

ADAPTIVE RECOGNITION

ANPR/ALPR CAMERAS AND SOFTWARE FOR ACCESS CONTROL

# User Manual

# Einar



# EINAR

## USER MANUAL

with Installation Checklist and other practical tips

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## 1. OVERVIEW

The Einar camera has its own web interface through which you can access the camera settings, the **LIVE**, the **PLAYBACK**, the **EVENTS** and the **SETTINGS** interfaces.

### Note

It is recommended to use an up-to-date web browser to access the web interface.

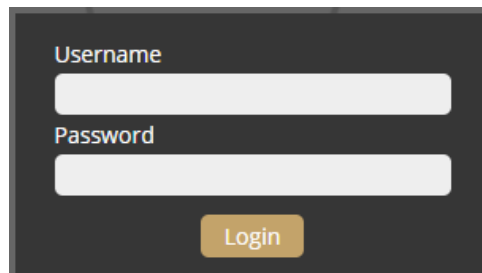
Accessing the web interface:

1. Start a browser and enter the camera IP address into the address bar of the browser.
2. Type the username and the password on the displayed login interface and click on **[Login]**.

The default user account is the following:

**Username:** admin

**Password:** admin



The image shows a dark-themed login form with two input fields. The first field is labeled 'Username' and the second is labeled 'Password'. Below the fields is a yellow 'Login' button.

## 1.1. DEFAULT IP ADDRESS

The camera – by default – obtains its IP address from the local DHCP server. A second link-local IP address is always present on the primary network interface.

## 1.2. LINK-LOCAL IP ADDRESS

The link-local IP address of the camera can be calculated using the device's MAC address or serial number. The last four characters are two hexadecimal numbers that can be converted into the last two parts of a link-local address (169.254.XX.YY).

Example: the camera with the MAC address 00-19-B4-01-42-1A ends with 42 and 1A, representing the decimal values 66 and 26. The link-local address of this camera is 169.254.66.26.

## 1.3. FINDING CAMERAS

You can find the camera on the network using the [AR DeviceTool](#). Double-click on the selected camera, and the Einar camera web interface will open in the default browser.

While running, the program continuously looks for detectible cameras on the network and displays them in a list with their current IP addresses. If the camera does not appear, ensure that the firewall does not block the multicast protocol on the network and that the camera and the PC are in the same network range.

## 2. AR DEVICE TOOL

With the AR DeviceTool, you can discover Einar cameras on the local network and upload Firmware, License and Engine files to them. Download the program here: [AR DeviceTool](#). It runs on Windows operating system.

Upload firmware		Upload license		Upload engine		
Name	Family	Version	Firmware	IP Address	MAC address	Upload information
ICAM-D221	EINAR	IPC-01-W	1.8.0.193	192.168.2.181	00:19:b4:00:d2:21	
ICAM-D223-PZ5	EINAR	IPC-01-T	1.8.0.165	192.168.2.101	00:19:b4:00:d2:23	
ICAM-D28D	EINAR	IPC-01-WW	1.8.0.233	192.168.2.54	00:19:b4:00:d2:8d	

Devices: 3    Offline: 1

### 2.1. FINDING CAMERAS

Once started, the program lists the cameras detected on the local network. The camera name, product family name, type, firmware version, IP address, MAC address and brief information about the current upload process will be displayed.

The currently available cameras are marked with green color in the first column. The red color indicates a previously discovered camera that has not been available since then.

Double-click on the selected camera to open its web interface in the default browser.

Upload firmware		Upload license		Upload engine		
Name	Family	Version	Firmware	IP Address	MAC address	Upload information
ICAM-D221	EINAR	IPC-01-W	1.8.0.193	192.168.2.181	00:19:b4:00:d2:21	
ICAM-D223-PZ5	EINAR	IPC-01-T	1.8.0.165	192.168.2.101	00:19:b4:00:d2:23	
ICAM-D28D	EINAR	IPC-01-WW	1.8.0.233	192.168.2.54	00:19:b4:00:d2:8d	

Devices: 3    Offline: 1

## 2.2. FIRMWARE, LICENSE, AND ENGINE UPLOAD

In addition to the camera's own web interface, you can also use the AR DeviceTool to upload Firmware, License or even Engine for the selected single camera or a group of cameras using Ctrl/Shift.

Upload firmware		Upload license		Upload engine			
Name	Family	Version	Firmware	IP Address	MAC address	Upload information	
<input checked="" type="checkbox"/> ICAM-D221	EINAR	IPC-01-W	1.8.0.193	192.168.2.181	00:19:b4:00:d2:21		
<input type="checkbox"/> ICAM-D223-PZ5	EINAR	IPC-01-T	1.8.0.165	192.168.2.101	00:19:b4:00:d2:23		
<input checked="" type="checkbox"/> ICAM-D28D	EINAR	IPC-01-WW	1.8.0.233	192.168.2.54	00:19:b4:00:d2:8d		

Devices: 3    Offline: 1

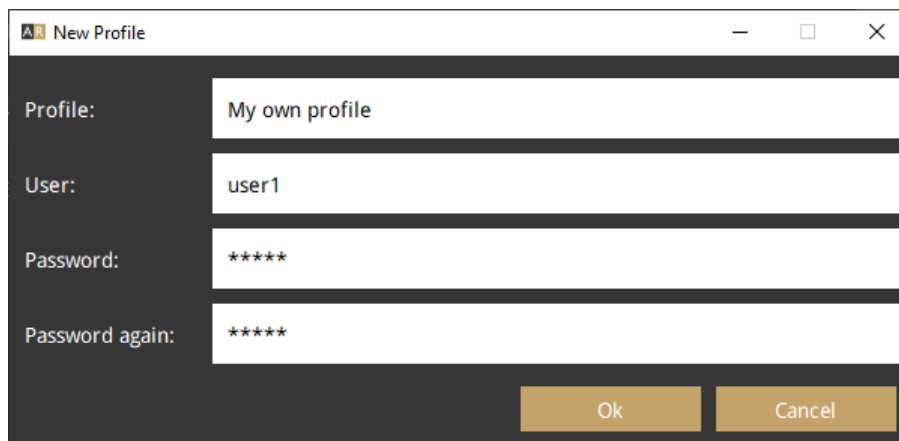
Select the camera(s) you want to update and press the **Upload firmware**, **Upload License** or **Upload engine** buttons that become active.

In the window that appears, enter the username and password to access the camera, select the file you want to upload and click **Start** to start the upload.

If you want to save the username and password to access the cameras, you can create user profiles to make uploads faster. This way, you don't have to enter IDs before each upload.

Click on "Please add a user profile!" or the "+" button and enter the required information. For further uploads, you will only need to select the user profile.

Previously created user profiles can be edited or deleted using the buttons next to the "+" button.



The image shows a dialog box titled "New Profile" with a dark background and white text. It contains four input fields and two buttons. The fields are labeled "Profile:", "User:", "Password:", and "Password again:". The "Profile:" field contains the text "My own profile". The "User:" field contains "user1". The "Password:" and "Password again:" fields contain "\*\*\*\*\*". At the bottom right, there are two buttons labeled "Ok" and "Cancel".





### 3. OVERVIEW OF THE WEB INTERFACE

The following menu items are available on the web interface:



#### 1. LIVE

Shows a live view of the camera streams.

#### 2. PLAYBACK

Browse recordings on the configured storage device.

#### 3. EVENTS

Browse the recorded events on the configured storage device.

#### 4. SETTINGS

Under this menu, you can access the following options:

#### SYSTEM

- Status
- Device
- Network
- Security
- Storage
- I/O
- Service

#### MEDIA

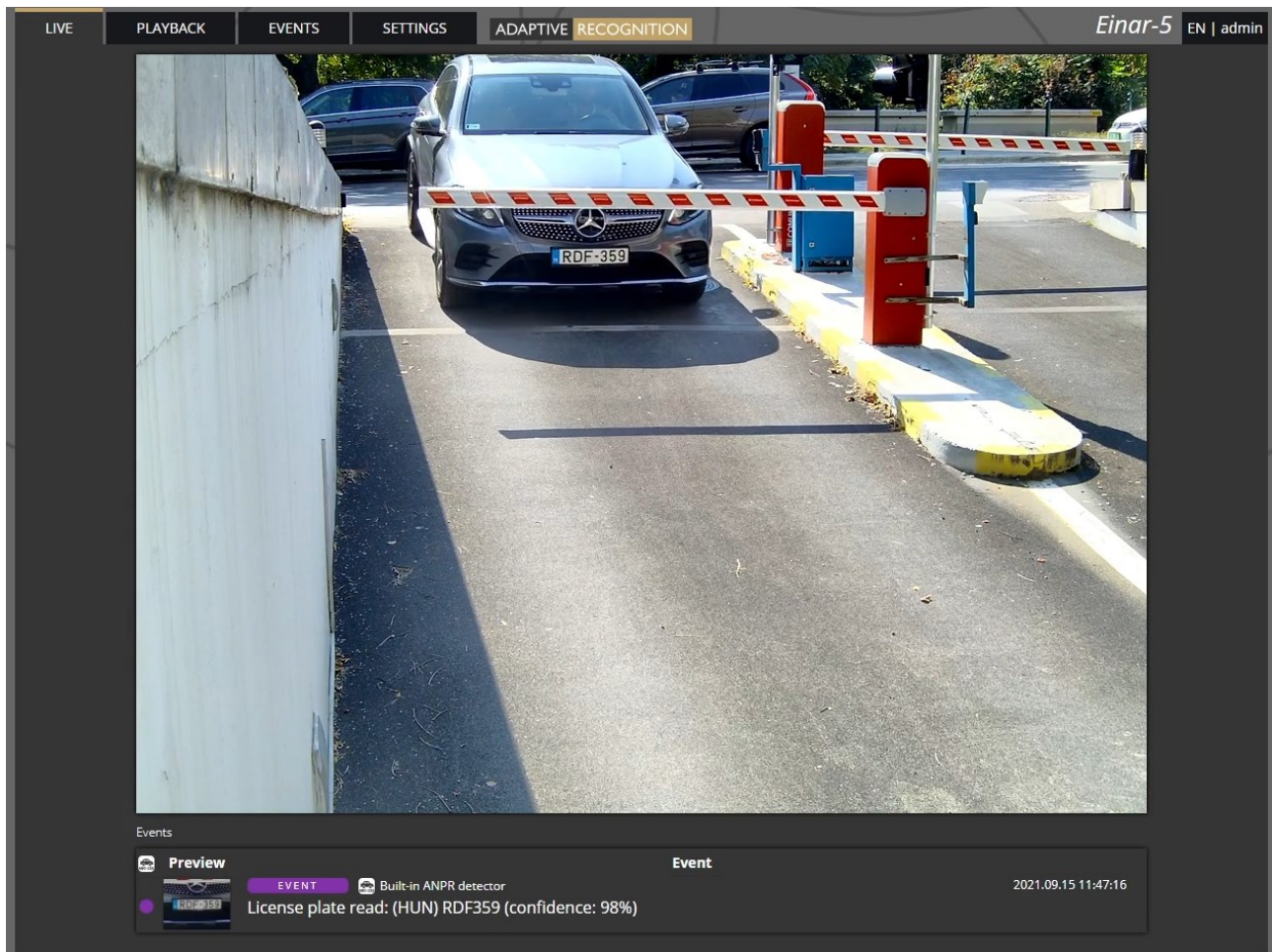
- Image
- Video
- Lens

#### ANALYTICS

- Settings
- Detectors

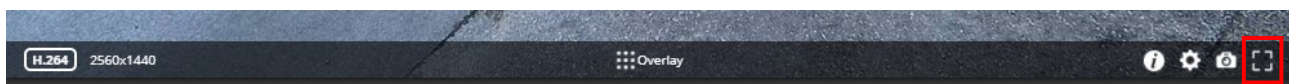
## 4. LIVE

After login, the interface navigates to the LIVE tab that shows a live feed of the camera streams.



### 4.1. FULL-SCREEN MODE

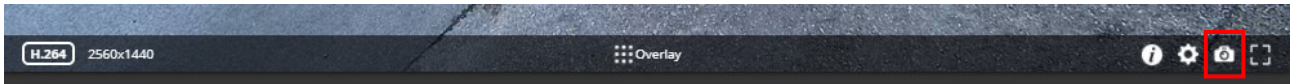
The camera's live stream can be displayed on full screen by clicking on the icon located in the image's bottom-right corner.



To exit from the full-screen mode, press the **ESC** keyboard key or click on the icon mentioned above.

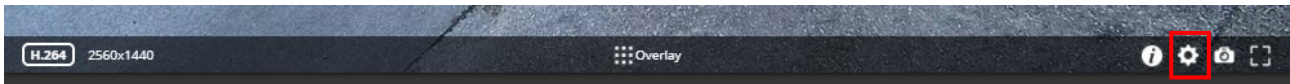
## 4.2. SAVING IMAGE

Next to the **full-screen** icon is the **Save image** icon. By clicking on it, you can save an image of the current live stream with previously selected OSD information. The CTRL + S keyboard shortcut can be used as well.



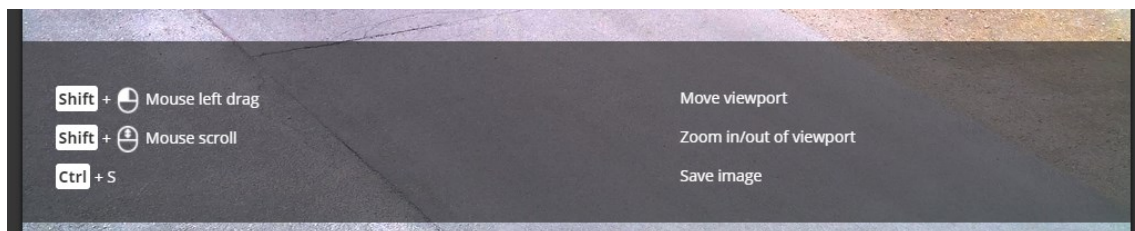
## 4.3. SWITCHING STREAM

The **Streams** button is located next to the **Save image** icon. By clicking on it, you can select which stream will be displayed as LIVE.



## 4.4. HELP

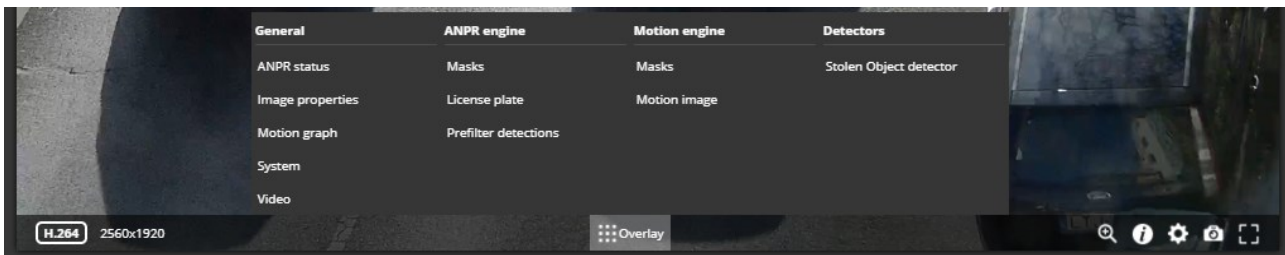
The last icon on the right is the **Help** button. It brings up keyboard shortcuts on how to use and navigate the video feed. To exit from the Help OSD, press the **Help** button or click on "Help OSD."



## 4.5. OVERLAY

In the middle, at the bottom of the window, is the **Overlay** button. With it, you can turn on/off the OSD, and you can view the masks of the applied detectors, image information, motion data, etc.

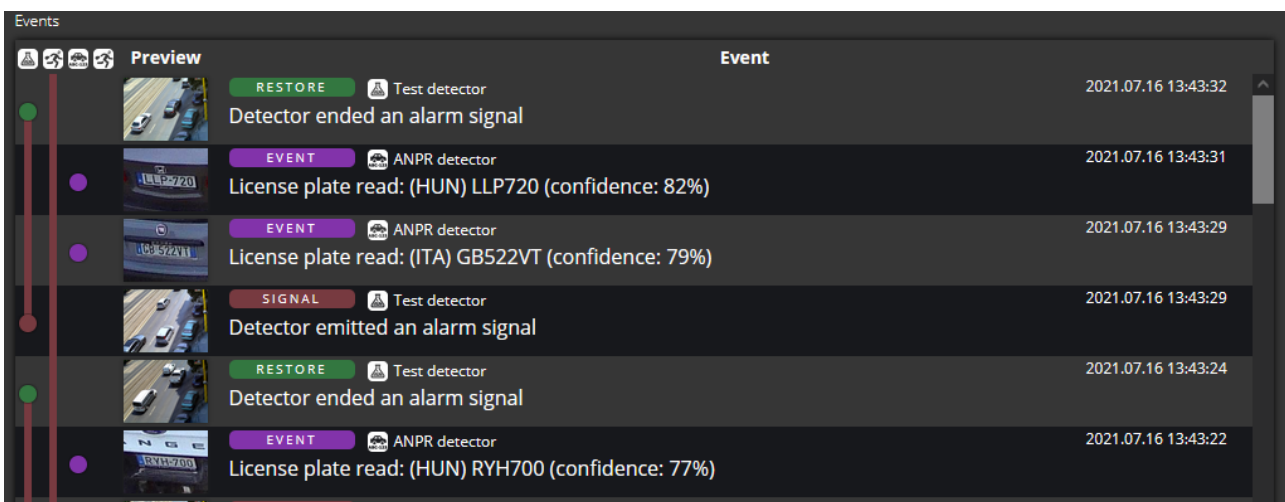
The overlay can be displayed in LIVE and PLAYBACK mode, as well as in any submenu of the SETTINGS menu where the video stream is visible, e.g. (7.8 Media/Images). The OSD layers come in handy for observing the internal workflow of the camera, setting up the device or troubleshooting.



## 4.6. EVENT PREVIEW

You can find the event preview section under the live stream image, displaying the notifications about the latest received events.

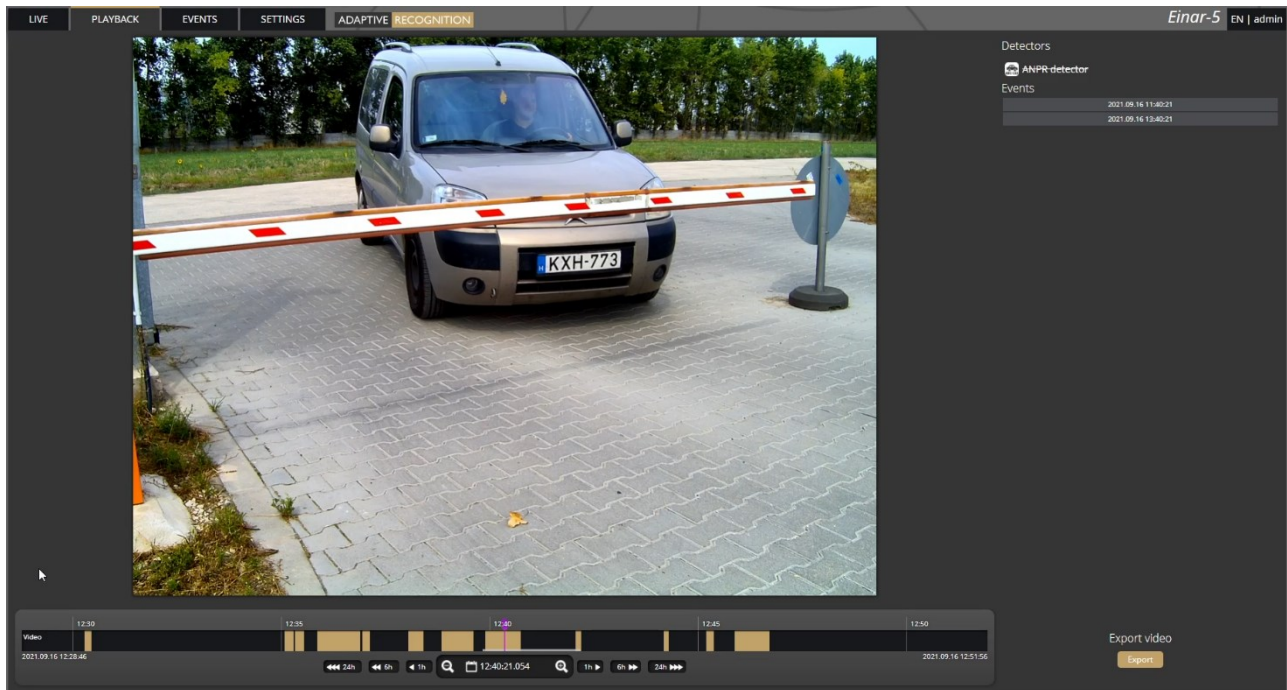
Basic events (like ANPR) are shown with a purple color and the "EVENT" text. A dark red colored "SIGNAL" text indicates a start of a longer event that lasts for multiple frames. A long event's end is marked with the green "RESTORE" text.



The list also contains the exact date and time an event was emitted. Clicking on the event's image brings up a more detailed view of that event.

## 5. PLAYBACK

You can access the **PLAYBACK** interface is accessible if the storage is turned on. By clicking on this tab, the recordings stored on the storage device will be listed. You can then navigate them by clicking on the timeline below the video feed.



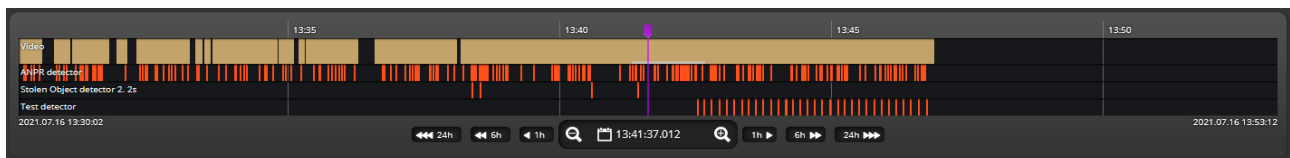
### Note

In case the storage is turned off but the storage device is available, the previously recorded elements can be viewed and played if the storage function is switched on.



## 5.1. NAVIGATE AMONG THE RECORDINGS

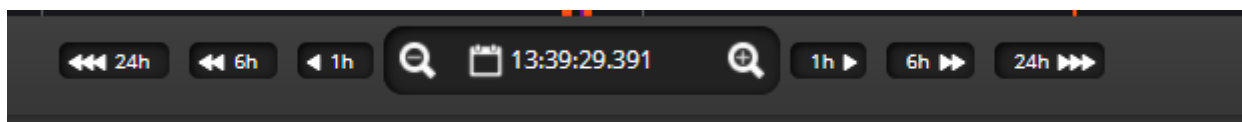
You can navigate among the recordings by using the timeline and calendar. The timeline is the black bar under the camera image. The gold bands indicate those time intervals where recordings exist. Under this section, the currently selected detectors are located. The red markers point where events have taken place.



Change the displayed timeline by clicking and holding the left mouse button and moving it to the left (backward in time) and/or to the right (forward in time). By clicking on the desired date, the timeline will skip to that point.

The displayed white stripe at the bottom of the blue or gold timeline indicates the video parts ready to be played.

In the middle of the timeline (see image above), there is a purple marker that shows where you are in the playback. Under this section, you can also see the current time of the playback.



The magnifying glasses located under the timeline are to increase (magnifying glass with + sign) or decrease (magnifying glass with – sign) the time interval found on the timeline.

In the middle of this panel, there is a calendar with which you can seek an exact date and time to play back.

The current time of the computer can be set with the "Now" button. After clicking on the [Done] button, the playback skips to the selected date.

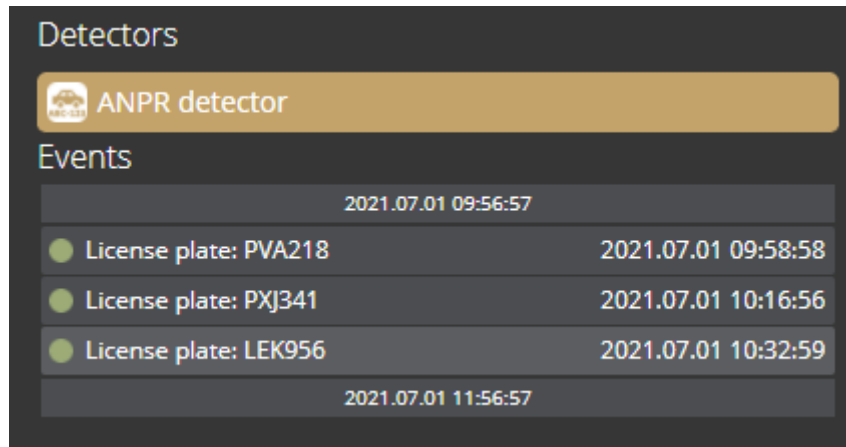
The small image that appears when the mouse cursor is positioned over the timeline shows a preview image of the video near that location.

By moving the cursor over the video, an OSD menu appears, the functionality of which is identical to the menu located on the live stream.

To modify the playback speed, click the cogwheel on the video menu and select a speed value. This is where you have the help and the image saving options.

## 5.2. FILTERING THE DETECTORS

You can find a list of the configured detectors and events related to them on the right side of the **PLAYBACK** interface.

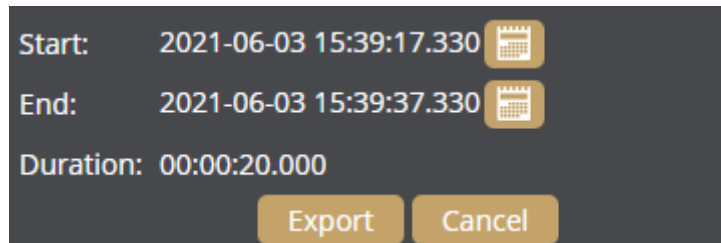


The events and timeline of each detector can be turned on/off by clicking on the appropriate detector button. Clicking on an event in the list navigates the playback to the event's date and time.

If you hover the cursor over an event located in the list, the detector related to the event is highlighted above the list. It works vice versa: by hovering the cursor over the detector, the events related to the detector will be highlighted in the list below.

### 5.3. EXPORTING THE RECORDINGS

Video clips can be saved as mp4 files and can be viewed in most modern video player applications. The "Export" button is located in the bottom-right corner of the **PLAYBACK** interface. By clicking on this button, a dialog box pops up, and two gold arrows appear on the timeline.



Drag the arrows with the mouse, and click the calendar buttons next to "Start" and "End" to modify the exported time range. The duration of the video to be exported is displayed in the bottom line ("Duration").

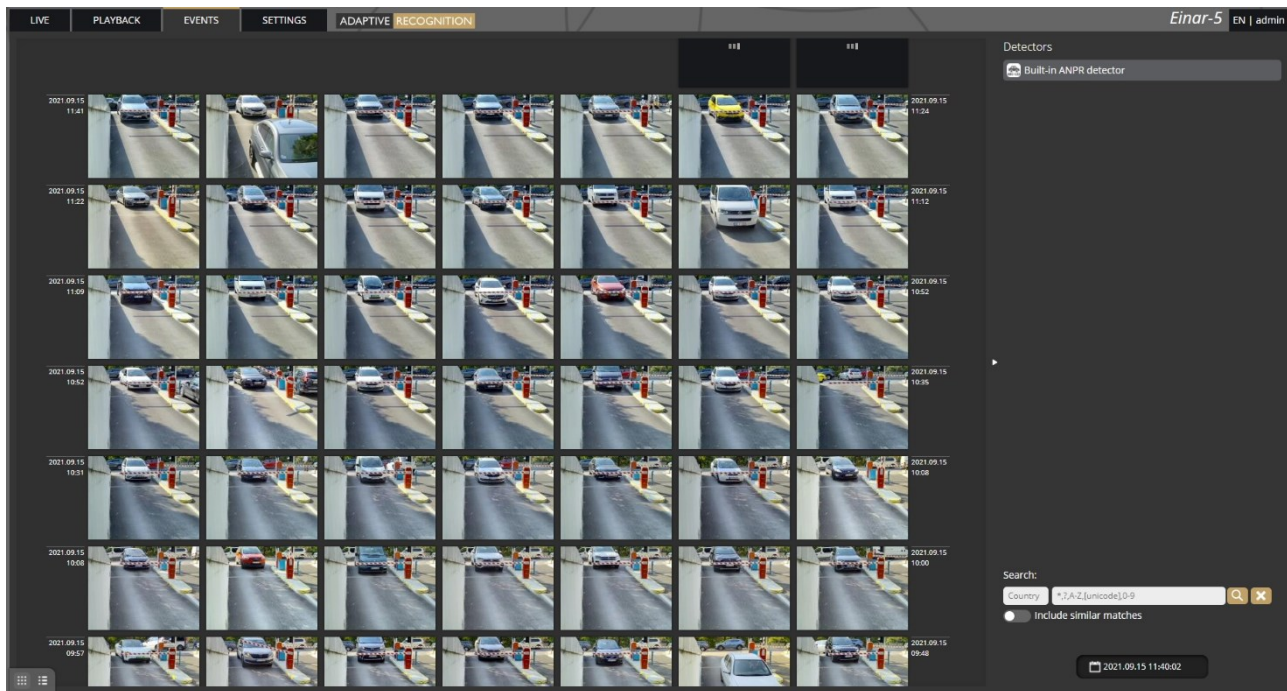
#### Note

You can adjust the exact time by clicking on the calendar icon.



## 6. EVENTS

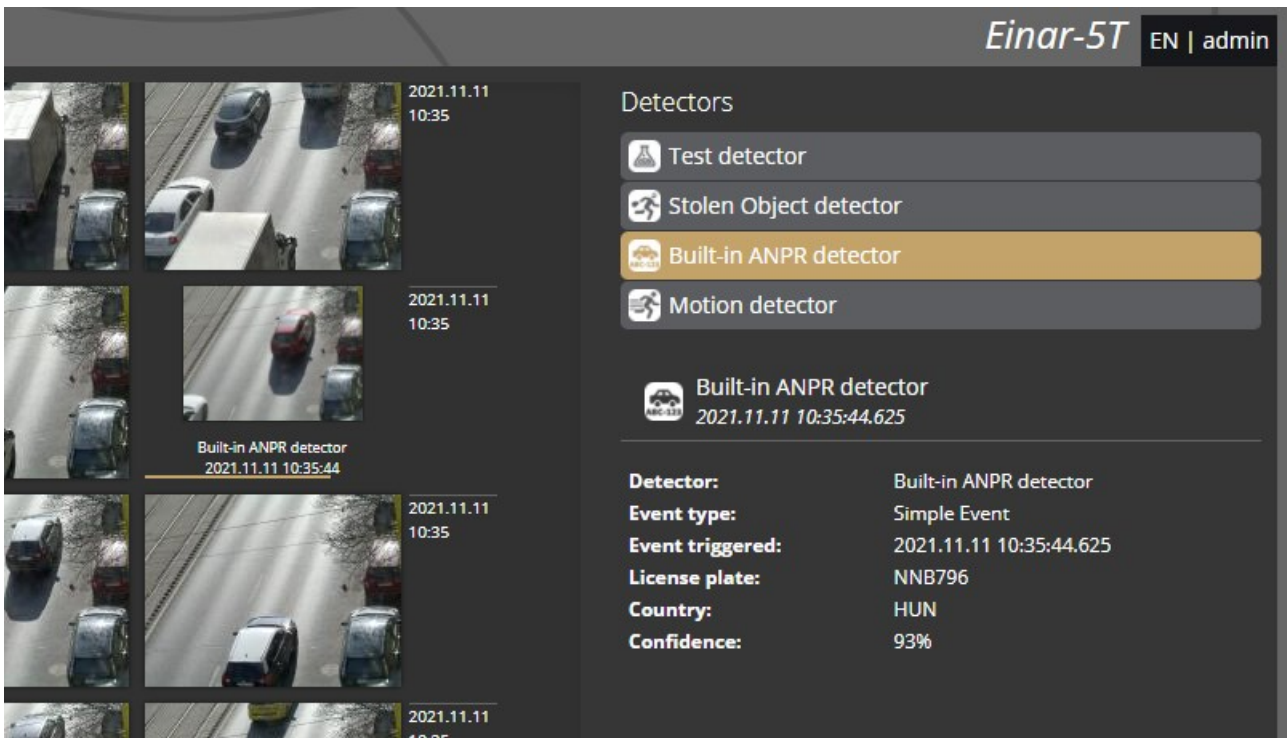
You can access the **EVENTS** interface provided that the storage is turned on. By clicking on this tab, all events recorded by the camera will be listed.



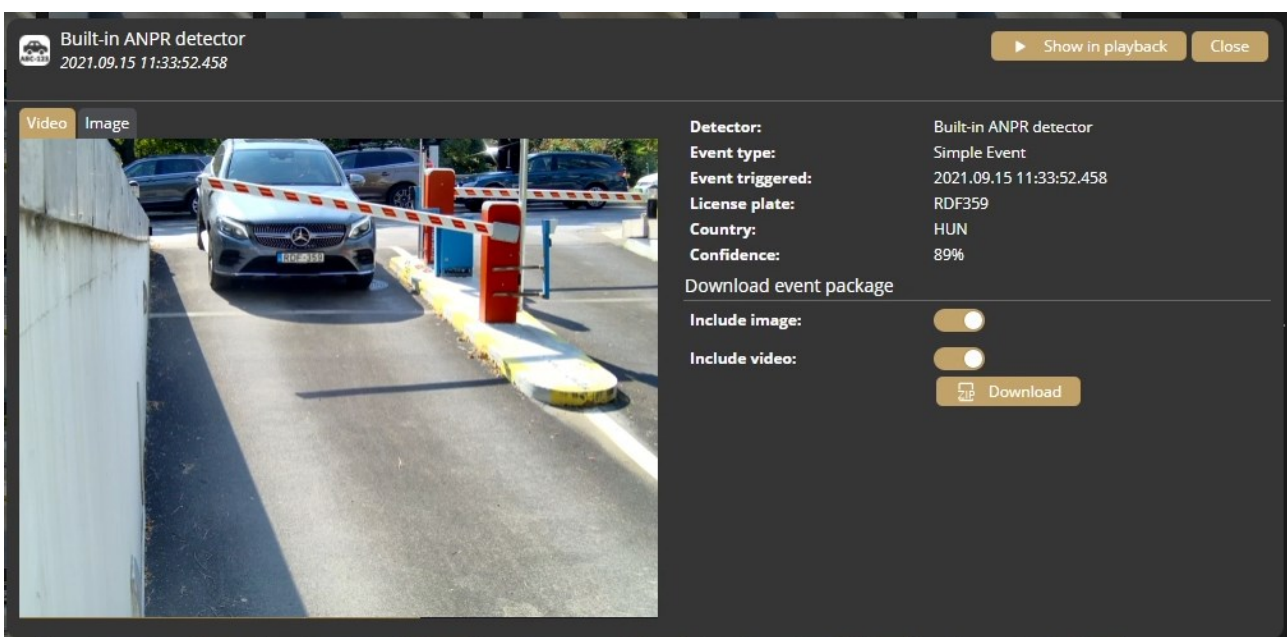
You can navigate between the recorded events in the event browser by scrolling through them with your mouse's wheel. The events appear as small images. The latest events are at the top.



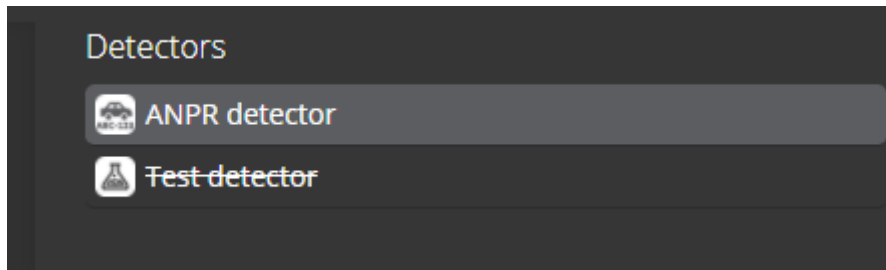
Hovering the cursor over an event, the detector related to the event is highlighted in the list on the right. Simultaneously, a video clip of the event will be loaded and played automatically.



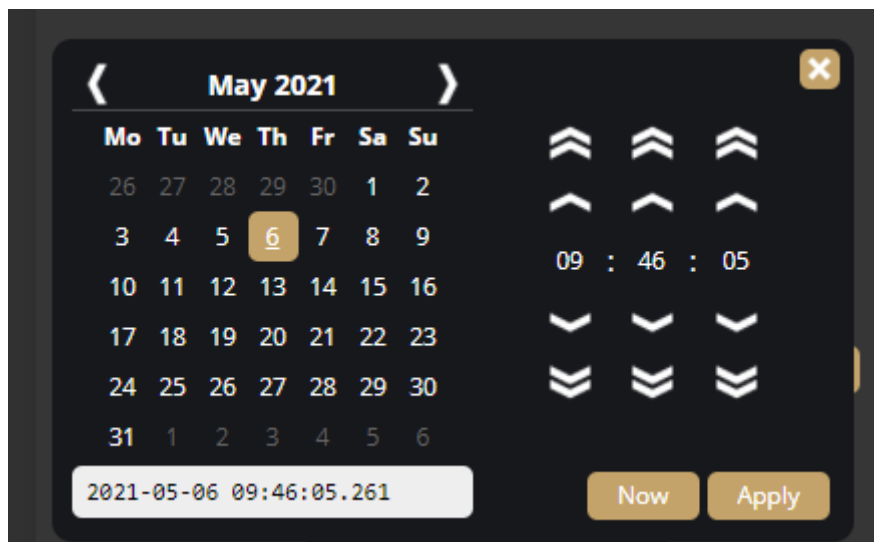
Clicking on an event brings up a detailed view of that event, including a video clip and any related image. The interface can be redirected to the **PLAYBACK** menu item by clicking on the **[Show in playback]** button. The data belonging to the event can be saved as a ZIP file by clicking on the **[Download]** button.



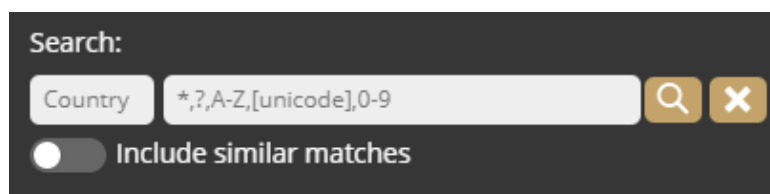
The configured detectors are displayed on the right. By moving the cursor over the detector, the events related to the detector will be highlighted in the event browser. By clicking on the detector, the display of its events can be turned on/off.



A calendar appears by clicking on the time located in the bottom-right corner. After setting the appropriate time and clicking on the [Apply] button in the calendar, the browser skips to the specified time.



On ANPR-capable devices, an additional license plate search form is available. Similar license plates can be listed if the "Include similar matches" option is turned on.

A screenshot of a search form. It has a "Search:" label, a "Country" dropdown menu, and a text input field containing the regex pattern "\*?,A-Z,[unicode],0-9". There are search and close icons to the right of the input field. Below the input field is a toggle switch labeled "Include similar matches", which is currently turned off.

## 7. SETTINGS

The SETTINGS page contains all customizable parameters of the camera.

### 7.1. SYSTEM / STATUS

On this interface, you can find a summary of the important data of the camera, the installed detectors, the operating time and the ANPR licenses.

#### Device

Name:	ICAM-D223-PZST	Type:	IPC-01-T
Description:	Intelligent IP camera	Serial:	221D223
Date & time:	2021.11.11 10:51:28	Firmware:	1.8.3.2
Storage:	Enabled	Location:	47.49312, 19.02404
License:	ANPR engine >		Uptime:
License key:	CARMEN SPI - 1000025		

For integrating this device check out the [API documentation](#)

#### Network

Wired connection:	192.168.7.13, 169.254.210.35 (MAC: 0019b400d223)	DNS:	1.1.1.1, 8.8.8.8
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#### Video

Stream 1:	<div style="display: flex; gap: 5px;"> <div style="background-color: #4a5568; color: white; padding: 2px 5px; border-radius: 3px;">H.264</div> <span>2560x1920, bitrate: 12000 kbit/s, GOP: 5</span> </div> <div style="display: flex; gap: 5px;"> <div style="background-color: #4a5568; color: white; padding: 2px 5px; border-radius: 3px;">M-JPEG</div> <span>2560x1920, bitrate: 20000 kbit/s</span> </div>
Stream 2:	<div style="display: flex; gap: 5px;"> <div style="background-color: #4a5568; color: white; padding: 2px 5px; border-radius: 3px;">H.264</div> <span>640x480, bitrate: 6000 kbit/s, GOP: 25</span> </div> <div style="display: flex; gap: 5px;"> <div style="background-color: #4a5568; color: white; padding: 2px 5px; border-radius: 3px;">M-JPEG</div> <span>640x480, bitrate: 17000 kbit/s</span> </div>

#### Detectors

- Test detector
- Stolen Object detector
- Built-in ANPR detector
- Motion detector

## 7.2. SYSTEM / DEVICE

On the **Device** interface, you can do the following:

- Modify the name, description and location of the device
- Reboot the device remotely
- Perform a factory reset (after clicking on the button, the original manufacturer settings are restored except for the network settings)
- Set the date and time
- Upload firmware, ANPR engine and license.

### General

Device name:  Location:    
Latitude Longitude

Device description:

---

### Date & time

Device time: 2021. 11. 11. 10:51:55

Use NTP:

NTP servers:

---

### Maintenance

Reboot:

Factory reset:

Firmware:    
Current firmware version: 1.8.3.2

ANPR engine:    
Current ANPR engine: 7.3.13.215 EUR

License:

### Date & time settings

The camera's current time is displayed at the **Device time** using your web browser's locale. The device time can be set manually by clicking on the **calendar icon**. You can synchronize the device to the computer time with the **Sync** button next to the calendar icon.

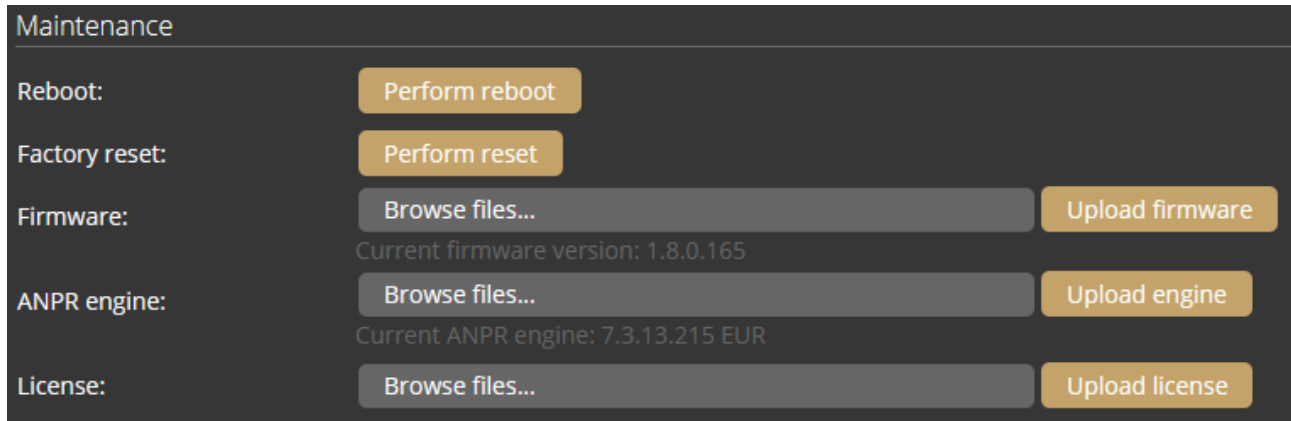
To automatically synchronize the time using an NTP server, turn on the "Use NTP" option and add an NTP server to the field of the **NTP servers**.

#### **Important!**

In the case of the camera being registered to the Intellio server, **do not** use NTP servers.

## Firmware, ANPR, License update

Click **[Browse files...]** on the field to be modified, then select the Firmware (.ifw), ANPR (.iep) or License (.ukeys) files to be uploaded. Finally, click on the corresponding upload button.



The update process can be interrupted by clicking on the **[Cancel]** button located on the panel showing the upload status.

When the upload is finished (in the case of uploading license before the update process), the camera asks a security question whether you are sure about the modification. Choosing "No" interrupts the update process, and the camera operates with the previous settings. If you opt for "Yes", the update continues. Updating and rebooting the camera may take a few minutes.

### ! Important!

During the update process **do not** unplug the camera.

## 7.3. SYSTEM / NETWORK

The **Network** menu item hides the network settings. The IP address assigned to the camera can be static or dynamic.

Default DNS: 8.8.8.8

The screenshot displays the network configuration interface. At the top, there are tabs for 'Settings' and 'Monitoring'. Under 'Settings', the 'DNS servers' section shows two entries: '1.1.1.1' and '8.8.8.8', each with a delete icon. Below this is an 'Add' button. The 'DNS search domain' section has an 'Add' button. The 'Default interface' is set to 'Wired connection' with a dropdown arrow. A 'Save' button is located below these options.

The 'Interfaces' section is active, showing 'Wired connection' details. It includes a table for 'Current address' with two rows: one for '192.168.7.13' with subnet '255.255.254.0' and mode 'dhcp', and another for '169.254.210.35' with subnet '255.255.0.0' and mode 'static'. Below the table, the 'Fallback to static' option is shown as a toggle switch that is currently turned on. The 'Static address' section contains three input fields: 'Address' (192.168.2.171), 'Netmask' (255.255.255.0), and 'Gateway' (192.168.2.10). A 'Save' button is at the bottom.




### Fallback to static

If the device is set to DHCP, the "**Fallback to static**" option will be accessible. The device will use the configured fallback address when obtaining a new address from a DHCP server fails.



## Monitoring

The Monitoring tab shows statistics of active media connections (e.g., live feeds, event stream) and lists all in- and outgoing traffic by network adapter.

Settings		Monitoring				
Media streams						
	Client	Type	Send	Waiting	Dropped	Uptime
	192.168.9.158	RTSP	2.41 Mbit/s	0 B	0 B	7 minutes 4 seconds
	192.168.3.47	IVS	0 bit/s	0 B	0 B	3 minutes 24 seconds
	192.168.3.47	IVS	14.35 Mbit/s	0 B	0 B	3 minutes 24 seconds
Interfaces						
	Interface	Send	Receive			
	Wired connection	16.88 Mbit/s	142.32 Kbit/s			

## 7.4. SYSTEM / SECURITY

In the **Users** database, you can perform the maintenance of the user data, like:

- Adding new users
- Deleting users
- Modifying the already existing user profiles

The default user is "**admin.**"

### Important!

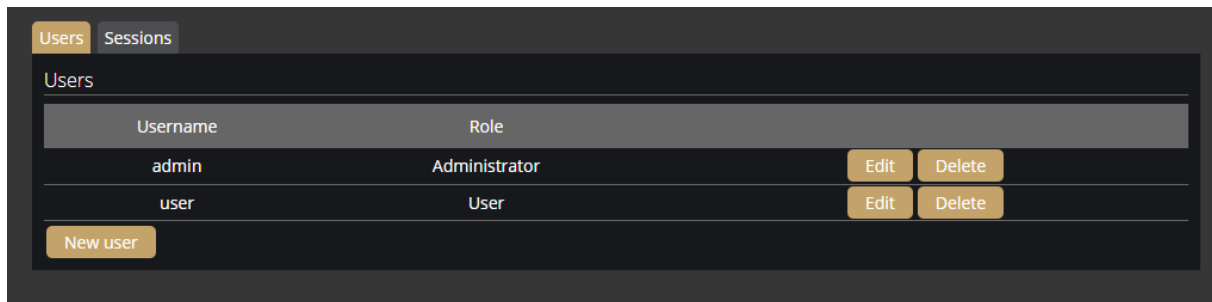
To increase the security of using the device on the network, please **change the default password** of your account.

When adding a new user, you can set three levels of permissions:

1. **Administrator:** The administrator can access and edit all parameters of a camera.
2. **User:** The user can view but not edit the parameters of the camera. Some pages containing sensitive information may be hidden.



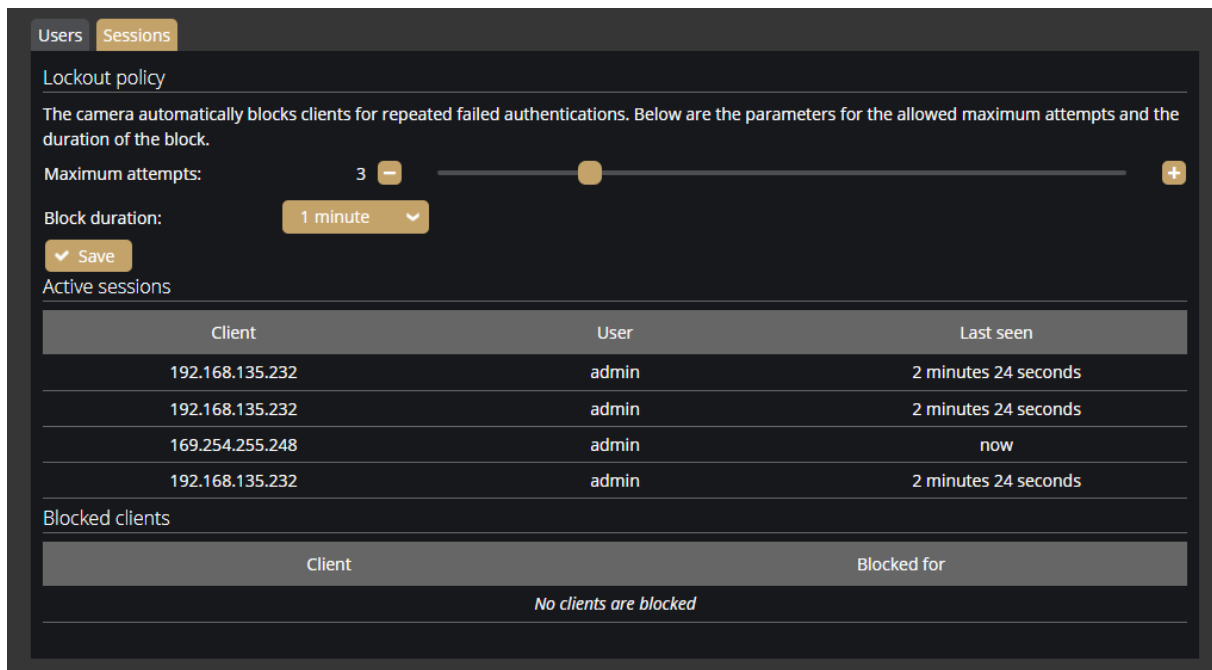
3. **Operator:** The operator has the same privileges as a user but can operate the camera zoom and focus (if available).



## Sessions

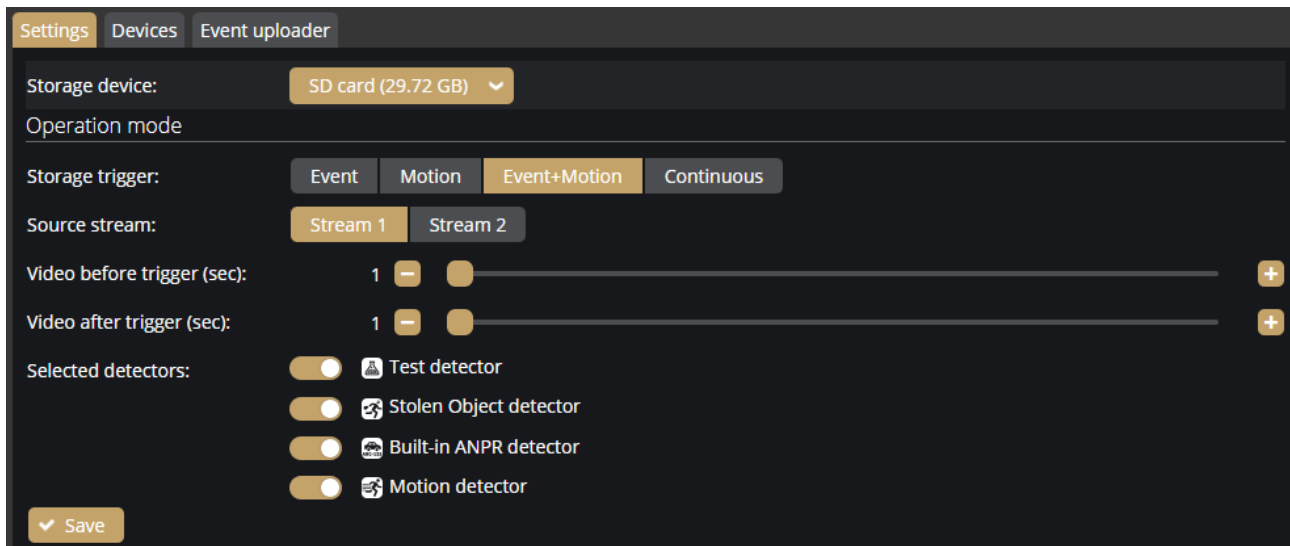
At **Lockout policy**, the maximum number of failed login attempts can be adjusted. After reaching the specified number, the device blocks that session. By default, after three failed login attempts, the camera blocks the client for a minute. Note that the number of **Maximum attempts** may vary between one and ten. The duration of the block can be set between 30 seconds and seven days.

The Active sessions and Blocked clients can also be seen on this tab.



## 7.5. SYSTEM / STORAGE

The settings related to the storage can be performed at **Storage**. After enabling the storage function, select a device under **Storage device** where the images, video streams and events are saved.



### Operation mode

Under **Operation mode**, the **storage trigger** can be selected. The image sequences will be saved based on this selection.

#### ! Important!

These settings only have an impact on the storage device. They do not affect the storage in the IVS.

The following can be selected as a **storage trigger**:

- **Event**: Only those image sequences will be stored which have taken place during the signaling of one of the detectors.
- **Motion**: When the camera detects motion, the storage process starts and finishes when the motion is over.
- **Event+Motion**: Storage is performed in cases of both an **Event** or **Motion**.
- **Continuous**: The storage function saves every frame regardless of event and motion.

## Recordings before and after activation (seconds)

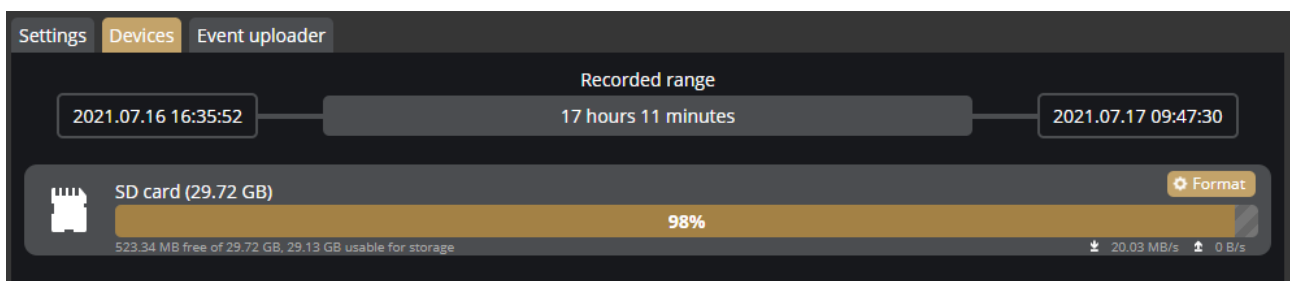
The recording time (in seconds) before and after the events can be regulated with the help of the sliders.

## Selected detectors

It may not be necessary to record at every detector signaling. Thus, the user can select which detector signals should trigger the recording.

## Devices

Under the **Devices** tab, information about the data of the SD card, the length of the recordings, the available storage, and the writing speed can be found.



## Formatting the SD card

With the "Format" button, you can format the storage unit immediately. After clicking on the **[Format]** button, a window pops up. Click on the **[Yes]** button to start the operation. The capacity bar indicates the remaining time of the formatting process.

### Important!

The formatting deletes every data from the SD card.

## Setting the GDS upload

Enable the upload to the GDS at "**Target**", then enter the required data to set the GDS server.

The following fields should be defined:

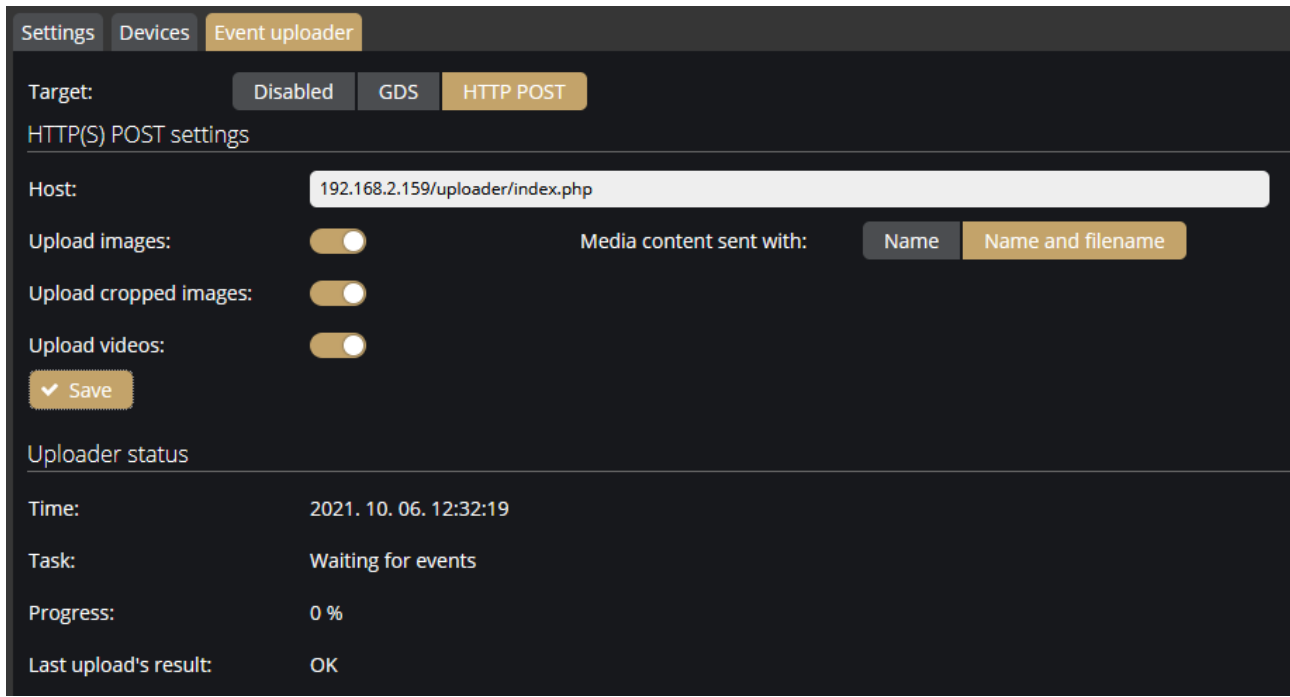
- **Server:** Address (IPv4) of the GDS server
- **Port:** Access port of the GDS server
- **Path:** Access within the server
- **Table name:** The name of the GDS table where the upload will be done
- **Username:** Username required for the identification
- **Auto obtain user:** The username can be queried automatically. The device queries the user token, which will be the user. However, it has to be authorized manually from the GDS site by a second party.

In the **Uploader status** section, you can view the status and the data of the uploader.

The screenshot shows the 'Event uploader' settings page. At the top, there are three tabs: 'Settings', 'Devices', and 'Event uploader'. Below the tabs, there are three buttons for 'Target': 'Disabled', 'GDS' (which is selected), and 'HTTP POST'. Under the 'GDS settings' section, there are input fields for 'Server' (192.168.2.196), 'Port' (8888), 'Path' (empty), 'Username' (primula), and 'Table name' (multi\_event). There is also a toggle for 'Auto obtain user' which is currently turned on. A 'Save' button is located below the 'Table name' field. The 'Uploader status' section shows the following information: 'Time: 2021. 07. 17. 6:45:06', 'Task: GDS Authentication', 'Progress: 0 %', and 'Last upload's result: Network error'.

## Setting the HTTP(S) upload

Enable the upload to the HTTP POST at “**Target**”, then enter the Host URL to set the HTTP event receiver.



The screenshot shows the 'Event uploader' settings page. At the top, there are three tabs: 'Settings', 'Devices', and 'Event uploader'. Below the tabs, the 'Target' is set to 'HTTP POST' (selected), with 'Disabled' and 'GDS' as other options. Under 'HTTP(S) POST settings', the 'Host' field contains '192.168.2.159/uploader/index.php'. There are three toggle switches: 'Upload images' (checked), 'Upload cropped images' (checked), and 'Upload videos' (checked). The 'Media content sent with' dropdown is set to 'Name and filename'. A 'Save' button is visible. Below this is the 'Uploader status' section, which shows: 'Time: 2021. 10. 06. 12:32:19', 'Task: Waiting for events', 'Progress: 0 %', and 'Last upload's result: OK'.

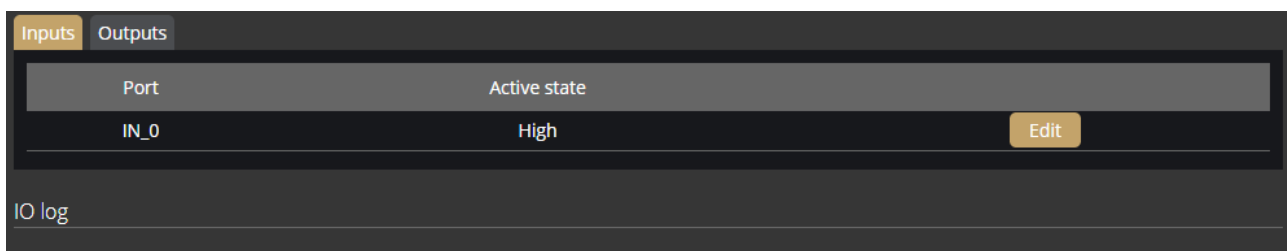
You can set which data should be uploaded in addition to the event data:

- Event image
- A cropped image of the license plate
- Video of the event.

## 7.6. SYSTEM / IO

The I/O ports allow communication between the information processing system (in this case, the camera) and the outside world (e.g., a person, computers, alarms, barriers, etc.).

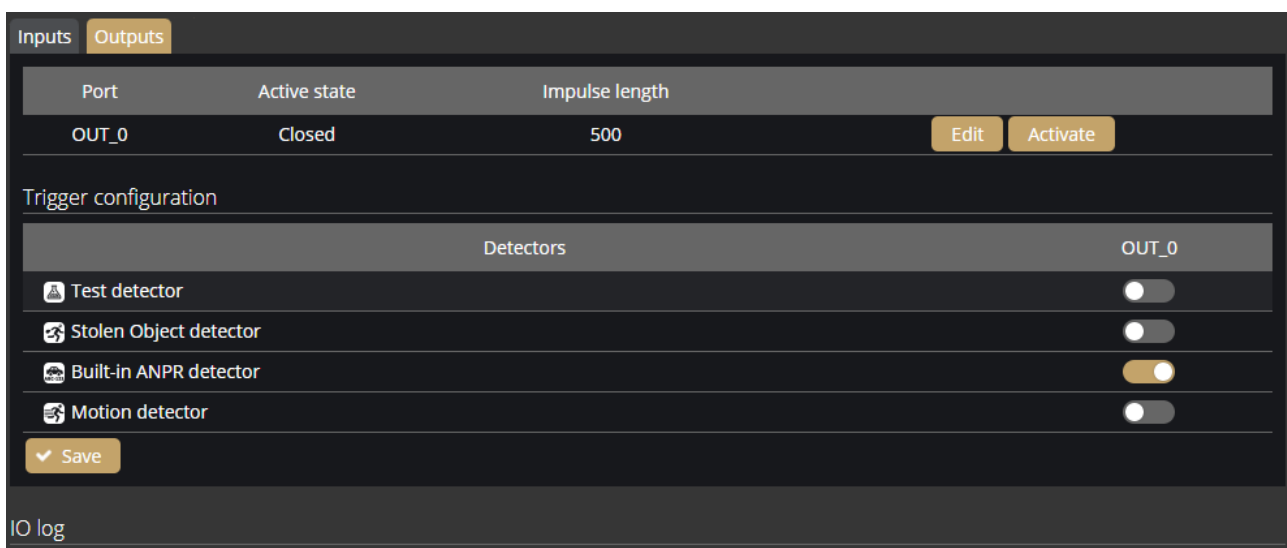
The conditions related to the information coming from the outside world to the camera and arriving through the input ports (input signals) can be adjusted by clicking the **[Edit]** button at the **Inputs** tab. When the **port's active state** is set to **"Low"**, the signal is only received from a detector if the device connected to the camera sends about 0-1 VDC. When the **port's active state** is set to **"High"**, then the signal is received from a detector if the device connected to the camera sends about 2-24 VDC.



You can also modify the **Output ports** at the **Outputs** tab.

The following parameters can be adjusted after clicking on the **Edit** button:

- **Active state:** The active state of the port. If it is **"Open"**, the port is open when an event occurs. If it is **"Closed"**, the port closes when an event occurs.
- **Impulse length (ms):** In the case of activating the output port, the length of the active state can be adjusted.



## 7.7. SYSTEM / SERVICE

### WebsERVER

- **Service port:** The service port of the Webservice can be specified by filling in the field.

### RTSP

- **Service port:** The service port of the RTSP can be specified by filling in the field.
- **Authentication required:** By selecting "Enabled", authentication is required when connecting to the RTSP stream.

### SNMP

- **Service enabled:** The SNMP service can be enabled or disabled.
- **Read community:** Password required for the camera properties on SNMP.
- MIB file can be downloaded from [here](#).

### UPnP

- **Allow discovery:** Enable or disable the device discovery provided by the UPnP protocol.

### IVS

- **Service port:** The service port of the IVS can be specified by filling in the field.

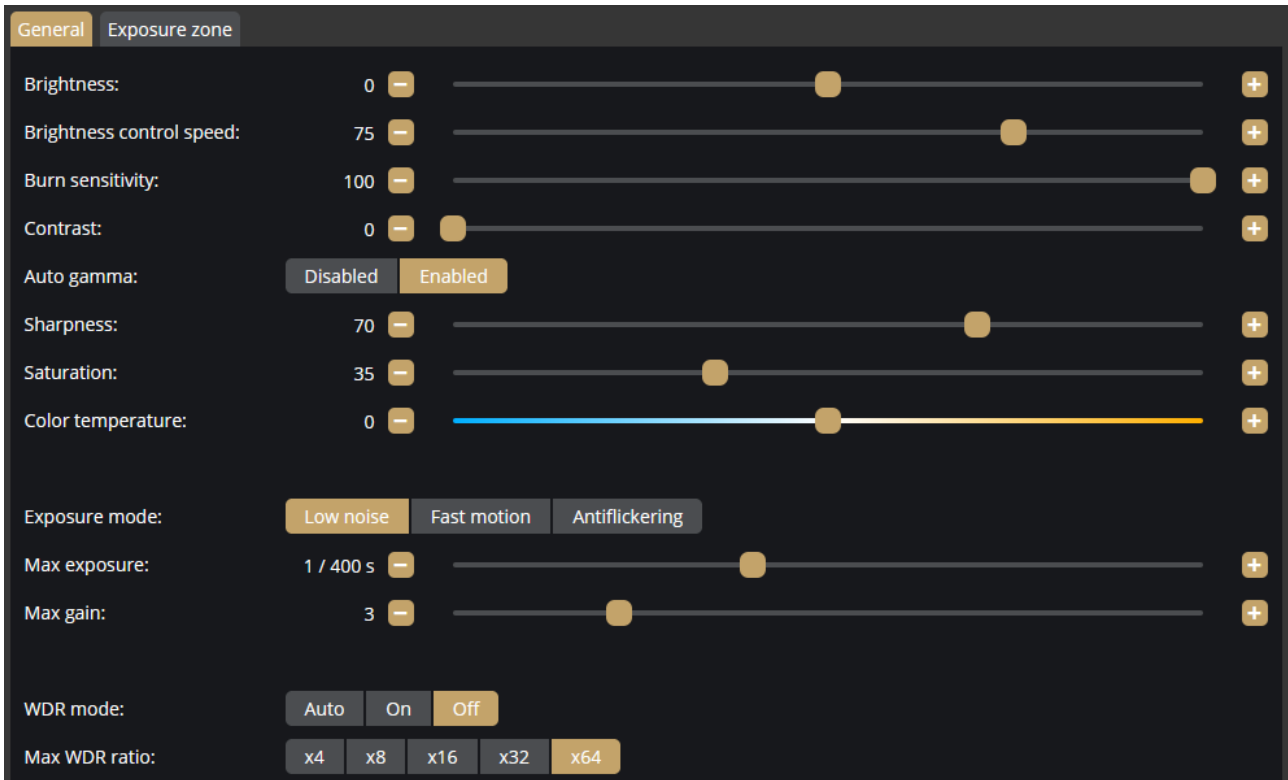
The screenshot displays a configuration interface with a dark background and light text. It is organized into sections for different services:

- Webservice:** Service port: 80
- RTSP:** Service port: 554; Authentication required: Enabled (radio button selected)
- SNMP:** Service enabled: Enabled (radio button selected); Read community: .....
- UPnP:** Allow discovery: Enabled (radio button selected)
- IVS:** Service port: 53539

At the bottom, there are two buttons: "Save" (with a checkmark icon) and "Reset" (with a circular arrow icon).

## 7.8. MEDIA / IMAGE

On this configuration interface, you can optimize the image quality.



Here, the following elements can be fine-tuned:

- **Brightness:** It sets the image brightness.
- **Brightness control speed:** It sets the speed of adaptation to the changing lighting conditions (e.g., how quickly the camera can adapt to the new lighting condition if the light is switched on in a dark room).
- **Burn sensitivity:** The more sensitive this setting is, the fewer burned pixels appear. Note, however, that the image will be darker. (e.g., to compensate for over-illuminated and, therefore, burnt-out number plates)
- **Contrast:** Brightness difference between the brightest and darkest points of the image.
- **Auto gamma:** It increases the contrast on the darker spots of the image so that the details are more visible even in poor lighting conditions.
- **Sharpness:** It makes the details sharper or more blurred.
- **Saturation:** It defines the saturation of colors in the image.
- **Color temperature:** It adjusts the reddish/bluish hue of the image.
- **Exposure mode:** It sets the mode related to the selection of the exposure time.
- **Max exposure:** The camera cannot expose longer than the specified value.



- **Max gain:** The digital gain cannot be greater than the specified value.
- **WDR mode:** With the Wide Dynamic Range function, you can achieve better image quality if the camera image contains both heavily burned and dark spots. The WDR function can be turned on/off or set to automatic.
- **Max WDR ratio:** The WDR merges two images. One of the images adjusts the exposure time to the brighter and the other to the darker spots. Therefore, combining the two images results in fewer burned bright spots and more visible dark spots. The Max WDR ratio adjusts the maximum overlap of the two images.
- **Day/night mode:** Day and night mode can be chosen manually or automatically.
- **Day/night preference:** A preferred setting of day or night mode can be defined, which is applied in the case of automatic shifting.
- **2D noise filter:** Noisy pixels are filtered based on the environment of a pixel.
- **3D noise filter:** The deviation of the same pixels of frames in the sequence determines if the image is noisy.
- **Iris control:** The iris can be kept open all the time or can be operated automatically.
- **Infra LED mode:** The infra LED can be operated automatically or can be disabled.
- **Infra LED power:** You can adjust the brightness of the infra LED.
- **Power line frequency:** The power line frequency of the region where the camera is installed. It is used to eliminate vertical flickering in artificially lit areas.
- **Horizontal flip:** Flips the image horizontally when enabled.
- **Vertical flip:** Flips the image vertically when enabled.



WDR mode:  Auto  On  Off

Max WDR ratio:  x4  x8  x16  x32  x64

Day/night mode:  Auto  Day  Night

☾ Night Day ☀

Day/night preference: -85

2D noise filter:  Disabled  Enabled

3D noise filter:  Disabled  Enabled

Iris control:  Auto  Keep open

Infra LED mode:  Auto  Disabled

Infra LED power: 50

Power line frequency:  50 Hz  60 Hz

Horizontal flip:  Disabled  Enabled

Vertical flip:  Disabled  Enabled

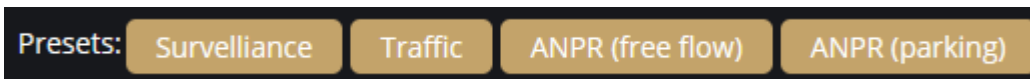
Presets:

## Presets

You can select preset values which are calibrated to different situations. These elements are not necessarily ideal settings for all cases; they are to be considered as guidelines. They generally show acceptable image settings for certain scenarios.

These preset values are the following:

- **Surveillance:** General setting for basic motion detection and surveillance
- **Traffic:** General setting for traffic observation
- **ANPR (free flow):** Ideal for free-flow traffic license plate reading
- **ANPR (parking):** Recommended for parking license plate reading

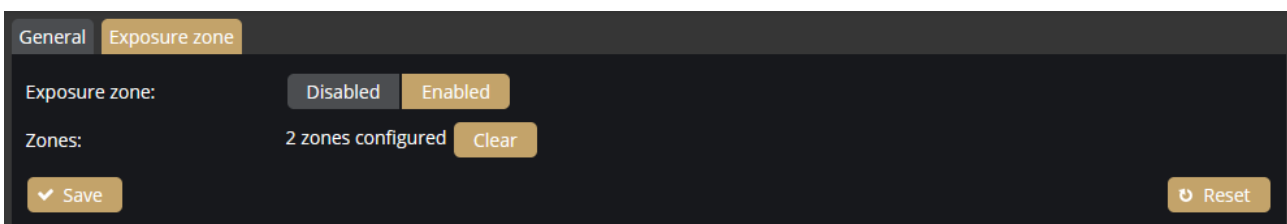


### Note

If the camera is included with on-board ANPR engine and your project does not involve parking, use free flow values.

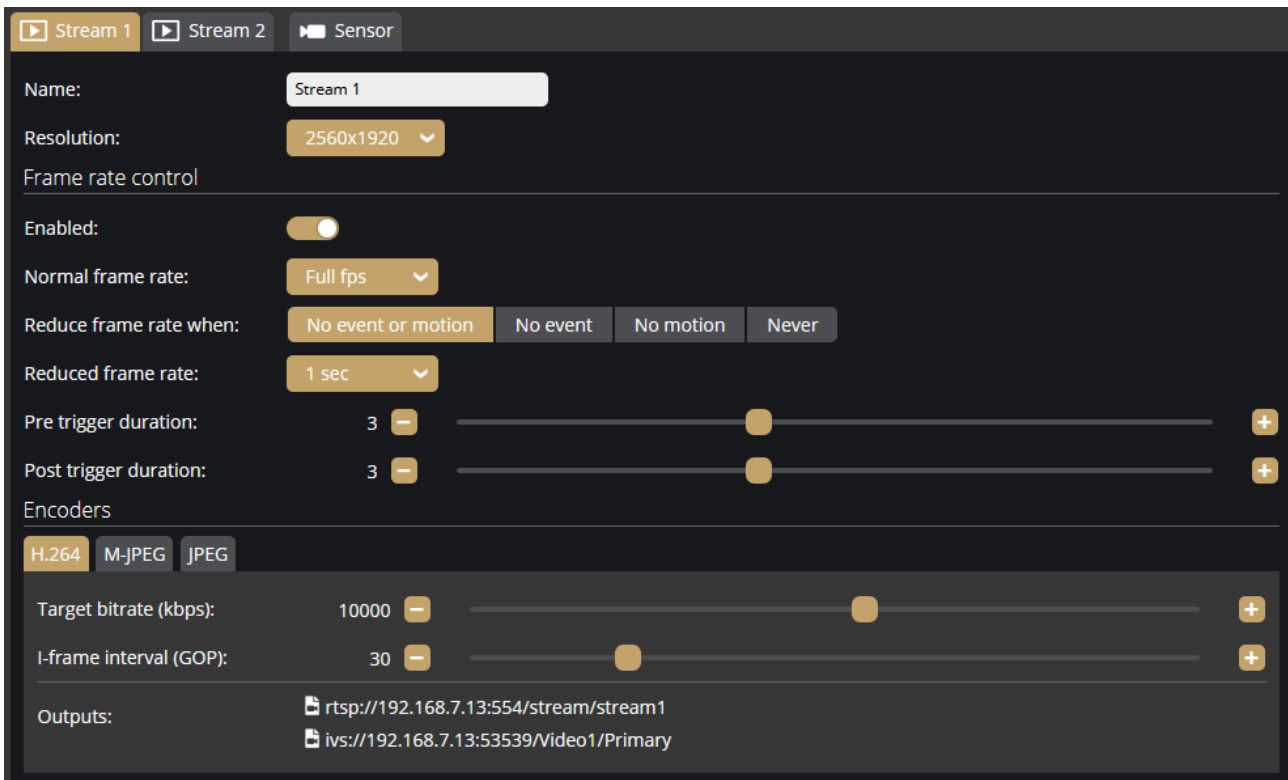
## Exposure Zone

The Exposure Zone tab allows you to draw and enable the zone(s) the image control is based on using polygons. If the area outside the expected area of license plate reading is disturbed or has an entirely different illumination and brightness, you may mask the area for license plate reading to balance the image control.



## 7.9. MEDIA / VIDEO

When clicking on the **Video** menu item, the functions related to the video encoders are displayed. Above these, the live stream of the camera remains visible.



On this interface, the settings (name, resolution, frame rate, etc.) of **Stream 1** and **Stream 2** can be performed separately.

### Frame rate control

It can be enabled or disabled. When it is disabled, the camera operates with maximum FPS regardless of the other settings located on this interface. After enabling it, the following functions can be set:

- **Normal frame rate:** The frame rate of the camera in normal state
- **Condition of reducing the frame rate:** The FPS can be set to be reduced upon Motion (exclusively), Event (exclusively), Motion or Event, or Never
- **Reduced frame rate:** Rate of the reduced frame rate
- **Pre trigger duration:** The length of the stored recordings before the events can be specified
- **Post trigger duration:** The length of the stored recordings after the events can be specified

## Encoders

You can adjust the **H.264** and the **MJPEG** versions of the streams separately, alongside defining the quality of the thumbnail images.

- **Target bitrate (kbps):** The bandwidth size can be adjusted.
- **I-frame interval (GOP):** The density of the I frames can be specified.
- **Quality:** The quality of the images can be specified.



The values to be set alternate stream by stream.

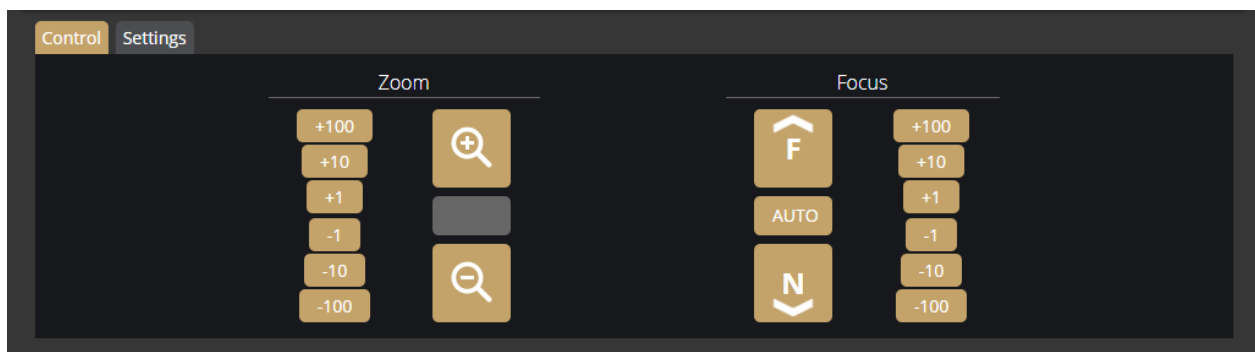
MJPEG streams can be enabled or disabled separately.

## Sensor

Under the **Sensor** tab, you can adjust the aspect ratio to 4:3 or 16:9.

## 7.10. MEDIA / LENS

On this interface, you can fine-tune the lens of the device: the **Focus** and the **Zoom** can be customized by using the corresponding buttons.



### Autofocus

The camera possesses autofocus. The autofocus function is enabled by default, but it can be disabled on the **Settings** tab with the "Change focus when zooming" option. If the "Change focus when zooming" option is turned on, the camera starts to look for the correct value by itself to achieve the sharpest image possible. This process begins simultaneously with the zooming.

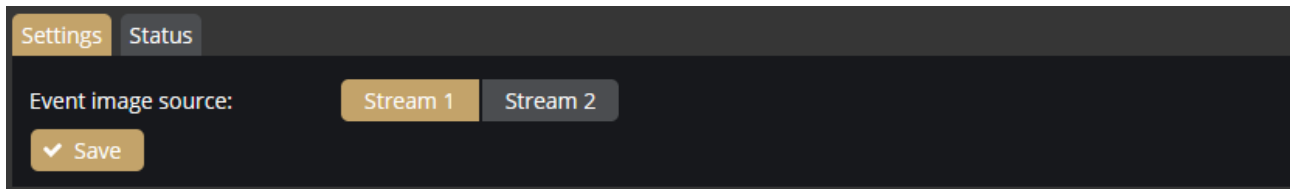
In the manual, disabled state, the autofocus can be initiated with the "AUTO" button in the **Focus** section.

**Lens distortion correction:** This setting can correct lens distortion occurring at specific zoom settings.

## 7.11. ANALYTICS / SETTINGS

### Settings

You can use the Settings tab to set the resolution and quality of the images – specified in Stream1 or Stream2 {*MEDIA / Video*} – to be assigned to events when uploading via API, GDS or HTTP.



### Status

The registered detectors' names, type, ID and status are displayed on the page alongside the list of detectors supported by the camera and their current/total quantity.

Detector	Type	ID	State
Test detector	Test detector	{459BD3EE-A61A-4B42-3C74-DD2CB954D62F}	✓
Stolen Object detector	Stolen object detector	{3E5BC0A6-A65A-4E56-DFFA-9B4D13816E4A}	✓
Built-in ANPR detector	ANPR detector	{8547C029-DCBD-EB4E-B9A0-EB4ACAC58D5B}	✓
Motion detector	Motion detector	{526DC4D9-D1E5-48A8-E8C0-3BEDD16CFCB5}	✓

Type	Currently active	Maximum supported
Test detector	1	16
IO detector	0	1
Stolen object detector	1	16
Motion detector	1	16
ANPR detector	1	16

## 7.12. ANALYTICS / DETECTORS

You can add, modify or delete the camera detectors in this window.

The list of detectors differs by camera type except for Motion engine, which can be found on all types.

### 7.12.1. Motion engine and general use of masks

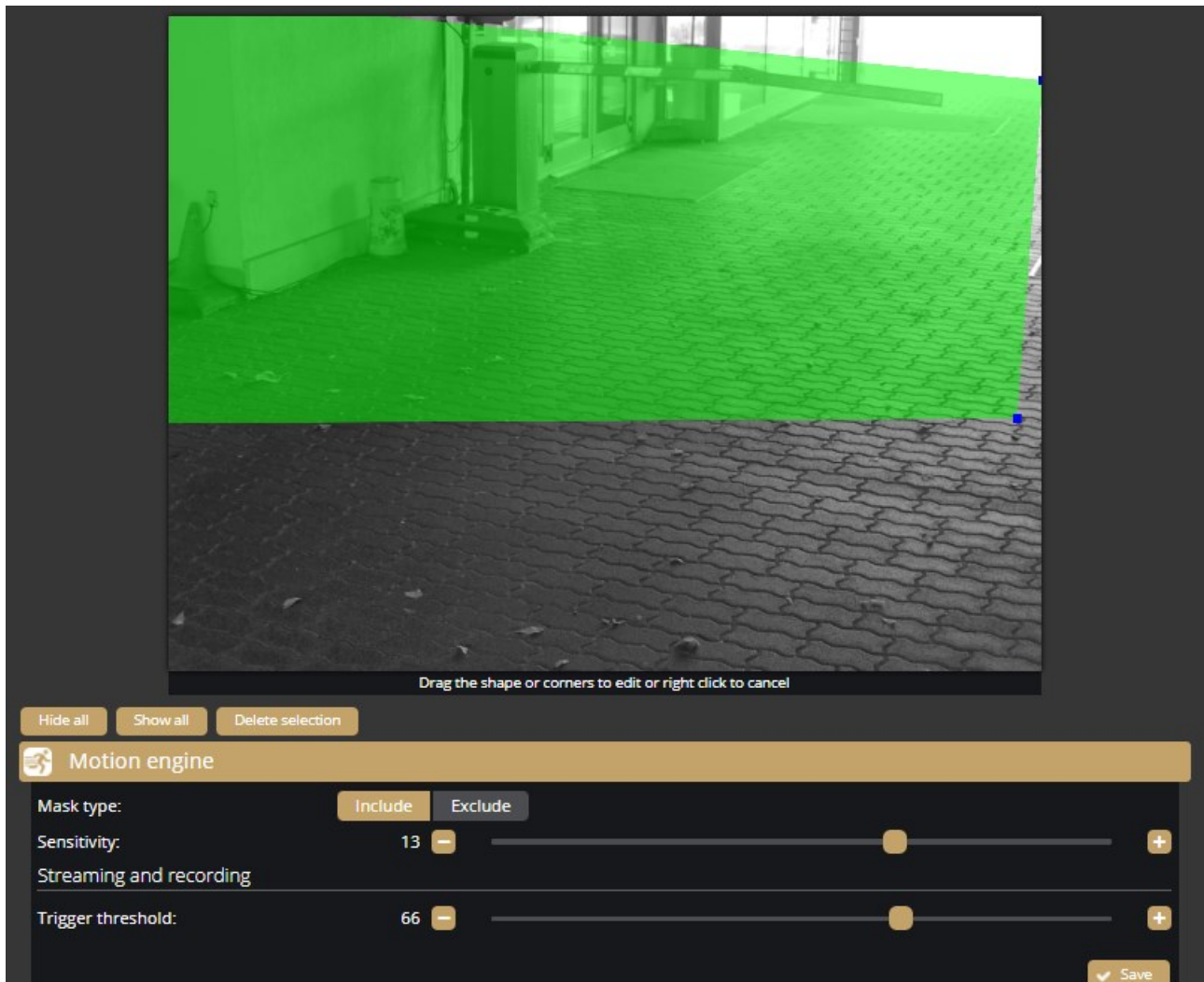
The Motion engine is a fundamental engine that regulates motion-based storage. It cannot be deleted.

#### Note

The Motion engine does not induce events; it is responsible for the setting of the motion-based recordings. As such, it can be found on all camera types.

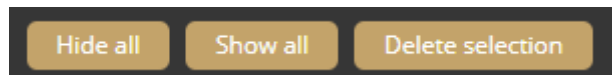
If you click on the engine, a mask can be applied to the live stream. This can be set to exclusive or inclusive with the "**Masks Type**" option. If the mask is set to "Include", the engine will only trigger when motion happens inside the selected area. When it is set to "Exclude", it will not trigger inside the area.

The mask can be modified by clicking on the green area.



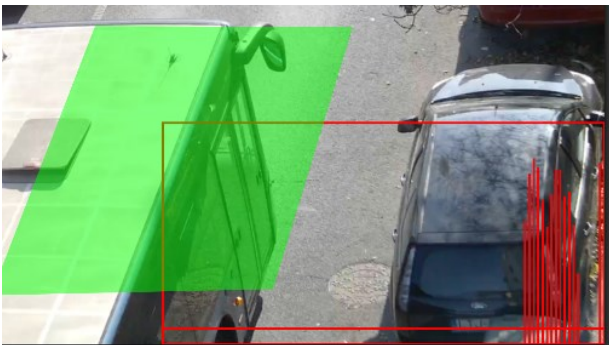
The screenshot displays the Motion engine interface. At the top, a live stream shows a green rectangular mask overlaid on a cobblestone-paved area. Below the video, a control panel includes buttons for "Hide all", "Show all", and "Delete selection". The "Motion engine" section features a "Mask type" selector with "Include" and "Exclude" options. Below this are two sliders: "Sensitivity" set to 13 and "Trigger threshold" set to 66. A "Save" button is located at the bottom right of the control panel. A text prompt at the bottom of the video area reads "Drag the shape or corners to edit or right click to cancel".

The mask can be deleted by clicking on the **[Delete selection]** button located under the live stream:



**Sensitivity:** It sets the sensitivity of the motion engine.

**Trigger threshold:** You can use it to define the sufficient level of motion in the image to trigger the motion engine. Further filtering can be done with the previously set sensitivity conditions to determine the degree of action intensity triggering recording. The "motion diagram" is the OSD belonging to the setting, which can provide visual assistance.



### 7.12.2. Motion detector

The Motion detector can be used to create events based on Motion engine. The following can be adjusted on the Motion detector interface:

- **Name:** The name of the detector can be entered.
- **Description:** To add a brief description to the detector.
- **Trigger threshold:** You can use it to define the sufficient level of motion in the image to trigger the motion detector.



## ANPR detector and ANPR engine

The ANPR detector and the ANPR engine jointly perform the reading of license plates.

### ! Important!

Both the detector and the engine must be present on the camera to operate the system. They are only available for cameras designed to read license plates.

### 7.12.3. ANPR engine

You can choose between the Onboard ANPR Engine running on the camera or the Carmen Cloud service for license plate recognition.

You can create a mask on the image, after which license plates will be detected only in the selected area. It is recommended to select the area where license plates are expected to appear on the image. The expected area of license plates can be plotted on the image with a polygon that contains a given number of vertices.

### ! Important!

Although the ANPR engine recognizes the license plates in the image, to make it work properly, the area around the license plate must be visible (front or rear of the vehicle).

In the case of **Onboard ANPR**, you can adjust the primary functions of the ANPR engine:

- **Engine:** It shows the current ANPR version and region.
- **Minimum confidence:** Use the slider to define what reading confidence percentage should trigger an event. A low value potentially results in more reading errors. A high value potentially leads to missed reading cases. Therefore, values between **50-70%** are recommended. Check the "ANPR Status" OSD layer to see the detected license plate numbers and their confidence values and then set the desired minimum confidence level based on the results.
- **Ignore same plate for (s):** Set a time limit for previously-read license plates. This value determines a waiting time in seconds before the same license plate is read again.
- **Country preference:** The selected region is prioritized and read with a higher confidence value by the license plate reading system. In comparison, license plates from other regions are managed with a lower confidence value.

The screenshot shows the 'ANPR engine' configuration interface. At the top right, it says 'Powered by CARMEN'. The 'Type' is set to 'Onboard'. The 'Engine' is '7.3.13.215 EUR'. The 'Minimum confidence' is set to 30% with a slider. The 'Ignore same plate for (s)' is set to 10. The 'Country preference' is set to 'HUN'. A 'Save' button is at the bottom right.

In the case of **Carmen Cloud**, the license plate recognition is not processed in the camera. Instead, images with license plates are selected in the camera and sent to the engine in the cloud for license plate recognition. A stable internet connection and a Carmen Cloud subscription are required for the license plate recognition to work in the cloud. For more information about Carmen Cloud, visit <https://adaptiverecognition.com/anpr-cloud/>.

You need to adjust the following parameters:

- **Minimum confidence:** Use the slider to define what reading confidence percentage should trigger an event. A low value potentially results in more reading errors. A high value potentially leads to missed reading cases. Therefore, values between **50-70%** are recommended. Check the "ANPR Status" OSD layer to see the detected license plate numbers and their confidence values and set the desired minimum confidence level based on the results.
- **Ignore same plate for (s):** A time limit can be set for previously-read license plates. This value determines a waiting time in seconds before the same license plate is read again.
- **ANPR Cloud URL:** Paste the URL you received when subscribing to the field.
- **ANPR Cloud key:** Enter the individual key of the subscription.

The **Status** field displays information about the operation of Carmen Cloud, e.g., successful/failed connection, upload status, expired credits, etc.

The screenshot shows the 'ANPR engine' configuration interface with 'Cloud' mode selected. The 'Type' is 'Cloud'. The 'Minimum confidence' is 30%. The 'Ignore same plate for (s)' is 10. The 'ANPR Cloud URL' is 'https://api-eu.anpr-cloud.com/free'. The 'ANPR Cloud key' field is empty. The 'Status' field is empty. A 'Save' button is at the bottom right.

#### 7.12.4. ANPR detector

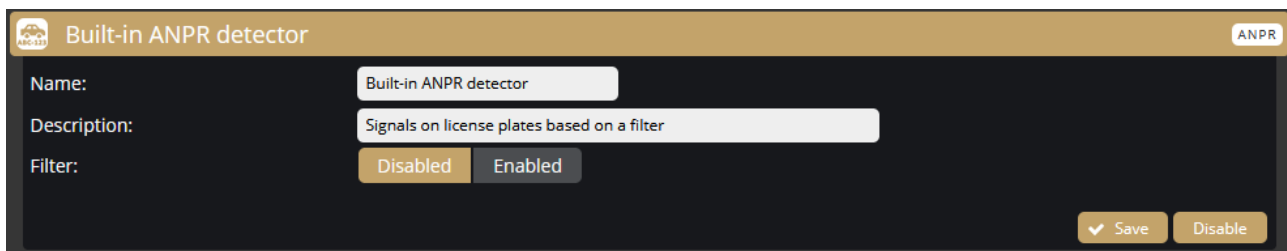
The ANPR detector is responsible for transmitting the events. A factory-set and non-erasable detector, the Built-in ANPR detector, is always present in the camera and generates the events of the license plate numbers detected by the ANPR Engine as soon as the camera is switched on.

#### ! Important!

The ANPR detector must be defined separately. The primary functions of the detector cannot be set under the **ANPR detector** section, but on the interface of the **ANPR engine**.

The following can be adjusted on the **ANPR detector** interface:

- **Name:** The name of the detector can be entered.
- **Description:** To add a brief description to the detector.
- **Filter:** The system can be set only to read certain license plates.



The screenshot shows the configuration interface for the 'Built-in ANPR detector'. The title bar includes the 'ANPR' logo. The interface has three main sections: 'Name' with a text input field containing 'Built-in ANPR detector'; 'Description' with a text input field containing 'Signals on license plates based on a filter'; and 'Filter' with two radio buttons, 'Disabled' (selected) and 'Enabled'. At the bottom right, there are 'Save' and 'Disable' buttons.

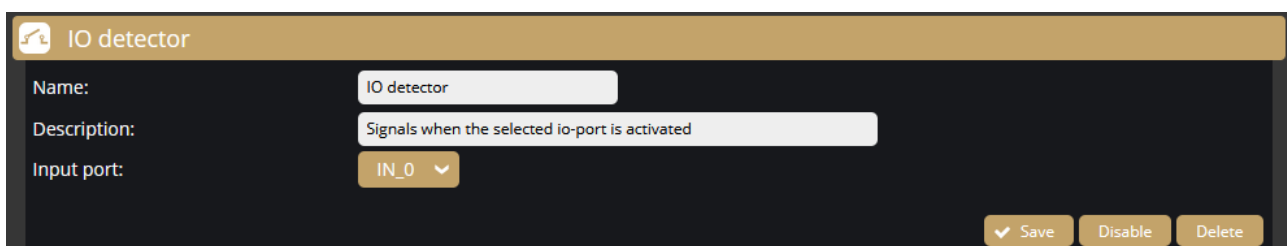
You can create additional ANPR detectors in addition to the Built-in ANPR detector. For example, by enabling filters and adding license plates to them, you can activate different detectors when certain license plates are detected, thus affecting the storage of the given group, the detector's manageability, and the query.

### 7.12.5. IO detector

The IO detector detects a signal at the camera contact input and, thus, an event is generated when the input is activated. Note that no license plate recognition is performed when the input is activated.

You can adjust the following on the **IO detector** interface:

- **Name:** To enter the name of the detector.
- **Description:** A brief description can be added to the detector.
- **Input port:** The input receiving the signal must be selected. Currently, "IN\_0" is the only available input on the camera.



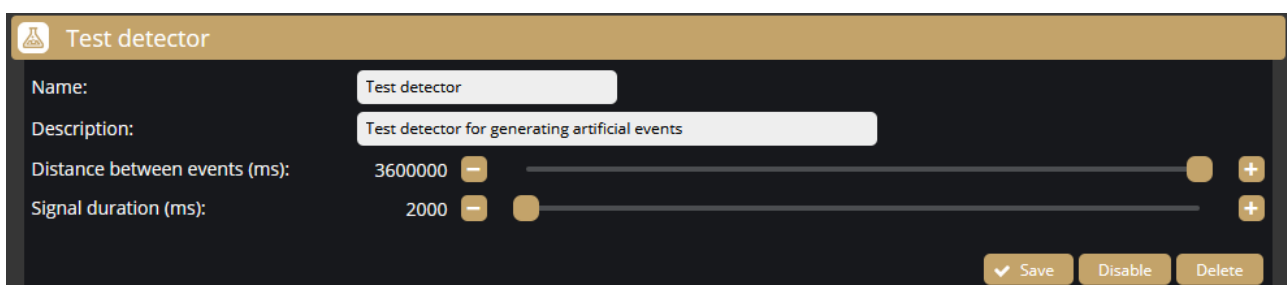
The screenshot shows the 'IO detector' configuration interface. It features a title bar with a camera icon and the text 'IO detector'. Below the title bar, there are three input fields: 'Name' with the value 'IO detector', 'Description' with the value 'Signals when the selected io-port is activated', and 'Input port' with a dropdown menu showing 'IN\_0'. At the bottom right, there are three buttons: 'Save', 'Disable', and 'Delete'.

### 7.12.6. Test detector

The Test detector can be used to test the camera's upload and storage capabilities. Important: use it for testing purposes only.

The following can be adjusted on the **Test detector** interface:

- **Name:** The name of the detector can be entered.
- **Description:** A brief description can be added to the detector.
- **Distance between events:** The camera produces a test event at the set intervals.
- **Signal duration:** To adjust the signal length.



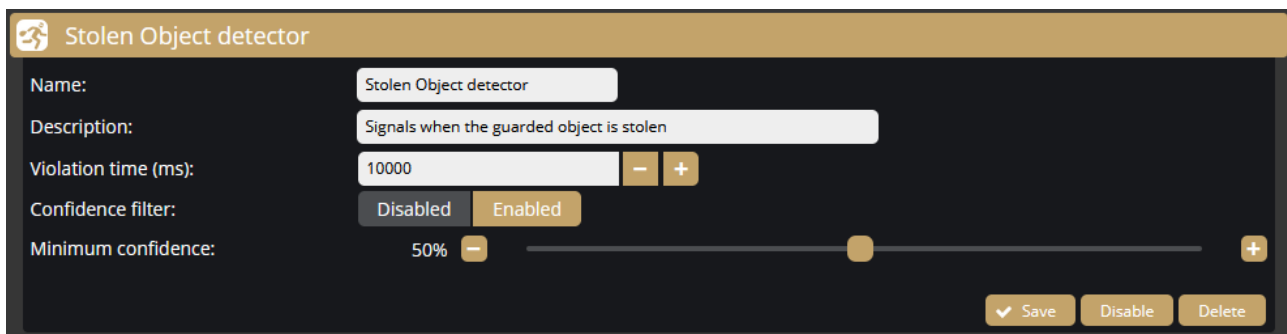
The screenshot shows the 'Test detector' configuration interface. It features a title bar with a test tube icon and the text 'Test detector'. Below the title bar, there are four input fields: 'Name' with the value 'Test detector', 'Description' with the value 'Test detector for generating artificial events', 'Distance between events (ms)' with a slider set to 3600000, and 'Signal duration (ms)' with a slider set to 2000. At the bottom right, there are three buttons: 'Save', 'Disable', and 'Delete'.

### 7.12.7. Stolen Object detector

This detector can be used to trigger an event when an object to be monitored moves. In addition to the settings below, you also need to mask the object in the image. The mask should surround the object to be monitored in such a way it slightly overlaps it.

The following can be adjusted on the **Stolen Object detector** interface:

- **Name:** Enter the name of the detector.
- **Description:** Add a brief description to the detector.
- **Violation time:** No signal is given if there is a change within the set time.
- **Confidence filter:** Set the "sensitivity" of the object monitoring.



The screenshot shows the configuration interface for the 'Stolen Object detector'. The interface has a dark background with a gold header bar. The settings are as follows:

- Name:** Stolen Object detector
- Description:** Signals when the guarded object is stolen
- Violation time (ms):** 10000, with minus and plus buttons for adjustment.
- Confidence filter:** A toggle switch currently set to 'Enabled'.
- Minimum confidence:** 50%, with a slider and plus/minus buttons for adjustment.

At the bottom right, there are three buttons: 'Save', 'Disable', and 'Delete'.

## 8. HOW TO USE THE EINAR CAMERA

This chapter gives you a quick overview of using Einar and what to look out for when installing and operating the camera.

### 8.1. CAMERA INSTALLATION

1. Mount the camera as follows (Please refer to the [Install Manual](#)):
  - a. If you want to store events in the camera, **insert the microSD card**.
  - b. If you want to use the camera's input and output, mount the **GPIO cable kit** to the camera.
  - c. For communication with the camera, use at least **Cat5E** outdoor shielded cable.
  - d. Use a **PoE+** rated PoE power adapter or a switch output capable of PoE+. If neither is available, you can also power the camera with 48V DC.
  - e. **Mount/secure the camera firmly** in its intended location.
  - f. **Ground the camera**, preferably using the grounding point on the camera, or at least using an FTP cable grounded at the PoE power supply end – e.g., switch – but take care not to create a ground loop.
  - g. The maximum angle of rotation and/or tilt of the camera should not exceed **25–30 degrees**.
  - h. The optical axis of the camera should **face the license plate** of the oncoming or departing vehicle. The camera's optical axis shall be as small an angle as possible with the axis of travel of passing vehicles.
  - i. The camera should be **at least one meter above the headlights** of vehicles. If possible, it should not be accessible without an assistive device. If the camera is mounted completely unprotected outdoors, it is recommended to mount it higher to minimize the risk of water falling on the front of the camera when raining.
  - j. Use **the waterproofing cap** that protects the RJ45 connector included in the package. Note that the cap must be fitted to the cable before the RJ45 plug is installed.
  - k. In the image, **the license plate should be horizontal**. In extreme cases, it may be necessary to turn the mounting bracket.
  - l. Adjust the camera lens angle of view *{Media / Lens}* so that the characters on the license plate are **at least 20–25 pixels high**—but no more than 50–60 pixels. Consider whether you want to recognize license plates with small character sizes. For example,

the characters on Italian license plates are smaller than those of countries geographically further north. The easiest way to check the character size of a license plate is to display the "ANPR Status" OSD layer in Live View and look at the "Avg. char height:" to see the character size *{Overlay}*.

- m. Use **real, moving vehicle(s)** to test the settings; it's not enough to just show a plain license plate in front of the camera.
  - n. Adjust the camera's direction and angle of view to make the license plate visible for **at least one, but preferably two seconds** with the right character size.
2. **Find the camera on the network**, then access the camera's web interface
    - a. From the MAC address of the camera, you can calculate the **IP address that is always available**. It is always in the format **169.254.aa.bb**, where the number aa/bb is the decimal value of the last two pairs of numbers in the MAC address *{Link-Local IP Address}*. However, if a DHCP server is available on the network, the camera will also get an IP address from the DHCP server. You can access the camera from both IP addresses.
    - b. Optionally, you can use the **AR Device Tool** to locate the camera on your local network. *{AR Device Tool}*.
    - c. You can access the camera's web interface with the **admin/admin** username/password pair. It is strongly recommended to change the default password.
  3. Some simple but important basic settings:
    - a. Upload the **ANPR Engine and License Key** to your camera *{System / Device}* according to the email received when you purchased the camera. Check the ANPR Engine quarterly to ensure that the camera is always running with the latest version of the engine. You will also need to update the License Key for updates after a year.
    - b. Check that the **camera has the latest firmware**. You can download the latest FW from ATSS. Upload it in *{System / Device}*.
    - c. **Check/set the camera time** *{System / Device}*.
    - d. If you haven't already done so, adjust the camera **angle of view** and take into consideration the character sizes as well *{see point (1) in this chapter and Media / Lens}*.
    - e. Set the appropriate **Image presets** for your installation *{Media / Image}*.
    - f. With the above steps and the default camera settings, you will get **license plate reading results**. These events will be listed in the Live interface below the live image.
  4. Fine-tuning

Besides checking everything in the Settings menu, there are a few settings that, in addition to the above, are particularly recommended to check/fine-tune to achieve above-average license plate recognition accuracy.

- a. Set the **Image settings** parameters to as perfect as possible. Take into account the location you are observing and, most importantly, make sure the number plates are legible. Check the good visibility of the license plates for a few days after the camera installation, during the day, night and sunrise/sunset times of the day. Repeat the process later to adjust for the different seasonal changes.
- b. Check the **resolution of the camera**. You may need to **increase the bandwidth** of the video stream *{Media / Video}*.
- c. Check the settings of the **ANPR engine** *{ANPR engine}*. Lowering the minimum confidence parameter will increase the chance of misreading license plates but will also reduce the probability of missing an unrecognized plate.
- d. Set the **country** where the camera is installed so that in the case of a type/country code engine, you increase the priority of the license plate numbers of that country *{ANPR engine}*.
- e. Draw the area on the picture where you expect to see number plates using a mask. This will increase the possibility of speeding up the number plate recognition, and cars parked/passing by in an undesirable place will not trigger an event. *{ANPR engine}*.
- f. During the setup, testing and checking of the operation, it is recommended to display the necessary OSD layer(s) to get technical feedback about the camera's internal operation, changes of image parameters, etc. We suggest displaying the **General/ANPR Status** and **General/Image properties** layers during camera setup *{Overlay}*. Also, display these captions during playback and reduce the playback speed to facilitate more accurate evaluation.

## 8.2. USING EINAR CAMERA

Below you will find some possibilities for creating access control with Einar and some other options for using the camera. A suitable combination of the following can also be implemented.

### 8.2.1. Standalone operation with onboard ANPR

The camera itself manages an access point. It activates its output when it recognizes the license plates registered in the camera to give an opening command, e.g., to a barrier. Einar stores events, which can be retrieved, downloaded and exported via the camera's own web interface. In addition to local storage on an SD card, it is also possible to configure an optional HTTP or GDS server for event upload.



The necessary devices and the most important, specific settings are as follows:

- microSD card
- GPIO cable kit
- Carmen ANPR Engine and License in Einar camera
- ANPR detector with filter enabled. (Registering license plate numbers in "Allowed license plate" field)
- A properly configured HTTP or GDS server (if required).

### 8.2.2. Standalone operation with Carmen Cloud

The camera itself manages an access point. It activates its output when it recognizes the number plates registered in the camera to give an opening command, e.g., to a barrier. Einar stores events, which can be retrieved, downloaded and exported via the camera's own web interface. In addition to local storage on an SD card, it is also possible to configure an optional HTTP or GDS server for event upload. The number plates are detected in the camera, but the number plates are recognized in Carmen Cloud.

The necessary devices and the most important, specific settings are as follows:

- Stable internet connection
- microSD card
- GPIO cable kit
- Einar camera without ANPR Engine and License
- Carmen Cloud subscription
- ANPR detector with filter enabled. (Registering license plate numbers in "Allowed license plate" field)
- A properly configured HTTP or GDS server (if required).

### 8.2.3. Integrated operation with 3<sup>rd</sup> party software

By mounting the camera at an access point, the camera uses its own API to allow the system integrator to connect the camera to the system integrator's own software. If required, the I/O can be used on the camera, or the system integrator can use its own software IO hardware.

The following data is available:

- live video stream,
- still image,
- query the input port status
- output port control

- current event data
- stored events data
- event video, event image, license plate coordinate.

The necessary devices and the most important, specific settings are as follows:

- Stable internet connection (if necessary)
- microSD card
- GPIO cable kit (if necessary)
- Onboard ANPR or Carmen Cloud subscription
- A properly configured HTTP or GDS server (if required).

#### 8.2.4. Integrated operation with ParkIT System

The camera provides video stream and motion information to the ParkIT System software. License plate recognition is processed within the ParkIT System on the server's side. The possible trigger source is transmitted from the camera input to the ParkIT System, then the open command is sent by the ParkIT System to the camera output. The IO management can be done via other (e.g., Moxa) devices as well.

ParkIT System installation manuals can be found in ATSS.

The necessary devices and the most important, specific settings are as follows:

- GPIO cable kit (if necessary)
- Einar camera without ANPR License & Engine
- Einar FW at least v1.8.2
- ParkIT System software and License, Carmen NNC, License, Engine and server PC

# Contact Information

## Headquarters:

Adaptive Recognition, Hungary Inc.  
Alkotás utca 41.  
HU-1123 Budapest, Hungary  
Phone: +36 1 201 9650  
Fax: +36 1 201 9651  
Web: [adaptiverecognition.com](http://adaptiverecognition.com)

## Service Address:

Adaptive Recognition, Hungary Inc.  
Ipari Park HRSZ1113/1  
HU-2074 Perbál, Hungary  
Phone: +36 1 2019650  
E-mail: [rmarequest@adaptiverecognition.com](mailto:rmarequest@adaptiverecognition.com)

AR Technical Support System (ATSS) is designed to provide you with the fastest and most proficient assistance, so you can quickly get back to business.

Information regarding hardware, software, manuals and FAQ are easily accessible for customers who previously registered to enter the dedicated ATSS site. Besides offering assistance, the site is also designed to provide maximum protection while managing your business information and the technical solutions utilized.

## New User

If this is your first online support request, please create an account by clicking on this [link](#).

## Returning User

All registered ATSS customers receive a personal access link via email. If you previously received a confirmation message from ATSS, it contains the embedded link that allows you to securely enter the support site.

If you need assistance with login or registration, please contact [atsshhelp@adaptiverecognition.com](mailto:atsshhelp@adaptiverecognition.com) for help.

