PUMATRONIX

NEVADA

NEVADA

LEADER IN EVASION MANAGEMENT AT TOLL PLAZAS

Integration

Pumatronix Equipamentos Eletrônicos Ltda.

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Change History

Date	Revision	Updated content
11/21/2022	1.0	Initial Version
24/06/2024	1.1	Updates for versions 1.9.0 to 1.16.0 Update of interface images
12/08/2025	1.2	Update to the record display screen; Update to the user access key; Details on the *Clone Infraction* option; Update to the TAG server configuration; Update to new infraction sending servers; Details on the *FreeFlow* automatic infraction disposal

Overview

This document aims to guide the developer in the use of the available operation interfaces and that allow operating the NEVADA 1.16.0 software, which is responsible for the management of the information produced, with the objective of monitoring vehicles that have evaded toll road concessionaires.

Installation information can be found in the Installation and Maintenance Guide. If any questions remain, please contact Pumatronix Technical Support.

According to the software 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.

Summary

1. NEVADA Web Interface

The home screen of the NEVADA System web interface has the functions always visible and available for access:

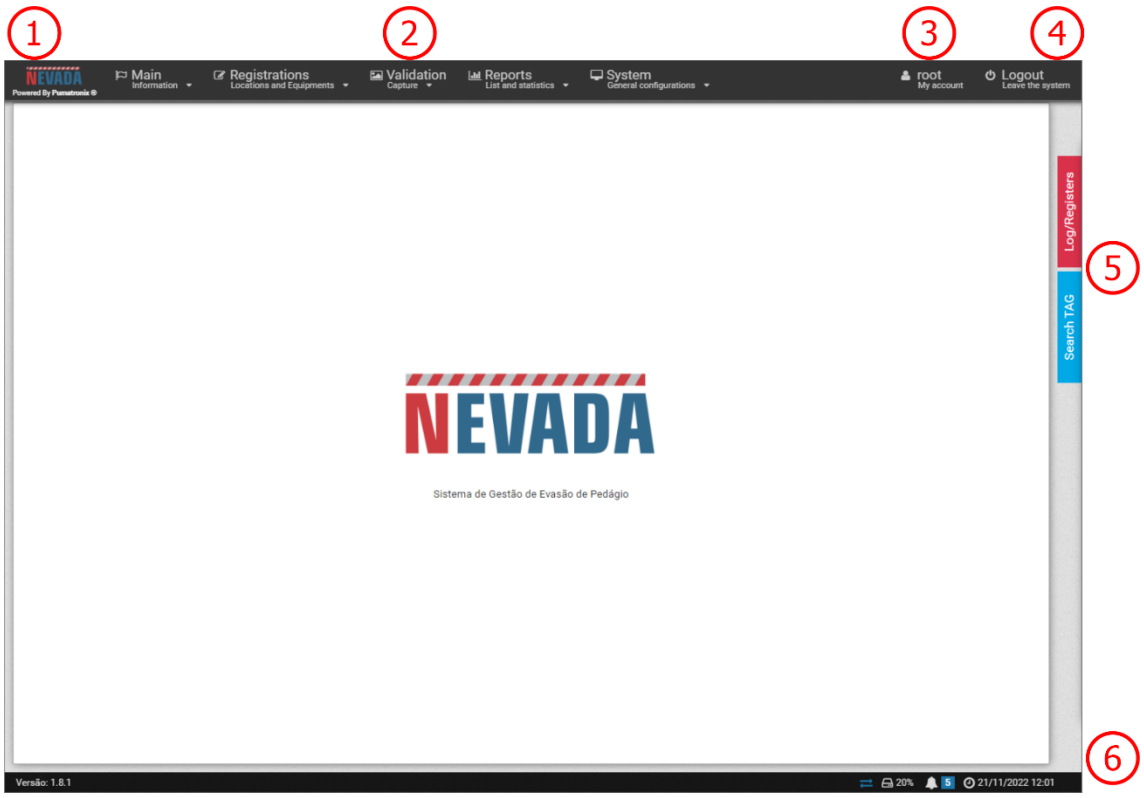


Figure 1 - Home Screen: 1) Home page access, 2) Menu Bar, 3) Logged-in User Account Data, 4) Disconnect Function, 5) Side Tabs, 6) Status Bar

When accessing the interface, the home screen displays key information about the current system situation in the Status Bar located at the footer of the page.

Figure 2 - Status Bar Information: 1) Updated Data, 2) Free Disk Space, 3) Notification Panel, 4) Server Date and Time

Custom user profile setting: Existing screens may be unavailable depending on the user's access profile connected to the system.

2. Notifications Panel

For *Notifications* to be visible to the user in the notifications pane, this option must be enabled at the time of creating a *User* or *Profile*. Notifications should be customized by accessing the System > Notifications menu, where you can choose which ones can be displayed by the system and characterize whether it is of type *Information*, *Alert* or *Error*:

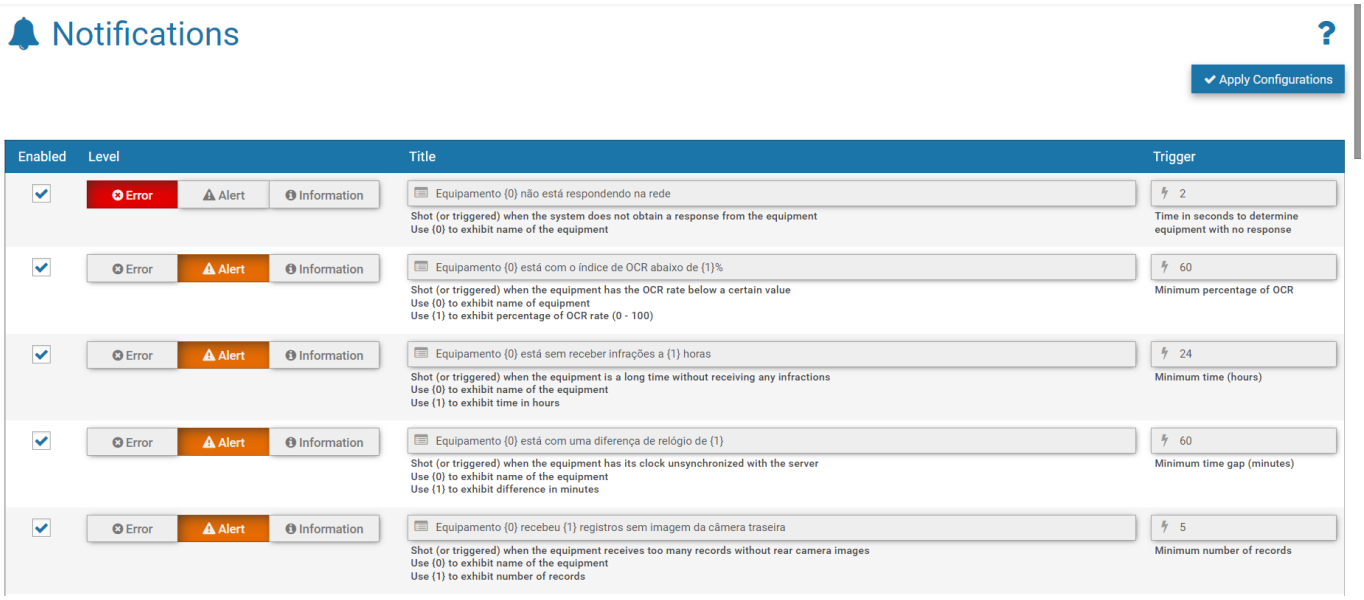


Figure 3 - Screen when accessing System menu>Notifications

To set up the *Resend Time* to the NEVADA Notifications panel, go to the menu *System >General Configurations* and in the Notifications option enter a value in hours.

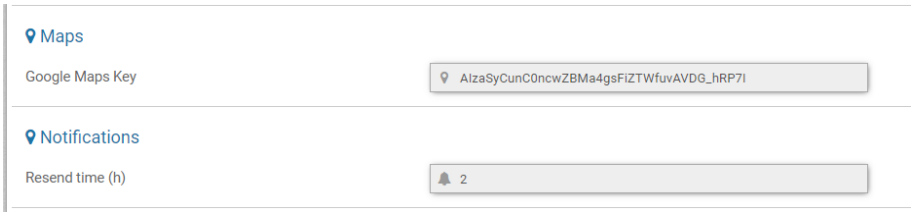
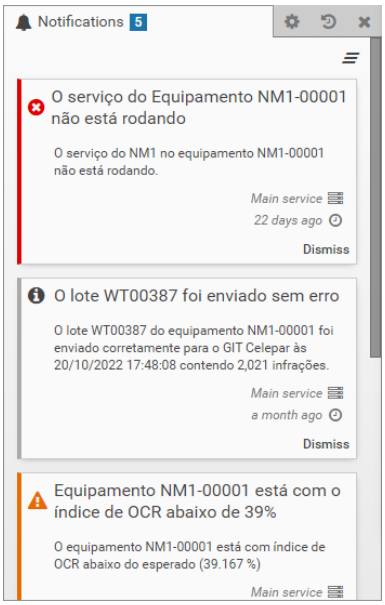
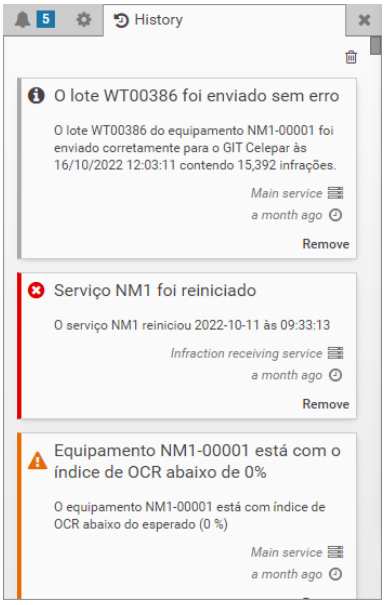
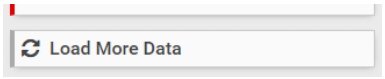
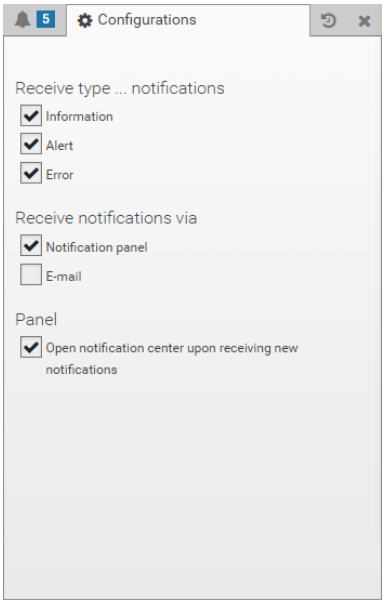


Figure 4 - Setting the Resend time in System>General Configurations

Flap	Description
Initial	 To remove a notification from the list, just click *Dismiss* and the notification remains in *History*.

Flap	Description
History	 The notifications panel is always available in the *Status Bar* for quick access and let to view *History* or remove some notification from it.
	 When you click on *Load more data*, the latest notifications in the history are displayed.
Configurations	 In the Configurations tab allows to choose which types of notifications you want to receive, whether to be sent to the configured email, and whether the dashboard should be displayed when a new notification occurs. To receive by email the server must be configured in *System>General Configurations*.

3. Side Flaps

The side tabs are always available to the right of the screen for quick access to the records made (*Log/Registers* tab), separated by sorting stage, and to perform the search for a license plate of interest (*Search TAG* tab) on the concessionaire's TAG server.

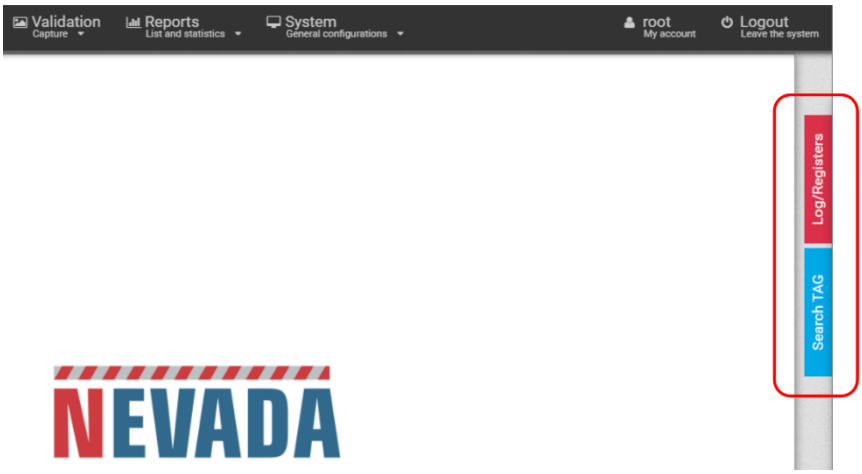
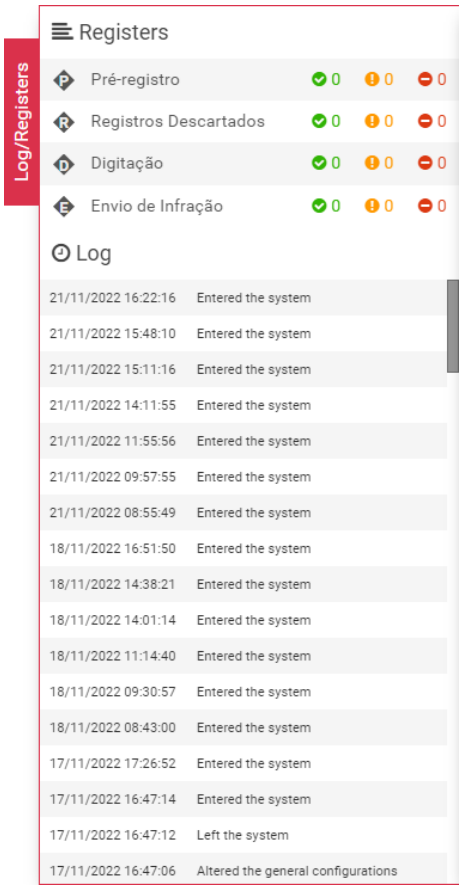
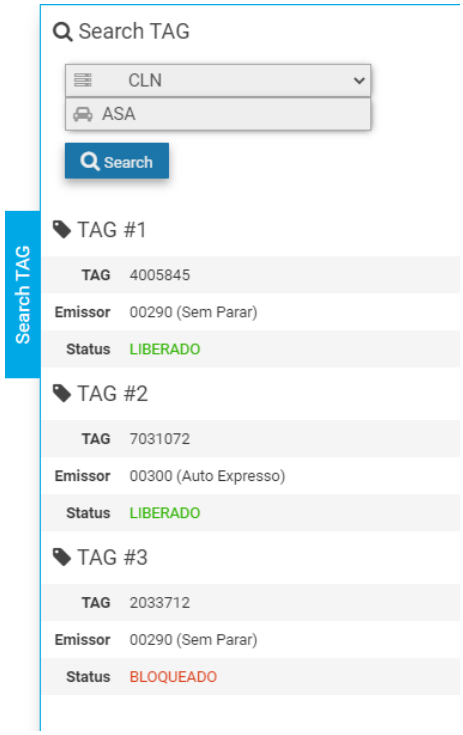


Figure 5 - Access to side flaps

Flap	Description
Log/Records	 Displays first the number of records per screening process and by status (*On time*, *In Attention*, and *Critical*) for each stage. You can access the records report for the stage by clicking the name of the desired stage or the status of the record. Similarly, in this tab all relevant system events are displayed chronologically with a brief description, and the complete list is available in *Reports>System Log*.

Flap	Description
Search TAG	 Performs a quick search by vehicle license plate or TAG number registered inthe concessionaire's TAG server, selecting the server and typing partof the desired license plate. The search results are displayed on the tab and separated by TAG, containing the information referring to the current status of the TAG.

4. Main Menu

Through the *Dashboard* you can graphically view the most relevant information regarding the records made. In *Telemetry* the status of the equipment can be tracked in real time.

4.1. Dashboard

The *Dashboard* is the records control panel that graphically displays the data by period, releasing the total number of records separated by screening process, by infractions activated and captured by NEVADA, by user- altered plates, and by manual discards performed.

At the beginning of the dashboard frame, you must select the period from which to collect the information in the charts by clicking the filter icon next to the period. The Total Records in the Period graph allows you to select the type of data display, whether in bars or lines.

Figure 6 - Dashboard home screen displaying the graph of Total Records in the Period and the number of Infractions in the period

Figure 7 - Dashboard with Chart of Changed Plates and Manual Disposals

Figure 8 - Dashboard graph with statistics on Queries on TAG Servers

4.2. Telemetry

Through Telemetry, information about the operation of equipment installed on a NEVADA runway is made available, in order to facilitate taking assertive actions in their maintenance. In order for them to be

monitored by Telemetry, the registered equipment must be configured in Registrations > Telemetry Configuration, grouped by track.

Custom user profile setting: The equipment that the user will have access to will be those linked to the locations allowed for the profile.

When accessing Telemetry, all the tracks registered in the Telemetry Configuration are displayed on the home screen and according to the user profile. The operating status is displayed with automatic updating every minute, which can be exported in report format by clicking Export PDF. It is possible to filter the view by operating status, selecting View equipment in *High Latency, Ok, Offline, Out of date, Disabled or Not Configured*.

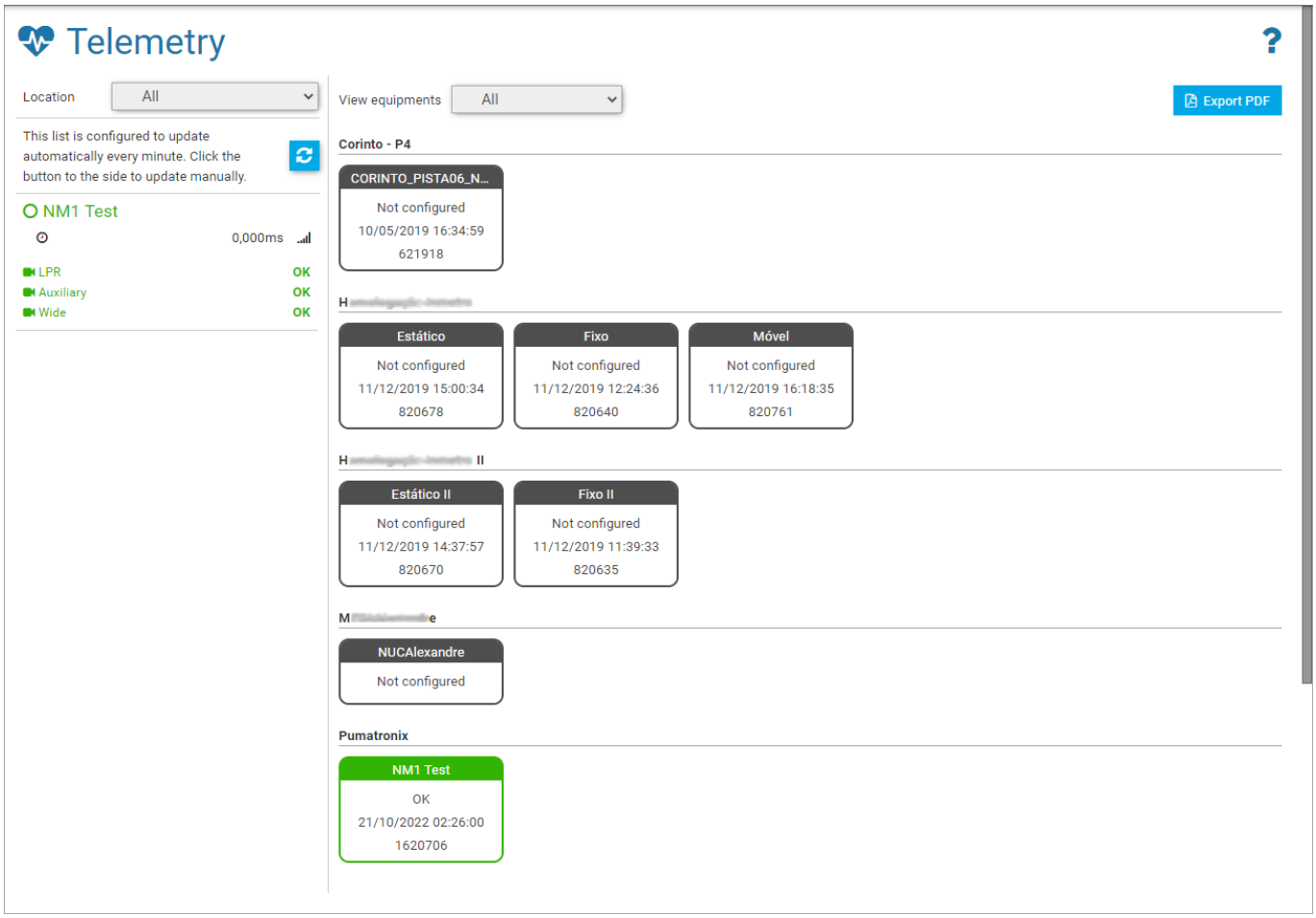


Figure 9 - Home screen in Main > Telemetry displaying the registered equipment

Depending on the selected Location, the monitored lanes that are in an OK operating state are displayed on the left of the screen and when selected, updated data on the set of devices and the lane status are displayed, as shown in the figure below. It is possible to collect information about the operation of the set of devices and each ITSCAM device separately:

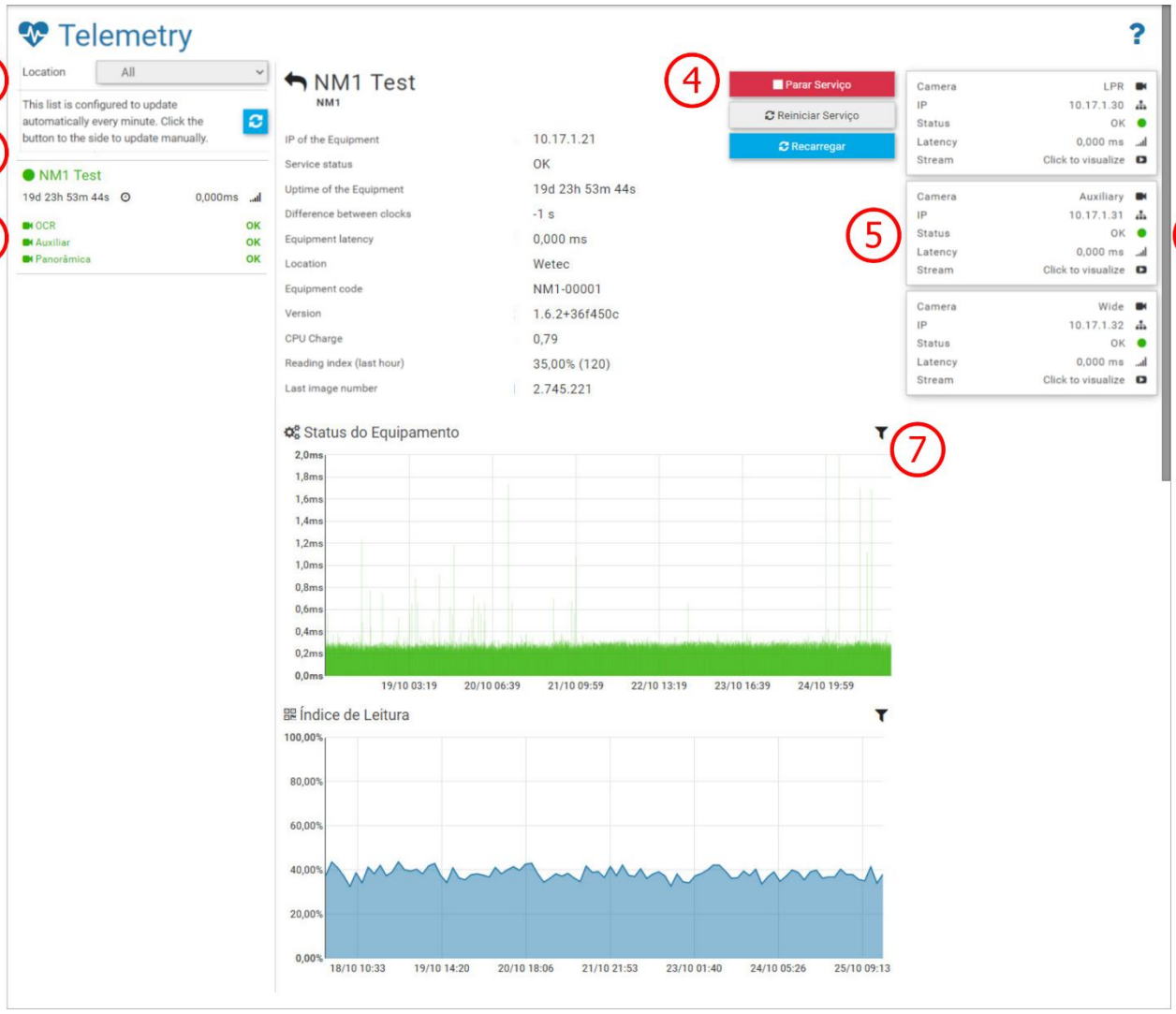
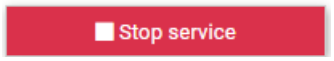
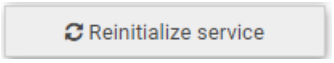
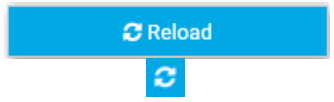
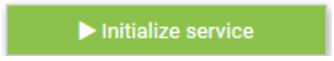


Figure 10 - Telemetry data from devices on a track: 1) Equipment Location Selection, 2) Option to recharge and update equipment data, 3) Equipment and device data, 4) Actions available for the track device set, 5) Status of each connected ITSCAM device, 6) Device image display option, 7) Period filter displayed on the chart

To follow the captured images live, click on the available link (6) corresponding to the device. To view the online video from the ITSCAM Panoramic device, it is necessary to have access to the network where the track is installed. The video function is important to check if any adjustments to zoom or focus are needed, or even to clean the lens of the ITSCAM device.

In addition to indicating the Service Status (3) of the NEVADA system and presenting other track data, some actions (4) can be performed, which will be enabled when the connection with the server is established, through the button interface:

	When you trigger the *Stop Service* button, the infraction notice collection service will be terminated on the track equipment set and no new infractions will be generated while theservice is stopped
	Allows user to restart NEVADA software
	The health is updated every minute, but you can force the equipment set status to updateby clicking the *Reload* button
	Displayed when the service is down, clicking this button starts the system service again

5. Registration Menu

Through the *Registrations* menu, the information of the tracks monitored in the NEVADA system is inserted, through the registration of the equipment and the respective locations.

In *Celepar Files* are sent the files with the identification of new types of brand/model, color and type of vehicles identified, to update the database of CELEPAR (Computer Company of Paraná).

In the *Telemetry Configuration* are registered the equipment of the tracks in operation and from which you want to monitor the operation on the *Telemetry* screen.

5.1. Equipment

The registration of each toll monitoring lane must be carried out by accessing the Registrations > Equipment menu and in +New Equipment by entering the initial data. The configuration of the set of optical devices installed in each registered lane occurs after its registration, available in the Configure option. The specifications of each field are described below:

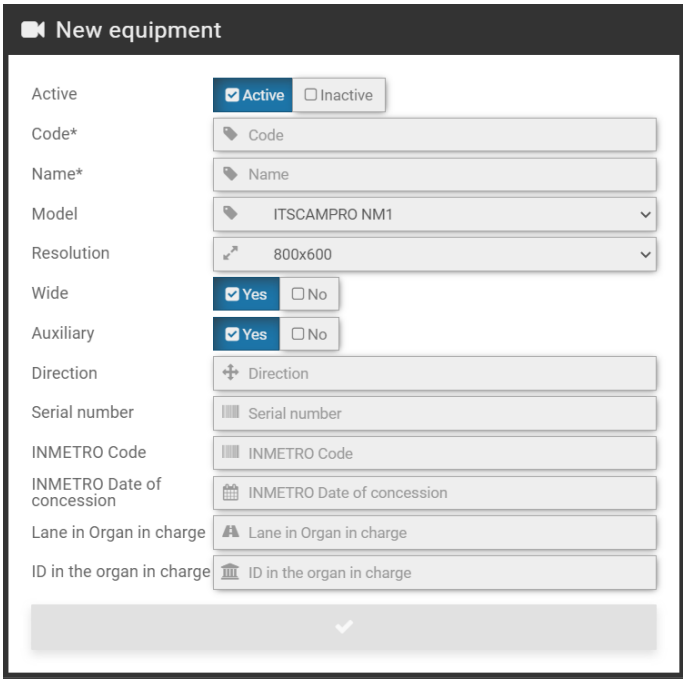
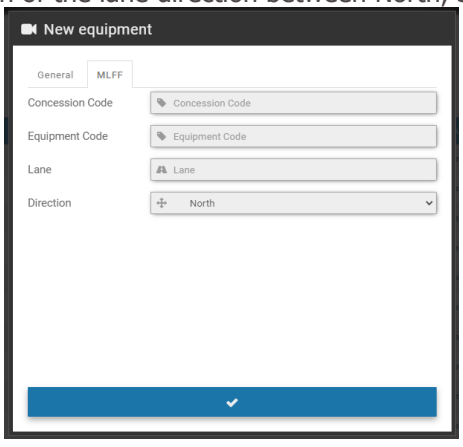


Figure 11 - Fields available in the registration of a new Equipment

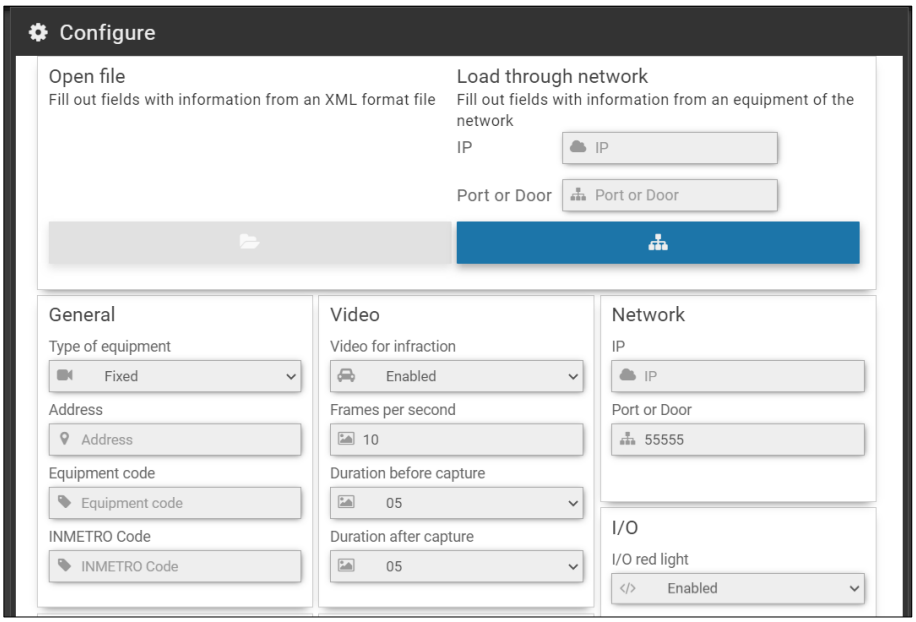
Field	Description
Active	select whether the registration is active or inactive
*Code**	mandatory field, used to link the records received from track equipment with registrationsin the NEVADA system. If the code registered in the equipment is not compatible with the code registered in NEVADA the records made by the equipment will not be processed.
*Name**	required field, with the name for the track
Model	select the system model between the options ITSCAMPRO NM1 (referring to a track monitored in NEVADA) and MLFF (referring to Free Flow equipment installed in a location). Equipment registered as an MLFF model must be configured in the tab provided, entering the values in the fields: • Concession Code: insertion of the concession identification code • Equipment Code: insertion of the equipment identification code • Track: insertion of the track identification • Direction: selection of the lane direction between North, South, East and West. 
Resolution	select the resolution of the image capture device installed in the front position, amongthose available: 752x480, 800x600, 1280x720, 1280x960, 1920x1440

Field	Description
Wide	select whether the system has the ITSCAM Panoramic device installed on the monitored track
Auxiliary	select whether the system has the ITSCAM device that captures the rear image installed on the track with toll evasion monitoring
Sense	indicate in which direction of the toll plaza is installed the monitored lane
Serial number	enter product serial number
INMETRO Code	code of the NEVADA/NM1 approval process in INMETRO to be displayed in the infringements. Contact Technical Support to enter your updated data
INMETRO Date of Concession	date of approval of NEVADA/NM1 in INMETRO to be displayed in the infringements.Contact Technical Support to enter your updated data
Lane in Organ in charge	indicate what is the clue, exactly as recorded by the supervisory body, to be displayed in the infringement
ID in the organ in charge	indicate how the clue is identified in the supervisory body, to be displayed in the infringement

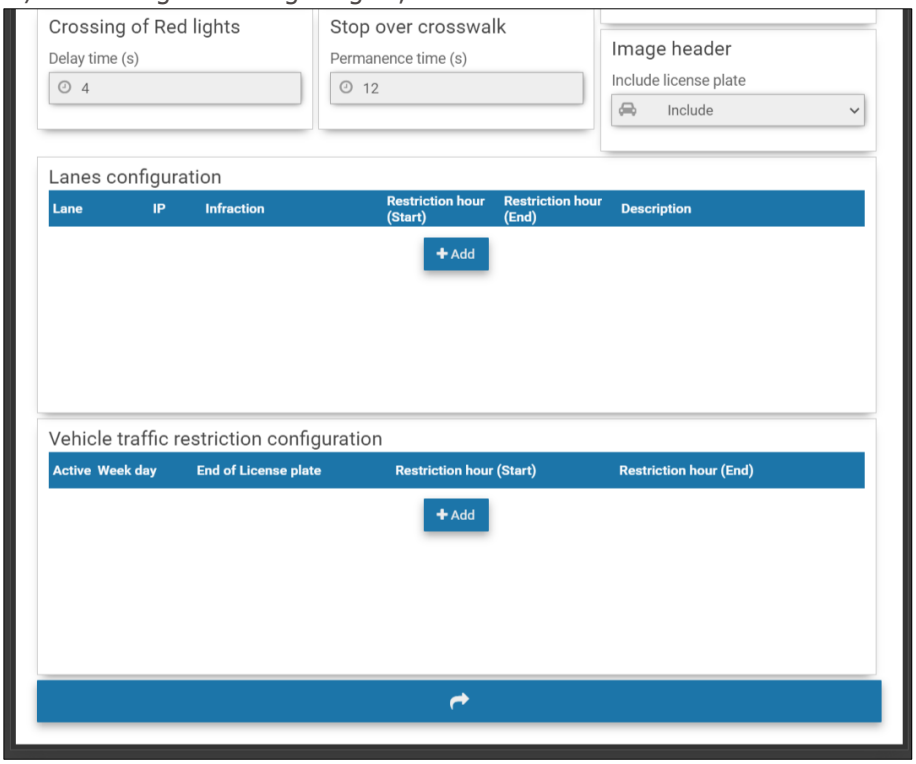
When accessing the Equipment register, the toll plaza lanes and MLFF model equipment registered in the system will be listed. For ITSCAMPRO NM1 models, Edit, Configuration, Download Settings, Apply Settings or Remove actions are possible, available via the buttons in the right column:

Figure 12 - Home screen in Registrations > Equipment

Action	Description
Edit	opens the screen for editing the track ID
Configure	opens the screen with the fields for setting up monitoring on a track:



- *Load through network*: option to load the settings of the indicated equipment anddisplay in the corresponding fields;
- *General*: registration of general information about the equipment, including type, address, code and INMETRO code;
- *Video*: Enable or disable video for infraction, insertion of the number of frames persecond, duration of the video before and after capture;
- *Network*: IP address and Monitored lane network port
- *I/O*: enabling the red-light signal;



- *Crossing of Red lights*: Delay time is the time that will be considered as "transition" from the semaphore signal from green to red when the system is monitoring signal feed infractions. If there is a pass record in this save period the record is discarded;

Action	Description
	• *Stop over crosswalk*: Length of stay is the minimum time that the car is parked on thetrack and the system generates a stop infraction on the track; • *Image header*: When you include the license plate in the image header you will not be able to edit it in the future, that is, the system generates the image header with the card information read. If there is some ocr reading error, the correction can bemade to the information saved in the database, but the image will remain with the old information of the license plate; • *Lanes configuration*: registration of ITSCAM that make up the monitored track, inserting the IP address, selecting the infraction and the period that will be made the records; • *Vehicle traffic restriction configuration*: indication of the end of license plate that will have restricted circulation and the restriction period
Download Configurations	the key used to encrypt the infractions that will be sent to the server will be downloaded. This file can be uploaded by accessing the track equipment interface. If the records are sent with the wrong key, they are discarded
Apply Configurations	all changes made are sent to the track equipment
Remove	removes the registration made to the track

5.2. Locations

Locations are the addresses of locations that must be linked to the Equipment and User registration. To register a new address, click on +New Location and fill in the specified fields:

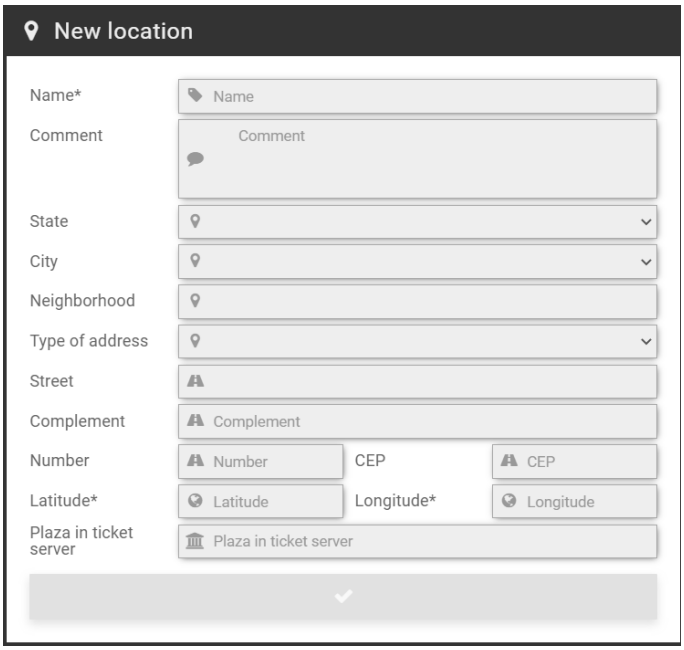


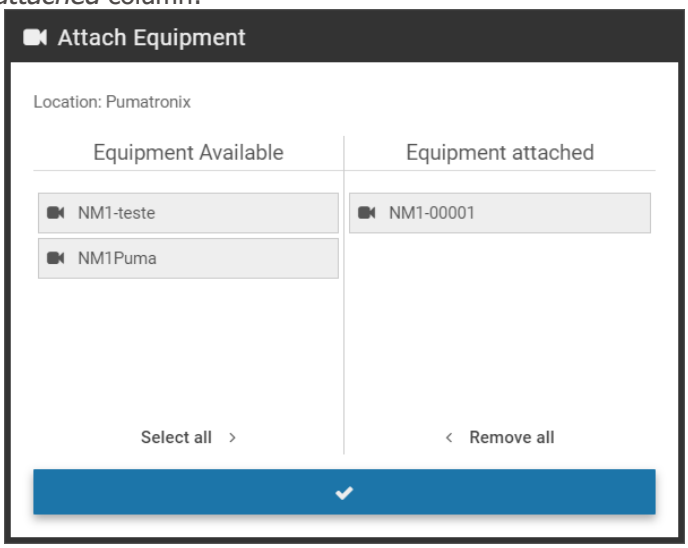
Figure 13 - Fields available in the registration of a new Location

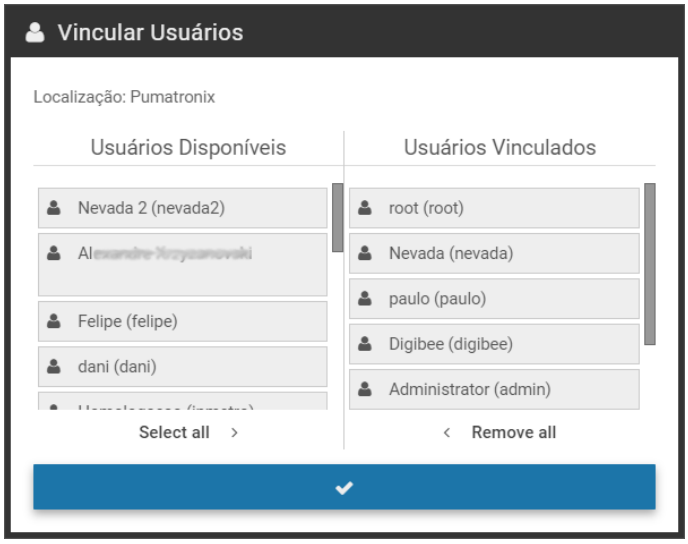
Action	Description
Name	must be created a name that identifies the location of NEVADA
Comment	for annotations relevant to the site
State, City	select the address data

Action	Description
Neighborhood	enter neighborhood data
Type of address	select whether it is a *Street*, *Avenue*, *Booth or Plaza* or *Road*
Street, *Complement*, *Number*, *CEP*	data about the address of the location
Latitude, *Longitude*	mandatory to enter global location positioning data
Plaza in ticket server	toll plaza code determined by the infraction sending server, considering the code as registered in the inspection body's system

Accessing the Locations menu displays the addresses of registered toll plazas that have the NEVADA system in operation. For each registered location, some actions are possible, available in the column on the right:

Figure 14 - Home screen at Registrations > Locations

Action	Description
Edit	opens the screen for editing the location ID
Attach Equipment	In the *Equipment Available* column, the equipment registered in the system that is not linked to another location is listed. To link to the current location, simply click and drag to the *Equipment attached* column: 
Attach Users	you can restrict users' access to certain locations as well as link the user to more than one location. *Available Users* will be linked when you click and drag to the *Attached Users* column, displayed in the screen:

Action	Description
	
Remove	the location register is removed

5.3. CELEPAR Files

The database of CELEPAR (Companhia de Informática do Paraná) offers efficiency in the inspection process because it is fed by the traffic department and the civil and military police with the registration information of vehicles and drivers, in addition to the records of theft or theft in the state of Paraná.

NEVADA can be fed with the data made available by CELEPAR when it is made available in the license and in the same way contribute to the upgrade, by identifying new vehicles in the infractions sent to the supervisory body. It is recommended to periodically upload the files, to feed the NEVADA server with updated vehicle information, in order to make the inspection more efficient. CELEPAR makes partial files available every 2 days and every month the complete files are updated.

When accessing, you can view the updated list of vehicles by clicking *Show/Hide Vehicles*.

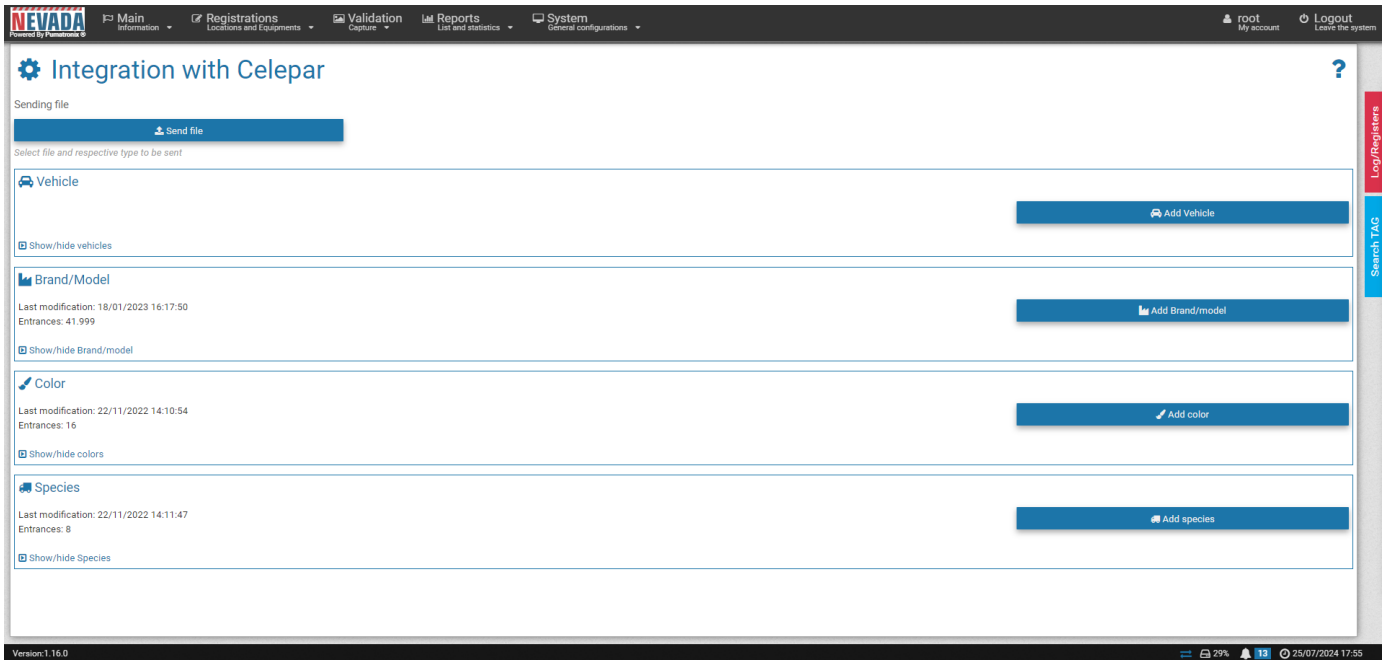


Figure 15 - Home screen in Registrations > Celepar Files

5.4. Telemetry Configuration

To define telemetry, go to the menu *Registrations > Telemetry Setup,* click *+New Equipment* and set up a newtrack that should be displayed in *Telemetry* by filling in the following fields in the *Equipment* tab:

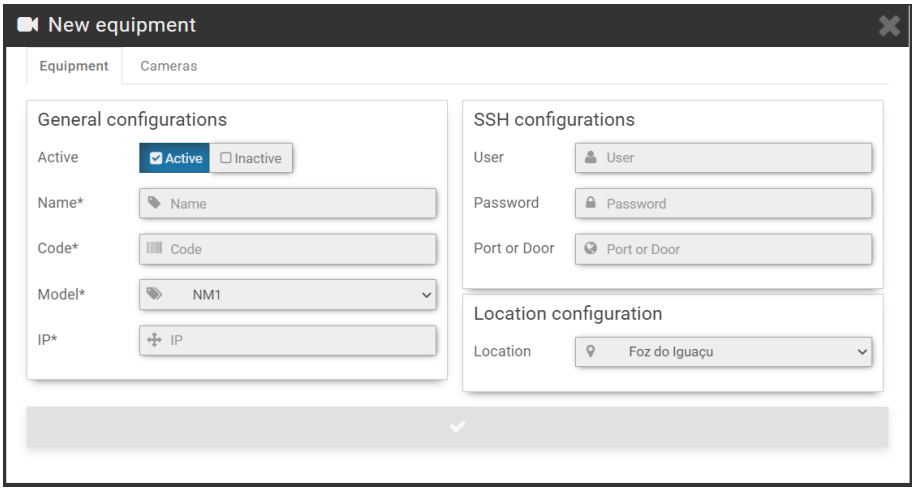


Figure 16 - Track data registration screen for Telemetry, Equipment tab

General Configurations	Description
Active	select whether it is active or inactive in telemetry
Name	required field to identify with a name the set of equipment of the track
Code	mandatory field, used to link the records received from track equipment with registrations in NEVADA. If the code registered in the equipment is not compatible with the code registered in NEVADA the records made by the equipment will not be processed
Model	required field to identify the NEVADA model

General Configurations	Description
IP	required field for the IP address of the track on the network
SSH Configurations	**Description**
User, Password	enter user login with authentication for server access
Port or Door	insert the communication port with the SSH protocol
Location Configuration	**Description**
Location	select from the locations registered in the system the one in which the track is located

In the *Cameras* tab, when you click *+Add*, the fields for configuring telemetry from an ITSCAM device that makes up the monitored track are available:

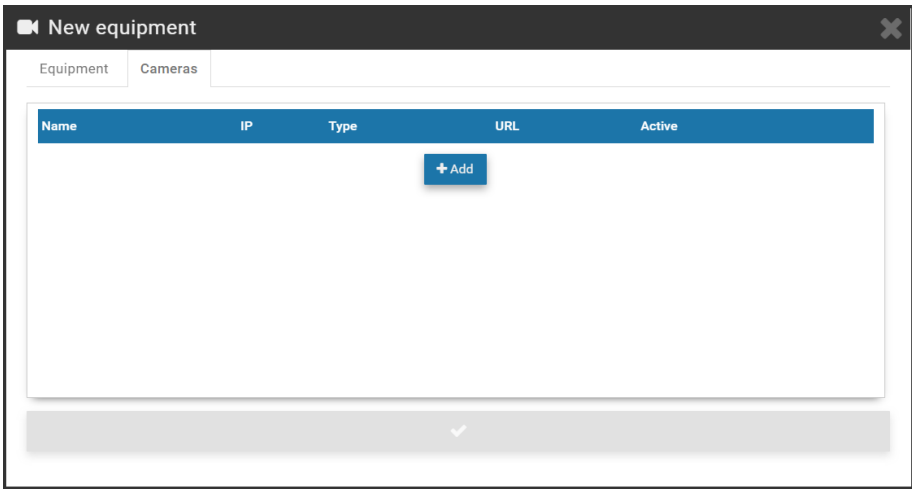


Figure 17 - Track data registration screen for Telemetry, Cameras tab

Action	Description
Name	identify ITSCAM with a display name on the *Telemetry* screen
IP	enter the IP address of the device on the local network
Type	select whether it is the Front, Rear or Panoramic ITSCAM
URL	enter the ITSCAM URL for displaying the MJPEG video
Active	select whether ITSCAM is active in monitoring
Remove button	removes ITSCAM from the *Cameras* list, and the action is irreversible
Copy button	copies the data to insert a new ITSCAM into the list

Telemetry is possible for all equipment registered and linked to any of the registered *Locations*. For each equipment inserted, some actions are possible, available in the column on the right:

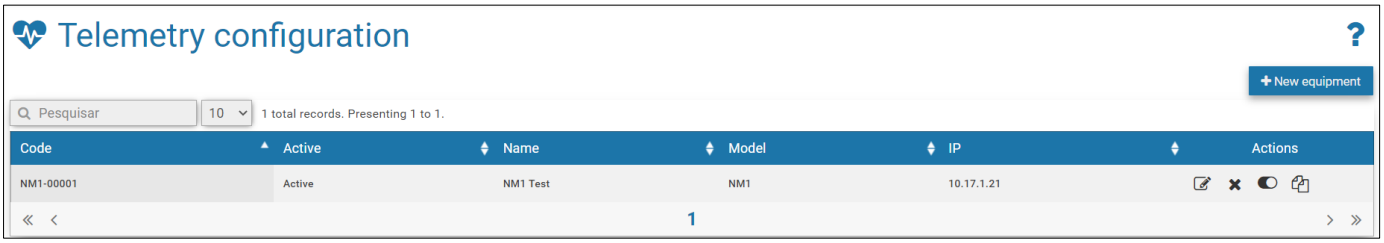


Figure 18 - Home screen in Registrations > Telemetry Configuration

Field	Description
Edit	opens the screen for editing equipment data configured for telemetry
Remove	removes the equipment set from the register for telemetry
Disable	keeps the registration disabled for the equipment set of the list
Copy	copies the registered data to create a new set of equipment

6. Validation Menu

The NEVADA system records and stores images of vehicles traveling through the monitored lanes. It is often necessary to perform a screening and manual validation of the registration performed by the system, so that it is properly characterized as an infraction or for it to be discarded. Among the various reasons for disposing of a record are:

1) factors related to TAG, which may have been released by the TAG server;
2) manual payment of the toll fee, after passing through the track;
3) visual changes on the license plate, which may have been tampered with, unreadable or obstructed at the time of capture; the captured image does not have the sufficient quality to record the infringement;
4) or the license plate is free of payment.

The storage capacity of the records is up to the limit available to the system. For this reason, it is essential to discard records that no longer have validity, as well as the referral of those who effectively characterize an infringement, because this way the necessary space for new records is freed up.

The manual validation process of the records is done in configured steps, which remain available for quick access in the *Validation* menu.

6.1. Records

Allows you to locate all records made by the tracks registered in the system. Initially, to view the last records, simply click *Search*, without selecting any filters, and they will be listed in descending chronological order. For a new search, click the *Filters* button, specify the filters to apply, and click *Search* again so that the filtered records appear according to:

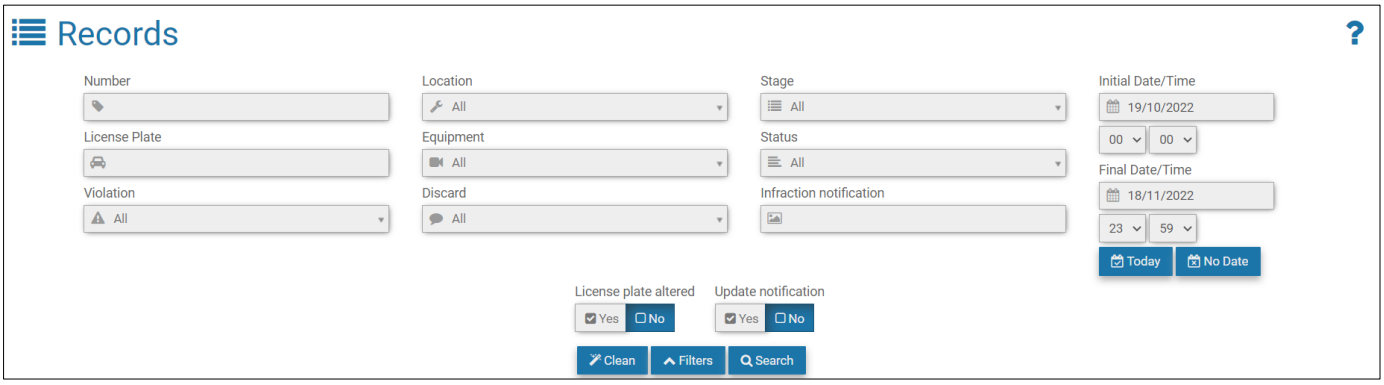


Figure 19 - Filters available in search for records stored in NEVADA

Filter	Description
Number	search for the registration storage number in NEVADA
License Plate	search for a specific vehicle license plate or by partial license plate
TAG	TAG status selection
Violation	search for registered violation
Location	search between equipment locations
Equipment	search by set of equipment on a track registered in the system
Image	search for the number of the image in the record
Discard	search for discard reason. Depends on enabling functionality in System>General Configurations
Stage	search by screening stage registered in the system
Status	search for registration status among the possible: *On time*, *In Attention*, Critical, *Out of Date*, *Released*, *Infraction* or *All*
Infraction notification	search by infraction notice number
Initial Date/Time *Final Date/Time*	search by period of registrations s. By default, the initial search considers the last 30 days

Additionally, the search result can be applied to the filter of records that have had the *License plate altered* in the system or with validated records. The search can also be updated automatically, and the last records made are listed by selecting *Yes* to *Update notification* and a range every 5, 10, 20, 30, or 60 seconds.

The result of the search for records is Figure 20, with the record *Status* symbol displayed on the left, indicating the record processing time, considering the *Quality Levels* defined by stage or global. When necessary, you can export the displayed listing to standard Excel files by clicking the *Export CSV* or *Export Excel* buttons.

For each record presented, specific actions are possible, depending on the violation or stage, available in the buttons in the right column:

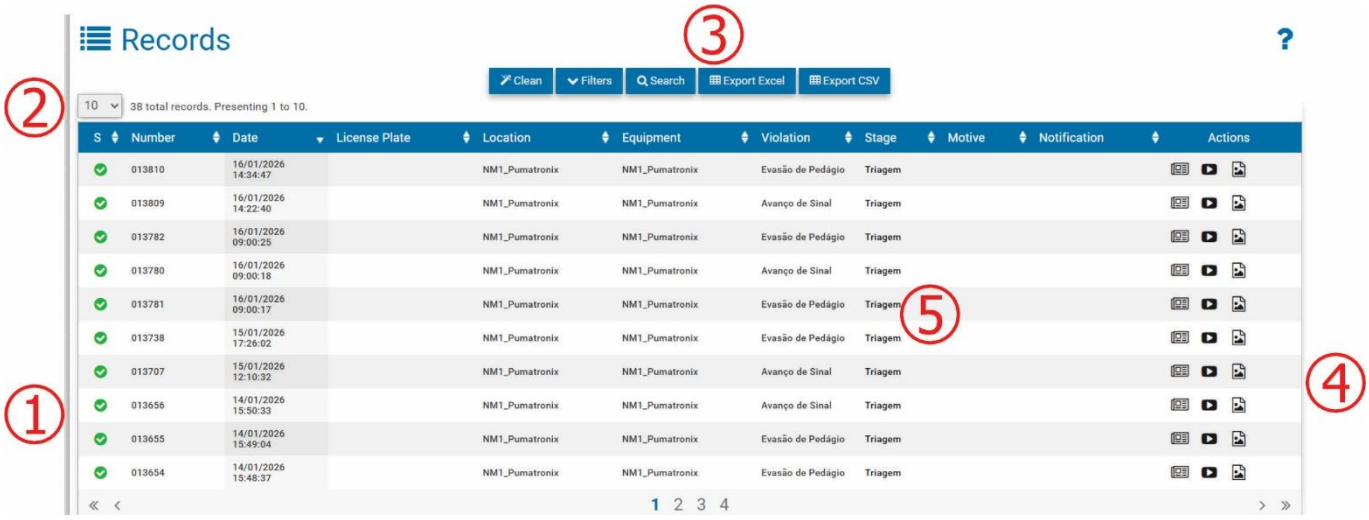


Figure 20 - Screen with a result of Records Search: 1) Registry Status; 2) Quantity per screen; 3) Options to export records listed, 4) Available actions, 5) Link access to the screening stage

Action	Description
View Record	The record has enlarged images on this screen, in addition to the OCR reading data of the license plate, the screening stage the record is in, and the current status of the record and TAG, with a brief history of the actions performed by the system, indicated to the right of the image. On this screen it is possible to change the recognized license plate, and thus, *Update TAG*, and it is also possible to unlink a previously discarded record to be used in a new record* in NEVADA:  *Note: When discarding a record, the Status is updated to Released and the Collection System button allows you to unlink the record from the NEVADA system, which indicates the transaction ID number that occurred in the concessionaire's collection system, and can then be used in a new record in the NEVADA system.
View Video	the video captured by ITSCAM Panoramic is displayed, and depending on the browser and its version, the option to download and preview in thumbnail may be available, as in Google Chrome
View Complete Auto	displays the format in which the record will be sent to the infringement notice, with the images of the image capture devices

Search TAG	when clicking, the *Search TAG* side tab displays the search result for the recognized card on theTAG server, with the updated information
Download	available for records in *Infraction* status, and auto images are downloaded to the computer
View Images of the Auto	images of the record are displayed, referring to the same vehicle and captured by each ITSCAM device. It aims to facilitate the validation of the license plate read in the OCR and the image depends onthe registered inspection body, because each body expects to receive the images with different information

6.2. Screening Process

The triage steps can be configured in *System> Screening Stages* and will be available in the *Validation* menu for manual validation when configured as manual stage and not system stage. The main features available ina manual validation stage are detailed in Figure 21, which exemplifies a validation screen that can be configured by the user. Clicking *Help* in *the* upper right corner appears the description of each available feature on the screen of the triage stage you've created.

To submit to the *Infraction* stage or to release the record, the action buttons located at the bottom of the screen are used.

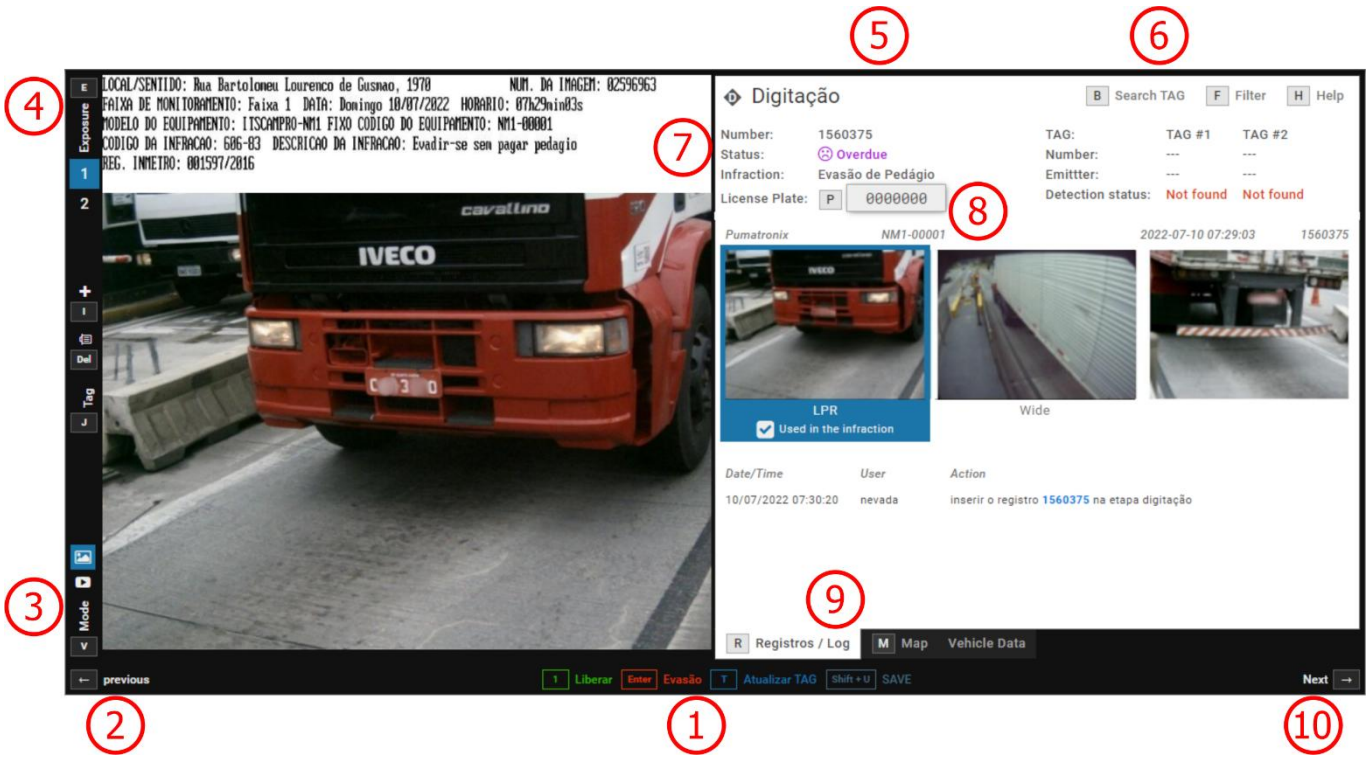


Figure 21 - Screen of a stage of manual Validation: 1) Screening action configured for the stage, 2) Returns to previous record, 3) View video selection, 4) View of captured images, 5) Screening stage identification, 6) Search TAG filters Options** for searches, 7) Record status, 8) Field for editing the registered plate, 9) View the record data, 10) Proceed to the next record*

*The action options and controls presented on the screen of a manual screening stage are customizable according tothe requirements of the created stage and may be differently from illustrated.

**The main actions and controls can be accessed by the user using keyboard shortcuts when configured.

7. Reports Menu

Evasion or vehicle license plate lists and statistics can be graphically viewed by accessing the options in the *Reports* menu. In addition to these, you can view the report of actions performed on the system by clicking *System Log*.

7.1. Evasion

The *Evasion Report* is the statistical data center regarding the quantitative of records with the toll evasion infraction, being filtered by plate, period, location or equipment. The presentation of the filtered data in graphs allows you to analyze the total per period, hours, days of the week and per concessionaire's TAG server. On the map you can view the quantitative by location and by TAG status. Figure 22 shows the interface buttons for customizing the graphics.

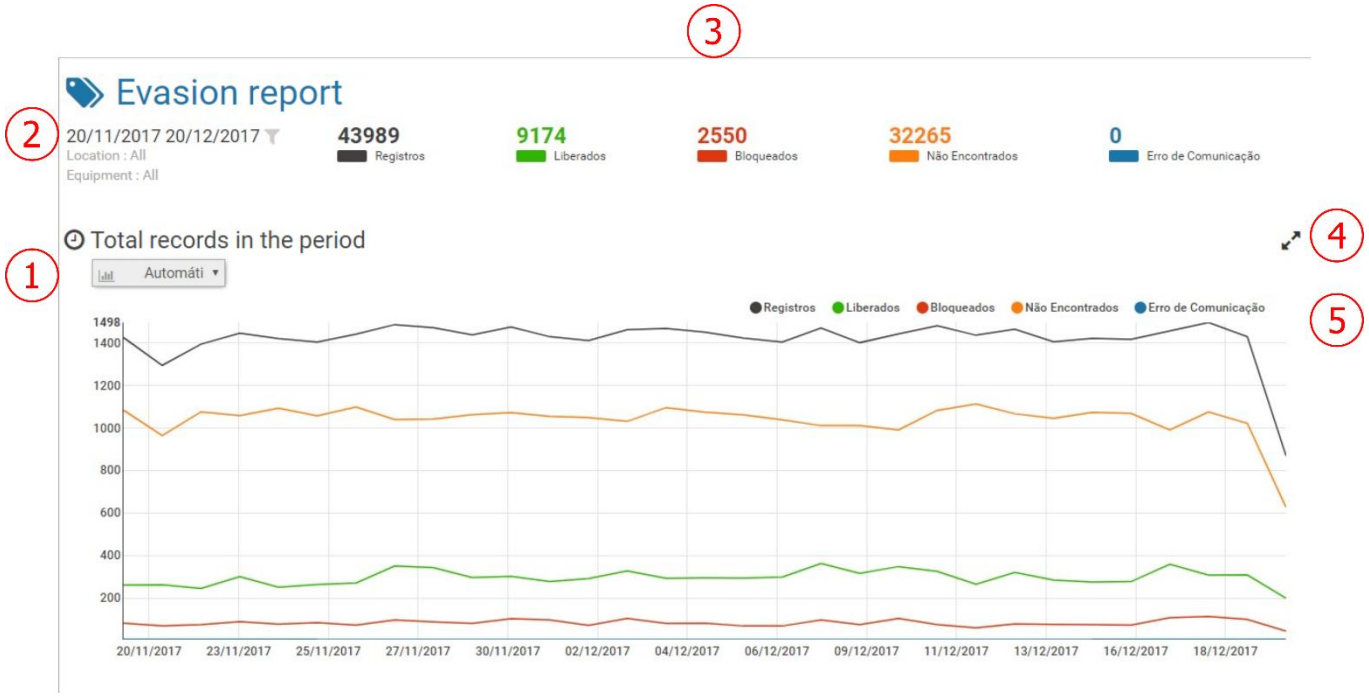


Figure 22 - Menu Screen Reports > Evasion: 1) Chart type, 2) Record period filter, 3) Number of records by TAG status, 4) Option to enlarge chart view size, 5) Legend and selection of data for display on chart

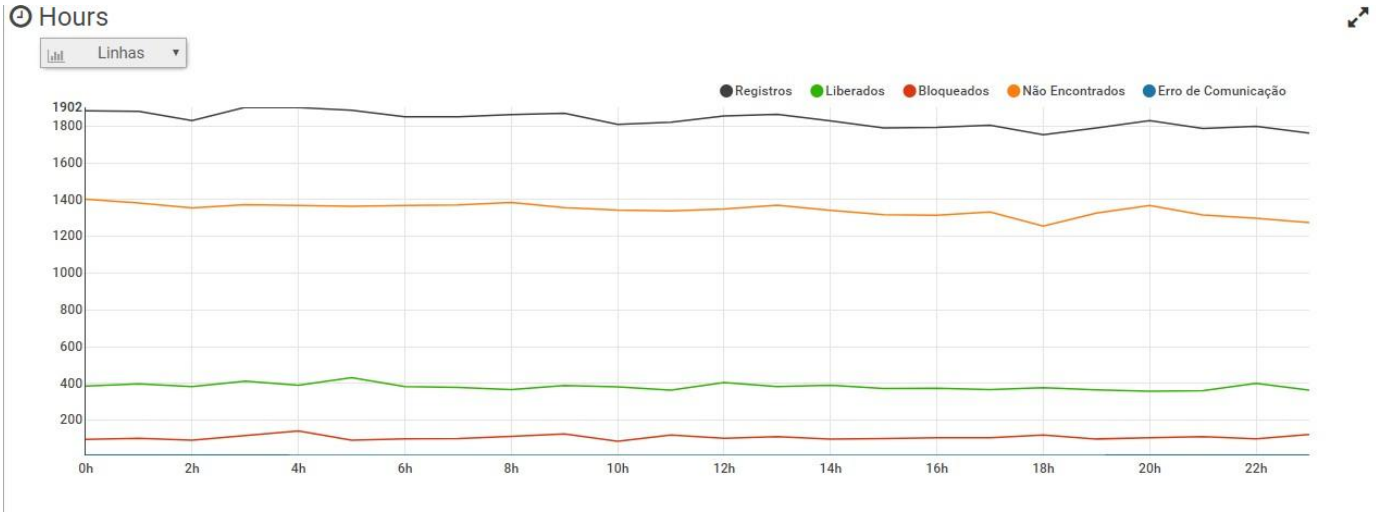


Figure 23 - Evasion Report showing quantitative graph by Hours

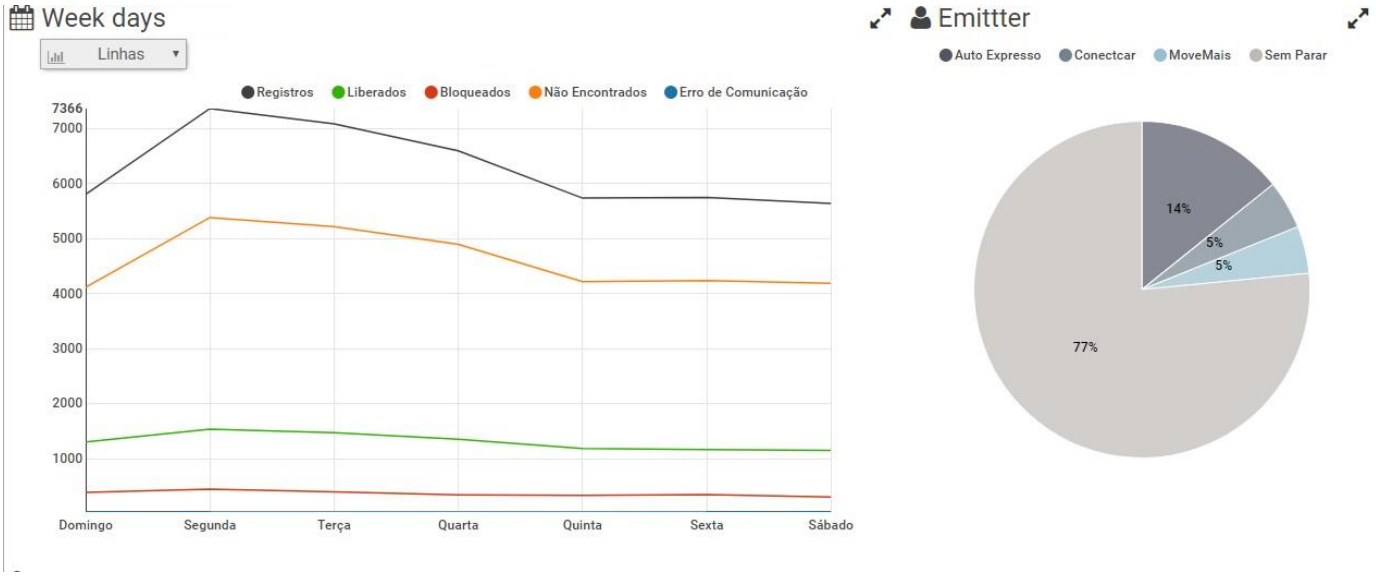


Figure 24 - Evasion Report showing quantitative graph by Days of the Week and TAG Issuer

Figure 25 - Evasion Report showing Quantitative Map by Localities

7.2. Evaders

When accessing the *Evaders* report, the screen for searching the database is presented by the number of records made per plate, regardless of whether or not the record was characterized as a toll evasion violation. You can apply *Filters* by license plate, equipment, location, TAG status, by sorting stages, and for a selected period.

When necessary, you can export the displayed listing to standard Excel files by clicking the *Export CSV or Export Excel* buttons. For each card record, some actions are available, depending on the status of each record, and you can:

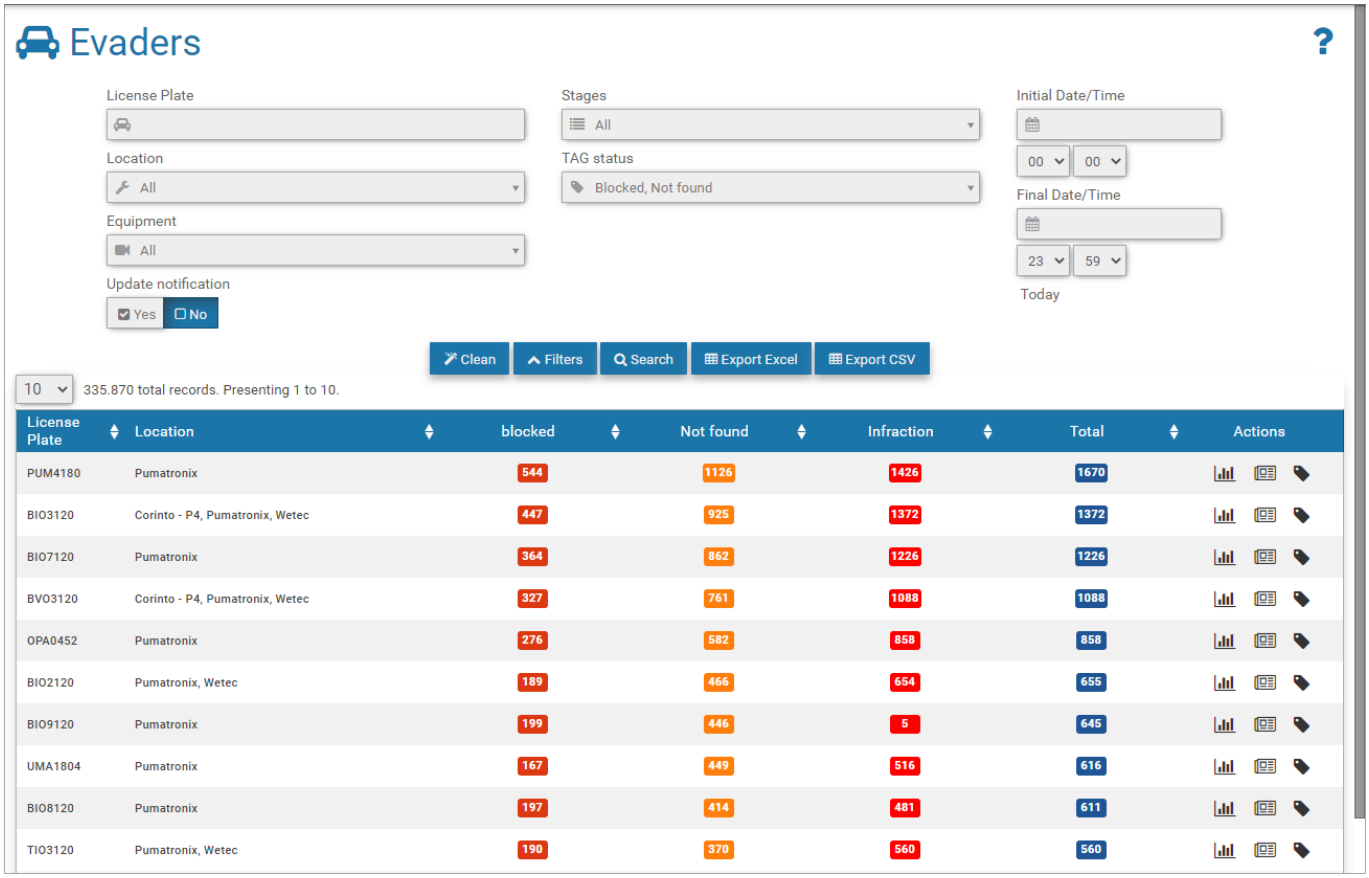


Figure 26 - Reports > Evaders menu screen

Action	Description
View Chart	the *Evasion Report* screen is displayed, displaying the statistics for the license plate
View Records	the *Records* screen is displayed, with the history of the records made for the
Search TAG	opens the *Search TAG* side tab and performs the search for the updated data on the TAG server

7.3. System Log

Displays the history of the actions performed on the system, being possible to apply *Filters* in the search for Logs made by period, per user and per action. Like other reports, you can export the displayed listing to standard Excel files by clicking the *Export CSV* or *Export Excel* buttons.

The actions allowed for each user must be configured in *System> Users* at the time of registration.

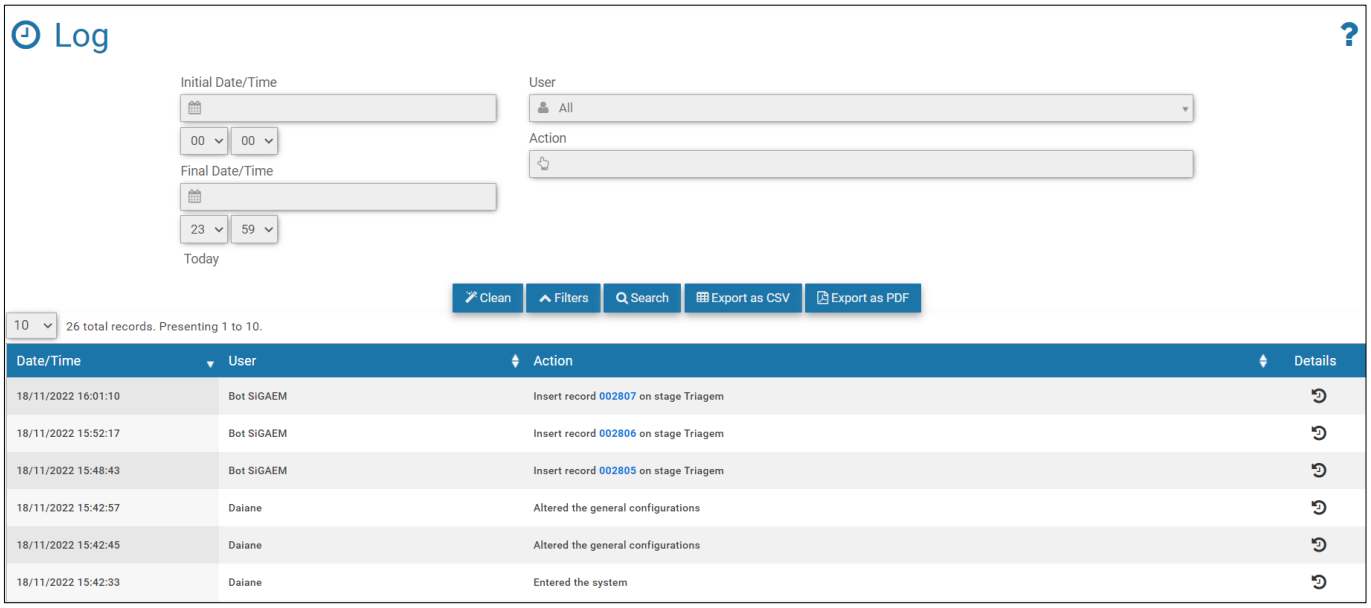


Figure 27 – Reports > System Log menu Screen

8. System Menu

In this menu are the general settings options available for the system, grouped in *Access Control*, *System*, *Configurations* and *System Maintenance* and will be covered following this manual, by configuration group.

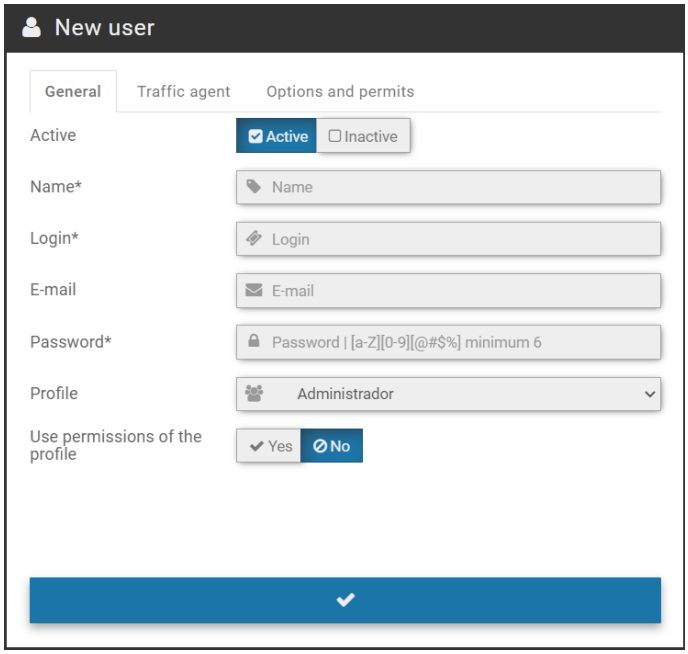
8.1. Access Control

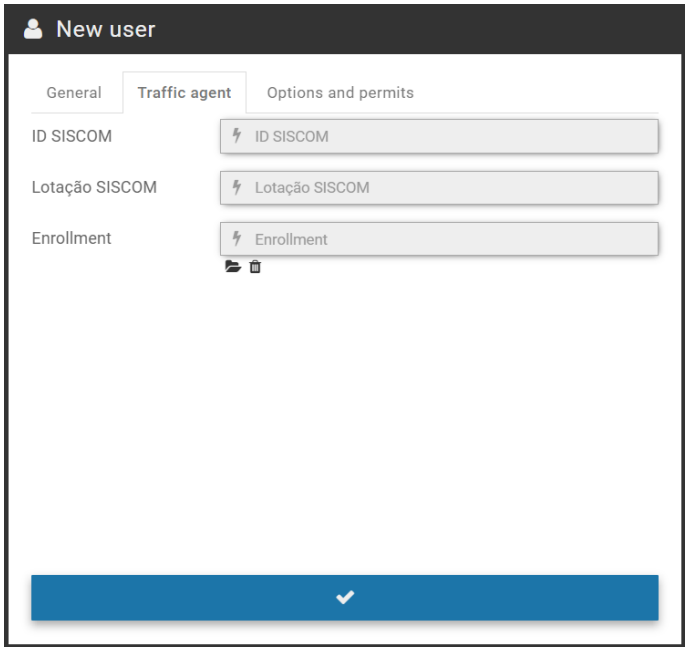
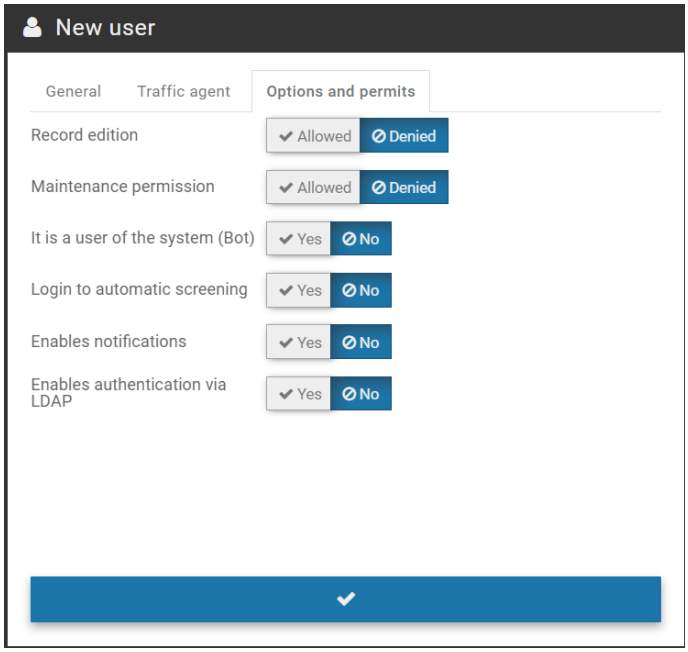
In addition to being able to control access to the system, users and access profiles must be registered, and so all actions performed on the system will be reported in *System Log*.

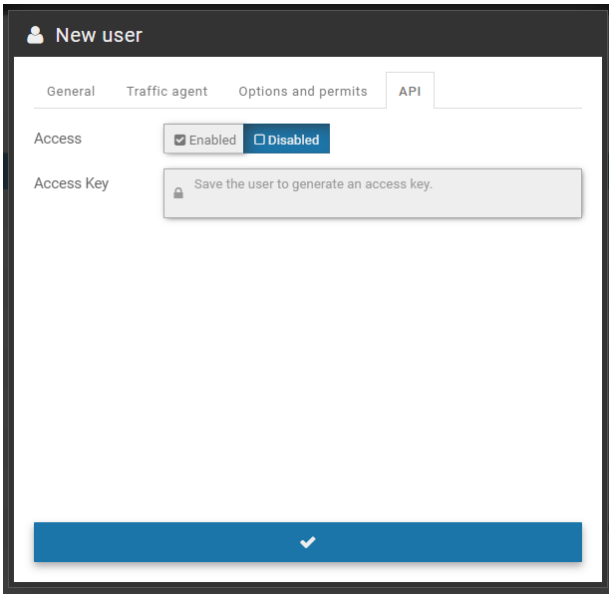
8.1.1. Users

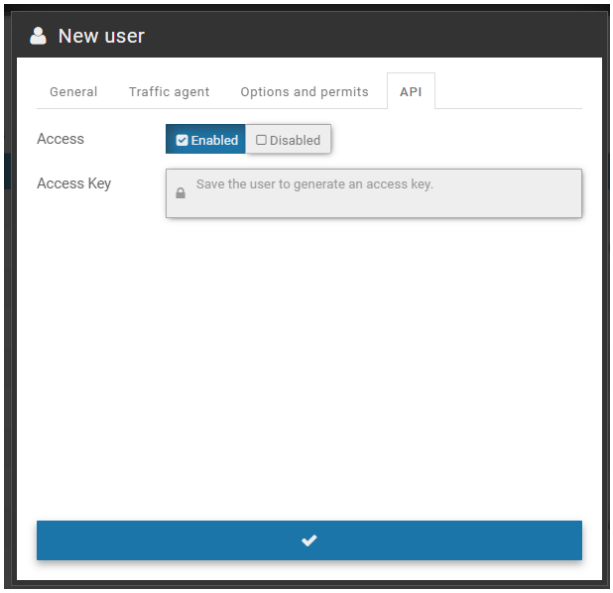
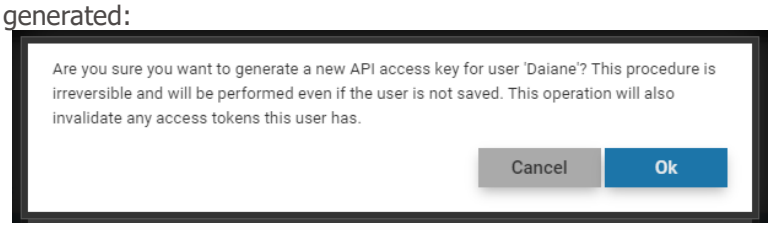
When registering a user, the data is specified, which access profile corresponds to, whether it is a *Traffic Agent*, and the settings and permissions.

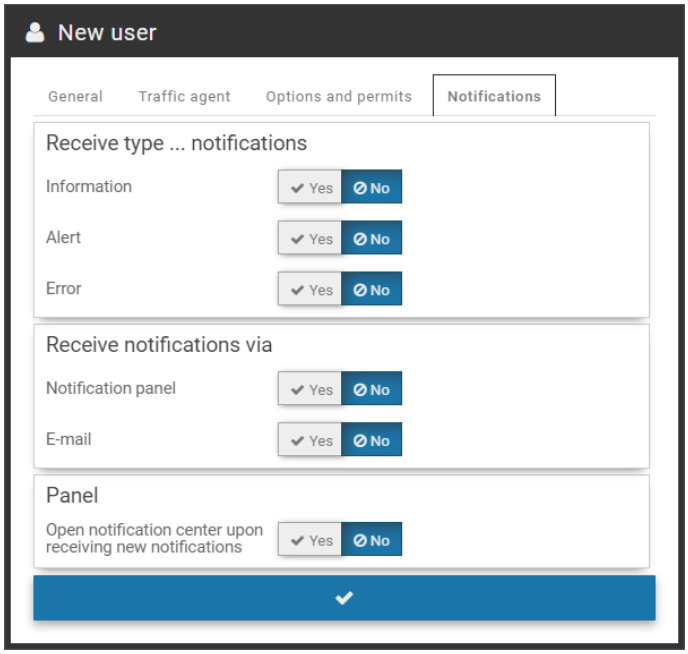
To add a new user, click *+New User* and the screen displays the fields for padding, sand paraded in three tabs:

Field	Description
General Tab	 *Figure 28 - Screen of New User > General Tab*
Active	select whether the user is *Active* or *Inactive*
Name	mandatory to create a name for user ID
Login	mandatory to enter the data to log in
E-mail	register an email from the user for sending system data
Password	mandatory to enter the access password to log in
Profile	select a profile that contains the desired access permissions
Use permissions of the profile	if profile permissions are not used, select *No,* and only user-specific permissions will be applied

Field	Description
Traffic Agent Tab	 *Figure 29 - Screen of New User > Traffic Agent Tab*
Code/ Workplace	enter the registration code of the traffic officer who will report violators online
Enrollment	enter the agent's license plate (numbers only)
Options and Permits tab	 *Figure 30 - Screen of New User > Options and Permits Tab*
Record Edition	select whether the user is allowed or denied editing the records
Maintenance Permission	select whether the user is allowed or denied performing system maintenance

Field	Description
It is a user of the system (Bot)	configure whether the user created is of the robot *Bot* type that performs the system functions by selecting *Yes* or *No.* If so, it will be accessible to be added to settings in *Automatic Screening.*
Login to Automatic screening	when enabled, this user's login will be monitored by the *Automatic Screening* engine for the condition "User is logged in"
Enables Notifications	select *Yes* or *No* to receive notifications to the user. The *Notifications* tab (Figure 34)will be made available for settings
Enables authentication via LDAP	select *Yes* or *No* to use the LDAP server for validation of the user's login. The LDAP server can be configured under System>General Configurations
API Tab	 *Figure 31 - API configuration for new user*

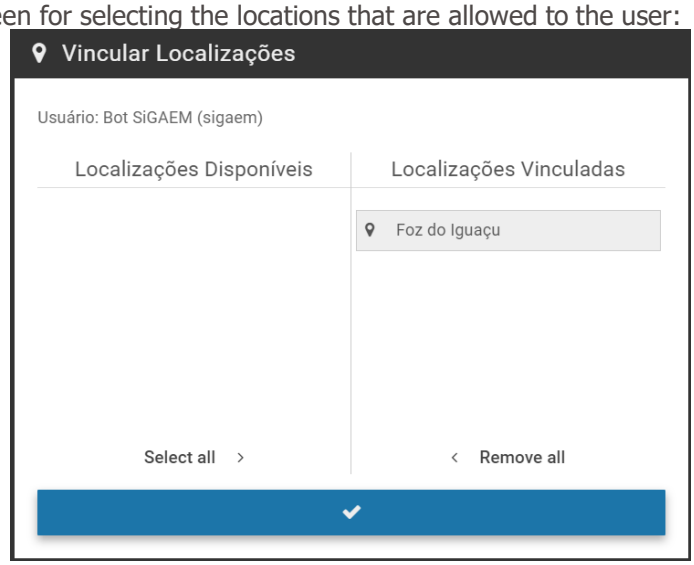
Field	Description
Access	Select whether API access is enabled or disabled for the user  *Figure 32 - User API access configuration screen*
Access Key	the displayed access key can be modified by clicking the "Generate new access key" button, which allows you to change the user's API access key by selecting and copying the key value. When you generate a new access key, all accesses are automatically invalidated and a new key is generated:  *Figure 33 - Alert screen*

Field	Description
Notifications Tab	 *Figure 34 - Screen of New User > Notifications Tab*
Receive notifications of the type	select whether the user should receive notifications of type *Information*, *Alert* and/or *Error*
Receive notifications via	select whether the user should receive notifications via *Notification panel* and/or *Email*
Panel	configures whether the notification panel should be opened for the user at the time of a new notification

The home screen displays the listing of registered users, which can be sorted by fields by clicking on the title at the top of the list. For each registered user, some actions are possible, available in the column on the right, including linking to locations with access permission, mandatory because it ensures greater security, restricting changes in the system.

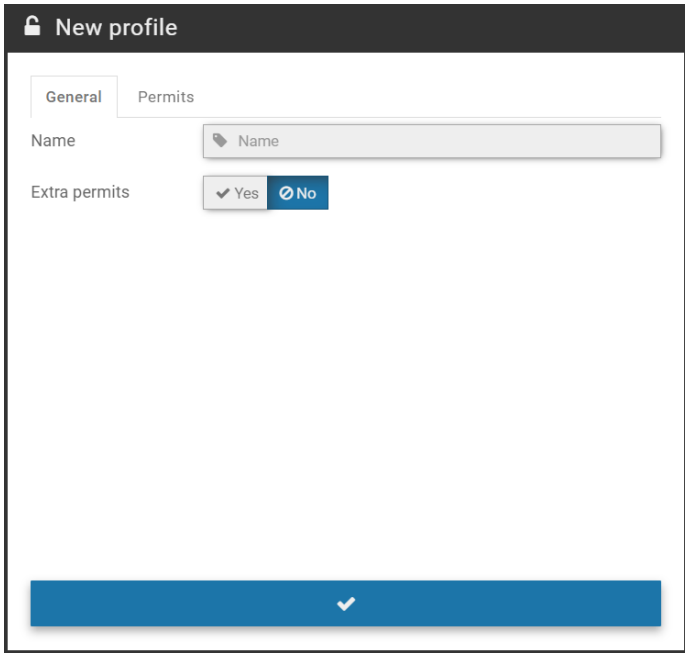
Figure 35 - Example of Home screen in System>Users

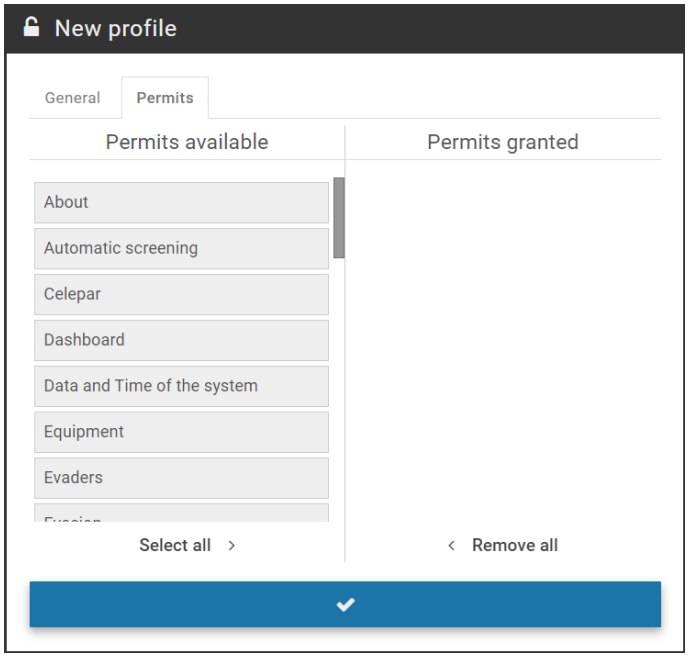
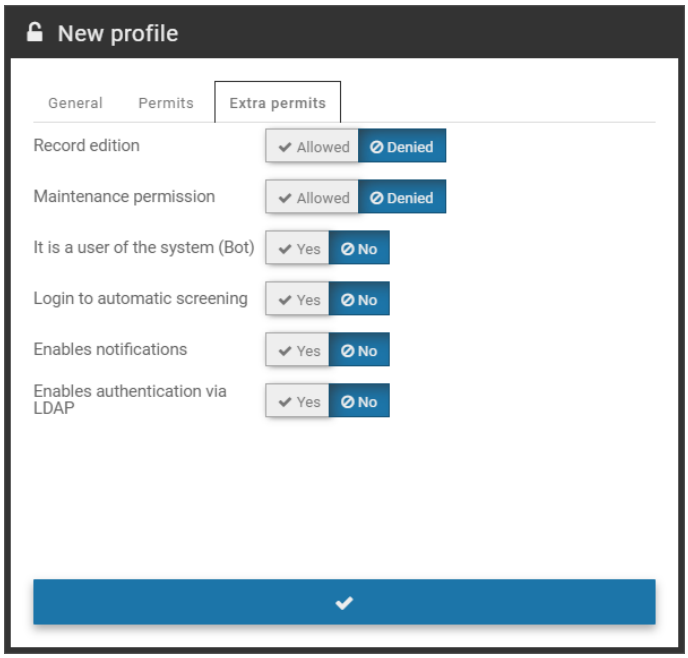
Field	Description
Edit	opens the screen for editing user data

Field	Description
Attach Locations	opens the screen for selecting the locations that are allowed to the user:  *Figure 36 - Selection of locations allowed to the User*
Remove	removes the registered user from the system

8.1.2. Profiles

Access profiles are used to generate different levels of access and changes to the system by registered users, linking them to a created profile. To add a new access profile, click *+New Profile* and configure the following fields available in the tabs:

Field	Description
General Tab	 *Figure 37 - Screen of New Profile > General Tab*

Field	Description
Name	create an ID for the profile
Extra permissions	select *Yes* or *No* to enable some additional permissions to select in a new tab
Permits Tab	 *Figure 38 - New Profile screen > Permissions Tab*
Permits Available	left column lists the menus and settings available in the interface
Permits Granted	profile permission will be released for functionality when selected and moved to the *Permits Granted* column
Extra Permits Tab	 *Figure 39 - Screen of New Profile > Extra Permits Tab* *Extra Permits* are the same specific permissions selected during new user setup

The home screen displays the listing of the registered profiles with the permissions of each and the actions available in the column on the right:

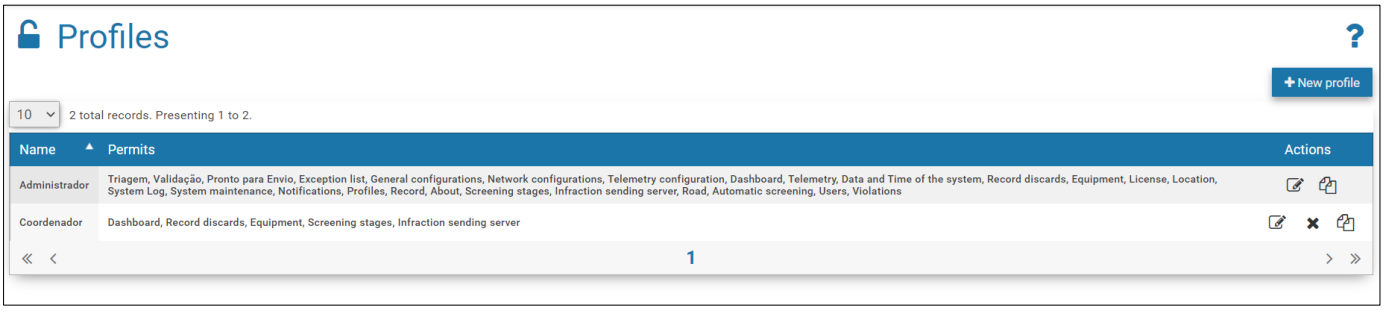


Figure 40 - Home screen in System>Profiles

Action	Description
Edit	opens the created profile settings window
Copy profile	copies profile properties to create a new one, and you need to change the id name
Remove	removes the created profile

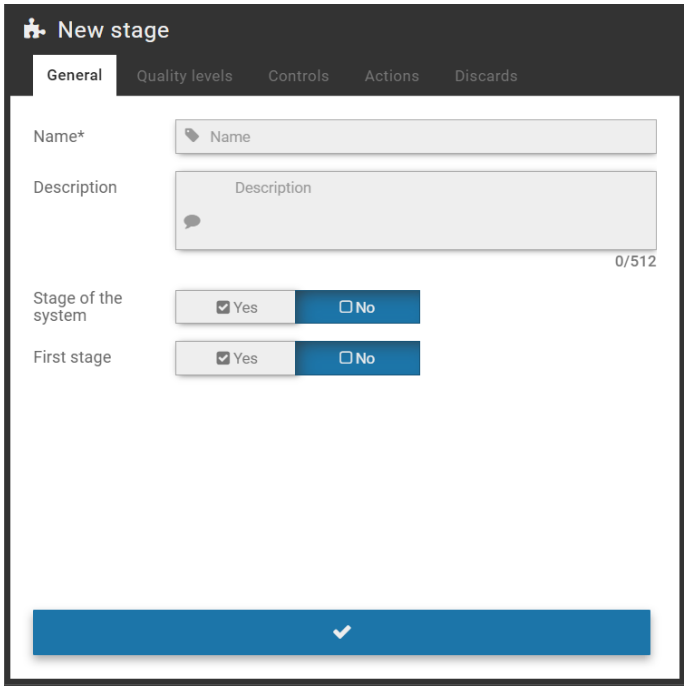
8.2. System

The adjustments in the operation of the system allow it to be customized for operation according to the needs of each toll plaza, being possible to configure some operations to be processed automatically, when the system itself executes them.

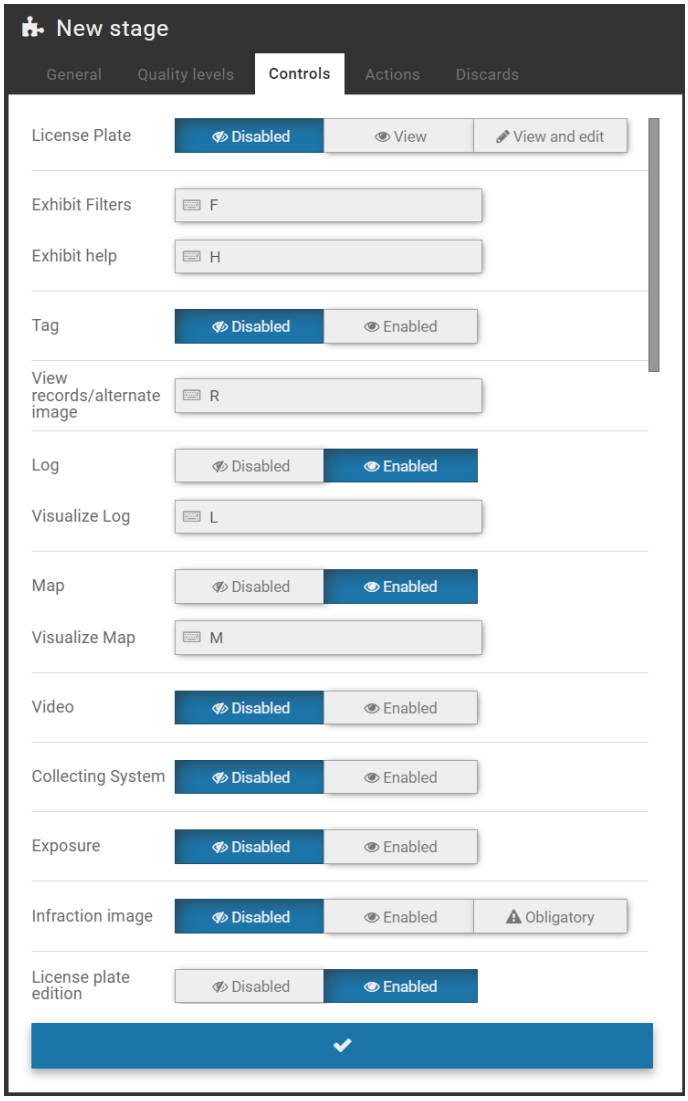
8.2.1. Screening Stages

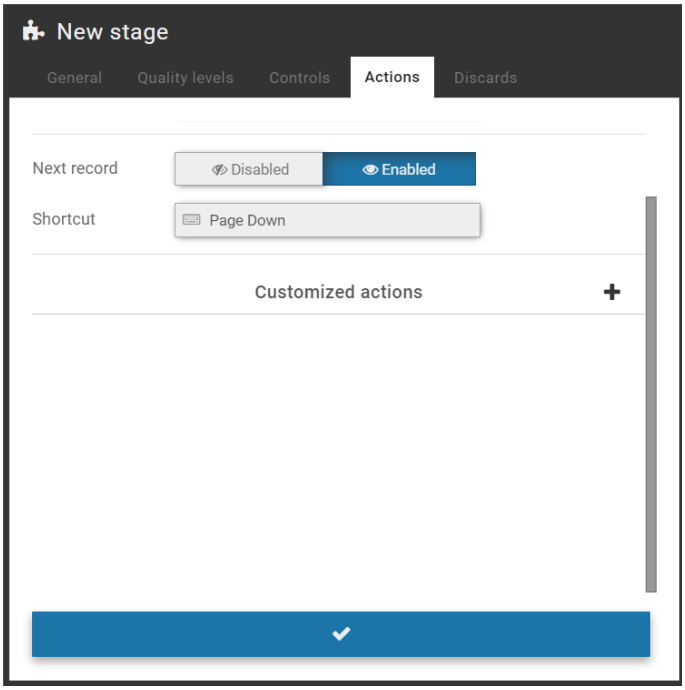
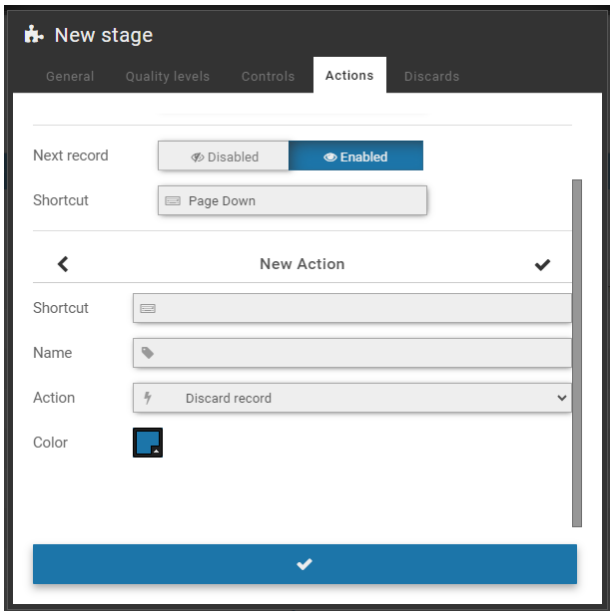
NEVADA records and stores images of vehicles traveling through the lanes that have the system installed. It is often necessary to perform a screening and manual validation of the registration performed by the system, so that it is properly characterized as an infraction, or for it to be released and discarded.

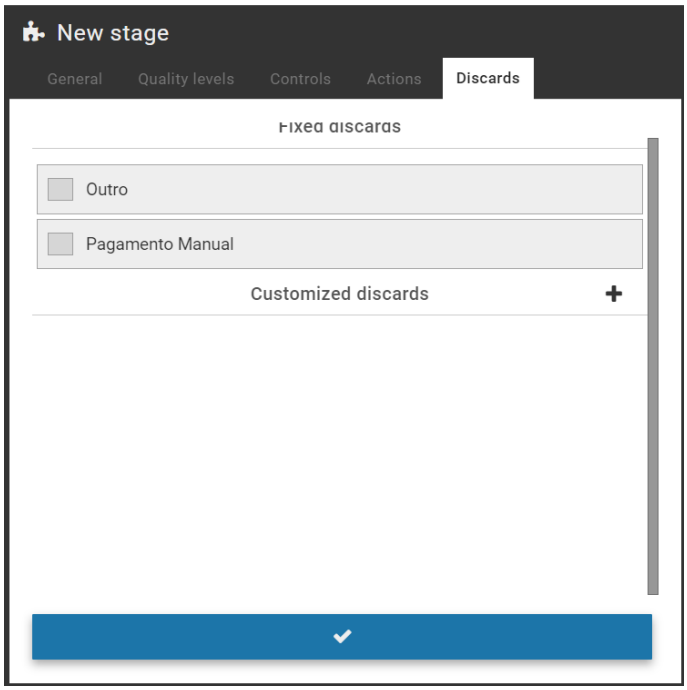
To perform the screening the process is divided into stages, and depending on manual or even automatic operations, the registry can go through one or more stages before having its cycle terminated within the system. The system allows the user to customize each stage, and the default system stages cannot be removed, just like the one that is configured as first. The factory standard stages: *Pré-Registro* (System), *Screening*, *Typing*, *Validation*, *Agent Validation*, *Infração* (System) and *Descartado* (System). New stages can be added and configured in the fields that are displayed by clicking *+New Stage*:

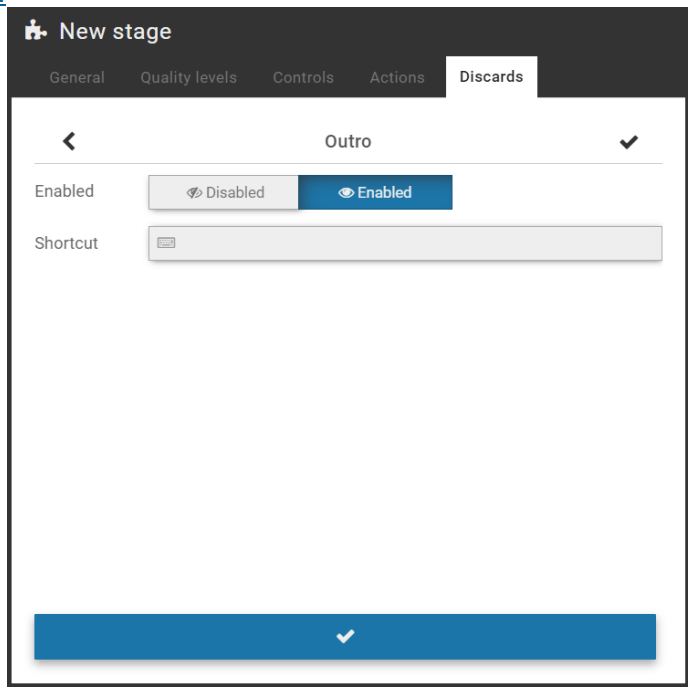
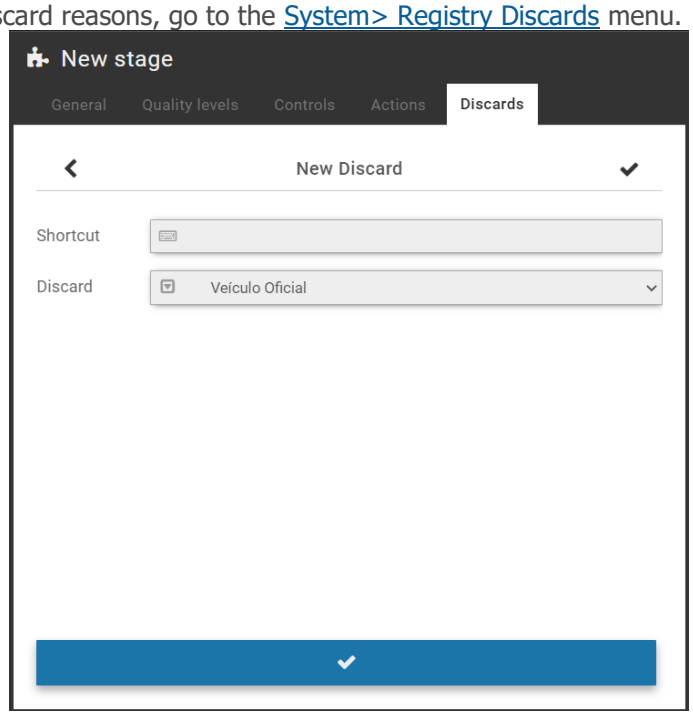
Field	Configuration
General Tab	 *Figure 41 - Screen of New Stage > General Tab*
Name	enter a stage ID
Description	enter a brief description that identifies the stage function in the sorting process
Stage of the system	select the *Yes* option, to be accessed in automatic sorting by robot users. By selecting the *No* option, the stage will be considered manual screening and the functionalities that will be available to the user must be customized by configuring theoptions available in the tabs. The manual sorting stage is available in the *Validation* menu after being customized: • *Quality Levels*; • *controls* that will be enabled in the validation interface; • the *actions* that will be performed, with their shortcuts; • the types of *Discards*.
First stage	When you create a new stage in the manual screening process and set it as the first stageby selecting *Yes*, it is for this stage that the records will be moved after they have been processed *All records that are received by NEVADA are initially entered into the database in the factory stage named "Pre-Registration"

Field	Configuration
Quality Levels Tab	 *Figure 42 - Setting Quality Levels for a Screening Stage*
Quality Levels	reference used by the system to characterize the status of the registry, considering the period that it is kept in the system, without being sent to the competent body. The deadline for issuing the infringement record varies according to the supervisory body, starting the count from the date of the infringement. The possible statuses of the registry are: 1. On time (editável); 2. In Attention (editável); 3. Critical (editável); 4. Overdue; 5. Infraction; 6. Unknown; 7. Released. On the *Validation* screen, during manual screening, the status of each record will be informed considering the formatted *Quality Levels* when entering the respective deadlines in days. You can only configure by stage when the use of *Global Quality Levels* is not enabled. To use these, it must be configured in *General Configurations*.

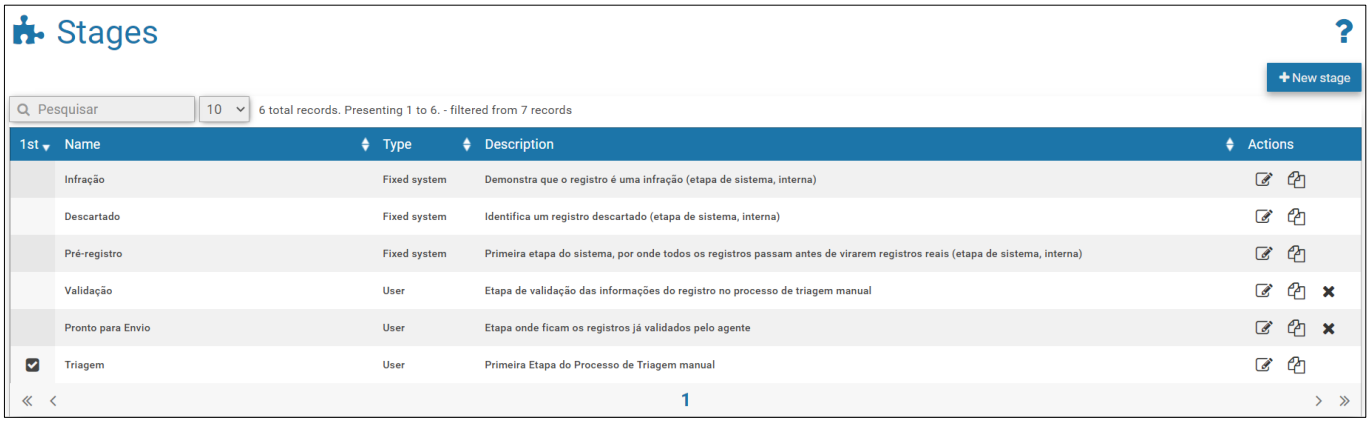
Field	Configuration
Controls Tab	 *Figure 43 - Configuration options of screening Controls* All enabled controls can be accessed on the screen of the sorting stage created or through the indicated keyboard shortcut. An example of displaying *Controls in* the validation screen interface is indicated in Screening Process.

Field	Configuration
Actions Tab	 *Figure 44 - Configuration Options for a Customized Action for the Screening Stage*
Previous Record	select whether the *Previous Record* button should be *enabled* or *disabled* on the sorting operation screen and indicate the respective keyboard shortcut to the action
Next Record	select whether the *Next Record* button should be *enabled* or *disabled* on the sorting operation screen and indicate the respective keyboard shortcut to the action
	 *Figure 45 - Options for Configuring a Custom Action for the Screening Stage*

Field	Configuration
Customized Actions	*Actions* can be customized and will be available to the user with authorized access to the screening process stage. To be able to perform an action on the screening screen, click to add *Customized Actions* and set up the *New Action* by typing a keyboard *Shortcut* to run, entering a *name*, and selecting the *color* that will appear in the interface. You can add the following actions: • *Discard record*; • *Mark record as violation*; • *Send record to stage*; • *Update TAG*.
Discards Tab	 *Figure 46 - Screening Stage Discards Configuration Options*

Field	Configuration
Fixed Discards	Before a record can be deleted during the screening stage, the reason for the deletion must be selected. In the *Discards* tab, those who will be admitted to the creation stage must be selected. Multiple discards can be chosen if configured in System>General Configurations.  *Figure 47 - Screening Stage Configuration Options of Fixed Discards*
Customized Discards	To add a discard to the stage screen, click *Customized Discards* and set up the *New Discard* by typing a shortcut to run and selecting which one will be enabled. To create new record discard reasons, go to the System> Registry Discards menu.  *Figure 48 - Stage configuration options of Customized Discards*

When accessing *Screening Stages* in the *System* menu, the ones that are registered for the screening process are either manual or automatic, with a brief description. For each stage you create, you can:



Action	Description
Edit	opens the screen to set up a new screening stage
Replicate	creates a new stage by copying the features and settings of the selected stage
Remove	removes from the system the registered stage

8.2.2. Record Discards

Discards are used in the screening processes in order to characterize in the system the reason for the disposal of a record. In the factory configuration are pre-registered and without possibility of exclusion the Discards *Other* and *Manual Payment*. However, you can create new ones by clicking *+New Discard*, with no quantity limit.

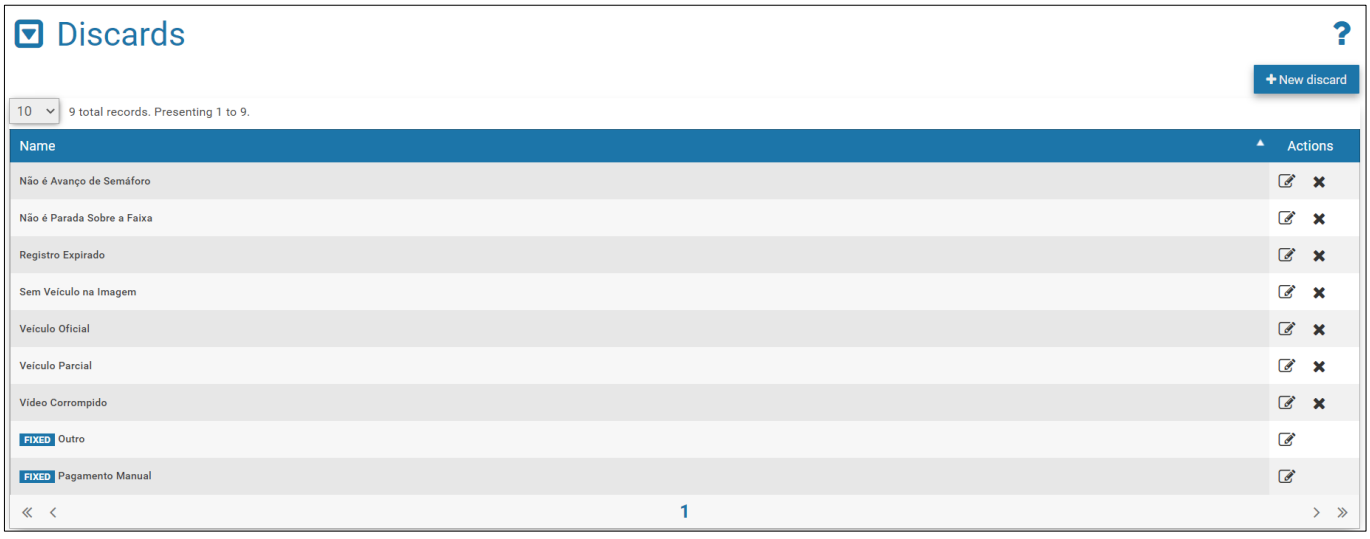


Figure 49 - Home screen in System>Record Discards

8.2.3. Exception List

In order for the system to delete the registrations of certain license plates exempt from payment, simply register it in the *Exception List*. Thus, the registration made for the boards registered in this list is automatically deleted.

To register a new card in the exception list, click + *Add License Plate* and fill in the fields:

Figure 50 - Configuration fields of a license plate in the Exception List

Field	Description
Active	select whether the plate registration is *Active* or *Inactive*
License Plate	type the license plate without spaces and without dashes
Comment	enter a comment to identify which vehicle it belongs to

For each card that you enter as an exception, you can *Edit* or *Remove* it from the list.

Figure 51 - Home screen in System>Exception List

8.2.4. Violations

Violations of the Brazilian Traffic Code are pre-registered from a factory in NEVADA and can be kept *Active* or *Inactive*. When you inactivate a violation, it will not be displayed in the screening and NEVADA will not be able to detect and perform the registration. You can change only the existing description by going to the *Edit* option.

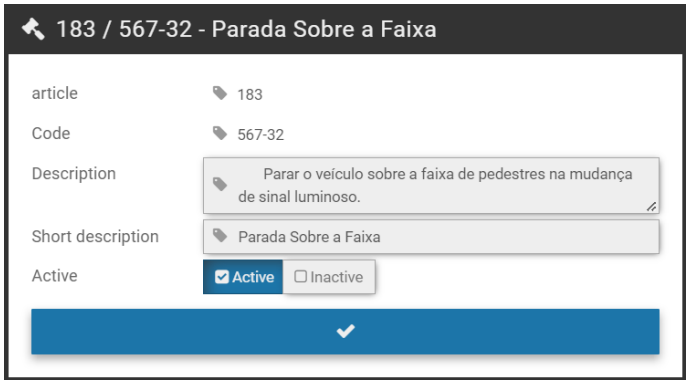


Figure 52 - Editing screen for a Violation

When accessing, all factory-registered and approved violations are listed with the description displayed and the *Edit* option available in the column on the right:

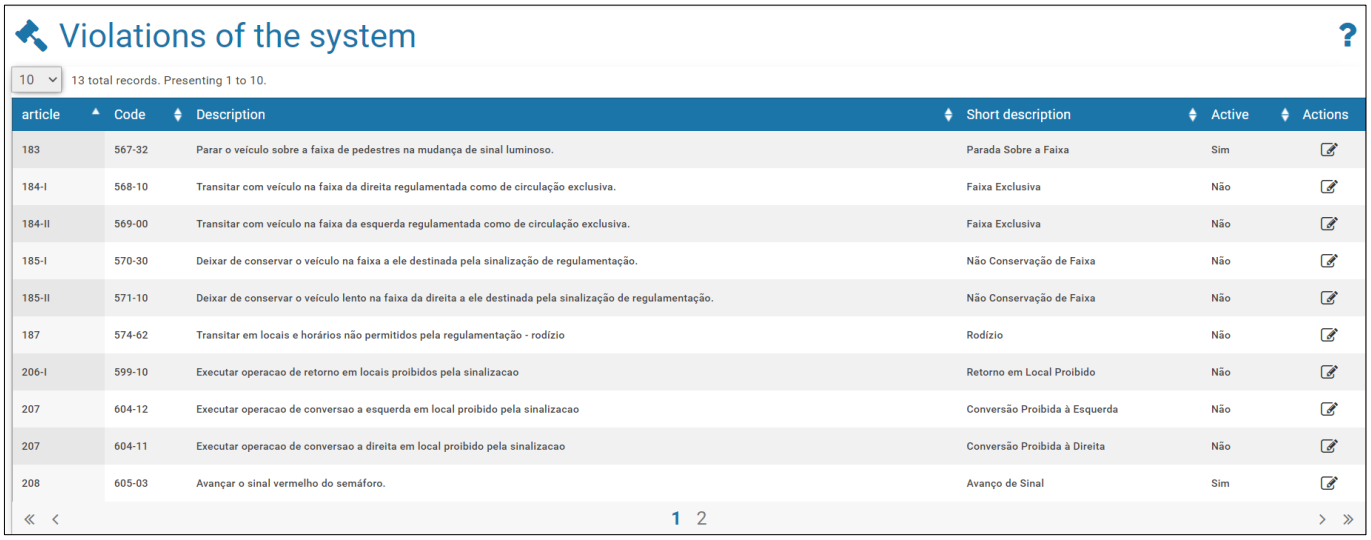
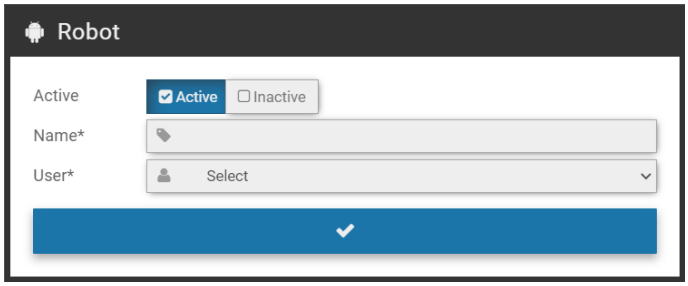


Figure 53 - Home screen in System>Violations

8.2.5. Automatic Screening

The NEVADA solution has a module to automatically sort records and can be fully customized. In this module, screening execution units called Robots are created. On the home screen you can +Add Robot by filling in the fields:

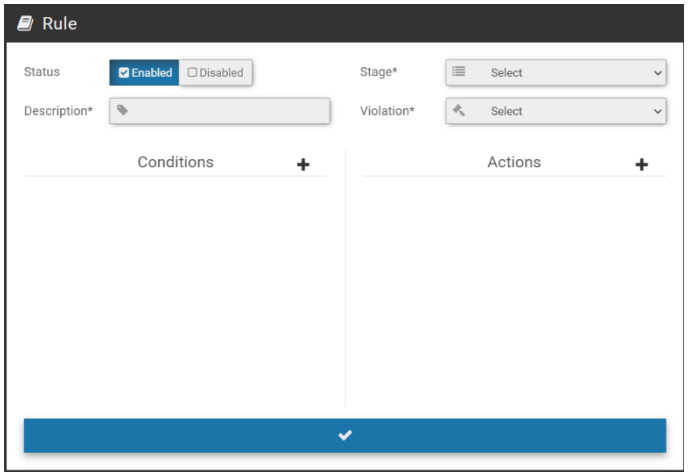
Figure 54 - Home screen in System>Automatic Screening

Field	Configuration
	 *Figure 55 - Creation of the Robot for Automatic Screening*
Active	make the robot *Active* or *Inactive*
Name	create a name for the robot
User	mandatorily, the actions of the robot must be linked to a user of type *Bot*, and this must be linked to a registered location, in order to perform the screening for the records of the linked locale

When selecting one of the created robots from the list on the left, the list of added rules is displayed, making it possible to Add Rule, Apply Rule or Order Rules. After all rules have been added, the robot will be able to operate by:

1. Order Rules, which will be ordered sequentially by stage and violation;
2. Apply Rules which will be executed by the robot.

Clicking *+Add Rule* fields will be displayed to set up a new rule for automatic screening:

Field	Configuration
	 *Figure 56 - Screen Add Rule*
Status	select whether the rule is *Enabled* or *Disabled*
Description	insert, mandatorily, a description with the characteristic of the rule that the robot will execute
Stage	link the rule to a screening stage by selecting between the registered ones in the system

Field	Configuration
Violation	bind the rule to a violation of the law by selecting from the registered in the system
Conditions	add the conditions for the robot to perform the rule action. For the *Bot to* perform an action, there does not have to be a condition. Just as several *Conditions* can be selected for the robot to operate some action, such as: • User is logged; • User is not logged; • License Plate is empty; • License Plate is not empty; • License Plate according to standard; • TAG status; • Registration expired; • Record discarded; • Record not discarded; • Removed Files; • Unremoved Files.
Actions	add the actions that will be performed by the robot, clicking +. Among the *Actions* that the robot can operate are: • Send Record to stage; • Discard Record; • Remove Files from Record; • Update Record's TAG • Clone the infraction: A single record can contain more than one infraction; therefore, cloning allows you to duplicate the record to send two infractions (functionality enabled through a specific license)

After creating each rule, it is still possible to Edit, Remove, Disable or Replicate each one by clicking on the corresponding icon in the column to the right of the list:

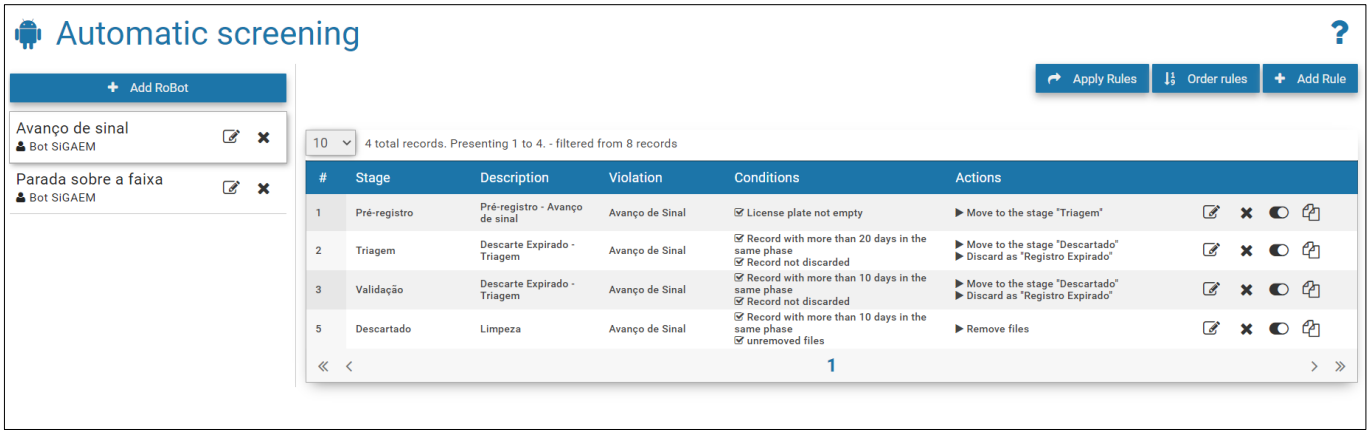
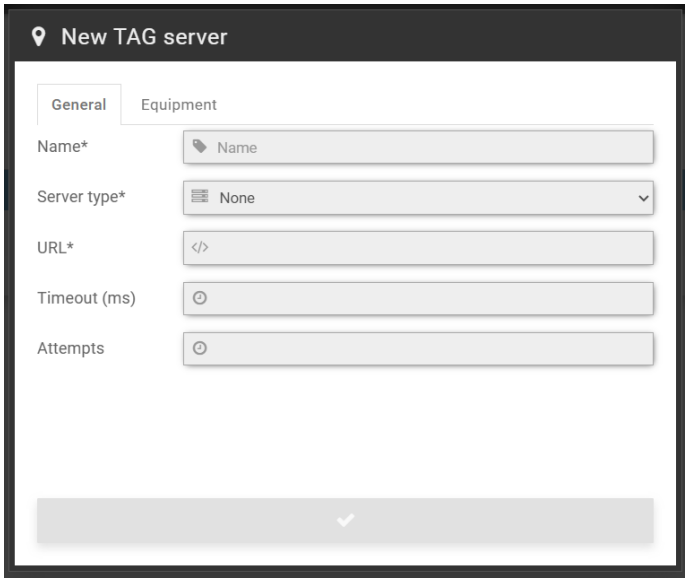
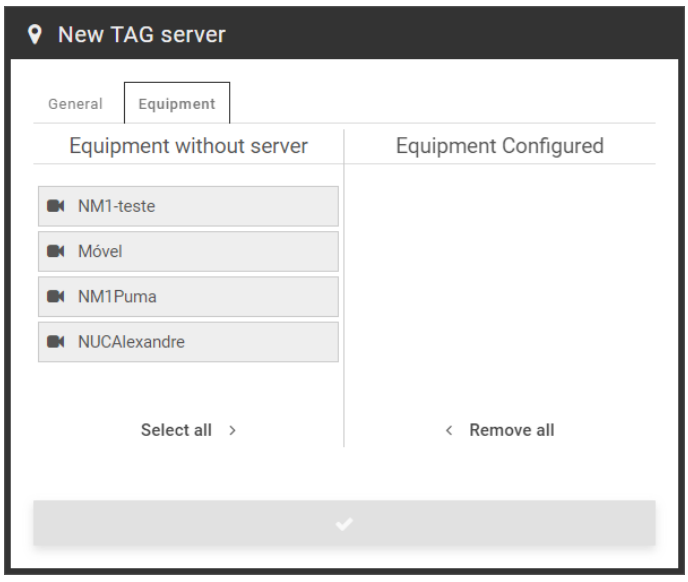


Figure 57 - List of Rules created for a robot in Automatic Triage

8.2.6. TAG Servers

To collect information from TAGs regarding automatic collection systems, operated on AVI-type toll lanes, it is necessary to register the TAG server on the system. Each TAG server can have a different operation from the other, so the configuration is adaptable for each type of collection system, according to the existing infrastructure.

To set up a new TAG server, click *+New Server* and enter the data:

Field	Configuration
	 *Figure 58 - Screen of New TAG Server> General Tab*
Name	insert, mandatorily, an ID to create a server
Server type	by default, the selected TAG servers are those supported by the NEVADA System. When selecting, the fields to configure will be made available according to the type of server
URL	enter the http address for access to the server
Timeout (ms)	server response timeout, in milliseconds
Tentativas	maximum number of retries for each TAG query
Equipment Tab	 *Figure 59 - Screen of New TAG Server > Equipment Tab*
Equipment without server	list of equipment available for collecting information from the TAG server

Field	Configuration
Equipment Configured	when moving to this column, the track equipment will collect the information from the registered TAG server

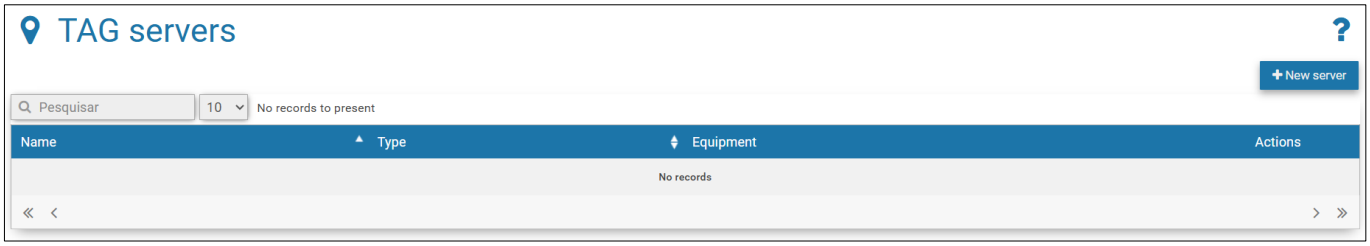


Figure 60 - Home screen in System>TAG servers

8.2.7. Infraction Sending Server

Registration of the data of the server of the inspection body responsible for fine the driver / owner of the vehicle, sending the toll evasion violations registered by NEVADA. It allows the registration of several supervisory bodies in the same system, favoring concessionaires with greater scope of operation so that they can operate properly.

To add the server that will receive the infractions, click *+New Supervisory Organ* and configure the operation by filling in the fields:

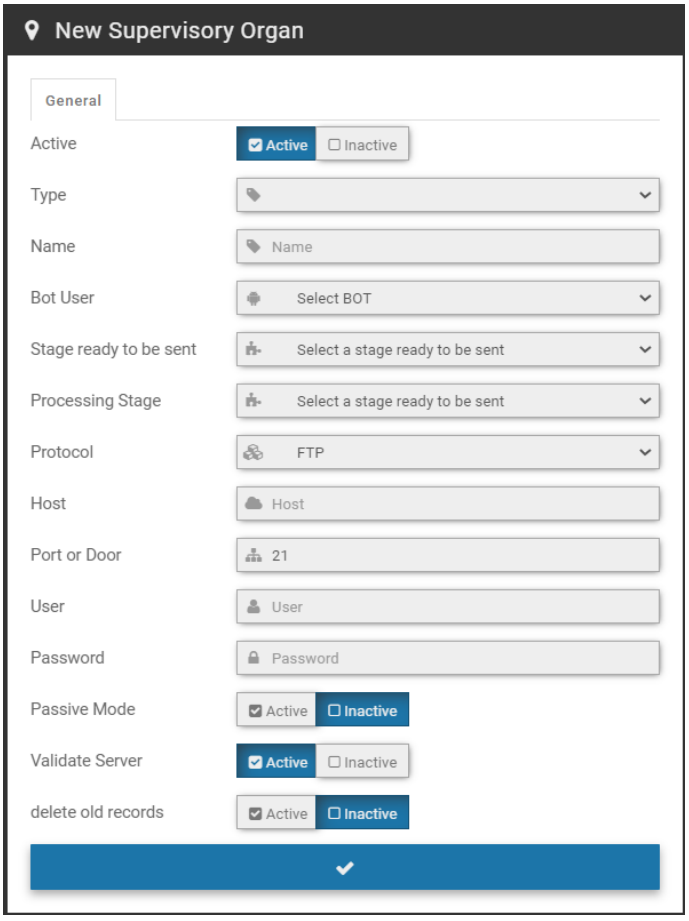


Figure 61 - Supervisory Organ server configuration options

Field	Configuration
Active	select whether the registered server is *Active* or *Inactive*
Type	select the type of Authorizing Body from those available and configure the server-specific fields in the available tab: • ANTT • CELEPAR GIT • CELEPAR PIR • DER SP • mGat • SERPRO • SISCOM • SMT - Bahia • SIT • MonitoraSP • DER-MG • Customizable
Name	enter an ID for the server
Bot User	select the Bot user responsible for the operation of sending the infringement
Stage ready to be sent	select which stage in the screening process considers the record to be ready to be sent to the server for performance
Processing Stage	select which stage of the screening process will be considered as prior to the process of sending the records to the server of the Actuator Agency. All records characterized as infraction are moved by NEVADA to this transient stage before submission, which can be accessed for verification of submission or resubmission of records.
Protocol	protocol used for transferring files, being possible to select between: FTP, FTPS, SFTP or HTTP
Host	enter the name of the server host
Port	enter the port number used by the server
User, Password	enter the data used by the user for authentication on the server
Max. Simultaneous Connections	enter the maximum number of simultaneous connections that the FTP server allows
Passive Mode	activate or inactivate the ftp protocol operation mode
Validate Server	enable or inactivate validation of the FTP server that receives the files. Turn off when proxy is active.
Delete old records	select whether the oldest records should be deleted after being sent to the Actuator Body, opting for *Active* or *Inactive*. By enabling this option, it assists in freeing up disk space for new records. To set up how they are deleted, fill in the fields: • *Older than (days)*: enter how many days the records will be kept archived untilthey are sent to the Actuator Agency • *Base directory*: enter the storage location of the records • *Frequency (hours)*: Set the frequency that will occur the shipment to the Actuator Body

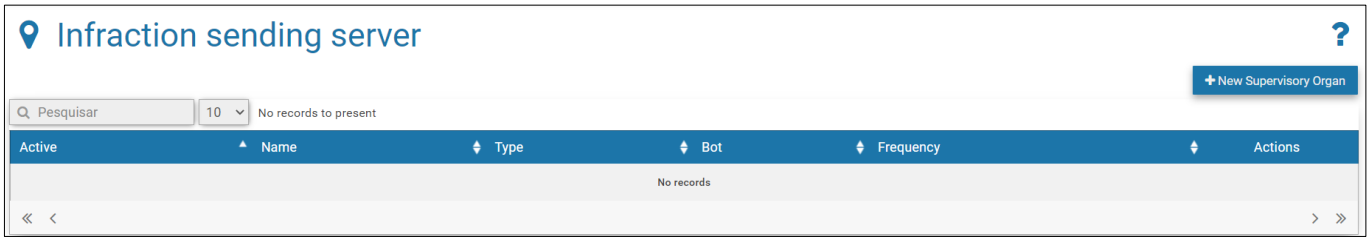


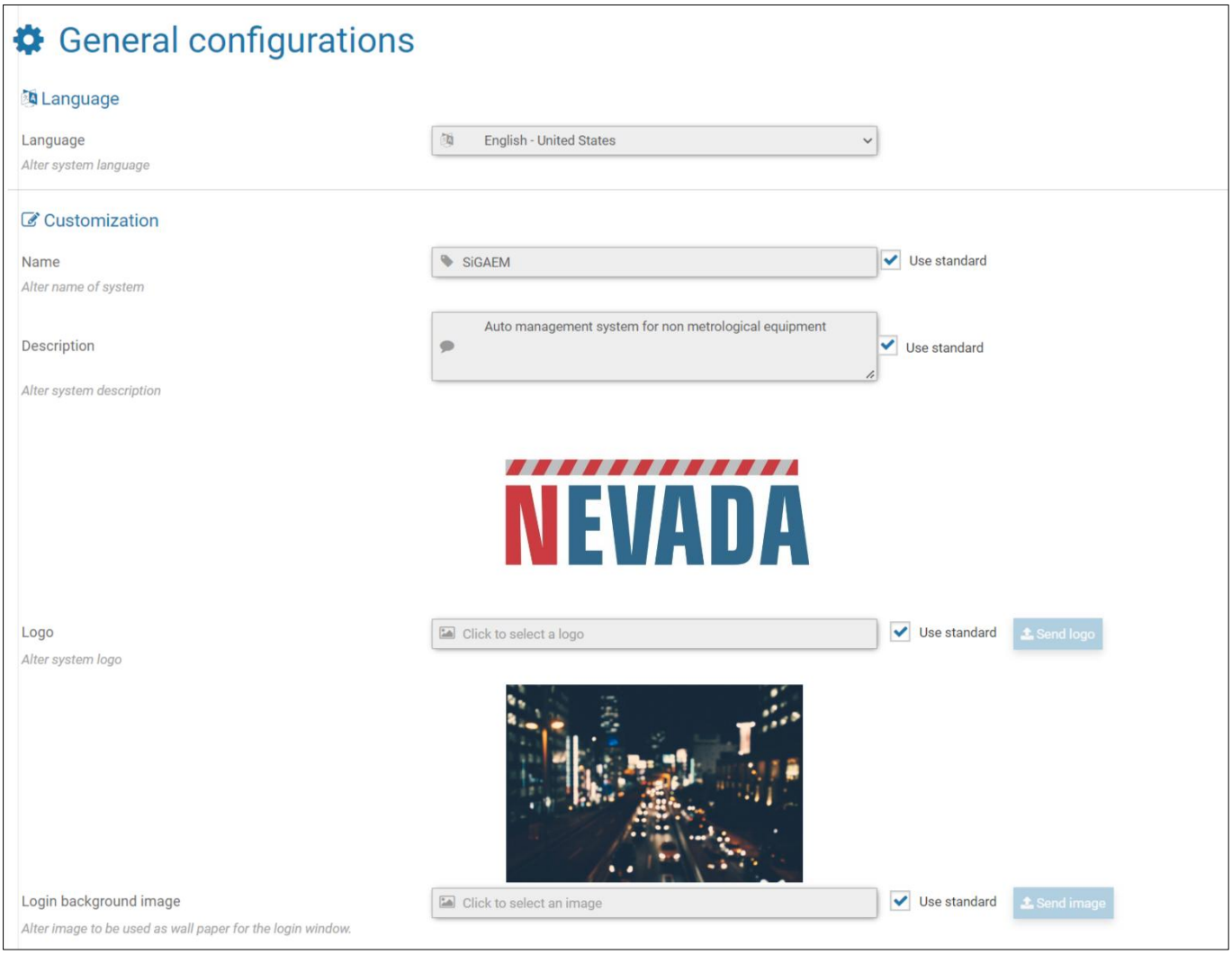
Figure 62 - Initial Screen in System>Infraction Sending Server

8.3. Configurations

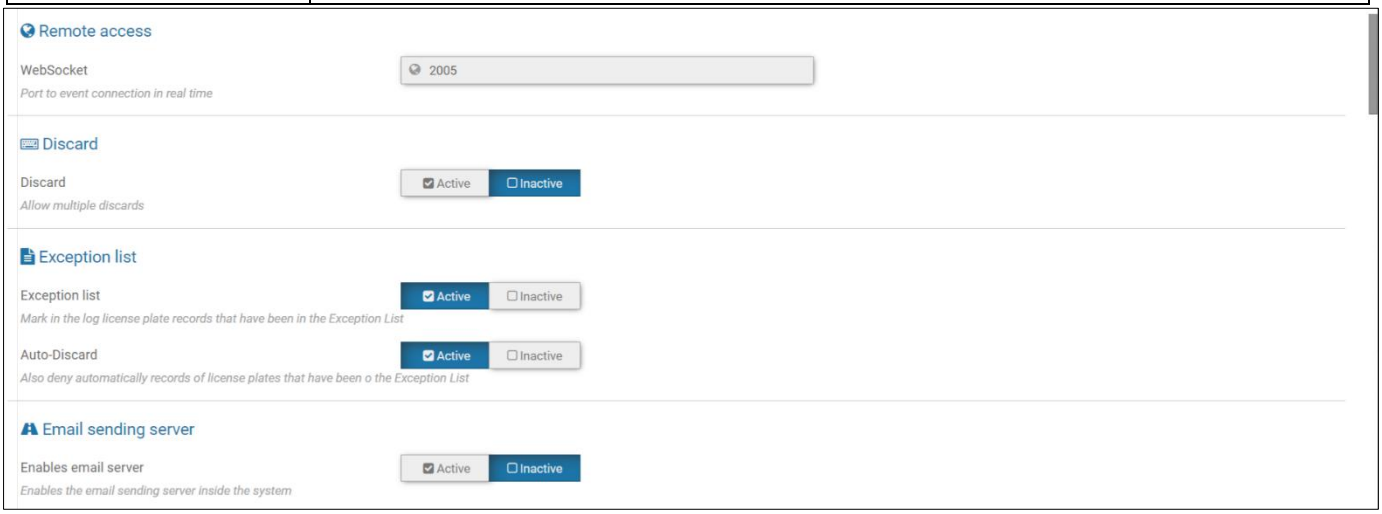
Set of system settings, which determine the overall operation and customization of specific features.

8.3.1. General Configurations

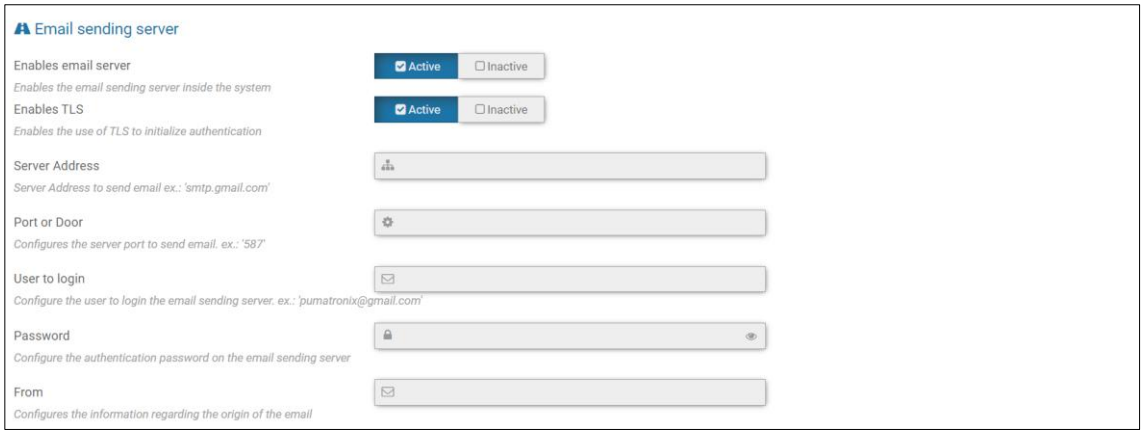
For system customization and activation of certain features, access the fields available in *General Configurations* and set up as directed. Any changes must be applied for it to go live by clicking the button at the end of the page. When applying, NEVADA will be updated.

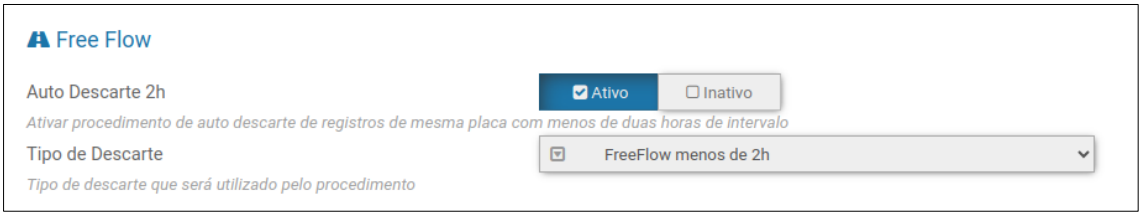


Field	Configuration
Language	select the display language of the interface among the available ones: Spanish, English or Portuguese
Customization	• *Name*: Registers the system name that will be displayed on the home screen,or the default name can be selected • *Description*: Register the description of the system that is on the home screen,or the default description can be selected • *Logo*: the default can be used, or a custom logo can be selected by sending theimage file • *Login Background Image*: Customizing the image displayed as a background in the system opening, which can be the default or sent the desired image file



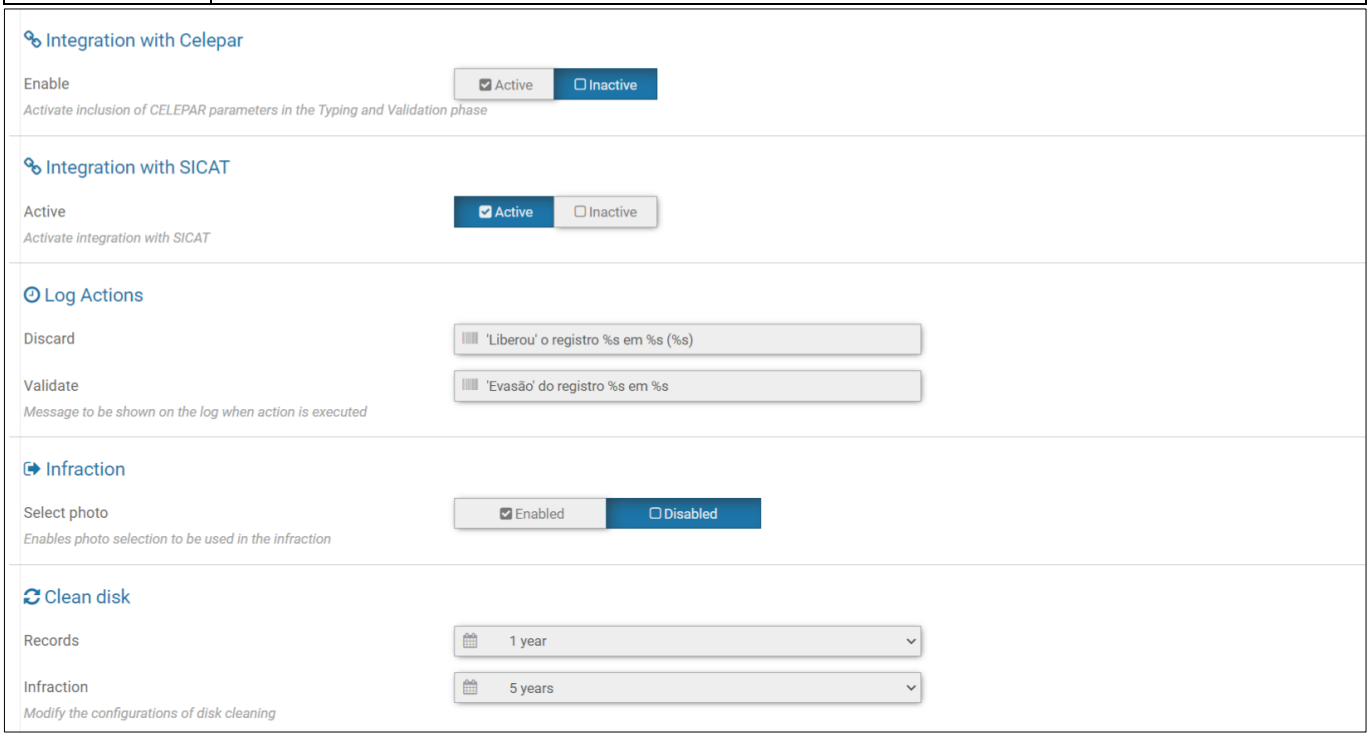
Field	Configuration
Remote Access	place to enter the communication port that sends the events in real time, and updates the system log data displayed in the *Status Bar* and the *Log/Registers* side tab
Discard	when activating you can select more than one drop reason for the same record during thesorting process
Exception list	the system discards the records for the cards inserted in System>Exception List only if this option is active. As well as the *Auto Discard* function, where it sends the record of the cards listed in the exceptions list for disposal. If inactive, the exception list is ignored

Field	Configuration
Email Sending Server	when you activate, the fields will be made available to set up sending notifications to a user's email. The data of the E-Mail Server Address and Port must be entered, in additionto the user and password. To improve identification, a sender name can be created by inserting it into the *From* field: 



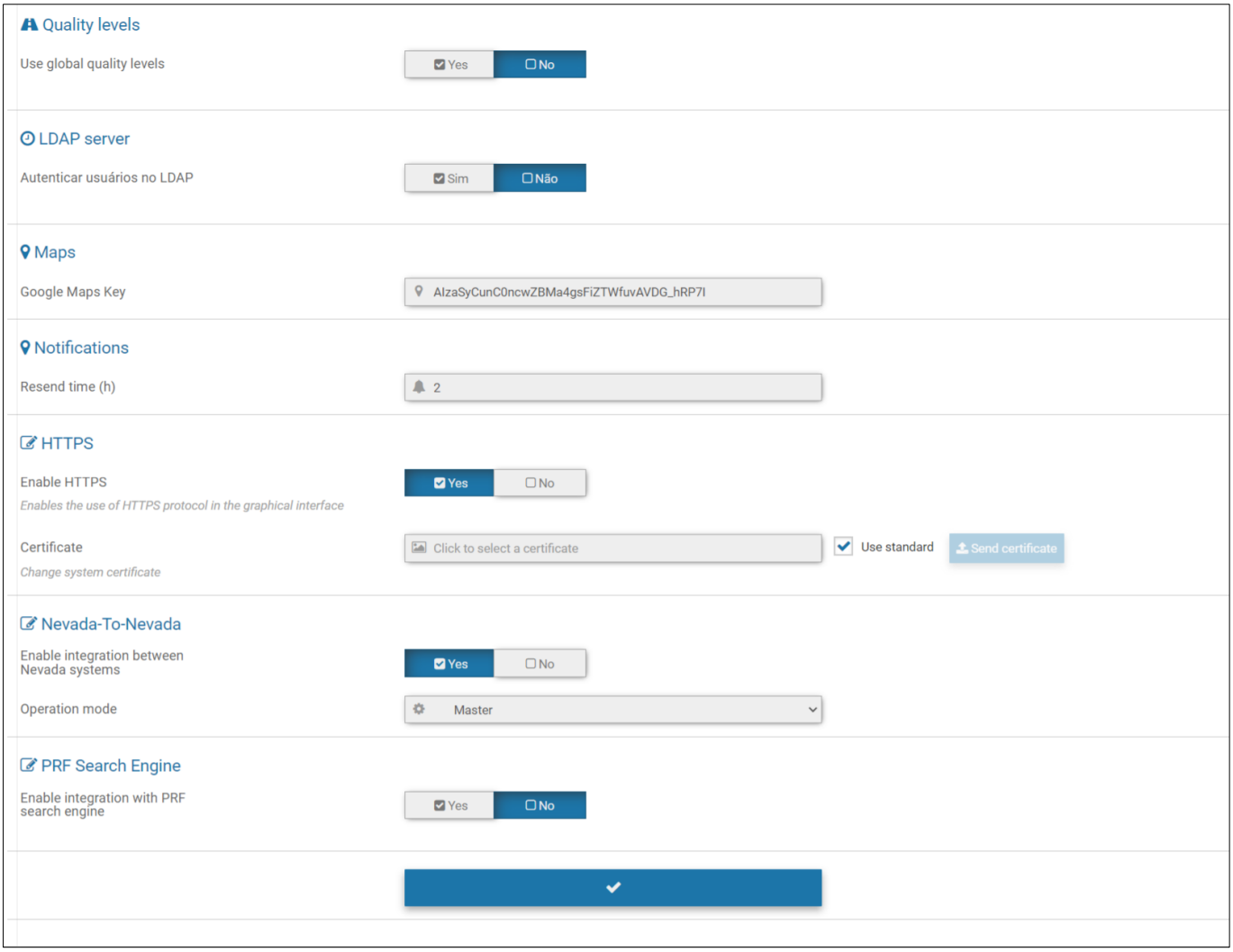
Field	Configuration
Exclusive lane	when the system is used for the recording of other non-metrological violations, such as 'transiting with vehicle in the exclusive lane', the settings are enabled in this field
PDF	pdf file template that will be used for download by the supervisory body in *Records,* being customized for each body

Field	Configuration
Toll evasion	the options available in the screening that allow to characterize toll evasion can beactivated: • *TAG*: To use tag features, this option must be enabled. • *Check Current TAG Status:* Current status data can be checked/updated at thetime of validation screening • *Double check for Mercosur*: when activating, the plates that are detected inthe Mercosur format and that are located in the database, are re-consulted to verify that the TAG is for the old format of the same card
Record Valid	additional manual validation option to confirm the registration made by NEVADA with the registration of the collection system used in the concessionaire. It is not characterized as a screening stage in the
Free Flow	automatic Dismissal of Infractions *FreeFlow*: • *Auto Discard 2h*: when activated, discards records of the same license plate with less than two hours interval; • *Discard Type*: select from the options: ○ FreeFlow less than 2h;



Field	Configuration
Integration with Celepar	when activating, the system will use CELEPAR parameters to generate the infractions
Integration with SICAT	to use SICAT data, this integration must be active. Server data must be configured under System >SICAT Integration. This option is only available for configuration when functionality is active on the system and if the user's profile has permission to access this screen.
Log Actions	allows you to customize the information of the disposal and validation actions performed,to be presented in *System Log*

Field	Configuration
Infraction	can be selected which of the captured photos will be sent in the infraction, enabling the option to *Select Photo*
Clean disk	period in which the registration remains on the server, which must be the period according to the requirement of the supervisory body



Field	Configuration
Quality levels	for them to be applied, the values of the global quality levels must be entered and selected *Yes*. The status of the record will be constituted in these values, and in the same way when you create a screening stage. When selected *No*, the record status considers the deadlines set by stage
LDAP server	user authentication server used by the concessionaire and that can be accessed for validation of the user's login in the NEVADA system. By selecting *Yes* enter the URL and path on the network to perform authentication
Maps	to use Google Maps geolocation services, the user must enter the Maps API key, and the map for interaction will be visible in *Reports>Evaders*
Notifications	notifications visible in the notification panel may be resubmitted within the period set outin the

Field	Configuration
HTTPS	when enabling the use of the HTTPS protocol in the graphical interface, the default system certificate must be changed
NEVADA-To-NEVADA	The integration between NEVADA systems allows data from multiple-lane records to be sent to a NEVADA, defined as *Master.* In general, all records validated in NEVADA *Slave* are submitted to Nevada *Master*. Contact Pumatronix Technical Support for more configuration details and access specific Application Notes for integration between NEVADA systems. • *PRF Search Engine:* available when Operation Mode in this integration is set to *Master*. Access data (*URL* and *Token)* must be configured by Technical Support.

8.3.2. Date and Time of the System

Sets the date and time used by the system to be used in the records made.

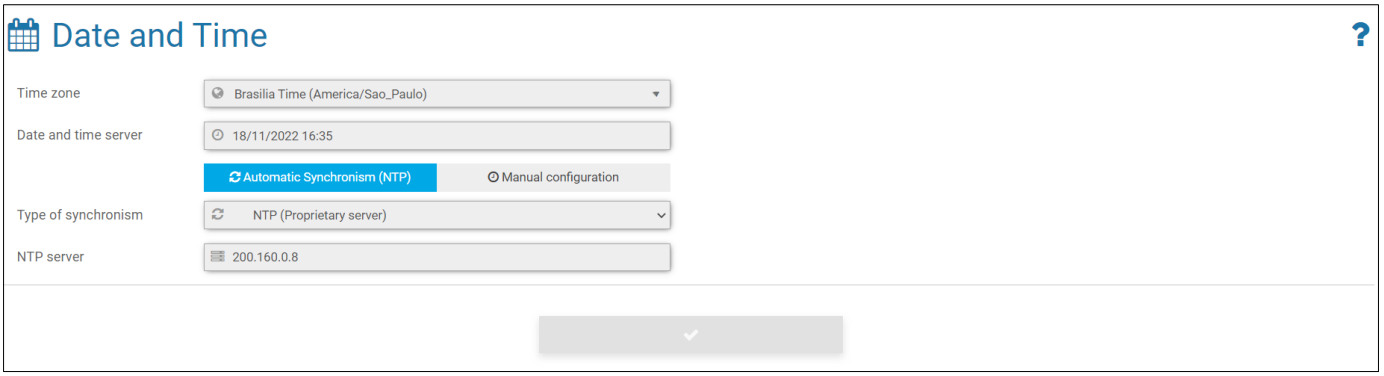
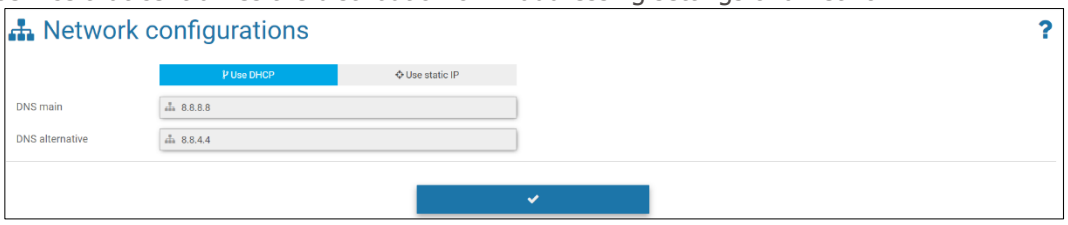
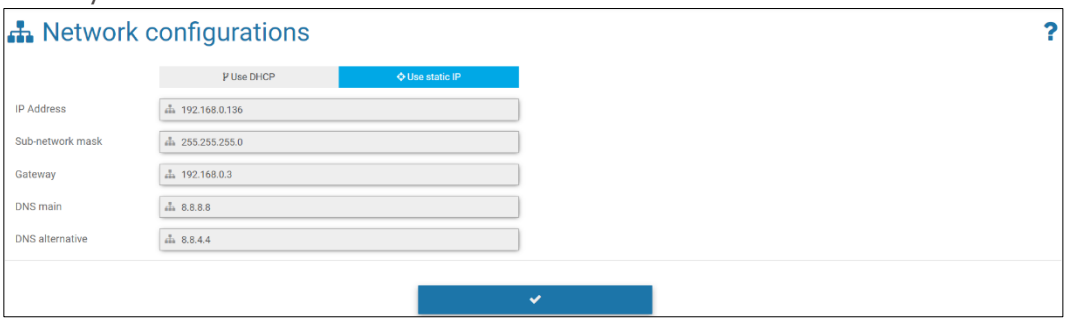


Figure 63 - Home screen in System>Date and Time of the System

Field	Configuration
Time zone	select the time zone in which the system is installed
Date and time server	displays the time in current use by NEVADA
Automatic Synchronism (NTP) option	
Type of synchronism	the default NTP server can be selected to receive the date and time data for the system, or some local NTP server
NTP server	enter the address of the owner NTP
Manual configuration option	
Date, Hour	enter the data manually

8.3.3. Network Configurations

Place for inserting the data network configurations in which the system will be operated, which can use *DHCP*or *Static IP* protocols. The fields must be filled in with the information requested to configure.

Field	Configuration
Use DHCP	service that centralizes the distribution of IP addressing settings of a network 
Use Static IP	manually enter the NETWORK IP address: 

8.3.4. SICAT Integration

SICAT is the *Integrated System of Control and Collection of Fees* that can be integrated with the NEVADA system. When performing the Processing of the OCR, the system connects to SICAT to search the data of the TAG associated with the license plate, which returns the payment information or not of the toll rate.

For proper functioning of this integration, it is necessary to associate a user of type *Bot* that represents the accesses to SICAT, as well as the disposal that will be performed automatically for the records with the identified payment.

SICAT web services: For NEVADA to access the SICAT database correctly, the path on the SICAT server must be indicated to obtain SICAT settings.

NEVADA web services: Similarly, in order for data recorded by NEVADA to be saved to the network, the path on the SICAT server must be indicated to save NEVADA settings.

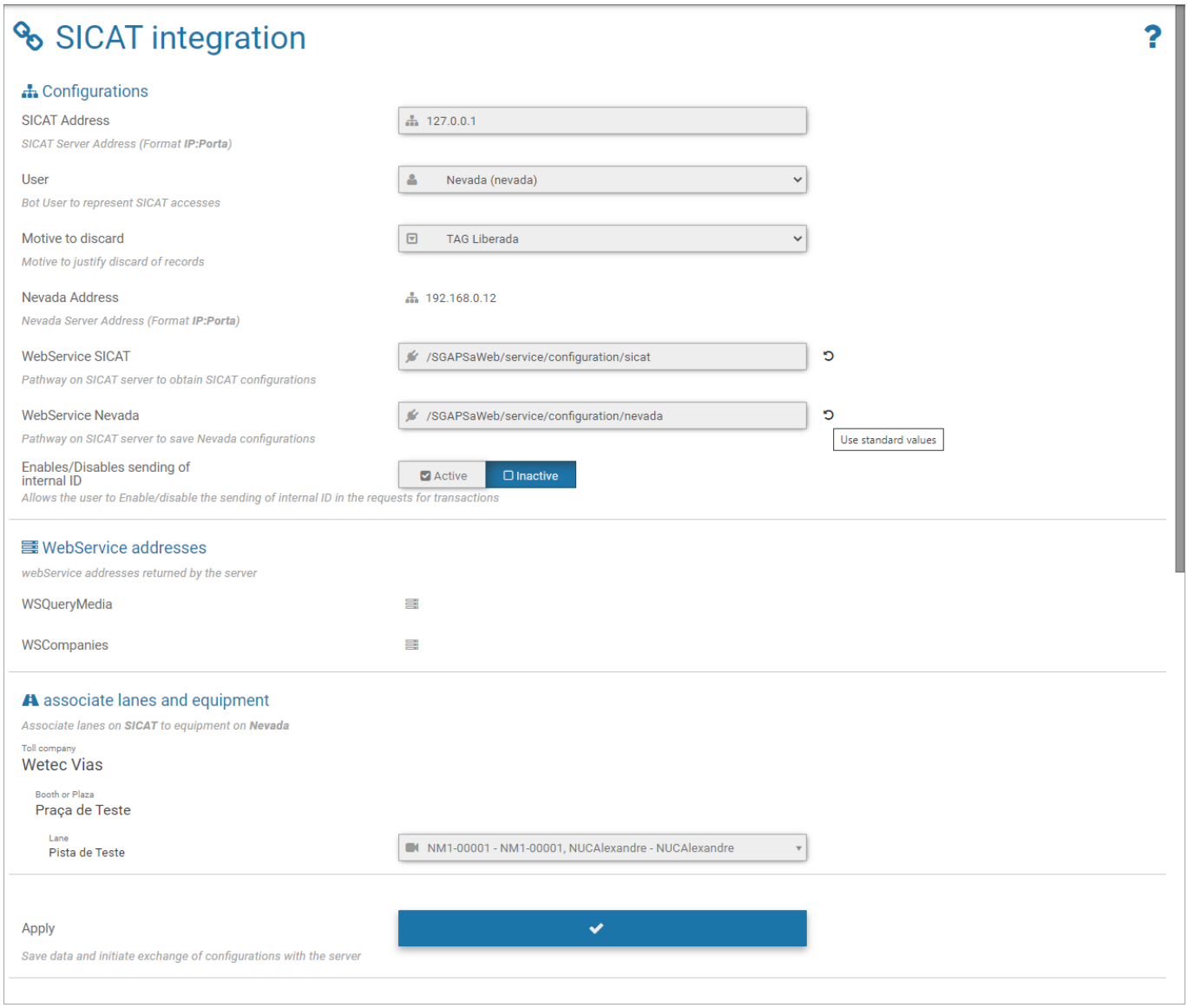


Figure 64 - Configurations available in System>SICAT Integration

8.3.5. Notifications

The list of notifications that can be displayed by NEVADA is available in the *System > Notifications*. The factory preconfigured *Title* can be edited with new text, and notification *Level* lets you set whether it's *Information*, *Alert*, or *Error*. In some notifications you can adjust trigger values. To disable, the check box in the left column must be cleared.

Adjustments are saved and applied by clicking *Apply Configurations*.

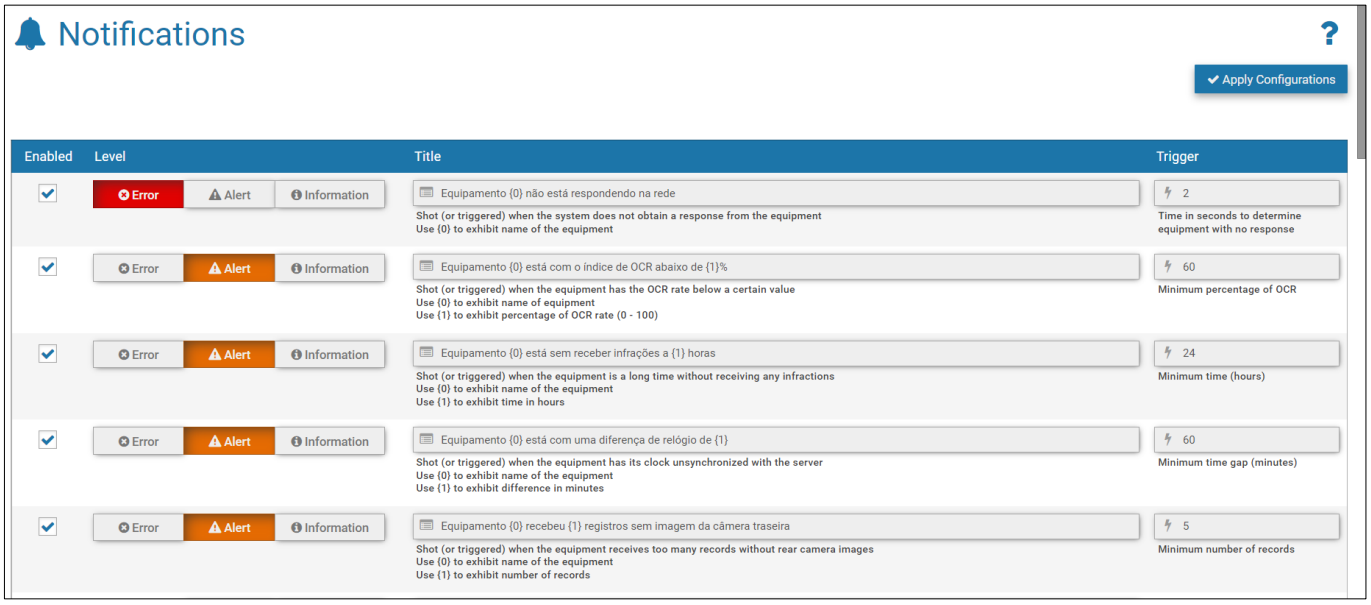


Figure 65 - Screen when accessing System >Notifications menu

8.4. System Maintenance

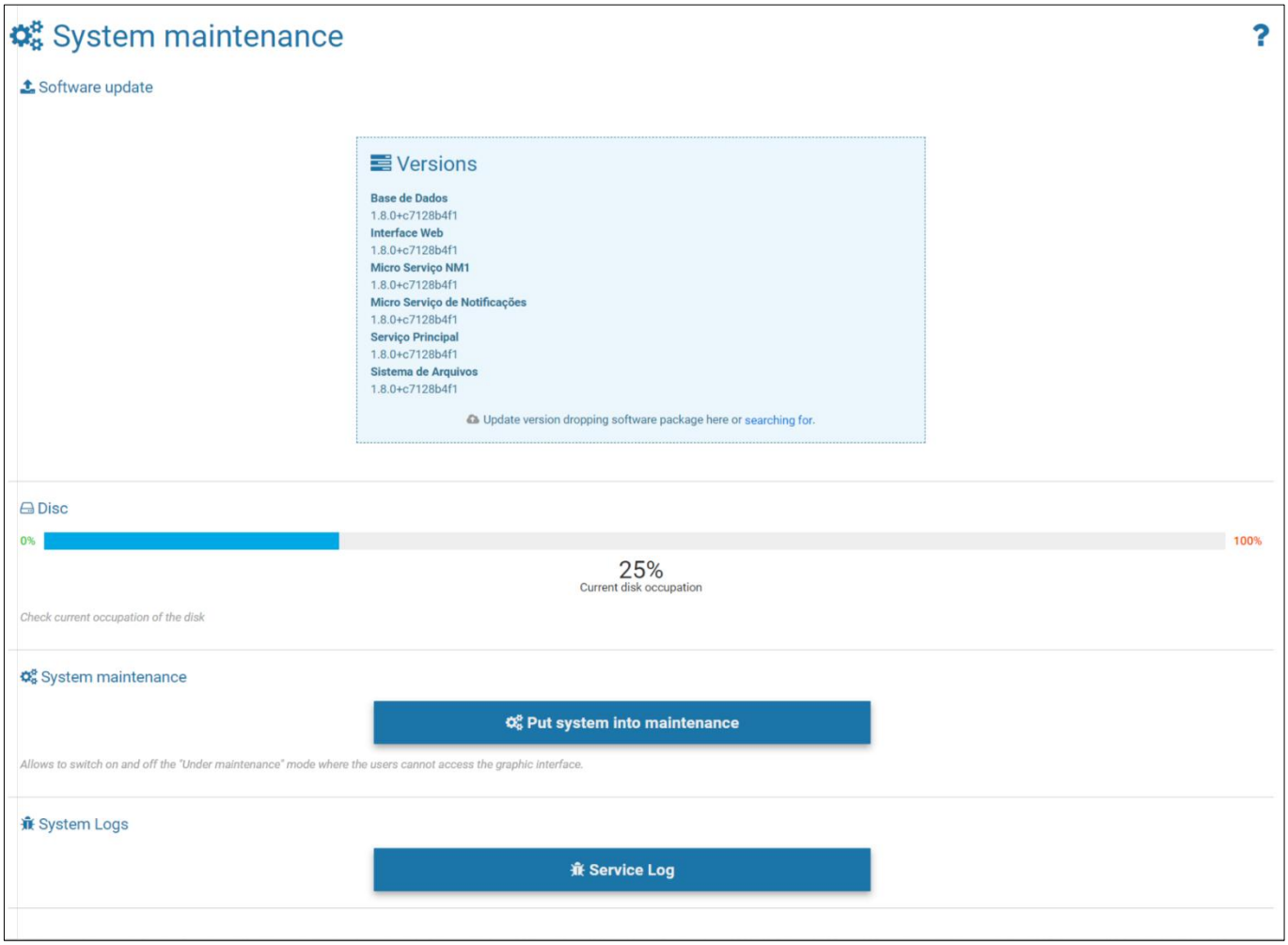
8.4.1. License

Display of license information in use, with the number of licensed equipment and the *Import License File* option if the amount of equipment used is increased.

Figure 66 - Screen displayed when accessing System>License

8.4.2. System Maintenance

Location for updating software packages, with information on disk occupancy and system maintenance options:



Field	Configuration
Disc	displays the percentage of current disk occupancy
System maintenance	for updating a software package, it is recommended to *Put System into Maintenance* so that all access es and changes to the system are blocked. Clicking again returns normal mode of use
System Logs	when assistance is required, information about the actions taken on the system can be downloaded to be sent to Pumatronix Technical Support
Backup of database	performs a backup of the database;
Restore of database	the database can be restored to a backup point performed, but all data will be erased from memory;
Reset Factory default	settings are reset to the factory default, but all data will be erased from memory;
Reinitialize server	use this option when the system is not operating normally.

9. Image Adjustments for ITSCAM VIGIA+ Devices

Below are the values applied to the ITSCAM VIGIA+ in the *Front* and Rear positions of NEVADA, from Firmware 18.8 and available through the web interface, in the *Settings* menu options.

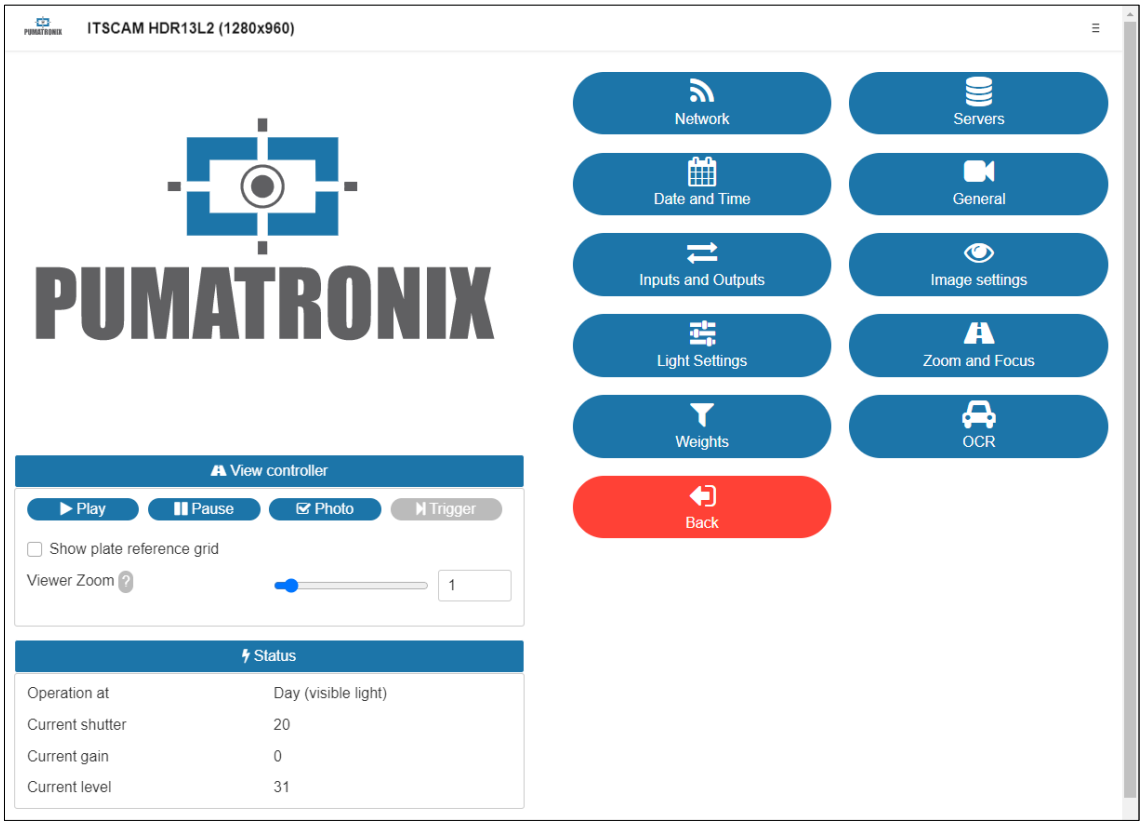


Figure 67 - Web interface screen of ITSCAM VIGIA+ device in Settings

Values applied in the *General* option:

Configuration	ITSCAM VIGIA+ with additional illuminator	ITSCAM VIGIA+ without additional illuminator
Auto Iris	Selected	Selected
Operation mode	Automatic	Automatic
Color photo in Night mode	Yes	Yes
Desired level	20	20
Day to Night Transition Threshold	50	50
Night to Day Transition Threshold	90	90
Visible transition threshold for IR	40	40
IR to Visible transition threshold	40	40

Values applied in the *Inputs* and *Outputs* option:

Configuration	ITSCAM VIGIA+ with additional illuminator	ITSCAM VIGIA+ without additional illuminator
Number of catches per Pulse	4	4
Respect illuminator rest time	Selected	Not selected
Outputs configured for	Trigger illuminator/flash	Control equipment
Flash mode	Automatic	Automatic

Configuration	ITSCAM VIGIA+ with additional illuminator	ITSCAM VIGIA+ without additional illuminator
Automatic flash with shooting	With infrared light	With infrared light
Flash power on the second shot	50%	7%

Values applied in the *Image Adjustment* option:

Configuration	ITSCAM VIGIA+ with additional illuminator	ITSCAM VIGIA+ without additional illuminator
Desired level	20	20
Gain working	Automatic	Automatic
Shutter working	Automatic	Automatic
Maximum Shutter (Resolution by 800x600)	30	30

Values applied in the *Lighting Adjustment* (*Day* Mode) option:

Configuration	ITSCAM VIGIA+ with additional illuminator	ITSCAM VIGIA+ without additional illuminator
Maximum gain/Overall gain	40	40
Gain 2nd Photo/ Gain plate in shadow	20	20
Gamma	Logarithmic	Logarithmic
Valor Gamma	110	110
Saturation	100	100
Brilliance	10	10
Contrast	100	110
White balance (Red, Green and Blue)	0	0

Values applied in the *Lighting Adjustmen*t (*Night* Mode) option:

Configuration	ITSCAM VIGIA+ with additional illuminator	ITSCAM VIGIA+ without additional illuminator
Maximum gain/ Reflective plate gain	10	40
Gain in 2nd Photo/Overall gain	40	1
Gamma	Logarithmic	Linear
Gamma value	150	0
Brilliance	3	3
Contrast	100	100

10. NEVADA API Documentation

NEVADA has a *Rest API* for integration with other applications, and the documentation for that API uses the *Open-Source* Swagger application. Because available operations may vary depending on the application version, the documentation must be accessed through the NEVADA system itself: http://<IP>/swagger-ui/index.html.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