

ANPR – license plate recognition system
USER MANUAL

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1 Introduction

This manual is intended for users who will use the license plate recognition system (hereinafter - ANPR). The instructions will provide information, which will help understand, manage and use the ANPR.

The ANPR system is composed of two parts: 1 - the numbers identification server (hereinafter - ANPR SERVER), 2 - WEB server (hereinafter - WEB SERVER). The system is linked to a MySQL server and runs on Windows operating system.

The ANPR SERVER is designed to configure the system and also executes a physical identification of the number using the images coming from different sources: IP cameras, WEB cameras, analog cameras connected through video cards, video files (AVI, MP4) and photos, as well as organizes the control of the devices (barriers, cameras, etc.). The server is for use of security personnel and administrators. An example is given in Figure No. 1

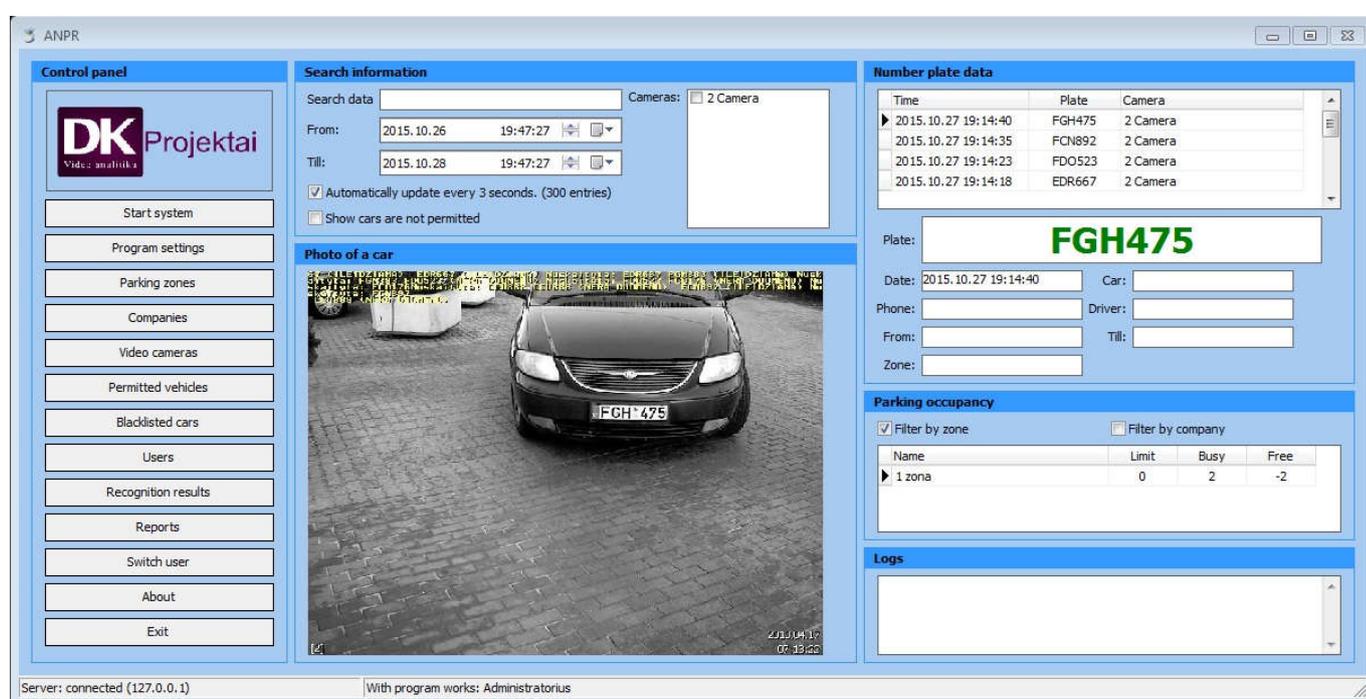


Figure No. 1

The WEB SERVER is intended for other users of the system (administrators, remote users). It provides the identification results and allows to add new data on incoming or departing motor transport. It allows you to easily provide rights of access to a protected area for any vehicle. An example is given in Figure No. 2

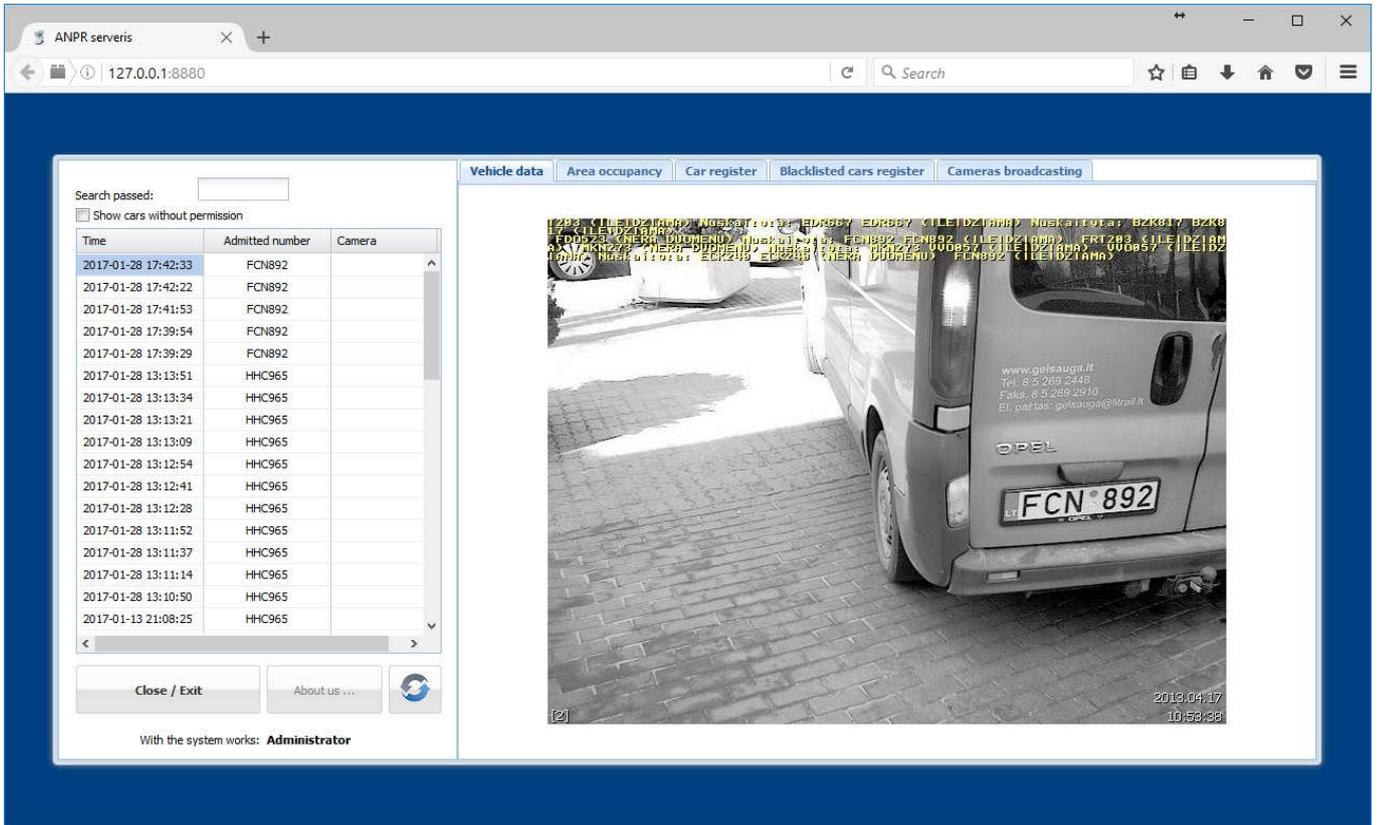
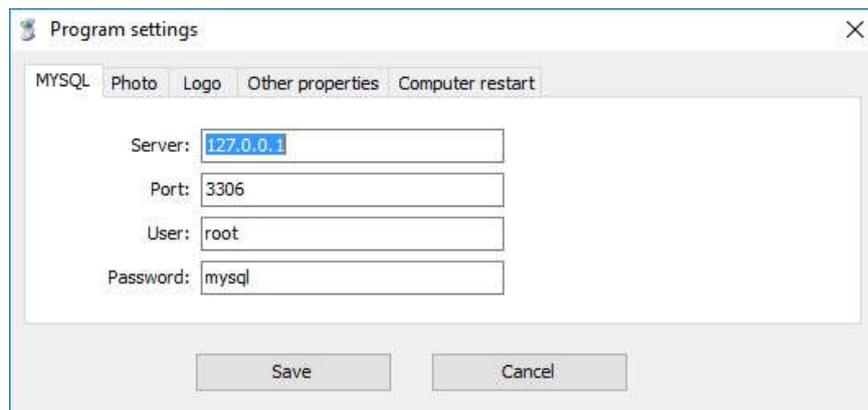


Figure No. 2

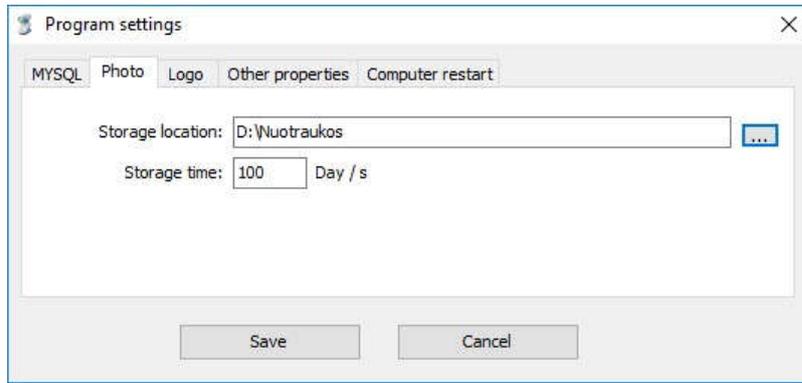
2 ANPR SERVER administration

2.1 Configuration on first start-up

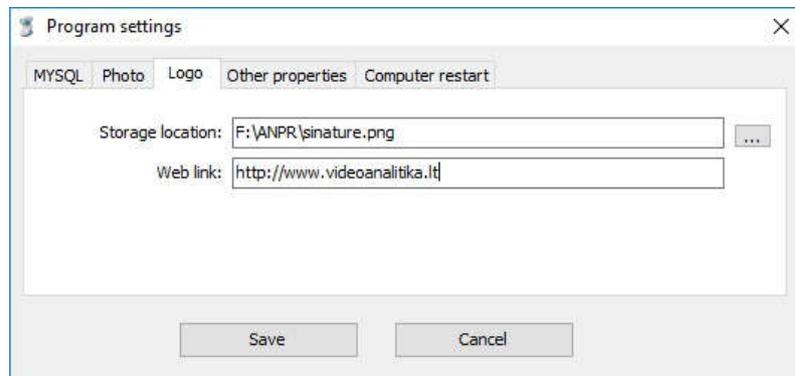
Working with the ANPR SERVER begins upon starting it. Upon the first run, the connection parameters for connecting to a MySQL server must be configured as well as other necessary data must be specified.



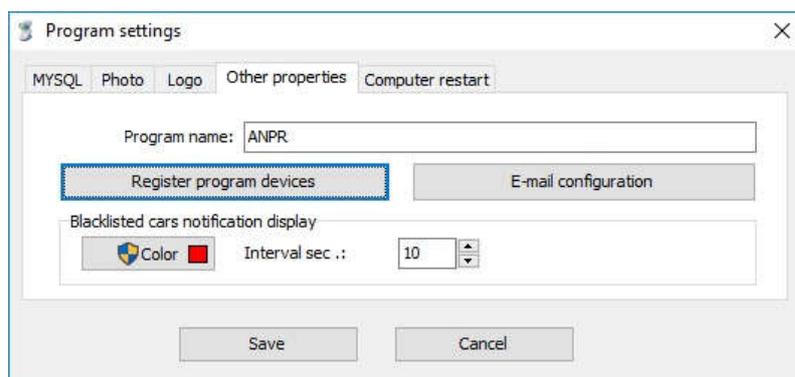
First, MySQL server data should be entered. If it is in the same computer - the settings will be as shown in the picture. If you prefer to use the MySQL server on another computer, then you need to copy the empty database "dk_numeriai_xxxx" together with all the tables from the computer and specify the login data of another server. Other settings can be configured later.



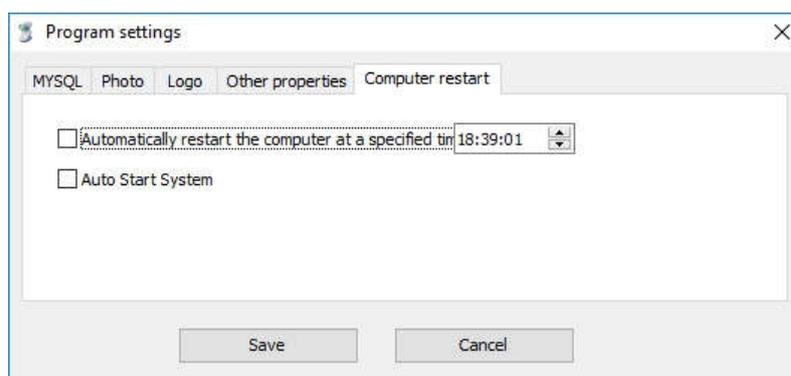
The next step - photo storage location and their storing time in days. The program will store photos of all vehicles that license plates were recognized in a set storage location, despite whether those vehicles are in a permissible "White" list, or in the "Black" wanted list. Upon the expiration of the storage period the program will automatically delete the oldest photos.



The following step - the logo. This setting is used to specify the program's logo location and website address, displayed in the main window of the program.



Next - additional settings. Here you can register the software, manage e-mail settings and time that the messages are displayed on the screen (time after which they are automatically hidden).



Next step - system restart. Here, automatic license plate number identification system restart time and auto-start can be set. The first parameter will restart the computer at the set time and if the restart system was initiated (license plate numbers recognition modules were run) - everything will be restored to the previous stage. The second parameter will automatically start the system and will start the license plate numbers recognition modules.

2.1.1 Software registration

This window displays the software registration details. The software uses a USB stick (or a USB card). For that, you need to connect any USB stick (that you do not use), fill in the details, generate a file (USBRegistration.ini) for sending and send it to info@videoanalitika.lt. This file's location is "C:\ANPR". After sending it, you will receive another file that you will have to save on your USB device that you have selected when registering the software.

WARNING!!! The USB device must be connected to the computer throughout the whole period of using the software. If it will be removed while the program is running - the program will stop. File copying to other devices is prohibited. However, using your USB device, you will be able to use the license plate recognition software on another computer, if for any reason you would need to, i.e. you cannot use the current computer (it is too weak, broke down, etc.). This is a key, which if you lose or damage, the issue will need to be addressed regarding re-purchase of the program.

2.2 Login

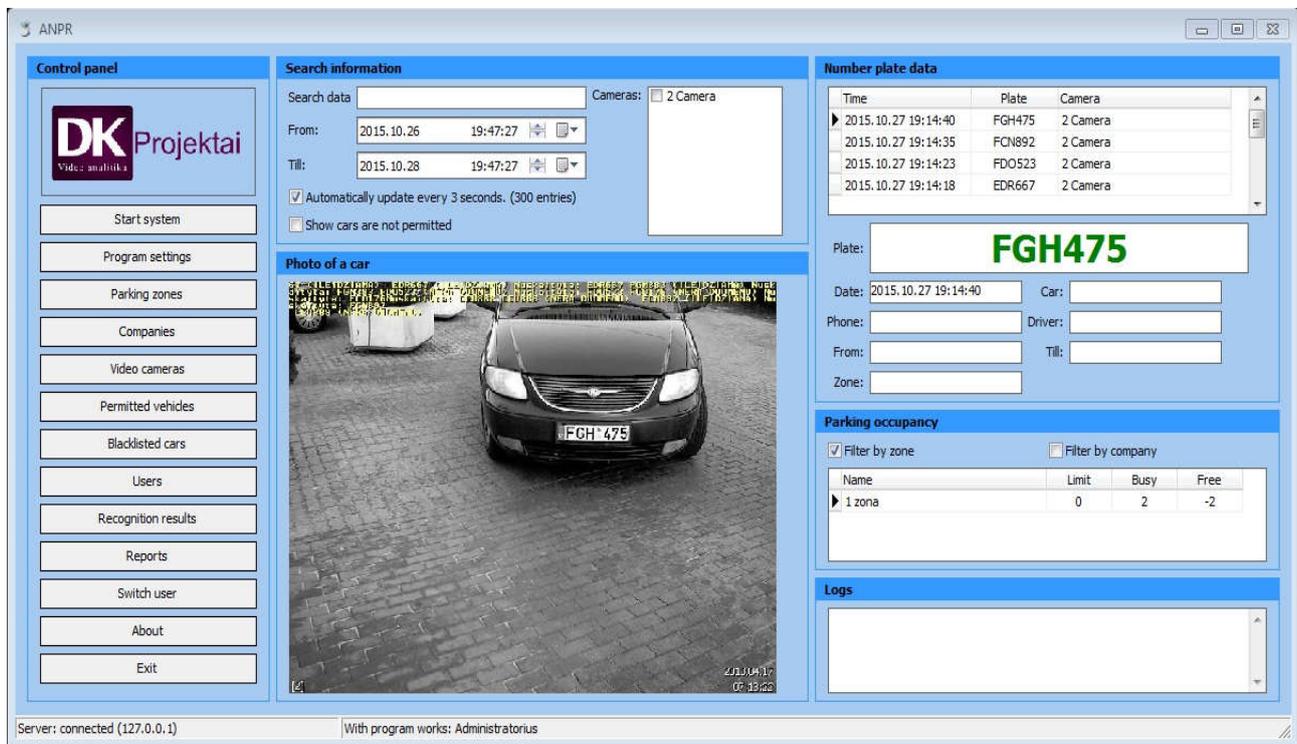
The system will start when the correct data will be entered. After the start-up, it is necessary to create a new program administrator profile with the following login information: Username - **Admin**, User password - **Admin**. Password can then be changed to a new one.



Subsequently, when logging in later, you must provide the correct login data. In case of ten incorrect login attempts, the program will automatically block the user.

2.3 Administration window

Upon a successful login to the ANPR system, the main administration window will be displayed.



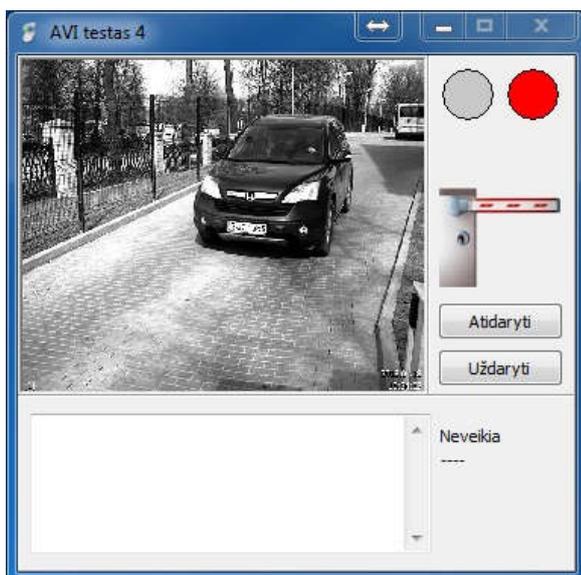
This window is divided into several areas: control panel with buttons, search data, license plate data, program performance register, parking occupancy and recognition photos. The control panel with buttons zone is intended for the system configuration purposes. The 'search information' area displays the last identified plate numbers and there is a possibility provided for a quick search of the identified number plates, time as well as the name of the camera that was used for it.

By clicking the buttons in this window, the following actions can be performed:

- **"Start system"**. The click of the button will start the number plates' recognition process. The system, by using IP video cameras settings data, will start separate processes for each camera settings, where the used processes will recognize the vehicle data and store it in a MySQL database as well as according control relays, that control the barriers and other devices, will be activated.

- **"Permitted vehicles"**. The click of the button will bring up a list of vehicles that are permitted to enter the protected area.
- **"Blacklisted cars"**. The click of the button will bring up a list of vehicles that when captured will trigger a sound signal, a pop-up window, and additionally an e-mail message.
- **"Recognition results"**. The click of the button will bring up a list of all (accepted/rejected) vehicles.
- **"Reports"**. The click of the button will bring up a report window, in which, by selecting preferred data, a report on recorded vehicles will be compiled.
- **"Users"**. The click of the button will open the configuration window.
- **"Parking zones"**. The click of the button will bring up the site zones configuration window. The system is designed so that it can be configured for any type of sites. It can manage different sites with different requirements. I.e. there is a big site, where any of the identified vehicles can enter zone No. 1, but only selected vehicles can enter zone No. 2, which is in the same site.
- **"Companies"**. The click of the button will bring up a configuration window of companies. Here you can create data of new companies, assign limits to them, thereby creating the possibility to use the system for calculating the available remaining spaces on the site.
- **"Video cameras"**. The click of the button will bring up the configuration window for the IP cameras, license plate recognition, relays and other settings.
- **"Switch user"**. The click of the button will stop the program and the current logged in user will be logged off, so that another user is able to login.
- **"Program settings"**. The click of the button will bring up the main program, mail server and registration settings window.
- **"About"**. The click of the button will bring up the software information window.
- **"Exit"**. The click of the button will stop all number plates' recognition processes and the ANPR server will be shut down.

2.3.1 System start



After clicking on "Start system", a separate window for each configured IP camera will open. It will display the live feed and basic camera settings. By opening this window, the numbers recognition process will automatically begin. I.e. the system will only then begin to recognize numbers and to continue working with them. The advanced settings window and the information register will be visible only when "Operating log" box will be checked in the "Video cameras" window. The buttons "Open" and "Close" are needed for manual gate opening and closing, or automatic closing after opening but not passing the site gate barrier.

2.3.2 Permitted vehicles

The 'Car register' window features a 'Quick search data' field at the top. Below it is a table with the following data:

License plate	Vehicle brand	Driver	Phone
DDK192	BMW	DKprojektai	+3706874983

Below the table is a 'Vehicle data' form with the following fields:

- License plate: DDK192
- Driver (Name, Surname): DKprojektai
- Vehicle brand: BMW
- Authorization is valid
- From: 2017-01-28 21:16:18
- to: 2017-01-29 21:16:18
- Valid only for one driving
- Let out button
- Date added: 2016.11.23 21:40:10
- User: Administrator
- Driver's phone: +3706874983
- Action zones: Zone1
- Company: PKPD

Buttons at the bottom: Add, Change, Delete, Close.

In this window, new vehicle data, that are allowed to enter the protected area, can be entered as well as existing data - edited. The vehicles can be registered here and they will simply be allowed in and out automatically. The system can also register guests. For this, the "Authorization is valid" box should be checked and the date and time set accordingly. In this window you can also easily search for a specific vehicle according to any of the criteria mentioned. When registering vehicles it is important to indicate the "Action zones" - cameras that the particular vehicle can pass through. If the system uses the companies' vacancies accounting - the company name must specified, to which the vehicle is assigned. In this window you can also set whether the car should be let out with an approval. This means that the car will be able to enter the territory freely, after the system has scanning its license plate number, but when leaving, the system, after recognizing the license plate number will not raise the barrier until you press "Let out" button in this window. This feature is also applicable in the WEB server environment.

2.3.3 Blacklisted cars

The 'Blacklisted cars' window features a 'Quick search data' field at the top. Below it is a table with the following data:

License plate
FCN892

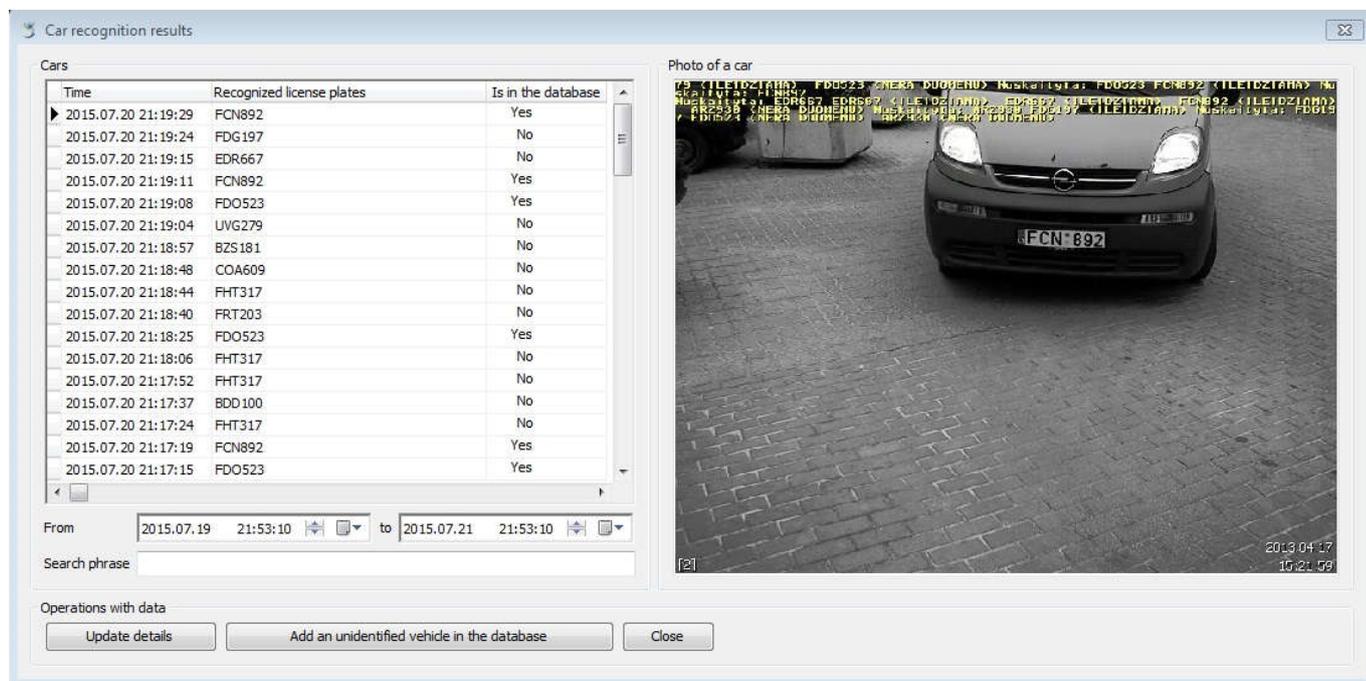
Below the table is a 'Vehicle data' form with the following fields:

- License plate: FCN892
- E. mail: donatas@videoanalitika.lt
- Authorization is valid
- From: 2015.10.27 19:10:04
- to: 2015.10.28 19:10:04
- Action zones: 1 zona

Buttons at the bottom: Add, Change, Delete, Close.

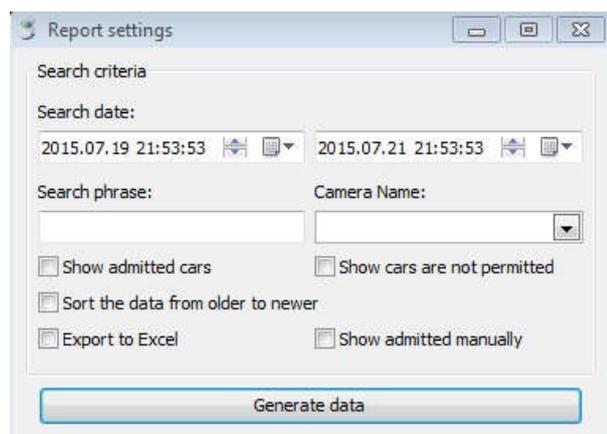
In this window, data on vehicles that are prohibited to enter the protected area, and upon which recognition an alert must be sent, can be entered as well as existing data - edited. The user will be alerted with a sound and visual message on the monitor screen and/or an e-mail message sent to users listed in the "E. mail" field, about the vehicles that are entered into this list.

2.3.4 Car recognition results

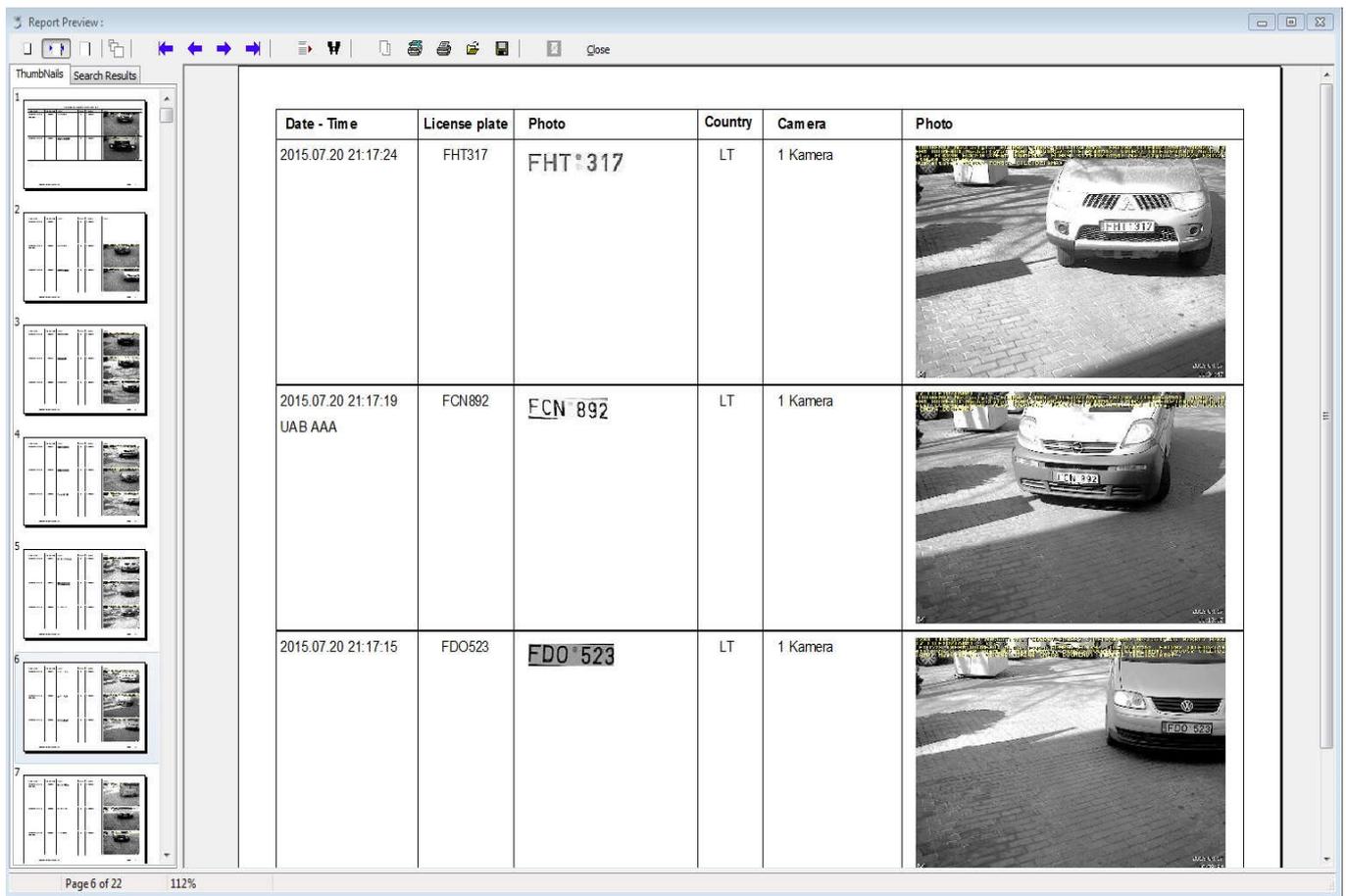


This window contains the details of all recorded vehicle number plates, which were caught in the field of vision of the cameras. Using this window, new vehicles can be added very easily, you just need to select the vehicle you want and press the button "Add an unidentified vehicle in the database". Using this window, you can also easily perform a search on a specific vehicle of interest using any of the criteria mentioned.

2.3.5 Reports

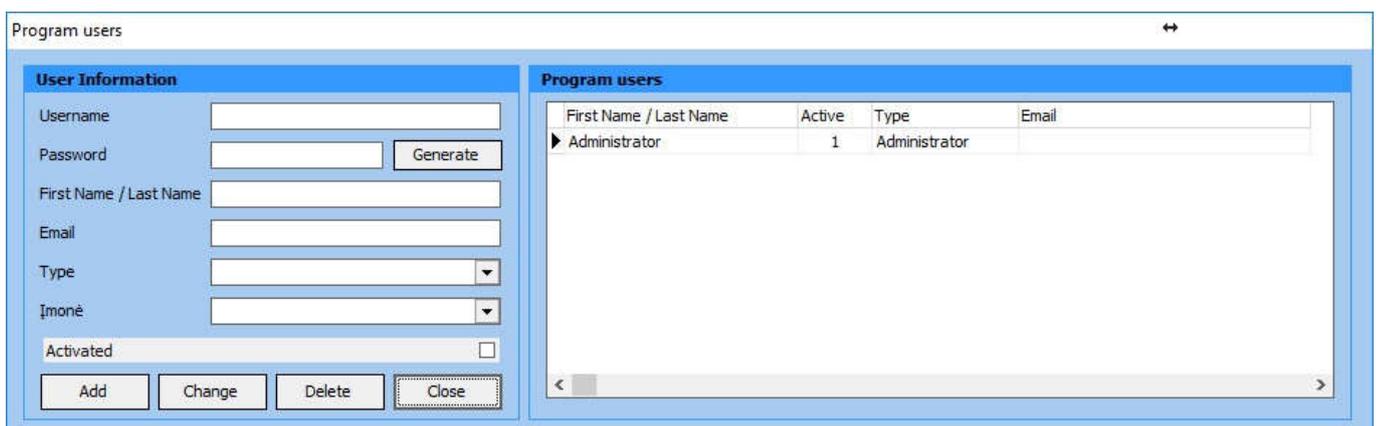


This window specifies the data, according to which a report will be generated on the recorded license plate numbers by the system. An example of a report is provided below. A generated report can be saved or printed.



2.3.6 Users

In this window, new users can be created or the current ones - adjusted. The main Administrator cannot be removed, neither can its login name be edited. You can only change the login password. The created users will be able to connect through the WEB server and register the vehicle entrances. The users can be created in the system, but they will not be able to perform any actions until the box "Activated" is checked. If the SMTP server in the system is configured correctly – the user will be sent a message after the registration about the registration data. The system uses two types of users – administrators (can perform all functions) and ordinary users (can perform limited functions). If in this window, a user will be assigned to a company and vacant places counting function will be activated, then the user, through a WEB SERVER, will be able to control/see how the assigned to him vehicle spaces are being used.



2.3.7 Parking zones

This window is for creating new parking zones. The limit of spaces is provided if you want the system to calculate the free spaces in a site, and depending on that number, either to let through or not to let through a recognized vehicle. Otherwise indicated 0 (no limit).

Name	Places limit
1 zona	30

2.3.8 Companies

In this window, new companies can be created. However, this functionality is used only in case the program is used to calculate the available spaces by companies.

Name	Places limit
UAB AAA	10
UAB BBB	20

Number of places in the area: 30

2.3.9 Video cameras

This window is essential, and the overall system performance depends on how the configuration is set here.

Camera ID	The camera title	URL of the camera
1	LT Enter	F:\Download\2.avi
2	LT Exit	F:\Download\2.avi

Camera Name *: LT Enter

Setting ANPR

Screenshot camera: http://xxx.xxx.xxx.xxx:xxxx/cgi-bin/snapshot.cgi?channel=0

Associated camera: LT Exit

Active camera

Operating log

Camera for exit

Closing with barrier time relay

Re-scan after (milisec.)*: 10000

Barrier time delay (milisec.)*: 1000

Extension (.jpg, .png): .jpg

* - Marked data is required

Add Change Delete Close

To begin using the system first you need to add an IP video camera and other data belonging to it. This can be done by completing the required fields in the tables: camera specifications, and other settings. Below are descriptions of the fields on individual tables. The upper part of the window displays the cameras that are already included as well as their main settings.

2.3.9.1 Camera data

The following table contains data the about an IP video camera:

- **"Camera Name"**. Indicate any preferred name. For the correct functioning of the system, different camera names must be assigned;
- **"Re-scan after (milisec.)"**. Specifies after how many seconds the system can again use the previous car's number. Suppose at 14:00:00 a car with the number ANR001 has arrived. It was recognized by the system, let through and recorded in the database. If this field is set to 300000 miliseconds, then the car will be able to enter only after 5 minutes. This function is more needed for the system itself so that it would not read the same number over repeatedly. Suppose a car

drove up, and then it took a little maneuvering forward and back in the field of view of the camera;

- **"Barrier time delay (milisec.)"**. This is the time after the successful identification of a license plate number after which the system will "sleep" - the system will not give any commands to the control devices, will not switch on the traffic lights, etc. However, the system will still record all license plate number in its field of view. This parameter in conjunction with other settings, works differently. I.e. if a ETH484 relay board will be used and "photo relay" in it chosen, then this parameter will be ignored;
- **"Active camera"**. When the box is checked, the system launches the camera and the license plate recognition through it. If unchecked - the camera will be ignored;
- **"Operating log"**. When the box is checked in an active camera window, additional settings and information register will appear;
- **"Camera for exit"**. This check box is used when entering and leaving vehicles number plates recognition is carried out in a single lane. I.e. when the camera sees both - the entering and leaving vehicles - the system will only see the vehicle and its number, and it is necessary to use the movement detector with directional identification to distinguish the movement direction. For detectors to correctly identify the direction, it is needed to specify which vehicles will be recorded using this camera. If entering - the check box should be unchecked, if leaving - then the box should be checked;
- **"Related camera"**. This function is used also when entering and leaving vehicles' license plate numbers recognition is carried out through one lane. After entering all the cameras used by the system, you will be able to pair them. I.e. "LT Enter" camera needs to be paired with "LT Exit" camera for the reason that after the front license plate number is scanned, the back plate would not be scanned, and in case two vehicles pass at the same time, the system would not give two commands to open the barrier.

2.3.9.2 ANPR configurator

ANPR data should be entered in this window:

In this window, the basic settings are configured. The window is divided into two main parts: Camera/File and the ANPR settings and numbers recognition results. You can test the license plate recognition system operation here from different sources: IP cameras, WEB cameras, analog cameras connected through video cards, video files (AVI, MP4) and photos.

- **"File/url"**. Camera's video stream address or video file/photo location path is specified. The system can handle both - RTSP and HTTP protocols to receive video stream, as well as use other video processing means from other devices connected to a computer. RTSP example:
192.168.1.84:554/cam/realmonitor?channel=1;
- **"Login"**. Specifies the IP camera's login name;
- **"Pass"**. Specifies the IP camera's login password;
- **"(http, rtsp,..)"**. Specifies the IP camera's incoming video stream type. If the video is not transmitted through protocols, the field is left blank;
- **"Device"**. Video transmission unit that is connected to a computer is selected;
- **"Scanning range"**. These settings are entered automatically from mouse movement in the image area. They are needed for the system to know whether to look for a car number in the entire area or only in the selected boundaries. This setting helps to reduce the recognition time by several times and helps to save computer processor's resources;
- **"Selected countries"**. Countries that car numbers will need to be identified. You can select multiple countries at the same time, i.e. LT, RU, PL;
- **"Scanner frequency (ms.)"**. This setting determines how often the program performs an automatic search for and identification number. Size is determined depending on the way the system is used. If number recognition is carried out in an area where cars are moving at high speeds and do not stop, then this value should be less than 500. However, if the system is used to manage the entrances to the parking sites, then the parameter can be greater than 500; This parameter is directly influences the choice of a computer processor.
- **"Minimum height (pix.)"**. The minimum height of pixels in a number in the frame. It is recommended to set the image so that this parameter is not less than 12px. Specifying this setting the system will bypass the found the car numbers that symbols are lesser than specified. You can correctly measure the height of the number symbols in a taken photo's window. You at first must choose "Measure" and with the help of mouse, measure the symbols height of a number. The photo may be zoomed-in our zoomed-out by turning the mouse wheel;
- **"Maximum height (pix.)"**. The maximum height of pixels in a number in the frame. Specifying this setting the system will bypass the found the car numbers that symbols are bigger than specified. You can correctly measure the height of the symbols number in a taken photo's window. You at first must choose "Measure" and with the help of mouse, measure the symbols height of a number. The photo may be zoomed-in our zoomed-out by turning the mouse wheel;
- **"Color scheme"**. Specifies what numbers will be recognized. Black letters on a white background or white letters on a black background (the latter is used by the military transport in Lithuania);
- **"Deflection angle*"**. This parameter specifies the angle for the camera to look for license plate numbers. I.e. if the license plate image is always at the same position, then the value of this parameter can be set to 5. But in most cases the cars stop at different angles and therefore numbers may differ. Therefore, it is necessary to specify what in what limits should the camera look for the license plates;
- **"Rotation angle"**. If the camera is fixed and cannot be adjusted while the number of the car it is not horizontal, then this parameter should be specified. (-) Sign to show a negative angle. For ease of the parameter setting, you can use an additional function. Just press the "Rotation angle" button

and in a pop-up window, with the help of a slider, alter the rotation to its horizontal position. After closing the window, this parameter will have changed;

- **"Show numbers without the country code"**. The system, after it recognizes the number is always trying to verify whether it corresponds to the country format. By selecting this option, the system will try to recognize the number, and if it will not be able to assign it to a specific country, then it will scan again and check whether the number is at all recognized in accordance to the first set country, without taking the country format into account.

2.3.9.3 Relay settings

The screenshot shows a software window titled "Camera settings". At the top right, there is a search bar labeled "Quick search data". Below it is a table with three columns: "Camera ID", "The camera title", and "URL of the camera". The table contains two rows: the first row has ID "1", title "LT Enter", and URL "F:\Download\2.avi"; the second row has ID "2", title "LT Exit", and URL "F:\Download\2.avi". Below the table are three tabs: "Camera specifications", "Relay settings", and "Other properties". The "Relay settings" tab is active, showing a "Type" label and a dropdown menu. At the bottom left, there is a note: "* - Marked data is required". At the bottom right, there are four buttons: "Add", "Change", "Delete", and "Close".

Camera ID	The camera title	URL of the camera
1	LT Enter	F:\Download\2.avi
2	LT Exit	F:\Download\2.avi

In this table, external devices or functions are chosen, that will trigger after recognition of a vehicle license plate number. In order for the system to start the control of the devices, a type must be selected from the following:

2.3.9.3.1 ETH484 relays

The screenshot shows the configuration interface for ETH484 relays. It includes tabs for 'Camera specifications', 'Relay settings', and 'Other properties'. The 'Relay settings' tab is selected. The interface features a 'Type' dropdown menu set to 'ETH484 relay'. The main configuration area, titled 'ETH484 settings', contains fields for 'Board number *:' (1), 'IP address *:' (192.168.1.64), 'Traffic lights ID *:', 'Barrier open ID *:' (led1), 'Barrier add. open ID *:', 'Barrier close ID *:' (led1), 'Barrier add. close ID *:', 'Extr. control*:' (in0), and 'Loop'. To the right of these fields are 'delay' and 'Test' buttons, and several 'Enable / Disable' buttons. On the far right, there is a 'Login:' field (admin) and a 'Pass:' field (masked with dots). Below that is a table titled 'All relays and contacts' with columns for 'Relay 1-8' and 'Out 1-8', and a 'Status' button. At the bottom right, there is a 'Communications port:' field (8801) and a 'Test' button.

The system is integrated and can work with ETH484 and IP camera type relays (4 or 8 relay blocks). They can be used for switching devices (traffic lights, barriers, etc.) on or off. If the system uses space calculation, then it is necessary to only use these types of boards, as for the entering and leaving cars' calculation, photo elements are used that indication shows whether the vehicle has entered, and can a command already be sent for the lowering of the barrier.

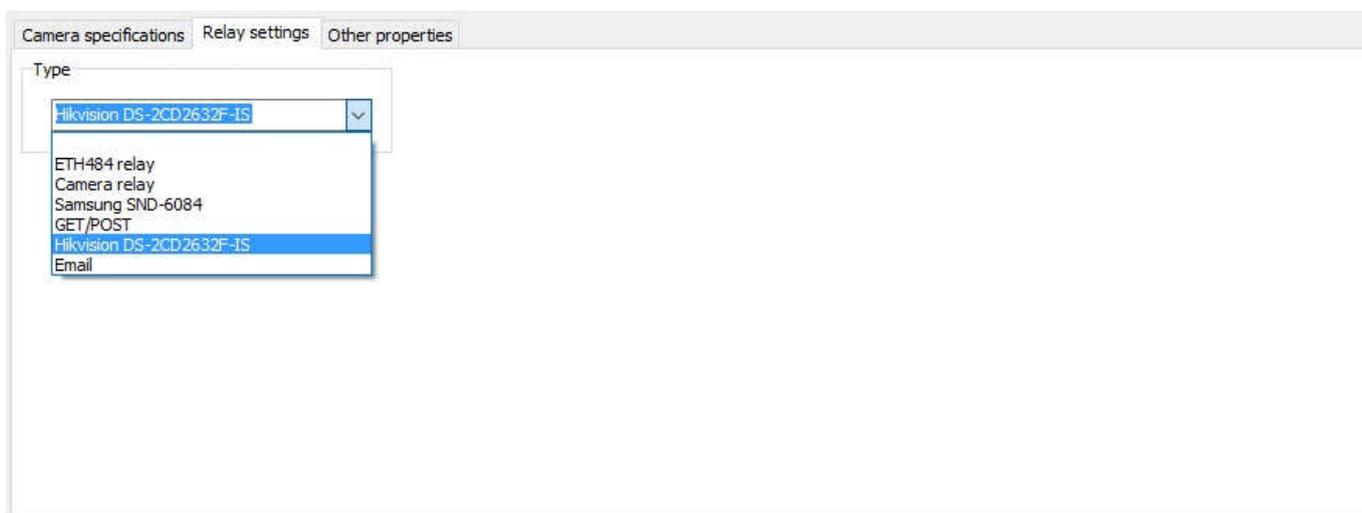
- **"Board number"**. Simply a number in sequence - the system can control a number of devices and therefore it can have few relay boards. In order to differentiate the boards, each of them must be assigned with a separate IP address;
- **"IP address"**. ETH484 relay board IP address;
- **"..... ID"**. Specifies the identifier of the relay contacts. In other words - the relay number. "led0" means relay 1, "led1" refers to relay 2, etc.;
- **"Traffic lights ID"**. The relay will control the traffic lights. Its operation is different from other, because the traffic lights should be turned off when "Photo relay" is triggered. If the system does not use traffic lights, then this setting may be blank;
- **"Barrier open ID"**. The relay which will close the barrier. After its selection, you must specify the time in seconds for how long the relay contact should remain active;
- **"Barrier add. open ID"**. The relay which will open an additional barrier. After its selection, you must specify the time in seconds for how long the relay contact should remain active;
- **"Barrier close ID"**. The relay, which will close the barrier. After its selection, you must specify the time in seconds for how long the relay contact should remain active. If in the camera settings there is the data box is checked on "Closing the barrier with time relay", then this setting can be left blank. In such way, the system will know that the barrier will close itself. In this case, you must properly set the "guard delay time (milisec.)" - and to synchronize it with real-time during which the barrier is lowered automatically;
- **"Barrier add. close ID"**. The relay which will close an additional barrier. After its selection, you must specify the time in seconds for how long the relay contact should remain active;

- **"Photo relay"**. Specifies the identifier of the relay contacts. "in0" refers to input contact 1, "in1" refers to input contact 2, etc. This setting is used then when you want the barrier to be lowered by the program when the photo relay or another device used for indication is released. I.e. loop
- **"Loop"**. Specifies the identifier of the relay contacts. "in0" refers to input contact 1, "in1" refers to input pin 2, etc. This setting is used when the system allows entering of the vehicles by their recognized license plate numbers and lets them out using a loop or other vehicle location indicator. NOTE. While loop is occupied - license plate numbers identification process will take place, but none of the devices will be activated;
- **"Status"** button is used for checking the relay status. Button Enable/Disable is used for testing of the relays;
- **"Communication port"**. This setting is required to indicate when the ETH484 relay boards are used.

2.3.9.3.2 Camera relays

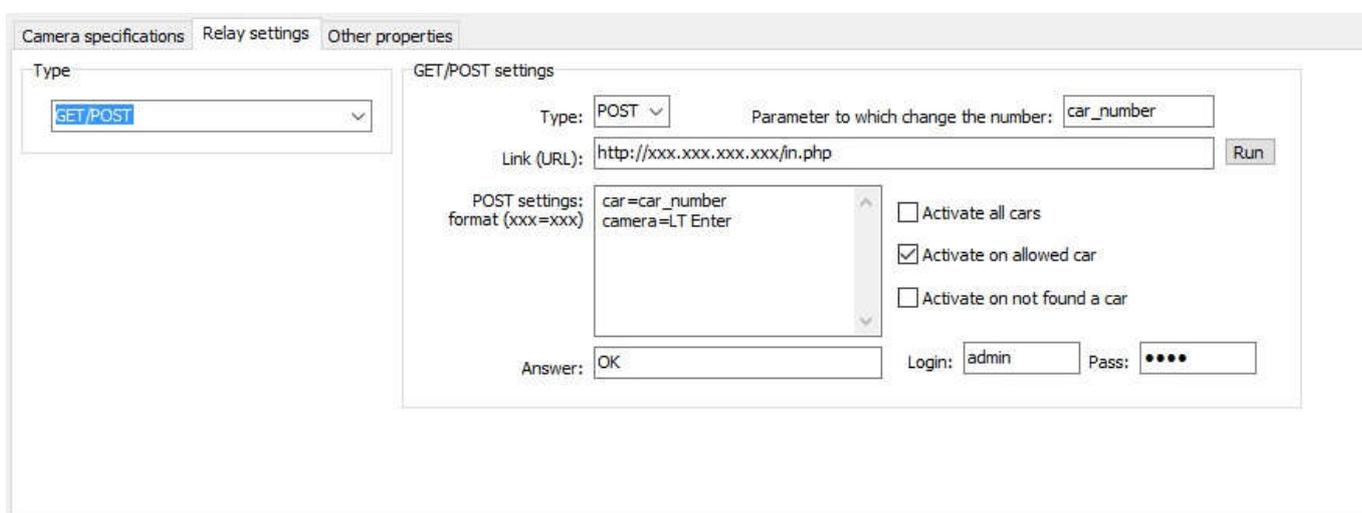
The system is integrated and can work with IP cameras or any devices that support HTTP commands. It can be IP cameras hazard relays, NVR devices or other manufacturers (not ETH484) devices. With this type of setting you can only manage a single unit (one barrier). When you select this type of installation the system cannot be used for car entry calculations. Here, settings are simple: indication of activation and deactivation of the URLs, and the device received reply after sending out a command (text).

2.3.9.3.3 Samsung or Hikvision cameras



The system is integrated and can operate IP cameras - Samsung SND-6084 and Hikvision DS-2CD2632F-IS output relays.

2.3.9.3.4 GET or POST requests



The system can be integrated with other systems by sending them information using GET or POST commands. Just specify the data (as shown in the illustration) and select in what event to activate the requests.

2.3.9.3.5 E-mail messages

The screenshot shows the 'Other properties' tab of a camera settings window. It features a 'Type' dropdown menu set to 'Email'. Below it, the 'Email messages' section contains three checkboxes: 'Activate all cars' (unchecked), 'Activate on allowed car' (checked), and 'Activate on not found a car' (unchecked). An 'E. mail:' field contains the address 'info@dkprojektai.lt'.

The system can send e-mails in the event of a specific situation. The letter will contain a picture, license plate number and date of the captured in it, vehicle. Just specify the data (as shown in the illustration) and select the event to activate the request.

2.3.9.4 Other settings

Other settings data should be entered in this window:

The screenshot displays the 'Camera settings' window. At the top, there is a 'Quick search data' search bar. Below it is a table listing camera configurations:

Camera ID	The camera title	URL of the camera
1	LT Enter	F:\Download\2.avi
2	LT Exit	F:\Download\2.avi

Below the table, the 'Other properties' tab is active, showing configuration for 'Zone 1'. It includes fields for 'Camera zone' (set to 'Zone 1'), 'LED board (BX - 5K1)' with 'COM port (COM3)' and 'Number of characters' fields, and 'GSM settings' with 'COM port (COM3)', 'Bitrate', and a 'Test' button. On the right, there are sections for 'Allow entry / exit to all with number scanning' (unchecked), 'Counting places' (unchecked), and two 'Notification' sections for 'disallowed number' and 'exceeded quantity limit', each with a 'Colour' selection, 'Interval sec.' spinner (set to 0), and an 'E. mail:' field.

* - Marked data is required

Buttons at the bottom: Add, Change, Delete, Close

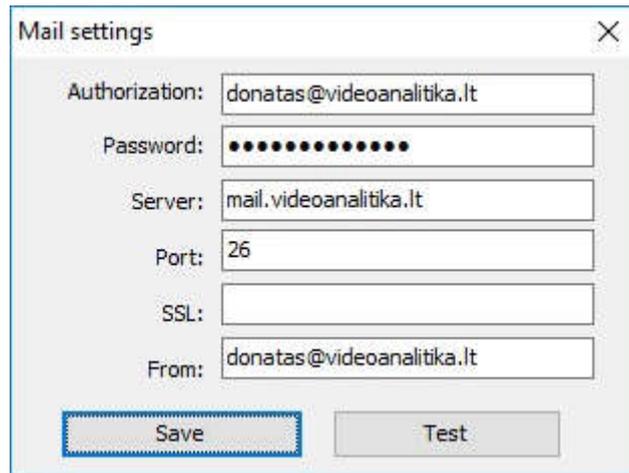
- **"Camera zone"**. This setting is mandatory. Even if the site is not divided into separate zones, you need to specify at least one. If there are zone divisions, then all zones should be included and cameras assigned to let in the recognized vehicles in and out;
- **"Counting places"**. This feature allows the system to enter site busyness control. After setting up the data, and the activation of the system, it will automatically control the access of vehicles according to the present site parking availability and render information in the main window. The calculation is possible by zone and by companies in the zones. Counting is only available when using the ETH484 relay board;
- **"Allow entry/exit to all with number scanning"**. This setting allows the system to allow entry and exit to vehicles simply by recognizing a license plate number. This functionality is needed in those cases when the parking lots are only being started to use and the license plate numbers of vehicles are still uncertain, or in cases when one only wants to find out who and when uses the parking lot;
- **"LED board"**. At present, the system can use the BX-SK1 type controller having light-boards. The system can work using the data output measure - LED light-board. After entering the settings and connecting the LED light-board to a computer, it will display information on identified vehicles' license plate numbers, or will display a word "STOP".
- **"COM port"**. A COM port number is entered to which the device is connected;
- **"Number of characters"**. This parameter indicates how many symbols are used in the light-board. I.e. two segments commonly use 8 (2xfour) characters. This parameter is required to ensure that if the number is less than the number of the text then the displayed text will be centered;
- **"GSM settings"**. In bad weather conditions or other circumstances when the vehicle license plate number may not be recognized or identified correctly. In order to fully automate the processes in the system, a GSM telephone (or a few of them) can be integrated. After configuring it, the system will be able to receive calls from the drivers, whose license plate numbers are in the "Permitted vehicles" register and accordingly if the caller telephone number matches, the system will send commands to the control devices.

The system can also show messages in a monitor's window about a blacklisted number and excess limit or send e-mails to set e-mail addresses.



2.3.10 Mail settings

In order for the program to work together with the WEB SERVER, it is necessary to setup the correct settings. It is for informing the users about accounts created for them and to remind the registration information. In addition, this information will be used when sending e-mails to the users about captured blacklisted cars.



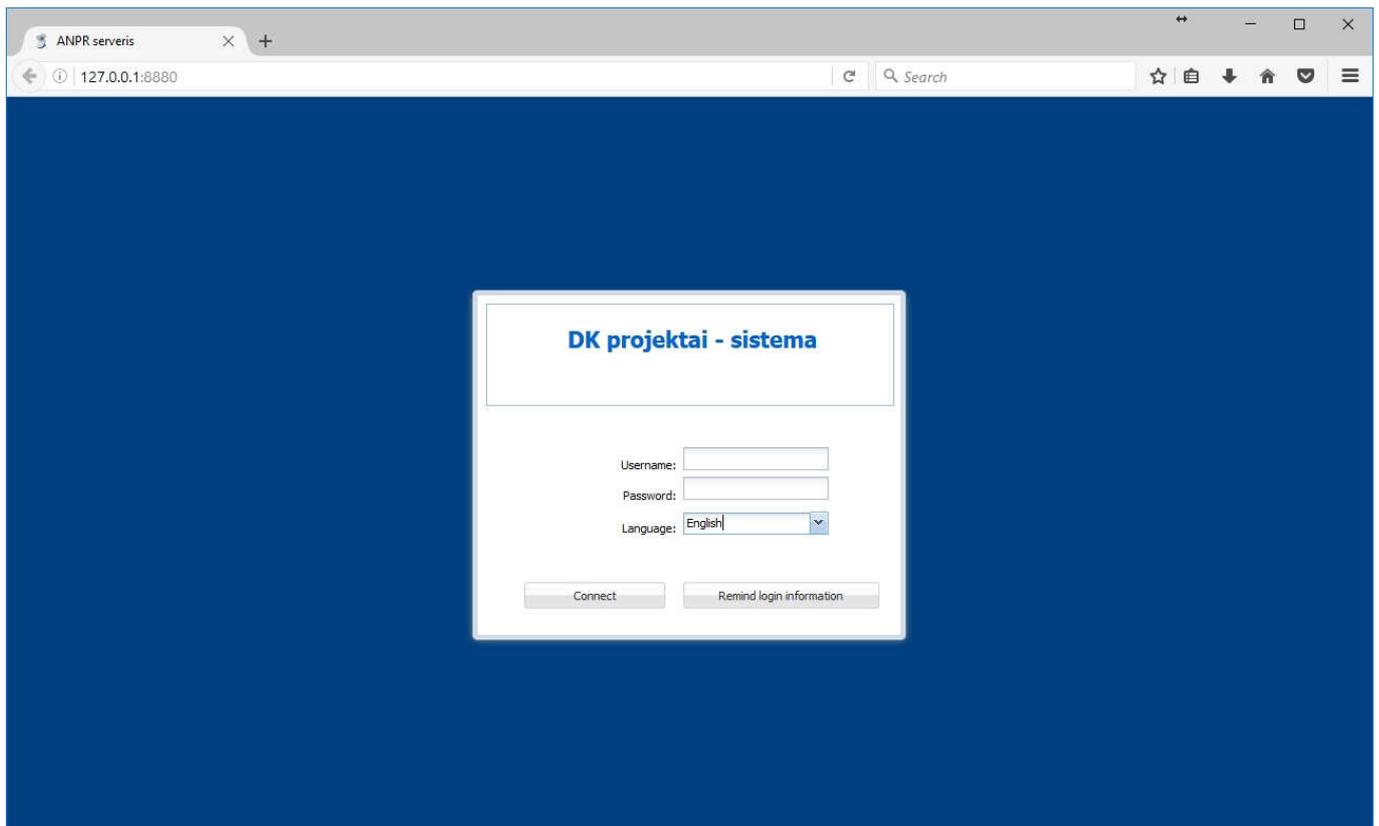
The image shows a 'Mail settings' dialog box with the following fields and buttons:

- Authorization: donatas@videoanalitika.lt
- Password: [Redacted]
- Server: mail.videoanalitika.lt
- Port: 26
- SSL: [Empty]
- From: donatas@videoanalitika.lt
- Buttons: Save, Test

3 WEB SERVER management

3.1 Login

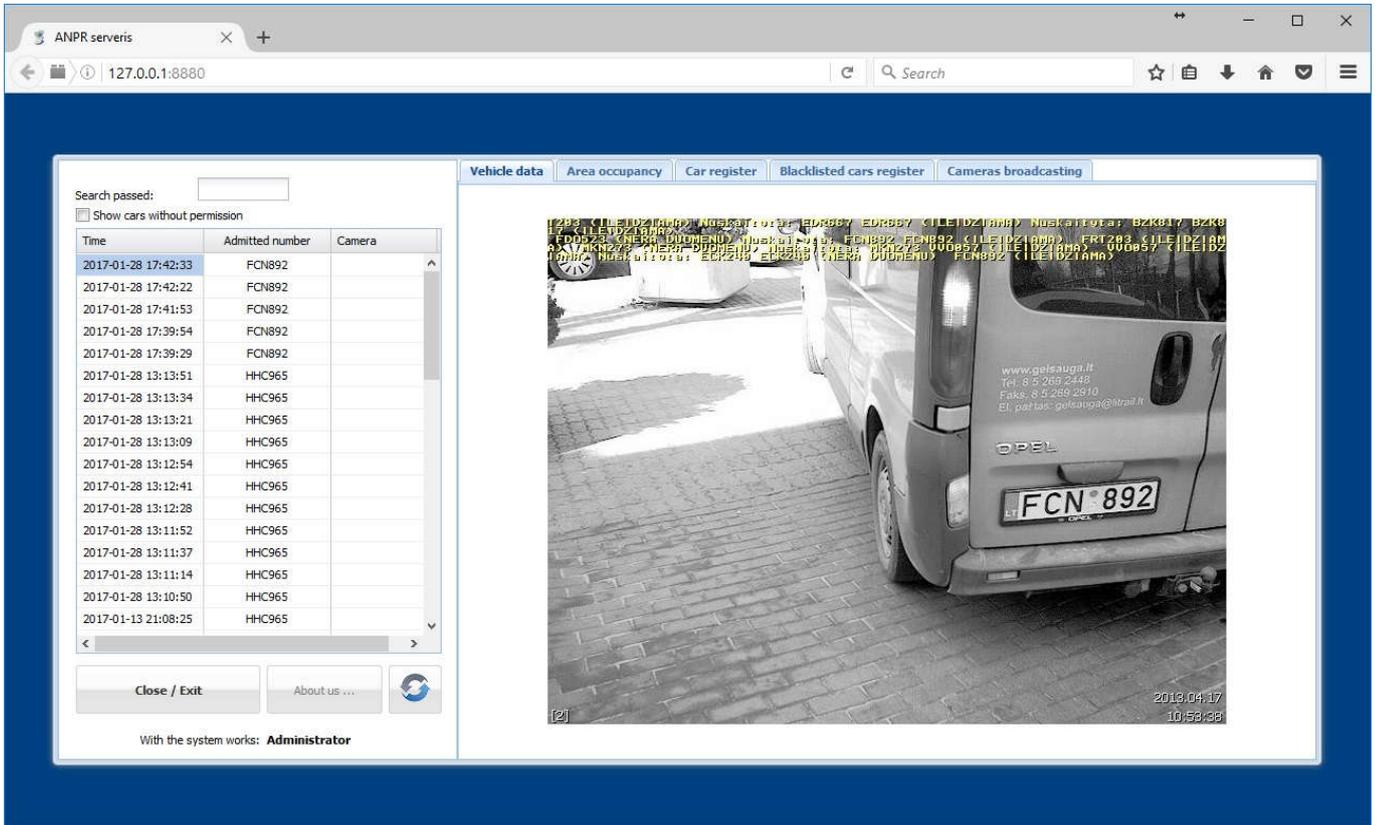
Working with the WEB server begins upon starting it (work for the administrator). The server runs in the background. The user wishing to connect needs to open any browser (Internet Explorer, Firefox, Chrome) and enter `http://xxx.xxx.xxx.xxx:8880` in the address line. This will open the user login window, where you need to enter the data that ANPR server administrator has registered and provided the user with. We recommend using the Firefox browser with a VLC plugin. In this way you will be able to see the real time camera stream and command the operation of the barriers.



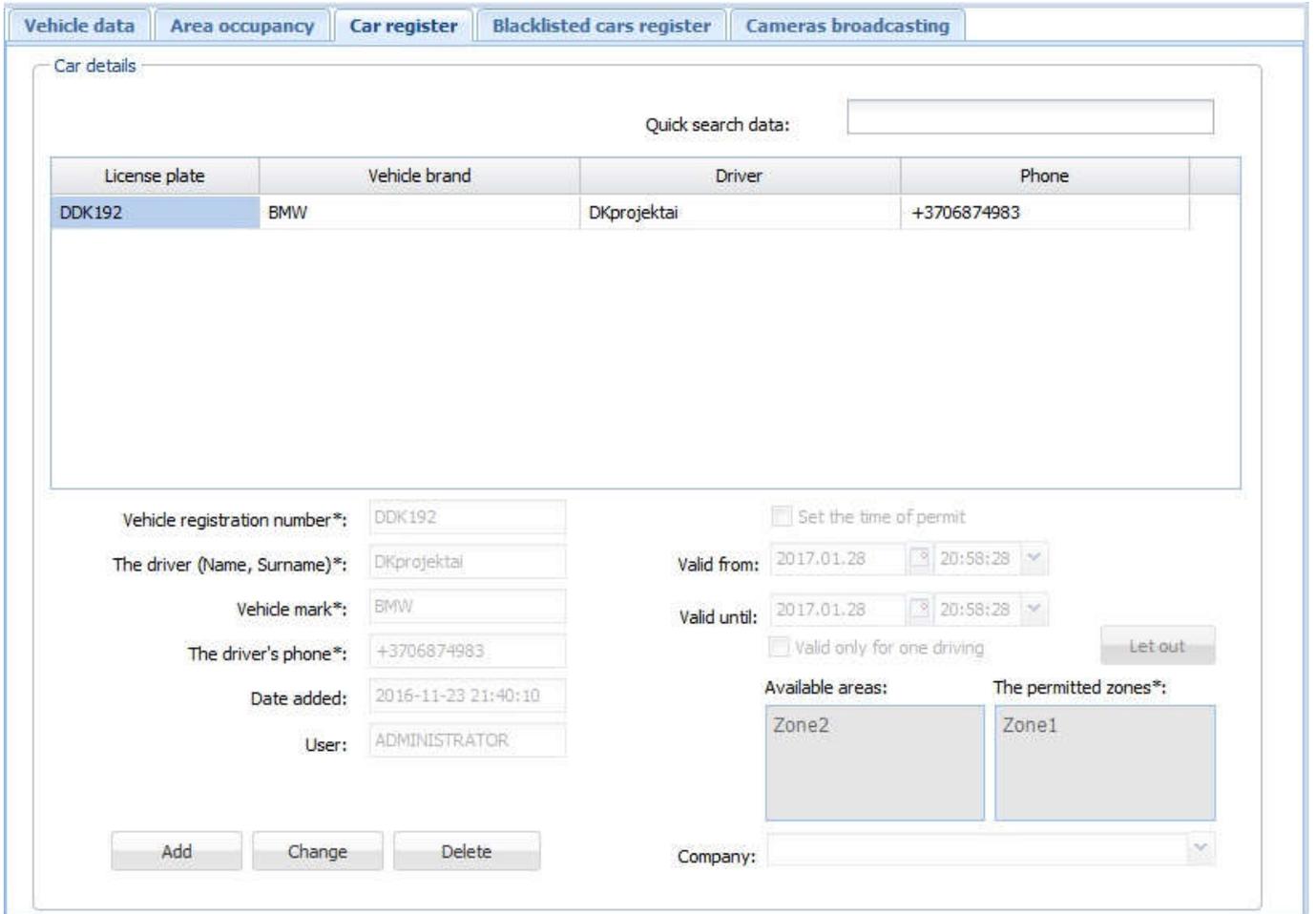
After entering the correct login data, the user will be redirected to the main program window. Please note that after ten unsuccessful login attempts, the program will block the user.

3.2 Software use

In this window, the user will be provided with the recognition results. The user can here perform a search, as well as enter and edit vehicle data. Each user will see only his administered vehicles.



The user, using an internet browser, has the right to enter cars, that are allowed to enter, data ("White list"). It can be done in the same way as in server section.



The user, using an internet browser, has the right to enter/edit wanted cars' data (blacklisted cars). It can be done in the same way as in server section.

Vehicle data Area occupancy Car register **Blacklisted cars register** Cameras broadcasting

Blacklisted cars

License plate

Quick search data:

Vehicle registration number*:

E. mail:

Date added:

User: ADMINISTRATOR

Set the time of permit

Valid from:

Valid until:

Available areas:

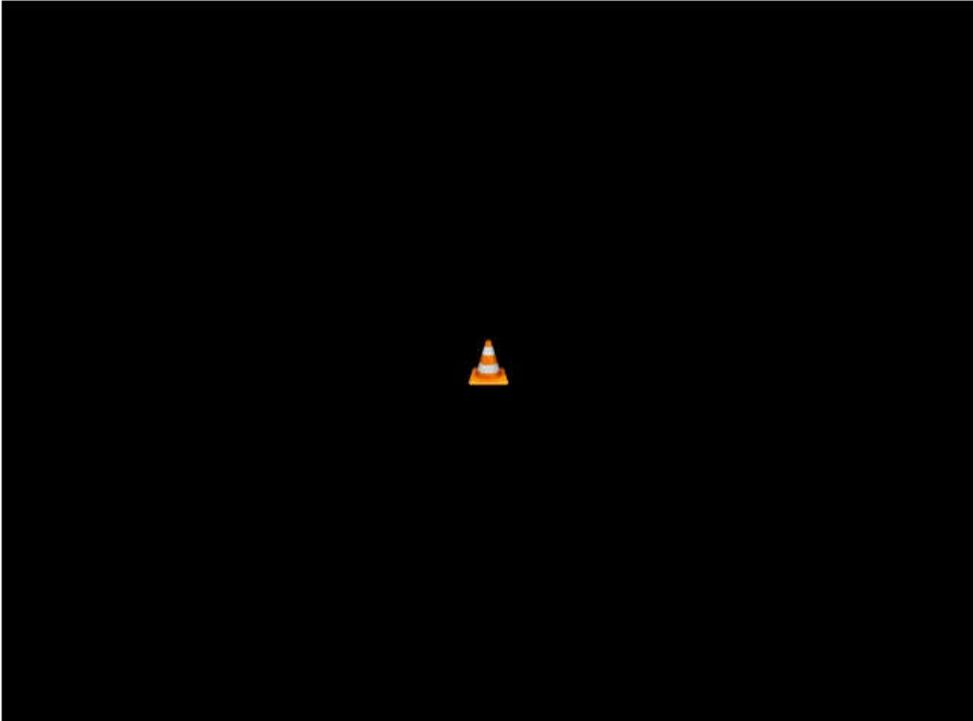
The permitted zones*:

Add Change Delete

The user has the ability to monitor assigned to him car spaces in real time. Vehicle deletion is available only to users who have the "Administrator" privileges. Here, information will be shown only if the system will have a configuration set for calculation of spaces.

Vehicle data	Area occupancy	Car register	Blacklisted cars register	Cameras broadcasting		
According to the companies / users:		Cars in the parking lot				
Name	Limit	Busy	Free	Entry time	License plate	Delete
UAB Bures	100	1	99	2017-01-28 17:42:33	FCN892	
PKPD	100	2	98	2017-01-28 17:42:33	DKK123	

The user has the ability to monitor the IP video cameras and activate barriers in real time via an internet browser. This function is available only when using Firefox with an integrated VLC plugin.

Vehicle data	Area occupancy	Car register	Blacklisted cars register	Cameras broadcasting
Cameras:				
<input type="button" value="LT Enter"/>				
<input type="button" value="LT Exit"/>				
<input type="button" value="Raise barrier"/>				
				

3.3 Additional information

- When entering and leaving, cars must stop at the white line;
 - The system can be configured so that the vehicle for which the entry is allowed, will enter through an automatically raised barrier and the barrier would as well automatically lower after passing through, after a specific time period or by switching on an automatic lowering function in the barrier itself (its controller). By using the additional control function - if the car approached the line, but is not be able to continue through the barrier, it will come down automatically after 60 seconds or will be lowered by clicking the appropriate camera's button "Close" by a security officer.
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