



Installation Manual

VCA



Let's Make Things Safer!



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1 Introduction

This manual is intended for administrators of WebCCTV and is applicable for version 4.8.0.0 or higher. You need to have the WebCCTV Alarm Component installed.



WebCCTV can be replaced by GuardNVR in this manual at all times.



The WebCCTV server has to be installed in order to use the VCA (Video Content Analysis).



WebCCTV Alarm Component of the same version of WebCCTV has to be installed if you wish to use VCA for triggering actions such as setting off the alarm, recording a video, sound notification, changing PTZ camera position, etc.

VCA, or Video Content Analysis, is an intelligent way to generate alarms based on behaviour of objects – people, vehicles, animals, etc. – detected by a camera.

VCA has been integrated in Quadrox WebCCTVNVR/GuardNVR software to be used with any of the connected cameras. It can be used with analogue and network cameras of any model and resolution, from VGA to 1-, 3- or 5-Megapixel.

VCA software was implemented into WebCCTV but can only be used when a VCA license is bought and activated. This license can be retrieved separately, to use on any analog or IP camera.

When configuring VCA, you need to set up rules for every parameter to analyse. These rules trigger an alarm. These alarms can be set up with the WebCCTV Alarm Component; see **Alarm Component Installation Manual** and **Alarms** section of **WebCCTV User Manual**.

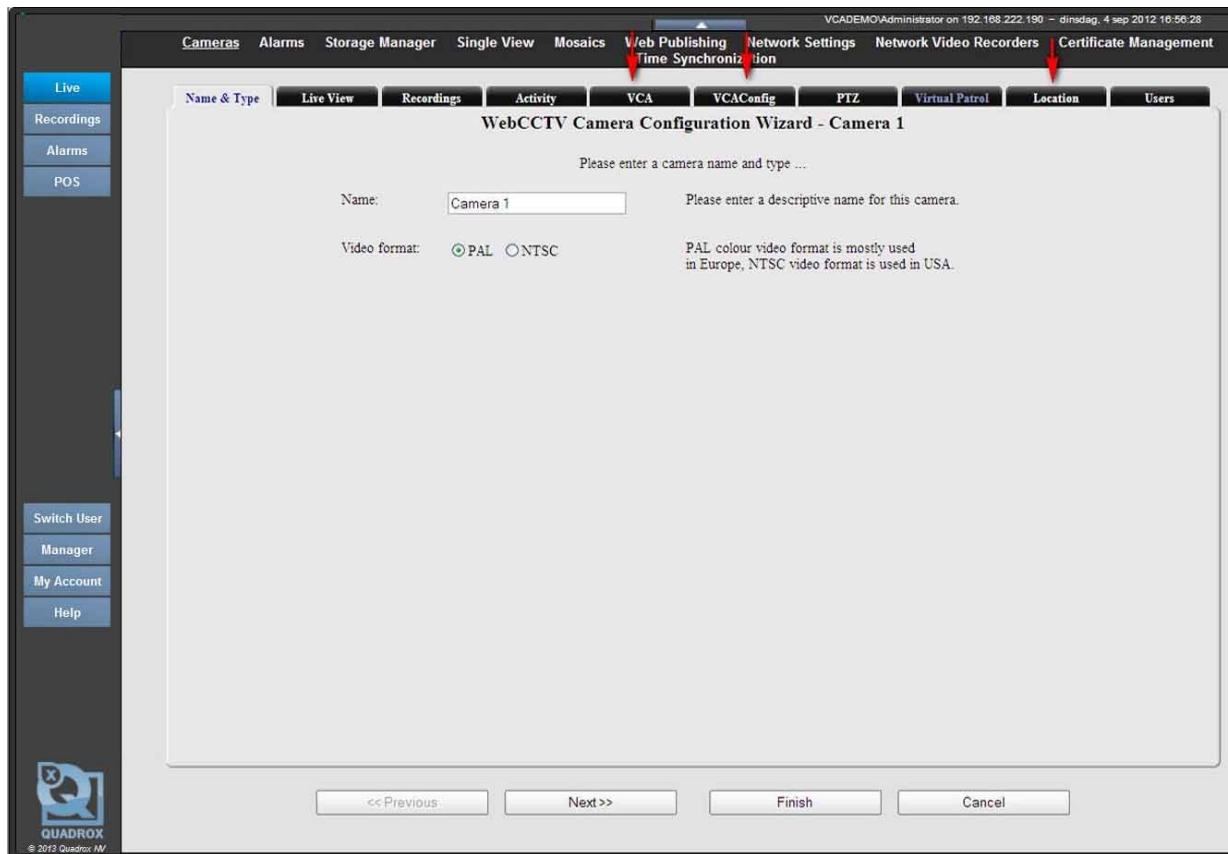
When your VCA license was activated, the user interface will show the VCA button in the upper right corner when you open the camera with enabled VCA in Video Browser's Live View window. The selected zones for the VCA will also be shown.



VCA enabled Camera

The configuration of the VCA settings is done through the camera wizard of WebCCV which can be found in WebCCTV Manager under Settings → Cameras → Click 'Edit' on the camera you want to configure the VCA settings for.

Now you enter the camera wizard, where you will see extra tabs: VCA and VCA Config.



Camera Wizard with VCA tabs

You can check if VCA license is activated on your WebCCTV. To do so, open Video Manager and navigate to Info. Check the field Allowed VCA Cameras. This number indicates how many cameras can use VCA on your PC. If you see “None”, then your WebCCTV does not have a VCA license. To obtain a license, you will need to request a VCA token via email: support@quadrox.be or phone: +32 (16) 582585.

After obtaining a token you can proceed with activating VCA on your system (see Chapter 2: Activating VCA License of this manual).

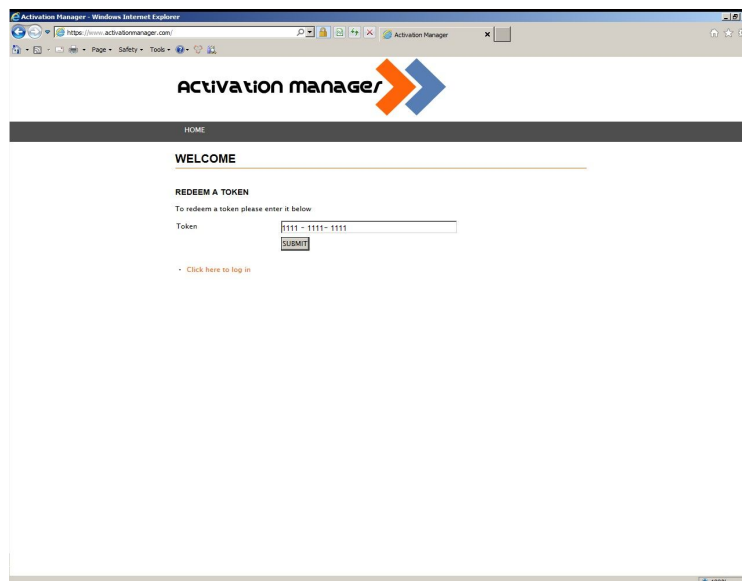
2 Activating VCA License



To activate VCA on your WebCCTV 4.7.7.0 and higher, you should redeem the VCA token and generate a license valid for your specific hardware configuration. You can obtain a VCA activation token by contacting Quadrox office via support@quadrox.be or +32 (16) 582585.

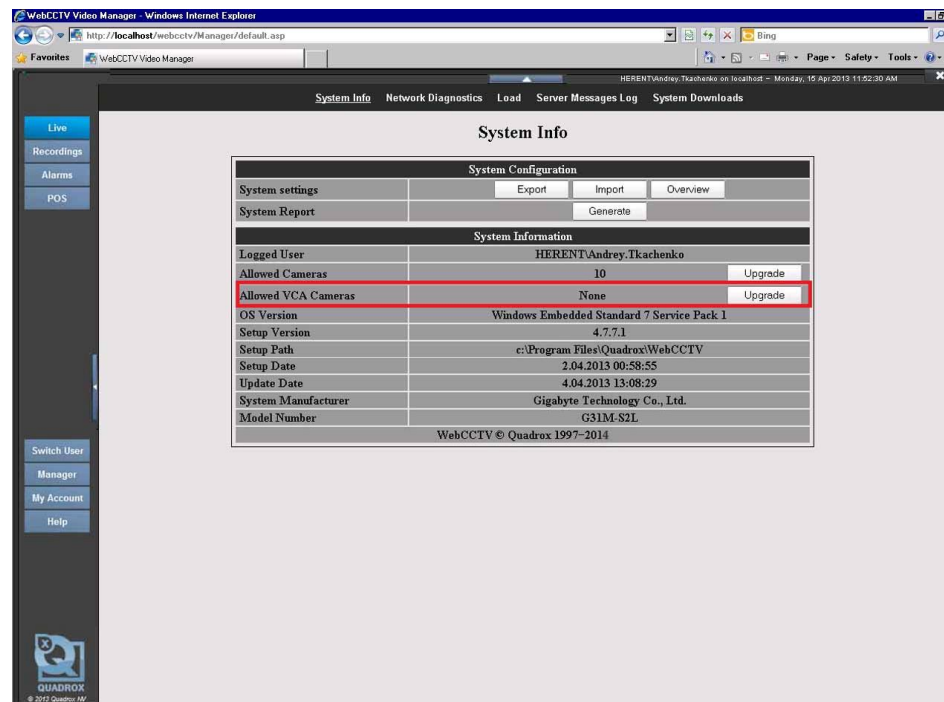
After you receive your activation token, you should perform the following steps to obtain and activate your VCA license:

1. Go to <http://www.activationmanager.com/> with your Internet Explorer
2. Enter a token you obtained in the “Token” field:



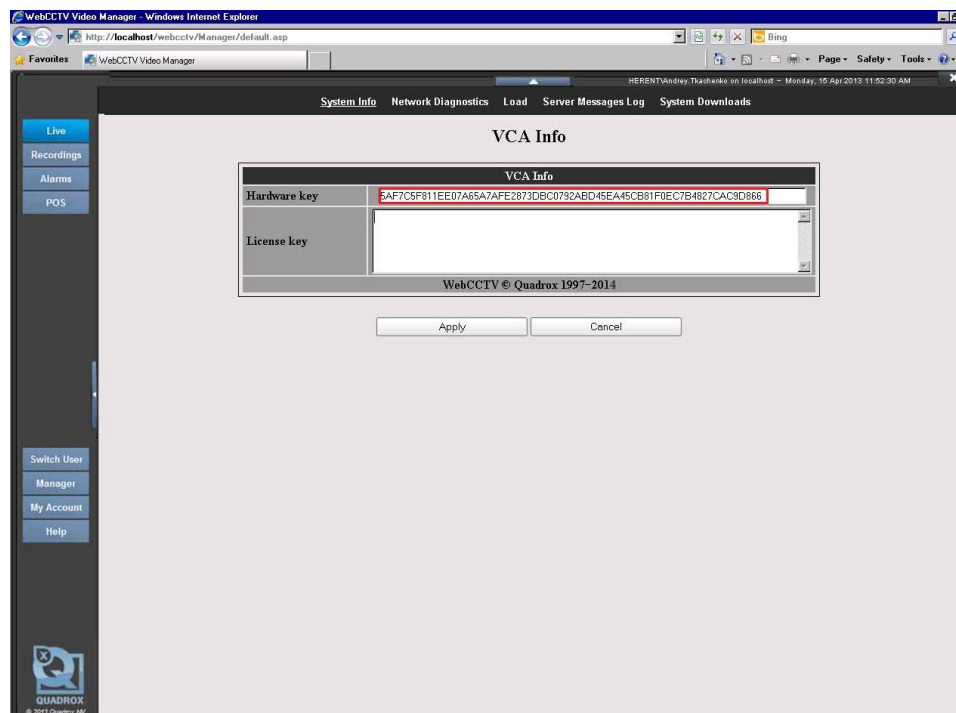
Activation Manager main page

3. Click “Submit.
4. In a new window of Internet Explorer open WebCCTV Video Manager. Don’t close **the Activation Manager window!**
5. In WebCCTV Video Manager, go to “Info” tab, find the line “Allowed VCA cameras” and click “Upgrade” button there:



WebCCTV System Info page – Allowed VCA Cameras

6. Copy the Hardware key from the “VCA Info” page:



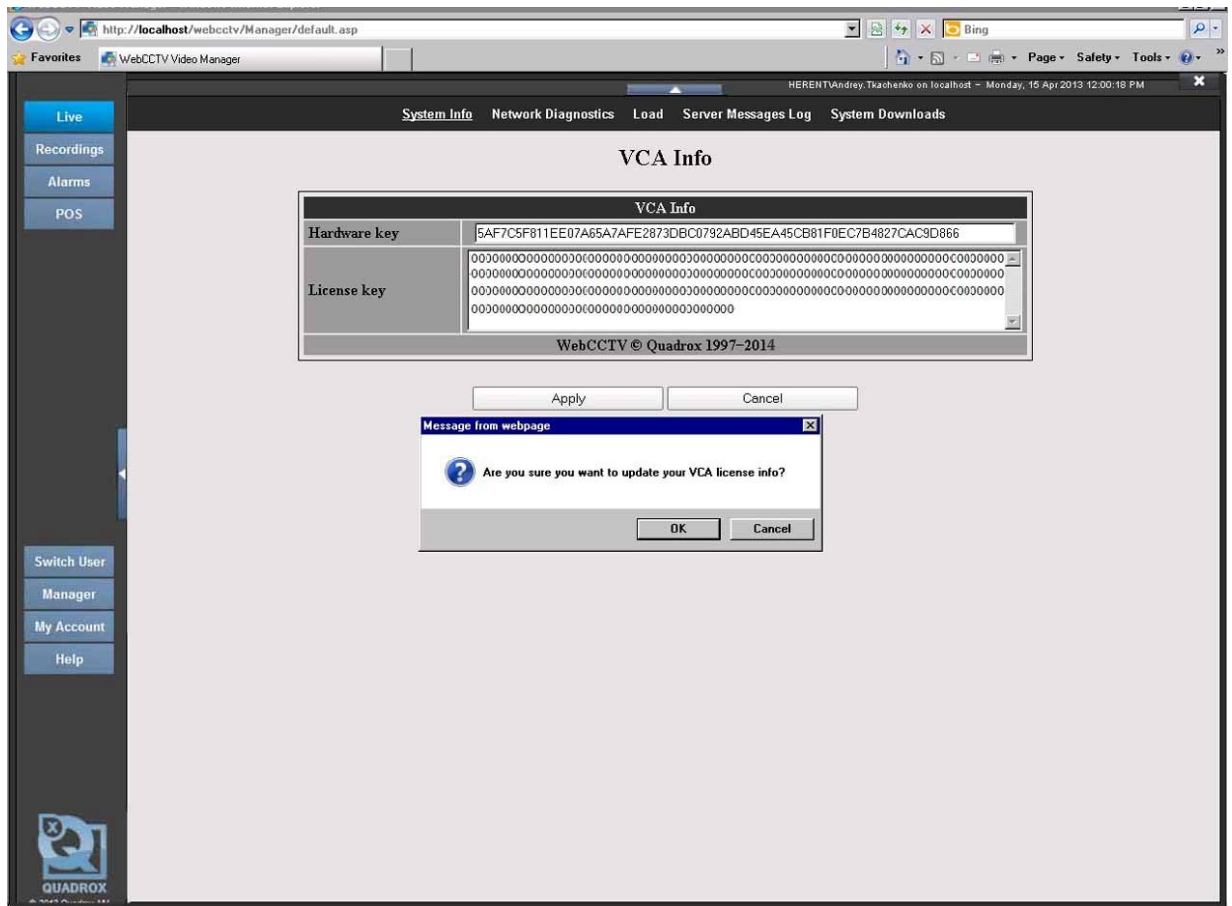
WebCCTV VCA Info

7. Switch back to Activation Manager page in Internet Explorer. **Don't close Video Manager!**
8. Paste the Hardware key you copied from Video Manager:



- ## Activation Manager – VCA License generation page

- ## Version 4.9 Series



WebCCTV VCA Info – License Confirmation

14. Restart WebCCTV Video Server.
15. After restart is complete, go back to Info page of Video Manager and check “Allowed VCA Cameras” to see if the activation was successful.

3 Configuration



To work, VCA needs to retrieve an absolute minimum of 8 fps (frames/second) in JPEG compression from the camera. We strongly advice to make sure that camera delivers 15 fps or more to get the best result. For H264 and MPEG4 compression you need to use default 15fps for best results. You can check the actual framerate of your camera: open WebCCTVNVR Video Browser's Live View, hold CTRL button and right-click right on the image. A pop-up window will show the actual frame rate. If the framerate is lower than 10 FPS, VCA might not work as expected.

The following tabs in the camera wizard need to be filled in:

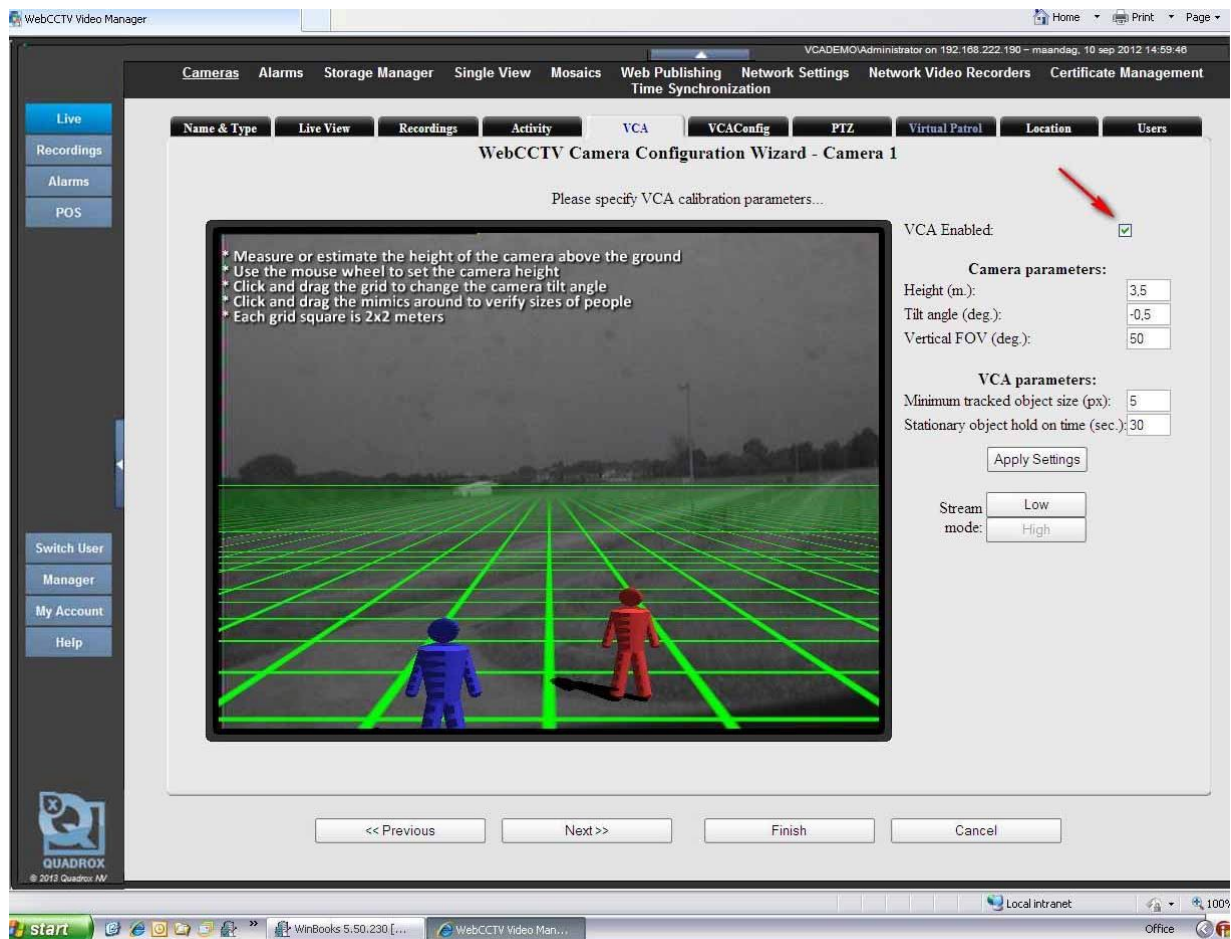
- VCA
- VCA Config

3.1 VCA

To be able to change the camera parameters, VCA needs to be enabled. To enable VCA, go to Video Manager → Settings → Cameras. Click 'Edit' link for the camera where you want to enable and configure VCA. Switch to VCA tab and check the VCA Enabled checkbox.



Note: If you already have VCA enabled on as many cameras as your VCA license allows, you will not be able to enable VCA for additional cameras. You will need to disable VCA on some of the previously configured cameras, or contact support for additional VCA license.



VCA enabled Screen



If you still need to activate your VCA license, please contact Quadrox support for the activation of this license via support@quadrox.be or +32 (16) 582585.

After enabling VCA, click Finish and restart WebCCTV.

3.1.1 Camera Parameters

To use the VCA zones and rules correctly, the camera needs to be calibrated. This is done through the camera parameters. The proper positioning of the camera makes sure the recognition of the object (size, speed) is more accurate

1. Height (meters): how height is the installed camera positioned
2. Tilt Angle (degrees): this angle normally varies between -45° and $+45^{\circ}$
3. Vertical FOV (Field of View) (degrees): defines the width angle of the camera lens. Usual lenses have around $45-50^{\circ}$; a Tele lens has a smaller width, and Wide Angle lenses can have more.

If you know the absolute numbers of the parameters, you can enter the information manually. If you do not know the parameters, you can click on the screen with the video on the right side and follow the onscreen instructions to change the height and tilt angle of the camera:

- Measure or estimate the height of the camera above the ground

- Use the mouse wheel to set the camera height
- Click and drag the grid to change the camera tilt angle
- Click and drag the mimics around to verify sizes of people
- Each grid square is 2x2 meters

The purpose of this is to receive approximately the same view as in the live view of the camera. The green line represents the horizon. If you feel you cannot get the same view; try changing the FOV by reducing or increasing the degrees. Only Height and Tilt Angle can be changed using the grid.

3.1.2 VCA Parameters

You also see two VCA parameters, Minimum tracked object size and Stationary object hold on time.

- Minimum tracked object size defines how big an object should be to be tracked by VCA. It is defined in pixels of a CIF image. Objects smaller than this size will not be tracked.
- Stationary object hold on time defines how long a non-moving object in the VCA zone will be tracked after it stops moving. (e.g. when a car stops in the zone and a passenger steps out and leaves the zone, the car will be ignored by the VCA after 60 seconds)

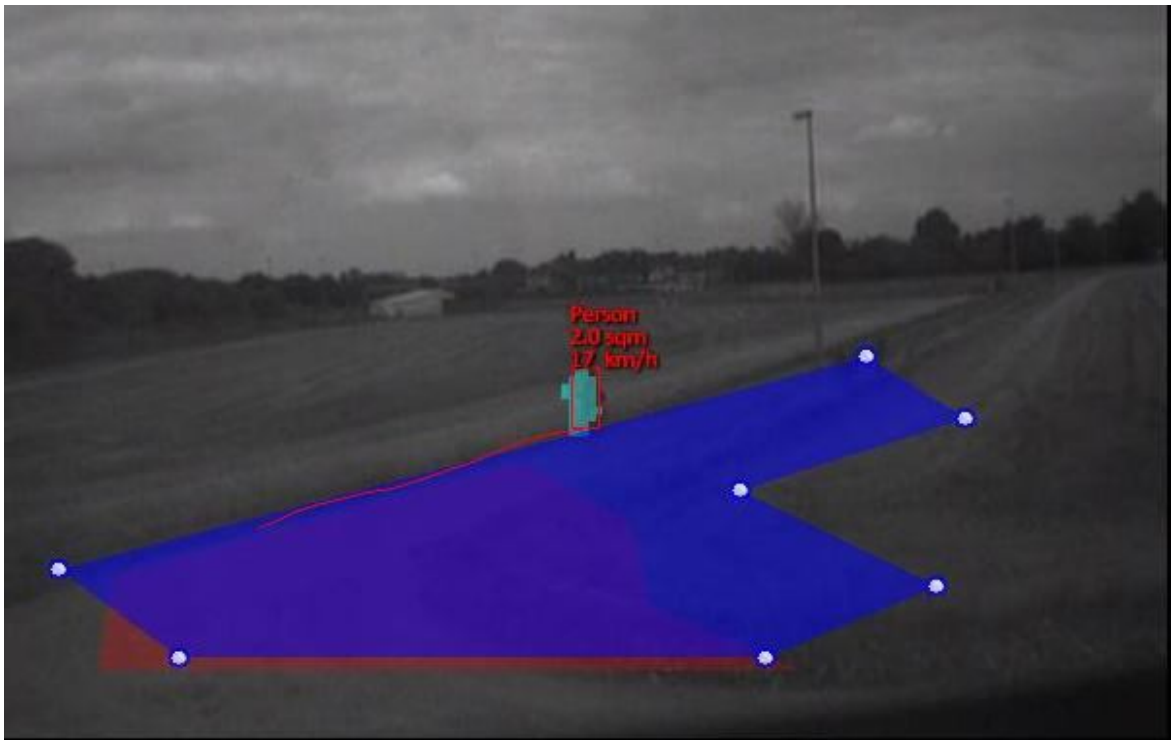
After you have changed the Camera Parameters, please click Apply Settings. Your settings will now be saved.

3.1.3 Streaming

To access and configure the VCA over the Internet, it is best to put the streaming mode to Low. For local streaming, it can be put to High.

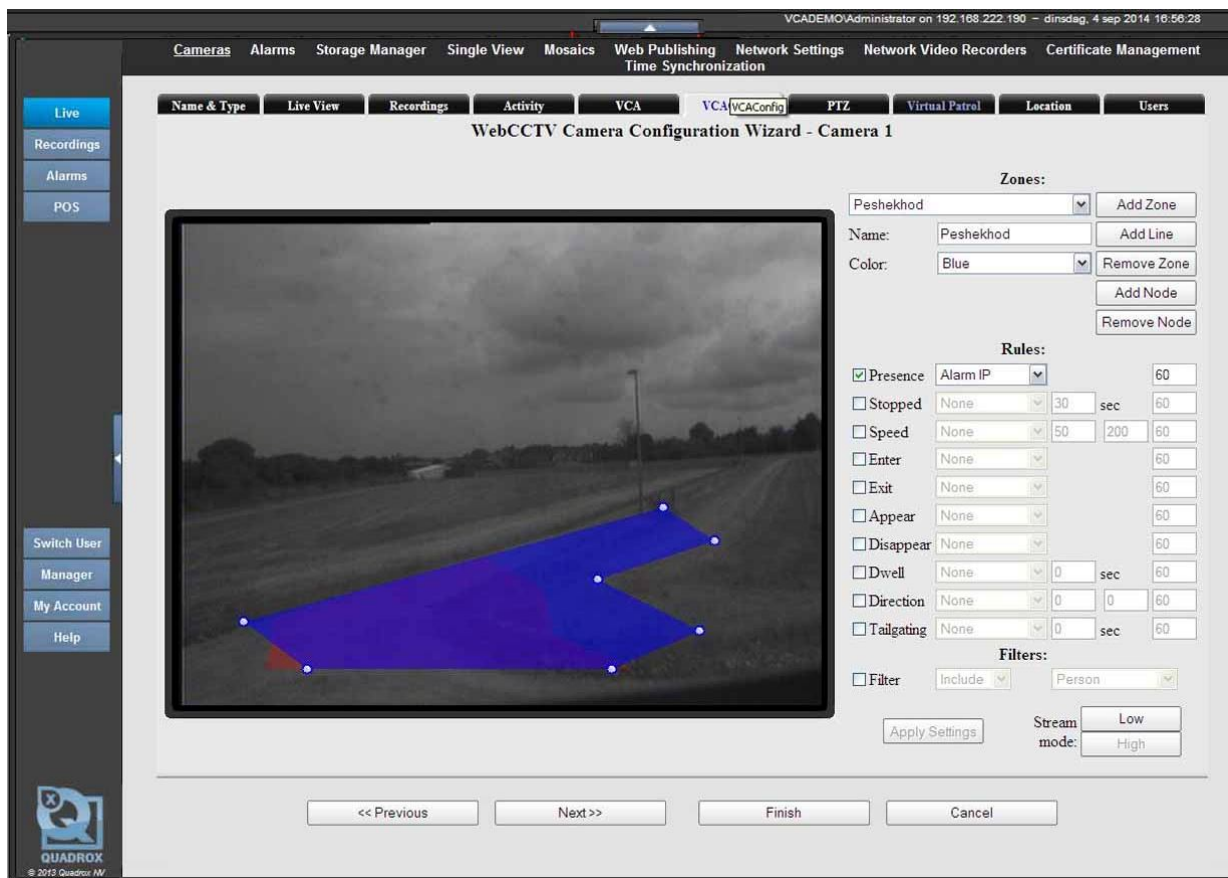
3.2 VCA Config

In this tab, you can configure the zones in which the VCA needs to happen, and the rules you want to track. After finishing the configuration, the VCA will display the route, size, speed and type of the recognized object. Through the screen, you might see light blue pixels. They are the minimum tracked object types that need to be recognized and that were defined in the VCA tab.



VCA Configuration screen with tracking

3.2.1 Zones



VCA Configuration screen

3.2.1.1 *Select zone*

You can choose from already created zones, or make a new zone. For this, click on Add Zone. A new square will appear. In the Name field, you can now enter a new name for the zone; and you can also change the color you want the zone to be visualized in.

To change the shape and position of the zone, you can drag and drop it; place the mouse pointer on a node and move it; or add and remove new nodes (see right, below Add Zone).

Add line is used as a special zone, and normally only used for counting and direction. For counting, we prefer to use a camera which is specified for this. This function is not yet fully operational.

3.2.2 *Rules*

For every zone, you can now enter a different set of rules. There are 10 different rules to choose from. For every rule you want to use, you need to specify a software alarm trigger. These alarms should be predefined in the Alarms section of WebCCTV Video Manager.



Note: To be able to create and set up alarms in WebCCTV, you need to install WebCCTV Alarm Component of the same version as your WebCCTV. Please refer to Alarm Component Installation Manual or contact support via support@quadrox.be or +32 (16) 582585.



Note: Procedures for creating and configuring alarms in WebCCTV are described in WebCCTV User Manual, chapter **3.3.2 Alarms**. You will need to add Generic Alarm Driver (see chapter **3.3.2.3 Generic Alarm Driver**) first, then create and configure necessary number of alarms to use with VCA (see chapter **3.3.2.5 Alarm Configuration Wizard**).

At the end of every rule, there also is the possibility to add a minimum time interval between two alarms. By default this is set at 60 seconds. It means that when the same action happens within this time frame of 60 seconds, no alarm will be triggered.

3.2.2.1 *Presence*

When an object enters the zone (e.g. the leg of a person); the rule is triggered. The object is now present.

3.2.2.2 *Stopped*

An alarm is triggered when an object stops in the zone for a duration that is more than the time that was specified.

3.2.2.3 *Speed*

The alarm is triggered when the speed of the object is inside the particular interval. The interval is set in km/h. If the object is moving slower or faster than the specified limits, the alarm will not be triggered.

3.2.2.4 *Enter and Exit*

This is a directional rule. The alarm is triggered when the object enters or exits the zone borders.

3.2.2.5 *(Dis)Appear*

The alarm is triggered when the VCA cannot see how the object appears or disappears. E.g. a bird came from behind a tree that was partially in and partially out of the zone; or a person suddenly appears from behind a wall that is present in the zone.

3.2.2.6 *Dwell*

An object needs to hang around in a zone for the minimum specified time before it triggers the alarm.

3.2.2.7 *Direction*

Direction only works in combination with the Line you can add (instead of a zone). When crossing the line in a particular direction, the alarm will be triggered (e.g. when a car violates a traffic sign and makes an illegal turn).

There are 2 parameters that need to be defined here as well:

- Direction (an object must be moving to trigger an alarm) between 0 and 360°
- Variance (a tolerance margin) in degrees.
e.g. a car cannot make a u-turn, but it can cross the direction line to enter a street that lies on 45° of that direction line.

3.2.2.8 *Tailgaiting*

Tailgaiting is useful when monitoring a queue. The alarm will be triggered when a new object (person) appears in the line within a specified time frame.

e.g. this is useful in a store at the POS area. The time interval is set at 10 seconds. If customers come to the POS area with an interval of 12 to 20 seconds, the alarm will not be triggered. If customers come to the POS area with an interval of less than 10 seconds, the alarm will be triggered and an automated message can be sent to notify that a second (or third) POS needs to be opened to prevent long waiting lines.

3.2.3 *Filters*

Each object is classified as one of four object types. This can be a:

- Person: object with size less than 2m² and a speed less than 20km/h
- Group of people: object bigger in size than a person but with speed less than 20km/h
- Vehicle: object with size larger than 2m² and speed more than 20km/h
- Clutter: none of the above (e.g. birds)

A filter can be set up to be not in use, include or exclude any of these object groups. For example, by default you would choose to exclude clutter.

3.2.4 Streaming

As for general VCA configuration, the streaming can be put to High and Low, where Low is preferable for remote connections.

To be able to save the settings, please click Apply Settings.

3.3 General rules

The VCA works best on a camera with framerate of at least 10 fps. The absolute minimum is 8, and 12 is recommended. Please make sure that your camera can provide such framerate, or VCA might not work as expected.

Take into account that VCA needs some time (and space on the image) to recognize an object. Therefore, it is best that the overview of the camera shows more than just the area of interest. The zones you create should have a gap between the image borders to provide to VCA the space and time to catch and classify the objects. If the zones are created too closely to the borders, the filters might not work as expected.



Note: If you want to use analogue cameras on a digitizer card for VCA, keep in mind that on a 4-channel card, you will only be able to use two inputs. On a 16-channel card, you will only be able to use 8 inputs. You will have to decrease the amount of channels per VCA that you want to use.



To work, VCA needs to retrieve an absolute minimum of 8 fps (frames/second) in JPEG compression from the camera. We strongly advice to make sure that camera delivers 15 fps or more to get the best result. For H264 and MPEG4 compression you need to use default 15fps for best results. You can check the actual framerate of your camera: open WebCCTVNVR Video Browser's Live View, hold CTRL button and right-click right on the image. A pop-up window will show the actual frame rate. If the framerate is lower than 10 FPS, VCA might not work as expected.