



# VaxALPR with MMC On-Camera Software

# Software Setup and Configuration Mobotix MOVE 2K Camera Main Manual

March 2023



# **1. Table of Contents**

2. Int	roduction
3. Be	st Practices in positioning and setting up the Mobotix MOVE camera <sup>2</sup>
4. Ca	mera Setup and configuration for License Plate Recognition
4.1	Setting up the Mobotix MOVE Camera
4.1.1	Set the date and time of the camera5
4.1.2	Setting a DNS Server
4.1.3	Zoom (Focal Length) and Focus6
4.1.4	Streaming Settings: Resolution
4.1.5	Stream Settings: Frame Rate
4.1.6	Setting the shutter speed and other important image settings
5. Lic	ensing the VaxALPR On Camera software14
5.1	Online Licensing15
5.2	Offline Licensing
5.2.1	Restart the Mobotix MOVE Camera21
5.3	Starting the ALPR software22
5.4	VaxALPR Settings24
5.4.1	VaxALPR Settings: Location
5.4.2	VaxALPR Settings: Plate options27
5.4.3	VaxALPR Settings: Video
5.4.4	VaxALPR Settings: Environment options
5.4.5	VaxALPR Settings: OCR options
5.4.6	VaxALPR Settings: Vehicle Direction Filters
5.4.7	VaxALPR Settings: MMC and Vehicle Classification
5.4.8	Frame Options40
5.4.9	Advanced42
5.4.10	VaxALPR Settings: Save changes43
5.5	VaxALPR Plates
5.6	VaxALPR Database
5.7	VaxALPR Blacklists and Whitelists50
5.8	VaxALPR Region of Interest54
5.9	VaxALPR Reporting
5.9.1	Reporting to Helix

# VaxALPR On Camera: Software Configuration - Version 3.1

5.9.2	2 JSON (JavaScript Object Notation)	59
5.9.3	3 Mobotix Move NVR	61
5.9.4	4 Sending HTTP / HTTPS POST XML Events	62
5.9.5	5 Connecting to Milestone	63
5.9.6	5 Well-Formed XML	63
5.9.7	7 Configuring Milestone	64
5.9.8	3 Genetec LPR Plugin	68
5.9.9	9 Network Optix Integration	69
5.9.1	10 Basic Setup	69
5.9.1	11 FTP Transmission	71
5.9.1	12 TCP Server	72
5.9.1	13 UTMC Integration	73
5.9.1	14 Overlay / Watermark	74
5.9.1	15 Output Port	75
5.9.1	16 MOVE's Submit Reporting Settings	76
5.9.1	17 Testing Reporting	77
5.10	VaxALPR Show Logfile	78
5.11	System Update	80
6.	Troubleshooting	81
6.1	VaxALPR On Camera software starts and then stops suddenly	81
6.2	The VaxALPR license is valid but a 'Check license' message appears	81
6.3	The VaxALPR On Camera software is running but not reading plates	81
6.4	VaxALPR is running but it does not read all of the plates	82
6.5	Plate patches are inverted on the plates list.	82
6.6	JSON or XML setup but no plates being received	83
7.	Dynamic Text Replacement Reserved Words	84
7.1	Additional values	86
7.2	Note on UTC time format:	87
8.	Changelog	88



# 2. Introduction

This guide has been designed to guide you through the process of for setting up and configuring the Mobotix MOVE camera and the VaxALPR On-Camera software.

The VaxALPR On-Camera software is a real-time solution for Automatic License Plate Recognition (ALPR) that runs entirely within the Mobotix MOVE camera. The software includes MMC (Make, Model and Color Recognition) with Vehicle Classification.

Contact Vaxtor for more information or register on the Vaxtor website Partner Zone. https://www.vaxtor.com/support/partner-downloads/

# **3.** Best Practices in positioning and setting up the Mobotix MOVE camera

ALPR (Automatic License Plate Recognition) is an image processing technology used to identify vehicles by their license plates. It is also known as ANPR (Automatic Number Plate Recognition) amongst other names.

A good clear image captured at the optimum angle is essential in order to achieve a good license plate recognition rate.

# **Very Important**

Please read the separately available document: "IP Camera Setup for ALPR" for a comprehensive guide to the best practices when setting up and positioning your ALPR camera.

This covers camera positioning, shutter speed, frame rate, image quality and infrared illumination.



# 4. Camera Setup and configuration for License Plate Recognition

In this section, we describe how to set up the Mobotix MOVE Camera for optimum image quality.

An intelligent ALPR camera is a specialized CCTV camera that has in-built software to identify license plates on still or moving vehicles. The ALPR software has been optimized to run on the **Mobotix MOVE Camera** taking advantage of the high speed processor and direct data transfer from the image sensor.

# 4.1 Setting up the Mobotix MOVE Camera

Once the Mobotix MOVE camera has been installed it must be set up and configured. Use a web browser to log on to the camera using its IP address. *(refer to the Mobotix MOVE documentation for the default IP address. The default username and password are normally: admin / meinsm.*)

The manual should be read in conjunction with the Mobotix MOVE camera manual, Mx\_ML\_MOVE\_Mx-VB1A-8-IR-VA\_V1.07\_EN\_20220726 User Guide.pdf which can be downloaded from the Mobotix website: <u>https://www.mobotix.com/en/manuals</u>.

# 4.1.1 Set the date and time of the camera

To set the **date and time** within the Mobotix MOVE camera, select the "System" Tab:

MOBOTIXMO	NG Hom	e System	Streaming	Camera	Logout	٢	English		
System	System								
Decurity Network	Host Name :	Mx VB1A 8 IR	AV.				^		
DDNS	Time zone :	GMT+00:00 Gambia, Liberia, Morocco, England							
TP.	Enable daylight saving time								
ΠP	Time offset:	01:00:00							
xMessageSystem vonts	Start date:	Mar			Start time:	01:00:00			
torage Management Tecording		3rd week							
chedule ile Location		Sun							
ew Information	End date:	Oct			End time:	02:00:00			
oftware Version oftware Upgrade		3rd week							
amteriance		Sun							
	Time format:	dd/mm/yyyy							
	<ul> <li>Sync with comp</li> </ul>	uter time							
	PC date:	03/08/2022 (dd/mm/yygy)							
	PC time:	15:58:50 [hh:mm:ss]							
	O Manual								
	Date:	01/04/2016 [dd/mm/www]							
	Time:	00:00:00							
	Sync with NTP a	in contress)							
	NTP server:						-		

Here we can set the time zone and synchronize the time with a time server and in this example we are using one of the UK NTP Servers.

# 4.1.2 Setting a DNS Server

When the software is first run it will attempt to connect to the internet to check for the latest version of the software. To allow this to happen you should configure a DNS server (Domain



Name Server). (Note this is also often needed for BOF connections to map your domain names).

To do this go to the main Mobotix MOVE System Tab menu and select Network and then Basic: Select a DNS server such as Google's as follows:

ΜΟΒΟΤΙΧ	MOVG	Home	System	Streaming	Camera	Logout	3	English	
System Security	• Networ	rk							
Network	▲ General								
Basic	O Get I	P address aut	omatically						
QoS	O Use 1	Use fixed IP address							
VLAN SNMP	IP addre	SS	192.168	3.1.222					
UPnP	Subnet r	mask	255,255	.255.0					
OpenVPN									
Bonjour	Default g	gateway	192.168	3.1.254					
DDNS	Primary	DNS	0000						
Mail			0.0.0.0						
FTP	Seconda	iry DNS	8.8.4.4						

In this case Google's is 8.8.8.8 with a secondary server of 8.8.4.4. These are free Google DNS servers which will map any domain names needed to the correct IP address.

# 4.1.3 Zoom (Focal Length) and Focus

Under the **Camera** tab you can change camera's field of view (FOV) using the ZOOM buttons to the portion of road that you require. Concentrate the FOV on the road only and do not waste resolution on grass verges, pavements etc. Sometimes this results in not enough resolution being available for accurate results in the main part of the image and it can also slow down recognition times

In this example about 2m on the left of the image is not being used for recognition:



The **focal length** of the lens determines how "zoomed in" the image is. It is usually expressed in millimeters (e.g., 6 mm, 25 mm, or 50 mm). The focal length tells us the angle of view (how much of the scene will be captured) and the magnification (how large individual elements will be). The longer the focal length, the narrower the angle of view and the higher the magnification. The shorter the focal length, the wider the angle of view and the lower the magnification.



In the case of zoom lenses, both the minimum and maximum focal lengths are stated, for example 3.6–22mm.

Mobotix MOVE cameras come with zoom or motorized lenses. As a rough guide, the following cameras will operate at the specified ranges:

Single lane (3m wide):

MOVE 4K (3.6-11mm lens) @1920 max HFOV 3m: 2-12.5m Range Day/Night MOVE 2K (3.6-11mm motorized lens) @1920 max HFOV 3m: 2.5-16m Range Day/Night MOVE 2K (9-22mm zoom lens) @1920 max HFOV 3m: 5.5-33m Range Day, Night 25m est.

Dual / Wide lane (6m wide):

MOVE 4K (3.6-11mm lens) @1920 max HFOV 6m: 4-12m Range Day/Night MOVE 2K (3.6-11mm motorized lens) @1920 max HFOV 6m: 4.5-16m Range Day/Night MOVE 2K (9-22mm zoom lens) @1920 max HFOV 6m: 10.5-33m Range Day, Night 25m est.

# 4.1.4 Streaming Settings: Resolution

The resolution of the camera determines the amount of detail that can be captured. The smaller the object detail, the higher the resolution that is required. If you are only running the Mobotix MOVE On-Camera VaxALPR App then there is no need to set the resolution in the main camera settings – you can specify this later with the App Settings. However, you should set ONE of the stream setting to have an Encode Type of MJPEG to ensure that live video can be viewed when setting up the App.

# 4.1.5 Stream Settings: Frame Rate

# NOTE: Does not need to be set for VaxALPR On-Camera

The frame rate, is the number of frames or images that the camera can capture per second. For example, 30 fps means the camera captures 30 frames in a single second of video.

If you are only running the Mobotix MOVE On-Camera VaxALPR App then there is no need to set the frame rate. The App will set this internally.



### 4.1.6 Setting the shutter speed and other important image settings

The camera's image and shutter settings should have been factory set for Vaxtor's ALPR. If you need to change or restore these then click on the Camera Tab.

The following options are displayed:



We will now examine these options in detail:



#### Exposure



Window Setting – turn on and then use the cursor to set a (red) window to be used for changing the image brightness. Useful if you have a wide-angle view and are picking up bright objects from the edge of the image which affects the exposure of vehicles.

AE Priority – Aperture priority allows you to set the shutter speed ( which needs to be fast ) over image quality. Realtime ensures that the shutter speed takes priority over the iris settings

Night Mode Priority Normal: This may lighten darker images Highlight detail: Decreases overall brightness to make bright targets more visible

Max Gain – 30db will lighten night time images – but the higher the gain, the more noisier the images will be in low light conditions. This is a compromise.

Auto Shutter allows you to set the shutter speed to 1/500<sup>th</sup> sec for slow to medium speed traffic.

Set this higher if the traffic is fast to avoid motion blur.  $1/1000^{th}$  sec should be good up to 150kph with a shallow angle of view and for very high speeds use  $1/2000^{th}$  sec.



### White Balance



#### **Picture Adjustment**



#### Set Auto White Balance to Normal

Set the Brightness and Contrast as required.

If using the camera at greater distances (20m+) at night then it may help to slightly increase the contrast by +1 or +2 to brighten the plates. (Additional gain may help also – see above)

It is best NOT to enhance the sharpness of the image as this is interfering with the original image.



#### **IR Function**

Exposure	
White Balance	
Picture Adjustment	
IR Function	4
Day/Night Function	
Light sensor	
Day/Night Threshold	
7	<b>→</b> ≎
4	⇔ఎ
IR Light Compensat	ion
Off	
Noise Reduction	
Gamma HDR	
Digital Zoom	
Backlight	
Profile	
TV System	
Linear (max 60	

## **Noise Reduction**

Exposure	•
White Balance	<b>V</b>
Picture Adjustment	▼
IR Function	~
Noise Reduction	4
3DNR	
Off	
2DNR	
On	
ColorNR	
Off	
Gamma HDR	•
Digital Zoom	•
Backlight	•
Profile	~
TV System	
Linear (max 60	

Set the IR to use the inbuild Light Sensor to determine when it is dark and the camera should switch to night mode and illuminate the IR LEDs.

The thresholds determine at what light level the camera changes. This may vary due to reflections from buildings or objects or ambient light in your scene.

# Night Mode to Day Mode 🎿

The lower the value, the earlier the camera switches to Day mode. The default value is 7. So if you want to change to Day Mode later, then increase this value. This can help if the camera re-focusses and has very little to focus on as the image is still dark

# Day Mode to Night Mode

The higher the value, the earlier the camera switches to Night mode. The default value is 4.

## **IR Light Compensation**

This option varies the amount of IR light emitted. It can be used when a vehicle is very close to the camera and the plate appears too bright.

2D Noise Reduction is recommended.

(3D combines frames and so should not be used)



# Gamma HDR



# Digital Zoom



Turn Gamma HDR off as this combines frames.

Turn Digital Zoom off. Use the optical zoom if required.



# Backlight



# Profile



Turn Backlight Exposure Off.

You can set and save various Camera Profiles if required.

The tick icon saves the current profile.

To load and apply a profile, select a profile number and use the load icon **Sec.** 



#### **TV System**



The TV system is normally only used if you connect an analogue CCTV monitor to it (PAL or NTSC). This is not normally required – so set this to Linear 60 and this will allow a higher shutter speeds to be set.

In addition to these guidelines Mobotix MOVE has a few tips: <u>https://www.Mobotix MOVE.com/en-gb/products/online-manual/50100#t10107225</u>

Test the above settings by running through the scenario with a vehicle. For best results, test the settings in the darkest lighting conditions. This way, you get a good result both during nighttime and daytime.

# 5. Licensing the VaxALPR On Camera software

Vaxtor's ALPR software with Make, Model & Color recognition should already be installed on your Move camera but it must be licensed before it can be used to recognize plates.

If installed, go to the camera's webpage: http://IPAddress/mobotix/index.html#

The tab title at the Vaxtor LPR webpage will show the version number and the build number. Both should match with the expected values for the current release.

	VaxALPR 1.0.8 [26717]
--	-----------------------

Contact your dealer or Vaxtor to purchase an appropriate license. E.g. 30 day demo, permanent etc. This will be sent to you in the form of a product key code.

There are two methods of licensing the software:

- a. Online if your camera is connected to the internet (recommended)
- b. Offline if your camera is not connected to the internet

# 5.1 Online Licensing

Ensure that the date & time of the camera are correctly set. Using a NTP server is not mandatory and synchronizing the time with the computer is a valid method.

MOBOTIXMO	/C Home	s System St	reaming	Camera	Logout	٩	English	
System	System							
Security <b>*</b> Network <b>*</b>	Host Name :	Mx-VB1A-8-IR-VA					0	
DDNS	Time zone :	GMT+00:00 Gambia	, Liberia, Mo	rocco, Englan	d			1
FTP	Enable daylight	saving time						
нттр	Time offset:	01:00:00						
MxMessageSystem Events ▲	Start date:	Mar			Start time:	01:00:00		
Application Motion Detection Network Failure Detection		3rd week						
MxMessageSystem Event		Sun						
Periodical Event Manual Trigger	End date:	Oct			End time:	02:00:00		1
Audio Detection Vaxtor ALPR		3rd week						
Storage Management 🛛 🔻		Sun						
Schedule	Time format:	dd/mm/yyyy						
The Location	O Sync with comp	uter time						
Factory Default Software Version	PC date:	30/08/2022 [dd/mm/yyyy]						
Software Upgrade Maintenance	PC time:	12:51:12 [hh:mm:ss]						
	O Manual							
	Date:	01/04/2016 [dd/mm/yyyy]						
	Time:	00:00:00 [hh:mm:ss]						l
	Sync with NTP s	erver						
	NTP server:	uk.pool.ntp.org					0	
	Save							

Ensure that the network setup is correctly set. The camera must have a correct DNS server configured, to do this go the main MOVE System menu and select Network & Basic. Select a DNS server such as: 8.8.8.8 with a secondary server of say 8.8.4.4. These are free Google DNS servers which will map your URL names.

Basic	O Get IP address automatically						
QoS	Use fixed IP address						
VLAN SNMP	IP address 192.168.1.222						
UPnP OpenVPN	Subnet mask	255.255.255.0					
Bonjour	Default gateway	192.168.1.254					
DDNS Mail	Primary DNS	8.8.8					
FTP	Secondary DNS	8.8.4.4					

Select the ALPR webpage from the System/Events tab:

Events	^
Application	
Motion Detection	
Network Failure Detection	
MxMessageSystem Event	
Periodical Event	
Manual Trigger	
Audio Detection	
ALPR	



. . or use a browser window to open: <a href="http://cameraip/mobotix/index.html">http://cameraip/mobotix/index.html</a>

The license dialogue box will appear:

License	4)>			
Product key Set and submit a valid Product Key. Product key				
Save	Product key	Country	Direction	Black
V2C Download C2V file. With this file, get a V2C with a valid license and upload it. Download C2V	pload V2C			

In the 'Product key' box enter the product key provided.

This will be a code formed by 5 groups of letters and numbers such as:

c9641677-4881-4283-9f42-cb169cb55b98.

Click on the button "Save product key". The window should change to:

License						
Submitting Product key						
= = = =	Date No plates found	Plate	Image	Formatted	Country	Directio

If the licensing has worked correctly then you will be redirected to the main ALPR software Plates page:





In the case that there has been an error, a descriptive message will appear at the bottom right corner of the screen:



Details of the error can be checked on the logfile. To open the log click on the "</>" symbol on the top right corner of the licensing window.





# 5.2 Offline Licensing

Go to the LPR webpage on the camera: <u>http://cameraip/mobotix/index.html</u> The license dialogue box will appear:

MOROTIN ANTOD					
MOBOTIX	License	<b>«</b> />			
	Product key Set and submit a valid Product Key.				
	Product key				
	Save Product key		Country	Direction	Black
	V2C				
CHARMARS .	Download C2V file. With this file, get a V2C with a valid license and upload it.				
	Download C2V Upload V2C				

Click on the 'Download C2V' button. A file named VaxALPR.c2v will be saved to your download directory.

Next using your web browser go the licensing portal: https://licensing.vaxtor.com and enter your product key in the textbox. Click on "Log In"



If a customer window appears, click on "Register Later".

	the Product key. Already regis	stered? Click here	Register Later
Customer Information			
First Name:		Middle Name:	
Last Name:		* E-mail:	
Locale:	English	✓ Batch Code:	~
Telephone:		Fax:	
CRM ID:		Ref ID:	
Description:			
Billing Details			
reet:			
		ZIP/Postal Code:	
City:		Country:	
City: State:			



VAXTOR VaxALPR On Camera: Software Configuration - Version 3.1

Click on "Offline Activation":

	DR			Welcome   Logout
Product Key : c964	1677-4881-4283-9f42-cb169cb	o55b98	Online	Activation Offline Activatio
Product Key:	c9641677-4881-4283-9f42	-cb169cb55b98		
Customer Name:	71	E-mail:	.71	
Channel Partner:		E-mail:		
Activations:	2	Remaining Activations:	1	
Previous Activations:	1 View	Enabled:	true	
Products		Lock Type		
> Move		SL-UserMode		
21 Vaxtor Technologies	Support			Sentinel LDK-EM

Click on the '...' button and upload the VaxALPR.c2v file downloaded earlier. Click on 'Generate' go generate a V2C file:

		5 VAXTOR		
Generate Licen	se			0 ×
Order Details				
Product Key:	c96416	77-4881-4283-9f42-cb169cb55	b98	
Customer: Activations: Vaxtor Ref: Entitlement Comments:	2	E-mail: Remaining Activations: #PO Ref:		1
Products:	Prod Move	uct	Lock Type SL-UserMode	
	Dowr	load RUS, a tool to generate C	2V	
Upload C2V				
Upload C2V: Comments:	VaxAlpr (10	.c2v		
			Ge	nerate Cancel



Download the V2C File by clicking on the blue link:

Generate License					0
Successfully generated t	he V2C/EXE/	ZIP file, but em	cannot send an e-ma ailing the file if requi	ail <mark>with thi</mark> s file to the sp red.	ecified recipients. Consi
Order Details					
Product Key:	c9641677-4	881-4283-9	f42-cb169cb55b98		
Customer:	-	E-mail:			120
Activations:	4	Remaining Activations			0
Vaxtor Ref:		#PO Ref:			
Entitlement Comments:					
Products:	Product			Lock Type	
	Move			SL-UserMode	
	Download	I <mark>RUS</mark> , a too	I to generate C2V		
Activation Details					
Key ID	Lock Type		Activation Date	Comments	Download
856351560820209343	SL-UserMo	ode	2022-06-29		V2C File

Return to the camera's licensing page (<u>http://cameraip/mobotix/index.html</u>) and click on "Upload V2C".

Select the file downloaded on the previous step.

The camera will redirect you to the Settings webpage and a confirmation message will appear at the bottom right corner.

	DR	VaxALPR 1.0.6 [24188]	Ξ
MOBOTIX Settings	Country options Country options Countries Afghanistan Choese countries from more to less probability of occurrance Selet and clik (p) Countries: Spain © Greenwar ators	VaxALPR 1.0.6 [24188]	=
			License V2C file submitted OKI



#### 5.2.1 Restart the Mobotix MOVE Camera

Once the VaxALPR On Camera software is installed and the license key is uploaded, you should restart the Mobotix MOVE Camera. Do this by selecting 'System', 'Factory Default' and Select the '**Reboot'** button.

MOBOTIXMO	VG	Home	System	Streaming	Camera	Logout	٢	English
MOBOTIX MOV	Factory De Restore fact System will Full Restor Restore fact Partial Res Reboot the s Reboot	Home efault ory settings a restart and ne e ory settings (r tore	System nd lose any c eed installer p excluding net	Streaming hanges? orogram to setup work settings)	Camera network.	Logout	(2)	English
Software Upgrade Maintenance								



# 5.3 Starting the ALPR software

Once licensed, go to the camera's ALPR webpage by selecting ALPR from the System/Events tab go directly to: <u>http://cameraip/mobotix/index.html</u> :

## VaxALPR On Camera user interface

This will open a new window with the VaxALPR On Camera main interface.

MOBOTIX SVAXTOR	Vax	ALPR 1.0.5 [DEV	-20220621]			=
	Plates					
	Date	Plate	Image	Formatted	Country	Direction
	03/08/2022, 17:24:05	1064/SN	YD64LSt	YD64:SN	GBR	Uninzwn
	09/08/2022, 17/24/03	BLTTYRP	BLII YXF	BLITYRP	GUR	Uninessn
	07/18/2022, 17:27850	BD1307K	BDI3 OZ	BD1302K	GBR	Unknown
	09/38/2222.1/2221/	AF49-B/V	AF69 HN	Arbenter	GUR	Uninown
	09/18/2022 17:22:11	SATJOAG	SA13 DAT	SATSCAR	GÜR	Unimove
	09/18/2022, 17:22:04	CUS3OBM	CUS3 OB	CUS3OBM	GRR	Unknown
	03/08/2022.17:21:01	ADSOLUTR	TACALE	ADSCUTR	GBR	Unknown .
	0 🚺 Astacht 1	2			5 items	

VaxALPR On Camera interface

The icon in the top right corner reveals the options menu including:

- <u>Plates:</u> To display a live feed of all the most recent plates read (if configured)
- <u>Settings:</u> To configure VaxALPR On Camera software
- <u>Region of Interest (ROI)</u>: To add/edit ROIs to include or exclude in the OCR analysis.
- <u>Reporting:</u> To configure reporting options for VaxALPR On Camera.
- <u>Blacklist:</u> To manage a Blacklist (e.g. to sound alarms).
- <u>Whitelist:</u> To manage a Whitelist (e.g. to activate a relay) (These appear if they have been enabled in Settings)
- <u>Database:</u> To review and search the list of recorded plates (If configured)
- <u>Download (XML) Config:</u> To export the VaxALPR On Camera settings to an XML file. The export will not include the black/whitelists or the recorded log file of plates.
- Upload XML Config: To import the VaxALPR On Camera settings from an XML file
- Logfile: To display the latest System Log for debugging purposes
- <u>System update:</u> To update the VaxALPR software to the latest version



## Live Video Button

When the GUI starts, a single image is grabbed from the camera and frozen for you to select from the menu or view captured plates. Press the Blue Play icon to start the live video.

If you do not need to see live video then press the Red Pause icon.



Note that if you are using say a 4g connection to the camera, then by viewing a live image in a browser window you will be streaming data over your connection to your PC for which you may be charged for.



# 5.4 VaxALPR Settings

In the **VaxALPR Setting page** it is possible to configure all of the LPR parameters. The settings are divided into different sections.

Note that the version / build number is shown in the web page title tab:



Select each section in turn from the headers on the left or move between them using the left

and right arrows at the bottom of the screen:

You can abandon your edits and reload the currently saved configuration file by clicking the Reload symbol, bottom right:



You can also save the current settings at any time by clicking on the disk symbol, bottom right:



(see VaxALPR Settings: Summary and Submit changes the end of the Settings section)



# 5.4.1 VaxALPR Settings: Location

# Countries (1-10)

Location		
Country options		
Countries		
Afghanistan		÷ +
Choose countries from more to less probability of occurrence Select and click [+]		
Countries:		
United Kingdom	ā	
Grammar strict		
Disable country analysis		

At least one country must be selected and up to ten countries may be included.

- Select a country from the drop-down list and click the <sup>+</sup> button. The country will be added to the list.
- To remove a country from the list, click the button.
- Additional countries will be added to the bottom of the list. Make sure that the list is ordered so that those countries with the higher probability of occurrence appear first. (*Tip: Think about this first and then add the countries one-by-one. If you make a mistake you will have to delete one or more entries and add them again.*)

# Required State (1-5)

Location	
Country options	
Countries	
United States	
Choose countries from more to less probability of occurrence Select and click [+]	
Countries:	
Canada	<b>a</b>
United States	<u>ā</u>
States:	
Alabama	
Alabama	
Alaska	
Arizona	
Arkansas	
California	
Colorado	
Connecticut	
Delaware	
District Columbia	
Florida	
Georgia	
Hawaii	
Idaho	
Illinois	
Indiana	
Iowa	
Kansas	
Kentucky	
Louisiana	
Maine	

If one of selected countries is *United States*, a main state must be selected from the dropdown menu. A total of five states can be added – again in likely order of occurrence.

Note that the same neural engine (used for matching character shapes) is used for all of the Americas, selecting the state simple loads the possible syntax (grammar) for those states to help with the letter O and zero for example. Other states not in the list will still be recognized.



#### Grammar Strict

Grammar Strict

- Select this checkbox 🗹 to force the Engine to only use the syntax from countries or states that you have selected. Plates that do not match these rules will **not** be reported. This is the recommended option for using ALPR for access control where exact matches are required.
- Do not select this checkbox when you want to report ALL valid license plates. This is the recommended option for ALPR in triggered mode. (see 'Working Mode' later)
- In the USA, plates are often seen from multiple States and so the recommended setting is **OFF**.

NOTE: False triggering may occur when this checkbox is not selected. E.g. some text seen on the rear of a truck may be read as it doesn't match the selected grammar.

#### **Disable country analysis**

Disable country analysis

Select this checkbox 🦉 to disable country analysis.

If enabled, country analysis uses machine learning to determine the country of origin of the plate, even if it is not in the list of countries selected above. The results are based on the image characteristics of the plate compared to an ever-growing database of international samples.

Note that this extra process will add some time to the OCR processing time. When tuning your system later note what effect this has.



# 5.4.2 VaxALPR Settings: Plate options

Plates	
Detect multiline	
Enable database	
Enable whitelist	
Enable blacklist	
Retry notifications	
Prioritize notificators	
Concernage	
Retry timer (0 - 60)	
10	
Background Mode	
Dark foreground, light background	
Minimum Number of Plate Characters (3 to 12)	
3	
Maximum Number of Plate Characters (5 to 12)	
7	

#### **Detect multiline plates**



• Some countries or regions do not have two or three-line plates. If this is the case then unticking this option will allow the engine to run faster.

#### Database

**IMPORTANT**: In order to save recorded plates in the camera's storage for later retrieval or viewing, you must install and configure an appropriate SD card in the camera. This can be checked from the camera's System menu under Storage Management.

The application only checks for available space on the SD card when launched and if it becomes full then no new plate reads will be added to the database. There is a default maximum size of 100,000 records and when this limit is reached the oldest records will be overwritten.

Note that if you are using a small SD card then the card may to become full before this circular buffer limit is reached and so no new reads will be written to the card and so you should reduce this buffer size accordingly. There is no definite standard record size as this depends on video resolution, the complexity of the image, the jpeg compression factor used etc. As a rough guide a 32GB SD card would store approximately 80,000 reads at 1920h.

Enable database

#### Enable database

To generate an on-board database (log file) of detected plates, select the 'Enable Database' checkbox. A maximum of 100,000 records may be stored in the database. The size of each image depends upon image complexity, resolution etc. but a 64GB SD card should store 100,000 reads and images on board.



## Black / White list activation



### **Enable whitelist**

• Select this checkbox 🦉 to enable plate checking against a predefined Whitelist.

#### Enable blacklist

• Select this checkbox does not be to enable plate checking against a predefined Blacklist. (see: <u>VaxALPR Blacklists and Whitelists</u> later in this manual )

Note that Black and White lists can be stored centrally on Vaxtor's Back Office "Helix" and automatically synchronized with all connected cameras.

# **Retry notifications**

Select this checkbox do retry the sending of any notifications if any fail, for example due to a comms problem. You may then specify a retry period in seconds (see Retry timer below)

#### **Prioritize notificators**

See low coverage mode below

Select this checkbox for a hybrid method of sending plates after a communication or back office failure. This mode causes the plate to be read and sent to the various end points (your reporting options) before anything else. i.e. before displaying the plate on the GUI, before storing it on the SD card, etc.

If the network / communications are working well then new reads are sent in real time. If not then they are added to a queue to send. You may want to then decrease the retry time to say 0 seconds to catch up.

#### Low coverage mode (FIFO)

Select this checkbox if your camera is remote and the communication links (WiFi or 3g for example) are regularly dropping out. When selected, events are **not** sent in real time to any configured Back Office or recipient (See Reporting options later in this manual). In very bad conditions this would cause a backlog of events being constantly tried.

With Low Coverage Mode selected, reads are retransmitted after a longer interval reducing the chance of an ever-increasing backlog.

# So the system will use a FIFO policy for sending reads.

Note this should NOT be used when using UTMC protocol or when using the system for access control where real time events are essential.



# **Retry Timer (1-60 seconds)**

Retry timer (1 - 6	0)		
10			

 You may specify a retry period in seconds to retry the sending of any notifications if any fail, for example due to a comms problem.
 See VaxALPR Reporting later in this manual.

#### How retries work

Normally the transfer process takes approximately 100ms without image, and 300ms with image. If the response from the server takes more than 5 seconds, you will get a timeout error on the camera, BUT this does not mean the data hasn't arrived at the endpoint.

Usually this is caused by the server receiving the request and processing the data **before** sending the data received acknowledgement to the client (the camera). The data is already on the server, but the camera only waits 5 seconds for the response. This can case the same data to be re-sent as the camera does not receive the OK response and the entry in the camera database is still marked as unsent. (or not received)

Check your endpoint software (back office) end ensure that responses are sent to the camera **immediately** after receiving the data before processing the data. Contact Vaxtor for further information.

#### **Background Mode**

Background Mode
Dark foreground, light background

- Select the option from the drop-down list that best defines the color of the target license plate. There are three possibilities:
  - *Dark foreground, light background*: The plate background color is lighter than the characters (e.g. black fonts on white background).
  - *Light foreground, dark background*: The plate background color is darker than the characters (e.g. white fonts on black background)
  - *Both*: Plates are expected in both forms.

NOTE: Do not select Both unless it you need to recognize both types as this can affect OCR performance.



# **Minimum Number of Plate Characters**

```
Minimum Number of Plate Characters (3 to 12)
```

• Set the minimum number of characters that you expect to see in your region.

#### **Maximum Number of Plate Characters**



• Set the maximum number of plate characters that expect to see in your region.

### 5.4.3 VaxALPR Settings: Video



This section displays real-time video based on the current settings.

When some parameters are edited such as resolution, the changes are immediately reflected in the video stream.

#### Play/pause video



In order to select a suitable image to verify the Character Height configuration, you can pause the video reproduction, using the play/pause button at the bottom of the image.



# Resolution

• Select the desired *Resolution* from the drop-down list. Any changes will immediately be shown on the live display. Some cameras have a limited choice of available resolutions.

**NOTE**: when the camera is setup to read plates in a single lane then a resolution of 1024x768 or 1280x720 is recommended. When the camera is setup to read plates in wide or multiple lanes, a resolution of 1920x1080 is recommended. Not all options may be available.

# Minimum Character Height (14-70 pixels)

This is the minimum height that a license plate's characters should be before being read. If the camera's lens (zoom) is setup correctly then the plate characters should be about 20-30 pixels high in the area of the field of view where they should be read. Set this too small and the tiny plates will cause misreads.

Note that for small plates such as most Arabic plates - or plates with additional small characters such as Costa Rica, – then a minimum character pixel height of 30 pixels is recommended.

• Set the minimum height of the plate's characters in pixels.

**NOTE**: The recommended difference between the min and max heights is about 10-20 pixels.

# Maximum Character Height (14-70 pixels)

• Set the maximum height of the plate's characters in pixels.

# Verifying the Character Height configuration

To verify that the height settings are correct, click over the live video to show two rectangles which represent the minimum and maximum thresholds. The height of characters on the plate should fall within these two rectangles. You can drag these rectangles around the screen to where your target plates are.





# 5.4.4 VaxALPR Settings: Environment options

Same Plate Delay (secon	ds)	
30		
Same Plate Max Chars D	istance	
1		
Maximum Slope Angle (0	-40 degrees)	
20		
Mutiplate frame		
Middle capture		
Multiplate minimum nur	nber of occurrences (1-10)	
1		
Multiplate maximum nu	mber of occurrences (1-10)	
5		
Multiplate recognition ti	neout (0-10000 milliseconds)	

#### Same Plate Delay (Max: 65535 seconds)

Sam	e Plate Delay (seconds)		
3	0		

Set the number of seconds that should elapse before reading the same plate twice. This is to prevent multiple reporting of the same plate in situations when the traffic is slow or stationary. For example, if a vehicle stops at a barrier and the plate is reported but the car



doesn't move for 30 seconds, then this delay should be set to say 60 seconds or more to prevent a duplicate read.

#### Same Plate Max Chars Distance

Same Plate Max Chars Distance	
2	

 Set the number of characters that two plates must differ by to be considered different. The Mobotix MOVE camera is capable or reading a plate several times as it passes through the field of view. If one character is misread on one of the reads then by setting this value to 2 then both reads will contribute towards the final reported plate text.

#### Maximum Slope Angle (0-40 degrees) (Advanced option – Default 20)

Maximum Slope Angle (0-40 degrees)			
20			

• Set the angle of slope of a plate that the engine should attempt to read up to.



NOTE: If you know that the plates will be skewed then by setting this parameter higher you can force the engine to look for plate shapes that are more skewed. However, you should setup your ALPR camera to keep plates as close to the horizontal as possible.

#### Multiplate frame reported

Mutiplate frame	
Middle capture	v
First capture	
Middle capture	
Last capture	

- Select which plate image should be saved from the drop-down list:
  - o First capture.
  - Middle capture.
  - o Last capture

A plate is normally read several times as it passes through the camera's field of view. You may want to use the largest (Last) image for oncoming traffic & the First image for vehicles moving away from the camera.



### Multiplate minimum number of occurrences (1-10)

Multiplate minimum number of occurrences	
1	

• Set the minimum number of times that a plate should be read within the Timeout period to be considered a valid plate.

### Multiplate maximum number of occurrences (1-10)



• Set the maximum number of times that a plate should be read before being reported (this may happen before the timeout).

#### **Multiplate Recognition Timeout**

ultiplate recognition timeout (0-1000	) milliseconds)	
900		

• Set the number of milliseconds that the engine should spend analyzing a plate. (1000 milliseconds = 1 second)

In free-flow mode the engine continuously analyses video frames and reads and reports plates. It makes a final decision on the plate read after an interval of time - the maximum recognition timeout period. There is a dedicated time counter for every plate which starts counting after the first read. When it reaches the preset timeout it stops, checks the number of samples read of the same plate and returns the "best" result.

If an instantaneous plate read is not needed then set this timer to say 1000ms (1 second) so that the engine continues to look for the same plate to read again for as long as possible. Note that if a new plate is spotted during this time, the old one will be reported and a new plate-trace started.

We call the number of times the same license plate has been read within the maximum recognition period the **multiplate rate**. Several reads of each plate are good and produce better results.



# 5.4.5 VaxALPR Settings: OCR options

OCR	
Minimum Global Confidence (0-100)	
70	
Minimum Character Confidence (0-100)	
50	
Minimum Country Confidence (0-100)	
50	
OCR complexity	
Low	~
Working mode	
Freeflow	~
Enable IR Mode (discard color information)	

### Minimum Global Confidence (0-100)



• Set the minimum confidence level that the whole plate read must meet in order to be accepted. The global confidence is the average of all individual characters' confidences. The recommended value is 80. Set lower if you see some plates in very bad condition but want to read them. (Setting this too low will cause the engine attempt to read other items such as vehicle signage etc. )

#### Minimum Character Confidence (0-100)



• Set the minimum confidence level that a single character must meet in order to be accepted. The recommended value is 70.

TIP: In regions with open grammars such as the USA keep these two values high, e.g. 90-80 respectively. Higher values mean a lower probability of false positives but a lower probability of missing plates.

#### Minimum Country Confidence (0-100)

N	mum Country Confidence (0-100)
	0

 Set the minimum confidence level to be applied when using automatic country analysis. (See the Location section).
 Default value 50%



# OCR Complexity

OCR complexity	
Medium	~
Low	
Medium	
High	

- This is the complexity of the analytics to be applied during the ALPR Engine's stage of plate reading. Set this according to the OCR mode and type of traffic expected. There are three possibilities:
  - *Low*: Recommended for very high-speed traffic where the OCR needs to work faster and your preference is for plate detection over perfect recognition.
  - *Medium* (Default): Recommended when the OCR mode is set to free-flow.
  - *High*: Recommended when the OCR mode is set to signaled (triggered.)
- NOTE: Higher complexities give more accurate reading but make the ALPR engine run slower.

#### Working mode selection

#### Working mode

Working mode	
Freeflow	~
Signaled	
Freeflow	

- Select the appropriate option from the drop-down list. There are two options:
  - *Free flow*: The system continuously analyzes the video and reports plates when detected. This is the normal mode of operation.
  - Signaled: The system only analyzes the video when a trigger is received.
- If *Working Mode* selected is set to 'Signaled', a **port** may be specified.

vorking mode			
Signaled			
Trigger on p	oort activation		
Port			
0			


• If when triggered, no plate is found in the field of view, then the word 'NONE' will be transmitted as the plate read.

#### Signaled Mode

You might use signaled mode in high security scenarios when you are able to detect a vehicle (by a loop or beam for example) and you want to capture an image even if there is no plate or a damaged or disguised plate; in this case you could use a physical port.

In signaled mode, if the software cannot find a plate in the image it will return the plate as "NONE" along with all the normal metadata including the id of the signaling source.

#### Enable IR Mode (discard color information)

Enable IR Mode (discard color information)

Enable this mode to only analyze plates in monochrome (from the green channel).

This speeds up the OCR processing time as less data has to be manipulated but all saved and transmitted images are subsequently in monochrome.



#### 5.4.6 VaxALPR Settings: Vehicle Direction Filters

Direction
Report vehicles moving away
Report vehicles approaching
Report vehicles with unknown direction

If the camera is pointing at a road or entrance where traffic is moving in both directions, then by ticking the boxes you can choose to only process/report plates in one direction. Note that at least two reads of a plate must have been obtained in order to determine the direction. If a car is maneuvering or stopped (or moving so fast that you only capture the plate once), then by also selecting 'Report vehicles with unknown direction' you will ensure that all required plates are captured.

Select all three options for normal usage.



## 5.4.7 VaxALPR Settings: MMC and Vehicle Classification

MMC and Vehicle Classification is included with the MOVE version of the ALPR software which adds a Make, Model and Color recognition capability to the ALPR along with the Vehicle Class. They can be used separately or alongside each other.

Make-Model-Color	
Minimum Confidence (0-100)	
50	
MMC Mode	
None	
None	
ММС	
Classification	
Both	

When MMC is enabled, the engine will find a plate and the MMC analytic will attempt to identify the make model and, if possible, the color of the vehicle using Deep Learning technology.

The software recognized approximately of 680 car manufacturers and 7,250 models and can recognize make, model, color from both front and rear views to a very high accuracy. The engine does not require any calibration and automatically determines the orientation of the vehicle. The software will report up to 11 colors but note that colors are often distorted by lighting and reflection on a vehicle.

Vehicle Classification or VClass should be used cameras that are setup to not only read the plate, but show as much of the front or back of the vehicle as possible at a reasonably shallow angle. The software will report vehicle types including: motorcycle (if it has a plate), car, pickup, van, truck and bus.

• Select MMC / Classification or both analytics.

Plates								
C								
Date	Plate	Image	Formatted	Char height	Make	Model	Color	Class
30/08/2022, 10:19:39	FE12EMF	FERENE	FE12EMF	18	Toyota	Auris	Black	<b>A</b>
30/08/2022, 10:19:34	YK67LCW	YK57LCT	YK67LCW	20	Mazda	2	White	8
30/08/2022, 10:19:26	MF22UUX	MF22UUX	MF22UUX	21	Ford	Transit Custom	Black	<del>60</del>

In the Plates or Database menu you can use the settings icon to display the MMC & Class data:



#### 5.4.8 Frame Options

This section allows the user to control the image compression and define a watermark for the saved / transmitted images.

Frame Options	
JPEG Compression Quality (1 - 100)	
100	
Image Patch JPEG Compression Quality (1 - 100)	
100	
Crop Images	
Crop Width (640-1920)	
1280	
Crop Height (480-1280)	
480	
Watermark       Watermark Template	
\$date\$ \$plateutf8\$ \$make\$ \$model\$ \$class\$	
Watermark Position	
Left-Top ~	
Watermark Size	
12px ~	

- Select the required compression ratio for the saved images. The lower the number, the higher the compression ratio (and smaller the image size) but the quality of images will be lower. A setting of 80 is a good compromise.
- Select the required compression for the plate patch as above. This is the small image of just the vehicle plate that is saved or transmitted.
- When a smaller image file size is needed you can use the 'Crop images' setting. This crops an area around the license plate to apply the compression to. This is better than over-compressing the whole image which will result in a very low-quality result!

When selected a dialogue box opens allowing you to specify a width and height of the cropped image to be saved/transmitted.

Database plate details			٥	×
	Date	06/12/2022, 12:33:23		
	Plate	YK16MLA		
	Formatted	YK16MLA		
	Country	GBR		
			«	»

In this case a landscape image of 1280x480 will be saved:

When still images are saved and/or transmitted to Helix or some other back office device using one of the other reporting options then the Watermark feature may be used to write for example the plate text and date onto the still image being sent.



The watermark template field allows you to insert dynamic text that will be overlaid onto the still image of the captured plate. Choose from the following list in the Annex <u>Dynamic Text</u> <u>Replacement Reserved Words</u>

You may then specify the font size to be used from a drop-down list and also select one of four preset positions for the watermark to be overlayed.



In this example the Date, time in UTC format, plate details & MMC have been specified:

See here for a Note on UTC time format:



#### 5.4.9 Advanced

Advanced	
Advanced	
Info	~
Check Vaxtor server for online updates	

The Advanced dropdown causes the log file to be created with different levels of complexity to aid with identifying problems such as communication errors Etc.

	Advanced	
	Advanced	
	Info	~
C	Trace Debug	
	Info	

You should only use this feature when requested to do so by Vaxtor Support staff.

The second option is Check Vaxtor server for online updates.

If this is selected and the camera has access to the internet, then each time the App is launched it will check online for the latest version and offer the option of downloading and updating.

Version 1.0.15 is available	.[	
Do you want to update?		
Changelog:		
Add: reset.cgi command		
Add: Online update option		
Fix: Video tab UI scroll		
Fix: Germany region recognition		
Fix: Australia and Hungary grammar		
Update: Improve false positives detect	tion	
	No	Yes

The dialogue box also displays the most recent changelog helping you make a more informed decision.



#### 5.4.10 VaxALPR Settings: Save changes

**IMPORTANT**: To avoid unexpected problems, it is recommended that you backup the current configuration to your PC by downloading the configuration XML file (*see: Upload config later in this manual* )

You can **abandon** your edits and reload the currently saved configuration file by clicking the Reload symbol, bottom right:



You must then save the current settings by clicking on the disk symbol, bottom right:





## 5.5 VaxALPR Plates

The most recent plate reads are stored in the camera's internal memory and are displayed when the Plates menu is selected:

	VaxALPR 1.0.5 [DEV-20220621]					
Plates						Plates
Date	Plate	Image	Formatted	Country	Direction	Region Reporti
10/08/2022, 17:53:55	VA13LWS	VAIJLKS	VA13LW5	GBR	Getting farther	Blackli Whiteli
10/08/2022, 17:53:28	AF22KFD	AF22 KFD	AF22KFD	GBR	Getting closer	Databi Downl Uploar
10/08/2022, 17:53:26	BG59WME	BG59 WHE	BG59WME	GBR	Getting farther	Logfil
10/08/2022, 17:53:20	FH09HWE	FHOS HWE	FH09HWE	GBR	Getting farther	ayaten
10/08/2022, 17:53:03	AY13GFJ	AY13 GF J	AY13GFJ	GBR	Getting closer	
10/08/2022, 17:53:01	WM70KTJ	WH70KTJ	WM70KTJ	GBR	Getting farther	
10/08/2022, 17:52:51	AD68KKM	AD58 KKK	AD68KKM	GBR	Unknown	
10/08/2022, 17:52:48	си18нмј	CUI8 HNJ	CU18HMJ	GBR	Getting closer	
10/08/2022, 17:52:30	AJ66EYP	A JEE EYP	AJ66EYP	GBR	Unknown	
10/08/2022, 17:52:25	AF15YHU	AFIS YHU	AF15YHU	GBR	Unknown	
10/08/2022,	AD020HP	TTTT2 OHP	AD020HP	GBR	Unknown	

More can be viewed as they will be stored in the browser's cache.

If the camera has a SD card installed, it is possible to store the LPR activity in a local database which can store up to 100,000 records. See the Database section below.

Click on a plate to view the plate read details:

Click the gear icon (top right) to reveal a list of fields that can be shown when a plate is selected:



Columns to show		×
	✓ Date	
Plate	Image	
Formatted	Country	
□ State	Direction	
□ Category	□ Speed	
Char height	□ Confidence	
Make	✓ Model	
Color	Class	
🗹 Multiplate rate	Proc time	
🗆 ROI Id	Blacklisted	
□ Whitelisted	Signaled	
🗆 Signal Id		
*		C

Note that you can get a more comprehensive view of the vehicle from the Database option described in the next section. You will need to have an SD card fitted to use this feature.

## (OCR) Processing Time

Note that if you do not have an SD card installed, you can look at the logfile to see the OCR processing time. When you view the OCR processing time you will see the multiplate rate alongside it. So if the multiplate rate is say 5 and the OCR processing time shows as 150ms, – then that means that **ONE** of the 5 reads (the one used to display the actual read being examined) took 150ms.



## 5.6 VaxALPR Database

- If the camera has a SD card installed, it is possible to store up to 100,000 plate reads in a local database. Once this limit is reached, new plate reads will replace the oldest ones. However if the SD card becomes full before you set limit is reached then data will no longer be able to be saved.
- As a rough guide a 32GB SD card would store approximately 80,000 reads.

## Database

earch for			x Load				1 of 1344		
late	Plate	Image	Formatted	Country	Direction	Make	Model	Color	Class
1/08/2022, 17:58:20	AD59EDG	AD59 FDG	AD59FDG	GBR	Getting farther	6			
1/08/2022, 17:58:18	BT16DAO	BTI6 DAD	BTI6DAO	GBR	Unknown				
1/08/2022, 17:58:13	GC155Z0	GC15 SZO	6015520	GBR	Getting closer				
1/08/2022, 17:58:08	GP52KLK	GP52 KLK	GP52KLK	GBR	Getting farther				
1/08/2022, 17:58:06	MT13CSX	MT13 CSX	MT13CSX	GBR	Getting farther				
1/08/2022, 17:57:38	Гј64ТБК	EJ64 TGK	ЕJ64TGK	GDR	Unknown				
1/08/2022, 17:57:25	F1NK5	TINIKS	FINKS	GBR	Unknown				

The Database screen comprises:

- (1) Search and Load area
- (2) Settings
- (3) Play / Pause updating the database with new reads
- (4) Page display control
- (5) Total items stored and CSV download
- (6) Main plate list

## **Plate details**

1. To show item details, click on a plate record.

мовотіх 🍕	MOBOTIX 5 VAXTOR VaxALPR1.0.						1.0.5 [DEV-20220621]				
Database Pla	ates										
Search for	Plare	Image	Formatteri	Country	Direction	Make	Model	Tal 1308	Class	Ľ	
10/08/2022, 18:00:51	AF703C0	AFTOX	*71500	GBR	Linknown	mane :		Color			
10/08/2022, 18:03:25	C#7EY8C	CE70	IRC	GRR	Unknown						
10/08/2022 18:03:07	ND68W5N	X068	SN KO68W5N	GBR	Unknown						

2. A new window appears with the vehicle details.



Database plate details			٥	×
	Date	10/08/2022, 18:00:51		
	Plate	AF70XCO		
	Formatted	AF70XCO		
	Country	GBR		
	Direction	Unknown		
		«	< >	»

You can move up and down the complete database by using the arrows at the bottom



Use the double arrows to move to the first of last record in the database. Note that if you have performed a Search (see below), then here you can step through all the plates that satisfy the search. E.g. all plates containing the numbers "123".

Use the Settings Icon, top right, to control what information is displayed when you select a plate. i.e. a list of the available stored fields:

Database plate deta	ils Fields to show		×	٥	×	
	□ ID ☑ Plate ☑ Country	<ul> <li>Date</li> <li>Formatted</li> <li>State</li> </ul>	2, 17:58:20	)		
		Category				
	Confidence	Char height Make				
	Model     Class	Color Multiplate rate	rther			
	Proc time	ROIId				
	Blacklisted	□ Whitelisted				
	□ Signaled	🗆 Signal Id		« <b>、</b> >	»	
GC155ZO	*	C	•		_	

Note that some of these fields may not be available in your version of the software or are used for internal purposes such as communicating with certain third-party applications of Back Offices or VMS systems such as Genetec or Milestone.

When setting up a system the most useful to display include the Height (average character height), OCR (processing time), Confidence, Multiplate (how many reads were processed) etc.



## **Page Control**

If there are more than 20 stored plate reads, the camera will paginate the results.

1. Use the Page Control box to navigate through the pages

2 of 11	

Use the UP and DOWN buttons to scroll 20 plates at a time – or click on the central part of the button (in this case on 2/11) and enter the target page directly and click on GoTo:

8	\$	Goto
---	----	------

## Search and Load Plates

#### Load plates

To load all the detected plates stored in camera, keep the Search input zone
 Search for plates...
 empty and click the Load button
 This will refresh the list with the latest captures.

#### Search for plates

- To search for a specific plate or partial plate stored in camera, enter the plate in the Search box and click the search button. Use the symbol "%" as a wildcard character.
- 2. Example of all plates containing the characters: '20':

2014			w Scarch				^	1 of 21	
ace	Plate	Image	Formatted	Country	Direction	Make	Model	Color	Class
1/08/2022, 18:14:31	0/20423	CV201	ZB (VOLATE	GBR	Unknown				
1.08/2022, 18:06:42	LM2EAHL	1 1/20 /	HL LM204HL	GBR	Unknown				
10092022, 18:04:34	ALXINEL	AE20 )	(EL MORE	GUR	Unknown				
1-06/2022, 18:02:37	4620780	AK2DF	ACOUND ACOUND	GRR	Getting tarther				
1/09/2022, 17:49:13	4F20V2	AF20	ITT vesses	GDR	Getting for the				
(66/2022.17:33-44	8T204K <sup>-</sup>	BT20	KKF BT2066F	GBR	Getting farther				
(66/2022, 17:17:10	EA20.MM	EN201	EACODAN	GBR	Getting ferther				

3. To clear the search criteria, click  $\bigcirc$  button inside the Search window zone, and click the  $\boxed{1000}$  button.

%HZM%	Search
-------	--------



#### Download the Plate list.

You can download the current Plate list by clicking on the CSV button:

Bitems CSV button. The resulting .csv file will be saved in your

downloads folder.

**NOTE**: In this example only 8 items were in the search list which were then downloaded successfully. if you need to download the full database, then this must be downloaded page by page, 20 records at a time.

Do this by Pausing the live reads each page in turn and downloading.

If you need to see all of the camera reads then it is recommended that you send all the plate reads as they happen to a back office such as Helix. The program contains many reporting protocols and methods, - see the Reporting section.



# 5.7 VaxALPR Blacklists and Whitelists

The software can be configured to match any captured plates against a blacklist or whitelist or determine if a plate is not in a list. This will generate an event that can be captured and processed.

These lists are stored in the camera or on a network shared location:

- 1. If a camera SD card is installed, the lists will be stored on it depending on available space. Approximately up to 1 million plates can be stored.
- 2. If an SD card is not available then the list will be stored in the camera's internal memory. *NOTE: The camera's internal memory is limited and so a maximum of 200 plates can be stored.*



Note that Lists can now be automatically synchronized with a central Helix Server. If you are running the Vaxtor Helix Back Office you can choose to merge and then synchronize all of your blacklists and similarly your whitelists with any number of connected Mobotix MOVE cameras running VaxALPR. This enables you to perform real time checks or access control on the edge in case a network fails. Once reconnected the lists will synchronize once more. This can be setup in the Helix-6 menu in Reporting. See later in this manual: <u>Helix Reporting.</u>

### VaxALPR Blacklist / Whitelist Disabled

Remember to enable black and/or whitelist checking in settings (see earlier in this manual):



### VaxALPR Blacklist: Initial load

• When Blacklist is first selected, then if no plates have been added to the list, a message appears:



Loading blacklist	×
No Plates have been loaded.	
	Close

But if the Blacklist *does* already contain plates then a message appears confirming how many plates have been loaded into temporary memory.

#### VaxALPR Blacklist: Reload



1. To Reload the saved Blacklist from the camera, click the Reload Icon button and wait for the confirmation (or error) message

#### VaxALPR Blacklist: Add a Plate

OBOTIX 🌎 VAXT	TOR		VaxALPR 1.0.5 [DEV-20220621]		
acklist					tatal: 3 plates
late	Description	from	To	Make	Model Color Class
o	1.00	#1-51-8532	0847-087	2-17	Support Theory Cospile 1
					Add inclui Nate

1. To add a Plate to the Blacklist click the button and enter the plate details:



Blacklist Detail	×	٢
Plate number		
Plate		
Description		
desc		
Make	Model	
Vehicle Make	Vehicle model	
Color	Classification	
Vehicle color	~	
VALID FROM	VALID UNTIL	
dd-MM-yyyy	dd-MM-yyyy	
	<b>3</b>	٥

- 2. Write a valid Plate (e.g. HA54ETR ) and add an optional description. Plate numbers must not contain spaces or special characters such as "-".
- Enter the Valid From and Valid To dates that the vehicle will be checked. In the case of a white list, this would be the dates that the vehicle would be allowed access to a site (so the Mobotix MOVE relay will be triggered only within these two dates).
   Note that the maximum To date that can be set at present is 31/12/2030. (The reason being that in the 2030s, there is a millennium-type event where the number of seconds since Jan 1<sup>st</sup> 1970 will exceed a 16 bit value! Beware!)
- 4. Add a Make, Model and Color if required.
- Add a Vehicle Class from the drop-down menu (e.g. car) (Note this may not be the same as the MMCV details that the program will generate from the shape of the vehicle.)
  - 8
- 6. Click the \_\_\_\_\_\_ icon to save the plate or close the window to discard the plate.

## Edit a Plate

- 1. Click on the a plate entry to re-edit a plate.
- 2. Edit any fields and click Save if required.

### Remove a Plate from the list

Click the to remove a plate and confirm the deletion.



## VaxALPR Blacklist: Remove all plates

面

1. Click the

icon to remove all plates from the local Blacklist and confirm.

## VaxALPR Blacklist: Upload/Download a list from a CSV file

## **Upload a CSV File**

The VaxALPR On Camera software can import a whitelist/blacklist from a .csv file by using the



upload icon. Simply select the .csv file on your PC.

**IMPORTANT**: The required header fields are: **CLASSIFICATION**, **COLOR**, **DESCRIPTION**, **FROM**, **ID and TO**. The first row of the csv file MUST contain field names including these headings.

### For example:

classification;COLOR;DESCRIPTION;FROM;id;MAKE;MODEL;plate\_number;TO CAR;red;Fred Bloggs;2022-07-31T23:00:00.000Z;10;Audi;Q3;VHY777;2023-03-01T00:00:00.000Z VAN;blue;Harry Oldham;2022-07-31T23:00:00.000Z;11;Ford;Kuga;ABC123;2022-08-30T23:00:00.000Z CAR;pink;Fozzie Bear;2022-01-01T23:00:00.000Z;12;VW;Golf;BCD234;2022-12-31T23:00:00.000Z

Note that the file should contain semi colons as delimiters and not commas and the date delimiter should be a hyphen, US format).

### Download a CSV file.

- 1. To download the Blacklist file from the camera to your PC, click the **\_\_\_\_\_** icon.
- 2. It will be downloaded to your PC's downloads folder as the file blacklist.csv.

#### VaxALPR: Whitelists

All the operations described above equally apply to whitelists.



# 5.8 VaxALPR Region of Interest

A Region of Interest (ROI), sometimes known as the Crop Zone, is used to define an area within the video frame where the OCR analytics takes place. The user can define a polygon and choose whether the area to look for plates in Inside or Outside this region. The user can then set multiple regions, i.e. multiple ROIs, in complex situations although this is rare.

Using an ROI can decrease OCR processing time and also reduce false positives. So, if the camera is looking across a large stretch of road as in the example below, the ROI can be used to limit the OCR to the area near to the camera thus reducing the processor load.

If a plate-shaped house window or road sign for example is within the camera's field of view and keeps getting mistaken for a license plate, then these false positives can be eliminated by creating a crop zone to exclude this part of the image.

Each ROI must be given a unique numeric Identifier from the dropdown list.



Note that the whole license plate must be in or out the ROI to pass the test.

**IMPORTANT**: ROIs con be configured to either include the areas defined from the OCR – or exclude them. If multiple ROIs are added they must all be of the same type.

### VaxALPR ROI: Add ROIs

- 1. To add a new ROI, click the main ticon:
- 2. Then, use the pop-down to allocate an ID number to the ROI that you are adding and if this is the first ROI, then specify the ROI Type between: *Included* or *Excluded*.

Region of	Interest	c	۵		Included	0	5	0
ż	A			1 2 3 4 6 6 7 2 5				



- 3. Draw points:
  - a. Add points: Click on the live image to add new points to define the polygon.



NOTE: Each ROI must have at least 3 points but can also be quite complex



NOTE: This only deletes them in the local web interface. If they have been saved to the camera then you will need to Submit ROIs once more.



Edit ROI...

icon:

### VaxALPR ROI: Edit an ROI

- 1. To edit an existing ROI, select the ROI Id from the list and click the
- 2. Move any points as required:
  - a. Add an extra point to last point added by moving the cursor and mouse click.



#### VaxALPR ROI: Save changes

#### Submit current ROIs

Once the ROIs have been setup, they **must** be saved into memory in the Mobotix MOVE camera.

To save all ROIs, Click on the submit ROIs icon
 To save all ROIs, Click on the submit ROIs icon
 and wait for the confirmation message.

Note: Once deleted, an ROI cannot be recovered. To avoid unexpected problems, it is recommended that you periodically backup the ROI configuration by downloading the current configuration XML file

(see: Download XML Config section later in this manual).

### VaxALPR ROI: Reload ROIs

1. To reload *ROIs* from the camera into the web interface for editing, click the Region of Interest

icon.



# 5.9 VaxALPR Reporting

VaxALPR is able to output all plate reads in real time using a variety of standard protocols so that the plate reads can be accepted remotely by a variety of programs including Vaxtor's powerful Back Office - Helix, which can accept and store plate reads in real time from hundreds of Mobotix MOVE cameras.

MOBOTIX G VAXTOR	
Reporting	Plates
Helix	Settings Region of Interest
JSON	Reporting
Secondary JSON	Download config Upload config
Mobotix Move NVR	Reset to default
XML	Log file
Genetec LPR Plugin	system upparte
Network Optix	
FTP	
TCP Server	
UTMC	
Overlay	
Output port	

By selecting one of the listed protocols, a sub-menu will appear with fields for setting up parameters such as remote IP addresses etc.

F	Reporting
	Helix
	NOSC
	Secondary JSON
	Mobotix Move NVR
	XML
	Genetec LPR Plugin
	Network Optix
	FTP
	TCP Server
	UTMC
	Overlay
	Output port



## 5.9.1 Reporting to Helix

To send encrypted reads to Helix, select Helix. This supports cameras in different time zones.

Helix	
Active	
Helix server URL	
https://helix-demo.vaxtor.com/helix6	
Apikey	Camera Id
935bd74a2d09442b9ae98e79ef33a5a4	228
Reader Id	Overview Id
0	0
Send Heartbeat	
Heartbeat timer	
60	
Sync Lists	

Select **Active** and enter the IP address (URL) of the receiving PC. E.g. **10.0.0.12:8080/helix6** *Note that this can be an http or an https address supporting data encryption.* 

Enter the Camera (or Reader ID – see Helix documentation) to be sent to Helix and an optional API key to be used for authentication. Overview ID is used if the camera is to be used as a color overview camera to be associated with another ALPR camera. (not yet available).

#### Send Heartbeat

Select this and a time interval for the camera to send a heartbeat ping to Helix. Helix can be programmed to also upload an image from the camera at a predetermined interval to monitor the image quality.

#### Sync Lists

Sync Lists		
Sync lists timer		
60		

Lists can be automatically synchronized with a central Helix Server. If you are running the Vaxtor Helix Back Office you can choose to merge and then synchronize all of your blacklists and similarly your whitelists with any number of connected MOVE cameras running VaxALPR. This enables you to perform real time checks or access control on the edge in case a network fails. Once reconnected the lists will synchronize once more.

Select this option and then define a time interval for the lists to be re-synchronized.

Click Submit reporting to store the configuration in the camera.





## 5.9.2 JSON (JavaScript Object Notation) and Secondary JSON

To activate this option:

- 1. Click on the XML header to expand the HTTP Post XML integration menu.
- 2. Enable the **Active** checkbox to enable JSON output and send HTTP / HTTPS POST messages in a JSON object

JSON	
Cive Active	
URL	
https://server	
Username	Password
Username	Password
Send notifications without images	
Message template	
{"plate":"SplateS";"date":"SdateS";"country":"ScountryS";"confidence":SconfidenceS;"left":SleftS;"top":StopS;"right":SrightS;"bottom":SbottomS;"charheight":Scharheight	;"processingtime":\$processingtime\$}

To setup this option, do the following:

- 1. Click on the Active button to expand the HTTP Post JSON integration menu.
- Enter the receiving URL. The URL should be a 'well-formed' URL such as: <u>http://myserver.com/</u> or <u>https://myserver.com:port/destination/mypage.php</u>. Both domain names or IP address can be used.

IMPORTANT: If you are using a URL rather than an IP address, make sure that you have setup a DNS server in the main MOVE settings menu.

Go the main MOVE System menu and select Network & Basic. Select a DNS server such as: 8.8.8.8 with a secondary server of say 8.8.4.4. These are free Google DNS servers which will map your URL names.

_			
	Basic	O Get IP address automatic	cally
	QoS	Use fixed IP address	
	VLAN		
	SNMP	IP address	192.168.1.222
	UPnP	Subnet mask	255.255.255.0
	OpenVPN		
	Bonjour	Default gateway	192.168.1.254
	DDNS	Duine and DNC	
		Primary DNS	8.8.8.8
	Mail		
	FTP	Secondary DNS	8.8.4.4
- 1			

- 3. Set the receiving server's username and password.
- 4. Choose whether to send images or not.
- 5. Modify the message template as required. The message can use Dynamic text.



*NOTE:* You can use dynamic text replacement to match the current plate information: A list is provided at the end of this manual: <u>Dynamic Text Replacement Reserved Words</u>

There is also a separate document "Complete List of Dynamic Replacement Reserved Words" for the latest additions.

- **\$image\$**: Full JPEG image encoded in base64.
- **\$jpegsize\$:** JPEG size in bytes.
- \$date\$: Timestamp in ISO8601 format
- **\$plate\$**: Plate number
- Etc.

You can add your own parameters into the message, so if you want to add say a site ID, your message might look like this:

{ "plate":"\$plate\$", "date":"\$date\$", "ip":"\$ip\$", "country":"\$country\$", "sitecode": 12345}

6. Click Submit reporting to store the configuration in the camera.





#### 5.9.3 Mobotix Move NVR

This reporting option will cause VaxALPR On Camera to send each plate event to a Mobotix Move NVR device. (Network Video Recorder).

To activate this option:

- 1. Click on the Mobotix Move NVR header to expand the NVR integration menu.
- 2. Enable the **Active** checkbox:

Mobotix Move NVR	
Active	
URL	
https://server	
Username	Pessword
Username	Password
Message template	
<pre>~?zm!versions*1.0f encodings*ufi 4?&gt; <analyticsusent winitsi:http://www.six.arg/2001/00L5hema-instance* winitsi:http://www.six.arg/2001/00L5hema-instance* winitsi:http://www.six.arg/2001/00L5hema-instance*</analyticsusent </pre>	

- Enter the target URL of the device. The URL should be a 'well-formed' URL such as: <u>https://myserver.com:port</u> Both domain names or IP address can be used.
- 4. Enter the username and password as necessary.
- 5. Modify the message as needed.

NOTE: You can use dynamic text replacement to match the current plate information: A list is provided at the end of this manual: <u>Dynamic Text Replacement Reserved Words</u>

There is also a separate document "Complete List of Dynamic Replacement Reserved Words" for the latest additions.

- **\$image\$**: Full JPEG image encoded in base64.
- **\$jpegsize\$:** JPEG size in bytes.
- **\$date\$**: Timestamp in ISO8601 format
- \$plate\$: Plate number
- Etc.
- 6. Scroll down and save your changes by clicking on the Submit Reporting icon:

Submit Reporting configuration	
•	



## 5.9.4 Sending HTTP / HTTPS POST XML Events

This reporting option will cause VaxALPR On Camera to send each plate event in an XML packet via an HTTP POST. This method can also be used to send events to Milestone.

To activate this option:

- 1. Click on the XML header to expand the HTTP Post XML integration menu.
- 2. Enable the **Active** checkbox:

XML	
Active	
URL .	
https://server	
Username	Password
Usemame	Pessword
Message template	
xmlversion="1.0" encoding="ull-4"	i i
<pre>"whatytics.vent xmins.w" nttp://www.wo.org/.2001/xmi.seneme-instance : xmins#"um.milestone-systems"&gt; <eventheader></eventheader></pre>	
<0>000000000-0000-0000-0000000000000//D>	ũ.

 Enter the target URL. The URL should be a 'well-formed' URL such as: <u>http://myserver.com/</u> or <u>https://myserver.com:port/destination/mypage.php</u>

For Milestone connections the URL should be: <u>http://milestoneserver:9090/</u>

Both domain names or IP address can be used.

- 4. Enter a username and password as necessary.
- 5. Modify the message as needed. By default, the message is a valid Analytic Event for Milestone.

NOTE: You can use dynamic text replacement to match the current plate information: A list is provided at the end of this manual: <u>Dynamic Text Replacement Reserved Words</u>

There is also a separate document "Complete List of Dynamic Replacement Reserved Words" for the latest additions.

- **\$image\$**: Full JPEG image encoded in base64.
- **\$jpegsize\$:** JPEG size in bytes.
- **\$date\$**: Timestamp in ISO8601 format
- **\$plate\$**: Plate number
- Etc.
- 6. Scroll down and save your changes by clicking on the Submit Reporting icon:

Submit Reporting configuration	
8	



## 5.9.5 Connecting to Milestone

See the separate guide: "Connecting On Camera to Milestone".

#### 5.9.6 Well-Formed XML

Below is an example of the default well-formed XML sent in an HTTP POST after the recognition of plate number M8016LS.

(A well-formed XML document is one which "adheres to the syntax rules specified by the XML 1.0 specification in that it must satisfy both physical and logical structures". )

NOTE: The bounding box information refers to the snapshot (image of the license plate patch encoded in base64 format) sent in the message.

```
<?xml version="1.0" encoding="utf-8"?>
<AnalyticsEvent xmlns:i="http://www.w3.org/2001/XMLSchema-instance" xmlns="urn:milestone-systems">
<EventHeader>
        <ID>0000000-0000-0000-0000-00000000000</ID>
        <Timestamp>2016-05-23T08:39:36.135998Z</Timestamp>
        <Type>License Plate Recognition</Type>
        <Message>VaxALPR On Camera Event</Message>
        <CustomTag>M8016LS</CustomTag>
        <Source>
                 <Name>192.168.0.100</Name>
        </Source>
</EventHeader>
<Description>M8016LS</Description>
<ObjectList>
        <Object>
                 <Name>Plate</Name>
                 <Confidence>0.972857</Confidence>
                 <Value>M8016LS</Value>
                 <AlarmTrigger>true</AlarmTrigger>
                 <Size>46</Size>
                 <BoundingBox>
                 <Top>0.42</Top>
                 <Left>0.23</Left>
                 <Bottom>0.54</Bottom>
                 <Right>0.55</Right>
                 </BoundingBox>
        </Object>
</ObjectList>
<SnapshotList>
        <Snapshot>
                 <TimeOffset>0</TimeOffset>
                 <Width>1280</Width>
                 <Height>960</Height>
                 <SizeInBytes>193656</SizeInBytes>
                 <Image>BASE64ENCODEDJPEG</Image>
        </Snapshot>
</SnapshotList>
<Vendor>
        <Name>Vaxtor Systems</Name>
</Vendor>
</AnalyticsEvent>
```

Well-formed XML sent in an HTTP POST



## 5.9.7 Configuring Milestone

Once the reporting option HTTP POST is configured, we need to set up Milestone to receive and handle our events. To do this, we recommend the following steps:

1. Enable Milestone to receive VaxALPR events.

In the Milestone Management Application click on the Options menu and then select the Settings option. This opens a new window.

Select the Analytic Events option and tick the **Enabled** checkbox. Save the changes using the **Ok** button.



Milestone Management Application > Options menu > Settings option

>		Milestone XP	Protect Professional 2016 R3 Managem
File Services Wizards Opti	ons Help		
8 🖬 🙂 📾 📾 🥝			
File Services Wizards Opti	General General Connecting hardware devices User Interface Default Pile Paths Audio recording Access Control Settings Analytics Events Event Server	Settings  Analytics events For: Social advectors Social advectors Social advectors Social advectors Social advectors For: For: Social advectors For: For: For: For: For: For: For: For:	
			OK Cancel

Milestone Management Application > Options > Settings > Analytic Events: Enabled

2. Create the VaxALPR On Camera Event in Milestone.

Click on the Surveillance Server drop down menu and click on the 'Advanced Configuration' drop down menu and on the 'Events and Output' drop down menu. Click on the 'Analytics Events' option and right-click to access the Create New button. Click on the '**Create New'** button to set up the event:

• Enter a **Name** for the Analytics Event (VaxALPR On Camera Event). Finally click on the **Ok** button to save the changes.





Surveillance Server > Advanced Configuration > Events and Output >Analytic Events: Create New

		Milestone XProtect	Professional 2016 R3 Management Application
Services Wizards Options Help			
Surveillance Server		Analytics Events	_ 🗆
Advanced Configuration			
Son Cameras and Storage Information			
Q Events and Output Analytics Events	Analytics Events	Name	
Hardware Input Events		VaxALPR On Camera Event	
Hardware Output			Test Event
Generic Events		Description:	
Output Control on Event     Scheduling and Archiving			
Matrix			
Logs     Notifications			
Central			
Server Access			
Master/Slave			
Services			
Servers     Alarms			
MIP Plug-ins			
⊕ t <sub>ab</sub> Transact			
			011 011

Surveillance Server > Advanced Configuration > Events and Output >Analytic Events: VaxALPR On Camera Event

3. Create the alarm that will trigger when Milestone receives the VaxALPR On Camera Event:



Click on the Surveillance Server drop down menu and then select the 'Advanced Configuration' drop-down menu and then the 'Alarms' drop down menu. Click on the 'Alarm Definitions' option and on right-click to access the 'Create New' button. Click on the **Create New** button to set up the alarm:

- Select the **Enable** checkbox to activate the alarm.
- Enter a Name of the alarm (Plate Detected).
- Select a **Triggering event** from the drop-down list. The Triggering event should be the **Analytics Event**. A second drop-down list will appear.
- Select the VaxALPR On Camera Event from the second drop-down list.
- Select a Source (the camera with the installed VaxALPR On Camera software).

Finally click on the **Ok** button to save the changes.



Surveillance Server > Advanced Configuration > Alarms >Alarm Definitions option: Create New



- File Senvicer Witzerde Ontione Helm		Milestone XProtect Professional 20	016 R3 Management Application
Surveillance Server		Alarm Definition	_ 0
Advanced Configuration			
Cameras and Storage 1			
Scheduling and Archivi     Alarm Definition	Alarm definition		
Matrix	Enable:		
Notifications	Name:	Plate Detected	
Access Control	Instructions:		^
Master/Slave			~
Gers     Services	Trigger		
Office Servers	Triggering event:	Analytics Events	v
Alarm Definitions	Sec.	VaxALPR On Camera Event	~
	Sources:	Cámara 1	Select
10 Sound Settings 	Activation period		
MIP Plug-ins     Transact	Time profile:	Always	~
	O Event based:	Start:	Select
		Stop:	Select
	Operator action required		
	Time limit:	1 minute	~
	Events triggered:		Select
	Other		
	Related cameras:		Select
	Related map:		v
	Initial alarm owner:		v
	Initial alarm priority:	High	~
	Initial alarm category:		~
	Events triggered by alarm:		Select
	Auto-close alarm:		
			OK Cance

Surveillance Server > Advanced Configuration > Alarms > Alarm Definitions: Plate Detected

4. Modify the Alarm Data Settings.

Click on the Surveillance Server drop down menu. Next click on the Advanced Configuration drop down menu and then on the Alarms drop-down menu. Next click on the Alarm Data Settings option and select the 'Alarm List Configuration' Tab and move the **Object** column from the Available columns to the Selected columns. This column will then indicate the plate number in Milestone.



Surveillance Server > Advanced Configuration > Alarms > Alarm Data Settings: Alarm List Configuration



### 5.9.8 Genetec LPR Plugin

This reporting option will cause VaxALPR On Camera to send each plate event to Genetec Security Centre as an ALPR event (not just a bookmark). The received reads can be used within Security Centre to generate alarms, open barriers etc.

Contact Genetec for more information and to obtain a license for the Genetec software.

To activate this option:

- 1. Click on the XML header to expand the Genetec LPR Plugin integration menu.
- 2. Enable the **Active** checkbox:

Genetec LPR Plugin	
C Active	
URL.	
https://server	
Username	Password
Username	Password
Camera Id	Camera Name
camera_id	camera_name
Latitude	Longitude
0	0

- 3. Enter the target **URL** of the Genetec server. The URL should be a 'well-formed' URL such as: <u>http://myserver.com/</u> or <u>https://myserver.com:port/destination/mypage.php</u>
- 4. Complete all other fields as necessary and click the Submit Reporting icon:

Submit Reporting configuration	
Ð	



#### 5.9.9 Network Optix Integration

#### 5.9.10 Basic Setup

This reporting options sends generic events and bookmark data to the **Network Optix n<sup>x</sup> Witness VMS** system.

To setup this option, do the following:

1. In Reporting click on the Network Optix option to expand the integration menu.

Network Optix	
Active	
URL	
https://server	
Camera Id	Source
camera_id	Source
Caption	Description
SplateS	Splate\$ (Scountry\$)
Username	Password
user	

- 2. Enable the **Active** checkbox.
- Enter the URL. The URL should be the address of the NX host server using port 7001: <u>http://nxserver:7001</u> e.g. <u>http://192.168.0.41:7001</u> (Note that the latest Optix NX enforces https. ) (ensure that the IP address of the camera is on the same subnet)
- 4. Enter your Username & Password.
- 5. Enter a "Source" parameter. This is used by the NX Server to reference the events received. E.g. 'LPR". This will mark all NX events as "LPR" events.
- 6. Enter the Caption and Description templates. This data will be saved with each event.
- 7. Modify the two messages as required. The message can use Dynamic text replacement such as in the Overlay reporting option.

*NOTE:* You can use dynamic text replacement to match the current plate information: A list is provided at the end of this manual: <u>Dynamic Text Replacement Reserved Words</u>

There is also a separate document "Complete List of Dynamic Replacement Reserved Words" for the latest additions.

- **\$image\$**: Full JPEG image encoded in base64.
- **\$jpegsize\$:** JPEG size in bytes.
- \$date\$: Timestamp in ISO8601 format
- **\$plate\$**: Plate number
- Etc...



You can add your own parameters into the message, so if you want to add say a site ID, your message might look like this:

{ "plate":"\$plate\$", "date":"\$date\$", "ip":"\$ip\$", "country":"\$country\$", "sitecode": 12345}

- 8. Enter the Camera ID. This is the ID that has been setup in the NX VMS settings. This can be found in Camera Settings.
- 9. When finished click on **Submit Reporting** icon:

•	
	8



## 5.9.11 FTP Transmission

Choose this option to specify a remote site to receive data and images:

FTP	
C Active	
URL	
ftp://server	
Username	Password
user	888
Filename	Template
Suuids.StpfiletypeS	\$date\$;\$plateutf8\$
Send Image	
Send Patch	
Send CSV file	

Enter the address of the FTP server and any required user name and password and then specify a filename which contains the image of the current plate.

The default filename template is: \$uuid\$.\$ftpfiletype\$ where:

- \$uuid\$ is the unique identifier for each image and
- \$ftpfiletype\$ is the image type. This word is important because it will add the words 'ocr', 'path' or 'overview' to the filenames depending on the image type.
   If this word is not included then all the images will be named identically, so only one will end up in the ftp storage.

You may also use other reserved words as appropriate in the Filename field to form the jpg filename with each file being an image of the vehicle.

Enter what csv data should be sent in the Template field by using dynamic text replacement separated by commas and select **Send CSV file** at the bottom of the dialogue box.

Select which images are to be sent using the two tick boxes. Select from the main vehicle image and/or the plate patch image.

#### A list is provided at the end of this manual: Dynamic Text Replacement Reserved Words

There is also a separate document "Complete List of Dynamic Replacement Reserved Words" for the latest additions.

- **\$image\$**: Full JPEG image encoded in base64.
- **\$jpegsize\$:** JPEG size in bytes.
- \$date\$: Timestamp in ISO8601 format
- **\$plate\$**: Plate number

Etc.



## 5.9.12 TCP Server

Choose this option to configure the Move camera as a TCP Server:

TCP Server	
C Active	
Template	Port (1024 - 65535)
@SplateS#	3000

Once set up, multiple clients can connect to the configured port in order to receive data. The camera will send a configurable string data type to all of the connected clients.

The connection will remain open until it is closed by the camera if there is a configuration change.

Only the port and Message need be setup. The message can as before be modified as necessary using dynamic text replacement to match the current plate's information as in the previous example.


## 5.9.13 UTMC Integration

Choose this reporting option if you want VaxALPR On Camera to send plate reads using UTMC protocol. The Urban Traffic Management & Control programme is a UK initiative for a more open method of communication in the ITS industry, especially in urban areas.

Plates can be sent in real time (individually) or in batches.

UTMC	
Cive Active	
URL	Camera Id
https://server	1
Username	Password
Username	Password
Heartbeat timer (seconds)	Diagnostic timer (seconds)
60	0
Plate retry timer (seconds)	Amount of plates per message
10	1
Send plates in realtime	Send Image
Send Plate Number	Send Plate Patch
Send Tags	Send Image as Overview

To activate this option, do the following:

- 1. Click on the UTMC protocol header to expand the UTMC setup menu as shown above.
- 2. Enable the **Active** checkbox.
- 3. Enter the **URL** of the receiving server.
- 4. Enter the **Heartbeat and Diagnostics** intervals to monitor the connection.
- 5. Enter a Camera **ID** (unique identifier for each camera).
- 6. All other fields are self-explanatory and define what data is transmitted to the UTMC BOF. Note that the default timeout is set to 5 seconds. If your server takes longer than this to respond then you should increase this value.
- 7. Click on the Submit reporting button to store the information in the camera.
- 8. Complete all other fields as necessary and click the Submit Reporting icon:

Submit Reporting configuration	
B	



## 5.9.14 Overlay / Watermark

The Overlay function allows the user to specify some text that will be written as a watermark onto the camera's video stream which can be sent to VMSs (Video Management Systems) such as Milestone, Genetec or Network Optix for example.

It can be used to watermark for example the time, date and last plate read as a video overlay.

To activate this option:

- 1. Click on the Overlay header to expand the menu.
- 2. Enable the Active checkbox:

Overlay	
Active	
Splate\$ \$	

The watermark template field allows you to insert dynamic text that will be overlaid onto the still image of the captured plate.

NOTE: You can use dynamic text replacement to match the current plate information: A list is provided at the end of this manual: <u>Dynamic Text Replacement Reserved Words</u>

There is also a separate document "Complete List of Dynamic Replacement Reserved Words" for the latest additions.

In this example we are using some simple dynamic text: **\$plate\$ \$date\$** The date is in ISO8601 format.

This results in the last plate read appearing in the Live Video window:





## 5.9.15 Output Port

This option allows the user to trigger the camera's output port (relay) when certain events occur. This could be used for example to open a barrier or sound an alarm.

To activate this option:

- 1. Click on the Output Port header to expand the menu.
- 2. Enable the **Active** checkbox:

Output port	
Carlie Active	
Port	
0	
Trigger with all	
Trigger with whitelist	
Trigger with blacklist	
) Trigger with no list	

The user can cause an event to be triggered Trigger in any or all of the following conditions:

Trigger with all	-	Trigger the output port when a plate is read
Trigger with whitelist	-	Trigger the output port when a plate is read & is in the whitelist
Trigger with Blacklist	-	Trigger the output port when a plate is read & is in the blacklist
Trigger with no list	-	Trigger the output port when a plate is read and is not in any lists

Select the output port to be triggered. See Mobotix MOVE documentation for configuring and wiring the output port.



## 5.9.16 MOVE's Submit Reporting Settings

Once you have configured your reporting options then remember to save them by pressing





ø

## 5.9.17 Testing Reporting

After configuring a notification, it is possible to simulate a read transmission. This feature can be used to confirm that the notification has been set up and is operating correctly.

Plate to test....

2.

To simulate a plate read notification:

- 1. Enter a plate number to test in the test window at the bottom of the screen e.g. ABC123
  - Click on the Test reporting icon:

The plate will be sent to all enabled reporting end points.

You can check if the plates have been successfully sent by checking the log file -

See next section.



# 5.10 VaxALPR Show Logfile

This function displays the current System Log for debugging and testing purposes.

MOBOTIX 🌗 VAXTOR	VaxALPR 1.0.5 [DEV-20220621]	
Reporting		Plates
Helix		Settings Region of Interest
JSON		Reporting
XML		Whitelist
Genetec LPR Plugin		Database Download config Unload config
Network Optix		Logfile
UTMC		System update
Overlay		
Output port		
•	Plate to test	

The application log appears as follows:

Logfile	×
22-08-16 16:08:02.383   1164-29316  isqlitenotificator.cpp  SD capacity is over 80% (80%). DB will store up to 27/129 records.	-
22-08-16 16:08:04.907[I]1164-1216] [vaxatpr.cpp] Plate (17px / 1 / 88ms / 1): AF69KH -	
22-08-16 16:08:04.907   1164-29316  [isqlitenotificator.cpp] Compacting database: 27140/27129	
22-08-16 16:08:25.385   1164-1216  vaxalpr.cpp] Plate (19px / 2 / 86ms / 1): L370D -	
22-08-16 16:08:29.742   1164-1216 [vaxalpr.cpp] Plate (22px / 1 / 98ms / 1); YH11MXJ -	
22-08-16 16:08:32.541  1164-1216  vaxalpr.cpp] Plate (28px / 1 / 100ms / 1): RX61AEZ -	
22-08-1616:08:38.927   1164-1216 [vaxalpr.cpp]Plate (18px / 2 / 104ms / 1): AE19TEJ -	
22-08-16 16:08:42.174  1164-1216  [vaxalpr.cpp] Plate (17px / 2 / 98ms / 1); Y10JFS -	
22-08-16 16:08:43.886   1164-1216  [vaxalpr.cpp] Plate (24px / 1 / 87ms / 1); NH04NNZ -	
22-08-16 16:08:46.351 1 1164-1216  [vaxalpr.cpp] Plate (26px / 1 / 89ms / 1]: KP63VND -	
22-08-16 16:08:50.042   1164-1216  vaxalpr.cpp] Plate (21px / 1 / 85ms / 1): SH58EHN -	
22-08-16 16:09:02.785   1164-1216  (vaxalpr.cpp) Plate (23px / 1 / 98ms / 1): AD59VSK -	
22-08-16 16:09:15.933   1164-1216  [vaxalpr.cpp] Plate (20px / 1 / 106ms / 1): KV17YEF	
22-08-16 16:09:15-945   1164-29316  [isqlitenotificator.cpp] SD capacity is over 80% (80%). DB will store up to 27128 records.	
22-08-1616:09:23.105  1164-1216  [vaxalpr.cpp] Plate (20px / 1 / 103ms / 1): AE13RKV	
22-08-16 16:09:23.106  1164-29316  [isqlitenolificator.cpp] Compacting database: 27139/27128	
22-08-16 16:10:12.661[I]1164-1216] [vaxalpr.cpp] Plate (16px / 1 / 92ms / 1); YD56WKW -	
22-08-16 16:10:18:547/I[1164-1216] [vaxalpr.cpp] Plate (26px / 1 / 95ms / 1]: KV69XZP -	
22-08-16-16:10:20:416[I]1164-1216[ [vaxalpr.cpp] Plate (25px / 1 / 107ms / 1): PA65COE -	
22-08-16 16:10:23.639   1164-1216  vaxalpr.cpp] Plate (18px / 3 / 120ms / 1): LR20GYS -	
22 08 16 16:10:33.557/i[1164 1216] [vaxaInt.crp] Plate (26px / 1 / 133ms / 1): YA13EWF -	
22-08-16 16:10:36-168  11164-1216  vaxalpr.cpp  Plate (16px/1/1/134ms/1): MA03XPK -	
22-08-16-16:10:54.337[i]1164-1216[[vaxalpr.cp]] Plate (25px/1/96ms/1); N9ARR	
22-08-16 16:11:13.82/I  164-1216  vaxa pr.cpp  Plate (18px/4/258ms/1):EKJ5VAE -	
22-08-16 16:11:29:199[11164-1216] [vaxa[nc.cp]] Plate (23px/1/93ms/1); FH07XFG-	
22-08-16 16:11:41.940()11:04-1216 (vizialpr.cpp) Plate (17px / 1.91ms / 1); R6MN J -	
$22$ (B FG FG 1142,250)(1164-1216) [VaxAptr.cpp] Plate ( $22p_{X}/1/1$ (Bms/1)] = 000 S - 000 (2000) [VaxAptr.cpp] Plate ( $22p_{X}/1/1$ (Bms/1)] = 000 S - 000 (2000) [VaxAptr.cpp] Plate ( $22p_{X}/1/1$ (Bms/1)] = 000 S - 000 (2000) [VaxAptr.cpp] Plate ( $22p_{X}/1/1$ (Bms/1)] = 000 S - 000 (2000) [VaxAptr.cpp] Plate ( $22p_{X}/1/1$ (2000) [VaxAptr.cpp] Plate ( $22p_{X$	
22-08-16-16:11:143.681(I)1164-2933 (6) (isqlitenothicator.cpp) 5D capacity is over 80% (80%). D5 will store up to 2/128 records.	
$2^{-0.5}$ to the 1144.8940 He4-1216 [VaxABrtep] Plate (1/px/3/256ms/1):E056008 -	
22-05-16 16:11:45-77 (µ1164-25116) [Equiterion/licator.cpp] Compacting database: 27139/27128	
22-08-16 16:12:06.615)(1164-124) [Vasa(h),Cp) Plate (259) (1) 27(1057) (1) PloC357	
22-06-16 (6:12:06:98 (i)) 104-12:16 (i)vaxaph:cpp) Faile (18gx/3/3/31ms/1); RU16NRL -	
22-03-10-16.17.09.639401104-17.10 [VAKA01A-CP] Plate [Z89X] 1 [ 10678 / 1 ] [ 10678 /	
22-05-16 16:12:18:798j11104-12:16 [vaxalpr.cpp] Plate (1/px/) / 100ms/ 1]:5306E0V -	
22/09/10/6/2222713/j1109/12/09/12/01/07/07/14/2/30%5/11/2/30\%5/11/2/30\%5/11/2/30\%5/11/2/30\%5/11/2/30\%5/11/2/30\%5/11/2/30\%5/11/2/30\%5/11/2/30\%5/11/2/30\%5/11/2/30\%5/11/2/30\%5/11/2/30\%5/100000000000000000000000000000000000	
22.06 16 (c).22.07.11 (c) 104 (22.06 (c).06 (c).22.07 (c	
22/05/16/06/25/37/07/05/12/07/05/07/06/07/07/07/07/07/07/07/07/07/07/07/07/07/	
22.06.10.16.12.460.07.210.1104.12.16[Vizian]rcanD]rtait: (1718/147.23.8118) 16.010172A	
22.00 11 (0:1:1:1:2:2:1:0) 1120 1120 1120 1120 120 120 120 120 120	
27-00-04 (which in the product of th	
22.08.16.1323.456(1)144.23316(1)444.23314(1)447(1)47(1)47(1)45(1)46(1)46(1)46(1)46(1)46(1)46(1)46(1)46	
22 of 10 to 10.10.10.20 Adapting 104 22.00 (adapting to the classical solution of the classical	
22.08.16.1326.06(1):14.2316(1):14.10(1):16(1):17(2):17	
2-10-16 [13:42,563][11:64-1216] [vax][nccon] [Pater (Jmx / 1):8mx / 11:62][14:16]	
22-08-16 16-14-32 723[1]1164-1216[Uavalar con P]4 (20m/ 1/2 00m/ 1/2 4F144X7 -	
2-06-1615(1454(395)[11164-1216][xxalancon][2416-(15xx/1)-(25xx/1)-	
22.08.16.16.14.57.9.818/11.16.12.16 [Usamphepp] take [20x / 1 / Johns / 1 HMO/FEG -	
a a to to the newspire restriction property are (signal a function of the second s	
* * * *	3



Note that the latest information is added to the bottom of the file so use the slider bar on the

right to navigate up and down. Use the '**Scroll to bottom'** icon: to move to the end of the file.

If new data is being recorded whilst you are browsing, then use the '**Reload'** icon to re-open the latest version of the file.

Error messages will appear here including if the program has failed to send data to a thirdparty application for some reason – or it has been rejected by a server.

Basic plate data includes the plate height, number of reads, time to process etc.

The logfile can be downloaded to your PC by selecting the '**Download Logfile'** icon:



44

Pressing the **control** icon allows you to reposition the logfile display in any one of four positions on your screen ( to allow you to view settings around the window).



Selecting reverts to the larger window, centre screen.





# 5.11 System Update

Select System Update to update the VaxALPR App to the latest version.

MOBOTIX 6 VAXTOR	VaxALPR 1.0.5 [DEV-20220621]	
Reporting		Plates
Helix		Settings Region of Interest
JSON		Reporting Blacklist
XML		Whitelist
Genetec LPR Plugin		Database Download config Upload confir
Network Optix		Log file
UTMC		System update
Overlay		
Output port		
8	Plate to test	

A window appears which allows you to select an update from your local PC if you have been sent one by Vaxtor.

Application Update	
Application upda	ate uploading a file
	Continue

Select the application from your PC and click 'Open':

~	VAX File	~
	Open	Cancel

The new version will be loaded.

The 💔

icon causes the logfile to be displayed.



# 6. Troubleshooting

Many license plate reading issues are caused due to:

- Incorrect positioning of the camera
- Incorrect camera lens (or zoom setting)
- Insufficient illumination
- Incorrect camera settings e.g. shutter speed
- Incorrect settings of the ALPR App.

In this section, we will study the most common of these issues and how to fix them.

# 6.1 VaxALPR On Camera software starts and then stops suddenly.

Solution:

Check that you have uploaded the license key and check that the date and time of the Mobotix MOVE camera is set correctly.

# 6.2 The VaxALPR license is valid but a 'Check license' message appears.

Solution:

Check that the date and time of the Mobotix MOVE camera is set correctly.

# 6.3 The VaxALPR On Camera software is running but not reading plates.

Solution:

Check if you can see the license plate in the image and that the image is of good quality, not under or over exposed. As a general rule, if you can't easily read the plates then the software won't be able to read them either!

Image is everything so first try to adjust the camera lens to zoom in or out. Failing that, check if the camera itself can be repositioned closer or further from the reading point. The captured image should show the complete vehicle. This however depends on the resolution that the camera has been set to.

If the video quality looks good then go to the camera's settings and ensure that the shutter speed is set high enough. (See earlier in this manual for a guide to shutter speeds)

If you CAN see the license plate clearly in the image and the software is not reading anything, try changing following parameters in the settings section of the App to be more tolerant:

- 1. In the Country options, do not select the **Grammar Strict** checkbox.
- 2. In the Video options, change the **Minimum Character Height** to 14 pixels.
- 3. In the Video options, change the **Maximum Character Height** to 60 pixels.
- 4. In the OCR options, change the **Minimum Global Confidence** to 50.



- 5. In the OCR options, change the **Minimum Character Confidence** to 25.
- 6. In the Region of Interest section, delete any existing **Region of Interests** (ROIs).

Once you can see the license plate image and the software is now reading, change these settings back one by one.

# 6.4 VaxALPR is running but it does not read all of the plates.

Solution:

In the VaxALPR configuration, in the Video options, check the that value of the resolution in the drop-down list is adequate.

View the log file and scroll to the end and look for the message:

[INFO] Vaxreader[xxxx]: -Plate 0 (<pixel height> - <milliseconds>): <plate> and check the value of the plate's character pixel height registered in the log.

If the resolution is 1280 x 960 and the pixel height of the plate is 40, It is recommended you set the resolution to a lower value.

# 6.5 Plate patches are inverted on the plates list.

After installing a new Mobotix MOVE camera, sometimes the plate patches appear upside down after being read. Note that the camera has an auto-sensor to determine the orientation.

Solution:

Set the correct orientation required in the Mobotix MOVE Camera Settings/ Stream section:

After changing this (or any other settings in the camera) you should stop start and restart In the VaxALPR Application – and all should be well.



# 6.6 JSON or XML setup but no plates being received

Solution

If you are using a remote URL to receive the data, check that a DNS server has been selected in the main Mobotix MOVE setup.

IMPORTANT: If you are using a URL rather than an IP address, make sure that you have setup a DNS server in the main MOVE settings menu.

Go the main MOVE System menu and select Network & Basic. Select a DNS server such as: 8.8.8.8 with a secondary server of say 8.8.4.4. These are free Google DNS servers which will map your URL names.

Basic	O Get IP address automati	cally
QoS	Use fixed IP address	
VLAN SNMP	IP address	192.168.1.222
UPnP OpenV/PN	Subnet mask	255.255.255.0
Bonjour	Default gateway	192.168.1.254
DDNS Mail	Primary DNS	8.8.8.8
FTP	Secondary DNS	8.8.4.4



# 7. Dynamic Text Replacement Reserved Words

\$date\$	Timestamp in ISO8601 format
\$plate\$	Plate number
\$tag\$	Unique hash for this plate number. Same plate number will always give the same \$tag\$. Format based on UTMC algorithm.
\$plateutf8\$	Plate number in utf8 format.
\$country\$	Full country of origin name.
\$countrycode\$	3 letter country code.
\$state\$	Plate State for USA.
\$category\$	Plate category for countries that support it.
\$blacklist\$	Description on the blacklist linked to the plate number.
\$whitelist\$	Description on the whitelist linked to the plate number.
\$ifblacklist\$ \$ifblacklist\$	If the plate is on the blacklist, the text in the 'if clause' will be displayed.
\$ifwhitelist\$ \$ifwhitelist\$	If the plate is on the whitelist, the text in the 'if clause' will be displayed.
\$ifnolist\$\$ifnolist\$	If the plate is not on a list, the test in the 'if clause' will be displayed.
\$confidence\$	Global confidence (0-100).
\$charheight\$	Average charheight (pixels).
\$processingtime\$	Processing time in milliseconds.
\$left\$	Left coordinate for the plate on the image (pixels).



\$right\$	Right coordinate for the plate on the image (pixels).
\$bottom\$	Bottom coordinate for the plate on the image (pixels).
\$absoluteleft\$	Plate left position based on the total image width (0-1).
\$absolutetop\$	Plate top position based on the total image height (0-1).
\$absoluteright\$	Plate right position based on the total image width (0-1).
\$absolutebottom\$	Plate bottom position based on the total image height (0-1).
\$width\$	OCR image width.
\$height\$	OCR image height.
\$ip\$	Camera IP address.
\$roiid\$	Roi ID where the plate number is found.
\$speed\$	Vehicle speed (Km/h).
\$multiplate\$	Amount of times that the plate has been read before reporting.
\$signaled\$	True if the read was caused by a trigger.
\$id\$	Database ID for this read.
\$direction\$	Enumerate with the vehicle direction (0: Unknown, 1: Towards, 2: Away, 3: Stopped)
\$directionstr\$	String with the vehicle direction.
\$safedate\$	Date in format %Y%m%d_%H%M%S in the camera time zone (Useful for filenames).
\$localdate\$	Date in format %d/%m/%Y in the camera time zone
\$localtime\$	Date in format %H: %M: %S in the camera time zone.



\$imageid\$	Signal ID in case of a trigger read.
\$plateimage\$	Plate crop JPEG image encoded in base64.
\$platejpegsize\$	JPEG size in bytes.
\$overviewimage\$	Overview JPEG image encoded in base64.
\$overviewjpegsize\$	JPEG size in bytes.
\$epoch\$	Unix epoch (seconds).
\$utcdate\$	Will report the date at ISO8601 format but always in UTC. (2020-12-31T16:11: 30.000Z)
\$etx\$	End transmission character (03)
\$stx\$	Start transmission character (02)

## 7.1 Additional values

\$image\$	Full JPEG image encoded in base64.
\$jpegsize\$	JPEG size in bytes.
\$make\$	The vehicle make
\$model\$	The vehicle model
\$color\$	The vehicle color
\$class\$	The vehicle classification (type – e.g. car, van etc)
\$vehicleaccess\$	Entry / Exit events (0: Unknown, 1: enter, 2: exit, 3: overstay)
\$dwelltime\$	Time spent in monitored area in seconds
\$year\$	Year



\$month\$	Month number
\$day\$	Day number
\$hour\$	Hour
\$minute\$	Minute
\$second\$	Seconds

# 7.2 Note on UTC time format:

Time UTC: 2021-04-13T00:50:15.000Z

( YYYY-MM-DDTHH:MM:SS.mmmZ - The last Z indicates the time is UTC)

Local Time: 2021-04-13T00:50:15.000-03:00

( YYYY-MM-DDTHH:MM:SS.mmm±hh:mm - Where the last ±hhmm is the difference from UTC time )



# 8. Changelog

Version 1.0.19

- ✓ Add: Support no wait (0 seconds) between retries
- ✓ Add: \$datehour\$ as a reserved word
- ✓ Fix: Slovenian grammar
- ✓ Update: Set 3 minutes as timeout to download an application update

Version 1.0.18

- ✓ Add: JPEG patch quality option
- ✓ Add: Option to prioritize external notifications
- ✓ Improves: Auto update management
- ✓ Improves: Singapore analytic in multi-lane scenarios
- ✓ Improves: OCR accuracy on high complexity
- ✓ Update: European country classifier
- ✓ Update: Hong Kong AVL list and grammar rules

Version 1.0.17

- ✓ Add: Add: Secondary JSON output
- ✓ Fix: Genetec LPR plugin date output reset

### Version 1.0.16

✓ Add: Allow branch switch

#### Version 1.0.15

- ✓ Add: reset.cgi command
- ✓ Add: Online update option
- ✓ Fix: Video tab UI scroll
- ✓ Fix: Germany region recognition
- ✓ Fix: Australia and Hungary grammar
- ✓ Update: Improve false positives detection

## Version 1.0.14

✓ Added min country confidence

Version 1.0.13

- ✓ Fix: UI error message display when analytic is not available
- ✓ Fix: Move NVR reporting options
- ✓ Fix: Verify application package before uncompressing

Version 1.0.12



✓ Fix: Whitelist and blacklist status was not displayed correctly on the Plates table

Version 1.0.11

- ✓ Fix: \$date\$ will be wrote using the user defined time zone
- ✓ Fix: Minimum number of characters can be set to 3
- ✓ Fix: Complexity level naming
- ✓ Added: Configurable crop dimensions
- ✓ Added: Move NVR reporting
- ✓ Improvements: New MMC network

Version 1.0.9

- ✓ Added TCP server reporting
- ✓ Added FTP reporting

## Version 2.0.0 Phobos

✓ Added low

### Version 1.0.8

- ✓ Added low coverage mode.
- ✓ Added \$mac\$ reserved word.
- ✓ Made JPEG compression quality configurable.
- ✓ Added crop option for the reported images.
- ✓ Added watermark option for the reported images.
- ✓ Egypt formatted plates will return the numeric part as standard characters.
- ✓ Minor UI corrections

### Version 1.0.7

- ✓ Added license check program to /tmp/app/bin. It will return 1 if there is a license loaded on the camera.
- ✓ Images on the main webpage will be visible event without database.
- ✓ Fix: UI validator for OptixNX was not working client side.

#### Version 1.0.6

- ✓ Added: Allow application update uploading the application package file.
- ✓ Added: Upload / Download configuration file.
- ✓ Fix: Crash with UTMC if SD card is not available.
- ✓ UI: Minor font and spelling changes. Added Vaxtor logo.

### Version 1.0.5

✓ Fix: Crash when notification queue gets full



Version 1.0.4

- ✓ Added: UTMC reporting
- ✓ Added: Version and build information on the webpage title
- ✓ Fix: MMC license issue reusing the same code after a firmware update
- ✓ Fix: Log level settings

Version 1.0.3

- ✓ Added Overlay notificator
- ✓ Added Digital IO management
- ✓ Update Australian and Taiwan NN model
- ✓ Improvements for Hong Kong custom plates
- ✓ Fix: Greek grammar
- ✓ Fix: Germany grammar for electric vehicles
- ✓ Fix: Background mode light on dark

Version 1.0.2

- ✓ Added MMC
- ✓ Added Genetec LPR plugin reporter
- ✓ Added OptixNX reporter
- ✓ SDCard is now mandatory to enable database
- ✓ Added Whitelist and blacklist
- ✓ Minor bugfixing

Version 1.0.1

✓ First release

Ends.