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USER GUIDE
METRICI LICENSE PLATE RECOGNITION

CHAPTER 1 PRESENTATION

If your installation is from scratch, read the entire manual.

If you have CentOS/ Redhat installed, go to Chapter 4

If the system is delivered by Metrici, it has all you need and go to Settings- Chapter5

Metrici LPR is a dedicated tool developed by Metrici to capture number plates with IP cameras, with special features and dedicated modules for different type of activities and installations.

As any software solution from Metrici, LPR is based on analyzing the video stream from IP cameras and recognizing different objects in the frames.

Metrici LPR is a complete solution for recognition of license plates placed on vehicles in accordance with the existing standards in each country.

- It works in 'free flow', which means analyzing the video streams from IP cameras in real time, on trigger (when receives command), or a combination of the two.
- The system can recognize an unlimited number of license plates in the same frame;
- Syntax analysis and simultaneous recognition of plates from several countries;
- Distributed operation (multiple cameras in multiple locations), with centralized reporting and administration;
- Predefined actions for each recognized license plate: open barrier, send warning e-mail, pop-up display on screen, change traffic lights, sends SMS;
- Multi-user reporting and administration interface with secure access and viewing rights for each location and user;
- Multi-threading operation with auto ranging based on the number of cores/threads available.

Metrici LPR can be used, day and night, for traffic monitoring systems, tolling and vignette control systems, parking, access control, border monitoring, industrial weighing systems, outdoor advertising auditing, gas stations and many other applications.

The user of the **Metrici LPR** must be aware that this software includes two solutions: one for license plate detection and recognition – the **Metrici detection engines (managed in Metrici Control Panel)** and the second one- a interface for managing one or more locations - **Metrici LPR Web Interface.**

Be aware that for the system to work you will make settings both in Metrici Control Panel, as well as in the Metrici Interface. So please read carefully this user guide.

The whole detection and analysis system is a three steps flow integrated in **Metrici LPR:**

The **ACQUISITION** block consists of one or more IP cameras, one for each monitored access point, and auxiliary equipment (IR illuminators, PoE switches etc).

The **PROCESSING** block consists of one or more computers containing software for real-time analysis of incoming video streams received from the IP cameras. Each interconnected camera needs its own analysis application. Analysis applications, or **detection engines** as are called by Metrici, are multi-threading and, therefore, they work faster on multi core and/or multiprocessor systems. Multiple analysis applications can be used simultaneously on the same computer. You can use more analysis applications in the same time on the same computer. This is the **CONTROL PANEL.**

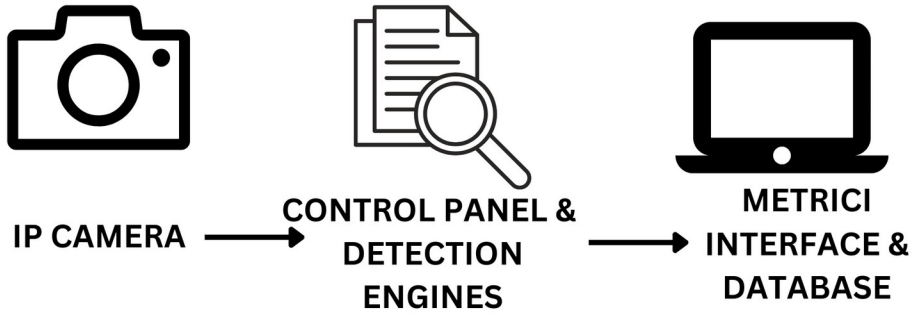
The **ADMINISTRATION and REPORTING** block is in fact a web interface application that receives data from the analysis application and can display them in a user friendly way. This application can be located on one of the computers for ANALYSIS or a completely independent computer. Between the PROCESSING and ADMINISTRATION AND REPORTING steps there is no need to have IP connectivity on the local network; it is sufficient to have a public network allowing traffic on port 80- **This is the INTERFACE**

For an optimum operation, we recommend installing **Metrici LPR** as exposed bellow on a computer meant for this purpose only.

For the software **Metrici LPR** to run, it needs a computer with 64 bits Linux OS. We will describe the process of installing CentOS7 operating system.

Note: In case you already have a computer running on CentOS 7, you will begin installation process with Metrici Install.

Note2: In case the system is purchased from Metrici, it is already installed and you only need to set it, so go from Chapter 5 and on.



CHAPTER 2
CENTOS 7 INSTALL

The procedure for installing Metrici is the same no matter what module what engine you are using. The first step is to install CentOS 7 operating software, under which Metrici works.

2.1 KICKSTART CENTOS INSTALLATION

The indicated method to install CentOS7 and Metrici is the kickstart one– this is a completely automatic option and will result in creating new partitions on your system: 8 GB for SWAP and the rest of the disk reserved for ROOT.

CAUTION! In case the system isn't new and has already some data written on it, the installation will delete everything on this computer when installing the operating system.

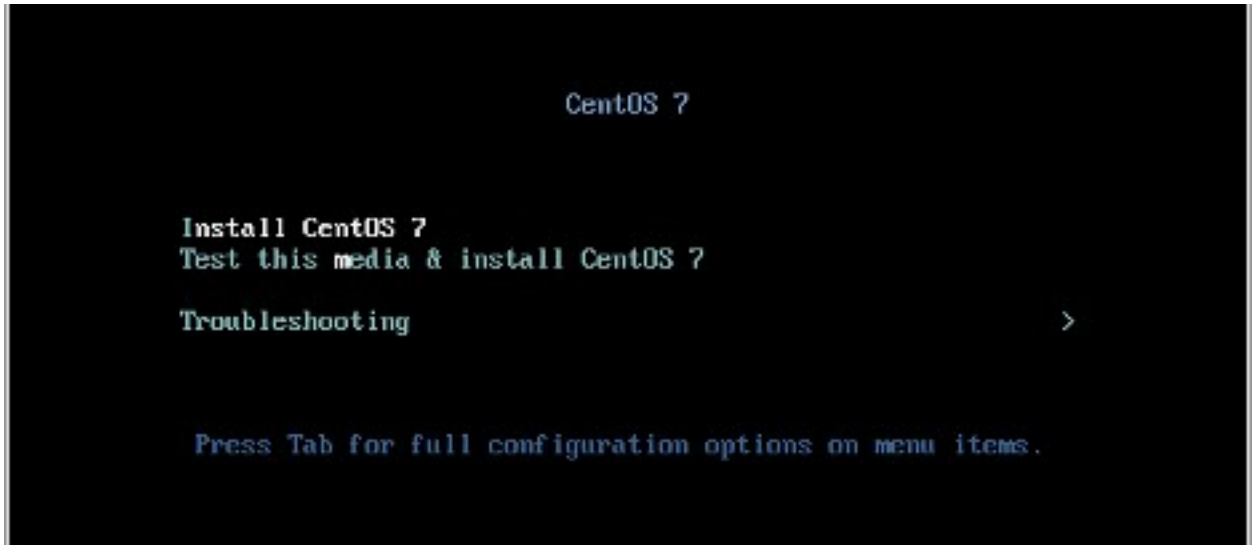
NOTE! For installing CentOS 7 and Metrici LPR, it is mandatory to have internet access, but only during install. After that, the web access is no longer mandatory and Metrici can work offline.

Downdload the image for CentOS: you can find the operating system on Metrici site at http://support.metrici.ro/operating_systems/

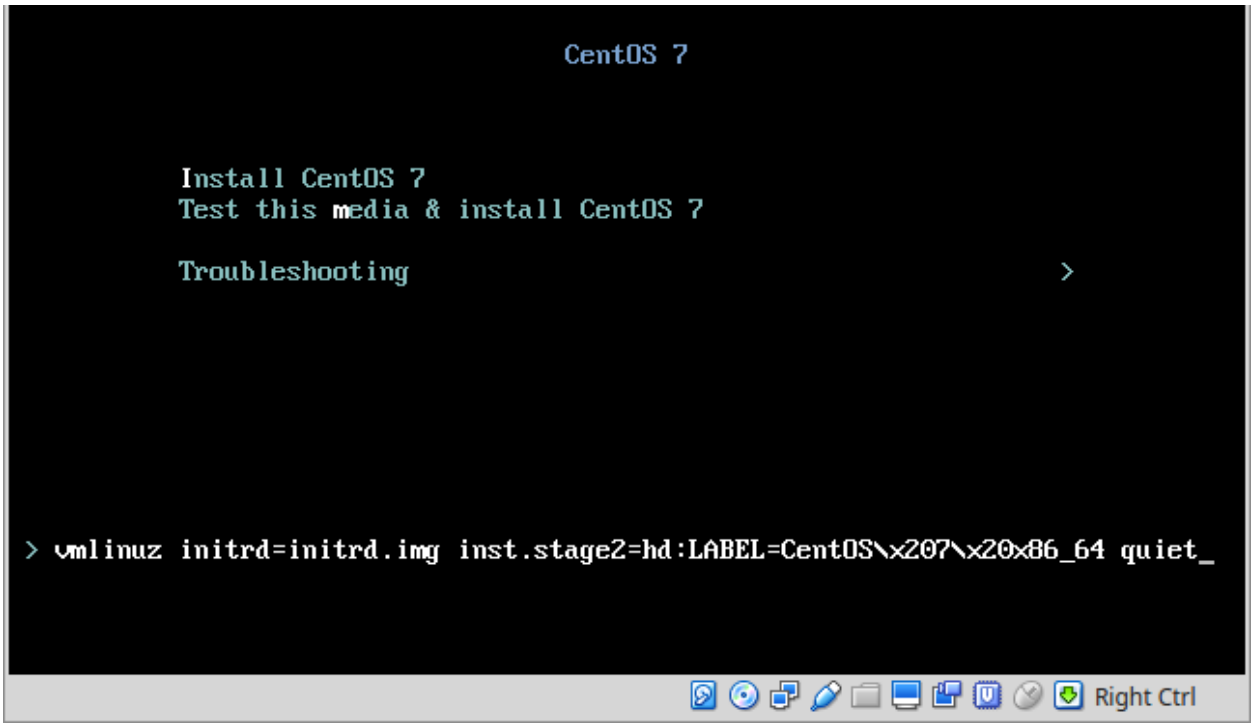
Download the Operating System and make a bootable stick or DVD.

NOTE! Before the installation, go to BIOS and make sure the PC will NOT BOOT in UEFI mode and will make the first boot from your stick.

At the first option screen, as in the next image, using the keyboard go to option Install CentOS, but **DO NOT PRESS ENTER**!



Press Tab instead. You will notice some parameters on the bottom of the screen. See next image.



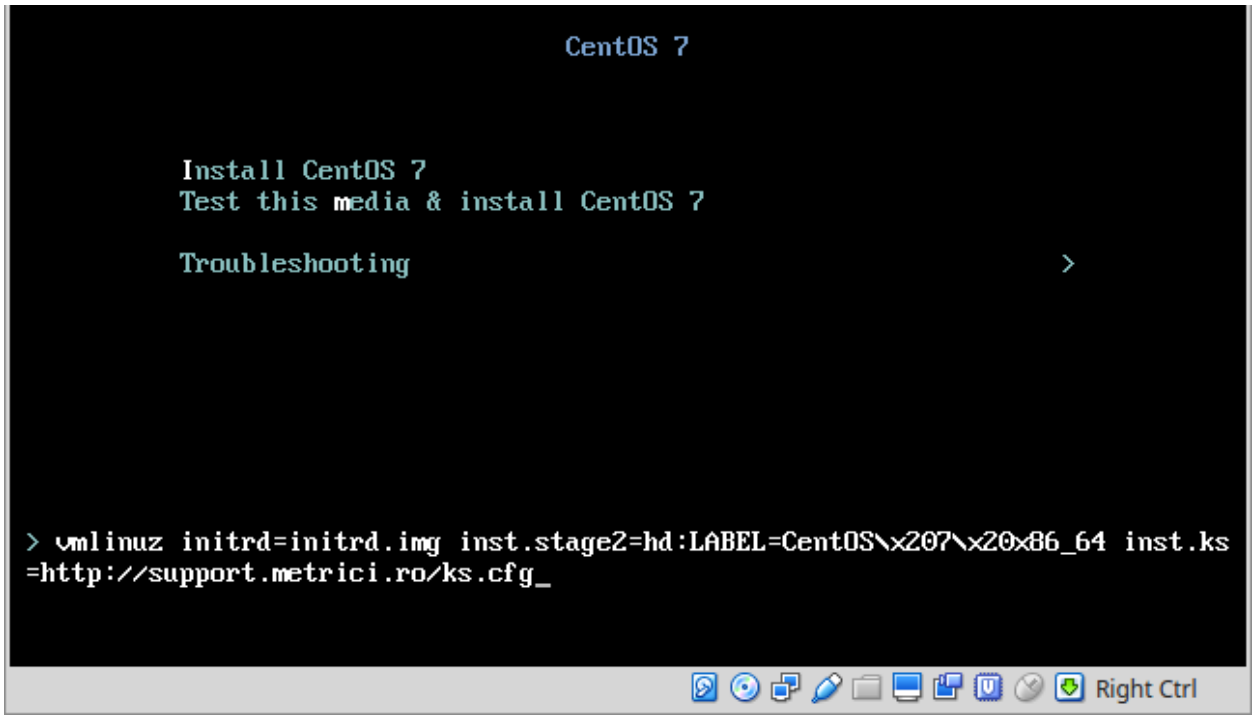
Add a space and then type **inst.ks=http://support.metrici.ro/ks.cfg** at the end of the code and then press Enter. See the next image.

ATTENTION! If the storage is NVMe type, then you will have to type instead the following text

inst.ks=http://support.metrici.ro/ks-nvme.cfg

CentOS will be installed and all the settings made. This will create a user with the name “**metrici**” and a root password ”**metriciadmin**”.

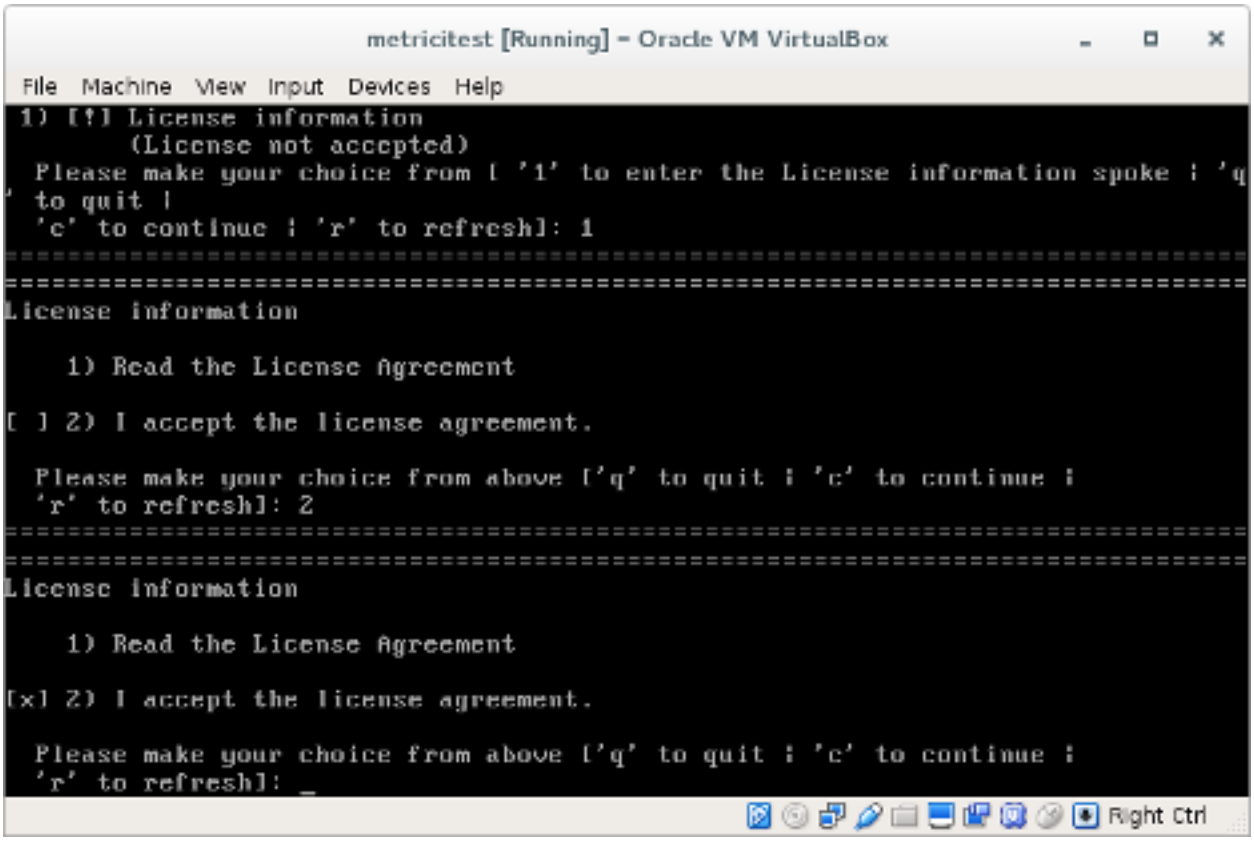
Reboot the machine if it doesn’t do it automatically.



CHAPTER 3
FIRST SETTINGS AFTER REBOOT

After the first boot, the system will ask for you to read the license agreement. You complete this task by choosing **LICENSE INFORMATION**.
In case you accept the terms, confirm by checking option **I accept the license agreement.**
You may continue after you click **FINISH CONFIGURATION** button, on the lower right.

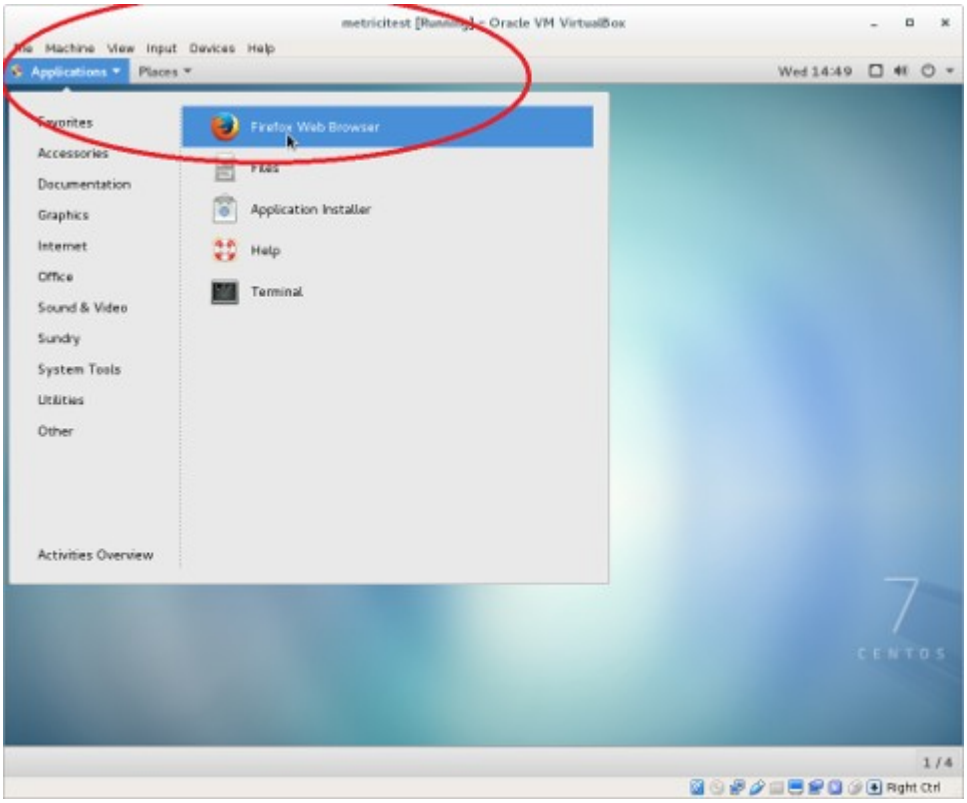
NOTE
It is possible that during the reboot, the system to ask for license agreement in a written text as in image bellow. In this case the steps explained above will be ignored.



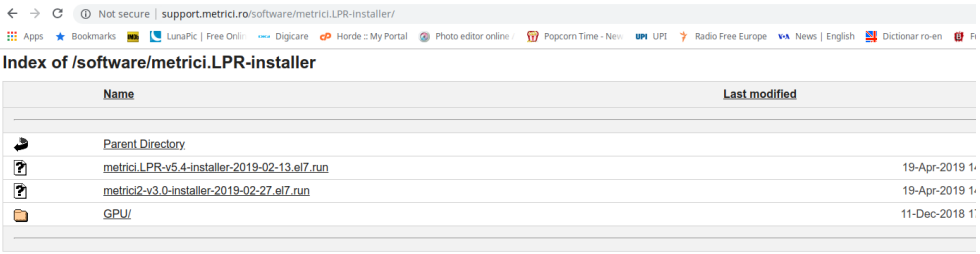
After the reboot, you can authenticate by using the user and password defined during installation- case of kickstart installation **metrici** with **metriciadmin.**

You navigate through the last settings, click Next.

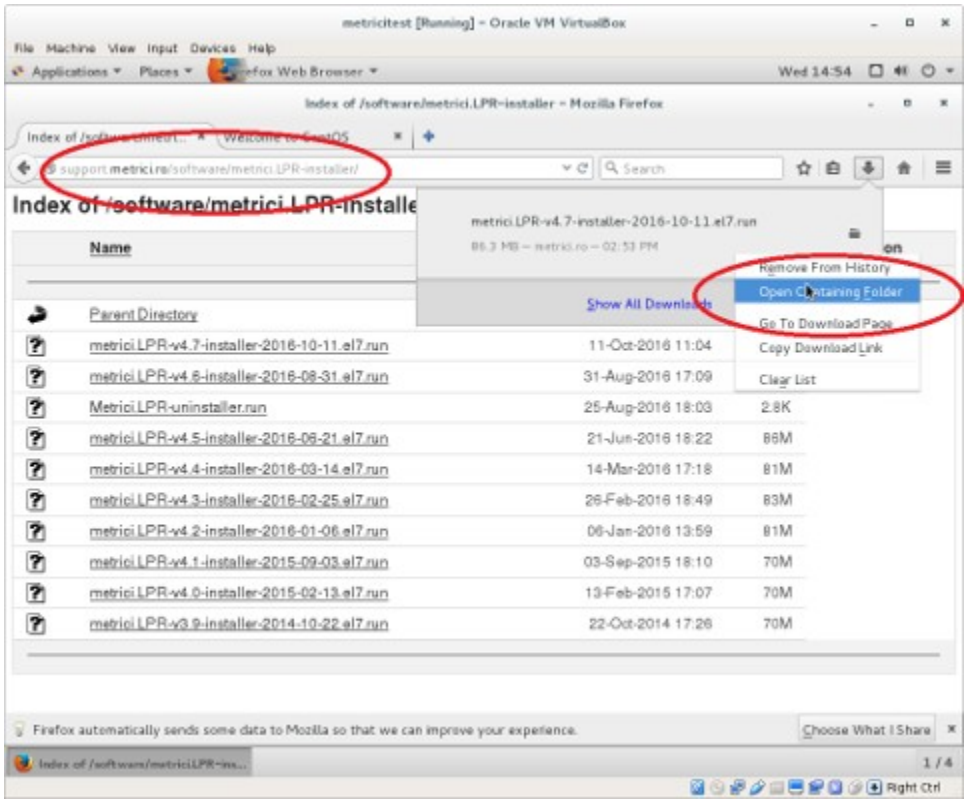
CHAPTER 4
DOWNLOAD AND INSTALL METRICI LPR



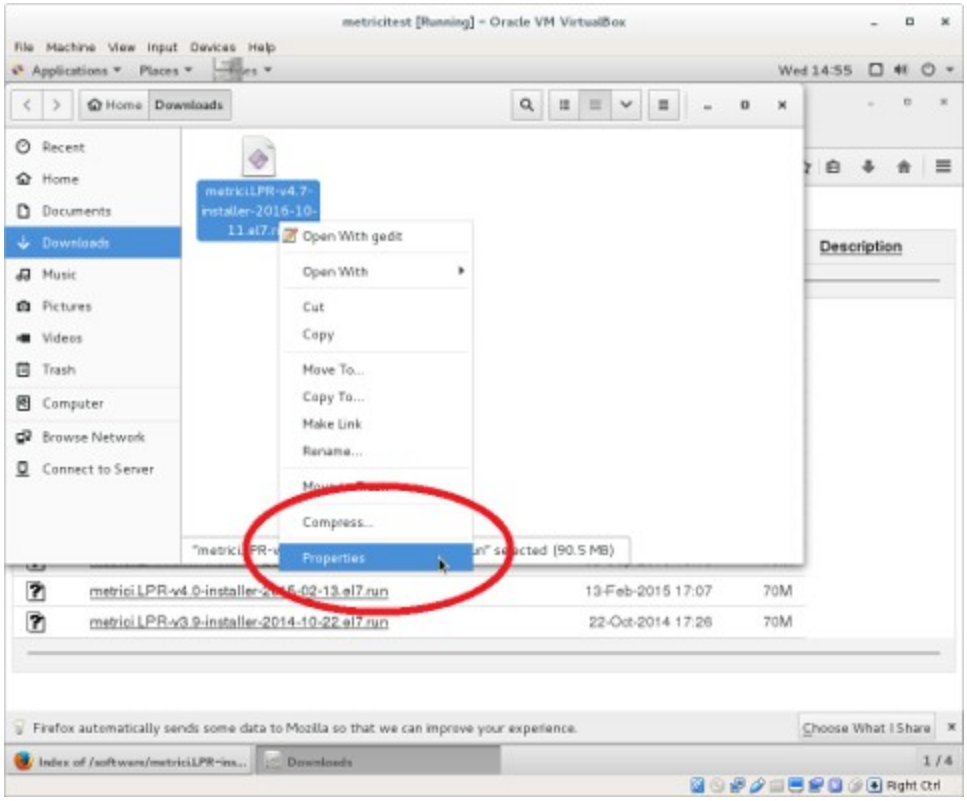
For **Metrici** kit to be downloaded, open Firefox browser from **Applications** menu, upper left.



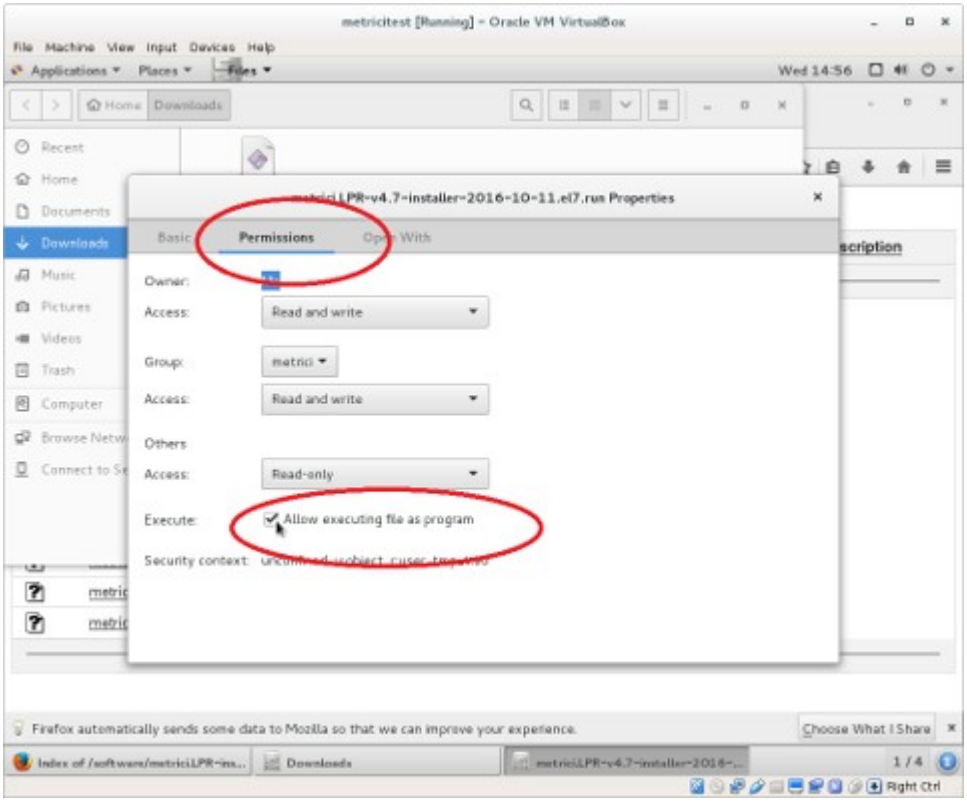
Access the address **http://support.metrici.ro/software/metrici-installer/**
Download metrici2-v3.5-installer-2020-12-14.el7.run, or the latest version of the software, with the suffix el7.run
Save it on disk



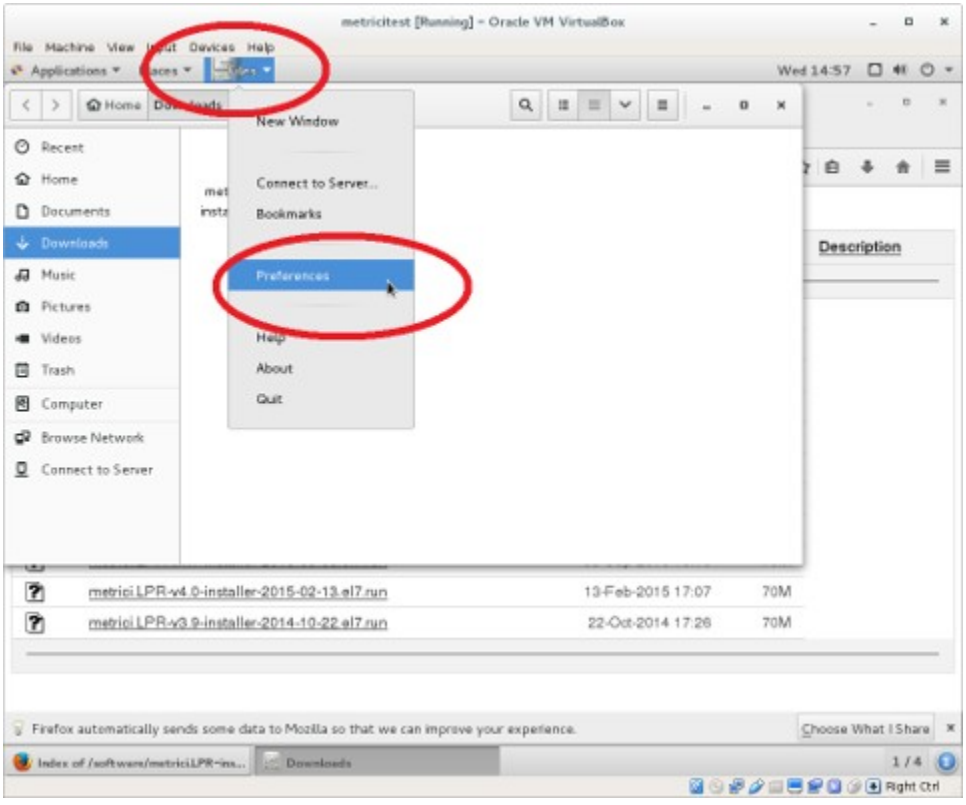
Open the folder where the file was saved. (Mouse right click and choose– Open Containing Folder).



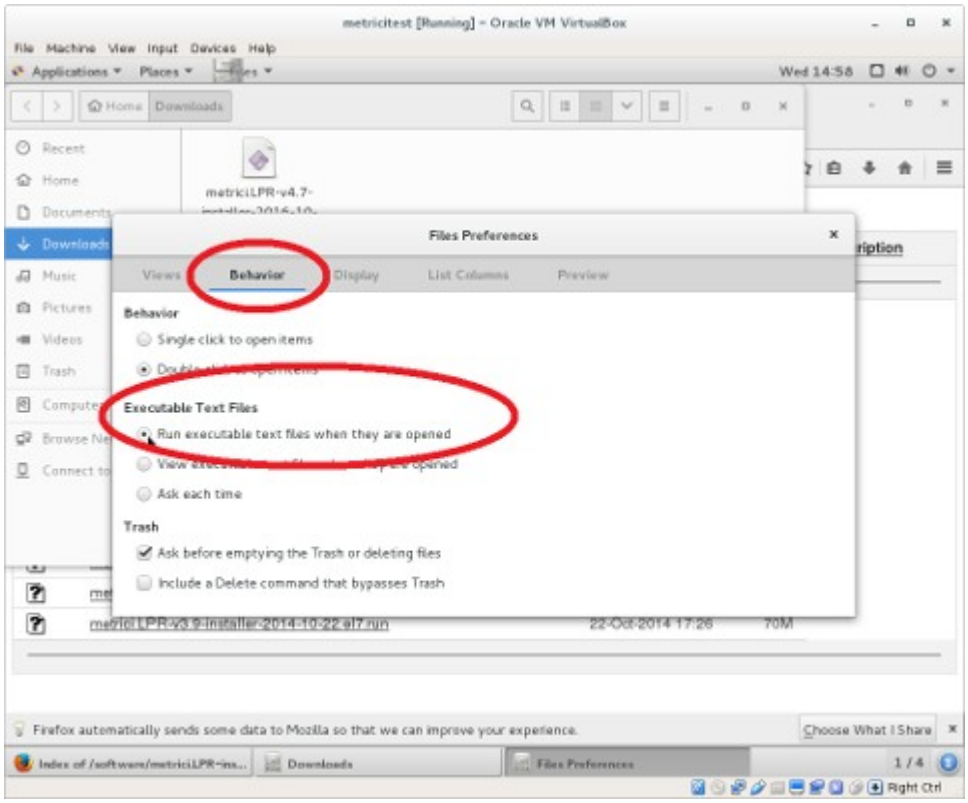
You need to change the administration rights for the file (rigt click on the file– choose **Properties** menu).



In the **Permissions** tab, check the option **Allow executing file as program**.



You access the menu **Files**, submenu **Preferences**, on the Operating system menu bar



In the **Behavior** tab, check the option **Run executable text files when they are opened.**

Double click on the installation program to launch Metrici. When asked, write the password for the user you are logged in CentOS7.

Wait for the installation to end, and reboot.

CHAPTER 5
LPR FIRST MANDATORY SETTINGS

IMPORTANT!

For a perfect setup, a user will have to do settings both in The Metrici Interface (where the data are sent and collected) as well as in Metrici Control Panel, where the detection is made.

All settings in the following chapters are mandatory to be addressed for the system to work!!!

5.1 Initiating
5.3 Users Administration
5.4 Locations and Cameras
6.1 LPR Engine Working Mode
6.2 LPR Input Stream
6.4 Detection Window (if necessary)
6.6 Reporting, Check Action and Trigger Out
6.9 Countries

5.1 LPR- INITIATING

When login to Metrici Interface, you will see a list of all Metrici Modules. You will only have access to the module you bought. The others will be blocked.

At the first log in to the Interface on localhost or on a remote server you will use the following credentials:

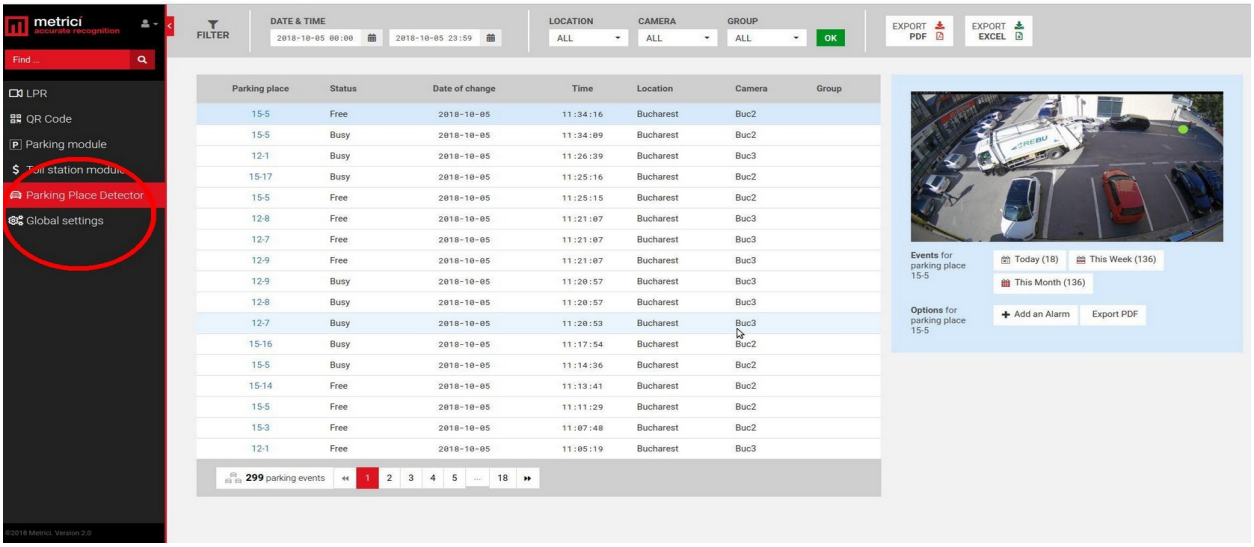
User: metrici@metrici.ro

Password: metriciadmin
Metrici recommends changing this password after log in.

After that any number of users and passwords can be added, deleted or modified.

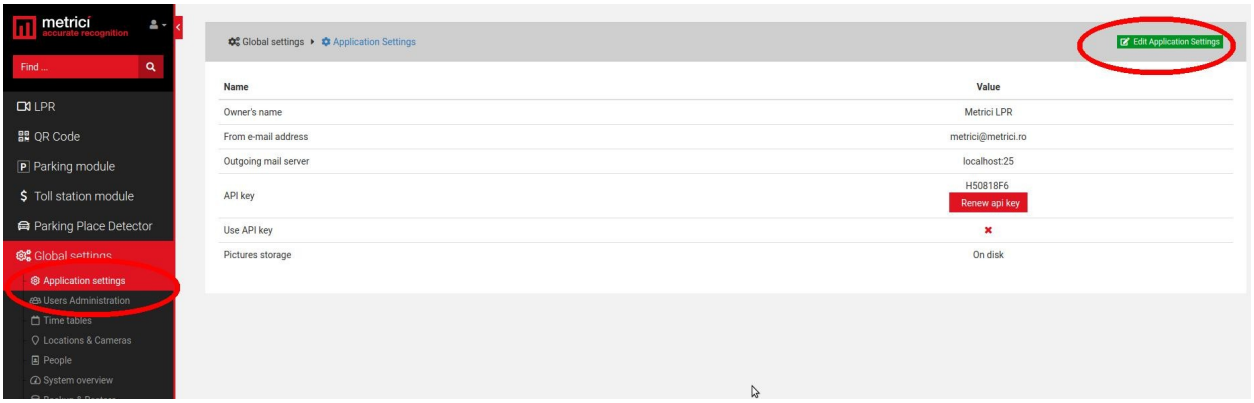
NOTE!

No matter what module you manage, the first settings will be made in Global Settings.

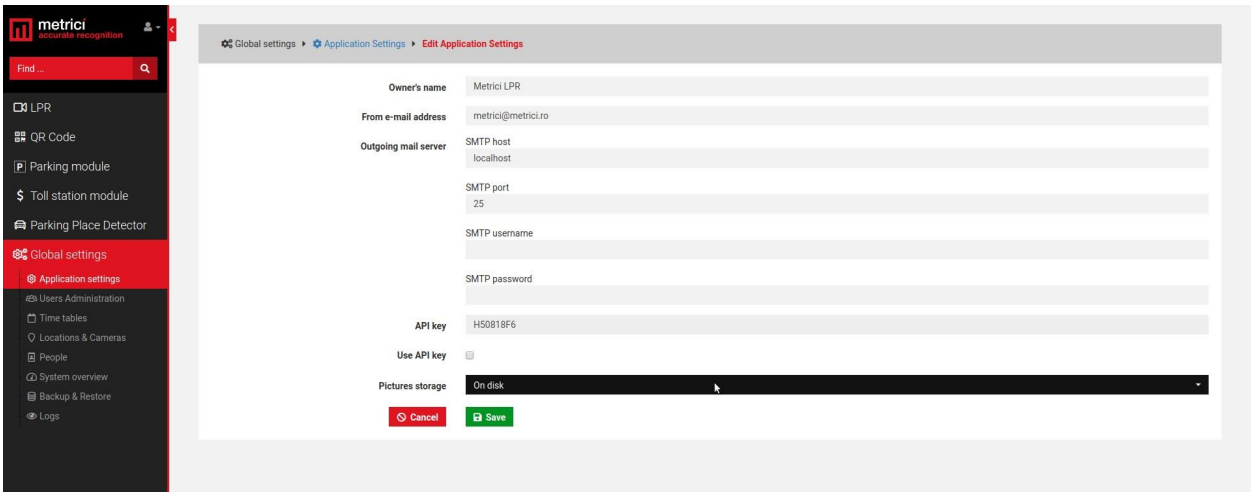


5.2 APPLICATION SETTINGS

In this menu you set the name of the owner. Also, you add the email address from which the alarm methods are sent.



After you click the green button upper right, a menu like next one is opened.



Owner's name is the name of the company or person who owns the Metrici system and has administration rights for it. "From email address" field is the address from which an email is sent when set in the Interface. This has to be a valid e-mail address.

Outgoing email services and SMTP ports are filled as they are known by the owner.

Outgoing mail server: localhost

SMTP host: set to 25

Metrici knows natively to send emails from localhost, but there are servers who refuse to receive mail without authentication. In that case you have the options to send mails via SMTP. You will fill in the data of the remote mail server as they were set.

SMTP port

SMTP username

SMTP password

API Key is an auto generated one. You will need this in case of a third application integration.

5.3 USERS ADMINISTRATION

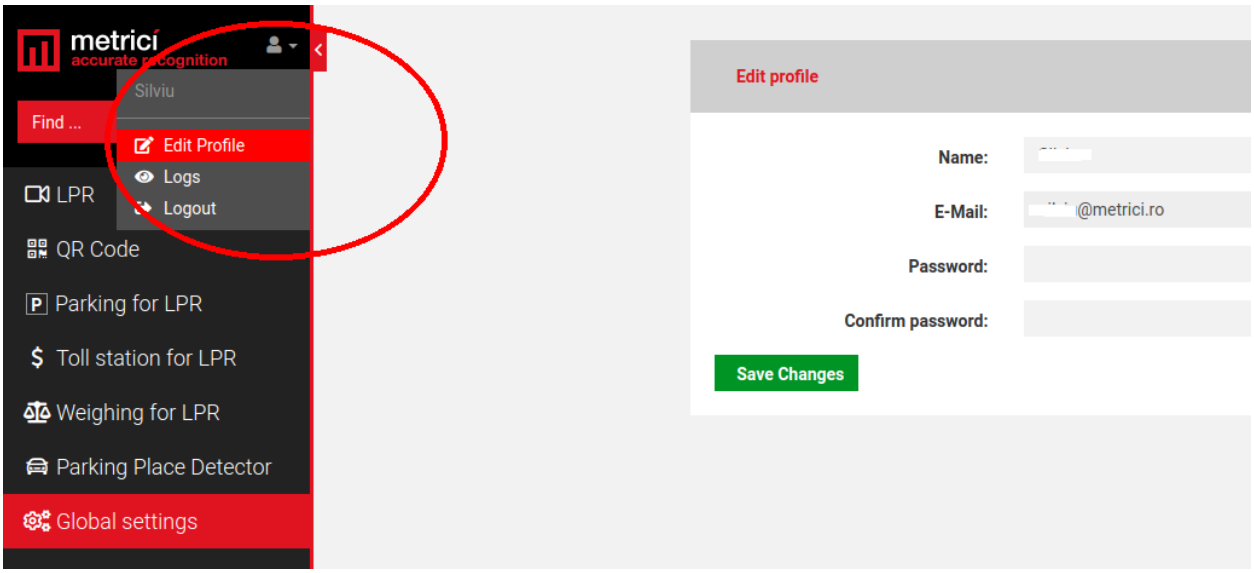
Any number of users can be added to the system. Each one of them can have its own administration rights. When a user is inactive, he will not be able to log in any more in Metrici Interface. However, it may be made active again by another user with administration rights.

When a new user is added, choose a name for it, designate and email address, choose the language in which the menu is displayed, set a password and confirm it. These data will be used when login by that particular user.

Finally click on the sections for which this user has administration and viewing rights, or just viewing rights.

At the default first page, choose on what menu or sub-menu you want this user to see first every time he logs in to Metrici Web Interface.

You will also set here on what location, camera and menu in the Interface the user has access to.

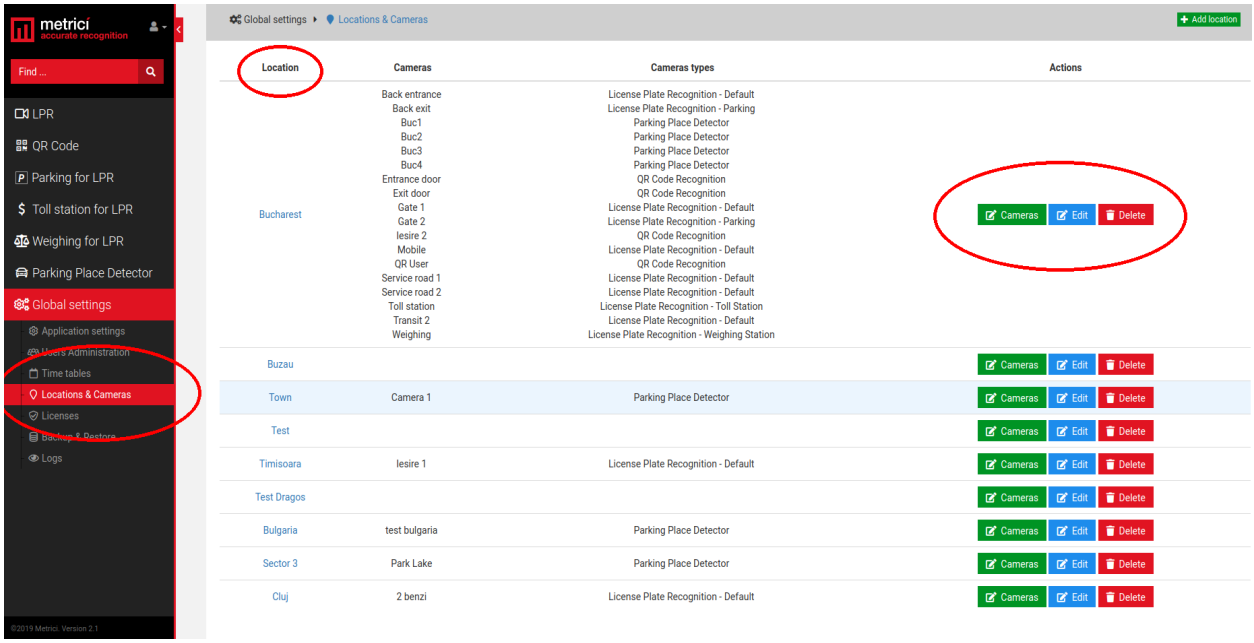


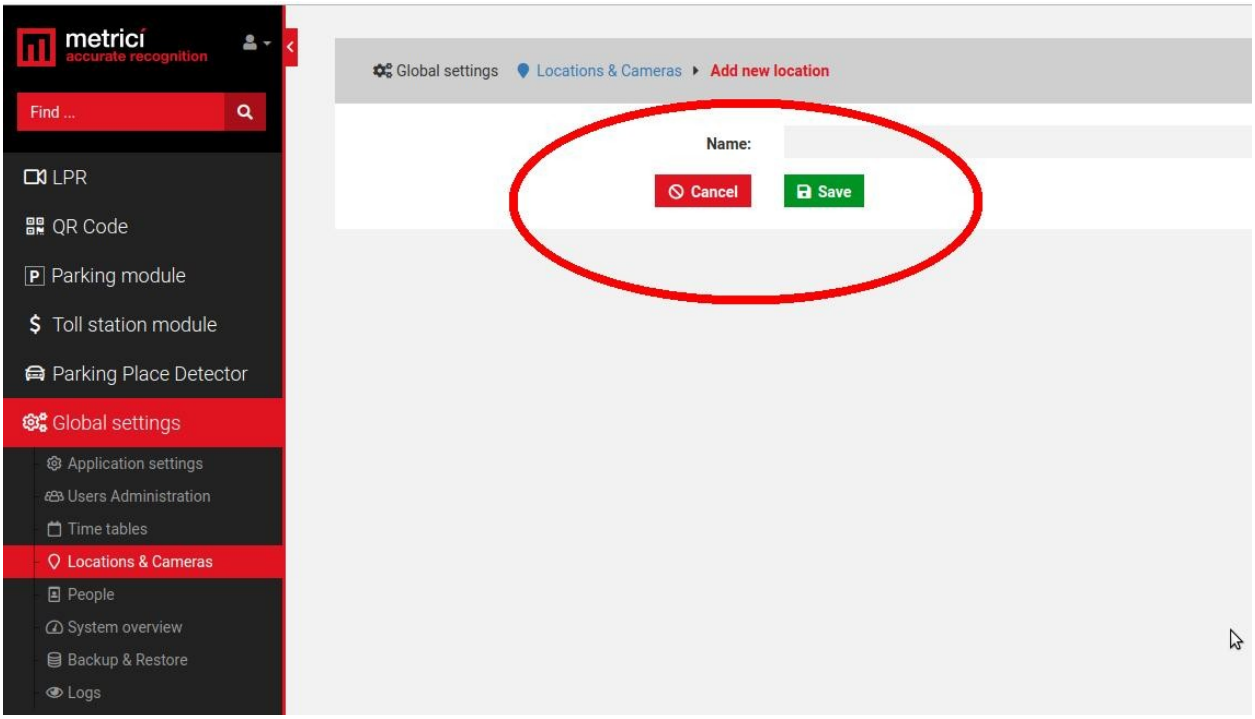
If a user wants to change his password, when in Interface, click on human symbol upper left and choose edit profile. Enter a new password and Save.

5.4 LOCATIONS & CAMERAS

No matter what module you manage, it is mandatory to set a location and add at least one camera to it for the system to properly work.

For a new location to be created, choose sub-menu Locations&Cameras and add a new location, click on the green button, upper right of the screen. Choose a name for it and Save. You can also set **Seconds to suppress action, which** is a time interval for a location in which an action will not be executed, even if set in the interface. It is in fact a time interval in which a number plate is ignored.


metrici
accurate recognition
Find ...
LPR
QR Code
Parking for LPR
Toll station for LPR
Weighing for LPR
Parking Place Detector
Global settings
Application settings
Users Administration
Time tables
Locations & Cameras
Licenses
Backup & Restore
Logs
©2019 Metrici. Version 2.1
Global settings
Locations & Cameras
Add location
Location
Cameras
Cameras types
Actions
Bucharest
Back entrance
Back exit
Buc1
Buc2
Buc3
Buc4
Entrance door
Exit door
Gate 1
Gate 2
Iesire 2
Mobile
QR User
Service road 1
Service road 2
Toll station
Transit 2
Weighing
License Plate Recognition - Default
License Plate Recognition - Parking
Parking Place Detector
Parking Place Detector
Parking Place Detector
Parking Place Detector
QR Code Recognition
QR Code Recognition
License Plate Recognition - Default
License Plate Recognition - Parking
QR Code Recognition
License Plate Recognition - Default
QR Code Recognition
License Plate Recognition - Default
License Plate Recognition - Default
License Plate Recognition - Toll Station
License Plate Recognition - Default
License Plate Recognition - Default
Cameras
Edit
Delete
Buzau
Town
Camera 1
Parking Place Detector
Test
Timisoara
Iesire 1
License Plate Recognition - Default
Test Dragos
Bulgaria
test bulgaria
Parking Place Detector
Sector 3
Park Lake
Parking Place Detector
Cluj
2 benzi
License Plate Recognition - Default


metrici
accurate recognition
Find ...
LPR
QR Code
Parking module
Toll station module
Parking Place Detector
Global settings
Application settings
Users Administration
Time tables
Locations & Cameras
People
System overview
Backup & Restore
Logs
Global settings
Locations & Cameras
Add new location
Name:
Cancel
Save

After a location has been created, click on its name or on the “Cameras” green button to add new cameras and edit it. The Edit button will only let you change its name.

Add a new camera or cameras to a location, by click on the Add Camera button on the upper right. Each camera you add to the system has some features.

Name: Choose a name for this camera to easily identify it and locate it

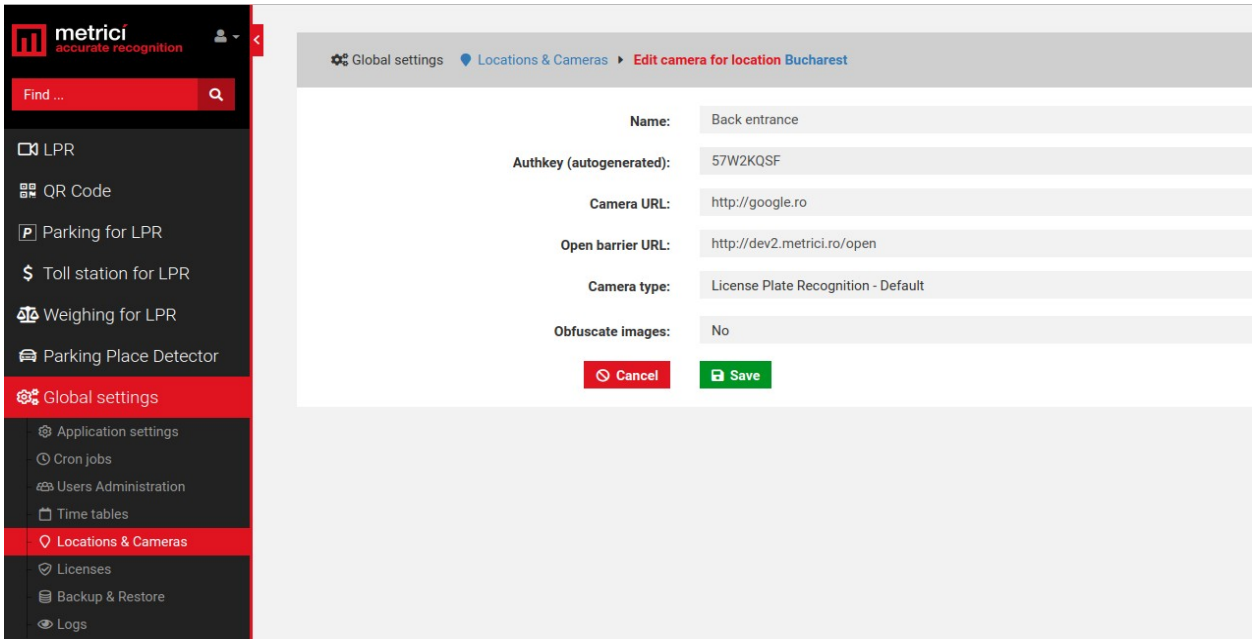
IMPORTANT!

Authkey (autogenerated): This field is automatically filled by the Metrici software when a camera is introduced in the system. You will need this key and the id in the Metrici Control Panel to integrate the camera with the Web Interface and to have the videostream in live view and other functionalities.

Camera URL: Is the IP address of the camera from which the video stream is received.

Camera barrier URL: is useful for LPR applications to open a barrier from live view, with a click on the screen. This is the IP address of the barrier connected to this particular camera. A camera can command only one barrier. You fill in here the IP address of the barrier controller.

Camera Type is the Metrici application for which this camera is used for. Choose the appropriate one- license plate recognition, Parking Place Detector, QR code recognition etc. Keep in mind that if you don’t select the correct application, you won’t see that camera and settings in your module and the system will not work at all.



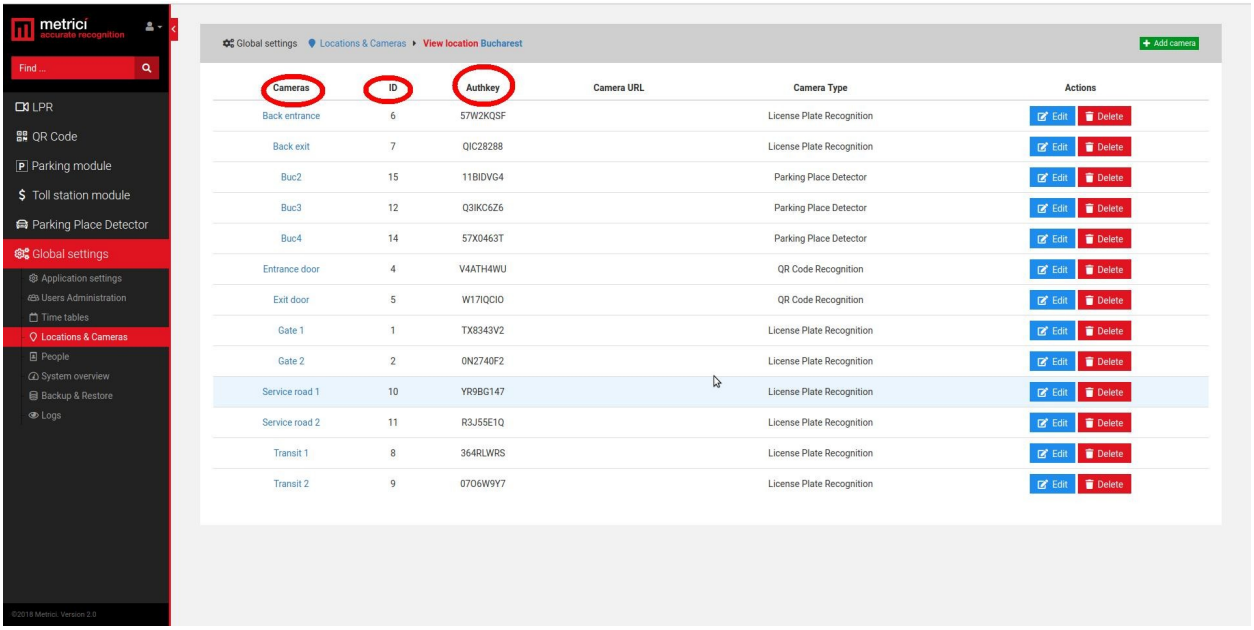
Obfuscate images: Is the Metrici feature that enables you to be GDPR compliant. For each camera in a location you can choose to blur the event photo recorded by Metrici. From the moment this option is checked, all photos for that camera will be blured. The option can be unchecked at any given time, but the already altered images will remain as such.

After all the cameras were added to the system you will see a list like in the next image.

IMPORTANT!

The ID and the authkey for each camera are mandatory to be added to the Metrici Control Panel – where detection engines are installed, on the server which runs the software. This can be on the same machine or other one.

When the ID and the cameras are added to the Metrici engines in Contro Panel, this will facilitate the communication between the engines and the Web Interface. If this step is omitted, no data will be recorded in database and the system will not work. See next chapter.



All cameras on the system can be later edited or deleted, as the user chooses.

CHAPTER 6
METRICI CONTROL PANEL SETTING AND USING

Metrici Control Panel application is in fact the "place" for processing detection engines and analyzing the video stream.

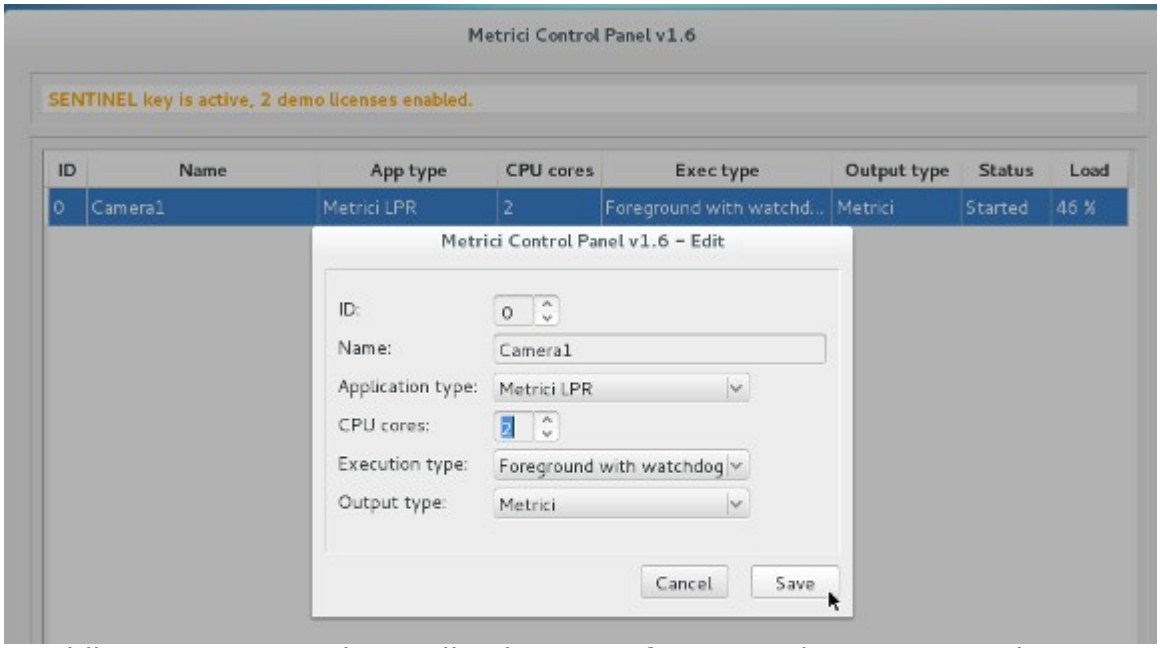
A setup Metrici may include one Interface and one Control Panel on same localhost (same server), or more Control Panels, on several machines, depending on how many cameras and detection engines are used, as the hardware have a maximum supported engines, depending on specifications: CPU, GPU, RAM etc and one central Interface.

The data processed in these servers will be send for recording and reporting towards the **Metrici Interface**, where they can be easily accessed in a friendly format. The detection application can work independently, but **Metrici Control Panel** makes sure that the engines are not jamming and are working as they are meant to do. Also, this is where you can set, change or later execute many useful options, as we are about to explain in this chapter.

Metrici Control Panel application will launch automatically each time the computer is on.

You can add a new detection engine by using the **Add** button. When adding a new application, you set the CPU and the number of **processing cores** for each camera

and it is to run on processor or GPU. The more processing power for each camera, the better the detection, and the application will operate more frames in real time.



After adding a camera and a application type, for a complete setup, such as connectivity , checking country syntax for recognized plate, actions to be executed, enter in **Execution type and choose Foreground with watchdog** working mode**.**

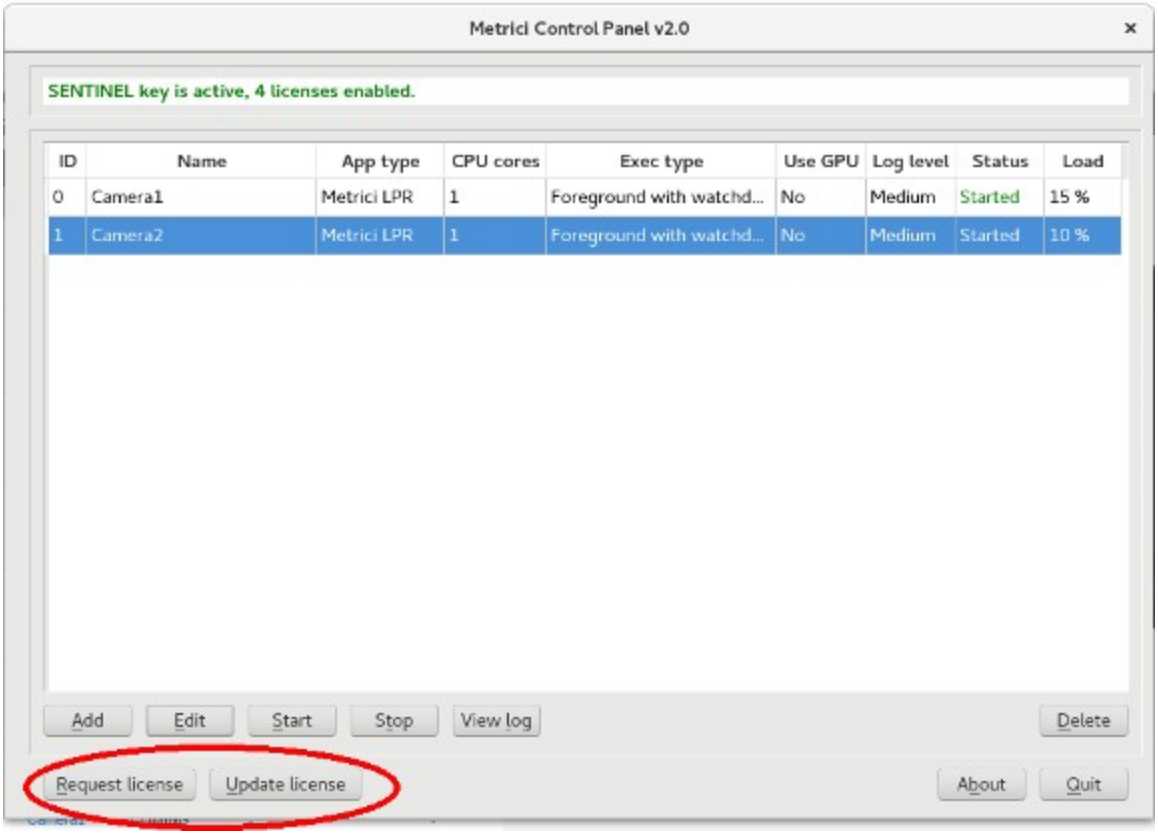
At a later date, this working mode can be changed. The four possible settings for this mode are:

- **Background**: the application will operate without showing the results of the detection on screen, but will send the data to **Metrici Interface**. This mode saves processing power.
- **Background with watchdog**: is the same way as Background, but the application will automatically restart in case of reboot or in case the computer is shut down.
- **Foreground**: the application detection is visible. This mode is especially used when installing the system to check the position of the camera, settings etc.
- **Foreground with watchdog**: the same as Foreground, but the application will automatically restart when shut down.

Metrici recommends a working mode set at **Background with watchdog after installation**.

6.0 License activation

At the Beginning of the installation or after you've done all the settings in Metrici Control Panel you may want to activate your license. In Metrici Control Panel, click on Request license. In the new window fill in the product key that is written on the



license certificate received from Metrici. Press OK

This will generate a c2v file that will be saved on computer, usually on desktop.

Go to http://support.metrici.ro/activate/ . In the designated fields write a valid e-mail address to which you have access and a phone number. Load the previously generated c2v file by pressing "Load the license request file". In the end press "Request activation".
It is important that you have access to the mail you provided because you will receive there the info for activation.

In about a two hour interval you will receive an email answer from Metrici such as

Activation license for LPR Metrici

Hello, you can download the activation file at:

http://support.metrici.ro/activate/keys/8457847584788928ks.v2c

Product code: 7866869_dfc93mo398-4k12e9i-29038-a9879-876nmcu6687.

You will download the file from that link, save it on computer and click on “Update license” in Metrici Control Panel. You will load there this file received from Metrici and Open.

6.1 LPR engine working mode and Trigger in

Keep in mind that a user must set each detection engine individually, as every camera has its own application/engine.

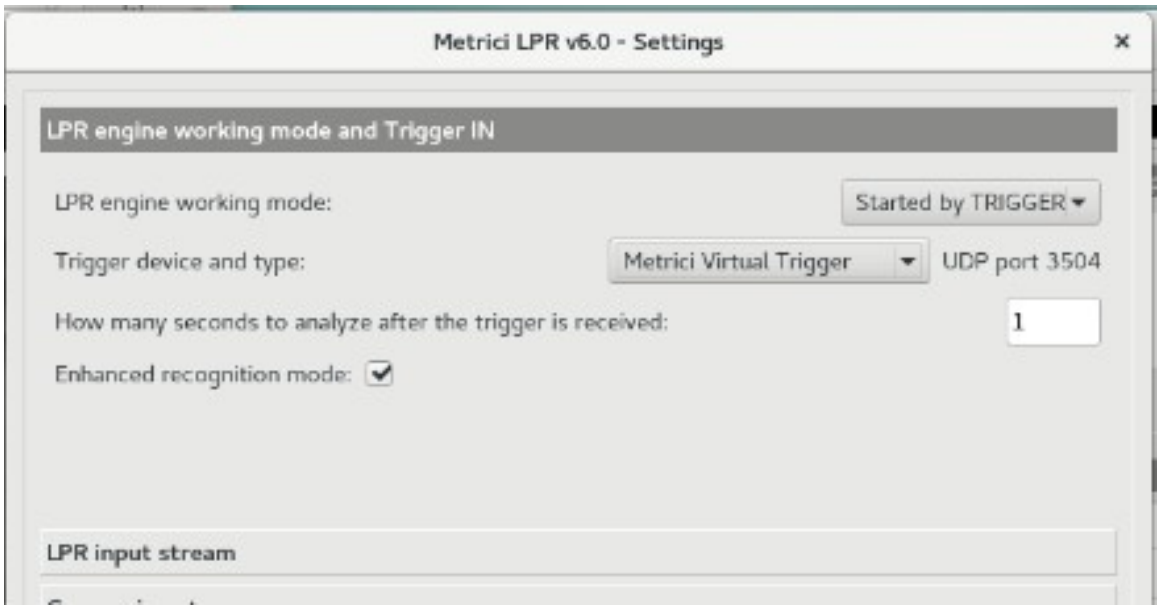
By pressing the **Settings** button, the first option is **LPR engine working mode & Trigger in** which will set the working mode for the detection software.

Trigger in refers to an external signal sent toward Metrici to start detection.

Metrici LPR can be active in continuous mode and try to detect plate numbers around the clock or if it receives a command/ trigger from a compatible device, such as Barix Barionet, LAN Controller connected to an inductive loop or a sensor etc . If you want to use continuous mode, skip to next point in this chapter. If you want to use trigger facility, keep reading below.

Metrici Virtual Trigger is useful in applications where a cross checking is used. This detection engine is receiving a signal to start detection from another engine – can be one of same type- in our case LPR, or different such as QR, CCR or PPD.

For example a LPR detection triggers a Qr code recognition which triggers a Container Code Recognition. From here, in Metrici Interface you can set different actions when one, two, or as many conditions you want are satisfied for an action to be made. The first rule is the events have each one a rule established in database and the detection to be triggered, as there is a unique verification key for every detection.



In this menu, if we choose Mertici Virtual Trigger, we inform the application that will **receive** a signal to start detection from another one.

To learn how to set a different engine to **send** the trigger see Chapter **Reporting, Check action and Trigger out.**

Keep in mind that when setting the detection with trigger you can also choose how many seconds the LPR engine is trying to detect a number plate. See next image.

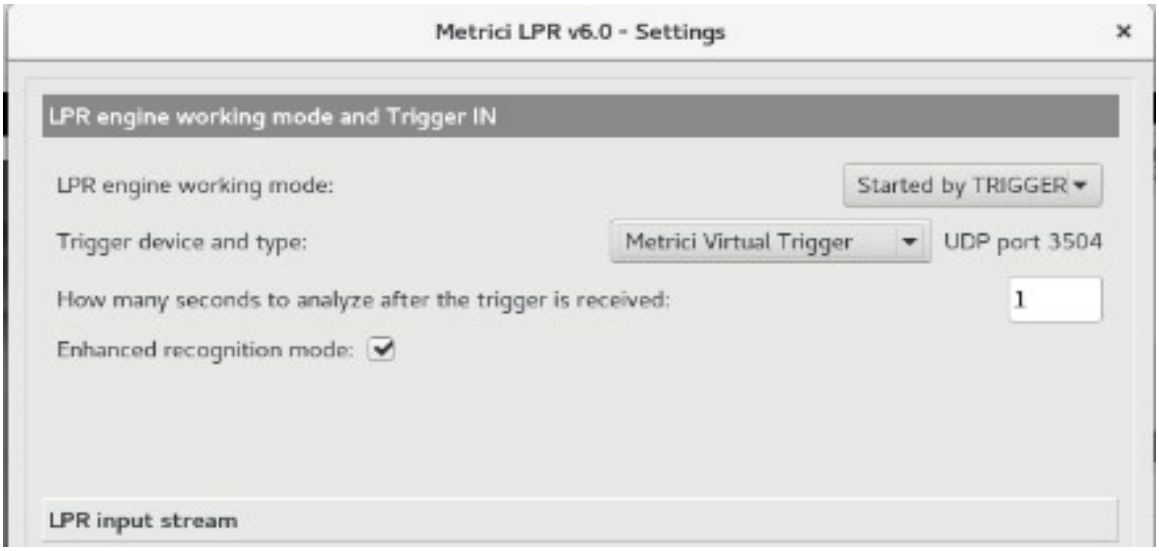
When setting another Metrici engine to send a trigger to this one, you set the port for the second one as the one generated by Metrici when you choose Metrici Virtual Trigger. For example, in the next image you will se port 3504. So the second engine, the one which sends the trigger will send the trigger to this port.

You first set the receiver – choose Metrici Virtual Trigger. Remember the port and you copy this in the second engine (the sender) at Reporting, Check action and Trigger out menu.

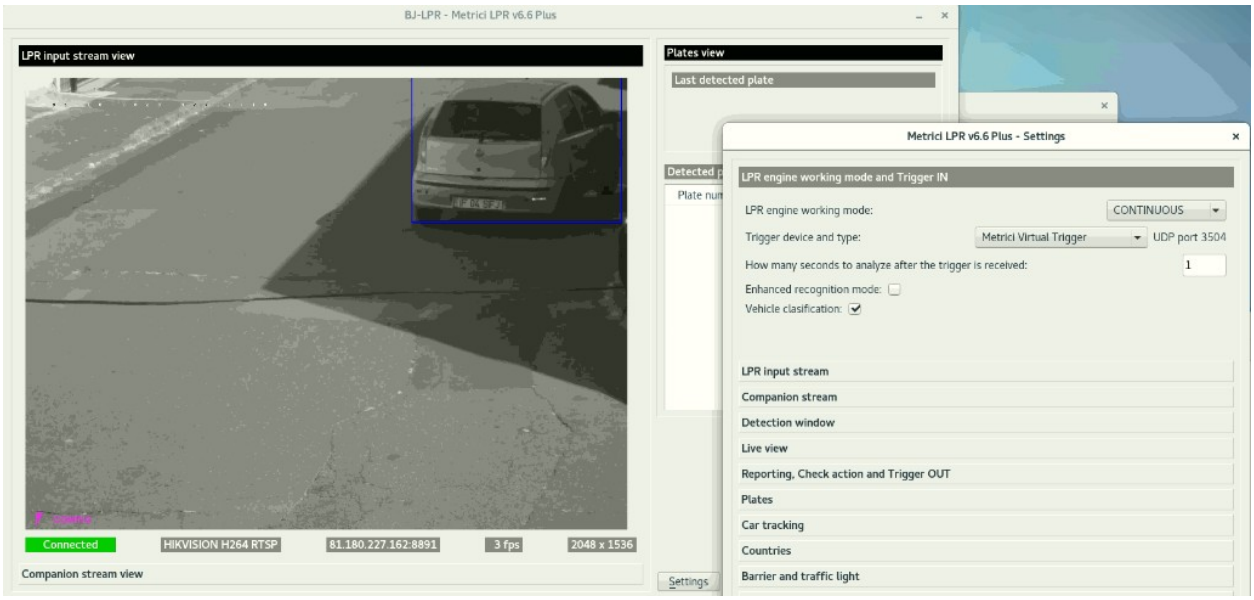
In case a trigger is received, no matter which one (virtual or from external device), and there is no number plate or this is not visible, dirty, partial etc., Metrici LPR engine will generate an event and will be added to database with the ID UNKNOWN. This will be accompanied by a still frame that you can check and see if there was a vehicle or not.

Also in this setting you can choose to enable an Enhanced recognition mode. What this will do is increase the accuracy, but will delay the detection. In fact the system will check the characters from number plates, individual- letter by letter, against the fonts for each country set in the Countries tab. The more countries there are, the

more will last to have an answer so Metrici advice is to be cautious with setting and not to use unless absolutely mandatory.



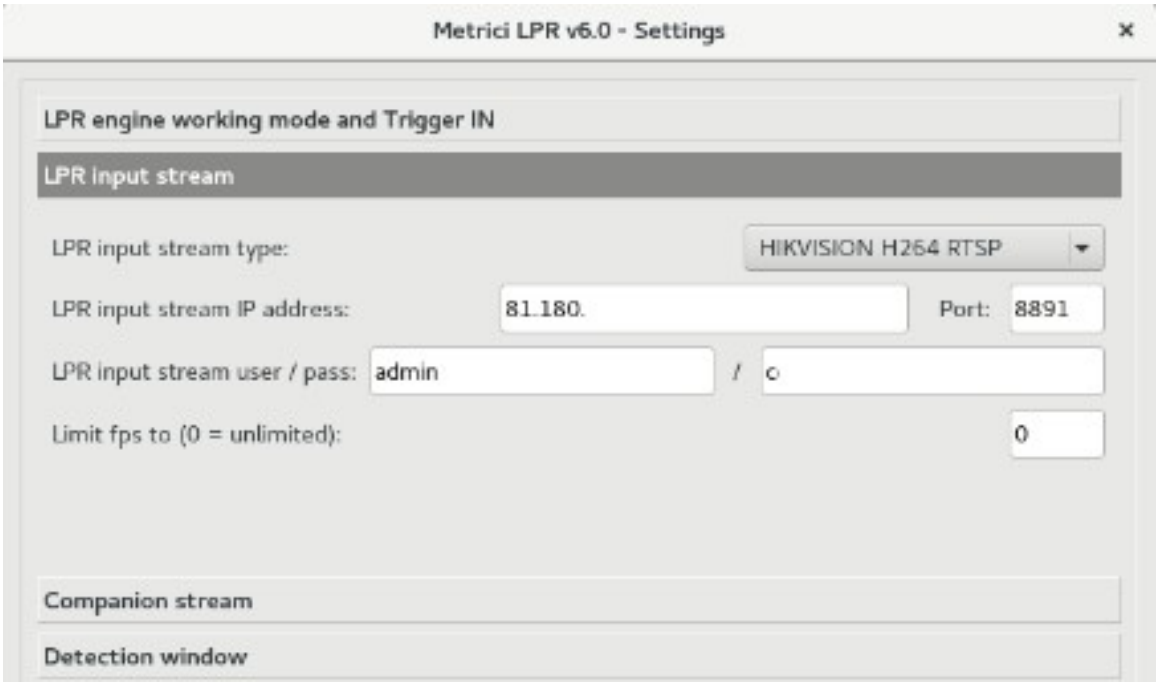
Vehicle Classification. Sometimes you need to know what type of vehicles are transiting an area. Also, you may need a security feature to only take actions when a vehicle is present, so the license plate belongs to one and is not written on a piece of paper or someone just holds on in hands. For that, you need to check the option vehicle classification is this menu. For this security feature, you will also need to make some settings in Metrici Interface. For now the categories are: bike, car, SUV/Pickup, van, bus, truck, tram, utility heavy machines.



6.2 LPR Input Stream

Section **LPR Input stream** will be filled with connectivity data of the camera: camera's IP, as well as the user and password as they were established when installing the camera.

Be careful to choose the correct camera name and the video stream type: Mjpeg, H.264, as was set in the camera. If you don't set the correct type, you will not see images live and the detection will not work also. If your model of camera isn't on Metrici list, just choose Generic camera and the video stream type.



6.3 Companion Stream

Companion Stream This option allows the user to set a new camera that will record an image along the one that captures the license plate. The images from the two cameras will be saved together on web interface. You will fill the IP of the camera, the user and the password.

Companion Stream Type: Choose the model of the second camera. In case this model is not on the list, choose Generic camera and the video format it uses.

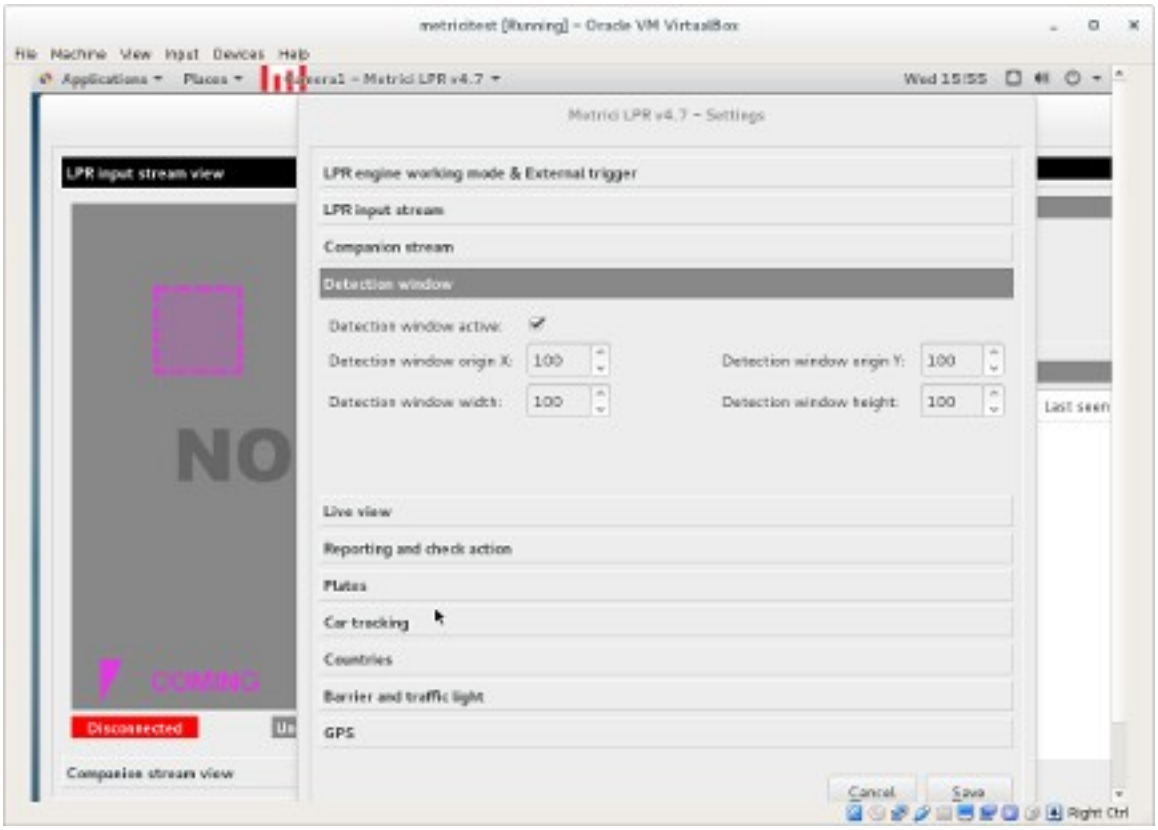
Companion Stream IP address is the IP address of the second camera as was set when installed.

Companion stream user /pass – user and password of the camera as were set when installed.

6.4 Detection Window

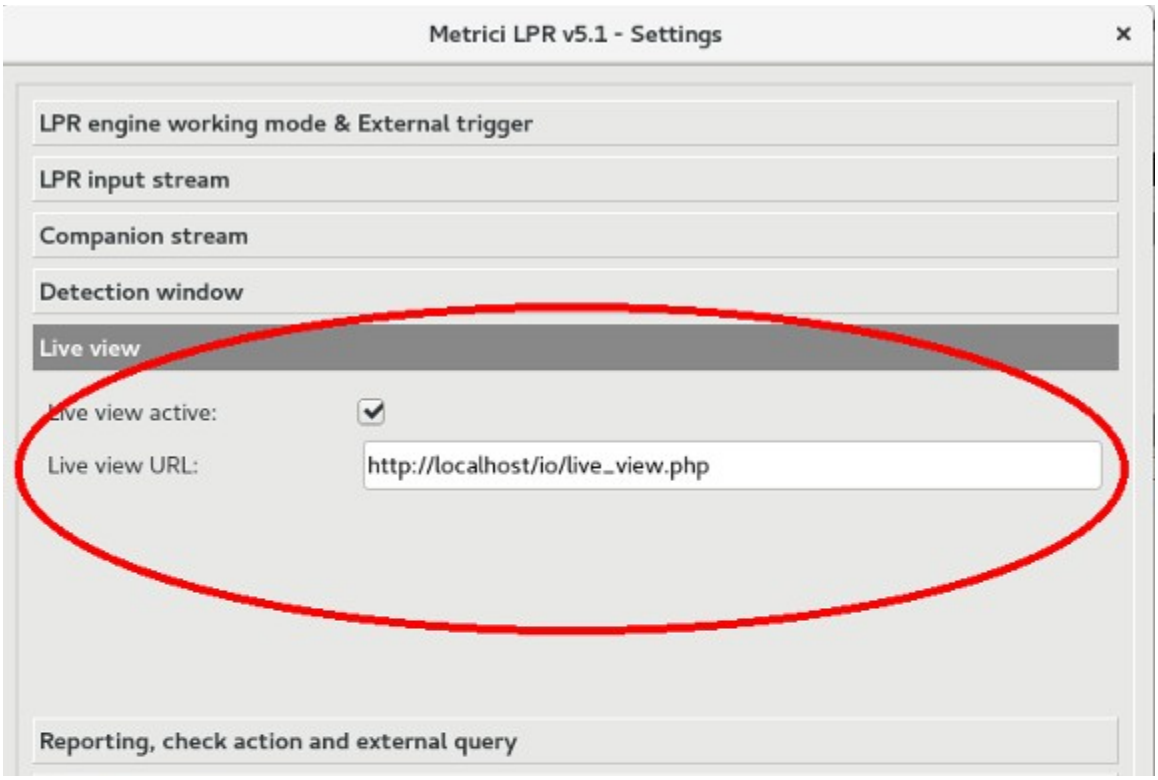
Detection window tab, when checked, will reduce the area scanned for license plates. This will allow a greater speed of detection, a smaller need of computer resources and faster processing. This option can be used for barriers, or in other areas where license plates can only be seen in a space smaller then the entire view field of the camera.

By changing the values from this function, you can modify the zone where the detection soft to look for plates. Detection window can also manually be set, with “click and drag” from the corners of the pink square.



6.5 Live view

Live view. By checking this button, images from detection camera will be “broadcasted” to the web interface or to an IP address. If it is not checked, no live view will be displayed in Metrici Interface.

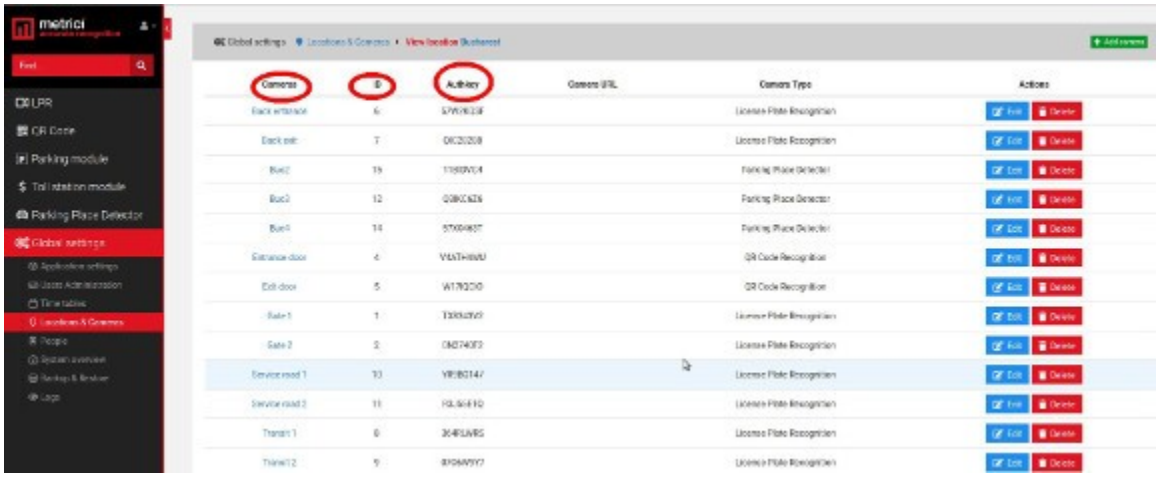


In order to have access to live view functions in web interface you click on Live view active and fill in the data for url. If the access is only on localhost you will write an URL such as http://localhost/io/live_view.php. If the access is web based you will write an address such as http://IP_ADDRESS/io/live_view.php and result a formula like http://192.1.1.1/io/live_view.php.

6.6 Reporting, check action and Trigger out

In this menu you will fill in the data from **authkey / id** generated by **Metrici LPR Web Interface**. These values were automatically set by **Metrici LPR Web Interface** when a camera was introduced in the system. This is the only way in which you integrate the communication between the detection unit – meaning the engine application and analysis centre- the interface. If you will not fill these data, you will not have access to Live View and Car Flow functions in Web Interface, it will not build a database and it will not create reports and statistics. The detection itself will work, but will keep all data on a local buffer, where you don't have access to and will not send them to the database.

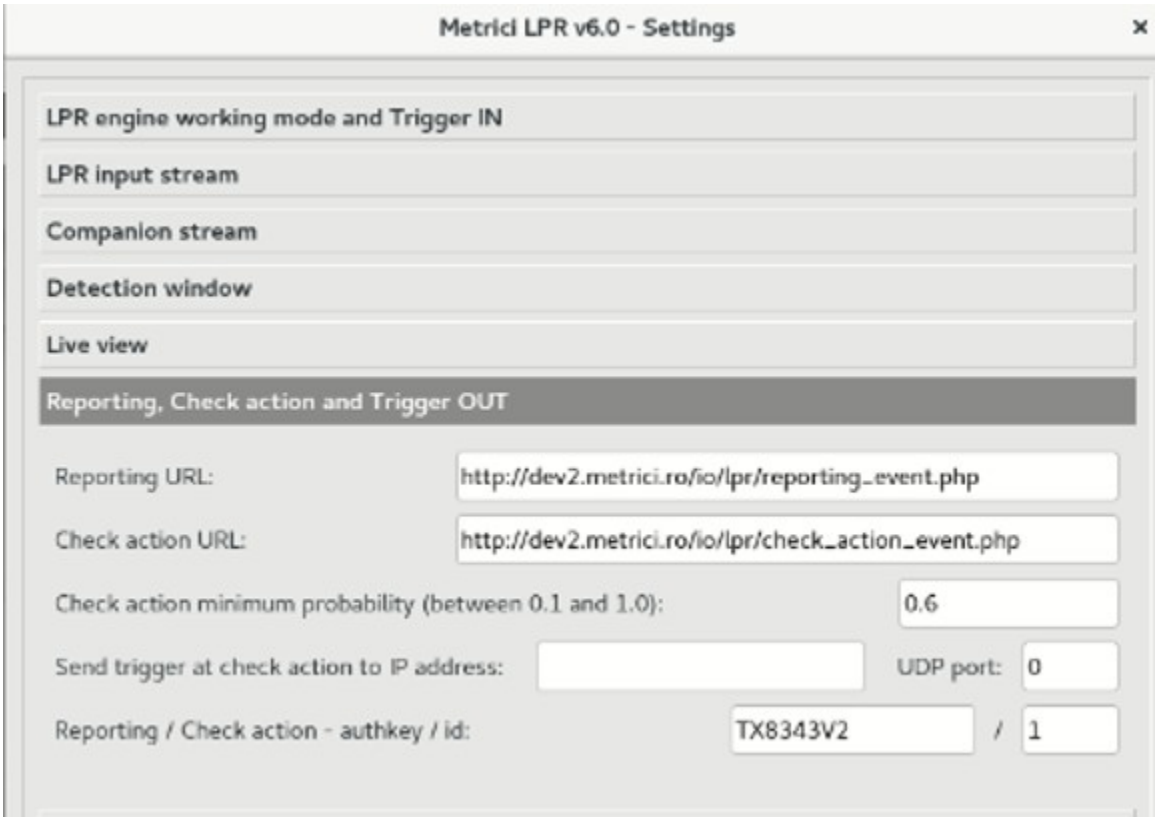
NOTE: ID and Authkey can be viewed in in **Metrici LPR Interface** on Global Settings **menu, Locations&Cameras** submenu and choose a location to view all the cameras set in. As in the next image. Each camera introduced has a unique ID and authkey - **See chapter 5.5.**



Reporting URL – the virtual address where the system will send the data of recognized license plates and the images from the cameras. This will be as http://IP_ADDRESS/io/lpr/new_plate_event.php. In case that reporting and administration interface is intalled on same computer with the analysis application, IP_ADDRESS will take the form 127.0.0.1.
The system tries to send the reporting event until a receiving confirmation comes from the server.

Check action URL – the address of the unit for checking the actions to be executed if a license plate is recognized. The actions can be set in **Metrici LPR Web Interface** and take a form such as: open barrier, send e-mail, popup on screen, change traffic light. See chapter LPR/Actions.
It will have a form like: http://IP_ADDRESS/io/lpr/check_action_event.php. In case that reporting and administration interface is intalled on same computer with the analysis application, IP_ADDRESS will be 127.0.0.1.
Reporting address and check action addresses can be different as check action is the first one to execute when a car is detected, afterwards reporting when a car exits from the field of view of the camera. In a parking installment or other scenarios with barriers, you will go to Metrici Interface and set a rule for the camera connected to the barrier to open it when recognizing a plate number, or the % rule (everybody has access)

Check action minimum probability between 0.1 and 1.0 tells the system which is the minimum value at which a license plate is checked for possible actions in database. In short, how sure is the engine has done a correct reading. We recommend a value of 0.6. This means that a plate has been seen in at least two frames.



Send trigger at check action to IP address is useful in cross checking situations or when you want two events to be registered together in database. For example at a weighing station a LPR detection in front of truck triggers a LPR detection for the back of the truck.

You will fill in here the IP address of the Metrici server or the address of a server on which another Metrici engine is installed. If more Metrici engines are on the same server you will fill in an adress such as 127.0.0.1, with the UDP port as in the one allocated in “LPR engine working mode and Trigger in” menu.

6.7 Plates

For **Plates** tab, the optimum value of **Plate min. length** and **Plate max. length** will be set only after placing the camera and choosing an appropriate resolution, depending on results. You can start with a Plate min. length = 120 and Plate max. length = 1000. Metrici recommends that a plate number has a minimum width of 200 pixels. So be sure to place and set the camera accordingly, to achieve such a result.

The option **Same plate delay (seconds)** will set how many seconds the program to wait for a license plate to be back in sight for reporting a new detection. For example, if we set this value at 5 seconds, the software will record a new event for a license plate if it gets more than 5 seconds between the time when a license plate exits the camera view and a new entry in the view field.

Single plate mode button, when activated, it assumes there is only one license plate in frame, any given moment. This mode will reduce the number of "false positive" detections in case a car stays for a longer period of time in the same position.

6.8 Car tracking

Car tracking will establish the direction of movement for the cars. The data from this option can later be accessed in the **Metrici LPR Web Interface.** Be careful to set the arrows correctly, especially when managing parking lots. In this cases, **the direction is the movement (coming or leaving) of the vehicle in relation to the location not to the camera view**. For example, if a vehicle approaches the camera, but in fact it is leaving a location, the set in Metrici will be for LEAVING. An example could be at the exit from a parking with the camera looking towards the interior. So the number plates coming towards the camera are in fact leaving and this is how you set it.

6.9 Countries

From the list of available countries, one can choose the ones from which the license plates to be recognized. In case only a few states are selected, license plates from other countries, not on this list, will be ignored by the detection engine and **will not be saved** in reports, lists or images.

In case "catch all" option is checked, the bigger the risk of recording "false positives", but all the possible license plates will be scanned. For example, it is possible to have saved in database entries with "Taxi" box or identification numbers of buses, other noise in the image.

IMPORTANT!
For a greater speed and an accurate recognition we recommend choosing only a few countries and the **first position on the list to be the country where the system is installed.**

6.10 Barrier and traffic light

Will set the parameters for closing and opening a barrier when a license plate is recognized.
You will fill in here the URL address of the device.

Instead of a barrier it can be any device that takes commands by HTTP protocol.

Delay before closing barrier will set the time interval, in seconds, the system waits before closing the barrier after it opened it for a recognized license plate.

Traffic light ON URL will be filled in case a traffic light is installed, which will commute when a license plate is detected if this option is checked for that particular number in Action list.

All the settings from **Barrier and traffic light** menu will be correlated with the **Metrici LPR Web Interface** menu for each license plate that is in action lists.

6.11 GPS

In case you will set a GPS device, this will save the data together with the image from the cameras.

6.12 Weight Scale

When integrating a weight scale, an IP address will be saved in the dedicated box. Metrici developed special firmware for communicating with industrial weighing scales. Each detected license plate will be recorded in database together with the weight of the vehicle.TCP Port can be changed manually accordingly to the data on set. See the Weighing Station Module user guide for more info.

6.13 Radar

When Metrici Observer Radar is connected, after filling the required data (IP address and TCP Port), the image of the license plate detected by Metrici will be saved together with the recorded speed of the vehicle. TCP Port can be changed and manually saved, depending on Barix settings on location.

NOTE: The detection system **Metrici Control Panel** can work independently of internet connection, records the data in a local buffer and will later save the information on server and on **Metrici LPR Web Interface,** when a connection at internet /network is set.

CHAPTER 7
GLOBAL SETTINGS OTHER SETTINGS

7.0 CRON JOBS

A user can set to receive reports by mail at a established time interval. You can select here what type of report to receive, where to send it, on what time interval: hourly, daily, weekly, monthly or once a year.

7.1 TIME TABLES

A time table is designated to apply some rules or settings on a specific hourly/daily/weekly program. To be more flexible in setting, a user can choose to have alarms or actions made only when special conditions are met.

This setting is applied for now at any Metrici module, **except** Parking Place Detector.

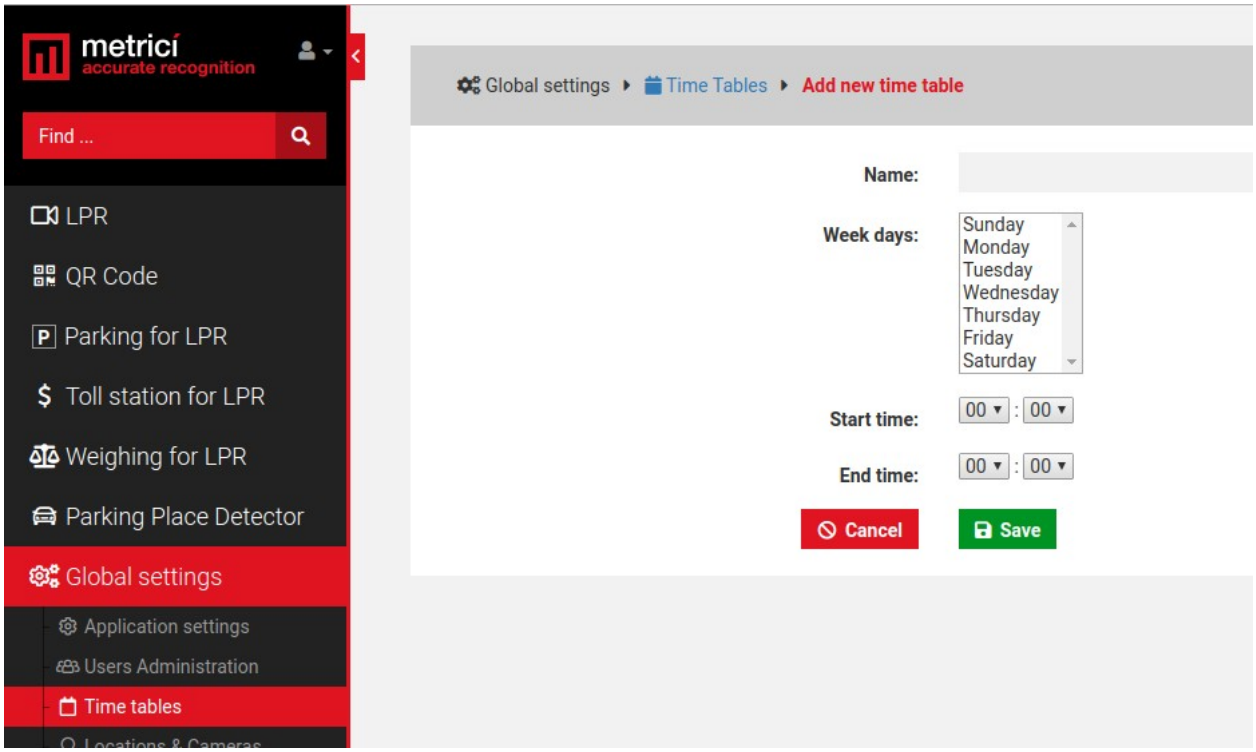
For example, a user can set to receive an alert email only when certain conditions are met.

Generally, the time table is used in Parking module, also, for toll stations, but also for QR code recognition engine.

Metrici has a default time table “All the time” which is valid 24/7. But customized time tables can be made that to to be used in action settings.

Click on the green “Add time table” button upper right. Choose the days of the week for which you want to set a time table. You can choose as many as you want from one to all week and choose an hour interval, also and Save.

This will create a time table for that period.



Customized time tables can be as specific as to complete a action or not only on Mondays, for example, from 8 till 9 a.m.

7.2 LICENSES

You can see here what type of licenses you have activated on your interface. The ones you don’t have access to are crossed out. You can update your license anytime with new modules and engines.

7.3 BACKUP AND RESTORE

You have two options for backup:

1. **Export general settings**

In this case you will save all the data set in Metrici Interface, but without the events. You will be able to save this way info about all the users, their administration rigts, the locations name and settings of the cameras etc.

2. **Full export** (entire database) will save an SQL file with all the data as the first one plus the events, but without the detection photos.

In case of backup click on restore button, browse to a folder and choose an SQL file saved as the steps described before and click on Save.

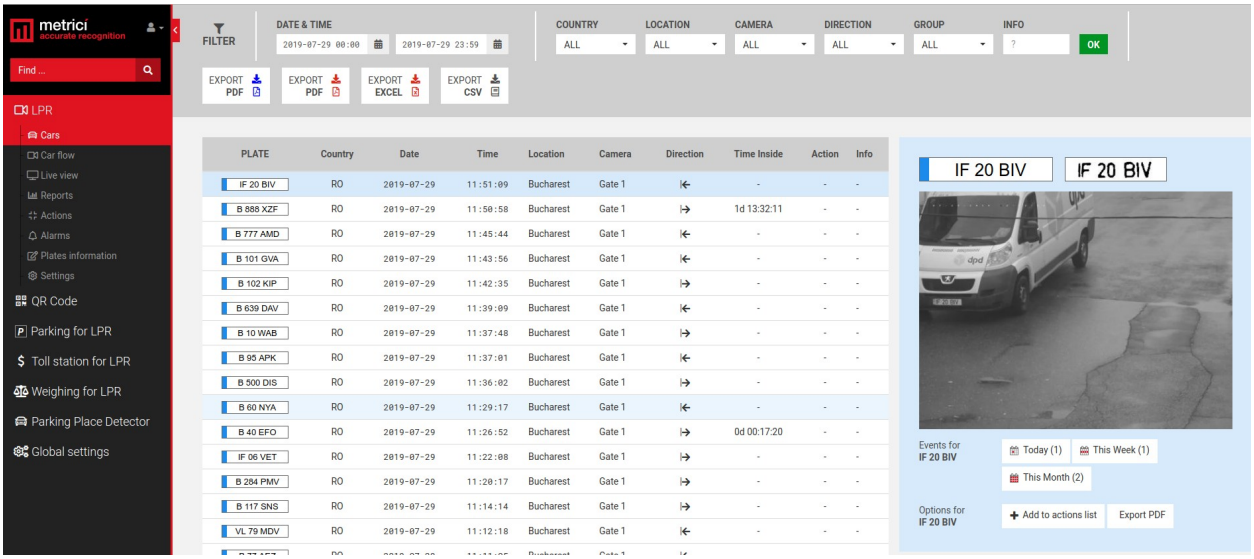
7.4 LOGS

The user with administration rights can view here all the logins of any user and the changes one made within the system or menus. You can search events by date, user or time interval. You can export in excel format the search results.

CHAPTER 8 LPR INTERFACE FEATURES

8.1 LPR VEHICLES

In this menu you see all the details of detections. All detected license plates will be displayed here.



You see a list of events and you have a top bar where a search can be filtered,

The available options for the filters are date and time, country, location, camera, direction or info (which is a field where each number plate introduced in database can have some additional info), speed, red light. You can also filter cars by the group it belongs to.

The events list include a time stamp for the detected number, the country from which the detected license plate is registered, hour, location in which the number was seen, the camera which detected it, direction of moving (as set in Metrici Control Panel) time inside (useful for parking applications but not only), if a action is set for that particular number and info.

On the right side of the screen, there are several more information for the selected number plate from the list.

The photo from the moment of detection is accompanied by data about number of events for that number on that day/week and month

There is also a button to add that number to an action list (See Action list chapter) and one button to export that event in PDF format.

8.2 VEHICLES FLOW

This is a method to generate alarms for certain events for the user who runs Metrici Interface. You have two options for the alerts: the alert consists of a beep sound when a detection is made. This is a format similar to liveview but not all the video stream is viewed, but only the last detection.

The available options are alerts for the **cars on the action list** (that are included in Metrici database- whitelist or blacklist) or **cars not on the list**. When you select an alert method, the list will be filled only with detection of our selection. If None is selected then all the detection will be listed as they happen.

A user can also choose for which locations and which camera to see the results. If one manages more locations and only one is chosen, the car flow alerts will only display detection in the selected location.

A click on the detected license plate or on the photo will maximize the picture from the moment of detection.

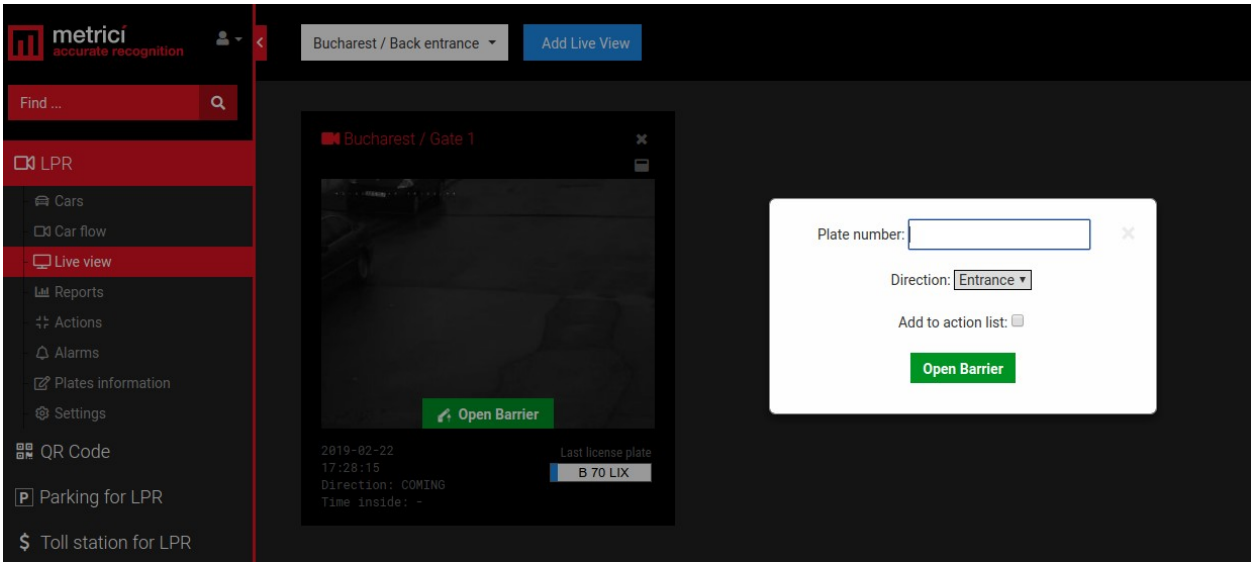
8.3 LIVE VIEW

From the drop down list of available cameras choose one by one the cameras you want from the drop down menu and click on blue button “Add live view”.

A view can be made full screen by click on the monitor icon. You can delete a camera from live view with a click on the “x”. After a full screen camera, to return to all cameras, click on the “_“ sign.

If a barrier is connected to a camera, a green button will let you open the barrier with just a click in live view (useful in cases in which the number is not visible or is missing) and the action can not be implemented automatically by Metrici.

In case this option is used in Parking Module with LPR be aware to enter the correct number plate and the direction of movement in the pop up window, so that the system can correctly keeps track of available spaces.



You also have the option to introduce that plate in action lists where more actions might be attributed to it.

By default the live view is automatically filled in with a URL as http://localhost/io/lpr/live_view.php. If the video is sent to another URL, replace localhost with it. For example http://metrici.ro/io/lpr/live_view.php.

8.4 REPORTS

Several reports are automatically generated by Metrici. Each report can be exported in XLS file.

- **Cars each hour** will display number of recognized license plates (number of detections) as well as unique cars (as it is possible a number to be detected more times as it travels more often in a location or in front of a camera).

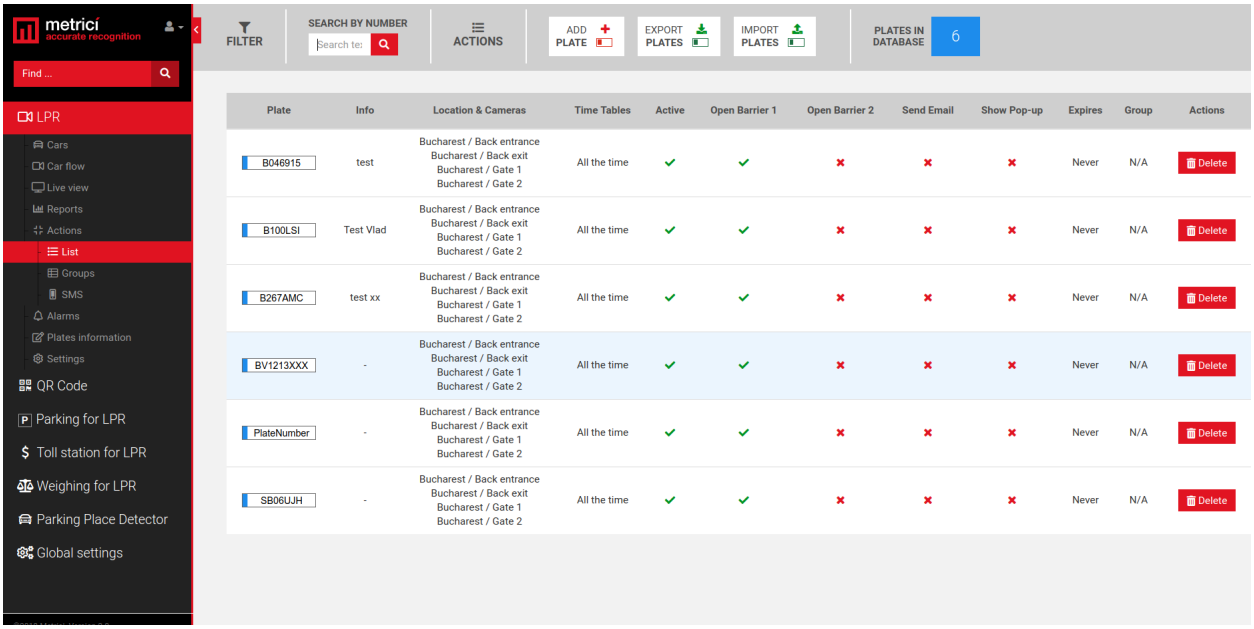
The reports can display a total sum for each hour for that location or an average by days. The average report will make a calculation for each hour of the day for all the days that we filter. The sum will display total number of detections for each hour, by adding the detections of each hour of the day for all the days that we filter. In top bar menu you can choose for what location or which camera you want to see the report.

- **Cars each day** will generate by default a report for all the days of the current month, but more days can be filtered from top bar menu.
- **Cars each month** will generate by default a report with all the months of the current year, but more months can be chosen for a report to be created.
- **Cars each camera** will generate a report with all the detections seen by each camera in a location
- **Top cars** will generate a list with the number plates that were detected more often. From top bar menu you can choose how long the list to be from 10/page to 100/page. For each event, when clicked you will see a list with all the detection for that particular number plate in the current month
- **Cars by origin** will generate a list with which country has more detections and the number. In case of Romania, the top will also be divided by counties.
- **Time inside** will display a report with the clients habits for a parking or a location. How long do usually clients stay inside a location.

8.5 ACTIONS

In this menu you add cars to action lists or delete others. You can create groups, also

Actions list will display a list with all the number plates introduced in database, with the settings for each one.



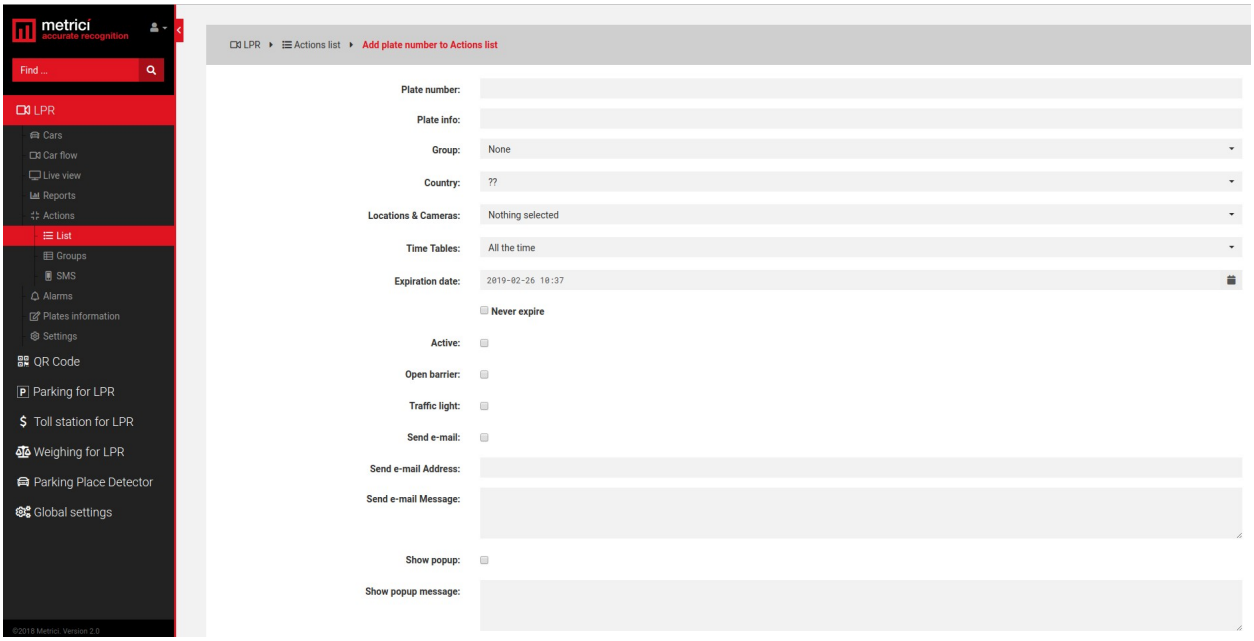
On top bar menu, one can search for a number plate in database. Also can Add plates, export or import lists.

The cars list will include plate number, info, Locations and Cameras for which that number has some settings set, time tables, whether this is active or not, which barriers to open (from 1 to unlimited), whether to send email, show popup, if it expire, if it belongs to a group or not.

When adding a new number plate to the lists, one of the fields to be filled require more attention.

First of all, write the number plate and info (if any). If this number plate belongs to a group you've created, select one. Be aware that a number plate introduced in a group will automatically copy all the settings of that group, for actions, time tables, location etc.

Locations and Camera: Choose for what location and for what camera that number plate has an action rule. One can choose that a number plate has only rights for one barrier, for example, in a location and not to all of them.



Choose a time table that you've created before if that number plate is assigned to a time table. The actions set in this menu will only work during that time table. For example, if you've created a time table Work Hours (Monday to Friday from 8 am to 8 pm) a barrier will be opened only in that time interval.

If that number plate has a expiration date for the actions, set one here or check "Never expire" otherwise.

Check **Active** button and choose what action to be made when this number is detected: open barrier, command a traffic light, send email or show a popup. For the email version, choose to what address the message should be sent and write what is the message.

Only if it is vehicle: Check this option if you want the action to be taken only if the number plate belongs to a car and it is not printed or someone holds it for example. To work properly, you will also check **Vehicle classification** option in **Control Panel**.

Action URL is the address of the hardware device that will be commanded when this number is detected: barrier, traffic light etc.

Cross Check is a special copyright feature of Metrici when an action is completed only when a series of conditions are met. Metrici checks in the all database and in all the Metrici engines if a unique key is to be found. Zero, by default, it means only one condition is met. If cross check is 1, then two conditions must be met simultaneously. For example, if for access control one uses LPR and QR code, might set a rule that a action to be made when both a number plate and a QR code are correct and linked in

database. A Metrici engine detects a QR Code and will triggers a LPR detection. If the two conditions are met and the number plate is connected in database to that QR code, the access will be granted.

The first rule is that the events have each one a rule established in database for that action and the detection to be triggered because there is a unique verification key for every detection. This means you have one detection that is triggered by Metrici Virtual Trigger in Control Panel settings.

The interconnection might be also between LPR and car classification or any other combinations.

IMPORTANT!

For all Metrici interface, whether we talk about searches, action lists or other data, the "_" sign replaces a letter or a number, and the "%" sign replaces as many letters and numbers.

So you can create an action list for cars beginning with MAI, for example, and you will set a rule such as plate number MAI_%,, you tell the system to initiate an alarm or open a barrier for any vehicle with license plates beginning with MAI followed by at least one other letter or number.

Also you can perform a search in database using the same special sign. A search could be as IF% where all the numbers containing the association IF will be displayed.

Blacklists

If you want to create a blacklist and have alarms for some particular license plates you can create a rule that specifies that when a number plate not on the action list, in groups, tenants etc is detected to trigger an event.

This is a situation where access is possible only for registered license plates- whitelist only, for example.

If you have particular license plates to initiate an alarm, then these will be added individually in action list, with the option send mail, or send SMS or initiate a http trigger to a hardware device.

Action list and access for everyone

Another example is when you have a paid parking lot with free access for everyone. In order to open the barrier for every car detected at the entrance, you will set an action for

license plate “%” to be active with open barrier, for every camera at the entrance. This rule will NOT be implemented at the exit.

The vehicle will be able to leave after the payment was done and the number plate is detected at the exit in case it is a payment parking.

CAUTION. If you make this rule for exit cameras and barriers, any car will be able to leave without payment.

This can be implemented in situations where the access is controlled, only vehicles from action list have the right to enter, for example, and then you leave the exit free flow rule.

So, to set this rule in Action list, from the drop-down list with locations and cameras you manage, choose the camera/cameras at the entrance barriers. You will create such a rule for every camera connected to a entrance barrier in the location. If you have 4 entries with barriers and 4 exits with barriers, this step will be repeated for each one of the 4 entrances.

You will also check the **Active** button and **Open barrier**. At the Action URL you will fill in the URL address of the barrier for each camera.

Keep in mind that for leaving the vehicle has a **time interval** set in Parking Setting at **Grace minutes after payment**.

For more information and settings, read the Parking module for LPR user guide info found on **Chapter 9**.

8.6 GROUPS

The groups options are introduced so to make things more easy for the users. When creating a group, keep in mind that all the settings set for this will be assigned to the cars that are introduced in, so the users doesn’t have to manually introduce actions for each number plate.

When a group is formed, be aware to correctly set the rules for that group, the locations and the camera where the action takes place, the time table, if it is has an expiration date etc.

All these settings will be transferred to a number plate if this is allocated to the group. When introducing a new number in the action list, you just fill in the **Plate number** and

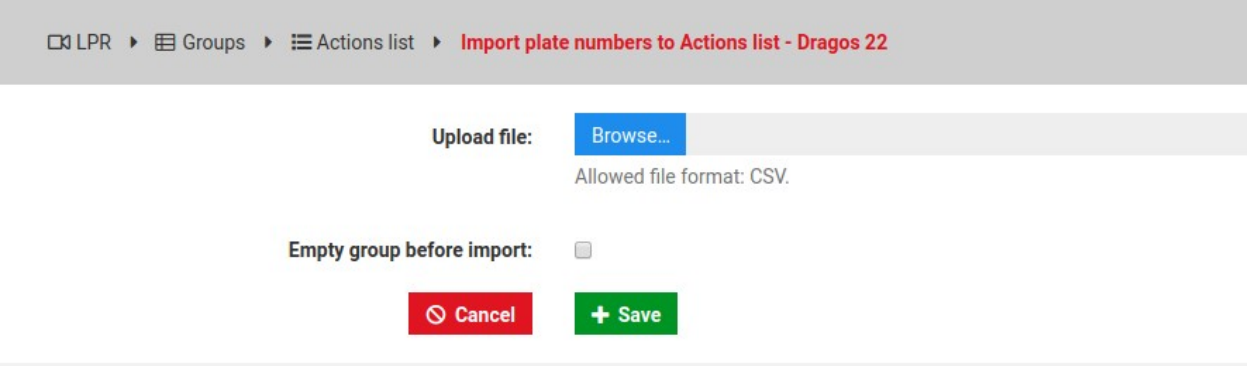
choose to what group it belongs to, leaving the other field as they are. The license plate will copy the group's settings.

In this menu you will see a list of all the groups you have created. When a name is clicked you will see a list with all the plate numbers assigned to that group and the actions to be made as well as the locations and cameras where these actions are active.

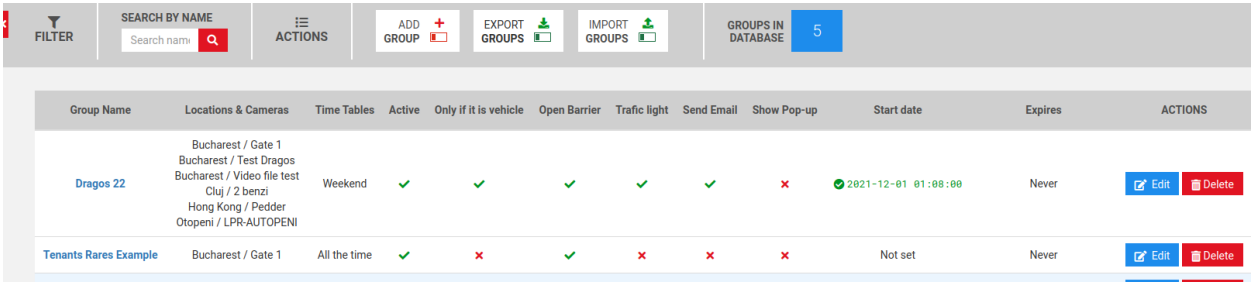
You have the option to import lists in CSV format.

For this click the IMPORT PLATES button on upper menu. If you use a third party management program or an external file that is always updated keep in mind to check the option EMPTY GROUP BEFORE IMPORT for not to double the plate numbers in your list every time you import.

If a new import does not contain old plate numbers, but only new ones, this option will NOT be checked.



Each group can receive a new plate number one by one with click on ADD PLATE button, upper menu. You will fill in the plate number and the INFO field if you wish. The plate will automatically get all the settings for that group.

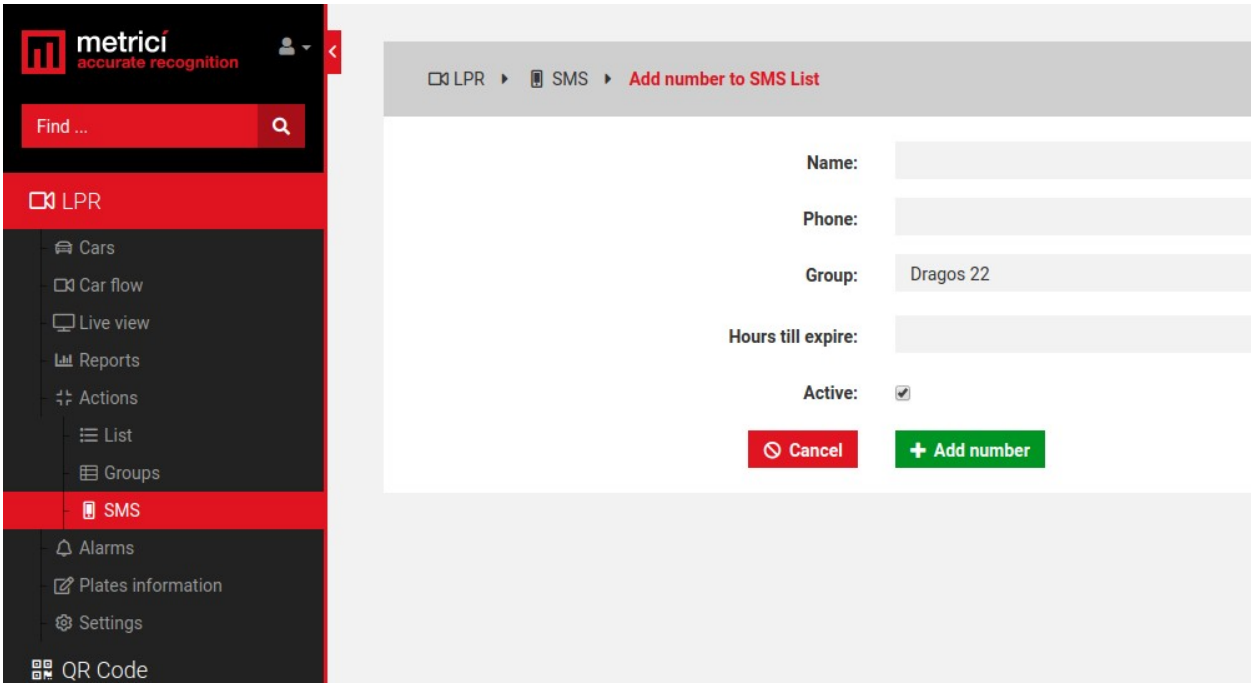


At any time after groups were created, you can export their settings as a csv file or you can import one.

For an export with the number plates belonging to a group, you click on its name, and choose option export .

8.7 SMS

In this menu, the user can introduce the phone number which have administration rights for the interface. In case with SMS module integration, the phone numbers introduced in this list can send, by SMS, plate numbers that will be automatically introduced in the actions list.



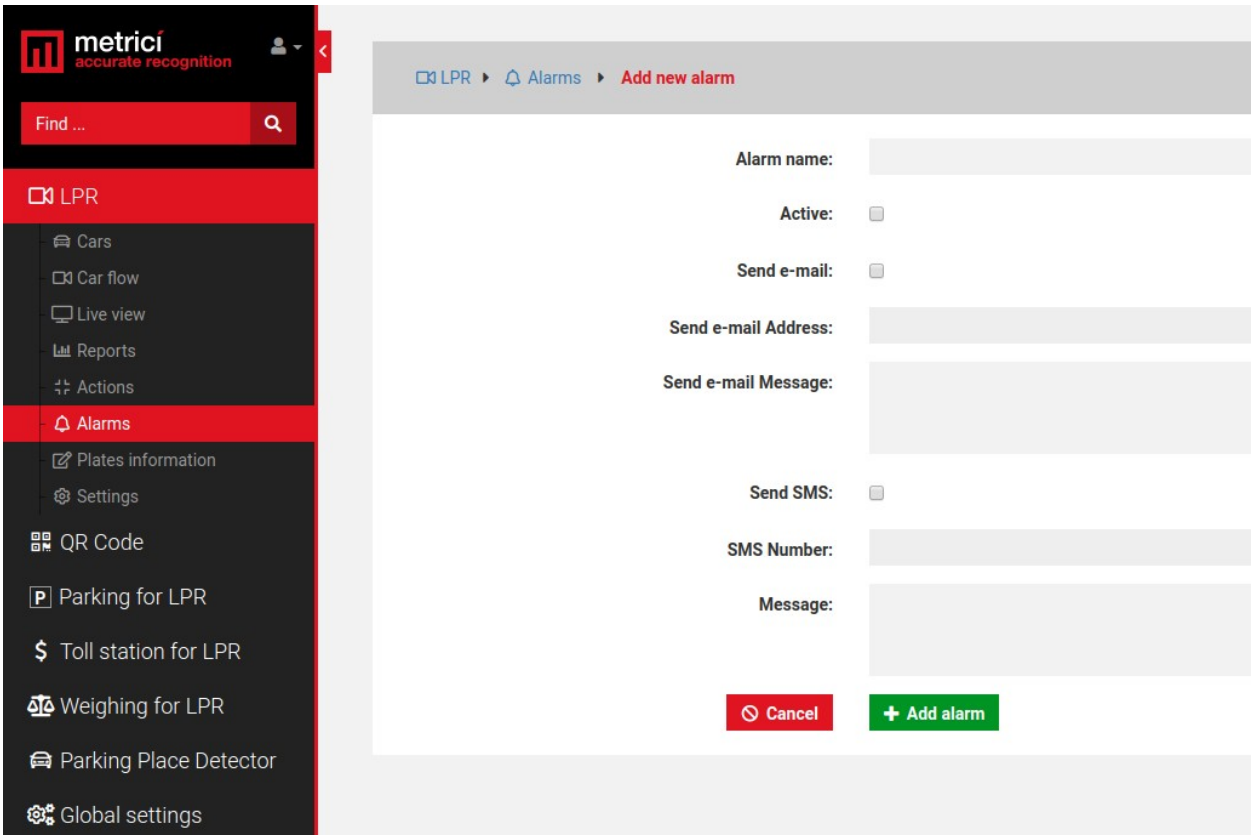
Filled in a name, the phone numbers and to which group is part of. Hours till expire is the time interval in which a plate numbers introduced by SMS in the action list by this phone has access rights, meaning a temporary right. After the time expires, the actions will no longer be completed. Click Add number green button when ready.

8.8 ALARMS

Different kind of alarms can be set in Metrici Interface. A new alarm can be set by click on the green button Add alarm.

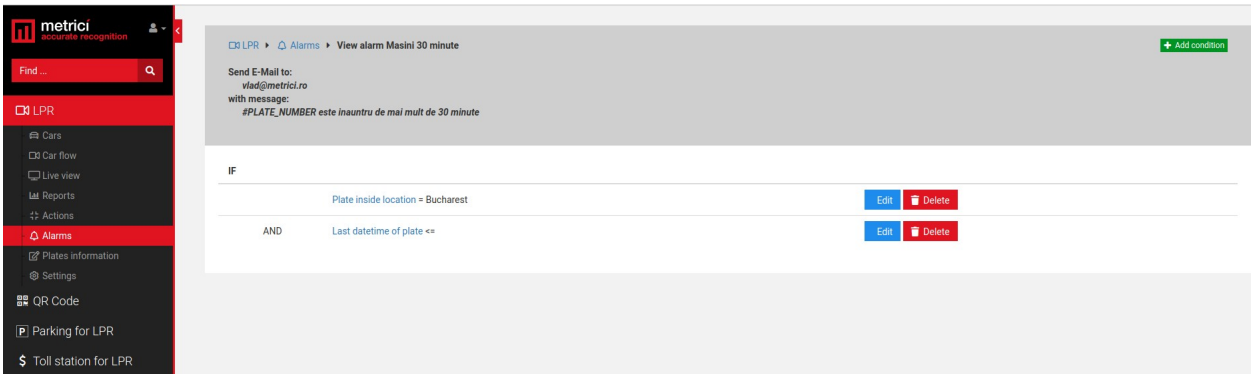
An alarm can be sent to an email address or to a phone number in case of integration with SMS module.

When creating an alarm, be aware this is a two step process. First of all you name the alarm and choose what action to be made (SMS or email), then you choose the conditions that must be met for the alarm to activate.



Name the alarm, click active, then set the email address and the message to accompany the alarm or choose to which phone number a SMS alert to be sent.

Click Add alarm when ready. After the alarm was created, click on its name to add conditions to it – these are the steps to be made for the alarm to initialize.



Click on the green Add Condition button upper right to add conditions to the alarm. You can add as many conditions as you want to an alarm.

Alarm item is the type of the alarms: Plate inside location, Last direction of plate, Last datetime of plate, Plate in group, Plate inside location, Speed.

You will have to add a degree of comparison and the location in which this condition is applied in.

“=” a condition belongs to, is equal to a specific value

“!=” this condition means that the setting is different/ not included in Alarm Item

“<” smaller than (is usually used for the alarms with time units)

“<=” smaller or equal to (also used for the alarms set with time units or percentage)

“>” bigger than … usually set for alarms set in timestamps

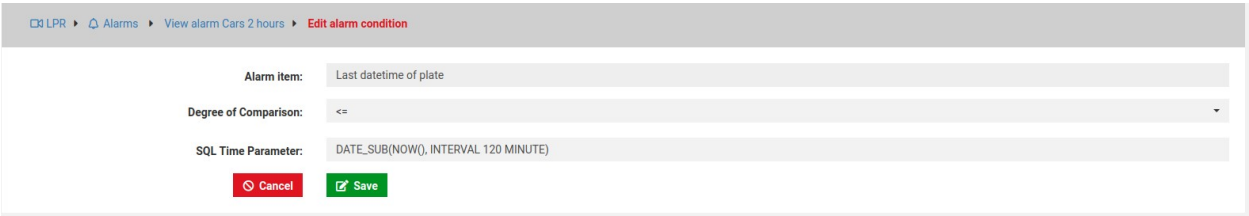
“>=” bigger or equal to a time unit, usually

For example to set an alarm when a car is inside the location for more than 2 hours, you will fix the parameters as

First condition: Plate inside location= “name of the location”

Second condition: last datetime of plate and SQL parameters <=DATE_SUB(NOW(), INTERVAL 2 HOUR

with the email or SMS message #PLATE_NUMBER is inside for more than 2 hours. See next examples



8.9 PLATES INFORMATION

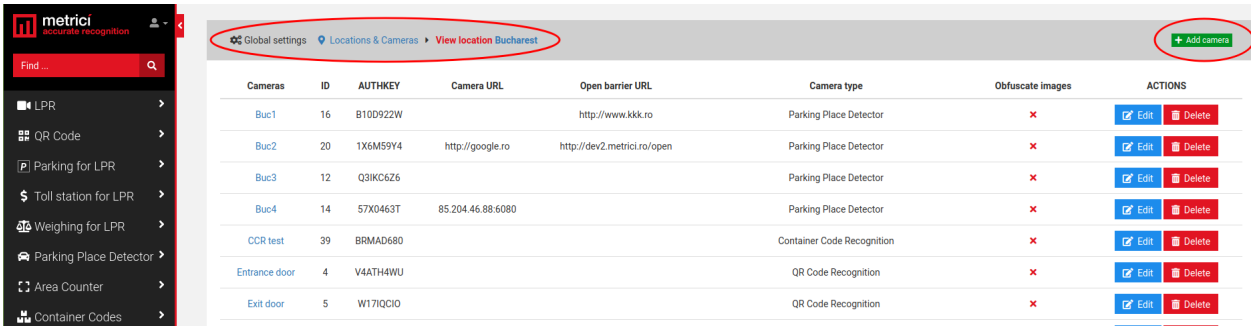
Is a list of the cars that were introduced in database along with other data on the info field. Click on the plate number or on Edit button to start editing that info. From top bar menu you can add other number plates to the list, you can export or you can import lists in CSV format.

8.10 VIDEO FILES PROCESSING

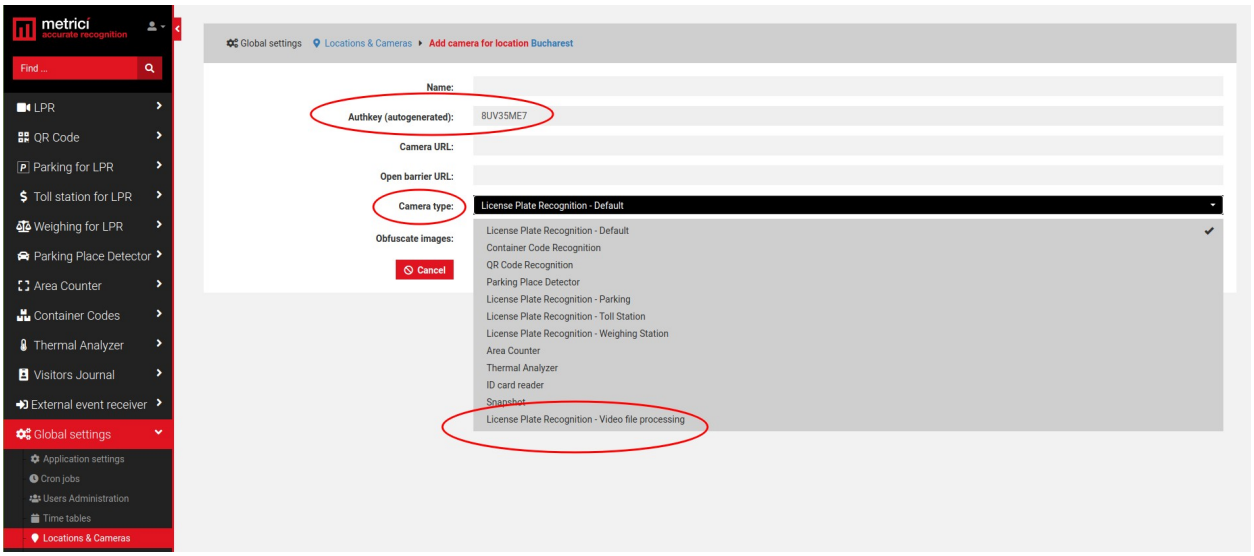
Metrici allows you to analyze and detect license plates in recorded videos format .mp4 or . avi extension. To have access to this feature, one must do some settings both in Metrici Interface and Metrici Control Panel.

First settings to be done in Global Settings/ Locations and Camera menu in Metrici Interface. You will select a location (click on its name) and add a new camera to it, virtually. Click on Add Camera button, upper right.

See next photo.

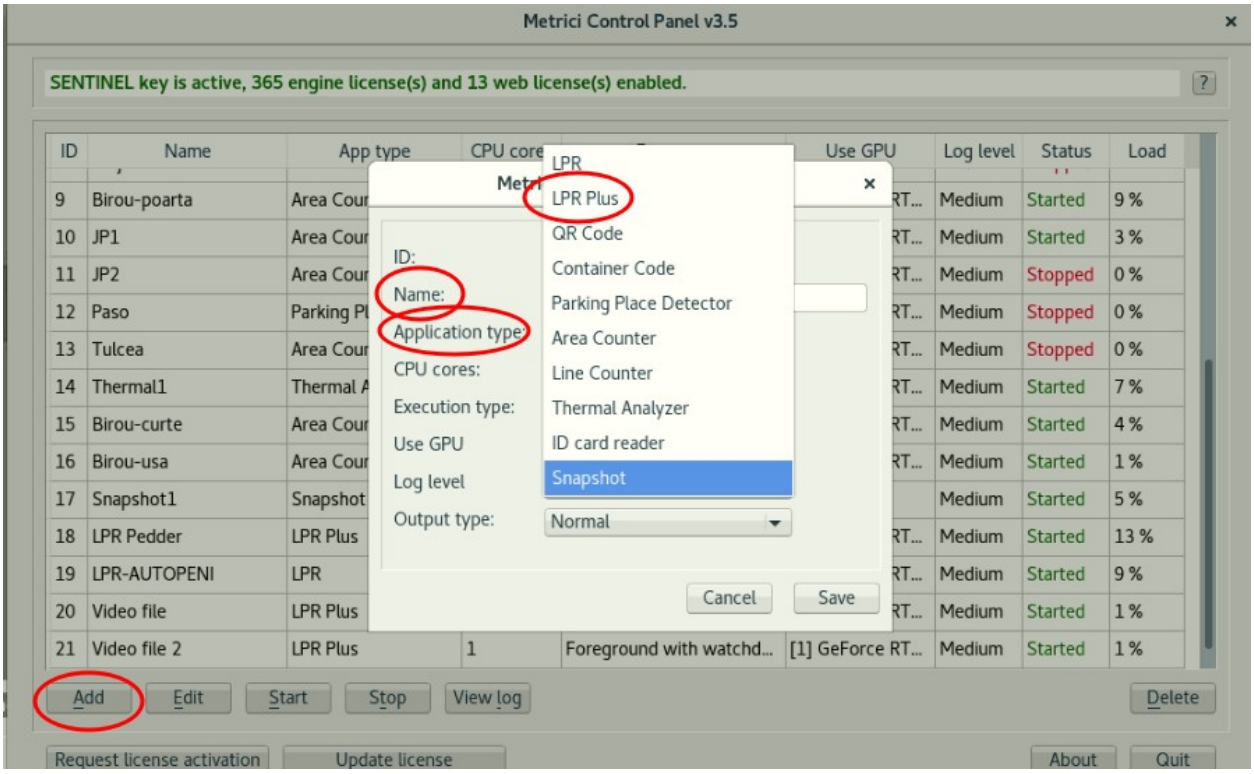


In the new window, fill in a new name for the camera, and from dropdown menu in Camera Type (Tip de camera), choose License Plate Recognition - Video files processing.



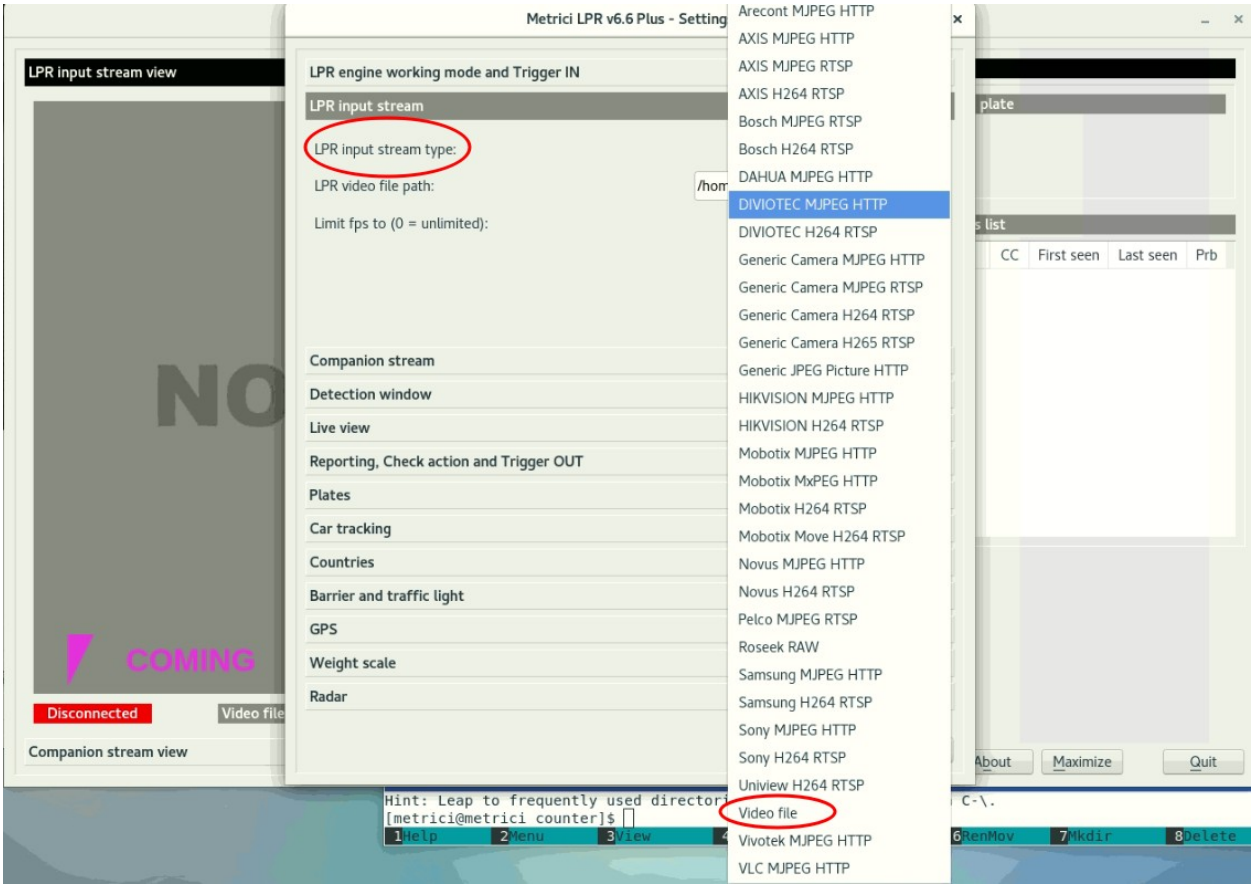
Save the settings. Please remember that you will need the authkey and the ID camera gets from Metrici when is introduced in the Interface. These will be filled-in the engine settings in the Control Panel.

In fact, the next settings will be done in Metrici Control Panel. So add a new camera in Control Panel- see also chapter 6.



Click on Add button, bottom left. Choose a name for the camera and in Application type choose LPR Plus. Up photo.

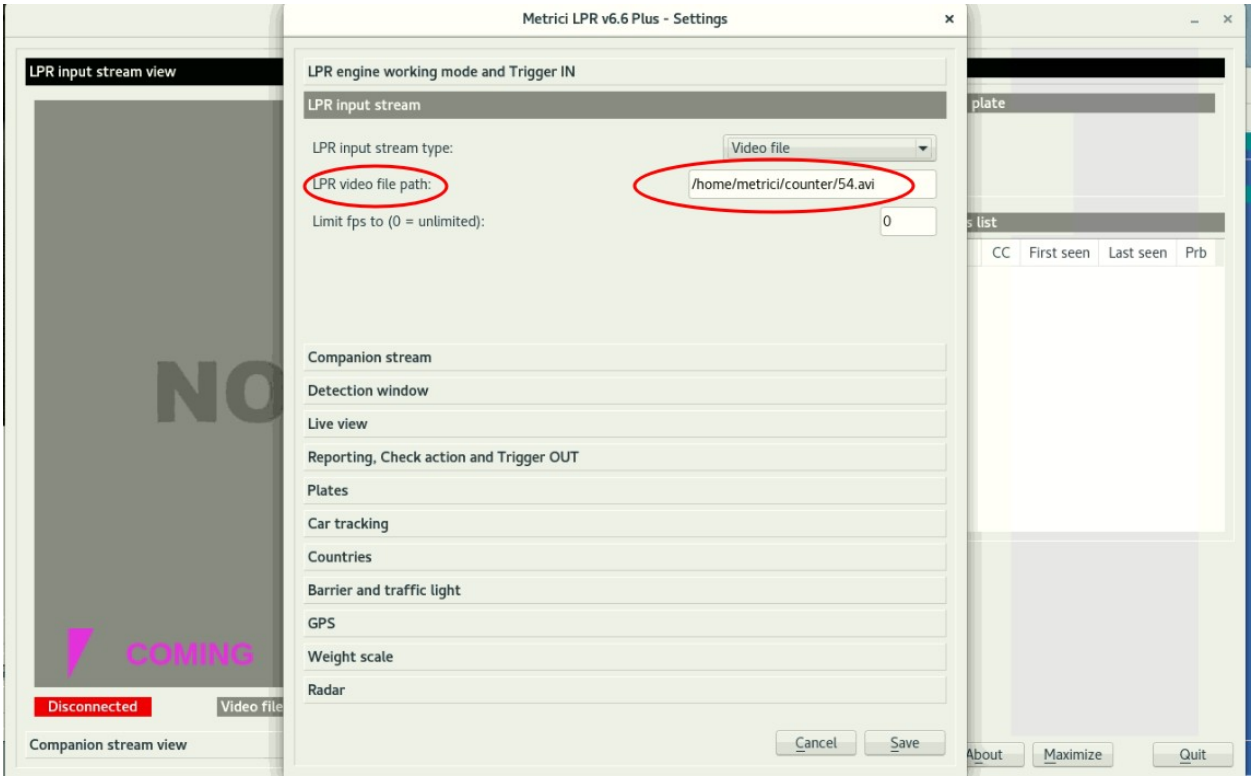
In the engine settings, in LPR Input Stream, in LPR Input Stream Type choose Video File. Next photo



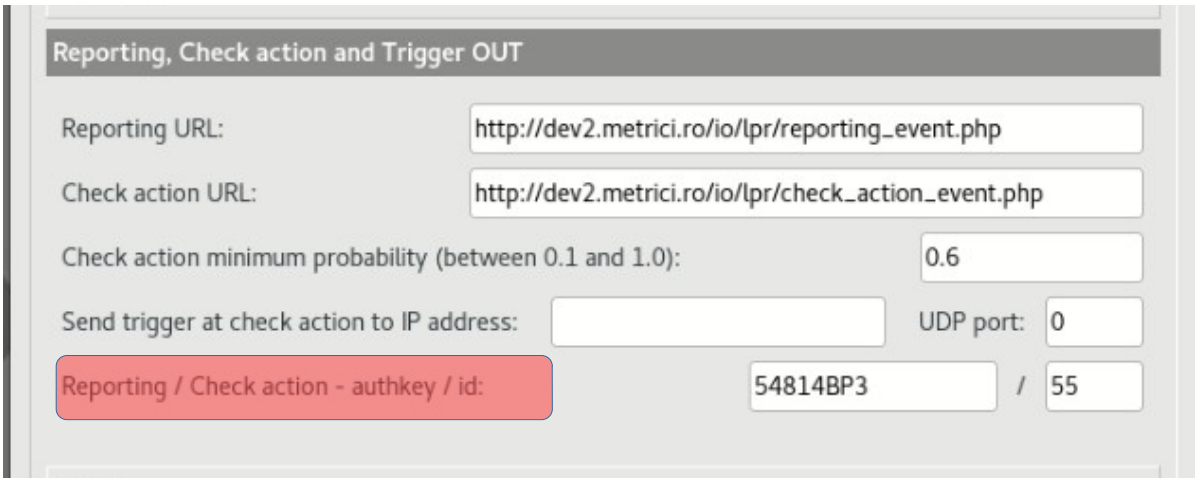
Then, in LPR Video File Path you will fill in the path to the folder where the engine searches for the files to analyze. in our next photo example, the path is home/metrici/counter, where 54.avi is camera's ID generated by Metrici in the Interface and the extension .avi shows that Metrici will analyze avi files. If mp4 files are to be analyzed the extension will be changed accordingly, but the ID remains the same.

But for a new installation, LPR Video file path will always be /var/www/metrici_storage/ID.avi or

/var/www/metrici_storage/ID.mp4



Then go to menu Reporting, Check Action and Trigger OUT and fill-in the authkey and the ID Metrici generated



To effectively analyze a video record, go in the Metrici Interface menu LPR/ Video Files Processing.

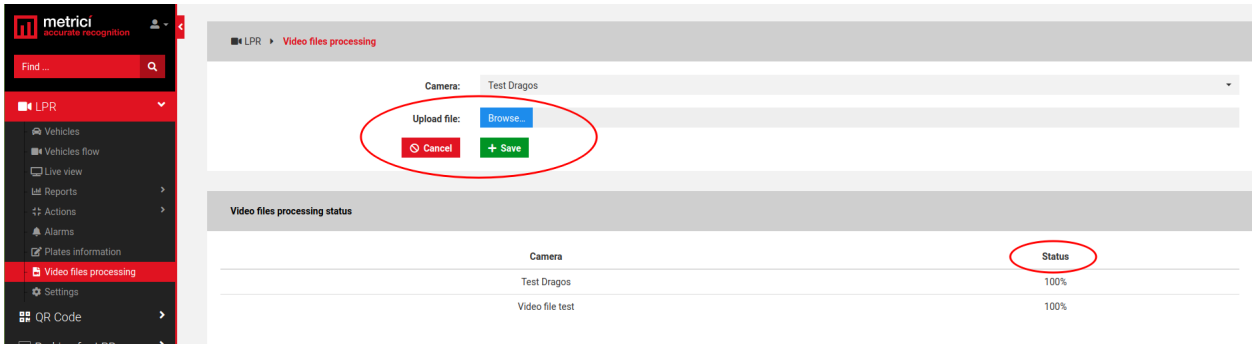
If more cameras are introduced in the system choose the one you want to analyze a video record. From browse button, search the file you want to upload. Click save

and wait to reach 100%. Until final analyze, no other file can be uploaded for the same camera. See next photo.

No matter the name of the file, Metrici will change it in ID.avi or ID.mp4. After the video is done the extension will be changed again in a format ID.avi.bac. When another file will be analyzed, this one will be overwritten.

The engine will only analyze the type of files set in the Control Panel so make sure to upload that particular type, or change the settings accordingly.

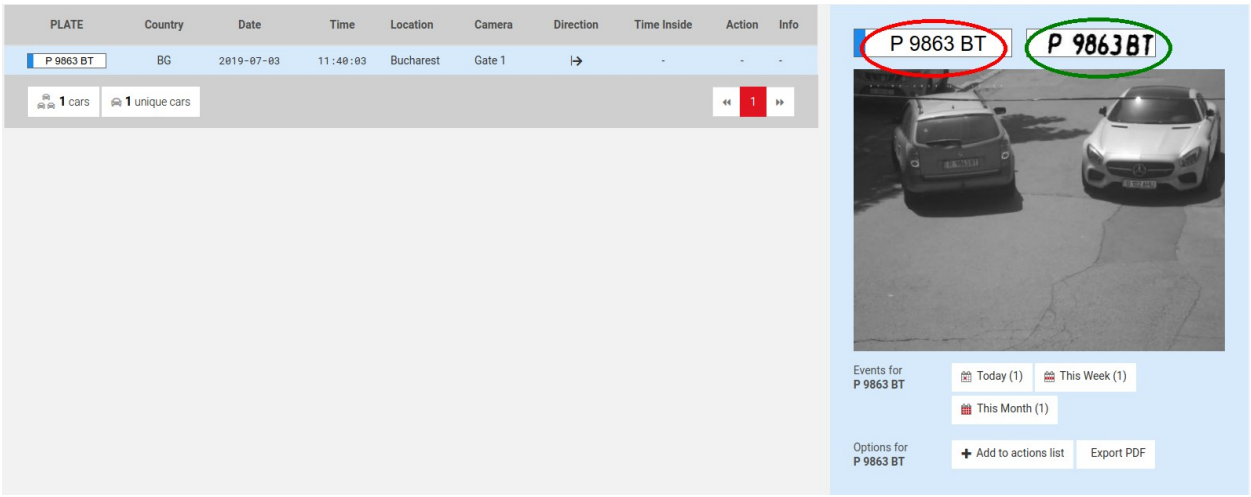
Attention. The analysis is done in real time, so a 29 minutes file will be analyzed in 29 minutes. Also, remember that you have a limit of 2 GB upload for a file.



8.11 LPR SETTINGS

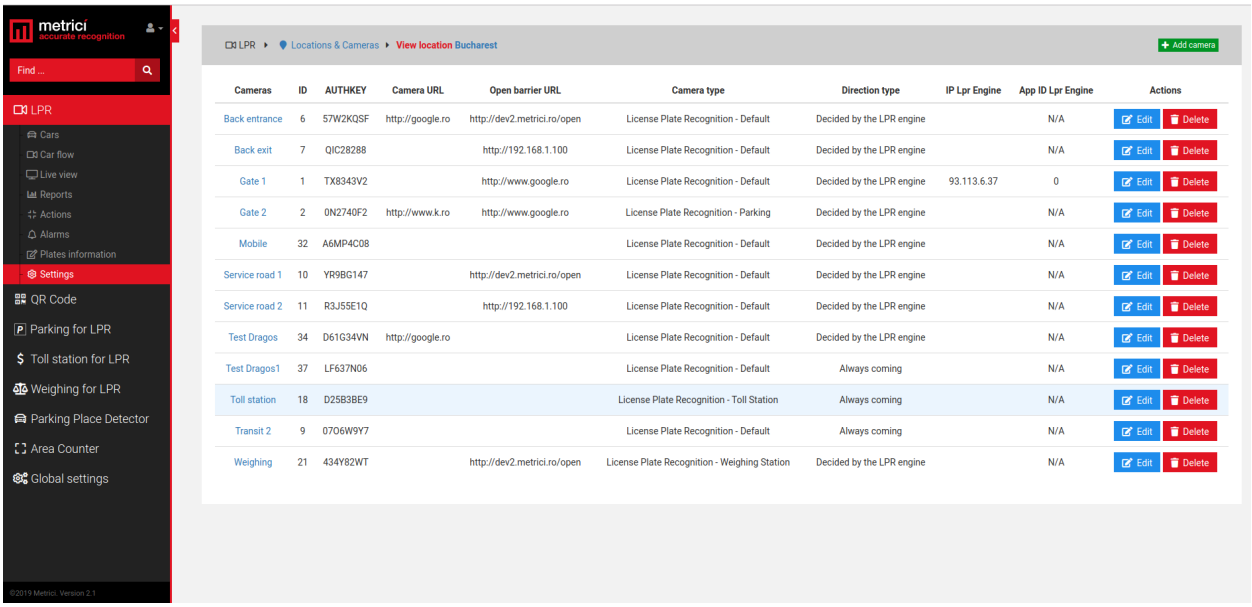
You can set here some parameters for the LPR module, Minimum probability display is from what percentage up number plate is introduced in database. By default minimum probability is 0.6 which means a 60% probability.

Show original plate is an option to display the photo of the number plate as was seen by the system in the moment of detection.
In the next image with green circle we have the image from the camera and with red how the neural network recognized the number plate.



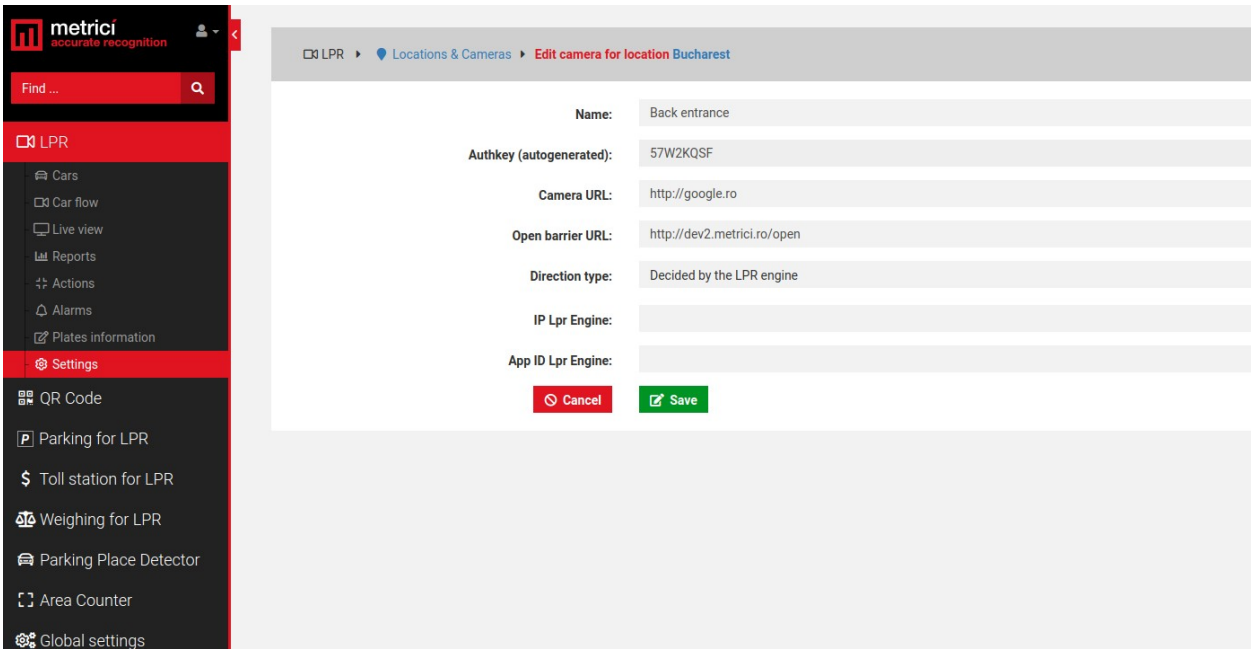
Delete plates after (days) is the time interval for which number plates are stored in database. 0 means the number plates/ detections are kept forever.

In this menu you can also edit the locations and cameras you manage for LPR in General Settings.



When selecting a location, a list will be generated with all the cameras introduced in that location, as in the image above

Click on a camera name to access its menu, as in the next image.



You can se set here some parameters.

The **name of the camera**

You can also see the **authkey** (authentificatiion key to communicate with **Control Panel**).

Camera URL: is the IP address of the camera which delivers the videostream.

Open barrier URL is useful in LPR application to open a barrier from Live view, with just a click on the image. You can set here the IP address for the barrier connected to this particular camera. A camera can only open/command only one barrier. In fact, the communication is not with the barrier, but with a LAN controller which commands the barrier.

Direction Type: This option is overwriting the direction information from detection engines. The setting options are **Always Coming, Always Leaving and Decided by LPR Engine.**

These options were added for the situation in which the detection is decided by trigger from an inductive loop for example. So, when Metrici is trying to detect license plates, the vehicle is probably stopped. In this situation, Metrici can not calculate which direction that car is going. Metrici detects the direction of movement by analyzing the differences in two successive frames. If the car just stays Metrici can not detect direction.

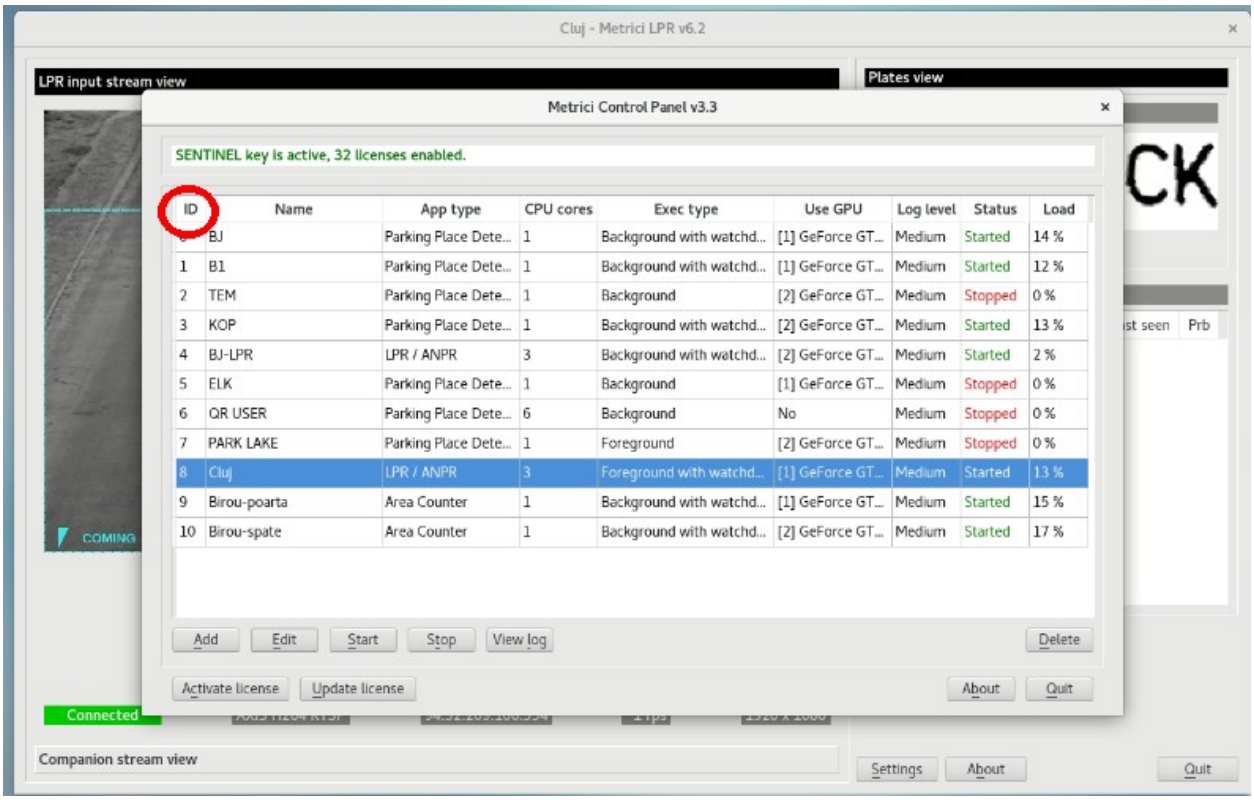
So this setting was introduced as a way for Metrici interface to rightfully calculate the car flow in and out of a parking. If the setting is **Always Leaving**, Metrici will know that any successful detection means a car is leaving the parking and will increase the number of free parking spaces in that location.

The next settings refer to the possibility of an image snap when opening a barrier from Interface. Usually if a barrier is opened from interface, the event is recorded in database but no image is saved for that event. Next settings come to remediate that problem.

IP LPR Engine is the server's address on which the Control Panel is active. It can have the form localhost, or an IP adress as 192.168.1.1, for example.

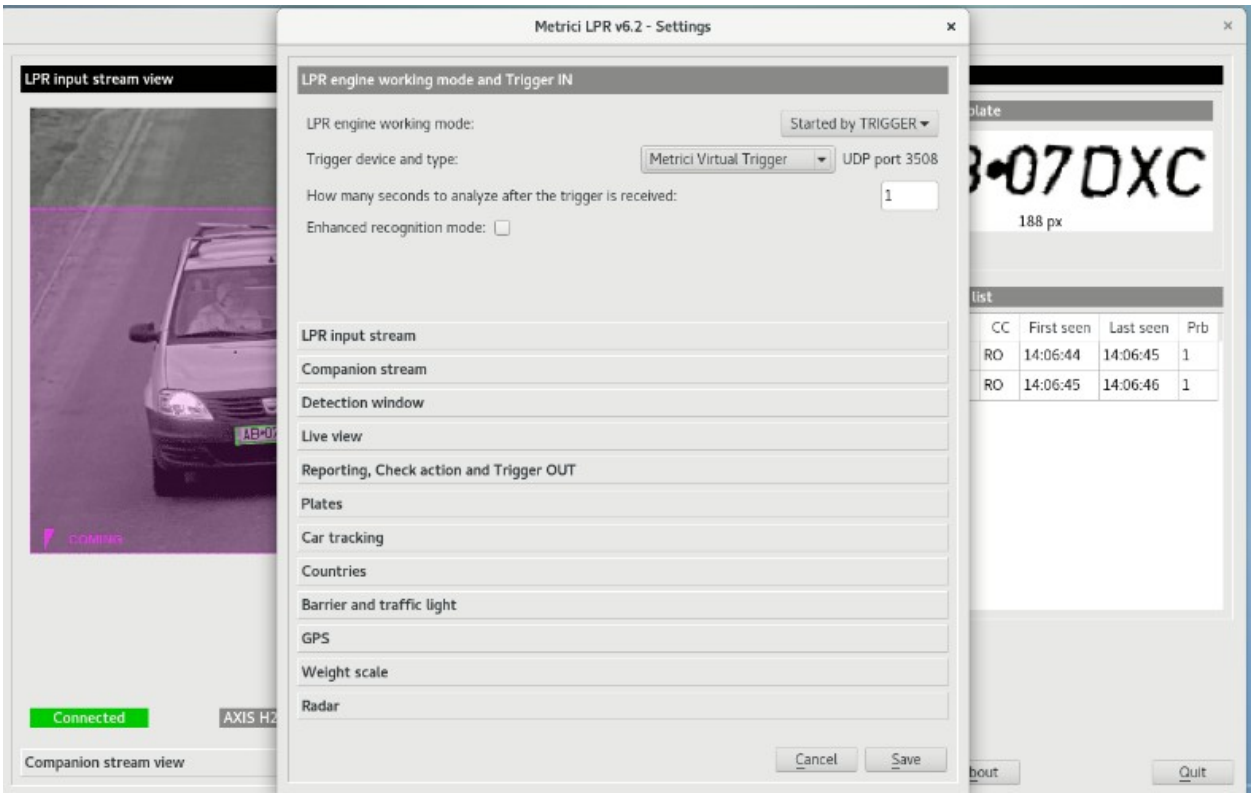
APP ID LPR Engine will be copied from Metrici Control Panel. When a camera is introduced in the system it automatically receives an ID in Control Panel.

APP ID for each camera is the first column of the left in Metrici Control Panel, as in the next image.



For a succesful functionality, some more settings have to be done: you select **Metrici Virtual Trigger** in Metrici Control Panel. For this, pick a camera, set it in **Foreground with watchdog** and access its settings.

For **LPR Engine Working Mode and Trigger In** tab**,** select Working mode **Started by trigger.** In the dropdown menu for **Trigger device and Type** choose **Metrici Virtual Trigger,** as in the next image.



If all settings were properly done, when opening a barrier from liveview in Interface, a trigger is sent to the LPR engine and a photo capture will be saved in database for that event.

Press Save button when done.

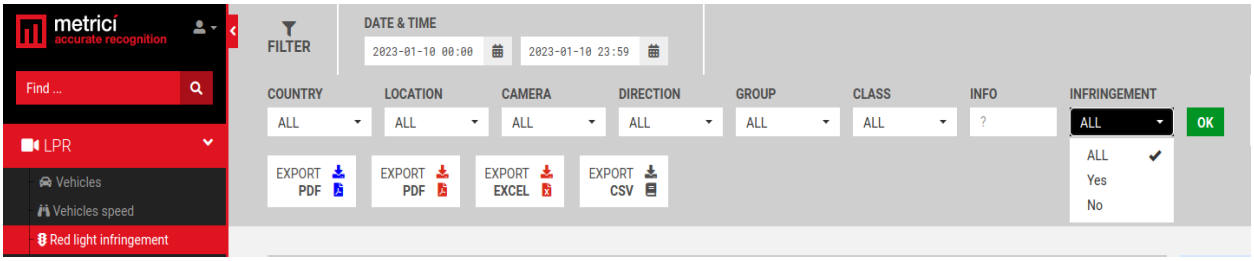
Border Camera- with two options- yes or no. A border camera is usually installed in a parking lot and this type of camera is the only one who is allowed to increase or decrease number of free places inside the parking lot. For example, the border cameras are the ones at the barriers. If any other cameras are installed throughout the parking lot, you will set them as border cameras – no. There are parking lots where, for

example, cameras are installed in strategic points around the parking lot to guide drivers.

8.12 RED LIGHT INFRINGEMENT &SPEED

Keep in mind that this menu works only when you have a companion camera linked to the LPR detection one. This camera should watch the face of a traffic light in ful view- not obstructed by any other object!

When RED LIGHT INFRINGEMENT menu in left column is chosen, a new filter menu appears on top of the page, where you can filter cars crossing on red light or not.



If you choose yes, you will see only car that did not stop on red light of a traffic light. This option is only available to LPR Plus module and can be activated when you have a companion camera working with the LPR one. For this menu to work you will make a detection area around the traffic light in your companion camera stream in Metrici Control Panel and Metrici will permanently see what color the traffic light is and will “inform” the LPR detection engine. When a detection is made and the traffic light is red, the event will be saved in database as a RED LIGHT INFRINGEMENT. Also keep in mind that the LPR detection area should suppose to be past the traffic light.

The Speed menu works in the same way, but when a Metrici Controller Radar is connected to the LPR engine, any LPR event will have a speed attached to it that could be filtered in the Interface the same way as red light ones.

Chapter 9

ADD-ON: PARKING MODULE FOR LPR

The parking module adds some features to the basic LPR. Among the features introduced by Parking are: possibility to create tenants and subtenants, possibility to reserve parking spaces for them, manage a location by floors or sections.

Be aware that to have the settings for Parking module visible in the interface, you must first introduce at least one camera in General Settings/ Locations and Camera as camera type Parking for LPR. You will also need a valid Metrici license.

9.0 GENERAL PRESENTATION AND FEATURES

Some other features are common to all LPR modules, some are dedicated to this specific module.

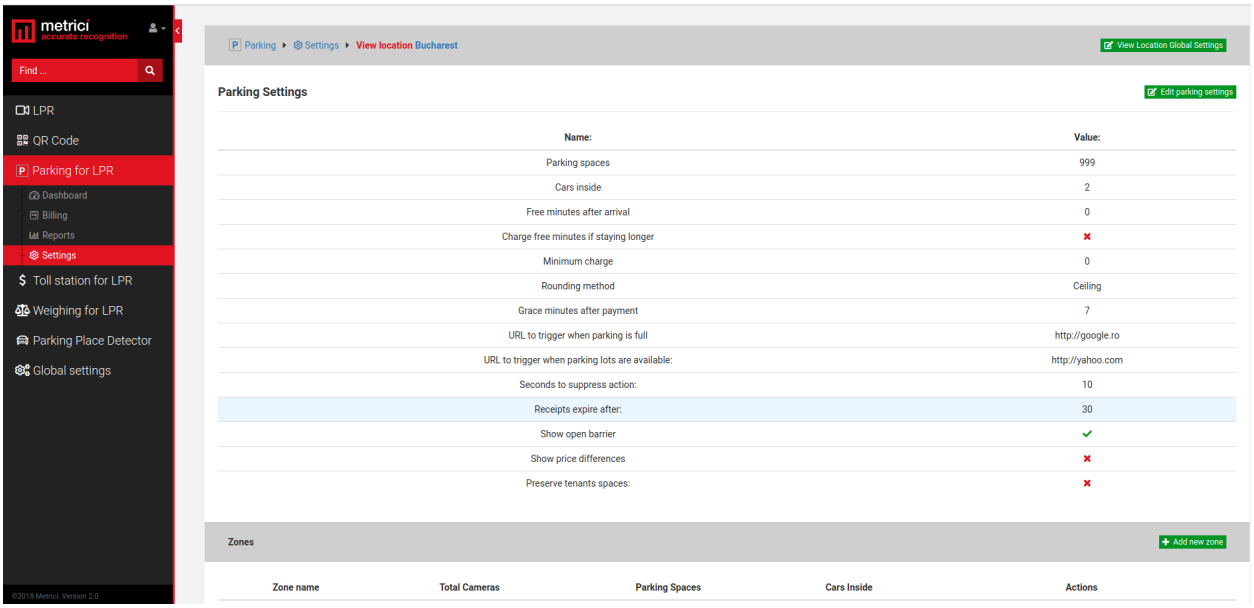
- The module allows defining the total parking spaces in a parking lot. The system calculates the number of occupied spaces and can command a traffic light or a display when the parking is full, or almost full at a capacity of...
- An unlimited number of spaces can be managed
- The parking can be organized in sections or stories and each one can be managed individually
- It can display total number of free parking spaces by stories or sections, if it is the case, and some other customized messages on a LED display
- It keeps track of the cars, free spaces, busy spaces, total. Any of this information or some others from Metrici can be sent to a LED display
- A user can define an unlimited number of timetables and pricing units, by the hour, half an hour, daily, fixed price, one pass etc.

- A timetable can be set to deny access in the parking between certain hours, or after 10 PM, for example.
- A time interval can be set in which a client who entered a parking can exit without pay(15 minutes, 2 hour etc)
- Integration with cash registers
- A user can set the mode for pricing roundup (up or nearest value).
- A time interval without pay can be defined. In this time interval, a visitor can exit without limitations.
- It automatically calculates time spent inside, total value to be paid and can deliver a receipt. Automatic calculation of the receipt is based on the timetables the manager sets: e.g. a differentiated price for day/night, week days/weekend, work hours or not. Depending on the time and interval spent inside, the system will generate a receipt. Any customized information can be printed on the receipt.
- The barrier can also be "manually" opened from live view – the event is recorded in database.
- It supports an unlimited number of operators, LPR cameras and cash registers. Each system operator can have its own administration rights.
- It supports defining groups and vehicles with subscription and free access.
- An unlimited number of tenants can be defined in interface. Each one of them can have their own interface in which to manage the car fleet, access program, access list. Each tenant can organize his own subtenants- for example a company can give a number of spaces to each of its departments, from there to each subdepartment. The numbers of levels of definable sub rentals is unlimited.
- The administrator has access to reports regarding the traffic, the payments, top cars, number of cars daily, monthly, number of cars at each camera, peak hours etc.
- The reports can be exported in PDF or XLS format.
- The system calculates time between 2 consecutive detection for each number: e.g. time spent inside, time on track, last events in the last day, week, month.
- Preserve tenants spaces: this option is to be used in parking lots when you want that parking spaces for the tenants to be always available for them and not for the other clients even if they are not occupied. Even if not all the

spaces for the tenants are full, the software will not include them in the calculation for available spaces if this option is checked.

- The system lets the user set special access lists: White list. The cars on this list can have a different statute: open barrier, free access, no charge. Possibility of a Black list: when a plate on that list is detected, the system will send an alert – email, SMS, pop-up.
- The system grants access in the parking based on a SMS which contains the license plate number. As a security feature, the number which sends the SMS must be on the white list for the phone numbers accepted, as in which can grant access to someone inside the parking. As a customized feature, this also could be integrated as a payment method.
- Alarms features: Alerts by e-mail or SMS when an event occurs: a certain number is detected, or a car stays more than x hours in the parking.
- Any number in the database can have special setting: for example the timetable in which can have access, the entrance where is free to enter etc.
- A detection window can be set.
- An ambient camera can be set along the LPR camera and the images from the two cameras are linked and both are saved in database. The user can have a larger image from the moment of detection or from a different angle, with the face of the driver etc.
- The system can function continuously or at trigger: inductive loops, radar, sensors.
- Also, a time interval can be set for a client to exit after he paid.
- Parking management with the interface from anywhere in the world and from any device (smartphone, computer, tablet) with internet access through the dedicated site.
- Special privilege for vehicles or group of vehicles which can have access free of charge.
- Search filter din database by number plate, location, date, camera, country, group.
- Integration with external systems and databases.
- Logs: Metrici saves information about the communication with external systems. In case of a malfunction, a log file can be accessed to fix the problem. Metrici keeps track of all the changes of a user.

9.1 SETTINGS



Click on the upper right green button Edit Parking Settings to modify the values of your parking.

- **Parking spaces**: total number of places that are inside the location
- **Cars inside** are numbers of cars that are already inside the parking when the parking module was activated. This number modifies live, but you can manually alter that number for the system to keep a correct count down. You can also empty the parking from this menu when you want. Or just add new numbers according to your needs. Be aware that if a vehicle leaves the parking without being registered or detected by Metrici, this will be considered as inside. When the parking is considered full by Metrici, it will no longer open the barrier. A parking might be in this situation if a barrier is open by remote control or even from Metrici Live View without writing the license plate and the direction.
- **Free minutes after arrival-** is a time unit in which a car entering the parking can exit without pay

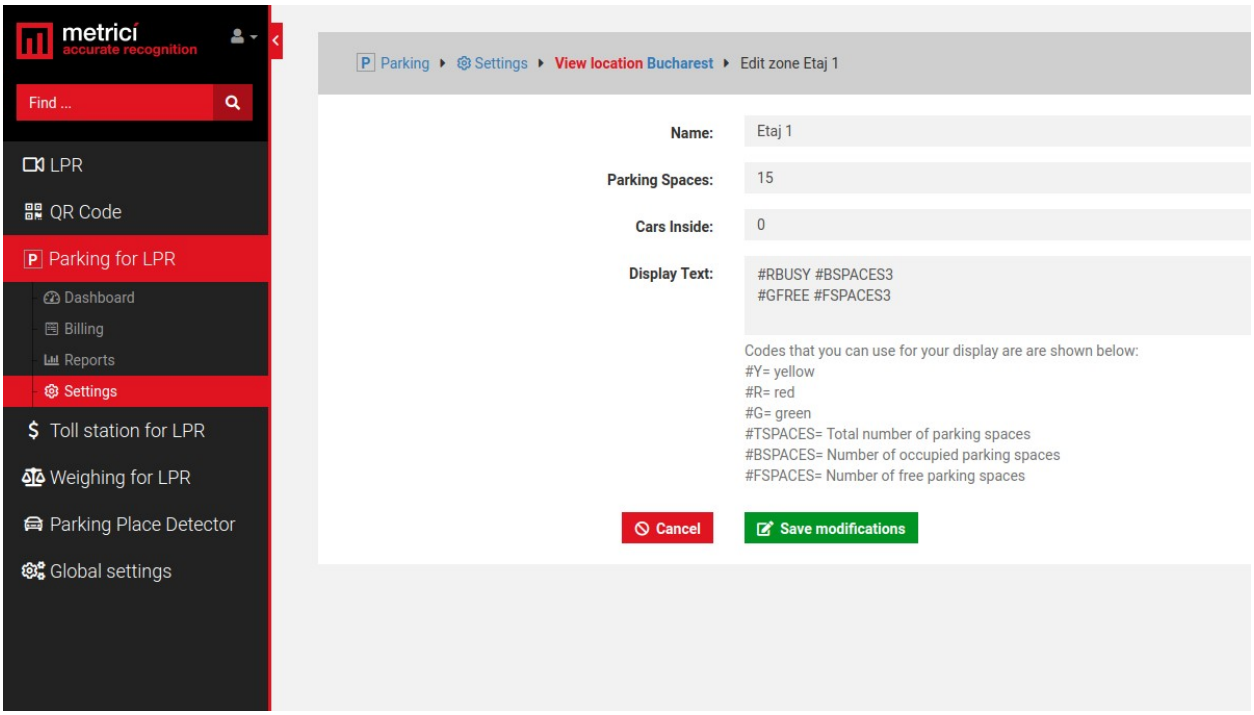
- **Charge free minutes if staying longer** is an option that if checked will count as paying time even the minutes defined in the prior step and will be added to the amount to be paid
- **Minimum charge** is the minimum amount of money a client will pay no matter how long he stayed
- **Rounding method**: There are two methods for rounding a sum to be paid: Ceiling and nearest value. Ceiling is suppose for the system to calculate the sum to be paid always to the highest value. For example, a 2 hours and 15 minutes stay will be charged as a three hour stay. The nearest value will round up low or high, as it is the case. For example a 2 hours 29 minutes stay will be calculated as a 2 hours parking, and a 2 hours 31 minutes stay will be counted as a three hours parking.
- **Grace minutes after payment** is a time interval in which a client can leave the parking after he paid.
- **URL to trigger when the parking is full** is the address of a hardware device to be accessed when there are no more spaces in the parking. This can be a LED Display, a traffic light, a barrier etc.
- **URL to trigger when parking lots are available** is an IP address of a hardware device to be accessed when there are free spaces.
- **Receipts expire after** is the time interval in minutes in which a receipt is valid- in minutes.
- **Show open barrier** when checked a button to open barrier appears on screen on liveview
- **Show price differences** when checked is a useful feature for when a client pays but will not exit in due time (in the time we set at the menu Grace minutes after payment). When this option is active it will display a total amount to pay and the difference between what he already paid and what owes next.
- **Display Text**: The code written here tells a Metrici display what information to show for that specific location. Here you will also find the URL you will fill in the display for it to know where to look for information. This will have a form such as **http://IP_OF_THIS_SERVER/io/lpr/location_display.php?id=1.** More information on this subject you can find in displays' users manuals
- In this menu a user has also the option to empty the parking. In case this button is clicked Metrici will count from zero- will consider there is no car in the parking and will display all the places as free.

- **Seconds to suppress action** is a time interval for a location in which an action will not be executed, even if set in the interface. It is in fact a time interval in which a number plate is ignored. This is useful in locations in which a car is seen with one camera and then almost immediately after by another camera so not to open the barrier twice for example. This settings is to be found on LPR/Settings. Clik on Edit button to set how many seconds an action to be ignored.

9.2 ZONES

A zone of a parking lot can be a story or a section of a parking. In cases, you have zones in your parking, Metrici will keep track of the places free/busy for each one.

Click on a zone name or on Edit button to modify the data for a parking zone.



Choose a name for your zone, as Story 1 or Section C, for example, allocate a number of parking spaces. When creating the zone, at Cars inside menu you write the number of cars that are already in that zone.

Display text is the text that will be shown on Metrici LED Displays where

#RBUSY #BSPACES3 will display in Red a text as BUSY 385 (where 385 is a number got in real time from Metrici database).

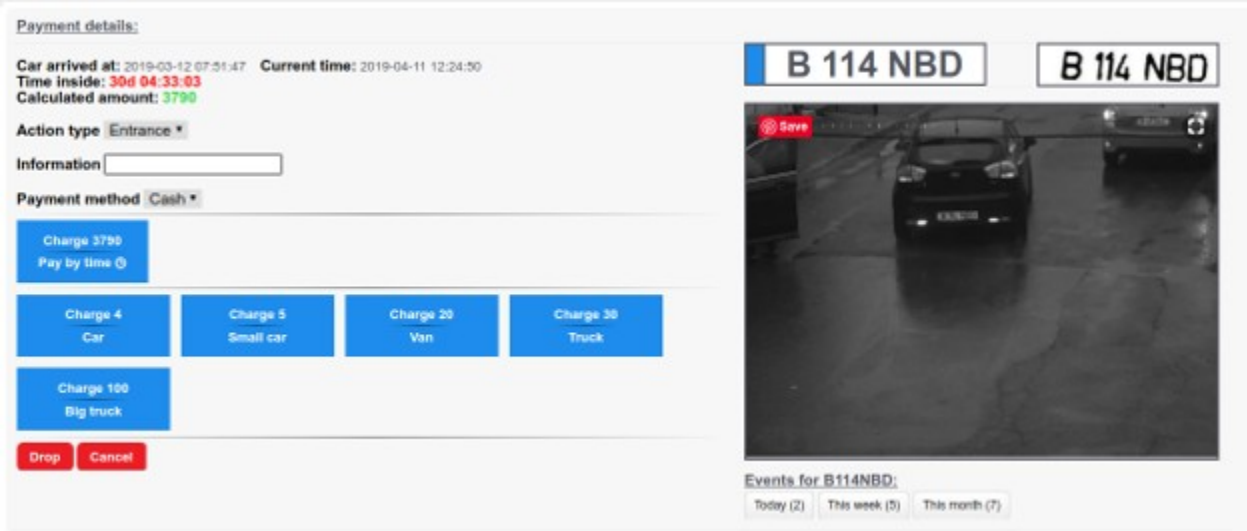
9.3 CASH REGISTER

Click on the green button Add New Cash Register to add a cash register. A cash register is only linked to a camera.

When new cash register is set, choose a name. Default item name is the name to be printed on the receipt – for example “ Parking Tax Mall Promenada”

Receipts expire after is the time interval in which the receipts are valid .

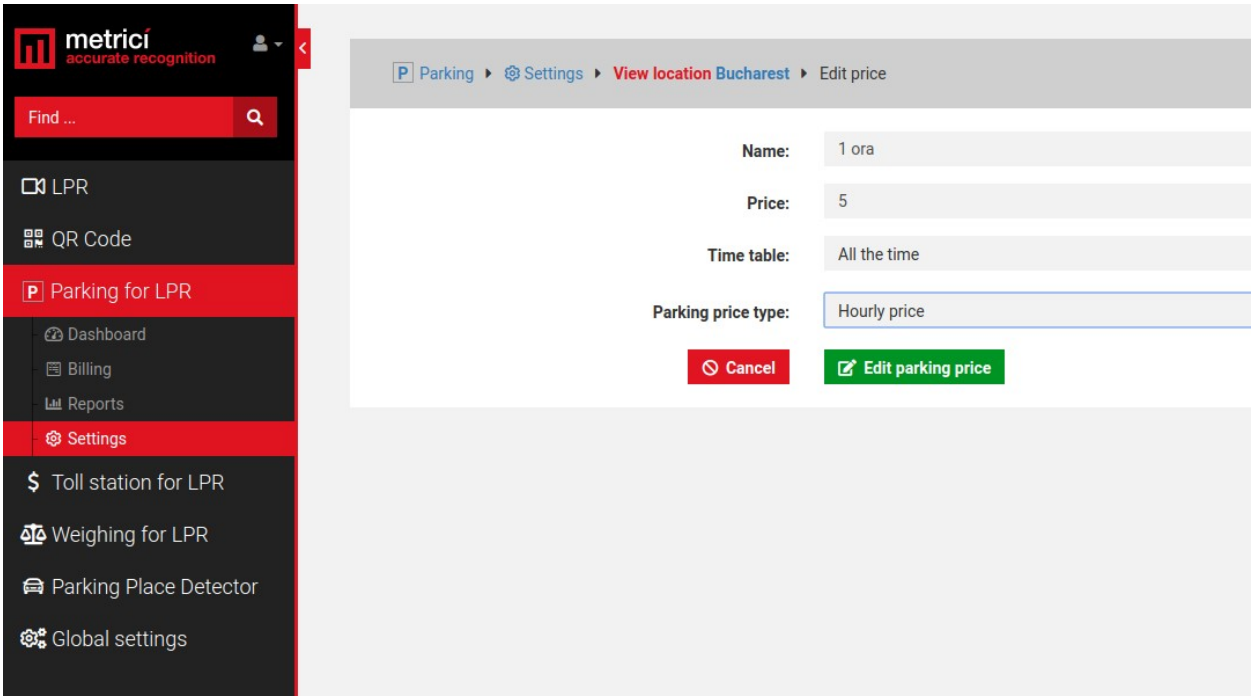
If more parking prices are defined (see next chapter), when charging a number plate more options appear as in the next image. You just choose the correct one fro that particular vehicle.



9.4 PARKING PRICES

You can set here as many parking prices as you want.

Click on Add price button to add a new price



Choose a name for it, what is the sum and the time table for this price. The price will only be applied in this time table.

Parking price type can be hourly, half an hour price and one-time. Hourly will calculate that price per each hour of stay, half an hour price will calculate the price for each half an hour of the stay, where one time is a fixed tariff no matter how long a car stays in the parking.

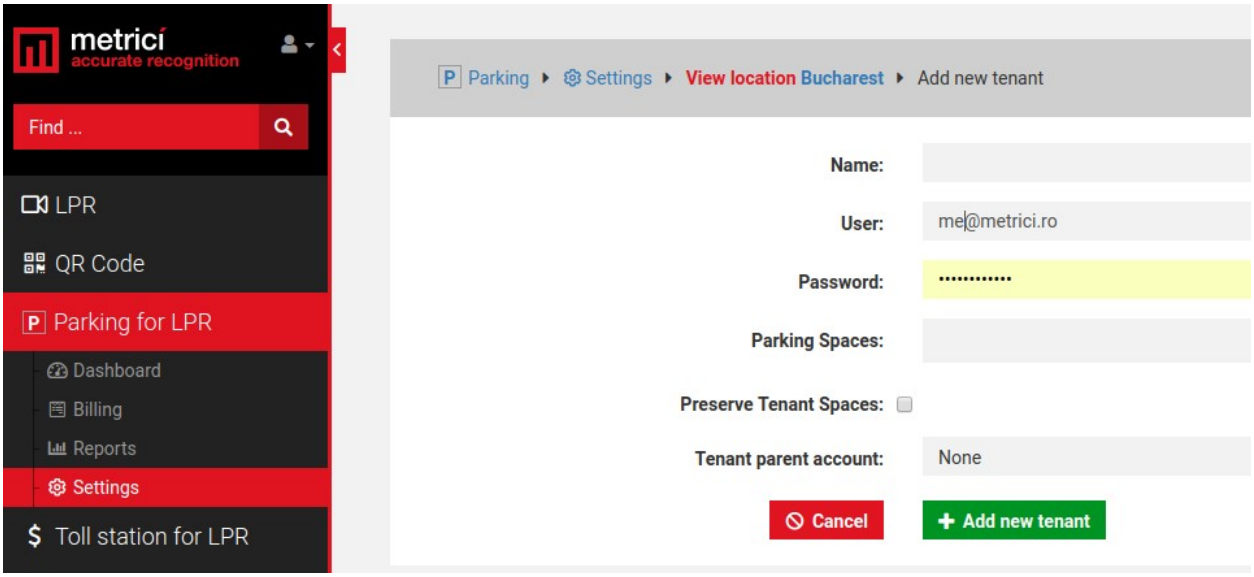
If you have a parking that has differentiated tariffs for weekdays and weekend, for morning or over night, you will have to do first a timetable for that time intervals. Then you go to parking prices and define the prices for that periods (hourly or one-time).

9.5 TENANTS

The tenants are a group of people/vehicles that have some things in common. As for example, a big office building can create a tenant for every company in the building that rented space. Or a factory can create tenants for every department and so on. At its own turn, a tenant can create its own subtenants and so on to unlimited levels.

The only condition that you have to respect is to be careful that the subtenants doesn’t have allocated more parking spaces than its “parent”.

Add a new tenant by click on the green button.



Choose a name for it which will be displayed in Metrici Interface. The user and password are the sign in credentials with which this tenant will access his own interface to manage his number plates and other data.

By default these data are filled automatically with the users credentials that creates the tenant, but can be different.

Allocate a number of spaces for that tenant and choose whether or not these parking places will be reserved by checking “Preserve Tenant Spaces” button. In this case the number of spaces allocated to this tenant will not be counted for everyone and will not be displayed as such but will always be reserved.

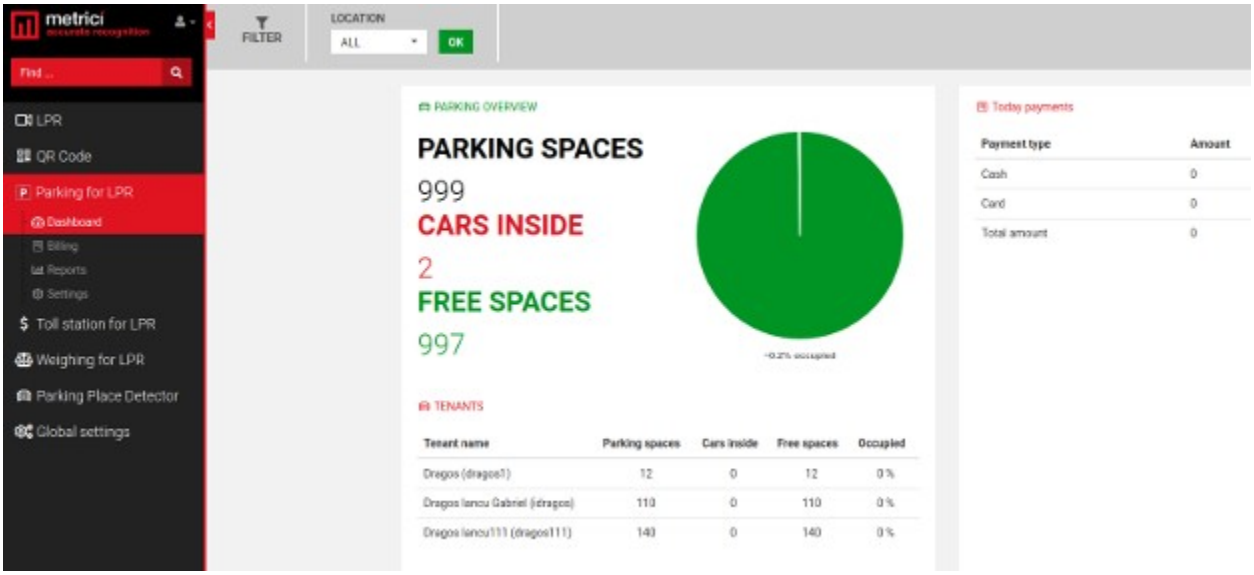
Also keep in mind that if a tenant has, let’s say, 10 parking spaces, but has a list of 15 cars that are allocated to him, after the first 10 enter the parking, the barrier will not open for the remaining 5 even if there are spaces available in the parking. Other of tenant’s vehicles may enter as his cars from inside the parking start to exit, so that he will not have more then 10 cars at the same time inside the parking lot.

Tenant parent account: if this is a subtenant for another tenant, choose who the tenant parent is.

Click on Add new tenant when ready.

9.6 DASHBOARD

Will display some graphics and information as the next picture



Total number of spaces defined in the parking lot, how many are busy and how many are free.

Also, the information about tenants will show how many spaces each tenant occupied.

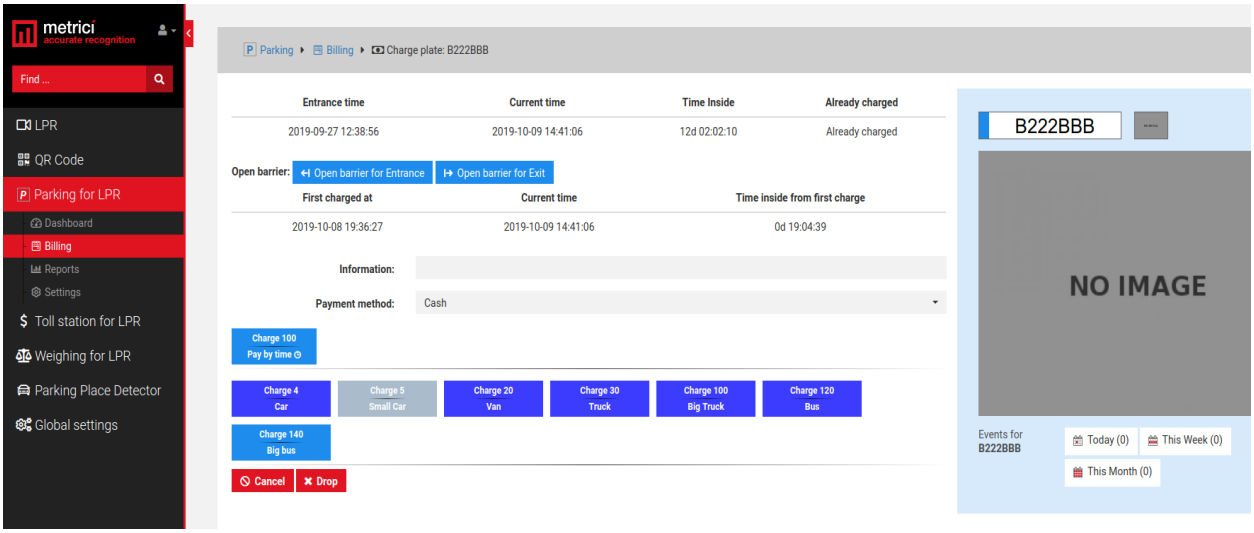
On the right there are info about the financial records of that day.

9.7 BILLING

This menu is useful when a car wishes to leave and it has to pay. The menu is also useful for when the number plate is not visible. There are two lists of cars in this menu. Cars that are inside the parking and cars that already paid but haven’t left the parking lot.

For the data to be shown in this menu, please select location, and cash register which will be used to bill the car.

The menu show info about the cars that are already inside and can be billed. When click on a number plate a window like next one will open, with all the options for payment available.



The system automatically calculates how long the car stayed in the parking and the amount to be paid if there is an hourly price.

If it is a one-time tariff, choose the appropriate one. All prices are color coded.

The information field is what to be printed on the receipt, besides the usual data (for example a company name or a Tax Identification Number).

Method of payment is cash or card. Choose the appropriate one for the cash register to properly function.

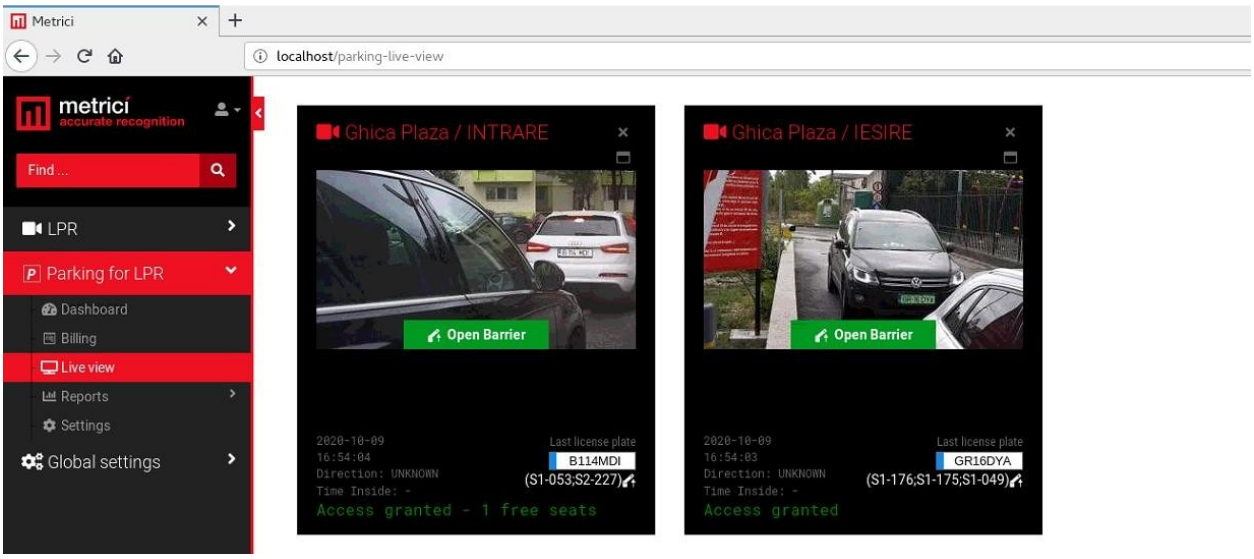
The red **Drop** button button will “take” the car out of the parking and the number of free spaces is automatically incremented by one- in fact the vehicle is simply discharged from the system. This is useful when a car left and the system didn’t see it or the cameras didn’t work etc.

The blue buttons **Open barriers for exit** and **Open barriers for entrance** are optional are to be used when the cash register is at the barrier and the operator can manually open the barrier. If the barrier is at another location, the barriers will be open automatically when a number plate is recognized and the system knows it already paid. The car at the barrier must be in the established grace minutes.

If the car won’t leave the parking in the time set in “grace minutes after payment”, the barrier will not automatically open at the exit. A new bill will must be issued for that vehicle to may exit.

9.8 LIVE VIEW

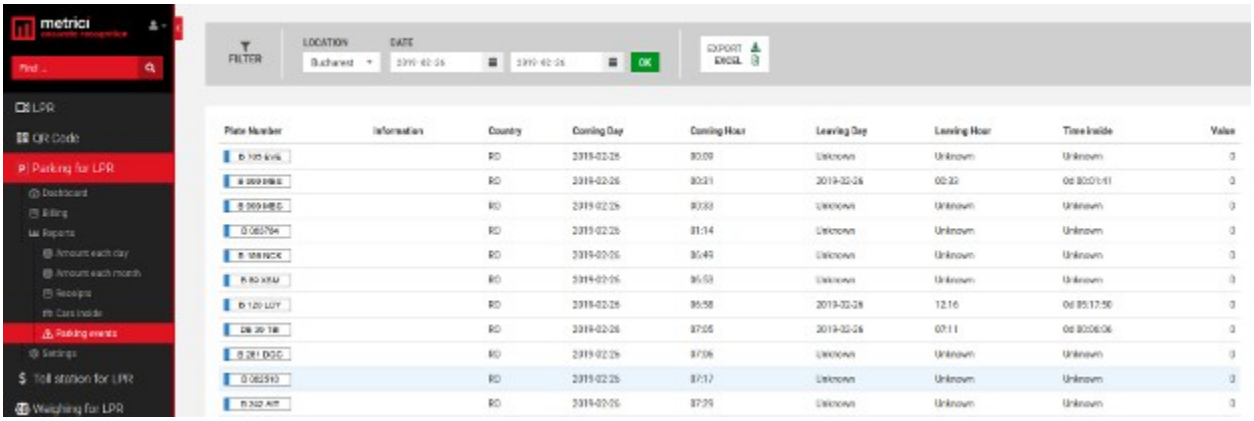
This menu allows to see a flow in real time of cars entering or exit a parking from a camera or all cameras in location. When a license plate is detected, an operator can manually open a barrier, from the tab on the screen. Also some additional information are displayed, such as the tenant (if it is the case) and how many parking places has available for it and if access is granted.



9.9 PARKING REPORTS

- **Amount each day** – will display how much was collected each day of the current month or another time interval chosen from the filters.
- **Amount each** month will display a monthly financial report.
- **Receipts** will display a list with all the receipts printed by the system for the chosen time interval, along plate number, a time stamp, location, cash register, payment method and value.
- **Cars inside** includes a list with all the cars that were detected entering a location, but haven't left yet. For each number plate there are displayed information about the location, the arrival time, current time, time spend inside in days and hours.

Parking events is a list with all the events registered in the selected location as in the next image



CHAPTER 10
ADD-ON WEIGHING STATION MODULE

10.1 SETTINGS

The weighing module is a complete autonomous way to do the weighing with no human intervention. The module allows access on the scale and off the scale based on a predefined list. Also emits alerts when the weighing difference is bigger than an established percentage.

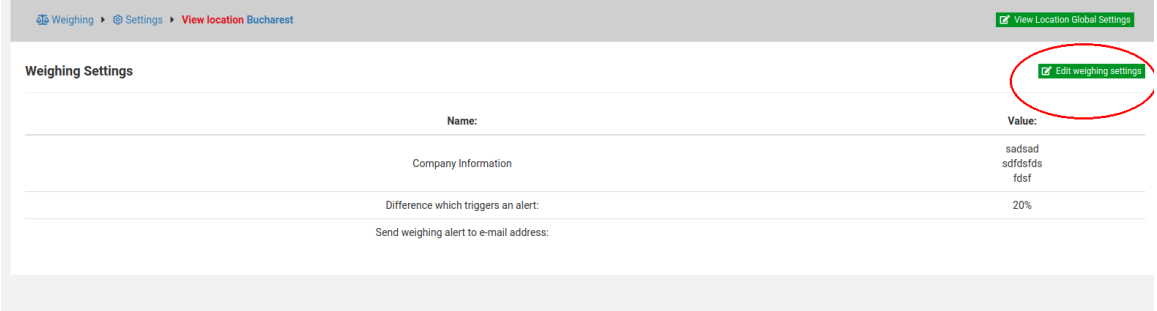
Usually, this module is integrated with three sensors, barriers, a green light/traffic light and the weighing station itself.

In order to do the setting to this module, you must first introduce at least one camera dedicated for Weighing Station Module.

Go to Global Setting/Locations and Camera and make a location or choose an existing one and add one camera. Choose Camera Type as “License Plate Recognition - Weighing Station”

When you return to Weighing module you will notice in settings the cameras introduced as for this purpose.

Click on view button for each camera to edit the settings.



In the next window, choose Edit Weighing Setting green button, on upper right (see picture above).

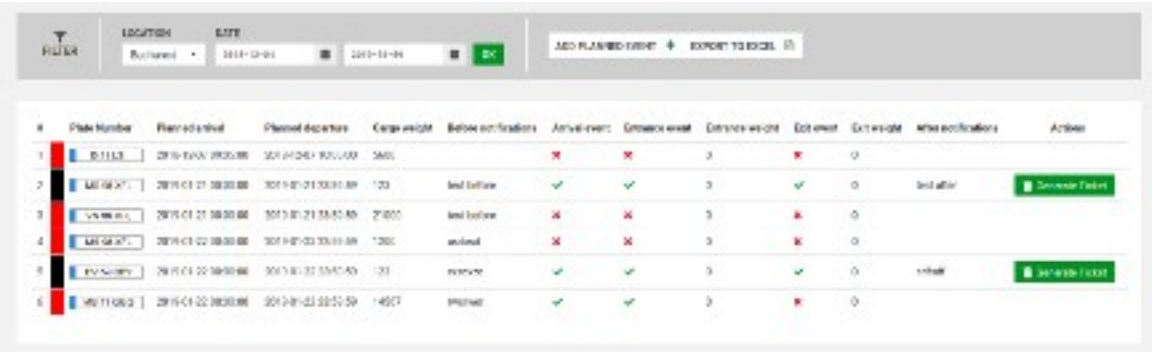
Company information is the data that are printed on a bill, in case this module is integrated with a cash register.

Difference which triggers an alert is the percent to which an email will be sent when the cargo has a weight difference of plus or minus.

Send weighing alert to email address is where the alarm is sent.

10.2 ADD EVENT

In order to benefit of these you need to add events to your weighing calendar. Go to Events and click on ADD PLANNED EVENT



In the next window (see picture below), you will fill in the plate number of the vehicle that will be weighed. You also add the dates for arrival and departure. It is not a problem if arrival hour and departure hour are not really well known, but the day is of most importance.

You also add how much weight the vehicle is suppose to load. When all these data are filled in, the plate number is introduced on a dedicated Action List for weighing.

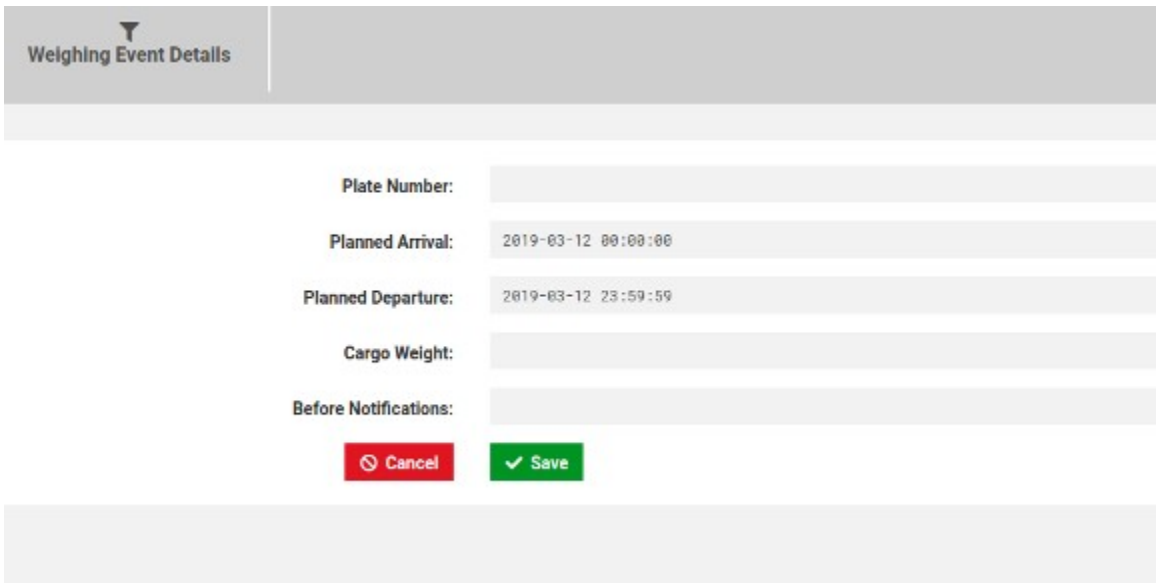
Metrici will allow access on the scale when the vehicle is detected and opens the first barrier. Then it waits for the weighing to stabilize, records the weight which is filled in a color coded event list – this is the empty weight.

Usually a series of sensors connected to Metrici will indicate the driver how to position the vehicle and lights a green light when the position is right.

After that, Metrici will open the second barrier to allow the vehicle to leave the weighing station and enter the location.

At the departure, the vehicle is weighed again and Metrici calculates the cargo weight. If the difference is bigger than a predefined percentage, an alarm is initiated.

It is very important the vehicle to follow the steps, as if one is missed, the actions can not be completed



On the Dashboard menu you can see a list of events for that day, for the week or for a certain period of time.

This is the automated work flow for Weighing module.

Keep in mind that a vehicle will be able to enter the location only on the date we set in planned events. If it arrives a day before or the next day, for example, the car will be ignored and the barrier will not open.

CHAPTER 11
ADD-ON TOLL STATION MODULE FOR LPR

11.1 SETTING

The toll station module is a dedicated interface for managing businesses that suppose to base on charging vehicles based on types, for example.

As for any other module you must first add at least one camera as License Plate Recognition - Toll Station type.

For this go to Global Settings/Locations and Camera choose a location or create one. Add to this location a camera for toll station.

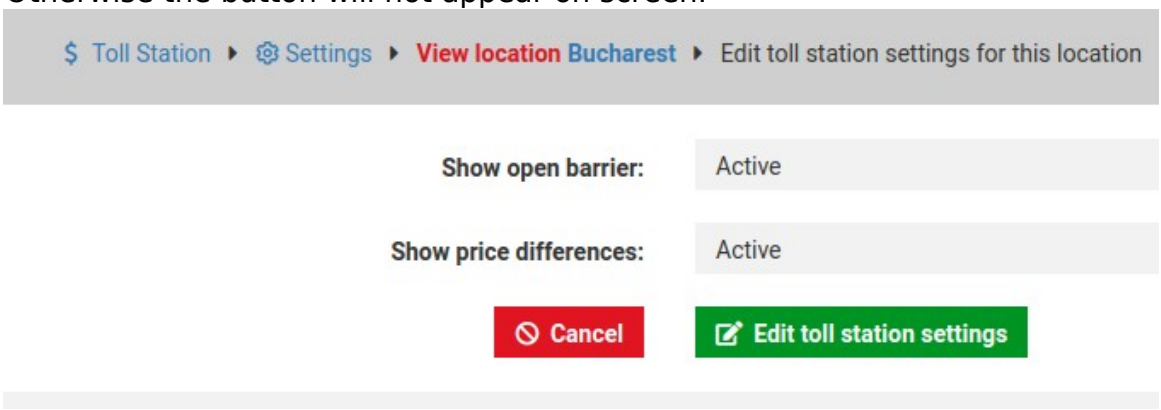
Now go to Toll Station for LPR settings and you will see here the cameras you added and the locations.

Clck on View green button to edit your settings or click on location’s name.

11.2 EDIT LOCATION

Click on Edit toll station setting where you have two options – see picture below.

Show open barrier lets a user open a barrier from live view when active. Otherwise the button will not appear on screen.



11.3 CASH REGISTER

In order to benefit of the full potential of Toll Station module, you need an installation with cash registers. As many cash registers as you want can be integrated with Metrici.

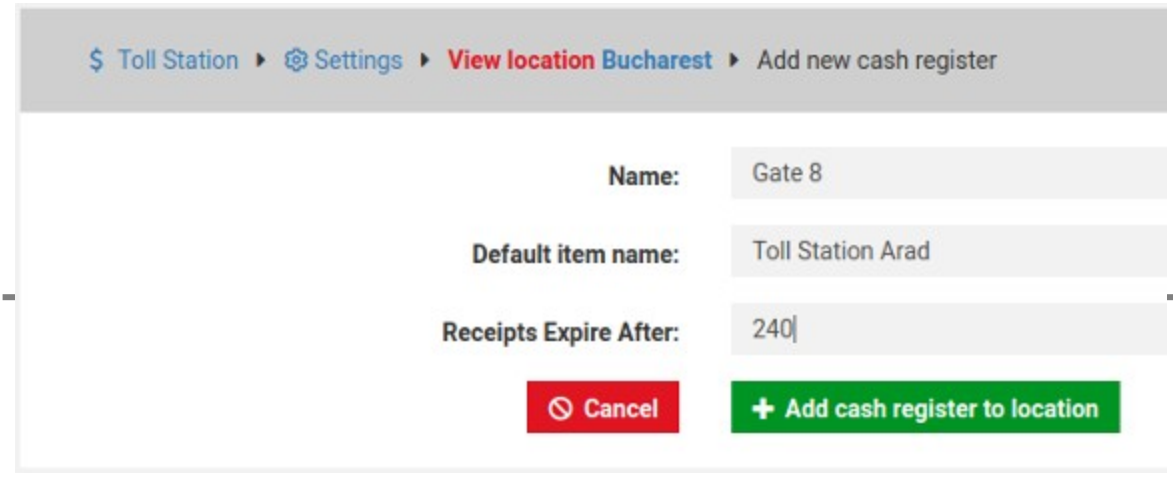
When adding a new cash register choose a name for it to better identify it in your list.

Default item name is the name of the “product” that will be printed on the bill.

Receipts expire after means that a payment allocated to a number is valid the time period you mention in this field. In that interval, a vehicle can pass and barriers open automatically

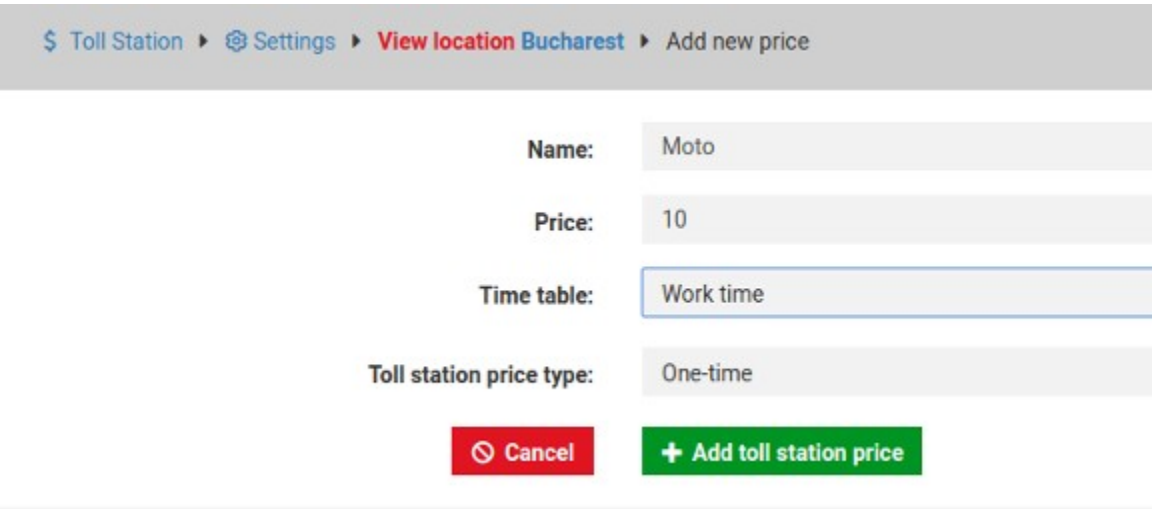
You will fill in THE MINUTES the receipts are valid so a 24 hour validation will mean 1440 minutes for example.

After all data are filled in, click on Add cash register to location.



11.4 TOLL STATION PRICES

You may add as many prices as you want to your location. You can also choose to what time table this particular price it applies to.



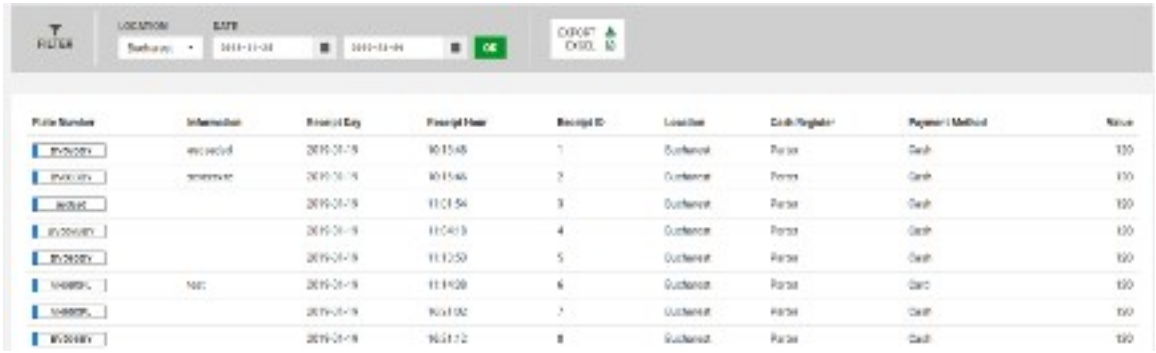
If you have differentiated prices for different categories of vehicles and also according to timetables, you will create more prices for each category of vehicles and each time table. For example you can have a time table weekend and one week days. So every category vehicle will have two prices defined: one for weekends and one for the days of the week.

11.5 REPORTS

Amount each day will let you see a graphic with the sums billed each day of a search interval.

Amount each month will generate a graphic with the sums billed each month of a search interval

Receipts will display a list with all the bills emitted during a time interval we select. The list will include for each bill: plate number, information (if any), Receipt day, Receipt hour, Receipt ID, Location, Cash Register, Payment Method and Value. See picture below.



11.6 BILLING

This menu acts in fact as a Car Flow/live view for Toll module. This includes a list of active receipts, meaning receipts that were printed and have not expired. After a receipt is no longer valid, it will disappear from this list.

When in billing, a user can emit receipts by click on a button. A user can also open a barrier from live view by click on the Open Barrier green button.

Metrici requires to write a motivation for opening the barrier from live view. This will be kept in database to be consulted later, along a snapshot from the live image.

11.7 DASHBOARD

In this menu you will see a list of the activity for the day as a Total Receipts, Active and Validated

The active receipts are the ones that are already in use. Validated are the one that expired.