SISTEMA ITSCAMPRO
Integration Manual

PUMATRONIX

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Change History

Date	Version	Updated content
12/01/2022	1.0	Initial Version

Overview

This document aims to guide the developer in the use of available operating interfaces that allow operating the ITSCAMPRO 1.11.2 software, being the software responsible for the management of the information produced, with the objective of monitoring vehicles through automatic license plate reading (LPR) or general characteristics of the vehicle, in addition to detecting dangerous loads transported. If you have any questions, please contact Pumatronix technical support.

> ⚠️ **According to the firmware version applied to the device accessed, the web access interface is differentiated and some functions can be made available only in the most current versions.**

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1. ITSCAMPRO Web Interface

The home screen of the ITSCAMPRO web interface has the functions always visible and available for access and displays the Mosaic, when configured as the home page of the logged in User, with the latest captures made by the registered devices, which are presented in mosaic format, configured for the selected size: 1x1, 2x2x, 3x3, 4x4, 5x5 or 6x6.
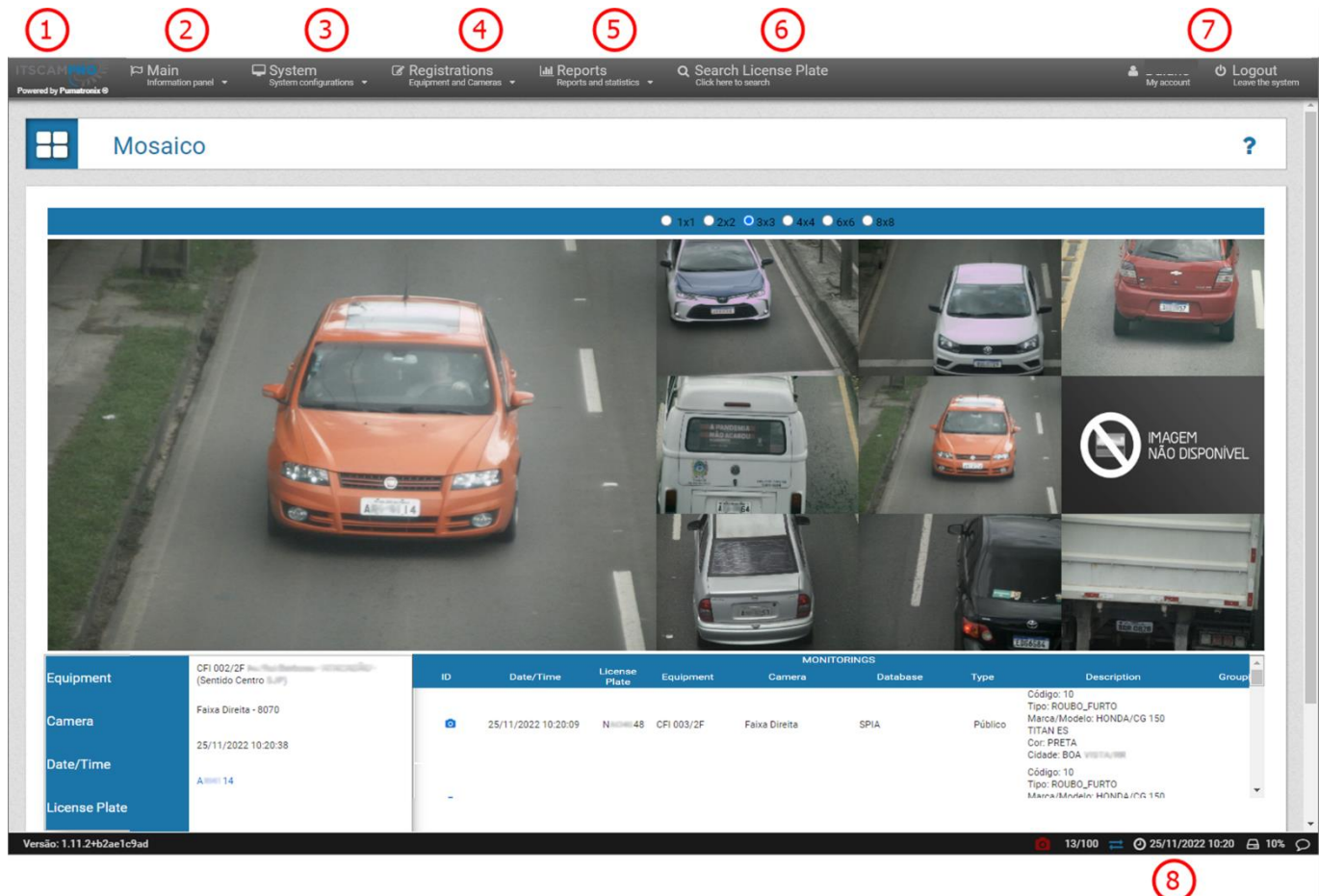

Figure 1 - Features available in the interface: 1) Access to the home page, 2) Main Menu, 3) System Menu, 4) Registration Menu, 5) Reports Menu, 6) Search Plate Function, 7) User Account Data and Logout, 8) Status Bar
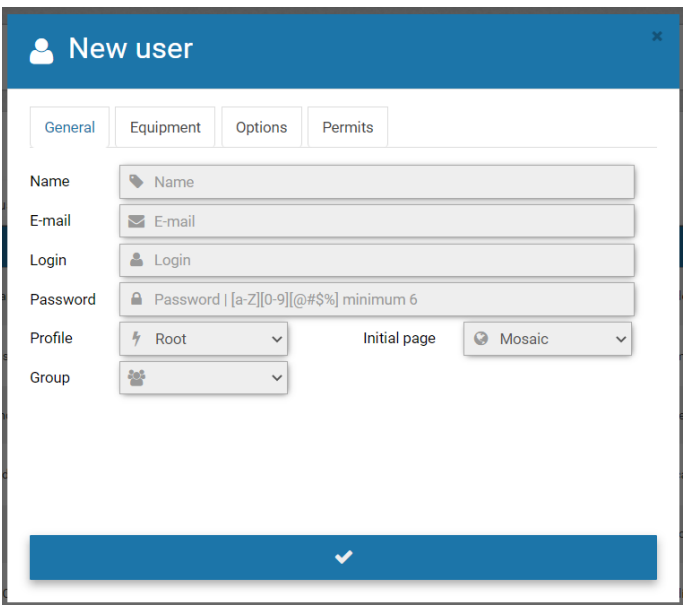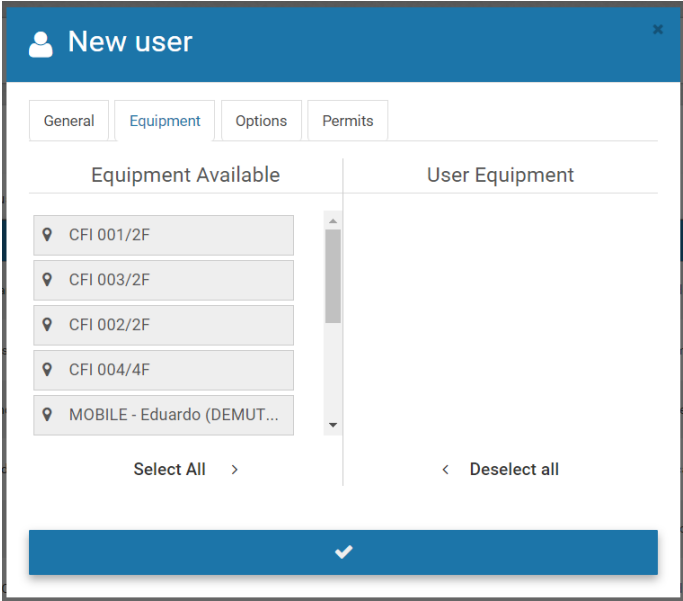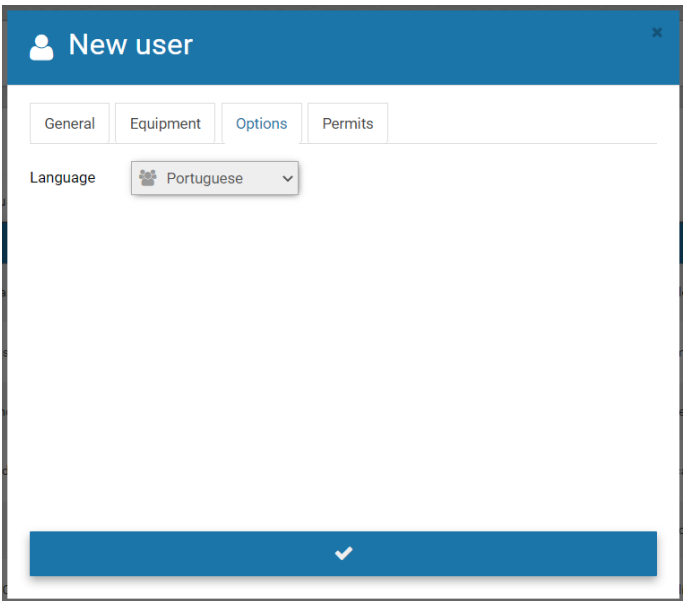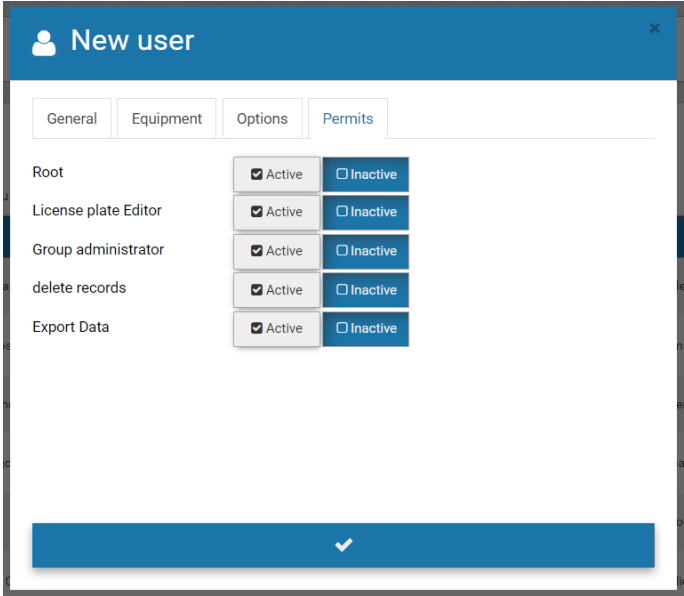
2. System Menu

Users

ITSCAMPRO allows the control of access to equipment independently by User *Groups* and allows different access levels to be made available to each user of the system, it is possible to register a user with full permission to access the system (*Root Profile*) and a user with restricted access to some reports and Monitoring of vehicles and traffic (*Operator*).

To add a new user, click *+New User* and the screen displays the fields for completion, separated into four tabs:
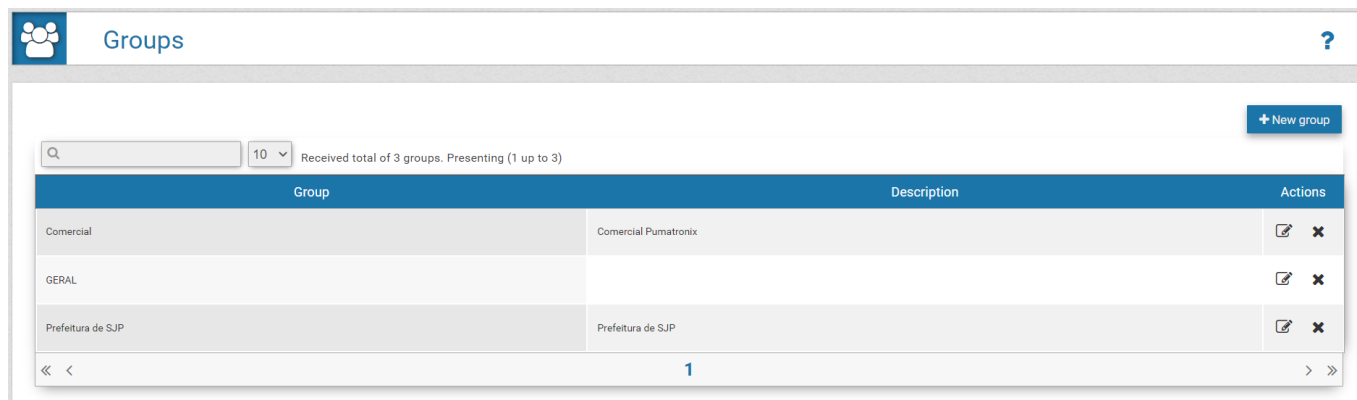
Field	Description
General Tab	
Name	required to create a name for user identification
E-mail	register a user email to send system data
Login	required to enter data to log in
Password	obrigatório inserir a senha de acesso para realizar o login
Profile	select a profile that contains the access permissions to the desired screens
Home Page	select what will be the home page displayed after login
Group	select a *Group* that will associate the equipment and monitoring list of the group with the user

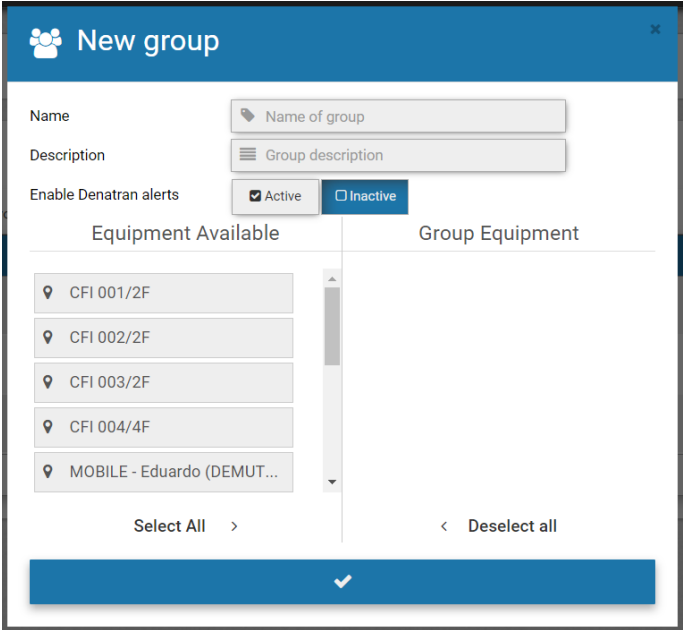| Field	Description
Equipment Tab	
Available Equipment	select which equipment the user will have access to and drag to the *User Equipment* column to allow access
User Equipment	view/remove equipment that the user can access
Options Tab	
Language	select the display language of the interface for the user, among the possible: *Portuguese, English or Spanish*

Field	Description
Permissions Tab	
Root	the user with the *Root* permission is the primary administrator of the system. In addition to being able to configure the groups and user, Root is allowed to do server administration tasks
License Plate Editor	the user with this permission can change the plate information detected in the records
Group Admin	the user with *Group Administrator* permission, can make changes to the group capture equipment and device settings, and can manage the monitored vehicles
Delete Records	select whether the user has permission to delete system records
Export Data	select whether the user has permission to export system record data

Groups

The User Groups setting aims to restrict access to equipment and the list of monitored vehicles when associating created users. Likewise, it allows to restrict access to the captures made only by the equipment that belongs to the group associated with the user.

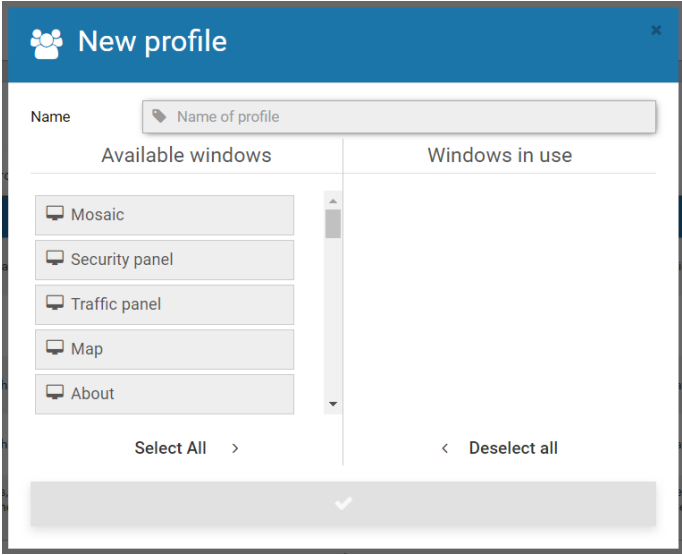To add a new user, click *+New Group* and the screen displays the fields to fill in:

Field	Description
Name	required to create a name for group identification
Description	enter group description
Enable Denatran Alerts	select whether Denatran alerts for the group will be *Active* or *Inactive*
Available Equipment	select which equipment is released for group access and drag to the *Group Equipment* column to allow access
Group Equipment	view/remove equipment that the group can access

Profiles

The *Profiles* configuration aims to restrict access to the ITSCAMPRO System screens by associating with *Users* or *Groups*. By default, users with a *Root* profile can search the Vehicle Monitoring in user groups other than the one with which it is associated.
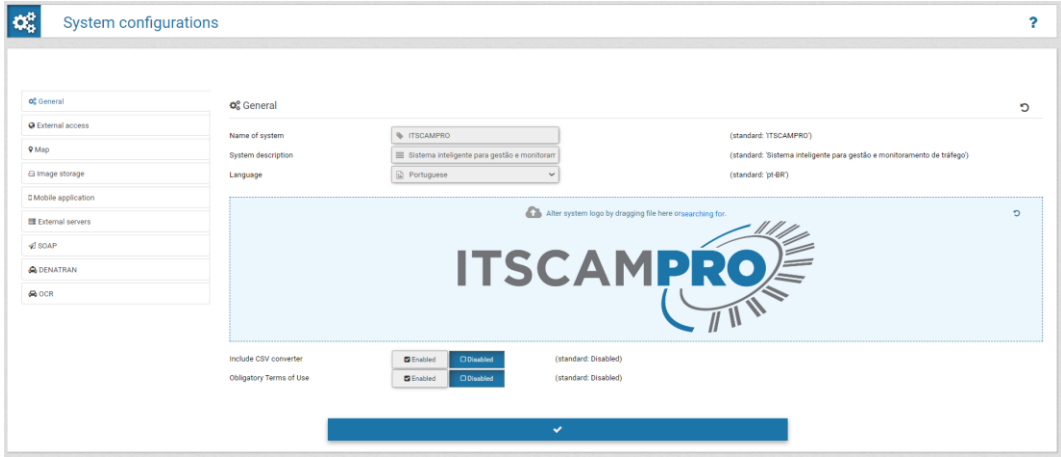
To add a new user, click *+New Profile* and the screen displays the fields to fill in:

Field	Description
Name	required to create a name for profile ID
Available Screens	select which screens are allowed for profile access and drag to the *Screens in use* column to allow access
Screens in Use	view/remove the allowed screens for the *Profile*

System Settings

The operation and functioning of the ITSCAMPRO System in various environments and infrastructure requires that the *System Settings* are correctly applied in the fields described:

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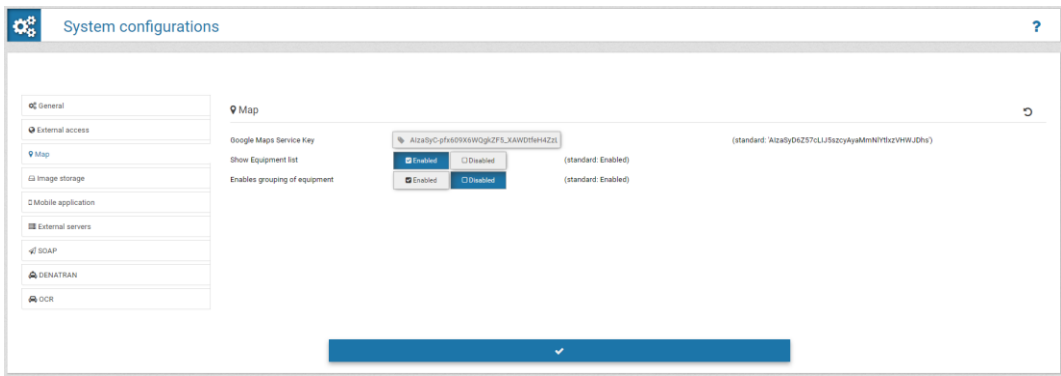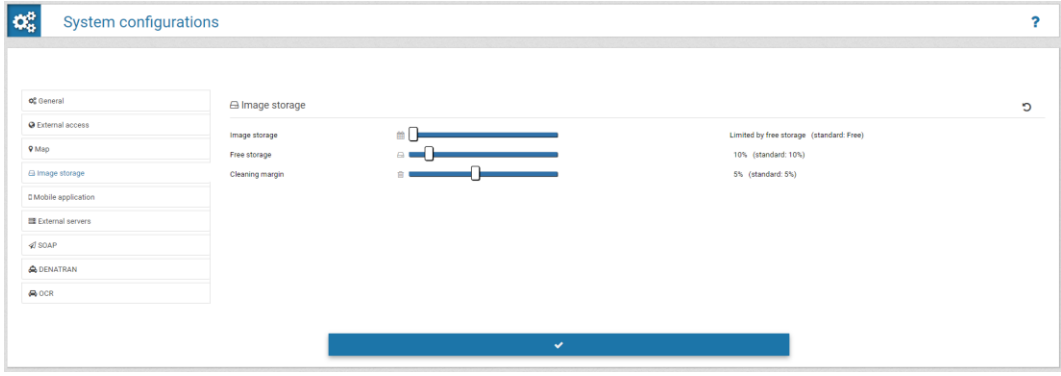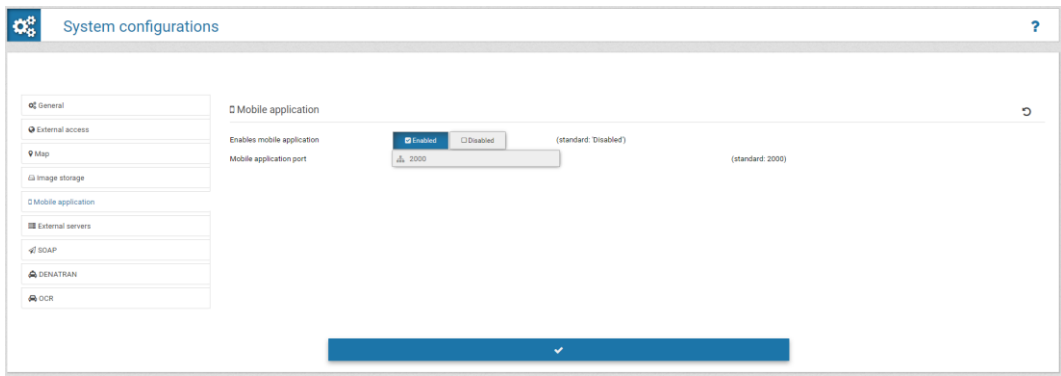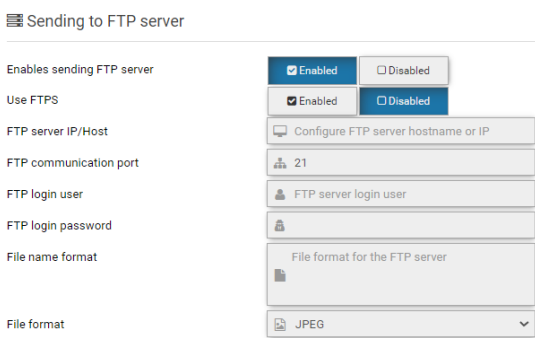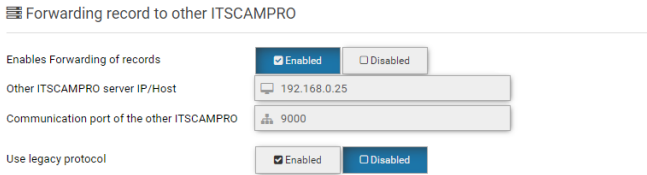| Field	Description
General Tab	
System Name	enter the name that will be displayed on the system login and access home screen
System Description	enter brief description to be displayed on the system login and access home screen
Language	select the display language of the interface
System Logo	change the system logo by inserting the image to be displayed on the login screen
Include CSV converter	select whether the CSV converter will be *Enabled* or *Disabled*
Term of Mandatory Use	select whether the Mandatory Use Term will be *Enabled* or *Disabled*

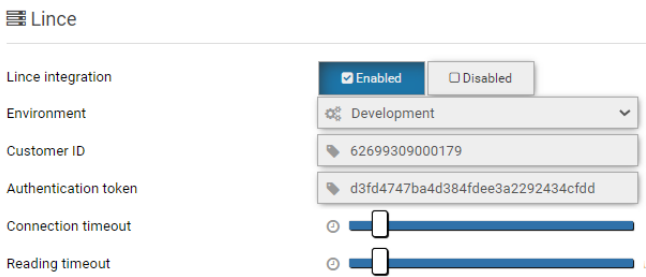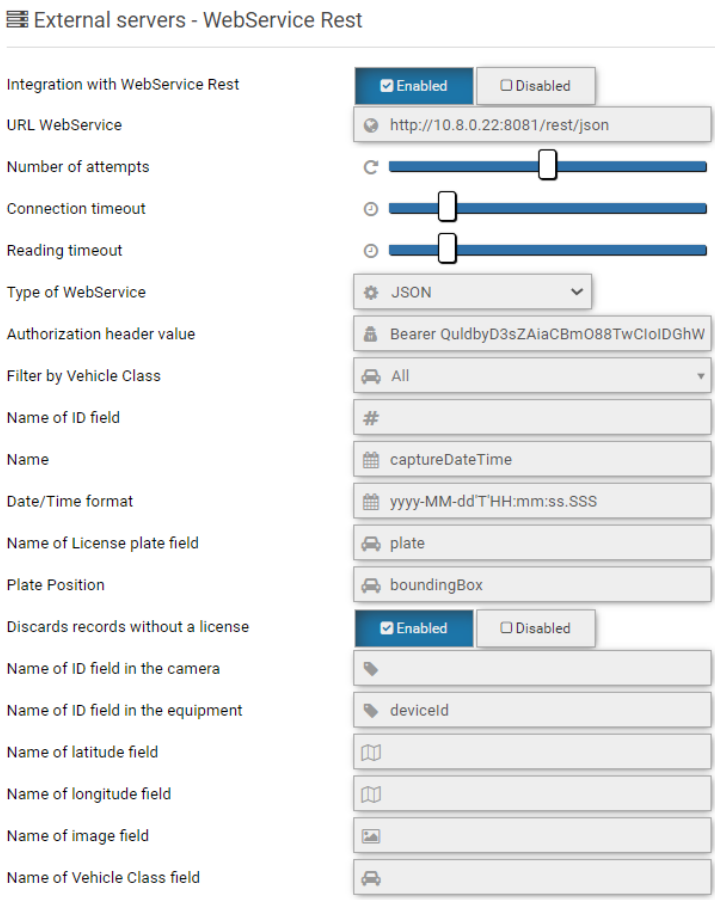| Field	Description
External Access Tab	As ITSCAMPRO may be behind a NAT, it is possible to configure some of the ports used in communication with the service.
ITSCAMPRO IP/External Host	enter the external IP or internet address where ITSCAMPRO will be visible on the internet since it is possible for the system to be accessed from outside the company intranet. This setting is very important for automatic status updates
Service Communication Port	enter communication port that the system must use to communicate with the ITSCAMPRO service for monitoring. In the case of an external access, it is necessary to include the forward network of that port to the server IP

Field	Description
Cameras Communication Port	enter port through which capture devices and equipment such as WetecFF and ITSCAMPRO Mobile will send the captures to the ITSCAMPRO server
Enable HTTPS	select whether the use of the HTTPS protocol in the graphical interface will be enabled
Certificate	click on the field to load the external certificate file or select Use default and the certificate

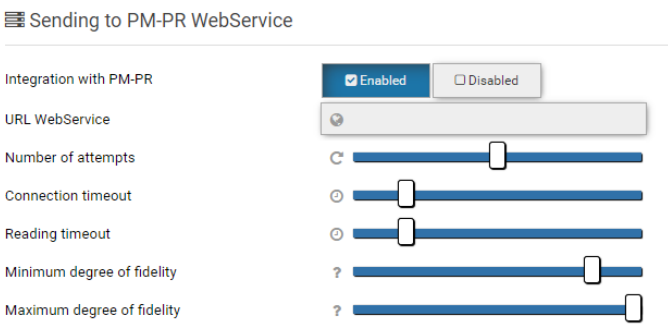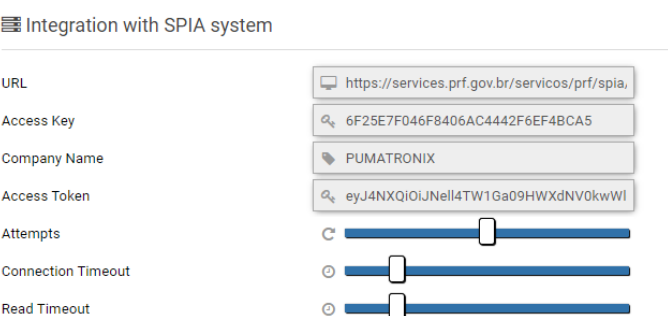| Field	Description
Map Tab	
Google Map Service Key	enter *Google Maps Services Access Key*
Show Equipment List	select whether the list of equipment in the Map view will be *Enabled* or *Disabled*
Enables Equipment Pooling	select whether the functionality of grouping the nearby equipment in the Map view will be *Enabled* or *Disabled*
Image Storage Tab	
Image Storage	set the time that the images will remain in ITSCAMPRO, which allows to keep the storage from 3 months up to 2 years or *Limited by Free Storage*, which removes the stored images considering the *Free Storage configuration*
Free Storage	set the minimum free HD space that should be maintained in the system, which can be 5% to 50%
Cleaning Margin	configure the margin (from 1% to 10%) that must be maintained with each HD cleaning operation, to prevent the system from cleaning with each new image when reaching the minimum HD limit

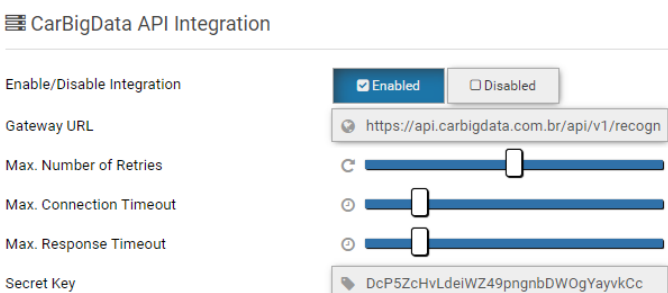| Field	Description
Mobile Application Tab	Access to ITSCAMPRO can be done using Android application.
Enable Mobile App	select whether integration with the mobile application will be *Enabled* or *Disabled*
Mobile App Port	configure the port that will be used for communication with the mobile application

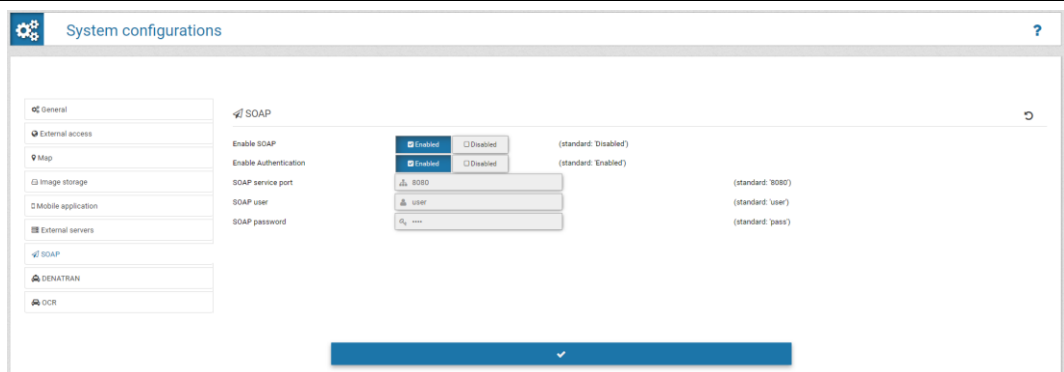| Field	Description
External Servers tab > Sending to FTP Server	
Enables FTP Server Sending	select whether sending to FTP server will be *Enabled* or *Disabled*
Use FTPS	select whether the use of FTPS will be *Enabled* or *Disabled*. When enabled ITSCAMPRO will use FTPS instead of unsecured FTP
IP/Host FTP Server	configure the IP address or HostName of the server to be sent
FTP Communication Port	enter the port that should be used in communication with the FTP server
FTP Login User	enter user to login to FTP server
FTP Login Password	enter password for FTP server login
Format File Name	customize the format that the files will be saved on the FTP server. • *cameraname:* The tag allows you to use the camera name in the file • *cameratype:* The tag allows using the camera type in the file path, differentiating when it is a front camera ('D') from a rear camera ('T') • *captureid:* The tag is exchanged for the capture identifier. This integer can be formatted as well (ft. %010d - use 10 digits by putting 0 to complete)

Field	Description
	• *datetime:* The tag can be used whenever it is necessary to include the date/time in the file name. This accepts the default date/time formatting fields (yyyy - year | MM - month | dd - day | HH - time | mm - minutes | ss - seconds) • *equipment:* The tag allows you to use the equipment identifier in the path of the file being saved on the FTP server • *imageid:* The tag is exchanged for a unique image identifier • *plate:* The tag is exchanged for the plate read by the OCR • *probability:* The tag allows the user to put the overall probability of the plate in the name of the FTP file
File Type	select the file format from the available formats: • *JPEG:* Standard system image format • *PNG:* Vector format but with data compression • *WEBP:* Vector format developed by Google with 26% more compression than PNG and 34% more compression than JPEG The configuration of the FTP file format allows the user to customize the upload in a very flexible way, including creating directory trees. Example of configuration and generated file format: *<datetime>yyyy</datetime>/ <datetime>MM</datetime> /<datetime>dd</datetime>/ <datetime>HHmmss</datetime> _<captureid>%10d</captureid>_ <plate>%s</plate>_ <imageid>%d</imageid>.jpg* *datetime: 20/05/2021 20:00:00* *captureid: 1* *plate: ABC1B34* *expo: 1* *2021/05/20/ 200000_0000000001_ABC1B34_1.jpg*
External Servers tab > Forwarding records to another ITSCAMPRO	
Enables Record Forwarding	select whether to *Enable* or *Disable* the forwarding of capture records to another ITSCAMPRO server
IP/Host from the other ITSCAMPRO server	configure IP or HostName to access the other ITSCAMPRO server
Communication port of the other ITSCAMPRO server	enter the communication port between ITSCAMPRO and the other ITSCAMPRO server
Use legacy protocol	select whether the use of the legacy protocol in the forwarding of records will be *Enabled* or *Disabled*

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Field	Description
External Servers Tab > Lince	
Lince Integration	select whether integration with the Lince server will be *Enabled* or *Disabled*
Environment	select server environment type
Client Identifier	enter customer identifier
Authentication Code	enter server authentication code
Connection Timeout	set the maximum time that will be expected for accepting a connection on the server
Response Timeout	set the maximum time that will be expected for receiving response from the server
External Servers tab > WebService Rest	 In addition to access by application, the information obtained by ITSCAMPRO can be forwarded to an FTP (File Transfer Protocol) server, another ITSCAMPRO, Web Service Rest or other external servers that are configured.

Field	Description
WebService Rest integration	select whether sending to a WebService Rest will be *Enabled* or *Disabled*
WebService URL	set WebService URL
Number of Attempts	set the number of attempts to send a record
Connection Timeout	set the maximum time the server will wait for a connection return
Reading Timeout	set the maximum time that the server will wait for a return of the information sent
WebService Type	select the type of data that will be sent and received in WebService that can be of type JSON or Multipart
Authorization Header Value	define the information that will be sent in the '*Authorization' field in the REST request*
Filter by vehicle class	select which vehicle classes will be routed to the WebService Rest that allows the options: *All, Unidentified, Car, Motorbike, Truck or Bus*
ID Field Name	set the name of the record identification field when sending to *WebService.* If the field is left blank this field will not be added on sending
Field Name Date/Time	customize the name of the date/time field when sending to *WebService.* If the field is left blank this field will not be added from sending
Date/Time Format	customize the format that will be sent the Date/Time
Name Plate Field	customize the name of the plate field when sending to *WebService*. If the field is left blank this field will not be added from sending
Plate Position	enter coordinates of the position where the plate was identified (x0,y0;x1,y1;x2,y2;x3,y3)
Discard Registration without Plate	select whether the discard of unmarked records will be *Enabled* or *Disabled*. When enabled, records without a plate will not be sent to WebService
Camera ID Field Name	customize the name of the capture/lane device identifier field. If the field is left blank this field will not be added on sending
Equipment ID Field Name	customize the name of the equipment identifier field. If the field is left blank this field will not be added on sending
Latitude Field Name	customize the name of the latitude field. If the field is left blank this field will not be added to sending
Longitude Field Name	customize the name of the longitude field. If the field is left blank this field will not be added to sending
Image Field Name	customize the name of the image field. If the field is left blank this field will not be added to sending
Vehicle Class field name	customize the *Vehicle Class Name* field when sending to *WebService*. If left blank, will not be added to sending

Field	Description
External Servers Tab > Submission to PM-PR Web Service	 The ITSCAMPRO system allows integration with the PM-PR intelligence system. The PM-PR WebService needs the lane to be configured, the lane identification is configured in the External Identified field of the capture device. In addition to the lane identifier, the location and a valid plate are requirements for the records that are sent to the PM-PR.
Integration with PM-PR	select whether integration with PM-PR will be *Enabled* or *Disabled*
Web Service URL	configure the URL that will be used to access the PM-PR *WebService*
Number of Attempts	set the maximum number of attempts to send a record to the PM-PR server
Connection Timeout	set the maximum time that will be expected for the acceptance of a connection on the server, between 0 to 60,000 milliseconds
Reading Timeout	set the maximum time that will be expected for receiving response from the server, between 0 to 60,000 milliseconds
Minimum Degree of Loyalty	define the minimum probability (between 0% and 100%) of the plate certainty so that ITSCAMPRO understands that the plate is valid and sends the image for validation. If the probability is lower, the image will not be sent in the record
Maximum Degree of Loyalty	define the minimum probability (between 0% and 100%) of the plate certainty so that ITSCAMPRO understands that the plate is valid and sends the image for validation. If the probability is higher, the image will not be sent in the record
External Servers Tab > Integration with the SPIA System (PRF)	 The ITSCAMPRO system allows integration with the PRF intelligence system called SPIA. The SPIA-PRF WebService needs the lane to be configured, lane identification is configured in the External Identified field of the capture device. In addition to the lane identifier, location is one of the requirements for records that are sent to the SPIA-PRF.
URL	enter the *URL* that will be used to access the SPIA-PRF *WebService*
Access key	enter the access key so that the PRF server accepts the system records

Field	Description
Company Name	configure the name of the company that is registered as responsible for the system that is sending the records to SPIA
Access token	enter *Access Token* to access the SPIA-PRF WebService (???systemconfig.help.spiaintegration.accesstoken???)
Attempts	set the maximum number of attempts to send a record to the SPIA-PRF server that can be 1 to 5 times
Connection Timeout	set the maximum time that will be expected for the acceptance of a connection on the server, between 0 to 60,000 milliseconds
Reading Timeout	set the maximum time that will be expected for receiving response from the server, between 0 to 60,000 milliseconds
External Servers Tab > Integration with CarBigData API	
Enable/Disable Integration	select whether integration with CarBigData API will be *Enabled* or *Disabled*
API URL	enter the URL that will be used to access the CarBigData API
Max. Number of Attempts	set the maximum number of attempts to send a record to the server
Max. Connection Time	set the maximum time that will be expected for accepting a connection on the server
Max. Response Time	set the maximum time that will be expected for receiving response from the server
Security Key	enter server security key
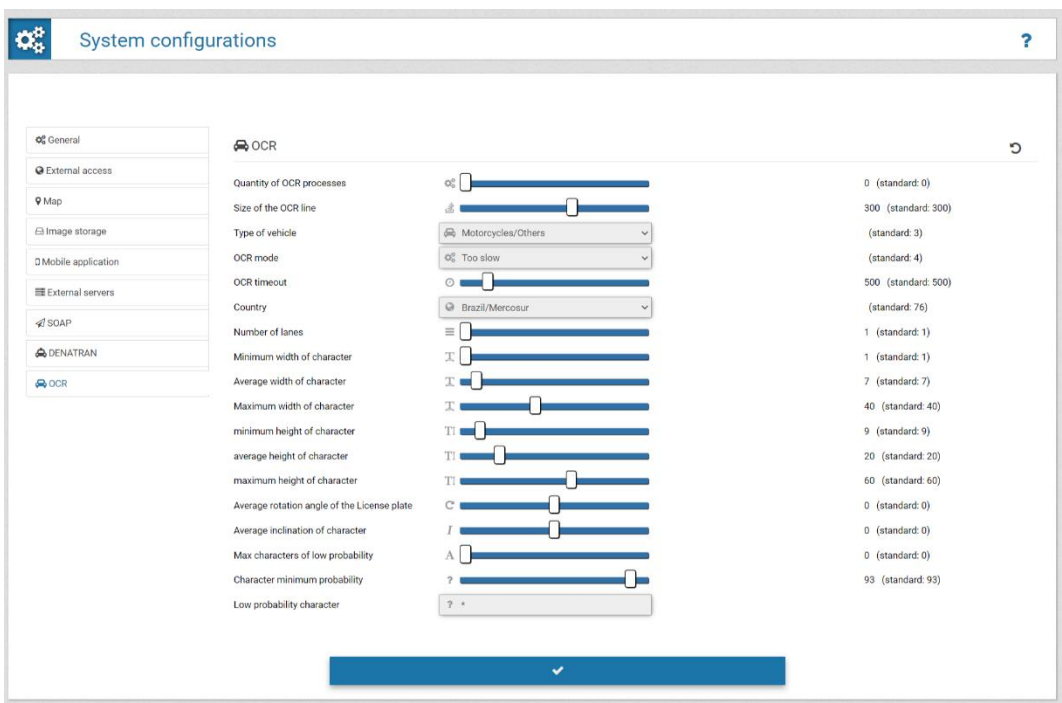
Field	Description
SOAP Tab	

Field	Description
Enable SOAP	select whether the use of the SOAP interface in ITSCAMPRO will be *Enabled* or *Disabled*
Enable Authentication	select whether to *Enable* or *Disable* soap WebService authentication in ITSCAMPRO
SOAP Service Port	configure on which ITSCAMPRO port WebService SOAP will be enabled
SOAP User	set username for SOAP authentication in ITSCAMPRO
SOAP Password	set password for SOAP authentication in ITSCAMPRO
DENATRAN tab	
Enables receipt of DENATRAN data	select whether to *Enable* or *Disable* the receipt of RENAVAM data by an FTP server
Use FTPS	select whether FTPS will be *Enabled* or *Disabled*. When enabled ITSCAMPRO will use FTPS instead of unsecured FTP
FTP Mode	select whether the FTP mode will be *Active* or *Passive*

Field	Description
IP/Host FTP Server	configure the IP address or HostName of the server to be sent
FTP Server Communication Port	enter the port that should be used in communication with the FTP server
FTP Login User	enter user to login to FTP server
FTP Login Password	enter password for FTP server login
DENATRAN Tab > RENAVAM	
Renavam File Directory	enter the name that will be displayed in the *Renavam File Directory*
Frequency	select the periodicity between the *Monthly, Daily and Hourly options*
Day	select the day
Hour	select the hour
Minute	select the minute
DENATRAN Tab > RESTRICTIONS	
Restrictions file directory	enter the name that will be displayed in the *Restrictions file directory*
Frequency	select the periodicity between the *Monthly, Daily and Hourly options*
Day	select the day
Hour	select the hour
Minute	select the minute

Field	Description
DENATRAN Tab > Theft and Robbery	Theft and robbery Send email — ☑ Enabled / ☐ Disabled Generate alert — ☑ Enabled / ☐ Disabled Exhibit Popup — ☑ Enabled / ☐ Disabled
Send Email	select whether to *Enable* or *Disable* emailing monitoring with *Theft and Robbery* information
Generate alert	select whether to *Enable* or *Disable* the generation of monitoring alerts with *Theft and Robbery information*
Display popup	select whether to *Enable* or *Disable* the display of the monitoring popup with *Theft and Robbery information*
DENATRAN Tab > Documentation	Documentation Send email — ☑ Enabled / ☐ Disabled Generate alert — ☑ Enabled / ☐ Disabled Exhibit Popup — ☑ Enabled / ☐ Disabled
Send Email	select whether to *Enable* or *Disable* the sending by e-mail of the monitoring with *Documentation information*
Generate alert	select whether the generation of monitoring alert with Documentation information will be *Enabled* or *Disabled*
Display popup	select whether to *Enable* or *Disable* the display of monitoring popups with *Documentation information*
DENATRAN Tab > Search and Seizure	Search and Seizure warrants Send email — ☑ Enabled / ☐ Disabled Generate alert — ☑ Enabled / ☐ Disabled Exhibit Popup — ☑ Enabled / ☐ Disabled
Send Email	select whether to *Enable* or *Disable* the e-mailing of monitoring with *Search and Seizure* information
Generate alert	select whether the generation of monitoring alerts with Search and Seizure information will be *Enabled* or *Disabled*
Display popup	select whether to *Enable* or *Disable* the display of monitoring popups with *Search and Seizure information*

Field	Description
DENATRAN Tab > REFERENCE DATA	REFERENCE DATA Type of data to import: [Brand of vehicles ▾] **Note:** before dragging or selecting a file, check the kind of data to be imported. ☁ drag file with reference data here or ...select one
Type of data to import	select the type of data to import from the options: *Vehicle Brands, Vehicle Categories, Vehicle Colors, Vehicle Types* or *Vehicle Types*

Field	Description
OCR Tab	
Number of OCR Processes	select *Number of OCR Processes*, from 0 to 40
OCR Queue Size	select *OCR Queue Size*, from 0 to 500
Vehicle Type	select *Vehicle Type* from the *Other*, *Motorcycle* or *Motorcycle/Other options*
OCR Mode	select *OCR Mode* from the *Disabled, Fast, Normal, Slow, or Very Slow options*
OCR Timeout	select *OCR Timeout*, from 0 to 4000
Country	select the country from the options: Argentina, Brazil/Mercosur, Chile, Mexico, Paraguay, Uruguay, European Union, France, or Netherlands
Number of Tracks	select *Number of Tracks*, from 1 to 8

Field	Description
Minimum Character Width	select *Minimum Character Width*, from 1 to 100
Average Character Width	select *Average Character Width*, from 1 to 100
Maximum Character Width	select *Maximum Character Width*, from 1 to 100
Minimum Character Height	select *Minimum Character Height*, from 1 to 100
Average Character Height	select *Average Character Height*, from 1 to 100
Maximum Character Height	select *Maximum Character Height*, from 1 to 100
Mean Angle of Plate Rotation	select *Average Rotation Angle of Plate*, from -90 to 90
Average Character Slope	select *Average Character Slope*, from -90 to 90
Max. Low Probability Characters	select *Max. Low Probability Characters*, from 0 to 10
Minimum Character Probability	select *Minimum Character Probability*, from 0 to 100
Low Probability Character	enter *Low Probability Character*

Field	Description
Third Party Cameras Tab	
FTP Server	select whether the Third-Party Camera FTP server will be *Enabled* or *Disabled*

Field	Description
Port	enter the port that should be used in communication with the FTP server of Third-Party Cameras
Protocol	select the FTP protocol that will be used
Mode	Select server mode

Date/Time Settings

The correct functioning of ITSCAMPRO requires that the date and time setting be checked, as the statistical information produced considers the system date and time setting.

Field	Description
Timezone	set time zone The ITSCAMPRO Time Zone setting allows you to ensure that date/time conversions are performed correctly
Synchronism Date/Time	
Type Synchronism	select the type of synchronism that will be used. For ITSCAMPRO we can use NTP with the default OS server or use NTP with a proprietary server
NTP Server	enter NTP server configuration port, if selected to use a proprietary NTP server
Manual Setup Date/Time	

Field	Description
Date	select through the calendar the correct date or configure the Server Date by typing through the keyboard
Hour	enter the correct time so that the server clock is synchronized with servers

Network Configurations
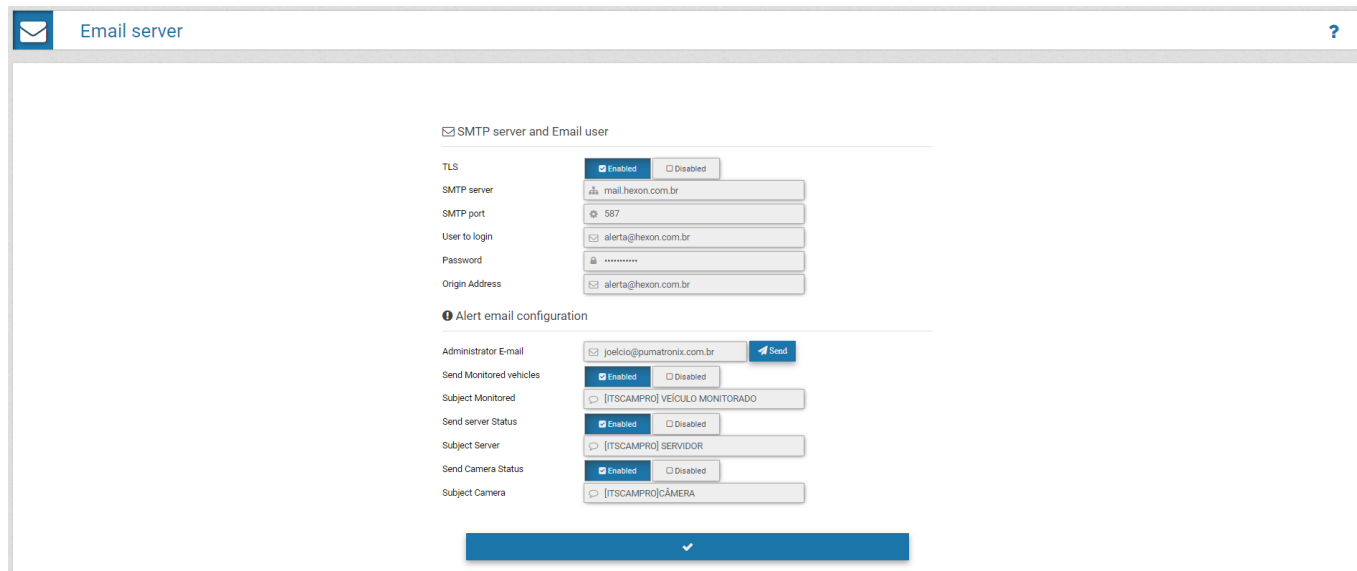
In this section you can change ITSCAMPRO server network settings. After saving the settings, the server restarts and the page reloads after 40 seconds.

Field	Description
Use DHCP Tab	 **DHCP (*Dynamic Host Configuration Protocol*)** Select this option to determine the use of dynamic host configuration. In this case, IP addresses, subnet mask and gateway will be automatically assigned to the server
Primary DNS	enter Primary DNS
Alternate DNS	enter *Alternate DNS*
Use Static IP Tab	 **Static IP** Select this option to manually assign IP addresses, subnet mask and gateway to the server
IP address	enter Address
Subnet Mask	enter *Subnet Mask*
Gateway	enter *Gateway*
Primary DNS	enter Primary DNS
Alternate DNS	enter *Alternate DNS*

The DNS fields assign addresses to domain name servers. The value(s) can be exchanged if using another server(s) and if the system is operating without internet access it is possible to leave the fields blank.

E-mail Server

One of the functionalities of ITSCAMPRO is the sending of e-mail with alerts to registered users. This requires configuring the SMTP Server and ITSCAMPRO Email User and which users should receive the alerts. These settings are available in the *Mail Server* menu.

Field	Description
TLS	select whether TLS will be *Enabled* or *Disabled*
SMTP Server	configure SMTP server address for sending emails by ITSCAMPRO
SMTP Port	enter SMTP server configuration port
Login User	enter user to login to server
Password	enter password for server login
Source Address	configure email address that should be displayed as the source of the email
Admin Email	configure list of emails that should receive administrative messages
Send Monitored Vehicles	select whether to *Enable* or *Disable* the sending of monitored vehicle emails
Monitored Subject	enter subject that will be sent in the monitored vehicle alert email
Send Server Status	select whether to *Enable* or *Disable* sending server status emails
Server Subject	enter subject that will be sent in the server status alert email
Send Camera Status	select whether to *Enable* or *Disable* the sending of status emails from capture devices
Camera Subject	enter subject that will be sent in the capture device status alert email
Dangerous Cargo Subject	enter subject that will be sent in the capture device status alert email

License

Display of the information about the license in use and the *Change System License* option if there is a need to include some integration.
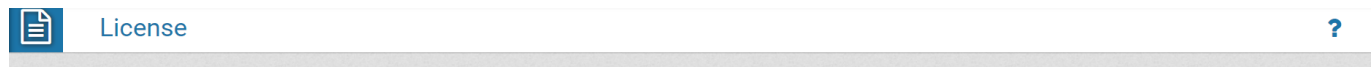
📄 License   **?**

🔓 Current license information

Library version
2.0.7
Hardware ID
4c4c4544-005a-5110-8052-b5c04f564e32
Customer
ITSCAMPRO - SUPORTE
Software Licensed
Yes
Number of cameras
100
Traffic module
Enabled
Monitoring Module
Enabled
Support to multiple languages
Enabled
Support to ITSCAMPRO application
Enabled
Supports Search by image similarity
Enabled
Number of cameras able to calculate descriptors
100
Support to integration with PM-PR
Enabled
Support to integration with Denatran
Enabled
Integration with the SPIA PRF / Alerta Brasil 3.0
Enabled
OCR support in the server
Enabled
Number of cameras with OCR
100
Support for Searches by Vehicle Classification
Enabled
CLASSIFIER algorithm support on the server
Enabled
Number of cameras allowed to run CLASSIFIER
100

☁️ Alter system license by dragging file here or searching for.
📄 The license file "license.lic" was uploaded by user "Undefined" at 15/09/2022

System Maintenance

On this page it is possible to do the main operations with the server where ITSCAMPRO is installed, since it is not always possible to physically access the equipment.

Field	Description
Software Upgrade	for updating a software package when a new version is made available. ITSCAMPRO has four software packages, and you can update them individually. The process is fully done in the background after sending the update file.
System Logs	when assistance is required, information about the actions taken on the system can be downloaded to be sent to Pumatronix Technical Support. ITSCAMPRO has a complete log of all operations done by the system in the background. This log file has the main function of assisting the development team in the analysis of ITSCAMPRO anomalies
Database Backup/Restore	*Backup:* downloads a backup of the complete system database. This backup is saved in a proprietary format and can only be used by ITSCAMPRO *Restore:* imports a backup file with predefined settings
System in Maintenance	for updating a software package, it is recommended to *put System in Maintenance* so that all accesses and changes to the system are blocked
Restart Server	use this option when the system is not operating normally
Factory Reset	settings are reset to factory default, but all data will be erased from the memory

System Restore: When restoring a database in ITSCAMPRO, all information that was stored on the equipment (including internal references to the images) will be overwritten.

Factory Restore: When you restore an ITSCAMPRO installation to the factory version, all information that was stored (including images) will be erased.

ITSCAMPRO Restart: Requesting a restart of ITSCAMPRO causes all connections to the image capture devices to be interrupted during the process and there may be a loss in vehicle recognition during this period.

3. Registrations Menu

Groupings

The records stored in the database can be more easily located when added to the *Groupings*, which consists of a common identifier that can be added to the description of the record, making it easier to search, especially when using the COMPARE function.

Images associated with a grouping are not removed by the automatic disk space management process.
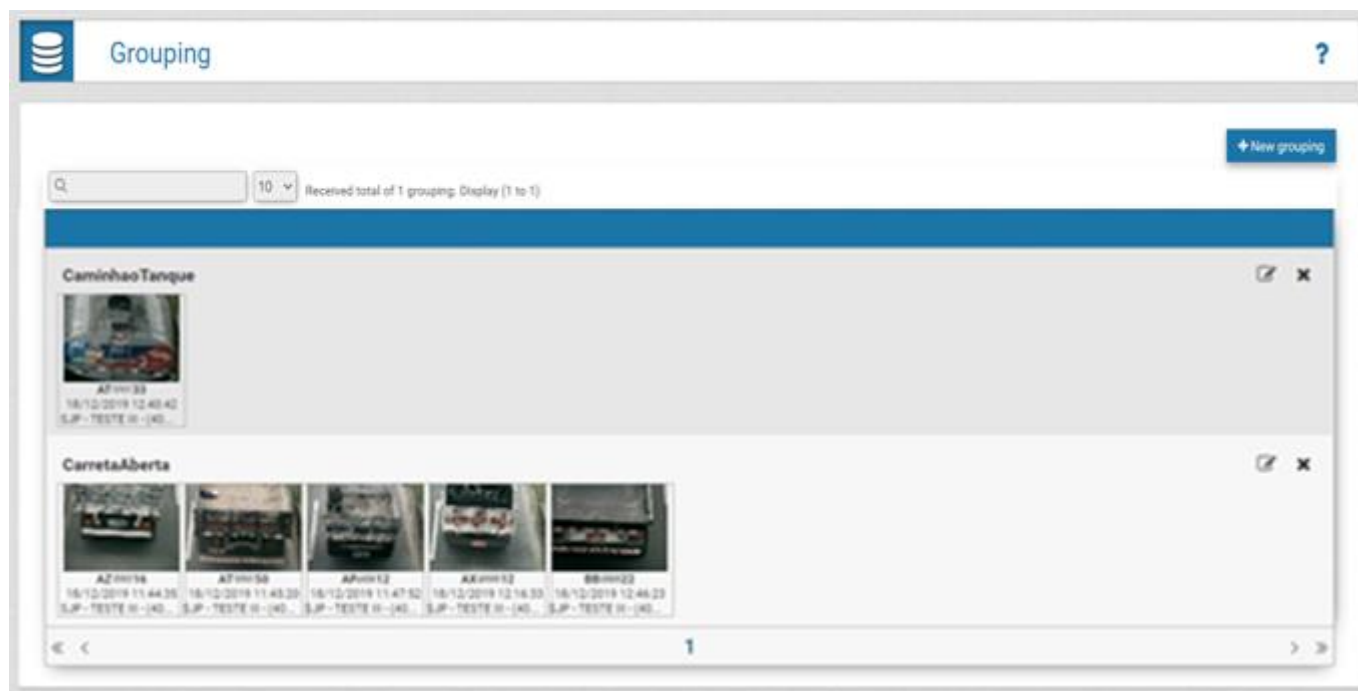
To add a new grouping, click *+New Grouping* and the screen displays the field to insert a new vehicle identifier:
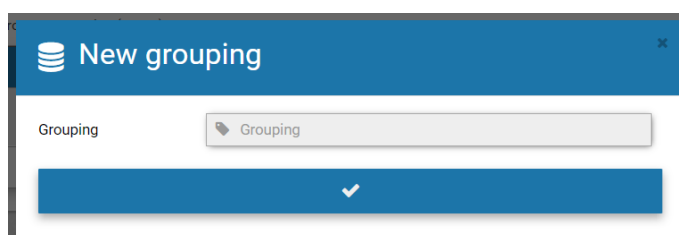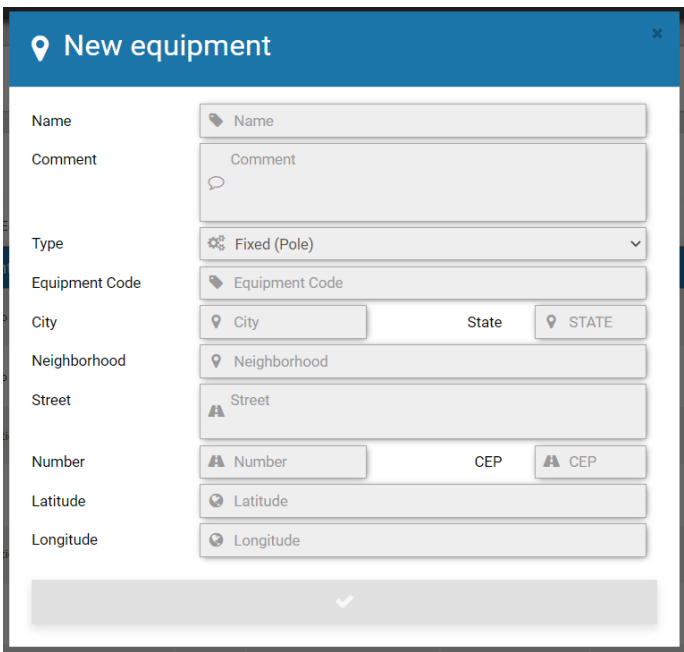
Equipment

A piece of equipment can be *Fixed (Pole), Static (Tripod), Mobile (Vehicles), Toll Station or Mobile.* It may contain a ALU (Arithmetic-Logic Unit) containing software that commands the devices of each lane or a group of devices that have the same geographical location.

When clicking on *+New Equipment*, the fields for registration are available:

Field	Description
Name	enter equipment name in the system (required field)
Comment	enter additional equipment information
Type	select the type of equipment that can be *Fixed (Pole)*, *Static (Tripod)*, *Mobile (Vehicles)*, *Toll Station* or *Mobile* (mandatory field)
Equipment Code	enter equipment identification code for FTP
Address (City/State/Neighborhood/Street/Number/Zip Code)	enter information of the address where the equipment is installed, usually of the fixed type

Field	Description
Latitude	enter latitude where the equipment is installed
Longitude	enter longitude where the equipment is installed

Cameras

Equipment that is connected as customers in ITSCAMPRO can be mobile, fixed, or static, but the final identification of the equipment is done through the capture device. Each capture device may contain different settings depending on the type of equipment to which it is linked in the register. In this screen it is possible to maintain the registrations of the capture devices and view in a simplified way the state of communication of ITSCAMPRO with the capture device.

To add a new capture device, click *+New Camera* and the screen displays the fields for configuration:

Field	Description
General Tab	
Active	select *Active* to enable operation of the image capture device in the ITSCAMPRO system or *Inactive* to disable
Name	enter name of the capture device in the system
Serial Number	enter serial number for identification of the capture device in the system
Type	define characteristic of how the capture device is installed. This installation can be of type *Pumatronix*, *Panoramic* or *Virtual*
Direction	set the direction of the road monitored by the capture device by selecting whether the images captured from the vehicle are from the *Front*, *Rear* or *No Direction Set*
Equipment	select to which equipment the device is linked, among those registered
Camera External ID	enter identification of the capture device for crossing with data from other systems
Recognized Image Req.	select *Active* or *Inactive* for image requisition on which plates have been recognized
Unrecognized Image Req.	select *Active* or *Inactive* for image requisition on which plates have been recognized

Field	Description
Features Tab	
External Servers - Forward records	select *Active* or *Inactive* to forward records to an ITSCAMPRO server
External Servers - Enables Lince Integration	select *Active* or *Inactive* to enable Lince integration
Enables SPIA Integration - Enables SPIA Integration	select *Active* or *Inactive* to enable SPIA integration
Enables SPIA Integration - lane ID in SPIA	enter lane ID in SPIA
OCR on Server - OCR on Server	select *Active* or *Inactive* for OCR on the server
CLASSIFIER on Server - CLASSIFIER on Server	select *Active* or *Inactive* for *CLASSIFIER* on the server
CLASSIFIER on Server - CLASSIFIER Scene	select scene from *CLASSIFIER* in *Closed Image* or *Panoramic Image*
COMPARE - Calculate descriptors	select *Active* or *Inactive* for the calculation of the descriptors of the images, a requirement for the use of the *COMPARE* Similarity Search functionality
COMPARE - Region of Interest	select *Active* or *Inactive* to define a region of interest for image analysis in *Similarity Search*, which considers the plate position

Field	Description
Region of Interest Tab	In the capture device configuration, when the COMPARE functionality is selected, a *Region of Interest* can be defined in the image to perform the capture. The adjustments for the region consider the optimal size and position of the plate in the image.

Monitored Vehicles

The ITSCAMPRO system supports integrations with vehicle safety and monitoring systems. When registering on *Monitored Vehicles*, the vehicle's license plate must be specified, and a description can be included. This registration can be performed by vehicle plates, individually, or a *CSV* file containing all the listed plates can be inserted in the system, by clicking on the *Import* button. When there is the identification of a vehicle license plate registered for monitoring, the system can generate visual and audible alerts and issue an email with the identification data. Visual identification alerts cannot be disabled, while audible alerts can be configured. For the functionality of sending email with alerts to work correctly, a valid SMTP server (mail sending server) must be configured in ITSCAMPRO. This configuration is done through the **"System > Email Server"** option.
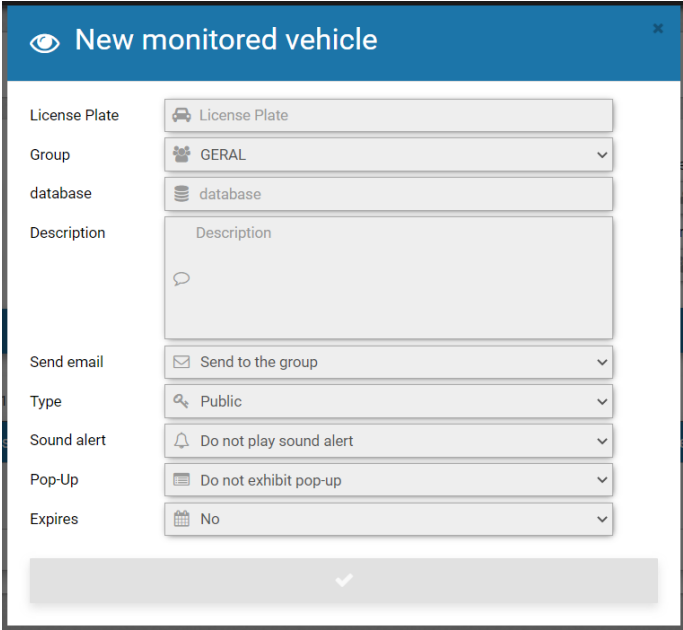
Filter	Description
Database	search by database among the options: *MONITORED, SPIA* or *All databases*
Registration	search by registration date
Description	search by description or part of a description
Audible Alert	sound alert search
Responsible	search by person responsible for registering the vehicle in the system
License Plate	search by plate
Expiration	search by expiration date
E-mail	search by status of sending by emails
Type	search by *Public* or *Private*
Group	search by group to which the tracked vehicle record belongs

To register a vehicle for monitoring, click *+New Monitored Vehicle* and the screen shows the fields to fill in:

Field	Description
License Plate	enter monitored vehicle plate data
Group	select the registered group that will have access to monitoring
Base Data	create an identification of a database to which the monitoring belongs
Description	enter monitoring description
Send Email	configure whether to send the vehicle detection alert monitored by e-mail, selected from the options: Do not send, Send to Group, Send to Addresses or Send to Group and Addresses
Type	select the type of vehicle registration if *Public* or *Private*
Audible Alert	configure whether to issue the audible alert at the time of detection of the monitored vehicle
Pop-Up	select whether to display the pop-up window when detecting the monitored vehicle
Expiration	select if the monitoring should expire
Expires at	select through the calendar the date on which the monitoring should expire

If the user already has a list or database with vehicles that must be monitored, they can import this list in a simple and automated way into the system. Click *Import* and the screen displays the fields to fill in:

Field	Description
	![Import monitoring file dialog] **Import monitoring file** Group: GERAL Database: Database Expires: No OITSCAMPROsupports sending files on CSV format with five columns per line: 1. license plate; 2. Description; 3. Send email to group (0 or 1); 4. Play alert sound (0 or 1); 5. show POPUP on Web (0 or 1) Ex.: ABC1234,Stolen vehicle,1,1,0 To send a monitored vehicles file drag file here or search for a. ITSCAMPRO can import CSV type files. The format of the lines must be PLATE, Description, SendEmail, Alarm, Popup. SendEmail, Alarm and Popup fields are optional and if they are not in the file rows a default value will be used.
Group	select the group with permission to access the list of monitored vehicles
Base Data	create a database ID for the watchlist
Expiration	select if the monitoring should expire
Expires at	select through the calendar the date on which the monitoring should expire
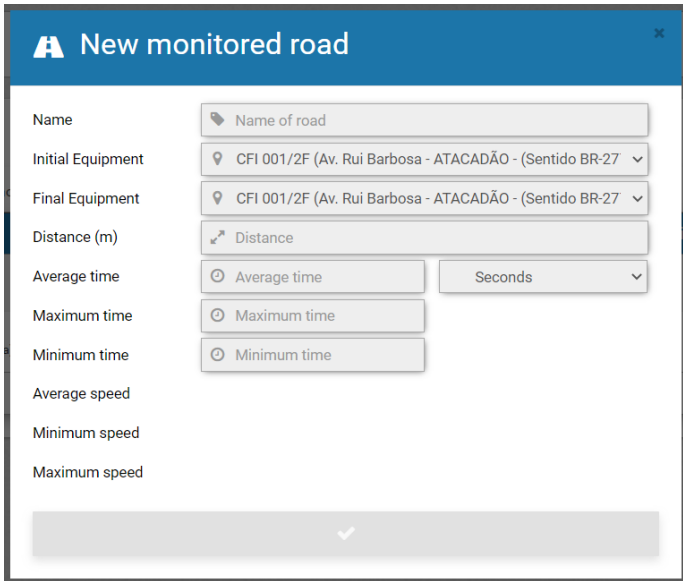
Monitored Sections

When using more than one equipment in a facility, ITSCAMPRO makes it possible to register the information of the route traveled by a vehicle, when defining the initial equipment and the final equipment for vehicle detection. With the information of the estimated Average, Maximum and Minimum times, and the *Distance* to travel the stretch, the speeds to travel the route are estimated.

The *Monitored Section* is used as a basis for generating the *Time and Speed* report in the *Reports* menu. In the *Similarity Search*, the search is optimized by presenting the data of the record made in the *Equipment* of a stretch and the *Date/Time* referring to the captures made.

To add a new monitored section, click *+New Monitored Section* and the screen displays the fields to fill in:

Field	Description
Name	enter name that will be associated with the monitored section
Initial Equipment	select equipment that represents the starting point of the section
Final Equipment	select equipment that represents the end point of the section
Distance	insert distance between the two points. If the system has an internet connection, the distance is calculated automatically
Average time	enter average time to go through the section. If the system has an internet connection, the average time is calculated automatically
Maximum time	enter maximum time to go through the section
Minimum time	enter minimum time to go through the section

Dangerous Cargo

To add a new dangerous cargo category, click *+New Monitoring* and the screen displays the fields to fill in:

Field	Description
Code	enter code for dangerous cargo identification in ITSCAMPRO
Name	enter name of dangerous cargo to be monitored
Send Notification	select whether to be notified when dangerous cargo is detected in the monitoring, between the *Yes* and *No options*
Send Email	configure whether to send the dangerous cargo detection alert by e-mail, selecting the options: Do not send, Send to Group, Send to Addresses or Send to Group and Addresses
Address(es) Separated by commas	enter the email addresses that will receive the dangerous cargo detection alert

Notifications

Notifications are messages generated by the system to communicate users about certain events, such as the registration of a new monitoring, an approved monitoring, a new registered approach. Users can also generate notifications for other users.
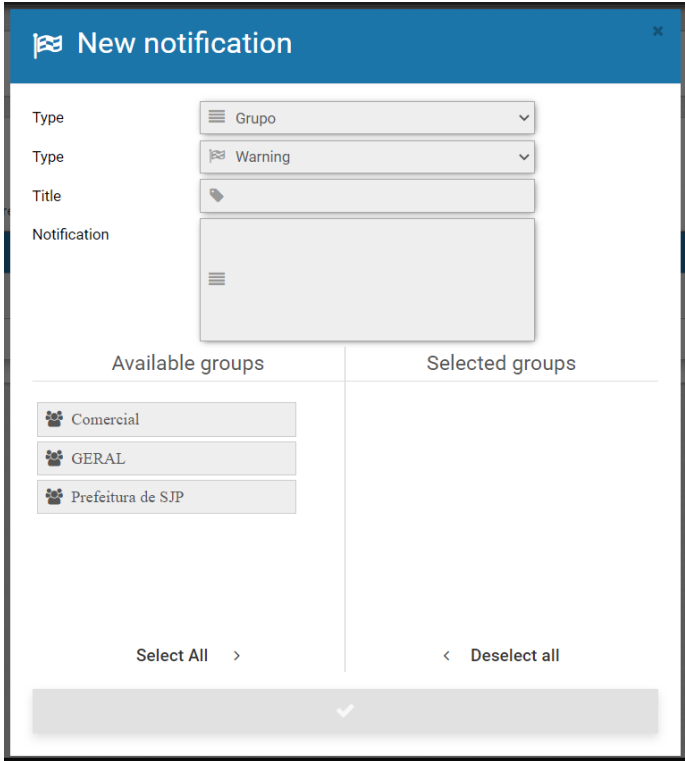
To add a new notification, click *+New Notification* and the screen displays the fields to fill in:

Field	Description
Type	select if the notification will be for a *Group* or *User*
Type	select the type of notification by filtering by *Warning*, *Error* or *Information*
Title	insert the title of the notification
Notification	enter the content that will be notified
Available Groups	select which groups or users will receive the notification and drag to the Selected *Groups column*
Groups Selected	view/remove groups or users registered in the system that are already associated with the new notification

Devices

To add a new mobile device, click *+New Device* and the screen displays the field to fill in the device name:
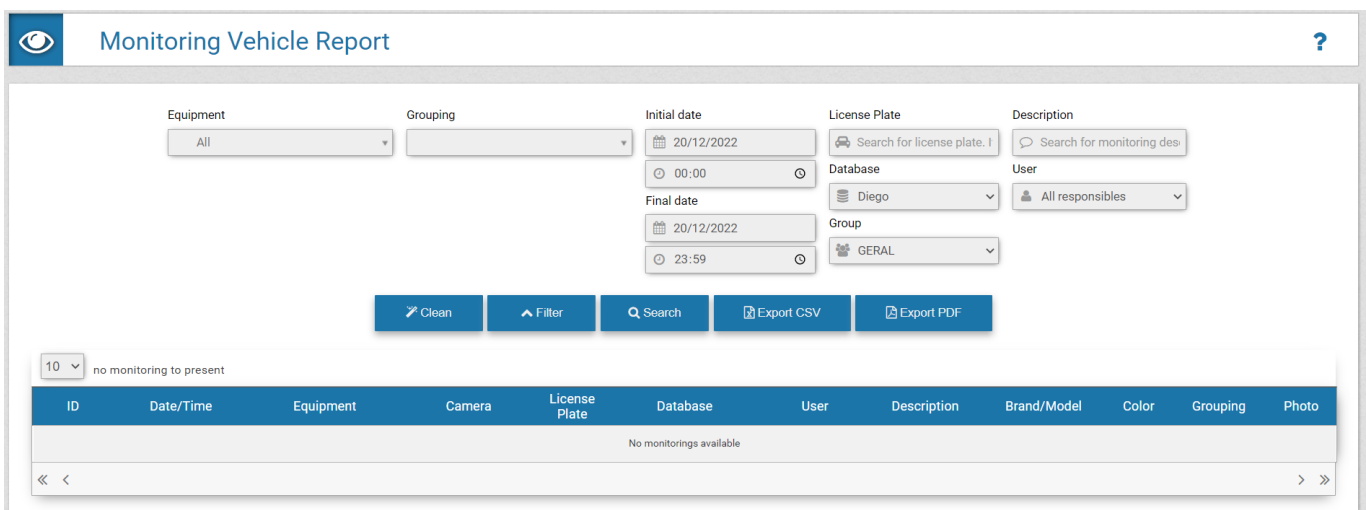
After identifying the new mobile device, click *Register*, available in the Actions column on the right in the device listing, and use the *QR Code* to register the device in the system:
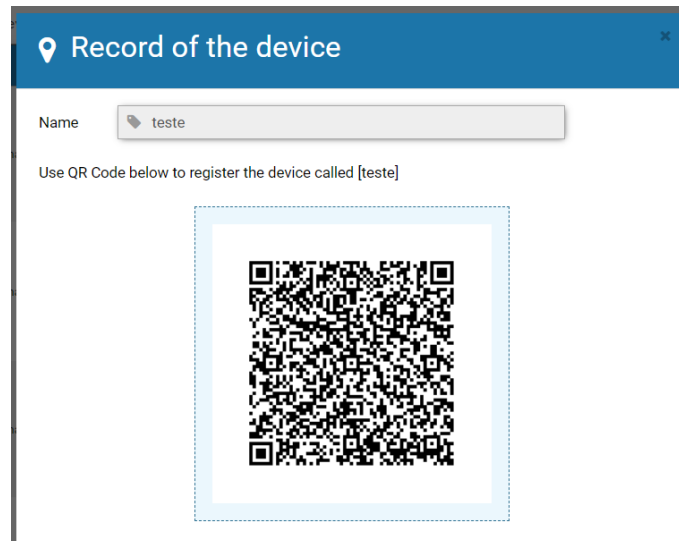
4. Reports Menu

Vehicle Monitoring

The *Vehicle Monitoring Report* is an important tool to assist the user in searching for captures of monitored vehicles. Every time a vehicle registered with monitoring is detected by any system capture device a log is generated. ITSCAMPRO allows the export of results in *CSV* or *PDF format*.

Filter	Description
Equipment	search by registered equipment
Groupings	search by registered groupings
Start Date	search by monitoring start date
End Date	search by monitoring end date
License Plate	search by plate
Database	search by registered database

Revision 1.0

Filter	Description
Group	search by registered group
Description	search by description/section description
User	search by registered user

Correlations

The *Correlations Report* is a tool for checking vehicle behavior patterns. For example, it is possible to make a search by correlating the captures of two or more equipment at a given time or the same equipment at different times. The result of this correlation will present all vehicle captures that were taken at the points and at the indicated interval.

Filter	Description
Equipment	select equipment used in the correlation
Date	select the date used as reference for the correlation
Hour	select the time used as reference for the correlation
Tolerance	select the time tolerance used in the correlation

It is also possible, using the interval between captures as a filter, to search by vehicles that have passed all selected equipment within a given time range.

Filter	Description
Equipment	select the *Initial* and *Final* equipment responsible for capturing the vehicle image
Start Date and Time	select search start date and time
End Date and Time	select search end date and time
Maximum interval between captures	select maximum time interval between captures made by the selected equipment

Data can be exported in .xls with or without images. Click *Create Graph* to instantly generate a graph with Total captures per equipment in the period:
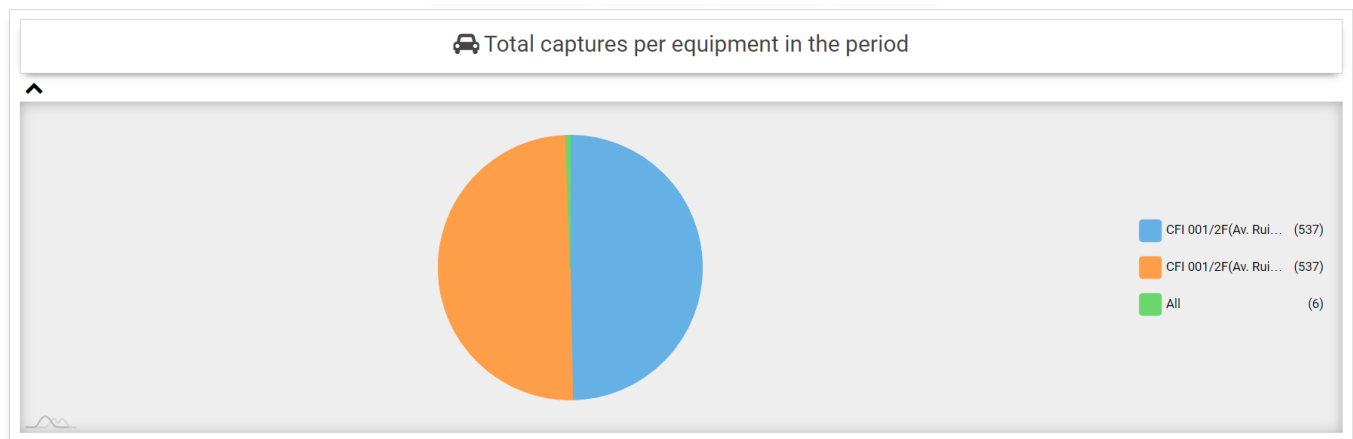
Captures

The *Capture Report* is a tool that allows the user to search the ITSCAMPRO system database through filters in the interface and present the result of this search to the user. ITSCAMPRO allows you to transform the search results into a *PDF* report and export them into a comma-separated values (*CSV*) file. However, in the *CSV* file, the images of the records are not exported.

Filter	Description
Equipment	search by registered equipment
Cameras	search by registered capture devices
Groupings	search by registered groupings
Start Date/Time	search by start date and/or time of capture
End Date/Time	search by date and/or end time of capture
License Plate	search by the characters of the plate (it is possible to use the character '*' as a wildcard)
License Plates	search by plate status by filtering by *Recognized* or *Unrecognized* or *All*
Vehicle Type	search by vehicle type filtering by *All Vehicles* or *Motorcycles* or *Others*
Plate Type	search by plate type filtering by *Light Background* or *Color Background* or *All Plate Types*
Capture Number	search by capture number
Evasion	search by records that have been marked as possible toll evasions by filtering by *Only Evaders*, *Only Non-Evaders* or *Evaders and Non-Evaders*
Forwarding	searches for the status of forwarding records to another ITSCAMPRO server by filtering by *Forwarded, Un Forwarded and Any*
Country	search by country
Vehicle Class	search by the one that allows filtering by: *All, Unidentified, Bus, Car, Motorcycle or Truck*

Similarity Search

Similarity Search is a tool available in ITSCAMPRO that allows the search by images like vehicles registered and stored in ITSCAMPRO and in a database.
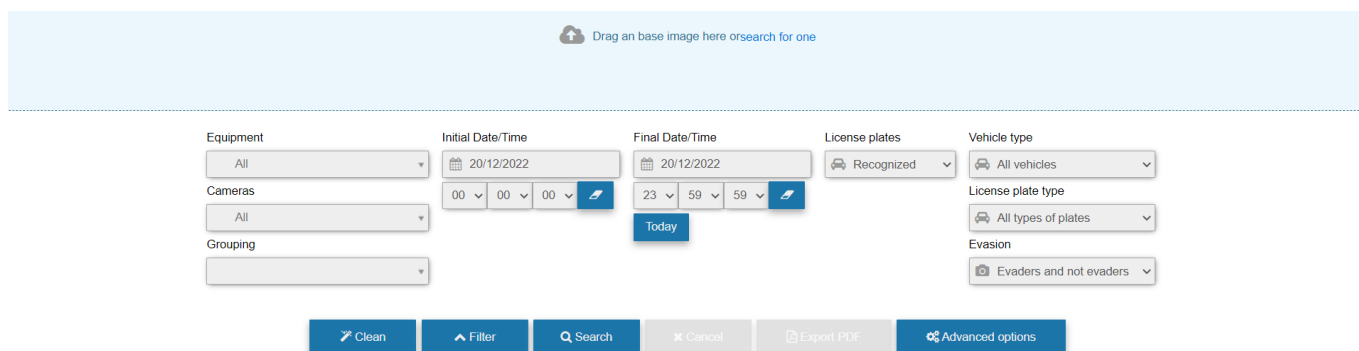
This functionality is released in the *COMPARE* module, which requires the upload and installation of the license in the ITSCAMPRO software, adaptation or installation of the image capture devices and the activation of the module, connecting the Hardkey to the processor, which limits the number of devices that can be configured.

The images generated in the **capture report** can be used as a search basis, performing the search of the report and in the *Similarity* field, click on the magnifying glass that contains the *Search by images similar to this function:*

External images can also be used via the *Reports > Similarity Search* menu by dragging or selecting the image:

In situations where the additional monitoring point has a different framing from the base image, it is possible to delimit a *Region of Interest* by clicking on the image and dragging until the desired region is defined, as shown in the example below. This function reduces the search by similar descriptors only in the portion delimited on the image that will be used as a base, optimizing the performance of COMPARE:

Choose base image for the search.
Obs.: it is possible to define a "region of interest" on the image.

Date/Time: 20/12/2022 16:30:51   Equipment: CFI 005/2F   Camera: ITSCAM600   License Plate: AMA0J38

Filter	Description
Equipment	search by registered equipment
Cameras	search by registered capture devices
Groupings	search by registered groupings
Start Date/Time	search by start date and/or time of capture
End Date/Time	search by date and/or end time of capture
License Plates	search by plate status by filtering by *Recognized* or *Unrecognized* or *All*
Vehicle Type	search by vehicle type filtering by All Vehicles *or* Motorcycles *or Others*
Plate Type	search by plate type filtering by *Light Background* or *Color Background* or *All Plate Types*
Evasion	search by evasion status by filtering for *Only Evaders, Only Non-Evaders* or *Evaders and Non-Evaders*

Traffic

The Traffic Report is a tool in which the user can generate graphs with the number of vehicles captured in an equipment in the period corresponding to one week (7 days). The report can be exported in *PDF* or *CSV* format.
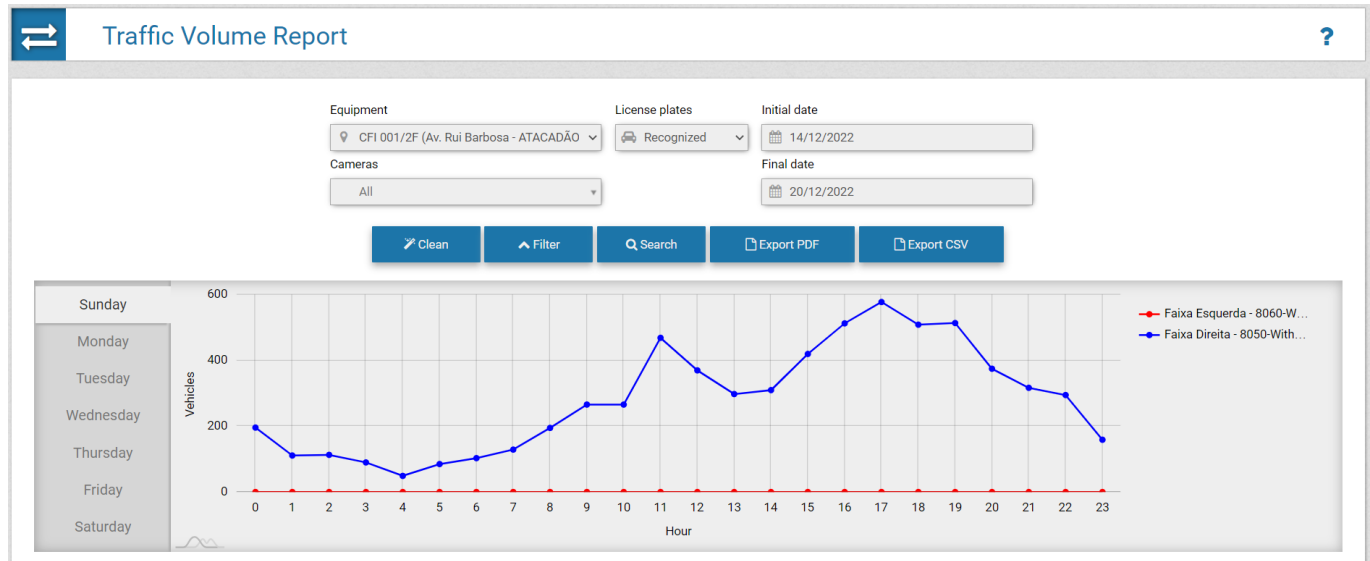
Filter	Description
Equipment	search by registered equipment
Cameras	search by registered capture devices
License Plates	search by plate status by filtering by *Recognized* or *Unrecognized* or *All*
Start Date	search by start date and/or time
End Date	search by end date and/or time

Time and Speed

The Time and Speed Report is a tool in which the user can generate graphs with the average travel time and the average speed of a monitored section. The report can be exported in *PDF* or *CSV format.*
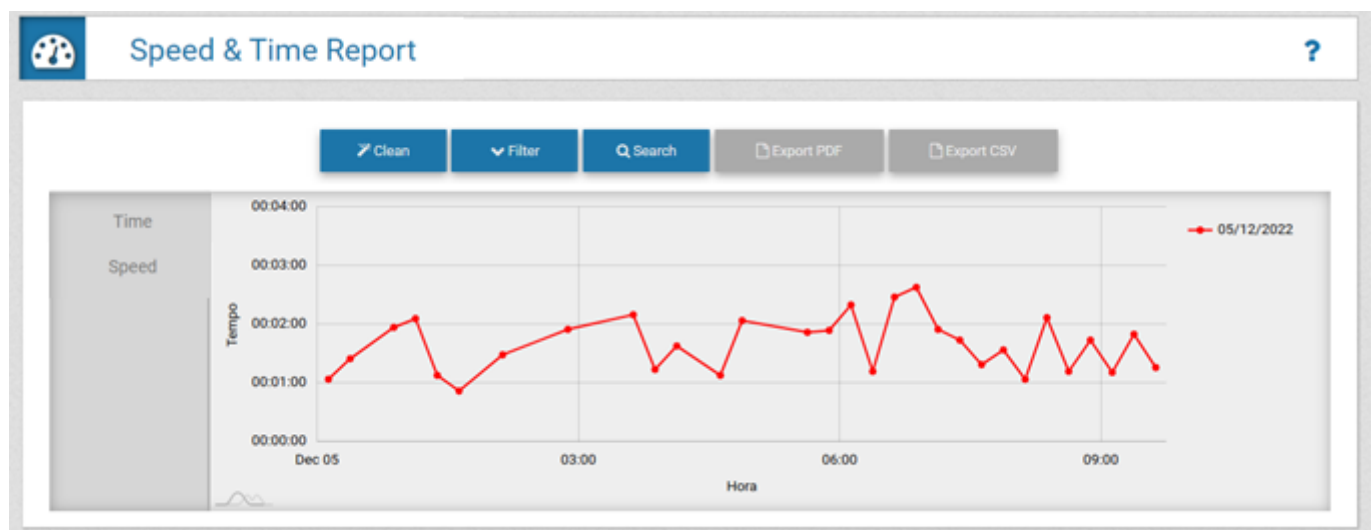
Filter	Description
Section	search by registered section

Filter	Description
Start Date	search by start date
End Date	search by end date
Cutt-off Time	sets the *Cut-off Time*, which is equivalent to the maximum value that a route can take, to remove from the calculation the vehicles that, for example, stopped during the route

Origin and Destination

The Origin and Destination Report presents in graphic format the number of records with the same plate read and the percentage of vehicles per destination equipment, identified by the color in the caption. The report can be exported in *PDF* or *CSV format.*
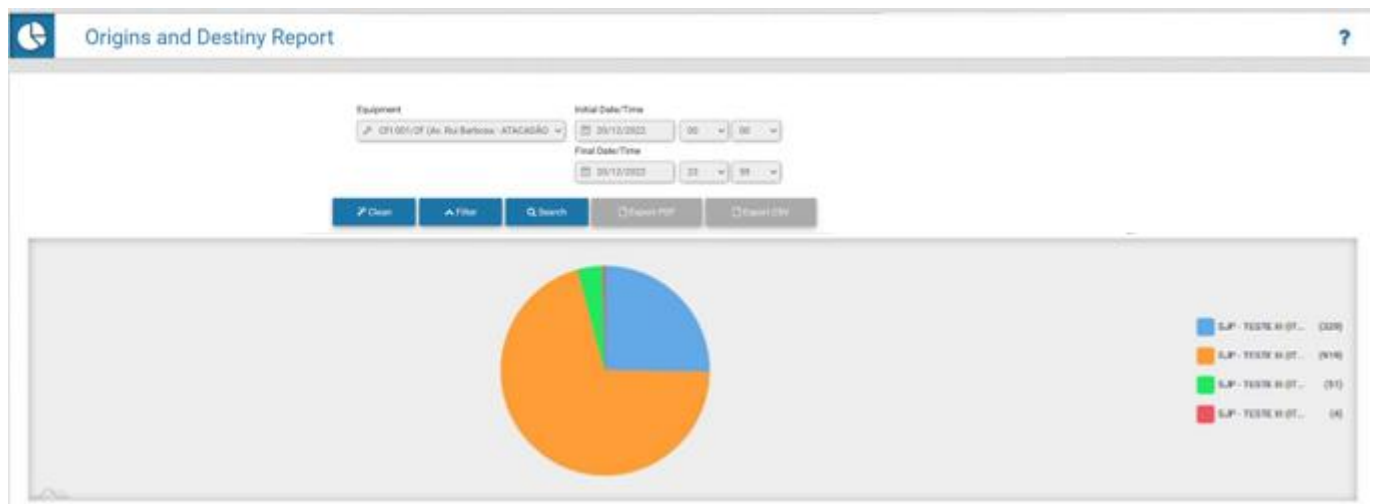
Filter	Description
Equipment	search by equipment that will be the source of the data generated in the report
Start Date/Time	search by start date and/or time
End Date/Time	search by end date and/or time

Changed Plates

Upon receiving a capture in the system, the user can change the plate of the capture that was received. This change may be necessary if the plate detection algorithm is unable to recognize the plate number due to some problem in the image or because the plate was partially covered up. The *Changed Plates Report* displays the date/time information, equipment, capture device, plate, and the changes that have been made to the plate. The log information can be better viewed by clicking on the capture list image.

System Log

Since ITSCAMPRO is a system that supports multi-users and each with a specific group of equipment and features, a log where it is possible to verify and audit the actions of users is extremely important. The *System Log Report* displays the Date/Time, User and a Message information displaying what action has been taken.

| Filter	Description
Start Date	search by start date and/or time
End Date	search by end date and/or time
User	search by registered user
Message	search by message/message snippet

5.   Search by Plate

Plate Search is a tool to search for a specific plate or for a partial plate stored in the database, which can be quickly performed in the Plate Search option, always visible in the top menu. Click the field, enter the desired plate, and press *Enter* to perform a search.

There are two ways to perform the search using a partial plate:

- To perform a search varying only one position, use the wildcard character "?". For example: if you search "BCY28?1" the system will search for all the plates only changing the position where the "?" is.
- To perform a search without specifying position, use the wildcard field "*". For example: if you search "BCY*" the system will fetch all boards starting with "BCY". There must be at least 3 non joker characters.

The search screen for similar plates opens in a new browser tab and initially displays only the list of similar plates found in the records. When selecting one of the similar plates found, the information is listed indicating the *Equipment* and *Camera* responsible for the records for this plate, along with the captured image.

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