



FIXED ANPR DEVICE

Installation and User Manual

Carmen[®] ANPR BOX

An NVIDIA[®] Jetson Nano[™]-based standalone device to enhance your IP camera with ANPR function.



Carmen Box

USER AND INSTALLATION MANUAL

with Installation Checklist and other practical tips

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1. OVERVIEW

The Carmen Box device has its own web interface through which you can access the 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.

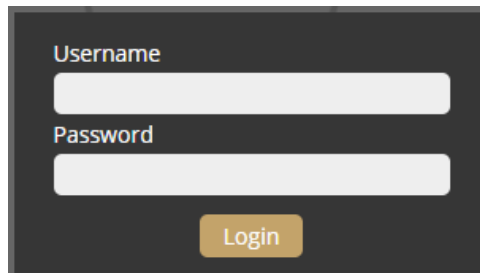
Accessing the web interface:

1. Start a browser and enter the device 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 screenshot shows a dark-themed login form. It contains two input fields: the top one is labeled 'Username' and the bottom one is labeled 'Password'. Below these fields is a yellow button with the text 'Login'.

1.1. DEFAULT IP ADDRESS

Carmen Box – 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 device 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 device with the MAC address 48-B0-2D-3E-42-1A ends with 42 and 1A, representing the decimal values 66 and 26. The link-local address of this device is 169.254.66.26.

1.3. FINDING DEVICES

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

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



2. AR DEVICE TOOL

With the AR DeviceTool, you can discover Einar or Visus cameras, Carmen Box or Carmen Nano devices on the local network. You can upload Firmware, License and Engine files to these cameras/devices. Download the program here: [AR DeviceTool](#).

Upload firmware Upload license Upload engine Check for updates							
Name	Family	Version	Firmware	IP Address	MAC address	Upload information	
IDEV-TRAFFIC	CBCX	Photon	1.0.0.2040	192.168.6.143	00:04:4b:e9:dc:20		
RIO - CarmenBox	CBCX	Photon	1.1.0.213	192.168.6.89	48:b0:2d:3d:f2:04		
ICAM-D7D6	EINAR	Einar-5	2.1.1.3	192.168.6.197	00:19:b4:02:d7:d6		
Einar	EINAR	Einar-5	2.1.1.3	192.168.6.82	00:19:b4:00:d2:5b		
Einar-PZS-T	EINAR	Einar-ST	2.1.1.3	192.168.6.240	00:19:b4:00:d2:23		

Devices: 5 Offline: 0

2.1. FINDING DEVICES/CAMERAS

Once started, the program lists the AR devices/cameras detected on the local network if the devices/cameras are in the same network segment as the computer. The device/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 devices/cameras are marked with green color in the first column.

The red color indicates a previously discovered device/camera that has not been available since then. If newer firmware or engine are available for any of the listed cameras/devices, a star sign is added into the green indicator.

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

Upload firmware Upload license Upload engine Check for updates							
Name	Family	Version	Firmware	IP Address	MAC address	Upload information	
ICAM-D209	EINAR	Einar-5	1.9.0.49	192.168.100.18	00:19:b4:02:d2:09		
Cam74	VISUS	ILD-420E-BL-IR	v4.6.0 (build 12)	192.168.100.74	00:19:b4:01:84:67		
Cam75	VISUS	ILD-420E-BL-IR	v4.6.1 (build 10)	192.168.100.75	00:19:b4:01:7f:cf		

Devices: 3 Offline: 1

2.2. FIRMWARE, LICENSE, AND ENGINE UPLOAD - MANUALLY

In addition to find devices/cameras, you can also use the AR DeviceTool to upload Firmware, License or even Engine for the selected single camera/device or a group of cameras/devices using Ctrl/Shift. The License file is unique for each device/camera, therefore it cannot be uploaded in groups.

Upload firmware		Upload license		Upload engine		Check for updates	
Name	Family	Version	Firmware	IP Address	MAC address	Upload information	
<input type="checkbox"/> IDEV-TRAFFIC	CBOX	Photon	1.0.0.2040	192.168.6.143	00:04:4b:e9:dc:20		
<input checked="" type="checkbox"/> ICAM-D7D6	EINAR	Einar-5	2.1.1.3	192.168.6.197	00:19:b4:02:d7:d6		
<input checked="" type="checkbox"/> Einar-PZS-T	EINAR	Einar-ST	2.1.1.3	192.168.6.240	00:19:b4:00:d2:23		
<input checked="" type="checkbox"/> Einar	EINAR	Einar-5	2.1.1.3	192.168.6.82	00:19:b4:00:d2:5b		
<input type="checkbox"/> RIO - CarmenBox	CBOX	Photon	1.1.0.213	192.168.6.89	48:b0:2d:3d:f2:04		

Devices: 5 Offline: 0

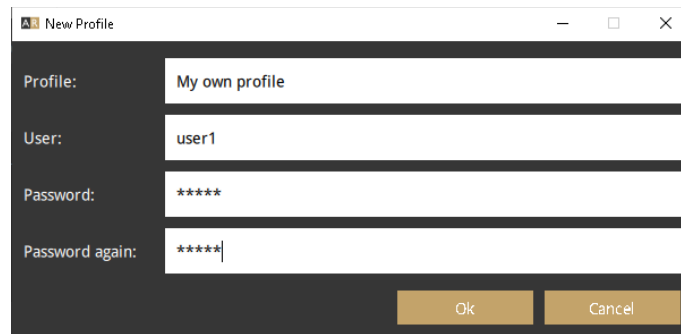
Select the device(s)/camera(s) you want to update and press the **[Upload firmware]**, **[Upload License]** or **[Upload engine]** buttons that become active.

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 device(s)/camera(s), you can create user profiles. This way, you don't have to enter credentials 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.



New Profile

Profile: My own profile

User: user1

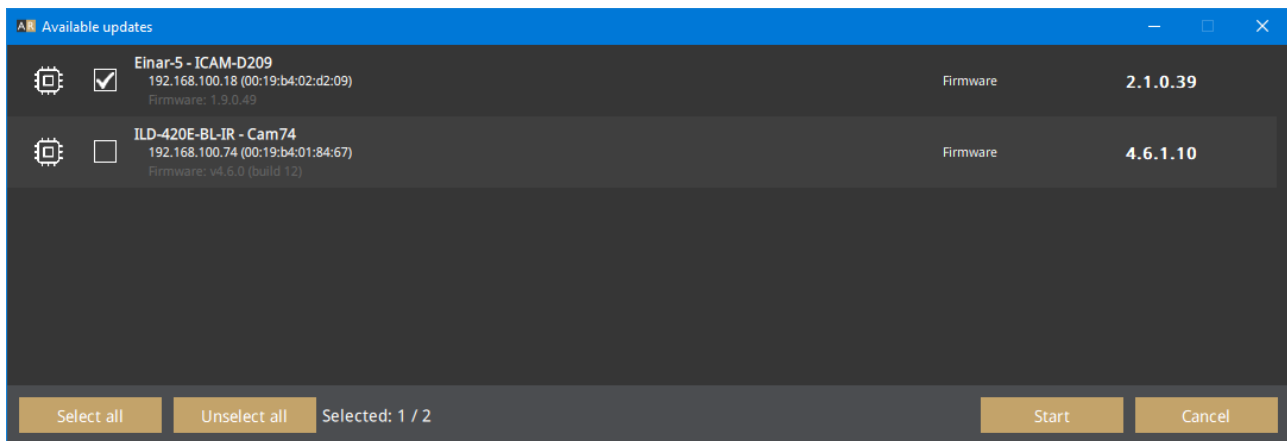
Password: *****

Password again: *****

Ok Cancel

2.3. FIRMWARE AND ENGINE – CHECKING FOR UPDATES

If your PC is connected to the internet, you can check if newer firmware or engine are available for any of your cameras/devices. Press **[Check for updates]** button, select device(s)/camera(s) you want to update and press **[Start]**. Confirmation and credentials must be provided.



AR DeviceTool downloads the appropriate firmware and/or engine from a central server, and uploads it to the selected device(s)/camera(s). A new folder will be created in your Download folder: ArDeviceToolDownloads. Please delete it if you no longer need the firmware(s)/engine(s).

3. OVERVIEW OF THE WEB INTERFACE

The following menu items are available on the web interface:



1. LIVE

Shows a live view of the connected 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
- Notifications
- External

MEDIA

- Video

ANALYTICS

- Settings
- Detectors

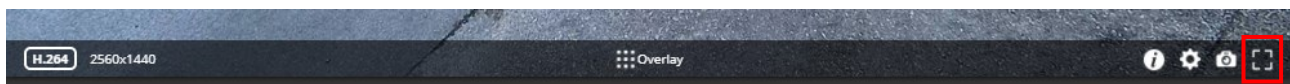
4. LIVE

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



4.1. FULL-SCREEN MODE

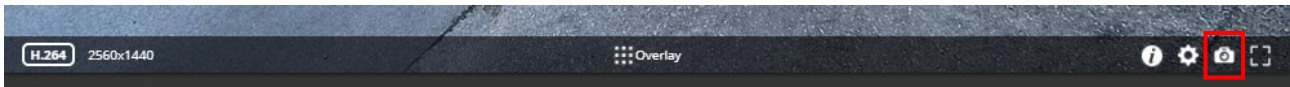
The camera's live stream can be displayed on full screen by clicking on the icon located in the bottom-right corner of the image.



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

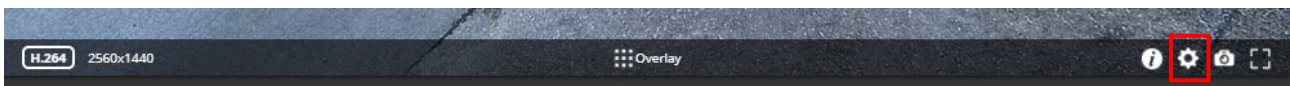
4.2. SAVING IMAGE

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

Next to the [Streams] icon 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 in the grey area.



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. *{External*
You can manage the associated Onvif devices in the External menu. You can add a new device, edit the data of existing devices and delete a device.

State	Address	User	Model	Serial	Name	Capabilities
Online	192.168.6.240	admin	IPC-01-T	221D223	Einar-5T	Video I/O Edit Remove
Online	192.168.7.50	admin	DS-2CD2683G2-IZS	DS-2CD2683G2-IZS202...	DS-2CD2683G2-IZS	Video I/O Edit Remove

For the added ONVIF device the Video button will only appear if the device does support a video channel. The IO button only appears if the added ONVIF device supports IO. Clicking on the Video or IO button will switch to that menu item.

The following should be set when adding a new device:

- **Name: (optional):** The name of the device can be entered.
- **Address:** IP address where the device is accessible.
- **ONVIF Username:** The device's ONVIF username.
- **ONVIF Password:** The device's ONVIF password.

New device

Name (optional):?

Address: ?

ONVIF Username: ?

ONVIF Password:

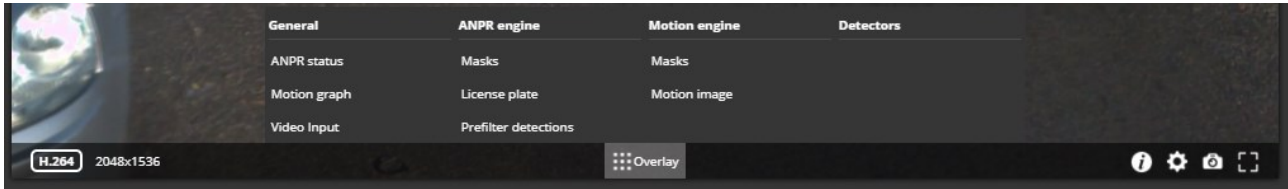
 Note

For many cameras, the ONVIF Username and Password do not match the username and password used in the browser. ONVIF may also need to be enabled on the camera.



Media / Video}.

The OSD layers come in handy for observing the internal workflow of the device, setting up the device or troubleshooting.



The most important parameters related to license plate recognition can be found on the **ANPR engine status** OSD, these are the following:

Found/Read: Number of images on which the device has started to detect („Read”) license plate, and („Found”) it. Values will be reseted after reboot.

Prefilter: „found” means the device detected license plate in that image (and in the ANPR mask).

„not-found” means that the device tried it, but did not detect any license plate in that image.

„idle” means that the device has not tried to detect plates. The prefilter does not run on every images.

Carmen-Engine: „found” is displayed when the Carmen ANPR recognition module has processed an image. „no-input” means the engine do not receive image from the prefilter.

Plate: Recognised license plate result of Carmen engine.

Avg. char height: Character height of recognised license plate.

Confidence: Confidence value of recognised license plate.






Confidence threshold: Minimum confidence value previously set in *{ANPR engine}*. License plates with confidence value below this threshold will be discarded.

Recognition memory: Recognised license plates which will not be recognised again. The time range while the recognised license plates remain in the memory can be set in *{ANPR engine}* "Ig-nore same plate for (s)".

4.6. EVENT PREVIEW

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

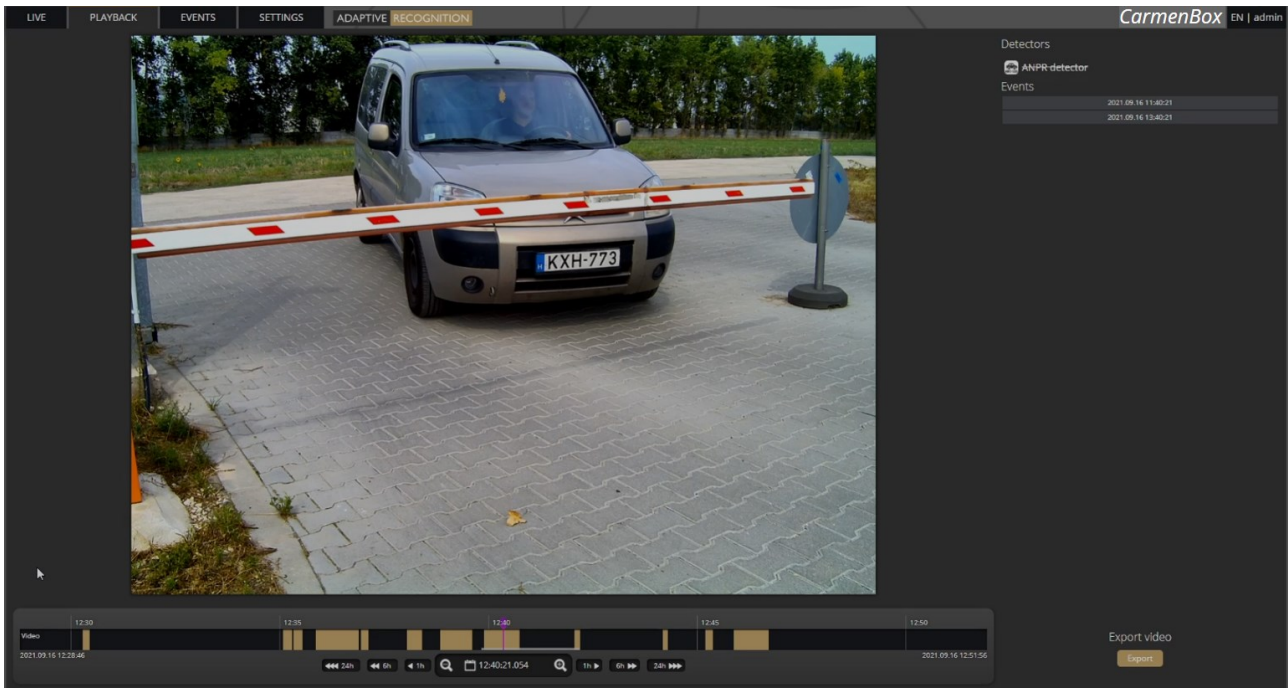
Basic events (like ANPR) are shown with a tan color and the "EVENT" text. A dark red colored "SIGNAL" text indicates a start of a longer event that lasts for multiple frames. A long end of event is marked with the green "RESTORE" text.

Preview	Event	
	RESTORE Motion detector	2023.01.24 12:33:58
	Motion in scene returned to normal	
	SIGNAL Motion detector	2023.01.24 12:33:58
	Motion over threshold in scene	
	RESTORE Motion detector	2023.01.24 12:33:47
	Motion in scene returned to normal	
	EVENT Built-in ANPR detector	2023.01.24 12:33:46
	License plate read: (HUN) SOS738 (confidence: 89%)	
	SIGNAL Motion detector	2023.01.24 12:33:46
	Motion over threshold in scene	

The list also contains the exact date and time an event was emitted. Clicking on the row of event brings up a more detailed view of that event. Clicking on the image shows the event image in full view. One more click takes you back to the event window.

5. PLAYBACK

You can access the **PLAYBACK** interface 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.

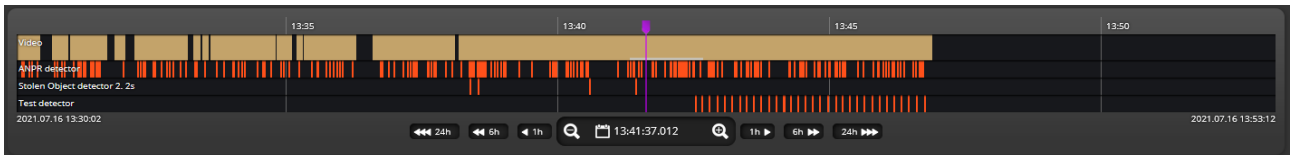


5.1. NAVIGATE AMONG THE RECORDINGS

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.

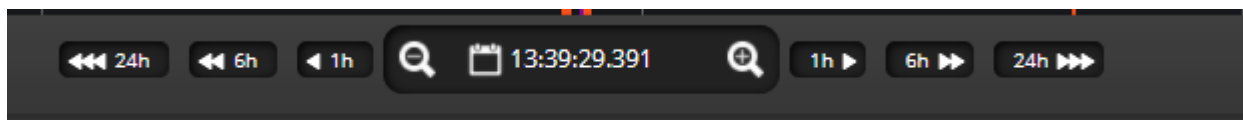
The **red markers** point where events have taken place.



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 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.

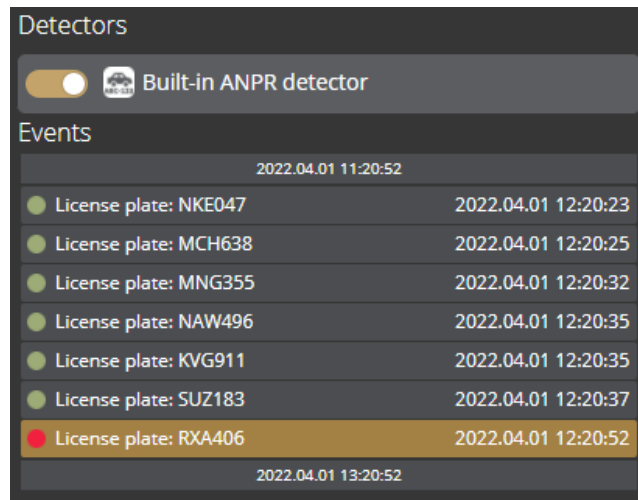
The small image that appears when the mouse cursor is positioned over the timeline shows a preview image of the video near that location.

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.

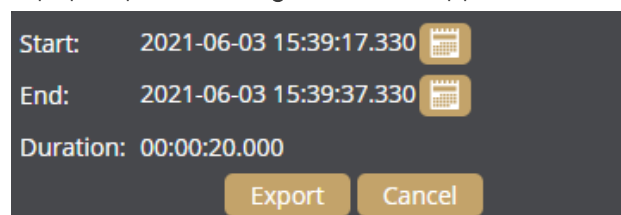


The events and timeline of each detector can be turned on/off by clicking on the appropriate detector button. Clicking on an event in the list navigates the playback to the date and time of the event.

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.



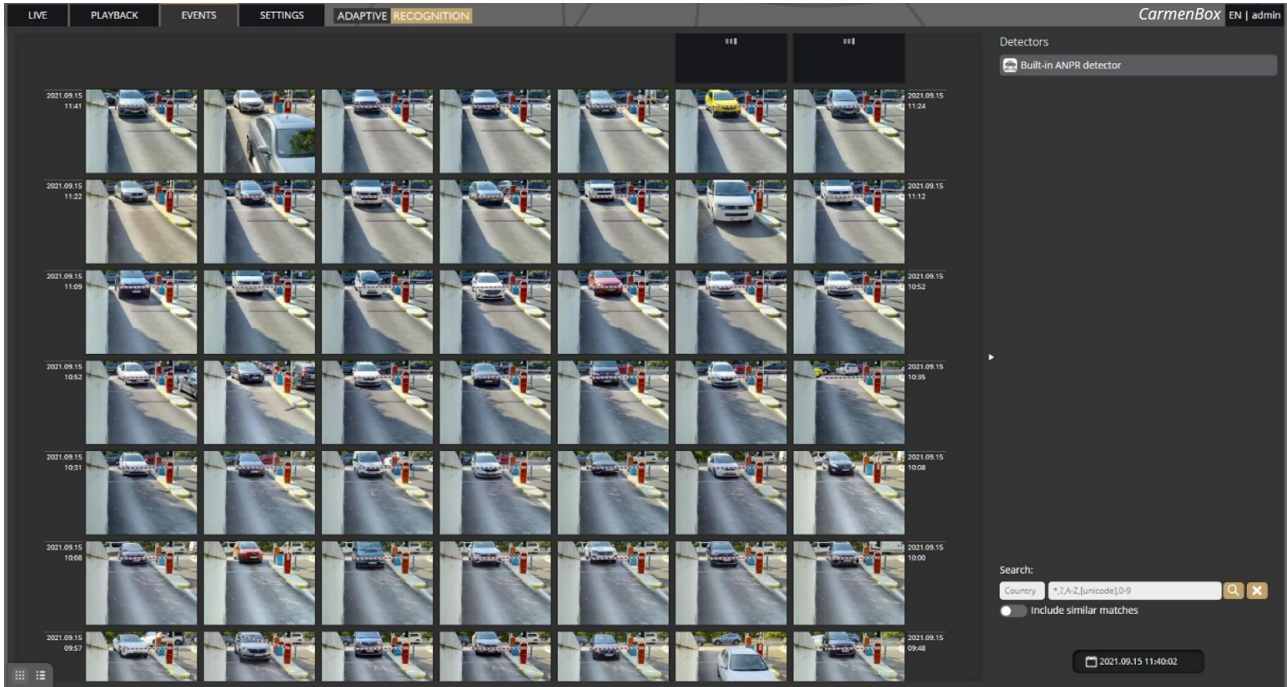
Drag the arrows with the mouse, and click the **[Calendar buttons]** next to "Start" and "End" to modify the exported time range. The duration of the video to be exported is displayed in the bottom line ("Duration").

Note

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

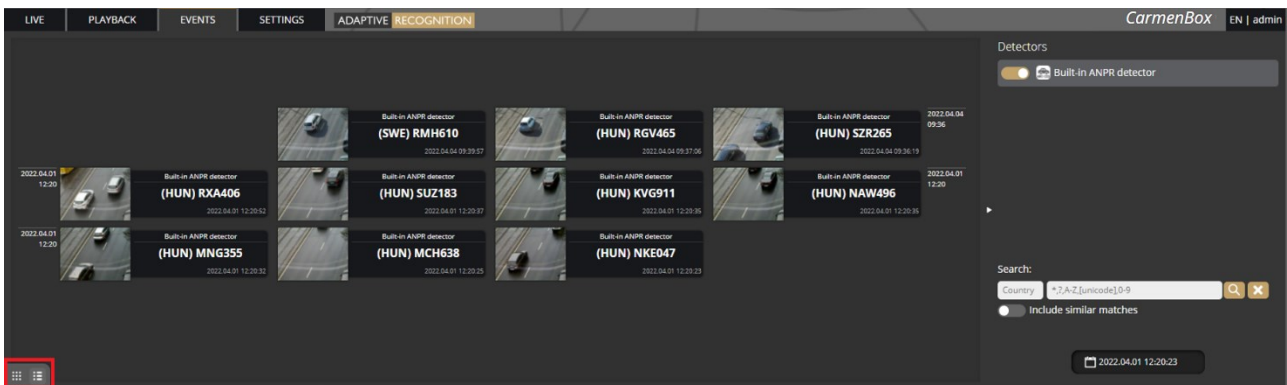
6. EVENTS

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

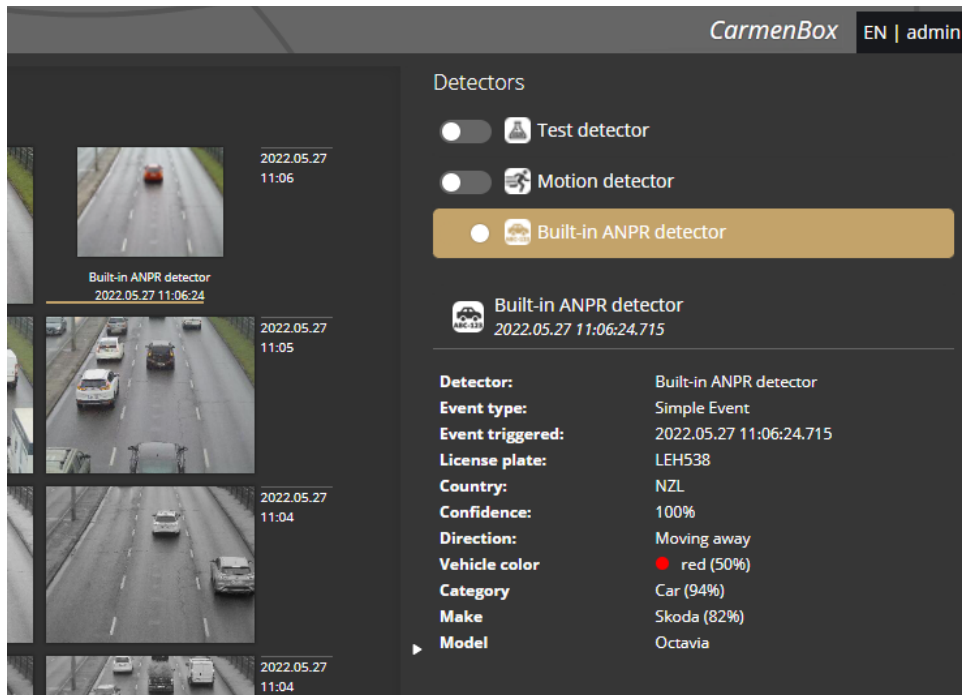


You can navigate between the recorded events in the event browser by scrolling through them with your **scroll wheel**. The events appear as small images. The latest events are at the top.

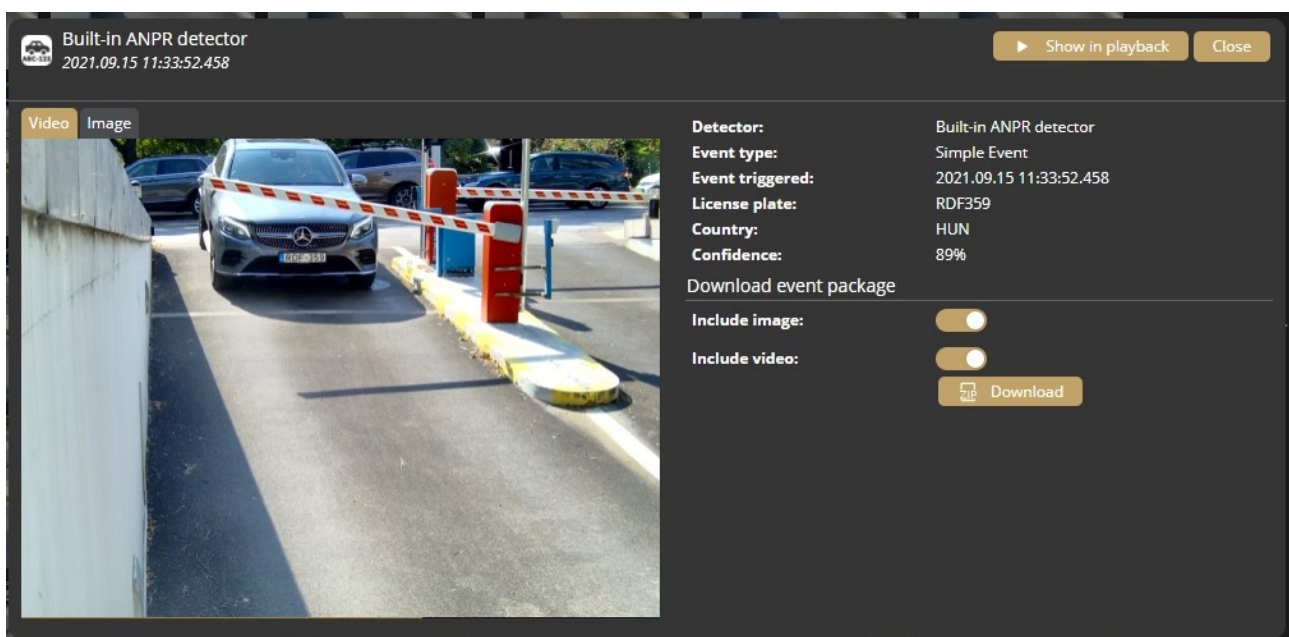
Use the buttons in the bottom left corner to switch between **Grid view** and **Detailed view**.



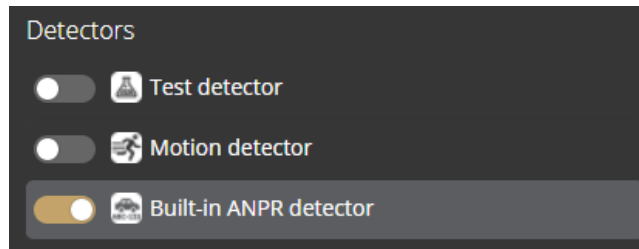
Hovering the cursor over an event, the detector related to the event is highlighted in the list on the right. Simultaneously, a video clip of the event will be loaded and played automatically.



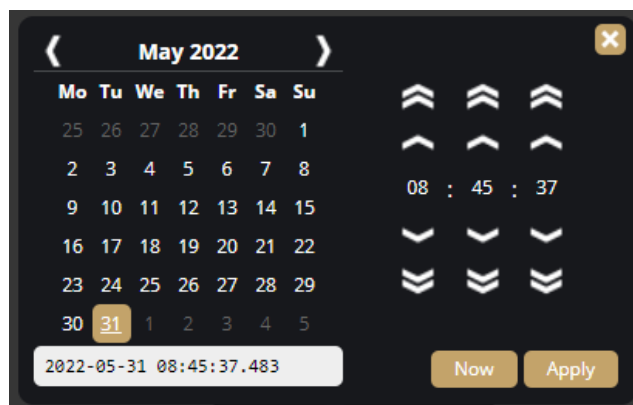
Clicking on an event brings up a detailed view of that event, including a video clip and any related image. The interface can be redirected to the **PLAYBACK** menu item by clicking on the **[Show in playback]** button. The data belonging to the event can be saved as a ZIP file by clicking on the **[Download]**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



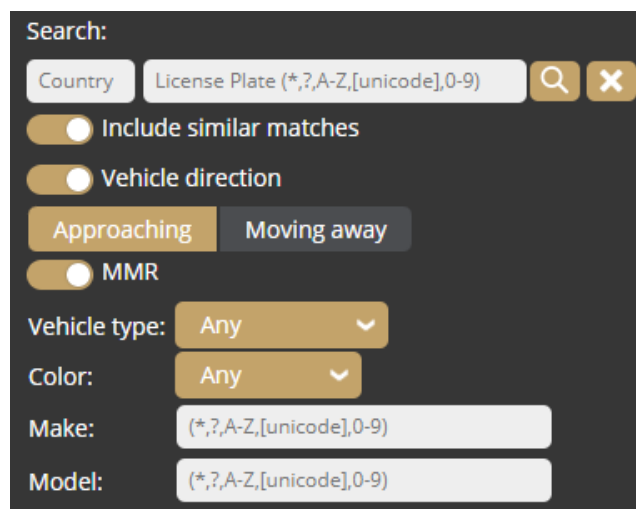
The configured detectors are displayed on the right. By moving the cursor over the detector, the events related to the detector will be highlighted in the event browser. By clicking on the detector, the display of its events can be turned on/off.



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.



An additional license plate search form is available. Similar license plates can be listed if the "Include similar matches" option is turned on. Searching based on vehicle direction and MMR data is also available.



7. SETTINGS

The SETTINGS page contains all customizable parameters of the device.

7.1. SYSTEM / STATUS

On this interface, you can find a summary of the important data of the device, the installed detectors, the operating time, the ANPR licenses, etc. API documentation can also be found here for integrating.

Device

Name:	CarmenBox	Type:	CARMEN_BOX
Description:	MM_teszt	Serial:	JB3DF204
Date & time:	2022.10.28 09:18:13	Firmware:	1.2.0.182
Storage:	Enabled	Location:	1.1, 1.1
License:	ANPR license >	Uptime:	27 minutes
License key:	USB key - 1214624		

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

Network

Wired connection:	192.168.7.13, 169.254.242.4 (MAC: 48b02d3df204)	DNS:	1.1.1.1, 8.8.8.8
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Video

Video input	2560x1920 @ 11.1 Mbit/s
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Detectors

Built-in ANPR 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: 2022. 05. 31. 6:54:42

Use NTP:

NTP servers:

NTP status: 10m 144.76.181.102

Maintenance

Reboot:

Factory reset:

Firmware:
Current firmware version: 1.1.0.266

ANPR engine:
Current ANPR engine: 7.3.14.102 EUR

License:

Date & time settings

The device'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 **[Set local time]** 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**. Use at least a local NTP server if you manage more than one camera and/or use integration via API/HTTP/FTP/etc.

Important!

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

NTP status shows the current status of each configured NTP server. The color indicates the state of the server and the value is the delay until synchronization is performed again.

Color states are the following:

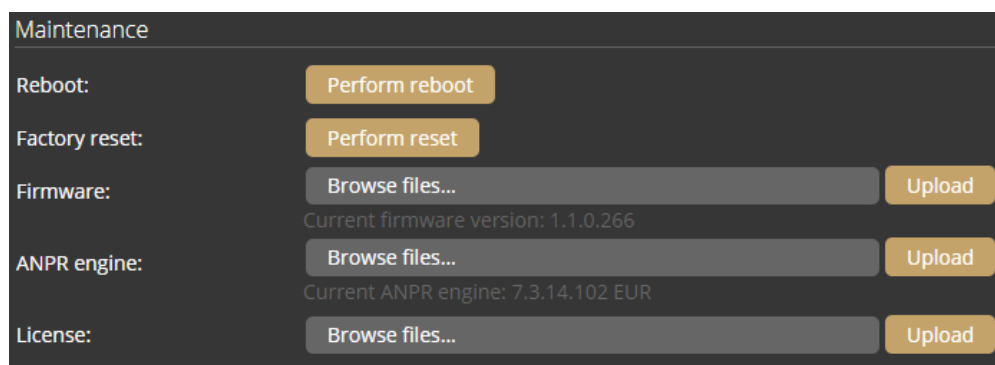
Red: Server is not suitable or unreachable.

Green: Server is working and used for synchronization.

Gray: Server is not used because there is a better alternative.

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 device asks a security question whether you are sure about the modification. Choosing [**No**] interrupts the update process, and the device operates with the previous settings. If you opt for [**Yes**], the update continues. Updating and rebooting the device may take a few minutes.

Important!

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

To use the device with the on-board ANPR function, license file and engine file must be uploaded to the device.

7.3. SYSTEM / NETWORK

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

Default DNS: 8.8.8.8

The screenshot shows the network configuration interface. At the top, there are tabs for 'Settings' and 'Monitoring'. Under 'Settings', there are fields for 'DNS servers' with values '1.1.1.1' and '8.8.8.8', and a 'DNS search domain' field with an 'Add' button. The 'Default interface' is set to 'Wired connection'. A 'Save' button is visible. Below this, the 'Interfaces' section is shown, with 'Wired connection' selected. It displays the 'MAC address' as '48:B0:2D:3E:8F:C6'. The 'Mode' is set to 'Static address' (with 'DHCP' also visible). The 'Fallback to static' option is a toggle switch that is currently turned off. Under 'Static address', there are input fields for 'Address' (192.168.2.171), 'Netmask' (255.255.255.0), and 'Gateway' (192.168.2.10). A 'Save' button is at the bottom. To the right, 'Current address' information is shown: '192.168.6.146' with 'Subnet: 255.255.254.0' and 'dhcp', and '169.254.143.198' with 'Subnet: 255.255.0.0' and 'static'.

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.

Put the Carmen Box device and your camera in the same network segment.

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.

The screenshot shows the 'Monitoring' tab with two sections:

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 name and password 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 the device.
2. **User:** The user can view but not edit the parameters of the device. Some pages containing sensitive information may be hidden.
3. **Operator:** The operator has the same privileges as a user.

The screenshot shows the 'Users' management interface with the following table:

Username	Role		
admin	Administrator	Edit	Delete
user	User	Edit	Delete

There is also a 'New user' button at the bottom left of the table.

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 device blocks the IP address of 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.

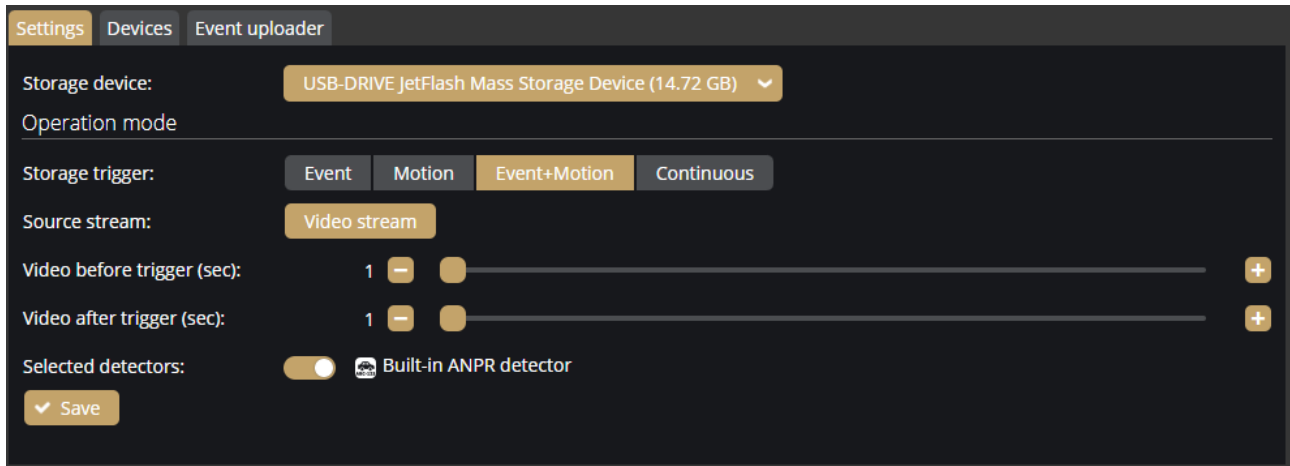
The screenshot displays the 'Sessions' tab in the Carmen Box interface. It features a 'Lockout policy' section with a slider for 'Maximum attempts' set to 3 and a dropdown for 'Block duration' set to 1 minute. Below this is a 'Save' button. The 'Active sessions' section contains a table with columns for Client, User, and Last seen. The 'Blocked clients' section is currently empty, showing 'No clients are blocked'.

Client	User	Last seen
192.168.135.232	admin	2 minutes 24 seconds
192.168.135.232	admin	2 minutes 24 seconds
169.254.255.248	admin	now
192.168.135.232	admin	2 minutes 24 seconds

Client	Blocked for
No clients are blocked	

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 selected detector(s).
- **Motion**: When the device 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)

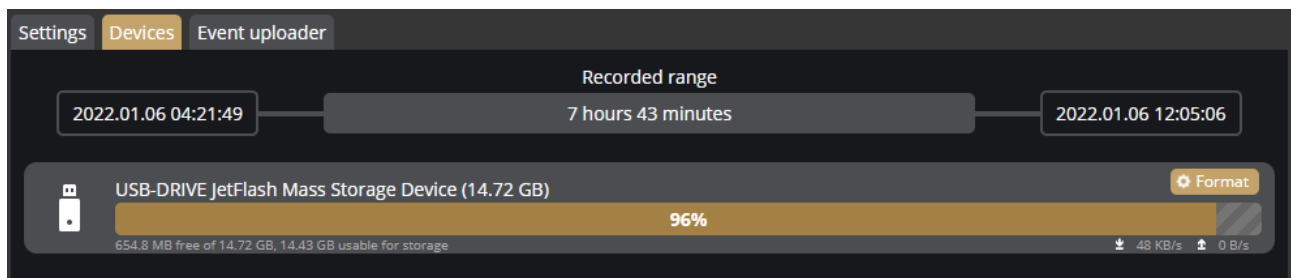
The recording time (in seconds) before and after the events can be regulated with the help of the sliders.

Selected detectors

It may not be necessary to record at every detector signalling. Thus, the user can select which detector signal(s) should trigger the recording.

Devices

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



Formatting the storage device

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 storage device.

Setting the GDS upload

Enable the upload to the GDS (Globessey Data Server) at **Upload mode**, then enter the required data to set the GDS server. A storage device is required for GDS upload to work. The uploader sends data only from previously stored content.

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.
- **Reset Uploader:** Resets the uploader progress to the current date. Event that are older and not yet uploaded will be ignored.

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 tabs for 'Settings', 'Devices', and 'Event uploader'. The 'Upload mode' is set to 'GDS'. Under 'GDS settings', the 'Server' is '192.168.6.80', 'Port' is '8888', 'Path' is 'gate', and 'Username' is 'primula'. The 'Table name' is 'multi_event'. The 'Auto obtain user' toggle is turned on. There is a 'Reset Uploader' button and a 'Save' button. The 'Uploader status' section shows the target as 'gds://primula@192.168.6.80:8888/gate#multi_event', the position as '2022.10.28 08:49:42', and the status as 'Success'. A progress bar at the bottom shows '0%'.

Setting the HTTP(S) upload

Enable the upload to the HTTP/HTTPS POST at **Upload mode**, then enter the full URL of the web service to set the HTTP event receiver. A storage device is required for HTTP(S) upload to work. The uploader sends data only from previously stored content.

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

The screenshot shows a dark-themed interface with the following elements:

- HTTP/HTTPS POST settings:**
 - Server:** A text input field containing `http:192.168.2.111:8083/ar_http_upload.php`.
 - Upload images:** A toggle switch that is turned on.
 - Upload cropped images:** A toggle switch that is turned on.
 - Upload videos:** A toggle switch that is turned on.
 - Reset Uploader:** A button labeled "Reset uploader".
 - Media content sent with:** Two radio buttons: "Name" (selected) and "Name and filename".
 - Save:** A button with a downward arrow and the text "Save".
- Uploader status:**
 - Target:** HttpPost: `http:192.168.2.111:8083/ar_http_upload.php`
 - Position:** n/a
 - Status:** Success
- Nothing to upload:** A message displayed in a shaded bar at the bottom of the status section.

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

Reset Uploader. Resets the uploader progress to the current date. Event that are older and not yet uploaded will be ignored.

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

Setting the FTP upload

Enable the upload to the FTP at **Upload mode**, then enter the required data to set the FTP upload. A storage device is required for FTP upload to work. The uploader sends data only from previously stored content.

The following fields should be defined:

- **Protocol:** the services that are supported by the uploader (FTP(ES), FTPS, SFTP) can be selected
- **Server:** IP address (IPv4) or hostname of the FTP server
- **Port:** the service's port where it listens to requests
- **Username/password:** Username and password required for the identification
- **Reset Uploader:** Resets the uploader progress to the current date. Event that are older and not yet uploaded will be ignored.

With the **[Start test]** button you can test the connection between the camera and the FTP server.

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

The screenshot shows a dark-themed interface with the following sections:

- FTP settings:**
 - Protocol: (dropdown)
 - Server:
 - Port:
 - Path:
 - Username:
 - Password:
 - Upload videos:
 - Test settings:
 - Reset Uploader:
 -
- Uploader status:**
 - Target: ftp://192.168.2.111:21/events/3df204/2022-10-28/
 - Position: n/a
 - Status: Success

A progress bar at the bottom indicates "Nothing to upload".

7.6. I/O

In the I/O menu you can modify the input and output settings of the added ONVIF devices, the trigger configuration and you can monitor the state changes of the input/output ports at IO log section.

Inputs		Outputs	
Port	Idle state	Active state	
ONVIF_DigitalInput_DS-2CD2683G2-IZS_AlarmIn_1	High	Low	Edit
ONVIF_DigitalInput_Einar-5T_IN_0	High	Low	Edit

IO log		
08:05:12	ONVIF_DS-2CD2683G2-IZS_AlarmOut_0	Port has been deactivated
08:05:17	ONVIF_DigitalInput_DS-2CD2683G2-IZS_AlarmIn_1	Port has been deactivated
14:09:36	ONVIF_Einar-5T_OUT_0	Port has been deactivated
14:09:36	ONVIF_DigitalInput_Einar-5T_IN_0	Port has been activated

On the input side, you can change the Auto-restore timeout value. If the Input stays in 'Active' state more than the given timeout in milliseconds then it will be restored to 'Deactive' state.

Edit port ONVIF_DigitalInput_DS-2CD2683G2-IZS_AlarmIn_1

Port: ONVIF_DigitalInput_DS-2CD2683G2-IZS_AlarmIn_1

Auto-restore timeout (ms): ? [-](#) [+](#)

[Save](#) [Cancel](#)

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

Inputs		Outputs			
Port	Idle state	Active state	Mode	Active	
ONVIF_DS-2CD2683G2-IZS_AlarmOut_0	Closed	Open	Impulse: 2000 ms	No	Edit Toggle
ONVIF_Einar-5T_OUT_0	Open	Closed	Impulse: 500 ms	No	Edit Toggle

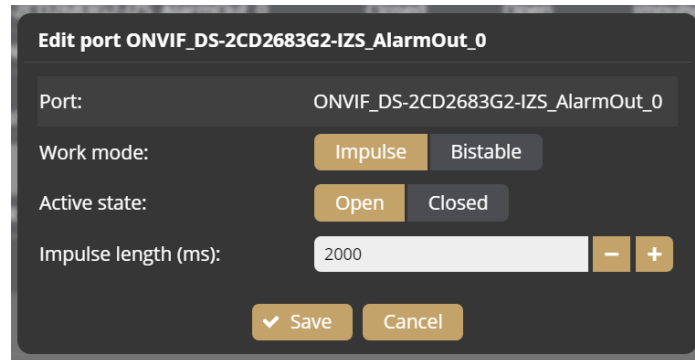
Trigger configuration		
Detector	Ports	
IO detector	none	Edit
Motion detector	none	Edit
Built-in ANPR detector	none	Edit

[Save](#)

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

- **Work mode:** Impulse or Bistable
- **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.



Edit port ONVIF_DS-2CD2683G2-IZS_AlarmOut_0

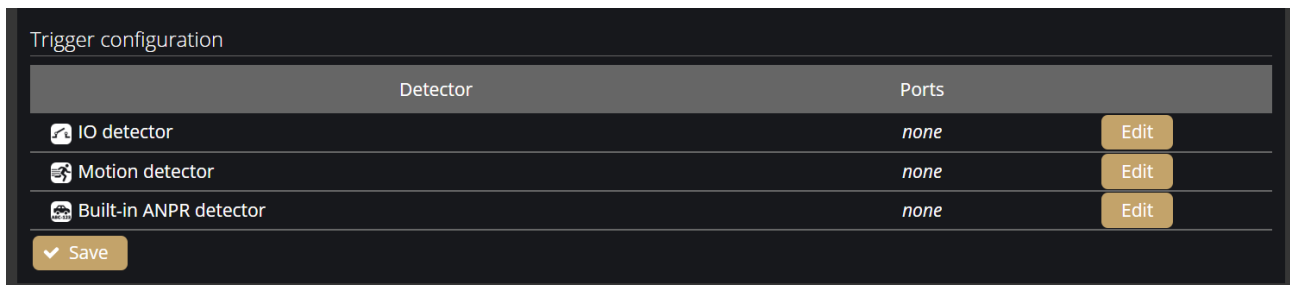
Port: ONVIF_DS-2CD2683G2-IZS_AlarmOut_0

Work mode: Impulse Bistable

Active state: Open Closed

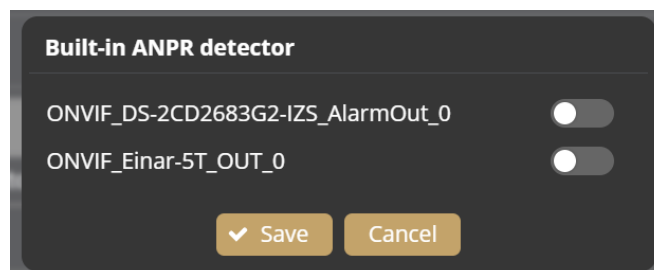
Impulse length (ms):

The detectors configured in the Analytics/Detectors menu can be associated to the Ports of the added ONVIF device in the Trigger configuration menu. (You can add an ONVIF device in the **External** menu.) For some cameras, the IO port must also be enabled separately on the camera.



Detector	Ports	
IO detector	none	<input type="button" value="Edit"/>
Motion detector	none	<input type="button" value="Edit"/>
Built-in ANPR detector	none	<input type="button" value="Edit"/>

Select which ONVIF device the Detector should be associated with.



Built-in ANPR detector

ONVIF_DS-2CD2683G2-IZS_AlarmOut_0

ONVIF_Einar-5T_OUT_0

7.7. SYSTEM / SERVICE

Webserver

- **Service port / Secure service port:** The service ports of the Webserver 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.

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.

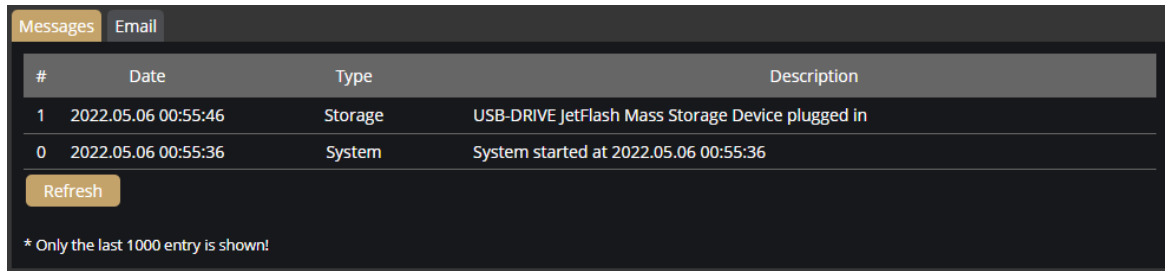
The screenshot displays a configuration panel with a dark background and light text. It is organized into sections for different services:

- Webserver:** Contains two input fields. The first is labeled "Service port:" and contains the value "80". The second is labeled "Secure service port:" and contains the value "443".
- RTSP:** Contains two controls. The first is labeled "Service port:" and contains the value "554". The second is labeled "Authentication required:" and has two toggle buttons: "Disabled" (grey) and "Enabled" (orange).
- UPnP:** Contains one control labeled "Allow discovery:" with two toggle buttons: "Disabled" (grey) and "Enabled" (orange).
- IVS ?**: Contains one input field labeled "Service port:" with the value "53539".

At the bottom of the panel is a "Save" button with a downward-pointing chevron icon.

7.8. SYSTEM / NOTIFICATIONS

In the **Messages** tab of this configuration interface, you can find system messages of the device.



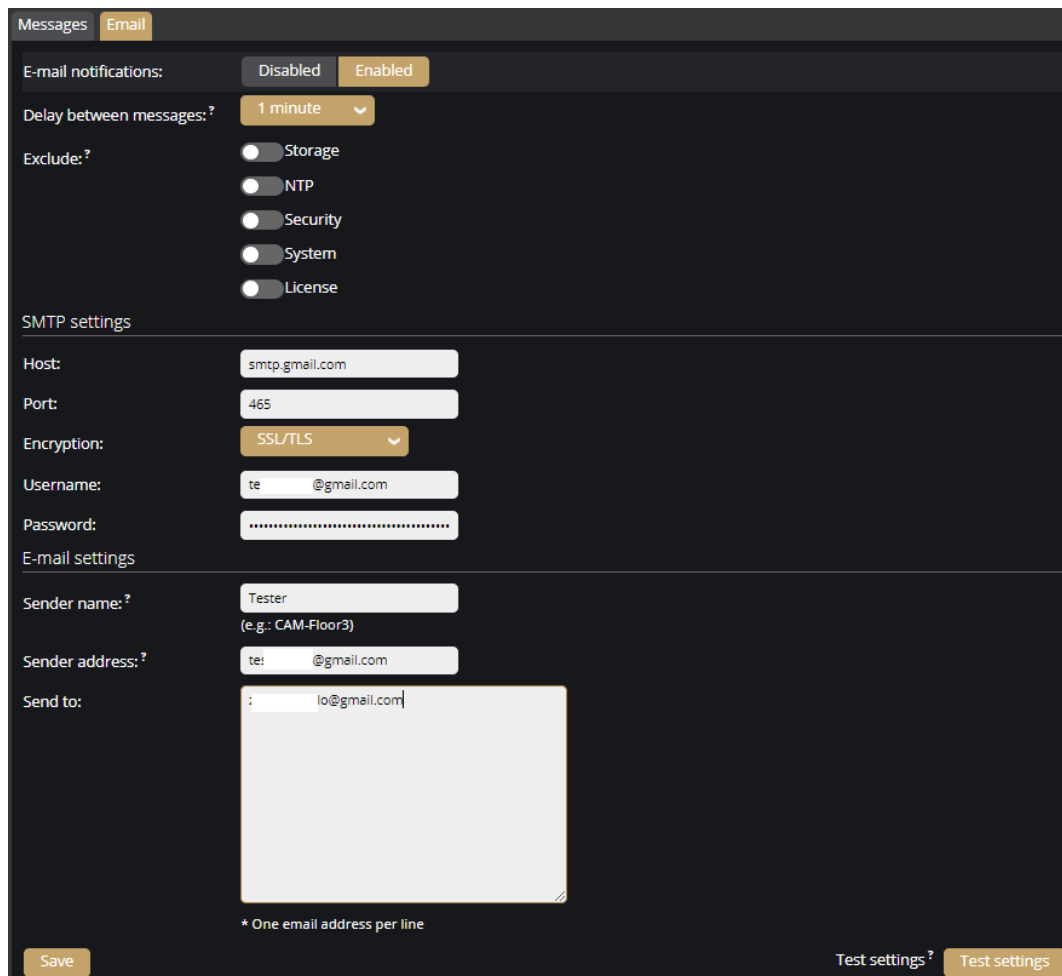
#	Date	Type	Description
1	2022.05.06 00:55:46	Storage	USB-DRIVE JetFlash Mass Storage Device plugged in
0	2022.05.06 00:55:36	System	System started at 2022.05.06 00:55:36

Refresh

* Only the last 1000 entry is shown!

In the **Email** tab, you can specify the email settings for sending messages. The following parameters can be adjusted after clicking on the **[Enabled]** button:

- **Delay between messages:** After sending an email, the device will wait at least the selected duration before it can send another email.
- **Exclude:** Notification types selected here are excluded from the email messages.
- **SMTP settings:** enter the required data to set the access of the SMTP service.
- **E-mail settings:** set the display name and the email address that the device uses when sending email messages. The "Send to" field is used to set the recipients.



Messages **Email**

E-mail notifications: Disabled Enabled

Delay between messages: 1 minute

Exclude: Storage NTP Security System License

SMTP settings

Host: smtp.gmail.com

Port: 465

Encryption: SSL/TLS

Username: te@gmail.com

Password:

E-mail settings

Sender name: Tester
(e.g.: CAM-Floor3)

Sender address: te@gmail.com

Send to: lo@gmail.com

* One email address per line

Save Test settings? Test settings

7.9. EXTERNAL

You can manage the associated Onvif devices in the External menu. You can add a new device, edit the data of existing devices and delete a device.

State	Address	User	Model	Serial	Name	Capabilities
Online	192.168.6.240	admin	IPC-01-T	221D223	Einar-5T	Video I/O Edit Remove
Online	192.168.7.50	admin	DS-2CD2683G2-IZS	DS-2CD2683G2-IZS202...	DS-2CD2683G2-IZS	Video I/O Edit Remove

New device

For the added ONVIF device the Video button will only appear if the device does support a video channel. The IO button only appears if the added ONVIF device supports IO. Clicking on the Video or IO button will switch to that menu item.

The following should be set when adding a new device:

- **Name: (optional):** The name of the device can be entered.
- **Address:** IP address where the device is accessible.
- **ONVIF Username:** The device's ONVIF username.
- **ONVIF Password:** The device's ONVIF password.

New device

Name (optional):

Address:

ONVIF Username:

ONVIF Password:

Note

For many cameras, the ONVIF Username and Password do not match the username and password used in the browser. ONVIF may also need to be enabled on the camera.

7.10. MEDIA / VIDEO

When clicking on the **Video** menu item, the video stream of the connected camera can be specified by filling in the field. Above these, the live stream of the connected camera remains visible.

Video input

The following parameters can be set:

- **RTSP source:** Select the streams of the added ONVIF devices from the list or select **Manual** option. If select the **Manual** option, enter the video stream url of the connected camera. Carmen Box can receive H.264 stream only. Put the Carmen Box device and your camera in the same network segment.
- **RTP over RTSP:** Determines the channel which is used to send video. Enable this option to use the reliable TCP connection.
- **User authentication:** If Carmen Box needs authentication to receive video stream from the connected camera, select „Enabled” and fill in the „User” and „Password” fields.

Some examples of RTSP source field values in case of different manufacturers:

AR Vidar, MicroCam:

```
rtsp://Camera_IP/stream/h264
```

Intellio Visus:

```
rtsp://Camera_IP:554/primary/h264
```

```
rtsp://Camera_IP:554/secondary/h264
```

Intellio Initio:

```
rtsp://Camera_IP:554
```

AXIS:

rtsp://Camera_IP/axis-media/media.amp

rtsp://Camera_IP:554/axis-media/media.amp?videocodec=h264&camera=1&fps=15&resolution=1920x1080

rtsp://Camera_IP:554/onvif-media/media.amp?profile=profile_1_h264&sessiontimeout=60&stream-type=unicast

rtsp://Camera_IP:554/onvif-media/media.amp?profile=profile2&sessiontimeout=60&stream-type=unicast

(tested with AXIS P1447-LE, Firmware version: 9.10.1)

Bosch:

rtsp://Camera_IP:554/rtsp_tunnel?p=0&h26x=4

rtsp://Camera_IP:554/rtsp_tunnel?p=1&inst=2&h26x=4

(tested with NBE-5503-AL, Firmware version: 6.60.0065)

Dahua:

Main stream:

rtsp://Camera_IP:554/cam/realmonitor?channel=1&subtype=0&unicast=true

rtsp://Camera_IP:554/live

Sub streams:

rtsp://Camera_IP:554/cam/realmonitor?channel=1&subtype=1&unicast=true (if Sub Stream 1 is enabled in the camera)

rtsp://Camera_IP:554/cam/realmonitor?channel=1&subtype=2&unicast=true (if Sub Stream 2 is enabled in the camera)

(tested with IPC-HDBW4431E-ASE, FW: 2.460.0000.14.R, Build Date: 2017-07-20)

Hanwha:

rtsp://Camera_IP/profile2/media.smp

(tested with PNO-A6081R, FW: 2.11.02_20210630_R206)

Hikvision:

Main stream:

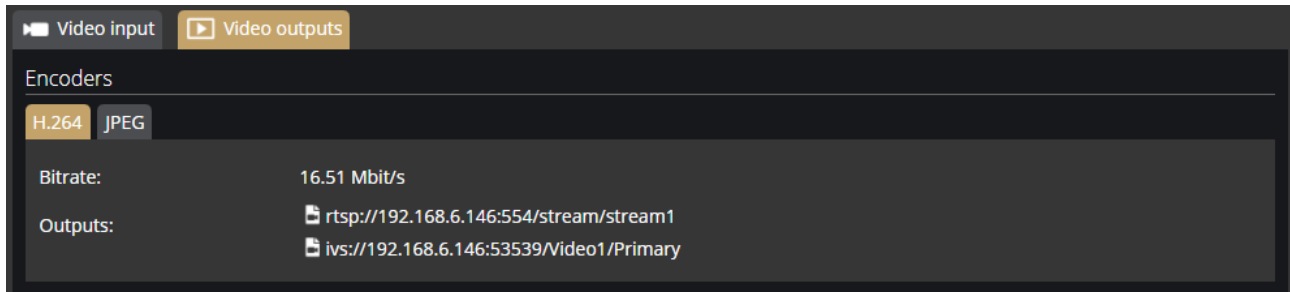
rtsp://Camera_IP:554/Streaming/Channels/101

Sub stream:

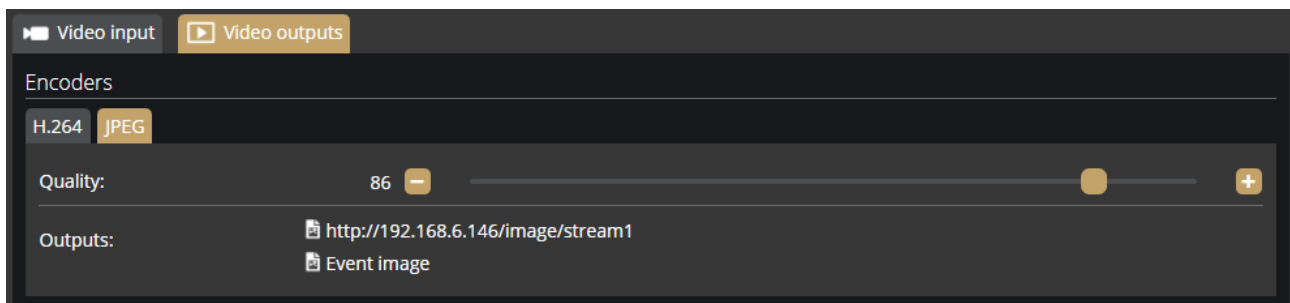
rtsp://Camera_IP:554/Streaming/Channels/102

Video outputs

Carmen Box can transfer the incoming video stream with a slight delay. These stream urls can be seen here.



JPEG still images can be accessed with the following url, and event image quality can be set here.



Videostream / image URL links can be found on this interface, such as:

H.264 stream: `rtsp://CARMEN_BOX_IP:554/stream/stream1`

JPEG image: http://CARMEN_BOX_IP/image/stream1

7.11. ANALYTICS / SETTINGS

Status

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

The screenshot shows the 'Status' tab in the Settings window. It contains two tables:

Detector	Type	ID	State
Test detector	Test detector	{BD4F8FF1-0F36-497B-2B3C-F242E93D22E5}	✓
Built-in ANPR detector	ANPR detector	{6581BEAB-7B68-9043-824A-DC5F1335E8F5}	✓

Type	Currently active	Maximum supported
Test detector	1	16
ANPR detector	1	16

7.12. ANALYTICS / DETECTORS

You can add, modify or delete the device's detectors in this window.

7.12.1. Motion engine and general use of masks

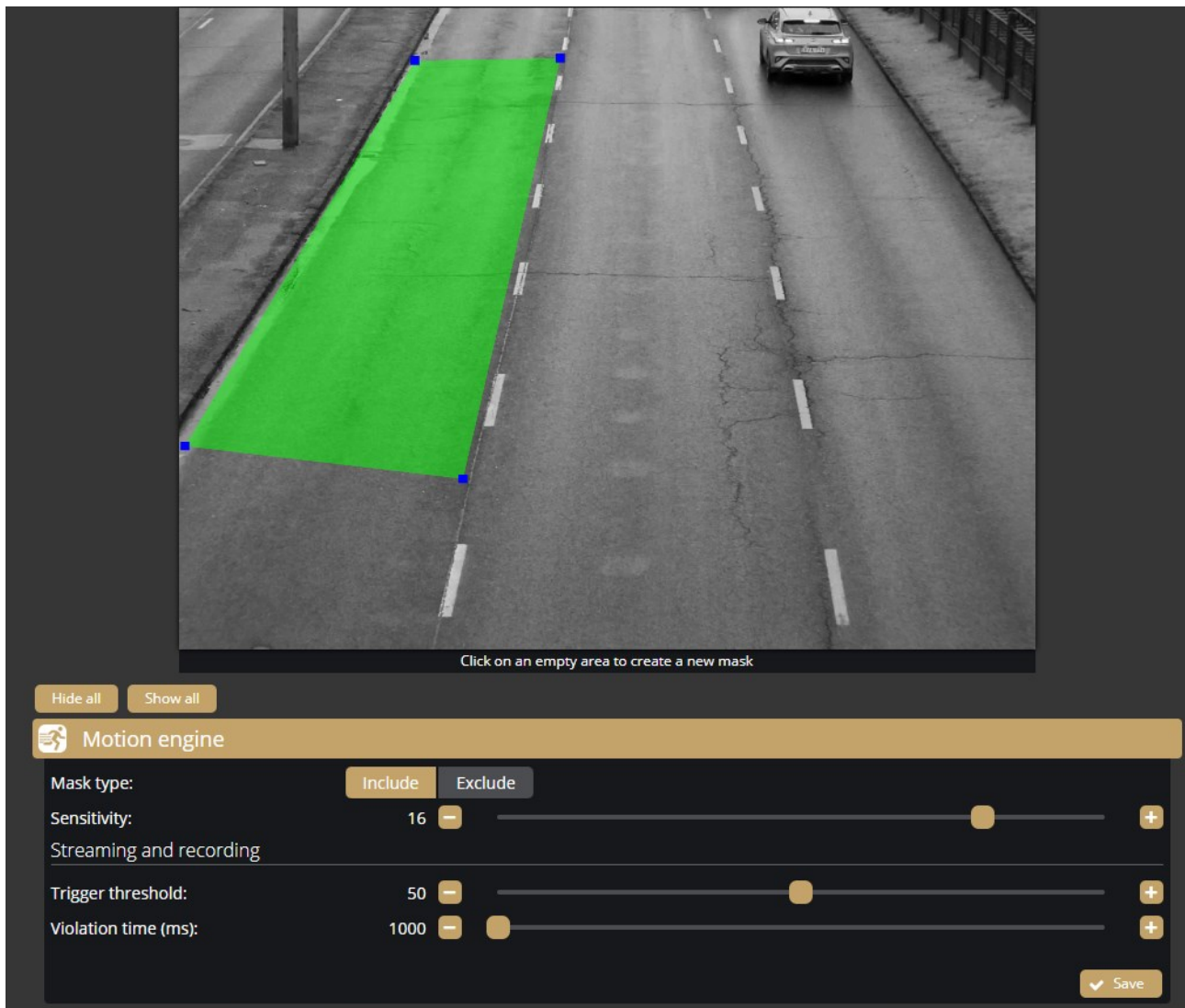
The Motion engine is a fundamental engine that regulates motion-based storage. It cannot be deleted.

Note

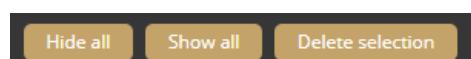
The Motion engine does not induce events; it is responsible for the setting of the motion-based recordings.

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.



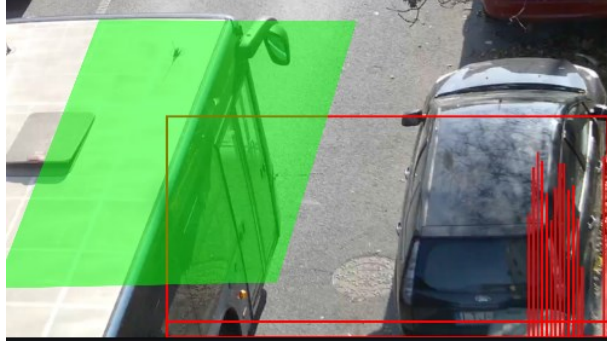
The mask can be deleted by clicking on the **[Delete selection]** button located under the live stream:



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 graph" is the OSD belonging to the setting, which can provide visual assistance. See also **{Overlay}**.

Violation time (ms): The time between sensing movement and the alarm event. If the movement stops during the masked area during this time, the alarm will not sound.



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.
- **Violation time (ms):** The time between sensing movement and the alarm event. If the movement stops during the masked area during this time, the alarm will not sound.

Motion detector Motion

Name:

Description:

Trigger threshold: 50

Violation time (ms): 1000

ANPR Engine and ANPR Detector

The ANPR Engine and the ANPR Detector(s) jointly perform the reading of license plates.

! Important!

Both the ANPR Engine and an ANPR Detector must be present and enabled on the device to operate the system. The mask of the ANPR Engine and the mask(s) of the ANPR De-tector(s) must have a common area where the detected license plate number will trigger an event.

7.12.3. ANPR engine

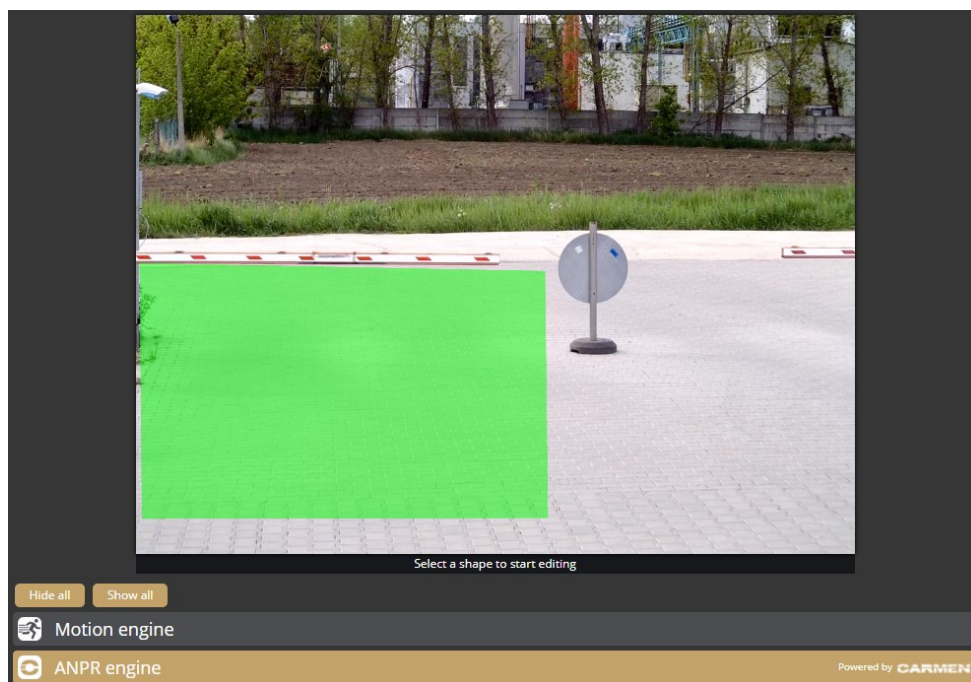
You can choose between the Onboard ANPR Engine running on the device or the Carmen Cloud service for license plate recognition.

You can create a mask on the image, after which license plates will be detected only in the selected area. It is recommended to define the area where license plates are expected to appear in the image with the proper character size, and from the proper angle of view (the license plate should be visible from as straight direction as possible, and should not be distorted or slanted).

The expected area of license plates can be plotted on the image with a polygon that contains a gi-ven 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 engine 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. See also *{Overlay}*.
- **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.
- **Color recognition:** When color recognition is active, the device will attempt to identify the plate and/or vehicle colors. This may slow down the speed of recognition.
- **Make & Model recognition:** When make and model recognition is active, the device will attempt to identify the make, model and color of the vehicle. This may slow down the speed of recognition.
- **Detect direction:** Attempt to detect direction of the vehicle movement by license plate. Enabling this option license plates will only be recognized after 2 successful recognition.
- **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.
- **Traffic type:** Type of traffic the device processes. Some engines contain more than one recognition possibility. If the uploaded engine supports „Quick“ recognition mode, you can select it as „SlowTraffic“ mode.



ANPR engine Powered by **CARMEN**

Type: Onboard ANPR Cloud

Engine: 7.3.14.160 EUR

Status: Ready

Minimum confidence: 41%

Ignore same plate for (s):

Color recognition: Disabled Enabled

Make & Model recognition: Disabled Enabled

Detect direction: Disabled Enabled

Country preference: HUN

Traffic type: Stop & go Slow traffic

Trigger modes: Onboard Plate Finder Software (API) Hardware (GPIO port)

Software trigger options

Stop on first recognition:

Hardware trigger options

Input port:

Input port action: State Impulse

Stop on first recognition:

Read count on impulse: 1

In the case of **Carmen Cloud**, the license plate recognition is not processed in the device. Instead, images with license plates are selected in the device 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:

- **State:** You can enable or disable the ANPR engine to send license plate images to ANPR Cloud.
- **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 engine 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. See also *{Overlay}*.
- **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.

- **Color recognition:** When color recognition is active, the device will attempt to identify the plate and/or vehicle colors. This may slow down the speed of recognition.
- **Make & Model recognition:** When make and model recognition is active, the device will attempt to identify the make, model and color of the vehicle. This may slow down the speed of recognition.
- **Detect direction:** Attempt to detect direction of the vehicle movement by license plate. Enabling this option license plates will only be recognized after 2 successful recognition.
- **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.

ANPR engine Powered by **CARMEN**

Type: [?] Onboard ANPR Cloud

State: Disabled Enabled

Status: Ready

Minimum confidence: [?] 41%

Ignore same plate for (s): [?] 10

Color recognition: [?] Disabled Enabled

Make & Model recognition: [?] Disabled Enabled

Detect direction: [?] Disabled Enabled

ANPR Cloud URL: [?]

ANPR Cloud key: [?]

Trigger modes: [?] Onboard Plate Finder Software (API) Hardware (GPIO port)

Software trigger options

Stop on first recognition: [?]

Hardware trigger options

Input port:

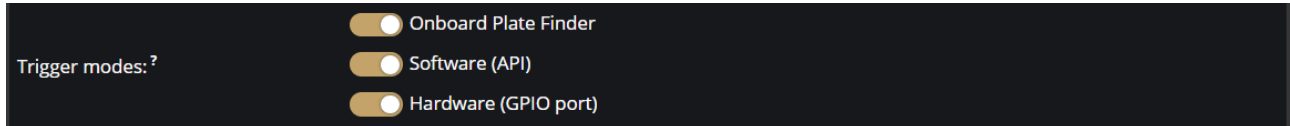
Input port action: [?] State Impulse

Stop on first recognition: [?]

Read count on impulse: 1

Trigger modes

By default the engine uses the on-board license plate finder to search for possible license plate locations before trying to detect license plates. This behaviour can be changed to use external triggers by configuring the **Trigger Mode** option.

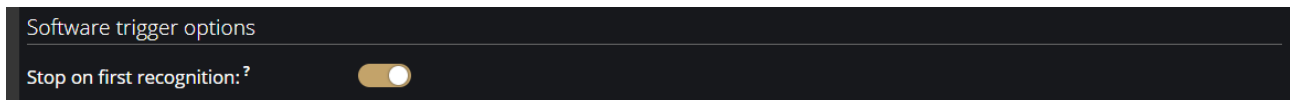


Available trigger modes are:

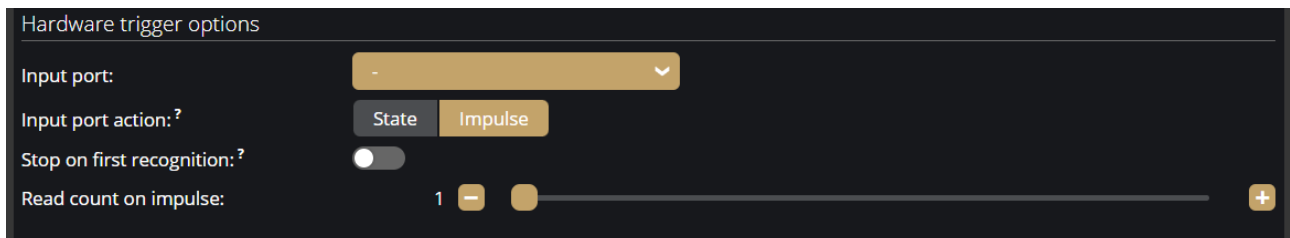
On-board Plate Finder: Engine is triggered automatically by the on-board license plate finder

Software (API): Engine can only be triggered using an API call (Analytics/TriggerEngine). See also API documentation in *{System / Status}*

Hardware (GPIO port): Input settings for the added ONVIF device can be specified.



Stop on first recognition: Any further license plate detection is stopped after the first successful plate detection.



Input port: Select the input port of the added ONVIF device.

Input port action: Activation on input port can trigger detection as follows:

- **State:** License plate detection runs continuously while the port is active.
- **Impulse:** Activation of the port triggers a set number of the detections. License plate detection runs until the set number of license plates are successfully recognised.

Stop on first recognition: Any further license plate detection is stopped after the first successful plate detection.

Read count on impulse: Specify the number of reads per impulse.

7.12.4. ANPR detector

ANPR detector(s) is responsible for creating events from the results of the ANPR Engine.

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

Important!

The ANPR detector must be defined separately. The primary functions of the license plate recognition 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 Carmen Box logo and the text 'Built-in ANPR detector' and 'ANPR'. The form contains the following fields:

- Name:** A text input field containing 'Built-in ANPR detector'.
- Description:** A text input field containing 'Signals on license plates based on a filter'.
- Filter:** Two radio buttons, 'Disabled' (selected) and 'Enabled'.

At the bottom right, there are two buttons: 'Save' (with a checkmark icon) and 'Disable'.

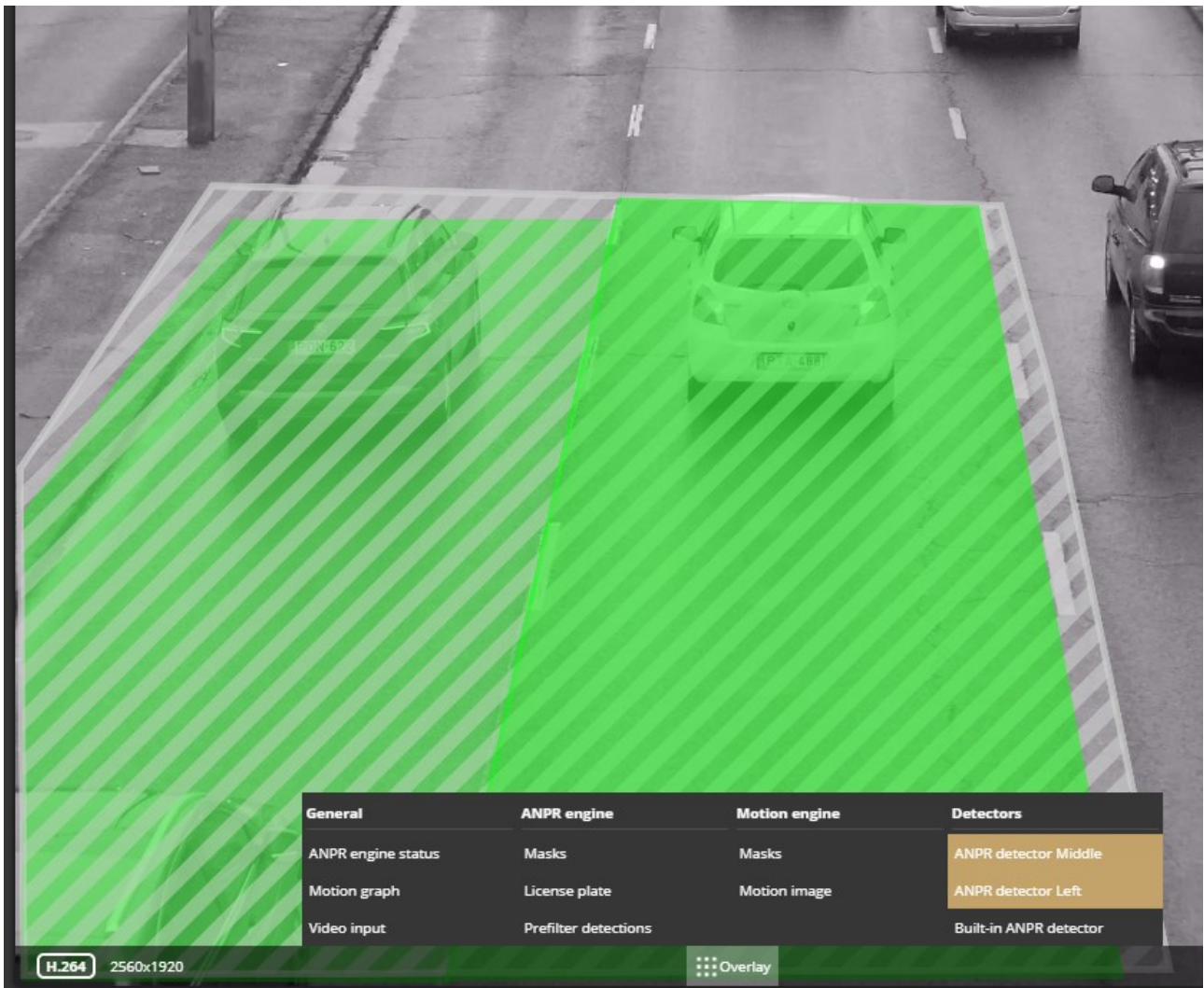
You can create additional ANPR detector(s) in addition to the Built-in ANPR detector. For example, by enabling filters and adding license plates to them, you can activate different detectors when certain license plates are detected, thus affecting the storage of the given group, or the detector's mana-geability. In the example below, the „ANPR detector MSNLP” is triggered if a license plate containing M, S, N, L or P characters are detected.

The screenshot shows the configuration interface for the 'ANPR detector MSNLP'. The title bar includes the Carmen Box logo and the text 'ANPR detector MSNLP' and 'ANPR'. The form contains the following fields:

- Name:** A text input field containing 'ANPR detector MSNLP'.
- Description:** A text input field containing 'Signals on license plates based on a filter'.
- Filter:** Two radio buttons, 'Disabled' and 'Enabled' (selected). Below them is a text area containing the following filter rules:
 - *M*
 - *S*
 - *N*
 - *L*
 - *P*
- Allowed license plate:** A large empty text area.

To the right of the filter text area, there is a note: 'Enter one filter per new line. Supports wildcard for single (?) and multiple (*) characters (e.g. ABC?23). Supports country codes with forward slash (e.g. GB/ABC123).' At the bottom right, there are three buttons: 'Save' (with a checkmark icon), 'Disable', and 'Delete'.

The individual masks defined in the different detectors can be used to determine where the recognised license plate appeared. In the example below, a separate detector generates the license plates detected in the left lane and the license plates detected in the middle lane. The ANPR Engine mask must have a common intersection with both detectors. This can be checked by activating the corresponding OSD layer(s).

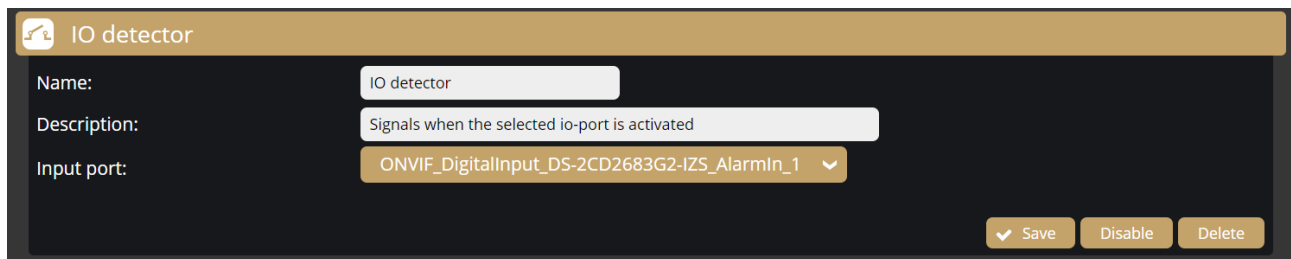


7.12.5. IO detector

The IO detector can be used to create events based on the input signals from the added ONVIF device. You can add a new ONVIF device in the System/ External menu.

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

- **Name:** The name of the detector can be entered.
- **Description:** A brief description can be added to the detector.
- **Input port:** The selectable the added ONVIF device



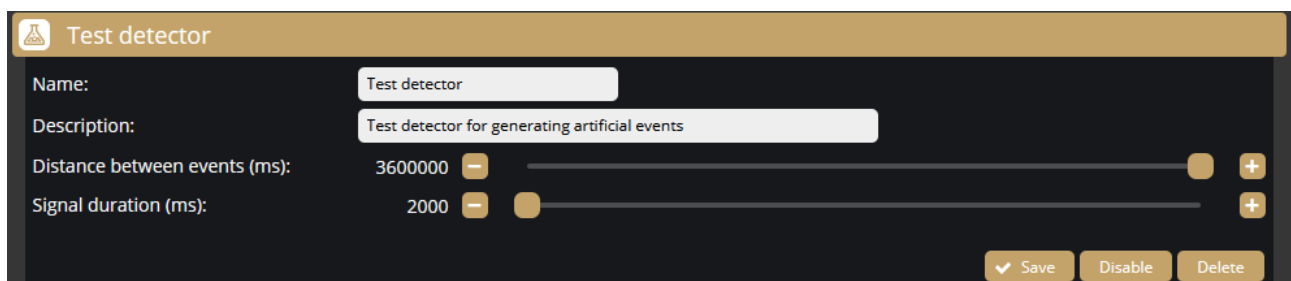
The screenshot shows the 'IO detector' configuration window. It has a title bar with a gear icon and the text 'IO detector'. Below the title bar, there are three input fields: 'Name:' with the value 'IO detector', 'Description:' with the value 'Signals when the selected io-port is activated', and 'Input port:' with a dropdown menu showing 'ONVIF_DigitalInput_DS-2CD2683G2-IZS_AlarmIn_1'. 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 device's upload and storage capabilities. We recommend to use it for testing purposes only, not to put unnecessary load to the SD card and the device.

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 device produces a test event at the set intervals.
- **Signal duration:** To adjust the signal length.



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

8. HOW TO USE THE CARMEN BOX

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

8.1. DEVICE INSTALLATION

1. Mount the device into a weatherproof cabinet near the connected camera or place it in your server room. Consider the temperature tolerance and IP protection of the device (-30°C to +60°C; IP40).
 - a. Provide uninterruptible power to the device's **power supply**. The Carmen Box device cannot work with PoE power supply. However it can provide PoE power to the connected camera.
 - b. Use the **LAN port** on the device to connect the device to your network.
 - c. Use the **PoE port** on the device to power and communicate with the connected camera. If your camera is far from the device on the network, and it is not connected to the device directly, use either port.
 - d. To **store events** in the device, plug an USB drive into the device's USB3 port or use microSD card inserted inside the device.
 - e. Carmen Neural Network Controller is installed in the device (miniPCIe format). Do not plug more Carmen NNC (eg. USB dongle) into the device.
2. **Find the device on the network**, then access the device's web interface
 - a. From the MAC address of the device, 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 device will also get an IP address from the DHCP server. You can access the device from both IP addresses.
 - b. Optionally, you can use the **AR Device Tool** to locate the device on your local network *{AR Device Tool}*.
 - c. You can access the web interface of the device with the **admin/admin** username/password pair. It is strongly recommended to change the default password.
3. Mount your camera or adjust your existing camera as follows:
 - a. The maximum angle of rotation and/or tilt of the camera should not exceed **25–30 degrees**.

- b. 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.
 - c. The camera should be **at least one meter above the headlights** of vehicles. If possible, it should not be accessible without an assistive device.
 - d. In the image, **the license plate should be horizontal**.
 - e. Adjust the camera lens angle of view so that the characters on the license plate are **at least 25 pixels high**. Consider whether you want to recognize license plates with smaller 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 engine status" OSD layer in Live View and look at the "Avg. char height" to see the character size *{Overlay}*.
 - f. 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.
 - g. 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.
4. Some simple but important basic settings:
- a. Upload the **ANPR Engine file, and License Key** to your device *{System / Device}* according to the email received when you purchased the device. Check the ANPR Engine quarterly to ensure that the device is always running with the latest version of the engine. You will also need to update the License Key for updates after a year. You need to see in the *{System / Status}* menu that your License key is present („License key: CARMEN SPI – xxxxxx" or „USB key - xxxxxxx") and your licence corresponds to the desired region (push the „ANPR License" button and the popup window shows the region and the validity time of the license).
 - b. Check that the **device has the latest firmware**. You can download the latest FW from [Adaptive Recognition website](#) or use AR DEvice Tool. Upload it in *{System / Device}*.
 - c. Check/set the **device 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 (3) in this chapter}*.
 - e. With the above steps and proper camera settings, you will get **license plate reading results**. These events will be listed in the Live interface below the live image.
 - f. After changing any settings (eg.: the field of view, position, direction of the camera, resolution, etc.) **restart** the device to reset internal statistics.

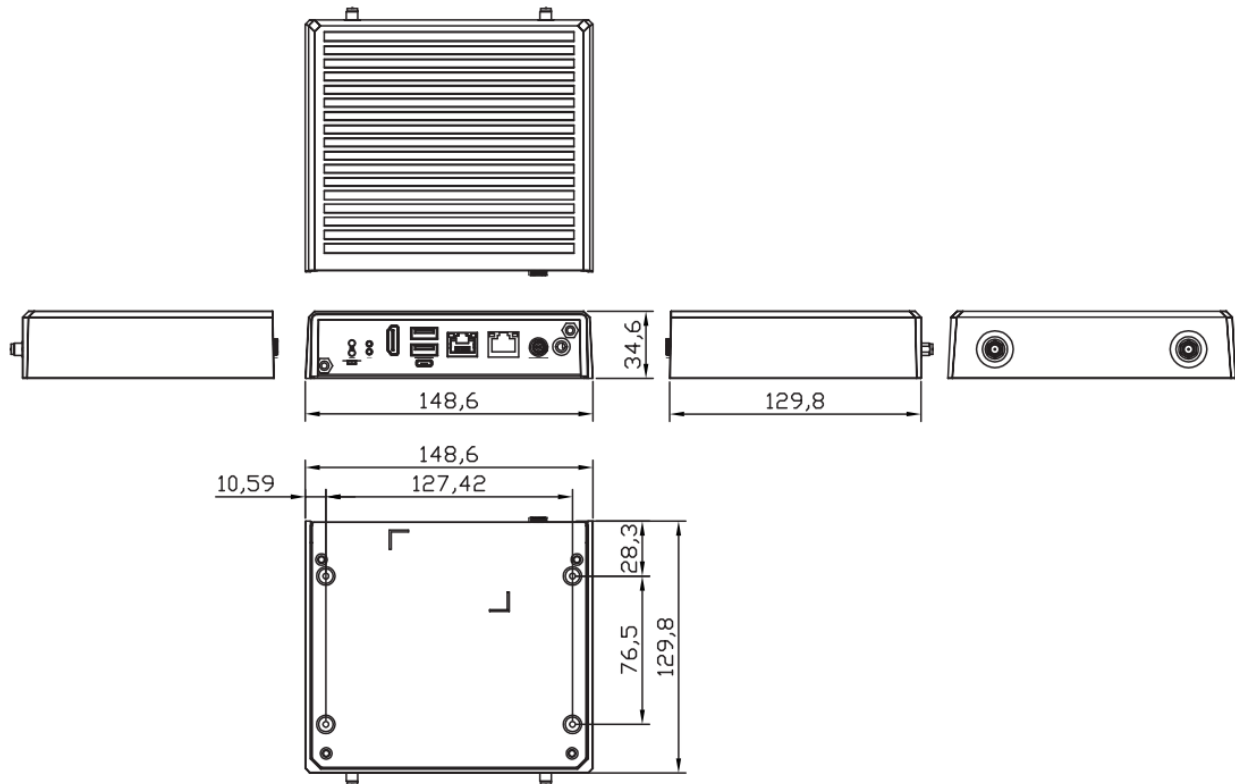
5. Fine-tuning

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.

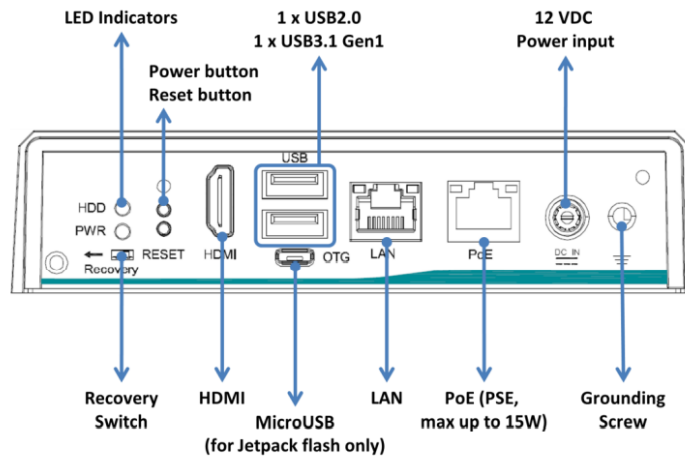
- a. Set your camera **image setting parameters** to as perfect as possible for ANPR. Take into account the location you are observing and, most importantly, make sure the license plates are legible. Check the good visibility of the license plates for a few days after the camera installation, during 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/FOV** of your camera. The pixel size of the license plate characters' has to be in the mentioned range (**min. 25 pixels**). You may need to increase the bandwidth of the video stream if the characters cannot be seen well.
- 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 device 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 license plates - with the proper character size, and from the proper angle of view - using a mask. This will increase the possibility of speeding up the license 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 internal operation of the device, changes of device's parameters, etc. We suggest displaying at least the **General/ANPR engine status** layer during device setup **{Overlay}**. Also, display these captions during playback and reduce the playback speed to facilitate more accurate evaluation.



8.2. DIMENSIONS



8.3. I/O OUTLETS



PWR LED	It lights up and will remain steady while the system is powered on.
HDD LED	The Yellow LED is linked to Solid-state Drive (SSD) activity signal. LED flashes every time SSD is accessed.

Power button	Allows users to turn the device on or to force the system off (by pressing the button for more than 10 seconds). The device switches on automatically when it receives power.
Reset button	Do not use it. If you forget the device's password, see "Reset to factory default" section <i>{Reset to factory default}</i>
Recovery switch	Do not use it. Removes the Carmen Box software from the device.
HDMI	Do not use it. There is not any useful info/image on this port.
OTG - MicroUSB	Do not use it.
USB 2.0 port (black)	You can use it, but the USB3 port is better for storage.
USB 3.1 Gen1 port (blue)	Connect an USB3 capable storage device here.
LAN	RJ-45 connector for 10/100/1000 Base-T Ethernet port.
PoE	RJ-45 connector for 10/100/1000 Base-T Ethernet port with PoE (IEEE 802.3af class 3, max. 15W, non-isolated) – connect your camera here.
Power input	12 V DC jack with screw. Firmly insert at least 60W adapter into this connector. Loose connection may cause system instability and make sure all components/devices are properly installed before connecting.
Grounding screw	Ground the device using this screw.

8.4. RESET TO FACTORY DEFAULT

If you forget the password for the "admin" user, you will need to reset the device to factory default settings. In this case, do the following:

- Connect a USB keyboard to the device
- Press and hold Left-Control + Left-Alt + Left-Shift + R buttons for at least 5 seconds
- While pressing the above buttons, the Num-lock + Scroll-lock + Caps-lock LEDs will light up according to the keys and indicate the buttons are pressed. When the R button is pressed, all three LEDs will flash. After holding down the R button for 5 seconds, the LEDs will turn off and the reset process will begin. The buttons can be released, the keyboard disconnected and the device restarted. The default settings are applied.

8.5. INSTALL STORAGE MEDIA

You can use one of the following storage media on which the CarmenBox can store events:

- external USB drive (plugged into the device's USB2/USB3 port), or
- microSD card inserted inside the device.

8.5.1. Installing the MicroSD card

Step 1: Turn off the system, and unplug the power adaptor.

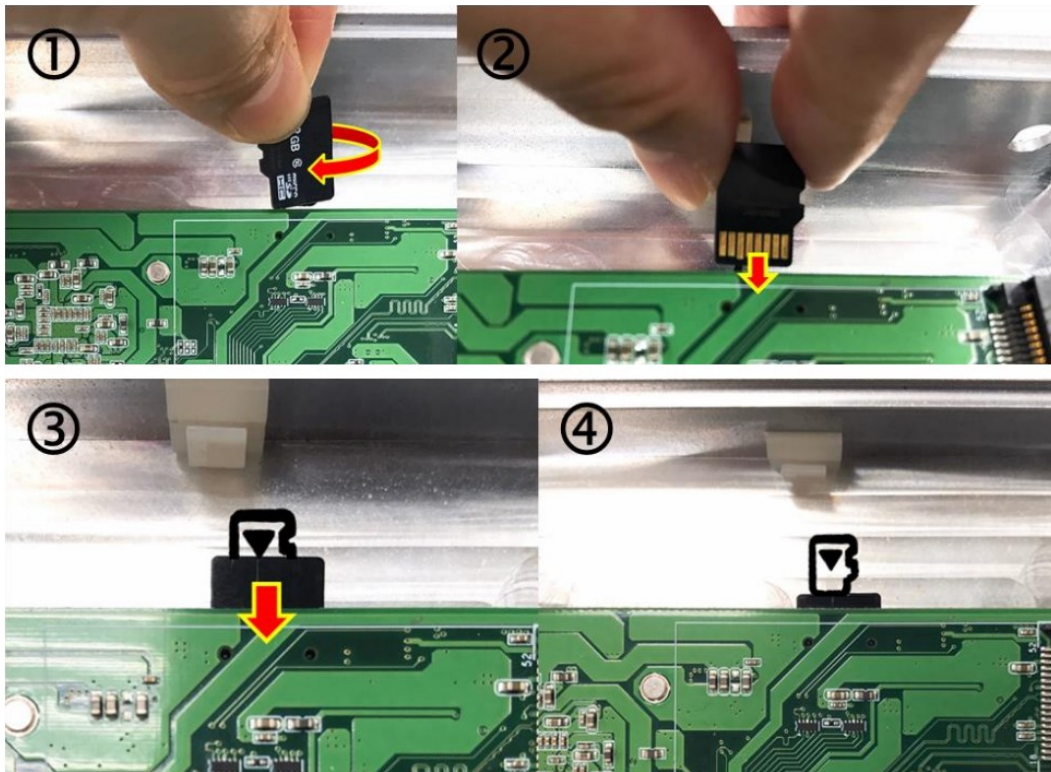
Step 2: Turn the system upside down to locate screws at the bottom side as red marked and loosen four screws.



Step 3: Remove the bottom cover, and locate MicroSD icon on the board.



Step 4: Turn the MicroSD card upside down, and hold it with fingers at a 30 degree angle up from horizontal, and then insert and press it gently.



Step 9: Mount the bottom cover, and tighten the 4 screws. Plug the power adaptor and the system automatically turns on.

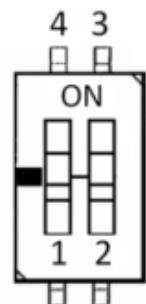
Step 10: After login, select MicroSD card as a storage media in System/Storage menu.

8.6. DEVICE RESTART

The Pin1 (AT mode) of SSW1 is turn OFF, the system will be automatically power on without pressing soft power button during power input; this switch ensures achieve auto power.

(The SSW1 switch is set as above in devices manufactured after 2023.02.13.)

Pin	Description	ON (Default)	OFF
1	AT / ATX Mode	ATX	AT
2	NC	NC	NC



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