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USER GUIDE

METRICI PARKING PLACE DETECTOR

CHAPTER 1 PRESENTATION

Parking Place Detector (PPD) is a dedicated tool developed by Metricí to manage large or small parking lots with IP cameras and software, with special features to help you better run your business and grow.

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

Metricí PPD is meant to fix problems in parking, security, retail, and comes with extra advantages of management and reports.

Metricí PPD sets the goal to eliminate some of the problems great parking lots have on everyday basis: which is the occupancy rate, which are the heat maps, how many visitors some have, what is the dynamic of a parking place or of the entire parking etc.

As any Metricí software, this module is separated in two. On one hand, we have the Metricí engines, where we introduce general settings for the IP cameras and on the other hand there is a Web Interface which can be managed on any device, where we have a user friendly interaction and control tools.

Metricí Web Interface will let you see, change, manage all the parking lot, or any parking space, create groups, alarms, time tables, introduce new user or change other, change status etc.

Any number of cameras and locations can be managed from same interface with different administration rights for any user.

CHAPTER 2

CENTOS 7 INSTALL

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

2.1 Kickstart CentOS installation

The indicated method to install CentOS7 and Metricí 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.

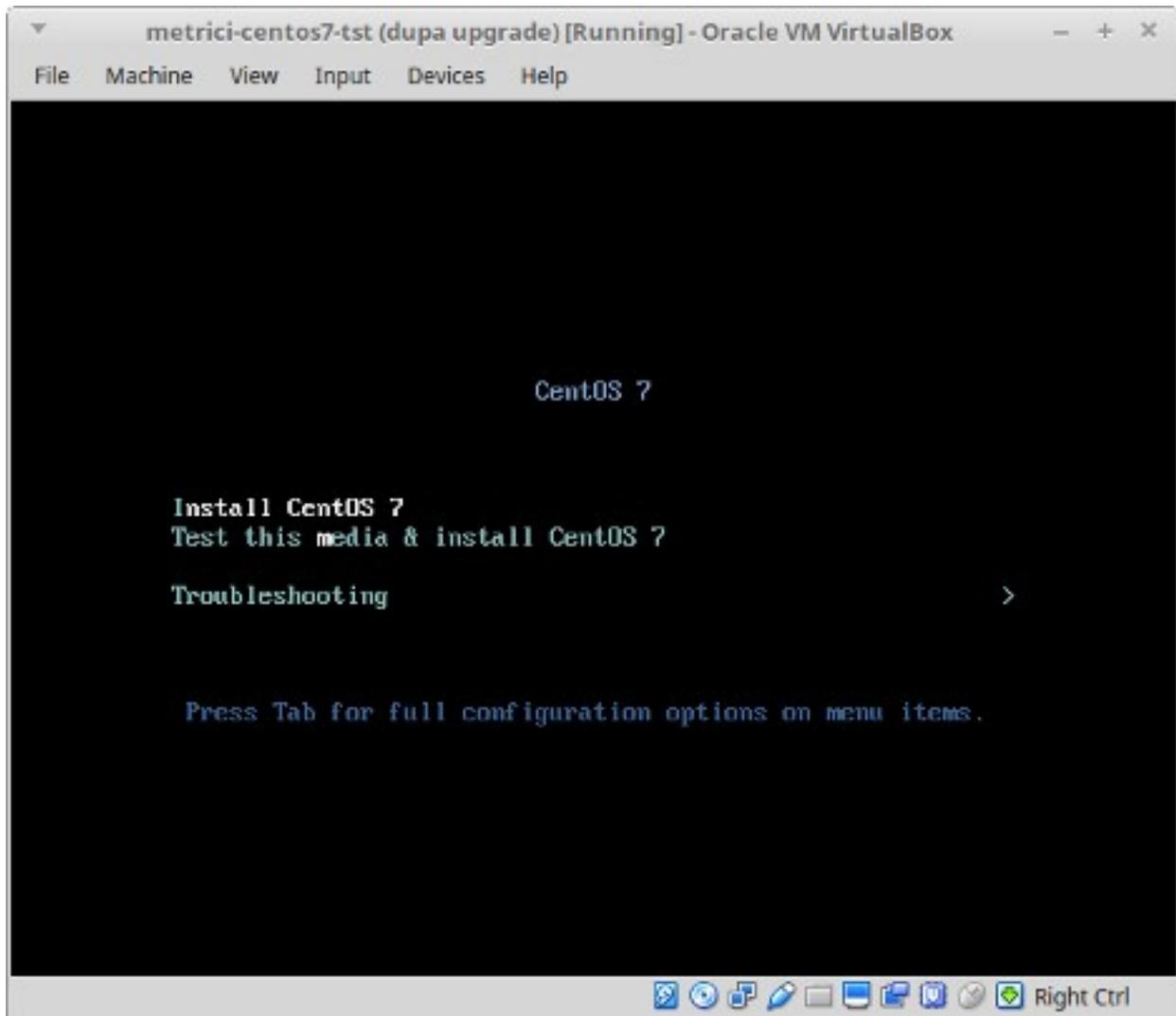
REMEMBER! For installing CentOS 7 and Metricí PPD, it is mandatory to have internet access, but only during install. After that, the web access is no longer mandatory and Metricí can work offline.

Download the image for CentOS: you can find the operating system on Metricí site at http://support.metricí.ro/operating_systems/

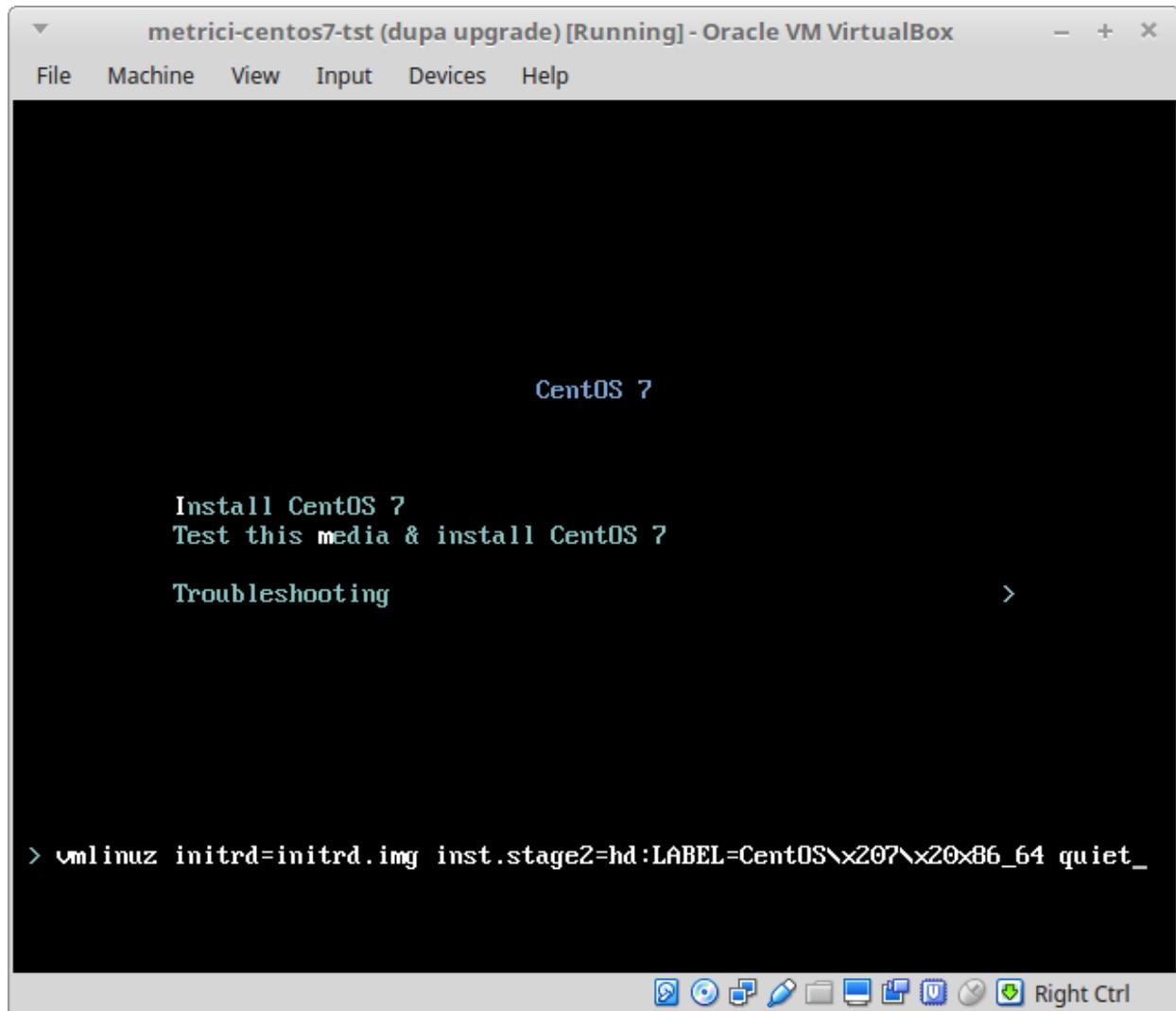
Download the Operating System and make a bootable stick or DVD.

REMEMBER! 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 USB stick.

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



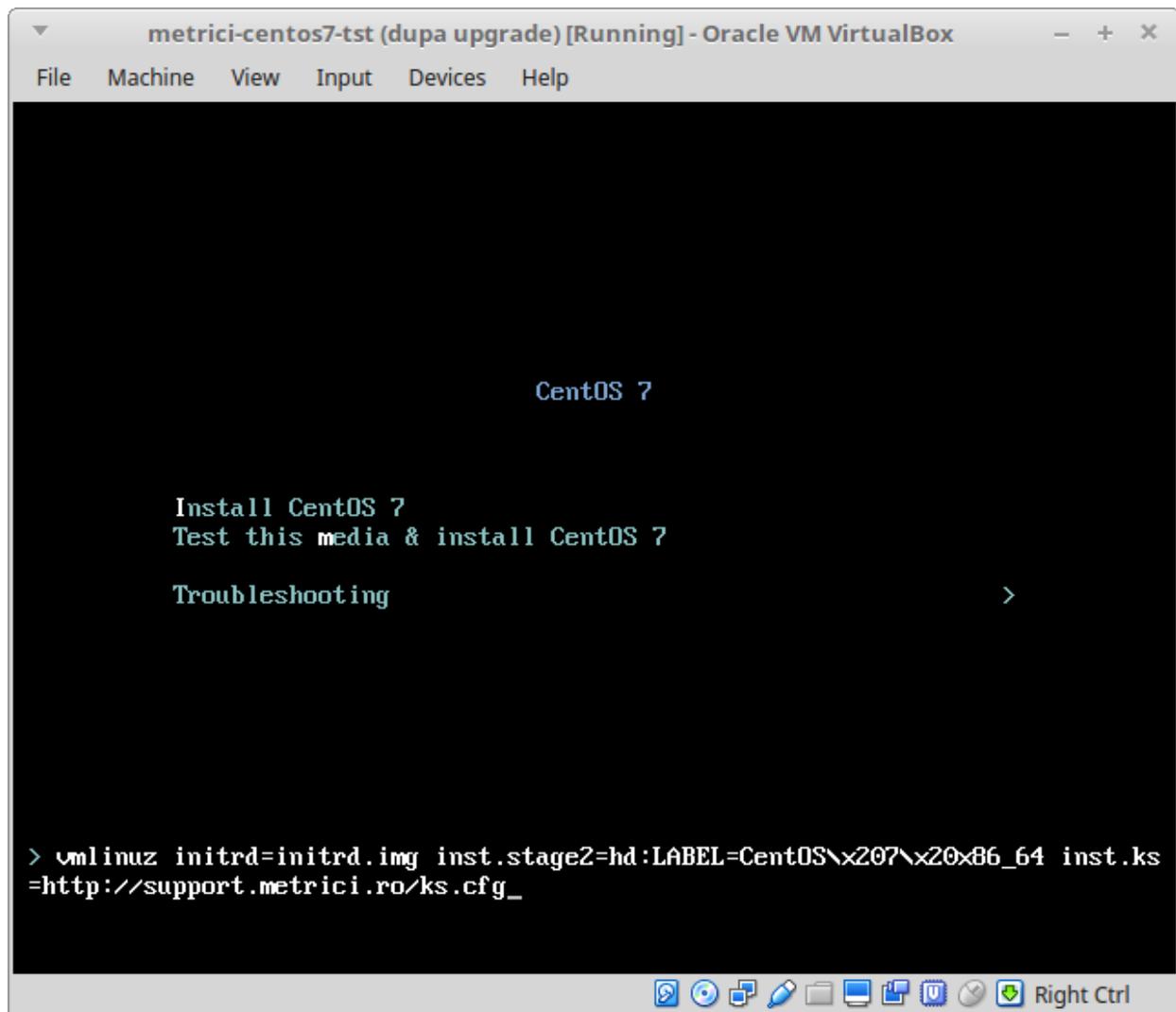
Press Tab instead. You will notice some parameters on the bottom of the screen. See next image.



Add a space and then type **inst.ks=<http://support.metricí.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.metricí.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 the reboot

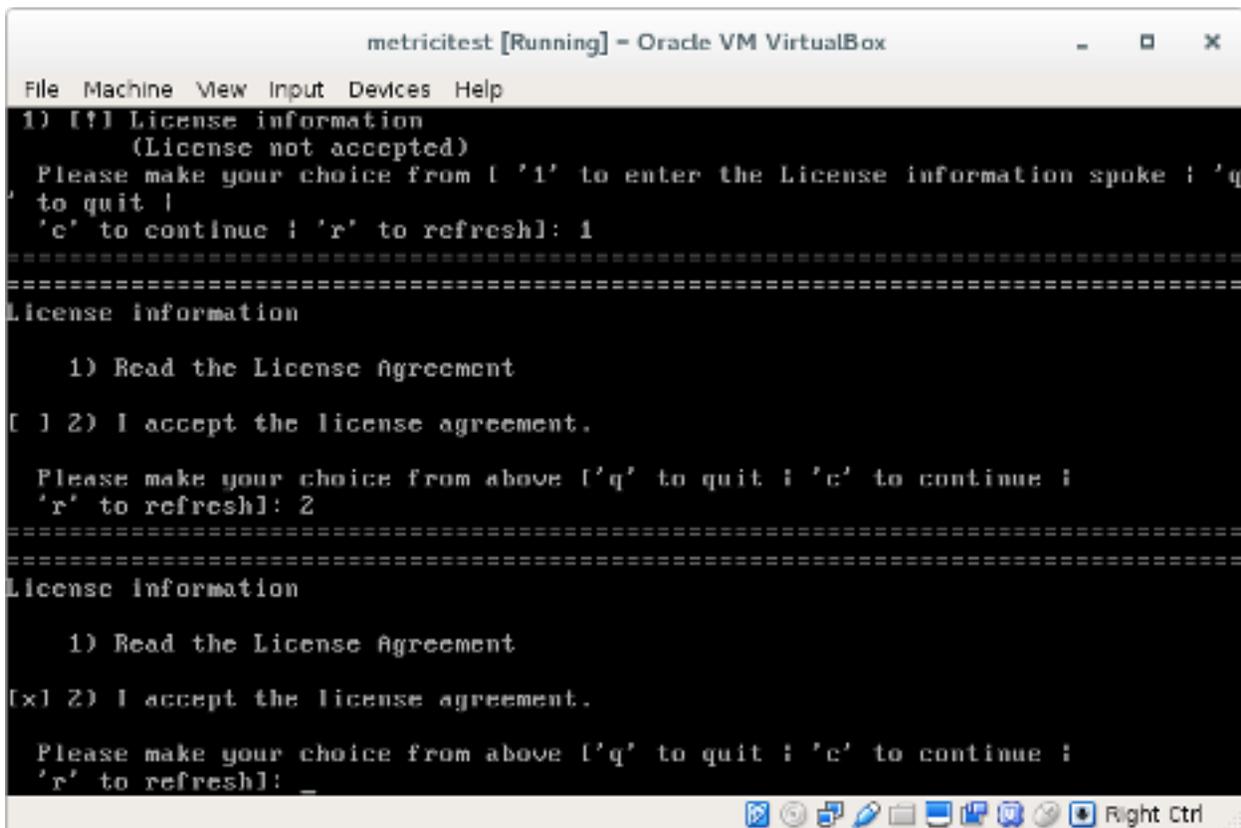
After the first boot, the system will ask for you to read the license agreement. You complete this task by choosing **LICENSE INFORMATION**.

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.



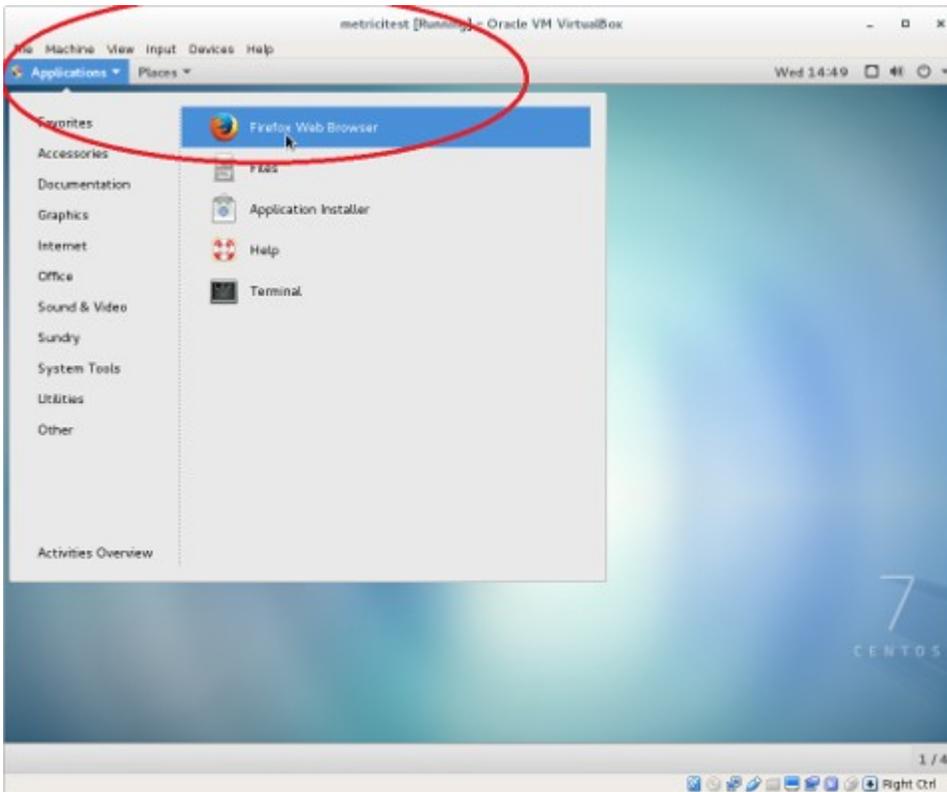
```
metricitest [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
1) [!] License information
   (License not accepted)
   Please make your choice from [ '1' to enter the License information spoke ; 'q'
   to quit ;
   'c' to continue ; 'r' to refresh]: 1
=====
License information
   1) Read the License Agreement
[ ] 2) I accept the license agreement.
   Please make your choice from above [ 'q' to quit ; 'c' to continue ;
   'r' to refresh]: 2
=====
License information
   1) Read the License Agreement
[x] 2) I accept the license agreement.
   Please make your choice from above [ 'q' to quit ; 'c' to continue ;
   'r' to refresh]: _
```

After the reboot, you can authenticate by using the user and password defined during installation. In case of kickstart installation that would be **metrici** and **metriciadmin**.

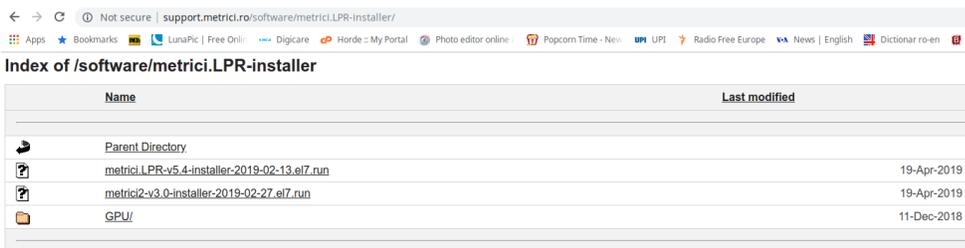
You navigate through the last settings, click Next.

CHAPTER 4

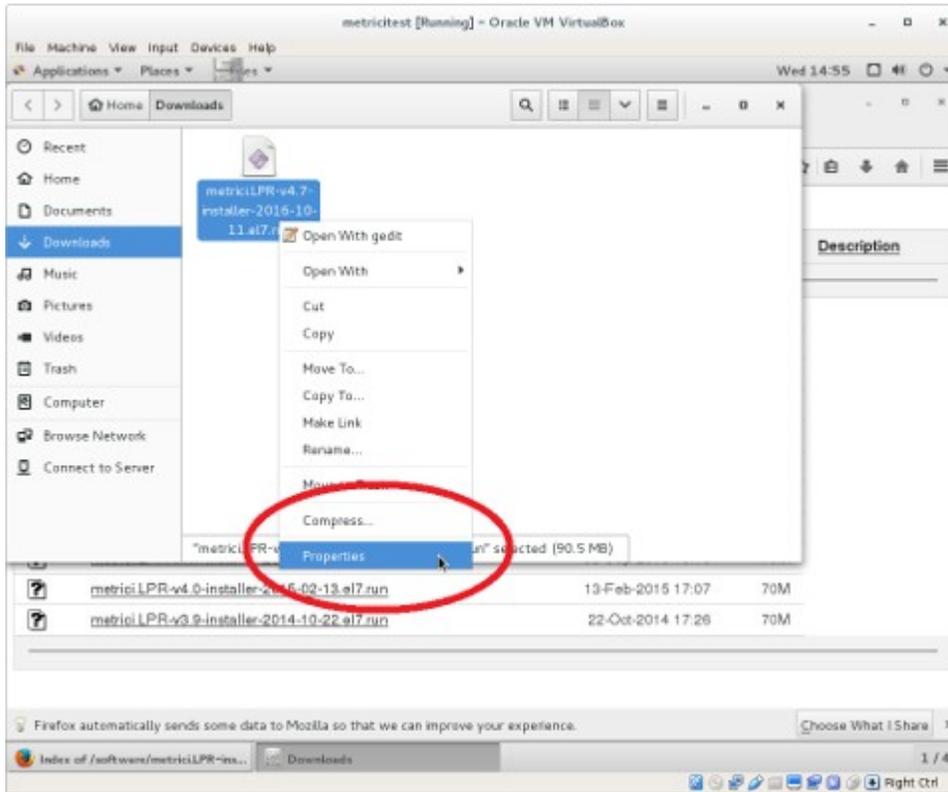
DOWNLOAD AND INSTALL METRICI PPD



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

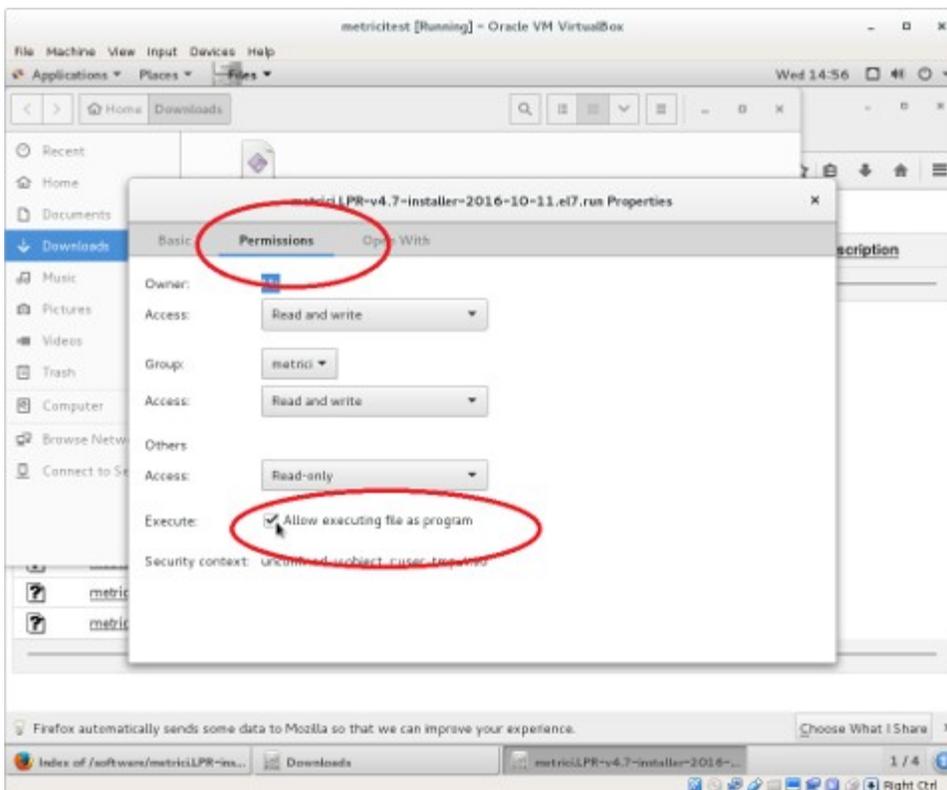


Access the address <http://support.metricí.ro/software/metricí-installer/>
Download [metricí2-v3.0-installer-2019-02-27.el7.run](#),
or the latest version of the software, with the suffix el7.run
Save it on disk

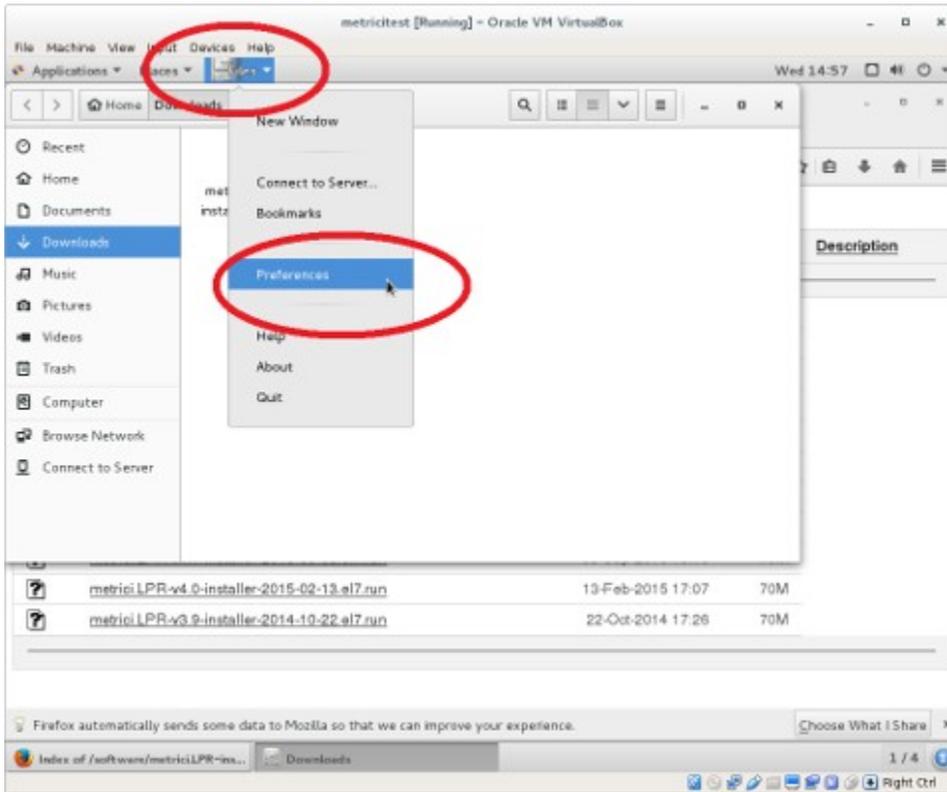


Open the folder where the file was saved (right click - Open Containing Folder).

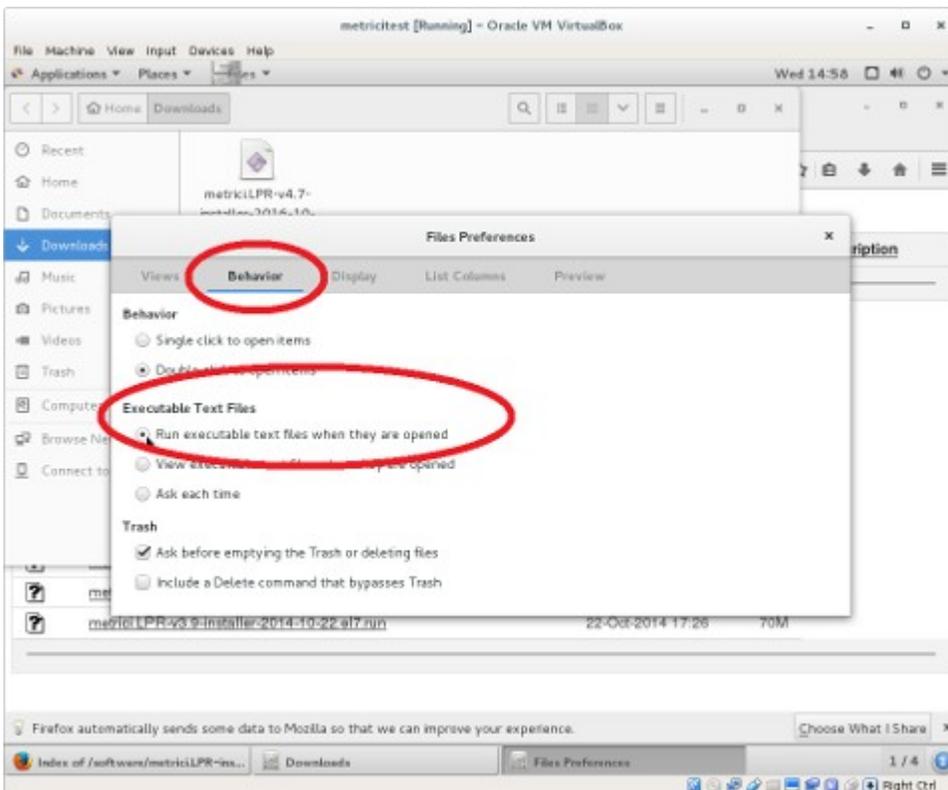
You need to change the administration rights for the file (right click on the file- **Properties** menu).



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 kit and wait to install and restart

CHAPTER 5 PPD SETTINGS

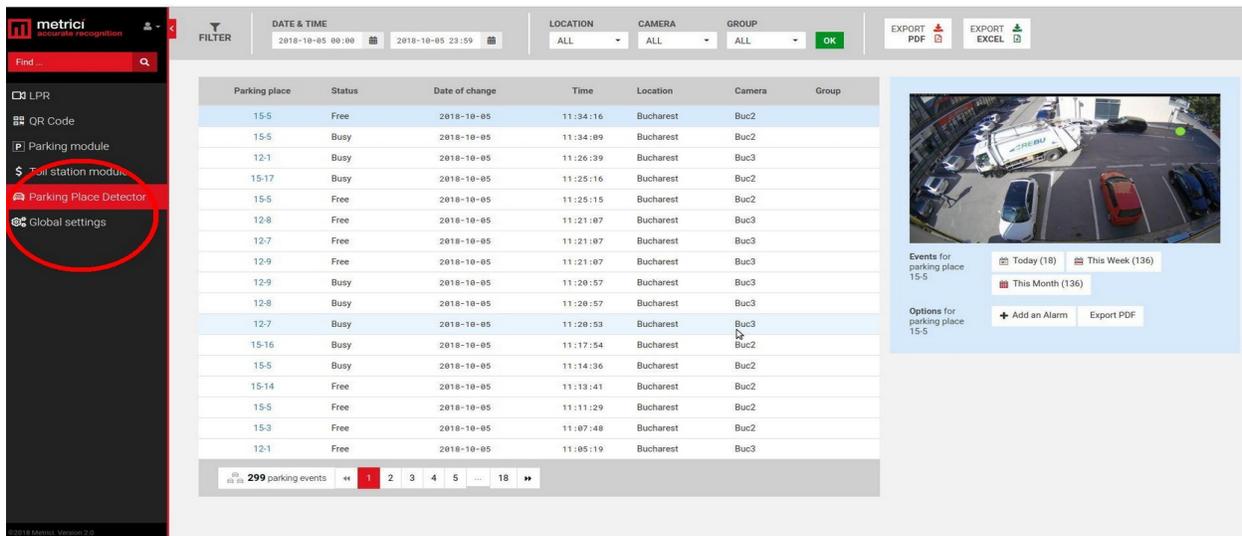
5.1 PARKING PLACE DETECTOR- INITIATING

When login to Metrici, you will see a list of all Metrici Modules. You will only have access to the module you bought licenses for. The others will be blocked. After the install the first login in localhost or on a remote server will be made with the 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 created or modified. See Global Settings, Users Administration Chapter.

NOTE

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



The screenshot displays the Metrici web application interface. On the left is a dark sidebar with navigation icons and labels: LPR, QR Code, Parking module, Toll station module, Parking Place Detector (highlighted with a red circle), and Global settings. The main area features a table of parking events with columns for Parking place, Status, Date of change, Time, Location, Camera, and Group. Above the table are filters for DATE & TIME, LOCATION, CAMERA, and GROUP. To the right of the table is a summary panel showing a camera view of a parking lot, event counts for '15-5' (Today: 18, This Week: 136, This Month: 136), and options to 'Add an Alarm' or 'Export PDF'. A footer at the bottom left indicates '©2018 Metrici, Version 3.0'.

Parking place	Status	Date of change	Time	Location	Camera	Group
15-5	Free	2018-10-05	11:34:16	Bucharest	Buc2	
15-5	Busy	2018-10-05	11:34:09	Bucharest	Buc2	
12-1	Busy	2018-10-05	11:26:39	Bucharest	Buc3	
15-17	Busy	2018-10-05	11:25:16	Bucharest	Buc2	
15-5	Free	2018-10-05	11:25:15	Bucharest	Buc2	
12-8	Free	2018-10-05	11:21:07	Bucharest	Buc3	
12-7	Free	2018-10-05	11:21:07	Bucharest	Buc3	
12-9	Free	2018-10-05	11:21:07	Bucharest	Buc3	
12-9	Busy	2018-10-05	11:20:57	Bucharest	Buc3	
12-8	Busy	2018-10-05	11:20:57	Bucharest	Buc3	
12-7	Busy	2018-10-05	11:20:53	Bucharest	Buc3	
15-16	Busy	2018-10-05	11:17:54	Bucharest	Buc2	
15-5	Busy	2018-10-05	11:14:36	Bucharest	Buc2	
15-14	Free	2018-10-05	11:13:41	Bucharest	Buc2	
15-5	Free	2018-10-05	11:11:29	Bucharest	Buc2	
15-3	Free	2018-10-05	11:07:48	Bucharest	Buc2	
12-1	Free	2018-10-05	11:05:19	Bucharest	Buc3	

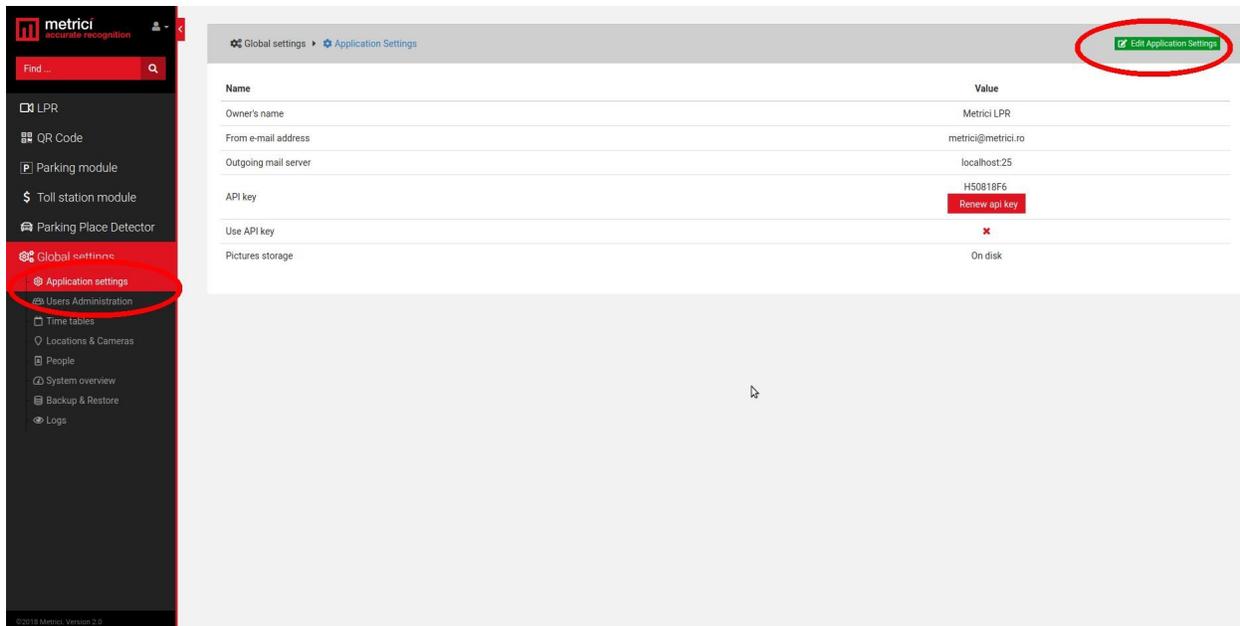
Fig.1

5.2 APPLICATION SETTINGS

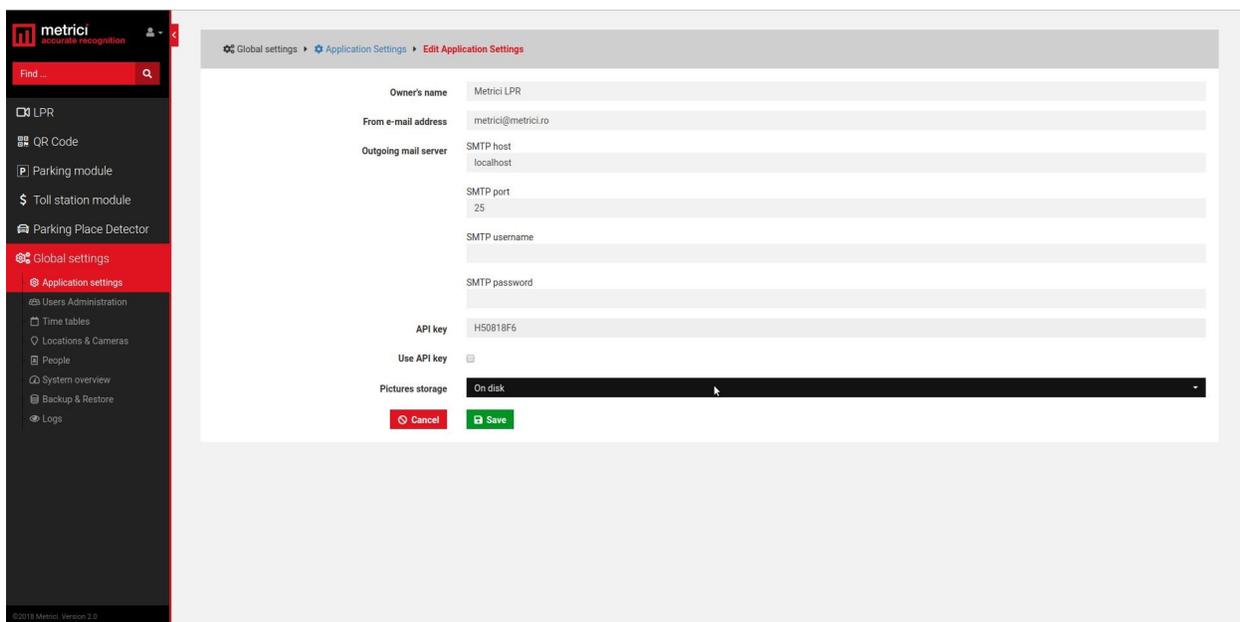
METRICI Parking Place Detector v1.0

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



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



METRICI Parking Place Detector v1.0 User Guide

Owner's name is the name of the company or person who owns the Metricí 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, as some servers.

Outgoing mail server: localhost

SMTP host: set to 25

Metricí 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 for this one.

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. However, it may be made active again by another user with administration rights.

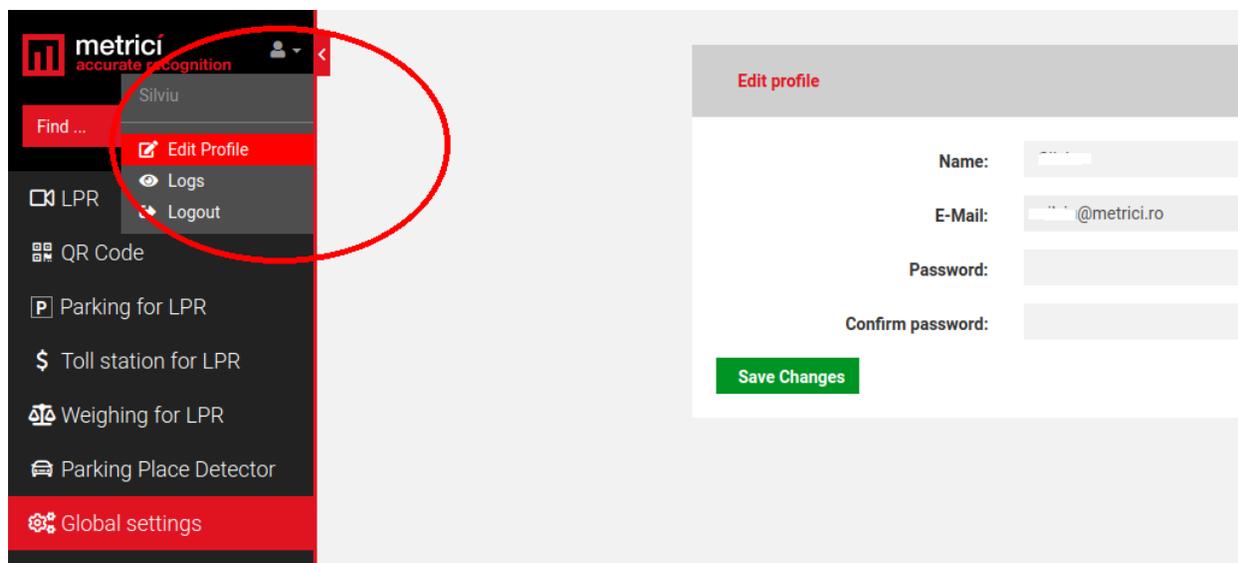
When a new user is added, choose a name for it, designate an email address, choose the language in which the menu is displayed, set a password and confirm it. These data will be used when login by that particular user.

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 Metricí Web Interface.

A user already created can change his passwords, after login, by click on the human symbol, upper left menu. Choose Edit profile and write a new password and confirm it.

An administrator of the system can also change the password for a different user in the same way.



5.4 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 a better use and understanding of this feature, see the other modules guide settings.

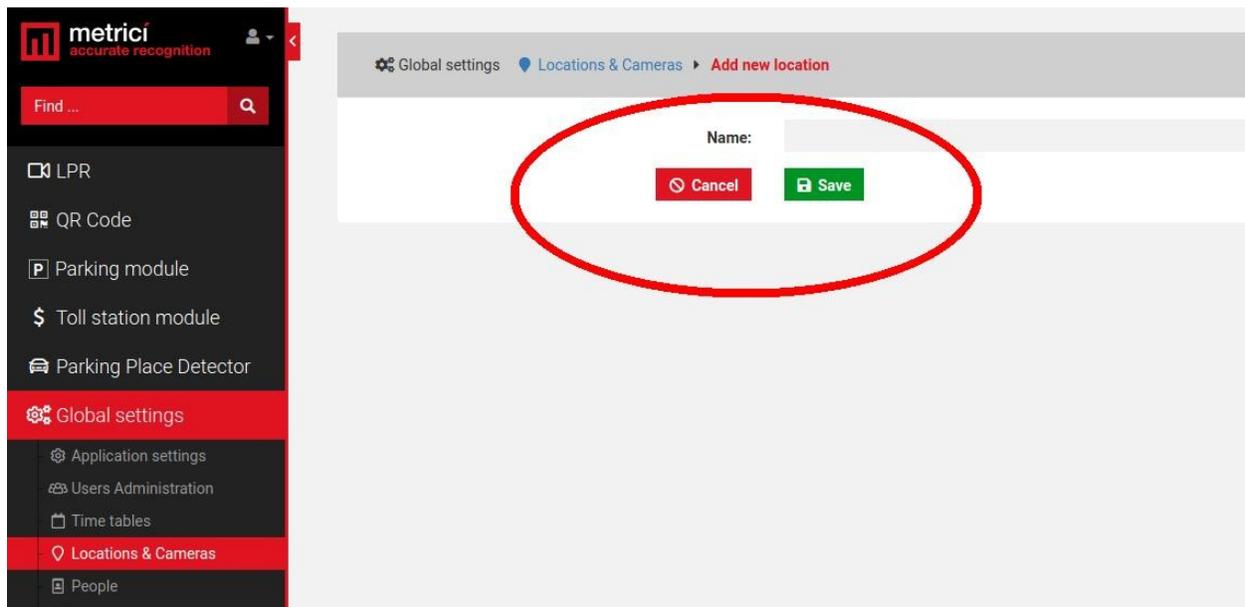
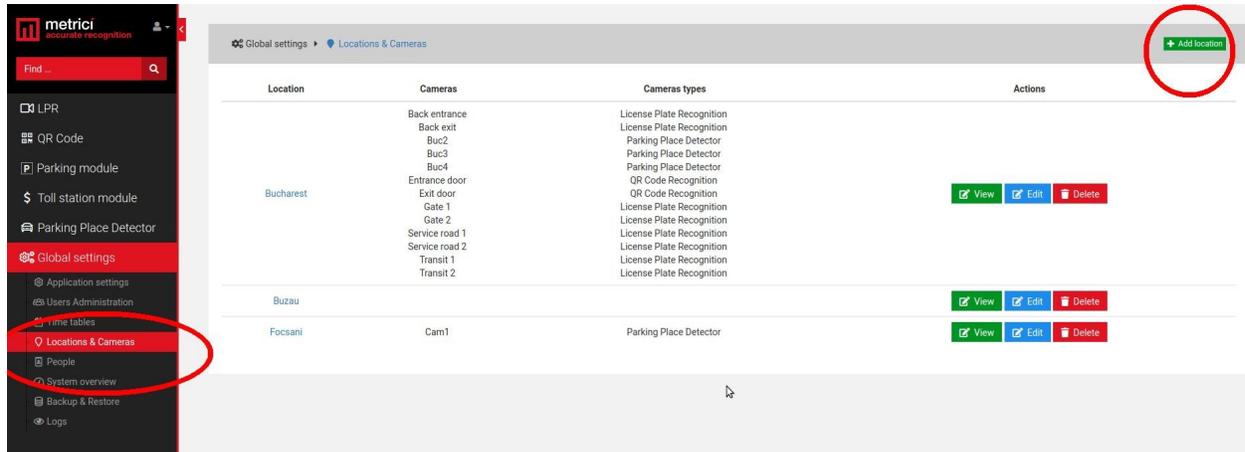
For example, a user can set to receive an alert email only when certain conditions are met.

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

5.5 LOCATIONS & CAMERAS

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.

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

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

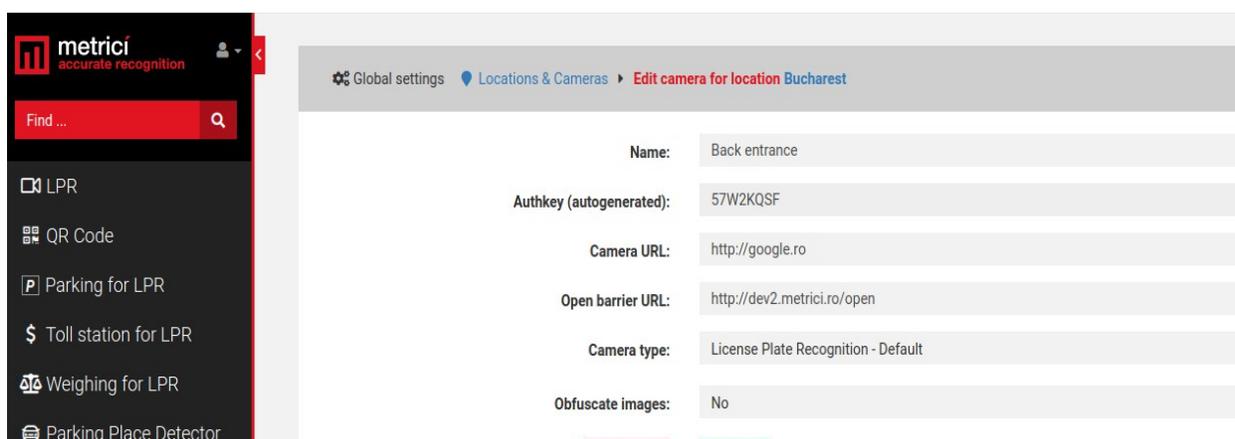
Authkey (autogenerated): This field is automatically filled by the Metrici software when a camera is introduced in the system. You will need this key and the id in the

Metricí Control Panel to integrate the camera with the Web Interface and to have the videostream in live view.

Camera URL: Is the IP address of the camera

Open 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.

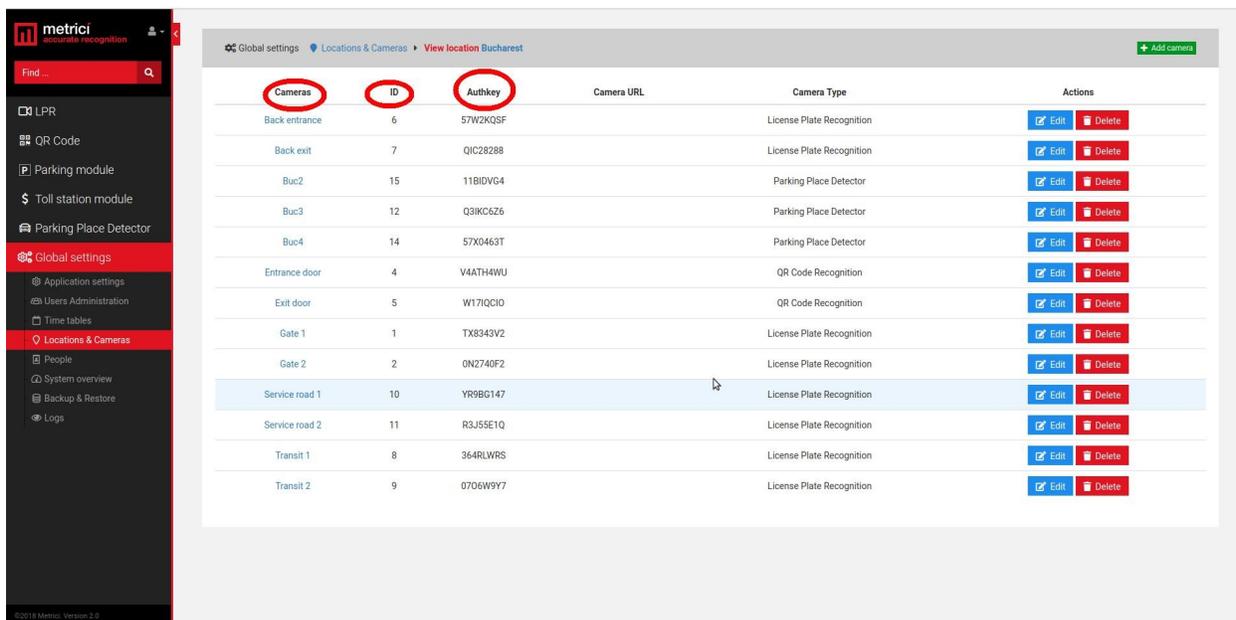
Camera Type is the application for which this camera is used for. Choose the appropriate one- license plate recognition, parking place detector, QR code recognition etc. Keep in mind that if you don't select the correct application, you won't see that camera and settings in your module.



Obfuscate images: Is the Metricí feature that enables you to be GDPR compliant. For each camera in a location you can choose to blur the event photo recorded by Metricí. From the moment this option is checked, all photos for that camera will be blurred. 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 the in the next image. The ID and the authkey for each camera are mandatory to be added to the Metricí Control Panel where the detection engines are located, on the server which runs the Metricí software. This can be on the same machine or other one.

When the ID and the authkey of the cameras are added to the Metricí engines, 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. In fact it will detect the cars, but no data will be sent to database and web interface.



All cameras on the system can be later edited or deleted, as the user chooses. Its type can be changed or the URL etc.

5.6 LICENSES

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

5.7 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 rights, 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 list, but without the photos from the moment of detections.

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.

5.8 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 6 PARKING PLACE DETECTOR MODULE

6.1 DASHBOARD

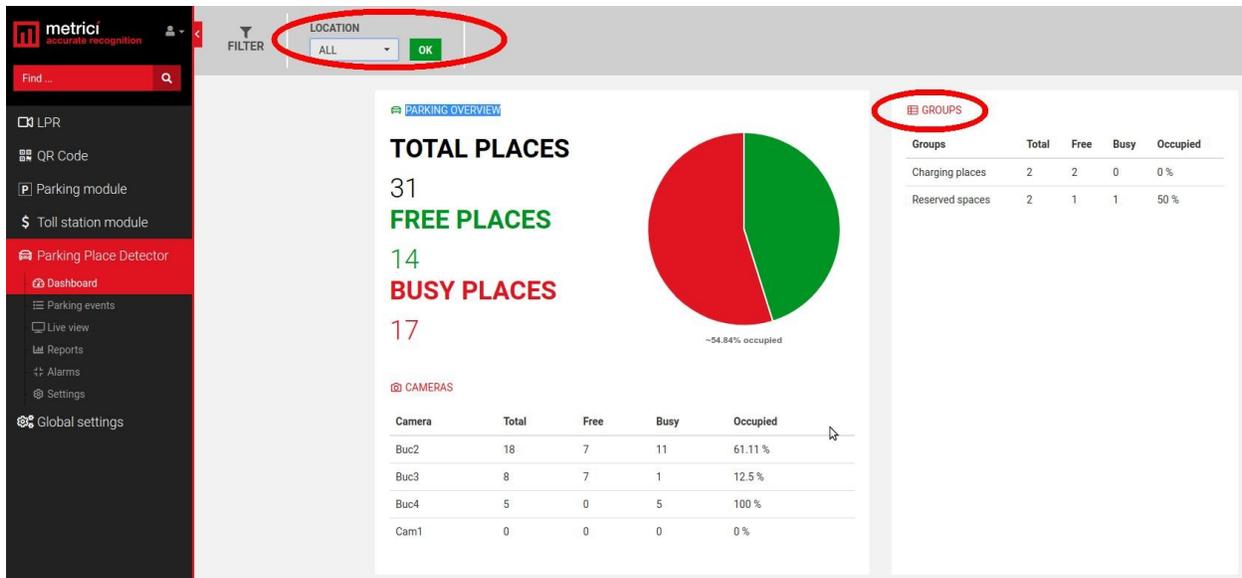
In the dashboard menu, you see all the details of a parking lot or more parking lots, if you manage more than one. On the left side, choose a location or all locations for which you want to see an instant report of the activity. Click OK button after you choose the location to display info about that choice.

A general view is displayed, as well as the occupancy rate for each camera at that particular moment in the selected location.

The total number of parking places set for each camera, number of free and busy ones, as well as the percentage occupancy is listed.

On the right side, you will see the data for each group set for a parking lot. A group can be different from cameras. A group can be made up of parking places belonging to more cameras, or a selection of a few places from more cameras. View Groups menu to read more about this setting.

The "name" of a parking place is in fact composed by the ID of the camera and the number of the place when created in the Metricí engine.



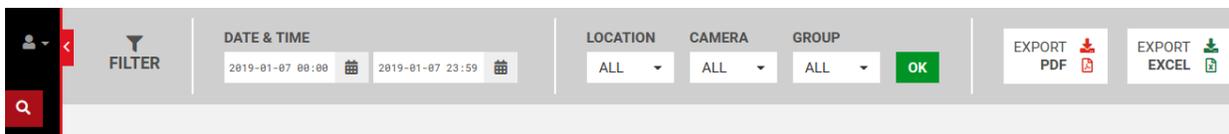
6.2 PARKING EVENTS

A list of all the changes intervened for any parking place will be displayed in this menu. Several filters can be applied from the dedicated bar on top of the page- see next photo.

These settings refer to a time interval, the location or the locations you want to see info about the camera or the group you want to monitor.

Any result, or the results of a search (filter) can be exported as a PDF file or an XLS file.

A PDF file will contain a list of the selected search with all the data about where, when and how a status of a parking place was changed, along a still image of the moment the event occurred. If a companion camera is attached, the photo from this one will be saved too. An XLS file will include a list of data events, without the photo captures.



Each event for a parking place has some info about it in the list. The status change, respectively if a place was occupied or free, date and time when the changing

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status event occurred, location and the camera where the change took place in, as well as the name of the group in which that particular place is a member of, if it is the case, as in the photo below.

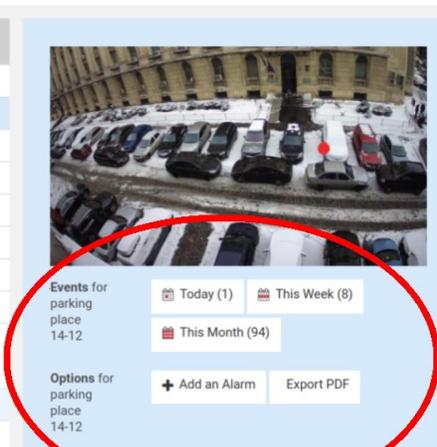
Parking place	Status	Date of change	Time	Location	Camera	Group
17-24	Free	2019-01-07	12:30:00	Town	Camera 1	
12-2	Free	2019-01-07	12:28:46	Bucharest	Buc3	
12-2	Busy	2019-01-07	12:28:37	Bucharest	Buc3	

On the right side of the screen some additional info about the selected parking place and some actions that can be made.

For a selected parking place, a user can see the number of events for that place in that day/ on that week and for the month. The buttons are interactive and can be clicked and the list on the left will change to the filter selected here: E.g. events for that particular place for a day/week or month- you will see a list with the events chosen.

Some options are also available. Add an alarm for that place, or export the event as PDF - see the alarms menu to see how to set it and what options are available. When create an alarm, remember to add conditions to it, so to work.

Parking place	Status	Date of change	Time	Location	Camera	Group
17-1	Busy	2019-01-07	10:27:07	Town	Camera 1	
14-12	Busy	2019-01-07	10:27:07	Bucharest	Buc4	
17-17	Busy	2019-01-07	10:27:07	Town	Camera 1	
17-23	Free	2019-01-07	10:27:07	Town	Camera 1	
14-1	Busy	2019-01-07	10:27:07	Bucharest	Buc4	
17-6	Busy	2019-01-07	10:27:07	Town	Camera 1	
14-14	Busy	2019-01-07	10:27:07	Bucharest	Buc4	
17-19	Busy	2019-01-07	10:27:07	Town	Camera 1	
17-25	Free	2019-01-07	10:27:07	Town	Camera 1	
14-3	Busy	2019-01-07	10:27:07	Bucharest	Buc4	Charging places
17-10	Busy	2019-01-07	10:27:07	Town	Camera 1	
14-16	Busy	2019-01-07	10:27:07	Bucharest	Buc4	



6.3 LIVE VIEW

As the name suggests, in this page you can set what cameras you want to watch live.

You can add or delete cameras as you want from this menu, as long as they are introduced in Global Settings, Location and Cameras and set as Parking Place Detector Cameras and you have view rights for this menu and cameras.

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To add more cameras, choose the one you want from dropdown menu and click on ADD LIVE VIEW button, upper left.

On a live view image click on the monitor diagram to maximize the view (full screen) or on X to close it. When you minimize an image that was made full screen, you will return to the view of all cameras set in live view.

By default the live view field is automatically filled in by Metrici in Control Panel with an URL such as http://localhost/io/ppd/live_view.php. If the video will be sent and visualized to another address change localhost with another address or IP, for example http://metrici.ro/io/ppd/live_view.php

6.4 REPORTS

In the reports section, a user can choose from three different scenarios, with the usual filters: a time interval, a location for which a report will be generated, the camera or cameras and the group.

These are the filters you can select for the reports menu.



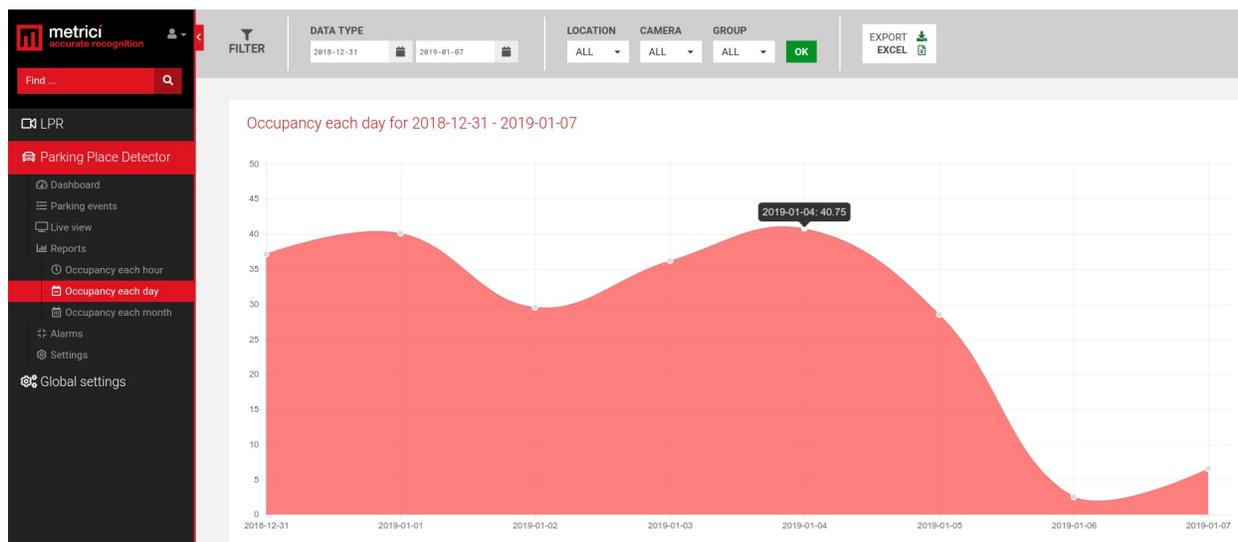
Tip: If you don't want a report from all the cameras in a location but only for a few of them, for example for section C, or for forth floor, you can create a group for the cameras in that section and choose a report for that particular group.

Note: Depending on the size of the database and the report you want to generate, the display can take a while, for the calculation to be made.

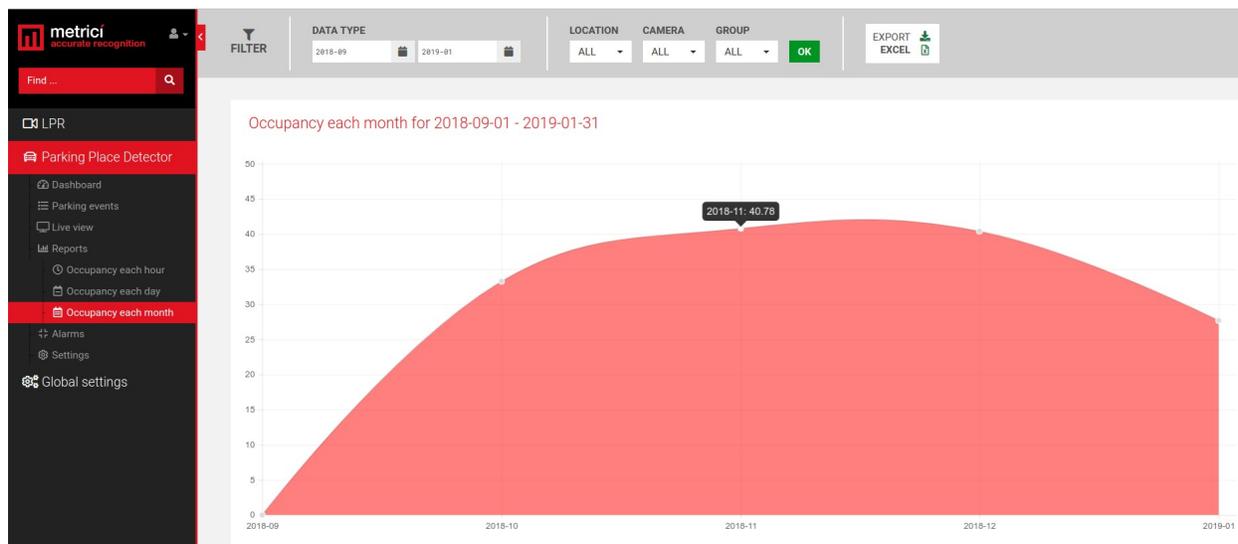
Occupancy each hour will generate a report with the occupancy percentage of a location, a camera, or a group for each hour of the selected time interval. This is how a 24 hour report shows like for a location:



Occupancy each day will generate a report with the occupancy percentage for the current week, by default, or another time interval set in the filter.



Occupancy each month will generate a graphic with the comparative occupancy percentage for the selected input data. By default, the system will generate a report for the current year, from the beginning of the year to today. These data can be changed in the filter menu.



6.5 ALARMS

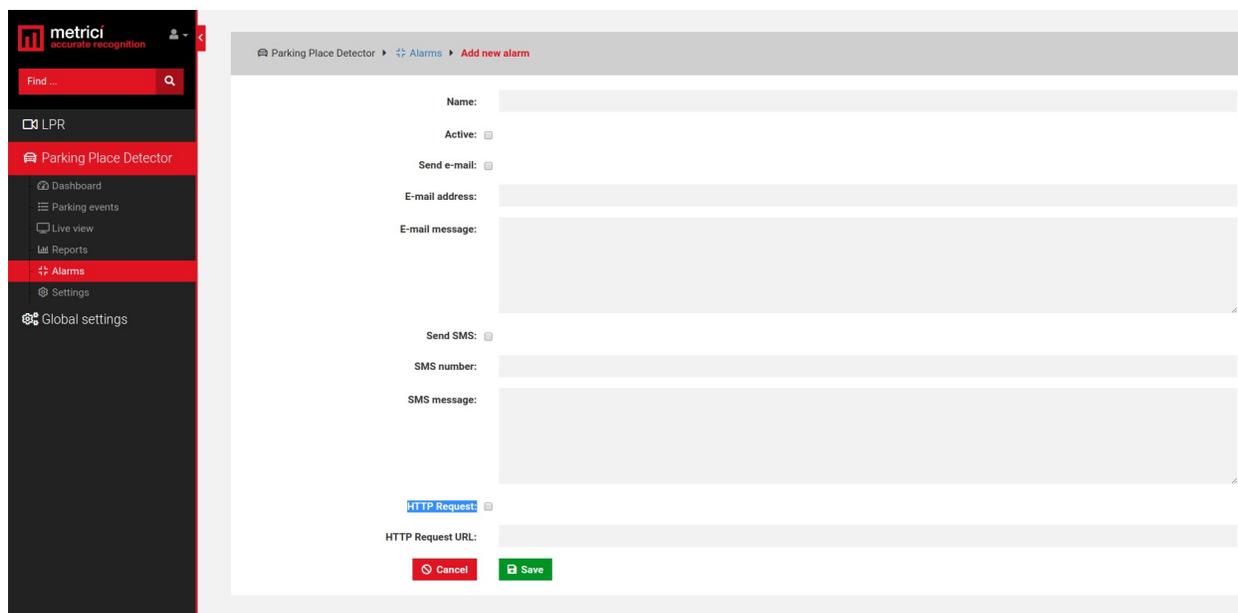
Each parking place, group, or camera can have an alarm set if one condition or more conditions are met.

The alarm can be set to be active or not and can be of two types: an email alert or a SMS message on a phone number if a GSM module is attached to the server.

E-mail address field will be filled with the address to which the mail will be sent. Also you can personalize the message that will be delivered.

The SMS option: Click on Send SMS box, add in the phone number to which the message will be sent and write the message that will be delivered.

More phone numbers can receive a SMS alert, but these numbers will have their own alarm set. No multiple phone numbers can be set in one alarm.

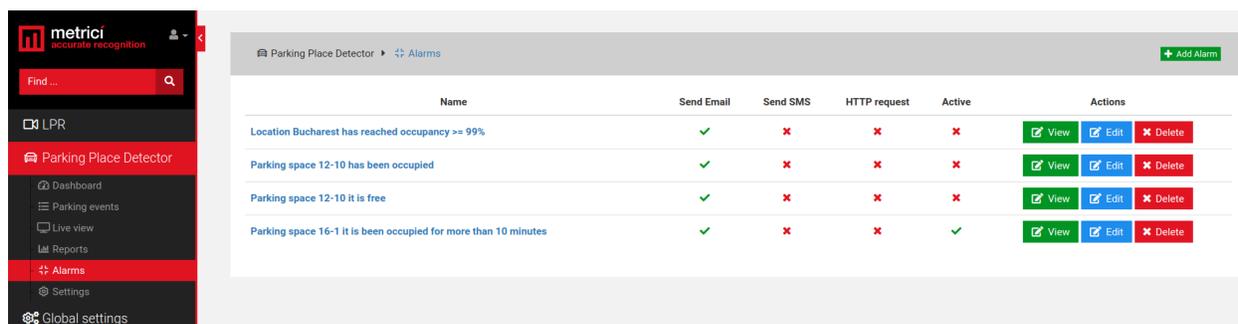


HTTP Requests refer to the fact the alarm can trigger an URL when set in this mode so it can activate a barrier or other external hardware system.

HTTP Requests URL - is the address Metrici accesses for this particular alarm.

For example you can have an alarm for when the parking is full. Case in which, this will access a traffic light and switch it to red denying access.

After an alarm was created (has a name) and a type (SMS, email), you will create the conditions in which this alarm is active. Conditions are the specific parameters that have to be met for the alarm to activate: send email, send SMS, activate a hardware etc.



Click on View green button to introduce new conditions for that alarm. The Edit button will let you change its name, whether is active or not etc.

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Introduce as many conditions as you want and save them. In the next image you will see how an alarm shows like: in this case the alarm is set when Place 12-10 is free for more than 5 minutes.



Keep in mind that for each condition you have a degree of comparison.

First condition for an alarm to be set is the establishment of an alarm item: this can take the form of Location, Group, or Place. For these items you will have next different conditions to be add.

So, for example, if an alarm item is set on Location the next condition will automatically be the occupancy percentage. You can set the value when the alarm is activated when a certain percentage of occupancy is reached.

When a group is selected, you will have to choose for what group/groups the alarm is active and also at what percentage, as the next condition.

Finally, when a place is selected as the first item, you will set next the status.

“=” 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

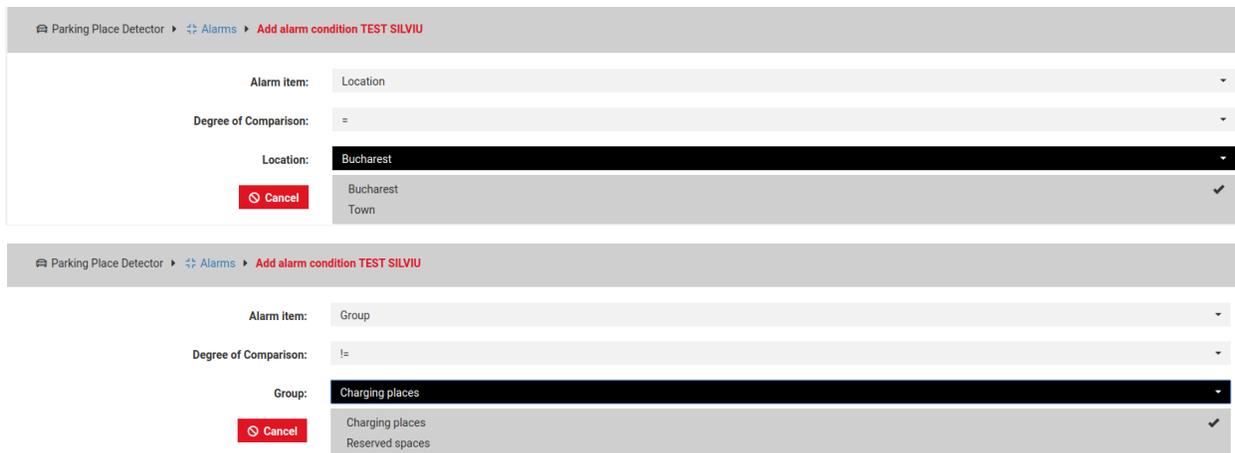
“>=” bigger or equal to a time unit, usually

For an alarm to be saved, finally you select a parameter to apply for.

If alarm item is set to Location, you choose a location at the last field

If Alarm Item is Group, choose a degree of comparison and the group for which this rule is applied

If Alarm Item is Place choose a degree of comparison -see photo



So for example we want an alarm when a place is occupied. We have to set three conditions

Place=choose the place for which you want that alarm

And Status=Busy

And More than=1 minute

Or let's say you want an alarm for when the parking is almost full. We create the alarm "Parking is full almost" then we populate with conditions

IF Location=your location for which you want an alarm

And Occupancy \geq 90%

Finally, if you want an alarm for example, at any change of status for a parking place, you must create two different alarms, one for each event- when is occupied and one for when it's free.

6.6 SETTINGS

Locations and cameras. Register places

Only locations introduced in Global Settings will appear in this menu. For a location to be displayed in Parking Place Detector, this has to have at least one camera assigned.

IMPORTANT

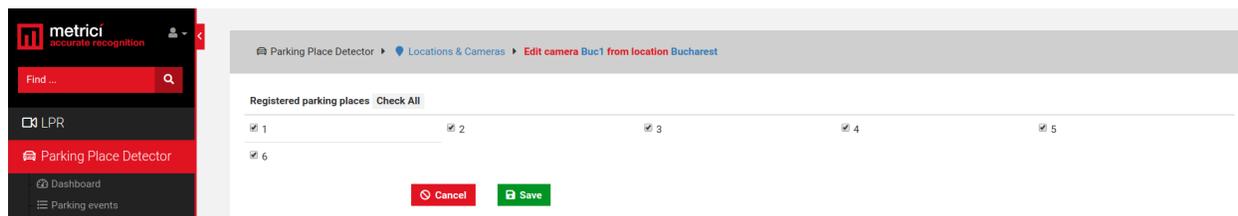
After the parking places were created in Metrici Control Panel, these must be registered in this menu. Without this step, the system will not work properly. To register is an operation in which you tell the system that a place is available for parking. Later on, on same menu you can unregister a place if, for example, the parking is reconfigured or there are works under way and no one can park there etc.

To register a place or all parking places designated to a camera Go to the menu **Parking Place Detector Settings** and choose **Locations & Cameras**.

Choose a location from your list and click on its name.

From the list of cameras in your location, choose one for which you want to register the parking places.

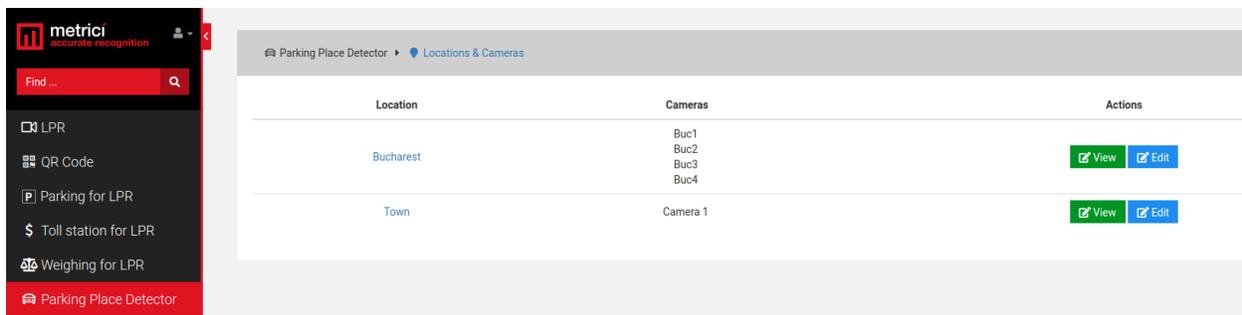
From the list of parking places allocated to that camera, choose the ones you want to register or click on “Check all” button to activate them all.



In case a place becomes unavailable due to reconfiguration of the parking lot, workings underway or any other motive, this can be unregistered, so not to be taken into account when making calculations about the occupancy percentage.

Communication with display

If you want to display info about available spaces in your parking on a LED display, go to Parking Place Detector Locations and Camera. From the list of your locations, click on blue EDIT button



In the Display text field you can use some codes to command Metrici LED display.

Codes that you can use for your display are shown below:

#Y= yellow

#R= red

#G= green

#TSPACES Total number of parking spaces

#BSPACES Number of occupied parking spaces

#FSPACES Number of free parking spaces

So if you want your display to show free spaces with green and busy places with red and allocate three characters for numbers you will use a code like

#RBUSY #BSPACES3

#GFREE #FSPACES3

On your Metrici LED display, in the specially designed interface for this hardware, you will fill an URL such as

URL: http://METRICI_IP_ADDRESS_OF_SERVER/io/ppd/location_display.php?id=1

#GFREE ACCESS will display the text FREE ACCESS in green.

REMEMBER that it is mandatory to specify the colour - without one of the codes #R, #G, #Y nothing will be displayed. The #BSPACES3 code tells the system to show the number of busy (#B) spaces (extracted automatically from Metrici Web Interface) for a location, a group displayed on three characters. Instead of 3 we can have any number of characters from 1-9. But remember that if you set to display a bigger number of characters comparing to the dimension of the Metrici Display, they will not fit in and the information will scroll. #FSPACES tells the display to show number of free spaces extracted from Web Interface, followed by the numbers of characters in which this information will be showed.

For a better understanding see also Metrici LED Display user guide.

Groups

A group is a format of multiple parking places that correspond to a specific characterization, set by the administrator.

A group can include as many parking places from any number of cameras. Not necessarily all the places from a camera must be introduced in a newly created group. You can choose only one place from a camera or more. For example, you can choose to create a group in a parking lot for parking places designated to people with disabilities. Or you can choose to create a group for the VIP places, or for a tenant.

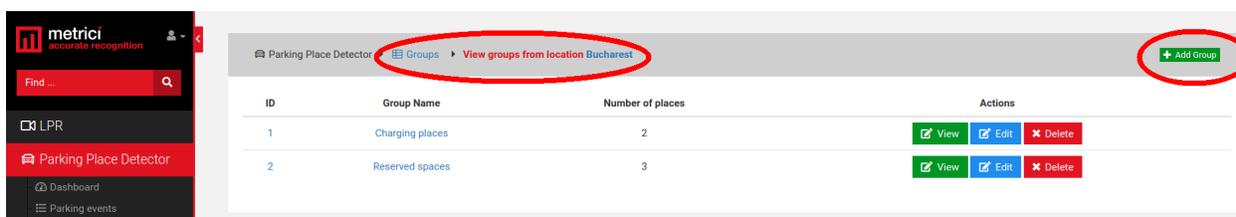
These can be spread on different levels and different cameras. This will not affect the possibility to group them and have a central management.

Click on a location's name to view or add a group for that location. Click on Add Group green button upper right of the window.

Choose a name for that group and write down the codes for communication with Metrici LED display (if you are using it.) If not, omit that. Click Save

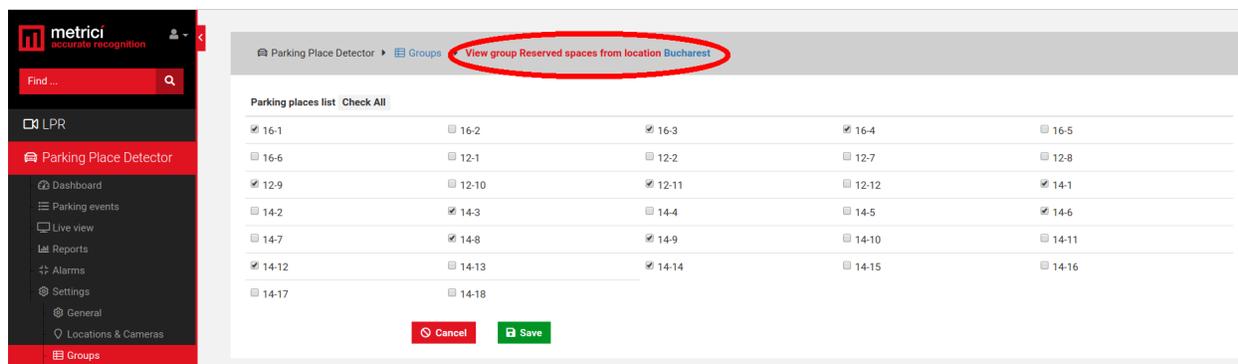
After a group was created go to the list of groups and click on a group name or View green button.

From the list of available spaces on that location, click on the one that you want to add to that group.

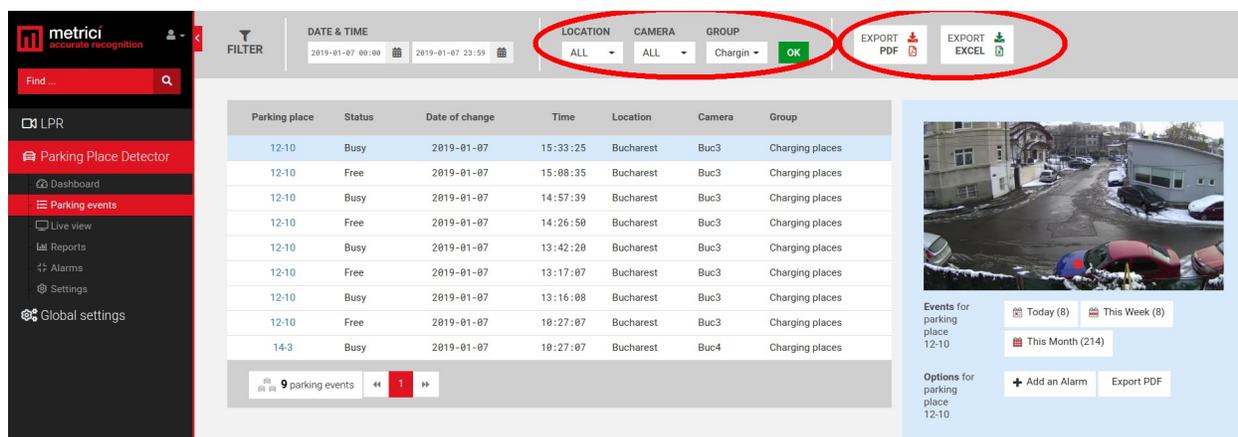


The group can be edited by clicking its name or View button. You can add or delete parking spaces for a group at any time.

From the list of parking places available in a location, from all cameras, choose the ones that suit the characteristics of your group.



The events registered by a group can be exported from “Parking Events” menu, selecting the group name from filters menu.



The filters also include cameras, location, date and time.

Clone groups characteristics

You can clone some group characteristics. This is useful in situation where LED signs are assigned to groups. For example, at a large parking lot, you can guide cars through LED signs toward free spaces. For that you need that some registered places to be common for more groups and LED signs. In order not to manually fill-in the registered places for all the group and LED signs, you just can clone some groups and for copy you just uncheck some places or add some other if necessary.

After creating a group and assigning some places to it, you can just click the Clone yellow button and all the data will be copied to the new one.



ID	Group Name	Number of places	Actions
1	Charging places	1	View Edit Clone Delete
2	Reserved spaces	7	View Edit Clone Delete

Another useful feature refer to the possibility to check and register or unregister more than one place at a time. To select more places, just click on the first one you want and press and hold Shift on the keyboard and go to the last one you want to check or uncheck. When you click on it, all parking places between the two points will be selected. Then release Shift key.

Location plan

For a more easy management, a plan/ map of a location can be uploaded in Metrici Interface. This allows an instant overview of a location with all the data from that location.

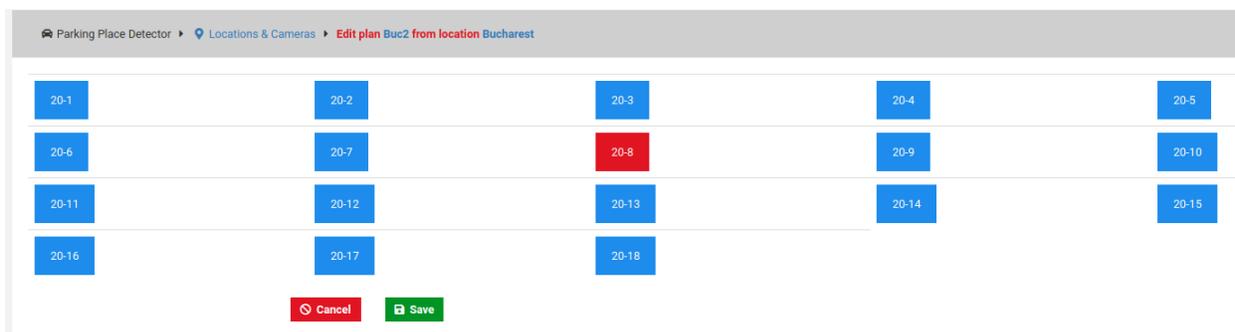
To set it you will have to upload a plan in the interface. In order to do that, you will go to **Parking Place Detector/ Settings/ Locations and camera** menu. From all locations on list, click on **Edit** button for the one you want a map to upload./

At the new page that it will be open, on **Emplacement Schematic** menu, choose the file you want to upload, select it and then click Save button.

The file must be in .jpeg or .png format.

After this first step, you will have to manually place the parking spaces in the location, operation similar to the one executed in Control Panel, but this time done in Interface.

For this go back to the menu Parking Place Detector/ Settings/Locations and Cameras. From all cameras in location you will have to select one by one and virtually draw on the map which parking polaces each one covers. So click on the name of the camera. A page similar to the next one will open with all the registered places for that camera.



20-1	20-2	20-3	20-4	20-5
20-6	20-7	20-8	20-9	20-10
20-11	20-12	20-13	20-14	20-15
20-16	20-17	20-18		

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

Click each parking place and manually draw where that particular space is located on the plan. Click Save. Repeat the operation for the others parking places and cameras in the location until all parking places placed.

When you will access Dashboard menu in Parking Place Detector you will see an instant view of the location with all data from detections of each camera.

CHAPTER 7

METRICI CONTROL PANEL SETTING AND USING

Metricí Control Panel application is in fact a unit for processing detection applications and data gathered by video cameras, as explained in the first pages of this guide.

The data processed in this application will be send for recording and reporting towards the **Metricí Interface**, where they can be easily accessed in a friendly format. The detection applications can work independently, but **Metricí 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

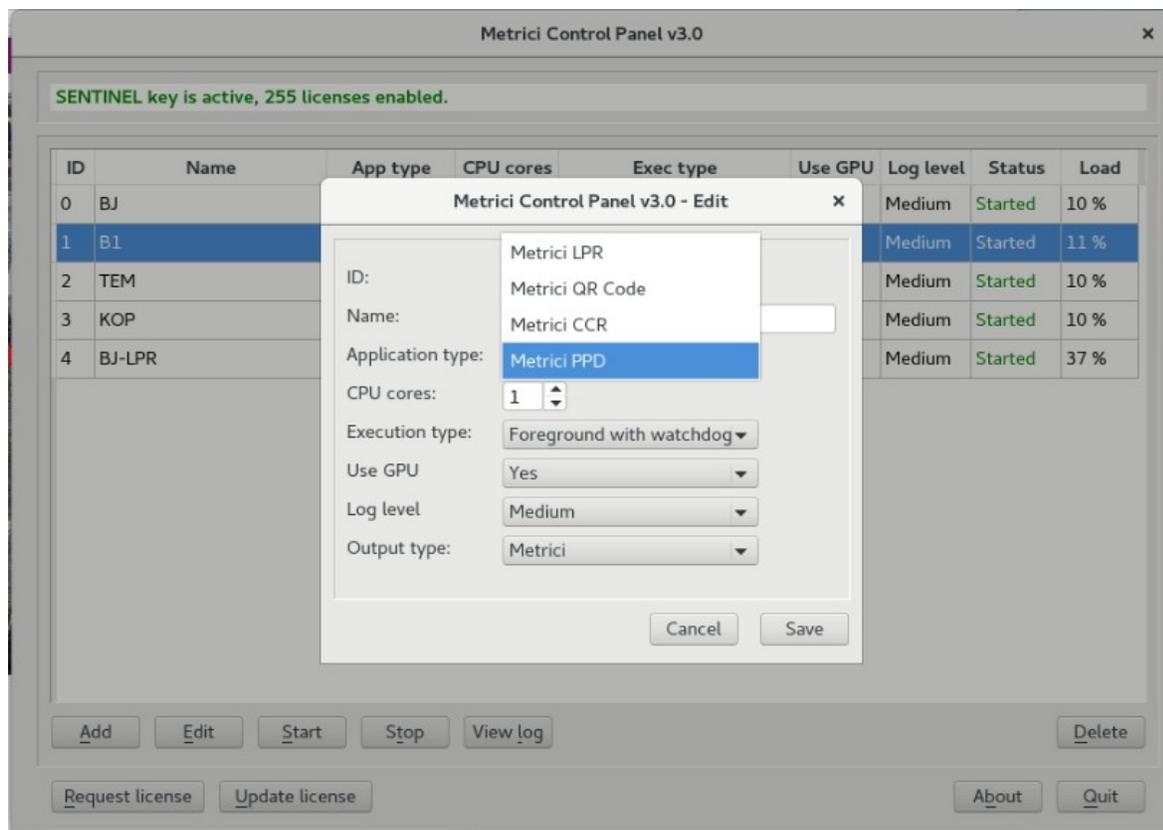
Metricí Control Panel application will launch automatically each time the computer is on.

There are several Metricí engines (applications) that you can choose from- LPR, PPD, QR Code and Container Code Recognition.

You can add a new detection application by using the **Add** button. When adding a new application, you set the CPU and the number of **processing cores** for each camera. The more processing power for each camera, the better the detection, and the application will operate more frames in real time.

For example, an INTEL i5 processor has 4 CPU cores, so if you want to designate a 3 Mpixels camera and a 1 Mpixel one to this, we recommend using 3 CPU cores for the first one and 1 CPU for the second.

Parking Place Detector relies heavily on GPU so the more performant it is, the better and faster the application works. Also, you can add more engines on the same server.



When first adding a camera in Control Panel, an ID will automatically be assigned to it by Metrici. You can also choose a name for it to better identify it later on.

You must then choose what for what application type this camera is used for: Metrici LPR, Metrici QR Code, Metrici CCR or Metrici PPD. Set the CPU cores and the execution type. Metrici recommends for installing and first setting using Execution Type Foreground with Watchdog.

At a later date, this working mode can be changed and we recommend doing it to Background with Watchdog as it needs less resources. The four possible settings for the detection software 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**.

GPU - As for Parking Place Detector, Metrici recommends using a Graphics Processing Unit -GPU so Enable GPU.

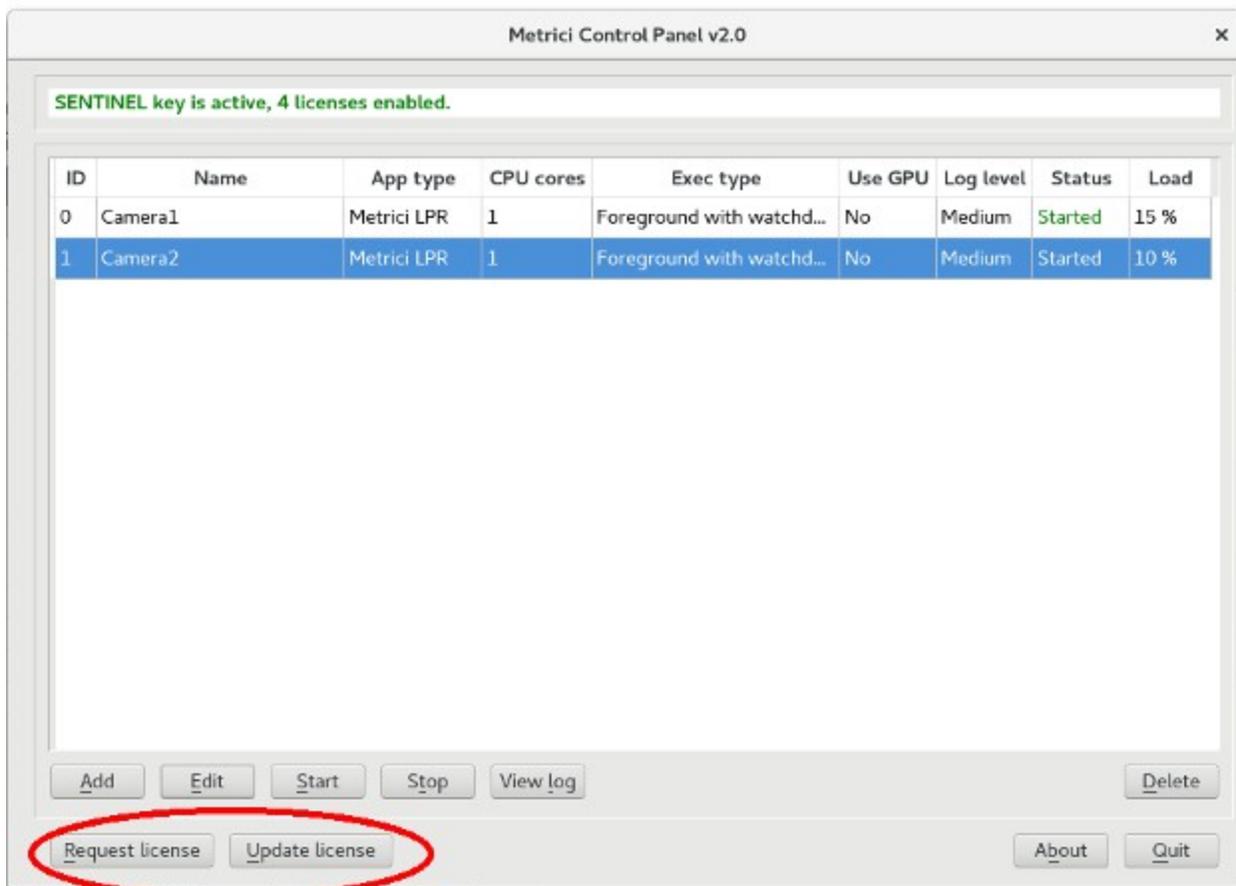
Log level- Metrici keeps track of all its activity, the communication with cameras, Interface or external systems. When a malfunction occurs you can check these logs to view what happened, so is better to have log level on Medium, at least.

REMEMBER! In case that more cameras will be connected to Control Panel, the settings in this chapter will be applied for each one of them, except license activation, which is made individually for the PC/server unit.

7.0 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 Metrici

Hello, you can download activation file at:

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

Product code: 7866869_df93mo398-4k12e9i-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.

IMPORTANT: The procedure is to be followed for each server with Metricí. If you have, let's say, 10 servers with Metricí, you will follow this license activation procedure for each one of them.

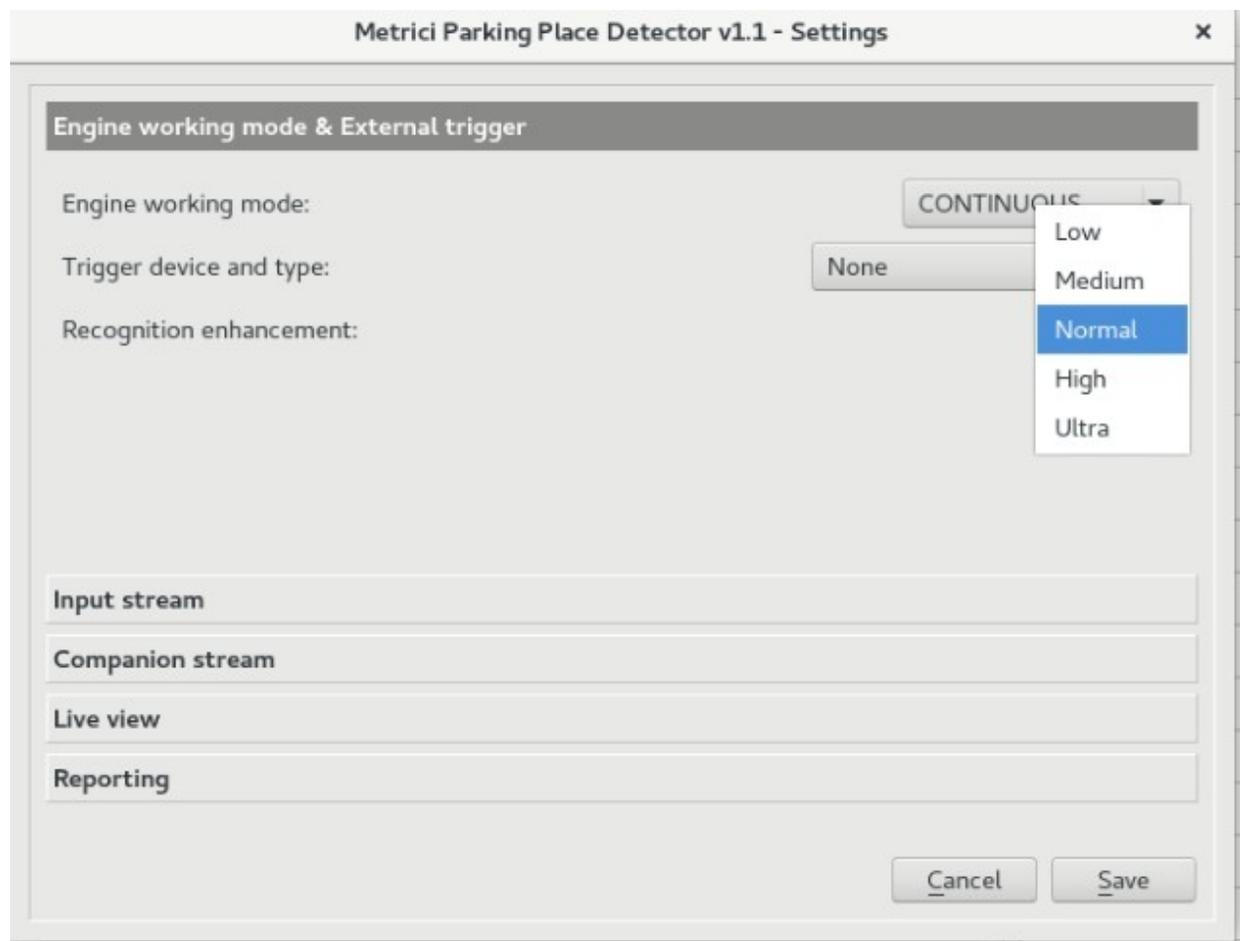
7.1 Engine working mode & External Trigger

After you add the camera and set it to foreground with watchdog, press the **Settings** button to begin initializing it.

In this menu, you set how the detection works and you have two options Continuous (Metricí is always looking for cars and if they are placed on a parking place you create) or at trigger- meaning Metricí receives “a request” to start the detection for vehicles.

The trigger situation for PPD is useful in cases of underground parking lots, where the lights are off when there is no activity. So when a car enters a parking and the lights are on, that can trigger a detection for Metricí. Also, a trigger can be generated by a LPR detection, for example, when a car approaches a parking thus generating a PPD engine and under 1 second the driver can see on a LED display how many free parking spaces are available inside that parking.

Keep in mind that when setting the detection with trigger you can also choose how many seconds the PPD engine is trying to detect the vehicles.



Choose who sends the trigger and on what port- Barix or Metrici Virtual Trigger. Barix is a LAN Controller with a special developed Metrici firmware which is very versatile and used in so many applications- see the Barix Integration manual for more details.

Also in this setting you can choose The Recognition Enhancement. See picture above.

What this will do is increase the accuracy of detection from Low to Ultra. The higher the precision, the more processing power is needed but the precision is much better. A normal setting would be just enough in most cases.

The smaller the cars are in the video, the greater the accuracy must be so you will choose "high" or even "ultra".

A Metrici virtual trigger is a copyright patent of Metrici when one detection engine is sending signals to activate other Metrici engine and so on. This is useful in applications where a cross checking is used but not only on that case. 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. The first rule is that the events

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must have each one a rule established in database and the detection to be triggered because there is a unique verification key for every detection which connects to the next in the chain.

In this menu, with Metricí Virtual Trigger, we set the application to **receive** a signal (trigger) to start detection from another Metricí engine - as a LPR, QR or CCR engine.

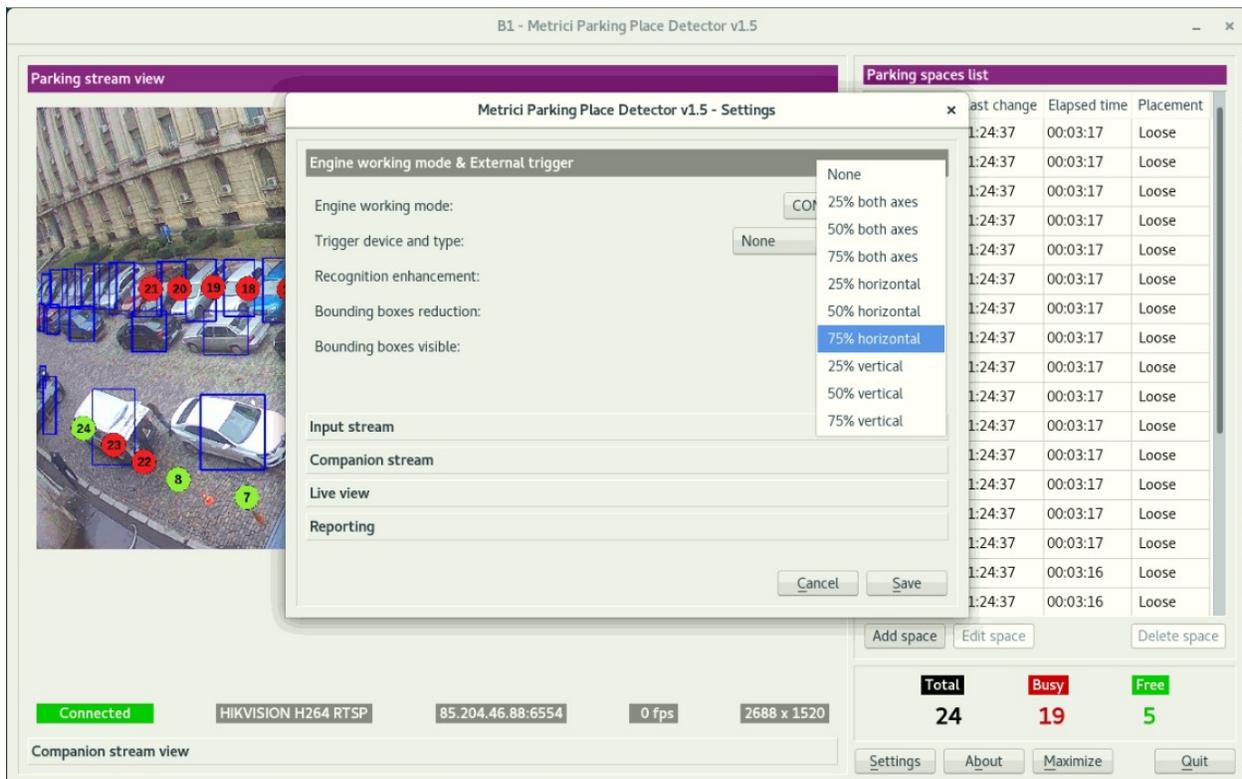
To see how to set a Metricí engine to **send** a signal (trigger) to another engine, see **LPR user guide** for additional info.

Bounding boxes

Before proceeding to this setup, it is recommended to define before the parking places. See last chapter of this user guide.

By default, the neuronal network "draws" a bounding box around any detected and recognized object. This may lead to some drawbacks when the detected objects, in this case, cars, are in an odd angle or when big cars are in the frame, as more bounding boxes may overlap one another and generate false readings.

To overcome this, a feature of boundin box - reduction was introduced.

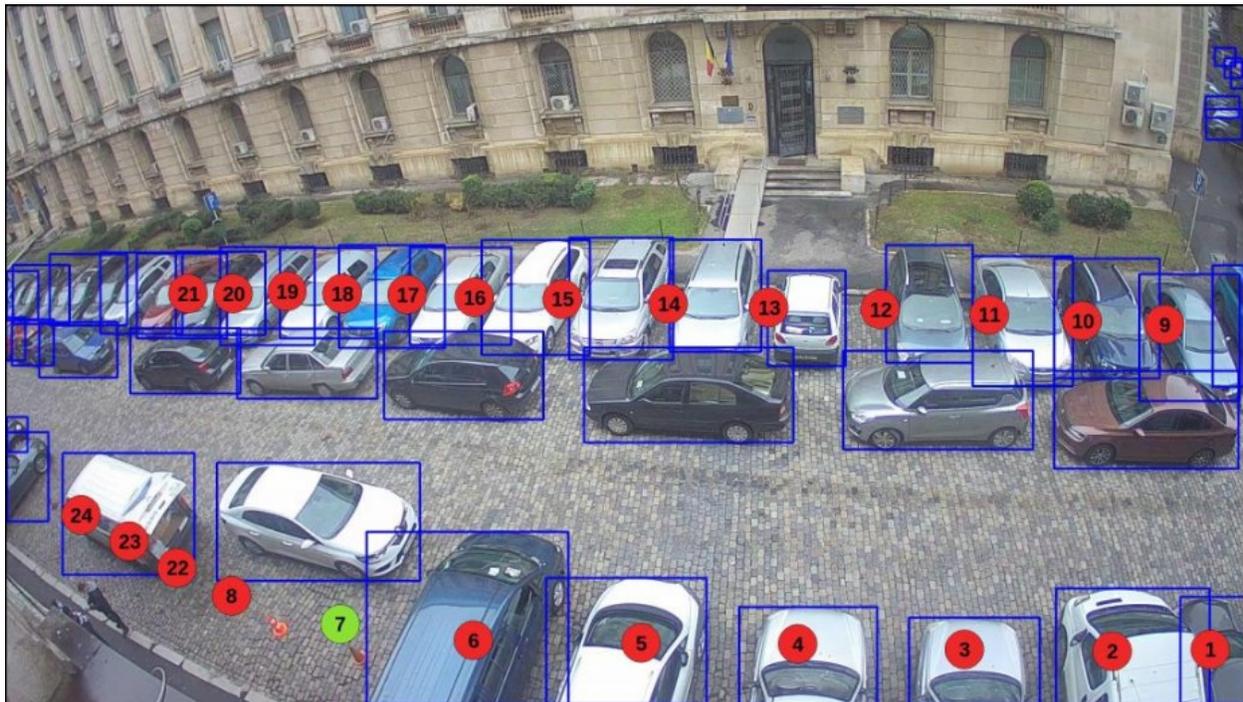


As seen above, the reduction can be made in horizontal plan, vertical one or both axes with 25%, 50% and 75% ratio.

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For comparison, you can see in the next image you can see how a bounding box with no reduction looks like.

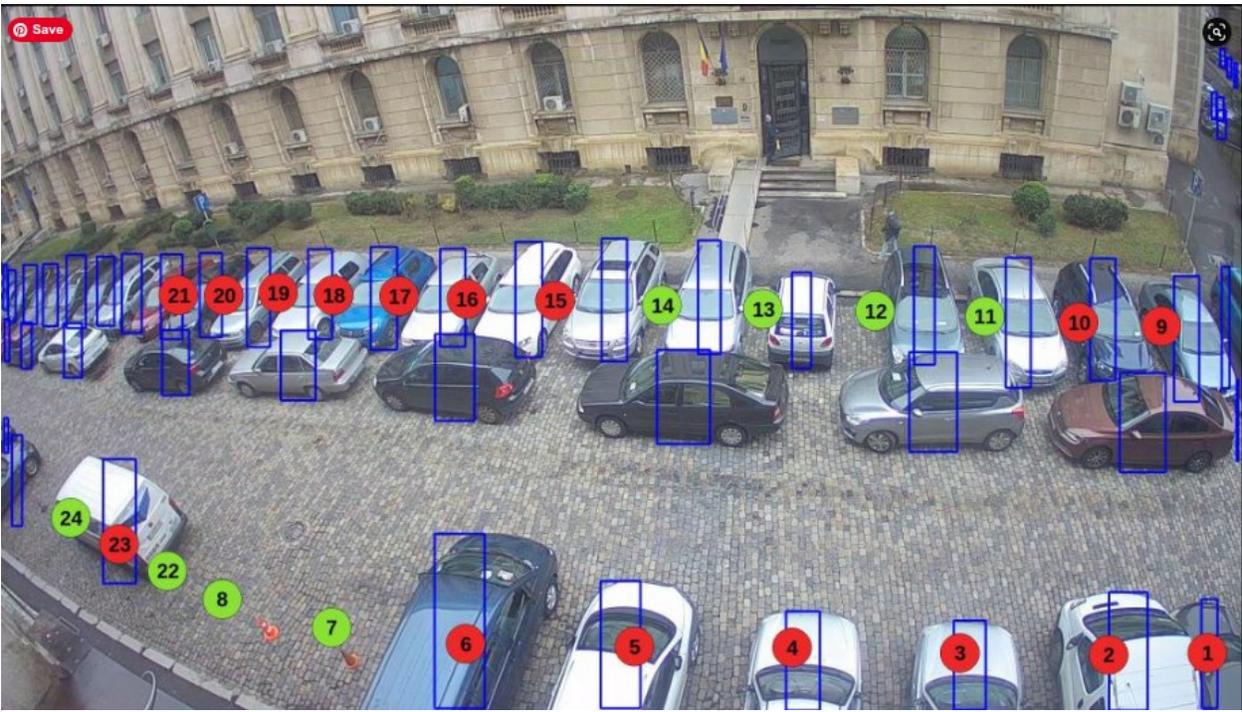


Compare with a 50% reduction on both axes. Please notice in the next image you can carefully place the detection circle to have an accurate detection. Please also read last chapter regarding "loose" or "strict" placement.

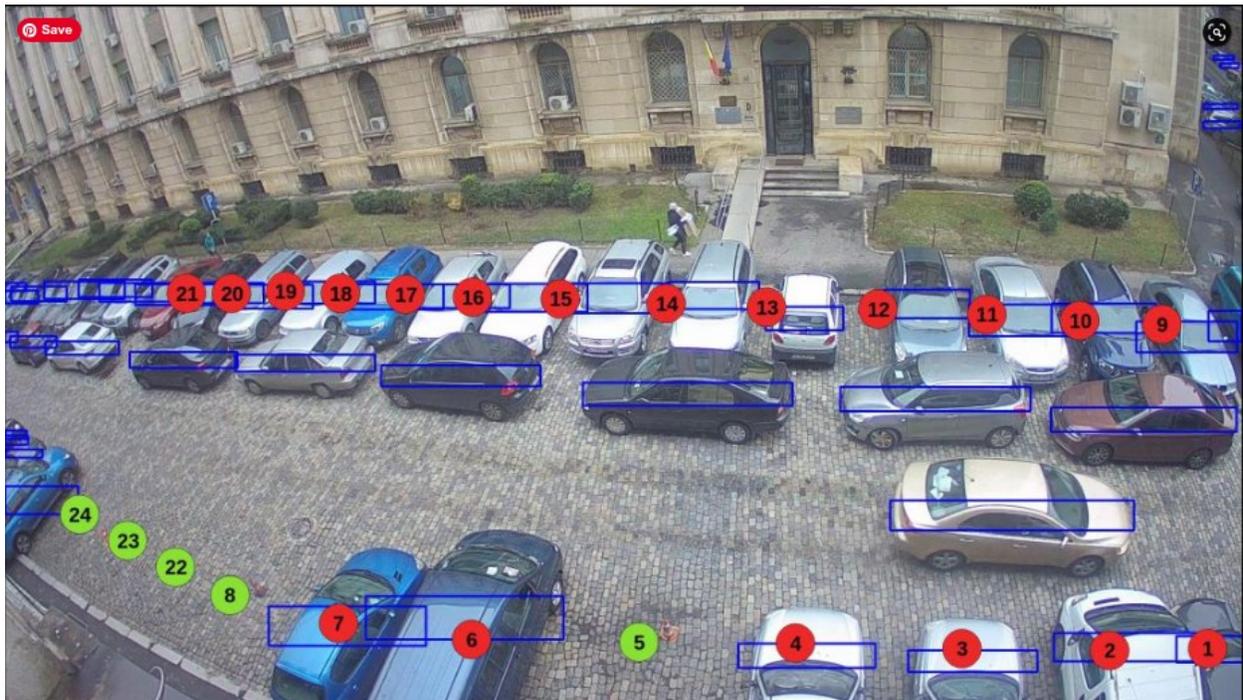
For example, parking places number 12 and 14 are marked as free although it is obvious that no car can fit there, because the detection circle/point does not meet anywhere the bounding box. So the cars are detected, but they do not occupy a parking place, as the AI thinks.



To conclude in the next image you can see a 75% reduction on horizontal plan. Notice again how the detection points should be placed.

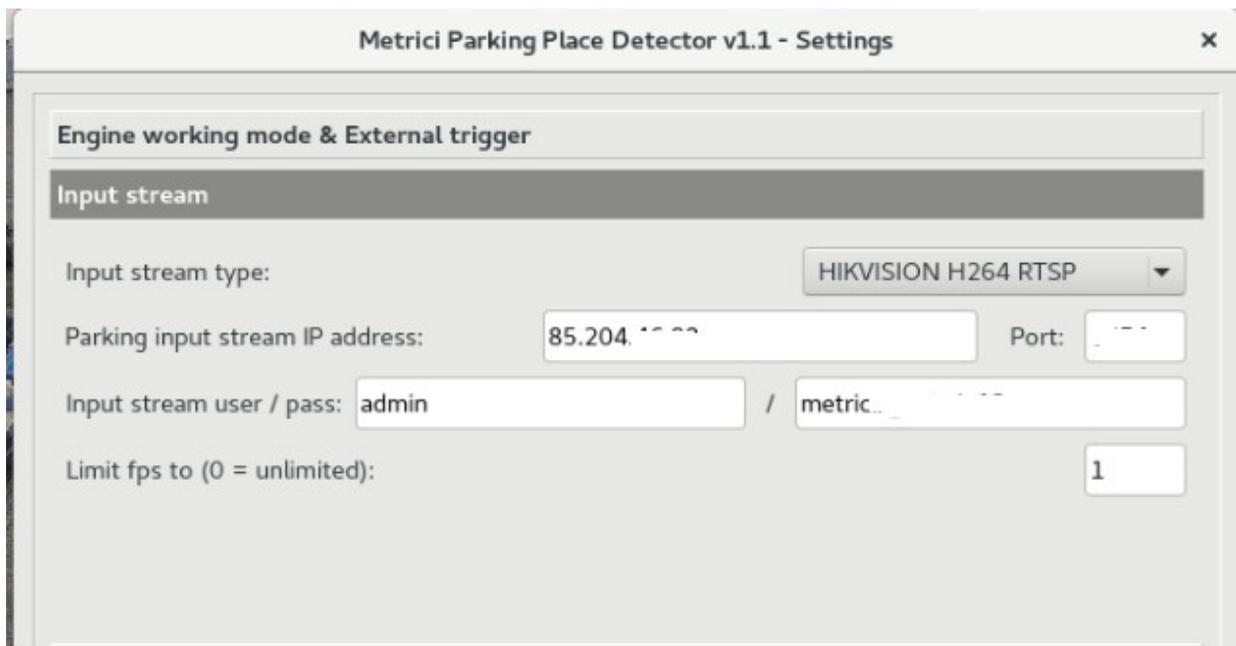


And 75% reduction in vertical plan.



Bounding box visible or not will let you see the bounding box in the Interface or not.

7.2 Input Stream



Section **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, as in the example below. **Be careful to choose the correct 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 you use a model of camera that isn't on Metrici list, just choose "Generic Camera". For PPD, Metrici recommends limiting the FPS to 1.

7.3 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 PPD/LPR/QR CODE/CCR events. 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. Generally used in LPR, CCR and QR code, but not limited to these.

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 stream 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.

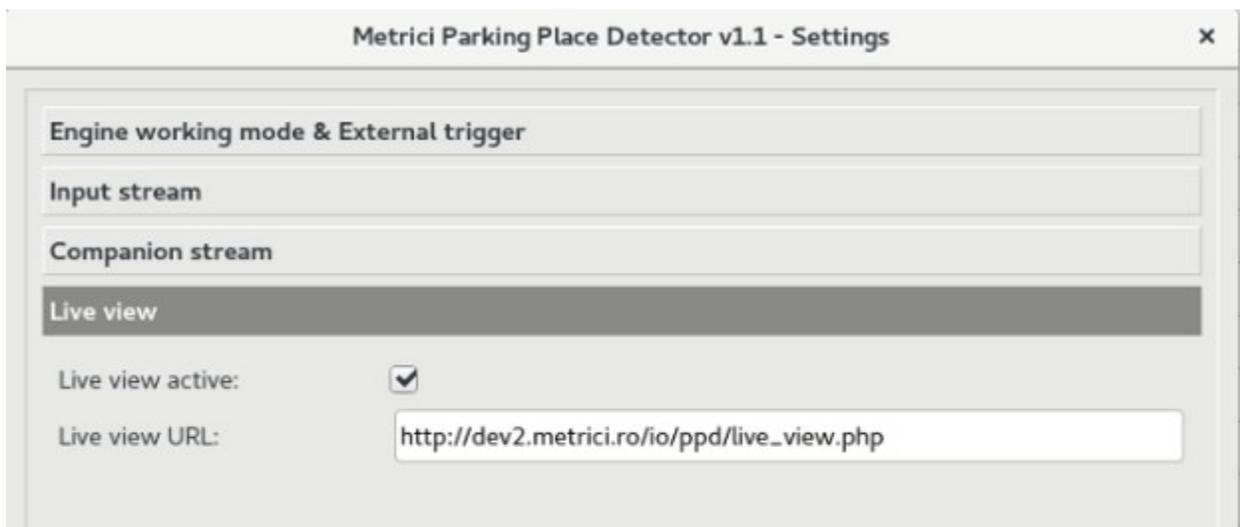
7.4 Live View

Live View tab, when checked active, will send the images to a server, or on localhost.

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 display in Metrici Interface

On Live View URL, you will fill in the address where the stream can be watched. If it is on same machine the address will have a form such as

http://localhost/io/ppd/live_view.php which is automatically filled in by Metrici.



If the access is web based you will write an address such as http://IP_ADDRESS/io/ppd/live_view.php and result a formula like http://192.1.1.1/io/ppd/live_view.php or also http://metrici.ro/io/ppd/live_view.php

7.5 Reporting

In the menu **Reporting** you will fill in where Metricí sends the data about status change for parking places. In order to activate the communications between the engines and the interface, you will also fill in the authkey and the ID generated by Metricí Interface when the camera was introduced in the Locations and Camera menu, which is the only way to integrate the communication between the detection unit and analysis centre. If you will not fill these data, you will not have access to Live View and you will not receive events, 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 **Metricí Interface** on Global Settings **menu, Locations&Cameras** submenu and choose a location to view all the cameras in . As in the next image.- **See chapter 5.5. Each camera has a unique ID and authkey which will be used in the engine.**



Metricí Parking Place Detector v1.1 - Settings

Engine working mode & External trigger

Input stream

Companion stream

Live view

Reporting

Reporting URL:

Reporting - authkey / id: /

Status change delay:

Status change delay is the time interval Metricí waits at a status change for a place before sending the events to database. An 8 seconds interval means that when a place is occupied by more than 8 seconds, that event is sent to database. This is useful to eliminate the false positive, when a car just passes by a parking place or over it. If the reporting is on same machine, the Reporting URL will take a form such as http://localhost/io/ppd/new_parking_place_event.php. This is how Metricí builds the database, the statistics and reports and creates the lists in Parking Events.

If the database is not on the same server and the reporting is done towards another URL you will fill in an address such as

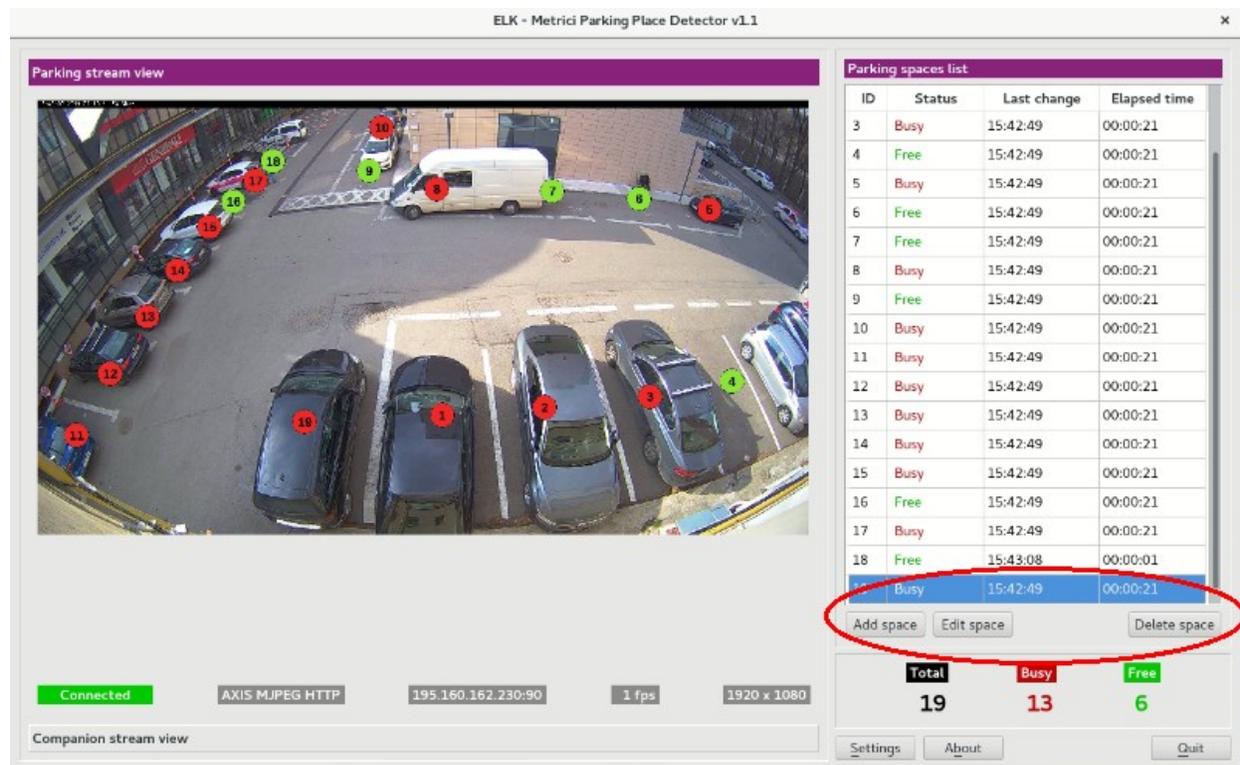
http://IP_ADDRESS/io/ppd/new_parking_place_event.php and will result a formula such as http://192.1.1.1/io/ppd/new_parking_place_event.php or http://metrici.ro/io/ppd/new_parking_place_event.php

7.6 Adding Parking Places

If all the above settings were done properly, you will have to see the camera live on screen and it is time to add the parking places allocated to each camera of the parking.

From the list of cameras go to each one of them and begin to add places by click on the Add Space button, on the lower right. A yellow dot will appear on Parking Stream View, at the left of the window. You just drag the dot where a parking place is suppose to be and Save. Metricí will immediately see if the place is busy or free. Metricí does not take into account if your parking bays are marked or not.

As a general rule, the dot must be placed where a car is suppose to park. Keep in mind that “the dot”, meaning the parking place, can be later moved, deleted, edited etc., if the parking configuration changes.

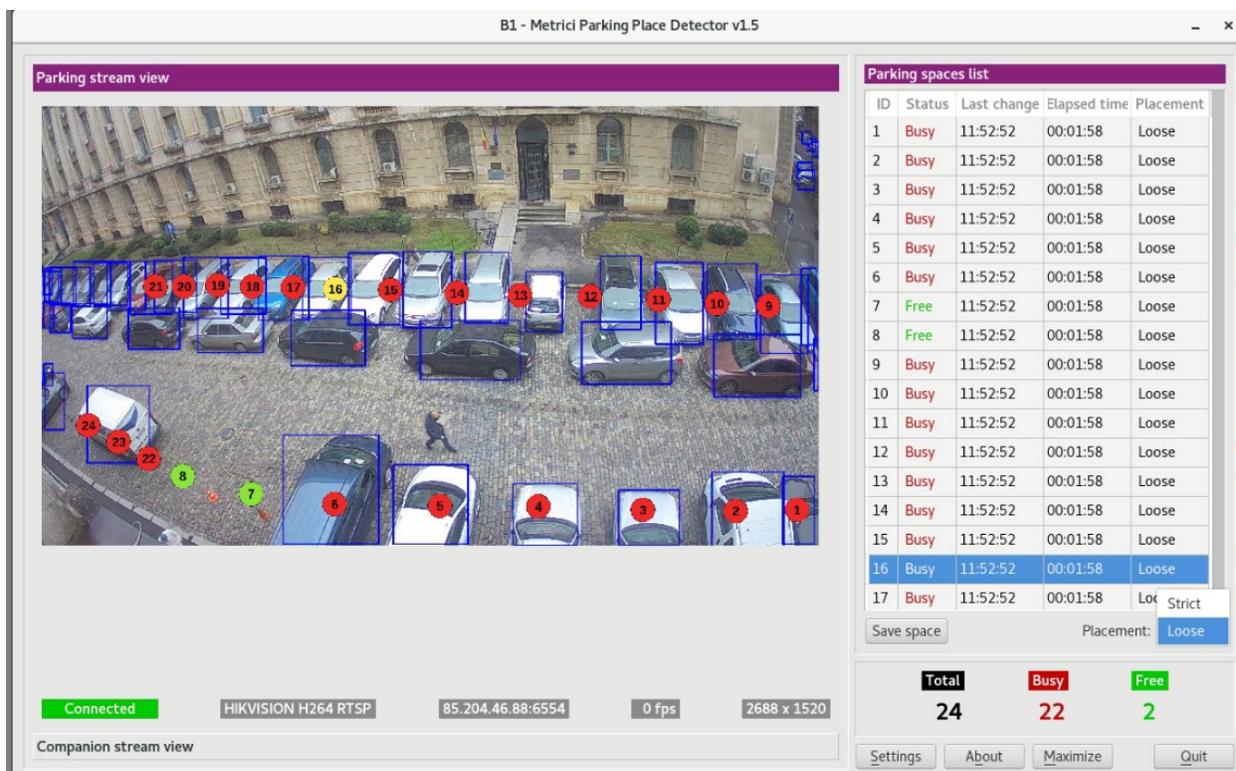


Repeat the process for each parking place and then go to the next camera in the parking. Remember that a vehicle must somehow be under a dot. When a dot is at the edge of a vehicle it is possible sometimes to have errors. Also be aware where you place the dots as one vehicle not to be exposed to two of them and have a false positive. There is also the chance that a car parks between two spaces.

Also errors can occur at the edges of the images. In the example image above at the right of place number 4 or above place 18, no parking places can be placed as the cars are overlapping.

Any time you want, you can drag and drop somewhere else every dot in the parking by click on the Edit button if the configuration changed or if there are other parking habits. You can also delete a place from the list, meaning a parking place is no longer valid. This operation can also be checked in the interface.

When adding or editing parking places, you can choose to have a "loose" or "strict" placement of the detection point, as in the next image.



A "loose" detection will allow an accurate reading of the occupancy status when the detection point/ circle will intersect the bounding box no matter how much. When "strict" is selected, the reading will be made as occupied when the **CENTER** of the detection point will intersect/ will be within the bounding box.

REMEMBER: Keep in mind that the parking places you created here must be validated/registered in the interface (**See Chapter 6.6**) Or go to PPD/Settings/Location and Camera choose the location and go to each camera to validate one or all places.

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 Web Interface**, when a connection at internet /network is set.