User Guide

�֎ VICON

Vicon License Plate Recognition (LPR) Cameras and Valerus-LPR Integration

XX281-70-02

✖ VALERUS

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General

The Roughneck® Pro Cameras with edge LPR is a solution for reading and responding to license plates without a need for a physical server. The camera is running the advanced LPR software in parallel to the rest of the functions; all functions happen on the edge, providing a cost-effective standalone solution where appropriate. The camera, however, can be fully integrated with the Valerus VMS to support those who need advanced video and LPR functions. The LPR Settings in the camera are the same whether it is being used as a standalone solution or integrated with Valerus VMS. When using the camera with Valerus, continue to follow the instructions in the Valerus Integration Configuration section of this manual.

Prerequisites

- SD Card: Included
- Valerus version 21.1. or higher; ENTERPRISE tier license for partner integration support

LPR Settings in the Camera

This section explains how to set up and configure the LPR functions on the camera, covering the standalone LPR camera and Valerus-LPR use case.

- Follow the camera installation quick guide to install and setup the camera on the network.

- Once that is complete, browse to the camera and log in to ensure that the SD card (included) is recognized and formatted.
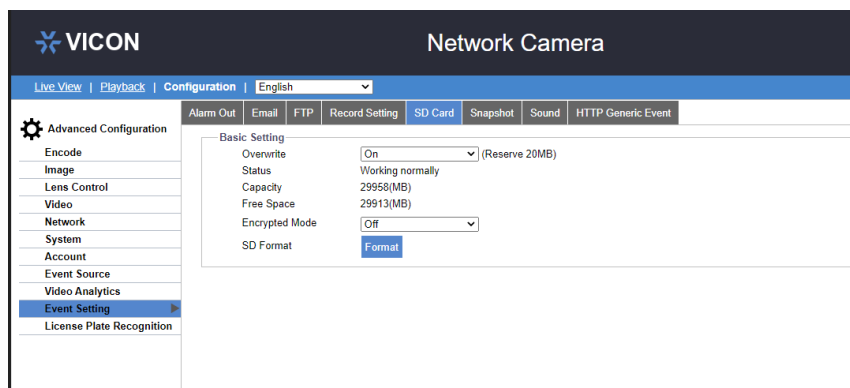
Set the camera parameters as follows:

- SD Card: Set Overwrite to On and format

- Encryption: Off

- Stream 2 is used for the LPR analytics and defaults to resolution of 1280x 720; do not change this in the VMS

Positioning the Camera

Refer to the camera installation quick guide and the full user manual to position the camera to the field-of-view required for the installation. It is important that the camera be positioned properly, so be sure to follow the guidelines for best results.
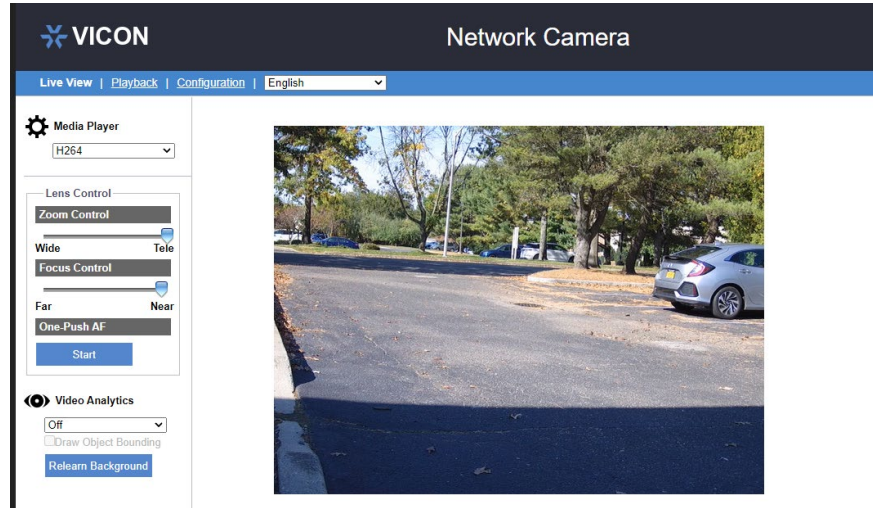
LPR Application Live Page

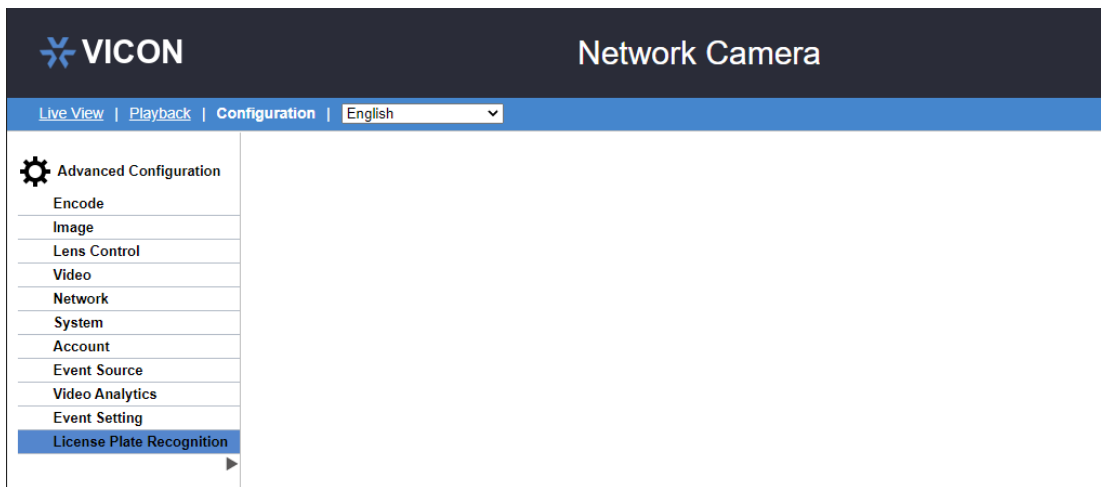After the camera is setup and can capture license plates, browse to the LPR page by clicking the link at the bottom of the camera menu list (as an alternative, browse to the camera's IP over port 9080).

Upon initial launch of the LPR application, the LPR UI opens at the Live page. When using the camera as a standalone solution or for general setup and review, the camera offers an easy-to-follow summary of the camera's captured and read actions. At the top of this page there are tabs that are used to setup the LPR features in the camera. Under the video, there is a summary of what parameters have been setup for this camera and a Calibration pattern, explained below.
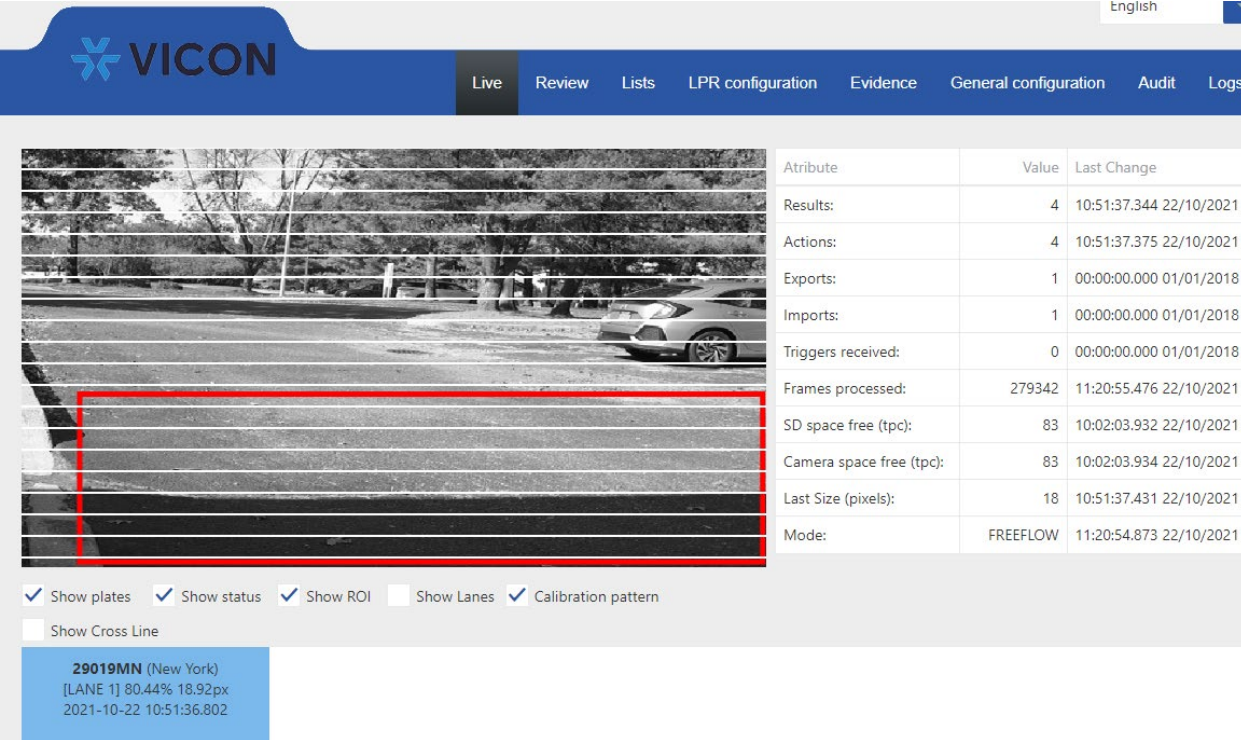
Verify Camera's FOV on Live Page

From the Live screen, check the boxes under the image to enable ROI and Calibration pattern. Calibration lines are shown at 20 pixels. Verify that license plates are at or above 20 pixels for optimal reading. Adjust FOV accordingly from the main camera page.

HLC

High Light Compensation (HLC) is used to reduce the blooming effect of bright light sources, such as headlights. HLC can be turned on from the Configuration > Image > Exposure screen. Select On to enable HLC and select the intensity using the slide bar, Low to High< or enter a number 0 – 6 in the field.

Review Page

The Review tab provides a summary of data. There are a variety of filters to sort results. A list of results will populate and video from each can be reviewed.
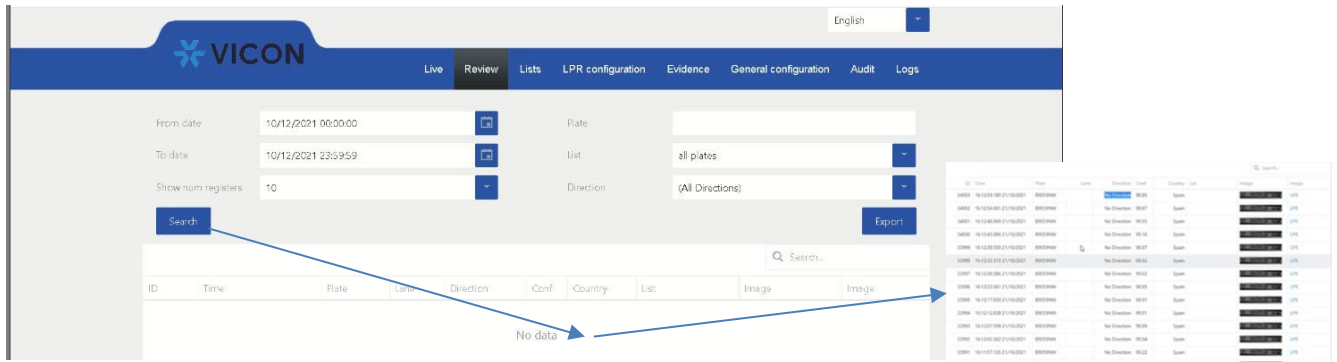
Lists

- There are four default lists; custom lists can be created as well.

- The all plates list is a summary of results (cannot be sent to Valerus) and not in list is a summary of those results that are not in any of the defined lists.

- Blocklist/Allowlist (the names of these lists can be changed) include plates that are acceptable or should not be allowed; actions can be configured for each list; each action has its own set up options to configure. (Valerus is an action; an image or xml file will be sent to Valerus.)

- For Valerus, the port number set here has to match the port number set in Valerus for this camera.

- A list can be imported and exported; this is important for those with prior license plate lists and need the LPR system to use them to make a decision, such as open a gate or send an alert. Export a list itself or only those results that match the list.
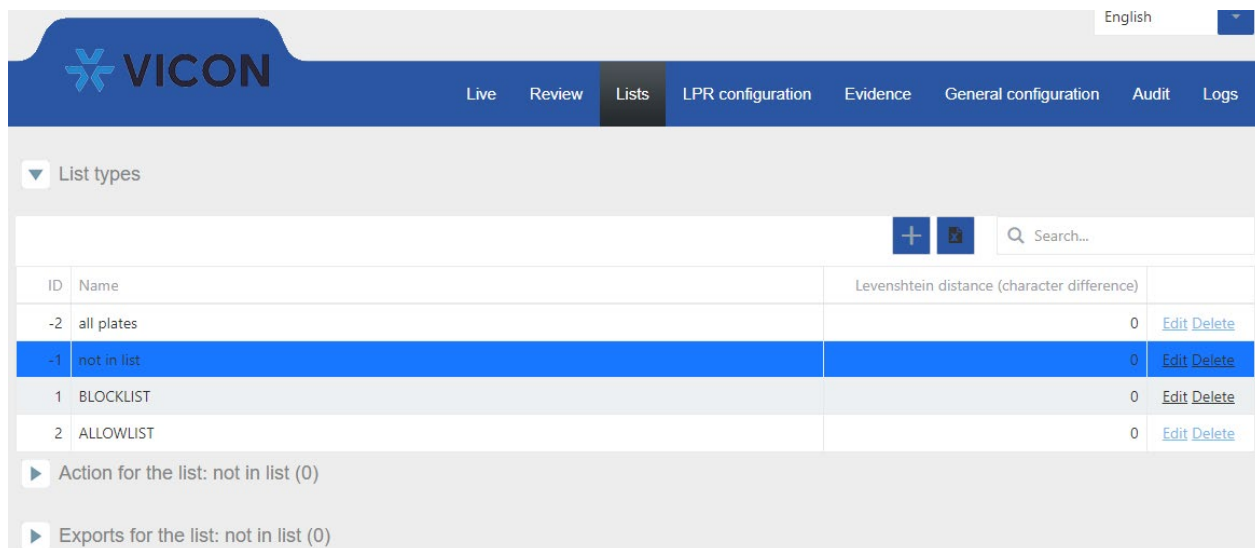
List Synchronization

A single camera can be made the primary camera from which license plates are added and/or removed for each list (Allow/Block/Custom list). Select a time frequency for the secondary camera to check for updated plate lists. Selecting *Enabled if change* will only send the list if changes have been made. Secondary cameras should be configured with the IP address of the primary camera and its ADMIN account credentials.

LPR Configuration Page

From the LPR configuration tab, select your region and state from the dropdown menu. The recommended maximum number of states is 5.

- There are three modes: FREEFLOW, where data is constantly read and there is no need for a trigger; TRIGGER, where an external sensor (i.e., ground loop) alerts when a car comes into view; and MOTION DETECTION, where there are results only when there is motion as a car moves into view.

- Although Trigger and Motion Detection may reduce the number of false alarms, it is recommended to select FREEFLOW for most low-speed or gated applications. Then the options can be selected, including the filters from time, captures or none.

- From the FREEFLOW mode, select a filter type.

Set Region of Interest

- Click Show ROI to set a region of interest (ROI).

- This improves efficiency by limiting the processing to an area where the plates of interest will appear (or be restricted to).

- There is a small animation to the left of the scene that demonstrates how to draw this area.

- This is helpful in a case where only one lane of traffic is of interest, or the focus would be on an entrance or an exit.

Set Expert Options

- Click Expert options to fine tune the settings to reduce false reads.

- Minimum character height (default is 20) can be lowered to 13; this helps to detect more detail in difficult scenes, but some false detections may occur.

- Minimum confidence can be lowered from the default value of 80; lowering the number can result in misreads being reported.

- The FPS setting here is not related to the camera setting, but for the capture.

- Camera position should be set for the mounting orientation of the camera.

- Be sure to click Restart service to activate the settings.

▼ Expert options

Info:	**?**
Minimum character height:	13
Maximum character height:	80
Minimum confidence (tpc):	25
Fps:	4
Minimum plate characters:	0
Compute traffic direction:	☐
Camera position:	● Left ○ Centre ○ Right
Minimum characters difference:	1
Timeout LPR (ms):	2000
Enable Angle Filter	☐
Angle Filter Minimum:	0
Angle Filter Maximum:	0

Evidence

Add a camera, for example one with a wider angle of view, so that every time there is a result from the LPR camera, it will combine with this camera, returning two images, one with just the license plate and one of the full scene, adding some context to the result.

General Configuration Page

In General configuration, select the Purge options to set the storage parameters for the SD card. SD card stores images, actions and import/export lists. Camera stores database (result).

Caution: Do not enable local recording to the SD card function, as it will conflict with the storage of the LPR event.

- There are three types of Purge, disabled (no purging, unless emergency purge goes into effect), days (number of days it will save before purge) or freespace (with customer selected parameters).

- There is a hard coded emergency purge that is always on and checks for freespace (parameters are the same as the defaults for freespace purge, 20% on SD card/50% on camera; guarantees 1 full day of data, so records less than 24 hours old will not be deleted); the parameters for this emergency purge will always overwrite any of the customizable parameters.

- Set how often it purges in Purge Interval, Hour, Day, Week or Month. For example, if Purge is set to Days, and 7 days is noted to preserve in storage and the Purge Interval is set to 1 hour, every hour it will purge all records that are between 7 days and 1 hour and 7 days old.

- Select Restart service to save settings.

Audit

Looks at actions in imports and exports. Summary of the database.
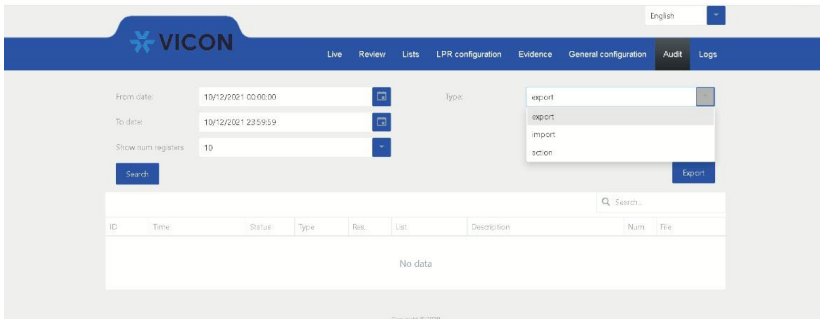
Logs

Displays current logs.
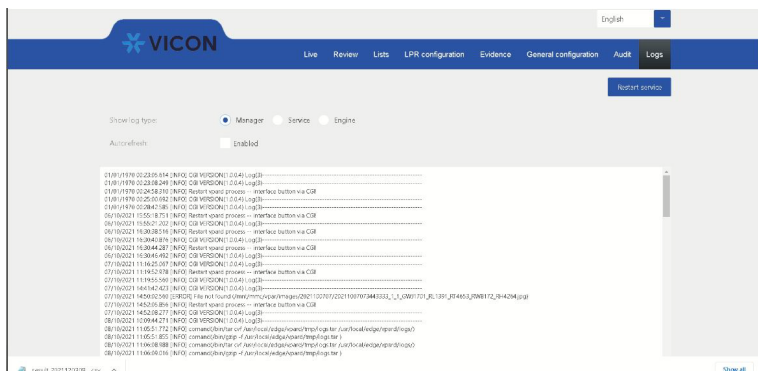
This completes the setup for the camera when is being used as a standalone solution. The next section will detail how to integrate the LPR camera into a Valerus VMS system.

Valerus Integration Configuration

In addition to providing a powerful, independent solution for license plate reading, vehicle access management and suspicious plate alerting, the Roughneck cameras with LPR offer an easy but powerful integration with Valerus.

Integrating the camera into a larger Valerus VMS system allows recording the video from the camera (not only the plate) like any of the other camera (continuous or on specific LPR events), viewing live and playback along with other cameras in the system, for example, in addition to the LPR camera focused on the car's license plate, adding overview cameras that can capture the entire car and maybe even the driver.

Once integrated, the events that are sent from the camera are stored in the Valerus database for easy searching and retrieval and also allow defining alarm rules that will trigger when specific terms are met, such as a plate in a suspect watch list is read.

Note that this process often will require going back and forth between the Valerus application and the LPR application.

Adding the LPR Sensor

The Vicon LPR camera needs to be configured to work with Valerus. Note that this process often will require going back and forth between the Valerus application and the LPR application.

- The first step is to add the camera to Valerus in the same way any other camera is added; refer to the full Valerus manual as needed.

- Once the camera is connected, go to Configuration>Resources>Video Channels, select the LPR camera from the list and click on the Show IDs button at the bottom of the screen.
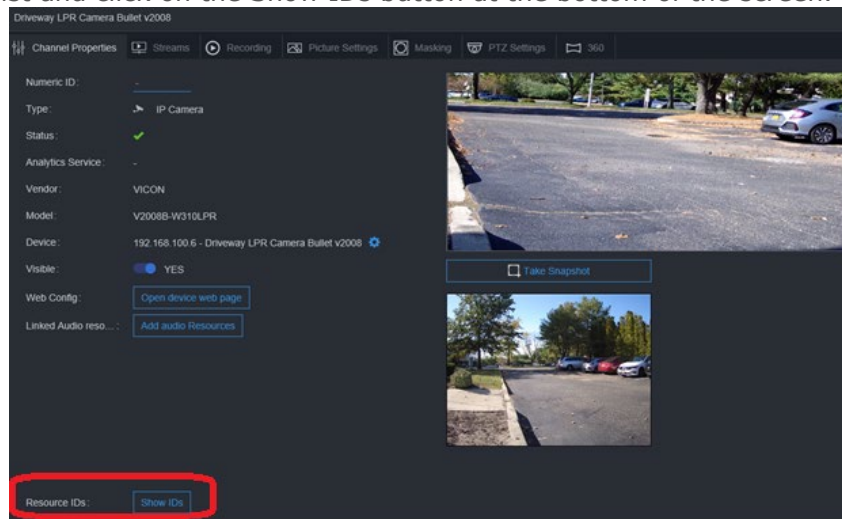
- Locate the Valerus Resource ID for this camera and copy it by either clicking the blue copy icon that displays when the cursor hovers over the ID or select and right click (Copy). This ID is used in the Roughneck LPR camera to correlate it with the video channel.
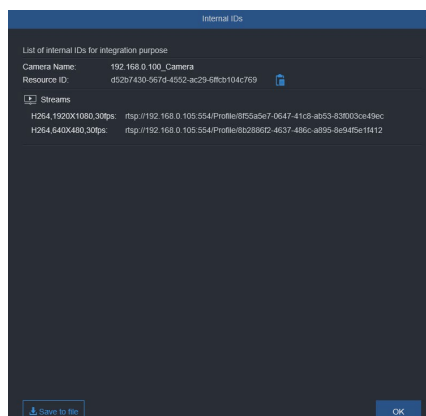
- Log back into the camera's LPR pages and go to the Lists tab. As previously explained, this tab allows setting lists and defining how the camera will respond. Below are two scenarios on how these are used with Valerus.

  Scenario 1:
  A public (not access control) area where multiple vehicles are expected to drive through, such as a school drop-off zone or the entrance to an open parking facility, has the need to read and store all the plates of vehicles coming in to allow future search if needed.
  Conditions:
  ➢   Entrance lane is monitored to allow reading plates.
  ➢   Additional cameras are recommended to provide full vehicle view (make and model) and maybe existing passenger view where relevant.

  System Configuration:
  ➢   LPR cameras are set up to read plates and are added to Valerus.
  ➢   LPR cameras are configured to send **all reads** to Valerus (no lists).
  ➢   Valerus is set to record the LPR and overview cameras and to receive all their events in the events database.

  Being that there is not a specific list of plates to work by, the pre-defined "not in list" list type will be used and be configured to send these to Valerus, essentially making all plate reads go to Valerus.
  ➢   Select the "not in list" entry and expand the "Actions for not in list"' section below it.
  ➢   Click the + button to add an action, name it, select Valerus from the action type drop down and set it to Enabled. Click Save

  ➢   Click on the line created to open its properties.
  ➢   Enter the Valerus Application Server IP in the Host field.
  ➢   Enter the port to be used to send events. This port needs to be open in the Application Server firewall to allow incoming events and will be used when adding the sensor to Valerus. The port here and the port in Valerus must match.
  ➢   Paste the Resource ID that was previously copied from Valerus in the appropriate field. This will be used by Valerus when events arrive to sync with the correct channel.

> ➢ Return to Valerus and navigate to Configuration>Network Devices>Integration Partners and click on "Add Partner." Follow the instructions in the Integration Partners section that follows.

Scenario 2:

An area (with no physical access control) allowing vehicle traffic with a need to monitor and notify when authorized or <u>not authorized</u> cars enter, such as:

> ➢ Employee parking area where it is desired to alert security when a car not on the employee list of car enters.

Conditions:

> ➢ Entrance lane is monitored to allow reading plates.
> ➢ Additional cameras are recommended to provide full vehicle view (make and model) and maybe existing passenger view where relevant.

System Configuration A (only alerts sent to Valerus):

> ➢ LPR cameras are set up to read plates and are added to Valerus.
> ➢ The list of known plates is added to the LPR cameras:
>   o An "Authorized" list containing all known employee license plates.
> ➢ LPR cameras are configured to send only <u>relevant</u> LPR reads to Valerus.
>   o Plates that <u>are not</u> included in the "Authorized" list in the employee parking example.
> ➢ Valerus is set to either store for Search purposes or with alarm rule to respond to these specific events.

System Configuration B (all events sent to Valerus):

> ➢ LPR cameras are set up to read plates and are added to Valerus.
> ➢ The list of known plates is added to the LPR cameras:
>   o An "Authorized" list containing all known employee license plates.
> ➢ LPR cameras are configured to send all LPR reads to Valerus.
> ➢ Valerus is set to either store for Search purposes or with alarm rule to respond to these specific events (not to all).

The difference is in the way the lists in the cameras are set up and what they send to Valerus. The rest of the configuration will be similar to System Configuration A described above.

In Configuration A, a list containing the Authorized plates will be added in the camera but <u>will not</u> send its events to Valerus, while the "not in list" list <u>will send</u> the events. Valerus will now have only those events that the plate read was not in the list (not a known employee).

In Configuration B, a list containing the Authorized plates will be added in the camera and set to send its events to Valerus in addition to the "not in list" one. Valerus will now have all the events and can define rules based on the list name that will part of the event information.

Integration Partners

A Vicon LPR system can be integrated with the Valerus system. Once the integration configuration is complete, events from the LPR system can be received in Valerus. In this way, for example, if an LPR sensor detects a suspicious license plate number (typically will be flagged as "blocklisted"), the related camera in the parking lot can provide video of the car along with the LPR information.

- From the Valerus main interface, select the Configuration tab from the top. Under Network Devices, select Integration Partners.
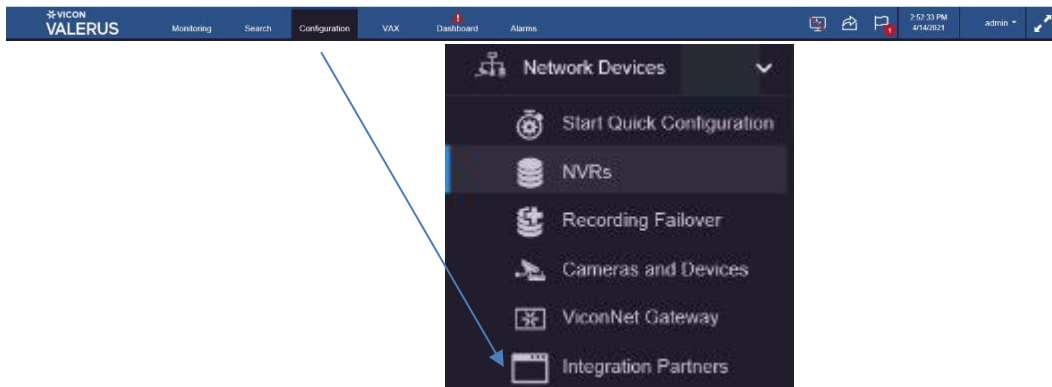
- Click Add Partner. The Add Partner System screen displays as below.
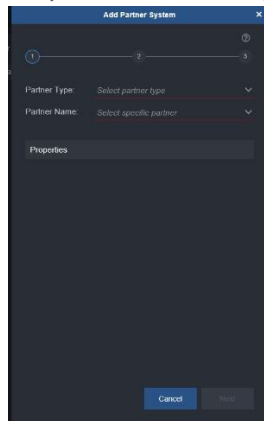
- From the Partner Type, select LPR. From the Partner Name, select Vicon LPR. Fill in the Properties fields as required. Enter a Name for the partner to be displayed in Valerus and the Port number Make sure it is the same port that the camera was set to send the events on. Click Next
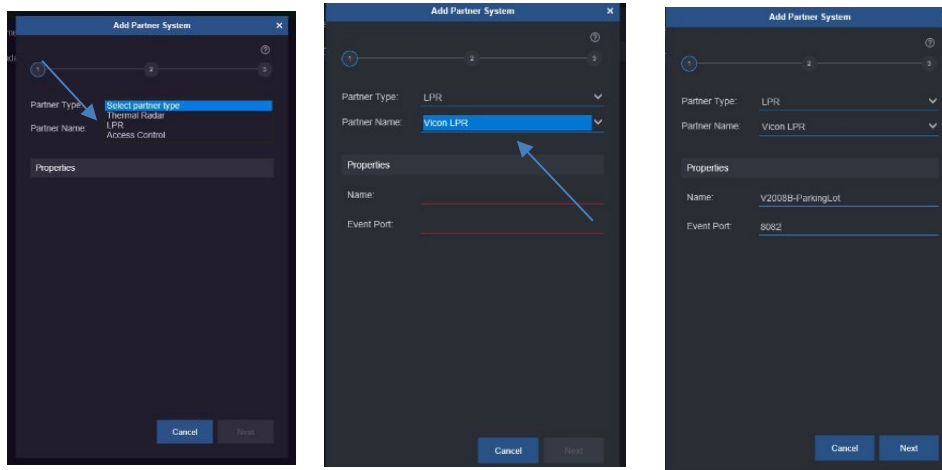
- In a large system, it is expected that only a certain number of cameras or video channels will be used to process for license plate recognition (f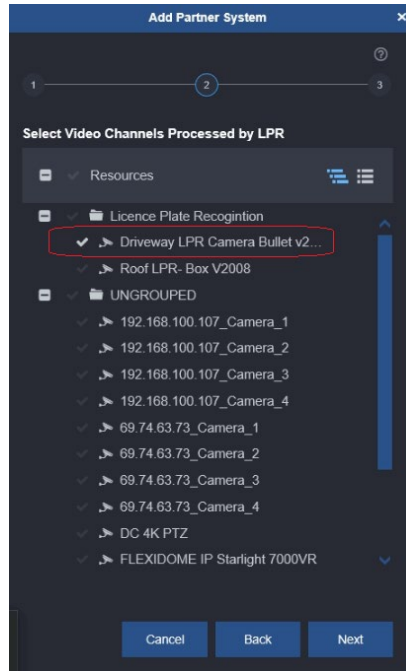or example the cameras covering entry to the parking garage). The entire list will be presented here, allowing you to select the video channel resources that will be processed by LPR from the list. Select the video channel for the camera. This is the same video channel used to get the Resource ID and will sync the LPR events with it. Click Next.

- It is not required to select an Event Type at this time; it is grayed out.
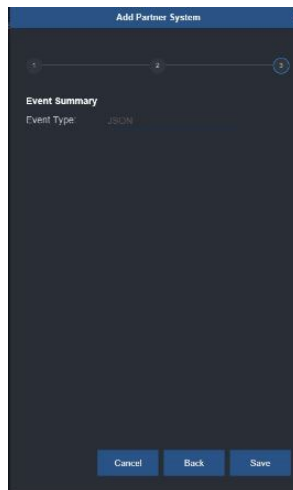

- Click Save. The partner is now listed on the Integration Partner screen. The Properties of the partner are listed to the right. The video channels selected for this device can be changed by clicking the Edit Device button; this may be required if channels are added or removed from the Vicon-LPR system.
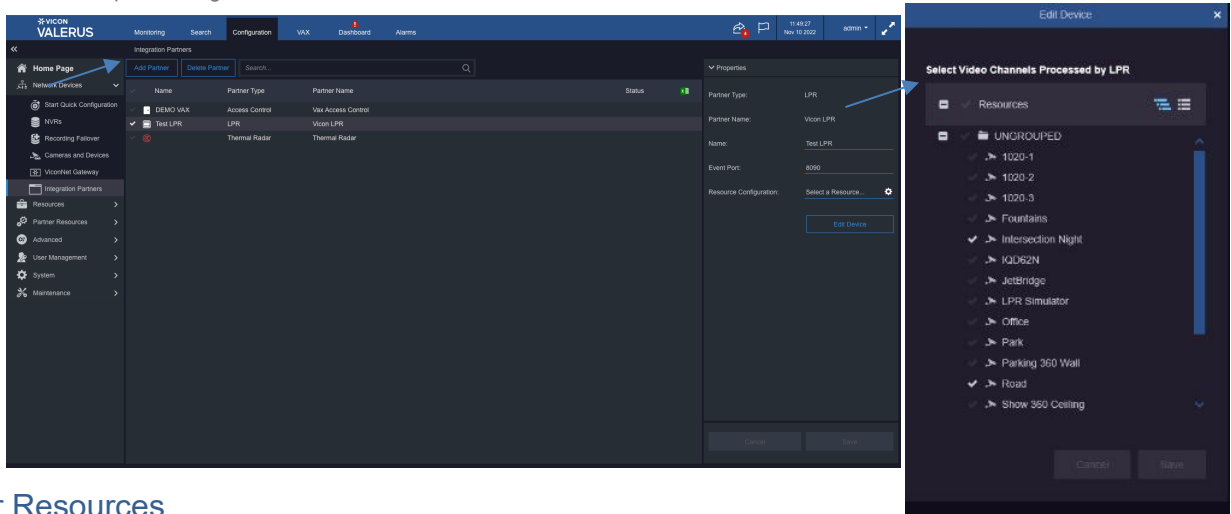
Partner Resources

After the LPR system has been added to Valerus, LPR resources are created for it and can be edited.

- Under Configuration, select Partner Resources, LPR Sensor. The following screen displays, showing the sensors that were previously configured under Integration Partners.
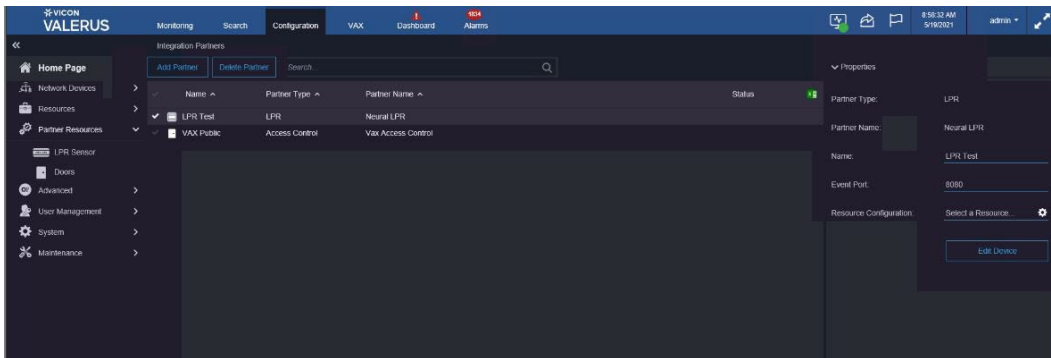
- The properties of each resource are shown, including the Partner type, its name and Numeric ID (if assigned). The Device it was associated with in Integration Partner configuration is shown, with a direct link to it, as needed. The Visible button determines if this resource will be listed in the appropriate resources list and on the Map screen.

- From here, a Related Resources can also be selected. Select the checkmark next to the desired resource; click Save. For example, if there is a camera near where the LPR camera is located (like a parking garage), it can be selected to display additional video with a different angle at the site where the car license plate is being read.
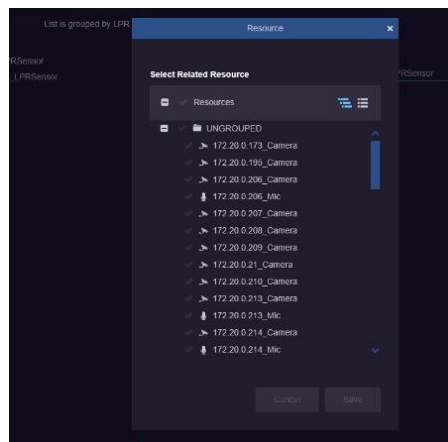
- The LPR sensor(s) will show on the Resources list and can be dragged to a tile for display. If there is an event, it will display in the tile as below. If there is no event, a message will display saying waiting for event data.
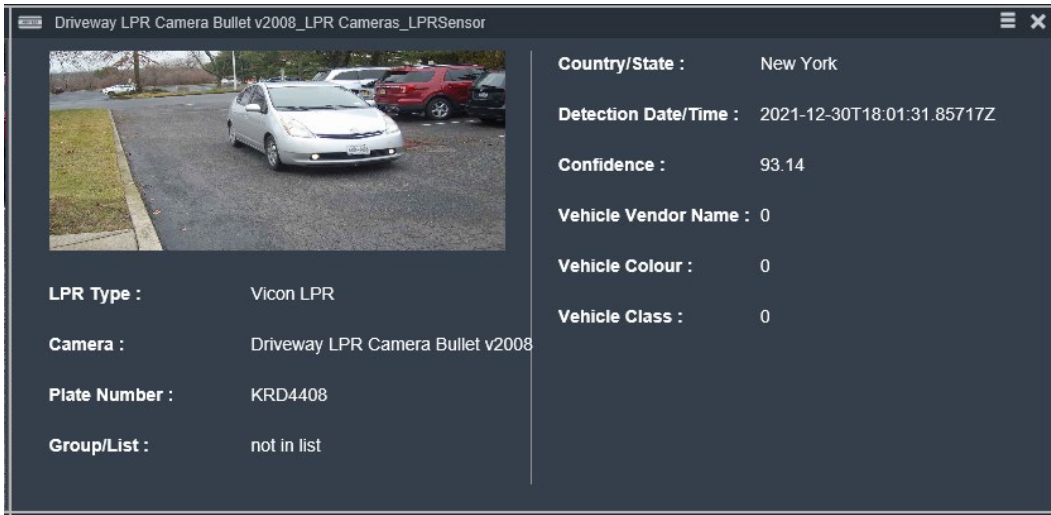
- The LPR sensor(s) is a resource that can be added to both a GEO and static map; a green LPR label will be shown on the map, allowing you to place it either next to the camera icon whose video is used for processing or by itself. When the map is displayed on the Monitoring screen, hovering over the LPR icon will show the properties of the device.

- When a license plate is read by the LPR system, it will be shown as a text bubble above the icon.

- If an alarm event for this LPR sensor is triggered (for example an alarm was set to alert if a blocklisted plate was read), the LPR icon will turn red, indicating it is in an alarmed state.
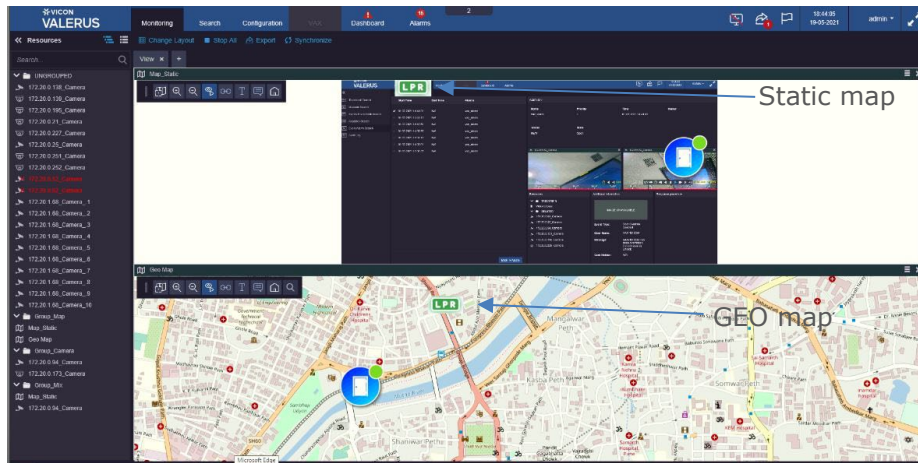

Setting Up Rules and Alarms

The Rules screen determines what happens when an event is triggered. Refer to the full Valerus user manual for details on how to set up rules and alarms.

- Under Valerus Configuration, Advanced, select Rules or Alarms.
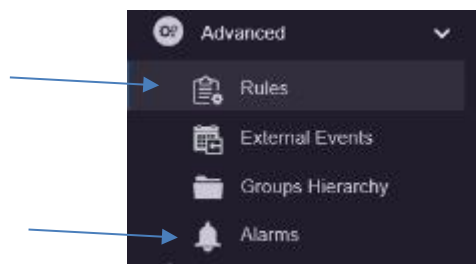
- When setting up the Rule, Specify Event, select event type as Integration Partner and LPR and Vicon LPR from the dropdown. Select the resource that will read the license plate. Click Configure Terms to define the parameters for the event. In the Scenarios above, select Plate Type, then Equals and then either not in list or Authorized list.
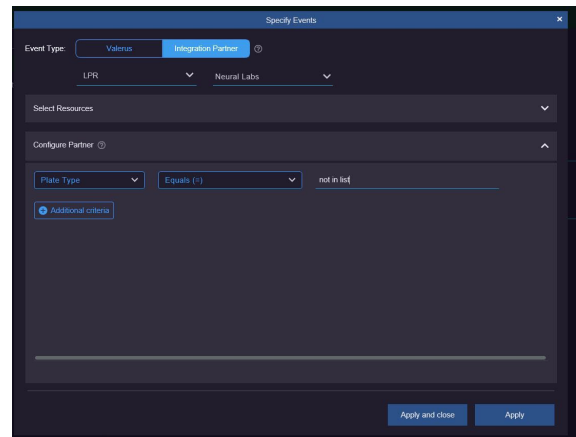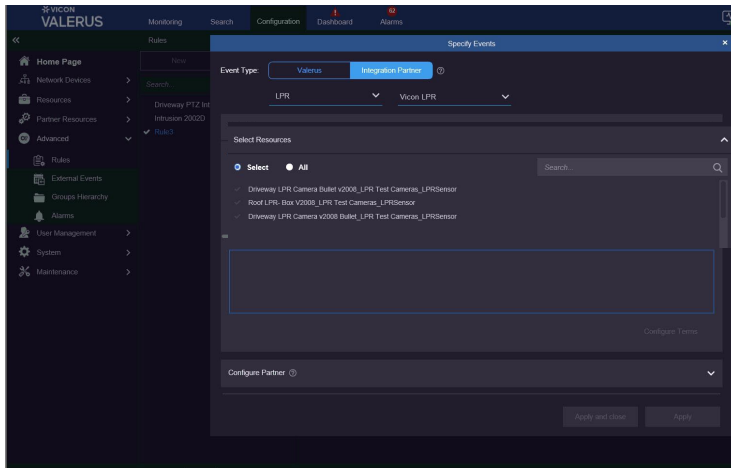

- When the rule is configured, click Apply and close. Then select the action to be taken when the event occurs under ON Actions.

From the Alarms screen, define which of these events are elevated to an alarm level, what resources are bundled with it and the life cycle for the alarm. When defining alarms for the integrated Vicon-LPR system, it can be determined how Valerus will respond to certain set conditions.

- Click the New button. The alarms editor screen displays. From Event, select Integration Partner.
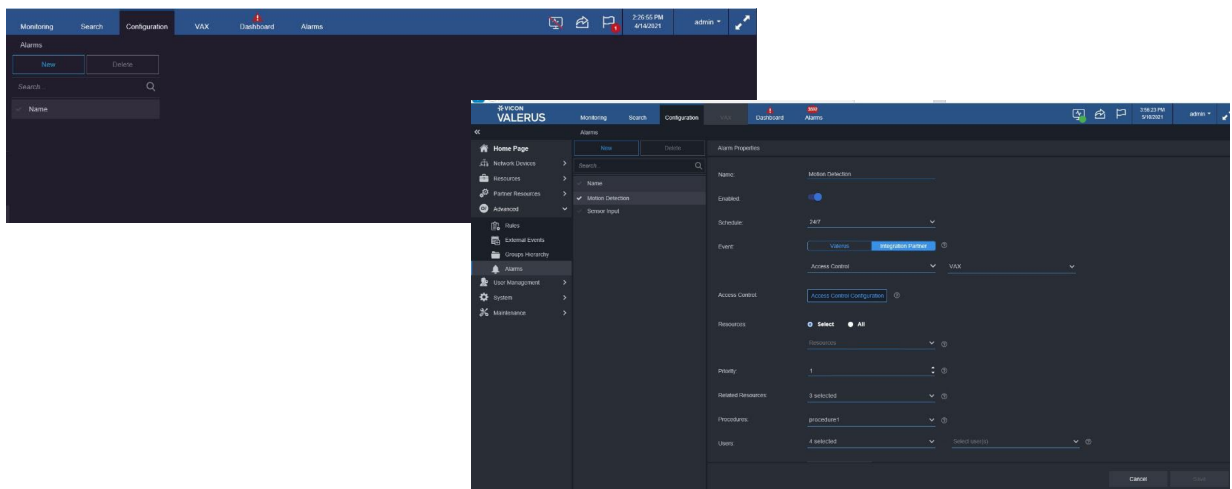
- Assign a name to the alarm in the Name field.

- The Enable/Disable button allows the alarm to be temporarily disabled as needed without deleting it. Use the slide button to enable/disable.

- Select a schedule from the dropdown list to define a schedule for this specific alarm to run on. This allows using an existing schedule or creating a new schedule using the scheduling system in Valerus. It is important to identify the correct schedule for each alarm to minimize the number of unwanted alarms.

- In the Event field, select Integration Partner for events that will be the trigger this alarm. Then select LPR event type from the dropdown and Vicon LPR from the next dropdown.
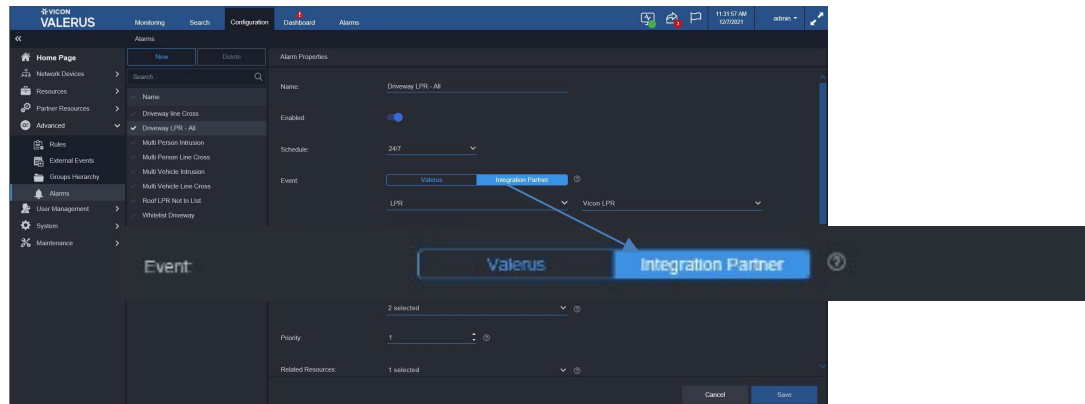
Note: If the selected system does not exist in Valerus or it exists but has no resources set (no LPR sensors), you will not be able to define the alarm for it.
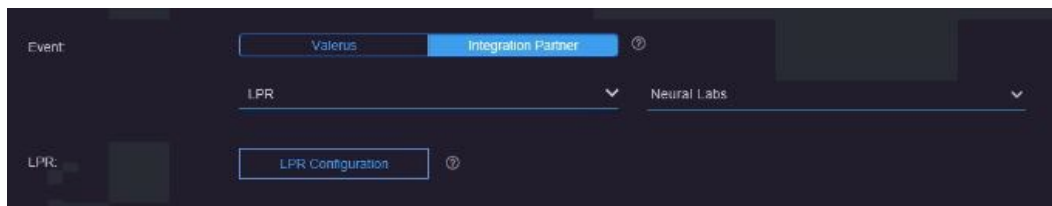
- Select LPR Configuration to open the following screen.
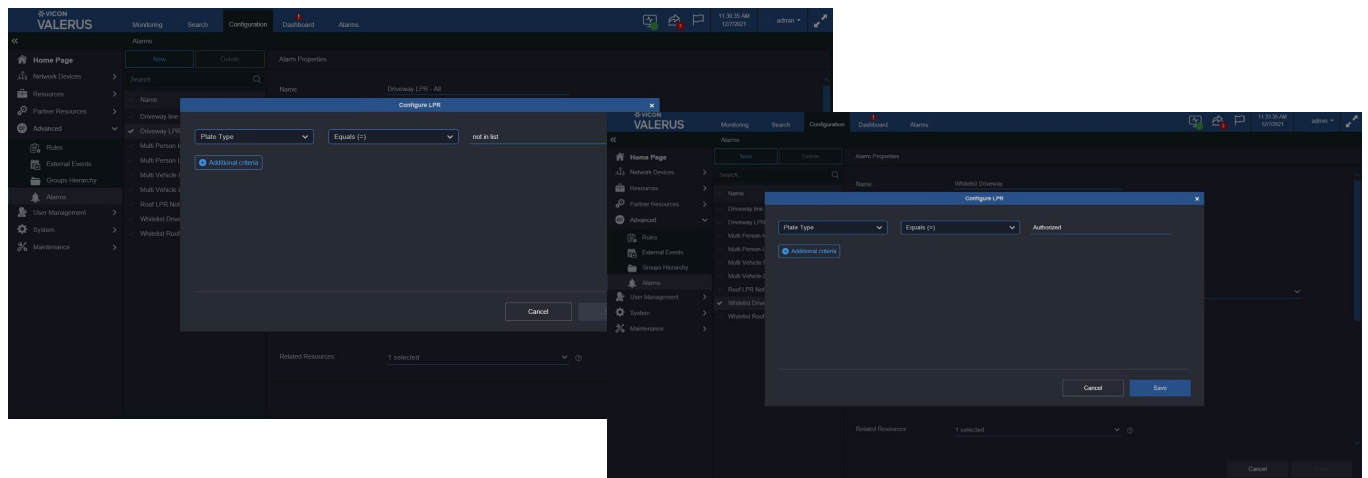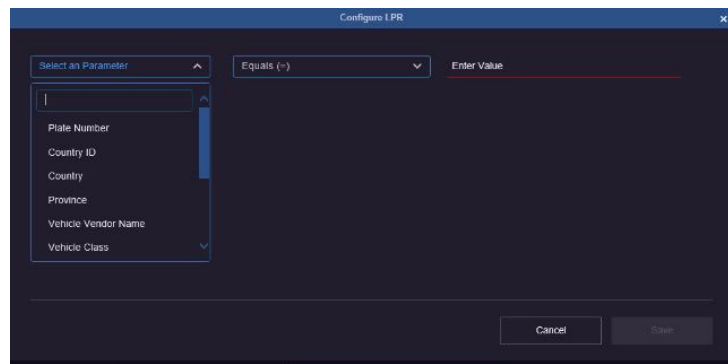
- Select the parameter needed from the dropdown list. Select an expression from the field for Equals/Contains; this dropdown changes depending on the parameter selected. Finally, enter a Value. Click Save to complete the configuration. The typical type of alarm from an LPR can be

when a license plate type is showing "Blocklist" or when the system spotted a particular vendor of car is being looked for. (The various list configurations are done in the Vicon-LPR system ahead of time; these impact on what is available from the dropdown lists. Refer to the Appendix for details on configuring these lists.)

- To add another option, click Additional criteria. This Additional criteria can be defined as a logical And/Or, meaning either of these can occur or both must occur for an alarm to be triggered. For example, you might want to know if a particular vendor car was identified AND the specific license plate number.

- From the Resources dropdown (Select button), choose the devices (i.e., LPR sensors) that the event is expected to trigger an alarm for. Multiple resources can be selected and will be treated as a logical OR if an alarm occurs; if an event is detected on one or the other device, the alarm will be triggered. Up to 5 devices can be linked to each alarm, so if, for example, 10 LPRs need to be selected, two alarms will need to be defined. An All button can be used to select all resources in the list in a single alarm.

- Enter a priority for the alarm, 1-5 with 1 being the highest. This priority level can be used later to sort the alarms in the Alarms Management screen.

- Using the Related Resources dropdown, select the resource(s) that will also be available when the alarm is triggered, creating an alarm bundle or package. This is useful if there are multiple cameras in the same area with different views (i.e., motion detected from camera A relates to camera B in the same area); having a related camera resource can provide a video display to see the alarm. The related resources will show on the Alarms Management screen along with the triggering resource. Note that the related resources selected here are those that will show in the alarm record in the Alarms Management screen, while the single related resource set for the sensor is used for Rules.

- As an added option, one of the procedures created (remember to create procedures prior to defining the alarms) can be selected to go along with the alarm.

- Select the users who will receive this alarm notification from the roles or users dropdown (or a combination of both). This is important in situations where certain alarms should be shared with specific users while others may need to be shared with different users (for instances where it is inappropriate for some users to view video from certain areas, i.e., alarms from the women's wing in a mixed prison should only go to the women's wing operators).

Alarms Management

The Alarms tab on the top of the Valerus interface opens a dedicated for Alarms Management and shows the alarms along with their status. These are the events that have been elevated to alarm status set in the Advanced, Alarms screen in Configuration, including LPR alarms. From this screen, the operator can work to review and categorize the alarms. This tab can be moved to another monitor for ease of use. **Refer to the Alarms Management Guide for details on using this screen.**

- At the top of the alarm page, there are several filtering options meant to simplify the selection of the alarms the operator needs to view and work on. In the Search field, LPR can be entered to sort the alarm list for only those types of alarms.
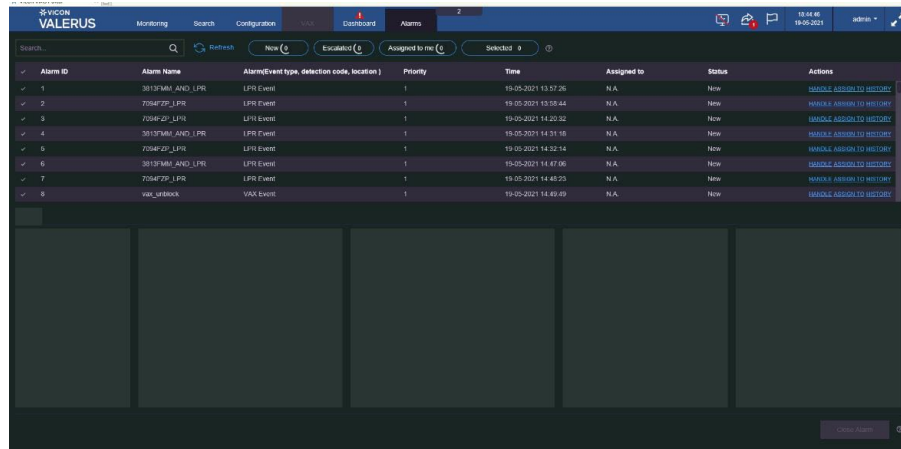

- After the list is sorted to show LPR alarms, each alarm can be selected to assign or handle. Multiple alarms can be selected. When an alarm has been selected, its details will display in the area at the bottom of the screen. The Additional Information area will display the details provided by the LPR system.
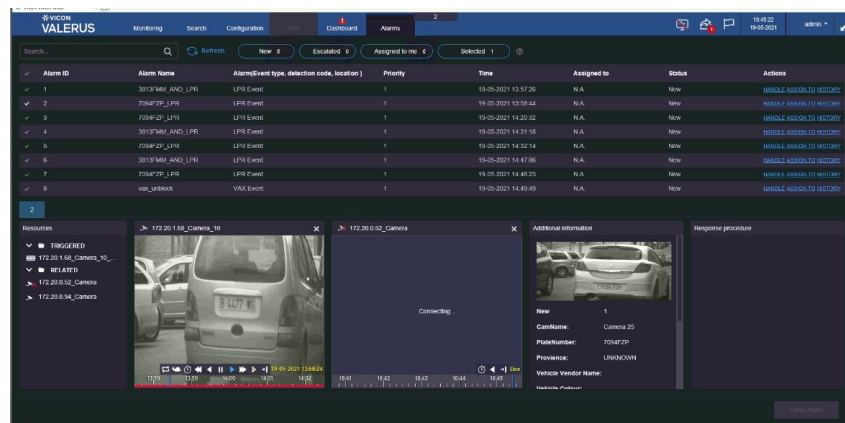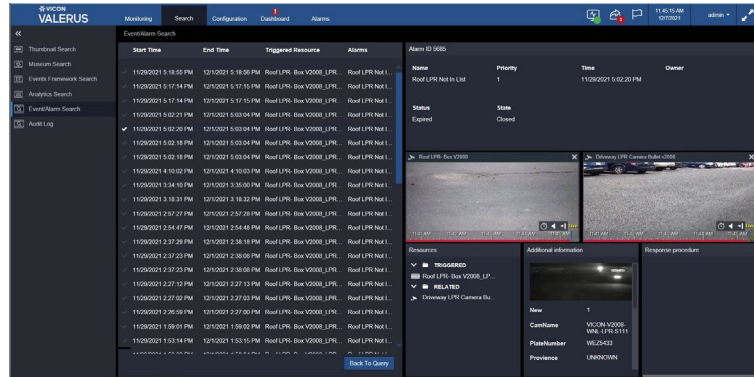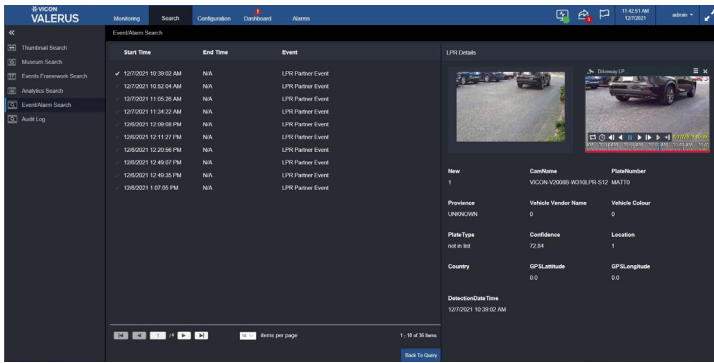

Search for Events/Alarms

Under the Search tab, select Event/Alarm Search. Refer to the full Valerus user manual for details about the Search function.
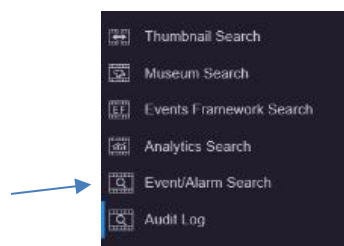
- Select the Event or Alarm to start the search.

When LPR Event or Alarm is selected, an Advanced Filters button is provided that allows the user to refine their search, including searching by plate number.

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