PUMATRONIX

VIGIA-VL

HIGH PROCESSING, CONNECTIVITY AND EMBEDDED SOFTWARE

Integration

Pumatronix Equipamentos Eletrônicos Ltda.

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Change History

Date	Revision	Content updated
31/03/2023	1.0	Initial Edition
06/03/2024	2.0.0	Inclusion of new functionality for testing the VLIO board; Update design of virtual loop; Serial port configuration update; Update for firmware version 2.12.0
11/17/2025	2.1.0	Update for firmware version 2.13.0

Revision 2.1.0

Overview

This document aims to guide the developer in using the available operating interfaces that allow operating the VIGIA-VL solution. This system contributes to the reduction of traffic congestion, which minimizes vehicle emissions. Likewise, it increases safety by detecting the presence of vehicles through the use of Virtual Loop regions for the road, which can be monitored in real time.

Information on equipment installation can be consulted in the Installation and Maintenance Guide. When in doubt, contact Pumatronix technical support.

According to the software version applied to the accessed device, the web access interface is differentiated and some functions may only be available in the most current versions.

Summary

1. VIGIA-VL Web Interface

VIGIA-VL has a Web interface for real-time monitoring of images, settings and statistics.
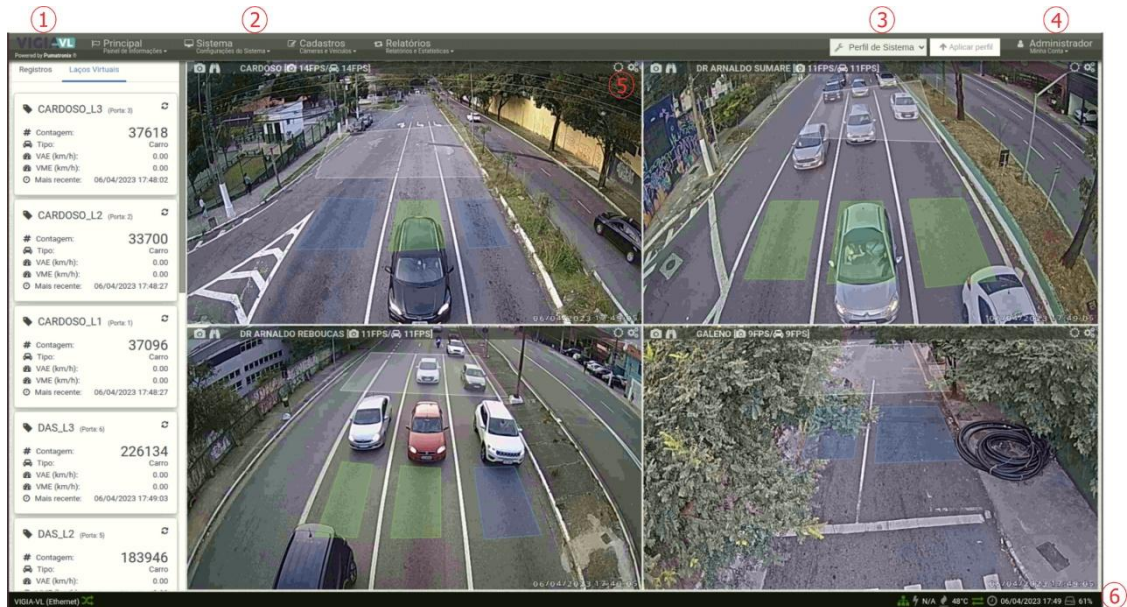

Figure 1 - Home Screen: 1) Access to the home page, 2) Menu Bar, 3) System profile, 4) User account data, Log out and Stop the device, 5) Camera status and control, 6) Status Bar

When accessing the interface, the initial screen presents the main information about the current situation of the system in the Status Bar located at the bottom of the page
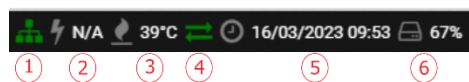

Figure 2 – Status Bar Information: 1) Network with internet access, 2) Electric voltage, 3) Temperature, 4) Real connected time, 5) Server date and time, 6) Free disk space

2. Main Menu

2.1. Dashboard

Through the Dashboard it is possible to graphically visualize and check the statistical information of the Vigia-VL server, such as resource consumption in real time.

2.1.1. System Status

In the system status, you can check the real-time situation of the system. The information displayed consists of: How long the system is running without interruptions (uptime*), current CPU consumption, current RAM memory consumption, and the amount of disk used. This information is periodically updated by the VIGIA-VL service.
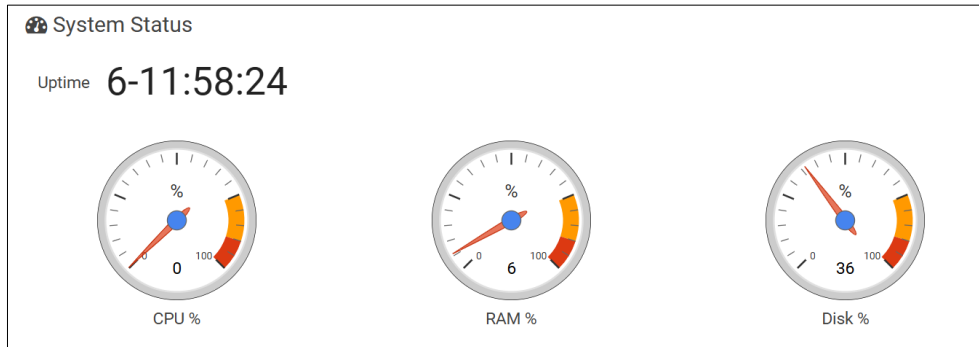
*The first number before the dash/hyphen (if present) indicates the number of days the system has been running without interruption.

2.1.2. History

The historical information is useful for analyzing the behavior of the VIGIA-VL during a given day (selected in the field). This assists in tasks such as hardware sizing.
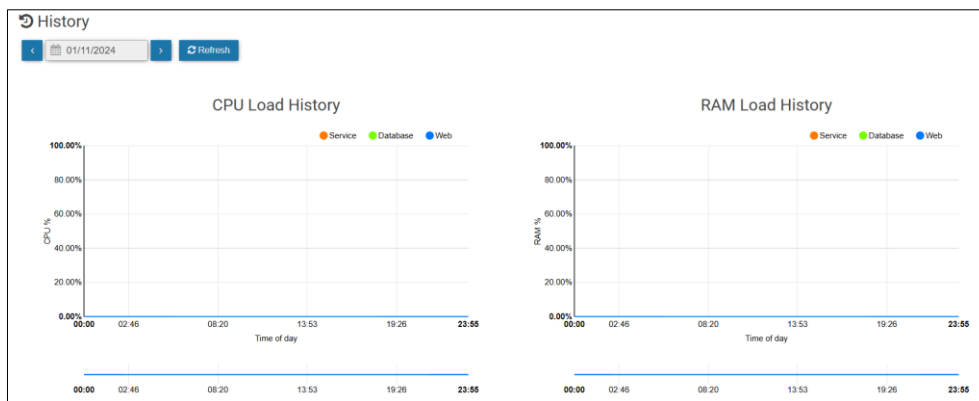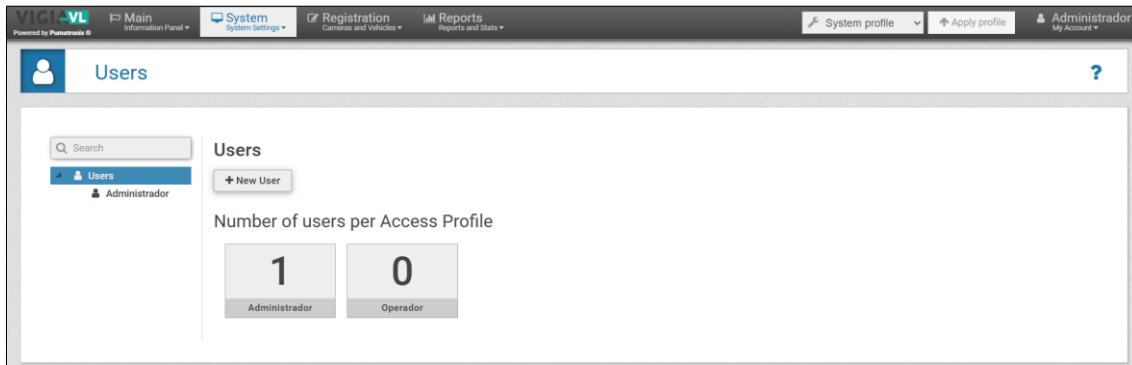

3. System Menu

In this menu are the general settings options available for the system, grouped into Access Control, System Settings and Maintenance, and will be covered in the sequence of this manual, by settings group.
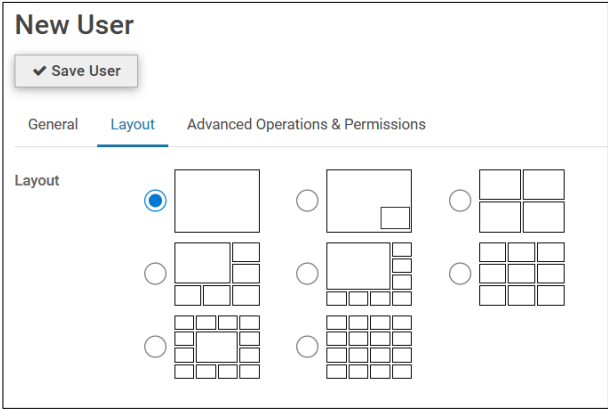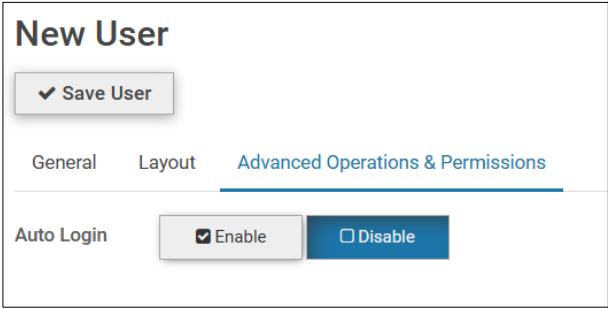
3.1. Access Control

To be able to control access to the system, users and access profiles must be registered.

3.1.1. Users

When registering a user, the data is specified, which access profile it corresponds to, whether it is an Administrator or Operator, and the settings and permissions. To add a new user, click on +New User and the screen displays the fields to be filled in, separated into three tabs:
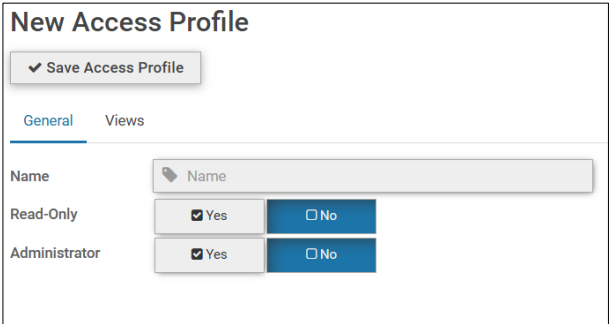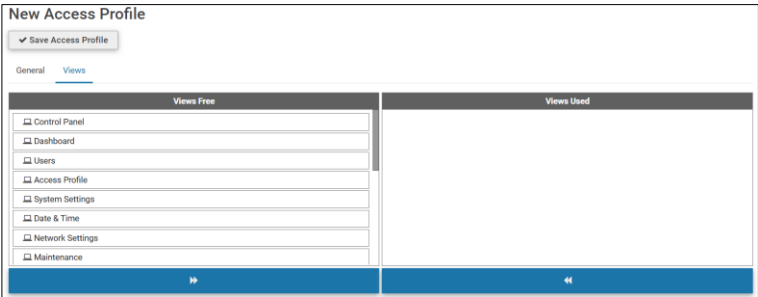
Field	Description
General Tab	
Name	name for identification and presentation of the user in the system
Active	enables or disables the user in the system
Login	used for system access, and must be unique
Password	used to access the system. To ensure the security and integrity of the system, there are some restrictions on the password: it must contain uppercase and lowercase letters, combined with a numeral and at least 1 special character that can be @, #, $ or %, and it must also contain at least 6 characters
Perfil de acesso	defines the screens the user will have access to

Field	Description
Layout Tab	Allows you to define the layout of the VIGIA-VL control panel.
Advanced Operations and Permissions Tab	
Auto Login	enables or disables automatic login for this user

3.1.2. Access Profiles

Access profiles are used to generate different levels of access and changes to the system for registered users, linking them to a profile that has been created.
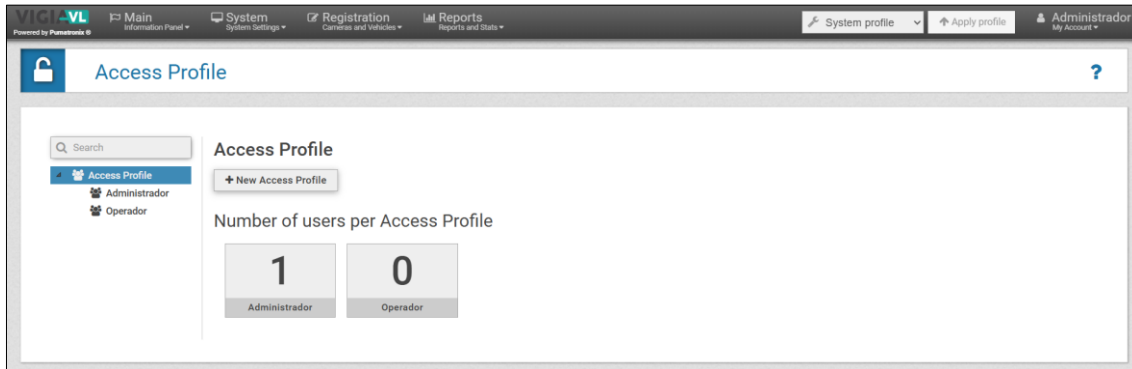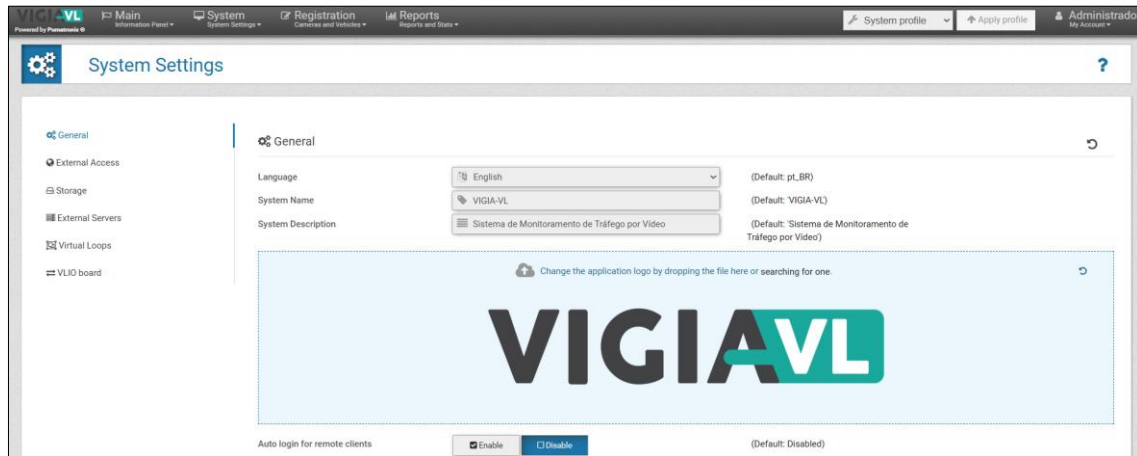
Field	Description
General Tab	
Name	profile name
Read Only	defines whether the user can only view, not make changes
Administrator	defines whether the user profile is system administrator
Screens Tab	 Permite definir as telas às quais os usuários com este perfil terão acesso
Non-Associated Screens	list of screens available to be enabled or disabled for the profile
Associated Screens	list of screens enabled for the profile
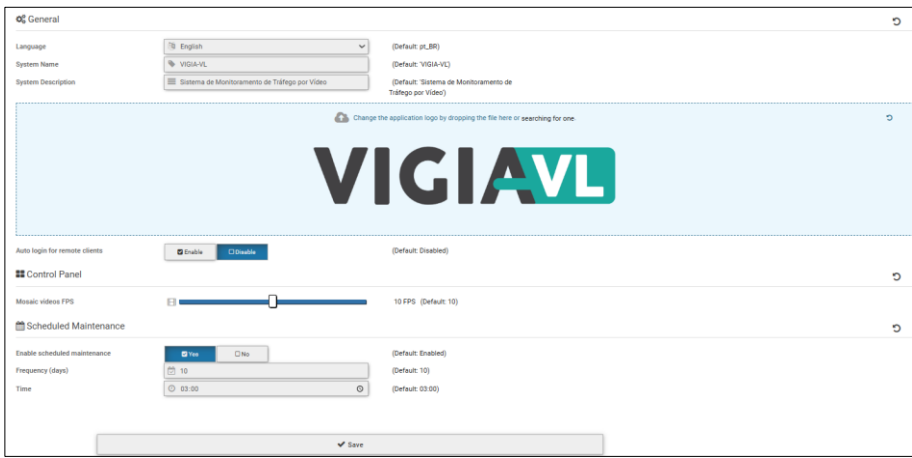
3.2. Settings

The set of system settings that determine the overall functioning and customization of specific functionalities.

To customize the system and activate certain functionalities, access the fields available under Settings and configure as indicated. Any change must be saved to go into operation by clicking on the button at the bottom of the page. When saving, VIGIA-VL will be updated.
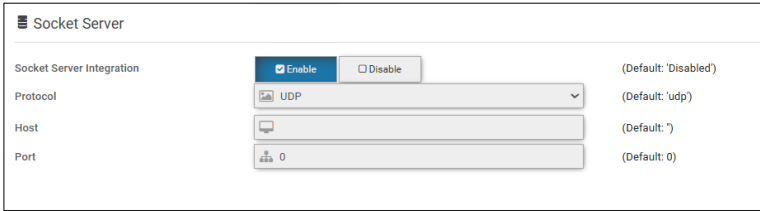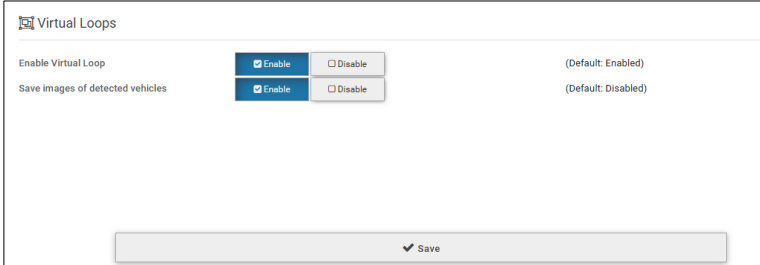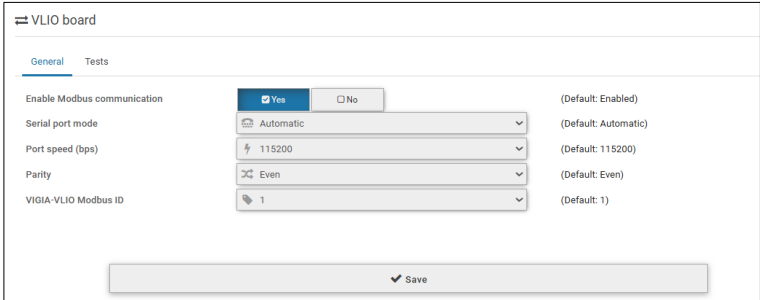
3.2.1. System Settings

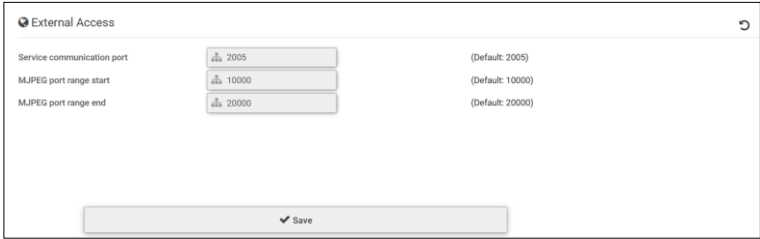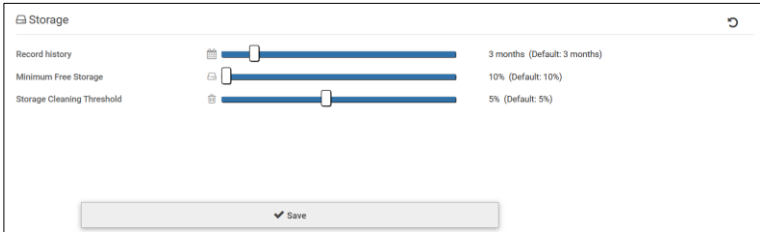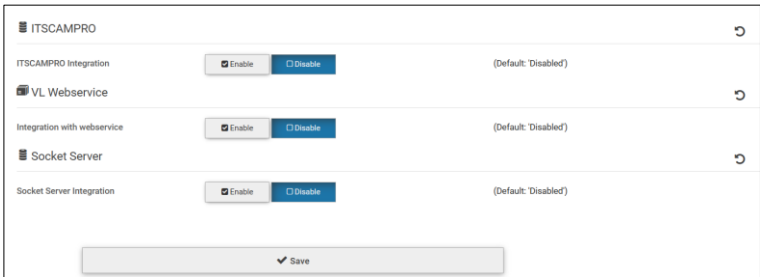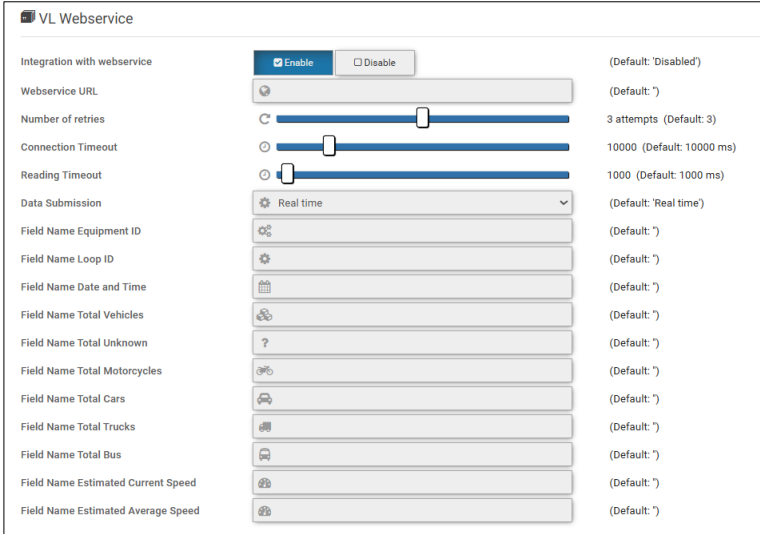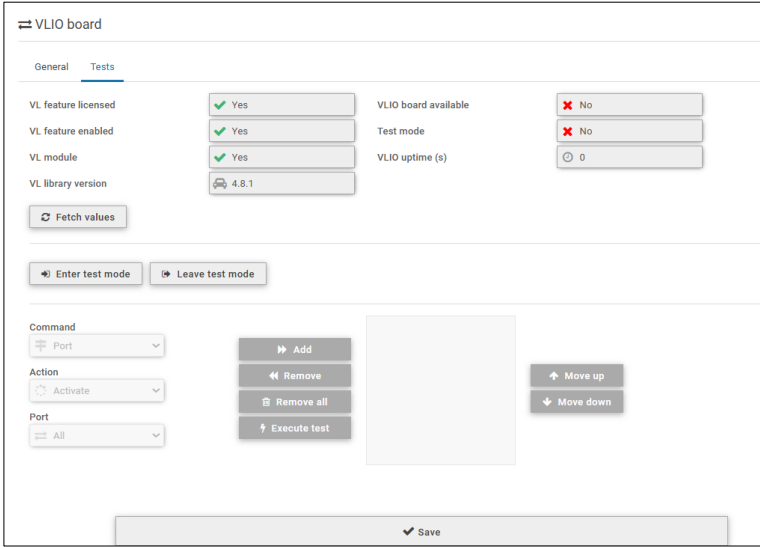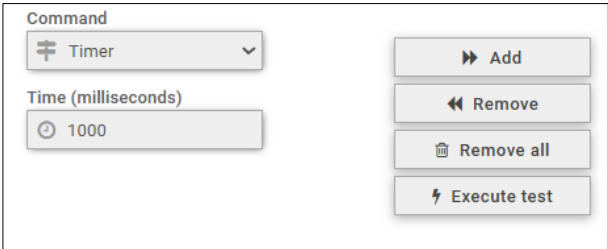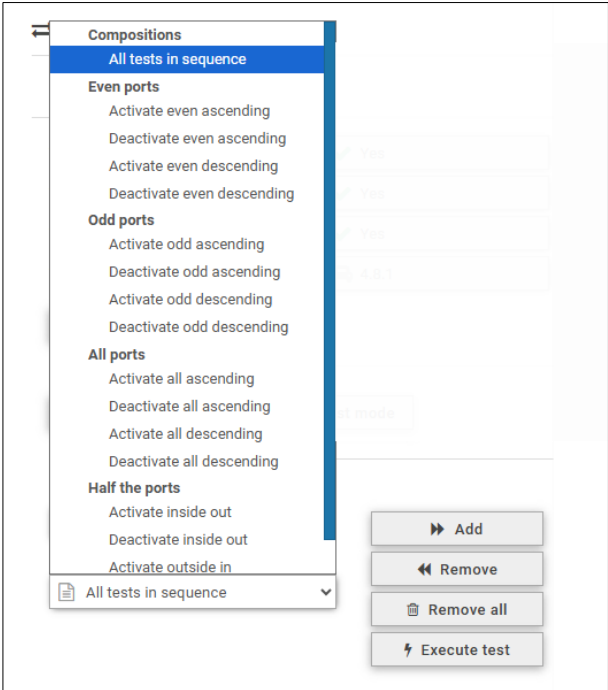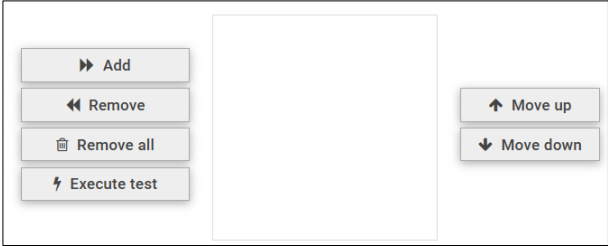| Field	Description
General Tab	
Language	select the interface display language from the available ones: Spanish, English or Portuguese
System Name	set the System Name
System Description	set a short System Description
Change System Logo	change the system logo by clicking or dragging an image file into this field
Automatic Login for Remote Clients	select whether automatic login for remote clients will be Enabled or Disabled
Mosaic videos FPS	select the Frames Per Second (FPS) rate of the videos displayed in the home screen mosaic (from 0 to 20)
Enable scheduled maintenance	select whether scheduled maintenance will be Enabled (Yes) or Disabled (No)
Frequency (days)	set the frequency, in days, of how often scheduled maintenance will be performed
Time	set the time when scheduled maintenance will be performed

Field	Description
External Access Tab	
Service communication port	enter the service communication port
MJPEG port range start	enter the MJPEG port range start
MJPEG port range end	enter the MJPEG port range end
Storage Tab	
Record History	selects how long the Record History will last in the system (from Unlimited to 2 years)
Minimum Free Storage	selects the Minimum Free Storage space (from 10 to 30%)
Storage Clearing Margin	selects the Storage Clearing Margin (from 1 to 10%)
External Servers Tab	
External Servers Tab > ITSCAMPRO	
ITSCAMPRO Integration	*select whether integration with the ITSCAMPRO server will be Enabled or Disabled*
ITSCAMPRO Host	*set the ITSCAMPRO Hostname*
ITSCAMPRO Port	*set the ITSCAMPRO Port number*

Field	Description
Send virtual loop images	*select whether to Enable or Disable the sending of images of virtual loops*
Send images when virtual loop state is	*select the virtual loop states to send the image from the following options: Select all, Idle, Active, Stopping, Stopped and Invalid*
Send images when vehicle type is	*select the vehicle type to send the image from the following options: Select all, Unidentified, Car, Motorcycle, Truck and Bus.*
External Servers Tab > *VL Webservice*	
Integration with webservice	select whether webservice server integration will be Enabled or Disabled
Webservice URL	insert webservice URL
Number of attempts	set the number of connection attempts with the server
Connection timeout	set connection timeout
Read timeout	set reading timeout
Sending data	select the data sending format among the options: Real Time or Periodic
Name of the field with the Loop ID	set Name of the field with the Loop ID
Name of the Date and Time field	set Name of the Date and Time field
Name of the field Total vehicles	set Name of the field Total vehicles
Field Name Total unknown	set Name of the field Total unknown
Field Name Total Motorcycles	set Name of the field Total motorcycles
Field Name Total Cars	set Name of the field Total Cars

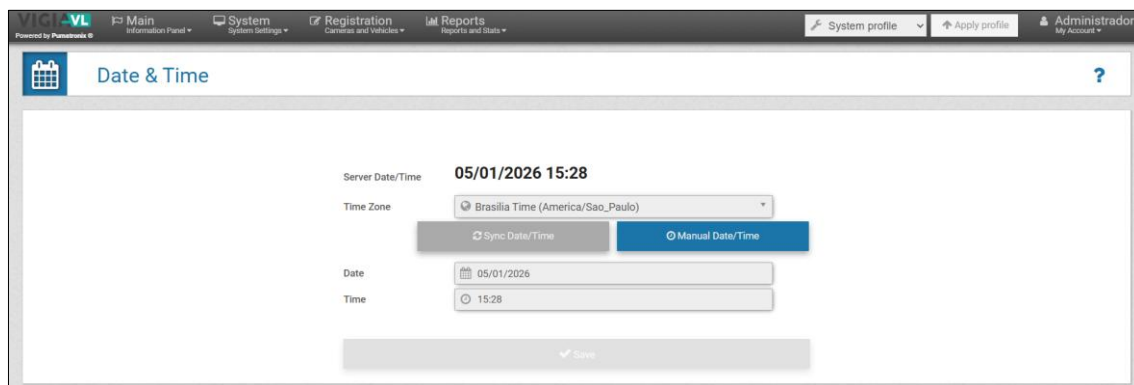| Field	Description
Field Name Total Trucks	set Name of the field Total Trucks
Field Name Total Buses	set Name of the field Total Buses
Name of the field Current Estimated Speed	set Name of the Estimated Current Speed field
Field Name Average Estimated Speed	define Name of the Average Estimated Speed field
External Servers Tab > *Socket Server*	
Socket server integration	selects whether Socket server integration will be Enabled or Disabled
Protocol	selects the protocol from the options: UDP or TCP
Address	insert the communication address used by the server
Port	insert the communication port used by the server
Virtual Loops Tab	
Enable Virtual Loop	select whether virtual loops will be enabled or disabled
Save images of detected vehicles	selects whether automatic saving of images of detected vehicles will be Enabled or Disabled
VLIO Board Tab > *General*	
Enable Modbus communication	defines whether the *Modbus* communication protocol will be enabled

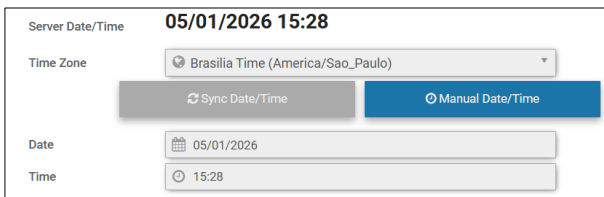| Field	Description
Serial port mode	selects the serial port mode from the options*: Automatic* or *Specific*
Serial Port (available when Specific Serial Port Mode is selected)	define which serial port you want to use in communicating with the *VLIO Board*
Port speed (bps)	selects the port speed in bits per second (from 4800 to 115200)
Parity	selects the type of parity from the options: *no parity, even* or *odd*
VIGIA-VLIO Modbus ID	selects the board's Modbus ID from the options: 1, 3, 5 or 7
VLIO Board Tab > *Tests*	
Licensed VL functionality	displays the status of the VL Functionality whether it is licensed or not
VL functionality enabled	displays the status of the VL Functionality whether it is enabled or disabled
VL module running	displays the status of the VL Module whether it is running or not
VL library version	displays the version number of the VL library
VLIO board available	displays whether the VLIO Card is available or not available
Test mode enabled	displays whether Test Mode is enabled or disabled
VLIO uptime (s)	displays the time in seconds of the VLIO Board in activity
Search values	button to search for field values
Enter test mode	button to enter VLIO Board test mode
Exit test mode	button to exit VLIO Board test mode
Command	Select the command to be performed by the test step from the options: *Port:* allows you to define commands to activate and deactivate ports; *Timer*: defines a timer in milliseconds; *Pre-configured:* allows you to choose pre-configured tests

Field	Description
Action (available with the selected Port Command)	select between Enable or Disable ports
Port (available with the selected Port Command)	define the ports that will undergo the action chosen in the *Action* field among the options: 1 to 16 or All
Time (milliseconds) (available with the selected Timer Command)	 enter the time in milliseconds of the timer
Test name (available with the Preconfigured Command selected)	 selects preconfigured tests. If more than one pre-configured test is chosen, they will be sequentially concatenated in the test list
VLIO Board Tab > Tests > Test List	 displays a view of all steps of the test to be executed
To add	includes the test defined in the commands section in the list
To remove	removes all selected tests from the list

Field	Description
Remove all	removes all tests from the list
Run test	runs all tests in the list
Move up	moves selected tests up one position in the list
Move down	moves selected tests down one position in the list

3.2.2. Date and Time

Keeping the date and time set correctly on the VIGIA-VL server is of utmost importance so that the date and time of the records are always correct.
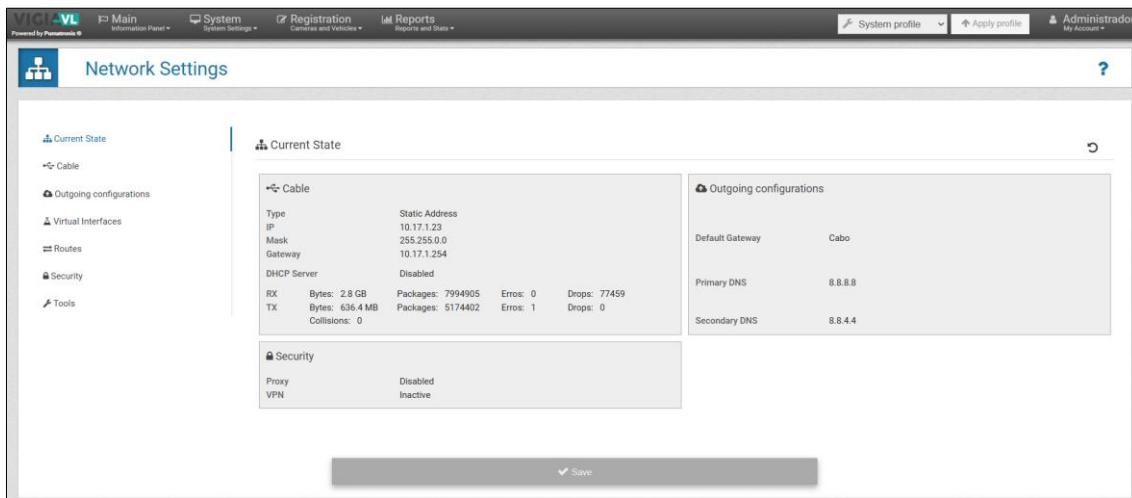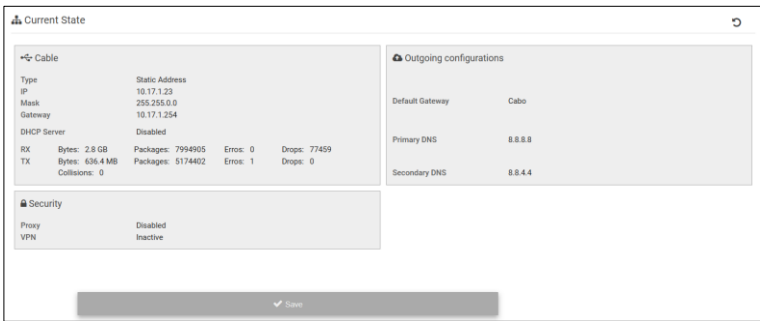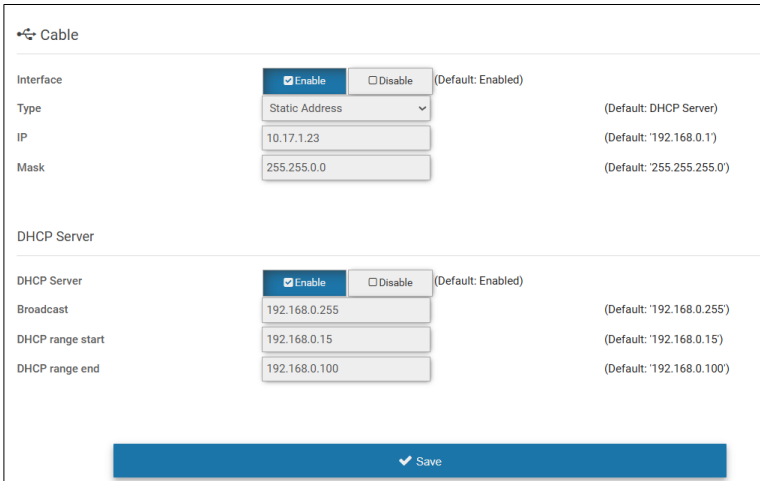

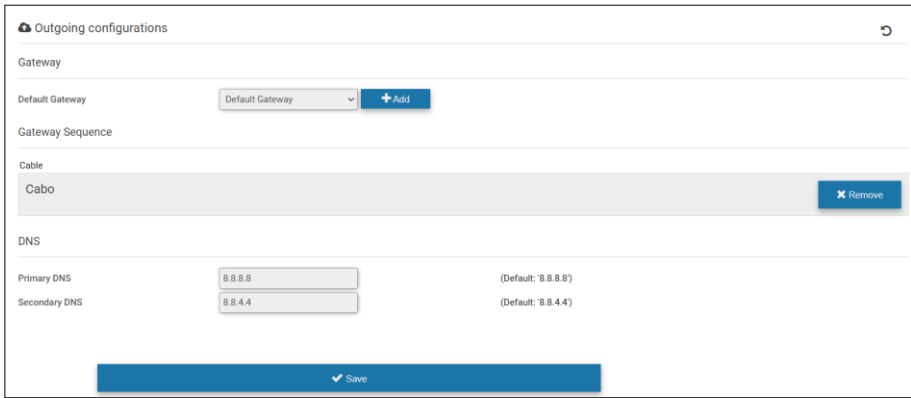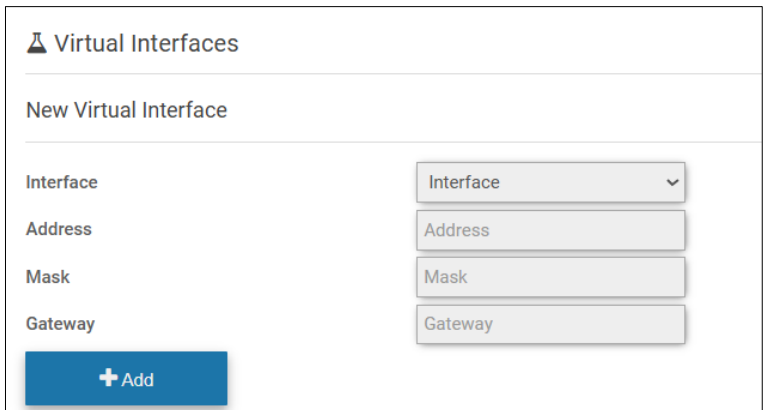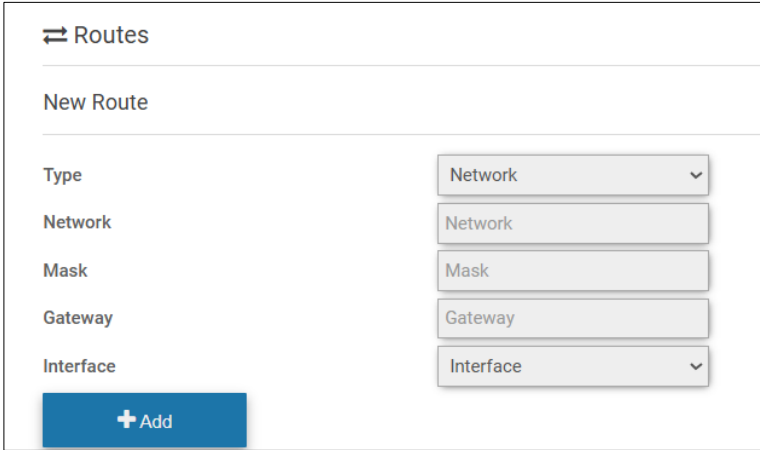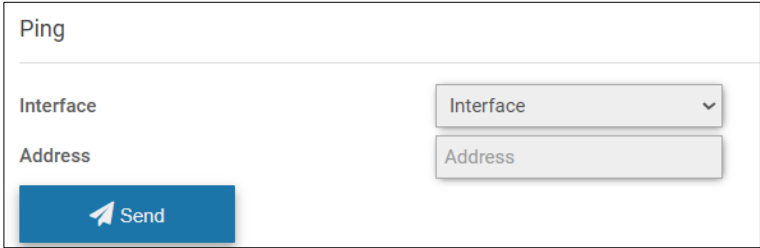| Field	Description
Time Zone	VIGIA-VL's time zone setting allows you to ensure that date and time conversions are performed correctly
Synchronize Date/Time	VIGIA-VL's time zone setting allows you to ensure that date and time conversions are performed correctly
Synchronization Type	In this field you can configure the type of synchronism that will be used. For the VIGIA-VL it is possible to use NTP with the operating system's default server or with a proprietary server
NTP Server	If the option to use a proprietary NTP server is selected, you must configure this address
Manual Date/Time	 In this mode users set the date and time manually.
Date	Select the date from the calendar or type it into the field
Time	Enter the correct time so that the server clock is synchronized with time servers

⚠️ **Manual Date/Time Configuration: in manual Date/Time configuration mode, the clock may vary over time and this may cause tickets to be recorded with the wrong date/time information.**
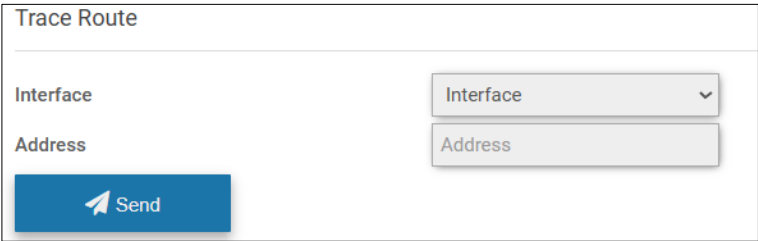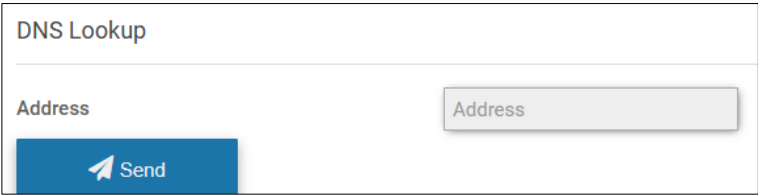
3.2.3. Network Settings

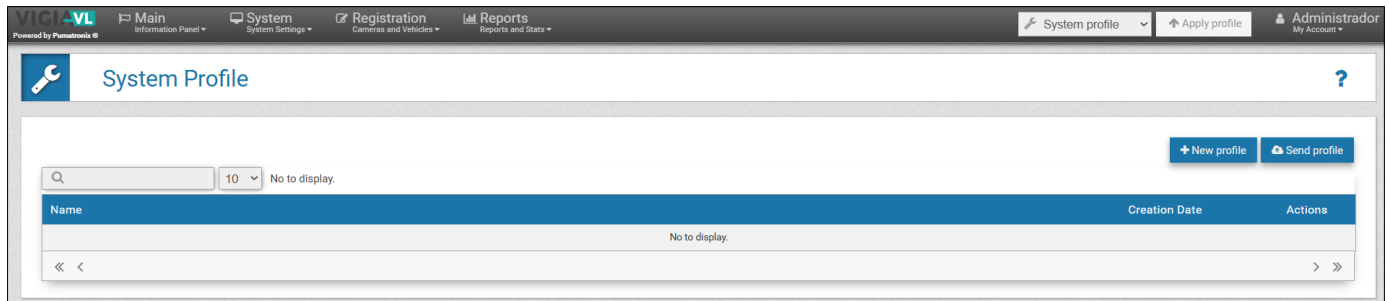| Fiel	Description
Current Status Tab	Allows you to see the current state of network settings, such as cable, output settings, and security.
Cable Tab	
Interface	selects whether the network interface Cable will be Enabled or Disabled
Type	select the type from Static Address or DHCP Client
IP	insert the network IP
Mask	insert the netmask

Fiel	Description
DHCP Server	select whether DHCP server is Enabled or Disabled
Broadcast	enter broadcast
Start of DHCP IPs	enter DHCP IPs Start
DCHP IPs End	insert End of the DCHP IPs
Outgoing configurations Tab	
Default Gateway	selects the interface to be used as Gateway and sets it by clicking on +Add
Primary DNS	insert Primary DNS
Secondary DNS	insert Secondary DNS
Virtual Interfaces Tab	
Interface	select the available connected interface
Address	enter address to be used
Mask	enter netmask
Gateway	insert gateway

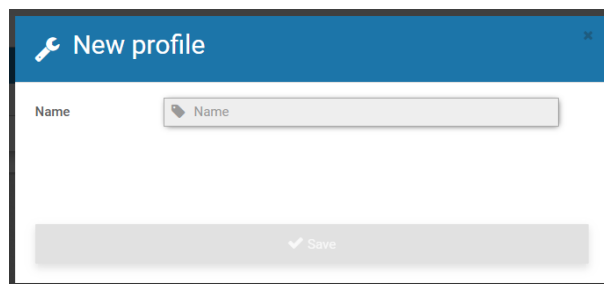| Fiel	Description
Routes Tab	
Type	select the route type between Network or Address
Network	enter the network
Mask	enter the netmask
Gateway	enter the gateway
Interface	select the available connected interface
Security Tab	
Proxy	select whether to Enable or Disable the Proxy
Address	insert address
Port	enter port
User	set user to access
Password	set password
VPN	allows you to insert a VPN configuration by clicking or dragging the file to this field
Tools Tab > Ping	
Interface	select available connected interface
Address	insert Address

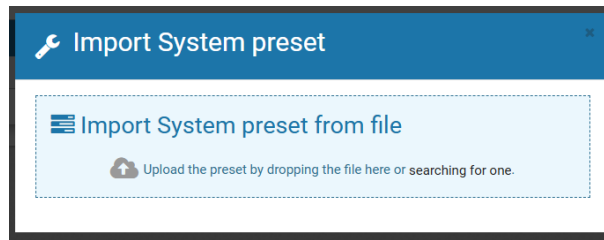| Fiel	Description
Tools Tab > Trace Route	
Interface	select available connected interface
Address	insert Address
Tools Tab > DNS Lookup	
Address	insert Address

3.2.4. System Profiles

Allows the user to save all system configurations in an internal file (profile), with the extension pro2. You can download, upload, apply and remove profiles.

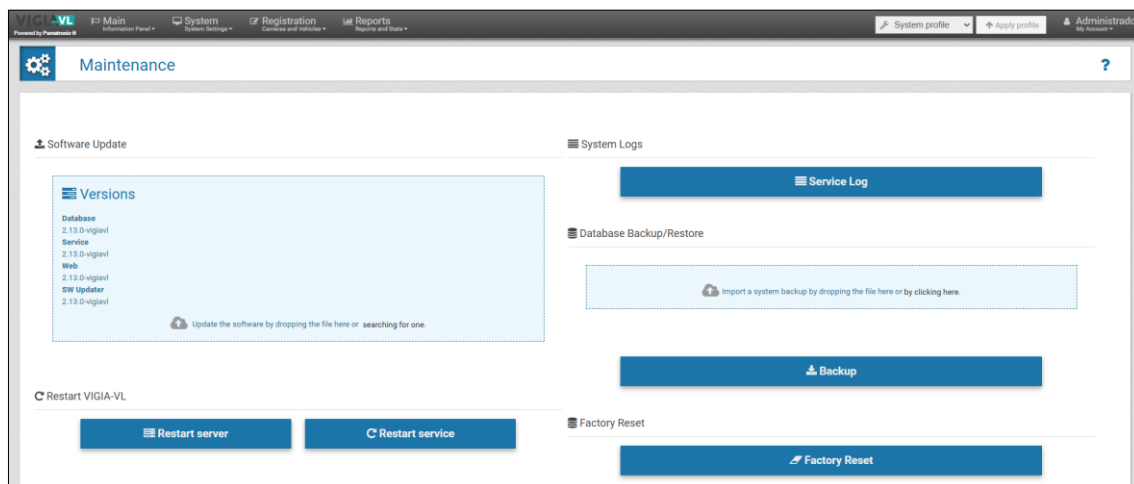To add a new system profile, click +New system profile:

Or import a predefined file in .pro2 format in the Send System Profile option:

3.3. System Maintenance

Place to update software packages and system maintenance options:

Field	Description
Software Update	location to update the software package, when available, by clicking or dragging the file to this location
Restart VIGIA-VL	use this option when the system is not operating normally
System Logs	when assistance is required, information about actions performed on the system can be downloaded for forwarding to Pumatronix Technical Support
Database Backup/Restore	Backup: performs a backup of the database; Restore: the database can be restored to a backup point made, but all data will be deleted from the memory;
Factory Reset	settings are restored to the factory default, but all data will be deleted from the memory

Loss of Information: during the equipment reset process, there may be losses in vehicle records.

3.3.1. License

Displaying information about the license in use, with the number of licensed devices and the option Import License File if the number of devices used is increased.
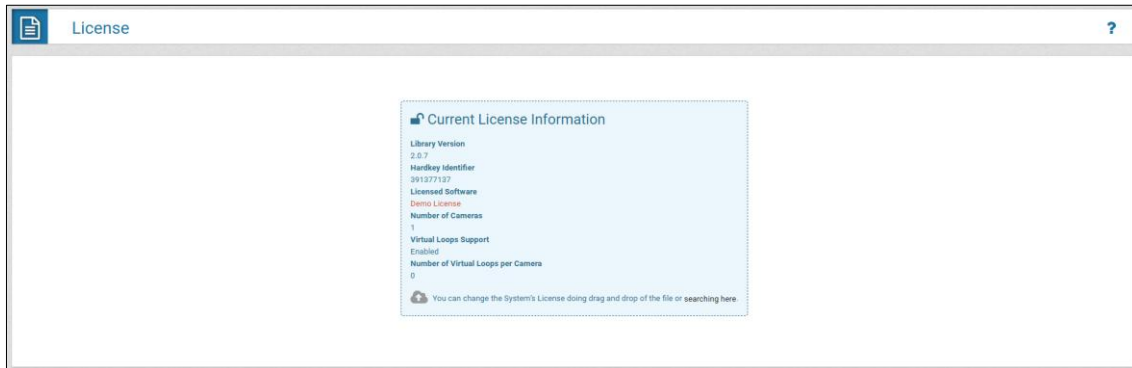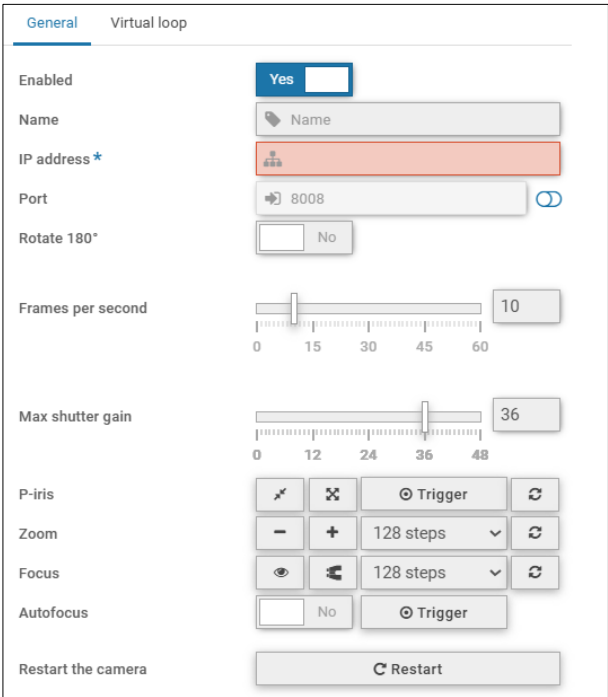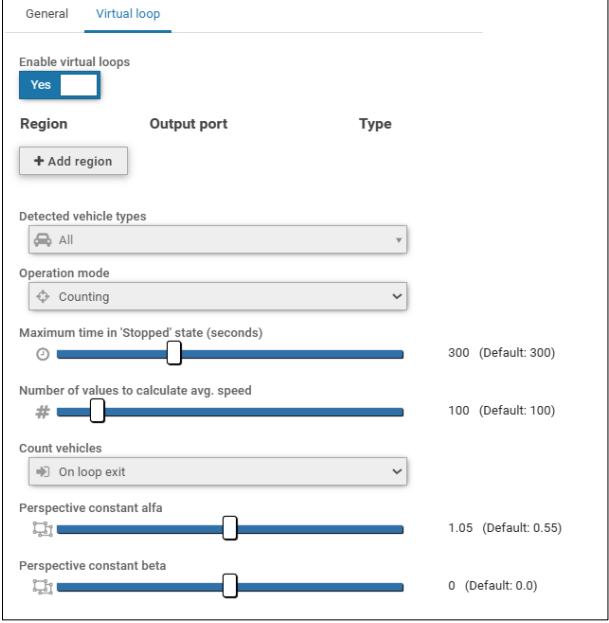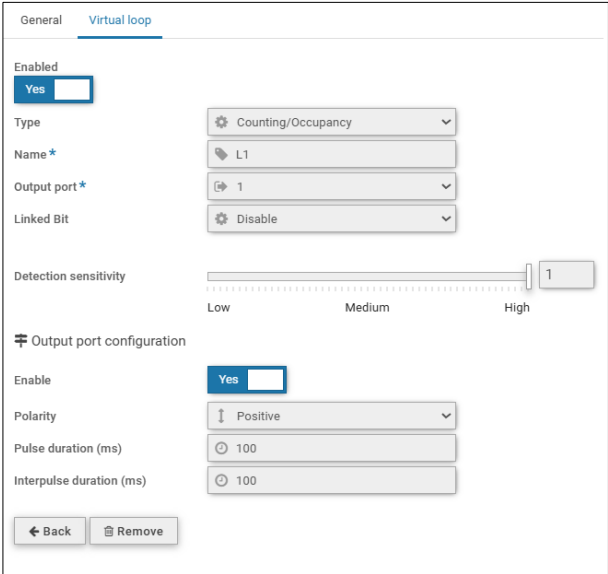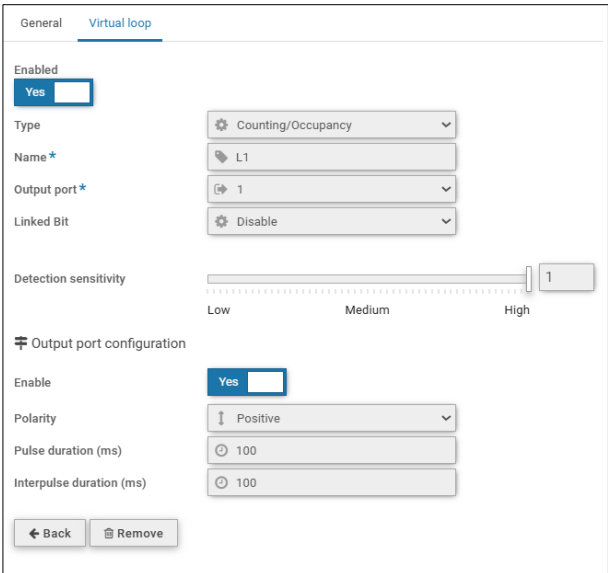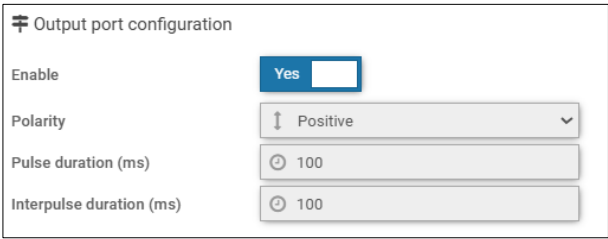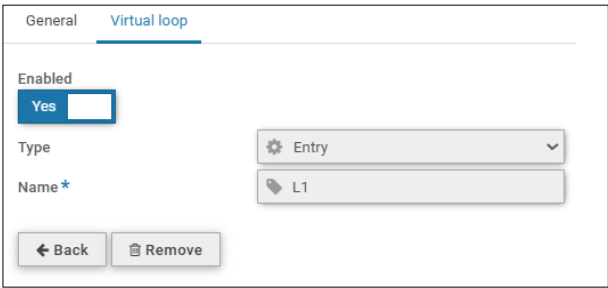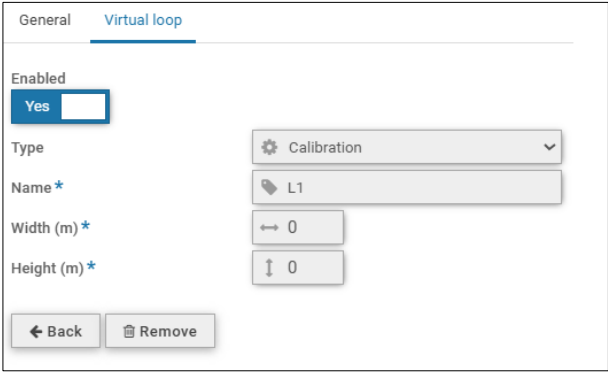

4. Registration Menu

4.1. Cameras

Allows you to register new image capture and processing devices to the system and configure the Virtual Loop of each registered device. At the end of the settings you must click Save Camera.
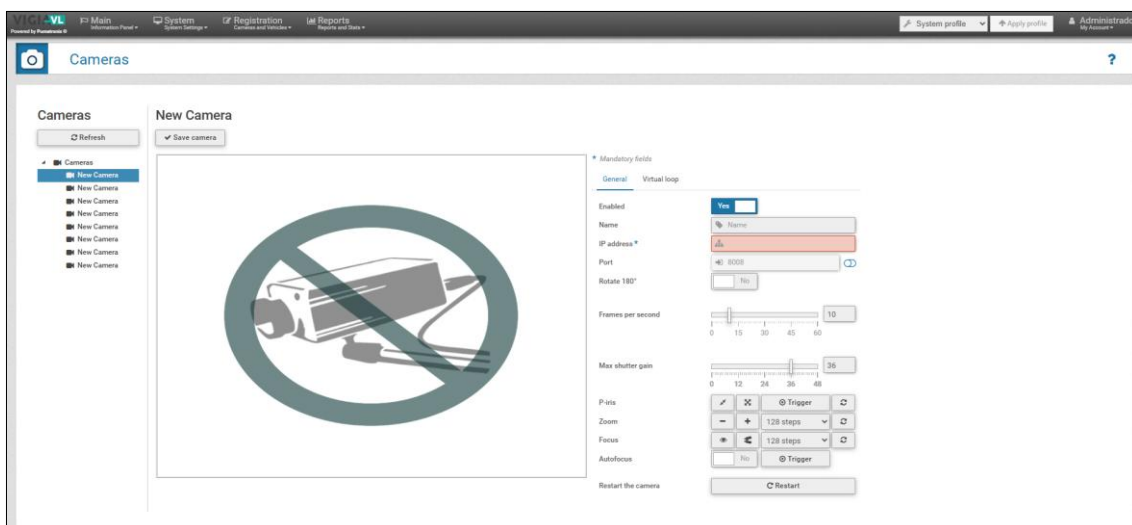
| Field	Description
General Tab	
Enabled	select if the Capture Device is Enabled, the Yes option leaves it running
Name	insert the name of the capture Device that will be displayed in the system
Video Address	enter the video address (required field)
Rotate 180	allows rotating the image of the Capture Device by 180°, for situations where the displayed image is upside down
Frames Per Second	sets the number of frames per second (from 0 to 60)
P-iris	allows the commands to close, open or fire the P-iris once
Zoom	enables the commands to zoom in and out and to set an exact number of steps
Focus	allows the commands to focus on near or distant objects and to set an exact amount of steps
Autofocus	selects whether autofocus is Enabled and allows the command to activate autofocus once
Reset Camera	button to restart the camera when it malfunctions

Field	Description
Virtual Loop tab	
Enable Virtual Loops	select if the Virtual Loops will be Enabled, the option Yes sets the loop running
Detected vehicle types	select one or more Types of detected vehicles, among the options: Select all; Unidentified; Car; Motorcycle; Truck; Bus
Operation Mode	select the Operation Mode from the options: Count or Occupancy
Output Edge	If the Operation Mode "Occupancy" is selected, select the exit border from the options: Top, Right, Bottom or Left
Maximum time in 'Stopped' state (seconds)	set Maximum time in the 'Stopped' state (from 1 to 900 seconds)
Number of values for average speed calculation	set the amount of values for average speed calculation (from 1 to 1000)
Vehicle count	If the Operation Mode "Count" is selected, select the vehicle count from the options: At loop exit or At loop entry
Constante de perspectiva alfa	definir Constante de perspectiva alfa (de 0.1 a 2)
Beta Perspective Constant	set Beta perspective constant (from -10 to 10)

Field	Description
Virtual Loop Tab > Add Region	
Enabled	select if the Virtual Loop region is Enabled
Type	select the region type from the options: Input, Count, or Calibration
Add Region > Type "Count	
Name	insert name of the region that will be displayed in the interface (required field)
Output Port	select output port (1 to 16) (required field)
Bit Binding	select Binding Bit (disabled or 01 to 32)
Detection Sensitivity	select Detection Sensitivity (from 30 the lowest to 1 the highest)

Field	Description
Output Port Configuration	
Enable	select if the output port is Enabled
Polarity	select polarity from the options: Positive or Negative
Pulse Time (ms)	set Pulse Time
Time Between Pulses (ms)	set Time between pulses
Add Region > Type "Input	
Name	define name for region (required field)
Identifier	select identifier (from 50 to 65) (required field)
Add Region > "Calibration" Type	
Name	define name for region (required field)
Width (m)	set width (from 0 to 100) (required field)
Height (m)	set height (from 0 to 100) (required field)

4.1.1. Virtual Loop Design

It is possible to draw the Virtual Loop by applying the commands in the video area itself. In this configuration, 3 types of loop can be created by combining keyboard keys and double clicking on the video area, the loop name is created automatically.
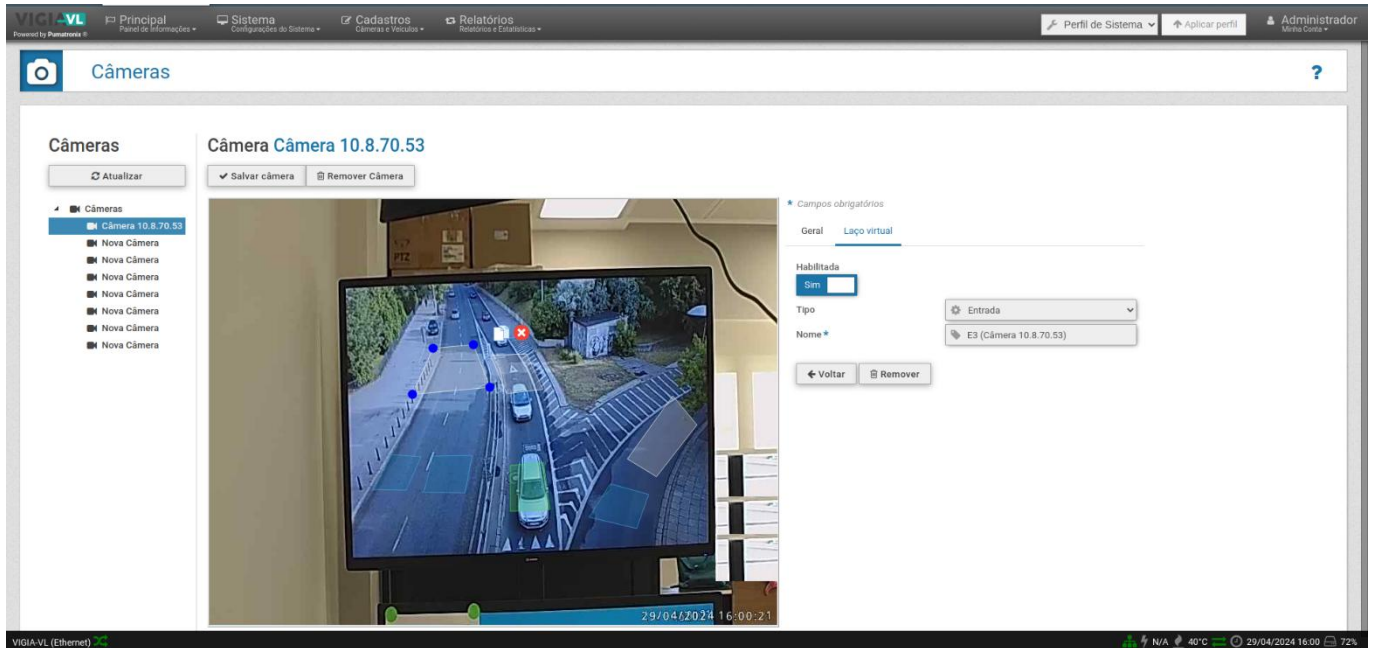
| Type of Loop	Command
Count/occupation loop	no key pressed + double click on the video area
Entry loop	ctrl key pressed + double click on the video area
Calibration loop	ctrl+shift key pressed + double click on the video area

5. Reports Menu

5.1. Registers Report

The Register Report is a tool that allows the user to search the VIGIA-VL database using filters and presents the search results clearly. VIGIA-VL allows searches in the log database with the following filters: Start and End Date/Time, image capture and processing device, License Plates (Recognized, Not Recognized or All), Specific License Plate, and Trigger Type.

The report displayed when you click Search can be exported in CSV format or in ZIP format, if exported with included images.

There is also the option to Remove selected Records.

⚠️ **When performing record removal, VIGIA-VL will completely remove records, including database information and file system images from the server. This operation cannot be reversed.**
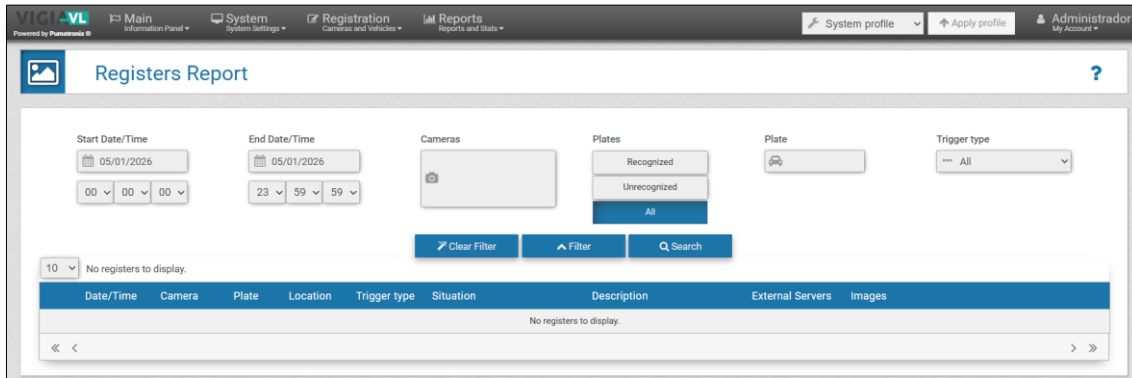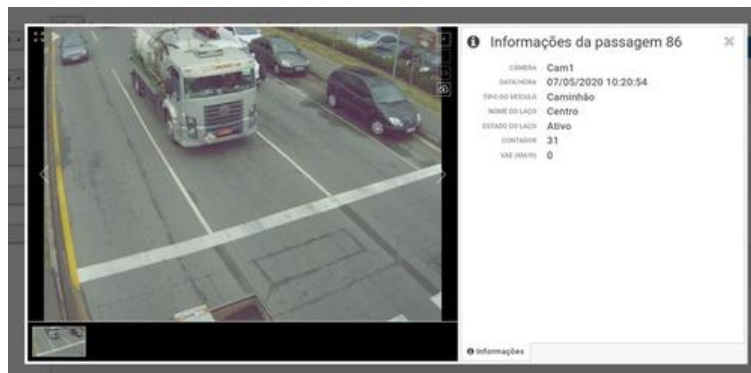
5.2. Passage report

The Passage Report displays statistics and information about VIGIA-VL records, which can be filtered by date and time, image capture and processing device, Entry region, or the Counting region that was activated at the time of passage. To generate the report, vehicles can be filtered by classification and estimated speed detected, or by estimated average speed (VAS). The report displayed when clicking Search can be exported in CSV format.
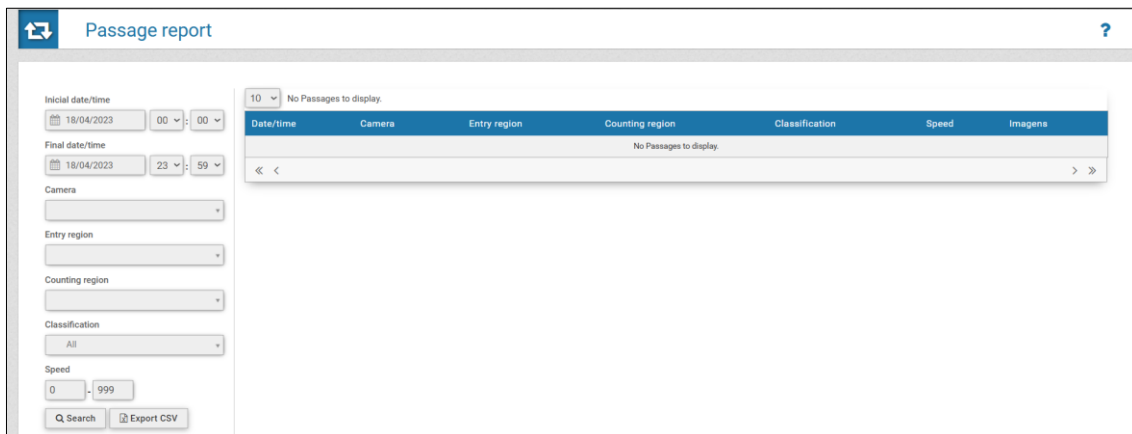
The Passage Report displays a thumbnail image captured when the vehicle passed through the virtual loop in the right-hand column. Clicking on the image enlarges it in the record viewer window, which displays vehicle and virtual loop data activated during passage, along with the record information.

5.3. Vehicle Count

The Count Report displays statistics and information about VIGIA-VL records, which can be filtered by date and time, image capture and processing device, and the counting region that was activated at the time of passage. To generate the report, vehicles can be filtered by classification. The report displayed when clicking Search can be exported in CSV format.

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