Operator's Guide

Operator's Guide

The list of terms used

1. The Guide – this document: Auto-Intellect Software Package: Operator's Guide.
2. The system – the *Auto-Intellect* software system.
3. Server - computer with installed *Auto-Intellect* software package.
4. Traffic – the flow of vehicles.
5. Vehicle Tracer – the interface object designed for viewing the recognized LP numbers, the types and speeds of vehicles, as well as for searching the LPR database and creating reports for specific time periods.
6. Traffic Monitor – the interface object designed for monitoring vehicle movement.
7. fps - frame frequency. Number of video stream frames processed by software per 1 second.

Operator's Guide. Introduction

On page:

The purpose and structure of the Guide

The Guide is an informational reference designed for users of the *Auto-Intellect* system with Operator access rights responded for operation with *Auto-Intellect* software and corresponding interface objects.

The Guide contains the following material:

1. General description of the *Auto-Intellect* software system.
2. How to use the *Auto-Intellect* software system.
3. Description of the user interface of the *Auto-Intellect* system.

The purpose of the Auto-Intellect system

The *Auto-Intellect* software system is designed for automated traffic monitoring and control, and has the following functionality:

1. License plate number recognition.
2. Centralized events registration and processing, generation of notifications and control commands according to flexible algorithms.
3. Searching matches between the recognized plate number and the numbers in the database connected to *Auto-Intellect.*
4. Creating the photo and video archive.
5. Determining the overall traffic parameters and the parameters of individual vehicles.
6. Software scalability.

Recommendations for using the Auto-Intellect system

The *Auto-Intellect* software is installed as an extension to the Intellect software package.

For proper operation of the *Auto-Intellect* system, please follow these recommendations:

1. Follow the job description accurately.
2. Use the system for the intended purpose only.
3. Do not use the computer with *Intellect* installed, to run other software which is not part of the *Intellect* package.

General description of the Auto-Intellect software package

The structure of the Auto-Intellect software package

Auto-Intellect includes the basic version of the *Intellect* software package with additional software modules, including those from third-party vendors that carry out particular functions: recognizing the vehicle parameters and registering the related events. *Auto-Intellect* includes the following software modules:

1. Auto-Uragan;
2. Arena;
3. CARMEN-Auto;
4. Carmen-parking;
5. VIT;
6. Radar;
7. Traffic Detector;
8. Traffic Light Detection;
9. External Plates Database;
10. Vehicle detector (included in information-gathering subsystem about traffic);
11. Vehicle processor (included in information-gathering subsystem about traffic);
12. Vehicle tracer;
13. CARMEN-Carriages;
14. IntLab-Carriages;
15. Container code recognition.

Note.
The database of identifiers/detections and the object from which the data is received to this database are to be located in one computer for correct working of *Auto-Intellect* so ftware package.

The Auto-Uragan software module functionality

The **Auto-Uragan** software module supports the following functionality:

1. License plates identification;
2. Saving the identified number to the plates detector database;
3. Identification and logging the determined speed of the vehicle to the plates database (while connecting the Radar module);
4. Identification and logging the determined class of a moving vehicle to the plates database (while connecting the Traffic detector module);
5. Check of identified license plates via connected search database;
6. Possibility to work with multilane driveway;
7. Identification of extended list of license plates types: all types of Russian license plates, all CIS countries and Baltic States, countries of Europe, Latin America and The USA. Worked out the main types of single-line plates of different countries, for each both civil and specialized (diplomatic, transit, military etc.);
8. Plates filtration according to their characters' sizes
9. Possibility to change level of plates' identification quality
10. Saving the frames of the identified plates to bmp, jpeg and avi formats
11. Calculation of the capture lanes in the area of identification restriction
12. Setting the alarm when the vehicle entering an oncoming lane.

The **Auto-Uragan** software module restricts operation with different typical plates'sizes and templet recognition with the abscense of new licensing key.

The **Auto-Uragan** software module uses the IPP 6.1 library.
The **Auto-Uragan** software module can work in one of the following modes:

1. Slow — the module processes the video stream with the speed not exceeding 3 fps.
2. Fast – the module processes all incoming frames.

The Arena software module functionality

The **Arena** software module supports the following functionality:

1. License plates identification;
2. Saving the identified number to the plates detector database;
3. Identification and logging the determined speed of the vehicle to the plates database;
4. Identification and logging the determined class of a moving vehicle to the plates database.

The CARMEN-Auto software module functionality

The **CARMEN-Auto** software module supports the following functionality:

1. License plates identification;
2. Saving the identified number to the plates detector database;
3. Identification and logging the determined speed of the vehicle to the plates database (while connecting the Radar module).

Supported number of recognizing streams is summed if several usb keys are in use. For example, if one key for one channel is installed, the fps processing is 10 fps. While the same second key installing the fps processing will be 20 fps. In this case it is possible to create two recognizing channels and on every channel the fps processing will be equal to 10 fps.

Note.
Sum of processed number of recognizing streams is allowed for multi-cores systems (which have several streams). Computers based on the Core i3, Core i5, Core i7 processors belong to these systems. Exact number of cores (streams) see in the documentation to the corresponding processor.

The Carmen-parking software module functionality

The **CARMEN-parking** software module supports the following functionality:

1. License plates identification;
2. Saving the identified number to the plates detector database.

The Container code recognition software module functionality

The **Container code recognition** software module supports the following functionality:

1. Identification of transport containers' license plates;
2. Saving the identified number to the plates detector database.

The VIT software module functionality

The **VIT** software module supports the following functionality:

1. Recognizing the license plates.
2. Saving the recognized number to the plates detector database.
3. Determining and logging the speed of the recognized vehicle to the plates database (if the Radar module is connected).
4. Check the recognized plates of vehicles via connected search database.
5. Possibility to work with multilane driveway (recognizing of vehicle plates in one frame is not more than 10).

6. Identification of extended list of license plates types: all types of Russian license plates, all CIS countries and Baltic States, countries of Europe, Latin America and The USA. Worked out the main types of single-line plates of different countries, for each both civil and specialized (diplomatic, transit, military etc.).
7. Possibility to change the quality level of vehicle plates recognizing.
8. Saving the frames of the recognized plates to bmp, jpeg and avi formats.
9. Calculation of the capture lanes in the area of recognizing restriction.

The **VIT** software module restricts working with different types of vehicle license plates in accordance to the Hasp licensing key.
The **VIT** software module can work in one of the following modes:

1. Slow — the module processes the video stream with the 6 fps speed.
2. Fast – the module processes the video stream with the 25 fps speed.

The working mode of the module also depends on *Hasp* licensing key.

The Radar software module functionality

The **Radar** software module supports the following functionality:

1. Registering the hardware devices of the speed-trap type.
2. Determining the speed of the vehicle using the speed-trap device.

The Traffic Detector software module functionality

The **Traffic Detector** software module is designed for determining general characteristics of the traffic, as well as of each vehicle's parameters.

It supports the following functionality:

1. Determining the overall number of vehicles that passed in each lane.
2. Saving the date and time of vehicle registration.
3. Determining the class of the vehicle.
4. Calculating the total number of vehicles of each class.
5. Determining the speed of the vehicle (using the video image processing algorithm).
6. Determining the speed of the vehicles moving along a specified lane.
7. Calculating the average traffic speed.
8. Calculating the average speed of the vehicles by their class:
   a. motorcycle;
   b. passenger car;
   c. truck shorter than 12 m;
   d. truck longer than 12 m;
   e. bus.
9. Determining the distance between the vehicles (up to 255 m).
10. Calculating the road load.
11. Registering some moving violations:
    a. exceeding the speed limit;
    b. driving along the wrong side of the road;
    c. stopping violations;
    d. invalid reversing;
    e. driving forbidden types of vehicle.
12. Detecting traffic jams.

The following tools can be used to create the report by results of detector working:

1. **Intellect Web Report System** module. This module is not included in the distributive of *Auto-Intellect* software and is installed separately (see Intellect Web Report System. User guide document).

2. **Traffic monitor** object. Configuration of this object is described in the Traffic Monitor interface object setup section. Working with the dialog box is described in the Auto Intellect Software Package. Operator's Guide document).

The Traffic Light Detection software module functionality

The **Traffic Light Detection** software module is designed for the following functions:

1. Determining the traffic light state without connection to the traffic light controller.
2. Creating the messages about permitted and forbidden moving directions.
3. Transmitting the data about permitted and forbidden moving directions to the **Traffic violations detection** module.

The External Plates Database software module functionality

The **External Plates Database** software module is designed for comparing the recognized plate number with the number from the external database.

The Information-gathering subsystem module functionality

On the page:

The information-gathering subsystem module is designed for:

1. Determining the overall parameters of vehicles that passed in camera's view;
2. Gathering information about traffic in general on the basis of vehicles' parameters statistic analysis;
3. Saving the information about traffic to database.

To realize the information-gathering subsystem features the following program modules should interoperate:

1. Vehicle detector;
2. Vehicle processor.

Use the *Intellect Web Report System* module to create reports based on the results the operation of data acquisition subsystem (see Intellect Web Report System . User Guide).

The Vehicle detector functionality

Vehicle detector module is the information-gathering subsystem about traffic in the *Auto-Intellect* software complex.

The module is designed for:

1. Registering vehicle's entrance and exit from the detection zone;
2. Determining the speed of the vehicle;
3. Determining the class of the vehicle;
4. Transmitting the data about the vehicle to the **Vehicle processor** module for handling and saving to the database.

The Vehicle processor functionality

The **Vehicle processor** module is a part of the information-gathering subsystem about traffic in the *Auto-Intellect* software complex.

The module is designed for:

1. Statistic data analysis of vehicles, received from the Vehicle detector module to gather overall information about vehicles;
2. Saving the data about traffic to the database.

The Traffic violations detection module functionality

The **Traffic violations detection** module is designd for identifying vehicles that have passed on the red light. Identifying is performed in real time.

The **Traffic violations detection** module supports the following functionality:

1. Setting the alarm when the red light passing is detected.
2. Setting the alarm when the vehicle going through the stop line on the red light.
3. Setting the alarm when the vehicle stops over the crosswalk line on the stoplight.
4. Registering the events in the database.

The Vehicle tracer module functionality

The **Vehicle tracer** module is designed for identifying vehicles that are on the wanted list or overspeeding. Identifying is performed in real time.

The **Vehicle tracer** module supports the following functionality:

1. displaying the plates that are in identifying detectors' view;
2. displaying vehicles' speed (the **Radar** module is to be connected while using the **CARMEN-Auto** and **Auto-Uragan** modules);
3. registering vehicle 's overspeeding with controlled voice notification of the operator;
4. registering the plate identification in the external database (for example in the search base) with controlled voice notification of the operator;
5. alarm handling;
6. search events in the *Auto-Intellect* recognizers database.

The Remote recognition software module functionality

The **Remote recognition** module is designed for license plates recognizing using cameras with LP recognition function: Vega Access and Vega III by Tattile vendor.

The CARMEN-Carriages software module functionality

The **CARMEN-Carriages** software module supports the following functionality:

1. Identification of carriages' license plates;
2. Saving the identified number to the plates detector database.

The IntLab-Carriages software module functionality

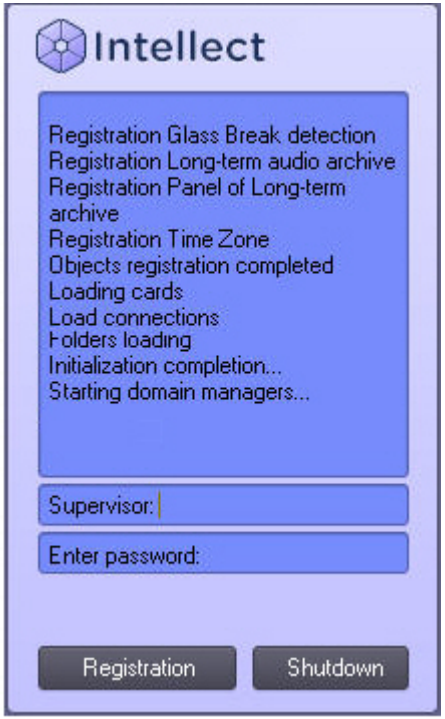
The **IntLab-Carriages** software module supports the following functionality:

1. Identification of carriages' license plates;
2. Saving the identified number to the plates detector database.

Using the Auto-Intellect software system

Starting and closing the system

Please check the working condition of all hardware components – connections, cameras, etc – prior to starting the system.



The system can be started using one of the following methods:

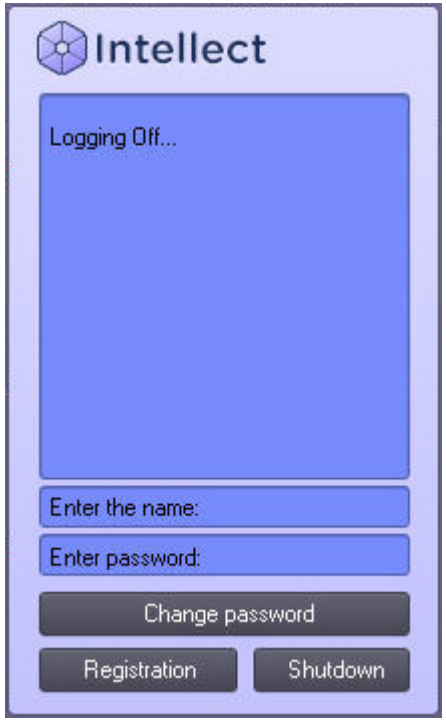
1. Automatically. The system starts automatically after the operating system boots up.
2. Manually. To start the system manually, in the **Start** menu, select **Programs** -> **Intellect** -> **Client Workstation**, or use the corresponding shortcut on the Desktop.

Access to the system can be protected by a password. In this case, enter your password to start the system.

To shut down the system, do the following:

1. Point the mouse to the upper right corner of the screen, the main control panel will open.
2. Click the  icon on the panel.
3. Select **Shutdown** in the menu that opens.

The shut down process will start, the password will be required if set.



Note.
The system can be set up to forbid the shut down. Then, the **Shutdown** item is not present in the menu.

Using the Traffic Monitor interface object

Displaying the current traffic information in table form

The table with current traffic parameters is shown in the **Table** sub-tab of the **Current value** tab.

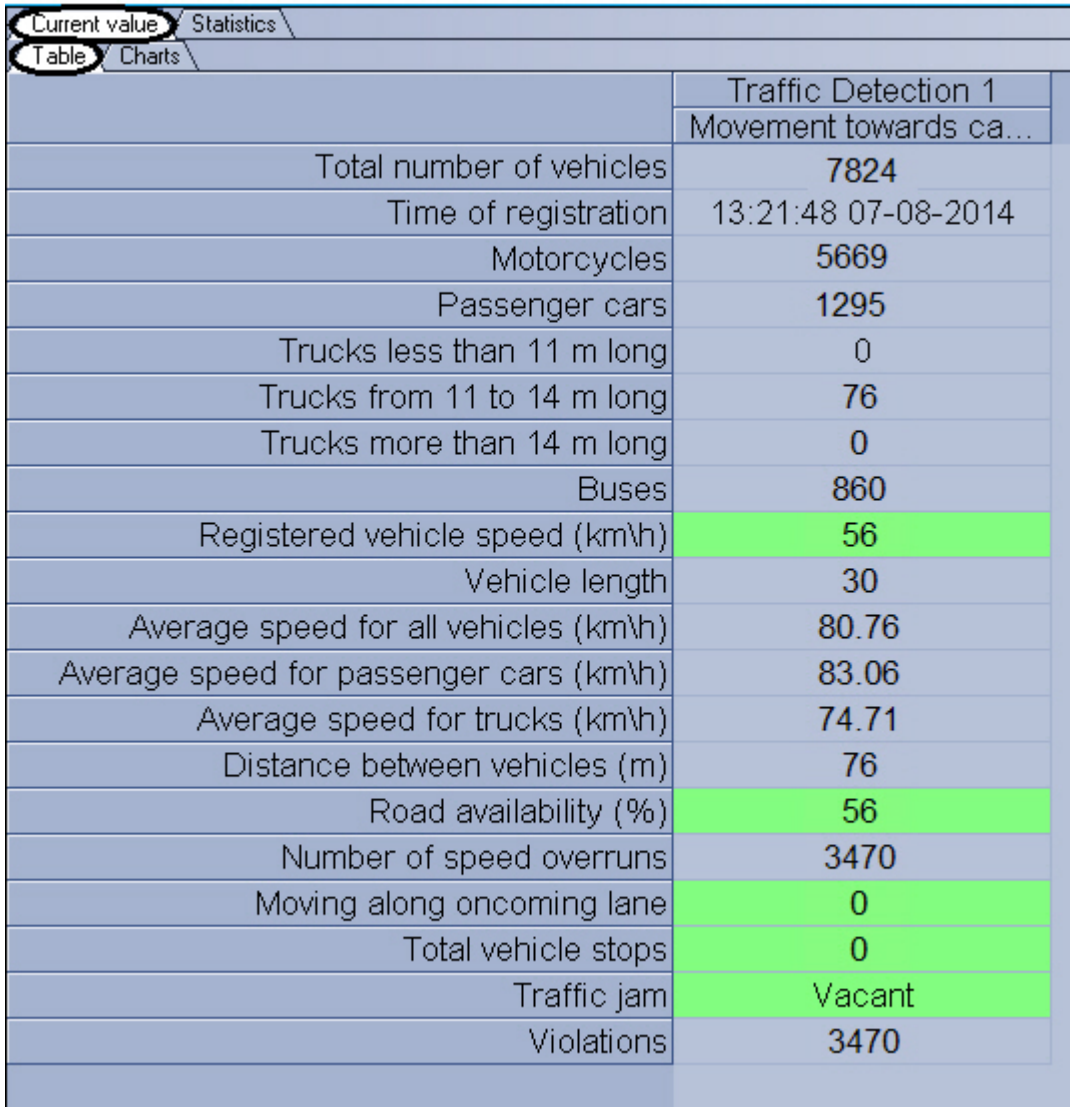
Displaying the current traffic parameters by lane in a table.

Current value | Statistics

Table | Charts

	Traffic Detection 1			
	1	2	3	4
Total number of vehicles	2124	2736	1501	1260
Time of registration	:8:46 04-02-2	:8:49 04-02-2	:8:49 04-02-2	:8:48 04-02-2
Motorcycles	0	0	0	0
Passenger cars	2119	2521	880	3
Trucks less than 11 m long	5	210	419	625
Trucks from 11 to 14 m long	6	20	3	22
Trucks more than 14 m long	0	0	0	0
Buses	0	5	202	632
Registered vehicle speed (km\h)	191	43	34	88
Vehicle length	6	20	3	22
Average speed for all vehicles (km\h)	180.75	16.20	38.09	102.26
Average speed for passenger cars (km\h)	180.82	15.99	39.30	30.33
Average speed for trucks (km\h)	150.00	18.65	36.37	102.44
Distance between vehicles (m)	94	22	30	137
Road availability (%)	5	20	10	10
Number of speed overruns	2114	22	171	1063
Moving along oncoming lane	0	0	0	0
Total vehicle stops	0	0	0	0
Traffic jam	Vacant	Vacant	Vacant	Vacant
Violations	2114	22	171	1063

Displaying the current traffic parameters by direction in a table.



	Traffic Detection 1 Movement towards ca...
Total number of vehicles	7824
Time of registration	13:21:48 07-08-2014
Motorcycles	5669
Passenger cars	1295
Trucks less than 11 m long	0
Trucks from 11 to 14 m long	76
Trucks more than 14 m long	0
Buses	860
Registered vehicle speed (km\h)	56
Vehicle length	30
Average speed for all vehicles (km\h)	80.76
Average speed for passenger cars (km\h)	83.06
Average speed for trucks (km\h)	74.71
Distance between vehicles (m)	76
Road availability (%)	56
Number of speed overruns	3470
Moving along oncoming lane	0
Total vehicle stops	0
Traffic jam	Vacant
Violations	3470

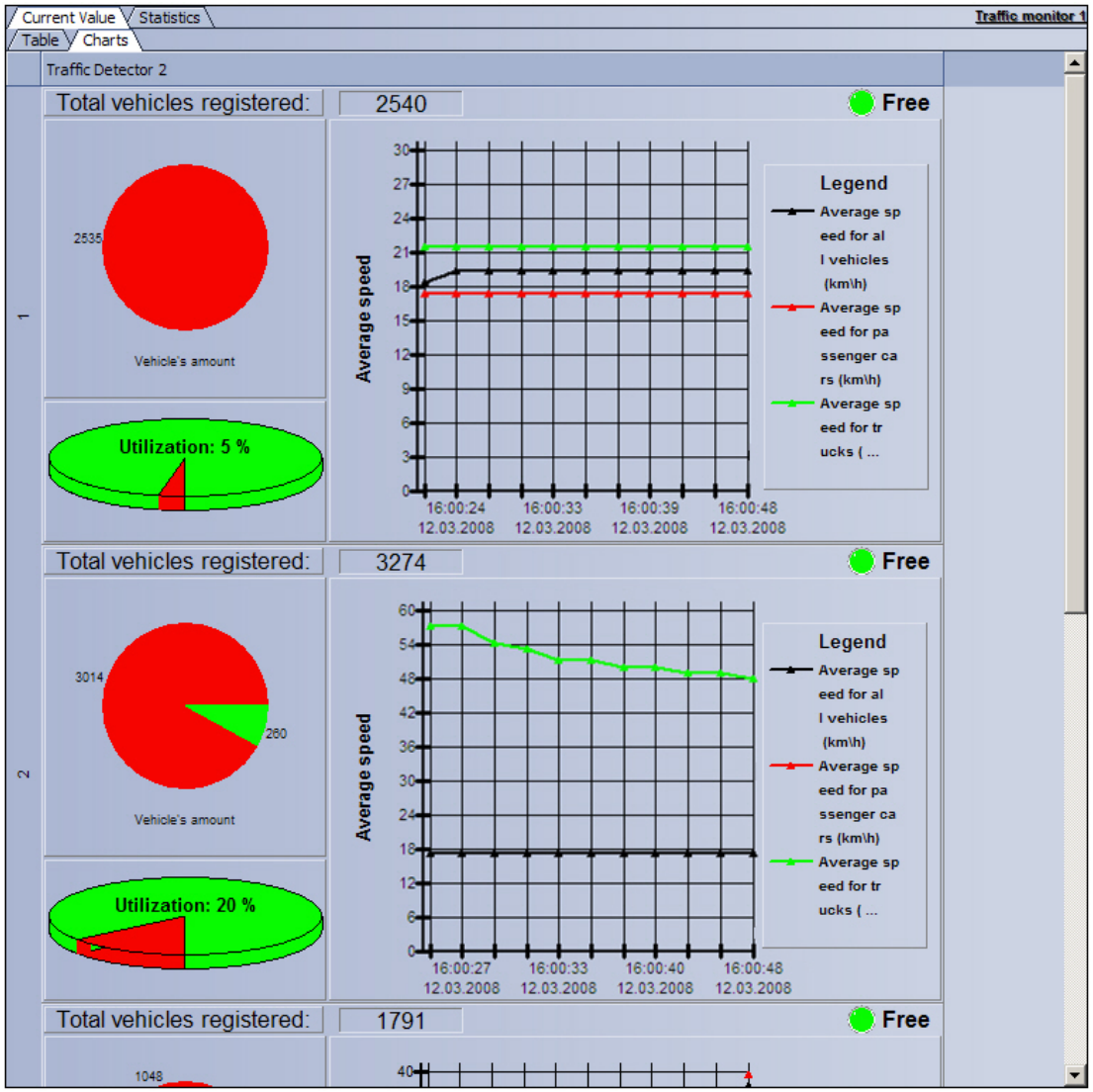
The system can be set up to display the traffic parameters by lane or by traffic movement direction. In case of the by-lane display, the columns correspond to traffic lanes, and rows correspond to traffic parameters. In case of the by-direction display, the columns correspond to traffic directions, and rows correspond to traffic parameters.

Note.
The **Time of registration** parameter for each lane corresponds to the time when the last vehicle passed. The **Time of registration** minus the **Statistics update period** is taken as the beginning of the period to base the statistics on, while the current moment is taken for the end of the statistics period.

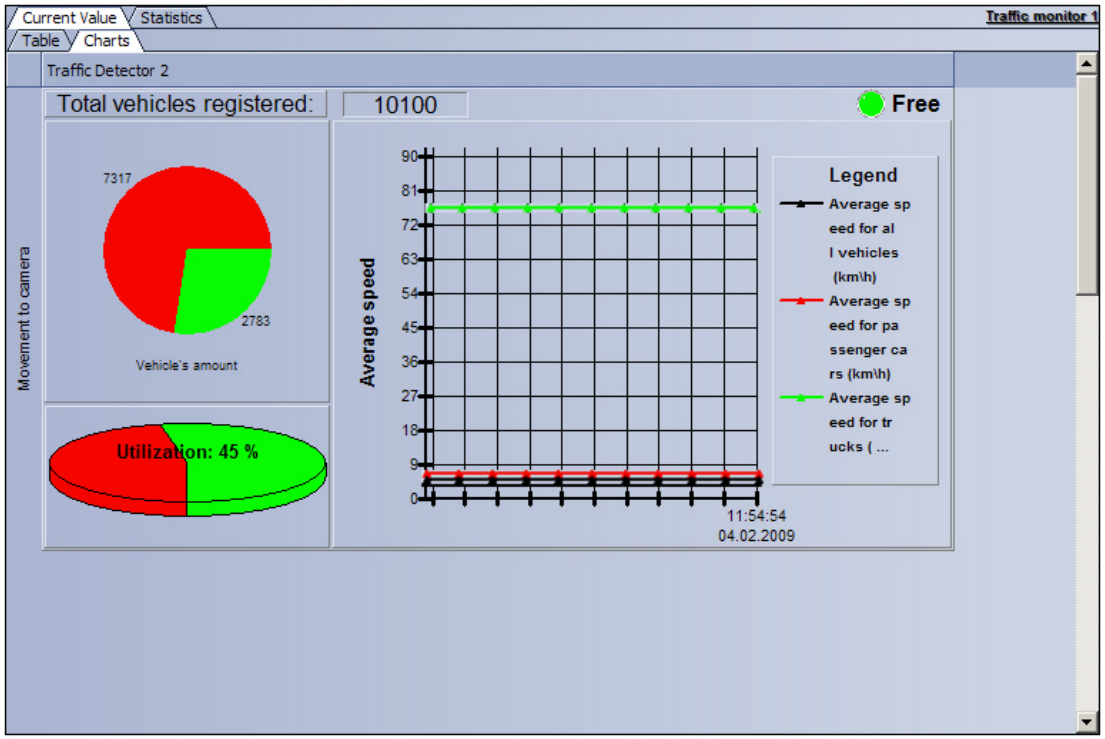
Displaying the current traffic information in graphic form

The charts with current traffic parameters are displayed in the **Charts** sub-tab of the **Current value** tab.

Displaying the charts of current traffic parameters by lane.



Displaying the charts of current traffic parameters by direction.

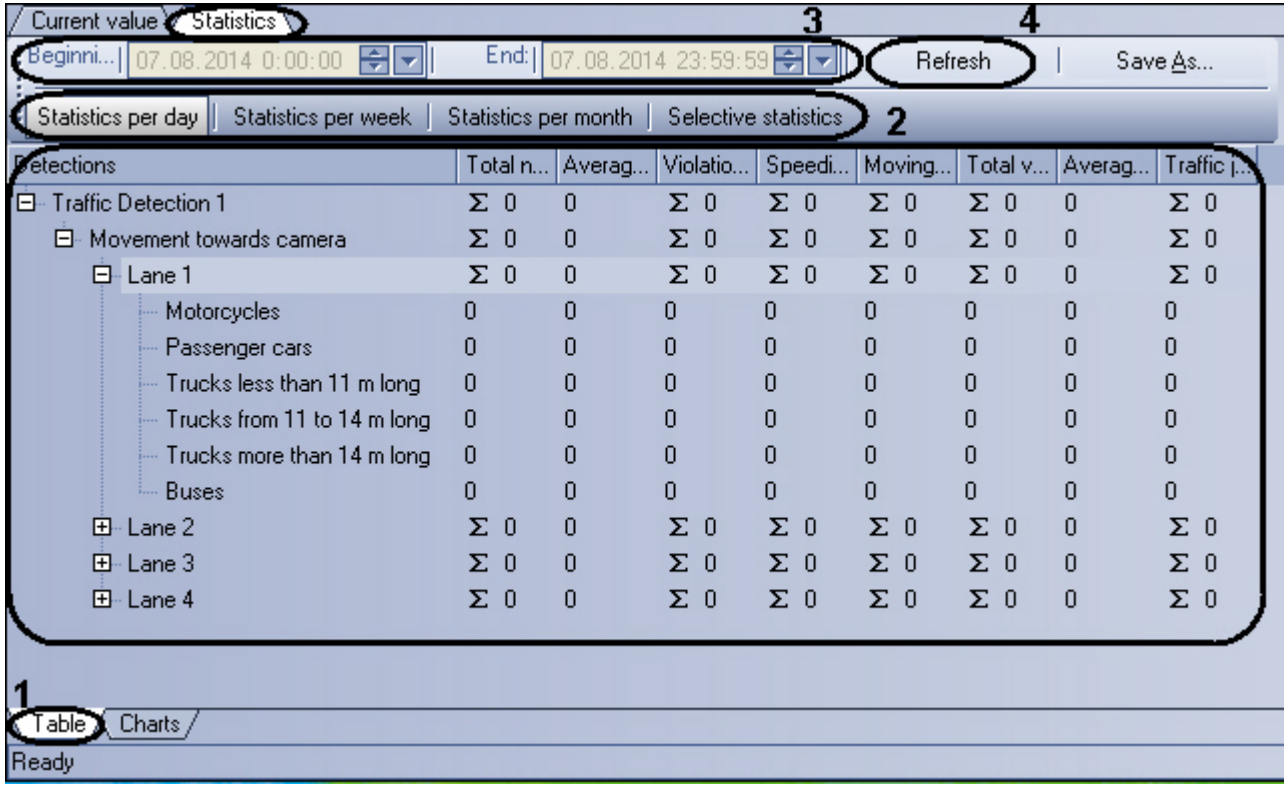


The system can be set up to display the traffic parameters by lane or by traffic movement direction.

The **Charts** tab consists of several sections corresponding to the lanes or the traffic movement directions. Each section consists of several subsections displaying some particular sets of traffic parameters in graphic form.

Creating a request for traffic statistics

To create a request for traffic statistics, use the **Statistics** tab.

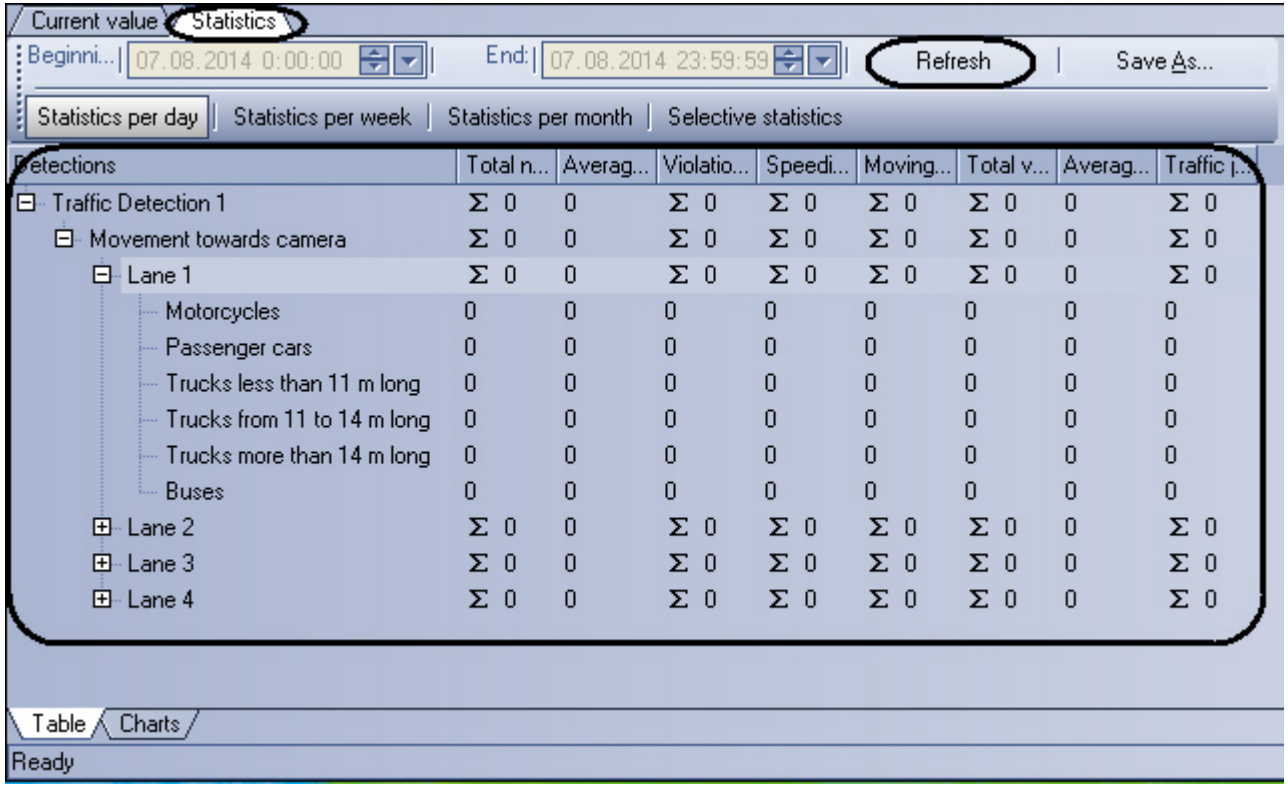


To create a request for traffic statistics, do the following:

1. Select the preferred type of statistics presentation by clicking the **Table** or the **Charts** tab.
2. Select the sampling period – **Day**, **Week**, **Month**, or **Specific time period** (specify the period manually).
3. If **Specific time period** is chosen, enter the beginning and the end date/time of the statistics period in the **Beginning** and the **End** fields.
4. Click the **Refresh** button to create or update the statistics.

Displaying traffic statistics in table form

The traffic statistics in table form are displayed in the **Table** sub-tab of the **Statistics** tab.

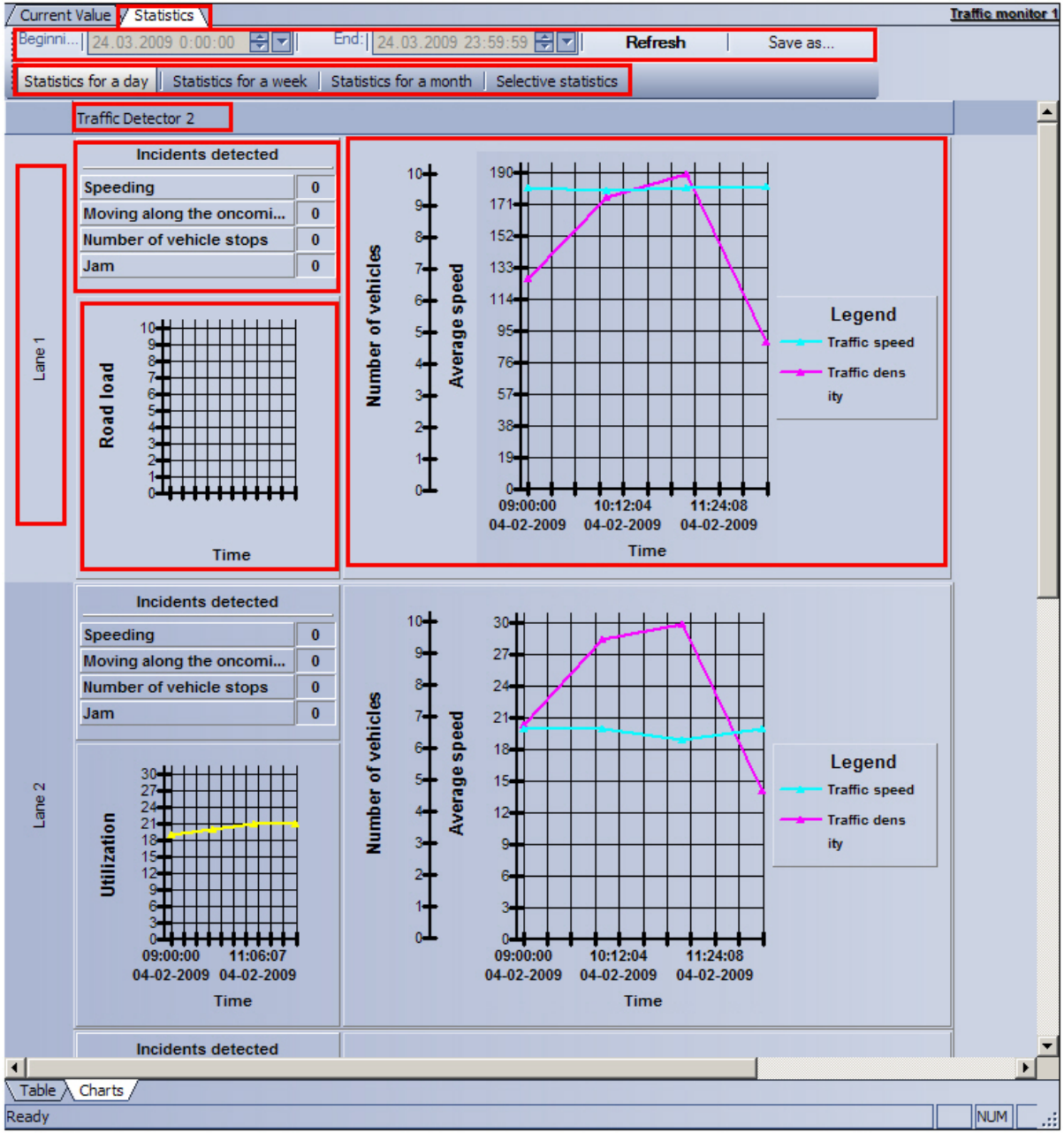


The traffic statistics are displayed in the following tree structure: **Recognizer name** -> **Movement direction** -> **Lane** -> **Vehicle type**. The statistics data for each level of the tree is shown.

Note.
To refresh the displayed statistics, click the **Refresh** button.

Displaying traffic statistics in graphic form

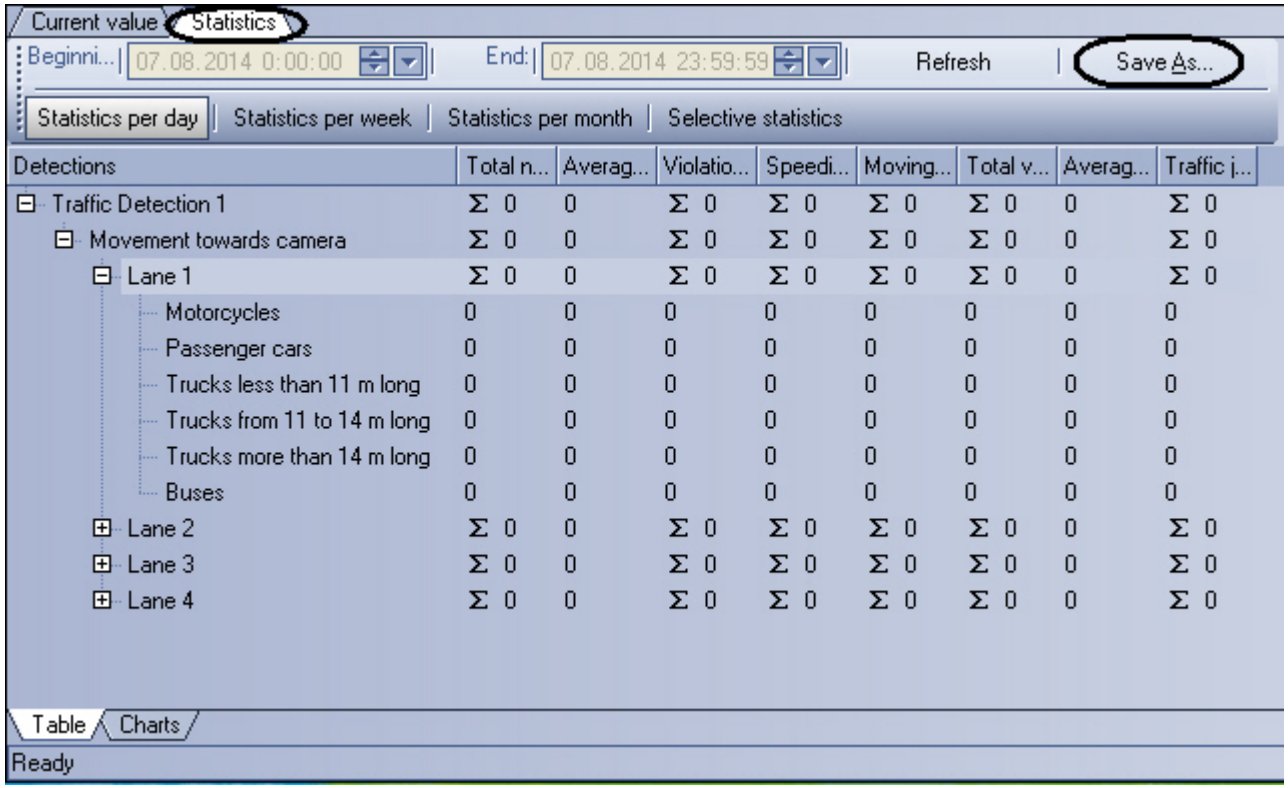
The traffic statistics in graphic form are displayed in the **Charts** sub-tab of the **Statistics** tab.


Current Value
Statistics
Traffic monitor 1
Beginni...
24.03.2009 0:00:00
End:
24.03.2009 23:59:59
Refresh
Save as...
Statistics for a day
Statistics for a week
Statistics for a month
Selective statistics
Traffic Detector 2
Lane 1
Incidents detected
Speeding 0
Moving along the oncomi... 0
Number of vehicle stops 0
Jam 0
Road load
Time
Number of vehicles
Average speed
09:00:00 04-02-2009
10:12:04 04-02-2009
11:24:08 04-02-2009
Time
Legend
Traffic speed
Traffic dens ity
Lane 2
Incidents detected
Speeding 0
Moving along the oncomi... 0
Number of vehicle stops 0
Jam 0
Utilization
09:00:00 04-02-2009
11:06:07 04-02-2009
Time
Number of vehicles
Average speed
09:00:00 04-02-2009
10:12:04 04-02-2009
11:24:08 04-02-2009
Time
Legend
Traffic speed
Traffic dens ity
Incidents detected
Table
Charts
Ready
NUM

Note.
To refresh the displayed statistics, click the **Refresh** button.

Saving traffic statistics to a file

The **Statistics** tab allows saving the traffic statistics into a file.



To export the traffic statistics into a file, do the following:

1. Create and display the request for traffic statistics (see the Creating a request for traffic statistics section).
2. Click the **Save as** button.
3. Enter the pathname in the window that opens and click **Save**.
4. The traffic statistics will be saved in the specified location in a CSV file.

The Vehicle Tracer interface object

Introduction

The **Vehicle Tracer** interface object includes the following components:

1. **On-line monitor** – is designed for displaying the data about identified plates and for handling alarms;
2. **Events monitor** –displays video frame with a vehicle, which plate is being recognized at the moment and also identified number and speed.
3. **Alarm window** - is designed for displaying the data about vehicles in case of coincidence of recognized plates with plates which are stored on the external orientation database.

Note.
Events monitor and **Alarm window** components are optional and aren't displayed with corresponding system settings (see the document Auto-Intellect software package: Administrator guide).

Viewing the data about passing vehicle

Viewing the data about passing vehicle is performed in the window **Events monitor**.

Note.
Events monitor component may not be displayed due to corresponding system settings (see the document Auto-Intellect software package: Administrator's guide).

In the **Events monitor** window the following data is displayed:

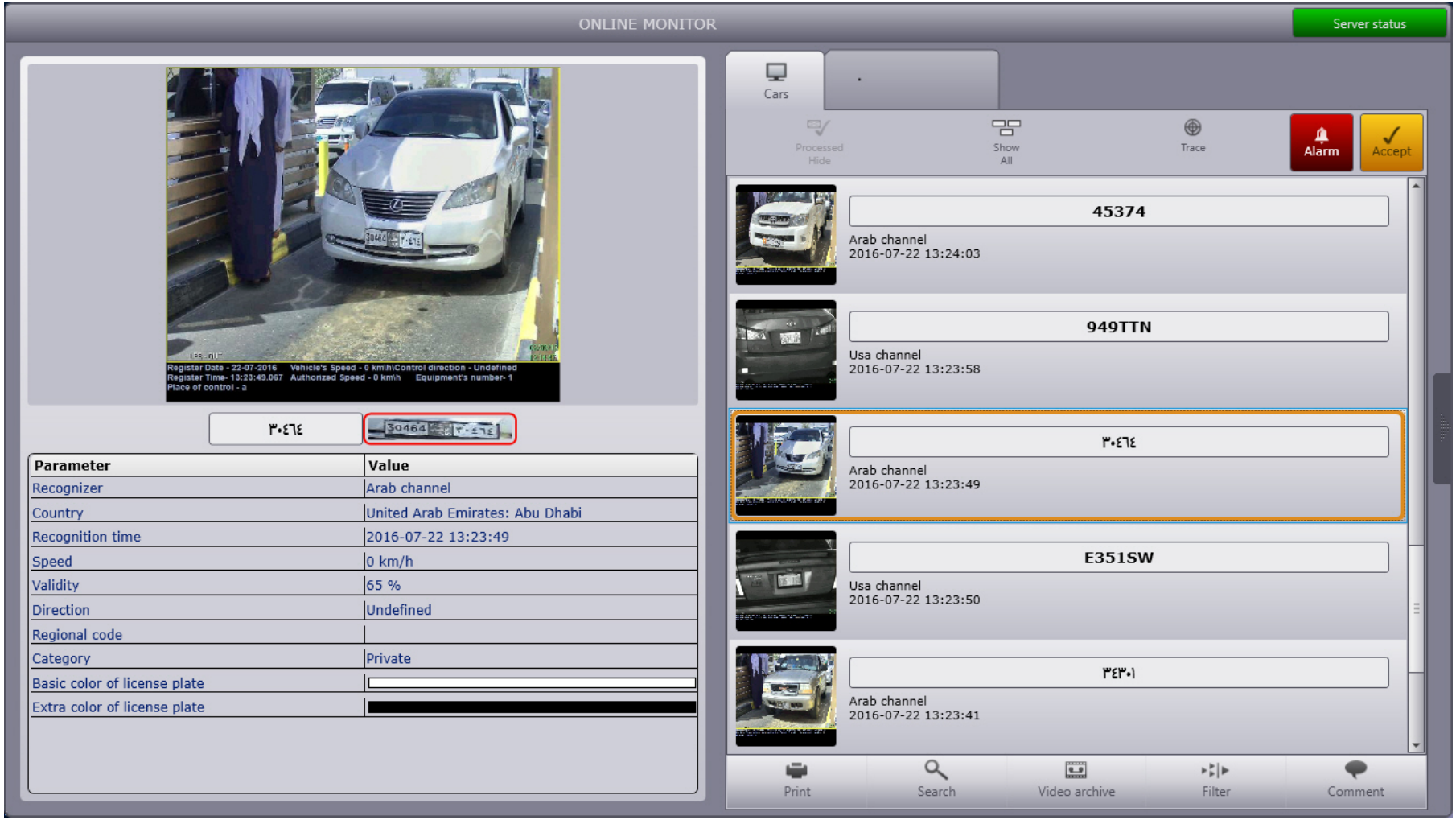
1. LPR channel (the name of the corresponding object **LPR channel**) (**1**);
2. vehicle's video frame with a sing, containing the following data (**2**):
    a. date and time of receiving data about the vehicle;
    b. vehicle's speed;
    c. vehicle's direction;
    d. speed, allowed on the controlled area of the road;
    e. vehicle's detector id number;
    f. control site.
3. vehicle's identified number and speed (**3**).
4. image of recognizing license plate (**4**).

Note.
In case, when **Uragan** or **CARMEN-Auto** module is used for identification, allowed speed, vehicle's speed and speed detector's number are displayed only if the **Radar** module is connected (see the document Auto-Intellect software package: Administrator's guide).

Note.
In case when alarm is registered for a vehicle (overspeeding, and /or identification of a plate in the external plates database), a field with a video frame is underlined red (**2**).

Viewing the data about the last identified vehicle

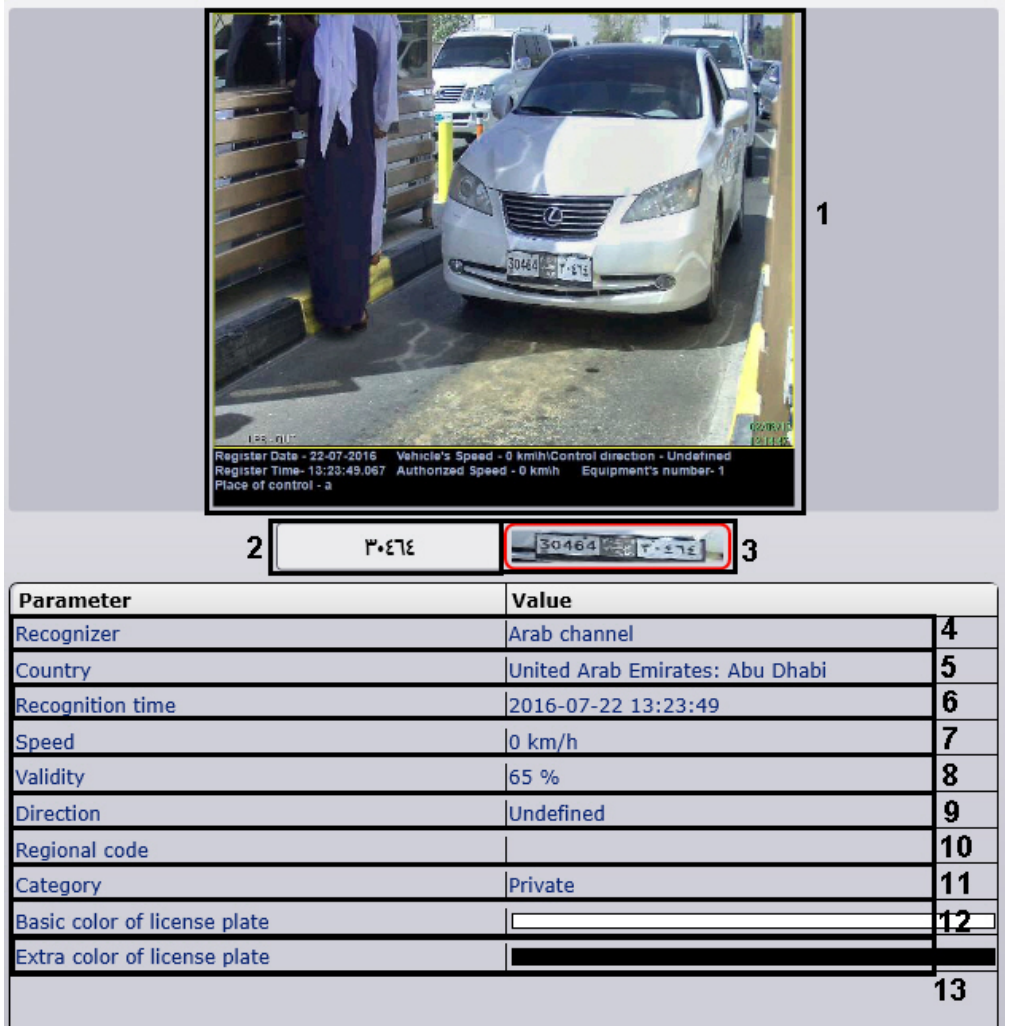
Viewing the data about the last identified vehicle is performed in the group **Last event** of **On-line monitor** window.



Note.
If there is selected an event in the identified vehicles protocol or in the alarms protocol, the data about this event will be displayed in the group **Last event** (see sections Viewing the protocol of the identified vehicles, Viewing the alarms protocol).

Viewing the data about the last identified vehicle is performed in the following way:

1. In field 1 there is displayed a vehicle's video frame with a sign (**1**).



2. Identified vehicle's plate is displayed in Field 2 (**2**).

> **Note.**
> If the plate hasn't been recognized, **Unidentified** message will be displayed in the field.

3. Image of recognizing vehicle's plate is displayed in Field 3 (**3**).
4. In the **Recognizer** field the name of plate's recognizer is displayed (the name of the corresponding object **Arab channel**) (**4**).
5. In the **Country** string there is displayed a country in accordance with the identified number (**5**).

> **Note.**

The country is displayed only in case when the **Uragan** or **CARMEN-Auto** modules are used for recognition.

6. In the **Recognition time** string the date and recognition time of vehicle's information is displayed (**6**).
7. In the **Speed** string the vehicle's speed is displayed (**7**).

> **Note.**
> In case, if **Uragan** or **CARMEN-Auto** modules are used for identification and **Radar** module is not connected, zero speed value is displayed.

> **Note.**
> Depending on **Vehicle Tracer** settings the speed is displayed in km/h or m/h (see the document Auto-Intellect software package: Administrator's guide).

8. In the **Validity** string validity of identified plate in percent is displayed (**8**).
9. In the **Direction** string the vehicle's direction (**Towards the camera** or **Off the camera**) is displayed (**9**).
10. Regional code of the recognizinf vehicle's plate is displayed in the **Regional code** field (**10**).
11. In the **Category** field the vehicle's category is displayed (**11**).

> **Note.**
> On default the **Category** field is missed. To display this field place the *carmen_detector.xml* file to the <*Intellect software installation directory*>/Modules folder.
> Structure of the *carmen_detector.xml* file is follows:
>
> <items>
> <item type="*ID of Carmen license plate*" category="*Name of plate's category*"/>
> </items>
>
> For example,
> <items>
> <item type="**212163**" category="**Private**" />
> <item type="**212164**" category="**Taxi**" />
> <item type="**212165**" category="**Private**" />
> <item type="**212166**" category="**Government**" />
> <item type="**212167**" category="**Government**" />
> <item type="**212168**" category="**Private**" />
> <item type="**212169**" category="**Private**" />
> <item type="**212170**" category="**Private**" />
> <item type="**212171**" category="**Public Transport**" />
> <item type="**212172**" category="**Taxi**" />
> <item type="**212173**" category="**Private**" />
> </items>

12. Set the basic color of llicense plate in the Field 12 (**12**).
13. Set the extra color of llicense plate in the Field 13 (**13**).

Viewing the data about the last identified vehicle is over.

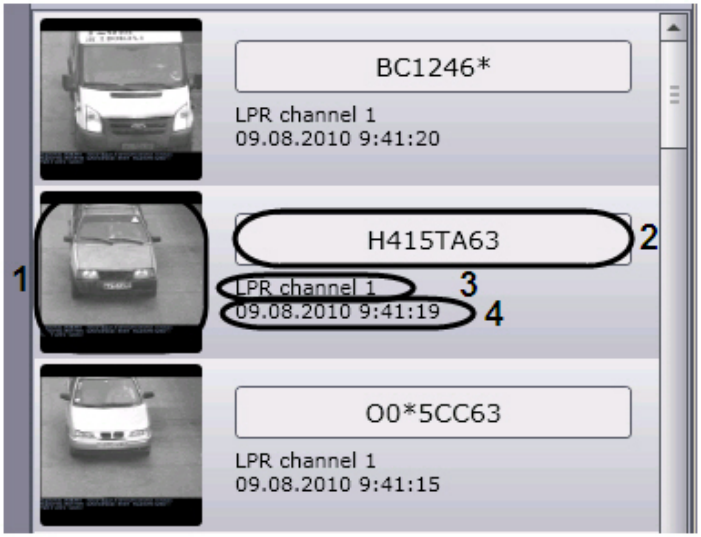
> **Note.**
> In case if there is registered an alarm for a vehicle, the reason of alarm is also displayed in the group **Last event**.

Note.
In the same way one can view the data about any event, selected in the identified vehicles protocol or in the alarm protocol (see sections Viewing the protocol of identified vehicles, Viewing the alarms protocol).

Viewing the protocol of identified vehicles

Viewing the protocol of identified vehicles is performed in **On-line monitor** window.

The protocol of identified vehicles is a table which contains information about identified vehicles (**2**). Select the tab **Events**, displaying the protocol of identified vehicles, to access to the protocol (**1**).



For every vehicle (event) the following data is displayed:

1. video frame of the vehicle (**1**);
2. identified vehicle's number (**2**);
3. vehicle's speed;
4. LPR channel (**3**);
5. time of receiving information about the vehicle (4).

> **Note.**
> In case, when **Uragan** or **CARMEN-Auto** module is used for identification, vehicle's speed is displayed only if the **Radar** module is connected» (see the document Auto-Intellect software package: Administrator guide).

For alarms there is displayed information about reasons of alarms (see section Alarms operation). Unprocessed by the operator alarms are underlined red, processed-underlined yellow (see section Alarm processing).

> **Note.**
> Processed events may not be displayed (see section Hiding the processed events in the protocol).

To view the detailed information about the event it is necessary to perform the following actions:

1. Click with a left mouse button upon the required event.
2. The data about the event will be displayed in the group **Last event** in result. Operative update of the identified vehicles protocol will be suspended in the process.
3. Viewing the data about the event according to section Viewing the data about the last identified vehicle.
4. To restore the active update of identified vehicles protocol click the **Trace** button in the upper area of the **On-line monitor** window.

Viewing the detailed data about the event is over.

Alarms operation

Alarms operation is done in the **On-line monitor** window.

Alarm is triggered by one of the following ways:

1. automatically – in case of overspeeding or vehicle's plate identification in the external database;
2. manually.

Manual triggering the alarm

Manual triggering the alarm is done in the following way:

1. Select the required event in the identified vehicles protocol, clicking it with a left button of the mouse (**1**).

2. Click the **Alarm** button (**2**).
3. In result of this operation the event will be underlined red and added to the alarms protocol (**1**).For an alarm, triggered by operator, there is displayed the reason of alarm **Mark ed by operator** and the time of triggering the event (2).

Note.
Information about alarms protocol is given in the section Viewing the alarms protocol.

Manual triggering the alarm is completed.

Viewing the alarms protocol

Alarms protocol is a table which contains information about vehicles for which alarm has been triggered (**2**). It necessary to activate a tab, that is located in the upper area of the **On-line monitor** window to access to access to the protocol (**1**).

Note.
Data about the last alarm is displayed on the tab.

Unprocessed by operator alarms are underlined red, processed-underlined yellow (see Alarm processing section).

Note.
Processed events may not be displayed (see Hiding the processed events in the protocol section).

Viewing the alarm protocol is done in a similar way with identified vehicles protocol (see section Viewing the identified vehicles protocol). The difference is that for an alarm there is displayed information about the reason of alarm:

1. **Marked by operator** - in case, when the alarm is triggered by operator (the time of triggering is also stated);
2. **Is found in: <external database name>** - in case, when the identified plate is found in the external database;
3. **Overspeeding** - in case, when the vehicle's overspeeding is registered.

Detailed information about an alarm with stating the reason of alarm one can see in the group Lat event (see Viewing the data about the last identified vehicle section). Viewing the detailed information about an alarm is similar with viewing the data about the event, registered in the identified vehicles protocol (see Viewing the identified vehicles protocol section).

In case when the identified vehicle's plate is found in the **External Plates Database**, the information about the vehicle, stored at this base, will be displayed.

Alarm processing

Alarm processing is done in the following way:

1. Select an alarm in the identified vehicles protocol or in the alarms protocol, clicking it by a left mouse button (**1**).

2. Click **Accept** (**2**).
3. The event will be underlined yellow in result (**3**).

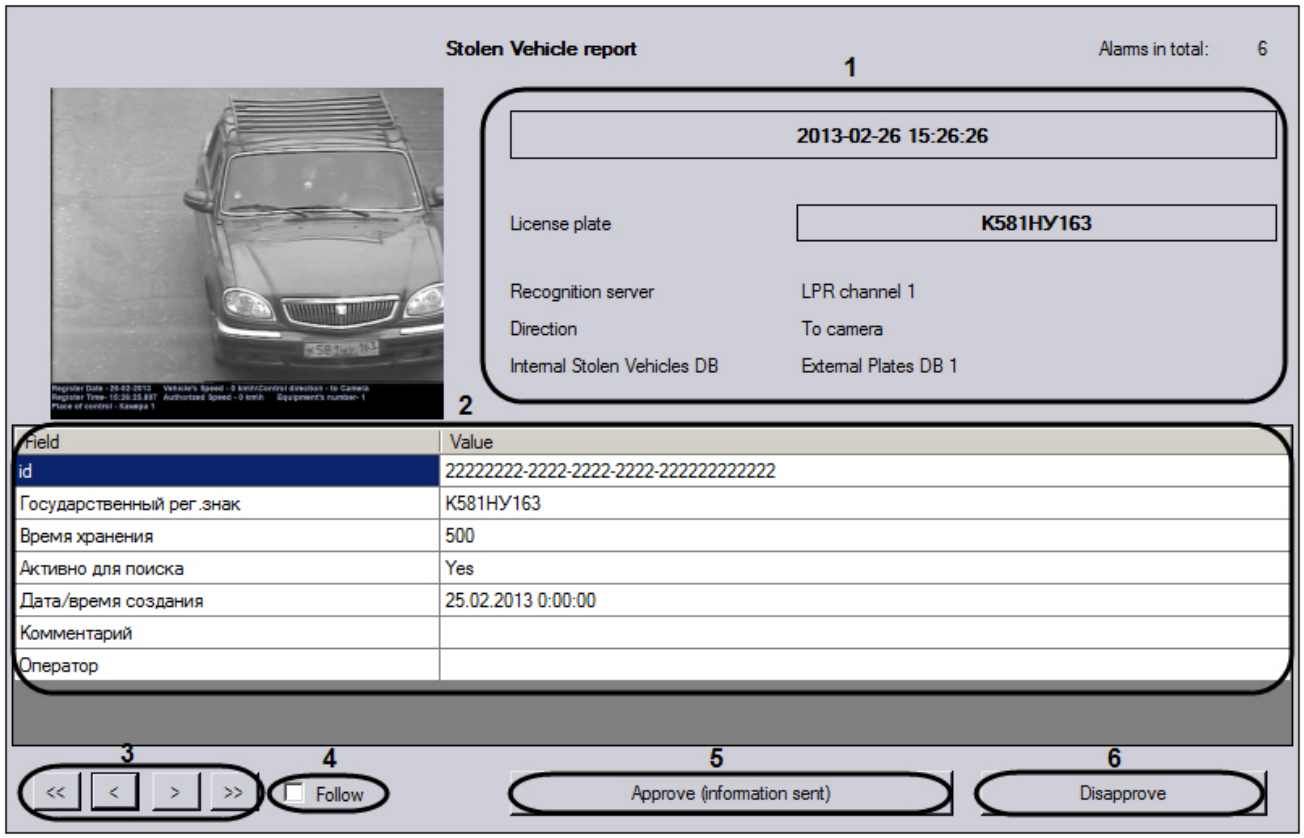
Alarm processing is completed.

Hiding the processed events in the protocol

There is possibility to hide processed events in the identified vehicles protocol and alarms protocol. To realize this possibility it is necessary to click the **Processed Hide** button.

Viewing the events information about alarm event in the Alarm window

In case of proper settings the **Alarm window** is displayed automatically in case of coincidence the recognized plates with plates stored in the database of operating monitoring.



In the **Alarm window** the following data is displayed:

1. Data about fixed event: date, plate, control border, direction, database of stolen vehicle reports (**1**).
2. Data about stolen vehicle report: ID, LP, storing time, status information, date and time of creation, comment, name and surname of operator who create the report (**2**).

Use buttons to scroll the reports (**3**).

To confirm the alarm status click the **Approve (information sent)** button (**5**). As a result the alarm will be marked as received in the **On-line monitor** window and deleted from the **Alarm window**. If the **Follow** checkbox is set the confirmed alarm disappears from all **Alarm windows** in the distributed system.

To close the window of stolen vehicle report click the **Disapprove** button (**6**). After click the button the alarm status is not changed in the **On-line monitor** (alarm is not processed).

Adding the comments to the events

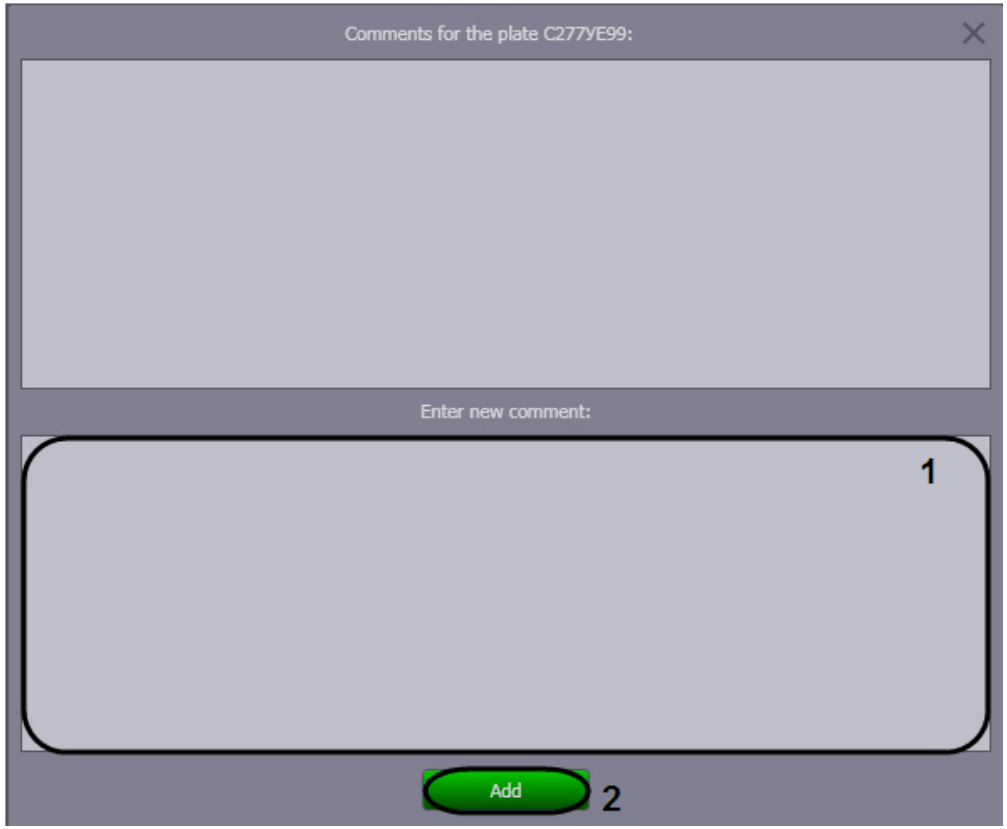
There is possibility to add commentary to the events. This possibility is realized in the **On-line monitor** window.

> ⚠ **Attention!**
> There is possibility to comment accepted events (are underlined yellow) is not provided.

To add a commentary to the event one has to carry out the following events:

1. To select an event in the identified vehicles protocol or events protocol, click it with a left mouse button (**1**). Operative update of the protocol, displayed on the screen, will be suspended in result.

2. Click **Comment** (**2**).
3. **Comments for the plate** window will open in result.



4. Enter the comment in the field after the stated date (**1**).
5. Click **Add** button to apply the comment to the event (**2**).
6. Repeat steps 2-5 for all the required comments.
7. To resume operative update of the protocol, displayed on the screen, click **Trace** button (**3**).

Adding the comments to the event is completed.

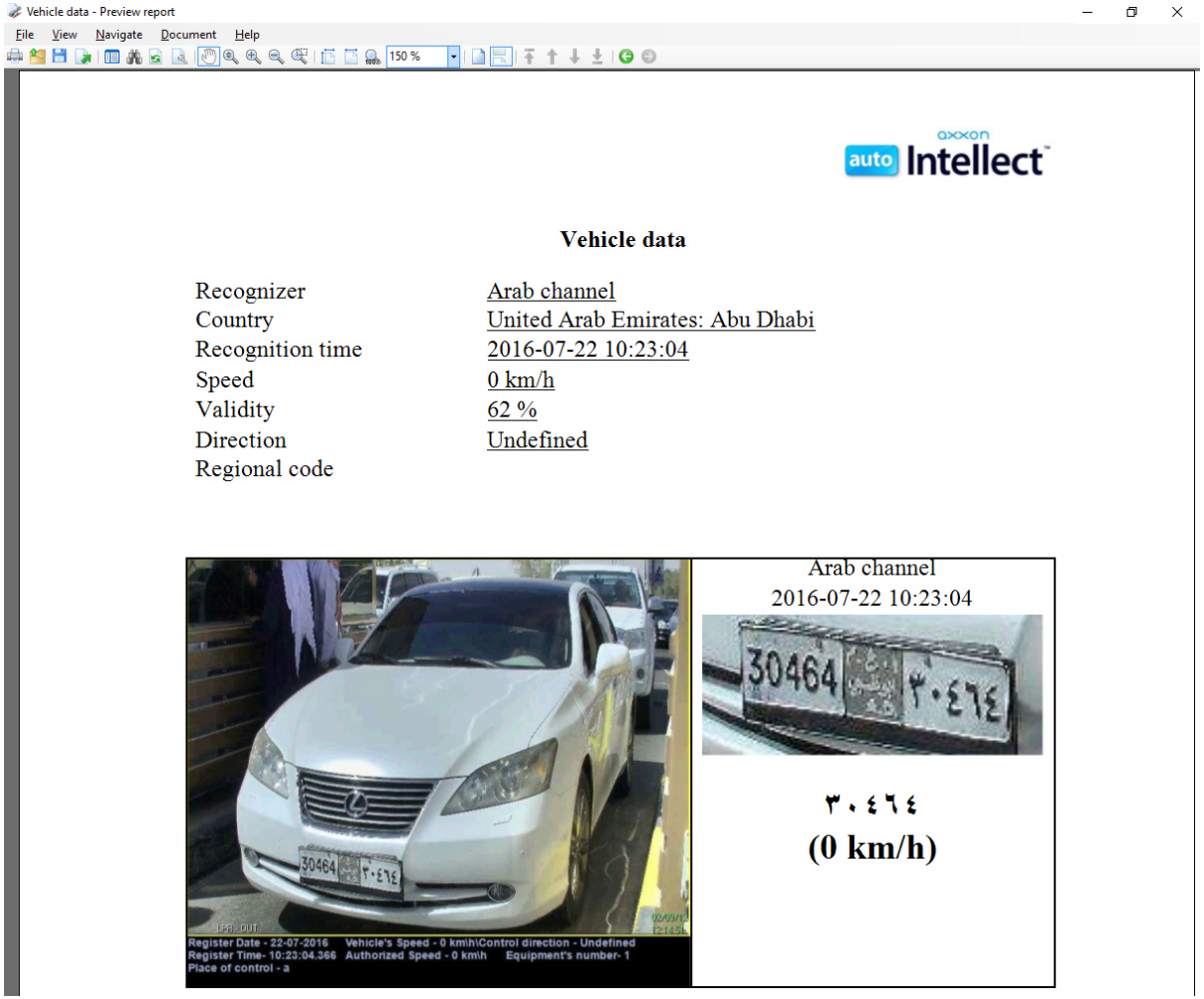
To view the comments to the event the required value should be selected in the identified vehicles protocol or in the alarms protocol. Comments will be displayed in one field (**4**).

Printing and exporting the data about the vehicle

Printing and exporting the data about the vehicle is done in the following way:

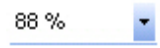
1. Select an event in the identified vehicles protocol or events protocol, clicking upon it with a left mouse button (**1**). Operative update of the protocol, displayed on the screen, will be suspended in result.

2. To build a report with vehicle characteristics click the **Print** button (**2**).
3. Preview report program will be run in result. Vehicle data report will be displayed in this program's window.



4. Carry out the necessary operations with a report, then quit the program for viewing the reports, having executed the point of the main menu **File** -> **Exit viewer** or clicked the button .

Operation	Call for operation		
	Start in the main menu	Start in the contextual window	Button on the toolbar
Open the report, saved in.rsd or .xml	File->Open	-	
Save the report in .rsd or .xml	File ->Save	-	

Export the report to one of the most common formats	File ->Export	-	
Print the report	File ->Print	-	
Activate the tool «Arm»	View-> Scrolling	Scrolling	
Zoom in the displaying of report's pages	View ->Zoom in	Zoom in	
Zoom out the displaying of report's pages	View ->Zoom out	Zoom out	
Enable dynamic scaling of report's pages	View ->Dynamic scaling	Dynamic scaling	
Zoom in the selected region scaling	View ->Region scaling	Region scaling	
Scale in page size	View ->In page size	In page size	
Scale in page's width size	View ->In page's width size	In page's width size	
Display pages in real size	View -> Real size	Real size	
Enter or select from the list the required scale of displaying the report's pages	View ->Set the scaling	Set the scaling	
Enable the mode of nonstop paginal report's displaying	-	-	
Enable the mode of by one page report's displaying	-	-	
Go to the first report's page	Navigate->The first page	The first page	
Go to the previous report's page	Navigate ->Previous page	Previous page	
Go to the next report's page	Navigate ->The next page	The next page	
Go to the last report's page	Navigate ->The last page	The last page	
Go to the required report's page (call for a dialog window « Go to page »)	Navigate -> Go to page	-	-
Display the previous report's view	Navigate ->Back	Back	
Display the next report's view	Navigate ->Forward	Forward	

Find the required characters string in the report	Document->Find	Find	
Update the report	Document -> Update	Update	
Edit the report (open the editing program)	Document ->Edit the report	Edit the report	
Display report's content	-	-	
Display information about the program to view the report	Help -> About program	-	-
Close the preview report program	File ->Close	-	-

Note.
Operations with report files (opening, saving, exporting, and printing) are performed with standard dialog OS Windows.

Note.
To go to the required page one should enter page's number in the field **Page №** of **Go to page** dialog window and then click **OK**.

5. To resume operative update of displayed protocol click the **Track** button. (**3**).

Printing and exporting the data about the vehicle is completed.

Viewing the video archive by event

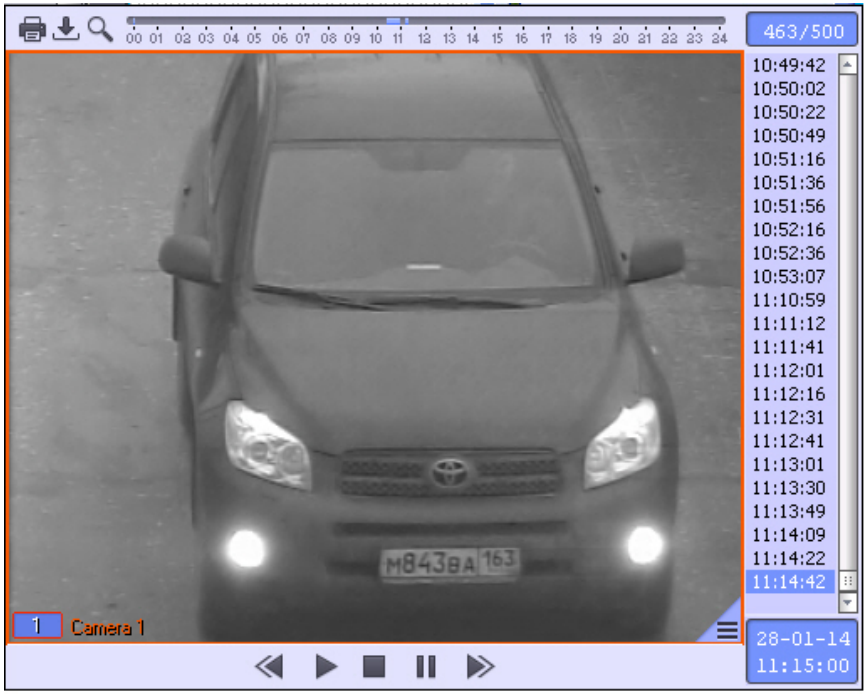
There is possibility to command from the component **On-line monitor** in order to reproduce the video archive by event in the interface window the **Monitor**.

Note.
The preliminary set **Monitor** object should be selected as a monitor for controlling on the **Vehicle Tracer** settings panel (see the document Auto-Intellect software package: Administrator Guide).

To view the video archive by event do the following:

1. Select the event in the identification vehicles protocol or alarms protocol, clicking upon it with a left mouse button (**1**). Operative update of the protocol, displayed on the screen, will be suspended in result.

2. Click **Video archive** (**2**).
3. In case, when currently the monitor with a video surveillance corresponding to the plates identification camera is displayed on the screen, this video surveillance window will enable the mode of displaying the archive recording by the event. Video archive navigation is described in the document Intellect software package: Operator's Guide. To close the video archive displaying mode it is necessary to click with a left button upon the  sign in the right bottom corner of the video surveillance window.



4. To resume operative update of displayed protocol click the **Trace** button (**3**).

Viewing the video archive by event is completed.

Using the filters in the protocols

There is possibility to select events to be displayed in the identified vehicles protocol and alarms protocol.

> **Attention!**
> Both displayed and hidden in the protocol events are saved in the recognizer's database of the *Auto-Intellect* software.

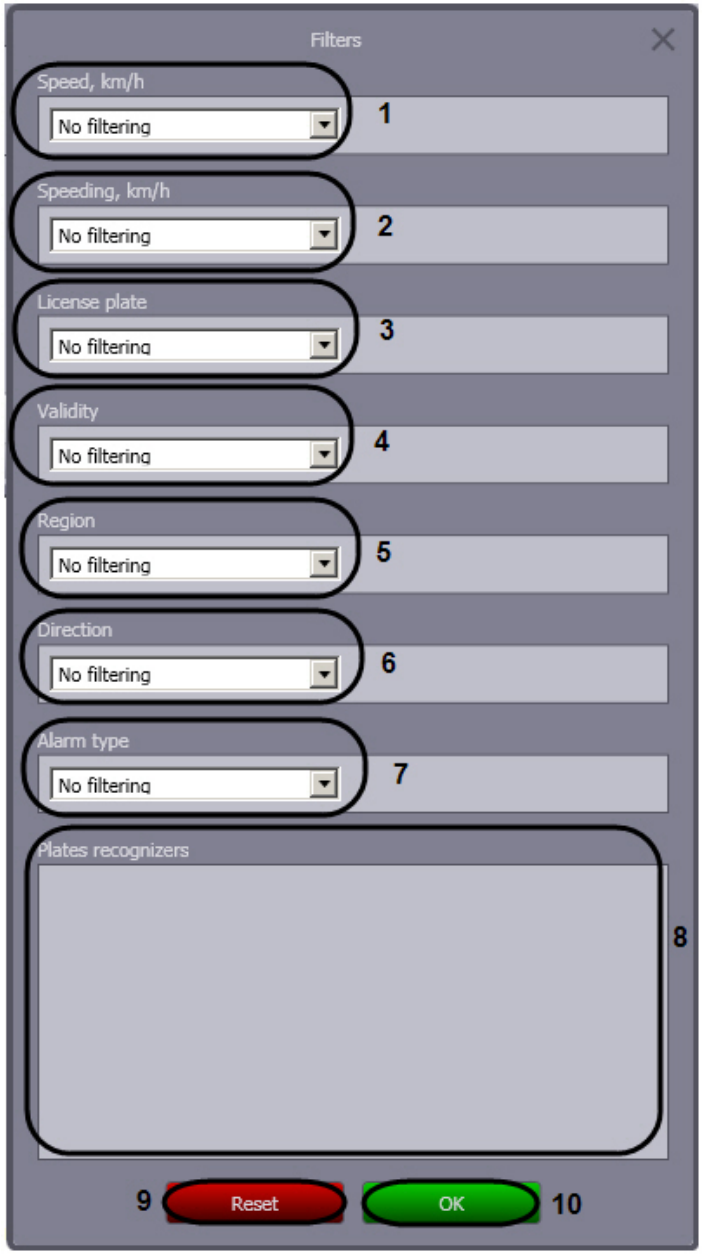
Events may be selected, using the following events:

1. speed;
2. overspeeding;
3. plate;
4. validity;
5. region;
6. direction;
7. alarm type;
8. identifiers.

Selection of filters, used in the protocols, is done in the following way:

1. Click Filter button in the **On-line monitor** window (**1**).

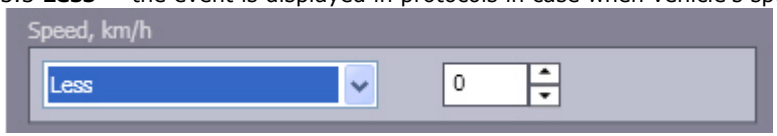
2. **Filters** dialog window will be displayed in result.



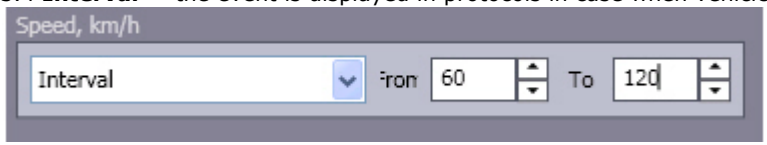
3. From the **Speed** list (**1**) select the required filter according to vehicle's speed, then enter the threshold value of the speed in the field(s) in km/h.
   The following speed filters are available:

3.1 **No filtering** — the event is displayed in protocols with any vehicle's speed.
3.2 **More** — the event is displayed in protocols in case when vehicle's speed is over threshold value.

3.3 **Less** — the event is displayed in protocols in case when vehicle's speed doesn't exceed the threshold value.



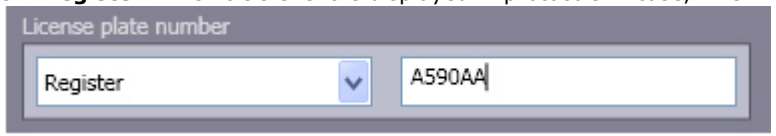
3.4 **Interval** — the event is displayed in protocols in case when vehicle's speed corresponds to the entered range of threshold value.



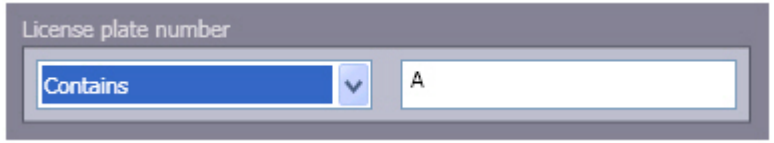
4. From the **Speeding** list (**2**) select the required vehicle's overspeeding filter and then enter threshold value of overspeeding in km/h.
The following overspeeding filters are available:
4.1 **No filtering** — the event is displayed in protocols with any vehicle's overspeeding.
4.2 **More** — the event is displayed in protocols in case when vehicle's overspeeding is over the threshold value.

> **Note.**
> The threshold value is calculated as a difference between the fixed vehicle's speed and the speed, permitted in the controlled area of the road.

5. From the **License plate number** list (**3**) select the required vehicle's plate filter and then in the field enter the number or its part which identification leads to event's displaying in protocols.
The following plate filters are available:
5.1 **No filtering** — the event is displayed in protocols with any vehicle's plate.
5.2 **Register** — vehicle's event is displayed in protocols in case, when vehicle's plate exactly matches the entered value.



5.3 **Contains** — vehicle's event is displayed in protocols in case, when vehicle's plate contains the entered value.

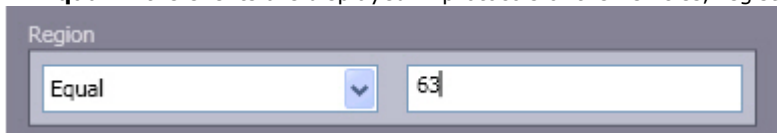


Note.
The expression, given for filters **Register** and **Contains**, may include usual characters and characters «*», stating for an unidentified plate's character. If the expression contains one or several characters «*», there are displayed only plates, containing unidentified characters in the set combination, in the protocols.

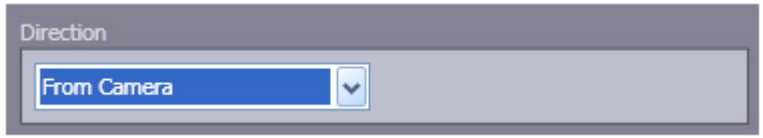
6. From the **Validity** list (**4**) select the required filter on percent of vehicle plates recognizing and then enter the threshold value of recognizing validity in the opened field (s).
   The following validity filters are available:
   6.1 **No filtering** - events are displayed for those vehicles which plates are recognized with any validity.
   6.2 **More** - events are displayed in the protocol if the recognizing validity is higher than the specified value.

   6.3 **Interval** - vehicle event is displayed in the protocol if the recognizing validity of vehicle plate belongs to the specified range of threshold values.

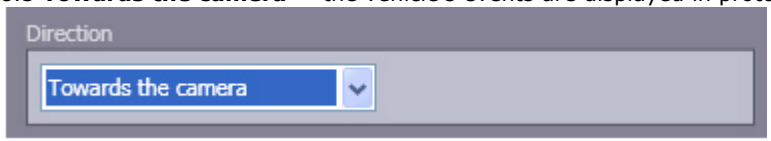
7. From the **Region** list (**5**) select the required region's filter, where the vehicle has been registered, and then enter region's number in the appeared window (**5**).
   The following region's filters are available:
   7.1 **No filtering** — the events are displayed in protocols of the vehicles, registered in any region.
   7.2 **Equal** — the events are displayed in protocols of the vehicles, registered in the given region.



8. From the **Direction** list (**6**) select vehicle's direction with which the event should be displayed in protocols.
   The following direction filters are available:
   8.1 **No filtering** — the vehicle's events are displayed in protocols with any direction in respect of the plates identification camera.
   8.2 **From camera** — the vehicle's event is displayed in case, when the vehicle was moving from the camera.

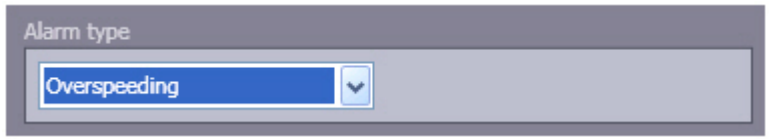


   8.3 **Towards the camera** — the vehicle's events are displayed in protocols in case, when the vehicle was moving towards the camera.

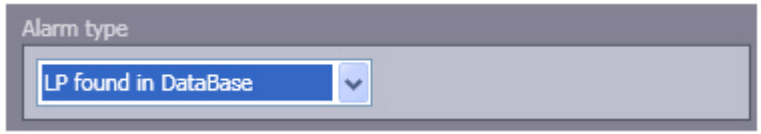


   8.4 **Undefined** — the vehicle's events are displayed in protocols in case, when the vehicle direction in relation to the camera has not been determined.

9. From the **Alarm type** list select the alarm type (**7**). Only alarms of the selected type will be displayed in protocols.
   The next alarm type filters are available:
   9.1 **No filtering** — the vehicle's events are displayed in protocols with any alarm type or its absence.
   9.2 **Overspeeding** — the vehicle's events for which overspeeding has been registered are displayed in protocols.

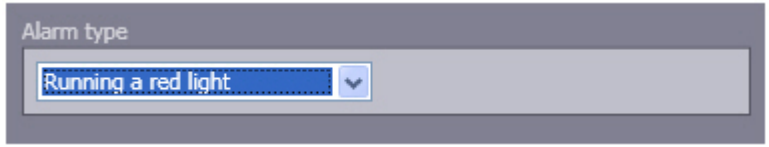


   9.3 **LP found in database** — the vehicle's events which plates have been found in the external plates database are displayed in protocols.

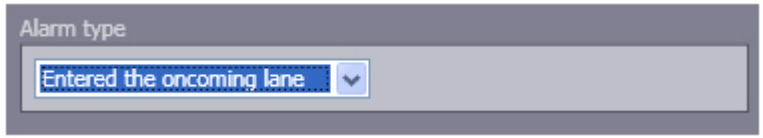


   9.4 **Alarm set by operator** — the vehicle's events, initialized manually, are displayed in protocols.

   9.5 **Running a red light** — the vehicle's events for which running a red light has been registered are displayed in protocols.

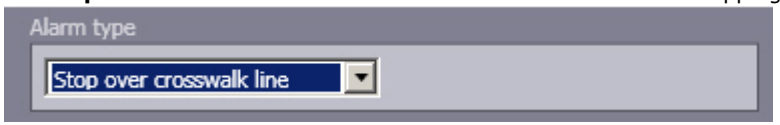


   9.6 **Entered the oncoming lane** — the vehicle's events for which entering the oncoming lane has been registered are displayed in protocols.



   9.7 **Crossed the stop line** — the vehicle's events for which crossing the stop line has been registered are displayed in protocols.

   9.8 **Stop over crosswalk line** – the vehicle's events for which stopping on the crosswalk line has been registered are displayed in protocols.



10. In the group **Plates recognizers** (**8**) set the checkboxes for those LP recognition Servers, which data have to be displayed in protocols.
11. Click **OK** to save filters settings and close the **Filters** dialog window (**10**).

Note.
To reset all the settings it is convenient to use **Reset** button (**9**).

Selecting the filters, used in protocols is over.

There is possibility to disable filters without changing the settings in **Filters** dialog window. Click the button **Show all** for it (**2**). All the registered events will be displayed in protocols in result. To resume the usage of filters, this button should be repeatedly pressed.

Viewing the Vehicle Tracer errors

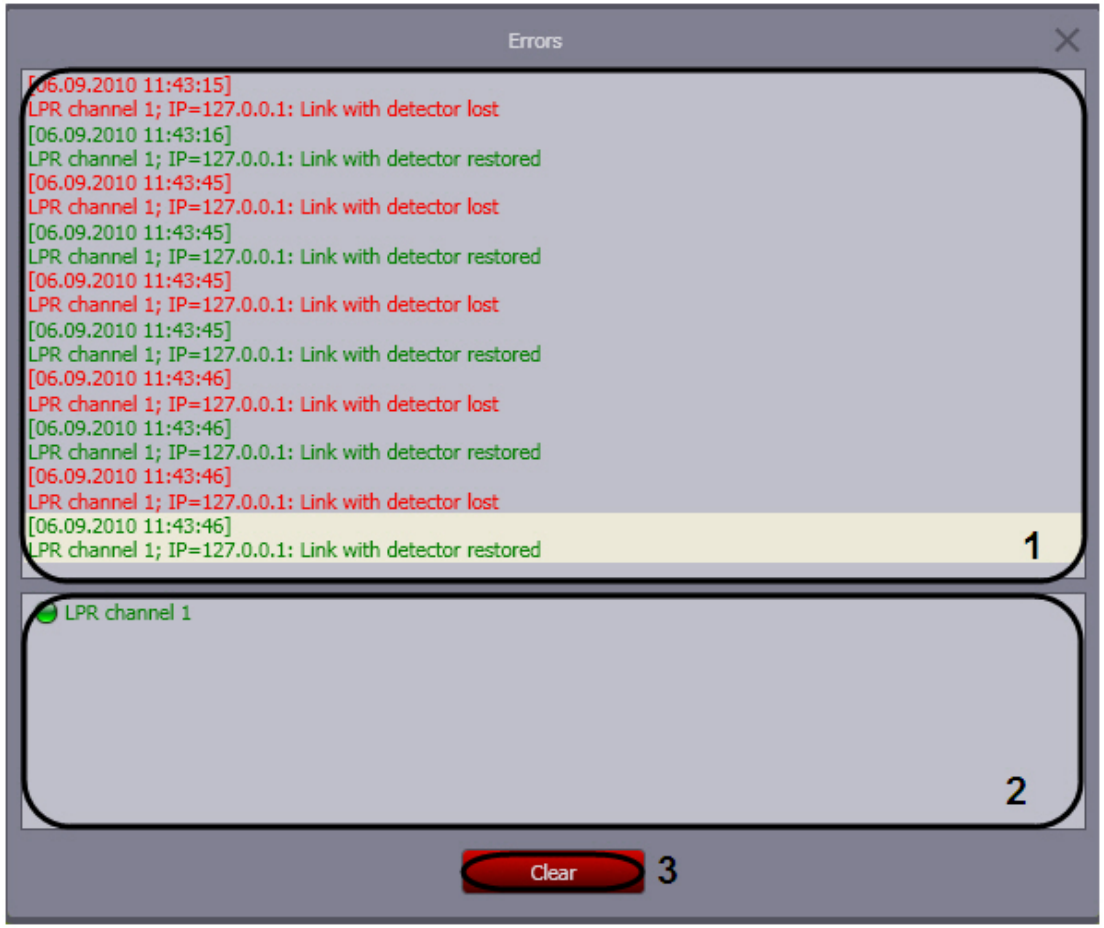
Without Vehicle Tracer errors the **Server status** button in the right upper corner of **On-line monitor** window is green. If errors are registered, the button is red.

If errors are registered, the button is red.

To view the **Vehicle Tracer** errors, do the following:

1. Click the button .

2. **Errors** dialog window will be displayed in result.

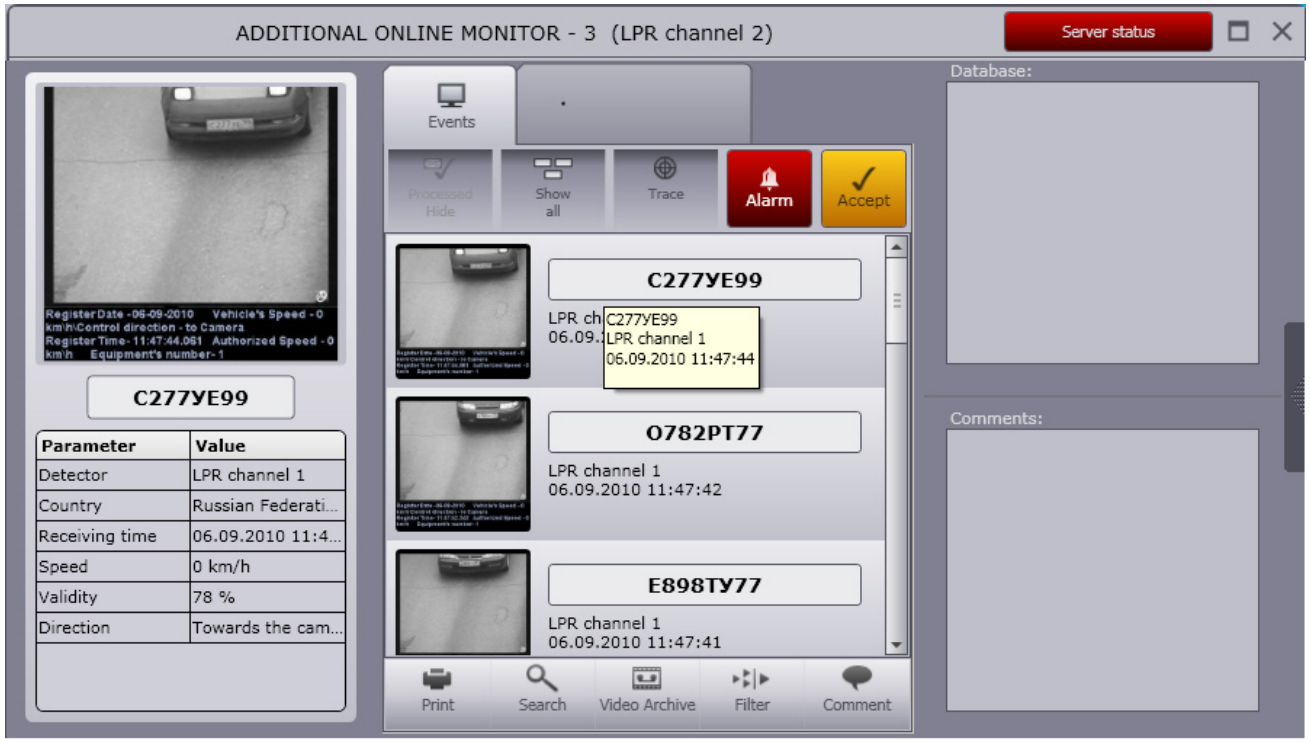


3. Data about occurred errors are displayed in Field 1 (**1**).
4. A list of all possible error sources is displayed in Field 2: LPR channels and/or external databases. Current error sources are marked by sign, idle sources are marked by sign (**2**).
5. To delete data about errors and close **Errors** dialog window click **Clear** button (**3**).
6. To close **Errors** dialog window without deleting data about mistakes, click button.
7. The button **Server status** will become green in result.

Viewing the Vehicle Tracer errors is completed.

Creating the additional components of On-line monitor

There is possibility to create additional interface components **On-line monitor**. Make a left double click upon the component **Events monitor** to create an additional component. In result of this operation there will be displayed an additional **On-line monitor** component in the center of the screen.



Creating of additional **On-line monitor** is completed.

Searching the events in the recognizer’s databases

Searching the events in the recognizer's databases of the *Auto-Intellect* program complex is performed in the dialog window **Events search in the recognizer's databases**. To call for this window click the **Search** button in the interface object **On-line monitor**.

Full functionality, provided to operator in the window **Searching the events in the recognizer's databases**, is the following:

1. Searching the events, stored at both local and remote recognizer's databases of the Auto-Intellect program complex.
2. Printing the reports concerning the search results.
3. Creating an own plates database (**Active tracer** database).

Setting up the events search

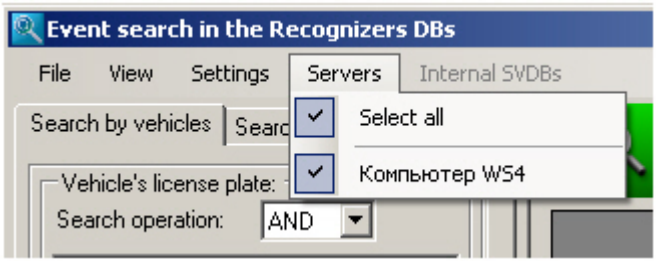
On the page:

Events search is set up in the following way:

1. Select the database, where events should be searched.
2. Set up the displaying of events search.
3. Set up the video archive.

Selecting recognizer databases for events search

To select recognizer databases for events search, select servers where required LPR databases are. To carry this out select the point **Servers** -> **<Name of the required database>** of the main menu in the **Event search in the Recognizers DBs** window. As a result the server will be marked with  icon.



Note.
To select all system servers select the point **Servers** -> **Select all**.

There will be search by selected servers.

Note.
Results of search on the server heading will be highlighted by red if some of selected servers is unavailable for search. If all servers are available for search the heading will be highlighted by green.

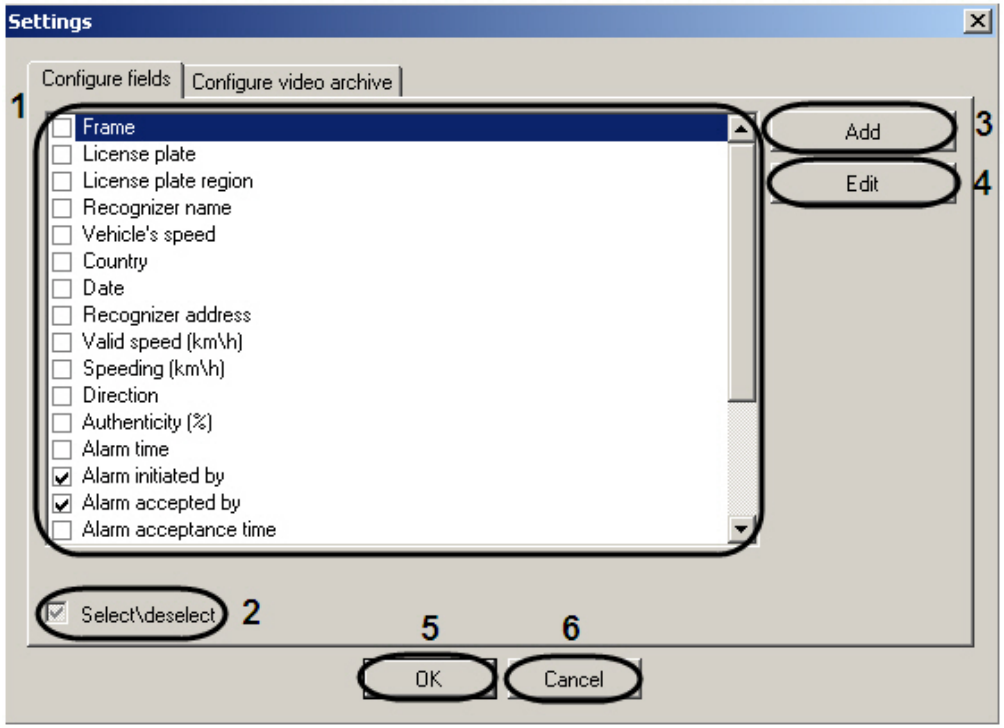
Event search results setup

Event search results are presented in the table. There is a possibility to choose which table's columns should be displayed and which shouldn't, to add new columns and also edit their displayed names.

To set up the displaying of search results do the following:

1. Select **Settings** in the main menu of the **Event search in the Recognizers DBs**.

As a result **Settings** dialog box is displayed. Set up of the event search results displaying is carried out in **Configure fields** tab.



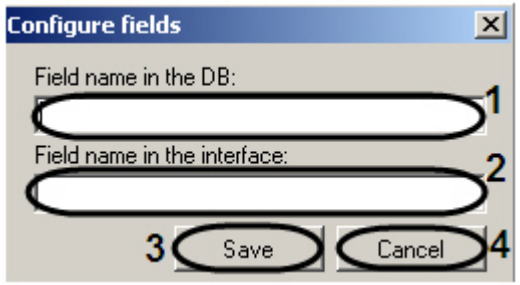
2. In the central field of the window (**1**) set the checkboxes for the columns that should be displayed in event search results table.

> **Note.**
> For displaying all the available columns in the search results table set the checkbox **Select\deselect** (**2**). If this checkbox isn't set, search results table is not displayed.

Columnname (on default)	Column's content
Frame	Video frame with a vehicle
Vehicle's speed	Vehicle's speed
Number	Identified plate's number
Region number	Region of identified number
Country	Country of the identified number
Detector name	Object name **LPR channel**, corresponding to Vehicle's detector number
Date	Data of vehicle's identification

Detector address	Number's detector address
Valid speed, km\h	Speed in km\h , that is valid on the road's area/ controlled by number's detector
Overspeed, km\h	Vehicle's overspeeding in km\h
Direction	A check, that the vehicle was moving towards the camera, detecting numbers
Authenticity, %	Plates identification authenticity is given in percent
Alarm time	Time of alarm registration according to the identified number
Alarm detection time	Time of alarm detection by the PC operator of the Auto-Intellect
Delay of alarm acceptance, sec	Time between registering the alarm and its acceptance by operator
Commentary	Commentary , added by the operator to the event with a vehicle
Alarm type	Alarm type(overspeeding or vehicle's identification in the external plates databases)
Alarm processed	A check, that the alarm has been accepted by the operator
External database	A check, that the alarm has been found in the External database
Alarm initiated by	Operator name who initiate the alarm
Alarm accepted by	Operator name who process the alarm
Red-light phase start time	Time of start alarm during which alarm was fixed
Time passed since the red-light phase start	Time period passed since the red-light phase starts until the alarm fixing moment

3. To add a new column to the event search results table do the following:
3.1 Click **Add** (**3**). As the result **Configure fields** dialog box opens.

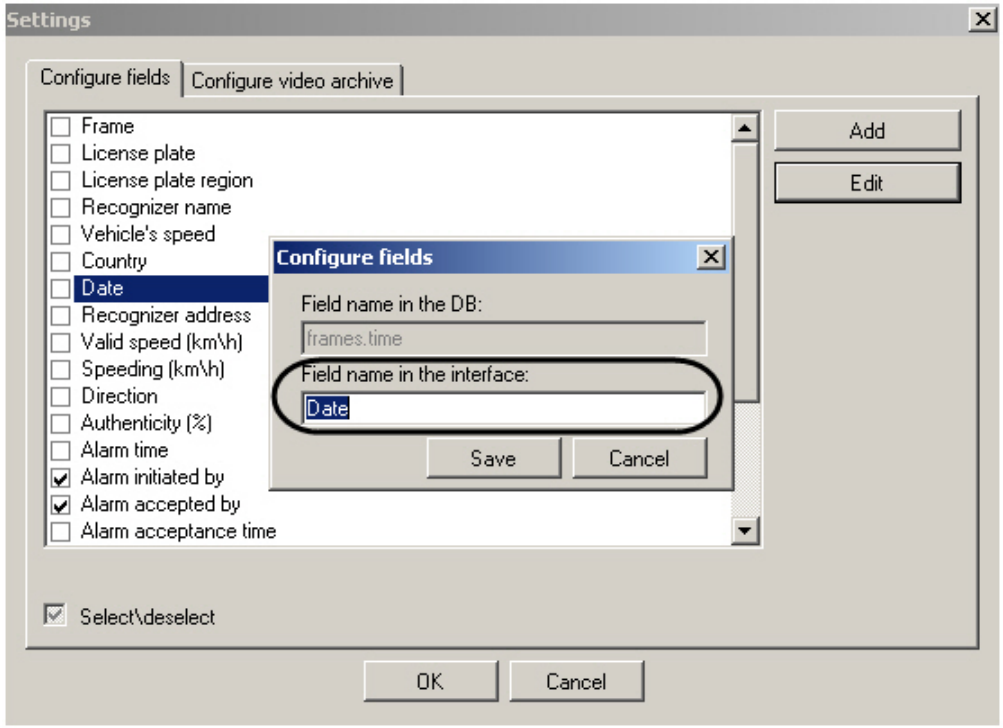


3.2 In the **Field name in the DB** enter the column's name in the connected recognizer's database, which content is required to be displayed in the event search results table (**1**).
3.3 In the **Field name in the interface** enter the name of this column in the event search results table (**2**).
3.4 Click **Save** to save the applied changes and close **Configure fields** dialog window (**3**).

Note.

Click **Cancel** to close this window without saving any changes (**4**).

4. To edit column's name in the event search results table do the following:
   4.1 In the **Available fields** group select the column, the name of which has to be changed (**1**).
   4.2 Click **Edit** (**4**).
   4.3 As a result **Configure fields** dialog box with blocked **Field name in the interface** field is displayed.



   4.4 Change the columns name in a required way in the event search results table and save the changes (see steps 4.3-4.4).
5. Click **OK** to save the changes and close the **Displayed fields selection** dialog window (**5**).

Note.
Click **Cancel** to close this window without saving any changes (**6**).

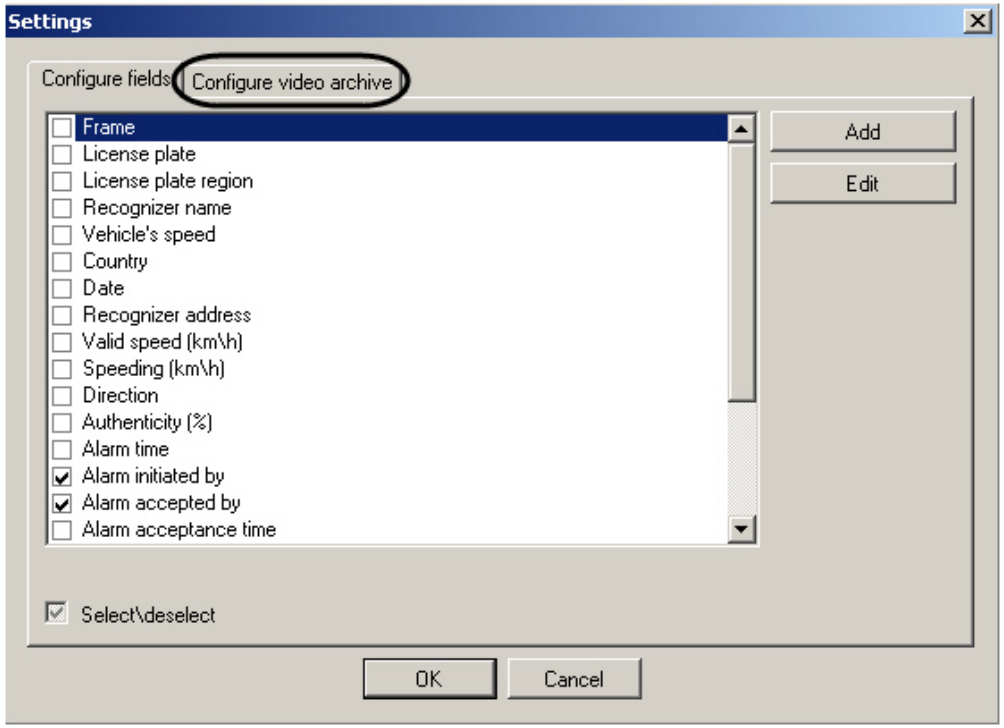
Setting up the event search results is completed.

Set up the video archive

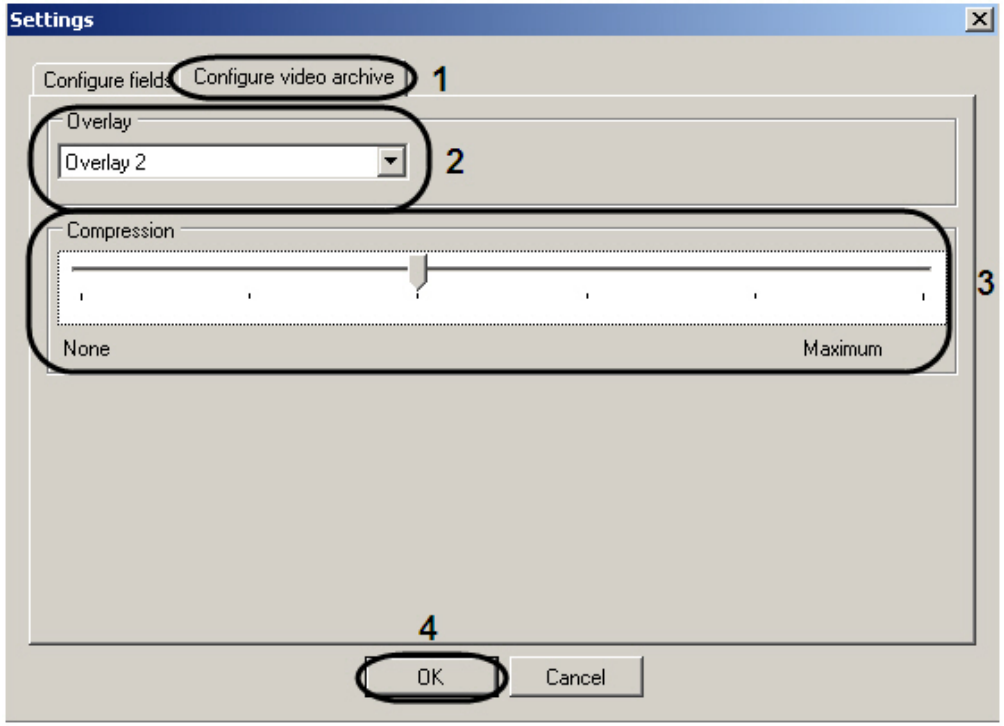
Video recordings of events are displayed in video archive. To set up the video recordings playback do the following:

1. Select **Settings** in the main menu of the **Event search in Recognizers DBs**.

As a result **Settings** dialog box is displayed.



2. Go to **Configure video archive** tab (**1**).



3. Select Overlay mode in the **Overlay** dropdown list (2).

> **Note.**
> Overlay is used to process the video using the video card and **Direct X** libraries, before it is displayed. Overlay allows to improve the image due to optimization of the pixel color settings. At the same time, the CPU's load reduces as the video is processed with the resources from the video capture card.

The overlay modes are presented in the table.

Overlay mode	**Description**
No	Videos from video cameras are not processed by video card
Overlay 1	Videos from video cameras are processed as one stream
Overlay 2 (set on default)	Videos from video cameras are processed independently of one another

4. In **Compression** field set the cursor in position that determines video compression degree (**3**). Minimal compression value is **None** – maximal video size, best quality. Maximal compression value is **Maximum** – minimal video size, worst quality.
5. To save changes click **OK** (**4**).

The setting of the events video recordings playback is completed.

Forming the search query

On the page:

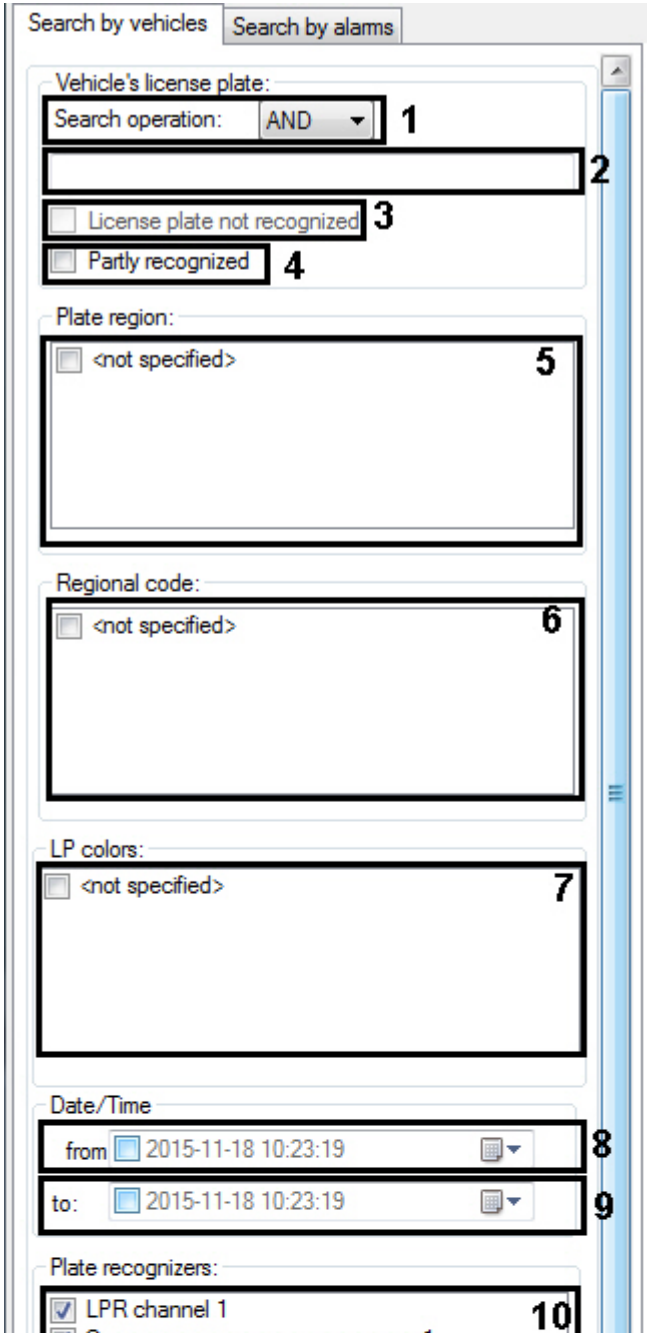
There is a possibility to form a search query:

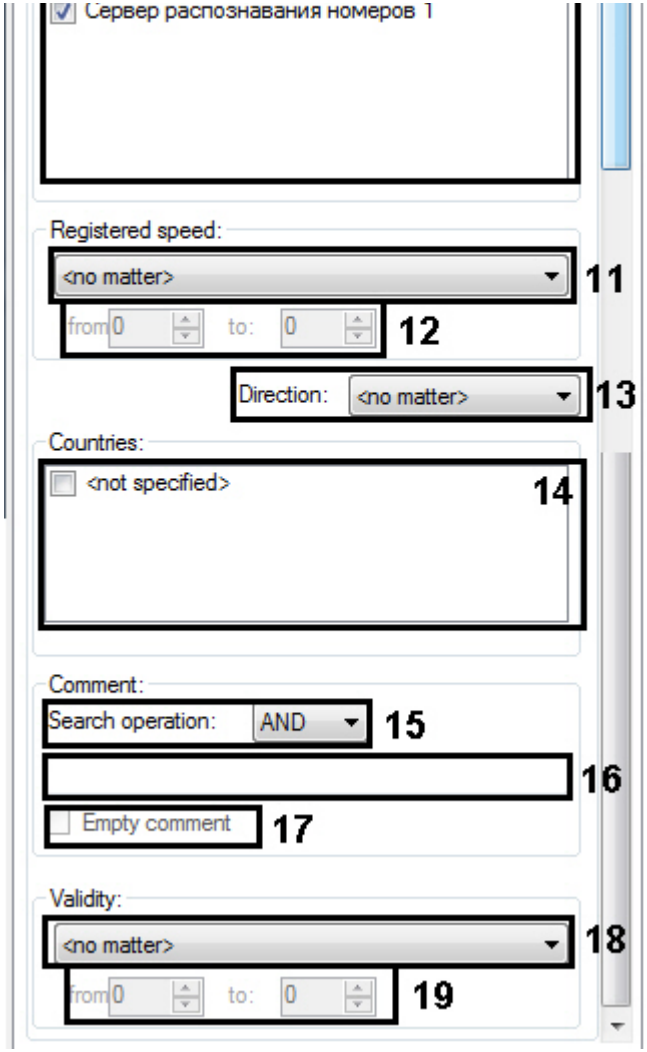
1. By events;
2. By alarms.

Forming the search query by events

Forming the search query by events is done in the following way:

1. Go to the tab **Search by events**.


Search by vehicles
Search by alarms
Vehicle's license plate:
Search operation:
AND
1
2
License plate not recognized
3
Partly recognized
4
Plate region:
<not specified>
5
Regional code:
<not specified>
6
LP colors:
<not specified>
7
Date/Time
from
2015-11-18 10:23:19
8
to:
2015-11-18 10:23:19
9
Plate recognizers:
LPR channel 1
10



2. From the **Search operation** list (**1**) select a logical construction, used for uniting several elements of the key phrase, corresponding to numbers of the vehicle, that are being searched:
   2.1 **and** – for searching by numbers, containing all the elements of the key phrase;
   2.2 **or** – for searching by numbers, containing at least one element of the key phrase.

> **Note.**
> For example, search query '[a-m]3_2 and 02' may return events with numbers 'a302mm63', 'a312mm02'.

3. In the field **Vehicle's numbers** (**2**) enter the key phrase, consisting of one or several comma separated elements, corresponding to the plates 'numbers that are being searched.

Note.
The key phrase may include usual characters and picture-characters in the required combination.

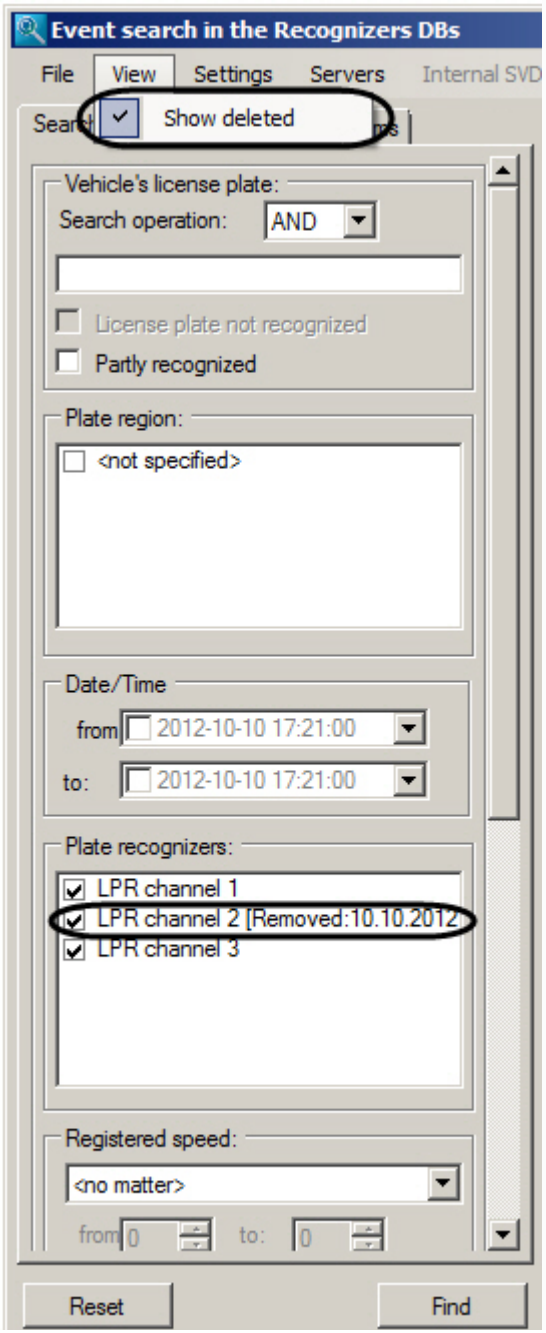
Picture-characters	Description of Picture-characters	Example of search query
%	Any string in length from zero and more characters	Search query 'a%385%78' returns numbers, containing the elements 'a', '385' and '78', divided by any number of characters, for example 'AO38578', 'a385mk78'
_ (underlining)	Any single character	Search query '2__5' returns numbers, containing the sequence of four characters , the first of which is '2', the last one is '5',for example, 'A256577', '2115OK43'
[]	Any single character , that is contained in the range ([a-e]) or in the set ([абвгде])	Search query '[е-м][2-5]53' returns numbers, containing the sequence of four characters. The sequence ends in '53', the first character belongs to the range е-м, the second one belongs to the range 2-5, for example, 'k453mn02', 'm253bt63'
[^]	Any single character , that is not contained in the range ([^a-e]) or in the set ([^абвгде])	Search query '[^е-м] 499' returns numbers, containing the sequence of four characters. The sequence ends in '499', the first character does not belong to the range е-м, for example 'b499bk57', 'n499578'

4. Set the checkbox **Plate not recognized** if it is necessary to display all the numbers (**3**).

Note.
Selection on one checkbox **Plate not recognized** is active only with logical construction selection **OR** in the **Search operation** dropdown list.

5. Set the **Recognized partially** checkbox if it is necessary to display partially recognized numbers (**4**).
6. In the **Plate region** group set the checkboxes for those regions, which events should be returned while being searched (**5**).
7. In the **Regional code** group set the checkboxes for those regional codes events for which should be returned while being searched (**6**).
8. In the **LP colors** group select color of regional code and basic color of the license pplate (**7**).
9. In the **Date/time** group (**8, 9**) set the time boundaries within which the required events have been registered. On default these boundaries are not activated (checkboxes from and to are disabled). To activate the boundaries it is necessary to set the checkboxes **From** and/or **To** and then click button (**8-9**) and in the appeared calendar set the required date. Enter the required time in the field **From** and/or **To**. In case, if only upper or bottom boundary is selected, the search query will return the events, having been registered before or after the set deadline correspondingly. To disable the search by data and time one should uncheck **From** and **To** checkboxes.
10. In the **License plate recognizers** group (**10**) set the checkboxes for those plate recognizers, which events are to be returned while being searched.

Note.
On default, information about objects removed from the *Intellect* software package is not displayed in the **Plate recognizers** group. Select **Show deleted** in the **View** menu of the **Event search in the Recognizers DBs** main window to search by removed servers of plate recognizers.


Event search in the Recognizers DBs
File
View
Settings
Servers
Internal SVD
Show deleted
Vehicle's license plate:
Search operation:
AND
License plate not recognized
Partly recognized
Plate region:
<not specified>
Date/Time
from
2012-10-10 17:21:00
to:
2012-10-10 17:21:00
Plate recognizers:
LPR channel 1
LPR channel 2 [Removed:10.10.2012
LPR channel 3
Registered speed:
<no matter>
from
0
to:
0
Reset
Find

After this all removed servers of plate recognizers will be displayed in the **Plate recognizers** group. Set checkboxes for those plate recognizers which will be used while being searched.

11. From the list **Registered speed** (**11**) select the required filter of vehicle's speed and then in the activated field (fields) (**12**) enter the threshold value(values) of vehicle's speed.
    The following speed filters are available:
    a. **No matter** – events of the vehicle, moving with any speed will be returned.
    b. **More** – events of the vehicle, moving with a speed, exceeding a single threshold value, will be returned.
    c. **Less** – events of the vehicle, moving with a speed, not exceeding a single threshold value, will be returned.
    d. **Interval** – events of the vehicle, moving with a speed, belonging to a single entered threshold value, will be returned.
12. From the **Direction** list (**13**) select the required filter concerning the direction of the vehicle. The following direction filters are available:
    a. **No matter** – events of the vehicle, moving in any direction concerning the LP recognizer's camera will be returned.
    b. **From the camera** – events of the vehicle, moving from the LP recognizer's camera will be returned.
    c. **To the camera** – events of the vehicle, moving to the LP recognizer's camera will be returned.
    d. **Undefine** – events of the vehicle, direction of which in relation to the LP recognizer's camera has not been determined will be returned.
13. In the **Countries** group (**14**) set the checkbox for the country, which events should be returned while being searched.
14. From the list **Search operation** (**15**) select a logical construction, used for uniting several elements of the key phrase, corresponding to numbers of the vehicle, that are being searched:
    a. **and** – for searching by numbers, containing all the elements of the key phrase;
    b. or – for searching by numbers, containing at least one element of the key phrase.
15. In the **Comment** field (**16**) enter the key phrase, containing one or several comma separated elements, corresponding to the comments, that are being searched.
16. Set the **Blank comment** checkbox in case if the event that is being searched can be left uncommented (**17**).

Note.
The selection of this **Blank comment** checkbox is active only with logical construction selection **OR** in the dropdown list **Search operation**.

17. From the **Validity** list (**18**) select the required Validity filter and then in the activated field (fields) (**19**) and enter the threshold Validity value (values). The following Validity filters are available:
    a. **No matter** – events of the vehicle, which numbers have been recognized with any validity.
    b. **More** – events of the vehicle, which numbers have been recognized with validity, exceeding the entered threshold value.
    c. **Less** – events of the vehicle, which numbers have been recognized with validity, not exceeding the entered threshold value.
    d. **Interval** – events of the vehicle, which numbers have been recognized with validity, belonging to the entered threshold value.

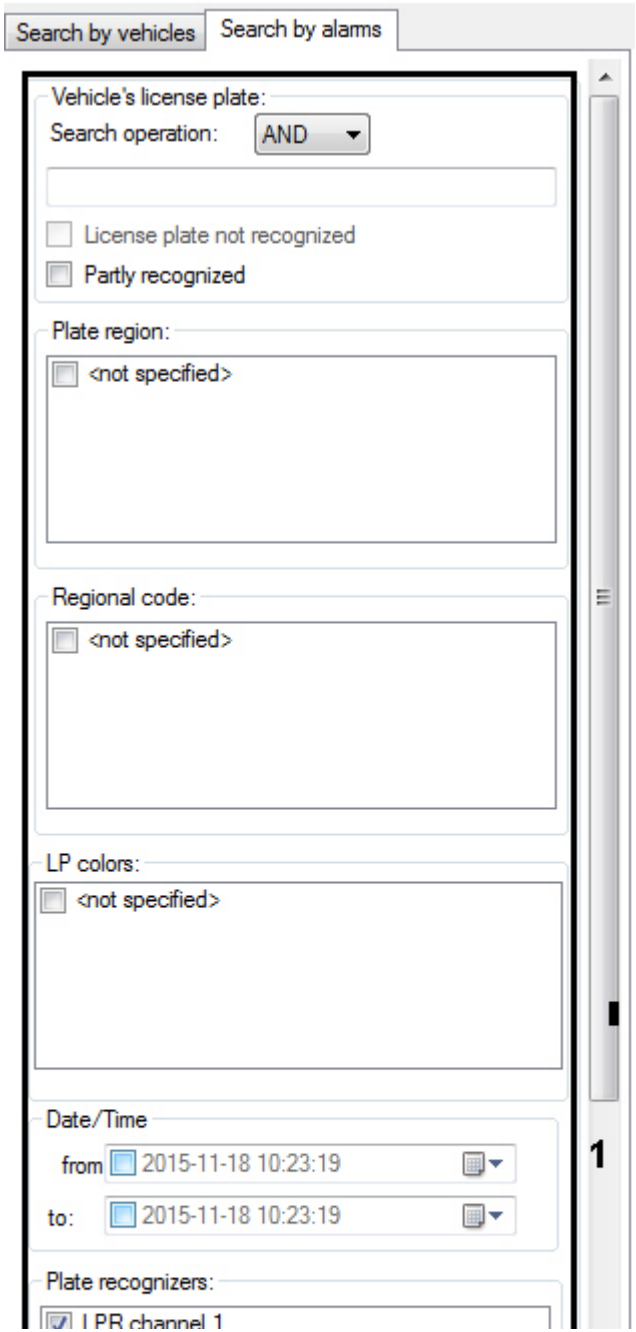
Forming the search query by events is completed.

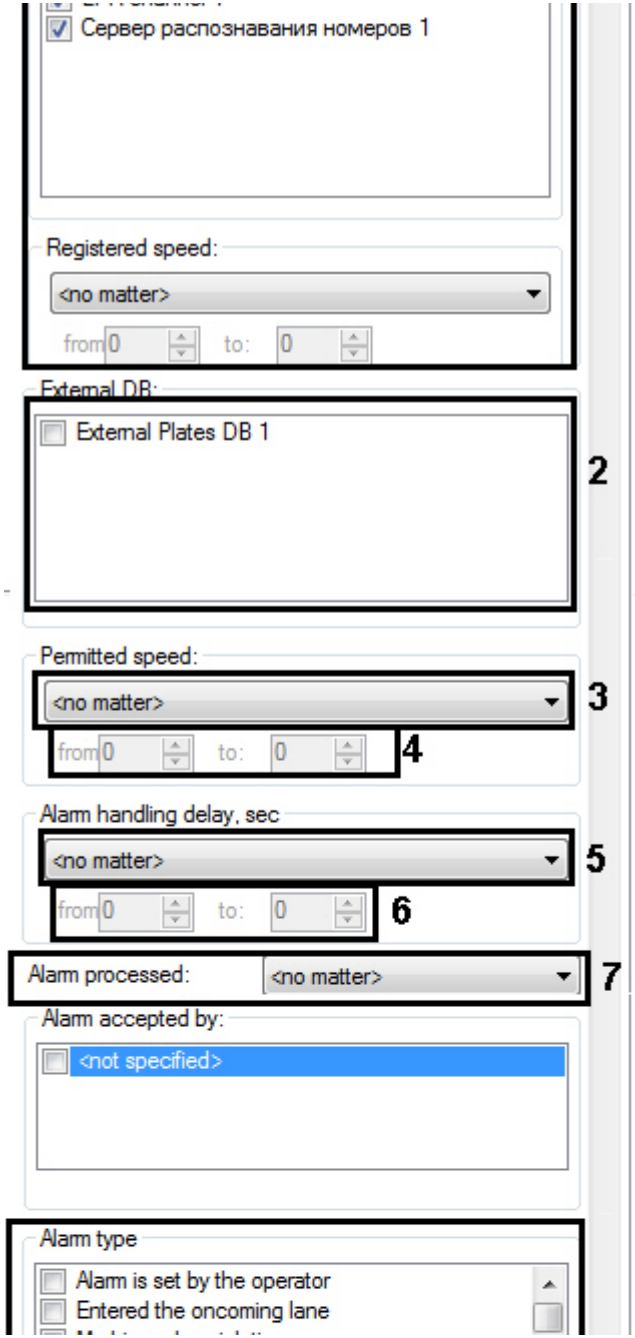
After forming the search query one should run its processing (see section Query launching).

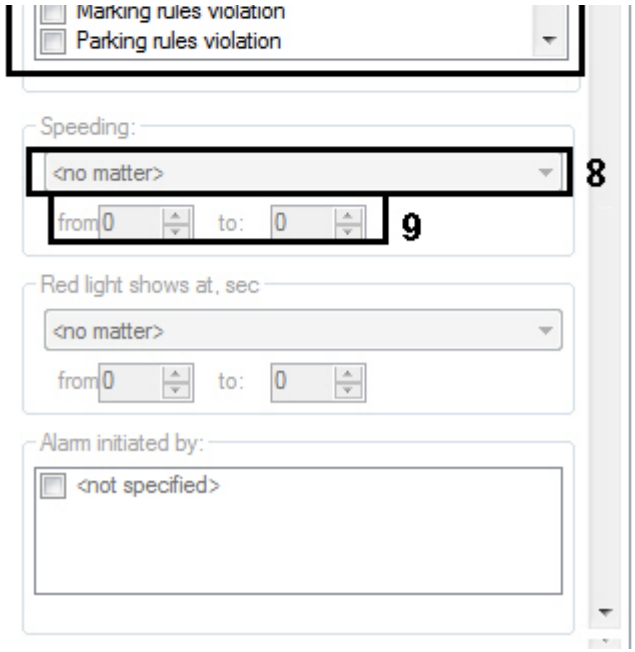
Forming the search query by alarms

Forming the search query by alarms is done in the following way:

1. Go to the **Search by alarms** tab.

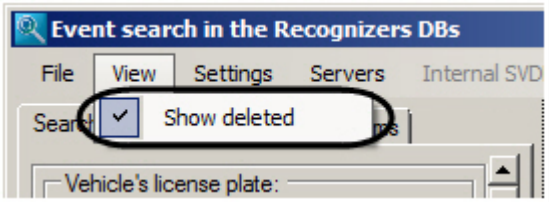

Search by vehicles
Search by alarms
Vehicle's license plate:
Search operation:
AND
License plate not recognized
Partly recognized
Plate region:
<not specified>
Regional code:
<not specified>
LP colors:
<not specified>
Date/Time
from
2015-11-18 10:23:19
to:
2015-11-18 10:23:19
Plate recognizers:
LPR channel 1
1


Сервер распознавания номеров 1
Registered speed:
<no matter>
from 0 to: 0
External DB:
External Plates DB 1
2
Permitted speed:
<no matter>
3
from 0 to: 0
4
Alarm handling delay, sec
<no matter>
5
from 0 to: 0
6
Alarm processed:
<no matter>
7
Alarm accepted by:
<not specified>
Alarm type
Alarm is set by the operator
Entered the oncoming lane



2. Repeat steps 2-14 of the section **Forming the search query by events** as applied to interface elements of the tab **Search by alarms** (**1**).
3. In the group **External database** (**2**) set the checkboxes for those external databases, which events have to be returned in search query results.

> **Note.**
> This setting is relevant in case, when the checkbox **Plate number is found in the DB** is set in the group **Alarm type** (see step 9).

> **Note.**
> The **External database** group contains a list of all the databases that have ever been used together with the **Vehicle Tracer** module but, on default, databases removed from the *Intellect* software package are not displayed in the list. Select the **Show deleted** in the **View** menu of **Event search in the Recognizers DBs**» main window to search by removed servers of plate recognizers.
>
> 
>
>
> As a result, all external databases removed from the system will be displayed in the list. Set checkboxes for those databases which will be used while being searched.

4. From the **Permitted speed** list (**3**) select the required speed filter, permitted on the controlled road area and then in the activated field (fields) (**4**) enter the threshold speed

value (values) in km/h.

The following filters of the permitted speed are available:

4.1 **No matter** – events of the vehicle, registered on the road area with any permitted speed will be returned.

4.2 **More** – events of the vehicle, registered on the road area with any permitted speed, exceeding the entered threshold value will be returned.

4.3 **Less** – events of the vehicle, registered on the road area with any permitted speed, not exceeding the entered threshold value will be returned.

4.4 **Interval** – events of the vehicle, registered on the road area with any permitted speed, that belong to the entered threshold value range will be returned.

5. From the list **Alarm handling delay, sec** (**5**) select the required filter according to the alarm handling delay and then in the activated field (fields), (**8**) enter the threshold value (values) of delay time in seconds.
   The following filters of alarm handling delay are available:
   5.1 **No matter** – alarms, accepted in any time after being registered or unaccepted at all.
   5.2 **More** – alarms will be returned, accepted with a delay, exceeding the entered threshold value.
   5.3 **Less** – alarms will be returned, accepted with a delay, not exceeding the entered threshold value.
   5.4 **Interval** – alarms will be returned, accepted with a delay, belonging to the entered threshold value.

> **Note.**
> This setting is relevant in case if from the **Alarm processed** list the value **No matter** or **Processed** is selected (see step 6).

6. From the list **Alarm processed** (**7**) select the required filter according to the alarm processing factor:
   6.1 **No matter** —both processed and unprocessed events will be returned.
   6.2 **Alarm is not processed** — only unprocessed events will be returned.
   6.3 **Alarm processed** — only processed events will be returned.
7. In the group **Alarm type** (**8**) set the checkboxes for those alarms, which have to be returned in results of search query:
   7.1 **No matter** — alarms will be returned with any alarm type or with the absence of it.
   7.2 **Alarm set by operator** — alarms will be returned, triggered manually.
   7.3 **Entered the oncoming lane** — events will be returned for which entering the oncoming lane has been registered.
   7.4 **LP found in database** — events will be returned which plates have been found in the external database.
   7.5 **Running a red light** — events will be returned for which running a red light has been registered.
   7.6 **Overspeeding** — events will be returned for which overspeeding has been registered.
   7.7 **Stop over crosswalk line** - events will be returned for which stopping over the crosswalk line at the stoplight has been registered.
   7.8 **Stop over stop line** — events will be returned for which stopping over the stop line at the stoplight has been registered.
   7.7 **Parking violation** - events will be returned for which violation of parking rules has been registered.
8. Form the **Speeding** list (**9**) select the required speeding filter and then in the activated field (fields) (**6**) enter the threshold value (values) of speeding in km/h.

> **Note.**
> This setting is relevant in case, when the checkbox **Speeding** is set in the group **Alarm type** (see step 8).

> **Note.**
> The value of speeding is calculated as a difference between the fixed vehicle's speed and the speed, permitted on the controlled area of the road.

The following filters of the speeding are available:
6.1 **No matter** – events of the vehicle, moving with any overspeeding or with the absence of it will be returned.

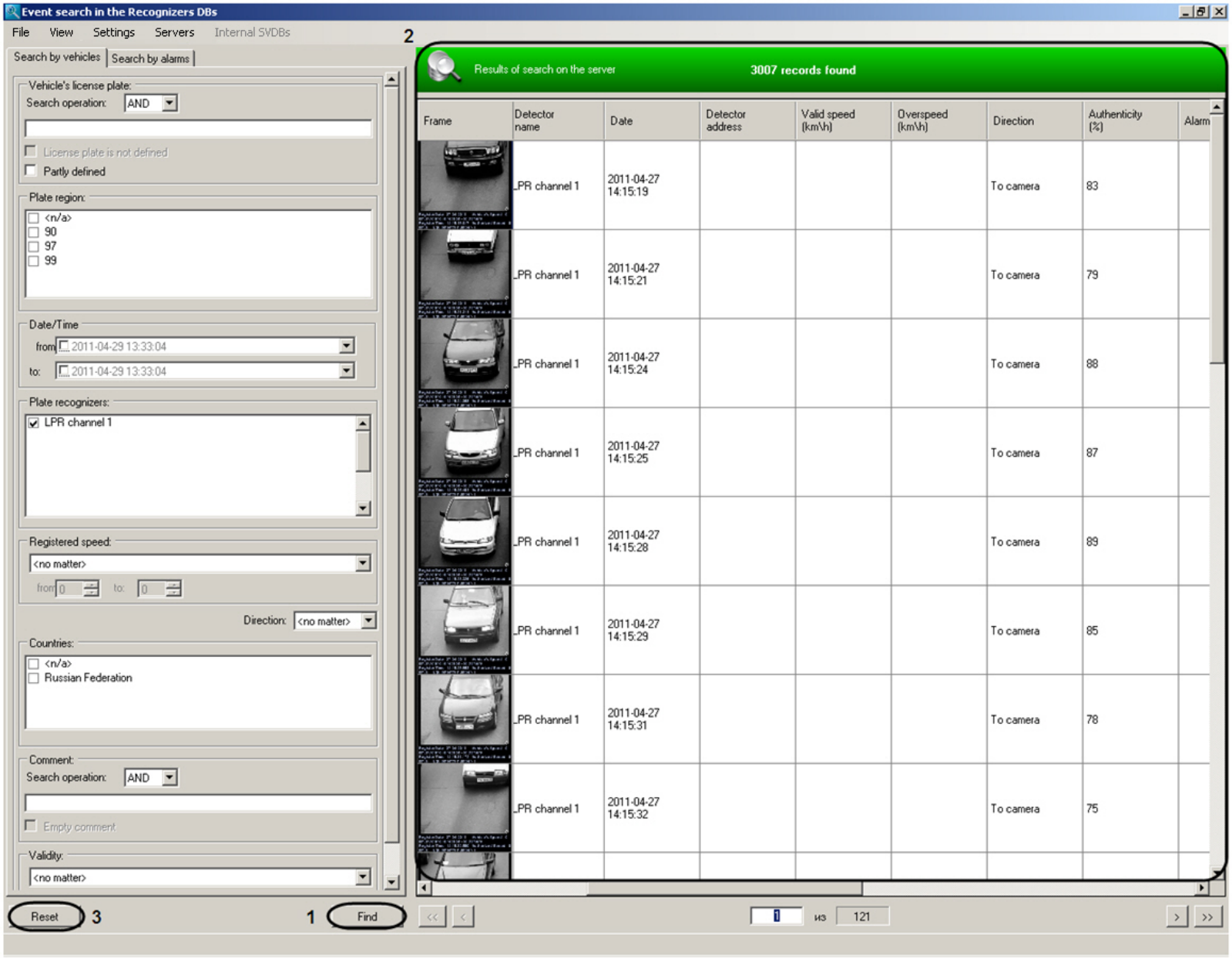
6.2 **More** – events of the vehicle, moving with overspeeding, exceeding the entered threshold value will be returned.
6.3 **Less** – events of the vehicle, moving with overspeeding, less than the entered threshold value will be returned.
6.4 **Interval** – events of the vehicle, moving with overspeeding, in the entered range of threshold values.

Forming the search query by alarms is completed.

After forming the search query one should launch its processing (see section Query launching).

Query launching

After forming the search query by vehicles or by alarms one should launch its processing, clicking **Find** (**1**).



As a result search results table will open (**2**).

Note.
To clear the tabs **Search by events**, **Search by alarms** from the entered search criterion it is convenient to use **Reset** button (**3**).

Viewing, printing and exporting the search results

Columns of **Search results** table (**1**) are displayed in accordance to the settings, given in the **Selection of displayed fields** dialog window (see Setting up the events search section).

Description of the column's content is given in the same section of the Guide.

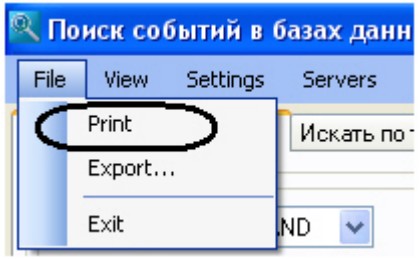

Results of search on the server
3007 records found
Frame
Detector name
Date
Detector address
Valid speed (km\h)
Overspeed (km\h)
Direction
Authenticity (%)
Alarm
LPR channel 1
2011-04-27 14:15:19
To camera
83
LPR channel 1
2011-04-27 14:15:21
To camera
79
LPR channel 1
2011-04-27 14:15:24
To camera
88
LPR channel 1
2011-04-27 14:15:25
To camera
87
LPR channel 1
2011-04-27 14:15:28
To camera
89
LPR channel 1
2011-04-27 14:15:29
To camera
85
LPR channel 1
2011-04-27 14:15:31
To camera
78
LPR channel 1
2011-04-27 14:15:32
To camera
75
1
2
1
из
121

For result's navigation in the table there are used the following interface elements:

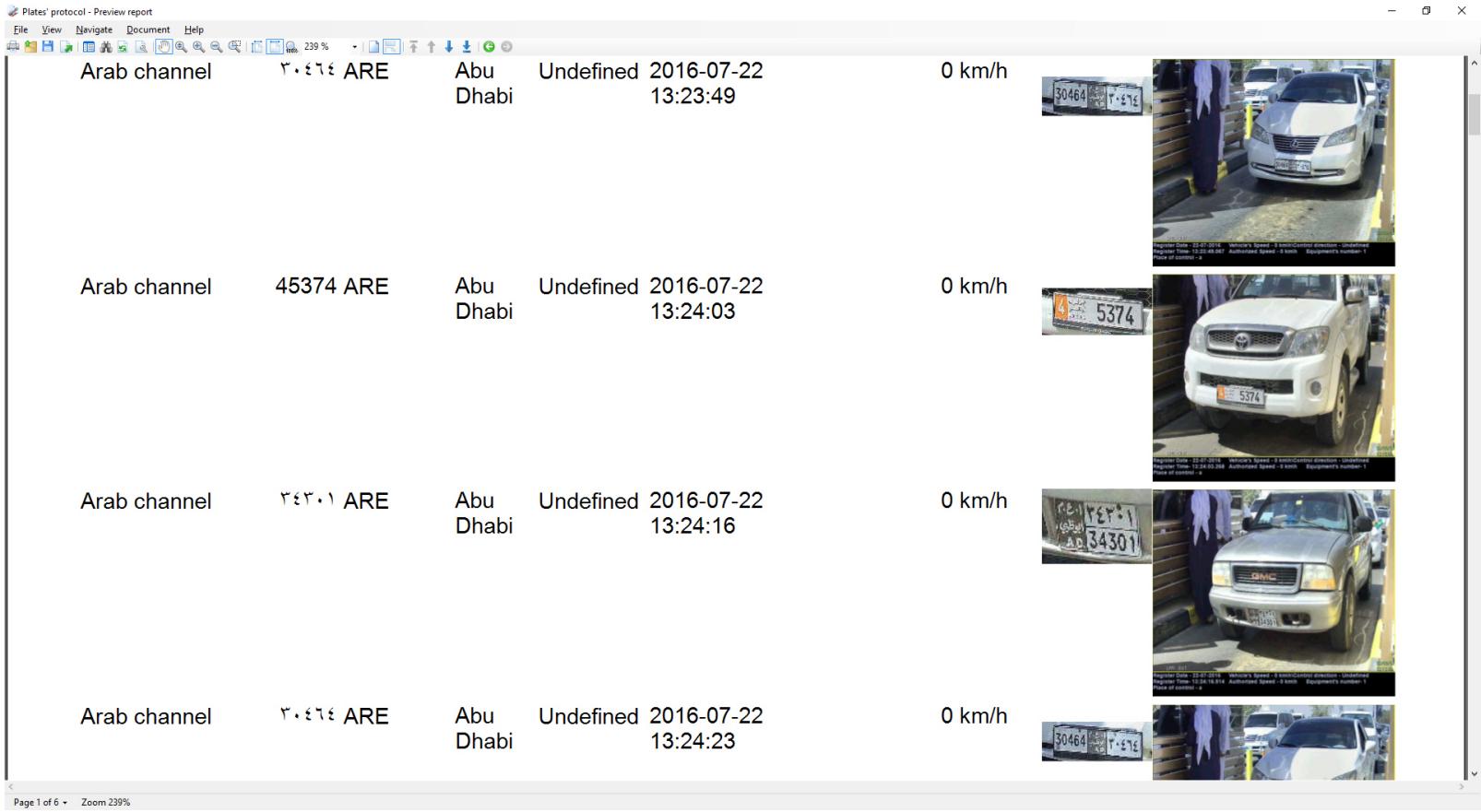
1. button << – transfer to the first page of the table;
2. button < – transfer to the previous page of the table;
3. field 1 – transfer to the required page of the table;
4. field 121 - number of pages in the table;
5. button > – transfer to the next page of the table;
6. button >> – transfer to the last page of the table.

> **Note.**
> To transfer to the required page one should enter its number in the field 2 (**2**), and then click **Enter**.

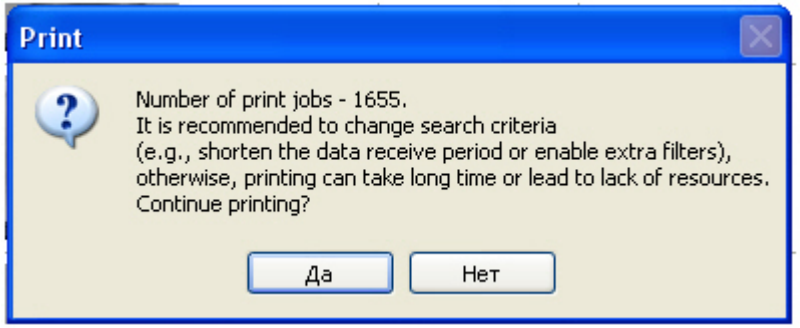
To print the **Event search results** or/and export them to one of the most commonly used formats select the point **File** of the main menu in the window **Event search in the Recognizers DBs**.



As a result preview report program will launch. In the window of this program there will be displayed License plates protocol.



If there are more than 1000 entries in the search results the following message will be displayed before the preview report program launch.

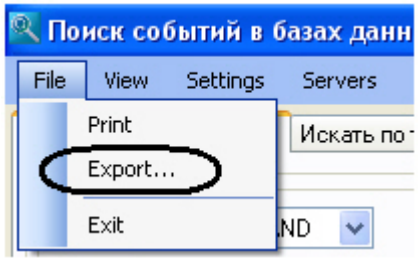


Click **Yes** to continue. Click **No** to come back to change the search criteria.

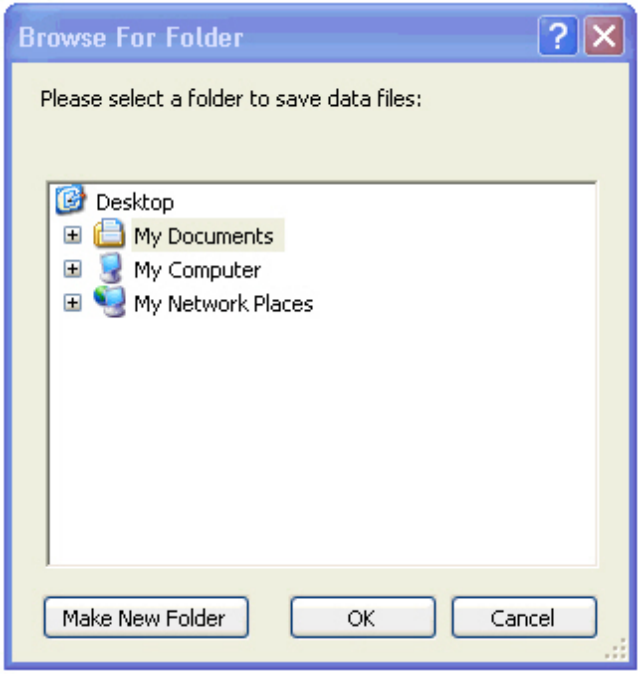
Perform the necessary operations with a report and then quit the program Preview report by following the points of the main menu **File** -> **Exit** or by clicking the button  (see step 4 in the section Printing and exporting the data about the vehicle).

The data about violations are exported into JPG files. The file contains the camera frame, the synchronous camera frame and meta-information in the Arena module format. This functionality is required for integration with the TRIS. The exported file can be opened in any program designed to view JPG files, but only the frame received from the main camera will be displayed.

To export the data about violations to files select the **Export** item in the **File** of the main menu in the window **Event search in the Recognizers DBs**.



In the opened window select the folder in which photos with violations are to be exported. Click **OK**.

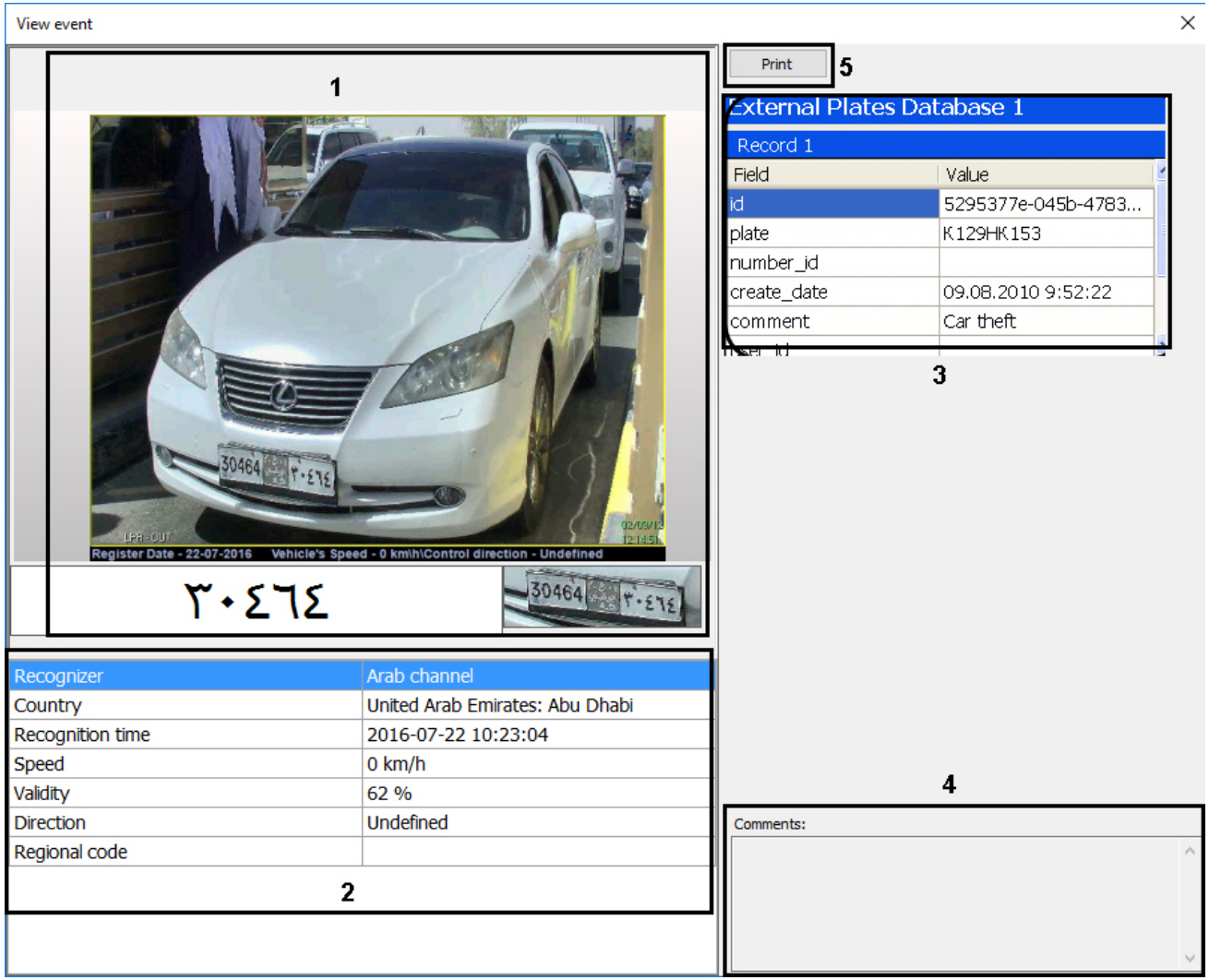


As a result all photos with violations corresponding to event search results will be exported to the specified folder.

Note.
If the Debug4 mode is enabled, then besides JPG-file containing frames from primary and synchronous cameras and meta-information, there will also be exported an archive containing information for the Arena module and frames from the synchronous camera.

Previewing and printing the data about the event

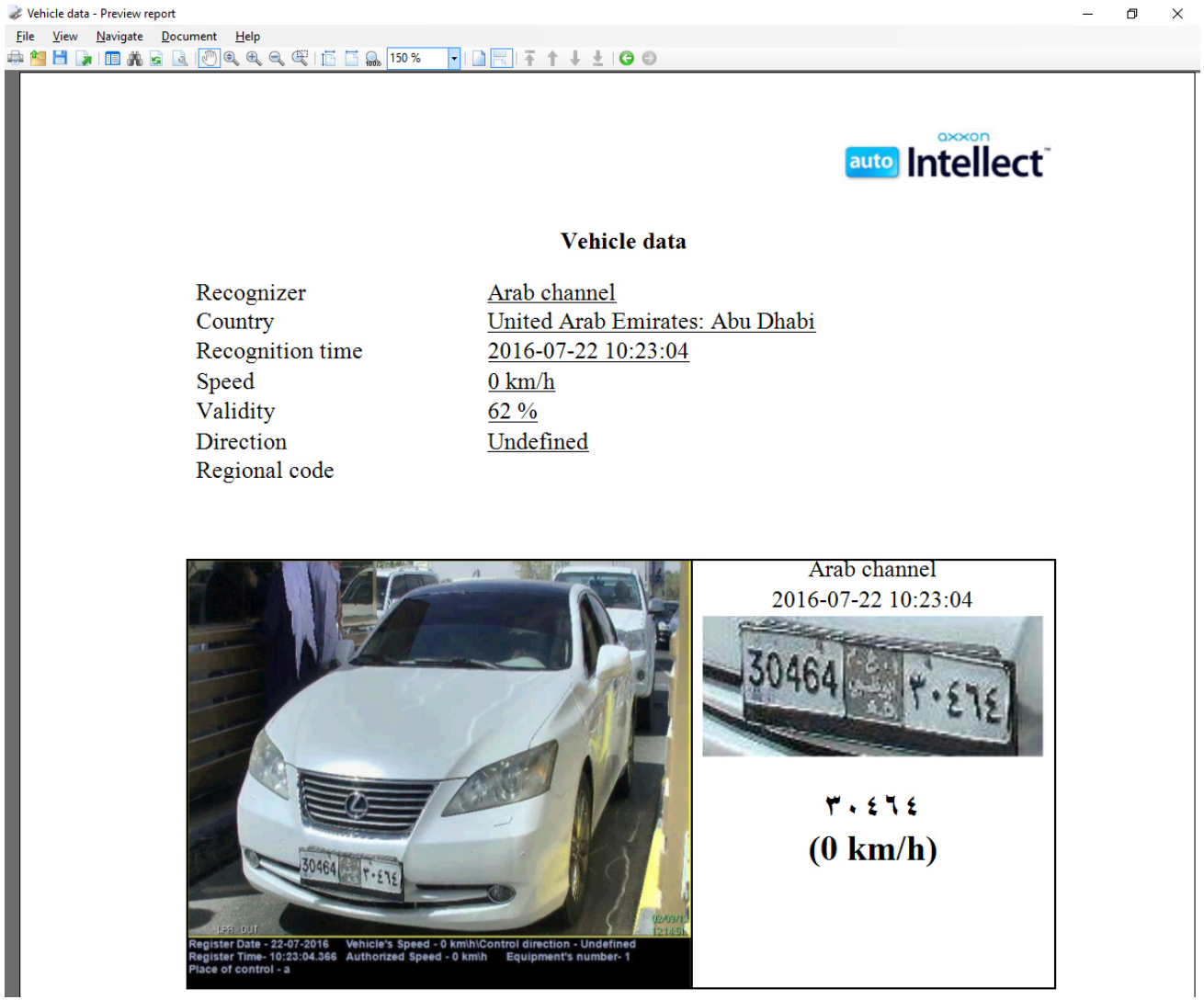
To view the data about the event it is necessary to make a left click upon the corresponding string in the search results table. **View event** dialog window will open in result.



In the **View event** there are displayed the following event characteristics:

1. Video frame with a sign, containing the following data (**1**):
    a. Date and time of receiving the data about the vehicle;
    b. Vehicle's speed;
    c. Vehicle's direction;
    d. Speed, permitted on the controlled road area;
    e. ID of speed's detector;
    f. Control site;
2. Vehicle's identified plate (**2**);
3. Image of recognizing plate (**2**).
4. Vehicle's plate detector (**2**)
5. Date and time of identifying the vehicle's plate (**2**);
6. Vehicle's speed (**2**);
7. Vehicle's direction according to the LP recognition camera (**2**);
8. Alarm's reason (**2**);
9. Data about the vehicle for the external LP database in case if the identified number has been found there (**3**);
10. Comments to the event (**4**).

To print the Report or/and export it to one of the most commonly used formats click the **Print** button (**5**). Preview report program will launch in result. In the window of this program there will be displayed Vehicle characteristics report.



Perform the necessary operations with a report and then quit the program Preview report by following the points of the main menu **File** -> **Exit** or by clicking the button (see step 4 in the Printing and exporting the data about the vehicle section).

Forming the Active tracking database

The **Active tracking** database is the *Auto-Intellect* software package database and is filled up by operator via the **Vehicle Tracer** module.

Note.

It is impossible to remove and change records excepting the status of stolen vehicle reports changing via the **Vehicle Tracer** module.

For total interaction between the **Active tracking** database and the **Vehicle Tracing** module the following conditions should be met:

1. The **Active tracking** database is connected to the *Auto-Intellect* spftware package as an external plates database.
2. This external database is used by **Vehicle Tracer** module for analyzing the identified plates.

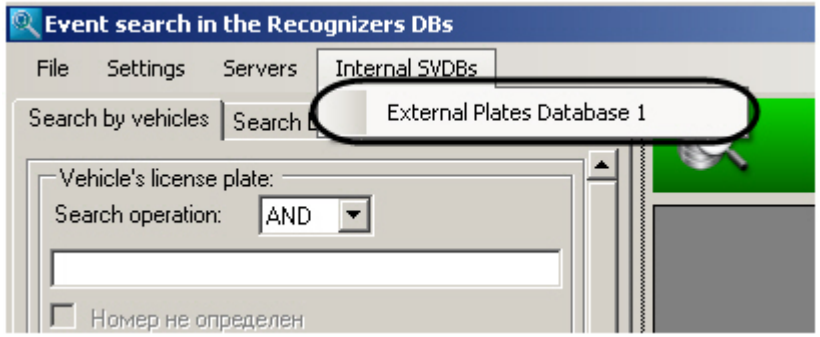
Meeting the following conditions the interaction of the **Active tracking** database and **Vehicle Tracer** module is done in the following way:

1. Vehicle's plate is entered by operator to the **Active tracking** database via the **Vehicle Tracer** module, stating the reason.
2. The **Vehicle Tracer** module compares the plate of a passing vehicle with plates, stored at the **Active tracking** database. In case, if the correspondence of the identified plate and the plate, stored at the **Active tracking** database is set up, alarm is generated.

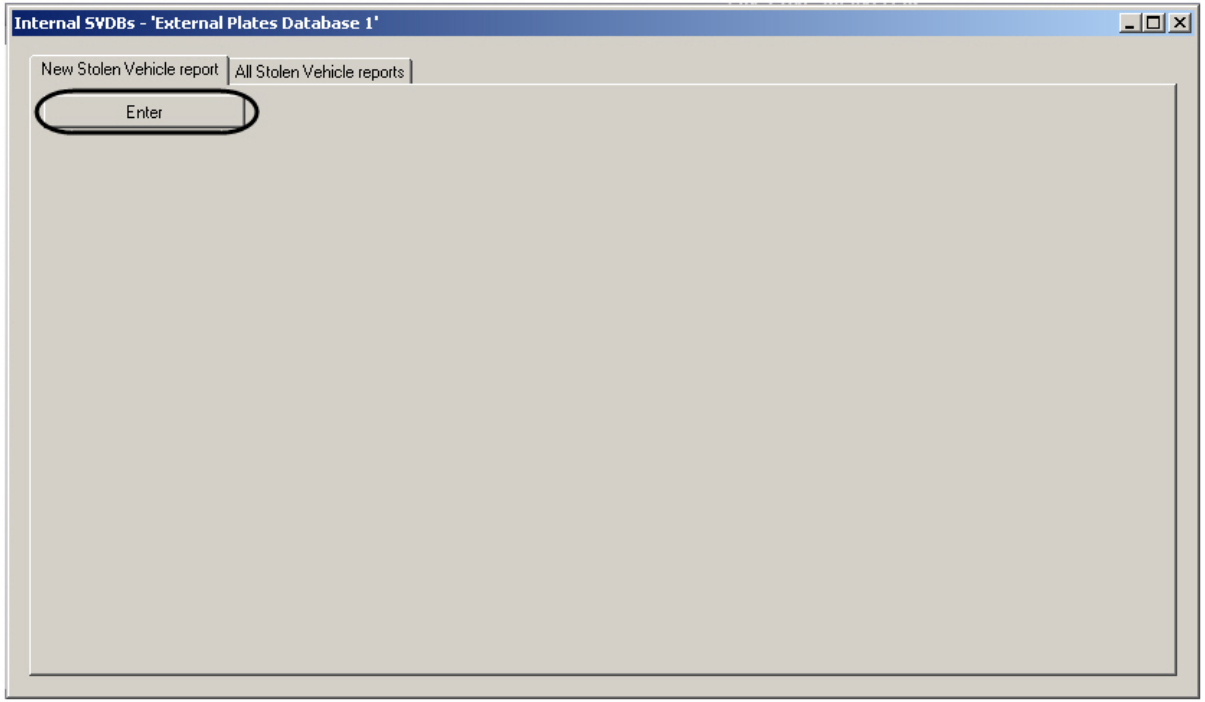
Active tracking option is convenient to be used in the *Auto-Intellect* distributed system, as it enables the operator at his workstation to notify the remote workstation operators about the vehicle that is to be captured.

Editing the data about the vehicle in the **Active tracking** database is done in the following way:

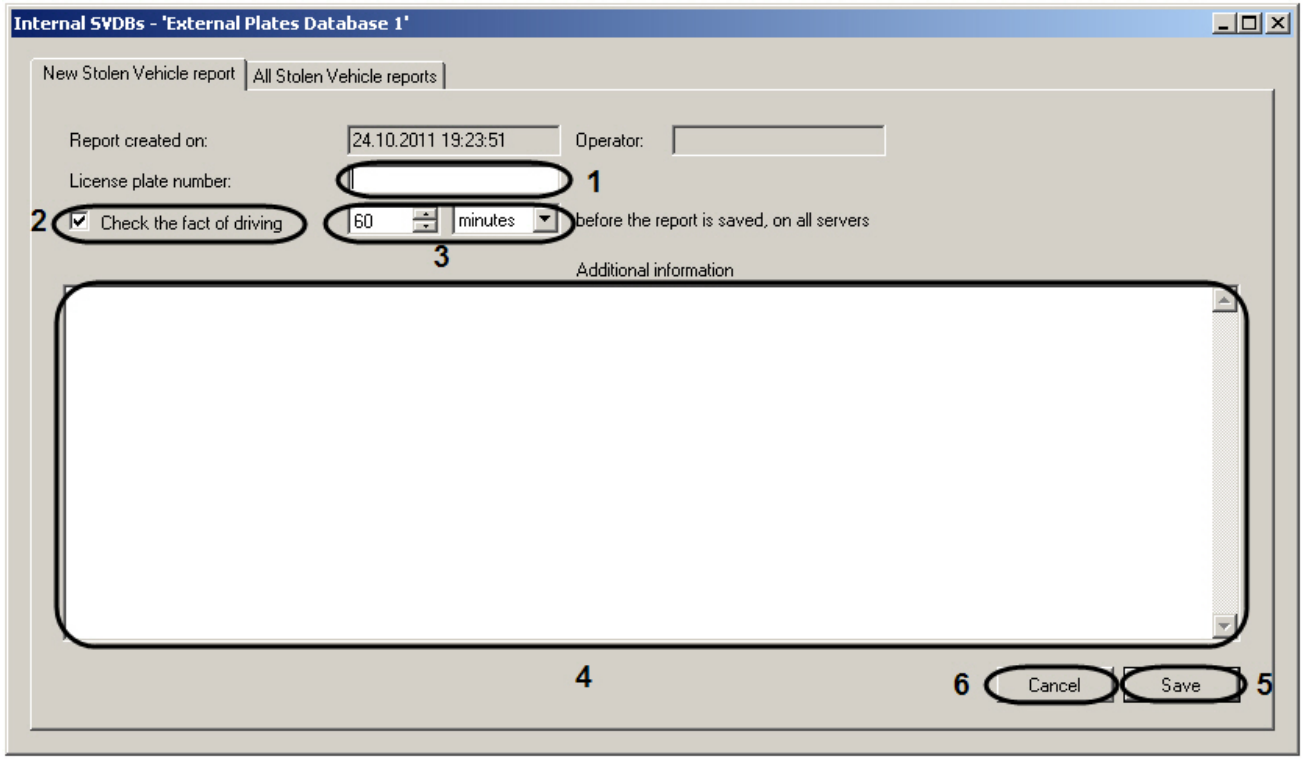
1. Click the **External Plates Database** in the main menu of the **Event search in the Recognizers DBs** window.



2. As a result **Internal SVDBs** dialog window will open.



3. Click **Enter** to add records to the database.
4. Enter the vehicle plate in the **License plate number:** field (**1**).

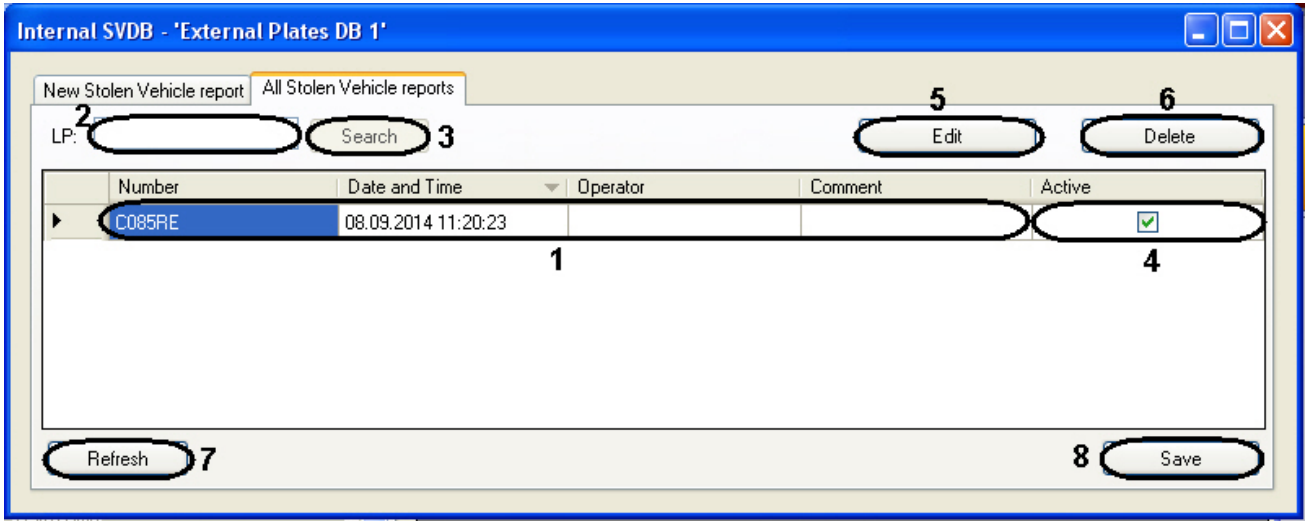


5. If the fact of vehicle driving to the stolen vehicle report by all boundaries is to be checked, do the following:
    a. Set the **Check the fact of driving** checkbox (**2**).
    b. Enter the time period using the **up-down** buttons and select the measuring unit from the drop-down list (**3**).
6. Enter the description of reason by which the stolen vehicle report is created in the **Additional information** field (**4**).
7. Click **Save** to save changes (**5**).

> **Note.**
> Click **Cancel** to cancel changes (**6**).

> **Note.**
> Entered stolen vehicle reports are added to the database with the **Active** status.

8. Go to the **All Stolen Vehicle reports** tab to change the status of stolen vehicle report.



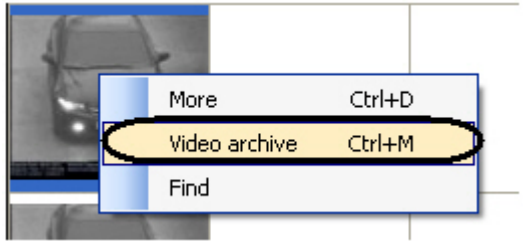
9. The list of stolen vehicle reports in database is displayed in the table (**1**):
   9.1 Plates of vehicles are wanted are specified in the **License plate** column.
   9.2 Time of adding the stolen vehicle report to the database is specified in the **Date and Time** column.
   9.3 Operator who has added the stolen vehicle report to the database is specified in the **Operator** column.
   9.4 The reason by which the stolen vehicle report is created is specified in the **Comment**» column.
   9.5 Checkboxes are set on the active stolen vehicle reports while viewing in the **Active** column.
10. Enter the part of the sought-for vehicle in the **License plate:** field and click **Search** to search vehicle in the table (**2**). Records corresponding to the request parameters will be highlighted red in the table.
11. Set checkboxes opposite those stolen vehicle reports which are active and uncheck checkboxes opposite those reports which are inactive in the **Active** column to change the reports status (**4**).
12. Click Edit to edit the selected stolen vehicle report (**5**).
13. Click Delete to remove the selected stolen vehicle report (**6**).
14. Click **Refresh** to refresh the list of stolen vehicle reports (**7**).
15. Click **Save** to save changes (**8**).

Adding the vehicle data to the **External Plates Database** is completed.

Viewing the video archive by event

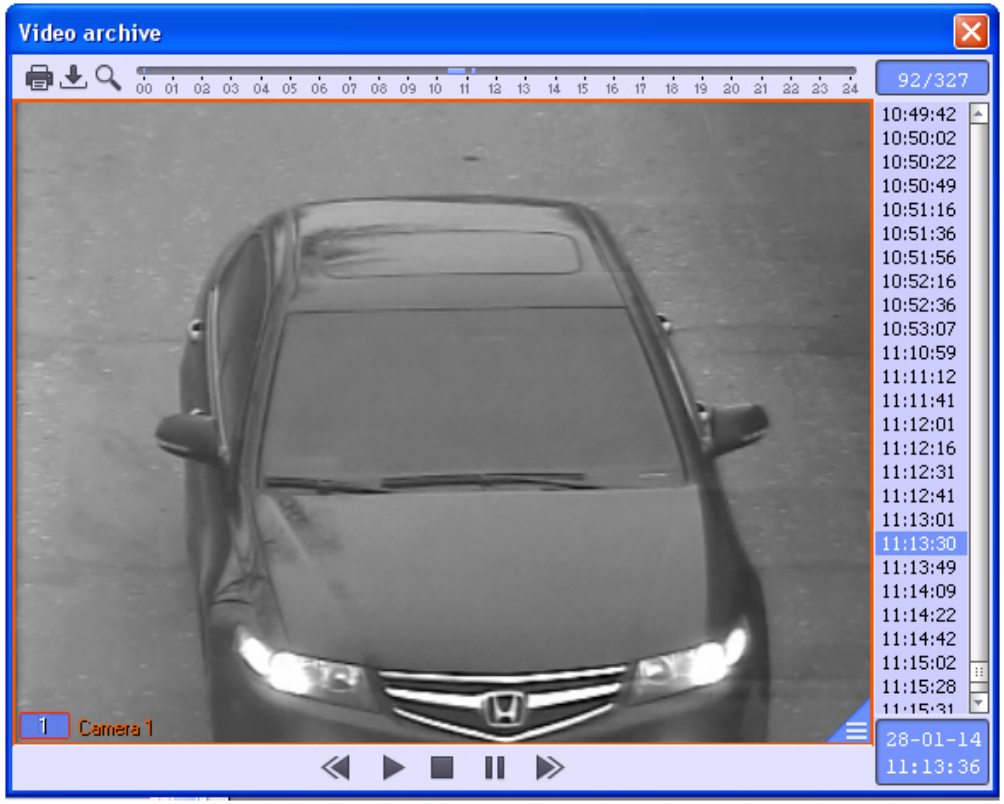
Viewing video archive by event is started in three ways:

1. Call for a required event contextual menu by clicking right mouse button and select **Video archive** option.



2. Select the required event by single clicking left mouse button and click **Ctrl + M** key combination.
3. Holding **Shift** key click the required event twice with left mouse button.

Video archive with videos of this event opens after carrying out any of above mentioned operations.



To close the video archive it is necessary to click the  sign in the right upper corner of the window.

Viewing the video archive by event is completed.

Description of the Auto-Intellect user interface

The Traffic Monitor interface object

Table panel of the Current value tab

The following figures show the **Table** sub-tab of the **Current value** tab displayed by lane and by direction respectively (depending on the system setup).

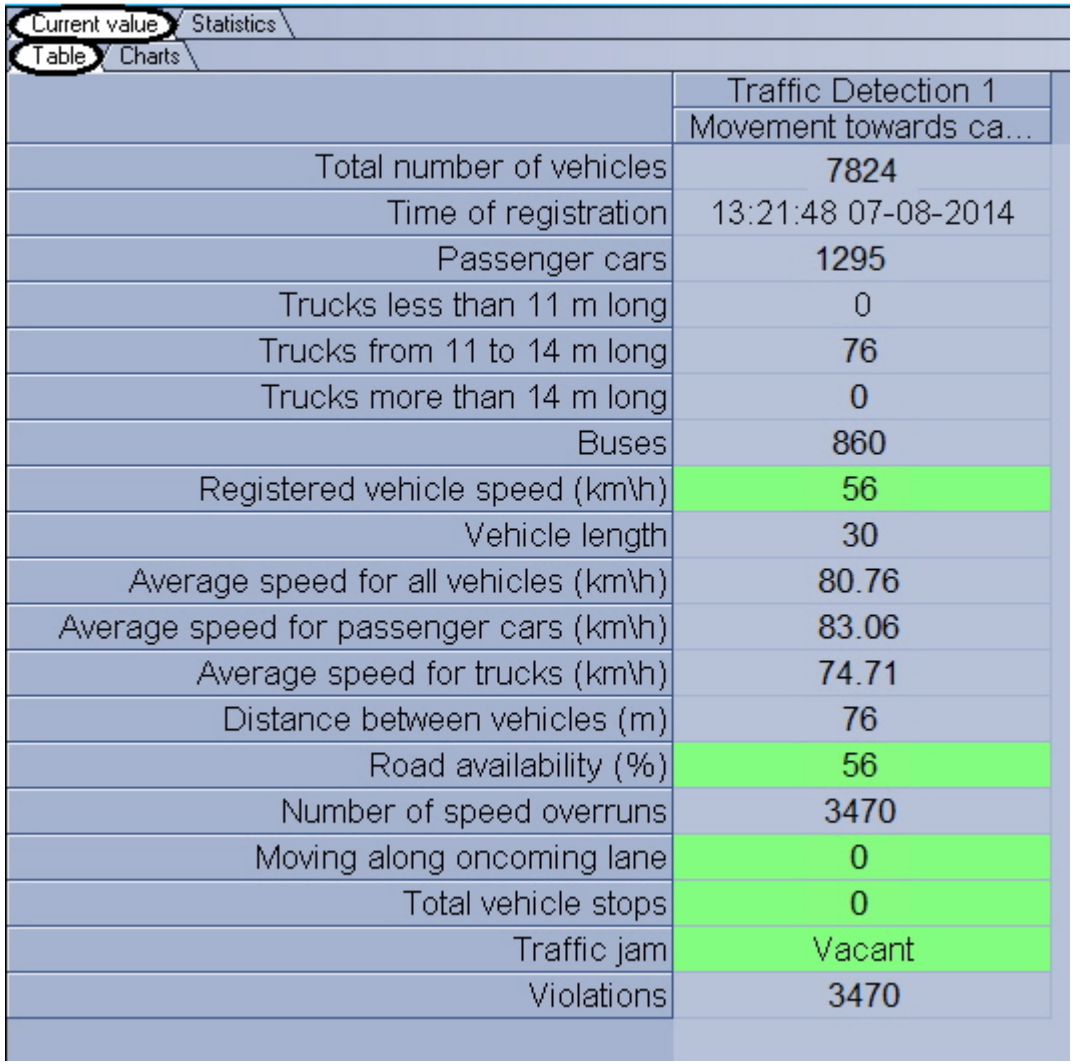
Dispalying by lanes:

Current value | Statistics

Table | Charts

	Traffic Detection 1			
	1	2	3	4
Total number of vehicles	2124	2736	1501	1260
Time of registration	8:46 04-02-2	8:49 04-02-2	8:49 04-02-2	8:48 04-02-2
Passenger cars	2119	2521	880	3
Trucks less than 11 m long	5	210	419	625
Trucks from 11 to 14 m long	6	20	3	22
Trucks more than 14 m long	0	0	0	0
Buses	0	5	202	632
Registered vehicle speed (km\h)	191	43	34	88
Vehicle length	6	20	3	22
Average speed for all vehicles (km\h)	180.75	16.20	38.09	102.26
Average speed for passenger cars (km\h)	180.82	15.99	39.30	30.33
Average speed for trucks (km\h)	150.00	18.65	36.37	102.44
Distance between vehicles (m)	94	22	30	137
Road availability (%)	5	20	10	10
Number of speed overruns	2114	22	171	1063
Moving along oncoming lane	0	0	0	0
Total vehicle stops	0	0	0	0
Traffic jam	Vacant	Vacant	Vacant	Vacant
Violations	2114	22	171	1063

Displaying by direction:



The following table describes the elements of the **Table** panel.

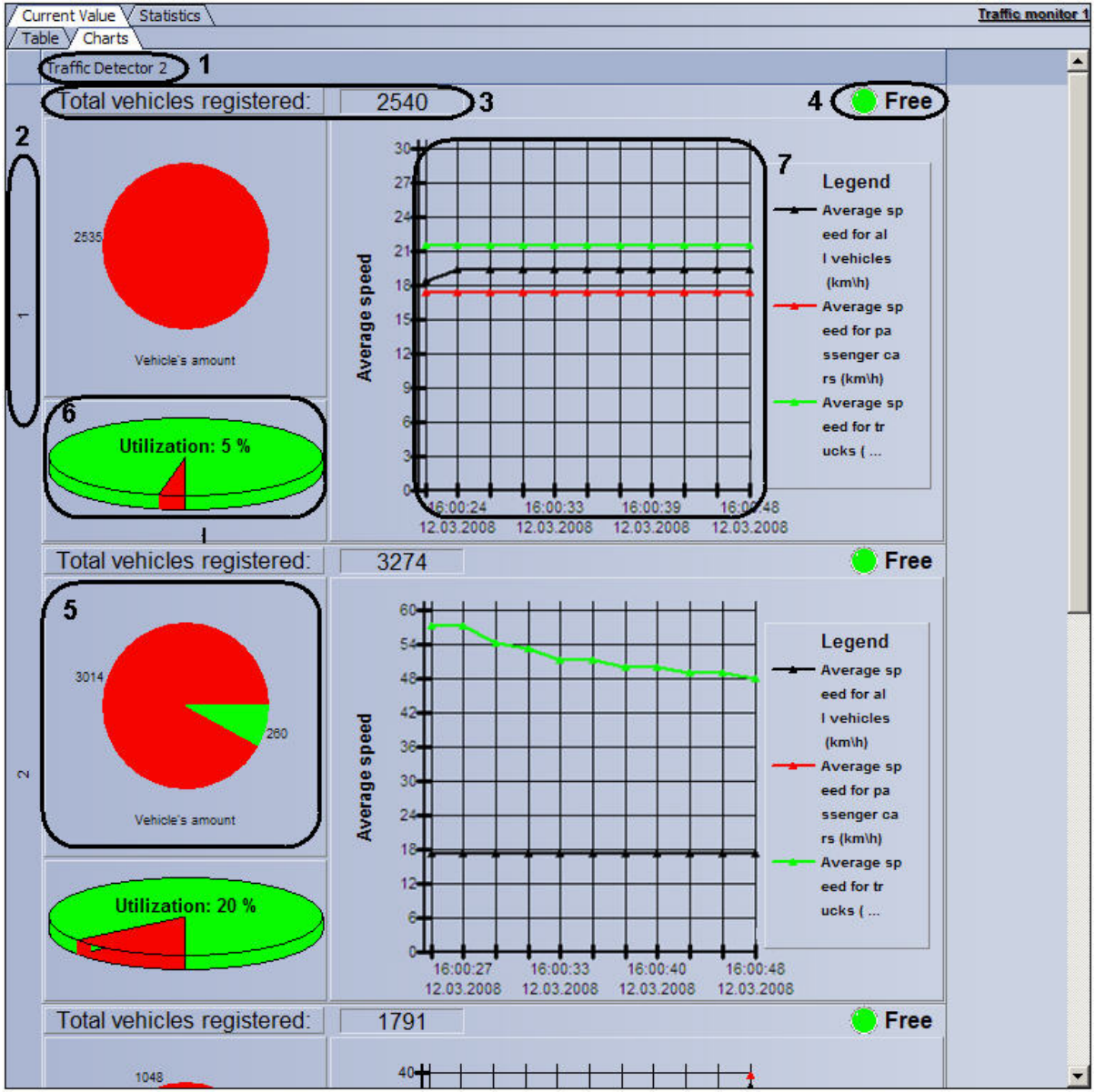
Field name	Description
Time of registration	The time when the last vehicle passed
Total number of vehicles	Total number of registered vehicles of all types
Passenger cars	The number of registered passenger cars

Trucks less than 11 m long	The number of registered trucks less than 11 m long
Trucks from 11 to 14 m long	The number of registered trucks from 11 to 14 m long
Trucks more than 14 m long	The number of registered trucks more than 14 m long
Buses	The number of registered buses
Registered speed of the vehicle	The speed of the last registered vehicle, km/h
Vehicle length	Total length of the registered vehicle, m
Average speed for all vehicles	Average speed for all registered vehicles, km/h
Average speed for passenger cars	Average speed for passenger car vehicles, km/h
Average speed for trucks	Average speed for registered trucks, km/h
Distance between vehicles	The distance between the last vehicle and the previous one, m
Road load	Average road load, %
Number of speed overruns	The number of speeding violations
Moving along the oncoming lane	The number of moving along the oncoming lane events
Number of vehicle stops	The number of vehicles stopped in the lane
Jam	Traffic jam indicator
Number of incidents	Total number of road rules violations for the lane (direction)

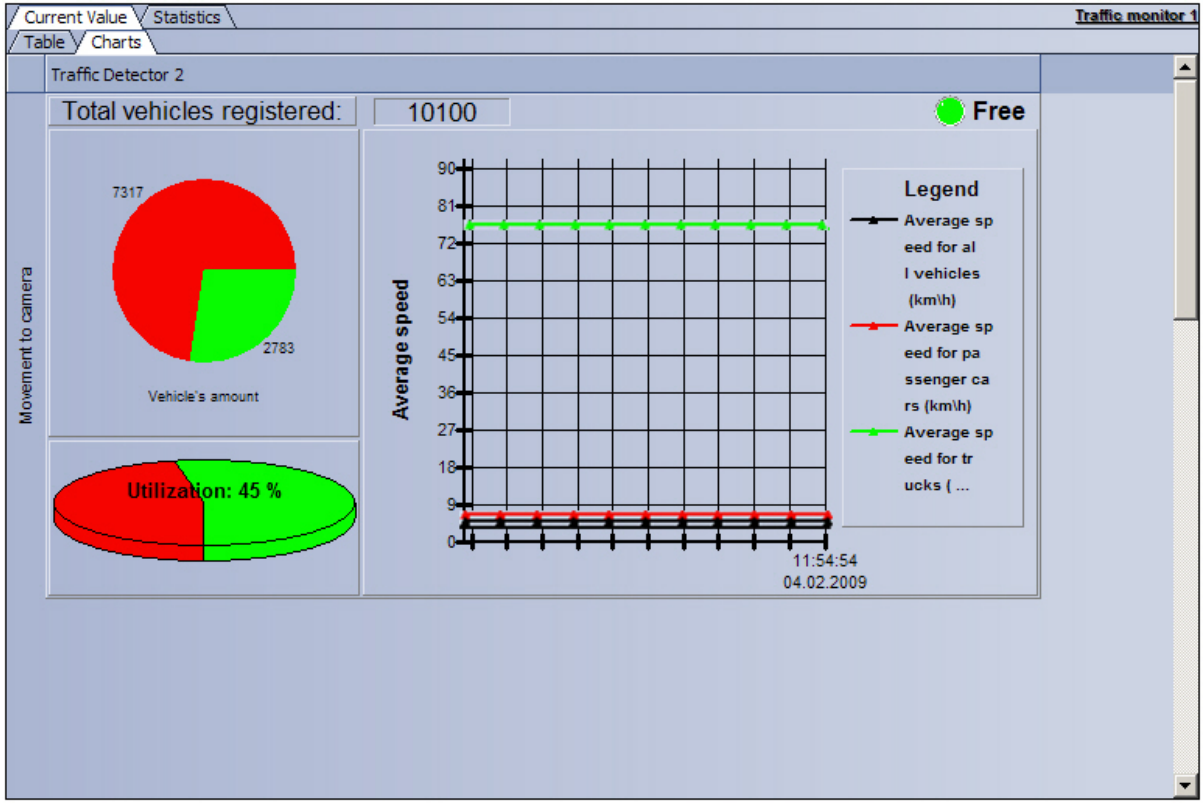
Charts panel of the Current value tab

The following figured show the **Charts** panel of the **Current value** tab displayed by lane and by direction, respectively (depending on the system setup).

Displaying by lanes:



Displaying by direction:

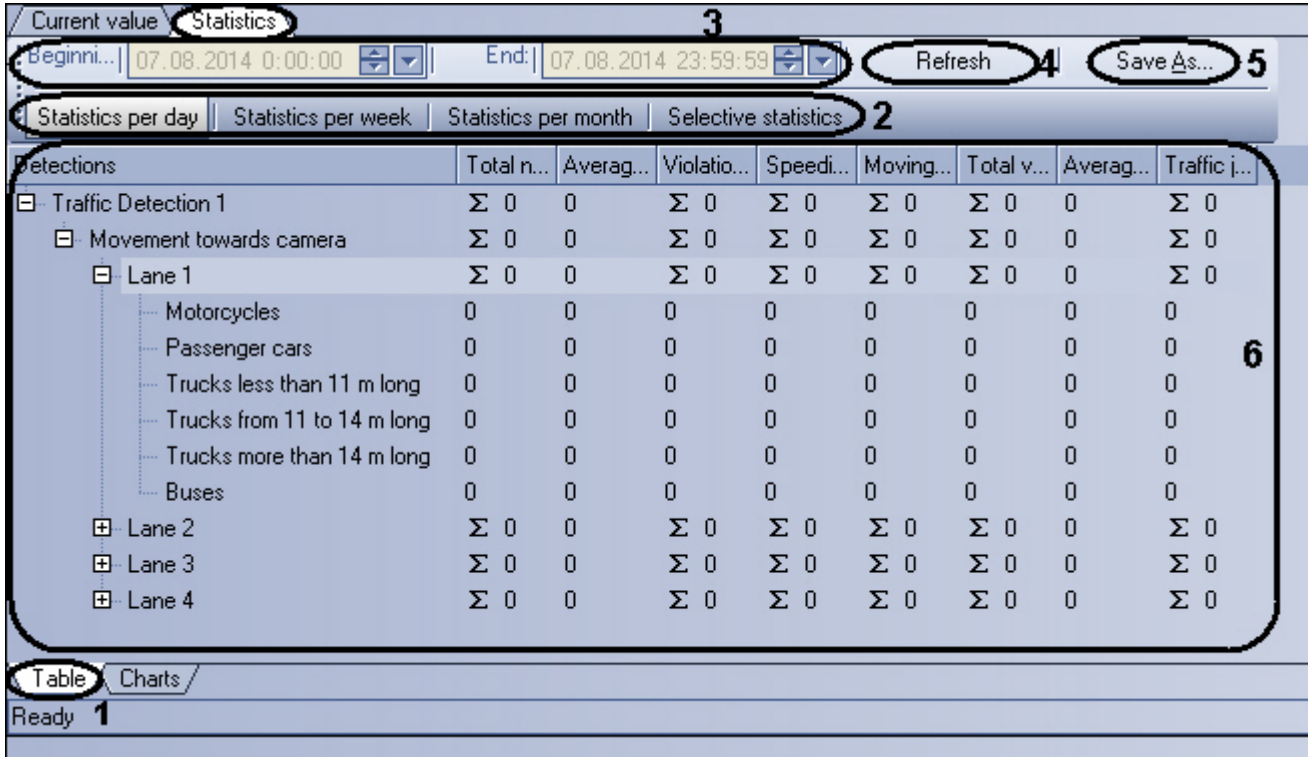


The following table describes the elements of the **Charts** panel.

Number of element	Description
1	The Traffic Detector name
2	The lane number or direction
3	Total number of vehicles registered for the lane (direction)
4	Indication of a traffic jam in the lane (direction)
5	Chart showing the number of vehicles in the lane (direction)
6	Chart showing the road load of the lane (direction), %
7	Chart showing the statistics for the average speed of different vehicles types

Table panel of the Statistics tab

The following figure shows the **Table** sub-tab of the **Statistics** tab.

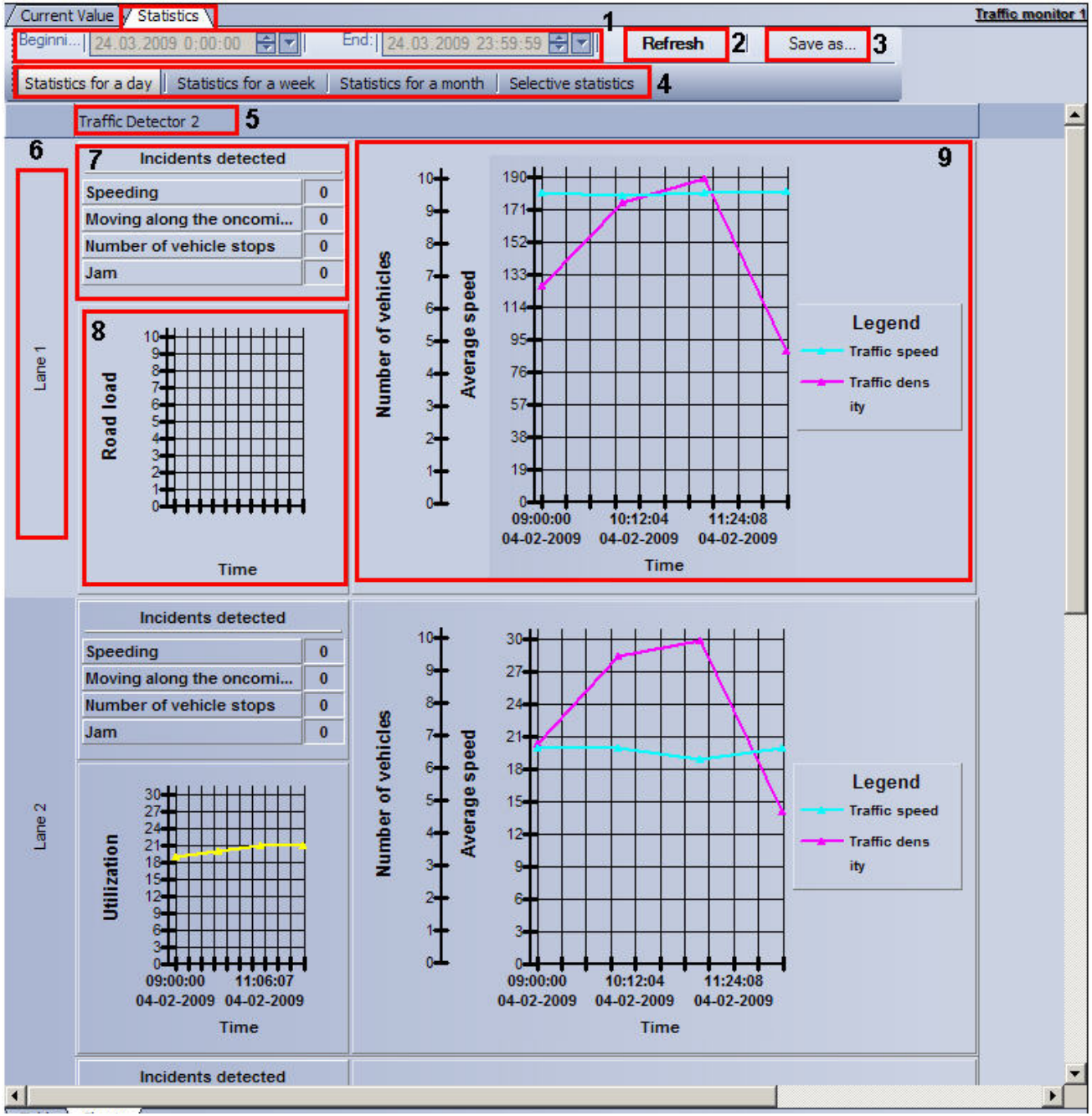


The following table describes the elements of the **Table** sub-tab.

Number of element	Description
2	Set of elements for selecting the statistic frequency
3	Set of elements for entering the beginning and end dates and times of the traffic statistics period
4	The **Refresh** button refreshes the displayed statistics.
5	The **Save as** button exports the displayed statistics to a file
6	Traffic statistics results

Charts panel of the Statistics tab

The following figure shows the **Charts** panel of the **Statistics** tab.


Current Value
Statistics
Traffic monitor 1
Beginni...
24.03.2009 0:00:00
End:
24.03.2009 23:59:59
Refresh
Save as...
1
2
3
Statistics for a day
Statistics for a week
Statistics for a month
Selective statistics
4
Traffic Detector 2
5
6
Lane 1
7
Incidents detected
Speeding 0
Moving along the oncomi... 0
Number of vehicle stops 0
Jam 0
8
Road load
Time
9
Number of vehicles
Average speed
09:00:00 04-02-2009
10:12:04 04-02-2009
11:24:08 04-02-2009
Time
Legend
Traffic speed
Traffic dens ity
Lane 2
Incidents detected
Speeding 0
Moving along the oncomi... 0
Number of vehicle stops 0
Jam 0
Utilization
09:00:00 04-02-2009
11:06:07 04-02-2009
Time
Number of vehicles
Average speed
09:00:00 04-02-2009
10:12:04 04-02-2009
11:24:08 04-02-2009
Time
Legend
Traffic speed
Traffic dens ity
Incidents detected

The following table describes the elements of the **Charts** panel.

Number of elements	Description
1	Set of elements for entering the beginning and end dates and times of the traffic statistics period
2	The **Refresh** button refreshes the displayed statistics.
3	The **Save as** button exports the displayed statistics to a file
4	Set of elements for selecting the statistic frequency
5	The Traffic Detector name
6	The lane number
7	Incident statistics for the lane
8	The road load chart
9	Chart showing the number of vehicles in the lane

The Vehicle Tracer interface description

The Events monitor

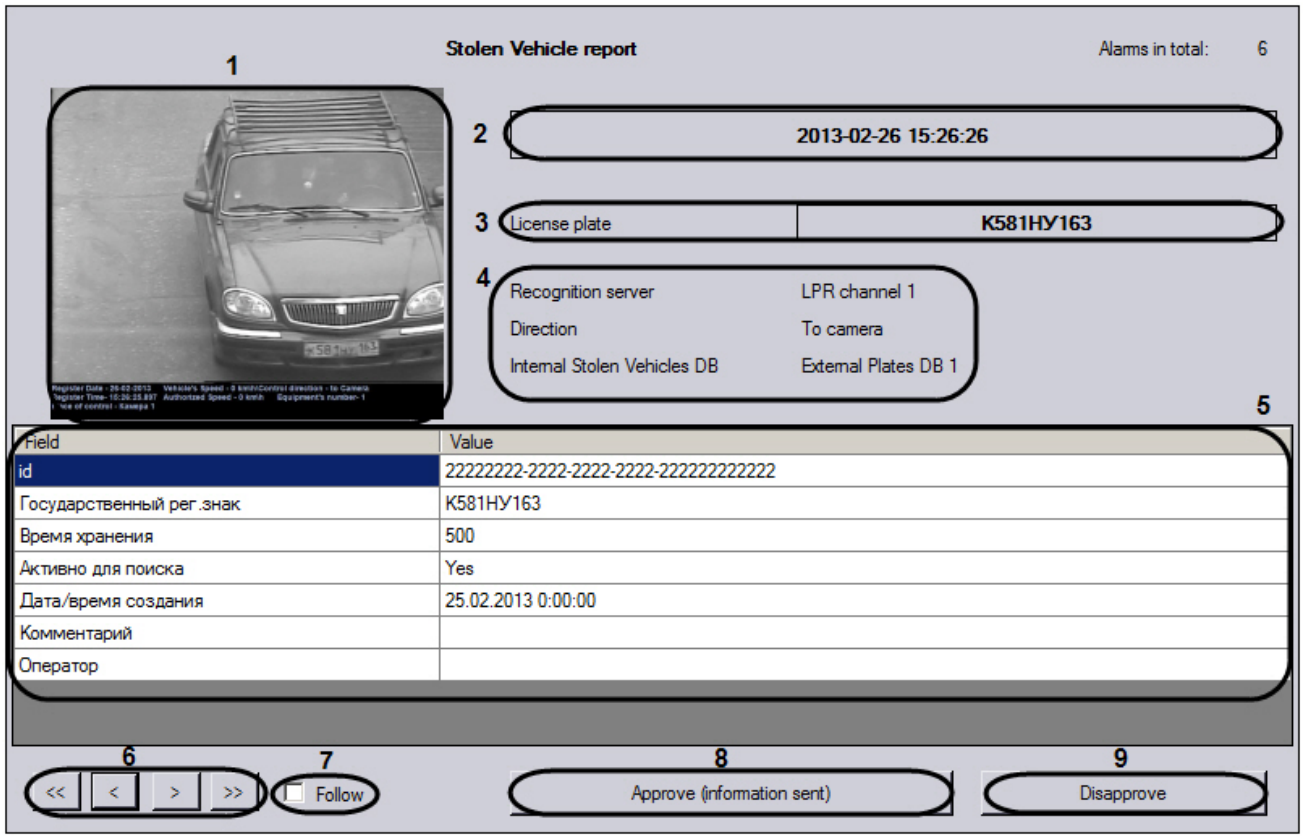
The **Events monitor** contains the following interface elements.

The Events monitor interface description is presented in the table:

Number of elements	Description
1	Detector of passing vehicle's plate
2	Signed frame with a passing vehicle
3	Identified vehicle's plate and speed (when the Uragan or CARMEN-Auto modules are used, the Radar module should be connected)

The Alarm window

The **Alarm window** contains the following interface elements.



The Alarm window interface description is presented in the following table.

Number of element	Description
1	The signed video frame with moving vehicle
2	Date and time of alarm event fixing.
3	Displaying the vehicle LP
4	Data about vehicles with which help the alarm was fixed
5	Orientation description
6	Go to the first orientation in the list; go to the previous orientation; go to the next orientation; go to the last orientation in the list

7	If the checkbox is set it disappears from all alarm windows in distributed environment when the alarm is confirmed, when the alarm is not confirmed – only from the current alarm window. If the checkbox is not set the alarm disappeared only from the current alarm window both when the alarm confirmed or not.
8	Confirm the event alarm status. The alarm is marked as received when click this button. The dialog box with the offer to print the orientation card will display.
9	Close the orientation window. The alarm status is not changed when click this button (alarm is not processed). Alarm will disappear from the **Alarm window**.

The On-line monitor

The **On-line monitor** contains the following interface elements.

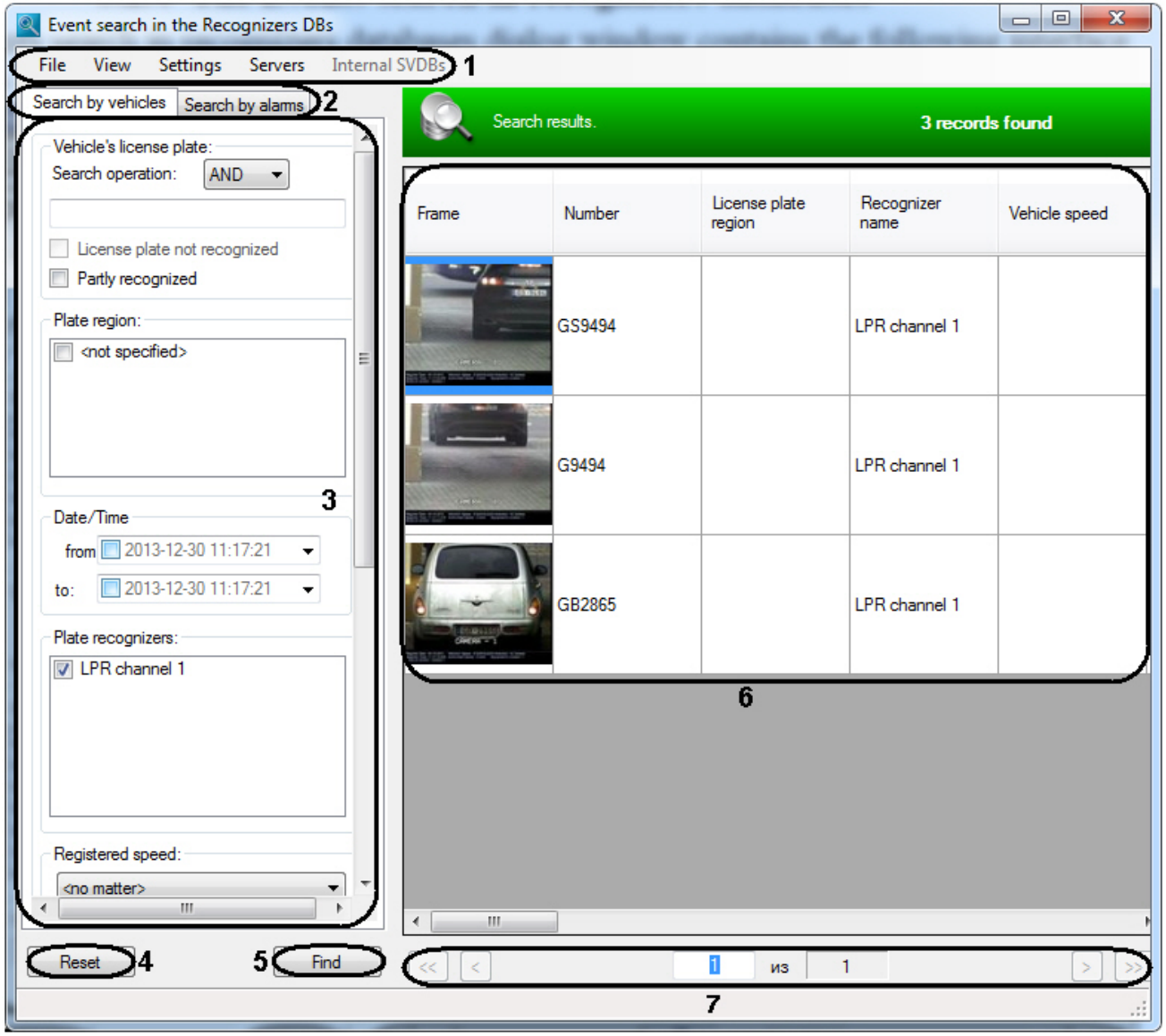
The **On-line monitor** interface description is presented in the following table.

Number of elemtnt	Description
1	Data about the last passed vehicle or event, selected in the identified vehicles protocol or in the alarms protocol
2	Transfer to the Events tab of the identified vehicles protocol.

3	Transfer to the alarms protocol tab. With alarms there displayed a video frame and number of the last alarm on the tab.
4	Hidden in the processes events protocols
5	Enabling/disabling setup filters.
6	Resuming the operative update of the displayed vehicle's protocol.
7	Triggering the alarm by operator.
8	Alarm acceptance.
9	Transfer to the list of errors in the operation of Vehicle Tracer module
10	Displaying the information from the external database.
11	The identified objects protocol or alarms protocol dependent on activated tabs- 2 or 3.
12	Roll down/roll up the displaying panel of comments and base.
13	Displaying the commentary to the selected event.
14	Forming the report with data about the selected event.
15	Opening the search window in the plates recognizers databases.
16	Transfer to the video archive of identified vehicles.
17	Transfer to filter settings, used in protocols.
18	Comments to the selected event with stated data and time of the commentary.

The Events search in recognizers databases

The **Events search in recognizers databases** dialog window contains the following interface elements.



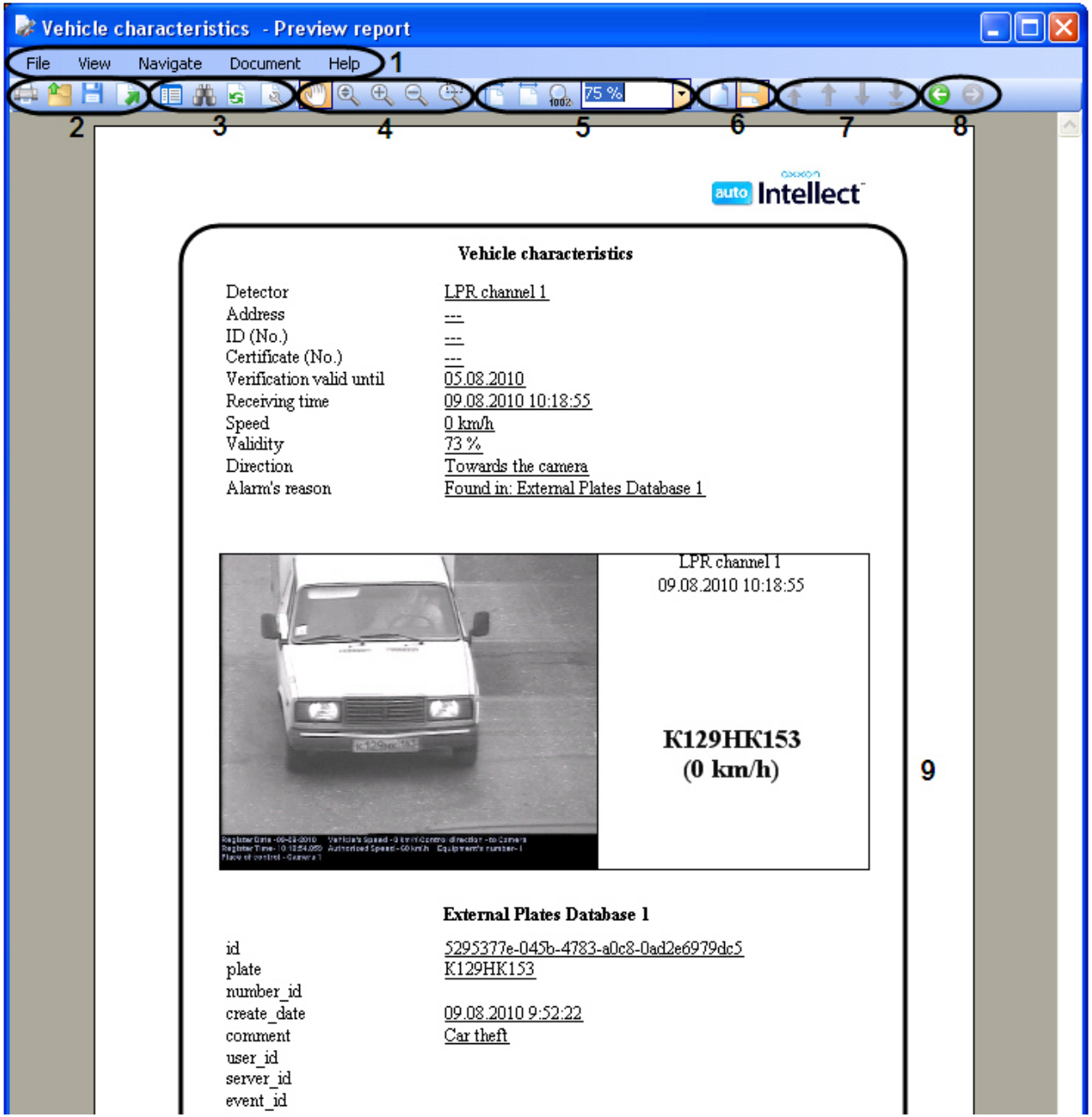
The **Events search in recognizers databases** interface description is presented in the following table.

Number of element	Description

1	The main menu, that enable to do the following operations: 1. File command: a. Printing the events search results; b. Closing the window Events search in recognizers databases 2. View command: a. Setting up the displaying of remote servers and databases; 3. Settings command: a. Setting up the displaying of events search results; b. Connecting the recognizers databases. 4. Servers command: a. Selecting the databases for searching the events. 5. Command Active tracking database a. Editing the Active tracking user database
2	Selecting the type of search: by events or by alarms
3	Forming the search query of the selected type
4	Clearing the search form from the given search criteria
5	Launching the search query processing
6	Events search results table
7	Navigation panel of the events search results

The preview report

The preview report program window contains the following interface elements.


Vehicle characteristics - Preview report
File
View
Navigate
Document
Help
1
2
3
4
5
6
7
8
75 %
auto Intellect
Vehicle characteristics
Detector LPR channel 1
Address ---
ID (No.) ---
Certificate (No.) ---
Verification valid until 05.08.2010
Receiving time 09.08.2010 10:18:55
Speed 0 km/h
Validity 73 %
Direction Towards the camera
Alarm's reason Found in: External Plates Database 1
LPR channel 1
09.08.2010 10:18:55
K129HK153
(0 km/h)
9
External Plates Database 1
id 5295377e-045b-4783-a0c8-0ad2e6979dc5
plate K129HK153
number_id
create_date 09.08.2010 9:52:22
comment Car theft
user_id
server_id
event_id

The preview report interface description is presented in the following table.

Number of element	Description
1	Main program's menu for viewing the reports (operations with a file, operations of previewing and navigating the report, operation with a report, viewing the information about program)
2	Block of elements for operations with a report file (printing, opening, saving, exporting the file)
3	Block of elements for operations with a report (displaying, content, search, update, edit)
4	Selecting the scaling mode and the scale of displaying the report
5	Zooming the report
6	Selecting the mode of displaying the report (displaying the pages by one page, nonstop page-by-page displaying)
7	Block of elements for navigation of the report
8	Block for step back and step forward of actions
9	Field for displaying the formed report