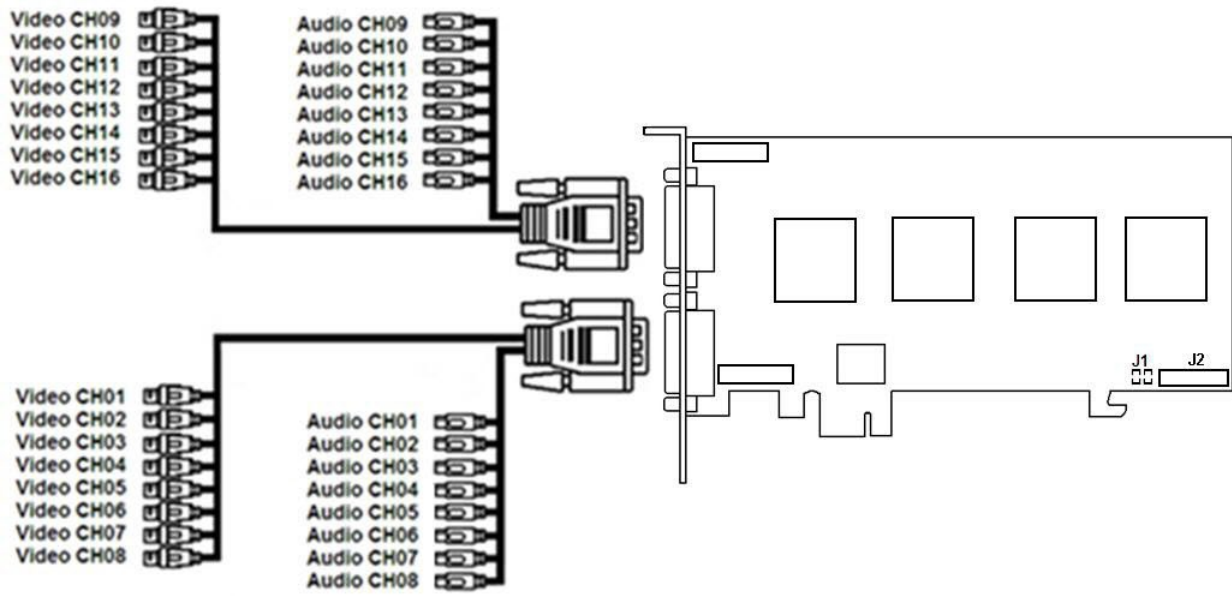
2. Web interface of the IP device. This interface is used to accomplish the following tasks:
 - a. Configuring the IP devices with consideration for routing.
 - b. Configuring modes for the IP devices to work with video and audio signals.
 - c. Viewing video images coming in from IP devices in standard Web browser mode.

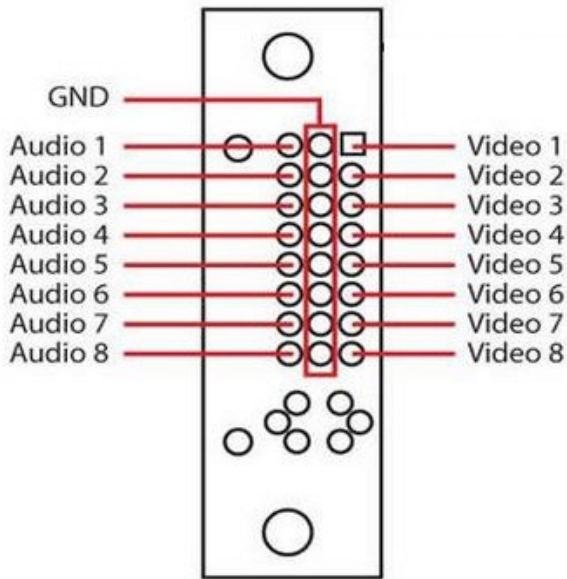
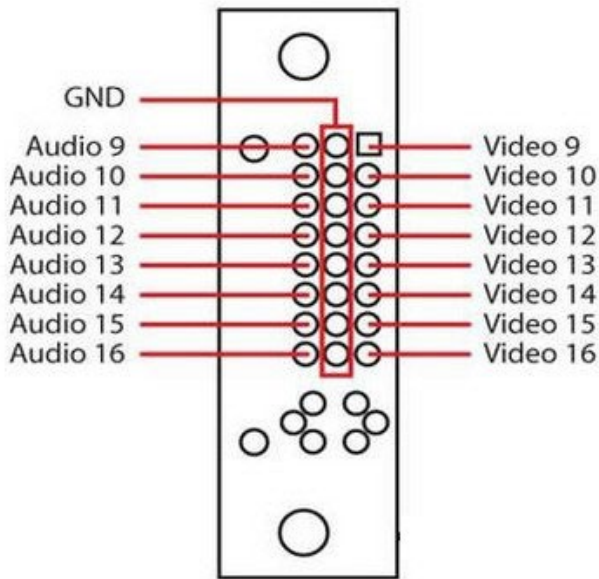
Configuration of IP devices in Windows is described in detail in the official reference documentation for the respective devices.

4.1.4 Video capture cards pins

WS-216 video capture card pins

WS-216 video capture card has two external DVI-I pins. Video and audio connection is performed with the help of DVI-I/BNC and DVI-I/RCA stubs correspondingly. Simultaneous connection of up to 8 cameras and up to 8 sound sources to one external pin of WS-216 video capture card is possible. The Watchdog cable is connected to the J1 pin. DI/DO card is connected to the J2 pin.



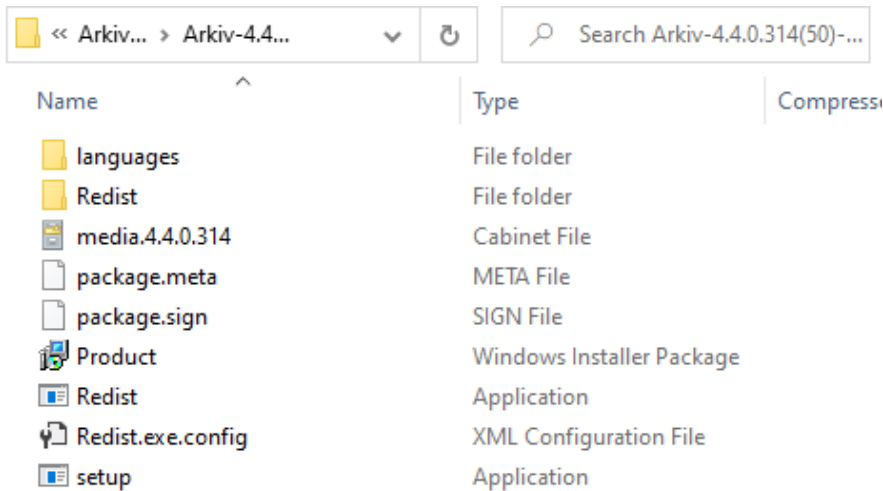


4.2 Installation the Arkiv Software Package

4.2.1 Installation

To install *Arkiv*, regardless of the type of installation, it is necessary to perform the following steps:

1. Open the *Arkiv* distribution package.

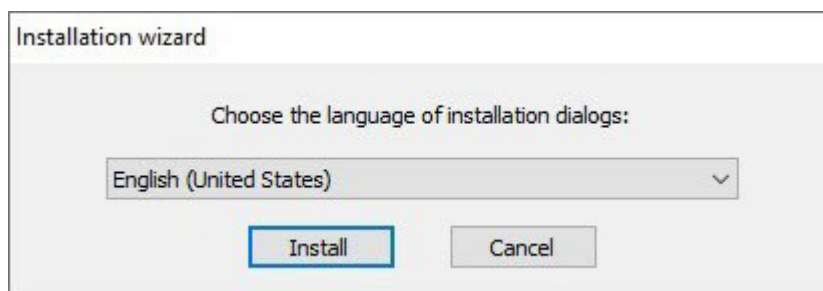


2. Run the Setup.exe file.

Note

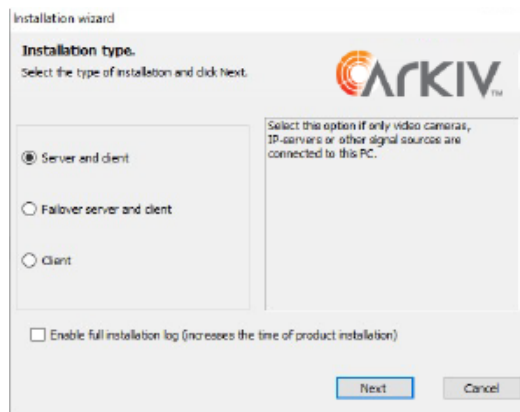
If you cannot run the installation files downloaded from the Internet, do as follows: allow running programs and unsafe files in Windows OS.

3. In the dialog box, choose the required language from the list and click the **Install** button.



4. Select the *Arkiv* installation type in the dialog box by clicking the appropriate option button:
 - a. **Client** – installs only a Client application that allows the user to connect to any Server and perform administration/management/monitoring operations with the protected object based on the permissions granted by the administrator.
 - b. **Server and Client** – installs Client and Server services. *Arkiv* Server:
 - i. Interacts with devices (cameras, microphones, inputs, outputs, etc.) that constitute a security system.

- ii. Writes video footage to archives on system disks; interacts with archives on NAS.
- iii. Hosts metadata database.
- iv. Employs detection tools to analyze live video.
 - v. Keeps configurations of the security system, user settings, custom layouts, macros, etc.
- c. **FailOver Server and Client** — installs Client and Server services enhanced with the FailOver capability. In emergency (power outage, network problems), the FailOver technology restores the Server configuration on another Server. Please refer to the section titled [Configuring FailOver VMS](#) (see [page 562](#)) for details on how to install VMS with the FailOver capability.



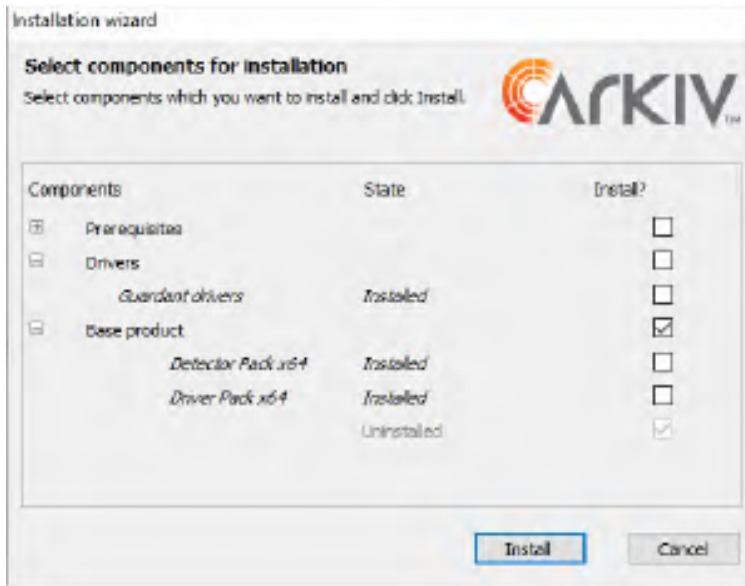
Note

We offer a separate installation package containing only the *Arkiv* Client. To obtain it, contact our [technical support](#). You can download additional packages from the [official website](#).

This installation package is intended only for Client updates. You cannot install it on a PC where *Arkiv* was not previously installed.

5. To record all installation-related events to a log file, select the **Enable full installation log** checkbox.
6. Click the **Next** button.

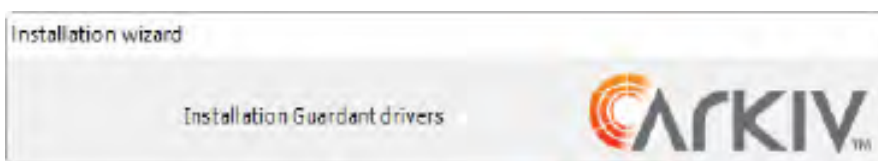
A dialog box prompts you to select the components for installation.



Note

To view the list of installed components, click .

7. Select checkboxes for the components that you want to install. We recommend installing all components.
8. Click the **Install** button. All selected components will be installed. The installation process may take considerable time. After that, the preparation process for the *Arkiv* installer will be initiated.



Attention!

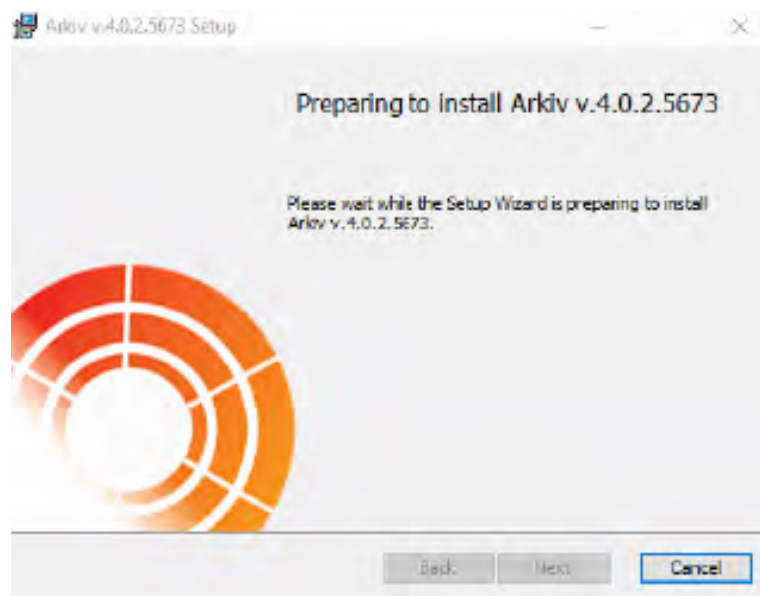
Starting from *Arkiv Driver Pack* 3.51, this driver package requires the Windows update KB2999226 to be installed. If this update is missing, you will see a warning. To continue installation, download the upgrade from the official Microsoft website. When installing the upgrade, consider the bitness of your system.

Note

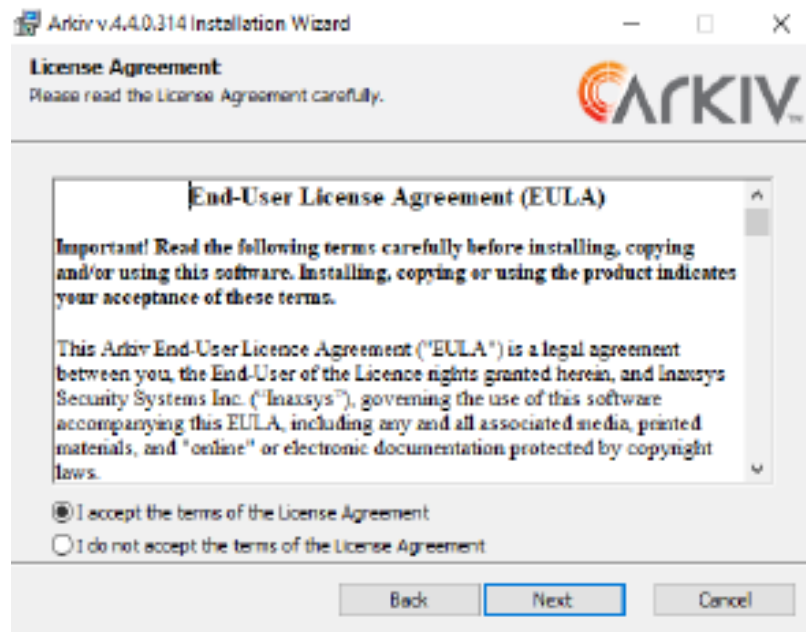
The following required software is installed, if necessary:

- a. PostgreSQL 10.8.0 Server database. If an older version of PostgreSQL is installed, it is updated to version 10.8.0. A new log database is automatically created (name: ngp, user name: ngp, password: ngp). By default, PostgreSQL is installed on the system disk. You can change the path using the command line options of the installation file (see [Silent install \(Quiet Mode\)](#)(see page 56)).
- b. *NET Framework 2.0*, *.NET Framework 3.5 SP1* and *.NET Framework 4.0*.
- c. Acrobat Reader, which is necessary for exporting in PDF format and printing freeze frames (see [Frame export](#)(see page 776)).

9. Click the **Next** button on the setup wizard's welcome screen.



10. To proceed with installation, carefully read and accept the terms of the license agreement by selecting the radio button next to **I accept the terms of the License Agreement** and click the **Next** button.



11. Select the folder for storing the log database and the metadata database used in *Arkiv*, and click the **Next** button.

Attention!

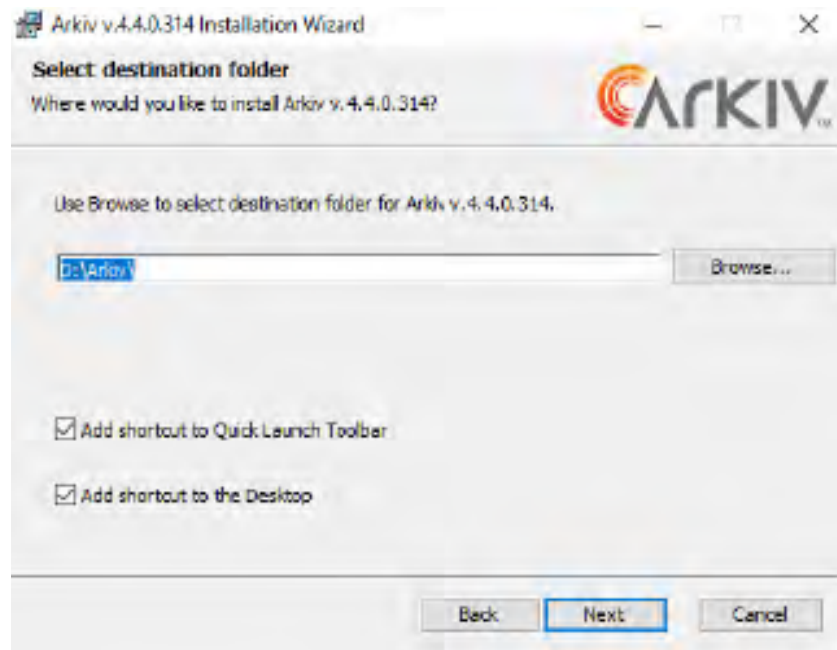
The path to the folder for storing the log database and the metadata database should contain only Latin letters and numbers.

Attention!

To reduce the load on the system disk, it is recommended to store the log database and the metadata database on a separate physical disk. To calculate the required amount of disk space for the log database, the metadata database and *Arkiv* software package, you can use the [Disk storage subsystem requirements](#)(see page 18) page.

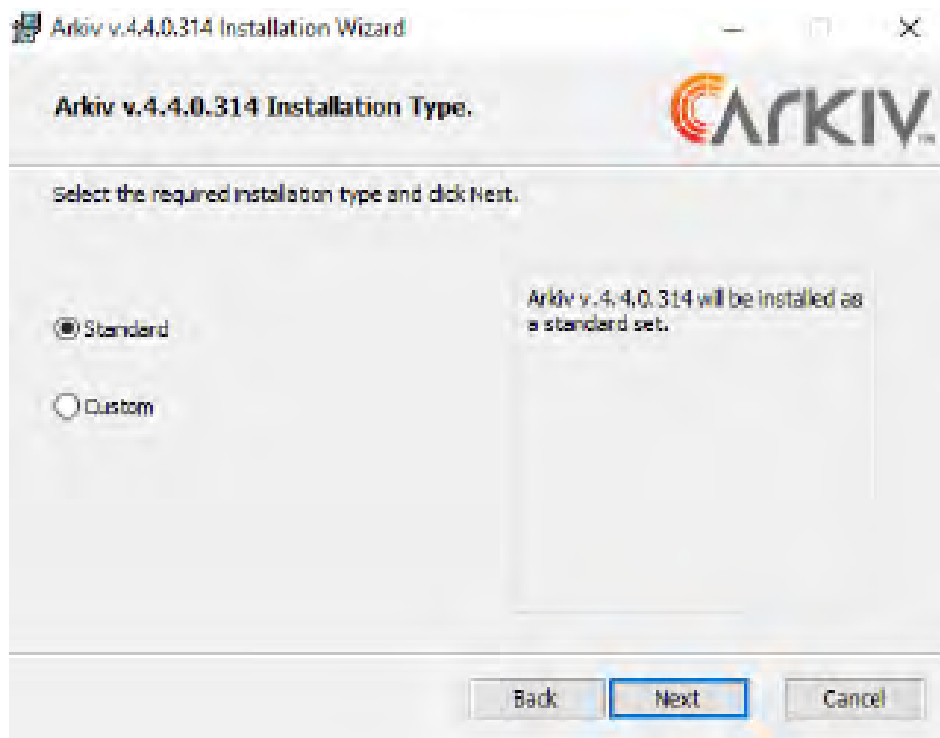
Note

The log database and the metadata database will be located in the X:\ArkivOneData\ folder (in the Data and vmda_db subfolders, respectively), where X is the drive letter with the largest amount of free memory. In the future, the metadata database can be placed in the network storage (see [Configuring storage of the system log and metadata](#)(see page 517)).



12. By default, shortcuts are added to both quick launch bar and desktop. De-select the corresponding checkboxes if it's not required.
13. By default, upon connecting to the Server, the Client may be automatically updated. If it's not required, clear the **Create an archive for automatic update** checkbox. In this case, you can save *Arkiv* VMS installation time, but the Clients will not be automatically updated upon their connection to the Server.
14. Click the **Next** button.
15. By default, the *Arkiv* Server name is identical to the PC name. If the PC name contains forbidden symbols, you have to set an appropriate name for the Server according to the recommendations, and click the **Next** button.

16. In the window that opens, select an installation method and click the **Next** button.
If the **Custom** installation method is selected, you can perform advanced configuration of the installation of *Arkiv*.
If the **Standard** installation method is selected, you are prompted to select an Arkiv-domain (Step 25).
Default values will be used for other settings.



17. Select a user account in the file browser:

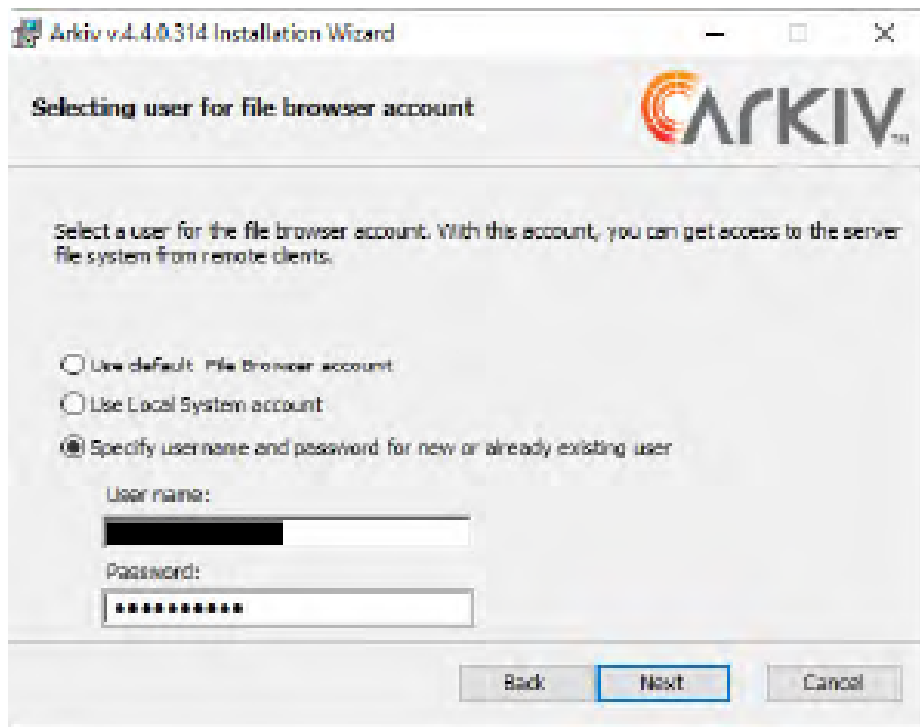
Note

The file browser helps to navigate through the Server's file system (such as when choosing disks for log volumes). The user account for the Windows file browser will be created with administrator privileges.

Attention!

After installation of *Arkiv*, make sure that a file browser account has been created in Windows and belongs to the Administrators group.

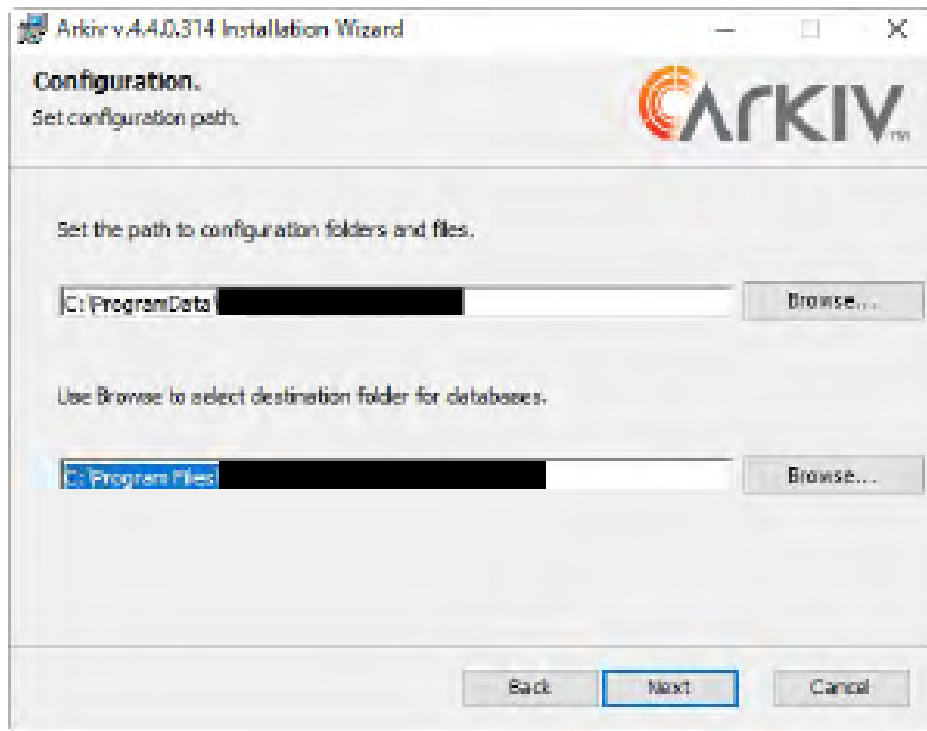
- a. Use default Arkiv File Browser account.
- b. Use Local System account.
- c. Specify username and password for new or already existing user.



18. Specify the path to *Arkiv* folders and configuration files.

Note

By default, the files and folders of the configuration are stored at the following path: C:\ProgramData\Inaxsys\Arkiv\.



19. Specify the path to the folder for installing *Arkiv*.

Note

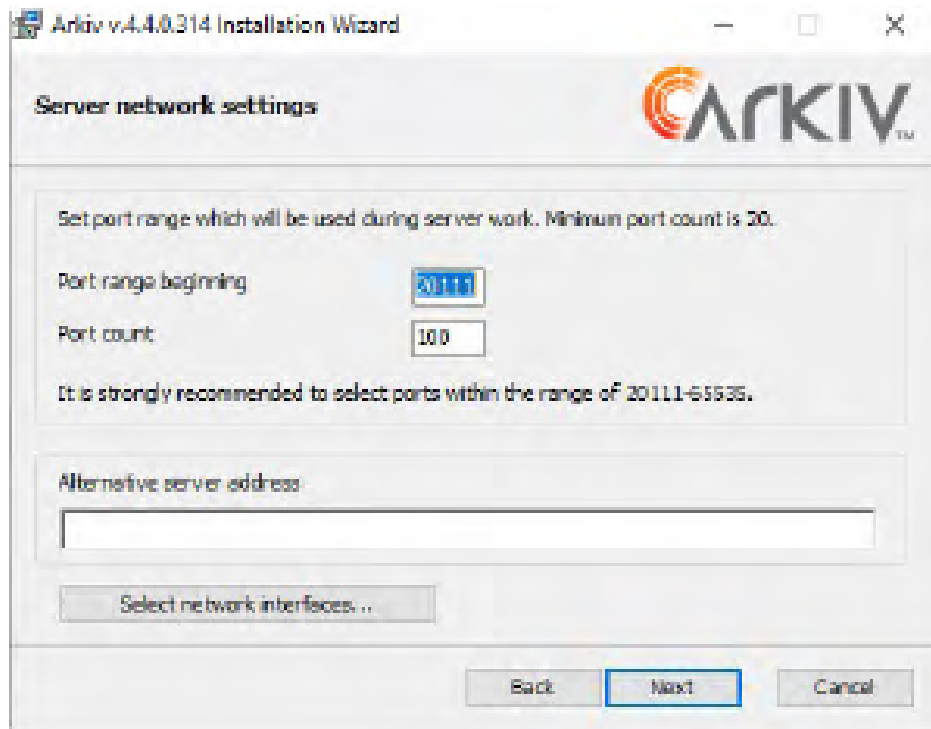
By default, *Arkiv* will be located in the C:\Program Files\Inaxsys\Arkiv\ folder.

Attention!

The installation path for *Arkiv* and its databases should contain only Latin letters and numbers.

20. Click the **Next** button.
21. Specify the range of ports to be used for the Server. To do so, specify the lower end of the range, as well as the number of ports. This range can be used by the local network administrator to [forward the port manually](#)³⁷ in cases where it is necessary to give the Client access to the Server from another network. The minimum possible number of ports is 20.
For a full list of ports, see [Ports used by the Arkiv Software Package](#)(see page 28). After you install *Arkiv*, you can change it manually (see [Configuring the Server ports](#)(see page 521)).

³⁷ https://en.wikipedia.org/wiki/Port_forwarding



Note

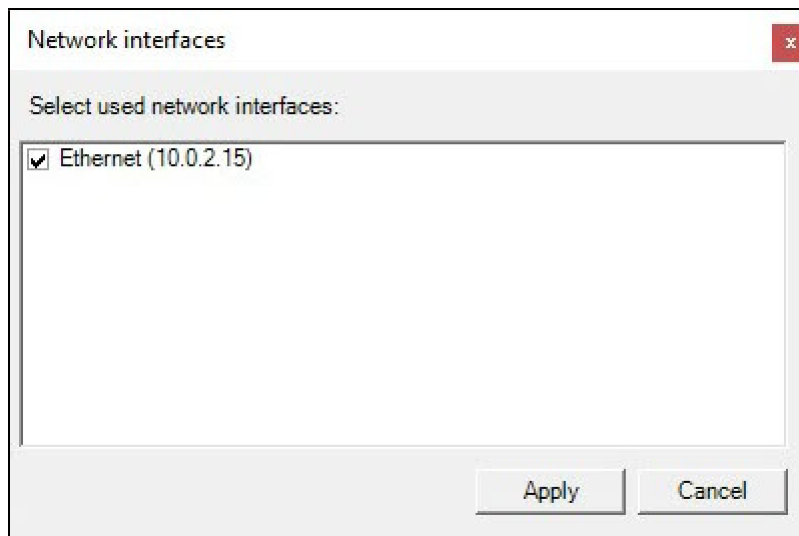
The number of ports that you select affects the scalability of the system. Keep the following in mind when specifying the number of ports:

- After the Server is installed, it occupies **10 ports**, including one for sending E-mails (via SMTP, see [The E-mail notifier object](#)(see page 411)) or text messages (via SMS, see [The SMS notifier object](#)(see page 414)).
- **Attention!** The FailOver Server and Client installation type uses 9 base ports and preset port ranges for each node (see [Ports used by the FailOver system](#)(see page 563));
- In a 64-bit configuration, **4 ports** are required for any number of IP devices. In a 32-bit configuration, **4 ports** are required for each **32 cameras**;
- Each archive requires **1 port**;
- **1 port** is required for viewing Video Footage through the Web-Client;
- **2 ports** are required for each decoded video stream on the currently opened layout in the Web-Client;
- **2 ports** are required for mobile Client;
- **2 ports** are required for any number of loudspeakers in the system (see [The Speaker Object](#)(see page 158));
- **1 port** is required for recording metadata into the DB;
- **2 ports** are required for service detection tools operation;
- **2 ports** are required for scene analytics detection tools operation;
- **2 ports** are required for neuro tracker operation;
- **2 ports** are required for neural counter operation.

Attention!

Connected devices will only work on ports in the specified range. If not enough ports are allocated, then some of the devices may not work or work unstable.

22. If necessary, set an alternative Server address — the outside local address for a Server behind the NAT³⁸. Interface specification format: "IP-address1 or DNS-name1, IP-address2 or DNS-name2".
23. To restrict visibility of the Servers on particular networks in the list of Servers during *Arkiv* setup, do the following:
 - a. Click the button **Select network interfaces...** The **Network interfaces** window opens.



- b. By default, use of all available network interfaces on the Server is allowed, meaning that Servers on the relevant networks will be visible in the list. If you do not want for the Servers on the networks of certain network interfaces to be visible in the list, clear the relevant checkboxes.

Note

Depending on the network topology, it will still be possible to reach the Servers manually (if broadcasting is allowed between the network segments).

- c. Click the **Apply** button.
24. Click the **Next** button.
25. Create a new Arkiv-domain with the name **Default** (for the definition of an Arkiv-domain see [Appendix 1. Glossary](#)(see page 867)). If you want to add the computer to an Arkiv-domain at a later time, select **Server will be manually added to already existing domain later**. Click the **Next** button.

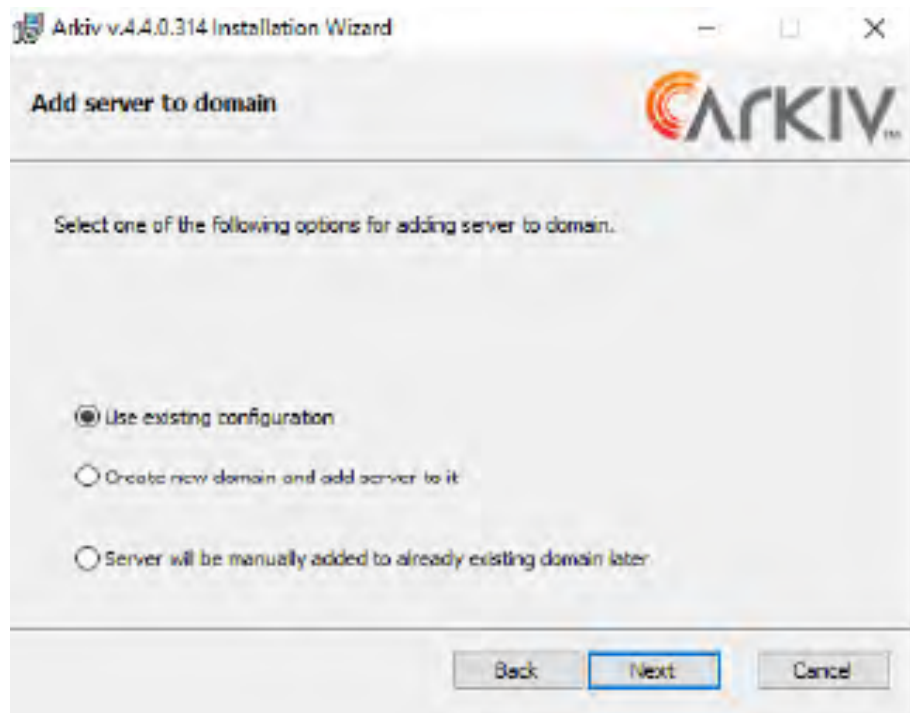
Note

When reinstalling *Arkiv*, you have the option of using the previous domain (select **Use existing configuration**).

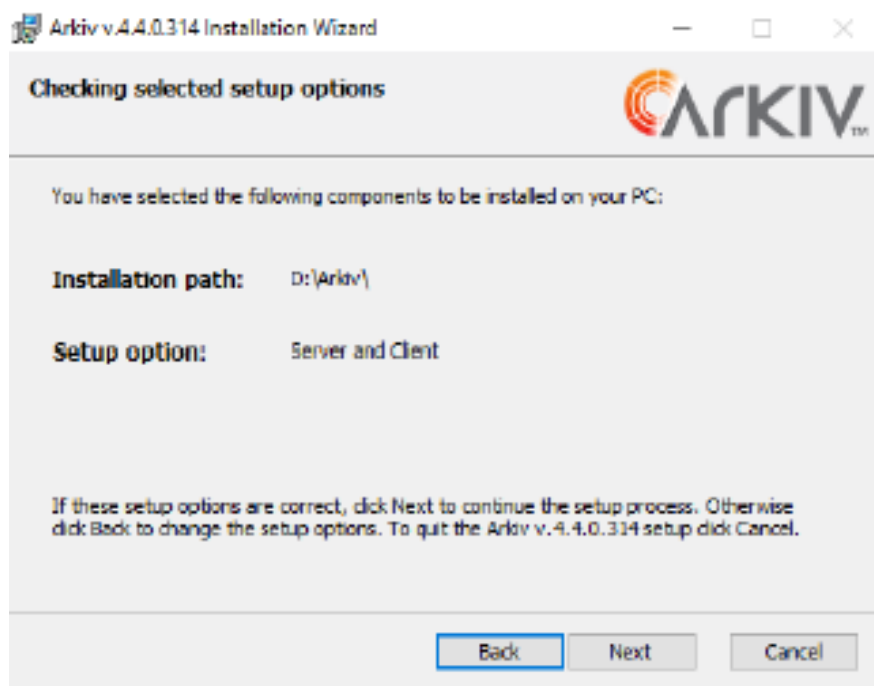
³⁸ <https://en.wikipedia.org/wiki/NAT>

Note

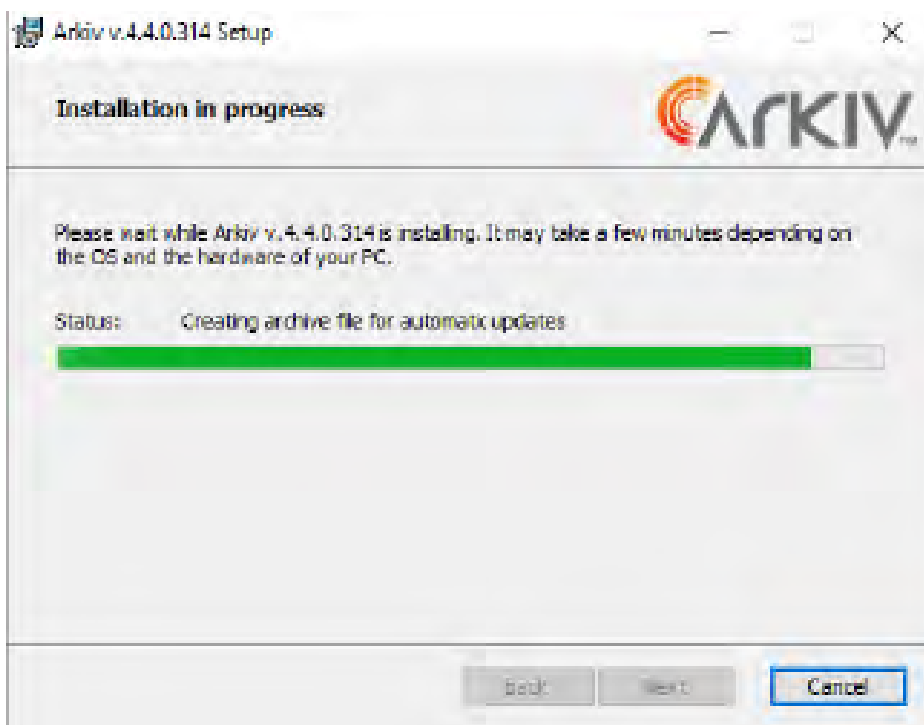
Using the same Arkiv-domain name does not guarantee that the Servers will be in the same Arkiv-domain. To place all Servers into one Arkiv-domain, you should use *Arkiv* interface to add each Server to the necessary Arkiv-domain. Arkiv-domain configuration is described in detail in [Configuring Arkiv-domains](#)(see page 91).



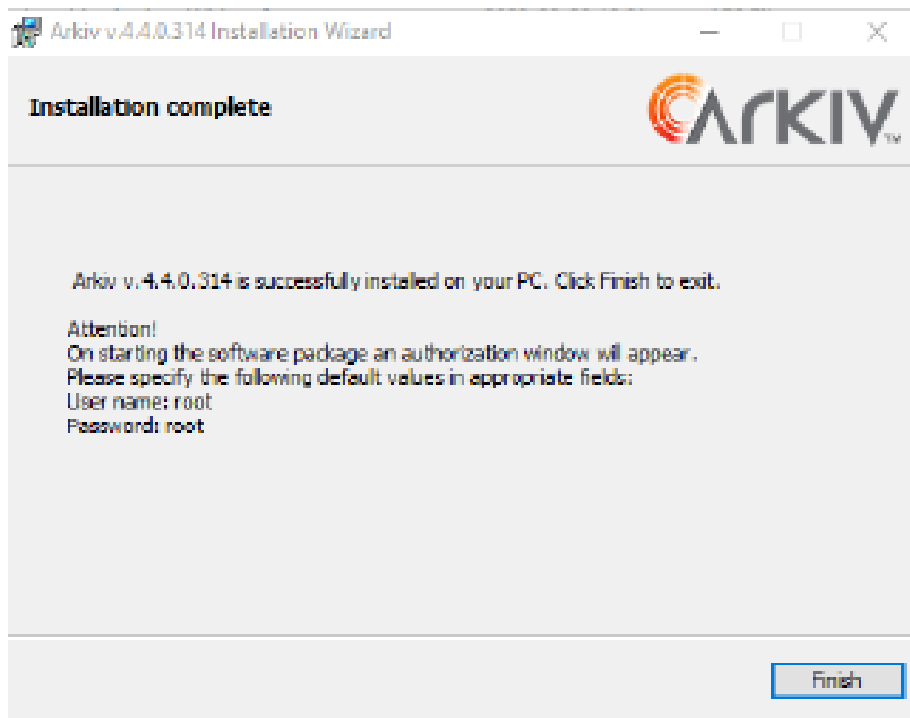
A dialog box appears, showing the installation parameters corresponding to the selected type of installation.



26. Verify your installation settings and click the **Next** button to begin installation of *Arkiv*. Installation of *Arkiv* is then performed.



After installation, a new dialog box will appear informing you that the installation of *Arkiv* is completed.



27. Click the **Finish** button to confirm completion of the installation.

Installation of *Arkiv* is now complete.

4.2.2 Installing DetectorPack addons

By default, the *Arkiv* VMS package only includes the basic *DetectorPack*, which contains the following set of detection tools:

1. Object Tracker (without Neural filter).
2. Retail Analytics.
3. VMD.
4. Tampering detection.
5. Service Audio detection tools.

Additional *DetectorPack* packages (addons):

1. Addon Neuro Pack contains the following tools:
 - a. Neural filter.
 - b. Neural tracker.
 - c. Neural counter.
 - d. Pose detection tools.
 - e. Smoke detection.
 - f. Fire detection.
 - g. Water level detection.

- h. Equipment detection tool (PPE).
- i. Person-based privacy masking.
- j. Object detection.

Note

Neuro Pack is required for the face and people masking feature to be applied to the exported video.

- 2. Addon Face Recognition Pack contains Face Recognition (no vendor name) and its subordinate detection tools.
- 3. Addon Face Recognition Pack (VL) contains Face Recognition (VL) and its subordinate detection tools.

Note

For the Face Recognition (VL) to work, it is necessary to install two packages from the *Arkiv DetectorPack*:

- Face Recognition Pack (VL);
- Facial Recognition SDK (VL).

Attention!

Only one of the optional Face Recognition packs could be installed: Face Recognition (no vendor name) or Face Recognition (VL). You cannot install both packs in the same system.

Attention!

Face Recognition pack Face Recognition (no vendor name) is guaranteed to work on Linux Debian 11 and Ubuntu 20.

Face Recognition packs Face Recognition (no vendor name) and Face Recognition (VL) are not guaranteed to work on Linux Debian 9, Debian 10, Ubuntu 18 and Ubuntu 19.

- 4. Addon VT LPR contains License plate recognition (VT).
- 5. Addon RR LPR contains License plate recognition (RR).
- 6. Addon IV LPR contains License plate recognition (IV).
- 7. Addon VL PPE contains the PPE detection (VL).

To install these add-on packages, do as follows:

- 1. Download the required packages on the official [website](#).
- 2. Stop the Server.
- 3. Run the executable file and wait for the installation to complete.
- 4. Start the Server.

Attention!

It is required that the versions of the main *DetectorPack* and the *DetectorPack* addons are the same. If the versions differ, it is necessary to update the version of the main *DetectorPack* so it matches the version of the *DetectorPack* addon.

4.2.3 Repairing Installation

A repair installation is used to re-install all components of the *Arkiv* software package.

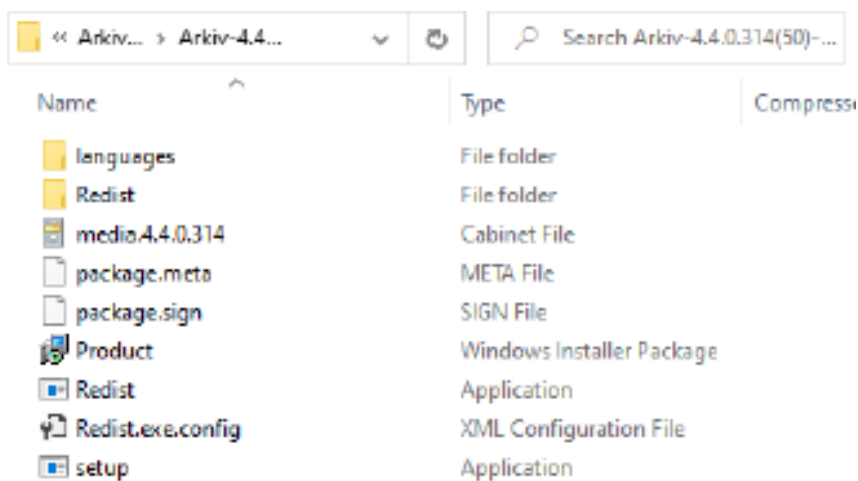
To start a repair installation, launch the *Arkiv* software without removing the previous version of the program.

Note

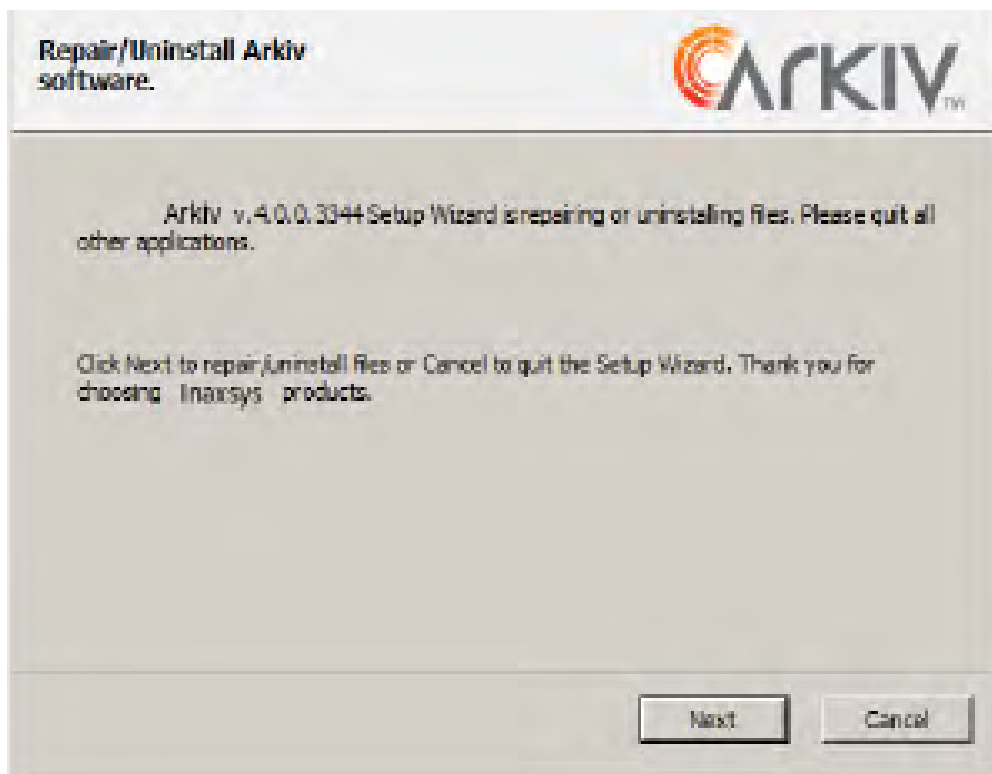
To ensure that *Arkiv* is re-installed correctly, all related applications should be closed before starting the repair installation.

To run a repair installation of the *Arkiv* software, you must perform the following steps:

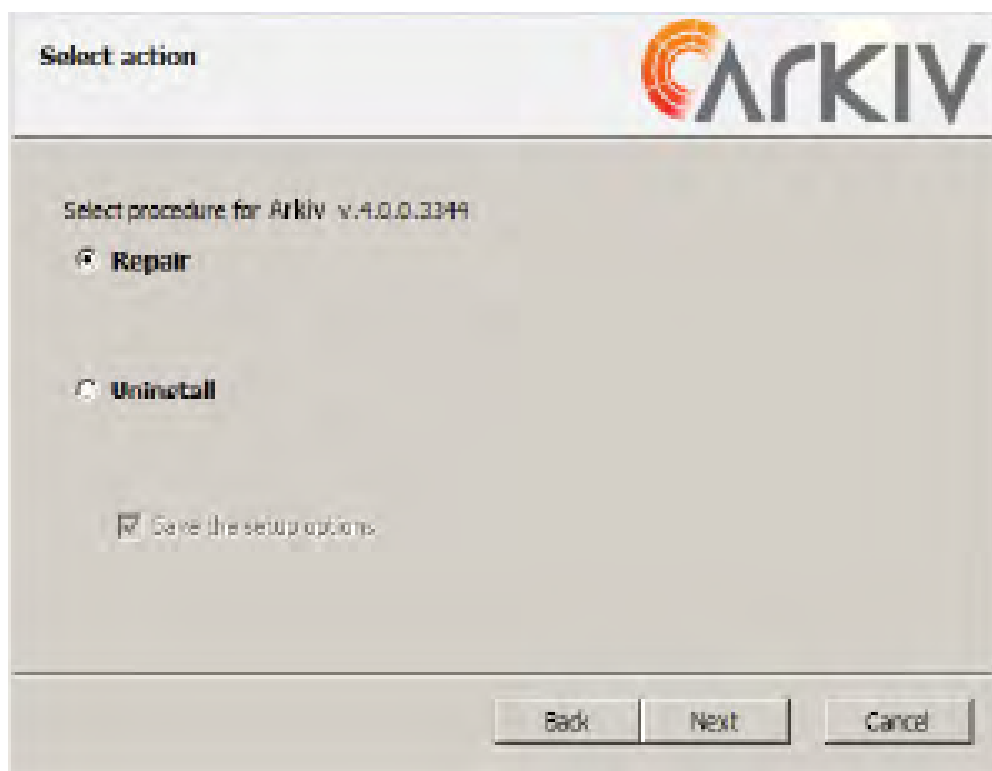
1. Open the *Arkiv* distribution package.



2. Run the setup file.
3. Click **Next** on the setup wizard's welcome screen.

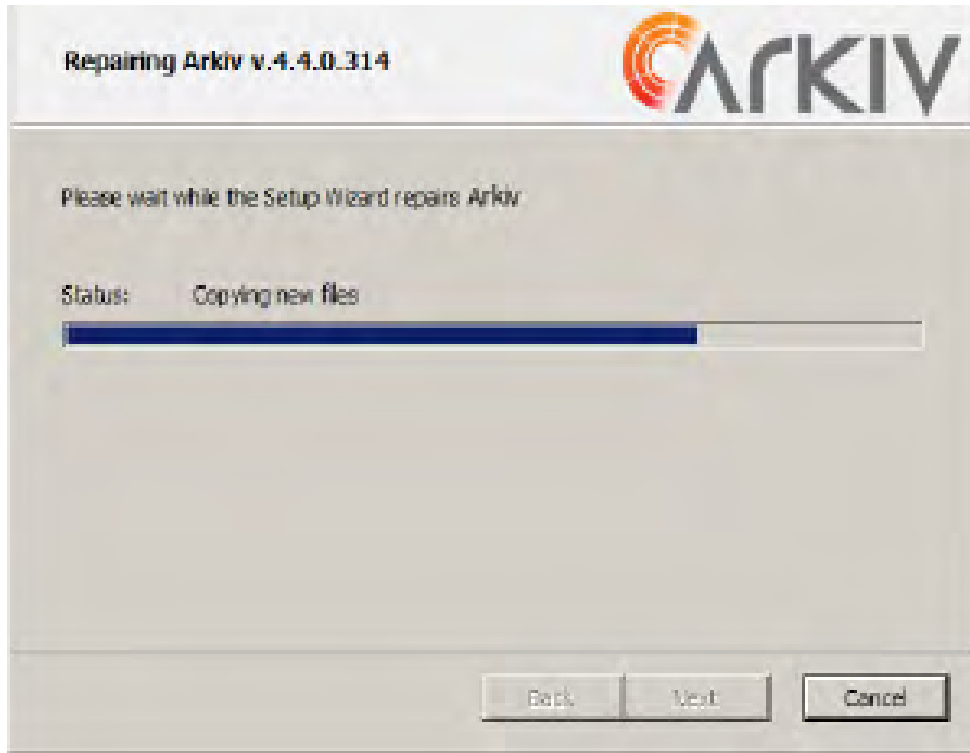


4. A dialog box will appear, allowing you to choose an operation.



5. Select the **Repair** option and click **Next**.

A dialog box will appear, showing the *Arkiv* repair process.



A dialog box will appear, indicating the completion of the repair process. Click **Finish**. Repair of *Arkiv* is now complete.

4.2.4 Removal

The *Arkiv* installation program can also remove the software. Use this option when you need to remove all components of *Arkiv* from your computer.

Note

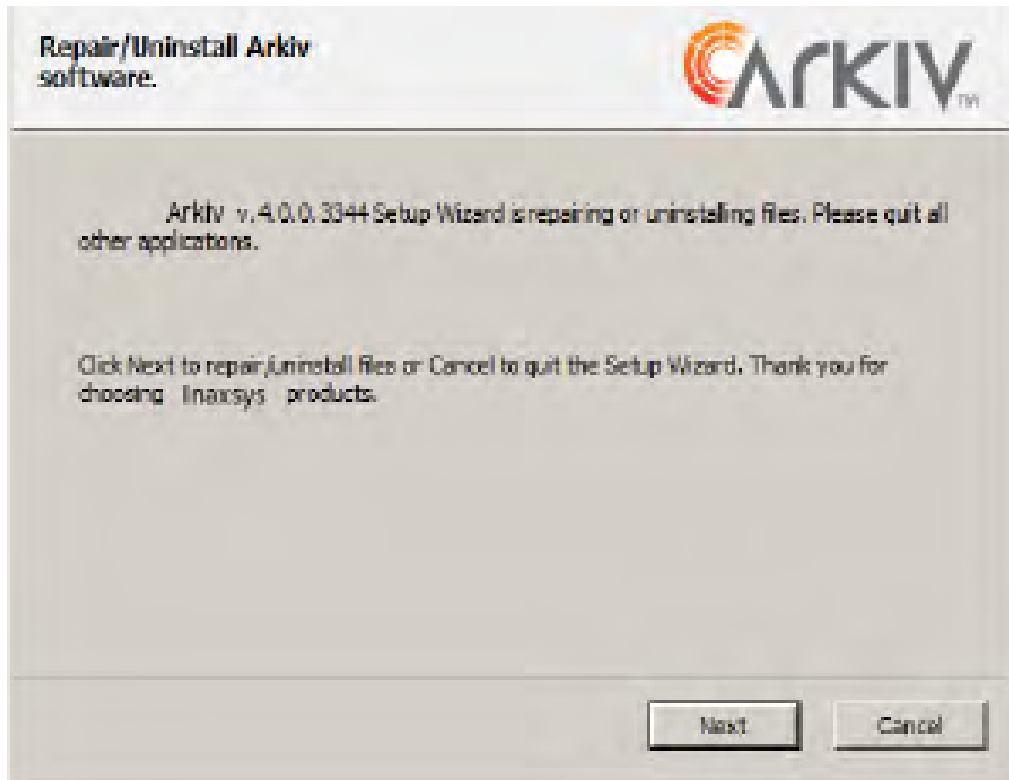
All related applications should be closed before beginning removal of the *Arkiv* software.

You can run the *Arkiv* uninstaller via one of the following methods:

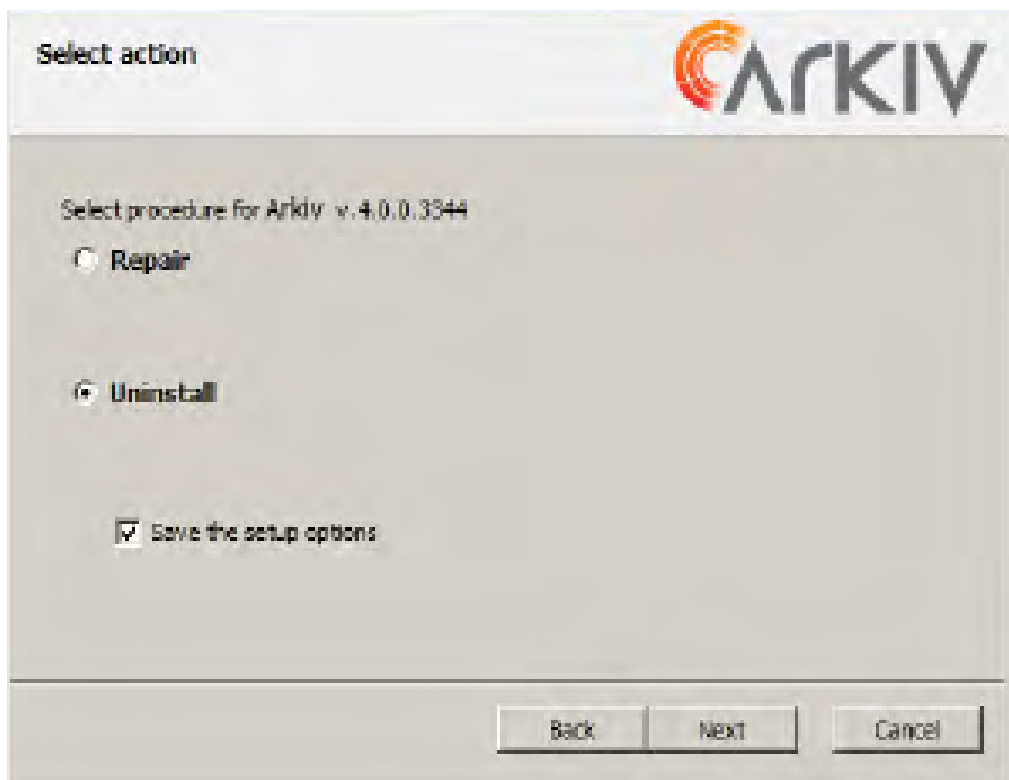
1. From the **Start** menu.
2. Using **Add or Remove Programs** in the Windows control panel.
3. By starting the executable file named `setup.exe`, which is included with the installed version of the product.

When you do this, the setup wizard's welcome screen appears. To remove *Arkiv*, you must observe the following procedure:

1. Click **Next** on the setup wizard's welcome screen.

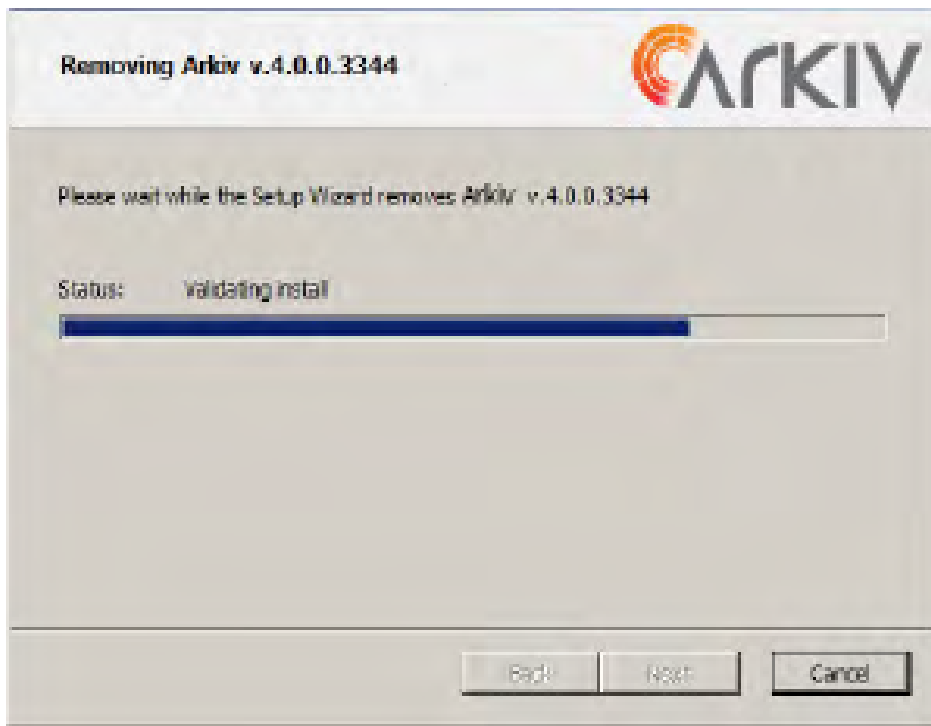


A dialog box will appear, allowing you to choose an operation.



2. Select **Uninstall**.
3. To save your *Arkiv* settings in a database, select the **Save the setup options** check box. This option may be useful when updating the product.
4. Click **Next**.

A dialog box will appear showing the *Arkiv* removal process.



A dialog box will appear, indicating the completion of the removal process. Click **Finish**. Removal of *Arkiv* is now complete.

Note

To completely remove *Arkiv*, use the Windows Control Panel to remove the following software:

1. PostgreSQL.
2. Inaxsys Situation detectors and DetectorPack.
3. Arkiv Driver Pack.

4.2.5 Silent install (Quiet Mode)

You can run *Arkiv* installation in quiet mode (unattended setup with no user intervention).

Note

During installation you may have to reboot the system. After rebooting the installation will continue automatically.

When Redist.exe process ends and not listed in Windows Task Manager, the installation is complete.

This mode of installation can be configured by adding command-line options to setup.exe. See the command-line options in the table.

Command-line option	Description
/? or /help	Open the Help window
/x or /uninstall	Remove <i>Arkiv</i> and save the configuration
/x/removeall	Remove <i>Arkiv</i> and delete the configuration
/r or /repair	Repair <i>Arkiv</i>
/qn or /quiet	Silent install
/norestart	Disable automatic reboot of the system during installation
/debug	Log installation
/noOSCheck	Skip OS compatibility check
/postgresinstalldir="D:\Postgres"	PostgreSQL installation folder
/LANG="en"	Select installation language: For example, en — English
/INSTALLTYPE="ServerClient"	Installation options: <ul style="list-style-type: none"> • ServerClient — Server and Client (default), • raftServer — Failover Server and Client, • Client.
/ADD="[]"	Hers is the list of components to install or remove (if you remove/uninstall software). See the possible values in the table below.
/REMOVE="[]"	Hers is the list of components NOT to install or remove (if you remove/uninstall software). See the possible values in the table below.
/dpcmd="INSTALL_BOSCH_VIDEOSDK=\no\""	Bosch VideoSDK driver Installation (see notes). <ul style="list-style-type: none"> • no — do not install, • yes — install.

Command-line option	Description
/CMD="[commands]"	Basic installation options and values. Commands are [option] = \"[value]\" or [option]=[value] . See available installation options in the table below.

☐ Attention!

Occasionally, when installing the **Bosch VideoSDK** driver, the CLI window opens. To continue with installation, close this window.

/ADD and /REMOVE values:

x86	x64
Acrobat	Acrobat
BaseProduct	BaseProduct
IPDriverPack_x86	IPDriverPack_x86
Guardant_x86	Guardant_amd64
Postgres	Postgres
dotnetfx35_x86	dotnetfx35_x86
Redis2005_x86	Redis2005_x86
Redis2010_x86	Redis2010_x86
DetectorPack	DetectorPack

Installation options:

Installation options	Description
QUICKLAUNCH_SHORTCUT='1'	Create shortcut: <ul style="list-style-type: none"> • 1 – Yes (default), • 0 – No.
DESKTOP_SHORTCUT='1'	Copy shortcut to desktop: <ul style="list-style-type: none"> • 1 – Yes (default), • 0 – No.
INSTALLDIR='[%ProgramFiles%\Inaxsys\Arkiv]'	Arkiv installation folder

Installation options	Description
NGP_IFACE_WHITELIST="0.0.0.0/0"	<p>Network interfaces The default value is "0.0.0.0/0" (all available network interfaces)</p> <p>Format of network interfaces: "IP-address1 / number of unit bits in the mask, IP-address2 /number of unit bits in the mask"</p>
NGP_ALT_ADDR="0.0.0.0"	<p>Setting the outside local address for a Server behind the NAT⁴²).</p> <p>Format of network interfaces: "IP Address1 or DNS-name1, IP address2 or DNS Name2"</p>
PORT_RANGE_START="20111"	The initial value of the port range for Server. 20111 — default.
PORT_RANGE_COUNT="100"	Number of ports in use. The minimum number is 20. 100 — default.
<u>Options for Server and Client installation</u>	
PATH_TO_DATA = 'X: \ArkivOneData', where X is the letter of the disk with the most free memory	<p>Directory for storing the log database and metadata database. Default is X:\ArkivOneData.</p> <p>The PATH_TO_DATA parameter should be after the INSTALDIR parameter.</p>
FBUSER_TYPE='DEFAULT'	<p>User account for file explorer:</p> <ul style="list-style-type: none"> • DEFAULT — create a new account; the default name selected will be ArkivFileBrowser, • SYSTEM — select an account from the Local System, • SPECIFY — create a new account; choose the user name and password.
FBUSER_NAME='[ArkivFileBrowse r]'	<p>Setting a user name and password for an account in file explorer.</p> <p>When you choose SPECIFY of the FBUSER_TYPE parameter</p>
FBUSER_PSW='[Arkiv2.0.0]'	
CONFIG_PATH='[CommonAppData Directory]'	Path to configurations files and folders
DOMAIN_NAME_TYPE = '[NewDomain]'	<p>Select Arkiv-domain:</p> <ul style="list-style-type: none"> • NewDomain — create new Arkiv-domain (default), • WithoutDomain — do NOT add Server to Arkiv-domain, • TheSameDomain — use existing Arkiv-domain.

42 <https://en.wikipedia.org/wiki/NAT>

Installation options	Description
WHATDBUSE = '[EXIST]'	<ul style="list-style-type: none"> EXIST — use existing log DB (default) NEWDB — create new DB
WHATVMDADBUSE = '[EXIST]'	<ul style="list-style-type: none"> EXIST — use existing object tracking DB (default) NEWDB — create new DB

The command for silent installation of *Arkiv* may look like:

```
setup.exe /quiet /norestart /debug /INSTALLTYPE="ServerClient" /REMOVE="Guardant_x86" /
CMD="CREATE_QUICKLAUNCH_SHORTCUT=\"0\" PORT_RANGE_COUNT=\"50\"
DOMAIN_NAME_TYPE=\"WithoutDomain\""
```

This will launch installation with the following options:

1. Quiet mode (/quiet);
2. no reboot (/norestart);
3. log installation to file (/ debug);
4. **Server and Client** (/ INSTALLTYPE = "ServerClient");
5. No *Guardant* drivers (/ REMOVE = "Guardant_x86");
6. And with the following properties (/ CMD =):
 - a. no shortcut (= "CREATE_QUICKLAUNCH_SHORTCUT=\"0\"");
 - b. 50 ports for Server (PORT_RANGE_COUNT="50");
 - c. Server NOT added to Arkiv-domain (DOMAIN_NAME_TYPE = '[WithoutDomain]').

4.2.6 Updating Drivers Pack

To install the latest version of Drivers Pack, do as follows:

1. Run the IPDriverPack.msi file.
2. After the installation is complete, restart the Server (see [Shutting down a Server](#)(see page 82), [Starting a Server](#)(see page 76)).

4.2.7 Upgrading from Arkiv to Arkiv 5

There are some limitations for upgrading from *Arkiv* to *Arkiv 5*:

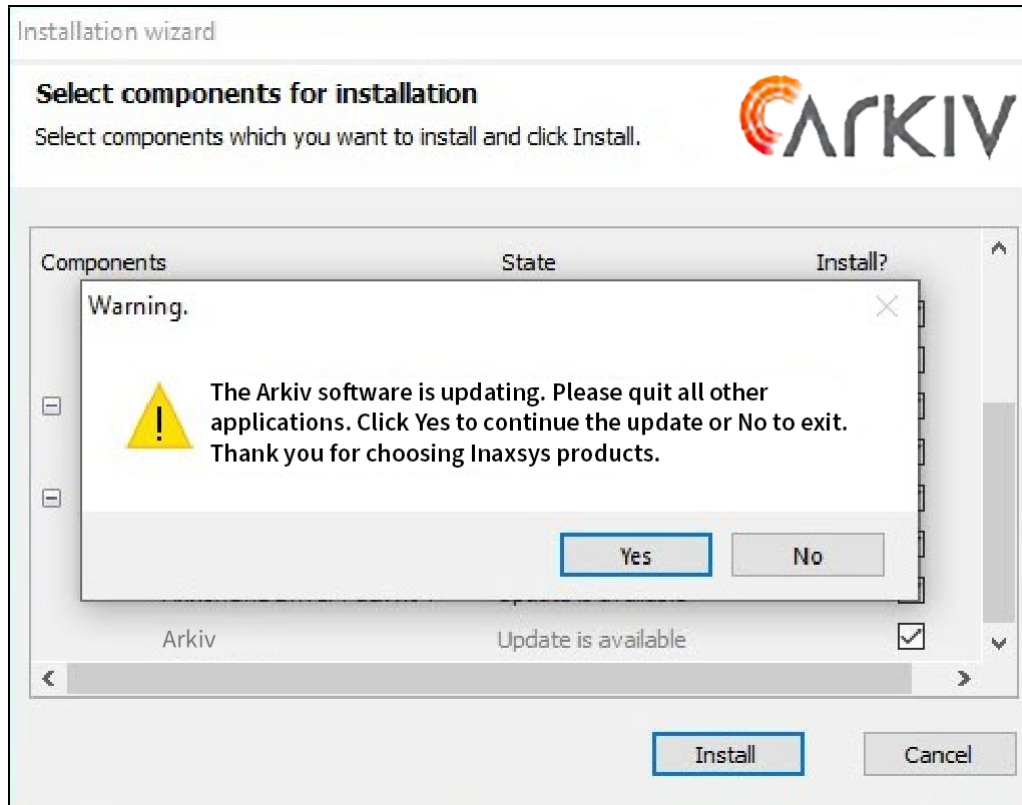
1. You can upgrade to *Arkiv* only from *Arkiv 5*.
2. Upgrade from *Arkiv* versions earlier than 4.5.10 to *Arkiv 5* is not available.
3. Updating the Client through the Server is not available, it is necessary to update it manually on each Client.
4. Upgrade from *Arkiv* to *Arkiv 5* via the supervisor web interface is not available.

Note

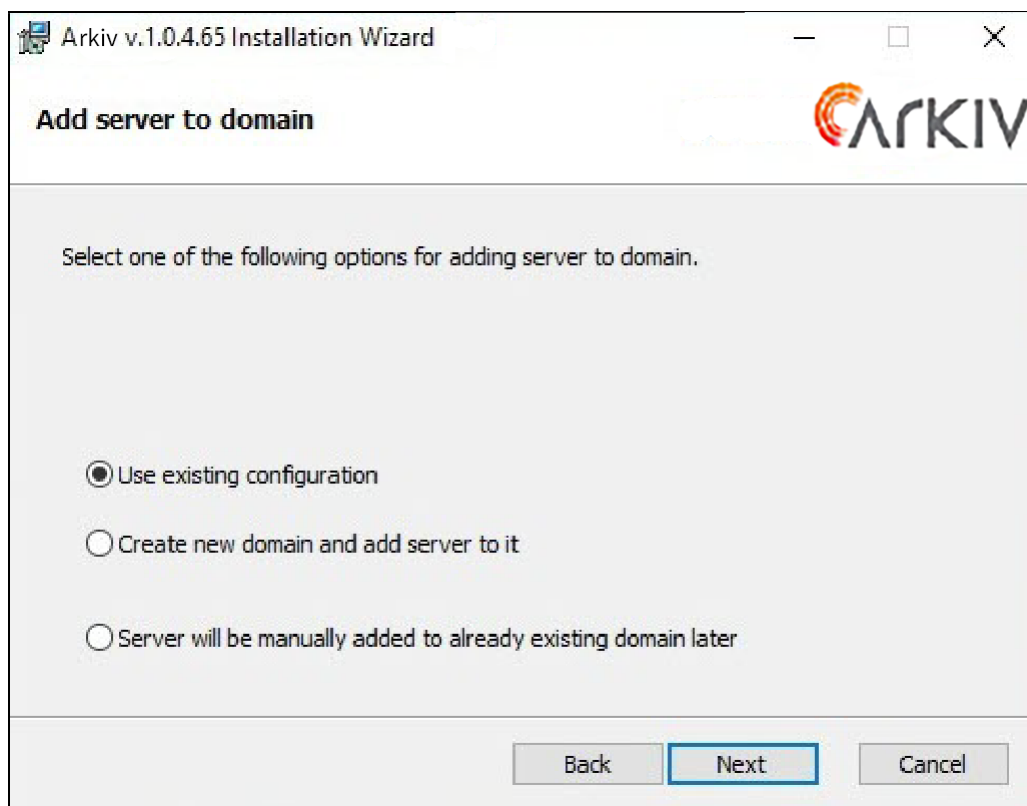
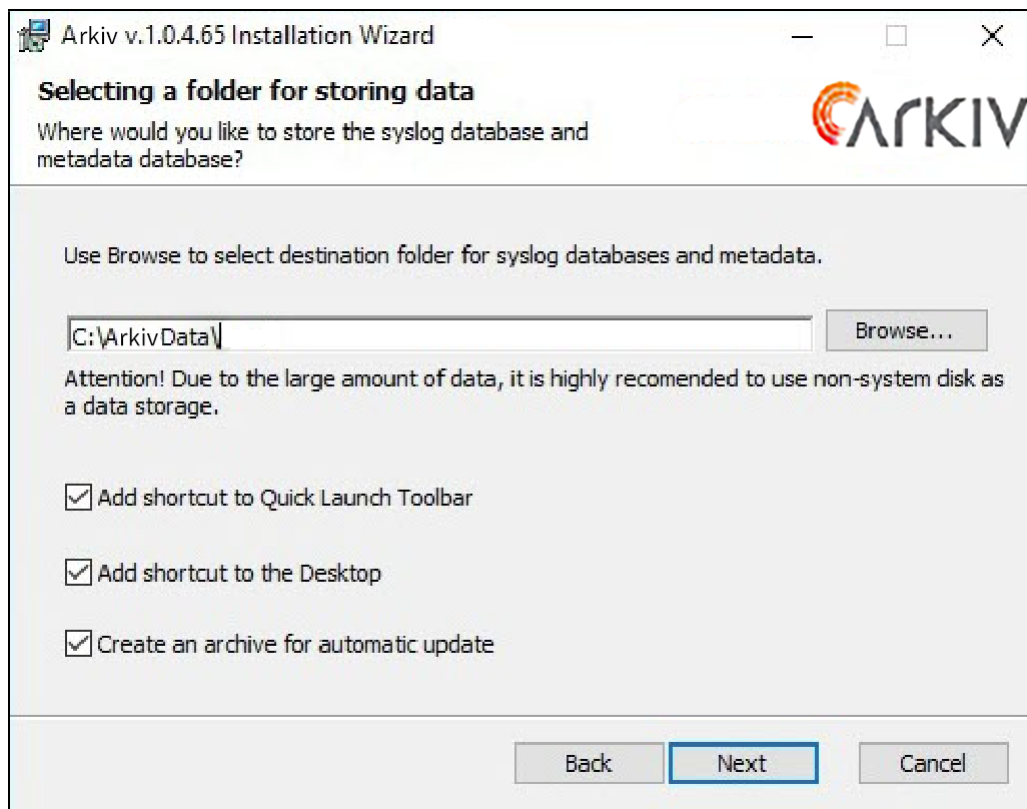
Arkiv 4.5.10 includes DetectorPack 3.6, *Arkiv* includes DetectorPack 3.7.4 (see [DetectorPack 3.7.4 Release Notes](#)) with updated manufacturer's SDK for the Face detection tool. This means that once you update DetectorPack, the previously recognized faces can no longer be searched.

To upgrade from Arkiv to Arkiv 5, do the following:

1. Stop the Server or the NGP_Supervisor service in case of a failover system. If there are several Servers in the Arkiv Domain, stop them all.
2. Launch the Arkiv 5 installer. Uninstalling Arkiv is not required.
3. In the warning window, click **Yes**.

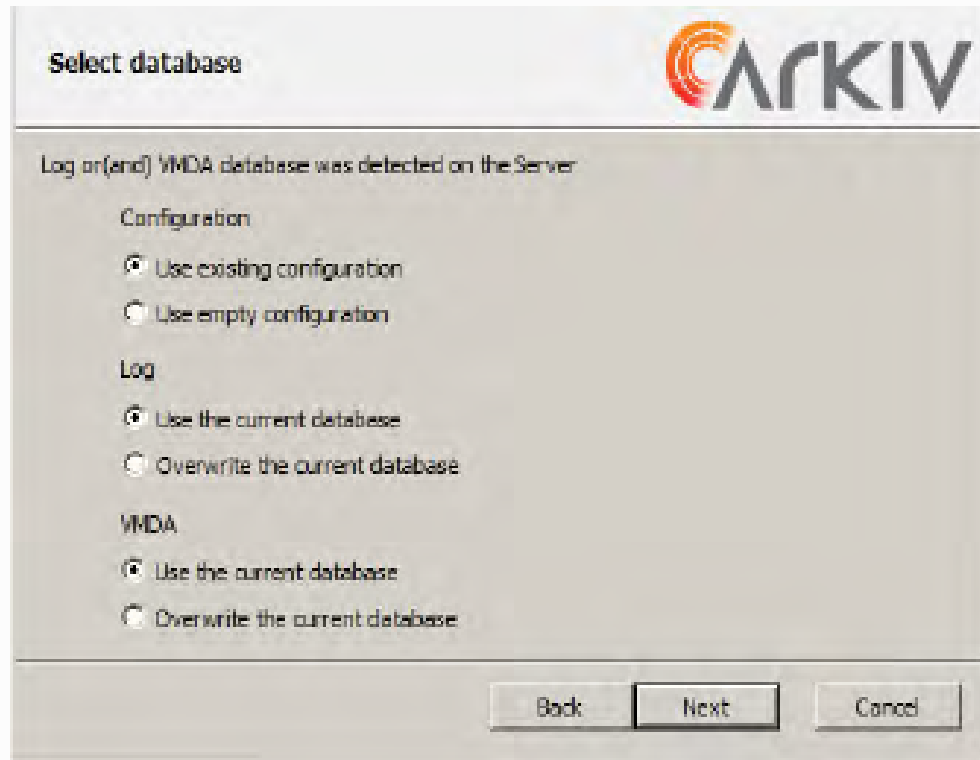


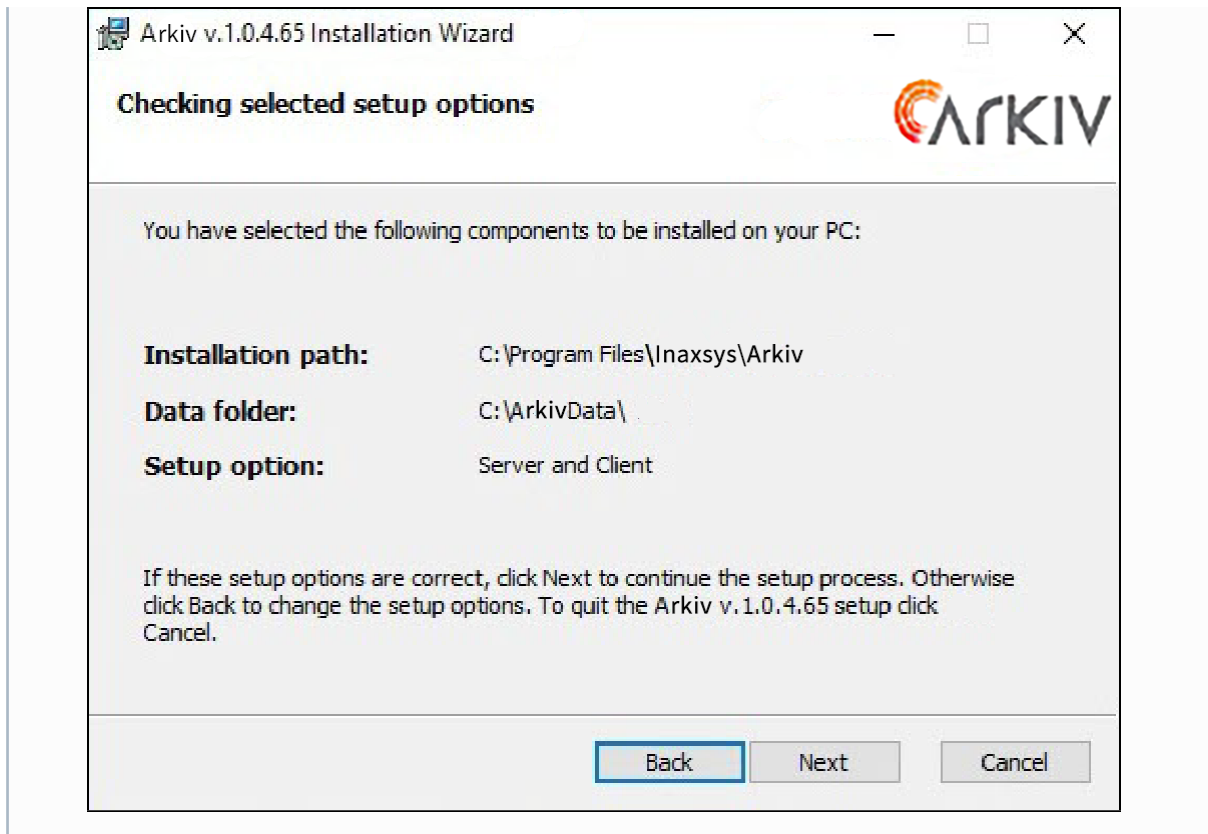
4. Run the installation by selecting an existing configuration. The procedure is the same as installation (see [Installation](#)(see page 36)).



Note

During the upgrade process from *Arkiv* to *Arkiv 5*, the installation path will remain the same.





5. After you complete the installation of *Arkiv*, use the [Activation Utility](#) (see page 824) to deactivate the license.

Attention!

Arkiv licenses are not compatible with *Arkiv 5*. After upgrade, you need to request a new license key.

6. Request a new license key and activate it.
7. Restart the Server.

Attention!

To ensure the correct operation of *Arkiv 5* after upgrading from *Arkiv*, it is necessary to restart the Server.

Attention!

After you update the Failover configuration, it is necessary to restart all DB Agents, and then restart all nodes.

Note

After upgrading from *Arkiv* to *Arkiv 5*, folder names will remain the same.

- ✔ The upgrade from *Arkiv* to *Arkiv 5* is completed.

5 Licensing of the software product

5.1 Arkiv license types

Activating Arkiv Free [Learn more](#)

[more](#)

Creating an activation request

[Learn more](#)

There are 6 types of *Arkiv* license: **Arkiv Demo**, **Arkiv Free**, **Arkiv Start**, **Arkiv Professional**, **Arkiv Enterprise** and **Arkiv Unified**. Upon installation, the software will be launched in *Arkiv Demo* mode. You should activate *Arkiv VMS* to utilize the full feature set of the security software package. You can activate the software by distributing an activation key on the system. Data on all the types of *Arkiv* licenses is presented in the table below.

Functionality	Type of license	Arkiv Professional	Arkiv Enterprise	Arkiv Unified
Maximum number of Servers in Arkiv-domain(see page 91)		30	30	Unlimited
Maximum number of channels in Arkiv-domain(see page 107)		Unlimited	Unlimited	Unlimited
Free Software Updates		Yes	Yes	Yes
Real time analytics (Object Tracker)		Yes	Yes	Yes
Support for SD cards (edge storage, playback only)(see page 161)		Yes	Yes	Yes

Macros (event response wizard)(see page 381)	Yes	Yes	Yes
ArkivNet Reports ⁵¹	Yes	Yes	Yes
Scene analytics detection tools(see page 245) (excluding Line crossing)	Yes	Yes	Yes
Line crossing(see page 255)	Yes	Yes	Yes
Scene synopsis (Timelapse Compressor)(see page 672)	Yes (country restriction)	Yes (country restriction)	Yes (country restriction)
Cross-System Client(see page 84)	Yes	Yes	Yes
AI Features and Retail License Pack			
Advanced archive search: <ul style="list-style-type: none"> • Post-Analytics smart forensic search(see page 705) • Face search(see page 718)⁶ • LPR search(see page 717) 	Optional	Yes	Yes
Target&Follow multicamera object tracking(see page 656)	Optional	Yes	Yes
Retail Analytics: <ul style="list-style-type: none"> • Visitors counter(see page 359) • Queue detection (see page 359) • Heat map(see page 814) 	Optional	Yes	Yes
Face Mask Detection(see page 279)	Optional	Yes	Yes
Neural Tracker(see page 261)	Optional	Yes	Yes
Smoke and fire detection(see page 329)	Optional	Yes	Yes

Neural Counter(see page 323)	Optional	Optional	Optional
Human Behavior Analytics			
Pose detection(see page 346) ⁶ includes: <ul style="list-style-type: none"> • Man down • Raised arms • Crouched man • Social distancing 	Optional	Optional	Optional
Personal Protective Equipment Detection			
Personal protective equipment detection(see page 332) includes: <ul style="list-style-type: none"> • Helmets • Hi-viz vests • Protective Clothing 	Optional	Optional	Optional
Add-On Modules			
Integration With Access Control System	Up to 50 readers	Up to 100 readers	Optional
Integration With Fire and Security Alarms System	Optional	Optional	Optional
Integration Perimeter Intrusion Detection System	Optional	Optional	Optional
Events from external systems (POS terminals, ACFA)(see page 183)	Optional	Optional	Optional
Custom AI Analytics	Optional	Optional	Optional
Water level detection(see page 367)	Optional	Optional	Optional
Offline analytics. Smart search in imported video.(see page 507)*****	No	No	Yes
Multicamera Tracking. Tracking follows objects across multiple camera FOVs based on appearance similarity.*****	Optional	Optional	Yes

Similarity Search****	No	Optional	Yes
Datacenter Domain Unification/Private Cloud	No	No	Yes
Real-time face recognition ⁵²	Optional	Optional	Optional
FaceCube external face recognition module(see page 295)	Optional	Optional	Optional
Real-time vehicle license plate recognition(see page 322) ⁴	Optional	Optional	Optional
Person-based privacy masking configuration(see page 343)	Yes	Yes	Yes
Searching for LPR/ANPR numbers and faces on video from multiple cameras(see page 728)	Optional	Yes	Yes
Data replication(see page 210)	No	Yes	Yes
Failover(see page 562)	No	Yes	Yes
Video walls management ⁵³	No	Yes	Yes
LDAP authentication supported(see page 440)	No	Yes	Yes

System features available for all licenses

Hardware Control panels Security keyboards Joysticks I/O modules	Unlimited	Unlimited	Unlimited
ArkivNet cloud service ⁵⁴	Yes	Yes	Yes

<p>Server</p> <p>ONVIF Profiles G, S, T(see page 107)</p> <p>H.265 support(see page 11)</p> <p>Edge analytics (metadata from IP devices)(see page 370)</p> <p>Configuration backup and restore(see page 842)</p> <p>Mass configuration of cameras(see page 112)</p> <p>Multicasting(see page 540)</p> <p>Hotkeys(see page 551)</p>	Yes	Yes	Yes	Yes	Yes	Yes
<p>Recorded Video / Investigation</p> <p>Local and network archives(see page 202)</p> <p>Events search(see page 702)</p> <p>Time slice search (search by time intervals)(see page 703)</p> <p>Simultaneous search in an archive of several video cameras(see page 728)</p> <p>Video bookmarking (searchable text comments) (see page 705)</p>	Yes	Yes	Yes	Yes	Yes	Yes

<p>Live Monitoring</p> <p>Basic audio and video analytics(see page 221)</p> <p>Embedded detection tools (see page 370)(except for Axis on-board tracker(see page 373)⁵)</p> <p>Interactive 3D map(see page 766)</p> <p>GreenStream adaptive bandwidth management(see page 661)</p> <p>Target&Follow Lite(see page 657)</p> <p>OnScreen PTZ mode(see page 653)</p> <p>Support for fisheye cameras and ImmerVision lenses(see page 729)</p> <p>Export of frames and video recordings to multiple formats(see page 776)</p> <p>Information boards(see page 740)</p>	Yes	Yes	Yes	Yes	Yes	Yes
<p>Remote clients</p> <p>Web-Client interface</p> <p>iOS app (including Apple TV)</p> <p>Android app</p>	Yes	Yes	Yes	Yes	Yes	Yes

Note

Information about the type of license you are using is displayed in the Server properties in the **Product type** field.
Users in the **admin** role get an informational message to renew the license 30 days or less before it expires.

Note

- ¹ – the system will operate in demo mode from 8:00 AM to 6:00 PM.
² – all Scene analytics detection tools are available in *Arkiv* Free license based on the metadata from the base VMD, except for Line crossing and Abandoned objects tools.
³ – to use Post-Analytics, you will need to request an additional free license.
⁴ – to use License plate recognition (VT), it is necessary to re-activate the updated license of the ANPR (see [Licensing of the software module for License plate recognition \(VT\)](#)(see page 307)).

⁵ – the module has to be purchased separately.

⁶ – with the license, you can use privacy masks based on data from the corresponding detection tools.

5.1.1 Disclaimer

Inaxsys reserves the right to make changes to the specification and cost of software licenses without notice and without any obligation to make the same changes to the licenses already sold. Orders are processed in accordance with the price list valid at the time of placing the order. If a placed order contains incorrect prices or license specifications, regardless of the cause of such errors. Inaxsys reserves the right to reject or cancel the order, even if it has already been processed.

5.2 Licensing methods

5.2.1 There are two licensing methods for *Arkiv*:

1. License file only.

The license file contains data on basic hardware configuration (motherboard, processor, hard disk, video adapter, RAM, and network card) of all Servers. If you change any 2 of the basic hardware components, your license will be invalid. For example, this is the case when you change both CPU and motherboard. However, changing a graphics card or upgrading RAM will not affect the license.

This is why when working with *Arkiv* you should bear in mind the following:

- a. The activation request should be sent from the computer that will host the *Arkiv* Server.
- b. You can upgrade your license only if you retain the initial basic hardware configuration of all the Servers.
- c. It is not possible to transfer a license from one computer to another.

2. License file + Guardant dongle.

This method allows replacing Server hardware and transferring the license to another computer. To activate *Arkiv* via this method, contact Inaxsys to receive a license file and Guardant dongle.

If you already have a Guardant dongle, you can perform activation yourself. To do so, connect the Guardant dongle to the computer that you wish to activate and perform the standard activation steps.

Attention!

You may use a Guardant Sign key with Linux.

Note

If you install virtualization products such as VirtualBox, VmWare etc., this may affect the license. Should you encounter this problem, you are advised to uninstall all virtualization products or apply for a new license file.

5.3 Product activation utility

License activation for the *Arkiv* software package is carried out through the product activation utility.

You can launch the product activation utility from the Windows **Start** menu: **Start -> All Programs -> Arkiv -> Utilities -> Program Activation.**

Note

The product activation utility program file LicenseTool.exe is located in the folder <Directory where Arkiv is installed>\Inaxsys\Arkiv Smart\bin\

Then you must select the name of one of the Arkiv Domain servers to which the license file will be applied (the file is applied to all Arkiv Domain servers launched at the moment of activation) and connect to the system, under an administrator's user name and password, to continue the activation process.



Arkiv v.1.0.2.31

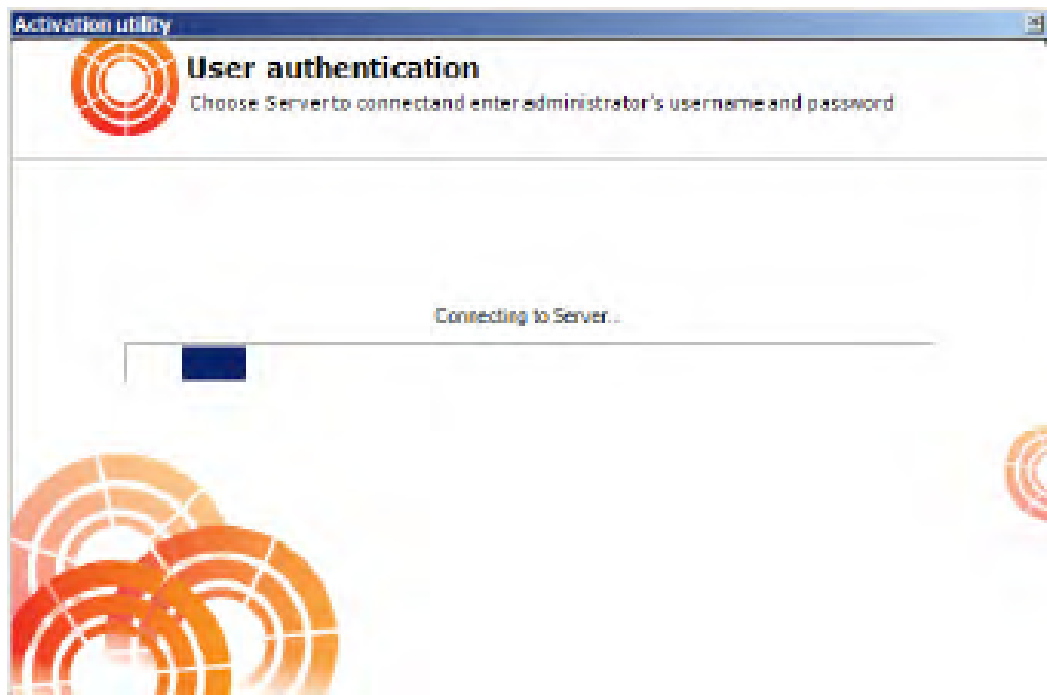
Server name or IP address: TEST >>

Username: root

Password: ●●●●●

Connect Close

The activation window will be displayed.



After the download is complete the main window of license utility will be displayed.



Note

To activate *Arkiv*, connect to a Server in the Arkiv domain. Otherwise, an error message appears.

5.4 License Activation

To activate *Arkiv*, please refer to the document titled [Activation Guide](#)⁵⁸, which presents step-by-step instructions on activating, updating and upgrading *Arkiv*.

It is also recommended that you use the prompts displayed in the product activation utility's dialog boxes.

6 Launching and Closing the Arkiv Software Package

6.1 Startup

6.1.1 Starting a Server

The *Arkiv* Server is started automatically when the operating system starts.

If the Server operation was stopped, perform one of the following actions to restart the Server:

1. Restart the system.
2. Select **Start server** from the **Start** → **All Programs** → **Arkiv** menu or in the *Arkiv Tray Tool* utility (see [Arkiv Tray Tool](#)(see page 824)).

Note

Run the command with the administrator permissions.

3. Start the NGP Host Service.

By default, the *Arkiv* Server start time is set to 120,000 ms. If the Server does not start within the set time, the second forced attempt will be made to start the Server.

You can use the `NGP_SERVICE_START_TIMEOUT_MS` system variable (see [Appendix 10. Creating system variable](#)(see page 927)) to increase the Server start time. The value of the variable should be specified in milliseconds.

6.1.2 Starting an Arkiv Client

The *Arkiv* Client can be started manually using the **Start** menu, which is intended for launching user programs in Windows.

Note

To launch the Client from command line, you have to specify the following parameters: login, password and Server.

For example: `C:\Program Files\Inaxsys\Arkiv\bin>Arkiv.exe --login=root --password=root --server=127.0.0.1`

To connect to multiple Servers, specify their addresses separated by commas.

For example: `C:\Program Files\Inaxsys\Arkiv\bin>Arkiv.exe --login=root --password=root --server=10.0.11.30, 10.0.11.34`

To start working with the software, perform the following steps:

1. Select **Start** → **All Programs** → **Arkiv** → **Arkiv**.

Note

The *Arkiv* software package program file `Arkiv.exe` is located in the folder <Arkiv installation folder>\Arkiv\bin\.

Note

To start the Client in Safe mode with OpenGL software emulation, select: **Start** → **Programs** → **Arkiv-Arkiv (Safe mode)**.

The Arkiv Client will then launch and an authorization window will appear.

2. Select a Server to connect to, and specify a port number.

[Connecting the Client to the Server behind NAT](#)(see page 921)

 Note

If the software is accessed by a remote user, the NetBIOS name or IP address of the computer with which the connection is established should be indicated in the **Server name or IP address** field.

 Note

The order of the Servers in the list is as follows:

- a. Preferred Servers (see [Selecting Preferred Servers](#)(see page 544)).
- b. The latest Server that was connected to.
- c. Other Servers are in alphabetical order.

3. Enter the user name and password and click **Connect**.

Note

The first login to the system is done with the user root, which has administrator permissions. Enter root in the **User Name** and **Password** fields. The administrator then needs to configure the system for multi-user access described in detail in the section titled [Configuring user permissions](#)(see page 430).

Attention!

You need to match software versions between the Server and the Client. The Drivers Pack's version must be the same as well. It is strongly recommended to avoid any connections if the product versions do not match.

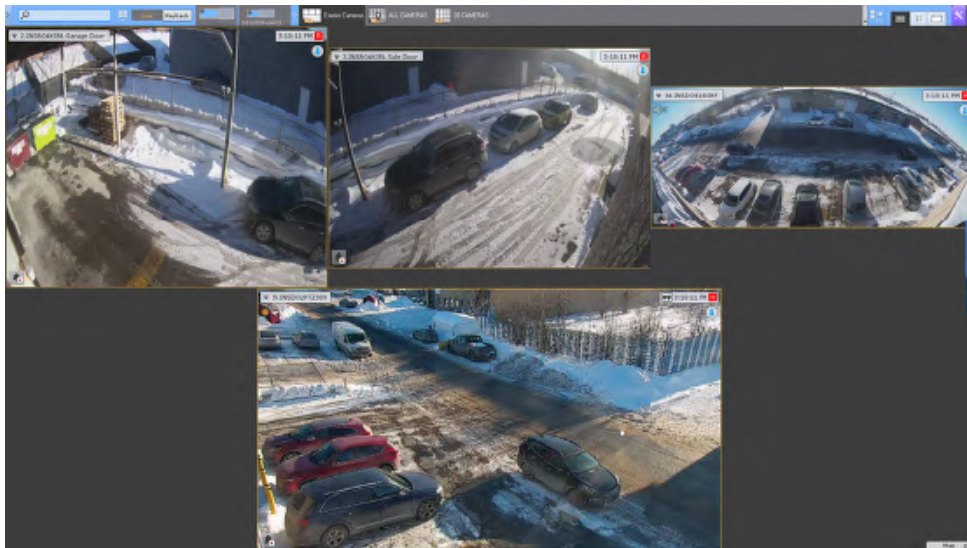
[Connecting LDAP users](#)(see page 85)

4. If the user requires the access confirmation by the system administrator, enter corresponding credentials and click **Connect**.

Attention!

When you first start the Client, the archive settings tab opens (see [Configuring Archives](#)(see page 200)). After the archive is created, camera addition starts automatically (see [Adding and removing IP devices](#)(see page 97)). IP Device Discovery Wizard launches.

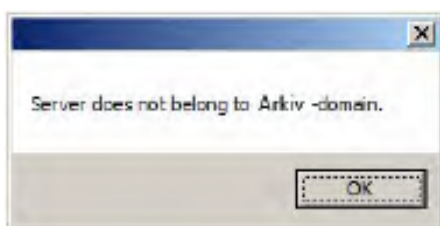
If authorization is successful, a video surveillance monitor will be displayed on the screen.





Note

If *Arkiv* is launched in *Arkiv Demo mode*, then after you enter the authorization parameters, a message to this effect will appear (see the section [Arkiv in Demo mode](#)(see page 80)).

If the Server to which *Arkiv* is connecting does not belong to any Arkiv-domain, after the **Connect** button in the authorization window is clicked, a message is displayed.



To connect to the Server, you must either create a new Arkiv-domain based on the Server or add the Server to an existing Arkiv-domain.

If you choose the first option, click **OK** in the message and follow the instructions given in the section [Creating a new domain](#). For the second option, click the  button and follow the instructions given in the section [Adding a Server to an existing Arkiv-domain](#)(see page 93). 

6.1.3 Running multiple Arkiv Clients

You can run multiple *Arkiv* Clients simultaneously on a single computer in order to connect to different Servers.

In this case, you must start Clients with the additional parameter **--monitor=N**, where N is the number of the monitor on which the Client is to be started.

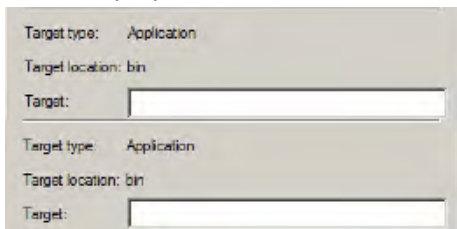
❑ Attention!

The maximum number of running Clients is limited to the number of connected monitors that support the minimum required resolution (see [Limitations of the Arkiv Software Package](#)(see page 13)).

You can run only one Client on a single monitor.

To run multiple Clients:

1. On your desktop, create a number of Client shortcuts equal to the number of connected monitors.
2. In the properties of each shortcut, in the **Target** line, add the additional parameter **--monitor=N**.



3. Start the Clients by using the shortcuts.

❑ Note

If a Client is started in window mode (see [Configuring the Client screen mode \(full screen or window\)](#)(see page 529)) and moved to another monitor, the situation changes: Clients will be started on the specified monitors even if a Client is already running on one or more of them.

6.1.4 Arkiv in demo mode

If activation has not been completed, *Arkiv free version* works in demo mode.

The system will operate in demo mode from 8:00 AM to 6:00 PM. There are limitations to functionality (see [Arkiv license types](#)(see page 66)).

The different types of demo modes are presented in table.

Type of demo mode	Conditions	Arkiv operation
Active	<i>Arkiv</i> can be started between the hours of 8:00 AM and 6:00 PM	Using <i>Arkiv</i> in demo mode
Inactive	<i>Arkiv</i> started outside the hours of 8:00 AM and 6:00 PM	The <i>Arkiv</i> server is not available, only the system configuration can be viewed

If a Client is connected to an Arkiv Domain in which there is at least one Server running in demo mode, an appropriate message is displayed, along with a list of Servers in the Arkiv Domain and their types of licenses.

Note

The notification is displayed after successful authorization.

If an Arkiv Domain includes at least one Server running in active demo mode, you will be given the option to continue working (2) or start the activation utility (1).



6.1.5 Automatic Start of the Client

You can use [Windows Task Scheduler](#)⁵⁹ to configure the *Arkiv* client to start automatically at the system start-up. It is recommended that you specify a Server start-up delay.

Note


You can also configure automatic authorization for the Client upon start-up (see [Configuring Cross-System Client and autologon](#)(see page 540)).

⁵⁹ [https://technet.microsoft.com/en-us/library/cc721931\(v=ws.11\).aspx](https://technet.microsoft.com/en-us/library/cc721931(v=ws.11).aspx)


6.2 Shutdown


6.2.1 Shutting down an Arkiv Client

Before closing *Arkiv*, you need to exit the user interfaces. To do this, perform one of the following:

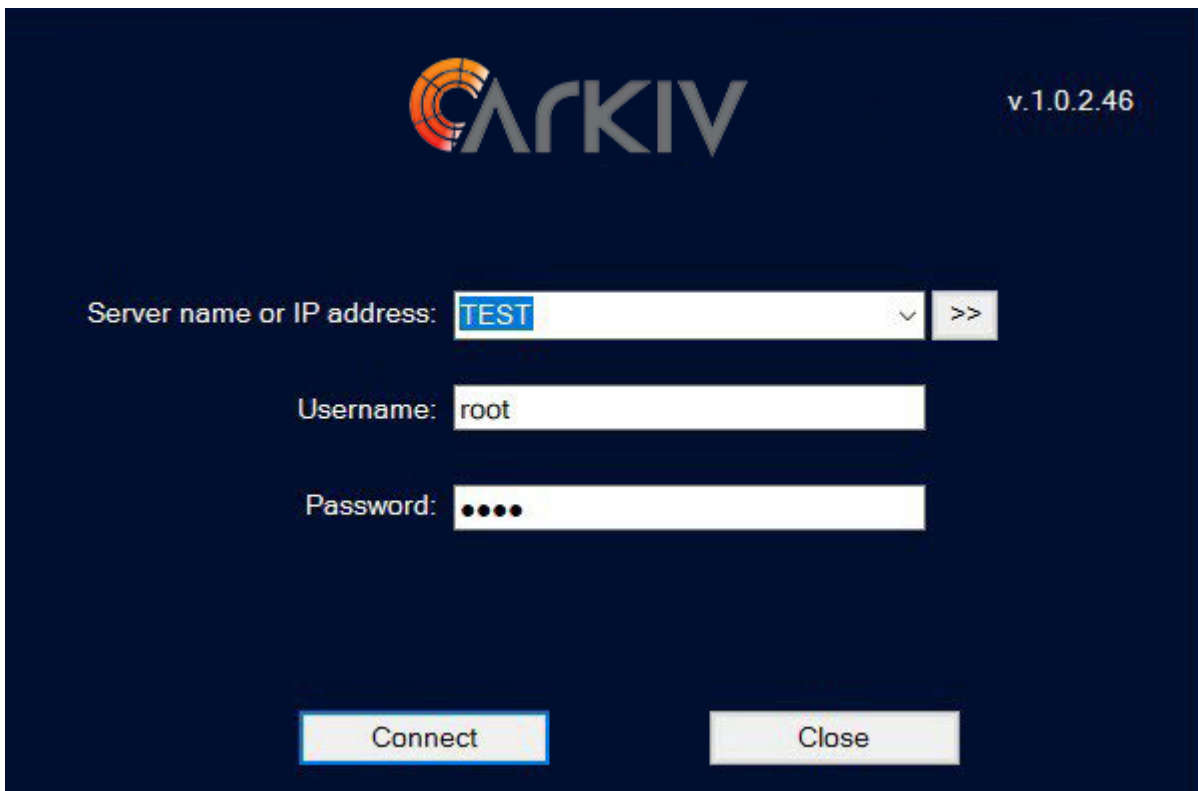
1. Click the  button located in the top-right corner of the *Arkiv* dialog box.

 **Note**

If the client is opened in full-screen mode (enabled by default), the  is not displayed. In this case you can exit the user interfaces using actions 2 and 3.

2. In the **Settings** tab, click the  button.
3. In the Windows taskbar notification area, in the context menu of the *Arkiv* icon, select **Close window**.

When you perform one of these actions, the authorization window will appear. To close *Arkiv* (completely exit the client), click the **Close** button.



6.2.2 Shutting down a Server

To shut down the *Arkiv* Server, perform one of the following actions:

1. Select **Stop server** from the **Start** → **All Programs** → **Arkiv** menu or in the *Arkiv Tray Tool* utility (see [Arkiv Tray Tool](#)(see page 824)).

Note

Run the command with the administrator permissions.

2. Stop the NGP Host Service.

By default, the *Arkiv* Server shutdown time is set to 60,000 ms. If the Server does not shut down within the set time, the second forced attempt will be made to shut down the Server.

You can use the `NGP_SERVICE_STOP_TIMEOUT_MS` system variable (see [Appendix 10. Creating system variable](#)(see page 927)) to increase the Server shutdown time. The value of the variable should be specified in milliseconds.

6.3 Automatic Server restart

If you change the following network settings in the operating system, the *Arkiv* Server is automatically rebooted:

- IP address;
- creating a new network connection.

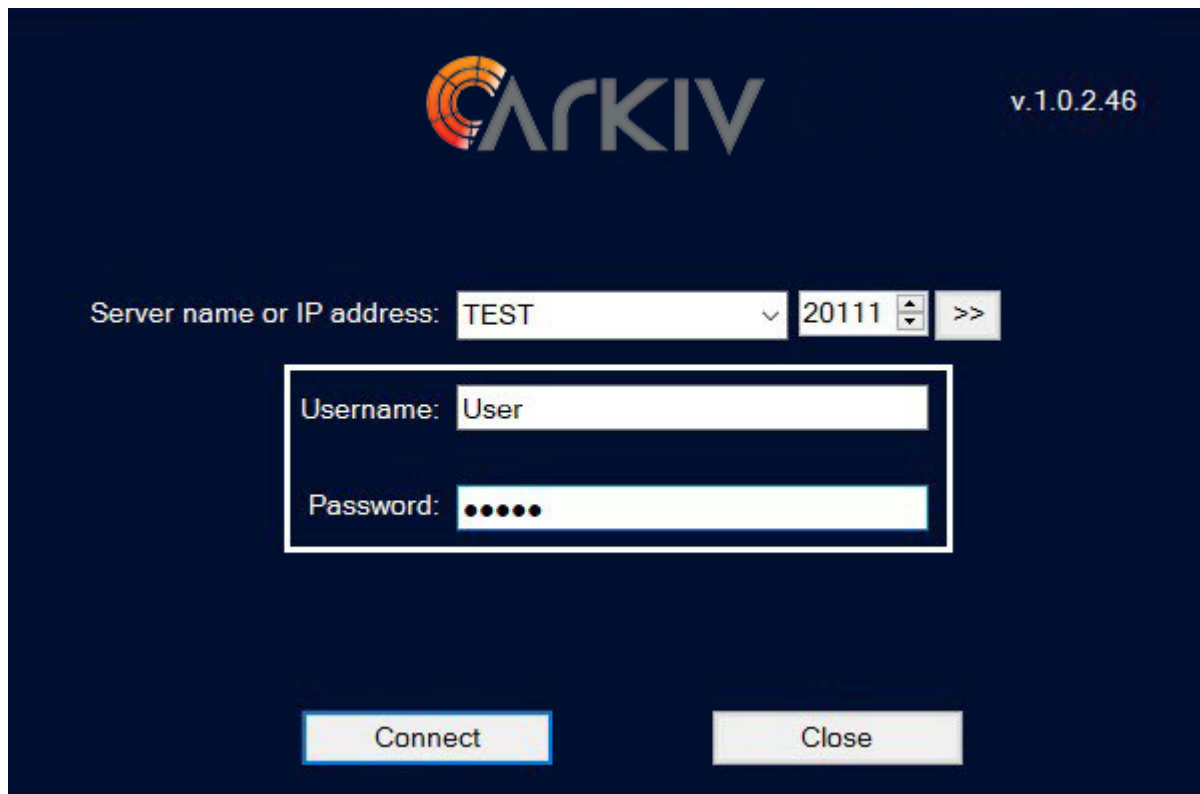
Attention!

While the Server restarts, the connection to cameras is temporarily lost and recording stops.

6.4 Switching Users Quickly

You can switch *Arkiv* users quickly without fully exiting the client. To do this, follow the steps below:

1. Exit the *Arkiv* user interface (see the section [Shutdown](#)(see page 82)).
2. When the authorization window appears, enter the user name under which you need to log in and the corresponding password and click **Connect**.



Switching users is now complete.

6.5 Cross-System Client

Cross-System Client empowers users to connect to multiple servers on various domains and in different systems from a single client workstation. All settings and cameras associated with these servers are consolidated in a single convenient view. That way you can access multiple independent surveillance systems simultaneously, even if the customer cannot or does not want to combine these systems.

This may happen for various reasons, such as:

1. your facilities are geographically dispersed, or
2. you want to mass configure multiple cameras from different systems.

A typical scenario may involve police plugging Cross-System Client in security systems at different retail chains/stores.

Cross-System Client automatically connects to specified Arkiv domains when you start it (see [Configuring Cross-System Client and autologon](#)(see page 540)). The client first connects to the primary Arkiv domain; connection to the other Arkiv domains is established in the background after the client starts.

Arkiv v.1.0.2.46

Server name or IP address: SAFECITY:20111,TEST:20111

Username: root

Password: ●●●●

Connecting to SAFECITY...

Connect Close

Note

You can also configure the Client connections to Arkiv domains in the sign-up in the authorization dialog box. To do this, enter comma-separated values for Servers as follows: <Server 1 Name or IP address>:<Connection port>, <Server 2 Name or IP address>:<Connection port>. Server 1 is the primary connection.

6.6 Connecting LDAP users

LDAP users are connected to the system in two steps:

1. The user logs in on the LDAP server.
2. The user then authenticates on the *Arkiv* server.

Attention!

Each Client to which LDAP users are connecting must have access to the LDAP catalog.

Note

When an LDAP user connects, the user's login and password in the LDAP as configured in the Server settings are used (see [Creating LDAP connections](#)(see page 444)). The login and password in the LDAP directory are not used when connecting to the Server.

6.7 Connecting to Another Server Quickly

You can connect to another Server without fully exiting the Client.

To do this, follow the steps below:

1. Exit the *Arkiv* user interface (see the section [Shutdown](#)(see page 82)).
2. When the authorization window appears, select the Server to which you need to connect the Client from the **Computer** list.
3. Enter the user name under which you need to log in and the corresponding password and click **Connect**.

Connection to another Server is now complete.

7 Configuration of the Arkiv Software Package

7.1 General information on system configuration

7.1.1 System configuration: stages

Most system configuration is performed via the **Settings** expanding menu, which contains six tabs for configuring certain parts of the system.



The main stages of system configuration are:

1. Configuring an Arkiv domain.
2. Connecting and configuring hardware.
3. Configuring archives.
4. Configuring layouts and the interactive map.
5. Configuring users and roles.

Attention!

Please avoid changing system settings from different Clients simultaneously.

7.1.2 Applying and resetting settings

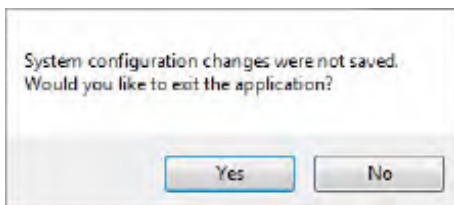
For a change in the system settings to take effect, you must click the **Apply** button.

After you click the button, a progress bar indicates that the settings are being applied. You can resume working with the system after the process completes.




If you want to discard changes and have not clicked the **Apply** button, click **Cancel**.

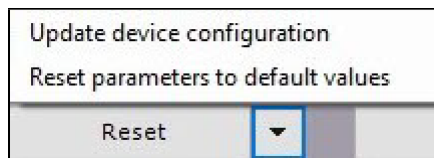
If an attempt is made to close the Client but not all changes have been saved yet, a dialog box asks whether to confirm closing or to cancel closing and save changes.




When setting up hardware, you can reset parameters to default values, or read configuration from the device at any time.

To reset parameters to default values, do the following:

1. Select the required device in the objects tree.
2. Click , then **Reset parameters to default values**.



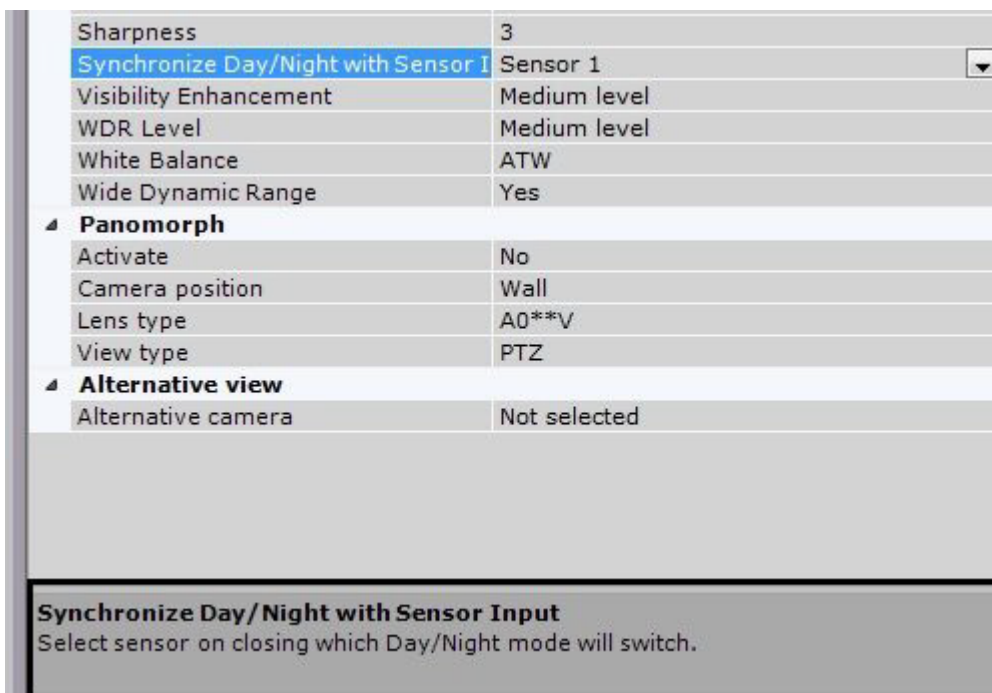
If a device's configuration differs from settings specified within the system, you can download the configuration from the device. To do it, follow the steps below:

1. Select the required device in the objects tree.
2. Click , then **Update device configuration**.

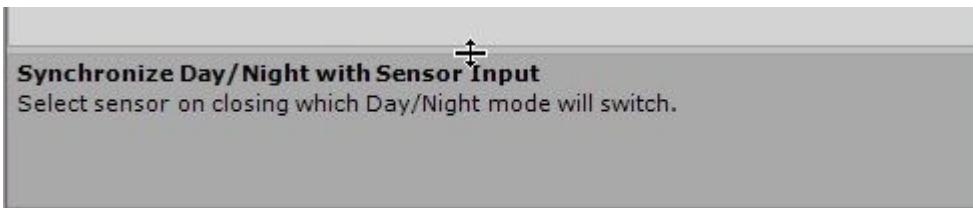
7.1.3 Display of parameters in interface

Most system parameters and hardware parameters are displayed in the *Arkiv* interface.

The description of a parameter is usually displayed in a special area when the relevant parameter is selected.



If the description of a parameter is truncated, you can stretch this area above the upper border.



7.1.4 System objects

Arkiv VMS has the following types of system objects:

1. Arkiv domain objects (see [Configuring Arkiv domains](#)(see page 91)).
2. Hardware objects: Server, IP Server, Camera, Microphone, PTZ, Input, Output, Embedded Storage (see [Configuring System Objects for Devices](#)(see page 104)).
3. **Event Source** objects are used to integrate Arkiv with external systems (see [Receiving Events from External Systems](#)(see page 183)).
4. **SMS and E-mail** objects used in macros and automatic rules for SMS and e-mail notifications (see [The SMS notifier object](#)(see page 414), [The E-mail notifier object](#)(see page 411)).
5. **Export Agent** objects used in macros and automatic rules for exporting video recordings and snapshots (see [Configuring export](#)(see page 545)).
6. Archive objects (see [Configuring Archives](#)(see page 200)).
7. Detection tool objects (see [Configuring detection tools](#)(see page 221)).
8. Role and user objects (see [Configuring user permissions](#)(see page 430)).
9. Macro objects (see [Configuring Macros](#)(see page 381)).

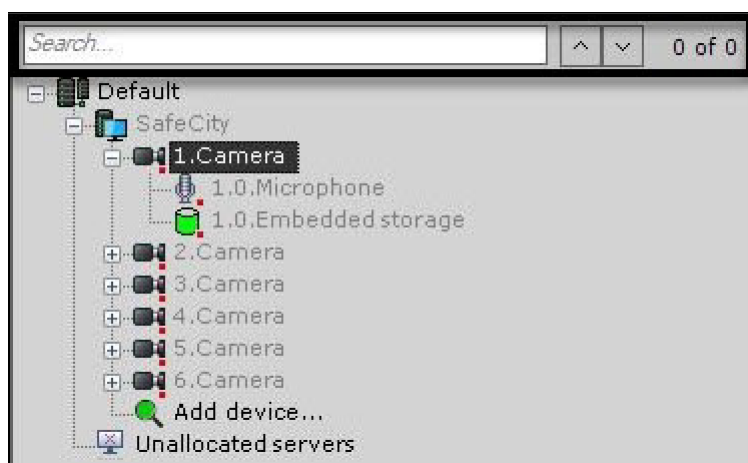
Some objects are created automatically, while others are created manually or are pre-created in the system.

7.1.5 Object search

Arkiv allows you to search for objects in the objects tree using only part of their name or the IP address. An object search can be performed on all tabs under **Devices**.

To search for objects, complete the following steps:

1. Select the tab containing the object tree that you need to search.

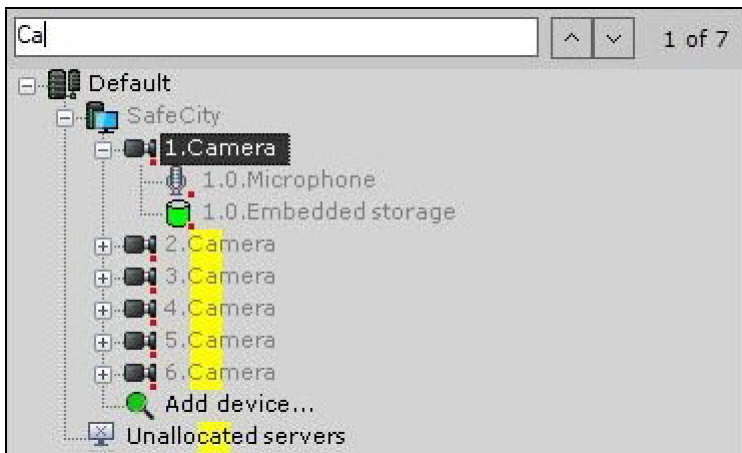


2. Enter the IP address, the full or partial name of the object in the **Search** field.

Note

- Search is not case-sensitive.
- Search can also be run based on object ID.

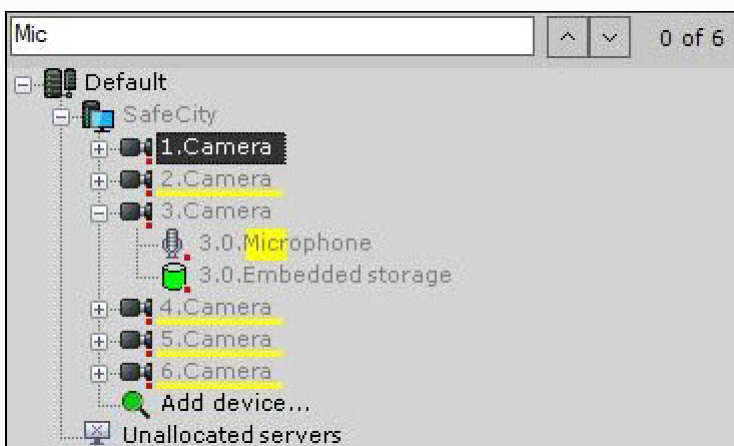
The search starts automatically once you enter something in the box. When the search is complete, you will see the number of objects found in the tree.




The parts of names corresponding to the characters you entered will be highlighted in yellow on the found objects.

Note

- If you search by an IP address, the found object will be fully highlighted.
- If a found object is located in a collapsed branch of objects, the branch will be highlighted with a yellow line.



You can use the   buttons or press ENTER to navigate through the search results.

The search results rotate in a loop; moving from the last object takes you back to the first object.

Note

If you move to an object located in a collapsed branch, the branch will automatically expand.

7.2 Hardware configuration

7.2.1 Configuring Arkiv domains

A distributed system based on the *Arkiv* software package is created within an Arkiv Domain, i.e., a selected group of *Arkiv* Servers.

When configuring Arkiv Domains, the following operations are used in the necessary combinations:

1. Creating a new domain.
2. Adding a Server to an existing Arkiv Domain.
3. Excluding a Server from the current Arkiv Domain.

Attention!

You cannot combine regular and Failover Servers within the same Arkiv domain (see [Configuring Failover VMS](#)(see page 562)).

To configure Arkiv Domains, you must have the appropriate permissions (see the section [Configuring user permissions](#)(see page 430)).

This section gives step-by-step instructions for each operation used in configuring Arkiv Domains, and then describes typical instances of their use.

Arkiv-domain object

The **Arkiv-domain** system object is at the base of the system.

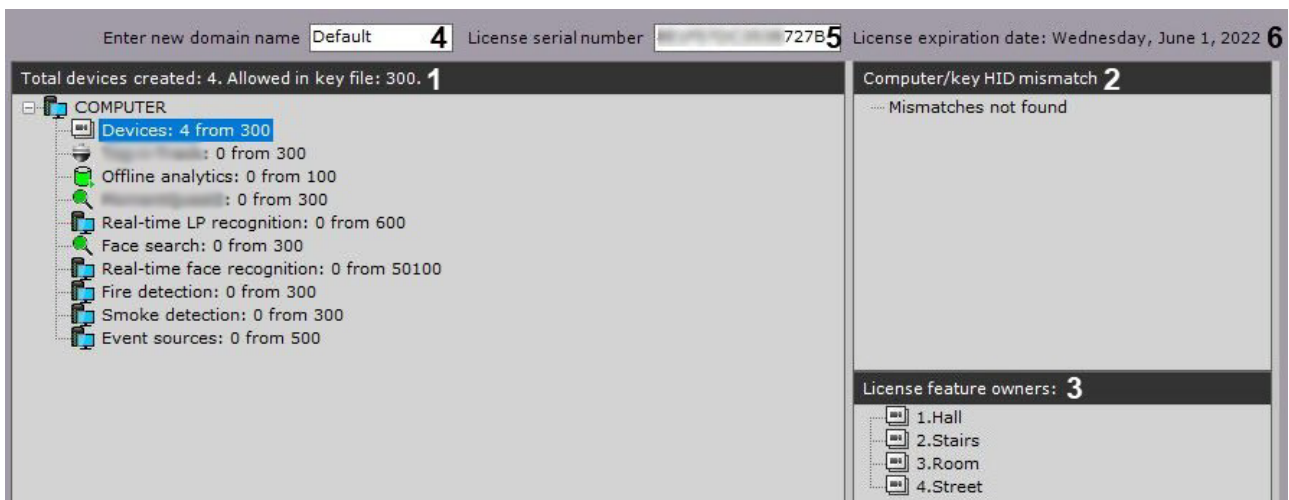
The **Arkiv-domain** object is the parent of the **Server** objects, which correspond to the servers that are in the Arkiv-domain.

When you select the **Arkiv domain** object in the **Total devices created** group (**1**), the software displays information about the Arkiv domain and the current license: Servers and their number, IP devices and various used functions.

Also displayed are license serial number (**5**) and license expiration date (**6**).

Note

The number of created devices means the total number of enabled IP video channels.



In the **Computer/key HID mismatch (2)** group, the license information/error is displayed.

If you select a licensing option in the relevant group (1), the **License feature owners (3)** group will include the objects currently using this license.

You can also rename the Arkiv-domain. To do so, enter the new name in the corresponding field (4) and click the **Apply** button.

Arkiv Domain operations

Creating a new domain

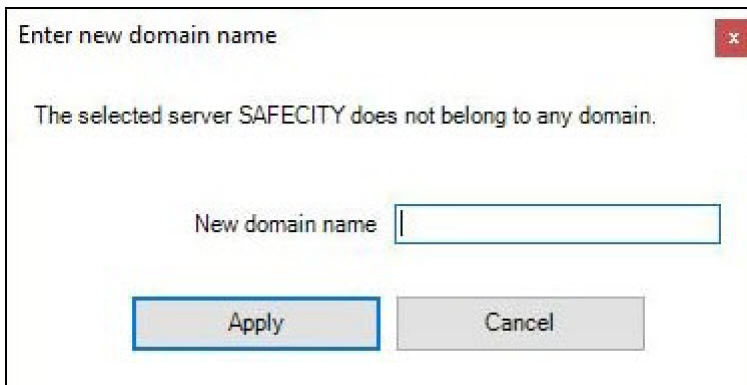
A new Arkiv Domain can be created in one of two ways:

1. During installation of the *Arkiv* software package with the Server and Client configuration type (see step 8 of the instructions in the section [Installation](#)(see page 36)).
2. When attempting to connect to a Server which does not belong to a domain.

In the second case a message will appear, in which you should click **OK** (see also the section [Startup](#)(see page 76)).



The **Enter new domain name** window will appear. In the **New domain name** field, enter the Arkiv Domain name to create a new group of computers based on the Server and click **Apply**.



❏ Attention!

It is not possible to use the above steps to add a Server to an existing Arkiv Domain. Assigning the same Arkiv Domain name to several Servers does not guarantee that those Servers will be in the same Arkiv Domain. Different Arkiv Domains can have identical names.

This will create a new Arkiv Domain based on the Server. The *Arkiv* software package will then be launched with the entered authorization parameters (see the section [Startup](#)(see page 76)).

Adding a Server to an existing Arkiv-domain

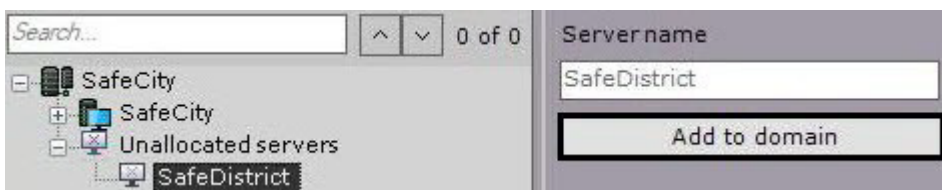
A Server can be added to the existing Arkiv-domain from any Server within that Arkiv-domain.

❏ Attention!

- Before configuring a distributed system, be sure to consolidate your Servers into the Arkiv-domain.
- When consolidating the Servers into the Arkiv-domain, each Server should have a unique IP address.
- Only unallocated Servers can be added to the Arkiv-domain. Unallocated Servers are the Servers that don't belong to any Arkiv-domain.

There are two ways to add a Server to the Arkiv-domain, depending on whether or not it is present in the search results (in the **Unallocated servers** group).

If a Server is present in the search results, select it and click the **Add to domain** button.



The Server will then be added to the Arkiv-domain from the **Unallocated servers** group.

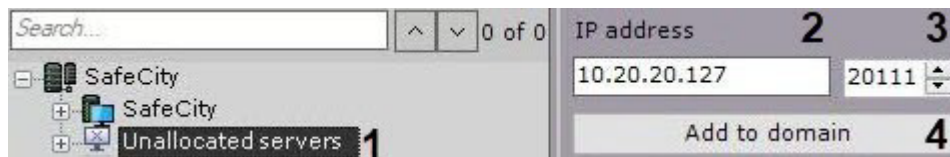
Since the search for the unallocated Servers is conducted using the broadcast packets, the results may not include Servers located in a different subnet (for example, beyond a router that blocks broadcast packets).

In this case, you can add a Server to the Arkiv-domain manually. This option can be used with all unallocated Servers, including those present in the **Unallocated servers** group.

- [Consolidating the Servers from different networks into Arkiv domain](#)(see page 918)
[Network settings utility](#)(see page 865)

To add a Server to the Arkiv-domain manually, do the following:

1. Select the **Unallocated servers** group (1).




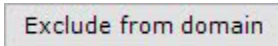
2. Enter the Server IP address (2).
3. Enter the Server port (3).
4. Click the **Add to domain** button (4).

The Server will then be manually added to the Arkiv-domain.

After a Server is added to the Arkiv-domain using any of the methods described, it will be displayed in the objects tree.



If a Server is not available when it is added to the Arkiv-domain, it will be displayed in the objects tree with the  icon.

The Server will be added to the Arkiv-domain when it becomes available. To undo adding a Server to the Arkiv-domain, select the Server and click the  button.

Removing a Server from an domain

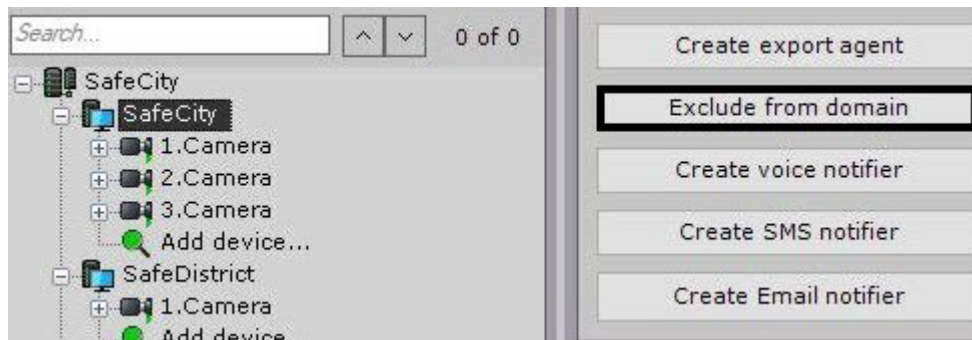
Any Server on a domain can be used to remove a Server from a domain.

□ **Attention!**

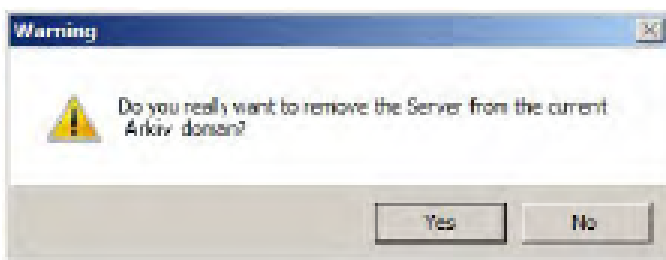
By excluding a Server, you also delete the macros, layouts, maps, object groups, roles, and users that have been created on the Server.

To remove a Server from an domain, you must perform the following steps:

1. Select the Server in the list and click the **Exclude from domain** button.



2. In the window which appears, confirm that you want to remove the Server from the domain by clicking the **Yes** button.



The Server will then be removed from the domain. If the current Client was connected to the excluded Server, the user interfaces will be unloaded and the user will be prompted to repeat the authorization procedure for *Arkiv* (see the section [Startup](#)(see page 76)).

Note

You can also exclude a Server from an domain using the activation utility.

Cases of Arkiv Domain configuration

All possible cases of Arkiv Domain configuration are, to some degree, a combination of two typical cases.

In the first typical case, the Servers for the future Arkiv Domain are selected before *Arkiv* installation. This case involves the following steps:

1. Selecting a Server on the basis of which the new Arkiv Domain will be created. Installing the *Arkiv* software package with the Server and Client configuration type, indicating the name of the new Arkiv Domain (see also step 8 of the instructions in the section [Installation](#)(see page 36)).

Note

Any Server in the future Arkiv Domain can be selected as the primary Server.



2. Installing the *Arkiv* software package with the **Server and Client** configuration type on the other servers of the future Arkiv Domain, without adding them to the Arkiv Domain (see also step 8 of the instructions in the section [Installation](#)(see page 36)).



3. Connecting to the primary server.
4. Adding the remaining Servers to the Arkiv Domain from the primary Server according to the instructions in the section [Adding a Server to an existing Arkiv-domain](#) (see page 93).

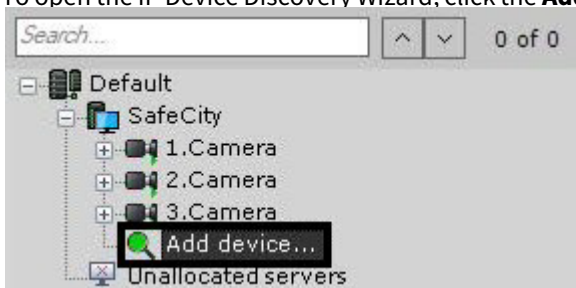
In the second typical case it is necessary to add servers which are part of another Arkiv Domain to a new Arkiv Domain. This case involves the following steps:

1. Excluding all the Servers which are to be added to the new Arkiv Domain from their current Arkiv Domains, according to the instructions in the section [Removing a Server from an domain](#) (see page 94).
2. Naming the new Arkiv Domain according to the instructions in the section [Creating a new domain](#) (see page 92), when attempting to connect to one of the Servers excluded in step 1.
3. Adding the remaining Servers to the Arkiv Domain from the primary Server according to the instructions in the section [Adding a Server to an existing Arkiv-domain](#) (see page 93).

7.2.2 Adding and removing IP devices

You can add video cameras and IP Servers to the system by using the IP Device Discovery Wizard.

To open the IP Device Discovery Wizard, click the **Add device ...** link at the end of the Server device list.



When the Wizard is opened for the first time after the Client is started, automatic search for new devices will begin.

During subsequent sessions, to launch the Wizard you must click the corresponding button. A progress bar indicates search progress.



To stop devices search at any time, click the **Stop** button.

Note
 Since multicast packets are used for device search, the search results may not contain the Servers and devices from other subnets.

The search results are color-coded based on the status of the device.

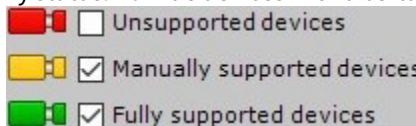
Color of video camera icon		Description					
		Fully supported device					
		Manual configuration required					
		Arkiv compatibility not guaranteed					

IP address	Port	Vendor	Username	Bind to the archive	ID	Latitude	Longitude
172.19.9.110	80	UNIVIEW	Auto	Archive Aqua	Auto	0	0
MAC address 48ea632d82e6		Model IPC324ER3-DVVF28	Password ****	Recording On motion	Name Auto	Azimuth 0	
IP address 169.254.9.250	80	ONVIF generic	Auto	Archive AliceBlue	Auto	0	0
MAC address not defined		Model generic	Password ****	Recording On motion	Name Auto	Azimuth 0	
IP address 47.47.119.119	29487	MicroDigital	Auto	Archive Aqua	Auto	0	0
MAC address 55:54:46:2D:38:22		Model MDC-I4230	Password ****	Recording On motion	Name Auto	Azimuth 0	

Note
 If you click the IP address, you will jump to the device web interface.

Search results can be filtered in two ways:

- By status. To hide devices with a certain status, deselect the relevant checkbox.



- By manufacturer, model or IP address. To do this, use the **Filter** field. For example, this filters the **Sony** devices.

Add device...

Search

Unsupported devices

Manually supported devices

Fully supported devices

Devices found (2): Filter:

IP address 172.19.9.52	Port 80	Vendor <input type="text" value="Sony"/>
MAC address d8-d4-3c-05-af-95		Model <input type="text" value="SNC-VB630"/>
IP address 172.19.90.250	Port 80	Vendor <input type="text" value="Sony"/>
MAC address d8-d4-3c-05-af-97		Model <input type="text" value="SNC-VB630"/>

In addition, you can filter cameras from a subnet.

Devices found (76): Filter:

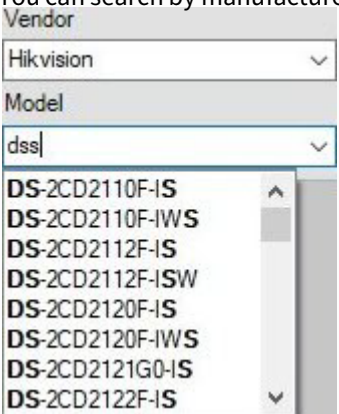
IP address 172.19.10.205	Port 80	Vendor <input type="text" value="iZett"/>
MAC address 00:0F:0D:25:12:74		Model <input type="text" value="HR-FD2030C"/>
IP address 172.19.10.232	Port 80	Vendor <input type="text" value="ONVIF generic"/>
MAC address not defined		Model generic
IP address 172.19.12.177	Port 80	Vendor <input type="text" value="ONVIF generic"/>
MAC address not defined		Model generic

When adding a device, you can immediately set several configuration options, such as:

1. Manufacturer and model.

Note

You can search by manufacturer and model of the device.



Vendor
Hikvision

Model
dss

- DS-2CD2110F-IS
- DS-2CD2110F-IWS
- DS-2CD2112F-IS
- DS-2CD2112F-ISW
- DS-2CD2120F-IS
- DS-2CD2120F-IWS
- DS-2CD2121G0-IS
- DS-2CD2122F-IS

2. Login and password.
3. ID and object name.

Note

An object identifier must contain: numbers, English characters and the "_" sign.
In the Object Tree, added devices will be sorted by ID.

4. In the Object Tree, added devices will be sorted by ID.
5. Select an archive and set the recording parameters (see [Configuring recording to an archive\(see page 207\)](#)):
 - a. **No** – camera is linked to the archive, no recording.
 - b. **Always** – continuous recording.
 - c. **On motion** (default setting) – a VMD tool and an automatic rule for writing to the specified archive are automatically created for the camera you are adding. By default, recording stops when an event detection is finished.
 - d. **On motion/Embedded detection** – an embedded VMD tool and an automatic rule for writing to the specified archive are automatically created for the camera you are adding. By default, recording stops when an event detection is finished.

Note

This option is available only for devices that have on-board VMD.

Note

When creating a new device, the pre-alarm time interval for video footage recording is automatically set to 3 seconds (see [Configuring recording to an archive\(see page 207\)](#)).

- e. Camera coordinates (latitude, longitude, azimuth) which are used when the camera is added to the geo map (see [Adding video cameras\(see page 491\)](#)).

In addition, three modes are available for adding a device to a configuration. These are described in the following table.

Parameters of adding devices

Start with default settings


Keep current settings

Start with parameters

	Device addition mode	Description
1	Add device with default settings	The IP device is added to the configuration with the default settings (the default settings are determined by <i>Arkiv</i> itself). Adding a device in this mode will change the current settings of the device.
2	Add device with current settings	The IP device is added to the configuration with the current settings, as specified in the web interface.
3	Add device with template settings	<p>The IP device is added to the configuration with the settings that have been previously specified for a device of the same model in the configuration. Select a device of the same model (the "template device") in the list. Only devices of the same model are shown in the list of search results for choosing the template device. The following settings will be copied from the template device to the new, similar device: firmware, video stream settings, buffering settings, Other settings (see The Video Camera Object(see page 107)), and Other settings for Microphone and Speaker objects, if these are configured for the template device. This mode is best when multiple cameras of the same model are in use at a site. If this is the case, we advise to:</p> <ul style="list-style-type: none"> • Add and configure one device. • Add the remaining devices, copying settings from the "template device" as described previously.

To add an IP device to a configuration:

1. Set device settings, if necessary.
2. Select a mode for adding the device to the configuration.
3. The device is then added to the configuration.

During a single configuration change, you can add a single device or all devices listed in the search results (other than devices for which compatibility is not guaranteed). To add one device, click the  button. To add all devices, click the **Add all** button.

If you set no individual access parameters while adding hardware, a dialog window appears for setting unified access parameters.

Change credentials

Enter credentials for all cameras:


Username:

Password:

Apply

Cancel

Note

To remove a device from the search results, click the  button.

Note

Remember that if you add all IP devices at the same time, the same mode and settings will be applied to all of them.

If an IP device is not shown in the search results (because it is located on another subnet or contact has been temporarily lost), you can add it manually. To do so, in the neutral-colored area above the search results, select the type of IP device that you are adding (with or without edge storage), specify an IP address and port, and select the manufacturer and model.

IP 0.0.0.0	Port 80	Vendor Zett
Device Type VideoDeviceInfoCategory	Model HR-FD2030C	Firmware VC1.0.1B...

Then add the device to the configuration by following the steps described previously.

To remove IP devices, select them in the device list (by left-clicking one or more devices, holding down the CTRL key to select multiple devices) and click the **Delete** button.

If you click the IP address, you will jump to the device Web interface.

Bulk creation of IP devices

You can add IP devices in bulk by importing their parameters from a CSV file.

❏ Attention!

You have to disable the UAC first.

Do the following:

1. Create a CSV file with devices listed as follows:

```
IP address, Port, Vendor, Model, Login, Password, Identifier, Object name, Latitude, Longitude,
Azimuth, Archive name, Recording mode
```

❏ Attention!

For each added camera, three parameters are required: IP address, Vendor and Model. If a required parameter is not specified, it will be automatically set to its default value. You should include commas even if no additional parameters are set.

❏ Note

To separate the integer and fractional parts in coordinates, use a point.

For example:

```
10.0.12.245 , 80, Bosch, Dinion IP starlight 8000 MP, service, Admin12345!, 1441, Camera 1, 0, 0, 0,
Archive AliceBlue, Always
10.0.12.246 ,, Bosch, Dinion IP starlight 8000 MP,,,,,,,,
10.0.12.247 , 80, Bosch, Dinion IP starlight 8000 MP,,, Camera 3,,, Archive AliceBlue, On motion
```

❏ Attention!

The vendor and model of the device must be specified exactly as in the [list of supported devices](#).

❏ Note

For correct display of the object name in *Arkiv VMS*, the CSV file must be UTF-8 or UTF-32 encoded.

2. Drag & drop the created file to the field in IP Device Discovery Wizard in *Arkiv*.

IP address 0.0.0.0	Port 3600	Vendor 360Vision	Username Auto	Bind to the archive Archive Aqua	ID Auto	Latitude 0	Longitude 0	+
Device type IP device	Model Predator Pred-XX-IP	Password ****	Recording On motion	Name Auto	Azimuth 0			

The devices will be added to the configuration.

7.2.3 Configuring System Objects for Devices

The Server Object

The **Server** object corresponds to a computer:

- on which *Arkiv* is installed in the **Server and Client** configuration;
- is on the Arkiv-domain.

The name of the **Server** object is the same as the computer's network name.

The **Server** object is the parent of the **Camera** and **IP Server** objects, which correspond to the hardware connected to the Server.

Click the **Server** object to view the following information:

1. Buttons for creating a system speaker or SMS and email notifications, button for excluding the Server from the Arkiv-domain, and button for launching the Configuration management utility (**1**).

2. Information on the installed version of *Arkiv* and active license (**2**).
3. Web Server configuration options (**3**, see [Configuring the Web-Server](#)(see page 105)).
4. List of cameras connected to the Servers, including main settings (**4**).

Note

The number of connected devices means the total number of available IP video channels, including disabled.

The list of cameras is shown as a table with the following columns: **Name**, **IP address**, **Vendor**, **Model**, **Geolocation**, **Azimuth**, **Quality**, **Frame rate** and **Resolution**.

The table can be sorted by any of the columns.

Note

If no cameras have been created on a Server, you are prompted to search for IP devices on the network (the IP Device Discovery Wizard is launched, see [Adding and removing IP devices](#)(see page 97)).

If a camera supports multistreaming, the information in the **Quality**, **Frame rate** and **Resolution** columns will be displayed as follows > value for the lowest-quality stream/value for the highest-quality stream.

Devices connected: 5					Find cameras on the network			
Name	IP address	Vendor	Model	Geolocat	Azimuth	Quality	Frame rate	Resolution
1.Camera	0.0.0.0		Virtual		0	High	25	1920x1080
2.Camera	0.0.0.0		Virtual		0	High	25	768x576
3.Camera	0.0.0.0		Virtual		0	High	25	1920x1080
4.Camera	0.0.0.0		Virtual		0	High	25	3840x2160

Configuring the Web-Server

The Web-Server allows accessing *Arkiv* remotely over the Internet (see, [Working with Arkiv Through the Web-Client](#)(see page 792)).

Attention

On the local computer with the Web-Server running, ports from the range [9001; 9001 + number of logical cores of the processor] must be open.

Attention

The Web-Server records incoming non-H.264 videos into MJPEG format, therefore the incoming traffic may increase dramatically.

To configure the Web-Server in the *Arkiv* software package:

1. Select a **Server** object.

Web-server properties			
4	Certificate file		^
7	CORS	No	
1	Enable	Yes	
2	Port	80	
5	Private key file		
6	SSL port	0	
3	URL path	/	v
Certificate file		Path to SSL certificate file.	

2. If you want to disable the Web-Server, set the value of **Enable** to **No** (1).
3. In the **Port** field, enter the port number on which the Web-Server will be located (2).
4. In the **URL path** field, enter the prefix that is added to the server address (3).
5. To connect to a Web-Server via the HTTPS protocol, do the following:
 - a. Specify a path to the certificate (4).

❏ Attention!

Arkiv supports SSL certificates in PEM format with TLS encryption v 1.2 and 1.3 and AES GCM, AES CCM and AES CBC algorithms.
The public key must be in CRT format, the private key must be in KEY format.

- b. Specify a path to the private key **(5)**.
- c. Enter a port number to connect to the HTTPS Server **(6)**;
6. If you want to enable CORS (Cross Origin Resource Sharing) in the Web-Server, select the corresponding parameter **(7)**.

The Arkiv VMS supports the following:

- a. CORS HTTP-headers for GET and POST requests.
 - b. Preflight requests.
7. Click the **Apply** button.

The Web-Server is now configured and available over the Internet at the following address: `http://<IP address of Arkiv Server>:<Port>/<Prefix>`. For example, if the Servers IP address is **10.0.11.1**, the port is **8000**, and the prefix is **/asip-api**, then the Web-Server can be accessed at the following address: `http://10.0.11.1:8000/asip-api`.

Configuring an RTSP Server

Arkiv supports RTSP streaming from cameras.

To configure an RTSP-Server:

1. Select a **Server** object.
2. In the **RTSP port** field, specify the port number that will be used for RTSP data transfer **(1)**.

Web-server properties	
Port	80
1 RTSP port	554
2 RTSP/HTTP port	8554
URL path	/

3. In the **RTSP/HTTP port** field, specify the port number for transfer of RTSP data via HTTP tunnel **(2)**.
4. Click the **Apply** button.

Configuration of the RTSP Server is now complete.

To receive videos from an RTSP Server, use the following link format:

- **Live:** `rtsp://login:password@IP-Address:554/hosts/HOSTNAME/DeviceIpint.N/SourceEndpoint.video:0:0` – high quality stream;
`rtsp://login:password@IP-Address:554/hosts/HOSTNAME/DeviceIpint.N/SourceEndpoint.video:0:1` – low quality stream.
- **Archive** `rtsp://login:password@IP-Address:554/archive/hosts/HOSTNAME/DeviceIpint.N/SourceEndpoint.video:0:0/20160907T050548.723000?speed=1`.

where:

- **login:password** – user login and password in the Arkiv VMS.

❏ Attention!

For correct operation of the RTSP Server, a user name has to match the following rules:

- start with a letter;
- contain only Latin, numerical and following extra characters: "/", "-", "_", ".", ":", "+".

- **hosts** – permanent section of a link.
- **HOSTNAME** – server name.
- **N** – camera ID in the *Arkiv* VMS.
- **SourceEndpoint.video:0:0** – permanent section of a link.
- **speed** – a parameter required for receiving video streams from an Archive.

The Video Camera Object

Creation and configuration of the **Video camera** object is done in the **Hardware** tab. The object tree of a video camera is generated automatically according to its functions which are integrated into the *Arkiv* software package (the presence of alarm inputs, relay outputs, PTZ unit, etc.).

❏ Note

You can configure recording options for a camera in the corresponding tab (see [Configuring Archives](#)(see page 200)).

When you have added a camera via the IP Device Discovery Wizard (see [Adding and removing IP devices](#)(see page 97)), you can edit the camera's parameters. The camera parameters are grouped as follows.

In the **Object identification** group, you can see the camera ID, and, if necessary, you can enter a camera name/short name and text comments.

Object identification	
Enable	Yes
Name	Camera
Comment	
ID	2
Short name	2

❏ Note

You may use camera's short name in hotkeys (see [Notes regarding hot key actions](#)(see page 553)).

❏ Note

By default, the short name is a camera's ID. The full name of the video camera in the object tree is displayed in the <Short name>. <Name> format.
After changing the short name and restarting the Client, the cameras in the object tree will be sorted by their short names.

Also, you can disable the camera by selecting **No** in the **Enable** field.

❏ Attention!

In terms of licensing, every camera enabled is one channel. Disabled cameras are not subject to licensing (see [Licensing of the software product](#)(see page 66)). If you run out of camera licenses, disable offline/unused cameras.

In the **Object features** group you can see the following camera properties:

1. The IP address (assigned automatically and can be changed if necessary).

Note

The port used to transmit data between the camera and the *Arkiv VMS* (this value is set to 80 by default but can be changed if necessary).

2. At first the port number is set through the camera's Web interface.
3. Camera positioning coordinates (latitude, longitude, azimuth).
4. The MAC address.
5. Manufacturer, model, firmware.
6. The number of the video channel (for an IP Server).
7. Device serial number (for Axis devices only, see [Axis IP Devices](#)(see page 166)).

Object features	
Address	0.0.0.0
Port	80
MAC address	
Manufacturer	
Model	Virtual
Driver version	3.0.0
1 Break unused connections	No
Current firmware	
Device serial number	
2 Low GOP	No
Video channel No.	0

You can also customize a number of options shared by all video cameras in this group:

1. If you want to interrupt video streaming from the camera to the Server whenever it is not needed, select **Yes** for **Break unused connections (1)**.
 Conditional interruption of video transmission from a camera to the Server, if:
 - a. the video stream is not displayed on either Client or web client layout;
 - b. the stream is currently not being recorded into Video Footage;
 - c. the stream is currently not being processed by any detection tool.
2. After starting the Client, the default setting is to display video only after the first I-frame (key frame) is received. If the stream comes with a relatively long GOP length (Group of Pictures) or GOV length (Group of Video Object Planes), e. the number of P- and B-frames between I-frames in the stream, the video may be not available for a minute. In this case, select **Yes** for the **Low GOP** keyframe rate setting (**2**). This will reduce the waiting time for video by pushing the preceding I-frame that can be stored in the memory buffer on the Server. In some cases, the I-frame will not be buffered, but in most cases this means that it will soon be received from the device.

In the **Authentication** group, you can set the username and password to connect to the camera.

Authentication	
Default	<input checked="" type="checkbox"/> No
Username	<input checked="" type="checkbox"/> User
Password	<input checked="" type="checkbox"/> ●●●●●●

If the username and/or password for connecting to the camera are different from the factory settings, select **No** in the **Default** field and enter the current credentials.

Attention!

If the camera supports the Digest HTTP-authorization, add the symbol " : " to the last character of the password.

To enable video buffering on Clients, set the buffer length in milliseconds in the **Video buffering** group.

▼ Video buffering	
Buffer size	0

This value should be between 50 and 1000 milliseconds. If the value **0** is selected, video buffering is disabled.

In the **Camera settings** group you can see video image parameters (contrast, brightness, color saturation, etc.). When configuring these, you can look up short parameters' descriptions in *Arkiv* GUI. For more detailed information, please refer to the camera manual.

Video stream settings	
Brightness	50
Color Saturation	50
Contrast	50
Day/Night Autoswitch Time	50
Exposure Mode	Auto
Flicker-free	50
Image Flip	None
IR Cut Filter Sensitivity	Medium level
IR Cut Filter	Auto
Sharpness	50
Shutter Speed	1/50
WDR Level	0
White Balance	AWB1
Wide Dynamic Range	None

Note

If you set up a camera via its web page, you cannot edit the parameters in the VMS (see [Adding and removing IP devices](#)(see page 97)). To configure the camera in the VMS, select the **Send settings to device** checkbox.

You can configure fisheye cameras in the **Panomorph** group.

▼ Panomorph	
Activate	No
Camera position	Wall
Lens type	Common fisheye-lens
View type	PTZ
Fit to frame	No

Select a standby / substitute camera from the current Arkiv domain in the **Alternative view** list. The sub camera shows in the layout when the main camera is offline.

Alternative view	
Alternative camera 1 ↗	1.Camera
Alternative camera 2 ↗	3.Camera

Then you can configure them to show the nearest cameras to the alerted one (see [Configuring Alarmed cameras layout](#)(see page 479)).

You can configure video streams under the viewing tile. If a camera supports multistreaming, you can configure two video streams separately: high quality and low quality. When creating an IP device with a high quality video stream, a stream with a higher resolution is selected.

To configure video streams, you should make sure that the **Send settings to device** checkbox is selected.

High-quality video stream	0. H.264/MPEG4
Audio	Yes
Bitrate	8192
Compression Mode	Variable bitrate
Frames per second (fps)	12
Keyframes Interval	25
Quality	Medium level
Resolution	1280 x 720
Transport Protocol	TCP
Video Codec	H.264
Low-quality video stream ↗	1. H.264/MJPEG/MPEG4
Audio	Yes
Bitrate	4096
Compression Mode	Variable bitrate
Frames per second (fps)	12
Keyframes Interval	25
Quality	Medium level
Resolution	352 x 288
Transport Protocol	TCP
Video Codec	H.264

Note

In most cases, the following parameters are set for video streams: bit rate, compression rate, frame rate, and resolution. Detailed information on configurable parameters can be found in the official reference documentation for the video camera.

If a camera does not support multistreaming, the parameters of the video streams are identical. In this case only the parameters of the high-quality video stream are editable (the parameters of the low-quality video stream are adjusted automatically).

Note

When some video stream parameters are changed, the video camera may automatically restart, in which case it will become unavailable for some time (depending on the video camera).

Image from the camera will be displayed in the preview window.

The screenshot displays the '2. Camera' configuration window. On the left is a settings tree with categories like Object identification, Object features, Authentication, Video buffering, Video stream settings, Panomorph, Other, Alternative view, and Geolocation. The main area shows two video stream preview windows: 'High-quality video stream' and 'Low-quality video stream'. The 'Low-quality video stream' window shows a white van and includes a timestamp '11:00:22 AM' and technical data: 'Client's server frame rates: 4.2 / 25.1', 'Bitrate: 116.9 Kbit/s', and 'Client's server frame size: 768x576 / 768x576'. At the bottom, a settings table for the selected stream is shown:

High-quality video stream	0. Auto
Compression Rate	1
Folder	C:/Users/1/Documents/cameras/2
Frames per second (fps)	25
Resolution	100 x 100
Video codec	Auto
Low-quality video stream	0. Auto
Adaptive video stream	

Note

The indicator in the upper right corner displays the current time and recording status (see [Time Display](#)(see page 597)).

To switch between streams in the preview window, click the **High-quality video stream** and **Low-quality video stream** tabs.

Note

When a stream is selected in the preview window, the settings for the relevant stream are displayed; settings for the other stream are hidden.

Restoring default camera settings

You can restore the default *Arkiv* settings for a camera.


Current camera settings will be discarded and replaced with the defaults.

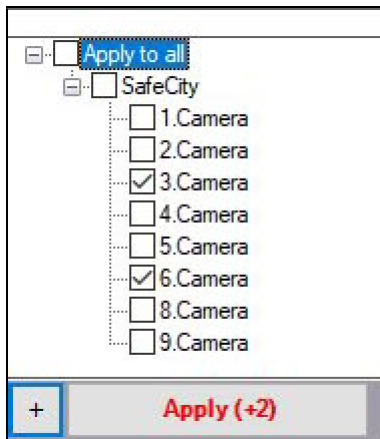
To restore default camera settings, select a camera in the device list. Click the **Reset** button and then the **Apply** button.



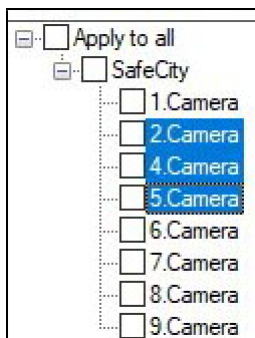
Mass configuration

You may bulk configure cameras of the same model and firmware. Do the following:

1. Configure any camera.
2. Click the  button and select cameras the same settings should be applied to.



A list of cameras of the same model and firmware opens. To quickly select multiple cameras, hold down the Shift key, select the first and last cameras the settings should be applied to. Selecting any camera from highlighted ones will result in selecting them all.



3. Click the **Apply** button.

Note

The number in brackets refers to the number of configured cameras.

Configuring fish-eye cameras

If you are using a fish-eye camera or video camera with a panomorph lens, configure the following settings of the **Video camera** object, in the **Panomorph** settings group:

1. To activate panoramic view, in the **Activate** list (1), select **Yes**.

Panomorph		
1	Activate	Yes
2	Camera position	Wall
3	Lens type	Common fisheye-lens
4	View type	PTZ
5	Fit to frame	Yes

2. In the **Camera position** list (2), select the mount of the video camera.

Important!

Some system features and functions depend on the chosen position of the video camera: digital zoom, display of video in the surveillance sector on the map, and immersive mode.

3. If it is a fish-eye camera, select the **Common fisheye-lens** lens type (3). If it is a video camera with a panomorph lens, select the corresponding type. When using wide angle dual lens XingYun devices, select the **Double sphere fish-eye-lens** type.

Note

The types of device lenses certified by ImmerVision are listed in the [document](#). You cannot select ImmerVision lenses in Linux.

4. If it is a video camera with an ImmerVision lens, select the appropriate display mode (4): 360° panorama with virtual PTZ (**PTZ**) or 180° panorama (**Perimeter**).
5. A typical fish-eye lens with standard settings produces a skewed image in the upper part of the screen. If this is the case, enable the **Fit to frame** option (5).


Important!

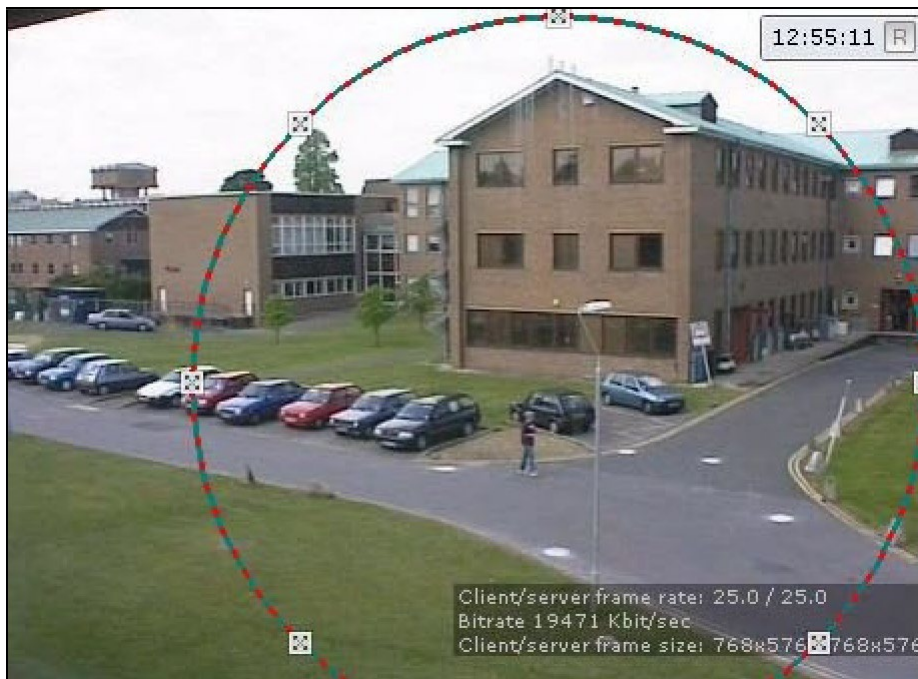
If you have multiple streams from a camera, you need to calibrate each stream. To do this, before applying the settings, switch to the required stream tab in the viewing tile (see [The Video Camera Object](#) (see page 107)).

Important!

Video is calibrated every time you change any parameters in the **Panomorph** group.

Manual calibration is also available. To do this:

- Disable **Fit to frame**, select **No** in the **Enable** list and click the **Apply** button.
- Select **Yes** in the **Enable** list.
- Configure the video area (circle). Left-click any point inside the circle and move the mouse pointer. To change the diameter of the circle, do as follows: click an anchor point  and move the mouse pointer.



d. Click the **Apply** button.

After applying the settings, the area outside the circle will be cut.

✔ Configuration of the fish-eye camera is complete.

Connecting and configuring cameras over standard protocols

Connecting and setting up devices with FFmpeg driver

FFmpeg generic driver is applied to receive video and audio data:

1. over RTSP and RTMP protocols (**1 channel device** model),
2. from connected USB devices (**Dshow device (USB camera)** model),
3. from the Server monitor screen (**Desktop capturer** model),
4. from the application window on the Server (**Window capturer** model, without audio).

Receiving video from the application window on the Server with the FFmpeg driver

To receive video from the application window on the Server, add an object with the following address format:

```
gdigrab://"Window title"
```

where "Window title" is the application window header.

❏ **Attention!**

The address may contain only Latin characters. If the app window header contains some other characters, use any 3rd party utility to change them.

IP address	Port	Vendor
<input type="text"/>	80	FFMPEG
Device type	Model	
IP device	Window capturer	

By default, videos are transmitted in MJPEG format. YUV422, H.264 and MPEG4 formats are also available.

▼ High-quality video stream	0. H.264/MJPEG
Compression rate	30
Frames per second (fps)	25
Maximum frame size	0
Resolution	D1
TV standard	NTSC
Video codec	MJPEG
> Low-quality video stream	H.264
> Adaptive video stream	MJPEG

Note

The YUV422⁶⁷ requires more network bandwidth. Take this into account when you select a format.

You can set a parameter string in the **Additional options** field.

▼ Other	
Additional options	
Transport protocol	TCP
▼ Alternative view	
Alternative camera 1	Not selected
Alternative camera 2	Not selected

Supported parameters	Description
-draw_mouse <int>	Mouse cursor presence. Available range: 0 to 1, default value: 1.
-show_region <int>	Capture area indication. Available range: 0 to 1, default value: 1.
-framerate <video_rate>	FPS value.
-video_size <image_size>	Video image size.
-offset_x <int>	Capture area X offset. Default value is 0.
-offset_y <int>	Capture area Y offset. Default value is 0.

⁶⁷ <https://en.wikipedia.org/wiki/YUV>

An example parameter string:

```
-draw_mouse 1 -show_region 1 -framerate 25 -video_size 640x480 -offset_x 10
-offset_y 10
```

Receiving video from the remote Client monitor with the FFmpeg driver

Your Server can receive video along with system and microphone audio from a remote Client with the FFmpeg driver over RTSP. To do it, follow the steps below:

1. On the Server:

- a. Open the port for receiving data from the remote Client.
- b. Add a **1 channel device** and specify its address in the **IP address** field in the following format.

```
listenrtsp://<Server IP-address>:<Port>/<RTSP-link>
```

IP address	Port	Vendor
listenrtsp://172.19.9.155	80	FFMPEG
Device type	Model	
IP device	1 channel device	

Note

RTSP link may be omitted.

2. On the remote Client:

- a. Download the package of open source FFmpeg libraries from the [official website](#)⁶⁸.
- b. Open the command prompt, and go to the folder containing the ffmpeg.exe file.
- c. Execute the following command:

```
ffmpeg.exe -f gdigrab -video_size 640x480 -i desktop -c:v <Codec> -f rtsp -muxdelay 0.1
"listenrtsp://<Server IP-address>:<Port>/<RTSP-link>"
```

where

Codec parameter may take mpeg2video, mpeg4, h264 or hevc value;

video_size 640x480 and **-muxdelay 0.1** parameters may be omitted or altered.

If necessary, you may specify additional parameters in this command.

Supported parameters	Description
-draw_mouse <int>	Mouse cursor presence. Available range: 0 to 1, default value: 1.
-show_region <int>	Capture area indication. Available range: 0 to 1, default value: 1.

⁶⁸ <https://www.ffmpeg.org/download.html>

Supported parameters	Description
-framerate <video_rate>	FPS value.
-video_size <image_size>	Video image size.
-offset_x <int>	Capture area X offset. Default value is 0.
-offset_y <int>	Capture area Y offset. Default value is 0.

After the command execution, remote Client's screen is shared on your display.

Receiving video from the Server monitor with the FFmpeg driver

To receive video from the Server monitor screen, add an object with the following address format:

```
gdigrab://desktop
```

IP address	Port	Vendor
gdigrab://desktop	80	FFMPEG
Device type	Model	
IP device	Desktop capturer	

Note

To receive video from remote Clients, you have to use RTSP transmission (see [Receiving video from the remote Client monitor with the FFmpeg driver](#)(see page 116)), or install Arkiv's Server services on your Client (see [Installation](#)(see page 36)).

By default, videos are transmitted from all Server monitors in MJPEG format. [YUV422](#)⁶⁹ and H.264 format is also available.

▼ High-quality video stream	0. H.264/MJPEG
Compression rate	30
Frames per second (fps)	25
Maximum frame size	0
Resolution	D1
TV standard	NTSC
Video codec	MJPEG
> Low-quality video stream	H.264
> Adaptive video stream	MJPEG

Note

The [YUV422](#)⁷⁰ requires more network bandwidth. Take this into account when you select a format.

⁶⁹ <https://en.wikipedia.org/wiki/YUV>

⁷⁰ <https://en.wikipedia.org/wiki/YUV>

You can set a parameter string in the **Additional Options** field.

Other	
Additional options	
Transport protocol	TCP
Alternative view	
Alternative camera 1	Not selected
Alternative camera 2	Not selected

Supported parameters	Description
-draw_mouse <int>	Mouse cursor presence. Available range: 0 to 1, default value: 1.
-show_region <int>	Capture area indication. Available range: 0 to 1, default value: 1.
-framerate <video_rate>	FPS value.
-video_size <image_size>	Video image size.
-offset_x <int>	Capture area X offset. Default value is 0.
-offset_y <int>	Capture area Y offset. Default value is 0.

An example parameter string:

```
-draw_mouse 1 -show_region 1 -framerate 25 -video_size 640x480 -offset_x 10
-offset_y 10
```

Receiving audio and video from connected USB devices

If a device is added automatically (see [Adding and removing IP devices](#)(see page 97)), separate objects are created for video and audio streams.

If you need to create a single object, add the device manually using the following address format:

```
dshow(<index>):(//(<video_device_name>)(:<audio_device_name>)
```

IP address	Port	Vendor
dshow://USB 2.0 HD C	80	FFMPEG
Device type	Model	
IP device	Dshow device(USB camera)	

If no index is specified in the address, the value is **0**. Use a non-**zero** index if you use multiple devices with the same name.

For example:

```
dshow://USB 2.0 HD Camera
dshow1://USB 2.0 HD Camera
```

Note

If a video or audio device is not present, it may be not specified in the address.

After you added the device, you have to set up its streams. For archive recording and transferring videos over the network, MJPEG codec is recommended; for detection purposes, use YUV422.

▼ High-quality video stream	0. YUV422/MPEG4/MJPEG
Expected frames per second (fps)	0
Resolution	Auto
Video codec	YUV422
▼ Low-quality video stream	1. YUV422/MPEG4/MJPEG
Bitrate	1024
Expected frames per second (fps)	0
Resolution	Auto
Video codec	MPEG4

If required, you can set a parameter string for FFmpeg app in the **Additional options** field.

▼ Other	
Additional options	
▼ Alternative view	
Alternative camera 1	Not selected
Alternative camera 2	Not selected

For example: receive video from a USB camera in YUV420P format, 1280x960 resolution.

```
-pixel_format yuv420p -video_size 1280x960
```

Parameters and their values differ by format and particular device. **To list possible parameter values, run the following command from the Windows command line:**

```
ffmpeg -list_options true -f dshow -i video="<device name>"
```

Receiving video and audio with FFmpeg driver over RTSP and RTMP protocols

Attention!

FFmpeg currently has the following limitations:

- only one stream is supported;
- video codecs are limited to H.264/H.265, audio to AAC.

To add a device, use the following address format:

```
protocol://[login:password@]IP-address[:port][/path]
```

IP address	Port	Vendor
rtsp://admin:123@172.1	80	FFMPEG
Device type	Model	
IP device	1 channel device	

Note

You can set login and password either in the address bar or in corresponding fields when adding the device. If authentication parameters are specified both ways, the address bar has the priority.

Attention!

If you use the address bar method, you must specify the port number. If no port number is specified, default ports are used (554 for RTSP, 1935 for RTMP).

After you add a device, you can set a parameter string for FFmpeg app in the **Additional Options** field. Parameters and their values differ by format, particular device and protocol used.

<input checked="" type="checkbox"/> Other	
Additional options	
Transport protocol	TCP
<input checked="" type="checkbox"/> Alternative view	
Alternative camera 1	Not selected
Alternative camera 2	Not selected

Note

See the full list of parameters for RTSP protocol on the [page](#)⁷¹.

Generic Drivers (General device, Generic)

General Device is a generic driver that supports nearly all devices from a particular camera vendor.

There are 2 types of generic drivers:

1. **General device.** Most configuration of General Device-connected cameras is performed via the web interface of the device. A detailed list of supported features is given on the page.

⁷¹ <https://ffmpeg.org/ffmpeg-protocols.html#rtsp>

2. **Generic.** When connected via a generic driver, the configuration of the device is read and transferred to *Arkiv*. After that, you can configure the device from within *Arkiv*.

Connection via generic drivers is available for the following devices:

	Axis	Bosch	Panasonic	Samsung	Sony	ONVIF
General Device	+	+	+	+	+	-
Generic	+	+	-	-	-	+

Devices connected via General Device drivers are findable via the IP device discovery wizard. The method for adding them to the system is the same as for ordinary devices (see [Adding and removing IP devices](#)(see page 97)).

IP address 172.19.9.52	Port 80	Vendor Bosch
MAC address d8-d4-3c-05-af-95	Model General Device(1 channel)	

Note


Axis devices are affected by a special restriction: if the user name and password for device access do not equal the default values, the number of channels for the device is not discoverable. Therefore, all non-integrated devices whose user name and password for device access do not equal the default values will be shown in search results as 1-channel General Devices.

You should always select a generic driver manually.

If a IP device is not displayed in search results, you can add it manually:

1. In the form for manually adding an IP device, select the device manufacturer from the list (1).

IP address 3 172.19.9.77	Port 80	Vendor 1 Bosch	Username Auto
Device type IP device	Model 2 generic	Password 4 ****	

2. In the **Model** field, select **General Device** or **Generic** (2). For Axis and Bosch General devices, select the number of channels on the device.
3. Enter the IP address and port for the device connection (3).
4. Enter the user name and password for connecting to the device (4).
5. Click the  button.

 Addition of the device is now complete.

Attention!

If a device, connected via a generic driver, is temporarily not available or it has incorrect connection settings, then it is not added to the configuration.

Connecting cameras via the GB/T28181 protocol

General information on GB/T28181 standard and supported functions

Arkiv supports connecting devices via the Chinese standard GB/T28181. This standard is based on SIP over UDP (and over TCP since GB/T28181-2016). **The GB/T28181 uses the following protocols over SIP:**

- SDP (Session Description Protocol);
- MANSCTP (Monitoring and Alarming Network System Control Description Protocol);
- MANSRTSP (Monitoring and Alarming Network System Real Time Streaming Protocol).

This allows receiving the status of sensors, events from detectors, PTZ and relays control, access the built-in archive of the IP device (make sure to set the correct device time zone in the *Arkiv*), etc. within the SIP session. Single-channel and multi-channel devices in single-stream mode and working with the UDP and TCP transport protocols is also supported.

At the same level of the OSI model, the RTP/RTCP protocol also works in parallel with the SIP protocol, which makes it possible to use the following functions:

- video transmission (including archival) in H264, H265, or MJPEG format;
- audio transmission in G.711a, G.711u, or G.726 format in PS (Program Stream) only. Archive audio is not supported.

For the most up-to-date information on this standard and the features supported in *Arkiv*.

Configuring an IP-device to operate via GB/T28181 standard

Configuration of IP devices connected via GB/T28181 is performed through the web interface of the devices. Settings are not sent from *Arkiv* to the device.

Before connecting a camera via this protocol to *Arkiv*, perform the following steps to configure SIP on the device:

1. Set the Server IP to equal the Server's IP address.
2. Set the Server port (5060 by default).
3. Set the Device ID. The ID should be set on all cameras connected via the GB/T28181 protocol and must be unique. The format of the connection code (device ID and server ID) is a 20-digit number:
 - a. the first 10 digits specify the address (according to the GB/T-2260-2007 standard);
 - b. the next 10 digits indicate device information.
If the IP device is located behind NAT, then forward and explicitly specify the external address of the Server, the port/port range for receiving video, and the SIP port of *Arkiv* Server. Example:
3402000001110000001/50557-51557@10.3.3.11/85.172.174.36
4. For the device to perform autodiscovery of the Server more quickly, reduce the default value of RefreshRegTime. The name of this setting may vary on some cameras.

Note.

For telemetry to work correctly, set RefreshRegTime to more than 600.

[Examples of IP device settings for connection via GB/T28181 standard](#)(see page 124)

Configuring IP-device connection via GB/T28181

Important!

No more than one SIP server can be used for IP devices connection via the GB/T28181 protocol. This means that several **Video Capture Device** objects with **GBT28181** type can be created in the *Arkiv* hardware tree, however, the part of the address after @ must match for all of them. The server ID, local address, external address, and port must be the same for all devices. If at least one parameter is different (for example, the local IP address is not set for some device when it is set for other devices), then such a device will not start.

Note.

Arkiv does not support auto-discovery of devices connected via GB/T28181 and these devices are not added using the Camera discovery tool.

After configuring the device as described earlier, add it to *Arkiv* as follows:

1. Run the IP discovery wizard (see [Adding and removing IP devices](#)(see page 97)).
2. In the form for manually adding an IP device, in the **Vendor** list, select **GBT28181** (1).

IP address 2	Port 3	Vendor 1	Username 4
34020000001320000000	5060	GBT28181	Auto
Device type	Model	Password	
IP device	1 channel device	****	

3. In the **IP address** field specify the value of Device ID parameter set during IP device configuration (2). **The following additional parameters can be specified optionally as follows:**

[gbt://]deviceID[/videoPort]@serverID[-serverLocalIP[/serverExternalIP]]

OR

[gbt://]deviceID[/videoPortFirst-videoPortLast]@serverID[-serverLocalIP[/serverExternalIP]]

where:

- deviceID is the Device ID parameter;
- serverID is the identifier of the *Arkiv* Server generated according to the same rules as the IP device ID (see above);
- videoPort is the port for receiving video;
- videoPortFirst – videoPortLast is range of ports for receiving video;
- serverLocalIP is the local IP address of the *Arkiv* Server, which sets the network interface on which the Server should be available;
- serverExternalIP is the global IP address of the *Arkiv* Server; this parameter is in use when the *Arkiv* Server is behind the gateway. In this case, this IP address is specified as the SIP Server IP address in the IP device settings.

Examples.

```
34020000001320000008@34020000002000000001
```

```
34020000001320000008@34020000002000000001-10.0.40.246/113.125.160.58
```

```
34020000001320000008@34020000002000000001-10.0.40.246
```

```
34020000001320000008@34020000002000000001-/113.125.160.58
```

```
34020000001320000008/50200@34020000002000000001
```


```
34020000001320000008/50200-50210@34020000002000000001-10.0.40.246
```

- In the **Port** field, enter the local port number that the *Arkiv* Server shall listen for receiving messages from the IP device (3). Usually this is the default SIP port: 5060.

Note.

The IP device SIP port is detected automatically.

- The **Username** and the **Password** fields are not used (4).
- Click the  button.

 Connection of the camera via **GB/T28181** is now complete.

On the page:

- [General information on GB/T28181 standard and supported functions](#)(see page 122)
- [Configuring an IP-device to operate via GB/T28181 standard](#)(see page 122)
- [Configuring IP-device connection via GB/T28181](#)(see page 122)

Examples of IP device settings for connection via GB/T28181 standard

Examples of IP device settings and connection settings in *Arkiv* for GB/T28181 standard are given below.

Note

The protocol is usually supported by cameras for China market not having any English interface. This is why some of the screenshots below are given in Chinese.

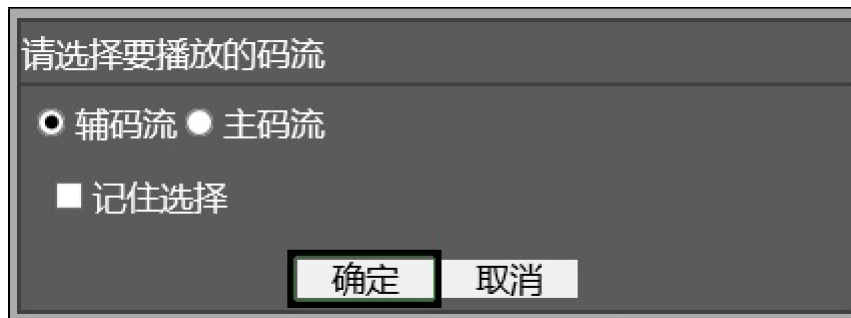
Jovision

Configure a Jovision camera for operation via GB/T28181 standard as follows:

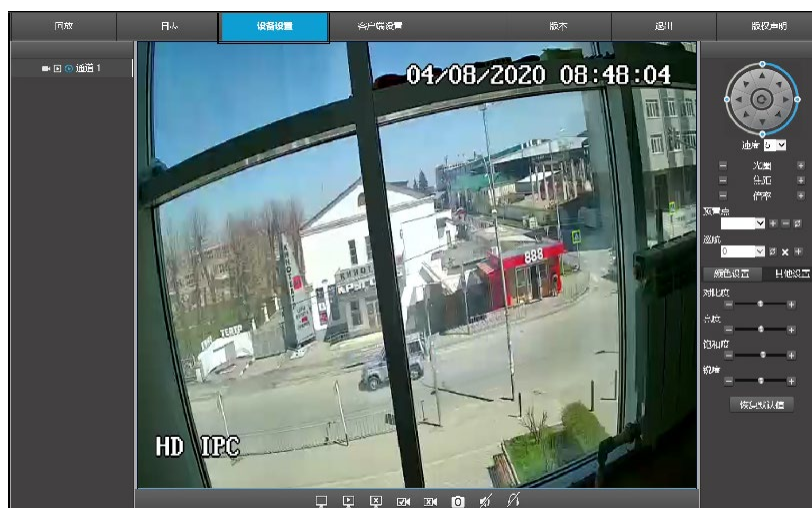
- Perform the following settings of the IP-device:**
 - Go to the IP device web interface.
 - Enter your login and password.



- c. Click **确定** (Confirm) in the dialog box opened.



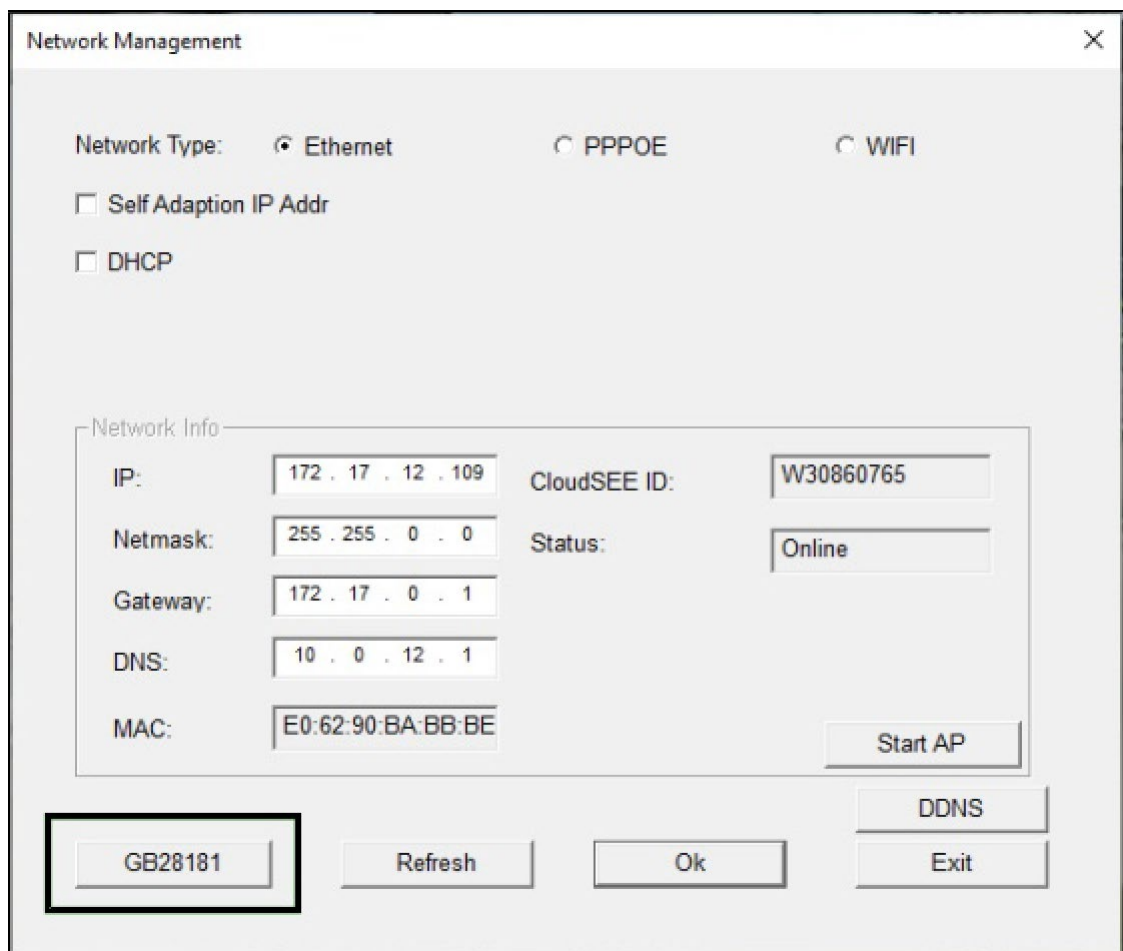
- d. Click **设备设置** (Device settings).



- e. Select **Network** in the dialog box.



- f. In the **Network Management** window, click **GB28181**.



- g. The **GB28181** window opens.

GB28181

Gb28181 Enable **1**

Device ID **2**

Password

Server Ip **3**

Server Port **4**

Local Port **5**

Refresh Interval **6**

Alarm ID

Keep Alive **7**

8

Ok Exit

- h. Set the **Gb28181 Enable** checkbox checked (**1**).
- i. In the **Device ID** field, enter the device identification number as described in [Connecting cameras via the GB/T28181 protocol](#)(see page 122) (**2**). Example on the picture shows Device ID 34020000001300000001.
- j. In the **Server Ip** field, enter the *Arkiv* server IP-address (**3**). The example shows IP 179.17.12.2
- k. In the **Server Port** field, enter *Arkiv* server port number assigned for receiving messages from the IP device (**4**) The example shows port 5070.
- l. In the **Local Port** field, enter the IP device SIP port number (**5**).
- m. In the **Refresh Interval** field, enter the device discovery period in seconds (**6**). The value shall not be less than 600.
- n. In the **Keep Alive** field, enter the period in seconds for sending messages confirming the device activity (**7**).
- o. Click the **Ok** button (**8**).

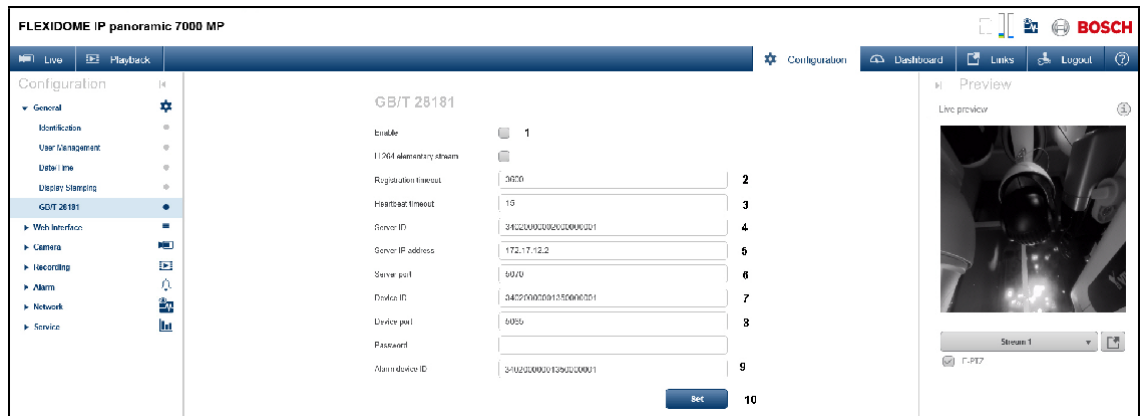
2. In *Arkiv*:

- a. Example value for the **IP address** field:
34020000001300000001@34020000001300000002-10.0.40.246/179.17.12.2
The Server ID 34020000001300000002 is not set on the Jovision device, so any Server ID can be chosen as per the conditions set in [Connecting cameras via the GB/T28181 protocol](#)(see page 122).
- b. Set **Port** to 5070.

Bosch

Configure a Bosch camera for operation via GB/T28181 standard as follows:

1. Perform the following settings of the IP-device:
 - a. Go to the IP device web interface.
 - b. Go to **Configuration – General – GB/T 28181**.



- c. Set the **Enable** checkbox checked (1).
- d. In the **Registration timeout** field, enter the device discovery period in seconds (2). The value shall not be less than 600.
- e. In the **Heartbeat timeout** field, enter the period in seconds for sending messages confirming the device activity (3).
- f. In the **Server ID** field, enter the Arkiv server identification number (4). The example shows **3402000002000000001**.
- g. In the **Server IP address** field, enter the Arkiv server IP-address (5). The example shows **172.17.12.2**.
- h. In the **Server port** field, enter Arkiv server port number assigned for receiving messages from the IP device (6). The example shows port **5070**.
- i. In the **Device ID** field, enter the device identification number as described in [Connecting cameras via the GB/T28181 protocol](#) (see page 122) (7). Example on the picture shows Device ID **3402000001350000001**.
- j. In the **Device port** field, enter the IP device SIP port number (8).
- k. In the **Alarm device ID** field, enter the channel identification number (9). The same value as **Device ID** may be used.
- l. Click the **Set** button (10).

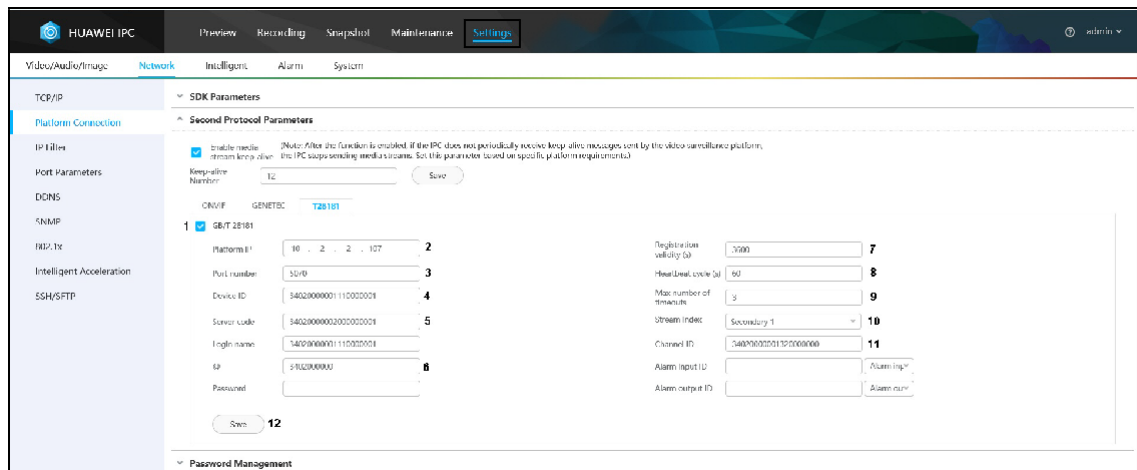
2. In Arkiv:

- a. Example value for the **IP address** field:
3402000001350000001@3402000002000000001-10.0.40.246/172.17.12.2
- b. Set **Port** to **5070**.

Huawei

Configure a Huawei camera for operation via GB/T28181 standard as follows:

1. Perform the following settings of the IP-device:
 - a. Go to the IP device web interface.
 - b. Go to **Settings – Platform connections – Second Protocol Parameters – T28181**.



- c. Set the **GB/T 28181** checkbox checked (1).
- d. In the **Platform IP** field, enter the *Arkiv* server IP-address (2). The example shows 10.2.2.107.
- e. In the **Port number** field, enter *Arkiv* server port number assigned for receiving messages from the IP device (3). The example shows port 5070.
- f. In the **Device ID** field, enter the device identification number as described in [Connecting cameras via the GB/T28181 protocol](#)(see page 122) (4). Example on the picture shows Device ID 340200000111000001.
- g. In the **Server code** field, enter the *Arkiv* server identification number (5). The example shows Server ID 340200000200000001.
- h. In the **@** field, enter the first 10 digits of the address according to GB/T-2260-2007 (6).
- i. In the **Registration validity (s)** field, enter the device discovery period in seconds (7). The value shall not be less than 600.
- j. In the **Heartbeat cycle (s)** field, enter the period in seconds for sending messages confirming the device activity (8).
- k. In the **Max number of timeouts** field, enter the maximum number of Heartbeat message omissions after which the device connection is considered lost (9).
- l. Select the video stream from the **Stream index** drop-down list (10).
- m. In the **Channel ID** field, enter the channel identification number in the same format as Device ID and Server ID (11).
- n. Click the **Save** button (12).

2. In *Arkiv*:

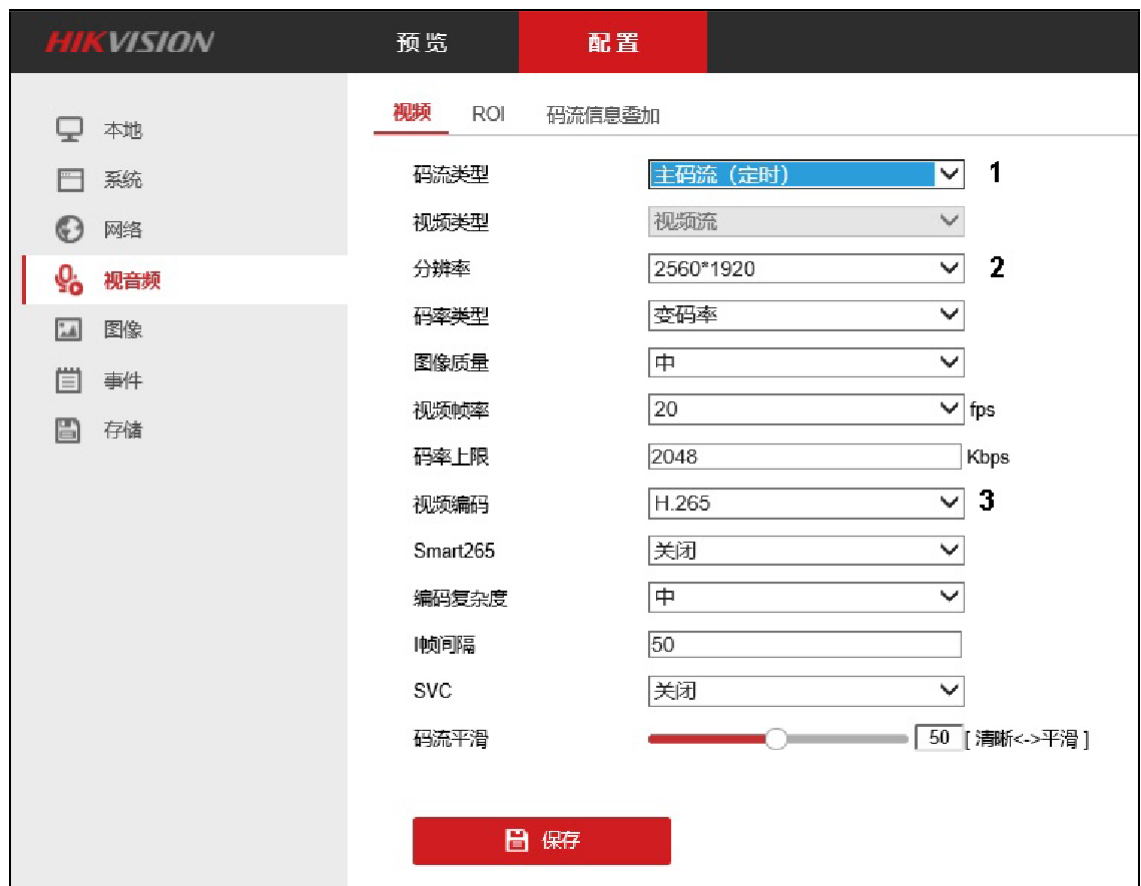
- a. Example value for the **IP address** field: 340200000111000001@340200000200000001-10.2.2.107
- b. Set **Port** to 5070.

Hikvision

The Hikvision cameras may support several GB/T28181 standard versions: GB/T28181-2011 and/or GB/T28181-2016. Examples of configuration for these versions are given below.

Setup video streams as follows before you configure the GB/T28181 standard on the IP device:

1. Go to 配置 - 视音频 - 视频 (Settings – Video and Audio – Video).
2. Configure the main stream:
 - a. From the 码流类型 (Stream type) drop-down list, select 主码流 (定时) (Main stream) (1).



- b. From the 分辨率 (Resolution) drop-down list, select the main stream resolution (2).
 - c. From the 视频编码 (Codec) drop-down list, select the main stream codec (3).
3. Configure the second stream:
 - a. From the 码流类型 (Stream type) drop-down list, select 子码流 (Second stream) (1).



b. From the 分辨率 (Resolution) drop-down list, select the second stream resolution (2).

c. From the 视频编码 (Codec) drop-down list, select the second stream codec (3).

4. Click 保存 (Save).

GB/T28181-2011

1. Go to 配置 - 高级设置 - 平台接入 (Settings – Advanced settings – Platform access).

配置项	值	备注
平台接入方式	28181	
本地SIP端口	5060	✓
传输协议	UDP	
白名单	编辑	
平台	平台1	
启用	<input checked="" type="checkbox"/>	1
协议版本	GB/T28181-2011	2
SIP服务器ID	34020000002000000001	✓ 3
SIP服务器域	3402000000	✓ 4
SIP服务器地址	109.248.191.112	✓ 5
SIP服务器端口	5070	✓ 6
SIP用户名	34020000001320000001	✓ 7
SIP用户认证ID	172171289	✓
密码	••••••	
密码确认	••••••	
注册有效期	3600	✓秒 8
注册状态	在线	
心跳周期	60	✓秒 9
28181码流索引	主码流 (定时)	10
最大心跳超时次数	3	✓ 11

- Set the 启用 (Enable) checkbox (1).
- From the 协议版本 (Protocol version) drop-down list, select **GB/T28181-2011** (2).
- In the **SIP服务器ID** (SIP Server ID) field, enter the Arkiv Server ID (3). The example shows Server ID **34020000002000000001**.
- In the **SIP服务器域** (SIP Server domain) field, enter first 10 digits of the address according to GB/T-2260-2007 (4).
- In the **SIP服务器地址** (SIP Server address) field, enter the Arkiv server IP-address (5). The example shows IP **109.248.191.112**.
- In the **SIP服务器端口** (SIP Server Port) field, enter the Arkiv server port number assigned for receiving messages from the IP device (6). The example shows port **5070**.
- In the **SIP用户名** (SIP user name) field, enter the device identification number as described in [Connecting cameras via the GB/T28181 protocol](#) (see page 122) (7). Example on the picture shows Device ID **34020000001320000001**.
- In the **注册有效期** (Registration period) field, enter the device discovery period in seconds (8). The value shall not be less than 600.
- In the **心跳周期** (Heartbeat period) field, enter the period in seconds for sending messages confirming the device activity (9).
- From the **28181码流索引** (Video stream) drop-down list, select one of the streams configured earlier (**主码流 (定时)** for Main stream or **子码流** for Second stream) (10).

12. In the **最大心跳超时次数** (number of timeouts for Heartbeat messages) field, enter the maximum number of Heartbeat message omissions after which the device connection is considered lost (**11**).
13. Go to the **视频通道编码ID** (Video channel ID) tab at the bottom of the settings page (**1**).

The screenshot shows the '编码ID' (Encoding ID) configuration page. At the top, there are three tabs: '报警输入编码ID', '视频通道编码ID' (selected), and '语音输出通道编码ID'. Below the tabs is a table with two columns: '通道号' (Channel No.) and '视频通道编码ID' (Video Channel ID). The first row shows channel '1' with ID '34020000001320000002'. A red box highlights the '视频通道编码ID' tab and the number '1' in the channel number column. A red '保存' (Save) button is located at the bottom left, with a '3' next to it.

通道号	视频通道编码ID
1	34020000001320000002

14. Enter the identifiers of all channels of the IP device in the same format as the device identifiers (**2**). The example shows ID **34020000001320000002**.
15. Click the **保存** (Save) button (**3**).

In *Arkiv*:

1. Example value for the **IP address** field: **34020000001320000001@3402000000200000001-109.248.191.112**
2. Set **Port** to **5070**.

GB/T28181-2016

1. Go to **配置 - 高级设置 - 平台接入** (Settings – Advanced settings – Platform access).

The screenshot displays the HIKVISION configuration page for SIP platform access. The left sidebar shows navigation options: Local (本地), System (系统), Network (网络), Basic Configuration (基本配置), and Advanced Configuration (高级配置). The main content area is titled 'Platform Access' (平台接入) and includes tabs for SNMP, FTP, Email, and HTTPS. The configuration fields are as follows:

Field Name	Value	Status/Note
平台接入方式	28181	
本地SIP端口	5060	✓
传输协议	TCP	1
白名单	编辑	
平台	平台1	
启用	<input checked="" type="checkbox"/>	2
协议版本	GB/T28181-2016	3
SIP服务器ID	34020000002000000001	✓ 4
SIP服务器域	3402000000	✓ 5
SIP服务器地址	109.248.191.112	✓ 6
SIP服务器端口	5070	✓ 7
SIP用户名	34020000001320000001	✓ 8
SIP用户认证ID	172171289	✓
密码	••••••	
密码确认	••••••	
注册有效期	3600	✓秒 9
注册状态	在线	
心跳周期	60	✓秒 10
28181码流索引	主码流 (定时)	11
注册间隔	60	秒 12
最大心跳超时次数	3	✓ 13
编码ID	视频通道编码ID	

- From the **传输协议** (Transport protocol) drop-down list, select the transport level protocol to be in use: UDP or TCP (**1**).
- Set the **启用** (Enable) checkbox (**2**).
- From the **协议版本** (Protocol version) drop-down list, select **GB/T28181-2016** (**3**).
- In the **SIP服务器ID** (SIP Server ID) field, enter the *Arkiv* Server ID (**4**). The example shows Server ID **34020000002000000001**.
- In the **SIP服务器域** (SIP Server domain) field, enter first 10 digits of the address according to GB/T-2260-2007 (**5**).
- In the **SIP服务器地址** (SIP Server address) field, enter the *Arkiv* server IP-address (**6**). The example shows IP **109.248.191.112**.
- In the **SIP服务器端口** (SIP Server Port) field, enter the *Arkiv* server port number assigned for receiving messages from the IP device (**7**). The example shows port **5070**.
- In the **SIP用户名** (SIP user name) field, enter the device identification number as described in [Connecting cameras via the GB/T28181 protocol](#) (see page 122) (**8**). Example on the picture shows Device ID **34020000001320000001**.

10. In the 注册有效期 (Registration period) field, enter the device discovery period in seconds (**9**). The value shall not be less than 600.
11. In the 心跳周期 (Heartbeat period) field, enter the period in seconds for sending messages confirming the device activity (**10**).
12. From the **28181**码流索引 (Video stream) drop-down list, select one of the streams configured earlier (主码流 (定时) for Main stream or 子码流 for Second stream) (**11**).
13. In the 注册间隔 (Registration interval) field, enter the device discovery interval in seconds (**12**).
14. In the 最大心跳超时次数 (number of timeouts for Heartbeat messages) field, enter the maximum number of Heartbeat message omissions after which the device connection is considered lost (**13**).
15. Go to the 视频通道编码ID (Video channel ID) tab at the bottom of the settings page (**1**).

通道号	视频通道编码ID
1	340200000132000002
2	

保存 3

16. Enter the identifiers of all channels of the IP device in the same format as the device identifiers (**2**). The example shows ID **340200000132000002**.
17. Click the 保存 (Save) button (**3**).

In Arkiv:

1. Example value for the **IP address** field: **340200000132000001@340200000200000001-109.248.191.112**
2. Set **Port** to **5070**.

Dahua

Configure a Dahua camera for operation via GB/T28181 standard as follows:

1. **Perform the following settings of the IP-device:**
 - a. Go to the IP device web interface.
 - b. Go to 网络设置 - 平台接入 - 国标**28181** (Network settings – Platform access – GBT28181).

10

- c. Set the 接入使能 (Enable connection) checkbox **(1)**.
- d. In the **SIP服务器编号** (SIP server number) enter the *Arkiv* Server ID **(2)**. The example shows Server ID **340200000200000001**.
- e. In the **SIP服务器IP** (SIP server IP address) enter the *Arkiv* server IP address **(3)**. The example shows IP **192.168.88.33**
- f. In the **设备编号** (Device number) field, enter the device identification number as described in [Connecting cameras via the GB/T28181 protocol](#)(see page 122) **(4)**. Example on the picture shows Device ID **3402000001300000001**.
- g. In the **本地SIP服务器端口** (Local SIP port) field, enter the IP device SIP port number **(5)**.
- h. In the **心跳周期** (Heartbeat period) field, enter the period in seconds for sending messages confirming the device activity **(6)**.
- i. In the **SIP服务器端口** (SIP server port) field, enter the *Arkiv* server port assigned for receiving messages from the IP device **(7)**. The example shows port **5060**.
- j. In the **注册有效期** (Registration period) field, enter the device discovery period in seconds **(8)**. The value shall not be less than 600.
- k. In the **最大心跳超时次数** (number of timeouts for Heartbeat messages) field, enter the maximum number of Heartbeat message omissions after which the device connection is considered lost **(9)**.
- l. Click **刷新** (Update).

2. In *Arkiv*:

- a. Example value for the **IP address** field: **3402000001300000001@340200000200000001-192.168.88.33**
- b. Set **Port** to **5060**.

On the page:

- [Jovision](#)(see page 124)
- [Bosch](#)(see page 127)
- [Huawei](#)(see page 128)
- [Hikvision](#)(see page 129)
 - [GB/T28181-2011](#)(see page 131)
 - [GB/T28181-2016](#)(see page 133)
- [Dahua](#)(see page 135)

Configuring connection of video cameras via RTSP

In IP Device Discovery Wizard, add a camera via RTSP with the following parameters:

1. In the list of manufacturers, select **RTSP** **(1)**.

IP address 2	Port	Vendor 1
rtsp://root:root@172.19.	554	RTSP
Device type	Model	
IP device	1_channel_device	

2. URL of the RTSP feed **(2)**. In general form, the address is as follows: **rtsp://<IP address of RTSP server>:<Port on RTSP server>/<Path>**.

Up to three simultaneous video streams are supported from RTSP-connected cameras. To access multiple streams, enter the relevant RTSP addresses, placing a semi-colon (;) after each address: **rtsp://<IP address of RTSP server1>:<Port on RTSP server1>/<Path>; rtsp://<IP address of RTSP server2>:<Port on RTSP server2>/<Path>; rtsp://<IP address of RTSP server3>:<Port on RTSP server3>/<Path>**.

❑ Important!

Generally, RTSP server parameters (port and path) are set through the web interface of the video camera. To do so, refer to the manufacturer's documentation for the video camera.

❑ Important!

If the username and/or password contain forbidden characters, such as "@", you have to escape these characters with relevant ASCII codes to avoid log-in problems. The "@" symbol is escaped as %40. For example, for a successful RTSP connection your device's URL may look like this: "rtsp://admin:New%40edge@192.168.0.75:554/RVi/1/1".

❑ Note

In some cases, the address format may be different. For example, a user name and password may be added to the address for connecting to the video camera.

Object features	
Address	rtsp://root:root@172.19.16
Port	554

You are advised to refer to the manufacturer's documentation for the video camera.

Even if the password field is empty, the address string must include a colon (:).

A correct address may look like this: rtsp://user:@10.10.27.50:10017/...

An example of an incorrect address: rtsp://user@10.10.27.50:10017/...

The **Video camera** object is created. If the address of the RTSP server is correctly specified, the video feed from the camera is shown in a preview tile.

❑ Note


Port, Login and **Password** can not be edited. These settings are specified in the URL of the feed.

If video is unavailable, examine the log file *APP_HOST.lpint*, which is located in the folder <Arkiv installation folder>\Arkiv\Logs.

❑ Important!


If APP_HOST.lpint is empty, in the log management utility, check the detail level of logging for the *Arkiv Server* (see [Configuring Logging levels\(see page 837\)](#)), The recommended detail level is **Debug**.

RTSP streaming over HTTPS is supported. To set this option, set the **Transport Protocol** parameter to **Tunneling RTSP over HTTPS**.

▼ High-quality video stream	0. Auto
Expected frames per second (fps)	30
Message for keepAliveCommand property	OPTIONS
npt range format	npt=now-
Resolution	Auto
SSRC filter	Yes
Transport protocol	 rtspoverhttps
Video codec	Auto
> Low-quality video stream	1. Auto
> Adaptive video stream	Disabled

❑ Important!

To get good video from some cameras, you should select **No** for the **SSRC identifier checking** in the video settings.

▼ High-quality video stream	0. Auto
Authorization token	
Expected frames per second	30
Message for keepAliveComm	OPTIONS
Proxy URL for RTSP tunneled	
Range header for RTSP PLAY	npt=now-
Resolution	Auto
RTSP range value	
Scale header for RTSP PLAY	
SSRC identifier checking	 No

Notes on configuring video cameras connected via ONVIF

By default, all ONVIF devices in the system are added as multistreaming (the **ONVIF 2.0** driver, see [Adding and removing IP devices](#)(see page 97)).

If the camera does not support multistreaming, then the video stream of lower quality will be disabled.

❑ Note

In some cases (for example, if you do not have video from a camera), you may need to synchronize the time between the server and the camera when you connect them via ONVIF.

❑ Attention!

If you connect cameras via ONVIF, auto focus (AF) and auto aperture are not available.

Connection through ONVIF Generic driver

With the ONVIF Generic driver, you have the following options:

1. Currently offline cameras can transfer their settings when they get back online.

To make it happen, follow the steps below:

- Add a camera via the ONVIF Generic driver (see [Generic Drivers \(General device, Generic\)](#)(see page 120)).
- When the device comes online, reset its parameters (see [Applying and resetting settings](#)(see page 87)).
- Load the configuration from the device (see [Applying and resetting settings](#)(see page 87)).

2. You can select another camera in object settings while keeping all layouts, macros and archive storage parameters.

To make it happen, follow the steps below:

- a. Add a camera via the ONVIF Generic driver (see [Generic Drivers \(General device, Generic\)](#)(see page 120)).
- b. Set archive storage parameters and create macros.
- c. In **Camera** object settings, specify a new IP address and user credentials (see [The Video Camera Object](#)(see page 107)).
- d. Reset device settings (see [Applying and resetting settings](#)(see page 87)).
- e. Load the configuration from the device (see [Applying and resetting settings](#)(see page 87)).

This operation will result in swapping cameras without the need to create a new object and remove the old one.

Resolution

Arkiv offers three resolutions for video from cameras connected via ONVIF: maximum, medium, and minimum.

Resolution	Maximum level
RTP Packet Reordering	Maximum level
TTL	Medium level
Video codec	Minimum level

A description of the resolution levels is given in the table.

Camera type / Resolution	Maximum	Medium	Minimum
Non-megapixel	Maximum camera resolution	Average camera resolution	Minimum camera resolution
Megapixel	Maximum camera resolution	Camera resolution closest to 1024x768	Camera resolution closest to 640x480

IP devices on other subnets (behind a NAT)

By default, [NAT⁷⁴](#)-friendly mode is enabled for cameras connected via the ONVIF driver.

To disable NAT-friendly mode, in the settings of a camera, select the **No** value for **Remapping IP-address**.

Other	
Compatibility mode	No
Event source	Metadata stream
Media2Service	Yes
Metadata transport protocol	UDP
Pull point renew mode	Yes
Remapping IP-address	No
Remapping IP-address for events	0

IP devices which partially support the ONVIF protocol

To connect IP devices which only partially support ONVIF functions to the *Arkiv* software package, you must use an ONVIF driver with compatibility mode enabled.

Note

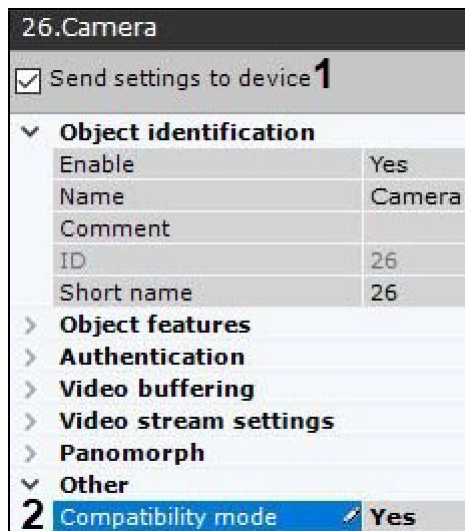
⁷⁴ <https://en.wikipedia.org/wiki/NAT>

Such video cameras include Hikvision models and early versions of firmware from Sony, Samsung, and others.

Compatibility mode makes it possible to receive a video image from video cameras; however, some capabilities of the *Arkiv* software package will be unavailable. Enabling compatibility mode is recommended if the connection settings are correct, but there is no video image.

To enable it you need:

1. Select the **Send settings to device** checkbox (1).



2. Select **Yes** for **Compatibility mode** (2).

On page:

- [Connection through ONVIF Generic driver](#)(see page 138)
- [Resolution](#)(see page 139)
- [IP devices on other subnets \(behind a NAT\)](#)(see page 139)
- [IP devices which partially support the ONVIF protocol](#)(see page 139)

Configuring connection of video cameras with dynamic IP addresses

Arkiv needs a permanent hostname, such as provided by DynDNS or similar dynamic DNS services to work with IP cameras that use DHCP.

Use your permanent DynDNS hostname to access an IP camera with a dynamic IP address.

Configuring virtual video cameras

The *Arkiv* software package enables you to work with virtual video cameras.

This requires running *Arkiv* in test mode and consists of imitating a stream of video data by playing an available video clip (recording). You can play video recordings using video compression algorithms supported by *Arkiv* (see [Specifications of the Arkiv Software Package](#)(see page 11)).


Note

Do not use video with [B-frames](#)⁷⁵.

To create and configure a virtual video camera, complete the following steps:

1. Run IP Device Discovery Wizard (see [Adding and removing IP devices](#)(see page 97)).
2. In the form for manually adding an IP device, select **Inaxsys** in the **Vendor** drop-down list (**1**).

IP address	Port	Vendor 1
0.0.0.0	80	<input type="text"/>
Device type	Model 2	
IP device	<input type="text" value="Virtual"/>	

3. Select **Virtual** from the models list to emulate a single-stream video camera. Select **Virtual several streams** to emulate a video camera supporting multiple streams (**2**).
4. Click the  button.
5. In the **Folder** field, specify the storage location of the video clip that will be used to imitate a video signal.

High-quality video stream	0. Auto
Compression Rate	1
Folder	D:/Test_video/New folder
Frames per second (fps)	25
Resolution	100 x 100
Video codec	Auto
Low-quality video stream	0. Auto
Adaptive video stream	

Note

The name of the video file and its file path must consist only of Latin characters.

Note

Scanning for files in a specified directory is limited to one minute.

6. By default, a video will be played back endlessly. To switch to one-shot playback, set **Yes** for the corresponding parameter.

Other	
Play the file once	<input type="text" value="Yes"/>
Alternative view	
Alternative camera 1	Not selected
Alternative camera 2	Not selected

7. Click the **Apply** button.

⁷⁵ https://en.wikipedia.org/wiki/Video_compression_picture_types#Macroblocks

Privacy mask settings

It is possible to apply a privacy mask to the video image to hide certain parts of the frame:

- when viewing live videos;
- when viewing the archive;
- on exported videos and still frames.

The detection tools that support privacy mask:

- [Configuring Face detection](#) (see page 267);
- [Configuring Face detection \(VL\)](#) (see page 272);
- [Configuring Face Detection and Temperature Control](#) (see page 287);
- [Configuring Masks Detection](#) (see page 279) (detection of a medical or similar mask on the face);
- [Person-based privacy masking configuration](#) (see page 343);
- [Specific settings for People masking detection tool](#) (see page 358) (based on data from pose detection tools).

Privacy mask will apply to all users who have the **View masked video** parameter set to **No** in the role configuration (see [Creating and configuring roles](#) (see page 431)).


Attention!

The mask will be displayed in the Client only. In the Web-Client and the Mobile Client, there will be no mask on the video image.


To configure privacy mask, do the following:

1. Select the **Video Camera** object and click the  button.

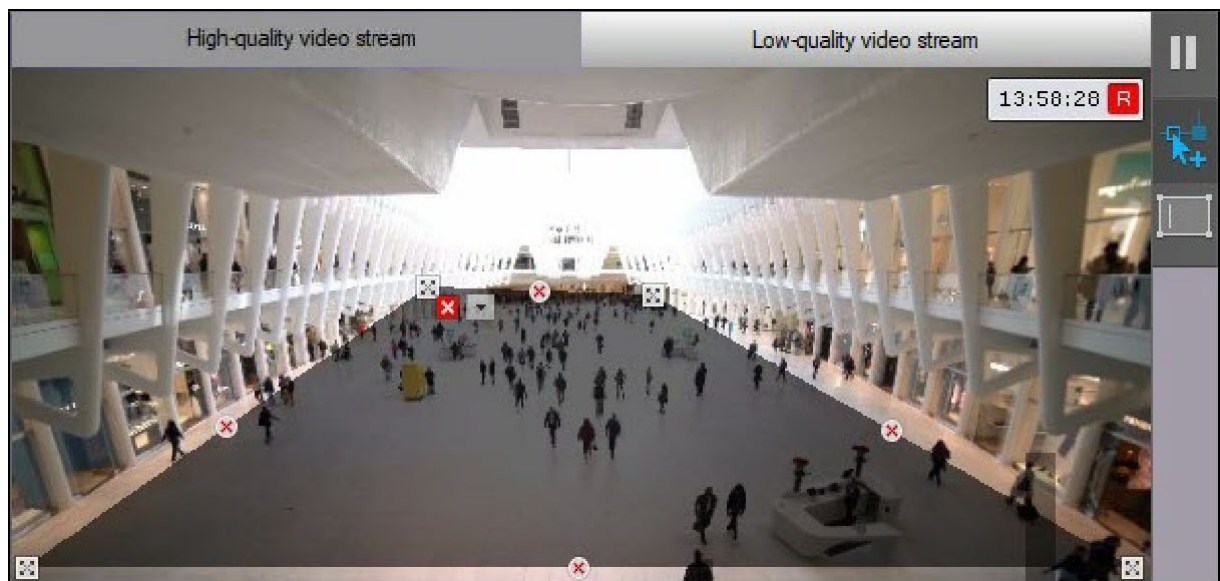
Note

The button is inactive, if the text overlay button is active  (see [Putting a text over the camera window](#) (see page 144)).

Note

For your convenience, you can click the  button and configure the mask on a still frame. To undo, click this button again.


2. In the preview window, sequentially set the anchor points of the closed area that you want to hide when viewing the live video image.

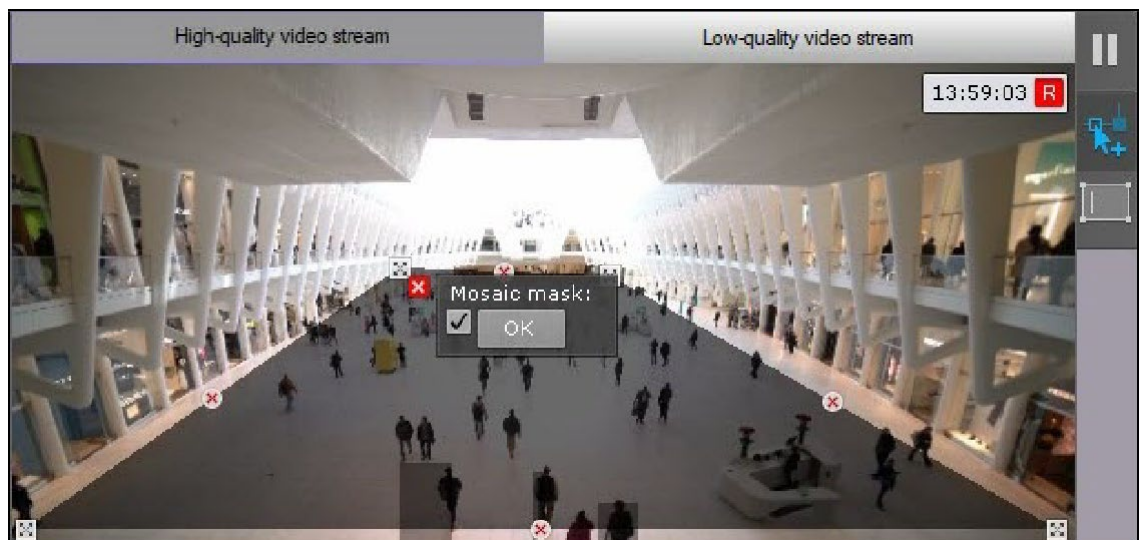


Note

When the area is being constructed, the anchor points are connected by a two-color dotted line which outlines the area's borders.

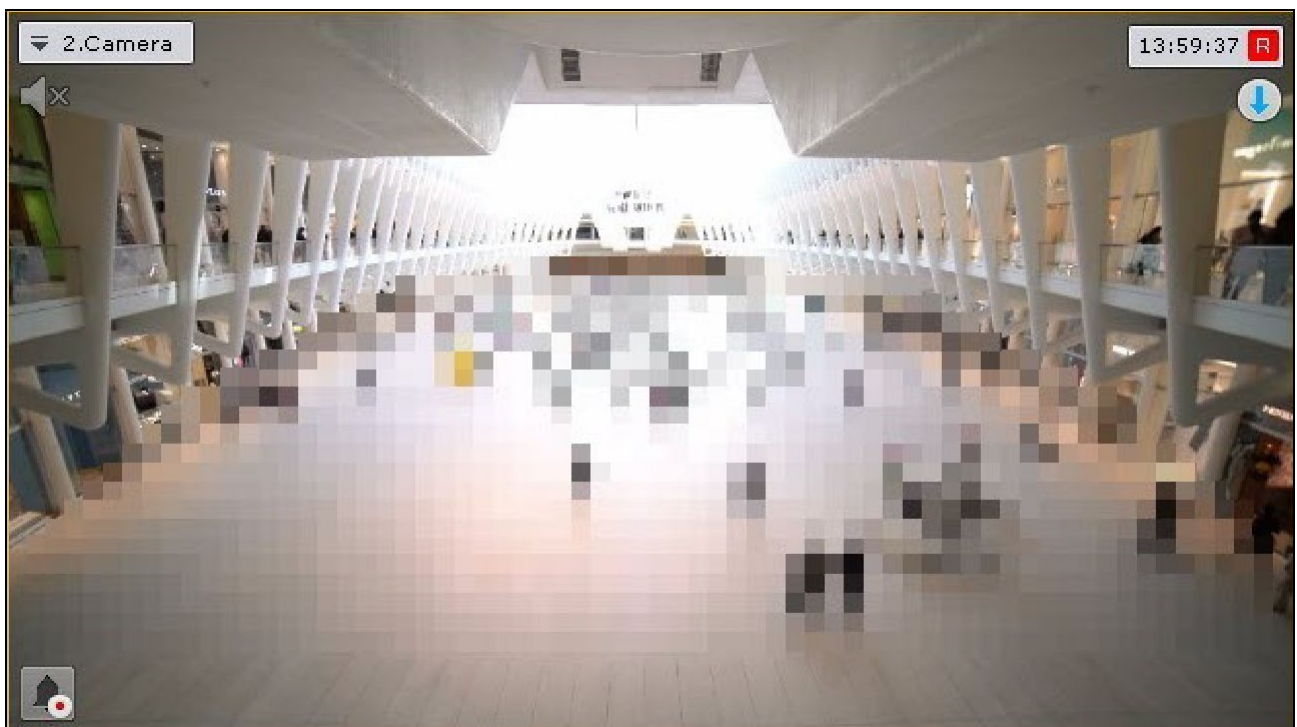
Action	Result
Left or right click in the video surveillance window	Create a new anchor point in the area
Right click on a created anchor point	Delete the area anchor point
Point the cursor to an anchor point and holding the left mouse button, move the mouse	Move the area anchor point
Click the  button	Delete the area

3. You can mask the selected area with black color (by default), or with a mosaic mask. To apply the mosaic mask, do the following:
 - a. Click the  button.
 - b. Set the checkbox.



- c. Click the **OK** button.
4. You can specify several areas.
5. Click the **Apply** button.


Privacy mask configuration is complete. When you view a video image from this camera, the selected area will be hidden.




Putting a text over the camera window

You can superimpose a text over video in the camera window. This text will be visible to all users in all monitoring modes but will not be present on exported frames and videos.


To put a text over the camera window, do the following:


1. Select a **Camera** object and click .

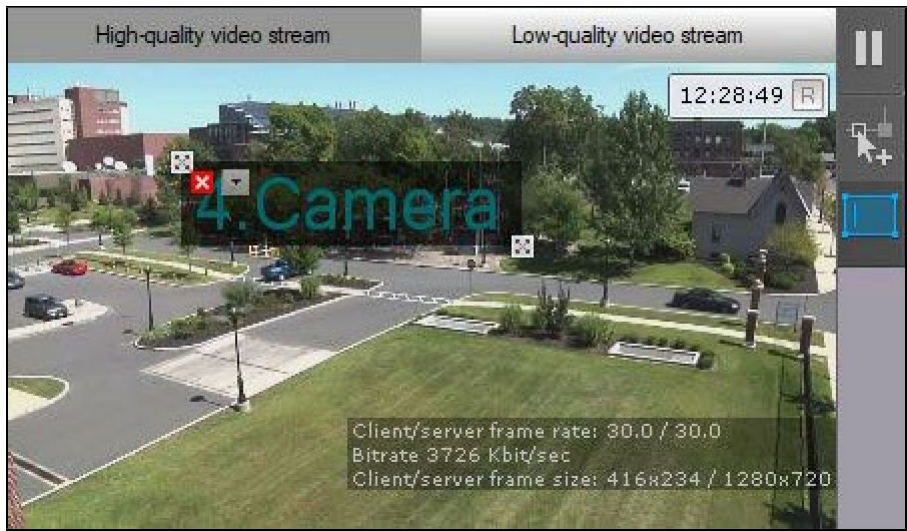
Note

You cannot do it if the  button is depressed (see [Privacy mask settings](#)(see page 142)).


Note


For your convenience, you can click the  button and configure the mask on a still frame/ snapshot. To undo, click this button again.

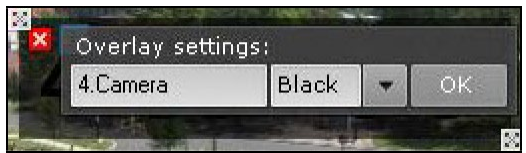
2. Click any mouse button anywhere in FoV to set two anchor points  of the rectangular area where the text will be displayed. The higher the area, the more the font size.



Note

To remove the area, click the  button.

3. Click .
4. Enter the required text. By default, the name of the video camera is displayed.



Attention!

The text string has to fit the width of the area. If not, you cannot apply settings. For a longer text, make the area wider.

5. Select a font color from the dropdown list.

6. Click the **OK** button.
7. If required, you can set multiple text areas in different parts of FoV.
8. Click **Apply**.

✔ Now, the text is superimposed over the video image.



The IP Server Object

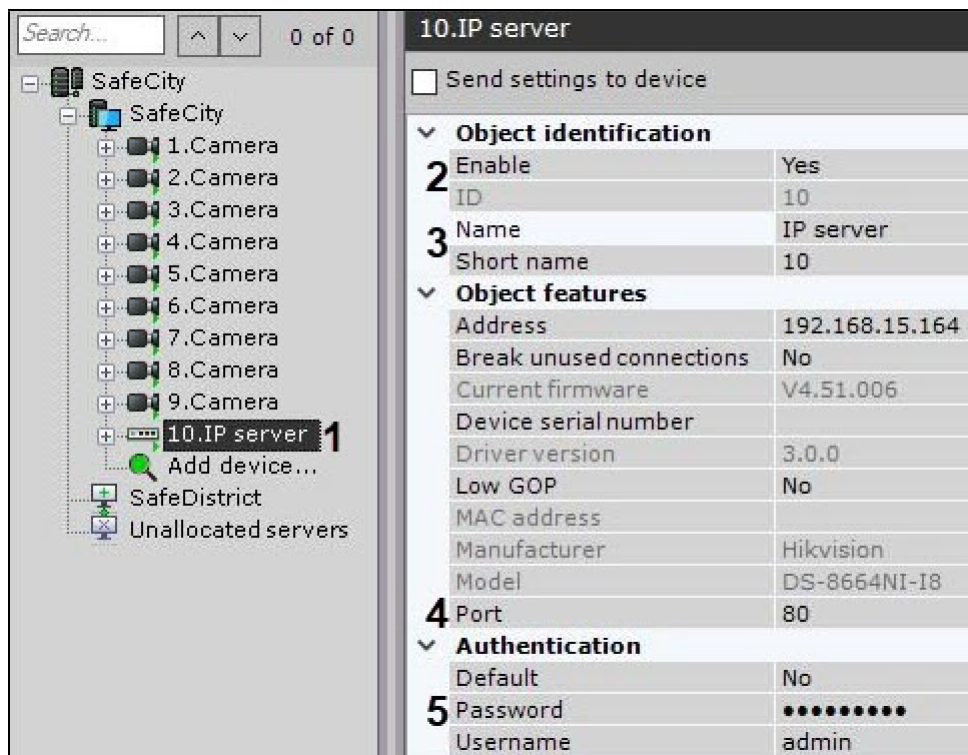
In the *Arkiv VMS*, an **IP Server** object relates to:

- video capture card;
- video server;
- control panel;
- DVR;
- input/output module.

If you configure a video capture card, video server or DVR, each video camera channel corresponds to a **Camera** object under the **IP Server** parent object.

To configure the IP server parent object, perform the following:

1. Select the **IP server** object in the objects tree (**1**).



2. Select **Yes** from the list in the **Enable** field to enable the object (2).
3. Enter the name of the IP server in the **Name** field (3).
4. Specify the number of the network port (4). The default value is **80**.

Note

The port number is initially set through the IP server's Web interface.

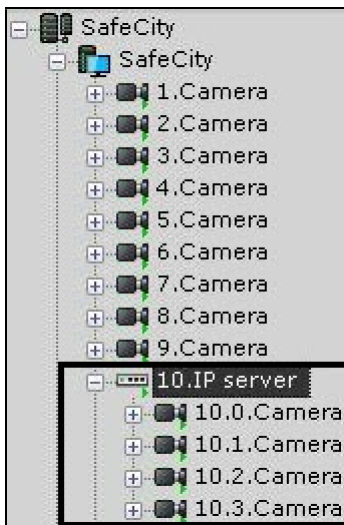
5. Set the authentication mode (5).

Note

The login and password for connecting to the IP server are set through its Web interface.

6. Click the **Apply** button.

The IP server and its video cameras will then be enabled, and the icon indicators for the IP server and video cameras in the objects tree will turn green.



Configuration of IP server channels must be performed separately for each channel (with the help of child objects of **Camera**).

By default, you cannot delete child **Camera** objects from the IP server. **To enable this feature, do as follows:**

1. Quit Client.
2. Start a text editor and open the Arkiv.exe.config configuration file located in: <Arkiv installation folder Arkiv>\bin.
3. Find the line <add key="AllowIpServerChannelRemove" value="false" /> and change **false** to **true**.
4. Save the changes to the file.

You can now delete **Camera** objects from the IP server.

Attention!

You cannot restore a deleted object. You will need to create the IP server again.


Configuring Virtual IP Servers

Arkiv supports working with a virtual IP server.

To create and configure a virtual IP server, perform the following steps:

1. Run IP Device Discovery Wizard (see [Adding and removing IP devices](#)(see page 97)).
2. In the form for manually adding an IP device, select **Inaxsys** in the **Vendor** drop-down list (**1**).

IP address	Port	Vendor
0.0.0.0	80	1 ▾
Device type		Model
IP device ▾		Virtual IP server 2 ▾

3. Select **Virtual** from the models list to emulate a single-stream video camera. Select **Virtual several streams** to emulate a video camera supporting multiple streams (**2**).
4. Click the  button.

An **IP server** object will be added. It will be used for creating 4 virtual video cameras; location of a video file to be used for signal emulation needs to be specified for each camera (see [Configuring virtual video cameras](#)(see page 140)).

The Microphone Object

If a microphone is part of an IP Server, then you must specify the video camera to which it will be linked in the settings of the given microphone. When you do this, the **Microphone** object will become a child of the specified **Camera** object.

☐ Attention

When a microphone is reassigned from one camera to another, all previously recorded audio is also transferred; when recorded video on the new camera is played, the transferred audio is played back.

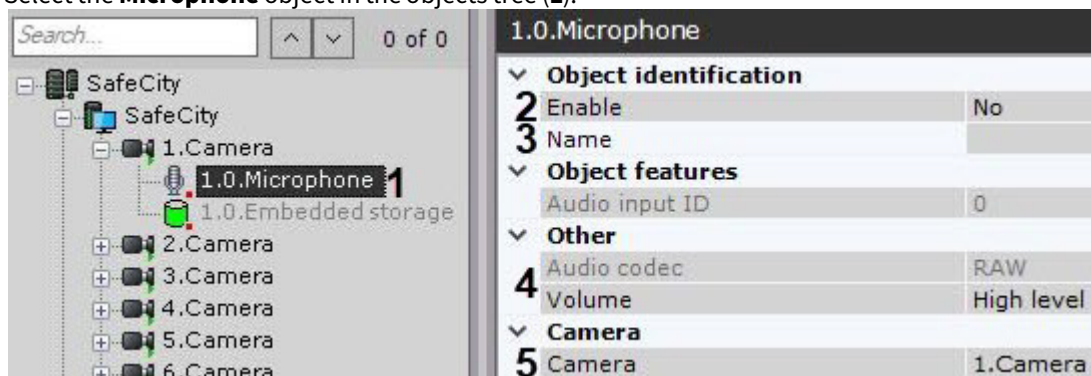
☐ Note

This setting is used during synchronized video and audio monitoring of a situation as well as during synchronized video and video recording to the archive (see the section [Audio Monitoring](#)(see page 763)).

In all other cases the **Microphone** object will automatically be displayed in the objects tree as a child of the video camera itself.

To configure the **Microphone** object, perform the following:

1. Select the **Microphone** object in the objects tree (1).

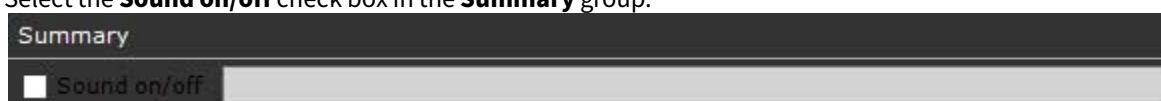


2. Enable the microphone by selecting **Yes** in the **Enable** field (2).
3. Enter the name of the microphone in the **Name** field (3).
4. Configure additional microphone parameters (audio codec, bit rate, etc.) in the **Other** group (4) using their descriptions in the interface of the *Arkiv* software package or, for more detail, in the official reference documentation of the parent video camera.
5. Choose a video camera to associate this microphone with (5). As a result of this operation, the selected camera will become a parent object for the microphone.
6. Click the **Apply** button.

The microphone will then be switched to its assigned work mode.

To check the microphone's operation, you must perform the following steps:

1. Select the **Sound on/off** check box in the **Summary** group.



2. Provide an audio signal to the microphone.
3. If the microphone is configured correctly, the audio signal will be transmitted to the Server's speakers. The strength of the incoming audio signal will be displayed on the indicator to the right of the **Sound on/off** check box.

Checking microphone operation is now complete.

If a microphone is part of an IP Server, the microphone settings allow choosing the video camera of the IP Server it will be matched to. When you do this, the microphone object will appear as the child object of the specified camera in the object tree.

The PTZ object

The **PTZ** object is displayed in the objects tree as the child object to the camera, if it is the PTZ camera.

To configure the PTZ device of the camera, do the following:

1. Select the **PTZ** object in the objects tree (1).

2.0.PTZ	
Object identification	
2 Enable	Yes
3 Name	
Object features	
Address	0
4 Discrete control via continuous control	No
5 Home preset	0
6 Home preset timeout	0
7 Multiple control	Yes
8 New PTZ interface	No
9 Patrol	No
10 Patrol speed	100
11 Save presets	Yes
12 Switch interval	10
13 Use device presets	No
Tag & Track	
Prediction time	500
14 Priority	None
PTZ command sending timeout	1000
Switch Frequency	3
Other	
Bitrate	9600
COM-port number	0
Data bits	8
Flow control	None
15 Parity check	None
Port type	RS-485
Preset speed	4
Stop-bit	1
Transport protocol	Pelco D
Camera	
16 Camera	2.Camera

2. Enable the PTZ device by selecting **Yes** in the **Enable** field (2).

3. Enter the name of the PTZ device (3).
4. If you need to use the step buttons to control the PTZ camera even if the camera does not support this mode, select **Yes** for the **Discrete control via continuous control** parameter (4, see [Control using step buttons and virtual joystick](#)(see page 651)). In this case, the discrete PTZ control will be emulated via the continuous control commands.
5. Select the **Home preset** by specifying the required identifier (5). The home preset will return automatically after the time period specified in the **Home preset timeout** field (6).

❑ Attention!

If the **Home preset timeout** value is greater than the **Operator idle time** value (see [Configuring PTZ control](#)(see page 519)), the **Operator idle time** value will be used.

6. To simultaneously control the PTZ camera by multiple users with the same priority, select **Yes** in the **Multiple control** list (7). Otherwise, only one user at a time will have a control (see [Controlling a PTZ Camera](#)(see page 644)).
7. **To use the existing presets on the device in Arkiv, do the following:**
 - a. If the camera is connected via the ONVIF protocol, set **Yes** for the **New PTZ interface** parameter (8). The presets created on the device will automatically appear in the PTZ control panel.
 - b. In any other case:
 - i. Set **Yes** for the **Use device presets** parameter (13).
 - ii. Create the presets with identical IDs in *Arkiv* (see [Creating and editing presets](#)(see page 647)).

❑ Attention!

If the use of the existing presets is disabled, they can be lost if the following conditions are met:

1. The recording of the presets to the device is enabled in *Arkiv* (see point 9).
2. The preset with the same ID is created in *Arkiv* (see [Creating and editing presets](#)(see page 647)).

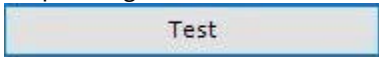
8. **Configure patrol:**
 - a. Select the default patrol mode: **Yes** — on, **No** — off (9). If patrolling is enabled by default, it can be stopped in PTZ control panel (see [Patrolling](#)(see page 652)). After you finish the PTZ control session, patrolling will resume automatically.
 - b. Set the time interval in seconds at which the PTZ device will switch between the presets in the patrol mode (12).
 - c. Set the transition speed from one preset to another in conditional units from 0 to 100 (10).
9. By default, the presets are recorded in the IP device. If you want to store the presets on the Server only, select **No** for the **Save presets** parameter (11).

❑ Note

This parameter is available only for the devices that support Absolute Positioning.

10. If necessary, configure the Target&Follow function (14, see [Configuring Target&Follow Pro](#)(see page 179)).
11. Depending on the camera, you may find other parameters in the **Other** group (15). To configure them, refer to their description in the interface or in the official documentation.
12. If necessary, select the camera to which this PTZ device should be assigned to (16). As a results, the object will become the child object to the selected camera.
13. Click the **Apply** button.

As a result, the PTZ device will switch to the specified operating mode.

To check the operation of the PTZ device, click the  button. If the PTZ device is configured correctly, it will turn one step and return to its original position.

[Controlling a PTZ Camera](#)(see page 644)

Configure HTTP-CGI commands to control Wash&Wiper

With *Arkiv*, you can control the Wash&Wiper feature in some Axis IP devices (M7016, P7216, Q7404, Q7436) using HTTP-CGI commands.

To set HTTP-CGI commands, do as follows:

1. Create presets for the camera, numbered as follows: 101, 102, 103 and 104 (see [The Presets List](#)(see page 647)).
2. Go to the **PTZ** object and specify commands in the appropriate fields.

Note

The corresponding **Camera** object should have the **Send settings to device** option enabled (see [The Video Camera Object](#)(see page 107)).

Other	
Autofocus	Yes
Control Queue	Yes
Poll Time	30
telemetry_P7210/url101	/axis-cgi/view/param.cgi?action=upd
telemetry_P7210/url102	/axis-cgi/view/param.cgi?action=upd
telemetry_P7210/url103	/axis-cgi/view/param.cgi?action=upd
telemetry_P7210/url104	/axis-cgi/view/param.cgi?action=upd
Users in Queue	20
3. Camera	
Camera	10.2.Camera

3. Click the **Apply** button.

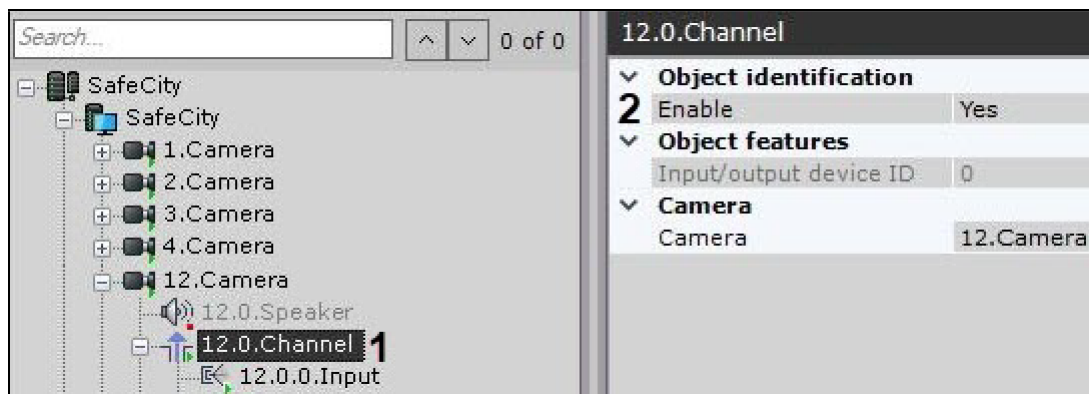
When the camera goes to the presets 101-104, this triggers a pre-configured command.

The Channel object

For I/O modules or video surveillance control panels (see [CCTV Keyboards](#)(see page 167)), the **Channel** object is displayed as a child object of an IP Server in the object tree (see [The IP Server Object](#)(see page 146)).

To configure the Channel object, do as follows:

1. Select the **Channel** object in the objects tree (1).



2. Enable the object (2).

Note

When a channel object is enabled/disabled, all **Input** and **Output** child objects are automatically enabled/disabled.

3. Click **Apply**.

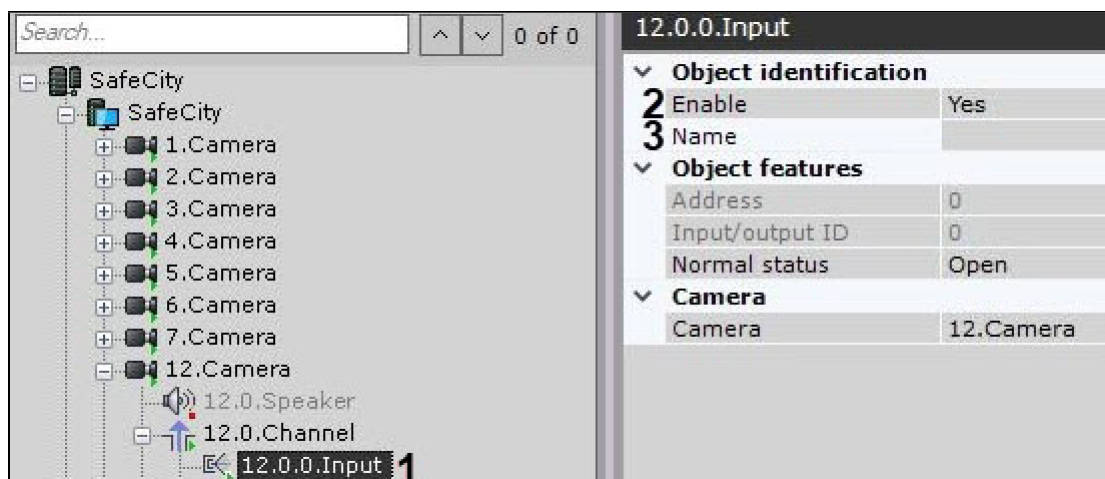
The Input Object

If a camera has a built-in or pluggable digital input, the **Input** object is displayed as a child object of the **Camera** in the object tree. The total number of **Input** objects for a camera corresponds to its number of pluggable digital inputs.

If a device is defined as an IP Server, Input will be displayed as a child of a **Channel** object in the object tree (see [The Channel object](#)(see page 152)).

To configure a Input object, perform the following:

1. Select the **Input** object in the objects tree (1).



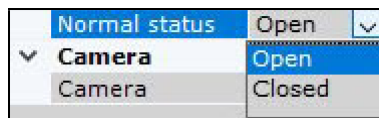
2. Enable the device (2).

Note

If an input is a child of a **Channel** object, then:

- a. Turning on an input automatically enables its parent **Channel** object.
- b. Turning off all **Input** and **Output** child objects automatically disables their parent **Channel** object.

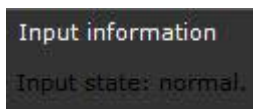
3. Enter the name of the Input (**3**).
4. Set the status to which the Input will be set when no alarm is present.



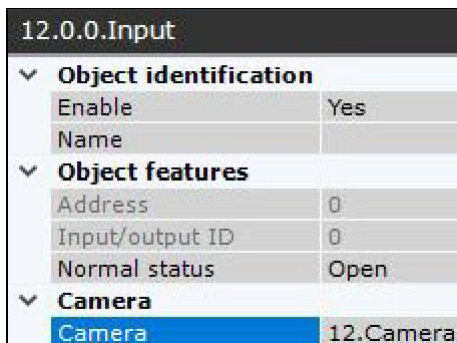
5. Click the **Apply** button.

The Input will then be switched to its assigned work mode.

The current status of the Input is displayed in the **Input information** group.



If an Input is part of an IP server, the Input settings allow choosing the video camera of the IP server it will be matched to. When you do this, the **Input** object will appear as the child object of the specified camera in the object tree.



Configure virtual inputs

[Switch between virtual IP-device states \(HttpListener\).](#)


The Arkiv software package enables you to work with virtual inputs. This involves triggering a virtual input and producing a virtual input event/alarm in the VMS. When triggered, the virtual input status switches – **Closed/Open**.

Creating and configuring virtual inputs

To create and configure a virtual input, complete the following steps:

1. Run IP Device Discovery Wizard (see [Adding and removing IP devices](#)(see page 97)).
2. In the form for manually adding an IP device, select **HttpListener** in the **Vendor** drop-down list (**1**).

IP address	Port 2	Vendor 1
0.0.0.0	8080	HttpListener
Device type	Model	
IP device	HttpListener device	

3. In the **Port** field, specify the port number that will be used Input status queries (**2**).
4. Click the  button.

The **IP Server** object is automatically created to host 4 virtual inputs.

Attention!

For a virtual Input to work correctly, please do as follows: use the **Open** circuit.

11.0.0.Input	
▼ Object identification	
Enable	Yes
Name	
▼ Object features	
Address	0
Input/output ID	0
Normal status	Open
▼ Camera	
Camera	11.Camera

You can configure virtual inputs in the same way as real ones. Also you can specify the time-out when virtual inputs reset their status in the **Alarm Expiration Time** field of the **IP Server** object. It ranges from 0 to 100.

▼ Other	
Alarm Expiration Time	2

This setting is applied only after you disable and enable the input again.

Switching virtual inputs

To switch virtual inputs, the HTTP request is used (see [Switch between virtual IP-device states \(HttpListener\)](#)).

The requests can be handled by macros (see [Executing a web query](#)(see page 424)). Create 2 macros for each virtual input: to switch to **Closed** and to switch to **Opened**.

General: Execute web-query

Basic

Authentication method: Basic

Command: POST

HTTP/HTTPS: HTTP

IP address: 127.0.0.1

Port: 8080

Username: |

Password: |

Path: /device/di/0

Query: {"state": "closed"}

You can run macros and requests from Dialog board (see [Configuring a Dialog Board](#)(see page 473)).

Virtual inputs' status on map

You can add virtual inputs to maps just as you do with real ones (see [Adding inputs and outputs](#)(see page 492)).

Virtual inputs status is color-coded (see [Displaying device status](#)(see page 773)).

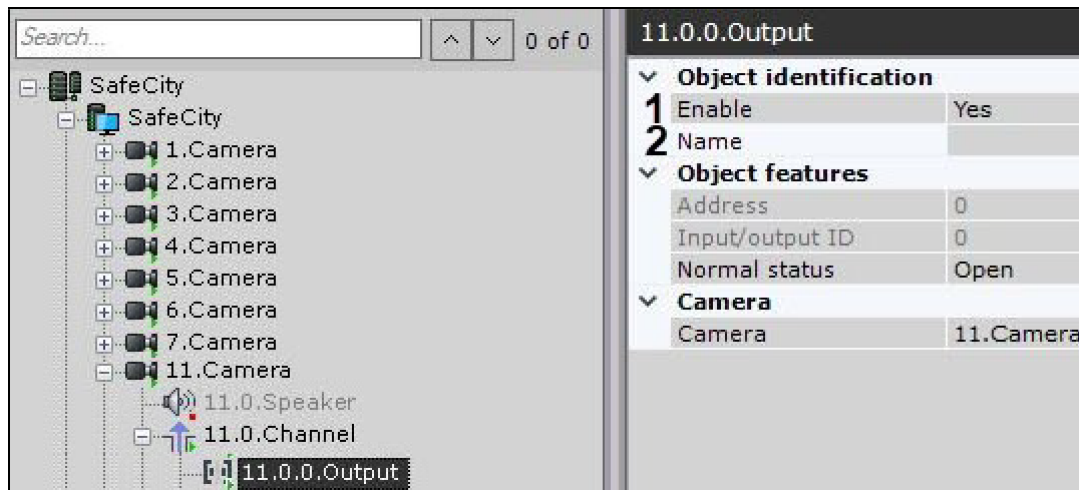
The Output Object

If a camera has a built-in or pluggable digital output, the **Output** object is displayed as a child object of the **Camera** in the object tree. The total number of **Output** objects for a camera corresponds to its number of pluggable digital outputs.

If a device is defined as an IP Server, a relay will be displayed as a child of a **Channel** object in the object tree (see [The Channel object](#)(see page 152)).

To configure a Output object, perform the following:

1. Select a **Output** object in the objects tree.
2. Enable the device (**1**).

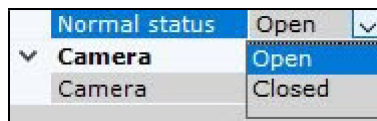


Note

If a output is a child of a **Channel** object, then:

- a. Turning on a output automatically enables its parent **Channel** object.
- b. Turning off all **Input** and **Output** child objects automatically disables their parent **Channel** object.

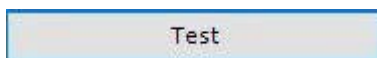
3. Enter the name of the Output (**2**).
4. Set the status to which the Output will be set when no alarm is present.



5. Click the **Apply** button.

The Output will then be switched to its assigned work mode.

To check the functioning of the Output, click the **Test** button. If the Output is configured correctly, its status will briefly change.



If an Output is part of an IP server, the sensor settings allow choosing the video camera of the IP server it will be matched to. When you do this, the **Output** object will appear as the child object of the specified camera in the object tree.

11.0.0.Output	
▼ Object identification	
Enable	Yes
Name	
▼ Object features	
Address	0
Input/output ID	0
Normal status	Open
▼ Camera	
Camera	11.Camera

The Speaker Object

The **Speaker** object is used for configuration of the sound alert triggered by a macros.

Attention!

Audio notifications cannot be played back via the system speakers on a remote Client. In this case, you are advised to [run an external program on Clients](#)(see page 417).

In *Arkiv* you can create the following types of **Speaker** objects:

1. **IP speaker device.** Created automatically if there is an audio outlet on an IP device.

Note

One audio outlet on an IP device corresponds to one child **Speaker** of the **Camera** object.

2. **System speaker.** Created manually. Sound on the system speaker is played back using the server's sound card.

A **Speaker** object can play audio notification files with the extensions:

1. .wav
2. .mp3
3. .mkv
4. .avi

The following audio notification file encoding formats are supported:

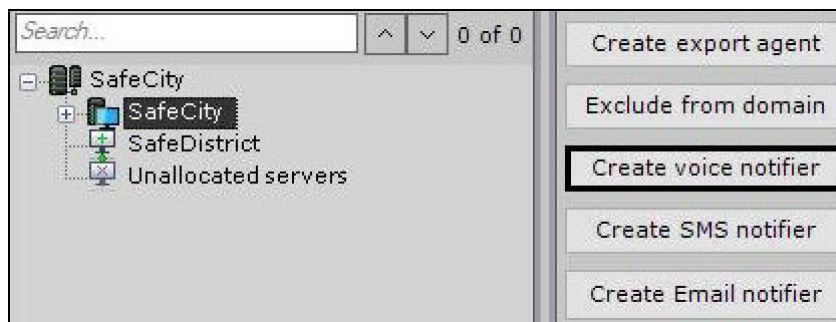
1. G.711
2. G.726
3. PCM

The audio notification file should be stored on the computer corresponding to the **Server** object on the basis of which the **Speaker** object is registered.

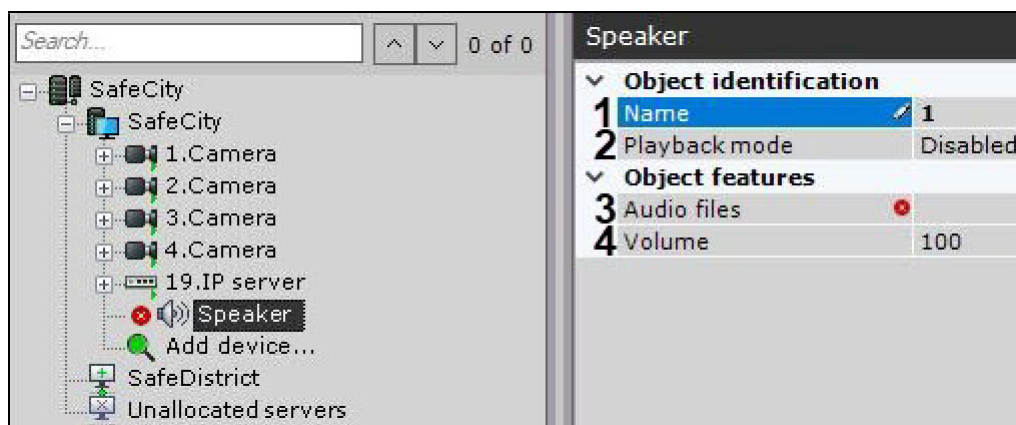
Creating and Configuring an Object

To create a Speaker system object, you must perform the following steps:

1. In the list of devices, highlight a **Server** object and click the **Create voice notifier** button.



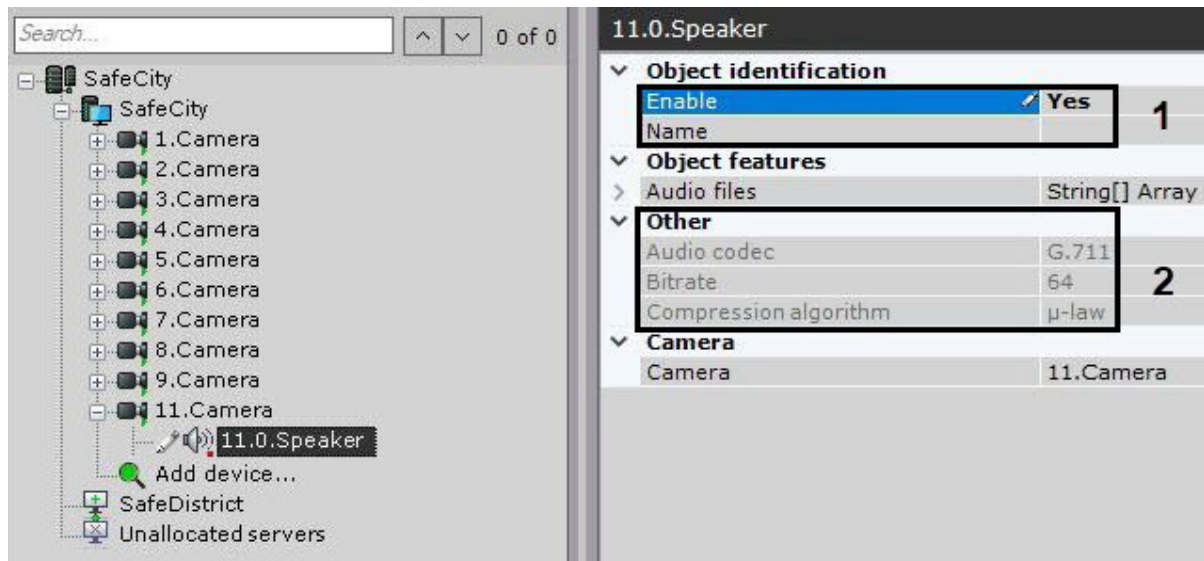
2. In the **Name** field (1), enter the desired name of the **Speaker** object.



3. Select the speaker mode: disabled, play back on Server, play back on Clients (2).
4. In the **Audio files** field (3), enter the full path to the audio notification file. This parameter is mandatory.
5. In the **Volume** field (4), enter the desired speaker volume level.

Note

By default, IP device speakers are disabled. To enable, for the **Enable** value (1), select **Yes**. When configuring the speaker of an IP device, you can set other parameters as well, such as the compression algorithm for the audio signal sent to the speaker for playback (2). Which speaker parameters you can configure is determined by the protocol for integration of the IP device and the Arkiv software package.



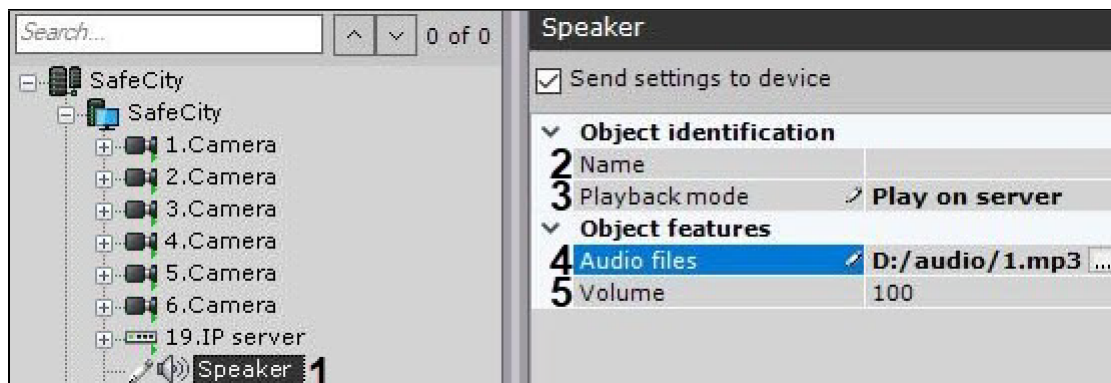
6. Click the **Apply** button.

✓ Creation of the **Speaker** object is complete.

Configuring a Speaker Object

To configure a Speaker object, you must perform the following steps:

1. In the list of devices, highlight the **Speaker** object which needs to be configured (1).



2. In the **Name** field (2), enter the desired name of the **Speaker** object.
3. Select the speaker mode: disabled, play back on Server, play back on Clients (3).
4. In the **Audio files** field (4), enter the full path to the audio notification file.
5. In the **Volume** field (5), enter the desired speaker volume level.
6. To parent an IP device to a speaker:
 - a. By default, IP device speakers are disabled. To enable, for the **Enable** value (1), select **Yes**.

▼	Object identification	
1	Enable	No
	Name	
▼	Object features	
	Audio input ID	0
▼	Other	
2	Audio codec	G.711
	Compression algorithm	μ-law
▼	Camera	
3	Camera	10.0.Camera

- b. When configuring the speaker of an IP device, you can set other parameters as well, such as the compression algorithm for the audio signal sent to the speaker for playback (**2**). Which speaker parameters you can configure is determined by the protocol for integration of the IP device and the *Arkiv* software package.
- c. Choose a video camera to associate this speaker with (**3**). As a result of this operation, the selected camera will become a parent object for the speaker.

7. Click the **Apply** button.

✔ Configuration of the **Speaker** object is now complete.

Checking Audio Notification

To check audio notification from a **Speaker** object, click the **Test** button.

11.0.Speaker

▼	Object identification	
	Enable	Yes
	Name	
▼	Object features	
>	Audio files	String[] Array ...
▼	Other	
	Audio codec	G.711
	Bitrate	64
	Compression algorithm	μ-law
▼	Camera	
	Camera	11.Camera

Audio files
Path to the audio files.

Test

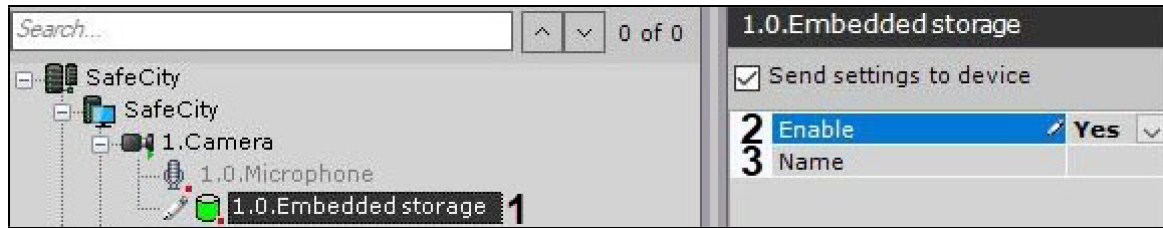
When you do this, the audio notification file whose path you indicated in the corresponding field plays back (see the section [Configuring a Speaker Object](#)(see page 160)).

The Embedded storage object

If a camera has on-board storage (SD card), the system will automatically create the corresponding object.

To configure on-board storage, do as follows:

1. Select the required object in the devices' list (1).



2. Select **Yes** in the **Enable** field to activate the object (2).
3. You can add the name of the object (3).
4. Click the **Apply** button.

✔ You have configured on-board storage. You can view video from on-board storage (if enabled) and copy it to the archive (see [Configuring data replication](#)(see page 210)).

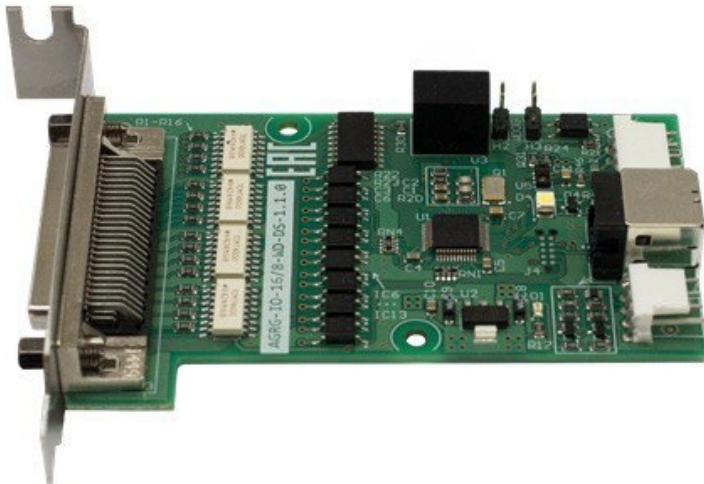
7.2.4 Particulars of Configuration of Devices

AGRG-IO-16/8-WD-DS Sensor-Relay cards

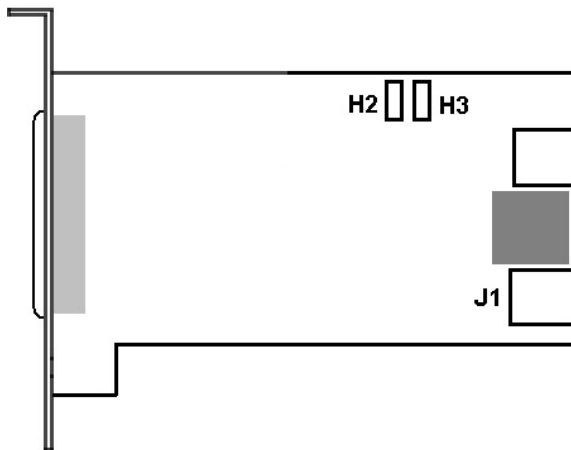
Connecting AGRG-IO-16/8-WD-DS Sensor-Relay cards

The *AGRG-IO-16/8-WD-DS Sensor-Relay* card is an interface of external sensors and external executive devices (relays) as a part of video surveillance and fire and security alarm systems.

The figure shows the appearance of *AGRG-IO-16/8-WD-DS* card.



The layout of card connectors:



The device is controlled via the USB interface. Electrical and technical specifications of the card are given in the [Electrical and technical specifications of ARGR-IO-16/8-WD-DS devices](#) (see page 164) section.

Connect the ARGR-IO-16/8-WD-DS card to the Server as follows:

1. Switch the computer power supply off. Remove the system cover.
2. Install the ARGR-IO-16/8-WD-DS card into a vacant motherboard slot and fix it in the casing.
3. Connect the loop (bundled with the distribution kit) to the **J1** connector and to a vacant USB connector on the motherboard of computer.
4. To activate the hardware control of the hang, connect the wires to the **H2 H3** connector.
5. To connect sensors and relays unsolder the connector bundled with the distribution kit.
 - a. The connecting wires from the executive devices are soldered to the contacts marked as "Relay" (see the table below).

Connector	Application	Connector	Application
1	Relay 1 (+)	26	Sensor 5
2	Relay 1	27	Sensor 5
3	Relay 2	28	Sensor 6
4	Relay 2	29	Sensor 6
5	Relay 3	30	Sensor 7
6	Relay 3	31	Sensor 7
7	Relay 4	32	Sensor 8
8	Relay 4	33	Sensor 8
9	Relay 5	34	Sensor 9
10	Relay 5	35	Sensor 9
11	Relay 6	36	Sensor 10

Connector	Application	Connector	Application
12	Relay 6	37	Sensor 10
13	Relay 7	38	Sensor 11
14	Relay 7	39	Sensor 11
15	Relay 8	40	Sensor 12
16	Relay 8	41	Sensor 12

- b. The connecting wires from the sensors are soldered to the contacts marked as "Sensor" (see the table below).

Connector	Application	Connector	Application
17	Sensor 1	42	Sensor 13
18	Sensor 1	43	Sensor 13
19	Sensor 2	44	Sensor 14
20	Sensor 2	45	Sensor 14
21	Sensor 3	46	Sensor 15
22	Sensor 3	47	Sensor 15
23	Sensor 4	48	Sensor 16
24	Sensor 4	49	Sensor 16
25	+ 12V (Output)	50	GND (Ground)

6. Fix the unsoldered connector in the casing bundled with the distribution kit.
7. Connect ready-for-use connector to external connector of the card in order to connect sensors and relays to the Server.

✔ The *AGRG-IO-16/8-WD-DS* card is now connected.

Electrical and technical specifications of *AGRG-IO-16/8-WD-DS* devices

When connecting the *AGRG-IO-16/8-WD-DS* sensor-relay cards, the electrical and technical specifications shown in the table below should be considered.

Parameter	Specification
Galvanic isolation on inputs/outputs	3750 V

Parameter	Specification
Inputs	Quantity - 16 Type - current loop Galvanic isolation - Yes Maximum voltage - 60 V Rated voltage - 12 V Maximum current - 60 mA
Outputs	Quantity - 8 Type - open collector Galvanic isolation - Yes Maximum voltage - 300 V Maximum current - 150 mA Minimum pick-up voltage - 1.0 V Minimum pick-up current - 5 mA
Reset Timer (Watchdog)	Customizable
Ping interval of all alarm inputs	100 ms for all contacts. Customizable
PC connection interface	USB 2.0, up to 5 meters
Power supply	500 mA consumption from USB port

Special features of configuring AGRG-IO-16/8-WD-DS card in Arkiv

The connected card is automatically detected in the IP Device Discovery Wizard (see [Adding and removing IP devices](#)(see page 97)).

If you add a device manually, enter the serial number of the device in the **IP address** field.

IP address	Port	Vendor
6704474152546672	3600	AGRG
Device type	Model	
IP device	IOUSB-16/8-WD-DS	

To read the serial number, use the manufacturer's [utility](#).

Axis IP Devices

Serial number check

To check serial numbers of Axis IP devices, do the following:

1. Enter a serial number into the appropriate field.

Object features	
Address	192.168.0.12
Port	80
MAC address	
Manufacturer	Axis
Model	P1357
Driver version	3.0.0
Break unused connections	No
Current firmware	
Device serial number	00409CD200C

2. Click **Apply**.
3. The device will be reconnected. Upon reconnection, the entered serial number will be checked against the real one. If numbers do not match, a separate event will be registered in the system Log.

Bonjour function

For Axis IP devices on which the Bonjour function is supported and enabled, changing the default value of the **Friendly name** parameter is strongly discouraged. If an arbitrary **Friendly name** value is set for an Axis IP device, a search for connected equipment in the *Arkiv* software package will give incorrect results for this IP device.

Note

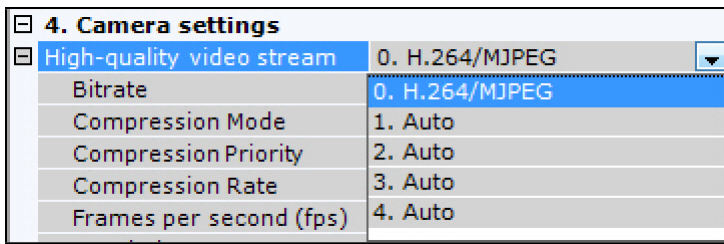
- The **Friendly name** parameter is configured through the Web interface of the IP device: Setup -> System options -> Network -> Bonjour.
- The default value of the **Friendly name** parameter is as follows: AXIS <model name> - <mac address>, where <model name> is the model of the Axis IP device and <mac address> is its MAC address (for example, AXIS 214 – 00408C7D2610).

Video streams

Arkiv can access the following video streams from Axis IP devices:

1. H.264/MJPEG video.
- 2–5. Streams matching the Quality, Balanced, Bandwidth, and Mobile profiles. These profiles are configured via the camera's Web interface.

In *Arkiv*, the Quality profile corresponds to stream **1. Auto**, Balanced is stream **2. Auto**, Bandwidth is stream **3. Auto**, and Mobile is stream **4. Auto** (see [The Video Camera Object](#)(see page 107)).



CCTV Keyboards

General Information about CCTV Keyboards

Video surveillance control panels can be connected to *Arkiv* in two ways:

1. Connecting a panel via the Windows driver as an HID USB device. This method makes the panel immediately available for specifying hotkeys (see [Assigning hot keys](#)(see page 552)).

❏ Attention!

In HID mode, some control panel buttons may not work in *Arkiv*.

2. Connecting a panel via the *Arkiv* driver. Using this method, the panel is added to the system similarly to that of IP devices (see [Adding and removing IP devices](#)(see page 97)).

❏ Attention!

To connect a control panel in this way, you need the *Arkiv* software to be installed in the **Server and Client** configuration. It's not possible to operate a board as a remote client.

The following control panels are supported in the current version of *Arkiv*:

	Windows driver	<i>Arkiv</i> driver
Axis T8310 (T8311, T8312, T8313)	+	+
Dahua DH-NKB1000	+	+
PELCO KBD5000	+	+
Videotec DCZ	+	+
Hikvision DS-1005KI	+	+
Hikvision DS-1100KI	-	+
Hikvision DS-1200KI	-	+
Hikvision DS-1600KI	-	+
UNIVIEW KB-1100	-	+

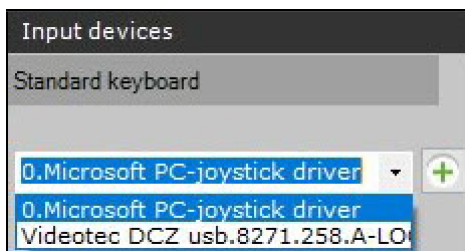
Axis T8310 specific configuration features

Setting up on a Server

To make a T8132 keyboard operate with Rev01 hardware, restart the *Arkiv* VMS server after you create the **IP Server** object (see [Shutting down a Server](#)(see page 82), [Starting a Server](#)(see page 76)).

Setting up on a Client

You can use the Axis T8310 control board with remote Clients through the driver embedded into the *Arkiv* software. The panel is not added to the system as an IP device, and is immediately available for assigning hotkeys.



Various models differ in connected [devices](#)⁷⁹.

T8310	All devices
T8311	Joystick only
T8311 / T8312	Joystick and keypad
T8311 / T8313	Joystick and jog dial
T8312	Keypad only
T8312 / T8313	Keypad and jog dial
T8313	Jog dial only

Hikvision DS-1100KI specific configuration features

To work with the DS-1100KI network keyboard in *Arkiv*, power on the device and do as follows:

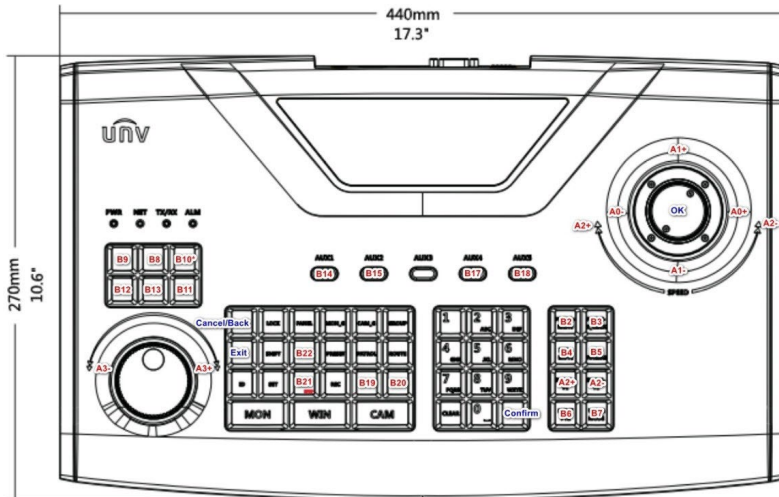
1. Switch the keyboard to **Server** mode.
2. Select **Third Platform Software**.
3. Enter the *Arkiv* Server's IP address and communication port number.
4. You have to use the same port to add the device to the *Arkiv* VMS.

⁷⁹ <https://www.axis.com/products/axis-t8310-video-surveillance-control-board>

UNIVIEW KB-1100 specific configuration features

General description of the UNIVIEW KB-1100 PTZ control device

A schematic representation of the UNIVIEW KB-1100 PTZ control device is shown in the figure below.



The following physical controls are available on the device:

Joystick is a rotary control moving along three axes:

- Pan axis (panning: left or right deviation).
- Tilt axis (tilt: up or down deviation).
- Zoom axis (scaling: clockwise or counterclockwise deviation).

Acceleration along each of the three axes depends on the degree of deviation from the center. The movement is carried out until release. When released, the control returns to its original position.

Jog-Wheel (not integrated into the *Arkiv* software package!) is a rotary control rotating only around its axis. When released, the control returns to its original position. In the illustration it is located at the bottom left (outer ring).

Shuttle is a rotary control rotating only around its axis. Allows the intermittent movement in one of two directions. It has no initial position; when released, it remains in place. In the illustration it is located at the bottom left (inner ring).

Button is a push control element that can represent two states. Allows the call of one of two functions (the function for pressing and the function for releasing). When released, it returns to its original position (“not pressed” state).

Of all the push-button controls of the remote control, the following blocks are integrated:

- A block of playback control keys (6 keys on the left: the record button is triggered after pressing a button on the joystick).
- Block of keys for control of focus, zoom, aperture and PTZ presets (8 keys).

The following keys to manipulate the device interface are also available (not related to *Arkiv*):

- Pressing the button on the remote control joystick (OK) (equivalent to pressing the ENTER key).
- Cancel the action / return one step back in the remote control menu (equivalent to pressing the ESC key).

- Numbers / letters are entered from the numeric keyboard, the mode (upper/lower register, digits) is switched by the SHIFT key.
- Moving through the menu items and within the fields is carried out by deviating the remote control vertically / horizontally.

Configuring a remote control before adding it to Arkiv

Configure the network PTZ 4-dimensional Joystick Remote Control from Uniview (KB-1100) before you create the appropriate object in the *Arkiv* VMS. **Proceed as follows:**

1. Switch on the control device.
2. Enter username and password in the device display. The default credentials are as follows:
 - a. Login: admin.
 - b. Password: 123456.
3. Configure the device network configuration. To do this, in the Local Cfg -> Net Cfg menu, set the following settings:
 - a. IP address.
 - b. Mask.
 - c. Gateway.
4. Add the *Arkiv* Server to the internal configuration of this CCTV joystick keyboard. To do this, in the Dev Manage -> Manual Cfg -> Add Dev menu, set the following settings:
 - a. ID – enter any number (range: 1-240, the number must not coincide with the ID of the remote control or other already added device).
 - b. Name – enter a string (1-8 characters).
 - c. DType – select VM (VideoManagementSystem, i.e. *Arkiv*).
 - d. LType – select NetWork (the device is integrated for connecting to *Arkiv* via the network).
 - e. After selecting LType, press the button on the joystick and enter the IP address of the *Arkiv* VMS Server and the port used (the default port is 60000).
5. Connect to *the Arkiv VMS*, added in the step above. To do this, enter the ID specified above in the FindDev -> Dev ID menu or select the found profile in the Dev Manage -> Search Dev menu.
6. If the device is found, information about it will be displayed on the device display.
7. Press on the ID field. This will onboard the remote control in the *Arkiv* VMS.


✔ Setting up the UNIVIEW KB-1100 control device is completed.

Configuring UNIVIEW KB-1100 in Arkiv

Configure the UNIVIEW KB-1100 PTZ joystick control as follows:

1. Go to IP Device Discovery Wizard (see [Adding and removing IP devices](#)(see page 97)).
2. In the **Vendor** list select **Uniview-joystick (1)**.

IP address 2	Port 3	Vendor 1
172.19.9.56	60000	Uniview-joystick ▾
Device type	Model	
IP device ▾	KB-1100	

3. In the **IP address** field, enter the IP address of the remote control (**2**).
4. In the **Port** field, enter the port number, as set in step 4 of the remote control settings configuration (**3**).
5. Click the .
6. Enable the newly created **IP Server** and its **Channel** child object.

- ✓ You have configured the UNIVIEW KB-1100 Joystick Remote Control and CCTV keyboard.

On page:

- [General description of the UNIVIEW KB-1100 PTZ control device\(see page 169\)](#)
- [Configuring a remote control before adding it to Arkiv\(see page 170\)](#)
- [Configuring UNIVIEW KB-1100 in Arkiv\(see page 170\)](#)

Hikvision DS-1200KI specific configuration features

Configuring the Hikvision DS-1200KI control device before adding it to Arkiv

Configure the Hikvision DS-1200KI PTZ control device as follows before creating the corresponding object in Arkiv:

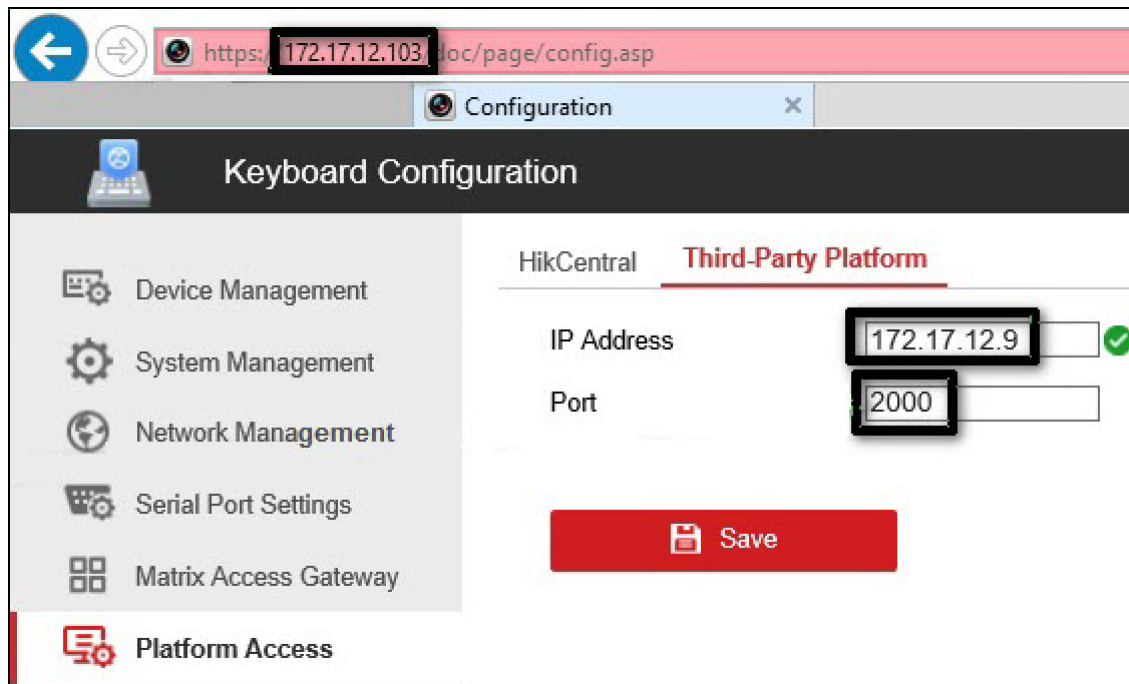
1. Set the control device address: **Select System – Network** in the device internal menu, then disable DHCP and set IP address and gateway.



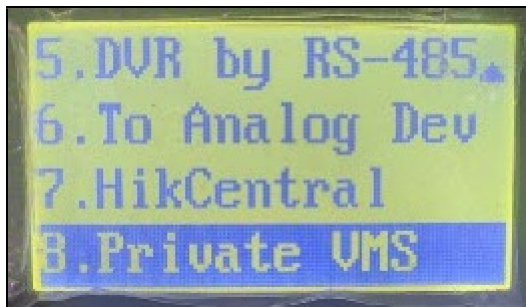
2. Set the Arkiv server IP address and port on the device. Open the device Web interface by entering the above set IP address in the web browser, then select **Platform Access – Third-Party Platform**.

Note.

The Web interface is only available on https by default, so please use https prefix before the IP address.



3. Set the **8. Private VMS** mode in the device's internal interface.



4. **Transfer the PTZ control device to operating mode by one of the following actions:**
 - a. Select any monitor MON (monitor) [integer in the range 1-9999], any camera CAM (camera) [integer in the range 0-999999]; in this mode all keys will work, including the WIN (subwindow of video wall) and MULT (layout size) keys for the monitor and camera.
 - b. Select any camera CAM (camera) [integer number in the range 1-999999 (number 0 is available only when setting the monitor)]; the WIN, MULT and CAM-G keys will not work in this mode.
 - c. Select any monitor MON (monitor) [integer in the range 1-9999] and any group of cameras CAM-G (camera group) [integer in the range 1-999999]; in this mode, only the MULT, OK keys and the rotations of the joystick axes will work.



Note.

To select these parameters, enter a number on the device keypad, then press the corresponding key (MON/WIN/CAM/CAM-G).
If the the server IP address and/or port is not accessible from the PTZ control device, the "Connect failed" message will be displayed on the control device screen after pressing the MON/WIN/CAM/CAM-G keys.

✓ The Hikvision DS-1200KI PTZ control device is now preconfigured.

Features of the Hikvision DS-1200KI control device operation in *Arkiv*

When the MULT, PRESET, PATROL, or PATTERN keys are pressed on the device, the following actions are performed:

- when entering a number in the range 1-99 and pressing MULT for each number, *Arkiv* receives a message about pressing the corresponding separate key with a number in the range 23-121 (B22-B120);
- when pressing PresetRec for the first time, *Arkiv* receives a message about pressing key 13 (B12), and the device displays **Record started**;
- after pressing PresetRec for the second time, *Arkiv* receives a message about pressing key 12 (B11), and **Record ended** appears on the device display;
- when entering a number in the range 1-65535 and pressing PresetRec, *Arkiv* receives a message about pressing key 22 (B21), and the device displays **PRESET**;
- when entering a number in the range 1-65535 and pressing Patrol, *Arkiv* receives a message about pressing key 17 (B16), and the device displays **PATROL**;
- when entering a number in the range 1-65535 and pressing PatternPlay, *Arkiv* receives a message about pressing key 18 (B17), and the device displays **PATTERN**;
- when entering a number in the range 65536-999999 and press any of the PresetRec/Patrol/PatternPlay buttons, nothing happens: such numbers are not processed.

On the page:

- [Configuring the Hikvision DS-1200KI control device before adding it to Arkiv](#)(see page 171)
- [Features of the Hikvision DS-1200KI control device operation in Arkiv](#)(see page 173)

Dahua DH-NKB1000 specific configuration features

Keyboard operating modes

To work correctly with *Arkiv* VMS, the keyboard must be recognized by Windows OS as the KEYBOARD 1000 game device.

If the keyboard is recognized as an HID device, hold down the Shift key on the device to toggle its operating mode.

Specific OS settings

If Windows Device Manager recognizes the keyboard as BETTER_USB_HS, the device will not work.

In this case, roll back the device driver. For correct operation, Windows Device Manager has to recognize the keyboard as a HID-compatible game controller.

Specific Arkiv settings

The *Arkiv* VMS may recognize a Dahua DH-NKB1000 keyboard as a Hikvision-joystick DS-1005KI due to their shared device ID.

For correct operation, the keyboard has to be recognized as Dahua DH-NKB1000.

The Pattern button will not work in the *Arkiv* VMS.

CH VM-Desktop USB multifunction controller

For the controller to work properly in *Arkiv*, the controller must be connected before the *Arkiv* Client is started.

Note

To learn about connecting the device, consult the manufacturer's official documentation.

Controller keys cannot be remapped.

Use of the CH VM-Desktop USB multifunction controller in *Arkiv* is described in the corresponding [section](#)(see [page 876](#)).

Configuring Vivotek Panoramic PTZ

Vivotek Panoramic PTZ is a technology for linking a fisheye camera to a PTZ camera.

This Vivotek technology allows simultaneously maintaining full situational awareness in the field of view of a fisheye camera, while maintaining the ability to carefully monitor a specific area in depth by using a PTZ unit.

Vivotek Panoramic PTZ is supported by the fisheye cameras Vivotek SF8172 and Vivotek SF 8172V and by the PTZ camera Vivotek SD8362E.

To use this technology in *Arkiv*:

1. Install and configure the cameras in accordance with the [official Vivotek documentation](#)⁸⁰.
2. Add the cameras to an *Arkiv* configuration.

Vivotek Panoramic PTZ support in *Arkiv* is implemented via the Areazoom (see [Control using Areazoom](#)(see [page 654](#))) and Point&Click functions (see [Control using Point&Click](#)(see [page 654](#))).

Video capture cards

Arkiv supports 3 PCIe and one USB video capture cards:

⁸⁰ <http://www.vivotek.com/panoramic%20ptz/>

1. PCIe:
 - a. Yuan SC300Q16.
 - b. Yuan SC3C0N8.⁸¹
 - c. Yuan WS216.
2. USB: Yuan PD652⁸².

WS-216 video capture cards

In *Arkiv*, each WS-216 video capture card corresponds to two devices: manufacturer **Inaxsys**, model **TW5864 PCI** (driver **Yuan, 2**) and manufacturer **CaptureDevice**, model **CaptureDevice** (driver **DShow, 1**).

IP address	Port	Vendor	
dshow8.m-s	0	CaptureDevice	
MAC address		Model	Firmware
not defined		CaptureDevice	auto
1			
IP address	Port	Vendor	
dshow9.m-s	0	CaptureDevice	
MAC address		Model	Firmware
not defined		CaptureDevice	auto
2			
IP address	Port	Vendor	
yuan0.m-s	0	Inaxsys	
MAC address		Model	Firmware
not defined		TW5864 PCI	auto
2			
IP address	Port	Vendor	
yuan1.m-s	0	Inaxsys	
MAC address		Model	Firmware
not defined		TW5864 PCI	auto

Note

If you have a WS-216 card added through the Yuan driver, in Windows Server OS you should activate: [Desktop Experience Feature](#)⁸³.

Cameras connected to *Arkiv* through the WS-216 card require the following configuration: add **Inaxsys TW5864 PCI** device configuration (**2**) and select the checkbox **Send settings to device** (see [The Video Camera Object](#)(see page 107)).

Note

Arkiv does not support receiving uncompressed video from WS-216 video capture cards. For video cameras that are connected through WS-216 video capture cards, you can choose one of the two codecs for a video stream:

1. H.264 (configurable).
2. H.264 (minimum resolution, non-configurable).

⁸¹ https://www.yuan.com.tw/products/capture/analog/sc3c0n8_l.htm

⁸² <https://www.yuan.com.tw/products/capture/external/pd652.htm>

⁸³ [https://technet.microsoft.com/en-us/library/dd759187\(v=ws.11\).aspx](https://technet.microsoft.com/en-us/library/dd759187(v=ws.11).aspx)

YUAN PD652 cards

To work with the YUAN PD652 cards in *Arkiv*, do as follows:

Attention!

Please see the list of supported OS for the YUAN PD652 board on the [official website of the⁸⁴ manufacturer](#).

1. Disable the system check for the digital signature of the drivers and install the card [driver⁸⁵](#).
2. Connect the camera to the card.
3. Create an IP device in *Arkiv*. The search result shows the camera connected through the YUAN PD652 card as follows.

IP address	Port	Vendor
yuan0.r-g	0	Inaxsys
MAC address		Model
not defined		DC1150 USB
		Firmware

4. In the IP device settings, select the TV standard supported by your camera.

High-quality video stream	0. YUV4xx
Expected frames per second (fps)	30
Resolution	720 x 480 x 16
TV standard	NTSC
Video Codec	YUV4xx
Low-quality video stream	0. YUV4xx
Expected frames per second (fps)	30
Resolution	720 x 480 x 16

Joysticks

Only joysticks that are detected in Windows as gaming input devices can be used in *Arkiv* for controlling PTZ cameras.

Information on how to view the status for a connected joystick is available in official Microsoft [documentation⁸⁶](#).

Note

We recommend that you calibrate the joystick before you start working with *Arkiv*.

Sony IP Devices

Some Sony models support encoding of the video signal in two formats simultaneously. To use this option you must perform the following steps:

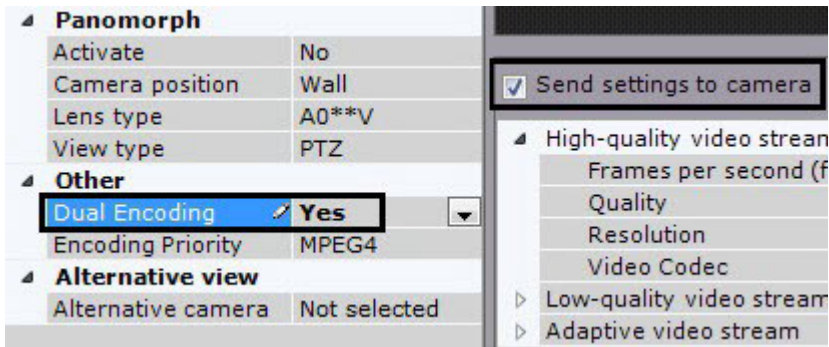
1. Select the **Send settings to camera** checkbox.

⁸⁴ <http://www.yuan.com.tw/products/capture/external/pd652.htm>

⁸⁵ <http://www.yuan.com.tw/download.htm>

⁸⁶ <http://support.microsoft.com/kb/831361/en-us>

- From the **Dual Encoding** list, select the codec which will take priority when dual encoding.

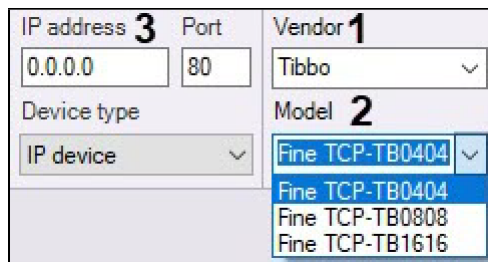



Setting up Tibbo relay/loop boards

Tibbo relay/loop boards allow monitoring air temperature and humidity on your premises.

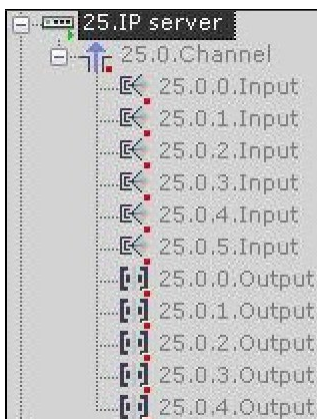
To add a board to the configuration, do the following:

- Go to IP Device Discovery Wizard (see [Adding and removing IP devices](#)(see page 97)).
- In the **Vendor** list, select **Tibbo** (1).



- Select your board from the **Model** list (2).
- Enter the IP address of the board (3).
- Click the  button.

The parent **IP Server** object, and **Channel, Input** and child objects under it will be added.



To configure the board, do the following:

1. Select the **IP Server**.

25.IP server	
<input checked="" type="checkbox"/>	Send settings to device
Object identification	
1	Enable Yes
	ID 25
	Name IP server
	Short name 25
Object features	
	Address 0.0.0.0
	Break unused connections No
	Current firmware
	Device serial number
	Driver version 3.0.0
	Low GOP No
	MAC address
	Manufacturer Tibbo
	Model Fine TCP-TB04
	Port 80
Authentication	
2	Default <input type="checkbox"/> No
	Password
	Username

2. Activate the object (**1**).
3. In the **Authentication** parameter group, set **Default** to **No** (**2**).
4. Select a **Channel** object.
5. Activate the object (**1**).

25.0.Channel	
Object identification	
1	Enable Yes
Object features	
	Input/output device ID 0
Other	
4	Always report other sensors status No
	Maximum humidity 90
2	Maximum temperature 35
	Minimum humidity 10
	Minimum temperature 15
3	State check period 500
Camera	
	Camera 25.IP server

6. Set permissible ranges for temperature (in centigrade) and relative humidity (in per cent) (**2**). If a reading falls out of the range, the corresponding Input (sensor) triggers an alarm.
7. Set the check period in milliseconds (**3**).

8. If you need to report sensors statuses when readings are within the range, set **Yes** for **Always report other sensors status (4)**. In this case, the following records will appear in the log file in specified intervals of time (see paragraph 7):

```
Special humidity ray#16 changed status to: false ,Sensor value: 16,8 Correct range [15, 58]. Time:
....
Special temperature ray#17 changed status to: false ,Sensor value: 29,8 Correct range [20, 60].
Time: ....
```

9. Click **Apply**.

✓ Now, the board is configured. Current temperature/humidity value will be displayed next to input's icon on the Map (see [Displaying device status](#)(see page 773)).

7.2.5 Configuring Tracking objects

Arkiv includes several features for tracking moving objects.

With Target&Follow Pro, an object can be tracked by a PTZ camera under the guidance of panoramic cameras.

⚠ Attention!

To use Target&Follow, make sure you have a PTZ camera in Arkiv that supports Absolute Positioning. The devices that support Target&Follow Pro are listed in the [Drivers Pack documentation](#). If a PTZ camera does not meet the requirement, you should add it to the VMS via Onvif.

With Target&Follow Lite, the operator is alerted to the camera in front of which the moving object is most likely to appear next. The camera is predicted based on object trajectory and mapping of cameras to map locations.

For these functions to work, all video cameras involved must have an activated **Object tracker** or **Neurotracker** object (see [General information on Scene Analytics detection tools](#)(see page 239)).

Configuring Target&Follow Lite

Configuration of Target&Follow Lite consists of linking video cameras with a site map (see [Configuring cameras in immersion mode](#)(see page 496)).

For stable operation of Target&Follow Lite, you have to set the following on the map (see [Configuring a camera in standard map viewing mode](#)(see page 494)):

- exact position of cameras,
- each camera's FoV,
- FoVs intersections – overlapping areas covered by more than one camera.

FoVs intersection – area, common for FoVs of two cameras – must be no less than triple footprint of the tracked object.

Configuring Target&Follow Pro

To configure Target&Follow Pro:

1. Link panoramic cameras to a PTZ camera.

2. Calibrate cameras.
3. Set the PTZ mode.

Camera requirements for Target&Follow Pro

For the Target&Follow Pro function to operate, the video cameras should be positioned on the top facing the flat surface (floor, ground) where the objects are moving.

The overview and the PTZ video cameras should be pointed in the same direction and be close to each other. If they are far from each other, they can interpret the scene differently. Because of this, sometimes the algorithm may not operate correctly.

For all objects from the overview video camera, the corresponding pan coordinates should be in the range from 0° to 180°, or from -180° to 0°.

In addition, the overview video cameras should meet the following requirements: [Video requirements for scene analytics detection tools](#)(see page 241).

Configuring Smooth Motion for PTZ cameras

To smooth panning of a PTZ camera while using Target&Follow Pro, you can configure:

1. The degree of prediction (**1**). This value should be in the range from 1 to 3000. The higher the value, the smoother is the panning of the camera.

Target&Follow	
1	Prediction time 500
	Priority None
2	PTZ command sending timeout 1000
	Switch Frequency 3

2. The rate at which coordinates are sent in milliseconds (**2**). This value should be in the range from 100 to 3000.

Linking panoramic cameras to a PTZ camera

To link panoramic cameras to a PTZ camera:

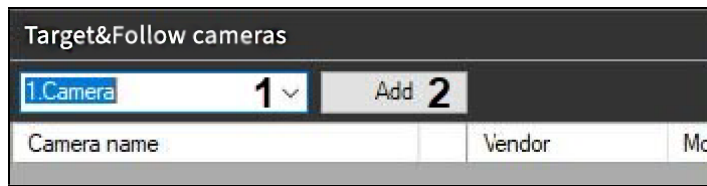
1. Go to the **PTZ** object of the relevant camera.
2. In the **Target&Follow cameras** group, in the list (**1**), select the camera that you want to link to the PTZ camera. Click the **Add** button (**2**).

Note

To search for a camera, enter its ID, the full or partial name in the **1** box.


Note

You can add only those cameras for which the [Object Tracking](#)(see page 239) was created and activated.




- Repeat this action for all cameras that you want to link to the PTZ. You can connect any number of panoramic cameras to a PTZ camera.

Note

To remove a camera from the list of panoramic cameras, click the .

- Click the **Apply** button.

 Linking of panoramic cameras to the PTZ camera is now complete.

Matching the telemetry device positions with the overview cameras frame points (calibration)

For the precise tracking of the object under observation, you should calibrate the telemetry device by matching at least four telemetry device positions with the frame points of each overview camera.

Attention!

The recommended number of points that should be set is 4-10. If you add more points, the algorithm will be configured more precisely. However, this may increase the chance that some of the points are set up incorrectly, which may cause the decrease of the operation quality.

The points set in the calibration setting should not be on the same line for both the overview and the PTZ camera. It is recommended to set the points for both cameras so that they evenly cover the entire frame. The calibration points should be set on the same surface (floor, ground). It is not recommended to set the points on different surfaces (for example, when some points are on the ground, and other points are on a tree, etc.).

To calibrate the telemetry device, do the following:

- Select the overview camera from the list (see [Linking panoramic cameras to a PTZ camera](#)(see page 180)).
- Focus the PTZ camera on any point. To do this, in the preview window click the button and change the orientation of the lens in one of the following ways:
 - Left-click on the frame and holding the button, move the mouse cursor in the required direction.
 - Use the Point&Click function (see [Control using Point&Click](#)(see page 654)).
- Left-click to add a point to the frame of the overview camera to which the PTZ camera is currently oriented.



Attention!


The object under observation should be inside the frame of the PTZ camera.

4. Repeat the process to set at least 4 points.
5. Repeat the process for all overview cameras (select the camera by clicking in the list of the overview cameras).
6. Click the **Apply** button to save the calibration points.


✔ Calibration of the telemetry device is complete.

It is recommended to perform a calibration check after calibration is complete. **To do this, do the following:**



1. Click the  button to the right of the preview window of the overview camera.
2. Click on different points in the image of the overview camera. If the PTZ camera is positioned correctly, the calibration is correct.

Note

To delete the calibration points, click the  button.

Setting PTZ mode for Target&Follow Pro

Target&Follow Pro can be used in four PTZ modes:

1. **Manual** – in this mode, a PTZ camera starts tracking an object only after the user selects the object in the viewing tile.
2. **Automatic** – in this mode, a PTZ camera automatically initiates tracking of all active objects. The PTZ camera focus on each object in sequence based on the specified dwell interval.
3. **User priority** – in this mode, automatic mode is used unless the user manually selects an object for tracking. As soon as the user selects an object for tracking, manual mode is activated. When an object is no longer selected or disappears from the PTZ field of view, automatic mode is reactivated.
4. **Manual PTZ control** – in this mode, the operator can take control of the PTZ cameras at any time. If the user does not control the PTZ camera, then the **Automatic** mode is used.

Select a mode in the **Priority** list (1). The dwell time is specified in seconds in the corresponding field (2).

Target&Follow	
Prediction time	500
1 Priority	Automatic
PTZ command sending timeout	1000
2 Switch Frequency	3

To save changes, click the **Apply** button.

7.2.6 Receiving Events from External Systems

Arkiv synchronizes the information from cash registers with the video from cameras pointed at the register area allowing you to monitor the process. In addition, *Arkiv* operators can receive events from any *Intellect* objects in real time and correlate the received information with the video. The event sources can be e.g.:

- Access control systems
- Security and fire alarm systems
- Perimeter security system

In *Arkiv*, information from external sources is superimposed on video from a selected camera.

Event source object

Arkiv uses the **Event source** object to get external events. **To create the object, make sure that:**

1. Run IP Device Discovery Wizard (see [Adding and removing IP devices](#)(see page 97)).
2. In the form for manually adding an IP device, select **Event source** in the **Device type** drop-down list.

IP address	Port	Vendor
0.0.0.0	3600	POSLegacy
Device type	Model	
Event source	POSLegacy Device	

- Click the  button.

✓ The **Event source** object is added to the system.

Note

Once created, the **Event source** object is enabled by default. To disable, select **No** in the **Enable** field.

Configuring POS devices

Arkiv can obtain data from POS devices and offers the following capabilities:

- Show titles in live and recorded video.
- Search titles in recorded video.

Connecting POS devices

To configure a POS device, do as follows:

- Select the **Event source** object.
- Select a connection type of the POS device (**1**).

Other	
1	TransportProtocol TCP
2	Port 2555
3	Connection speed 9600
3	Parity Control None
4	Terminal type XML PROTOCOL
	Font Courier New; 12
	Color <input type="checkbox"/> White
	Ignore Case Yes
	Repeats Processing None
5	DOS to WIN Conversion No
6	Initial UTF-8 Format No
7	Retalix POS-terminal No
	Background color <input checked="" type="checkbox"/> Black
	Bills only No
	Display duration 0
	Erase upon completion No
	Message handling method Linearly
	Sample timestamp off 0
>	Serial ports String[] Array
	Template file
	Timeout 100
8	UDP packet maximum 4096

- Specify the Server connection port (**2**).
- To connect via RS-232, select connection speed and parity check (**3**).
- Select the type of your POS device (**4**).
- Select **Yes** in the **DOS to WIN Conversion** field if the data from the POS device is DOS-encoded (**5**).
- If the data is UTF-8 encoded, select **Yes** in the **Initial UTF-8 Format** to enable correct display of captions (**6**).
- If a Retalix terminal is used, select **Yes** in the corresponding field (**7**).

9. Set the maximum size of UDP datagrams in bytes (**8**). Oversized packets will be ignored.
10. Click the **Apply** button.

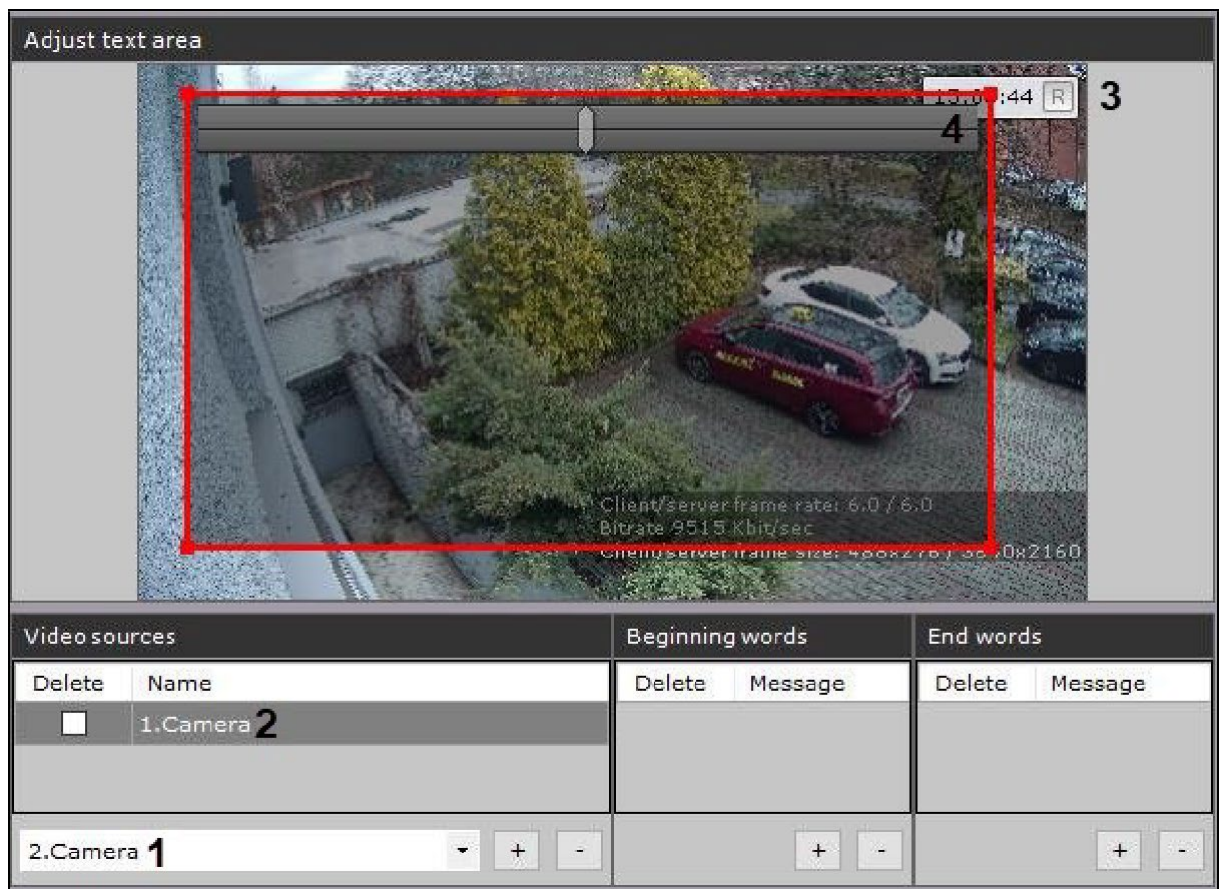
✔ You have successfully connected your POS device.

Configuring titles view

You can configure the font and where you want the titles displayed on screen. The titles are displayed in a rectangular area superimposed on video.

To configure the titles view, do as follows:

1. In the **Video sources** group, select a camera from the list and click the **+** button to add the camera for titles overlay (**1**). Titles from any one POS device can be overlaid on video from several cameras.



The screenshot shows the 'Adjust text area' configuration window. The main area displays a video feed of a parking lot with a red car and a white car. A red rectangular area is overlaid on the video, representing the titles area. A slider below the video feed allows adjusting the transparency of the titles area. The interface also shows a 'Video sources' table with two cameras listed: '1.Camera 2' and '2.Camera 1'. The '2.Camera 1' row has a '+' button next to it, indicating it is selected for titles overlay.

Video sources		Beginning words		End words	
Delete	Name	Delete	Message	Delete	Message
<input type="checkbox"/>	1.Camera 2				
	2.Camera 1				

Note

To disable titles overlay for a camera, select the **Delete** checkbox and click the **-** button.

2. Select a camera in the **Video sources** group (**2**). The **Adjust text area** group shows video from the selected camera and the adjustable titles area (**3**).
3. You can configure the titles area: Resize it by moving the anchor points. Move it with [Drag-and-drop](https://en.wikipedia.org/wiki/Drag-and-drop).⁸⁸
4. Change transparency with the slider (**4**). Slide left for more transparency, slide right for less.

⁸⁸ <https://en.wikipedia.org/wiki/Drag-and-drop>

5. In the **Font** field, click the  button and specify font settings in a standard Windows box (1).


Other	
Transport Protocol	TCP
Port	2555
Connection speed	9600
Parity Control	None
Terminal type	None
1 Font	Courier New; 12
2 Color	<input type="checkbox"/> White
Ignore Case	Yes
Repeats Processing	None
DOS to WIN Conversion	No
Initial UTF-8 Format	No
Retalix POS-terminal	No
3 Background color	<input checked="" type="checkbox"/> Black
4 Bills only	No
5 Display duration	0
6 Erase upon completion	No
7 Message handling method	Linearly
8 Sample timestamp offset	0
> Serial ports	String[] Array
Template file	
Timeout	100
UDP packet maximum	4096

6. Select font color (2).
 7. Select captions font color in the camera window (3).
 8. If you need to display only the lines contained between start and end markers of the receipt, **Yes** for the **Bills only** parameter (4).
 9. In the **Display duration** field, set the time in seconds for accumulated text rows on the screen (5). If you set **0**, captions will stay on the screen. New events replace old ones on a continuous basis.

Note

For shops where the checkout is never crowded, we recommend the captions display duration under 10 seconds.

10. If you don't need to display any lines following the end marker of the receipt, set **Yes** for the **Erase upon completion** parameter (6).
 11. Select a method of processing incoming data (7):
 a. **PROCESS_LINEARLY** – incoming data is stored in a buffer until the next EOL is received, and only after that is transmitted to *Arkiv*.
 b. **PROCESS_EVENT** – each data portion is immediately transferred to *Arkiv*.
 c. **PROCESS_JSON** – not available in the current version.
 12. By default, titles/captions are written to the database in sync with video. Though you may want to go to **Sample timestamp offset** and set up to 5 seconds time lag/jump in seconds in the range of [-5; 5] (8).
 13. Click the **Apply** button.

 You have configured the titles view.

Configuring receipt beginning/end

The database stores only a full receipt. A receipt starts and ends with the configured phrases. If not configured, receipts contain 2000 lines. In this case, search will not work until the receipt is saved into the database (see [Titles search](#)(see page 716)).

Attention!

It is strongly recommended that you configure this setting for shops with low-intensity events at the checkout. Otherwise, the accumulation of 2000 lines can take a long time.

To configure the beginning and the end of a receipt, do as follows:

1. Populate the **Beginning words (1)** group. To add words, click the **+** button. To remove words, select their **Delete** check boxes and click the **-** button.

Beginning words 1		End words 2	
Delete	Message	Delete	Message
<input type="checkbox"/>	New word	<input type="checkbox"/>	New word
<input type="checkbox"/>	New word (1)	<input type="checkbox"/>	New word (1)
<input type="checkbox"/>	New word (2)	<input type="checkbox"/>	New word (2)
+ -		+ -	

2. Populate the **End words (2)** group in the same manner.

Note

You can add any number of delimiting words. Double click a word to edit it.

3. Delimiting words are case-sensitive by default. To ignore case, select **Yes** in the corresponding field (**1**).

1	Ignore Case	Yes
2	Repeats Processing	None <input type="button" value="v"/>
	DOS to WIN Conversion	None
	Initial UTF-8 Format	Ignore repeats
	Retail POS-terminal	

4. Select how to treat repetitions (**2**).
 - a. Select **Ignore repeats** to skip repeating beginning words before the end words show up. When the end words show up, the next receipt starts with the beginning words.
 - b. Select **None** to skip the end words and delimit receipts by the beginning words only.
5. Click the **Apply** button.




You have configured how receipts are delimited.

Configuring keywords

Keywords can be highlighted in the titles.


To configure keywords, do as follows:


1. Select any number of keywords in the **Word highlighting** group with the **+** button. Double click a keyword to edit it.

Word highlighting		1	2	3	4	5
Delete	Message	Color	Change background color	Background color	Case sensitive	Whole string
<input type="checkbox"/>	Beer	 Red	<input checked="" type="checkbox"/>	 Black	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	Whiskey	 Red	<input checked="" type="checkbox"/>	 Black	<input type="checkbox"/>	<input type="checkbox"/>

Note

To remove words, select their **Delete** check boxes and click the – button.

2. **You can also configure these parameters:**
 - a. Highlighting color (1). In the appropriate column, click the  button and choose a color.
 - b. If you want to change the color of the background of the titles output in the camera window, select the corresponding check box (2) and select the required color (3) when this word appears.
 - c. Select the **Case sensitive** check if you want (4).
 - d. To highlight the whole line, select the **Whole string** checkbox (5).
3. Click the **Apply** button.

 You have configured highlighting for keywords.

Importing parcers

A special parsing algorithm processes the receipts and adds data to the receipts database. This is an option for advanced settings.


The choice of parcers depends on POS data structure:

1. XML parcer for .txt files;
2. POS parcer for .prl files.

The XML parser specifies the rules for adding data to the receipts database if you have XML data from a POS terminal. The XML parser also validates the XML data against a schema.

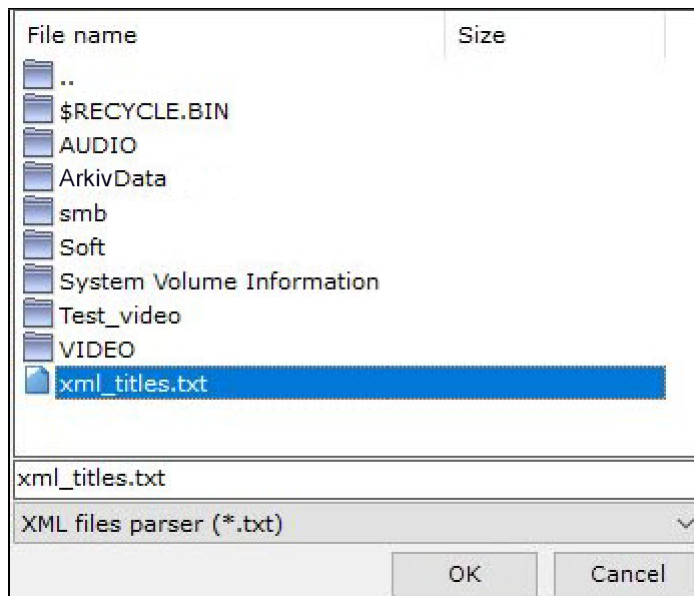
The POS parser specifies the rules for adding data to the receipts database if the data is from a POS terminal is other than XML. The parser depends on the POS terminal data structure.

To import a parcer, do as follows:

1. In the **Template file (1)** field, click the  button.

Other	
Transport Protocol	TCP
Port	2555
Connection speed	9600
Parity Control	None
2 Terminal type	XML PROTOCOL
Font	Courier New; 12
Color	<input type="checkbox"/> White
Ignore Case	Yes
Repeats Processing	None
DOS to WIN Conversion	No
Initial UTF-8 Format	No
Retalix POS-terminal	No
Background color	<input checked="" type="checkbox"/> Black
Bills only	No
Display duration	0
Erase upon completion	No
Message handling method	Linearly
Sample timestamp offset	0
> Serial ports	String[] Array
1 Template file	

You can browse for the required parser.



2. Select the type of the parser and the file.
3. If you use an XML parser, select **XML PROTOCOL** in the **Terminal type** field (2).
4. Click the **Apply** button.

✔ You have imported the parser.

Receiving Intellect Events

To be able to receive *Intellect* events, do as follows:

1. On the *Intellect* machine, configure a data transfer module.
2. In *Arkiv*, select the **Event source** object.

Other	
1	Transport Protocol TCP
2	Port 2555
	Connection speed 9600
	Parity Control None
3	Terminal type XML PROTOCOL
	Font Courier New; 12
	Color <input type="checkbox"/> White
	Ignore Case Yes
	Repeats Processing None
	DOS to WIN Conversion No
	Initial UTF-8 Format No
	Retalix POS-terminal No
	Background color <input checked="" type="checkbox"/> Black
	Bills only No
	Display duration 0
	Erase upon completion No
	Message handling method Linearly
	Sample timestamp offset 0
>	Serial ports String[] Array
4	Template file C:\Users\SafeCity\NewData

3. Select **TCP** in the **Transport Protocol** field (1).
4. Specify the connection port to *Intellect* (2).
5. Select **XML PROTOCOL** in the **Terminal type** field (3).
6. Select a preconfigured parser (4, see [Configuring parser](#)).
7. Configure the data output similar to that of the POS device (see [Configuring titles view](#)(see page 185)).
8. Configure keywords, if necessary (see [Configuring keywords](#)(see page 187)).
9. Click the **Apply** button.

If the setup procedure was done correctly, the events from specified objects will be displayed in the viewing tile on *Intellect* in the same way as POS device captions do (see [Viewing titles from POS terminals](#)(see page 639)).

Configuring Receiving Events from CommaxComplexServer

CommaxComplexServer events can be forwarded to the *Arkiv* VMS in two formats:

1. In JSON format using the **Event source** (see [Configuring Commax Complex Server via Event Source](#)(see page 191)).
2. As events from virtual inputs. This creates a virtual IP Server in the VMS (see [Configuring Commax Complex Server via virtual IP server](#)(see page 191)).

Note

CommaxComplexServer is smart apartment complex management software. It receives input from gates, doors, elevator call buttons etc.


Configure CommaxComplexServer before connecting to *Arkiv*.

Configuring Commax Complex Server via Event Source

Connect Commax Complex Server via Event Source as follows:

1. Run IP Device Discovery Wizard (see [Adding and removing IP devices](#)(see page 97)).
2. In the field for manually adding an IP device, select **Event Source** in the **Device Type** drop-down list (1).

IP address	Port 3	Vendor 2
0.0.0.0	2555	Commax Complex Server ▾
Device type 1	Model	
Event source ▾	ComplexServer(Manual)	

3. In the **Vendor** list select **Commax Complex Server** (2).
4. Enter the destination port name for Commax Complex Server events (3).
5. Click the button .

The **Event Source** object is added to the system.

- ✓ The Commax Complex Server connection is now configured.

Note

You can present information as caption (titles) superimposed on video in the Camera window. See POS configuration instructions for that (see [Configuring POS devices](#)(see page 184)).


Configuring Commax Complex Server via virtual IP server

Connect to Commax Complex Server via virtual IP server as follows:

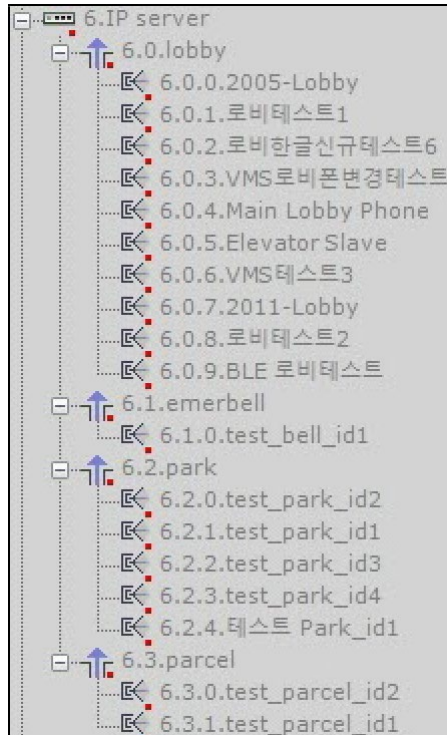
1. Run IP Device Discovery Wizard (see [Adding and removing IP devices](#)(see page 97)).
2. In the field for manually adding an IP device, select **Commax Complex Server** in the **Vendor** drop-down list (1).


IP address 3	Port 4	Vendor 1
10.0.11.50	2555	Commax Complex Server ▾
Device type	Model 2	
IP device ▾	generic ▾	

3. Select **generic** in the **Model** list (2).
4. Enter the IP address of the Commax Complex Server (3).
5. Enter the destination port name for Commax Complex Server events (4).

6. Click the button .

The parent **IP Server** object and **Channel** and **Input** objects under it are added according to Commax Complex Server configuration. The names of the **Input** objects in the VMS and Commax Complex Server are the same.

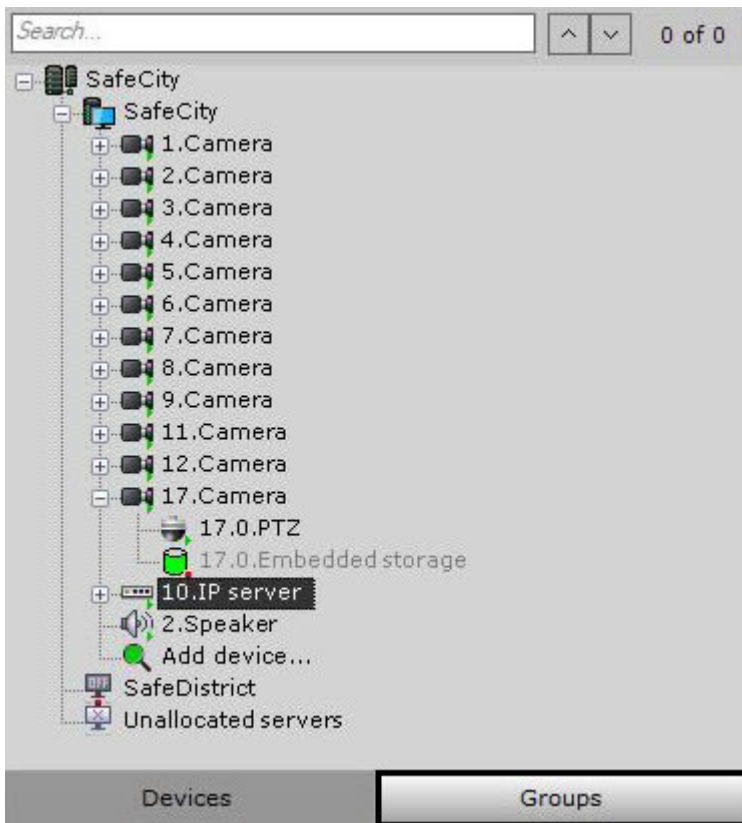


-  The Commax Complex Server connection is now configured.

7.2.7 Configuring video camera groups

You can manually group video cameras to enable quicker selection of a specific video camera for display.

Video camera groups are configured through the interface using the **Devices** tab (under **Settings**). To configure device groups, you must have the appropriate permissions to configure devices.



Procedure for configuring video camera groups

To configure video camera groups, complete the following steps:


1. Create **Group** objects.
2. Add video cameras created in the system to **Group** objects.
3. Create a system of groups and subgroups.

Creating a Group object

To create a **Group** object, complete the following steps:

1. Go to the **Groups** tab.

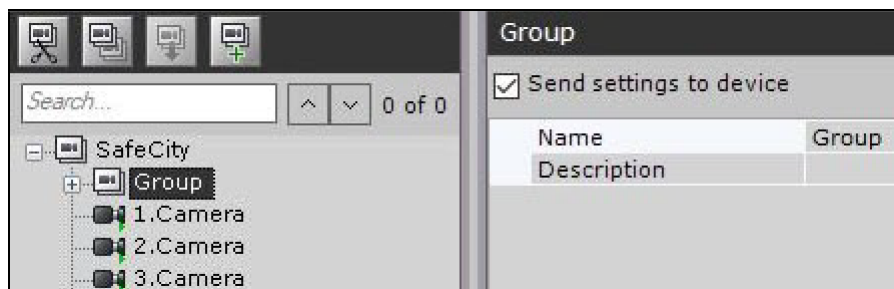


2. To create a **Group** object, click the  button or select **Add group** in the context menu of the main group.


Note

By default, an object (whose name is the same as the Arkiv-domain) is available, including all cameras that have been created in the system. This object is referred to here and elsewhere in the document as the "main group". This object cannot be deleted. Cameras in this group cannot be deleted.

3. Specify the group name in the **Name** field.



4. Enter a description of the group in the appropriate field.
5. Click the **Apply** button.

 The **Group** object has now been created.

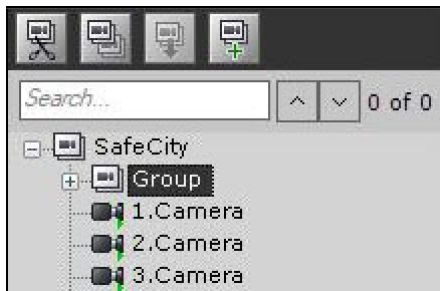
Adding video cameras created in the system to Group objects



To add video cameras to groups, complete the following steps:

Note

Video cameras are added to groups via management operations (see the section titled [Managing Group and Video camera objects](#)(see page 196)). The standard method for adding video cameras to groups is presented below.

1. In the main group, select a video camera to add to the selected group.



2. Click the  button or select **Copy** from the context menu of the selected video camera.
3. Select the **Group** object to which you need to add the video camera.
4. Click the  button or select **Paste** from the context menu of the selected group.
5. Fill the groups with the necessary video cameras (see steps 1-4).

Note

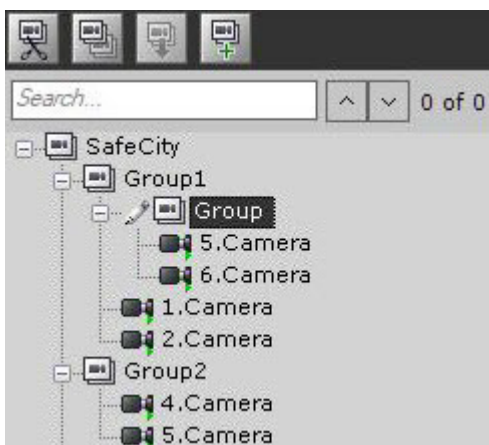
One video camera can be assigned to multiple groups.

6. Click the **Apply** button.

✓ Adding video cameras to groups is now complete.

Creating a system of groups and subgroups

Groups can be included within other groups, forming a system of groups and subgroups.

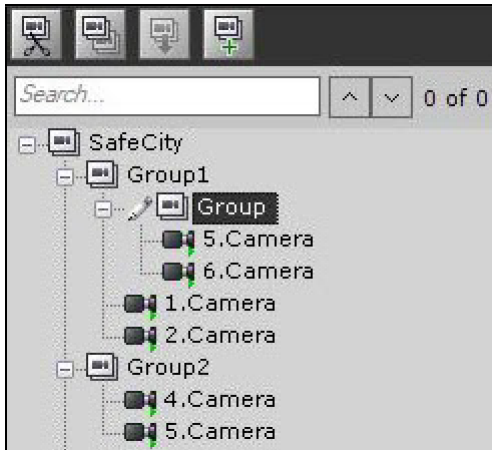




A system of groups and subgroups can be created via group management operations and video camera management operations (see the section titled [Managing Group and Video camera objects](#)(see page 196)).



Group objects can be moved or copied to other **Group** objects or to the main group.

Managing Group and Video camera objects

The main operations used to manage groups and video cameras are presented in table.



Action	Execution
<p>Cut/Paste</p> <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <p>Note</p> <p>You can cut a Video camera object only from a Group object. You cannot cut a Camera object from the main group. It is also impossible to cut the main group.</p> </div>	<p>Using your mouse:</p> <ol style="list-style-type: none"> 1. Left-click and hold the Video camera/Group object. 2. Drag the object to the Group object (or to the main group if you are dragging a Group object). 3. Release the left mouse button. <p>Using the toolbar:</p> <ol style="list-style-type: none"> 1. Left-click the Video camera/Group object that you want to move. 2. On the toolbar, click . 3. Left-click the Group object (or the main group, if one of the Group objects is being moved) to which you want to move the Video camera/Group object. 4. On the toolbar, click . <p>Using the keyboard:</p> <ol style="list-style-type: none"> 1. Left-click the Video camera/Group object that you want to move. 2. Press the key combination Ctrl+X. 3. Left-click the Group object (or the main group, if one of the Group objects is being moved) to which you want to move the Video camera/Group object. 4. Press the key combination Ctrl+V.

Action	Execution
<p>Copy/Paste</p>	<p>Using your mouse:</p> <ol style="list-style-type: none"> 1. Left-click and hold the Video camera/Group object while simultaneously holding down the Ctrl key. 2. Drag the selected object to the Group object (or to the main group, if the Group object is being copied). 3. Release the left mouse button. <hr/> <p>Using the toolbar:</p> <ol style="list-style-type: none"> 1. Left-click the Video camera/Group object that you want to copy. 2. On the toolbar, click . 3. Left-click the Group object (or the main group, if one of the Group objects is being copied) to which you want to copy the Video camera/Group object. 4. On the toolbar, click . <hr/> <p>Using the keyboard:</p> <ol style="list-style-type: none"> 1. Left-click the Video camera/Group object that you want to copy. 2. Press the key combination Ctrl+C. 3. Left-click the Group object (or the main group, if one of the Group objects is being copied) to which you want to copy the Video camera/Group object. 4. Press the key combination Ctrl+V.
<p>Deletion</p> <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <p><input type="checkbox"/> Note</p> <p>You can delete a Video camera object only from a Group object. You cannot delete a Camera object from the main group.</p> </div>	<ol style="list-style-type: none"> 1. Left-click the Video camera/Group object that you want to delete. 2. Press the Delete key.

7.2.8 Autocopy data from local to centralized servers

Arkiv VMS supports automatic copying of the archive (video, audio, alarms) and camera events from local servers that are not in the same Arkiv domain with the centralized server.

Note

This is useful, for example, in the following case:

- The video from a bus on the route network is written to a temporary archive on the local server specific for each bus.
- When the bus arrives at the depot, the archive and camera events are automatically transferred to the centralized server.

To use this option, configure the centralized server as follows:

1. Manually add the **Interop** IP device to the configuration (see [Adding and removing IP devices](#)(see page 97));

IP address	Port	Vendor
0.0.0.0	80	Interop
Device type	Model	
IP device	Interop Device	

2. Enable [The Embedded storage object](#)(see page 161).
3. Specify the address of the device in the following format (**1**): <IP-address of local server>:<name of local server in Arkiv domain>:<ID of camera on server>.

Attention!

The Server name is case-sensitive.

If the name is Server1, no connection will occur if you enter server1 or SERVER1.

Object features	
1	Address 10.0.11.64:Server:16
2	Port 80
	MAC address
	Manufacturer Interop
	Model Interop Device
	Driver version 3.0.0
	Break unused connections No
	Current firmware
	Device serial number
	Low GOP No
	Video channel No. 0
Authentication	
	Default Yes
3	Username root
	Password ****
Video buffering	
	Buffer size 0
Video stream settings	
4	Live video mode Yes
Panomorph	
	Activate No
	Camera position Wall
	Lens type Common fisheye-lens
	View type PTZ
	Fit to frame No
Other	
5	Maximum speed x32
6	Transport protocol TCP

4. Specify a port of the local Server from which data is transmitted (2). If you use TCP protocol (see 8), please specify the RTSP port number (554 by default, see [Configuring an RTSP Server](#)(see page 106)). If you use rtspsverhttp or rtspsverhttps protocol, specify the Web server's port (80 by default, [Configuring the Web-Server](#)(see page 105)).
5. Specify the user name and password (3). The user must have permissions to access the local server.
6. If you want to display live video from the local server when it is available, select **Yes** in the appropriate field (4).
7. Specify the maximum playback speed (5).
8. Select the data transfer protocol (6).
9. Click the **Apply** button.
10. Repeat the above steps for all the required cameras from all local servers.
11. Configure automatic replication from the embedded storages of the added devices to the centralized server archive (see [Configuring data replication](#)(see page 210)).

Attention!

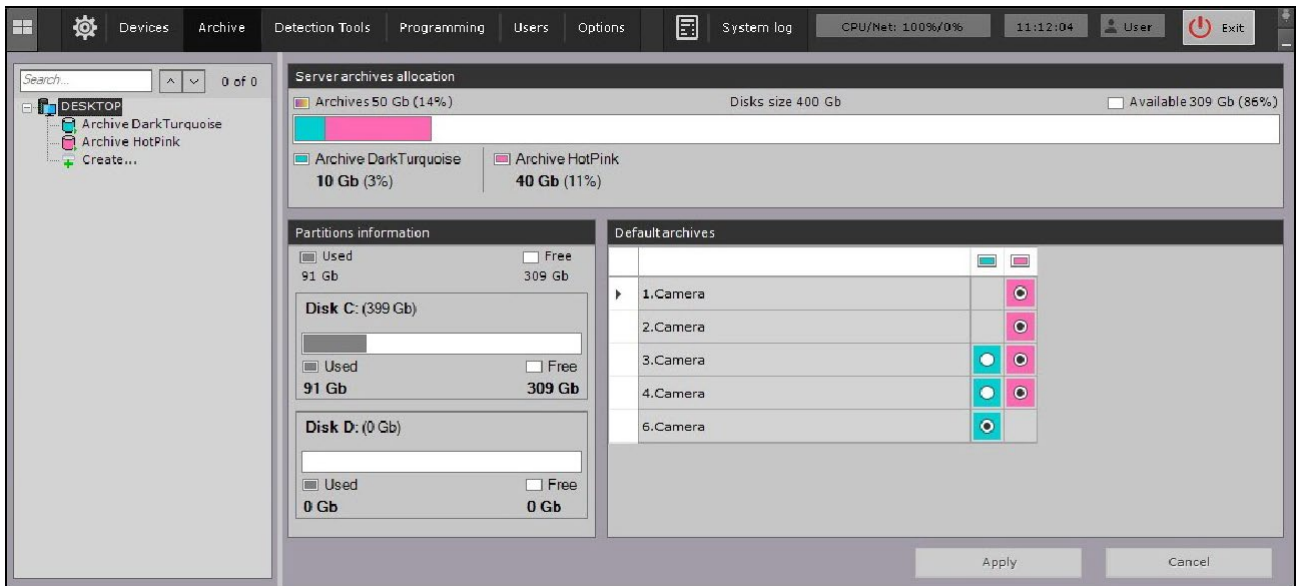
With a high network load, there may be gaps in the centralized server archive.

- ✔ You have successfully set up automatic data copying from the local servers to the centralized server.

7.3 Configuring Archives

7.3.1 General information of configuring archives

You can configure archives using the interface in the **Archive** tab (under **Settings**). To create archives you must have the appropriate permissions.



On the base of one Server you can create an unlimited number of archives.

⚠ Attention!

We do not recommend you to operate a large single volume video footage archive. It's more practical to divide the archive to multiple volumes located on different hardware devices. We recommend you to create an archive with volumes no larger than 30 TB each.

An archive can be placed on local disks or on network disks. To compare these types of archives, review the following table.

Local archive	Network archive
An archive can be distributed on several volumes of the Server.	Archive can be stored on multiple network storage devices.
On one logical disk for one archive you can create only one volume, which occupies either a file of a set size or the entire partition (logical disk).	Archive can be stored only as a file of a specified size.
An archive can contain multiple volumes, which may be in the form of a file or a partition.	

Data can be copied between archives.

You can configure archives as follows:

1. Create archives (see [Creating archives](#)(see page 202)).
2. Configure recording of the video stream from video cameras to the archives (see [Configuring recording to an archive](#)(see page 207)).
3. Configure data replication, if necessary (see [Configuring data replication](#)(see page 210)).

You can also connect external archives — a set of video recordings with time links.

[Video surveillance in archive mode](#)(see page 668)

7.3.2 General information of SolidStore file system

Fragmented files accumulate over time in the Windows file system. This is due to the fact that the operating system sequentially fills the free disk space when writing files.

Free disk space, which appears when old files are deleted, can be located in different parts of the disk; therefore, each file can be split into many fragments.

When reading or writing such a file, the hard drive head must constantly move, which reduces the read/write speed and causes mechanical wear of the disc.

Inaxsys has developed its own file system SolidStore especially for storing video archives. The system is installed on a blank physical or logical drive, which is fully allocated to Arkiv video archive (see [Creating archives](#)(see page 202)). In developing SolidStore, it was taken into account that recording will only be sequenced in one direction (looping mode), and the newest data is written in place of the oldest.

Attention!

Loop recording (FIFO overwriting) should erase the earliest recordings, but in some cases selected recordings within 10% of the oldest ones may be compromised. This feature protects archive volumes from fragmentation.

In such cases, these earliest 10% of videos in archive may have gaps.

By optimizing the reading/writing process we managed to minimize the travel of the hard disk head along its surface and to achieve three important advantages:

- Enable high read/write speeds, approaching the physical access speed limit of the hard disk.
- Increase the service life of the hard disk.
- Solve the problem of data fragmentation: as data is written only in looping mode, fragmentation is minimal and does not accumulate with time. This way, the read/write speed remains high throughout the operation of the video surveillance system.

SolidStore relieves the user from the need to periodically stop the video surveillance system and run the Disk Defragmenter tool. This significantly increases video surveillance uptime and the protected facilities remain under the watchful eyes of the security personnel.

If it is not possible to allocate a separate disk for Arkiv video archive, it can be written as a regular file in the existing Windows file system.

7.3.3 Creating archives

Creating a local archive

To create a local archive:

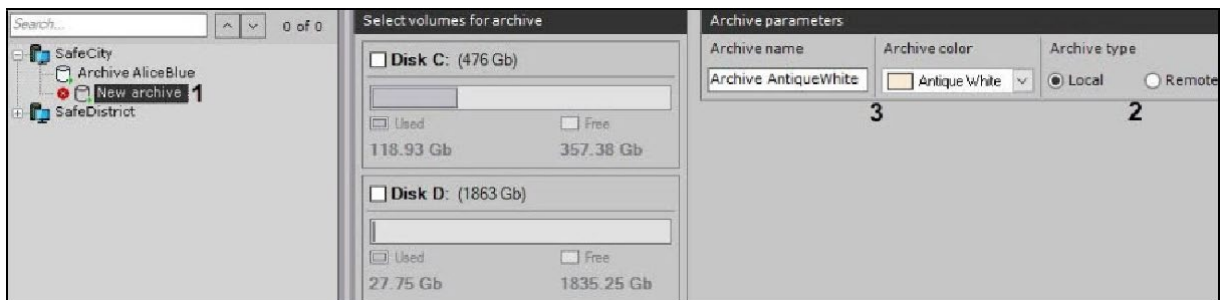
1. In the branch of the **Server** object corresponding to the computer on which you need to organize an archive, click the **Create** link.



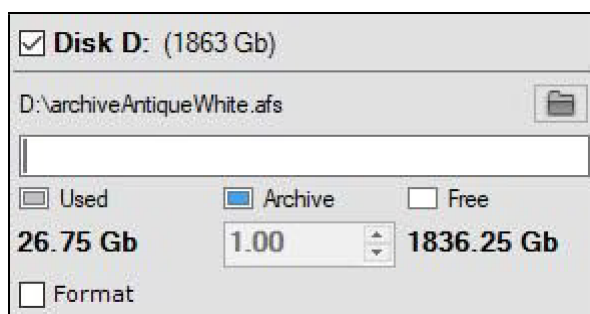
Note

You can also create an archive by selecting the matching command in the context menu of the **Server** object (the menu can be brought up by right-clicking the name of the Server).

2. Highlight the **New archive** link which appears (1).



3. Set the archive type to **Local** (2).
4. Specify the name and color of the archive (3).
5. Configure archive volumes.
 - a. For the disks that you want to include in the archive, select the corresponding check boxes.
 - b. If a disk does not have a file system, the disk can contain an archive volume in the form of a partition. In this case, select the **Formatting** check box. This will format the disk using the SolidStore file system developed by Inaxsys (see [General information of SolidStore file system](#)(see page 201)).



Note

The file system on the disk can be erased by using the standard Disk Management utility in Windows. Instructions for starting and using the utility are given on the [Microsoft website](#)⁹⁰. Deleting the file system on the disk in the disk management utility consists of the following:

- i. Delete the volume.
- ii. Create a new volume in the resulting unformatted area.
- iii. Assign a letter to the volume, but do not format it.

The system disk cannot be completely allocated for an archive.

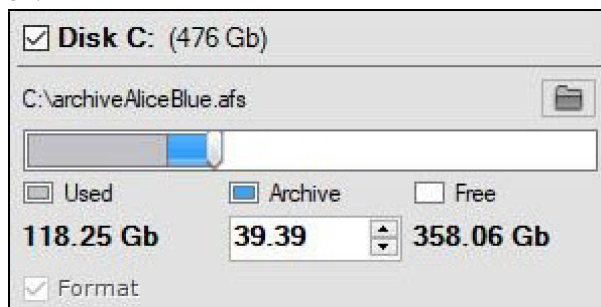
 Important!

When selecting the disk on which to place the archive volume, take its size into account. If the archive is completely filled, the oldest data will be overwritten with new data.

 Note


Note that you cannot create an archive volume as a partition on a removable disk, since its partition cannot be erased through the Disk Management utility.

- c. On disks that have a file system, you can store an archive volume in the form of a file. For this archive volume, you must enter a file size (in gigabytes) or set it by moving the slider. The size of the archive file must be more than 1 GB. For the Fat32 file system, the maximum archive size is 4 GB.

 **Important!**

If the archive is completely filled, the oldest data will be overwritten with new data.

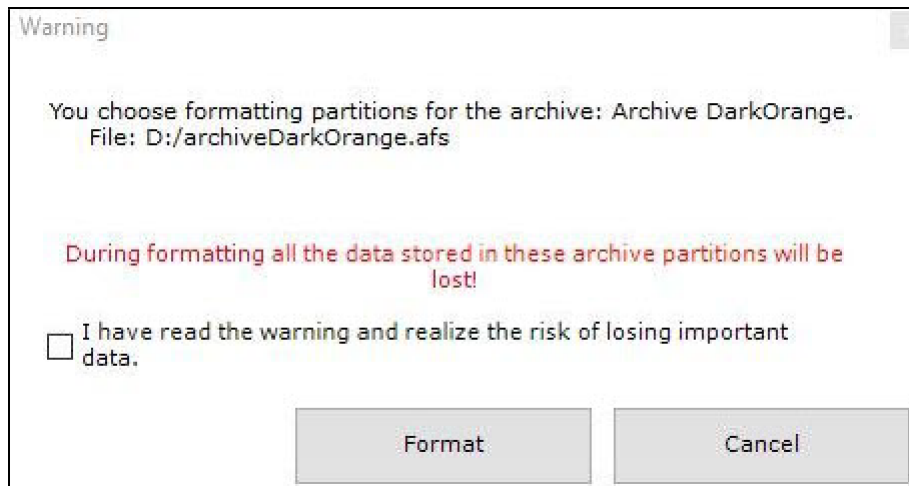
 Note

By default, the file name will be the same as the name of the archive, and the file will be located at the root directory of the disk. To change the name and/or location of the file, click the  button.

6. Click the **Apply** button.

If volumes are configured in the form of partitions, a dialog box is displayed, warning about formatting of the relevant system disks.

⁹⁰ <http://windows.microsoft.com/en-us/windows/create-format-hard-disk-partition#create-format-hard-disk-partition=windows-7>



7. Read through the list of partitions that will be formatted. If the list is correct, select **I have read the warning and realize the risk of losing important data**, then click **Format**. Otherwise, click **Cancel** to return to the archive settings.

✓ Creation of the local archive is now complete.

Creating a network archive

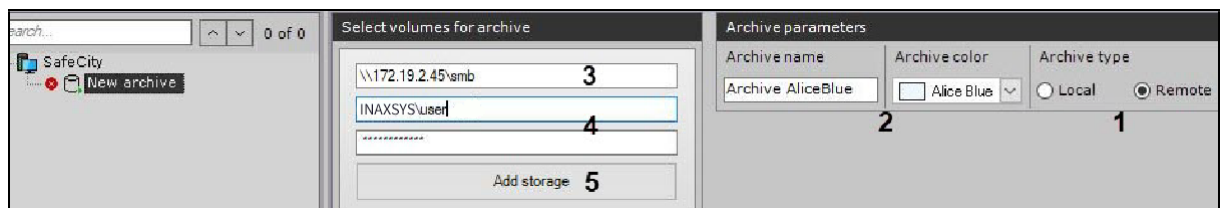
Network archives are files on NAS (network attached storage).

To create a network archive, do as follows:

1. Go to the **Server** object and click the **Create** button.



2. Set the archive type to **Remote** (1).



3. Specify the name and color of the archive (2).
4. Enter a path to the archive network destination (3).

⚠ Attention!

If a particular PC is used to access a particular network archive from multiple user accounts, do the following:

- a. Launch text editor and open the file: C:\Windows\System32\Drivers\etc\hosts, then add the following string: "192.168.1.1 DNSname1", where 192.168.1.1 – IP address of the NAS, DNSname1 – domain name of the NAS.
- b. The name of a newly created network archive must include the actual domain name.

If you need to add several network archives under different user accounts, do the following:

- a. Launch text editor and open the file: C:\Windows\System32\Drivers\etc\hosts, and add IP addresses and domain names of all necessary NAS.
- b. The names of newly created archives must include actual domain names.

In a backup Server-driven failover system (see [Setting up a configuration with the backup Server](#) (see page 568)), if domain names differ from one Server to another, the hosts file on the backup Server must include records from all Servers.

5. Enter the user name and password (4). The user must have permissions to access the NAS.

Attention!

The login should be specified with a prefix of the domain (domainname\username) or name of the computer (computername\username) where this account is located.

6. Click the **Add storage** button (5).

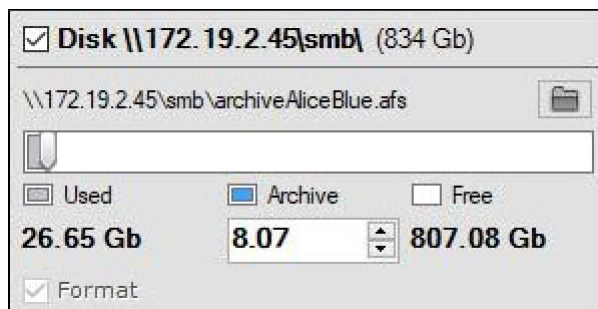
This will connect you to the NAS. When you are connected, you can see a dialog box for setting up your archive.

Attention!

Only one network user can connect to NAS at a time. This is a limitation of OS Windows.

If this error occurs, disconnect the previous user in one of the following ways:

1. Run the command `net use /delete`⁹¹.
2. Use `Psexec`⁹² to open the command prompt as the LocalSystem user (`psexec.exe -i -s cmd.exe`) and execute the same command.



7. For this archive volume, you must enter a file size (in gigabytes) or set it by moving the slider. The size of the archive file must be more than 1 GB. For the Fat32 file system, the maximum archive size is 4 GB.

Note

To change the archive folder, click the  button and browse to a desired location.

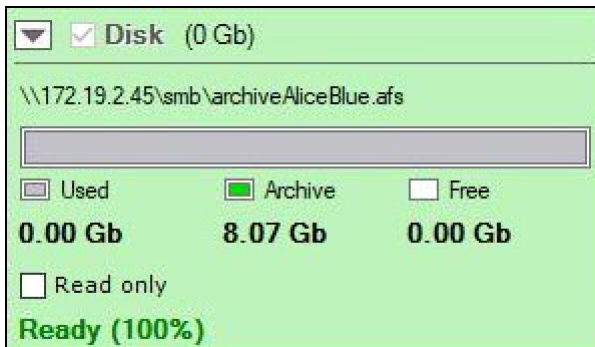
8. If you want, you can add other NAS for your archive and set them up.

⁹¹ <https://technet.microsoft.com/en-us/library/bb490717.aspx>

⁹² <https://docs.microsoft.com/en-gb/>

9. Click the **Apply** button.

✓ You have created your network archive. After creating the archive, the NAS status is displayed.



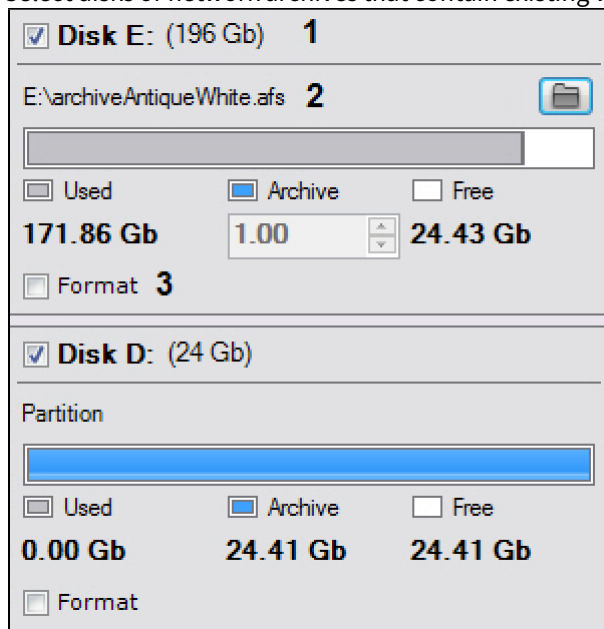
Creating an archive based on existing archive volumes

If an archive is created from an existing volume, it will be possible to extract saved video from the file only if the following conditions are met:

- The currently selected computer has the same name as the name of the Server or node on which the video has been saved to an existing Video Footage volume.
- The IDs of the video cameras from which the recordings were written to the existing archive volume are the same as the IDs of the current video cameras.

To create an archive based on an existing volume:

1. Create an archive (see [Creating a local archive](#)(see page 202)).
2. Select disks or network archives that contain existing volumes (by selecting check boxes, **1**).



Note

A new archive can contain volumes that previously belonged to different archives

3. If the volume is in file form, select the archive file to which recording was performed (2).
4. Clear the **Format** check box (3).

Note

If the **Format** check box is selected, the archive entries that are currently stored on the volume will be erased.

5. If necessary, create new archive volumes on free partitions.
 6. Click the **Apply** button.
- ✓ The archive is created and, if all requirements are met, the archive recordings are available.

7.3.4 Configuring recording to an archive

Video and audio streams are recorded synchronously.

Binding a camera to an archive determines the archive to which a video stream will be recorded and how.

You can bind a single camera to an archive or bind a group of cameras by using the same settings.

To bind a camera to an archive:

1. Select the new archive.
2. Select the check box that corresponds to the camera for which you want to configure archive recording (1).

	<input checked="" type="checkbox"/> 1. Camera 1	3	4	5	6
	Constant recording	Depth, days	Prerecord, sec	Recording fra...	Camera stream
	Always 2	0	3	No	High-quality stream

3. **Configure settings for archive recording:**
 - a. In the **Constant recording** list, select the archive recording mode (2).
 - i. If **No** is selected, the video stream will be recorded to the archive only when an operator manually initiates an alarm or an automatic rule is initiated.
 - ii. If **Always** is selected, video will be recorded to the archive non-stop.
 - iii. If a time schedule is selected (see [Configuring schedules](#)(see page 519)), video will be recorded non-stop to the archive during the selected time period. Recording to the archive can also be initiated by the operator or an automatic rule.
 - b. In the **Depth, days** field, specify a video footage retention time value for the given camera (in days). **Zero** value means unlimited retention.

Attention!

If your footage archive includes videos from one or more cameras with unlimited retention, the archive will run out of free space at some point, and FIFO based re-recording will be automatically started regardless of retention time settings. In this case, we cannot guarantee that the actual retention time settings will be preserved for other cameras. Therefore, if you set unlimited retention time for at least one camera, you may find it pointless to limit retention time for other cameras.

To avoid retention time collisions between cameras, please make sure to provide enough storage capacity for your footage archive (see [Disk storage subsystem requirements](#)(see page 18)).

❑ Attention!

Further, if you are increasing the available archive retention time, or setting the parameter to **0**, please note that this setting may be not applied to earlier records. Older footage falling outside the initial retention time may become inaccessible.

❑ Note

When setting a retention time parameter for a particular camera archive, please note that global retention time limits have higher priority (see [Configuring access restrictions to older footage](#)(see page 211)).

If your entire archive is set to, say, 10 days, and the camera retention time is set to 20 days, camera footage will be actually retained for 10 days only.

- c. In the **Prerecord, sec** field (**4**), enter the buffering time of the video stream from the camera in seconds. This value should be in the range [0; 30].

❑ Note

Pre-alarm recording is the period of pre-event recording that will be added to the beginning of an alarm event recording.

❑ Attention!

If a macro starts recording, the pre-alarm recording time may be longer, according to your settings (see [Record to archive](#)(see page 397)).

- d. If you want to record pruned, decimated video, choose **By keyframes** from **Recording frame key only** (**5**). This applies to all video streams except MJPEG. With MJPEG codec, please use the explicit value of frame rate. Video pruning by frame dropping reduces the size of recorded video and saves storage, but video with skipped frames feels like the movement is delayed, and motion feels more choppy.

❑ Attention!

When you prune by frame dropping, in all video streams except MJPEG, only I-fames (Intra-Coded Frame or Key Frames) are saved. Different codecs feature various compression levels with key frames rates going down from 3 to under 1 I-frames per second. MJPEG video contains only I-frames (Intra-coded pictures with a complete image), so it makes sense to set a desired frame rate here.

- e. Select a stream for archive recording (**6**).

❑ Note

This setting is relevant for cameras that support multistreaming.

4. Click the **Apply** button.

✔ Binding of the camera to the archive is now complete.

To bind multiple cameras:

1. Select the check boxes next to the cameras for which you want to configure archive recording. To select all cameras, select the **Select all** check box.

2. Configure archive recording settings for the group of cameras (marked with yellow). The indicated settings for archive recording are applied to the selected cameras.
3. Perform custom configuration of camera recording settings, if necessary.
4. Click the **Apply** button.

✔ The camera is now bound to the archive.

7.3.5 Setting the default archive

The default archive of a video camera is the archive to which images from a given video camera are recorded during user-initiated alarms. For each video camera one and only one default archive must be set. The first archive to which recording of a video stream from a video camera was configured automatically becomes the default archive (see [Configuring recording to an archive](#)(see page 207)).

To switch the default archive for a camera:

1. Select a **Server** object.

The **Default archives** form displays a list of cameras and archives, which are marked with the corresponding colors. If archive recording to at least one archive is enabled for a particular camera, the camera is visually marked as related to its default archive.

Default archives			
1.Camera			
2.Camera			
3.Camera			
5.Camera			
6.Camera			
7.Camera			
8.Camera			
10.Camera			

2. To change the default archive for a camera, move the designator to the relevant archive.

3. Click the **Apply** button.

✔ Configuration of the default camera archive is now complete.

7.3.6 Configuring data replication

Replication of archives refers to constant, block-by-block copying of fixed-size information (video, audio, metadata) from one archive to another archive on the same domain.

Attention!

Replication occurs as information blocks are accumulated. 1 block may contain more than a minute of video.

Attention!

Replication is performed only to the end of the archive. It is not possible to overwrite existing data in the archive.

To transfer the old data from **Archive 1** to **Archive 2** and continue writing new data to Archive 2, do as follows:

1. Replicate the data from **Archive 1** to **Archive 2**, while **Archive 2** cannot be written to.
2. Configure the camera to write to **Archive 2**.

Note

The primary purpose of data replication is to ensure long-term storage and access to multimedia recordings on remote storage devices.

Any archive can be the source or recipient of replication. Moreover, every archive can simultaneously be both the sender and recipient of data.

Note

Events indicating the start and successful completion of data replication are generated in the system (see [Event Control](#)(see page 786)). These events can be used as macro triggers.

To configure data replication:

1. In the list of archives on the domain, select the archive to which you want to copy data from other archives.
2. Select one or more archives from which you want to copy data (**1**). You can also replicate video from on-board camera storage (**4**, see [The Embedded storage object](#)(see page 161)).

3. For each archive, select the cameras from which data will be copied to the source archive (2). To select all cameras, click the **Select All** button.

Note

Data for a particular camera can be copied to the replication archive only from one archive. When you select a camera for replication from an archive, the camera becomes unavailable for replication from any other archive.

Note

You cannot select cameras if they are already recording to the replication archive.

4. Select replication period (3):
- Always** – replication is performed continuously.
 - On demand** – replication is performed manually.

Attention!

You can use macros to replicate on schedule (see [Start replication](#)(see page 406)).

5. Click the **Apply** button.

You have now configured data replication. If you have chosen the **Always** replication period, data replication starts immediately after changes are applied.

7.3.7 Configuring access restrictions to older footage

You can make only newest recordings in your available for the VMS users.

To do this, select the history (in days) in the appropriate field and click **Apply**.

Archive parameters				
Archive name	Archive size	Depth, days	Filled archive volume	Archive state
Archive2	1.00 Gb	0	98% : 0.98 Gb	Ready

Note

If the history value is set at **0**, all recorded video is available for playback.

You can view only video recordings not exceeding the retention time setting. All other videos will be deleted.

Attention!

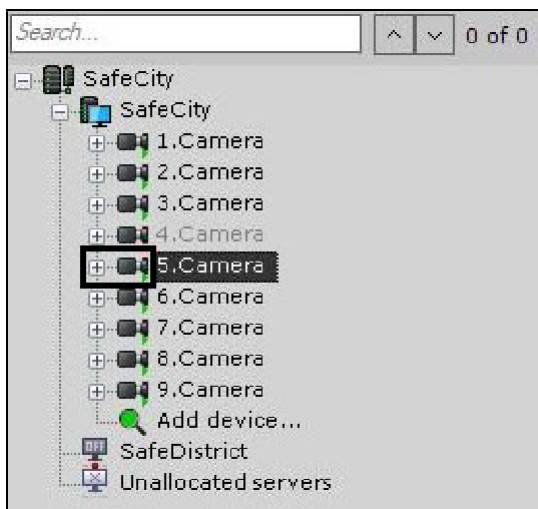
Further, if you are **increasing** the Archive retention time (**0** - stands for unlimited time), this setting is applied for new records only. Earlier records falling outside the initial retention time become inaccessible.

7.3.8 How to preserve Video Footage continuity after replacing a video source

Arkiv supports keeping video source's recorded footage after the device is replaced.

To do this:

1. Copy the old video device ID and delete it from the system.



2. Create a new device under the same ID (**1**) and bind it to the same footage archive (**2**, see [Adding and removing IP devices](#)(see page 97)).

IP address	Port	Vendor	Username	Bind to the archive	ID	Latitude	Longitude	+
0.0.0.0	3600	360Vision	Auto	Archive AliceBlue 2	5 1	0	0	
Device type	Model	Password	Recording	Name	Azimuth			
IP device	Predator Pred-XX-IP	****	On motion	Auto	0			

Attention!

Any other parameters of the new device may differ (make and model, ID, etc.).

If you swap NVRs, make sure you preserve the same order of video channels for connected cameras.

Creating a new device with the old ID makes the previously recorded footage available for viewing / processing within the system.

7.3.9 Protecting video footage from FIFO overwriting

In the Arkiv software package, data is being recorded cyclically (First In First Out). Normally, older video footage is overwritten by the newer.

You can protect selected videos from being overwritten. A macro copies protected recordings to another Video Footage.

To protect videos, do the following:

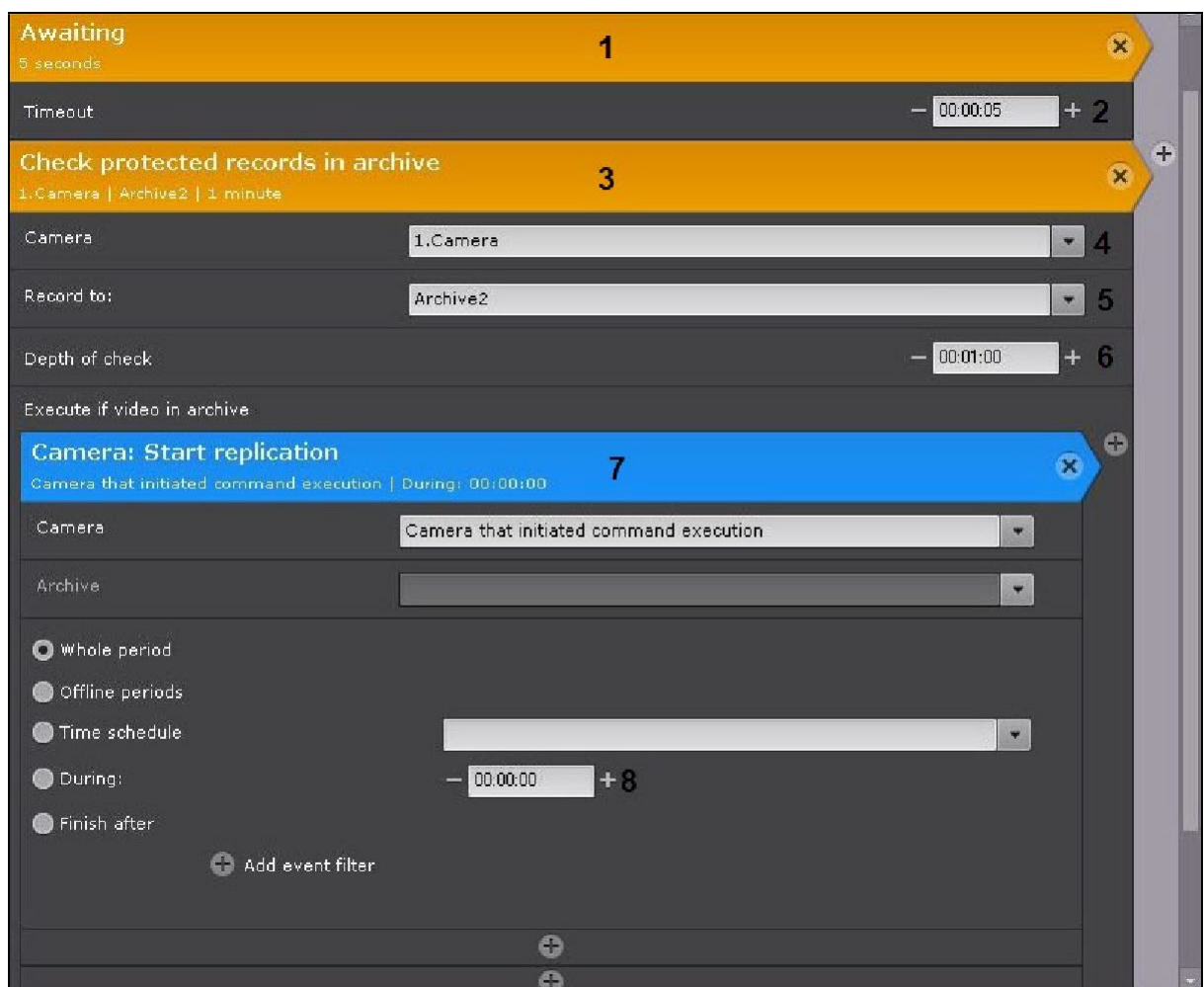
1. Configure on-demand replication (see [Configuring data replication](#)(see page 210)).
2. Configure a macro (see [Setting up a macro for automatic copying of protected records](#)(see page 213)).
3. Configure protection for necessary videos (see [Setting up record protection](#)(see page 214)).

You can further edit the list of protected recordings through the web client.

Setting up a macro for automatic copying of protected records

You have to create and set up a **cyclical** macro (see [General information about the macros](#)(see page 381)) as follows:

1. First action in the macro must be the [Awaiting](#)(see page 394) (**1**).



2. The timeout delay value sets the time interval for checking Video Footage for protected records (**2**).
3. The second action in the macro must be checking Video Footage for protected records (**3**). **On this step, you have to:**

- a. Select a camera or a group of cameras whose Video Footages have to be checked for protected records (4).
- b. If you select a particular camera, specify the archive to be checked (5). If a group of cameras was selected in the previous step, only default archive will be checked for each of them (see [Setting the default archive](#)(see page 209)).
- c. Specify the depth of the check in HH:MM:SS format (6). The time interval between checks is calculated as follows: [starting time of the earliest recording in archive, starting time of the earliest recording in archive + depth of the check].
- d. Add data replication as a conditional action upon discovery of protected records within the scanning interval (7, see [Start replication](#)(see page 406)).
- e. Select the Replication time for a time interval (8). The replication duration defines the time interval from which protected records have to be copied to another Video Footage. All protected intervals starting within the [starting time of the earliest recording in Video Footage; starting time of the earliest recording in Video Footage + replication duration] range will be copied to Video Footage for replication. Normally, the replication duration has to be equal to the depth of the check defined in Step 3c.

The screenshot shows settings that make the system scan once in a minute (2) for protected records in Camera 4's (4) archive AliceBlue (5) within the [starting time of the earliest recording in archive + 10 minutes] time interval (6). If this interval contains protected records, the replication will be launched to copy all protected records falling into [starting time of the earliest recording in archive; starting time of the earliest recording in archive + 10 minutes] (8) interval to archive specified for replication.

Setting up record protection



To protect a record, create a bookmark – a special case of the operator comment (see [Operator comments](#)(see page 636)).

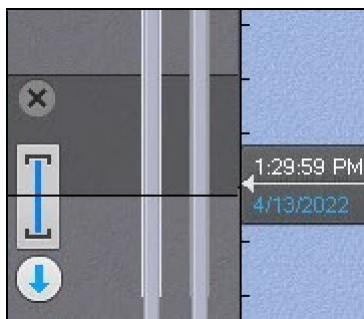
To create a bookmark, do as follows:


1. Select the required camera on the layout and switch to the archive mode (see [Switching to Archive Mode](#)(see page 668)).

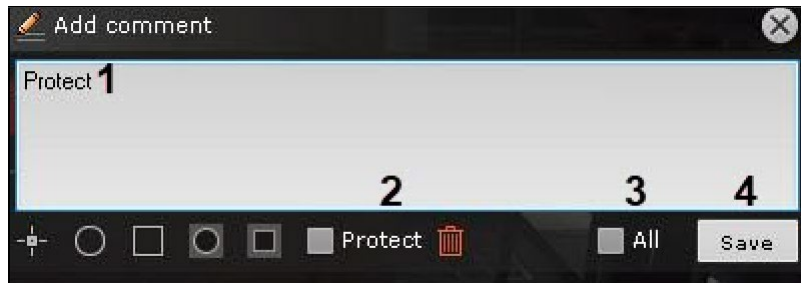
Note

If you need to protect the same time interval in multiple camera archives, switch the necessary cameras to the archive mode.

2. Set the protected time interval on the timeline in the archive with the  and  buttons (see [The Timeline](#)(see page 606)).

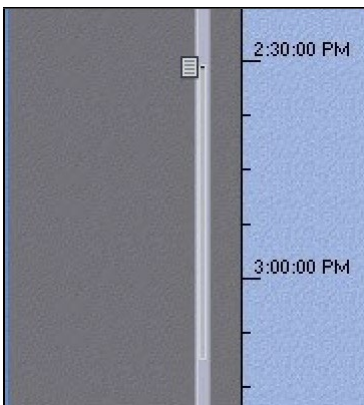



3. Click the  button in the video surveillance window.
4. Enter a comment (1).



5. Set the **Protect** checkbox (2)
6. Set the **All** (3) checkbox if it is necessary to protect the specified interval from all cameras currently in the archive mode.
7. Click the **Save** button (4).

✔ The newly created bookmark will appear on the timeline.



The protected interval will be highlighted in light grey, and its beginning will be marked with .

Click the  button to delete the specified protected interval in the archive.

7.3.10 Increasing capacity of an archive volume

You can increase capacity of an archive volume.

Increasing capacity of an archive volume as a partition

You can increase volume capacity only with standard media. This option does not work with RAID disk sets.

Attention!

Inaxsys cannot guarantee archive data integrity after this action is complete.

To increase volume capacity, do the following:

1. Stop the *Arkiv Server* (see [Shutting down a Server](#)(see page 82)).

2. Use the Windows disk management utility to [increase](#)⁹⁴ volume capacity.
3. Start the Server (see [Starting a Server](#)(see page 76)).

Increasing capacity of an archive volume as a file

To increase volume capacity, use the `-expand` parameter in console utility for working with archives (see [Console utility for working with archives](#)(see page 862)).

7.3.11 Editing archives

You can edit the archives that have been created in the system. You can perform the following actions on them:

1. Rename an archive (see [Creating archives](#)(see page 202)).
2. Add new volumes. Addition of a new volume also occurs during archive creation (see [Creating archives](#)(see page 202)).
3. [Deleting and formatting archive volumes](#)(see page 216).
4. Change settings for archive recording (see [Configuring recording to an archive](#)(see page 207)).
5. Change replication settings (see [Configuring data replication](#)(see page 210)).

7.3.12 Deleting and formatting archive volumes

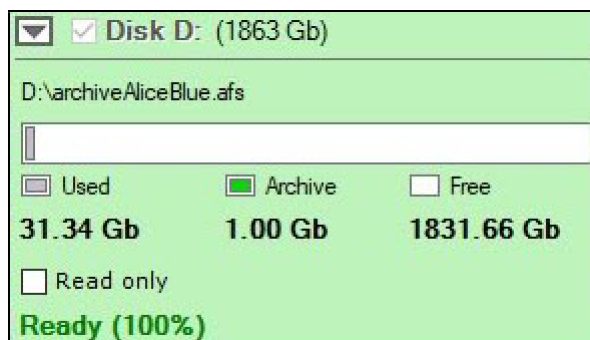
You can delete and format archive volumes.

Note

To delete and format volumes of an object archive, use gRPC API (see [Remove archive using gRPC API methods](#)).

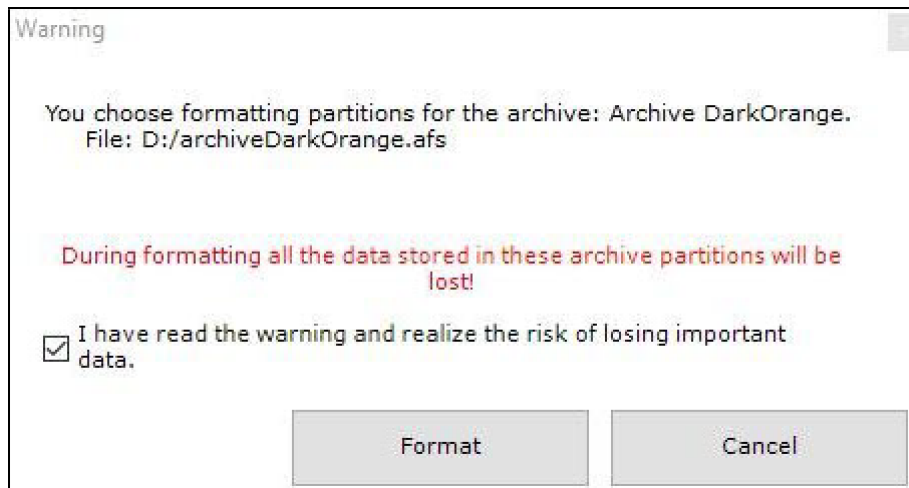
To format the archive volume, do as follows:

1. Click the  button.
2. Select **Format volume**.



3. Click **Apply**. A dialog box is displayed, warning about formatting of the selected volumes.


⁹⁴ <https://docs.microsoft.com/en-us/windows-server/storage/disk-management/extend-a-basic-volume>

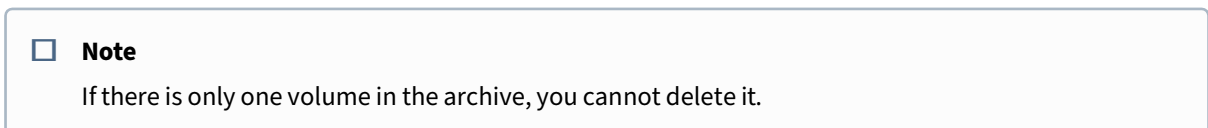


4. Select the checkbox and click **Format**.

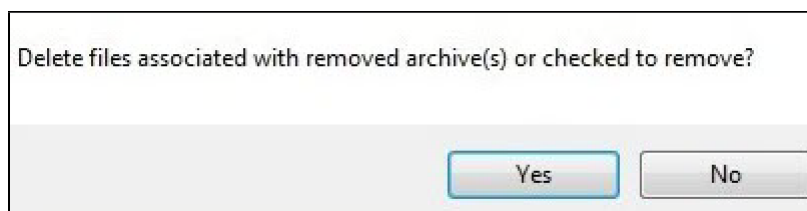
✔ The volume formatting is complete.

To remove a volume, do as follows:

1. Click the  button.
2. Select **Remove volume**.



3. Click **Apply**.
4. If necessary, you can remove archive files.



⚠ Attention!

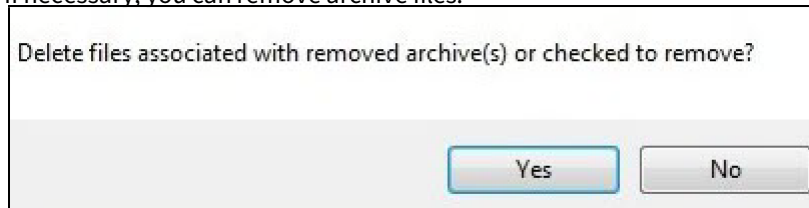
If you delete the archive files, then all the video footage that they contained will be lost. If you do not delete archive files, you can re-use them to create another archive (see [Creating an archive based on existing archive volumes](#)(see page 206)). You can as well use a partition to re-create an archive.

7.3.13 Deleting archives

To delete an archive from the system, do the following:

1. Select the archive to be deleted in the archive list.
2. Click the **Remove** button.
3. Click the **Apply** button.

If necessary, you can remove archive files.



Attention!

If you delete the archive files, then all the video footage that they contained will be lost. If you do not delete archive files, you can re-use them to create another archive (see [Creating an archive based on existing archive volumes](#) (see page 206)). You can as well use a partition to re-create an archive.

Deleting an archive from the system is now complete.

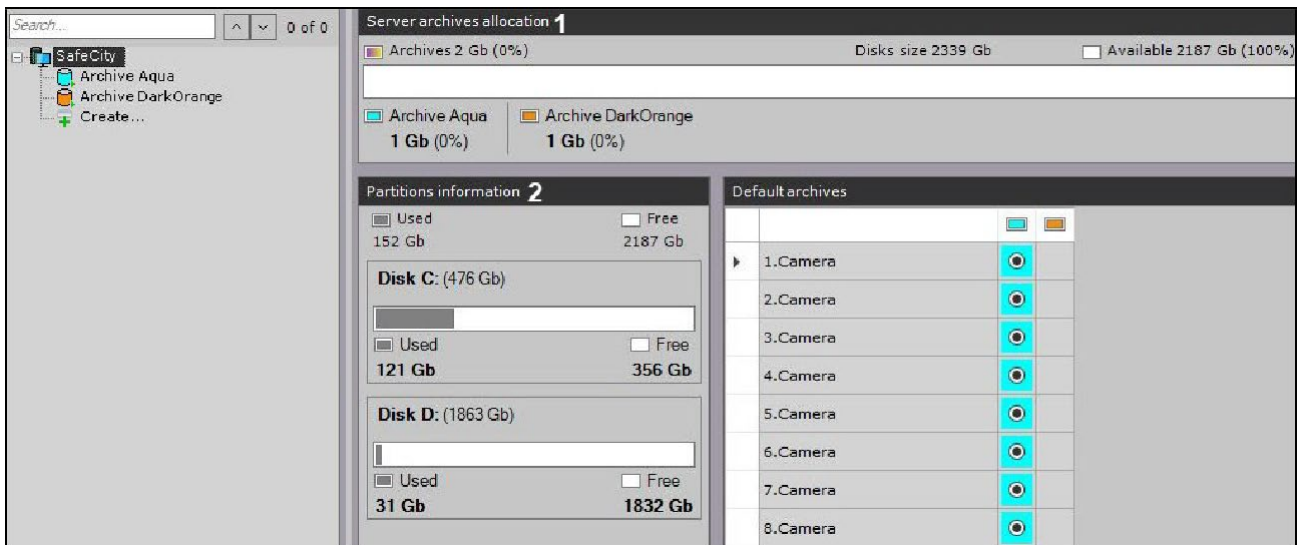
Note

To delete object archive, use gRPC API (see [Remove archive using gRPC API methods](#)).

7.3.14 View information about the size of archives and Server disk space

Selecting a **Server** object displays statistical information about the available Server disks and created archives.

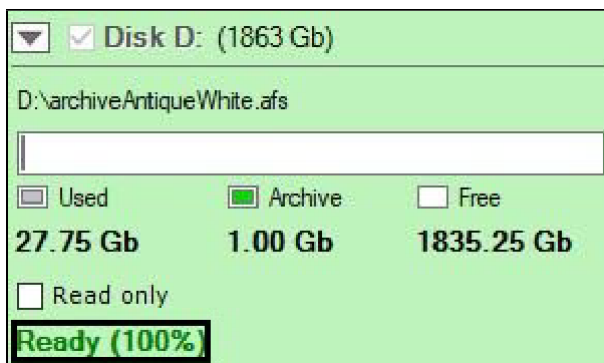
Figure (1) shows the overall balance of free disk space between the Server archives.



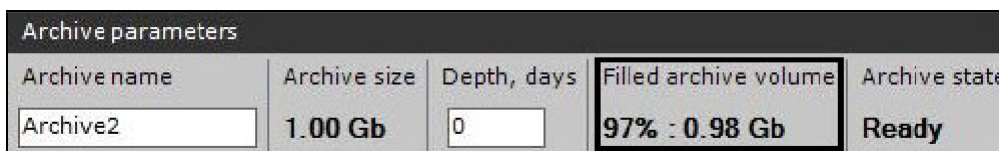
In addition, a list of disks is displayed, containing information about the total disk capacity, space used, and total free space (2).

When you select an archive, the following information is displayed:

1. The percentage of used space on each volume in the archive. This parameter indicates whether the volume's data is being rewritten. If the percentage is 100%, the new data is overwriting the old data.

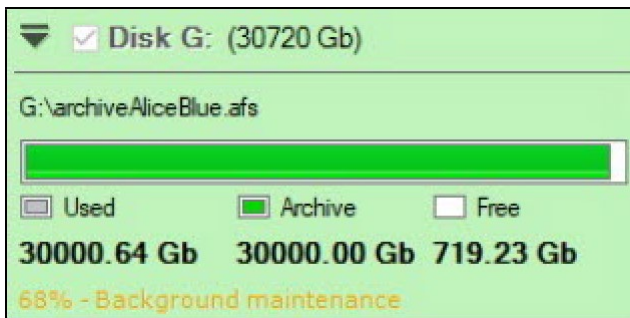


2. The approximate volume usage in percentage and gigabytes (2) is displayed in the **Filled archive volume** field of the **Archive Parameters** group.



When you update *Arkiv* or restart the Server, or create the archive based on the existing volume etc., the archive is reindexed.

- ✓ Reindexing progress bar is displayed.

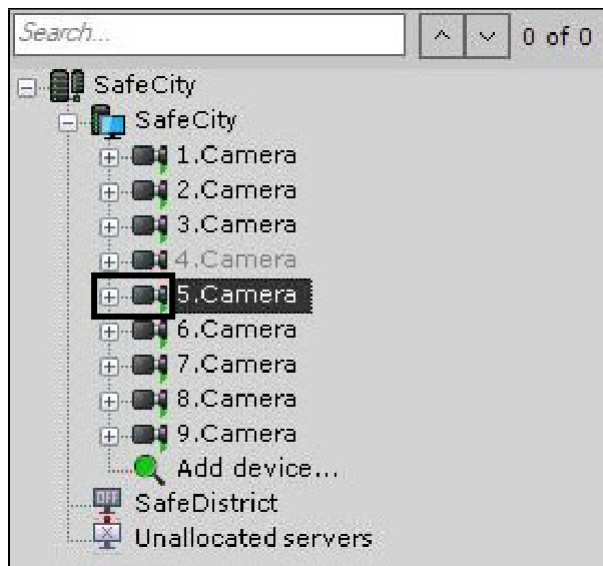


7.3.15 Saving the archive when replacing a video source

In *Arkiv*, it is possible to save the archive in case of replacing a video camera, NVR or any other video source.

To do this:

1. Delete the old device, but keep in mind its ID.



2. Create a new device in the system with the same ID (1) and bind it to the old archive (2, see [Adding and removing IP devices](#) (see page 97)).

IP address 0.0.0.0	Port 3600	Vendor 360Vision	Username Auto	Bind to the archive Archive AliceBlue 2	ID 5 1	Latitude 0	Longitude 0	+
Device type IP device	Model Predator Pred-XX-IP	Password ****	Recording On motion	Name Auto	Azimuth 0			

⚠ Attention!

Device model, IP-address and any other device parameters may differ from the previous one.

In the case of replacing the NVR, the video cameras should be connected to the same channels as before. After creating a new device with the old ID, the archive recorded earlier will be available in the system.

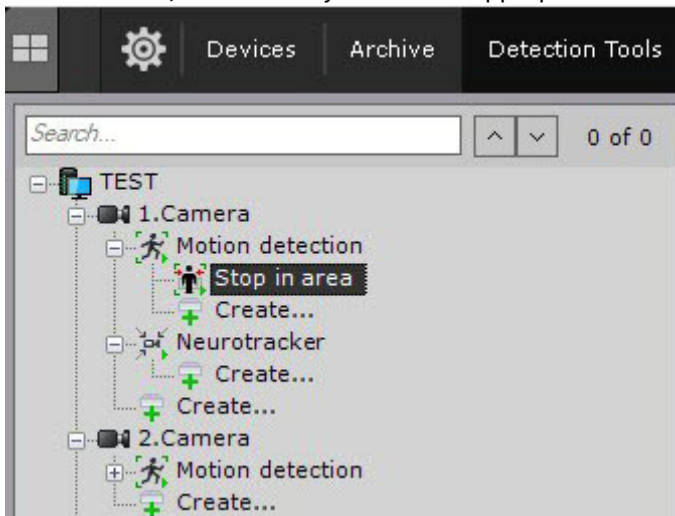
7.4 Configuring detection tools

7.4.1 General Information on Configuring Detection

In the *Arkiv* software package, several types of detection tools process incoming data:

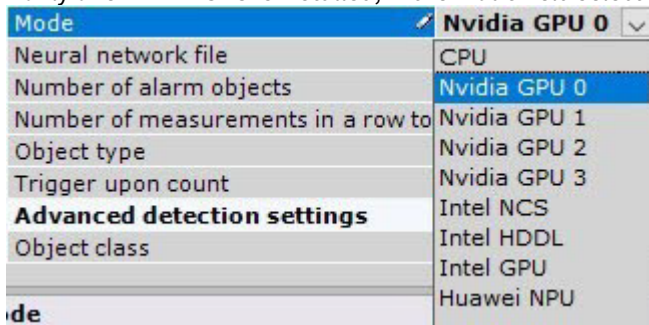
1. Motion in area detection.
2. Scene analytics detection tools.
3. Face detection.
4. Automatic number plate recognition tool.
5. Fire detection and smoke detection.
6. Pose detection.
7. Personal protective equipment detection tools.
8. Retail analytics.
9. Water level detection.
10. Service detection tools:
 - a. Video detection.
 - b. Audio detection.
11. Neurocounter.
12. Detection tools embedded in a video camera.

Detection tools are configured using the **Detection Tools** tab interface (within the **Settings** tab). To configure detection tools, it is necessary to have the appropriate user rights.



When configuring the detection, in the **Mode** field, select NVIDIA GPU one by one.

If only one NVIDIA GPU is installed, in the **Mode** field select **Nvidia GPU 0**.



If more than one NVIDIA GPU is installed, in the **Mode** field select the video card which should be used for detection.

It is possible to change the order of NVIDIA GPUs display using the CUDA_DEVICE_ORDER system variable (see [Appendix 10. Creating system variable](#)(see page 927)) by specifying the required value:

1. The FASTEST_FIRST value numbers the GPUs from the most powerful card to the less powerful ones, i.e. **GPU 0** is the most powerful card.
2. The PCI_BUS_ID value numbers the GPUs according to the physical location of the cards in the PCI-E slots on the motherboard, i.e. **GPU 0** is the card in the highest slot.

To find out information about the availability, quantity and numbering of NVIDIA GPUs, do the following:

1. Run a command line as an administrator.
2. In the command line type the nvidia-smi query.
3. Press **Enter**.

The command line window will display information about the installed NVIDIA GPUs.

```

Administrator: Command Prompt
Microsoft Windows [Version 10.0.19044.1706]
(c) Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>nvidia-smi
Thu Jun 09 12:02:45 2022

+-----+
| NVIDIA-SMI 457.09          Driver Version: 457.09          CUDA Version: 11.1          |
+-----+-----+-----+
| GPU   Name                TCC/WDDM | Bus-Id          Disp.A | Volatile Uncorr. ECC |
| Fan  Temp  Perf  Pwr:Usage/Cap|                 Memory-Usage | GPU-Util  Compute M. |
|=====+=====+=====+
|  0   GeForce GT 710      WDDM      | 00000000:01:00.0 N/A |           N/A       N/A |
| 50%   50C   P8     N/A /  N/A | 692MiB / 1024MiB |           N/A       Default |
|                               |                 |           N/A       N/A |
+-----+-----+-----+

Processes:
  GPU   GI   CI           PID   Type   Process name                      GPU Memory
   ID   ID   ID                                     Usage
+-----+-----+-----+
| No running processes found |
+-----+-----+-----+

C:\WINDOWS\system32>

```

Attention!

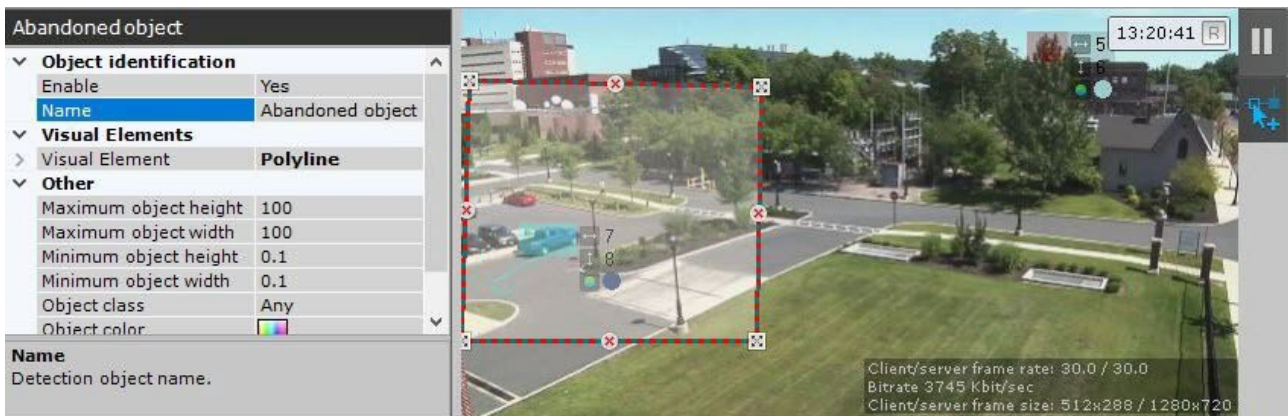
If you select a non-installed NVIDIA GPU in the **Mode** field, detection will not be performed.

For a video camera and its corresponding branch to appear in the detection tools list, the camera should be enabled in *Arkiv*.

Note

By default, camera inputs that can be activated through an automatic rule are displayed on the list of detection tools.

In the viewing tile, on the right side of the detection configuration window, you can set visual parameters.



Note

The indicator in the upper right corner displays the current time and recording status (see [Time Display](#)(see page 597)).

The default system setting to a detection event is not to trigger any response actions. To set system response, create an automatic rule or a macro (see [Create Macros](#)(see page 382), [Automatic Rules](#)(see page 379)).

7.4.2 General information on metadata

Metadata is information that describes object-related content in the camera FOV.

In *Arkiv* metadata can be obtained in two ways:

1. By analyzing video stream on Server by detection tools.
2. By receiving metadata from camera built-in analytics (see [Embedded Detection Tools](#)(see page 370)).

Attention!

To extract metadata from video, you have to de-compress and analyze the video stream, which increases the Server's workload, thus limiting the number of available camera channels.

The following tools are used for server-side analysis and metadata generation:

1. [Object Tracker](#)(see page 245).
2. [Neural Tracker](#)(see page 261).

Note

Object tracker and Neural Tracker generate metadata containing the following information about moving objects in FOV: object type, position, size and color, motion speed and direction, etc.

3. [VMD](#)(see page 264).

Note

VMD generates less accurate data. It does not detect object type and color.

4. [Face detection tools](#)(see page 265).

Note

Face detection metadata contains face bounding boxes and their positions, as well as face vectors.

5. [Automatic Number Plate Recognition \(LPR/ANPR\) tools](#)(see page 296). **Note**

ANPR metadata contains license plate bounding boxes and their positions, as well as vehicle registration numbers.

6. [Pose detection](#)(see page 348). **Note**

Metadata from pose detection tools contains information on positions and pose (skeleton) of all people in FOV.

7. [Personal protective equipment detection tools](#)(see page 332). **Note**

Equipment detection metadata contains information about the position of all the people in FOV.

The metadata is used for the following system options:

Option	Required source of metadata
Scene Analytics (see page 245)	Object Tracker (see page 245), Neural Tracker (see page 261), Embedded Detection Tools (see page 370), or VMD (see page 264)
Forensic search Post-Analytics (see page 705)	Object Tracker (see page 245), Neural Tracker (see page 261), Embedded Detection Tools (see page 370), VMD (see page 264), Face detection tools (see page 265), Automatic Number Plate Recognition (LPR/ANPR) tools (see page 296), Pose detection tools (see page 346), Personal protective equipment detection tools (see page 332)
Face search (see page 718)	Face detection tools (see page 265)
LPR search (see page 717)	Automatic Number Plate Recognition (LPR/ANPR) tools (see page 296)
Timelapse Compressor (see page 672)	Object Tracker (see page 245), Neural Tracker (see page 261), Embedded Detection Tools (see page 370), or VMD (see page 264)
Target&Follow Pro (see page 656)	Object Tracker (see page 245), Neural Tracker (see page 261), Embedded Detection Tools (see page 370), or VMD (see page 264)
Object tracking (see page 631)	Any

Option	Required source of metadata
Autozoom (see page 663)	Any

❏ Attention!

If a camera uses several sources of metadata, the required source is selected automatically, except for [Post-Analytics](#)(see page 500).

To perform face/license number searches, only metadata from corresponding detection tools is used.

By default, metadata is stored as files in the object trajectory database in the local Server directory that was selected when installing *Arkiv* (see [Installation](#)(see page 36)) in the `vmda_db\VMDB.DB.0\vmda_schema` subfolder.

❏ Note

If necessary, you can place metadata on any available network storage (see [Configuring storage of the system log and metadata](#)(see page 517)).

7.4.3 General information on Neural Analytics

The *Arkiv* VMS offers AI analytics based on neural networks. These AI tools include:

1. **Face detection tools** (see [Face detection tools](#)(see page 265)).
Neural network detects faces.
2. **Automatic Number Plate Recognition (LPR/ANPR) tools** (see [Automatic Number Plate Recognition \(LPR/ANPR\) tools](#)(see page 296)).
Neural network recognizes vehicle license plates.
3. **Neural Network Filter for Object Tracker** (see [Setting general parameters of Tracker-based Scene Analytics detection tools](#)(see page 245)).
The neural network filter processes the results of the tracker and filters out false alarms on complex video images (foliage, glare, etc.).
4. **Neural Tracker** (see [Setting up Neural Tracker-based Scene Analytics detection tools](#)(see page 261)).
Neural Tracker detects only objects of a specified class. The Neural Tracker is more accurate than the regular one, and detects even static objects, but it requires more computing resources.
5. **Neural Counter** (see [Neural Counter](#)(see page 323)).
The Neural Counter relies on a neural network to work out the number of objects in the zone.
6. **Smoke and Fire Detection Tools based on Neural Network** (see [Fire and Smoke Detection Tools](#)(see page 328)).
Neural network detects fire and smoke in FOV.
7. **Object detection.**
Neural network is trained to recognize specific types of objects, it detects them in FOV.
8. **Posture Detection based on Neural Network** (see [Configure Pose detection tools](#)(see page 348)).
Neural network identifies each person's "skeleton" and detects poses that may represent a security threat.
9. **Equipment detection tool based on Neural Network** (see [Personal protective equipment detection tools](#)(see page 332)).
Neural network detects the necessary equipment and PPE in the frame. Segmenting and classifying neural networks are used to operate the Equipment detection tool (PPE).
10. **Person-based privacy masking** (see [Person-based privacy masking](#)(see page 342)).
Segmenting neural network is used to structure up an image of a human body.

11. **Water Level Detection** (see [Water Level Detection](#)(see page 367)).

The detection tool may use the neural network to detect water transparency and level.

[Hardware requirements for neural analytics operation](#)(see page 23)

Data collection requirements for neural network training

To train neural networks, it is necessary to collect and submit to Inaxsys video recordings and images from your actual cameras taken in the same resolution and under the same conditions as in your future application.

For example, if your neural network is intended to analyze outdoor video feeds, your footage must contain all range of weather conditions (sun, rain, snow, fog, etc.) in different times of day (daytime, twilight, night).

General requirements for collected data:

- when collecting video recordings and images, specific requirements for object images, scene, angle, illumination and video stream are met for those detection tools that you plan to use (see [Configuring detection tools](#)(see page 221));
- if it is required to train the neural network in different conditions of time of day, lighting, angle, object types or weather, then the video material should be collected in equal shares for each condition, that is, it should be balanced.

Note

Example. It is necessary to detect a person in the surveillance area at night and during the day.

Data collected correctly:

- 4 video recordings of the surveillance area, each 5 minutes long;
- the object of interest appears in the frame in each video fragment;
- 2 fragments were recorded in night conditions, 2 – in daytime conditions.

Data collected incorrectly:

- 3 video recordings of the surveillance area, each 5 minutes long;
- the object of interest appears in the frame in each video fragment;
- 2 fragments were recorded in night conditions, 1 – in daytime conditions.

Extra requirements for video footage for each neural analytics tool are listed in the following table:

Tool	Requirements
Neural Filter	No less than 1000 frames containing objects of interest in given scene conditions, and the same amount of footage containing no objects (background footage).
Neural Tracker	3 to 5 minutes of video containing objects of interest in given scene conditions. The more the number and variability of the situations in the scene, the better.
Posture detection tools	10 seconds of video of a scene with no persons. No less than 100 different persons in given scene conditions. Attention! Different conditions mean, among others, different postures of an individual in scene (tilting, different limbs patterns, etc.).

Tool	Requirements
Personal protective equipment detection tools	<p>A list of all reference equipment with examples should be collected from the object and agreed with the analytics manufacturer (see Example of providing a list of valid equipment at the facility(see page 339)).</p> <p>Several video recordings 3-5 minutes each with personnel in the given scene conditions.</p> <p>Personnel should move and change posture in the collected video recordings, as well as remove and put on equipment at intervals of 30 seconds.</p> <p>Since the Personal protective equipment detection tools are designed for artificial constant lighting, video recordings in other lighting conditions are not required.</p>
Fire and Smoke Detection Tools	No less than 1000 frames containing objects of interest in given scene conditions, and the same amount of footage containing no objects (background footage).
Food recognition *	Images of at least 80% of the actual menu items should be provided. Each menu item requires 20 to 40 images shot in different conditions.

If the above requirements for the collection of data transmitted for training the neural network model are met, and if the neural network is operated in conditions that are as similar as possible to the conditions in which the material for its training was collected, then the overall accuracy** of neural network analytics is guaranteed from 90% to 97% and the percentage of false positives is 5-7%. For general networks***, an overall accuracy of 80-95% and a false positive rate of 5-20% are guaranteed.

Note

* Will be available in future versions of *Arkiv* software.

** Accuracy is indicated for a neural network model, which was trained under operating conditions.

*** A general network is a network that was not trained under operating conditions.

The requirements may be changed or added to at any time.

7.4.4 Processors used for detection tools operation

Refer to the following table to check the compatibility of detection tools and processors.

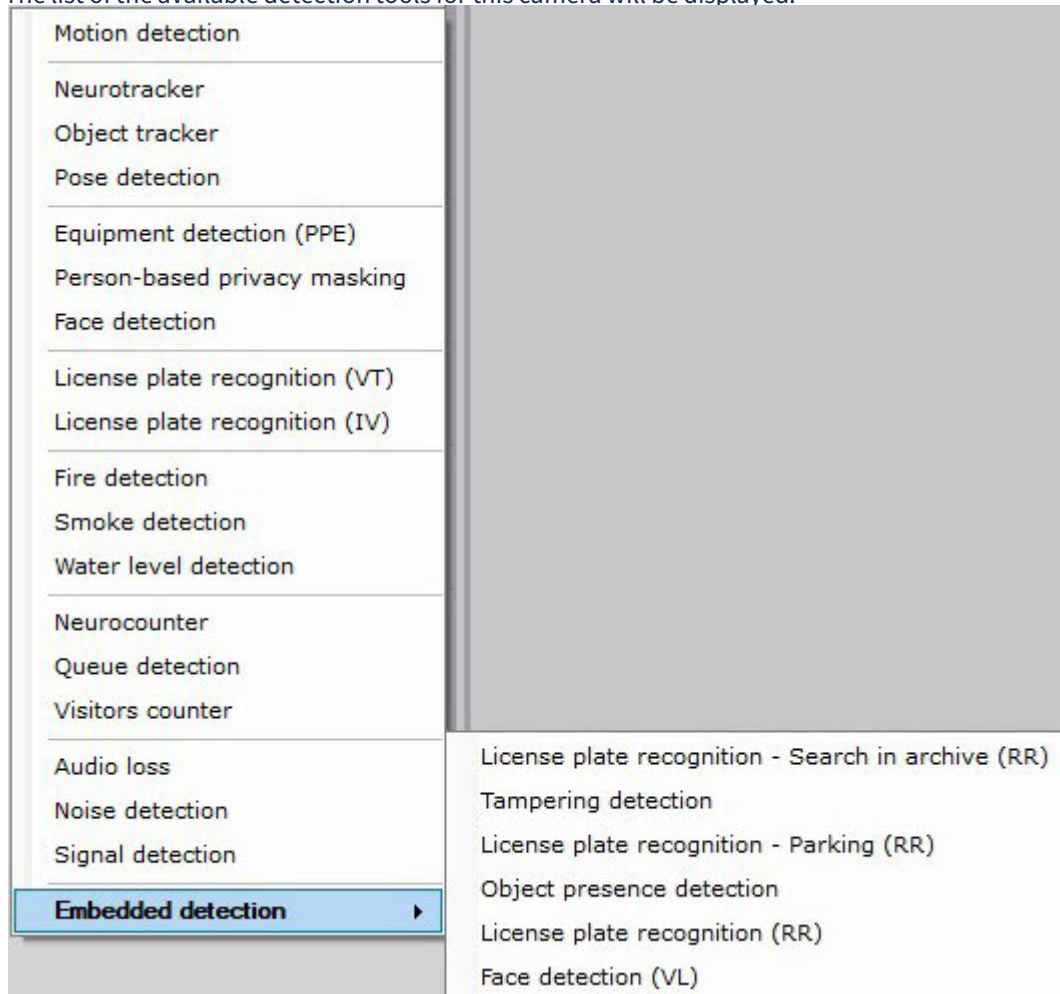
Detection tool	Windows x64			Linux AMD64		
	CPU	GPU	VPU	CPU	GPU	VPU
VMD (see page 233)	✓	✓	✗	✓	✓	✗
Service video detection tool (see page 235)	✓	✗	✗	✓	✗	✗
Service audio detection tool (see page 238)	✓	✗	✗	✓	✗	✗

Object Tracker(see page 245)	✓	✗	✗	✓	✗	✗
Neural Tracker(see page 261)	✓	✓	✓	✓	✓	✓
Neural network filter(see page 245)	✓	✓	✓	✓	✓	✓
Neurocounter(see page 324)	✓	✓	✓	✓	✓	✓
Face detection tools(see page 265)	✓	✓	✗	✓	✓	✗
VT Automatic Number Plate Recognition (see page 301)	✓	✗	✓	✓	✗	✓
IV Automatic Number Plate Recognition (see page 315)	✓	✓	✗	✓	✓	✗
RR Automatic Number Plate Recognition (see page 318)	✓	✓	✗	✓	✓	✗
Smoke and Fire detection tools(see page 329)	✓	✓	✓	✓	✓	✓
Pose detection tools(see page 348)	✓	✓	✓	✓	✓	✓
Retail analytics detection tools(see page 362)	✓	✗	✗	✓	✗	✗
Water level detection tool(see page 367) without using a neural network	✓	✗	✗	✓	✗	✗
Water level detection tool(see page 367) using a neural network	✓	✓	✓	✓	✓	✓
Personal protective equipment detection tools(see page 332)	✓	✓	✓	✓	✗	✗
Person-based privacy masking(see page 343)	✓	✓	✓	✓	✓	✓

7.4.5 Creating Detection Tools

To create detection tools, do the following:

1. Click the **Create** link in the corresponding camera object tree.
The list of the available detection tools for this camera will be displayed.



2. Select the required detection tool.

Note

Service Video and Audio Detection Tools are available in the **Embedded detection** list.

3. Click the **Apply** button.

Creation of the detection tool is now complete.

Several identical detection tools can work on the same camera stream:

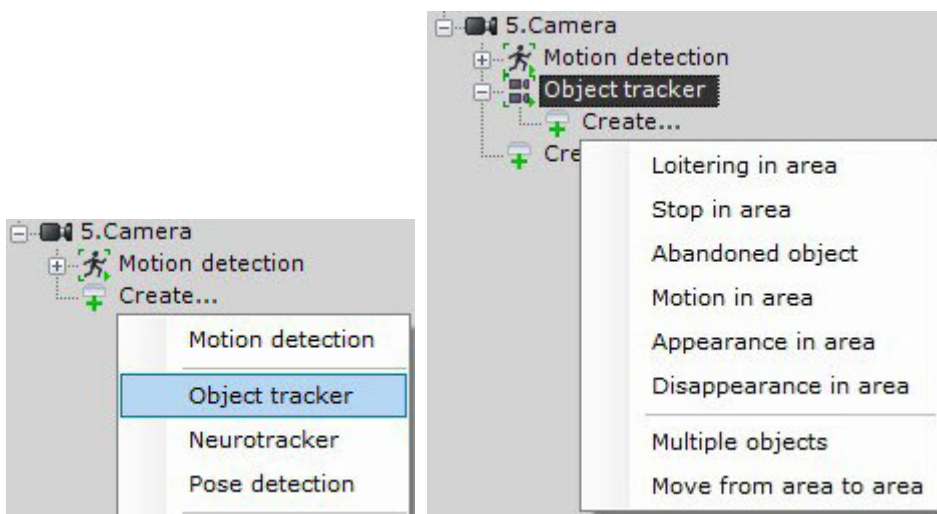
Detection tools	The number of identical detection tools on the same video camera
Configuring VMD(see page 233), Setting up Neural Tracker-based Scene Analytics detection tools(see page 261), Setting up Tracker-based Scene Analytics detection tools(see page 245), Configuring a Neurocounter(see page 324)	10

Detection tools	The number of identical detection tools on the same video camera
Configuring Water level detection (see page 367), Configuring the Queue detection tool (see page 362), Configuring the Visitors counter (see page 365), Configuring Masks Detection (see page 279)	Unlimited

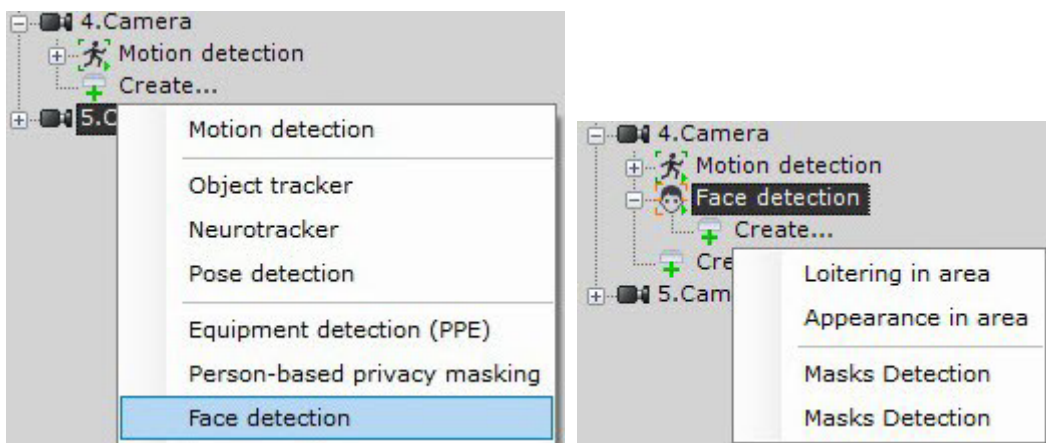
Attention!

For other detection tools and their detection sub-tools in *Arkiv* it is not possible to create the same detection tools and their detection sub-tools on the same video camera.

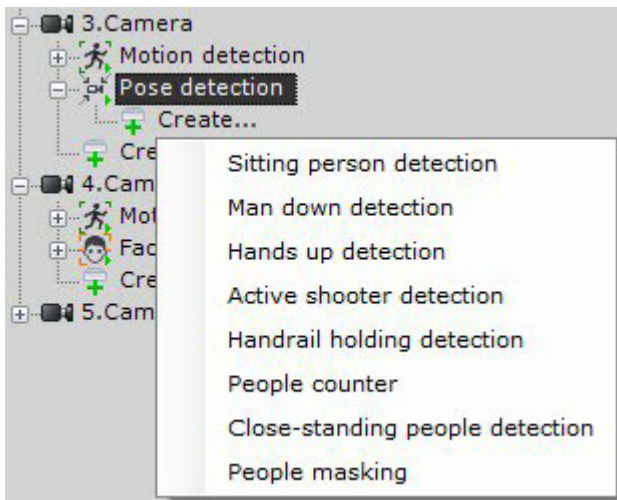
To create Scene Analytics detection tools, it is necessary to first create the **Object tracker** base object, **Neural tracker**, or **VMD**. Further Scene Analytics detection tools will be created on the basis of these objects.




Face detection tools are created in the same way: the **Face detection** base object is created, and on the basis of it other detection tools are created.



Pose detection tools are created on the basis of the **Pose Detection** object (see [Configure Pose detection tools](#)(see page 348)).



It is possible to mass create detection tools of the same type for the selected video cameras. To do this:

1. Create the required detection tool on any video camera.
2. Click the **Apply** button.
3. Click the  button and select the cameras for which you want to create the same detection tool.



4. Click the **Apply** button.

To remove a detection tool, select the required object and click the **Remove** button. To disable the detection tool, set **No** for the **Enable** parameter.

Attention!

When you delete a detection tool, all its metadata is also deleted. It is not possible to use the deleted detection tool as a source of metadata for the search.



7.4.6 VMD (video motion detection)

Video requirements for VMD

Motion detection runs properly if video match the following requirements:

1. Camera requirements:
 - a. Resolution: Min. 320x240 pixels.
 - b. Frames per second: Min. 1 fps.
 - c. Camera shaking must not cause image shifting of more than 1% of the frame size.
2. Lighting requirements:
 - a. Moderate lighting. Lighting that is too little (night) or too much (bright sunlight) may impact the quality of video analytics.
 - b. No major fluctuations in lighting levels.
3. Scene and camera angle requirements:
 - a. Moving objects must be visually separable from each other in the video.
 - b. The background must be primarily static and not undergo sudden changes.
 - c. Minimal obscuration of moving objects by static objects (columns, trees, etc.).
 - d. Reflective surfaces and harsh shadows from moving objects can affect the quality of analytics.
 - e. Long single-color objects may not be tracked properly.
4. Object requirements:
 - a. There is no noise on the video image and there are no artifacts caused by the compression algorithm.
 - b. The width and height of the objects in the image must be not less than 1% of the frame size (if resolution is over 1920 pixels) or 15 pixels for lower resolution.
 - c. The width and height of the objects in the image must not exceed 75% of the frame size.
 - d. The speed of objects in the frame must be at least 1 pixel per second.
 - e. In order to detect the object it is to be visible at not less than 8 frames.
 - f. Within two adjacent frames the object cannot move in the movement direction for the distance that is longer than its size. This condition is essential for correct calculation of the object's trajectory (track).

VMD features and specifications

The motion detection tool is triggered by motion in a video camera's field of view (FOV).

VMD metadata can be used in Scene Analytics detection tools (see [Setting up VMD-based Scene Analytics detection tools](#)(see page 264)).

Configuring VMD

- [Creating Detection Tools](#)(see page 229)
- [General Information on Configuring Detection](#)(see page 221)
- [Extra information overlay \(Masks\)](#)(see page 641)

To configure a VMD:

- To record **Motion mask** to archive, set **Yes** for the corresponding parameter (1).

Motion detection		
∨	Object features	
1	Record mask to archive	No
2	Record objects tracking	No
3	Video stream from camera	Low-quality video stream
∨	Other	
4	Alarm end delay	10
5	Camera position	Wall
6	Decode only key frames	No
7	Decoder mode	CPU
8	Frames processed per second	20
9	Motion mask	Yes
10	Object tracking	No
11	Sensitivity: Contrast	12
12	Sensitivity: Size	9

- The Video Motion Detection tool can receive tracking metadata generated by the Motion mask. The metadata are recorded into the database by default. To disable, select **No** in the **Record objects tracking** (2).
- If a camera supports multistreaming, select the stream for which detection is needed (3). Selecting a low-quality video stream allows reducing the load on the Server.
- In the **Alarm end delay** field, set a value in seconds for the time interval within which the detection tool remains triggered after motion stops (4). If motion is re-detected within this interval, no new event will be created.
- To reduce false alarms rate from a fish-eye camera, you have to position it properly (5). For other devices, this parameter is not valid.
- If necessary, enable the video stream grooming (6). In this case, only the I-frames will be decoded.

❑ Important

This setting applies to all codecs. If a codec has keyframes and p-frames, the keyframe is decoded no more often than every 500 milliseconds. For the MJPEG codec, each frame is considered to be I-frame.

This feature reduces the Server load but, as can be expected, negatively impacts the quality of detection.

This setting should be activated on "blind" Servers (Servers that do not display video) on which it is necessary to perform detection.

- Select a processing resource for decoding video streams (7). When you select a GPU, a stand-alone graphics card takes priority (when decoding with NVidia NVDEC chips). If there's no appropriate GPU, the decoding will use the Intel Quick Sync Video technology. Otherwise, CPU resources will be used for decoding.
- Set the frame rate value for the detection tool to process (8). This value should be in the range [0,1016; 100].
- The VMD analyzes differences between the current frame and the static background (11, 12). Depending on a particular scene, we recommend the following sensitivity values for contrast and size:
 - Maximum sensitivity (street scenes where target objects are smaller):
 - Sensitivity: contrast** = 16.
 - Sensitivity: size** = 10.
 - Medium sensitivity (default values for generic scenes):
 - Sensitivity: contrast** = 12.
 - Sensitivity: size** = 9.
 - Low sensitivity (indoor cameras with an average distance to object of ca. 4m):
 - Sensitivity: contrast** = 8.

ii. **Sensitivity: size** = 8.

For your convenience with setting sensitivity value, in the preview window you can see the Motion mask. To disable it, select **No** in the **Motion mask (9)** field.



If there is motion, but it does not exceed the threshold value (because of the detection sensitivity), the mask cells are colored green. If motion triggers VMD, the cells turn red.

10. To get tracked objects and their parameters (percentage of the FoV width/height, color) displayed in the Preview window, select **Yes** in the **Object tracking (10)**.
11. By default, VMD (video motion detection) covers the entire FoV. In the FoV, you can set exclude areas – closed areas, inside of which you want no detection. Exclude area are created similar to scene analysis configuration (see [Setting General Zones for Scene analytics detection tools](#)(see page 248)).
12. Click **Apply**.

VMD configuration is now complete.

[Checking the Triggering of a Detection Tool](#)(see page 378)

7.4.7 Tampering Detection

Functions of tampering detection

The camera tampering detection analyzes the video image to determine the nature of its change.

Name of detection tool analysis	Analysis result
Compression artifacts analysis	The detection triggers when compression artifacts appear on the image

Name of detection tool analysis	Analysis result
Quality degradation analysis	<p>The detection triggers when the video image received from a video camera loses quality.</p> <p>For example, the detection tool may trigger upon excessive light, loss of focus, lens blocking, or sudden drop in scene illumination.</p>
Image noise analysis	<p>The detection triggers when video noise appears on the image</p> <p>For example, the detection tool may trigger upon low bit rate or ripples in the image (snow)</p>
Scene change analysis	<p>The detection triggers when the background of the video image changes, indicating a change in the position of the video camera in space</p>
Blurred image analysis	<p>The detection triggers when the blurred contours appear on the image.</p> <p>For example, the detection tool may trigger when the image is blurry due to a dirty lens.</p>

Video requirements for tampering detection

To ensure the correct operation of the tampering detection, the following requirements should be met:

1. Camera requirements:
 - a. Resolution: Min. 320x240 pixels.
 - b. Frames per second: Min. 1 fps.
 - c. Color: video analytics work with both black-and-white and color images.
 - d. Camera shaking must not cause image shifting of more than 1% of the frame size.
2. Lighting requirements:
 - a. Moderate lighting. Lighting that is too little (night) or too much (bright sunlight) may impact the quality of video analytics.
 - b. No major fluctuations in lighting levels.
3. Scene and camera angle requirements:
 - a. Moving objects must be visually separable from each other in the video.
 - b. The background must be primarily static and not undergo sudden changes.
 - c. Minimal obscuration of moving objects by static objects (columns, trees, etc.).
 - d. Reflective surfaces and harsh shadows from moving objects can affect the quality of analytics.
 - e. Long single-color objects may not be tracked properly.
4. Object requirements:
 - a. There is no noise on the video image and there are no artifacts caused by the compression algorithm.
 - b. The width and height of the objects in the image must be not less than 1% of the frame size (if resolution is over 1920 pixels) or 15 pixels for lower resolution.
 - c. The width and height of the objects in the image must not exceed 75% of the frame size.
 - d. The speed of objects in the frame must be at least 1 pixel per second.
 - e. In order to detect the object it is to be visible at not less than 8 frames.

- f. Within two adjacent frames the object cannot move in the movement direction for the distance that is longer than its size. This condition is essential for correct calculation of the object's trajectory (track).

Configuring tampering detection

[Video requirements for tampering detection](#)(see page 236)

To set up the Tampering detection, do the following:

1. If a camera supports multi-streaming, select the stream for which detection is needed (**1**). Selecting a low-quality video stream allows reducing the load on the Server.

Tampering detection	
▼ Object features	
1 Video stream from camera	Low-quality video stream
▼ Other	
7 Blurred image analysis	Yes
Compression artifacts analysis	Yes
2 Decode only key frames	Yes
3 Decoder mode	CPU
4 Event duration to trigger detection (sec)	20
5 Frames processed per second	20
7 Image noise analysis	Yes
7 Quality degradation analysis	Yes
Scene change analysis	Yes
6 Sensitivity	50

2. The default setting for all detection tools is **Decode only key frames (2)**. In this case, only key frames are decoded. To disable the decoding of key frames, select **No** in the corresponding field.

Attention!

This feature reduces the Server load but, as can be expected, negatively impacts the quality of detection.

This setting should be activated on "blind" Servers (Servers that do not display video) on which it is necessary to perform detection.

For the MJPEG codec, each frame is considered a key frame.

3. Select a processing resource for decoding video streams (**3**). When you select a GPU, a stand-alone graphics card takes priority (when decoding with NVIDIA NVDEC chips). If there's no appropriate GPU, the decoding will use the Intel Quick Sync Video technology. Otherwise, CPU resources will be used for decoding.
4. Set the frame rate value for each detection tool to process (**5**). This value should be in the range [0.016, 100].

Attention!

Frames processed per second and **Decode only key frames** parameters **are** correlated.

If no local Clients are connected to a Server, the following rules are set for remote Clients:

- If the interval between consecutive I-frames exceeds the value specified in the **Frames processed per second** field, the detection tool will process I-frames.
- If the I-frame frequency is lower than the value specified in the **Frames processed per second** field, the detection tool will use the set value.

If at least one local Client connects to the Server, the detection tool is forced to use the set value. After the local Client disconnects, the indicated rules become valid again.

5. Select one or more analyzes to be applied to the video image. If you select Blurred image analysis, Compression artifacts analysis, Image noise analysis, Quality degradation analysis, or Scene change analysis, configure the following parameters:
 - a. **Event duration to trigger detection (sec)** is the maximum time of the event duration after which the detection tool will trigger (4). But, the detection tool can trigger even earlier if the algorithm undoubtedly determines the noise. If the detection tool does not trigger after the event duration time expires, it means that the corresponding image defect was not detected with the specified detector sensitivity (6).
 - b. **Sensitivity** of detection tool operation in standard units from 0 to 100 (6).
6. To save settings, click the **Apply** button.

Tampering detection is now configured.

7.4.8 Service Audio Detection Tools

Functions of Service Audio Detection Tools

The following detection tools enable analysis of the audio signal from a microphone.

Name of a Detection Tool object	Detection description
Audio loss	A detection tool which is triggered by the line break from the microphone to the Server (complete absence of sound).
Signal detection	A detection tool which is triggered by the reception of an audio signal from an audio device.
Noise detection	A detection tool which is triggered by the appearance of noise.

Attention!

Audio loss detection may operate incorrectly with video cameras emitting a background signal with a non-zero volume, even if the integrated microphone is physically disabled.

Set Parameters of Audio Detection

To set audio detection tools, do the following:

1. In the **Period** field (1), enter a time value in milliseconds. This parameter sets the time interval after which a portion of the audio stream is analyzed. The value should be within the range [0, 65535]. If the value is 0,

each portion of the audio stream is analyzed.

Signal detection	
▼ Object identification	
Enable	Yes
Name	Signal detection
▼ Other	
Decoder mode	CPU
2 Percentage of signal in audio stream	2
1 Period	0

- For the signal detection tool, set the threshold in percentage (**2**). The tool triggers on exceeding the threshold. Set the value by trial-and-error.
- For the noise detection tool, set the threshold in percentage (**3**). The tool triggers on exceeding the threshold. Set the value by trial-and-error.

Noise detection	
▼ Object identification	
Enable	Yes
Name	Noise detection
▼ Other	
Decoder mode	CPU
3 Percentage of noise in audio stream	2
Period	0

- To save settings, click the **Apply** button.

7.4.9 Scene Analytics detection tools

General information on Scene Analytics detection tools

Arkiv uses two different trackers for moving objects detection and metadata calculation:

- Object Tracker** is a primary tool.
- Neural Tracker** is essentially the same but operates through neural networks. The neural one is more accurate and detects even static objects, but it requires more computing resources.

The Scene Analytics detection tools work with both trackers.

Attention!

The abandoned objects detection tool works only with the primary tracker.

When created, both **Object Tracker** and **Neural Tracker** objects are enabled by default. Tracked objects' parameters (relative width and height, color) are displayed in the camera window.

Note

Up to 25 objects can be tracked at the same time.



Functions of Scene Analytics detection tools

The following detection tools enable analysis of the situation in a video camera's field of view.

Name of a Detection Tool object	Detection description
Motion in area	Motion in Area detection tool. Important! This tool is not triggered if an object enters the area (refer to Appearance in area).
Stop in area	Non-activity detection tool. Important! This tool is not triggered if an object exits the area (refer to Disappearance in area).
Appearance in area	Entry into Area detection tool. Important! This tool does is not triggered if an object appears inside the area without crossing its perimeter (refer to Motion in Area).
Disappearance in area	Exit from Area detection tool. Important! This tool does is not triggered if an object disappears (or becomes idle) inside the area without crossing its perimeter (refer to Stop in Area).
Loitering	Detection tool triggered by the lengthy presence of an object in an area of a video camera's field of view.

Name of a Detection Tool object	Detection description
Abandoned object	Detection tool triggered by the appearance of an abandoned object in an area of a video camera's field of view.
Line crossing	Detection tool triggered by the trajectory of an object crossing a virtual line.
Multiple objects	Detection tool is triggered when the number of objects within the designated area exceeds a predefined value.
Move from area to area	Detection tool is triggered when an object moves from one pre-specified area to another within the scene.

Attention!

To detect any motion within an area, you need to apply two detection tools: **Motion in Area** and **Appearance in area**.

Note

Neural filter and Neural Tracker require Addon Neuro Pack to be installed (see [Installing DetectorPack addons](#)(see page 50)).

Video requirements for scene analytics detection tools

Video requirements for object tracker-based scene analytics detection tools

For video analytics to work correctly, the following requirements must be met:

1. Camera requirements:
 - a. Resolution min. 640x360 pixels.

Attention!

Pixel resolutions over 800x600 are not recommended for this detection tool. Higher resolutions lead to increased RAM consumption and CPU load with no significant increase in tracker's performance.
 - b. Frames per second: min. 6 fps.
 - c. Color: video analytics work with both black-and-white and color images.
 - d. Camera shaking must not cause image shifting of more than 1% of the frame size.
2. Lighting requirements:
 - a. Moderate lighting. Lighting that is too little (night) or too much (bright sunlight) may impact the quality of video analytics.
 - b. No major fluctuations in lighting levels.
3. Scene and camera angle requirements:
 - a. Moving objects must be visually separable from each other in the video.

- b. The background must be primarily static and not undergo sudden changes.
 - c. Minimal obscuration of moving objects by static objects (columns, trees, etc.).
 - d. Reflective surfaces and harsh shadows from moving objects can affect the quality of analytics.
 - e. Long single-color objects may not be tracked properly.
4. Object requirements:
- a. There is no noise on the video image and there are no artifacts caused by the compression algorithm.
 - b. The width or height of the objects in the image must be not less than 1% of the frame size (if resolution is over 1920 pixels) or 15 pixels for lower resolution.
 - c. The width or height of the objects in the image must not exceed 75% of the frame size.
 - d. The speed of objects in the frame must be at least 1 pixel per second.
 - e. In order to detect the object it is to be visible at not less than 8 frames.
 - f. Within two adjacent frames the object cannot move in the movement direction for the distance that is longer than its size. This condition is essential for correct calculation of the object's trajectory (track).

Video requirements for object tracker (with neural filter)-based scene analytics detection tools

For video analytics to work correctly, the following requirements must be met:

1. Camera requirements:
 - a. Resolution min. 640x360 pixels.
 - b. Frames per second: min. 6 fps.
 - c. Color: video analytics work with both black-and-white and color images.
 - d. Camera shaking must not cause image shifting of more than 1% of the frame size.
2. Lighting requirements:
 - a. Moderate lighting. Lighting that is too little (night) or too much (bright sunlight) may impact the quality of video analytics.
 - b. No major fluctuations in lighting levels.
3. Scene and camera angle requirements:
 - a. Moving objects must be visually separable from each other in the video.
 - b. The background must be primarily static and not undergo sudden changes.
 - c. Minimal obscuration of moving objects by static objects (columns, trees, etc.).
 - d. Reflective surfaces and harsh shadows from moving objects can affect the quality of analytics.
 - e. Long single-color objects may not be tracked properly.
4. Object requirements:
 - a. There is no noise on the video image and there are no artifacts caused by the compression algorithm.
 - b. The width or height of the objects in the image must be not less than 1% of the frame size (if resolution is over 1920 pixels) or 15 pixels for lower resolution.
 - c. The width or height of the objects in the image must not exceed 75% of the frame size.
 - d. The speed of objects in the frame must be at least 1 pixel per second.
 - e. In order to detect the object it is to be visible at not less than 8 frames.
 - f. Within two adjacent frames the object cannot move in the movement direction for the distance that is longer than its size. This condition is essential for correct calculation of the object's trajectory (track).
5. [Camera requirements for neural filter operation](#)(see page 245).

Video requirements for VMD-based scene analytics detection tools

For video analytics to work correctly, the following requirements must be met:

1. Camera requirements:
 - a. Resolution min. 640x360.
 - b. Frames per second: min. 6 fps
 - c. Color: video analytics work with both black-and-white and color images.

- d. Camera shaking must not cause image shifting of more than 1% of the frame size.
- 2. Lighting requirements:
 - a. Moderate lighting. Lighting that is too little (night) or too much (bright sunlight) may impact the quality of video analytics.
 - b. No major fluctuations in lighting levels.
- 3. Scene and camera angle requirements:
 - a. Moving objects must be visually separable from each other in the video.
 - b. The background must be primarily static and not undergo sudden changes.
 - c. Minimal obscuration of moving objects by static objects (columns, trees, etc.).
 - d. Reflective surfaces and harsh shadows from moving objects can affect the quality of analytics.
 - e. Long single-color objects may not be tracked properly.
- 4. Object requirements:
 - a. There is no noise on the video image and there are no artifacts caused by the compression algorithm.
 - b. The width or height of the objects in the image must be not less than 1% of the frame size (if resolution is over 1920 pixels) or 15 pixels for lower resolution.
 - c. The width or height of the objects in the image must not exceed 75% of the frame size.
 - d. The speed of objects in the frame must be at least 1 pixel per second.
 - e. In order to detect the object it is to be visible at not less than 8 frames.
 - f. Within two adjacent frames the object cannot move in the movement direction for the distance that is longer than its size. This condition is essential for correct calculation of the object's trajectory (track).

Video stream and scene requirements for neural tracker operation

The neural tracker operation imposes the following requirements:

1. To the video stream from the camera:
 - a. The resolution is at least 640x360 pixels. It is also not recommended to use a resolution higher than 1920x1080, since higher resolution does not increase the detection quality, but significantly increases the consumption of resources. The optimal resolution for solving typical tasks is 1280x720 (see [Examples of configuring neural tracker for solving typical tasks](#)(see page 265)).
 - b. The frame rate per second in the video stream from the camera is at least 8 for solving typical tasks.
 - c. Both colorless (gray) and color images.
2. To lighting:
 - a. Lighting in the scene is at least 50 lux per square meter. In conditions of insufficient or excessive lighting (night or light-striking), stable operation of the video analytics is not guaranteed.
 - b. There are no abrupt changes in lighting.
3. To the scene and camera angle:
 - a. Moving objects are visually separable from each other.
 - b. The background is mostly static and does not change abruptly.
 - c. Moving objects are minimally obscured by static objects in the scene (columns, trees, etc.).
 - d. The analyzed scene does not have reflective surfaces and sharp shadows from moving objects. If present, they should be masked.
 - e. Camera shake does not result in image offsets greater than 1% of the frame size.

Attention!

Correct operation of the neural tracker is not guaranteed when using a fish-eye lens.

- [Hardware requirements for neural analytics operation](#)(see page 23)
- [Objects image requirements for neural tracker](#)(see page 244)

Objects image requirements for neural tracker

To ensure the correct operation of detection tools based on the neural tracker, the following image requirements should be met:

1. The object to be detected is clearly distinguishable by the human eye.
2. The width or height of the objects does not exceed 75% of the frame size.
3. The image is not noisy and not distorted by compression algorithm artifacts.
4. The duration of the object's visibility is at least 6 frames.
5. The object moves in the certain direction between two adjacent frames at a distance which does not exceed the object's size. This condition is necessary for the correct calculation of the trajectory of the object (track).
6. The minimum value of pixel density per meter is observed:

Image resolution	Object type	Minimum pixel density per meter (ratio of the object width in pixels to the object width in meters)	Minimum object size in pixels, width x height	Ratio of the object width to the frame width as a percentage
1920x1080	Human	55	~25x105	~3%
1280x720	Human	35	~17x70	~3%
640x360	Human	17	~10x42	~3%
1920x1080	Light vehicle (2 axles)	55	~354x300	~20%
1280x720	Light vehicle (2 axles)	35	~240x205	~20%
640x360	Light vehicle (2 axles)	17	~132x112	~20%

[Video stream and scene requirements for neural tracker operation](#)(see page 243)

Camera requirements for abandoned objects detection

Make sure the following requirements for abandoned object detection are met:

1. Camera requirements:

1. Resolution must be not less than 640x480 pixels.
2. Color: analytics works both with color and monochromatic images.
3. It is not allowed to the image shift be more than 1% from the frame size due to camera shake.
 - Lighting requirements:
 1. Moderate lighting. The quality of analytics performance can be lower in case of low lighting (night) or over lighting (overexposure).
 2. There must be no dramatic changes in lighting.
 - Scene and camera angle requirements:
 1. Background is mostly static and is not changed.
 2. Incorrect analytics performance can be caused by reflective surfaces.
 3. Abandoned objects are hidden by moving objects not longer than 10% of the time.
 - Object images requirements:
 1. An abandoned object must be visible on the image.
 2. The digital noise and compression-related artifacts are minimal.
 3. The width and height of the objects in the image must be not less than 1% of the frame size (if resolution is over 1920 pixels) or 15 pixels for lower resolution.
 4. The width and height of the objects in the image must not exceed 25% of the frame size.

If these conditions are in place, the abandoned object detection tool is guaranteed to:

- detect 92 items out of 100;
- keep false positives to 20 out of 100.

Camera requirements for neural filter operation

To operate the neural filter, a camera must match the following requirements:

1. Use color cameras. Monochrome image may noticeably decrease the detection quality.
2. Video resolution is no less than 640x360.
3. Frame rate is no less than 6 fps.
4. An object must occupy no less than 5% of the FoV width/height.
5. Objects must be visually separated from the background as well as from each other.

Attention!

We cannot guarantee normal operation of the neural filter with a fisheye camera.

Configuring Scene Analytics Detection Tools

Setting up Tracker-based Scene Analytics detection tools

Setting general parameters of Tracker-based Scene Analytics detection tools

Some parameters can be configured for Scene Analytics detection tools simultaneously. To configure them, do as follows:

1. Select the **Object tracker** object.

Object tracker	
Object identification	
Enable	Yes
Name	Object tracker
Object features	
1 Record objects tracking	Yes
2 Video stream from camera	Low-quality video stream
Other	
Abandoned object detection	No
Abandoned object detection sensitivity	9
Alarm on object's max. idle time in area	60
3 Auto sensitivity	Yes
4 Camera position	Wall
5 Decoder mode	CPU
Long-time abandoned object detection	No
Max. object height	100
Max. object width	100
Min. object height	2
Min. object width	2
6 Motion detection sensitivity	25
Advanced detection settings	
7 Antishaker	No
8 Frame size change	1280
Leveling rod height	20
Object calibration	No
9 Time of object in DB	3

2. By default, video stream metadata are recorded to the database. You can disable the recording by selecting **No** in the **Record objects tracking** list (**1**).

Attention!

Video decompression and analysis are used to obtain metadata, which causes high Server load and limits the number of video cameras that can be used on it.

3. If the video camera supports multistreaming, select the stream for which detection is needed (**2**). Selecting a low-quality video stream allows reducing the load on the Server.

Attention!

To display the object tracks properly, make sure that all video streams from multistreaming camera have the same aspect ratio settings.

4. If you need to automatically adjust the sensitivity of the scene analytics detection tools, select **Yes** in the **Auto sensitivity** list (**3**).

Note

It is recommended to enable this option if the lighting fluctuates significantly in the course of the video camera operation (for example, in outdoor conditions).

5. To reduce the number of false positives from a fish-eye camera, you have to position it properly (**4**). For other devices, this parameter is not valid.

6. Select a processing resource for decoding video streams (**5**). When you select a GPU, a stand-alone graphics card takes priority (when decoding with NVIDIA NVDEC chips). If there is no appropriate GPU, the decoding will use the Intel Quick Sync Video technology. Otherwise, CPU resources will be used for decoding.
7. In the **Motion detection sensitivity** field (**6**), set the sensitivity of the scene analytics detection tools to motion in the range [1; 100].
8. To smooth camera shake, set **Yes** for the **Antishaker** parameter (**7**). This parameter is recommended to use only when the camera shake is evident.
9. Analyzed framed are scaled down to a specified resolution (**8**, 1280 pixels on the longer side). This is how it works:
 - a. If the longer side of the source image exceeds the value specified in the **Frame size change** field, it is divided by two.
 - b. If the resulting resolution falls below the specified value, it is used further.
 - c. If the resulting resolution still exceeds the specified limit, it is divided by two, etc.

Note

For example, the source image resolution is 2048*1536, and the specified value is set to **1000**.

In this case, the source resolution will be halved two times (512*384), as after the first division, the number of pixels on the longer side exceeds the limit (1024 > 1000).

Note

If detection is performed on a higher resolution stream and detection errors occur, it is recommended to reduce the compression.

10. Enter the time interval in seconds, during which object properties will be stored in the **Time of object in DB** field (**9**). If the object leaves and enters the FOV within the specified time, it will be identified as one and the same object (same ID).
11. If necessary, configure the neural network filter (see [Hardware requirements for neural analytics operation](#)(see page 23)). The neural network filter processes the results of the tracker and filters out false positives on complex video images (foliage, glare, etc.).

Attention!

A neural network filter can be used either for analyzing moving objects, or for analyzing abandoned objects only. You cannot operate two neural networks simultaneously.

- a. Enable the filter by selecting **Yes** (**1**).

Neural network filter	
2	Abandoned object filter file
	Abandoned object filter mode Nvidia GPU 0
1	Enable filter <input checked="" type="checkbox"/> Yes
3	Moving object filter file <input checked="" type="checkbox"/> D:/human_car.ann
	Moving object filter mode Nvidia GPU 0

- b. Select the processor for the neural network – CPU, one of GPUs, or one of Intel GPUs (**2**, see [Hardware requirements for neural analytics operation](#)(see page 23), [General Information on Configuring Detection](#)(see page 221)).

[Camera requirements for neural filter operation](#)(see page 245)

Attention!

It may take several minutes to launch the algorithm on NVIDIA GPU after you apply the settings.

- c. Select a neural network (**3**). To access a neural network, contact [Inaxsys](#) technical support. If no neural network file is specified, or the settings are incorrect, the filter will not operate.


12. Click the **Apply** button.

The general parameters of the Scene Analytics detection tools are now set.

Setting General Zones for Scene analytics detection tools

By default, the entire FoV is a Scene analytics detection tools zone. If you need to exclude parts of the scene prone to false alarms from detection (leaves, water, etc.), you should set exclude areas – zone with Scene analytics detection tools and metadata generation disabled.

To do so, follow the steps:


1. Select the **Object Tracker** object and click the  button.
2. In the FoV, set the nodes of the closed area, in order, inside of which you want no detection.




Note


When the area is being constructed, the nodes are connected by a two-color dotted line which outlines the area's borders.

Note

For your convenience, you can click the  button and configure the mask on a still frame/snapshot. To undo, click this button again.

Action	Result
--------	--------

Click in the viewing tile.	Creates a new area node
Right-click on a created node.	Deletes the area node
Position the cursor on a node and hold down the left mouse button while you move the mouse.	Moves the area node
Click the  button.	Deletes the area

Once the area is closed, you will see the  buttons on the borderlines. If you click them, a new node is added. This allows you to be more flexible with zoning.

3. Set the required masking areas.
4. Click the **Apply** button.

You have successfully created the detection zone.

Note

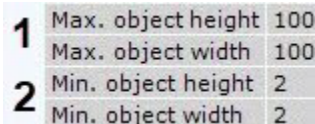
These settings will apply for all Scene analytics detection tools on the selected camera.

Set the minimum and maximum object size for detection

You can set the minimum and maximum object size for detection by specifying numerical values or reference areas on screen. Objects of all sizes beyond the set values will not trigger detection.

To specify the size, do as follows:

1. Select the **Object tracker** object.
2. In the **Max. object height** and **Max. object width** fields (1), enter the maximum height and width of a detectable object as a percent of the FOV height. The values should be in the range [0,05; 100].



Attention!


If you activate the **Object calibration** parameter in tracker settings, please note that in this case min/max size of objects is specified in decimeters, not in FOV percentage (see [Configure Perspective](#)(see page 250)).

3. In the **Min. object height** and **Min. object width** fields (2), enter the minimum height and width of a detectable object as a percent of the FOV height. The values should be in the range [0,05; 100].
4. Click the **Apply** button.

To set the reference area on screen, do as follows:


1. Select the **Object tracker** object.




2. Click the **min**  button and set the minimum size of a detectable object. You can do so by dragging and dropping the nodes of the reference area.



Note

For your convenience, you can click the  button and configure the mask on a still frame/snapshot. To undo, click this button again.

3. Click the **max**  button and set the maximum size of a detectable object.



Note

By default, the maximum size is the whole size of FOV, so the nodes are located in the corners.

4. Click the **Apply** button.

You have successfully set the minimum and maximum object size for detection.




Note

These settings will apply for all Scene Analytics detection tools on the selected camera.

Configure Perspective


The Perspective enhances detection tools performance and helps evaluate real sizes of objects based on simplified calibration system.

To configure the perspective, do the following:


1. Select the **Object tracker** object and click the  button.
2. Set the size of the same object in different areas of the field of view. To create a calibration length, left-click within the video image in the viewing tile and add two anchor points. Set at least three calibration lengths. You can resize the length by stretching its anchor points . You can move it on screen by [dragging and dropping](#)⁹⁸ .



Note

For your convenience, you can click the  button and configure the mask on a still frame/snapshot. To undo, click this button again.

Note

To delete it, click the  button.

3. Select **Yes** in the **Object calibration** option (1).

Advanced detection settings	
Antishaker	No
Frame size change	1280
2 Leveling rod height	20
1 Object calibration	No
Time of object in DB	3

4. Enter the height in decimeters of the object you want to find in the **Leveling rod height** field (2).

Attention!

Objects smaller than the specified value will not be detected.

5. Click the **Apply** button.

⁹⁸ https://en.wikipedia.org/wiki/Drag_and_drop

Perspective is now configured.

Note

These settings will apply for all Scene Analytics detection tools on the selected camera.

Recommendations on configuring Object Tracker

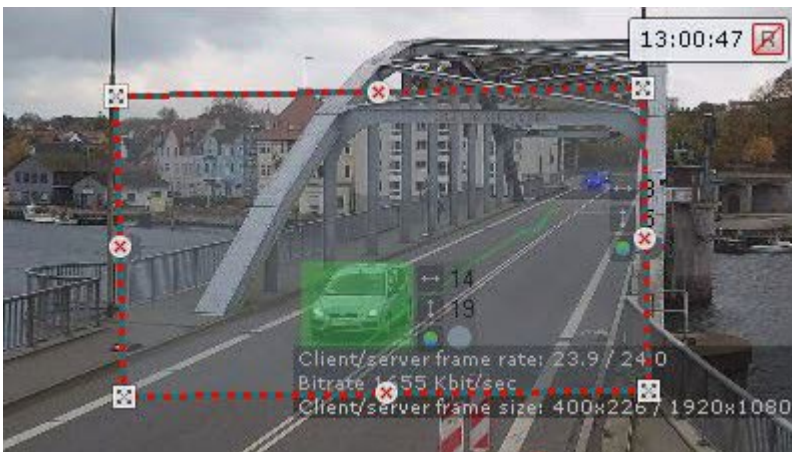
To avoid false positives of Scene Analytics detection tools, please follow the recommendations here:

1. Configure the **Tracker object** object iteratively and check operation quality in each iteration.
2. The parameters that affect operation quality most are: **Minimum size**, **Maximum size** (see [Set the minimum and maximum object size for detection](#)(see page 249)), and **Sensitivity** (see [Setting general parameters of Tracker-based Scene Analytics detection tools](#)(see page 245)).
3. It is recommended to use **Auto sensitivity** mode to ensure quality of the Tracker operation in changing lighting conditions.
4. If lighting is stable, it could be reasonable to adjust the **Sensitivity** value manually. Set **Sensitivity** value about 35 to detect objects with low contrast or about 15 to detect contrast object.
5. Minimum size is to be selected so that it is a little less than typical object size on the image.
6. Maximum size is to be selected so that it is a little greater than typical object size on the image, considering that the object can be joined with its shadow.
7. Lowering the **Time of Object in DB** allows excluding triggering of false static objects, while setting it to a higher value could allow not breaking off alarms for overlapping or temporarily disappearing objects in some cases.

Configuring the Detection Zone

For each type of Scene analytics detection tool you can set a detection zone.

After creating a detection tool, its rectangular detection zone is displayed in a bright color. If you have set privacy masks, they are grayed out (see [Setting General Zones for Scene analytics detection tools](#)(see page 248)).




Configuration of the detection zone is carried out in the same way as for general zones for Scene analytics detection tools (see [Setting General Zones for Scene analytics detection tools](#)(see page 248)).

Configuring detected objects

You can set a number of parameters that describe the objects that should cause a trigger for each Scene analytics detection tool.

To configure the settings of the detected objects, do the following:

1. Select the corresponding Scene analytics detection tool.

	Other	
1	Maximum object height	100
2	Maximum object speed	500
3	Maximum object width	100
4	Minimum object height	0.1
5	Minimum object width	0.1
6	Minimum object speed	0
7	Object class	Any
8	Object color	
9	X-axis offset	15
10	Y-axis offset	10

2. Set the maximum and minimum height of the object that should cause a trigger as a percentage of the frame size (**1, 4**). The values should be in the range [0,05; 100].
3. Set the maximum and minimum speed per second of the object that should cause a trigger as a percentage of the frame size (**2, 6**). The values should be in the range [0; 500].

Note

In *Arkiv* speed is a conditional value. It is calculated using the values of different dimensions. The speed calculation algorithm takes into account both the frame width and the frame height. For visual understanding of the speed values, it is recommended to go to the speed configuration when searching in the archive (see [Configuring minimum and maximum object speed](#)(see page 713)).

Note

These parameters are not set for the Abandoned object detection tool.

4. Set the maximum and minimum width of the object that should cause a trigger as a percentage of the frame size (**3, 5**). The values should be in the range [0,05; 100].
5. Select the class of the object that should cause a trigger (**7**).

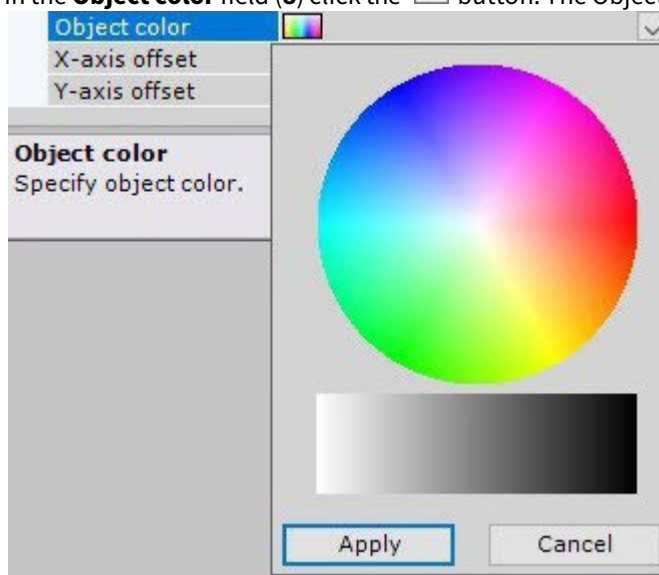
Note

A **Group** is a group of two or more people moving beside each other for some time. If you select this class of object, the detection tool will not trigger, if it detects the movement of one person. If you select the **Human** class, the detection tool will not trigger, if it detects the movement of several people beside each other.

Any
Face
Face and group
Human
Human and group
Group
Vehicle
Vehicle and group

6. Set a color (or color range) of the object that should cause a trigger:

- a. In the **Object color** field (8) click the  button. The Object color dialog box opens.



- b. Set the color range of the object with **drag-and-drop**⁹⁹ on the RGB or black-and-white color palette.



Note

Any click on the palette is interpreted as the beginning of a new range. The previous range will disappear.

To cancel a selected color, click on any palette, save the changes, and click the **Apply** button.

Attention!

Arkiv logic treats all objects as monochrome. The object color in *Arkiv* is an average of all object colors on the video image.

⁹⁹ https://en.wikipedia.org/wiki/Drag_and_drop

All objects of the specified colors will be detected. If no object color is set, the detection tool will trigger to objects of any color.


7. Set the X-axis offset and Y-axis offset as a percentage of the track area to specify the detection tool triggering area (**9, 10**). The values should be in the range [1; 50].
8. Click the **Apply** button.

Configuring the detected objects is complete.

Settings specific to Cross Line Detection

After you create and select a line crossing detection tool, you can see a virtual "tripwire" line in the FoV.

To set up line crossing detection, do the following:


1. Set up a virtual line in FoV.
 - a. Set the end points of the line .



Note

When the line is being constructed, the end points are connected by a two-color dotted line. The direction of the object's motion across the line is indicated by dotted arrows.

Action	Result
Position the cursor on an end point and, holding down the left mouse button, move the mouse	Moves the line end point
Position the cursor on the line, holding down the left mouse button, move the mouse	Moving the line

- b. By default, Line crossing detection monitors object motion across the line in both directions. To suspend detection of motion in one direction, click the button  to that direction.


Attention!

At least one direction must be selected for detection.

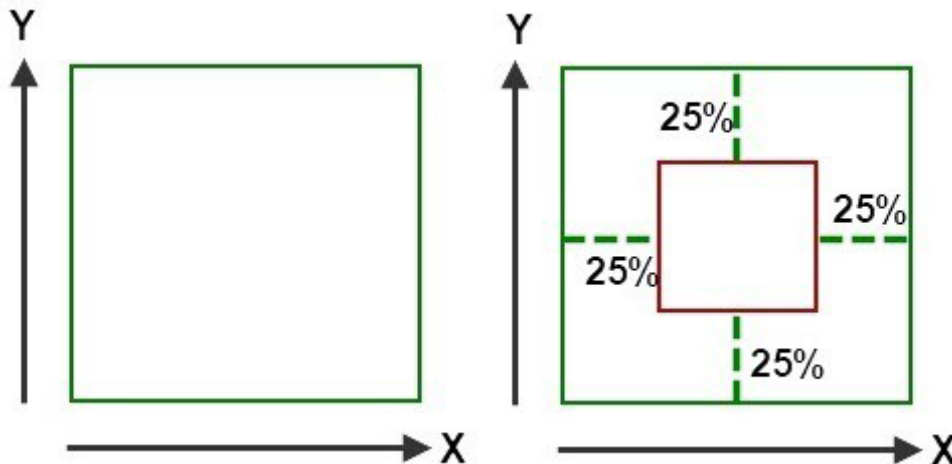
Note

An unmonitored direction of object motion is indicated by a dimmed arrow.

2. If an object in FoV performs repetitive movements near the virtual line, it may cause excessive triggering of the detection tool. In this case, set an area within the object's track which must cross the line completely to trigger the tool. To do it, set the X and Y offset values as percentage of track width and height.

Line crossing	
<input type="checkbox"/> Other	
Maximum object height	100
Maximum object speed	500
Maximum object width	100
Minimum object height	0.1
Minimum object speed	0
Minimum object width	0.1
Object class	Any
Object color	
X-axis offset	15
Y-axis offset	10

Here's an example: the green triangle is the track of the object. If you specify X and Y offset values as 25%, the tool will be triggered only if the entire red triangle goes beyond the virtual line.



3. Click the **Apply** button.

Settings specific to Abandoned object detection

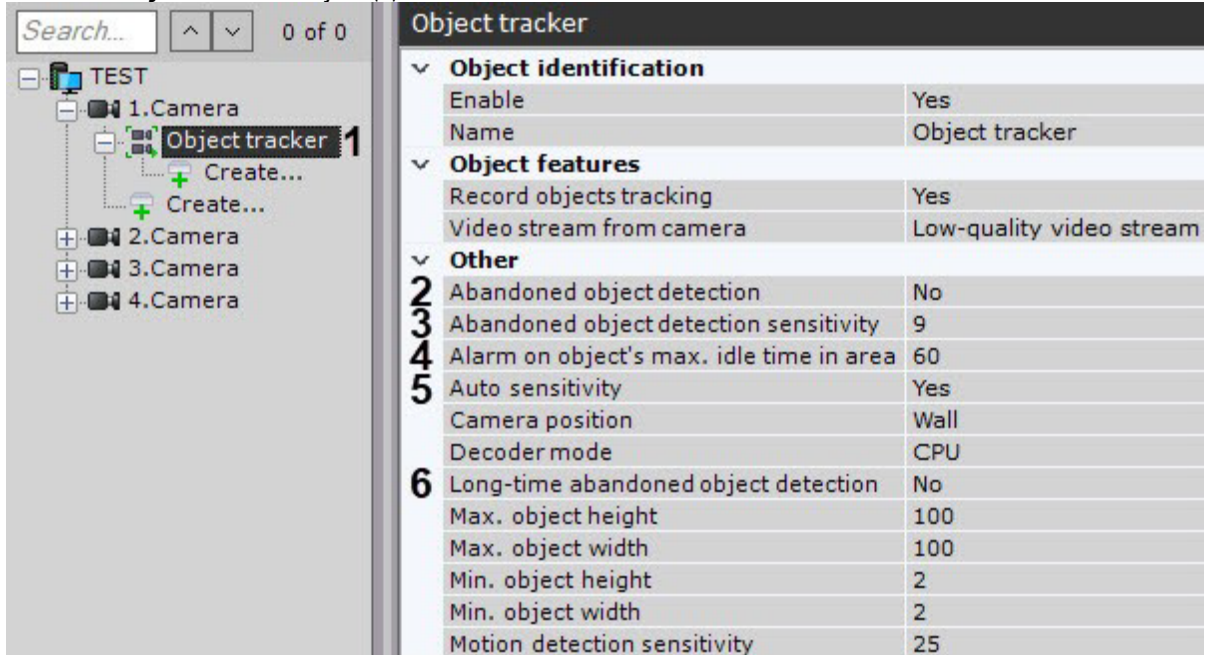
- [Camera requirements for abandoned objects detection](#)(see page 244)

Attention!

The **Abandoned object** detection can operate only with the basic **Object tracker**.

To configure Abandoned object detection, do as follows:

1. Select the **Object Tracker** object (1).



Object tracker	
Object identification	
Enable	Yes
Name	Object tracker
Object features	
Record objects tracking	Yes
Video stream from camera	Low-quality video stream
Other	
2 Abandoned object detection	No
3 Abandoned object detection sensitivity	9
4 Alarm on object's max. idle time in area	60
5 Auto sensitivity	Yes
Camera position	Wall
Decoder mode	CPU
6 Long-time abandoned object detection	No
Max. object height	100
Max. object width	100
Min. object height	2
Min. object width	2
Motion detection sensitivity	25

2. To enable the **Abandoned object detection** (2), select **Yes** for the corresponding parameter.

Note

Objects abandoned for 10 seconds or longer will be detected.

3. In the **Abandoned object detection sensitivity** field (3), set the sensitivity for **Abandoned object detection** (2) and **Long-time abandoned object detection** (6). This value should be in the range [1, 100].

Note

This parameter depends on the lighting conditions and should be chosen empirically. It is recommended to select the parameter value starting from 20.

4. In the **Alarm on object's max. idle time in area** field (4) specify the time in seconds. If the object remains idle for the time longer than the specified, it will be detected. This value should be in the range [15, 1800].

Note

This parameter is used only for the **Long-time abandoned object detection**. It is recommended to select the parameter value starting from 15.

5. To enable the **Auto sensitivity** (5), select **Yes** for the corresponding parameter.

Attention!

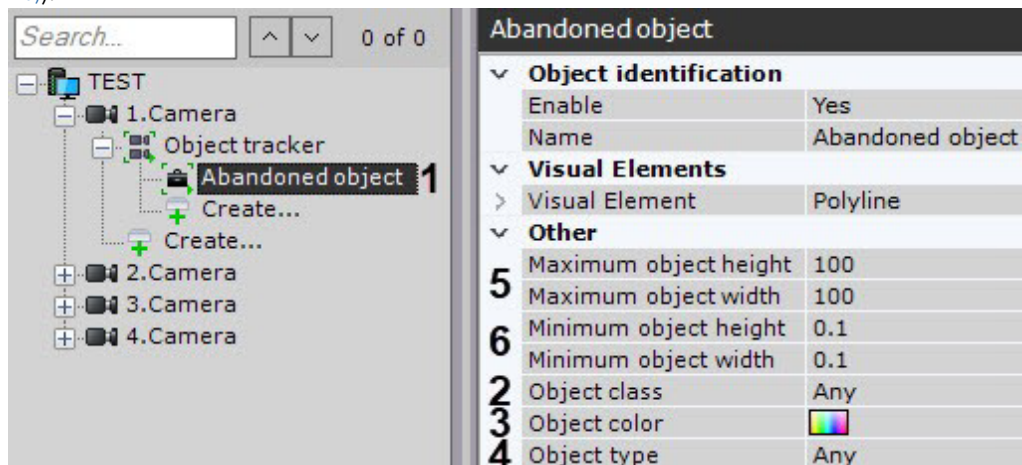
If auto sensitivity is enabled, sensitivity adjustments for moving and abandoned objects are not applied. To apply manual sensitivity adjustments, it is necessary to disable the auto sensitivity.

6. To enable the **Long-time abandoned object detection**, select **Yes** for the corresponding parameter (6).

Note

If you enable the **Long-time abandoned object detection** parameter (6) and the **Neural network filter** (see [Setting general parameters of Tracker-based Scene Analytics detection tools](#)(see page 245)), it can reduce the number of false positives during detection.

7. Under the **Object Tracker** object, create the **Abandoned object** object (see [Creating Detection Tools](#)(see page 229)).



8. To enable the **Abandoned object** detection sub-tool, do the following:
- Select object class (2).
 - Select object color (3).
 - Select object type (4).
 - Specify the maximum height and width of the object (5). The value should be in the range [0.05, 100].
 - Specify the minimum height and width of the object (6). The value should be in the range [0.05, 100].

Attention!

In the settings of the **Object tracker** detection tool and the **Abandoned object** sub-tool, the values of the maximum and minimum height and width of the object should be equal.

9. Click the **Apply** button.

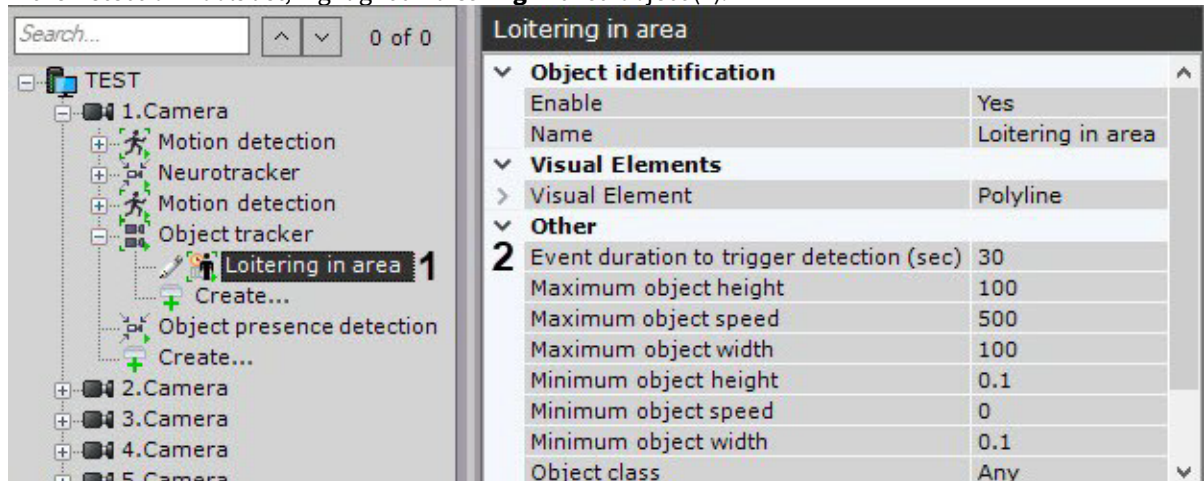
Abandoned object detection is now configured.

Settings specific to Loitering Detection

When configuring the Loitering detection tool, you must set the maximum time an object can be in the analyzed area: when the maximum time is exceeded, the detection tool is triggered.

To set a maximum time, you must perform the following steps:

1. In the Detection Tools list, highlight a **Loitering in area** object (1).



2. In the **Event duration to trigger detection (sec)** field (2), enter the maximum object loitering time in seconds. This value should be in the range [0, 3600].
3. Click the **Apply** button.

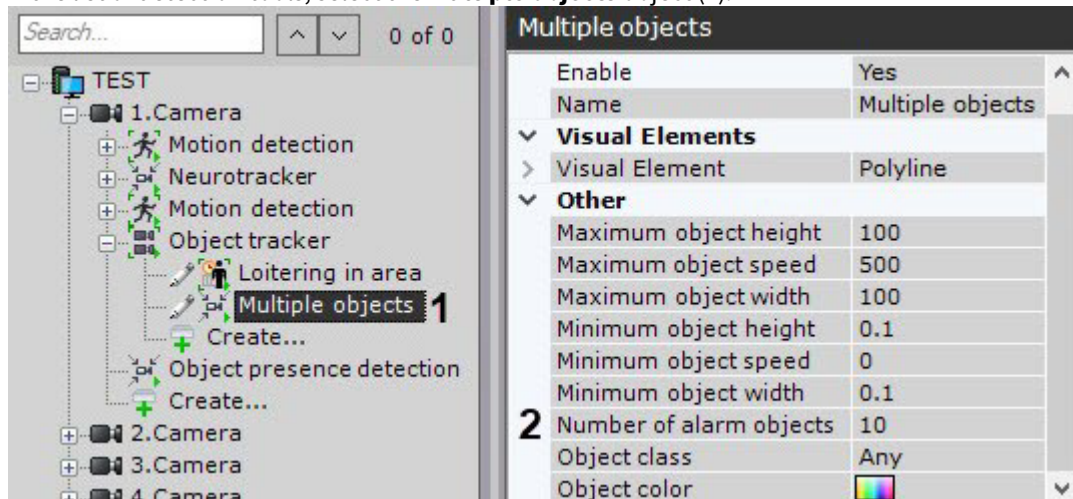
The maximum loitering time is now set.

Settings specific to Multiple objects

When configuring the Multiple objects detection tool, you should set the maximum number of objects within the analyzed zone. Exceeding this number leads to triggering the tool.

To configure the detection tool, do the following:

1. In the list of detection tools, select the **Multiple objects** object (1).



2. Enter the corresponding value into the **Number of alarm objects** (2) field.
3. Click the **Apply** button.

When the specified number of objects in the zone is exceeded, the detection tool generates the **Start Time of Detection Tool Trigger** event. When the number of objects in the zone decreases below the specified value, the **End Time of Detection Tool Trigger** event is generated.

Settings specific to Stop in area detection

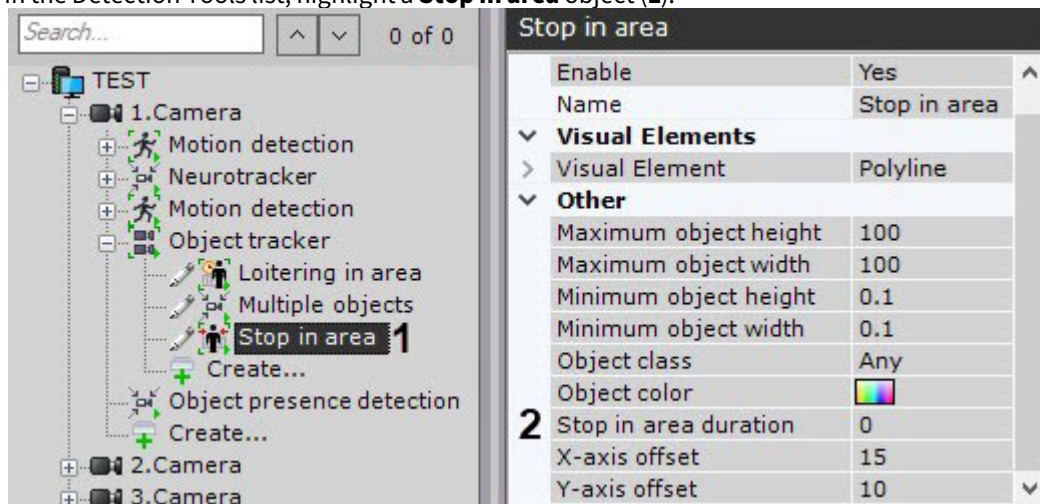
The detection tool will trigger if an object stops and remains idle for a specified time period.

Note

The object doesn't have to be completely idle, minor jitter is permitted.

To set a specified time period, you must perform the following steps:

1. In the Detection Tools list, highlight a **Stop in area** object (1).



2. Set the idle period duration for triggering the tool (2). This value should fall into the range of [0, 3600].

Attention!

Set this parameter to a value lower than the **Time of object in DB** in Object tracker settings (see [Setting general parameters of Tracker-based Scene Analytics detection tools](#)(see page 245)).

Attention!

If a detection tools runs on VMD metadata, the **Stop in area duration** should be set to 0. Otherwise, the detection tools will not work.


3. Click the **Apply** button.

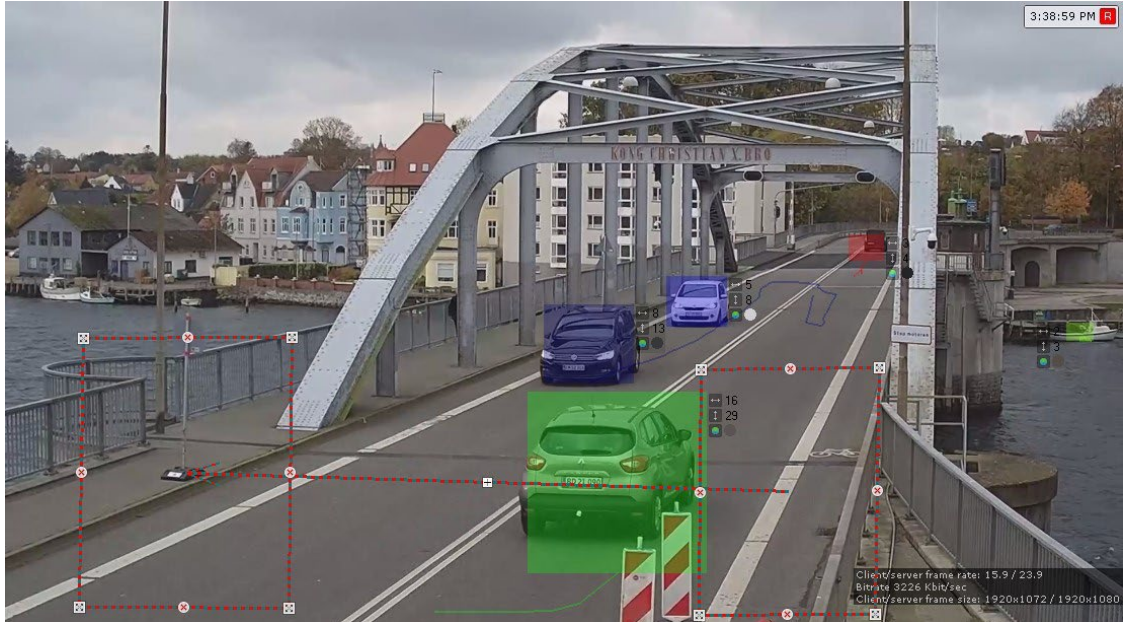
Settings specific to Move from area to area detection tool

To configure the Move from area to area detection tool, do the following:

1. Set the general parameters (see [Setting general parameters of Tracker-based Scene Analytics detection tools](#)(see page 245)).
2. Set two areas in the preview window. The tool is triggered if any object moves from one area to the other in the specified direction.

By default, the areas are located on the right side and the left side of the video image. The anchor points of each area are connected by a two-color dotted line. To reshape the area, drag its anchor points . To move the entire area, left click and drag its border. To add the anchor points, click .

3. In the preview window, set the directions of the object movement. The direction of movement between the areas is indicated by a dotted arrow. To change the direction of movement, click  on the direction arrow. The available directions are:
 - a. Left.
 - b. Right.
 - c. Both directions.



4. Click the **Apply** button.

The Move from area to area detection tool is configured.

Setting up Neural Tracker-based Scene Analytics detection tools

- [Video requirements for scene analytics detection tools\(see page 241\)](#)
- [Video stream and scene requirements for neural tracker operation\(see page 243\)](#)
- [Objects image requirements for neural tracker\(see page 244\)](#)
- [Hardware requirements for neural analytics operation\(see page 23\)](#)

To configure the neural tracker-based Scene Analytics detection tools, do the following:

1. Select the **Neurotracker** object.

Neurotracker	
▼ Object identification	
Enable	No
Name	Neurotracker
▼ Object features	
1 Record objects tracking	Yes
2 Video stream from camera	Low-quality video stream
▼ Other	
3 Camera position	Wall
4 Decoder mode	CPU
5 Detection threshold	30
6 Frames processed per second	6
7 Minimum number of detection triggers	6
8 Neural network file	
9 Neurofilter	No
10 Neurofilter file	
11 Neurofilter mode	CPU
12 Neurotracker mode	CPU
13 Object type	Human
▼ Advanced detection settings	
14 Hide moving objects	No
15 Hide stationary objects	Yes
16 Track retention time	0.7

2. By default, metadata are recorded into the database. To disable metadata recording, select **No** (**1**) from the **Record object tracking** list.
3. If the camera supports multistreaming, select the stream on which you want to perform detection (**2**).
4. To reduce the number of false positives from a fish-eye camera, in the **Camera position** field, select the correct position of the device (**3**). For other devices, this parameter is not valid.
5. Select the processor for decoding video streams (**4**). When you select a GPU, a stand-alone graphics card takes priority (when decoding with NVIDIA NVDEC chips). If there is no appropriate GPU, the decoding will use the Intel Quick Sync Video technology. Otherwise, CPU resources will be used for decoding (see [General Information on Configuring Detection](#)(see page 221)).
6. Set the **Detection threshold** for objects in percent (**5**). If the detection probability falls below the specified value, the data will be ignored. The higher the value, the higher the accuracy, but some triggers may not be considered.
7. In the **Frames processed per second** field, set the frame rate value for the neural network to process (**6**). The higher the value, the more accurate the tracking, but the higher the load on the CPU.

❏ Attention!

At least 6 FPS is recommended. For the fast moving objects (running individuals, vehicles), you should set the frame rate at 12 FPS or above (see [Examples of configuring neural tracker for solving typical tasks](#)(see page 265)).

8. Specify the **Minimum number of detection triggers** for the neural tracker to display the object track (**7**). The higher the value of this parameter, the longer it takes from detecting an object to displaying its track. Low value of this parameter may lead to false triggering.
9. You can use the neural filter to sort out video recordings featuring selected objects and their tracks. For example, the neural tracker detects all freight trucks, and the neural filter sorts out only video recordings that contain trucks with cargo door open. To set up a neural filter, do the following:
 - a. to use the neural filter, set **Yes** in the corresponding field (**9**).

- b. in the **Neurofilter file** field, select a neural network file (**10**).
 - c. in the **Neurofilter mode** field, select a processor to be used for neural network operation (**11**).
10. In the **Neurotracker mode** field, select the processor for the neural network operation: the CPU, one of GPUs or one of Intel processors (**12**, see [Hardware requirements for neural analytics operation](#)(see page 23), [General Information on Configuring Detection](#)(see page 221)).

Attention!

We recommend using the GPU.

It may take several minutes to launch the algorithm on NVIDIA GPU after you apply the settings. You can use caching to speed up future launches (see [Configuring the acceleration of GPU-based neuroanalytics](#)(see page 381)).

If Neural Tracker is running on GPU, object tracks may be lagging behind the objects. If this happens, set the camera buffer size to 1000 milliseconds (see [The Video Camera Object](#)(see page 107)).

11. In the **Object type** field (**13**), select the recognition object type, or in the **Neural network file** field (**8**), select the neural network file.

Attention!

To train your neural network, contact Inaxsys (see [Data collection requirements for neural network training](#)(see page 227)).

A trained neural network for a particular scene allows you to detect only objects of a certain type (e.g. person, cyclist, motorcyclist, etc.).

If the neural network file is not specified, the default file will be used, which is selected depending on the selected object type (**13**) and the selected processor for the neural network operation (**4**).

Note

For the correct neural network operation on Linux OS, place the corresponding file in the /opt/Inaxsys/DetectorPack/NeuroSDK directory.

12. If you don't need to detect moving objects, select **Yes** in the **Hide moving objects** field (**14**). An object is treated as static if it does not change its position more than 10% of its width or height during its track lifetime.
13. If you don't need to detect static objects, select **Yes** in the **Hide stationary objects** field (**15**). This parameter lowers the number of false positives when detecting moving objects.
14. In the **Track retention time** field, set a time interval in seconds after which the tracking of a vehicle is considered lost (**16**). This helps if objects in scene temporarily overlap each other. For example, a larger vehicle may completely block a smaller one from the view.
15. By default, the entire FOV is a detection area. If you need to narrow down the analysis area, in the preview window set one or more areas in which you want to perform the analysis.

Note

The procedure of setting areas is identical to the base tracker's (see [Setting General Zones for Scene analytics detection tools](#)(see page 248)). The only difference is that the neural tracker areas are processed while the base tracker areas are ignored.

16. Click the **Apply** button.
17. The next step is to create and configure the necessary detection tools on the basis of neural tracker. The configuration procedure is the same as for the base tracker (see [Setting up Tracker-based Scene Analytics detection tools](#)(see page 245)).

❑ Attention!

To trigger a **Motion in Area** detection tool under a neural network tracker, an object should be displaced by at least 25% of its width or height in FOV.

❑ Attention!

The abandoned objects detection tool works only with the base object tracker.

Setting up VMD-based Scene Analytics detection tools

❑ Video requirements for VMD(see page 233)

To configure Scene Analytics detection tools based on video motion detection, do the following:

1. Request an updated license file from Inaxsys manager.
2. Select a **Motion detection** object.

Motion detection	
Object features	
Record mask to archive	No
2 Record objects tracking	Yes
Other	
Alarm end delay	10
4 Camera position	Wall
5 Decode only key frames	No
6 Decoder mode	CPU
3 Frames processed per second	20
Motion mask	Yes
1 Object tracking	No
Sensitivity: Contrast	12
Sensitivity: Size	9

3. Select **Yes** in the **Object tracking** field (1).
4. By default, metadata are not recorded into the database. To enable metadata recording, select **Yes** from the **Record objects tracking** list (2).
5. For a proper operation of VMD-based Scene Analytics detection tool, it must analyze a frame at least every 500 milliseconds (see [Configuring VMD](#)(see page 233) section for **Frames processed per second** (3) and **Decode key frames** (5) parameters description).
6. Select a processing resource for decoding video streams (6). When you select an NVIDIA GPU, priority is given to a discrete graphics card (when decoding on NVIDIA NVDEC chips). If there's no appropriate GPU, then decoding will use the Intel Quick Sync Video technology. Otherwise, CPU resources will be used for decoding.
7. To reduce false alarms rate from a fish-eye camera, you have to position it properly (4). For other devices, this parameter is not valid.
8. Click the **Apply** button.
9. Next, you have to create and configure the necessary VMD-based detection tools. The configuration procedure is the same as for the primary tracker (see [Setting up Tracker-based Scene Analytics detection tools](#)(see page 245)).

❑ Attention!

VMD-generated metadata does not include object type and color information.

❑ Attention!

The abandoned objects detection tool works only with the primary tracker.

Examples of configuring neural tracker for solving typical tasks

Settings	Task: detection of moving people	Task: detection of moving vehicles
Main		
The number of frames processed per second	6	12
Minimum number of triggerings	6	6
Neural filter	No	No
Camera position	Wall	Wall
Recognition threshold	30	30
Neural network file	Path to the *.ann neural network file. You can also select Object type – in this case, this field should be left blank.	Path to the *.ann neural network file. You can also select Object type – in this case, this field should be left blank.
Advanced		
Hide static objects	Yes	Yes

❑ Note

By default, the neural tracker is configured for detection of moving people.

7.4.10 Face detection tools

There are two types of face detection tools in *Arkiv*:

1. [Face detection](#)(see page 267).
2. [Face detection \(VL\)](#)(see page 272).

❑ Attention!

You can install a *DetectorPack* add-on of only one of the given types. It is forbidden to install both add-ons on the same system.

Functions of face detection tools

The **Face detection** basic object and the **Face detection (VL)** object are triggered every time a face is captured in the frame. Basic object is enough to perform a search for faces in the archive (see [Face search](#)(see page 718)).

In addition, the following types of detection tools based on metadata from the face detection (see [General information on metadata](#)(see page 224)) are available in *Arkiv*:

1. Appearance in area – a detection tool is triggered by the appearance of an object and subsequent face capture in FOV.
2. Loitering in area – a detection tool triggered by the lengthy presence of an object and its face capture in FOV.
3. Mask detection – a detection tool is triggered by the face captured with or without a mask.

The *Arkiv* database stores all faces in binary form:

1. All captured face images are vectorized* and stored in the **t_face_vector** table, and their corresponding capture events are stored in the **t_json_event** table.
2. Reference images (see [Lists of facial templates](#)) are stored in the **t_face_listed** table.

* Face vector is the mathematical representation of a face image created upon face capture.

❑ Note

These detection tools require Add-on Face Recognition Pack to be installed (see [Installing DetectorPack addons](#)(see page 50)).

❑ Attention!

With an increase in the number of faces in the database, the statistical error increases: the more faces in the database, the more often similar faces will be recognized when searching in the archive. Accordingly, the degree of similarity when comparing the reference face with the captured face will decrease.

This statistical error is relevant if:

1. The [Requirements for face detection tools](#)(see page 266) are met.
2. The database contains over a million faces.

An example of the error calculation results:

1. Face detection, mugshot dataset (good quality photo), 12 million faces in database, and false matching probability is 0.003%. With these initial data, the researchers obtained an identification error of 0.76%.
2. Face detection (VL), the initial data are the same. The identification error is 0.81%.

Requirements for face detection tools

Face detection works properly if video cameras are installed and set up as follows:

1. The frame rate should not be less than 12 FPS and not less than 6 FPS for face recognition at turnstiles.

2. The maximum angle of frontal perspective of the photos of people's faces received from video cameras should not exceed +/- 15°.
3. The distance between the pupils on the photos of people's faces received from video cameras should not be less than 32 pixels.
4. Mutual faces covering should be minimal.
5. Faces should be evenly illuminated with diffused light of at least 200 lux. Directional side lighting is not allowed.
6. The contrast of the photos of the captured faces should be over 64 grayscale. Insufficient or excessive lighting is not allowed.
7. There should be no backlighting and sharp gradients of light and shade.
8. The photos of the captured faces received from video cameras should be clear. Image blurring caused by motion is not allowed.

Note

The required distance between the camera and the face can be set using a lens with the required focal length.

Configuring Face detection

To configure the basic Face detection tool, do the following:

1. Select the **Face detection** object.

Face detection	
Object identification	
Enable	Yes
Name	Face detection
Object features	
1 Real-time recognition	Yes
2 Record objects tracking	Yes
3 Video stream from camera	High-quality video stream
4 Real-time recognition on external service	No

2. If you need to use this detection tool for real-time face recognition, set the corresponding parameter to **Yes** (**1**, see [Configuring real-time face recognition](#)(see page 290)).
3. If you need to record metadata, select **Yes** from the **Record objects tracking** list (**2**).
4. If the camera supports multistreaming, select the stream for which detection is needed (**3**). For the correct operation of the **Face detection**, it is recommended to use a High-quality video stream.
5. If you need to use this face detection tool in real-time together with FaceCube Recognition Server (see [Configuring FaceCube integration](#)(see page 295)), set **Yes** for the **Real-time recognition on external service** parameter (**4**).
6. If you need to save age and gender information for each captured face in the database, select **Yes** in the corresponding field (**1**).

Note

The average error in age recognition is 5 years.

Face detection		
▼	Other	
1	Age and gender	No
2	Camera transform	No
3	Decoder mode	CPU
4	Face detection period (msec)	250
5	Face mask detection	No
6	Filter false alarms	Yes
7	Frame size change	1920
	Maximum face height	100
8	Maximum face width	100
	Minimum face height	5
	Minimum face width	5
9	Minimum threshold of face authenticity	90
10	Mode	CPU
11	Send face images	No
12	Track loss time	500

7. If you use a bi-spherical XingYun lens, the detector will analyze two 180° spherical images by default (see [Configuring fish-eye cameras](#)(see page 112)). This may decrease recognition quality. To dewarp the image before detection, select **Yes** for the **Camera transform** parameter (2). This parameter is relevant for other types of image transformation as well.
8. Select a processing resource for decoding video streams (3). When you select a GPU, a stand-alone graphics card takes priority (when decoding with NVIDIA NVDEC chips). If there is no appropriate GPU, the decoding will use the Intel Quick Sync Video technology. Otherwise, CPU resources will be used for decoding.
9. Set the time (in milliseconds) between face search operations in a video frame in the **Face detection period (msec)** field (4). Acceptable values range is [1; 10000]. Increasing this value decreases the Server load, but can result in some faces being undetected.
10. If you plan to apply the masks detection tool, set **Yes** for the **Face mask detection** parameter (5, see [Configuring Masks Detection](#)(see page 279)).
11. In some cases, the detection tool may mistake other object for a face. Select **Yes** in the **Filter false alarms** field (6) to filter out non-face objects, while calculating the vector model of a face and its recording into the metadata DB. If the filtering is on, false results will appear in the detection feed (see [Face recognition and search](#)(see page 734)), but will be ignored during searches in the archive.
12. Analyzed framed are scaled down to a specified resolution (7, 1920 pixels on the longer side). This is how it works:
 - a. If the longer side of the source image exceeds the value specified in the **Frame size change** field, it is divided by two.
 - b. If the resulting resolution falls below the specified value, it is used further.
 - c. If the resulting resolution still exceeds the specified limit, it is divided by two, etc.

Note

For example, the source image resolution is 2048*1536, and the specified value is set to 1000.

In this case, the source resolution will be halved two times (512*384), as after the first division, the number of pixels on the longer side exceeds the limit (1024 > 1000).


Note

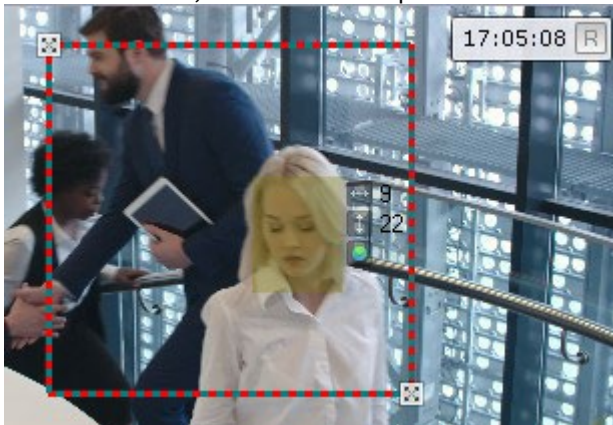
If detection is performed on a higher resolution stream and detection errors occur, it is recommended to reduce the compression.

13. Specify the minimum and maximum sizes of the captured faces as a percentage of the frame size **(8)**.
14. In the **Minimum threshold of face authenticity** field, set the minimum level of face recognition accuracy for the creation of a track **(9)**. You can set any value by trial-and-error. No less than 90 is recommended. The higher the value, the fewer faces are detected, while the recognition accuracy increases.
15. Select the processor for the face detection – CPU or NVIDIA GPU **(10)**, see [General Information on Configuring Detection](#)(see page 221)).

❏ Attention!

It may take several minutes to launch the algorithm on NVIDIA GPU after you apply the settings. You should use caching to speed up future launches (see [Optimization of Face detection on GPU](#)(see page 271)).

16. If you use FaceCube integration (see [Configuring FaceCube integration](#)(see page 295)), activate the **Send face images** parameter **(11)**.
17. Enter the time in milliseconds after which the face track is considered to be lost in the **Track loss time** field **(12)**. Acceptable values range is [1; 10000]. This parameter applies when a face moves in a frame and gets hidden behind an obstacle for some time. If this time is less than the set value, the face will be recognized as the same.
18. If necessary, fine-tune the detection tool (see [Fine-tuning the Face detection tool](#)(see page 269)).
19. In the preview window, set the rectangular area of the frame in which you want to perform face detection. To select the area, move the anchor points .



20. Click the **Apply** button.

The basic Face detection tool is now configured.

Fine-tuning the Face detection tool

❏ Attention!

To fine-tune this detection tool, you will require assistance from Inaxsys tech support.

To fine-tune the Face detection tool, do as follows:

1. Configure face rotation angle analysis:

- a. If it is necessary to determine the face rotation angle, then set **Yes** for the **Analyze face rotation angle** parameter (1).

Face detection		
v Advanced detection settings		
1	Analyze face rotation angle	No
2	Face detection algorithm	ALG1 (high speed, low accuracy)
3	Face rotation pitch (°)	45
4	Face rotation roll (°)	45
5	Face rotation yaw from (°)	-45
6	Face rotation yaw to (°)	45
7	False mask detections filtering	Yes
8	Ignore repeated recognitions	No
9	Minimum face masking threshold	70
10	Minimum face quality for face mask detection	30
11	Minimum face recognition quality	50
12	Minimum filtering threshold	50
13	Minimum filtering threshold for face mask detection	30
14	Period of ignoring repeated recognitions	2
15	Process color frames	No
16	Repeated recognitions similarity threshold	85

- b. In the **Face rotation pitch (°)** field (3), set the allowable face tilt up/down angle in degrees. The value should be in the range [0; 90].
- c. In the **Face rotation roll (°)** field (4), set the allowable face tilt right/left angle in degrees. The value should be in the range [0; 90].
- d. In the **Face rotation yaw from (°)** field (5), set the minimum allowable angle of face rotation to the right or left. The value should be in the range [-90; 90].
- e. In the **Face rotation yaw to (°)** field (6), set the maximum allowable angle of face rotation to the right or left. The value should be in the range [-90; 90].

Note

The specified rotation angle settings filter out the faces that are recorded to the archive of detected faces.

Face rotation angles are displayed in the detection event data from the Face detection tool.

2. Select a face detection algorithm (2):
 - a. **ALG1** – high speed, low accuracy.
 - b. **ALG2** – average speed, average accuracy.
 - c. **ALG3** – low speed, high accuracy.
3. Set up false mask detections filtering:
 - a. To apply filters, set **Yes** for the **False mask detections filtering** parameter (7).
 - b. Set the minimal percentage of probability which makes the additional algorithm identify a track as a masked face in the **Minimum filtering threshold for face mask detection** field (13). If the algorithm takes a decision that the track relates to a masked face with a probability value lower than the specified threshold, the track will be ignored. Set the value by trial-and-error, values over 30 are recommended.
4. Set the minimum threshold value for mask detection (9). Set a value by trial-and-error, values over 70 are recommended.
5. Set the minimum quality of a face image for recognition with a mask (10, see [Configuring Masks Detection](#)(see page 279)). Set the value by trial-and-error, values over 30 are recommended.
6. Set the minimum quality of a face image for recognition without a mask (11). Set the value by trial-and-error, values over 50 are recommended.

7. If it is necessary to filter out false positives, set the minimum percentage of probability which makes the algorithm identify a track as a human face in the **Minimum filtering threshold** field (**12**, see [Configuring Face detection](#)(see page 267)). If the algorithm takes a decision that the track relates to a face with a probability value lower than the specified threshold, the track will be ignored. Set the value by trial-and-error, values over 50 are recommended.
8. If it is necessary for the detection tool to use a color frame for processing, then set **Yes** for the **Process color frames** parameter (**15**). By default, a black and white frame is processed.
9. Configure the repeated face recognition ignoring:
 - a. If it is necessary to ignore repeated recognition of the same face, then set **Yes** for the **Ignore repeated recognitions** parameter (**8**).
 - b. In the **Repeated recognitions similarity threshold** field (**16**), set the similarity threshold of a face with the previous recognized ones in percentage from 0 to 100. If the similarity threshold is below the specified value, then the face will be recognized as a new one.
 - c. In the **Period of ignoring repeated recognitions** field (**14**), set the period in minutes during which new recognized faces will be compared with the previous ones to identify similarities. The value should be in the range [0; 30].
10. Click the **Apply** button.

Fine-tuning the Face detection tool is now complete.

Optimization of Face detection on GPU

Cache affects the initialization speed-up and optimizes video memory consumption.

To optimize Face detection operation on GPU, do the following:

1. Shut down the Server (see [Shutting down a Server](#)(see page 82)).

Attention!

If the system uses the software running on GPU, it is necessary to stop its operation.

2. Create the GPU_CACHE_DIR system variable (see [Appendix 10. Creating system variable](#)(see page 927)). Specify in the **Variable value** field the path to the cache location with an arbitrary folder name. For example, D:\AN_GPU_cache.

Note

The cache of all detection tools and neural networks will be stored in the specified directory.

3. Run the command line as administrator.
4. Open the C:\Program Files\Common Files\Inaxsys\DetectorPack\TvaFaceGpuCacheGenerator.exe file (**1**) in the command line.

Attention!

TvaFaceGpuCacheGenerator.exe requires at least 1.4 GB of free video memory to run on GPU.


```

C:\Program Files\Common Files\Inaxsys\DetectorPack>TvaFaceGpuCacheGenerator.exe 1
Nvidia driver version: 472.12
Cuda driver version: 11.4
TvaFaceSDK version: 2.15.0.a11fd8cc
-----
Available Devices:
[ORDINAL]. [NAME] [UUID] [CUDA-CC] [CURRENT-FREE-GPU-MEM (MB)]
0. [NVIDIA GeForce GTX 1070] [GPU-862d7791-1507-d6f5-f5be-6bf7f3a05825] [6.1] [6033.09]
-----
Please enter device ordinal mentioned in the list above, to generate cache for...
NOTE: the device should have MORE than 1.4GB of free GPU memory in order to success
NOTE: this application will fail if the GPU is being used by other applications
      please quit all such applications before starting the caching process.
Available choices: [0-0]
Enter your choice: 0 2
Do you want to edit default detector image dimensions (640x360 1920x1080 will be used by default) (y/n)? y 3
Please, list all required resolutions in the format XxX, separated by spaces:
3840x2160 2688x1520 4

```

- Specify the ID of the required GPU (**2**, see [General Information on Configuring Detection](#)(see page 221)).
- If you want to change the resolution of the video stream for Face detection, you should enter **y** (**3**) and specify the required resolution (**4**).

Note

GPU uses the default video stream resolutions. Changing the resolution of the video stream will increase the percentage of face detection when using the resolutions from 1920*1080 and higher.

- Press **Enter**. The cache creation process will start. It will take about 20 minutes. The cache creation was successful, if the result value is "0".

Optimization of Face detection on GPU is complete.

Attention!

When you update the add-on Face Recognition Pack (see [Installing DetectorPack addons](#)(see page 50)) or change the NVIDIA GPU model, you need to recreate the cache.

Configuring Face detection (VL)

To configure the Face detection (VL), do the following:

- Select the **Face detection (VL)** object.

Face detection (VL)	
Object identification	
Enable	Yes
Name	Face detection (VL)
Object features	
1 Real-time recognition	No
2 Record objects tracking	Yes
3 Video stream from camera	Low-quality video stream

- If you need to use this detection tool for real-time face recognition, set the corresponding parameter to **Yes** (**1**, see [Configuring real-time face recognition](#)).
- If you need to record metadata, select **Yes** from the **Record objects tracking** list (**2**).


- If the camera supports multistreaming, select the stream for which detection is needed (**3**). For the correct operation of the **Face detection (VL)**, it is recommended to use a High-quality video stream.

Face detection (VL)		
▼	Other	
4	Decoder mode	CPU
5	Face attributes recognition	No
6	Maximum face size	100
7	Medical mask detection	No
8	Minimum face size	10
9	Minimum image quality	50
10	Minimum threshold of face authenticity	60
11	Mode	CPU

- Select a processing resource for decoding video streams (**4**). When you select a GPU, a stand-alone graphics card takes priority (when decoding with NVIDIA NVDEC chips). If there is no appropriate GPU, the decoding will use the Intel Quick Sync Video technology. Otherwise, CPU resources will be used for decoding.
- In the **Face attributes recognition** field (**5**), select **Yes** if it is necessary to recognize gender and age.
- Set the maximum size of the captured faces as a percentage of the frame size (**6**).
- If necessary, set **Yes** for the **Medical mask detection** parameter (**7**, see [Configuring masks detection](#)).
- Set the minimum size of the captured faces as a percentage of the frame size (**8**).
- Set the **Minimum image quality** of a person's face for face detection (**9**). A required value should be selected empirically, at least 50 is recommended.
- In the **Minimum threshold of face authenticity** field (**10**), set the minimum level of face recognition accuracy for the creation of a track. A required value should be selected empirically, at least 90 is recommended. The higher the value, the higher the recognition quality will be.
- Select the processor for the face detection – CPU or NVIDIA GPU (**11**, see [General Information on Configuring Detection](#)).

Attention!

It may take several minutes to launch the algorithm on an NVIDIA GPU after you apply the settings.

- If necessary, fine-tune the detection tool (see [Fine-tuning the face detection \(VL\)](#)(see page 274)).
- In the preview window, set the rectangular area of the frame where faces should be detected. To select the area, move the anchor points .



- Click the **Apply** button.

The Face detection (VL) is now configured.

Fine-tuning the face detection (VL)

Attention!

To fine tune this detection tool, you will require the assistance from Inaxsys tech support.

To fine-tune the face detection tool, do as follows:

1. If necessary, set **Yes** for the **Advanced logging for SDK** parameter (1).

Face detection (VL)		
v Advanced detection settings		
1	Advanced logging for SDK	No
2	Analyze face rotation angle	No
3	Face recognition algorithm	Algorithm 2
4	Face rotation pitch (°)	45
5	Face rotation roll (°)	45
6	Face rotation yaw from (°)	-45
7	Face rotation yaw to (°)	45
8	Minimum number of detections	3
9	Number of frames between detections	7
10	Number of frames without detections	8
11	Number of threads	4
12	Track timeout	2

2. Select a face detection algorithm (3):
 - a. **Algorithm 1** – the recognition speed depends on the background and the number of faces in the frame. Works slower than **Algorithm 3**.
 - b. **Algorithm 2** – high speed, low accuracy. The recognition speed depends on the number of faces in the frame.
 - c. **Algorithm 3** – average speed, high accuracy. The recognition speed depends on the resolution of the image. Optimal for most scenes.
3. Configure the face rotation angle analysis:
 - a. If it is necessary to determine the face rotation angle, then set **Yes** for the **Analyze face rotation angle** parameter (2).
 - b. In the **Face rotation pitch (°)** field (4), set the allowable face tilt up/down angle in degrees. The value should be in the range [0; 90].
 - c. In the **Face rotation roll (°)** field (5), set the allowable face tilt right/left angle in degrees. The value should be in the range [0; 90].
 - d. In the **Face rotation yaw from (°)** field (6), set the minimum allowable angle of face rotation to the right or left. The value should be in the range [-90; 90].
 - e. In the **Face rotation yaw to (°)** field (7), set the maximum allowable angle of face rotation to the right or left. The value should be in the range [-90; 90].
4. In the **Minimum number of detections** field (8), enter the time in milliseconds in the range [1; 10000], after which the track will be considered a detected face.
5. In the **Number of frames between detections** field (9), enter the time in milliseconds in the range [1; 10000]. The lower the value, the more likely the TrackEngine will detect a new face as soon as it appears in the selected area.
6. In the **Number of frames without detections** field (10), enter the time in milliseconds in the range [1; 10000]. If there is no face detection in the selected area, the TrackEngine will continue to process the specified number of frames before the track is considered lost.

Note

TrackEngine does not perform face recognition. It tracks the position of one person's face in a sequence of frames, choosing the best frame and preparing the necessary data for external systems.

TrackEngine is based on face detection and analysis methods provided by the FaceEngine library.

7. Specify the **Number of threads** per recognition channel (**11**). The value should be in the range [1; 256].
8. In the **Track timeout** field (**12**), enter the time in seconds in the range [1; 60], after which the face track is considered lost.
9. Click the **Apply** button.

Fine-tuning the face detection (VL) is now complete.

License activation for Face detection (VL)

To activate a license for Face detection (VL) (see [Installing DetectorPack addons](#), [Configuring Face detection \(VL\)](#) (see page 272)), do the following:

1. Request EID and ProductID from [technical support](#).

Attention!

EID and ProductID are linked with the MAC address of the server. If the MAC address changes, you need to request EID and ProductID again.

2. Go to the [website](#).

Attention!

If you fail to login to the website, please contact [technical support](#).

3. Log in using the received EID.

4. Fill in the user registration data.

Sentinel EMS
ENTITLEMENT MANAGEMENT SYSTEM

Welcome | [Logout](#)

User Registration

Please take some time to register with us. Already registered? [Login](#) | [Register Later!](#)

* Required fields

User Information

* First Name:

* Last Name:

* Country:

* Address Line 1:

Address Line 2:

* City:

* State/Province:

* ZIP/Postal Code:

* Phone:

Fax:

Company Web site:

User Company:

User Account Information

* E-mail:

* Confirm E-mail:

* Password:

* Confirm Password:

Save 1

Sentinel EMS 4.4.300 © 2018 SafeNet, Inc. All Rights Reserved | [Support](#)

gemalto

5. Click the **Save** button (1).

6. Click the **Activate** button (2) to activate the license.

The screenshot shows the Sentinel EMS web interface. The 'Entitlements' tab is active. The 'Associated Product and Features' section contains a table with the following data:

Product/Product Suite	Start Date	End Date	Quantity
<input checked="" type="checkbox"/> FullSDK_exp_v5.x 2	03/25/2022	Never expires	5 out of 5

An 'Activate' button is highlighted with a red box and the number '2'.

7. On the command line, run the following file as administrator: C:\Program Files\Common Files\Inaxsys\DetectorPack\VLSdk\gpu\FingerprintViewer.exe.

```
C:\Program Files\Common Files\Inaxsys\DetectorPack\VLSdk\gpu>FingerprintViewer.exe
Using license file: ./data/license.conf
To run with default license file path:
    FingerprintViewer.exe
If you want to specify license file:
    FingerprintViewer.exe <path to license.conf>
[24.03.2022 13:46:24] [Debug] [createLicense] creation of the FitLicense license!
[24.03.2022 13:46:24] [Debug] [Fitlicense Windows] deviceId = ██████████
Fingerprint for the current device:
██████████
```

The output of the command is shown in a black terminal window. The final line, 'Fingerprint for the current device:', is followed by a redacted area (a black box) and the number '3'.

8. To confirm the license activation, specify the Email address (4). The licenseFile.v2c file with license data will be sent to the specified Email address.

Activate Product(s) ? X

EID:

▼ Enter Quantity

Product	Remaining Quantity	Quantity	External ID
FullSDK_exp_v5.x 2	5	1	<input type="text"/>

SDK_expire_v1.0 as a default License Model

Activation for Own use:

4 Activatee Email Address: Add if not already available.

Device: New Available

Device Name:

5* Device FingerPrint:

Time Zone:

Remarks:

6 **Activate** Cancel

9. In the **Device FingerPrint** field (5) specify the FingerPrint data (3).
10. Click the **Activate** button (6).
11. Make sure the license is successfully activated (7).

License Certificate X

7 License generated successfully

EID

12. Open the following file in a text editor: C:\Program Files\Common Files\Inaxsys\DetectorPack\VLSdk\gpu\data\license.conf.
13. Enter the received EID (8) and ProductID (9).

```
<param name="EID" type="Value::String" text="received EID"/>
<param name="ProductID" type="Value::String" text="received ProductID"/>
```


3. Depending on your particular task, set other parameters values according to the table.

Triggering event	Parameters values		
	Lower face part masking	No mask	Full face masking
No mask of any kind	Absence	Presence	Absence
No medical mask	Absence	Presence	Presence
No balaclava	Presence	Presence	Absence
Any mask present	Presence	Absence	Presence
Medical mask present	Presence	Absence	Absence
Balaclava present	Absence	Absence	Presence

Note

The **Other types of masks** parameter is not supported in this software version.

4. If required, you can set the advanced parameters (see [Fine-tuning the Face detection tool](#)(see page 269)).
 5. Click the **Apply** button.

Configuring the Mask detection tool is complete.

Configuring Appearance in area and Loitering in area detection


On this page:

- [Appearance in area detection](#)(see page 280)
- [Loitering in area detection](#)(see page 281)

Appearance in area detection

To configure the detection tool, do the following:

1. Select the **Appearance in area** object.

Appearance in area	
>	Object identification
>	Visual Elements
∨	Other
Maximum object height	100
Maximum object speed	500
Maximum object width	100
Minimum object height	0.1
Minimum object width	0.1
Minimum speed	0
Object class	Any
Object color	
X-axis offset	15
Y-axis offset	10

2. Configure the parameters of the captured face (just as with the detected objects, see [Configuring detected objects](#)(see page 252)).

Attention!

The object class should be either **Any** or **Face**.

Note

The metadata from the Face detection tool do not include color characteristics, so the color setting is not relevant for this detection tool.


3. In the preview window, set an area inside the FOV where a person should appear. This is similar to the Scene analytics detection tools (see [Configuring the Detection Zone](#)(see page 252)).
4. Click the **Apply** button.

Configuring the Appearance in area detection tool is complete.

Loitering in area detection

To configure the detection tool, do the following:

1. Select the **Loitering in area** object.

Loitering in area	
>	Object identification
>	Visual Elements
∨	Other
	Event duration to trigger detection (sec) 30
	Maximum object height 100
	Maximum object speed 500
	Maximum object width 100
	Minimum object height 0.1
	Minimum object speed 0
	Minimum object width 0.1
	Object class Any
	Object color 
	X-axis offset 15
	Y-axis offset 10

2. In the **Event duration to trigger detection (sec)** field, set the maximum time in seconds of the object loitering in the analyzed area. When this time is exceeded, the detection tool will trigger. The value should be in the range [0; 86400].
3. Configure the parameters of the captured face (just as with the detected objects, see [Configuring detected objects](#)(see page 252)).

Attention!

The object class should be either **Any** or **Face**.

Note

The metadata from the Face detection tool do not include color characteristics, so the color setting is not relevant for this detection tool.

4. In the preview window, set an area inside the FOV where a person should loiter. This is similar to the Scene analytics detection tools (see [Configuring the Detection Zone](#)(see page 252)).
5. Click the **Apply** button.

Configuring the Loitering in area detection tool is complete.

Face Detection and Temperature Control with Mobotix M16 TR cameras

Functional parameters of the Face Detection and Temperature Control

When working with Mobotix M16 TR cameras, the standard face detection algorithm (see [Functions of face detection tools](#)(see page 266)) is used along with an additional option of temperature measurement.

For each recognized face, the following is performed:

1. Temperature measurement.
2. Display the measurement result next to the face bounding box.
3. Recording the temperature value into the system log along with the face recognition event (see [The System Log](#)(see page 787)).

You can as well set the system to launch a macro if temperature readings exceed the maximum permitted value (see [Specific parameters for triggering a face recognition macro](#)(see page 389)).

Camera requirements for face detection and temperature control

Face detection with temperature control works properly if cameras are installed and set up as follows:

1. At least 8 frames per second.
2. Minimum resolution is at least 1280 x 960 pixels.
3. Indoor installation only.
4. To establish maximum measurement accuracy, avoid installing cameras near exits to street, in direct sunlight, and close to HVAC outlets.
5. Keep the distance from camera to the subject of measurement within the range of 1-2 meters.
6. For best accuracy, install the Electromagnetic Radiation Absorber (BB) at the same distance from camera as the subjects of measurement.
7. The maximum angle of incidence should not exceed +/- 15° off the ground level.
8. Distance between pupils on the received photos of face must be not less than 32 pixels.
9. There should be minimum mutual overshadowing of the captured faces.
10. The faces should be evenly illuminated with a diffused light of at least 200 lux. Directional side lighting is not allowed.
11. The sharpness of the captured faces on the received photos must be over 64 grayscale. Deficient or exceeding illumination is not allowed.
12. There should be no back light and sharp gradients of light and shade.
13. The photos of the captured faces received from video cameras should be clear. Image blurring caused by motion is not allowed.

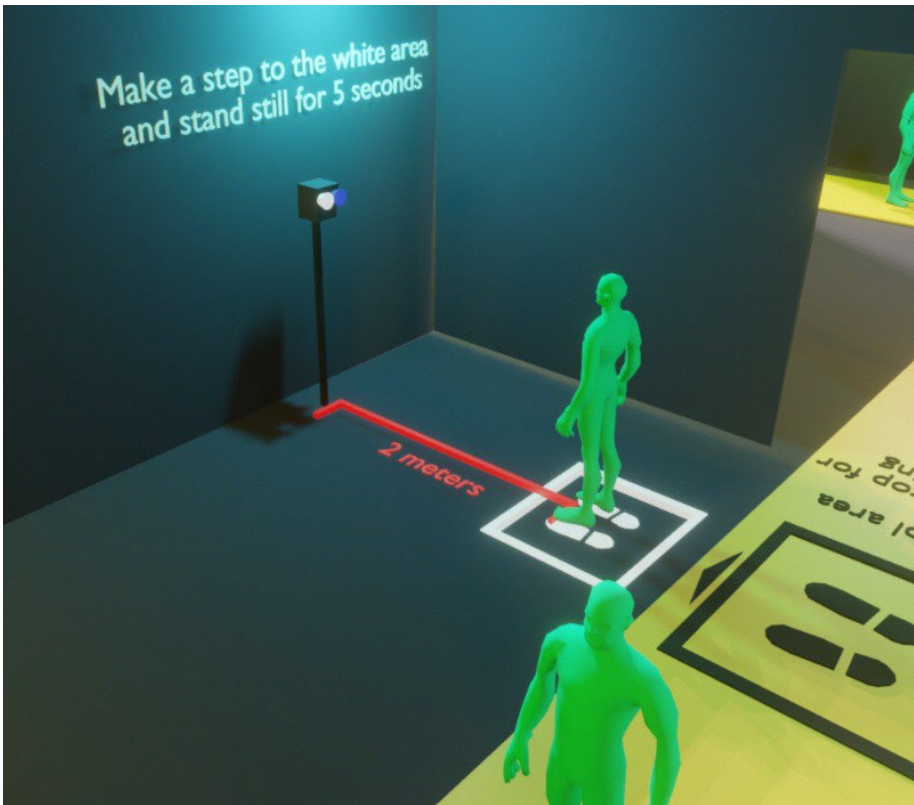
Note

The required distance between the camera and the face can be set using a lens with required focal length.

Temperature screening protocol

For maximum measurement accuracy, please make sure that:

1. Subjects of measurement must have their body temperature normalized. To do this, please avoid their exposure to direct sunlight, incoming air flow from street or HVAC, and exclude any other factors that may cause momentary changes in body temperature.
2. The measurement area may contain only one individual.
3. No headgear, medical mask or glasses may be worn in the area.
4. The subject should dwell in the control area no less than 3 seconds, standing/sitting still, facing the camera.



Pre-configuration of the Mobotix M16 TR camera

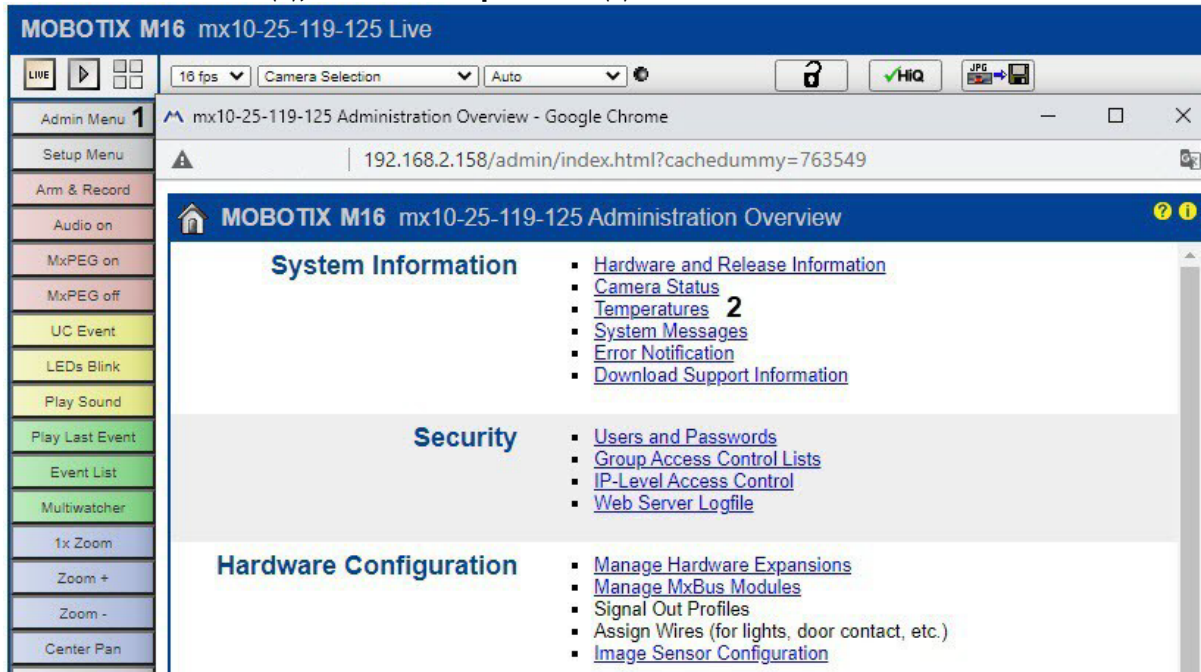
⚠ Attention!

Install MX-V5.2.6.7 (2020-06-16) or later firmware.

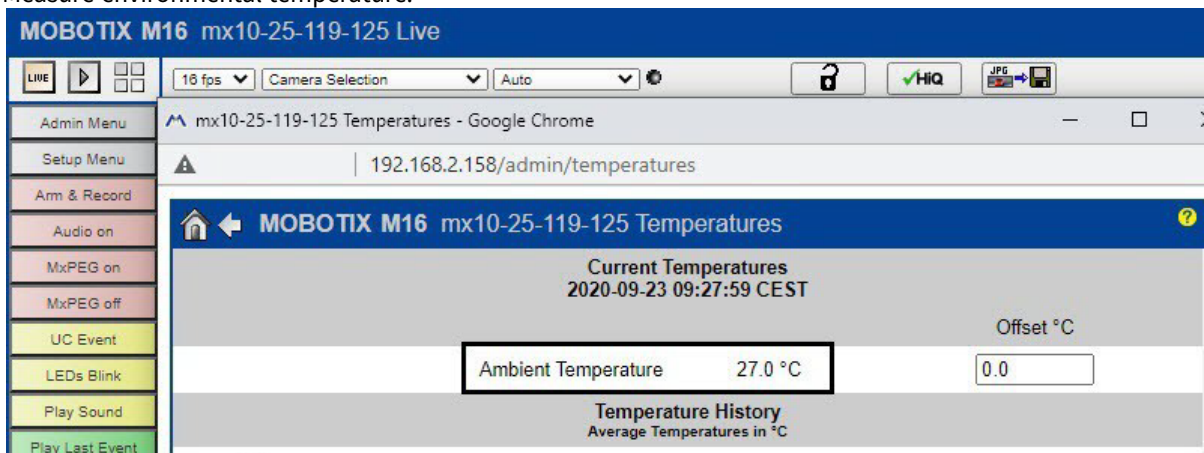
For detailed configuration via the web interface, refer to manufacturer's instructions.

Before starting *Arkiv*, please configure the camera via the web interface:

1. Proceed to admin menu (1), and select **Temperatures** (2).



2. Measure environmental temperature.



3. Select **Setup Menu (1)**, and then **Thermal Sensor Settings (2)**.

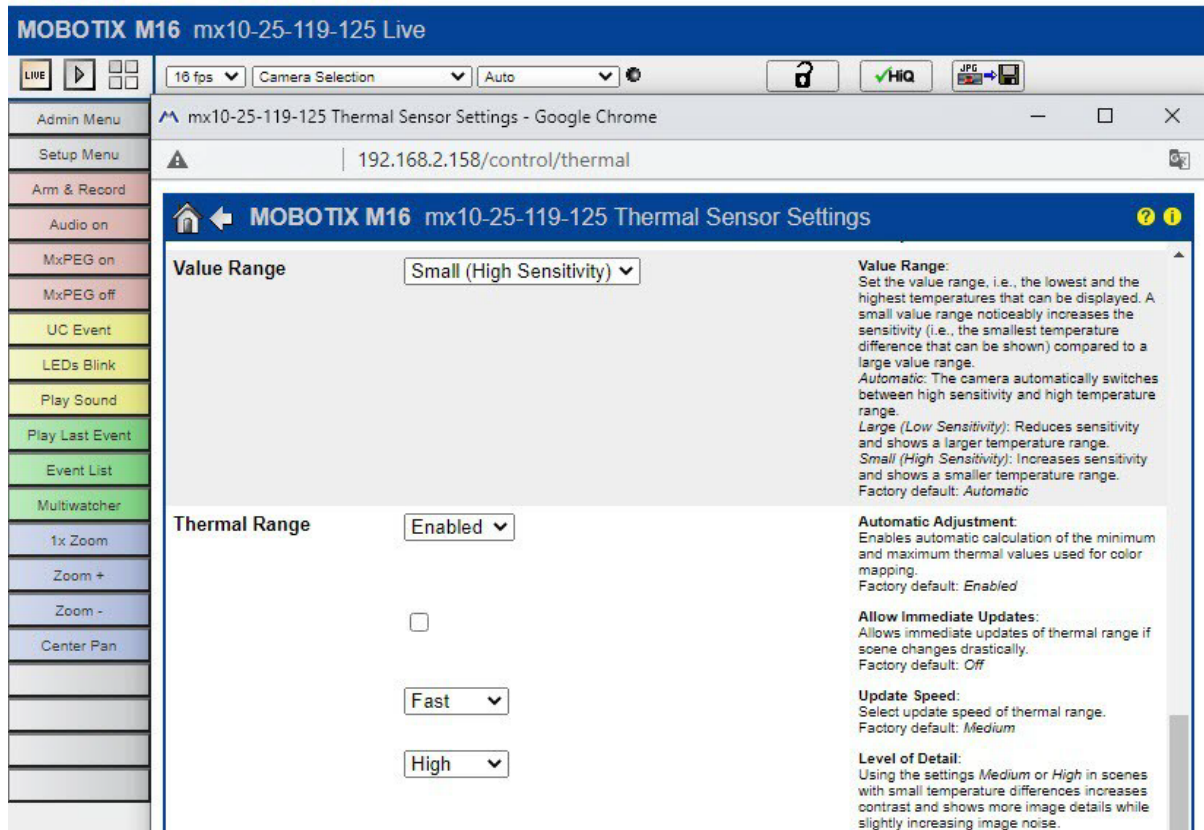
The screenshot shows the MOBOTIX M16 web interface. The top navigation bar includes 'LIVE', '16 fps', 'Camera Selection', 'Auto', and 'HIQ'. The left sidebar contains various menu items, with 'Setup Menu' highlighted and labeled '1'. The main content area displays the 'MOBOTIX M16 mx10-25-119-125 Setup Overview' page. Under the 'Image Control' section, 'Thermal Sensor Settings' is highlighted and labeled '2'. The 'Event Control' section is also visible.

4. Select the **Temperature Compensation** checkbox (1).

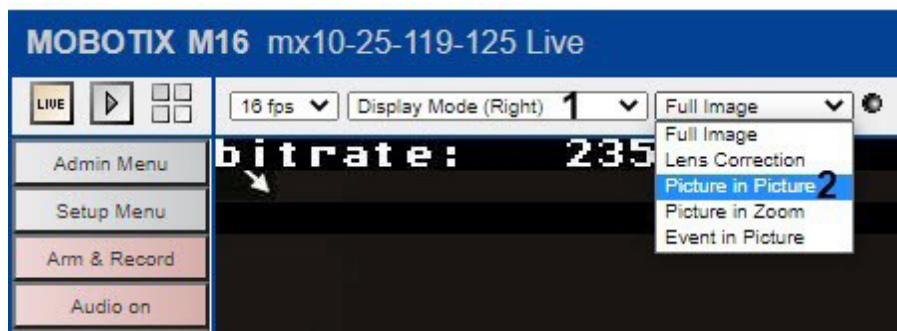
The screenshot shows the 'MOBOTIX M16 mx10-25-119-125 Thermal Sensor Settings' page. The left sidebar contains various menu items, with 'Setup Menu' highlighted and labeled '1'. The main content area displays the 'MOBOTIX M16 mx10-25-119-125 Thermal Sensor Settings' page. The 'Linear Mode' checkbox is checked. The 'Temperature Compensation' checkbox is checked and labeled '1'. Below it, there are input fields for '100', '95', and '27', with the '27' field labeled '2'. The right side of the page contains detailed information about the settings, including 'Factory default: On', 'Enable Linear Mode', 'Manual Configuration', 'Object Emissivity', 'Atmospheric Transmission', and 'Ambient Temperature'.

5. Enter the environmental temperature value (2, see point 2).

6. Specify the **Value Range** and **Thermal Range** parameters as shown on the screenshot.



7. To caption video with temperature readings, select **Display Mode (Right) (1)**, and then **Picture in Picture (2)** checkboxes.



8. Save the settings.


Configuring Face Detection and Temperature Control

To configure face detection and temperature control, do the following:

1. Add a **Temperature Matrix Data** object in the **Embedded Detection** group.
2. Under the newly added object, create a **Face Detection and Temperature Control**.

3. Select temperature unit (1).

Face detection and temperature control	
Frame size change	1920
Maximum face height	100
Maximum face width	100
Minimum face height	2
Minimum face width	2
Minimum threshold of face authenticity	90
Mode	CPU
Period of face search	250
Send face images	No
2 Show thermal overlay	No
1 Temperature unit	Degree Celsius (°C)
Track loss time	500


4. To caption video with thermal data, do the following:
- Select **Yes** for the **Show thermal overlay** parameter (2).
 - In the Preview window, drag anchor points  to draw an area where thermal data should be displayed.



5. If you use an Electromagnetic radiation absorber (BB), do the following:

- a. Specify its temperature (**3**). If temperature readings in this point are different, the bias will be used to re-calculate readings across all measurement points.

Advanced detection settings	
3	Electromagnetic radiation absorber (BB) temperature 37.5
	Face detection algorithm ALG1
	Maximum face deflection rate 15
	Minimum face recognition quality 50
	Minimum filtering threshold 50
4	Temperature value offset 0

- b. In the Preview window, double click to add anchor points  at the position of the electromagnetic radiation absorber (BB).



6. If you have discovered that your readings differ from actual temperature values, add the offset value into the **Temperature value offset** field (**4**). Bias values may be positive or negative.

Note

The rest of this detection tool parameters are identical to those of the basic face detection tool (see [Configuring Face detection](#)(see page 267)).

7. Click the **Apply** button.

You have configured detection tool now.

Configuring real-time face recognition

You can program automatic responses to an identification of a recognized face against an external list (for example, of wanted persons).

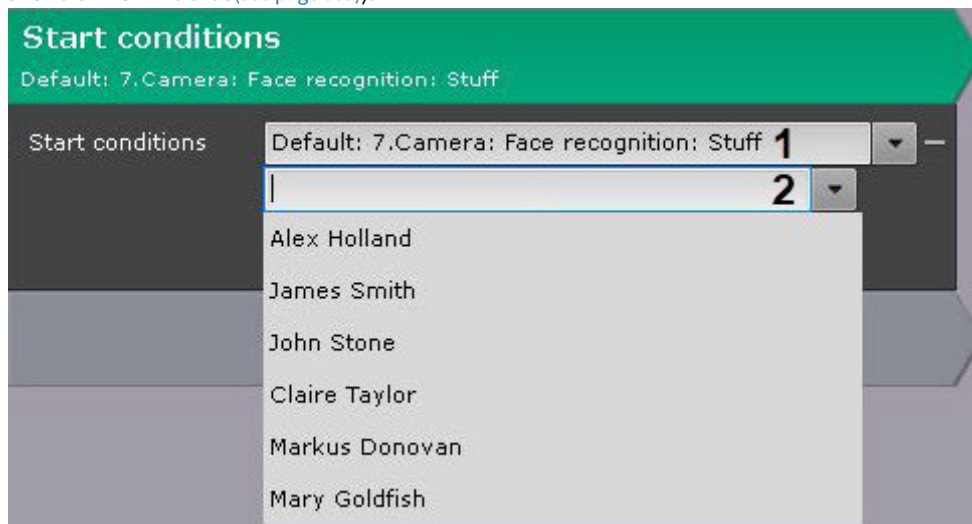
To do it, follow the steps below:

1. Activate the **Real-time recognition** parameter for the required detection tools (see [Configuring Face detection](#)(see page 267)).
2. Create one or more Lists of Persons. Add reference images of persons of interest to the lists (see [Lists of facial templates](#)).
3. Configure automatic responses to positive identification against the list.

Configuring macros when working with lists of Facial Templates

To set an automatic response to an FR event, do as follows:

1. Create a macro (see [Create Macros](#)(see page 382)).
2. As a starting condition, select the **Face recognition** event and the desired list (**1**, see [Configuring filters for event-driven macros](#)(see page 385)).



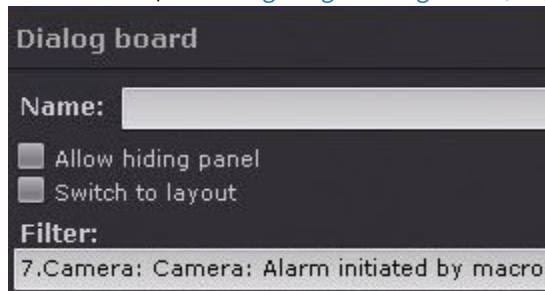
3. By default, the macro is triggered by recognition of any face from the list. If required, you can specify a particular person whose facial recognition will trigger the macro (**2**).

Note

To select another person, clear the **2** field and re-open the list.

4. Program an action or a sequence of actions to be performed in response to an identification of a recognized face against the designated list (see [Settings specific to actions](#)(see page 392)).

5. If the response involves initiating an alarm, you can configure the Dialog board to filter **Alarm initiated by macro** event (see [Configuring a Dialog Board](#)(see page 473)).



- [Examples of macros used for working with face lists](#)(see page 291)

Examples of macros used for working with face lists

On this page:

- [Alarm initiation](#)(see page 291)
- [Response to a recognition of a non-listed person](#)(see page 292)
- [Sending an E-mail](#)(see page 293)
- [Starting export](#)(see page 294)

Alarm initiation

Start conditions

Default: 7.Camera: Face recognition: Stuff

Start conditions: ▼ –

▼

+ Add event filter

Alarm initiation

Initiate if no active | Camera that initiated command execution ✕ +

Working mode: ▼

Camera: ▼

Random

Record to: ▼

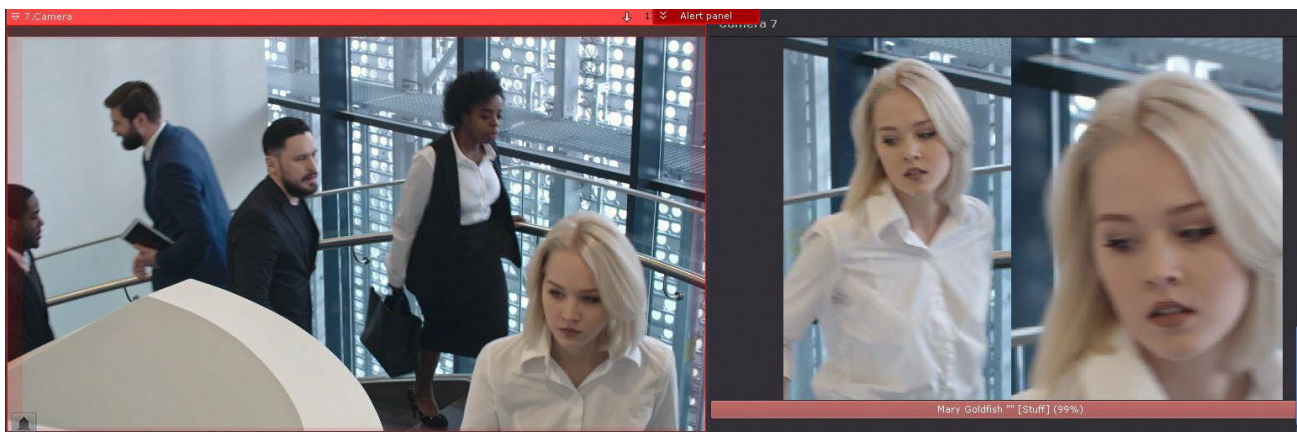
+

+

This macro can be used together with the Dialog Board (see [Configure the Dialog Board](#)(see page 473)).

If the Dialog Board is configured to display an alarm and linked with a video camera (see [Linking cells](#)(see page 458)), then when a face from the list is recognized, the following information will be displayed on the Dialog Board:

1. Reference photo from the face list.
2. An enlarged image of the recognized face in the frame.
3. The name of the recognized person, the comment in quotation marks, the name of the face list in square brackets, and the percentage of similarity with the reference face in parentheses (see [Lists of facial templates](#)).



Response to a recognition of a non-listed person

Start conditions

Default: 7.Camera: Faces: Triggering

Start conditions: -

+

+ Add event filter

Awaiting x

Default: 7.Camera: Face recognition: Wanted|5 seconds

Timeout: - +

Start conditions: -

+

+ Add event filter

Execute if event occurred

+

Execute if no event occurred

Alarm initiation x +

Initiate if no active | Camera that initiated command execution

Working mode: -

Camera: -

Random

Record to: -

+

+

Sending an E-mail

The screenshot displays two configuration sections in a dark-themed interface:

- Start conditions:** A green header bar with the text "Start conditions" and "Default: 7.Camera: Face recognition: Stuff". Below it is a dropdown menu with the same text and a minus sign. A plus sign icon and the text "Add event filter" are positioned below the dropdown.
- Send E-mail:** A blue header bar with the text "Send E-mail" and "Camera that initiated command execution". A close button (X) and a plus sign icon are on the right. Below the header are several fields:
 - Email message:** A dropdown menu with "COMPUTER/1.User e-mail" and a minus sign.
 - To:** A text input field containing "mail@server.com".
 - Subject:** A text input field containing "Notification: Attention, automatic rule is triggered."
 - Message:** A large, empty text area.
 - Export agent:** A dropdown menu with "1.Export agent" and a minus sign.
 - Camera:** A dropdown menu with "Camera that initiated command execution" and a minus sign.
 - Archive:** A dropdown menu that is currently empty.
 - During:** A time input field with a minus sign, "00:00:00", and a plus sign.

If the E-mail is sent via the SMTP Server (see [The E-mail notifier object](#)(see page 411)), then 3 files will be attached to the message:

- full frame at the moment of face recognition;
- reference photo from the face list;
- an enlarged image of the recognized face in the frame.

Starting export

As with the E-mail notifications, three files will be exported when you export an image for a facial recognition event i.e. when a match from Lists of Facial Templates is detected:

The screenshot displays two configuration panels in the Arkiv software interface. The top panel, titled 'Start conditions', has a green header and shows a dropdown menu with the selected value 'Default: 7.Camera: Face recognition: Stuff'. Below this is an 'Add event filter' button. The bottom panel, titled 'Video export', has a blue header and shows a dropdown menu with the selected value '1.Export agent'. Below this are fields for 'Camera' (set to 'Camera that initiated command execution') and 'Archive'. There are four radio button options: 'Image export' (selected), 'Time schedule', 'During:' (with a time input field set to '00:00:00'), and 'Finish after'. Both panels have 'Add event filter' buttons at the bottom.

- Full frame at the moment of facial recognition;
- Reference photo from the List of Facial Templates.
- Close up shot of the target face captured in the scene.

Configuring FaceCube integration

Arkiv supports the FaceCube facial recognition server (see <https://www.bio-cube.co.kr/vs-face>).

Please see the FaceCube integration workflows below:

1. Arkiv captures and recognizes a face, then passes the facial image to the FaceCube facial recognition server.
2. FaceCube checks the facial image against the DB.
3. If a match is found, the Arkiv VMS receives the results (see [Face recognition and search](#)(see page 734)).

To configure FaceCube workflows, do as follows:

1. Configure the FaceCube facial recognition server and add Reference faces (see <https://www.bio-cube.co.kr/>).

2. Create a face list in *Arkiv* and enter the address of the FaceCube facial recognition server into the **List settings** field ([Lists of facial templates](#)).

	Delete	Face lists	%	List settings
✎	×	Wanted	80	http://127.0.0.1:10111/FaceCubePlus

3. Activate the **Real-time recognition on external service** parameter and **Send face images** in the facial recognition settings (see [Configuring Face detection](#)(see page 267)).
4. Configure automatic responses to positive identification against the list (see [Configuring macros when working with lists of Facial Templates](#)(see page 290)).

7.4.11 Automatic Number Plate Recognition (LPR/ANPR) tools

License plate recognition (VT)

License plate recognition (VT) features and specifications

License plate recognition (VT) (Automatic Number Plate Recognition Tool) is designed to implement the following functions:

1. Vehicle license plate recognition The full list of supported countries:

Proven installations	Done
LPR VT is already used in multiple deployments to recognize the license numbers of the countries, listed below.	LPR VT is comprehensively tested in recognition of license plates of countries listed below. The results quality obtained in test environment is satisfiable. Still, LPR VT is not used in real-world installations in those countries yet.

Proven installations	Done
<ul style="list-style-type: none"> • Albania • Argentina • Azerbaijan • Belarus • Brazil • Colombia • Czech Republic • Georgia • Israel • Kazakhstan • Mexico • Moldova • Mongolia • Poland • Russia • Spain • Ukraine • United Kingdom • Uzbekistan • Bulgaria • Chile • Austria • Belgium • France • Guatemala • Hungary • Latvia • Lithuania • Netherlands • Paraguay • Taiwan • Uruguay • Iran • Jordan 	<ul style="list-style-type: none"> • Armenia • Bolivia • Bosnia and Herzegovina • Denmark • Ecuador • El Salvador • Finland • Greece • Italy • Malta • Montenegro • Norway • Peru • Portugal • Philippines • Romania • Slovakia • Slovenia • Sweden • Tajikistan • Canada • Estonia • Germany • Honduras • India • Kyrgyzstan • Nicaragua • Panama • Serbia • Korea Republic • Switzerland • Turkmenistan • Croatia • Malaysia • New Zealand • Singapore • Turkey • Bahrain • Luxembourg • South Africa • Vietnam • Andorra • Kenya • Australia

2. Write a recognized number to a database.
3. Check the recognized license plates of vehicles on the lists of license plates.

License plate recognition (VT) works in one of the following modes:

1. Fast – It processes video feeds up to 25 fps with a maximum vehicle speed of 180 km/h.
2. Slow – It processes video feeds up to 6 fps with a maximum vehicle speed of 20 km/h.

Note

Install the additional Addon VT LPR to work with License plate recognition (VT).

Camera requirements for License plate recognition (VT)

ANPR works properly if the following camera installation requirements are met (for a list of supported countries, see [License plate recognition \(VT\) features and specifications](#)(see page 296)):

- the camera should be installed in a horizontal position;
- in order to recognize state license plates on high-speed roads, the camera should have the Global Shutter mode;
- character height is at least 15px, stroke width is at least 2px;
- minimum allowable contrast for uniformly contaminated license plates should be at least 10% (contrasting visibility of characters relative to the background is 25 on a 256-point scale);
- maximum allowable non-uniform contamination is no more than 12% (the ratio of the contaminated area to the total area of the license plate);
- the geometric proportions of the image shall not deviate by more than 10% from the real geometric proportions of the license plate;
- the camera has the correct focal length settings. The table below provides an example of the correlation between viewing angle and sensor size, as well as lens focal length. A standard video surveillance calculator was used for calculations:

Object distance, m	Object width, m	Focal length, mm	Viewing angle, degrees	Sensor size, inches
3	4	4	85	1/3
3	4	5	65	1/2
3	3	5	65	1/3
3	3	6	55	1/2
7	4	8	40	1/3
7	4	10	35	1/2
7	3	10	35	1/3
7	3	12	25	1/2
11	4	13	28	1/3
11	4	18	22	1/2
11	3	18	22	1/2

Object distance, m	Object width, m	Focal length, mm	Viewing angle, degrees	Sensor size, inches
11	3	23	16	1/2
15	4	18	22	1/3
15	4	23	16	1/2
15	3	23	16	1/3
15	3	30	12	1/2

- the camera has a 1.0, 1.2, 1.3, 1.4, or 1.8 aperture lens;
- in order to provide 24-hour recognition in an area with changing lighting conditions, the camera should have infrared illumination (built-in or stand-alone IR projector);
- the camera has the correct exposure settings which depend on the level of the camera's inclination to the surface of the license plate, as well as on the vehicle speed. Approximate shutter speeds are shown in the table below:

Exposure, s	Maximum vehicle speed in the surveillance area, km/h
1/200	18
1/250	22
1/500	45
1/750	68
1/1000	90
1/1500	136
1/2000	181

Note

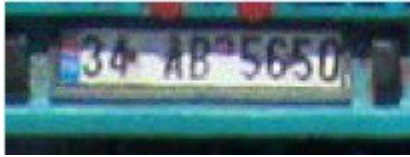
If you transmit MPEG-4 or H.264 streams over a stable connection, please set GOP length (Group of Pictures), i.e. the number of P- and B-frames between I-frames, to no more than 4 – 8 frames.

Attention!

The maximum vehicle speed for correct license plate recognition is limited to 180 km/h.

For stable ANPR operation, make sure that the image of the license plate is not:

- unequally lit;



- overexposed;



- blurred;



- distorted;



- interlaced;



- dirty.



Attention!

Otherwise, recognition accuracy might be compromised.

Some example number plate images that should be recognized fully and properly:



Configuring License plate recognition (VT)

❑ Attention!

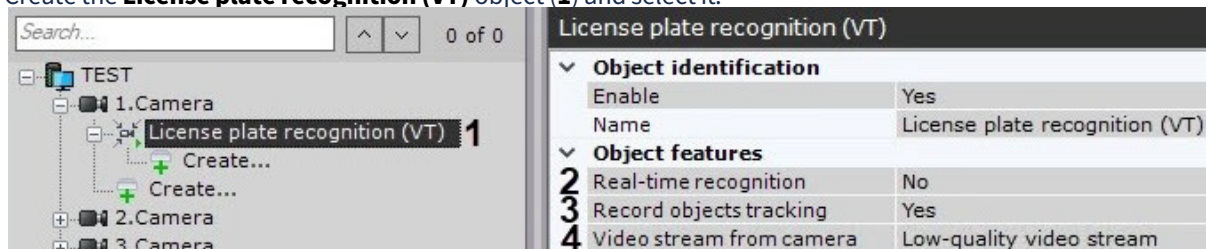
The license plate recognition requires a CPU that supports the SSE4.1/SSE4.2 instructions.

❑ Attention!

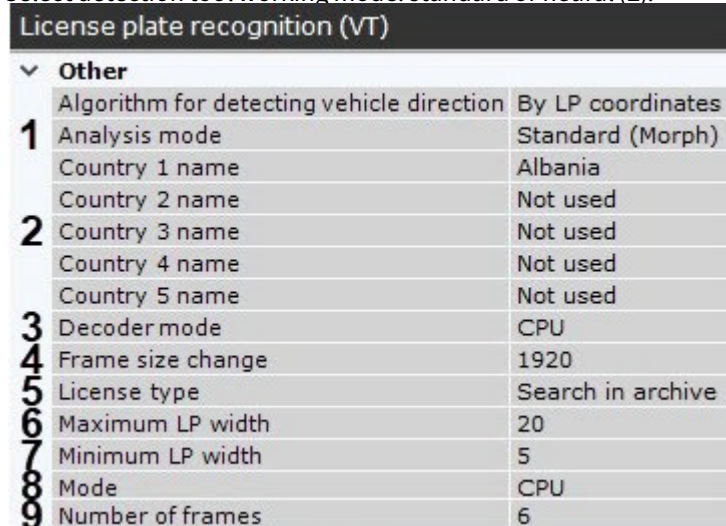
Arkiv ANPR/LPR is not compatible with Auto Intellect.
Uninstall *Arkiv VMS* and *Auto Intellect*, then reinstall *Arkiv*.

To configure ANPR, do as follows:

1. Download ANPR (VT) from the [website](#) and install it.
2. Create the **License plate recognition (VT)** object (1) and select it.



3. If you need to use this detection tool for real-time license plate recognition, set the corresponding parameter to **Yes** (2) (see [Configuring real-time vehicle license plate recognition](#)(see page 322)).
4. If you need to enable recording of metadata to the database, select **Yes** from the **Record objects tracking** list (3).
5. If the camera supports multistreaming, select the stream for which detection is needed. Selecting a low-quality video stream allows reducing the load on the Server (4).
6. Select detection tool working mode: standard or neural (1).



7. In the appropriate fields, select one or more countries for ANPR (2).

❑ Attention!

The more countries you select, the slower the recognition works and the greater the likelihood of the recognition error.

❑ Note

To recognize the old USSR license plates, you need to select the corresponding country in the list.

8. Select a processing resource for decoding video streams (**3**) (see [Hardware requirements for GPU based video decoding](#)(see page 25)). When you select a GPU, a stand-alone graphics card takes priority (when decoding with NVIDIA NVDEC chips). If there is no appropriate GPU, the decoding will use the Intel Quick Sync Video technology. Otherwise, CPU resources will be used for decoding.
9. Analyzed framed are scaled down to a specified resolution (**4**, 1920 pixels on the longer side). This is how it works:
 - a. If the longer side of the source image exceeds the value specified in the **Frame size change** field, it is divided by two.
 - b. If the resulting resolution falls below the specified value, it is used further.
 - c. If the resulting resolution still exceeds the specified limit, it is divided by two, etc.

❑ Note

For example, the source image resolution is 2048*1536, and the specified value is set to **1000**.

In this case, the source resolution will be halved two times (down to 512*384), as after the first division, the number of pixels on the longer side exceeds the limit (1024 > 1000).

❑ Note

If detection is performed on a higher resolution stream and detection errors occur, it is recommended to reduce the compression.

10. Select the current license type (**5**).

License	Description
Search in archive	Basic ANPR Search License. Attention! This type of license provides a 30-sec delay between the number recognition and the corresponding event (see Vehicle number plate recognition and search (see page 737)).
Standard (25 FPS or 6 FPS)	The 25 FPS license has a priority. The 6 FPS license is used only if you don't have 25 FPS license. You cannot use the license plate recognition function if you have not purchased both licenses.
Fast speed (25 FPS)	The "Fast" license allows you to process video feeds up to 25 FPS with a maximum vehicle speed of 150 km/h. You cannot use the license plate recognition function if you have not purchased the license.

License	Description
Slow speed (6 FPS)	The "Slow" license allows you to process video feeds up to 6 FPS with a maximum vehicle speed of 20 km/h. You cannot use the license plate recognition function if you have not purchased the license.

❑ Attention!

All license types except the standard one (**Search in archive**) require the hardware key or the software key activation (see [Licensing of the software module for License plate recognition \(VT\)](#)(see page 307)).

You can use a 60-day trial key (see [Licensing of the software module for License plate recognition \(VT\)](#)(see page 307)).

❑ Attention!

You can use only a hardware key on virtual machines. To use a hardware key, select the **Standard** (25 FPS or 6 FPS) license type.

- Set the maximum and minimum width of the vehicle license plate as a percentage of the FOV width (**6, 7**).

❑ Attention!


The **Minimum LP width** parameter affects the CPU load as follows: the higher the parameter is, the higher the load.

- Choose a processor to run detection on (**8**, see [Hardware requirements for License plate recognition \(VT\)](#)(see page 26), [General Information on Configuring Detection](#)(see page 221)). In standard mode, detection runs on the CPU only. In neural network analysis mode, the algorithm runs on the NVIDIA GPU.
- Set the number of frames required for LPR/ANPR (**9**). This is a necessary condition, but it is not sufficient for the first output. This condition delays the LPR output. This parameter allows increasing the reliability of the results, as well as hiding false positives.
- If necessary, configure the advanced detection settings (see [Fine-tuning the VT number plate detection tool](#)(see page 304)).


15. You can configure the ANPR area in FOV. The area is resized by moving the anchor points.



Note

For your convenience, you can click the  button and configure the mask on a still frame. To undo, click this button again.

Note

Detection area is displayed by default. You can click the  button to hide the area. To undo, click this button again.

16. Click the **Apply** button.

Configuration of ANPR is now complete.

Fine-tuning the VT number plate detection tool

Attention!

To fine tune this detection tool, you will require assistance from Inaxsys tech support.

To fine-tune the detection tool, do as follows:

1. If necessary, enable **Advanced image analysis (1)**.
Yes – improves the quality of recognition under adverse conditions (for example, if the characteristics/ settings of the camera do not fully meet the requirements, or in bad weather). The processing time of the frame increases by 20-30%, depending on its size. Under normal conditions, this setting does not affect the quality of recognition.

License plate recognition (VT)		
▼	Advanced detection settings	
1	Advanced image analysis	No
2	Algorithm of recognition of distorted LP image	No
3	Contrast threshold	40
4	LP advanced search algorithm	No
5	LP display quality	0
6	Maximum number of threads	1
7	Minimum similarity	40
8	Timeout	0
9	Tracker timeout, sec	3

2. To recognize the numbers at sharp angles with respect to the camera, select **Yes** in the **Algorithm of recognition of distorted LP image** field (2).
3. Set the image contrast threshold (3). The default value is **40**. On a high-quality image, increase this value to 50-60. If the image has poor contrast, lower this value.
4. If you expect different sizes of number plates within FOV, activate the **LP advanced search algorithm** (4). This parameter accounts for max and min width of number plates, and, in some cases, may help increasing recognition quality and optimizing CPU load.
5. To set up a number plate recognition event:
 - a. Specify the minimum percentage of similarity between the recognition result and the corresponding number plate template, for positive LPR result (7). Use this parameter to filter the results by reliability.
 - b. By default, a number plate recognition event is registered after a track containing a number plate disappears from FOV. You can set the moment of registration to a **Timeout** in seconds (8), or to reaching a similarity percentage specified in the **LP display quality** field (5). If both parameters are set to non-zero, the recognition event will be registered upon matching the first condition.

Note

The **LP display quality** parameter value must be no lower than the **Minimum similarity** value.

6. Specify the maximum number of recognition threads (6). If the value is **0**, the recognition process will occur in the same thread that starts it.

Important

The cumulative value of this parameter across all NPR detection tools must not exceed:

- the licensed number of recognition threads (check your license with the lsvpwcutility);
- the number of CPU cores;
- 100.

7. In the **Tracker timeout, sec** field, set a time interval in seconds after which the tracking of a vehicle is reset (9).

Note

Use this setting to eliminate double-triggering in such cases as, for example, another recognition of the same number after it has been obstructed for some time, and then reappears in scene. If you set Tracker timeout to a value greater than a probable time of obstruction, the detection tool will not double-trigger.

8. If necessary, set additional parameters. For more details, refer to the table.

License plate recognition (VT)	
VodiCTL_VPW_DYNAMIC_ENABLE	Yes
VodiCTL_VPW_DYNAMIC_OUTPUT_PERIOD	0.5
VodiCTL_VPW_DYNAMIC_OUTPUT_TIMEOUT	1
VodiCTL_VPW_DYNAMIC_WITH_DUPLICATE	Yes
VodiCTL_VPW_IMAGE_BLUR	13
VodiCTL_VPW_LOG_SETTINGS	No
VodiCTL_VPW_PLATE_FILTER_RODROPFACOR	0
VodiCTL_VPW_PLATE_FILTER_ROFACTOR	95
VodiCTL_VPW_PLATE_FILTER_SYMCOUNT	0
VodiCTL_VPW_PLATE_STAR_MAX	0

Parameter	Description
VodiCTL_VPW_DYNAMIC_ENABLE	<p>Enable/disable the number recognition dynamics (by default, the dynamics is enabled).</p> <p>If the value is Yes, then tracking is enabled, and the number is recognized by the set of frames. If the value is No, then tracking is disabled, and the number is recognized by each frame separately without taking to account the previous ones, and the quality can vary from 0 to 100%.</p>
VodiCTL_VPW_DYNAMIC_OUTPUT_PERIOD	Time period (in microseconds) over which the recognition result is to be displayed to the user. This parameter can be used only if the VodiCTL_VPW_DYNAMIC_WITH_DUPLICATE parameter is set.
VodiCTL_VPW_DYNAMIC_OUTPUT_TIMEOUT	The minimum time required to monitor the license plate (in microseconds) before displaying the recognition result to the user. This parameter can only be used when the “Dynamic” mode is on. In this mode, the trajectory of the vehicle is monitored, and the user does not immediately receive the recognition result of the license plate, but after the time specified for this setting. In this case, the first recognition result will be replaced by the result of higher quality and subsequently displayed to the user. If parameter 0 is set for this value, the user gets the first result of recognizing the detected license plate. After the time specified in this parameter expires, the monitoring of the trajectory of the license plate continues until it disappears from the frame.
VodiCTL_VPW_DYNAMIC_WITH_DUPLICATE	Enable/disable the periodic output of license plate recognition results.
VodiCTL_VPW_IMAGE_BLUR	The parameter for internal use. The recommended value to set is 13.
VodiCTL_VPW_LOG_SETTINGS	Enable/disable logging of all recognition parameters.

VodiCTL_VPW_PLATE_FILTER_RO DROPFACOR	The license plate filter coefficient by the so-called image density – ratio of white pixels to total pixels (second strategy). The type is unsigned. This coefficient is used for image thresholding and has the optimal values, which are determined by developers using their own test samples. The parameter is considered as a service one, and its value should be set according to the recommendations of technical support specialists.
VodiCTL_VPW_PLATE_FILTER_ROF ACTOR	The license plate filter coefficient by the so-called image density – ratio of white pixels to total pixels (first strategy). The type is unsigned. This coefficient is used for image thresholding and has the optimal values, which are determined by developers using their own test samples. The parameter is considered as a service one, and its value should be set according to the recommendations of technical support specialists.
VodiCTL_VPW_PLATE_FILTER_SYM COUNT	Enable/disable the simple license plates filter algorithm by the minimum number of recognized symbols on them. If the algorithm is enabled (the value of the parameter is greater than 0), the base search for symbols on the prospective license plate (geometry, proportions) is performed. If less symbols are recognized on the prospective license plate than specified in this parameter, this prospective license plate is not considered a license plate. That is, the value of this parameter is the minimum characters that must be present on the prospective license plate when the basic algorithm is in use.
VodiCTL_VPW_PLATE_STAR_MAX	Maximum unrecognized symbols on the license plate, at which the result will still be considered the result of the recognition of the license plate.

9. Click the **Apply** button.

Licensing of the software module for License plate recognition (VT)

On this page:

- [Installing the license key environment](#)(see page 308)
- [Installing a demo license](#)(see page 308)
- [Installing a hardware key](#)(see page 309)
- [Installing a software key](#)(see page 309)
- [Activating and updating the license](#)(see page 311)
- [Removing a license](#)(see page 313)
- [Checking a license](#)(see page 313)

Installing the license key environment

The license keys for License plate recognition (VT) require the Sentinel LDK Run-time environment. It is installed automatically with the Addon VT LPR (see [Installing DetectorPack addons](#)(see page 50)).

To manually install the Sentinel LDK Run-time environment, do the following:

1. Download the [haspdinst_EOAWT.exe](#) installer.
2. Run the command line as system administrator.
3. Execute the **haspdinst_EOAWT.exe -i -fi -fss** command.
4. Restart the OS.

Note

If the environment is successfully installed, the Sentinel Admin Control Center web application will open in the Web browser at <http://127.0.0.1:1947/>.

Installation of the Sentinel LDK Run-time environment is complete.

Installing a demo license

Attention!

Before you install a demo license, it is necessary to install the Sentinel LDK Run-time environment.

The Sentinel LDK Run-time environment and a standard demo license for searching the recognized license plates in the archive are installed automatically with the Addon VT LPR (see [Installing DetectorPack addons](#)(see page 50)).

Attention!

If you use this license, note that there is a 30 seconds delay between the recognition of a license plate and the appearance of a corresponding event (see [Vehicle number plate recognition and search](#)(see page 737)).

With demo license, the License plate recognition (VT) works for all available countries on 4 channels at 25 FPS or on 4 channels at 6 FPS. The demo mode is valid for 60 days from the moment the demo key is activated.

Attention!

Demo mode of the License plate recognition (VT) is not allowed on virtual machines.

To install a demo license, do the following:

1. Download the distribution package: [25 FPS](#) or [6 FPS](#).
2. Run the command line as system administrator.
3. Execute the **SDK_4hi_60d_WORLD.exe -i -fi -fss** command (for a 25 FPS demo license) or **SDK_4lo_60d_WORLD.exe -i -fi -fss** command (for a 6 FPS demo license).
4. Restart the OS.

Note

Information about the installed demo license is displayed in the [Sentinel Admin Control Center](#) web application, on the **Sentinel Keys** tab.

The installation of the demo license is now complete.

Installing a hardware key

 Attention!

Before you install a hardware key, it is necessary to install the Sentinel LDK Run-time environment.

To install a hardware key, do the following:

1. Download and install the [HASPUserSetup.exe](#) driver distribution package.
2. Connect the hardware key to the Server where you plan to use the License plate recognition (VT). If the Sentinel LDK Run-time environment is successfully installed, the license is automatically recognized by *Arkiv* and it is ready to use.

 Note

Information about the installed hardware key is displayed in the [Sentinel Admin Control Center](#) web application, on the **Sentinel Keys** tab.

The installation of the hardware key is now complete.

Installing a software key

 Attention!

Before you install a software key, it is necessary to install the Sentinel LDK Run-time environment.

 Attention!

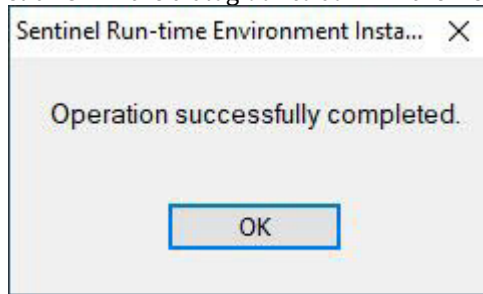
The License plate recognition (VT) license is not automatically transferred to a new node in a failover system (see [Configuring Failover VMS](#)(see page 562)).

To ensure the License plate recognition (VT) operation, it is necessary to manually activate the license on the computer where the node is running.

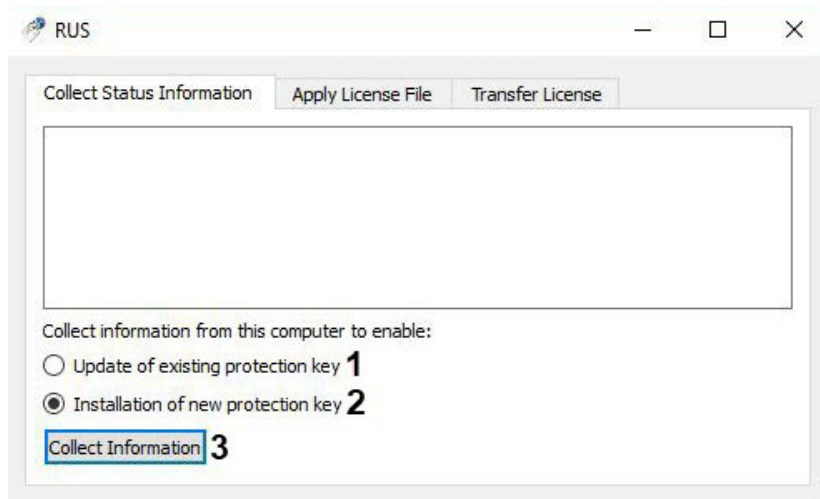
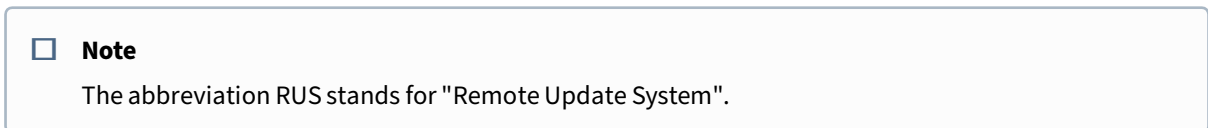
To install a software key, do the following:

1. Download the [RUS_EOAWT.exe](#).
2. Run the command line as system administrator.
3. Execute the **haspdinst_EOAWT.exe -fr -purge** command.

4. Click **OK** in the dialog box to confirm the installation is completed.

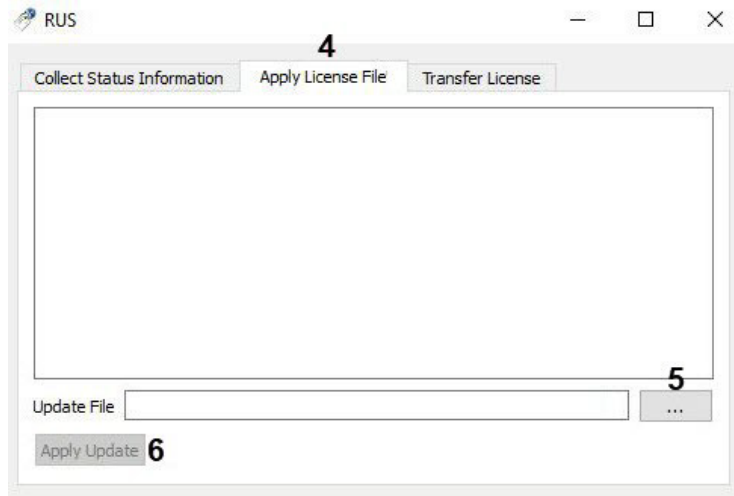


5. Run the RUS_EOAWT.exe file to start the Remote Update System. The **RUS** dialog box opens.



6. Set the **Collect information from this computer to enable** switch into one of the following positions:
 - a. **Update of existing protection key (1)** if a demo license is already in use.
 - b. **Installation of new protection key (2)** if license for a "clean computer" is required, i.e. if there is no demo license on the Server.
7. Click **Collect Information (3)**.
8. Save the file with the c2v extension to the required directory.
9. Close the RUS_EOAWT.exe utility.
10. Give the created file with the c2v extension to the Inaxsys manager.
11. Get a v2c file from the Inaxsys manager.

- Run the RUS_EOAWT.exe utility and go to the **Apply License File** tab (4).



- Specify location of the license file in the **Update File** field using the ... button (5).
- Click **Apply Update** (6).
- Restart the OS.

Note

Information about the installed software key is displayed in the [Sentinel Admin Control Center](#) web application, on the **Sentinel Keys** tab.

The installation of the software key is now complete.

Activating and updating the license

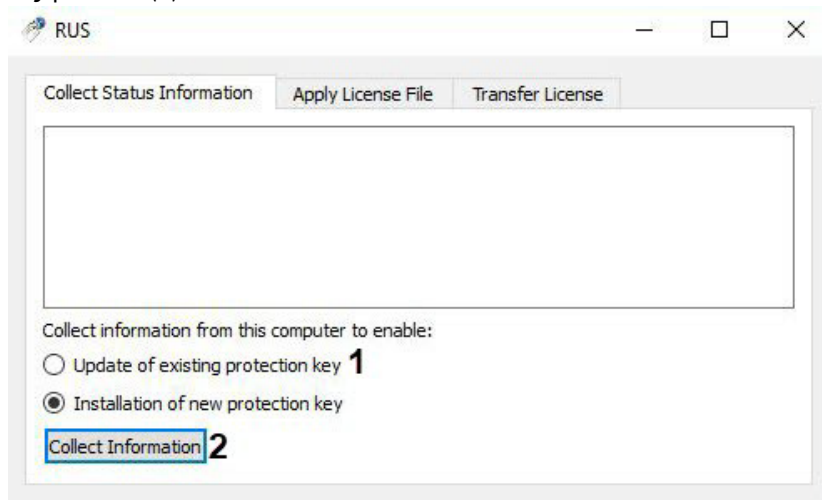
Attention!

Before you install a software key, it is necessary to install the Sentinel LDK Run-time environment and the RUS_EOAWT.exe utility.

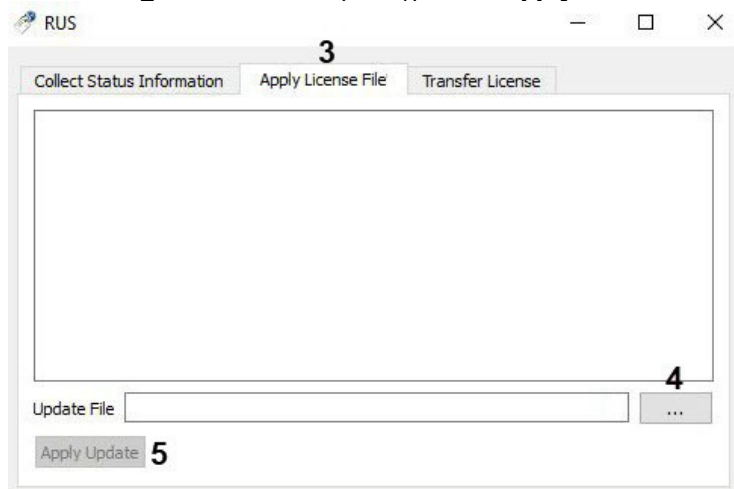
To activate/update the license, do the following:

- Run the RUS_EOAWT.exe utility.

- Set the **Collect information from this computer to enable** switch to the **Update of existing protection key** position (1).



- Click **Collect Information** (2).
- Save the file with the c2v extension to the required directory.
- Close the RUS_EOAWT.exe utility.
- Give the created file with the c2v extension to the Inaxsys manager.
- Get a v2c file from the Inaxsys manager.
- Run the RUS_EOAWT.exe utility and go to the **Apply License File** tab (3).



- Specify location of the license file in the **Update File** field using the ... button (4).
- Click **Apply Update** (5).
- Restart the OS.

Note

Information about the activated/updated license is displayed in the [Sentinel Admin Control Center](#) web application, on the **Sentinel Keys** tab.

The activation/update of the license is now complete.

Removing a license

To delete a license, do the following:

1. Delete the v2c license file from the C:\Program Files (x86)\Common Files\SafeNet Sentinel\Sentinel LDK\installed\ folder.
2. Restart the OS.

The removal of the license is now complete.

Checking a license

You can check the current license status on the Server. To do this, open the [Sentinel Admin Control Center](#) web application. The license information is displayed on the **Features** tab.

License plate recognition (IV)

License plate recognition (IV) features and specifications

License plate recognition (IV) is designed to implement the following functions:

1. Recognize the license plate number of vehicles.

- List of supported countries: Australia, Belarus, Brazil, Canada, China, Czech Republic, Egypt, Finland, France, Germany, Great Britain, India, Indonesia, Israel, Italy, Japan, Kazakhstan, Mexico, Monaco, Mongolia, Pakistan, Poland, Qatar, Russia, Republic of South Africa, Saudi Arabia, Slovenia, South Korea, Spain, Sri Lanka, Taiwan, Thailand, Turkey, Ukraine, United Arab Emirates, United States of America, Uzbekistan, Vietnam.

Recognition of license plates of vehicles as part of conglomerates:

- European Union (Austria, Germany);
- K.U.B.R (Kazakhstan, Ukraine, Belarus, Russia);
- Malaysia, Singapore;
- Middle East (Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syria, United Arab Emirates, Yemen);
- North America (Canada, Mexico, United States of America).

Motorcycle license plate recognition only for Brazil.

2. Write a recognized number to a database.
3. Check the recognized license plates of vehicles on the lists of license plates.

Note

Install the additional Addon IV LPR to work with License plate recognition (IV).

Attention!

Only a 64-bit version is available.

Camera requirements for License plate recognition (IV)

- **Camera specifications**

- The minimum video resolution is 640*480, the recommended resolution is 720p or 1080p.
- The minimum frame rate is 15 fps, the recommended frame rate is 25-30 fps.
- Auto Focus and Zoom would be useful for making small adjustments after setting up ANPR.
- Automatic white balance / automatic gain.
- IR for night mode with good contrast of license plate images.
- HDR/WDR.
- In order to recognize state license plates on high-speed roads, the camera should have the Global Shutter mode.

- **Video requirements**

- The video image should be clear, contrasting, without distortion, not blurred.
- The size of the license plate should be 15 – 70% of the total size of the image.
- The license plate must contain no more than two rows of characters.

- **Camera installation requirements**

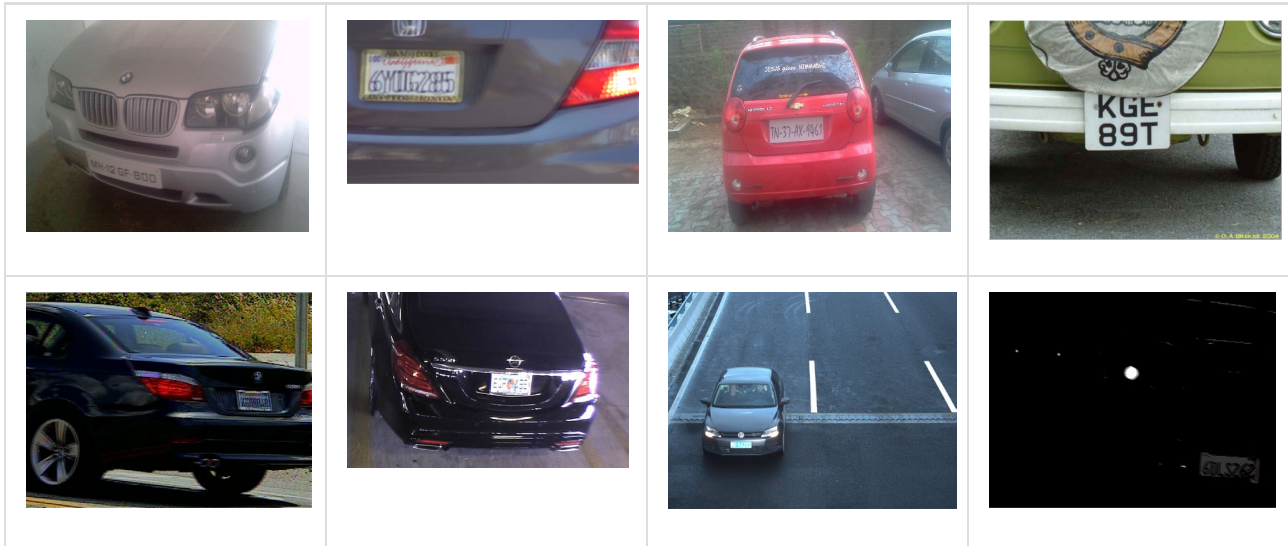
- The video camera should be mounted at 0,6 – 2,4 meters above the ground.
- The angle formed by the lower line of the license plate and the horizon line should be from 0 to 20 degrees.

Examples of correct and incorrect video images

Video images that meet the video camera mounting and setup requirements for the Licence plate recognition (IV).



Video images that do not meet the video camera mounting and setup requirements for the Licence plate recognition (IV).



Configuring License plate recognition (IV)

To configure License plate recognition (IV), do as follows:

1. Submit to the technical support the MAC address of the Server where the detection tool will be used.

Attention!

The detection tool will not operate on the Server with a different MAC address.

2. Copy the license received from technical support into the C:\Program Files\Common Files\Inxsys\DetectorPack\LicenseFile_LprIV.txt file.
3. Restart the Server (see [Shutting down a Server](#)(see page 82), [Starting a Server](#)(see page 76)).
4. Create the **License plate recognition (IV)** object and select it.

License plate recognition (IV)	
Object identification	
Enable	Yes
Name	License plate recognition (IV)
Object features	
1 Real-time recognition	No
2 Record objects tracking	Yes
3 Video stream from camera	Low-quality video stream
Visual Elements	
> Visual Element	Detection area (rectangle)

5. If you need to use this detection tool for real-time license plate recognition, set the corresponding parameter to **Yes (1)**, see [Configuring online Vehicle License Plate recognition](#)(see page 322)).
6. If you need to record metadata, select **Yes** from the **Record objects tracking** list (2).
7. If the camera supports multistreaming, select the stream for which detection is needed (3). Selecting a low-quality video stream allows reducing the load on the Server.
8. Select the **Algorithm for detecting vehicle direction (1)**:

- a. By LP coordinates: if LP coordinates change position from top to bottom, the vehicle moves towards the camera. If LP coordinates change position from bottom to top, the vehicle moves away from the camera.
- b. By LP scale change: if LP scale increases, the vehicle moves towards the camera. If LP scale decreases, the vehicle moves away from the camera.

License plate recognition (IV)		
∨	Other	
1	Algorithm for detecting vehicle direction	By LP coordinates
2	Country name	USA, medium CPU load
3	Decoder mode	CPU
4	Frame size change	1920
5	Frames processed per second	100
6	Maximal number of cores	0
7	Maximum LP width	10
8	Minimum LP width	1
9	Minimum recognition quality, in %	80
10	Processing unit	CPU

9. Select the country from the list for LPR and the level of recognition accuracy (**2**).
 - a. High CPU load, high recognition accuracy – provides the maximum recognition accuracy, but creates a high load on the CPU and/or GPU.
 - b. Medium CPU load, medium recognition accuracy – provides a high recognition accuracy, requires less computing resources than the maximum accuracy.
 - c. Low CPU load, low recognition accuracy – provides the fastest recognition speed, but the recognition accuracy is low.
10. Select a processing resource for decoding video streams (**3**). When you select a GPU, a stand-alone graphics card takes priority (when decoding with NVIDIA NVDEC chips). If there is no appropriate GPU, the decoding will use the Intel Quick Sync Video technology. Otherwise, CPU resources will be used for decoding.
11. By default, the analyzed framed are scaled down to a specified resolution (**4**, 1920 pixels on the longer side). This is how it works:
 - a. If the longer side of the source image exceeds the value specified in the **Frame size change** field, it is divided by two.
 - b. If the resulting resolution falls below the specified value, it is used further.
 - c. If the resulting resolution still exceeds the specified limit, it is divided by two, etc.

Note

For example, the source image resolution is 2048*1536, and the specified value is set to **1000**.

In this case, the source resolution will be halved two times (512*384), as after the first division, the number of pixels on the longer side exceeds the limit (1024 > 1000).

Note

If detection is performed on a higher resolution stream and detection errors occur, it is recommended to reduce the compression.

12. Set the number of frames processed per second by the detection tool (**5**). The value should be in the range [0,016; 100].
13. Set the maximum number of processor cores available for the detection tool. The **0** value means that all cores are used (**6**). The value should be in the range [-1; 1].
14. Set the maximum and minimum width of the license plate as a percentage of the frame width (**7**, **8**). The value should be in the range [1; 100].

15. Set minimum quality of LPR **(9)**. The higher the minimum recognition quality, the fewer false positives will be detected. The value should be in the range [0; 100].
16. Select the processor for the detection tool – the CPU or one of NVIDIA GPUs (**10**, see [General Information on Configuring Detection](#)(see page 221)).

☐ Attention!

It may take several minutes to launch the algorithm on NVIDIA GPU. You can use caching to speed up future launches (see [Configuring the acceleration of GPU-based neuroanalytics](#)(see page 381)).

☐ Note

If there are several GPUs in the system, a specific NVIDIA GPU value can be assigned to each License plate recognition (IV) tool.


17. In the **Event timeout** field (**1**) specify the time interval in seconds between the initial LP recognition and event registration. The value should be in the range [0; 3600]. The **0** value sets the event registration to the moment when the track disappears from FOV.

License plate recognition (IV)		
Advanced detection settings		
1	Event timeout	1
2	Maximal number of characters in LP	10
3	Minimal number of characters in LP	5
4	Tracker timeout	3

18. Specify the maximum and minimum number of characters in LP (**2, 3**). The value should be in the range [1; 20].
19. In the **Tracker timeout** field (**4**), enter a time period in seconds after which the vehicle track is considered lost. The value should be in the range [0; 3600].


☐ Note

This parameter should be used to prevent double detections that occur, for example, when the LP is recognized in the frame then gets hidden behind a visual obstacle and after that gets recognized by the detection tool again. If you set the timeout longer than the time of possible LP overlapping in the frame, the detection tool will trigger only once.


20. You can configure the LPR area in the FOV. The area is resized by moving the anchor points .



Note

For your convenience, you can click the  button and configure the mask on a still frame. To undo, click this button again.

Note

Detection area is displayed by default. You can click the  button to hide the area. To undo, click this button again.

21. Click the **Apply** button.

Configuration of License plate recognition (IV) is now complete.

License plate recognition (RR)

License plate recognition (RR) features and specifications

The License plate recognition (RR) is designed to implement the following features:

1. Recognize license plates.

Note

List of supported countries: Armenia, Azerbaijan, Belarus, Czech Republic, Estonia, Georgia, Kyrgyzstan, Kazakhstan, Lithuania, Latvia, Moldova, Russia, Ukraine, Uzbekistan, Vietnam, Peru, Spain, Mexico, Poland, Malaysia, Myanmar, Finland.

2. Write the recognized license plates into a database.
3. Check the recognized license plates on the lists of license plates.
4. Determine the vehicle driving direction.

Depending on the features required, the Arkiv VMS offers three types of License plate recognition (RR) tools:

License plate recognition - Search in archive (RR)

License plate recognition - Parking (RR)

License plate recognition (RR)

1. **License plate recognition (RR)** – recognizes license plates in real time. Recognition is performed in the Fast mode (video stream processing at a speed of up to 30 FPS).
2. **License plate recognition – Parking (RR)** – recognizes license plates in real time. Recognition is performed in the Slow mode (video stream processing at a speed of up to 8 FPS).

Note

The sampling rate for the detection tool is 150 milliseconds, all other frames are skipped.

3. **License plate recognition – Search in archive (RR)** – recognizes license plates in the archive. Recognition is performed in the Fast mode (video stream processing at a speed of up to 30 FPS).

Note

This detection tool generates events with a 30 sec delay after the license plate recognition.

Note

License plate recognition (RR) requires Add-on RR LPR to be installed (see [Installing DetectorPack addons](#)(see page 50)).

Camera requirements for License plate recognition (RR)

To ensure recognition of state license plates using appropriate detection tools, it is necessary to install and configure video cameras in such a way that the following requirements are met:

- Character height is at least 10px, preferably 20px or more.
- Minimum resolution is 1280*720. The recommended resolution is 1920*1080.
- Minimum frame rate for the Slow mode is 5 FPS. Minimum frame rate for the Fast mode is 20 FPS.
- Maximum horizontal angle is 30°.
- Maximum vertical angle is 45°.
- Expected image contrast: the contrast difference between characters of the LP and the background should be at least 20 units with the image brightness scale from 0 to 255.
- In order to recognize state license plates on high-speed roads, the camera should have the Global Shutter mode.

Configuring License plate recognition (RR)

To configure License plate recognition (RR), do as follows:

1. Download Add-on RR LPR from the [website](#) and install it.

Note

To make the detection tool operate on Windows Server 2012 R2, make sure to install the Media Foundation component.

2. Create the required detection tool and select it.

License plate recognition (RR)		
Object features		
1	Real-time recognition	Yes
2	Record objects tracking	Yes
3	Video stream from camera	High-quality video stream

3. If you need to use this detection tool for real-time license plate recognition, set the corresponding parameter to **Yes (1)** (see [Configuring real-time vehicle license plate recognition](#)(see page 322)).
4. To record metadata to the database, select **Yes** from the **Record objects tracking** list (2).
5. If the camera supports multistreaming, select the stream for which detection is needed. Selecting a low-quality video stream reduces the load on the Server (3).

Other		
4	Algorithm for detecting vehicle direction	By LP coordinates
	Country 1 name	Germany
	Country 2 name	Not used
5	Country 3 name	Not used
	Country 4 name	Not used
	Country 5 name	Not used
6	Decoder mode	CPU
7	Frames processed per second	100
8	Minimum recognition quality, in %	80
9	Mode	CPU
10	Speed detection	Kmph
11	Speed detection area height	0
12	Speed detection area width	0
13	Vehicle recognition	Yes

6. Select the **Algorithm for detecting vehicle direction (4)**:
 - a. By LP coordinates: if LP coordinates change position from top to bottom, the vehicle moves towards the camera. If LP coordinates change position from bottom to top, the vehicle moves away from the camera.
 - b. By LP scale change: if LP scale increases, the vehicle moves towards the camera. If LP scale decreases, the vehicle moves away from the camera.
7. In the corresponding fields, select from the list one or more countries for LPR (5).
8. Select the processor for decoding video streams (6). When you select a GPU, a stand-alone graphics card takes priority (when decoding with NVIDIA NVDEC chips). If there is no appropriate GPU, the decoding will be done with Intel Quick Sync Video technology. Otherwise, the CPU resources will be used for decoding.
9. Set the number of frames processed per second by the detection tool (7). The value should be in the range [0;100].
10. Set the minimum quality of LPR (8). The value should be in the range [0; 100]. The higher the minimum recognition quality, the fewer false detections will occur.
11. Select the processor for the detection tool: the CPU or one of NVIDIA GPUs (9) (see [General Information on Configuring Detection](#)(see page 221)).

Attention!

It may take several minutes to launch the algorithm on NVIDIA GPU. You can use caching to speed up future launches (see [Configuring the acceleration of GPU-based neuroanalytics](#)(see page 381)).

12. From the **Speed detection** list, select the unit of measurement of vehicle speed (10).
13. Specify the speed detection area height and width (11, 12). The value should be in the range [0; 500].

14. If you need to search for the recognized LPs in the archive, set **Yes** for the corresponding parameter (**13**, see [LPR search](#)(see page 717)).
15. In the **Event timeout** field (**14**) specify the time interval in seconds between the initial LP recognition and event registration. The **0** value sets the event registration to the moment when the track disappears from FOV.

Note

Skip this step with **License plate recognition - Search in archive (RR)**.

Advanced detection settings	
14 Force report timeout	0
15 Frame size change	1920
16 Maximum number of threads	4

16. By default, the analyzed frames are scaled down to a specified resolution (**15**, 1920 pixels on the longer side). This is how it works:
 - a. If the longer side of the source image exceeds the value specified in the **Frame size change** field, it is divided by two.
 - b. If the resulting resolution falls below the specified value, this resolution will be used further.
 - c. If the resulting resolution still exceeds the specified value, it is divided by two, etc.

Note

For example, the source image resolution is 2048*1536, and the specified value is set to **1000**.

In this case, the source resolution will be halved two times (512*384), as after the first division, the number of pixels on the longer side exceeds the limit (1024 > 1000).

Note

If detection is performed on a higher resolution stream and detection errors occur, it is recommended to reduce the compression.


17. Specify the maximum number of recognition threads (**16**). If the value is **0**, the recognition process will occur in the same thread that starts it.

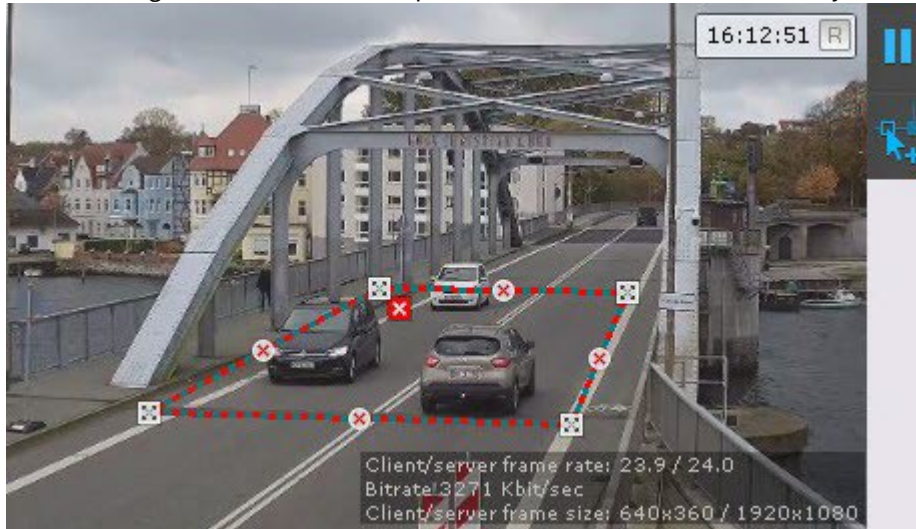
Attention!

The cumulative value of this parameters across all LPR detection tools should not exceed the number of CPU cores and is limited to **100**.


Attention!

Starting from *DetectorPack* 3.8.0.95 the **Maximum number of threads** parameter is not present.


18. You can configure the LPR area in the preview window. The area is resized by moving the anchor points .



Note

For your convenience, you can click the  button and configure the mask on a still frame. To undo, click this button again.

Note

Detection zone is displayed by default. You can click the  button to hide the area. To undo, click this button again.

19. Click the **Apply** button.

Configuration of License plate recognition (RR) is now complete.

Configuring real-time vehicle license plate recognition

You can program automatic responses to an identification of a recognized LP against an external list (for example, of wanted vehicles).

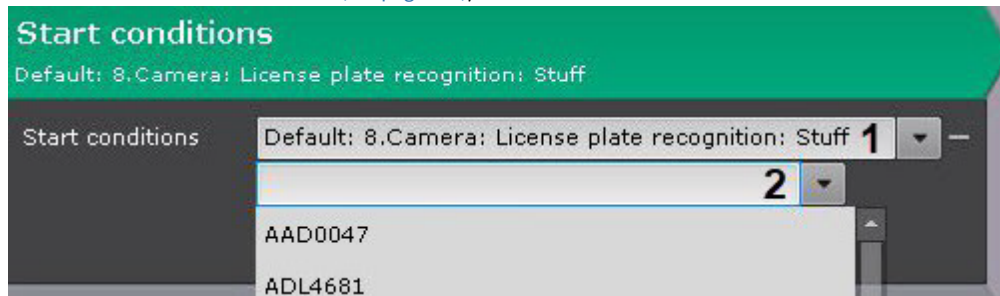
To do it, follow the steps below:

1. Activate the **Real-time recognition** parameter for the required detection tools (see [Configuring License plate recognition \(VT\)](#)(see page 301)).
2. Create one or more Lists of LPs ([Lists of vehicle numbers](#)).
3. Add reference images of LPs of interest to the lists.
4. Configure automatic responses to positive identification against the list (see [Configuring macros when working with ANPR lists](#)(see page 323)).

Configuring macros when working with ANPR lists

To set an automatic response to an FR event, do as follows:

1. Create a macro (see [Create Macros](#)(see page 382)).
2. As a starting condition, select the **License plate recognition** event and the desired list (**1**, see [Configuring filters for event-driven macros](#)(see page 385)).

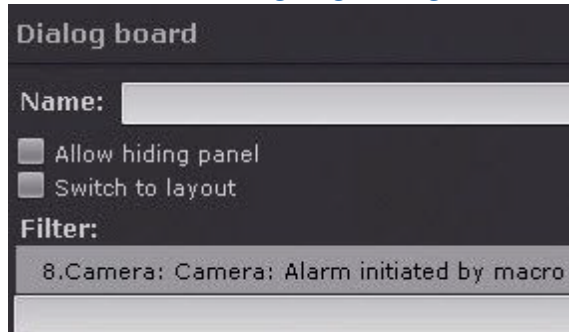


3. By default, the macro is triggered by recognition of any number from the list. If required, you can specify a particular number whose recognition will trigger the macro (**2**).

Note

To select another number, clear the **2** field and re-open the list.

4. Program an action or a sequence of actions to be performed in response to an identification of a recognized LP against the designated list (see [Settings specific to actions](#)(see page 392)).
5. If the response involves initiating an alarm, you can configure the Dialog Board to filter **Alarm initiated by macro** events (see [Configuring a Dialog Board](#)(see page 473)).



7.4.12 Neural Counter

Video stream and scene requirements for neural counter operation

The neural counter operation imposes the following requirements:

1. To the video stream from the camera:
 - a. The resolution is at least 640x360 pixels. It is also not recommended to use a resolution higher than 1920x1080, since higher resolution does not increase the detection quality, but significantly increases the consumption of resources. The optimal resolution for solving typical tasks is 1280x720 (see [Example of configuring neural counter for solving typical task](#)(see page 327)).
 - b. The frame rate per second in the video stream from the camera is at least 8 for solving typical task.
 - c. Both colorless (gray) and color images.

2. To lighting:
 - a. Lighting in the scene is at least 50 lux per square meter. In conditions of insufficient or excessive lighting (night or light-striking), stable operation of the video analytics is not guaranteed.
 - b. There are no abrupt changes in lighting.
3. To the scene and camera angle:
 - a. Moving objects are visually separable from each other.
 - b. The background is mostly static and does not change abruptly.
 - c. Moving objects are minimally obscured by static objects in the scene (columns, trees, etc.).
 - d. The analyzed scene does not have reflective surfaces and sharp shadows from moving objects. If present, they should be masked.
 - e. Camera shake does not result in image offsets greater than 1% of the frame size.

Attention!

Correct operation of the neural counter is not guaranteed when using a fish-eye lens.

- [Hardware requirements for neural analytics operation](#)(see page 23)
[Objects image requirements for neural counter](#)(see page 328)

Functions of the neural counter

The neural counter relies on a neural network to work out the number of objects in the zone.

A detection event that can be used to launch a macro is generated when the number of objects in FoV matches the pre-defined conditions (see [Configuring filters for event-driven macros](#)(see page 385)).

Note

Unlike the [Multiple objects detection tool](#) (see [Settings specific to Multiple objects](#)(see page 259)), the neural counter generates events of one type, namely – triggering.
 The neural counter is less resource-intensive than [Multiple objects detection tool based on Neural Tracker](#).

Note

For the neural counter to work, install [Addon Neuro Pack](#) (see [Installing DetectorPack addons](#)(see page 50)).

Configuring a Neurocounter

- [Video stream and scene requirements for neural counter operation](#)(see page 323)
[Hardware requirements for neural analytics operation](#)(see page 23)

To configure Neurocounter, do the following:

1. To record mask (highlighting of recognized objects) to the archive, select **Yes** for the corresponding parameter (1).

Neurocounter	
▼ Object identification	
Enable	Yes
Name	Neurocounter
▼ Object features	
1 Record mask to archive	No
2 Video stream from camera	Low-quality video stream

2. If the camera supports multistreaming, select the stream for which detection is needed (2).

Neurocounter	
▼ Other	
3 Decoder mode	CPU
4 Detected objects	No
5 Detection threshold	30
6 Frames processed per second	1
7 Mode	CPU
8 Neural network file	
9 Number of alarm objects	5
10 Number of measurements in a row to trigger	3
11 Object type	Human
12 Trigger upon count	Greater than threshold value

3. Select a processing resource for decoding video streams (3). When you select a GPU, a stand-alone graphics card takes priority (when decoding with NVIDIA NVDEC chips). If there is no appropriate GPU, the decoding will use the Intel Quick Sync Video technology. Otherwise, CPU resources will be used for decoding.
4. If you need to outline the recognized objects in the preview window, select **Yes** for the **Detected objects** parameter (4).
5. Set the recognition threshold for objects in percent (5). If the recognition probability falls below the specified value, the data will be ignored. The higher the value, the higher the recognition accuracy, but some triggers may not be considered.
6. Set the frame rate value for the detection tool to process per second (6). This value should be in the range [0,016; 100].

Note

The default values (3 output frames and 1 FPS) indicate that Neurocounter will analyze one frame every second. If Neurocounter detects the specified number of objects (or more) on 3 frames, then it triggers.

7. Select the processor for the neural network – CPU, one of NVIDIA GPUs or one of Intel GPUs (7, see [Hardware requirements for neural analytics operation](#)(see page 23), [General Information on Configuring Detection](#)(see page 221)).

Attention!

If you specify other processing resource than the CPU, this device will carry the most of computing load. However, the CPU will also be used to run Neurocounter.

Attention!

It may take several minutes to launch the algorithm on NVIDIA GPU after you apply the settings. You can use caching to speed up future launches (see [Configuring the acceleration of GPU-based neuroanalytics](#)(see page 381)).

8. In the **Object type** field (**11**), select the object type for counting, or in the **Neural network file** field (**8**), select the neural network file.

Attention!

To train your neural network, contact Inaxsys (see [Data collection requirements for neural network training](#)(see page 227)).

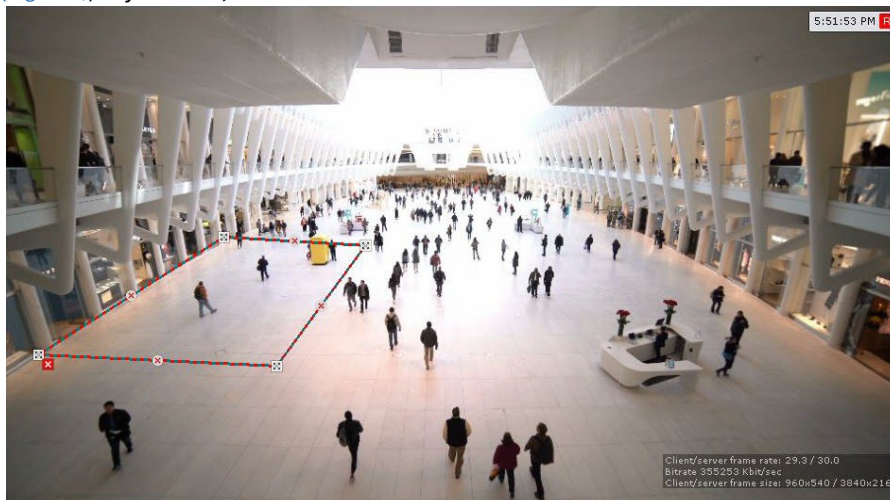
A trained neural network for a particular scene allows you to detect only objects of a certain type (e.g. person, cyclist, motorcyclist, etc.).

If the neural network file is not specified, the default file will be used, which is selected depending on the selected object type (**11**) and the selected processor for the neural network operation (**7**).

Note

For correct neural network operation on Linux, place the corresponding file in the /opt/Inaxsys/DetectorPack/NeuroSDK directory.

9. Set the triggering condition for Neurocounter:
 - a. In the **Number of alarm objects** field (**9**), set the threshold value for the number of objects in FOV.
 - b. In the **Trigger upon count** field (**12**), select when you want to generate the trigger – when the number of objects in the detection area is greater or less than the threshold value.
10. Set the minimum number of frames on which Neurocounter should detect objects in order to trigger (**10**). The value should be in the range [2; 20].
11. In the preview window, you can set the detection areas with the help of anchor points much like privacy masks in Scene Analytics detection tools (see [Setting General Zones for Scene analytics detection tools](#)(see page 248)). By default, the entire FOV is a detection area.




12. Click the **Apply** button.

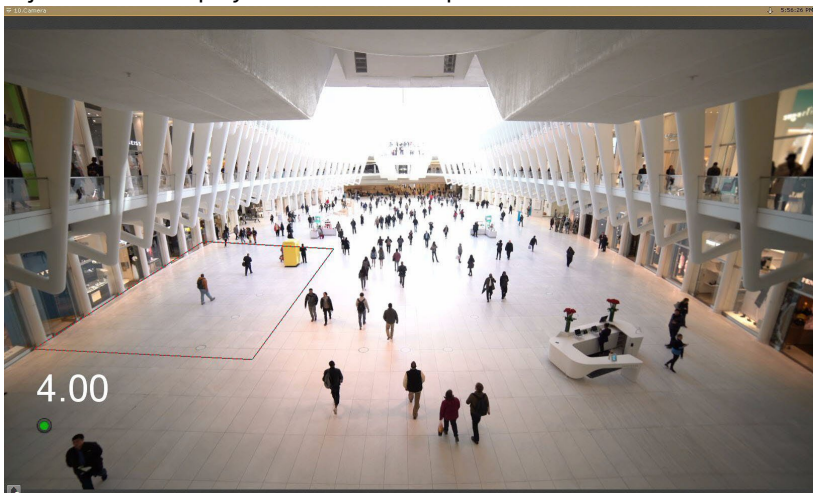
It is possible to display the sensor and the number of objects in the controlled area in the video surveillance window on the layout. To configure this option, do the following:

1. Switch to the Layout Editing mode (see [Switching to Layout Editing mode](#)(see page 451)).

- Place the sensor anywhere in FOV.



- Customize the font. To do this, click the  button.
- Save the layout (see [Exiting Layout Editing mode](#)(see page 476)). As a result, the sensor and the number of objects will be displayed in the selected place:



Example of configuring neural counter for solving typical task

To detect objects with a speed less than 0,3 m/s, the following settings are recommended:

- The number of frames for analysis and output:** 3.
- The number of frames processed per second:** 1.
- Neural filter:** No.
- Recognition threshold:** 30.
- Neural network file:** Path to the *.ann neural network file. You can also select **Object type** — in this case, this field should be left blank.

Note

By default, the neural counter is configured for detection of objects with a speed less than 0,3 m/s.

To solve tasks in which the speed of the object is greater than 0,3 m/s, it is necessary to increase the number of processed frames and/or reduce the number of frames for analysis and output. The values are selected by trial-and-error method depending on the conditions of the task.

Objects image requirements for neural counter

To ensure the correct operation of neural counter, the following image requirements should be met:

1. The object to be detected is clearly distinguishable by the human eye.
2. The width or height of the objects does not exceed 75% of the frame size.
3. The image is not noisy and not distorted by compression algorithm artifacts.
4. The duration of the object's visibility is at least 6 frames.
5. The object moves in the certain direction between two adjacent frames at a distance which does not exceed the object's size. This condition is necessary for the correct calculation of the trajectory of the object (track).
6. The minimum value of pixel density per meter is observed:

Image resolution	Object type	Minimum pixel density per meter (ratio of the object width in pixels to the object width in meters)	Minimum object size in pixels, width x height	Ratio of the object width to the frame width as a percentage
1920x1080	Human	55	~25x105	~3%
1280x720	Human	35	~17x70	~3%
640x360	Human	17	~10x42	~3%
1920x1080	Light vehicle (2 axles)	55	~354x300	~20%
1280x720	Light vehicle (2 axles)	35	~240x205	~20%
640x360	Light vehicle (2 axles)	17	~132x112	~20%

[Video stream and scene requirements for neural counter operation](#) (see page 323)

7.4.13 Fire and Smoke Detection Tools

Functions of Fire and Smoke detection

Important!

Unlike standard smoke/fire detection systems, smoke and fire software detection tools face many issues with the scene and the background image. We cannot warrant 100% smoke/fire detection. The smoke and fire detection tools are meant to increase the likelihood of detecting smoke/fire. However, there may be both false alarms and failures to detect actual fire/smoke events in the camera's FoV.

We keep improving smoke and fire detection and use machine learning based on a [Neural network](#)¹²⁴. If the fire/smoke detection tools does not respond to actual fire/smoke events, please record a video clip and send it to [Inaxsys](#). We will update *Arkiv* to refine detection. Help us train the neural network with video feeds from your scene to deliver best results for your fire security.

Note

These detection tools require Addon Neuro Pack to be installed (see [Installing DetectorPack addons](#)(see page 50)).

Camera requirements for Fire and Smoke Detection

Please follow these recommendations for proper fire and smoke detection:

1. Use color cameras. With black and white cameras, the detection quality can be noticeably worse.
2. The video resolution must be at least 640x360.
3. FPS directly affects detection efficiency: in most cases, the default value (1 detection per 10 seconds) is sufficient to detect smoke or fire which develops in more than one minute.
4. The minimal recognized fire/smoke area depends on the particular neural network used. For a standard neural network (see [Configuring Smoke and Fire Detection Tools](#)(see page 329)), the fire/smoke area must occupy at least 10% of the frame.

Note

In some cases, when fire is expected to be clearly visible, the fire area may be sufficient at 1-3% of the FoV width/height.

5. Fire/smoke should be visually separated from the background.

Attention!

If you set a rectangular recognition area for the detection tool, the limitations apply to this area rather than to the entire frame (see [Configuring Smoke and Fire Detection Tools](#)(see page 329)).

[Hardware requirements for neural analytics operation](#)(see page 23)

Configuring Smoke and Fire Detection Tools

[Camera requirements for Fire and Smoke Detection](#)(see page 329)
[Hardware requirements for neural analytics operation](#)(see page 23)

124 https://en.wikipedia.org/wiki/Artificial_neural_network

To configure smoke (fire) detection tool:

1. To record the sensitivity scale of the detection tool to the archive (see [Extra information overlay \(Masks\)](#)(see page 641)), select **Yes** for the **Record mask to archive** parameter (1).

Fire detection		
v Object features		
1	Record mask to archive	No
2	Video stream from camera	Low-quality video stream
v Other		
3	Decoder mode	CPU
4	Frames processed per second	0.1
5	Mode	CPU
6	Neural network file	
7	Number of measurements in a row to trigger detection	5
8	Scanning mode	No
9	Sensitivity	33
v Advanced detection settings		
10	Ignore black and white image	No

2. If the camera supports multistreaming, select the stream for which detection is needed (2). Selecting a low-quality video stream allows reducing the load on the Server.
3. Select a processing resource for decoding video streams (3). When you select a GPU, a stand-alone graphics card takes priority (when decoding with NVIDIA NVDEC chips). If there is no appropriate GPU, the decoding will use the Intel Quick Sync Video technology. Otherwise, CPU resources will be used for decoding.
4. Set the frame rate value for the detection tool to process per second (4). The value should be in the [0,016; 100] range.

Note

The default values (5 frames for output and 0,1 FPS) indicate that the tool will analyze frame over 50 seconds span. The detection tool analyzes 1 frame every 10 seconds. If it detects smoke/fire on 5 consecutive frames, the detection tool will trigger an alert.

5. Select the processor for the neural network — CPU, one of Nvidia GPUs or one of Intel GPUs (5, see [Hardware requirements for neural analytics operation](#)(see page 23), [General Information on Configuring Detection](#)(see page 221)).

Attention!

It may take several minutes to launch the algorithm on NVIDIA GPU after you apply the settings. You can use caching to speed up future launches (see [Configuring the acceleration of GPU-based neuroanalytics](#)(see page 381)).

Attention!

If you specify other processing resource than the CPU, this device will carry the most of computing load. However, the CPU will also be used to run the detection tool.

6. Select a neural network file (6). The following standard neural networks for different processor types are located in the C:\Program Files\Common Files\Inaxsys\DetectorPack\NeuroSDK directory:

smoke_movidius.ann

Smoke detector / IntelNCS¹²⁶

smoke_openvino.ann	Smoke detector / CPU
smoke_original.ann	Smoke detector / GPU
fire_movidius.ann	Fire detector / IntelNCS ¹²⁷
fire_openvino.ann	Fire detector / CPU
fire_original.ann	Fire detector / GPU

Enter full path to a custom neural network file into this field. This is not required if you use standard neural networks which are selected automatically.

Note

For correct neural network operation on Linux, place the corresponding file in the /opt/Inaxsys/DetectorPack/NeuroSDK directory.

7. Set the minimum number of frames with smoke (fire) for triggering the tool (**7**). The value should be in the [5; 20] range.
8. To detect the objects without changing the frame size, select **Yes** in the **Scanning mode** field (**8**).
9. Set the sensitivity of the tool by trial and error (**9**). The value should be in the [1; 99] range. The preview window displays the sensitivity scale of the detection tool that relates to the sensitivity parameter. If the scale is green, smoke (fire) is not detected. If the scale is yellow, smoke (fire) is detected, but not enough to trigger the tool. If the scale is red, smoke (fire) is detected and the detection tool will trigger, if the scale is red through the sampling period (50 seconds by default, see item 4).
Example. The sensitivity parameter value of 40 implies that the alert is triggered when the scale has at least 4 divisions full over the entire detection time span. The triggering will stop when the scale has less than 2 divisions full over the detection time span. The alert will trigger again if the scale has at least 4 divisions full over the entire detection time span.
10. Select **Yes** for the **Ignore black and white image** parameter (**10**), if it is necessary that the detection tool does not trigger when the image is black and white.
11. By default, the detection is performed over full image area. In the preview window, you can set several detection areas using the anchor points as follows:
 - a. Right-click anywhere in the preview window.
 - b. Select **Detection area (rectangle)** for a rectangular area. If you specify a rectangular area, the detection tool will work only within its limits. The rest of the FOV will be ignored.
 - c. Select **Analytics Area (polygon)** to set one or several polygonal areas. If you specify one or several polygonal areas, the detection tool will process the entire FOV while the remaining part of the FOV

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will be blacked out.



Note

You can configure detection areas similarly to privacy masks in Scene analytics detection tools (see [Setting General Zones for Scene analytics detection tools](#)(see page 248)).

Attention!

You can use trial and error method to decide which type of detection area (rectangular or polygonal) is more effective in your case. Some neural networks give better detection with rectangles while others are better with polygons.

7.4.14 Personal protective equipment detection tools

Equipment detection tool (PPE)

Functions of the Equipment detection tool (PPE)

The Equipment detection tool (PPE) locates individuals wearing no personal protective equipment within the area where it's required, and also individuals wearing improperly applied PPE.

Attention!

It is recommended to use the detector in a "gateway" environment: at the entrance to an area in which equipment or PPE is required, the employee is delayed for 5-10 seconds, during which the detection tool determines the presence of the necessary equipment (see [Examples of configuring Equipment detection tool \(PPE\) for solving typical tasks](#)(see page 337)).

For detection tool operation, at least two separate neural networks are used:

- segmenting network – it structures up an image of a human body (locates head, shoulders, arms, hands, thighs, legs and feet);
- classifying network – it detects equipment (PPE) on a specified body part, and checks if it's properly applied.

❑ Attention!

To train a classification neural network, it is necessary to provide a list of equipment (see [Example of providing a list of valid equipment at the facility](#)(see page 339)).

❑ Note

The equipment detection tool (PPE) requires an additional Neuro Pack to be installed (see [Installing DetectorPack addons](#)(see page 50)).

Video stream and scene requirements for Equipment detection tool (PPE) operation

The Equipment detection tool (PPE) operation imposes the following requirements:

1. To the video stream from the camera:
 - a. The resolution is at least 640x360 pixels. It is also not recommended to use a resolution higher than 1920x1080, since higher resolution does not increase the detection quality, but significantly increases the consumption of resources. The optimal resolution for solving typical tasks is 1280x720.
 - b. The frame rate per second in the video stream from the camera is at least 3 for solving typical tasks.
 - c. Color image only.
2. To lighting:
 - a. Lighting in the scene is at least 200 lux per square meter. In conditions of insufficient or excessive lighting (night or light-striking), stable operation of the video analytics is not guaranteed.
 - b. There are no abrupt changes in lighting.
3. To the scene and camera angle:
 - a. Moving objects are visually separable from each other.
 - b. The background is mostly static and does not change abruptly.
 - c. There are no products made of rods in the detection area.
 - d. Moving objects are minimally obscured by static objects in the scene (columns, trees, etc.).
 - e. The analyzed scene does not have reflective surfaces and sharp shadows from moving objects. If present, they should be masked.
 - f. Camera shake does not result in image offsets greater than 1% of the frame size.

❑ Attention!

Correct operation of the detection tool is not guaranteed when using a fish-eye lens.

- ❑ [Hardware requirements for neural analytics operation](#)(see page 23)
[Objects image requirements for Equipment detection tool \(PPE\)](#)(see page 338)

Configuring equipment detection tool (PPE)

- ❑ [Video stream and scene requirements for Equipment detection tool \(PPE\) operation](#)(see page 333)
[Objects image requirements for Equipment detection tool \(PPE\)](#)(see page 338)
[Hardware requirements for neural analytics operation](#)(see page 23)

To configure the Equipment detection tool (PPE), do the following:

- To record mask (body-based segmentation) to the archive (see [Extra information overlay \(Masks\)](#)(see page 641)), select **Yes** in the corresponding parameter (**1**).

Equipment detection (PPE)		
▼ Object features		
1	Record mask to archive	No
2	Record objects tracking	Yes
3	Video stream from camera	Low-quality video stream
▼ Other		
	Classification network 1 file	
	Classification network 2 file	
4	Classification network 3 file	
	Classification network 4 file	
	Classification network 5 file	
5	Decoder mode	CPU
6	Frames processed per second	1
7	Min person height	0.01
8	Min person width	0.01
9	Mode	CPU
10	Segmenting network file	
▼ Advanced detection settings		
11	Mask	No
12	Number of measurements in a row to trigger detection	3
13	One event per PPE element	Yes

- By default, metadata is not recorded to the database. To enable metadata recording, select **Yes** in the **Record objects tracking** parameter (**2**).
- If the camera supports multistreaming, select the stream for which detection is needed (**3**).
- By default, the following **neural networks** are used according to the selected processing device (**9**): Classification neural network (head) and Classification neural network (body). To initialize only one item of equipment, select the required classification neural network file (**4**). There should be a separate classification neural network to recognize equipment on each body segment. The following classification neural networks for different processor types are located in the C:\Program Files\Common Files\Inaxsys\DetectorPack\NeuroSDK directory:

ppeHelmet(head)General_movidius.ann	Classification neural network (head) / IntelNCS ¹²⁸
ppeHelmet(head)General_openvino.ann	Classification neural network (head) / CPU
ppeHelmet(head)General_origin.ann	Classification neural network (head) / GPU
ppeSafetyVest(body)General_movidius.ann	Classification neural network (body) / IntelNCS ¹²⁹
ppeSafetyVest(body)General_openvino.ann	Classification neural network (body) / CPU

¹²⁸ <https://software.intel.com/en-us/neural-compute-stick>

¹²⁹ <https://software.intel.com/en-us/neural-compute-stick>

ppeSafetyVest(body)General_origin.ann	Classification neural network (body) / GPU
---------------------------------------	--

If you use a custom neural network, it is necessary to specify the path to the file **(3)**.

Note

To ensure the correct operation of the neural network on Linux OS, the corresponding file should be located in the /opt/Inaxsys/DetectorPack/NeuroSDK directory.

5. Select a processing resource for decoding video streams **(5)**. When you select a GPU, a stand-alone graphics card takes priority (when decoding with NVIDIA NVDEC chips). If there is no appropriate GPU, the decoding will use the Intel Quick Sync Video technology. Otherwise, CPU resources will be used for decoding (see [General Information on Configuring Detection](#)(see page 221)).
6. Set the frame rate value for the detection tool to process per second **(6)**. This value should be in the range [0,016; 100].

Attention!

To apply detection in gateway mode (see [Examples of configuring Equipment detection tool \(PPE for solving typical tasks](#)(see page 337)), we recommend that you use the detection tool standard settings: 1 fps and 3 frames for output (see i.10).
To apply detection in continuous mode for busy scenes, set the delay to no less than 4 FPS, and the number of frames for output to no less than 6.

7. Set the minimum height and width of a person **(7, 8)** in the frame as a percentage of the frame height/width (0,15 = 15%). Objects which are smaller than the specified size will not be detected. The value should be in the range [0; 1].
8. Select the processor for the neural network – CPU, one of GPUs, or Intel processors **(9)**, see [Hardware requirements for neural analytics operation](#)(see page 23)).

Attention!

If you specify other processing resource than the CPU, this device will carry the most of computing load. However, the CPU will also be used to run the detection tool.
If you have Intel HDDL selected, it can process only the segmenting neural networks. The CPU will process the classifying networks.

Attention!

It may take several minutes to launch the algorithm on NVIDIA GPU after you apply the settings. You can use caching to speed up future launches (see [Configuring the acceleration of GPU-based neuroanalytics](#)(see page 381)).

9. By default, the Segmenting neural network (head, body) is used according to the selected processing device **(9)**. The following segmenting neural networks for different processor types are located in the C:\Program Files\Common Files\Inaxsys\DetectorPack\NeuroSDK directory:

ppeSegmentationByPose_movidius.ann	Segmenting neural network (head, body) / IntelNCS ¹³⁰
ppeSegmentationByPose_openvino.ann	Segmenting neural network (head, body) / CPU

¹³⁰ <https://software.intel.com/en-us/neural-compute-stick>

ppeSegmentationByPose_origin_onnx.ann

Segmenting neural network (head, body) / GPU

If you use a custom neural network, it is necessary to specify the path to the file **(10)**.

Note

To ensure the correct operation of the neural network in Linux OS, the corresponding file should be located in the /opt/Inaxsys/DetectorPack/NeuroSDK directory.

10. Enable the **Mask** parameter to display body segments in the preview window **(11)**.
11. Set the minimum number of frames containing people with no PPE for the tool to trigger **(12)**. The value should be in the range [1; 20].
12. By default, each equipment element triggering occurs once during a continuous tracking of a person. You can set triggering to multiple by setting the **One event per PPE element** parameter to **No (13)**.

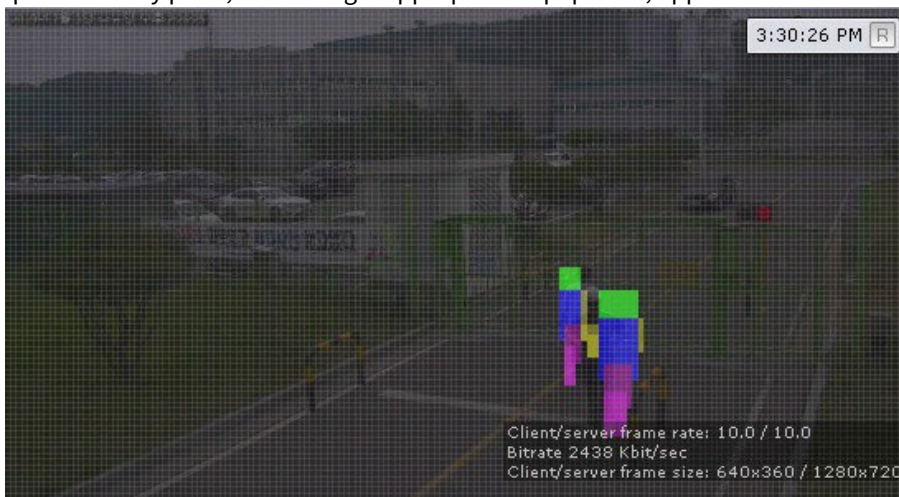
Note

Example. An individual not wearing a helmet appears in the FOV, puts on a helmet, then puts it off. If the **One event per PPE element** parameter is enabled, you will have one alarm event, otherwise two.

13. In the preview window, you can set the detection zones with the help of anchor points much like privacy masks in Scene Analytics detection tools (see [Setting General Zones for Scene analytics detection tools](#)(see page 248)). By default, the entire FOV is a detection area.
14. Click the **Apply** button.

The Equipment detection tool (PPE) is now configured.

The Equipment detection tool (PPE) triggers an alarm when a person not wearing required equipment (PPE) on specified body parts, or wearing inappropriate equipment, appears in the FOV.



The Equipment detection tool (PPE) recognizes equipment of the following colors:

1. Helmets:
 - a. Yellow.
 - b. White.
 - c. Blue.
 - d. Green.
 - e. Orange.
 - f. Black.

g. Red.



2. Vests:

- a. Yellow.
- b. Orange.



☐ Attention!

To ensure the correct reception of the E-mail notifications (see [E-mail notification](#)(see page 409)) after the Equipment detection tool (PPE) is triggered, it is necessary to set up a separate macro command with an E-mail message for each item of equipment.

Examples of configuring Equipment detection tool (PPE) for solving typical tasks

Typical tasks for detecting personal protective equipment are the following:

1. Detection in gateway conditions. A gateway is a border, which can be either a virtual line or a door, a barrier, a turnstile. The algorithm for working in gateway conditions is as follows:
 - a. A person stops in front of an area where PPE is required.
 - b. The person poses in a way that it is possible to check the presence of all items of equipment (the item is not overlapped by the person himself, other items of equipment, items of clothing).

- c. Human screening. There should be no obstacles between the person and the camera, blocking the person for screening.
2. Detection in a production conditions: persons move freely in the detection area.

Note

By default, the Equipment detection tool (PPE) is configured for detection in gateway conditions.

The recommended settings for solving typical tasks are as follows:

Settings	Equipment detection in gateway conditions	Equipment detection in production conditions
Main		
The number of frames processed per second	1	3
Minimum person height	0,01	0,09
Minimum person width	0,01	0,03
Advanced		
Number of frames for analysis and output	3	7
Mask	No	No
One event per item of equipment	Yes	Yes

Objects image requirements for Equipment detection tool (PPE)

To ensure the correct recognition of personal protective equipment, the following image requirements should be met:

1. The object to be detected (PPE) is clearly distinguishable by the human eye.
2. The image is not noisy and not distorted by compression algorithm artifacts.
3. The width or height of the equipment does not exceed 75% of the frame size.
4. The duration of the object's visibility is at least 3-8 frames. The minimum number of frames depends on the task.
5. There are no visible physical barriers between the camera lens and the analyzed object.
6. The minimum value of pixel density per meter is observed:

Image resolution	Object type	Minimum pixel density per meter (ratio of the object width in pixels to the object width in meters)	Minimum object size in pixels, width x height
1920x1080	Human	170	~102x309
1280x720	Human	128	~77x233

Image resolution	Object type	Minimum pixel density per meter (ratio of the object width in pixels to the object width in meters)	Minimum object size in pixels, width x height
640x360	Human	80	~48x145

7. The minimum dimensions of the equipment on the body areas in pixels are observed. An example of equipment dimensions for a resolution of 1920x1080:
- upper body (torso) 75*100,
 - legs 75*105,
 - head 60*65,
 - hands 65*60,
 - feet 45*40,
 - set of equipment 165*295.

[Video stream and scene requirements for Equipment detection tool \(PPE\) operation\(see page 333\)](#)

Example of providing a list of valid equipment at the facility

[Data collection requirements for neural network training\(see page 227\)](#)

For correct detection, it is important to understand exactly what items of equipment are used at the facility.

A complete list of equipment should be provided regardless of the current season of the year. This will help to reduce the number of false events from the Personal protective equipment detection tools and get the most positive experience from using this analytics.

Below are examples of lists in the form of a table:

Gloves #1



Gloves #2



Gloves #3



Gloves #4







7.4.15 Person-based privacy masking

Person-based privacy mask functions

The privacy mask hides selected parts of a human body from viewing on video.

A segmenting network structures up an image of a human body: locates head, shoulders, arms, hands, thighs, legs and feet.

Note

Person-based privacy masking requires the Add-on Neuro Pack to be installed.

Camera requirements for privacy masking

For person-based privacy masking operation, a camera must match the following requirements:

1. Frame rate is no less than 12 FPS.
2. Pixel density must be at least 170 pixels per meter.
3. Average illumination in scenes with privacy masking must not drop below 200 lux.

Attention!

We cannot guarantee normal operation with a fisheye camera.

[Hardware requirements for neural analytics operation](#)(see page 23)

Person-based privacy masking configuration

[Camera requirements for privacy masking](#)(see page 343)
[Hardware requirements for neural analytics operation](#)(see page 23)

To configure Person-based privacy masking, do the following:

- To record mask to the archive (see [Extra information overlay \(Masks\)](#)(see page 641)), set **Yes** for the corresponding parameter **(1)**.

Person-based privacy masking	
Object identification	
Enable	Yes
Name	Person-based privacy masking
Object features	
1 Record mask to archive	No
2 Video stream from camera	Low-quality video stream
Other	
Body	No
3 Decoder mode	CPU
Feet	No
Forearms	No
4 Frames processed per second	1
Hands	No
Head	Yes
Hips	No
5 Mode	CPU
6 Segmenting network file	
Shins	No
Shoulders	No
Advanced detection settings	
7 Number of measurements in a row to trigger detection	3

- If the camera supports multistreaming, select the stream for which detection is needed **(2)**.
- Select a processing resource for decoding video streams **(3)**. When you select a GPU, a stand-alone graphics card takes priority (when decoding with NVIDIA NVDEC chips). If there is no appropriate GPU, the decoding will use the Intel Quick Sync Video technology. Otherwise, CPU resources will be used for decoding.
- Set the frame rate value for the detection tool to process per second **(4)**. This value should be in the range [0,016; 100].
- Select the processor for the neural network – CPU, one of NVIDIA GPUs, or one of Intel GPUs **(5)**, see [Hardware requirements for neural analytics operation](#)(see page 23), [General Information on Configuring Detection](#)(see page 221).

Attention!

If you specify other processing resource than the CPU, this device will carry the most of computing load. However, the CPU will also be used to run the detection tool.

Attention!

It may take several minutes to launch the algorithm on NVIDIA GPU after you apply the settings. You can use caching to speed up future launches (see [Configuring the acceleration of GPU-based neuroanalytics](#)(see page 381)).

- Select the segmenting neural network file **(6)**. The following standard neural networks for different processor types are located in the C:\Program Files\Common Files\Inaxsys\DetectorPack\NeuroSDK directory:

poseEstimator_openvino.ann	Person-based privacy masking / CPU
poseEstimator_original.ann	Person-based privacy masking / GPU

poseEstimator_movidius.ann

Person-based privacy masking / IntelNCS¹³¹

Enter full path to a custom neural network file into this field. This is not required if you use standard neural networks which are selected automatically.

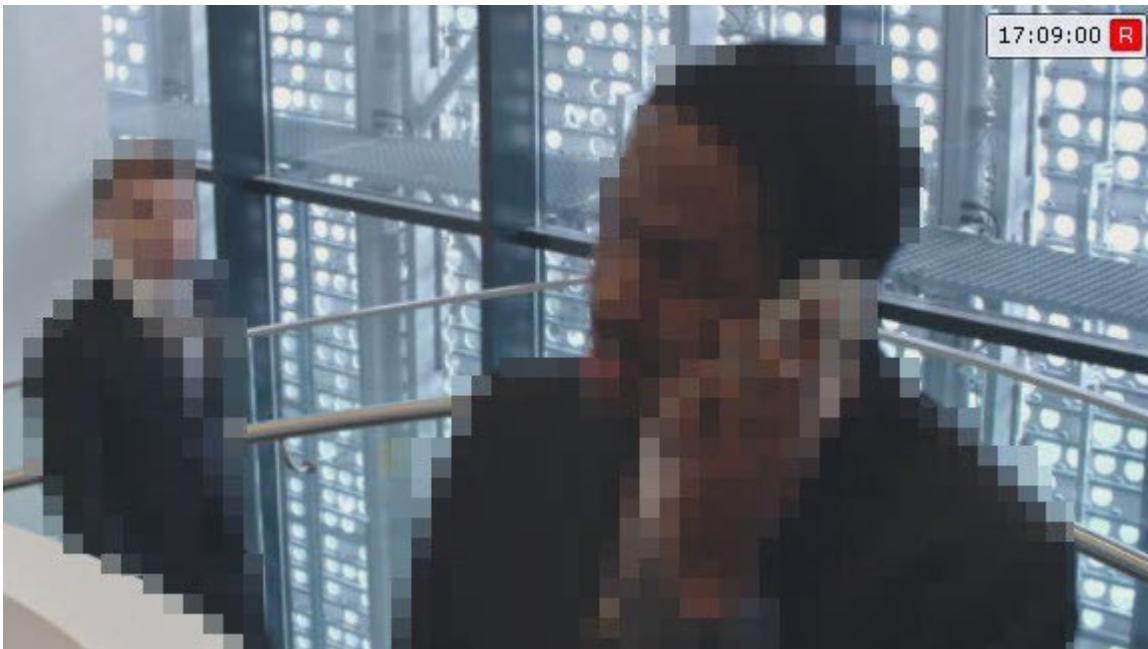
Note

For correct neural network operation on Linux, place the corresponding file in the /opt/Inaxsys/DetectorPack/NeuroSDK directory.

7. Set the minimum number of frames in which the detection tool should detect objects in order to trigger (7). The value should be in the range [1; 20].
8. Select **Yes** for all body parts that should be masked within FOV.
9. Click the **Apply** button.

Privacy mask configuration is now complete.

Selected body parts of all individuals within FOV will be hidden from view. For a user group with limited rights to view masked video (see [Creating and configuring roles](#)(see page 431)), the mask is displayed on the video image of the selected camera in the **Detection Tools** and **Hardware** sections, on the layouts, in the archive and when exporting. For the **admin** user group, the mask is displayed only on the video image of the selected camera in the **Detection Tools** and **Hardware** sections, and when exporting, if the **View masked video** checkbox is clear (see [Standard video recordings export](#)(see page 778)).



¹³¹ <https://software.intel.com/en-us/neural-compute-stick>

7.4.16 Pose detection tools

Functions of Pose detection tool

The Pose detection tool uses a neural network and add-on detection tools to determine each person's skeleton and detect poses that could indicate a potentially dangerous situation.

The following detection tools can be created on the basis of the Pose detection tool:

Detection Tool	Detection tool description
Sitting person detection (see page 350)	Detection tool triggers when there is a sitting human in the frame
Man down detection (see page 352)	Detection tool triggers when there is a prostrate human in the frame
Hands up detection (see page 354)	Detection tool triggers when there is a human raising one or two hands in the frame. A hand is considered raised if the forearm is parallel to the back
Handrail holding detection (see page 354)	Detection tool triggers when there is a human in the specified part of the frame who does not hold any of specified handrails
People counter detection (see page 355)	Detection tool counts objects in the specified area. Detection tool triggers when the number of objects reaches or exceeds the specified limit
Close-standing people detection (see page 356)	Detection tool triggers when the distance between people in the frame exceeds the specified minimum value
People masking detection (see page 358)	Detection tool masks people in the video image. Detection tool does not trigger

Note

Pose detection tools require Addon Neuro Pack to be installed (see [Installing DetectorPack addons](#)(see page 50)).

Video stream and scene requirements for Pose detection tools

The Pose detection tools operation has the following requirements:

1. To the video stream from the camera:
 - a. The resolution is at least 640x360 pixels. It is also not recommended to use a resolution higher than 1920x1080, since higher resolution does not increase the detection quality, but significantly increases the consumption of resources. The optimal resolution for solving typical tasks is 1280x720.
 - b. The frame rate per second in the video stream from the camera is at least 8.

- c. Color image only.
2. To the lighting:
 - a. Scene lighting is at least 50 lux per square meter. In conditions of insufficient or excessive lighting (night or light-striking), stable operation of the analytics is not guaranteed.
 - b. There are no abrupt changes in lighting.
3. To the scene and camera angle:
 - a. Moving objects are visually separable from each other in the image.
 - b. The background is mostly static and does not change abruptly.
 - c. Moving objects are minimally obscured by the static objects in the scene (columns, trees, etc.).
 - d. The analyzed scene does not have reflective surfaces and sharp shadows from moving objects. If present, they should be masked.
 - e. Camera shake does not result in image offsets greater than 1% of the frame size.

❑ Attention!

Correct operation of the Pose detection tools is not guaranteed when using a fish-eye lens.

- ❑** [Hardware requirements for neural analytics operation](#)(see page 23)
[Objects image requirements for Pose detection tool](#)(see page 347)

Objects image requirements for Pose detection tool

To ensure the correct recognition of a person's posture, the following image requirements should be met:

1. The detected object is clearly distinguishable by the human eye.
2. The detected object is completely within the frame.
3. The image is not noisy and not distorted by the compression algorithm artifacts.
4. The duration of the object visibility is at least 2 frames.
5. The minimum value of pixel density per meter is observed:

Image resolution	Object type	Minimum pixel density per meter (ratio of the object width in pixels to the object width in meters)	Minimum object size in pixels, width x height
For Pose sub-detection tools			
1920x1080	Human	170	~102x309
1280x720	Human	128	~77x233
640x360	Human	80	~48x145
For classical Pose sub-detection* tools			
1920x1080	Human	100	~45x187

Image resolution	Object type	Minimum pixel density per meter (ratio of the object width in pixels to the object width in meters)	Minimum object size in pixels, width x height
1280x720	Human	68	~31x134
640x360	Human	35	~15x65

[Video stream and scene requirements for Pose detection tools](#)(see page 346)

* see information about classical Pose sub-detection tools here: [Functions of Scene Analytics detection tools](#)(see page 240)

Configure Pose detection tools

Setting up common parameters for Pose detection tools

[Video stream and scene requirements for Pose detection tools](#)(see page 346)
[Objects image requirements for Pose detection tool](#)(see page 347)
[Hardware requirements for neural analytics operation](#)(see page 23)

To configure the common parameters for Pose detection tools, do as follows:

1. Select the **Pose detection** object.

Pose detection	
Object identification	
Enable	Yes
Name	Pose detection
Object features	
1 Record objects tracking	Yes
2 Video stream from camera	Low-quality video stream
Other	
3 Decoder mode	CPU
4 Frames processed per second	3
5 Mode	CPU
6 Neural network file	

2. By default, video stream metadata are recorded to the database. You can disable it by selecting **No** in the **Record objects tracking** list (**1**).
3. If the camera supports multistreaming, select the stream for which detection is needed (**2**). Selecting a low-quality video stream allows reducing the load on the Server.
4. Select a processing resource for decoding video streams (**3**). When you select a GPU, a stand-alone graphics card takes priority (when decoding with NVIDIA NVDEC chips). If there is no appropriate GPU, the decoding will use the Intel Quick Sync Video technology. Otherwise, CPU resources will be used for decoding.

5. Set the frame rate value for the detection tool to process per second (**4**). This value should be in the range [0,016; 100].

❑ Attention!

With static individuals in scene, set the FPS to no less than 2. With moving individuals in scene, the FPS should be set to 4 and above.

The higher the FPS value, the higher the accuracy of pose detection, but the load on the CPU is higher as well. For FPS=1, the accuracy will be no less than 70%.

This parameter varies depending on the object speed of movement. To solve typical tasks, FPS value from 3 to 20 is sufficient. Examples:

- pose detection for moderately moving objects (without sudden movements) – FPS 3;
- pose detection for moving objects – FPS 12.

6. Select the processor for the neural network – CPU, one of NVIDIA GPUs or one of Intel GPUs (**5**, see [Hardware requirements for neural analytics operation](#)(see page 23), [General Information on Configuring Detection](#)(see page 221)).

❑ Attention!

It may take several minutes to launch the algorithm on NVIDIA GPU after you apply the settings. You can use caching to speed up future launches (see [Configuring the acceleration of GPU-based neuroanalytics](#)(see page 381)).

❑ Attention!

If you specify other processing resource than the CPU, the selected device will carry the most of computing load. However, the CPU will also be used to run the detection tool.

❑ Attention!

Man down or sitting pose detection accuracy may depend on the particular processor. If another selected processor gives less accurate results, set the detection parameters empirically, and configure scene perspective (see [Specific settings for the Man down detection tool](#)(see page 352), [Specific settings for the Sitting person detection tool](#)(see page 350)).

7. Select a neural network file (**6**).

❑ Note

To ensure the correct operation of the neural network on Linux OS, the corresponding file should be located in the /opt/Inaxsys/DetectorPack/NeuroSDK directory.

8. By default, the entire FOV is an area for detection. If necessary, you can specify the areas for detection and skip areas in the preview window. To set an area for detection, right-click on the image, and select the required area.

Area for detection
Skip area

❑ Note

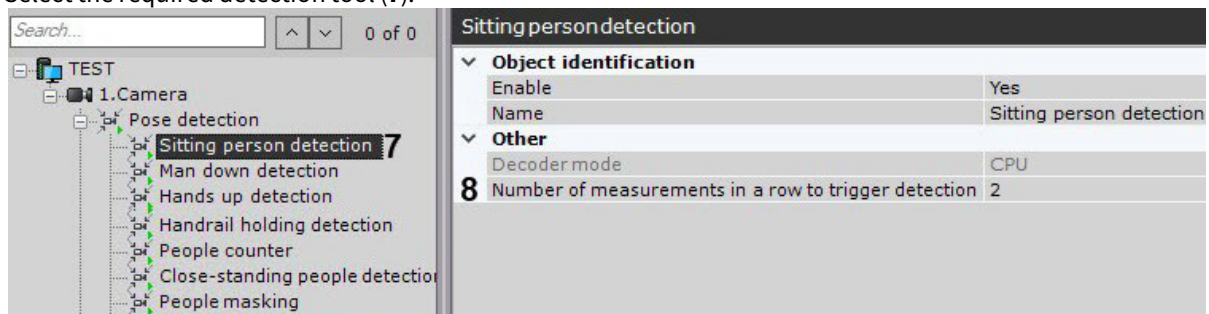
The areas are set the same way as for the Scene Analytics detection tools (see [Configuring the Detection Zone](#)(see page 252)).

This is how it works:

- a. if you specify areas for detection only, no detection will be performed in the rest of FOV.
- b. if you specify skip areas only, the detection will be performed in the rest of FOV.



9. Select the required detection tool (**7**).



10. Set the minimum number of frames with a relevant pose or behavior for the tool to trigger (**8**).

Note

The default values (2 frames and 1000 milliseconds) indicate that the tool will analyze one frame every second. When a pose is detected in 2 subsequent frames, the tool will trigger.

Note

This parameter is not used when configuring people masking.

11. Click the **Apply** button.



Setting up the common parameters for the Pose detection tools is complete.

Specific settings for the Sitting person detection tool

- [Setting up common parameters for Pose detection tools](#)(see page 348)

To detect a sitting pose, you should configure frame perspective first.

To do this, do the following:

1. Select a detection tool, and click the  button in the preview window.
2. Set the size of the same person in different areas of the FOV. To create a leveling rod, left-click on the video image to add two anchor points. You should set at least three leveling rods. The size of the leveling rod should be about the average height of a person at this point in the frame. You can resize the rod by stretching its anchor points . You can move it on screen by [dragging and dropping](#).



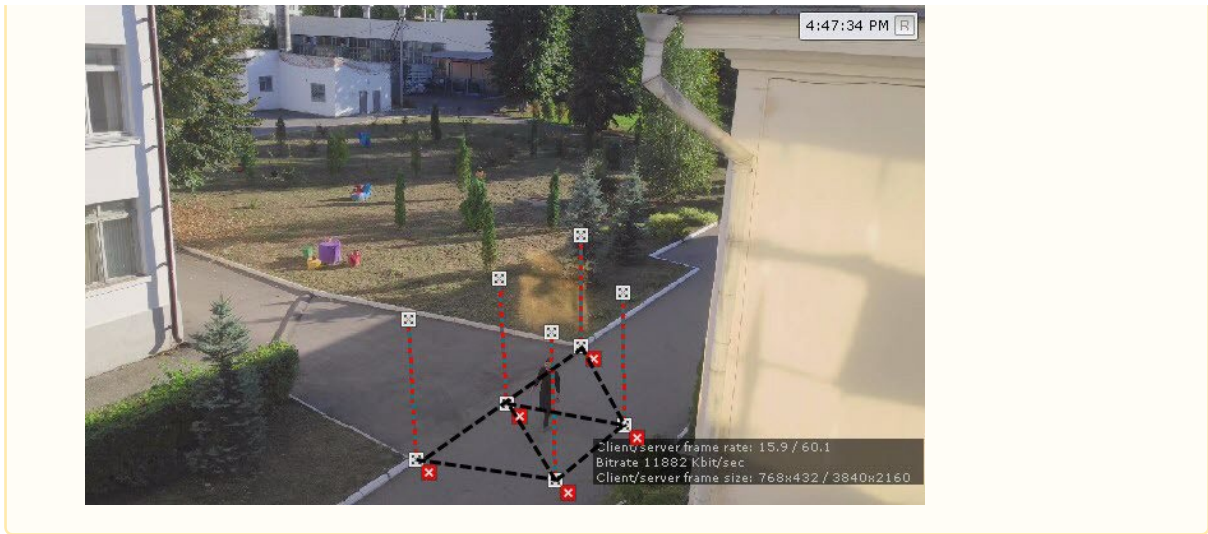
Attention!

When setting up the leveling rods, the following conditions should be met:

- a. The rods that are located at the same distance from the video camera lens, should be of the same size.
- b. The feet of the rods should be located on the same surface (e.g. floor).
- c. In complex scenes, it is recommended to add more than three rods to increase the accuracy of the detection.
- d. In the parts of the frame where the lens vertical distortion is observed, the rods should be parallel to the nearest vertical objects (e.g. door, wardrobe).

Attention!


For portrait-oriented scenes (such as corridor, shopping aisle, warehouse aisle, etc.), the arrangement of the rods should form triangles.



Note

For your convenience, you can click the  button and configure the mask on a still frame. To undo, click this button again.

Note

To delete the rod, click the  button.

3. Click the **Apply** button.


Configuring the Sitting person detection tool is complete.


Specific settings for the Man down detection tool

[Setting up common parameters for Pose detection tools\(see page 348\)](#)

To detect a lying pose, you should configure frame perspective first.

To do this, do the following:

1. Select a detection tool, and click the  button in the preview window.
2. Set the size of the same person in different areas of the FOV. To create a leveling rod, left-click on the video image to add two anchor points. You should set at least three leveling rods. The size of the leveling rod should be about the average height of a person at this point in the frame. You can resize the rod by

stretching its anchor points . You can move it on screen by [dragging and dropping](#).



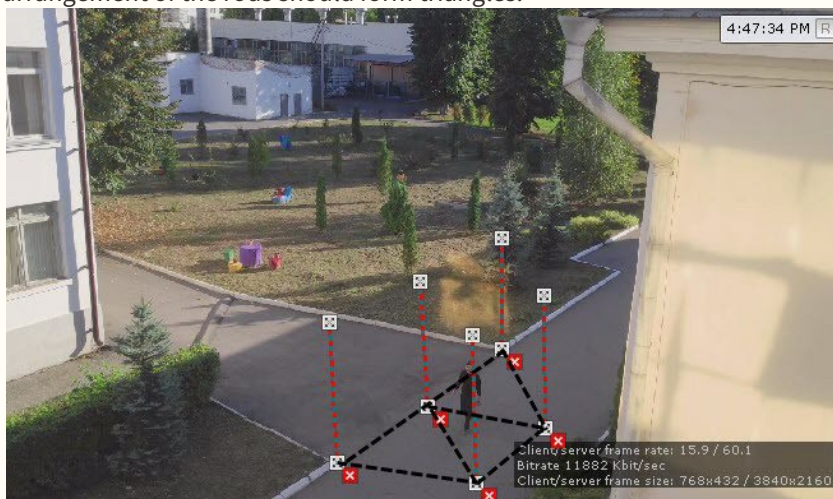
Attention!

When setting up the leveling rods, the following conditions should be met:


- The rods that are located at the same distance from the video camera lens, should be of the same size.
- The feet of the rods should be located on the same surface (e.g. floor).
- In complex scenes, it is recommended to add more than three rods to increase the accuracy of the detection.
- In the parts of the frame where the lens vertical distortion is observed, the rods should be parallel to the nearest vertical objects (e.g. door, wardrobe).

Attention!


For portrait-oriented scenes (such as corridor, shopping aisle, warehouse aisle, etc.), the arrangement of the rods should form triangles.



Note

For your convenience, you can click the  button and configure the mask on a still frame. To undo, click this button again.

Note

To delete the rod, click the  button.

3. Click the **Apply** button.

Configuring the Man down detection tool is complete.

Specific settings for Hands up detection tool

The Hands up detection tool triggers if a person with one or both hands raised is detected in a specified area.

To configure the Hands up detection tool, do the following:

1. Configure general settings (see [Setting up common parameters for Pose detection tools](#)(see page 348)).
2. Set the detection tool operation **Mode (1)**:
 - a. Both hands: triggers only if the person has both hands raised.
 - b. One hand: triggers only if the person has one hand raised.
 - c. Only left hand or Only right hand: triggers only if one selected hand is raised.
 - d. Left or Right hand: triggers only if the selected hand is raised.

Hands up detection	
<input checked="" type="checkbox"/> Object identification	
Enable	Yes
Name	Hands up detection
<input checked="" type="checkbox"/> Other	
Decoder mode	CPU
1 Mode	Both hands
2 Number of measurements in a row to trigger detection	2

3. Set the minimum number of frames in which the counter should detect a person with a raised hand/hands in order to trigger (**2**). The value should be in the range [1; 20].

Note

The Hands up detection tool works in the areas for detection and skip areas specified in the Pose detection tools (see [Setting up common parameters for Pose detection tools](#)(see page 348)).

Configuring the Hands up detection tool is complete.

Specific settings for Handrail holding detection tool

To configure the Handrail holding detection tool, do the following:

1. Set common parameters (see [Setting up common parameters for Pose detection tools](#)(see page 348)).
2. Click anywhere in the Preview window.

3. Mark one or several handrails with lines (1).

Handrail line 1
Handrail area 2

Attention!

If lens distortion makes the handrail non-linear, use several lines.

4. Set anchor points to specify the area where a person should hold the handrail (2).



Configuring the Handrail holding detection tool is complete.

Specific settings for People counter detection tool

The People counter detection tool counts the number of people in the specified area using the pose detection metadata.

A macro triggers when the number of individuals in FOV matches the pre-defined conditions (see [Configuring filters for event-driven macros](#)(see page 385)).

Note

Unlike the Multiple objects detection tool (see [Settings specific to Multiple objects](#)(see page 259)), the counter generates events of just one type, namely triggering.

As opposed to Neurocounter (see [Configuring a Neurocounter](#)(see page 324)), People counter detection tool counts only people.

To configure the People counter detection tool, do the following:

1. Set common parameters (see [Setting up common parameters for Pose detection tools](#)(see page 348)).

- To record mask to the archive, set **Yes** for the corresponding parameter **(1)**.

People counter	
Object identification	
Enable	Yes
Name	People counter
Object features	
1 Record mask to archive	No
Other	
2 Alarm when value	In range
Decoder mode	CPU
3 End value of alarm range settings	100
4 Event interval	1
5 Number of measurements in a row to trigger detection	3
6 Start value of alarm range settings	5

- Set the People counter detection tool triggering condition:
 - Set the condition polarity, i.e. triggering when the number of people in the specified area is within the set range, or out of the range **(2)**.
 - Set the range of the number of people in FOV **(3, 5)**. The value should be in the range [0; 100].
- Set an interval in seconds between two consecutive triggering of the counter when the number of individuals in FOV continuously matches the condition(s) **(4)**. The value should be in the range [1; 10000].
- Set the minimum number of frames in which the counter should detect the specified number of people in order to trigger **(6)**. The value should be in the range [1; 20].
- In the preview window, you can set the detection areas with the help of the anchor points much like privacy masks in the Scene analytics detection tools (see [Setting General Zones for Scene analytics detection tools](#)(see page 248)). By default, the entire FOV is a detection area.

Configuring the People counter detection tool is complete.

Specific settings for Close-standing people detection tool

- [Setting up common parameters for Pose detection tools](#)(see page 348)

By default, the Close-standing people detection tool triggers when "skeleton" bounding boxes around individuals collide.


- Note**
Bounding boxes are not displayed in the interface. They are usually a bit larger than the "skeletons" dimensions.

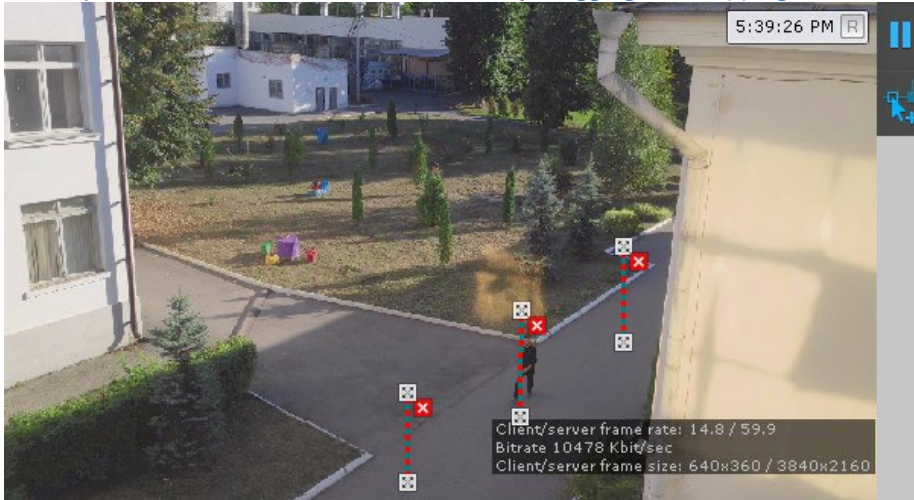
You can set another triggering distance by adjusting the frame perspective:

- Attention!**
For portrait-oriented scenes (such as corridor, shopping aisle, warehouse aisle, etc.) perspective adjustment is a must.



- Select a detection tool, and click the  button in the preview window.

2. Set the size of the same object in different areas of the frame. To create a leveling rod, left-click on the video image and add two anchor points. Set at least three leveling rods. The size of the leveling rod should be about the average height of a person at this point in the frame. You can resize the rod by stretching its anchor points . You can move it on screen by [dragging and dropping](#).



Attention!


When setting up the leveling rods, the following conditions should be met:

- a. The rods that are located at the same distance from the video camera lens, should be of the same size.
- b. The feet of the rods should be located on the same surface (e.g. floor).
- c. In complex scenes, it is recommended to add more than three rods to increase the accuracy of the detection.
- d. In the parts of the frame where the lens vertical distortion is observed, the rods should be parallel to the nearest vertical objects (e.g. door, wardrobe).


Attention!

For portrait-oriented scenes (such as corridor, shopping aisle, warehouse aisle, etc.), the arrangement of the rods should form triangles.

Note

For your convenience, you can click the  button and configure the mask on a still frame. To undo, click this button again.

Note

To delete the rod, click the  button.

3. In the **Distance sensitivity** field (1) enter a triggering distance value in meters between people. The detection tool will trigger if the distance between people in the frame becomes equal or less than the

specified value. The value should be in the range [0; 20].

Close-standing people detection	
Object identification	
Enable	Yes
Name	Close-standing people detec
Other	
Decoder mode	CPU
1 Distance sensitivity	2
2 Leveling rod length	1.7
3 Number of measurements in a row to trigger detection	4

- In the **Leveling rod length** field (**2**) enter the average height of a person (in meters), according to which the leveling rods are set. The value should be in the range [0; 3].
- Set the minimum number of frames in which the detection tool should detect close-standing people in order to trigger (**3**). The value should be in the range [1; 100].

Configuring the frame perspective for the Close-standing people detection tool is complete.

Specific settings for People masking detection tool

This detection tool does not trigger. It uses the Pose detection tools metadata to mask people on the video image:

- on live video;
- in the archive;
- when exporting from the archive.

Attention!

Masking function works only for those users who have the **View masked video** parameter disabled in the role settings (see [Creating and configuring roles](#)(see page 431)).



7.4.17 Retail Analytics

Functions of retail analytics

Name of a Detection Tool object	Detection description
Queue detection	Triggers if the specified number of people in the queue is exceeded.
Visitors counter	This detector monitors the number of visitors within the protected area, and triggers if the specified count is exceeded.

Camera requirements for Queue detection

The following table contains the requirements for the cameras used by the queue detection tool:

Camera	<ul style="list-style-type: none"> Resolution: 720 x 576 (CIF4), 360 x 288 (CIF1) is also allowed to use. Increasing the resolution above CIF4 does not improve the operating quality of the recognition algorithm. Frames per second: 6 or more. Color: color or greyscale. No camera jitter is allowed.
Illumination	<ul style="list-style-type: none"> Best recognition results are achieved under moderate illumination. If the scene is under- or over-illuminated, the recognition accuracy may drop down. Sharp changes in illumination may lead to improper operation of analytics.
Scene and camera angle	<ul style="list-style-type: none"> Vertically downward position of the camera is the best for the purpose. The closer to vertical, the more accurate the estimation. Camera FOV dimensions: minimum 3x3 m (6x6 humans), optimal 4x4 m (8x8 humans), maximum 8x8 m (16x16 humans). The background should be primarily static and should not undergo sudden changes. Reflective surfaces and harsh shadows from moving objects can affect the quality of analytics. Analytics may not work correctly if there are periodic movements of the background objects in the camera FOV (leafage, TV screens, etc.).
Images of objects	<ul style="list-style-type: none"> Image quality: the image should be clear, with no visible compression artifacts. Dimensions of a human in scene: bounding rectangle has to occupy from 0,25% to 10% of the frame area.

Camera requirements for Visitor Counter operation

The following table contains the requirements for cameras to enable the effective operation of the visitor counter:

Camera	<ul style="list-style-type: none"> Resolution: 720 x 576 (CIF4) or 360 x 288 (CIF1) pixel resolution. Using pixel resolutions higher than CIF4 do not lead to higher recognition accuracy. Frames per second: 25. Color: color camera is obligatory. No camera jitter is allowed.
Illumination:	<ul style="list-style-type: none"> Best recognition results are achieved under moderate illumination. If the scene is under- or over-illuminated, the recognition accuracy may drop down. Sharp changes in illumination may lead to improper operation of analytics.
Scene and viewing angle:	<ul style="list-style-type: none"> Vertically downward position is the best for the purpose. The closer to vertical, the more accurate counting. Camera FOV dimensions: min. 2 x 2m, optimal 4 x 4m. The background must be primarily static and not undergo sudden changes. The counting area must not contain any moving objects except for humans. Reflective surfaces and harsh shadows from moving objects can affect the quality of analytics. Leafage, TV screens or any periodic object movement in the background may cause analytics glitches. If possible, avoid obstruction of the humans by static objects such as pillars, trees, etc.
Images of objects within the scene:	<ul style="list-style-type: none"> Image quality: the image must be clear and sharp with no visible compression artifacts. The allowable size of a person is described in Requirements for the person size in the frame(see page 360).
Other requirements:	<ul style="list-style-type: none"> The visitors must not move in a continuous flow; smaller groups of humans are counted correctly.

Requirements for the person size in the frame

The person size is the area of the rectangle circumscribed around the person, as a percentage of the frame area. To ensure the correct operation of the detection tool, it is necessary to select the size of a person in the range from the minimum value, depending on the frame width, to 60% of the frame width.

Note

Frame width means not the original resolution of the video image, but the compressed size that depends on the **Frame size change** parameter (see [Configuring the Visitors counter](#)(see page 365)).

The minimum size of a person, depending on the frame width, is given in the table:

Frame width, px	Minimum size of a person in %
320	18,8
360	16,7
384	15,7
400	15
426	14,1
512	11,8
640	9,4
800	7,5
832	7,3
854	7,1
960	6,3
1024	5,9
1120	5,4
1152	5,2
1280	4,7
1440	4,2
1600	3,8
1792	3,4
1856	3,3
1920	3,2
2048	3,0
2304	2,7

Frame width, px	Minimum size of a person in %
2560	2,4
2732	2,2
2800	2,2
3200	1,9
3840	1,6
4096	1,5
6400	1
8192	0,8

Configuring retail analytics detection tools

Configuring the Queue detection tool

[Camera requirements for Queue detection](#)(see page 359)

To configure the Queue detection tool, do the following:

1. To record mask (highlighting the queue on the video) to the archive (see [Extra information overlay \(Masks\)](#) (see page 641)), select **Yes** for the corresponding parameter (**1**).

Queue detection	
Object identification	
Enable	Yes
Name	Queue detection
Object features	
1 Record mask to archive	No
2 Video stream from camera	Low-quality video stream
Other	
3 Current queue size report interval	0
4 Decoder mode	CPU
5 Frame size change	1920
6 Frames processed per second	1
7 Human size	10
8 Queue size	5
9 Sensitivity	0.5

2. If the camera supports multistreaming, select the stream for which detection is needed (**2**). Selecting a low-quality video stream allows reducing the load on the Server.

3. Set the event transmission interval in seconds for sending the data to the ArkivData report subsystem (see [Queue length report](#)), if the queue length exceeds the set limit (**3**). If **0** value is selected, no events will be transmitted.
4. Select a processing resource for decoding video streams (**4**). When you select a GPU, a stand-alone graphics card takes priority (when decoding with NVIDIA NVDEC chips). If there is no appropriate GPU, the decoding will use the Intel Quick Sync Video technology. Otherwise, CPU resources will be used for decoding.
5. Analyzed framed are scaled down to a specified resolution (**5**, 1920 pixels on the longer side). This is how it works:
 - a. If the longer side of the source image exceeds the value specified in the **Frame size change** field, it is divided by two.
 - b. If the resulting resolution falls below the specified value, it is used further.
 - c. If the resulting resolution still exceeds the specified limit, it is divided by two, etc.


Note

For example, the source image resolution is 2048*1536, and the specified value is set to **1000**.

In this case, the source resolution will be halved two times (512*384), as after the first division, the number of pixels on the longer side exceeds the limit (1024 > 1000).

Note

If detection is performed on a higher resolution stream and detection errors occur, it is recommended to reduce the compression.

6. Set the frame rate value for the detection tool to process per second (**6**). This value should be in the range [0,016; 100]. The higher the value of this parameter, the higher the CPU load.
7. Click the  button and set the minimum size of a human (**7**). You can do so by dragging the anchor points of the rectangular area.

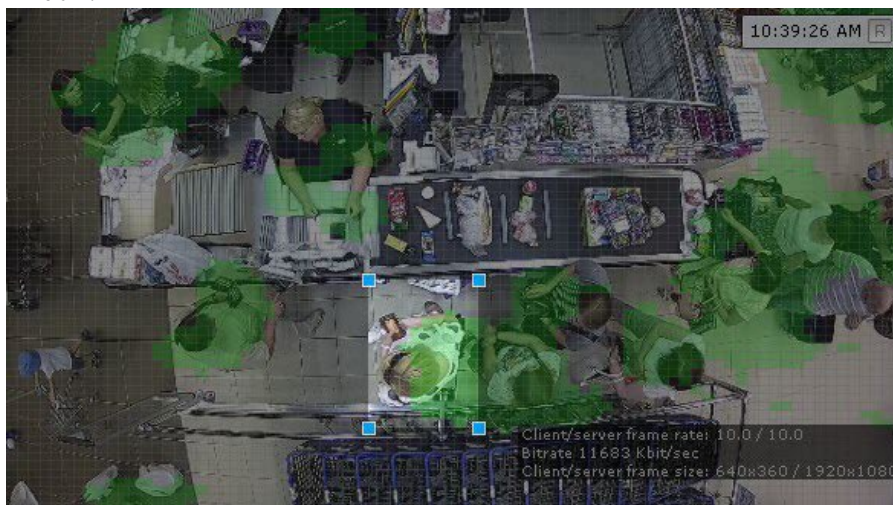
Note

It is recommended to set the minimum size of a human graphically. The number in the **Human size** field is a conventional value.



8. Specify the number of people in the queue above which the detection tool triggers (**8**). The value should be in the range [2; 20].
9. Specify the detection tool sensitivity in standard units from 0 to 1 (**9**). The higher the sensitivity, the smaller the disturbances will be attribute to the queue, i.e. the algorithm will react to more insignificant movement. If you specify the lowest sensitivity value, the detection tool will process only significant changes in the scene.

You should set the sensitivity value empirically based on the Motion Mask data displayed in the preview window.



10. In the preview window, you can set the detection areas with the help of the anchor points much like privacy masks in Scene Analytics detection tools (see [Setting General Zones for Scene analytics detection tools](#)(see page 248)).
11. Click the **Apply** button.

The Queue detection tool is now configured. When the detection tool is triggered, the following events are generated:

```
Camera. Detection "Queue detection" triggered, queue (min.: 10, max.: 10)
```

where min. and max. is estimated queue length.

Configuring the Visitors counter

Camera requirements for Visitors counter operation (see page 360)

Attention!

The Visitors counter is better fit for producing average figures than exact values.

Attention!

We cannot guarantee correct operation of the Visitors counter with fish-eye video cameras.

To configure the Visitors counter:

1. If the camera supports multistreaming, select the stream to be used for detection. Select a low-quality video stream to reduce Server load **(1)**.

Visitors counter	
▼	Object features
1	Video stream from camera Low-quality video stream
▼	Visual Elements
>	Visual Element Detection area (polygon)
>	Visual Element Visitors entrance/exit areas
>	Visual Element Visitors entrance/exit areas
▼	Other
2	Decoder mode CPU
3	Frame size change 640
4	Frames processed per second 25
	Human size 20
5	Number of people indoor 0
6	People indoor counter No
7	People indoor counter threshold 10000

2. Select a processing resource for decoding video streams **(2)**. When you select a GPU, a stand-alone graphics card takes priority (when decoding with NVidia NVDEC chips). If there's no appropriate GPU, the decoding will use the Intel Quick Sync Video technology. Otherwise, CPU resources will be used for decoding.
3. By default, the frame is compressed during the analysis to the specified size **(3)**, default size is 1920 pixels on the larger side). In this case, the following algorithm is used:
 - a. If the original resolution on the larger side of the frame is greater than the one specified in the **Frame size change** field, then it is divided in half.
 - b. If the resulting resolution is less than the specified one, then the algorithm stops and this resolution is used.
 - c. If the resulting resolution is still greater than the specified one, then it is divided in half until it becomes less.


Note

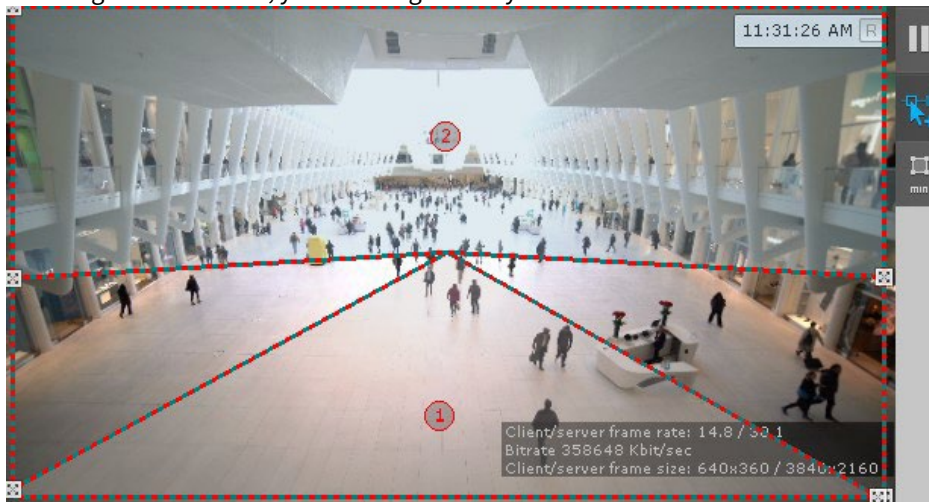
For example, the original video resolution is 2048*1536, the specified value is **1000**. In this case, the original resolution will be halved 2 times (512*384), because after the first division, the value on the larger side of the frame will be greater than the specified value (1024 > 1000).

Note

To avoid detection errors on streams with a higher resolution, it is recommended that compression be reduced.

4. Set the frame rate value for the detection tool to process (4). This value should be in the range [0,016; 100].
5. By default, the detection tool outputs the Camera. Visitor access in the direction of "Entrance" and Camera. Visitor access in the direction of "Exit" events. If total footfall and visitor number control/exceeding notification is required, do the following:
 - a. Select **Yes** for the **People indoor counter** parameter (6).
 - b. Enter the current number of visitors within the area (5).
 - c. Set the threshold value for the Visitors counter; exceeding this limit will generate the corresponding event (7).
6. In the Preview window, set the detection area. It is divided to two sectors, #1 and #2. When an object moves from #2 to #1, the system treats it as entry; alternatively, #1 to #2 is treated as exit.

To configure the sectors, you can drag them by corners  or sides.




To swap sectors, just click inside one of them.

Note

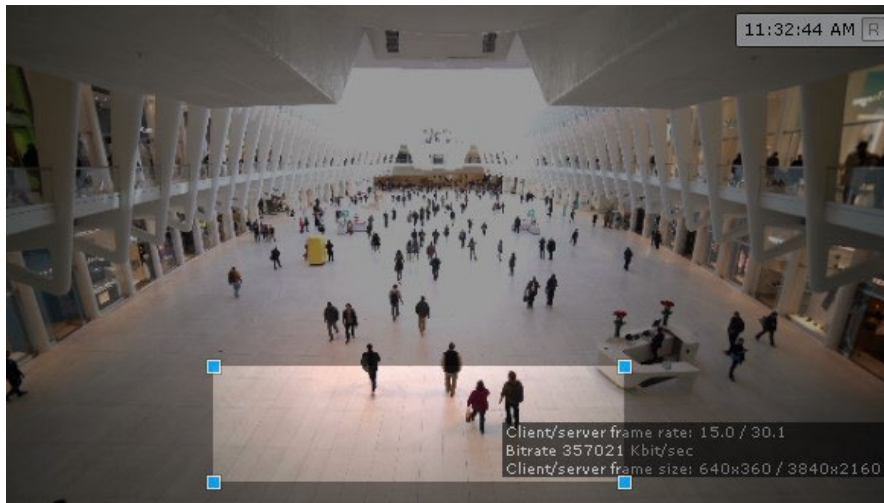
To show/hide sectors in the Preview window, click the  button.



7. Click  and specify the approximate size of a human. You can do so by dragging the corners of the rectangular area.

Attention!

When specifying the size of a person, consider the [Requirements for the person size in the frame](#)(see page 360).



8. Click **Apply**.

Configuration of the Visitors counter is now complete.

7.4.18 Water Level Detection

Camera requirements for Water level detection

To establish accurate results, please ensure the following:

1. Only color cameras are used.
2. Video resolution is no less than 640x360.
3. No glares or shadows are cast over the measurement scale.

Configuring Water level detection

[Camera requirements for Water level detection](#)(see page 367)

To configure Water level detection, do the following:

- To record water level detection readings to the archive, set **Yes** for the **Record mask to archive** parameter (1).

Water level detection		
<ul style="list-style-type: none"> ▼ Object features 		
1	Record mask to archive	No
2	Video stream from camera	Low-quality video stream
<ul style="list-style-type: none"> > Visual Elements 		
<ul style="list-style-type: none"> ▼ Other 		
3	Decoder mode	CPU
4	Frame size change	1920
5	Frames processed per second	10
6	Neural network	
7	Neural network file	
8	Neural network mode	CPU
9	Visible bottom value	0
10	Visible top value	1

- If the camera supports multistreaming, select the stream for which detection is needed. Select a low-quality video stream to reduce the Server load (2).
- Select a processing resource for decoding video streams (3). When you select a GPU, a stand-alone graphics card takes priority (when decoding with NVIDIA NVDEC chips). If there is no appropriate GPU, the decoding will use the Intel Quick Sync Video technology. If neural network is not used, the algorithm can work only on CPU (see [General Information on Configuring Detection](#)(see page 221)).
- Analyzed framed are scaled down to a specified resolution (4, 1920 pixels on the longer side). This is how it works:
 - If the longer side of the source image exceeds the value specified in the **Frame size change** field, it is divided by two.
 - If the resulting resolution falls below the specified value, it is used further.
 - If the resulting resolution still exceeds the specified limit, it is divided by two, etc.

Note

For example, the source image resolution is 2048*1536, and the specified value is set to **1000**.
In this case, the source resolution will be halved two times (512*384), as after the first division, the number of pixels on the longer side exceeds the limit (1024 > 1000).

Note

If detection is performed on a higher resolution stream and detection errors occur, it is recommended to reduce the compression.

- Set the frame rate value for the detection tool to process per second (5). The value should be in the range [0,016; 100].
- If the water in the frame is transparent and the detection tool cannot correctly identify its level, use **Neural network** (6):
 - If **No** is selected, the detection tool will work based on the algorithm without using the neural network, ignoring the value specified in the **Neural network file** field.
 - If **Yes** is selected:
 - If no value is selected in the **Neural network file** field, the system will automatically select the required standard neural network for the device specified in the **Neural network mode** field.
 - If a custom neural network is selected in the **Neural network file** field that corresponds to the device specified in the **Neural network mode** field and is a water level neural network, the

detection tool will create an engine using this network.

Attention!

If the neural network file is not specified correctly, the detection tool will not work. The engine will recreate itself every 20 seconds.

7. Select the neural network file (**7**). The following standard neural networks for different processor types are located in the C:\Program Files\Common Files\Inaxsys\DetectorPack\NeuroSDK directory:

WaterLevelRuleNet_movidius.ann	Water level detection / IntelNCS ¹³⁶
WaterLevelRuleNet_openvino.ann	Water level detection / CPU
WaterLevelRuleNet_origin_onnx.ann	Water level detection / GPU

Enter the path to a custom neural network file into this field.

Note

For correct neural network operation on Linux, place the corresponding file in the /opt/Inaxsys/DetectorPack/NeuroSDK directory.


8. Select the processor for the neural network – CPU, one of GPUs, or one of Intel processors (**8**) (see [Hardware requirements for neural analytics operation](#)(see page 23), [General Information on Configuring Detection](#)(see page 221)).

Attention!

It may take several minutes to launch the algorithm on NVIDIA GPU after you apply the settings. You can use caching to speed up future launches (see [Configuring the acceleration of GPU-based neuroanalytics](#)(see page 381)).

Attention!

If you specify other processing resource than the CPU, this device will carry the most of computing load. However, the CPU will also be used to run the detection tool.

9. On the measurement scale (**9, 10**), set the top and bottom visible values in normal conditions. The value should be in the range [0; 19].
10. Move the anchor points  in the preview window:

¹³⁶ <https://software.intel.com/en-us/neural-compute-stick>

- a. Set the measurement scale in the frame.



Attention!

Top and bottom values of the measurement scale should match the actual settings (see i. 9).

Note




Water level sensor is shown in the lower left corner. If the sensor is blue, the water level is below high and critical marks. If the sensor is yellow, the water level is at high mark, but below critical mark. A red sensor means that water level is above critical mark.

- b. Draw a line to set the top limit for water level upon reaching which the detection tool triggers an alarm.
- c. Draw a line to set the top limit for water level upon reaching which the detection tool highlights the sensor icon in the video surveillance window with yellow color.

11. Click the **Apply** button.

Configuring Water level detection tool is complete.

When you have created a detection tool, you can see a sensor on the layout in the video surveillance window.

If the sensor icon is green , the water level is lower than both critical and high marks. If the icon is yellow , the water level is above the high mark, but below the critical mark. A red icon  means that the water level is above the critical mark.

You can also add a numerical value of the water level to the video surveillance window (see [Configuring display of water level detection](#)(see page 465)).

7.4.19 Embedded Detection Tools

By the date the documentation in created, the *Arkiv* software package includes integrated analytics for multiple video cameras ([Drivers Pack release notes](#)).

If *Arkiv* supports built-in analytics for a device, then detectors can be created (see [Creating Detection Tools](#)(see page 229)).

Note

Some devices may have issues with interdependent embedded analytics. If there is already a relevant detection tool in *Arkiv*, you can add another one, but it will not work.

Embedded Temperature Detection Tool

Arkiv supports selected models of thermal cameras with an embedded temperature detection tool ([the Drivers Pack documentation](#), **body temperature detection**). This detection tool recognizes human faces on video, and performs temperature measurement on them.

Normally, you should set up a detection tool as follows:

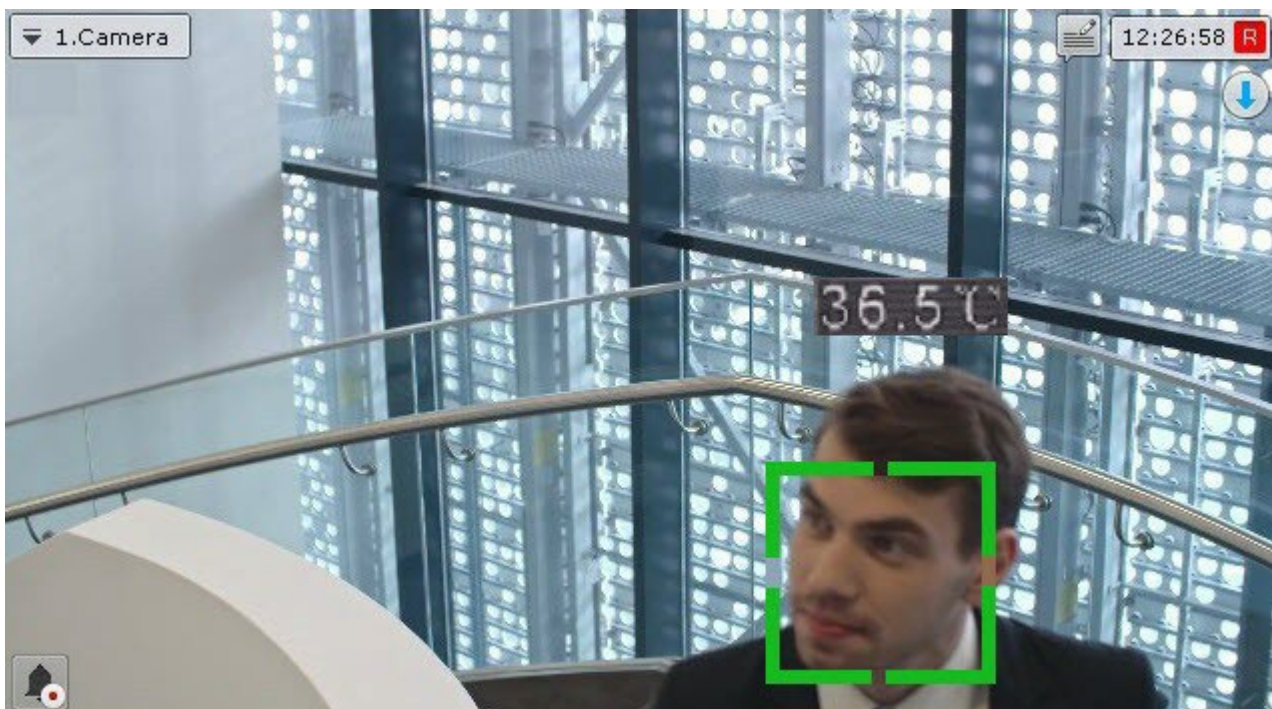
1. Create a detection tool (see [Creating Detection Tools](#)(see page 229)).
2. Using the camera manufacturer's documentation, set up the detection tool in the *Arkiv* VMS.

Attention!

As a rule, a camera requires specifying the temperature threshold, upon reaching which the detection tool would trigger an alarm.

3. If required, set up macros to perform pre-defined actions upon triggering the detector (see [Configuring MACROS](#)(see page 381)).

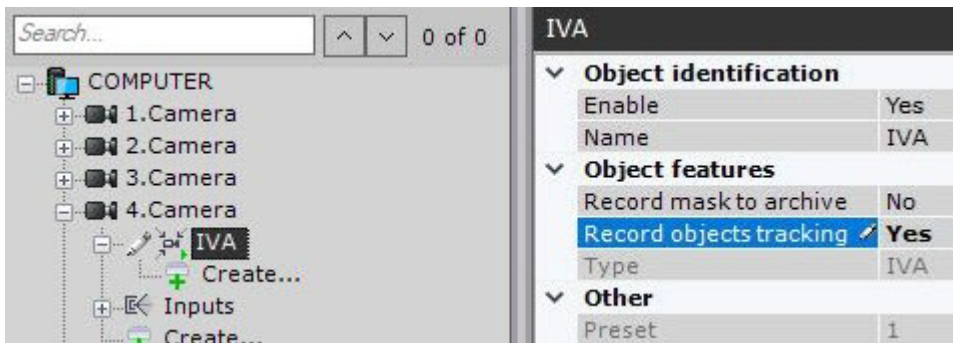
Some cameras are capable to display a bounding box over the facial image along with corresponding temperature readings. If this option is available, it can be activated via the web interface of a particular camera.



Obtaining metadata

Arkiv is also able to obtain metadata directly from certain video cameras. For example, metadata can be received from a Bosch IVA system.

To receive metadata from a Bosch IVA, you need to create an **IVA** object and select **Yes** in the **Record objects tracking** list.



ANPR

The VMS can process ANPR data from some cameras' on-board analytics.

Note

Please contact technical support <https://support.inaxsys.com/> for a list of cameras with this feature.

Generally, when configuring the embedded analytics you must follow official documentation for the corresponding video camera or parameter description in the *Arkiv* interface.

Motion Mask

If the camera supports Motion Mask, then when you configure VMD, it will be displayed in the preview window.



If there is motion, but it does not exceed the threshold value (because of the detection sensitivity), the mask cells are colored green. If motion triggers VMD, the cells turn red.

Inaxsys tracking in Axis devices

You can use analytics from Inaxsys ([Configuring Scene Analytics Detection Tools](#)(see page 245)) on Axis devices.

□ Note

This option is available for all Axis devices on the following hardware platforms:

- MIPS (ARTPEC-4 and ARTPEC-5 CPUs),
- ARMv7 (ARTPEC-6 and ARTPEC-7 CPUs).

For full list of setup parameters, refer to the [Inaxsys Tracker help](#).

All CPU heavy analytics and metadata generation tasks are delegated to the camera in this case.

To do this:

1. Go to the device's web interface.
2. Select the **Setup** menu (1) → **Applications** (2).

The screenshot shows the web interface of an AXIS Q1615 Network Camera. The navigation menu on the left includes 'Basic Setup', 'Video & Audio', 'Live View Config', 'Detectors', 'Applications 2', 'Events', 'Recordings', 'Languages', 'System Options', and 'About'. The 'Applications 2' menu item is highlighted. The main content area is titled 'Application Packages' and includes an 'Upload Application' section with a 'Choose File' button and an 'Upload Package' button. The 'Installed Applications' section contains a table with the following data:

Application	Version	Vendor	Status	License
AXIS Video Motion Detection	3.2-0	Axis Communications	Idle	None

3. Select the [ACAP¹⁴⁰](#) application (3) and click **Upload Package** (4).

□ Important!

¹⁴⁰ <http://www.axis.com/us/en/support/developer-support/axis-camera-application-platform>

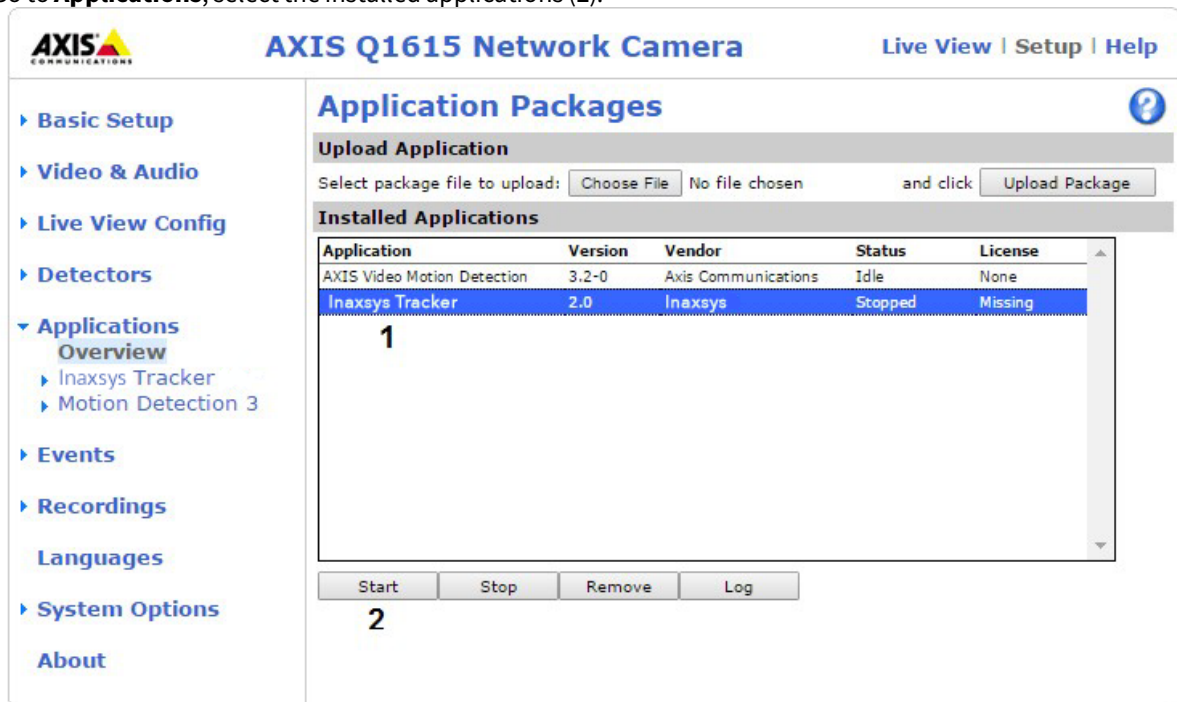
For application, contact [Inaxsys help-desk](#). You will be given a license code that is to be registered along with camera's MAC address on [Axis website](#)¹⁴² in order to get the license file.

4. Go to **Inaxsys Tracker** menu (1) → **License** (2).

5. Select the license file (3).
6. Click **Install** (4).

¹⁴² <https://auth.axis.com/authn/authentication/html-experimental>

7. Go to **Applications**, select the installed applications (**1**).



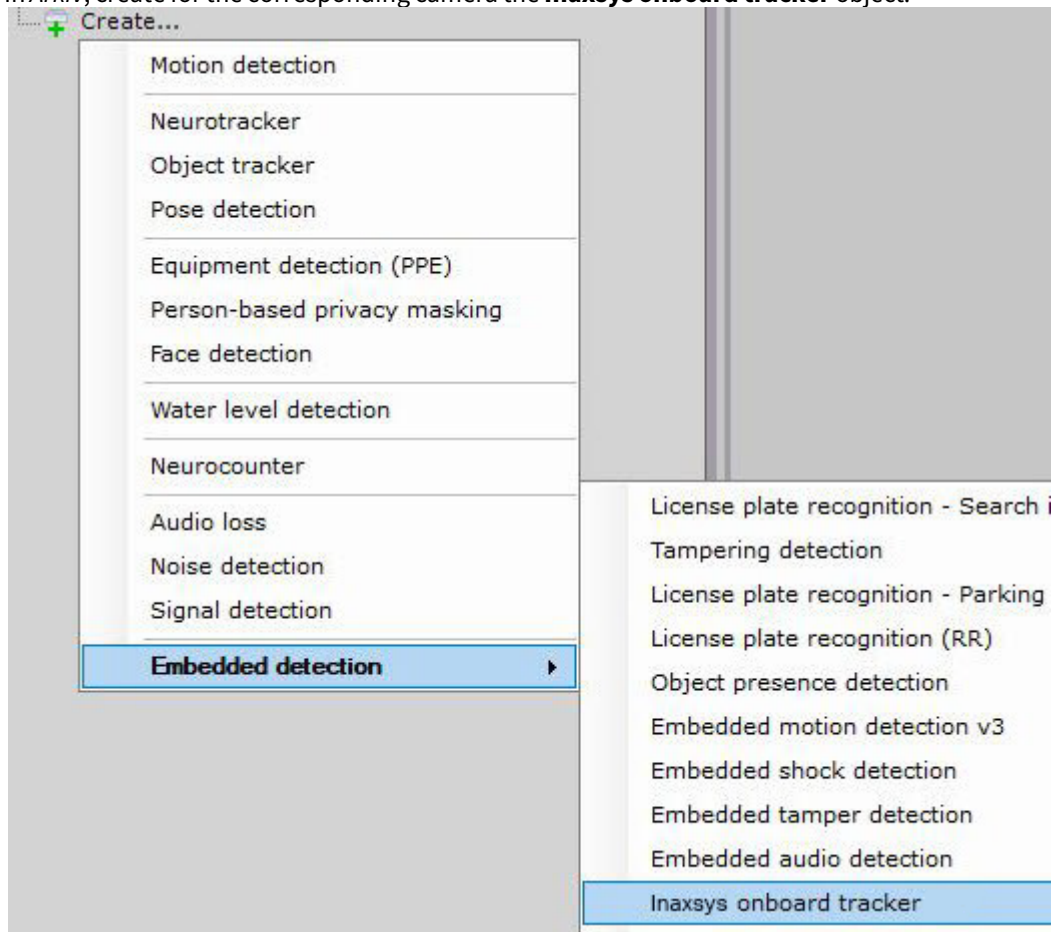
The screenshot shows the web interface for an AXIS Q1615 Network Camera. The page title is "AXIS Q1615 Network Camera" and it includes links for "Live View", "Setup", and "Help". The left sidebar contains a navigation menu with the following items: Basic Setup, Video & Audio, Live View Config, Detectors, Applications Overview (highlighted), Inaxsys Tracker, Motion Detection 3, Events, Recordings, Languages, System Options, and About. The main content area is titled "Application Packages" and includes an "Upload Application" section with a "Choose File" button and an "Upload Package" button. Below this is a table of installed applications:

Application	Version	Vendor	Status	License
AXIS Video Motion Detection	3.2-0	Axis Communications	Idle	None
Inaxsys Tracker	2.0	Inaxsys	Stopped	Missing

A large number "1" is overlaid on the "Inaxsys Tracker" row. Below the table, there are four buttons: "Start", "Stop", "Remove", and "Log". A large number "2" is overlaid on the "Start" button.

8. Click **Start** (**2**).

9. In *Arkiv*, create for the corresponding camera the **Inaxsys onboard tracker** object.



10. Configure the tracker and create the required detection tools.

Note

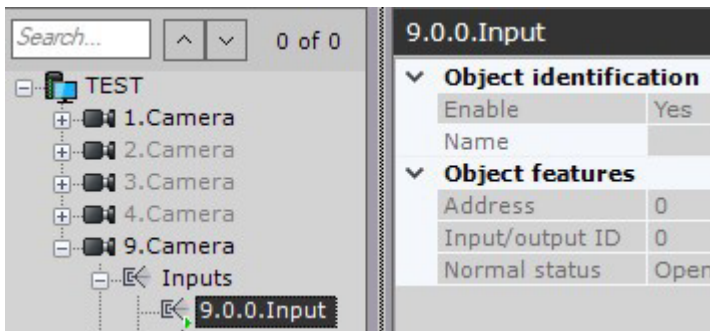
You can configure the **Inaxsys onboard tracker** object similar to the [General information on Scene Analytics detection tools](#) (see page 239).

You cannot configure perspective for solution based on Axis devices.

7.4.20 Configuring Inputs

After becoming enabled on the **Devices** tab, the **Input** object appears on the **Detection Tools** tab (see the section [The Input Object](#) (see page 153)).

Check the functioning of the Input in the **Devices** tab (see the section [The Input Object](#) (see page 153)). The **detection properties** field in the **Detection Tools** tab duplicates the settings entered in the **Devices** tab under **Settings** and is not editable.




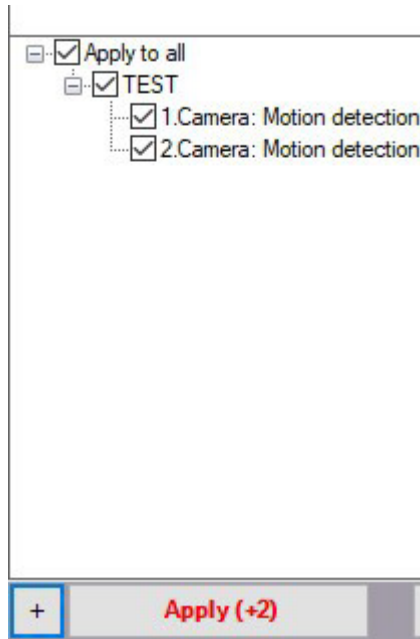
Perform the follow actions for the **Input detection tool**, on the **Detection Tools tab**:

1. Check triggering of the detection tool with the help of the Triggers ribbon (optional) (see the section [Checking the Triggering of a Detection Tool](#)(see page 378)).
2. Set the rules to be automatically executed when the detection tool is triggered (see the section titled [Automatic Rules](#)(see page 379)).

7.4.21 Mass configure detection tools

You can mass configure detection tools as follows:

1. Configure one detection tool.
2. Click the button  and select detections tools the same settings should be applied to.

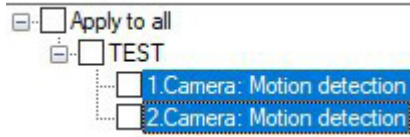


Attention!

Detection zones cannot be changed by bulk configuration.

The list of detection tools of the same type in the current Arkiv-domain opens. To select multiple detection tools, hold down the Shift key, select the first and last one the settings should be applied to. Selecting any

tool from highlighted ones will result in selecting them all.



3. Click the **Apply** button.

Note

The number in brackets refers to the number of configured detection tools.

7.4.22 Checking the Triggering of a Detection Tool

You can check the triggering of detection tools in the **Detection Tools tab**.

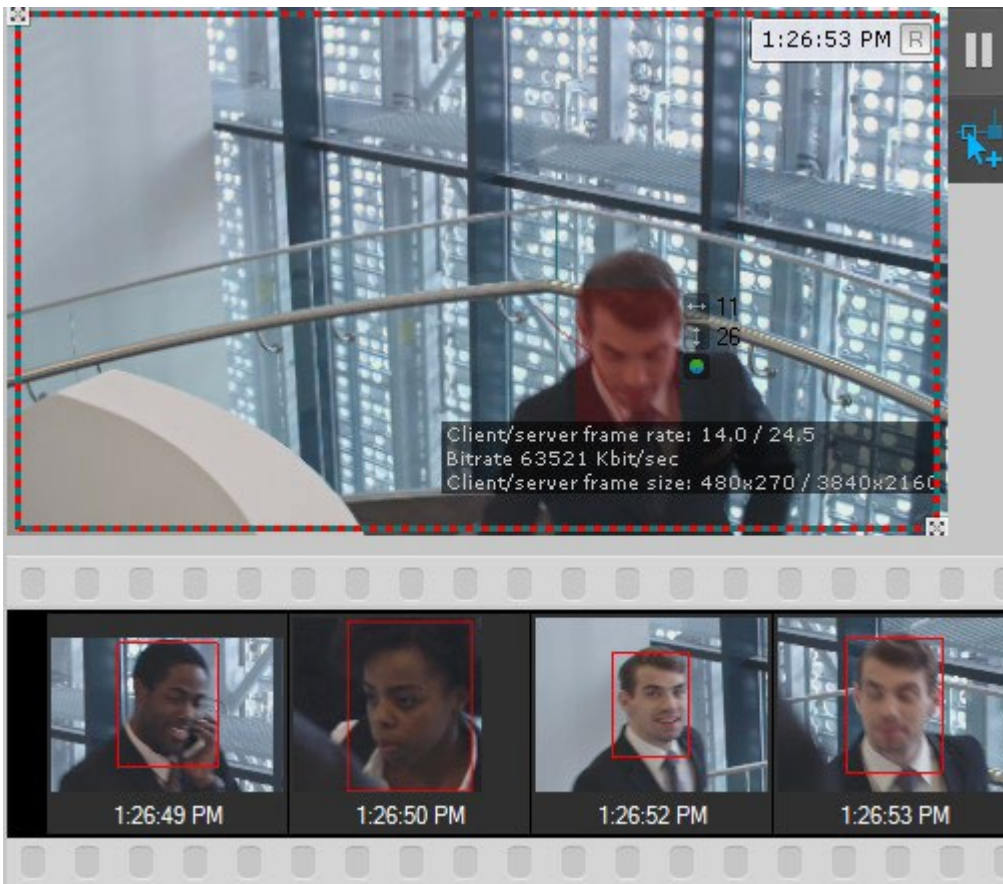
To use this option you must perform the following steps:

1. In the Detection Tools list, highlight the detection tool object whose triggering you need to check.

Attention!

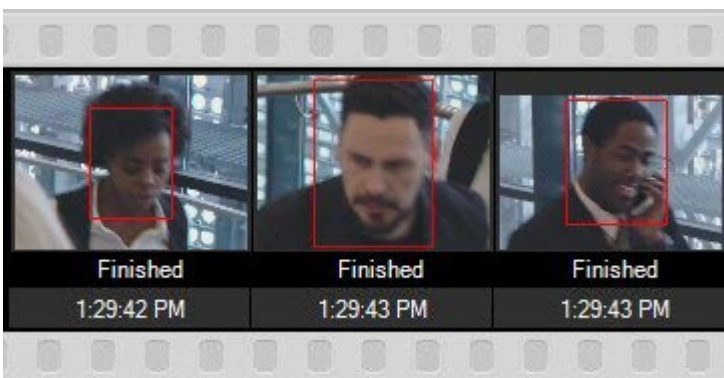
The Detection Tool object should be enabled and configured.

2. Produce an event whose occurrence should trigger the detection tool: motion in the frame, turning the video camera, providing sound to an audio device, etc.
3. If the detection tool is configured correctly, video image frames from the video camera corresponding to the detection tool will be displayed on the trigger ribbon with the time they were received indicated.



VMS checks the on/off status of detection tools when they triggered and stopped. Not applicable to detection of: quality loss, position change, disappearance of an object, motion stop and ANPR.

After the end of triggering, you get the **Finished** message.

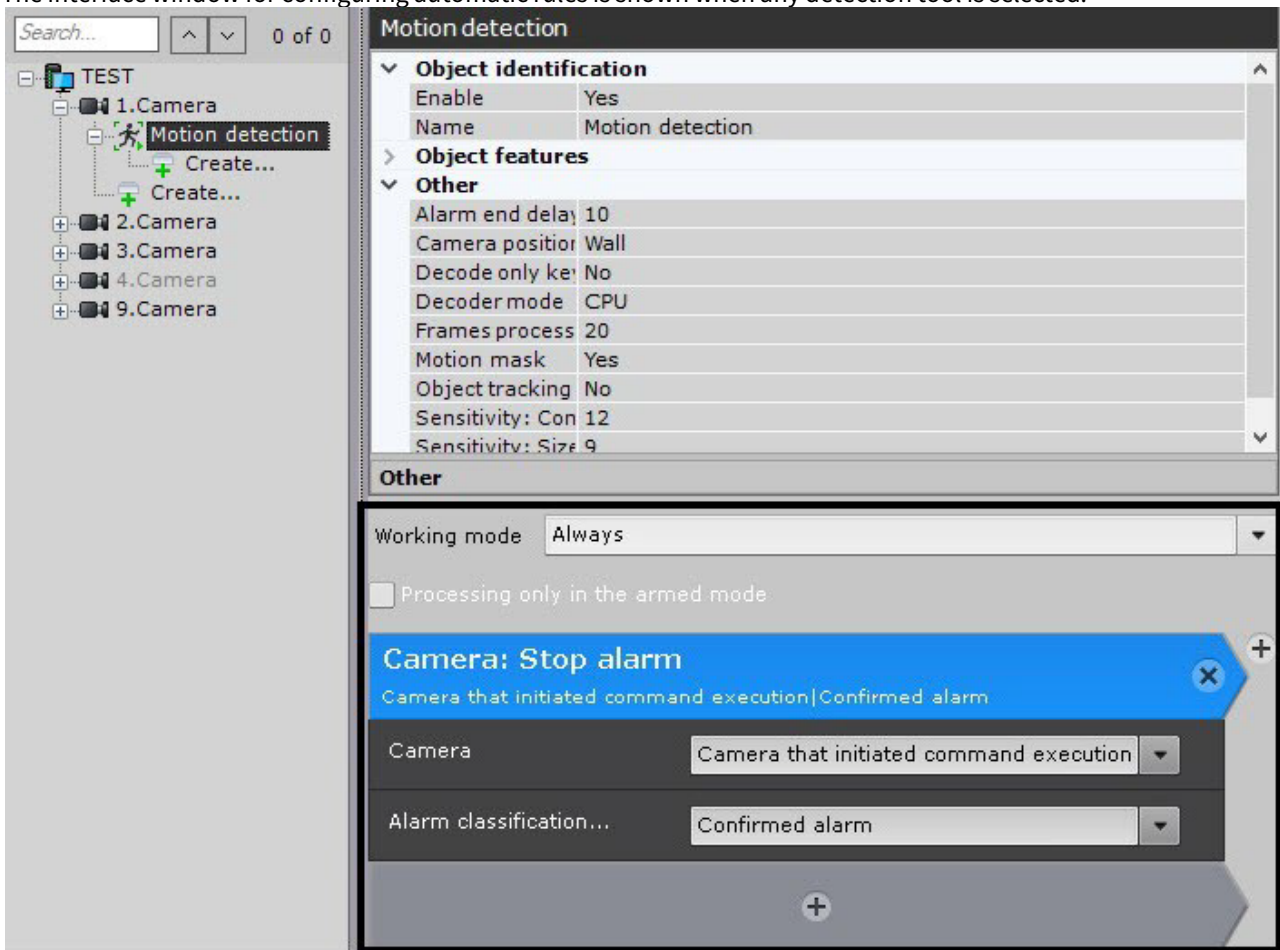


Checking the triggering of a detection tool is now complete.

7.4.23 Automatic Rules

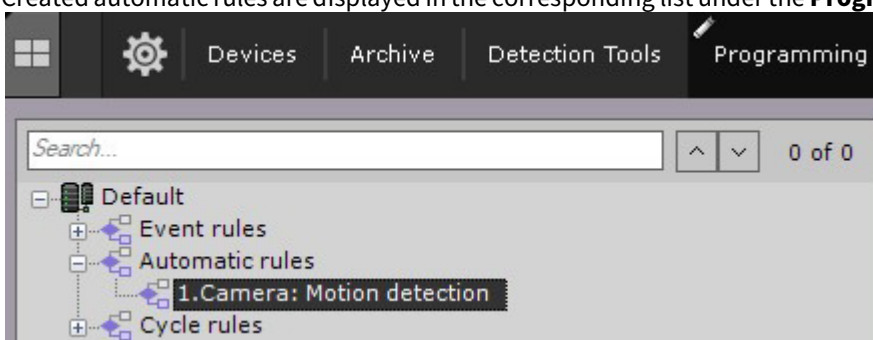
Automatic rules are basic macros: particular actions that are performed when a detection tool is triggered (see [Configuring Macros](#)(see page 381)). One or multiple automatic rules can be set for each detection tool.

The interface window for configuring automatic rules is shown when any detection tool is selected.



Configuring automatic rules and their mode of operation is the same as configuring macros (see [Configuring MACROS](#)(see page 381)).

Created automatic rules are displayed in the corresponding list under the **Programming** tab.



Note

When you create the [Record to archive](#)(see page 397) automatic rule, the recording stops when VMD (see [Configuring Scene Analytics Detection Tools](#)(see page 245)) triggering stops.

7.4.24 Configuring the acceleration of GPU-based neuroanalytics

It may take several minutes to launch neuroanalytics algorithms on NVIDIA GPU after Server reboot. Meanwhile, the neuromodels are optimized for the current GPU type.

You can use the caching function to ensure that this operation is performed only once. Caching saves the optimization results on the hard drive and uses it for the subsequent analytics runs.

To activate the caching, create the GPU_CACHE_DIR system variable and specify the existing folder as its value, where the optimization result will be stored (see [Appendix 10. Creating system variable](#)(see page 927)).

The cache size depends on the number of neural networks used and their type, the minimum size is 70 MB.

❏ Attention!

This function works in beta mode for all detection tools which use neuroanalytics (see [General information on Neural Analytics](#)(see page 226)), except [Face detection](#)(see page 267). To optimize [Face detection](#)(see page 267) operation using the GPU_CACHE_DIR system variable, you need to perform additional actions (see [Optimization of Face detection on GPU](#)(see page 271)).

7.5 Configuring Macros

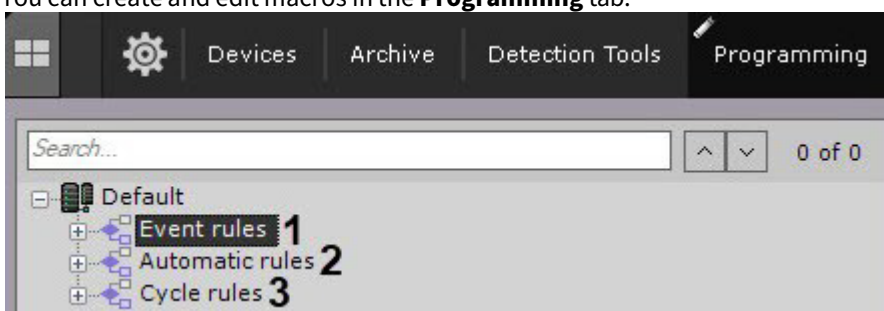
7.5.1 General information about the macros

Macro is a tool intended for configuring system responses to events. System response may involve one or several different actions.

❏ Attention!

You can apply macros within a single Arkiv domain only. Macro conditions and actions cannot include objects from another Arkiv domain.

You can create and edit macros in the **Programming** tab.



Macros can be of 3 types:

1. Event-driven (**1**). These macros can be run automatically on detection/event or initiated by the user. When triggered, the commands in the macro are executed once.
2. [Automatic Rules](#)(see page 379) (**2**).
3. Cyclic (**3**). Cyclic macros are run on the first Server in the Arkiv domain (alphabetical order) available at the time of launching the macro. Cyclic macros are executed immediately after you save them unless they have been created outside the time schedule for commands (see [Create Macros](#)(see page 382)). After completing all

the commands, the macro is automatically restarted. Cyclic macros cannot be started by the user. Additionally, a cyclic macro can be launched at a specified time interval, or at a random moment within the specified time interval. When triggered, the commands in such a macro are executed once.

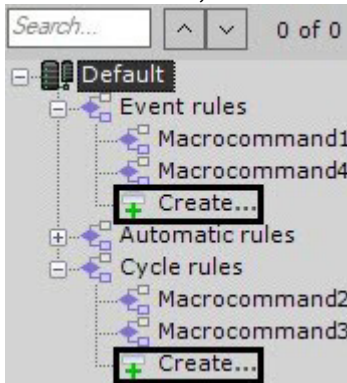
Attention!

If an event occurs while the cyclic macro is busy, it is skipped.
If an event occurs while the event-driven macro is busy, it is processed as configured.

Unless the macro has standby commands (see [Wait for event](#)(see page 392), [Wait for timeout](#)(see page 394), [Wait till previous action finishes](#)(see page 395)), all commands are performed simultaneously.

7.5.2 Create Macros

To create a macro, click the **Create** button in the required list.



Then do as follows:

1. Enter the name of the macro (1).

Name: 1 Working mode: 2

Add to menu 3

Start conditions 4
Default: IP device connection lost

Start conditions: -
Threshold: +

Alarm initiation 5
Initiate if no active | Default

Working mode: -
Camera: -
 Random
Record to: -
Alarm flag position: + -


2. Select the macro working mode (2):

Mode	Event-driven	Cyclic
Never	Manual execution only (see Working with Dialog Board (see page 752), Macros control (see page 786))	Disabled, manual execution is possible (see Macros control (see page 786))
Always	Always on	Always on
Time schedule	Runs within the selected time schedule (see Creating schedules (see page 520)). Manual execution is possible at any time	Runs within the specified time schedule


Note



When creating a macro, the **Always** mode is used by default.

3. If you need to add a macro to the control menu on the layout (see [Macros control](#)(see page 786)), set the corresponding checkbox (3).

4. To configure event-driven macros, click the  button and select one or more trigger events (4, see [Configuring filters for event-driven macros](#)(see page 385)). If the event filter is left blank, the macro can be executed only manually.

Note

To delete an event from the filter, click the  button.

5. Add one or more actions to the macro (5, see [Settings specific to actions](#)(see page 392)). Click the  button to do this. To delete an action, click the  button.

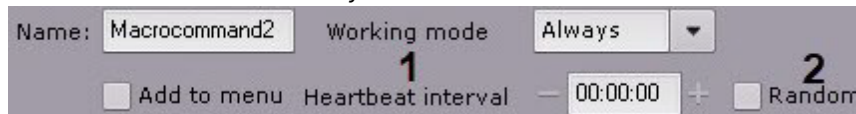
Note

The macro can be executed for a group of cameras (see [Creating a system of groups and subgroups](#)(see page 195)).

Note

To hide the start conditions and action for the macro, click the action name.

6. A cyclic macro can be launched automatically at a specified time interval, or at a random moment within the specified time interval. To configure this action, do as follows:
- In the **Heartbeat Interval** field, specify the time interval in the HH:MM:SS format (1). For example, if you set the interval to 8 hours and leave the **Random** checkbox clear (see 6b), the macro will be launched every 8 hours strictly. The macro will be launched according to cycle settings even if the actions from its previous launch are not completed. In this case, several instances of the same macro will be executed simultaneously.



- Set the **Random** checkbox (2), if you need to launch the macro at a random moment set by the **Heartbeat interval** parameter. For example, if the interval is set to 8 hours, then once every 8 hours at a random moment, the macro will be launched.

Attention!

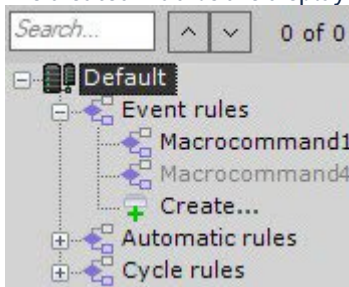
If the macro working mode is linked to a time schedule, and the launch time falls out of the schedule, the macro will not be launched.

7. To save the macro, click the **Apply** button.

Attention!

By default, the created macros are available only to the users from the admin group (see [Creating and configuring roles](#)(see page 431)).

The created macros are displayed in the list. If the **Never** mode is selected for the macro, it is grayed out.



You can copy macros. To do it, do the following:

1. Select the macro to copy.
2. Click the **Create** button.

A new macro with the similar parameter will be created.

Note

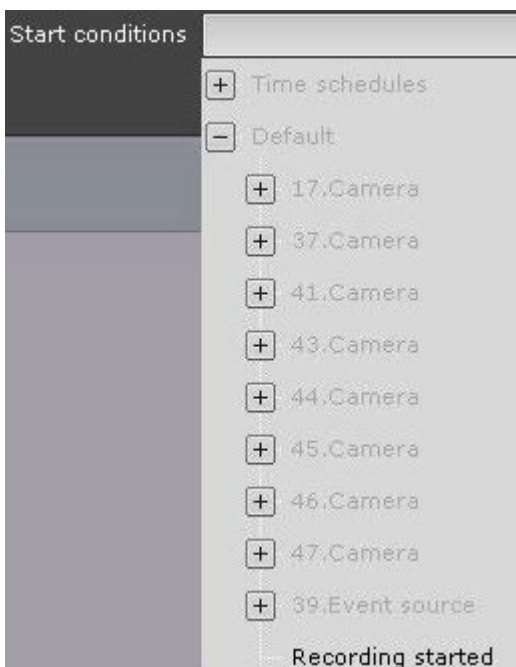
To create an empty macro with no parameters specified, select any of the common macros groups, and click the **Create** button.

To delete a macro, select it in the list and click the **Remove** button.

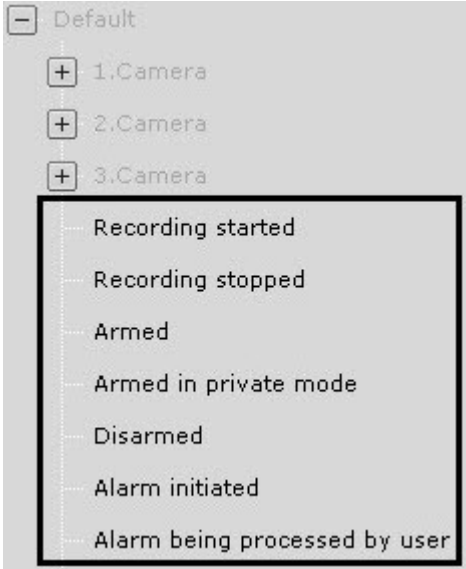

7.5.3 Configuring filters for event-driven macros


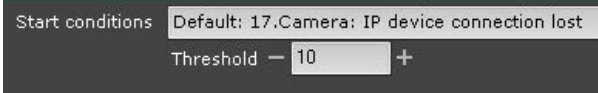
When you create event-driven macros, you can select one or more trigger events.


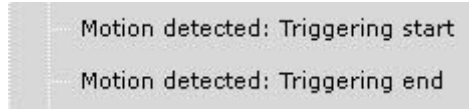
You can also filter events:


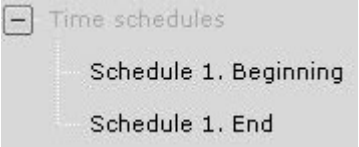
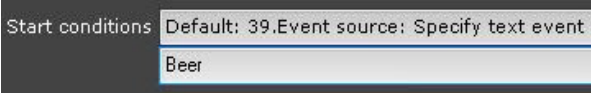


The following events are available for selection:

Object	Event	Image
Arkiv domain	<p>A string of events.</p> <p>If you select an event from an Arkiv domain, the macro will be launched when this event is received from any object in the Arkiv domain.</p>	
Server	<p>Server disconnected</p> <p>Server connected</p>	

Object	Event	Image
Camera	Recording started	
	Recording stopped	
	Armed	
	Armed in private mode	
	Disarmed	
	Alarm initiated	
	Alarm being processed by user	
	Alarm skipped	
	Alarm processed	
	Alarm processed – Confirmed alarm	
	Alarm processed – Suspicious situation	
	Alarm processed – False alarm	
	Connected	
	Disconnected	
Signal lost		
Signal restored	<p>You can set a threshold for these type of events: the time in seconds (0 to 100) between switching from Signal Lost to Signal Restored state. For example, setting 10 seconds threshold for the Signal Lost condition means triggering the macro only if the time interval between the last Signal Restored event and the new Signal Lost event is no less than 10 seconds.</p>	

Object	Event	Image
Group of cameras	<p>A string of events.</p> <p>If you select an event from a group of cameras, the macro will be launched when this event is received from any camera in the group.</p>	 <p>The screenshot shows a list of events for 'Group 1'. The events are: Recording started, Recording stopped, Armed, Armed in private mode, Disarmed, Alarm initiated, Alarm being processed by user, Alarm skipped, Alarm processed, Alarm processed - Confirmed alarm, and Alarm processed - Suspicious situation.</p>
Detector, Input and Output	<p>Triggering start</p> <div style="border: 1px solid orange; padding: 10px; margin: 10px 0;"> <p>□ Attention!</p> <p>If triggering conditions for a macro include a Start Time of Detection Tool Trigger event, any changes in macro's settings that have been saved while the detection tool is triggered (before the End Time of Detection Tool Trigger event) will lead to re-executing the macro. The same logic is applied when you create a macro. If you are creating a macro, and the detection tool is triggered, the macro will be executed immediately after the creation is complete.</p> </div> <p>Triggering end</p>	 <p>The screenshot shows two event entries: 'Motion detected: Triggering start' and 'Motion detected: Triggering end'.</p>

Object	Event	Image
	<p>Triggering (for detection tools, which do not have the start and end of the triggering, see Checking the Triggering of a Detection Tool(see page 378))</p> <p>Specified Triggering (for face detection only, see Specific parameters for triggering a face recognition macro(see page 389))</p>	
Archive	<p>Archive partition error</p> <p>Archive partition restored</p>	
Time schedules	<p>Beginning</p> <p>End</p>	
Event source	<p>Description for the Event source object, you must specify the trigger word or phrase. When it comes up in the captions, the macro starts.</p> <p>For example, this filter triggers the macro when the word "Beer" appears in the captions.</p> <p>If a macro is triggered by a simultaneous combination of words and/or values, use braces for logical AND. For example, {Beer} {Belgium}.</p>	

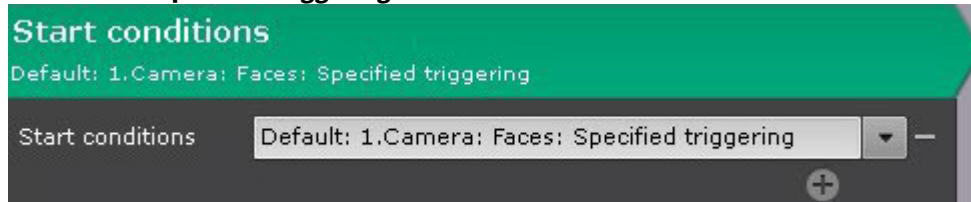
Specific parameters for triggering a face recognition macro

You can set a number of specific parameters which affect triggering a face recognition macro:

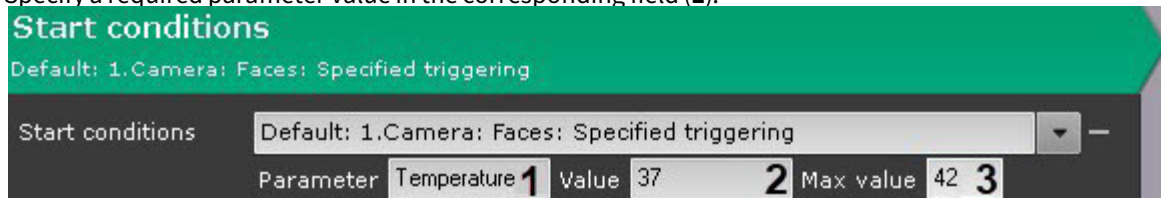
1. **Age** of the individual (requires activation of the **Gender and Age** parameter, see [Configuring Face detection](#)(see page 267)).
2. **Gender** of the individual (requires activation of the **Gender and Age** parameter, see [Configuring Face detection](#)(see page 267)). Value: **1** = female, **2** = male.
3. **TemperatureValue**: body temperature of the individual (requires the **Face Detection and Temperature Control**, see [Face Detection and Temperature Control with Mobotix M16 TR cameras](#)(see page 282)).

To set specific parameters, do the following:

1. Select **Faces: Specified triggering** event as a launch condition.



2. Click **+**.
3. Specify a required parameter value in the corresponding field **(1)**.



Attention!

The parameter is case-sensitive.

4. In the **Value (2)** and **Max value (3)** fields, set the range of parameter values within which the macro will be triggered.

Note

Examples.

If you set **Age** to [18, 100], the macro will be triggered only if the detection tool returns the age value of 18 or more.

If you set **Gender** to [1, 1], the macro will be triggered only if the detection tool returns the individual's gender as female.

If you set **Gender** to [2, 2], the macro will be triggered only if the detection tool returns the individual's gender as male.

If you set **TemperatureValue** to [37, 100], the macro will be triggered only if the detection tool returns the temperature value of 37 or more.

5. Add one or more actions into the macro (see [Settings specific to actions](#)(see page 392)).
6. Click the **Apply** button.

Triggering macros by statistical data

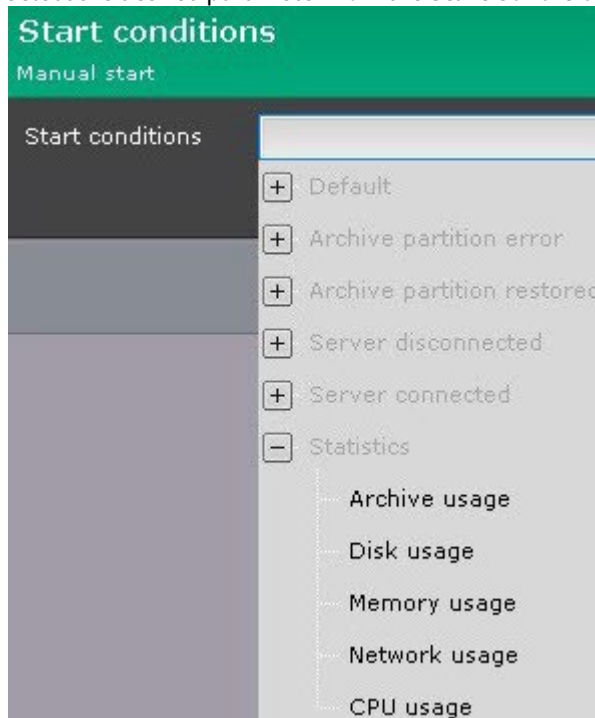
Event-triggered macros can be launched not only by events of particular type (see [Configuring Filters for Event-driven Macros](#)(see page 385)) but also by statistical parameters.

A macro can be initiated by the following parameters reaching pre-defined criteria:

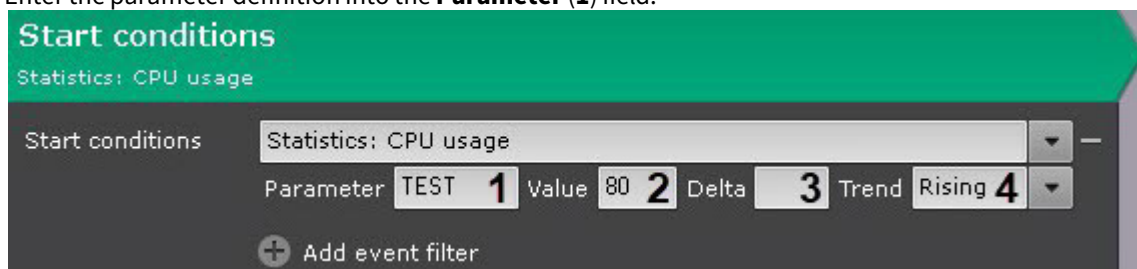
1. The percentage of used space in Archive.
2. The percentage of used space on a volume.
3. The percentage of used RAM on a Server.
4. The percentage of used network bandwidth on a Server.
5. The percentage of CPU load on a Server.

To set up triggering macros by statistics, do as follows:

1. Select the desired parameter from the **Start Conditions** list in the **Statistics** group.



2. Enter the parameter definition into the **Parameter (1)** field.



Archive usage	Archive in the following format: hosts/TEST/MultimediaStorage.AliceBlue/ MultimediaStorage.
Disk usage	TEST@C:\ , where TEST is the name of a Server within the Arkiv-domain, C:\ is the volume name. Important! You cannot monitor storage capacity of a disk fully allocated for Archive.
Memory usage (RAM)	The name of a server within the Arkiv-domain.

Network usage	The name of a server within the Arkiv-domain.
CPU usage	The name of a server within the Arkiv-domain.

3. Enter the threshold value into the **Value (2)** field.
4. For **Leaving** condition, enter the range into the **Delta (3)** field (see section 5).
5. From the **Trend (4)** list, select a triggering condition for the macro.

Leaving	The macro is triggered if a parameter value goes out of the specified range [Value - Delta; Value].
Rising	The macro is triggered if the parameter value exceeds the threshold specified in the Value field.
Falling	The macro is triggered if the parameter value falls behind the threshold specified in the Value field.

Attention!

The triggering conditions are set not for current but for future events. For instance, if the current CPU load is 85%, and you set the triggering condition to exceeding 80%, the macro will be launched only when the CPU load exceeds 80% value next time.

6. If necessary, you can set several event and/or statistical conditions for triggering macros.

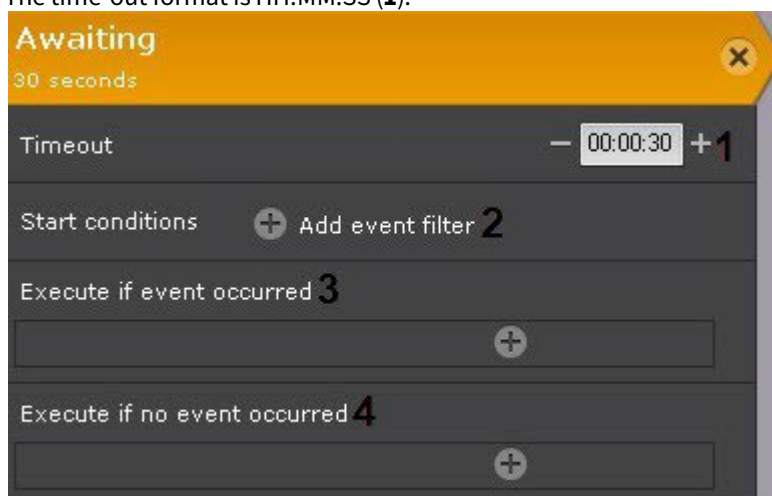
7.5.4 Settings specific to actions

Wait for event

This is the IF condition for running a command (only after the specified events occur).

You can enter the following parameters in the **Awaiting** command:

1. The time-out format is HH:MM:SS (**1**).



2. Break command – here you enter one or more events that override the Wait command (2). If you do not specify events, the time-out applies.
3. If necessary, select and configure the action to perform when an event from Break Command occurs. A new **Awaiting** instance is also an option (3).
4. If necessary, select and configure the action to perform if none of the events that were set in Break Command occurred during time-out. A new **Awaiting** instance is also an option (4).

For example, this macro is conditioned by the **Motion detected event** on **Camera 9** (1).

Awaiting ✕

Default: 9.Camera: Motion detected: Triggering start|4 minutes

Timeout
– 00:04:00 +3

Start conditions

Default: 9.Camera: Motion detected: Triggering start **1**

–

+ Add event filter

Execute if event occurred **2**

Record to archive
✕
+

9.Camera | Archive AliceBlue

Camera

9.Camera

▼

Record to:

Archive AliceBlue

▼

Finish after

00:00:00

+

+ Add event filter

Prerecord, sec

00:00:00

+

Recording frame rate

0

+

Execute if no event occurred **4**

Voice notification on client
✕
+

COMPUTER/1.Speaker

Speaker:

COMPUTER/1.Speaker

▼

Role▼

Finish after

00:00:00

+

+

When it occurs, the macro continues. This also starts recording (2). Further macro actions are executed, if any. If this event does not occur, the time-out is 4 minutes (3). After this time, a sound notification (4) plays.

❑ Attention!

The **Awaiting** command does not affect the commands below (outside of) it.

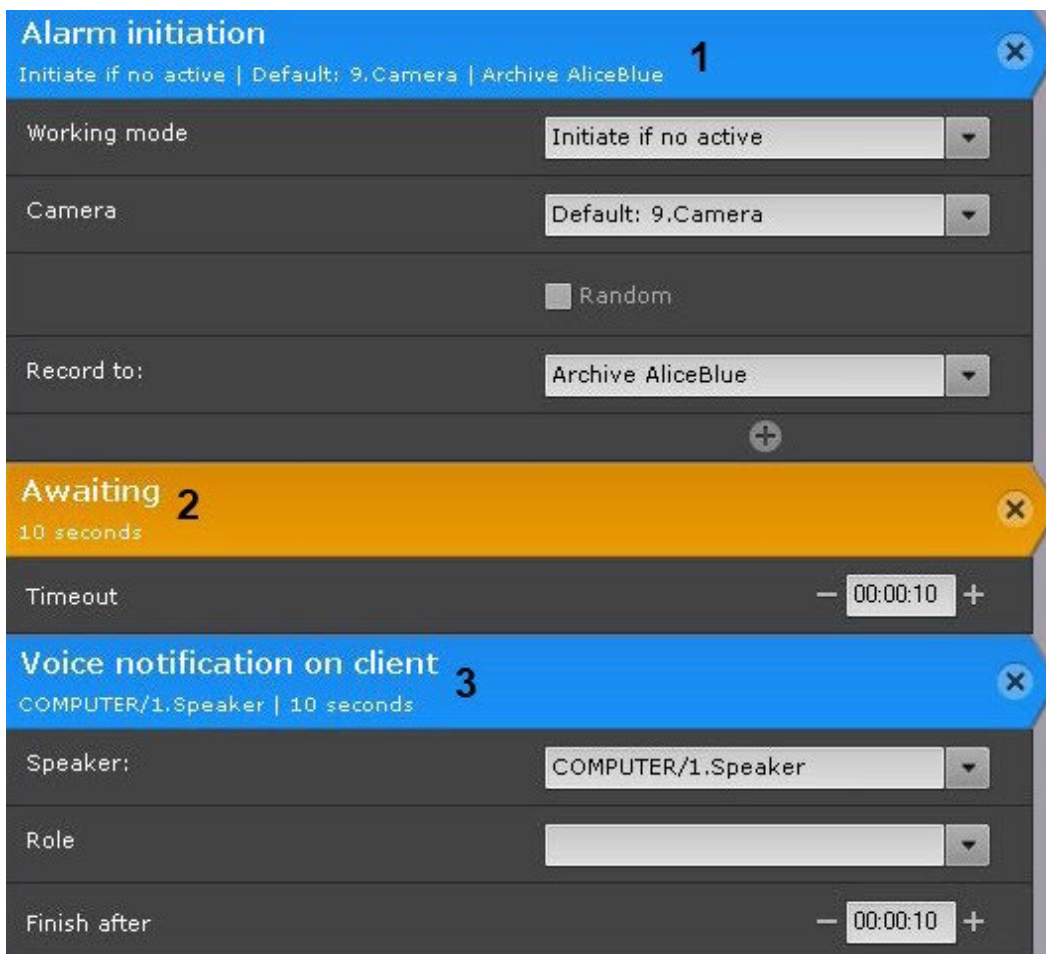
Wait for timeout

This command delays launch for downstream commands.

The time-out format is HH:MM:SS.



For example, when performing that macro, an alarm will be initiated in the system (1), and then after 10 seconds (2) – an audio alert (3).



Wait till previous action finishes

This is the IF condition for running a command (only if the previous steps are completed/not completed in the specified time).

To configure, set up the following parameters:

1. Set waiting period in HH:MM:SS format for previous action to be performed (**1**). If 00:00:00 is set, then waiting will last forever.

2. Specify the action to perform if the previous command was completed within the specified timeout (**2**).
3. Specify the action to perform if the previous action was **not** completed within the specified timeout (**3**). If the timeout is **00:00:00**, this setting is not applicable.

Attention!

This command does not affect the commands below (outside of) it.

Example: In this macro, replication (**1**) and the program on the Client (**5**) start at the same time. If replication is completed within 10 minutes (**2**), an Email message (**3**) is sent. Otherwise, a voice alert (**4**) is played.

Camera: Start replication

9.Camera | Archive AntiqueWhite | During: 00:00:00

1

Camera

Archive

Whole period
 Offline periods
 Time schedule
 During:
 Finish after

Add event filter

Wait till previous action finishes

10 minutes

Timeout **2**

Do if previous action completes before timeout

Send E-mail**3**

Email message:

To:

Subject:

Message:

Do after timeout if previous action fails to complete before that time

Voice notification on client**4**

COMPUTER/1.Speaker | 5 seconds

Speaker:

Role

Finish after

Launch external program on client**5**Path to file:

Record to archive

To configure **Record to archive**:

1. Selecting a camera or group of cameras for recording (1). An implicit selection of a video camera is also allowed – **Camera that initiated command execution**.

❏ Attention!

If the start of the macro was triggered by the activation of input or output (see [Configuring filters for event-driven macros](#) (see page 385)) that is not connected to any camera, you need to select a specific camera here. If you select a group of cameras or a camera that triggered the command, the action will not start.

2. Select an archive to write to (2).
3. Configuring conditions that end recording.

Condition	Description
Timer (3)	Only a timer value is set. Recording stops according to the time setting.
Event filter (5)	One or several events are set, the timer is set to 00:00:00. Recording stops on any IF event.
Timer (3) + Intelligent event filter (IF) (5)	One or several events are set, the timer is set to non-zero. Recording stops when the set time interval expires after any IF event (trigger) occurs.

Timer (3) + **OR** flag (4) + IF (5)

One or several events are set, the timer is set to non-zero, the **OR** flag is set. In this case, the recording stops on any of the two conditions: after the time interval expires or if an IF event (trigger) occurs.

Note

The **OR** flag can be set only if the timer setting is not 00:00:00.

Note

An implicit selection of an event is allowed – **Last event for condition that initiated execution.** For example, if the event that triggered the execution of the command was the **Start time of detection tool trigger** from any type of detection tools, then the end event will be the **End time of detection tool trigger** from the same tool.

4. Set the pre-alarm recording time (6). The maximum pre-alarm recording time is 30 seconds.

Attention!

By default, the pre-alarm recording time interval is set to the value specified in Archive settings (see [Configuring recording to an archive](#)(see page 207)).

The longest pre-alarm recording time available in the Archive settings is used.

Changing this value in a specific macro does not affect the Archive settings.

5. If you have cameras in continuous recording mode (see [Configuring recording to an archive](#)(see page 207)) and you want to record with specified fps (see example 2) change the frame rate, enter the required frame rate (7). After the macro command completes, recording resumes at the frame rate specified in the archive settings. You can use special codes:

- a. **0** – do not change the current frame rate (default).
- b. **-1** – record only I-frames.
- c. **1000** – record at the standard fps of the camera.

Attention!

Fps for pre-recording will not change.

If the macro command is set to complete some time after a specified event has been received (see p. 3), the frame rate will change for this Check-in Event-time.

Attention!

When you prune by frame dropping, in all video streams except MJPEG, only I-frames (Intra-Coded Frame or Key Frames) are saved, so please use codes: **-1** and **1000**.

If you go for a custom frame rate this will lead to dropping some key frames.

MJPEG video contains only I-frames (Intra-coded pictures with a complete image), so it makes sense to set a desired frame rate here.

Example 1. A macro-command to initiate VMD-triggered recording to the Archive from any camera within **Default** Arkiv domain.

The screenshot displays two configuration panels. The top panel, titled 'Start conditions' with a green header, shows a dropdown menu set to 'Default: Motion detected: Triggering start' and an 'Add event filter' button. The bottom panel, titled 'Record to archive' with a blue header, includes a dropdown for 'Camera' set to 'Camera that initiated command execution', a 'Record to:' dropdown, a 'Finish after' time field set to '00:00:00' with an '-OR-' option, another dropdown set to 'Last event for condition that initiated execution', an 'Add event filter' button, a 'Prerecord, sec' field set to '00:00:03', and a 'Recording frame rate' field set to '0'.

Example 2. All video cameras from the **Default** Arkiv Domain are set to continuously record video at the specified fps by dropping frames (see [Configuring recording to an archive](#)(see page 207)). When you have a motion detection

event, you need to switch to full fps recording. Configure the following macro to do so:

The image shows two configuration panels. The top panel, titled 'Start conditions' (green header), has a subtitle 'Default: Motion detected: Triggering start'. It features a dropdown menu for 'Start conditions' set to 'Default: Motion detected: Triggering start', a plus icon to add filters, and another plus icon labeled 'Add event filter'. The bottom panel, titled 'Record to archive' (blue header), has a subtitle 'Camera that initiated command execution'. It includes a dropdown for 'Camera' set to 'Camera that initiated command execution', a 'Record to:' dropdown, a 'Finish after' time field set to '00:00:00' with a '-OR-' option and a dropdown set to 'Last event for condition that initiated execution', another 'Add event filter' plus icon, a 'Prerecord, sec' field set to '00:00:03', and a 'Recording frame rate' field set to '12'.

Trigger an alarm

This starts recording and an alarm.

Most of the parameters are from the **Record to archive** command settings (see [Record to archive](#)(see page 397)). Other than that, there are following settings:

1. Select Alarm mode (**1**, always or only when there are no other active alarms for the camera).

The image shows the 'Alarm initiation' configuration panel (blue header) with a subtitle 'Initiate if no active | Default'. It contains five numbered settings: 1. 'Working mode' dropdown set to 'Initiate if no active'; 2. 'Camera' dropdown set to 'Default'; 3. A checked checkbox for 'Random'; 4. 'Record to:' dropdown; 5. 'Alarm flag position' time field set to '00:00:00' with plus and minus icons.

2. Selecting a camera or group of cameras (**2**). An implicit selection of a video camera is also allowed – **Camera that initiated command execution**.

❑ Attention!

If the start of the macro was triggered by the activation of input or output (see [Configuring filters for event-driven macros](#)(see page 385)) that is not connected to any camera, you need to select a specific camera here. If you select a group of cameras or a camera that triggered the command, the action will not start.

3. If you selected a group of cameras or an Arkiv-domain at the previous step, you can select the **Random (3)** checkbox to initiate an alarm on a random camera from this group/domain.
4. Select an archive to write to **(4)**.
5. In the **Alarm flag position** field, enter the number of seconds by which the alarm flag will be shifted back from the event time that started the macro **(5)**.

❑ Note

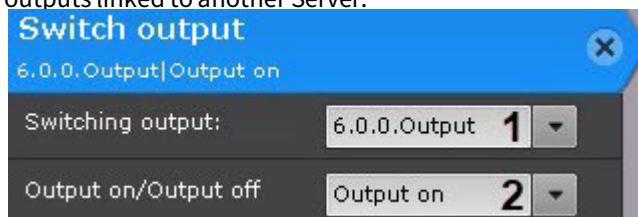
If the alarm flag position is set, the event footage plays from the moment corresponding to the flag's position, and not from the alarm start.

Switch output

This action switches a output to a pre-selected state.

To configure this action, do as follows:

1. Select a output to switch by the macro **(1)**. You can select any active output within your system, including outputs linked to another Server.



2. Outputs switch back after On-time **(2)**, or after Check-in Event-time for any specified events.

Arm /disarm a camera

To configure these actions, select a camera or group of cameras that you want to arm or disarm. An implicit selection of a video camera is also allowed – **Camera that initiated command execution.**



❏ Attention!

If the start of the macro was triggered by the activation of input or output (see [Configuring filters for event-driven macros](#)(see page 385)) that is not connected to any camera, you need to select a specific camera here. If you select a group of cameras or a camera that triggered the command, the action will not start.

Switching to a PTZ camera preset

To configure the action, set up the parameters:

1. **PTZ (1)** – select a PTZ unit. Any pan/tilt positioners/PTZ cameras can be used, including those from other Servers (if they are on).

2. **Preset number (2)** – select the camera preset to go to, when the macro starts.
3. **Speed (3)** – panning speed. This value should be in the range [1; 100].

View camera

It is possible to open the layout with the specified camera.

The **View camera** macro uses the following algorithm:

1. Searches for the layouts available to the current user that contain the selected camera.
2. Selects the layout with the minimum number of cells to display the selected camera.
3. If the required layout does not exist, creates a new layout with the selected camera.
4. Switches to the selected layout or the created layout.
5. Performs the specified action.

To configure the **View camera** macro, do the following:

1. Select the camera to be displayed (**1**) or **Camera that initiated command execution** (see [Configuring filters for event-driven macros](#)(see page 385)). You can select a group of cameras for the **Switch to archive** mode (see step 2).

❏ Attention!

If the macro was triggered by a sensor or a relay (see [Configuring filters for event-driven macros](#)(see page 385)) that are not associated with the camera, the action will not be triggered.

2. Select the display mode (2).

Display mode	Description
Select camera	The camera is highlighted on the layout.
Zoom in camera	The camera is highlighted on the layout, the viewing tile takes up 98% of the screen.
Zoom in and show map	The camera is highlighted on the layout, the viewing tile takes up 50% of the screen, the map under the tile shows the camera.
Switch to immersion mode	Immersive mode (see page 774) is on, the viewing tile takes up 50% of the screen.
Switch to archive mode	The camera is highlighted on the layout and it is in archive mode. If a group of cameras is specified, then a layout is created with all the cameras in archive mode.
Mark camera	The camera is added and highlighted on the Marked cameras layout (see Creating special layouts (see page 478)).
Unmark camera	The camera is deleted from the Marked cameras layout (see Creating special layouts (see page 478)).

3. Specify the number of the monitor on which the camera should be displayed (3).
4. Select the user roles, for which this macro will be available (4).

The configuration of the **View camera** macro is complete.

Open layout

You can open any layout you created (the **Open layout** macro) or restore the previous one (the **Restore layout** macro).

Monitor: Open layout
New layout 2

Layout **1** New layout 2

Specify monitor number **2** 1

Role **3** admin

Monitor: Restore layout
Monitor: Restore layout

To configure the **Open layout** macro, do the following:

1. Select the layout (**1**).
2. Specify the number of the monitor on which you want to open the selected layout (**2**).
3. Select the role of users who can access this macro (**3**).

Starting export

This exports a snapshot or video.

To configure, set up the following parameters:

1. **Export agent (1)** – select Server (aka **Export agent** object) to send recording to (see [Configuring Export agent](#)(see page 549)).

Video export
Default: 1.Camera 1 | AliceBlue | Offset 00:00:00 | During: 00:00:00

Export agent **1** 1.Export agent

Camera **2** Default: 1.Camera 1

Archive **3** AliceBlue

Image export

Time schedule **4** Time Zone 1

During: **4** – 00:00:00 +

Finish after

Default: 1.Camera 1: Alarm processed

+ Add event filter

File name **5**

Comment **6**

Offset **7** – 00:00:00 +


2. **Camera (2)** – select a camera for export. An implicit selection of a video camera is also allowed – **Camera that initiated command execution**.

❏ Attention!

If the start of the macro was triggered by the activation of input or output (see [Configuring filters for event-driven macros](#)(see page 385)) that is not connected to any camera, you need to select a specific camera here. If you select a group of cameras or a camera that triggered the command, the action will not start.

3. **Archive (3)** – select an archive for export.
4. Set the export interval (**4**).

Option	Description
Image export	Exports a snapshot with the time stamp identical to the start time of action. Important! The image cannot be exported if the video camera does not have an archive.
Time schedule	You need to select a time schedule. Exports images from within time schedule. Video recording interval – [Beginning of the specified time slot; the end of the specified time slot].
During:	You should set the export duration in HH: MM: SS. The starting point of the exported video is the command start. End point is defined on the basis of the specified duration – (Interval [command start; command start + duration]).
Finish after	Select one or more events that will trigger export stop. The starting point of the exported video will be the command start, the end point – the moment of receiving any these events.

5. You can click the  button to add additional parameters:
 - a. File name (**5**).

❏ Attention!

You can use the following templates for file names and text comments:

- **%startTime%** , or **[START_TIME]**, or **{startTime}**: the starting time of exported interval.
- **%finishTime%** , or **[FINISH_TIME]**, or **{finishTime}** : the finishing time of exported interval.

You may use the following templates for macros triggered by a text message from an event source (see [Configuring filters for event-driven macros](#)(see page 385)):

- **%startEvent%**, or **[START_EVENT]**, or **{startEvent}**: an event that triggered exporting.
- **%finishEvent%** , or **[FINISH_EVENT]**, or **{finishEvent}**: an event that stopped the export.

- b. Comments superimposed as captions over the exported video (**6**).

- c. **Offset (7)** is a time period used to roll back the start time of exported video. If you set this this parameter to non-zero, the time interval of the exported video will be as follows:
 [action start – (duration + offset); action start – offset].
 If exported video(s) fall into a specific slot on [Time schedule](#), this parameter is used to define the start time for video retrieval. For example, if you set the Offset (GUI: Buffer) to 48 hours, all videos from the given Time schedule slot recorded within 48 hours before the action start will be exported.

Example: A macro command for automatically exporting video recordings of all alarm events evaluated by operators as "confirmed".

The screenshot displays two configuration panels in a dark-themed interface. The top panel, titled 'Start conditions' with a green header, is set to 'Manual start' and shows a dropdown menu for 'Start conditions' with the value 'Default: MotionDetection: Triggering start'. Below it is an 'Add event filter' button. The bottom panel, titled 'Video export' with a blue header, shows a dropdown for 'Export agent' set to '1.Export agent', a dropdown for 'Camera' set to 'Camera that initiated command execution', and an empty 'Archive' dropdown. It features radio buttons for 'Image export', 'Time schedule', 'During:', and 'Finish after'. The 'During:' field is set to '00:00:00'. The 'Finish after' dropdown is set to 'Default: Alarm processed - Confirmed alarm'. Both panels have 'Add event filter' buttons at the bottom.

Start replication

This command starts the replication process.

To configure the command, perform the following:

1. Configure on-demand replication if replication is performed from the archive (see [Configuring data replication](#)(see page 210)). To replicate from the on-board storage (SD card or other storage embedded in the video camera), enable the corresponding object ([The Embedded storage object](#)(see page 161)).

2. Select a video camera or a group of cameras to replicate (1). An implicit selection of a video camera is also allowed – **Camera that initiated command execution**.

Attention!

If the start of the macro was triggered by the activation of input or output (see [Configuring filters for event-driven macros](#)(see page 385)) that is not connected to any camera, you need to select a specific camera here. If you select a group of cameras or a camera that triggered the command, the action will not start.

3. Select an archive file to which video recordings will be replicated (2).
4. Select the replication period (3).

Option	Description
Whole period	All missing video recordings made prior to the command start time will be copied.
Offline periods	The system copies footage recorded to embedded storage (camera's SD card) during offline periods (between consecutive Signal lost and Signal restored events). If no Offset parameter (see paragraph 5) is specified, the replication covers offline footage recorded during the last 24 hours.
Time schedule	Select a time schedule (see Creating schedules (see page 520)). All recordings made according to the time schedule settings for the last 24 hours prior to the command start time will be copied.
During:	Set the replication duration in HH:MM:SS. Video recordings from the period [start action, start action + duration] will be copied. An additional Offset parameter can be specified as needed (see 5).

Option	Description
Finish after	Select one or more end events. All video recordings between the start point (when the action starts) and the end point (when the event is received) will be copied. Important! Replication will not start until the end event is received.

- Specify **Offset(4)**, if you specified the parameter **During:** for replication in previous step. Video recordings from the period [start action – offset, start action + duration – offset] will be copied.

To run replication on schedule (corresponding to **Time schedule 1**), configure the macro as follows:

The screenshot shows the configuration interface for a macro. At the top, there is a green header 'Start conditions' with the subtitle 'Time schedules: Schedule 1. Beginning'. Below this, there is a 'Filters' section with a dropdown menu set to 'Time schedules: Schedule 1. Beginning' and a '+ Add event filter' button. The main configuration area is titled 'Camera: Start replication' and includes the following settings:

- Camera: 1.Camera
- Archive: Archive AntiqueWhite
- Whole period:
- Time schedule: Schedule 1
- During: - 00:00:00 +
- Finish after: Time schedules: Schedule 1. End

At the bottom of the configuration area, there is another '+ Add event filter' button and a '+' icon for adding more filters.

Play audio on Server

You can play back audio through a Server PC's loudspeaker.

Attention!

To make the client-side audio playback possible, you have to create a **Speaker** object allowing **Play on Server** playback mode (see [The Speaker Object](#)(see page 158)).

To configure the action, set up the parameters:

- Select a speaker (**1**).



2. In the **Audio file** field (2), enter the full path to the audio notification file.
3. Configure a condition (IF event, trigger) that will cancel the notification:

Condition	Description
Timer (3)	Only a timer value is set. Alerts are cancelled according to the time setting.
Event filter (5)	One or several events are set, the timer is set to 00:00:00. Alerts are cancelled according to the IF event (trigger).
Timer (3) + Intelligent event filter (IF) (5).	One or several events are set, the timer is set to non-zero. Alerts are cancelled in a given time after the selected IF event (trigger) occurs.
Timer (3) + OR flag (4) + IF (5).	One or several events are set, the timer is set to non-zero, the OR flag is set. In this case, the alert is cancelled on any of the two conditions: after the time interval expires or if an IF event (trigger) occurs.

Note

The **OR** flag can be set only if the timer setting is not 00:00:00.

Note

An implicit selection of an event is allowed – **Last event for condition that initiated execution**. For example, if the event that triggered the execution of the command was the **Start time of detection tool trigger** from any type of detection tools, then the end event will be the **End time of detection tool trigger** from the same tool.

E-mail notification

This sends E-mails to the specified addresses. Exported videos or frames can be attached.

Attention!

Connection to *ArkivNet* is required to receive alerts by E-mail (see [ArkivNet Setup and Operation](#)).

To configure the E-mail notification:

1. **Email message (1)** – select the system object for the E-mail notifications when a macro starts (see [The E-mail notifier object](#)(see page 411)).

2. **To (2):** enter the E-mail address to which you want to send the message.

Note

Multiple E-mail addresses can be specified. Separate them with comma (,) or semicolon (;).


Note

Notifications will also be sent to the addresses you specified when configuring the **E-mail** object (see [The E-mail notifier object](#)(see page 411)).

3. **Subject (3)** – the subject of the E-mail notification that will be sent when a macro starts.
4. **Message (4)** – enter the text that should be sent in the E-mail notification when a macro starts.

Note

You can use templates in the message (see [Text templates in macros](#)(see page 425)).

- If necessary, you can attach exported video or a frame to your message. Click the  button (**5**) to add and configure additional parameters. Configuration of these parameters is identical to configuration of export (see [Starting export](#)(see page 404)).

Note

If the **During** is not specified, the frame is sent. You can set the format of video and frame export in the Export agent settings (see [Configuring Export agent](#)).

- If a macro is launched from a group of cameras (see [Configuring filters for event-driven macros](#)(see page 385)), you can send the frames from all cameras in the group in a single E-mail message. To do this, set the **All in one email** checkbox (**6**). If this checkbox is not set, there will be a separate E-mail for each camera in the group.

The E-mail notifier object

On this page:

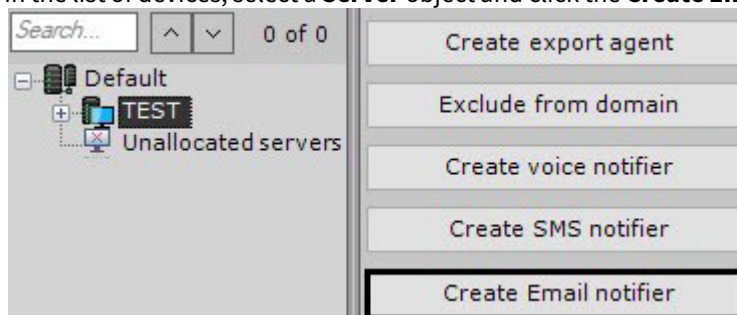
- [Creating the E-mail notifier object](#)(see page 411)
- [Configuring the E-mail notifier object](#)(see page 412)
- [Checking E-mail notification](#)(see page 413)

The **E-mail notifier** object is used to configure the electronic messages, which then can be sent to the user when a macro or an automatic rule is triggered.

Creating the E-mail notifier object

To create the **E-mail notifier** object, do the following:

- In the list of devices, select a **Server** object and click the **Create Email notifier** button.



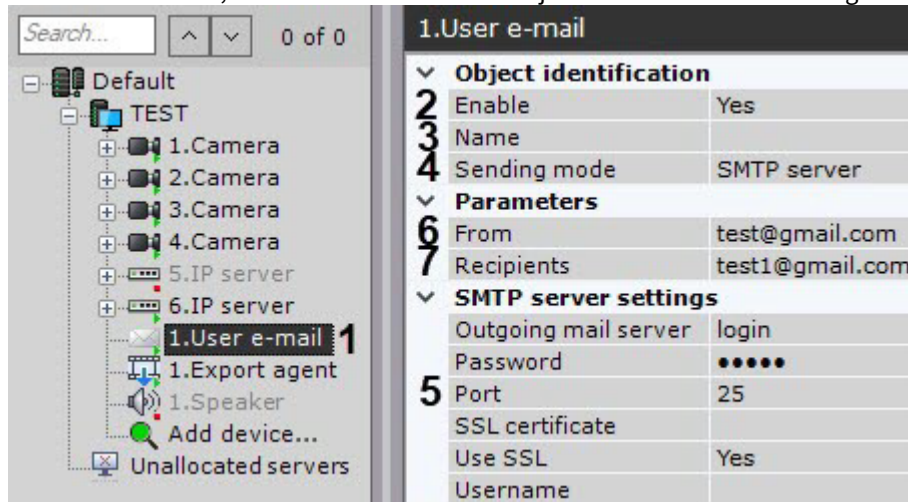
- Click the **Apply** button.

The **E-mail notifier** object will appear in the list of devices.

Configuring the E-mail notifier object

To configure the **E-mail notifier** object, do the following:

1. In the list of devices, select the **Email notifier** object which needs to be configured (1).



1. Activate the **Email notifier** object by selecting **Yes** in the **Enable** list (2).
2. In the **Name** field (3) enter the required name of the **E-mail notifier** object.
3. Select the mode for sending the E-mail notifications: through *ArkivNet* or through the specified SMTP Server (4).

Attention!

To send notifications through *ArkivNet*, you should connect to it (see [Connecting Arkiv-domain to ArkivNet](#)).
ArkivNet has a limit of 10 messages a day.

Note

Message through *ArkivNet* will be sent within a minute.

4. Configure the SMTP Server, if this mode was selected (5):
 - a. In the **Outgoing mail server** field, enter the outgoing E-mail SMTP Server.
 - b. In the **Password** field, enter the password of the user account on the outgoing E-mail Server.
 - c. In the **Port** field, enter the number of the port used by the outgoing E-mail Server.
 - d. In the **SSL certificate** field, specify the path to the SSL certificate file, if you use this protocol. If no certificate is specified, but the **Use SSL** parameter is enabled, then the E-mail Server certificate will be used.
 - e. If you need to use SSL-encrypted connection when connecting to the outgoing E-mail Server, select **Yes** from the **Use SSL** list.
 - f. In the **Name** field, enter the name of the user account used to send messages on the outgoing E-mail Server.
5. In the **From** field, enter the E-mail address from which the messages will be sent (6).

❏ Attention!

When using email notification, E-mail Servers may disable the user account or deny authentication in some cases. We recommend you to disable all security parameters in your email account beforehand.

6. In the **Recipients** field (7), enter one or several E-mail addresses to which messages will be sent.
7. Click the **Apply** button.

Configuration of the **E-mail notifier** object is now complete.

Checking E-mail notification

To check the E-mail notification from the **Email notifier** object, send a test message by clicking the **Test** button.

1. User e-mail	
Object identification	
Enable	Yes
Name	
Sending mode	SMTP server
Parameters	
From	test@gmail.com
Recipients	test1@gmail.com
SMTP server settings	
Outgoing mail server	login
Password	•••••
Port	25
SSL certificate	
Use SSL	Yes
Username	
Object identification	
Test	

When you do this, the following message will be sent to the E-mail address specified in the **Recipients** field (see [Configuring the E-mail notifier object](#)): "Test message".

SMS notification

To configure the action, set up the parameters:

1. **Modem: (1)** – select the **SMS** object for SMS notifications when a macro starts.

2. **Message text: (2)** – enter the SMS text for SMS notifications.

Attention!

The number of characters in a message is limited to:

- 160 ASCII characters;
- 70 Unicode characters.

If the limit is exceeded, a multi-part text message is transmitted.

Note

You can use templates to build a message body (see [Text templates in macros](#)(see page 425)).

3. Enter the phone numbers of anyone who should be notified **(3)**.

Note

Several phone numbers can be specified. Separate them with semicolon (;).

Note

Notifications/alerts will also be sent at the phone numbers you specified when configuring [The SMS notifier object](#)(see page 414).

The SMS notifier object

On this page:

- [Configuring SMS notification](#)(see page 415)
- [Creating the SMS notifier object](#)(see page 415)
- [Configuring the SMS notifier object](#)(see page 416)
- [Checking SMS notifications](#)(see page 416)

The **SMS notifier** object is used to configure SMS messages, which then can be sent to the user when a macro or an automatic rule is triggered.

☐ **Attention!**

To use SMS notification, you need a modem recognizable by the OS as a COM device. No other types of modems can be used for this purpose.

For example, the following modem types are supported:

1. Siemens TC-35.
2. Flyer U12 (Windows 7 and lower).

Operation of other modems is possible, but not guaranteed. We recommend you to check the supported Windows versions for each particular device.

Carrier-locked modems are not recommended.

☐ **Note**

If a USB modem is used to send SMS messages, use the modem utility from the modem software bundle together with *Arkiv*. The utility sends to the modem the unlock code necessary for the correct operation of the device.

Configuring SMS notification

To configure SMS notification, do the following:

1. Shut down the Server (see [Shutting down a Server](#)(see page 82)).
2. Connect the modem and wait for the signal level to be determined in the utility supplied with the modem.
3. Make sure that the number of the SMS center is identified. Do not connect to the Internet.
4. Start the Server and the Client. Create and configure the **SMS notifier** object.

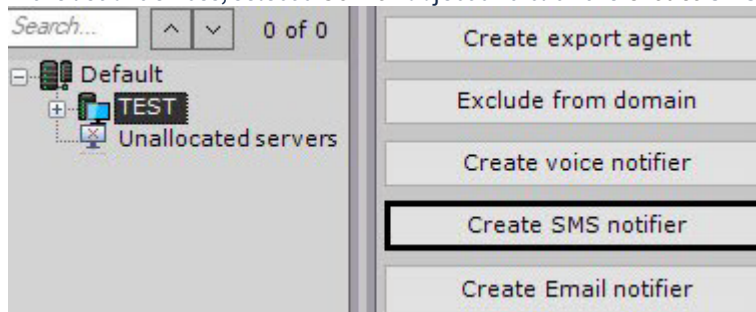
☐ **Note**

If this order of operations is not followed, the modem port will not be occupied by *Arkiv Server*, the SMS notification will not work.

Creating the SMS notifier object

To create the **SMS notifier** object, do the following:

1. In the list of devices, select a **Server** object and click the **Create SMS notifier** button.



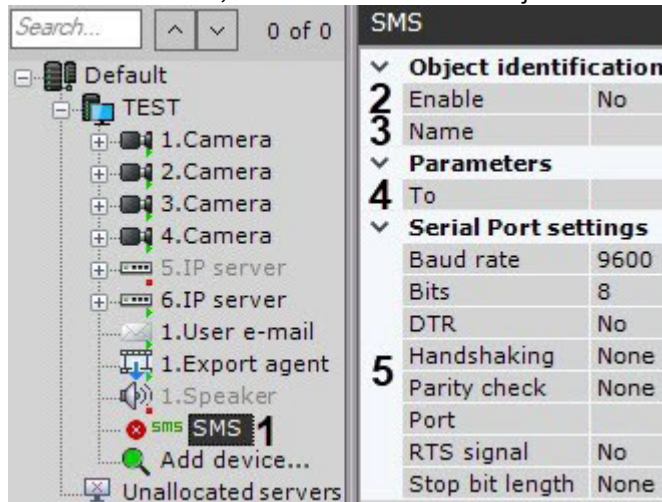
2. Click the **Apply** button.

The **SMS notifier** object will appear in the list of devices.

Configuring the SMS notifier object

To configure the **SMS notifier** object, do the following:

1. In the list of devices, select the **SMS notifier** object which needs to be configured (1).



2. Activate the **SMS notifier** object by selecting **Yes** in the **Enable** list (2).
3. In the **Name** field (3), enter the required name of the **SMS notifier** object.
4. In the **To** field (4), enter the cellular telephone number in international format (+<country code>xxxxxxxxxx), to which messages will be sent.
5. In the **Serial Port settings** group (5), configure the port settings used to connect to the GSM modem through which SMS messages will be sent:
 - a. Select the speed of the data transmission via the GSM modem from the **Baud rate** list.
 - b. In the **Bits** field, enter the number of bits in the byte of a data packet.
 - c. If you need to use a DTR control signal, select **Yes** from the **DTR** list.
 - d. If you need to control the serial port data protocol, select the required method of control from the **Handshaking** list: hardware (RTS/STS), software (XOn/XOff), or alternating.
 - e. If you need to use parity check when transmitting the data, select the required method of parity check from the **Parity check** list.
 - f. From the **Port** list, select the serial port used to connect to the GSM modem.
 - g. If hardware control of the serial port data protocol is enabled (see step 4.d) and you need to use RTS signal, select **Yes** from the **RTS signal** list.
 - h. In the **Stop bits length** field, enter the length of the stop bits if you need to use stop bits when transmitting the data.
6. Click the **Apply** button.

Configuration of the **SMS notifier** object is now complete.

Checking SMS notifications

To check SMS notifications from the **SMS notifier** object, send a test message by clicking the **Test** button. When you do this, the following message will be sent to the mobile phone number specified in the **To** field (see [Configuring the SMS notifier object](#) (see page 416)): "This is a test message to check Arkiv SMS notification."

Note

If the recipient does not receive the message, make sure that the settings of the **SMS notifier** object were properly configured.

Push notification

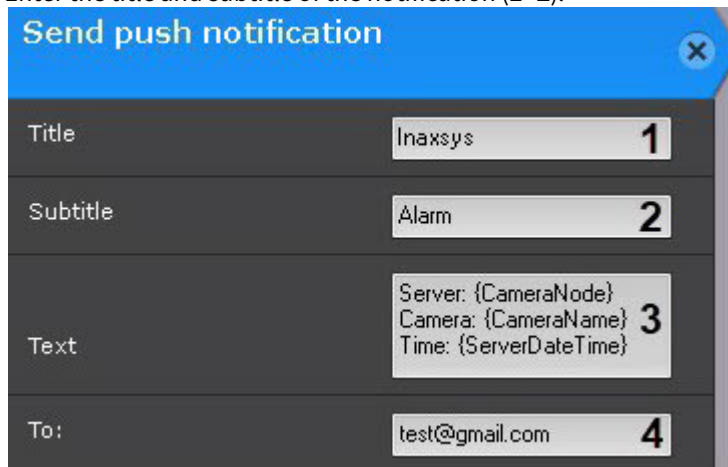
This command sends a push notification to the device with the *ArkivNet* app installed.

To run the command, make sure the following requirements are met:

- the Arkiv Domain must be connected to *ArkivNet* ([Connecting Arkiv-domain to ArkivNet](#));
- the person who is notified must log in with *ArkivNet* cloud credentials in the *ArkivNet* app.

To configure this command, do as follows:

1. Enter the title and subtitle of the notification (1–2).



Field	Value	Label
Title	Inaxsys	1
Subtitle	Alarm	2
Text	Server: {CameraNode} Camera: {CameraName} Time: {ServerDateTime}	3
To:	test@gmail.com	4

2. Enter the main text of the notification (3). Text templates may be used (see [Text templates in macros](#)(see page 425)).
3. Enter the e-mail address of the user who will be notified (4). Only one address is allowed.

Starting an external program on Clients

This starts an external program on your *Arkiv* client.

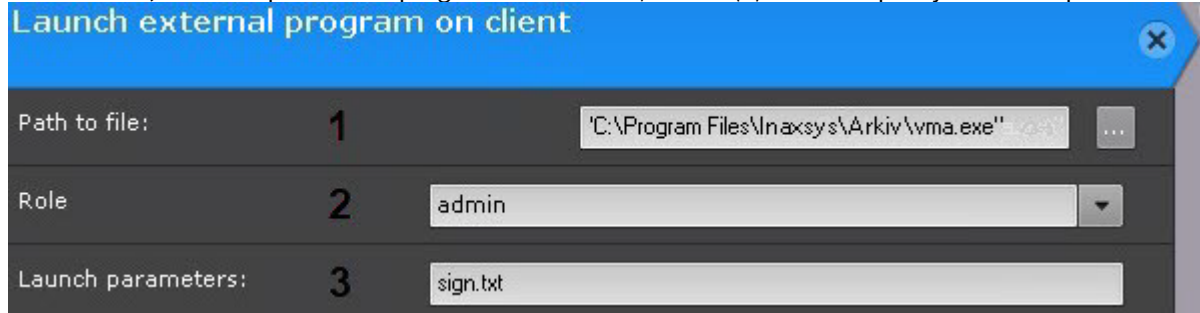
The external program is started on all Clients that are connected to the domain.

Attention!

The external program is not started on a computer that is an *Arkiv* Server, if the Client is not running on the computer when a macro is triggered.

To configure, do the following:

1. On all Clients, enter the path to the program's executable/run file (1). You can specify a network path.



2. Select users of the (external) program (2).
3. You can also add command-line options (3). When you start an external program, its directory matches the one in which the executable file is located. If there is a file in the startup parameters and it is located in the directory with the program's executable file, you do not need to specify the path to it.

Attention!

To run the program, you need administrator permissions. You have to disable UAC (in OS Windows Server 2012 versions, 8, 8.1 and you need to edit [the registry](#)¹⁴⁸), or start *Arkiv* with administrator rights.

Starting an external program on Servers

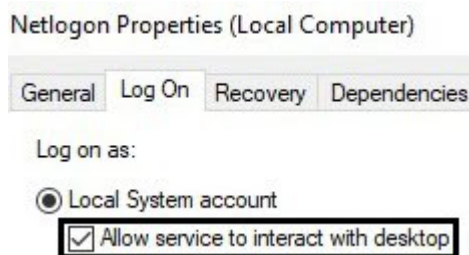
This starts an external program on your Arkiv-domain.

Attention!

Any software containing a GUI is not recommended to be executed on the Server. If you encounter a problem launching interactive services, please refer to the [Windows](#)¹⁴⁹ OS user manual.

To configure, do the following:

1. Allow interaction of the server **NGP Host service** with the desktop: **Start** → **Control Panel** → **Administrative Tools** → **Services** → **Net Logon** → **Properties** → **Log on**.



Note

For **Failover Server and Client** installation type (see [Installation](#)(see page 36)), you have to allow the **NGP RaFT supervisor service** to interact with desktop.

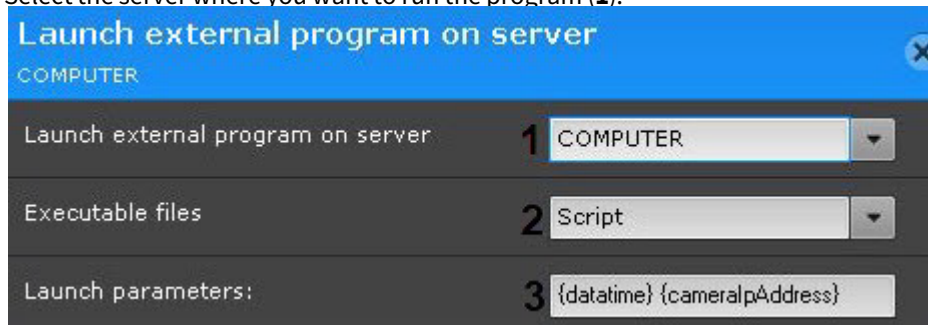
2. Add to folder <Directory where *Arkiv* is installed>\UserScripts\ one or more bat files with the application startup command.

¹⁴⁸ <http://winaero.com/blog/how-to-turn-off-and-disable-uac-in-windows-10/>

¹⁴⁹ <https://docs.microsoft.com/en-us/windows/desktop/Services/interactive-services>

The command should include a path to the executable file. You can specify a network path and command-line options (see [Starting an external program on Clients](#)(see page 417)).

3. Select the server where you want to run the program (1).



4. Select a bat. file with the run command (2).
5. Enter templates, if they were set via a bat file (3).

Attention!

If it is expected that the query result contains spaces and/or some special shell characters (> & | < etc.), then the template should be enclosed in quotation marks (""). For example, "{rectangles}". The entire template string should be enclosed in quotation marks.

Example 1: If you apply the following bat file:

```
SET "datetime=%1"
SET "cameraIpAddress=%2"

msg * Current time is %datetime%, IP-address: %cameraIpAddress%
```

executing the macro will lead to the following message:

Current time is 20220606T115247.741763, IP-address: 172.19.9.50

OK

Example 2: Exporting camera connection status events (offline/online) to a csv.bat file containing the following:

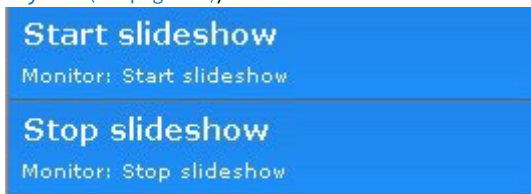
```
SELECT "timestamp"
,REGEXP_REPLACE("object_id", 'hosts/', '') as device,
CASE
    WHEN ("any_values"::json->>'state') = '4' THEN 'Signal Lost'
    WHEN ("any_values"::json->>'state') = '3' THEN 'Signal Restored'
    ELSE ''
END as state
FROM public."t_json_event"
WHERE type = '0' AND ("any_values"::json->>'state'='3' OR "any_values"::json->>'state'='4') AND timestamp
>= '20200211T0000'
ORDER by timestamp DESC
```

Example 3: Exporting detection tools triggering events to a csv.bat file containing the following:

```
SELECT "timestamp",
       REGEXP_REPLACE("object_id", 'hosts/', '') as device,
       CASE
           WHEN ("any_values"::json->>'phase') = '1' THEN 'Closed'
           WHEN ("any_values"::json->>'phase') = '2' THEN 'Opened'
           ELSE ''
       END as state
FROM public."t_json_event"
WHERE type = '1' AND timestamp >= '20200209T110000' AND "object_id" LIKE '%ray%'
ORDER by timestamp DESC
```

Start/stop slideshows of layouts

These actions start and stop the slideshow of the layouts on the operator's monitor (see [Selection and Slideshow of Layouts](#)(see page 755)).



Note

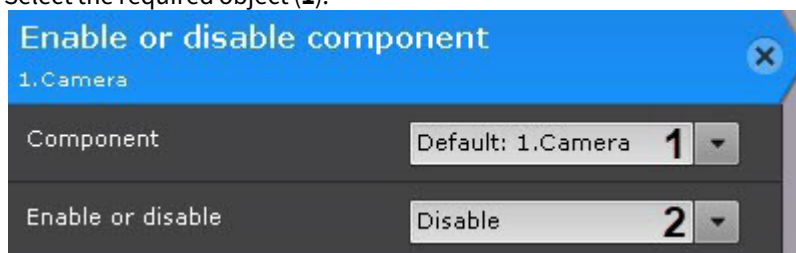
To stop slideshow of layouts, you can select any camera window with the left click. After restarting the Client, slideshow resumes.

Enable/disable a component

This action enables or disables the selected camera, detection tool or input.

To configure this action, do as follows:

1. Select the required object **(1)**.



2. Select the desired command **(2)**.

Checking for archive video recordings

This action checks recorded video from a specific camera or group of cameras for the specified period.

To configure this action, do as follows:

1. Select a camera or a group of cameras to verify their video footage **(1)**.

❏ Attention!

If the start of the macro was triggered by the activation of input or output (see [Configuring filters for event-driven macros](#)(see page 385)) that is not connected to any camera, you need to select a specific camera here. If you select a group of cameras or a camera that triggered the command, the action will not start.

2. Select an archive where you want to check if recorded video is available **(2)**. If you leave the field empty, all recorded video in the camera's archives is checked.
3. Specify how far back in the past to scan **(3)**. The verification time period covers: [the time of the action start - (minus) the depth of the check; start time of the action].
4. Select a reaction if the archive entries are found **(4)**.
5. Select a reaction if the archive entries are not found **(5)**.

Note

If [E-mail](#)(see page 409) or [SMS-notification](#)(see page 413) is selected as a reaction, then the target cameras will be indicated in the message (if a group of cameras was selected) for which there are no entries in the archive for the specified period.

You can also use two special purpose templates in the message:

- {failureRecordCheck} – failed verification of a record in a Archive (format: Server Name|Camera Name|Archive Name);
- {successRecordCheck} – successful verification of a record in a Archive (format: Server Name|Camera Name|Archive Name).

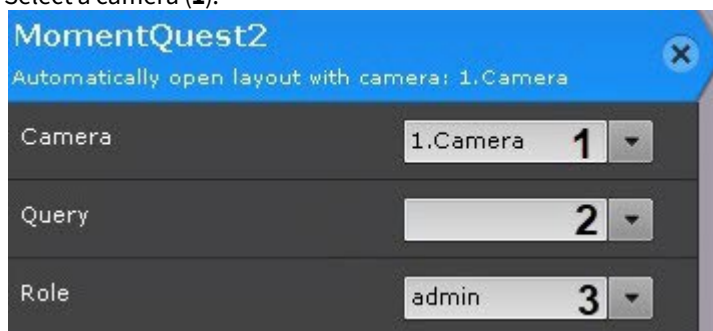
Important! For proper execution of the macro, synchronize the time across all Servers within the Arkiv domain.

Switching to Forensic Search results

This allows you to open saved search results.

To configure this action, do as follows:

1. Select a camera (1).



2. Select a previously saved search query (2).
3. You can target users by selecting a role (3).

Voice notification from Client

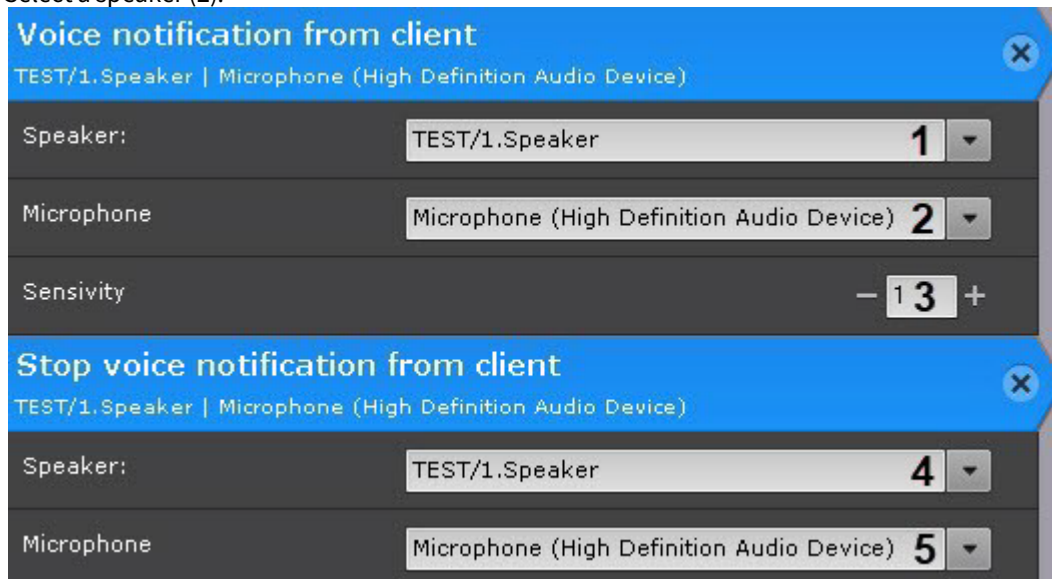
Use this action for routing the voice transmission from a client PC to a designated loudspeaker.

Attention!

If a Client resides behind the NAT, you have to specify the external IP address of the switch for this Client with a port range larger than 1000 (see [Network settings utility](#)(see page 865)).

To configure this action, do as follows:

1. Select a speaker (1).



2. Select a microphone (2).
3. Specify sensitivity from 0 to 100 (3).

To stop sound, use the **Stop voice notification from client** command on Client.

To configure this command, select a speaker (4) and a microphone (5).

Voice notification on Client

You can play back audio via Client PC's loudspeakers.

❏ Attention!

To make the Client-side audio playback possible, you have to create a **Speaker** object allowing **Play on client** playback mode (see [The Speaker Object](#)(see page 158)).

To configure this action, do as follows:

1. Select the speaker for audio alerts (1) playback.



2. Select a role to address alerts to specific users (2).
3. If you need to cancel audio alerts after some time, set the required time interval (3).
4. For event-triggered audio alerts cancellation, do the following:
 - a. Create a new event macro with all required events filtered (see [Create Macros](#)(see page 382), [Configuring filters for event-driven macros](#)(see page 385)).

- b. Add a **Stop voice notification on client** action to a macro.

- c. Select the loudspeaker where you want to cancel audio alerts (**1**).
- d. If you need to cancel alerts after a certain amount of time, set the required time interval (**2**).

Executing a macro

This action launches another macro.

To set up this procedure, select the necessary macro.

This action launches only event-related macros.

Alarm dispatch

This action consists of alarm management and evaluation.

To configure this action, do as follows:

1. Select a video camera or a group of cameras to dispatch an alarm (**1**).

❏ Attention!

If the start of the macro was triggered by the activation of input or output (see [Configuring filters for event-driven macros](#) (see page 385)) that is not connected to any camera, you need to select a specific camera here. If you select a group of cameras or a camera that triggered the command, the action will not start.

2. Select the alarm status (**2**).

Executing a web query

This action sends a GET or POST query to a specified Server.

To configure this action, do as follows:

1. Select the authentication method: Basic or Digest (1).



General: Execute web-query	
Authentication method	Basic 1
Command	POST 2
HTTP/HTTPS	HTTP 3
IP address	10.0.111.1 4
Port	80 5
Username:	user 6
Password:	password 7
Path	/camera/list 8
Query	9

2. Select query type (2). 4 types are available: POST, GET, PUT, DELETE.
3. Select HTTP or HTTPS Server protocol (3).
4. Enter the IP address of the Server (4).
5. Enter the port number of the Server (5).
6. Enter the username (6) and password (7) to be used for automatic authorization.
7. Enter query string (8).
8. For a POST query, enter its body (9).

Note

You can use templates to build a query body (see [Text templates in macros](#)(see page 425)).

Text templates in macros

You can use message templates in commands (see [E-mail notification](#)(see page 409), [SMS notification](#)(see page 414), [Executing a Web-query](#)(see page 424)) that involve sending notifications:

- {cameraNode} – Server name;
- {eventNode} – Server name (used if the macro launching condition is not linked to a particular camera);
- {cameraName} – name and short name of the camera that initiated the macro;
- {cameraLabel} – just the camera's name;
- {cameraIpAdress} – camera's IP address;
- {cameraId} – camera's ID;
- {cameraRef} – the VIDEOSOURCEID identifier;

- {list} – name of the List of Facial Templates or ANPR list;
- {plate} – recognized vehicle number;
- {plateDirection} – the direction of movement of the vehicle in the frame;

Note

Possible values:

- 1** – from top to bottom;
- 2** – from bottom to top.

- {name} – name of the recognized person from Lists of Facial Templates;
- {age} – age of the recognized individual;
- {gender} – gender of the recognized individual;

Attention!

The {age} and {gender} templates can be applied when the following conditions are met:

- The **Gender and Age** parameter is activated in facial detection tool settings (see [Configuring Face detection](#)(see page 267)).
- The **Face Appeared: Specified Triggering** event is selected as a launch condition for this macro (s).

- {appearedTime} – UTC time of object detection;
- {dateTime} – date and UTC time of triggering the macro in ISO format;
- {serverDateTime} – local Server time of triggering the macro in ISO format;
- {rectangles} – coordinates and size of the object that triggered the detection tool;
- statistics templates:
 - {cpuUsage} – percentage of CPU load on a Server;
 - {netUsage} – percentage of used network bandwidth on a Server;
 - {memoryUsage} – percentage of used RAM on a Server;
 - {diskUsage} – percentage of disk usage;
 - {archiveUsage} – percentage of Video Footage usage.

Attention!

You can apply statistics templates only if you launch a macro by a corresponding statistical condition (see [Triggering macros by statistical data](#)(see page 390)).

Note

Templates allow {} and %%. For example, %cameraId%.

Note

Date/time templates (such as dateTime, serverDateTime, appearedTime and serverAppearedTime) offer an extended input option which allows you to set date and time in arbitrary format. A format description parameter must be contained within a pair of @ symbols.

Here's an example: {dateTime@%Y-%m-%d %H:%M:%S@}. In this case, the actual format is presented as 2020-10-04 18:43:23.

Available parameters:

Parameter	Description
%a	Abbreviation for the day of the week
%A	Full name of the day of the week
%b	Abbreviation for the month
%B	Full name of the month
%y	Last two digits of the year
%Y	Full number of the year
%m	Month of the year
%d	Day of the month
%H	Hour in 24h format
%M	Minute as a decimal number
%S	Second as a decimal number
%F	Fractions of second

Combined parameters:

Parameter	Description
%D	Equivalent to %m/%d/%y
%T	Equivalent to %H:%M:%S

E.g. this macro sends an email of the following format when a water level detection tool triggers:

The screenshot shows a configuration window for a macro. It has two main sections: 'Start conditions' (green header) and 'Send E-mail' (blue header). In the 'Start conditions' section, there is a dropdown menu with the text 'Ult: 2.Camera: Water level overrun detected: Triggering start' and a minus sign. Below it is a plus sign and the text 'Add event filter'. The 'Send E-mail' section has a close button (X) in the top right. It contains four input fields: 'Email message:' with a dropdown showing 'TEST/1.User e-mail'; 'To:' with the text 'test@dmil.com'; 'Subject:' with the text 'Notification: Attention, automatic rule is triggered.'; and 'Message:' with a text area containing 'Server: {CameraNode}', 'Camera: {CameraIPAddress}{CameraName}', and 'Time: {DateTime}'. There is a plus sign at the bottom of the 'Send E-mail' section.

```
Subject: Notification: Attention, water level detection is triggered.

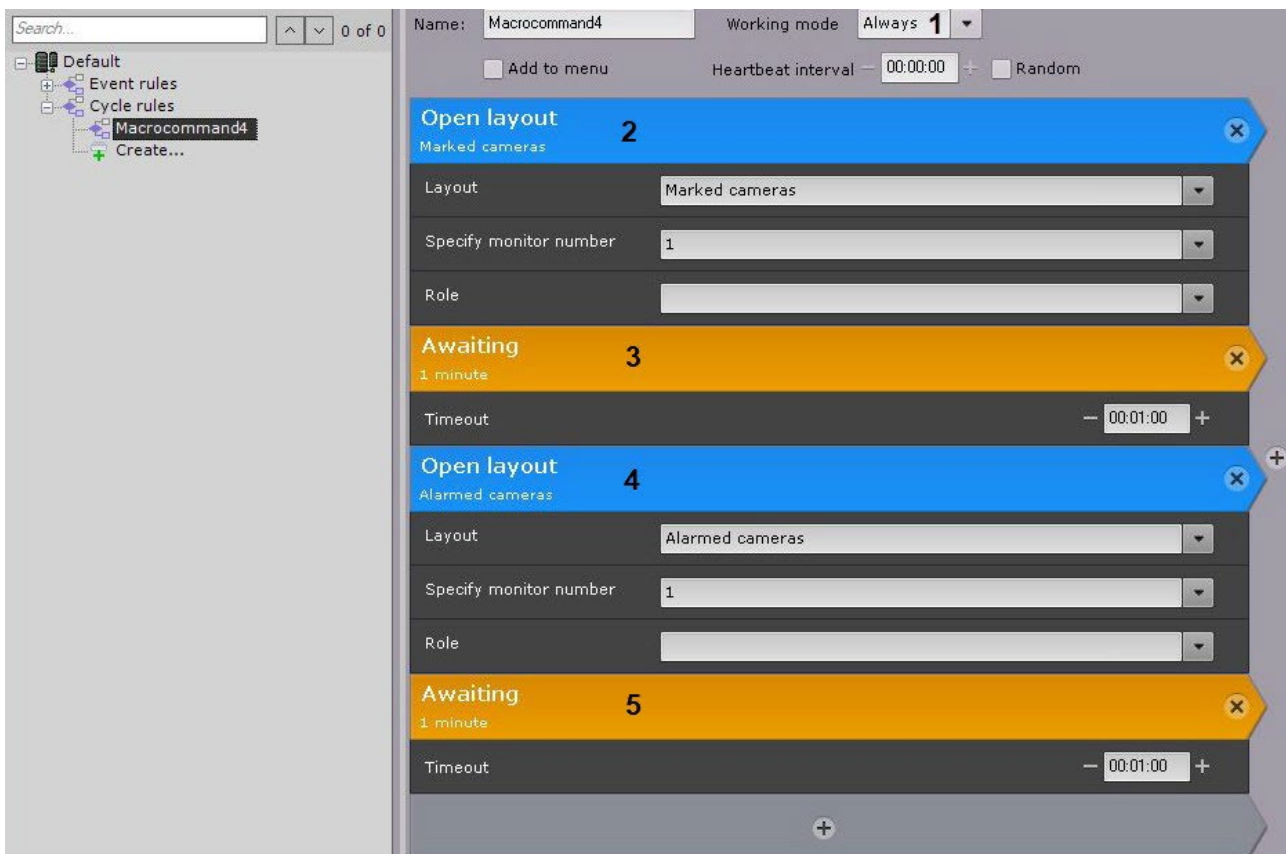
Server: Server1
Camera: 10.0.11.36 34.Camera
Time: 20190812T085517.926430
```

7.5.5 Cyclical macros

❏ Attention!

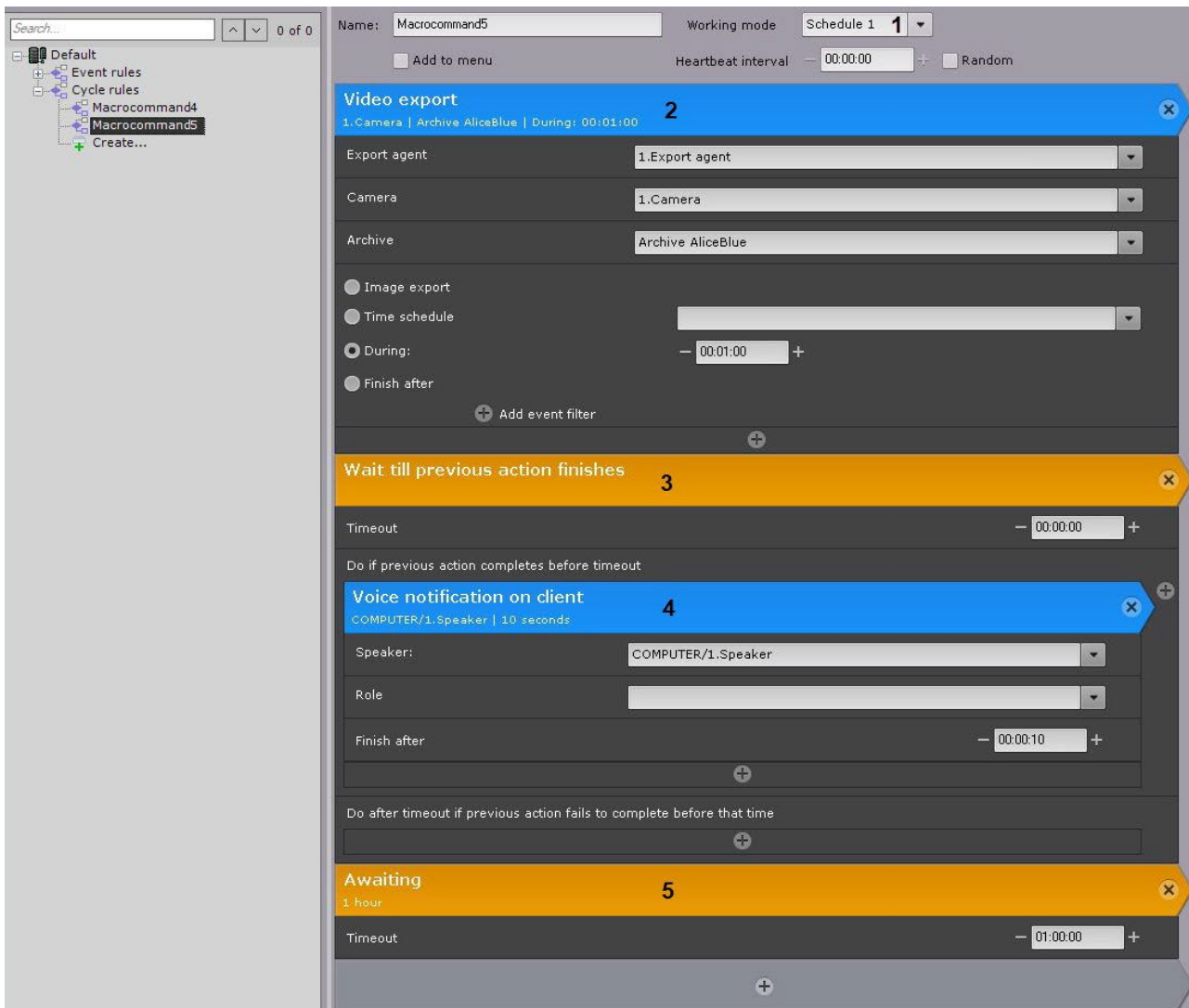
If you do not have the **Wait** command in a cyclic macro, the time-out between cycles is 1 second.

Example 1. This macro runs continuously (1), starting from the moment that you saved it.



The cycle consists of alternating layouts with marked cameras (2) and layouts with alarmed cameras (4). interval – 1 minute (3, 5).

Example 2. This macro runs continuously within the time schedule 1 (1).



Every hour (5) video from camera 1 is exported (2). After the export is completed (3), an audio alert is sounded (4).

- [Wait for timeout](#)(see page 394)
- [Wait till previous action finishes](#)(see page 395)

7.6 Configuring user permissions

In *Arkiv*, every user has permissions based on his role.

By default, there is one role (**admin**) and one user (**root**). The **root** user belongs to the **admin** role and has rights to configure all components of the video surveillance system. To add a user with individual permissions, create a new role with the necessary permissions and then create a new user account.

- Note**
Only **admin** users can create other admin role users.

Roles and users can be added and configured in **Settings**, on the **Users** tab.

There are two types of users: local (stored in the Server database) and LDAP¹⁵⁰ (see [Connecting LDAP users](#)(see page 85)).

To enable LDAP users, you must configure access to LDAP catalogs.

The actions of all system users are recorded in the system log (see [The System Log](#)(see page 787)).

□ Note

The following user actions are logged:

- Client started/quit.
- Settings for hardware, archive, or detection tool are deleted/added or changed.
- Macros are created, deleted, or changed.
- User permissions are added, deleted, or changed.
- Camera alarm is initiated.
- Camera is armed/disarmed.
- Create/edit comments.
- Snapshot or video is exported.
- PTZ.

In all user-specific events, the user IP address is indicated.

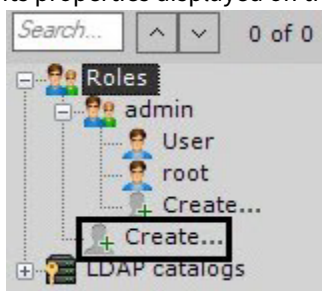
Date & time	Event type	Description
19.04.2022 23:59:57	Info	Camera "8.Camera". End of detection Motion detection triggering Extended info: "Motion detection"
19.04.2022 23:59:56	Debug info	Macro "8.Camera. Motion detection" activated

7.6.1 Creating and configuring roles

A role is intended for assigning a group of users individual rights and permissions for administration, management and/or monitoring of individual components of *Arkiv*.

To create a new role, do the following:

1. At the end of the list of the system roles, click the **Create** link. The new role will be added to the system, with its properties displayed on the right side.



¹⁵⁰ https://en.wikipedia.org/wiki/Lightweight_Directory_Access_Protocol


2. Configure the access permissions.

The screenshot displays the configuration interface for a role named 'TEST'. The interface is divided into two main panes. The left pane, titled 'Role', contains a tree view of settings categories: Basic, Map control, Other, Access to Functions, Access to Settings, Access to Tabs, Supervisor confirmation, Time schedule management, and Video walls management. The right pane shows a list of permissions for the 'TEST' role, organized into sections: 'TEST' (with sub-items for cameras and archives), 'Archive DeepPink', and 'Default' (with sub-items for automatic and event rules). Red boxes and numbers (1-11) highlight specific settings: 1 (Name), 2 (Map management), 3 (Archive depth viewing restriction), 4 (Access to Functions), 5 (Access to Settings), 6 (Layouts tab), 7 (Supervisor for access to export), 8 (Time schedule), 9 (TEST role), 10 (Camera permissions), and 11 (Automatic rules).

Parameters	Access permission	Description
Basic		
Name	–	Enter a name for the role (1)
Map control		Select the access level to the maps for users with the current role (2)
Map management	View only	You can only view maps
	View/ move/ scale	You can views, move, and scale maps

Parameters	Access permission	Description
	Full access	All options available
Other		
Archive depth viewing restriction	–	If you need to limit the access of users of a given role to all system archives, you can specify the archive depth limit in hours (3). If no limit is set, users may view all video recordings
Access to Functions		Set access permissions to <i>Arkiv</i> functions (4)
Access to Search in archive mode	Yes	Archive search (see Video surveillance in Archive Search mode (see page 695))
	No	
Adding camera to layout in monitoring mode	Yes	Adding a camera to a layout in live video mode (see Adding cameras to cells (see page 456))
	No	
Adding/editing presets	Yes	Adding and editing presets for PTZ cameras (see Selecting a preset (see page 648))
	No	
Alarms processing	–	Alarms management (see Video surveillance in Alarm Management mode (see page 689))
	No access	Users have no access to alarm videos
	View only	Users can view alarm videos, but they can't evaluate alarms
	Full access	Users can view alarm videos and evaluate alarms
Allow comments in archive	–	Creating comments in the archive (see Operator comments (see page 636)) and protected records (see Protecting video footage from FIFO overwriting (see page 212))
	No access	No comments allowed
	Create	Add comments to the archive

Parameter s	Access permission	Description
	Create/Protect	Add comments to the archive, create protected records
	Create/Protect/Edit/Delete	Add comments to the archive, create and edit protected records
Allow to delete records	Yes	Removing video recordings from the archive (see Delete a part of an archive (see page 677))
	No	
Allow unprotected export	Yes	Exporting frames and video recordings without password protection (see Frame export (see page 776), Standard video recordings export (see page 778)). Set No to require setting a password when exporting (see Exporting Frames and Video Recordings (see page 776))
	No	
Export	Yes	Exporting frames and video recordings (see Exporting Frames and Video Recordings (see page 776))
	No	
Layout editing	Yes	Editing layouts (see Editing layouts (see page 451))
	No	
Minimize to taskbar	Yes	Minimizing the Client to the tray (see Interface of the Arkiv Software Package (see page 27))
	No	
Operating domain	Yes	Managing Arkiv domain (see Arkiv Domain operations (see page 92))
	No	
Permissions to access via WebUI	Yes	Access to the Web server (see Working with Arkiv Through the Web- Client (see page 792))
	No	
Realtime recognition setup	Yes	Faces and license plates recognition in real-time (see Configuring real-time face recognition (see page 290), Configuring real-time vehicle license plate recognition (see page 322))
	No	
Show captions	Yes	Displaying captions (see Viewing titles from POS terminals (see page 639))
	No	

Parameter s	Access permission	Description
Show faces	Yes	Showing faces (see Masking faces (see page 502))
	No	
System log	Yes	Viewing the system log (see The System Log (see page 787))
	No	
Unlock camera menu button	Yes	Context menu of a video camera (see Viewing Tile Context Menu (see page 596))
	No	
View masked video	Yes	Viewing masked video (see Setting up privacy masking in Video Footage (see page 503), Specific settings for People masking detection tool (see page 358))
	No	
Access to Settings		
Archive settings	Yes	<p>Configure the access permissions to the Settings tabs and to the system error messages (5).</p> <div style="border: 1px solid #ffc107; padding: 10px; margin: 10px 0;"> <p><input type="checkbox"/> Attention!</p> <p>If you set the User Permission settings parameter to Device access rights only, all users of the given role will have the rights to change only the access rights to the connected devices.</p> </div> <div style="border: 1px solid #17a2b8; padding: 10px; margin: 10px 0;"> <p><input type="checkbox"/> Note</p> <p>Error messages are displayed in real-time in the Layouts interface.</p>  </div>
	No	
Detection settings	Yes	
	No	
Device settings	Yes	
	No	
Options settings	Yes	
	No	
Programming settings	Yes	
	No	
Show error messages	Yes	
	No	
User Permission settings	Yes	
	No	

Parameter s	Access permission	Description
Access to Tabs		
Layouts tab	Yes	Set access permissions to the Layouts interface in <i>Arkiv</i> (6). This parameter applies to both the Client and the Web Client (see Web-Client's GUI (see page 795))
	No	
Supervisor confirmation		Set the parameters to apply the four-eye principle (7)
Supervisor for access to export	–	If the administrator has to confirm the launch of export for users of this role (see Exporting Frames and Video Recordings (see page 776)), select the corresponding role in the list
Supervisor for authorization in client	–	If the administrator has to confirm the login of users of this role (see Starting an Arkiv Client (see page 76)), select the corresponding role in the list
Time schedule management		
Time schedule	–	If you need to grant the users in this role permissions only for a certain period of time, select a time schedule (8) from the list. These users will not be able to use their permissions outside of the selected time schedule
Video walls management		
Server	Yes	Configure the rights to manage the connected Clients' monitors by setting permissions for each Server on Arkiv domain (9). A user who has management permissions for the monitors of a particular Server can manage monitors of any Client connected to that Server
	No	

3. Set the access permissions to hardware and archives of an Arkiv domain (10).

Device	Access permission	Description
Video camera	No access	You cannot access the device
	Archive only	You can only view video footage in archive
	Live in Armed mode	You can view video from the camera only when the camera is armed

Device	Access permission	Description
	Live	You can live video from the camera. Other functions and device configuration are not available
	Live/Archive	You can view live and recorded video from the camera. You cannot arm/disarm/configure the camera
	Live/Archive/Control	All functions available. You cannot configure the device
	Live/Archive/Control/Configure	All functions and settings available
Microphone	No access	You cannot listen to live sound from the video camera. You cannot listen to sound recordings from the archive
	Live Audio	You can listen to live sound from the video camera (the microphone should be turned on). You cannot listen to sound recordings from the archive
	Live Audio and Archive	All functions are available
PTZ	No access	You cannot control the PTZ device
	Minimum level	You control the PTZ device with the corresponding priority (see Controlling a PTZ Camera (see page 644))
	Low level	
	Medium level	
	High level	
	Maximum level	
Archive	No access	Access is not provided to this archive
	Full access	Archive is available for all function

You can configure group permissions to access devices and archives of a particular Server. To do so, select an access level for the **Server** object. Depending on the selected level, particular access levels are automatically configured for the devices and archives of the relevant Server:

Server access level	Device/archive	Device/archive access level
Custom	-	Access levels for devices and archives are set manually
No access	-	No access to devices and archives
Archive Only	Video camera	Archive only
	Microphone	Live Audio and Archive
	PTZ	Medium level
	Archive	Full access
Live in Armed Mode	Video camera	You can view armed cameras
	Microphone	Live Audio.
	PTZ	Medium level.
	Archive	No access
Live	Video camera	You can view live video
	Microphone	Live Audio
	PTZ	Medium level
	Archive	No access
Live/Archive	Video camera	You can view live and recorded video
	Microphone	Live Audio and Archive
	PTZ	Medium level
	Archive	Full access

Live/Archive/Control	Video camera	All functions. Configuration not available
	Microphone	Live Audio and Archive
	PTZ	Medium level
	Archive	Full access
Live/Archive/Control/Configure	Video camera	All functions + configuration available
	Microphone	Live Audio and Archive
	PTZ	Maximum level
	Archive	Full access

4. Select the appropriate access level to set the possibility to manually run all or some macros (see [Configuring Macros](#)(see page 381)) from the **Layouts** interface (11).

☐ Attention!

By default, created macros are available only to users from the **admin** group. Users outside the **admin** group can create macros, if they have the permissions to create them. They cannot use them until they have the permissions to use them.

Macros access level	Macro type	Access permission	Description
No access	Automatic rules	No	No access to macros
	Event rules		
	Cycle rules		
Custom	Automatic rules	Yes	Access permission for macros is set manually
		No	
	Event rules	Yes	
		No	
	Cycle rules	Yes	
		No	
Full access	Automatic rules	Yes	Full access to macros

Macros access level	Macro type	Access permission	Description
	Event rules		
	Cycle rules		

- Click the **Apply** button to save the role.

The new role has been created.

You can copy a role. To do it, do the following:

- Select the role to copy.
- Click the **Create** button.

A new role will be created with the same parameters as the selected role.

Note

To create an empty user role with no parameters specified, select the **Roles** common group, and click the **Create** button.

To delete a role, do the following:

- Select the role to delete.
- Click the **Delete** button.

Note

You cannot delete a role if the user who is logged in belongs to that role.

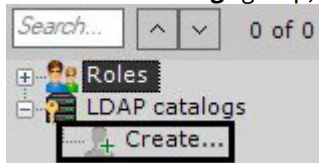
- Click the **Apply** button to save the changes.

The role has been deleted. All users who belong to this role will also be deleted.

7.6.2 Connecting to an LDAP catalog

To connect to an LDAP catalog:

- In the **LDAP catalogs** group, click **Create...**



An **LDAP** object is added in the system. On the right, a panel displays configuration settings for the **LDAP** catalog.

2. Enter a name for the catalog in the appropriate field (1).

LDAP settings

Name:	LDAP 1	1
Server name or IP address:	ldap.postland.org	2
Port:	636	3
Base DN:	ou=Address,dc=inaxsys,dc=us	4
User:	uid=your.login,ou=Users,dc=inaxsys,dc=us	5
Password:	*****	
	<input checked="" type="checkbox"/> Use secure connection (SSL)	6
Search filter:	(objectClass=person)	7
LDAP templates:	OpenLDAP	10
	Microsoft Active Directory	
Username attribute:	cn	8
DN attribute:	entrydn	9
Role for automatic registration of user:		11
Test connection		

3. Enter the address of the LDAP catalog server (2) and port (3).
4. In the **Base DN** field, enter the Distinguished Name of the branch from which to start search (4).

□ Attention!

If LDAP users are located in multiple directories with a tree-like structure, you cannot establish instant synchronization across all users.

To synchronize each user group within a DN branch, you have to specify the path to the corresponding directory.

For example, LDAP contains a directory **Employees** including subdirectories **Managers**, **Cashiers** and **Salesmen**.

DN branches for synchronizing users within **Managers** directory:

ou=Managers,ou=Employees,dc=example,dc=com.

DN branches for synchronizing users within **Cashiers** directory:

ou=Cashiers,ou=Employees,dc=example,dc=com.

DN branches for synchronizing users within **Salesmen** directory:

ou=Salesmen,ou=Employees,dc=example,dc=com.

5. Enter the name of a user who has write access to the base DN, in LDAP format (RDN + DN) with password (5).
6. If encryption (SSL) is required for connecting to the LDAP server, select the corresponding check box (6).
7. In the **Search filter** field, enter a string for filtering catalog entries (7).

❑ Attention!

To upload users by groups, not by directories, you should use the Member Of filter attribute. For example:

```
(& (objectClass=user)
(memberof=CN=YourGroup, OU=Users, DC=YourDomain, DC=com) .
```

8. In the **Username attribute** field, enter the field from which the user's login is obtained (**8**).

❑ Note

To search users by attribute **sAMAccountName**, enter their names in small letters – **samaccountname**.

9. In the **DN attribute** field, enter the field from which the user's DN is obtained (**9**).

❑ Note

To set a login and DN attribute, you can use Microsoft Active Directory and OpenLDAP LDAP templates. To use a template, click the relevant link (**10**).

10. Specify a default user role for users created via LDAP (**11**). If no role is specified, no automatic user creation will be possible for this catalog.
11. Click the **Apply** button.

The LDAP catalog is now added to the system.

To test the connection, click the **Test connection** button. If connection is successful, the form on the lower part of the screen displays information about the catalog users. Otherwise, an error message appears.

cn	entrydn
name1 surname1	cn=name1 surname1,ou=load,ou=Groups,dc=example,dc=com
name2 surname2	cn=name2 surname2,ou=load,ou=Groups,dc=example,dc=com
name3 surname3	cn=name3 surname3,ou=load,ou=Groups,dc=example,dc=com

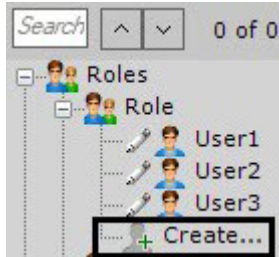
7.6.3 Working with users

In *Arkiv*, multiple users can be assigned to the same role. A user will be granted the permissions for administration, management and/or monitoring that are indicated in the settings of the user's role. When adding a new user, the name and password necessary for that user to log in to the system are specified.

Creating local users

To add a new local user:

1. At the end of the list for a particular role click the **Create** link.



The new user is then added to the system, and the permissions configuration panel for that user opens on the right.

User	
▼ Basic	
1 Name	User
▼ Additional	
Comment	
▼ Basic	
Company ID	
Date of creation	4/21/2022 11:34 AM
IP address	
Lock user account	No
2 Role	Role
Social ID	
User e-mail	
▼ LDAP	
Catalog	
▼ Security	
4 Change password on next access	No
3 Password	•••••
▼ Simultaneous connections limitation	
5 Maximum number of mobile app connections	
Maximum number of web app connections	

2. Enter a user name (**1**).
3. Select the role you want to attribute to the user (**2**).
4. Enter the password in the **Security** configuration group (**3**).

- a. Click . The **Change password** window opens.

Change password

Password:

Confirmation:

- b. Enter the user's assigned password in the **Password** field.
 - c. Retype the assigned password in the **Confirmation** field.
 - d. Click **OK** to save the settings.
5. To force a user to change the password upon the next connection to the Client, set the corresponding parameter (**4**) to **Yes**.

- If you want to limit the number of connections for a user through Web or mobile Clients, do as follows: specify a maximum number of connections (**5**). The **Maximum number of web app connections** parameter also sets a limit on maximum number of RTSP queries from a particular user.

Attention!

The limit on the number of connections will take effect after the server is restarted (see [Launching and Closing the Arkiv Software Package](#)(see page 76)).

- If necessary, enter additional information about the user (e-mail, IP address, personal and company ID, etc.) in appropriate fields.
- Click the **Apply** button to save the settings.

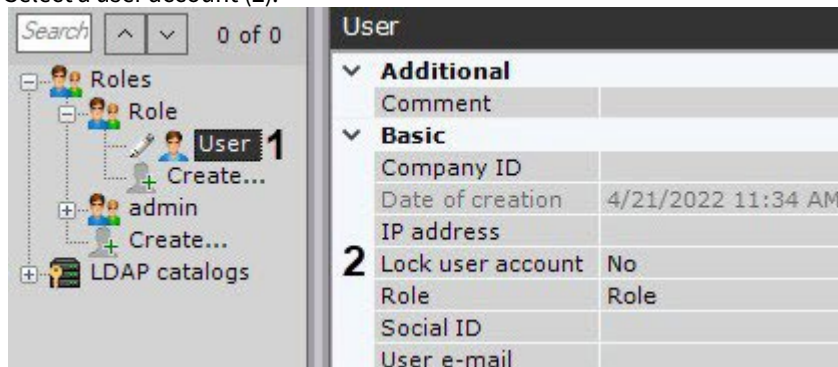
The user has now been added and assigned a role.

Locking a user account

You can lock user accounts to prevent unwanted logins.

To do this:

- Select a user account (**1**).



- In the **Lock user account** field, select **Yes** (**2**).
- Click **Apply**.

To unlock an account, select **No** in the **Lock user account** field.

Creating LDAP connections

When adding an LDAP user, the user's login is selected from the specified LDAP catalog. No password is required.

To add an LDAP user:

- Add the user to the system (see [Creating local users](#)(see page 442)).

2. Select the LDAP catalog that contains the user (1, see [Connecting to an LDAP catalog](#)(see page 440)).

User	
Company ID	
Date of creation	20.04.2022 16:06
IP address	
Lock user account	No
Role	Role
Social ID	
User e-mail	
▼ LDAP <ol style="list-style-type: none"> 1 Catalog ↗ LDAP 1 2 Username ↗ Patrick Woolcocks ▼ 	

3. In the **Username** field, click the button (2).

A window with all users of the LDAP catalog opens.

Setting LDAP username

1 Patrick Woolcocks

2

cn	entrydn
Patrick Woolcocks	cn=Patrick Woolcocks,ou=str,ou=Address...

3

4. Find a user via search (1) or manually select a user from the list (2). Click **OK** (3).
5. Specify the other user settings (see [Creating local users](#)(see page 442)).
6. Click the **Apply** button to save the settings.

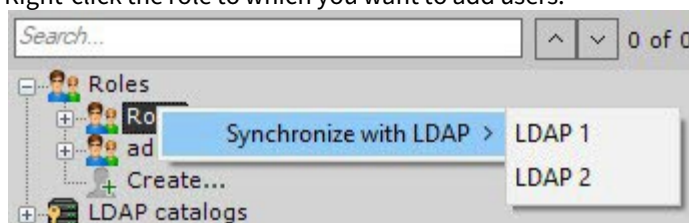
The user has now been added and assigned a role.

When an LDAP user connects, the user's login from Server settings is used with the password from the LDAP catalog.

Synchronize LDAP users

To add users from an LDAP directory to a specific role, do as follows:

1. Right-click the role to which you want to add users.



2. Choose **Synchronize with LDAP** and then the required LDAP directory (see [Connecting to an LDAP catalog](#)(see page 440)).

All users in the selected directory will be added to this role. By default, the user name will match the login in the LDAP directory.

Deleting users

To delete a user from the tree:

1. Select the user to delete.
2. Click **Delete**.

Note

You cannot delete the user through which you logged into the system.

3. Click the **Apply** button to save the settings.

The user has now been deleted from the tree.

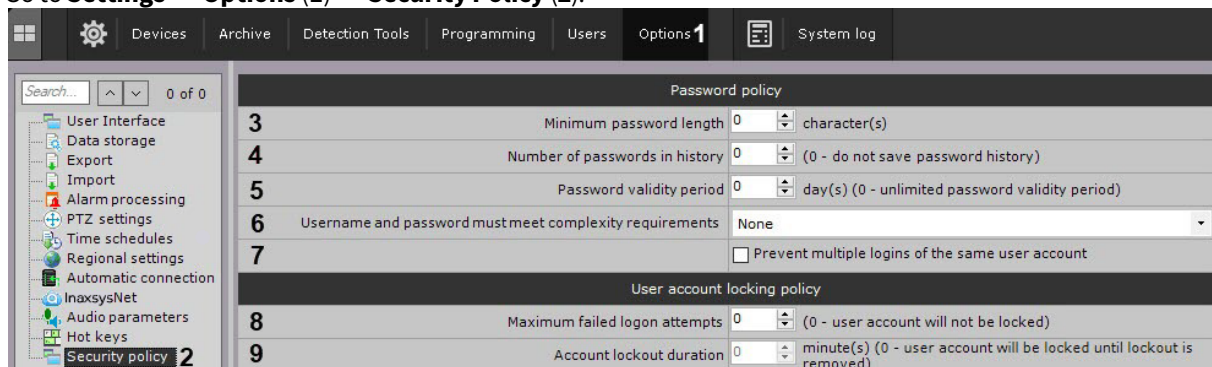
Attention!

If you delete a user account on the LDAP server, it will be automatically deleted from *Arkiv VMS*.

7.6.4 Configuring the user security policy

To configure the user security policy, do as follows:

1. Go to **Settings** → **Options (1)** → **Security Policy (2)**.



2. Set the minimum password length (3).
3. Set the number of the most recent passwords for each user to be stored in history (4). 0 – do not store password history. If this value is non-zero, the passwords stored in history may not be reused.
4. Set the password expiration time interval in days (5). After the time interval expires, the user will be prompted to set a new password. 0 – the password never expires.
5. Select the positions to meet complexity requirements: nothing, password only, user name and password (6). The requirements:
 - a. user name:
 - i. should contain no less than 6 characters and at least 2 digits;
 - ii. should not include common role names, such as: admin, administrator, admin1, root, super, superuser, supervisor.
 - b. The password has to contain at least 8 characters, which should meet at least 3 requirements listed below:
 - i. at least 1 capital letter;

- ii. at least 2 lowercase letters;
 - iii. at least 3 digits;
 - iv. at least 4 special characters: !\"#\$%&'()*+,-./:;<=>@[\\]^_`{|}~
6. If you need to limit the number of sessions per user to one, set the corresponding checkbox (7). This requirement also applies to web and mobile Clients.
 7. Set the number of failed login attempts to lock a user's account (8). 0 – no account locking on incorrect passwords. If this value is non-zero, when a new user is created, they will be given the name user with a random number from 10000 to 99999. The name can be changed in the user settings.

Attention!

When unblocked, the user is offered only one authentication attempt. A successful authentication will reset the failed attempts counter to zero, otherwise the user account will be blocked again.

8. Set the duration of user account locking on failed login attempts in minutes (9). 0 – the account can be unlocked by the administrator only (see [Locking a user account](#)(see page 444)).
9. Click the **Apply** button.

Attention!

If any user accounts created in your system before you applied changes in security policy are incompatible with the new requirements, the users will be prompted to change their credentials upon their next login.

Change credentials x

Please change your credentials to comply with the account security policy.

Username:

Password:

Confirmation:

Apply

Cancel

7.7 Configuring Layouts

Arkiv allows users to configure custom layouts.


Separate layouts are configured for each user of the system. To configure layouts, log into any Server of Arkiv-domain under the appropriate user name and configure the layouts for that user. Layouts created for the user will be available when you connect from any Client to any Server in the Arkiv-domain. The layout is selected for display and editing only for a specific user – other users of the system will not see any changes on their screen.

Note

Creation, editing, copying, and deletion of layouts are available to users that belong to roles with the **Changing custom layouts** component activated (see [Configuring user permissions](#)(see page 430)).

After you configure user's layouts, you may limit user's privileges.

7.7.1 Creating and deleting layouts

Layouts are created based on standard layout types. To create a new layout, click the  button in the context menu and select one of the standard layouts.



This takes you to layout editing mode (see [Switching to Layout Editing mode](#)(see page 451)).

Note

A new layout is also created when you select a video camera that is not displayed in any previously created layout (see [Objects Panel](#)(see page 615), [Camera Search Panel](#)(see page 612)).
If you do this, layout editing mode does not start and the layout will not be saved.

The newly created layout will be named automatically. You can rename it later.

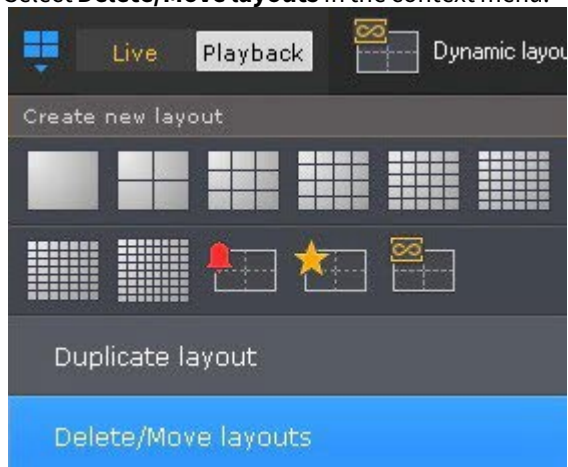
To save the layout, exit layout editing mode and save changes (see [Exiting Layout Editing mode](#)(see page 476)).

The layout will then be placed at the beginning of the list in the layout panel.

If you do not save changes and exit, the layout will not be saved.

To delete layouts:

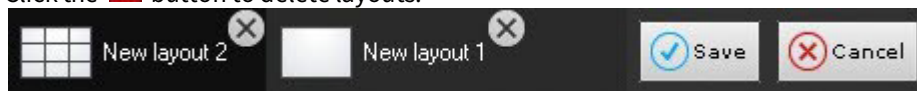
1. Select **Delete/Move layouts** in the context menu.



Note

You can not access it in the Layout Editing mode though.

2. Click the  button to delete layouts.



3. Click **Save**.

You will exit Manage Layouts mode and save changes.

The layouts have now been deleted.

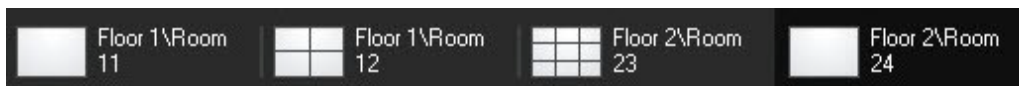
7.7.2 Rename Layouts

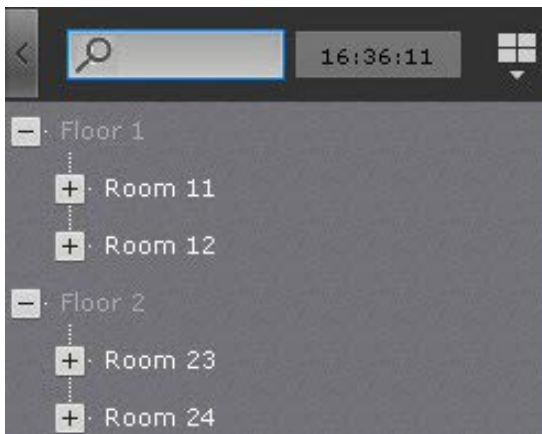
To rename a layout, double left-click and enter a new name.



You can rename layouts in Manage Layouts mode either.

Using the "\" symbol in the layout name, you can build a layout tree in the Object Panel (see [Objects Panel](#)(see page 615)).





7.7.3 Reorder Layouts


To reorder layouts in the ribbon:

1. Go to Manage Layouts mode (see [Creating and deleting layouts](#)(see page 448)).
2. Drag & drop layouts.
3. Click **Save**.

You have now reordered layouts.

7.7.4 Layout copying

You can copy existing layouts.

Select the layout that you want to copy. Click the  button to open the context menu and select **Duplicate layout**.



An identical layout is then created.

Note

Layouts cannot be copied while in editing mode.

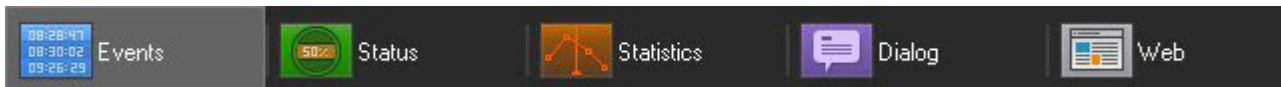
7.7.5 Editing layouts

Every layout consists of cells, which are viewing portals that can hold either video cameras or information boards.

Arkiv offers 5 types of information boards that can be added to layouts:

1. Events Board.
2. Health Board (for servers and cameras).
3. Statistics Board.
4. Dialog Board.
5. Web Board.

Information boards are available on the layouts ribbon in editing mode.



When a camera is added to a cell, a viewing tile appears.

Switching to Layout Editing mode

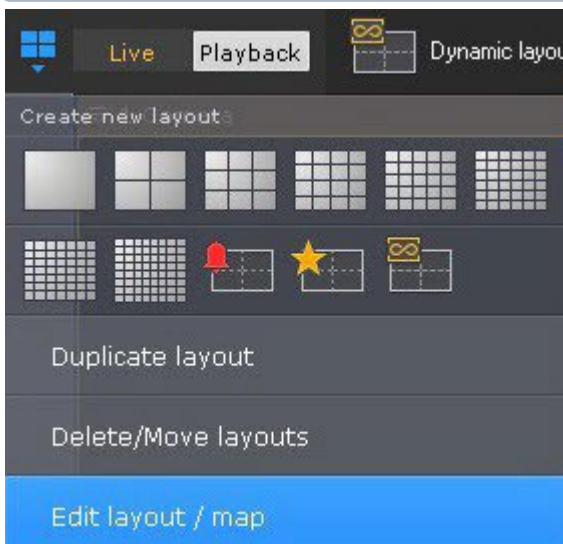
When you create a layout, you are automatically taken to the Layout Editing mode. Alternately, you can click the



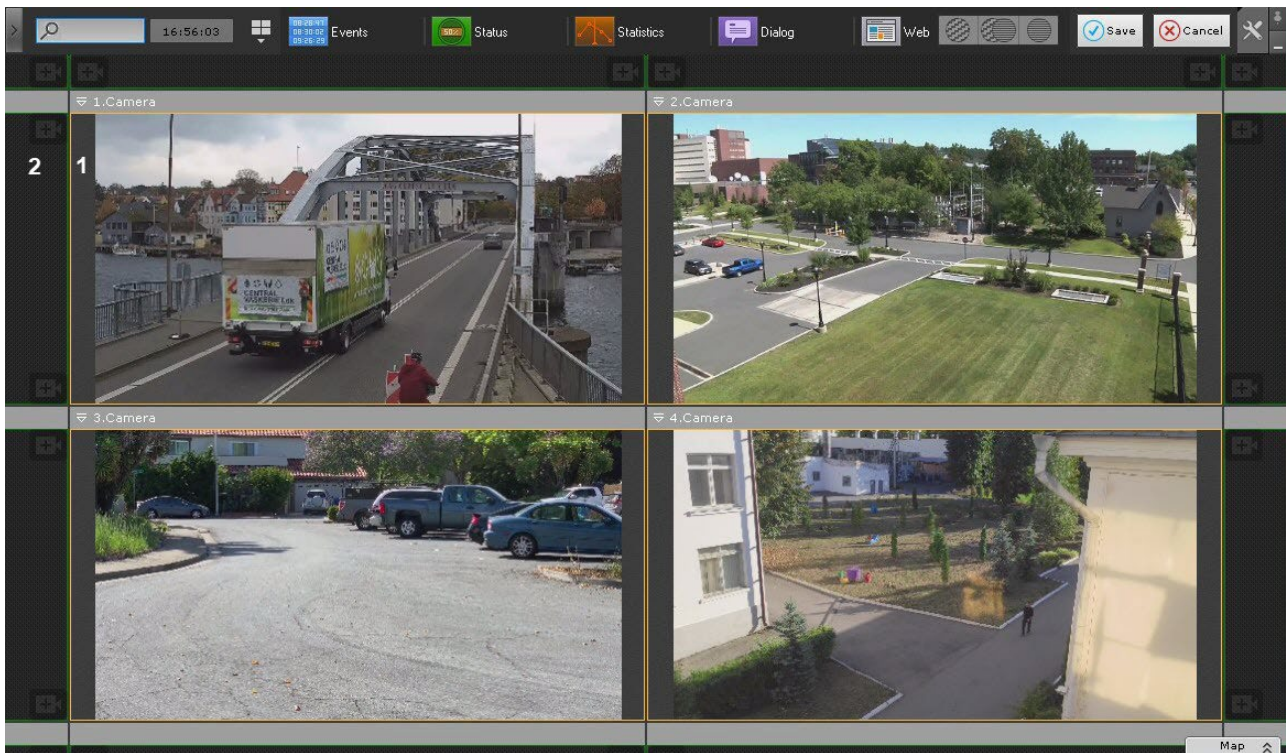
button and select **Edit layout / map** in the context menu of the layouts ribbon.

Note

To use Layout Editing mode, you must have required permissions.



In Layout Editing mode, space is divided by a grid of equal-sized squares for holding viewing tiles (1).



On the edge of the layout there are grid square fragments (**2**), which are parts of ordinary empty cells and allow adding new cells to the layout (see [Adding new cells to a layout](#)(see page 452)).

Selecting a layout for editing

To edit a layout, do as follows:

1. Go to the layout you want to change (see [The Layouts panel](#)(see page 611)).
2. Switch to the Layout Editing mode (see [Switching to Layout Editing mode](#)(see page 451)).

Otherwise, select a layout for editing in the layouts ribbon. You can also use Layout Editing mode to create a new layout (see [Creating and deleting layouts](#)(see page 448)) for editing.

Configuring layout cells

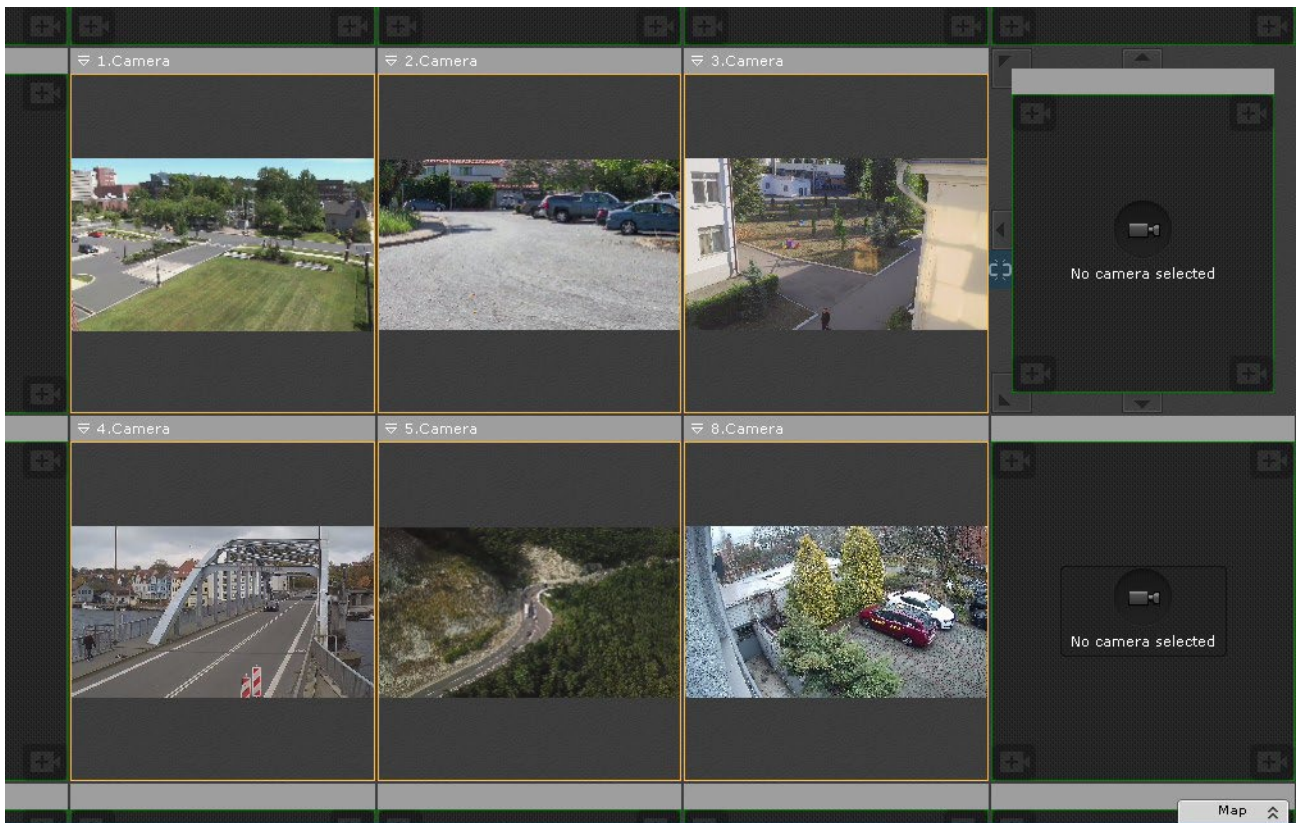
Adding new cells to a layout

- [Switching to Layout Editing mode](#)(see page 451)

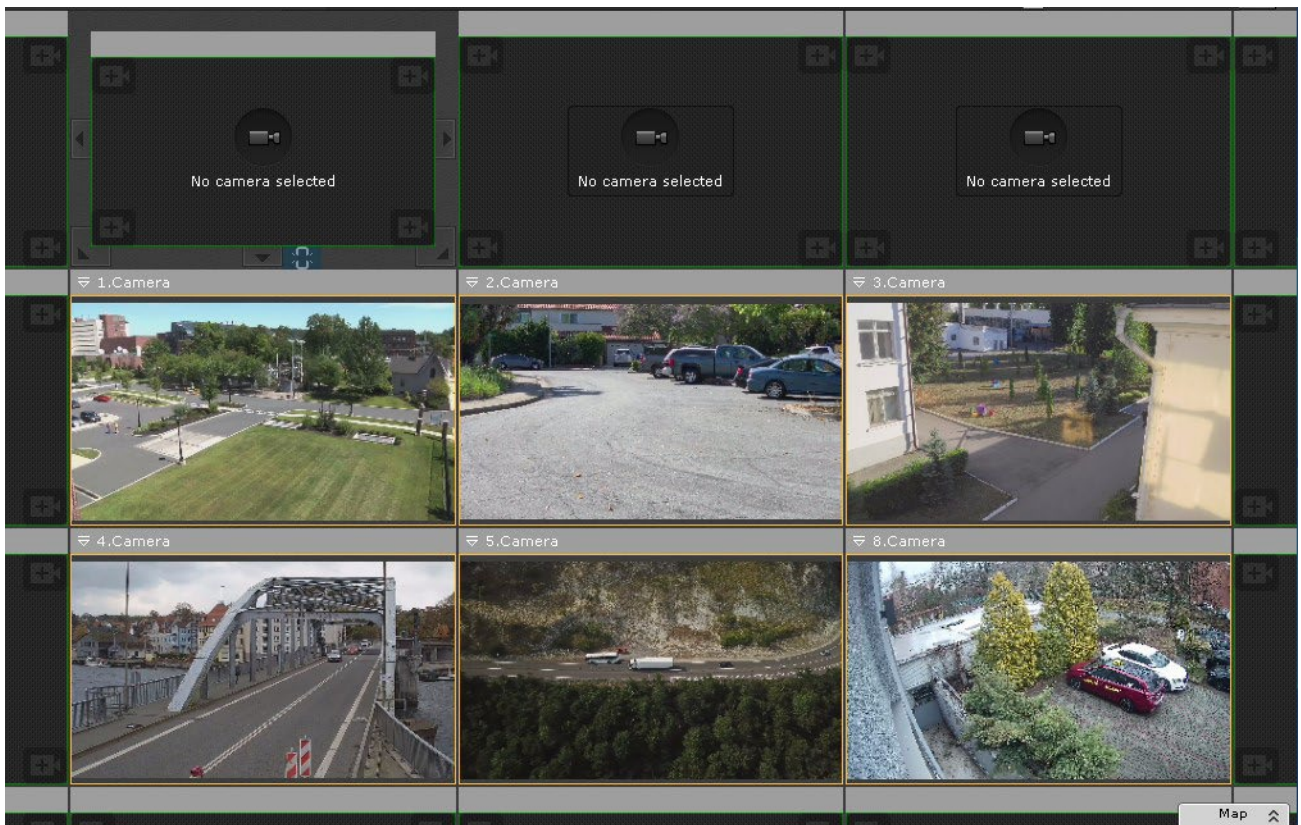
You can add new cells to a layout in one of three ways:

1. Drag a non-empty cell onto a grid square fragment (see [Moving cells](#)(see page 456)).
2. Left-click a grid square fragment and resize it (see [Resizing cells](#)(see page 455)).
3. Left-click a grid square fragment and select a video camera or information board in it (see [Adding cameras to cells](#)(see page 456)).

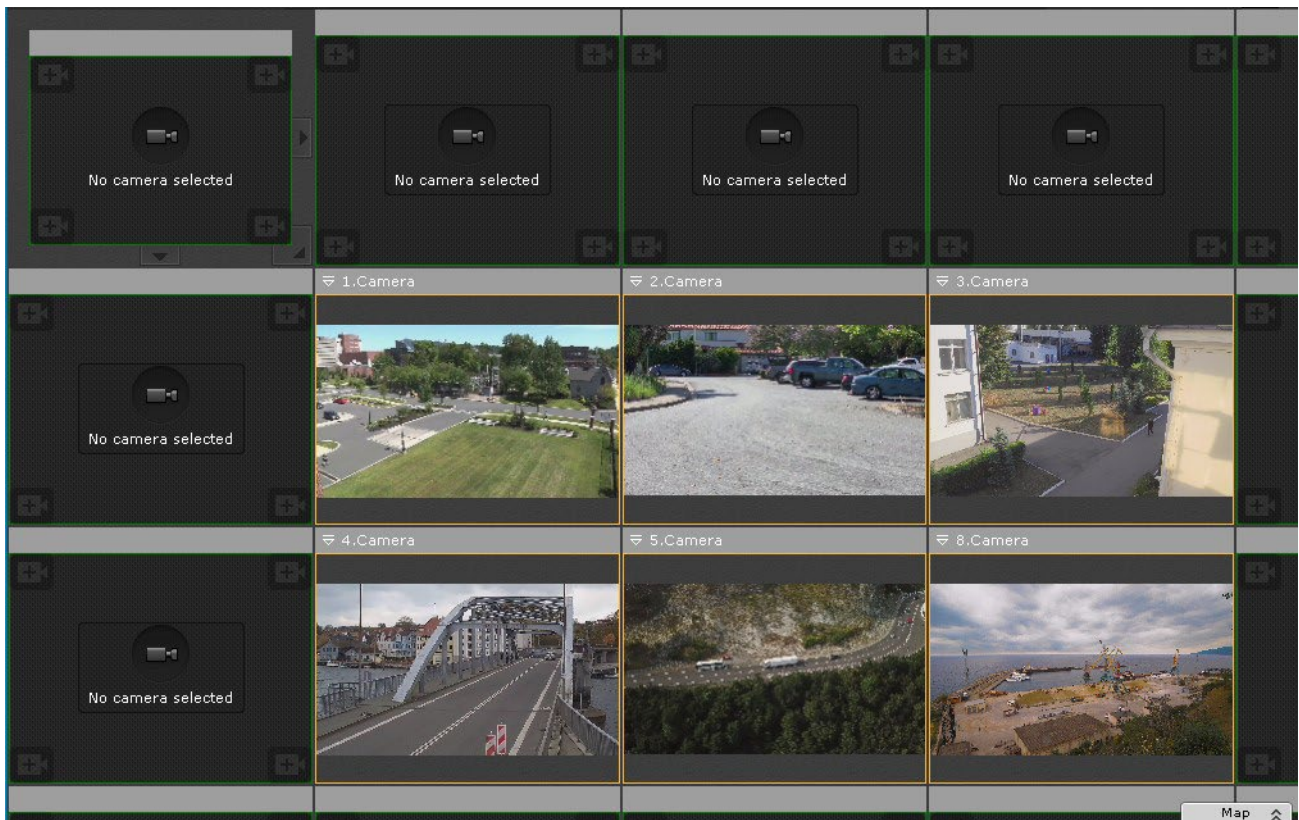
Cells are added in rows. For example, when editing a six-square (3*2) layout, a column of two grid squares is added when a fragment is chosen on the left or right side of the screen.



A row of three squares is added when you select a fragment from the upper or lower part of the screen.



When you select a corner fragment, both a row and column are added.



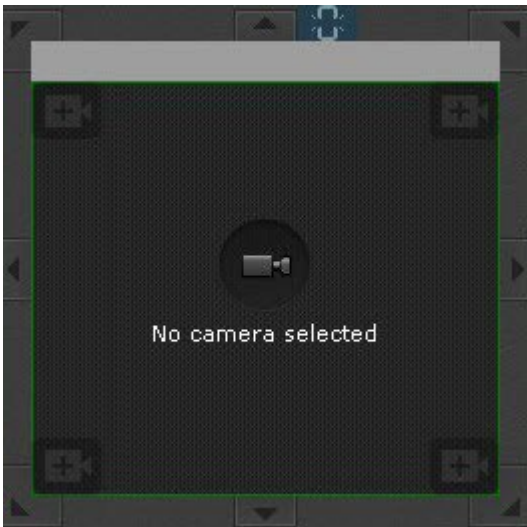
Resizing cells

[Switching to Layout Editing mode](#)(see page 451)

To resize a cell, use the buttons on its edges.

Button	Action	Button	Action
	Increases the cell by a column to the left and row above		Increases the cell by a column to the right and row below
	Increases the cell by a column to the left		Increases the cell by a column to the right
	Increases the cell by a column to the left and row below		Increases the cell by a column to the right and row above
	Increases the cell by a row below		Increases the cell by a row above

When you point the cursor at any button, a darkened area that shows the size of the cell after resizing is displayed.



You can also select and resize any tile. To resize, click the button on the cell border and expand/contract the cell as you wish. You can resize the cell only in one direction. You cannot resize the cell in two directions with the corner buttons.

If you expand a tile, the neighboring tiles contract and vice versa.

Note

If the cell is in the outermost top/bottom row or left/right column, you cannot resize it by clicking and dragging the borders. You should add an extra cell to the current row or column first.

Attention!

If you expand the cell over the next one or several cells, they are deleted.

Moving cells

[Switching to Layout Editing mode](#)(see page 451)

To move a cell, left-click the frame of the grid square fragment and drag it to the necessary position.

The cells are then switched: the contents of the previously occupied cell are moved to the location of the cell being moved.

If a cell is moved to a grid square fragment, new cells are added to the layout (see [Adding new cells to a layout](#)(see page 452)).

Adding cameras to cells

[Switching to Layout Editing mode](#)(see page 451)

There are two ways to add a video camera to a cell:

1. Using the **Objects Panel**.
2. Using the **Camera Search Panel**.

A video camera can be added to an empty cell or to a cell containing an information panel or another video camera.

Note

Cameras from any Arkiv domain can be added to the layout.

Note

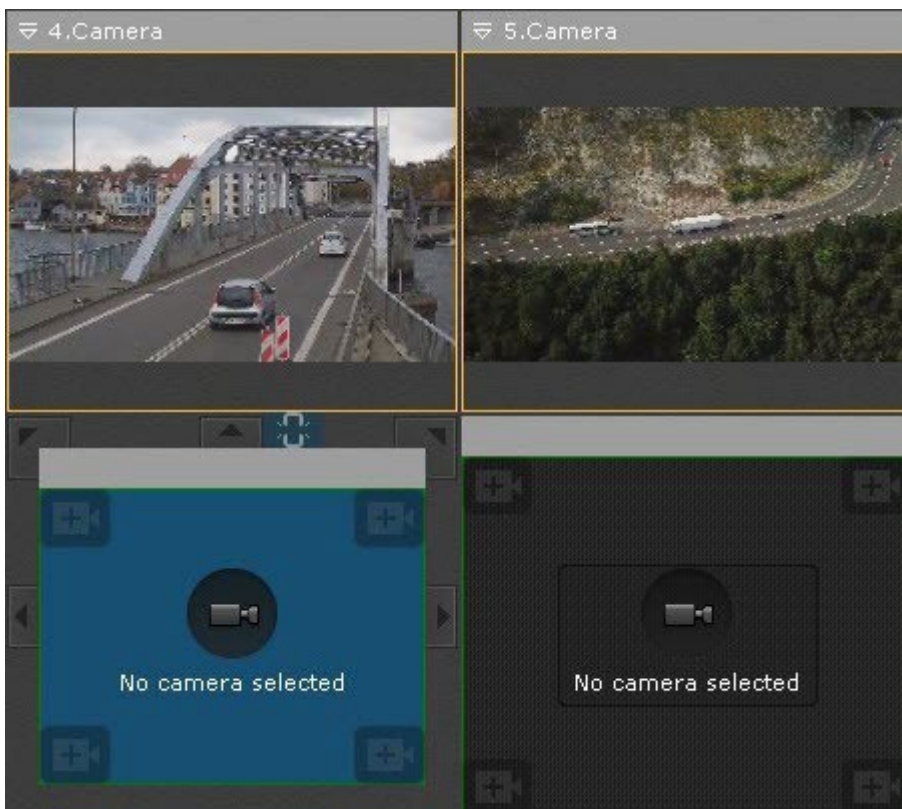
The same video camera can be added to several cells of the same layout.

Adding a video camera using the Objects Panel

To add a video camera using the **Objects Panel**, perform the following steps:

1. Switch the cell to the active mode (with a mouse click).
2. Click a video camera in the **Objects Panel** (see [Objects Panel](#)(see page 615)).

You can drag&drop cameras to a cell too. The empty cell with the cursor in it, is highlighted when you drag the camera.



To add multiple cameras to a layout, do the following:

1. In the objects pane, shift-click several cameras to select.
2. Left-click on any selected camera.
3. Drag the icon onto the layout.
4. Release the mouse button.

You can use the **Object Panel** for adding all cameras within a group/Arkiv domain to the layout. To do it, follow the steps below:

1. Left click on the group/Arkiv domain in the panel.
2. While keeping the mouse button pressed, move the cursor to the layout.
3. Release the mouse button.

Adding a video camera using the Camera Search Panel

To add a video camera to a cell, perform the following steps:

1. Switch the cell to the active mode with a mouse click and select a video camera from the list in the **Camera Search Panel** (see [Camera Search Panel](#)(see page 612)).
2. Select a video camera from the list in the **Camera Search Panel** with the mouse pointer and, holding down the mouse button, move the pointer into a cell. Then release the button.

Adding information boards to cells

[Switching to Layout Editing mode](#)(see page 451)

You can add information boards to cells in two ways:

1. Activate the cell (by clicking it) and select the information board that you want to add to the cell.
2. Click an information board to select it. Drag the information board to the layout cell and then release the mouse.



You can add an information board to an empty cell or to a cell that contains a camera or other information board.

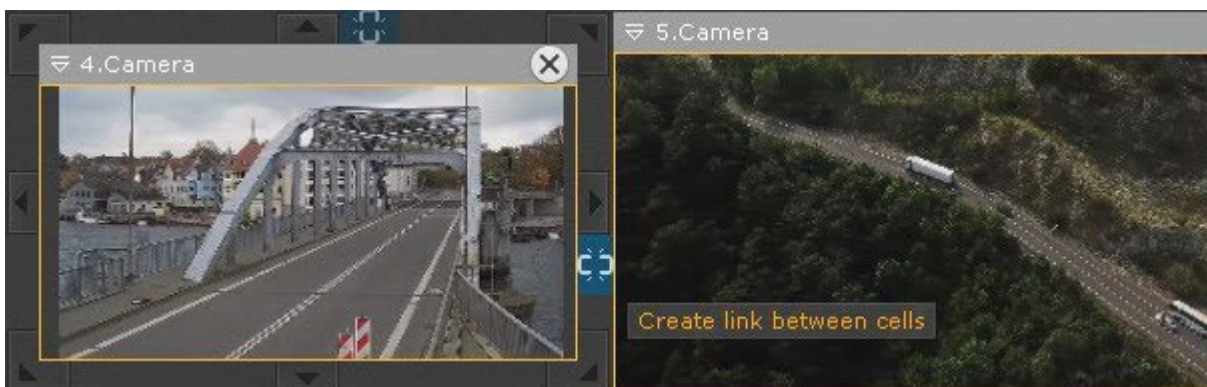
Note

After you add an information board to the cell, you should configure it (see [Configuring information boards](#)(see page 467)).

Linking cells

[Switching to Layout Editing mode](#)(see page 451)

You can link cells. To create a link, select cells and click the  button on the border. To delete the link, click .



You can create the following links:

1. A viewing tile to a viewing tile. You can link cells from the same row only.

This way you can hide cell borders in live view and have a virtually merged FoV from several cameras.



2. An information board to viewing tile. This way you can link adjacent cells, up/down and across. A single information board can be linked with multiple cameras. If the viewing tile is linked to **Event Board**, you can click an event and switch to the Archive mode (see [Switching a camera linked to an Event Board to the archives](#)(see page 743)).
3. Also, you can link 2 information panels or empty cells to panels (see [Configuring Alarmed cameras layout](#)(see page 479)).

All linked cells have a different scaling logic (see [Scaling the surveillance window](#)(see page 622)).

Merging videos from adjacent cameras (FrameMerge)

[Switching to Layout Editing mode](#)(see page 451)

FrameMerge stitches video feeds from neighboring cameras into a single panoramic view.

The resulting video is available:

- as live video feeds,
- as recorded footage,
- as exported video files.

Attention!

The maximum horizontal resolution of exported video is 8184 pixels.

To use this option, cameras and their video feeds must match the following conditions:

1. Install cameras as close to each other as possible.
2. No more than 3 cameras' feeds can be merged horizontally.
3. The cameras must have:
 - a. pixel resolution of no less than 640 * 480;
 - b. identical aspect ratio for the high and low bitrate streams;
 - c. identical parameters of lenses.
4. You have to synchronize time on all cameras (for example, via NTP protocol).
5. Camera jitter must not result in more than 1% image shift in both directions.
6. The recommended image overlap across adjacent cameras is 20–25 percent of image width.
7. Camera images must be aligned vertically.

For best results in merging, ensure the following:

1. Daylight illumination.

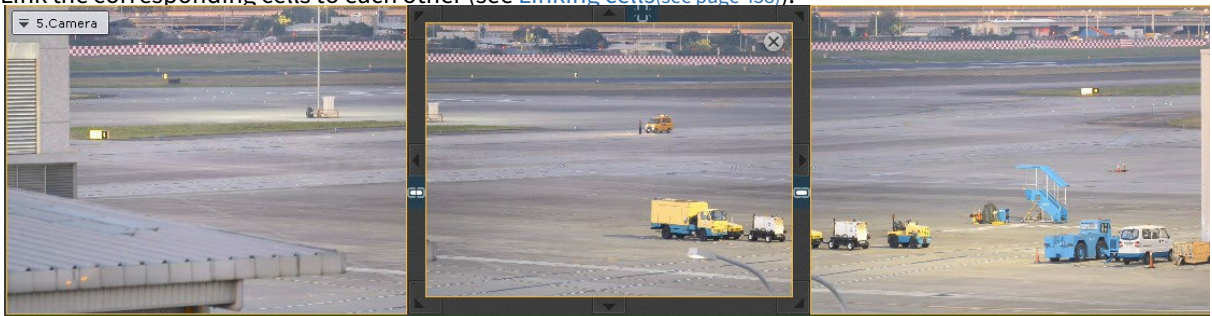
2. Sufficient light to capture small details.
3. No over-exposed areas within the scene.
4. Minimum video noise and compression artifacts.
5. Moving objects must be visually separated within the FOV.
6. Same set of objects in overlapping areas.

Attention!

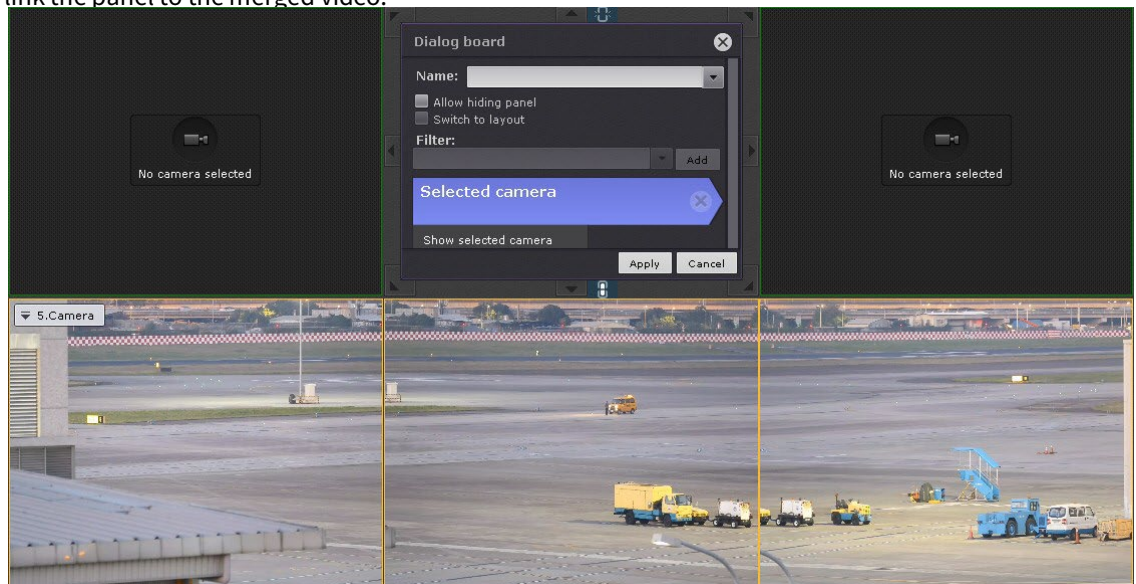
If overlapping areas are plain monochrome (e.g. the sky), no merging is possible.

To configure video merging, do the following:

1. Place the cameras horizontally within the layout.
2. Link the corresponding cells to each other (see [Linking cells](#)(see page 458)).



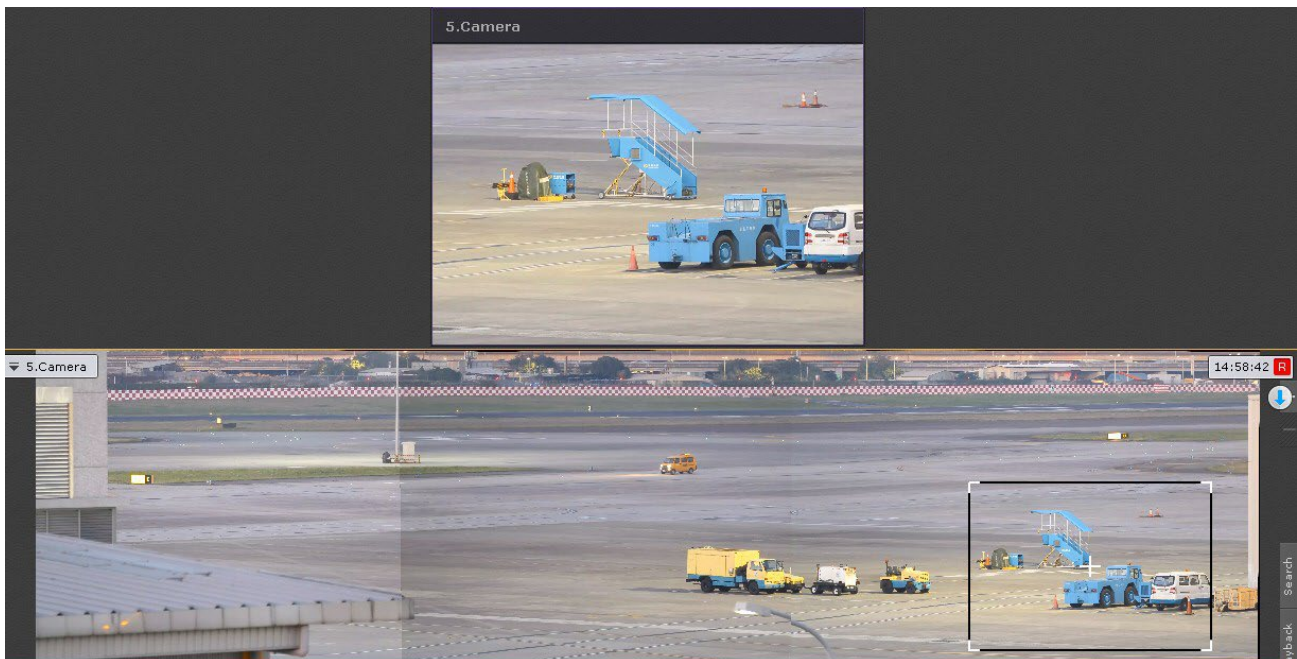
3. If you need to display a sub-area of the merged video in a separate window, do the following:
 - a. add a dialog board to the layout (see [Configuring a Dialog Board](#)(see page 473));
 - b. configure the panel to display the selected camera;
 - c. link the panel to the merged video.



4. Save the layout.

While merging video feeds, the system automatically scans images from adjacent cameras for appropriate stitching points.

The resulting image will be displayed in a single viewing window. If you select a rectangular area within the video image (as for Area zoom function, see [Control using Areazoom](#)(see page 654)), the cropped image appears in the dialog board.




Attention!

Do not move or reposition cameras after merging their video feeds. If any of the cameras change its position, you have to reconfigure the merging.

Clearing cells

[Switching to Layout Editing mode](#)(see page 451)

To remove an information board or camera from a cell, in the upper-right corner, click the  button.

If clearing cells in a row or column removes content from all of these cells, the entire row and/or column is removed from the layout.

Configuring viewing tiles

Selecting default functions for viewing tiles

[Switching to Layout Editing mode](#)(see page 451)

Default values for video stream quality, object tracking, autozoom, and video display (contrast, focus, deinterlacing and flip) functions can be set for viewing tiles.

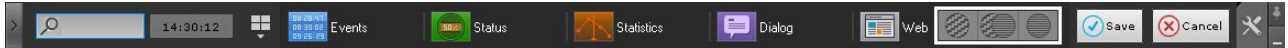
After the user switches to a layout, these functions are activated automatically.


To set a function as a default one, activate it during Layout Editing mode (see [Selecting video stream quality in a viewing tile](#)(see page 661), [Tracking objects](#)(see page 631), [Autozoom](#)(see page 663), [Video image processing](#)(see page 625), [Selecting viewing mode for videos from a fisheye camera](#)(see page 730)) and save changes before exiting the mode.


Select the default video stream for each camera within your layout


[Switching to Layout Editing mode](#)(see page 451)

Use the upper panel to select the default video stream for all cameras within the layout:



 – low quality stream.

 – GreenStream. The default setting for video stream is low-quality. Upon selection of a Camera Window, the highest resolution stream is displayed by default. After you switch to another Camera Window, the inactive camera window returns to lower resolution/fps display.

 – high quality stream.

Selecting the default video mode for a camera

[Switching to Layout Editing mode](#)(see page 451)

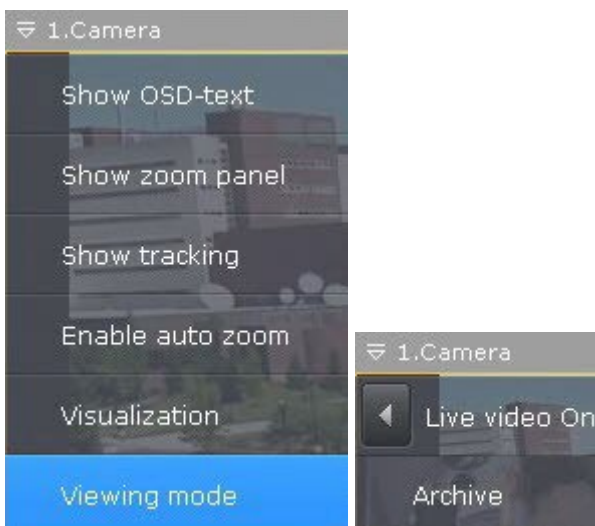
By default, when you switch to a layout, all video cameras are in Real-time/Live viewing mode.

You can select a default video mode for each camera: Real-time mode or Archive mode.

Note

This function is not available if the camera is not attached to an archive.

To select a default video mode, in the context menu of the viewing tile, select **Viewing mode** and select the necessary mode.



If Archive mode is selected, when you switch to the layout, the camera is immediately in Archive mode.

Moving input and output icons in a viewing tile

[Switching to Layout Editing mode](#)(see page 451)


You can move input and output icons in a viewing tile.

To do so, left-click the input or output icon and drag it to the place in the viewing tile where you want to put the icon.


Configuring default zoom levels (the Fit screen function)

[Switching to Layout Editing mode](#)(see page 451)

The Fit screen function allows displaying a viewing tile by default so that it occupies all of the available space on the screen (full screen). The default zoom level for full screen display is calculated automatically as a minimum zoom value that allows filling the available screen space with the viewing tile contents.

To enable the Fit screen function for a specific video tile, display the digital zoom controller (see [Digitally Zooming Video Images](#)(see page 623)), click the  button on it, and save changes when exiting editing mode.

Note

To disable the Fit screen function, click the  button again.

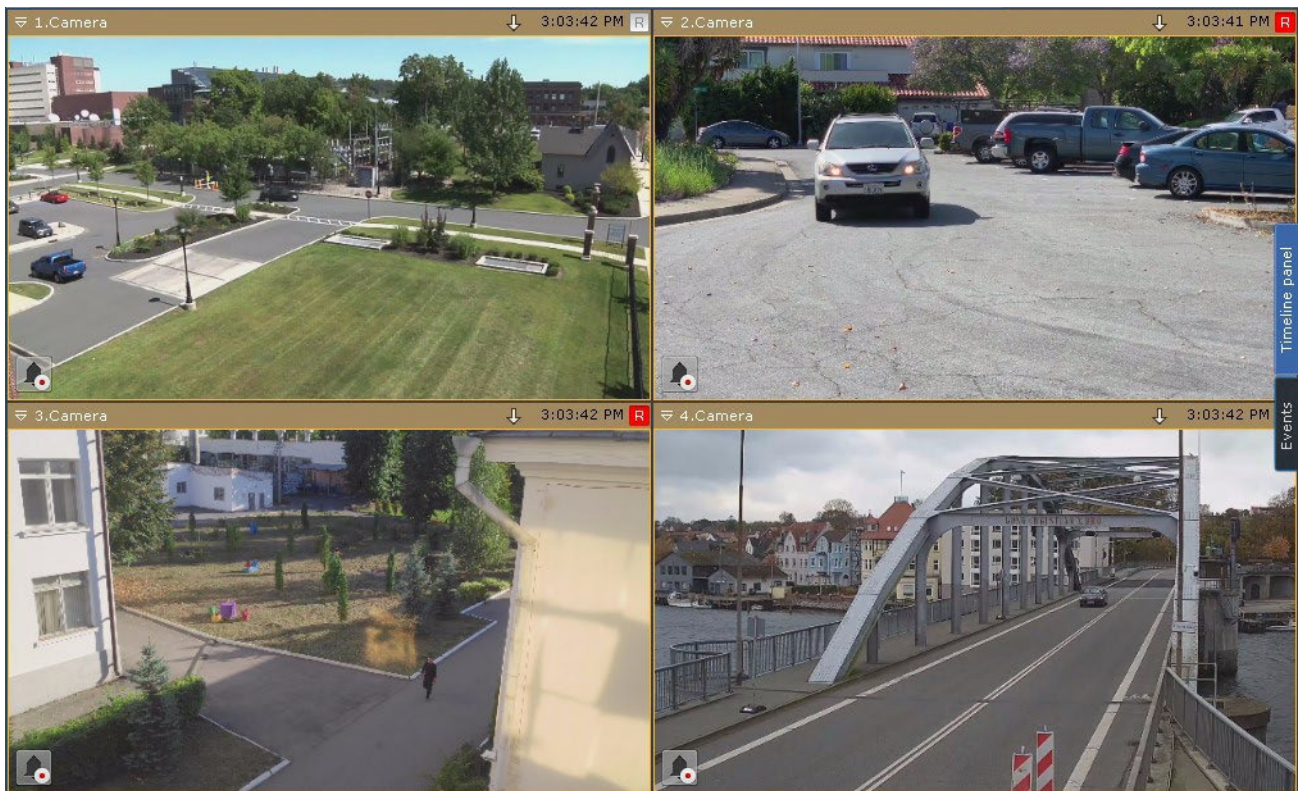
To enable the Fit screen function for all video tiles on the layout open the context menu and select **Image size adjustment**.



Note

To disable Fit screen across all layouts reselect **Image size adjustment**.

Now when a user switches to this layout, the video in the viewing tile is displayed at the calculated minimum necessary level of digital zoom and the viewing tile occupies all available space.




Configuring pan/tilt angle for video cameras with Immervision lenses in 180° Panorama display format

[Switching to Layout Editing mode](#)(see page 451)

You can set the pan/tilt angle for fisheye cameras in 180° Panorama display format when switching to a layout.

This is useful when needing to display the entire viewable area in the layout (two areas of 180° each). In this case, the video camera is added twice but with different viewing angles.



To set the viewing angle, click and hold the  button (see [180 degree Panorama](#)(see page 732)).

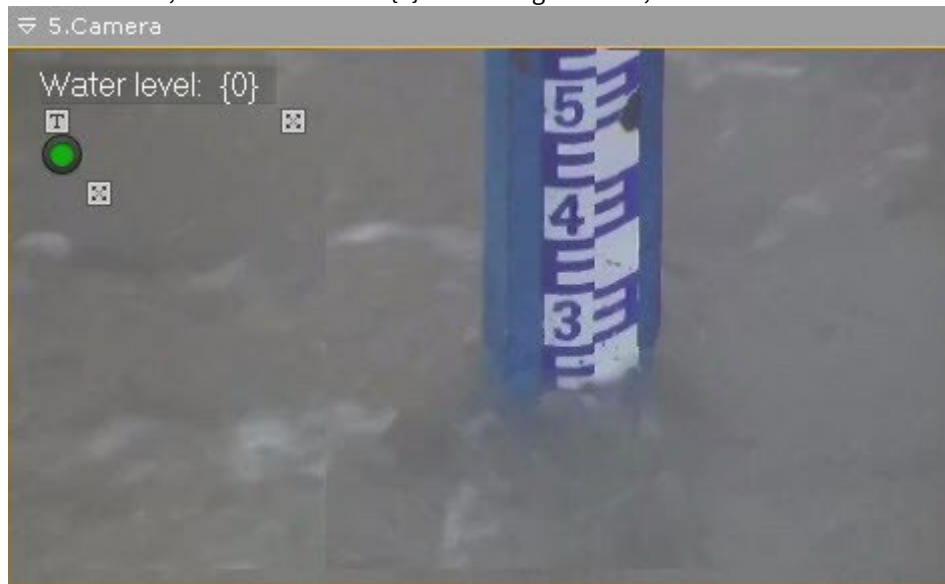
Configuring display of water level detection


[Switching to Layout Editing mode](#)(see page 451)

If you have created a water level detector for a camera (see [Configuring Water level detection](#)(see page 367)), you can see the water level sensor in the camera window.

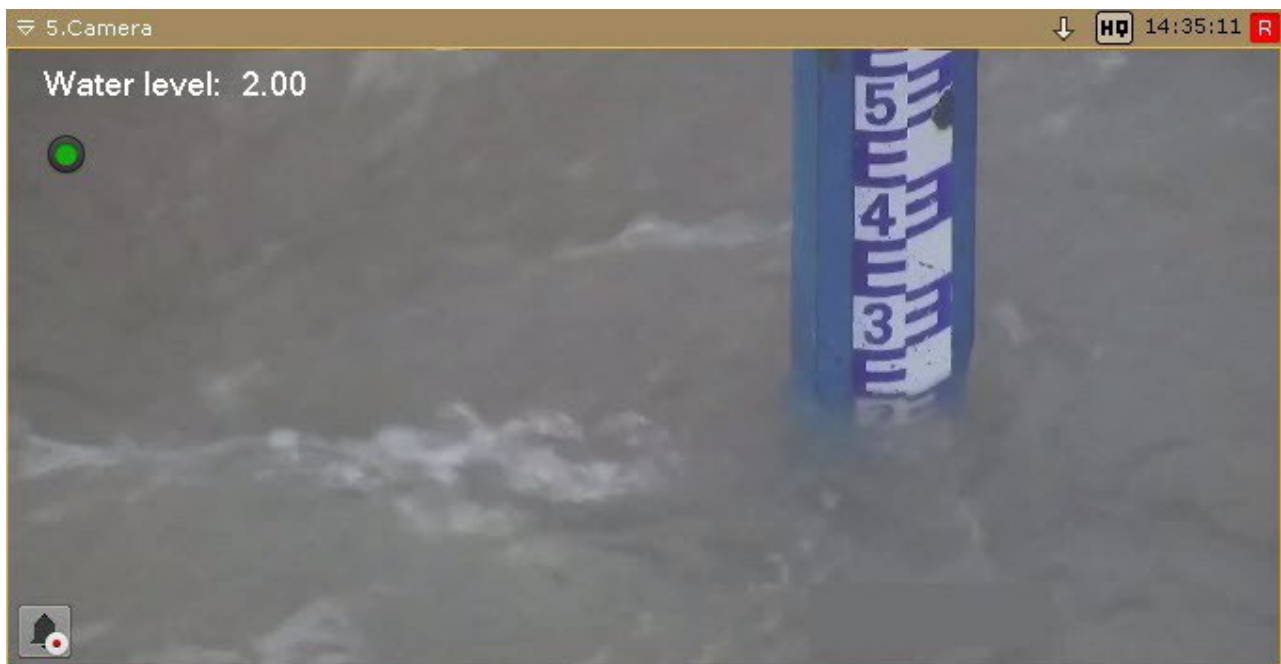
You can also display numerical value of current water levels for the detector. To do it, follow the steps below:

1. In the text field, enter "Water level: {0}". To configure fonts, click .



2. Use  buttons to scale up/down the text and the sensor icon.
3. You can move the sensor just as any other object (see [Moving input and output icons in a viewing tile](#)(see page 463)).

When the layout is saved, you see the information displayed in the camera window.



Adding links to other cameras to the Camera Window

- [Switching to Layout Editing mode](#)(see page 451)


You can add links to other cameras to the Camera Window. If you click on such a link, you go to the corresponding camera's window (see [Switching to other camera via a link in the Camera Window](#)(see page 639)).

To add a link, do the following:

1. While holding the Ctrl button on your PC keyboard, left-click the camera icon on the **Objects Panel** (see [Objects Panel](#)(see page 615)), and drag it into the Camera Window.


A link will be added to a window as a thumbnail




2. To rotate the thumbnail, click . Each click rotates the thumbnail by 45°.



Note

If you add a text note to the link (see 3), the thumbnail disappears after you rotate it by 360°, and you will have just the text to switch to another camera.

To bring back the thumbnail, click .

Note

To remove the link, click the  button.

3. If required, you can add a text comment to a link via the appropriate text field. To set font attributes, click the  button.
4. Use  buttons to scale up/down the text and the thumbnail.
5. You can move the link just as any other object (see [Moving input and output icons in a viewing tile](#)(see page 463)).

When the layout is saved, you see the newly created link in the Camera Window.



Configuring information boards

Configuring information board templates

- [Switching to Layout Editing mode](#)(see page 451)

To save information board parameters as a template, specify a name when configuring an information board.




If a name is not specified for the information board (it is not necessary to specify one), no template with the information board parameters is saved or made available when creating new information boards.

When configuring a new information board, you can use previous templates for the type of information board in question by selecting one from the **Name** list.



If you save the new information board with the same name, the template parameters are updated and all information boards based on the template are updated as well.


To delete a template, in the **Name** list, click the  button across from the template. The parameters of information boards based on the deleted template are saved, but their names are discarded.

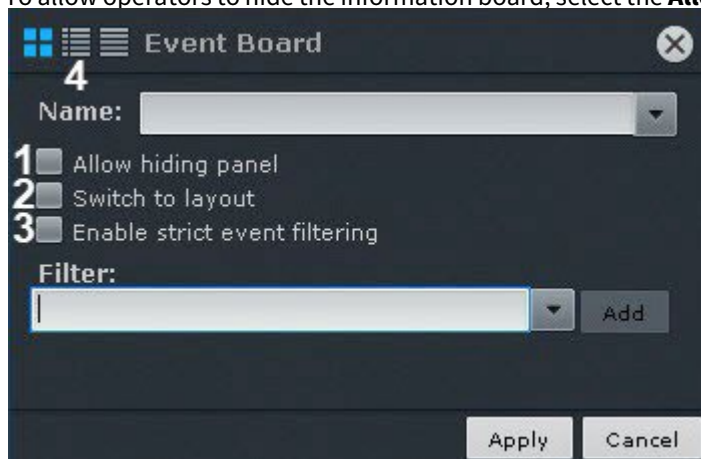
Configuring an Event Board

 [Switching to Layout Editing mode](#)(see page 451)

Event Boards display some or all system events.

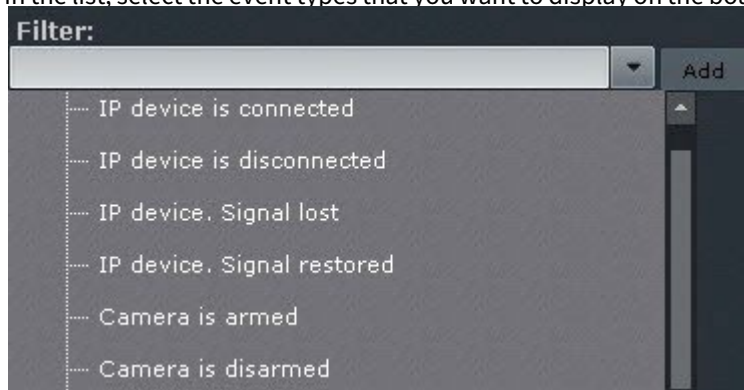
To configure an **Event Board**:

1. Add an information board to the layout (see [Adding information boards to cells](#)(see page 458)).
2. In the upper-right corner, click the  button.
3. To allow operators to hide the information board, select the **Allow hiding panel** check box (1).




4. To automatically open the layout with this information board when an event matching the filter occurs, select the **Switch to layout** check box (2) (see paragraph 5).
If other layouts contain information boards with the same parameters, the layout with the smallest number of cells is opened. If there are multiple layouts with identical numbers of cells, the layout that comes first in the alphabet is chosen. If a layout containing this information board is open when an event is received, no switch to another layout is performed.

- By default, some events on the **Event board** come with audit events. If no display of audit events is required, select the **Enable strict event filtering** checkbox (3).
- In the list, select the event types that you want to display on the board and click **Add**.



To add events of the same type from different devices, enter the name of the event in the **Filter** field. This will list only the events of the chosen type. To list all events, clear the **Filter** field.

Note

To remove an added event type, click the  button.

If no event type is selected, all system events are displayed on the information board.

Note

You can also add any text to the filter. For example, if you add **Signal lost** filter, **Event Board** will display event data from all devices in the system.

Note

To display facial detection tool triggering, we recommend that you select 2 events:
Triggered detection "Face appeared" and **Triggered specified detection "Face appeared"**.

- Select the default view for information on the **Event Board** (see [Options for displaying information on Events Boards](#)(see page 742)): the first frame of the event and time, first frame and text, or text only (4).
- Click the **Apply** button to save changes.


Configuration of the **Event Board** is complete.

Configuring a Health Board

[Switching to Layout Editing mode](#)(see page 451)

System Health Boards display the status of selected system servers and connected cameras.

To configure a Health Board:


- Add an information board to the layout (see [Adding information boards to cells](#)(see page 458)).
- In the upper-right corner, click the  button.

3. To allow operators to hide the information board, select the **Allow hiding panel** check box (1).



4. To automatically open the layout with this information board when the status of a monitored server or camera changes, select the **Switch to layout** check box (2) (see paragraphs 5 and 6). If other layouts contain information boards with the same parameters, the layout with the smallest number of cells is opened. If there are multiple layouts with identical numbers of cells, the layout that comes first in the alphabet is chosen. If a layout containing this information board is opened when an event is received, no switch to another layout is performed.
5. Select the Servers you want to monitor. To do so, select one server (3) or all servers from the Arkiv domain (click **All selected servers**) (4) and click the **Add** button.

Note

To remove the selected server, click the  button.

6. To display the status of only distressed servers out of those selected, select **Distressed servers only** (4). A server is classified as distressed if any of the following are true:
- Any components (CPU, hard disk, or network connection) are in critical condition.
 - There is no connection to the Server.
 - Any video cameras of the Server are in critical condition.

Note

Information about the status of Servers and cameras is given in the section [Working with System Health Boards](#)(see page 744).

7. Select the default view for display of information on the Health Board (see [Working with System Health Boards](#)(see page 744)): diagram, diagram with text, or table (5).
8. Click the **Apply** button to save changes (6).


Configuration of the Health Board is complete.

Configuring a Statistics Board

 **Switching to Layout Editing mode**(see page 451)

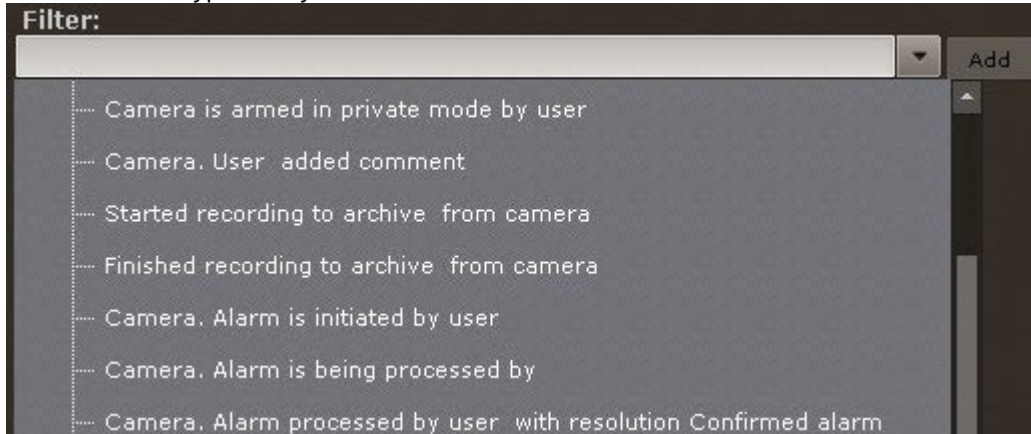
Statistics Boards display information on the number of events of the selected type or types, as a number and graph.

To configure a Statistics Board:

1. Add an information board to the layout (see [Adding information boards to cells](#)(see page 458)).
2. In the upper-right corner, click the  button.
3. To allow operators to hide the information board from a layout, select the **Allow hiding panel** check box (**1**).




4. Select the event types that you want to be counted and click **Add**.



To add events of the same type from different devices, enter the name of the event in the **Filter** field. This will list only the events of the chosen type. To list all events, clear the **Filter** field.

 **Note**

To remove an added event type, click the  button.

- If no event type is selected, all system events are counted.
5. Select the time period for display of statistics on the graph (**2**).
 6. Click **Apply** to save the changes.

Configuration of the Statistics Board is complete.

Configuring a Web Board


[Switching to Layout Editing mode](#)(see page 451)

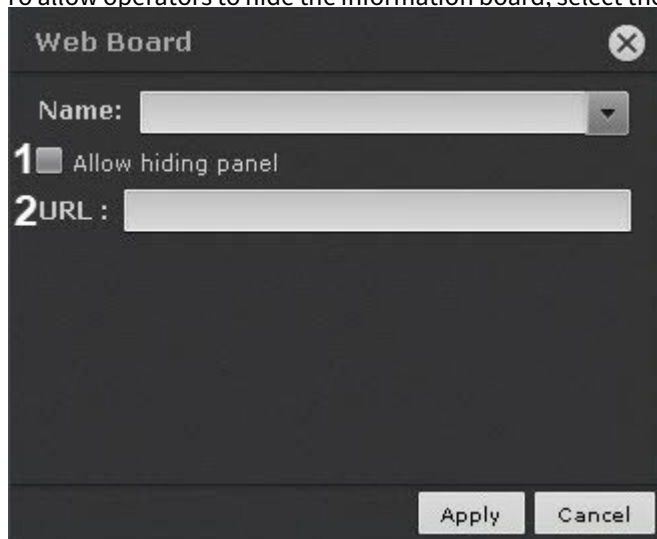
Web Board allows users to view a selected Web page in the tile.

Note

Arkiv VMS shows Web pages in Internet Explorer.

To configure **Web Board**:

1. Add an information board to the layout (see [Adding information boards to cells](#)(see page 458)).
2. In the upper-right corner, click the  button.
3. To allow operators to hide the information board, select the **Allow hiding panel** check box (1).



4. Enter the address in the **URL** field (2).

Note

The **URL** field supports addresses in the following formats:

- http://www.site.com
- http://site.com
- https://www.site.com
- https://site.com
- www.site.com
- site.com
- [IP-address]
- [IP-address]:[Port]
- http://[IP-address]
- http://[IP-address]:[Port]

5. Click the **Apply** button to save changes.

Configuration of the **Web Board** is complete.

Configuring a Dialog Board


 **Switching to Layout Editing mode**(see page 451)

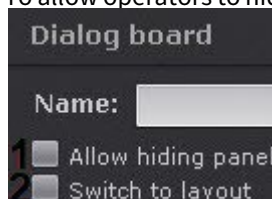
Dialog board allows users to view info about alerts/detection events and quickly start macros to respond.

In addition, the panel can display:

- video from the selected camera on the layout;
- video from the Related camera for the selected camera on the layout;
- video from the Related camera for the camera linked to the panel;
- alarm event from the selected or linked camera;
- still image.

You can configure Dialog board as follows:

1. Add an information board to the layout (see [Adding information boards to cells](#)(see page 458)).
2. In the upper-right corner, click the  button.
3. To allow operators to hide the information board, select the **Allow hiding panel** check box (1).




4. Select the **Switch to layout** check box (2) (see paragraph 5) to automatically open the layout with this information board when an event matching the filter occurs.
If other layouts contain information boards with the same parameters, the layout with the smallest number of cells is opened. If there are multiple layouts with identical numbers of cells, the layout that comes first in the alphabet is chosen. If a layout containing this information board is opened when an event is received, no switch to another layout is performed.
5. Select the event types that you want to display on the board and click **Add**.



To add events of the same type from different devices, enter the name of the event in the **Filter** field. This will list only the events of the chosen type. To list all events, clear the filter field.

 **Note**


To remove an added event type, click the  button.

 **Note**

If the board has video, the event filter is not required.

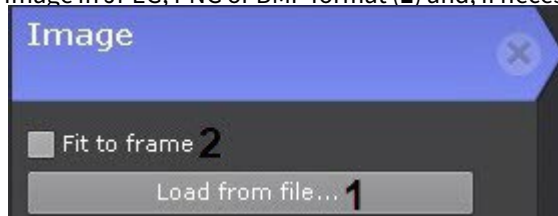
If no event type is selected, all system events are displayed on the information board.

6. Configure the information board:

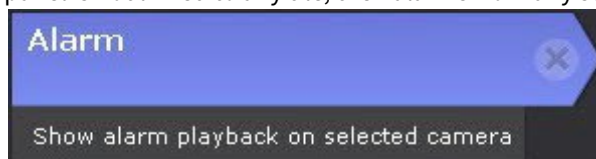
- a. If you want video on the board, then click the  button and select the item in the menu. You cannot add other elements if you have video here.
 - i. **Selected camera** – if you want to display video from the selected camera (**1**).



- ii. **Related camera of selected camera** – if you want to display video from the related (alternative, see [The Video Camera Object](#)(see page 107)) camera of the selected camera (**2**).
 - iii. **Related camera of linked camera** – if you want to display video from the related (alternative, see [The Video Camera Object](#)(see page 107)) camera of the linked camera (**3**). In this case, the panel must be connected to some camera window.
- b. If you want to display a still image on the panel, select the **Image** element. To do this, select a desired image in JPEG, PNG or BMP format (**1**) and, if necessary, adjust it to panel size (**2**).



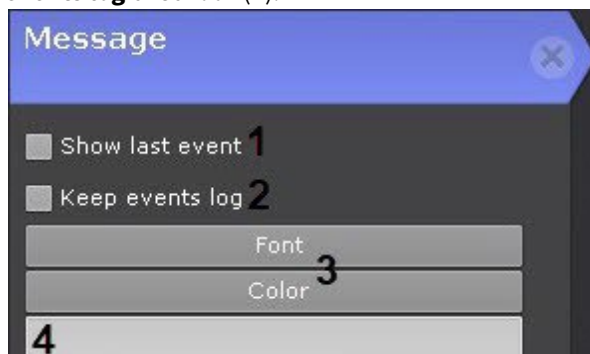
- c. If you want to display an alarm event in the panel from the selected or linked camera, select **Alarm**. If the panel is linked to any camera window, then alarms from this camera will be displayed. If the panel is not linked to any tile, then alarms from any selected camera will be displayed.



When you add the **Alarm** item to the message panel, you can also add pre-programmed buttons to evaluate the alarm event (see item e below). It is color-coded as follows: green – **False alarm**, yellow – **Non-critical alarm**, red – **Critical alarm**.




- d. If necessary, add a message that will be displayed on the panel in case of event (4). You can select the font and color (3) of the message. If it is necessary to display the event text, set the **Show last event** checkbox (1). To keep all events on the panel and be able to navigate between them, set the **Keep events log** checkbox (2).



- e. If necessary, add the comments field. Select the appropriate check box to make comments mandatory.



- f. Add one or more Response Buttons. To configure Response Buttons, you should set the mandatory and optional parameters (by clicking ):

- enter the name of the Button (1);

- select a macro that will start when you click the Button (2);
- if you want to hide the board after pressing the Response Button, select the checkbox (3);
- select location for the Button: on the left, in the center, on the right (4);
- select a color (5).

7. Click **Apply** to save the changes

Configuration of the Dialog board is complete.

Configuring Alarms Panel on a layout

You can configure the size of Alarms Panel (see [Alert Panel](#)(see page 614)) with included videos for each layout separately.

To do it, follow the steps below:

1. Go to the desired layout.
2. Open the Alarms Panel and set desired sizes of videos, and of the panel itself (see [Alert Panel](#)(see page 614)).
3. Switch to the Layout Editing mode (see [Switching to Layout Editing mode](#)(see page 451)).
4. Exit the Layout Editing mode and save changes (see [Exiting Layout Editing mode](#)(see page 476)).

The Alarms Panel will always open as you have specified it for this layout.

Exiting Layout Editing mode

To exit Layout Editing mode and save changes, click **Save** in the upper panel.



To exit Editing mode without saving changes, click **Cancel**.

7.7.6 Share Layouts


You can share custom layouts with other users. The user can share only his/her custom layouts.

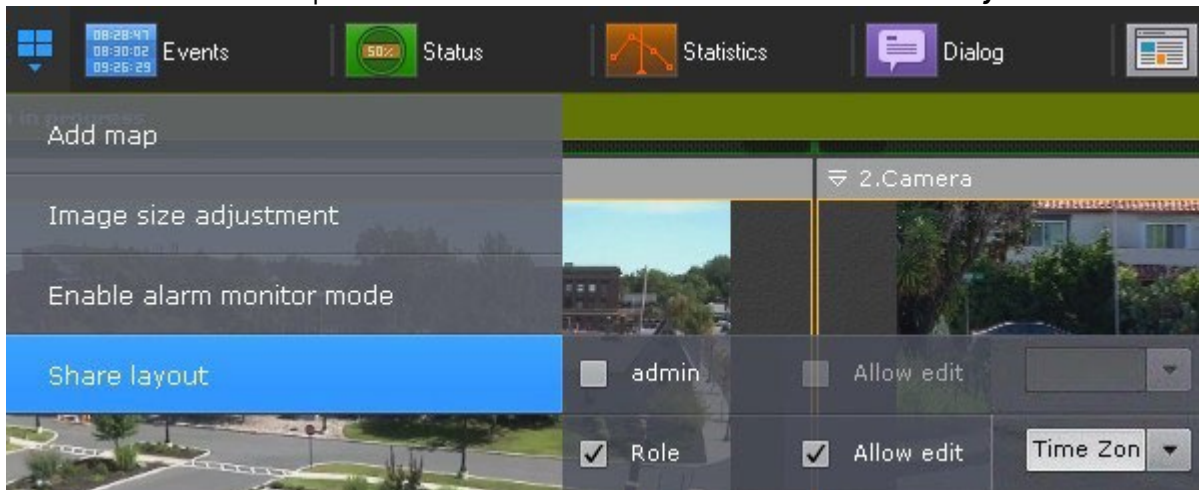
Note

This feature comes in handy, when it is only the administrator's job to create and edit layouts. After configuring, the administrator can assign the layouts to users/roles.

To share a layout, complete the following steps:

1. Select a layout (see [Selecting a layout for editing](#)(see page 452)) and go to Layout Editing mode (see [Switching to Layout Editing mode](#)(see page 451)).

2. Click the  button and open the context menu. Select one or several roles in **Share layout**.



Note

You can select the roles of the selected Arkiv domain. Arkiv domain can be selected on the [Camera Search Panel](#)(see page 612).

3. If you want to grant rights to edit layouts, select the **Allow edit** checkbox for the required user role.
4. If you want to make the layout accessible only within a pre-defined time window, select the corresponding Time Zone from the list.
5. Exit layout editing mode (see [Exiting Layout Editing mode](#)(see page 476)).

This layout is shared with other users.

These users can not edit and share this layout. They can:

1. Work with layout (see [The Layouts panel](#)(see page 611)).
2. Delete it from their list (see [Creating and deleting layouts](#)(see page 448)).

Note

Only the layout owner can completely remove it from the VMS.

Upon removal, the layout becomes unavailable to all users. If the removed layout was open on some user's monitor, it is immediately replaced by another layout.

3. Copy the layout (see [Layout copying](#)(see page 450)). If you copy the layout, you are the owner of your copy. You can edit it.




Shared layouts are sealed with the following sign:




7.7.7 Configuring special layouts

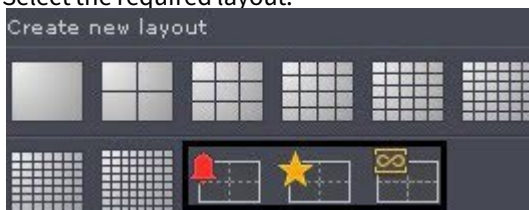
Creating special layouts

There are three special layouts available in *Arkiv*:

1. Marked cameras — displays all marked cameras .
2. Alarmed cameras — displays all cameras with alarms .
3. Dynamic layout — displays the cameras added from the **Object Panel** in Live video mode .

To create a special layout, do as follows:

1. Click  to open the **Layouts** context menu.
2. Select the required layout.



The layout is created and added to the panel.



You can limit the number of cameras on special layouts by the layout format — 1, 4, 9, 16, 25, 36, 49, 64 (to select the format, click on the corresponding button in the menu). The **Dynamic layout** is created empty.

Note

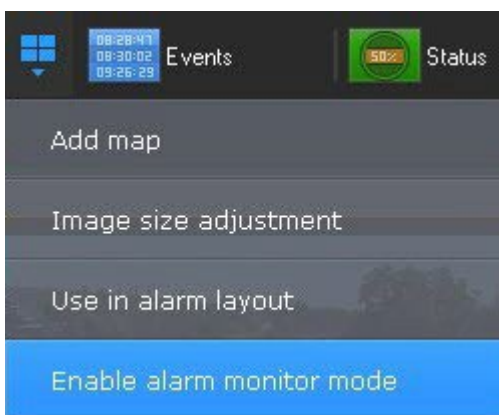
By default, the **Marked cameras** layout is 3 * 3, and the **Alarmed cameras** layout changes automatically depending on the number of alarms.



Note

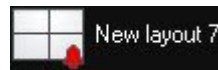
To return to automatic change of the **Alarmed cameras** layout, click the format that you selected again.

You can change any standard layout to an alarmed one. To do this, in the layout editing mode, open the menu and select **Enable alarm monitor mode**.



In this mode, only alarmed cameras will be displayed.

If the alarm monitor mode is enabled, the layout will be marked with

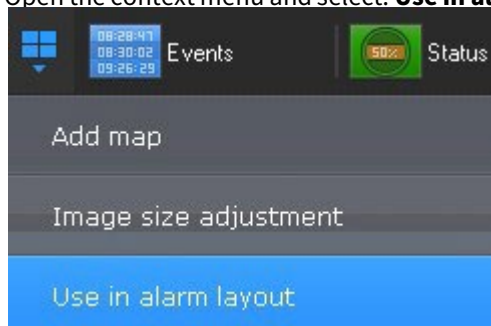


Configuring Alarmed cameras layout

By default, special layout display alerts from all cameras. You can limit this: alerts only from the selected layouts.

To do this:

1. Select the layout (see [Selecting a layout for editing](#)(see page 452)).
2. Open the context menu and select: **Use in alarm layout**.



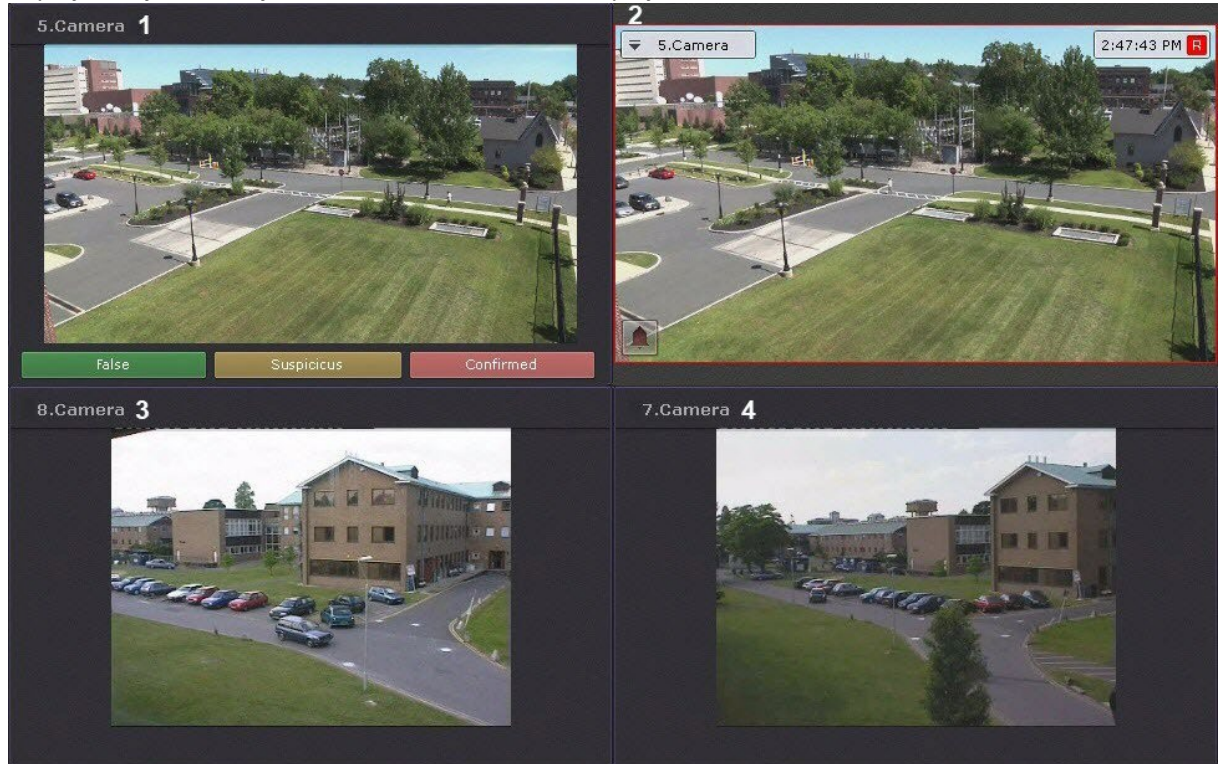
3. Save changes (see [Exiting Layout Editing mode](#)(see page 476)).

Note

To undo, select: **Disable use in alarm layout.**

Also, you can customize the layout with active alarms to show:

1. An alarm and the Alarm Management option (**1**). If there are several alarms, the longest-standing alarm is displayed. If you classify an alarm, the next alarm is displayed.

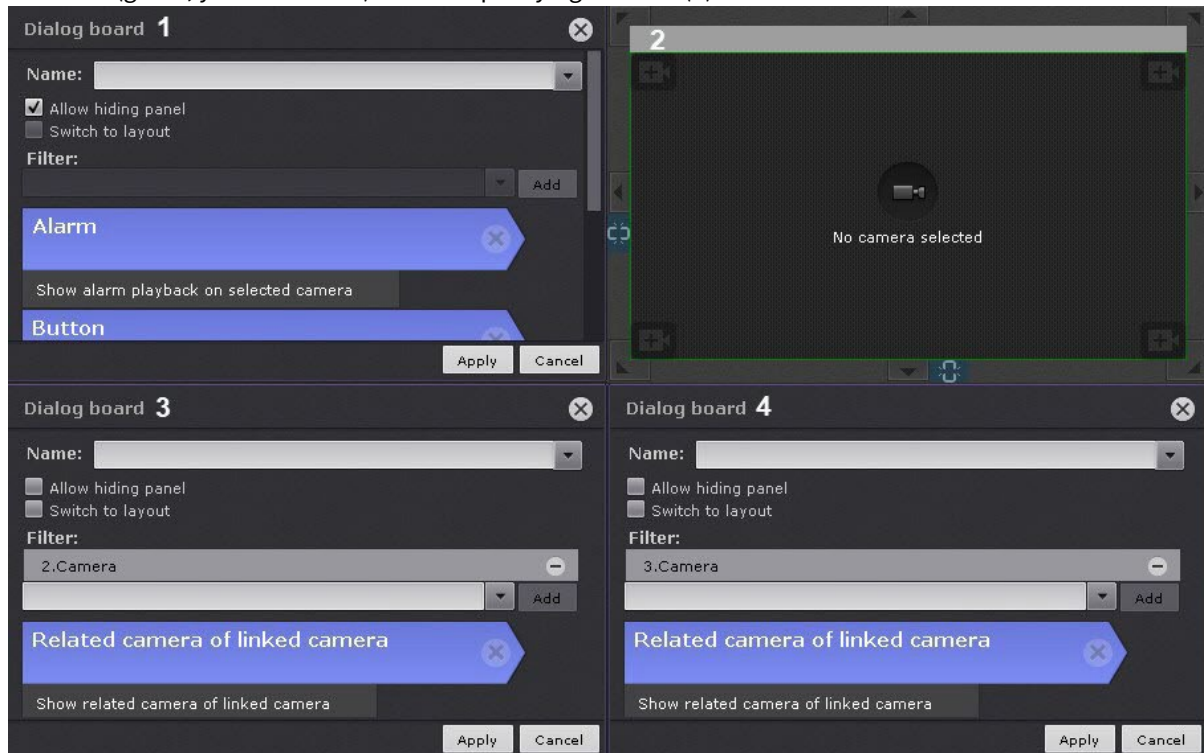


2. An alerted camera in Live Video mode (**2**).
3. 2 additional cameras (**3**, **4**) in Live Video mode (for example, the 2 nearest ones to the alarmed one).

Do the following:

1. Switch to the Layout Editing mode (see [Switching to Layout Editing mode](#)(see page 451)).

- In the first cell, add a Dialog board (see [Configuring a Dialog Board](#)(see page 473)) with the **Alarm** element and 3 buttons (green, yellow and red) without specifying a macro (**1**).



- Leave the second cell empty (**2**).
- In the third and fourth cells, add a message panel with **Related camera of linked camera** (**3, 4**).
- Link cells as follows: 1 with 2, 2 with 4, 3 with 4 (see [Linking cells](#)(see page 458)).
- Save the layout.
- For each camera, select 2 stand-by cameras (for example, those closest to it, see [The Video Camera Object](#)(see page 107)).

Note

In cell **4**, the first stand-by camera will be displayed, in cell **3** – the second.

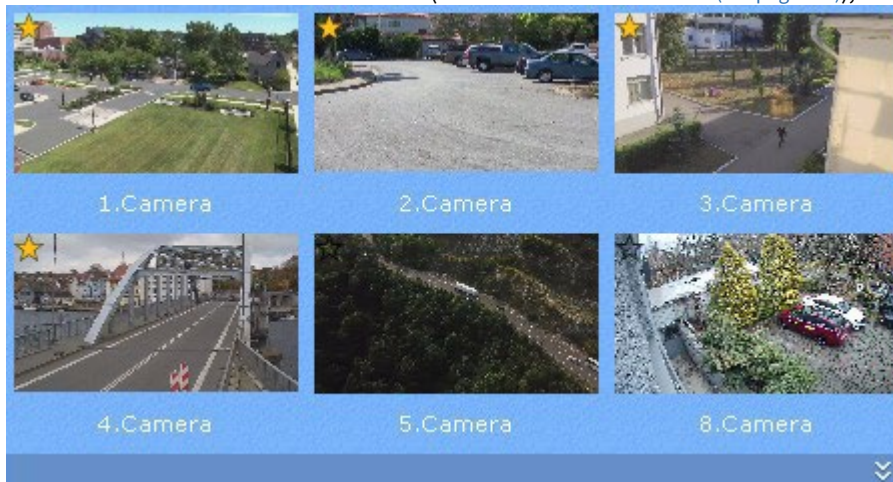
Configuring Marked cameras layout

To add a tag to a video camera, do one of the following actions:

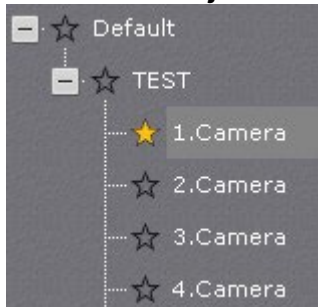
- Click the star  in the top left corner of the camera window;



- Click the star in **Camera Search Panel** (see [Camera Search Panel](#)(see page 612));



- Click the star in **Object Panel** (see [Objects Panel](#)(see page 615));



Attention!

You can add tags to cameras on any video wall (see [Managing monitors on a local Client](#)(see page 759)).

If you exceed the maximum number of cameras allowed, only the cameras most recently selected remain on the layout.

Note

To remove the tag, click the star again .

You can move cameras around on layouts by drag-and-drop.

Attention!

Camera windows are not saved on the layout. After restarting the Client or Server, you should add them again.

Note

You can use [Duplicate layout](#)(see page 450) to create a copy of the current special layout.


7.7.8 Configuring user-defined slide shows

A slide show is a set of layouts displayed on the operator's screen in a specified order for a specified dwelling time (see [Configuring the slideshow parameters](#)(see page 524)).

By default, the system includes only one slide show that includes all available layouts.

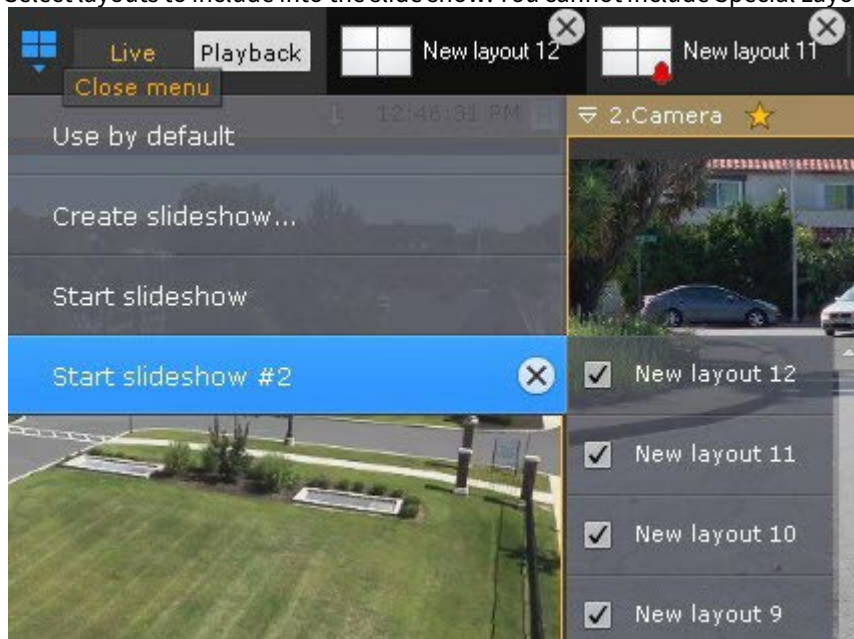
To create a user-defined slide show, do the following:

1. Go to Manage Layouts mode (see [Creating and deleting layouts](#)(see page 448)).


2. Click  and select **Create slideshow...**



3. Select layouts to include into the slide show. You cannot include Special Layouts into slide show.



4. Click **Save**.


To remove a user-defined slide show, click the  button.

7.7.9 Setting the default layout

You can set a default layout to be displayed after you launch the Web Client.

To set the default layout, do the following:


1. Go to Manage Layouts mode (see [Creating and deleting layouts\(see page 448\)](#)).
2. Go to the desired layout.

3. Click  and select **Use by default**.



Now, the current layout is assigned as default.

To assign another layout as default, repeat the steps above.

To make the system operate without a default layout, click  and select **Do not use by default**.



7.7.10 Setting a layout ID

You can set an ID for a layout. This may appear useful for calling layouts with hotkeys (see [Notes regarding hot key actions](#)(see page 553)).

To specify an ID, do the following:

1. Double click on a layout thumbnail.



2. Enter an ID.



3. Click anywhere in the Client UI.

Now, the ID is added and displayed before the layout name.



Note

When you hover the mouse cursor over a layout, the name and ID (if specified) of the layout are displayed separately.

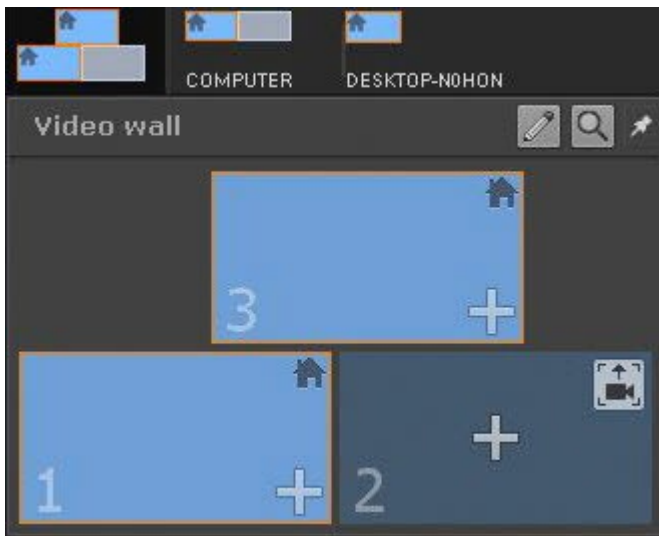


7.8 Configuring Videowall


A Videowall is a set of display monitors physically and logically connected to act as a single screen.


A Videowall may include any monitor connected to any Client within the Arkiv-domain.

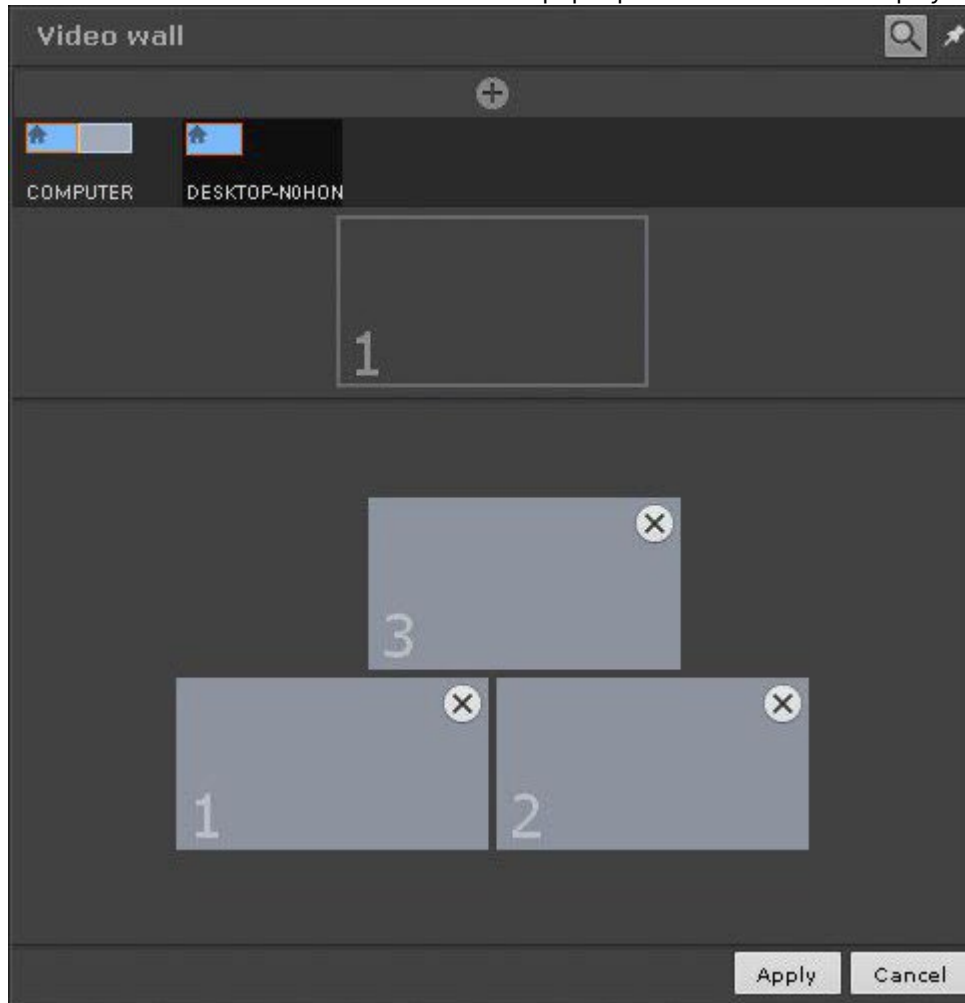
You can set up a Videowall via a dedicated panel (see [Videowall Panel](#)(see page 610)).



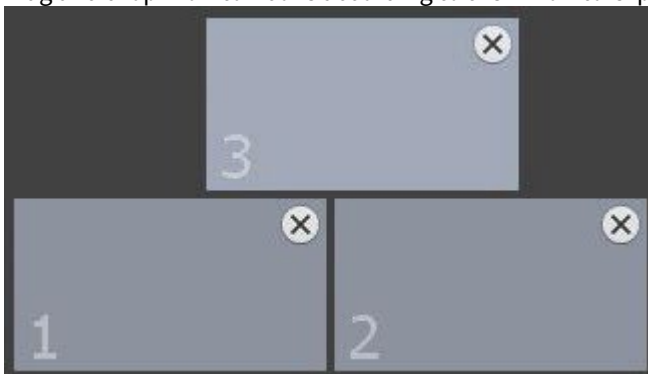
To set up a Videowall, do the following:

1. Click the  button.


- Click the  button. The list of available Clients pops up. Left click a Client to display its active monitors.



- Drag and drop monitor icons according to their monitors' physical locations on the Videowall.



Note

An ID number is assigned to each monitor added to a Videowall. To display the ID number of a monitor, click .

- Click **Apply**.

Now, the Videowall is configured.

Note

You can manage Videowall's monitors the same way as Client monitors (see [Managing monitors on a local Client](#)(see page 759), [Managing monitors on remote Clients within the Arkiv-domain](#)(see page 762)).

7.9 Configuring the Interactive Map

Configuration of the interactive map is performed in layout editing mode (see the sections [Interactive Map](#)(see page 611), [Switching to Layout Editing mode](#)(see page 451)).


Note

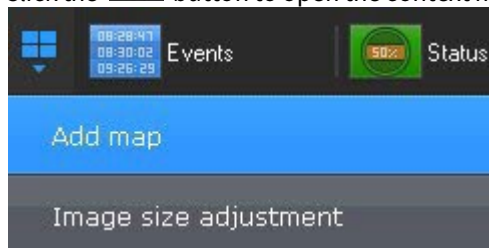
Creation, editing, and deletion of interactive maps are available to users with roles for which the **Change maps** component is activated (see the section [Configuring user permissions](#)(see page 430)).

7.9.1 Creating a new map

To create a new map, complete the following steps:

1. Do one of the following four actions:
 - a. In the lower-left part of the screen, click the  button (after displaying the map, see [Opening and closing the map](#)(see page 766)).

- b. Click the  button to open the context menu of the Layouts Panel and select **Add map**.



- c. In the map context menu (right-click on the empty background), select **Add new map**.
- d. Select a video camera from the list on the video camera panel by clicking on it and, while holding down the mouse button, move the cursor to the empty map background and then release the mouse button.

Note

Actions **c** and **d** are available, if no maps have been created in the system.

2. Enter the name of the map (1).

3. Select what will be used as a map: an image or geodata from OpenStreetMap (2).

❑ **Attention!**

Arkiv relies on geodata from OpenStreetMap provider received via Mapbox service. Creation of a map based on OpenStreetMap geodata provider is limited by default. To create OpenStreetMap maps, you should:

- Purchase an [OpenStreetMap license](https://www.mapbox.com/pricing/#gltile)¹⁵¹ for Static Tiles API from MapBox provider: <https://www.mapbox.com/pricing/#gltile>
- Quit the Client (see [Shutting down an Arkiv Client](#)(see page 82)).
- Open a configuration file `Arkiv.exe.config` in a word processor. The file is located in the `<Installation Directory of Arkiv>\bin`.
- Find the OpenStreetMap parameters group.

```
<provider name="OpenStreetMap">
  <param name="Id" value="32AAE9D2-CB9D-4B45-8BB8-
CE180629600D" />
  <param name="Copyright" value="© MapBox, ©
OpenStreetMap" />
  <param name="MinZoom" value="3" />
  <param name="MaxZoom" value="17" />
  <param name="DefaultZoom" value="9" />
  <param name="Enabled" value="true" />
  <param name="ApiKey"
value="pk.eyJ1Ijoicm9tYW5rYWxpbluIiw1YSI6ImNpcjF5bTlzNjAwN3
podm5uc2ZuaXVtcDMifQ.bUKBmLRZtczKqy0W5wvsZg" />
</provider>
```

- Set the **true** value for the **Enabled** parameter.
- For the **ApiKey** parameter, enter the received key.
- Save the changes to the file.
- Run the Client (see [Starting an Arkiv Client](#)(see page 76)).

As a result, it will be possible to use the geodata from OpenStreetMap provider as a map. When used, all requested map fragments will be saved on the computer hard drive, on which *Arkiv One* user interface is running. When the map fragments are reloaded, OpenStreetMap service is not accessed.

¹⁵¹ <https://www.mapbox.com/pricing/>

Note

The maximum image size is 4 million pixels (the number of pixels at 2000x2000 resolution). If a larger image is selected, no map is created.

4. In the corresponding field **(3)**, click the button and select the image that will be used as the site plan (if the **Raster image** map type is selected). The supported formats are png, jpg, jpeg, jpe, gif and bmp.

Note

If the image is not selected, a map with a white background will be created.

5. If you use a geo maps, enter the address, or the postal index, or OpenStreetMap coordinates (refer to [provider's website](#)¹⁵² for details) of the desired location into the **Address** field, then click the button. Use the slider or the mouse scroll wheel to zoom in and out, and any standard method for map navigation.

New Map

Name

City

Type

OpenStreetMap

Address

Paris

6. Select the users who can access the map **(4)**: all users, current user only (**Not shared** position), selected roles only **(5)**.
7. Click the **Apply** button.

Creation of a new map is complete.



¹⁵² <http://wiki.openstreetmap.org/wiki/RU:Search?uselang=ru>

7.9.2 Adding system objects to the map

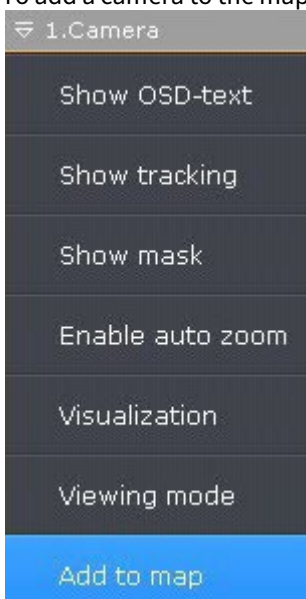
On maps you can add three types of system objects (video camera, input, and output) as well as objects for switching to another map.

Adding video cameras

You can add cameras to the map in one of three ways:

1. By using the viewing tile context menu.
2. By using the map context menu.
3. By dragging a video camera icon from the video camera panel to the map.

To add a camera to the map, in the context menu of the viewing tile, select **Add to map**.



The camera is added to the map.

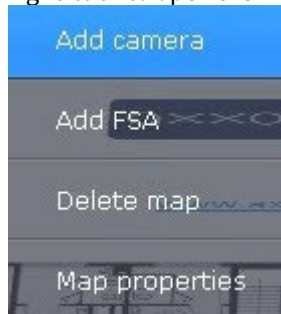
Attention!

When a camera is added to a geo map, its icon is automatically positioned according to the camera coordinates (see [The Video Camera Object](#)(see page 107)).

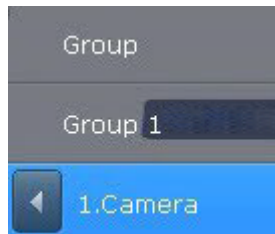
If the cameras have a built-in GPS tracker, their locations on the map change automatically according to the received data (see [Configuring cameras with an embedded GPS tracker](#)(see page 495)).

To add a video camera by using the map context menu:

1. Right-click to open the map context menu and select **Add camera**.



2. Select the necessary video camera in the displayed list by using one of the following methods:
 1. If the necessary video camera is included in a group, you must first select the group (the group may also contain subgroups), then select the video camera.
 2. If the necessary video camera is not included in one of the groups, you must select the list of all video cameras that follows the list of groups.



The camera is added to the map.

You can also, in the video camera panel, left-click a video camera's icon. Drag it to the map.

If you use this method to transfer a group of cameras to the Map, all cameras within the group will be added.

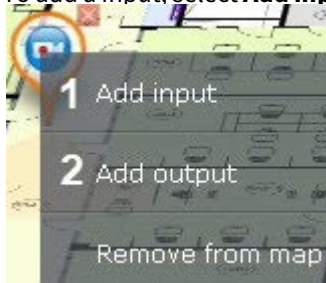
Adding inputs and outputs

To add inputs and outputs of video camera to the map:

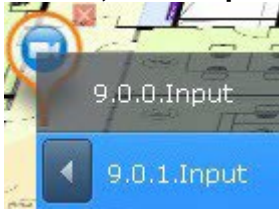
Note

Only **Input** and **Output** objects that have been activated can be added to the map.

1. Right-click the icon of the video camera on the map. A context menu appears.
2. To add a input, select **Add input (1)**. To add a output, select **Add output (2)**.



3. In the list, select a **Input** or **Output** object.



Inputs and outputs have now been added.

By default, the icons of the input and output are attached to the video camera's icon. If you move the video camera icon, the icons of all of the video camera's devices are moved as well.

However, you can detach the input and output icons from the icon of the video camera. To do so, move them. Then the input and output icons are moved independently.

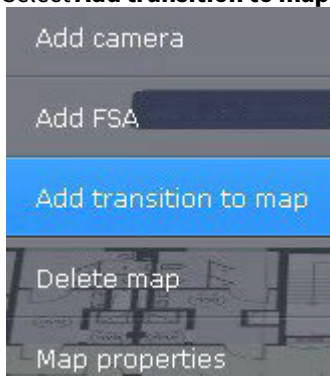
To add inputs and outputs of I/O devices to the map, do the following:

1. Right-click anywhere on the map for a context menu.
2. Select **Add input** or **Add output**.
3. In the list, select a **Input** or **Output** object.

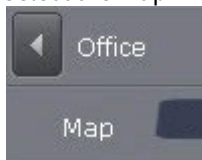
Adding switches to another map

You can add a "switch" to another map in one of two ways:

1. Select the tab of the map to which you want the switch to point and, without releasing the mouse button, drag it to the map and release the mouse button.
 2. By using the map context menu.
1. Select **Add transition to map**.



2. Select the map in the system to which the new switch will point.



Addition of the switch is now complete.



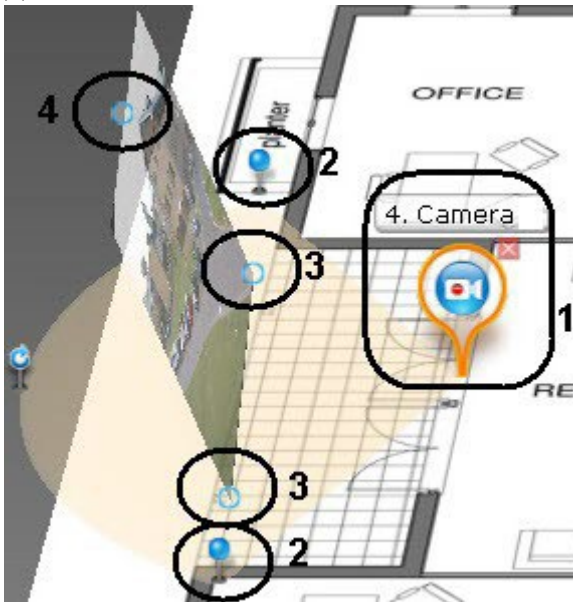
Then drag the switch icon to the necessary place on the map.

7.9.3 Configuring cameras on the map

Configuring a camera in standard map viewing mode

After adding a camera to the map, perform the following actions:

1. Drag the video camera's icon to the place on the map that represents the camera's actual location at the site (1).



2. On the map, use the corner nodes to adjust the video camera's field of view to match the actual situation at the site (2).

Important!

For ceiling-mounted fisheye cameras (see [Configuring fish-eye cameras](#)(see page 112)), you are advised to set a 360° field of view. If you do so, the video from the camera will be directly available in the specified area:



3. Configure the area for video display:

Important!

The video display area is not available for ceiling-mounted fisheye cameras.

- Using the points at the base (**3**), set the size of the area (left-click and drag the cursor).
- Using a third point (**4**) to change the tilt of the area.

Note

You can switch map display to flat while working with the Map (see [Customizing an Interactive Map](#)(see page 770)).

- Using the slider in the lower-right corner to set the default transparency of the area.



Configuration of the camera in standard map viewing mode is complete.

Configuring cameras with an embedded GPS tracker

Some devices contain an embedded GPS tracker that transmits the current coordinates of the device to *Arkiv* VMS.

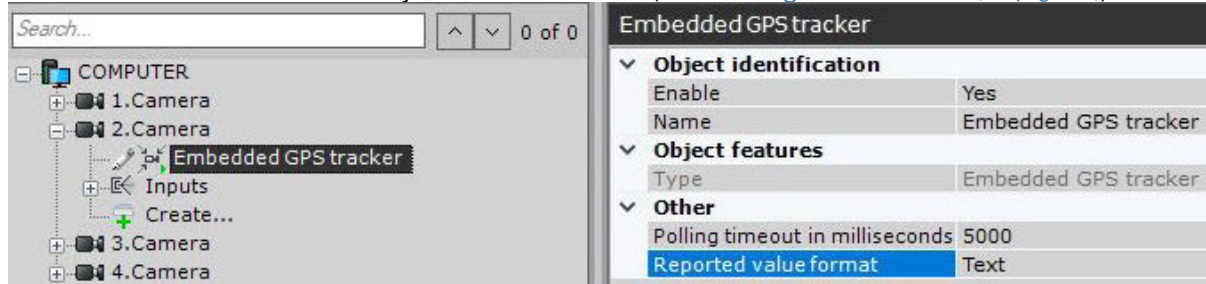
Location of these devices/cameras and their feeds are automatically geotagged when displayed on a geo map.

Note

This feature is widely used when cameras are installed, for example, in ambulances or public transport.

To enable this feature, do as follows:

1. Create an embedded GPS tracker object for video cameras (see [Creating Detection Tools](#)(see page 229)).



2. Create a geomap (see [Creating a new map](#)(see page 488)).
3. Add video cameras to the geomap (see [Adding video cameras](#)(see page 491)).

Configuring cameras in immersion mode

You can link video to the objects shown on a map. This allows making video surveillance more visual and informative.

The feature is available through immersion mode (see [Immersion mode](#)(see page 774)).

To link video to a map, use the four attachment points. Objects in the video need to be linked to their depiction on the site map.

To link objects with symbols on the map:

1. Click an object in the video. A point is added.

Important!

When specifying points on an image, follow the rules:

1. All 4 points should belong to the same horizontal plane. Place points on the floor or on the ground.
2. Do not place 3 points on one line.
3. Points should show the perspective of the plane.


2. Click on the depiction of the object on the map. A second point is added, connected by a line to the first point.

Important!

When a fourth link is made, it is possible that the second point cannot be placed in some areas. This occurs when the system cannot find a valid angle for displaying the video and map for the given links. Most likely, the links have been set incorrectly.



After a fourth link is added, an angle is chosen so that the surveillance objects in the video and on the map coincide.

To remove a link, place the cursor above the first point in the link and click the  button. After all links are added, it is possible to change the location of previously set points by dragging them while holding the left mouse button.

To save links between video and the map, exit layout editing mode and save changes. The links you make are discarded if any of the following occur before you exit and save changes:

- The position of the video camera icon on the map is changed.
- The angle of display of the video display area for the camera on the map is changed.
- The field of view of the camera on the map is changed in any way.

7.9.4 Attaching a map to a layout

You can attach a map to a layout. This means that when you switch to the layout, the attached map opens automatically.

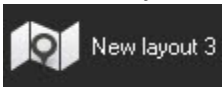
To attach a map to a layout:

1. Select the layout with which you want to associate the map in the layouts ribbon or create a new layout (see [Creating and deleting layouts](#)(see page 448) and [Selecting a layout for editing](#)(see page 452)).
2. Go to map editing mode (see the section [Opening and closing the map](#)(see page 766))
3. Go to an existing map with which you want to associate the layout or create a new map (see the sections [Switching between maps](#)(see page 771) and [Creating a new map](#)(see page 488)).
4. Save changes and exit layout editing mode (see [Exiting Layout Editing mode](#)(see page 476)).

After you save the layout, its icon resembles than shown in picture below.




If a map is open in 2D mode when you save a layout, when you switch to that layout, the map will always open in 2D mode. The layout icon resembles that shown in picture below.




The map is now attached to the layout.

7.9.5 Removing objects from the map

To remove an object from the map, click the  button that is next to the object icon, or in the context menu, select **Remove from map**.



Note

To delete a map switch, you must click the  button.


7.9.6 Setting keywords for geo map search

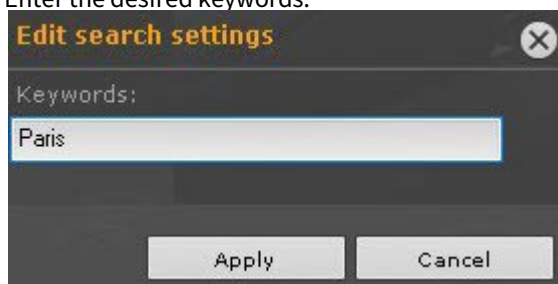
The keywords are needed to locate a site or a street on OpenStreetMap.

For example, if you are searching for a site or a street in a particular city/town, the name of the town has to be entered as a keyword.

The default keyword is the address set during the map creation process (see [Creating a new map](#)(see page 488)).

To set new keywords, you need to:

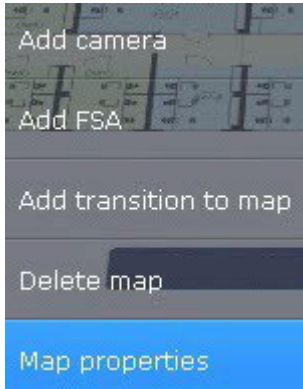
1. Click  in the lower panel.
2. Enter the desired keywords.



3. Click **Apply**.

7.9.7 Changing map type and display

You can change the type and display of a map that has been created previously. To do so, open the map context menu and select **Map properties**.



A map properties configuration window opens, which is similar to the map creation window (see [Creating a new map](#)(see page 488)).

7.9.8 Renaming the map

To rename the map, in the lower-left corner of the screen, left-click a tab and specify a new name.



7.9.9 Sorting of map lists

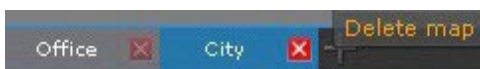
You can change the order of tabs for previously created maps. By default, tabs with maps are ordered by creation date.

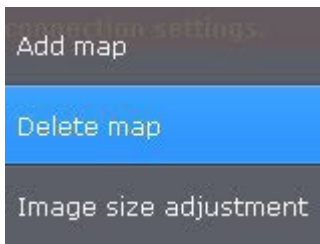
To change the order, drag and drop tabs as necessary. Left-click a tab and drag it to the desired location.



7.9.10 Deleting a map

To delete a map, in the lower-left corner of the screen, select the **X** button on the corresponding tab. Alternatively, in the context menu, you can select **Delete map**.





7.10 System preferences

7.10.1 Server settings

Configuring Forensic Search Post-Analytics in Archive

On the page:

- [Turning on the video stream metadata recording](#)(see page 500)
- [Configuring user permissions for Forensic Search in archive](#)(see page 501)

To make it possible to perform Forensic Search Post-Analytics of the archives of a video camera, the following conditions must be met:

1. Video meets the requirements (see [Video suitability for Forensic Search of recorded video \(requirements\)](#)(see page 501)).
2. There are video stream recordings from the desired video camera in the archive (see [Configuring recording to an archive](#)(see page 207)).
3. There are metadata recordings from this video stream in the object trajectory database. Metadata can be generated by *Arkiv* (see [General information on Scene Analytics detection tools](#)(see page 239), [Face detection tools](#)(see page 265)) or received from a video camera (see [Embedded Detection Tools](#)(see page 370)).
4. The user has the appropriate permissions.

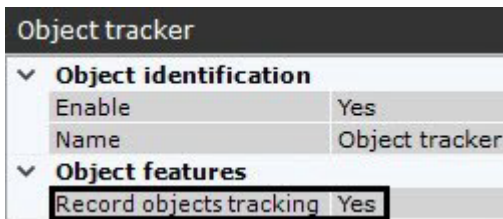
This section contains information on how to configure the *Arkiv* software package to satisfy these conditions.

Turning on the video stream metadata recording

To enable metadata recording, select **Yes** in the **Record objects tracking** list for the corresponding detection tool (object tracker, facial recognition, base motion detection, onboard video analytics).

Note

The metadata recording is enabled by default.



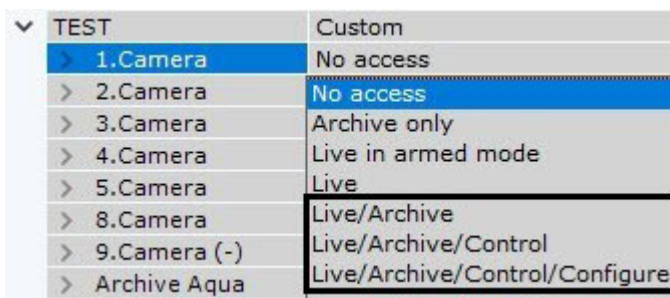
In video motion detection (VMD) settings, you have to activate the **Object tracking** parameter (see [Setting up VMD-based Scene Analytics detection tools](#)(see page 264)).

Note

Information on configuring storage of metadata is provided in the section titled [Configuring storage of the archive, system log, and metadata](#)(see page 517).

Configuring user permissions for Forensic Search in archive

You need **Live/Archive**, **Live/Archive/Control** or **Live/Archive/Control/Configure** permissions for a video camera to perform a smart search (see [Configuring user permissions](#)(see page 430)).



Video suitability for Forensic Search of recorded video (requirements)

For Forensic Search of recorded video to be possible, video must meet the same requirements as those applied to video for detection tools (see [Video requirements for scene analytics detection tools](#)(see page 241)).

In addition, the minimum and maximum detectable object speeds in video are related to the camera's frame rate.

1. The maximum detectable speed depends on the size of the object. The following table shows the relationship between the maximum detectable speed and the frame rate for typical objects (people and cars):

Frame rate	Maximum detectable speed for people	Maximum detectable speed for cars
6 fps	5 km/hr	40 km/hr
12 fps	10 km/hr	85 km/hr
25 fps	20 km/hr	170 km/hr

So if it is necessary, for example, to detect people moving at speeds of up to 10 km/hr, it is sufficient to record at 12 fps.

2. The minimum object speed should be such that the object moves at a rate of at least 1 pixel per frame.

Setting up privacy masking

Masking faces

You can mask recognized faces of a designated users' group (role).

The face(s) will be masked:

- during Live or Video Footage viewing;
- during Video Footage search.

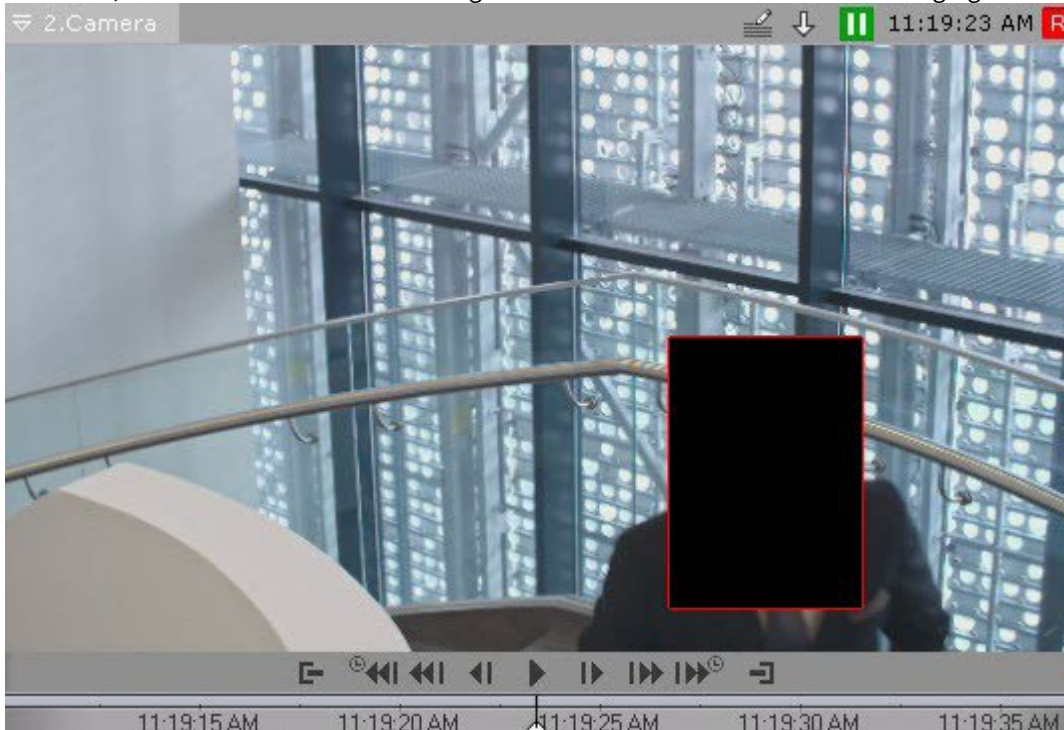
Attention!

Privacy masks are displayed in the standalone Client software only. You cannot use masks with both Web and Mobile Clients.

To do it, follow the steps below:

1. Create and configure Face Detection Tools for cameras where face masking is necessary (see [Functions of face detection tools](#)(see page 266)).
2. Set **No** for the **Show faces** parameter in the Role Settings panel (see [Creating and configuring roles](#)(see page 431)).

As a result, faces will be masked on all designated cameras' videos for all users belonging to this role.



Setting up privacy masking in Video Footage

You can mask any objects from Video Footage viewing by any particular user.

The objects will be masked:

- during Video Footage viewing;
- during Video Footage search;
- on exported videos.

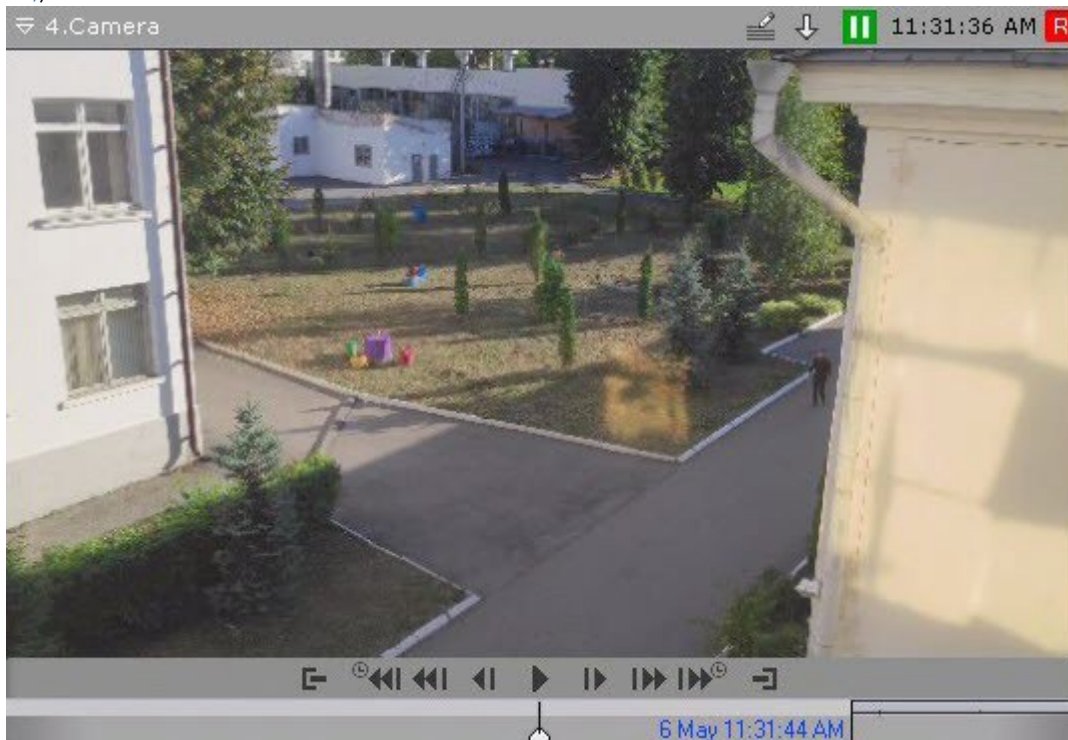
Attention!

Privacy masks are displayed in the standalone Client software only. You cannot use masks with both web and mobile Clients.

To do this, set **No** for the **View masked video** option in Role Settings (see [Creating and configuring roles](#)(see page 431)). The objects will be masked for all users belonging to this role.

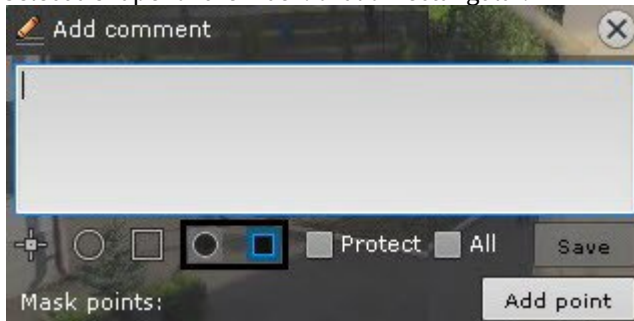
To mask an object from Video Footage viewing, do the following:

1. Proceed to Archive Mode and find the object to be masked (see [Switching to Archive Mode](#)(see page 668)).
2. Locate the frame where the object first appears in the camera's FoV (see [Navigating in the Archive](#)(see page 678)).



3. Click the  button.

4. Select a shape for the mask: oval or rectangular.



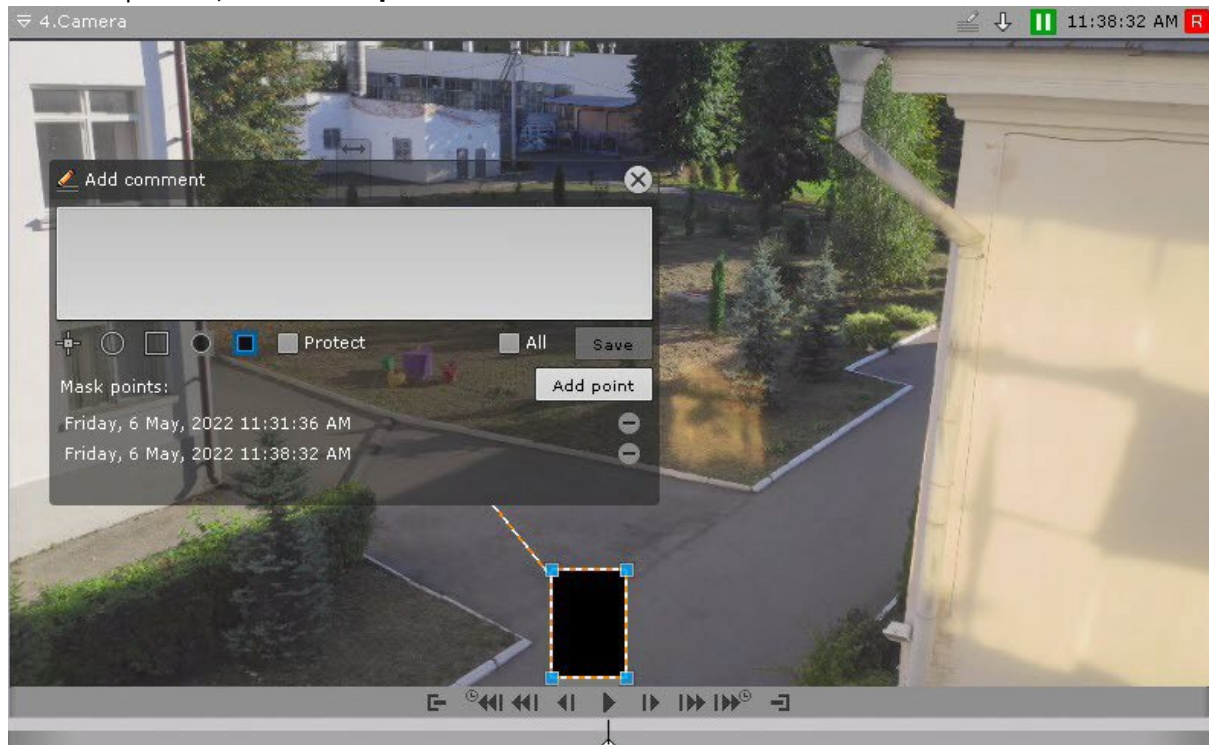
5. Apply the mask over the object.

Note

The procedure of setting up a mask is similar to adding a comment (see [Adding a comment](#)(see page 637)).

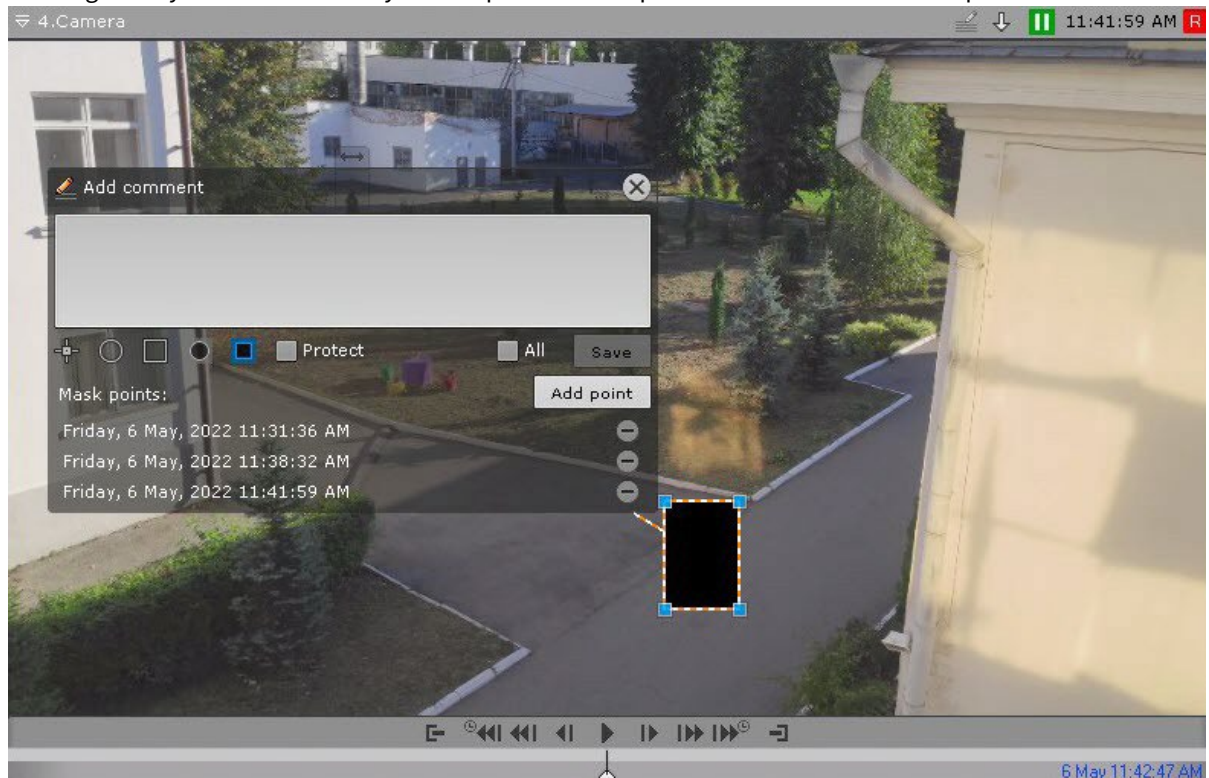


6. Locate the last frame before the object disappears from the camera's FoV and place the mask over it. To save mask position, click the **Add point** button.




7. The system automatically interpolates the mask position on intermediate frames, assuming the object's motion is uniform and rectilinear.

8. Check the video. If necessary, you can specify additional mask positions on intermediate frames for better masking. The system automatically re-interpolates mask positions within the video sequence.



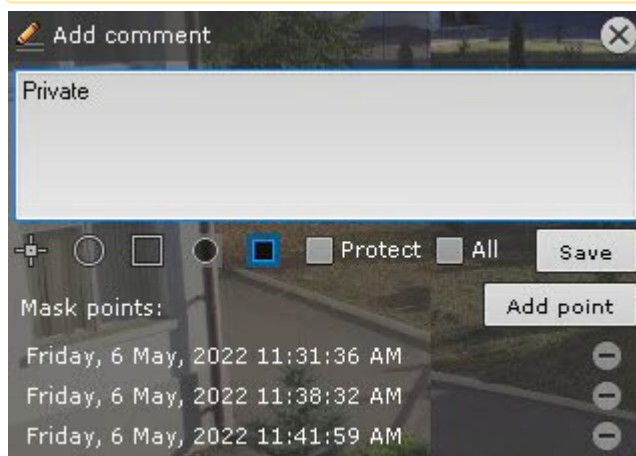
Note

To remove a mask position, click the  button.

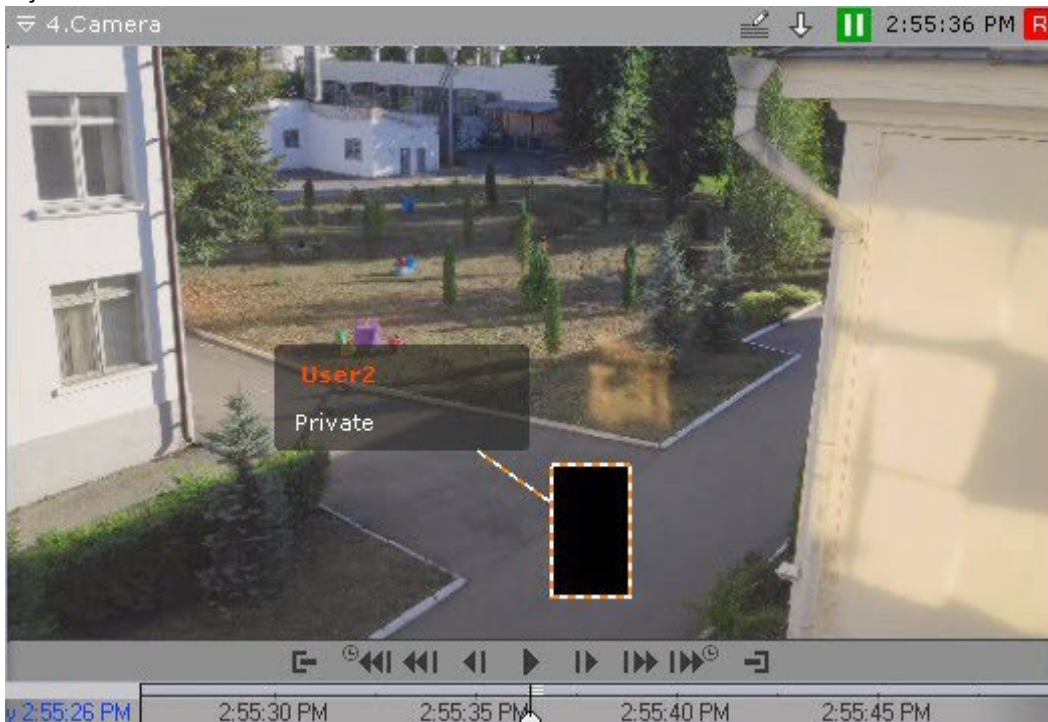
9. After setting all necessary mask positions, enter your text notes and click **Save**.

Attention!

After the mask is saved, you can not delete it. Only the users having roles where **View masked video** parameter is set to **Yes** may bypass the masking (see [Creating and configuring roles](#)(see page 431)).



The object is now hidden. When viewing the Video Footage, users without appropriate access rights will see the object masked.



Analyzing video from external systems (Offline Analytics)

You can run *Arkiv* analytics on any video file from either external or internal storage.

To do this, you need to [import](#)(see page 507) the video file and [index](#)(see page 509) it.

After that, you will have the following options available:

1. [Forensic Search for Fragments \(Post-Analytics\)](#)(see page 705).
2. [Face search](#)(see page 718).
3. [LPR search](#)(see page 717).
4. [Searching comments](#)(see page 705).

Note

You can search only by text comments entered after the video is imported (see [Operator comments](#)(see page 636)).

5. [Compressed playback of archives \(Timelapse Compressor\)](#)(see page 672).

Select a mirror archive (see [Selecting an Archive](#)(see page 669)) to run video analytics on and **Offline Analytics** for metadata source (see [Forensic Search for Fragments \(Post-Analytics\)](#)(see page 705)).


Importing video to Arkiv

To import external video data, do as follows:

1. Create an archive. It must be equal to or larger than the total size of all files in it (see [Creating archives](#)(see page 202)).

2. Run IP Device Discovery Wizard (see [Adding and removing IP devices](#)(see page 97)):
- In the form for manually adding an IP device, select **Inaxsys** in the **Vendor** drop-down list (1).

IP address	Port	Vendor	Username	Bind to the archive
0.0.0.0	80	Inaxsys 1	Auto	Archive DeepPink 3
Device type	Model	Password	Recording	
IP device	ExternalArchive 2	••••	No	

- Select **ExternalArchive** from the models list (2).
- Select the archive file to which video recordings will be added (3).
- Click the  button.

Attention!

When you add a camera:

- Continuous replication from the on-board storage to the selected archive file (see [Configuring data replication](#)(see page 210)).
- The **Scene Analytics** object will be created (see [Creating Detection Tools](#)(see page 229)) and metadata enabled (see [Setting general parameters of Tracker-based Scene Analytics detection tools](#)(see page 245)).

3. Configure **Object Tracking** (see [Setting general parameters of Tracker-based Scene Analytics detection tools](#)(see page 245)). If you want to find persons and car numbers in video footage, then create and configure the appropriate detection tools (see [Configuring License plate recognition \(VT\)](#)(see page 301), [Configuring Face detection](#)(see page 267)).

Attention!

Do not remove the Object Tracker from your system. Otherwise you cannot import videos into your system.

4. If necessary, change the mode of data replication (see [Configuring data replication](#)(see page 210)). If you select **On Demand** mode you can start the analysis of the video image manually (see [Indexing video from external sources](#)(see page 509)).

Attention!

Replication is performed only to the end of the archive. It is not possible to overwrite existing data in the archive (see [Configuring data replication](#)(see page 210)).

If you ignore this rule, the videos will not be indexed.

It's preferable to import all the videos from a folder at once, otherwise you have to manually remove metadata and records from the Archive before the next replication (see [Indexing video from external sources](#)(see page 509)).

5. In the **Folder** field, specify the storage location of the video footage that will be used as External Archive.

High-quality video stream	0. Auto
Compression Rate	1
Folder	C:\Users\1\Desktop\cameras\20220506T100000_camera1
Frames per second (fps)	25
Resolution	100 x 100
Video codec	Auto

❑ Attention!

The following compression algorithms are supported: MJPEG, MPEG-2, MPEG-4, MxPEG, H.264, H.265, Hik264 (x86 only) as well as uncompressed ("raw") video.
A "raw" format is a stream of consecutive frames without time stamps.

6. Imported folders with video footage or video files must be ISO 8601 timestamped: YYYYMMDDTHHMMSS.
- a. If the timestamp is in the folder name, all the videos starting from the specified date and time will be imported without exception. The video recordings are ordered according to the file name as follows:

❑ Note

For example, if the **20220506T100000_camera1** folder contains 3 files (1.avi, 2.avi, 3.avi), they will come into the archive as follows:

1. avi: [6 May 2022, 10:00:00; 6 May 2022, 10:00:00 + the duration of 1.avi].
2. avi: [6 May 2022, 10:00:00 + the duration of 1.avi; 6 May 2022, 10:00:00 + the duration of 1. avi and 2.avi].
3. avi: [6 May 2022, 10:00:00 + the duration of 1.avi and 2.avi; 6 May 2022, 10:00:00 + the duration of 1.avi and 2.avi and 3.avi].

- b. If the folder name does not have the timestamp, all the video files will be imported in accordance with their timestamps. If the file name is incorrect, the starting point of the recording on the timeline will correspond to the modification date of the file.

❑ Attention!

Arkiv operation may be incorrect if video recordings in the folder overlap. No error messages are displayed in this case.

The date in the folder name or file name (or their creation dates) may not precede the metadata storage period as defined in the system (see [Configuring storage of the system log and metadata](#)(see page 517)).

If you add a **Z** character to the end of the timestamp, the time zones for the videos will be GMT+0, otherwise – the time zone of the Server.

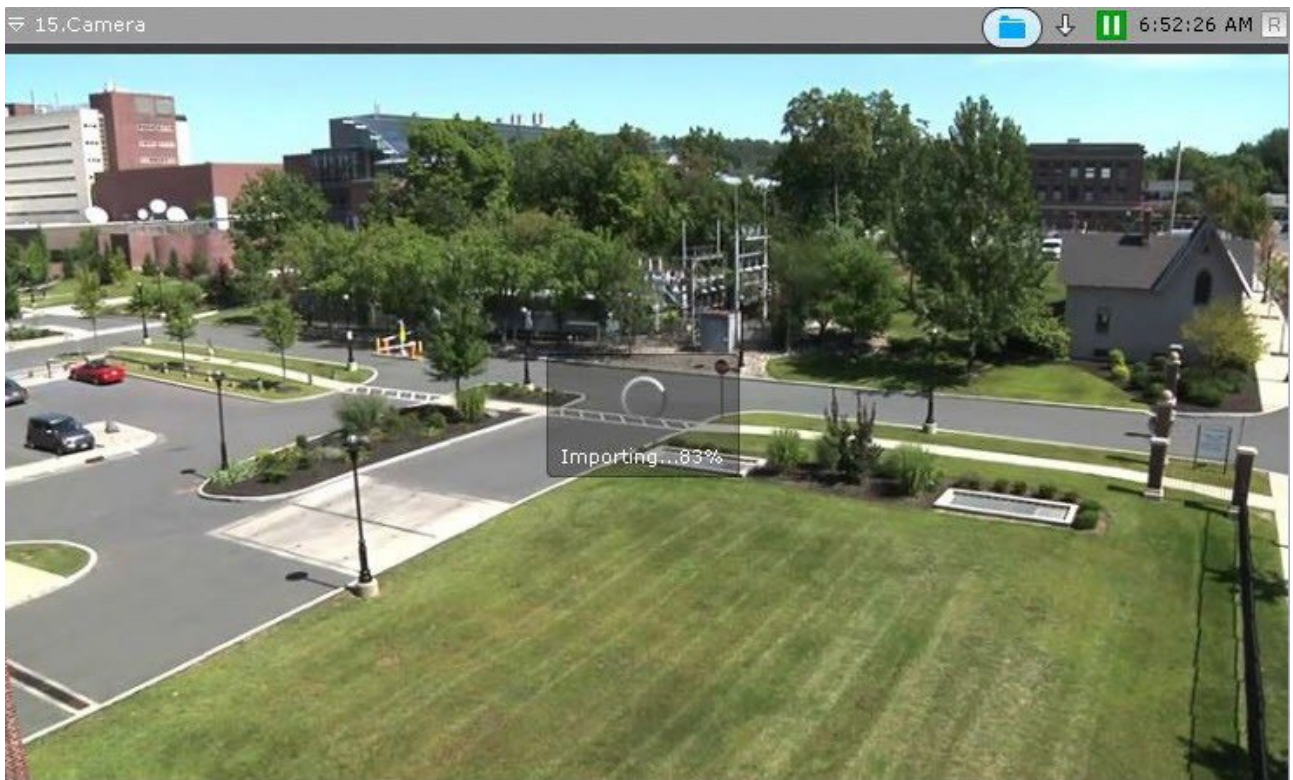
For example, 20220228T125130Z.avi. In the Archive mode, this video recording will fit into the timeline from 28 February 2022, 12:51:30 GMT+0 to February 28, 2022, 12:51:30 + recording time GMT+0.

7. Click the **Apply** button.

Indexing video from external sources

By default, indexing starts automatically after specifying video files (see [Importing video to Arkiv](#)(see page 507)). This may take a while and increase the CPU usage. Similar to the export process, the status of the indexing process is displayed at the top of the screen (see [Viewing export progress](#)(see page 785)) and in the viewing tile.

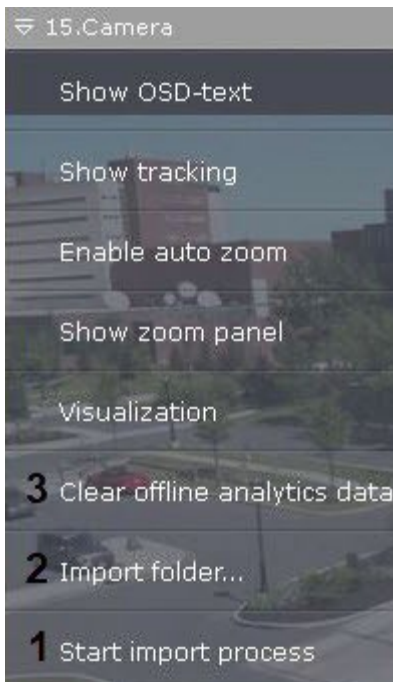




Attention!

You should not view the replicated archive during indexing.
Also, do not run multiple simultaneous indexing procedures.

If you set the **On demand** replication period (see [Configuring data replication](#)(see page 210)), then to start the indexing procedure select **Start import process (1)** from the context menu of the viewing tile.



If you want to index the video from another folder, click **Import folder... (2)**, or click  in the viewing tile.

Attention!

If you change the folder, all files in Mirror Archive and metadata will be lost.

Attention!

You can select only the folder specified in the settings and its sub-folders.

To remove metadata and video from an archive, select **Clear offline analytics data (3)** and confirm file formatting.

Warning



You choose formatting partitions for the archive: Archive AliceBlue.

During formatting all the data stored in these archive partitions will be lost!

Format

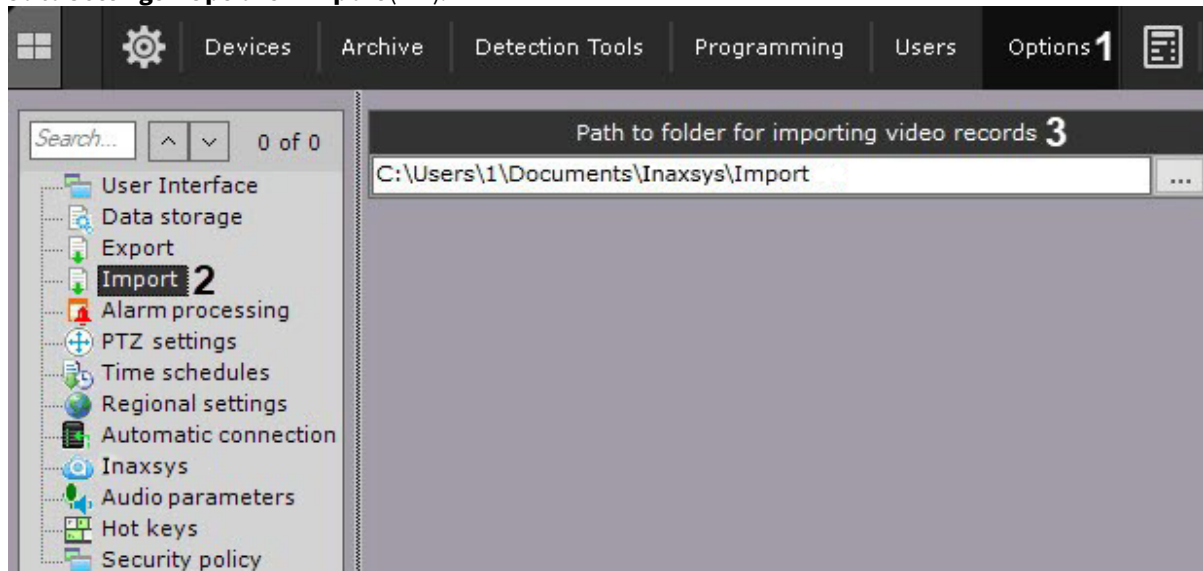
Cancel

How to set a folder to import videos from

If you need videos from a different folder on Server to be indexed in addition to already processed footage, you can select only the folder specified in the settings, and its sub-folders (see [Indexing video from external sources](#)(see page 509)).

To specify the folder, do the following:

1. Go to **Settings->Options->Import (1-2)**.



2. Specify the path to the folder (3).
3. Click the **Apply** button.

Configuring hardware video decoding for display on the Client

In the *Arkiv* Client, there are two ways for hardware video decoding:

1. Using the Intel Quick Sync Video technology (see [Hardware-based decoding with Intel Quick Sync Video](#)(see page 512)).
2. Using the NVDEC chip on NVIDIA graphics cards (see [Hardware-based decoding with NVIDIA NVDEC chips](#)(see page 514)).

In addition, decoding with both Intel QSV and NVDEC is possible (see [Simultaneous decoding with Intel Quick Sync Video and NVIDIA NVDEC chips](#)(see page 516)).

Attention!

Hardware decoding is not supported for the videos that were created using the YUV422 format. If hardware decoding is enabled, such video will be decoded by the software on the CPU.

Hardware-based decoding with Intel Quick Sync Video

Intel Quick Sync Video is a technology available on some Intel processors, that provides hardware acceleration for video encoding and decoding. This technology provides faster and more energy efficient processing of video content.

❑ Attention!

Arkiv applies Intel Quick Sync Video for decoding:

1. Video in the formats: H.264, H.265 and H.265+.
2. Live mode, Archive mode (forward playback only) and [Timelapse Compressor](#)(see page 672) mode.

❑ Attention!

If the Client shares the same computer with the Server, which applies a detection tool to a video stream, Intel Quick Sync Video will not be used for displaying this stream.

❑ Note

Maximum pixel resolution depends on your particular version of the Intel Quick Sync. For details, refer to <https://www.intel.com/content/www/us/en/homepage.html>.

To use Intel Quick Sync Video, make sure your system meets the following requirements:

1. The CPU has an integrated graphics core with Intel Quick Sync Video support.

❑ Note

You can check if the CPU supports Intel Quick Sync Video [here](#)¹⁵³.

❑ Attention!

For H.265 and H.265+ video formats, Intel Quick Sync Video technology is supported only on Intel processors with microarchitecture: Braswell (only decoding), Cherry Trail (only decoding), Skylake, Apollo Lake, Kaby Lake, Gemini, Coffee Lake and newer microarchitecture.

2. The mainboard supports the GPU core (includes [Flexible Display Interface](#)¹⁵⁴).
3. The graphics driver supports Intel Quick Sync Video. We recommend using the latest version of [the Intel HD Graphics Driver](#)¹⁵⁵.

❑ Note

You can also update the driver automatically using the [Intel Driver Update Utility](#)¹⁵⁶.

To enable Intel Quick Sync Video in Arkiv, do the following:

1. Enable using the integrated graphics core in the BIOS settings.

❑ Note

Depending on the BIOS version, the option may be named differently (**iGPU, Internal Graphics, Integrated Graphics Adapter – PEG**).

2. It is not allowed to use an integrated graphics core and an external graphics card at the same time. In this case, to use Intel Quick Sync Video, do the following:

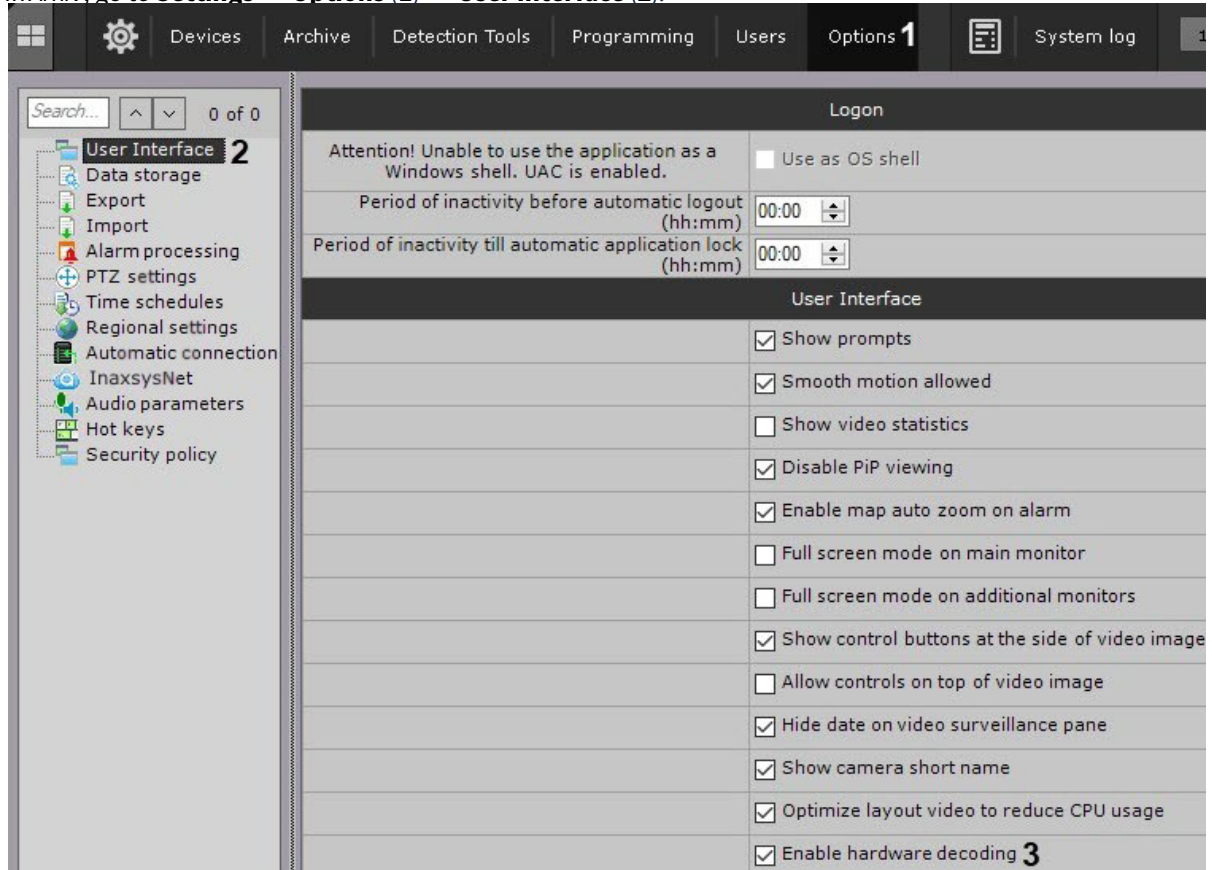
¹⁵³ <http://ark.intel.com/>

¹⁵⁴ https://en.wikipedia.org/wiki/Flexible_Display_Interface

¹⁵⁵ <https://downloadcenter.intel.com/search?keyword=Intel%C2%AE+HD+Graphics+Driver>

¹⁵⁶ http://www.intel.com/content/www/us/en/support/detect.html?iid=dc_iduu

- a. Enable **Multi-Monitor** in the BIOS settings.
 - b. In Windows OS connect a virtual monitor to the integrated graphics core and extend the desktop to it.
3. In *Arkiv*, go to **Settings** → **Options (1)** → **User Interface (2)**.



4. Set the **Enable hardware decoding** checkbox (3).
5. Click the **Apply** button.

Intel Quick Sync Video in *Arkiv* is enabled.

Hardware-based decoding with NVIDIA NVDEC chips

NVDEC chips on NVIDIA GPUs provide accelerated hardware-based video decoding. This helps to reduce the load on the CPU and/or increase the number of the video cameras displayed on the Client.

❑ Attention!

In *Arkiv*, the NVDEC chips are used to decode:

1. Video in the H.264, H.265 and MPEG-2 formats.
2. Live mode, Archive mode (forward playback only) and **Timelapse Compressor** (see page 672) mode.

❑ Attention!

Before you start, make sure to install the latest driver for your NVIDIA GPU.

Note

A list of the devices that support decoding with NVDEC chips, see on the [NVIDIA official website](#)¹⁵⁷.

Note

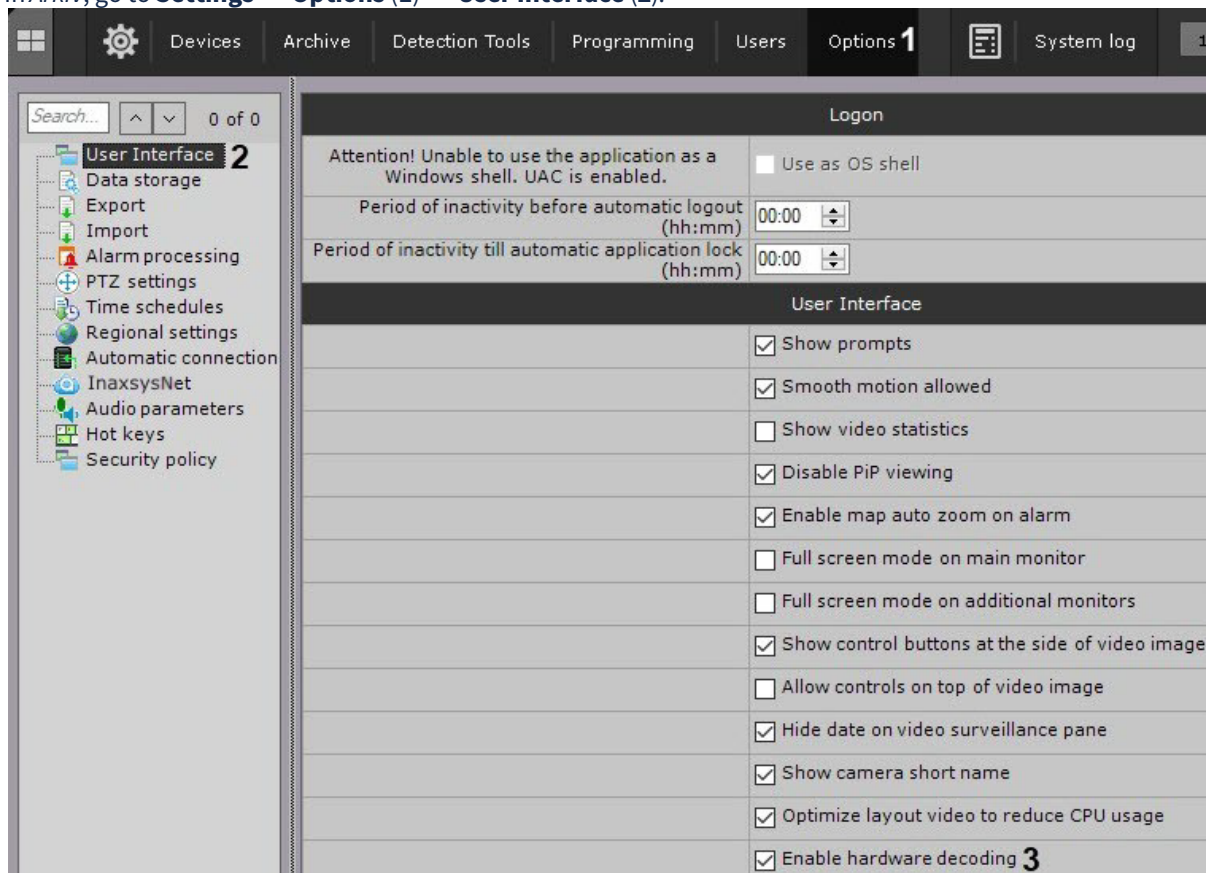
When decoding with NVIDIA NVDEC chips on portable computers due to the specifics of the devices interaction, the resources of the built-in graphics card will also be used.

When decoding with NVDEC chips, the following limitations apply:

1. Maximum video resolution for the H.264 format is 4096x4096.
2. Maximum video resolution for the H.265 format is 8192x8192.
3. The maximum total frame rate per second for the H.264 format is 648 FPS.

To enable decoding with NVDEC chips, do the following:

1. In *Arkiv*, go to **Settings** → **Options (1)** → **User Interface (2)**.



2. Set the **Enable hardware decoding** checkbox **(3)**.
3. Click the **Apply** button.

Decoding with NVDEC chips is enabled.

¹⁵⁷ <https://developer.nvidia.com/video-encode-decode-gpu-support-matrix>

Simultaneous decoding with Intel Quick Sync Video and NVIDIA NVDEC chips

Arkiv allows simultaneous decoding with Intel Quick Sync Video and NVIDIA NVDEC chips.

In this case, NVIDIA devices will be used first for decoding. When their resources end, Intel Quick Sync Video technology will be used.

For the simultaneous decoding, it is necessary to configure the decoding with Intel Quick Sync Video (see [Hardware-based decoding with Intel Quick Sync Video](#)(see page 512)) and with NVIDIA NVDEC chips (see [Hardware-based decoding with NVIDIA NVDEC chips](#)(see page 514)).

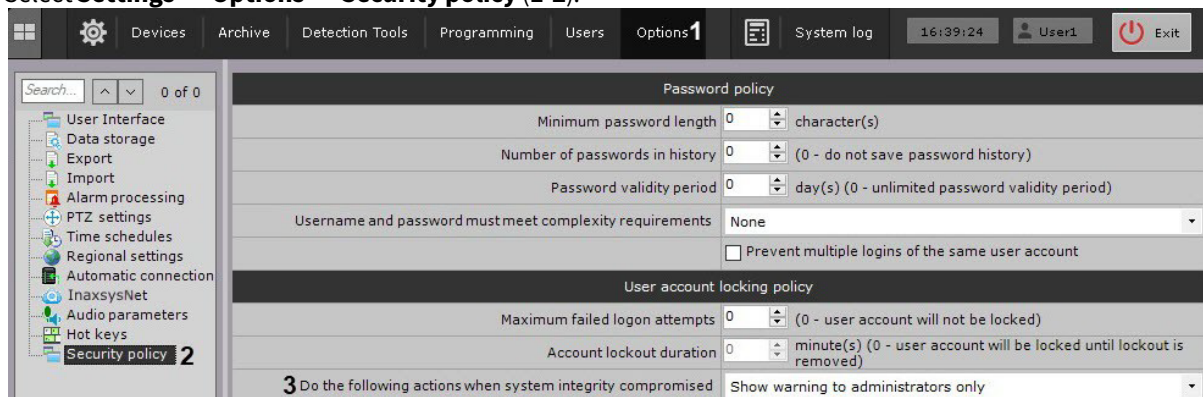
Configuring automatic response when Arkiv VMS PC integrity check fails

When you start Servers and Clients, Arkiv automatically checks the digital signature for all executable files (exe, dll, so).

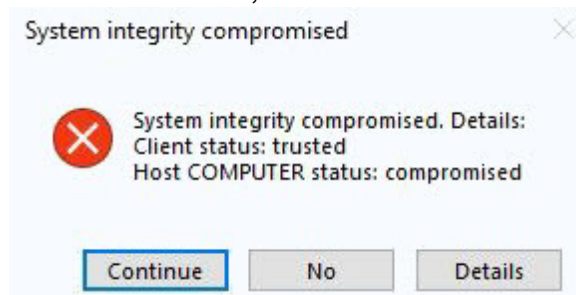
If all files are in place and match their signatures, the **System integrity check passed successfully** record appears in the system log (see [The System Log](#)(see page 787)).

Otherwise, you can set the system to automatically perform one of the pre-configured actions. To select a response, do as follows:

1. Select **Settings** → **Options** → **Security policy (1-2)**.



2. From the **Do the following actions when system integrity compromised (3)** choose the necessary response:
 - a. **Show warning to administrators only** – if selected, when the Client starts, an alert will be displayed for users of the **admin**;



Note

To resume launching the Client, click **Continue**; to quit, click **No**. To open a text file containing the list of compromised files, click **Details**.

- b. **Show warning to all users** – in this case, all users will be alerted;
 - c. **Block all users without administrator rights** – allows only users in the **admin** role to access the Server. For all non-administrators who were in the system at the time of the check, the Client will shut down and a notification will be displayed;
 - d. **Stop non-vital services** – shuts down all system objects that are subject to licensing (video cameras, detection tools, etc.). Upon launching the Client, each user will see a notification message.
3. Click **Apply**.

Configuring storage of the system log and metadata

The system log is a log containing system information on events, including system error entries.

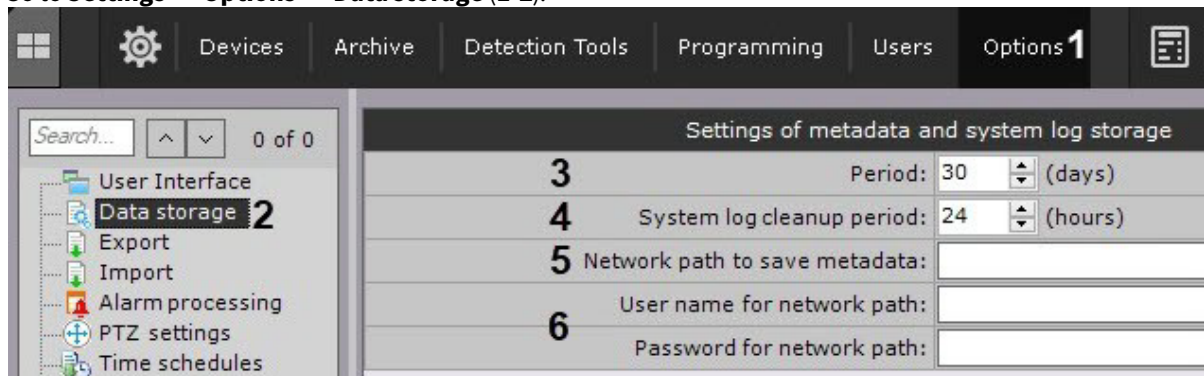
The system log is stored in a local database for each server. You can set access to the system log for a user group in the **Users** tab under **Settings** (see the section titled [Configuring user permissions](#)(see page 430)).

By default, metadata files are stored in Server's metadata database: C:

\ProgramFiles\Inaxsys\Arkiv\Metadata\vmdb_db\VMDB_DB.0\vmdb_schema; if necessary, you can place them on any available network storage.

To configure storage of the system log and metadata:

1. Go to **Settings** → **Options** → **Data storage (1-2)**.



2. In the **Period** field, enter the amount of days to store the system log in the Server's database and to store metadata in the database (**3**). The maximum time is 1000 days.

Attention!

If you enter **zero** value:

- a. System Log events will be stored 0 days.
- b. Metadata retention time becomes unlimited.

Attention!

If you have less than 15 GB of free disk space, the metadata DB is overwritten – new data records over the oldest data records.

3. In the appropriate field, enter the amount of hours after which outdated events will be purged from the system log (**4**).
Outdated events are events that have been stored in the system log for a period greater than that indicated in step 2.

Note

The metadata database is purged of video recordings that have been stored for more than the specified storage period:

- a. Every 12 hours after *Arkiv* is started.
- b. Every time you start the Post-Analytics forensic search tool (see [Forensic Search for Fragments \(Post-Analytics\)](#)(see page 705)).

If the camera is not recording when DB is cleaned up, then its recordings are preserved irrespective of their timestamp.

4. The metadata database can be stored on NAS if necessary (by default, it is located locally as set during [Installation](#)(see page 36)). Do the following:
 - a. Enter a path to the network destination for metadata database (5).
 - b. Enter the user name and password (6). The user must have permissions to access the NAS.

Note

If you clear the path to NAS, metadata will be stored in the local database again

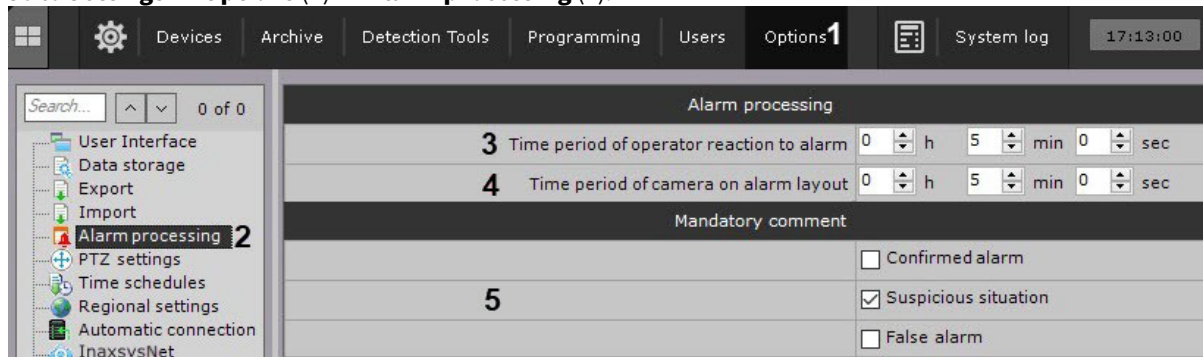
5. Click the **Apply** button.

Configuration of the system log is now complete.

Configuring Alarm Management Mode

To configure alarm handling in the system, you must perform the following steps:

1. Go to **Settings** → **Options (1)** → **Alarm processing (2)**.



2. In the **Time period of operator reaction to alarm** field, enter the time during which an operator who accepted an alarm for processing and exited alarm mode without evaluating it must return to alarm mode (3). The minimum value is 2 minutes.

Note

To take an alarm for processing, it is necessary to switch to the alarm management mode.

Note

After an alarm is taken into processing, the time for handling it is not limited.

3. Set the slideshow interval of alarm layout (4, see [Working with Special layouts](#)(see page 757)). After the specified time has elapsed, the alarm will be removed from the layout and its place will be taken by the next one, which has not yet been displayed on the layout.

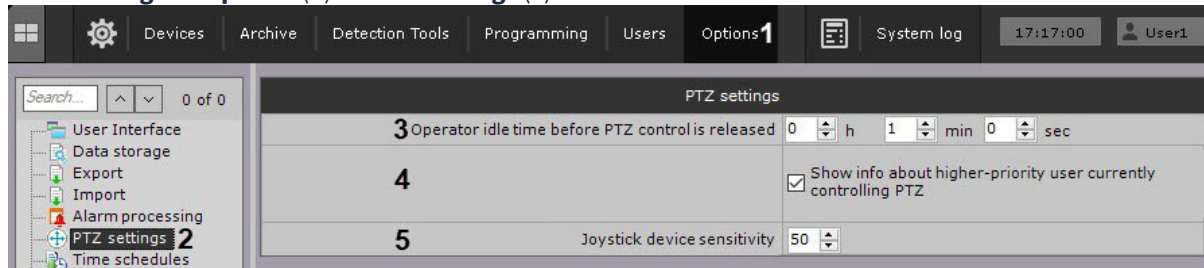
4. Select the alarm classifications after accepting which the operator is required to enter a comment (5).
5. Click the **Apply** button.

Configuration of alarm handling is now complete.

Configuring PTZ control

To configure PTZ control, do as follows:

1. Go to **Settings** → **Options (1)** → **PTZ Settings (2)**.



2. Set the operator idle time in hours, minutes and seconds (3). When the time runs out, the PTZ control is unlocked automatically if the operator did not perform any actions.
3. By default, if the higher priority user controls the PTZ camera, then the PTZ control panel displays the name of the user. To disable the display of this information, clear the corresponding checkbox (4).
4. Set the **Joystick device sensitivity** (5, see [Joystick Configuration](#)(see page 556)). The sensitivity range depends on the value specified in the device model repository for a particular device.

Note

For example, the following is specified in the Axis T8311 device model repository:

```
<property id="deviceSensitivity" xsi:type="PropertyIntRangeType">
  <value>
    <min>5</min>
    <max>100</max>
    <default>50</default>
  </value>
</property>
```

This means that the sensitivity for this device can be set in the range from 5 to 100.

5. Click the **Apply** button.

PTZ control is now configured.

- [Controlling a PTZ Camera](#)(see page 644)
- [Creating and configuring roles](#)(see page 431)

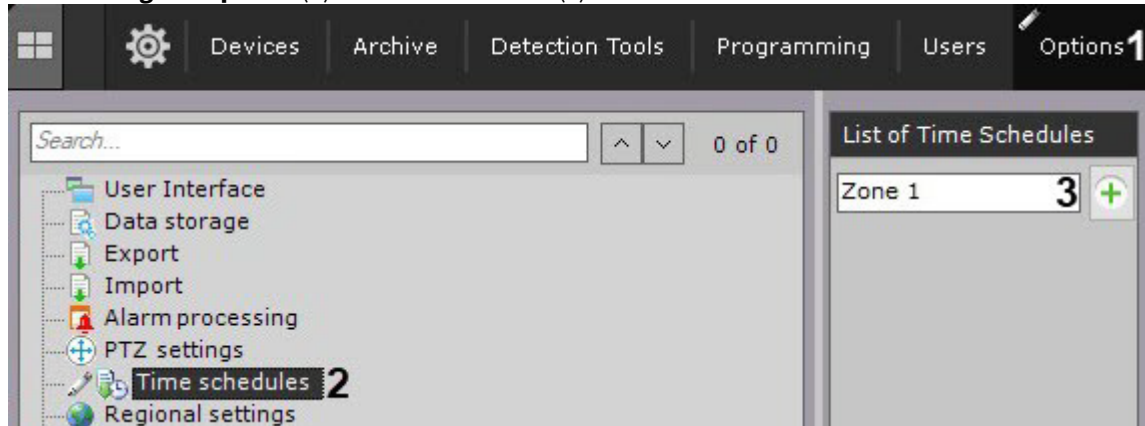
Configuring schedules


A schedule consists of all the time intervals for which video streams from video cameras will be recorded to archive.

Creating schedules





To create a schedule, complete the following steps:

1. Go to **Settings** → **Options (1)** → **Time Schedules (2)**.




2. In the **List of Time Schedules**, enter the name of the required schedule (**3**) and click .
3. Set the time intervals for the schedule:
 - a. Enter the interval's start time in the **From** column with the help of the buttons accessible by left-clicking the appropriate cell twice (**1**).

Time schedule intervals		3								
From 1	To 2	Sun	Mon	Tu	Wed	Thurs	Fr	Sat	All	
8:00 AM	8:00 PM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12:00 PM	8:00 AM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

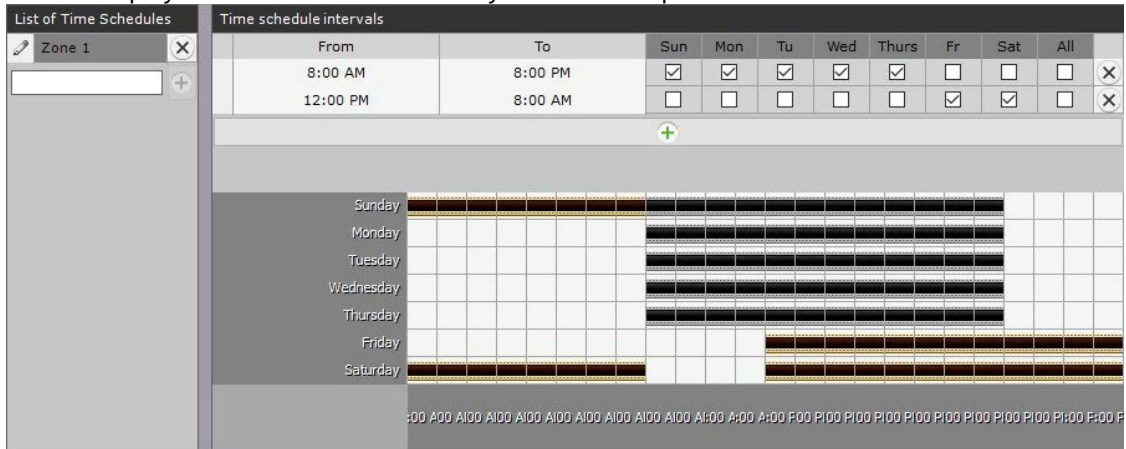
Button	Action
	Shift the interval start back by 1 hour
	Shift the interval start back by 5 minutes
	Shift the interval start ahead by 5 minutes
	Shift the interval start ahead by 1 hour

- b. Enter the interval's end time in the **To** column with the help of the buttons accessible by left-clicking the appropriate cell twice (**2**).
- c. Select the days of the week to be included in the interval by selecting the appropriate check boxes (**3**).
- d. Create the necessary number of intervals to be included in the schedule.

Note


To delete a time interval, click  in the corresponding row.

A visual display of time intervals for each day of the week is provided on the time chart.



4. Click the **Apply** button.

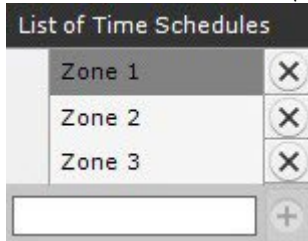
Creation of a schedule is now complete.


 [Configuring recording to an archive](#)(see page 207)
[Create MACROS](#)(see page 382)

Deleting a schedule

To delete a schedule, complete the following steps:

1. Go to the list of schedules (under **Settings** → **Options** → **Time Schedules**).



2. Click  beside the schedule that you want to delete.
3. Click the **Apply** button.

Deletion of a schedule is now complete.

Configuring the Server ports

On this page:

- [Changing the gRPC API port](#)(see page 522)
- [Changing the port range of the Server](#)(see page 522)

After *Arkiv* is installed, you can change the port range for Servers, the gRPC API port number (see [Ports used by the Arkiv Software Package](#)(see page 28)).

Changing the gRPC API port

To change the gRPC API port number, create an NGP_NATIVE_BL_PORT system variable, and set its value to the required port number (see [Appendix 10. Creating system variable](#)(see page 927)).

Changing the port range of the Server

To change the port range for a Server, use the Network settings utility (see [Network settings utility](#)(see page 865)).

7.10.2 Client settings

Configuring the user interface

Selecting the interface language

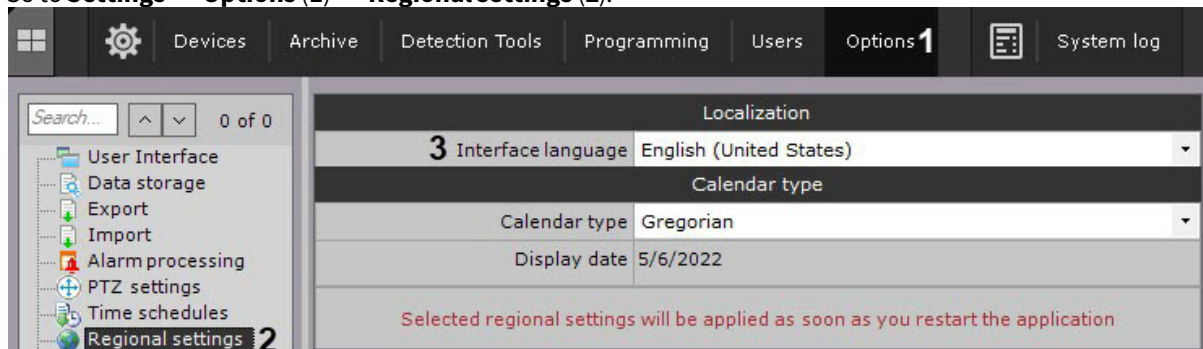
When working with *Arkiv*, the user can choose the Client interface language.

Attention!

The language of the events in the system log is determined by the settings of the OS on the Server.

To select the Client interface language, do the following:

1. Go to **Settings** → **Options (1)** → **Regional settings (2)**.



2. Select *Arkiv* interface language from the **Interface language** drop-down list (3).
3. Click the **Apply** button to save the changes.
4. Restart *Arkiv* (see [Shutting down an Arkiv Client](#)(see page 82), [Starting an Arkiv Client](#)(see page 76)).

When *Arkiv* is restarted, the selected interface language will be applied. To

change the language of the events in the system log, do the following:

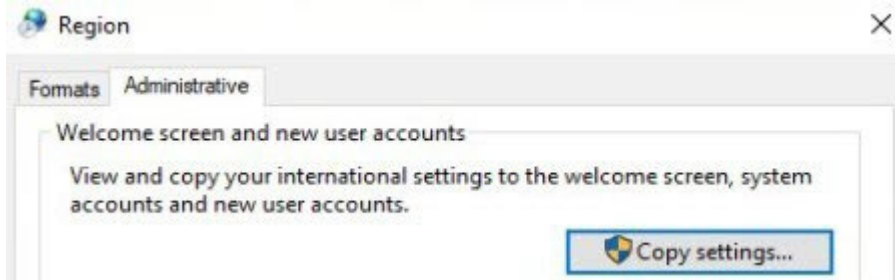
1. On the Server, go to **Control Panel** → **Region**.

Note

The configuration is given for Windows 10 OS.



2. From the **Format** drop-down list, select the required language.
3. Go to the **Administrative** tab.



4. Click the **Copy settings** button.
5. Set the **Welcome screen and system accounts** checkbox.



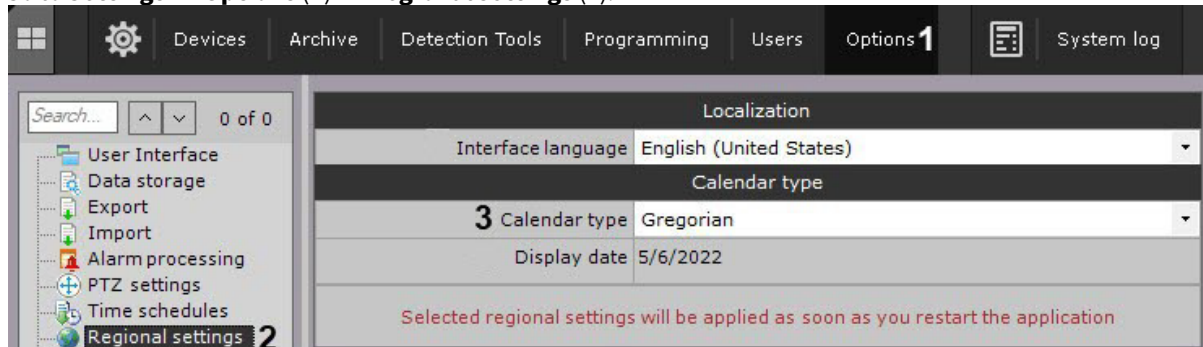
6. Click the **OK** button in both windows.
7. Restart the Server (see [Shutting down a Server](#)(see page 82), [Starting a Server](#)(see page 76)).

The language of the events in the system log is changed.

Selecting the calendar type

When working with *Arkiv*, the user can choose the calendar type (Gregorian or Persian). To select the calendar type, do the following:

1. Go to **Settings** → **Options (1)** → **Regional settings (2)**.



2. Select the calendar type that is used in *Arkiv* from the **Calendar type** drop-down list (3).
3. Click the **Apply** button to save the changes.
4. Restart *Arkiv* (see [Shutting down an Arkiv Client](#)(see page 82), [Starting an Arkiv Client](#)(see page 76)).

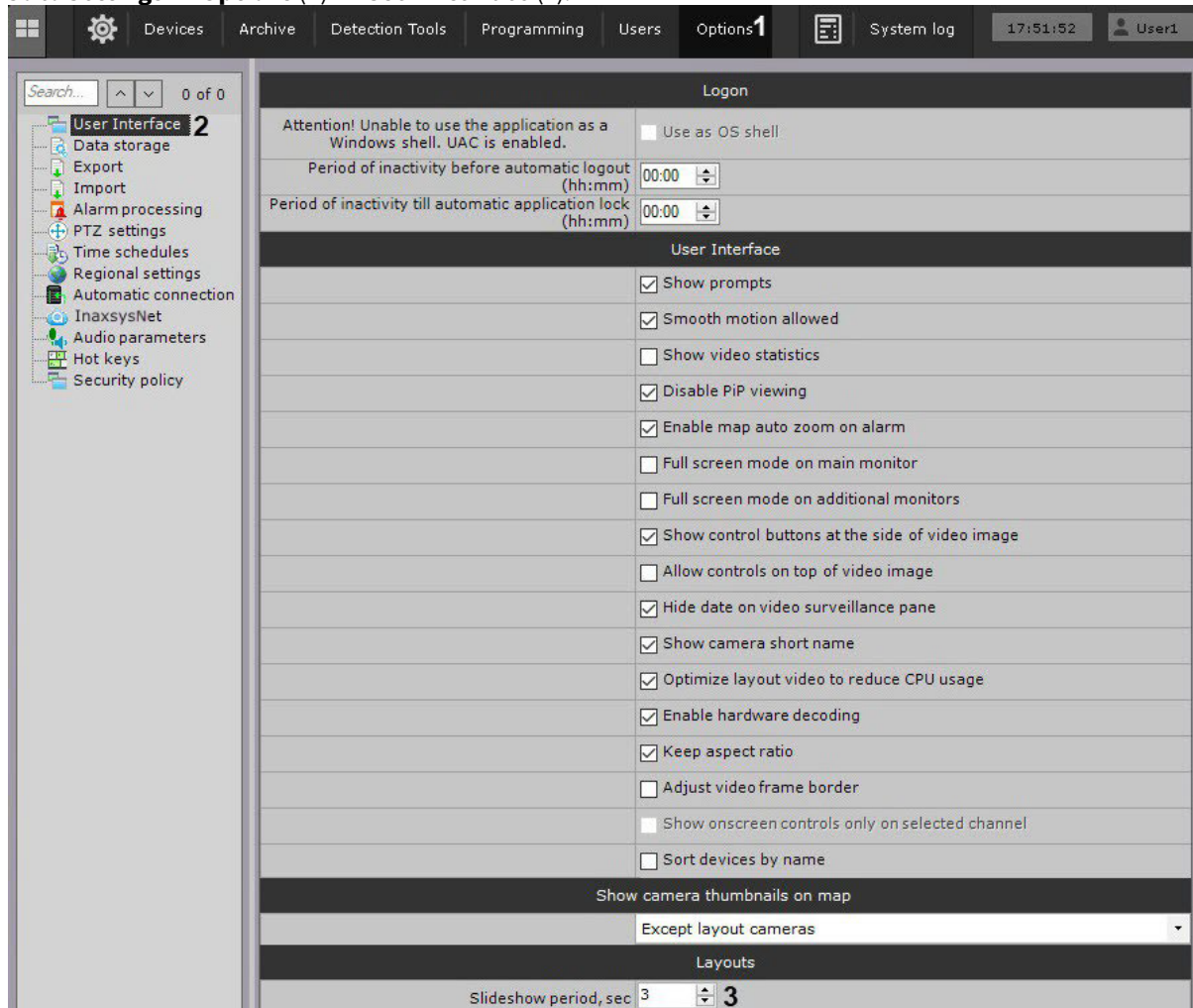
When *Arkiv* is restarted, the selected calendar type will be applied.

Configuring the slideshow parameters

The slideshow mode is a cyclic switching of the layouts within the specified period. The slideshow is launched using the context menu of the layouts panel.

To configure the slideshow period, do the following:

1. Go to **Settings** → **Options (1)** → **User Interface (2)**.



2. Set the slideshow period in seconds (**3**).
3. Click the **Apply** button.

The slideshow period is configured. The layouts will be switched within the specified period.

Note

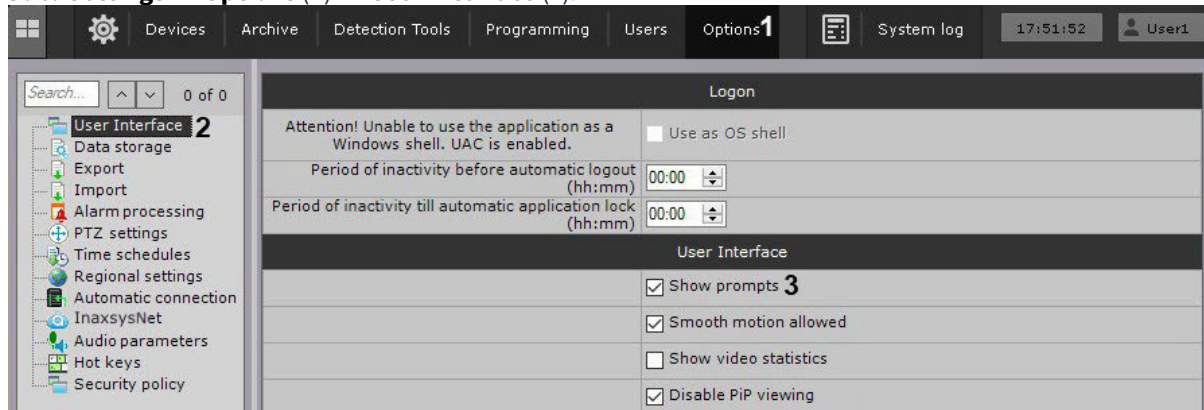
Only the users with the **Layout editing** permission can switch the modes (see [Creating and configuring roles](#)(see page 431)).

Hiding prompts

In *Arkiv*, prompts are displayed when the cursor is hovered over a control element. By default, the prompts are enabled.

To disable the prompts, do the following:

1. Go to **Settings** → **Options (1)** → **User Interface (2)**.



2. Clear the **Show prompts** checkbox (3).
3. Click the **Apply** button.

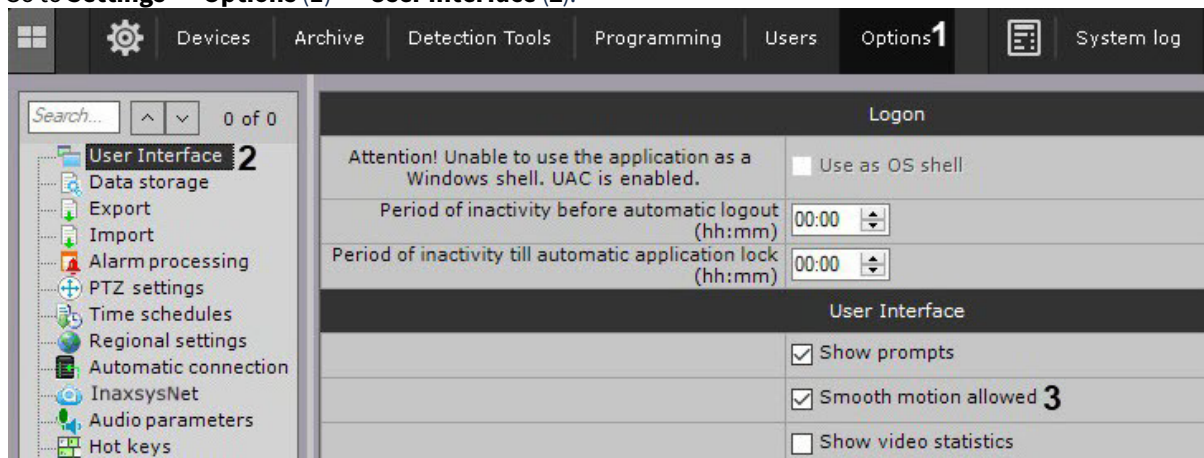
Prompts are now disabled. You can re-enabled prompts by setting the **Show prompts** checkbox.

Configuring smooth motion

Smooth motion allows smoothly changing the position of the surveillance windows, as well as smoothly switching between the tabs. By default, smooth motion is enabled.

To disable smooth motion, do the following:

1. Go to **Settings** → **Options (1)** → **User Interface (2)**.



2. Clear the **Smooth motion allowed** checkbox (3).
3. Click the **Apply** button.

Smooth motion of the surveillance windows is disabled.

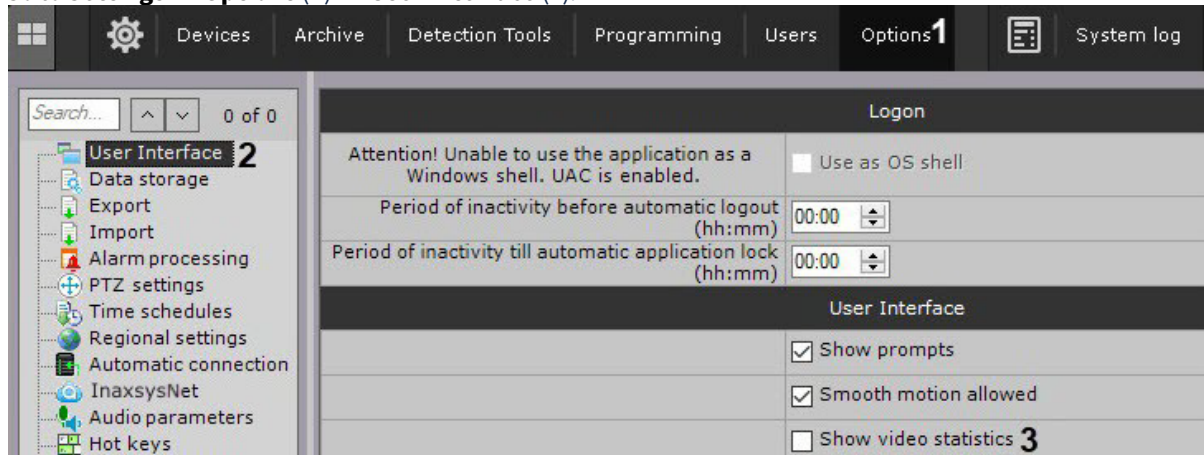
Configuring display of video statistics

You can display the following video statistics in the surveillance window:

1. Frame rate of the displayed video stream.
2. Frame rate of the video stream received from a video camera or an archive.
3. Bitrate of a compressed video stream.
4. Resolution of the displayed video stream.

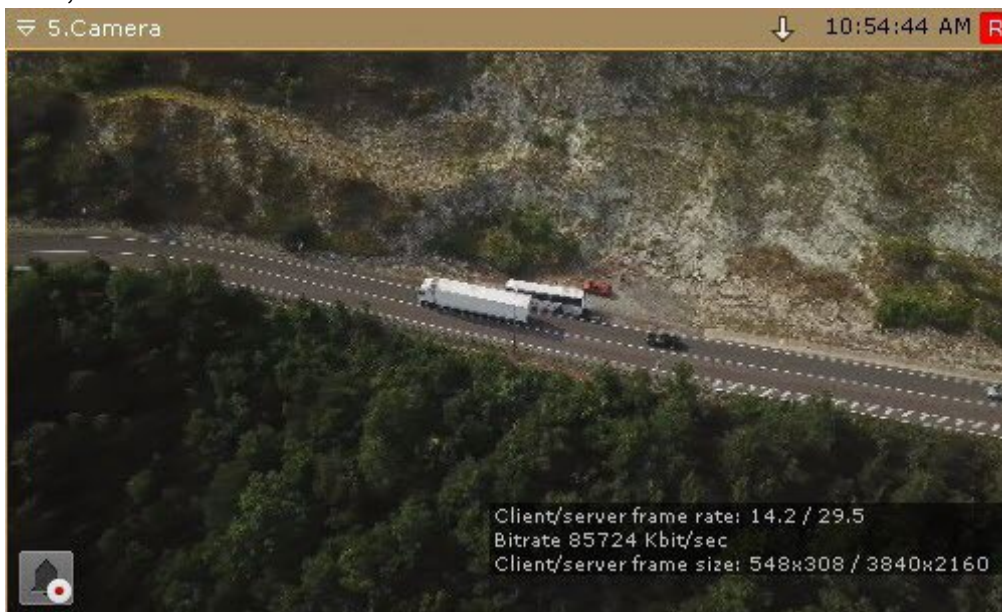
To display video statistics, do the following:

1. Go to **Settings** → **Options (1)** → **User Interface (2)**.



2. Set the **Show video statistics** checkbox (**3**).
3. Click the **Apply** button.

The video statistics will now be displayed in the surveillance window for the following modes: Live Video, Archive, Alarm, and Archive Search.

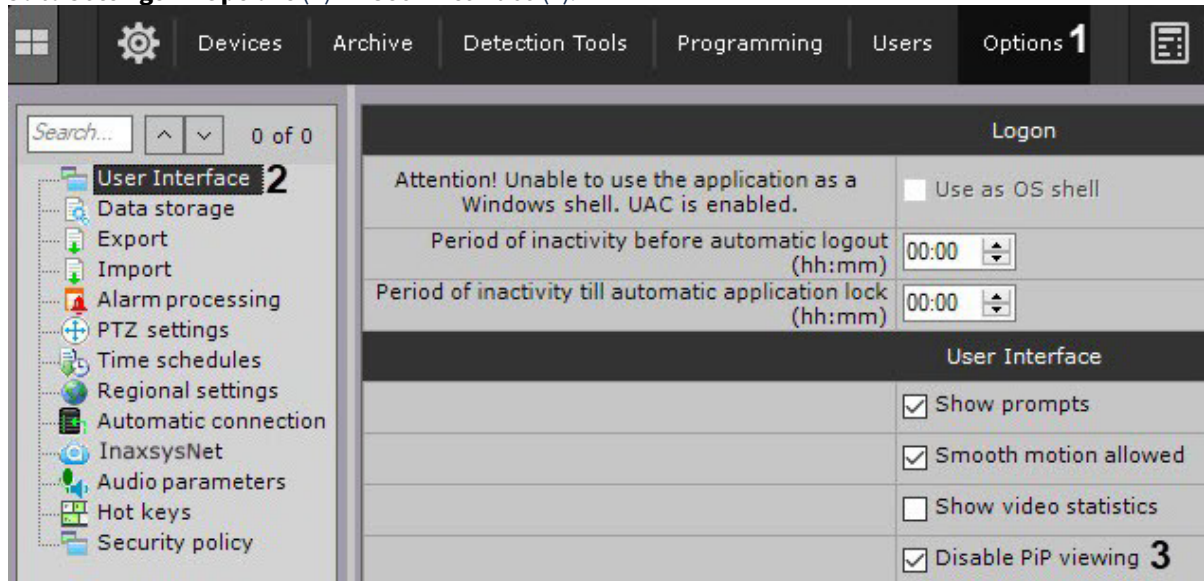


Configuring preview of alarm events

You can disable the preview of alarm events in the surveillance window.

To do this, do the following:

1. Go to **Settings** → **Options (1)** → **User Interface (2)**.



2. Set the **Disable PiP viewing** checkbox (3).
3. Click the **Apply** button.

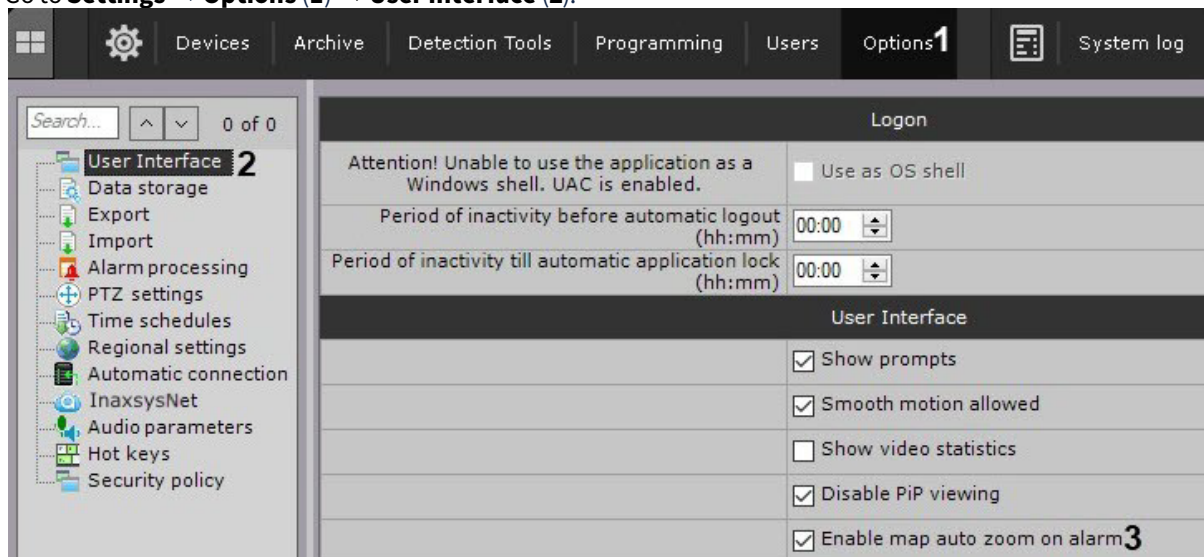
Preview of alarm events is disabled.

Configuring map auto zoom

It is possible to zoom the map automatically and place the icon of the alarm camera at the center of the map.

To do this, do the following:

1. Go to **Settings** → **Options (1)** → **User Interface (2)**.



2. Set the **Enable map auto zoom on alarm** (3) checkbox.
3. Click the **Apply** button.

Map auto zoom on alarm is configured. When an alarm occurs, the icon of the alarm camera will be placed at the center of the zoomed map.

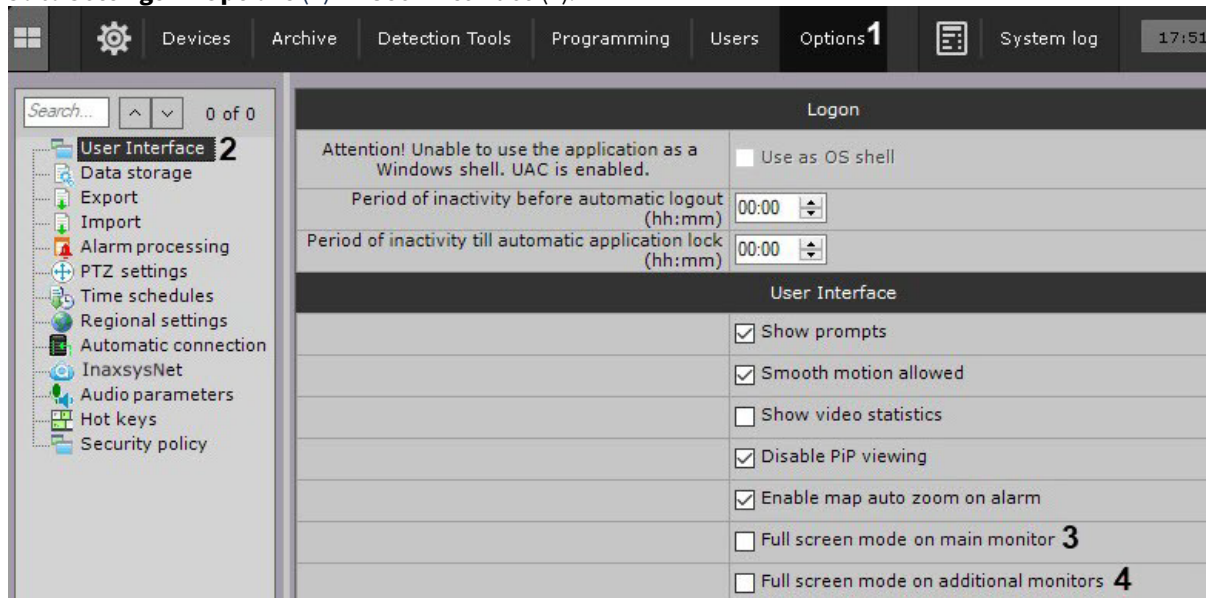
Configuring the Client screen mode (full screen or window)

By default, the Client (main monitor and all additional monitors) is displayed in full screen mode.

It is possible to use window mode both on the main monitor and on the additional monitors.

To do this, do the following:

1. Go to **Settings** → **Options (1)** → **User Interface (2)**.



2. To use window mode on the main monitor, clear the **Full screen on main monitor** checkbox (3).
3. To use window mode on the additional monitors, clear the **Full screen on additional monitors** checkbox (4).
4. Click the **Apply** button.
5. Restart *Arkiv* (see [Shutting down an Arkiv Client](#)(see page 82), [Starting an Arkiv Client](#)(see page 76)).

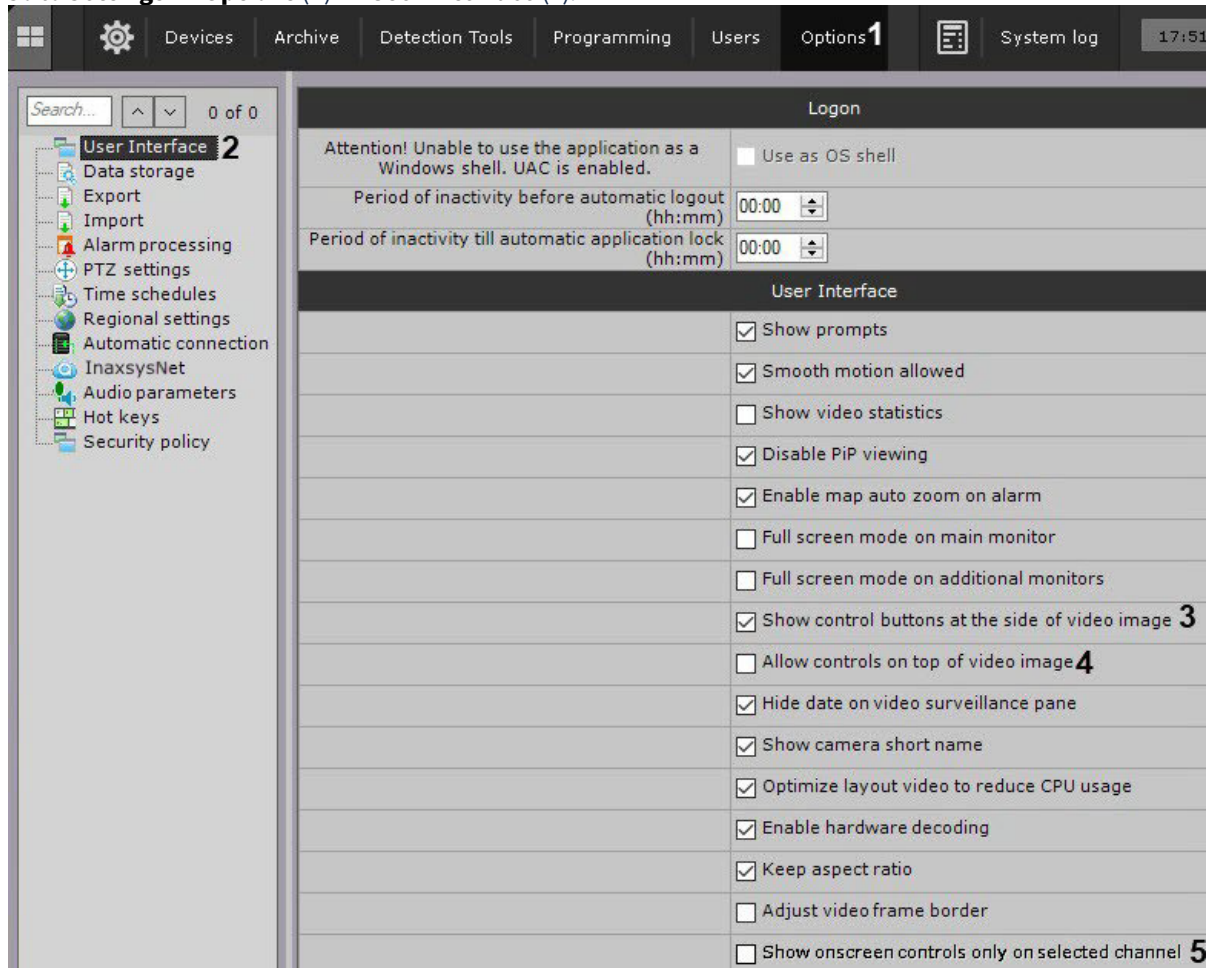
The window mode is configured. The *Arkiv* Client will be displayed in window mode on new start.

Configuring the display of the surveillance window

- [Surveillance window](#)(see page 593)

To configuring the display of the surveillance window, do the following:

1. Go to **Settings** → **Options (1)** → **User Interface (2)**.



2. By default, the surveillance mode selection buttons are located at the side of the surveillance window. To move the buttons inside of the surveillance window, clear the **Show control buttons at the side of video image** checkbox (3).

Attention!

With this display of the surveillance window, the following won't be available: the zoom function (in real-time and archive modes, see [Scaling the surveillance window](#)(see page 622)) and the immersive mode button (see [Immersive mode](#)(see page 774)).

3. By default, the surveillance window elements (context menus, export buttons, PTZ mode selection buttons, etc.) are displayed outside of the video image. To move the control buttons on the video image, clear the **Allow controls on top of video image** checkbox (4).
4. If it is necessary to display the surveillance window elements only for the active window on the layout, set the **Show onscreen controls only on selected channel** checkbox (5). This parameter is valid only if the **Allow controls on top of video image** checkbox is set (4).
5. Click the **Apply** button.
6. Reopen the layout or create a new one (see [The Layouts panel](#)(see page 611)).

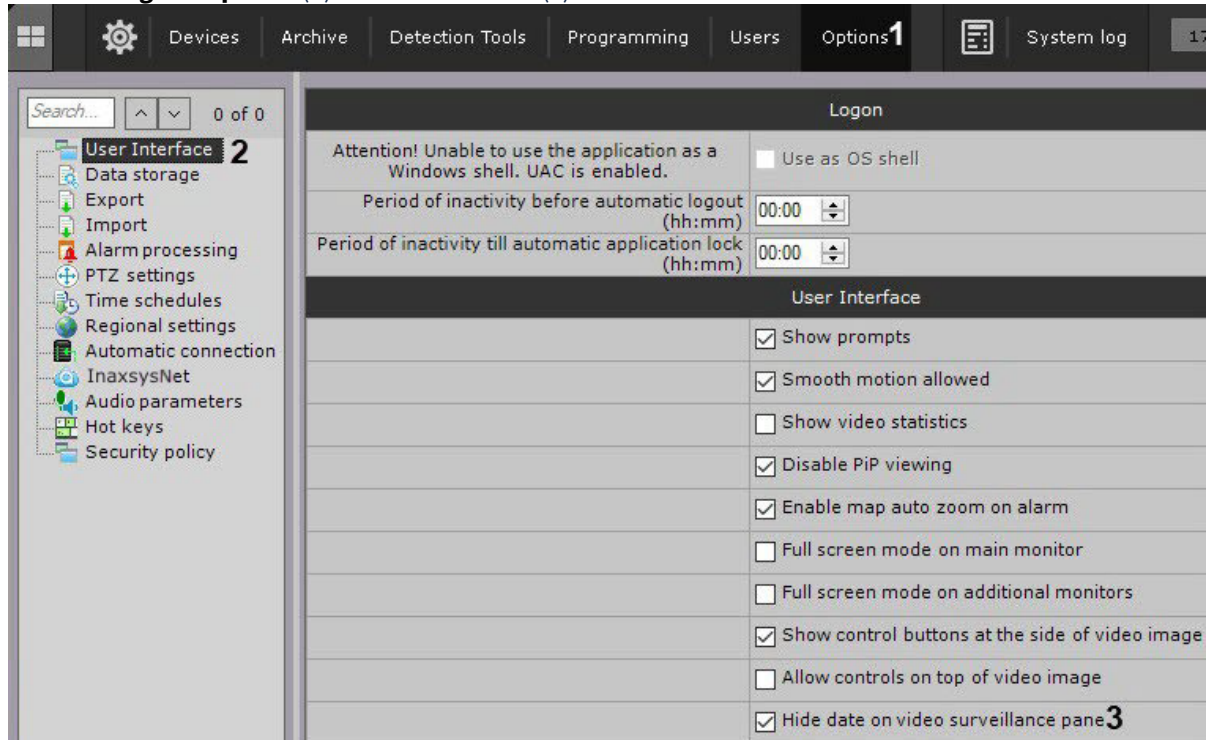
Configuring the display of the surveillance window is complete.

Configuring time display

By default, the time indicator (see [Time Display](#)(see page 597)) in the surveillance window does not display the date.

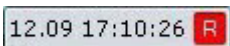
To display the date, do the following:

1. Go to **Settings** → **Options (1)** → **User Interface (2)**.



2. Clear the **Hide date on video surveillance pane** checkbox (3).
3. Click the **Apply** button.
4. Reopen the layout or create a new one (see [Layouts Management](#)(see page 754)).

The time indicator is configured. The date will be displayed to the left of the time.



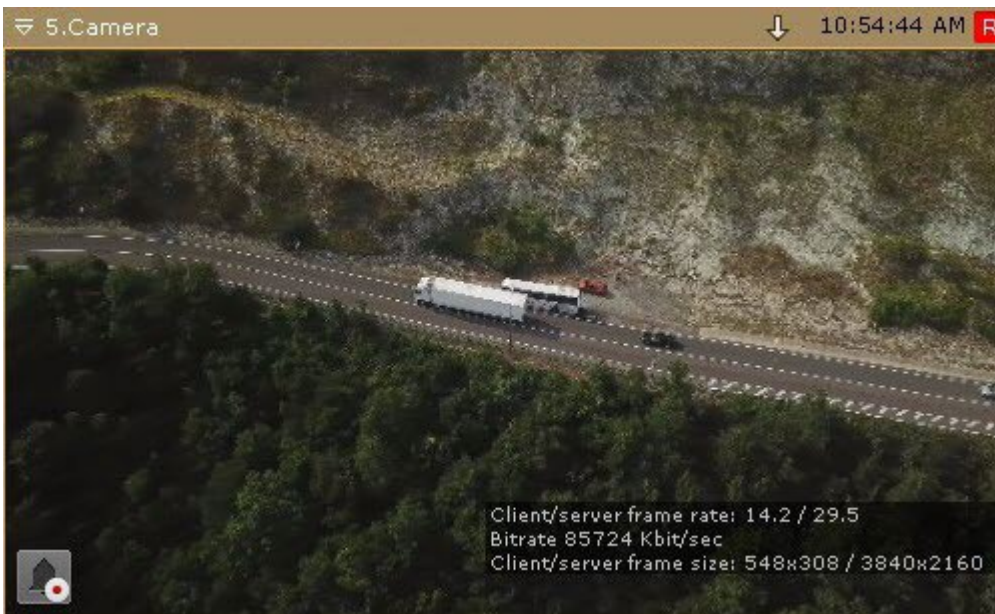
You can also hide the time indicator in the surveillance window. To do it, do the following:

1. Go to the role settings (see [Creating and configuring roles](#)(see page 431)).
2. In the **Access to Functions** group, set **No** for the **Unlock camera menu button** parameter.
3. Set the camera access level — **Live**.

As a result, the time indicator of the specified cameras will be disabled for all users of this role.

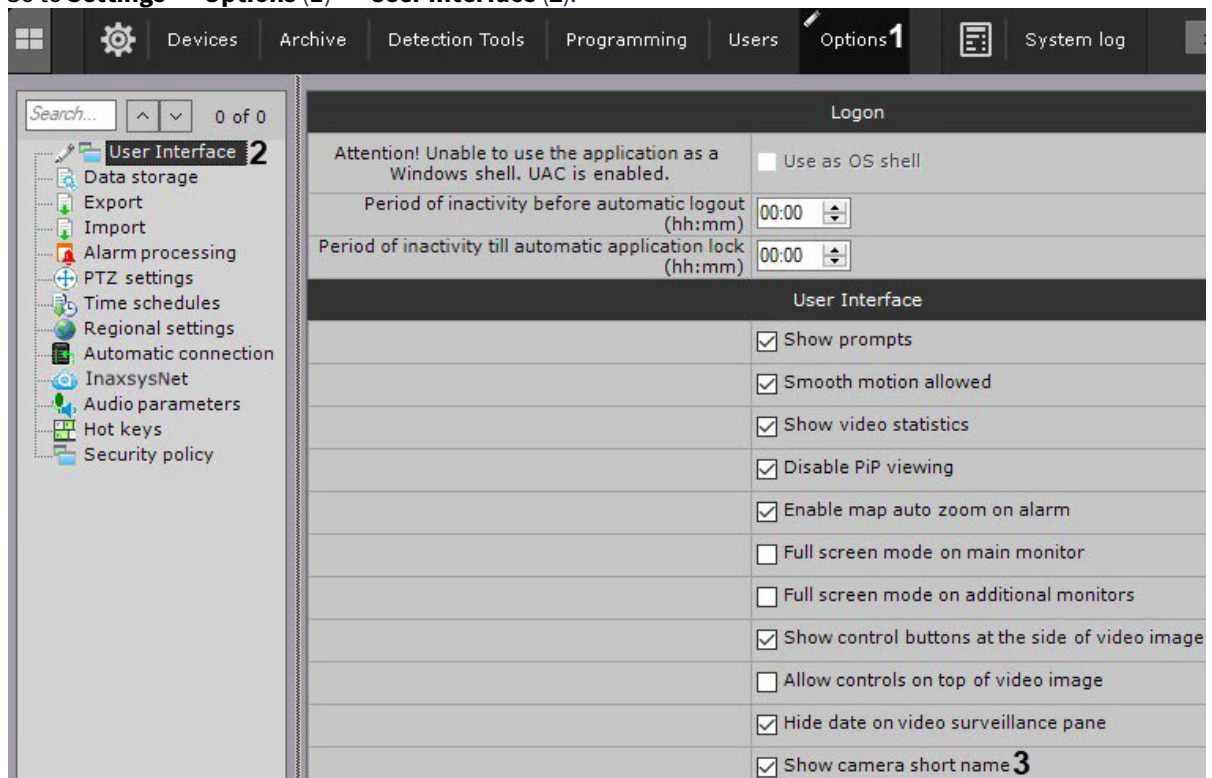
Configuring the display of the camera short name

By default, the camera short name is displayed in the surveillance window (see [The Video Camera Object](#)(see page 107)).



To disable displaying the short name, do as follows:

1. Go to **Settings** → **Options (1)** → **User Interface (2)**.



2. Clear the **Show camera short name** checkbox (3).
3. Click the **Apply** button.
4. Reopen the layout (see [Layouts Management](#)(see page 754)).

The camera short name display is disabled.



Optimizing video image on the layout

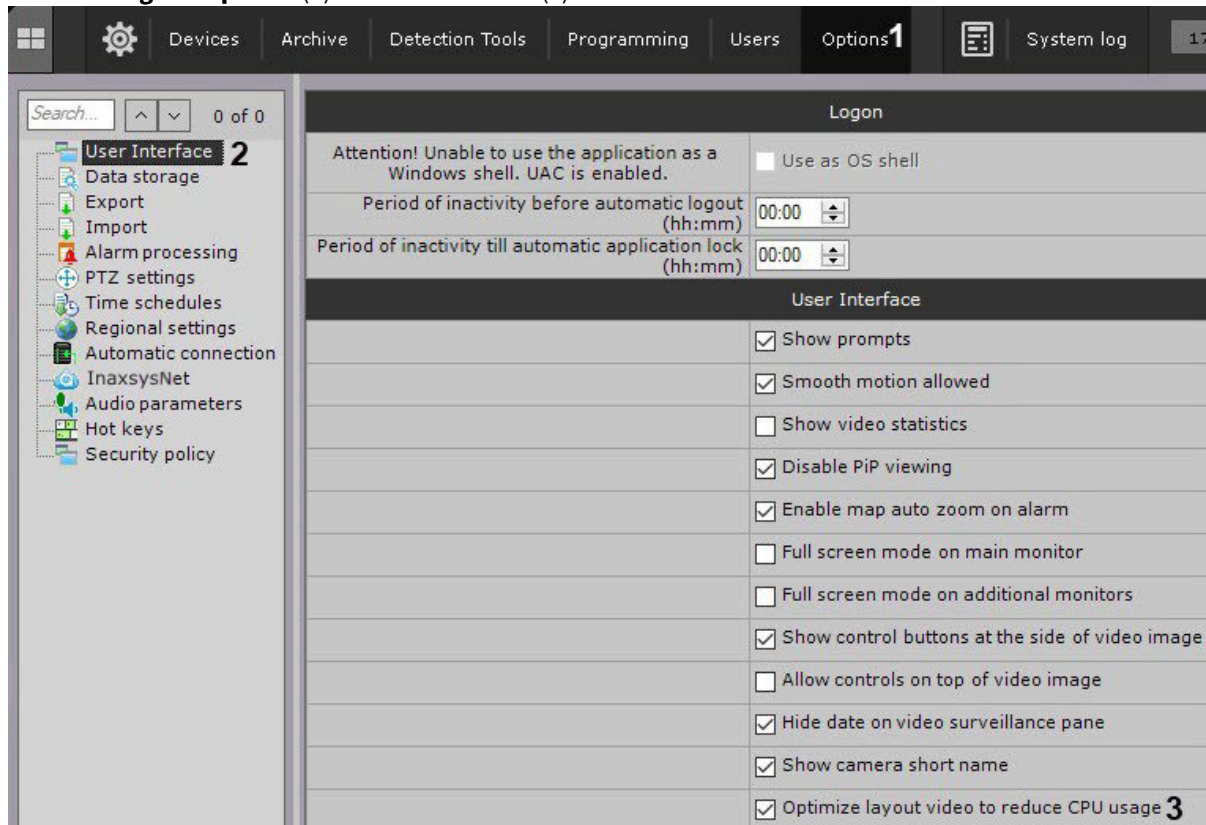
It is possible to automatically reduce the number of the displayed pixels in the layout if the screen resolution is lower than the stream resolution from the video camera. This allows reducing the CPU load.

Video image optimization is enabled by default. To disable it, do the following:

Note

If video image optimization is enabled, the definition of the image in the layout may decrease.

1. Go to **Settings** → **Options (1)** → **User Interface (2)**.

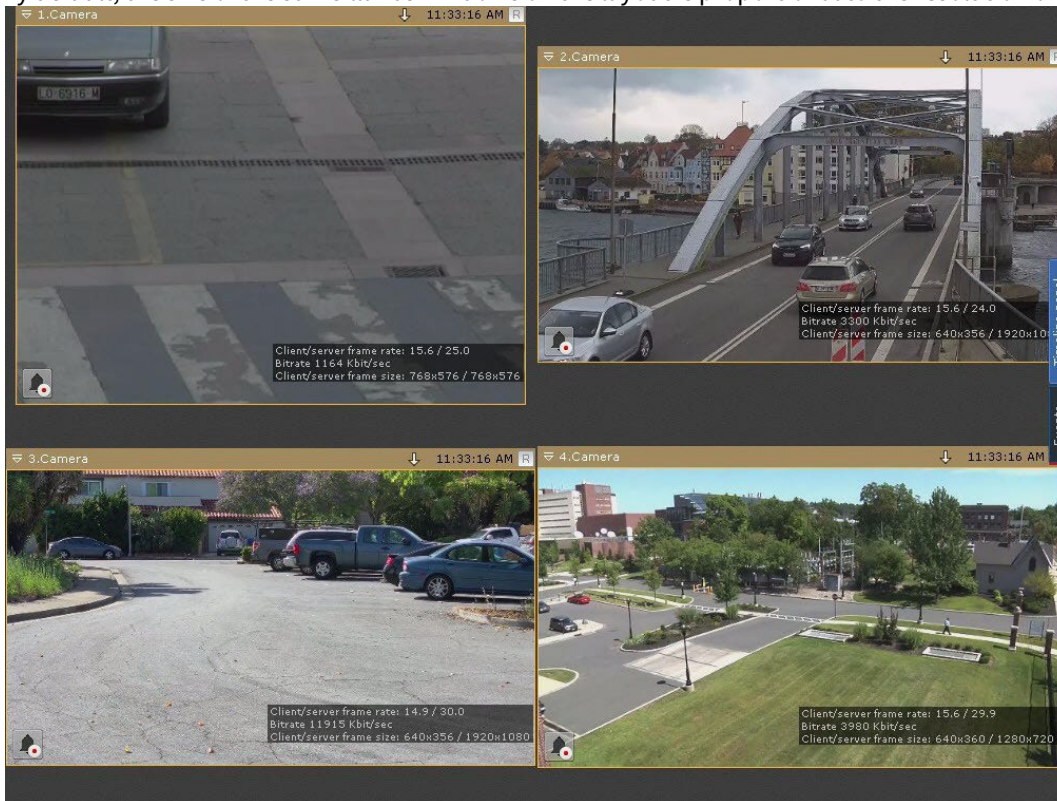


2. Clear the **Optimize layout video to reduce CPU usage** checkbox (3).
3. Click the **Apply** button.

Video image optimization is disabled.

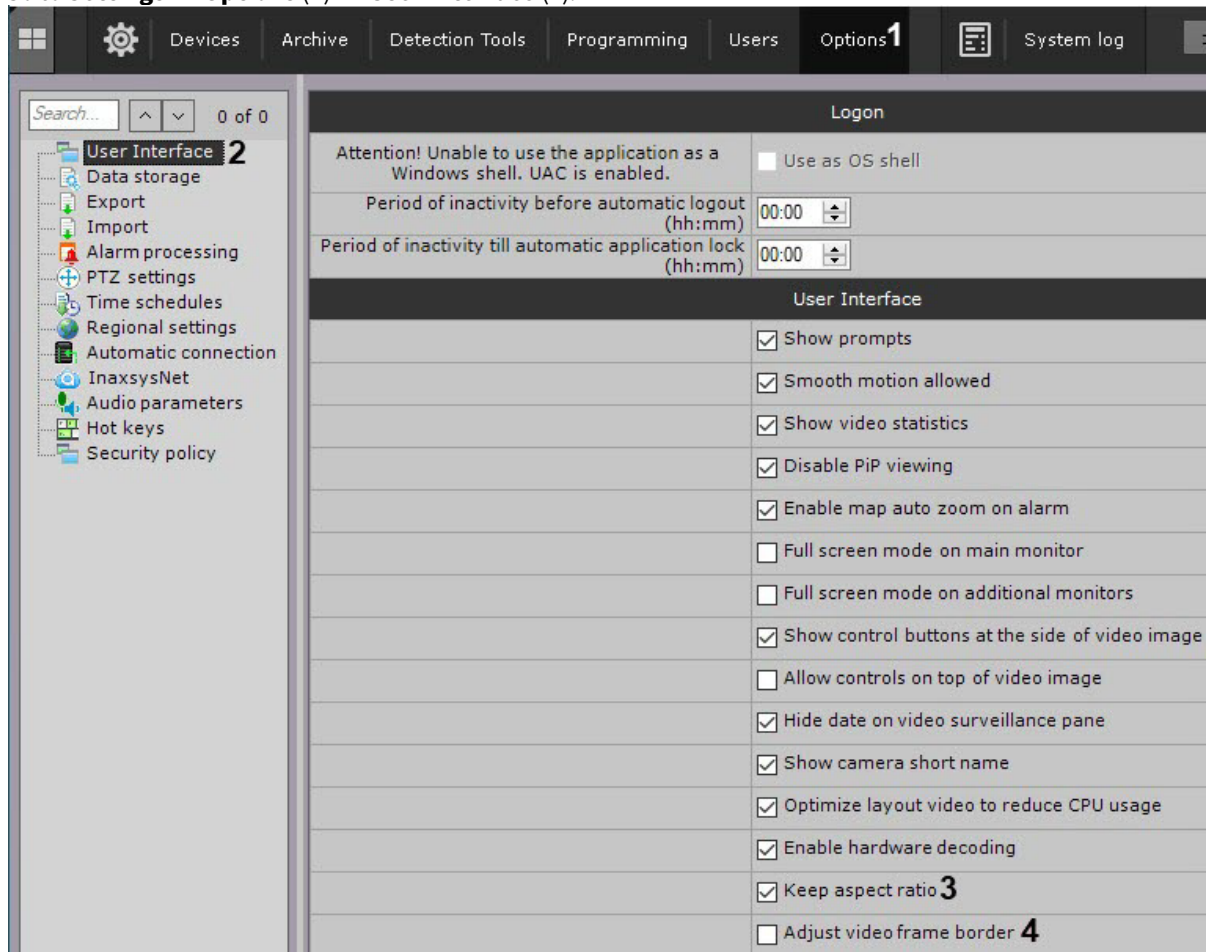
Configuring video display on the layout

By default, the size of the surveillance windows on the layout is proportional to the resolution of the video image.



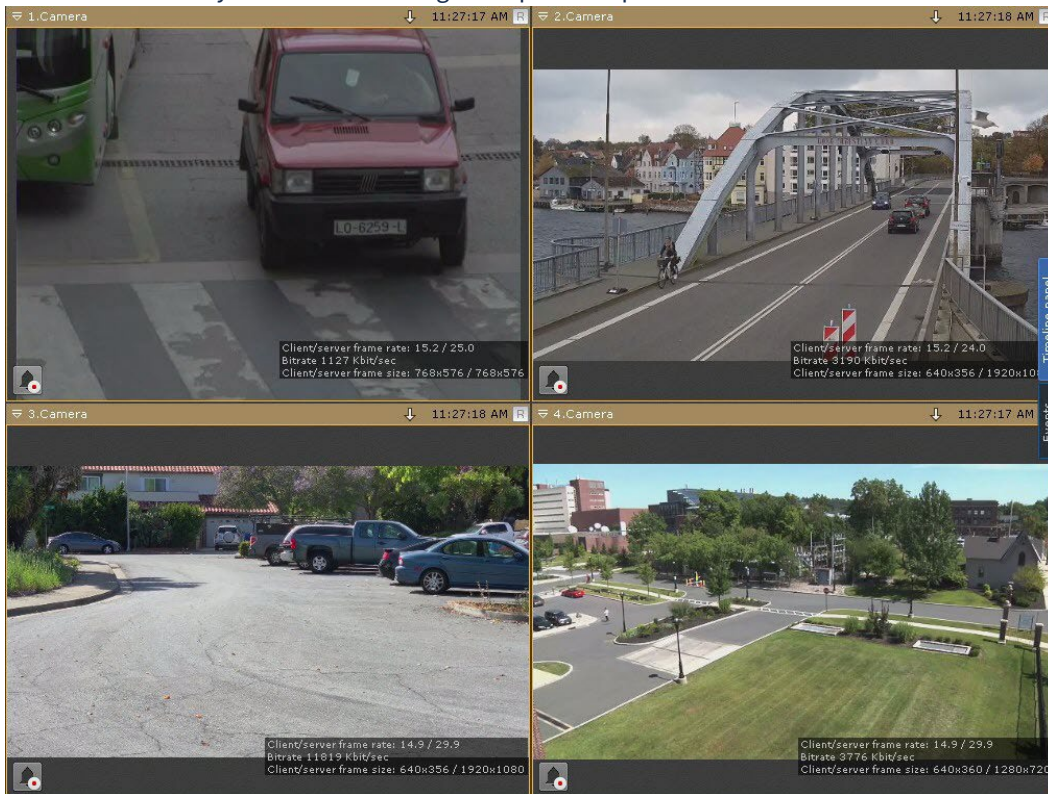
For the surveillance windows to be of a fixed size and occupy the entire area of the layout, do the following:

1. Go to **Settings** → **Options (1)** → **User Interface (2)**.



2. Clear the **Adjust video frame border** checkbox (**4**).
3. Click the **Apply** button.
4. Reopen the layout (see [Layouts Management](#)(see page 754)).

Configuring the surveillance windows is complete. The surveillance windows are of a fixed size and occupy the entire area of the layout. The video images keep their aspect ratio.



To expand the video image to the entire surveillance window, do the following:

1. Clear the **Keep aspect ratio** checkbox (3).
2. Click the **Apply** button.
3. Reopen the layout (see [Layouts Management](#)(see page 754)).

Configuring the surveillance windows is complete. The video image is expanded to the entire surveillance window.

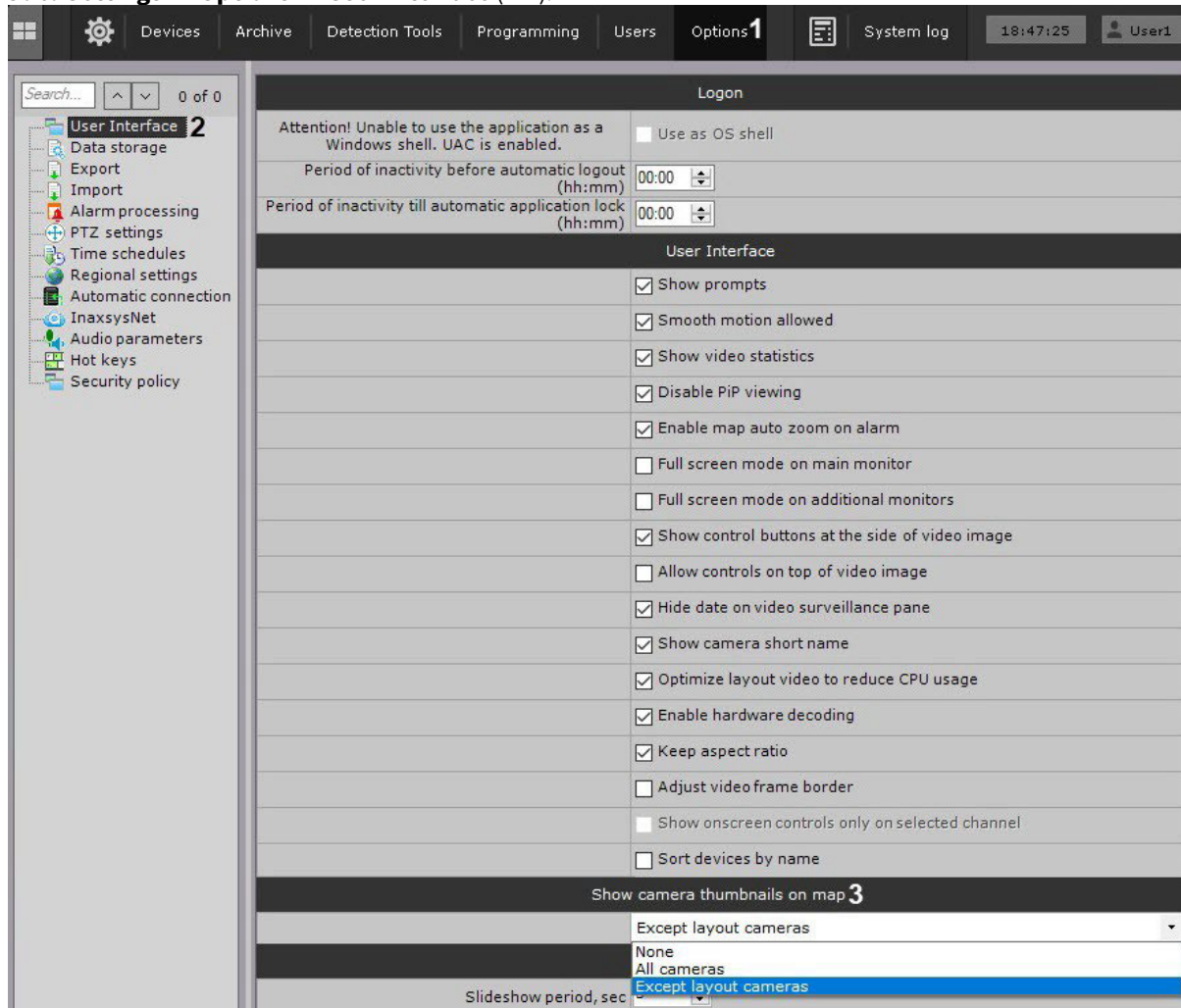


- [Configuring Layouts\(see page 447\)](#)
- [Configuring viewing tiles\(see page 461\)](#)

Configuring video display on the map

By default, the map shows video (see [Configuring a camera in standard map viewing mode\(see page 494\)](#)) only from cameras that are not on the current layout.

You can enable or disable video from all cameras on the map:

1. Go to **Settings** → **Options** → **User Interface (1-2)**.

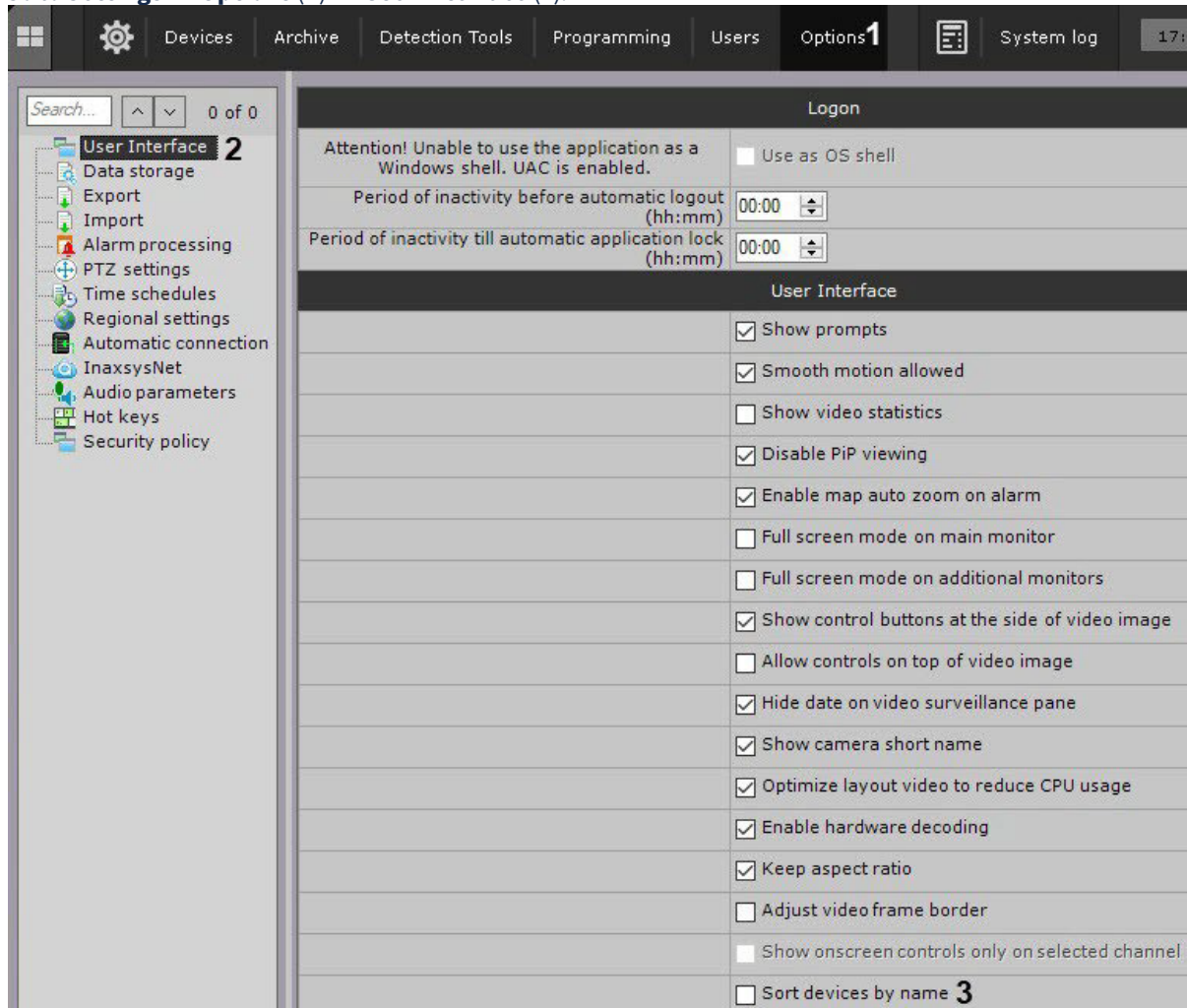
2. Choose video display mode on the map **(3)**.
3. Click **Apply** to save the changes.
4. Reopen the Layout (see [Layouts Management](#)(see page 754)).

Configuring camera sorting on Objects Panel

By default, the cameras on the Objects Panel (see [Objects Panel](#)(see page 615)) are sorted by the short name (see [The Video Camera Object](#)(see page 107)).

To enable the sorting by the name, do the following:

1. Go to **Settings** → **Options (1)** → **User Interface (2)**.



2. Set the **Sort devices by name** checkbox (3).
3. Click the **Apply** button.

Sorting the cameras by the name on the Objects Panel is enabled.

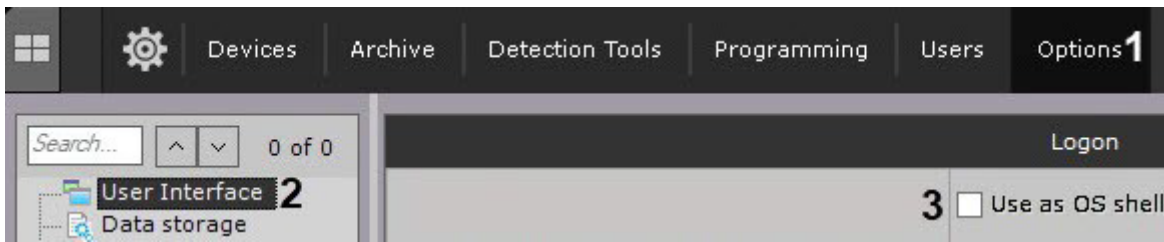
Configuring how Arkiv starts

Configuring Arkiv instead of the standard Windows OS shell

Autorun of *Arkiv*, instead of the standard Windows OS shell, is used in cases where you need to restrict access to computers running the digital video surveillance system, including preventing the launch of various applications, file copying and deletion, various Windows operations, and other non-standard use of the computers.

If you configure *Arkiv* to autorun instead of the standard Windows shell, *Arkiv* will launch instead of Windows Explorer immediately after Windows loads. This makes it impossible for the user to launch certain applications installed on the computer or to work with certain program dialog boxes.

To activate autorun of the *Arkiv* software package instead of the standard Windows shell, select the **Use as OS shell** (3) check box in **Settings** → **Options** → **User Interface (1-2)** and click **Apply**.



Arkiv will now launch instead of the standard Windows shell the next time you start Windows.

Note

If User Accounts Control is enabled in the Windows OS, *Arkiv* VMS cannot automatically start in place of OS shell (the appropriate check box is grayed out). Disable UAC.
In Windows OS 8, 8.1 and 10 you also need to make changes to the [registry](#)¹⁵⁸ and reboot your PC.

Configuring Cross-System Client and autologon

It is possible for the Client to automatically connect to Servers on different Arkiv domains – [Cross-System Client](#)(see [page 84](#)).

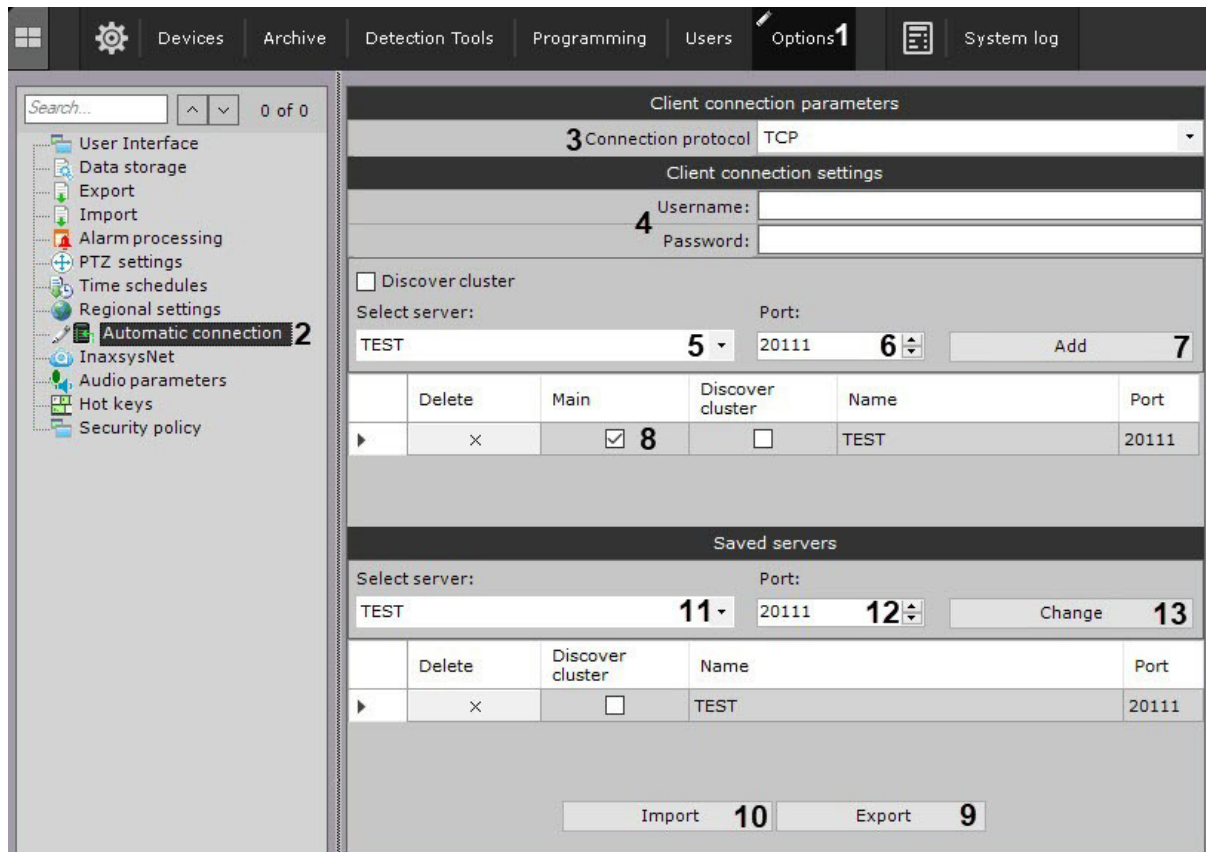
For this to take place, the following conditions must be true:

- Professional or Universe license has been activated on each Server to which the Client is connected;
- connection to all Servers made via with the same user name/password combination on each Arkiv domain;
- Server names and IP addresses are unique.

Configuration of automatic connection to Servers on different Arkiv domains is performed as follows:

1. Go to **Settings** → **Options** → **Automatic connection (1-2)**.

¹⁵⁸ <http://winaero.com/blog/how-to-turn-off-and-disable-uac-in-windows-10/>



2. Configuring the protocol used by Clients to connect to the Server allows prioritizing reliability or speed of data transmission (3). The connection protocol is set individually for each Server in an Arkiv-domain. All Clients connected to the Server will receive video streams over the selected protocol. Descriptions and recommendations for selecting a protocol are given in the table.

Protocol	Description
TCP	This protocol is more reliable but bandwidth-intensive. Recommended for Servers with small numbers of cameras.
UDP unicast	UDP is typically faster but less reliable for data transmission. Unicast involves data transmission to a single recipient. This protocol is best for Servers with many cameras connected to a single Client.
UDP multicast	Multicast refers to data transmission to a group of recipients. This protocol is designed for Servers with many cameras connected to multiple Clients. Important! This protocol has to be supported by all network components, in particular, switches.

3. Type the user name and password needed for logging in to each Arkiv domain (4).
 4. Indicate the Servers to connect to. For each Server, perform the following steps:
 a. select the Server in the list (5);
 b. indicate the port for connecting to the Server (6).

Note

If the **Port** field is left blank, the standard port (20111) will be used for connecting.

- c. Click the **Add** button (7).

 Note

It is possible to connect to only one Server on an Arkiv domain. So when a Server is added to the list, all other Servers on the Arkiv domain become unavailable for selection.

 Note

To remove a Server from the list, click the ✕ button.

5. After all Servers have been added to the list, select the main Arkiv domain.
When connecting, the Client will use the parameters (maps, layouts, user rights) of the main Arkiv domain. To select a main Arkiv domain, select the check box in the relevant column of a Server that is on the Arkiv domain (8).
6. Click the **Apply** button.

Click **Export** (9) to save the automatic Server connection and Preferred Servers (see [Selecting Preferred Servers](#)(see page 544)) configuration to the JSON file.

To load the preset configuration to other Clients, do the following:

1. Click **Import** (10).
2. Click **Apply**.

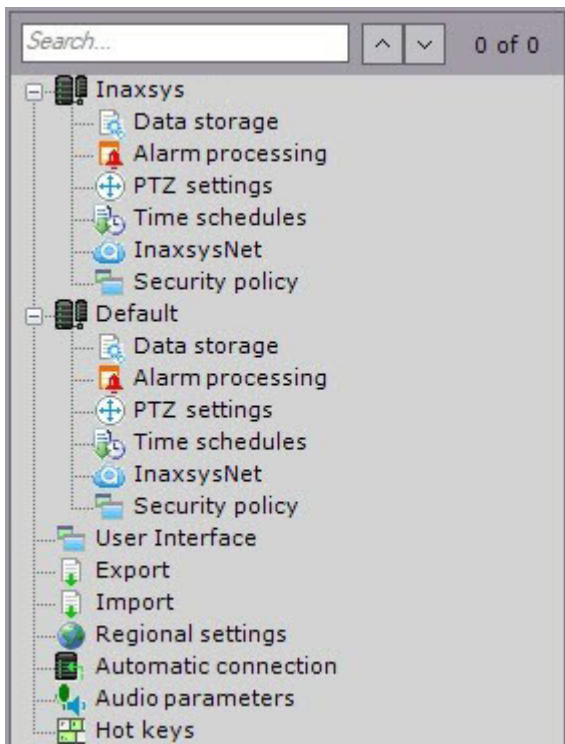
To change a port on an added Server, do the following:

1. Select this Server again from the list (11).
2. Enter a new port (12).
3. Click **Change** (13).

Autoconnection to Servers on different Arkiv domains is now complete.

The next time *Arkiv* is started, connection to the selected Servers with the specified user credentials will occur automatically.

If the Client is connected to several Servers, the Server settings are reproduced for each Server (see [Server settings](#)(see page 500)).

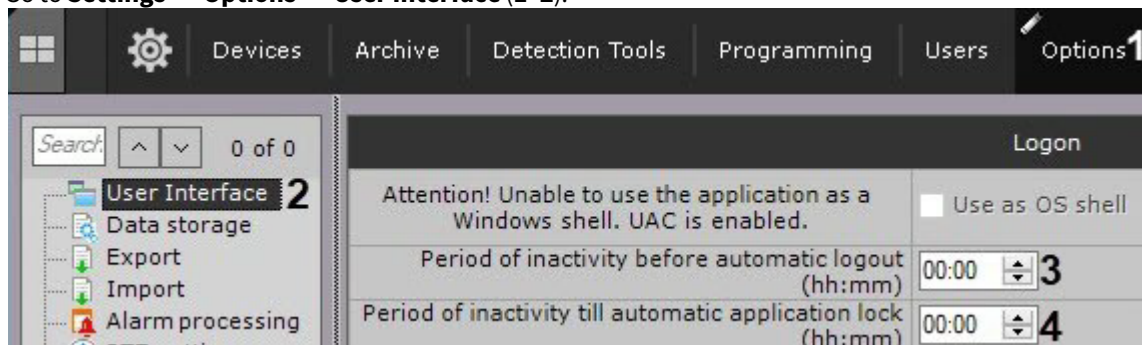


Configuring automatic exiting and locking of the Client

You can set the system to automatically exit and/or lock the Client if the user stays idle for a pre-determined time, i.e. no signals come from HID devices (keyboard, mouse, joystick, etc.).

To do so:

1. Go to **Settings** → **Options** → **User Interface (1-2)**.



2. In the **Period of inactivity before automatic logout (hh:mm)** field, enter the duration of user inactivity after which the Client should be quit (3).
If the field is blank or equals 00:00, the Client will not be quit.
3. Enter a value in the **Period of inactivity till automatic application lock (hh:mm)** field to set the time interval (4). To unlock the Client, the user has to re-login.
If the field is left blank or the value is set to 00:00, no locking will occur.

Note

- If a viewing layout is open, no automatic blocking occurs.

- You can lock the Client at any time using hotkeys (see [Assigning hot keys](#)(see page 552), [Appendix 6. Hotkeys in Arkiv](#)(see page 879)).

- Click the **Apply** button.

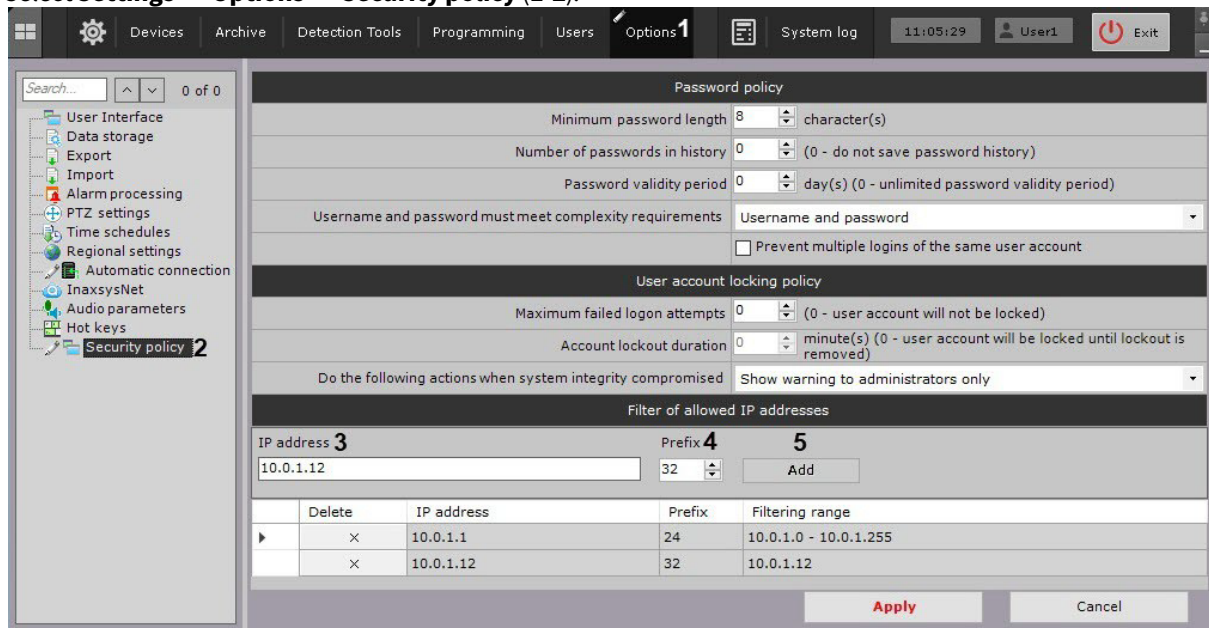
Configuration of automatic quit of the Client is now complete.

IP address filtering configuration

You can restrict remote clients' access to the server to a range of IP addresses.

To do this:

- Select **Settings** → **Options** → **Security policy (1-2)**.



- In the **Filter of allowed IP addresses** group, enter the IP address (3) and **subnet mask**¹⁵⁹ (4) to set the range of addresses from which a connection will be permitted.
- Click the **Add** button (5).
- Click **Apply**.

The range is now added to the list. No connection will be possible from addresses not in the list.

To remove an address or a range from the list, do the following:

- Click the **×** button.
- Click **Apply**.

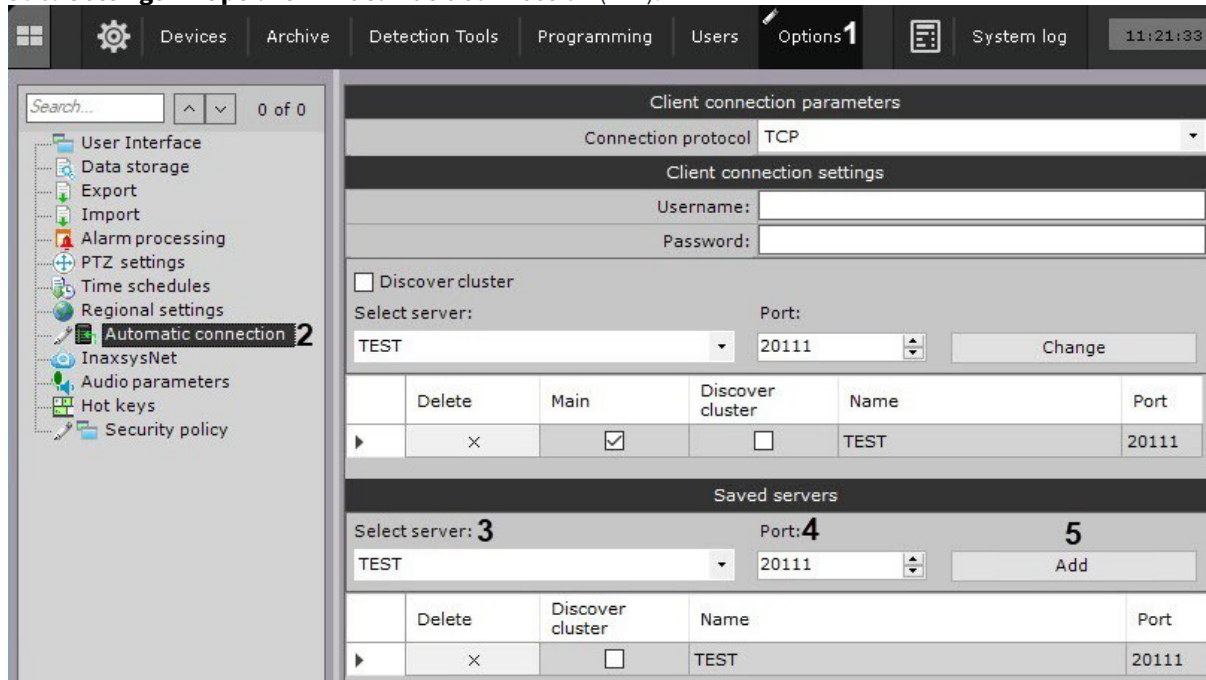
Selecting Preferred Servers

You can set Preferred Servers, which will be displayed at the top of the list when you launch Client (see [Starting an Arkiv Client](#)(see page 76)).

To do it, follow the steps below:

¹⁵⁹ <https://en.wikipedia.org/wiki/Subnetwork>

1. Go to **Settings** → **Options** → **Automatic connection (1-2)**.



2. In the **Saved servers** group, select the Server from the list (3).
3. Change the default port if needed (4).
4. Click **Add** (5).
5. Repeat the steps for all target Servers.
6. Click **Apply**.

Note

You can save the Preferred Servers list to a JSON file and load it to another Client (see [Configuring Cross-System Client and autologon](#)(see page 540)).

Configuring export

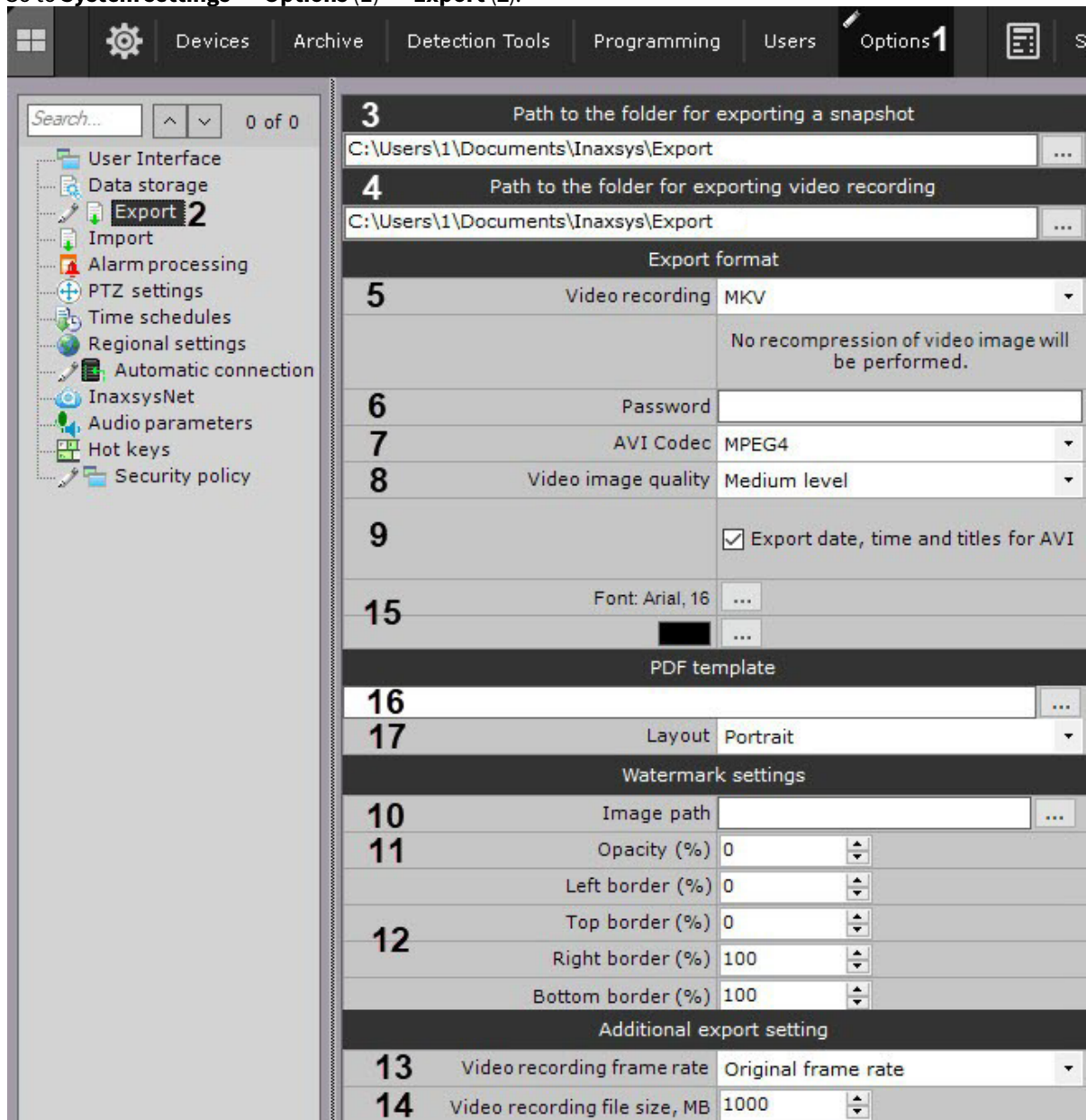
Configuring export options


Configuring export includes:

- setting the default destination folders for exported files;
- setting the default formats for export of video and snapshots;
- configuring export of video in AVI format;
- configuring the template for export of snapshots in PDF format;
- other export settings.

Configure export as follows:

1. Go to **System settings** → **Options (1)** → **Export (2)**.



2. In the **Path to the folder for exporting a snapshot (3)** and **Path to the folder for exporting video recording (4)**, enter the full path to the folders where exported files are to be saved. To do this, click the button  .

Note

During export you can specify any path.

Note

By default, on Windows XP, exported files are stored in C:\Documents and Settings\User\My Documents\Inaxsys\Export\. On Windows 7 and Windows Vista, they are stored in C:\Users\User\Documents\Inaxsys\Export\.

❑ Attention!

These fields also allow you to specify the name template for the exported files, as follows:



- {0} – camera ID;
- {1} – camera name;
- {2} – date;
- {3} – time;
- {4} – recording duration (for video export only).

3. Select the default formats for export of video and snapshots (**5**). You can select any available format during export. Snapshots can be exported in two formats: JPG and PDF. Videos can be exported into the following 4 formats: MP4, MKV, EXE and AVI.

❑ Note

Video is exported in MKV format without recompression.

Video is exported in AVI format with recompression in the selected codec (see point 4).

When video is exported in EXE format, a self-contained executable file is generated, containing video, playback tools, and necessary codecs.

4. If you want to export to an encrypted zip archive, set a password (**6**). If you are exporting an .exe file, you will need to enter a password when you open the file.
5. Specify settings for video export in AVI format: select a codec (**7**) and compression quality (**8**).
6. If you want to superimpose captions in the exported video, select the **Export date, time and titles for AVI** check box. When exporting to MKV, captions are always added, you can turn them off when playing (**9**).
7. You can watermark exported video footage as follows:

❑ Attention!

The watermark settings are applied to the entire Arkiv-domain.

- a. Select a file with a watermark (**10**). PNG, JPEG, BMP pictures are allowed.
- b. Set the transparency of the watermark: 100% – opaque, 0% – clear (**11**).
- c. Set the location of the watermark (**12**). To do this, specify the border of the watermarked area on each side of the frame as percentage of the frame size. The top left corner should be taken as the origin point.

The default values are:

Left	Top	Right	Bottom
0	0	100	100

the watermarked area will occupy the entire frame, and the watermark will be placed in the center of the image. To place the watermark in a corner, specify the following values:

for the top-left corner:

Left 0	Top 0	Right watermark width as percentage of the frame width	Bottom watermark height as percentage of the frame height
------------------	-----------------	--	---

for the bottom-left corner:

Left 0	Top 100 minus watermark height as percentage of the frame height	Right watermark width as percentage of the frame width	Bottom 100
------------------	--	--	----------------------

for the top-right corner:

Left 100 minus watermark width as percentage of the frame width	Top 0	Right 100	Bottom watermark height as percentage of the frame height
---	-----------------	---------------------	---

for the bottom-right corner:

Left 100 minus watermark width as percentage of the frame width	Top 100 minus watermark height as percentage of the frame height	Right 100	Bottom 100
---	--	---------------------	----------------------

8. Select a frame rate for the exported video: if **Original frame rate** is selected, the original frame rate is kept; if **1/2** is selected, the exported frame rate will be two times smaller than the original one; if **1/4** is selected, four times smaller, and if **1/8** is selected, eight times smaller (**13**).

Note

The minimum frame rate of exported video is 1 fps.

9. Set the limit for an exported video file size in megabytes (**14**). If the exported video exceeds the specified size, multiple export files will be created.

Note

The minimum value is 5 megabytes.

Due to Windows limitations, you cannot export files of more than 4 Gb to EXE format.

Attention!

Zero value sets export to a single file irrelevant to its size.

10. Configure a template for export of snapshots in PDF format:
- Select the font and font color (**15**).
 - If necessary, select the PNG image to use as the background of the PDF document (**16**).

- c. Select the document orientation (**17**).
Exported PDFs consist of three sections: comment entered during export; date and time of the snapshot; and snapshot image.
- d. Configure the size of the sections and their position on the page.



Note

Section sizes and positions can be changed like [standard windows](#)¹⁶⁰.

11. Click the **Apply** button.

Export configuration is now complete.

Configuring Export agent

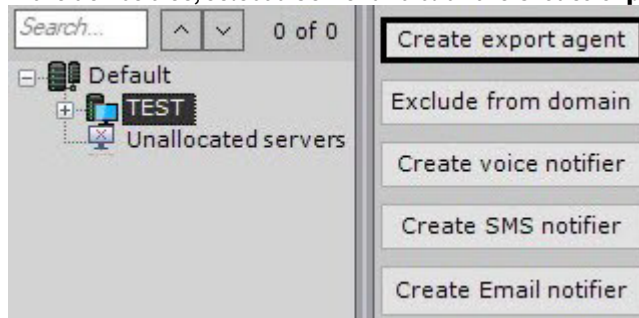
Export agent is a service that allows automatically exporting frames and video recordings to a particular Server when an event occurs in the system.

To start automatic export of frames and video recordings, you need to create a macro in the Cycle rules (see [Configuring Macros](#)(see page 381)).

To create and configure the Export agent, do the following:

¹⁶⁰ <http://windows.microsoft.com/en-us/windows/working-with-windows#1TC=windows-7>

1. In the device tree, select a Server and click the **Create export agent** button.



2. To enable the Export agent, set **Yes** for the **Enable** parameter (1).

1.Export agent	
✓ Object identification	
1	Enable No
2	Name
✓ Object features	
	Folder for frames D:/
	Folder for video D:/
	Frame frequency Original frame frequency
3	Image file format JPEG
	Maximum file size 4096
	Video codec Default
	Video file format MKV
	Video quality Medium level
✓ Authorization	
4	Username
	Password
✓ Watermark	
	Border-bottom 1
	Border-left 0
5	Border-right 1
	Border-top 0
	Opacity (%) 100
	Watermark image

3. In the relevant field, set the object name (2).
4. Specify the full paths to the folders that will store the exported frames and video recordings (3). For the network folders, enter the username and password of the user who has the access to the NAS (4).
5. Specify other export options (5). See their description in [Configuring export options](#)(see page 545).
6. Click the **Apply** button.

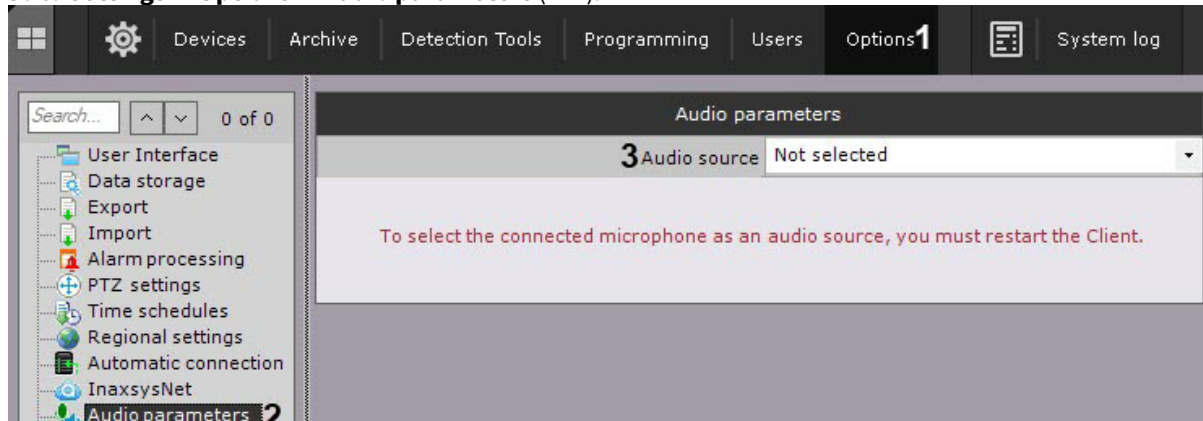
Creating and configuring the Export agent is now complete.

Configuring audio on the Client

To broadcast audio from the Client microphone on a camera speaker, you must configure audio on the Client.

Do the following:

1. Go to **Settings -> Options -> Audio parameters (1-2)**.



2. In the **Audio source** field, select the system device that will be used as the audio source for playback on the camera speaker (3).

Note

The default device is shown in the list in bold.

3. Click the **Apply** button.

Configuration of audio on the Client is now complete.

Configuring hot keys

Introduction to hot keys in Arkiv

In *Arkiv*, hot keys for standard keyboards and joysticks can be set to perform certain actions. The operator's work with hotkeys is divided into 6 modes:

1. Global mode, in which a hot key is always available.
2. Live Video mode.
3. Archive viewing and search in archive mode.
4. Time Compressor mode.
5. Alarm Processing mode.
6. Programming – running macros.

When setting hot keys, keep the following rules in mind:

- the same shortcut can be used for different actions in different modes;
- a shortcut in any particular mode can be associated with only one action;
- shortcuts set in Global mode cannot be redefined in other modes;
- hot keys are available only when the Client is active;
- on standard keyboards, alphanumeric keys must be preceded by modifier keys (CTRL, ALT, SHIFT);
- during system configuration (when the Settings tab is open), only one action with hot keys is available: go to layouts (the Activate panel of configuration command).

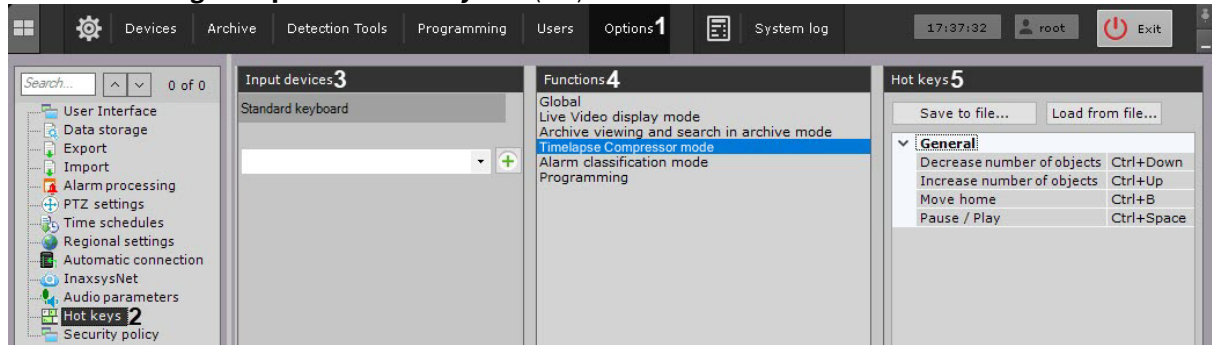
Note

Please refer to the list of hotkeys in [Appendix 6](#) (see page 879) to this guide.

Assigning hot keys

To assign hot keys:

1. Select the **Settings** → **Options** → **Hot keys** tab (1-2).



2. In the list, select the device for which you want to configure hot keys (3).
3. Select the mode for which you want to configure hot keys (4, see [Introduction to hot keys in Arkiv](#) (see page 551)).
4. To assign a shortcut to a specific action:
 - a. Double-click the current shortcut assigned to the action (5). The field is now cleared.

Note

For some actions in Global mode, you cannot change the default hot keys.

- b. Press the key/key combination/joystick button to assign to the action.

Note

If the field is left empty, no hot key will be assigned to the action.

5. Assign hot keys for all actions of interest.
6. Click the **Apply** button.

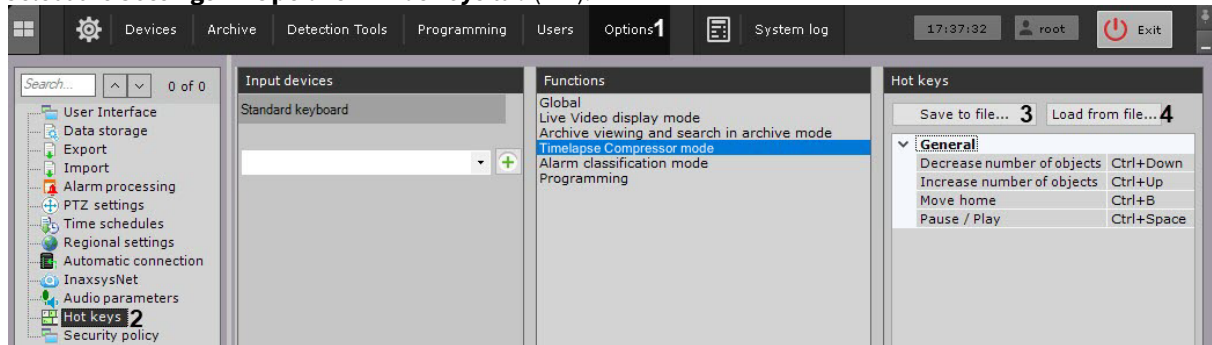
Assignment of hot keys is now complete.

Exporting and importing hot keys

You can export and import hot key configuration files from and to the Client. Export and import of hot keys is performed via files in XML format.

To export hot keys:

1. Select the **Settings** → **Options** → **Hot keys** tab (1-2).



2. Click the **Save to file...** button (3).
3. Select where to save the file and give it a name.

Export of hot keys is now complete.

To import hot keys:

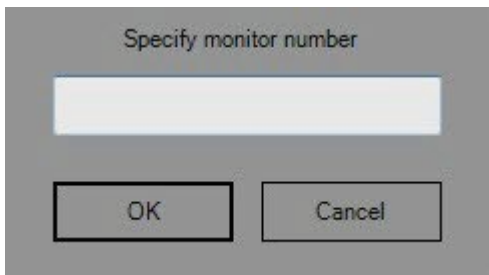
1. Select the **Settings** → **Options** → **Hot keys** tab (1-2).
2. Click the **Load from file...** button (4).
3. Select a file that contains a hot key configuration. Click the **Open** button.
The hot key combinations are imported into the Client, so long as a valid file is selected.
4. Click the **Apply** button.

Import of hot keys is now complete.

Notes regarding hot key actions

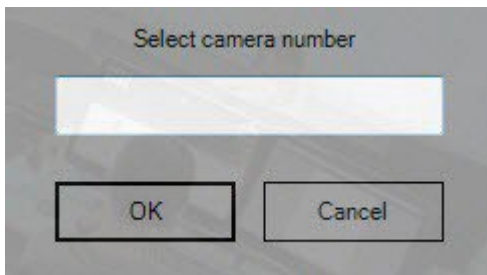
To select an active monitor in a multi-monitor configuration (see [Managing monitors on a local Client](#)(see page 759)), click **Select Monitor by number** (Global mode).

When you click the button or press the hotkeys, a window opens, where you can enter the monitor ID.



Enter the monitor ID and click **OK**. This monitor becomes active.

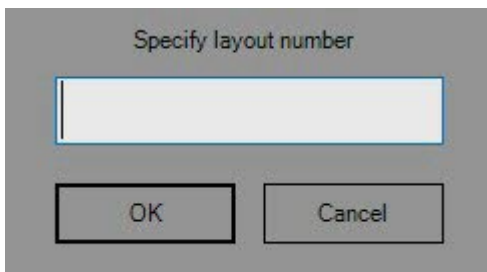
When a key or key combination assigned to the **Camera selection in current layout** action (Global mode) is pressed, the go to camera by ID window opens.



Enter the destination camera's user-friendly ID (see [The Video Camera Object](#)(see page 107)), then click **OK**.

If the current layout contains a camera with the specified ID, the relevant viewing tile becomes active. If the current layout does not contain a camera with the specified ID, a minimum layout containing the camera is opened.

If you press hotkeys for **Select layout by number** (Global mode), a window opens requesting you to enter the layout number. The layouts are sorted left to right, starting from 1.



Enter the number of a desired layout, then click **OK**.

If you press hotkeys for **Select layout by ID** (Global mode), a window opens requesting you to enter the layout ID (see [Setting a layout ID](#)(see page 485)).

In all other cases, no system actions occur.

Descriptions of other non-trivial actions performed via hot keys are given in the table.


Mode	Action	Description
Global (general)	Navigation (up, left, down, right)	Navigate or move within the selected interface element. These keys are active only when a navigable menu or panel/ribbon is open.
	Activate layout ribbon	When this key is pressed, the layout ribbon expands, allowing to navigate between and select layouts. When the ribbon is minimized or a layout is selected, the relevant viewing tile becomes active.
	Activate panel of video walls	When this key is pressed, the panel of video walls expands, allowing to navigate between available monitors. When the panel is minimized, the viewing tile becomes active.
	Activate camera panel	When this key is pressed, the camera panel expands, allowing to navigate between and select cameras. When the panel is minimized or a camera is selected, a viewing tile becomes active.

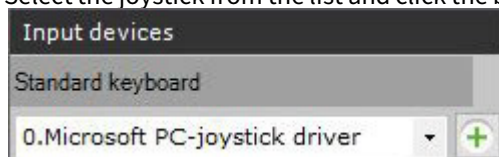
	Activate panel of configuration	Pressing this key a second time opens the tools panel, on the Layouts ribbon.
	Open alarm panel	Pressing this key again minimizes the panel.
	Open panel with hardware list (left)	Pressing this key again minimizes the panel.
Global (map)	Switch to 3D mode	If the map is in 2D mode, clicking this button switches to 3D mode. If the map is in 3D mode, clicking this button hides the map.
Live Video mode	Open the menu of the selected camera and select a menu item.	Pressing this key again closes the menu.
	Switch to Archive mode	If a viewing tile in a layout is active, the archive is opened only for that particular camera. Pressing this key again switches to Live Video mode. If there are no active viewing tiles in the layout, the archive is opened for all cameras in the layout.
Archive viewing and search in Archive mode	Go to Search in Archive mode.	Pressing this key again switches to Archive mode.
	Go to the next/previous frame	Holding this key moves forward/backward frame by frame until the key is released.
	Go to the next/previous video clip	Holding this key moves forward/backward between video clips until the key is released.
	Go to TimeCompressor mode	Pressing this key again switches to standard Archive mode.

Open list of timeline events	Pressing this key again closes the list.
Move to next hour Move to next month Move to next timestamp Move to previous hour Move to previous month Move to previous timestamp	Listed are the actions available while operating the Calendar (see Navigating Using the Timeline (see page 678)).

Joystick Configuration

To configure the joystick, do as follows:

1. Connect the joystick to a computer.
2. Calibrate the joystick.
3. Select the joystick from the list and click the button .



4. Set keyboard shortcuts, and click **Apply**.
5. Configure the sensitivity for PTZ controls:
 - a. Start a text processor (i.e. Notepad) and open the file <Joystick_Name>.xml, which is located in C:\Users\<User_Name>\AppData\Local\Inaxsys\Arkiv\HotKeysXmlConfigurationFiles.
 - b. Set the sensitivity for commands in **<Sensitivity>0.2</Sensitivity>**.

```
<HotKeysSchemaDeviceCommands>
<CommandName>DiscreteZoomOut</CommandName>
<HotKey>A2-</HotKey>
<Sensitivity>0.2</Sensitivity>
</HotKeysSchemaDeviceCommands>
```

The sensitivity values range from 0.0 (low sensitivity) to 1.0 (high sensitivity). Please see the commands that have sensitivity settings in the table.

Command	Command description
DiscreteMoveXAxisRight	Pan right (Move right)
DiscreteMoveXAxisLeft	Pan left (Move left)
DiscreteMoveYAxisUp	Tilt up (Move up)
DiscreteMoveYAxisDown	Tilt down (Move down)
DiscreteZoomIn	Zoom in
DiscreteZoomOut	Zoom out
DiscreteFocusNear	Reduce the focal length
DiscreteFocusFar	Increase the focal length
DiscreteIrisOpen	Open the iris
DiscreteIrisClose	Close the iris

⚠ Attention!

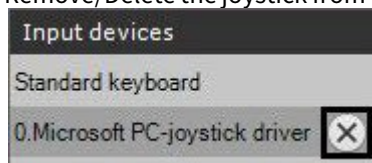
Do not set values outside the range and edit other parameters in the file.

- c. Save the changes to the file.

Joystick configuration is now complete.

If the joystick is already configured and the specified file does not have the **Sensitivity** parameter, do as follows:

1. Remove/Delete the joystick from the *Arkiv VMS*.



2. Click the **Apply** button.
3. Add and configure the joystick again.

Configuring video capturing on operator monitor

Video recording from the computer monitor is used to control the operator's actions. You can broadcast video from the computer monitor to *Arkiv* via the common protocols using the third-party software, for example:

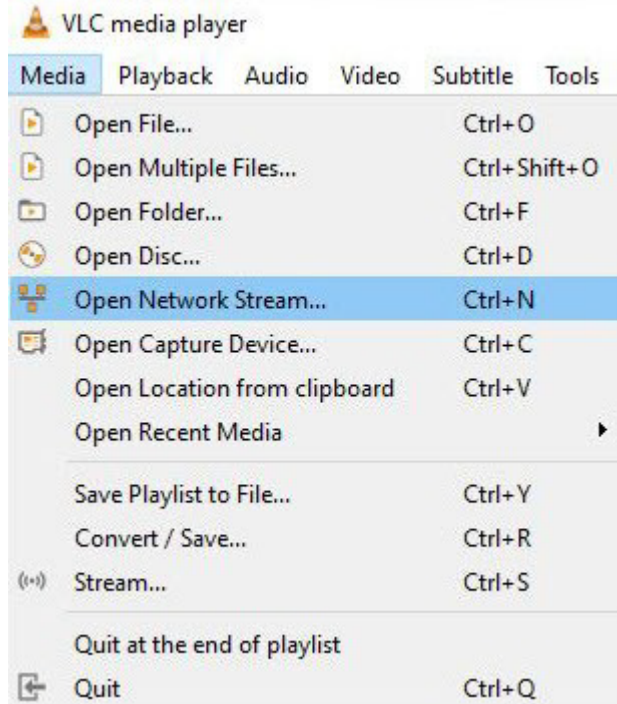
1. Via the RTSP protocol using the VLC Media Player.

2. Via the ONVIF protocol using the ScreenOnvif software, which can be purchased on the website <http://screenonvif.com/en>.

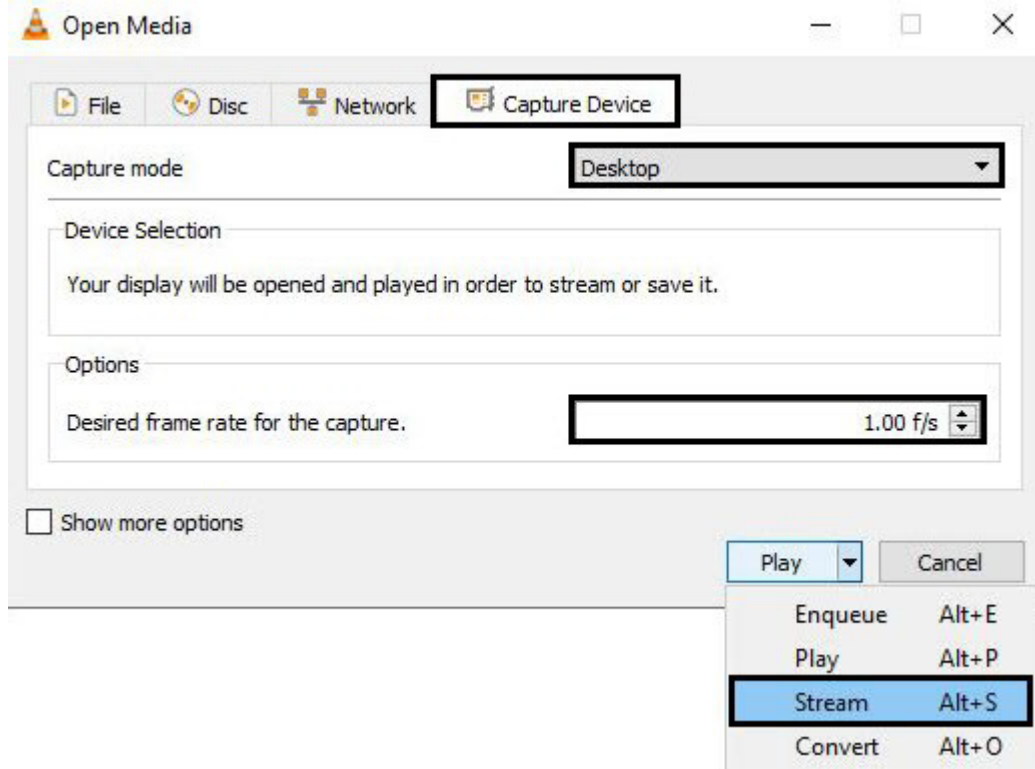
This section describes how to configure VLC Media Player to broadcast video from the computer monitor to *Arkiv* via the RTSP protocol. Configuring *Arkiv* to receive and record such a video stream is performed in a standard way as described in [Configuring an RTSP Server](#)(see page 106) and [Configuring recording to an archive](#)(see page 207).

Configuring VLC Media Player to broadcast video from the computer monitor to *Arkiv* via the RTSP protocol is performed in the following way:

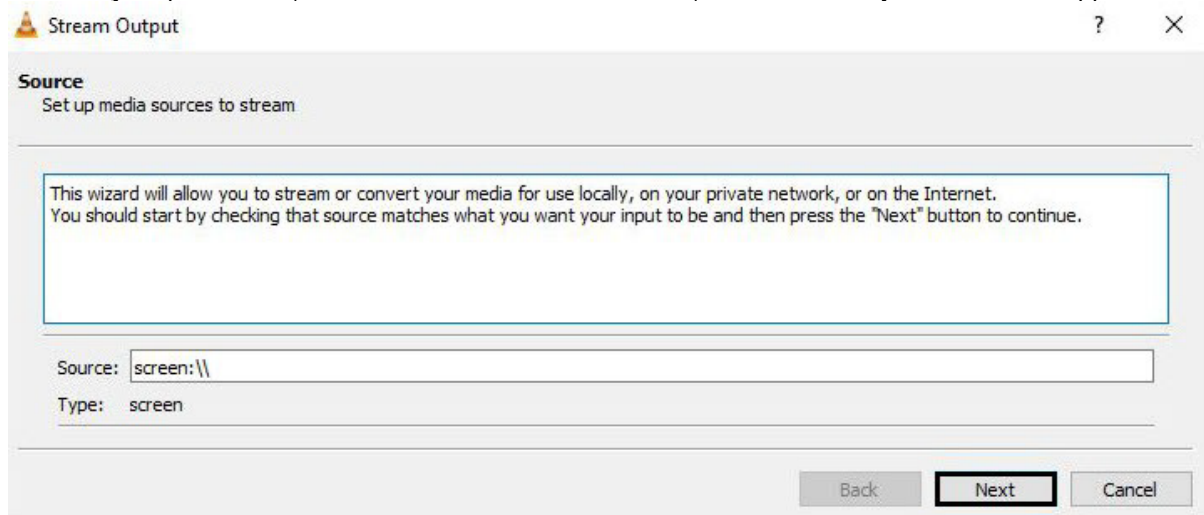
1. Run VLC Media Player.
2. Select the **Open Network Stream...** item in the **Media** menu.



- In the appeared window go to the **Capture Device** tab.



- From the **Capture mode** drop-down list, select the **Desktop** value.
- Set the required frame rate value for the capture in the corresponding field.
- In the **Play** drop-down list, select the **Stream** value. As a result, the **Stream Output** window will appear.



- Click the **Next** button.

- In the appeared window, select the **RTSP** value from the **New destination** drop-down list and click the **Add** button.

Stream Output

Destination Setup
Select destinations to stream to

+

Add destinations following the streaming methods you need. Be sure to check with transcoding that the format is compatible with the method used.

New destination: RTSP

Display locally

Back Next Cancel

- Go to the **RTSP** tab.
- Specify the port and the path to the stream, if necessary.

Stream Output

Destination Setup
Select destinations to stream to

+

RTSP

This module outputs the transcoded stream to a network via RTSP.

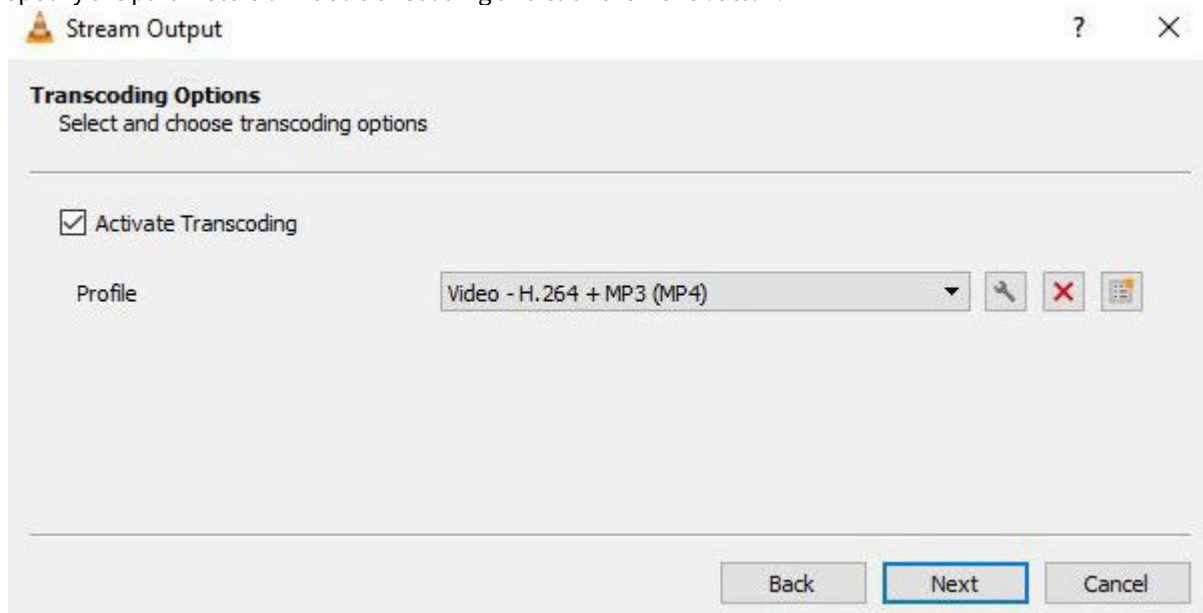
Port: 8554

Path: /

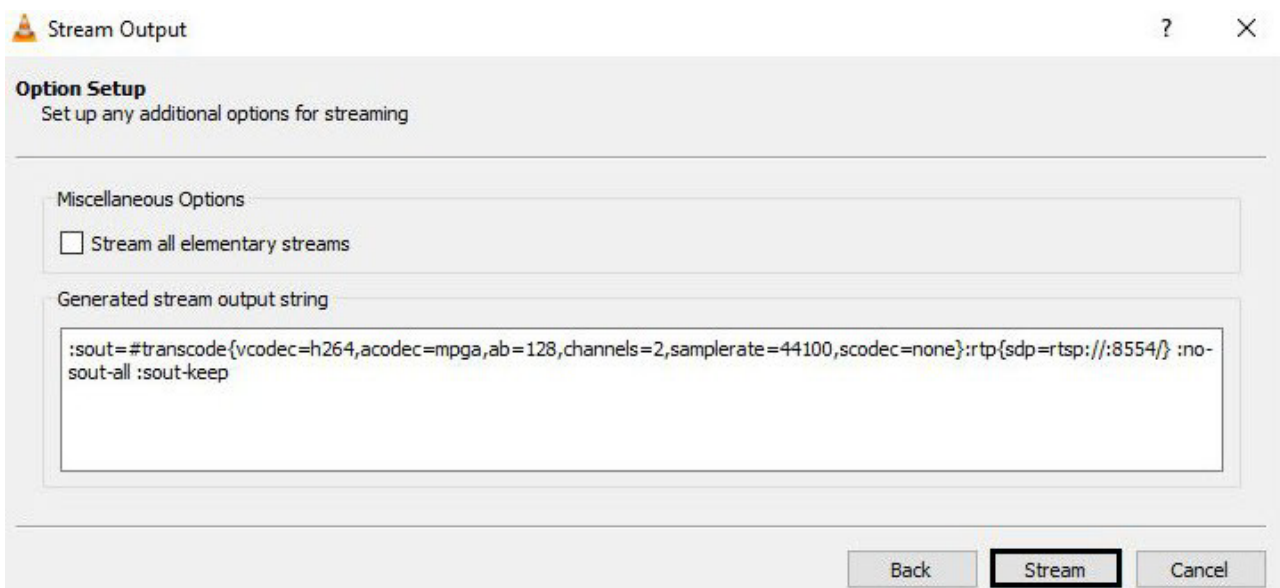
Back Next Cancel

- Click the **Next** button.

12. Specify the parameters of video transcoding and click the **Next** button.



13. Click the **Stream** button in the appeared window.



After that, you can configure *Arkiv* to receive the RTSP stream and record it to the archive (see [Configuring connection of video cameras via RTSP](#)(see page 136) and [Configuring recording to an archive](#)(see page 207)).

Configuring VLC Media Player to broadcast video from the computer monitor to *Arkiv* via the RTSP protocol is completed.

7.11 Configuring Failover VMS

7.11.1 General information about a failover system

A failover system automatically prevents data loss when one of the servers in the system fails.

In a failover system, the servers are combined into a logical structure – the cluster.

The *Arkiv* Failover system has two types of configuration.

1. The basic configuration allows system supervisors to permit launching *Arkiv* servers (nodes) on any Servers within the system.

Note

While selecting a Server to transfer a node to, the supervisor tries to keep in balance the whole cluster's performance. If all Servers deliver more or less the same performance, the selection is performed randomly.

If Servers significantly differ in their performance, the supervisor may launch several nodes on a more capable Server, and no nodes on a less capable one.

2. In the configuration with the specified backup Server, a node from the primary Server can be migrated only to the backup Server. After the primary Server is back online, the node is returned.

Node migration is automatic and takes no more than one minute.

Note

In a system counting 100 cameras, the node is transferred in less than one minute in both Failover System configuration types. All Servers within the system have identical specifications: Intel i5-7400 3GHz 4-core CPU, 16Gb RAM.

This section contains the following terms:

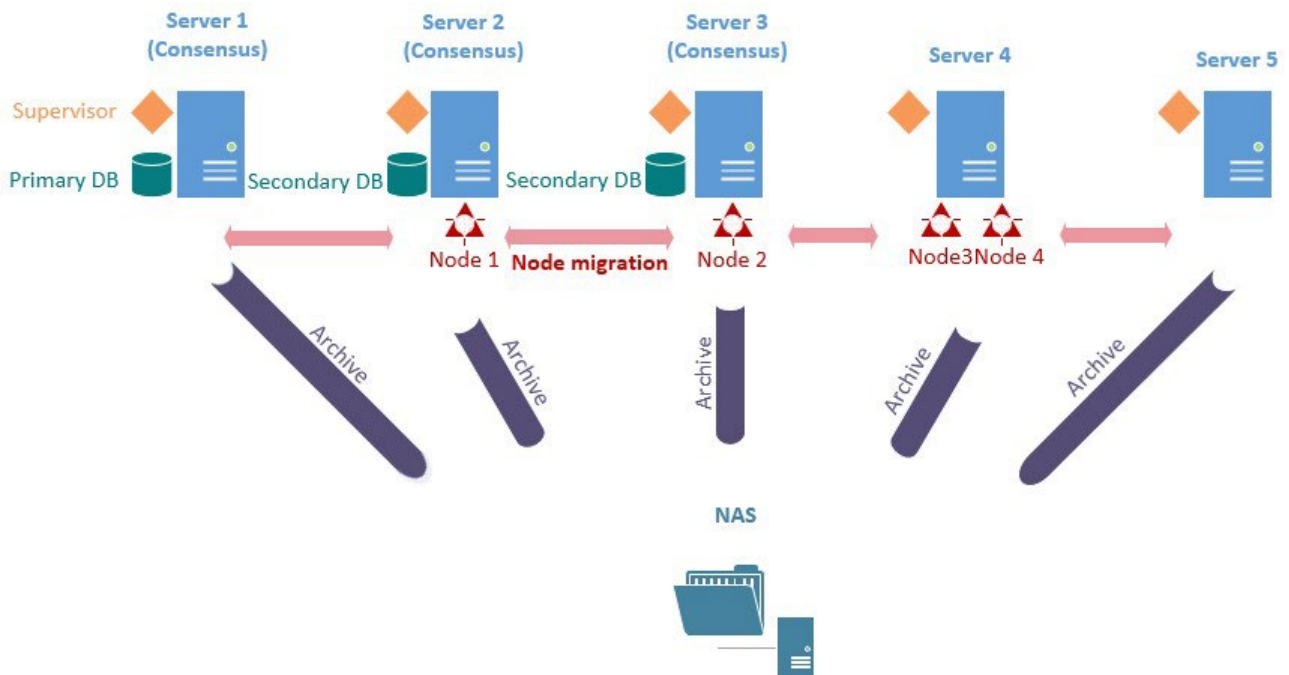
- **Server** – a computer with **Failover Server and Client** configuration of *Arkiv* installed;
- **Node** – an instance of the Server services. A Server can have multiple nodes running;
- **Cluster** – logical grouping of Servers that allows migration of clusters between them. A cluster may encompass nodes from different *Arkiv* domains;
- **Supervisor** – the service that monitors the status of nodes and their migration.

To implement Failover in your system, we strongly recommend that:

- the system administrator should have full control over all communication channels and hardware that provides fault tolerance at all times;
- you should build a cluster from servers in the same LAN;
- use only the network archives, that are available from all servers in the cluster.

Example:

CLUSTER



7.11.2 Ports used by the failover system

Each failover system server uses the following ports:

- 4000 (Supervisor Web Interface(see page 564), only TCP),
- 4646 (Nomad¹⁶¹ HTTP API, only TCP),
- 4647 (Nomad¹⁶² RPC, only TCP),
- 4648 (Nomad¹⁶³ LAN/WAN Serf (Gossip), TCP and UDP),
- 8300 (Consul¹⁶⁴ Server RPC, only TCP),
- 8301 (Consul¹⁶⁵ LAN Serf (Gossip), TCP and UDP),
- 8302 (Consul¹⁶⁶ WAN Serf (Gossip), TCP and UDP),
- 8500 (Consul¹⁶⁷ HTTP API, only TCP),
- 8600 (Consul¹⁶⁸ DNS, TCP and UDP).

Moreover, each node of the cluster has its pre-defined unique port range (see [Installation](#)(see page 36)).

For best results, use port numbers from 20111 to 32000.

161 <https://www.nomadproject.io/docs/install/production/requirements#ports-used>

162 <https://www.nomadproject.io/docs/install/production/requirements#ports-used>

163 <https://www.nomadproject.io/docs/install/production/requirements#ports-used>

164 <https://www.consul.io/docs/install/ports#required-ports>

165 <https://www.consul.io/docs/install/ports#required-ports>

166 <https://www.consul.io/docs/install/ports#required-ports>

167 <https://www.consul.io/docs/install/ports#required-ports>

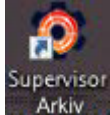
168 <https://www.consul.io/docs/install/ports#required-ports>

7.11.3 Supervisor Web Interface

You can configure a failover system in the Supervisor Web interface at <http://localhost:4000>¹⁶⁹.

Note

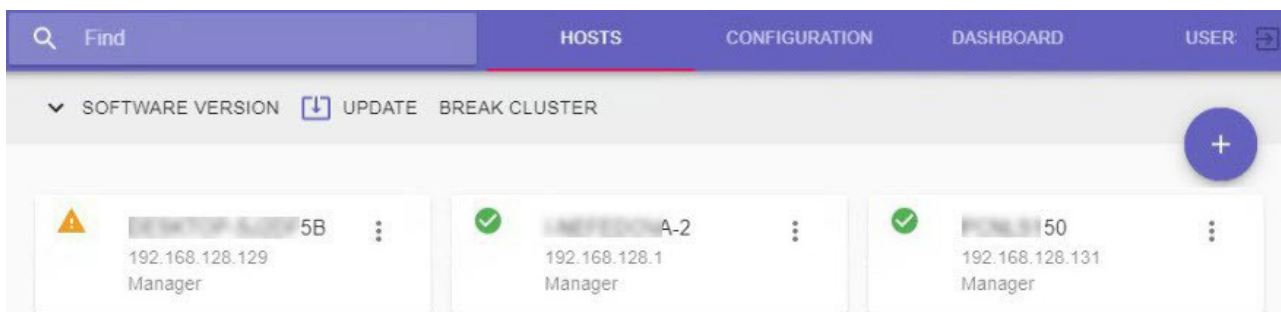
After installation, a shortcut is added to your desktop.



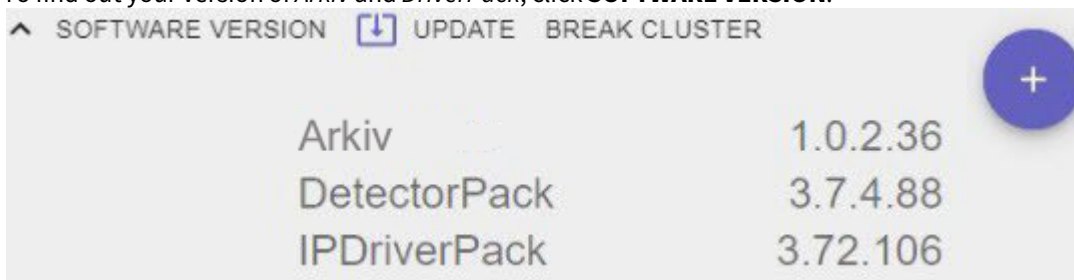
On Linux OS, no additional shortcuts are created after installation. To access the supervisor web interface, go to <http://localhost:4000>¹⁷⁰.

The Supervisor Web interface has 4 tabs:

1. **HOSTS** – [Creating a Cluster](#)(see page 565).
2. **CONFIGURATION** – [Failover Database](#)(see page 567), [Configure a Failover System Cluster](#)(see page 568).
3. **DASHBOARD** – [Cluster Monitoring](#)(see page 581).
4. **USERS** – [Set up access to a supervisor](#)(see page 578).



To find out your version of *Arkiv* and *DriverPack*, click **SOFTWARE VERSION**.



To search hosts and servers, enter their names in the search bar in the **HOSTS** tab or **DASHBOARD** tabs at the top of the window.



¹⁶⁹ <http://127.0.0.1:4000>.

¹⁷⁰ <http://127.0.0.1:4000>.

7.11.4 Creating a Cluster

The first time you launch the Supervisor, you should initialize the cluster. To do this:

1. Select the Server's IP address from the list and click **NEXT**.



Choose a network interface to use as a server

169.254.10.121

169.254.172.22

169.254.96.143

169.254.42.153

10.0.36.31

169.254.110.144

192.168.169.1

192.168.128.1

NEXT

2. Add the required Servers to the cluster. To do this, enter the IP address and click **LINK**.



Link other servers to cluster

IP address

192.168.128.131|

LINK

BACK

NEXT

⚠ Attention!

All Cluster Servers must be accessible to each other.

All Servers must be hosted on computers with the same architecture (x86, x64).

Attention!

The first three Servers added become the master Servers.
 The operation of the cluster is coordinated by its master Servers, which, in particular, take decisions to migrate nodes from one Server to another.
 You can have 3 or 5 master Servers in the cluster.
 If only two Servers are added, they can be configured as **1+1** (primary + backup Server).

3. If required, you can add a user with administrator rights. After the cluster is created, only this user will have access to the supervisor. Please follow the steps below:

- a. Click the **Add** button.

The screenshot shows a progress bar with four steps: 1. Set server address (checked), 2. Link other servers (checked), 3. Create user (active), and 4. Bootstrap. Below the progress bar, the title is 'Create a user with administrator privileges'. An information icon is followed by the instruction 'Add username and password and click next'. There are two input fields: 'Login' with the value 'root' and 'Password' with masked characters '....'. A 'BACK' button is on the left, and 'CANCEL' and 'NEXT' buttons are on the right.

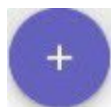
- b. Enter access credentials and click the **NEXT** button.

4. After you added all Servers, click the **INITIALIZE** button.

The screenshot shows a progress bar with four steps: 1. Set server address (checked), 2. Link other servers (checked), 3. Create user (checked), and 4. Bootstrap (active). Below the progress bar, the title is 'Confirm creating configuration Pool'. There is a list of three server addresses, each with a server icon to its left: 192.168.128.1, 192.168.128.131, and 192.168.128.129. A 'BACK' button is on the left, and an 'INITIALIZE' button is on the right.

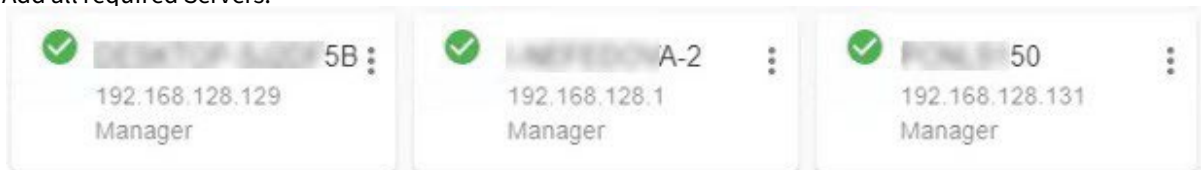
This will initialize the cluster based on the selected Servers. To add more Servers to the cluster, do the following:

1. On the **HOSTS** tab, click




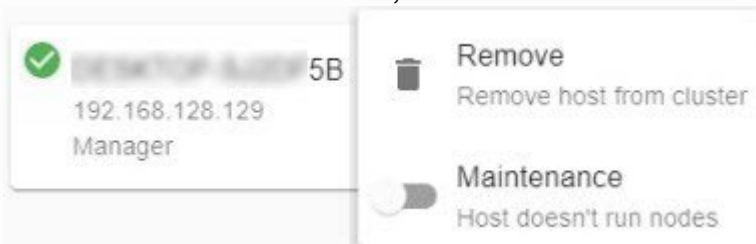
2. Enter the IP address of the Server.

3. If the Server you are adding is master, select the **Manager** checkbox.
4. Click **ADD HOST**.
5. Add all required Servers.



Note

To remove a Server from the cluster, click  and then Remove.



Attention!

To change the IP addresses of the Server in the cluster, do as follows:

1. Remove the Server from the cluster.
2. Change the IP address of the Server.
3. Add the Server with a new IP address.

7.11.5 Failover Database

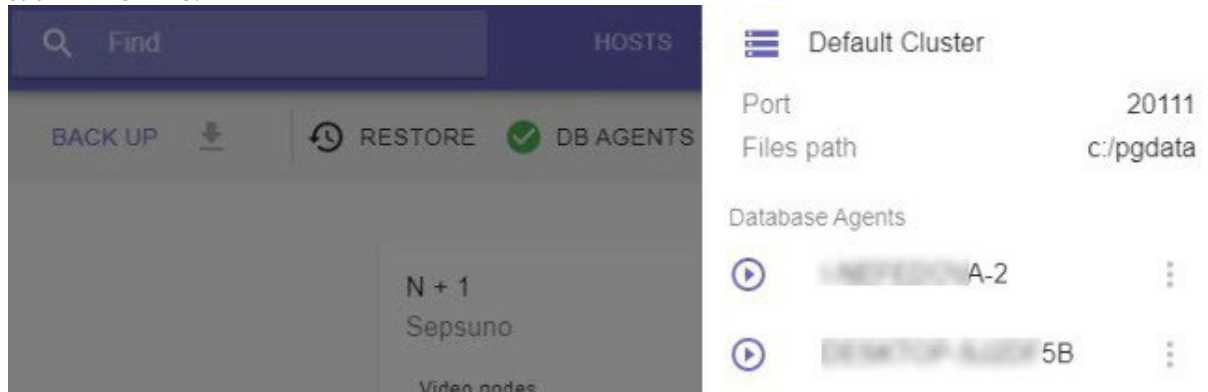
By default, the database is created automatically when the cluster is initialized, and its agents are launched on the master Servers.

The database is located in the C:\pgdata folder and uses port 20110 (see [Ports used by the Arkiv Software Package](#)(see page 28)).

To manage database agents, do the following:

1. Go to the **CONFIGURATION** tab.

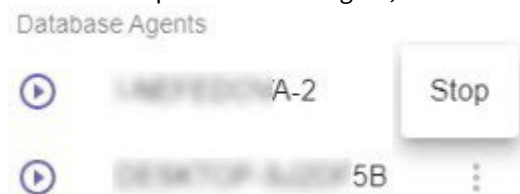
2. Click **DB AGENTS**.



3. The icon next to the Server indicates the current status of the agent.

Icon	Status
	Launch expected
	Launched
	Stopped

4. Click to stop or launch the agent, and select the required action.



7.11.6 Configure a Failover System Cluster

A failover system can be configured in two ways:

1. Basic configuration. There are no pre-assigned backup Servers in this configuration. The supervisor independently decides where to host a particular node. Only network archives can be used in this configuration.
2. Configuration with the specified backup Server. In this configuration, a backup server is assigned to host a node which for some reason cannot operate on its primary server. Along with network archives, local archives can be used in this configuration.

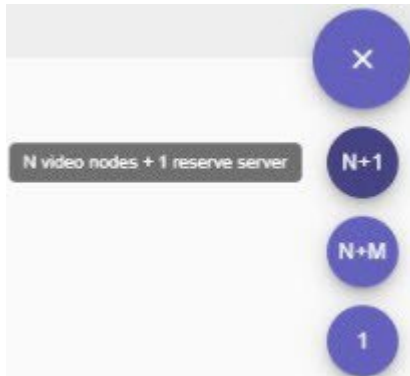
In addition, you can create independent nodes.


Setting up a configuration with the backup Server

A configuration with the backup Server can include two or more Servers.


To set up the configuration, do the following:

1. Hover the mouse cursor over the  button and click the **N+1** button.



2. Click  and assign a backup Server.



3. Click  and add primary Servers.

4. If you need to maintain a local event database on Servers, activate the corresponding switch **(1)**.



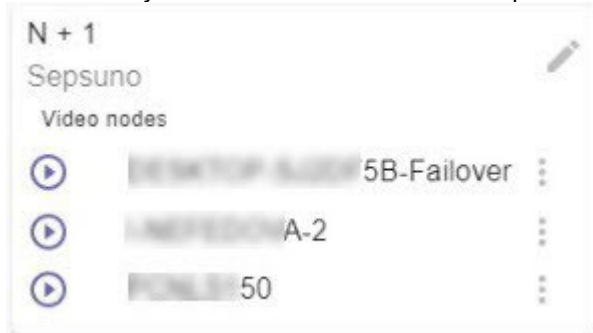
5. If you need to maintain local footage archives on primary Servers, activate the corresponding switch **(2)**.

Attention!

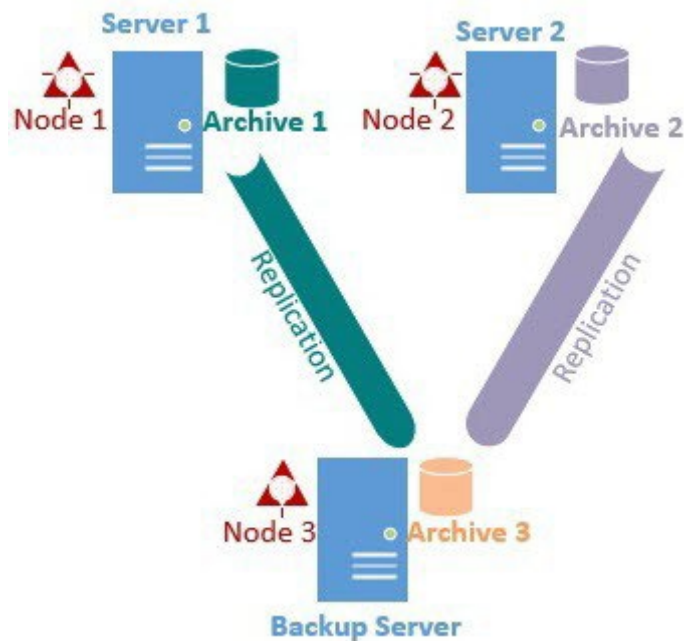
The local video footage will be created as a 10 GB file located in the C:/temp_arch folder. If the node is migrated from a primary Server to a backup one, video data will be recorded to this file and replicated to the main Archive (video footage) on the backup Server (see paragraph 10).

6. If you need to replicate local archives to the backup Server on permanent basis, activate the corresponding switch **(3)**. Otherwise, the replication will be performed only when the corresponding node is migrated to the backup server.
7. By default, the self-diagnostics service is running on all nodes (see [Self-diagnostics service](#)(see page 586)). To stop it, de-activate the **Self diagnostics** parameter **(4)**.
8. Click the **Logging** button to set the logging options **(5)**, see [Setting up basic configuration](#)).
9. Click the **APPLY** button.
- The configuration is now created, and the nodes are now automatically started. "Failover" string will be

automatically added to the name of the backup node.

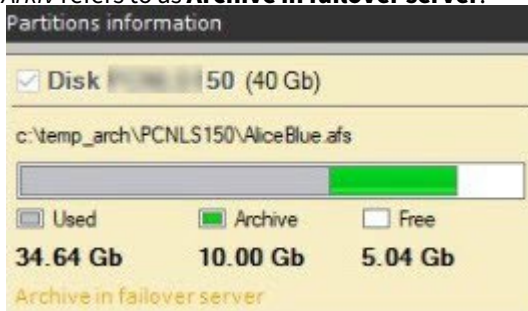


10. Merge all nodes into a single Arkiv domain (see [Connecting to a Node and Configuring of an Arkiv domain](#)(see page 582)).
11. Configure the footage archives operation:
 - a. On the backup node, create an archive for replication (see [Creating archives](#)(see page 202)).
 - b. On the primary nodes, configure the replication from the primary Servers' archives to the backup node's archive. The replication period should be set to **Always** (see [Configuring data replication](#)(see page 210)). You have to set the replication time period to **Always** regardless of the value of the **Force archive replication** parameter (see paragraph 6).



Configuration of the Failover system is now complete.

When a node is migrated to the Failover Server, the latter creates a temporary 10 GB archive in C:\temp_arch which Arkiv refers to as **Archive in failover server**.



Its records will be replicated to Backup Server's main archive (see **Archive 3** on the picture above) .

If necessary, you can further edit the configuration. To do so, click . You can perform the following actions:

- add/remove Servers;
- add/delete nodes;
- activate/de-activate the self-diagnostics service;
- change logging parameters;
- completely remove the configuration.

To manually stop or launch a node, click and select the required action.



Creating and configuring independent nodes

You can host separate nodes on cluster's Servers which are not used by any configuration.


Failover doesn't cover these nodes since they rely on local databases. If the host Server fails, the nodes can not be migrated.

To create an independent node, do as follows:

1. Go to the **CONFIGURATION** tab.

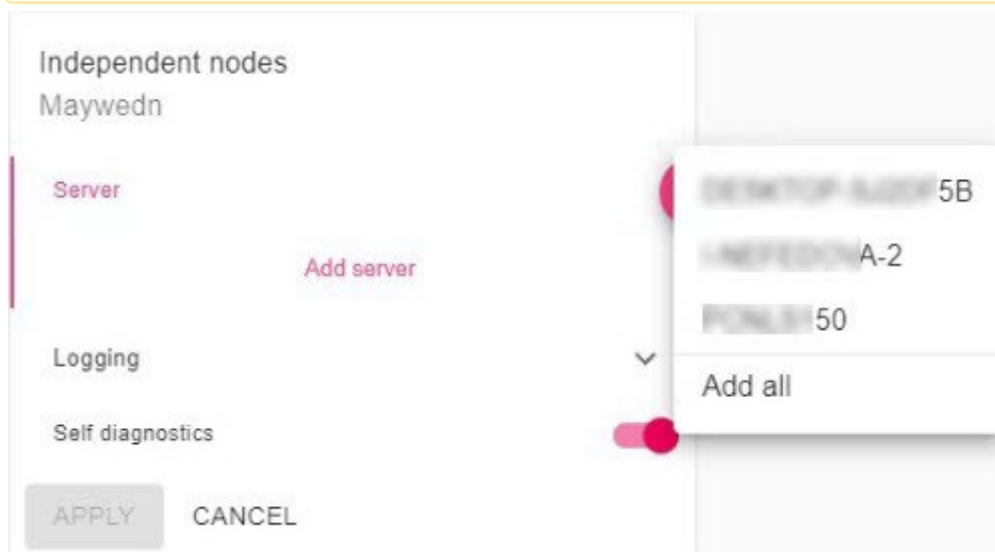
2. Point the cursor at  and click **1**.



3. Click  and select Servers where independent nodes should be launched.

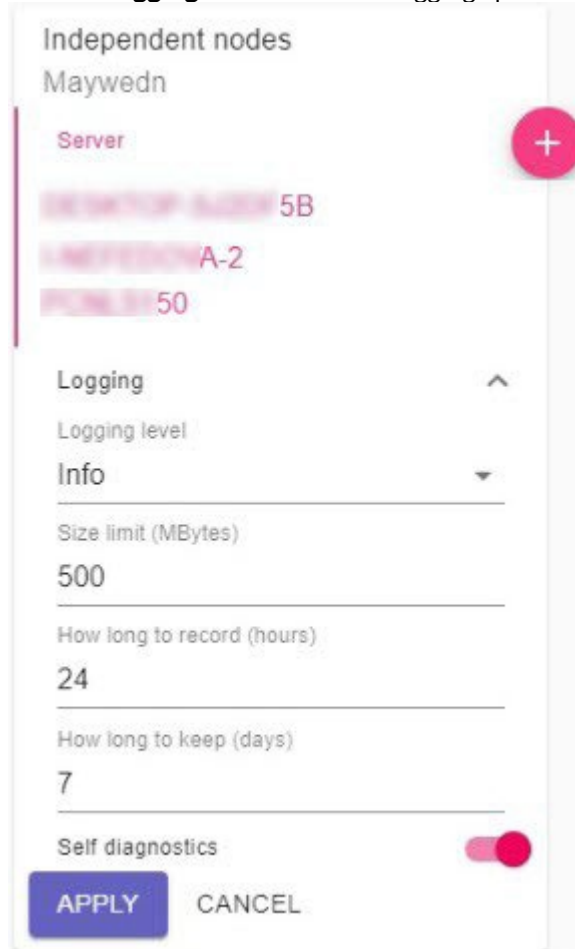
Attention!

You can create only one independent node on each Server.



4. By default, the self-diagnostics service is running (see [Self-diagnostics service](#)(see page 586)). To stop it, deactivate the **Self diagnostics** parameter.

- Click the **Logging** button to set the logging options.



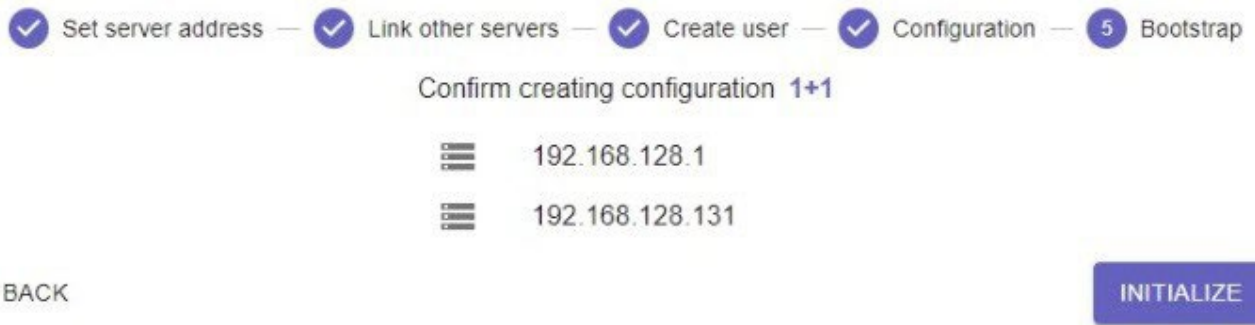
- Click the **APPLY** button.

The nodes are now created; they should start automatically.



1+1 Cluster Configuration

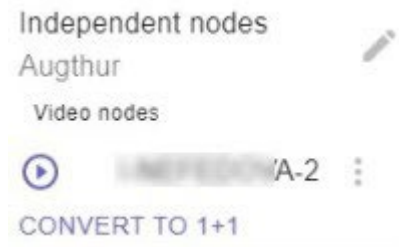
Before setting up a cluster in this configuration, you have to initialize the cluster after two Servers have been added.




In this case, the primary node will reside on the Server from which the cluster was initialized.

If a cluster has been initialized on one Server only:

1. Add the second Server to the configuration.
2. Click the **CONVERT TO 1+1** button on the **Configuration** page.



If necessary, you can further edit the configuration. To do so, click . You can perform the following actions:

- activate/de-activate the self-diagnostics service;

1 + 1
Augthur

Server
A-2

Reserve Server
50

Force archive replication

Self diagnostics

Logging ^

Logging level
Info ▼

Size limit (MBytes)
500

How long to record (hours)
24

How long to keep (days)
7

APPLY CANCEL


- change logging parameters.

In this configuration, a local Archive (video footage) will be automatically created as a 10 GB file located in the C:/temp_arch folder.

If a node is transferred to a backup Server, the primary archive must be replicated as a backup archive. To do it, follow the steps below:

1. On the backup node, create an archive for replication (see [Creating archives](#)(see page 202)).
2. On the primary nodes, configure the replication from the primary Servers' archives to the backup node's archive. The replication period should be set to **Always** (see [Configuring data replication](#)(see page 210)). You have to set the replication time period to **Always**.

Note

Further changes in the configuration may include only logging parameters. To do this, click the button 

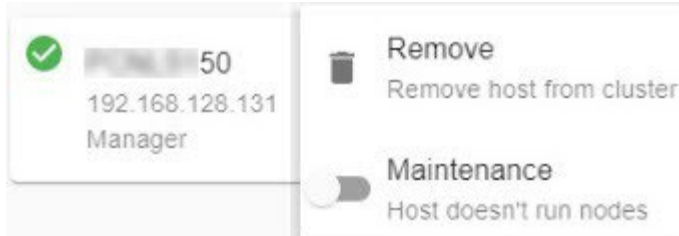
Attention!

If the backup Server fails while the system is running, you cannot stop the primary node.
If the backup server is down, the primary node will not restart.

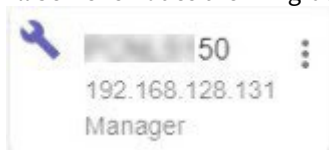
Suspending a Server within a cluster

In some cases, you may need to temporarily suspend the operation of a Server within a cluster. To do this:

1. Open the Server menu on the **Configuration** page.
2. Activate the **Maintenance** switch.



All Server's nodes then migrate to other Servers, and the status of the Server is updated.

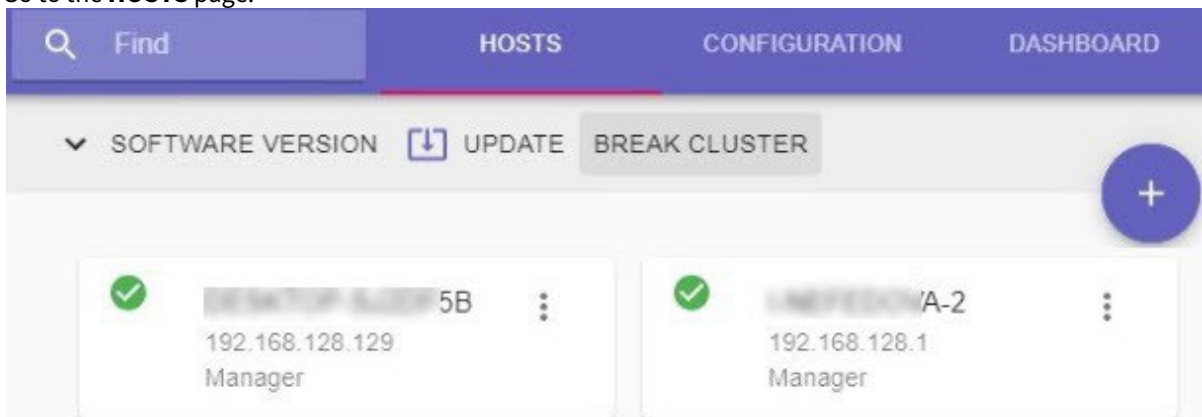


To resume the Server's operation within the cluster, toggle the Service switch to its initial position.

Disbanding a cluster

To disband a cluster, do the following:

1. Go to the **HOSTS** page.



2. Click the **BREAK CLUSTER** button.
3. Confirm the action.

Are you sure you want to break cluster?



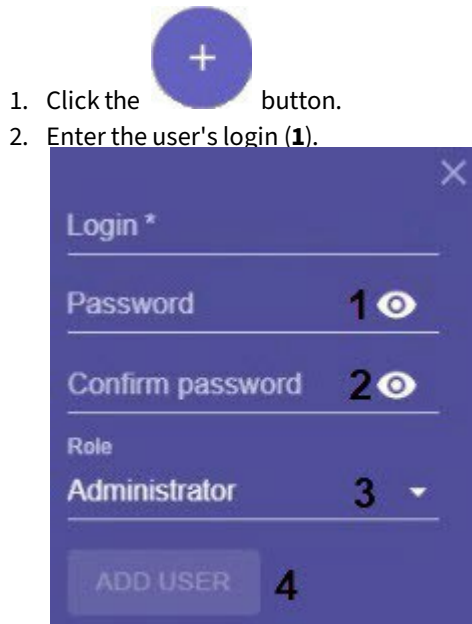
The cluster is now disbanded.

7.11.7 Set up access to a supervisor

When you launch the supervisor for the first time and create the cluster, you can create a user with the Administrator role (see [Creating a Cluster](#)(see page 565)).

In the future, you can create users with two roles: Administrator or Operator. Administrators have full access to the cluster configuration while operators can only view the configuration and monitor the state of the system.

Users can be created in the **USERS** tab. To create a user:




1. Click the  button.
2. Enter the user's login (**1**).

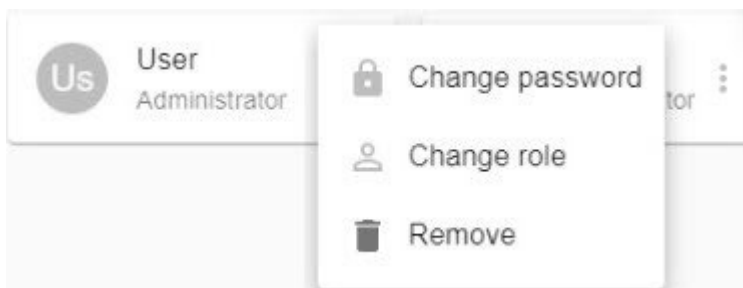
3. Enter the user's password (**2**).
4. Select the role to which the user will be added (**3**).

Note

The first user you create will be automatically added to the Administrator role.

5. Click the **ADD USER** button (**4**).

User creation is complete. Click  to edit the user.



The following operations are allowed:

- change password,
- change role,

- delete user.

If at least one user was created, then the authentication is required when connecting to the Supervisor web interface.

Sign in
http://127.0.0.1:4000

Username

Password

7.11.8 Configuration backup and restore for failover VMS

You can back up your cluster, DBs, and nodes configuration and restore it.

By default, backup copies of the cluster configuration are created each 24 hours on each Manager Server. If a backup copy was created by operator's command, the next automatic backup will be performed not earlier than after 24 hours.

Attention!

The object trajectory DB cannot be backed up. In the event of server hardware failure, all metadata stored in the database will be lost irretrievably.

To create a backup:

1. Go to the **CONFIGURATION** tab.
2. Click the **BACK UP** button (1) and download the backup by clicking the  button.



To restore a configuration from a backup:

Create a cluster first.

1. Go to the **CONFIGURATION** tab.
2. Click the **RESTORE** button (2) and select the file with the configuration backup.



3. Click the **RESTORE** button.

Attention!

Restoring configuration will stop all active tasks.

Configuration restore completed.

To transfer the configuration from a common security server to a failover system:

1. Create a copy of the configuration on the server (see [Backing up a configuration](#)(see page 850)).
2. Connect to the configuration backup and restore utility on the node (see [Connecting to a Node and Configuring of an Arkiv domain](#)(see page 582)).

Backup and restore configuration tool



User authentication
Choose server to connect and enter administrator's username and password

Server name or IP address: 8.1 >> A-

Username: root

Password: *****

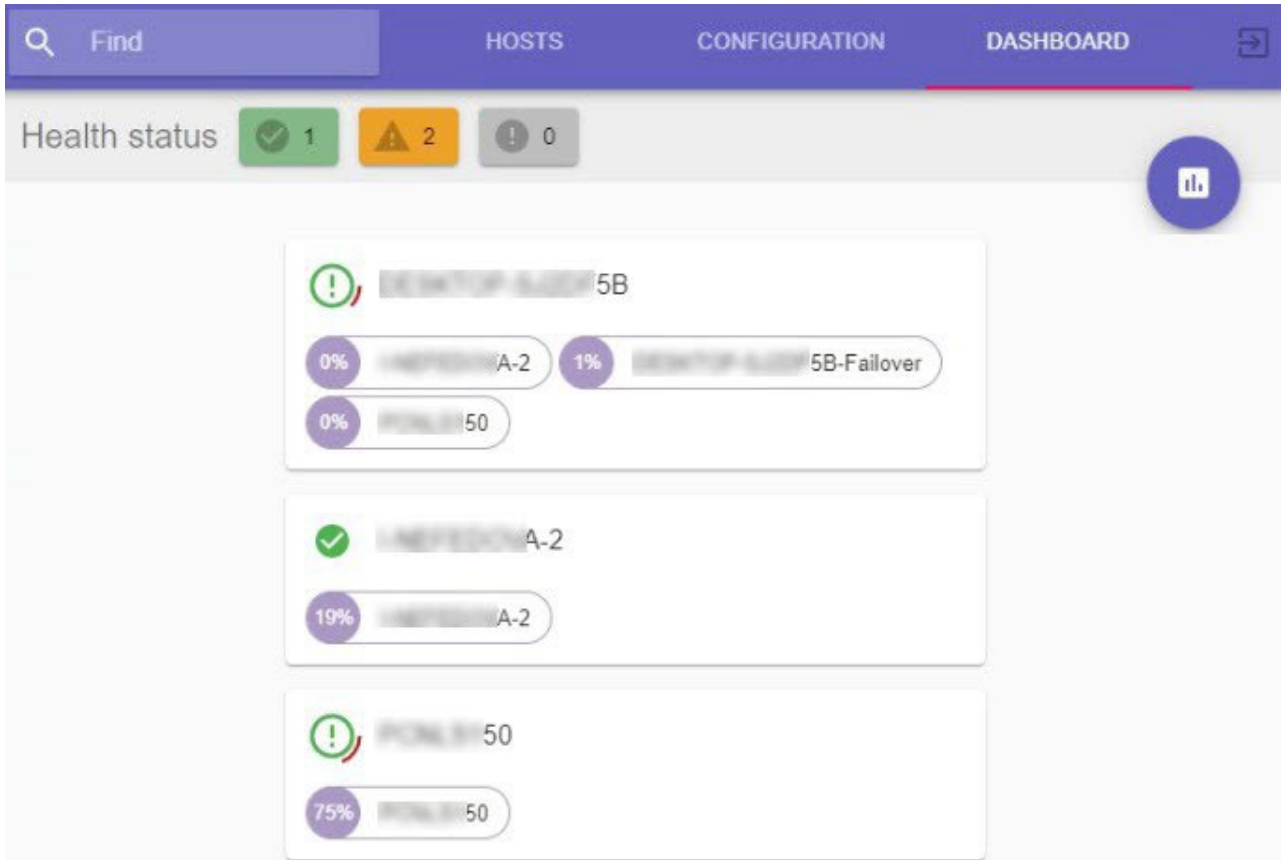
Next >>

Inaxsys
SECURITY SYSTEMS INC.

3. Restore the saved configuration (see [Restoring a configuration](#)(see page 854)).

7.11.9 Cluster Monitoring

You can monitor clusters in the **DASHBOARD** tab.



The following information is available:

1. The status of all cluster servers. All cluster servers are cross-checked against a number of criteria. The status info of a server reflects the cross-check results.

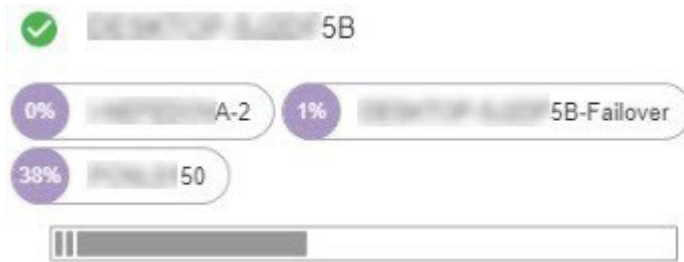
Status	Description
	The server successfully passed all checks.
	The server did not pass some checks. The red stripe around the icon reflects the percentage of failed checks.

2. The percentage of allocated CPU resources is calculated for all running nodes. For example, for a node consuming 9300 standard units out of total of 12400, the percentage is: $(9300/12400) * 100\% = 75\%$.




Attention!

This parameter does not reflect the actual Server CPU load; the amount of the node related load can be either higher or lower than the displayed value.

To open the CPU server load diagram, click **Show Resource**.



You can filter servers by status using the **Health status** panel.

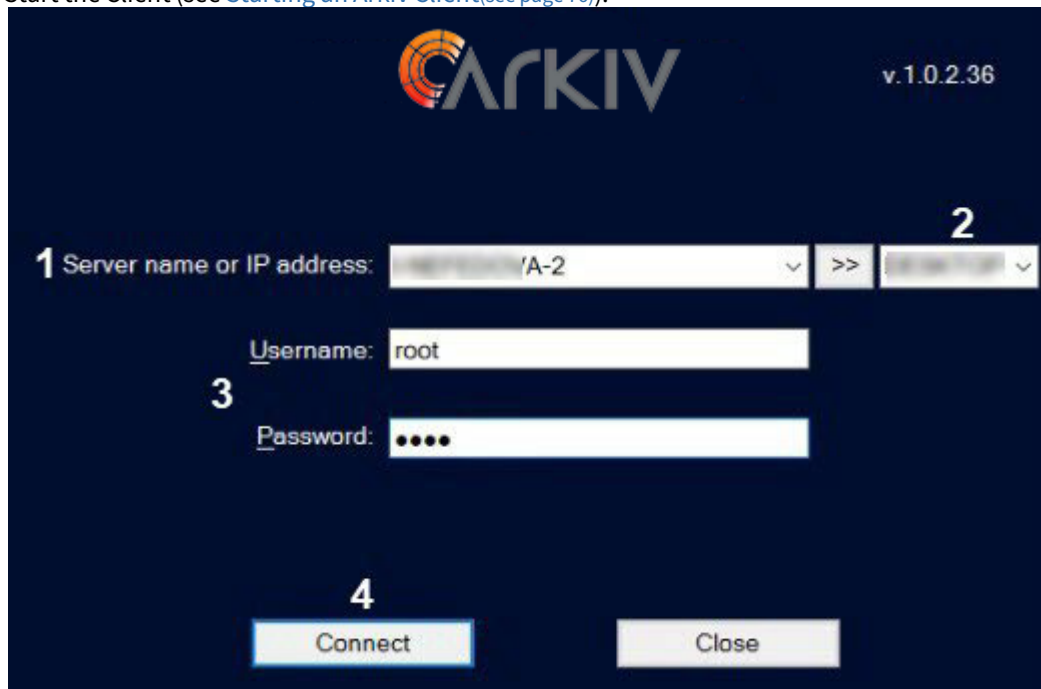
Status	Description
	Servers that passed all checks.
	Servers that did not pass some of the checks.
	Servers that failed all checks.


The icon indicates the number of cluster servers in this status.

7.11.10 Connecting to a Node and Configuring of an Arkiv domain

When the cluster is configured, connect the client to the node. Do the following:

1. Start the Client (see [Starting an Arkiv Client](#)(see page 76)).



2. Enter the IP address of any cluster server (1) and click the  button.

Attention!

You cannot connect to a node located behind a NAT.

3. Select from the list the node you want to connect to (2). Enter first characters of the node name into this field, and the fast search starts.
4. Enter the user name and password (3) and click **Connect** (4).

During the first connection to the node, you will be prompted to create an Arkiv domain (see [Creating a new domain](#)(see page 92)).

You can then merge nodes into a unified logical structure following standard procedures of Arkiv domain configuration (see [Configuring Arkiv domains](#)(see page 91)).

Attention!

An Arkiv domain cannot include nodes from different clusters.

7.11.11 Configuring automatic connections to nodes

Configuring automatic connections to a failover system is similar to setting up an automatic connection to a common security server (see [Configuring Cross-System Client and autologon](#)(see page 540)), with a few minor changes. To add a node to AutoStart, do as follows:

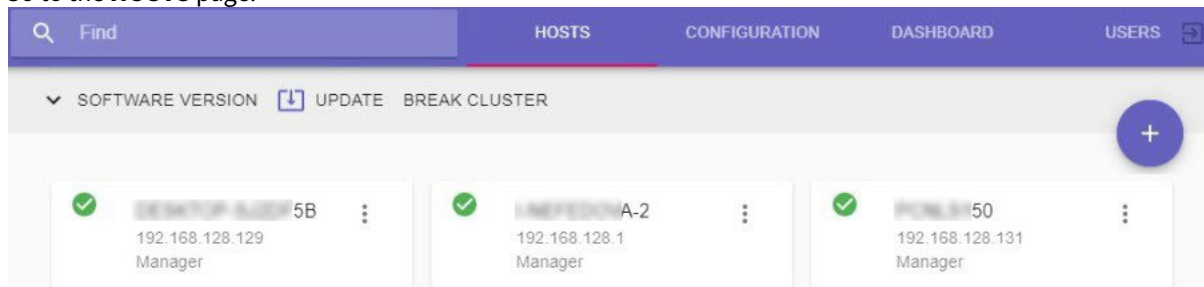
1. Select the **Discover cluster** check box (1).

2. Enter the IP address of any cluster server (2) and click the button (3).
3. Select from the list the node you want to add to AutoStart (4).
4. Click the **Add** button (5).

7.11.12 Upgrading Servers within a cluster

To upgrade all Servers within a cluster, do the following:

1. Go to the **HOSTS** page.



2. Click **UPDATE**.

Attention!

You can bulk upgrade the entire cluster only if all of its servers are accessible.

- On your PC, select the required distribution in zip archive, or specify a web link (1).

Update cluster software from following package:

1 Specify file From Internet

Cluster update policy
All servers at once 2

Enable full installation log 3

AxxonOne-1.0.2.46(46)-x64-full.zip

START

Update cluster software from following package:

Specify file From Internet

https://...

Cluster update policy
All servers at once

Enable full installation log

START

- Select the update method: all Servers simultaneously, or one after another (2). In the former case, all nodes operation will be halted until the update is finished, in the latter case the nodes will operate without interruption.
- To record all installation-related events to a log file (3), select the **Enable full installation log** check box.
- Click **START**.

The installation package download starts. You can cancel the update unless the download is complete.

Update cluster software from following package:

Specify file From Internet

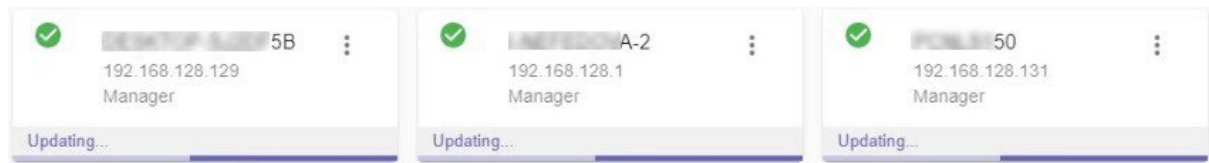
Cluster update policy
All servers at once

Enable full installation log

AxxonOne-1.0.2.46(46)-x64-full.zip

CANCEL

- After the installation package is downloaded, the *Arkiv* software suite will be updated in quiet mode on all Servers within the cluster. Depending on the previously selected update method, the Servers will be updated simultaneously or one after another.

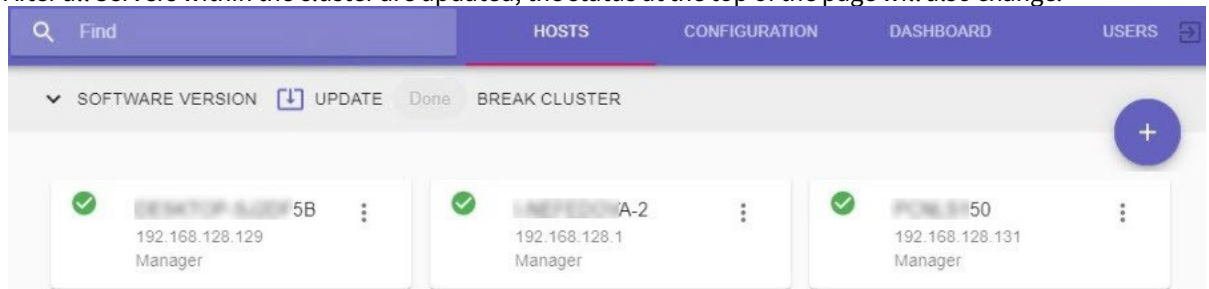


After the update is completed on a Server, its status will change to **Done**.

Note

If the upgrade fails, you will see the **Error** message in the status bar.

After all Servers within the cluster are updated, the status at the top of the page will also change.



7.11.13 Setting network interfaces for system nodes operation

By default, failover system nodes use all available network interfaces.

To limit the number of network interfaces, do the following:

1. Locate the file C:\Program Files\RaftLauncher\current\raft-settings.xml and add a new parameter:

```
<item key="NGP_IFACE_WHITELIST">172.17.0.0/16</item>
```

Use the following settings format: "IP-address1/number of unit bits in the mask, IP-address2/number of unit bits in the mask".

2. Add the same parameter to another file: C:\Program Files\Inaxsys\Arkiv\bin\raft\raft-settings.xml.

7.12 Self-diagnostics service

7.12.1 What is the self-diagnostics service

The Self-checking Service collects system metrics and checks all *Arkiv* VMS components. The data obtained are compared with the indicators of normal operation of the system. When deviations occur, system health alerts are generated, which can be tracked in the web interface (see [Viewing metrics in the self-diagnostics service](#)(see page 587)).

Examples of system health tracking:

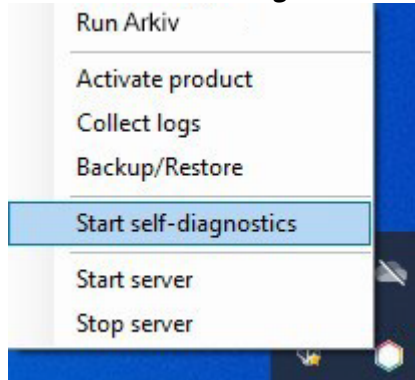
- out of RAM;
- camera is connected but does not send data;
- no events from a detection tool;

- no records in Video Footage;
- no footage is recorded on detection;
- out of system disk space.

7.12.2 Starting and stopping the self-diagnostics service

To launch the self-diagnostics service, complete one of the following two actions:

1. Select the **Start self-diagnostics** command in the [Arkiv Tray Tool](#) (see page 824) utility.



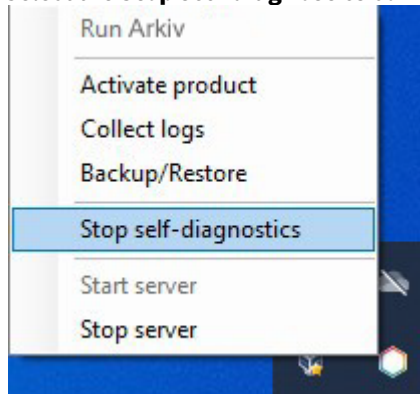
2. Launch the NGP_Self_Diagnostics.

Note

In a failover system, the self-diagnostics service is activated/de-activated in cluster settings (see [Configure a Failover System Cluster](#) (see page 568)).

To stop the self-diagnostics service, complete one of the following actions:

1. Select the **Stop self-diagnostics** command in the [Arkiv Tray Tool](#) (see page 824) utility.

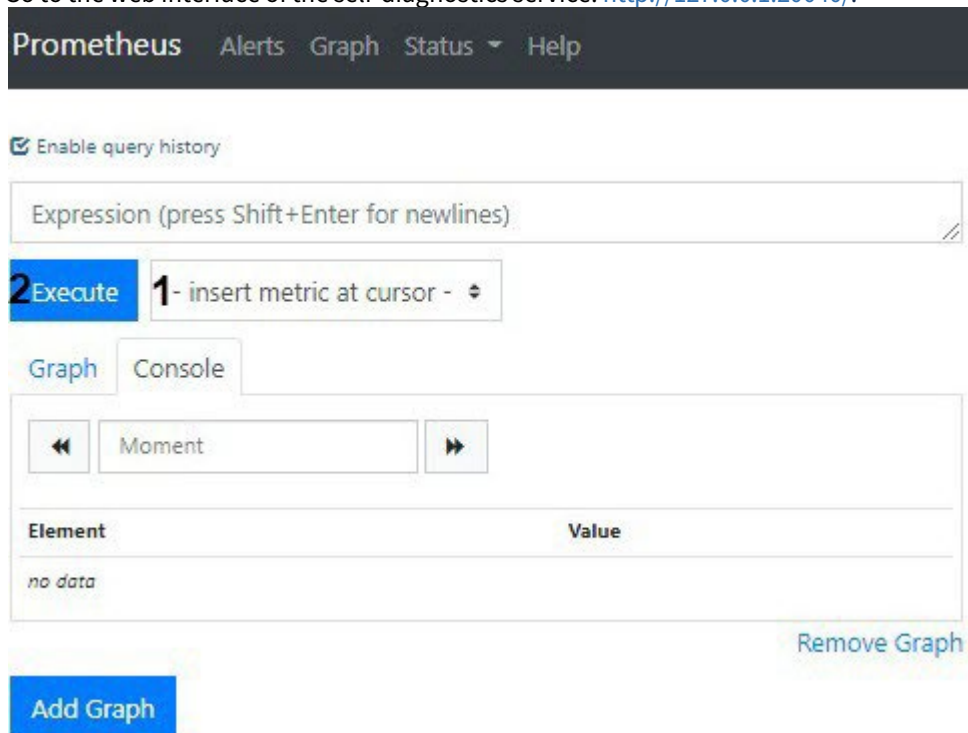


2. Stop the NGP_Self_Diagnostics.

7.12.3 Viewing metrics in the self-diagnostics service

To view the system status data, do the following:

1. Go to the web interface of the self-diagnostics service: <http://127.0.0.1:20040/>.



The screenshot shows the Prometheus web interface. At the top, there is a navigation bar with 'Prometheus', 'Alerts', 'Graph', 'Status', and 'Help'. Below this, there is a checkbox for 'Enable query history'. The main area contains a text input field for the 'Expression (press Shift+Enter for newlines)'. Below the input field, there is a blue 'Execute' button and a dropdown menu labeled '1- insert metric at cursor -'. Below the dropdown, there are two tabs: 'Graph' and 'Console'. The 'Graph' tab is active, showing a 'Moment' view with left and right navigation arrows. Below the graph, there is a table with two columns: 'Element' and 'Value'. The table currently displays 'no data'. At the bottom right of the graph area, there is a 'Remove Graph' link. At the bottom left, there is a blue 'Add Graph' button.

2. Select the required metric in the list **(1)** or enter the query in the **Expression** field.
Description of useful metrics

Metric	Description
ALERTS_FOR_STATE	<p>Troubleshooting by the self-diagnostics service.</p> <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <p>Example</p> <pre>ALERTS_FOR_STATE{alertname="ipint_is_not_activated",ep_name="hosts/Server1/DeviceIpint.99",instance="127.0.0.1:20108",job="ngp_exporter",ngp_alert="true"}</pre> </div> <p>Possible values of the alertname parameter (see What is the self-diagnostics service(see page 586)):</p> <ul style="list-style-type: none"> • low_os_memory — out of RAM; • ipint_is_not_activated — camera is connected but does not send data; • no_samples_in_detector — no events from a detection tool; • restart_services_when_archive_source_not_activated — the archive is not working; • restart_services_when_no_samples_in_archive — recording to archive with 0 FPS; • restart_services_when_no_ping_from_detector_to_archive — no recording to the archive on detection tool triggering; • logs_disk_space_is_low/db_disk_space_is_low — out of system disk space.
ngp_archive_channel_fps	The frame rate of all video cameras recording to archive.
ngp_cpu_total_usage	The percentage of CPU load on a Server.
ngp_fps	The frame rate of all Server video cameras, all detection tools and their decoders.

The request allows for:

- a. Using multiple metrics.
- b. Using expressions to find problems. For example, a query like `ngp_fps <17` will return all metrics, where FPS was less than 17. For a complete list of logical and arithmetic operators, see [the official Prometheus documentation](#)¹⁷².
- c. Filtering by any of the parameters. For example, a query like `ngp_fps{ep_name=~"hosts/TEST/DeviceIpint.2/SourceEndpoint.video:0:0"}` will return FPS values only for the specified source.

Examples of useful queries for Windows:

The CPU loading graph similar to the Windows System monitor:

```
sum by (process_id) (100 / scalar(wmi_cs_logical_processors) *
(irate(wmi_process_cpu_time_total{job="os_export", process="AppHost"}[10m]))) or
ngp_cpu_total_usage
```

¹⁷² <https://prometheus.io/docs/prometheus/latest/querying/operators/>

The graph of RAM usage by the AppHost processes and a total memory space:

```
sum by (process_id) (avg_over_time(wmi_process_working_set{job=~"os_export",
process="AppHost"}[5m])) / 1024 or avg_over_time(wmi_os_virtual_memory_bytes{job=~"os_export"
}[5m]) / 1024
```

The percentage of RAM usage:

```
100.0 - 100 * avg_over_time(wmi_os_virtual_memory_free_bytes{job=~"os_export"}[5m]) /
avg_over_time(wmi_os_virtual_memory_bytes{job=~"os_export"}[5m])
```

Examples of useful queries for Linux:

The graph of RAM usage by the AppHost processes and a total memory space in bytes:

```
sum by (groupname) (namedprocess_namegroup_memory_bytes{memtype="resident"})
```

The percentage of RAM usage:

```
100 - node_memory_MemAvailable_bytes * 100 / node_memory_MemTotal_bytes
```

The graph of the CPU load by the AppHost processes as a percentage:

```
sum by (groupname) (rate(namedprocess_namegroup_cpu_seconds_total[1m])) * 100
```

The graph of the CPU load as a percentage:

```
100 * avg without (cpu) (1 - rate(node_cpu_seconds_total{mode="idle"}[1m]))
```

3. Click the **Execute** button (2).

The **Console** tab will display all possible values of all elements at the time the query is completed.

Enable query history

Load time: 90ms
 Resolution: 14s
 Total time series: 8

Execute
ALERTS_FOR_STATE ▾

Graph
Console

◀

2022-05-13 12:49:32

▶

Element	Value
ngp_fps(ep_name="hosts/TEST/AVDetector.59/EventSupplier",instance="127.0.0.1:20108",job="ngp_exporter.TEST")	10.040759
ngp_fps(ep_name="hosts/TEST/AVDetector.60/EventSupplier",instance="127.0.0.1:20108",job="ngp_exporter.TEST")	9.976295
ngp_fps(ep_name="hosts/TEST/DeviceIpint.1/SourceEndpoint.video:0:0",instance="127.0.0.1:20108",job="ngp_exporter.TEST")	10
ngp_fps(ep_name="hosts/TEST/DeviceIpint.2/SourceEndpoint.video:0:0",instance="127.0.0.1:20108",job="ngp_exporter.TEST")	23.990404
ngp_fps(ep_name="hosts/TEST/DeviceIpint.3/SourceEndpoint.video:0:0",instance="127.0.0.1:20108",job="ngp_exporter.TEST")	30.036043
ngp_fps(ep_name="hosts/TEST/DeviceIpint.7/SourceEndpoint.video:0:0",instance="127.0.0.1:20108",job="ngp_exporter.TEST")	24.976873
ngp_fps(ep_name="hosts/TEST/DeviceIpint.7/SourceEndpoint.video:0:1",instance="127.0.0.1:20108",job="ngp_exporter.TEST")	24.995504
ngp_fps(ep_name="hosts/TEST/VideoDecoder.1/SourceEndpoint.video",instance="127.0.0.1:20108",job="ngp_exporter.TEST")	10.01955

[Remove Graph](#)

4. When you set a date and time in your calendar, the data will be updated.

Graph
Console

◀

2022-05-13 12:49:32

▶

◀

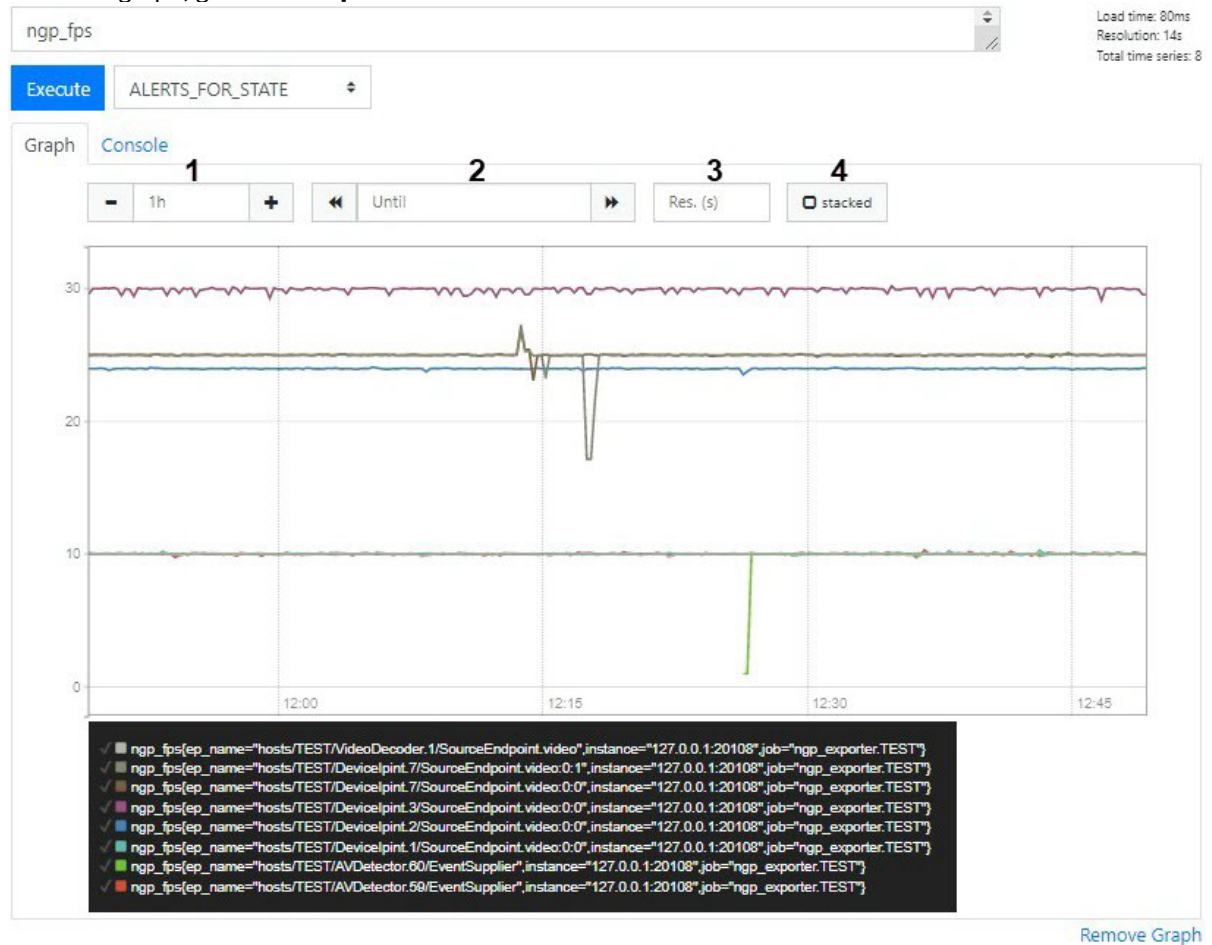
May 2022

Su	Mo	Tu	We	Th	Fr	Sa
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	1	2	3	4
5	6	7	8	9	10	11

^ ^ ^
12 : **49** : **32**
 v v v

↻
🗑
✕

5. To build a graph, go to the **Graph** tab.



In the field **1**, set the time interval of the graph. In the field **2**, set its end point. In the field **3**, set the interval between the data points. To fill the chart, set the **stacked** (**4**) checkbox.

8 Working with the Arkiv Software Package

8.1 Main Elements of the User Interface

8.1.1 Surveillance window

Surveillance window is used to display video stream on the monitor of a computer with specific parameters for the purpose of video surveillance, archive viewing, and forensic search in archives. The surveillance window also has a function which allows the generation and evaluation of alarm events in the process of video monitoring of a guarded location.

The surveillance window has flexible display options (see [Configuring the display of the surveillance window](#)(see page 529)):

1. Control buttons over the video image, mode selector buttons inside the window.



2. Control buttons over the video, selector buttons outside.



3. Control buttons outside the video, selector buttons inside.



4. Control buttons and selector buttons outside the video image.



There are two states of a surveillance window within the layout: active or inactive.

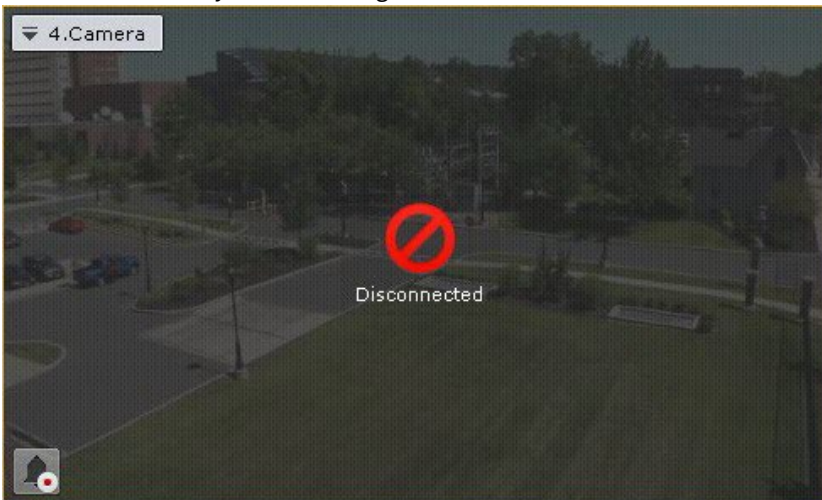
A window in active state includes an additional navigation panel (see [Advanced Archive Navigation Panel](#)(see page 599)) and video mode selection tabs (see [Video Surveillance Mode Selection Tabs](#)(see page 598)).

To switch a window to active state, click anywhere inside the window; clicking outside de-activates it.



A more detailed description of the functions of the surveillance window can be found in [Video Surveillance](#)(see page 620).

If the connection to the camera is lost, the surveillance window is darkened and you get a corresponding message on the most recently received image.



To copy the camera name to the Clipboard, right-click on it 4.Camera.

Color Coding of Frames

Color coding of the frame of a viewing tile is used to indicate the status of the video camera.

Color of viewing tile frame	Camera status
Red	Active alarm
<u>No active camera alarms</u>	

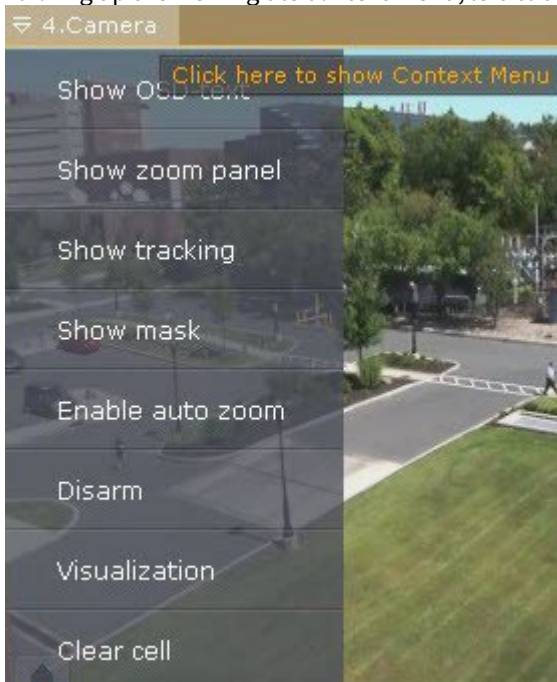
Green	Camera disarmed
Yellow	Camera armed
Gray	Archive mode

Viewing Tile Context Menu

The viewing tile context menu is used to access the following functions (depending on the enabled surveillance mode):

1. Video surveillance.
2. Audio monitoring.
3. Exporting frames and recordings.
4. Object tracking.

To bring up the viewing tile context menu, left-click the video camera icon in the upper left-hand corner of the tile.



Time Display

The time display appears in the upper right-hand corner of the viewing tile.



Note

Depending on the settings (see [Configuring time display](#)(see page 531)), the indicator may show the date

5/19/2022 4:17:55 PM **R**

Current time of Client is displayed on the indicator in real-time mode:

4:19:13 PM **R**

If the Client's time is different from the Server time, the Server time will also be displayed below the indicator.

4:31:01 PM **R**
 3:31:01 PM

In archive, alarm, and video frame search modes, it shows the time of the fragment being viewed and the playback mode:

1. Forward playback 4:19:15 PM **R**
2. Reverse playback 4:22:21 PM **R**
3. Pause 4:19:51 PM **R**

If the video is currently being recorded from the camera, the letter **R** is displayed in red to the right of the clock:

4:19:13 PM **R**. Otherwise, the letter **R** is displayed in gray: 4:28:34 PM **R**

If the camera is not linked to the archive, the letter **R** is crossed out: 4:29:28 PM ~~R~~

Display of Video Statistics

You can display video statistics in the viewing tile (see the section titled [Configuring display of video statistics](#) (see page 526)). In real-time mode the video display statistics are shown. In Alarm, Archive, and Clip Search modes, it shows the time of the fragment being viewed and the playback mode:



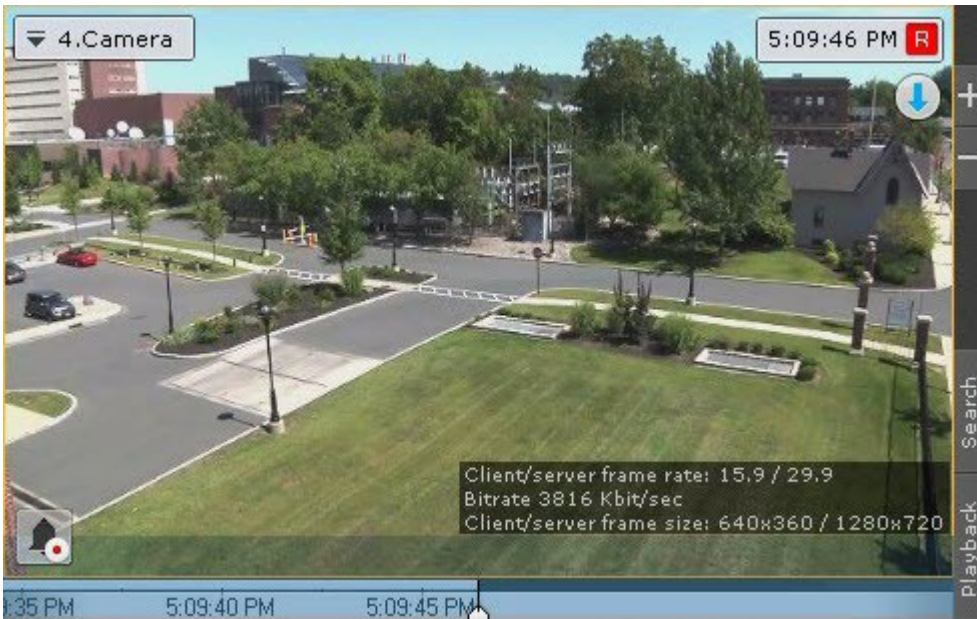
Video statistic	Parameter description
Client-side FPS	Frame rate of the displayed video stream.
Server-side FPS	Frame rate of the video stream received from a video camera or an archive.
Bitrate	Bitrate of a compressed video stream.
Frame size	Resolution of the displayed video stream.

Note

The video stream parameters are updated every 10 seconds.

Video Surveillance Mode Selection Tabs

To select the video surveillance mode, use the tabs in the lower right-hand part of the viewing tile:



Alarm Management mode is activated when an alarm is triggered (see [Initiating an Alarm](#)(see page 689)).

Advanced Archive Navigation Panel

The advanced Archive Navigation Panel is displayed in the lower portion of the screen in **Archive** or **Archive Search** modes.



When you click a live camera tile, the advanced Navigation Panel shows only the timeline and the Archive selection

button.



Note

If the camera is not linked to a video Archive, the panel will be unavailable.

In Live Video mode, if you click the timeline, you go to Archive mode.


The advanced Archive Navigation Panel includes the following components:




1. Timeline.
2. Playback control buttons.
3. Archive selection button.
4. Tabs for compressed and standard Archive playback modes.

Tracks are marked in different colors depending on the alarm status or detection tool activation:



Condition	Track color
Archive absent (1)	Gray
Archive (2)	White
Archive present, alarm active (3)	Red
Archive present, detection tool activated (no alarm) (4)	Yellow

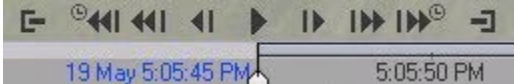
Additionally, the timeline on the advanced Archive Navigation Panel features missing footage tags . A tag is displayed when footage is missing for over 40% of the currently visible part of the timeline. Depending on the duration of the missing footage, tags may have different thickness:

1.  – less than one hour.
2.  – from 1 to 24 hours.
3.  – more than 24 hours.


The duration of missing footage is indicated near the tag.







The date of the first recording in a Video Footage Archive is displayed near the left edge of the Archive stripe.



Note

In this case, the Archive portion left of the marker  contains videos shot when the camera was not linked to this particular Archive.

The playback control buttons on the advanced Navigation Panel are the same as the buttons on the Playback Panel (see [The Playback Panel](#) (see page 609)). The advanced Archive Navigation Panel also has the buttons to jump forward and back by **N** seconds:  and .

N – is a step value, 30 sec by default. If you press Ctrl +  once, you increase the jump step by 30 sec, if you hit Ctrl +  – you cut the jump step by 30 sec. The maximum step value is – 300 seconds.

The advanced Archive Navigation Panel is used to position the Archive at a specific time, control playback, and switch to compressed Archive playback mode.

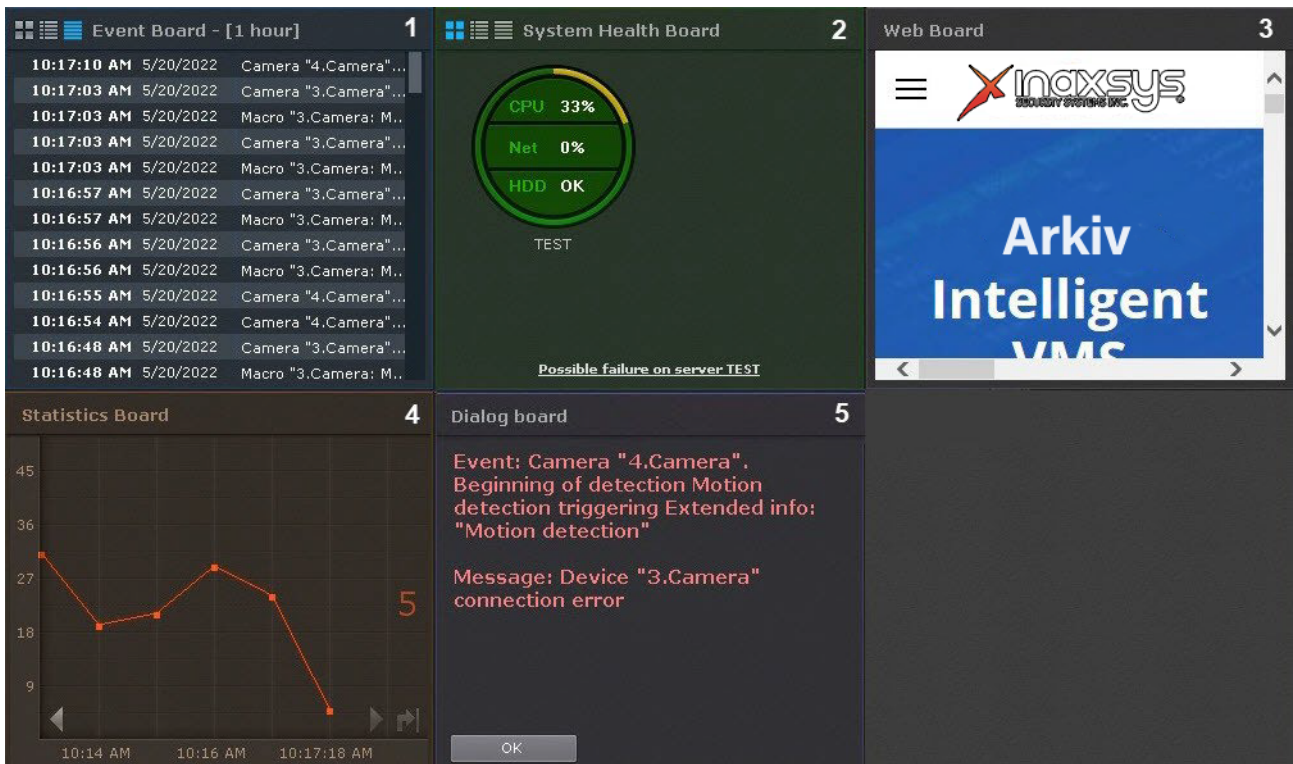
The advanced Archive Navigation Panel works completely in sync with the Playback Panel and the timeline:

1. The playback mode selected on the advanced Navigation Panel is displayed on the Playback Panel.
2. The playback speed that is set on the Playback Panel will be used as the playback speed when playback is restarted on the advanced Navigation Panel, and vice versa.
3. Any movement through the main timeline is duplicated onto the timeline of the advanced Navigation Panel.

8.1.2 Information boards

Information boards offer a quick view of system status and events. There are five kinds of information boards, each displaying a specific type of information:

1. [Event Board](#) (see page 742) **(1)**.
2. [System Health Board](#) (see page 744) **(2)**.
3. [Web Board](#) (see page 752) **(3)**.
4. [Statistics Board](#) (see page 750) **(4)**.
5. [Dialog board](#) (see page 752) **(5)**.

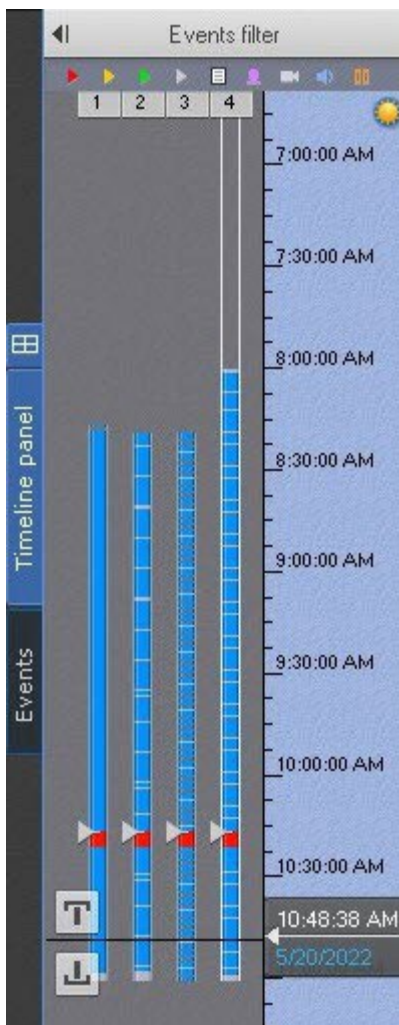


To learn about information boards, consult the relevant [section](#)(see page 740).

8.1.3 The Archive Navigation Panel

Show and Hide the Archive Navigation Panel

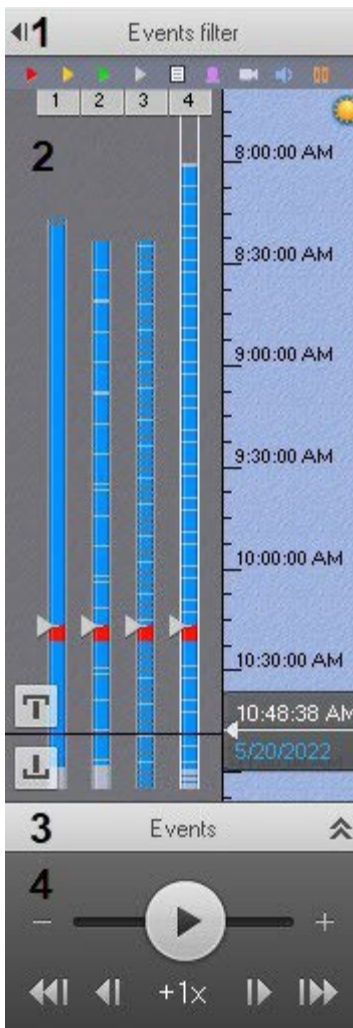
The Archive Navigation Panel is located on the right side of the screen and is automatically displayed when you switch to Archive mode (see [Switching to Archive Mode](#)(see page 668)).



To show/hide the panel, press the **Timeline panel** button.

The Structure and Function of the Archive Navigation Panel

The archive navigation panel is automatically displayed in the right-hand part of the screen when you switch the viewing tile to Archive or Search for Clip by Frame mode.



The archive navigation panel includes the following components:

1. [The alarm events filter](#)(see page 604) **(1)**.
2. [Timeline](#)(see page 606) **(2)**.
3. [Events List](#)(see page 608) **(3)**.
4. [Playback panel](#)(see page 609) **(4)**.

The archive navigation panel is used for the following functions:

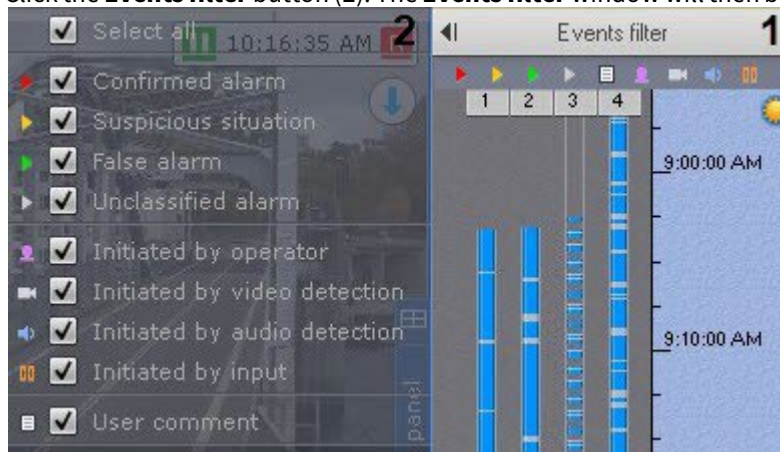
1. Navigating through the archive.
2. Playing back recordings.
3. Selecting playback mode: forward or backward.
4. Setting playback speed.
5. Selecting events for display on the timeline and in the events list.
6. Viewing the list of events of the selected type.

Events filter

The **Events filter** component allows selecting the type of events that are displayed on the Archive Navigation Panel.

To select an event type:

1. Click the **Events filter** button (1). The **Events filter** window will then be displayed (2).



2. Select the checkboxes for the types of alarms which should be displayed on the Archive Navigation Panel, according to their status:
 - a. Confirmed alarm.
 - b. Suspicious situation.
 - c. False alarm.
 - d. Unclassified alarm.

Note.

If you clear the checkbox for a certain type of alarm, this type of alarm and the corresponding track are no longer displayed on the timeline.

3. Select the checkboxes for the types of alarms which should be displayed on the Archive Navigation Panel, according to the cause of their initiation:
 - a. Initiated by operator.
 - b. Initiated by video detection tool (basic or embedded, including their sub-detection tools).
 - c. Initiated by audio detection tool (basic, situation analysis, or embedded).
 - d. Initiated by input.

Note

By default, all checkboxes are already selected.

Attention

To display alarms on the timeline, select at least one type of alarm event and one initiator.

4. Select the checkbox to display operator comments.
5. Click the **Apply** button.

Note

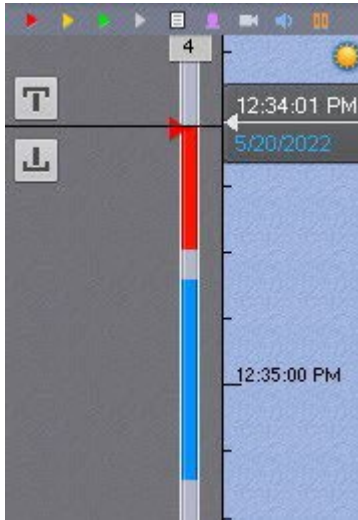
To close **Events filter**, click to same button again.

Selection of events is now complete.

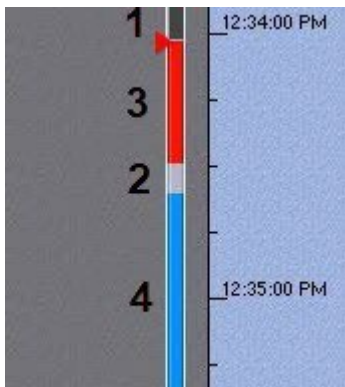
Events of the selected type are now displayed on the timeline (see [The Timeline](#)(see page 606)) and in the events list (see [Events List](#)(see page 608)).

The Timeline

The timeline is a graphical representation of the time axis of the archive and is located in the middle part of the navigation panel.



The timeline contains indicators of the presence of recordings, or tracks.



Tracks are marked in different colors depending on the alarm status or detection tool activation:

Condition	Track color
Archive absent (1)	Gray
Archive (2)	White
Archive present, alarm active (3)	Red
Archive present, detection tool activated (no alarm) (4)	Blue

Note

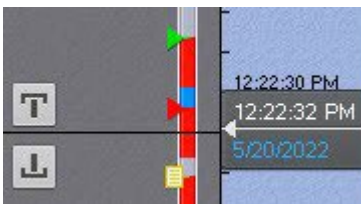
Pre-alarm recordings are white on the timeline, post-alarm footage is blue.

Note

If video recordings overlap or coincide in time, the available footage is prioritized as follows:

1. If there is recorded video, then red colored recordings have the highest priority and white ones have the least priority.
2. Grey footage takes priority over dark grey.

At the moment when an alarm is assigned a status (critical, non-critical, false, or unclassified), a flag is added to the track. A flag is added to the point on the timeline when the alarm began.



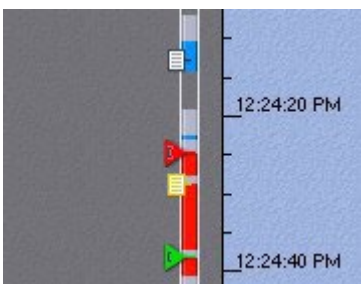
The flag is colored according to the alarm status:

1. Green – false alarm.
2. Yellow – non-critical alarm.
3. Red – critical alarm.
4. Gray – unclassified alarm.

Note

Display of any particular alarm event in the list is determined by filter settings (see the section titled [Events filter](#)(see page 604)).

Operator comments are displayed with the corresponding icons on the track. An icon is placed on the timeline at the point corresponding to the commented frame (or to the first frame of the interval, if the comment is for an interval).



If comments were left during alarm classification, the icons are displayed in the appropriate colors.

You can scroll and zoom the timeline using the mouse.

To scroll the timeline, move the cursor on its background vertically while holding down the left mouse button. To change the scale of the timeline, right-click the timeline's background and, while holding down the right mouse button, move the cursor down to zoom out or up to zoom in.

The timeline lets you select at which moment to start playback of a recording in the viewing tile. To choose at which moment to begin playback, you can either left-click the indicator and hold it down while dragging it to the desired position, or just left-click the left portion of the timeline.

If there is no recording in the selected position, the indicator will automatically move to the position corresponding to the nearest recording.

Note

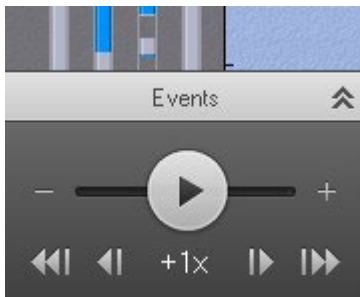
You can also set a timeline indicator in the desired position by indicating the exact date and time (see the section titled [Navigating Using the Timeline](#)(see page 678)).

You can also position the timeline indicator with the help of the events list (see the section [Events List](#)(see page 608)).

Events List

The Events List displays alarms and operator comments.

To display the events list, click the **Events** button.



The events list is now displayed.



Note

Whether or not a particular event is displayed in the list depends on the filter settings (see the section [Events filter](#)(see page 604)).

Note

The list displays only the alarm events that are currently in the visible portion of the timeline.

To hide the events list, click the **Events** button again.

When you place the cursor over an event in the list, detailed event information appears.

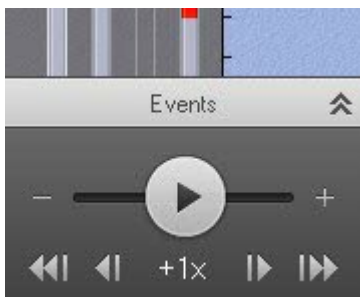


Note







Navigation through the archive by using the events list is described in the section [Navigating Using the Events list](#)(see page 681).


The Playback Panel

The playback panel is located in the lower part of the navigation panel.



The playback panel contains the following buttons:

1. Go to preceding frame .
2. Go to next frame .
3. Switches to the preceding recording .
4. Switches to the next recording .
5. Play  / Pause .

The  button also acts as a slider which sets the speed and mode (forward/backward) of playback.

Note

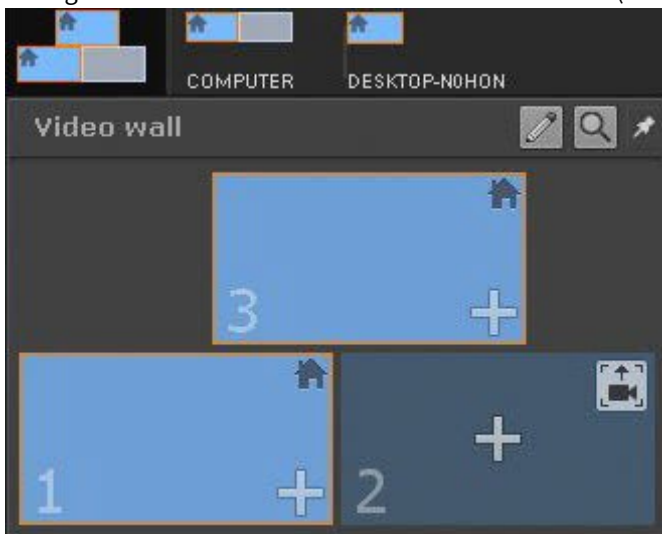
Use of the playback panel is described in detail in the section [Navigating Using the Playback Panel](#)(see page 682).

8.1.4 Video Wall Panel

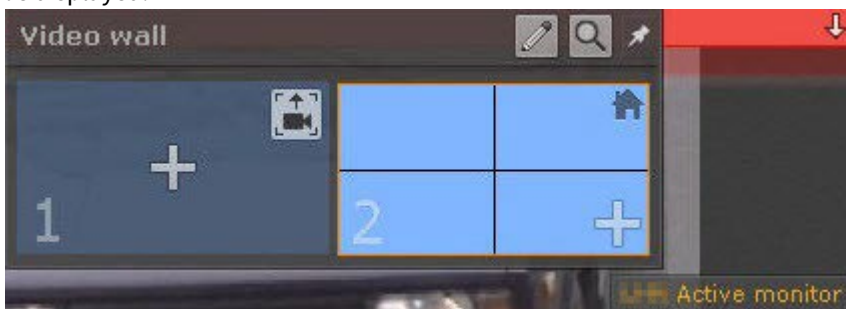
[Configuring Videowall](#)(see page 485)

The Video Wall panel is automatically displayed at the top of the screen.

The panel is used to set up a video wall from all monitors currently connected to Arkiv-domain Servers on which video walls management is permitted for the given User. The panel is hidden from users with no permissions for management of video walls in all Arkiv-domain Servers (see [Creating and configuring roles](#)(see page 431)).




When you hover the mouse pointer over the monitor, the name of the Client to which it belongs and its status will be displayed.



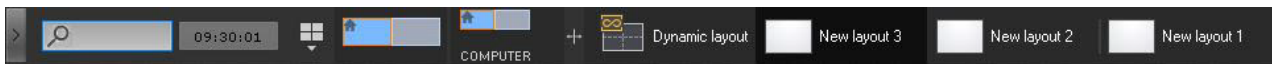
To keep the panel always visible, click the  button.

Note

To hide the panel, click the  button.

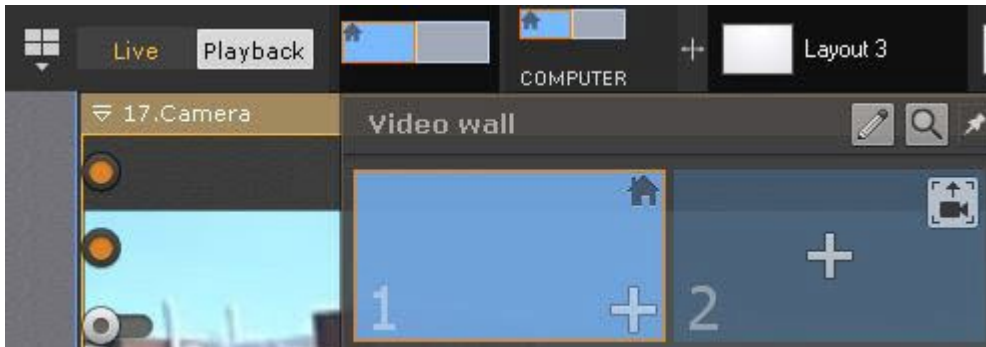
8.1.5 Monitor Panel


The Monitor panel is automatically displayed at the top of the screen.



The panel shows thumbnail views of Client monitors currently connected to Arkiv domain Servers on which video walls management is permitted for the given User (see [Creating and configuring roles](#)(see page 431)).


To open an expanded monitor view, click on its thumbnail.



If you need to always display expanded monitor views, click .

Note.

To disable expanded views, click .

You can change width of the Monitor panel. To do it, click and drag the panel border .

When you resize the Monitor panel, the Layout panel is automatically changed.

8.1.6 The Layouts panel

The Layouts panel is automatically displayed at the top of the screen.



The panel shows layouts available in the system.

Note

If the client is connected to multiple Arkiv domains, only layouts from the main Arkiv domain are available.

[Layouts Management](#)(see page 754)

8.1.7 Interactive Map

The 3D interactive map is used to visualize the secured facility, control cameras and identify cameras' location.

Interactive maps in *Arkiv* can obtain image data from graphics of the site or geospatial data from OpenStreetMap.

Note

To work with OpenStreetMap maps in *Arkiv*, you need to purchase an [OpenStreetMap](https://openstreetmap.org/)¹⁷³ license.

The map can contain icons for cameras, inputs, and outputs. The area in which live video is displayed and field of view are indicated for each camera.



Please refer to the section titled [Working with the Interactive Map](#) (see page 766) for further details on how to work with the 3D map.


8.1.8 Camera Search Panel

The **Camera Search Panel** lists all video cameras connected to *Arkiv* VMS. It also allows the user to find cameras.

¹⁷³ <http://www.openstreetmap.org/copyright>

When the object panel is closed (see [Objects Panel](#)(see page 615)), after you click on the search bar (1), the area (2) opens that lists all cameras within your Arkiv-domain.



When the object panel is open, the search will be performed inside it. To open the Objects Panel, click the  button.

Note

The search result for objects is displayed on the main and additional monitors.

Note

If the client is connected to multiple Arkiv-domains, cameras from the main Arkiv-domain are listed by default. To find cameras from another Arkiv-domain, select the domain from the drop-down list (3).

To search for a specific camera, enter its full name or part of it into the search bar.



If you click a camera, a layout opens with the minimum number of cells for displaying the selected camera views.

Note

If the current layout contains the selected camera, the relevant viewing tile becomes active.

If there is no layout with the selected video camera, a new layout with a single cell is created.

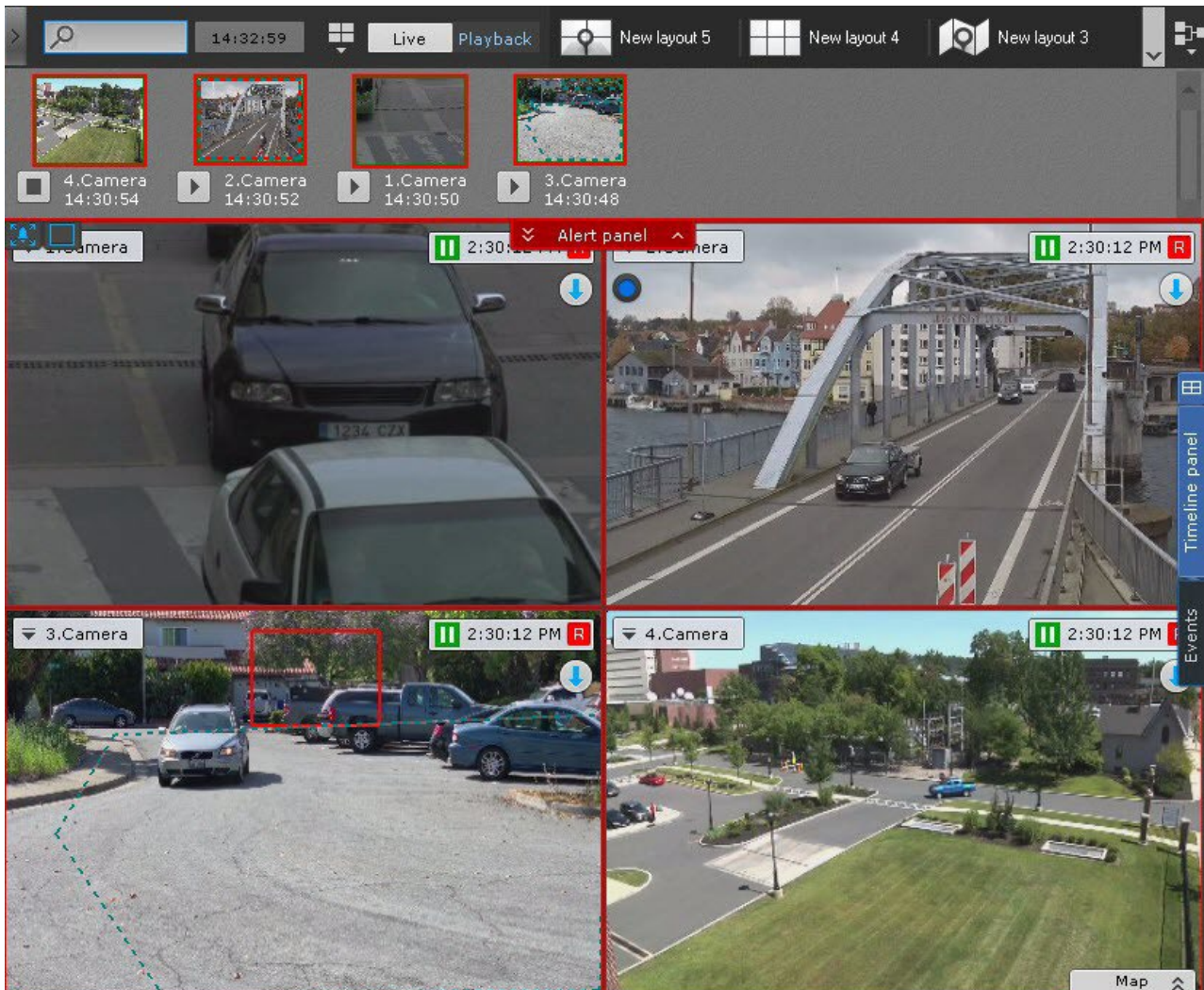
8.1.9 Alert Panel

Alert panel allows users to view and manage alerts/detection events.

Alert panel displays video footage for all alerts/detection events in individual Event Preview tiles.


Alert panel is at the top of the screen. The default setting is Auto Hide. To open Alert panel, click the

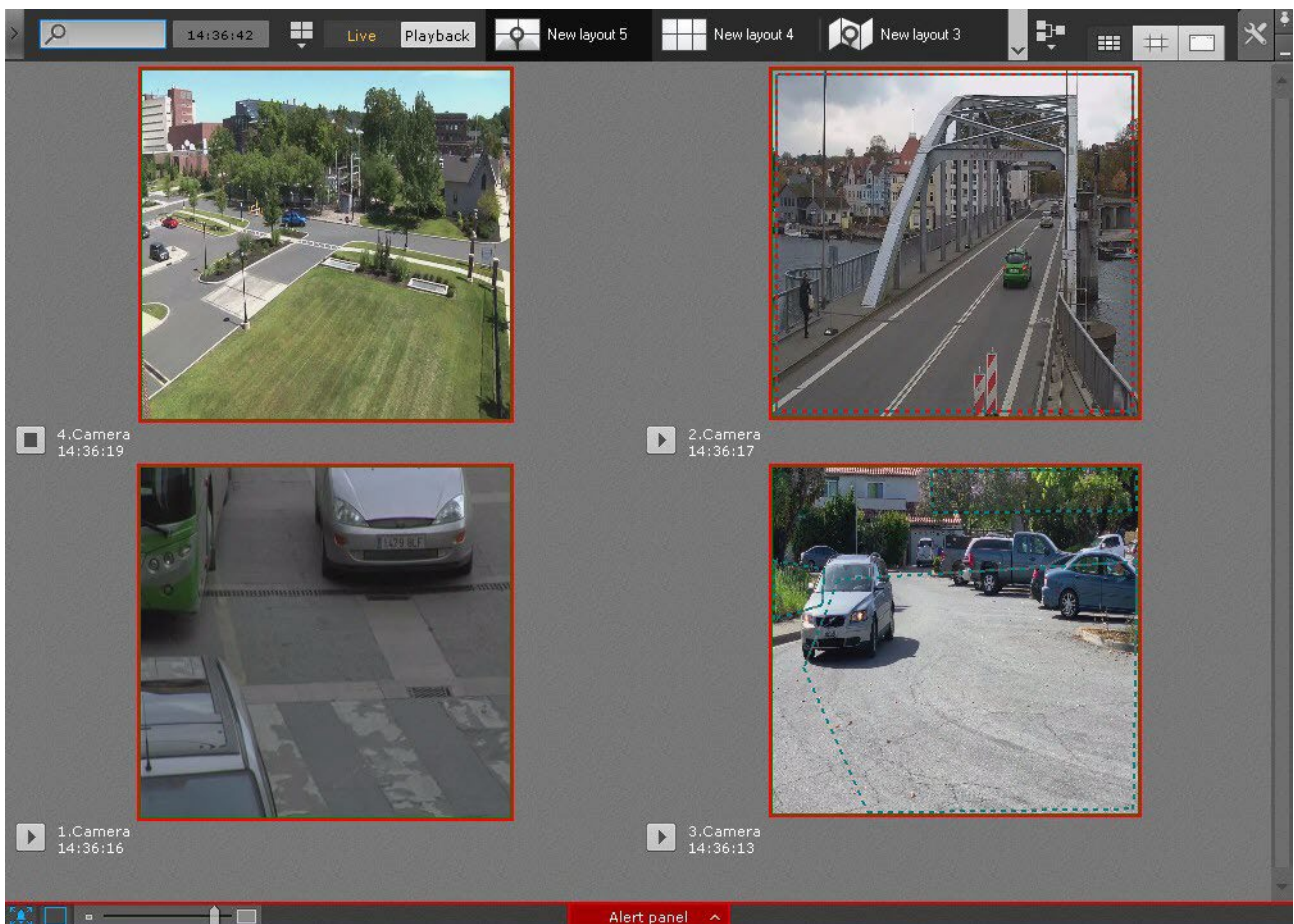
 **Alert panel**  button.



The panel opens downwards, occupying a vertical strip on the screen. You can stretch or shrink it from 10% to 50% of the screen height.


To resize the panel, left-click the **Alert panel** button and hold and drag the pointer up or down.


You can also expand the panel to full screen. This will hide the camera views (layout). To do so, click the  button.



You can resize thumbnails of video fragments displayed on the panel.

You can do this when the size of the panel is exceeds the minimum size (10% of the screen height).

To resize Event Previews, use the slider  in the bottom left corner of the panel.

To hide the panel, click the  button.

8.1.10 Objects Panel

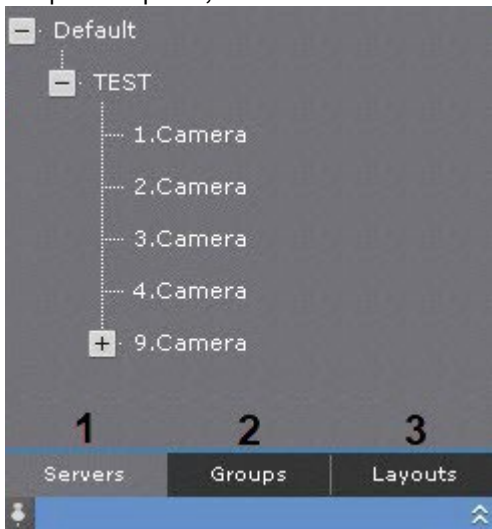
If you have permissions, Objects Panel displays cameras from all servers in the Arkiv-domain.

Note

If the Client is connected to multiple Arkiv-domains, you can see cameras from all Arkiv-domains according to your permissions.



To open this panel, click the  button in the upper left corner of the screen.



To open the site or facility on an additional monitor (see [Monitor Management](#)(see page 759)), click the **Object tree** button on the left side of the screen.

Note

On Object Panel, the cameras can be sorted either by name or by a short name (see [Configuring camera sorting on Objects Panel](#)(see page 538)).

If you have no connection to a camera, then it will be colored red on Object Panel.





The object tree on the panel can be represented as Servers (**1**), Groups (**2**) and Layouts (**3**).

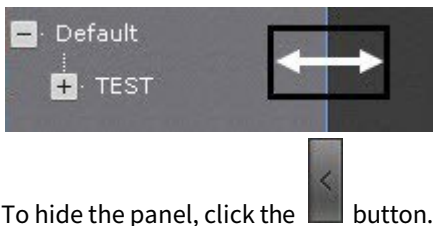
If you select a camera on the panel, a layout opens with the minimum number of cells for displaying the selected camera views (see [Camera Search Panel](#)(see page 612)).


Note

The search results are displayed in the Objects Panel dynamically – as users type and refine their queries.

To lock the panel, click the  button in its bottom left corner. Press the  button to unlock the panel.

You can resize the Objects Panel according to your needs. To do this, left-click and drag the right border of the panel.



To hide the panel, click the  button.

8.1.11 The PTZ Control Panel

The PTZ control panel is displayed automatically in the right-hand part of the screen when the viewing tile of a PTZ camera is activated in Live Video mode.

Note

The PTZ control panel is displayed only if the **PTZ** object for the particular video camera is enabled (see the section titled [The PTZ object](#)(see page 150)).



The PTZ control panel is used for the following functions:

1. Controlling PTZ video cameras.
2. Setting and switching to camera presets.
3. Launching/stopping PTZ tours.

4. Launching/stopping patrolling.

The PTZ control panel includes the following interface elements:

1. Presets list.
2. PTZ tours list.
3. Dialer.
4. PTZ controls for iris, focus, and optical zoom.

Note

If a camera does not support a function, the controls for this function cannot be accessed.

5. Virtual 3D joystick.

Note

The type of virtual 3D joystick and adjustment scale depend on the type of PTZ cameras: discrete or continuous control of Pan, Tilt, Zoom, Focus, and Iris.



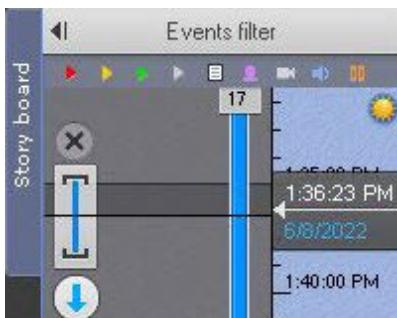
6. Patrol button.

Note

Use of the dialer, PTZ controls, joystick, and patrol button is described in the section [Controlling a PTZ Camera](#)(see page 644).

8.1.12 Story board

The Story board becomes available after you set a time interval on the timeline (see [Standard video recordings export](#)(see page 778)).



To open the board, click the corresponding button.

In the Story board, you can check all videos related to an incident to export them with one click (see [Exporting all event videos](#)(see page 782)S(see page 781)).



To hide the board, click once more the **Story board** button.

8.2 Video Surveillance

8.2.1 Video Surveillance Modes

The video image from a video camera is displayed on the computer monitor through the Client's interface objects, namely the video surveillance monitor and the viewing tile.



There are four modes for working with a viewing tile:

1. Live Video mode.
2. Alarm Management mode.
3. Archive mode.
4. Archive Search mode.

Note

Alarm Management mode is available if an alarm has been initiated in the system.

8.2.2 Functions Available in All Video Surveillance Modes

The following video surveillance functions are available in all video surveillance modes:

1. Selecting a video camera.
2. Scaling the viewing tile.
3. Digitally zooming video images.
4. Processing video images.
5. Rotating video Images.

6. Tracking objects.
7. Operator comments.
8. Viewing titles from POS terminals.
9. Partial decoding of video.

Scaling the surveillance window



The scale of the surveillance window can be adjusted.

This can be done in one of three ways:

1. Using the buttons in the upper right-hand part of the active surveillance window.
2. Using the buttons in the top panel.
3. Using the mouse.

If you click a surveillance window, you can see the size control buttons on the right-hand side.



1.  – increases the size of the surveillance window by one step.
2.  – resets the size of the surveillance window.

When a surveillance window is enlarged, the scale of the entire layout is increased. Some of the cells are moved off the screen.

Surveillance windows are enlarged as follows:

1. If a surveillance window occupies 100% of any of the sides of the layout (maximum surveillance window size), it cannot be enlarged.
2. If a surveillance window occupies 50% or more (but not 100%) of any of the sides of the layout, it is enlarged as much as possible.
3. If a surveillance window occupies less than 50% on both sides of the layout, it is enlarged in two steps: the first step enlarges the surveillance window to 50% on the corresponding side of the layout and the second step enlarges the surveillance window to the maximum size.

Note

The third case applies to layouts that contain nine or more cells.




If a surveillance window is linked to another one or an information board, at the first enlargement step (to 50%), the surveillance window and the other window/information board are displayed together and occupy all of the screen on one side.

Note

In this case, the first step takes into account the total size of the related cells: the related cells must be less than 50% of both sides of the layout.

Also, if you click a surveillance window, you can control its size with the buttons on the top panel:



1.  – resets the size of the surveillance window.
2.  – resizes the window up to 50% on one side of the layout.
3.  – maximizes the size of the surveillance window.

How to resize the surveillance window using a mouse:

1. In full screen mode, click anywhere to minimize the window.
2. Otherwise, double click inside the window to display it in full screen mode.

Digitally Zooming Video Images

Digital zooming in a video image enables a gradual increase in the magnification of a video image without changing the dimensions of the viewing tile.

The video image can be enlarged using the following tools:

1. Digital zoom scale.
2. Area selection.
3. Mouse scroll wheel.

Enlarging a video image using the digital zoom scale

To display the digital zoom scale on the viewing tile screen, select **Show digital zoom** in the context menu of the viewing tile.

Displaying the zoom control:



Digital zoom scale:



To enlarge a video image, left-click the slider and hold and drag the digital zoom scale up to the desired value. The maximum zoom is 16x. To return back to the original image, move the slider back to its original position.

To hide the digital zoom scale, select **Hide digital zoom** in the context menu of the viewing tile. Also, 3 seconds after you scale down the video image to the minimum, the zoom scale will automatically hide.



After hiding the digital zoom scale, the selected zoom level of the image will be preserved when switching between image viewing modes.

Enlarging a video image through area selection

To enlarge a video image, select the area of the image that you would like to enlarge.



You can select an area by doing the following:

1. Click and hold down the left mouse button inside the viewing tile.
2. Move the mouse cursor to the desired position.
3. Release the left mouse button.

Once you have completed the above actions, the selected area will be displayed across the entire viewing tile.



Note

If you select an area that requires a zoom of more than 16x to display, it will be marked with a red frame. The video image will not be enlarged.



Enlarging a video image using the mouse scroll wheel

When using the mouse scroll wheel, the video image is enlarged relative to the mouse cursor. A description of this process is provided in the table below.

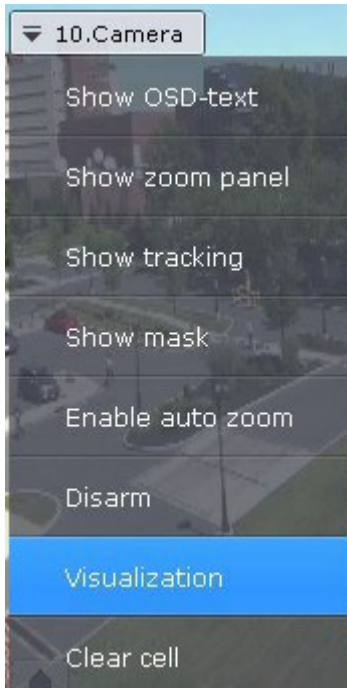
Action	Executed function
Mouse wheel is scrolled forward by one level	The video image is enlarged by 2x
Mouse wheel is scrolled backward by one level	The video image is reduced by 2x

Video image processing

In *Arkiv*, the video image processing functions implemented in the viewing tile enhance the performance and convenience of using the video surveillance system.

The following video image processing functions are available from the viewing tile:

1. Contrast.
2. Sharpness.
3. Deinterlacing.



To enable video image processing functions, use the **Visualization** option in the context menu of the viewing tile. Only one image processing function can be enabled at a time.

Changing the Contrast Level

An *Arkiv* operator is granted access to adjust the contrast of a video image.

To adjust the contrast, select the **Contrast** option in the **Visualization** context menu.



An example of the **Contrast** function is given in the following image.



To return to the original image, reselect the **Contrast** option in the **Visualization** context menu.

Setting the Sharpness Level

An Arkiv operator is granted access to adjust the sharpness of a video image.

To adjust the sharpness, select the **Sharpness** option in the **Visualization** context menu.



The image in the following picture shows an example of use of the **Sharpness** tool.

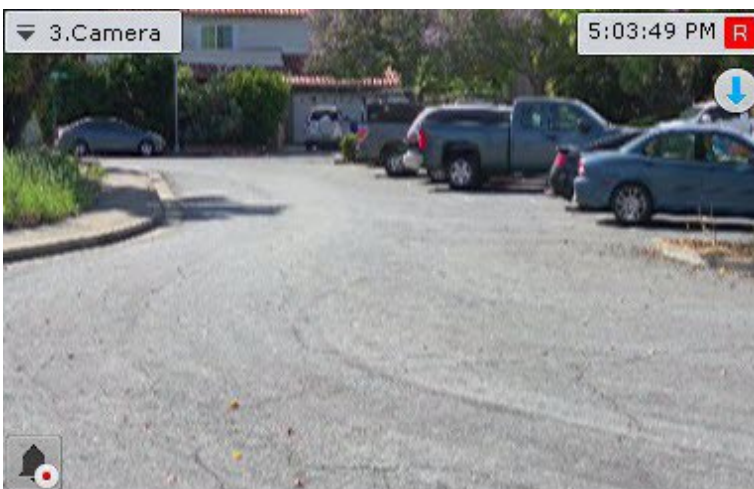


To return to the original image, use the **Sharpness** function again.

Using Deinterlacing

The **Deinterlacing** tool is used to correct tooth-type distortions (also called "combing artifacts"), which appear on the borders of video image fragments when objects move quickly relative to the background.

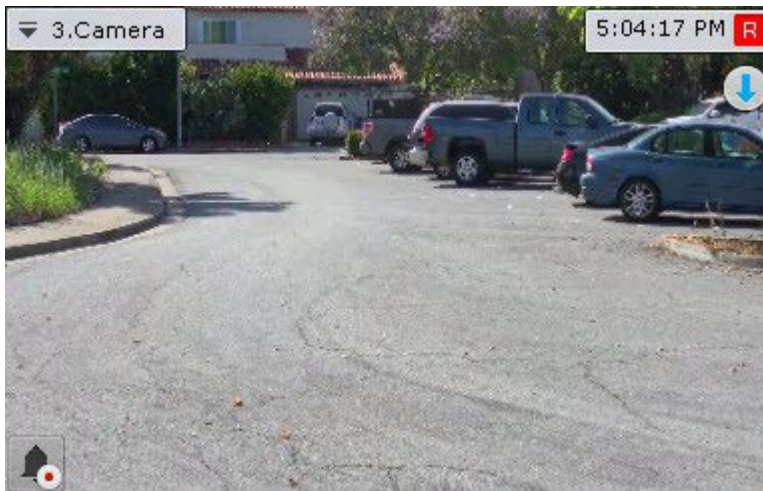
An example of a combing artifact is shown in the picture below.



To utilize this tool, select the **Deinterlace** option in the **Visualization** context menu.



The image in the viewing tile will then be corrected.



To disable **Deinterlacing**, reselect the **Deinterlace** option.

Rotate Video Image

You can rotate a video 90°, 180° or 270° degrees.

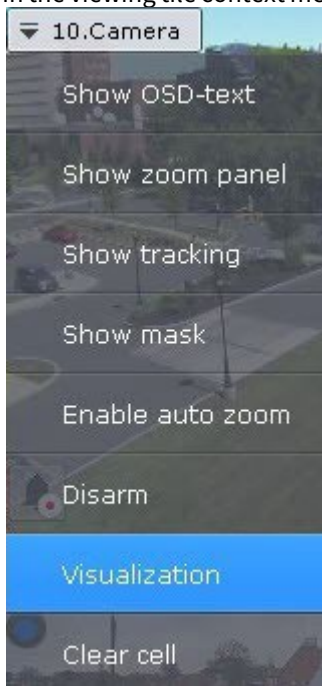
Note

If you enable video rotation, only video in Live Video and Archive modes is rotated:

- NA (not applicable) for video display on the map and on the alarms.
- NA to recording for archives.
- NA for export.
- NA for analytics (metadata).

To rotate video, complete the following steps:

1. In the viewing tile context menu, select **Visualization**.



2. Select the angle of rotation (clockwise).



Video rotation is now complete.



To disable video rotation, select **Visualization** → **Disable rotation** in the viewing tile context menu.



Tracking objects

Object tracking allows a user to visually track the movement of objects in a camera's field of view or in a video recording in an archive.

⚠ Attention!

Object Tracking is available if:

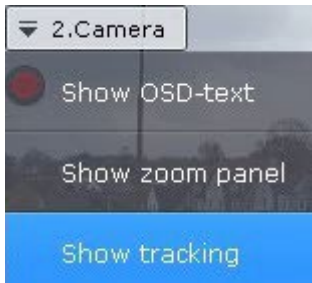
1. the object tracker is activated for this camera (see [General information on Scene Analytics detection tools](#)(see page 239));
2. the Video Motion Detection tool is activated (see [Configuring VMD](#)(see page 233));
3. at least one of the Embedded Analytic tools is activated (see [Embedded Detection Tools](#)(see page 370)).

Object tracking performs the following functions:

1. Recognizes the presence of a moving object and dynamically marks it with a transparent rectangle on the video image.
2. Displays the trajectory of the object's movement.

Motion is detected based on the time gradient of the video image's difference between frames.

To enable object tracking, select **Show tracking** in the viewing tile context menu.



Object tracking functions will now be activated.



To disable object tracking, click **Hide tracking** in the viewing tile context menu.

If you have created a Scene Analytics detection tool for this video camera (see [Functions of Scene Analytics detection tools](#)(see page 240)), then you can see the detection parameters (areas, lines) in Live Video mode along with object tracking in the camera window.



Note

Areas to be excluded from surveillance are outlined in dotted black and green line while detection areas are outlined in black and gray.

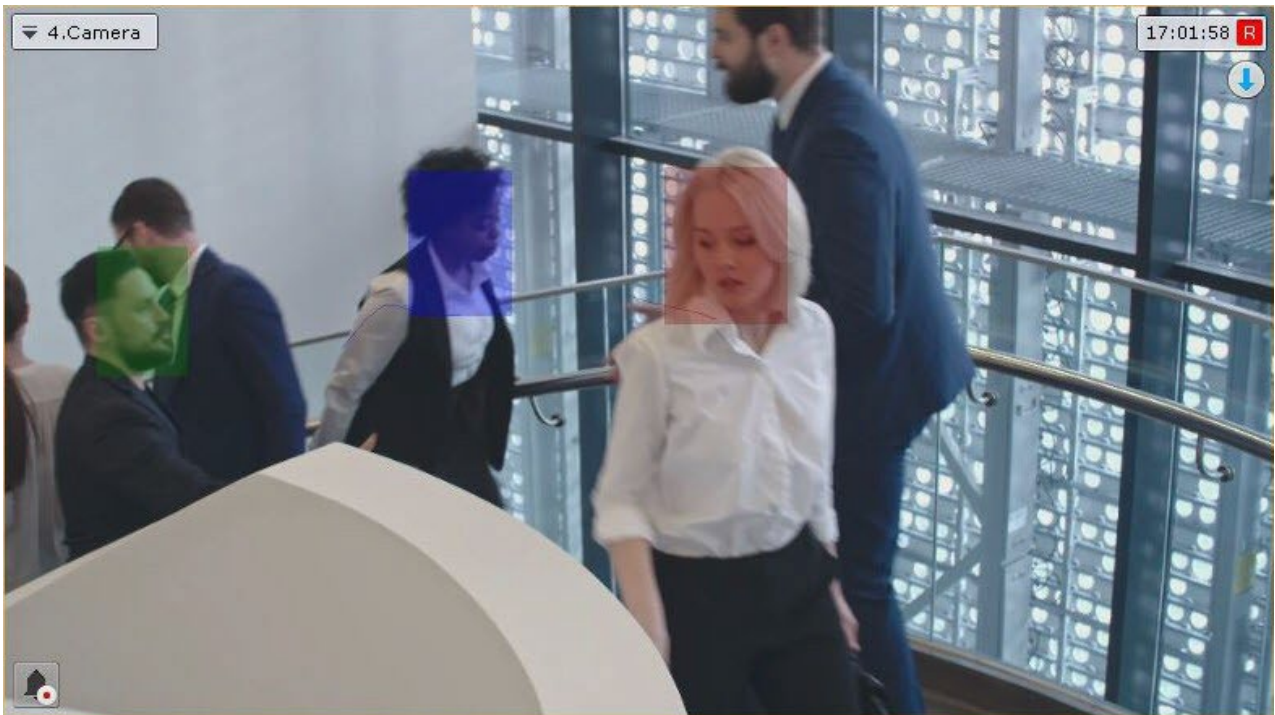
If an ANPR detection tool has been created for a camera, the license plates within the video image will be outlined (see [Automatic Number Plate Recognition \(LPR/ANPR\) tools](#)(see page 296)).



☐ Attention!

To ensure correct display of the outline, set the camera's **Video Buffering** parameter with the range of 500–1000 (see [The Video Camera Object](#)(see page 107)).

If a face detection tool has been created for a camera, all faces within the video image will be outlined.



If a pose detection tool (see [Configure Pose detection tools](#)(see page 348)) has been created for a camera, a human skeleton is highlighted over the video image.




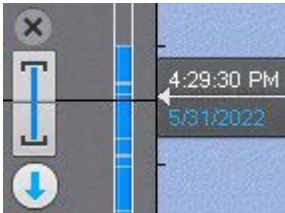
Operator comments

Operator comments on past or ongoing events allow a more complete understanding about the situation at the site.


Comments are displayed during playback (see [Viewing recorded video with operator comments](#)(see page 675)) and are marked with tags on the timeline (see [The Timeline](#)(see page 606)). Comments can also be searched (see [Searching comments](#)(see page 705)).


Adding comments in different surveillance modes

In Archive and Archive Analysis modes, comments can be added both for specific frames and for intervals of time. To add a comment for an interval, select an interval on the timeline, place the timeline indicator either inside the interval or at one border of it, and click the  button.




Note

If comments are added during playback in Archive or Archive Analysis mode, playback is paused after the  button is clicked.

In Alarm Management mode, operators can be required to give comments after classifying an event (see [Configuring Alarm Management Mode](#)(see page 518)) or comments can be left in free form, before event classification, by clicking the  button. The comment applies to the entire duration of the alarm. You can add a comment in real time only if archive recording is enabled.





Adding a comment

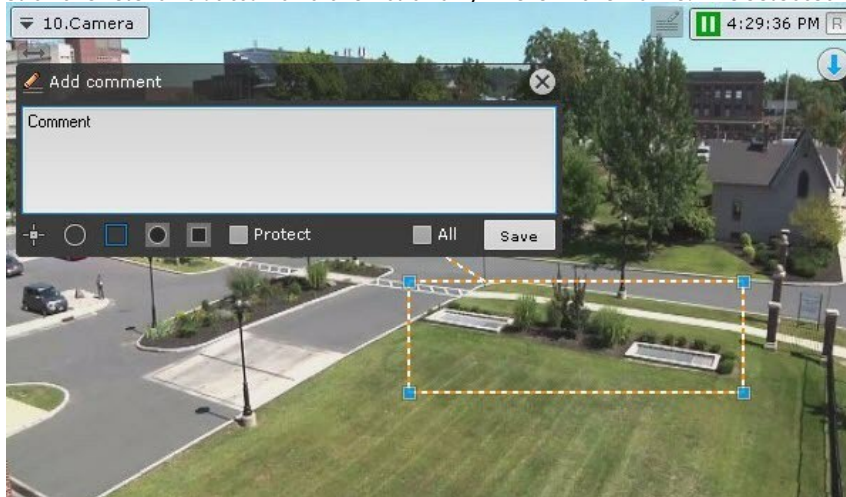
To add a comment, click the  button. A dialog box opens for entering a comment.





The number of characters in the comment is limited.

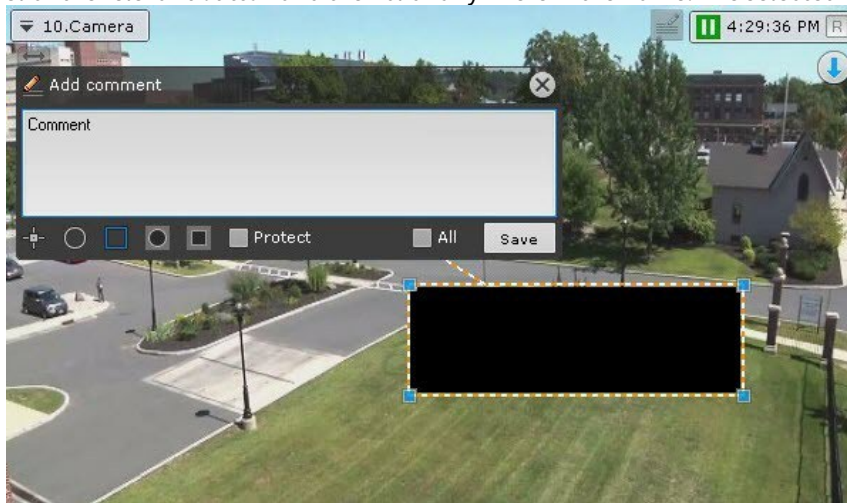
The following parameters can be configured:


1. Position of comment in the frame (the window with the comment is movable by dragging the window title).
2. Transparency of comment window, by adjusting the  slider from left to right (from opaque to maximum transparency).
3. Marking the area of interest in the frame, with a dot () , oval () , or rectangle (). To do so:
 - a. Click the relevant button and then click anywhere in the frame. The selected element is displayed.



- b. Move the element to the required area of the frame. To do this, left-click on the element and move the cursor without releasing it.
 - c. Set the size of the element by stretching its anchor points.
4. Marking the privacy zone — the area of the frame that should be hidden. You can mark it with an oval () or rectangle (). To do so:



- a. Click the relevant button and then click anywhere in the frame. The selected element is displayed.





- b. Move the element to the required area of the frame. To do this, left-click on the element and move the cursor without releasing it.
- c. Set the size of the element by stretching its anchor points.
- d. The Mask position will be displayed below the comment. Click the **Add** button. Click  to delete a position.

Note
The privacy zone cannot be set in real time.

Note
For one comment, you can specify either the area of interest, or the privacy zone.

5. Protection of an archive interval with a comment from overwriting. To protect archive records with a comment from being deleted, click the  button. To cancel protection, click the  button (see [Setting up record protection](#)(see page 214)).
6. Adding a comment to all cameras on the layout — set the **All** check box.

To save the comment, click the **Save** button. Otherwise, click  to cancel.

After being saved, a comment is displayed in the frame as specified. To delete the comment, before you perform any other command in the system, click the  button.



Switching to other camera via a link in the Camera window

The Camera window may contain links to other cameras (see [Adding links to other cameras to the Camera Window](#)(see page 466)).



When you click a link, the corresponding camera is selected, and the Camera window expands.

If a linked camera is not present on the currently selected layout, a layout containing the required camera is selected. If there are multiple layouts containing the required camera, the layout with the least number of windows is selected.

If a linked camera is not present on any layouts, a temporary layout is selected that will be automatically deleted after you proceed to another layout.

If one or more cameras are in Archive or Archive Search modes, after you click the link, you will see it | them also in Archive or Archive Search modes respectively.

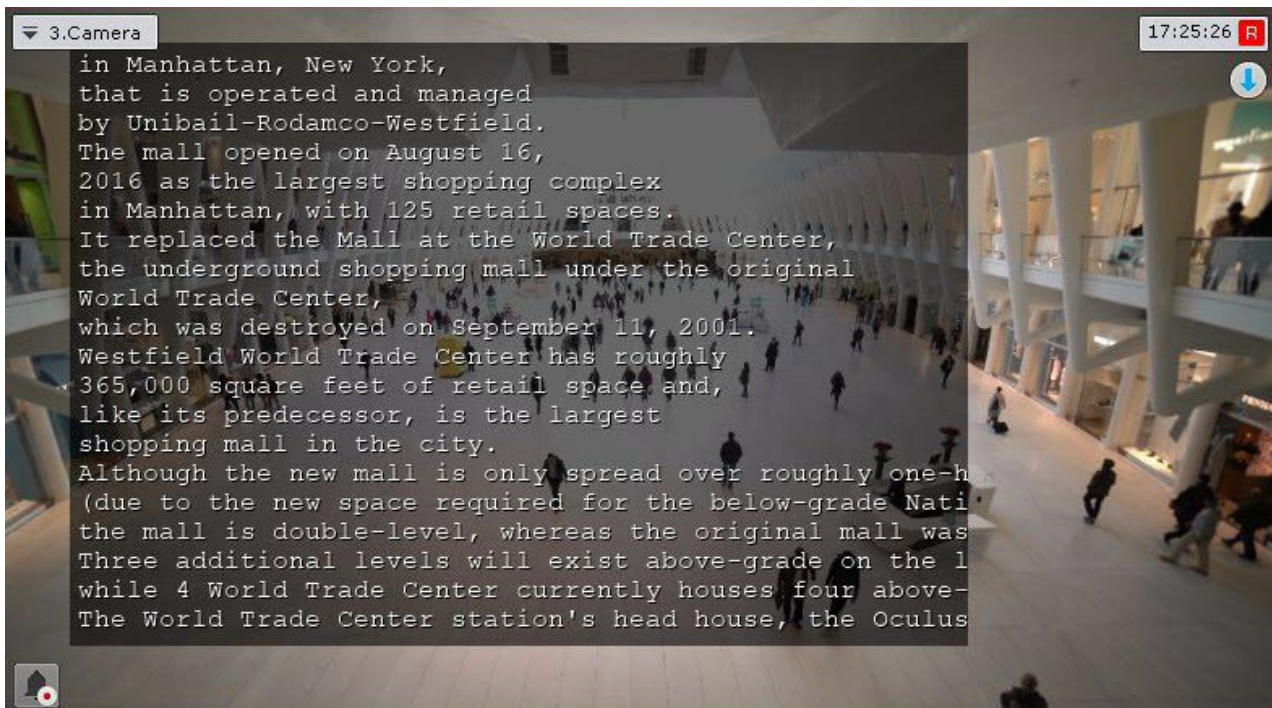
Viewing titles from POS terminals

If you have configured the titles overlay, the video tiles show titles superimposed on video (see [Configuring titles view](#)(see page 185)).

You can have titles from several POS terminals in the same camera window.

Attention!

Captions/titles are displayed only if the camera is located on the current layout.
If you collapse the Client, then captions are not received.



Note

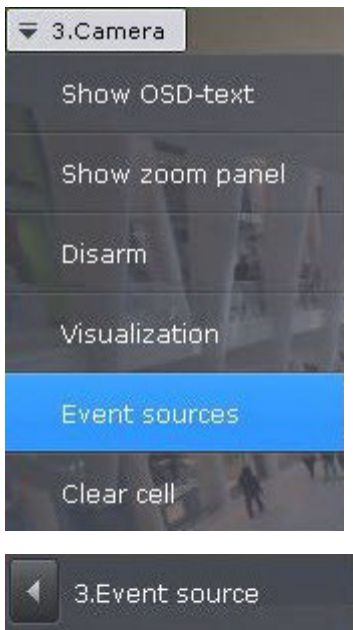
Keywords or lines can be highlighted according to the settings (see [Configuring keywords](#)(see page 187)).

If you view recorded video, titles are synced by time.

Note

With certain captions' output settings (the **Display duration** parameter = 0, see [Configuring titles view](#)(see page 185)) and low-intensity events at the checkout, you may have a time lag between the captions displayed and the video time stamp.

To disable titles overlay, select **Event sources** in the context menu of the viewing tile and a POS terminal that you want to hide.



Partial decoding of video

Video encoding/compression is a digital video processing technique aimed at reducing the bit rate of streamed video and bandwidth consumption. Video is compressed according to a specific software algorithm – codec.

To compress video signals from IP-devices, standard codecs such as MPEG-4 or vendor's proprietary codecs are used.

Before displaying the compressed video signal on screen, it is automatically decompressed.

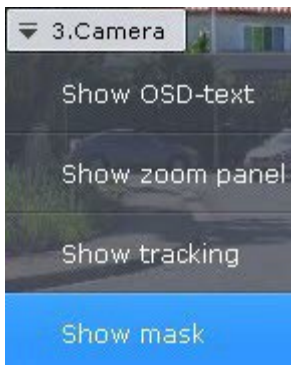
If the resolution of a viewing tile is lower than that of compressed video, only part of the video stream is decoded. This reduces CPU load on *Arkiv* Clients. Partial decoding does not affect bandwidth requirements. Partial decoding works with MPEG-2, MJPEG and MxPEG.

Extra information overlay (Masks)

Some detection tools allow to superimpose on video the following information and patterns:

1. [Motion detection \(VMD\)](#) – (see page 233) Motion Mask.
2. [Equipment detection tool \(PPE\)](#) (see page 332) and [Person-based Privacy Masking](#) (see page 342) – segments of the human body.
3. [Fire and Smoke Detection Tools](#) (see page 328) – the sensitivity scale of the detection tool.
4. [Neural Counter](#) (see page 323) – highlighting of the recognized objects.
5. [Water Level Detection](#) (see page 367) – the water level readings.
6. [Queue Detection](#) (see page 362) – highlighting of the queue/line.

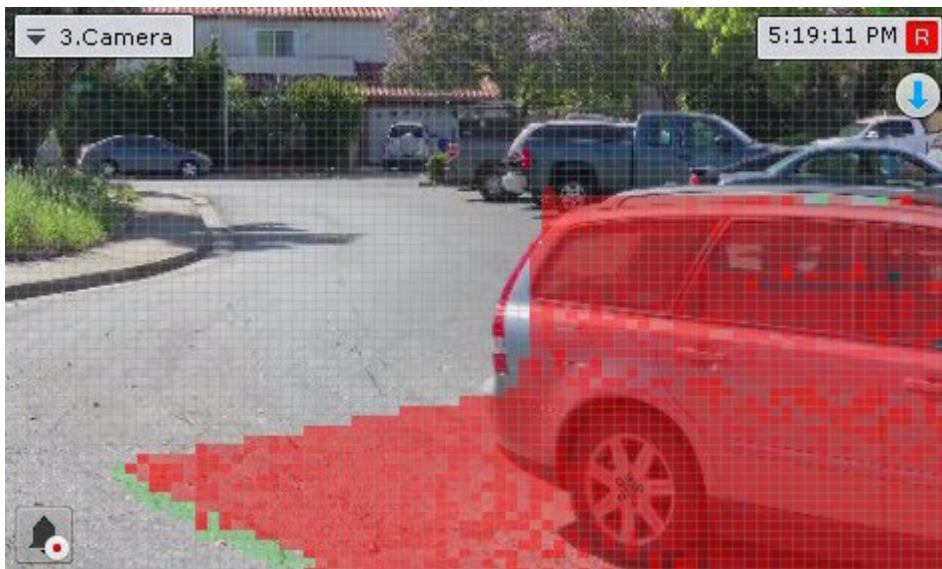
To enable viewing with information/patterns/mask overlay, go to the camera window menu and select **Show mask**.



Note

This option is available only if you have created one of the above-mentioned detection tools for this camera.

This brings up the desired information onscreen.

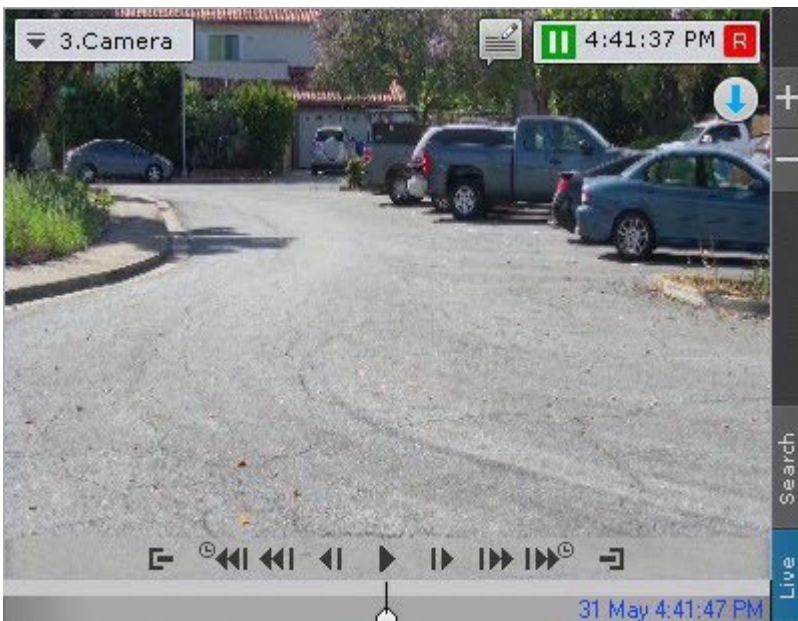


To disable this function, click **Hide mask** in the viewing tile's context menu.

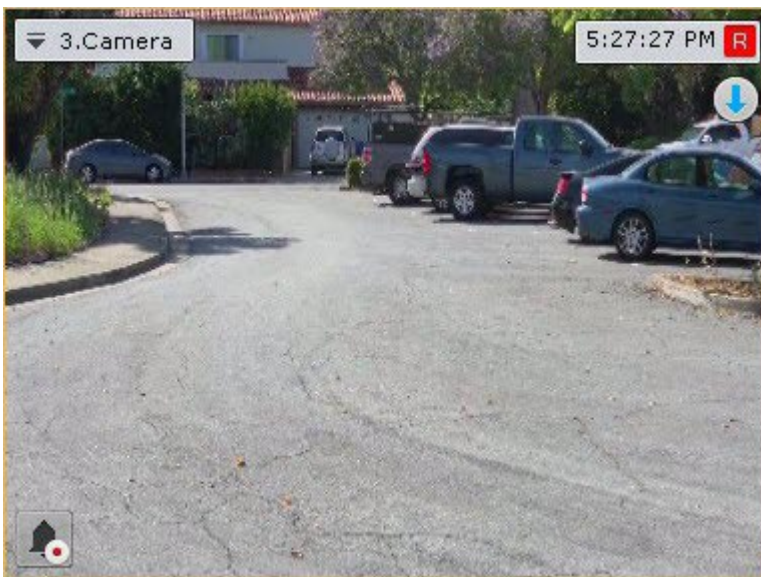
8.2.3 Real-time video surveillance

Switching to Live Video Mode

To switch the Camera Window from a different surveillance mode to Live Video viewing mode, click the **Live** tab in the lower-right corner.



The viewing tile will then appear in Live Video mode.



Video Surveillance Functions Available in Live Video Mode

In Live Video mode, the following video surveillance functions are accessible:

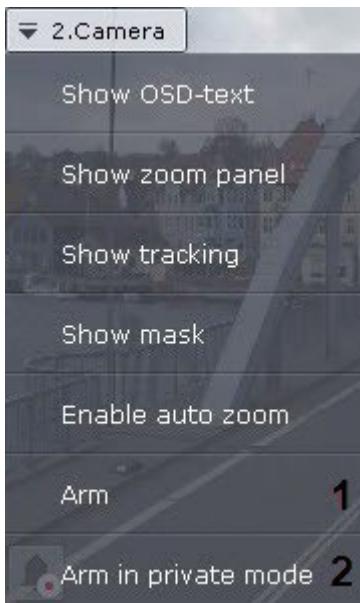
1. Selecting video stream quality in a viewing tile.
2. Autozoom.
3. Functions for tracking of moving objects.
4. Arming/disarming a video camera.
5. Controlling a PTZ Camera.
6. Controlling outputs.
7. Displaying the input status.
8. Autoreplace offline cameras on layouts.

9. Snapshot.
10. [Functions Available in All Video Surveillance Modes](#)(see page 621).

Arming and Disarming a Video Camera

In *Arkiv*, a video camera is armed via all the detection tools registered for that video camera. To arm a camera, select one of the following two parameters in the context menu of the viewing tile:

1. **Arm (1)**. In this case, the camera will be available to all users who have access to it.
2. **Arm in private mode (2)**. In this case, the camera will not be available to the users with the **Live in Armed mode**.



To disarm a camera, select **Disarm** in the context menu of the viewing tile. The video camera will then be disarmed.

Controlling a PTZ Camera

PTZ video camera can be controlled with the PTZ Control Panel or directly in the Viewing Tile (see [Controlling a PTZ Video Camera in the OnScreen PTZ Mode](#)(see page 653), [Control using Areazoom](#)(see page 654), [Control using Point&Click](#)(see page 654)).

The user gains access to this panel when the viewing tile of a video camera in Live Video mode that supports a PTZ control interface is selected.

☐ Attention!

PTZ camera is controlled in accordance with the priority settings (see [Creating and configuring roles](#)(see page 431)). If multiple users have the same control priority, they can control a PTZ camera simultaneously. If the user with higher priority controls the PTZ camera with the the PTZ control panel (as long as the camera is selected) users with a lower priority can not control it. If the user with higher priority controls the PTZ camera, the relevant information is displayed on the panel.



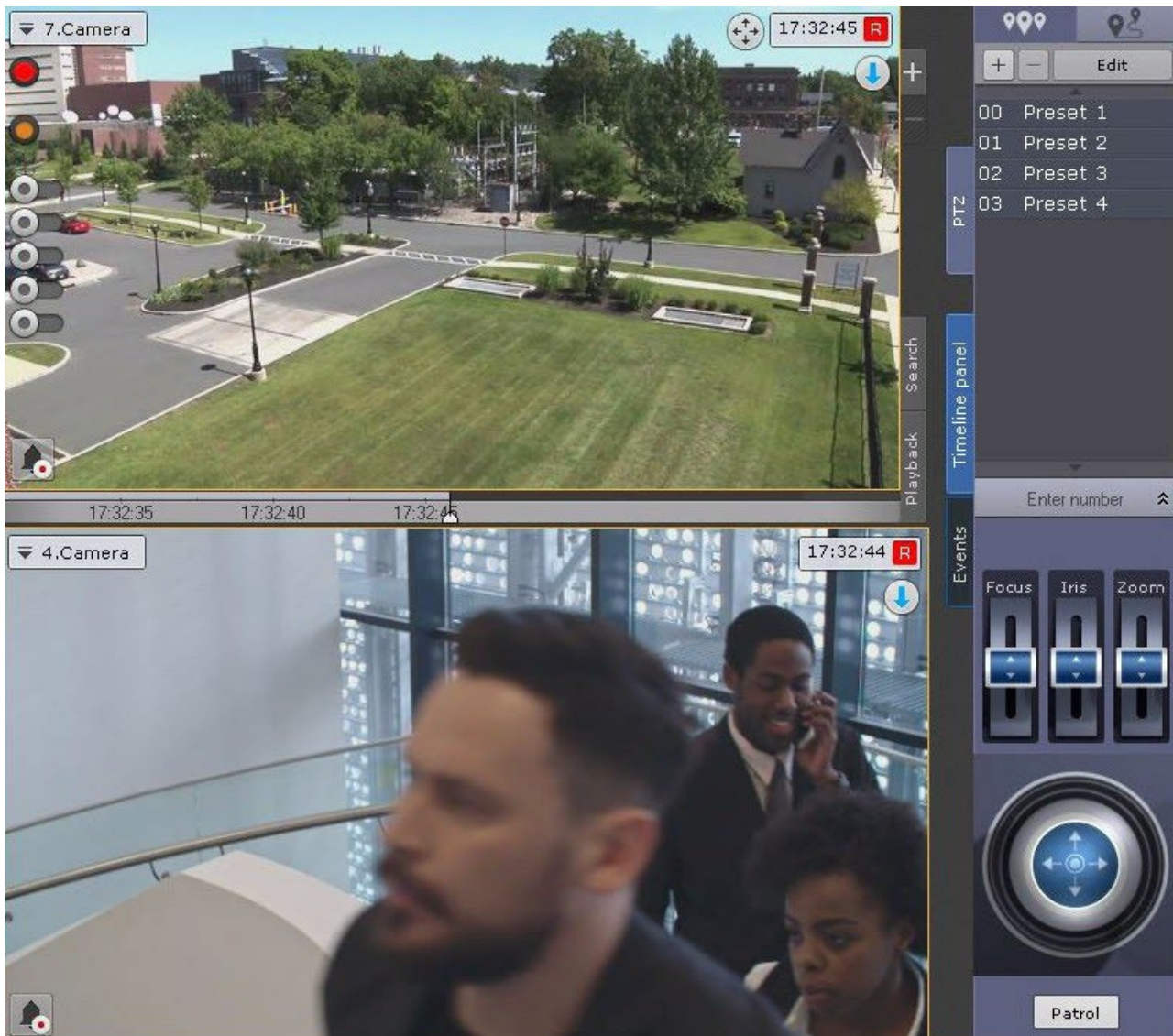
PTZ control is
currently locked
by another user
NEWCOMPUTER
root
admin

Take control

If you disabled the option to simultaneously control a PTZ camera by multiple users, users with the same priority take over the control on a first-come, first-served basis.

However, a user with equal or higher priority can take over the PTZ control. To do this, click the **Take control** button.

If the user that controls the PTZ camera is idle a certain time (see [Configuring PTZ control](#)(see page 519)), it is automatically unlocked and the control becomes available to all users.



The following actions can be performed using the PTZ device control panel:


1. Use presets.
2. Modify the parameters of the iris, focus, and optical zoom.
3. Modify the horizontal and vertical tilt angle of the video camera.
4. Starting/stopping patrol mode.

Note

Setting presets is described in detail in the section [The PTZ Control Panel](#) (see page 617).

Presets

Creating and editing presets

The presets list created for a selected video camera is displayed in the upper part of the PTZ control panel in the  tab.




For each preset in the list, the following parameters are displayed:

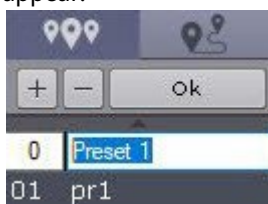
1. The identification number
2. A descriptive name

The presets list is used for the following functions:

1. Creating presets.
2. Editing the identification number and name of an existing preset.
3. Deleting presets.
4. Switching to a preset.

You can create up to 100 presets with numbers from 0 to 99. To create a preset, you must perform the following steps:

1. Place the PTZ camera in the position which is to be saved as a preset.
2. Click . Fields for entering an identification number and a descriptive name for the preset will then appear.



3. Fill in these fields as desired.

Attention!

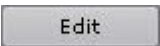
If a preset with the identification number entered already exists, its parameters, as well as the corresponding PTZ camera position, will be overwritten.

4. Left-click anywhere in the presets list and press **Enter** to save changes.

Creation of a preset is now complete.


To edit the number and name of an existing preset, you must perform the following steps:

1. Highlight the desired preset in the list.

2. Click . The identification number and descriptive name fields will then become accessible for editing.
3. Modify the preset number and/or name as desired.
4. Left-click anywhere in the presets list to save changes.

Editing of the preset is now complete.

To delete an existing preset, you must perform the following steps:

1. Highlight the desired preset in the list.
2. Click .

The preset has now been deleted.

To switch to a preset, left-click the corresponding line in the presets list. The camera will then be switched to the desired position.

Note

See the section [Selecting a preset](#) (see page 648).

Selecting a preset

To switch a PTZ camera to a preset, you can use the presets list. To do this, left-click the corresponding line in the given presets list.




To switch a PTZ camera to a preset, you can use the Enter number panel. To display the Enter number panel, click the **Enter number** button.




To switch to a preset using the Enter number panel, you must perform the following steps:

- Using the numeric buttons (0-9), enter the number of the preset to which you want to switch. The entered number is displayed in a special field.

To delete the last digit entered, click the  button.





- Click the  button to switch to the preset with the number entered. The camera will then be switched to the desired position.


Switching to a preset using the Enter number panel is now complete.

Note

Examples of entering a number:

5,  – switch to preset number 5;

0, 5,  – switch to preset number 5;


5, 7,  – switch to preset number 57.

PTZ Tours

During a PTZ tour, the camera automatically scrolls between pre-listed preset positions.

Attention!

In *Arkiv*, you can set up PTZ tours only for cameras connected via the ONVIF Generic driver (see [Generic Drivers \(General device, Generic\)](#)(see page 120)).

The presets list created for a selected video camera is displayed in the upper part of the PTZ control panel in the  tab.




Creating and editing PTZ tours

Arkiv automatically adds PTZ tours created with the camera's web interface.

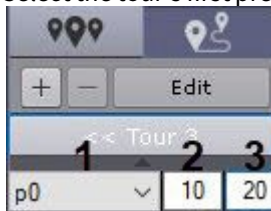


To add a new tour, do the following:

1. Click the  button.
2. Enter a name of the new tour, and click the **Ok** button.




3. Select the tour's first preset (**1**).



4. Specify dwelling time in seconds for this preset (**2**).
5. Specify transition speed to this preset in standard units from 1 to 100 (**3**).

Attention!

This parameter is reserved for future *Arkiv* software versions.

6. Click the **Ok** button.
7. Add all other desired presets in the same way.
8. Click  to return to the PTZ tours list.

To alter a tour, select it in the list and click **Edit**.



To delete a tour, select it and click .

Launching a PTZ tour

To start a tour, do the following:

1. Select a tour from the list.

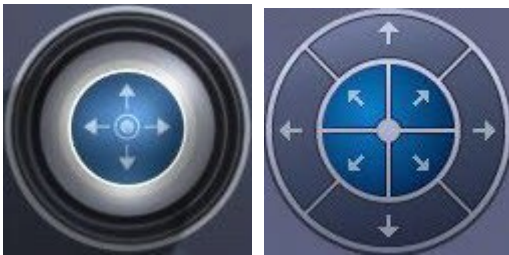


2. Click the **Patrol** button.

To stop a tour, click again the **Patrol** button.

Control using step buttons and virtual joystick

To control a PTZ camera, you can use both step buttons (discrete PTZ mode) and the virtual joystick (the camera must support continuous PTZ), if the camera supports both modes.



To select, click the  and  buttons.

Otherwise, only one of the modes may be used.

Note

If your camera is set to Discrete PTZ control via Continuous, your control options will be limited to buttons only (see [The PTZ object](#)(see page 150)).

Set the sensitivity level of PTZ step buttons by selecting a value from 1 to 10.



If you press and hold the buttons, the PTZ camera will move continuously.

Attention!

Interaction between PTZ cameras and the Client may cause the cameras to jerk in some cases. Cameras also may jerk when they are connected by the ONVIF protocol (see [Notes on configuring video cameras connected via ONVIF](#)(see page 138)).

Virtual joysticks are controlled as follows:

1. Click and hold down the left mouse button in the central (blue) portion of the joystick.
2. Drag the joystick in the necessary direction.

Note

You can also move the joystick by clicking and holding the left mouse button outside of the joystick border.
The turn speed depends on the tilt of the joystick: the greater the tilt, the higher the speed.

Note

If you rotate a camera view/viewing tile 180°, you will have PTZ controls inverted.

Patrolling

Patrolling is an automatic change in the position of a camera along a route defined in the camera's presets list.

Note

You can use a cycle macro to set up patrolling (PTZ camera tour, see [Switching to a PTZ camera preset](#)(see page 402), [Wait for timeout](#)(see page 394), [Cyclical macros](#)(see page 428)).

Patrolling must be activated in camera settings (see [The PTZ object](#)(see page 150)). In this case, the operator can stop patrolling by clicking the **Patrol** button on the PTZ control panel. After the manual PTZ control session is over, patrolling will resume automatically.



If patrolling is switched off in camera settings, you can switch it on by clicking the **Patrol** button.

Attention!

Manual control takes priority over automatic control. Any interference in the patrolling process cancels it.

To stop patrolling, click the **Patrol** button again.

Note

Any user (regardless of priority, see [Creating and configuring roles](#)(see page 431)) can stop patrolling.

Patrolling will automatically stop when a manual PTZ control session is over, or after you close the PTZ control panel.

Note


Control session automatically stops after a set idle time (see [Configuring PTZ control](#)(see page 519)).

Controlling Focus, Iris and Optical Zoom

To control focus, iris and optical zoom, use the corresponding sliders.



To control focus, iris, and optical zoom, move the corresponding slider up or down.

If the camera has AF (auto focus), you can see the corresponding  button under the slider.




Some devices allow to control optical zoom with the mouse scroll wheel.

To control optical zoom with the mouse, go to OnScreen PTZ mode (see [Controlling a PTZ Video Camera in the OnScreen PTZ Mode](#)(see page 653)), otherwise the zooming will be digital (see [Digitally Zooming Video Images](#)(see page 623)).

Controlling a PTZ Video Camera in the OnScreen PTZ Mode

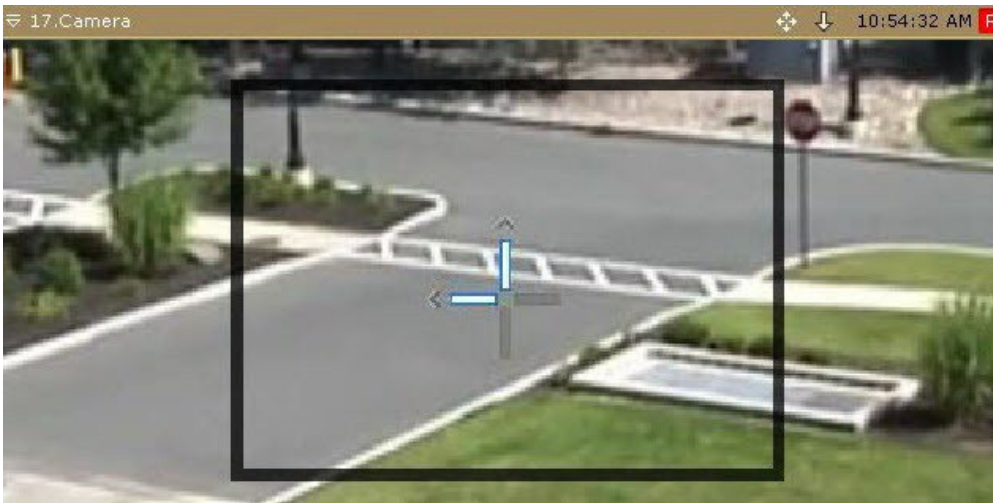
The OnScreen PTZ mode enables controlling a PTZ video camera by mouse manipulations in the Viewing tile.

Click  to enable this mode.


Note

In OnScreen PTZ mode, the Areazoom function is disabled (see [Control using Areazoom](#)(see page 654)).

To change the viewing angle, click on a video image with the left mouse button and move the mouse pointer in the required direction. During this action the software displays a visual element on the image showing the camera lens movement direction and speed.



The faster you move the mouse, the faster the camera rotation will be.

Click  again to disable the OnScreen PTZ mode.

Control using Point&Click

To change the focus of the camera lens, left-click anywhere within the video image in the viewing tile.

Attention!

To operate Point&Click, go to **OnScreen PTZ** mode (see [Controlling a PTZ Video Camera in the OnScreen PTZ Mode](#)(see page 653)).

Once you have done that, the focus of the camera lens will automatically change to the selected area. The focus is changed using *Arkiv* algorithms.

Note

This function is available for only some CCTV cameras.
For more information, contact Inaxsys.

Control using Areazoom

You can focus on a particular area in a video frame.

Note

Areazoom function is unavailable if the **OnScreen PTZ** mode is enabled (see [Controlling a PTZ Video Camera in the OnScreen PTZ Mode](#)(see page 653)).

To do so:

1. Click a point to focus on it.



2. Holding down the mouse button, moving outward from the center of the focus area, the user sets the size of the area. Releasing the mouse button finalizes the selection.



The lens is reoriented and the image is enlarged so that the selected area now fills the entire viewing tile.

Note

This function is available for only some CCTV cameras.
For more information, contact Inaxsys.

Functions for tracking of moving objects

Arkiv includes several features for tracking moving objects.

With Target&Follow, an object can be tracked by a PTZ camera under the guidance of panoramic cameras.

With Target&Follow Lite, the operator is alerted to the camera in front of which the moving object is most likely to appear next. The camera is predicted based on object trajectory and mapping of cameras to map locations.

Target&Follow Pro

Target&Follow functionality depends on the PTZ mode that is specified in the settings.

Attention!

To use Target&Follow Pro, make sure your PTZ camera supports Absolute Positioning. The devices that support Target&Follow Pro are listed in the [Drivers Pack documentation](#).

When connecting via the ONVIF protocol, Absolute Positioning support is also required. Contact camera vendor for Information on the Absolute Positioning support in the ONVIF protocol.

Attention!

If manual or control priority mode is selected, for Target&Follow Pro you must activate object tracking in the viewing tile of the overview camera (see the [Tracking objects](#)(see page 631) section).

- If automatic mode is selected, the PTZ camera will track all active objects. In this case the PTZ camera switches focus between each object with the specified dwell time.

Note

The PTZ camera is positioned so that the moving object is in the center of the frame.

- In manual mode, the PTZ camera tracks an object only after the object is manually selected in the viewing tile (left-click to track). If you click anywhere in overview camera's FOV that contains no tracks, the PTZ camera cancels object tracking and focuses on the specified point.



- If control priority mode is selected, the PTZ camera automatically tracks an object until another object is manually selected for tracking in the viewing tile. If an object is deselected (by clicking again) or if it leaves the field of view of the PTZ camera, automatic mode is re-activated.
- If the PTZ camera is in manual mode, the user controls it with on screen or with a joystick / CCTV keyboard. If the user does not operate the PTZ camera ([The PTZ Control Panel](#)(see page 617) hidden), then the Automatic mode is used.

Note

Target&Follow Pro cannot be used with the OnScreen PTZ mode simultaneously (see [Controlling a PTZ Video Camera in the OnScreen PTZ Mode](#)(see page 653)).

Target&Follow Lite

Attention!

For Target&Follow Lite to work, you must activate object tracking in the viewing tile (see the [Tracking objects](#)(see page 631) section).

Target&Follow Lite works as follows:

1. The operator left-clicks an object to start tracking it (the object is outlined with a white frame).



2. After the selected object leaves the field of view of the camera, the video camera's location on the map and trajectory of the object are used to predict the camera in front of which the object is **likely to appear**.
3. The viewing tile of that camera is activated. If the current layout does not contain that camera, a minimal layout with the camera is shown.

Note.

If the viewing tile for that camera is currently in archive mode, the tile is switched to Live Video mode and made active.

Note.

If video in the viewing tile of the original camera is magnified and the predicted camera is not in the layout, the viewing tile with the camera is made active and the same degree of digital zoom is applied.

Attention!

Target&Follow Lite merely predicts, and therefore cannot guarantee, that the object will appear in front of a given camera.

4. To continue tracking the object, select it again in the camera window.

Simultaneously using Target&Follow Pro and Target&Follow Lite

In some cases, it may be useful for Target&Follow Pro and Target&Follow Lite features to be active at the same time.

For example:

- In Target&Follow Pro, manual or control priority mode is selected for the PTZ mode.
- In Target&Follow Lite, an object is selected in the field of view of the camera that is designated as the overview camera for Target&Follow Pro.

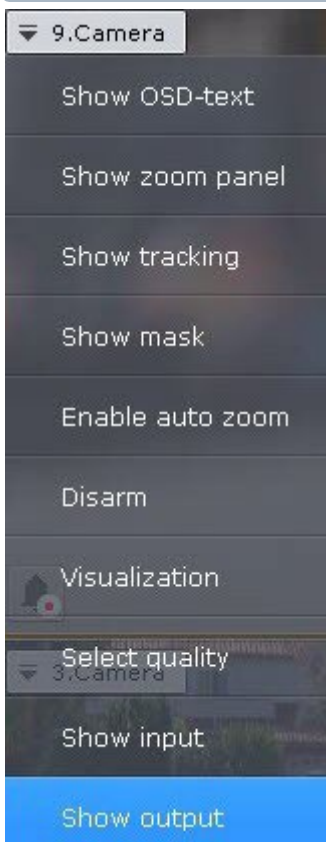
In this case, both features are active: the object will be tracked by the PTZ camera and its trajectory will be used to predict the camera in front of which it will appear next.

Managing Outputs

To control a output, select **Show output** in the context menu of the viewing title.

Note

You must first activate an object before you can control its output.



This opens **Output Switch**.



Note

To hide **Output Switch**, select **Hide output** in the context menu of the viewing tile.

You can toggle the output state by clicking the radio button.

Note

If a output is controlled by several operators simultaneously, the output will remain activated as long as at least one operator requires it.

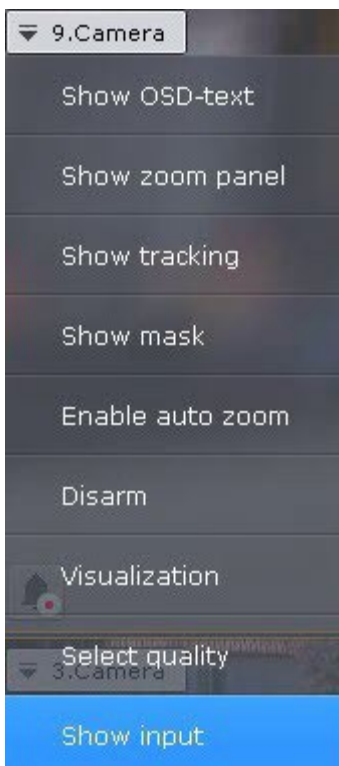
Output Switch	Output status
	Normal
	Activated

Displaying the input status

To display the status of a video camera's input, select **Show input** in the context menu of the viewing tile.

Note

You must first activate an object to display the status of its input.







The status of the input will now appear in the viewing tile.

Note

To hide the input status, select **Hide input** in the context menu of the viewing tile.



There are four possible statuses of a input.

Input status	Description
	Video camera is armed, input is in normal status
	Video camera is armed, input is in alarm status
	Video camera is disarmed, input is in normal status
	Video camera is disarmed, input is in alarm status

Selecting video stream quality in a viewing tile (GreenStream)

[The Video Camera Object](#)(see page 107)

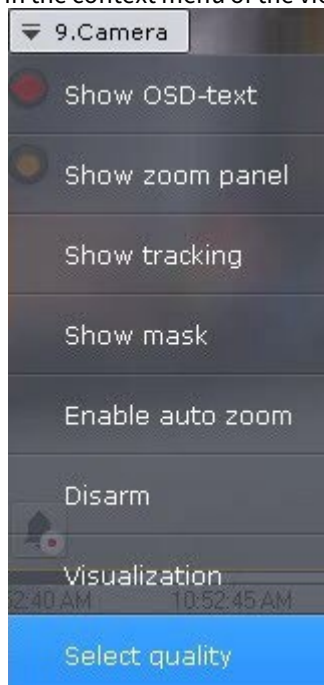
If the video camera supports multistreaming, you can select the quality of the video stream that you want to display in viewing tiles.

Note

If the video camera is not configured for multiple video streams, this action is not available.

To select the video stream quality, do as follows:

1. In the context menu of the viewing tile, select the **Select quality** item.



2. Select the quality of the video stream that you want for display in the viewing tile.



Item	Description
Auto (GreenStream, default)	The camera has two video streams: high quality video stream and low quality video stream. If the size of the cell where the video image from the camera is displayed is close to the low quality resolution with a 10% height or width margin, the video image will be displayed using the low quality stream. In other cases, the high quality video stream will be displayed.
High quality	A high quality video stream is used in the video surveillance window.
Low quality	A low-quality video stream is used in the video surveillance window. When you enlarge the surveillance window, the video stream switches to a high quality video stream.

Note

The automatic video stream selection (the **Auto** item) is unavailable, if automatic resolution selection is set for any stream.

3. Click in the area between the tiles.

Selection of the video stream quality in the viewing tile is complete.

The **HQ** symbol in the video surveillance window indicates high quality stream.



Autozoom

The **Autozoom** function performs automatic control of digital zoom.

If a viewing tile is inactive and autozoom is enabled, the following actions occur:

1. The smallest rectangular area that contains all tracked objects (even if object tracking is disabled) is chosen.
2. Maximum digital zoom is performed for the selected area.

If autozoom is enabled but there are no moving objects in the video frame, the contents of the viewing tile are shown at their original size.

Note

If the Fit screen function is activated for a viewing tile, the default digital zoom level is used.

Autozoom stops when a viewing tile is selected and resumes when the viewing tile is no longer active.

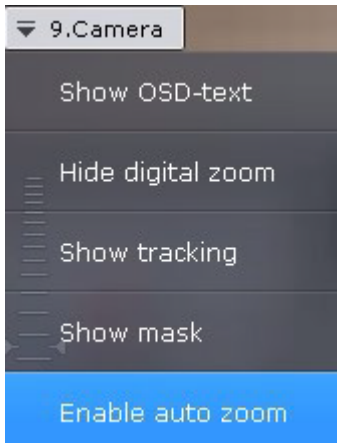
Autozoom can be enabled both for a single camera and for all video cameras in a layout.

To enable autozoom for a specific camera, in the viewing tile context menu, select **Enable auto zoom**.

Important

Autozoom is available if:

1. the object tracker is activated for this camera (see [General information on Scene Analytics detection tools](#)(see page 239)).
2. the Video Motion Detection tool is activated (see [Configuring VMD](#)(see page 233)).
3. at least one of the Embedded Analytic tools is activated (see [Embedded Detection Tools](#)(see page 370)).

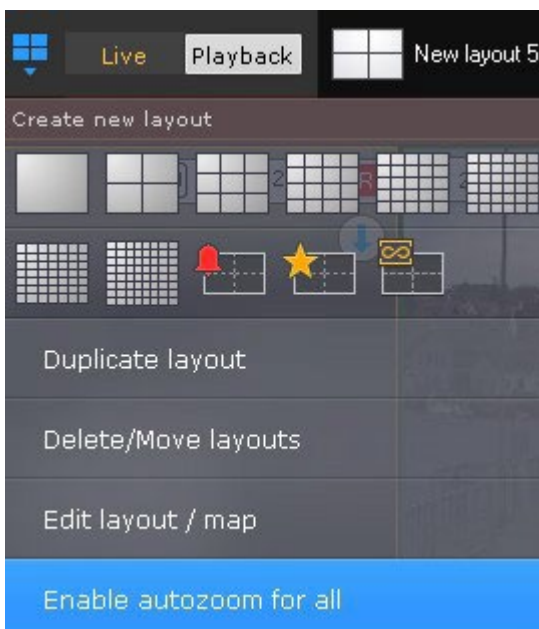


Note

Autozoom resizing takes into account objects from all tracking sources that are activated for a particular video camera.

To disable autozoom, select the corresponding command in the viewing tile context menu.

To enable autozoom for all cameras in a layout, select **Enable autozoom for all**.



To disable autozoom for all cameras in a layout, select **Disable autozoom for all**.

Note

If autozoom is activated for one or more cameras in a layout, by default the menu displays the **Disable autozoom for all** option.

 Note

When you switch to the layout editing mode, the auto zoom is disabled for all cameras.

Autoreplace Offline Cameras on Layouts

If the main camera goes offline and a sub camera is defined in the settings (see [The Video Camera Object](#)(see page 107)), they are automatically replaced: the sub camera shows in the tile in place of the main one.

Cameras are swapped across all layouts in the system.

When connection restores, changes are automatically undone.

Snapshot

In Live Video mode, you can "freeze" video. To do so, click the time display (scrubber) in a viewing tile.

This will cause the viewing tile to be highlighted with a blue border. A snowflake icon will appear in the time field.



To return to live video, click the display again.

Viewing selected camera's detection tool triggering events

You can get quick access to selected camera's detection tool triggering events from any layout. To do it, follow the steps below:

1. Select a camera on the layout.

- Click the **Events** button on the right margin of the screen.
An events panel (see [Working with Event Boards](#)(see page 742)) opens containing detection tool triggering events for this camera only.



To hide the panel, click again the **Events** button.

Removing a camera from a layout

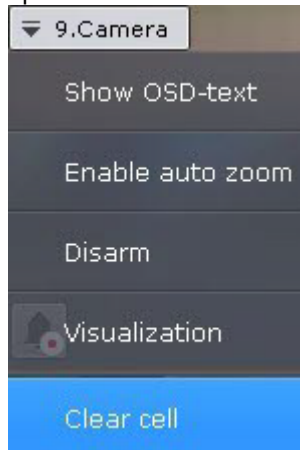
You can remove a camera from any given layout.

Attention!

These changes are not saved, and the camera will reappear when you call the layout again, or relaunch the Client.

To do it, follow the steps below:

1. Open the Camera Window context menu.



2. Select **Clear cell**.

The corresponding layout cell becomes empty.



You can further drag and drop a camera from the Objects panel (see [Objects Panel](#)(see page 615)) or Camera search panel (see [Camera Search Panel](#)(see page 612)).

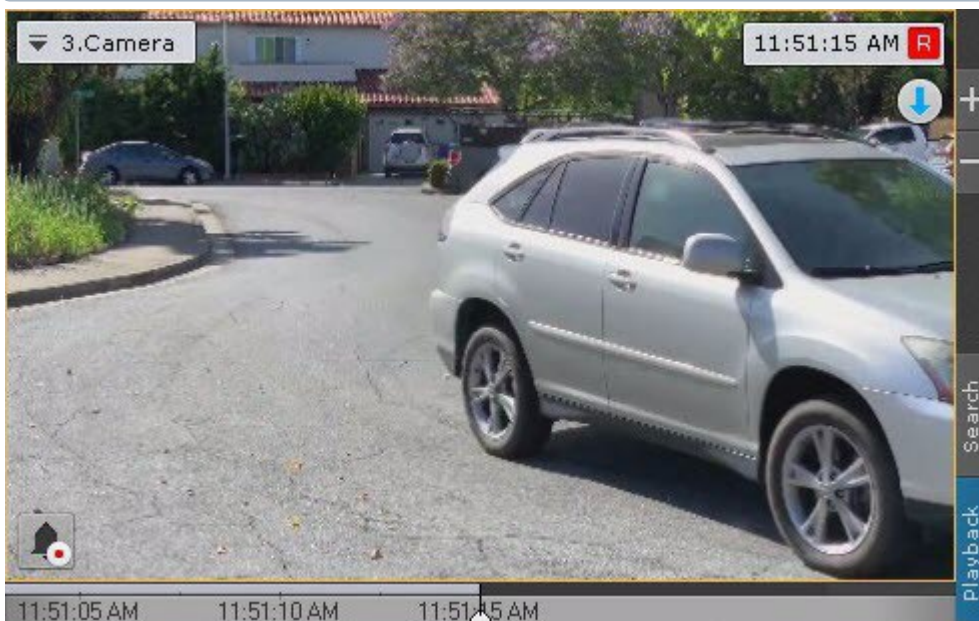
8.2.4 Video surveillance in archive mode

Switching to Archive Mode

To switch from a different surveillance mode to the Archive mode, click the **Playback** tab in the lower-right corner of the Camera Window.

Note

If a camera is not linked to a video archive and has no on-board storage, this tab will be not available.

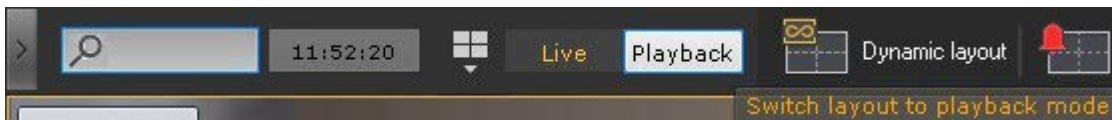


You can also switch from Live Video mode to Archive mode if you select a position on the advanced archive navigation panel (see [Advanced Archive Navigation Panel](#)(see page 599)).

Note

In Live Video mode, if the viewing tile is not active, the tabs for switching to other modes and the advanced archive navigation panel are not displayed. To activate, click the viewing tile.

To switch all cameras within a layout to Archive mode, click the **Playback** button on the upper panel.



To return to live viewing, click **Live**.

Furthermore, if all cameras within a layout are in Live Video mode, you have to open the Archive navigation panel to switch the cameras to Archive mode (see [Show and Hide the Archive Navigation Panel](#)(see page 602)).


Note

If archive mode is selected as the default video mode for a camera in a layout, when you switch to that layout, the camera is immediately in archive mode (see [Selecting the default video mode for a camera](#)(see page 462)).

On first access to Archive mode, the most recently recorded video will be selected on the timeline (see [The Timeline](#)(see page 606)). On further accesses to a particular camera archive, the timeline indicator will show the position of the most recent video in the Archive.

Attention!

If you prefer to open the most recently recorded video when accessing the Archive (Video Footage), create a `ResetArchivePosition` parameter in the following registry key on the Client:
HKEY_LOCAL_MACHINE\SOFTWARE\Inxsys.

Click  to create a temporary layout for Archive (video footage) viewing.

The temporary layout is not preserved after you switch to any other layout.

Video Surveillance Functions Available in Archive Mode

In archive mode the following video surveillance functions are accessible:

1. Autozoom.

Note

Refer to section [Real-time video surveillance](#)(see page 642) for a description of switching to the results of a saved search query and the **Autozoom** function.


2. Selecting an archive for viewing of recordings.
3. Synchronized playback of archives.
4. Compressed playback of archives.
5. Viewing recorded video with operator comments.
6. Viewing external archives.
7. Navigating through the archive.
8. Displaying why Scene Analytics detection tools have been triggered.
9. Viewing the results of a saved search query.
10. Manual archive replication.
11. [Target&Follow Lite](#)(see page 688).
12. [Functions Available in All Video Surveillance Modes](#)(see page 621).

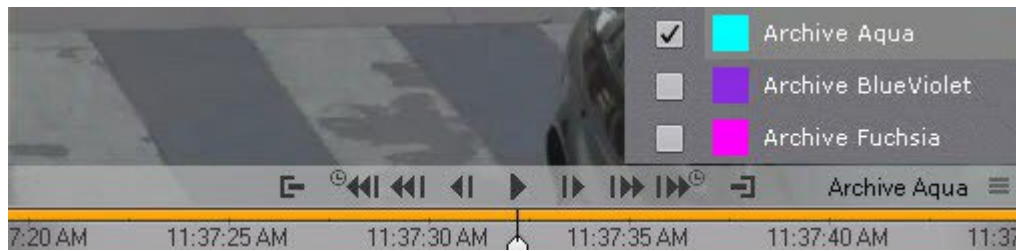
Selecting an Archive

You can select video footage to view only if the camera is recording to several archives.

If you do not select an archive, the default archive is played back (see [Configuring recording to an archive](#)(see page 207)).

To select another archive for playback:

1. Click the archive name or the  button on the advanced archive navigation panel.
2. Select the required archive from the list.



Note

You can select all available Mirror Archives (if any, see [Configuring data replication](#)(see page 210)) and on-board storage (if enabled, see [The Embedded storage object](#)(see page 161)).



You can now view video footage from the selected archive in the viewing tile.

Attention!

The next time you enter the Archive mode, the selected (not default!) archive will be displayed.

Note

If there is no recording in the selected archive, a message to that effect will appear in the viewing tile.

Viewing a combined Archive

In some cases, you might need to record videos from a single camera into multiple Archives.

For example, videos triggered by Detection Tool #1 go into into Archive #1, and videos triggered by Detection Tool #2 are recorded into Archive #2.

For more user convenience, *Arkiv* offers an option to visually combine records from different Archives. To view a combined Archive, you need:

1. Go to the Archive selection menu (see [Selecting an Archive](#)(see page 669)).

2. Check boxes for the Archives to be combined.



Records from all checked Archives will appear on the timeline. You can apply any system function to a combined Archive.

Note

Clicking on a particular Archive brings you to viewing videos from this Archive only.

Note

If you select multiple archives for a particular camera, and then switch all the layout to Archive mode, all cameras will be set to multi-archive display.

When combining multiple streams from the same camera into one Archive, the highest quality stream is prioritized.

For example, if:

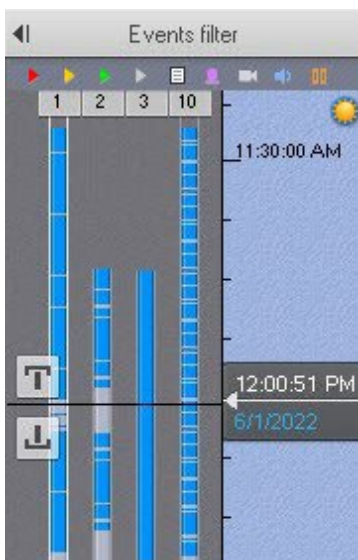
- a lower quality video stream is permanently recorded into Archive #1,
- and a high quality video stream is recorded into Archive #2 by VMD,

then the combined Archive will consist of high quality motion-triggered records and low quality "other" videos.

Synchronized playback of archives

Synchronized playback of archives lets you play back archives from several different video cameras simultaneously.

To enable synchronized playback, switch a few video cameras into archive mode. The timeline will then display time axes for the corresponding archives.



Synchronized archive playback is controlled through the playback panel in the same way as playback for a single archive.

Compressed playback of archives (Timelapse Compressor)

During compressed playback (Timelapse Compressor), the viewing tile simultaneously displays tracked objects from different moments in time within the selected portion of the archive. This lets you quickly look through the archive to find important events and investigate them in more detail.

For condensed playback of archived video from a camera, the following conditions must be true:

1. Camera is bound to an archive (see [Configuring recording to an archive](#)(see page 207)).
2. The camera must have at least one active source of metadata (Object Tracker, Video Motion Detection, Embedded Analytics).

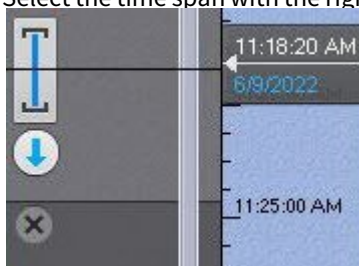
⚠ Attention!

For the Object Tracker, you have to select the video stream currently selected for Video Footage recording (see [Setting general parameters of Tracker-based Scene Analytics detection tools](#)(see page 245)).

Switching to Timelapse Compressor mode

To use Timelapse Compressor, complete the following steps:


1. You can set the time span for viewing video in Timelapse Compressor on the timeline in one of the following ways:
 - a. Set the pointer to the start position. In that case you view the whole archive to the end of it (see the section titled [Navigating Using the Timeline](#)(see page 678)).
 - b. Select the time span with the right-click.



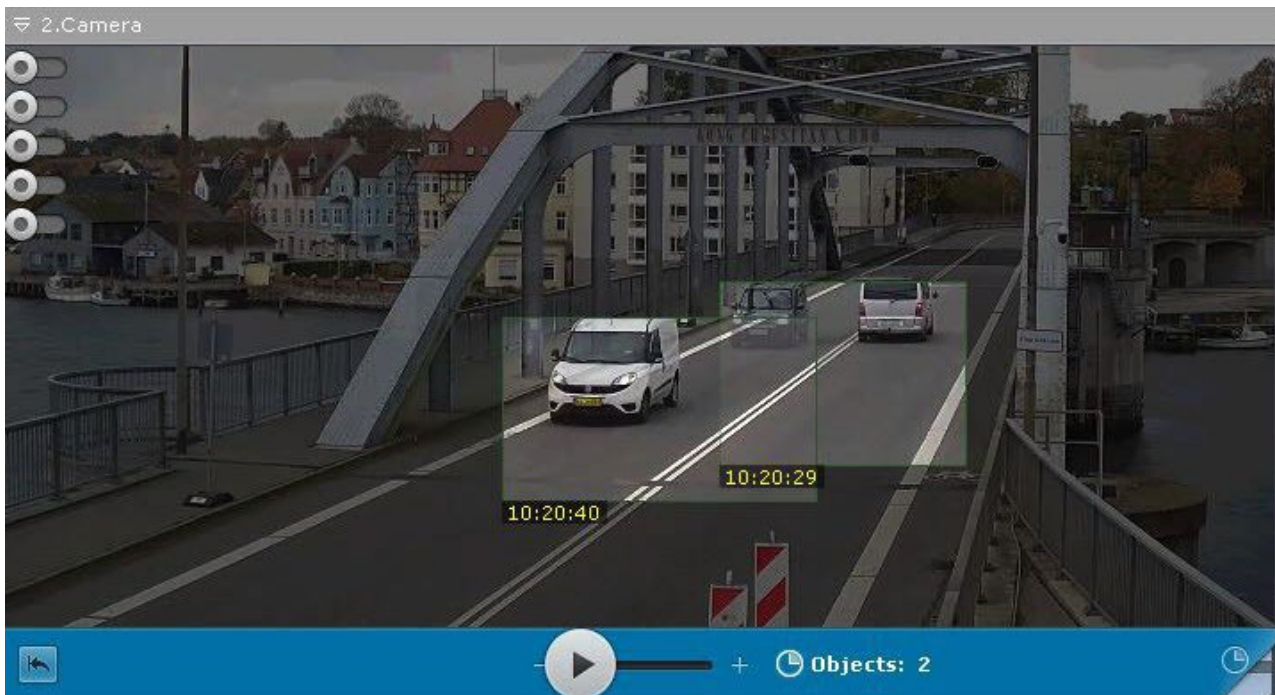
□ Note

The Timelapse Compressor mode allows you to view the results of a specific archive search (see [Viewing Search Results In Timelapse Compressor](#)(see page 724)).



2. Click the  button on the advanced archive navigation panel.

The archive will now start playing in compressed mode.




Note

Only one video camera can run Timelapse Compressor at one time. If synchronized playback is started and a video camera is switched to Timelapse Compressor mode, playback of all other video cameras will be automatically paused.

Note

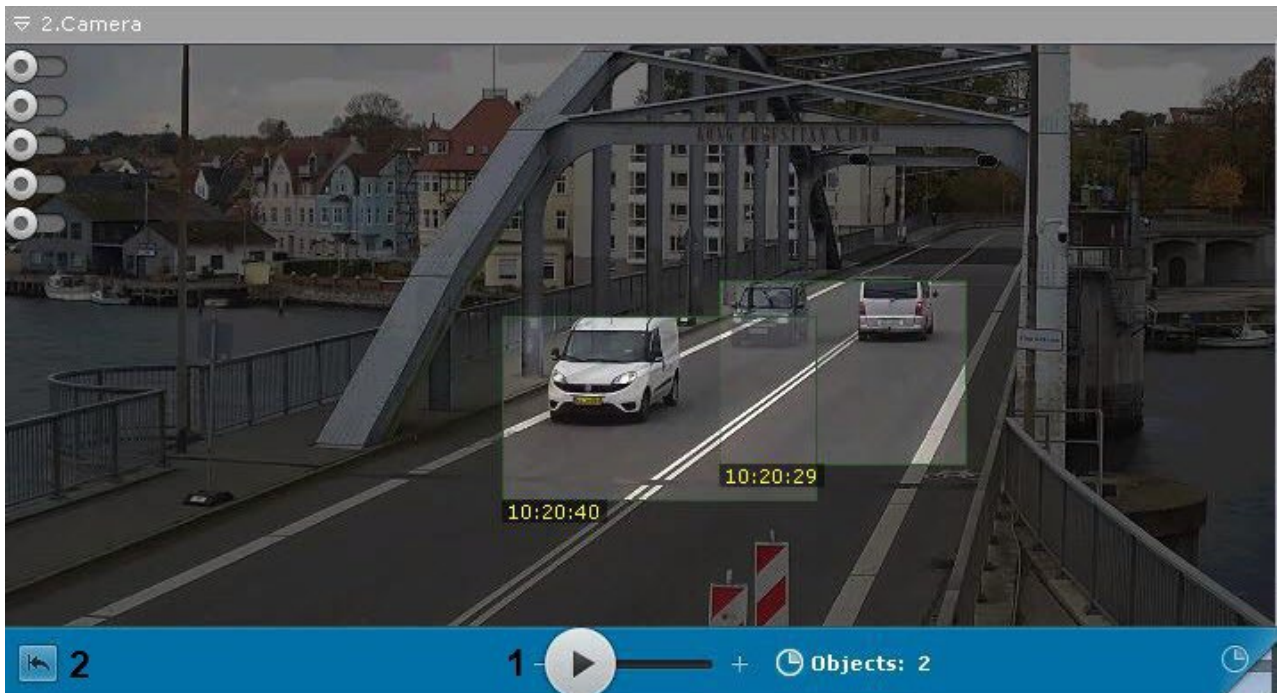
To switch back to the standard archive browsing mode, click the displayed area of the advanced archive

navigation panel .

Playback control

Playback control in Timelapse Compressor mode is managed using the advanced navigation panel and the playback panel.

To set the desired number of tracked objects to be simultaneously displayed, set the slider in the appropriate position (**1**). The extreme left position of the slider corresponds to two objects, the extreme right – sixteen.



Note


Once you have configured this setting, playback begins at the beginning of the selected interval.

Note

However, according to the logic of the algorithm, the number of displayed objects may be greater.

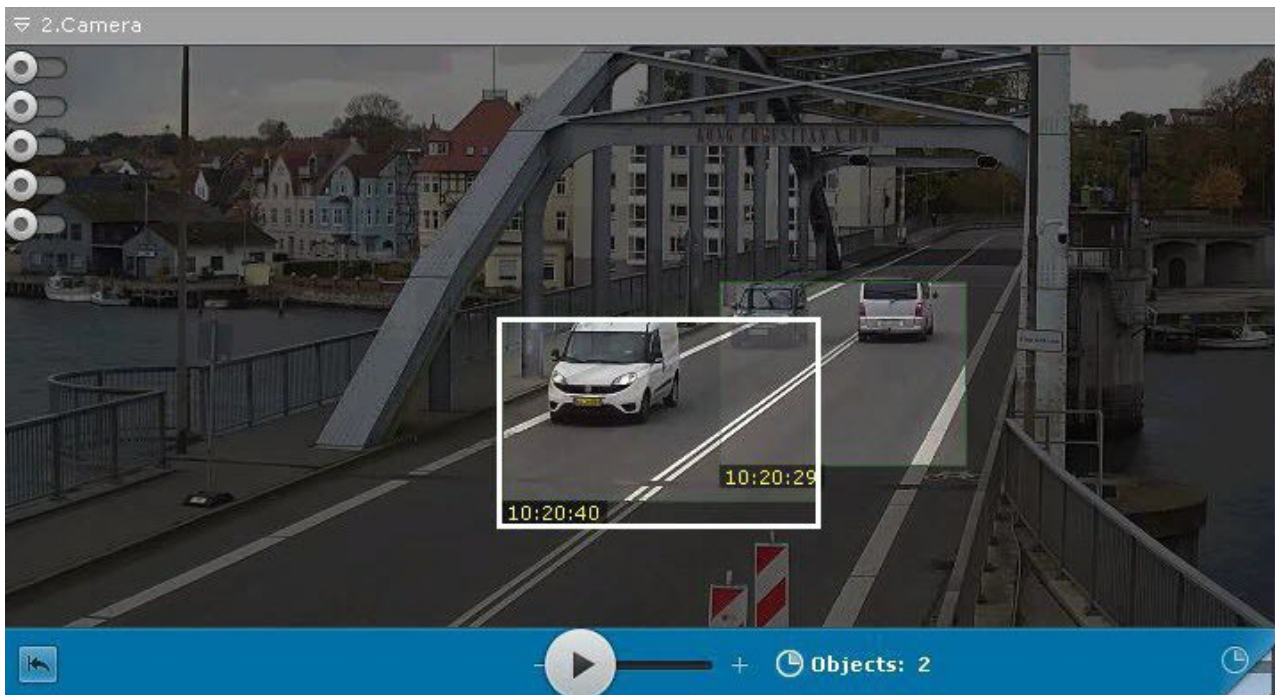


To stop or start playback, use the  and  buttons on the playback panel or the identical buttons on the advanced navigation panel.

To start archive playback in Timelapse Compressor mode starting at the beginning of the selected interval, click the  button (2).

Switching back to the original recording of an object


To leave Timelapse Compressor mode to go back to the original recording of an object, left-click the object.



The system will now automatically switch back to the original recording of the object in standard archive playback mode. Playback of the recording will be paused, and the beginning of the recording will correspond to the moment at which the object was selected.

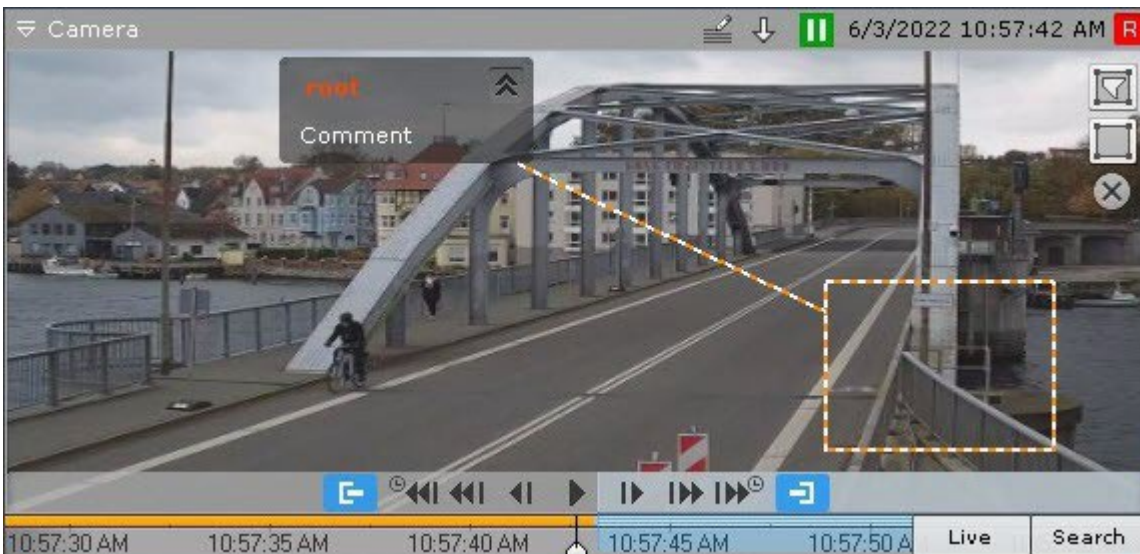
The period during which the objects remains in the camera's field of view is displayed in the viewing tile.

Note

Once you have switched back to the original recording of the object, you can return to Timelapse Compressor mode to the place where the switch was made. To do this, click the  tab. In this case, playback in Timelapse Compressor mode will be paused.

Viewing recorded video with operator comments

Operator comments are displayed when recorded video is played back in a viewing tile.




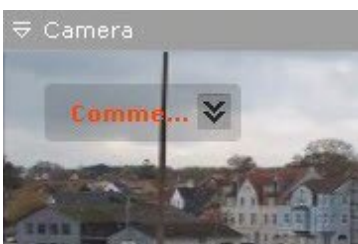
Comment text begins display five seconds before the frame for which the comment was added (before the first frame, if the comment was set for an interval), with gradual outlining of the area (or point) that was specified when adding the comment.


When the commented frame is shown or during the commented interval, the area (or point) is also highlighted,



Five seconds after the commented frame (after the end of the interval, if the comment was for an interval), the comment is hidden.

To minimize comments and the displayed area, if any was specified, click the  button.



To return to the full comment, click the  button.

Viewing External Archives

External Archive is time-referenced video footage (see [Importing video to Arkiv](#)(see page 507)).







If you go to Archive mode, the timeline shows available video recordings. If there is no time overlapping for video recordings, the space between them is blank.

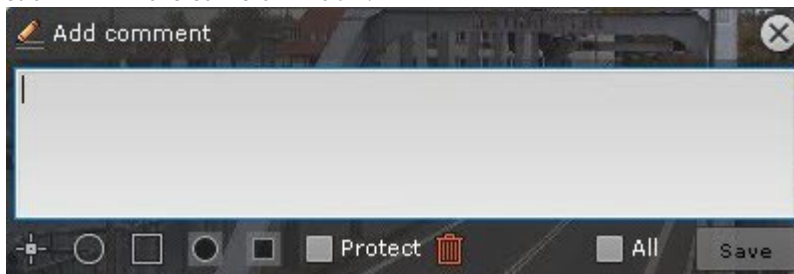
If video recordings overlap, they are displayed as one track that spans from the beginning of the first video clip to the end of the second.


If you want to watch this track, both video clips are played sequentially and in full.

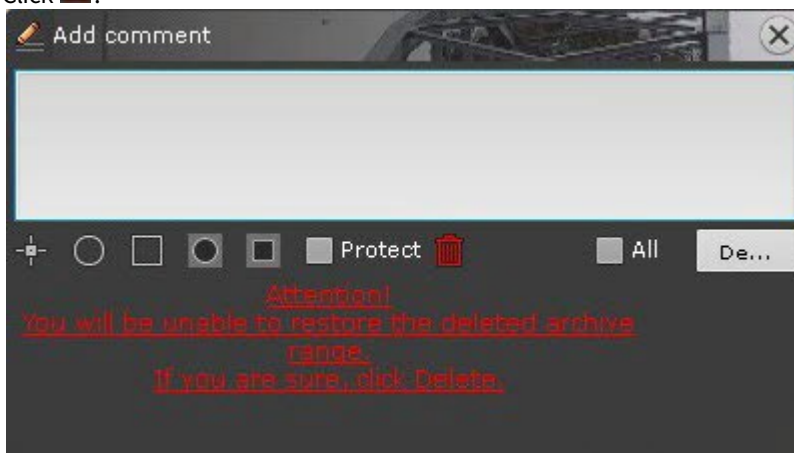
Delete a part of an archive

You can delete an arbitrary part of an archive. To do this:

1. Set the time interval for the footage to be deleted from the archive:
 - a. on the main timeline, set the indicator to the beginning of the interval, click the  button, then set the indicator to the end of the interval and click  again; as an alternative, you can right-drag the mouse over the required interval. To delete the interval, click  ;
 - b. on the additional navigation panel, you can set the time interval the same way using the   buttons. You cannot set the interval with the mouse on the additional panel.
2. Click  in the Camera window.



3. To delete footage within the specified time interval for all cameras within the archive, check the **All** box .
4. Click .



- Click the **Delete** button to confirm the deletion.

Attention!

You cannot recover deleted footage.

Attention!

If several archives were selected for viewing (see [Viewing a combined Archive](#)(see page 670)), the footage will be deleted from all of them.

After the deletion is complete, the remaining footage may contain some artifacts near the cut points.

Navigating in the Archive

You can navigate in the archive using the following interface elements:

- Timeline.
- Advanced navigation panel.
- Events list.
- Playback panel.
- Time indicator.

You can also navigate through the archive by easily flipping through recordings.

Navigating Using the Timeline

Note

Use of the timeline is described in detail in the section [The Timeline](#)(see page 606).

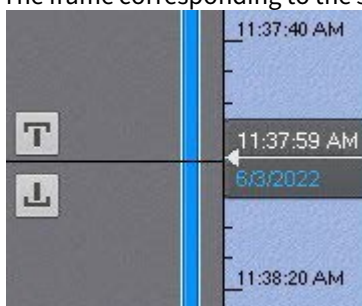
You can select recordings in the archive for playback in a viewing tile by using the timeline, in one of two ways:

- Left-click the indicator and drag it to the corresponding position on the timeline. Alternatively, you can left-click the left portion of the timeline.

Note

The position on the timeline is a graphical representation of a specific moment in time.

The frame corresponding to the selected position (moment in time) will then be displayed in the viewing tile.



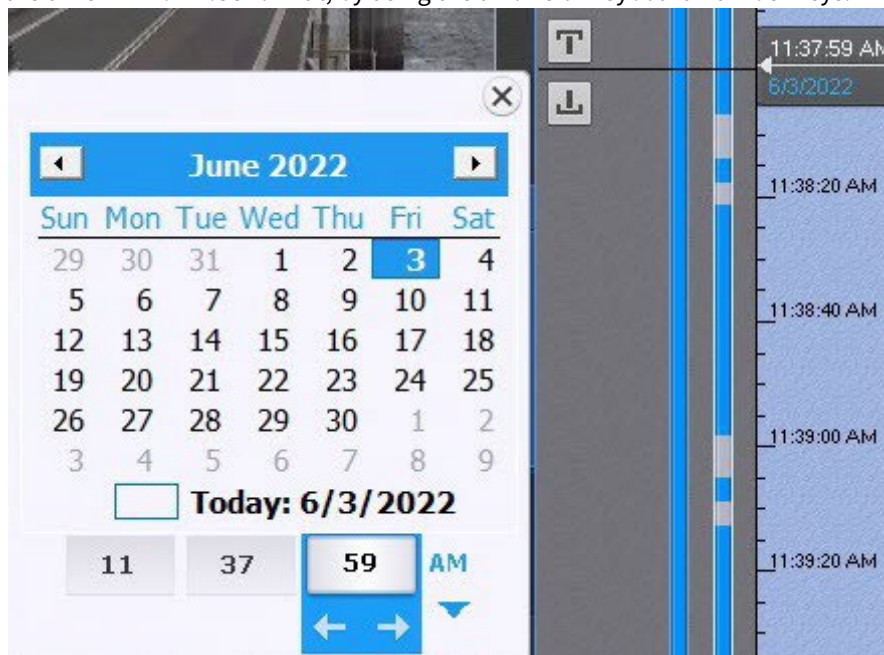
Attention!

If the system clock is shifted back one hour (for example, in winter saving), the videos from the lost hour will disappear from the timeline but remain accessible.

For example, at 3 PM the clock is shifted back one hour. If you place the timeline marker anywhere after 02:00:00, videos shot after the shift will be played back.

If you set the marker to 01:59:59 or earlier, videos shot from 01:59:59 to 02:59:59 (time stamped before the shift) will be played back.

2. Click the indicator. The calendar opens. Select the date to which you want to jump in the archive and specify the time in HH:MM:SS format, by using the arrows or keyboard number keys.



Note

The Tab key can be used to navigate across various elements of the Calendar.

You are then taken to the specified point in the archive.

If one video camera is in archive mode and you move the indicator to a point for which there is no video, the indicator will automatically go to the video for the closest point in time. If two or more video cameras are in archive mode, you will not be taken to the video for the closest point in time; the message **No archive** will be shown on screen.

To play back the selected recording, use the playback panel (see the section titled [Navigating Using the Playback Panel](#)(see page 681)).

Navigation using the advanced panel

You can use the advanced navigation panel to select recordings in the archive for playback in the viewing tile. To do this, complete one of the following two actions:

1. Left-click the timeline and hold down the button while dragging the scale to the desired position.
2. Left-click the desired moment in time on the timeline.

3. Left-click and hold the desired moment in time on the timeline.





When you left-click and hold left the mouse button and the timeline is moved, you can view the corresponding recording in fast forward. The further left you click, the faster is the playback speed.

Note







The current moment in time is determined by the cursor located in the center of the timeline. The position of the cursor relative to the timeline never changes.





Once the selected moment is reached, playback stops. The speed of playback depends on the speed of the timeline’s movement.




To start archive playback click  in the middle of the timeline. To pause playback, click the  button or left-click the timeline.

To control playback, use the playback panel (see the section titled [Navigating Using the Playback Panel](#)(see page 681)) or the advanced navigation panel.

Playback		Pause	
Item	Description	Item	Description
	Decreases playback speed by one level		Go to the preceding frame
	Increases playback speed by one level		Go to the next frame
	Go to the previous recording		Go to the previous recording

Playback		Pause	
	Go to the next recording		Go to the next recording
	Jump back by N* seconds		Jump forward by N* seconds
*see Navigation using the advanced panel (see page 679).			

Attention!

Click and hold the  button to jump to the end of the archive.

Navigating Using the Events list

The Events List and the timeline are dynamically linked: when you select an event in the list, the timeline indicator automatically jumps to the selected position.



For details, see the section titled [Events List](#)(see page 608).

Navigating using the Playback Panel

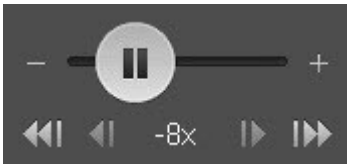
To navigate in the archive using the playback panel, you must first select a recording for playback.

Once a recording is selected, the following operations are accessible:

1. Play recording: .
2. Pause/Stop playback: .
3. Go to the preceding frame .
4. Go to the next frame .
5. Go to the previous recording .
6. Go to the next recording .



You can fast-forward/fast-rewind and change playback direction (forward/back).



Fast-rewind playback:



Slow playback:



For reverse playback of a recording, move the slider to the left of the position corresponding to zero playback speed (the center of the slider); for forward playback, move it to the right. The current playback speed is displayed under the slider. During forward playback of a recording, a  sign appears before the speed; during reverse playback, a  sign appears. The value **0x** corresponds to zero speed, i.e., no playback; the value **1x** corresponds to the frame rate of recording.

To speed up playback by one step, click . To slow down by one step, click . To temporarily change the playback speed, move the slider in the desired direction.

To slow playback N-fold, do as follows:

1. Accelerate playback N-fold.
2. Click the value of the current playback speed below the slider.

This slows the playback N-fold. To return to the fast playback, click the current speed again.

If one camera is in the Archive mode, you can fast forward/backward up to 128 x. If several cameras are in the Archive mode, then you can speed up and slow down playback up to 32 x.

Navigation via the time indicator

The time indicator in a viewing tile can be used to set the time of the current day on the timeline to which you want to navigate in the archive.

To do so, left-click the indicator and specify the time in HH:MM:SS format, by using the arrows or keyboard number keys.



You are then taken to the specified point in the archive.

If one video camera is in archive mode and you try to navigate to a point for which there is no video, you will be automatically taken to the video for the closest point in time. If two or more video cameras are in archive mode, you will not be taken to the video for the closest point in time; the message **No archive** will be shown on screen.

Keyboard navigation

You can use keyboard shortcuts to navigate through an archive and control video playback.

Key or key combination	Resultant action during pause	Resultant action during play
Spacebar	Begins playback	Pauses playback
Ctrl+Spacebar	Uses the current position to set the export interval	Uses the current position to set the export interval
Up-Arrow	Increases playback speed by one level	Increases playback speed by one level
Down-Arrow	Decreases playback speed by one level	Decreases playback speed by one level
Left-Arrow	Moves back to the preceding key frame	-
Right-Arrow	Moves forward to the next key frame	-
Page up	Switches to the preceding recording	Switches to the preceding recording
Page down	Switches to the next recording	Switches to the next recording

Displaying the causes of triggered Scene Analytics detection tools

When positioning the archive in the range [-1 sec.; +1 sec.] from when the Scene Analytics detection tool was triggered, the objects that triggered the detection unit will be marked on the video frame.

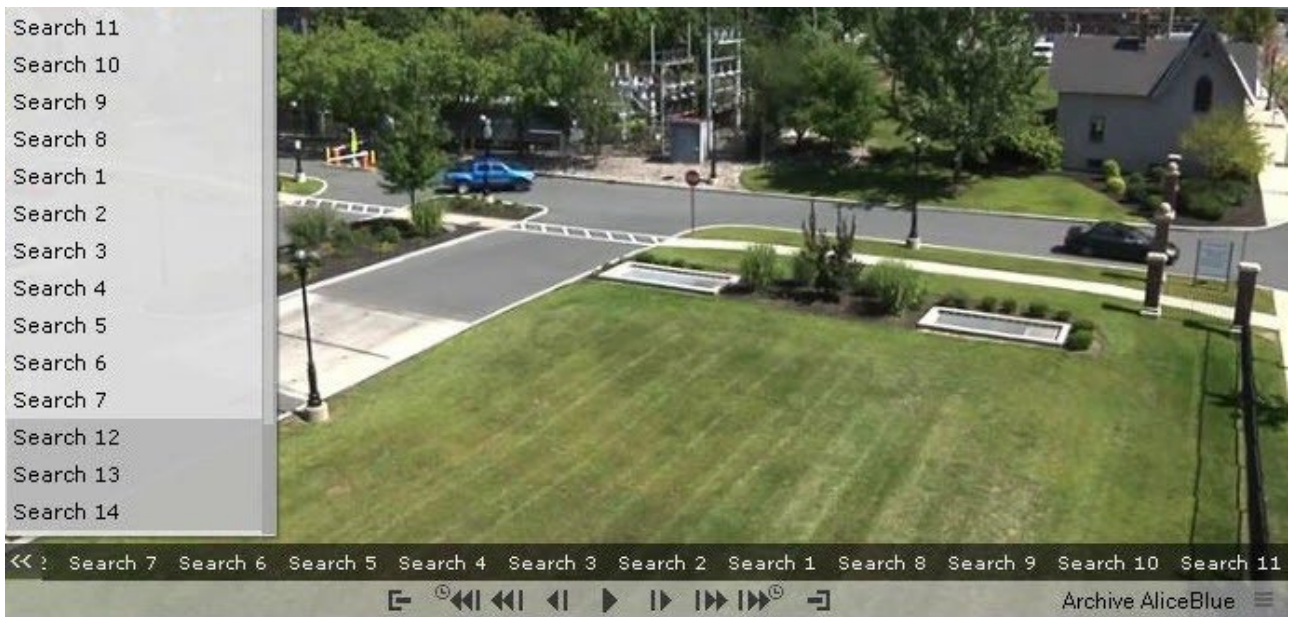


Viewing the results of a saved search query

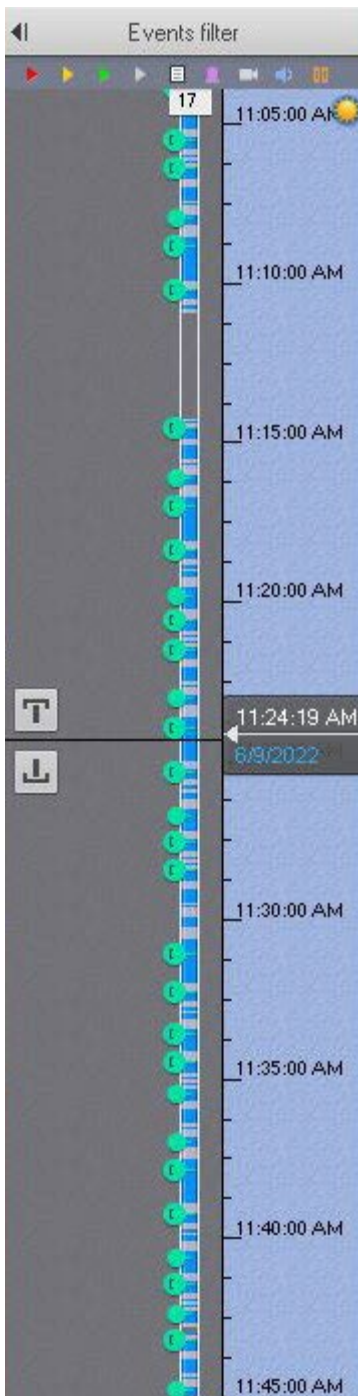
If the system has saved Forensic Search queries for a video camera, tabs for these queries are displayed in the lower-right corner of the corresponding viewing tile.



If not all tabs fit in the viewing tile, a full list of saved Forensic Search queries is available by clicking the <<< button.



Clicking a tab switches to Archive mode, displaying the results of the relevant search on the timeline (the process is similar to viewing search results in Archive Analysis mode).



The standard Archive mode controls are used for navigating between search results (see [Navigating in the Archive](#)(see page 678)).

Note

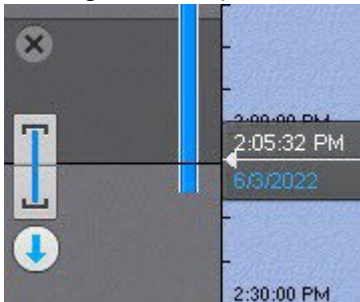
To search in standard archive mode without displaying search results, click the corresponding tab in the viewing tile.


The parameters for the search are displayed when switching from search results to Archive Analysis mode.

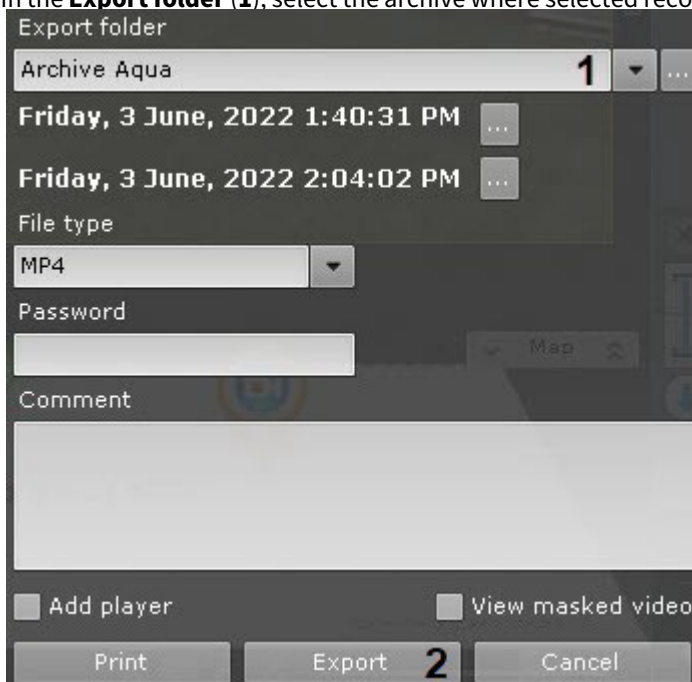
Manual Archive Replication

You can protect selected video recordings from being overwritten. To do this:

1. Create a new archive (see [Creating Archive](#)) and configure on-demand replication for it (see [Configuring data replication](#)(see page 210)).
2. Switch to Archive Mode (see [Switching to Archive Mode](#)(see page 668)).
3. Set the time interval on the timeline (see [Standard video recordings export](#)(see page 778)). Recordings from this range will be copied to the new file.



4. Click the button .
5. In the **Export folder (1)**, select the archive where selected recordings will be copied.



Attention!

You can replicate recorded video only to the "right" end (later point in time) of the archive. It is not possible to overwrite existing data in the archive.

If the selected replication range starts and ends earlier than the starting time of the mirror archive (e.g. you want to copy a hour of video footage from 9 a.m. to 10 a.m., but the mirror archive starts at 11.a.m.), replication will not be possible (the **Export** button is not available).

- Click the **Export** button (2).

Selected recordings have now been copied to the specified file.

Target&Follow Lite in Archive mode

- [Configuring Target&Follow Lite](#)(see page 179)

Attention!

For Target&Follow Lite to work, you must activate object tracking in the viewing tile (see the [Tracking objects](#)(see page 631) section).

Target&Follow Lite in the Archive mode works as follows:

- Left click an object's track to select the object of interest.



- The most probable camera where the object **may have been** captured next is suggested.
- After selecting an object, you are switched to the suggested camera. Camera footage will be played back automatically from the moment when the target object was supposed to appear in the FoV.

Attention!

Target&Follow Lite merely predicts, and therefore cannot guarantee, that the object will appear in front of a given camera.

8.2.5 Video surveillance in Alarm Management mode


Video surveillance functions available in Alarm Management mode

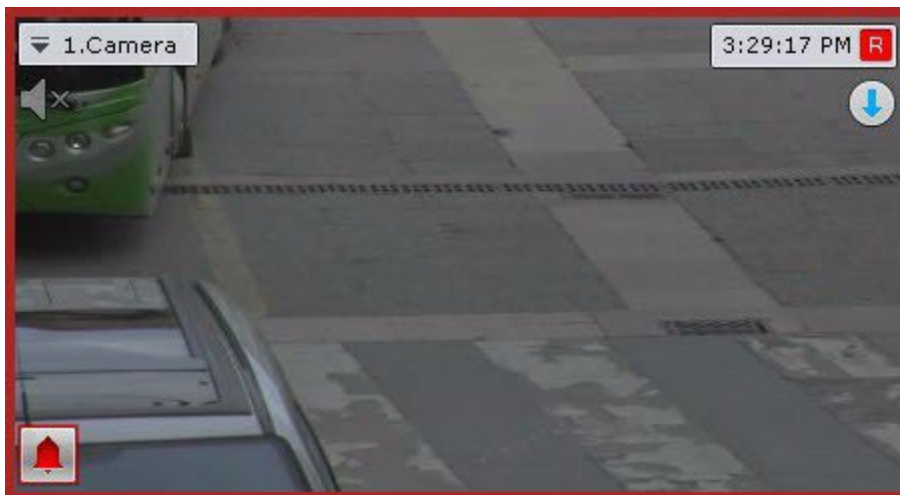
The following video surveillance functions are available in Alarm Management mode:

1. Forwarding and reversing playback of an alarm at various speeds.
2. Evaluating alarms (assigning a status).
3. [Functions Available in All Video Surveillance Modes](#)(see page 621).

Switch to Alarm Management mode

When an alarm is initiated, the system switches to alarm mode automatically at the moment the event is accepted for processing. Operator can escape the Alarm management mode. To return a viewing tile from a different

surveillance mode to Alarm Management mode, in the lower-left corner of the tile, click the  button.



The viewing tile will then appear in **Alarm Management** mode.

If there are multiple alarms for a camera, Alarm Management mode will open to the most recent alarm.

Initiating an Alarm

A system alarm can be initiated in one of two ways:


1. Manually (by an operator).
2. Automatically (when a detection tool is triggered).

Note


You can initiate an alarm only if the specific video camera is linked to the archive.

Manual Initiation

To initiate an alarm manually, you must perform the following steps:

1. In the lower-left corner of the viewing tile, click the  button.



2. The operation will trigger an alarm that appears on Alert panel (see [Alert Panel](#)(see page 614)). To classify an alarm, click the  button again.

Note

When in Alarm Management mode, the user that initiated the alarm will be indicated at the bottom of the viewing tile.



Manual initiation of an alarm is now complete.

Automatic Initiation

Automatic rules or macros can be configured to initiate an alarm (see the section titled [Trigger an alarm](#)(see page 400)).

If an alarm is initiated automatically, the **Alert panel** tab is color-coded .

To evaluate the situation, click the Alert panel tab, select the event and classify it in Alarms Management (see the section titled [Selecting Events for Alarm Management](#)(see page 692)).

Working with Alert Panel



Viewing Alarms in Event Preview

Each alert/alarm event is displayed on Alert panel as follows: each Event Preview tile shows a thumbnail with the first frame of video footage for the relevant event, the playback button, time stamp of the event and camera ID.




When you hover over the Event Preview tile, all information about the alarm pops up.




If you click the  button, the event footage/alarm recording will then be played back in Event Preview in a repeating cycle. To stop playback, click the  button.

On the Alert panel, click on the alarm event video window to play back the event video in the camera window.


If the  button is activated on the Alert panel, the alarm video will appear in a temporary layout containing just the current camera.

If the button is inactive, the video playback will start in the regular layout.

Outlining Objects that Triggered Detection

In the Event Preview tile, you can outline objects that triggered detection/an alarm. To do so, click the  button.

The object is outlined only if the alarm was initiated by detection tools.

To undo object outlining, click the  button again.

Selecting Events for Alarm Management

When you click the Event Preview tile, a layout opens that has the relevant camera's view. The layout is selected automatically with the following algorithm:

1. The system searches for layouts that contain the alarmed camera. The user must have permissions to view it.
2. The system chooses the layout with the minimum number of cells to display the selected video camera.
3. If the required layout does not yet exist, the system creates a new layout with a single video camera.
4. The system switches to the selected layout.
5. The video camera becomes active in the selected layout. The viewing tile is expanded by one level. It switches to the Alarm Management mode (if you have selected an active alarm) or to the Archive mode (if you have selected a processed/classified alarm or missed/unclassified).

Working with the Alarm Management window

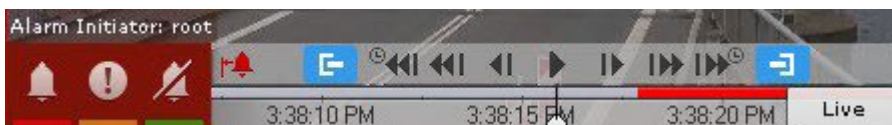
Alarm Handling Tile Interface Elements

The alarm handling tile is a viewing tile which, besides the standard interface elements (context menu, time indicator, etc.), also contains elements for alarm playback and evaluation:

1. Playback panel.
2. Timeline.
3. A button for quick positioning of the timeline indicator in the position corresponding to the beginning of the alarm.

Alarm Playback

As soon as an alarm is accepted for evaluation, the alarm recording is played back automatically one time, at 1X speed. Playback is launched either from the moment of the beginning of the alarm, or from the moment corresponding to the position of the alarm flag (only when the alarm is initiated automatically; see the section [Trigger an alarm](#)(see page 400)).



If the alarm was initiated automatically, the visual element set for the detection tool which initiated the alarm will be displayed in the viewing tile: or a detection area or virtual tripwire, which triggers the detection tool when it is crossed. The object which caused the trigger will be outlined with a red frame.

Display of an **Area** visual element:




Display of a **Line** visual element:



The name of the detection unit that initiated the alarm is displayed in the lower portion of the viewing tile.

To navigate the fragment of an alarm event, use the Advanced archive navigation panel (see [Navigation using the advanced panel](#)(see page 679)) or the Playback panel (see [Navigating using the Playback Panel](#)(see page 682)).

To switch to a required fragment of an alarm event in order to play it again, hold the timeline pointer with the left mouse button and drag it to the required position.

To go to the beginning of the alarm event, click .




Processing an Alarm

To process an alarm, use the group of colored buttons in the lower left-hand corner of the Alarm Management tile. After processing of the alarm, the viewing tile on the given client automatically switches to Live Video mode. The alarm is no longer in the **Alarms** tab.

❑ Attention!

In the case of multi-user event processing, only the first operator to switch to alarm mode may process the alarm (if he or she has the appropriate permissions). For the rest of the operators, the Alarm Management buttons are not displayed.



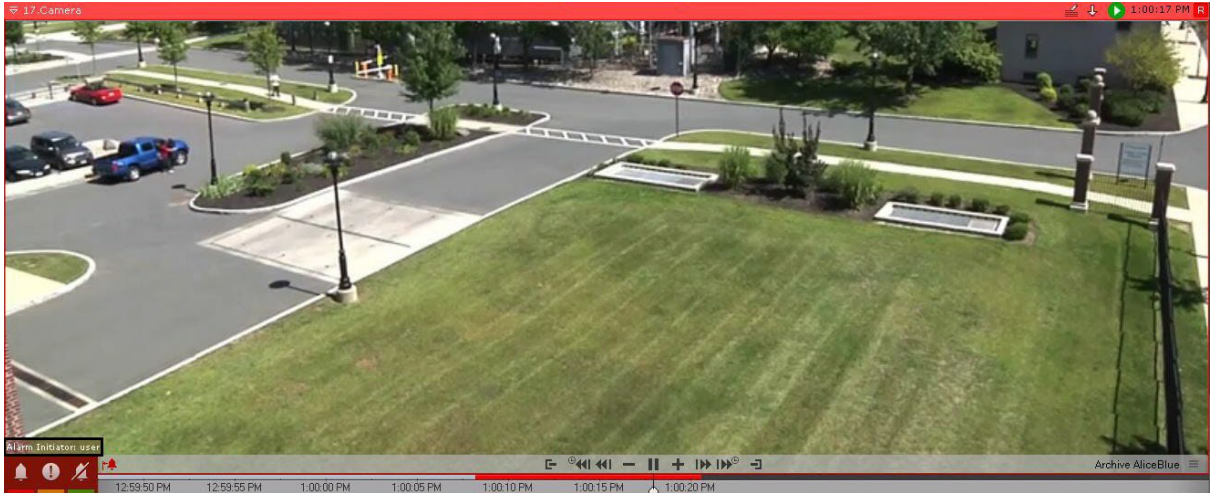
Button	Executed function
	Confirmed alarm
	Suspicious alarm
	False alarm

Limitations when working with alarm events in case of multi-user processing

In the case of multi-user processing, only one operator may accept an alarm for processing. Other operators may switch to alarm mode with limited functions for the purpose of playing back the alarm. This can be done in one of two ways:

1. Click the  button (see the section [Video surveillance in Alarm Management mode](#)(see page 689)).

- Switch to the **Alarms** tab and select the alarm from the alarms list.



In Alarm Management mode with limited functions, the Alarm Management buttons are not displayed. Instead, the name of the operator who is currently processing the alarm is displayed. The other functions of the alarm handling tile remain unchanged.

After processing of the alarm on another client, on the given client the status assigned to the alarm is displayed in place of the name of the operator.

If a user has accepted an alarm for processing and leaves Alarm Management mode (going to Live Video mode, Archive or Archive Search mode, the viewing tile for another camera, etc.), after an amount of time equal to the operator's idle time after leaving, other users will also have the opportunity to accept the alarm for processing.

If more than one alarm appears for one camera, any operator may access all alarms not yet accepted for processing.

8.2.6 Video surveillance in Archive Search mode

Switching to Archive Search mode

To switch the Camera Window from a different surveillance mode to the Archive Search mode, click the **Search** tab in the lower-right corner.

Note

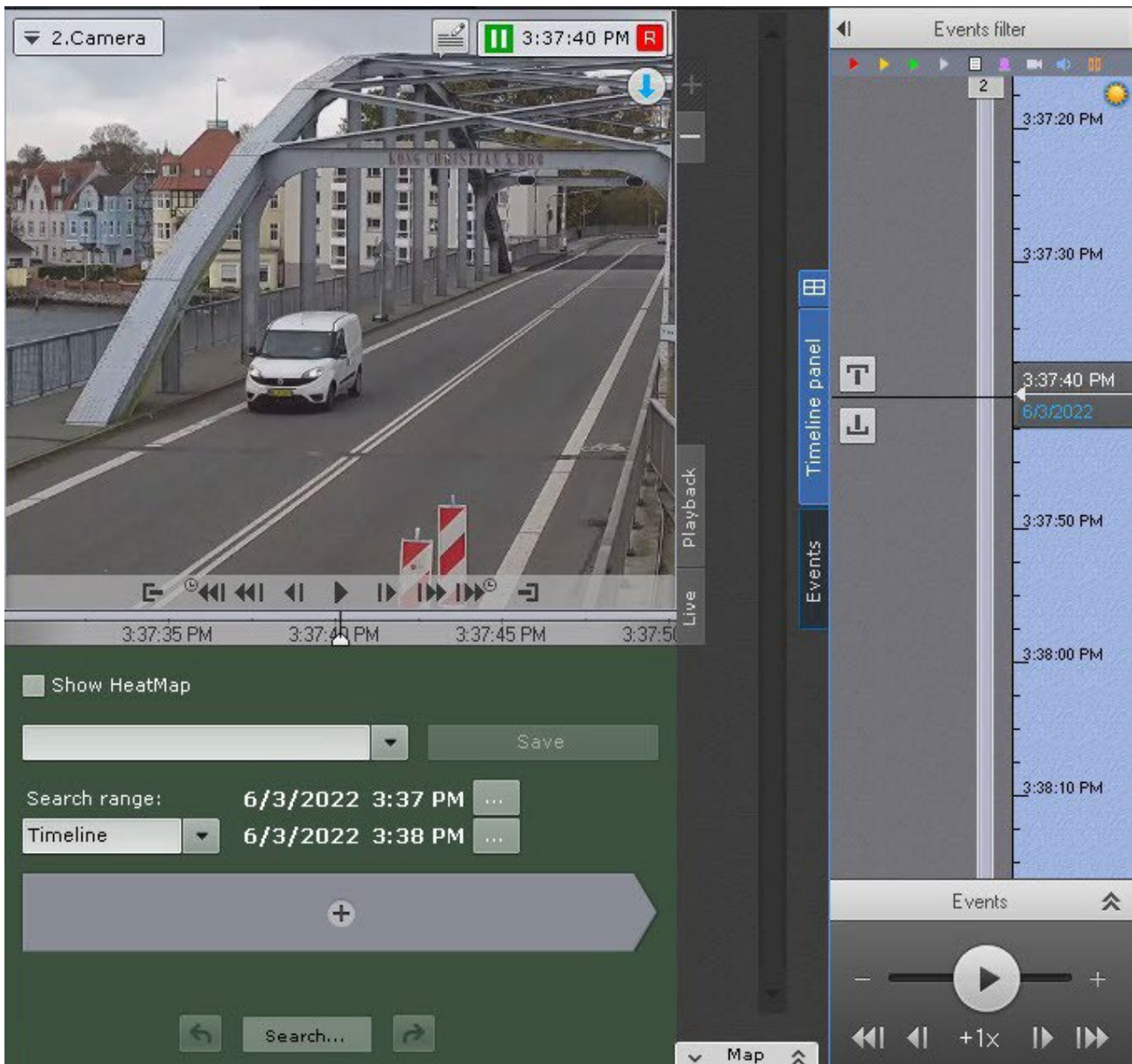
If the video camera is not linked to a video archive, this tab will be unavailable.

Note

In Live Video mode, if the viewing tile is not active, the tabs for switching to other modes are not displayed. To display the tabs, click the viewing tile by using either button of the mouse.



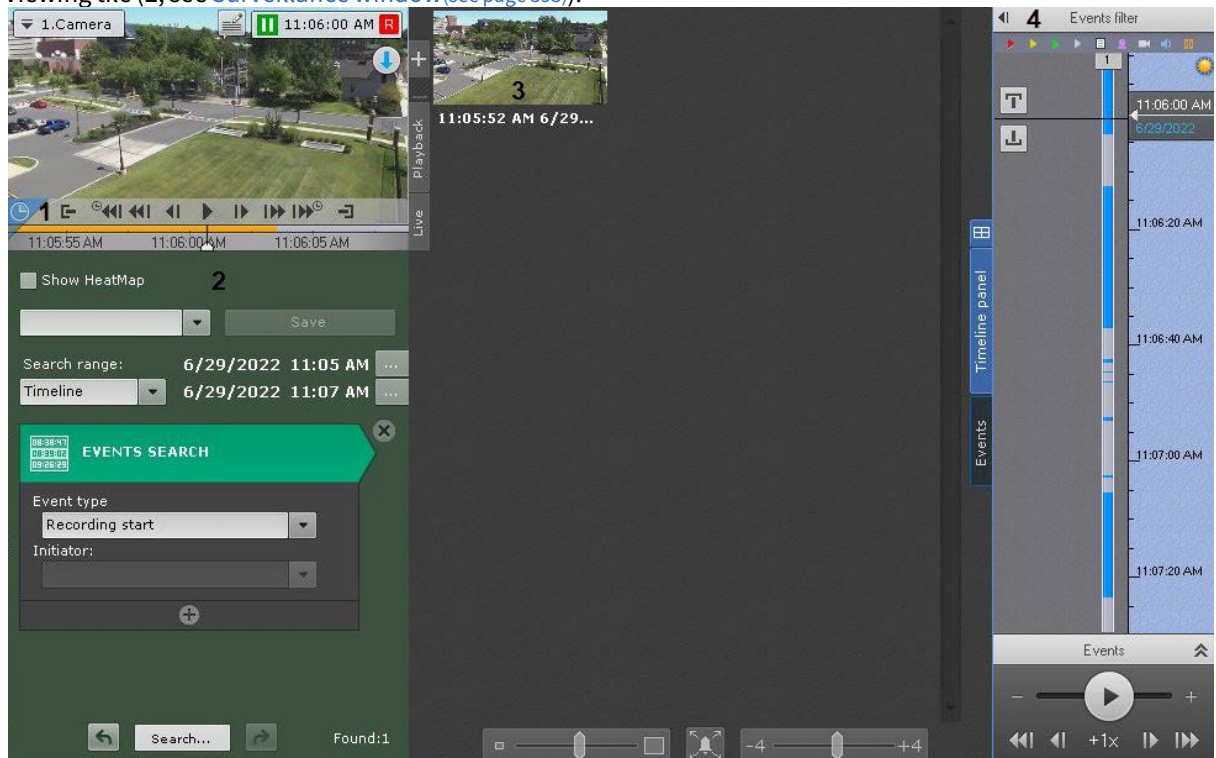
The archive analysis interface will then appear.




Archive Search mode interface

The visual layout of Archive Search mode is divided into the following 4 components:


1. Viewing tile (1, see [Surveillance window](#)(see page 593)).



2. Search control panel (2, see [Search in an archive of a single video camera](#)(see page 700)).
3. Search results panel (3, see [Viewing search results](#)(see page 722)).
4. Archive navigation panel (4, see [The Archive Navigation Panel](#)(see page 602)).

You can hide search parameters for a portrait-oriented camera. To do so, click the  button.



To unhide, press the  button.

Video surveillance functions available in Archive Search mode

In Archive Search mode, the following video surveillance functions are available:

1. Selecting an archive for video recording analysis.
2. Autozoom.
3. Navigating through the archive.
4. Display of the causes of triggered Scene Analytics detection tools.
5. Viewing recorded video with operator comments.
6. Events search.
7. Forensic search.
8. Time search.
9. Searching comments.
10. Switching between search results.
11. Playing back fragments retrieved by searches of specific moments in time.
12. Zooming in on objects that trigger detection tools.
13. [Functions Available in All Video Surveillance Modes](#)(see page 621).

Note

The functions for navigating through an archive, displaying the causes of Scene Analytics detection tool triggering, and **Archive Selection** were inherited from archive mode; their descriptions are [Video surveillance in archive mode](#)(see page 668). The Autozoom function is described in the [Real-time video surveillance](#)(see page 642) section.

Search in an archive of a single video camera

Selecting the search type

To start a search, click **+** and choose the search type.

Thumbnail Search	
Events Search	
Motion in area	Metadata search
Loitering	Metadata search
Multiple objects	Metadata search
Move from area to area	Metadata search
Comments Search	
Search by titles	
Search by LPs	
Face Search	

Note

The current *Arkiv* suite release supports only search of a single type at one time.

Note

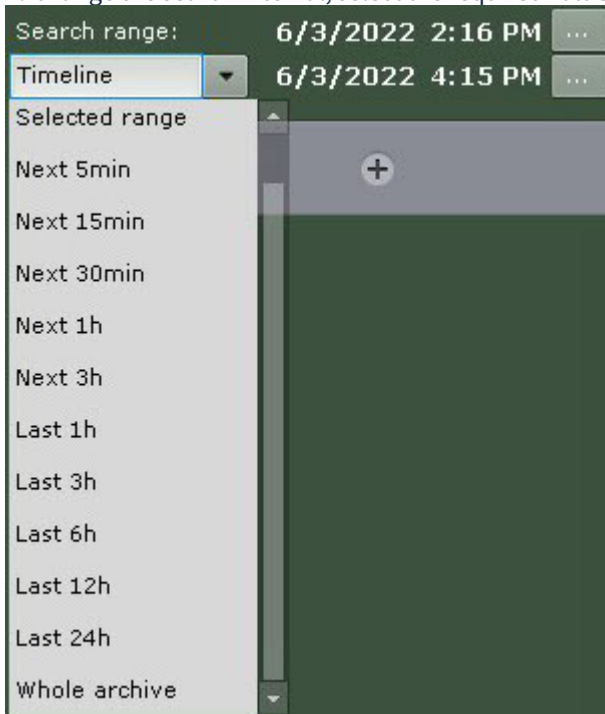
In the on-board storage of the camera, you can only find video episodes with thumbnail search (TimeSlice).





Setting a search interval

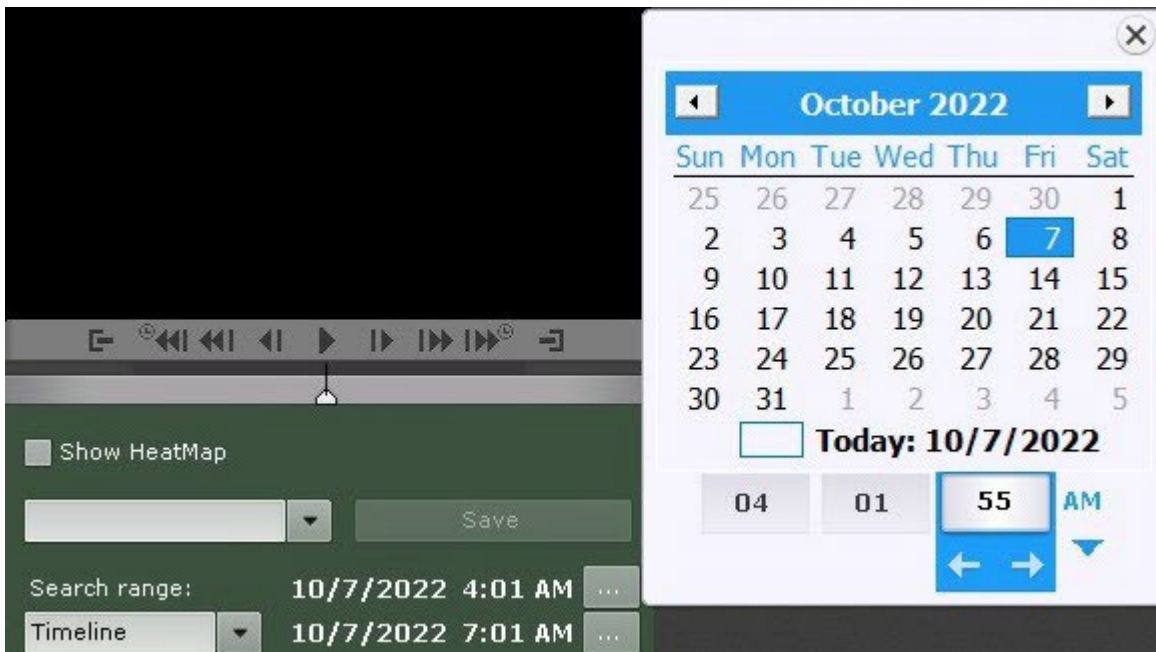
Setting a search interval is a common procedure for all types of the archive search.

By default, the search spans across the part of the archive that is displayed on the timeline (see [Navigating Using the Timeline](#)(see page 678)).

To change the search interval, select the required value from the **Search range** drop-down list.



Search range	Description
Timeline	The search spans across the part of the archive that is displayed on the timeline. The interval can also be set manually with the upper and bottom buttons  .
Selected range	The search will be performed within the interval currently selected on the timeline. You can set the interval using the  and  buttons.
Next 5min/15min/30min/1h/3h	The search will be performed within the following interval [specified start of the interval; specified start of the interval + 5min/15min/30min/1h/3h]. To set the beginning of the interval, click the  button.
Last 1h/3h/6h/12h/24h	The search will be performed within the last hour (or 3, 6, 12, 24 hours) of the archive.
Whole archive	The search will be performed across the entire archive.

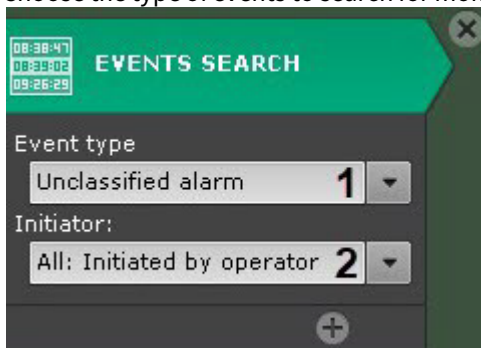


Events search

This type of search lets you select events in the archive based on the type of event.

To do this, complete the following steps:

1. Choose the type of events to search for moments (1).



Event	Description
All alarms	The search finds moments in the archive containing all types of alarms
Non-critical alarm	The search finds moments in the archive containing non-critical alarms
Critical alarm	The search finds moments in the archive containing critical alarms

Event	Description
Unclassified alarm	The search finds moments in the archive containing unclassified alarms
False alarm	The search finds moments in the archive containing false alarms
Triggering	The search finds moments when detection units were triggered
Recording start	The search finds the beginning and end of recordings from the specified video camera regardless of the initiator

2. Select an event initiator from a list with the same name (2).

Note

An event initiator could be an operator, a video camera input, or any detection unit that is activated in the system. The search results will show the moments in time containing the events that were triggered by the initiator.

To search for face recognition and ANPR events, select **Realtime recognition**.

3. If necessary, click **+** and add more similar search conditions.
4. Set the search interval (see [Setting a search interval](#)(see page 700)).
5. Click the **Search** button.

Note

Once launched, the search can be stopped at any time. To do this, click the **Stop** button which appears instead of the **Search** button.

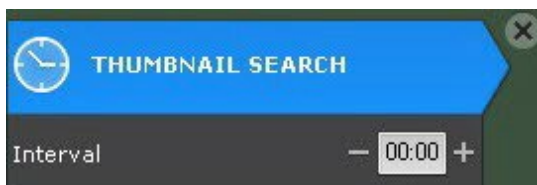
This starts a search in the archive based on the defined criteria. Search results are available on the search results panel.

Note

To zoom objects that caused an alarm or triggered a detection unit, select the **Expand alarm object** check box in the lower portion of the search results panel.

Time search for video fragments (TimeSlice)

The search of fragments by time is meant for quick search of moment of interest by dividing a selected time period into equally sized fragments.



Search by time is performed using the following algorithm:

1. [Setting a search interval](#) (see page 700).
2. In the **Interval** field, specify the duration of the video episodes in the MM:SS format:
 - a. If you do not specify the duration (00:00), TimeSlice (Thumbnail Search) splits video footage from the selected time interval into 12 equal episodes.
 - b. If you set the duration other than 0, TimeSlice splits the selected time interval into video clips of the specified duration. The number of slices depends on the specified parameters.

Note

It's recommended to set the interval value to no less than 10 seconds.

3. Start the first search iteration (click the **Search** button).

Note

Once launched, the search can be stopped at any time. To do this, click the **Stop** button which appears instead of the **Search** button.

The search results panel displays frames that match moments in time that are equally spaced from each other; the search control panel shows the number of fragments found.



4. If the specific moment is not found, then start the second search iteration: double-clicking on the found moment triggers the search in the time interval from this moment to the next one.
5. Keep searching until the specific moment is found.

Note

Information on playback of video fragments is provided in the section titled [Playback of video fragments](#)(see page 725).

Searching comments

Comments search allows filtering for comments that contain certain text.

To search comments:

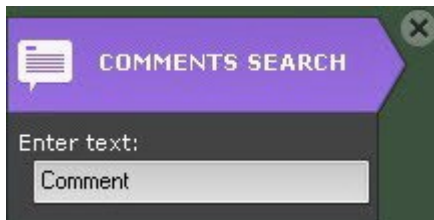
1. Set the search interval (see [Setting a search interval](#)(see page 700)).
2. Enter the text that you want to find in comments.

Attention

Search is performed for the entire string of entered text, not for separate words.

Note

If no text is specified, all comments for the selected interval are found.



3. Click the **Search** button.

Note

Once launched, the search can be stopped at any time. To do this, click the **Stop** button which appears instead of the **Search** button.

This starts a search for video fragments based on the defined criteria. The search results pane displays frames for which there are comments containing the search text. The relevant comment is displayed under each frame.



Note

If the comment was left for an interval, the first frame of the interval is displayed.

Forensic Search for Fragments (Post-Analytics)

Forensic Search lets you search for moments in the archive using the following criteria:

1. Motion in Area.
2. Loitering of an object in a specific area.
3. Simultaneous presence of a large number of objects in a specific area.
4. Crossing of a virtual line by an object's trajectory.
5. Motion from one area to another.

Motion in Area


To perform forensic search for motion in area:

1. In the Viewing Tile, define the area to be analyzed during search in accordance with the selected condition. The nodes of an area are connected by a two-colored dotted line. By default, an area is defined by 4 nodes with the coordinates (30%, 30%), (70%, 30%), (70%, 70%) and (30%, 70%) as percentages of the width and height of the frame, respectively.

The screenshot displays the Arkiv software interface. At the top, a video player shows a camera feed labeled '17.Camera' with a timestamp of 1:15:57 PM. The video frame shows an outdoor scene with a road, a blue car, and a grassy area. A red and white dotted line defines a search area. Below the video player is a timeline with timestamps from 1:15:45 PM to 1:16:10 PM. A control bar includes a 'Show HeatMap' checkbox, a search range input, and a 'Save' button. The search range is set to 6/9/2022 12:37 PM. The timeline is set to 6/9/2022 1:16 PM. A green banner at the bottom indicates 'MOTION IN AREA' with a 'Metadata search' button. The metadata source is set to 'Object tracker'.

To edit an area, use the following actions.

Action	Result
Right-click on a line	Creates a new area node
Right-click on a created node	Deletes the area node
Position the cursor on a node and hold down the left mouse button while you move the mouse	Moves the area node

2. Select the metadata source if there are several for this video camera. This parameter will not be displayed if there is only one source.
3. Specify any number of additional parameters by clicking , if necessary (see [Configure the search parameters](#)(see page 711)).
4. Set the search interval (see [Setting a search interval](#)(see page 700)).
5. Click the **Search** button.

Note

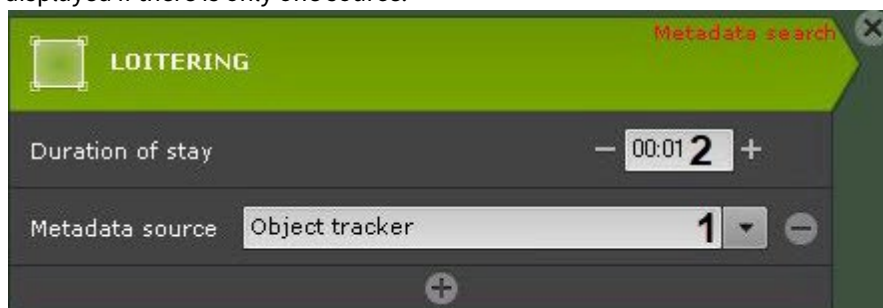
Once launched, the search can be stopped at any time. To do this, click the **Stop** button which appears instead of the **Search** button.


The found moments will be displayed in the search results panel.

Loitering of an object in a specific area

To search for moments of an object loitering in an area:

1. In the Viewing Tile, define the area to be analyzed during search in accordance with the selected condition (see [Motion in Area](#)(see page 706)).
2. Select the metadata source if there are several for this video camera (**1**). This parameter will not be displayed if there is only one source.



3. Set the minimum duration of stay in the area (**2**, in seconds and minutes). Search results contain recorded video in which the object is present in the area for longer than the indicated time.
4. Specify any number of additional parameters by clicking , if necessary (see [Configure the search parameters](#)(see page 711)).
5. Set the search interval (see [Setting a search interval](#)(see page 700)).
6. Click the **Search** button.

Note

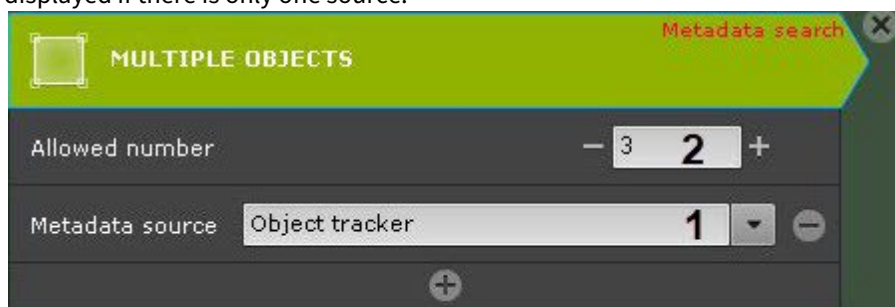
Once launched, the search can be stopped at any time. To do this, click the **Stop** button which appears instead of the **Search** button.



The found moments will be displayed in the search results panel.

Simultaneous presence of a large number of objects in a specific area

To search for moments when objects gather in an area:

1. In the Viewing Tile, define the area to be analyzed during search in accordance with the selected condition (see [Motion in Area](#)(see page 706)).
2. Select the metadata source if there are several for this video camera (**1**). This parameter will not be displayed if there is only one source.



3. Specify the number of objects allowed in the area (**2**). Search results contain recorded video in which the number of objects in the area exceeds the specified number.
4. Specify any number of additional parameters by clicking , if necessary (see [Configure the search parameters](#)(see page 711)). 
5. Set the search interval (see [Setting a search interval](#)(see page 700)).
6. Click the **Search** button.

Note

Once launched, the search can be stopped at any time. To do this, click the **Stop** button which appears instead of the **Search** button.

The found moments will be displayed in the search results panel.

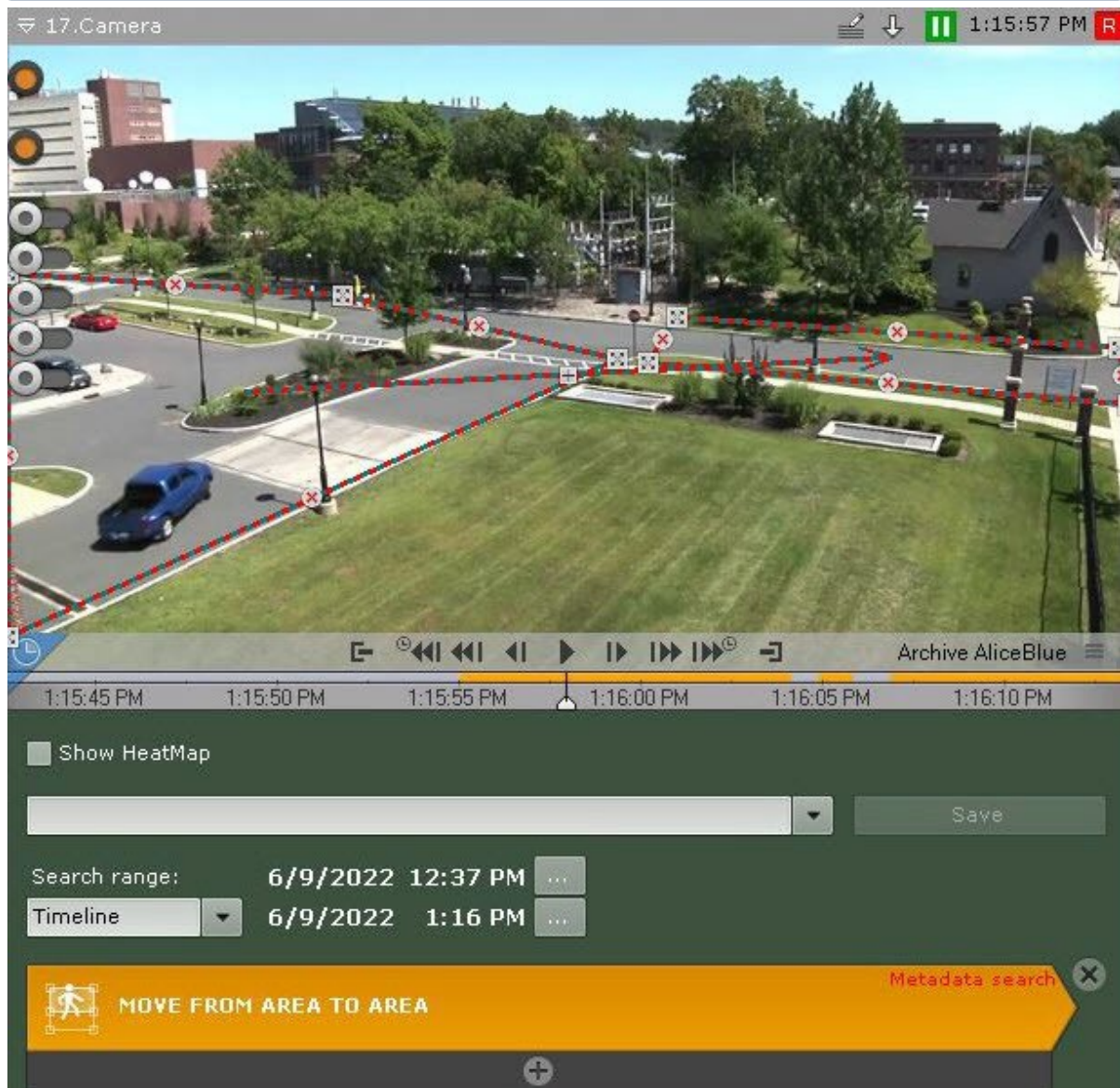
Motion from one area to another

To search for moments when the object moves from one area to another:


1. Set two areas in the Viewing Tile: the area the object moves from and the one it moves to. The nodes of each area are connected by a two-colored dotted line. The direction of motion between the areas is indicated by a dotted arrow. By default, each area is defined by 4 nodes. The nodes of the first area have the coordinates (20%, 40%), (40%, 40%), (40%, 60%), (20%, 60%), and those of the second have the coordinates (60%, 40%), (80%, 40%), (80%, 60%), (60%, 60%) as percentages of the width and height of the frame, respectively.



Note

You can collapse the graphical elements if they block the visual elements and prevent editing them. To hide them, select the **Hide graphical elements** check box.



Area editing operations are described in the [Motion in Area](#) (see page 706) section.

To change the direction of motion between the areas, click the  button on the direction arrow.

2. Select the metadata source if there are several for this video camera. This parameter will not be displayed if there is only one source.
3. Specify any number of additional parameters by clicking , if necessary (see [Configure the search parameters](#) (see page 711)). 
4. Set the search interval (see [Setting a search interval](#) (see page 700)).
5. Click the **Search** button.

Note

Once launched, the search can be stopped at any time. To do this, click the **Stop** button which appears instead of the **Search** button.

The found moments will be displayed in the search results panel.

Crossing of a virtual line by an object's trajectory

To search for moments when the object crosses a virtual line:


1. Set the virtual line to be crossed in the Viewing Tile.

The end points of the line are connected by a two-colored dotted line. The direction of the object's motion across the line is indicated by dotted arrows.

By default, the end points of the line have the coordinates (50%, 30%) and (50%, 70%) as percentages of the width and height of the frame, respectively.



To move the end point of a line, position the cursor on the end point and hold down the left mouse button as you move the mouse.

By default, both directions of motion across the virtual line are taken into account when searching the archive. If you do not need to search in a specific direction, click the  button corresponding to that direction.

Attention!

At least one direction must be selected for the search.

Note

A disregarded direction of object motion is indicated by a dimmed arrow.

2. Select the metadata source if there are several for this video camera. This parameter will not be displayed if there is only one source.
3. Specify any number of additional parameters by clicking, if necessary (see [Configure the search parameters](#)(see page 711)).
4. Set the search interval (see [Setting a search interval](#)(see page 700)).
5. Click the **Search** button.

Note

Once launched, the search can be stopped at any time. To do this, click the **Stop** button which appears instead of the **Search** button.

Configure the search parameters

It is not required to specify parameters, but for more precise results, it is possible to set one or more parameters for each criterion:

The search criteria	Possible parameters
Motion in Area	Direction of movement Maximum and minimum object size Maximum and minimum object speed Object color Object type Entry/exit from area
Loitering in area	Maximum and minimum object size Object color Object type
Many objects in area	Maximum and minimum object size Object color Object type
Object trajectory crossing a virtual line Motion from area to area	Maximum and minimum object size Maximum and minimum object speed Object color Object type

Configuring minimum and maximum object size

The procedures for setting the minimum and maximum size of a moving object are identical.

The minimum (or maximum) size of a moving object can be set using any of the following methods:

Note

The first method lets you roughly configure the size, and the second method allows you to set the size precisely.

1. Position the cursor on a visual element node and hold down the left mouse button while moving the mouse (1).

The screenshot displays the Arkiv software interface. At the top, a video player shows a camera view of a street scene. A red dashed box is drawn over a portion of the video, with a 'max' label at its bottom-left corner and a 'min' label at its bottom-right corner. A red dashed box is also drawn over a smaller portion of the video, with a '1' label at its bottom-left corner. The video player includes a timeline at the bottom with time markers from 1:15:45 PM to 1:16:10 PM. Below the video player, there is a 'Show HeatMap' checkbox, a search range input field, and a 'Save' button. The 'Search range' is set to 6/9/2022 12:37 PM. The 'Timeline' is set to 6/9/2022 1:16 PM. A green banner at the bottom of the interface reads 'MOTION IN AREA' with a 'Metadata search' button. Below the banner, there are two sections for configuring motion detection: 'Maximum size' and 'Minimum size'. Each section has 'W' and 'H' input fields with '+' and '-' buttons. The 'Maximum size' section has W: 21 and H: 25. The 'Minimum size' section has W: 6 and H: 7. A large '2' is placed between the two sections.

2. Set the width and height of an object of the minimum (maximum) size using the arrows in the upper and lower margins, respectively. The dimensions of a visual element in the viewing tile can be changed in a similar manner **(2)**.

The minimum (maximum) size of an object is now set.

Configuring minimum and maximum object speed

In the *Arkiv VMS*, the speed is a relative value computed from parameters of different units. The computing algorithm includes both frame width and height. For more accurate search, we recommend you to perform several search iterations while setting speed values empirically.

The procedures for setting the minimum and maximum speed of a moving object are identical.

The minimum (or maximum) speed of a moving object can be set using any of the following methods:

1. Position the cursor on an end point of the arrow and hold down either mouse button while you move the mouse. The length of the arrow will correspond to the minimum (maximum) displacement of the object per

second (1).

The screenshot displays the Arkiv software interface. At the top, a camera feed shows a street scene with a red dashed line and arrows indicating a tracked object's path. The interface includes a timeline at the bottom with a playhead at 1:16:35 PM, a search range of 6/9/2022 12:40 PM, and a 'MOTION IN AREA' search filter. The 'Maximum speed' is set to 31 and the 'Minimum speed' is set to 12. A red '1' is placed near the tracked object, and a red '2' is placed near the speed input fields.

2. Use the arrows to set the minimum (maximum) speed of the object as percentages of the frame per second (2).

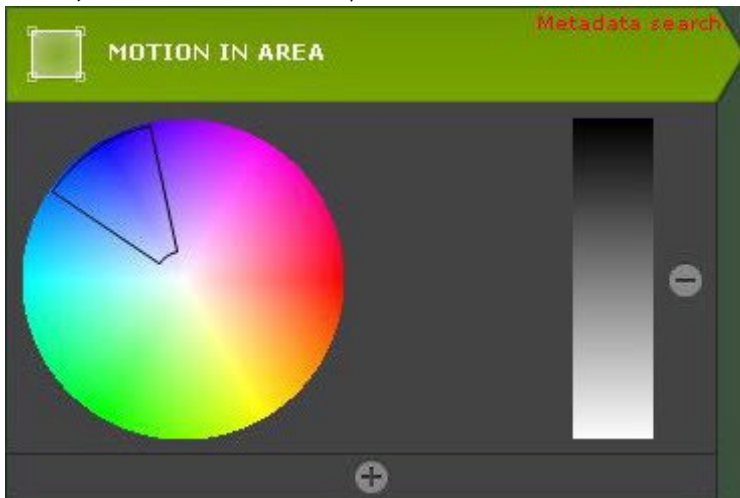
The minimum (maximum) speed of a moving object is now set.

The following objects will be included in the search results:

- If you set only the maximum speed – the objects that move slower, than the maximum speed.
- If only the minimum speed is specified – the objects that move faster than the minimum speed.
- If both the maximum and the minimum speed are specified – the objects whose speed does not exceed the maximum, but is more than the minimum speed.

Configuring object color

The color range is selected using drag-and-drop on the color palette (click and hold any mouse button, move the mouse, then release the button).



Any click on the palette is interpreted as the beginning of a new range; the previous range will disappear.

Attention!

Arkiv uses a logic according to which all objects are monochrome. The color of an object in *Arkiv* is an average of all object colors in the video image. All objects of specified colors will be included in search results.

Attention!

It is not possible to search by color when using metadata from a motion detection (see [Setting up VMD-based Scene Analytics detection tools](#)(see page 264)).

Configuring direction of object movement

By default, when searching the archive, the system searches for motion in all directions. It is possible to prevent searching for motion in one or several specific directions.

Click with either mouse button to designate a direction in which you do not want to perform movement search (privacy mask). The sector corresponding to the direction is then colored gray. If necessary, repeat this action for other directions. To reactivate searches for a masked (gray) direction, click it again with either mouse button.

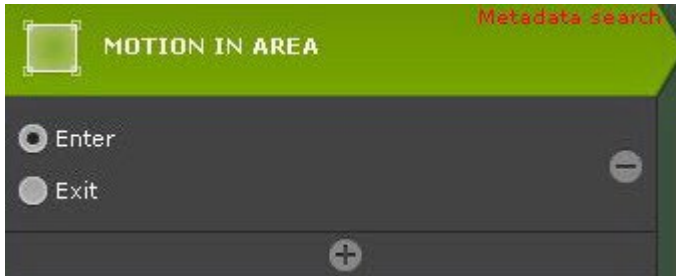


The required directions of an object's movement are now set.

Configuring object entry/exit from area

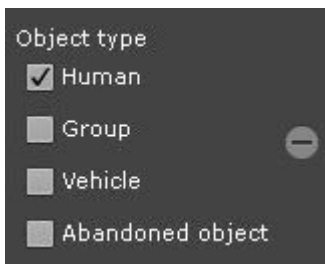
"Entry" occurs when an object enters the field of view and crosses its boundaries; "exit" occurs when an object disappears from the field of view and crosses its boundaries.

To find moments when an object enters an area, select **Enter**, or for moments when an object exits an area, select **Exit**.



Choosing the object type

You can search for moving objects of one or several types: a person, a group of people, a vehicle, or an item left behind. To do this, check the corresponding boxes.



Note

The object type is determined by analyzing its appearance. An item that does not move for some time is considered to be abandoned, e.g. a parked car.

Attention!

You cannot search by object type in VMD-generated metadata (see [Setting up VMD-based Scene Analytics detection tools](#)(see page 264)).

Titles search

Titles search allows you to find the necessary words in the titles DB received from the POS devices.

To search the titles DB, do as follows:

1. Set a time interval for your search (see [Setting a search interval](#)(see page 700)).
2. Enter the text that you want to find in the titles. You can search the whole word or part of it.

Attention!

You should enter at least three characters to make a search. The search is performed for the entire string of entered text, not for separate words.

Note

There is no search by empty string.



3. Click the **Search** button.

Note

After starting the search, it can be stopped at any time. To do this, click the **Stop** button which replaces the **Search** button.

This starts a search for video fragments based on the defined criteria. The search results pane displays frames for which there are titles containing the search text.

Attention!

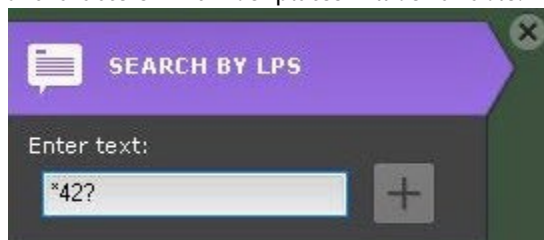
When you search for events, the event time corresponds to the start time of the receipt, rather than the time of occurrence of the search text.

LPR search

With LPR search you can find video footage for the recognized number plates.

To search recorded video for LPR results:

1. Set a time interval for your search (see [Setting a search interval\(see page 700\)](#)).
2. Enter the number plate. Fuzzy search supported if you enter the number with the ? mask for any one character, and the * mask for any number of characters). For example, a search query ?42* will show all vehicles with license plate containing 4 and 2 in the second and third position respectively. The total number of characters in number plates will be variable.



3. Click the **Search** button.

Note

Once launched, the search can be stopped at any time. To do this, click the **Stop** button which appears instead of the **Search** button.

This starts a search for video fragments based on the defined criteria. The search results pane displays frames for which there are number plates containing the search text.

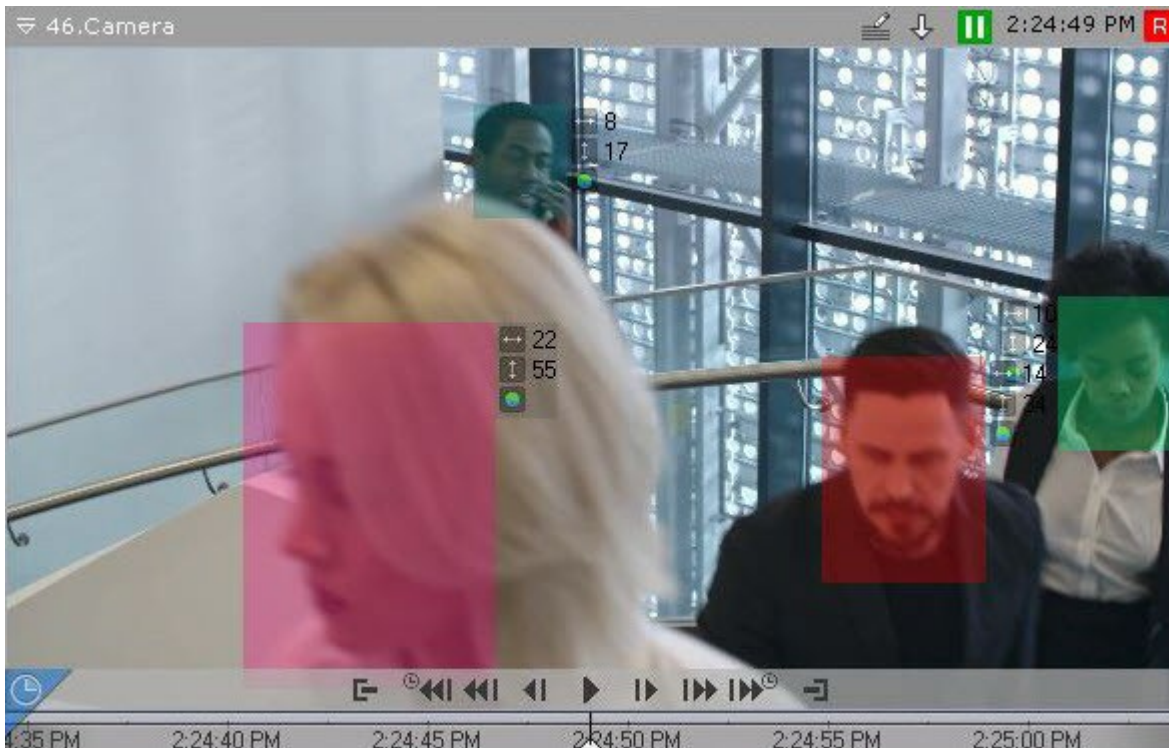
A recognized number plate will be highlighted by a red frame in the Viewing tile.



Face search

Face search allows to find faces similar to a given photo in an archive.

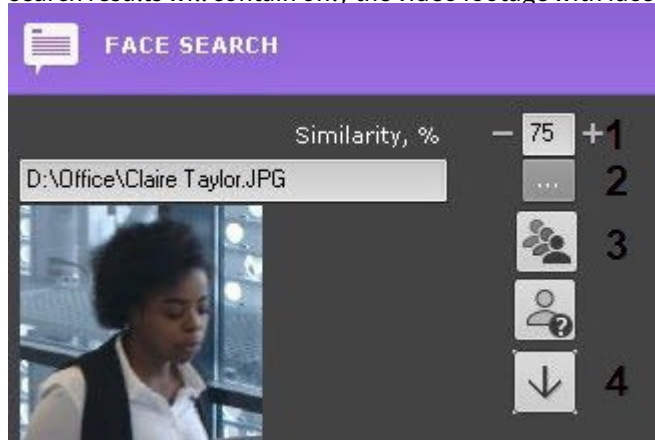
If you perform facial search via the camera window, face track and dimensions are always highlighted.





To perform face search:

1. Set the search interval (see [Setting a search interval\(see page 700\)](#)).

- Set the minimum similarity level (in %) between the face in the photo and faces from the archive (1). The search results will contain only the video footage with faces with similarity levels above the set value.



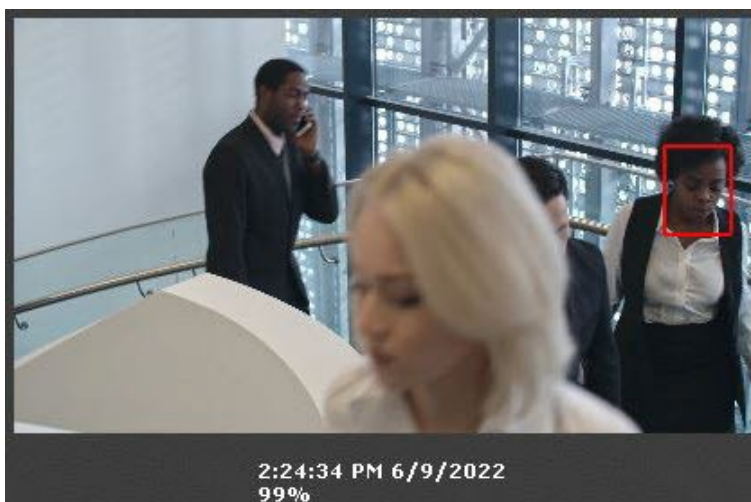
- Select a photo with the face to be searched for in the archive (2). Supported formats: png, jpg, jpeg, jpe. Clicking on a face will select this face as a search parameter. If you do not select a photo, then all faces recognized during the specified time will be displayed.
- Select, how to sort search results:  – by the face match;  – by time (3).
- Click the **Search** button.

Note

Once launched, the search can be stopped at any time. To do this, click the **Stop** button which appears instead of the **Search** button.


This starts a search in the archive based on the defined criteria.

The video frames with faces satisfying search conditions will be displayed in the search results panel. A recognized face will be highlighted with a red frame, and the face similarity level (in %) will be shown below.



To instantly export a facial image from the scene, do the following:

- Click a face track within the camera window.

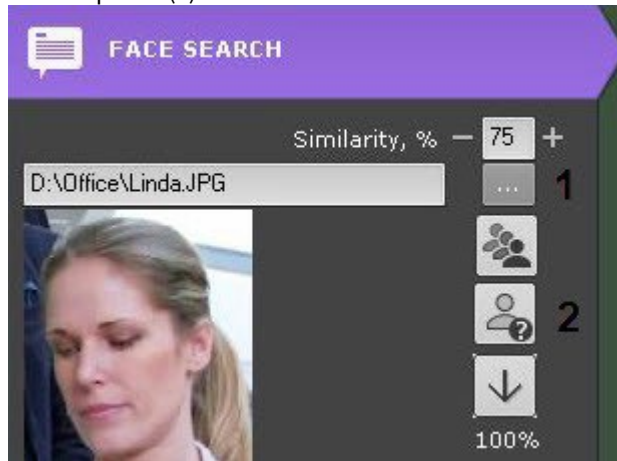
2. Click the button  (4).

The facial image will be saved to a pre-specified folder (see [Configuring export options](#)(see page 545)).

Tell "friend" from "foe" by a picture

To determine the friend-foe status, do as follows:

1. Select a photo (1).



2. Click the  button.

The Search bar (2) will display the probability that the person is a "stranger".

The algorithm is as follows:

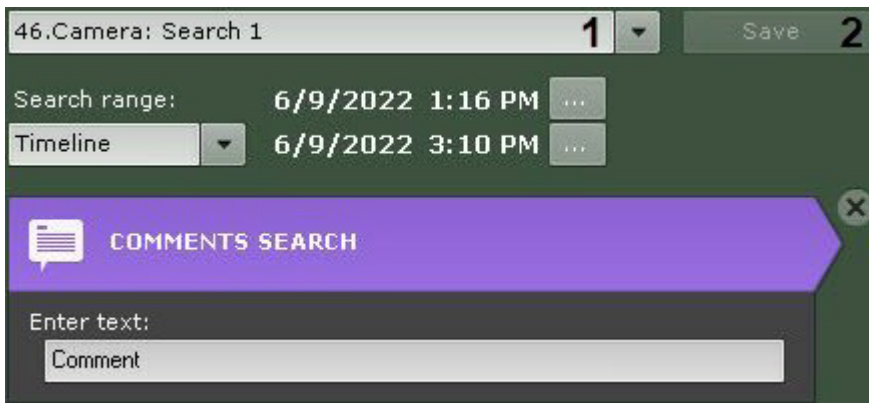
1. The person is compared to all the recognized persons in the last 30 days.
2. The number of days (**N**) in which the person was captured by camera and recognized is calculated.
3. The probability is calculated according to the formula $(1 - N/30) * 100$.

Saving search queries

Saving a search query allows you to:

- quickly retrieve its results;
- apply search criteria to other cameras.

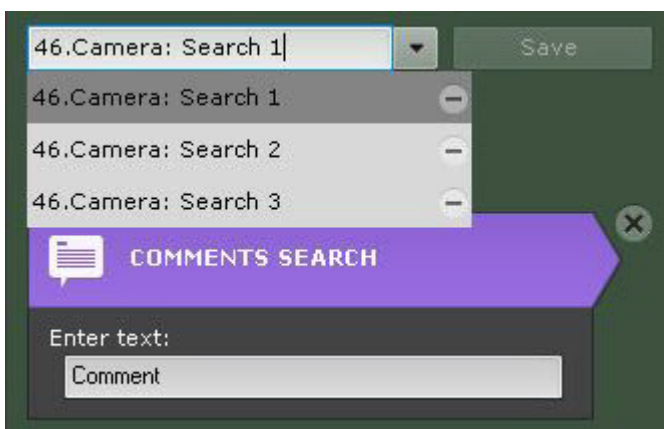
To save a search query, specify a name (1) and click the **Save** button (2). After this, the tab for the search query becomes available in the lower-right corner of the viewing tile in Archive mode (see [Viewing the results of a saved search query](#)(see page 684)).



Attention!


The search range can not be saved.

To apply the saved search criteria to another camera's archive, switch the camera to Archive Search mode and select the required search query.



To edit a search query, view the list and select the relevant query.

Changes are not saved until the **Save** button is clicked. If the query name is changed, the query is saved under the new name and the old, unchanged query remains available.



To delete a search query, click the  button.

Switching between search results

If a search was run more than once and the user did not exit Archive Search mode during that time, it is possible to switch between search results.

Note

The number of stored results is limited only by the amount of RAM in the server.

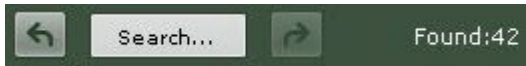
Click  on the search control panel to switch to the previous search result, and click  to switch to the next result.

Each time you switch between results, the search results panel displays the moments corresponding to the previous/next result.

Working with search results

Viewing search results

The Search Control Panel shows how many episodes are found when the search is complete.



The search results panel displays the precise moments in an archive that correspond to the defined search criteria. The precise time of each moment is displayed underneath (**1**).

Note

An alarm object is outlined in red.

Note


To copy the time and the start date of the video fragment to the Clipboard, right-click on them.



A scroll bar is located on the right side of the search results panel (2). Beneath is a time scale adjuster (3).

If you choose a spot on the the timeline, the search results are automatically sorted. The closest episode will be highlighted in search results.

You can filter the search results and keep only the important episodes. To do this:

1. Double-click the episode, that you want to keep. Its thumbnail is tagged with a star .

Note

To remove the tag, click the star again .

2. Tag all the episodes you want to keep.

3. Click **Clear** to delete untagged episodes from the search results.

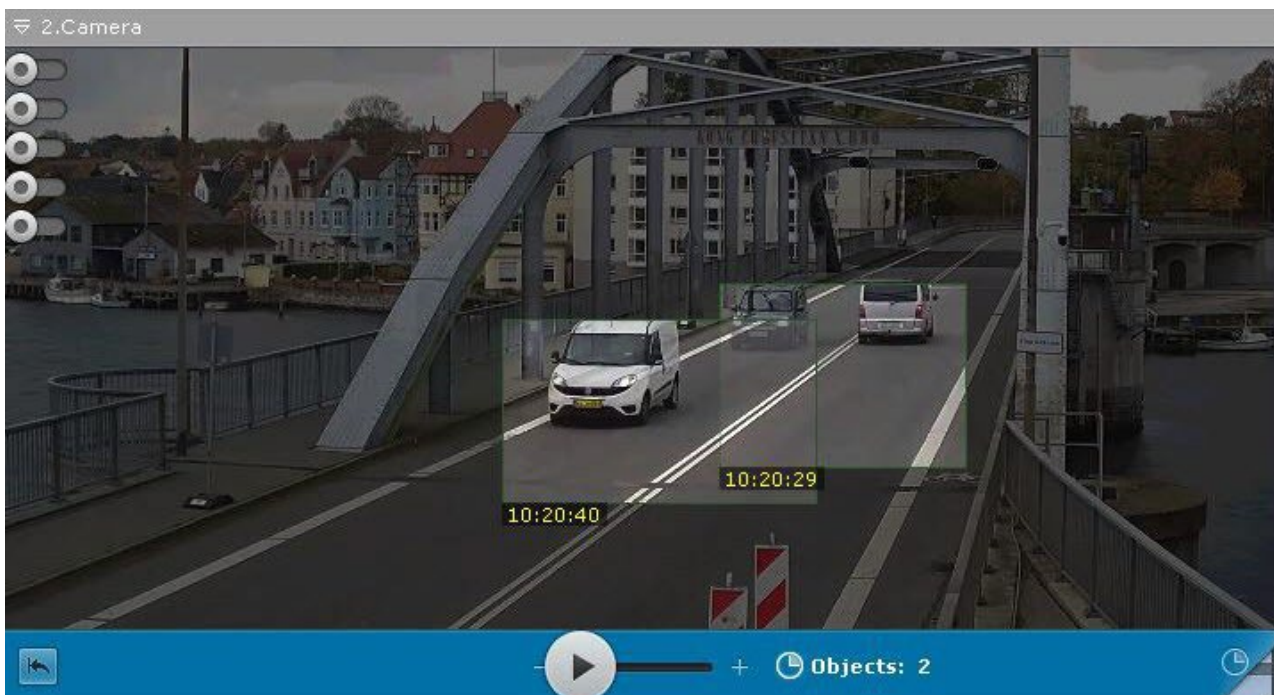


Viewing Search Results In Timelapse Compressor

When you search recorded video for motion events by metadata ([LPR search](#)(see page 717), [Face search](#)(see page 718), [Forensic Search for Fragments \(Post-Analytics\)](#)(see page 705)), you can view results in the [Timelapse Compressor mode](#)(see page 672).



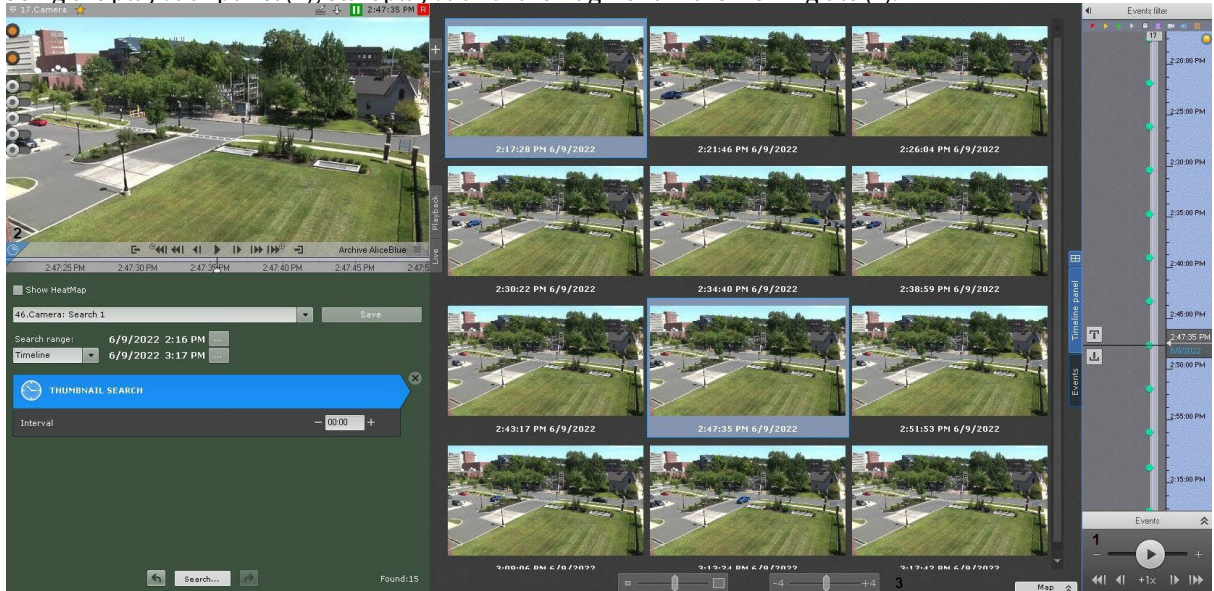
To do this, click the button on the timeline in the camera window.



Playback of video fragments

To view the video fragment corresponding to a found moment in the archive, complete the following steps:

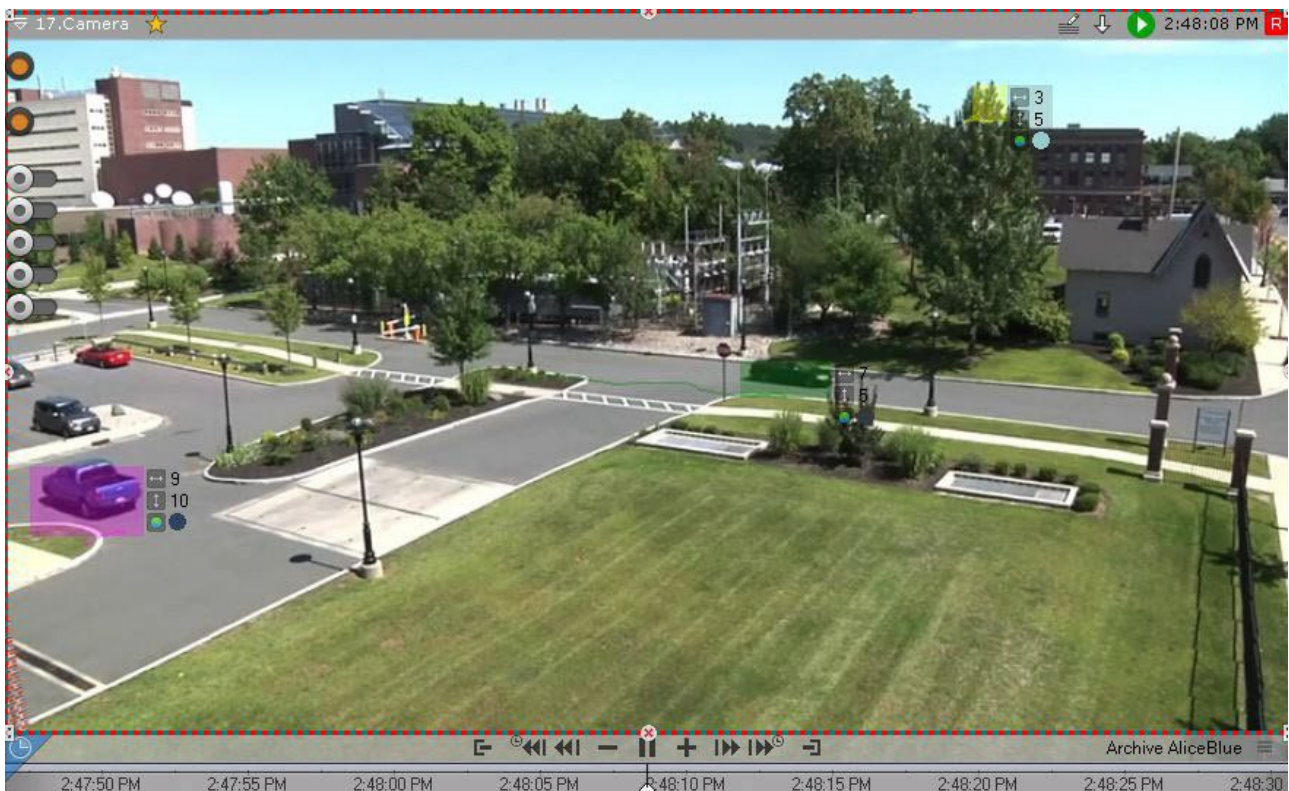
1. Left-click the found moment on the search results panel.
2. Using the playback panel (1), start playback of the fragment in the viewing tile (2).



By default, the playback starts with the time specified under the thumbnail. You can use the control (3) to change the start time. If the control is in the leftmost position, playback starts 4 seconds earlier than the start time. If the control is in the far right position, playback starts 4 seconds later.

Note

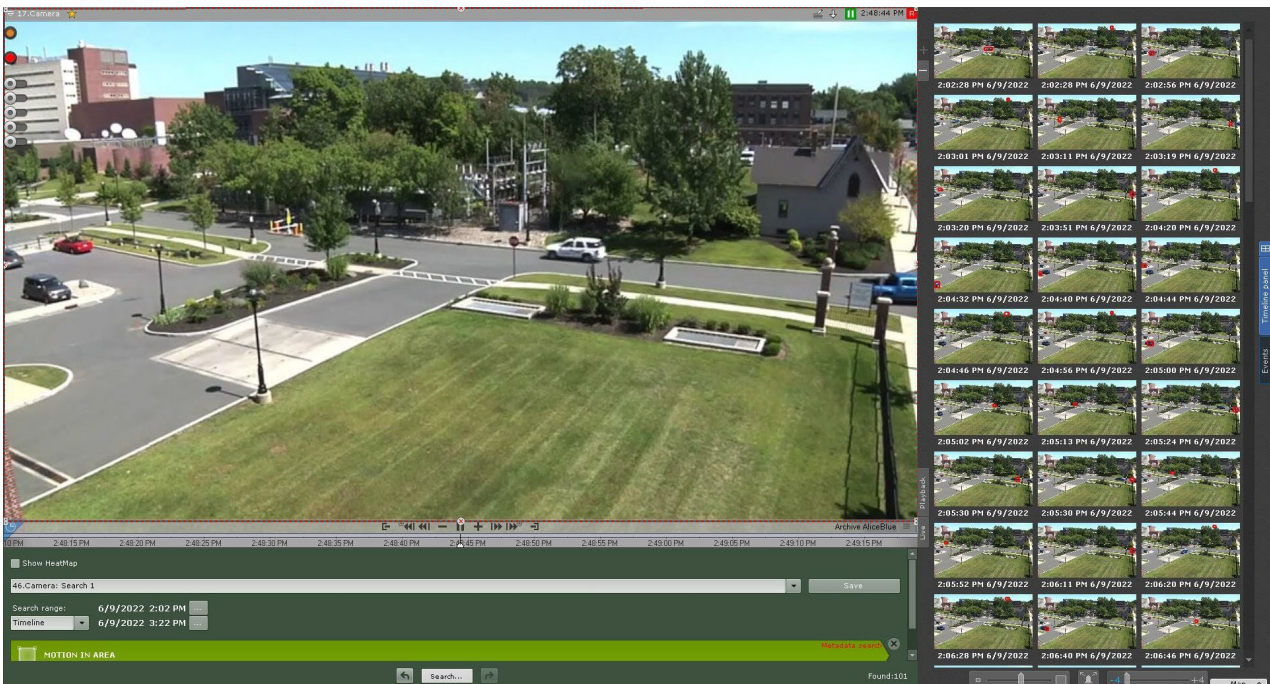
If object tracking is activated in the viewing tile, then the properties of tracked objects (width and height as a percentage of the width or height of the frame) are displayed when viewing video fragments found through forensic search.



Note

To switch between video fragments, use the corresponding buttons on the playback panel or on the advanced navigation panel (see the sections titled [Navigation using the advanced panel](#)(see page 679) and [Navigating using the Playback Panel](#)(see page 682)).


Extreme zooming a camera window makes the Search Conditions and Archive Navigation panels become hidden (see [Scaling the surveillance window](#)(see page 622)).



Enlargement of found moments

When you find moments in archive video, you can enlarge the following:

- object that triggered the detection tool (during event search);
- track (during forensic search);
- commented area of the frame (during comment search).

To do so, above the search results, click the  button.




☐ Attention!

Enlargement occurs only in the following cases:

1. If the height and width of the visual item specified in the forensic search settings are less than 1/3 of the frame dimensions.
2. If the tracking object occupies less than 1/3 of the frame (for detection tool search).
3. If the object marked by the comment occupies less than 1/3 of the frame (for comments search).

In all other cases, the found moments are displayed in their entirety.



To close zoom, click the  button again.

Exporting the video fragments and repeated search

To export the video fragment corresponding to a found moment in the archive:

1. Double-click the found moment on the search results panel. The interval for export will be set apart from this moment until the next found moment.

☐ Important

Double-clicking the found moment will also cause a repeated search within the selected time interval for export.

2. Export the video (see [Exporting Video Recordings](#)(see page 778)).

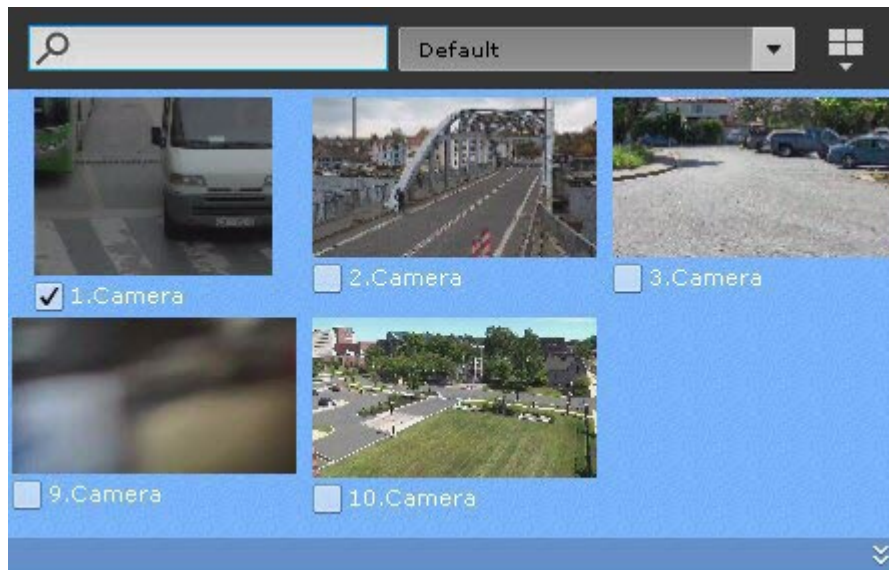
Simultaneous search in an archive of several video cameras

☐ Attention!

The number of video cameras for search is not limited.

To search in the archive of several video cameras simultaneously, do the following:

1. Choose the search type and set its parameters (see [Search in an archive of a single video camera](#)(see page 700)).
2. On the Camera Search Panel, select the video cameras, the archive of which should be searched, by setting the corresponding checkboxes (see [Camera Search Panel](#)(see page 612)).



To search all video cameras in an Arkiv-domain, open the Objects Panel (see [Objects Panel](#)(see page 615)) and set the checkbox next to the Arkiv-domain.



3. Click the **Search** button.

Note

When searching in the archive of several video cameras simultaneously, the timeline is used (see [The Timeline](#)(see page 606)) to set the beginning and end of the viewed channel segments. This can affect the search result. The closer the timeline is, the smaller channel segments are used for the search.

8.2.7 Working with fisheye cameras

Viewing modes for video from fisheye cameras

Arkiv allows viewing the video stream and video archive from fisheye cameras, dewarping the video image into one of the following formats:

1. 360° panorama.
2. Regional view.
3. 180° panorama (for video camera with an Immervision lens).

Selecting viewing mode for videos from a fisheye camera

By default, fisheye camera video viewing mode setting is taken from device settings (see [Configuring fish-eye cameras](#)(see page 112)), or from layout settings (see [Selecting default functions for viewing tiles](#)(see page 461)).

To change the viewing mode, do the following:

1. Open the camera's context menu.
2. Select **Change panomorph view type to PTZ** or **Change panomorph view type to Perimeter**.



Note

This setting is not preserved if you switch to another layout.

360 degree Panorama and Regional view (virtual PTZ)

By default, video from fisheye cameras is displayed in viewing tiles as a 360° panorama.

Note

This display format is only available in Live Video and Archive Video modes.



When digital zoom is applied to video (see [Digitally Zooming Video Images](#)) by one notch or more, regional viewing begins.

The following actions are available when viewing video in this format:

1. Point & Click functionality (see [Control using Point&Click](#)).
2. Change the angle of view of the fisheye camera, by left-clicking in the viewing tile.



In both viewing modes, all standard video surveillance functions are available for the fisheye camera.

When using a dual lens fisheye camera, the default viewing mode is set to two 180° views.



When you zoom in one of the images, both views will be merged into a single panoramic view.



180 degree Panorama


This viewing mode is available for:

- cameras with Immersion lenses;
- dual lens fisheye cameras.

Note

If the video camera is wall-mounted, the angle of view cannot be configured (see [Configuring fish-eye cameras](#)(see page 112)).



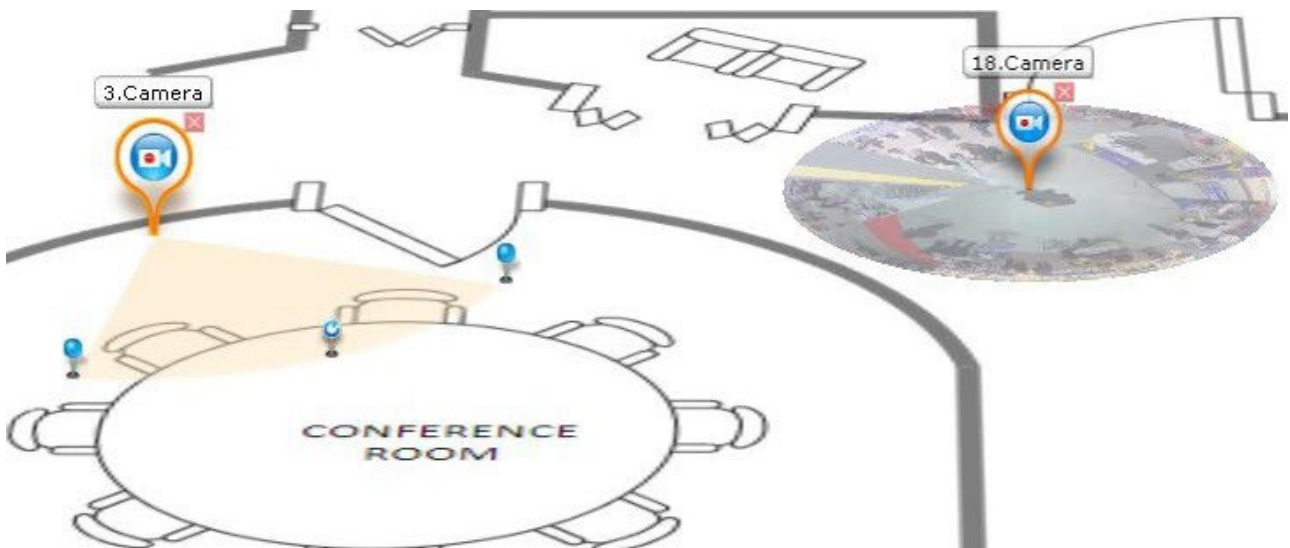
To set the viewing angle, click and hold the  button while moving the cursor to the left or right.

Point&Click (see [Control using Point&Click](#)(see page 654)) and all standard video viewing functions are available when viewing video in this format.

Fisheye cameras on an interactive map

Viewing video and controlling a fisheye camera from the map

If a fisheye camera is ceiling-mounted (this position is selected in the video camera settings, see [Configuring fish-eye cameras](#)(see page 112)) and a 360° field of view is specified for it on the map, the video from the camera is displayed on the map in real time.



To refocus the angle of view of a fisheye camera so that a chosen point in the viewing tile becomes the center of the frame, left-click that point (this is the Point & Click function, see [Control using Point&Click](#)(see page 654)).

Note

If the viewing tile for the fisheye camera is inactive when it is clicked, the first click on the video on the map activates the viewing tile. The second click activates the Point & Click function.


Fish-eye cameras in immersive mode

In immersive mode (see [Immersive mode](#)(see page 774)), the video from a fish-eye camera is displayed on the entirety of the video surveillance screen, above the map display, as virtual PTZ (see [Viewing modes for video from fish-eye cameras](#)(see page 729)).



In immersive mode, only the following video surveillance functions are available for fish-eye cameras.

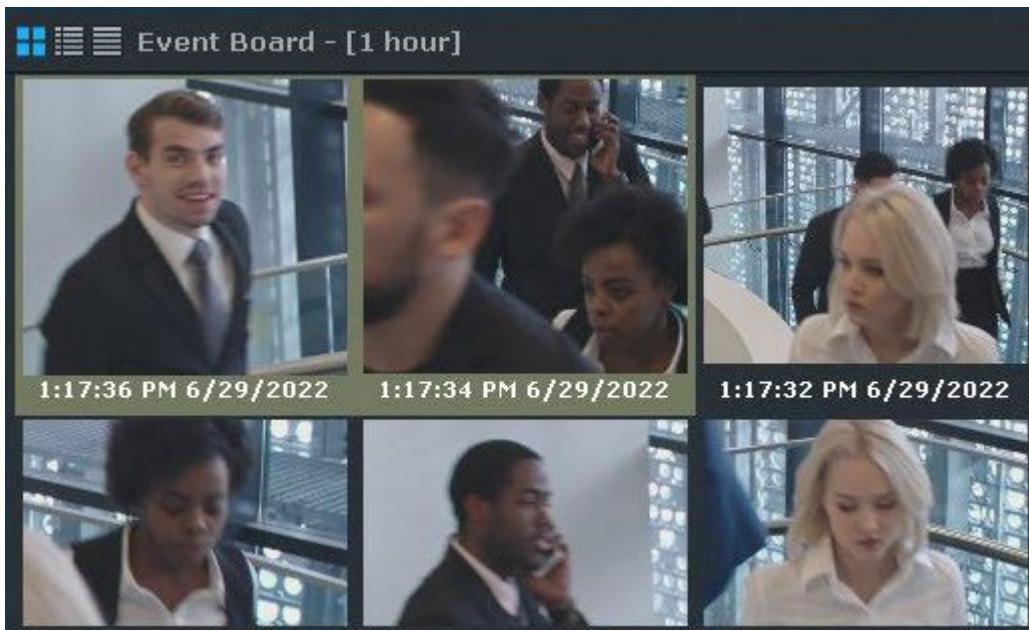
1. Digital zoom via mouse scrolling (see [Enlarging a video image using the mouse scroll wheel](#)(see page 625)).
2. Point&Click functionality (see [Control using Point&Click](#)(see page 654)).
3. To change the angle of view of a fish-eye camera, move the mouse around the video image while holding down the left mouse button.

To exit immersive mode, click the  button.

8.2.8 Face recognition and search

Face recognition events are registered in the System Log (see [The System Log](#)(see page 787)).

These events can as well be displayed on the Events Board (see [Working with Event Boards](#)(see page 742)) or Dialog Board (see [Working with Dialog Board](#)(see page 752)).



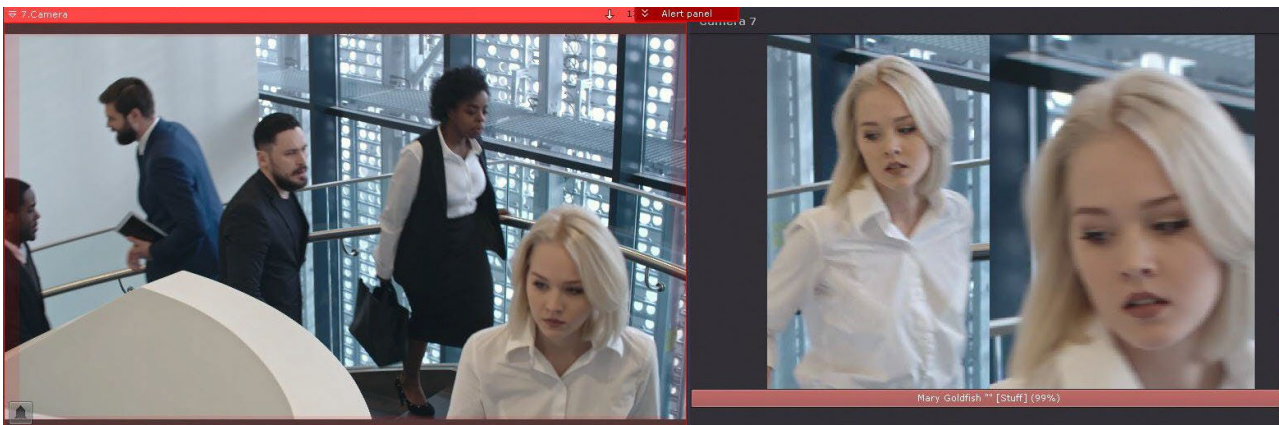
If you activate the age and gender information collection, its results will be displayed on the panel and saved into the System Log (see [Configuring Face detection](#)(see page 267)).

Event Board - [1 hour]			
1:27:05 PM	6/29/2022	Camera "4.Camera".	Detection Face recognition triggered. Age - "60", Gender - Male, Temperature - N/A °C Extended info: "Face detection"
1:27:04 PM	6/29/2022	Camera "4.Camera".	Detection Face recognition triggered. Age - "55", Gender - Male, Temperature - N/A °C Extended info: "Face detection"
1:27:03 PM	6/29/2022	Camera "4.Camera".	Detection Face recognition triggered. Age - "57", Gender - Male, Temperature - N/A °C Extended info: "Face detection"
1:27:00 PM	6/29/2022	Camera "4.Camera".	Detection Face recognition triggered. Age - "24", Gender - Male, Temperature - N/A °C Extended info: "Face detection"
1:26:58 PM	6/29/2022	Camera "4.Camera".	Detection Face recognition triggered. Age - "45", Gender - Female, Temperature - N/A °C Extended info: "Face detection"
1:26:58 PM	6/29/2022	Camera "4.Camera".	Detection Face recognition triggered. Age - "24", Gender - Male, Temperature - N/A °C Extended info: "Face detection"
1:26:56 PM	6/29/2022	Camera "4.Camera".	Detection Face recognition triggered. Age - "22", Gender - Male, Temperature - N/A °C Extended info: "Face detection"
1:26:55 PM	6/29/2022	Camera "4.Camera".	Detection Face recognition triggered. Age - "52", Gender - Male, Temperature - N/A °C Extended info: "Face detection"

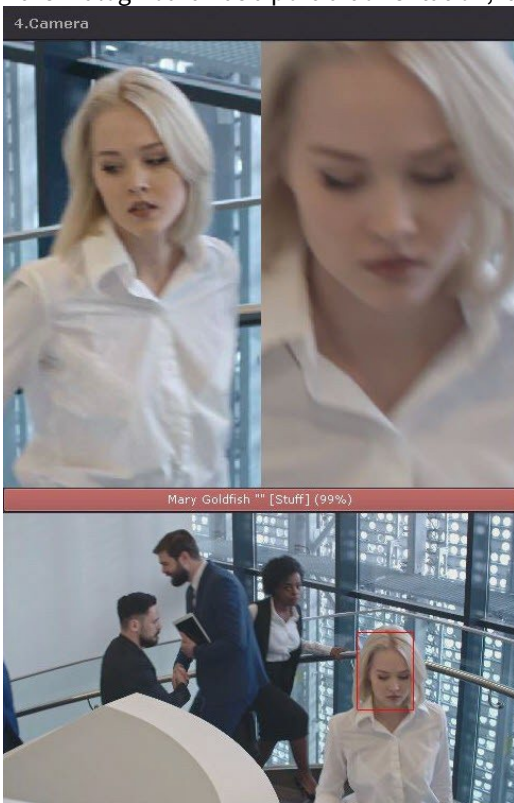
If the Camera window is linked to the Event Board (see [Linking cells](#)(see page 458)), you can double click on an event to start the Video Footage search for sequences containing the recognized face.

If you have created any lists of faces, configured an alarm on facial recognition, and linked the Camera window to the dialog board, you will have the following information on screen upon recognition a person that belongs to the list:

1. Reference photo from the List of Faces.
2. Close up shots of faces captured in the scene.
3. Additional information about the person, and similarity percentage between the recognized and reference photos.



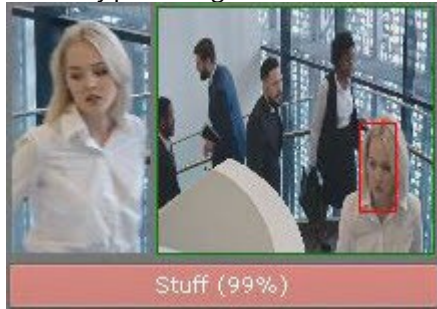
If the Dialog Board has a portrait orientation, its lower part will display the alarm video.



The Alarm notification panel will also include:

1. Reference photo.
2. Thumbnail preview of the source recognition video.
3. Name of the list of faces.

4. Similarity percentage.



You can search FR events in recorded video from one (see [Face search](#)(see page 718)) or multiple cameras (see [Simultaneous search in an archive of several video cameras](#)(see page 728)).

You can set the system to mask recognized faces from viewing (see [Masking faces](#)(see page 502)).



8.2.9 Vehicle number plate recognition and search

VMS logs every ANPR number (see [The System Log](#)(see page 787)).

Attention!

Depending on detection tool settings, a delay may occur between the number recognition and the registration of the corresponding event (see [Configuring License plate recognition \(VT\)](#)(see page 301), [Configuring License plate recognition \(IV\)](#)(see page 315)).

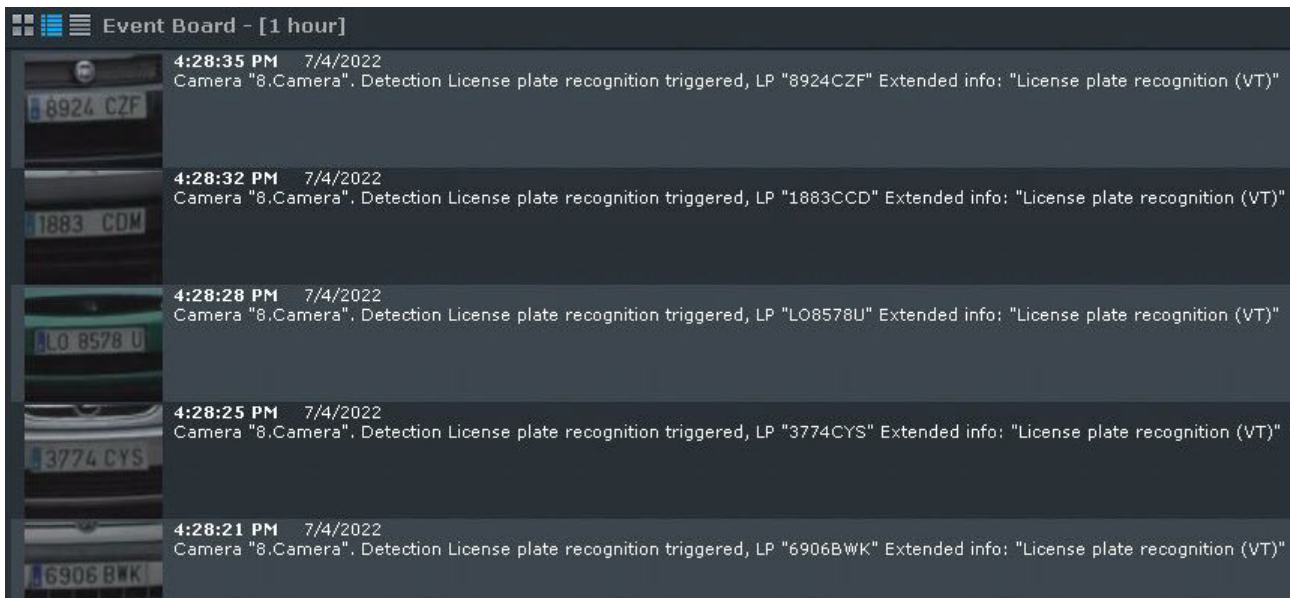
The event is time-stamped with the time of recognition, not registration.

For example, if a car passes the camera at 12:05:00, and the detection tool is set to a 10 sec timeout, the event will be registered at 12:05:10 and the event data will include 12:05:00 as the time of recognition.

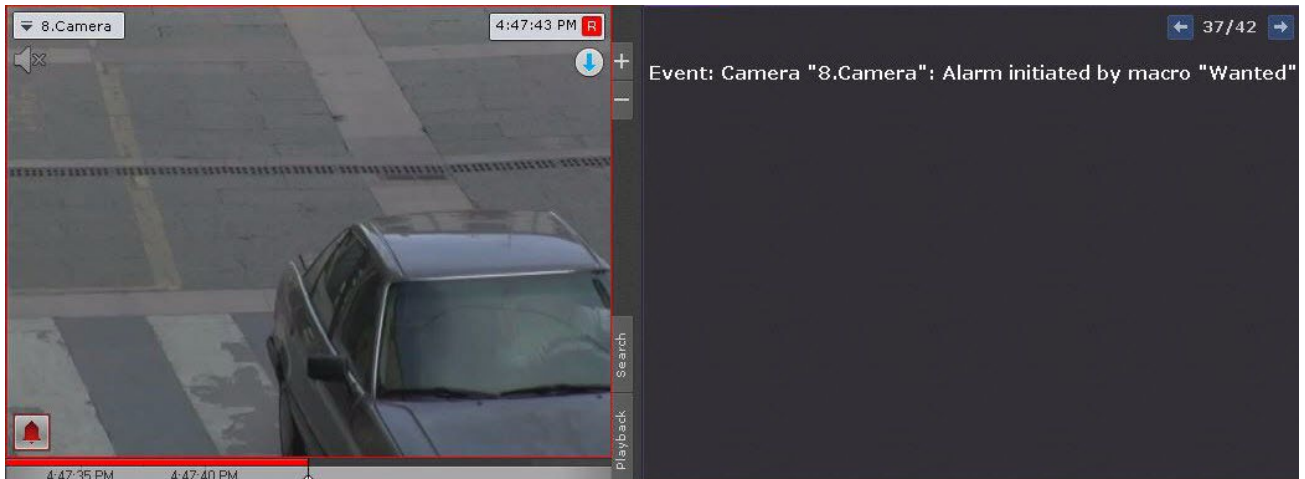
Attention!

The standard license provides a more than 30-sec delay between the number recognition and the corresponding event (see [Configuring License plate recognition \(VT\)](#)(see page 301).

All relevant events can be displayed on the Event Board (see [Working with Event Boards](#)(see page 742)) or Dialog Board (see [Working with Dialog Board](#)(see page 752)).



If you have created any LP lists in your system, you can program automatic responses (e.g. alarm triggering) to LP recognition events related to list's entries (see [Configuring real-time vehicle license plate recognition](#)(see page 322)).



8.2.10 Temperature screening

In *Arkiv*, only two methods of temperature screening are available:

1. With the use of Mobotix M16 TR cameras. In this case, temperature values are displayed next to each recognized face's bounding box (see [Face Detection and Temperature Control with Mobotix M16 TR cameras](#)(see page 282)).

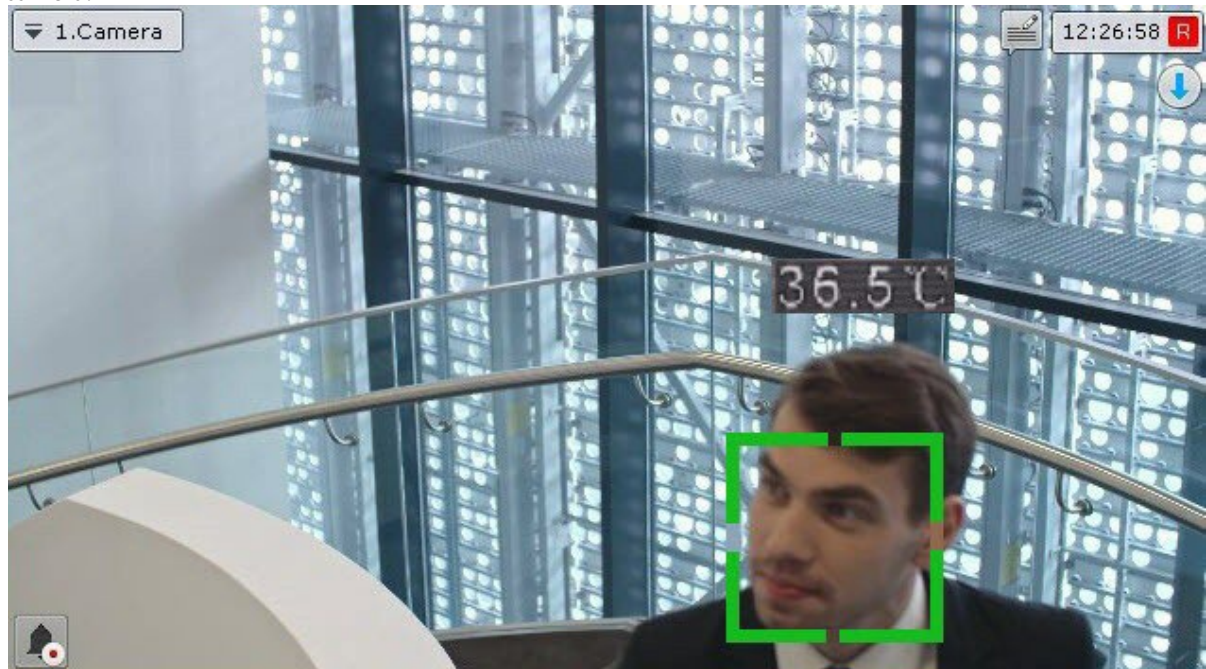


Each face recognition event contains thermal measurement data which can be displayed on the Events Board (see [Working with Event Boards](#)(see page 742)).

2. With the use of built-in detection tools of selected camera models (see [Embedded Detection Tools](#)(see page 370)).

Some cameras are capable to display a bounding box over the facial image along with corresponding temperature readings. If this option is available, it can be activated via the web interface of a particular

camera.



8.3 Working with information boards

8.3.1 Resizing information boards

You can resize information boards in the same way as viewing tiles (see [Scaling the surveillance window](#) (see page 622)).

Note

When the Statistics Board is enlarged, the graph is enlarged as well, displaying data for a broader range of time. When the size of the Statistics Board is reduced, the opposite occurs. In both cases, the right-hand border of the graph is constant.


If an information board tile is linked to a viewing tile, at the first enlargement step (to 50%), the viewing tile and information board tile are displayed together and occupy all of the screen on one side.

Note

In this case, the first step takes into account the total size of the related cells: the related cells must be less than 50% of both sides of the layout.

8.3.2 Hiding information boards

Operators can hide information boards in a layout, if this is allowed in the settings.

To hide an information board, in its upper-right corner, click the  button.

Note

If configured, Dialog Board hides after you click a **Response Button** (see [Configuring a Dialog Board](#)(see page 473)).

If all cells in the layout have the same size, the space freed up after hiding an information board is allocated to the neighboring cells. Horizontal neighbors have priority over vertical ones.

If free space cannot be distributed horizontally, it is distributed between the vertical neighbors.

In more complicated cases (when cell sizes are different), an attempt is made to distribute the free space between horizontal neighboring cells. If this is not possible, free space is distributed between vertical neighboring cells. If even this second attempt is unsuccessful due to the layout configuration, the space remains empty.

Hidden information boards are displayed in two cases:

1. After switching to another layout and back to the original one.
2. When an event occurs that requires the operator's attention. A description of such events for each type of information board is given in the following table.

Types of information boards	Events that trigger board display
Dialog and Events	An event matching the board filtering settings occurs
Health	Server condition worsens
Statistics	New events occur

8.3.3 Automatically switching to layouts with information boards

Automatic switching to a layout with an information board is possible for Event Board, Health Board and Dialog Board (if it is set up to Automated Responses to Events). This option is available when configuring boards of these types.

Automatic switching to a layout with Event Board or Dialog Board occurs when all of the following conditions are met:

1. The current layout does not contain Event/Dialog Board.
2. An event matching the board filtering settings has occurred in the system.

Automatic switching to a layout with a Health Board occurs when the following conditions are met:

1. The current layout does not contain a Health Board.
2. The status of a monitored server or camera worsens.

The layout with the smallest number of cells is chosen for display. If there are multiple layouts with identical numbers of cells, the layout that comes first in the alphabet is chosen.

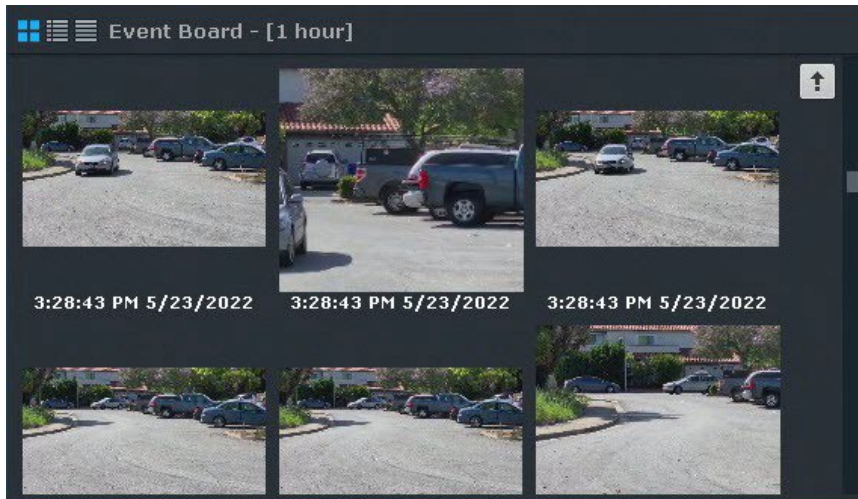
8.3.4 Working with Event Boards

Options for displaying information on Events Boards

Events Boards display information about selected system events. Configuration of the events to display is performed in the corresponding [section](#) (see page 468).

Events on the board can be displayed in three ways, chosen via the buttons in the upper-left corner of the board:

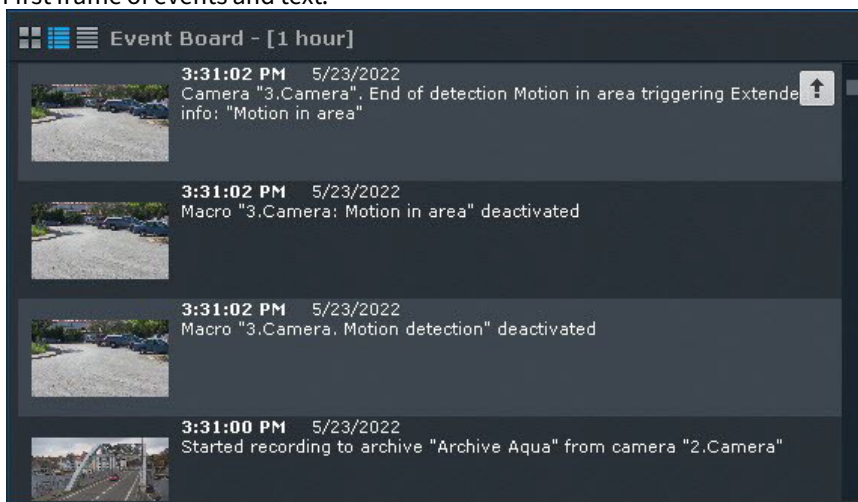
1. First frame of events and their time:




Note

The frame is not displayed when there is no recording in the archive.

2. First frame of events and text:




3. Text only:



Time	Date	Event Description
3:31:10 PM	5/23/2022	Macro "3.Camera: Motion in area" activated
3:31:06 PM	5/23/2022	Camera "3.Camera". Beginning of detection Motion detection t...
3:31:06 PM	5/23/2022	Macro "3.Camera. Motion detection" activated
3:31:06 PM	5/23/2022	Macro "2.Camera. Motion detection" activated
3:31:06 PM	5/23/2022	Camera "2.Camera". Beginning of detection Motion detection t...
3:31:02 PM	5/23/2022	Camera "3.Camera". End of detection Motion in area triggerin...
3:31:02 PM	5/23/2022	Macro "3.Camera: Motion in area" deactivated
3:31:02 PM	5/23/2022	Macro "3.Camera. Motion detection" deactivated
3:31:00 PM	5/23/2022	Started recording to archive "Archive Aqua" from camera "2.C...
3:31:00 PM	5/23/2022	Macro "Macrocommand3" activated
3:31:00 PM	5/23/2022	Macro "Macrocommand2" activated
3:31:00 PM	5/23/2022	Finished recording to archive "Archive Aqua" from camera "2....
3:31:00 PM	5/23/2022	Macro "Macrocommand3" deactivated
3:31:00 PM	5/23/2022	Macro "2.Camera. Motion detection" deactivated
3:31:00 PM	5/23/2022	Macro "Macrocommand3" deactivated

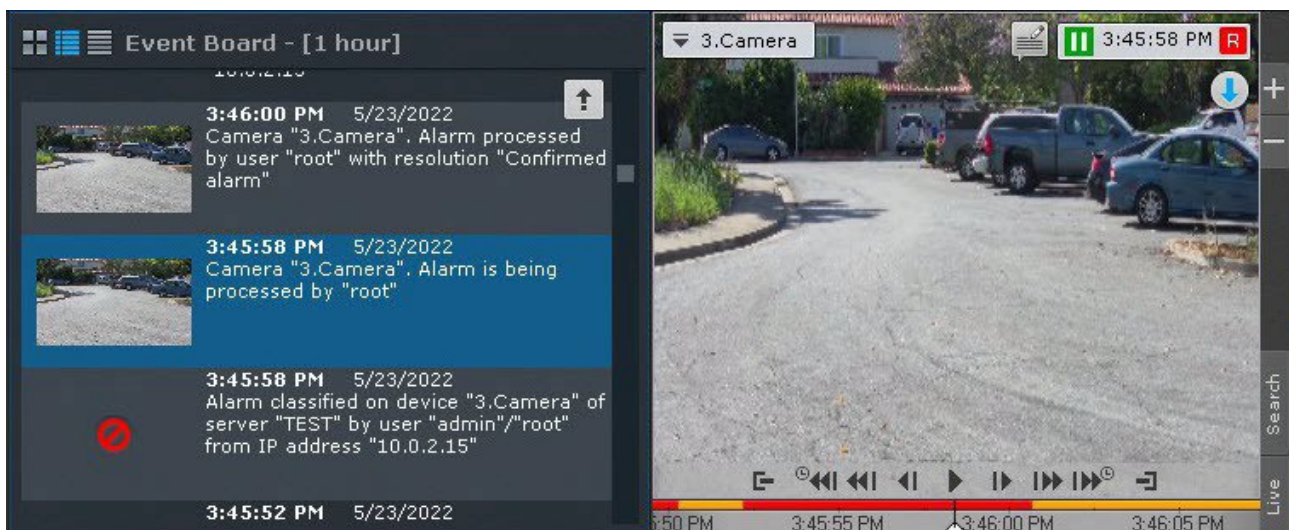
When a layout is switched to, by default the **Events Boards** is displayed as configured in the settings.

At the top of the list are the most recent events. If you are at the end of the list, you can use the  button in the panel's top-right corner to go to the most recent events. New events are highlighted for 4 seconds. The panel may include up to 100 events. If the number of events exceeds the maximum permitted value, the newer events will be displayed in place of older ones.

You can also access the events panel on the right side of the screen (see [Viewing selected camera's detection tool triggering events](#)(see page 665)). In this case, it includes only detection events for a selected camera.

Switching a camera linked to an Event Board to the archives

If an Event Board is linked with a camera, clicking an event will switch the camera to Archive mode at the point in time corresponding to the event.



The screenshot displays the 'Event Board - [1 hour]' interface. On the left, a list of events is shown, with the most recent event highlighted in blue. The event details are as follows:

Time	Date	Event Description
3:46:00 PM	5/23/2022	Camera "3.Camera". Alarm processed by user "root" with resolution "Confirmed alarm"
3:45:58 PM	5/23/2022	Camera "3.Camera". Alarm is being processed by "root"
3:45:58 PM	5/23/2022	Alarm classified on device "3.Camera" of server "TEST" by user "admin"/"root" from IP address "10.0.2.15"
3:45:52 PM	5/23/2022	

On the right, a live video feed from '3.Camera' is shown, displaying a parking lot with several cars. The video player interface includes a timeline at the bottom with a playhead positioned at 3:46:00 PM. The video player also shows a 'Live Search' button on the right side.

Note

If there is no archive for a camera when an alarm occurs, the archive is positioned at the closest recorded archive entry.

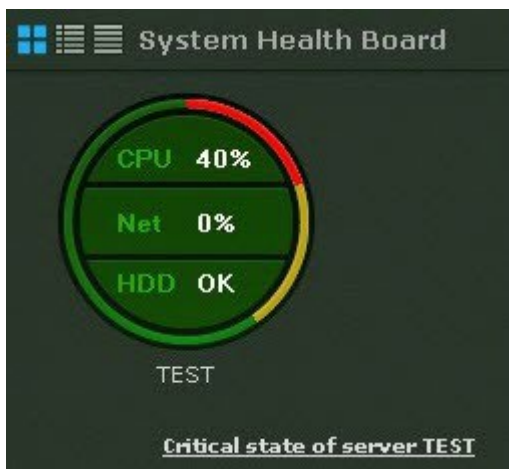
Note

If an Event Board is linked to several cameras, all cameras transition to Archive mode.

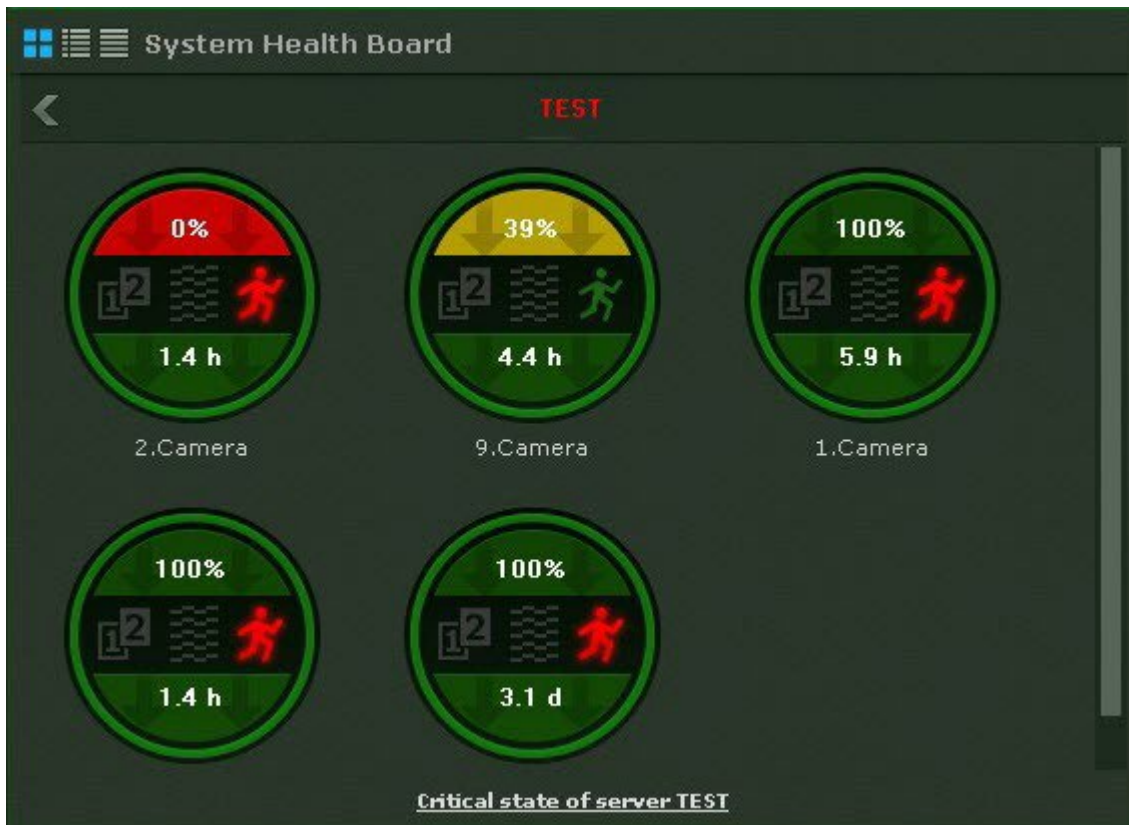
8.3.5 Working with System Health Boards

System Health Boards display the status of selected system servers and connected cameras.

By default, the panel displays the status of Servers.




To switch to viewing the status of cameras, click the diagram for the relevant server.



Note

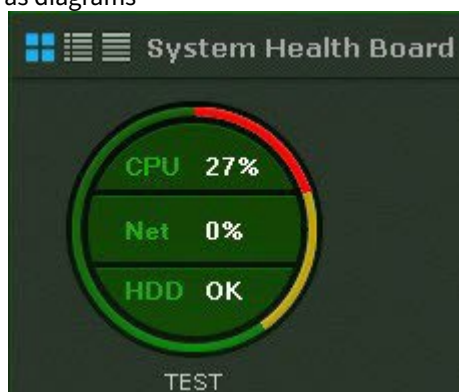
In table mode, you can view server status by clicking the relevant line in the table.

To switch to a view of server status, click the  button.

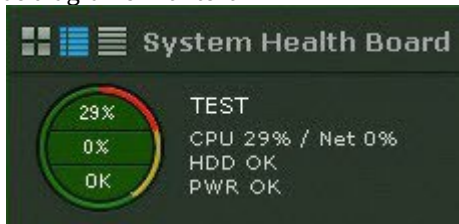
Viewing server status

Information about the status of servers can be displayed in three ways, chosen via the buttons in the upper-left corner of the board:

1. as diagrams



2. as diagrams with text



3. as a table

	CPU	Net	HDD	PWR.	Replication time left	Server
	28%	0%	✓	✓		TEST

Note

Disconnected Servers are displayed at the end of the list with dimmed brightness.

Tables can be sorted by any column in any direction.

On each server the following metrics are monitored: CPU, Network usage, Disk subsystem status, Power status.


Note

The remaining time of the archive replication is also displayed in the table.

Areas of the diagram change color based on the respective status.

	CPU	Network	HDD
Red	Load >95%	Connection failure	Critical load on the disk subsystem, data loss when recording to archive over 10%
Yellow	Load from 85% to 94%	At 70% to 100% of capacity	Elevated load on the disk subsystem, data loss when recording to archive under 10%
Green	Load <85%	At less than 70% of capacity	Normal functioning of the disk subsystem (proper operation)



When you switch the server to reserve power, an  icon is added to the chart. The icon disappears when you restore the main power.

The edge of the diagram changes color based on the status of the connected cameras (see [Viewing camera status](#)(see page 747)).

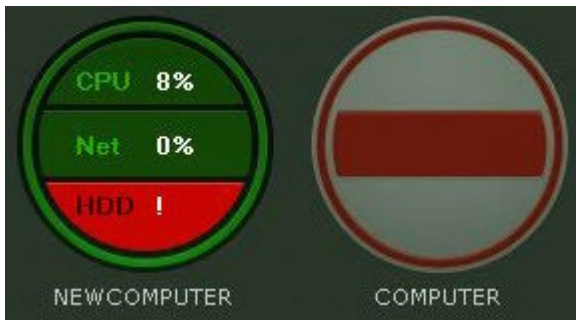
If the entire edge is green, all cameras are in normal condition. If part of the edge is yellow or red, some cameras have borderline or critical status.

Overall server status is determined from the above parameters as follows:

1. Normal – all components and cameras are normal.
2. Borderline – possible problems with the status of at least one component or camera.
3. Critical – at least one component or camera is in critical condition.

Server information is updated every ten seconds.

If the connection to a server is lost, a corresponding icon is used to depict it.



If all servers are in normal condition, the bottom of the board displays a status bar with information about the number of monitored and distressed servers.

Monitored servers: 2 Distressed servers: 0

If the status of any server worsens, the status bar is replaced by a message. When the message is clicked, the server status is displayed (if the board is currently displaying camera status).

Critical state of server COMPUTER

The message then closes and the status bar again appears.

Note

If the status of several servers worsens, a message is shown for the last one.

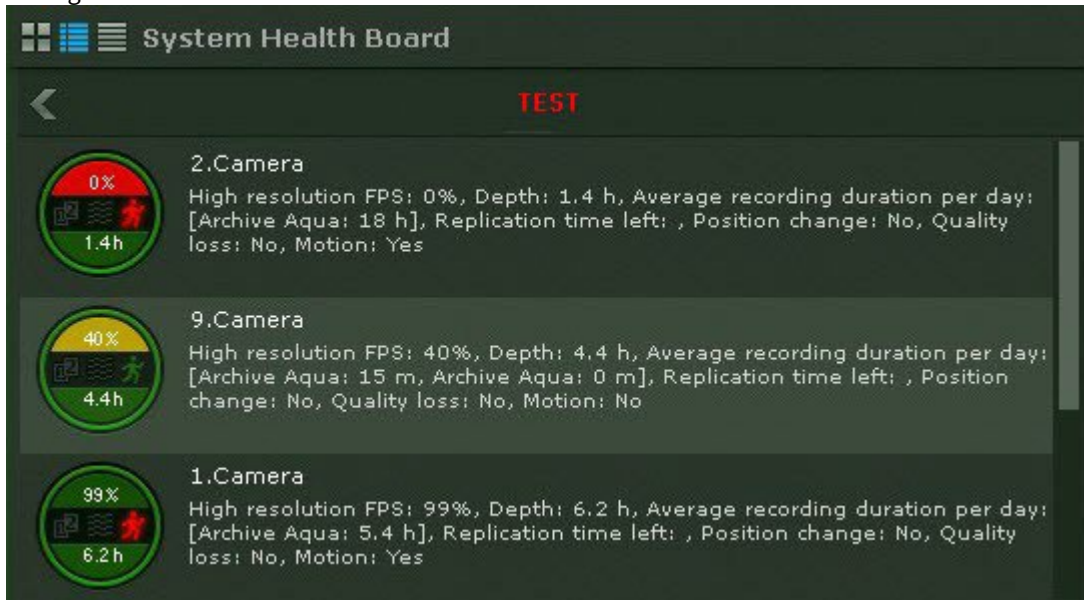
Viewing camera status

Information about the status of cameras can be displayed in three ways, chosen via the buttons in the upper-left corner of the board:

1. As diagrams.



2. As diagrams with text.



3. As a table.

↓	Camera	High resolution FPS	Depth	Average recording d...	Replication time left	Quality loss	Motion	Position change
!	2.Camera	0%	1.4 h	1.2 d		No	Yes	No
?	9.Camera	39%	4.4 h	15 m 0 m		No	No	No
✓	1.Camera	99%	1.4 h	24 h		No	Yes	No
✓	3.Camera	100%	1.4 h	23 h		No	Yes	No
✓	4.Camera	100%	3.1 d	58 m		No	Yes	No

Note

Disconnected cameras are displayed at the end of the list with dimmed brightness.

Tables can be sorted by any column in any direction.

The following information is displayed for each camera:

1. The percentage rate of actual video fps to the camera's high definition stream fps setting (see [The Video Camera Object](#)(see page 107)).
2. Status of detection tools (loss of quality, position change, motion).
3. **Depth** refers to the number of hours or days from the start of the earliest video stored in any archive to the end of the most recent video (if archive recording is not configured for the camera, this section is colored gray on the diagram).
4. Average recording time, in hours per day, is the ratio of the total recording time to the age of the archive/retention time (time from the earliest stored video to now).

Note

For constant recording, this parameter value is equal to 24 hours. If the recording takes 50 percent of total time, the value is 12 hours.

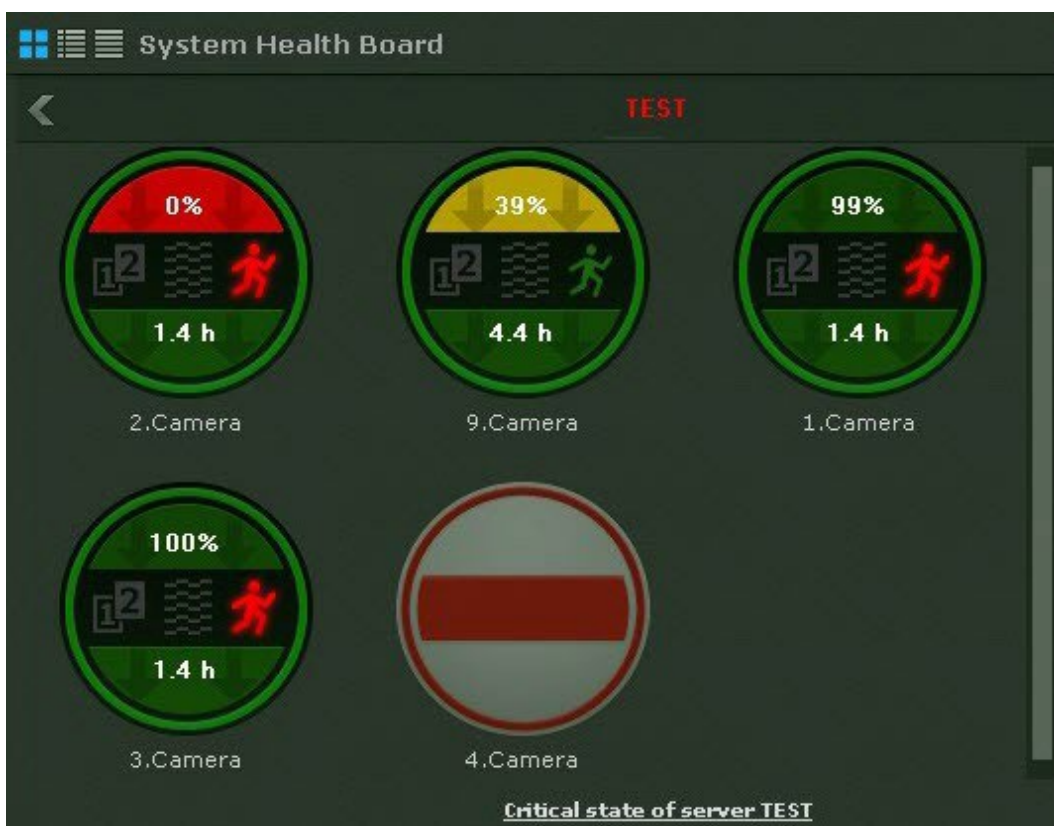
5. Remaining time for replication of the archive.

The camera status is measured based on the signal from the camera and stream rate:

1. Normal – camera signal present, frame rate is from 70% to 100%. The camera is colored green on the diagram and in the table.
2. Borderline – camera signal present, frame rate is from 20% to 70%. The camera is colored yellow on the diagram and in the table.
3. Critical – no camera signal or frame rate is less than 20%. The camera is colored red on the diagram and in the table.

Information is updated every ten seconds.

If there is no signal from a camera, the appearance of the diagram changes accordingly.



Information about detection tools is received in real time. Depending on the status of detection tools, the corresponding icons change color:

- green – detection tool status is normal,
- red – detection tool activated,
- gray – detection tool disabled.

8.3.6 Working with Statistics Boards

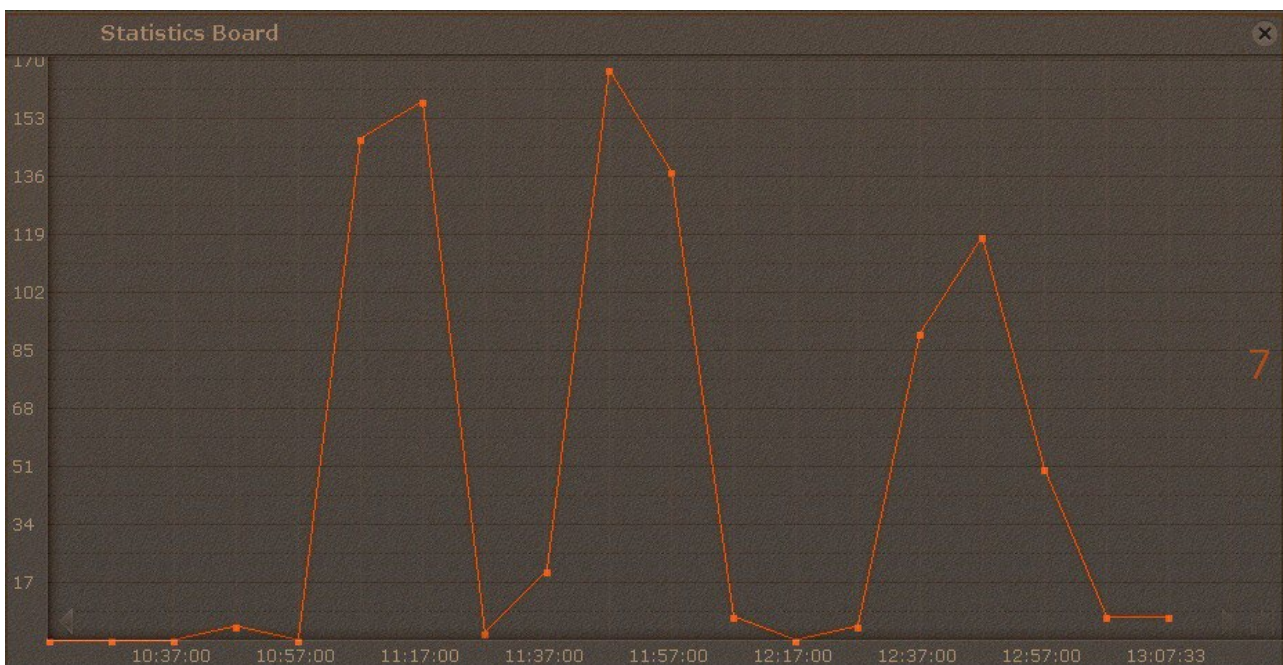
The Statistics Board is a graph of the number of events of a certain type for a specified timeframe. The type of events and amount of time between the points of the graph are configured in the board settings (see [Configuring a Statistics Board](#)(see page 471)).

The points of the graph change over time and depend on the current time and interval specified in the settings.

The points are calculated every minute/hour/day/etc. based on the selected unit of measurement (if the interval is specified in minutes, then every minute; if specified in hours, then every hour, and so forth) and is performed as follows:

1. The current time (last point on the graph) is rounded to the nearest whole unit of time (if the interval in the settings is specified in minutes, then the nearest whole minute; if specified in hours, then the nearest whole hour, and so forth).
2. This rounded time is used as the next-to-last point.
3. The formula for the other points is as follows: the adjacent point to the right, minus the interval of time specified in the settings.

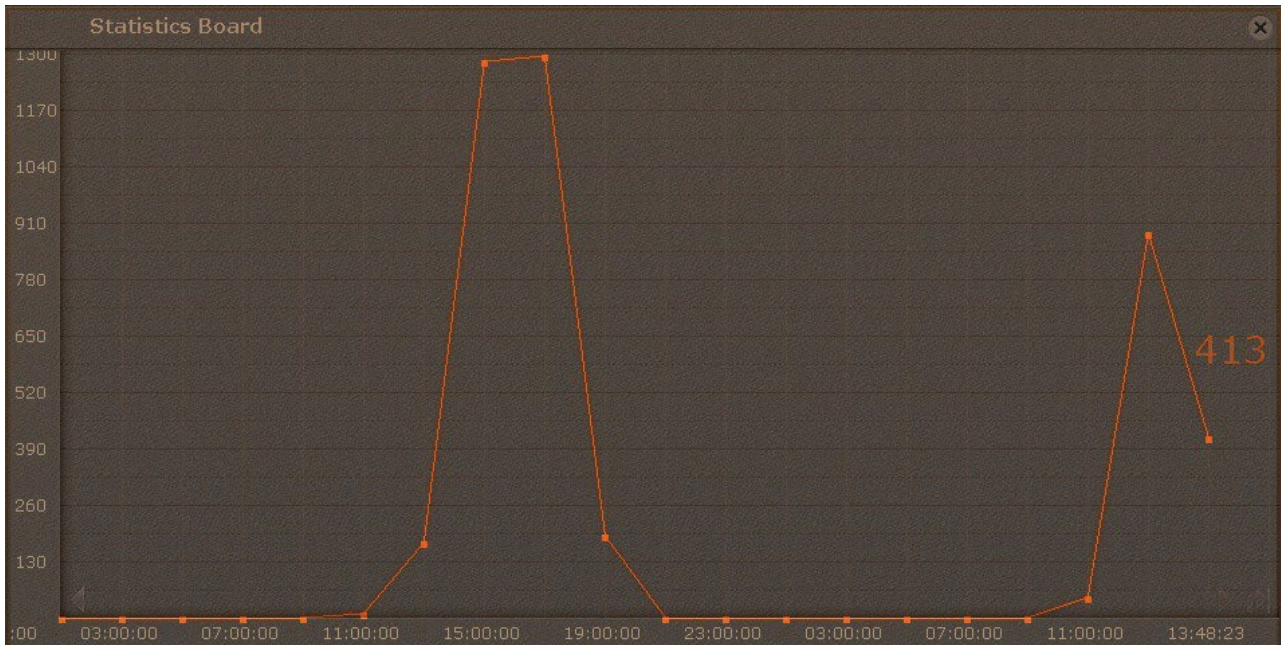
For example, the interval is set to **10** minutes on this sample graph here. The current time (**1:07:33 p.m.**) is the last point on the graph, so after rounding this to the next whole minute we get the value for the next-to-last point: **1:07:00 p.m.** Correspondingly, the points before it are **12:57:00 p.m.**, **12:47:00 p.m.**, etc.





When the current time becomes **1:08:00 p.m.**, the points will be updated to **12:58:00 p.m.**, **12:48:00 p.m.**, etc.

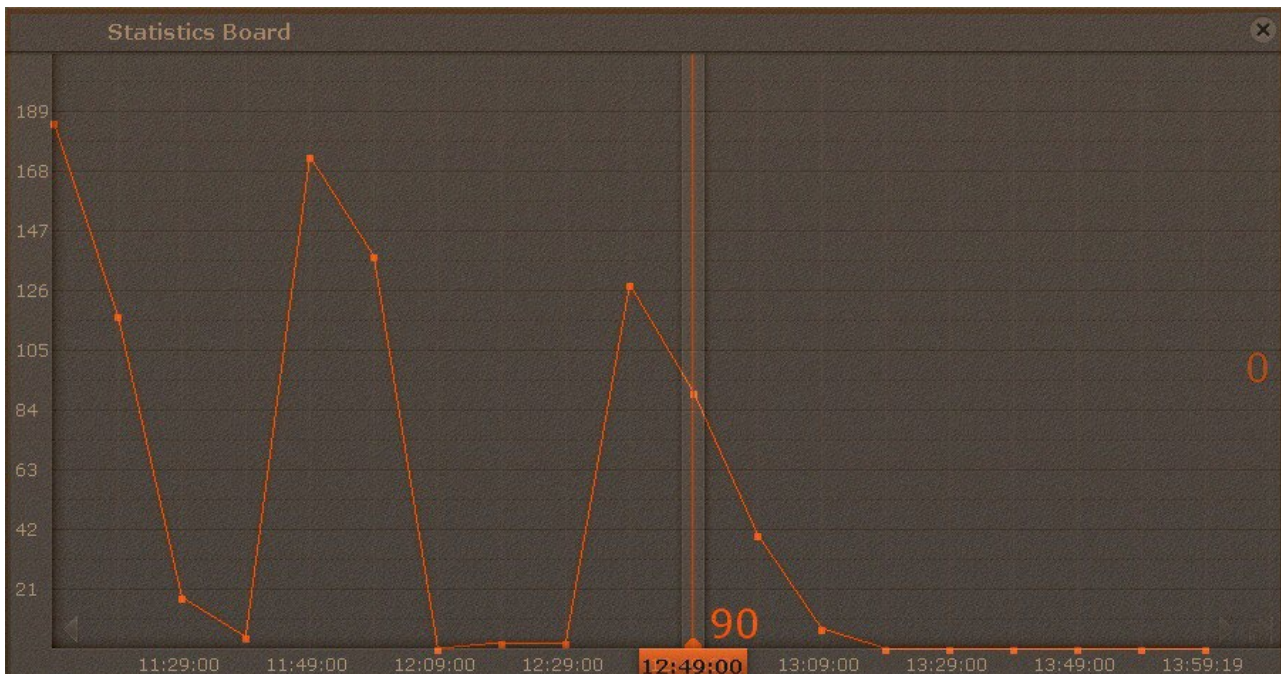
The graph displays the current number of events. The number of events is recalculated every minute and does not depend on the interval chosen.

For example, for this graph with a time interval of **2 hours** and a current time of **1:48:23 p.m.**, the current number of events equals **413**, for the period from **11:48:00 a.m.** to **1:48:00 p.m.**



To scroll through the graph, use the arrows  on the graph edges. To jump to the last point on the graph, click the  button.

Clicking anywhere on the graph jumps to the nearest point and the relevant value is indicated.

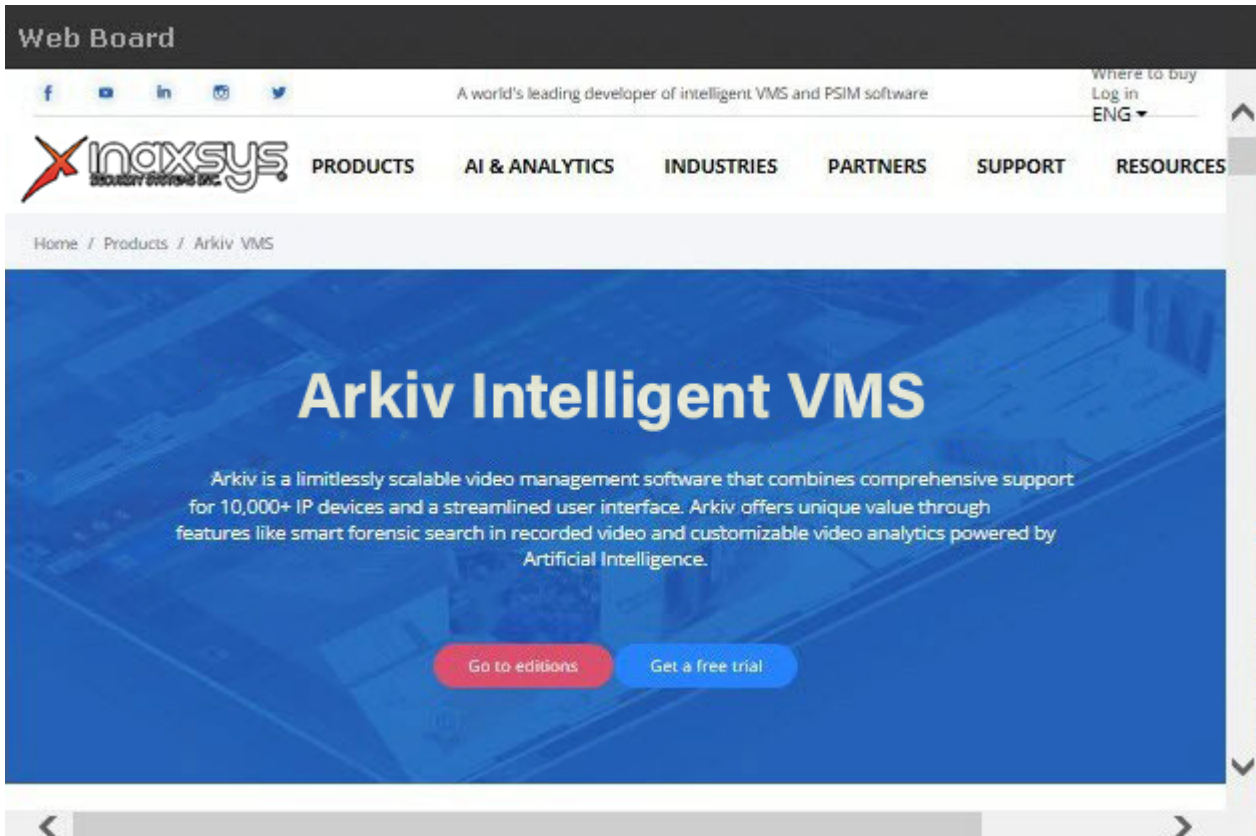


8.3.7 Working with Web Boards

Web Board allows users to view a selected web page in the camera window.

In Web Board, you can view web sites in Internet Explorer.

If the web page does not fit the board, vertical and horizontal scroll bars are displayed. In this case, the upper-left corner of the web page is displayed.



Note

If there is no network connection, no access to the requested page or if there are other problems, Web Board displays standard Internet Explorer browser error messages.

8.3.8 Working with Dialog Board

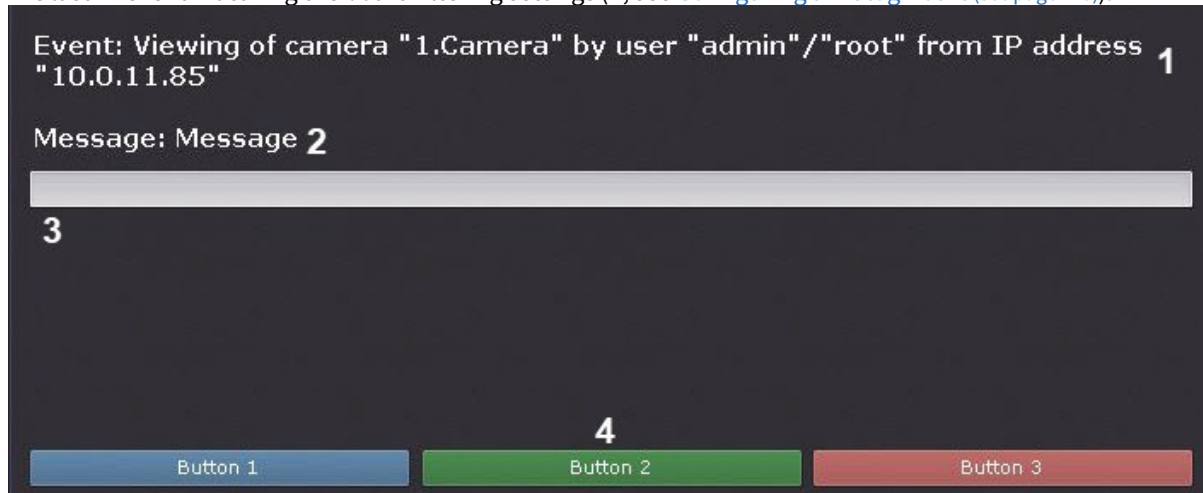
[Configuring a Dialog Board](#)(see page 473)

Dialog Board works in three modes:

1. Automated Responses to Events.
2. View and Evaluate Alarm.
3. View Video (Active camera).

In Automated Responses to Events, the board shows:

1. The last-in event matching the board filtering settings (**1**, see [Configuring a Dialog Board](#)(see page 473)).

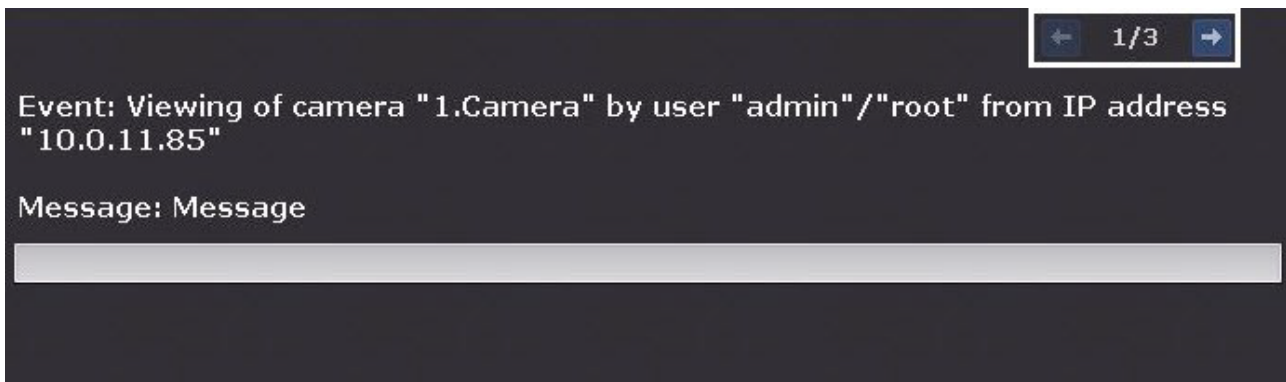


Note

All of the above mentioned elements of the board are optional. You configure the board to show them.

2. Text message as configured (**2**).
3. Comments filed (**3**). Comments input can be optional or mandatory (as configured). Comments are logged to [System Log](#)(see page 787), when you click a response button.
4. Response Buttons (**4**). If you click a response button, the macro starts, and the board auto-hides (if configured, see [Hiding information boards](#)(see page 740)).

If the pane has a history of events (see [Configuring a Dialog Board](#)(see page 473)), you can use browse it with arrows in top-right corner. Event history is erased after you switch to another layout.



In the second mode, the panel will display an alarm event from the selected or linked camera, depending on the panel setting and the event evaluation buttons.



In the third mode, the panel shows video:

1. from the selected camera;
2. from the stand-by camera for the selected camera;
3. from the stand-by camera for the linked camera.

You can select a camera if you click on its tile on a layout, in the Objects panel (see [Objects Panel](#)(see page 615)) or on the map (see [Working with the Interactive Map](#)(see page 766)).



The panel can also display a selected still image.

8.4 Layouts Management

The *Arkiv* user can run the following commands here:

1. Select a layout for display on screen.
2. Start and stop slideshows of layouts. Slideshow is rotation through all available layouts according to an assigned frequency (dwell-time).

3. Create temporary layouts.

You can work with layouts done on the Layouts ribbon (see [The Layouts panel](#)(see page 611)).

8.4.1 Changing cameras on a layout

You can change cameras on the current layout. These changes will not be saved and will be automatically discarded when you switch to another layout.

You can change:

- one of the cameras;
- all cameras on the layout.

To change one camera, drag-and-drop the camera from the Objects Panel (see [Objects Panel](#)(see page 615)) or from the Camera Search Panel (see [Camera Search Panel](#)(see page 612)) to the layout cell of your choice.

Note

Camera that was dragged-and-dropped to the camera cell in the archive mode (see [Switching to Archive Mode](#)(see page 668)), will also be in the archive mode, if recording to the archive is configured for this camera.

To change all cameras on the layout, select multiple cameras on the Objects Panel, and drag-and-drop them into the layout.

Note

To select multiple cameras, use **Ctrl** and **Shift** keys.

After you drag-and-drop a group of cameras, the layout will display all cameras from this group. After you drag-and-drop an Arkiv-domain, the layout will display all cameras from this domain.

Note

Currently disabled cameras will not be added to the layout.

8.4.2 Selection and Slideshow of Layouts

To display a layout, click it with the left mouse button.



If the Client is connected to multiple Arkiv-domains, layouts for the main Arkiv-domain are listed by default. To view the layouts of other Arkiv-domains, select the desired domain on the [camera search panel](#)(see page 612).

If another user has shared the layout, you will see the following icon:



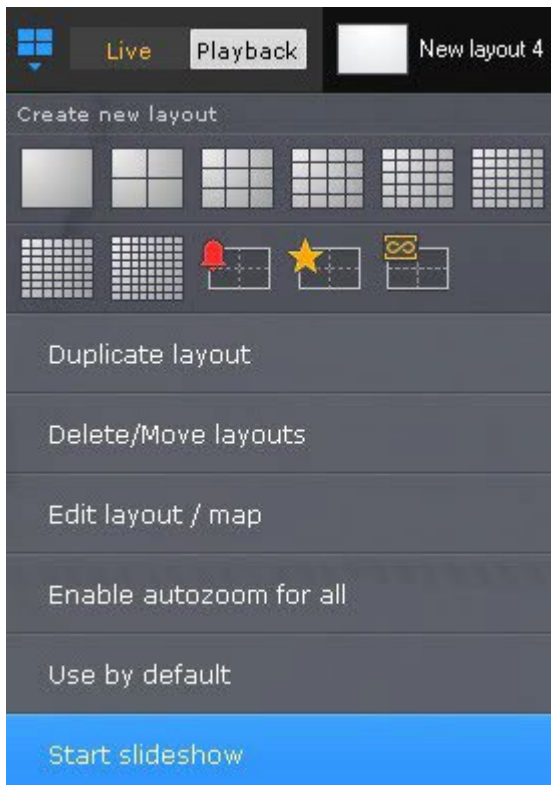
Shared layouts are by default sorted by name on the Layouts panel.

Note

If you hover the mouse cursor over such a layout, you will see the name of the user that has shared it.



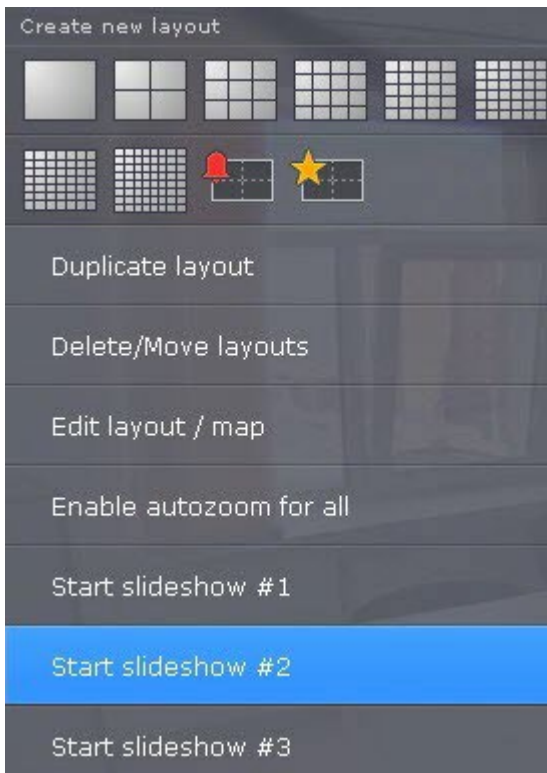
To launch a slideshow, click the  button, and select **Start slideshow** in the context menu of the layout panel.

**Note**

If you have only one layout in VMS, you do not have **Start slideshow** in the context menu.

This will launch a carousel of all available layouts according to the assigned dwell-time (see [Configuring the slideshow parameters](#)(see page 524)). Special layouts (see [Working with Special layouts](#)(see page 757)) are excluded from slideshows.

To launch a user-defined slide show, select the required one from the list.



Note

To launch a slide show on a video wall (see [Monitor Management](#)(see page 759)), select the required monitor in the Video Wall Management Panel (see [Monitor Panel](#)(see page 610)).

To turn off Slideshow mode, select **Stop slideshow** in the context menu of the layouts panel or left-click any viewing tile.

8.4.3 Working with Special layouts

[Configuring special layouts](#)(see page 478)

Alerted Cameras layout

The first 10 seconds after the alert appears in the special layout, it is highlighted.



Cameras disappear from the Alerted Cameras layout in 2 cases:

1. After the alert is classified and the next camera is on (see [Processing an Alarm](#)(see page 693)).
2. After the timeout expires (see [Configuring Alarm Management Mode](#)(see page 518)).

Note

The alarm sticks to the layout while the Alarm Management window is open and before the timeout expires. If you select a different camera without classifying the alarm, the alarm evaluation timeout resets.

New alerted cameras will populate the layout as follows:

1. If there are any free cells on the layouts after you have classified or missed the alert, the first free cell is taken.
2. If there are no free cells on the layout, the new alerted cameras takes the next free cell. If there are no free cells, the alerted camera is added to the waiting list

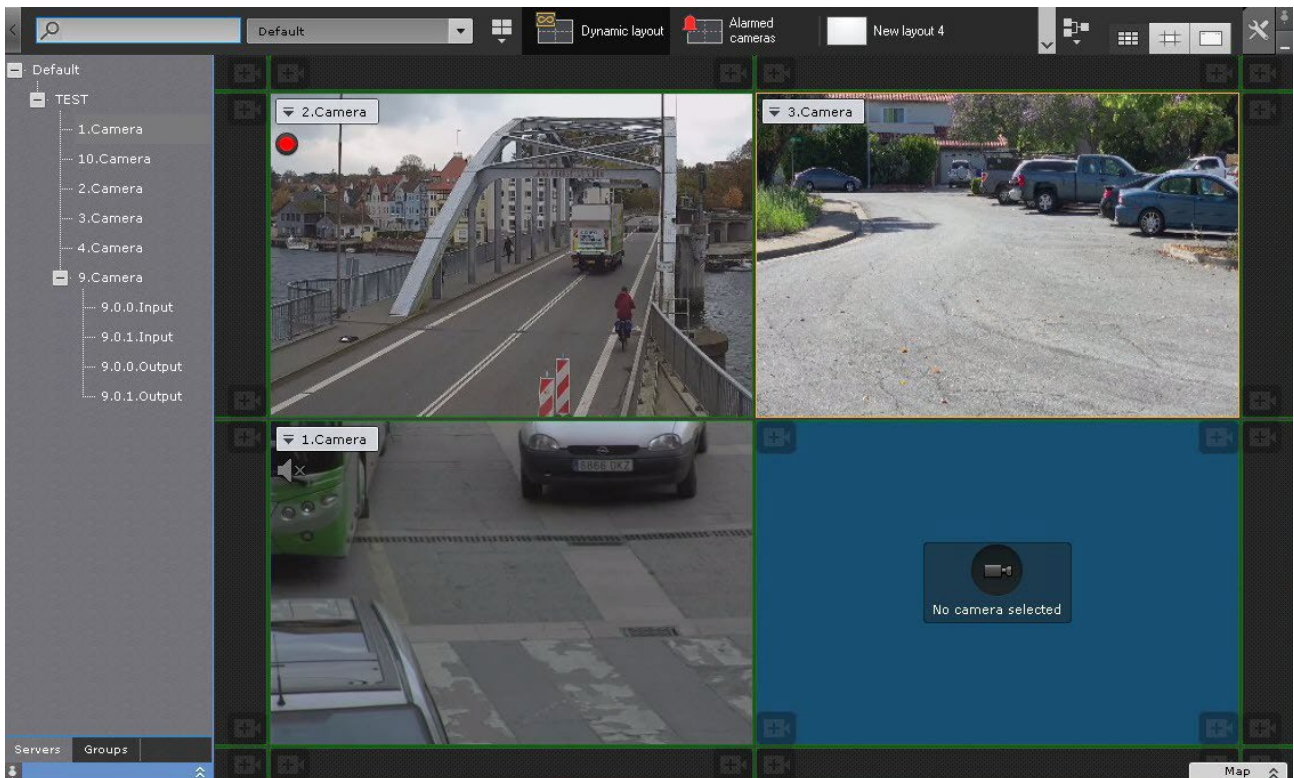
Selected Cameras layout

All selected cameras are displayed on this layout.

Dynamic layout

By default, Dynamic layout is empty. You can add cameras from the object panel (see [Objects Panel](#)(see page 615)) one by one or several at once (a group, all video cameras of the Server or Arkiv Domains).

To do this, select the target unit on the Object panel and drag&drop it to the layout. During camera drag&drop, the layout shows the grid. The empty cell with the cursor in it, is highlighted when you drag the camera.



If you switch from Dynamic layout to any other, all cameras remain in the current mode. Those in the Archive mode, will keep it when you return to Dynamic layout. The pointer position on Timeline remains intact either.

All changes to Dynamic layout are preserved until you exit the Client. After you launch the Client, the Dynamic layout is always empty.

However, you can back up your Dynamic layout at any given time (see [Layout copying](#)(see page 450)).

8.5 Monitor Management

8.5.1 Managing monitors on a local Client

You can display layout on any hardware monitor of a Client. To do it, follow the steps below:

1. Click anywhere on the local Client's monitor layout diagram (see [Monitor Panel](#)(see page 610)).


Note.

Client monitor management falls under user rights (see [Creating and configuring roles](#)(see page 431)).

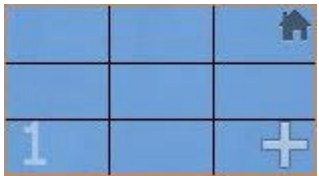

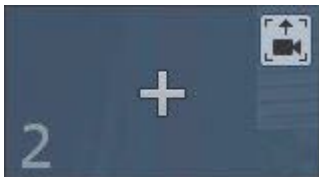
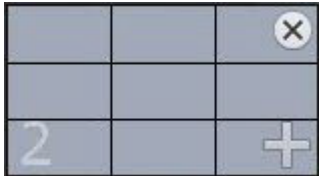
Monitors expanded views open.

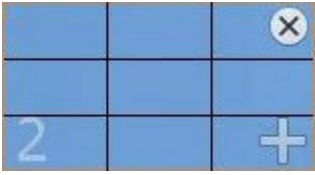


Note

Each monitor has its unique ID number. To display the ID number of a monitor, click .


The thumbnails may appear differently, depending on the status of the monitors in *Arkiv*.

Thumbnail	Monitor status
	Active main monitor
	Inactive main monitor
	Unassigned additional monitor
	Inactive additional monitor (video wall)

Thumbnail	Monitor status
	Active additional monitor (video wall)

Note.

The image of the monitors shows the currently open layout.

2. To display the layout on the monitor, you have to:
 - a. Click the **+** button on the non-distributed additional video monitor's thumbnail. The additional monitor becomes active, and the layout of the main monitor is duplicated to it.
 - b. Set up a layout on an additional monitor (see the [Configuring layouts](#)(see page 447) section). You can configure the layout of the additional monitor through the main monitor (the additional monitor must be active). Changes affect only the additional monitor; the layout of the main monitor is not changed.
 - c. Click the main monitor's thumbnail. The additional monitor becomes inactive, and the original layout is displayed on the main monitor. If the additional monitor becomes inactive, editing of the layout does not affect it.
3. To display a currently selected camera on the main monitor, do the following:
 - a. Click the  button on the non-distributed additional video monitor.
 - b. Selecting a camera on the primary monitor makes its video feed visible on the additional monitor.

The additional monitors are now configured.

To edit a layout on an additional monitor, do the following:

1. Activate the additional monitor (by clicking its thumbnail).
2. Edit the layout.
3. Make the additional monitor inactive.

You can change the set of cameras to be displayed on the main or additional monitor using the Objects Panel; these changes are not saved, and the initial layout is restored after rebooting the Client. To do it, follow the steps below:


1. Open and lock the Monitor panel (see [Monitor Panel](#)(see page 610)).
2. Open the Objects Panel (see [Objects Panel](#)(see page 615)).
3. Using the **Ctrl** or **Shift** keys, select one or several cameras on the panel.
4. Left-click on any selected camera.
5. Drag the camera icon onto a desired cell on the main or additional monitor's layout diagram.
6. Release the mouse button.

Note

The result of the object search is displayed on both the main and additional monitors.

Another way to move a video camera to the required cell on the layout diagram of the main or additional monitor, or between them is to grab the camera's icon on the interactive map (see [Working with the Interactive Map](#)(see page 766)) or on the object tree.

You can also move a group of cameras, all cameras from a Server or an Arkiv-domain.

You can close main and additional monitor views separately. To close an additional monitor in *Arkiv*, click the  button on its thumbnail.

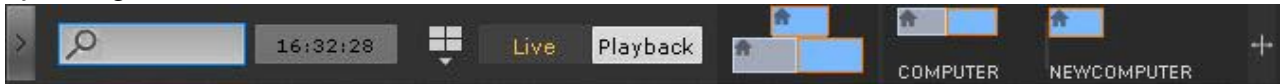
8.5.2 Managing monitors on remote Clients within the Arkiv-domain

Having appropriate user rights, you can remotely manage monitors on remote Clients connected to a Server within the Arkiv-domain (see [Creating and configuring roles](#)(see page 431)).

The following actions are possible:

1. Add a layout to an additional monitor of a remote Client.
2. Select another layout or a camera on the additional monitor.
3. Edit a layout on the main or additional monitor.
4. Shut down the additional monitor.

To display a layout on the additional monitor of a remote Client, click anywhere on the required Client's monitor layout diagram, and select a non-distributed video monitor (see [Monitor Panel](#)(see page 610)).



Note

You can add a layout to the additional monitor of a remote Client the same way as you do it for a local Client (see [Managing monitors on a local Client](#)(see page 759)).


To select another layout on a remote Client's monitor, do the following:

1. Select the desired layout on the local Client (see [Selection and Slideshow of Layouts](#)(see page 755)).
2. Click anywhere on the remote Client's monitor layout diagram, and then on the required monitor's view.

The selected layout will be displayed on a selected monitor of the remote Client.

If a single camera is displayed on the remote Client's additional monitor, you can switch to another camera by selecting it through the local Client.

To edit the remote Client's main or additional monitor layout, do the following:

1. Select (see [The Layouts Panel](#)(see page 611)) or configure (see [Creating and deleting layouts](#)(see page 448)) the desired layout on the local Client.
2. Click anywhere on the remote Client's monitor layout diagram.
3. Click the  on the main or secondary monitor layout diagram.



The remote Client's layout is saved, and will be available after rebooting the Client.


You can change the set of cameras to be displayed on the main or additional monitor using the Objects Panel; these changes are not saved, and the initial layout is restored after rebooting the Client. To do it, follow the steps below:

1. Open and lock the Monitor Panel (see [Monitor Panel](#)(see page 610)).
2. Open the Objects Panel (see [Objects Panel](#)(see page 615)).

3. Using the **Ctrl** or **Shift** keys, select one or several cameras on the panel.
4. Left-click on any selected camera.
5. Drag the camera icon onto a desired cell on the main or additional monitor's layout diagram.
6. Release the mouse button.

Another way to put a camera into a desired cell on the main or secondary monitor layout diagram is to capture the camera's icon on the interactive Map (see [Working with the Interactive Map](#)(see page 766)).

You can also move a group of cameras, all cameras from a Server or an Arkiv-Domain.

To close an additional monitor on a remote Client, click the  button on the monitor's thumbnail.

8.6 Audio Monitoring

8.6.1 General Information

Audio monitoring of a situation is carried out using the microphones that correspond to a video camera surveying the situation.

In different viewing tile modes, different audio monitoring functions are accessible:

1. Live playback mode – listening to sound from a microphone in real time; playing back sound from Client microphone on camera speakers.
2. Archive mode, Alarm Management mode, Archive Search mode – playback of sound recorded from a microphone.

Note

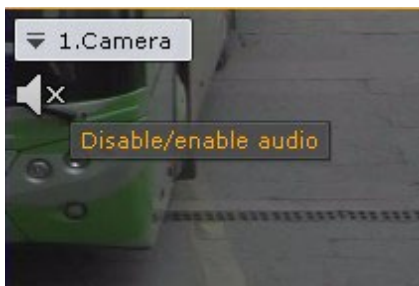
In Archive mode and Archive Search mode, an audio recording can be played back only from the microphone corresponding to the currently selected video camera, and only in forward playback mode at a speed of 1x.

8.6.2 Listening on the Client to sound from a camera microphone

Attention!

The **Microphone** object must be enabled (see the section titled [The Microphone Object](#)(see page 149)).

To listen on the Client to sound from the microphone of a camera, left-click to activate the speaker icon in the viewing tile.



Note

Audio from only one camera can be played back at a time

The speaker icon now becomes active and a volume slider appears.



Volume is controlled using the volume adjuster.

The far left position of the adjuster represents the minimum volume, and the far right position represents the maximum volume.

Note

The *Arkiv VMS* has an embedded sound booster.

To turn off audio playback, click the speaker icon again.

If a camera has several microphones connected, use the following procedure to select the audio source:

1. Open the camera's context menu.
2. Select **Sound**.



3. Select the microphone you need.

**Note**

The currently selected microphone is marked as **On**. If you select a **7.0** microphone, the **9.0** microphone is set to off, and **7.0** microphone to on.

Note

If a currently specified loudspeaker goes offline, the system automatically switches to another available one.

After the first loudspeaker goes back online, no automatic switching will occur.

To automatically activate the first loudspeaker in such a case, you have to create a `NGP_PORTSOUND_HOSTAPI` system variable and set it to DS (see [Appendix 10. Creating system variable](#)(see page 927)).

8.6.3 Playing back sound from Client microphone on camera speakers

- [Audio transmission from the Client's microphone behind NAT to the Server's or camera's loudspeaker](#)(see page 925)

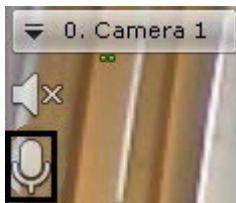
Sound from the Client microphone can be broadcast both on a single camera and on all cameras in a layout.

□ **Attention!**

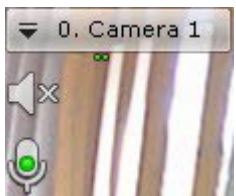
To use this option:

1. Configuration of audio on the Client is now completed (see [Configuring audio on the Client](#)(see page 550)).
2. **Speaker** objects are activated for the corresponding cameras (see [The Speaker Object](#)(see page 158)).

To broadcast sound on the speaker of a single camera, left-click the microphone icon in the viewing tile.

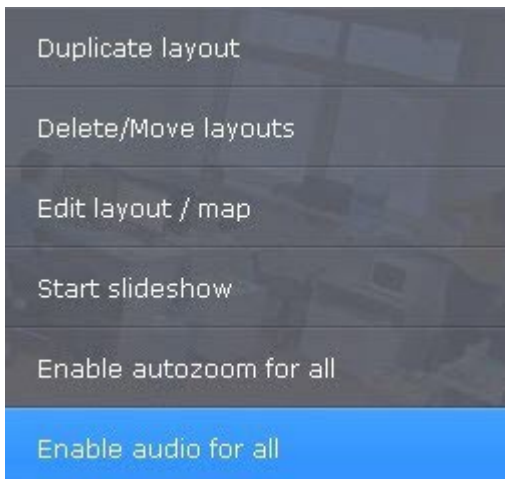


The microphone icon now becomes active.



To turn off broadcasting of sound on a camera speaker, click the microphone icon again.

To broadcast sound on speakers on all cameras in a layout, in the context menu of the layouts ribbon, select **Enable audio for all**.



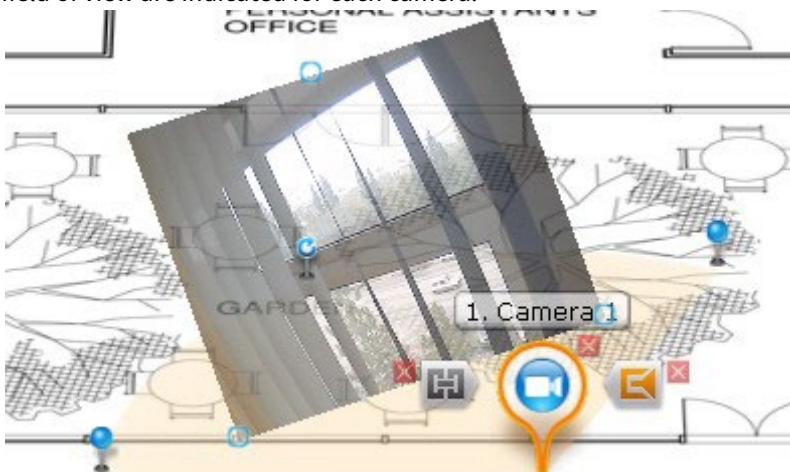
The microphone icon is then activated for all cameras that have an activated **Speaker** object.
To turn off sound broadcasting on all cameras, select **Disable audio for all**.

8.7 Working with the Interactive Map

You can use the interactive map in three modes:

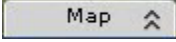
1. 3D mode, in which both the map and layout are available.
2. 2D mode, in which only the map is available.
3. Immersion mode, in which video is overlaid on the map.

The map can contain icons for cameras, inputs, outputs, and counters. The area in which live video is displayed and field of view are indicated for each camera.

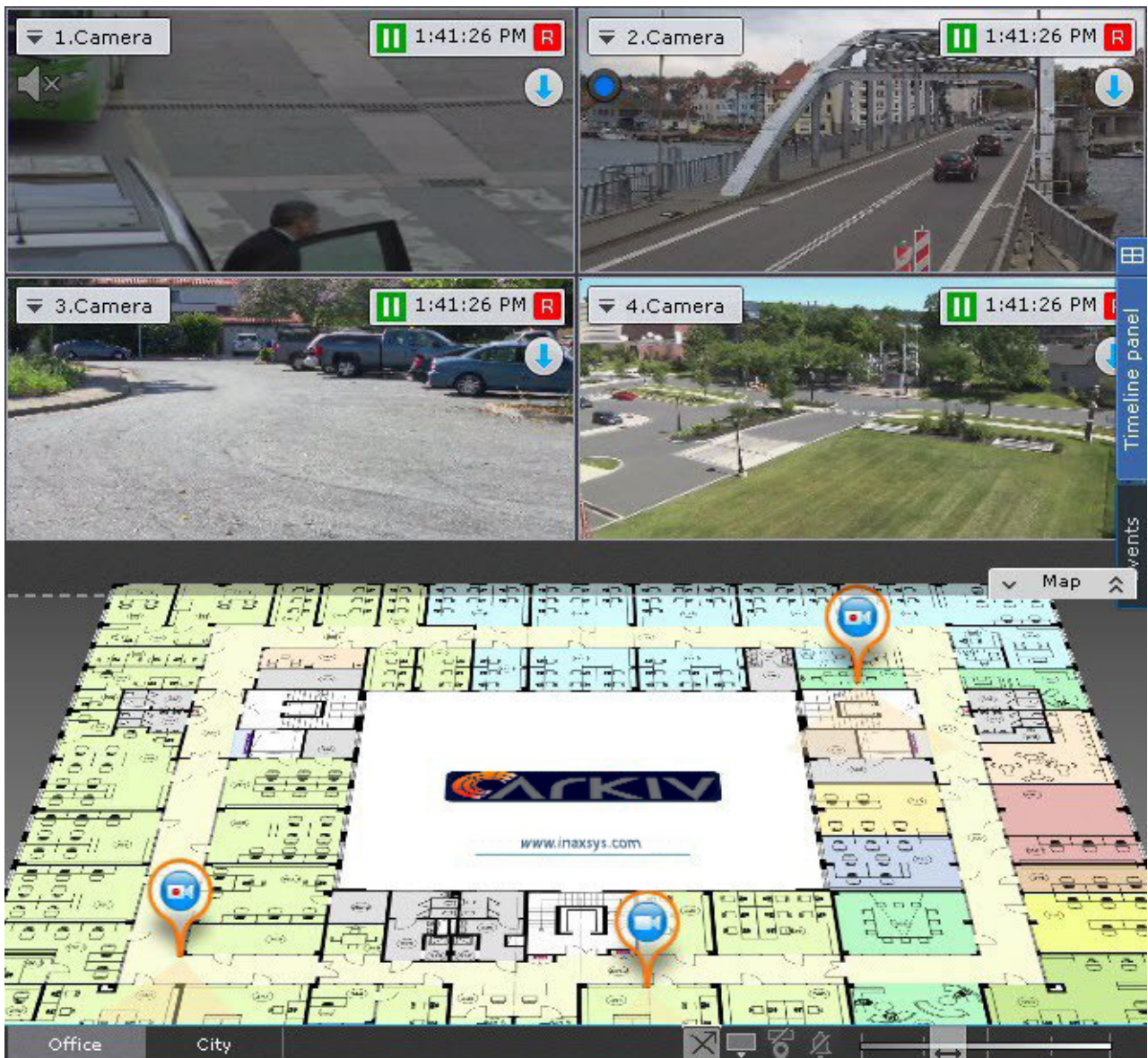



8.7.1 Opening and closing the map

You can switch to Map View from all modes of operation except for Archive Search.

To go Map View, click the **Map** button in the bottom right corner .

The Map will open in a 3D view while the current layout contracts to fit the screen area over the map.



To switch to 2D map view and close the layout, click the  button to the left of the **Map** button.

If you expand a tile to full screen, the map auto-hides (see [Scaling the surveillance window](#)(see page 622)).

Note

When you minimize the tile, the map appears again.

8.7.2 Geo map search

Using the OpenStreetMap web service, you can search for sites or streets within a pre-defined city/town (see [Setting keywords for geo map search](#)(see page 498), refer to [the provider's website](#)¹⁷⁸ for details).

¹⁷⁸ https://wiki.openstreetmap.org/wiki/Main_Page


To do so, enter the street name in the corresponding field, and press **Enter**.



8.7.3 Changing the map tilt

You can change the tilt of the map by adjusting the border between the map and the layout areas.



To switch to 2D map view and close the layout, click the  button to the left of the **Map** button.

Note

You can also switch to 2D when the map is hidden.



To return to 3D, click the **Map** button. To close the map, click the  button.

8.7.4 Scaling and focusing of map

Map scale and focus can be changed both manually and automatically.

Note

The map is automatically resized and refocused if this function is activated in the settings (see [Configuring map auto zoom](#)(see page 528)).

Automatic adjustment of map scale and focus occurs when a video camera alarm occurs, if no video camera icon is selected on the map.

In this case, the map is scaled and refocused to center the icon for the alarm camera on the map.

If alarms occur for several video cameras simultaneously, the map scale and position are adjusted to show all icons for the relevant video cameras.

After a video camera alarm ends and there are no alarms for other video cameras, the map scale and position return to their initial status.

Automatic scaling and focusing of the map stops when the user clicks to select the icon of a video camera on the map or viewing tile.

To manually adjust the map scale, use the mouse scroll wheel (the cursor must be above the map) or use the map scale slider.



After increasing the scale, you can refocus the map with the mouse (by clicking and holding the left mouse button) in the direction of your choice.

8.7.5 Customizing an Interactive Map



You can change some of the map settings in Live Video. Use the controls in the bottom right corner of the screen.





You can adjust transparency of video display in the Map View using a dedicated slider in the bottom right corner.



The leftmost position corresponds to no video, the rightmost makes the video opaque.

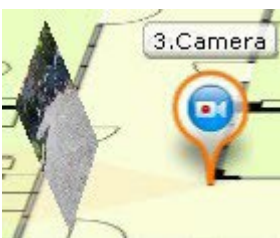
Use the  /  button to toggle the display of devices' names and their IDs.

To enable/disable camera icon fluttering on alarm, use the  /  button.

To change the action when you click on the video camera icon on the map, use  (takes you to the layout with the camera) /  (switches to immersion mode (see [Immersion mode](#)(see page 774))).

To change map view, use the button  (3D view) /  (flat view).

Video in 3D view:



Video in flat view:

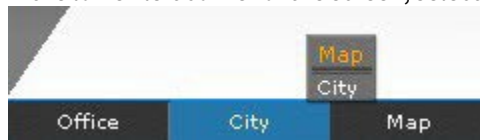


8.7.6 Switching between maps

In any mode, you can switch between the maps that have been created in the system.

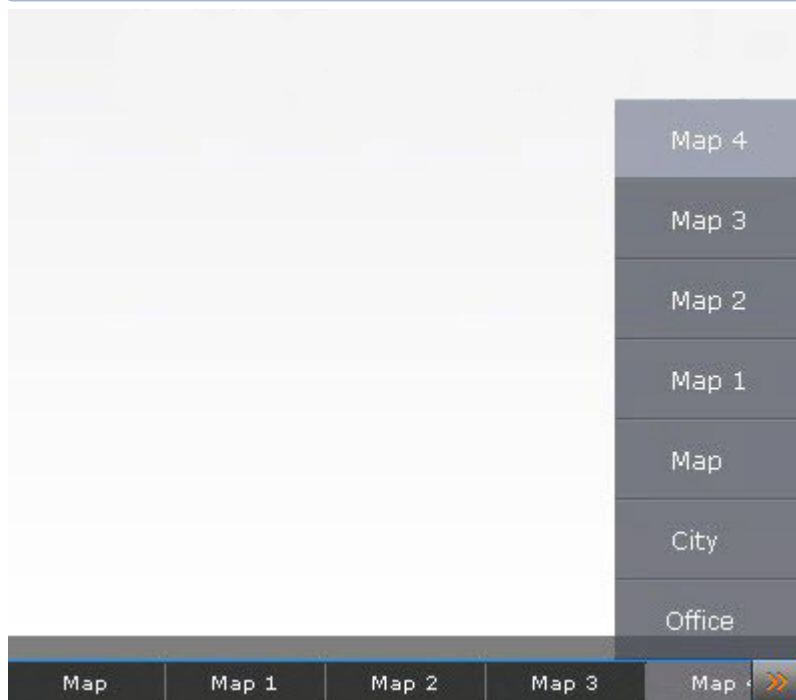
You can switch between maps in two ways:

1. In the lower-left corner of the screen, select the corresponding tab.



Note

If many maps have been created, some tabs may not fit on the screen. If this happens, click the button. In the drop-down menu that opens, select a map.



2. By left-clicking a map icon for switching, if it has been created (see [Adding switches to another map](#) (see page 493)).




The icon header shows the name of the destination map.





8.7.7 Controlling devices from the map

You can manage devices on the map (video cameras, outputs) by using the context menus of the corresponding icons. You can control devices in all modes.

Commands for controlling video cameras are given in the table below.

Command (context menu item)	Condition	Icon status after the command is performed
Arm	The camera is disarmed	
Private Arm Arming and Disarming a Video Camera (see page 644)	The camera is disarmed	
Disarm	Camera armed	

Commands for controlling outputs are given in the table below.

Command (context menu item)	Condition	Icon status after the command is performed
Turns the output on	Output in normal status	
Disable output	Output is activated	







Note

From within the map, you cannot switch the status of the output if there are macros with the corresponding action running in the system.



8.7.8 Displaying device status

The icons on the map indicate the current status of the corresponding devices.

The possible states of the video camera icon are described in the table below.

Map icon	Camera status
	Camera disarmed, no archive recording
	Camera disarmed, archive recording active
	Camera armed, no archive recording
	Camera armed, archive recording active
	Camera alarm, archive recording active
	Camera connection lost





The possible states of the Output icon are described in the table below.

Map icon	Output status
	Output is activated
	Output in normal status

Note

When a macro changes the Output status, the Output icon on the map does not change.

The possible states of the Input icon are described in the table below.

Map icon	Input status
	Video camera is armed, Input is in normal status
	Video camera is armed, Input is in alarm status
	Video camera is disarmed, Input is in normal status
	Video camera is disarmed, Input is in alarm status

Inputs (sensors) connected to Tibbo boards also show temperature/humidity values on the map (see [Setting up Tibbo relay/loop boards](#)(see page 177)).

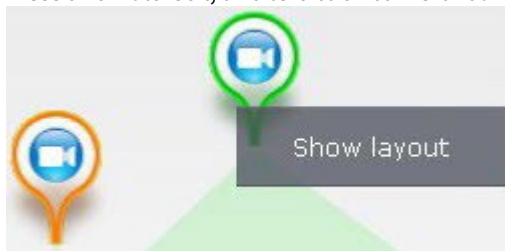


8.7.9 Selecting Cameras for a Temporary Layout

You can use the Map to select cameras for viewing their video feeds on a temporary layout.

Do the following:

1. Press and hold Ctrl, and left-click camera icons.



2. Click the **Show layout** button.


The selected cameras' views appear on the temporary layout which is not preserved after you switch to any other layout.

8.7.10 Immersion mode


In Immersion mode, video from a selected camera is overlaid on the map display.

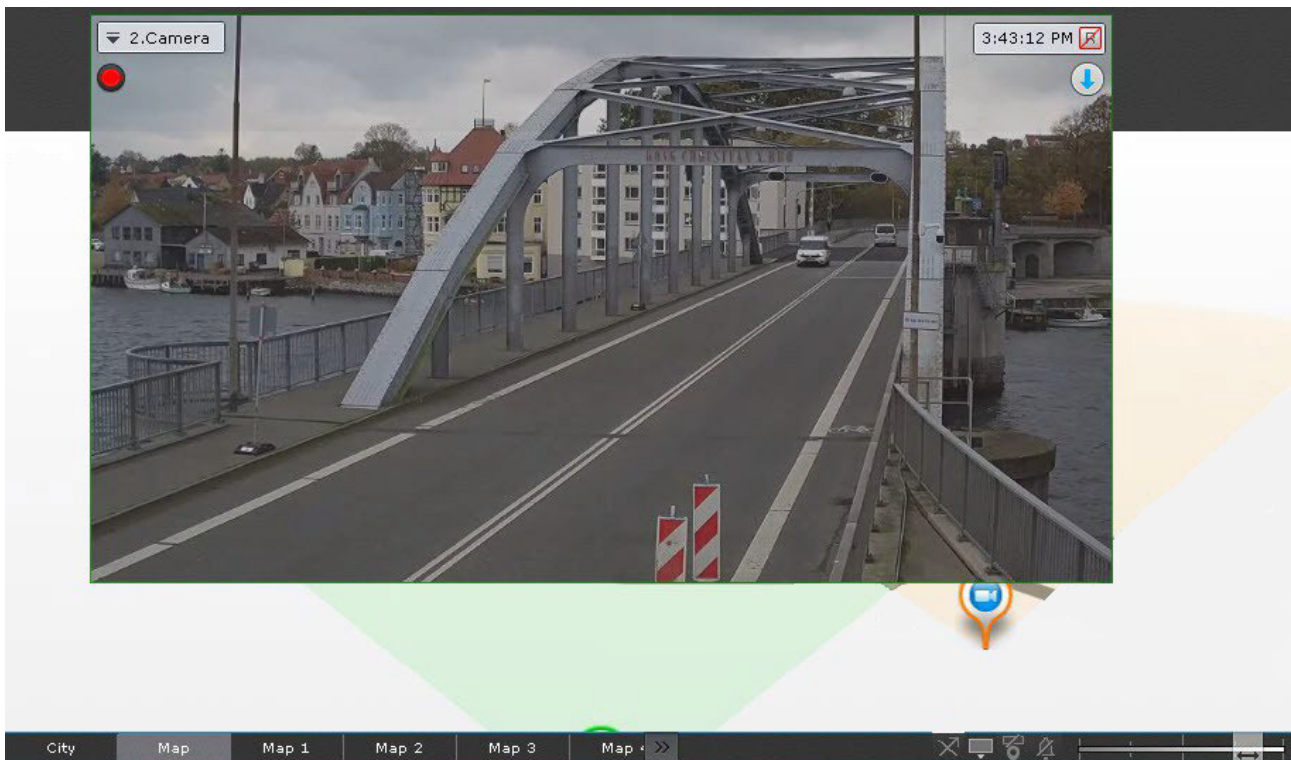
If links have been created between video and the map (see [Configuring cameras in immersion mode](#)(see page 496)), an angle will be chosen so that objects in the video match the objects as depicted on the map.

If links have not been created, the map is shown so that the video is located in the field of view specified for the camera on the map. The field of view is oriented upwards.

To switch to Immersion mode, click the  button on the right border of the viewing tile or, on the map, left-click a video icon, field of view, or video display area.

Note

The second method is possible if the button  is not pressed (see [Customizing an Interactive Map](#)(see page 770)).





In Immersion mode you can view video from only one video camera at a time.

To select another video camera, do one of the following:

1. Click the video camera icon or its field of view on the map, if possible.
2. Exit Immersion mode and select the necessary video camera on the map.

To exit Immersion mode, do one of the following:

1. Click the  button.
2. Minimize the viewing tile by clicking the  button.
3. Click a part of the map that does not contain the camera field of view.

□ Note

Actions 2 and 3 do not apply if a fisheye camera is in Immersion mode (see [Fish-eye cameras in immersive mode](#)(see page 734)).

8.8 Exporting Frames and Video Recordings

Users with the corresponding rights can export snapshots and video. If a Client is connected to multiple Arkiv-domains, export of snapshots and video is available only for cameras on the Arkiv-domains on which the user has the corresponding rights.

Still frames can be exported to JPG and PDF, videos can be exported to AVI, MP4, MKV and EXE formats.

Exported videos will contain synchro audio.

The name of the exported file contains the following information: name of camera, export date, and export duration.

□ Note.

The date and time of the event in the file name are given based on the Windows locale settings.

□ Note.

The file name can be up to 70 characters long.

When exporting a snapshot to PDF, you can also print the document immediately.

A digital watermark is added to exported snapshots and video. Watermark authentication is available in the corresponding bundled utility (see the [Digital signature verification utility](#)(see page 840) section).

□ Note

Exported videos and snapshots are digitally signed with the SHA-256 algorithm.


Titles containing a date and time stamp will be superimposed on exported video.

□ Note.


Captions are stored in a separate video track and, if necessary, are disabled in the player through software.

8.8.1 Frame export

You can export snapshots at any time when working with a camera in *Arkiv*. To export a snapshot:

1. If exporting from archive mode or archive analysis mode, specify an export area and mask if necessary (see the [Configuring export area and masks](#)(see page 783) section).
2. In the viewing tile, in the upper-right corner, click the  button.

Attention!

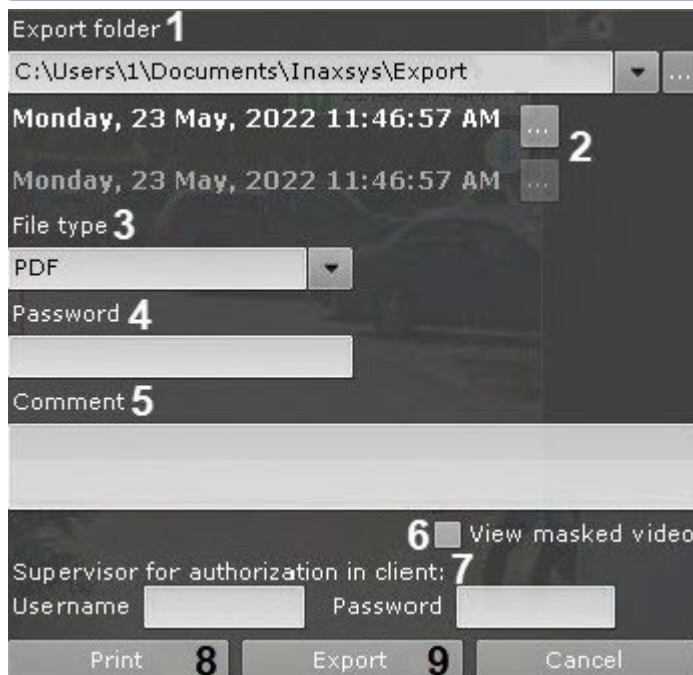
To instantly export a frame with standard settings, right-click the  button.

- Specify the folder to which you want to export the snapshot (1).

Note.

By default, snapshots are exported to the folder specified in the export settings (see the [Configuring export](#)(see page 545) section).

If you change this folder, the new path to exported files will be kept in memory until the Client restarts.



- Select the date and time for a snapshot (2). The default setting is the frame currently displayed in the viewing tile. If you are watching recorded video, then the snapshot with the frame displayed at the time when you hit the button.

Note.

If you are watching live video, then the snapshot with the frame displayed at the time when you hit the button. Date and time fields are not displayed.

- Select the snapshot format: PDF or JPG (3).
- If you want to export a snapshot to an encrypted zip archive, set a password (4).

Attention!

This setting may be overridden by the user role settings (see [Creating and configuring roles](#)(see page 431)).

- If exporting a snapshot to PDF format, you can add comments (5).

8. To export unmasked frames from the Video Footage, the user must have appropriate access rights. To perform such an export, check the **View masked video** box (6).
9. Enter the credentials of the supervisor who confirms the launch of export (7).

Note

The supervisor enters their password only if it is required by user rights settings. If no export confirmation is required, these fields will not be displayed.

10. If exporting to PDF, you can immediately send the file to print (8). In this case, the snapshot is not saved to disk.
11. To export the snapshot, click the corresponding button (9).

Export begins. Progress is shown in the export panel (see the [Viewing export progress](#)(see page 785) section).

Export of the frame is now complete. The frame exported to JPG will also be placed on the Clipboard.

8.8.2 Exporting Video Recordings




Standard video recordings export

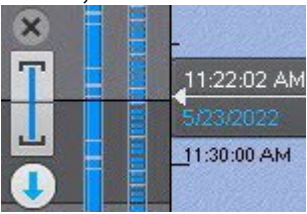



The standard export of the video recordings is performed according to the following procedure:

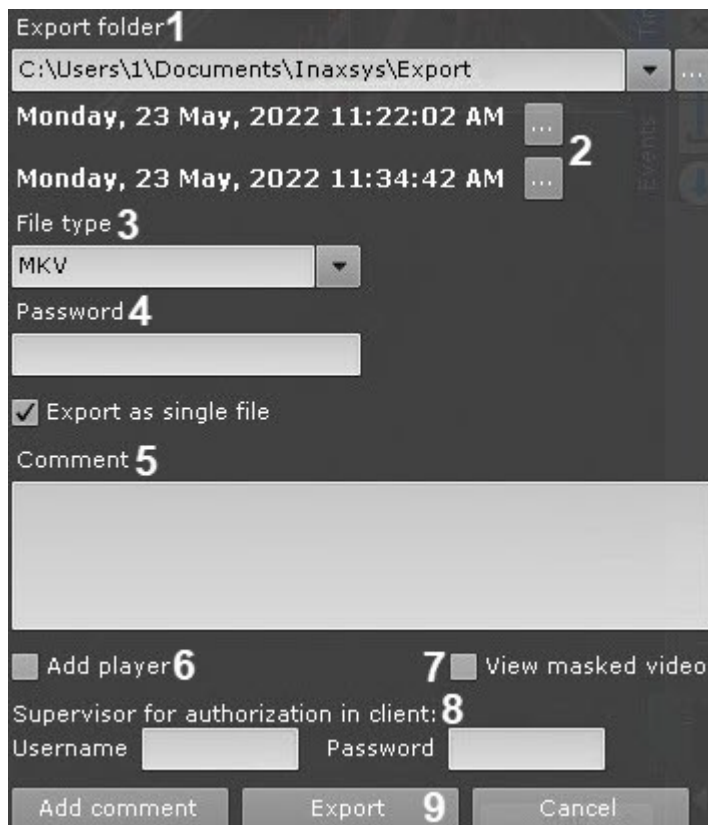
1. Setting the export interval.

Set the export interval on the primary or the secondary timeline. You can set the export interval later by entering the date and time (see item 3c below):

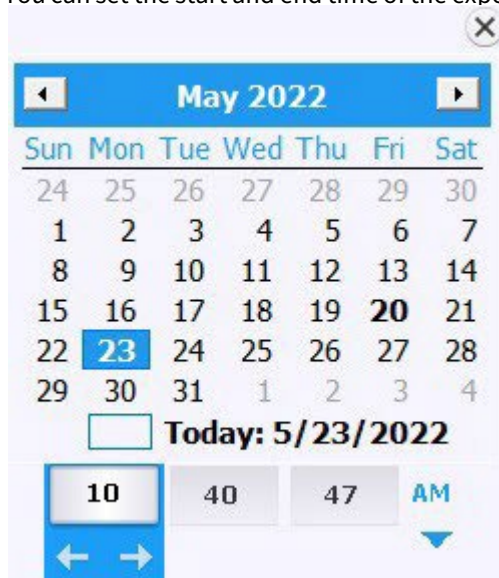
 - a. on the primary timeline, move the marker to the beginning of the interval that you want to export.

Click the  button. Move the marker to the end of the interval that you want to export. Click the  button. You can also select the export interval by using the right mouse button. To clear the interval, click the  button;


 - b. you can specify the interval on the additional navigation panel in the same way, by clicking the   buttons. You cannot use the mouse to select the export interval on the additional navigation panel.
2. Setting the export area and masks (see the [Configuring export area and masks](#)(see page 783)).
3. Setting the export format.
 - a. Click the  button on the timeline or in the surveillance window. The export window opens.



- b. If necessary, change the export path (1). By default, the file is exported to the folder specified in the settings (see [Configuring export](#)(see page 545)). If the folder was changed, the new path for the exported files is saved until the Client restart.
- c. You can set the start and end time of the exported interval using the calendar (2).



- d. If necessary, specify a different file format into which you want to export the video recording (3). Video recordings can be exported into the following 4 formats: MP4, MKV, EXE and AVI.

Note

Video recordings are exported into the MKV format without recompression. Video recordings are exported into the AVI format with recompression by the codec selected in the settings. Export into the AVI format may take longer because of recompression. In addition, the AVI format export increases the CPU load, especially when you export several files at once (see [Simultaneous export of video from multiple cameras](#)(see page 781), [Exporting all event videos](#)(see page 782)).

When video recordings are exported into the EXE format, an executable file is compiled, containing video recording, playback tools, and necessary codecs. When exporting into the EXE format, note that Windows OS does not allow launching executable files of more than 4 GB.

Attention!

If you export video recordings from the fish-eye camera in the EXE format, the entire panoramic view is exported, that can be rotated to the desired angle of view in the player. If the export is performed in the MKV, MP4 or AVI formats, the selected section on the camera in the layout interface is exported.

- e. If you want to export into the encrypted ZIP archive, set the archive password (4). When exporting into the EXE format, you will need to enter the password when you open the file.

Attention!

Setting a password will be mandatory, if this condition is set in the user role settings (see [Creating and configuring roles](#)(see page 431)).

- f. If necessary, add a comment to the export. The comment will be displayed as captions when the exported video recording is played back (5).
- g. If you export a video recording into the MKV or AVI format, and you need to add the Arkiv Player utility (see [The Arkiv Player User Guide](#)) to the same folder, set the corresponding checkbox (6).
- h. If there is a masked object in the exported video recording (see [Setting up privacy masking in Video Footage](#)(see page 503)), then if you have the appropriate access rights, you can export the unmasked video recording. To do this, set the **View masked video** checkbox (7).
- i. Enter the username and the password of the supervisor who confirms the launch of the export (8).

Note

Entering the supervisor password is only required if this is set in the access rights settings (see [Creating and configuring roles](#)(see page 431)). If the confirmation is not required for the export, these fields will not be displayed in the window.

- j. Click the **Export** button (9).

The export process starts. The progress is displayed on the export panel (see [Viewing export progress](#)(see page 785)).


Note

You can stop export at any time by clicking the **Stop** button.

Note


The duration of the exported file can be longer than the specified duration, because the key frame is not always at the beginning of the export interval.


Instant video export

You can instantly export video without needing to specify an export range. To do so, click the  button in a viewing tile at any time.

 Note.

Then specify export settings, as described in the [Standard video recordings export](#)(see page 778) section.

If export is performed from Live Video mode, the first frame of the exported video will be the moment when the  button was clicked. Export will continue for 10 minutes or until the **Stop** button on the export panel is clicked (see the [Viewing export progress](#)(see page 785) section).

If export is performed from Archive mode or Archive Analysis mode, the first frame of the exported video will be the position of the bar on the timeline when the  button was clicked. Export will continue for 10 minutes or until the **Stop** button on the export panel is clicked (see the [Viewing export progress](#)(see page 785) section).

The length of the exported video clip will depend on the time of export and resources of the Server.

 Note.

If export is performed from Archive mode or Archive Analysis mode, you can pre-configure an export area and masks (see the [Configuring export area and masks](#)(see page 783) section).

Simultaneous export of video from multiple cameras

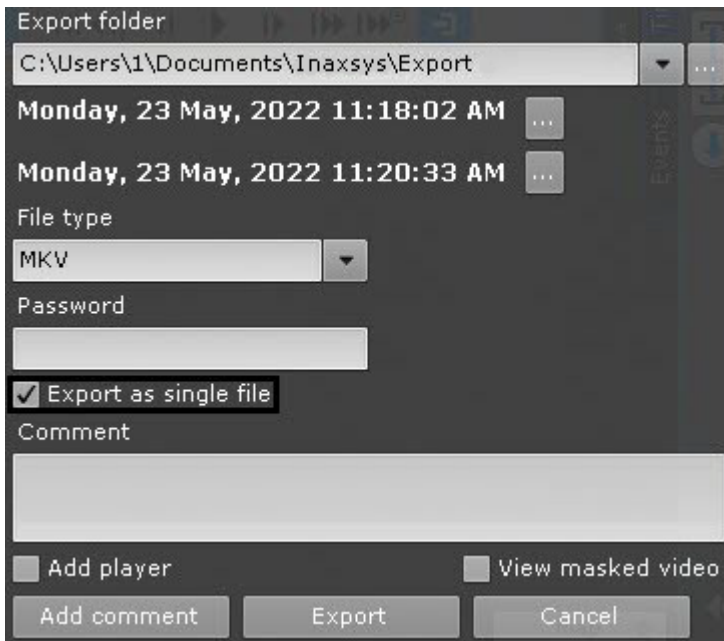
If multiple cameras in a layout have been switched to Archive mode, you can simultaneously export video from all of them.

To do this, select the export interval on the primary timeline or in the calendar and start exporting (see the [Standard video recordings export](#)(see page 778) section).

By default, the video is exported to a single file. To export video from different video cameras to separate files, deselect the **Export as single file** check box in the export window.

 Note.

When you export to one file, the streams are written in parallel. To view exported video, use a player that allows playing multiple instances and different streams in each (for example, VLC).



Video from each camera is exported to a separate file. Comments made during export are added to each exported video.

Note.

For each video you can pre-set an export area and masks (see the [Configuring export area and masks](#)(see page 783) section).

Exporting all event videos

You can use the Story board (see [Story board](#)(see page 619)) for one-click export of an event video from multiple cameras' Video Footage.


To do so, follow the steps below:


1. Click on the thumbnail of interest.
2. Set a time interval on the timeline for export.
This will add the thumbnail of the selected video clip to the Story board.



3. Click the + button in the middle of the thumbnail. The video clip will be added to the export batch.

Note

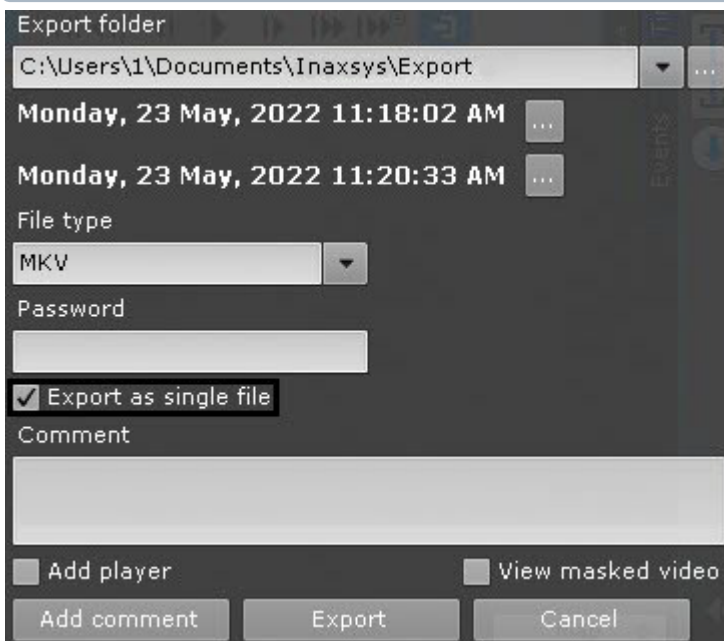
To remove it from the batch, click the  button.

4. Repeat these steps for all videos of interest.
5. Click the  button to export all selected clips.

By default, the video is exported to a single file. To export video from different video cameras to separate files, deselect the **Export as single file** checkbox in the export window.

Note.

When you export to one file, the streams are written in parallel. To view exported video, use a player that allows playing multiple instances and different streams in each (for example, VLC).



This opens the Export window. Follow the same steps as with the standard export procedure (see [Standard video recordings export](#)(see page 778)).

Note

We recommend you to export to the EXE format.


8.8.3 Configuring export area and masks

If you are exporting a snapshot or video from Archive mode or Archive Analysis mode, you can specify an export area and masks.

You can specify an export area and masks at the same time.

By specifying an export area, you export only the portion of the frame that is of interest, while omitting the remainder.

To specify an export area:

1. In a viewing tile, click the  button.
A rectangular area with four corner points is displayed.




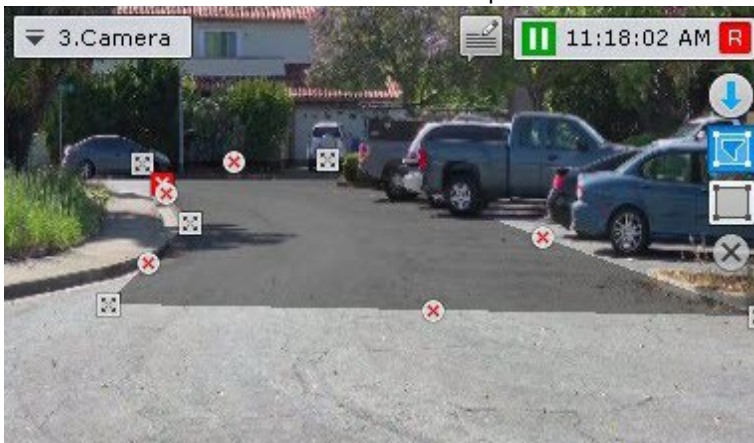
2. Reposition the corner points to specify the area that you want to export. To reposition the corner points, left-click a corner point and drag it.

Configuration of the export area is now complete.


Masking allows you to hide complex or irrelevant areas of the frame so that they do not appear in an exported file. You can set an unlimited number of masks.

To specify a mask:

1. In a viewing tile, click the  button.
2. Use the corner points to enclose the area that you want to mask. To add a corner point, left-click the video. You can add an unlimited number of corner points.

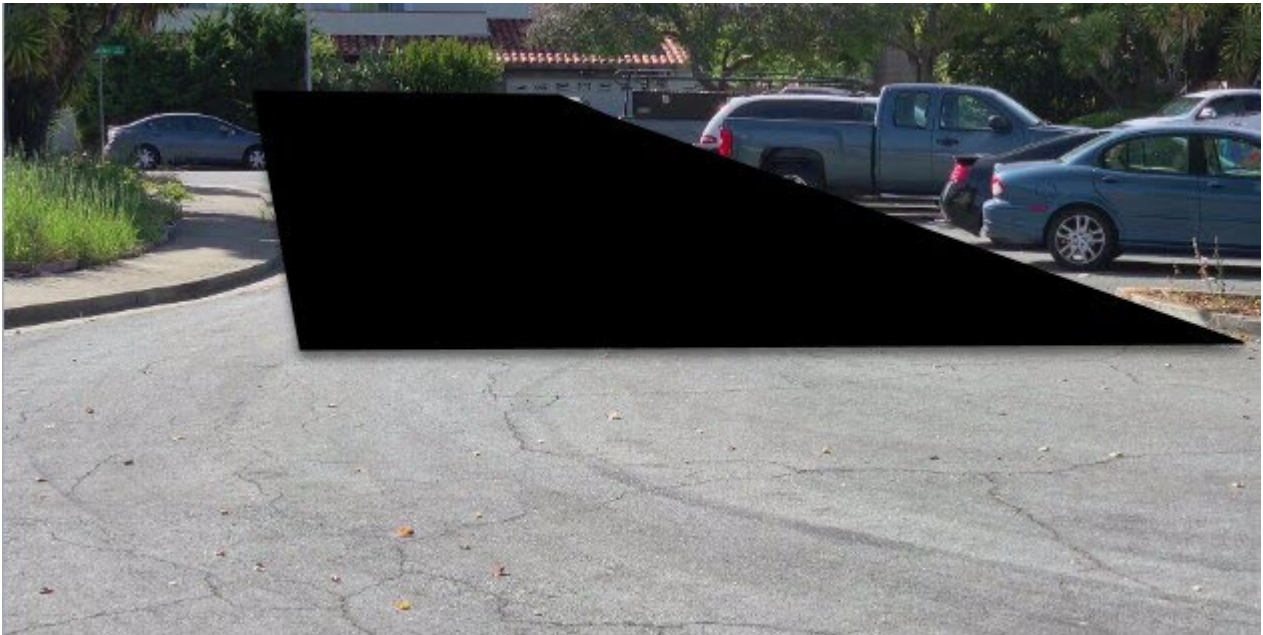


After you add a mask, you can perform the following actions:

- move corner points (left-click a corner point and drag it),
- delete corner points (right-click a corner point),
- delete a mask (click the  button),
- add a new mask.

Mask creation is now complete.

In the exported snapshot or video, the masked area is filled in with black.





8.8.4 Viewing export progress


After export is started, the export progress is displayed on the export panel. The export panel is displayed near the top of the monitor after the export process is started, and is hidden after all messages are closed.



To stop the export process, click the **Finish** button. In this case the file will be saved. The length of the exported fragment will depend on the export time and resources of the Server.

To cancel export, click the **Cancel** button. In this case, the file is not saved.

If several export processes are active, you can switch between them by clicking the   buttons. The following information is displayed between them: number of the current export operation/total number of export operations (export progress for all operations).

To close the export progress message, click the  button.

Note.

If export is active, you cannot close the message.

If an error occurs during export, it will be indicated on the dynamic error panel (see [Control in Live Video mode](#)(see page 787)).



8.9 Macros control

A macro may include settings (see [Create Macros](#)(see page 382)) to display the  control menu in the upper panel.



Those macros that are currently active (enabled as **Always** or within a time schedule, see [Create Macros](#)(see page 382)), are marked as **(On)**. To enable or disable macros you need to select them in the list. When you disable a macro, the mode is changed to **Never**.

Note

If you disable a macro, which is active within the time schedule, then this mode will be restored after reactivation.

Note

The status of the macro in the menu changes only a few seconds after a command is completed.

Event-driven macros can be triggered by using the corresponding buttons on the Dialog board (see [Working with Dialog Board](#)(see page 752)) or by using hotkeys.

8.10 Event Control

Event control in the *Arkiv* software package can be conducted in three ways:

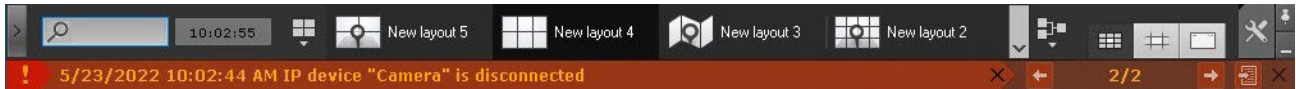
1. In Live Video mode.
2. Using the system log.
3. By logging events in external logs.

Note

Configuration of logging to external files is carried out through the log management utility (see the section [Log Management Utility](#)(see page 835)).

8.10.1 Control in Live Video mode

Messages about system errors which have occurred are displayed in real time on a dynamic error panel. When there are no unaccepted errors, this panel is not displayed; when there are such errors, it is displayed in Arkiv's **Layouts** tab.



Note

This feature is configured on the **Permissions** tab (see the section [Creating and configuring roles](#)(see page 431)).

To accept an error and delete it from the error panel, click the cross.

To accept all errors and close the error panel, click the cross on the right-hand side of the panel.

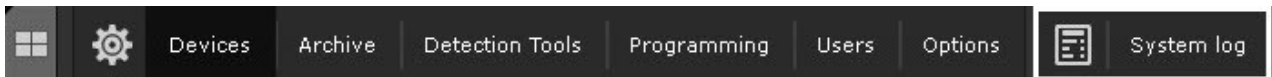
To switch between error messages, click the   buttons.

To jump to System log (see [The System Log](#)(see page 787)), and open error messages, click the  button.

8.10.2 The System Log

Information about events which have occurred in the system is stored in the system log.

To access the system log, select **Settings** → **System log**.



When you do this, a window appears which can be used to search, view, and export system log events.

Setting Event Search Filters

To view and/or export system log events, first you need to perform a search for them.

To search for system log events, you need to set one or more filters:

1. Time period during which the events were recorded.
2. Event type:
 - a. Information,
 - b. Alarm,
 - c. Error,
 - d. Debug info,
 - e. Audit – user actions log.
3. A key phrase contained in the system event descriptions.

Note

The time period is a mandatory filter, while the event type and key phrase are optional.

Search filters can be set as follows:

1. In the **From (1)** and **To (2)** fields you can enter the date and time of the beginning and end of the period during which the events you are searching for were recorded.

Note

The date format is DD-MM-YYYY and the time format is HH:MM:SS.XXX.

Note

By default, the event search period is defined as the past 24 hours.

2. Selecting event types for search (3).
3. Select the Arkiv domain where you need to search for events (4).
4. If user actions search was selected (the **Audit** type), choose a particular system user (5). If no user is selected, the search function will return actions of all system users.
5. Enter the text that matches the events you want to find in the **Search** text field (6). To find license plate numbers, enter the full or partial number. Use **?** (any one character) and ***** (any number of any characters). For example, a search query **?20*** shows all vehicles with a license plate containing **2** and **0** in the second and third position respectively. The total number of characters in number plates can be arbitrary.

Attention!

You can use OR and AND logical operators when searching data in the system log:

- to search with the OR logical operator, separate the words with the symbol "|";
- to search with the AND logical operator, use a space.

The event search filters have been set.

Next you must start the event search (see the section titled [Event search procedure](#)(see page 788)).

Event search procedure

To start a search for system log events which satisfy the filters which have been set (see the section [Setting Event Search Filters](#)(see page 787)), click the **Search** button (1).

The screenshot shows the 'Filter parameters' section of the Arkiv software. It includes fields for 'From' (5/23/2022 12:00:00 AM) and 'To' (5/23/2022 11:59:59 PM), a 'Search' input field with a 'Search' button, and a 'Back' button. A checkbox labeled 'Add new events to results of the search' is present. The 'Event type' section has checkboxes for 'Debug info', 'Info', 'Alarm', 'Error', and 'Audit', with 'Debug info' selected. The 'Available domains' dropdown is set to 'All domains', and the 'User' dropdown is set to 'All users'. An 'Export' button and a 'Clear' button are also visible. Below the filters is a table of search results with columns for 'Date & time', 'Event type', and 'Description'. The table contains 10 rows of event data.

Date & time	Event type	Description
5/23/2022 11:40:26 AM	Info	Camera "3.Camera". End of detection Motion in area triggering Extended info: "Motion in area"
5/23/2022 11:40:26 AM	Debug info	Macro "3.Camera: Motion in area" deactivated
5/23/2022 11:40:26 AM	Info	Finished recording to archive "Archive Aqua" from camera "3.Camera"
5/23/2022 11:40:26 AM	Info	Started recording to archive "Archive Aqua" from camera "3.Camera"
5/23/2022 11:40:26 AM	Debug info	Macro "3.Camera: Motion in area" activated
5/23/2022 11:40:26 AM	Info	Camera "3.Camera". Beginning of detection Motion in area triggering Extended info: "Motion in area"
5/23/2022 11:40:20 AM	Info	Camera "3.Camera". End of detection Motion in area triggering Extended info: "Motion in area"
5/23/2022 11:40:20 AM	Debug info	Macro "3.Camera: Motion in area" deactivated
5/23/2022 11:40:20 AM	Info	Finished recording to archive "Archive Aqua" from camera "3.Camera"

When you do that, a search results table appears (2).

To accept all errors and close the error panel, click the **Clear** button (3).

Refreshing Event Search Results

You can automatically refresh the event search results table, i.e., add events to it which happened after the search was started (see the section [Event search procedure](#)(see page 788)). To do this, select the **Add new events to results of the search** checkbox.

This is a close-up of the 'Filter parameters' section, specifically focusing on the checkbox labeled 'Add new events to results of the search' which is currently unchecked.

Note

Select this checkbox to update events automatically with no need to search again.

Viewing Event Search Results

System log event search results are displayed in a table (1).

Note

Events in the table are sorted by the date they were registered, beginning with the most recent one.

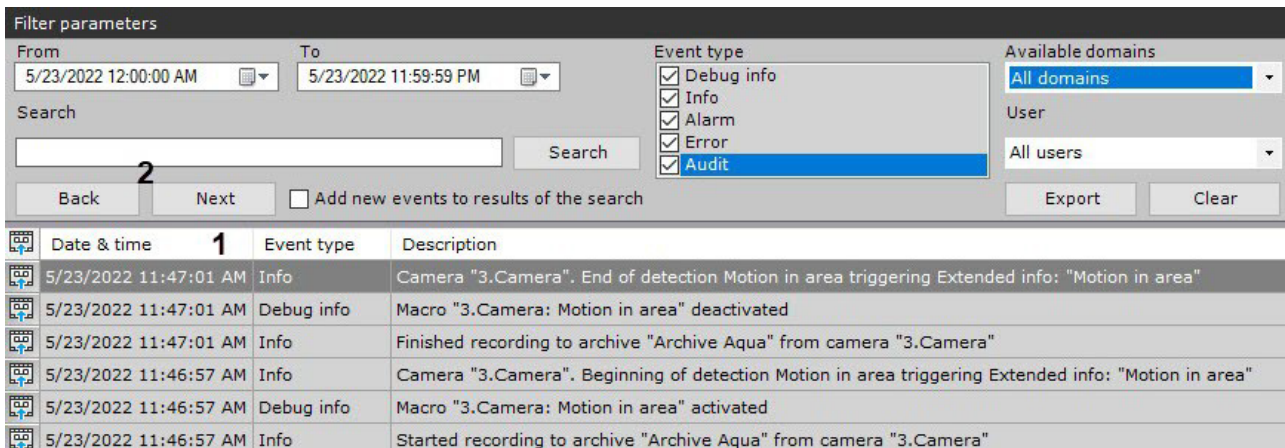


Table column	Contents of column
	Switching to archive video of specific events
Date & time	Date and time of the event was recorded in the system in the format DD.MM.YYYY HH:MM:SS
Event type	Event type (Information, Alarm, Debug info, Error)
Description	System description of the event

The search results table may be more than one page. To navigate through a table which is more than one page, use the following buttons (2):

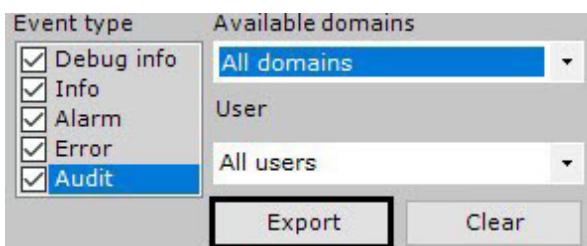
1. **Back** – go back to the previous page of the table.
2. **Next** – go to the next page of the table.

Note

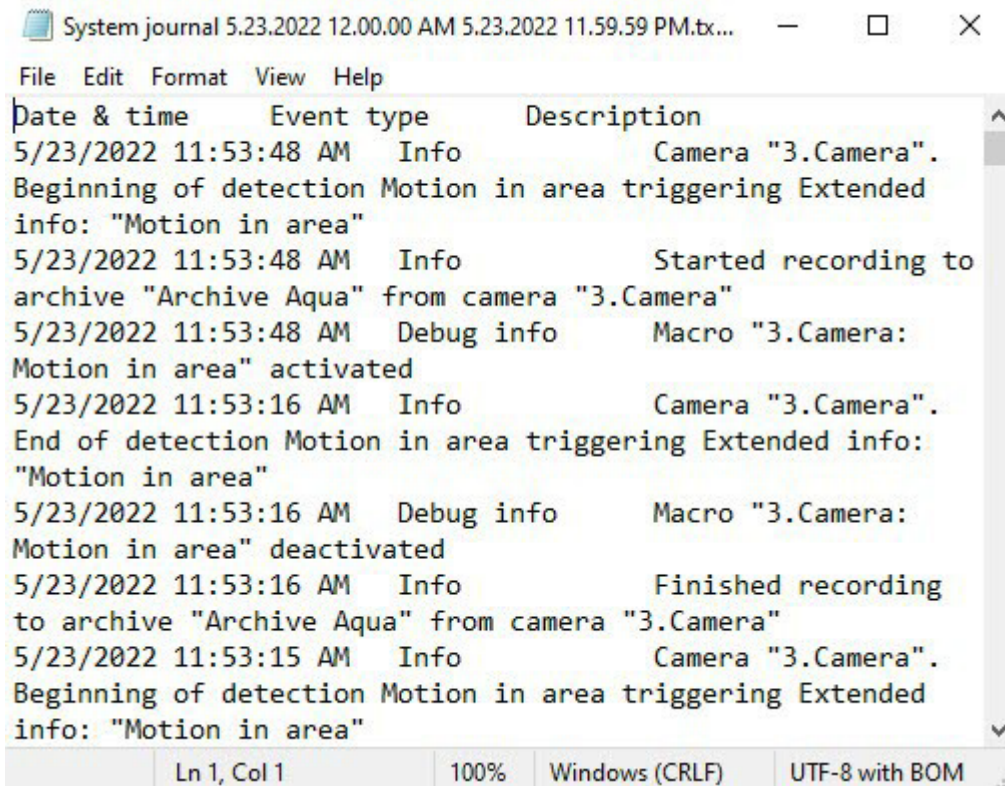
Once the *Arkiv VMS* is installed, the log may show a **Table end violation** error. This is part of the installation routine and not a bug.

Exporting Event Search Results

To export the system log event search results, click the **Export** button.



When you do this, the standard Windows “Save as” dialog box appears, using which you can save the search results as a file with a .txt (text) extension or .csv (comma-separated).











Switching to archive video of specific events

To switch to archive video of specific events, click the  icon next to the event or double-click the relevant row.

Note

Archive viewing can be triggered by events coming from cameras, inputs (sensors) and outputs (relays). To make it work, I/O must be linked to a particular camera (see [The Input Object](#)(see page 153), [The Output Object](#)(see page 156)).

	Date & time	Event type	Description
	5/23/2022 11:47:01 AM	Info	Camera "3.Camera". End of detection Motion in area triggering Extended info: "Motion in area"
	5/23/2022 11:47:01 AM	Debug info	Macro "3.Camera: Motion in area" deactivated
	5/23/2022 11:47:01 AM	Info	Finished recording to archive "Archive Aqua" from camera "3.Camera"
	5/23/2022 11:46:57 AM	Info	Camera "3.Camera". Beginning of detection Motion in area triggering Extended info: "Motion in area"
	5/23/2022 11:46:57 AM	Debug info	Macro "3.Camera: Motion in area" activated
	5/23/2022 11:46:57 AM	Info	Started recording to archive "Archive Aqua" from camera "3.Camera"
	5/23/2022 11:46:52 AM	Info	Camera "2.Camera". End of detection Motion detection triggering Extended info: "Motion detection"

The system will now switch to Archive mode and fetch the video of the selected event.

8.11 Working with Arkiv Through the Web-Client

8.11.1 Web-Client overview

The Web-Client offers the following options:

1. [Viewing live videos](#)(see page 805).
2. [Controlling PTZ cameras](#)(see page 807).
3. [Viewing Archive](#)(see page 809).
4. [Archive search](#)(see page 812).
5. [Listening to a camera's microphone](#)(see page 818).
6. [Exporting still frames and videos](#)(see page 819).
7. [Digital zooming](#)(see page 819).
8. [Working with bookmarks](#)(see page 821).
9. [Viewing Camera and Archive Statistics](#)(see page 820).

8.11.2 Hardware and software requirements for the Web-Client operation

The Web-Client operates correctly with the latest versions of Google Chrome, Firefox and Microsoft Edge browsers.

Note

Since no 3rd party technologies are used in the Web-Client, it may operate with other browsers; in this case, we cannot guarantee its stable operation.

Attention!

No support for Safari and Internet Explorer is provided in the current version.

To monitor 16 FullHD* camera videos on a single browser tab, you need at least an Intel Core i3 CPU and 1Gb of RAM.

* conditions are:

- dual stream cameras,
- each stream's frame rate is 25 FPS,
- the second stream's resolution is 360p,
- if the layout includes more than one camera, the browser shows streams with lower bitrates.

8.11.3 Starting the Web-Client

Use of *Arkiv* through a Web-Client takes place remotely, through a Web browser and the TCP/IP protocol. Remote video surveillance via a Web browser does not require installation of *Arkiv*.

Attention!

Opera browser supports Web-Client starting from version 15.
In the Windows OS, the Web-Client for Safari browser is not supported.

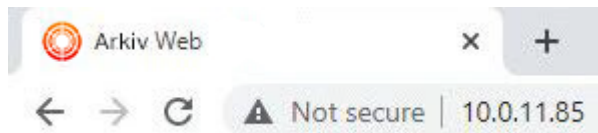
To start the Web-Client:

1. Start a Web browser.
2. In the address bar, type the address of the *Arkiv* Server in the following format: <web server IP address>:<Port>/<Prefix>.

[Connecting the Web and Mobile Clients to the Server behind NAT](#)(see page 924)

Attention!

The Server URL is case-sensitive. You have to type in the URL using the exact case of characters specified in settings (see [Configuring the Web Server](#)(see page 105)).



Attention!

If the Web-Server is properly configured (see [Configuring the Web-Server](#)(see page 105)), then a secure HTTPS connection is automatically established.

3. Enter a username and password for connecting to the *Arkiv* Web-Server.

Sign in

http://10.0.11.85

Your connection to this site is not private

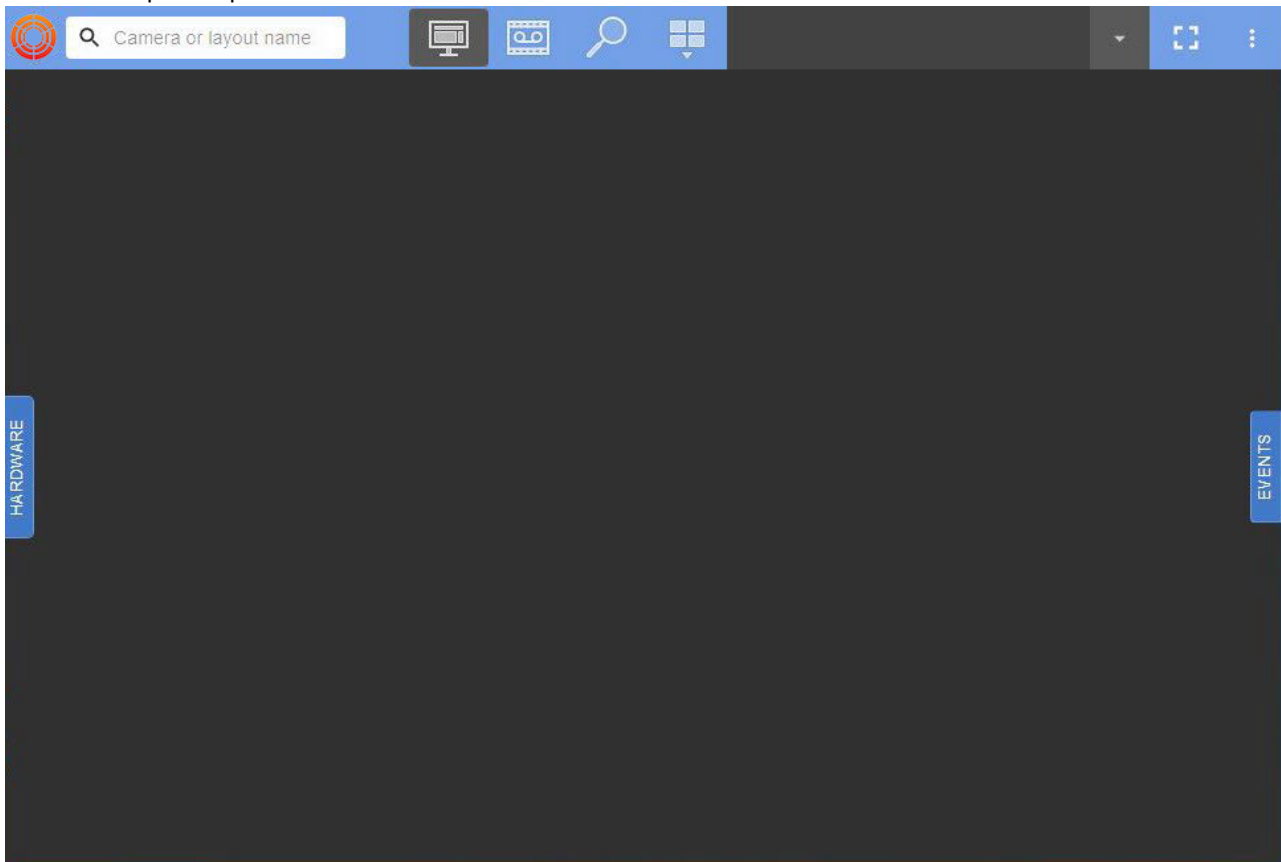
Username

Password

Attention!

After 5 successive failed authorization attempts, the user is blocked for 10 minutes.

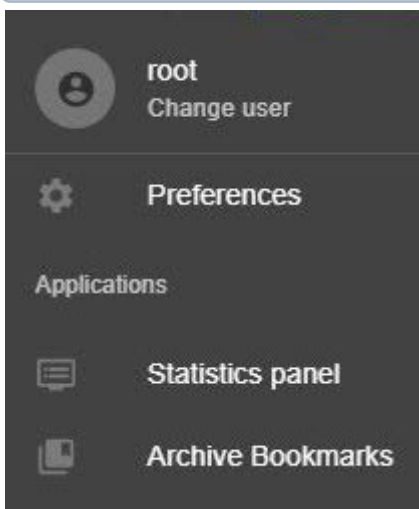
This will show the Web-Client interface. By default, the first listed layout will be displayed. If there are no layouts, the Cameras panel opens on the left and shows the video from the first listed video camera.



To switch between users, press the **Change user** link in the upper-right corner; another authentication will follow.

Note

The name of the current user is indicated near this point.





8.11.4 Web-Client's GUI

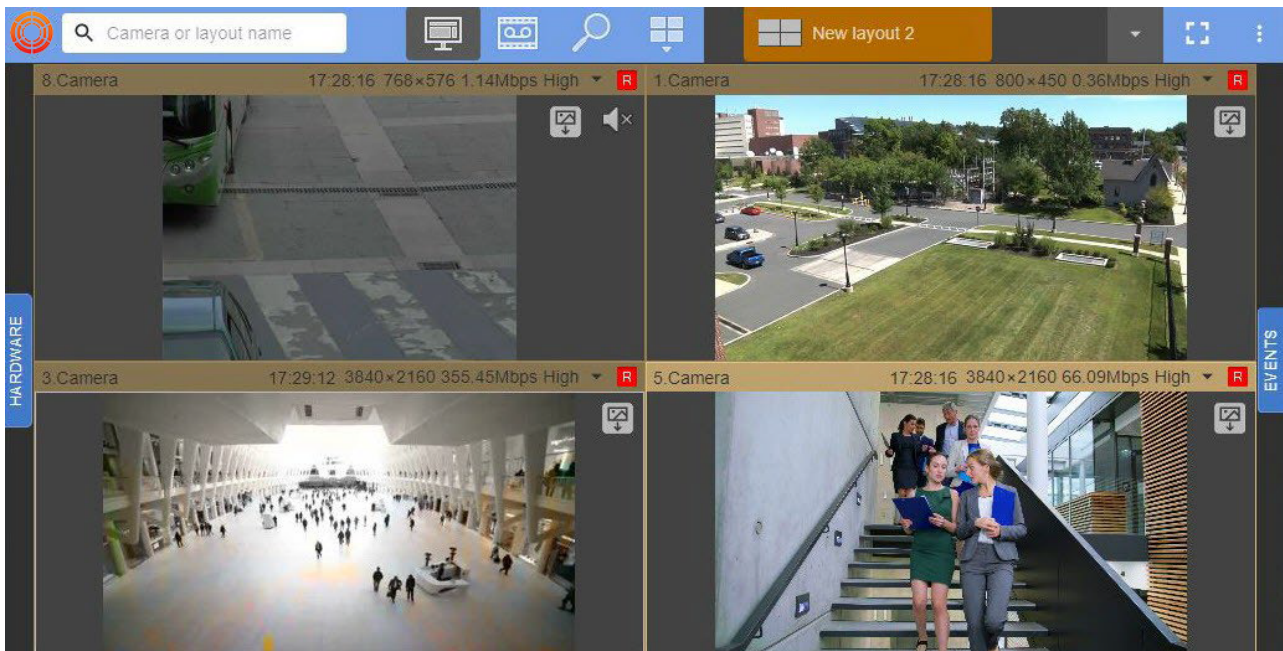
The upper panel of the Web-Client contains the following elements:

- the cameras panel (see [Searching for video cameras in the Web-Client](#)(see page 798));
- the surveillance mode selection buttons;
- the layouts menu and the list of available layouts (see [Working with layouts in Web-Client](#)(see page 801));

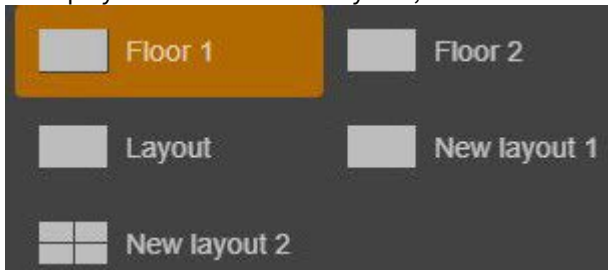
❏ Attention!

The Web-Client displays the layouts available to a particular user. You can create and edit layouts using the *Arkiv Client* (see [Configuring Layouts](#)(see page 447)). The number of cameras on the layouts is not limited.

- the full-screen mode button ,
- the three-dot menu button .



To display the list of available layouts, hover the mouse over the layouts panel.



You can also search layouts. To do it, follow the steps below:

1. Hover the mouse cursor over the Layouts panel.

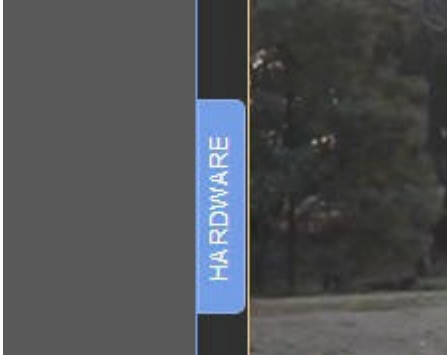
2. Enter a layout name or its fragment.

A search bar appears, and the panel displays layouts matching your search criteria.




Note

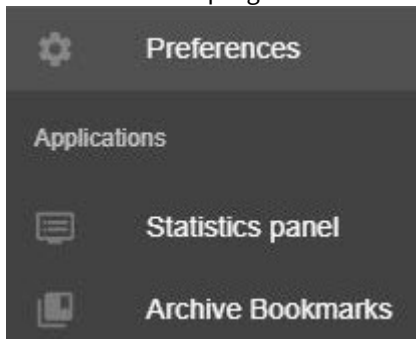
Web-Client GUI has the possibility to change the width of the cameras panel. To do this, click the left mouse button on the **Hardware** panel and drag it to the left or to the right.



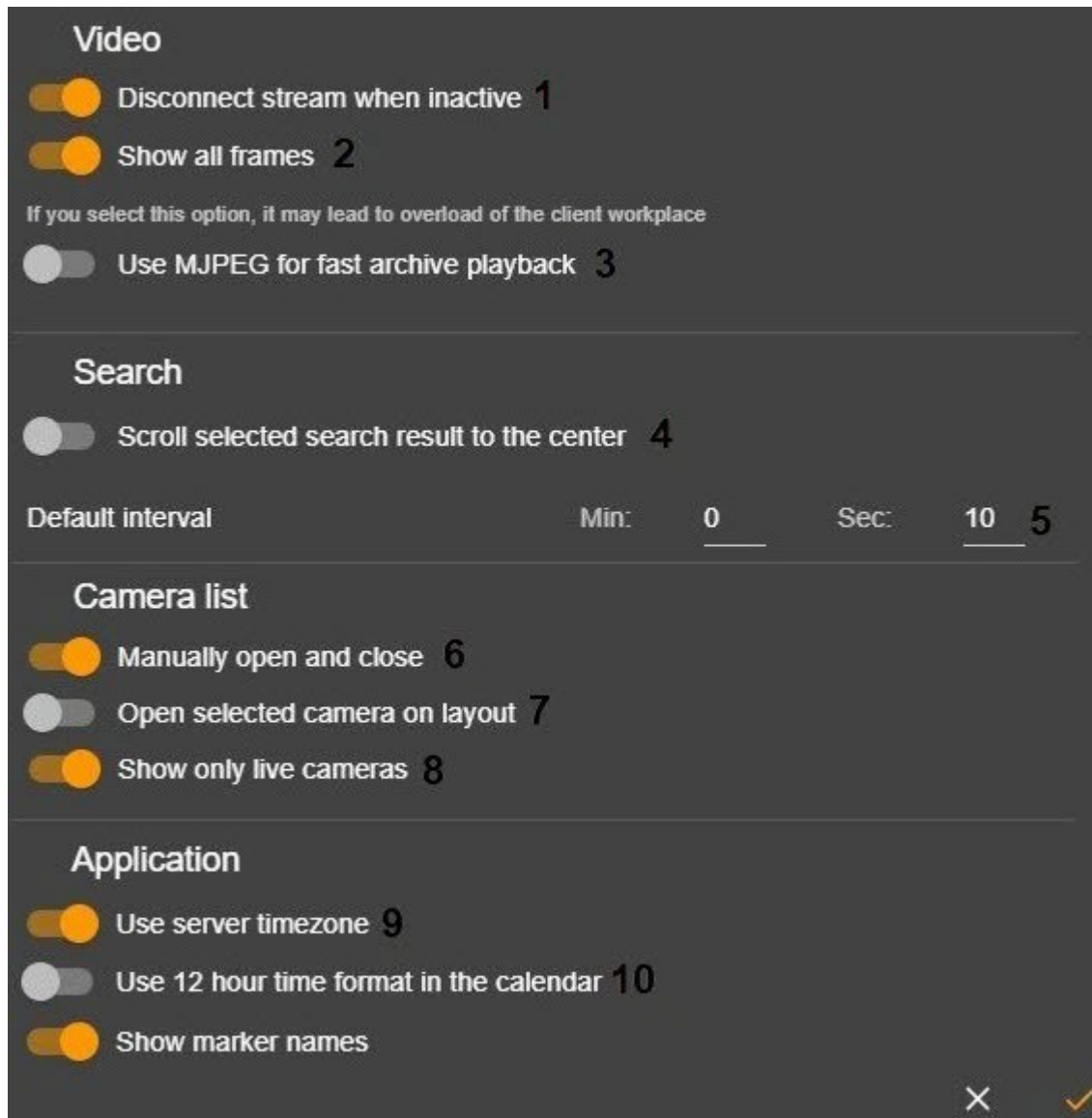
8.11.5 Web-Client Configuration

To configure the Web-Client, you need to:


1. Click  in the top-right corner and select **Preferences**.



2. By default, when you switch to another tab in the browser and minimize it, the video stream transmission stops. In order not to interrupt the video stream transmission, disable the **Disconnect stream when inactive** option (1). This setting is common to all Web-Client users in a particular browser.

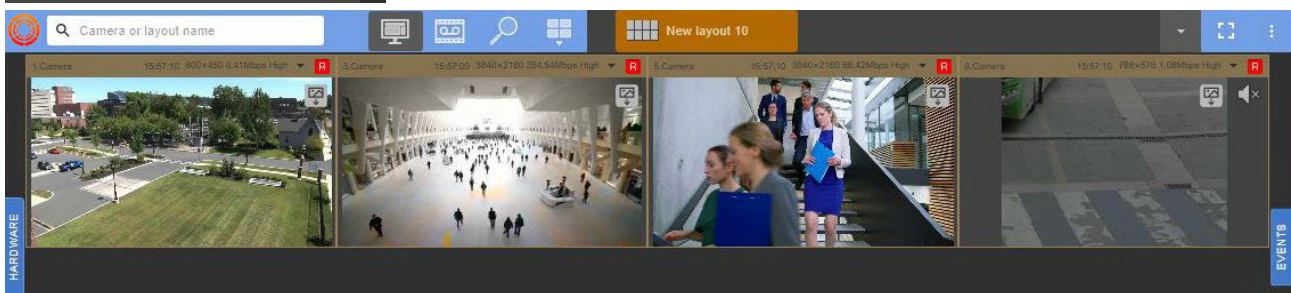
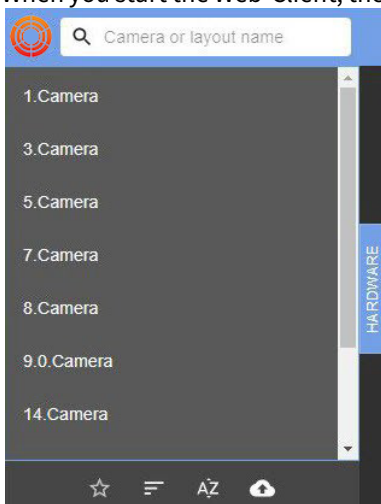


3. By default, if a layout with several cameras is open on the screen, then only key frames (I-frames) are displayed for all H.264 format cameras. If you select a specific video camera, all frames will be displayed. In order to display all frames in H.264 format, regardless of whether a video camera is selected or not, activate the **Show all frames** option (2).
4. By default, the H.264 codec is used for fast archive playback. In order to use the MJPEG codec, activate the **Use MJPEG for fast archive playback** option (3). This setting is common to all Web-Client users in a particular browser.
5. To position the retrieved video in the center of the screen, activate the **Scroll selected search result to the center** option (4). This setting is common to all Web-Client users in a particular browser.
6. Set the default interval for Time Slice (5, see [Types of Archive search available via the Web-Client](#)(see page 814)).
7. By default, the cameras panel does not close after you select a device. To minimize the panel, deactivate the **Manually open and close** option (6). This setting is common to all Web-Client users in a particular browser.



8. When you select a camera in cameras panel, the layout featuring this camera's window opens. If there are several such layouts, then the one with fewer cells is selected. To expand camera view to full screen, deactivate the **Open selected camera on layout** option (7).
9. By default, only enabled cameras are displayed in the Web-Client. In order for the Web-Client to display all cameras, deactivate the **Show only live cameras** option (8). This setting is common to all Web-Client users in a particular browser.
10. By default, the Web-Client cameras display the Server time. In order for the Web-Client cameras to display the PC time, deactivate the **Use server timezone** option (9). This setting is common to all Web-Client users in a particular browser.
11. By default, the Web-Client displays time in 24-hour format. In order for the time to be displayed in 12-hour format, deactivate the **Use 12 hour time format in the calendar** option (10). This setting is common to all Web-Client users in a particular browser.
12. Click the  button.

8.11.6 Searching for video cameras in the Web-Client

When you start the Web-Client, the cameras panel opens on the left. It displays the list of all available devices.



By default, the panel displays all available cameras. You can also create a list of the favorite cameras. To do this, do the following:

1. Point the mouse cursor to the camera.
2. Click the  button to add the camera to the list. The asterisk becomes filled . Another click on the asterisk excludes the camera from the list.

Attention!


The list of the favorite cameras is common for all Web-Client users in a particular browser.

Click the **Favorites** button at the bottom of the panel to display the favorite cameras only. Click the same button again to display all available cameras.

Additionally, it is possible to make favorite the cameras from the pre-prepared list in Excel format. To do this, do the following:



1. Create an Excel file containing two columns: the **id** column for camera IDs and the **name** column for camera names.

	A	B
1	id	name
2	8	Camera1
3	9	Camera2

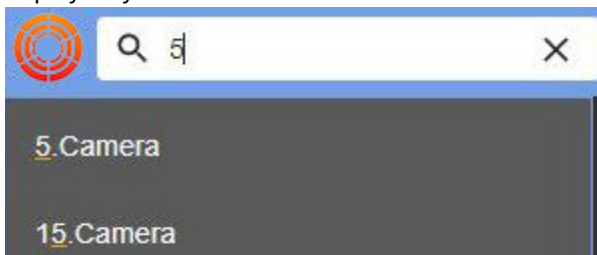
2. Click the  button and select the file.

Attention!

After downloading the file, only the cameras listed in the file will become favorite.

Click the  button to sort the cameras on the panel by ID, or click the  button to sort the cameras by name.

To search for a camera, enter the full or partial device name in the **Camera name** field. The cameras panel will display only the devices that meet the search criteria. All matching devices will be highlighted.



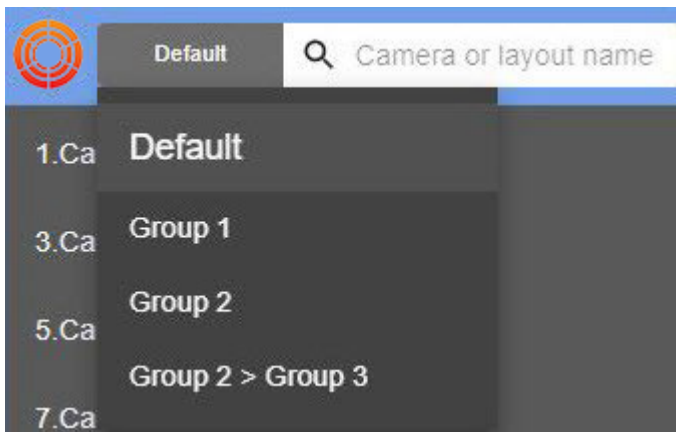
Note

The search result includes both the list of cameras and the list of layouts.

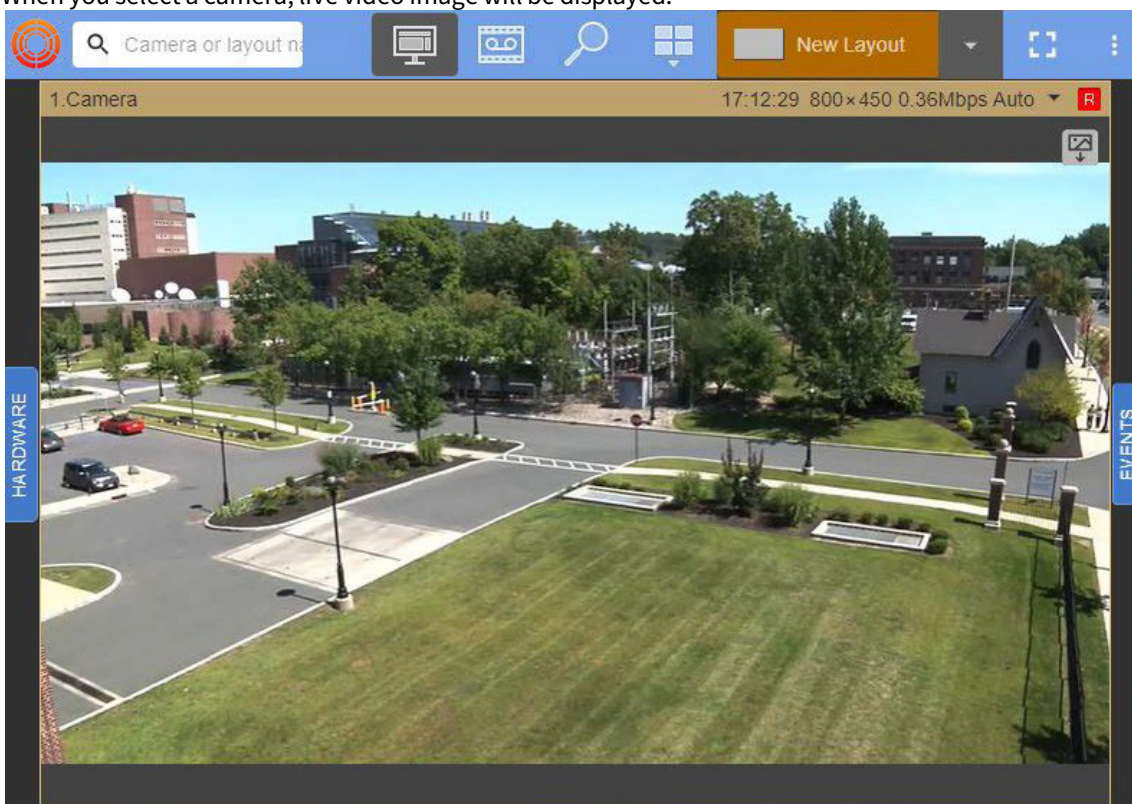
Note

When you add new cameras to the Server configuration, they appear in the Web-Client dynamically without page reload.

To display a camera group (see [Configuring video camera groups](#)(see page 192)), click the **Default** button and select the required group.



When you select a camera, live video image will be displayed.



Each surveillance window in the upper right corner contains:

- time display (see [Time Display](#)(see page 597) in the main Client);
- video stream parameters;
- archive recording indicator.

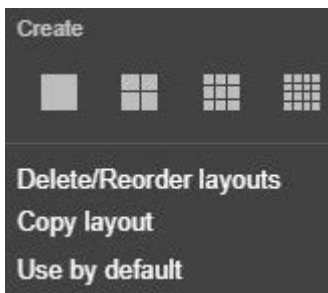
8.11.7 Working with layouts in Web-Client

Summary of how to work with layouts in Web-Client

 [Configuring Layouts](#)(see page 447)



To create and edit layouts in Web-Client click  to access the corresponding menu.




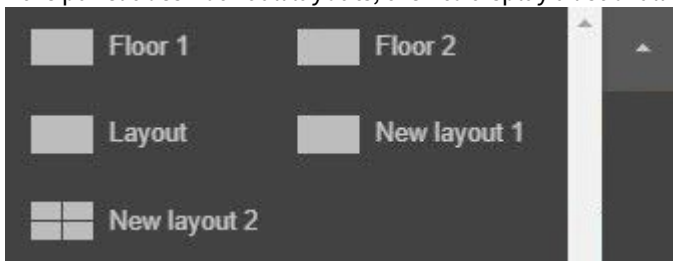
There are a number of things you need to consider when dealing with layouts in Web-Client:


1. In Web-Client, you cannot edit/share/delete layouts created in the main Client. You can only copy layouts.
2. Layouts created in Web-Client will not be available in the main Client.

Selecting and searching for a layout

To go to the layout, click it on the panel.

If the panel does not fit all layouts, then to display a list of all available layouts, in the upper right corner click .




To close the layout list, you need to press a button .

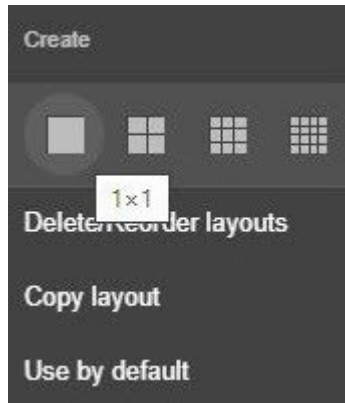
You can also search layouts in the search bar for video cameras. To do this, enter the layout name in part or in full. This will show only those layouts that meet the search conditions.



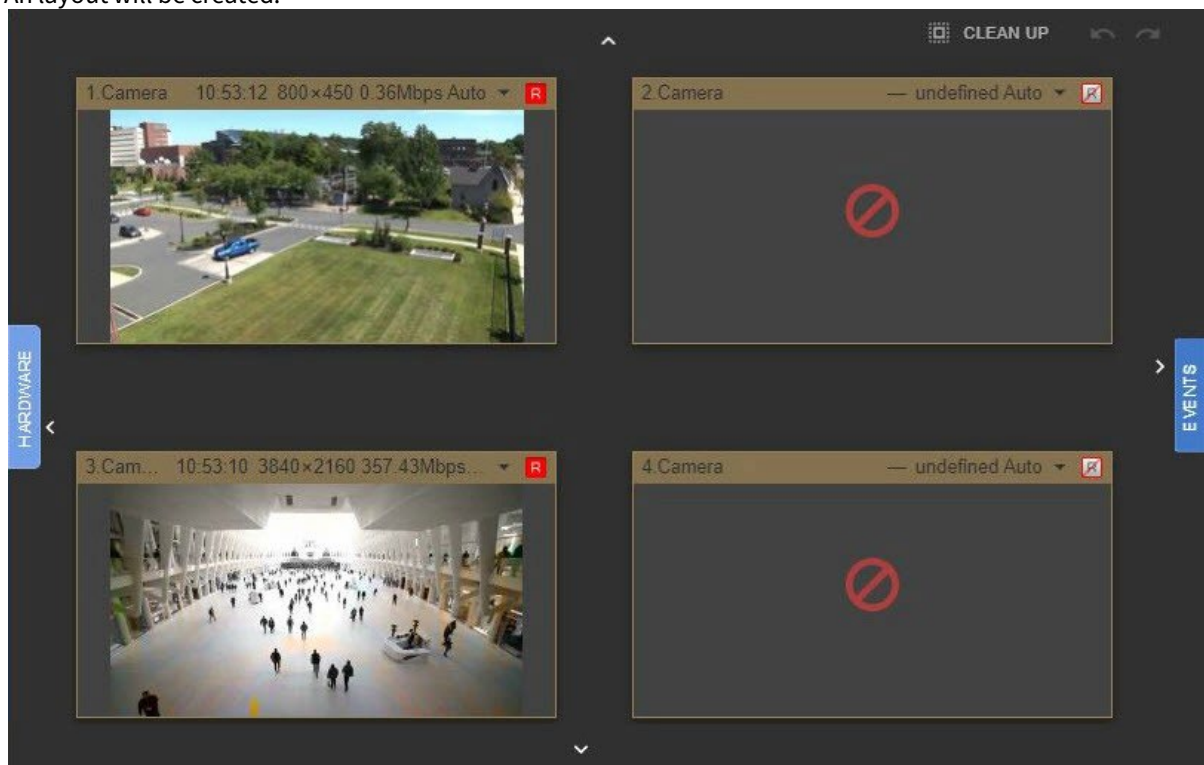
Creating a new layout in Web-Client

To create a new layout in Web-Client, do as follows:

1. Click  and choose one of the standard layout types.




An layout will be created.

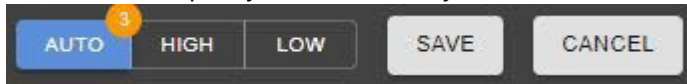


2. You can add new columns or rows of cells using arrows on the layout boundaries (similar to the main Client, see [Adding new cells to a layout](#)(see page 452)).

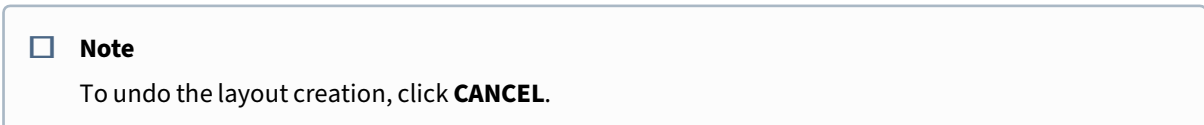
Note
To delete a column or a row of empty cells, click **CLEAN UP**.

Note
When editing a layout, the buttons to undo and redo the last action are available .

3. You can resize the cells using arrows on the cell boundaries (similar to the main Client, see [Resizing cells](#)(see page 455)).
4. Adding video cameras to the cells. To do this, drag & drop a camera from the cameras panel (see [Searching for video cameras in the Web-Client](#)(see page 798)).
5. Select the default stream for each video camera from the **Quality** list. Use the buttons at the top of the screen to select quality for all camera layouts.




6. Click **SAVE**.



You have created your layouts.

Editing and deleting layouts in Web-Client


To edit a layout in Web-Client, do as follows:

1. Select the layout.
2. Click  and select **Edit Layout**.
3. Make changes.
4. Click **Save**.



To rename a layout, do as follows:

1. Double left-click and enter a new name.
2. Click **Save**.

To rearrange the layouts, do as follows:

1. Click  and select **Delete/Reorder Layouts**.
2. Drag & drop layouts wherever you want.
3. Click **Save**.

To delete a layout, do as follows:

1. Click  and select **Delete/Reorder Layouts**.
2. Click to the right of the layout .


Selecting the default layout in Web-Client

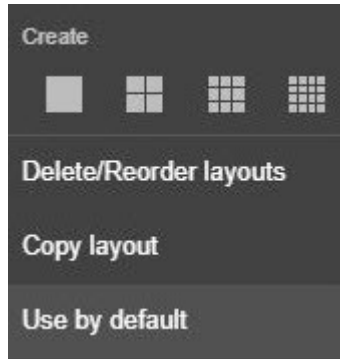
You can select the default layout for each user to be displayed after they launch Web-Client. If you don't set this layout, they'll see a blank screen.

If no layouts have been created before, the video cameras panel opens on the left and displays the video image from the first video camera in order.

If some layouts have been created previously, the first layout in order will be displayed by default.

To set the default layout, do as follows:

1. Go to the required layout.
2. Click the  button and select **Use by default**.



After that, the layout icon will look like this:




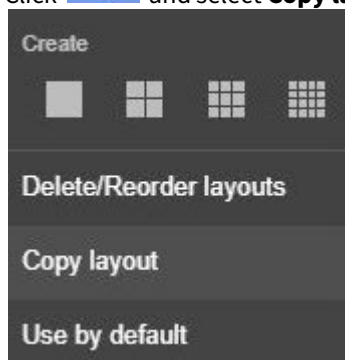
To remove the default layout, click the  button and select **Do not use by default**.

Copying layouts in Web-Client

[Layout copying](#)(see page 450)

To copy a layout in Web-Client, do as follows:

1. Select the layout.
2. Click  and select **Copy layout**.





3. You can make changes to the layout.
4. Click **Save**.

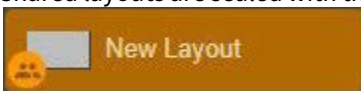
Sharing layouts in Web-Client

[Share Layouts](#)(see page 477)

To share a layout in Web-Client, do as follows:

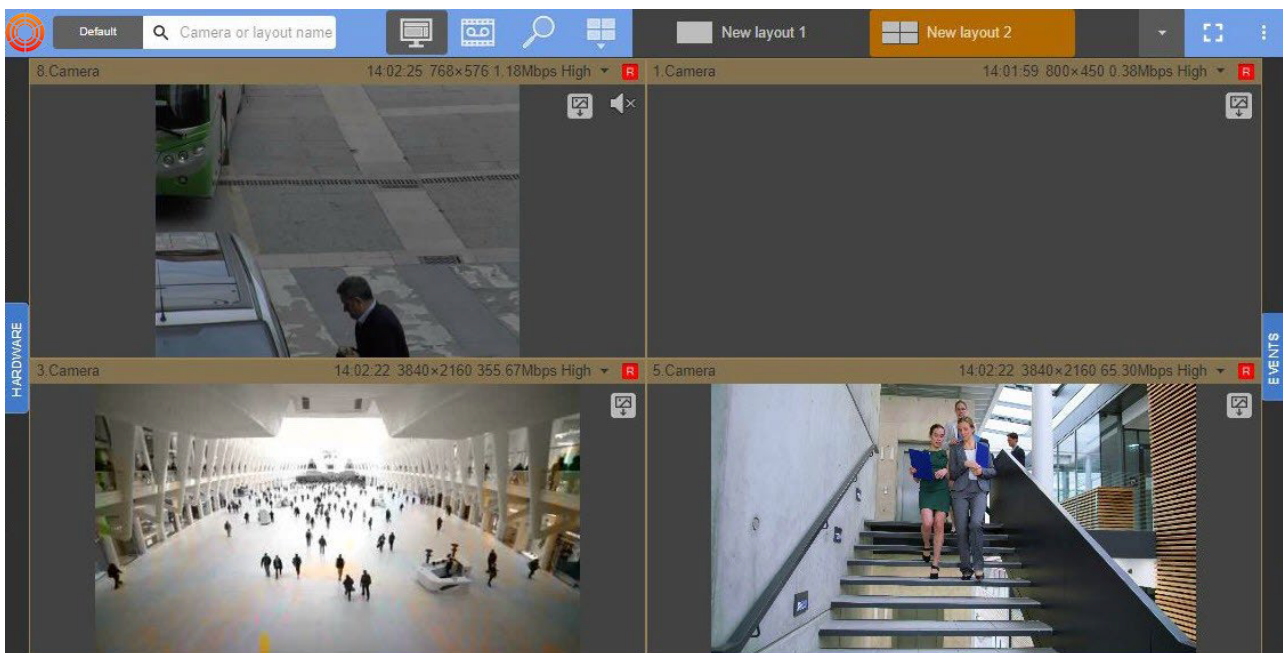
1. Select the layout.
2. Click  and select **Edit Layout**.
3. Click  and in **Share With**, select one or several target roles to share layout with.
4. Click **Save**.

Shared layouts are sealed with the following sign:



8.11.8 Real-time video surveillance via the Web-Client

To view a video image, you should select either a camera on the panel see [Searching for video cameras in the Web-Client](#)(see page 798), or one of the available layouts (see [Web-Client's GUI](#)(see page 795)).



The Web-Client supports playback of the following video formats: MJPEG, H.264, H.265. Any other formats are re-coded to MJPEG on the Server.

Attention!

H.265 video playback is possible only in Safari browser with hardware acceleration.

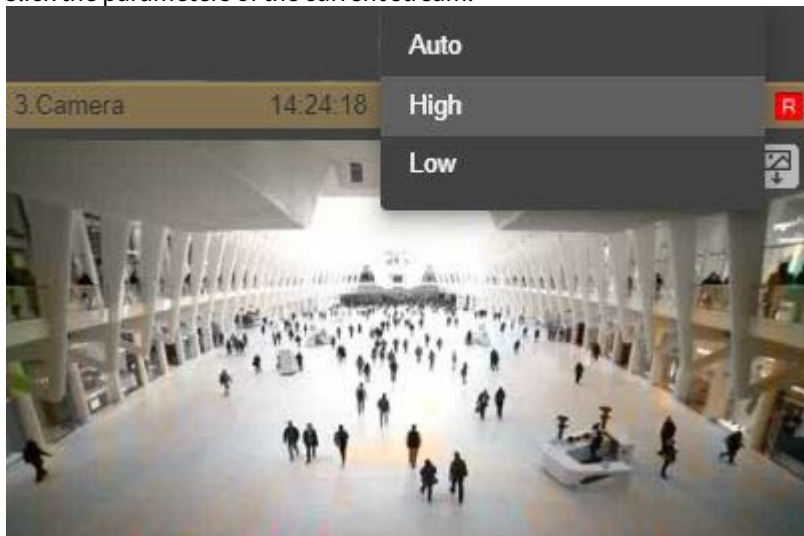
You can playback a video in the Web-Client with 2 players: JPEG and MP4. If your browser supports MP4 format, the MP4 player is used. Otherwise, your videos will be played back via the JPEG player.

Attention!

If your layout contains several camera windows, only the reference frames may be displayed in H.264 video format cameras, depending on settings (see [Web-Client Configuration](#)(see page 796)). For the selected camera, all frames will be displayed. In MPEG video format each frame is displayed.

To select a displayed stream in the Web Client manually (see [The Video Camera Object](#)(see page 107)), do as follows:

1. Click the parameters of the current stream.





2. Select a stream to be displayed.

Menu item	Description
Auto (GreenStream, default)	The camera has two video streams: high quality video stream and low quality video stream. If the size of the cell where the video image from the camera is displayed is close to the low quality resolution with a 10% height or width margin, the video image will be displayed using the low quality stream. In other cases, the high quality video stream will be displayed.
High quality	A high quality video stream is used in the video surveillance window (see The Video Camera Object (see page 107)).
Low quality	A low-quality video stream is used in the video surveillance window (see The Video Camera Object (see page 107)). When you enlarge the surveillance window, the video stream switches to a high quality video stream.

Note

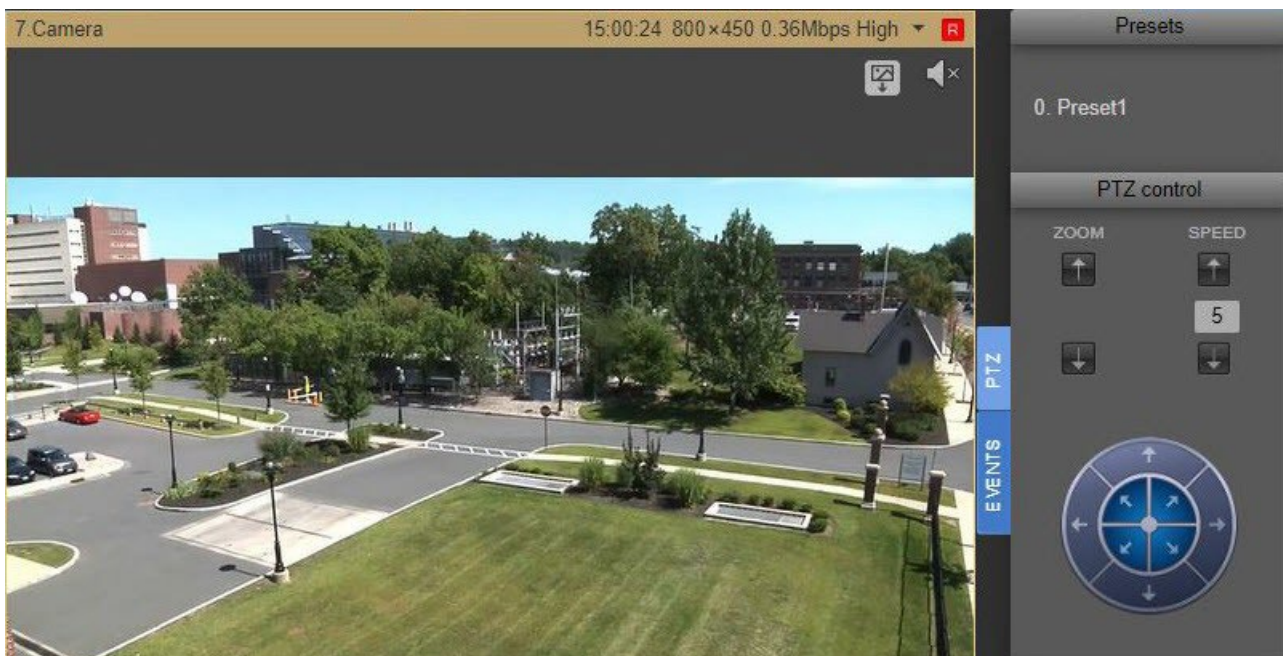
The video stream settings are saved when switching between the layouts, but after the page reloads, the video stream that was specified when creating the layout will be automatically selected.

Click the  button for the full screen view. To exit full screen mode, click again the  button, or press the **Esc** key.

To open a temporary layout from a certain camera on the layout, double right-click on camera video image. To return to the layout, double-click on the video image again.

8.11.9 Controlling PTZ cameras through the Web-Client

A PTZ video camera is controlled through the PTZ device control panel.



The following actions can be performed using the PTZ device control panel:

1. Use presets.
2. Adjust optical zoom and positioning speed of the video camera.
3. Modify the horizontal and vertical tilt angle of the video camera.

Controlling a PTZ camera through the Web-Client by using presets


To go to a preset, select the relevant line in the list of presets.




Changing the optical zoom of a PTZ camera in the Web-Client

To change the optical zoom of a PTZ unit, use the buttons in the **ZOOM** group.




 – increase image.


 – reduce image.


Changing the positioning speed of a PTZ camera in the Web-Client

To change the positioning speed of a PTZ camera, use the buttons in the **SPEED** group.



 – increase positioning speed.

 – reduce positioning speed.

 – field displaying the current positioning speed.

Changing the tilt of a PTZ camera in the Web-Client

To change the tilt of a PTZ camera, use the arrows in the **PTZ Control** group.



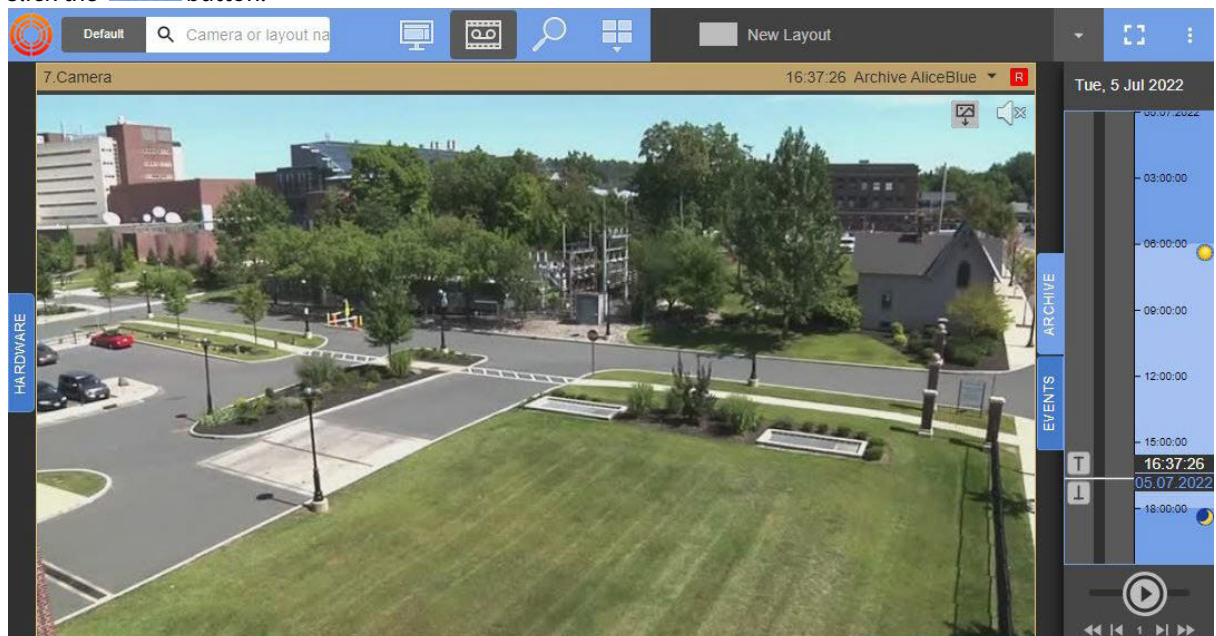
The arrow direction indicates the direction in which the camera lens will be moved when the arrow is clicked.

8.11.10 Viewing video archives through the Web-Client

To view a camera's Archive, do as follows:

1. Pick a camera on the camera panel or on the layout.

2. Click the  button.



Note

Video Footage opened by default is specified as Default Archive in settings (see [Configuring recording to an archive](#)(see page 207)).

3. The archive navigation panel is then displayed, with the following interface features:
 - a. Timeline. Archive navigation via the timeline in the Web-Client is the same as when working in the Arkiv Client (see [Navigating Using the Timeline](#)(see page 678)).

Attention!

You cannot resize the timeline in the Web-Client. By default, the timeline displays the current date's recordings. You can switch to another date using the position selection panel (see 3c).

Note

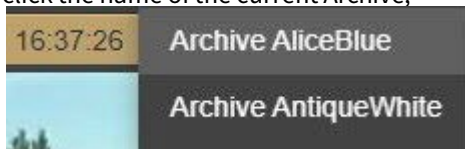
Similarly to the regular Client (see [The Timeline](#)(see page 606)), alarms are indicated on the timeline as flags, and comments as icons.

- b. Playback control panel. Archive navigation via the playback panel in the Web-Client is the same as when working in the *Arkiv* Client (see [Navigating using the Playback Panel](#)(see page 682)).

Attention!

Fast reverse playback in H.264 format will be not smooth because of the use of I-frames.

- c. Archive position selection panel. The archive position selection panel is opened by left-clicking the date above the timeline.
4. To select an Archive, do as follows:
- a. click the name of the current Archive;

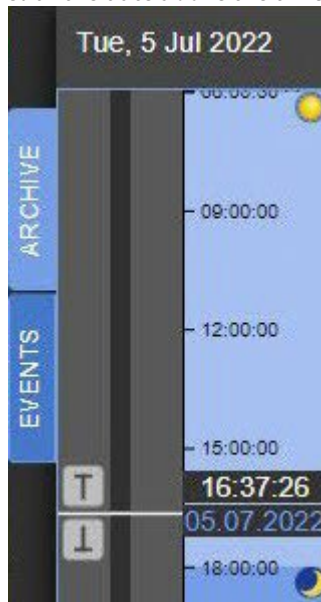


- b. pick the Archive of interest.

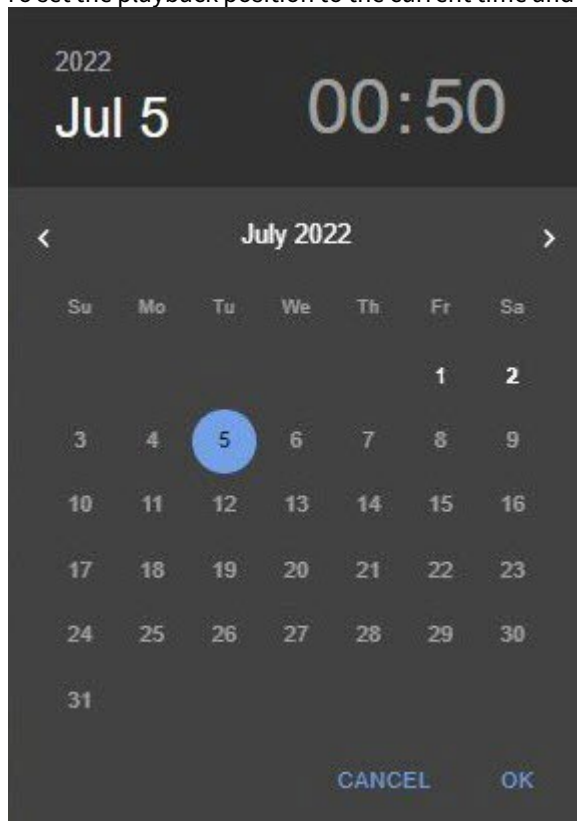
8.11.11 Archive position selection panel for the Web-Client



To choose a time position in the archive by using the archive position selection panel:

1. Click the date above the timeline to open the position selection panel.



2. To set the playback position to the current time and date, go to step 6.

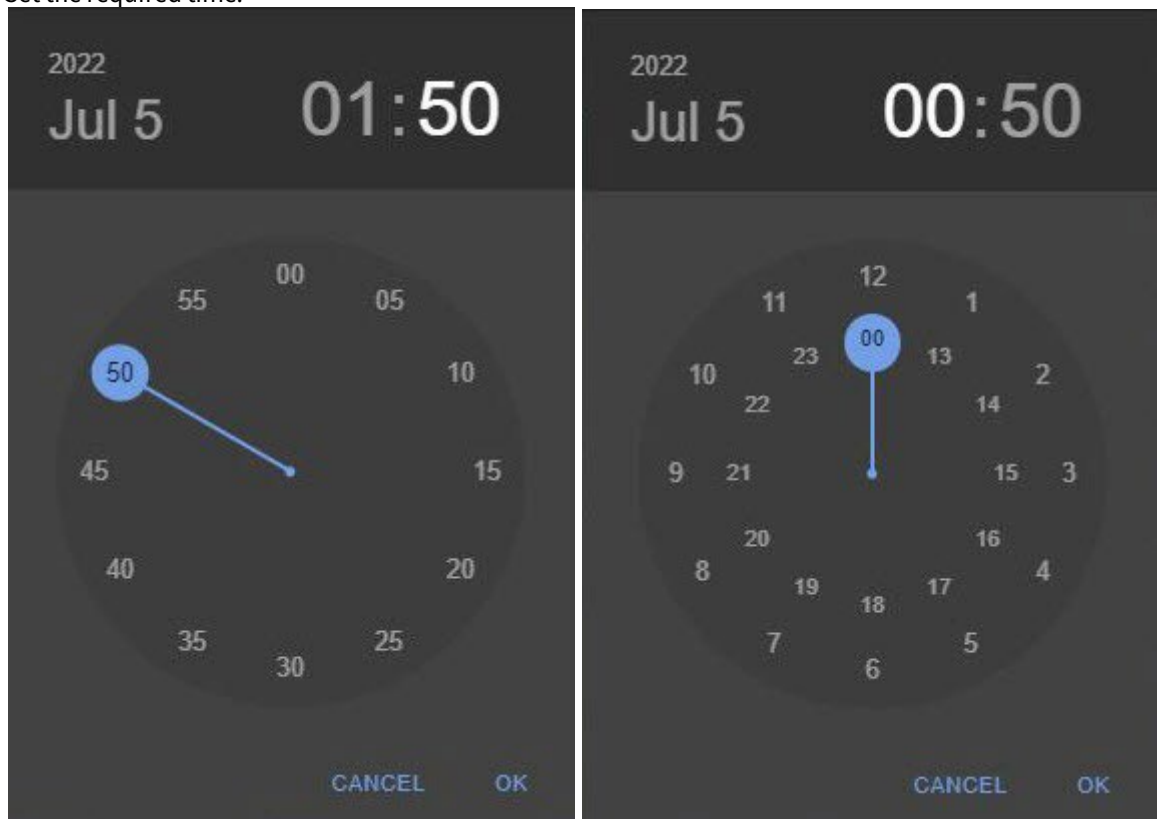


3. Use the  and  buttons to select a month.
4. Click the necessary date on the calendar to select a day.

Note

The days, for which there is video footage are in light shade.

5. Set the required time.




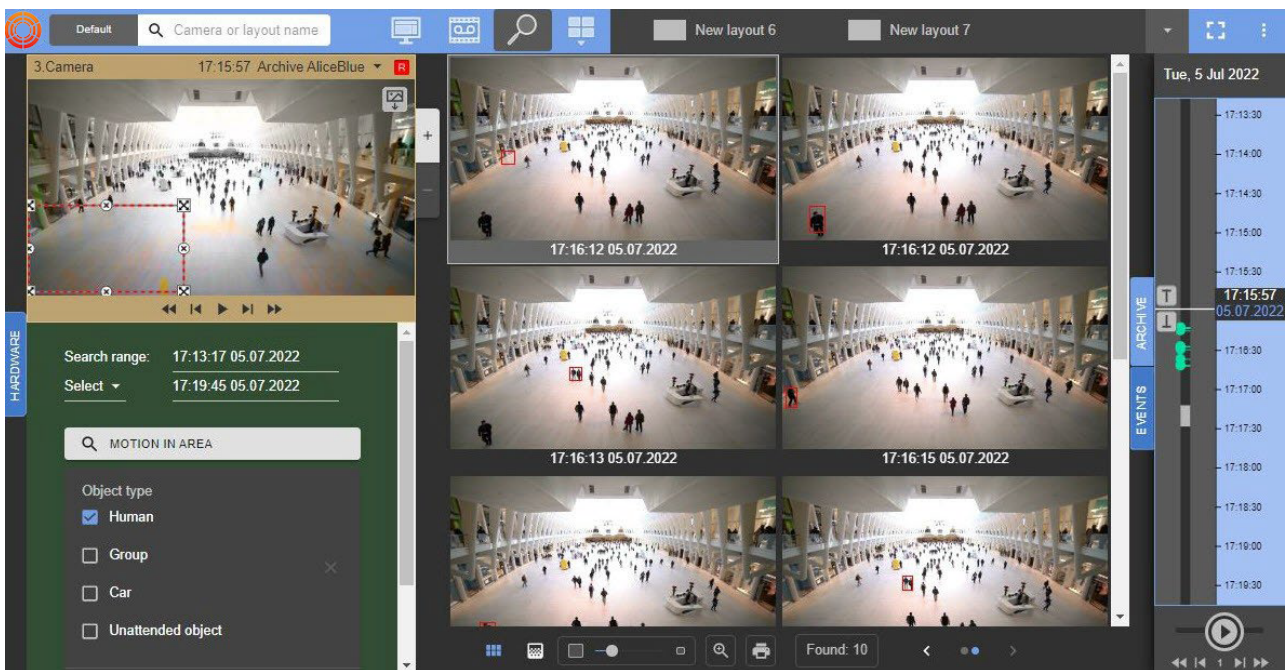
6. To set the playback position, click the **OK** button.

The time position in the archive is now chosen.

8.11.12 Archive search in the Web-Client

You can search in the archive in the Web-Client. To search in the archive, do the following:

1. Select the required camera on the camera panel or on the layout.
2. Click the  button.



Note


The previews of the search results are downloaded and displayed when you scroll the screen.

Attention!

In addition to the type of the search, the number of the search results depends on how long the timeline covers (the timeline of the Web-Client is similar to the timeline of the Client (see [The Timeline](#)(see page 606))). The more time the timeline covers, the more extensive the search will be.

The interface of the search in the archive in the Web-Client is similar to the interface of the Client (see [Archive Search mode interface](#)(see page 697)).



You can resize the video surveillance window using the  buttons.

Attention!

If you select a device on the cameras panel (see [Searching for video cameras in the Web-Client](#)(see page 798)), the following conditions exist:

- If you switch to the camera that was searched previously, the search conditions will be from the previous search.
- If you switch to the camera that was not searched previously, the search conditions will be from the camera from which the transition was made.

If you change the camera inside the search, the previous results will be deleted.



Types of Archive search available via the Web-Client

The Web-Client interface offers the following types of search:

1. Motion in an area.
2. Line crossing.
3. Motion between areas.
4. Large Number of Objects detection tool.
5. Loitering.
6. Face search.

Attention!

You can load only JPEG images.

7. LPN search.
8. TimeSlice.

Note

The default interval is set in the Web-Client's settings (see [Web-Client Configuration](#)(see page 796)).

9. Events search.

Archive search interface and search parameters pane are identical to those in the standalone Client software (see [Video surveillance in Archive Search mode](#)(see page 695)).

You can also build a Heat Map with the Web-Client (see [Building a Heat Map](#)(see page 814)).

Building a Heat Map

Attention!

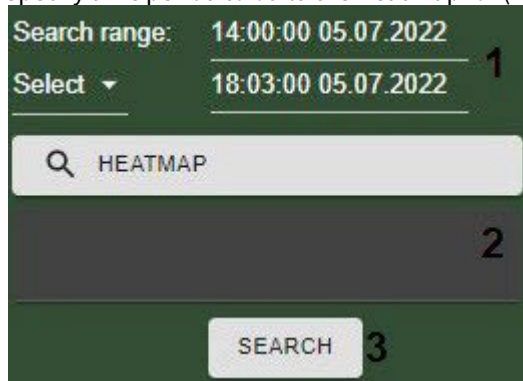
To build a Heat Map, you need at least one source of metadata (for example, an Object Tracker).

Heat Maps are useful for evaluation of motion intensity within the scene and determining common trajectories of moving objects.

How to build a Heat Map:

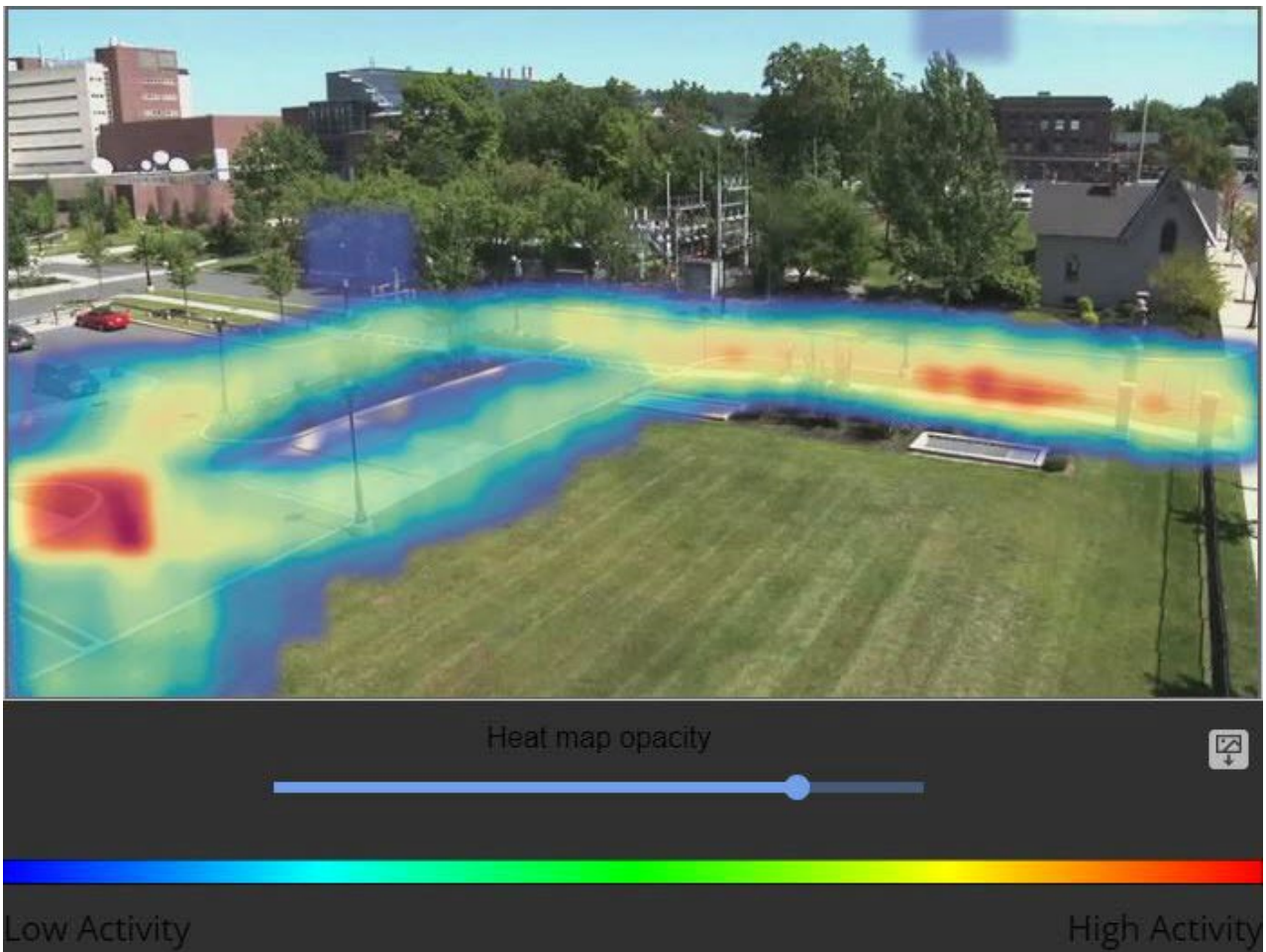
1. Proceed to the Archive search.

- Specify time period to build the Heat Map for **(1)**.




- From the **Select** drop-down list select **Heat Map**.
- Select the source of metadata **(2)**.
- Click the **SEARCH** button **(3)**.

The Heat Map appears in the search results window.



Use the dedicated slider to adjust the transparency of the heat map.

Click  to download the heat map.

You can build a report based on the received data.

Simultaneous search in multiple camera Video Footage via the Web-Client

You can use the Web-Client for multiple camera Video Footage searching by:

- facial recognition events;
- ANPR events;
- detection tool triggering events;
- TimeSlice.

To simultaneously search multiple camera's Video Footage, do the following:

1. Proceed to the Video Footage search (see [Archive search in the Web-Client](#)(see page 812)).
2. Set the search criteria.
3. Open Cameras panel and select the required devices (see [Searching for video cameras in the Web-Client](#)(see page 798)).




Note

To select all cameras, select the appropriate box on the bottom of the page.

4. Click the **Search** button.

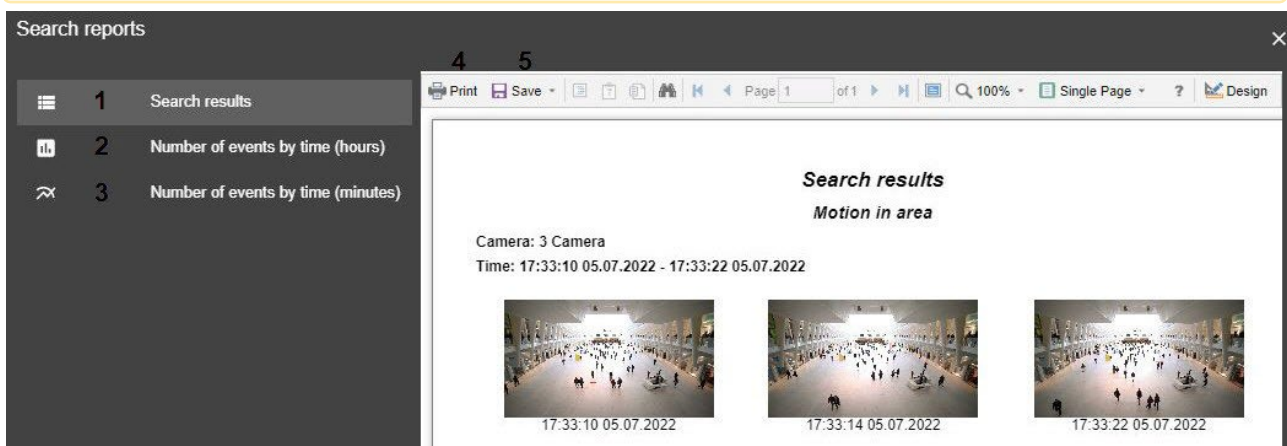
Reporting the search results

The Web-Client also includes the [Stimulsoft](#)¹⁸⁰ report editor for building reports on retrieved video fragments.

To build a report after you finished searching, click  in the bottom part of the screen.

Attention!

The report is limited to first 60 retrieved videos.



There are 3 types of reports available:

1. Retrieved fragments **(1)**.
2. Retrieved fragments (number/per hours) **(2)**.
3. Retrieved fragments (number/per minutes) **(3)**.

Click Print **(4)** to hardcopy a report, or **Save** **(5)** to export into an appropriate format.

8.11.13 Alarm Monitoring via the Web-Client

You can use the Web-Client to monitor active alarms across the entire Arkiv-domain.

To make the Web-Client display active alarms, select any camera or a layout (see [Searching for video cameras in the Web-Client](#)(see page 798), [Web-Client's GUI](#)(see page 795)).

Note

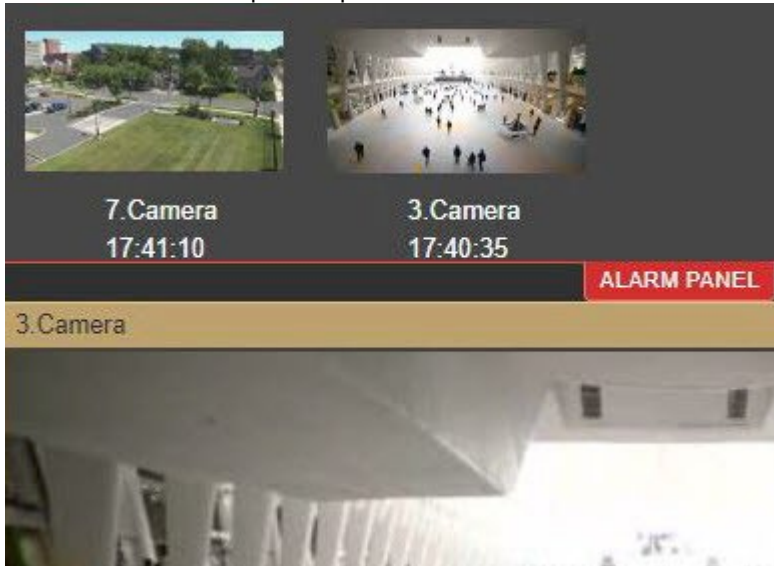
The alarms that were triggered before selecting a camera or a layout are only displayed if the user is in the workplace. After you reload the page, go to the open statistics or bookmarks sections, the panel with the current alarms will disappear.

¹⁸⁰ <https://www.stimulsoft.com/en/documentation/online/user-manual/>

When an alarm goes off, the Alarm Panel appears on top (like in the Client, see [Alert Panel](#)(see page 614)).



Click **Alarm Panel** to open the panel.




If you click on the alarm thumbnail on the panel, you will go to the archive mode to view the event.

8.11.14 Listening to a camera's microphone via the Web-Client

Attention!

You can play back audio in mp4 format only.

To listen to a camera's microphone, click the  button in the camera window.

Note

Audio playback in Web browsers is supported in Windows 8 and higher OS versions.


After you complete this action, a volume slider appears.



Note

You cannot play back audio from multiple cameras simultaneously.

The higher is the slider position, the higher is the volume.

To mute audio, click the  button.

8.11.15 Digital video zoom in the Web-Client

Digital zoom of video occurs in a viewing tile during viewing of live video as well as when viewing archive video. To increase the zoom level, use the mouse scroll wheel.


The image cannot be made smaller than the source size. The maximum video zoom is 16x.

To select the viewed portion of the frame at a changed scale, drag the mouse outside of the video viewing area.

Note



For PTZ units, you can zoom in by using the buttons in the **ZOOM** group.

8.11.16 Export in Web-Client

To export a snapshot/frame, click the  button while viewing video. A JPG file will be exported to a folder specified in the Server settings.

To export video, do as follows:

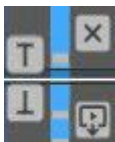
1. Switch to Archive mode (see [Viewing video archives through the Web-Client](#)(see page 809)).
2. On the timeline, set the timeline indicator to the location that matches the beginning of the export interval.

Click the  button. Set the indicator to the location that matches the end of the export interval. Click the  button.

3. Click the  button.

Note

To delete the export interval click the  button.



4. Select the video format (1). You can export videos to AVI, MKV, MP4 and EXE formats.

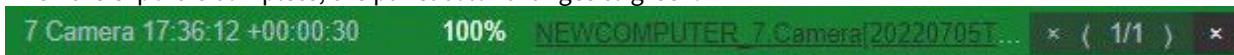


5. If you are exporting a video in AVI format, select the compression level (2).
 - a. 4 – minimum compression, maximum file size;
 - b. 6 – maximum compression, minimum file size.
6. If necessary, add comments for the export (3). The comments will be shown as captions when the exported video is played.
7. Click the **EXPORT** button (4).

The progress bar is displayed on the drop-down panel as in the Client (see [Viewing export progress](#) (see page 785)).



When the export is complete, the panel color changes to green.



To download an exported file, click its name on the panel.

8.11.17 Viewing Camera and Archive Statistics

To view camera statistics, click  in the top right corner, and select **Statistics Panel**.


Video-streams statistics for all cameras											
CAMERAS						ARCHIVES					
Host	Name ↑	Resolution	FPS	Bitrate	Format	Warn	Resolution	FPS	Bitrate	Format	Warn
NEWCOMPUTER											
	1.Camera	800x450	24.99	0.32	H264	✓					
	9.0.Camera	1280x720	11.97	1.69	H264	⚠	704x576	24.96	0.19	H264	✓
	14.Camera	1920x1080	24.82	1.24	H264	✓	352x288	25.32	0.07	H264	✓
	15.Camera	1920x1080	30.06	0.92	H265	✓	3840x2160	24.29	1.38	H265	✓


Note

Loading statistics from large number of cameras may take some time. The loading process is visualized by a progress indicator.

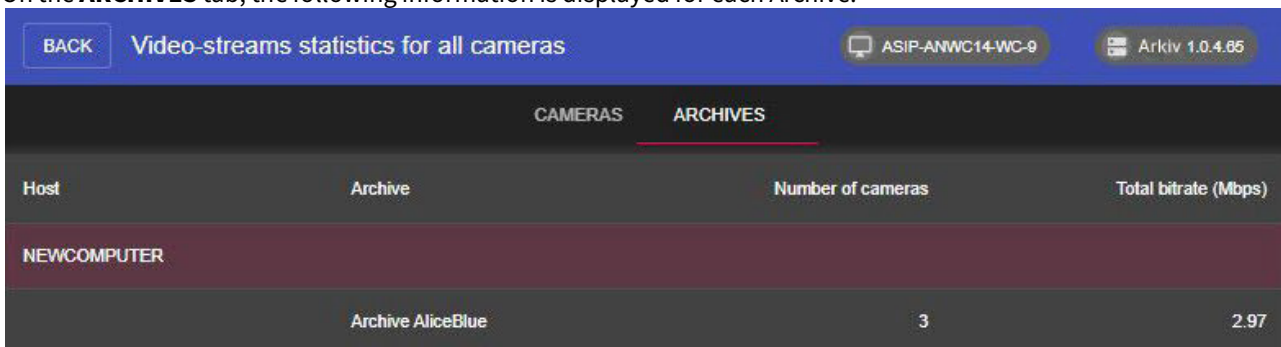
On the **CAMERAS** tab, the following parameters are displayed for each video stream of each camera:

- resolution;
- frame rate;
- bit rate;
- compression format.

If the bitrate exceeds the expected value, and there is more than 1Mbit per megapixel, the stream is marked with .

If the bitrate exceeds the expected value, and there is more than 2Mbit per megapixel, the stream is marked with .

On the **ARCHIVES** tab, the following information is displayed for each Archive:



Host	Archive	Number of cameras	Total bitrate (Mbps)
NEWCOMPUTER	Archive AliceBlue	3	2.97

- name;
- number of linked cameras;
- cumulative bit rate of linked cameras.


Note

The indicator in the upper right corner displays the *Arkiv* Web-Client and Server version numbers.

To return to the previous page, click **BACK** in the left upper corner of the screen.

8.11.18 Working with bookmarks in the Web-Client

A bookmark represents either a comment to Video Footage (see [Operator comments](#)(see page 636)), or a protected video (see [Protecting video footage from FIFO overwriting](#)(see page 212)).

To work with bookmarks, click the  button in the top right corner of the Web-Client window, and select the **Archive Bookmarks** option.

Select	Begins ↓	Ends	Created	Created by	Protected	Name	Comment	Video
<input type="checkbox"/>	18:16:15 05.07.2022	18:16:15 05.07.2022	18:16:36 05.07.2022	root	<input type="checkbox"/>	3.Camera	5	
<input type="checkbox"/>	18:15:50 05.07.2022	18:15:50 05.07.2022	18:16:29 05.07.2022	root	<input type="checkbox"/>	3.Camera	4	
<input checked="" type="checkbox"/>	18:15:00 05.07.2022	18:15:00 05.07.2022	18:15:49 05.07.2022	root	<input checked="" type="checkbox"/>	1.Camera	2	
<input type="checkbox"/>	18:14:52 05.07.2022	18:14:52 05.07.2022	18:15:42 05.07.2022	root	<input checked="" type="checkbox"/>	1.Camera	1	
<input type="checkbox"/>	18:14:45 05.07.2022	18:14:47 05.07.2022	18:15:27 05.07.2022	root	<input checked="" type="checkbox"/>	1.Camera	Important	

Attention!

You can access only the bookmarks on the visible part of the footage archive (see [Configuring access restrictions to older footage](#)(see page 211)).

The system does not display bookmarks related to currently re-recorded part of the archive.

You can:

1. Edit a bookmark.
2. Delete a bookmark.
3. Un-protect a protected video.
4. Delete a protected video.

Use the search bar to locate a necessary bookmark.



To proceed to a particular video, click the button in the **Video** column.

Click **BACK** to return to the main page.

Editing a bookmark

To edit a bookmark, do as follows:

1. Select the required bookmark from the list.
2. Click the **EDIT BOOKMARK** button.

Begins
2022-07-05 18:22:04

Ends
2022-07-05 18:22:05

Comment

Protected

SAVE BOOKMARK
CANCEL

3. If necessary, you can alter the time interval and/or a text comment.
4. Click **SAVE BOOKMARK**.

Deleting a bookmark

To delete a bookmark, select it from the list and click **DELETE BOOKMARK**.

Hold Ctrl key to select multiple bookmarks.

Un-protecting a video

To un-protect a video, clear the **Protected** checkbox beside the bookmark.

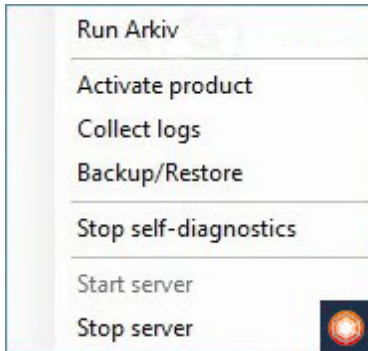
Deleting a protected video

To delete a protected video, select a protected bookmark and click the **DELETE RECORD** button.

9 Description of utilities

9.1 Arkiv Tray Tool

The *Arkiv* Tray Tool launches automatically during system startup and displays an icon in the Microsoft Windows taskbar notification area.



Note.

The executable TrayTool.exe is located at <Arkiv installation folder>\Arkiv\bin.

With the *Arkiv* Tray Tool utility, you can quickly start the following applications from the notification area:

- Client,
- Activation Utility,
- Arkiv Support Tool,
- Configuration Backup and Restore utility,
- Self-checking Service,
- Server rebooting.

9.2 Activation Utility

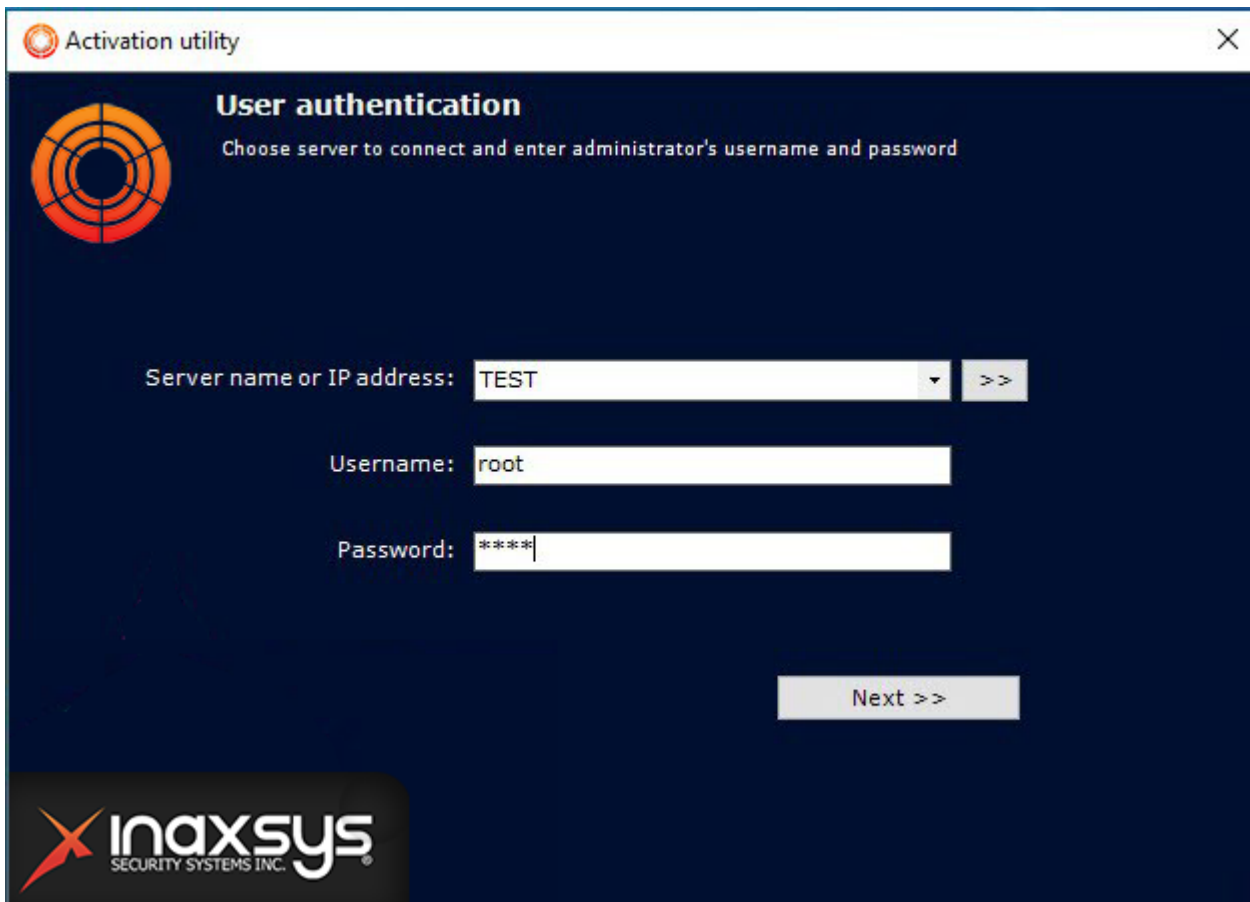
License activation for the *Arkiv* software package is carried out through the product activation utility.

The activation utility is accessible at **Start -> All Programs -> Arkiv -> Utilities -> Program Activation**, or from the tray menu (see the [Arkiv Tray Tool](#) (see page 824) section).

Note

The product activation utility program file LicenseTool.exe is located in the folder <Directory where *Arkiv* is installed>\Inaxsys\Arkiv Smart\bin\

Then you must select the name of one of the Arkiv Domain servers to which the license file will be applied (the file is applied to all Arkiv Domain servers launched at the moment of activation) and connect to the system, under an administrator's user name and password, to continue the activation process.



Activation utility

User authentication

Choose server to connect and enter administrator's username and password

Server name or IP address: TEST >>

Username: root

Password: ****

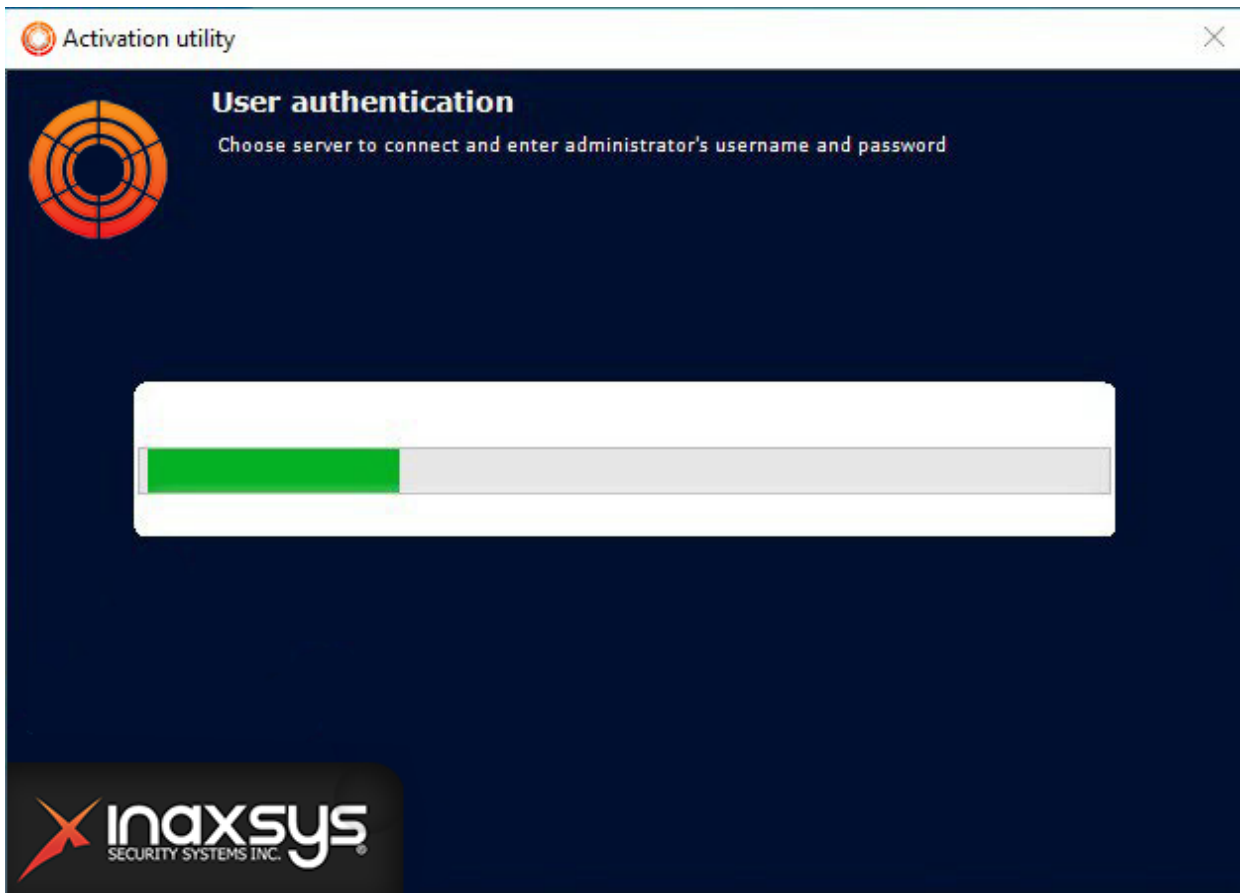
Next >>

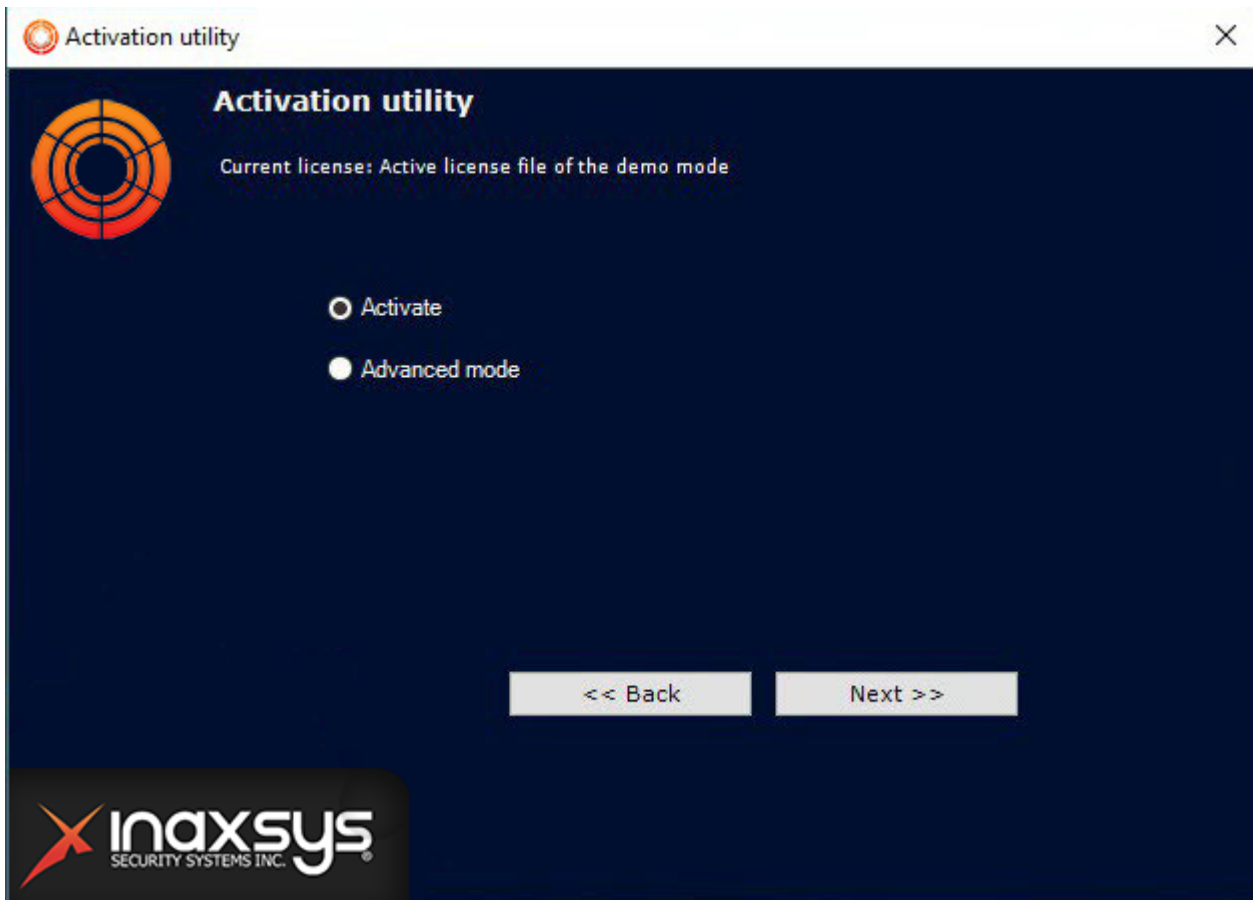
Inaxsys
SECURITY SYSTEMS INC.

After the download is complete the main window of license utility will be displayed.

Note

To activate *Arkiv*, connect to a Server in the Arkiv domain. Otherwise, an error message appears.





To activate *Arkiv*, please refer to the document titled [Activation Guide](#), which presents step-by-step instructions on activating, updating and upgrading *Arkiv*.

It is also recommended that you use the prompts displayed in the product activation utility's dialog boxes.

9.3 Arkiv Support Tool

9.3.1 Purpose of the Support.exe Utility

The Support.exe utility is designed to collect information about the configuration and operating status of hardware, the Windows operating system, and the *Arkiv* software. The utility generates an archive that can be used by the company's technical support department. In case of malfunctions or errors in the *Arkiv* software package, please visit our technical support server at <https://support.inaxsys.com/> and compose a message containing a description of the problem and attach the archive that was generated by the Support.exe utility.

9.3.2 Launching and Closing the Utility

The Support.exe utility is launched using the **Start** menu, which is intended for launching user programs in Windows. Go to **Start** → **All Programs** → **Arkiv** → **Gathering system information**.

Note

- The Support.exe utility is located in the folder <Arkiv installation directory>\Arkiv\bin
- The Support.exe utility requires administrator rights to run.

The Support.exe utility dialog box will then be displayed.

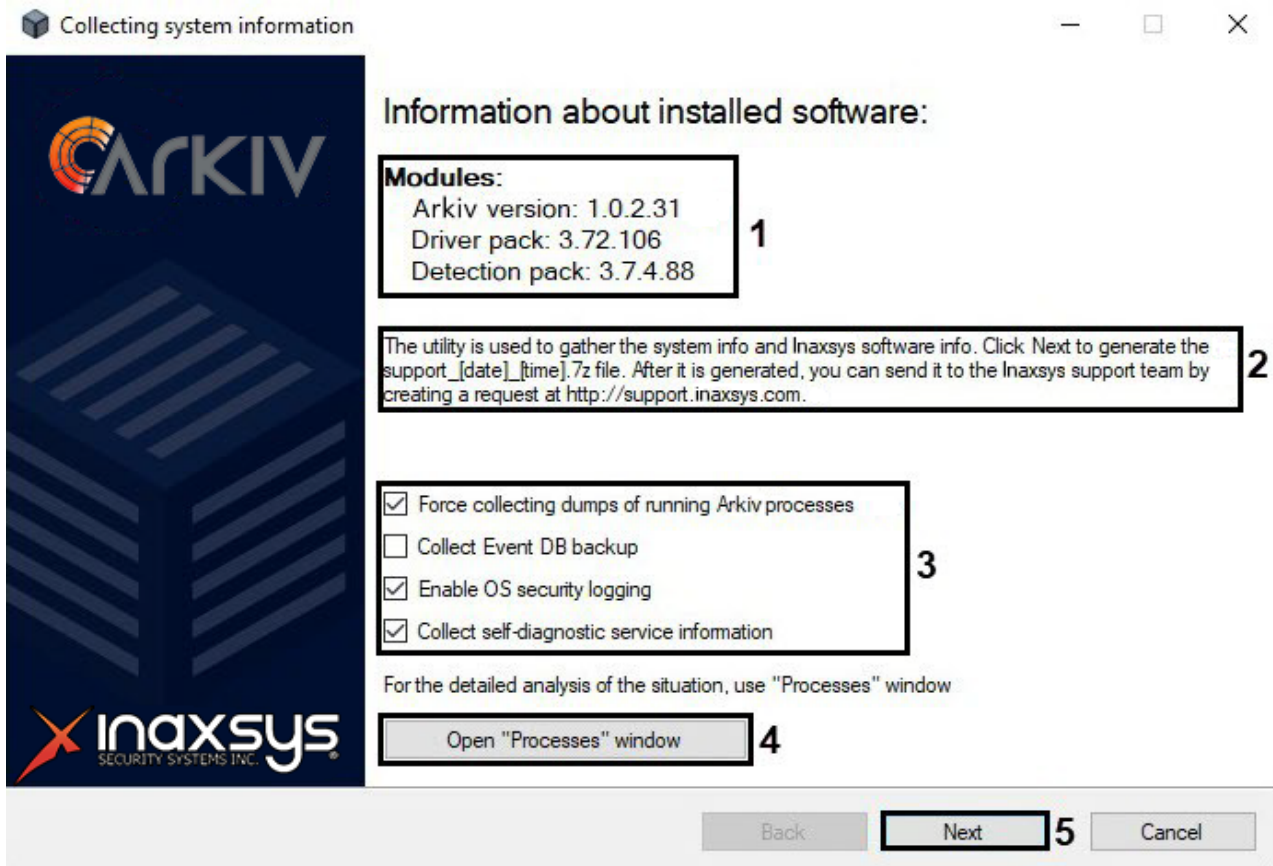


To close the Support.exe utility, click the **Cancel** button or .

9.3.3 Description of the Support.exe utility interface

The Support.exe user interface includes the following elements:

1. Summary of installed software **(1)**.
2. Short instructions on how to use the Support.exe utility **(2)**.
3. Check boxes for configuring data collection **(3)**.
4. A button for launching the **Processes** service, which offers an in-depth situation analysis **(4)**.
5. A button for starting the information gathering process **(5)**.



9.3.4 The Processes Service

The **Processes** service is used for detailed analysis of a situation. To launch it, click the **Open "Processes" window** button; the **Processes** window will then appear, displaying information about processes running on the computer initiated by the Support.exe utility.

Processes

Show info about all processes in system

PID	Process name	CPU us...	Memory	Memory...	Read	Process...	V.mem.	Written
10088	Decoder	2.46%	90 MB		0 KB	NT AU...	4509 MB	2172 MB
10664	MultimediaStorage...	0.4%	30 MB		81154 KB	NT AU...	4436 MB	855544...
10772	FileBrowser		9 MB		32 KB	TEST/...	4244 MB	2482 MB
11040	VMDA		16 MB		6 KB	NT AU...	4367 MB	3482 MB
12292	TvaFaceDetector		35 MB		84201 KB	NT AU...	4498 MB	16305 ...
1304	AVDetector		46 MB		25964 KB	NT AU...	5710 MB	8487 MB
1996	AppHost.exe		46 MB		821138 KB	NT AU...	4388 MB	31758 ...
2408	Ipint		82 MB		2467575...	NT AU...	4610 MB	19152 ...
3060	Statistics		11 MB		32 KB	NT AU...	4252 MB	8 MB
3120	AppDataDetector		24 MB		25923 KB	NT AU...	4379 MB	7596 MB
3568	Cloud		7 MB		32 KB	NT AU...	4251 MB	7 MB
3732	Notification		14 MB		0 KB	NT AU...	4331 MB	11 MB
4120	MultimediaStorage...		18 MB		59741 KB	NT AU...	4347 MB	2019 MB
4628	LprDetector_Intelli...		31 MB		25923 KB	NT AU...	4347 MB	39 MB
5012	EventDatabase		17 MB		0 KB	NT AU...	4335 MB	19 MB
6676	Asip		47 MB		67625 KB	NT AU...	5775 MB	251 MB
7432	LprDetector_Roadar	28.53%	132 MB		91521 KB	NT AU...	5625 MB	2722 MB
8132	MMSS		18 MB		19 KB	NT AU...	4429 MB	6665 MB
8744	PoseDetector		24 MB		25923 KB	NT AU...	5464 MB	4635 MB
9060	NativeBL		34 MB		26542 KB	NT AU...	4465 MB	1265 MB
9116	NeuroTracker		14 MB		74437 KB	NT AU...	5560 MB	224 MB
9316	Discovery		151 MB		66665 KB	NT AU...	5734 MB	1100 MB

A list of all possible *Arkiv* processes is given in the table.

Process	Description
Arkiv.Discovery	Process that searches for peripheral devices (video cameras, analog video cards, devices connected to a serial port, etc.).
Arkiv.VMDA	Process responsible for the metadata database, writes metadata and searches in the archive.
Arkiv.MMSS	Web server process.
Arkiv.Notification	Process for managing events in the system and creating a database of these events.
Arkiv.Arkiv	GUI process.
Arkiv.Bootstrap	Main process responsible for configuration, licensing, storing settings, and starting other processes.

Arkiv.FileBrowser	Process that provides access to the file system and information about server files.
Arkiv.NVR	Logic module responsible for alarms and automatic rules.
Arkiv.InfraServer	Process responsible for interaction between <i>Arkiv</i> modules.
Arkiv.Decoder	Process that performs decoding of multimedia streams.
Arkiv.Detector	Process that performs detection.
Arkiv.Proxy	Process that performs buffering and grooming of multimedia streams.
Arkiv.NVR_Archive	Process that writes multimedia data to the archive.
Arkiv.Ipint	Process that interfaces with the Drivers Pack.
Arkiv.MiscMMSS	Process that plays back audio on the server audio card.


Note

Selecting the **Show info about all processes in system** check box enables viewing of all processes running on the computer.

Processes

Show info about all processes in system

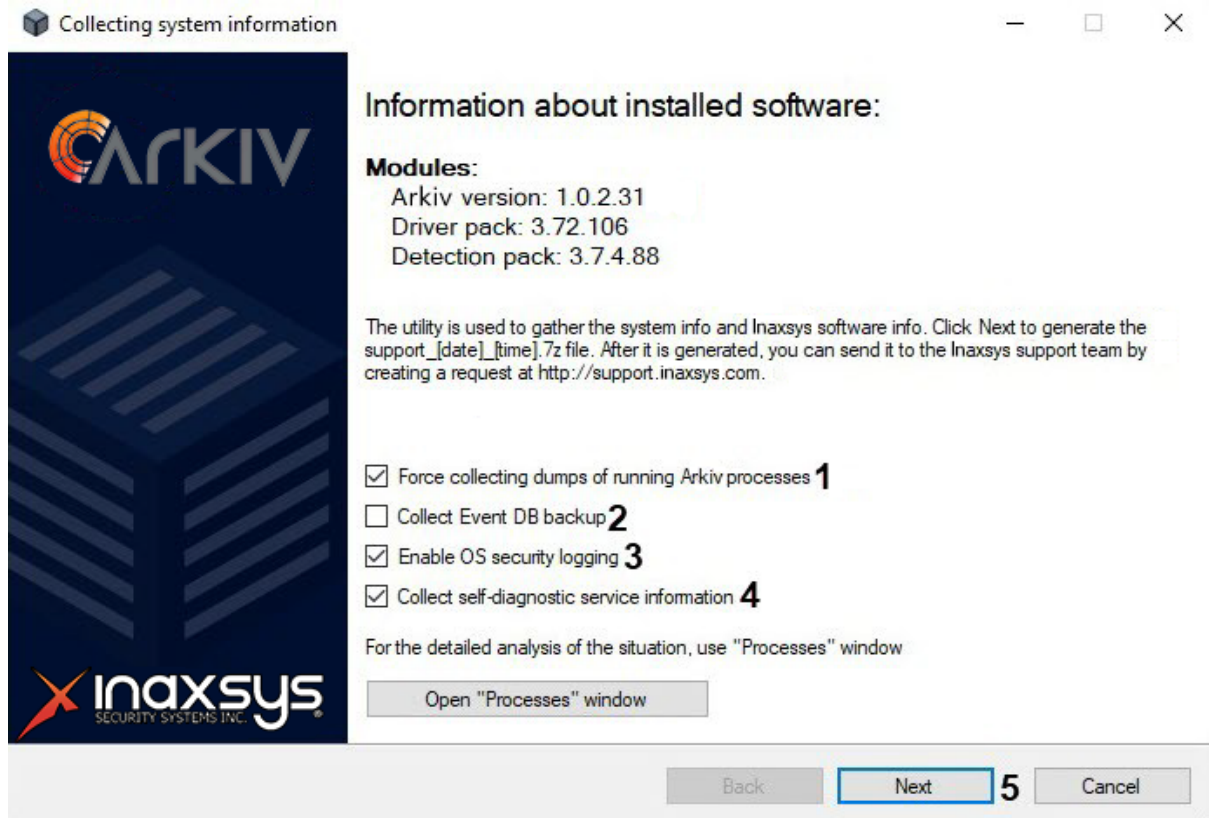
PID	Process name	CPU us...	Memory	Memory...	Read	Process...	V.mem.	Written
10088	Decoder	1.24%	90 MB		0 KB	NT AU...	4509 MB	2173 MB
10664	MultimediaStorage...		30 MB		81174 KB	NT AU...	4436 MB	855544...
10772	FileBrowser		9 MB		32 KB	TEST/...	4244 MB	2483 MB
11040	VMDA		16 MB		6 KB	NT AU...	4367 MB	3482 MB
12292	TvaFaceDetector		35 MB		84201 KB	NT AU...	4498 MB	16305 ...
1304	AVDetector		46 MB		25964 KB	NT AU...	5710 MB	8487 MB
1996	AppHost.exe	0.4%	46 MB		821138 KB	NT AU...	4387 MB	31758 ...
2408	Ipint	0.79%	82 MB		2469478...	NT AU...	4610 MB	19153 ...
3060	Statistics		11 MB		32 KB	NT AU...	4252 MB	8 MB
3120	AppDataDetector		24 MB		25923 KB	NT AU...	4379 MB	7596 MB
3568	Cloud		7 MB		32 KB	NT AU...	4251 MB	7 MB
3732	Notification		14 MB		0 KB	NT AU...	4331 MB	11 MB
4120	MultimediaStorage...		18 MB		59761 KB	NT AU...	4347 MB	2019 MB
4628	LprDetector_Intelli...		31 MB		25923 KB	NT AU...	4347 MB	39 MB
5012	EventDatabase		17 MB		0 KB	NT AU...	4335 MB	19 MB
6676	Asip		47 MB		67625 KB	NT AU...	5772 MB	253 MB
7432	LprDetector_Roadar	30.97%	130 MB	-1024 KB	91521 KB	NT AU...	5623 MB	2722 MB
8132	MMSS		18 MB		19 KB	NT AU...	4429 MB	6668 MB
8744	PoseDetector		24 MB		25923 KB	NT AU...	5464 MB	4635 MB
9060	NativeBL		34 MB		26542 KB	NT AU...	4465 MB	1266 MB
9116	NeuroTracker		14 MB		74437 KB	NT AU...	5560 MB	224 MB
9316	Discovery		151 MB		66665 KB	NT AU...	5734 MB	1100 MB

Click the  button to close the **Processes** window.

9.3.5 Collecting Data on the Configuration of Servers and Clients Using the Support

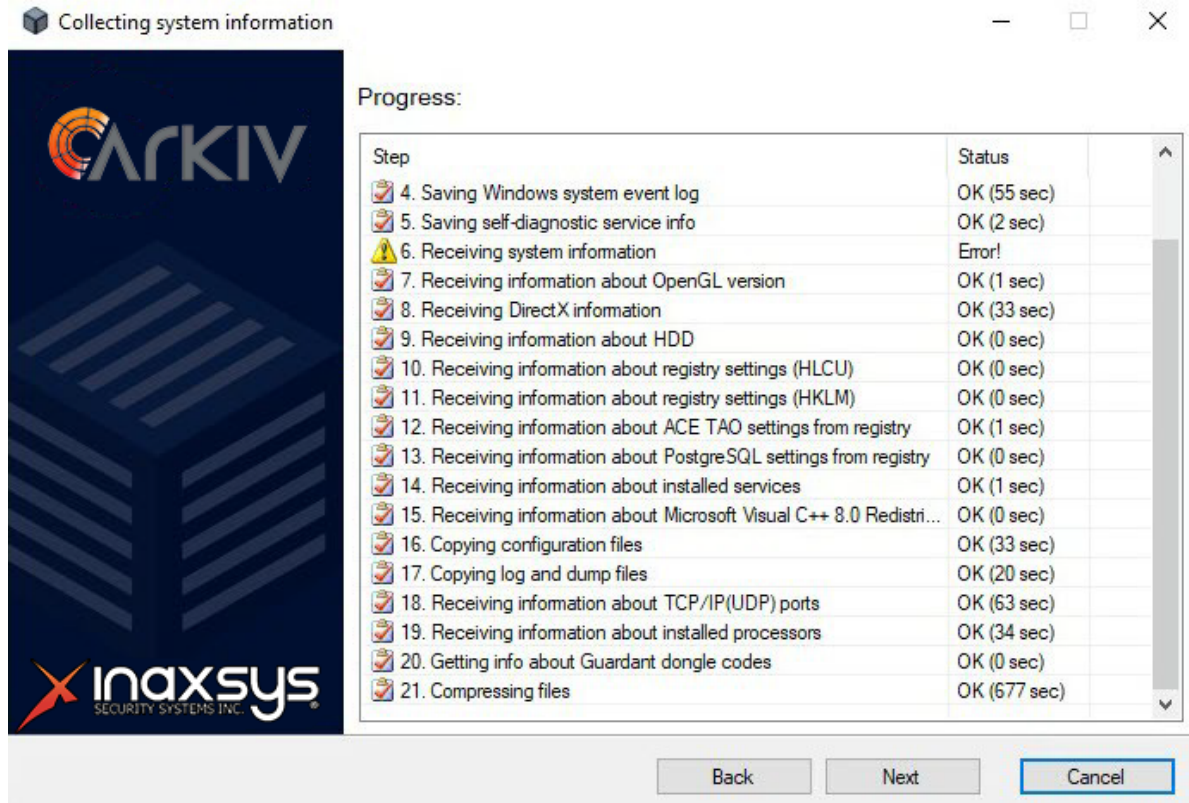
To collect data using the Support.exe utility, perform the following:

1. Launch the Support.exe utility (see the section [Launching and Closing the Utility](#)(see page 827)).



2. By default, a report includes data about already launched *Arkiv* processes. To exclude this data from reports, deselect the checkbox **(1)**.
3. Select the corresponding checkbox to include a backup copy of events database in reports **(2)**.
4. By default, a report includes information about Windows security system. To exclude this data from reports, deselect the checkbox **(3)**.
5. Select the corresponding checkbox to include a self-diagnostic service (see [Self-diagnostics service](#)(see page 586)) information in reports **(4)**.
6. Click the **Next** button **(5)**.
The data collection process will begin. The table that displays the progress of data collection includes two columns: **Step** and **Status**. In the **Step** column, a brief description of the stage of information collection is displayed. In the **Status** column, a progress indicator and the time spent on executing the stage are

displayed.



7. When information collection is complete, click the **Next** button.
8. A window containing information about the generated archive **support_[date]_[time].7z** will then appear. You can access the folder containing this archive by clicking the **Open directory with file** button.

Note

The archive is located in the folder <System disk>:\Documents and Settings\<Current User>\My Documents if you're using Windows XP, or in the folder <System disk>:\Users\<Current User>\Documents if you're using Windows Vista.



9. Send an email with the attached **support_[date]_[time].7z archive** to the Inaxsys technical support department.

9.4 Log Management Utility

By default, information about all system events is recorded in the *Arkiv* system log, which is stored in a local database of the server. It is possible to record information about desired events in external logs, which are log files stored in local directories of a server. Log data is archived at set intervals and moved to the log archive.

Configuration of these capabilities is carried out through the log management utility.

Arkiv component	Log storage directory
Server	<Arkiv installation folder>\logs
Client	<Letter of system disk>: \Users\<User>\Appdata\Local\Inaxsys\Arkiv\logs (for Windows Vista, and Windows 7 and higher) <Letter of system disk>:\Documents and Settings\User\Local Settings\Application Data\Inaxsys\Arkiv\Logs (for Windows XP)

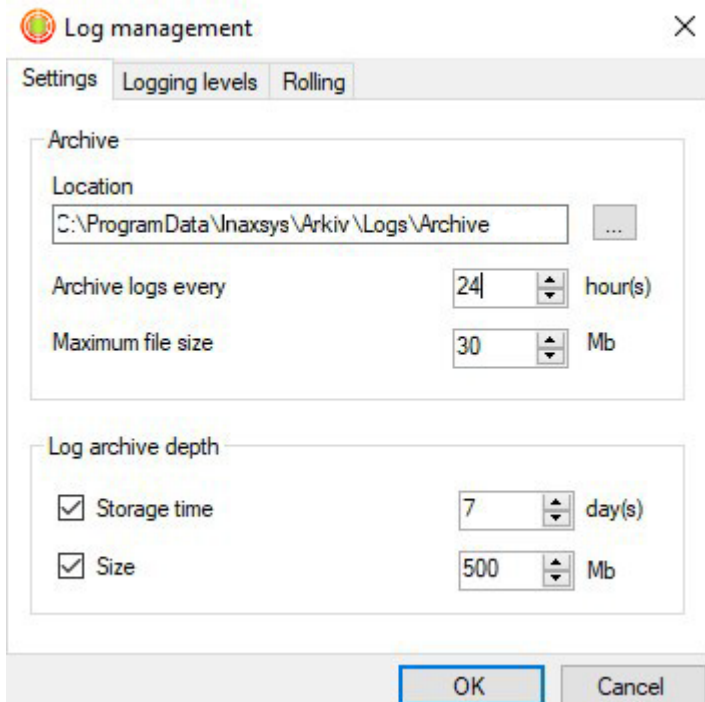
The log management utility is used to configure the following parameters:

1. Parameters for the archive of external logs containing information about system events.
2. Logging levels for the *Arkiv* Client and Server.

9.4.1 Starting and closing the utility

The log management utility can be launched using the **Start** menu, which is intended for launching user programs in Windows. **Start** → **All Programs** → **Arkiv** → **Utilities** → **Logs Archiving**.

The log management utility dialog box will then appear.



To close the log management utility, click the **Cancel** button or  (accessible in all tabs of the utility).

9.4.2 Configuring a Log archive

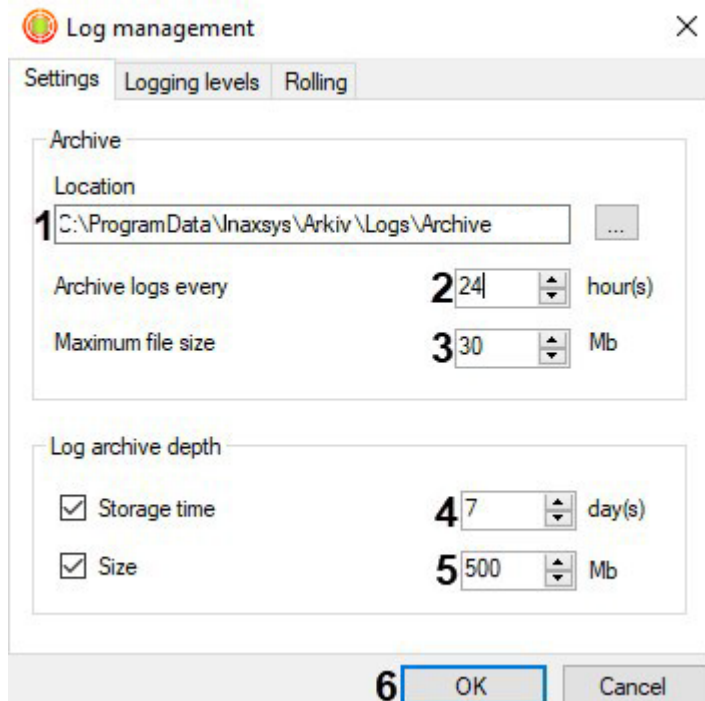
Configuring a log archive is carried out in the **Settings** tab of the log management utility.

To configure a log archive, you must perform the following steps:

1. In the **Location** field (1), enter the complete path to the directory to which the event logs should be moved after archiving.

Note

To set the path using standard Windows methods, click .



2. In the **Archive logs every...hour(s)** field (2), enter the interval for event log archiving, in hours.
3. Set the maximum size of the log archive file in megabytes (3). When the specified size is reached, a new log archive file is created.
4. In the **Log archive depth** group, set the following parameters:
 - a. In the **Storage time** field (4), indicate the maximum retention time in days of a log in the archive, after which the log is deleted.
 - b. In the **Size** field (5), indicate the maximum size of the archive, above which the oldest logs are deleted from the archive.

Note

Archive disk space restrictions take priority over log retention time restrictions. For example, the oldest logs will be automatically deleted even if their retention time has not expired, if the archive size has exceeded the maximum value.

Note

If it is not necessary to impose any limitations on log retention period and/or size, clear the corresponding check boxes in the **Log archive depth** (4-5).

5. Click **OK** (6) to save changes.

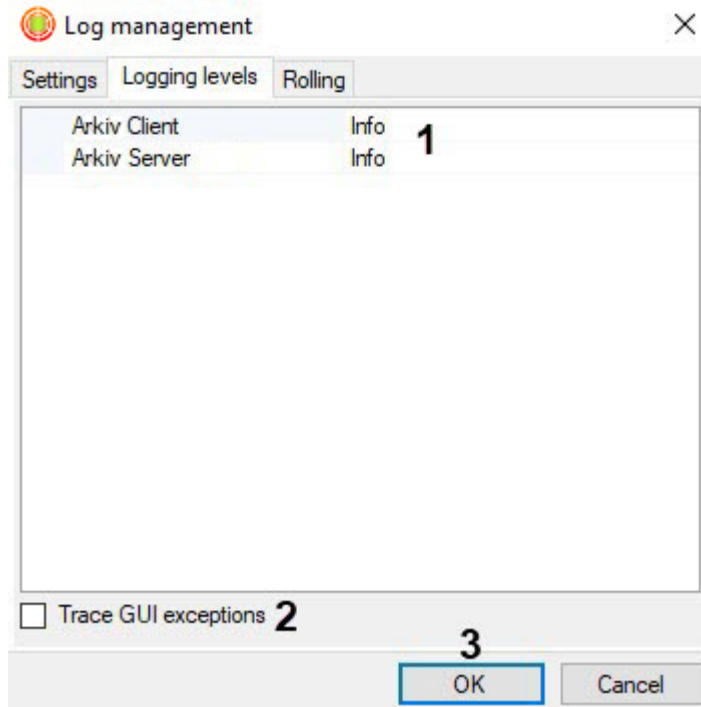
Configuration of the log archive is now complete.

9.4.3 Configuring Logging levels

Logging levels differ in the list of events to be recorded in external logs, as well as the level of event specification (low, medium, high). Configuration of levels is carried out in the **Logging levels** tab of the log management utility.

To configure the logging level, you must perform the following steps:

1. Select the desired logging level of the Client (Arkiv Client) and the Server (Arkiv Server) (1).



Note

If you change the logging level of a Server, the server will be restarted.

Note

If the *Arkiv VMS* is installed in the **Failover Server and Client** configuration, you can log in as either a Client or a Supervisor.

Logging level	Logging level description
None	Event logging disabled
Error	Low specification level – only system errors are logged
Warning	Low level of detail - only system warnings and system errors are logged
Info	Low level of detail - logs informational messages, system warnings, and system errors
Debug	Medium level of detail - logs debugging events, informational messages, system warnings, and system errors

Trace	High specification level – all system events are logged
-------	---

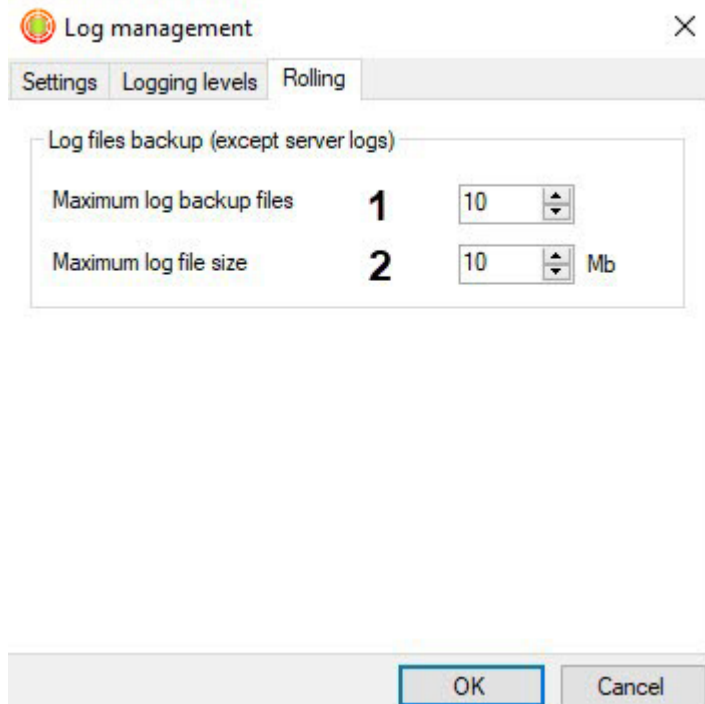
- If you need to include GUI exceptions into the logs, select the corresponding check box **(2)**.
- Click **OK (3)** to save changes.

Configuration of logging levels is complete.

9.4.4 Set the size and maximum number of logs

To adjust the size and maximum number of logs:

- Switch to the **Rolling** tab.




- Set the maximum number of logs **(1)**.
- Set the maximum size of the log in megabytes **(2)**. When the specified size is reached, a new log is created.
- Click **OK** to save changes.

9.4.5 Configuring Client RAM usage logging

You can log Client RAM usage at specified intervals (Arkiv.exe process). To do this:

- Quit Client (see [Shutting down an Arkiv Client](#)(see page 82)).
- Open the Arkiv.exe configuration file, located in the <System disk>:\Program Files \Inaxsys\Arkiv\bin, in a text editor.

- Find the **MemoryUsageDumpIntervalSeconds** option and set a value for it, corresponding to the period of adding the information to the log in seconds.

 Arkiv.exe - Notepad

```
File Edit Format View Help
<add key="MapOnlyViewModeTransformationTime" value="400"/>
<add key="SlideButtonAnimationTime" value="200"/>
<add key="ImmersionModeTransformationTime" value="800"/>
<add key="MapImageMaxSizeInPixels" value="4000000"/>
<add key="AutoResolutionSelectPercentLimit" value="10"/>
<add key="MemoryUsageDumpIntervalSeconds" value="0"/>
<add key="EnableHighProcessPriority" value="true"/>
<add key="AllowIpServerChannelRemove" value="false"/>
<add key="LdapConnectionTimeoutSeconds" value="30"/>
```

Note

Value **0** – no information is logged.

- Save the changes to the file.
- Run client (see [Starting an Arkiv Client](#)(see page 76)).

Here is an example of the Client RAM usage information in the log:

```
*** Memory usage: ***
Private size 425 MB
Working set 404 MB
```

Private size – the amount of reserved memory.

Working set – memory footprint.

9.5 Digital signature verification utility

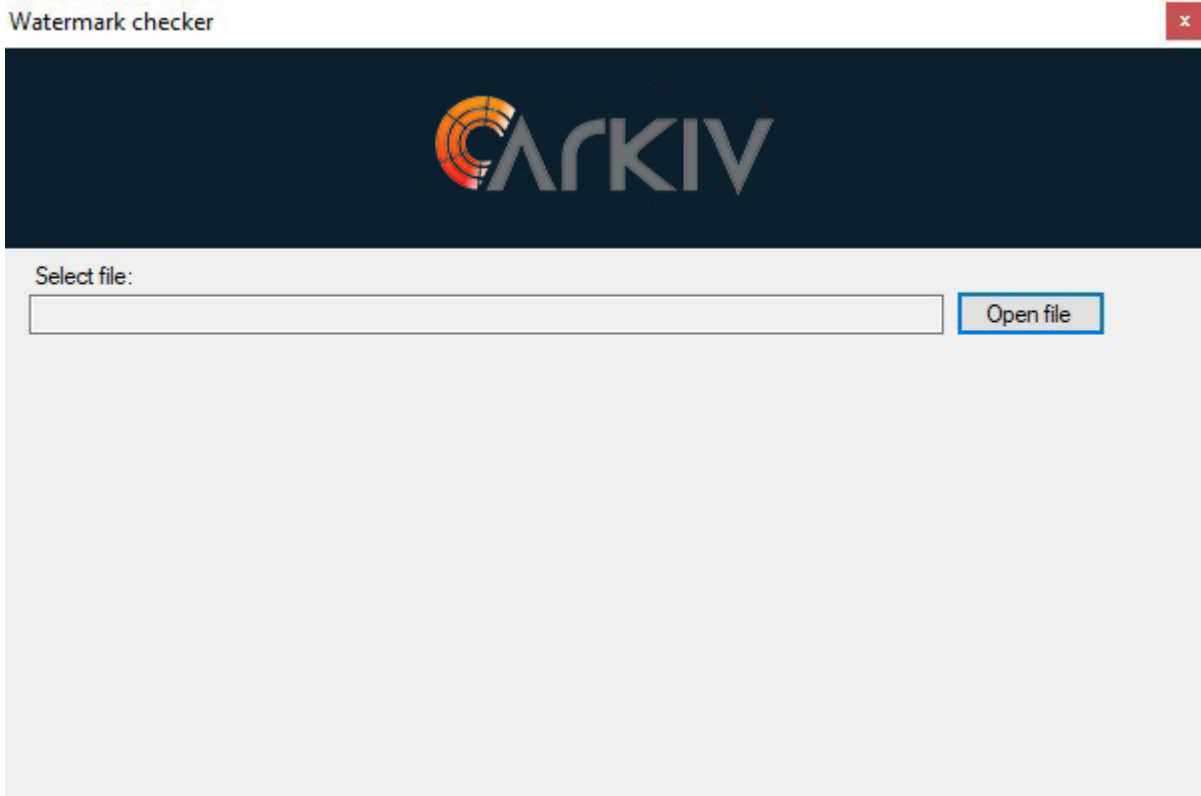
This utility verifies the digital signature that is added during export of video and snapshots from *Arkiv*.

To start the utility, open the standard **Start** menu in Windows: **Start > Programs > Arkiv > Utilities > Watermark checker**.

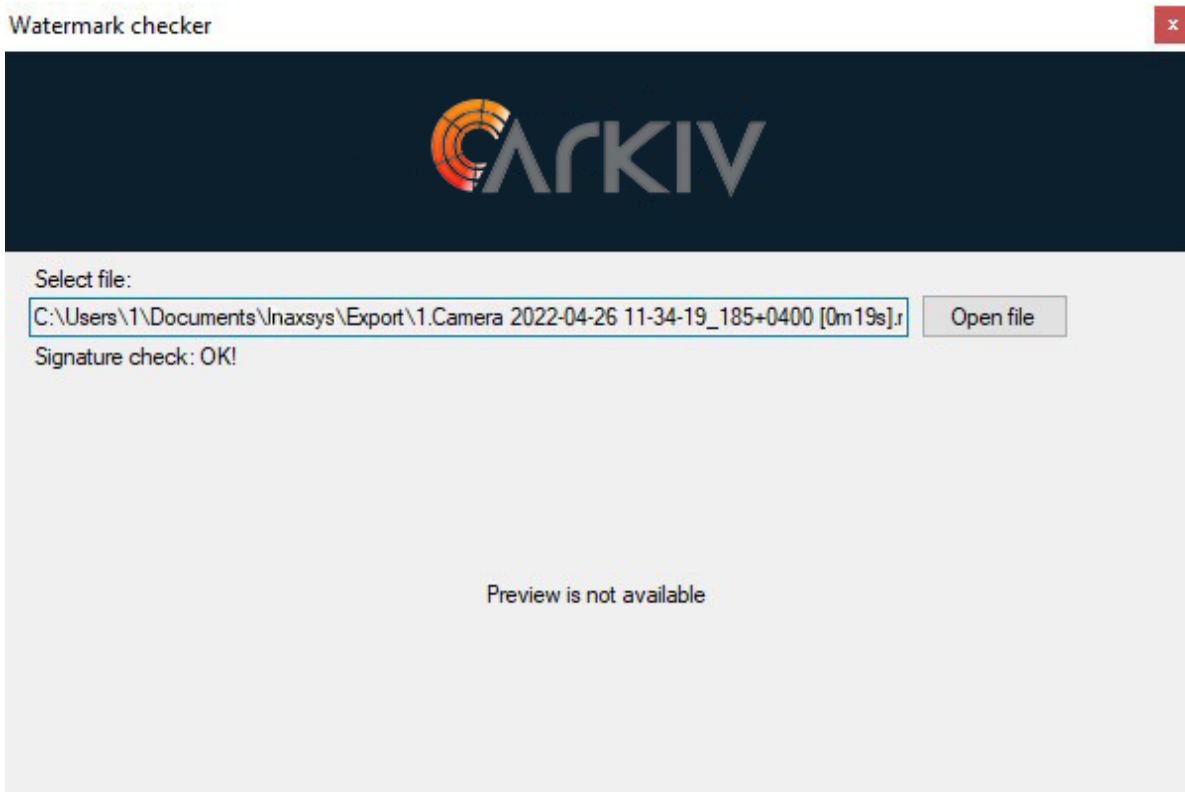
Note

The utility executable file WatermarkCheck.exe is also located in the folder <System disk>:\Program Files\Inaxsys\Arkiv\bin\.

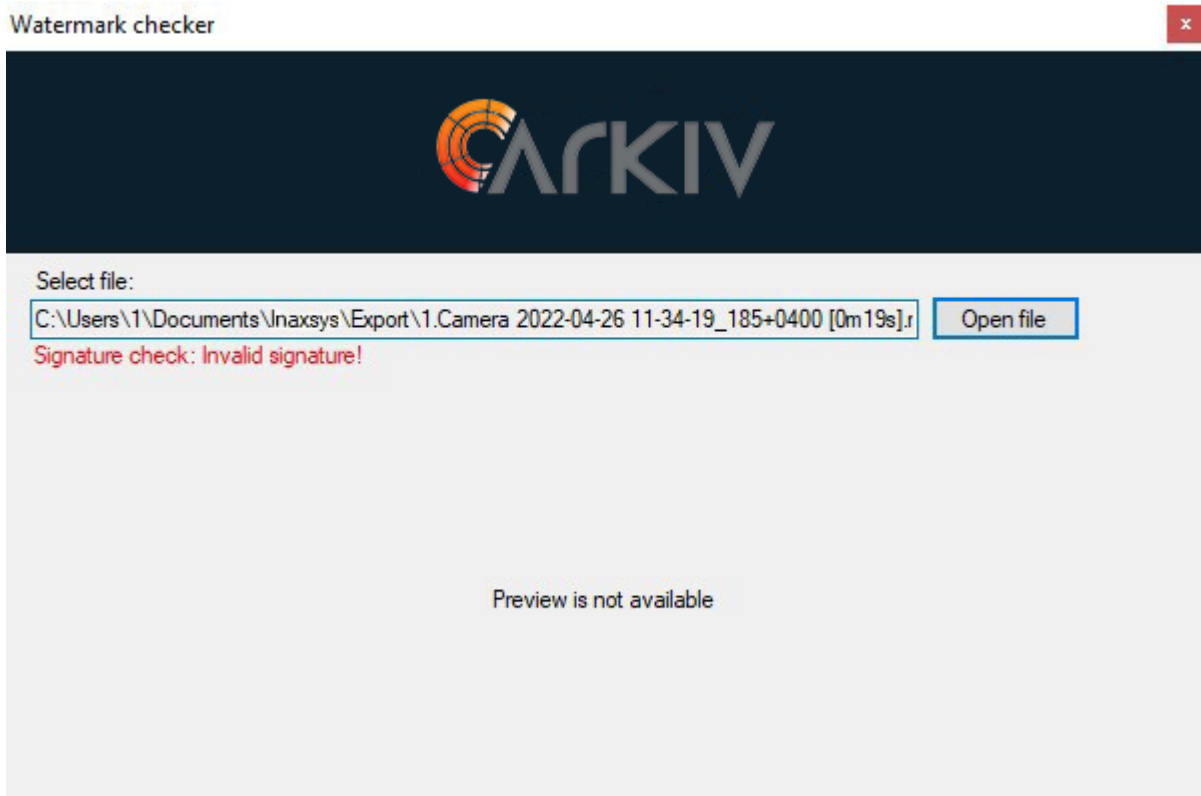
To check a digital signature, click the **Open file** button and select the file of the exported snapshot or video.



If the digital signature is valid, the utility will show the message: **Signature check: OK!**




If it is not valid, the utility will show the message: **Signature check: Invalid signature!**



Note

During verification of a digital signature, the thumbnail of a snapshot is shown in the utility window. Videos cannot be previewed during the verification process.

Digital signature verification is now complete.

To quit the utility, click the  button.

9.6 Backup and Restore Utility

9.6.1 Purpose of BackupTool.exe

BackupTool.exe allows system users to save a copy of the system configuration, roll back the configuration to a previous version, and restore the system configuration from a previously created copy.

Attention!

The backup and restore utility may be applied to both the local configuration of a selected Server (including video cameras, archives, detection tools, event sources, logging levels) and the global configuration of the Arkiv domain (users, maps, layouts, etc.).

This utility can also be used to change the name of the local Server.

9.6.2 Starting and quitting BackupTool.exe

Start BackupTool.exe from **Start -> All Programs -> Arkiv -> Utilities -> Backup and restore**, or from the tray menu (see the [Arkiv Tray Tool](#)(see page 824) section).

Note.

The BackupTool.exe executable is located at <Arkiv installation folder>\Arkiv\bin\.

After you perform this action, BackupTool.exe displays a dialog box.

Then select the name of an Arkiv-domain Server whose configuration you want to use and log in to it, using the name and password of an *Arkiv* administrator.

Backup and restore configuration tool

User authentication
Choose server to connect and enter administrator's username and password

Server name or IP address: TEST >>

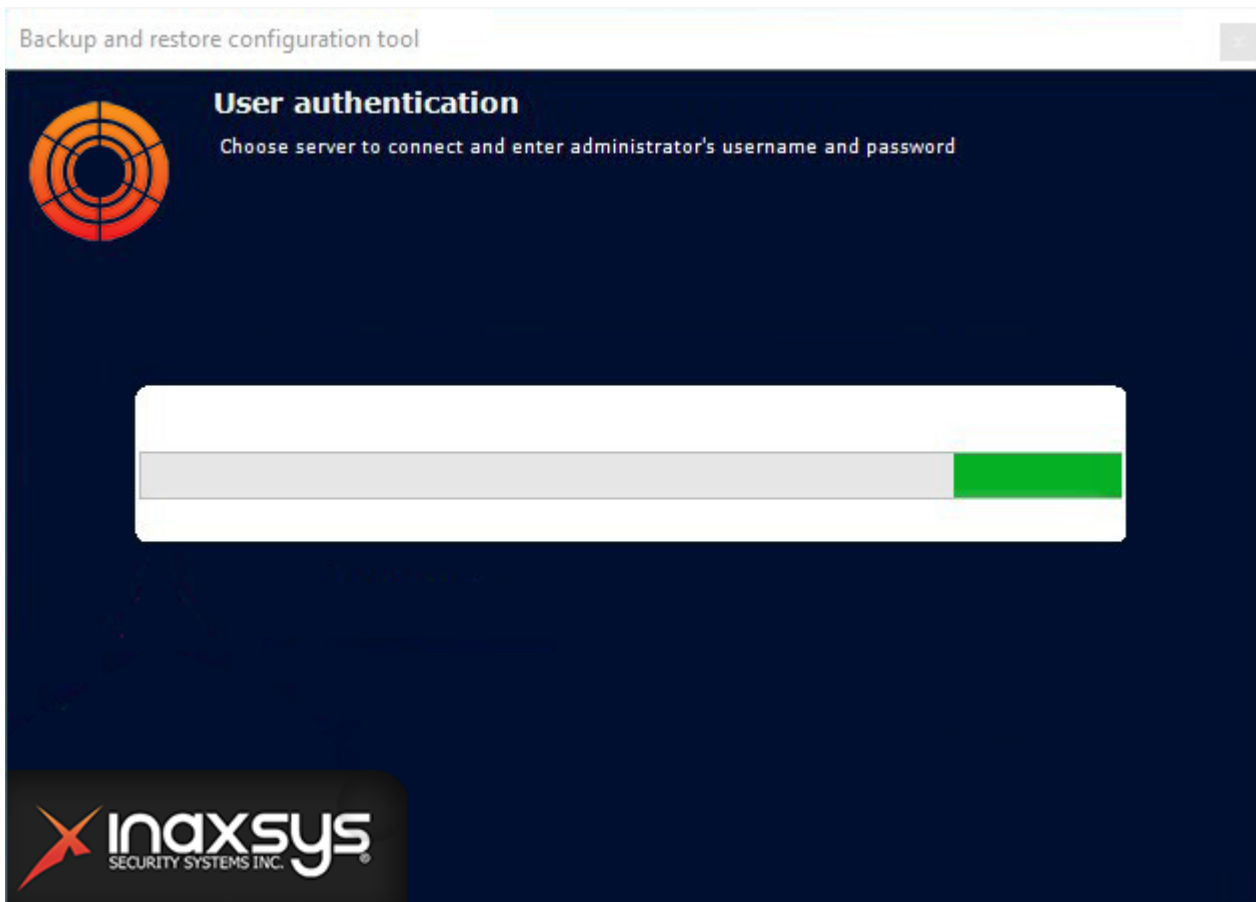
Username: User

Password: *****

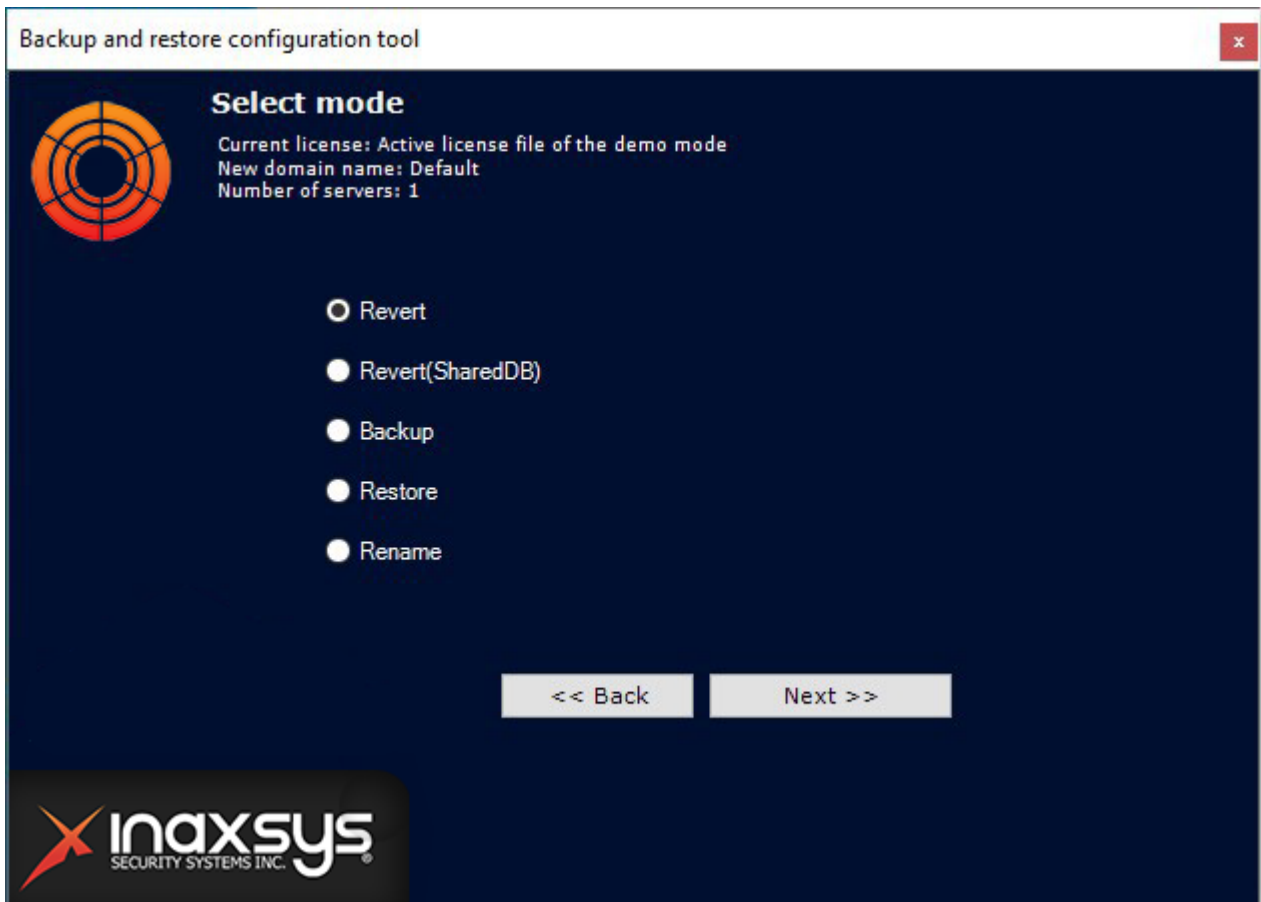
Next >>


Inaxsys
SECURITY SYSTEMS INC.

A progress indicator is displayed.



After loading is complete, the main page of the Backup and restore utility is shown.

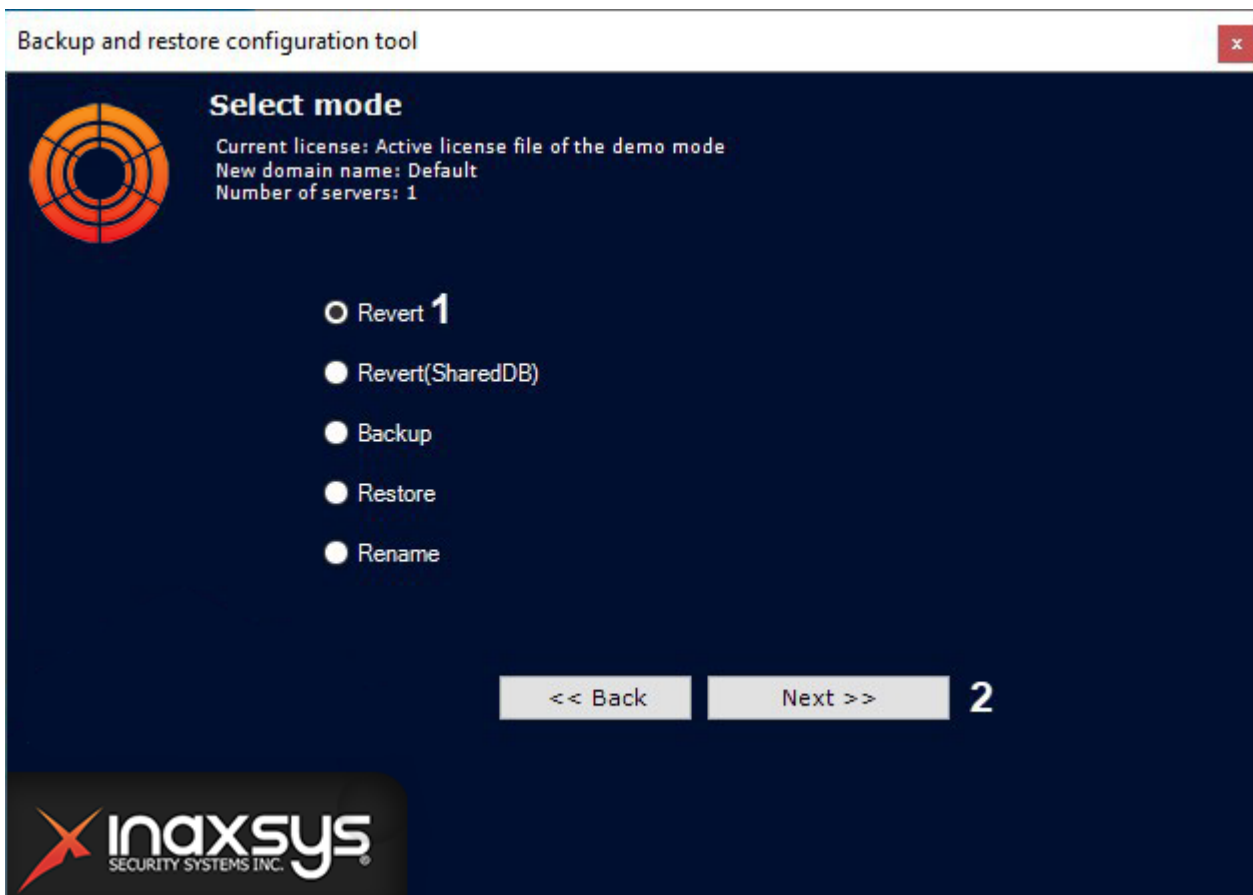


To quit BackupTool.exe, click the  button.

9.6.3 Roll back the local configuration to a selected restore point

The system creates a restore point when the local configuration of the Server is changed (creation/deletion/ changing settings of any objects, linking cameras to different archives, etc.). You can roll back your configuration to any available restore point at any time.

To roll back, on the main page of the Backup and restore utility, set the switch to the **Revert** position (1). To continue, click the **Next >>** button (2).



A window then opens, displaying a list of available restore points and their respective creation times, with a description of what was changed.

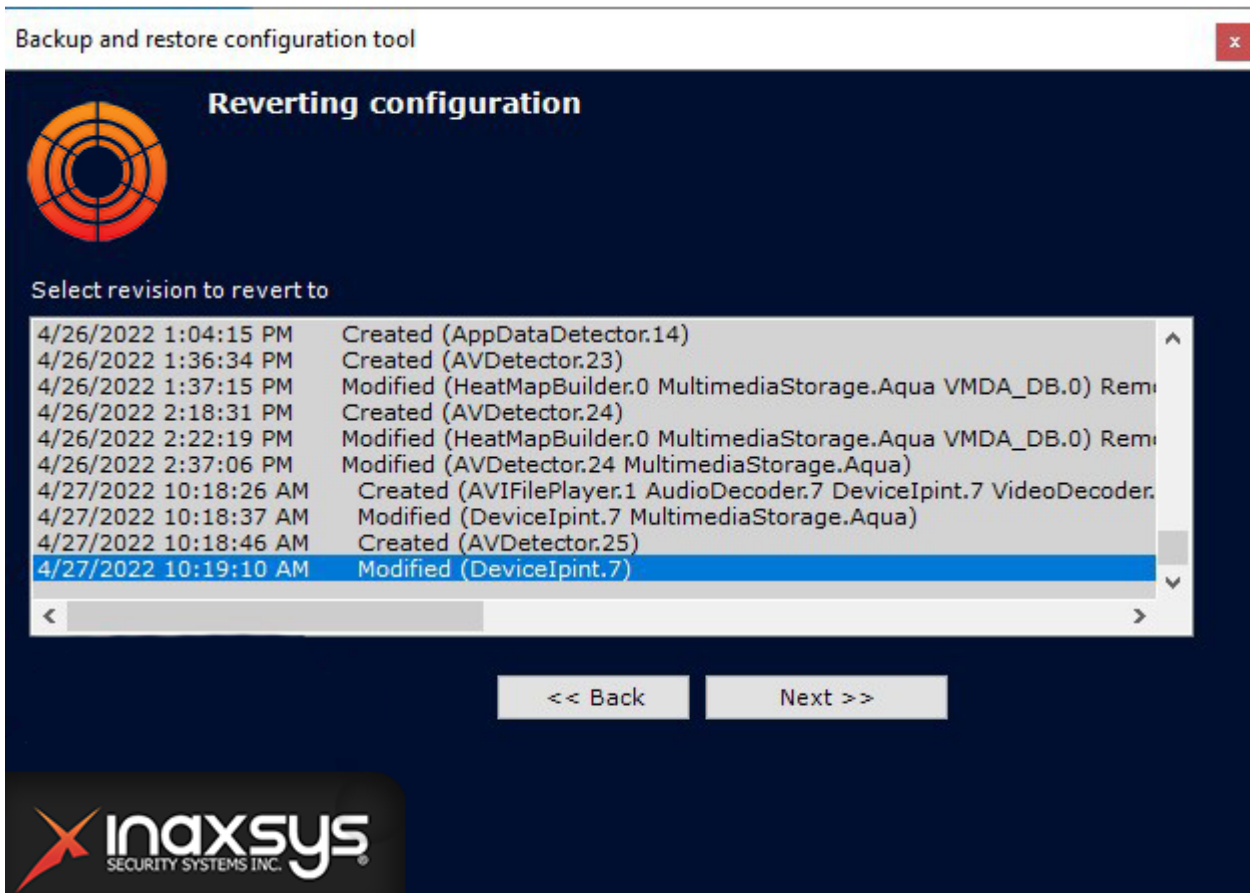
Note.

If multiple changes were made in a configuration but the **Apply** button was clicked only once, only one restore point is created in the list.

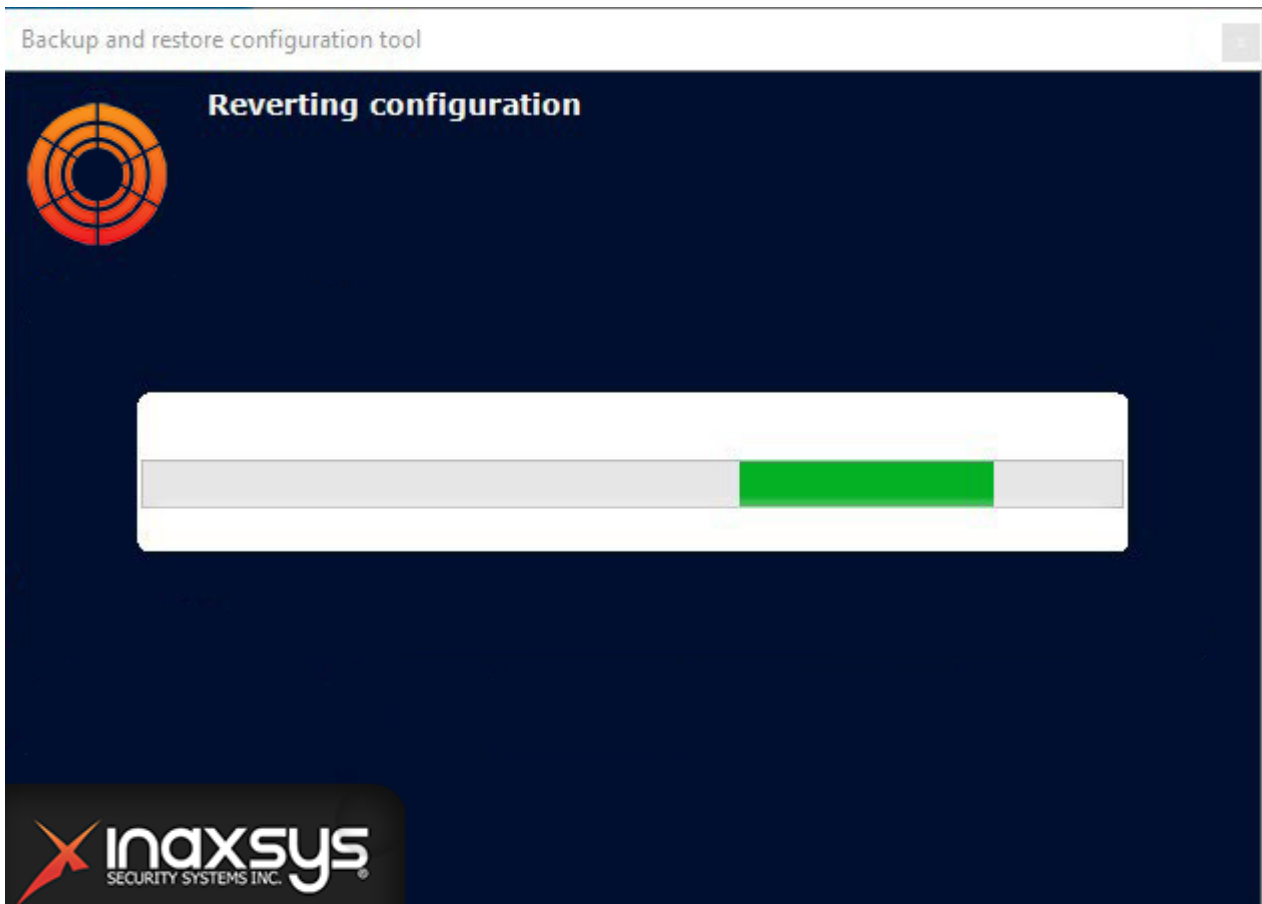
In the list, select the restore point to which you want to roll back. To continue, click the **Next** button.

Note.

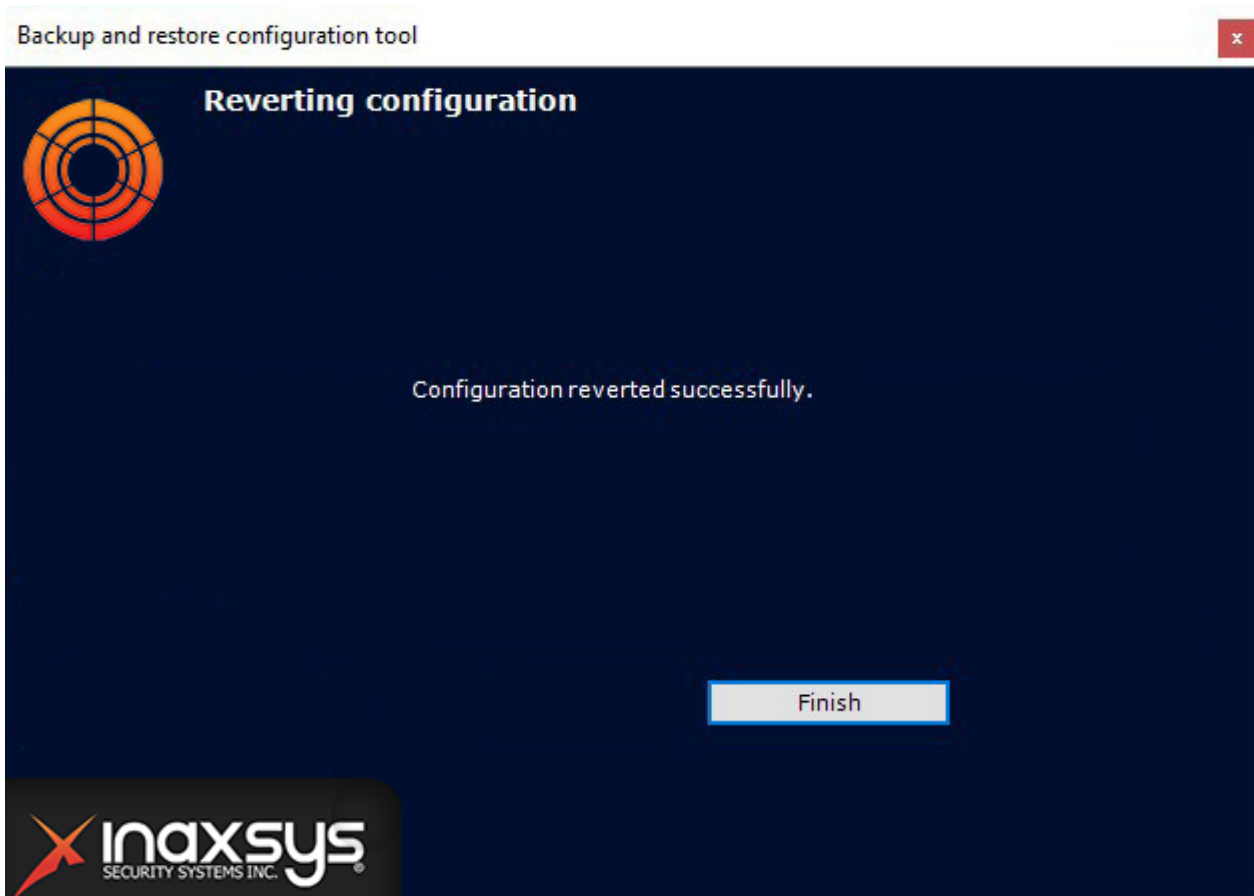
Empty configuration corresponds to when the system was first created.



Rollback of the configuration now begins.



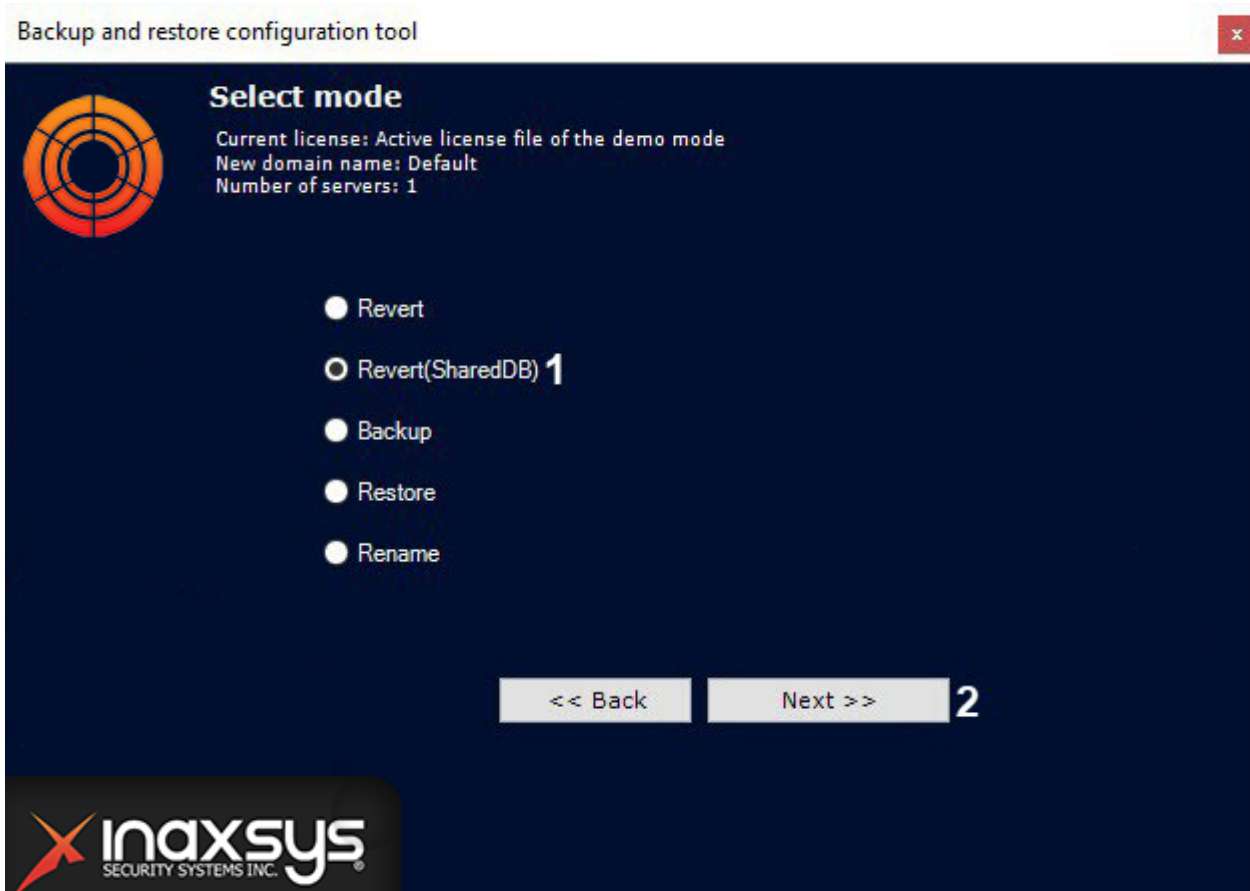
After the operation is completed, a message is shown to notify of successful rollback.



To close the window, click the **Finish** button.

9.6.4 Roll back the global configuration to a selected restore point

The system creates a restore point when the global configuration of the Arkiv domain is changed (creation/deletion of roles, users, maps, layouts, etc.). You can roll back your configuration to any available restore point at any time. To launch the roll back process, go to the main page of Backup and restore utility (1) and set the switch to the **Revert (SharedDB)** position. To continue, click **Next >>** (2).



Further steps are the same as for rolling back the local configuration (see [Roll back the local configuration to a selected restore point](#)(see page 845)).

9.6.5 Backing up a configuration

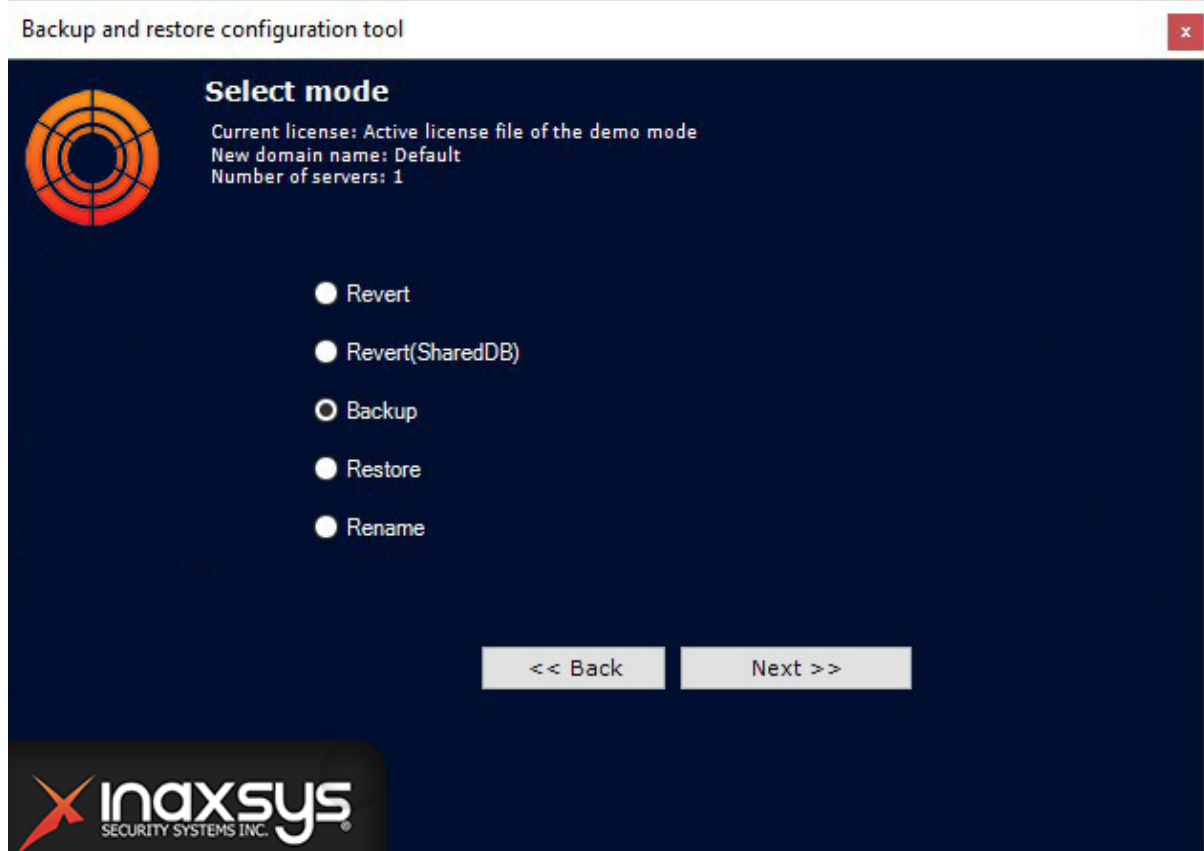
Backing up a configuration involves creating and saving copies of the license key, domain structure, all created objects along with their parameters and relationships with history of changes, as well as database containing users, groups, passwords, and layouts.

☐ Attention!

We recommend you to back up your configuration after any major change in system configuration.

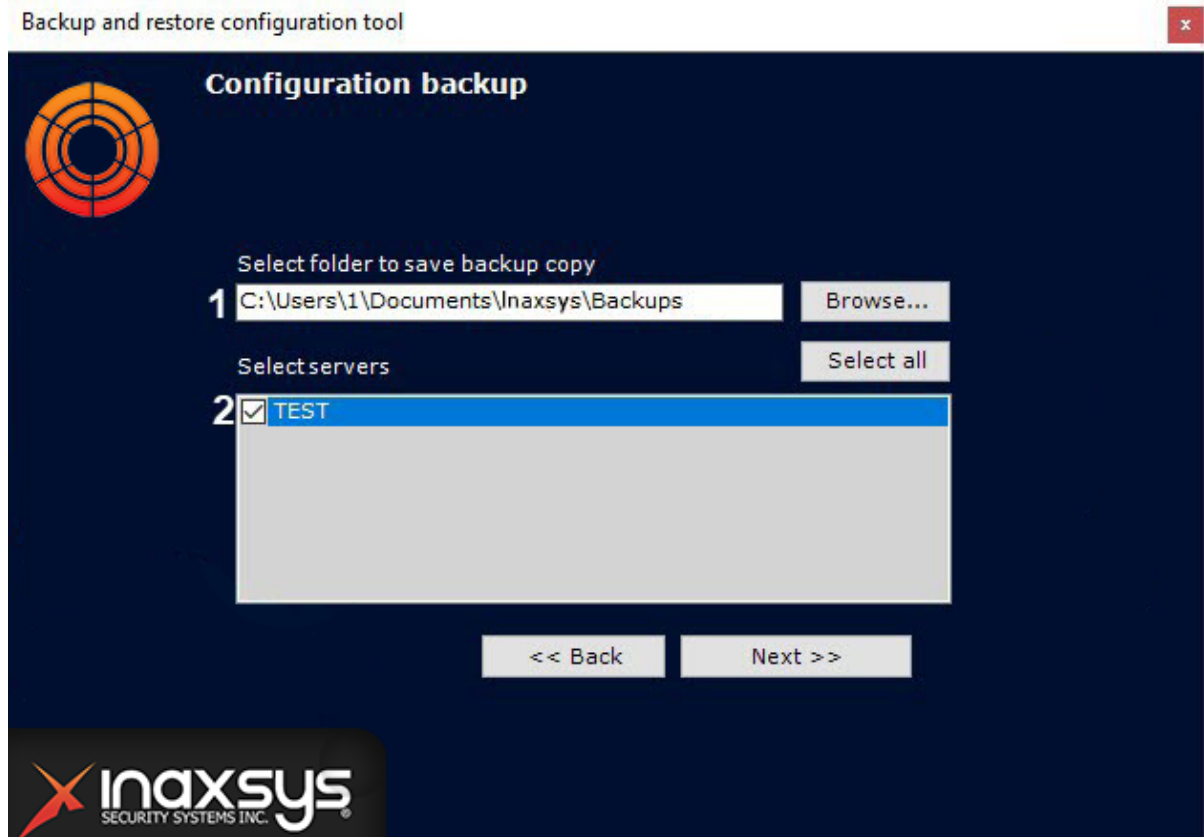
To create a backup of the system configuration:

1. On the main page of the Backup and restore utility, set the switch to the **Backup** position.



- A window then opens for configuring backup options.
2. In the field **(1)**, specify a folder for saving the backup. The default folder is C:\Users\username\Documents\Inaxsys\Backups\. To switch to a different folder, click **Browse...** and select

a folder in the dialog box.

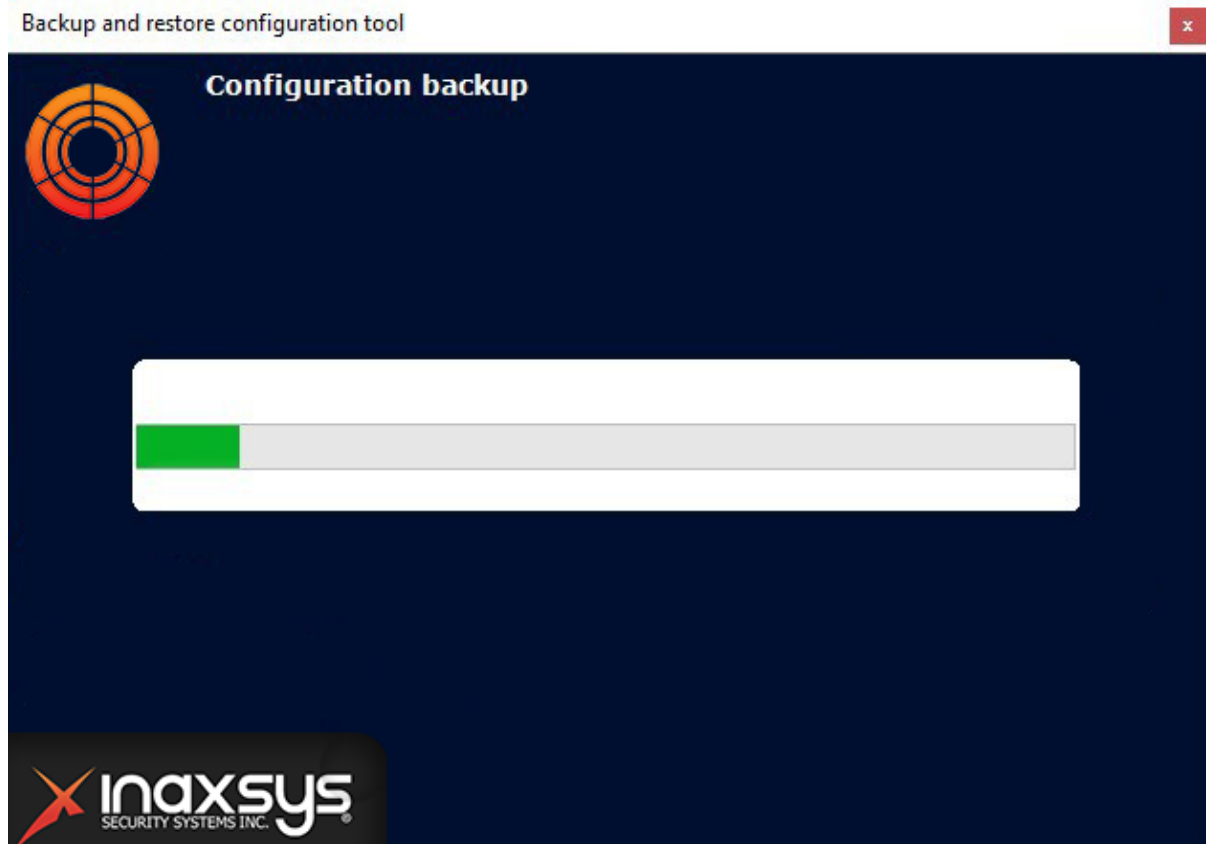


Note

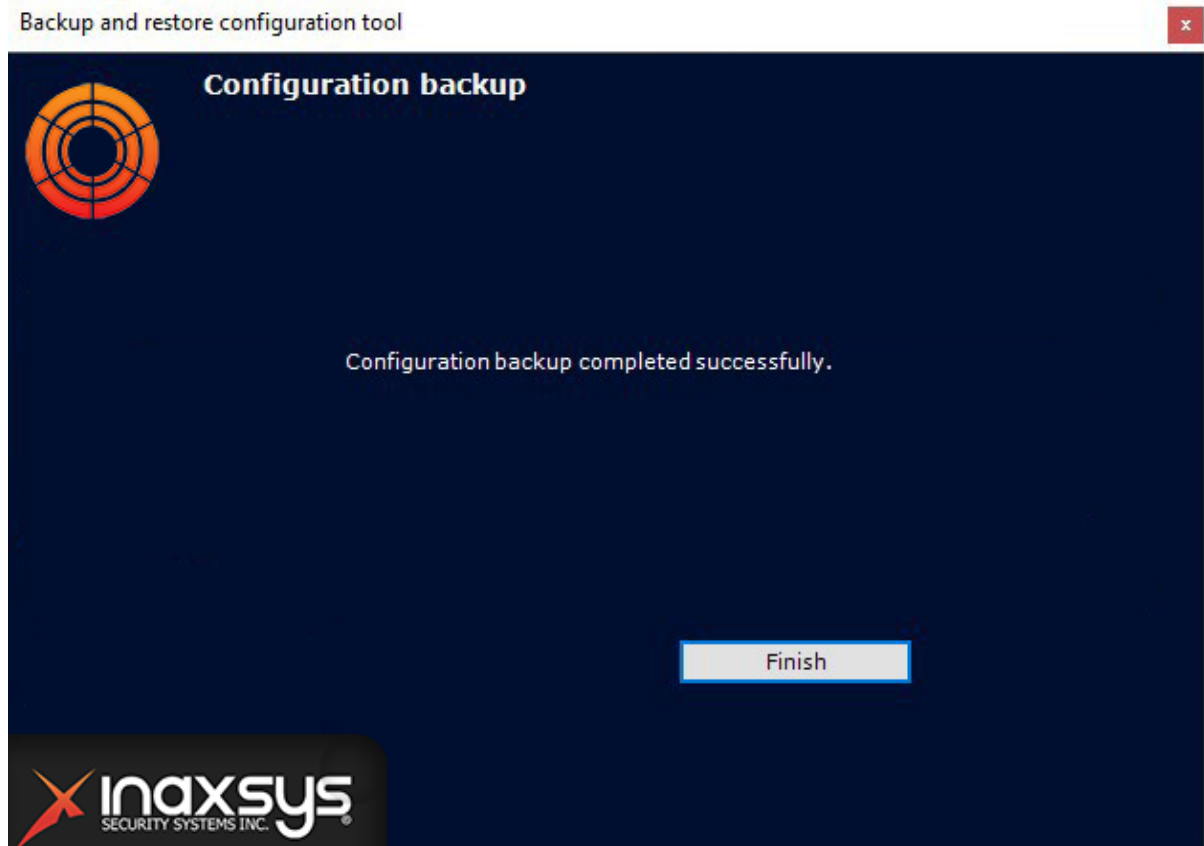
For each copy of the backup configuration, a separate folder is created. The folder name contains the date and time of the backup copy and has the following format: YYYYMMDDHHMMSS. The default time zone is UTC + 0

3. In the other field (2), select servers for creating the backup. You can select multiple servers. To select all servers, click the **Select all** button. Start the backup process by clicking the **Next** button.

Progress information is shown in the following window.



4. When the backup is complete, a window notifies of successful copying.



5. To close the window, click the **Finish** button.

A backup of the configuration has now been created.

9.6.6 Restoring a configuration

Attention!

We can guarantee that your configuration will be fully recovered if:

- the backup was created on the same software version (including the build number);
- the backup was created on the same PC (for licensing without the Guardant key).

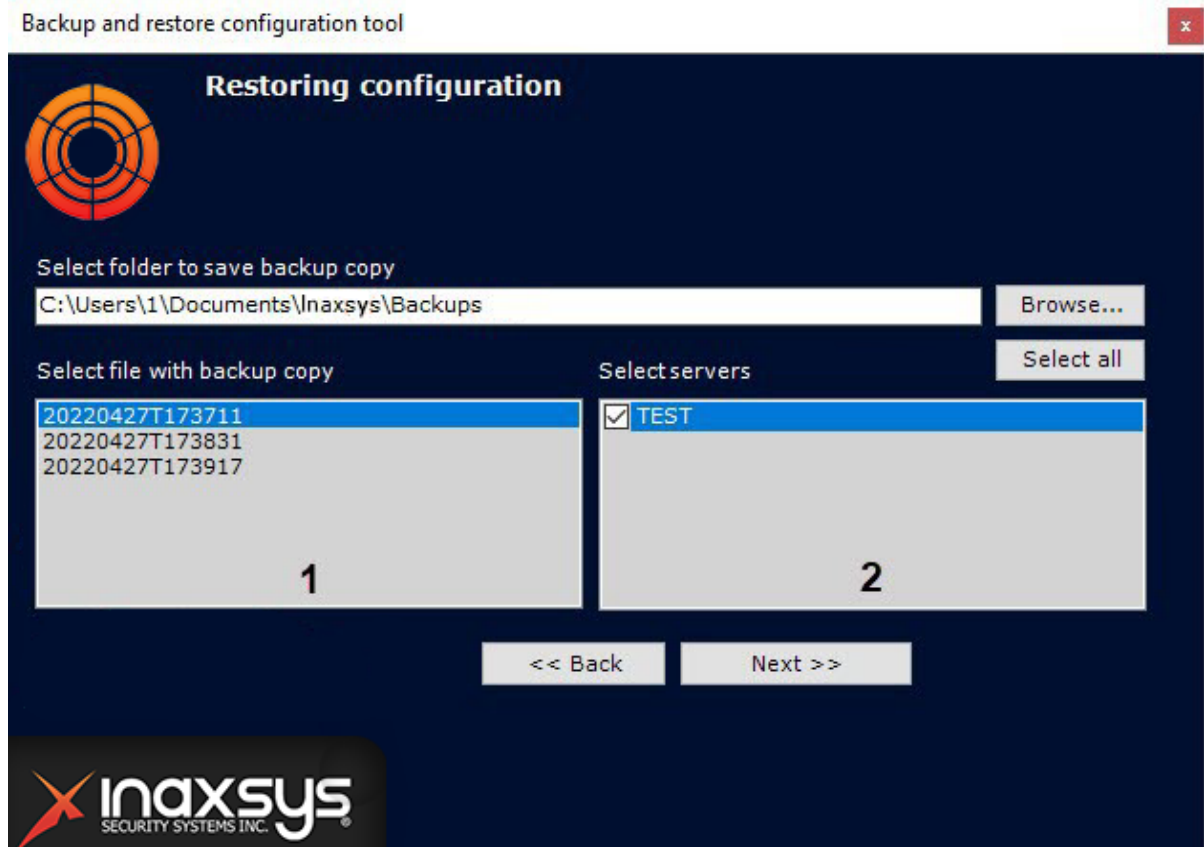
The information about the product version and the PC's HID can be found in a JSON file in the saved configuration folder.

Attention!

To successfully restore a configuration, please ensure that the current Server name is exactly the same as the Server name in the backup configuration.

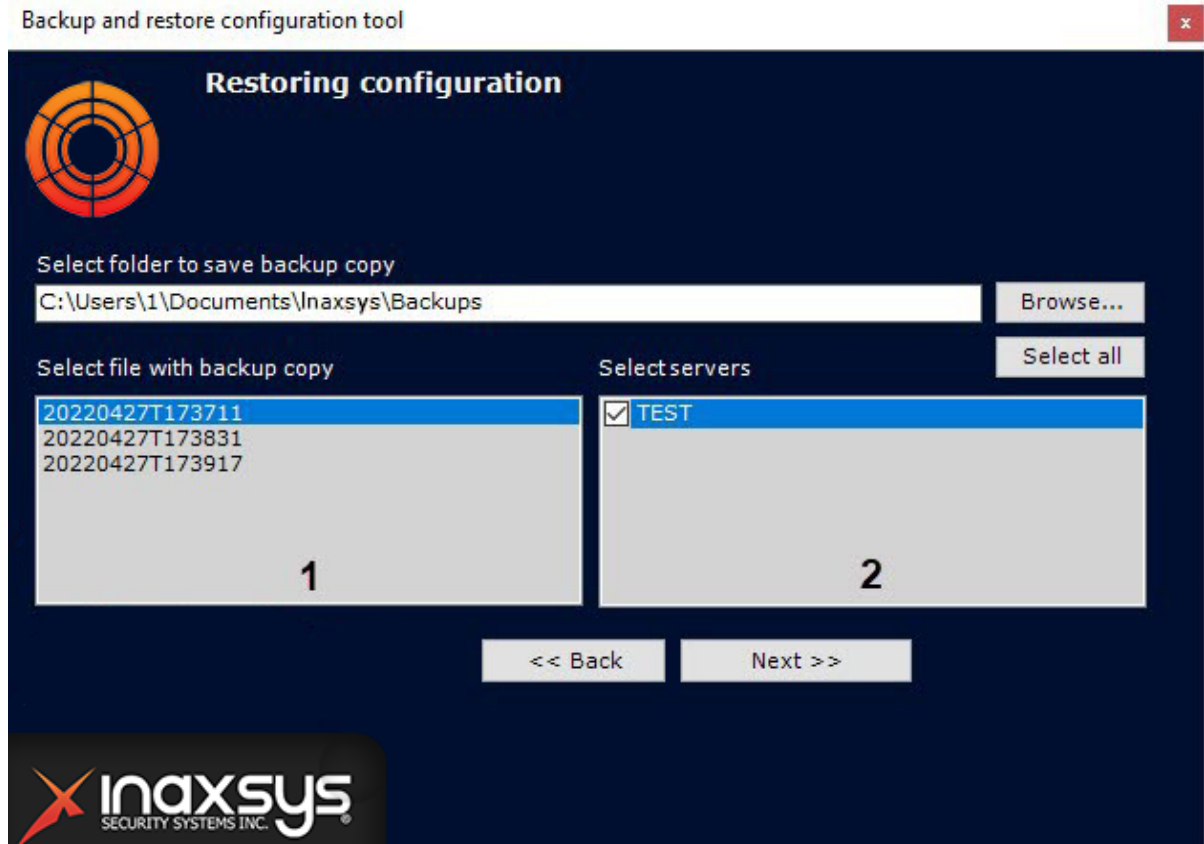
To restore a configuration:

1. On the main page of the Backup and restore utility, set the switch to the **Restore** position.



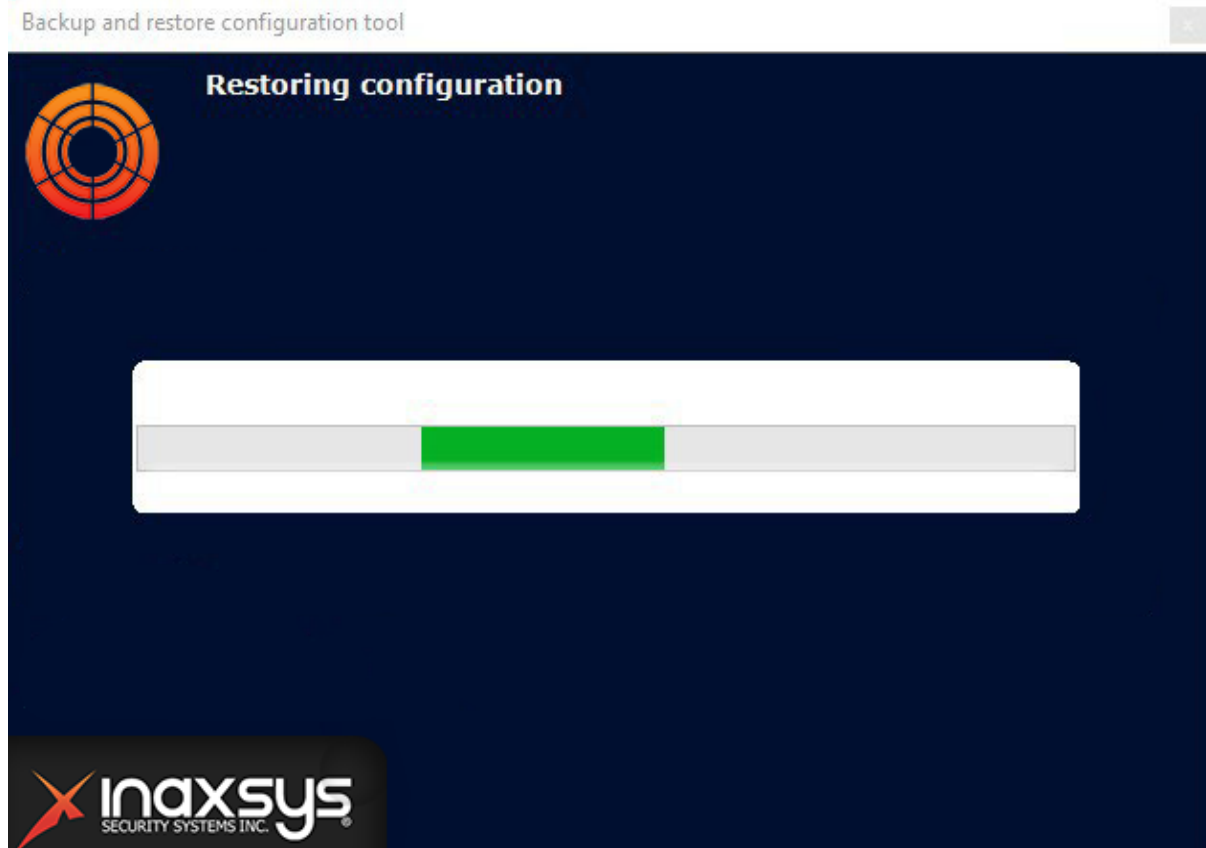
A window then opens for configuring restoration of the configuration.

- In the field (1), specify the file containing the configuration backup.

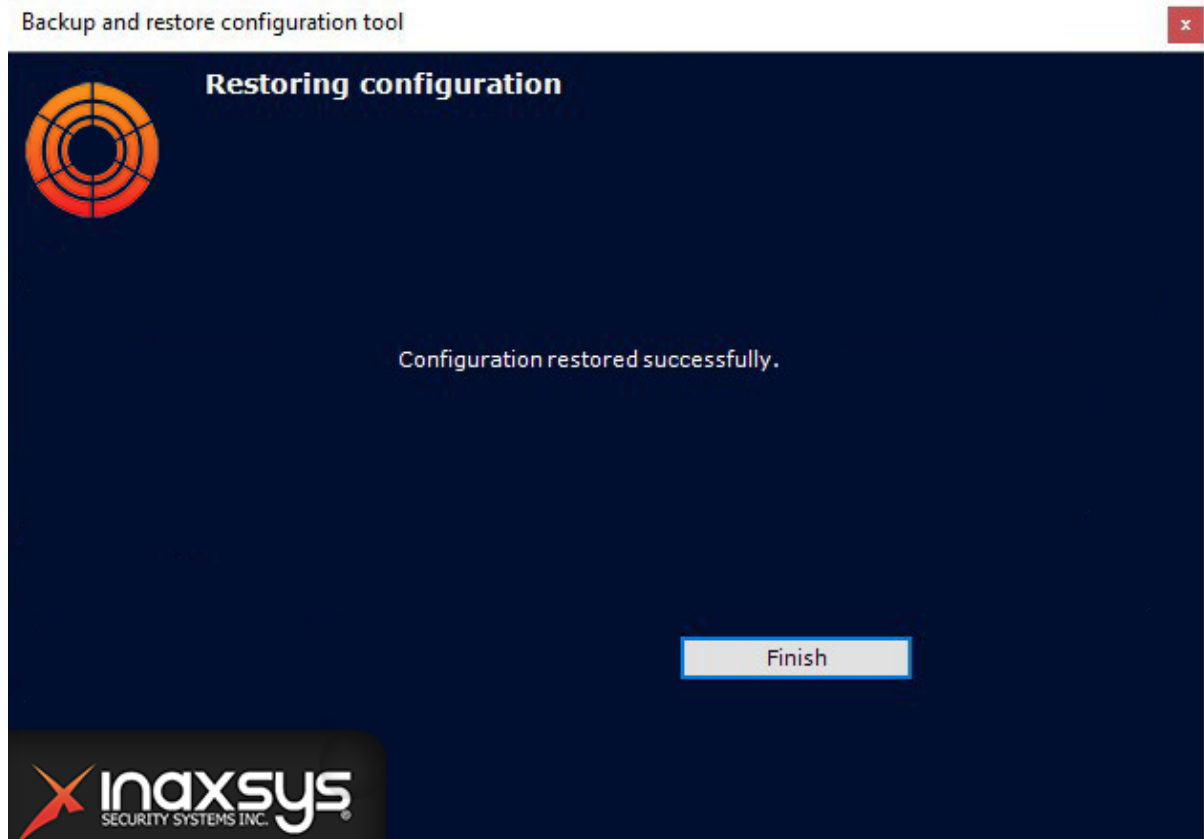


- After the file is opened, the servers on the current domain are displayed in the other field (2). You can select a server in the list only if it is on the domain and the open file contains the corresponding backup. To start restoration, click the **Next** button.

Progress information is shown in the following window.



- When restoration is complete, a message informs of successful completion.



- To close the window, click the **Finish** button.

Restoration of the configuration is now complete.

Attention!

The *Arkiv* Server must be restarted after restoring a configuration.

9.6.7 Changing the Server name

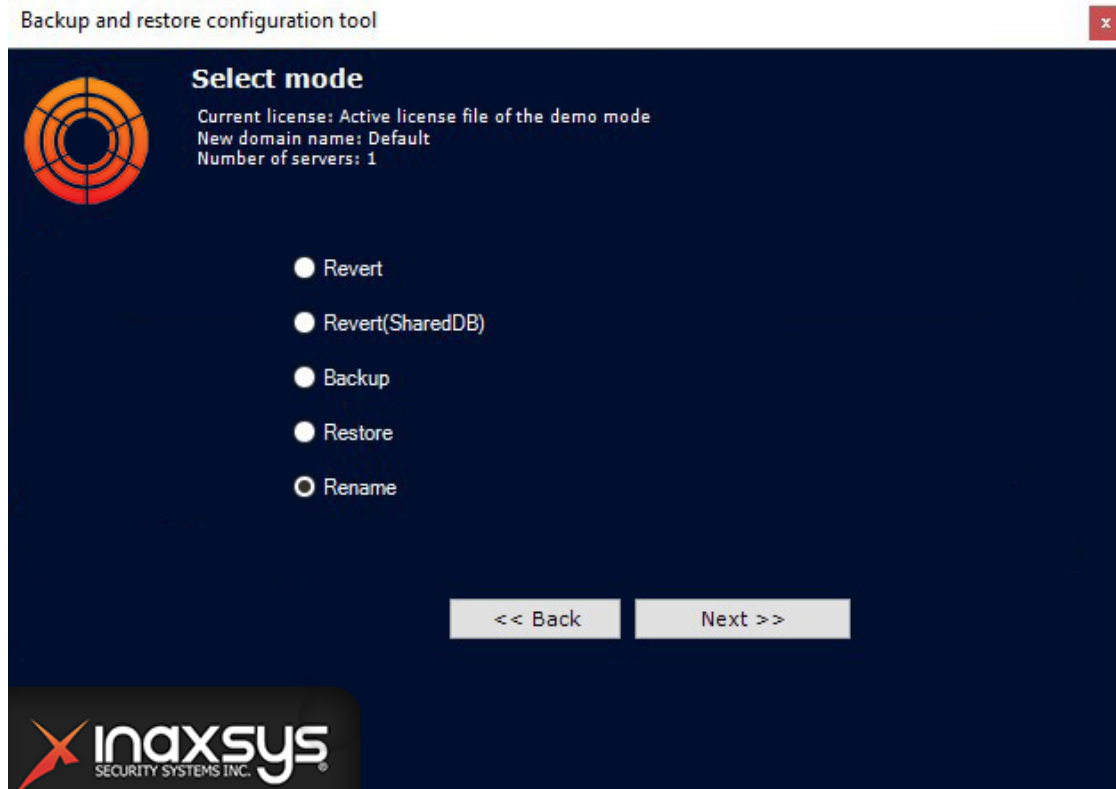
To change the local Server name using the Backup and Restore Utility, do the following:

Attention!

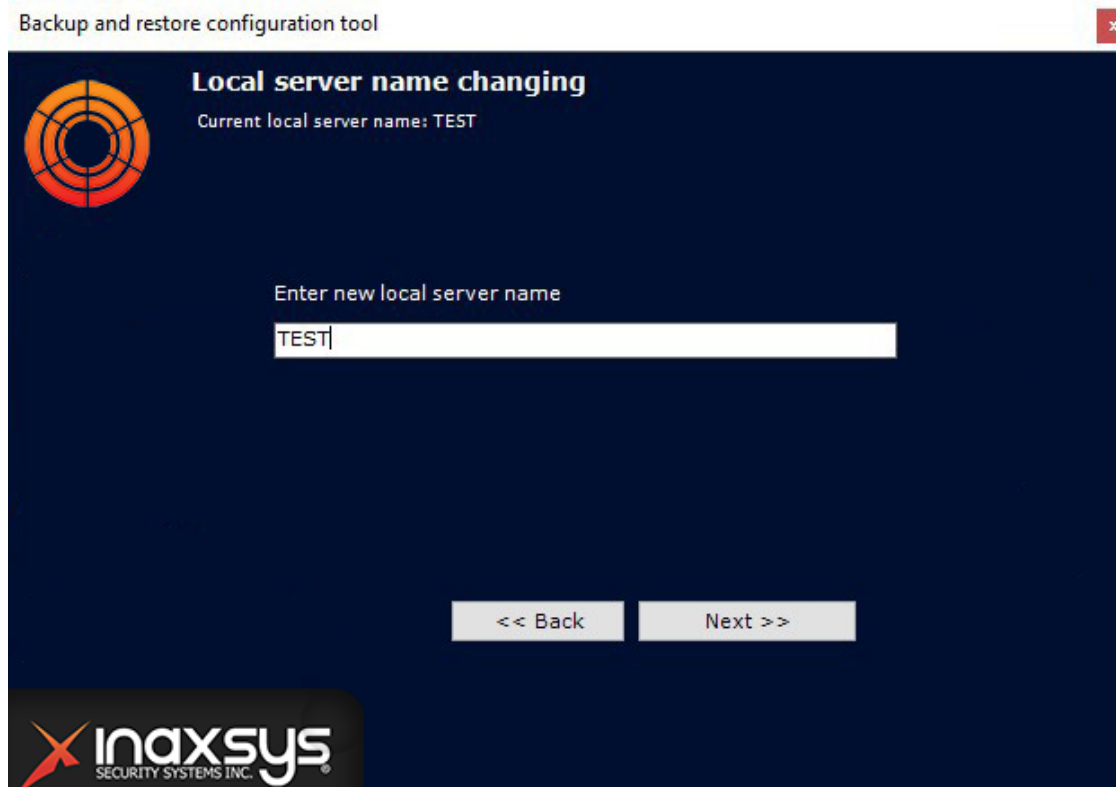
After this command is completed, the Server is excluded from Arkiv-domain. You will not be able to access the archive. All maps, automatic rules and macros will be deleted. The cameras of the renamed Server will be deleted from the layouts.

- Connect to the Server that requires a name change (see [Starting and quitting BackupTool.exe](#)(see page 843)).

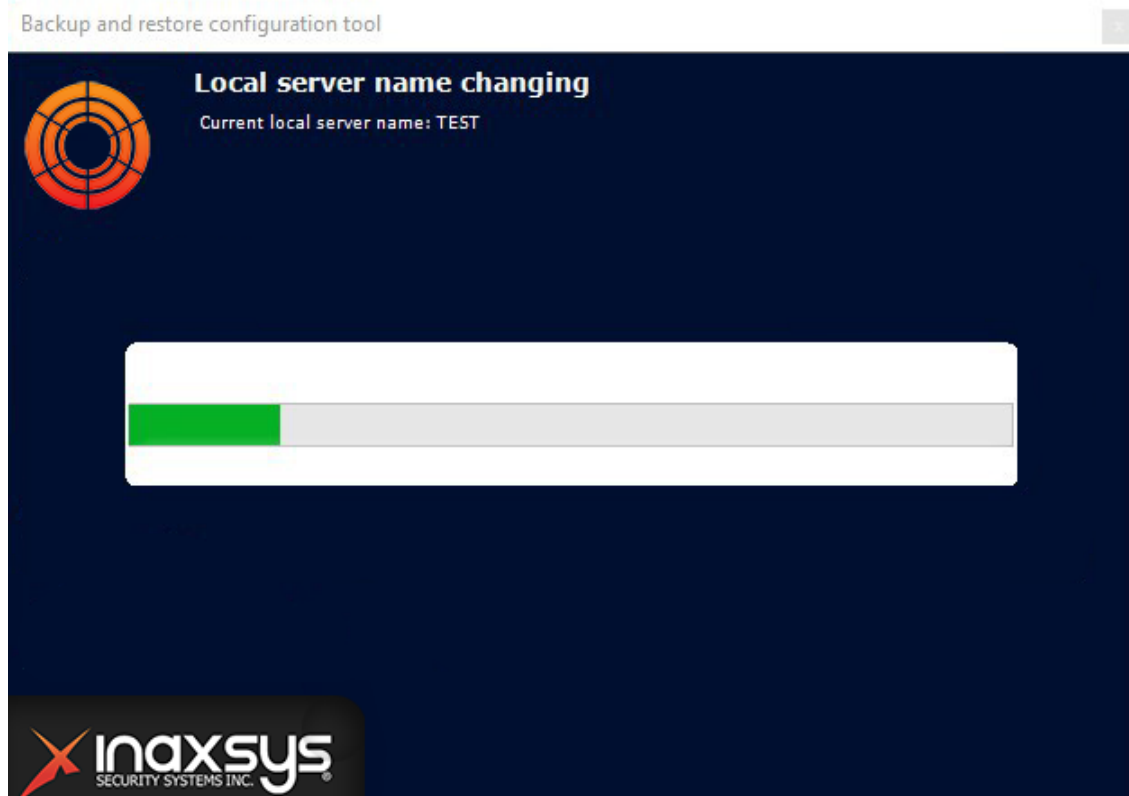
2. Select **Rename** and click the **Next** button on the Utility main page.



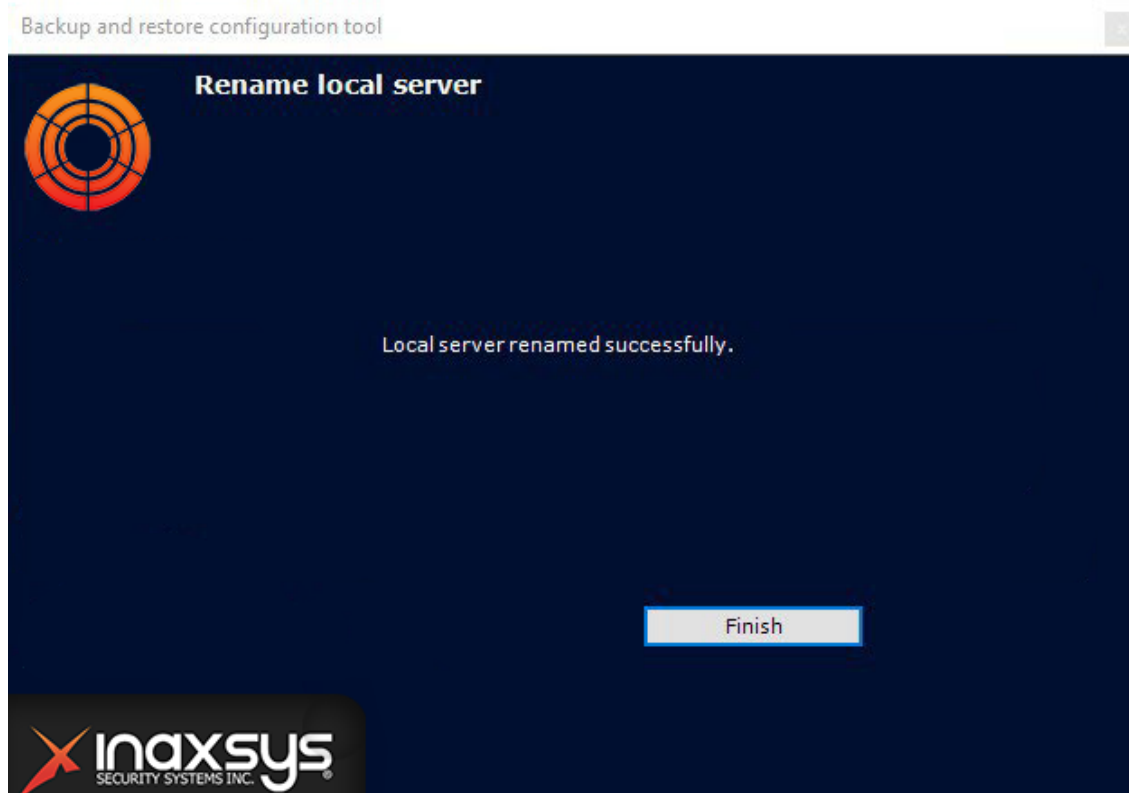
3. Enter the new Server name and click the **Next** button.



The Server name change process will start.



If the operation completes successfully, a notification message will appear.

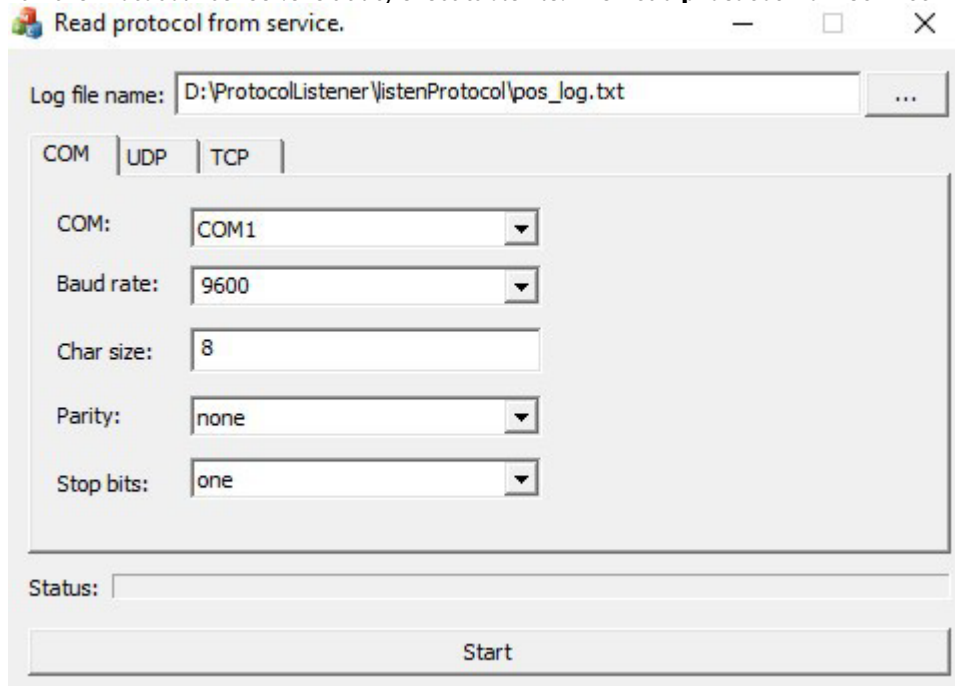


Server name change is complete.

9.7 POS-terminal log collection utility

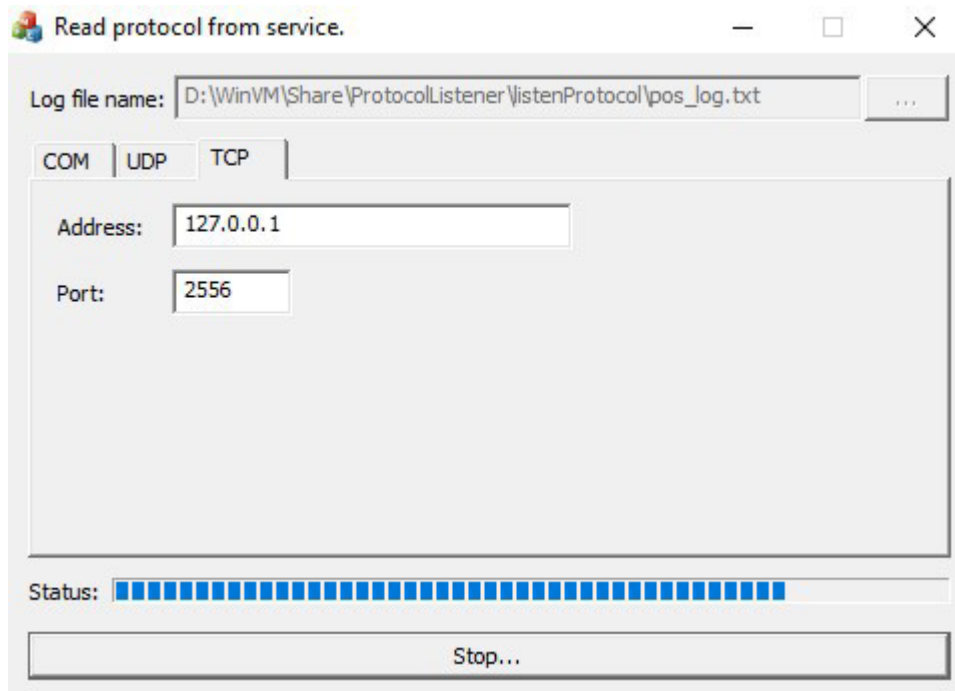
To collect information from the POS-terminal using a special utility, do the following:

1. Disable the Event Source object (see [Configuring POS devices](#)(see page 184)) and shutdown the Server (see [Shutting down a Server](#)(see page 82)).
2. If the POS-terminal supports data transmission via Ethernet or via the COM port, download the POS Terminal Data Collection Utility at the [Inaxsys website](#).
3. Unpack the archive.
4. Connect the POS-terminal to the computer.
5. Run the ProtocolListener.exe utility executable file. The **Read protocol from service** window opens.



6. In the **Log file name** field, specify a path to the folder where the file with the required information will be saved. By default, the file is saved in the same folder where the archive with the utility was unpacked.
7. If the POS-terminal is connected to the computer via the COM-port, specify the connection parameters in the **COM** tab.
8. If the POS-terminal is connected to the computer via Ethernet, specify the connection parameters for the TCP or UDP protocol in the corresponding tab.
9. Click the **Start** button to start log collection.
10. Start using the POS-terminal, i.e. issuing receipts. Execute all possible operations including Cancel, Return, etc.

Process of log collection is displayed in the **Status** progress bar.



To finish log collection, click the **Stop** button.

After executing all possible operations on the POS-terminal, send the log file with copies of receipts to Inaxsys.

Attention!

If the log file of the POS-terminal requires software processing, then provide Inaxsys with the protocol description. The POS-terminal manufacturer can give you the protocol description.

9.8 Console utility for working with archives

`vfs_format.exe` is a console utility for working with *Arkiv* archives.

Attention!

For the correct operation of the utility, you have to remove the corresponding archive volume in *Arkiv* without removing the archive files (see [Deleting and formatting archive volumes](#) (see page 216)).

The utility is located in `<Arkiv installation folder>\bin`.

Attention!

Run the command line as Administrator.

Note

To launch the utility on Linux OS, run the following command:
`ngprun start_app vfs_tools + arguments.`
 To open the argument list, run the `vfs_tools --help` command.

The utility contains the following parameters:

Parameter	Description
--help	Help window
--volume	Archive volume path. The basic parameter must always be present in the query. For example: vfs_format.exe --volume D:\archiveAntiqueWhite.afs (for the archive volume as a file) or vfs_format.exe --volume D:\ (for the archive volume as a disk).
--fill	Populate an archive with multiple copies of video footage from another archive. The system fills up a destination archive with multiple copies of a source archive. For easier timeline handling, each new copy is written with 1 minute offset. For example: vfs_format.exe --volume S:\FILEONE.afs --fill G:\
--cache-to-memory	Copy an archive to RAM and further copy to a destination archive. Use with the --fill parameter. This parameter is valid only for archives that could fit to RAM. For example: vfs_format.exe --volume S:\FILEONE.afs --fill G:\ --cache-to-memory
--dump	Collect service information about the archive volume in a TXT or XML file. For example: vfs_format.exe --volume D:\archiveAntiqueWhite.afs --dump C:\DumpArc.txt
--expand	Specify the new size of the archive volume in blocks. By default, the size of one block is 4MB, if the --format parameter was not applied. This parameter is relevant only for the archive volume as a file. For example: vfs_format.exe --volume D:\archiveAntiqueWhite.afs --expand 128
--size	Specify the new size of the archive volume in megabytes. This parameter is relevant only for the archive volume as a file. For example: vfs_format.exe --volume D:\archiveAntiqueWhite.afs --size 4096
--format	Split the archive volume into blocks of the specified size (in megabytes). For example: vfs_format.exe --volume D:\archiveAntiqueWhite.afs --format 16
--copy	Copy archive volume. Specify the path and name of the new archive file. If the archive volume is copied as a disk, create a partition without formatting, larger than the copied volume. If you have a smaller partition, then only the most recent entries are copied. For example: vfs_format.exe --volume D:\archiveAntiqueWhite.afs --copy C:\NewArc.afs

Parameter	Description
--skip-bad-block	<p>Skip the bad blocks when copying the archive volume. This parameter is used only together with --copy.</p> <p>For example: vfs_format.exe --volume D:\archiveAliceBlue.afs --copy C:\NewArc.afs --skip-bad-block</p>
--modify-corrupted-flag	<p>Enable/disable re-indexing of the archive volume. 1 – enable reindexing, 0 – disable.</p> <p>For example: vfs_format.exe --volume D:\archiveAliceBlue.afs --modify-corrupted-flag 1</p>
--build-meta	<p>Launch the process of metadata generation of an archive volume (including timeline markers and video footage size per channel).</p> <p>For example: vfs-format.exe --volume D:\ --build-meta</p> <div style="border: 1px solid #f0e68c; padding: 10px; margin-top: 10px;"> <p>☐ Attention!</p> <p>Processing large archives may take significant amount of time.</p> </div>
--clear-meta	<p>Delete metadata of the archive volume.</p> <p>For example: vfs-format.exe --volume D:\ --clear-meta</p>
--clear-data	<p>Delete the archive volume service information (does not operate without the from and to arguments).</p> <p>For example: vfs_format.exe --volume C:\archiveAliceBlue.afs --clear-data --from 20220210T110000 --to 20220210T114000.</p> <p>--from and --to are used to set the UTC time intervals in the ISO YYYYMMDDThhmmss format.</p> <p>Then you should confirm the deletion.</p>
--log-level	<p>Set the logging level for this action. Available values:</p> <ul style="list-style-type: none"> • 0 – OFF • 10 – ERROR • 20 – WARN • 40 – INFO • 50 – DEBUG • 60 – TRACE • 100 – ALL

To log error messages, you should add a path for the log file at the end of each query.

For example: vfs_format.exe --volume S:\FILEONE.afs --fill G:\ --log-level=100 > S:\log.txt.

9.9 Network settings utility

You can launch the network settings utility from the Windows Start menu: **Start -> All Programs -> Arkiv -> Utilities -> Network settings.**

The utility allows you to:

1. Set the external IP address or DNS name of the router if the Server is located behind the NAT¹⁸³ (1).

Note

You may set multiple interfaces using a comma separated list, such as: "IP Address1 or DNS Name1, IP address2 or DNS Name2".
For example: 88.78.12.33, ExampleArkiv.ddns.net.

2. Set the port range for operation of the *Arkiv* Server (2-3). To do this, specify the beginning of the range and the number of ports. The number of ports should not be lower than 20.

Attention!

Within an Arkiv Domain, the port ranges of Servers should not overlap.

Note

The number of ports that you select affects the scalability of the system. Keep the following in mind when specifying the number of ports:

- **6 ports** is a minimum system requirement for machines with *Arkiv*.
- In a 32-bit configuration, for every **32 cameras**, **6 ports** are required (for multistreaming cameras). In a 64-bit configuration, for any number of cameras, **6 ports** are required.
- **2 ports** are required to write to the **archive**.
- To use the Object Tracking database (track recording), **1 port** is required.
- To use basic detection tools, **2 ports** are required.
- To use Scene Analytics, **2 ports** are required.

¹⁸³ https://en.wikipedia.org/wiki/Network_address_translation

- To use E-mail- (through SMTP), SMS or server audio notification **1 port** is required .

3. Restrict the visibility of Servers from various networks in the Servers list during the *Arkiv* setup **(4)**.

Possible values:

- a. "0.0.0.0/0" – servers from all networks will be visible.
- b. "10.0.1.23/32,192.168.0.7/32" – only Servers from specified networks will be visible.
- c. "127.0.0.1" – only Servers from the local network will be visible.

After you save the settings, the Server will be restarted.

10 Appendices

10.1 Appendix 1. Glossary

Active viewing tile – viewing tile currently in use by the user.

AWS (automated workstation) – security system user workstation, a minimally equipped personal computer with *Arkiv* software installed.

Archive – all audio/video files stored on a hard disk that can be played and exported to supported formats.

Default archive of a video camera – the archive to which images from a given video camera are recorded during user-initiated alarms.

Audio detection tool – a detection tool used to analyze the audio signal from a microphone.

Audio recording: 1. the process of recording a digitized audio signal on a hard disk; 2. audio data stored in a specific format on a hard disk.

The audio subsystem encompasses all the tools that provide for the collection of audio data, its processing, and its storage on media.

Video detection tool – a detection tool used to analyze the video image from a video camera.

Video recording: 1. the process of recording a digitized video signal on a hard disk; 2. video information stored in a specific format on a hard disk.

Video camera: 1. source of a video signal; 2. a system object displaying the properties of an installed video camera and controlling its operation.

The video subsystem encompasses all the tools that provide for the acquisition of video data, its processing, and its storage on media.

Timeline – an interface object used to search for video recordings and navigate an archive.

Input: 1. a physical device intended for receiving information on the status of an object; 2. a system object that displays the properties of an installed Input.

Scene Analytics detection tool – a detection tool used to analyze the situation in a camera's field of view according to set criteria.

Audio signal detection – a detection tool is triggered by an increase in the signal/noise ratio above a set level.

Loss of quality detection – a detection tool is triggered by a loss of quality in the video image from a camera.

Position change detection – a detection tool is triggered by a substantial change in the background of a video image indicating a change in the position of the camera in space.

Object disappearance detection – a detection tool is triggered by the disappearance of an object in a set area of a video camera's field of view.

Abandoned object detection – a detection tool is triggered when an object remains motionless in a detection zone for a prolonged period.

No Signal detection – a detection tool is triggered by the absence of an audio signal from an audio device.

Line Crossing detection – a detection tool is triggered when the trajectory of an object crosses a virtual line in a video camera's field of view.

Object appearance detection – a detection tool is triggered by the appearance of an object in a set area of a video camera's field of view.

Stopping detection – a detection tool is triggered by the cessation of motion in a set area of a video camera's field of view.

Noise detection – a detection tool is triggered by an decrease in the signal/noise ratio below a set level.

Arkiv Domain – a selected group of computers on which the server configuration of the *Arkiv* software package is installed. Linking the servers in a group makes it possible to set up interaction between them, thus organizing a distributed system.

Detection zone – the area of a video image processed by a detection tool is triggered.

Interface cable – cable used to connect two or more devices together for data transfer.

Interface object – a system object used for interaction between the user and software (data input/output).

Client – designation for a personal computer on which *Arkiv* software is installed (or will be installed) as a Client. Designation for the graphical shell of the *Arkiv* software package.

Slideshow – automatic switching of user layouts, or of viewing tiles in a single layout if working with standard layouts.

Licensing – regulating and setting the terms for usage of Inaxsys software modules.

Detection zone: 1. the area of a video image processed by a detection tool is triggered; 2. a tool which allows the user to mark out an area of the video image which is not to be processed by a detection tool is triggered.

Microphone: 1. a source of audio signals; 2. a system object used to manage the parameters of audio signal reception.

Video surveillance monitor – an interface object used to manage the user interfaces of the *Arkiv* software, e.g., layouts, viewing tiles, various panels and context menus, etc.

Viewing tile – interface object displaying the video stream coming from a certain video camera and enabling control of that video camera.

Dial panel – panel (part of the PTZ control panel) used to dial a preset.

Archive navigation panel – all interface objects used to work with an archive, e.g., timeline, list of alarm events, etc.

Control panel – panel made up of tabs accessible to the user, used to navigate from one group of interface objects to another.

Playback control panel – panel containing buttons to control playback of video recordings: Play, Pause, Go to next video recording, etc.

PTZ control panel – all interface objects used to control a certain PTZ device.

Layout control ribbon – panel containing tools to create, edit, and manage layouts.

PTZ device – a system object displaying the properties of an installed PTZ camera device.

Note

Also used to designate a physical device

The PTZ subsystem encompasses all the tools that provide for remote control of a PTZ device and the lens of a video camera.

The analytics subsystem encompasses all the tools that provide for automatic analysis of incoming video and audio data.

The Forensic Search in archive subsystem is a set of tools for searching video recordings in the archive by using video image metadata.

The Output subsystem encompasses all the tools that provide for the triggering of an execution device connected to the embedded Output port of a video camera or IP server when a detection tool is triggered (including one which processes the embedded Input of a video camera or IP server) is triggered.

The notification subsystem encompasses all the tools that provide for notification of the user about events which have occurred in the system.

Event registration subsystem – all the tools that provide for the collection of data about system events, processing, and its storage on media.

Pre-alarm recording is the period of pre-event recording that will be added to the beginning of an alarm event recording.

Preset – preprogrammed positioning of a PTZ device.

Software package – all software and hardware tools used together to build a security system.

Software module – a program or functionally complete component of a program used to perform a specific functional task (perform a user function).

Layout – preserved positioning of viewing tiles relative to each other.

Distributed system – a group consisting of several interacting *Arkiv* servers (up to four) and clients (unlimited number). *Arkiv* servers are linked within an Arkiv Domain.

Output: 1. a physical device/electromechanical switch; 2. a system object that displays the properties of an installed Output.

Server – designation for a personal computer on which the Server configuration of *Arkiv* software is installed (or will be installed).

Security system – a set of devices used for video surveillance, audio surveillance, and object recognition, all controlled by the *Arkiv* software system.

The system log is a log containing system information on events, including system error entries.

Object tracking – a function which allows an operator to visually track the movement of objects in a camera's field of view.

Alarm flag – the flag symbol designating either the moment an alarm event began or a certain moment before the beginning of an alarm event.

Color coding – software-based graphical notification to a security system operator about the current status or operating mode of system objects (equipment, software modules).

Facial vector – mathematical representation of a facial image created upon face capture.

Captured faces – images detected on video by the facial detection tool.

Recognized faces – captured faces that reach a pre-defined degree of similarity against reference facial images.

Reference faces – pre-defined facial images to compare captured faces to.

10.2 Appendix 2. Known issues in the Arkiv Software Package

10.2.1 Possible Errors During Installation

On page:

- [Error starting NGP Host Service](#)(see page 870)
- [Errors Connecting to the Postgres Database](#)(see page 870)
- [Error installing Drivers Pack](#)(see page 870)
- [Window OS 10 installation error](#)(see page 870)
- [An error occurred while installing on Windows with the language pack Norsk \(bokmål\)](#)(see page 871)
- [Error uninstalling Arkiv on systems with Videoinspector installed](#)(see page 871)

Error starting NGP Host Service

If port **20111** is busy during installation of *Arkiv* (for example, because of *nethost.exe* processes that have not been unloaded), an error message regarding the launch of NGP Host Service appears.

To continue installation, free up port **20111** and try again.

Errors Connecting to the Postgres Database

After installation of the Postgres database, the *Arkiv* installer may quit prematurely. This situation may be associated with the inability of the installer to connect to the Postgres database, if the firewall is enabled. To prevent this, disable your firewall during installation.

Note

Disabling the firewall during installation can cause another problem: see [No signal from video cameras and failure to connect to other servers](#)(see page 872).

Error installing Drivers Pack

In some cases, you may encounter errors while installing *Drivers Pack*:

```
Installation failed because the Universal C Runtime is not installed. Please run Windows Update and install all required Windows updates (KB2999226). You can download the UCRT separately from here: 'https://support.microsoft.com/en-us/kb/2999226'.
```

This can be solved by installing the Windows update [KB2999226](#)¹⁸⁴.

Window OS 10 installation error

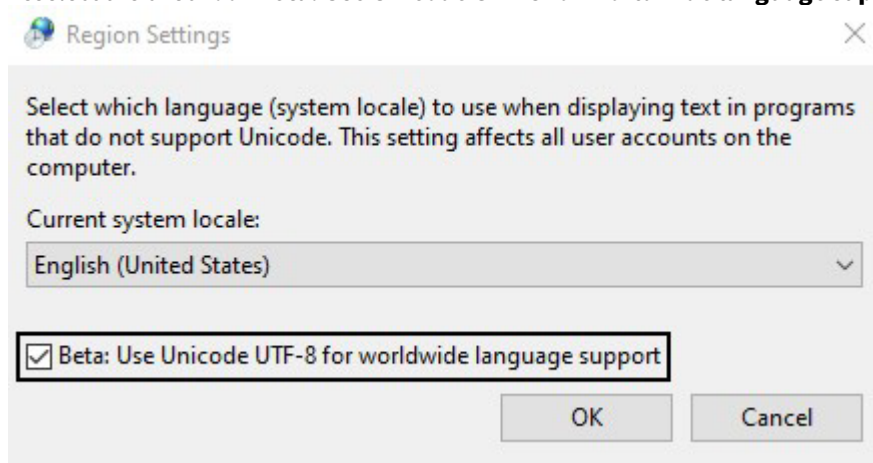
When you install *Arkiv* on Windows 10.0.17763 and up you may see the Create Recovery Archive error message.

To fix the error, do as follows:

1. Go to Control Panel → Clock and Region → Region → Administrative tab → Change System Locale.

¹⁸⁴ <https://support.microsoft.com/en-us/help/2999226/update-for-universal-c-runtime-in-windows>

2. Deselect the checkbox **Beta: Use Unicode UTF-8 for worldwide language support**.



3. Reinstall *Arkiv*.

An error occurred while installing on Windows with the language pack Norsk (bokmål)

Installing the *Arkiv* server on Windows with the language pack Norsk (bokmål) is not possible due to incompatibility with PostgreSQL.

You must install Norsk Language Pack (nynorsk).

Error uninstalling *Arkiv* on systems with Videoinspector installed In

some cases, uninstalling *Arkiv* may be impossible if Videoinspector is used. For *Arkiv* to work correctly, you are advised to first uninstall Videoinspector.

10.2.2 Possible Errors During Start-Up

The Client cannot be connected to the Server

If a "**Cannot find Server**" message appears after you connect to a Server, do the following:

1. Go to **Control Panel** -> **Regional Settings** -> **More**.
2. Change current language of non-Unicode applications to the one that is present in keyboard settings, and may appear in user name and folders.
3. Reboot the PC.

If a **Connection Error** message appears after you connect to a Server, do the following:

1. Go to **Local Security Policy interface**.
2. Select **Local Policies** -> **Security Settings**.
3. Turn off the following parameter: **System cryptography: use FIPS compliant algorithms for encryption, hashing, and signing**.

Launching the *Arkiv* software program with client logging enabled can take a long time when the ESET NOD32 Antivirus 4 **Real-time file system protection** mode is on.

To solve this problem, add the *Arkiv* installation folder and the folder with the client logs (<Letter of system disk>:\Users\<User>\Appdata\Local\Inaxsys\Arkiv\logs) to the list of exceptions in ESET NOD32 Antivirus 4.

10.2.3 Possible Errors During Operation

On page:

- All video channels or archives stop working once the license maximum is reached(see page 872)
- No signal from video cameras and failure to connect to other Servers(see page 872)
- Incorrect display of Client interface elements(see page 872)
- Server error on Windows Server 2012(see page 873)
- Emergency shutdown of the Client on Windows 8.1(see page 873)
- Error creating new archives even when license restriction on total capacity is observed(see page 873)
- Arkiv VMS operation with Windows Defender software(see page 873)
- Upper panel display problem(see page 873)
- High CPU load during OpenGL software emulation(see page 874)
- Arkiv operation with NetLimiter 2(see page 874)
- Exported videos' playback in Movies and TV application(see page 874)
- Arkiv operation on Windows N and KN editions(see page 874)

All video channels or archives stop working once the license maximum is reached

If the activation key allows using fewer video channels than currently created in the system, it will not be possible to work with all video channels. To resume operation, remove the objects corresponding to the excess video channels and restart the Server.

Note

Restart the Server through the Start menu as follows:

1. **All Programs** → **Arkiv** → **Shut Down Server**
2. **All Programs** → **Arkiv** → **Start Server**

Similarly, if the activation key allows using archives with a total capacity less than the current one, you should adjust the capacity of the archives to the required amount and then restart the Server.

No signal from video cameras and failure to connect to other Servers

If the Windows Firewall (or firewall of other manufacturers) was disabled during installation of *Arkiv*, *Arkiv* services and applications will not be automatically added to the list of firewall exceptions.

After you turn on the firewall, you may see no signal from cameras in both main and Web-Client, and no possibility to connect to other Servers.

To solve this problem, add the following applications to the firewall exceptions: Apphost.exe, NetHost.exe, Arkiv.exe, and LicenceTool.exe.

Incorrect display of Client interface elements

Client interface elements may be distorted on systems with some versions of GeForce drivers (such as 327.23, 337.88) installed.

In some cases this problem is solved by disabling stream optimization for the Arkiv.exe process:

1. Run **Control panel** → **NVIDIA control panel** → **3D parameters** → **Software settings**.
2. Click the **Add** button and select the Arkiv.exe file (<Arkiv installation directory >/bin).
3. Set the **Off** parameter for the **Threaded optimisation** function.
4. Click the **Apply** button.

If this solution does not eliminate the problem, then install an older driver for the graphics card.

Server error on Windows Server 2012

You may experience errors when running the Server on Windows Server 2012. To fix the errors:

1. Go to the registry branch HKEY_LOCAL_MACHINE\System\CurrentControlSet\Control\Session Manager\SubSystems\.
2. Find the **Windows** parameter and change its value as follows: in the string "SharedSection = 1024,20480, **768**", replace **768** with **4096**.
3. Save the changes and restart the computer.

Emergency shutdown of the Client on Windows 8.1

You may see the Client shutting down on Windows 8.1 with an error: " The name of the failed module: KERNELBASE.dll Exception code: 0xe0434352 ".

In this case, please contact Microsoft support.

Error creating new archives even when license restriction on total capacity is observed

If the user creates archives at the same time (in other words, without applying changes) while deleting some existing archives, creation of the archives may be forbidden even if the total archive capacity does not exceed the amount of the license restriction.

Note

This happens because when verifying the license restrictions, the size of created archives is calculated based on the total capacity at the time when changes were applied.

In such a situation, the user should first delete the unnecessary archives and apply changes, then create new archives.

Arkiv VMS operation with Windows Defender software

If you have Windows Defender software installed in your system, some problems may occur when accessing and saving data to the archive, as well as significant slowing down of Post-Analytics searches.

As a workaround, you can either disable Windows Defender or add AppHost.exe, AppHostSvc.exe and vfs_format.exe files to the exceptions list.

Upper panel display problem

In some cases, the Client may have a problem displaying the upper panel.

In this case, it is recommended to install the most recent version of [Intel graphics subsystem](#)¹⁸⁵ drivers.

High CPU load during OpenGL software emulation

If your computer's graphics card does not meet OpenGL requirements (see [Limitations of the Arkiv Software Package](#)(see page 13)), OpenGL can be emulated in software.

But in this case the CPU load may be high.

Arkiv operation with NetLimiter 2

If *NetLimiter 2* is installed in the system, there may be a significantly increased load on the processor when working with *Arkiv*.

This problem is resolved by removing *NetLimiter 2*.

Exported videos' playback in Movies and TV application

Due to the lack of G.711 and G.726 codecs support in Windows 10's "Movies and TV" app, the app doesn't play audio in exported video.

You can use alternative video viewer applications to obtain the full playback.

Arkiv operation on Windows N and KN editions

Arkiv is not guaranteed to work on Windows N or KN editions. For correct operation, you need to install the [Media Feature Pack](#)¹⁸⁶.

10.3 Appendix 3. Assigning of the domain takes place when the Arkiv server is installed

The Windows OS will create two accounts when the *Arkiv* software package is installed using a **Client and Server** type of configuration.

1. An account with administrator rights which is used by the *Arkiv* file browser. The name of this account is set during installation of *Arkiv* (see [Installation](#)(see page 36)). For *Arkiv* to function correctly, this account must have Windows administrator rights. If the account is a domain user account, you must also add the account to the **Users** and **Power Users** groups.

Note

The file browser helps to navigate through the Server's file system (such as when choosing disks for log volumes).

The account can also be used for configuring access rights to the hard disk.

2. Arkivpostgres – an account under which the log data database service is started.

¹⁸⁵ <https://www.intel.com/content/www/us/en/support/products/80939/graphics.html>

¹⁸⁶ <https://support.microsoft.com/en-us/topic/media-feature-pack-list-for-windows-n-editions-c1c6ffa-d052-8338-7a79-a4bb980a700a>

Note

A log database (Postgres) is used for storing system events.

10.4 Appendix 4. Using Arkiv with anti-virus software

On page:

- [NOD32](#)(see page 875)
- [ESET Smart Security](#)(see page 876)
- [AVG](#)(see page 876)
- [DrWeb](#)(see page 876)

To ensure the correct operation of *Arkiv*, it is recommended to configure the antivirus as follows:

1. Add the following processes to the exclusion list:
 - a. consul.exe
 - b. nomad.exe
 - c. apphost.exe
 - d. postgres.exe
2. Add the following folders to the exclusion list:
 - a. C:\ProgramData\Inaxsys\Arkiv
 - b. C:\Program Files\Inaxsys\Arkiv
 - c. C:\Program Files\Common Files\Inaxsys
 - d. Postgres and metadata folders if they are not default
3. Add the following ports to the exclusion list:
 - a. 20109-20210
 - b. 4000 (only for Failover installation type)
 - c. 4646-4648 (only for Failover installation type)
 - d. 8300-8302 (only for Failover installation type)
 - e. 8500 (only for Failover installation type)
 - f. 8600 (only for Failover installation type)

Depending on the anti-virus software that you use, when you install, start, and use *Arkiv*, your anti-virus software may ask for permission for the software components to perform Internet access.

It is recommended that you allow these components to do so for proper functioning of the application.

Recommendations for specific anti-virus programs are given below.

10.4.1 NOD32

When using NOD32 Antivirus, it is strongly recommended to either disable the Web Access Protection service or to add the IP addresses of IP cameras to the list of exceptions for anti-virus scanning.

See also section [Possible Errors During Start-Up](#)(see page 871).

10.4.2 ESET Smart Security

If you use ESET Smart Security, select automatic mode with Firewall exceptions and add the remote servers to the exceptions by creating network rules (for help with creating these rules, refer to the official user guide for the anti-virus software).

10.4.3 AVG

When using AVG on a configuration with many video cameras, it is strongly recommended to add the IP addresses of IP cameras to the list of exceptions. Otherwise, the avgsa.exe process may severely slow down the CPU.

This action can be performed only in the paid version of AVG.

When installing *Arkiv*, allow the NetHost.exe and ngpsh.exe processes to run.

10.4.4 DrWeb

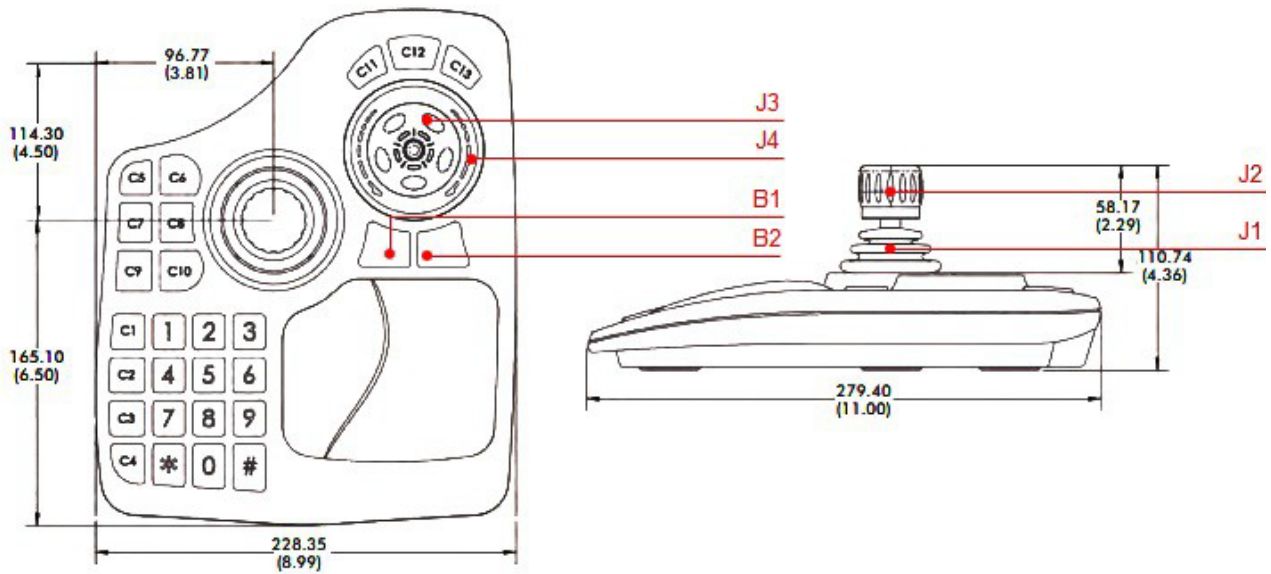
If you use DrWeb anti-virus software, perform the following actions before installing *Arkiv*:

1. Disable automatic start of the DrWeb firewall.
2. In the proactive protection settings, select the option to use custom settings and enable the following options:
 - a. Allow low-level disk access
 - b. Allow system services
 - c. Allow loading drivers
 - d. Allow user drivers
 - e. Allow Winlogon shell parameters
3. In the SpiDer Gate settings, add the apphost.exe and Arkiv.exe processes to the list of exceptions for scanning of incoming traffic. If possible, it is recommended to disable scanning of incoming and outgoing traffic.

10.5 Appendix 5. Using CH VM-Desktop USB multifunction controllers with Arkiv

CH VM-Desktop USB multifunction controllers offer a range of input controls:

- Three-axis joystick for PTZ and digital zoom control (**J1** and **J2**)
- Jog/shuttle dial (**J3** and **J4**)
- 27 keys:
 - 10 number keys
 - * key
 - # key
 - Programmable keys **C1** to **C13** (keys cannot be remapped in *Arkiv*)
 - Two additional keys (**B1** and **B2**)



The multifunction controller can be used to operate *Arkiv* on the active monitor.

Note

The active monitor is either the main one (if all additional monitors are inactive or not connected) or an additional one, if the additional monitor is active (see [Managing monitors on a local Client](#)(see page 759)). The active monitor can be selected only by using the mouse. If no mouse is present, the multifunction controller will work on the main monitor only.

A description of key functions is given in the table.

Key	When available	Function
J1	Always	PTZ control for the selected camera. If the selected camera does not support PTZ control, the action is ignored.
J2	Always	Optical zoom control for the selected camera. If the selected camera does not support PTZ control, the action is ignored.
J3 (rotate counterclockwise)	Archive mode	Go to previous frame. If playback is active, the action is ignored.
J3 (rotate clockwise)	Archive mode	Go to next frame. If playback is active, the action is ignored.

J4 (rotate counterclockwise)	Archive mode	Go to previous video fragment.
J4 (rotate clockwise)	Archive mode	Go to next video fragment.
J4	Live Video mode	Iris control for the selected camera.
1	Live Video mode	Start/stop patrol mode.
2.3	Live Video mode	Focus control for the selected camera.
* n #	Always	<p>Select a camera in a layout.</p> <p>n is the number of the camera to be activated via the number keys.</p> <p>If the camera with the relevant number is not in the current layout, a search is performed for the minimum layout containing the camera; the minimum layout is then displayed.</p> <p>If no such layout exists, a layout with one camera is created.</p>
# n #	Always	<p>Go to layout.</p> <p>n is the layout to be activated via the number keys; the number corresponds to the order in which the layout appears in the list.</p>
C10	Always	<p>Clear number.</p> <p>If the operator did not finish typing the number of a camera or layout (the # key was not pressed), pressing the C10 key clears the previously entered number.</p>
C1	Alarm Management mode	Accept alarm with False Alarm resolution.
C2	Alarm Management mode	Accept alarm with Non-Critical Alarm resolution.
C3	Alarm Management mode	Accept alarm with Critical Alarm resolution.
C4	Always	<p>Manually initiate an alarm and go to Alarm Management mode.</p> <p>Go to Alarm Management mode if an alarm has been previously initiated.</p>

C5	Always	Increase size of layout cell.
C6	Always	Reduce size of layout cell.
C7	Always	Go to previous layout in the list.
C8	Always	Go to next layout in the list.
C11	Archive mode	Slow down playback.
C12	Archive mode	Start/pause video playback.
C13	Archive mode	Speed up playback.
B2	Archive mode, Alarm Management mode	Go to Live Video mode (without alarm classification).
B2	Live Video mode	Go to Archive Mode.
C9	Archive mode	Open/hide calendar.
B1, B2	Open calendar	Cycle through calendar elements (equivalent to pressing the tab key). days of month - hours - minutes - seconds - am/pm (B2 key) and in reverse (by pressing the B1 key).
J3	Open calendar	Navigate by days and set hours, minutes, seconds, and AM/PM.
J4	Open calendar	Navigate by months.

10.6 Appendix 6. Hotkeys in Arkiv

Arkiv comes with the following default hotkeys:

Function	Hotkey
Global	
<u>General</u>	
Activate panel of cameras	F4

Activate panel of configuration	F5
Activate panel of layouts	F2
Activate panel of video walls	F3
Select item of menu and panels, click Save, Apply, OK	Enter
Navigation. Down	Down
Navigation. Left	Left
Navigation. Right	Right
Navigation. Up	Up
Open menu of current layout	F1
Open panel with list of devices	F7
Open alarm panel	F6
Hide menu/panel, click Cancel	Esc
Lock application	Ctrl + Alt + L
Remove current value	Delete
Digit 1	D1
Digit 9	D9
<u>Layouts</u>	
Camera selection in current layout	Ctrl + N
Select monitor by number	Shift + N
Select layout by number	Alt + N
Select the previous* camera in current layout cell	
Select the next* camera in current layout cell	
Navigation the cameras, upward shift	Alt + Up
Navigation the cameras, left shift	Alt + Left
Navigation the cameras, downward shift	Alt + Down

Navigation the cameras, right shift	Alt + Right
Move to the previous layout	Shift + Left
Move to the next layout	Shift + Right
Increase layout cell	Ctrl + Add (+)
Decrease layout cell	Ctrl + Subtract (-)
* by ID	
Live Video display mode	
<u>Videocamera</u>	
Open menu of selected camera and select item	F9
Switch to archive mode	Ctrl + Tab
Switch to alarm classification mode	Ctrl + R
Switch to search in archive mode	Ctrl + F
Arm	Ctrl + A
Disarm	Ctrl + D
<u>PTZ</u>	
Move up	NumPad8
Move left	NumPad4
Move down	NumPad2
Move right	NumPad6
Close iris	Next
Focus far	End
Open iris	PageUp
Patrolling	Multiply (*)
Focus near	Home
Zoom in	NumPad9

Zoom out	NumPad3
Archive	
Open menu of selected camera and select item	Ctrl + E
Pause/Play	Ctrl + Space
Switch to Timelapse Compressor mode	Ctrl + T
Go to the previous video clip	Ctrl + Shift + Left
Go to the previous frame	Ctrl + Left
Go to the next video clip	Ctrl + Shift + Right
Go to the next frame	Ctrl + Right
Show calendar	F8
Increase playback speed	Ctrl + Up
Reduce playback speed	Ctrl + Down
TimelapseCompressor	
Pause/Play	Ctrl + Space
Move home	Ctrl + B
Increase number of objects	Ctrl + Up
Decrease number of objects	Ctrl + Down
Alarms	
Go to the previous frame	Ctrl + Left
Go to the next frame	Ctrl + Right
Resolution False alarm	Ctrl + D3
Resolution Non-critical alarm	Ctrl + D2
Resolution Critical alarm	Ctrl + D1
Increase playback speed	Ctrl + Up
Reduce playback speed	Ctrl + Down

10.7 Appendix 7. Automated configuration backup and restore

You can use the ngpsh.exe utility and json commands to back up and restore your system configuration.

❏ Attention!

These configuration backups are incompatible with those created with the Backup and configuration recovery utility, and vice versa.

To create a configuration backup:

1. Use Windows command line to access the <Arkiv installation directory>\Arkiv\bin folder.
2. Execute the following command:

```
ngpsh.exe backup backupJson [path_to_backup_folder] [node_name] [local]
[shared] [license] [tickets]
```

Where

Parameter	Description
path_to_backup_folder	Required parameter. Specify a folder to save the configuration backup to. You have to use two "\" characters in the path.
node_name	Required parameter. Name of a Server whose configuration you want to save.
local	Add it, if you need to save the local configuration for this Server: all created objects along with their parameters, links and changes' histories.
shared	Add it, if you need to save the global configuration for an Arkiv domain: users, layouts, etc.
license	Add it, if you need to save a license.
tickets	Add it, if you need to save the Arkiv domain structure.

An example:

```
ngpsh.exe backup backupJson c:\\backups Server1 local
```

To restore a configuration from a backup:

```
ngpsh.exe backup restoreJson [path_to_backup_file] [node_name] [local]
[shared] [license] [tickets] [deleteLocal] [deleteShared]
```

Where

P a r a m e t e r	Description
d e l e t e L o c a l	Add it, if you need to clear the local configuration from objects not present in the backup copy.
d e l e t e S h a r e d	Add it, if you need to clear the global configuration from objects not present in the backup copy.

An example:

```
ngpsh.exe backup restoreJson c:\\backups\\Server1.json local
```

10.8 Appendix 8. Configuring and operating the Arkiv in Linux OS

10.8.1 Linux OS supported versions

Arkiv supports all 64-bit distribution packages based on Debian 9, Debian 10, and Debian 11, including Ubuntu 18, Ubuntu 19, and Ubuntu 20.

❑ Attention!

For *Arkiv* to operate correctly on Linux GUI, you should use one of the following graphical shells: GNOME, XFCE, CINNAMON, MATE.

❑ Attention!

The stable operation of the Client is not guaranteed on Ubuntu 18 and 19. It is recommended to install only *Arkiv* Server. Both the Client and *Arkiv* Server are supported on Ubuntu 20 and newer versions. If *Arkiv* is installed on AstraLinux, only the SE 1.6 version is certified and supported.

The Client can be installed only after installing the Server of the same version.

Updating the OS will not affect *Arkiv* performance. Still, it is recommended to make a backup copy of the configuration before updating the OS (see [Backing up a configuration](#)(see page 850)).

- ❑** [Installing the Arkiv Server in Linux OS](#)(see page 886)
[Installing the Arkiv Client on Linux OS](#)(see page 893)

10.8.2 Arkiv limitations in Linux OS

❑ Attention!

To install, upgrade or modify *Arkiv* in Linux OS, it is necessary to use the programs and commands described in this document. If you use third-party programs, *Arkiv* may not work correctly.

The following features are currently not available in *Arkiv* operating on Linux OS:

1. POS devices (see [Configuring POS devices](#)(see page 184)).
2. Web Boards (see [Working with Web Boards](#)(see page 752)).
3. Intel Quick Sync Video (see [Hardware-based decoding with Intel Quick Sync Video](#)(see page 512)).
4. Upgrading Servers within a cluster via the supervisor Web-interface (see [Upgrading Servers within a cluster](#)(see page 584)).
5. *Arkiv* Tray Tool(see page 824).

❑ Attention!

For more information see [Potential problems with Linux OS](#)(see page 912).

❏ Attention!

Upgrade from *Arkiv* to *Arkiv 5* in Linux OS is not possible.

10.8.3 Installing sudo

The sudo software is used for installing and configuring *Arkiv*.

If it is not included in the OS distribution package, then to install it and add the user, it is necessary to run the following commands in the root mode:

```
apt-get install sudo
usermod -aG sudo user
reboot
```

10.8.4 Installing the Arkiv in Linux OS

Installing the Arkiv Server in Linux OS

Installing from repository

Installation from the repository is performed automatically, including all the system components.

To install from the repository, do the following:

1. Sequentially run the commands:

```
echo 'deb http://download.Inaxsys.com/debian-repository stable main' | sudo tee -a /etc/apt/sources.list.d/Inaxsys.list
echo 'deb http://download.Inaxsys.com/debian-repository stretch backports/main' | sudo tee -a /etc/apt/sources.list.d/Inaxsys.list
wget --quiet -O - "http://download.Inaxsys.com/debian-repository/info@Inaxsys.com.gpg.key" | sudo apt-key --keyring /etc/apt/trusted.gpg.d/Inaxsys.gpg add - && sudo apt-get update
```

❏ Attention!

If you install *Arkiv* on AstraLinux SE, then instead of commands from step 1, you should sequentially run the following commands:

```
echo 'deb http://download.Inaxsys.com/debian-repository stretch main backports/astra backports/main' | sudo tee -a /etc/apt/sources.list.d/Inaxsys.list

wget --quiet -O - "http://download.Inaxsys.com/debian-repository/info@Inaxsys.com.gpg.key" | apt-key --keyring /etc/apt/trusted.gpg.d/Inaxsys.gpg add - && sudo apt-get update
```

Note

If the distribution packages based on Debian 10 are used, it may be necessary to install additional packages:

```
apt-get install wget
apt-get install gnupg
```

- To install *Arkiv* Server, run the following command:

```
sudo apt install Arkiv-one
```

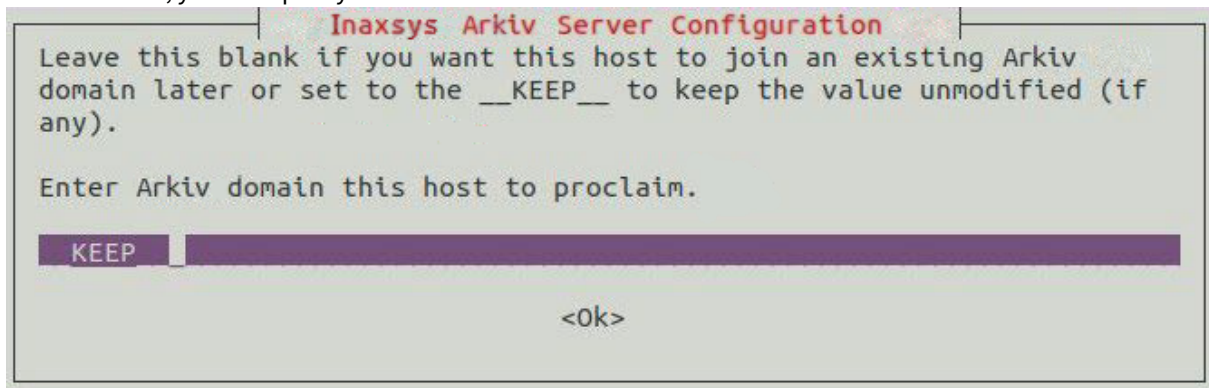
To install the FailOver Server, run the following command:

```
sudo apt install Arkiv-one-raft
```

Attention!

It is not allowed to simultaneously install the regular Server and the FailOver Server.

During the installation, the installer will request the name of the domain for the *Arkiv* Server. If you leave this field blank, you can specify it on the Client at the first connection.



Manual installation

To install the *Arkiv* Server manually, do the following:

- Add the repositories by sequentially running the following commands:

```
echo 'deb http://download.Inaxsys.com/debian-repository stable main' | sudo tee -a /etc/apt/sources.list.d/Inaxsys.list
echo 'deb http://download.Inaxsys.com/debian-repository stretch backports/main' | sudo tee -a /etc/apt/sources.list.d/Inaxsys.list
wget --quiet -O - "http://download.Inaxsys.com/debian-repository/info@Inaxsys.com.gpg.key" | sudo apt-key --keyring /etc/apt/trusted.gpg.d/Inaxsys.gpg add - && sudo apt-get update
```


❏ Attention!

If you install *Arkiv* on AstraLinux SE, then instead of commands from step 1, you should sequentially run the following commands:

```
echo 'deb http://download.Inaxsys.com/debian-repository stretch main backports/astra
backports/main' | sudo tee -a /etc/apt/sources.list.d/Inaxsys.list

wget --quiet -O - "http://download.Inaxsys.com/debian-repository/ info@Inaxsys.com.gpg.key"
| apt-key --keyring /etc/apt/trusted.gpg.d/Inaxsys.gpg add - && sudo apt-get update
```

2. To download the packages, run one of the following commands:

a. Server only:

```
sudo apt install -d Arkiv-one
```

b. Server and Client:

```
sudo apt install -d Arkiv-one-client
```

By default, the files are downloaded to the `/var/cache/apt/archives` folder. If it is necessary to download the files to another folder, run the following command:

```
apt-get install -d Arkiv-one -o=dir::cache=/home/user/Downloads/
```

In this case, the packages will be downloaded to the `/home/user/Downloads` folder.

❏ Attention!

If you plan to install the downloaded packages on another computer with no Internet access, then the OS version on that computer should match the OS version of the computer on which the packages were downloaded.

3. To install the previously downloaded packages, run the command:

```
sudo dpkg -i /home/user/Downloads/*.deb || sudo apt-get install -f -y
```

where

user – user name;

Downloads – folder with downloaded packages.

Package examples...

Example of packages required to install the server side:

```
Arkiv-drivers-pack_3.71_amd64.deb
Arkiv-detector-pack_3.7_amd64.deb
Arkiv-one-core_1.0.4_amd64.deb
Arkiv-one_1.0.4_all.deb
```

Example of packages required to install the Server in the Failover mode:

```
Arkiv-drivers-pack_3.71_amd64.deb
Arkiv-detector-pack_3.7_amd64.deb
Arkiv-one-core_1.0.4_amd64.deb
Arkiv-one-raft_1.0.4_amd64.deb
```

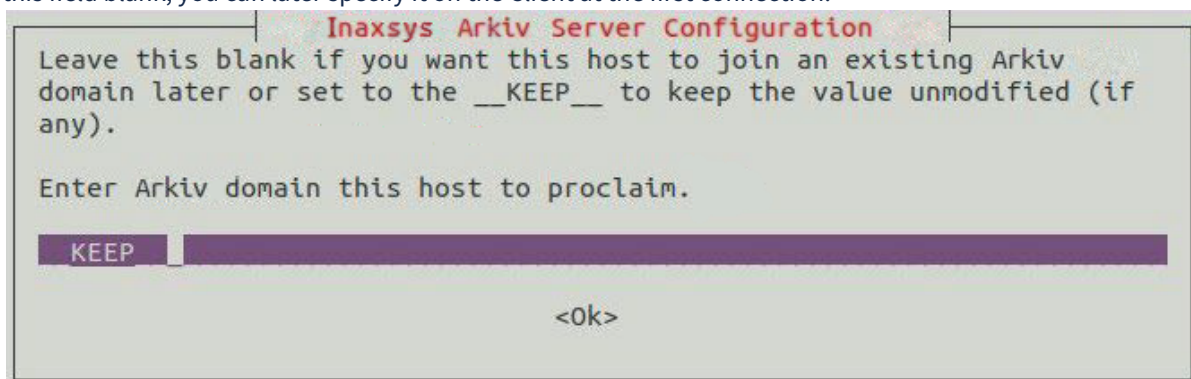
Example of packages required for the Server and Client installation type:

```
Arkiv-drivers-pack_3.71_amd64.deb
Arkiv-detector-pack_3.7_amd64.deb
Arkiv-one_1.0.4_all.deb
Arkiv-one-core_1.0.4_amd64.deb
Arkiv-one-client-bin_1.0.4_amd64.deb
Arkiv-one-client_1.0.4_all.deb
```

❏ Attention!

The folder should not contain other packages.
It is not allowed to simultaneously install the regular Server and the Failover Server.

During the installation, the installer will request the name of the domain for the *Arkiv* Server. If you leave this field blank, you can later specify it on the Client at the first connection.



4. If necessary, you can change the Server configuration after installation (see [Arkiv Server configuration change on Linux OS](#)(see page 906)).

Installation is complete.

You can install the *Arkiv DetectorPack* and *Drivers Pack* from the repository. To do this, sequentially run the following commands:

```
sudo apt-get install Arkiv-drivers-pack
sudo apt-get install Arkiv-detector-pack
```

❏ Attention!

The *Arkiv DetectorPack* and *Drivers Pack* should be installed from the repository before installing the main part of *Arkiv*.

If the *Arkiv DetectorPack* and *Drivers Pack* were installed from the repository, it is necessary to remove them from the folder with downloaded installation packages.

Manual for installing the Arkiv Server on Ubuntu

This is a manual for installing the *Arkiv 5.0* Server on Ubuntu OS 18 version and later. The manual describes the silent installation from the repository.

- [Before the installation](#)(see page 890)
- [Installing the Arkiv Server](#)(see page 890)
- [After the installation](#)(see page 891)
 - [Basic commands for checking the installation](#)(see page 891)
 - [Next steps](#)(see page 892)
- [Possible errors during installation](#)(see page 892)
- [Additional commands for the Server](#)(see page 892)
- [Default folders](#)(see page 892)

Before the installation

All actions are performed in the terminal as the root user. If you use third-party programs, for example, Discover, you may need to reinstall *Arkiv*.

Installing the Arkiv Server

To install the *Arkiv* Server, do the following:

1. Add the Inaxsys repositories by sequentially running the commands:

```
echo 'deb http://download.Inaxsys.com/debian-repository stable main' | sudo tee -a /etc/apt/sources.list.d/Inaxsys.list
echo 'deb http://download.Inaxsys.com/debian-repository stretch backports/main' | sudo tee -a /etc/apt/sources.list.d/Inaxsys.list
wget --quiet -O - "http://download.Inaxsys.com/debian-repository/info@Inaxsys.com.gpg.key" | sudo apt-key --keyring /etc/apt/trusted.gpg.d/Inaxsys.gpg add - && sudo apt-get update
```

2. Install the required version of *Arkiv*.

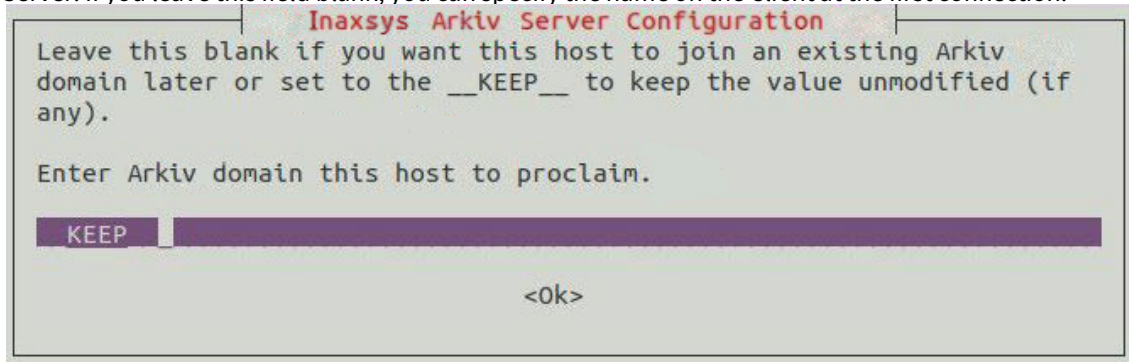
❏ Attention!

The installation command depends on your variant of the software package: either the Server or the Failover Server. These are two different types of the software package. You should install one of them. Both variants are described below (for more information about the installation types, see [Installation](#)(see page 36), [General information about a failover system](#)(see page 562)).

- a. If you need to install only the Server part of *Arkiv*, sequentially run the commands:

```
sudo apt install Arkiv-one
sudo apt-get install -f -y
```

During the installation, the installer will request the name of the Arkiv-domain for the *Arkiv* Server. If you leave this field blank, you can specify the name on the Client at the first connection.



- b. If you need to install the Failover Server, sequentially run the commands:

```
sudo apt install Arkiv-one-raft
sudo apt-get install -f -y
```

After the installation

Basic commands for checking the installation

Check the versions of the installed *Arkiv* modules:

```
dpkg -l | grep Arkiv
```

Check the server status:

```
sudo systemctl status Arkiv-one
sudo systemctl status Arkiv-one-raft # for Failover Server
```

Start and stop of the *Arkiv* Server (if it was installed):

```
sudo systemctl stop Arkiv-one
sudo systemctl start Arkiv-one
```

Start and stop of the *Arkiv* Failover Server (if it was installed):

```
sudo systemctl start Arkiv-one-raft
sudo systemctl stop Arkiv-one-raft
```

Next steps

For *Arkiv Server*: [Configuring Arkiv domains](#)(see page 91)

For *Arkiv Failover Server*: [Creating a Cluster](#)(see page 565) and [Configure a Failover System Cluster](#)(see page 568)

Possible errors during installation

Packages from the unfinished repositories aren't loaded

Add [trusted=yes] to the repository path. Example:

```
deb [trusted=yes] http://download.inaxsys.com/debian-repository stretch main backports/main
```

The repository key isn't added

Load the key. Run the command:

```
sudo apt-key add key_file_name
```

Additional commands for the Server

Use the required command depending on the version of the installed software package: only the Server (Arkiv-one) or the Failover Server (Arkiv-one-raft).

```
# display of the package dependencies
apt-cache depends
# display of the repositories with the package
apt-cache policy
# build reconfiguration
dpkg-reconfigure Arkiv-one
dpkg-reconfigure Arkiv-one-raft
```

Default folders

The following folders are used by default:

1. Logs and Client configuration: /home/USER/.local/share/Inaxsys/
2. Server configuration: /opt/Inaxsys/Arkiv/

The path to the Support log collection utility: /opt/Inaxsys/Arkiv/bin/support

- ❑ Manual installation of the *Arkiv Server* is described here: [Manual installation](#)(see page 887). The section about *Arkiv* on Linux: [Appendix 8. Configuring and operating the Arkiv in Linux OS](#)(see page 885).

Installing the Arkiv Client on Linux OS

❑ Attention!

The stable operation of the Client is not guaranteed on Ubuntu 18 and 19. It is recommended to install only *Arkiv Server* (see [Installing the Arkiv Server in Linux OS](#)(see page 886)). Both the Client and *Arkiv Server* are supported on Ubuntu 20 and newer versions.

❑ Attention!

The Client can be installed only after installing the Server of the same version (see [Installing the Arkiv Server in Linux OS](#)(see page 886)).

To install the *Arkiv* Client on Linux OS, do the following:

1. For the automatic installation from the repository:
 - a. Add the repositories by sequentially running the following commands:

```
echo 'deb http://download.inaxsys.com/debian-repository stable main' | sudo tee -a /etc/
apt/sources.list.d/inaxsys.list
echo 'deb http://download.inaxsys.com/debian-repository stretch backports/main' | sudo tee
-a /etc/apt/sources.list.d/inaxsys.list
wget --quiet -O - "http://download.inaxsys.com/debian-repository/info@inaxsys.com.gpg.key"
| sudo apt-key --keyring /etc/apt/trusted.gpg.d/inaxsys.gpg add
- && sudo apt-get update
```

❑ Attention!

If you install *Arkiv* on AstraLinux SE 1.6, then instead of the commands from the step 1, you should sequentially run the following commands:

```
echo 'deb http://download.inaxsys.com/debian-repository stretch main backports/ astra
backports/main' | sudo tee -a /etc/apt/sources.list.d/inaxsys.list

wget --quiet -O - "http://download.inaxsys.com/debian-repository/
info@inaxsys.com.gpg.key" | apt-key --keyring /etc/apt/trusted.gpg.d/inaxsys.gpg add
- && sudo apt-get update
```

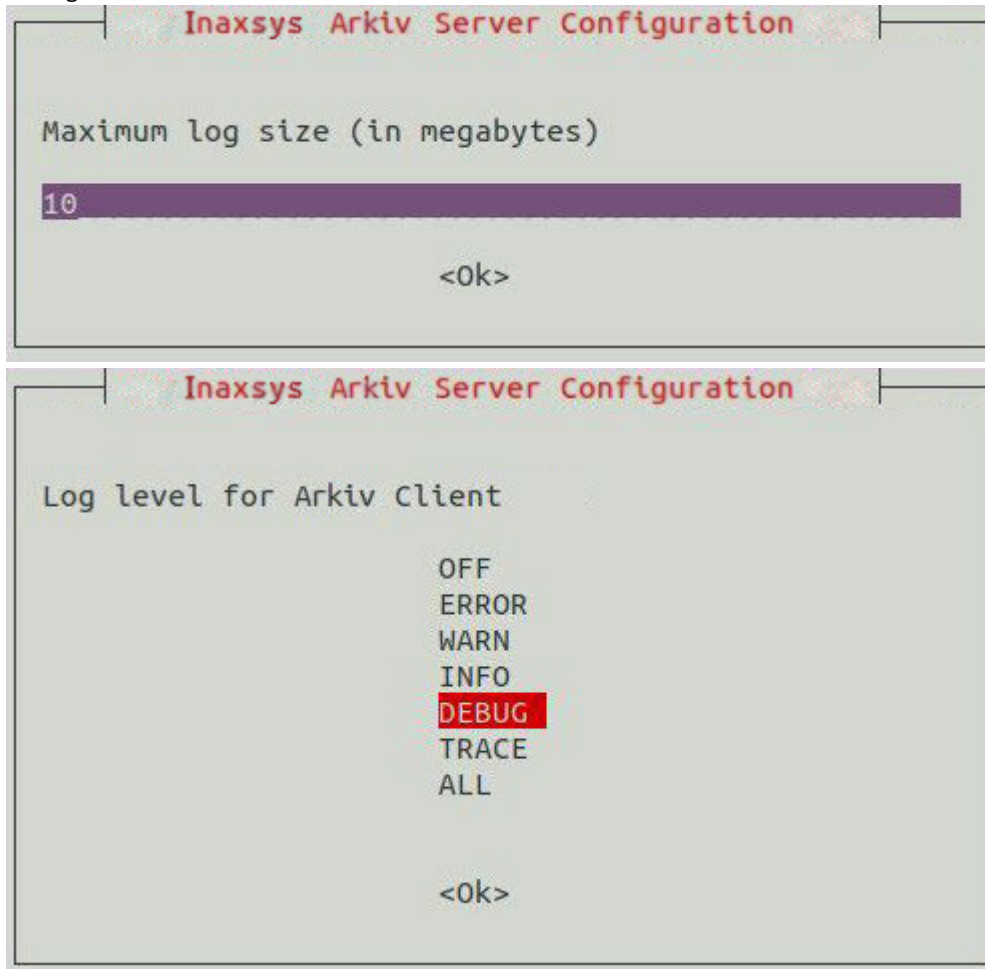
- b. If you use Ubuntu 20.04 or Debian 11, then install the mono-complete from the stretch repository:

```
sudo apt purge "mono-*" "libmono-*"
sudo apt autoremove
sudo apt-get update
sudo apt-get install mono-complete -t stretch
```

- c. Run the command:


```
sudo apt-get install Arkiv-one-client
```

- d. During installation, it will be necessary to specify the maximum size of the log files in megabytes and the log level.



Note

The specified value can be changed (see [Configuring the Arkiv Client logging parameters on Linux OS](#) (see page 910)). To do this, run the command:
`sudo dpkg-reconfigure Arkiv-one-client`

2. For the manual installation:
 - a. Go to the downloaded deb-packages folder.
 - b. Run the following commands:

```
sudo dpkg -i Arkiv-one-client-bin_1.0.4.25_amd64.deb
sudo dpkg -i Arkiv-one-client_1.0.4.25_all.deb
```

where 1.0.4.25 is the version and the build number.

When the installation is complete, the Client icon will be displayed in the application menu.

❏ Attention!

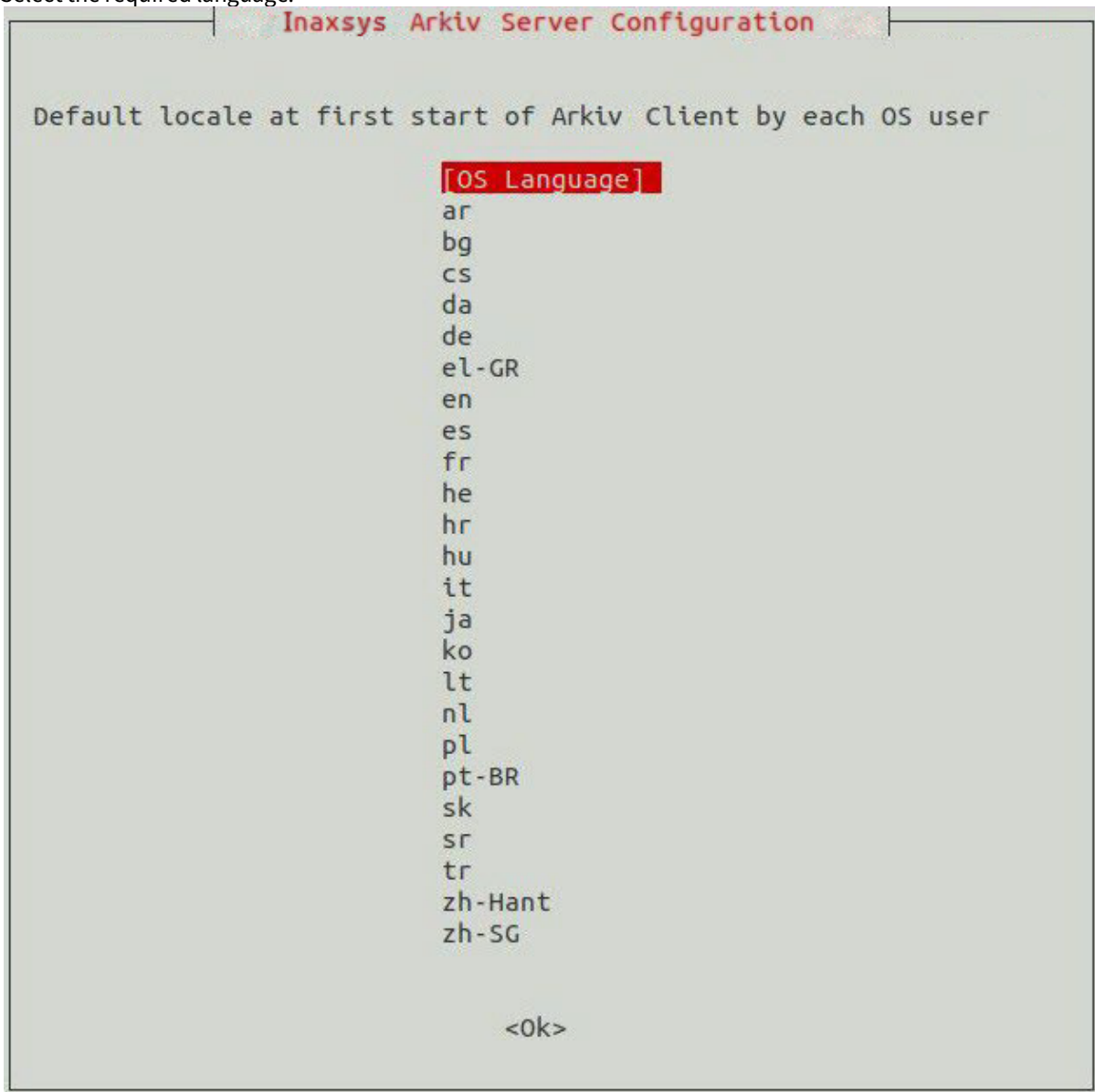
It is not recommended to run the Client as root user or with root permissions.

By default, at the first Client start, the OS interface language will be used. To change the language of the Client interface at the first start, do the following:

1. Run the following command.

```
sudo dpkg-reconfigure Arkiv-one-client
```

2. Select the required language.



Note

This setting should be configured for each OS user separately.

Attention!

For the next launches the interface language can be changed in the Client settings (see [Selecting the interface language](#)(see page 522)).

Configuration and log folders

The following folders are being used by default:

1. Logs and Client configuration:

```
/home/USER/.local/share/Inaxsys/
```

2. Server configuration:

```
/opt/Inaxsys/Arkiv/
```

Arkiv Server launch using Docker

To run the *Arkiv* Server using Docker, do the following:

1. Install Docker (see [Docker installation](#)(see page 896) and [Specifics of Docker installation on Ubuntu](#)(see page 899)).
2. Create the *Arkiv* container (see [Creating the Arkiv container](#)(see page 901)).

Minimum requirements to run *Arkiv* using Docker on Ubuntu:

- Dual core processor;
- 4 GB RAM;
- 200 GB HDD.

Docker installation

To install the Docker, do the following:

1. Prepare the environment:
 - a. Install the packages to use the repository via HTTPS.

```
sudo apt-get install apt-transport-https ca-certificates curl gnupg2 software-properties-common
```

- b. Add official Docker GPG key.

```
curl -fsSL https://download.docker.com/linux/debian/gpg | sudo apt-key add -
```

```
sudo apt-key fingerprint 0EBFCD88
```

c. Configure the repository:

i. for the x86_64 / amd64 architecture:

• Debian:

```
sudo add-apt-repository "deb [arch=amd64] https://download.docker.com/linux/  
debian $(lsb_release -cs) stable"
```

• Ubuntu:

```
sudo add-apt-repository "deb [arch=amd64] https://download.docker.com/linux/  
ubuntu $(lsb_release -cs) stable"
```

ii. for the armhf architecture:

• Debian:

```
sudo add-apt-repository "deb [arch=armhf] https://download.docker.com/linux/  
debian $(lsb_release -cs) stable"
```

• Ubuntu:

```
sudo add-apt-repository "deb [arch=armhf] https://download.docker.com/linux/  
ubuntu $(lsb_release -cs) stable"
```

d. Update the lists of packages:

```
sudo apt-get update
```

2. Install and configure the Docker:

a. Install docker-ce.

```
sudo apt-get install docker-ce docker-compose
```

b. Add a user to the Docker.

```
sudo adduser user docker
```

c. Install git.

```
sudo apt-get install git gettext
```

d. Go to the directory where the container will be located.

```
cd /home
```

- e. Clone the files from the repository.

```
git clone https://src.inaxsys.dev/bitbucket/scm/one/Arkiv.docker.git
```

- f. Update the cloned repository files:

- i. Go to Arkiv.docker folder.

```
cd /Arkiv.docker
```

- ii. Download the content from the git repository.

```
git pull
```

3. Install the container:

- a. Place the downloaded .deb packages in the /server/build folder of the container.

```
mv /home/user/Downloads/Arkiv-* /home/Arkiv.docker/server/build/
```

- b. Go to the directory where Arkiv-one.sh is located.

```
cd /home/Arkiv.docker/server
```

- c. Start building the container.

```
./Arkiv-one.sh build
```

When the container is built, the terminal will display the information:

Example:

```
Successfully built fce00881f1c7  
Successfully tagged Arkiv-one:latest
```

- d. Restart the OS after the container is built.

```
sudo reboot
```

The Docker is installed.

Start the container.

```
./Arkiv-one.sh start
```

If you need to check the status of the Server, use the command:

```
./Arkiv-one.sh status
```

The list of commands you can use with Arkiv-one.sh:

```
Commands:
build          - build ${PRODUCT_DISPLAY_NAME} image from deb packages
uninstall tag.. - remove ${PRODUCT_DISPLAY_NAME} image(s). Use 'all' to remove all known images
list          - list available ${PRODUCT_DISPLAY_NAME} images
versions [tag] - print versions of major ${PRODUCT_DISPLAY_NAME} components in the image(s)

start [tag]    - start ${PRODUCT_DISPLAY_NAME}
stop          - stop running ${PRODUCT_DISPLAY_NAME}
status        - show ${PRODUCT_DISPLAY_NAME} status
reconfigure   - reconfigure ${PRODUCT_DISPLAY_NAME}
start_app <command> [argument]... - run ${PRODUCT_DISPLAY_NAME} service command
support       - collect support information

install_udev [tag] - install ${PRODUCT_DISPLAY_NAME} udev rules on host system. Required to
                  support peripherals such as Guardant token or Neural Net
                  Accelerators inside the container.
remove_udev    - remove udev rules from host system
```

Specifics of Docker installation on Ubuntu

To install the Docker on Ubuntu, do the following:

1. Prepare the environment:
 - a. Install the packages to use the repository via HTTPS.

```
sudo apt-get install apt-transport-https ca-certificates curl gnupg2 software-properties-
common
```

- b. Add the official Docker GPG key.

```
curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo apt-key add -
```

```
sudo apt-key fingerprint <0EBFCD88>
```

- c. Configure the repository:
 - i. for the x86_64 / amd64 architecture.

```
sudo add-apt-repository "deb [arch=amd64] https://download.docker.com/linux/ubuntu $
(lsb_release -cs) stable"
```

- ii. for the armhf architecture.

```
sudo add-apt-repository "deb [arch=armhf] https://download.docker.com/linux/ubuntu $
(lsb_release -cs) stable"
```

- d. Update the lists.


```
sudo apt-get update
```

2. Install and configure the Docker:

a. Install docker-ce.

```
sudo apt-get install docker-ce docker-compose
```

b. Add a user to the Docker.

```
sudo adduser user docker
```

c. Install git.

```
sudo apt-get install git gettext
```

d. Go to the directory where the container will be located.

```
cd /home
```

e. Clone the repository.

```
git clone https://bitbucket.org/Inaxsys/Arkiv.docker.git
```

f. Update the repository:

i. Go to Arkiv.docker folder.

```
cd Arkiv.docker
```

ii. Download content from git.

```
git pull
```

3. Install the container:

a. Place the downloaded .deb packages in the /server/build folder of the container.

```
mv /home/user/Downloads/Arkiv-* /home/Arkiv.docker/server/build/
```

b. Start building the container.

```
cd /home/Arkiv.docker/server
```

c. Restart OS after the container is built.

```
sudo reboot
```

The Docker is installed on Ubuntu.

Creating the Arkiv container

To create the *Arkiv* container, do the following:

1. Copy the *Arkiv*, *Arkiv DetectorPack* and *Drivers Pack* deb-packages into the folder `~/Arkiv.docker/next/build/`.
2. Go to the folder `~/Arkiv.docker/next`

```
cd ~/Arkiv.docker/next
```

3. Execute the command.

```
./Arkiv-one.sh build
```

The *Arkiv* container build is going to start.

4. To view the list of the built-up containers, execute the following command after the operation is complete.

```
./Arkiv-one.sh list
```

Working with the Arkiv container

- The list of containers.

```
./Arkiv-one.sh list
```

- Launching the container.

```
./Arkiv-one.sh start 1.0.2.25
```

- Viewing the container status.

```
./Arkiv-one.sh status
```

- Stopping the container.

```
./Arkiv-one.sh stop
```

- Collecting the system data.

```
./Arkiv-one.sh support
```

The file will be saved in the `'~/Arkiv.docker/one/data/'` directory.

- Viewing the installed packages version.

```
./Arkiv-one.sh versions
```

Updating the Arkiv software in Linux OS

To update the *Arkiv* software from the repository, it is necessary to execute the following commands in the **root** mode:

```
sudo apt-get update
sudo apt-get upgrade
```

To update the *Arkiv* software from the folder, do the following:

1. Go to the folder with the downloaded packages.
2. Execute the following command:

```
sudo dpkg -i *
```

Attention!

After the update is completed, it is necessary to check the access rights of the archive file and the folder where it is stored.

The **ngp** user should be specified as the owner of both the file and the folder.

Uninstalling the Arkiv software in Linux OS

To uninstall the *Arkiv* but save the configuration, run the following command:

```
sudo apt remove Arkiv-*
```

To completely remove the *Arkiv*, run the following commands in sequence:

```
sudo apt --purge remove Arkiv-* -y
```

```
sudo apt autoremove -y
```

```
sudo rm -r /opt/Inaxsys/
```

10.8.5 Moving the Arkiv configuration from Windows OS to Linux OS

To transfer *Arkiv* configuration from Windows OS to Linux OS, do the following:

1. Create the backup configuration in Windows OS (see [Backing up a configuration](#)(see page 850)).

- Execute the following command in Linux OS:

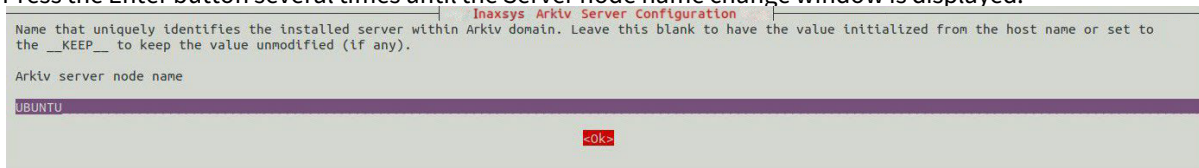
```
sudo dpkg-reconfigure Arkiv-one
```

Attention!

The Server in Linux OS must belong to some Arkiv-domain.

The following window will be displayed.

- Press the Enter button several times until the Server node name change window is displayed.



- Enter the Server node name which is used in Windows OS.
- Run the backup and configuration recovery utility (see [Backup and Restore Utility](#)(see page 842)) and select the specified Server on its launch.
- Restore the configuration by selecting the saved backup.
- Deactivate the license (see [Deactivating a license](#)) and distribute the license file again (see [Activation by applying license file](#)).

10.8.6 Starting and stopping the Arkiv Server in Linux OS

Server start:

```
sudo service Arkiv-one start
```

Server stop:

```
sudo service Arkiv-one stop
```

Server restart:

```
sudo service Arkiv-one restart
```

Server status check:

```
sudo service Arkiv-one status
```

10.8.7 Archive creation features in Linux OS

Archive as a disk creation features in Linux OS

To allocate the disk for recording, execute the command in the root mode.

```
sudo su
```

```
fdisk -l
```

where

- `/dev/sda` – the first physical disk;
- `/dev/sda1` – the first section of the first physical disk;
- `/dev/sda2` – the second section of the first physical disk;
- `dev/sdb` – the second physical disk.

To delete the disk section, do the following:

1. Go to the disk where it is necessary to delete a section.

```
fdisk /dev/sdb
```

2. Delete the section.

```
d
```

3. Specify the section number.

```
2
```

4. Save the changes.

```
w
```

To create a section, do the following:

1. Go to the disk where it is necessary to create a section.

```
fdisk /dev/sdb
```

2. Create the section.

```
n
```

3. Specify the section: primary (p) or extended (e).

p

- Specify the section number.

1

- Specify the section size. G – gigabytes, M – megabytes, K – kilobytes.

+5G

- Save the changes.

w

To create the archive as a disk, do the following:

- Create a new archive in the *Arkiv* Client (see [Creating a local archive](#)(see page 202)).
- Select the archive volume.
- Specify the path to section in the address window. For example: `/dev/sdb1`. If it is required to use the whole disk as an archive, specify the `/dev/sdc`, `/dev/sdd` and so on.
- Set the **Format** checkbox and click the **Apply** button.

Attention!

At this point you cannot change the archive size.

Archive as a file creation features in Linux OS

By default, in Linux OS the **ngp** user has rights to record only in the `/opt/Inaxsys/Arkiv/` directory. To create an archive in another directory, do the following:

- Create a folder with write permissions.

```
sudo mkdir -m755 /home/archive
```

- Change the folder owner to **ngp** user.

```
sudo chown -R ngp:ngp /home/archive/
```

- Check the permissions on created folder.

```
ls -lt /home/
```

If there is a string with the **ngp** user permissions in the result, it is now possible to create an archive as a file in this directory.


```
drw-r--r--  2 ngp   ngp   4096 aug.  8 15:18 archive
```

Features of archives with ext and xfs file systems

When you work with archives (both local and network) on ext and xfs file systems, take into account the following features:

1. When you create an archive (see [Creating Archive](#)), the displayed free disk space is calculated based on the actual used space.

Note

For example, the disk size is 60 GB, and a 10 GB archive is created on it, but it is only 1 GB full. When you try to create a second archive on this disk, 59 GB of free space will be displayed, not 50 GB.

2. Availability of the entire archive file size is not guaranteed in cases when other files run out of available space.

Note

Due to the ext and xfs file systems features, it is possible to create archives whose total size exceeds the free disk space.

Attention!

In such cases, it is necessary for the system administrator to control the free disk space.

Features of NAS archives

For connecting to the NAS server, use the following versions of protocols:

- SMB2/SMB3 (2.02, 2.10, 3.00, 3.02, 3.1.1);
- NFSv3, NFSv4.

It is also possible to use the CIFS and iSCSI protocols.

10.8.8 Arkiv Server configuration change on Linux OS

To change the Server configuration, do the following:

1. Run the following command.

```
sudo dpkg-reconfigure Arkiv-one
```

2. Enter the Arkiv-domain ID to which the Server should be added. To skip this step, press the Enter button.

Inaxsys Arkiv Server Configuration

Leave this blank if you want this host to join an existing Arkiv domain later or set to the `__KEEP__` to keep the value unmodified (if any).

Enter Arkiv domain this host to proclaim.

`KEEP`

<Ok>

3. Change the Server node name.

Inaxsys Arkiv Server Configuration

Name that uniquely identifies the installed server within Arkiv domain. Leave this blank to have the value initialized from the host name or set to the `__KEEP__` to keep the value unmodified (if any).

Arkiv server node name

`UBUNTU-D`

<Ok>

4. Specify the beginning of the port range for the Server operation.

Inaxsys Arkiv Server Configuration

This port is used to determine base port of a TCP port span for Arkiv applications. You may need to change this value if you run several instances of Arkiv on the same host.

TCP port - base for Arkiv TCP ports range

`20111`

<Ok>

5. Specify the number of ports for the Server operation.

Inaxsys Arkiv Server Configuration

In addition to the base port it determines TCP ports range used by Arkiv applications.

Arkiv TCP ports span

`100`

<Ok>

6. Restrict the visibility of Servers from various networks in the Servers list during *Arkiv* setup. Possible values:

- a. `0.0.0.0/0` – Servers from all networks will be visible.
- b. `10.0.1.23/32,192.168.0.7/32` – only the Servers from the specified networks will be visible.
- c. `127.0.0.1` – only the Servers from the local network will be visible.

Inaxsys Arkiv Server Configuration

Comma-separated list of network interfaces in CIDR notation for Inaxsys Arkiv to listen on. Leave it empty if Arkiv is supposed to use all available network interfaces.

List of network interfaces for Arkiv to listen on.

<Ok>

7. Specify the alternative Server address – the external address of the switch if the Server is located behind the NAT¹⁹⁰. The format of interfaces setting: "IP Address1 or DNS Name1, IP Address2 or DNS Name2".

Inaxsys Arkiv Server Configuration

It may be used to specify public address for Inaxsys Arkiv when access a server working behind the NAT from outside. Appropriate port forwarding must be set up on the NAT itself in order to make this option work. Leave it empty if unsure or the server is not supposed to be accessed from outside.

Alternate primary network interfaces for Arkiv to listen on.

<ok>

8. Select the Server log level (see [Configuring Logging levels](#)(see page 837)).

Inaxsys Arkiv Server Configuration

Log level for Arkiv

0
ERROR
WARN
INFO
DEBUG
TRACE
ALL

<ok>

9. Specify the address of the database Server.

Inaxsys Arkiv Server Configuration

Enter host for Inaxsys Arkiv DB. Leave it empty or set to the __KEEP__ to keep the value unmodified.

Arkiv DB host

localhost _____

<ok>

10. Specify the port of the database operation.

Inaxsys Arkiv Server Configuration

Enter TCP-port which Inaxsys Arkiv DB listens to. Leave it empty or set to the __KEEP__ to keep the value unmodified.

Arkiv DB port

20110 _____

<ok>

¹⁹⁰ https://en.wikipedia.org/wiki/Network_address_translation

- Specify the maximum time in days the log will be stored in the archive. After that time, the log will be deleted (see [Configuring a Log archive](#)(see page 836)).

Inaxsys Arkiv Server Configuration

Remove rotated logs older than <count> days

7

<Ok>

- Specify the maximum size of the archive, above which the earliest logs will be deleted from the archive (see [Configuring a Log archive](#)(see page 836)).

Inaxsys Arkiv Server Configuration

Log maximum size (in MiB)

10

<Ok>

- Specify the maximum size of the log directory.

Inaxsys Arkiv Server Configuration

Suffixes M (stands for MiB) and G (stands for GiB) are supported.

Logs directory maximum size (in bytes)

500M

<Ok>

Server configuration change is complete.

10.8.9 Configuring the metadata storage in NAS on Linux OS

To store the metadata in a network attached storage (NAS), do the following:

- Create a shared network folder.
- On the Server in Linux OS, create the **netdir** folder. For example, in the **/media** folder:

```
sudo mkdir /media/netdir
```

- Install the **cifs-utils** utility.

```
sudo apt-get install cifs-utils
```

4. Attach the shared network folder to the created **netdir** folder.

```
sudo mount -t cifs //IP-address/common /media/netdir -o
user=User,password=123,uid=1001,gid=1002,vers=2.0
```

where,

- a. IP-address – NAS address,
- b. common – shared network folder,
- c. user, password – NAS access credentials,
- d. uid, gid – id of the user and ngp group; they can be obtained using the following command:

```
id ngp
```

5. In the *Arkiv* metadata storage settings, specify the `/media/netdir` path (see [Configuring storage of the system log and metadata](#)(see page 517)).

After you restart Linux OS, the attached folder will be deleted. To configure the network folder to be attached on the OS loading, do the following:

1. Open the `/etc/fstab` file.

```
sudo nano /etc/fstab
```

2. Add the following string to the file:

```
//IP-address/common /media/netdir cifs user=User,password=123,uid=1001,gid=1002,vers=2.0 0 0
```

3. Save file.

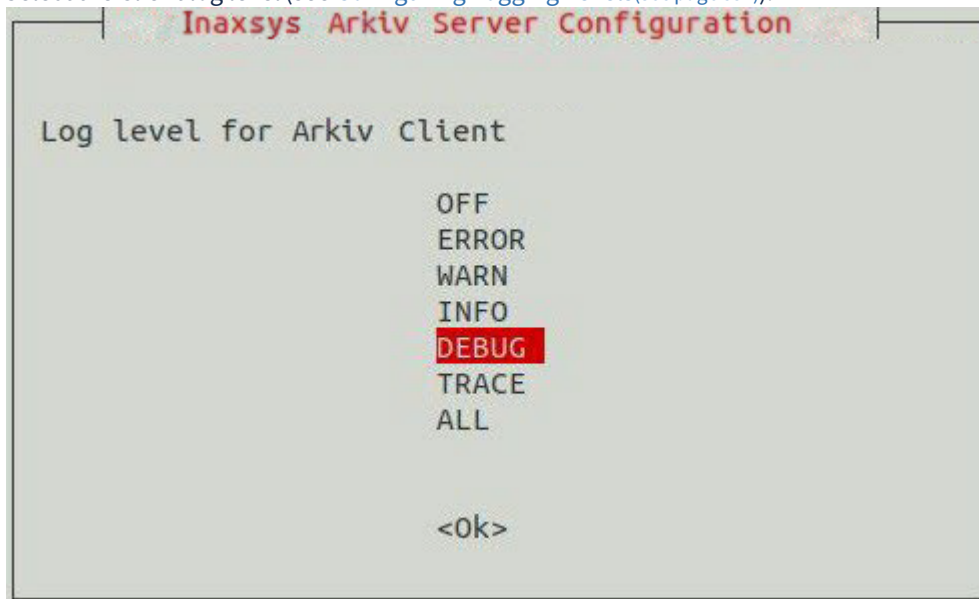
10.8.10 Configuring the Arkiv Client logging parameters on Linux OS

To change the *Arkiv* Client logging parameters, do the following:

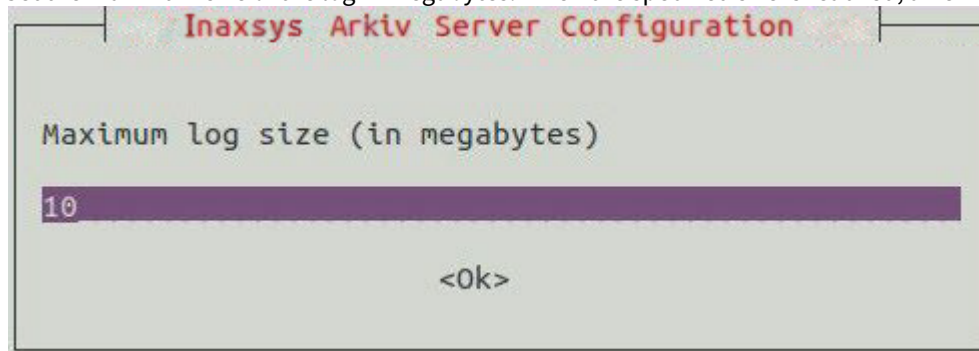
1. Execute the following command.

```
sudo dpkg-reconfigure Arkiv-one-client
```

2. Select the Client log level (see [Configuring Logging Levels](#)(see page 837)).



3. Set the maximum size of the log in megabytes. When the specified size is reached, a new log is created.



10.8.11 System data collection in Linux OS

To collect the system data in Linux OS, execute the following command:

```
sudo /opt/Inaxsys/Arkiv/bin/support /home/user
```

where

- /opt/Inaxsys/Arkiv/bin/support – the utility location directory; /
- home/user – the user's home directory.

10.8.12 Potential problems with Linux OS

Problem with displaying a dialog box or a drop-down list

In some cases, when you change the configuration of objects for which you need to set a location or select a value from the drop-down list, when you click on the button to select a location or list value, they do not open.

Note

In fact, the location selection window or a drop-down list are opened outside the interface shell, and therefore are not visible to the user.

To resolve this problem, select a different desktop environment and restart *Arkiv*. For example, use Gnome Classic instead of Gnome for Debian 11.

Specifics of detection tools operation on NVIDIA GPUs in Linux OS

By default, the Nouveau driver can be installed in Linux OS. This driver does not guarantee stable operation when using NVIDIA graphics cards for decoding *Arkiv* detection tools (see [Configuring detection tools](#)(see page 221)).

To resolve the problem, you need to install the current graphics card driver from the official NVIDIA website and run the command in the terminal:

```
nvidia-smi
```

If the operating system uses the installed driver to work, the driver version will be displayed. Otherwise, if the current driver is installed, but the operating system uses the Nouveau driver, you need to add it to the exclusions list and restart the computer. Below is an example of Ubuntu commands to add the Nouveau driver to the exclusion list:

```
sudo bash -c "echo blacklist nouveau > /etc/modprobe.d/blacklist-nvidia-nouveau.conf"
sudo bash -c "echo options nouveau modeset=0 >> /etc/modprobe.d/blacklist-nvidia-nouveau.conf"
```

After restarting, the operating system will use the installed NVIDIA driver.

10.8.13 Licensing of the software module for License plate recognition (VT) on Linux OS

On this page:

- [General information](#)(see page 913)
- [Installing the Sentinel LDK Run-time environment](#)(see page 913)
- [Installing a demo license](#)(see page 913)
- [Installing a hardware key](#)(see page 915)
- [Installing a software key](#)(see page 915)

- [Updating the license](#)(see page 916)
- [Removing a license](#)(see page 917)
- [Checking a license](#)(see page 918)

General information

The software module for License plate recognition (VT) in *Arkiv* is licensed by the processed video channels and by countries (see [License plate recognition \(VT\)](#)(see page 296)).

Attention!

It is necessary to run the commands as the root user.

Installing the Sentinel LDK Run-time environment

To install the Sentinel LDK Run-time environment, do the following:

1. Upload the [aksusbd-8.31.1.tar](#) environment to the Server on which the license will be used.
2. Unpack the archive.

```
sudo tar xvf ~/aksusbd-8.31.1.tar -C ~
```

3. Run the installation.

```
sudo ./aksusbd-8.31.1/dinst /home/<Username>/aksusbd-8.31.1
```

Note

If the environment is successfully installed, the Sentinel Admin Control Center web application will open in the Web browser at <http://127.0.0.1:1947/>.

Installation of the Sentinel LDK Run-time environment is complete.

Installing a demo license

Attention!

Before you install a demo license, it is necessary to install the Sentinel LDK Run-time environment.

Attention!

Demo mode of the License plate recognition (VT) is not allowed on virtual machines.

There is a demo license used for demo mode of the License plate recognition (VT).

[Search in the archive](#) — a standard demo license for searching the recognized license plates in the archive

❑ Attention!

If you use this license, note that there is a 30 seconds delay between the recognition of a license plate and the appearance of a corresponding event (see [Vehicle number plate recognition and search](#)(see page 737)).

To install a demo license, do the following:

1. Download [hasp_SDK_2.14.tar.gz](#).
2. Unpack [hasp_SDK_2.14.tar.gz](#).

```
sudo tar zxvf ~/hasp_SDK_2.14.tar.gz -C ~
```

3. Download the installation file of the demo license: [Search in the archive](#).
4. Activate the demo license.
 - a. for 64-bit system:

```
cd ./hasp/bin
```

```
sudo ./hasp_update_x86_64 u ArkivArchiveSearchII.v2c
```

- b. for 32-bit system:

```
cd ./hasp/bin
```

```
sudo ./hasp_update u ArkivArchiveSearchII.v2c
```

❑ Note

If the result is “0”, it means the demo license is successfully installed.

5. After you activate the demo license, restart the OS.

```
sudo reboot
```

❑ Note

Information about the installed demo license is displayed in the [Sentinel Admin Control Center¹⁹⁶](#) web application, on the **Sentinel Keys** tab.

The installation of the demo license is now complete.

Installing a hardware key

❑ Attention!

Before you install a hardware key, it is necessary to install the Sentinel LDK Run-time environment.

To ensure the hardware key operation, it is necessary to connect the hardware key to the Server where you plan to use the License plate recognition (VT). If the Sentinel LDK Run-time environment is successfully installed, the license is automatically recognized by *Arkiv* and it is ready to use.

❑ Note

Information about the installed hardware key is displayed in the [Sentinel Admin Control Center¹⁹⁷](#) web application, on the **Sentinel Keys** tab.

The installation of the hardware key is now complete.

Installing a software key

❑ Attention!

Before you install a software key, it is necessary to install the Sentinel LDK Run-time environment.

To install a software key, do the following:

1. Upload the [hasp_SDK_2.14.tar.gz](#) environment to the Server on which the license will be used.
2. Unpack the archive.

```
sudo tar zxvf ~/hasp_SDK_2.14.tar.gz -C ~
```

3. Create a snapshot of the Server hardware. A snapshot is a file with the c2v extension. The created file fingerprint.c2v will be located in the current directory.

```
cd ~/hasp/bin
```

- a. for 64-bit system:

```
sudo ./hasp_update_x86_64 f > fingerprint.c2v
```

- b. for 32-bit system:

¹⁹⁶ <http://127.0.0.1:1947/>

¹⁹⁷ <http://127.0.0.1:1947/>

```
sudo ./hasp_update f > fingerprint.c2v
```

4. Give the created file with the c2v extension to the Inaxsys manager.
5. Get a v2c file from the Inaxsys manager. The received file will contain license information that will be available for use only on your Server.
6. Activate the license to install a software key.
 - a. for 64-bit system:

```
cd ./hasp/bin
```

```
sudo ./hasp_update_x86_64 u <Received file with the v2c extension>
```

- b. for 32-bit system:

```
cd ./hasp/bin
```

```
sudo ./hasp_update u <Received file with the v2c extension>
```

7. After you activate the license, restart the OS.

```
sudo reboot
```

Note

Information about the installed software key is displayed in the [Sentinel Admin Control Center¹⁹⁹](#) web application, on the **Sentinel Keys** tab.

The installation of the software key is now complete.

Updating the license

To update the license, do the following:

1. Create a snapshot of the Server hardware. A snapshot is a file with the c2v extension. The created file haspinfo.c2v will be located in the current directory.

```
cd ~/hasp/bin
```

- a. for 64-bit system:

```
sudo ./hasp_update_x86_64 i <HASP ID> > haspinfo.c2v
```

where <HASP ID>

¹⁹⁹ <http://127.0.0.1:1947/>

```
hasp_update_x86_64 lf
```

b. for 32-bit system:

```
sudo ./hasp_update i <HASP ID> > haspinfo.c2v
```

where <HASP ID>

```
hasp_update lf
```

2. Give the created file with the c2v extension to the Inaxsys manager.
3. Get a v2c file from the Inaxsys manager. The received file will contain license information that will be available for use only on your Server.
4. Update the license.

```
cd ./hasp/bin
```

a. for 64-bit system:

```
sudo ./hasp_update_x86_64 u <Received file with the v2c extension>
```

b. for 32-bit system:

```
sudo ./hasp_update u <Received file with the v2c extension>
```

5. After you update the license, restart the OS.

```
sudo reboot
```

Note

Information about the updated license is displayed in the [Sentinel Admin Control Center²⁰⁰](#) web application, on the **Sentinel Keys** tab.

The update of the license is now complete.

Removing a license

To delete a license, do the following:

1. Open the contents of the c2v file that was created for the installation, activation or update of the current license. The license ID in the body of the key is indicated as <hasp id="Identifier of the current license">.
2. Delete the v2c file that has the same ID as the c2v file located in /var/hasplm/installed/107392/.
3. Stop the processes.

²⁰⁰ <http://127.0.0.1:1947/>


```
killall aksusbd
killall haspmlid
```

4. Start the services.

```
haspmlid -s
aksusbd
```

5. After you delete the license, restart the OS.

```
sudo reboot
```

The removal of the license is now complete.

Checking a license

You can check the current license status on the Server. To do this, open the [Sentinel Admin Control Center](#)²⁰¹ web application. The license information is displayed on the **Features** tab.

If there is no Web browser on the Server, execute the following two commands in the console one by one:

```
curl -X POST -d 'accremote=1' http://localhost:1947/_int_/config.html
wget --post-data 'accremote=1' http://localhost:1947/_int_/config.html
```

10.9 Appendix 9. Using Arkiv with NAT

10.9.1 Consolidating the Servers from different networks into Arkiv domain

To consolidate the Servers from different networks separated by routers into Arkiv domain, do the following:

1. Set the port range for operation and the router's public IP address on each Server that is to be included in the Arkiv domain (see [Network settings utility](#)(see page 865)).

❑ Attention!

The Server port ranges of Arkiv Domain should not overlap within the same network. By default, the base port is 20111, and the port range is 20111-20210. Hence, it is necessary to set and forward the port range 20211-20310 for the second Server, the port range 20311-20410 for the third Server, and so on (see [Ports used by the Arkiv Software Package](#)(see page 28)).

❑ Attention!

The router's public IP address should be static.

²⁰¹ <http://127.0.0.1:1947/>

NTServiceOpts registry setting

External IP address of router: 88.78.12.13

Base port: 20111

Number of ports: 100

Interface mask: 0.0.0.0/0

Save

2. For each router, forward the specified ports of the Server, which is located behind this switch, and the gRPC API 20109 port.
3. Connect the Client to the Server from any network (see [Starting an Arkiv Client](#)(see page 76), [Connecting the Client to the Server behind NAT](#)(see page 921)).
4. Manually add other Servers to the Arkiv domain using the public IP address of the corresponding router and the external base port of the Server (see [Adding a Server to an existing Arkiv-domain](#)(see page 93)).

Search... 0 of 0

Default

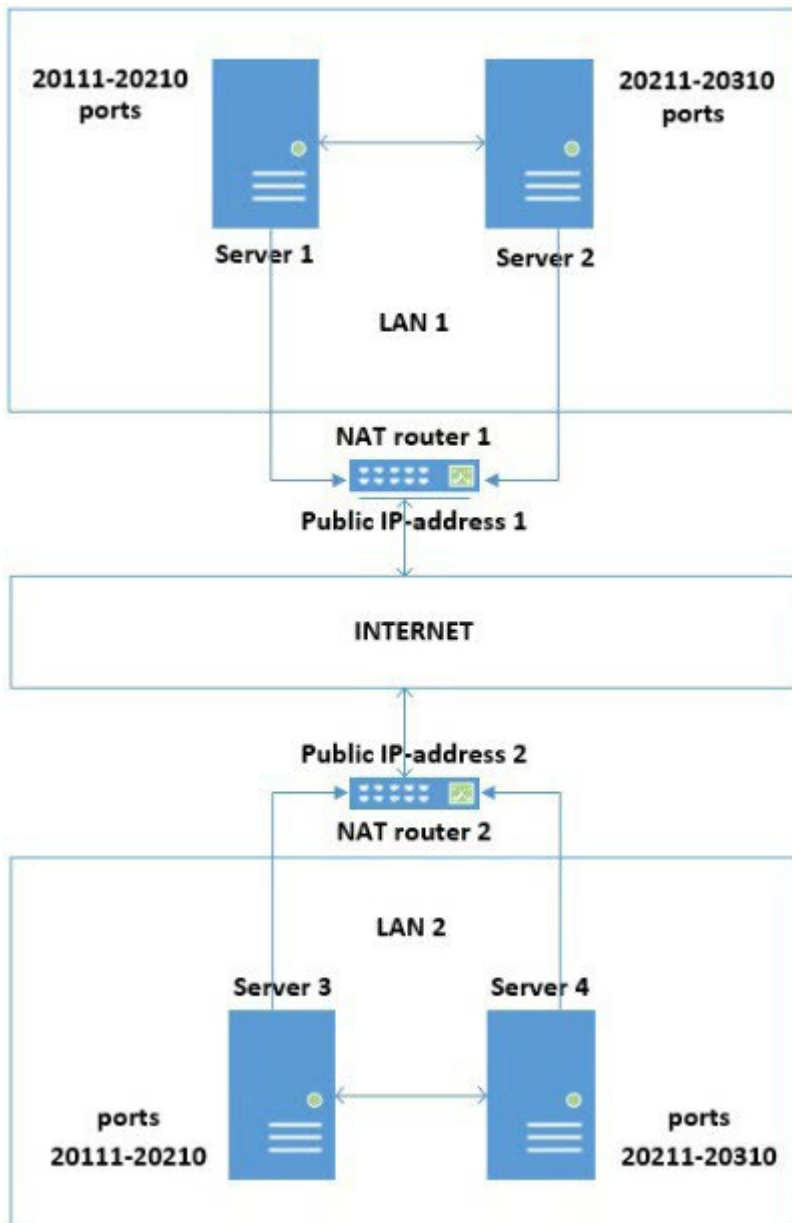
TEST

Unallocated servers

IP address: 88.78.12.13 20111

Add to domain

Example:



To combine Servers into one Arkiv domain in this configuration, do the following:

1. On Server 1, set the port range 20111-20210 and the public IP address of router 1.
2. On Server 2, set the port range 20211-20310 and the public IP address of router 1.
3. On Server 3, set the port range 20111-20210 and the public IP address of router 2.
4. On Server 4, set the port range 20211-20310 and the public IP address of router 2.
5. On router 1, configure the forwarding of:
 - a. the router ports 20111-20210 to the internal IP address of Server 1 and ports 20111-20210;
 - b. the router ports 20211-20310 to the internal IP address of Server 2 and ports 20211-20310;
 - c. the gRPC API 20109 port (always static) to the internal IP address of Server 1 and the internal IP address of Server 2.
6. On router 2, configure the forwarding of:
 - a. the router ports 20111-20210 to the internal IP address of Server 3 and ports 20111-20210;
 - b. the router ports 20211-20310 to the internal IP address of Server 4 and ports 20211-20310;

- c. the gRPC API 20109 port (always static) to the internal IP address of Server 3 and the internal IP address of Server 4.
- 7. Connect to Server 1.
- 8. Manually add Server 2 to the Arkiv domain using the local IP address of Server 2 and port 20211.
- 9. Manually add Server 3 to the Arkiv domain using the public IP address of router 2 and port 20111.
- 10. Manually add Server 4 to the Arkiv domain using the public IP address of router 2 and port 20211.

10.9.2 Connecting the Client to the Server behind NAT

To connect the Client to the Server behind NAT, do the following:

1. On the Server, set the port range for operation. By default, the base port is 20111, and the port range is 20111-20210 (see [Ports used by the Arkiv Software Package](#)(see page 28)).
2. Open the port range 57000–65000 on the Server (see [Ports used by the Arkiv Software Package](#)(see page 28)).

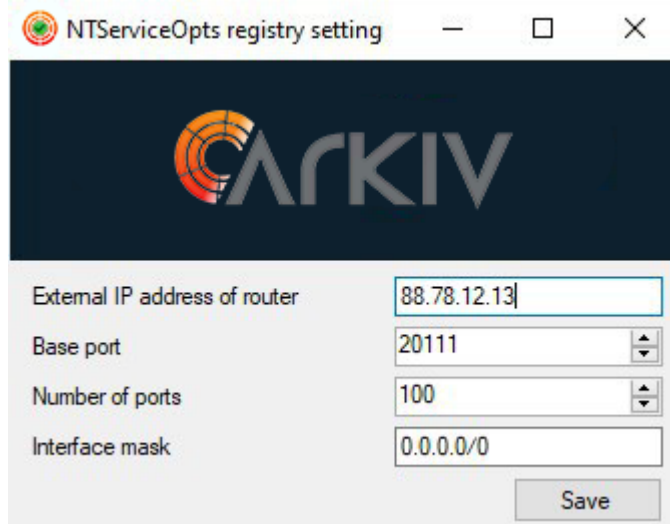
❑ Attention!

If you do not open the port range 57000–65000 on the Server, there will be a problem with receiving the events to the Client from the Server. To solve the problem, create the NGP_POLL_EVENTS system variable on the Client and set its value to 1 (see [Appendix 10. Creating system variable](#)(see page 927)).

3. Set the router public IP address (see [Network settings utility](#)(see page 865)).

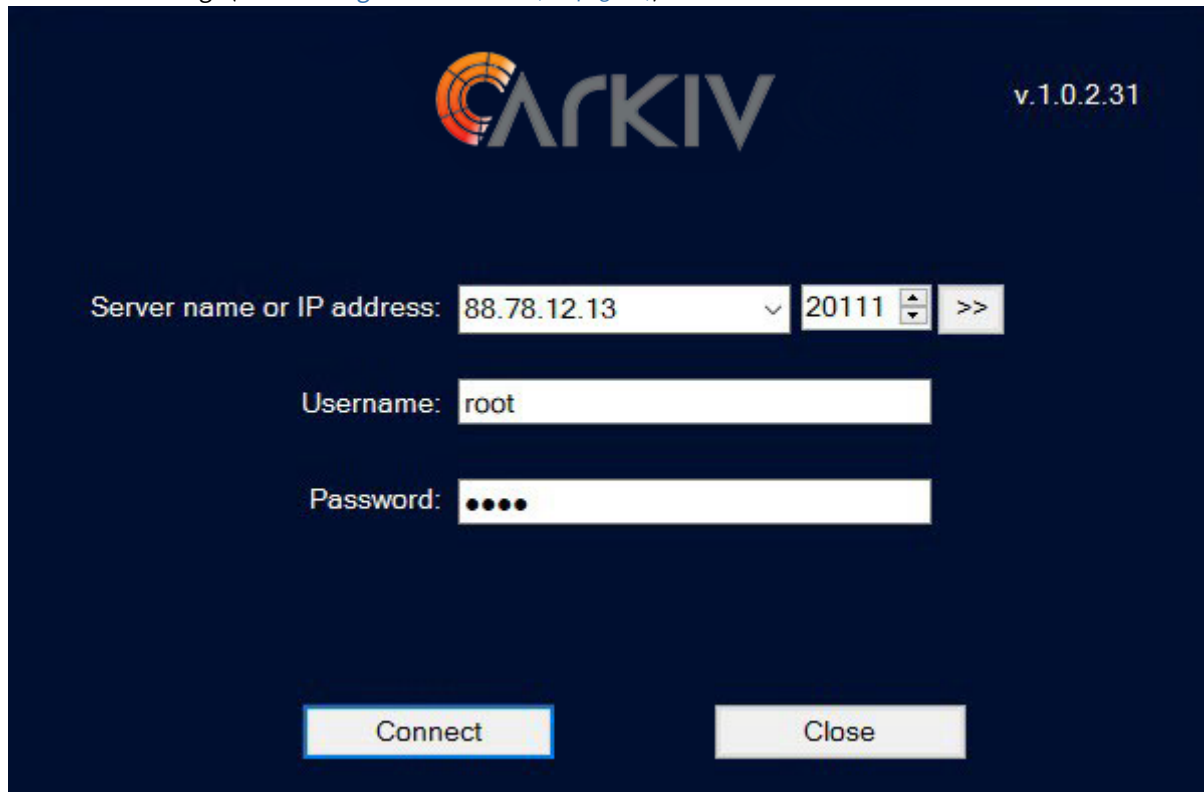
❑ Attention!

The router public IP address should be static.



4. On the router, forward the specified Server ports and the gRPC API 20109 port.

5. Launch the Client and specify the router external IP address and the Server external base port in the connection settings (see [Starting an Arkiv Client](#)(see page 76)).



The screenshot shows the Arkiv Client connection settings dialog box. At the top left is the Arkiv logo, and at the top right is the version number "v.1.0.2.31". The dialog has a dark blue background with white text and input fields. The "Server name or IP address:" label is followed by a text input field containing "88.78.12.13", a dropdown arrow, a port input field containing "20111", and a ">>" button. Below this are "Username:" and "Password:" labels, each followed by a text input field. The "Username:" field contains "root", and the "Password:" field contains five black dots. At the bottom, there are two buttons: "Connect" (highlighted with a blue border) and "Close".

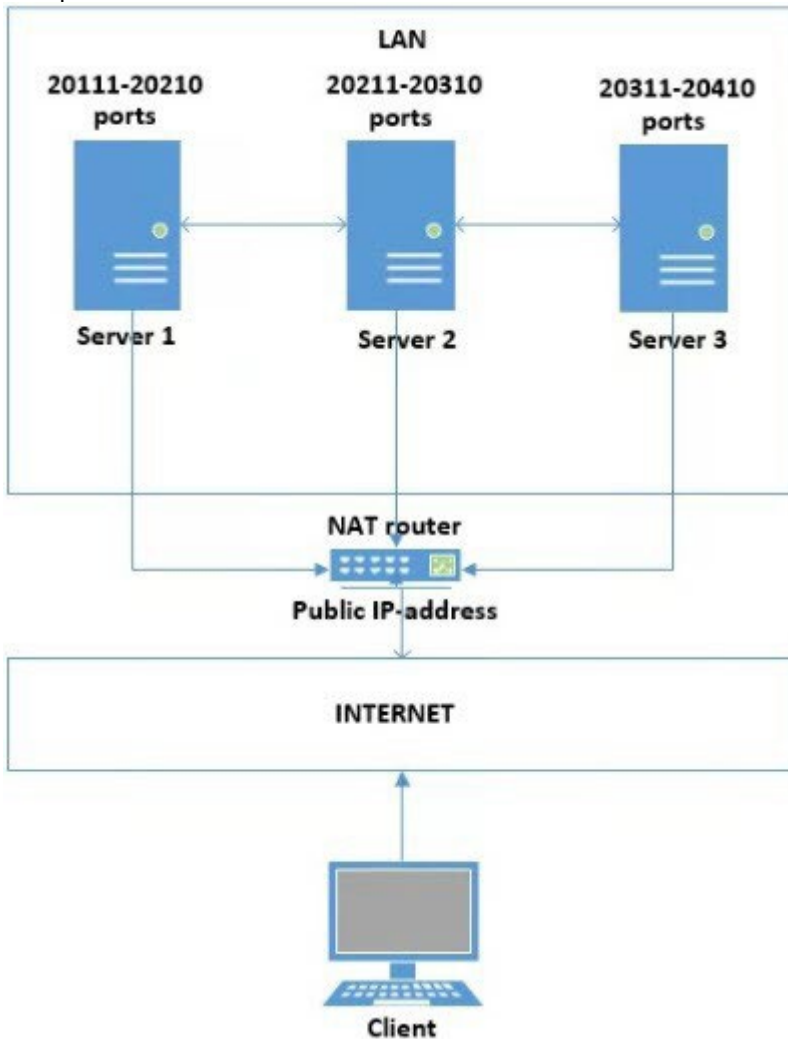
Attention!

When connecting the Client from an external network, only those Servers that have access to the external network will be available in the Arkiv-domain configuration (see [Consolidating the Servers from different networks into Arkiv-domain](#)(see page 918)).

Attention!

In a failover system, it is not possible to connect to the node that is behind NAT (see [Connecting to a Node and Configuring of an Arkiv-domain](#)(see page 582)).

Example.



To connect the Client to the Servers behind NAT, do the following:

1. On the Server 1, set the port range 20111-20210 and the router public IP address.
2. On the Server 2, set the port range 20211-20310 and the router public IP address.
3. On the Server 3, set the port range 20311-20410 and the router public IP address.
4. On the Server 1, 2 and 3, open the port range 57000–65000 and create the `NGP_POLL_EVENTS` system variable on the Client.
5. On the router, configure the forwarding of:
 - a. The router ports 20111-20210 to the internal IP address of the Server 1 and ports 20111-20210.
 - b. The router ports 20211-20310 to the internal IP address of the Server 2 and ports 20211-20310.
 - c. The router ports 20311-20410 to the internal IP address of the Server 3 and ports 20311-20410.
 - d. The gRPC API 20109 port (always static) to the internal IP addresses of the Server 1, 2 and 3.
6. When connecting the Client, enter the router public IP address and port:
 - a. port 20111 to connect to the Server 1.
 - b. port 20211 to connect to the Server 2.
 - c. port 20311 to connect to the Server 3.

10.9.3 Connecting the Web and Mobile Clients to the Server behind NAT

To connect Web and Mobile Clients to the Server behind NAT, do the following:

1. On the router, forward the specified port of the Web server (see [Configuring the Web-Server](#)(see page 105)). The default port is 80.

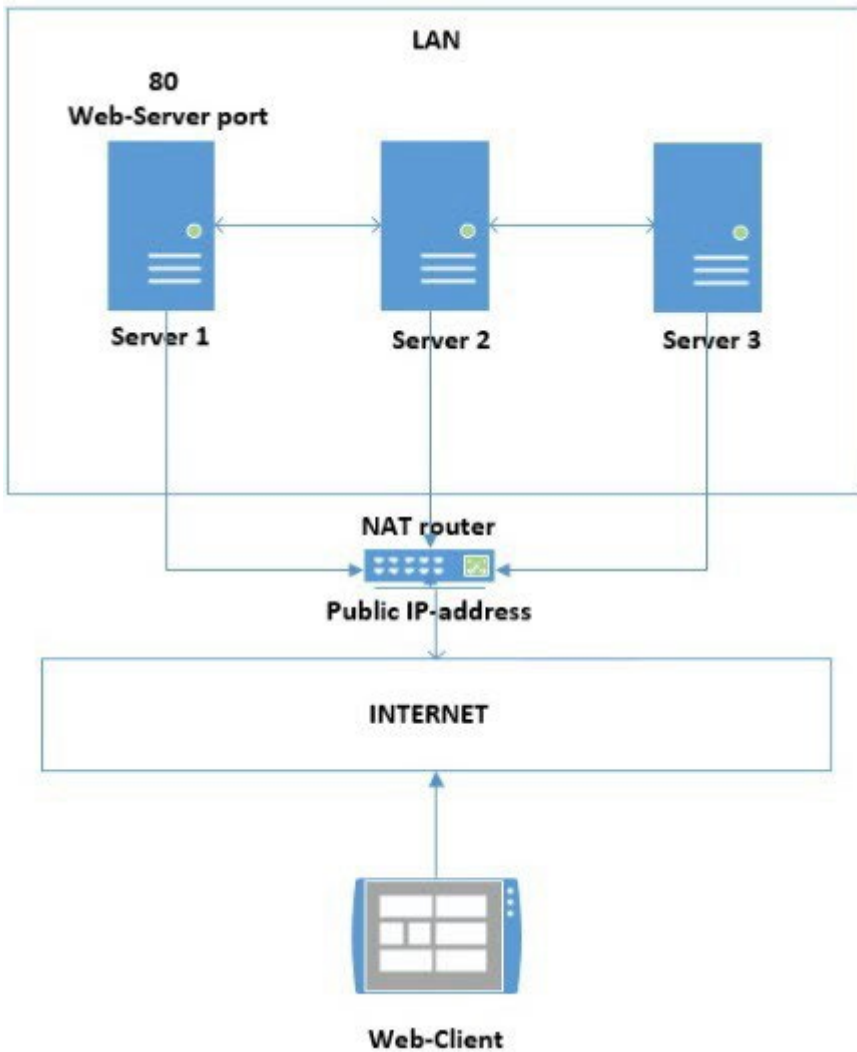
Web-server properties	
Certificate file	
CORS	No
Enable	Yes
Port	80
Private key file	
RTSP port	554

Note

To access all Servers of the Arkiv domain, it is enough to forward any single port of the Web server.

2. When connecting using a Web browser or Mobile Client, use the Server's public IP address and the forwarded port of the Web server (see [Starting the Web-Client](#)(see page 792)).

Example:



To connect the Web Client to the Arkiv domain in this configuration, do the following:

1. On the router, forward the port 80 to the internal IP address of Server 1 and port 80.
2. When starting the Web Client, use the router's public IP address and port 80.

10.9.4 Audio transmission from the Client's microphone behind NAT to the Server's or camera's loudspeaker

[Playing back sound from Client microphone on camera speakers\(see page 765\)](#)

To transmit audio from the Client's microphone behind NAT to the Server's or camera's loudspeaker, do the following:

1. On the Client, specify a unique port range and an external router's public IP address. Follow the steps below:
 - a. Add an `NGP_CLIENT_PORT_BASE` environmental variable and set its value to the first port number in the range (see [Appendix 10. Creating system variable\(see page 927\)](#)).

- b. Add an `NGP_CLIENT_PORT_SPAN` environmental variable and set its value to the number of ports in the range.

☐ Attention!

We recommend you to use no less than 100 ports.

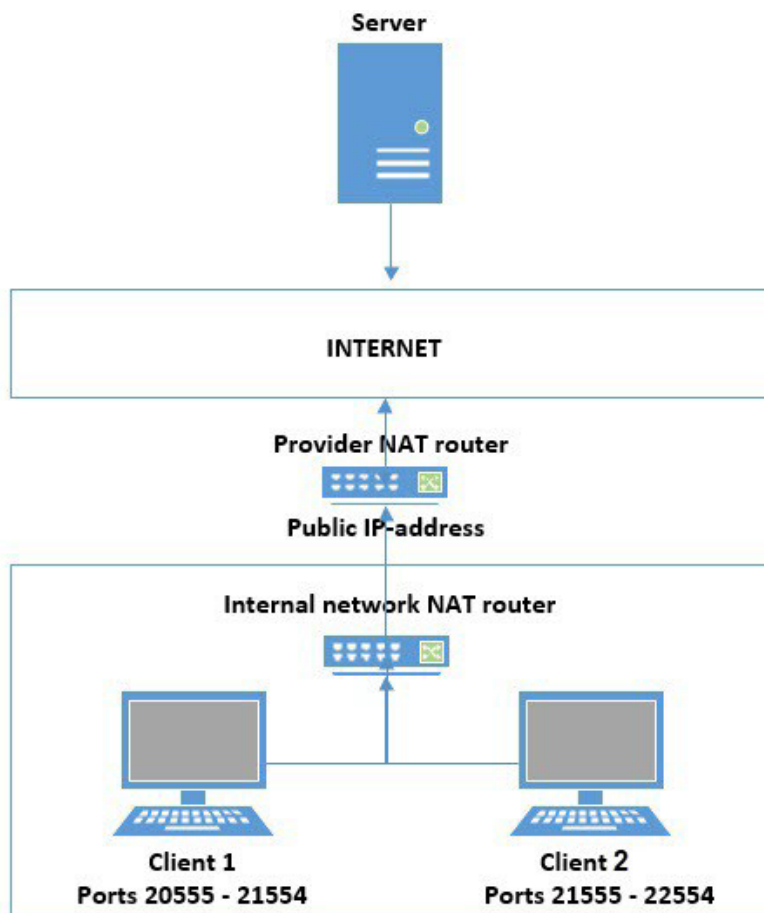
☐ Attention!

If you have multiple Clients within your network, their port ranges must not overlap.

- c. Add an `NGP_ALT_ADDR` environmental variable and set its value to the public IP address of the external router.

2. Configure forwarding of the specified ports on both external and internal router.

Example:



To transmit audio from microphones connected to Client 1 and Client 2 to the Server's or camera's loudspeaker, do the following:

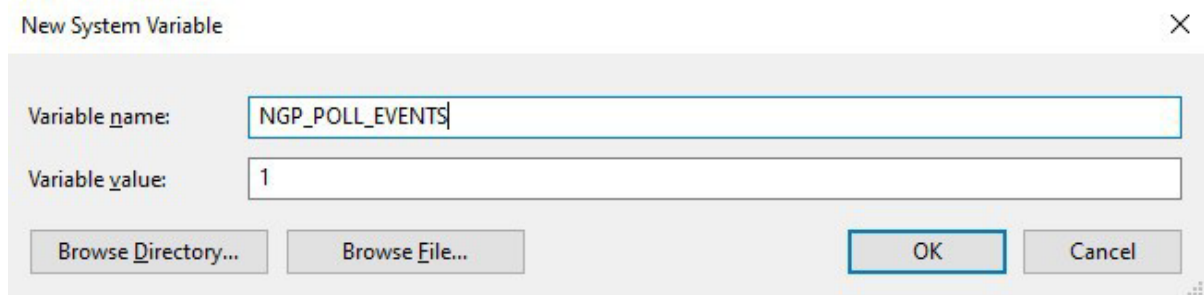
1. On Client 1, set port range to 20555-21554, and the public IP address of your Internet provider's router.
2. On Client 2, set port range to 21555-22554, and the public IP address of your Internet provider's router.
3. Configure port forwarding on the internal router:
 - a. ports 20555-21554 to the internal IP address of Client 1 and ports 20555-21554;

- b. ports 21555-22554 to the internal IP address of Client 2 and ports 21555-22554.
4. Configure port forwarding on the provider's router:
 - a. router ports 20555-21554 to the IP address of the internal router and ports 20555-21554;
 - b. router ports 21555-22554 to the IP address of the internal router and ports 21555-22554.

10.10 Appendix 10. Creating system variable

To add a new system variable:

1. Go to **Control panel** → **System** → **Advanced system settings**.
2. Click the **Environment Variables...** button.
3. Under **System variables** group, click the **New...** button.
4. Specify the name and value of variable.



New System Variable

Variable name: NGP_POLL_EVENTS

Variable value: 1

Browse Directory... Browse File... OK Cancel

5. Click the **OK** button.