Ex-Sight.Com™
VACAM ANPR User Manual
Version 2.0

Last Update: 29.11.15

Contents

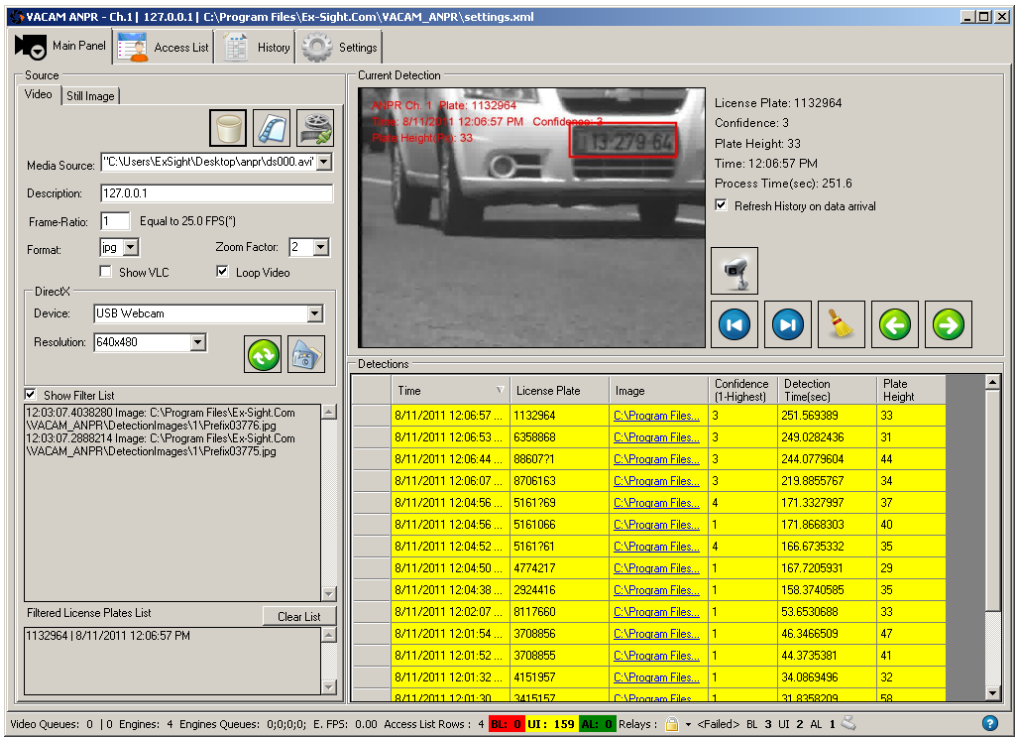
1 Overview

VACAM ANPR is multi channel License Plate Recognition software designed for identification of vehicle license plates, access control, and vehicle management. The system incorporates most advanced multi level recognition algorithms. Each captured plate is matched to predefined vehicle lists which are referred to as “access”, “unidentified”, and “non access”. This classification allows the program to alert for each type of detected plates accordingly. For instance, as a vehicle approaches an entrance gate, it is automatically opened or shut depending on the status of an identified plate. VACAM ANPR operates with IP or Analog video sources based either on constant video stream or on such external triggers as electrical signals, dry contacts, or video content analysis.

1.1 The Advantages of VACAM ANPR

Trigger devices support
Relay support
Frame masking
Advanced license plate search
Plate deviation angle +45° to -45°
Plate filtering
PTZ (Pan|Tilt|Zoom) control
Automatic video signal recovery
Circular storage management
Vehicle detection statistics
Embedded system time sync.
Remote restart support | access list
Username &password authentication

2 VACAM ANPR Menu Panel



MINIMUM REQUIREMENTS

Client:

Dual Core CPU

2GB RAM

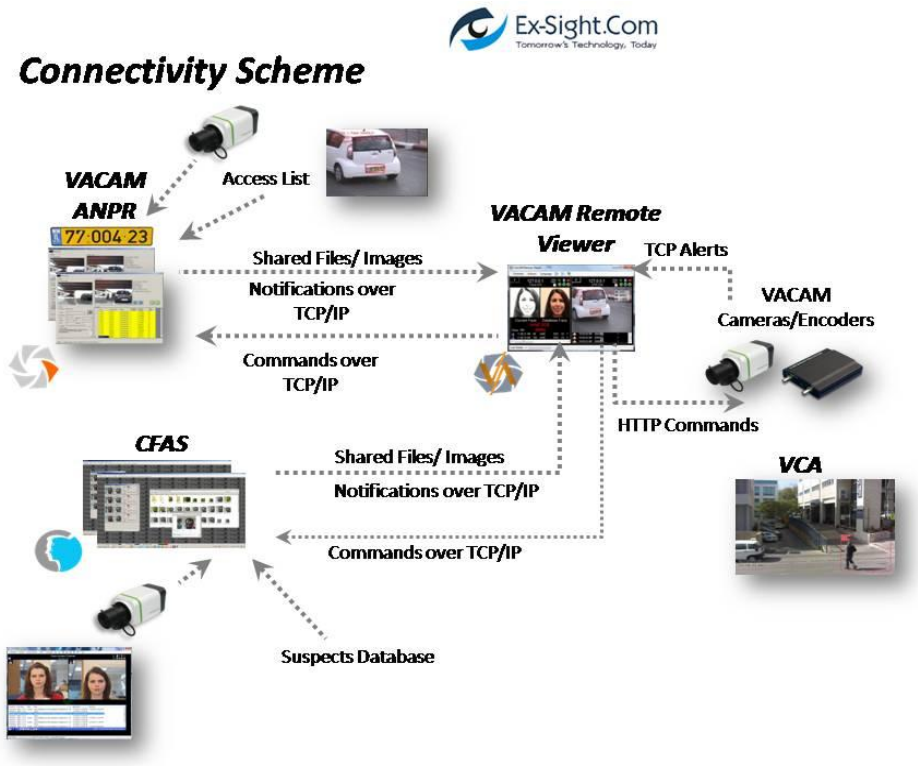
Microsoft Windows (XP/ViSTA/7)

REMOTE VIEWER:
ATOM CPU
1GB RAM
Microsoft Windows (7/XP/Vista)

RECOMMENDED ADJUSTMENT
Visible License Plate
Min. rotation angle between the camera and the vehicle (Max. 45 degrees)

3 VACAM ANPR integration with Ex-Sight's products

VACAM Remote Viewer* Connectivity with *VACAM ANPR



The ***Remote Viewer*** software communicates with *Ex-Sight's* major security products: ***VACAM ANPR*** and ***CFAS***.
Every connection between the **"Remote Application"** (***VACAM ANPR*** or ***CFAS***) to ***VACAM Remote Viewer*** is defined as a **"Remote Channel"**.

Note: To quickly set up remote channels based on default values, refer to the section "First Time Usage".

Every remote channel has 2 TCP/IP ports: the **Command Port** and the **Status Port**. Via these ports, the software communicates with the remote applications. For information about connection setup to remote applications, see section 3.2. ("***VACAM Remote Viewer*** connection to ***VACAM ANPR***").

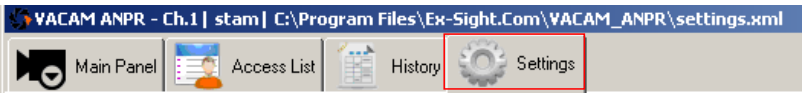
The remote application has an **Access List** (***VACAM ANPR***), or a **Suspect Database** (***CFAS***).

Based on the video source, the application sends alerts to VACAM Remote Viewer. Every alert has 3 components:

1. Details about an alert in the Access List/Suspects Database.
2. An image(s) path for an alert:
   - 2.1 One image for an ANPR (License Plate Recognition) alert.
   - 2.2 Two images for a face alert: an image of the currently captured face and an image of the suspect from the suspect database.
3. Real-time data about an alert, such as its time, confidence level (in ANPR alerts), or the similarity level between the current face and the database face (in face alerts).

The above mentioned alerts are received by ***VACAM Remote Viewer*** and displayed on the respective remote channel.

4 *VACAM ANPR* Settings tab



Communication Ports

Under the "Settings" tab, find the "TCP Communication Ports" category, which contains the following port numbers:

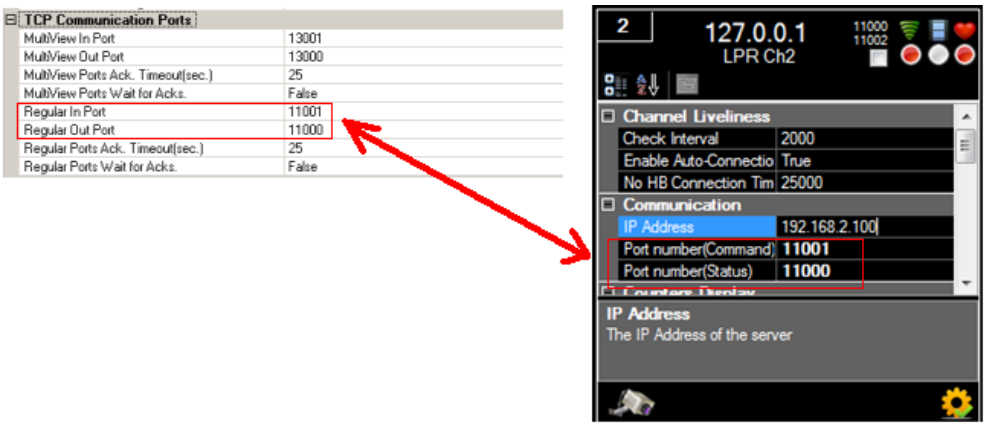
2 sets of **Command** + **Status** ports: the “Regular In Port” & “Regular Out Port” and “MultiView in Port” & “MultiView Out Port”. Select to communicate with either of these sets.

“Regular In Port” and **“MultiView In Port”** are the ports through which VACAM ANPR gets commands from VACAM Remote Viewer. They correspond with the **Command Port** in VACAM Remote Viewer

“Out Port” and **“MultiView Out Port”** are the ports through which VACAM ANPR sends its statuses and alerts to VACAM Remote Viewer. These ports correspond with the **Status Port** in VACAM Remote Viewer.

The default values for these ports are as following:

1. In Port =11001 , Out Port = 11000
2. MultiView In Port=13001, MultiView Out Port =13000



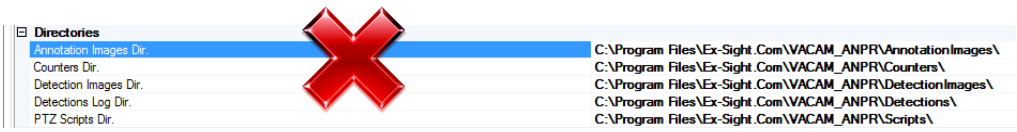
For example, it is possible configure VACAM Remote Viewer to work with VACAM ANPR that is installed on a PC with an IP address = 192.168.2.100 on ‘In Port’ and ‘Out Port’ (instead of the default Multi-View ports):

3. Go to the channel settings (by pressing the channel number on the upper-left corner), and enter corresponding values as shown on the above screenshot, press the “Apply” button on the bottom-right corner.

5 Directories

For the alert images to appear on ***VACAM Remote Viewer***, follow these steps:

1. Share the directory of the Annotation Images (located in the settings under the "Directories" category).
2. Set the "Annotation Images Dir." value to that of the network path of the shared directory.
   Note: In case ***VACAM ANPR*** and ***VACAM Remote Viewer*** run on the same PC, it is possible to set the "Annotation Images Dir." value to the physical path of the shared directory (see the image below).



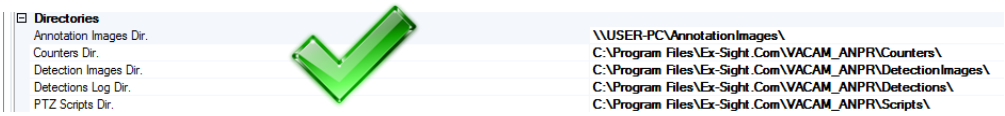
VACAM ANPR "Directories" by default:

The "Annotation Images Dir." is set to a physical path. Thus alert images cannot be displayed /grabbed by ***VACAM Remote Viewer.***

In order to allow remote viewer to grab the images from a different PC, follow these steps:

1 Share the Annotation Images Directory.
2 Set the shared network path as the value for "Annotation Images Dir.".

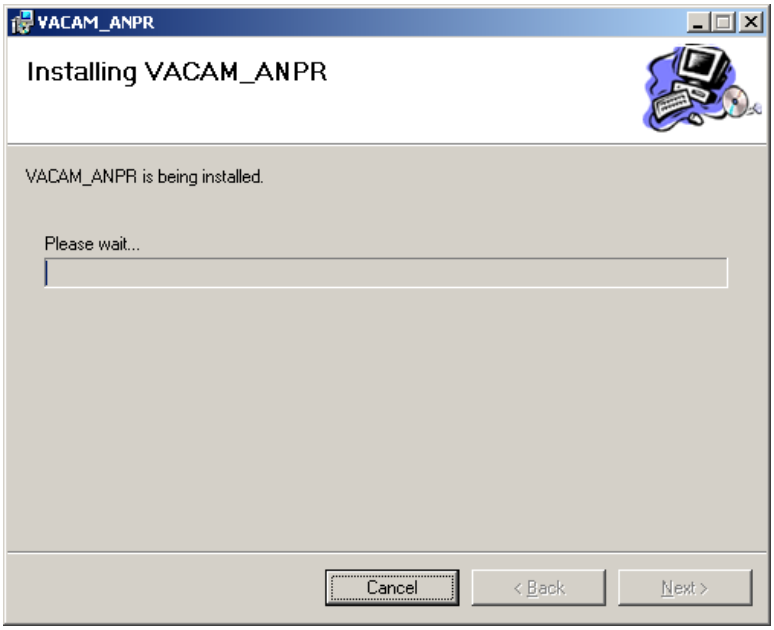
For example:



After completing this procedure, VACAM ANPR will display alert images.

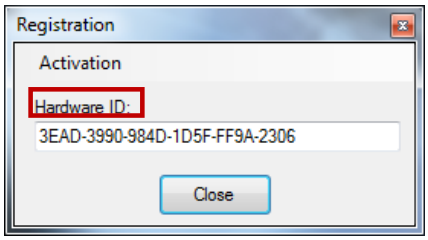
6 Installation Guide

- Download from Ex-Sight's FTP
- Extract contents into a desired folder
- Run **setup.exe**
- Finish setup

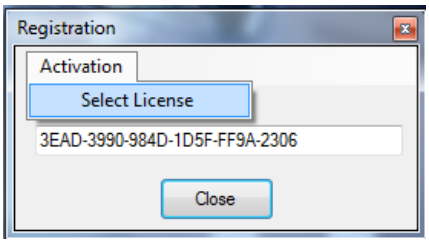


7 The VACAM ANPR Activation

Register/activate your product:
Double click on" VACAM ANPR Activation" icon located on your desktop.
The following window will appear:



To receive the license, copy the hardware ID in the box above and send it to Ex-Sight.
After you receive the license file, you will need to copy it to the installation folder.



Do this by clicking on **ACTIVATION** and then by selecting the received license, or simply by copying the received license to the application folder "C:\Program Files\Ex-Sight.Com\VACAM_ANPR" by default.

8 First time software usage

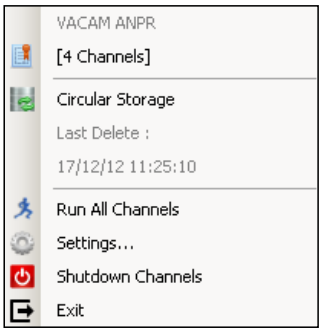
First Time Usage:

- Run VACAM ANPR from the link on your desktop: 

- The application icon will appear in the notification area (System Tray).

Comment [E1]: screenshot

- Right click on the icon  to open the context menu in the notification area:

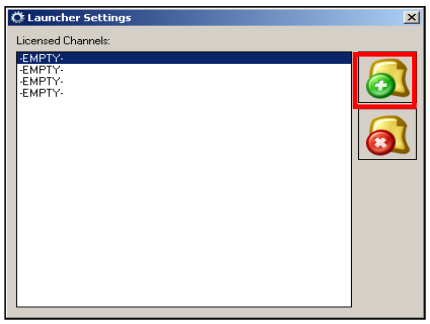


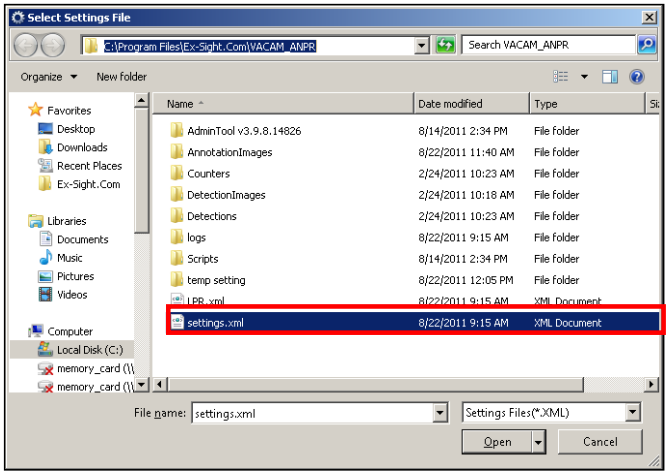
The following functions will be displayed:

Channels: number of licensed channels
Circular storage: enables the user to erase old data according to settings
Run all channels: runs/restarts all channels defined in settings
Settings: enable to define channels

Open a new channel:

The “Settings” section displays the number of allowed channels depending on the license type.
The launcher screenshot below displays a 4 channel license.
Choose an empty channel.
Click on the “**SELECT SETTINGS LOCATION**” button.



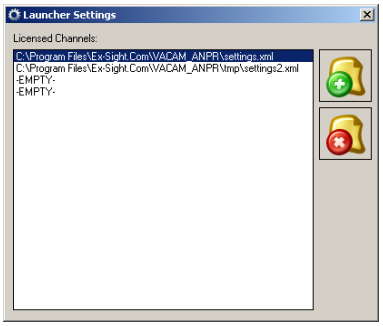


Select the file “settings.xml” (default on “C:\Program Files\Ex-Sight.Com\VACAM_ANPR”)
Duplicate the settings.xml file (to settings2.xml, settings3.xml, etc).

Note: The duplication of the settings files is necessary because it enables the user to configure every channel accordingly. For example, channel 1 may handle access control scenario, while channel 2 may handle a highway scenario.

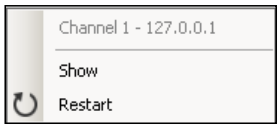
(!) While it is possible to use the same settings file for all channels, it is not recommended to do that, since applying /loading/saving the settings in one channel might affect other channels.

The snapshot below shows two out of four channels assigned to different setting files:



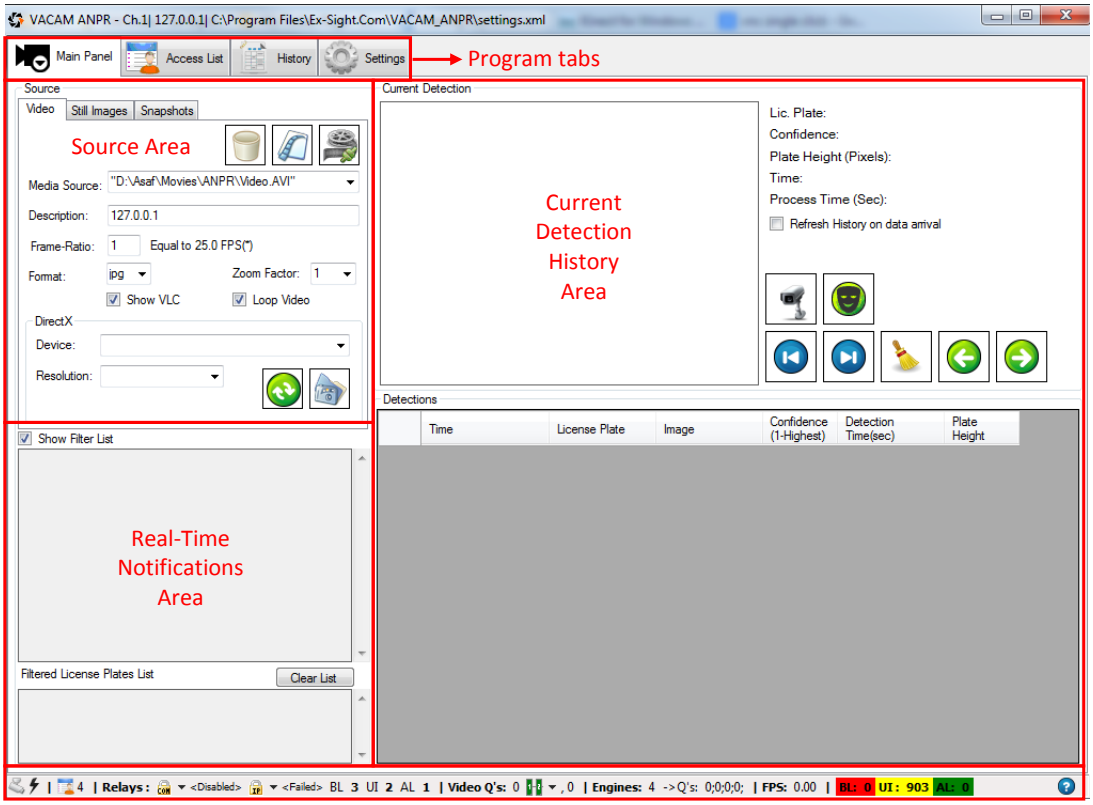
Once this step is completed, you will be able to use the channel.
Close the settings window and select the channel you have recently set.
All configured channels will be automatically loaded
Once the channels are defined, the **DETECTOR CHANNEL ICON** will appear.

A right click on this icon will open the following window:



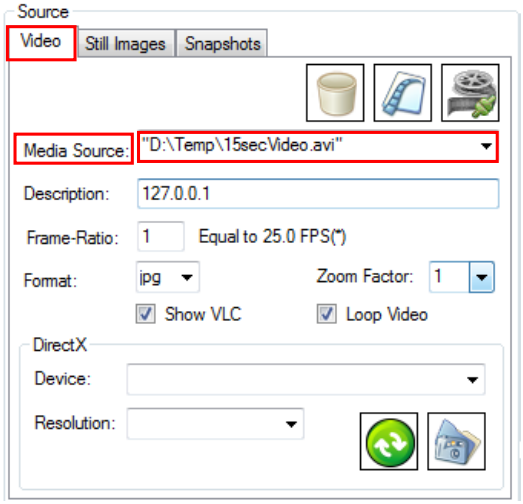
A left click on **SHOW** (or a double-click on the icon) will display the program's **Main Panel**.

9 Main Panel Functionalities



9.1 Source Area

Video Source




Play input video button


Select video file location


Clear input & processing queues


Select device and run


Refresh device list

Media Source Path: provides the RTSP Media URL/Stream name of the video source.

Note: The Media URL/Stream name must be provided to you by the manufacturer of the camera.
For your convenience, a file named 'RTSP LIST.xls' has been attached to VACAM ANPR's installation pack (you can find it under the installation path by default 'C:\Program Files\Ex-sight.Com\VACAM_ANPR\').This file contains RTSP (Real Time Streaming Protocol) stream names for most of the IP cameras on the market today – use it to find your camera's stream name.

The table below shows an exemplified list of RTSP values of Samsung cameras:

Manufacturer	Camera Model	RTSP Support	Firmware Version	RTSP URL	✓	*
Samsung						
Samsung	SCC-C6475P	No		none		***
Samsung	SNB-1000	Yes		rtsp://ip_adx/mpeg4unicast		***
Samsung	SNB-2000	Yes		rtsp://ip_adx/mpeg4unicast		***

Example: given is a Samsung model SNB-1000 IP camera with an IP number 10.12.13.111. To use it as a video source (**6.1.1.1**), write “rtsp://10.12.13.111/mpeg4unicast” in the Media Source box.

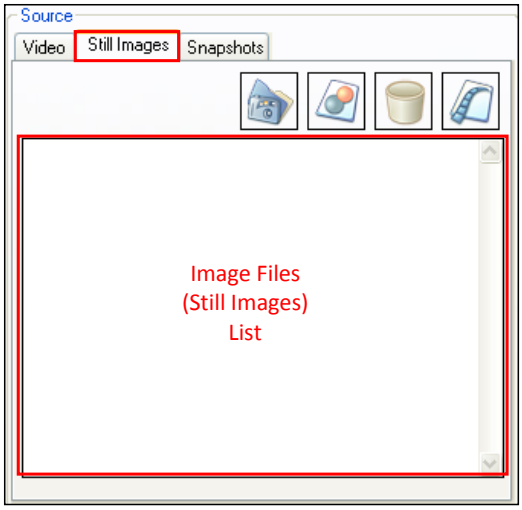
Description. A name entered into this field appears on the top of the page and is used to describe avideo source (IP/name/location/etc).

Note: The access list counters will be saved under that description name at “C:\Program Files\Ex-sight.Com\VACAM_ANPR\Counters\1\<description>.txt”, so for a description like "MyCounters" the counters will be saved at “C:\Program Files\Ex-sight.Com\VACAM_ANPR\Counters\1\ MyCounters.txt”

Frame ratio: Choose 1 to generate the highest frame rate for the detector to detect.Choosing X says to the detector to record and process one image out of X images.
For example: for a 25 FPS video source, choosing 2 will generate 12.5 FPS for the ANPR engine to process, while for a 30 FPS video source, choosing 2 will generate 15 FPS for the ANPR engine to process.
Format of stored picture. May be used to lower stored data space (jpg)/improved picture look (png) using different picture formats.
The **Zoom Factor** of input video. The ANPR engine has the ability to make it easier for a lower quality frame to be detected by using a magnifying algorithm.
Note: Increasing the value to 2 will suffice in case ANPR finds it difficult to detect plates at regular values. The zoom factor will drastically affect the software efficiency and should be handled with care.
Under **DirectX** you will find a list of available devices that are directly connected to the PC(via an analog card, USB, etc.).
Device - a list of devices that are directly connected to the PC.
Resolution - the available resolutions for the selected device.
Show VLC - When this checkbox is checked while pressing the “Play input video” button the VLC video window will be visible on top of the ANPR channel. In case it will be unchecked it will be hidden at the system tray.

Loop Video – this checkbox must remain marked, as it commands the video player (VLC) to always keep the video alive (even after abrupt network disconnections).
Note: Unmarking this checkbox when using a live video source will stop the video frames arrival upon any kind of network disconnection.
When playing a video file, keeping the checkbox checked will play the video from the beginning when it finished playing.

Still Images Source




Execute on selected list of files

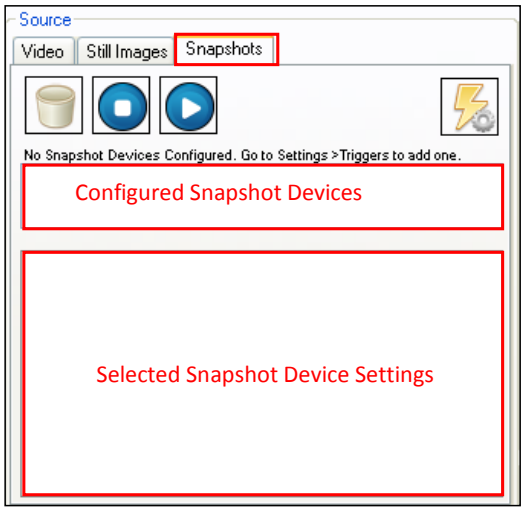

Clear files list


Add Files to list


Load files from directory

Note: This functionality enables you to manually add image files to the files list as well and detect license plates extracted from those images. It is fit for real-life usages (e.g. by parking supervisors). Besides, it serves as a calibration tool.
Calibrating example: Take an image/ images of a vehicle and alter its topographic parameters to create the best license plate detection scenario.

Snapshots Source




Shows trigger settings of selected snapshot device

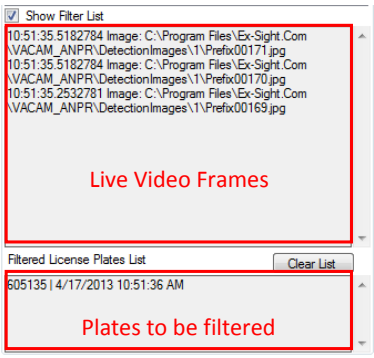

Starts Snapshot Sequence on selected device


Stops Snapshot Sequence on selected


Clears input & processing

Manually operated snapshot devices

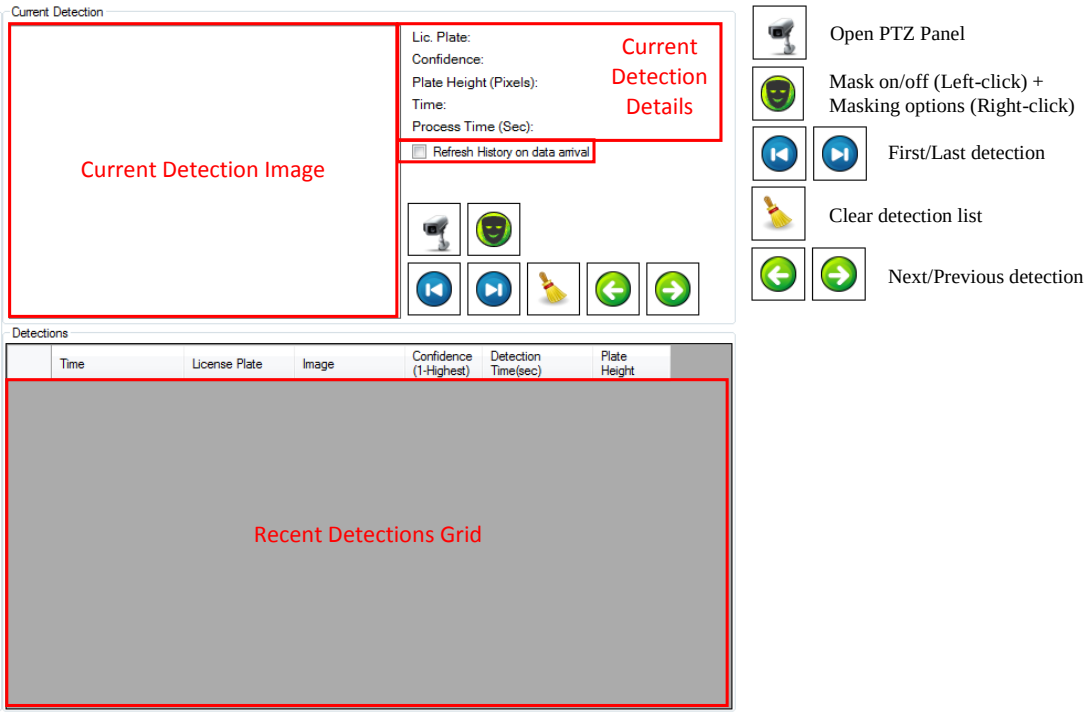
A snapshot device is configured under the settings tab (General->Triggers - section '6.1.16 Triggers') View the FPS ratio of each snapshot device in real-time as shown on the right>



9.1 Real time Notifications Area

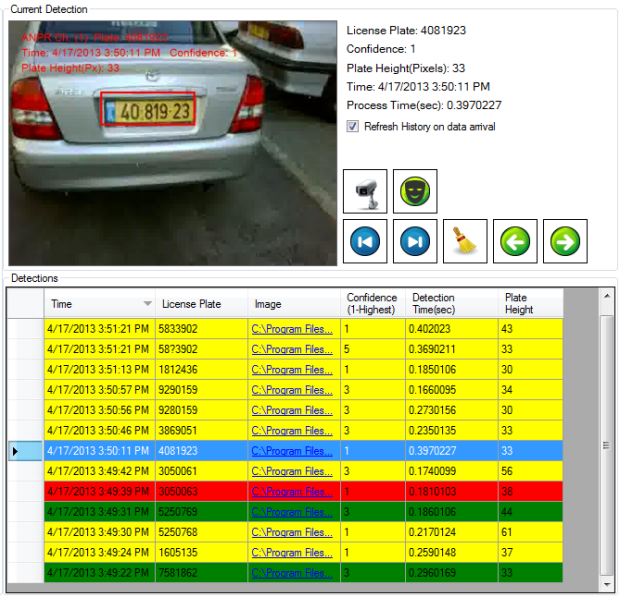
View real-time the video frames arriving from the video source (VLC or a snapshot device), and as well the plates currently held in the Filter List. Press the “Clear List” button to clear the Filter List.
For more information, see “Filter List Settings” (“General Settings”>> “Detection” add a reference here).

9.2 Current Detection History Area



View recent ***VACAM ANPR*** channel detections (the maximum rows in this grid can be configured under the "Settings Tab": "General->Graphic User Interface").
Note: This area show detections only if the **"Refresh History on Data Arrival"** checkbox is marked. Otherwise, detections are still logged and send via TCP to clients. No changes are made in the User Interface (UI) PC resources in terms of CPU & memory. Unmark this checkbox once you have finished calibrating the channel (unless you need VACAM ANPR to view live detections).

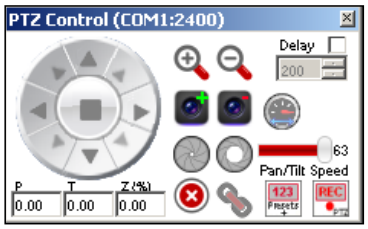
ANPR detections are marked as follows:
Green: Approved List
Yellow: Unidentified
Red: Black List



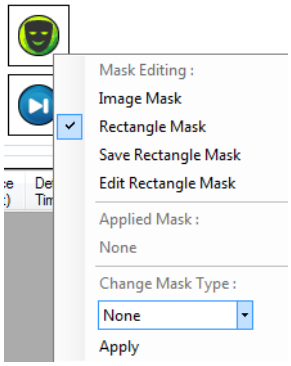
Time	License Plate	Image	Confidence (1-Highest)	Detection Time(sec)	Plate Height
4/17/2013 3:51:21 PM	5833902	C:\Program Files...	1	0.402023	43
4/17/2013 3:51:21 PM	58?3902	C:\Program Files...	5	0.3690211	33
4/17/2013 3:51:13 PM	1812436	C:\Program Files...	1	0.1850106	30
4/17/2013 3:50:57 PM	9290159	C:\Program Files...	3	0.1660095	34
4/17/2013 3:50:56 PM	9280159	C:\Program Files...	3	0.2730156	30
4/17/2013 3:50:46 PM	3869051	C:\Program Files...	3	0.2350135	33
4/17/2013 3:50:11 PM	4081923	C:\Program Files...	1	0.3970227	33
4/17/2013 3:49:42 PM	3050061	C:\Program Files...	3	0.1740099	56
4/17/2013 3:49:39 PM	3050063	C:\Program Files...	1	0.1810103	38
4/17/2013 3:49:31 PM	5250769	C:\Program Files...	3	0.1860106	44
4/17/2013 3:49:30 PM	5250768	C:\Program Files...	1	0.2170124	61
4/17/2013 3:49:24 PM	1605135	C:\Program Files...	1	0.2590148	37
4/17/2013 3:49:22 PM	7581862	C:\Program Files...	3	0.2960169	33

9.3 PTZ (Pan Tilt Zoom) Panel

To open the **PTZ (Pan Tilt Zoom)** panel, click on the  icon.
The panel on the right will appear.
Use this panel to calibrate the video source manually, or to record/play a PTZ script that can be fired at the specific time of the day.
For more information about PTZ control, see appendix X.X (to be written)

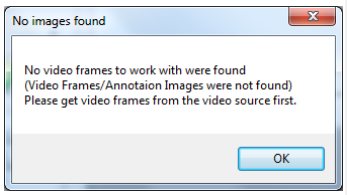


9.4 Masking options



To view/change the masking options, right-click on the mask icon (as seen on the right).
Under Mask Editing, select the displayed mask type (Image/Rectangle) which appears on the top of the video and the Current Detection Image.
Under Applied Mask, view the mask type which is currently in use by the ANPR detector.
Under Change Mask Type, change the mask that will be applied onto the ANPR detector (press Apply following your selection).
While editing a mask, you can click on Show Edited Mask to see the mask being edited (and not applied yet). To see the mask being applied onto the ANPR detector, click on Show Mask In Use.

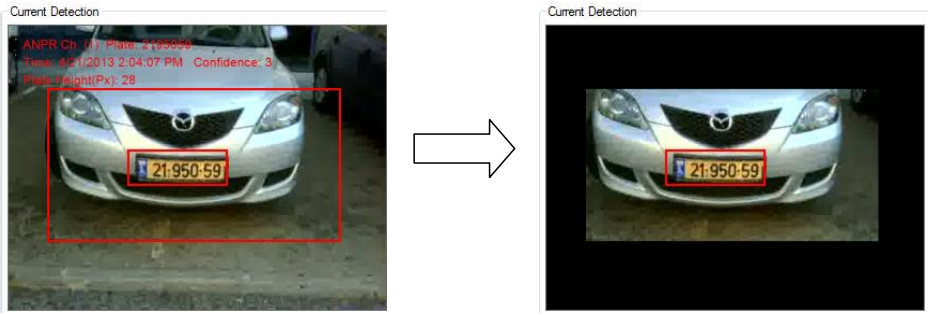
The Rectangle Mask Editing



When editing the rectangle mask for the first time, you may encounter the following message on the right:

Note: The mask size is not available, as no frames are available from the video source. To enable the program to obtain the frame size, connect to your video source for a few seconds.

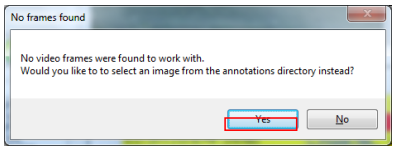
After the program has obtained the frame size, click on the **Edit Rectangle Mask** to mark the desired mask (by clicking on the top-left and bottom-right corners):



After marking the top-left corner and the bottom-right corner, click **Save Rectangle Mask** to save the mask and to apply it onto the detector if necessary.

Image Mask Editing

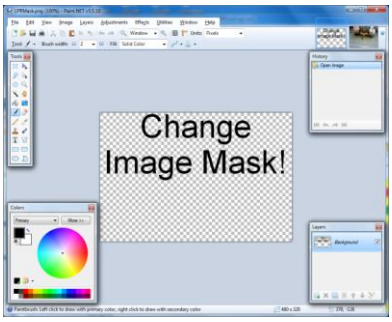
During initial image mask editing, following message will appear: Clicking “yes” will enable you to select an image from the “Annotations Directory” or any other image of the same size as that of the video frames.



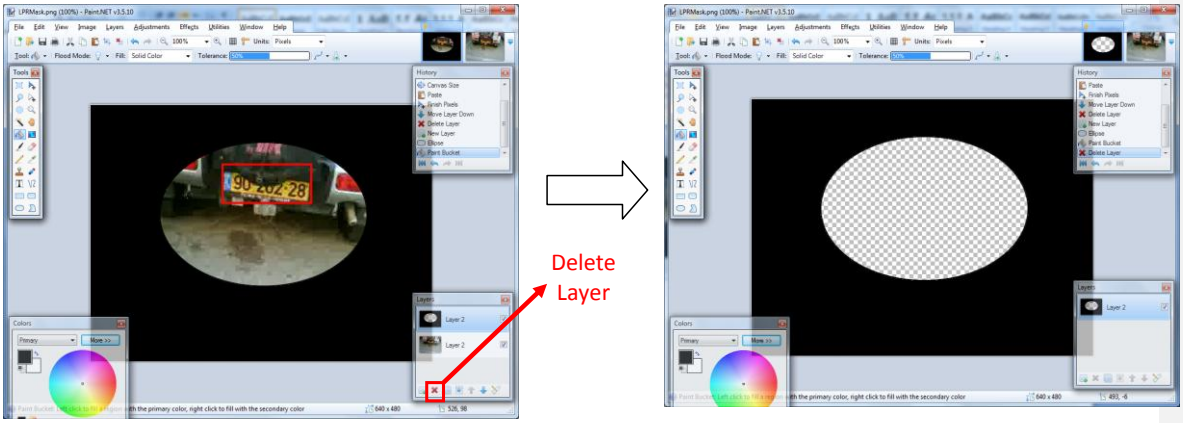
Independently of what you click: ‘Yes’ or ‘No’, the Image Editor (see “General settings” > “Mask”) will open.

Comment [E2]: section reference

Then 2 categories will be displayed:
1. The image mask
2. The image from the annotations/detections directory (if found).
See the example below:

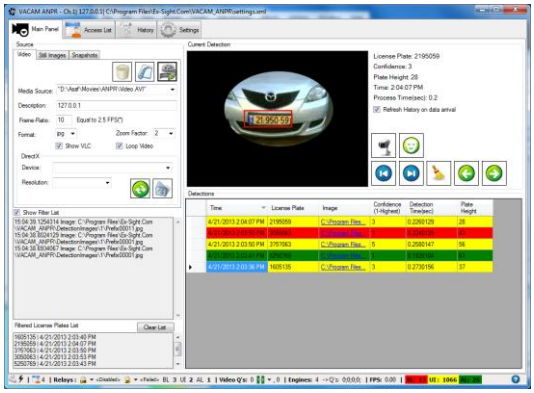


To create a mask in the image editor, put the annotation/detection image as the background, and put the mask layer on the top. Then mark masked areas in black, while leaving unmasked areas transparent (see the snapshot below):



Then delete the layer of the annotation/detection image (like the snapshot above, on the right) and save the file (Select auto-detect at Bit Depth) to complete the process.
For detailed information about masking, refer to section "6.1.9 Mask".
Once you have saved the mask file to its original file name, press "Refresh Image Mask" to see the mask you have created.
In case the selected mask is of the "image" type, the image mask will also be re-applied on the detector:

Comment [E3]: number



9.5 Status Bar Panel

PTZ:
A left click on this icon opens the PTZ control panel. 

Triggers Indicator: 

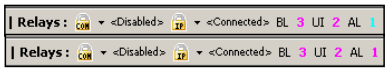
Trigger (of digital input) statuses: when one of the defined triggers is activated, the icon turns yellow ().

Access List Length: 

Current number of license plates on the access list

Relays:
Relay COM( )
When the relay circuit is closed (e.g. if the gate is open), the relevant relay number is colored green.
When the relay circuit is open, it is colored red

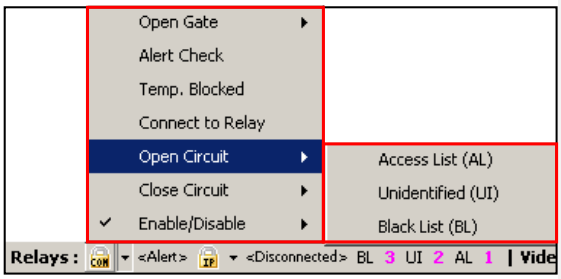
Relay IP( )
Relay connected via network.
Figures in purple ("circuit open") and blue ("circuit closed")



Note: refer to the number of relay IDs associated with the relevant AL, BL, and UI.

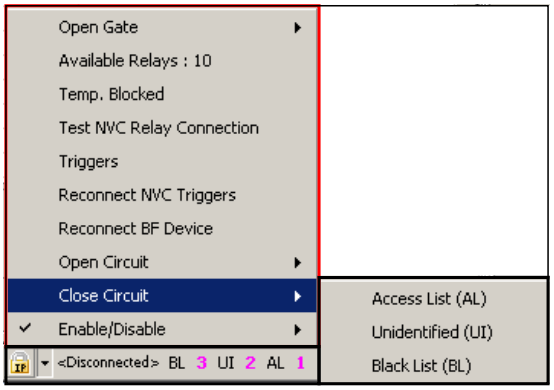
COM Relays Menu:

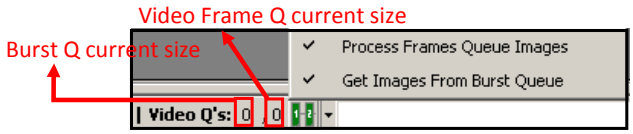
Open Gate: sends a pulse to the relay to open the relevant gate (AL/UI/BL) and to close it within a certain period of time as defined in the settings.
Alert check: Sends alerts if cables are disconnected.
Temp. Blocked: Blocks opening/closing commands regardless of their source. When blocked, the following icon appears -> .
Connect to Relay: Connects to the COM relay.
Open Circuit/Close Circuit: Sends a pulse to the relay to open/close the relevant circuit (AL/UI/BL).
Enable/Disable: Automatic gate opening after detection.



IP Relays Menu:

Open Gate: Opens the gate and to close it within a certain period of time as defined in the settings.
Temp. Blocked: Blocks opening/closing commands regardless of their source. When blocked, the following icon appears ->
Test NVC Relay Connection: Performs connectivity check-up.
Triggers: Displays the list of defined triggers connected to NVC.
Reconnect NVC Triggers: Reconnects to the NVC trigger devices.
Reconnect BF Device: Reconnects the BF device
Open Circuit/Close Circuit: The program sends a pulse to the relay to open/close the relevant circuit.
Enable/Disable: Allows/disallows automatic gate opening after detection.





Video Q's (Video Queues):
Two types of queues are used by the system:
The **Burst Queue** and the **Video Frame Queue**
The Queues icon ( ) shows which of the queues is enabled at the current time:

No queue is enabled (typically happens when the processing trigger is turned off). This is indicative of the following:

- Images from the video source are being ignored.
- The application Video Frame Queue is not forwarding its frames to the engines to be processed.

Burst Queue is enabled. This is indicative of the following:

- Images from the video source are being forwarded.
- The application Video Frame Queue is not forwarding its frames to the engines to be processed. (This is a rarely used combination)

Burst Queue is disabled. This is indicative of the following:

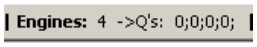
- New images from the video source are being ignored
- The application Video Frame Queue is enabled. This means that the application Video Frame Queue is forwarding its current frames to the engines to be processed. (This is a rarely used combination).

Both Queues are enabled. This means that frames that arrive from the video source are being received, forwarded to the Video Frame Queue, and further to the engines to be processed.

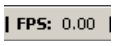
A click on the Queues icon ( ) will toggle it to enable ( )/disable ( ) the queues
A click on the **'Burst Q current size'** will display the current size and the queue overflow information. For more information about the **Video Queues**, see section '0.0.0 – VACAM ANPR Queues'.

Comment [A4]: Need to create this section and update the reference

Engines:
Gives the number of concurrent processing units ("engines") in the system and presents each engine's current processing queue count.



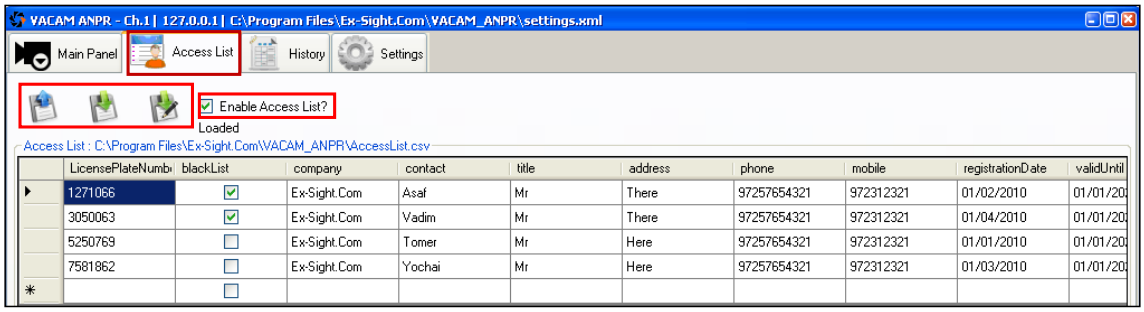
FPS:
Shows the total number of frames extracted from the video source(s) per second.



Counters:
Displays the counters of Black List/Unidentified List/ Access List license plates

About:
Displays the application details

10 Access List tab



General description:

The Access List is a CSV file configured under the VACAM ANPR applications. It can be opened, edited or changed by VACAM ANPR, Excel, or any other software fit for CSV files.

The Access List file includes 2 mandatory fields:

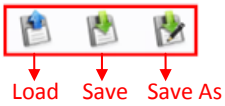
1. The “License Plate Number” (**must be the first one**) contains the license plate number (may include letters).
2. The “Blacklist Check” field (**must be the second one**) contains the Boolean value (‘True” or “False”) of the license plate marking:
    - If marked as ‘Black List’ > True
    - If marked ‘Access List’ > False

Other fields may also be added to the access list (e.g. the driver’s name and ID). The chosen fields will be logged upon each detection and sent via TCP to connected clients.

Main Functionalities:

Enable Access List:
If this check-box is unmarked, the system will not perform an access list comparison and all detections will be tagged as “Unidentified".

Load /Save list/ Save as:
Contains commands to load/save the access list



Usage:

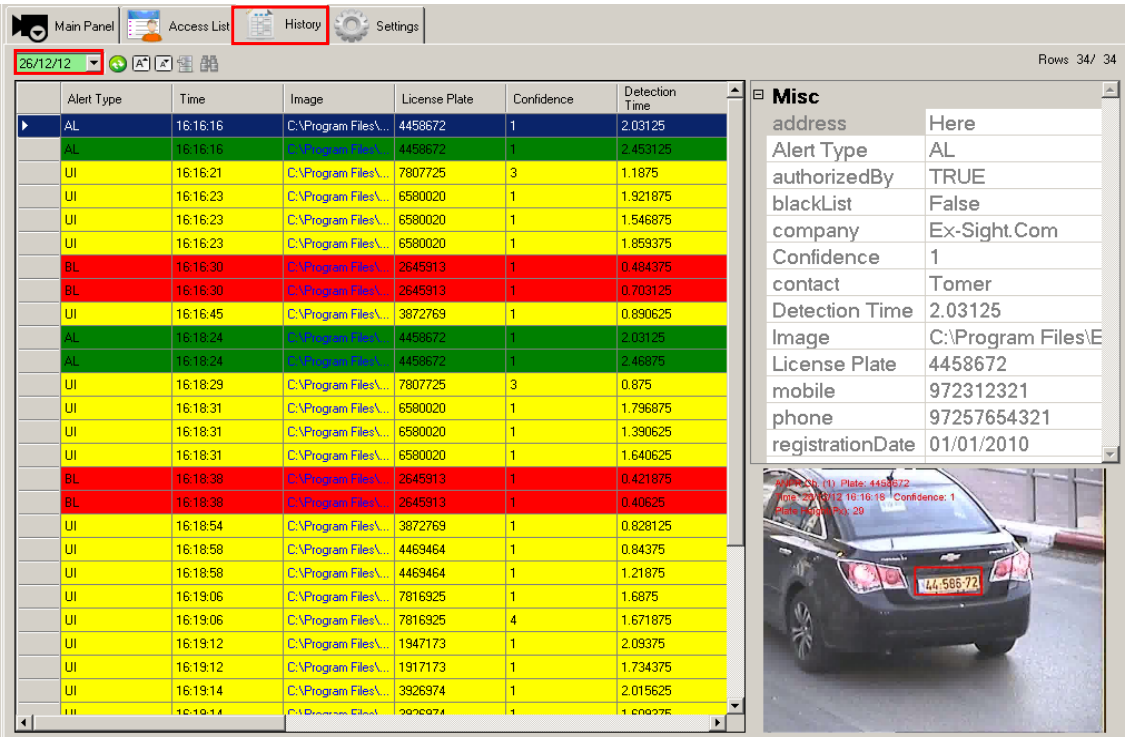
Any piece of data from the Detection Grid, as well as from other locations, can be copied to any Access List data field. (Ctrl+C –Ctrl+V). The data may include the list of the company’s visitors or unwanted persons, etc.

Notes:

- Any piece of data in the Access List can be saved for future use.
- The License Plate field must not contain duplicate values.

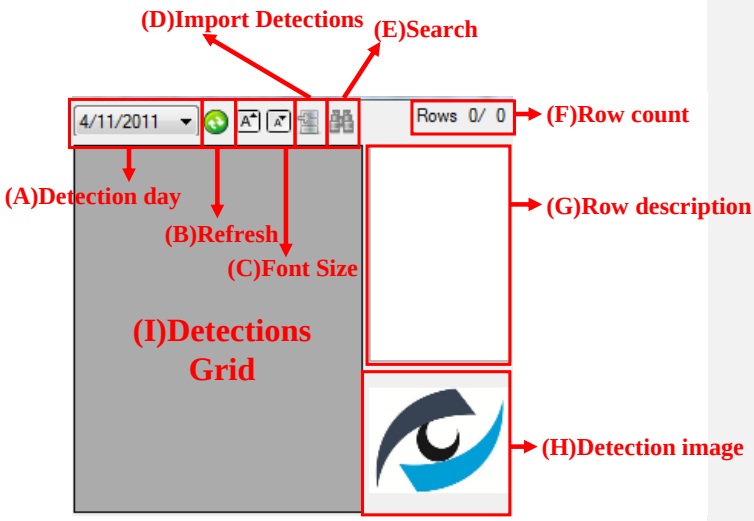
11 History Tab

To start viewing daily history reports, select a day from the list (marked in red).



Alert Type	Time	Image	License Plate	Confidence	Detection Time
AL	16:16:16	C:\Program Files\...	4458672	1	2.03125
AL	16:16:16	C:\Program Files\...	4458672	1	2.453125
UI	16:16:21	C:\Program Files\...	7807725	3	1.1875
UI	16:16:23	C:\Program Files\...	6580020	1	1.921875
UI	16:16:23	C:\Program Files\...	6580020	1	1.546875
UI	16:16:23	C:\Program Files\...	6580020	1	1.859375
BL	16:16:30	C:\Program Files\...	2645913	1	0.484375
BL	16:16:30	C:\Program Files\...	2645913	1	0.703125
UI	16:16:45	C:\Program Files\...	3872769	1	0.890625
AL	16:18:24	C:\Program Files\...	4458672	1	2.03125
AL	16:18:24	C:\Program Files\...	4458672	1	2.46875
UI	16:18:29	C:\Program Files\...	7807725	3	0.875
UI	16:18:31	C:\Program Files\...	6580020	1	1.796875
UI	16:18:31	C:\Program Files\...	6580020	1	1.390625
UI	16:18:31	C:\Program Files\...	6580020	1	1.640625
BL	16:18:38	C:\Program Files\...	2645913	1	0.421875
BL	16:18:38	C:\Program Files\...	2645913	1	0.40625
UI	16:18:54	C:\Program Files\...	3872769	1	0.828125
UI	16:18:58	C:\Program Files\...	4469464	1	0.84375
UI	16:18:58	C:\Program Files\...	4469464	1	1.21875
UI	16:19:06	C:\Program Files\...	7816925	1	1.6875
UI	16:19:06	C:\Program Files\...	7816925	4	1.671875
UI	16:19:12	C:\Program Files\...	1947173	1	2.09375
UI	16:19:12	C:\Program Files\...	1917173	1	1.734375
UI	16:19:14	C:\Program Files\...	3926974	1	2.015625

History Tab options



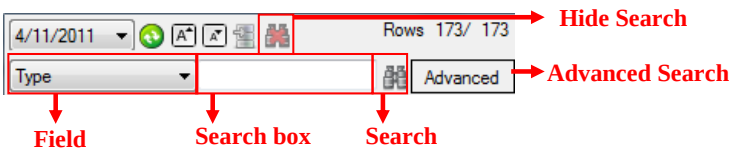
(A) Detection day – a daily list of detection logs – select a day from the list to view the detection log of that day.

(B) Refreshes the daily list of detections logs.

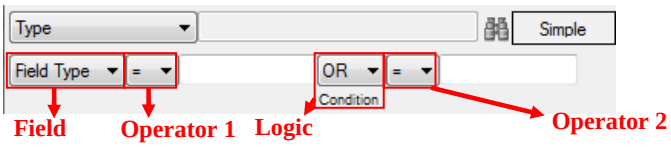
(C) Increases/decreases the font size on the row description panel (G).

(D) Enables you to import detections from the detections log file (CSV – the native format of VACAM ANPR detection logs, or MDB).

(E) Allows you to search the selected detection log. Opens the following panel:



In simple search, select the field to search and find rows that have similar text in the selected field. When you press on “Advanced”, the following panel will appear:



Here you can refine the search by defining the field type: Text (default), Number, or Date/Time. Then you can select 1 or 2 operators and a logic condition (AND or OR) to base the search on.

(F) The row count (Shown rows out of/Total rows in detection log)

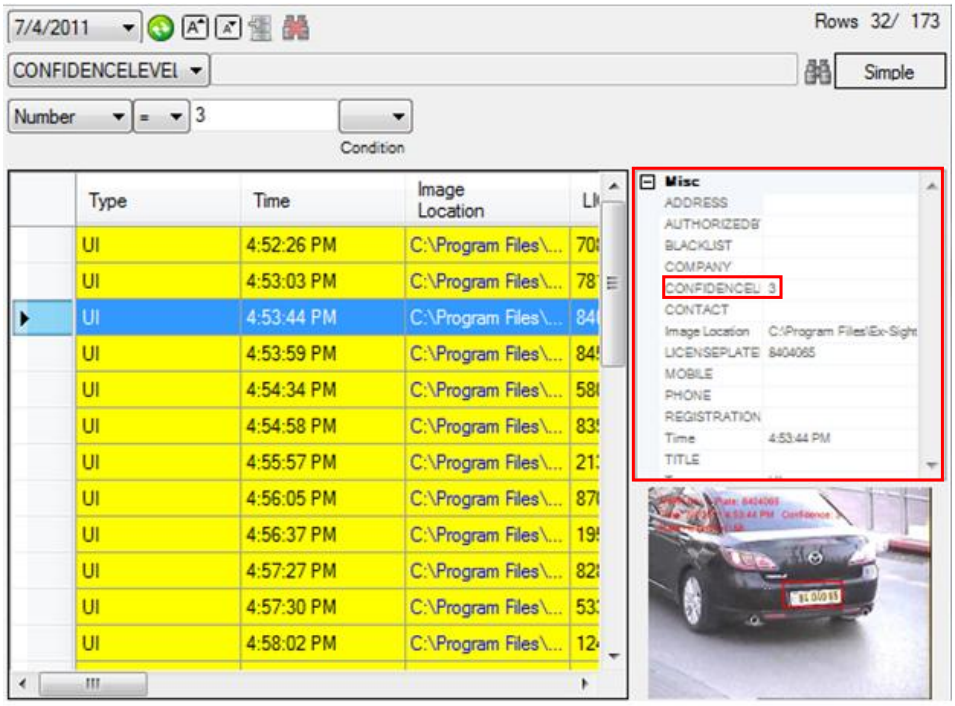
(G) The content of the selected row

(H) The detection image.

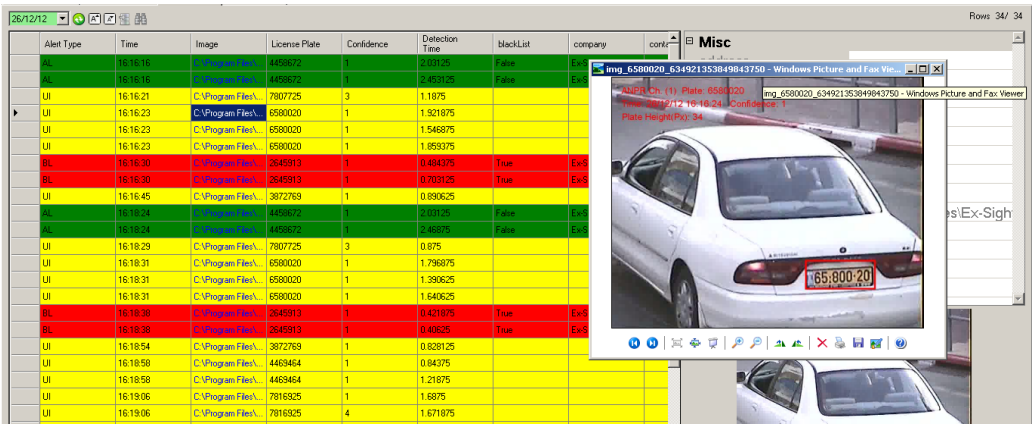
(I) The detection grid where all the rows of the detection log are presented.

Log display & Search example

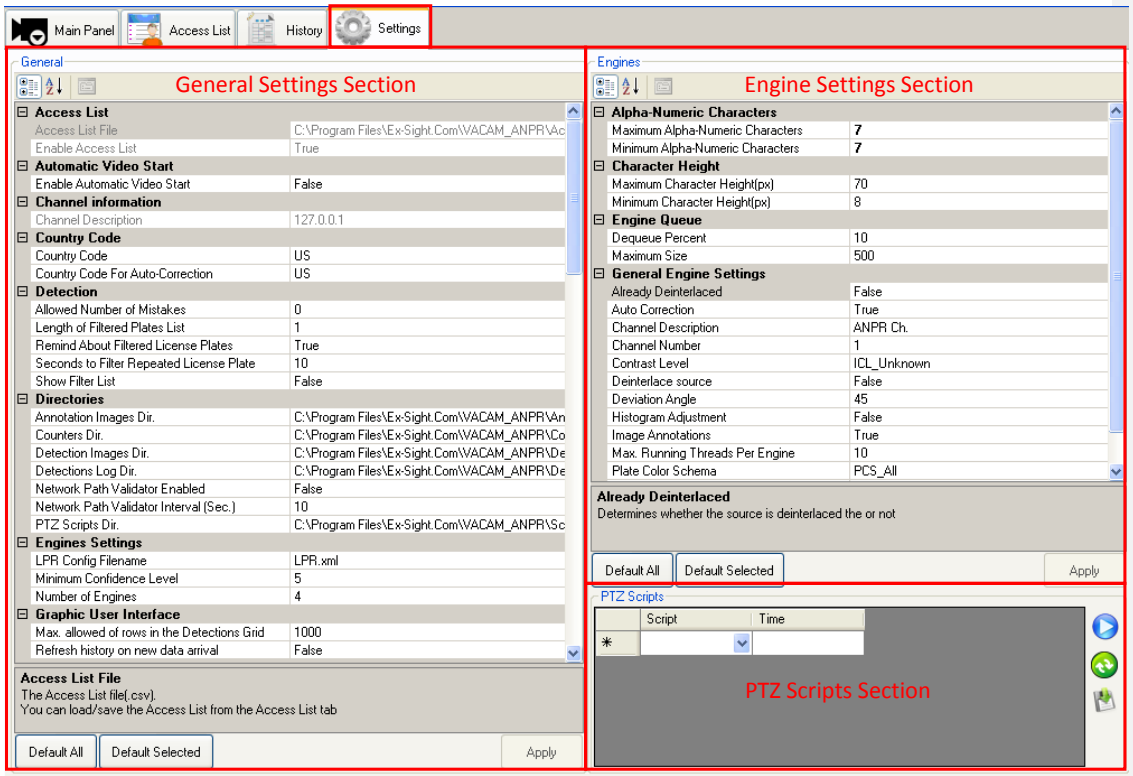
Example: Search of detected license plates on the detection log dated 7.4.2011
The detection's confidence level (CONFIDENCELEVEL) equals 3.
The right top window displays the details from the selected row:



Example: Search of detected license plates on the detection log dated 7.4.2011
The detection's confidence level (CONFIDENCELEVEL) equals 3. The right top window displays the details from the selected row.
To open an image intended for use in external software, double-click on the Image Location:



12 Settings Tab: Advanced User Settings



12.1 General settings section

Access list

- **Access list file**:Access List files (csv).
  You can load/save Access Lists from the Access List tab.
  For more information on "how to change the access list", turn to section 5.5 (access list section).
- **Enable access list**: Enable/Disable the use of the Access List:
  If you do not have any need in using the access list alert, you can turn it off.

Comment [A5]: Change Ref

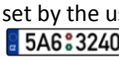
Automatic video start

- **Enable automatic video start**: Enable/Disable automatic video start.
  Turning this option on starts the VLC video source automatically and eliminates the need to click "play" every time the channel starts. In case constant video (VLC) serves as a video source and there is no human operator, this value must be set to "true" after calibration.

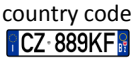
Channel information

- **Channel description:** The user defines name the channel's name.
  The default name is 127.0.0.1 (the local host).
  The default name from the Media Source field will be automatically converted into the IP address of the video source (camera, etc) and will be found in the Channel Description field.
  This helps the user keep the channel's location/use/purposes better described and organized.
  This is important in case you have many channels/cameras/video sources to be distinguished from one another.
  Note: Channel description appears in the channel title, as well as in the tooltip of the channel on the system tray.

Country code

- **Country code:** The country code of the plates that VACAM ANPR tries to detect.
  Note: It is very important for the ANPR detection to identify the type of plate. It should be set by the user to the correct value in order for the VACAM ANPR to work properly.
  

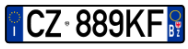
  

- **Country Code for Auto Correction:**
- When "Auto Correction" is enabled in Engine Settings, the program will correct the plates according to the country code provided there.
  

Detection

This category contains the detection mistakes criteria (**"Allowed number of mistakes"**) and the **Filter List**.

- **Allowed number of mistakes:** the number of allowed mistakes in plate detection vs. the access list. Changing this value will change the strictness of the comparison between the detected plate vs. the plate from the access list (0 is the default value which allows no mistakes).

Example: Given is the following plate from the Access List (marked as "AL") "**CZ889KT**": 

The program is currently detecting the plate "**CZ889KF**". In case **"Allowed number of mistakes"=0**, this detection will be marked as "Unidentified" (UI), as the plate from the access list differs in one character from the currently detected plate (the last character is T vs. F).
To get an alert for this plate, set the "Allowed Number of Mistakes" to 1 (the one character variation). Then the detection will be marked as "Access List" (AL).

Length of Filtered Plates List

The filtered plates list (see “6.1.2 “Real time Notifications Area”) is the list of plates with the recent time notifications. When a plate is detected, it is matched to the filter list. In case of match, the plate is filtered, and thus no action is performed by the program (the detection is neither logged nor transmitted as an alert).

Note: Change this value to change the length of this list.
Example: In case the license plate above is detected once, while the value of the “Length of Filtered Plates List” is 1, the detection will appear on the detection list, but it will not display the same plate again unless another plate is detected.
If the value is 2, the plate above will first appear and then be filtered until 2 different plates are detected.

Note: Using this feature helps avoid unnecessary repetition of identical license plates.

- **License plates notifications:**
  When set to **True**, only the plate’s first detection is registered on the filter list. After **“Seconds to Filter Repeated License Plate”** elapses, an identical filtered plate can be detected and command program to perform respective actions, e.g. open the gate according to the alert type.
  When this value is set to **False**, each detected plate will be saved to the filter list with the time stamp. This means that if several detections have occurred with time gaps smaller than **“Seconds to Filter Repeated License Plate”,** the detected license plate will appear only once**.**
  For more information, see **“Length of filtered plates list”** and **“Seconds To Filter Repeated License Plate”.**
- **Seconds To Filter Repeated License Plate:**
  The number of seconds to pass until the repeated license plate appears on the detections grid.
  Example: If the given value is set to 10 seconds, while the value of “Length of Filtered Plates List” is set to 1, the license plate will be detected twice. However, if next detection occurs in less than 10 seconds, it will be filtered by the program.
  Show filter list: Shows/Hides the filter list that consists out of 2 fields: the filtered license plate and the time it was last detected.

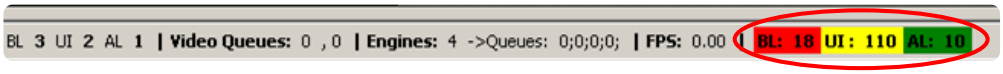
Directories

- **Annotation Images Dir.:**

This directory stores the all the detection images: the video frame containing the captured plate and text annotations providing detection details. (Detection details are displayed in the “History Tab”.
For more information about the history tab, see the “History Tab” section (5.6).

- **Counters Dir.:**

Counter files contain the recent counting of any alert type (BL/UI/AL).
Changing the channel’s description changes the counter’s file name thus zeroing all the counters.
The counters are displayed on the status bar, as shown below.



- **Detection Images Dir.:**
  Containing detection Images and stores new images until they are processed by the ANPR detector.

- **Detection Log Dir.:**
  Contains detections logs displayed in the History Tab (section 6.3).

Comment [E6]: check

A detection log contains image paths, confidence levels, detection time, and license plate numbers:

O533944	C:\Program Files\Ex-Sight.Com\VACAM_ANPR\AnnotationImages\img_O533944_634353683623301617.jpg	1	4.431253
O533955	C:\Program Files\Ex-Sight.Com\VACAM_ANPR\AnnotationImages\img_O533955_634353683649503115.jpg	1	1.357078
533201	C:\Program Files\Ex-Sight.Com\VACAM_ANPR\AnnotationImages\img_0533201_634353683649623122.jpg	1	2.683154
533202	C:\Program Files\Ex-Sight.Com\VACAM_ANPR\AnnotationImages\img_0533202_634353683683565063.jpg	1	1.699097
3320465	C:\Program Files\Ex-Sight.Com\VACAM_ANPR\AnnotationImages\img_3320465_634353683714136812.jpg	1	4.690268
1970032	C:\Program Files\Ex-Sight.Com\VACAM_ANPR\AnnotationImages\img_1970032_634353683742378427.jpg	3	3.047174
9700322	C:\Program Files\Ex-Sight.Com\VACAM_ANPR\AnnotationImages\img_9700322_634353683757849312.jpg	1	2.933168

- **Network Path Validator Enabled:**
  Determines whether or not to use the network path validator in order to ensure that the paths that are provided are available, and if not set them temporarily to the default location that lies on the hard drive , until the paths are avilable again (in that case the original paths will be restored).
  By setting this value to “True”, you ensure that there will be no loss of valueable information (all the detections will be logged, either in the original network path, or on the local default path that lies on the hard drive).
- **Network Path Validator Interval (sec).**
  The interval (in seconds) to pass between consecutive path verifications(the interval might get bigger when paths don't exist - might get up to ~6 minutes of delay) if all paths are invalid network paths.
- **PTZ Scripts Dir.:**
  The PTZ scripts directory

13 Engine settings

- **LPR Config Filename:** ANPR Configuration Filename to use:

The user needs to create for each channel he has a deferent file in order for the settings to be separate for each channel.
The default path of the lpr.xml is "C:\Program Files\Ex-Sight.Com\VACAM_ANPR\lpr.xml"

- **Minimum confidence level:** Minimum confidence level(5 is poor, 1 is excellent)

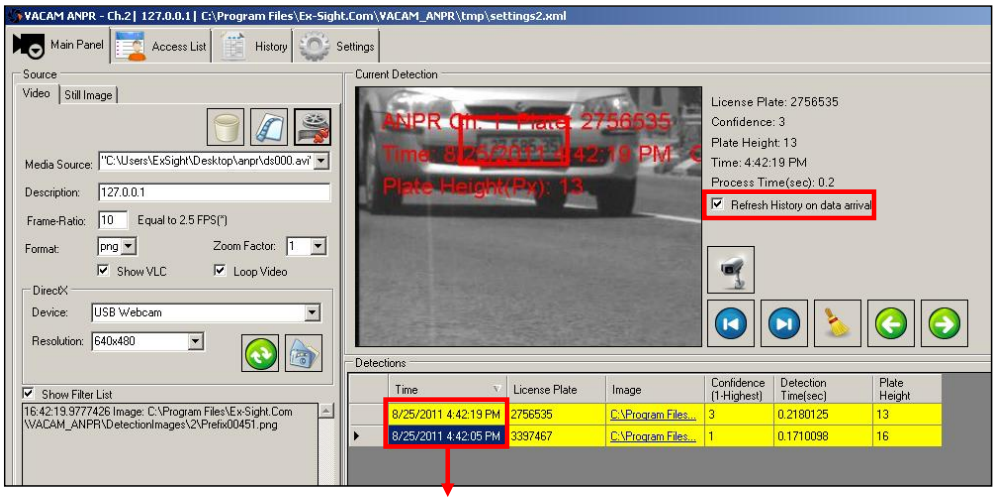
The confidence level value will determine how accurate the user wants the detected plate numbers to be in equivalent to the original plate.
Choosing low confidence level will produce more detections while high confidence produces a more quality detection with higher chance of a correct detection.

- **Number of engines:** Number of ANPR engines to use.

VACAM ANPR support multi threading. Users with multi processor units can set the engines numbers to the amount of cores.
Example: choosing 2 for 2 cores CPU and 4 for a 4 cores CPU.

14 Graphic User Interface

- **Max. Allowed Rows in the Detection Grid:** Maximum allowed number of rows in the Detections Grid.
  The grid's behavior: FIFO (First In First Out).
  Example: Given are 5 detected images (enter order = older<- 5 4 3 2 1 ->newer). The max allowed of rows in the detection grid is set to 5.
  On next detection, the oldest images will be cleared from the grid and picture will take its place (older 4 3 2 1 **X** newer).



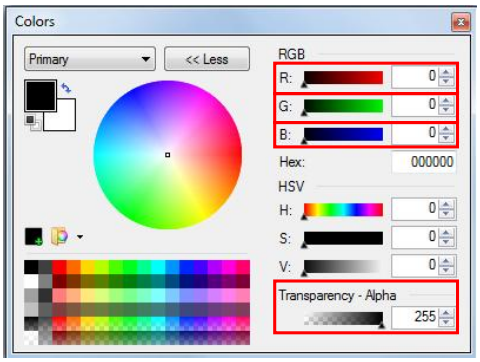
  When a new license plate arrives, the old one is automatically dragged down.
- **Refresh history on new data arrival:**
  When set to true, the newly detected plate is displayed upon detection. Reflects the check box at the main panel (marked red above).
  Note: The default value is **"False"**(for efficiency), so when you first calibrate the channel and want to see detections as they appear, you must(!) set it to **"True"** , otherwise you might think the program is not detecting plates while it is!.

Mask

- **Image Editor exe path**: The full path to the Image Editor exe file. Recommended software : Paint.net (you can get it free at http://www.getpaint.net/, help documentation is available at http://www.getpaint.net/doc/latest/)

- **Image Path :** The Path to the Mask Image (PNG, grayscale) : masked areas in the image should be **Black** - and all the rest should be **Transparent**(for exact color definition see below).
  To use the Image Mask set **'LPR Mask: Type'** to **'Image'**.

  Notes:
  - Mask Image should be the same size as the received video frame size! (otherwise the mask won't work properly as the masked areas won't be correlated with the actual video).
  - The ARGB (**A**lpha **R**ed **G**reen **B**lue) definition for **Black** is **ARGB** (255,0,0,0), meaning that the alpha level is 255 and the rest of the values are 0(as can be seen on the right in the Paint.net Colors window).
  - The ARGB definition for **Transparent** is **ARGB**(0,0,0,0), meaning that all the values are 0.



- **On Video Opacity:** When **"Show on Video"** is 'True'**:** the Opacity of the On Video Mask(from 0 for full transparency to 255 for full opacity).

- **Rectangle:** The LPR Rectangle Mask. To use it set **'LPR Mask: Type'** to **'Rectangle'**.

- **Rectangle Image Path:** The Path to the Rectangle Mask Image (for most cases should not be changed).

- **Show on Video:** Show the Mask on the Video Source (Relevant only for VLC video source).

- **Type:** The LPR Mask type: None/Image/Rectangle.

PTZ control

- **Baud rate:** Baud Rate for the PTZ controller
- **Device address:** PTZ Device Address accessed
- **Ip address of the PTZ device (if any):** IP Address of the PTZ device (if exists).
  Connection Type must be 'SerialOverIP' for this to work
- **Port number of the PTZ device (if any):** Port Number of the PTZ device (if exists).
  Connection Type must be 'SerialOverIP' for this to work
- **PTZ com port:** COM port of the PTZ controller
- **PTZ connection type:**
  Direct COM: the PTZ controller connected directly to this machine (via USB or COM port).
  Serial Over IP: the PTZ controller located on a remote device (Commands are transmitted over the network connection).
- **PTZ protocol:** PTZ Protocol used, depending on the support protocol on the device you use.
- **Script scheduler check interval:** The interval to pass (in seconds) between successive checks of the script scheduler table. Low values will generate better accuracy during the time of the script execution but will slow the program down.
- **Script scheduler filename:** Specify The PTZ script scheduler filename path.

Queues management

- **Clear Q's on AL Plate**: Clear the Processing Queues upon the detection of an AL (Access List) Plate.
- **Clear Q's on BL Plate**: Clears the Processing Queues upon the detection of the Black List Plate.
- **Clear Q's on UI Plate**: Clears the Processing Queues upon detection of an UI (Unidentified) Plate.

Relays (COM)

Relay setting for direct connection to the PC via USB or COM port

- **Double Pulse Automatic Close:** Close the door automatically by sending a pulse for opening the door and then, after X seconds send the same pulse (close circuit) to close the door.
- **Double Pulse Automatic Close (Seconds):** Time interval X to wait before closing the door.
- **Internal Circuit Delay(seconds):** Time interval that the circuit of the relay is closed.
- **Relay Number -> Blacklist (BL):** Relay number for 'Blacklist'(BL) detections.
- **Relay Number ->Identified (AL):** Relay number for 'Identified'(AL) detections.
- **Relay Number -> Not identified (UI):** Relay number for 'Not Identified/Unidentified'(UI) detections.
- **Relay Enabled:** Enable/Disable the use of the relay controller.
- **Relay Port:** The COM port of the relay controller.

Relays (IP)

Authentication:
Enabled: Enable/Disable IP Relay commands authentication (by **"Authentication: Username"** and **"Authentication: Password"**).

Note: Authentication is applicable the NVC/HDIR Cameras/Encoders. If you are using an HDIR camera, the Username & Password must be correct in order for the relays to work, even if this value is set to False.
Authentication: Password: Edge device password
Authentication: Username: Edge device username
BF Model Type: 'IP Relay Model' must be set to **'BF'**.
BF Model: Auto Reconnect: When set to True, the program will attempt to reconnect to the BF device in case of a timeout.
BF Model: Check Status Interval (ms): The time interval for checking the status of the BF device (in milliseconds)

Note: This value must be lower than the Response Timeout (at least by 100 ms).
IP Relay Model: Determines the IP Relay Model type.
Relay IP Address: The remote relay IP address.
Relay Number-Black List (BL): The relay number for "Blacklist" (BL) detections. Enter -1 to disable.

Note: NVC Relay numbers start from 0.
Relay Number-Identified (AL): The Relay number for "Identified" (AL) detections. Enter -1 to disable.

Note: NVC Relay numbers start from 0.
Relay Number –Not Identified (UI): The relay number for "Not Identified/Unidentified (UI)" detections: Enter-1 to disable.

Note: NVC Relay numbers start from 0.
Relays command Port: The HTTT command port of the IP Relay.
Relays Enabled: Enable/Disable the use of IP Relays.
Relays Timeout (sec): The time period (in seconds) between turning the relay **On** and switching it **Off**.
Response Timeout: The edge devices' response timeout.

Note: For BF devices**,** the default value is 1500ms (should be higher than **'The BF Model: Check Status Interval'**). For other devices, the default value is 5000ms (should be higher than 1000 ms).

Security:

Login: Enable: Commands whether or not to display the Login Screen upon the user's request to show the application.
Login: Password: The login password.
Login: Username: The login username.

Note: The default username & password are "**root: pass"**.

15 Storage settings

"Circular Storage" is a timed operation that deletes all old data.
This allows the program to run with minimum user intervention, since it prevents the detention of old data. To prevent the program's malfunction due to old data retention, set the following values:

- The time period of data retention in the memory
- The hard drive space available

- **Circular Storage Days (Annotations):** The number of days in storage for annotation Images.
  Note: Enter 0 to disable the circular storage for this data (notice that in this case images will never be deleted!).
- **Circular Storage Days (Detection Logs):** The number of days in storage for the Detection Logs (that can be seen in the history tab).
  Note: Enter 0 to disable the circular storage for this data (notice that in this case detection logs will never be deleted!).
- **Detections Circular Storage Minutes:** The number of minutes in storage for detection Images (the images that emerge from the video source and are processed for license plates detection).
  Example: in case the value is 15, images older than 15 minutes will be deleted.
- **Enable Circular storage:** Enable/Disable Circular Storage.
  Note: Disabling the Circular Storage will cause the application to store data on the hard drive without ever deleting it, which may cause the program's malfunction.

16 TCP Communication ports

VACAM ANPR contains 2 sets of TCP ports, through which the communication between VACAM ANPR and external programs (e.g. VACAM Remote Viewer), is maintained:

- MultiView ports (default ports for VACAM Remote Viewer)
- Regular Ports

Every set is comprised of **In** port (to receive commands) and **Out** port (to output alerts, statuses, etc.)

- **MultiView**

In port: MultiView TCP Incoming Port

Out port: MultiView TCP Outgoing Port

Ports Ack. Timeout (sec.): The timeout (in seconds), after which the program stops waiting for acknowledgements from remote software and restarts MultiView Communication (minimum 11 seconds).

Ports API Version: The API Version used in the communication of the MultiView Ports

Ports Wait for Acks.: Determines whether MultiView ports will wait for acknowledgements from the ANPR channel. In case no acknowledgement is received, communication will be restarted.

Regular In Port: Regular TCP Incoming Port

Regular Out Port: Regular TCP Outgoing Port

Regular Ports Ack. Timeout (sec.): The timeout (in seconds), after which the program stops waiting for acknowledgements from remote software and restarts Regular Communication (minimum 11 seconds)

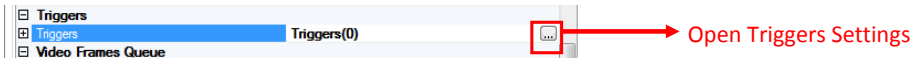
Regular Ports API Version: The API Version used in the communication of the Regular Ports

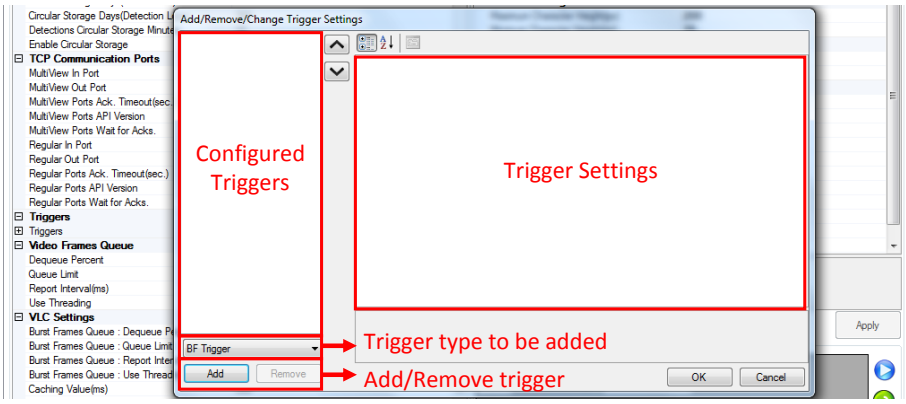
Regular Ports Wait for Acks.: Determines whether Regular ports will wait for acknowledgements from the ANPR channel. In case no acknowledgement is received, communication will be restarted.

17 Triggers

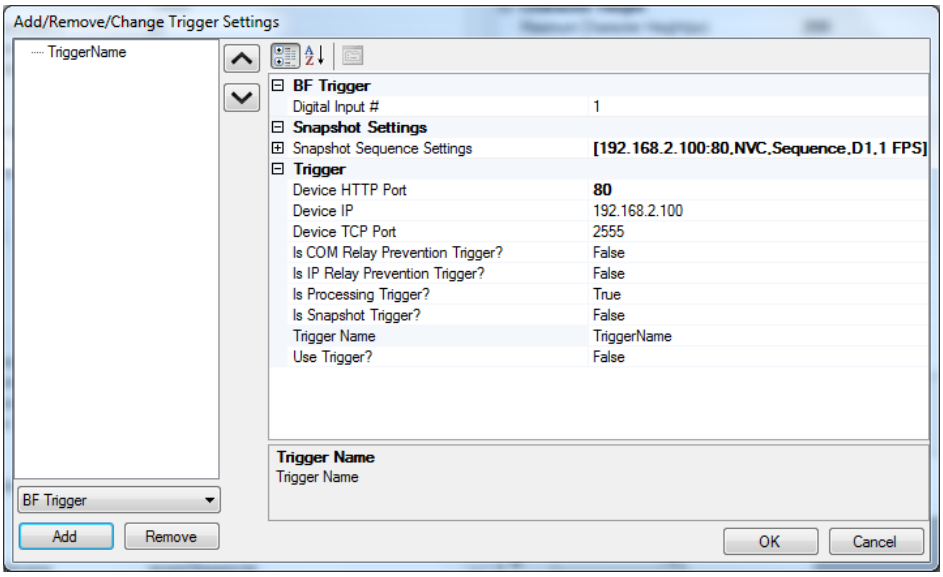
Triggers enable the program to detect license plates only when necessary (as opposed to constant detection from video).
Below is the example of ANPR trigger deployment:

To Add/Remove/Change Triggers Settings, follow these steps:





After adding a trigger the "Trigger Settings" section will show the newly added trigger settings:

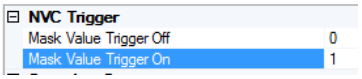


BF Trigger

- **Digital Input #:** The number of the Digital Input (DI).
  Note: In order to use BF triggers 'Relays (IP)->IP Relay Model' must be 'BF'.

NVC Trigger

Select and add “NVC Trigger” in the “Trigger Type”. The following window will appear:



- **Mask Value Trigger Off:** The mask value that signals that the trigger is off (0 by default when dealing with a single DI device).
- **Mask Value Trigger On:** The mask value that says that the trigger is on (1 by default when dealing with a single DI device).

18 Snapshot Settings

The Snapshot Settings inform the program as to what type of Snapshot Sequence to attach to each Trigger Settings (the snapshot device type, the address, the timeout, etc.)

Snapshot Settings	
Snapshot Sequence Settings	[192.168.2.100:80,NVC,Sequence,D1,1 FI
Authentication:Password	
Authentication:Username	
Device Type	NVC
HTTP Port	80
IP Address	192.168.2.100
Off Trigger Stops Sequence	True
Quality	70
Resolution	D1
Sequence FPS	1
Sequence Timeout(sec.)	10
Single Frame Only	False
Snapshot Profile Number	1
StorageProcess Options	ProcessOnly

You can use/test the snapshot devices manually, without the physical triggers as seen in section **'6.1.1.2 Snapshots Source'.**

- **Authentication:Password:** The Password to be used for login(when required) - may be blank when the device does not require credentials to retrieve snapshots.
- **Authentication:Username :** The Username to be used for login(when required) - may be blank when the device does not require credentials to retrieve snapshots.
- **Device Type :** When set to **HDIR** 'Resolution' and 'Quality' are not relevant and pre-determined within the device (within the selected **'Snapshot Profile Number'**).
- **HTTP Port:** The HTTP port used for communicating with the device (80 by default).
- **IP Address:** The IP Address of the device (camera/encoder).
- **Off Trigger Stops Sequence:** Allow/Disallow from the 'Off' Trigger to end the sequence.
- **Quality:** The Quality of the snapshot that is taken for every event/alert (0-100).
  Note: Not Relevant for **HDIR** device type.
- **Resolution:** The Resolution of the snapshot that is taken for every event/alert.
  Note: Not Relevant for **HDIR** device type.
- **Sequence FPS:** The Snapshot Sequence FPS(Frame Per Second)
  The higher this value is, you have better chance of capturing the plates out of the video(the faster the cars move, you need more FPS) – **but at the same time, the CPU works harder**, so setting this value should be handled with care while calibrating the channel and seeing the actual video that the channel should process.
- **Sequence Timeout (sec.):** The Snapshot Sequence Timeout(in seconds).
  When set to 0 the sequence will end only upon an 'Off' trigger(in case **'Off Trigger Stops Sequence'** is true, otherwise will never stop).
  Note: Setting this value to 0 while setting **'Off Trigger Stops Sequence'** to 'False' actually makes the snapshot device to be a constant video source, because when the trigger will trigger once, it will keep bringing frames to be detected until the user will actively press on the 'Stop' button (as described in section '6.1.1.2 Snapshots Source').
- **Single Frame Only:** 'True' ->Take only one snapshot instead of taking a snapshot sequence.

- **Snapshot Profile Number:** Relevant for the HDIR devices - the Video Profile Number to be used when taking the snapshot (includes Resolution & Quality).

  Note: To go to the HDIR profile settings go to **Setup->Image->Audio and Video** – there you will find **VIDEO PROFILE 1** and **VIDEO PROFILE 2** – adjust them to fit your needs, and then select one of them here(by typing 1 or 2).
- **Storage&Process Options :**
  - **ProcessOnly**: The fastest way to get the LPR detection
    - Not saving the raw snapshot to HD.
    - Needs extra memory for snapshots.
  - **StoreOnly**: Snapshots are only stored and not processed.
  - **StoreAndProcessFromMemory:** Fast LPR detection
    - Saving the raw snapshot to HD
    - Needs extra memory for snapshots.
  - **StoreAndProcessFromHD**: Slower LPR detection.
    - Saving the raw snapshot to HD
    - Does not need extra memory for snapshots
    -

  Note: Snapshots will be saved to the 'Detection Images Dir.'

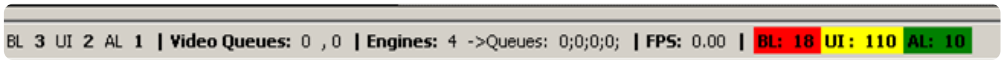
Trigger

In this category you will find all the settings the make out the trigger and its behavior.

- **Device HTTP Port:** The trigger device HTTP Port(by which commands are passed to the device).
  Note: Relevant only for NVC triggers.
- **Device IP:** The trigger device IP.
- **Device TCP Port:** The trigger device TCP Port(by which the trigger events are received).
  Note: Relevant only for NVC triggers.
- **Is COM Relay Prevention Trigger? :** When set to true the trigger will cause the COM Relay to block/unblock according to the trigger status (an 'On' trigger will block the relay, while an 'Off' trigger will unblock it) - when the relay is blocked, it won't be allowed to open or close. See section '6.1.4 Status Bar Panel'-> 'COM Relays Menu'->' Temp. Blocked' for more details.
- **Is IP Relay Prevention Trigger? :** When set to true the trigger will cause the IP Relay to block/unblock according to the trigger status (an 'On' trigger will block the relay, while an 'Off' trigger will unblock it) - when the relay is blocked, it won't be allowed to open or close. See section '6.1.4 Status Bar Panel'-> 'IP Relays Menu'->' Temp. Blocked' for more details.
- **Is Processing Trigger? :** When set to true the trigger will cause the LPR detection to Start/Stop processing according to the trigger status ('On' to start, 'Off' to stop). See section '6.1.4 Status Bar Panel'-> 'Video Q's (Video Queues)' for more details.
- **Is Snapshot Trigger? :** When set to true the trigger will cause the program to get a snapshot sequence from the camera (the sequence frame rate, duration, etc. can be configured under 'Snapshot Sequence Settings').
- **Trigger Name :** The Trigger Name.
- **Use Trigger? :** Enables/Disables the trigger.

Video Frames Queue

- **Dequeue Percent:** To prevent the video from overloading in video queues and thus causing 100% CPU usage, set the “Dequeue” value.
  Example: The “**Dequeue percent”** is set to 10 percent:
  In case the queue reaches its limit, 10% of the old images will be removed from the queue and will not be detected.



- **Queue Limit:** The limit of the queue: when reached, a percentage (defined by 'Dequeue percent') of the queue is removed.

- **Report interval (ms):** Interval to pass between subsequent file reporting from the Video Frames Queue to the Engines Queues.

- **Use threading:** Determines whether or not to use multi-threading for pushing the video frames of this queue to the engines queues. When set to True frames will be brought to the engines queues faster, but unordered.

19 VLC Settings

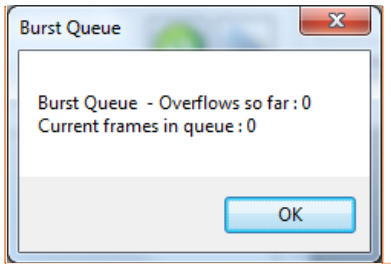
Burst Queue

In this queue, the system saves images to the Hard Drive and allows VLC to use them.

For more information, see '0.0.0 – VACAM ANPR Queues'.

Comment [A7]: Add this section

Comment [A8]: Add this snapshot to the new VACAM ANPR Queues section



- **Burst frames queue: Dequeue percent:** Percent of the queue to remove when the limit is reached. Set to 100 if you want to clear the queue in such case.

- **Burst frames queue: queue limit:** Limit of the queue: when reached, a percentage (defined by 'Burst Frames Queue: Dequeue percent') of the queue is removed.

- **Burst frames queue: report interval (ms):** Interval to pass between subsequent file reporting from the Burst Queue to the Video Frames Queue.

- **Burst frames queue: use threading:** Determines whether or not to use multi-threading for extracting the frames out of the Burst Queue. When set to true frames will be brought to the Video Frames Queue faster, but unordered.

- **Enable VLC log:** Set this value to true only when you are experiencing trouble with the VLC player. Otherwise set it to false to get overall better performance.

- **Ensure video ok interval (ms):** Upon Video Loss, there has to be a time interval (in milliseconds) between Video Loss checking that the video is OK again.
  Important: if this value is set to less than the time it takes to connect to the camera, the video might never return.

- **Frame ratio:** Frames Per Second (FPS) =25/Frame Ratio.
  *According to 25 FPS video source.
  For more information about this refer to section (5.3.2).

- **Image format:** Recommended formats: jpeg or png

- **Loop video:** Determines whether or not to loop the video when it reaches the end

- **Recent streams history filename:** It's the Filename of the file that holds the recent history of streams that were used.

- **Recent streams history save limit:** The limit for the number of recent stream strings to save.
  Changing this property will clear the history.

- **Refresh system tray:** It refreshes the system tray to get rid of unwanted VLC Icons.
  *Important note: settings this value to true may cause instability of the VLC software. Use it only after you have tried it before with success.

- **Show VLC player:** Determines whether or not to display the VLC Player.

- **Source string:** It's the source string for the VLC player.

- **VLC exe path:** The full path to the vlc.exe file.

- **Zoom factor:** The image Zoom Factor.

20 ENGINES SECTION

Alpha-Numeric Characters

- **Maximum alpha-numeric characters:** Select the maximum number of alpha-numeric characters in the license plate. Insuring not to present a longer plate length then 7 for this case

- **Minimum alpha-numeric characters:** Select the minimum number of alpha-numeric characters in the license plate. Insuring not to present a shorter plate length then 7 for this case
  *combining the two bullets we making sure the plate will show 7 digits.

Character height

- **Maximum character height (PX):** Maximum character height of the license plate (in pixels).

- **Minimum character height (PX):** Minimum character height of the license plate (in pixels).

Engine queue

- **Dequeue percent:** Percent of the Dequeue when the limit is reached.
  Set to 100 if you want to clear the queue in such case.

- **Maximum size:** The maximum allowed number of images in the engines queue.

General engine settings

- **Already deinterlaced:** Determines whether the source is de interlaced or not.

- **Auto correction:** Enable /Disable auto correction of license plate numbers.

- **Channel description:** Channel description.

- **Channel number:** Channel number.

- **Contrast level:** Contrast level.

- **Deinterlaced source:** Determines whether to interlace the source or not.

- **Deviation angle:** The plate's deviation angle [lower value leads to better performance]
  Range 0<= deviation_angle<=45. Minimal recommended value.

- **Histogram adjustment:** Determines whether to adjust the image histogram or not.

- **Image annotations:** Enable/Disable saving these engines detections to image files located under the directory 'AnnotationImages'.

- **Max running threads per engine:** Maximum allowed number of running threads per engines.

- **Plate color scheme:** Plate color scheme.

- **Precise mode:**
  PM_Normal-for images with normal quality without noise and blurring.
  PM_Mode1-used for noised images, night images.
  PM_Mode2-for noised and night images captured with motion blur effect.
  PM_Night-for night images captured with IR illuminator.

.

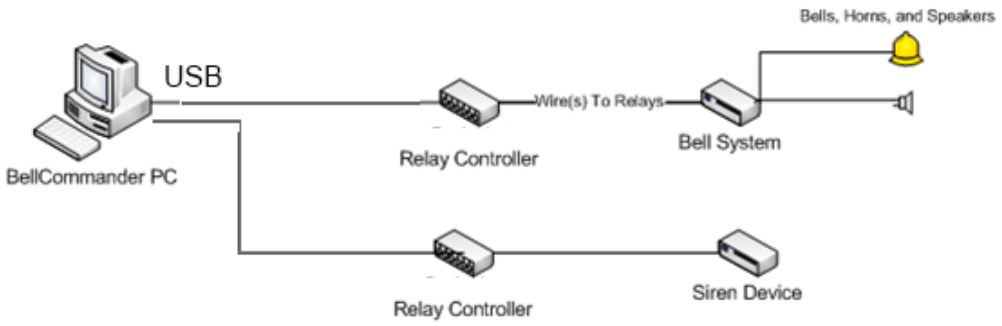
- The value indicating whether the source image is rotated by specified angle in degrees. Default value: 0.

21 Optional Hardware Components

EasyDAQ USB 4 channels Relay:

General connection

Relay practical use, for example the bell system below (could be a gate, door, etc).


Bells, Horns, and Speakers
USB
Wire(s) To Relays
BellCommander PC
Relay Controller
Bell System
Relay Controller
Siren Device

Features

- USB connected & powered card, 4 relays (240VAC@10A) and 4 general purpose DIO channels (logic level, rated @ 25mA per chan)
- OS compatibility: Win98SE/ME/2K/XP/Vista, Windows CE, Windows 7, Mac OSX and Linux
- Example code downloads available for: Labview, VB, VC, C#, JAVA, Agilent VEE & Delphi. Uses simple ASCII/Hex text command strings
- Command set & software interface is identical to our existing range of Serial & USB port products. If you have previously used our products, your code can be easily ported to this product
- USB interface chip has a unique (factory set) serial number programmed into it. The card will be automatically assigned the next available USB port number when first connected to your target system. The USB port number will remain the same (if later reconnected) but can be manually changed using the device manager if needed.
- USB 0V & +5V available via screw terminal blocks. Can be used for onward powering or switching of target application, contact closure purposes etc (300mA max). Option to power relays from an external +5V supply.
- PCB tracking (& relays) are designed to handle 10 amps @ 240V AC, or 8A @ 30V DC (switched or continuous)
- Relays are SPDT, Form C, changeover type, with N/O, COM and N/C contacts taken to edge mounted screw terminal blocks. See page 2 for detailed relay spec.

Description

Low cost, general purpose, USB connected & powered card with 4 relays & 4 general purpose DIO channels. The card uses SM devices to achieve a compact, integrated design, resulting in a small profile and low weight. Relays & PCB tracking are designed to handle240VAC@10A. USB power & 4 relay status LED indicators.

Fixed screw terminal blocks (see images) give access to N/O, COM & N/C relay contacts, four DIO channels and the USB 0V & +5V power which can be used for onward switching to your target application. DIO channels are capable of supplying 25mA per channel @ normal TTL voltage levels (+5VDC max).

Each card has a USB virtual COM port chip with a unique (factory set) serial number. The card is automatically assigned the next available COM port number by your OS. The COM port number will remain reserved (against the unique serial number, even if card is disconnected) but can be manually re-assigned via the Device manager if required.

Example programs are available in LabView, Visual C, Visual Basic, C#, JAVA, Agilent VEE and Delphi which demonstrate basic functionality of the card.