

Installation and Setup Guide

EDGE module for VIVOTEK

Software version:

1.0.2.

Manual version:

1.0



vit
raising technologies™

1 Description	3
1.1 Guide overview	3
1.2 EDGE module overview	3
2 Module installation	4
2.1 Configuration of camera video stream	6
2.2 License activation	6
3 Module configuration	7
3.1 Service Camera	7
3.1.1 Marking of the carriageway control zone	9
Add new lane	9
Remove active lane	10
Remove all lanes	10
3.2 Service ANPR	10
Licenses	10
Templates	11
Recognition settings	12
Detection	13
Recognition	13
Min validity	13
Tracking	13
Selection of recognition zone and exclusion zone	13
Add new inclusion zone	14
Add new exclusion zone	14
Remove active zone	15
Remove all zones	15
Setting the size of the numbers	15
3.3 Service License	16
Download c2v	16
Upload v2c	16
Groups	16
Keys	17
3.4 Event Recipients	17
Add a new Recipient	17
Editing an existing Recipient	18
3.5 Event Rules	18
Adding a new Rule	19
Name	19
Enable this rule	19
Select trigger	19
Package Content	19
Action	20
Editing an existing Rule	20

Attachment 1	20
Supported Camera models	20
Attachment 2	22
Composition of data packets transmitted to the Recipients.	22
VAST2	22
EFKON	22
EDGE	22
Attachment 3	23
List of supported countries	23
Proven installations	23
Done	23
In progress	24

1 Description

1.1 Guide overview

This manual is intended for integrators, system administrators, users with camera administrator rights. VIVOTEK and EDGE module (further - Module).

This manual contains a description of the functionality of the VIVOTEK Camera Module (further - Camera) and instructions for its installation, configuration and operation.

1.2 EDGE module overview

The module is designed for automatic vehicle identification in the control zone of the camera using the license plate recognition technology.

The module is designed to work in cameras VIVOTEK. The list of supported cameras and their requirements are given in Attachment 1.

Module Functionality:

- Getting the video stream from the camera in which it is installed
- License plate recognition
- Generation of metadata about the recognized number
- Transmission of vehicle recognition data to external Recipients

2 Module installation

The module is supplied as an installation package.

The Module is installed by downloading the package through the Camera administrator interface (fig. 1).

Attention: it is recommended to use browsers XXXX versions xxxx and above.

To install you must go:

Configuration ->Applications -> Package management ->Upload package.

The screenshot displays the VIVOTEK camera administrator interface. The top navigation bar includes 'Home', 'Client settings', 'Configuration', and 'Language'. The main heading is 'Applications > Package management'. The left sidebar lists various system settings, with 'Applications' expanded to show 'Package management'. The main content area has two tabs: 'Status' and 'License'. Under 'Upload package', there is a checked 'Save to SD card' option, a 'Select file' button, and an 'Upload' button. The 'Resource status' section shows expandable items for CPU, Storage, SD card (Ready), and Memory status. The 'Package list' table is as follows:

	Module name	Vendor	Version	Status	License		
<input type="radio"/>	Trend Micro IoT Security	VIVOTEK	1.0.2	Installed	N/A		
<input type="radio"/>	VCA	VIVOTEK	6.0.22	OFF	N/A		
<input type="radio"/>	GENETEC	VIVOTEK	1.0a.a0.0.0	OFF	N/A		
<input type="radio"/>	EDGE	VIT	1.0.1	ON	N/A		

At the bottom of the package list, there are 'Start', 'Stop', and 'Schedule' buttons. The footer shows 'Version: 0101d_1080b'.

Fig.1

Important: At the module loading moment the option "Save to SD card" must be necessarily set (fig. 2).

Important: SD card must be formatted in EXT4.

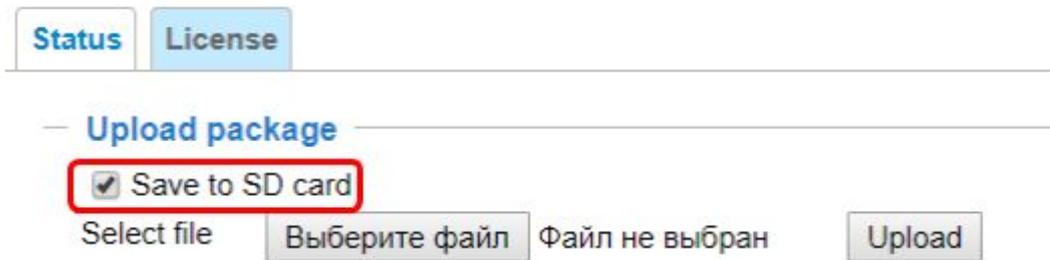


Fig. 2

After successfully installing the Module in the table "Package list" (fig. 3) EDGE line appears indicating the manufacturer (VIT), the version of the module, active status (ON) and the installation location (SD Card).

Package list

	Module name	Vendor	Version	Status	License		
<input type="radio"/>	Trend Micro IoT Security	VIVOTEK	1.0.2	Installed	N/A		
<input type="radio"/>	VCA	VIVOTEK	6.0.22	OFF	N/A		
<input type="radio"/>	GENETEC	VIVOTEK	1.0a.a0.0.0	OFF	N/A		
<input type="radio"/>	EDGE	VIT	1.0.1	ON	N/A		

Start Stop Schedule

Fig. 3

Important: Once the package is installed it will be switched off - OFF is displayed in the Status column. It need to be run. Select a package in the list of packages and click Start, as shown in figure 4. The package status should change to ON.

Package list

	Module name	Vendor	Version	Status	License		
<input type="radio"/>	GENETEC	VIVOTEK	1.0a.a0.2.0	ON	N/A		
<input type="radio"/>	Trend Micro IoT Security	VIVOTEK	1.2b.a1.3.3	Installed	N/A		
<input checked="" type="radio"/>	EDGE	VIT	1.0.1	OFF	N/A		

Start Stop Schedule

Fig. 4

2.1 Configuration of camera video stream

To display Live video in the Module configuration interface, you must configure the parameters of the Camera video stream - at least one of the video streams must work in MJPEG mode. For example, to configure stream number 4 in the settings.:

Configuration -> Media -> Video -> Video settings for stream 1

Type of stream JPEG must be selected.

These settings affect only the display of live-video screens Module configuration. The parameters used for recognition are configured in paragraph 3.

2.2 License activation

Module requires an activated license to work. License activation is described in paragraph 3.3 of this manual. After installing, please get a license from your manager, as described in paragraph 3.3.

3 Module configuration

The functionality of the module is provided by the system of services and events. Services perform data collection and analysis in the camera control zone. The event system delivers measurement results to specific recipients (addressee).

The configuration interface (fig. 5) of the Module is available via the EDGE link in the Package List table. It can be specified alternatively in the address bar of the browser /EDGE/www/index.html.

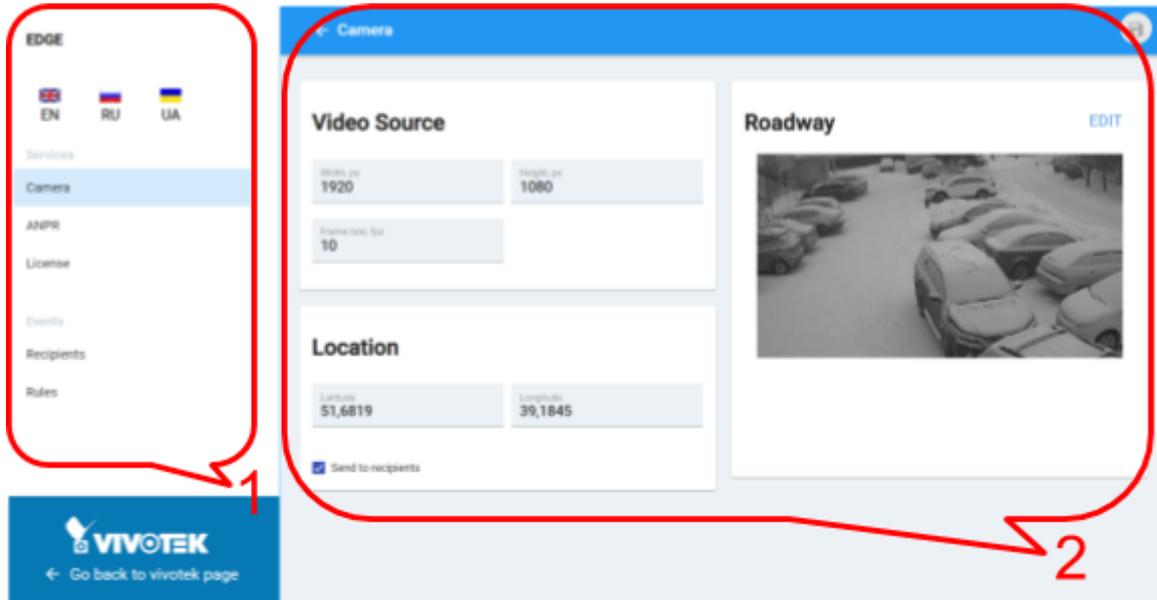


Fig. 5

On fig. 5, the following are marked: 1 - navigation panel; 2 - settings panel.

3.1 Service Camera

The Camera service provides the EDGE module with a stream of control zone images for analysis. Information about the geographical position and marking of the carriageway control zone can be added to the images.

The Video Source panel (fig.6) sets the parameters of the stream of images. The maximum values of the parameters depend on the camera model.



Fig. 6

- Parameters Width and Height. Set the resolution of images in pixels. The default maximum values for the camera model. If smaller values are specified, the corresponding scaling of the images is performed.
- Frame rate parameter. Sets the frequency of image registration, fps. For objects with a vehicle movement of up to 30 km/h, the recommended value is 4-6 fps, more than 30 km/h - 10 fps.

The Location panel (fig.7) sets the geographical position of the camera (control zone). Information can be used in the formation of events.

Location

Latitude 51,681853	Longitude 39,184518
-----------------------	------------------------

Send to recipients

Fig. 7

- Latitude parameter. Coordinate of latitude, degrees.
 - Plus. North from equator
 - Minus. South from equator
- Longitude parameter. Coordinate of longitude, degrees.
 - Plus. East from Greenwich
 - Minus. West from Greenwich

The option Send to recipients allows the use of camera geolocation data when generating events.

The Roadway panel sets the marking of the carriageway control zone. Information can be used in the formation of events.

Roadway

EDIT



Fig.8

- The image displays the current state of the markup.
- The Edit button opens the contextual settings panel for editing markup (paragraph 3.1.1).

3.1.1 Marking of the carriageway control zone

Add new lane

Adds a color polygon on the frame (fig. 9). It must be placed in such a way that it covers the zone that corresponds to one lane of the vehicle.

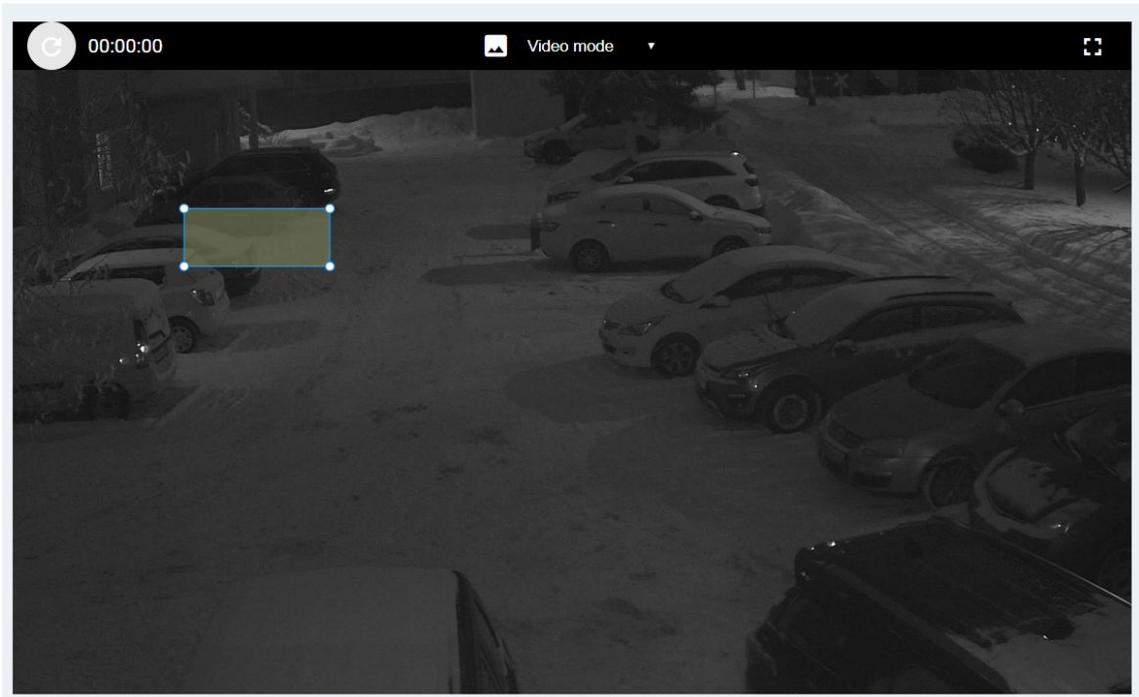


Fig. 9

For this, it is necessary to place the vertices of the polygon in such a way that they coincide with the vertices of the Traffic Band of the Vehicle (fig. 10). If 4 vertices of the polygon are not enough for positioning, then new vertex can be added by double-clicking on any face of the polygon. By double-clicking on the top of the polygon, you can delete the given top of the polygon.

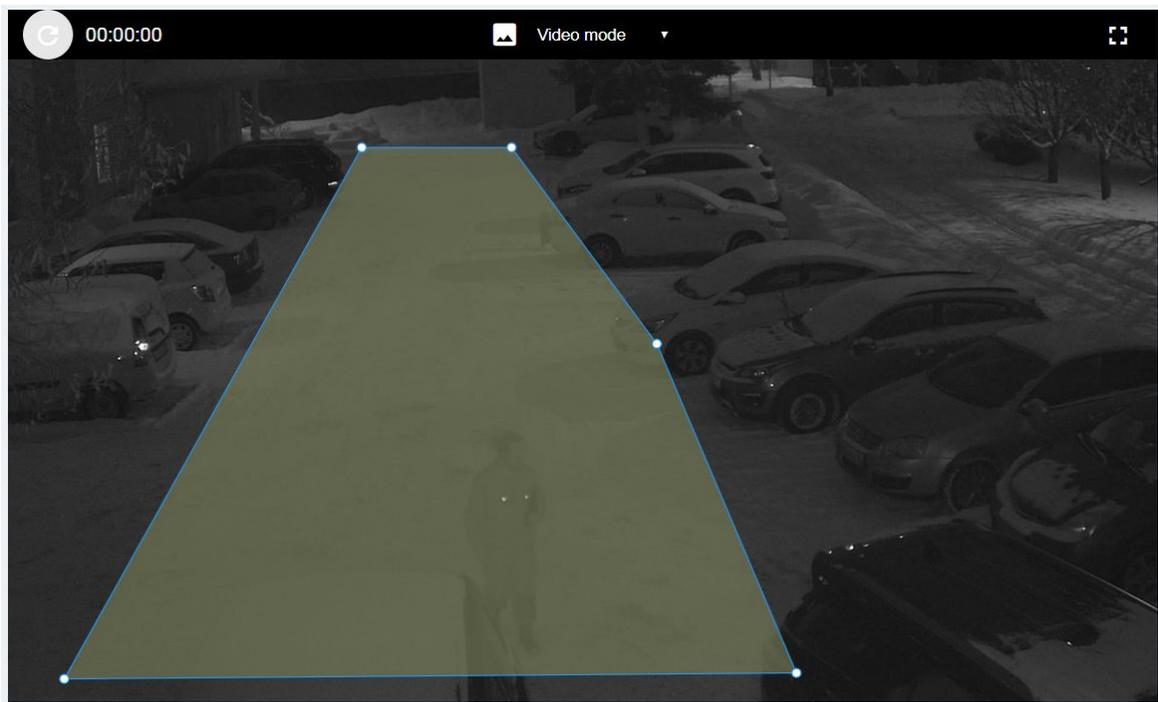


Fig. 10

You can add an unlimited number of vehicle lanes. Each lane will be highlighted by a separate polygon.

Each given lane of the vehicle can be specified by own name (fig. 11).



Fig. 11

To do this, click on the edit button  and enter the name in the text box.

Remove active lane

Allows you to remove the active (highlighted) lane of the vehicle.

Remove all lanes

Allows you to delete all specified vehicle lanes.

After setting the Bands, you must save the changes by clicking on the button in the upper right corner of

the screen  .

3.2 Service ANPR

To configure the recognition, you must go to the menu item ANPR.

The items for setting Licenses, Templates and Recognized settings will appear in the Settings panel.

Licenses

The block displays the type and number of Anpr licenses available to the User (fig. 12).



Fig. 12

Group - set of licenses that are granted locally installed keys and have the same value for the Restrictions parameter.

- If licenses as part of a key, intended to limit the fps up to 25 frames per second, they will be included in the group Freeflow.
- If licenses as part of a key, intended to limit the fps up to 6 frames per second, they will be included in the group Parking.

Templates

The block displays the list of templates of vehicle numbers with which the Module makes a comparison when searching for license plates in the frame and recognizing characters on them (fig. 13). For each country supported by the Module, a separate set of license plate templates is formed.



Fig. 13

By default, the list of templates is minimized to a 4-line window. You can expand the entire list, for this you need to click on the Expand button. To return to its original state, click the Collapse button.

In this list, you can delete individual types of number patterns (fig. 14). To do this you need to click on the image of the cross to the right of the template.



Fig. 14

To change the list of countries or the batch selection of templates, you must click on the Change button at the bottom of the list. After that, the page for selecting the Countries and Templates will be loaded (fig. 15).

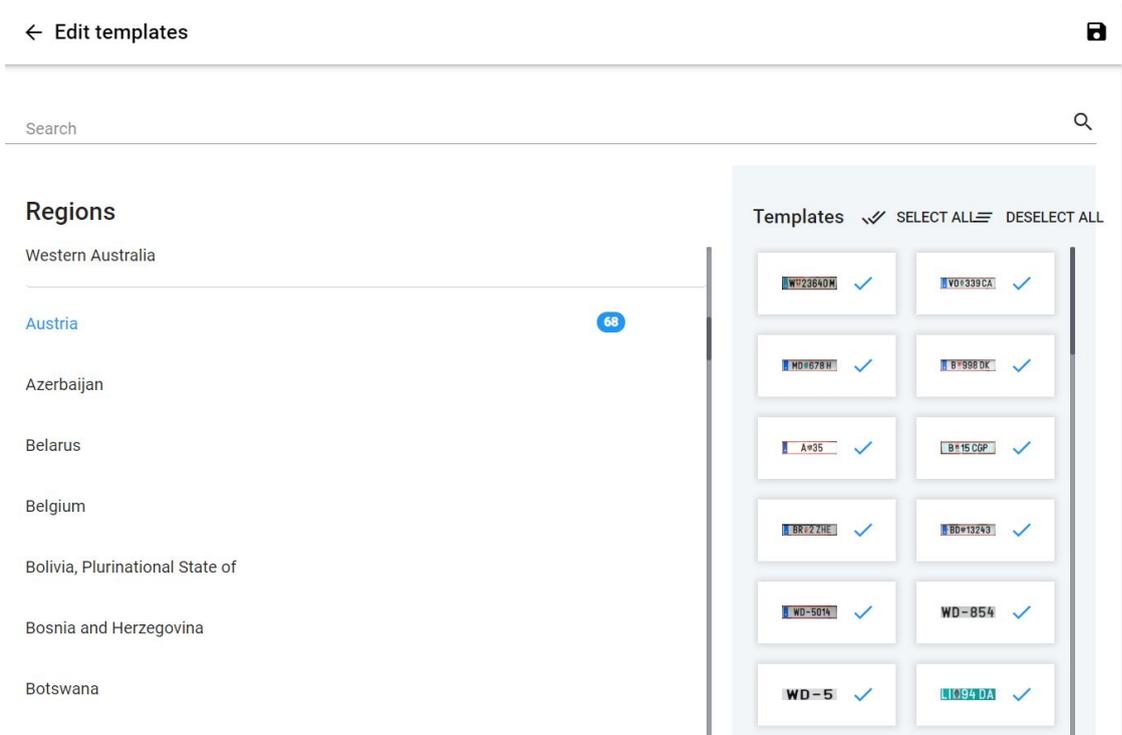


Fig. 15

In the Regions column the Country whose numbers you need to recognize can be selected.

For quick search of a country, you can enter its name in the Search field.

It is not recommended to mark the use of templates for those numbers that do not appear in the control zone (for example, templates of another country), since this negatively affects the quality of recognition.

When selecting a country from the list, templates available for selection will be loaded in the Templates column.

The Select all and Unselect All buttons allow, respectively, to select or deselect all the Templates of the current Country.

Please note that you can select Templates selectively, it is not necessary to select all. This is especially true when it is necessary to recognize the numbers of nearby countries. It is not expedient to choose all the Templates of these countries - there are types of numbers that move exclusively within the country: temporary, diplomatic, military, police numbers, etc. there is not need to select them.

After selecting Templates, you must save all changes.

To do this, click on the button  at the top of the page. After that, you will be returned to the recognition Settings page.

Recognition settings

The block contains a set of parameters for setting up license plate recognition (fig. 16).

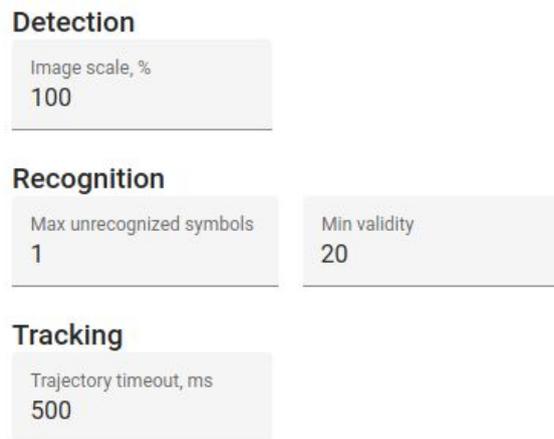


Fig. 16

Detection

The index for scaling each frame (in height and width), where 100% is the original frame resolution. This index allows you to reduce the frame before it will search for license plates. Thus, it is possible to improve the performance of the recognition module by reducing the time spent on the search. In this case, subsequent character recognition will be carried out on the frame of the original size.

Recognition

Max unrecognized symbol

The maximum number of unrecognized characters on the number plate, at which the resulting string will still be considered the result of number recognition and will be returned to the user. In this case, unrecognized symbols in the result are indicated by an asterisk (*).

Min validity

The minimum allowed accuracy of the recognition result, in which this result can still be given to the user

Tracking

Timeout waiting for updates of the movement trajectory at which the recognition results of one number will be stucked (connected) together in one movement trajectory.

- If the number plate has disappeared from the frame (blocked or the vehicle has left) and after the time specified for this setting has not appeared in the frame, it is considered lost. It is concluded that the car left the observation zone.
- If the number plate reappears in the frame before the expiration of the specified time, it is considered that it has been temporarily blocked. Monitoring the trajectory of movement continues.

Selection of recognition zone and exclusion zone

This setting allows you to improve recognition performance by cutting off those areas in which license plates can not be fixed (or recognition is undesirable).

In addition, it is possible to avoid false positives, which are provoked by images of billboards, trees, lattice fences.

The “Change recognition zones” button opens a window in which you can create, edit or delete enabling / excluding zones (fig. 17).

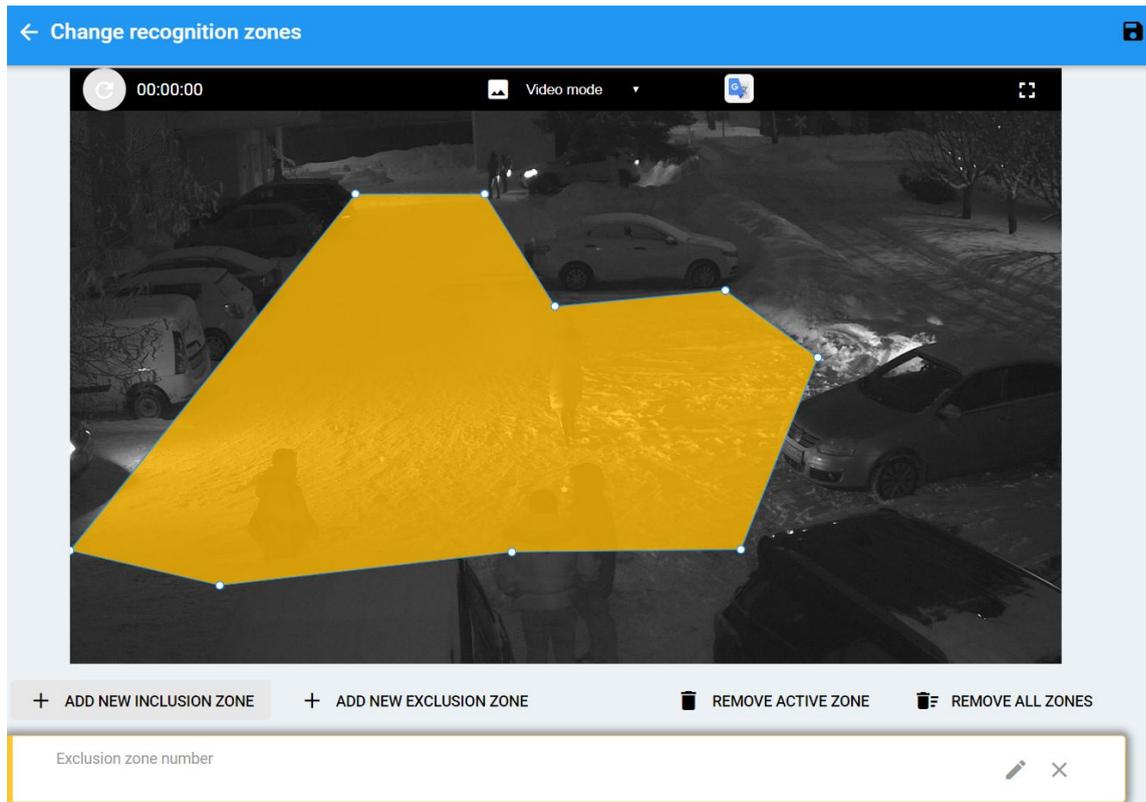


Fig. 17

Add new inclusion zone

Allows you to specify the zone in which the recognition of vehicle numbers will be made. Clicking on the button adds a new color polygon on the frame. It must be placed in such a way that it overlaps the area of possible occurrence of vehicle numbers.

If the 4-polygon vertices for positioning is not enough, by double click mouse button on any face of a polygon, you can add a new vertex.

You can add any number of vehicle recognition zones. Each Zone will be highlighted by a separate polygon.

Each Zone can be set to its name (fig. 18).



Fig. 18

To do this, click on the edit button  and enter the name in the text box.

Add new exclusion zone

Allows you to specify a zone in which the results of recognition of vehicle numbers will be ignored. Clicking on the button adds a color polygon on the frame. It must be placed in such a way that it corresponds to the ignore zone.

If the 4-polygon vertices for positioning is not enough, by double click mouse button on any face of a polygon, you can add a new vertex.

You can add any number of vehicle recognition zones. Each Zone will be highlighted by a separate polygon.

Each Zone can be specified by its name (fig. 19).



Fig. 19

To do this, click on the edit button  and enter the name in the text box.

Remove active zone

Allows you to delete the active (selected) zone.

Remove all zones

Allows you to delete all specified zones.

After setting up the Zones, you must save the changes by clicking on the button in the upper right corner

of the screen  .

Setting the size of the numbers

The "Change license plate width" button opens the window for setting the maximum and minimum probable size of a vehicle number in a frame (fig. 20).

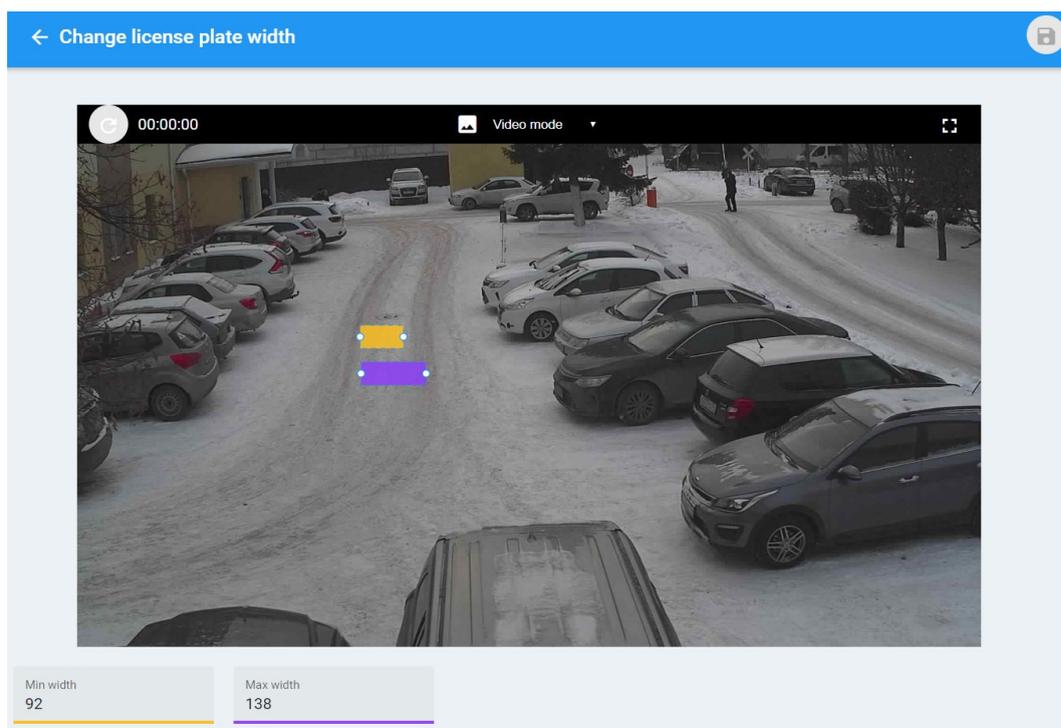


Fig. 20

The value of the Min width setting is determined by the minimum width (in pixels) of the image of the two-line number plate in the far upper corner of the image of the control zone.

The Max width setting value is determined by the maximum width (in pixels) of a single-line number plate in the near lower corner of the image of the control zone.

You can adjust these values either by changing the size of the zone on the frame, or by manually entering it in the value field.

3.3 Service License

All actions for the installation and activation of keys, licenses are made in the License section (fig. 21).

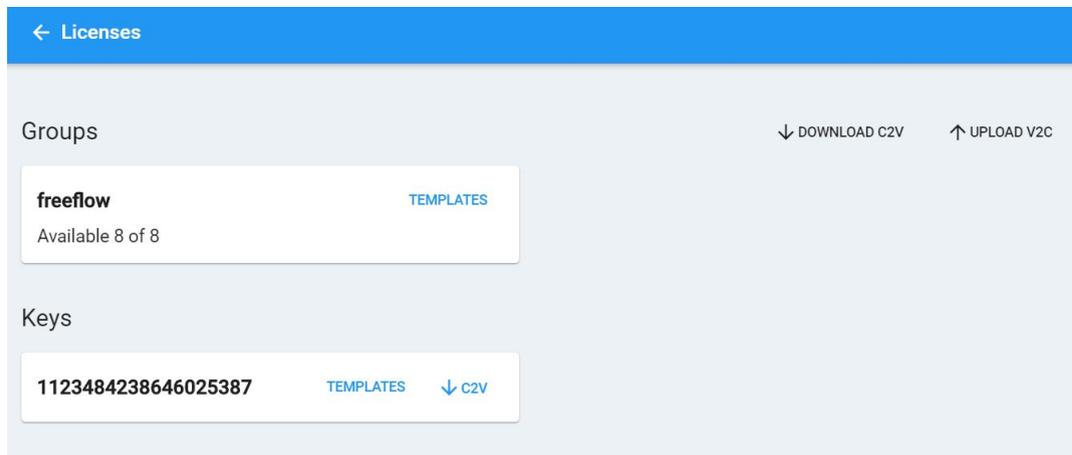


Fig. 21

Download c2v

Allows to generate a file host.c2v to generate a new security key for this camera. The resulting file must be sent to the manager VIT to activate this license and receive after that. v2c file that need to be uploaded using upload v2c.

Upload v2c

Allows you to download the firmware (file format v2c) for an existing security key. If there are several security keys, the target is automatically determined by the key identifier (key-id).

Groups

The Groups block displays a set of licenses that are provided by locally installed keys and have the same value of the Restriction parameter.

- If licenses as part of a key, intended to limit the fps up to 25 frames per second, they will be included in the group Freeflow.
- If licenses as part of a key, intended to limit the fps up to 6 frames per second, they will be included in the group Parking.

Clicking Templates button displays a list of available Templates for license plate recognition, available for all security keys.

Keys

In the Keys block, all locally set security keys are displayed (their identifiers are displayed in the web interface) and compares them with the available control actions.

Templates button - the list of available Templates for recognition of license plates accessible by this key is displayed.

Button c2v - allows you to get a cast of this key.

3.4 Event Recipients

The module allows you to send the recognition results to multiple external customers (further - recipients).

Supports 3 types of recipients:

- VAST2
- EFKON
- Edge

Different data packet format and its composition has been developed for each type of recipients. Specifications of supported data packages are provided in Attachment 2.

To set up a video source, go to the Recipient Menu item.

A list of existing recipients and a button to add a new one will appear in the Function block.

Add a new Recipient

To add a new recipient, click on the button “Add recipient”.

Recipient add form will appear (fig. 22).

← New recipient

Common

Name Test Vast2	Type vast2
--------------------	---------------

Option

Server address	
Username	Password

Fig. 22

Name

Target ID for the module administrator. Text field.

Type

Select the Type of Recipient from the drop-down list.

Option

Specify the connection parameters to recipient. The list of parameters can vary depending on the Type of Recipient.

After filling in all fields, you must save the changes by clicking on the button in the upper right corner of

the screen  .

Editing an existing Recipient

The list of existing recipients is presented in the form of a set of blocks by the number of recipients (fig. 23).

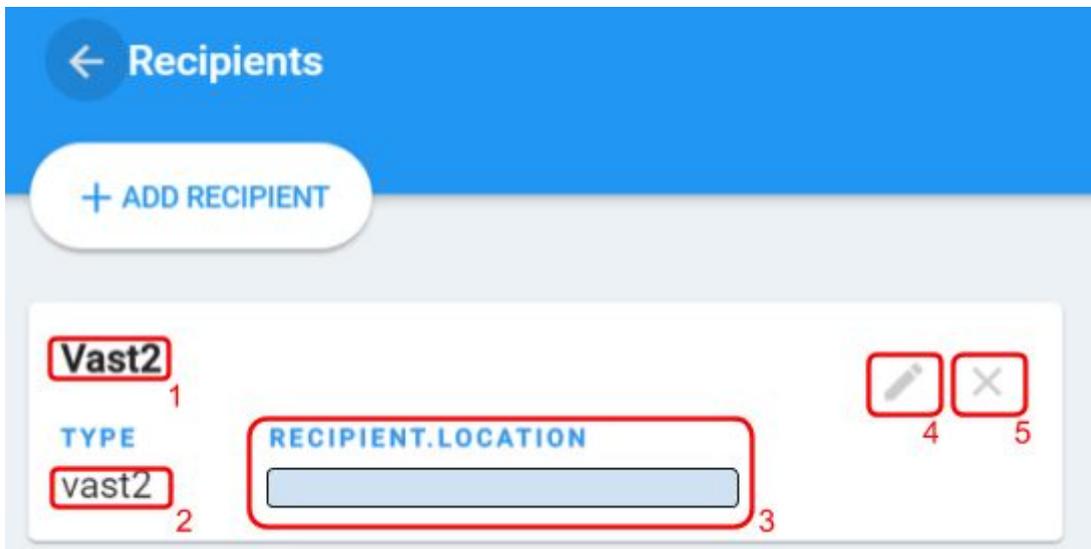


Fig. 23

Block includes:

1. Name
2. Type
3. IP-address
4. Edit button
5. Delete button

The edit button opens the completed Recipient registration form.

3.5 Event Rules

In the Rules section, the administrator configures the Rules for processing recognition events (fig. 24). In the Functional block, the button for adding a new Rule (1) and a List of existing (2) are displayed.

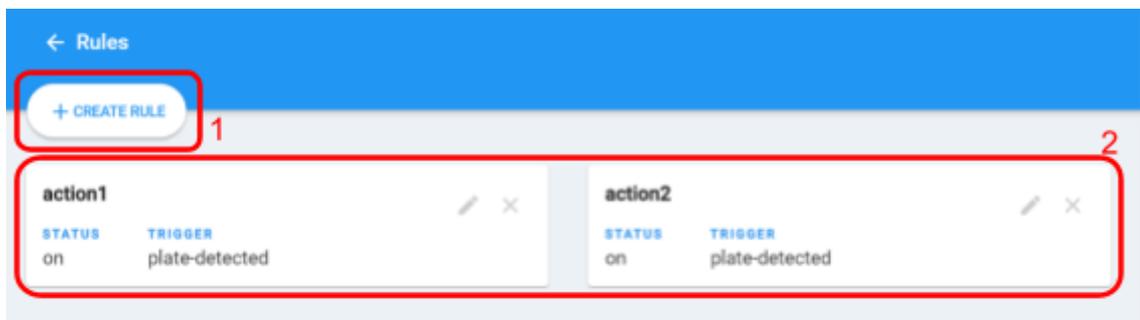


Fig. 24

Adding a new Rule

To add a new rule, click on the “Create rule” button.
A form for adding a rule will appear (fig. 25).

Fig. 25

Name

Identifier of the Rule for the administrator of the Module. Text field.

Enable this rule

If the mark is not valid, the Rule will not be executed.

Select trigger

Indicates the type of event on which the recognition event is sent to the Recipient:

- The number appeared in the control zone (Plate detected).
- Number disappeared from the control zone (Plate Lost)

Package Content

Indicates the composition of the data sent to Recipient:

- Vehicle Image (Car photo)
- Number plate images (License plate photo)
- Free text (text note)

Action

The block displays the list of Recipients created in the Module. You can mark one or several recipients to send them a data packet in accordance with this Rule.

After filling in all fields, you must save the changes by clicking on the button in the upper right corner of

the screen  .

Editing an existing Rule

The list of existing Rules is presented in the form of a set of blocks by the number of Rules (fig. 26).



Fig. 26

Block include:

1. Name
2. Status
3. Trigger type
4. Edit button
5. Delete button

The edit button opens the completed registration form of the Rule.

Attachment 1

Supported Camera models

Model	FW Version
IB9365-HT	0107a
IP9165-LPC	0106b
IP9172-LPC	0109a

Camera requirements:

1. CPU - Arm v7 (minimum HI3519)
2. ROM about 1Gb
3. RAM above 60 MB
4. MicroSD/SDHC/SDXC memory card with file system EXT4

Attachment 2

Composition of data packets transmitted to the Recipients.

VAST2

- Event commit time
- MAC-address of the Camera
- Camera name
- Vehicle number
- Vehicle country of registration
- Geographical location of the control zone
- Vehicle lane name
- Name of vehicle recognition zone
- Driving direction of the vehicle
- Image of vehicle number
- Vehicle image
- Free text (field Text note)

EFKON

- Event commit time
- MAC-address of the Camera
- Vehicle number
- Image of vehicle number
- Vehicle image
- Free text (field Text note)

EDGE

- Event commit time
- MAC-address of the Camera
- Vehicle number
- Vehicle country of registration
- Geographical location of the control zone
- Vehicle lane name
- Name of vehicle recognition zone
- Driving direction of the vehicle
- Image of vehicle number
- Vehicle image
- Free text (field Text note)

Attachment 3

List of supported countries

Proven installations

- All the license plate templates are available for the countries listed below.
- Software is already used in multiple deployments.

Albania	Moldova	Belgium
Argentina	Mongolia	France
Azerbaijan	Poland	Guatemala
Belarus	Russia	Hungary
Brazil	Spain	Latvia
Colombia	Ukraine	Lithuania
Czech Republic	United Kingdom	Netherlands
Georgia	Uzbekistan	Paraguay
Israel	Bulgaria	Taiwan
Kazakhstan	Chile	Uruguay
Mexico	Austria	

Done

- The license plate templates are available for the countries listed below.
- Software is comprehensively tested in recognition of license plates of countries listed below. The results quality obtained in test environment is satisfiable. Still, Software is not used in real-world installations in those countries yet.

Armenia	Norway	India
Bolivia	Peru	Kyrgyzstan
Bosnia and Herzegovina	Portugal	Nicaragua
Denmark	Philippines	Panama
Ecuador	Romania	Serbia
El Salvador	Slovakia	Korea Republic
Finland	Slovenia	Switzerland
Greece	Sweden	Turkmenistan
Iran	Tajikistan	Croatia
Italy	Canada	Malaysia
Jordan	Estonia	New Zealand
Malta	Germany	Singapore
Montenegro	Honduras	Turkey

In progress

- The sets of license plate templates available for the countries below are either incomplete, not relevant or require test materials in order to evaluate recognition quality.
- There were no deployments of AutoSDK in those countries.

Algeria
Angola
Bahrain
Cameroon
Costa Rica
Cuba
Cyprus
Dominican Republic
Iceland
Ireland
Kuwait
Luxembourg
Macedonia

Nigeria
Oman
Qatar
Saudi Arabia
South Africa
Sri Lanka
Tunisia
United Arab Emirates
Venezuela
Vietnam
Andorra
Australia
Egypt

Equatorial Guinea
Ethiopia
Gibraltar
Grenada
Holy See
Hong Kong
Indonesia
Japan
Kenya
Kosovo
Puerto Rico
Seychelles
United States