
VaxOCR UIC

ON CAMERA Version

User Manual

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Introduction

VaxOCR UIC is an application developed by Vaxtor Recognition Technologies that runs onboard suitable Axis CCTV cameras which will read standard UIC codes (International Union of Railways Wagon and coach numbers) which adhere to the International Standard.

The UIC OCR engine has been developed from Vaxtor's ALPR engine and therefore takes advantage of many of the current integration and publishing capabilities that have been developed by Vaxtor over many years.

UIC reads can be written to the Axis internal SD card (if fitted), a shared network drive or data can be sent to many other destinations and VMS systems such as Milestone and Genetec using the comprehensive list of reporting options.

This manual will guide you through the installation, configuration and these result publishing procedures. It also includes some tips about camera setup and configuration to maximize the OCR analytics performance and UIC Code read accuracy.

Note that the wagons should be stationary or moving very slowly at 10kph or less. In this case the software will report the direction of travel of the wagon.

UIC Wagon Numbers

A UIC Code comprises 12 digits. For Example: **83 52 7912 096 7** normally printed as a multi-line (see below) – but the software will also read single line codes:



Digits 1-2: Type of vehicle and indication of the interoperability capacity (on multiple units, type)

Digits 3-4: Country Code (Owner before 2006)

Digits 5-8: Vehicle class information

Digits 9-11: Individual running number (serial number)

Digit 12: Self-check digit

Requirements for UIC Code Images

OCR (Optical Character Recognition) is an image processing technology used to locate and read the codes printed or painted onto railway wagons. You can see from the nature of the code positioning that they can be very hard even for a human to decode but recognizing the characters is more challenging if the images have any of the following characteristics or artifacts:

- Over / Under exposed
- Blurred or Distorted
- Unevenly lit
- Low contrast as shown below
- Damaged text
- Badly painted text
- Bad weather conditions



Low contrast text is almost impossible to read correctly

The less clear that the wagon text images are, then the more likely it is that the OCR software will report them incorrectly ---- Garbage In → Garbage Out.

As a general guide, if a human has difficulty reading the codes, then so will an intelligent OCR camera!

Camera Requirements

It is recommended that you use an **Axis Camera** with an **ARTPEC-6** processor or later. Most current Axis models have these processors and normally a high resolution capable of reading UIC Code text. Contact Vaxtor for help selecting a camera.

1.1 Frame Rate

The frame rate, also known as frames per second (FPS), is the number of frames or images that the camera can capture per second. For example, 30 fps means the camera captured 30 frames in a single second of video.

When using VaxOCR On Camera, then setting the frame rate has no effect, – the camera sends frames at about 25fps to the App. However, if you use the camera as a remote IP OCR camera connected to a PC running the Vaxtor OCR software – then the fps settings will have an effect and it should be set to at least 25fps. (note that a PC version of this software is not currently available).

1.2 Shutter Speed

Shutter speed, also known as the “exposure time”, is the length of time a camera shutter is open for in order to expose light onto the camera sensor. The shutter speed is measured in seconds, or fractions of a second. The bigger the denominator, the faster the speed. For example, 1/250th means one two-hundred-and-fiftieth of a second or four milliseconds. (1 second = 1000 milliseconds)

The following minimum shutter speeds are recommended but may be decreased:

Wagon speed:

- **Stationary** → Minimum exposure time **1/125th sec** (8 milliseconds)
- **Very Slow** → Minimum exposure time **1/500th sec** (4 milliseconds)
- **Slow** → Minimum exposure time **1/1000th sec** (2 milliseconds)

UIC codes are always read perpendicularly to the camera and transverse the field of view and so higher shutter speeds are required than for say vehicles which travel towards the camera. Fast moving wagons cannot be read.

1.3 Resolution and Lens Focal Length

1.3.1 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. There are several factors that determine the detail captured:

1. The resolution (pixel size) of the camera sensor. This sensor (normally CMOS) where the light eventually falls and a typical IP camera has a sensor resolution of 2 or 4 Megapixels.
2. The resolution of the camera's electronics. An Axis Q1785 can output video at a resolution of 1920 x 1080 – but may be set to a lower resolution if not needed.
3. The quality and focal length of the lens. The quality of the optics can play a part in challenging circumstances. The focal length (zoom factor) determines the field of view that can be seen.

1.3.2 Focal length

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 10–40 mm.

1.3.3 Illumination

UIC Codes are normally painted onto both sides of the wagons and, unlike license plates are **NOT** retro-reflective. Sufficient ambient lighting must be used to adequately illuminate the text so that it can be read at a reasonably fast shutter speed without the camera adding too much gain to brighten the image. (a maximum gain of about 12 is advised)

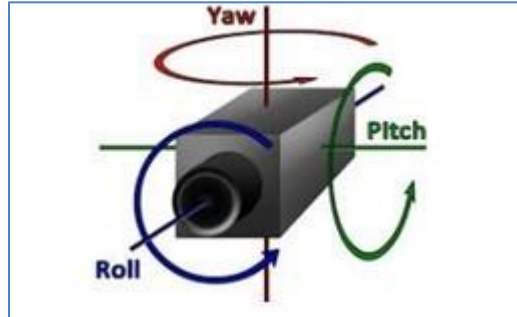
Adding gain effectively amplifies the video signal, including any noise which can result in a very grainy image which is prone to OCR errors.

Other requirements

The positioning of the camera is key to achieving maximum OCR accuracy.

1.4 Camera Orientation and Placement

The image orientation is a key factor to achieve the maximum OCR efficiency. It is recommended that you stay within the following thresholds



Roll Rotation: Below 15°

Yaw Rotation: Below 25°

Pitch Rotation: Below 25°

In other words, keep the camera as perpendicular to the wagon as possible.

Accuracy will decrease significantly if these guidelines are not adhered to.

The camera should be placed at the side of the wagon keeping the angles minimal. Note that wagons sometimes have protrusions which could prevent characters from being read as they become obscured.

1.5 Examples of camera orientation

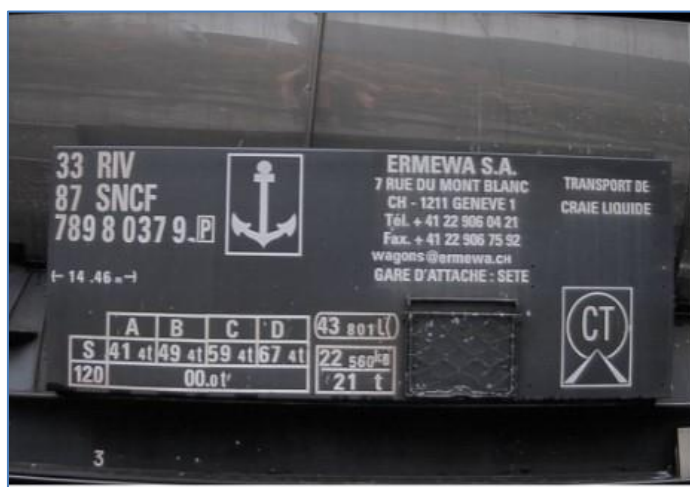
The following examples illustrate various camera positions. The more acute the angle, the more likely that there will be OCR errors:



An acute angle will increase the chances of OCR errors



A very acute angle can cause obscuration



Correct angle minimizes the change of mis-reads.

1.6 Character pixel height

The most accurate way of measuring the size of the characters on a wagon is to use the height of each character. The optimal range is from 20 to 30 pixels high. There is a tool to help determine the correct lens to use to attain this height described later in this manual.

The software can be configured to read characters as low as 20 pixels high – or as high as 70 pixels high, but in order to maximize reading accuracy and not waste processor time looking for very large characters you should try to keep to this 20-30 range.

Speed of traffic

The software may be run onboard an Axis camera as described in this manual, but in the future may be run on a PC or server and the Axis cameras used to send live video to the PCs for processing. This is used for faster moving wagons.

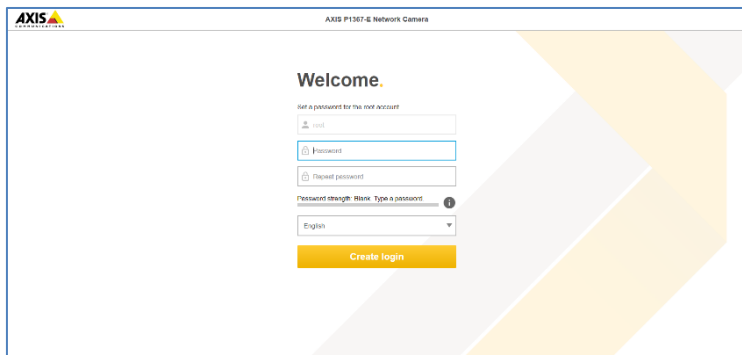
The Axis camera's processor (ARTPEC 6 or above) can take more than one second to process a UIC Code read and so the wagon must be stationary or moving very slowly. (walking pace)

(This is due to the huge variance in possible locations and qualities of codes with no specific background such as is found on license plates).

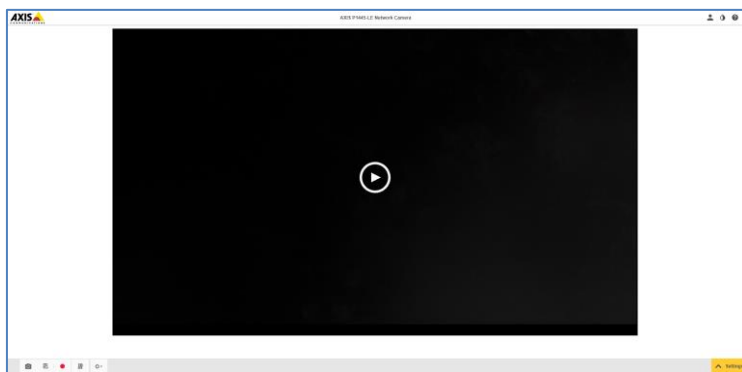
Note that the software will report single and multiple line UIC codes and also report the direction of travel of the wagon.

Setting up the Axis Camera

Once the Axis camera has been installed on site it must be set up and configured. Use a web browser to logon to the camera using its IP address. (refer to the Axis documentation for the default IP address. The default username and passwords are normally: root / pass).

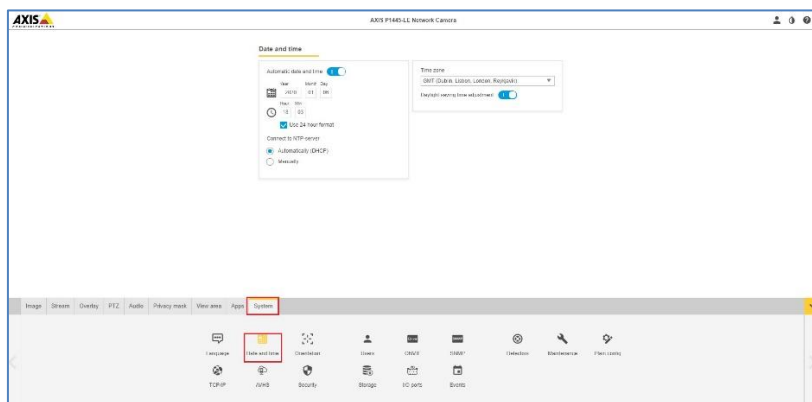


Once logged on, select “Settings” from the bottom right of the window:



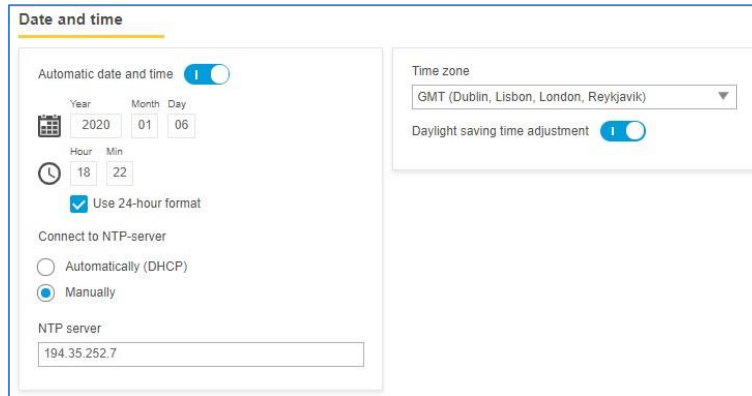
1.7 Set the date and time of the camera

To set the **date and time** within the Axis camera, select the “System” Tab and choose the Date & Time option.



Axis camera setup: System > Date & Time

In this example we are using one of the UK Stratum 1 NTP Servers:

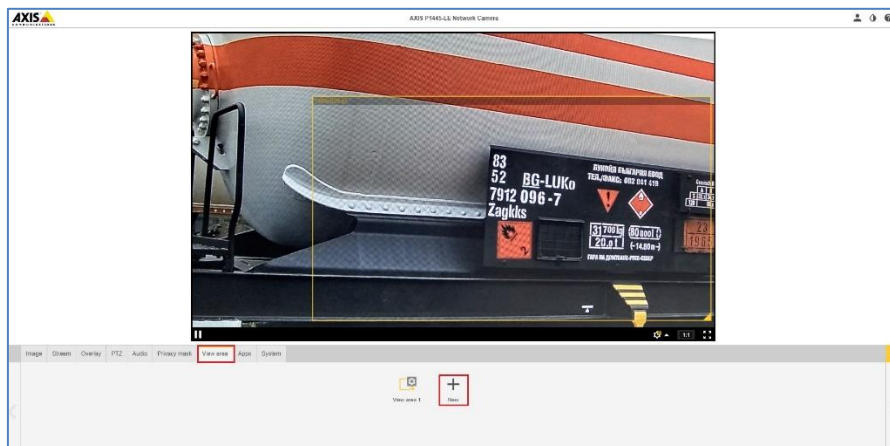


1.8 Set the resolution, shutter speed and frame rate

Different frame rates, shutter speeds and resolutions should be setup depending on where the camera is to be placed. See section 3 for shutter speed recommendations and note that for on-camera use the frame rate has no effect.

1.9 Set the View Areas.

On some Axis camera models, you can define one or more View Areas.



These rectangular areas can be named and are essentially areas of interest which reduces the bandwidth of the data transmitted to a remote recording device and equally saves storage space when video is saved remotely or on the camera's internal SD card if fitted.

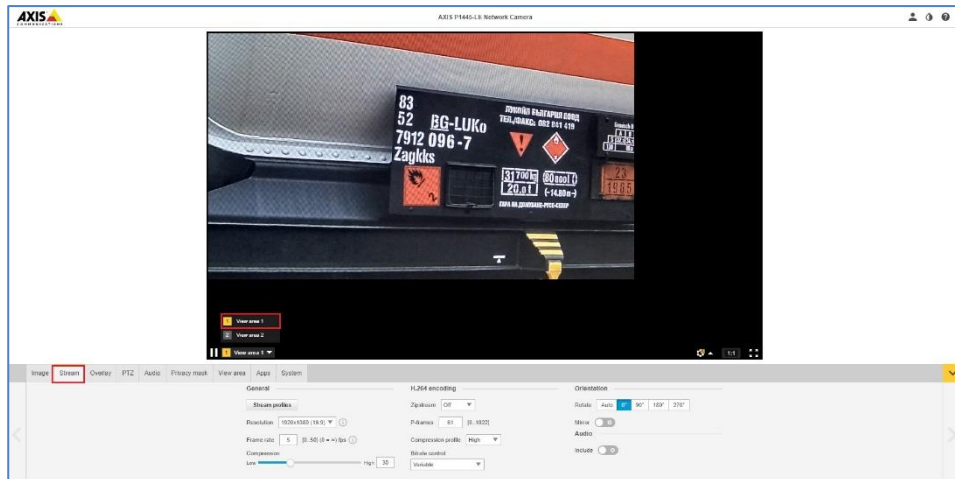
In this example only the area bounded in yellow will be sent to any recording equipment – and only this part of the video image will be passed onto the OCR engine for OCR processing.

Note that you can also set multiple Regions of Interest (ROI) within the OCR App which can be defined as polygons and the bounded areas can be included or excluded from the OCR processing. See later in this manual.

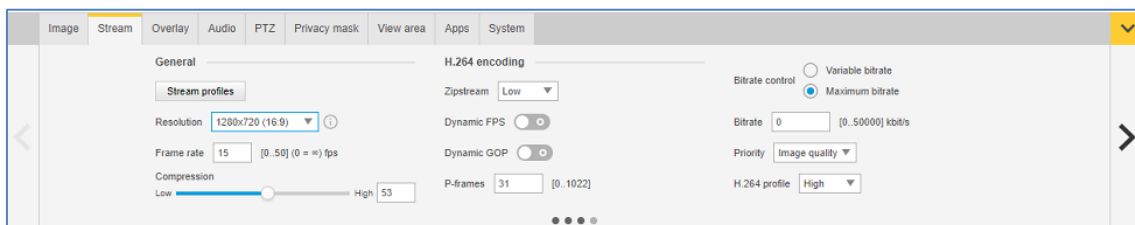
1.10 Set the frame rate and resolution

For each rectangular View Area set the **frame rate (max)** and **resolution** in the Axis camera.

- Click on the Stream Tab and choose the appropriate View Area (if your camera supports them):

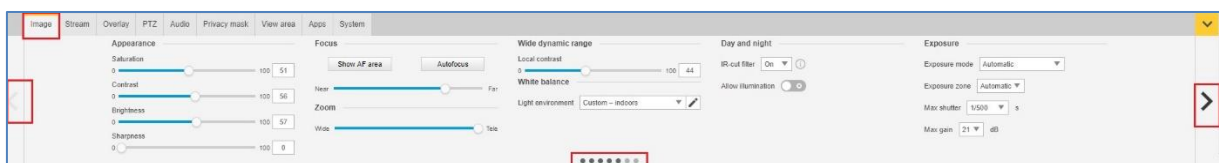


- Note that changing the resolution only affects the video stream (if you are recording this). You set the resolution for the OCR with in App.
- Similarly for the frame rate. The App will run as fast as it can up to 25fps.
- All the other Stream options have no effect on the On-board OCR.



1.11 Setting the shutter speed and other important image settings

To set the **shutter speed (minimum exposure time)** and other important settings in the Axis camera, we need to click on the Image Tab. The following window is displayed:



Note that these menus have side-scrolling arrows to the left and right to scroll through all the Image setting options.

Set the following:

- **Maximum Shutter speed (maximum exposure time).** See Section 4.2
- Do **NOT** enable **Wide Dynamic Range**.
- Set the **IR-cut filter** to **On** in the Day and Night section. This causes the filter to be present on color images (to remove IR light interference / color distortion) and this keeps the camera in Day Mode. Note that sufficient white light should be provided to be able to view the UIC Code text at night without the need for excessive gain whilst maintaining a high shutter speed.
- Set the **Max gain** to 12dB or below if possible to reduce noise on the images.
- Deselect the **Enable IR Illumination** checkbox in the IR Illumination section.

Other settings

In Appearance, it is advisable to set **Sharpness** to midway or lower. You do not want the camera altering the pixels in any way by enhancing edges.

Target aperture – this controls the iris and should normally be midway. A smaller iris (towards closed) will increase the depth of field but cut down the light received.

Exposure level – this setting will attempt to lighten or darken the resulting image – subject to the gain, iris and shutter settings. Normally leave midway.

Blur-noise trade-off – Low noise means shutter priority, Low motion blur means gain priority. Leave these midway as your maximum shutter speed will determine when the aperture will start to change.

Note that a P1445 has a motorized varifocal lens and will therefore need re-focusing after a zoom change. A Q1700 series has a true motorized zoom lens that should maintain its focus.

1.12 Configuring the VaxOCR UIC software

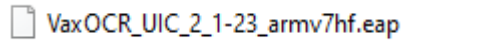
Once the Axis camera is installed and setup, we need to install and configure the VaxOCR On Camera software. The following steps are required:

1. Install the software
2. Upload the license key
3. Restart the Axis Camera
4. Start the software
5. Configure the software. VaxOCR Configuration

1.12.1 Installing the software

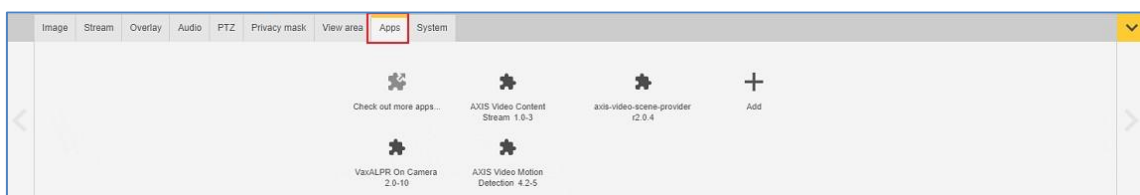
To install the VaxOCR UIC On Camera software, do the following:

1. Contact Vaxtor for the latest version of the VaxOCR UIC software for Axis cameras. It should look something like:



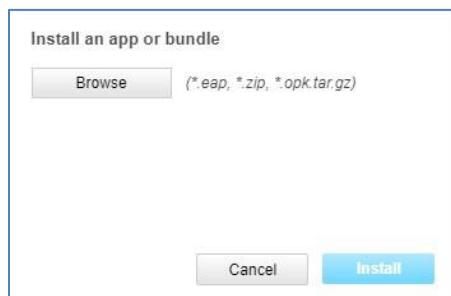
More recent Axis cameras such as the P1445-LE, P1375-E, Q1700 and Q1785-LE all have ARTPEC 6 processors. The software will also run on the later ARTPEC 7 processor.

2. In the Axis camera's settings section, click on the Applications (Apps) tab.



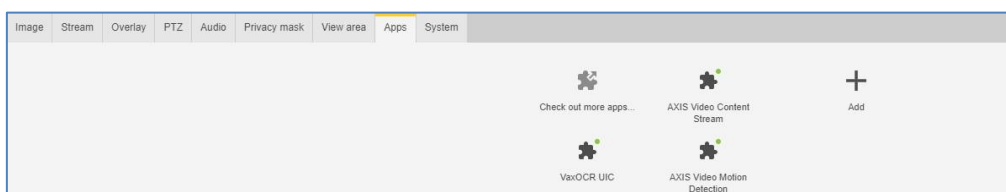
Axis camera setup: Apps > Add

3. Click the + (Add button) and browse for the file **VaxOCR_UIC_2_1_1-23_armv7hf.eap**



Axis camera setup: Apps > Add > Browse

4. Click the **Install** button to install the software.
5. After installation the App will appear on screen.



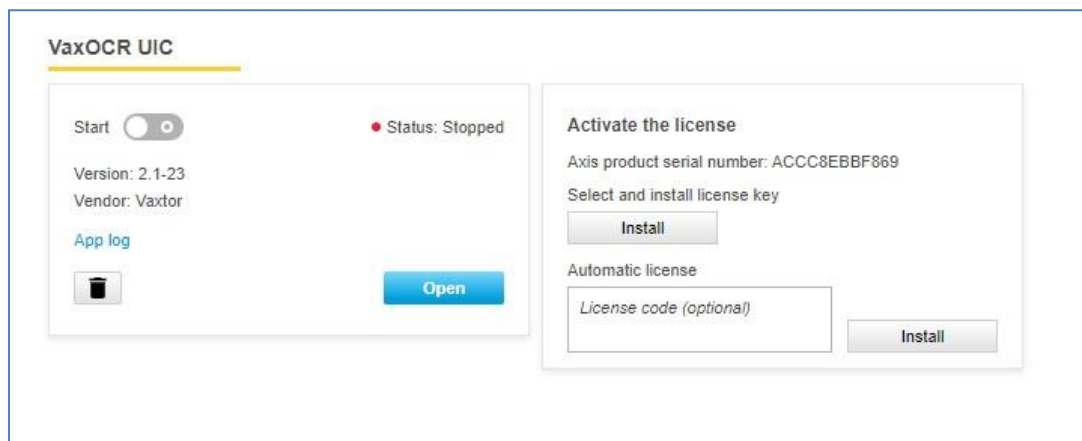
Axis camera setup: Applications > Overview

NOTE: If you encounter any issue whilst installing the software, upgrade the Axis camera firmware to the latest version available for your specific product model (the minimum version required is 5.70).

1.12.2 Upload the license key

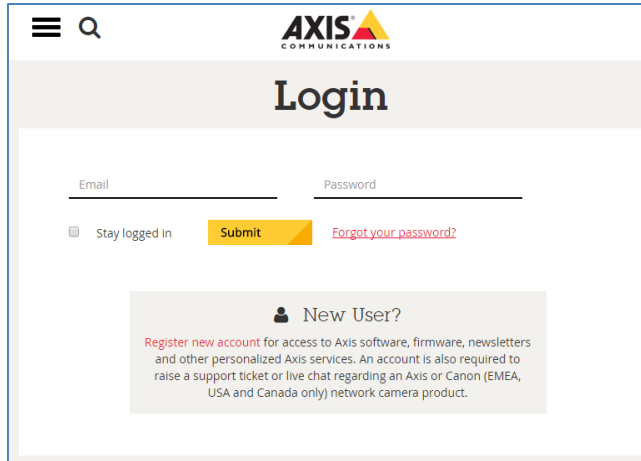
The VaxOCR UIC On Camera software requires a license key. Whether you need a trial license (30 days) or already have a paid-for permanent license code, do the following steps and select the appropriate option.

1. From the Axis camera's setup screen, and click on the Apps menu. Then click on the VaxOCR UIC application. **Take note of the Axis product serial number that appears in the License Activation section.**



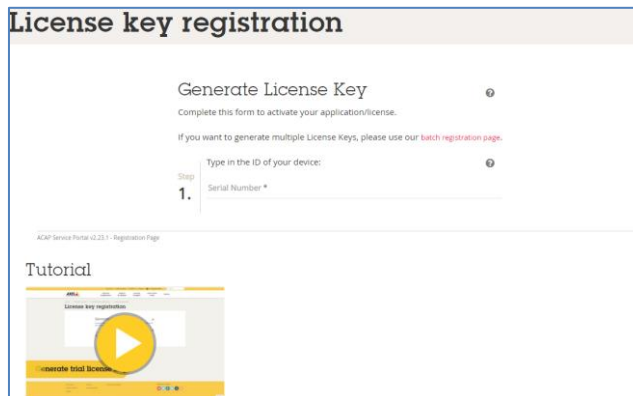
Axis camera setup: Apps > VaxOCR UIC On Camera > License

2. Using your browser, go to the Axis website:
<https://www.axis.com/global/en/products/camera-applications/license-key-registration#/registration>.
If you already are an Axis user, just log in. Otherwise, register a new account.



Axis website: Log in to download a trial license

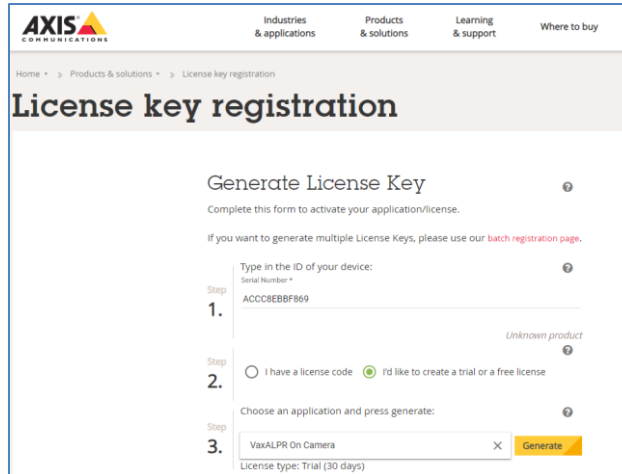
3. In the License key registration web page, do the following:
 - Type in the ID (Axis product serial number) of your camera.



Axis website: Enter the camera serial number

To generate a trial license

- Select the corresponding radio button. Select Vaxtor OCR UIC On Camera as the application name and press the Generate button.



Axis website: Generate a trial license key

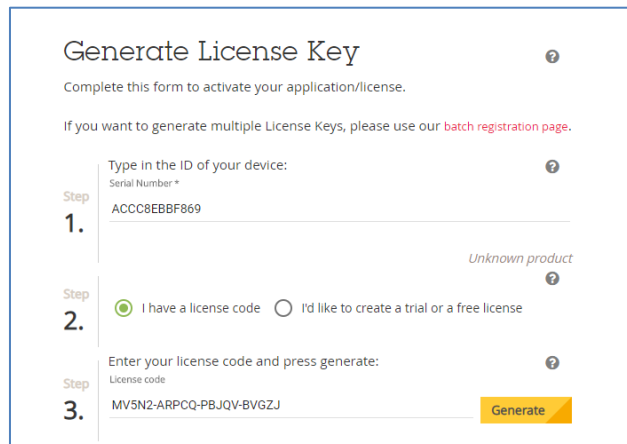
- Download the trial license key to your PC.

Step 4. You can download your license key through the following link:
Expiration date: Nov 24, 2018 ●
[Download license key \(Show the content of the license key \)](#)

Axis website: Download trial license key

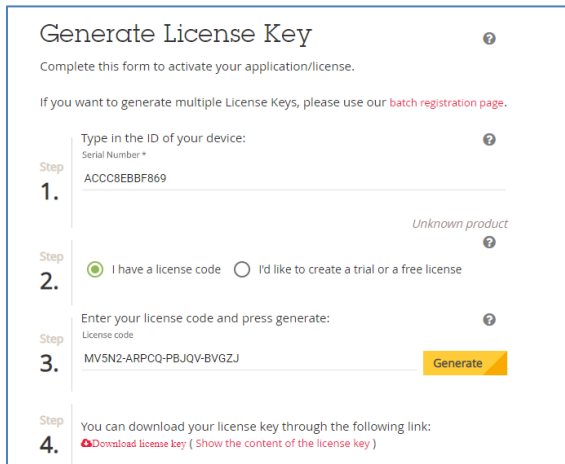
To generate a permanent license

- To purchase your permanent license, contact Vaxtor and send us your Product Serial number along with your order. When this process is completed you will be sent a License code.
- Select the corresponding radio button ('I have a license code') and enter your code and press the Generate button.



Axis website: Generate a permanent license key

- Download the permanent license key using the link shown in red.



Generate License Key

Complete this form to activate your application/license.

If you want to generate multiple License Keys, please use our [batch registration page](#).

Type in the ID of your device:
Serial Number *

Step 1. ACCC8EBBF869 Unknown product

Step 2. I have a license code I'd like to create a trial or a free license

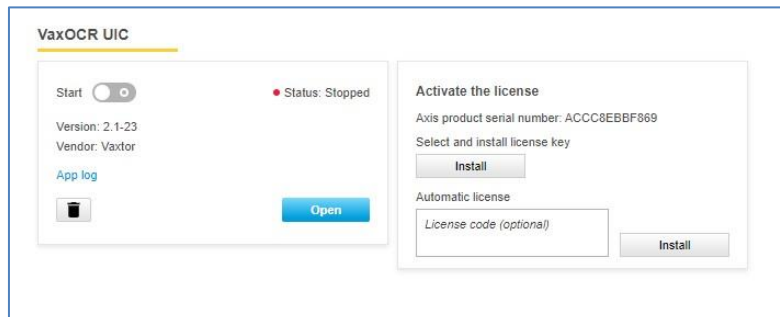
Enter your license code and press generate:
License code

Step 3. MV5N2-ARPCQ-PBJQV-6VGZJ Generate

Step 4. You can download your license key through the following link:
[Download license key \(Show the content of the license key\)](#)

Axis website: Download license key

- Now that you have the license key, go back to the Axis camera's setup and click on the Apps menu. Click on the VaxOCR UIC On Camera > and in the 'Activate the License' section click 'Install'.
(Note if you have a bulk license code you can enter it in the Automatic License box)



VaxOCR UIC

Start Status: Stopped

Version: 2.1-23
Vendor: Vaxtor

App log

Open

Activate the license

Axis product serial number: ACCC8EBBF869

Select and install license key

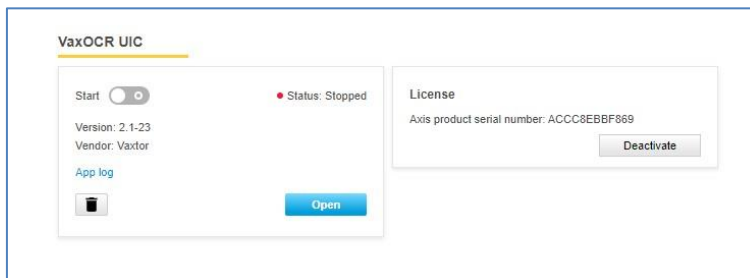
Install

Automatic license

License code (optional)

Install

- A file menu will open appear select 'License option. Click on the Select file button and select the license key file you have just downloaded. Click 'Open'.
- Next click on the Install button.
- The permanent license should now be installed correctly.



VaxOCR UIC

Start Status: Stopped

Version: 2.1-23
Vendor: Vaxtor

App log

Open

License

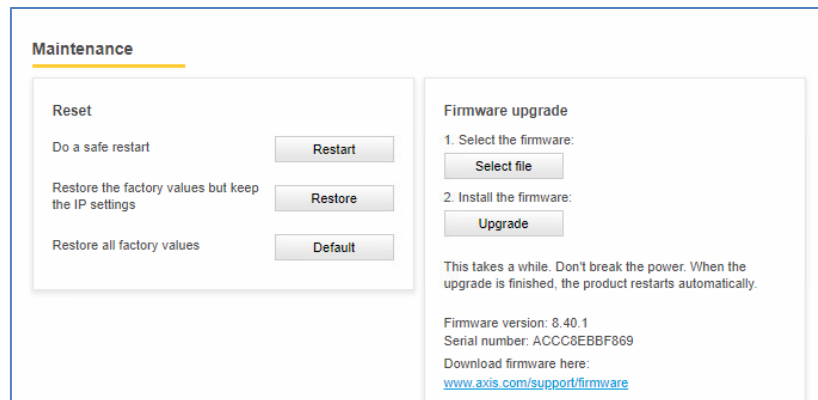
Axis product serial number: ACCC8EBBF869

Deactivate

Axis camera setup: Apps > VaxOCR UIC On Camera > License

1.12.3 Restart the Axis Camera

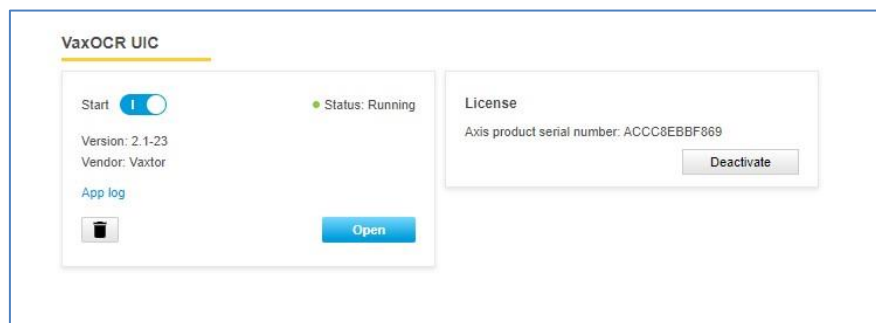
Once the VaxOCR UIC On Camera software is installed and the license key is uploaded, you should restart the Axis Camera. Do this by selecting the 'System' tab and click on the 'Maintenance' icon. Select the '**Restart**' button.



Axis camera setup: System Tab > Maintenance > Restart

1.12.4 Starting the VaxOCR UIC Code Recognition software

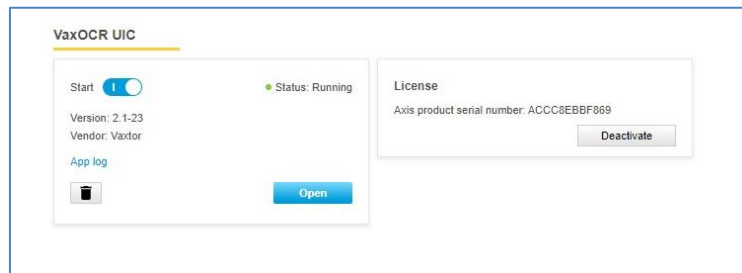
To start the VaxOCR UIC On Camera software, select the Axis camera's Settings, click on the Apps Tab and select the VaxOCR UIC App. Use the Start Slider to start the application. The Status should change to 'Running'.



Axis camera setup: Apps > VaxOCR UIC On Camera

Configuring the VaxOCR UIC Application

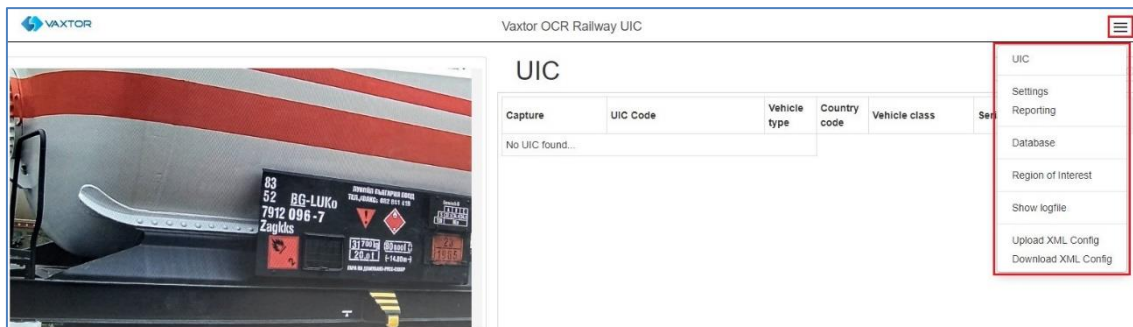
Once the software is running you can configure the VaxOCR UIC software by clicking on the blue Open button.



Axis camera setup: Apps > VaxOCR UIC On Camera

VaxOCR UIC On Camera user interface

This will open a new window with the VaxOCR UIC main interface.



VaxOCR UIC interface

The icon in the top right corner reveals the options menu.

VaxOCR UIC includes the following options:

- UICs: To display a live feed of all the most recent wagons read (if configured - *This is covered later in this manual*)
- Setting: To configure the VaxOCR UIC software
- Reporting: To configure the various reporting options.
Check the VaxALPR On Camera Integration Guide for further details.
- Database: To review and search the list of recorded plates (if configured)
- Region of Interest: To add/edit ROIs to include or exclude in the OCR analysis.
- Show logfile: Displays the internal logfile to show tech details of reads etc.
- Upload XML Config: To import the VaxOCR UIC settings from a XML file.
- Download XML Config: To export the VaxOCR UIC settings to a XML file.

VaxOCR UIC not running

If the VaxOCR UIC application is not running correctly, you will see the message:



If the software is not able to run correctly, please ensure that:

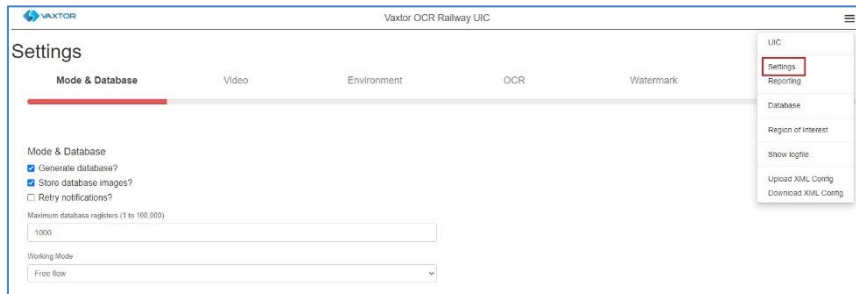
- The date and time of the camera is set correctly.
- A valid license has been uploaded and activated.
- The previous version was uninstalled before installing a new one. If this was not performed the log file in the camera may contain an error message requiring the software to be reinstalled. In this case
 - Uninstall the current version by clicking the Bin icon below the App Log button.



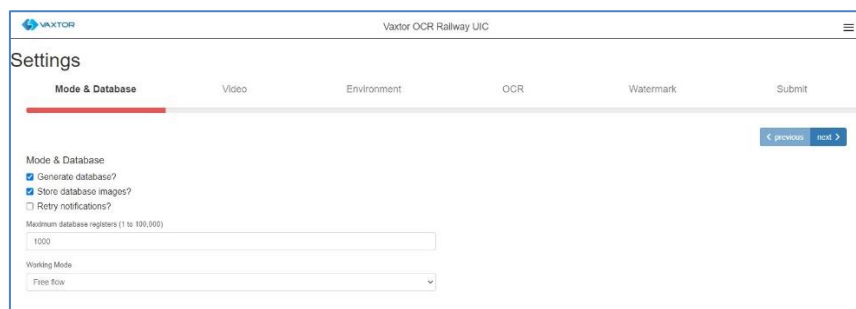
- Shutdown and restart the camera.
- Reinstall the latest version.

1.13 VaxOCR UIC Settings

In the **VaxOCR Settings page** it is possible to configure all of the OCR parameters. The settings are divided into four different sections and a Summary section.

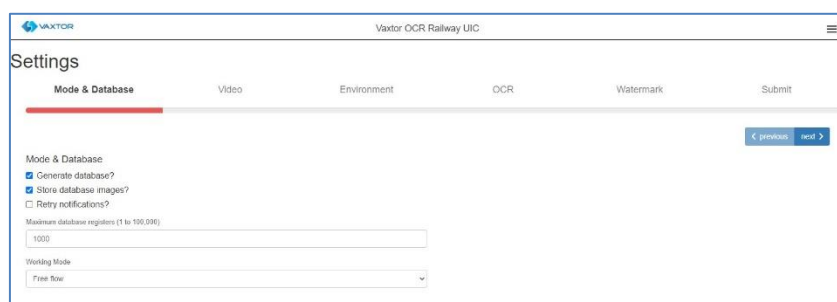


To move between the steps, use the blue previous/next buttons or click on the headers over the red progress bar.



The last step, *Submit*, will save all of the settings to the camera's memory.

1.13.1 VaxOCR UIC Settings: Mode & Database



IMPORTANT: In order to save recorded UIC Codes in the camera's storage for later retrieval or viewing, you must install and configure an appropriate SD card in the camera. There is a *Storage icon* in the Axis main setting area where you can also setup shared network storage.

The system does not check for available space on the SD card and if it becomes full the database functions will stop working.

Mode & Database

- Generate database?
- Store database images?
- Retry notifications?

Generate database

- To generate an on-board database (log file) of detected UIC Codes, select the 'Generate Database' checkbox. A maximum of 100,000 records may be stored in the database.

Store database images

- To also store images of each UIC Code, select the 'Store database images?' checkbox. These images are automatically deleted when the matching UIC Code is deleted.

Retry notifications

- Select this checkbox to retry any notifications if any fail, for example due to a comms problem. See VaxOCR Reporting later in this manual.

Next set the maximum database size to the desired level.

Maximum database registers (1 to 100,000)

Working mode selection

Working mode

Working Mode

- Select the appropriate option from the drop-down list. There are two options:
 - *Free flow*: The system continuously analyzes the video and reports UIC Codes when detected.
 - *Signaled*: The system only analyzes the video when the defined port changes its state from disabled to enabled.

- If **Working Mode** selected is set to 'Signaled', a port must be specified that will be used to trigger the OCR:

Working Mode

Signaled

Port

0

Is Virtual Port?

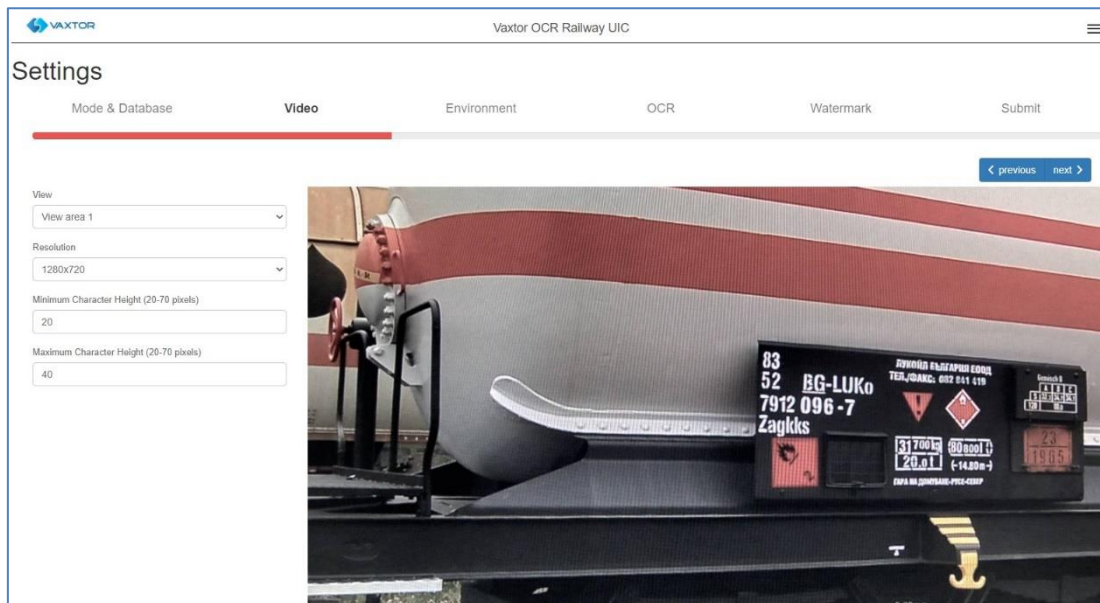
- Specify whether the selected **Port** is virtual or not.

There is an additional way to trigger the LPR in Signaled Mode:

http://CAMERA_IP/local/Vaxreader/trigger.cgi?id=12345AbcdE

..where `id` is optional and can be any string. This will trigger the LPR and links the image with the id. This id will be stored in the wagons table in the database and it is included in the Vaxtor protocol TCP/IP message.

1.13.2 VaxOCR UIC : Video Options



The screenshot shows the 'Settings' page for 'Vaxtor OCR Railway UIC'. The 'Video' tab is active, showing configuration options for the video stream. On the left, there are settings for 'View area 1', 'Resolution' (1280x720), 'Minimum Character Height (20-70 pixels)' (20), and 'Maximum Character Height (20-70 pixels)' (40). On the right, a live video feed shows a train wagon with a sign that reads '83 52 BG-LUKO 7912 096-7 Zaglks'. The sign also includes 'SERVISI PELAYANAN KEMERDEHAAN TERJADANG. 082 545 419' and 'KEMERDEHAAN'.

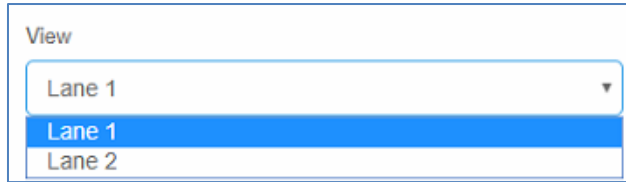
This section displays real-time video based on the current settings.

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

View

- If you are using Axis View Areas, select an area from any available in the drop-down list.

(These are previously set up in the main Axis camera settings. You may setup several View areas from the same camera)



Resolution

- Select the desired *Resolution* from the drop-down list. Any changes will immediately be shown on the live display.

Tip: do not use a resolution greater than you need, this will slow down the OCR engine.

-



Minimum Character Height (20-70 pixels)

This is the minimum height that a UIC Code's characters should be before being read. If the lens (zoom) is setup correctly then the characters should be about 20-30 pixels high in the area of the field of view where they should be read. Small characters will cause misreads.

- Set the minimum height of the UIC Code's characters in pixels.

NOTE: The recommended difference between the min and max heights is about 10-15 pixels.

Maximum Character Height (20-70 pixels)

- Set the maximum height of the UIC Code's characters in pixels.

Once set, click on the live image to display the two sizes specified. They are shown as a tallow and red rectangle. This will allow you to accurately set the heights. Re-click to move the two boxes around the image.



1.13.3 VaxOCR UIC Settings: Environment options

Same Plate Delay (seconds)
<input type="text" value="60"/>
JPEG quality (1 to 100)
<input type="text" value="80"/>

Same Plate Delay (seconds)

Same Plate Delay (seconds)
<input type="text" value="60"/>

- Set the number of seconds that should elapse before reading the same UIC Code twice. This is to prevent multiple reporting of the same code in situations when the wagon is moving slowly or is stationary. For example, if a wagon stops and the code is reported but the wagon doesn't move for 600 seconds, then this delay should be set to say 6000 seconds or more to prevent a duplicate read.

NOTE: When using signaled (triggered) mode, it is recommended that you set this delay to 0 seconds.

1.13.4 VaxOCR UIC Settings: OCR options

OCR Complexity

OCR complexity
<input type="text" value="Medium"/>

- This is the complexity of the analytics to be applied during the OCR Engine's stage of code reading. Set this according to the OCR mode and type of traffic expected. There are three possibilities:
 - *Low*: Recommended for higher-speed wagons where the OCR needs to work faster and our preference is for code 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 also make the OCR engine work slower.

1.13.5 VaxOCR UIC: Watermark

The Axis camera has a built in Overlay option to overlay text onto the video stream including the last read plate details and other dynamic text.

See the *VaxALPR On Camera Axis Software Developer's Guide* for more details and see the *Reporting* section later in this manual.

Inserting a watermark using Reporting is useful when video is being sent to a VMS such as Milestone or Axis's own and the overlay text is written onto the video stream. However, when still images are transmitted to Helix or some other device using one of the other reporting options then the software has no knowledge of the video stream and so this Watermark option should be used which will write for example the UIC Code 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 variables:

- **\$timestamp\$**: 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 text 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).
- **\$top\$**: Top 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.
- **\$roid\$**: 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 has been done due to 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.
- **\$platejpegsizes\$**: JPEG size in bytes.
- **\$overviewimage\$**: Overview JPEG image encoded in base64.
- **\$overviewjpegsizes\$**: JPEG size in bytes.
- **\$epoch\$**: Unix epoch (seconds).
- **\$utcdates\$**: 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)

Note that in addition to the standard reserved words described above the new words pertinent to UIC codes are:

- **\$vehicletype\$** **UIC Vehicle type**
- **\$countrycode\$** **UIC Country code**
- **\$vehicleclass\$** **UIC Vehicle class**
- **\$serialnumber\$** **UIC Serial number**
- **\$uiccode\$** **UIC Self check digit**
- **\$direction\$** **Direction of travel - string with possible values ("0", "1" or "2").**
- **\$directionstr\$** **Direction of travel - string with possible values ("Unknown", "Left", "Right")**

Note that this list of protocols is always being updated, contact Vaxtor for details.

In the example below we are using the \$localdate\$ and \$plate\$ fields.

Next select the position of the watermark from the four options available and finally select the font size required. All saved images will now have this information burnt into the still images of the plate capture.




JPEG compression quality

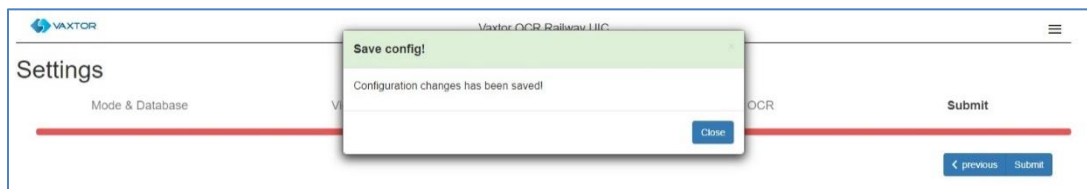
JPEG compression (1 to 100)
80

- Select the required compression ratio for the saved images. The lower the number, the higher the compression ratio but the quality of images will be lower.

1.13.6 VaxOCR UIC : Submit changes

Submit configuration

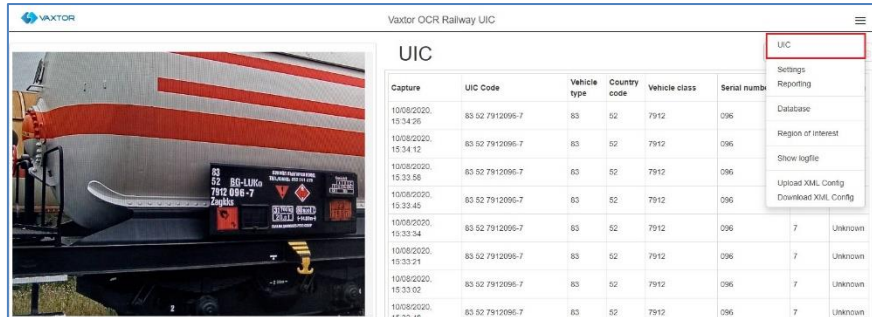
1. To save all of the OCR settings, click the  button.
2. Wait for the confirmation (or error) message.



IMPORTANT: To avoid unexpected problems, it is recommended that you backup the current configuration to the Axis camera by downloading the configuration XML file (see: [Download XML Config](#) section later in this manual).

1.14 VaxOCR: UIC Codes and Database

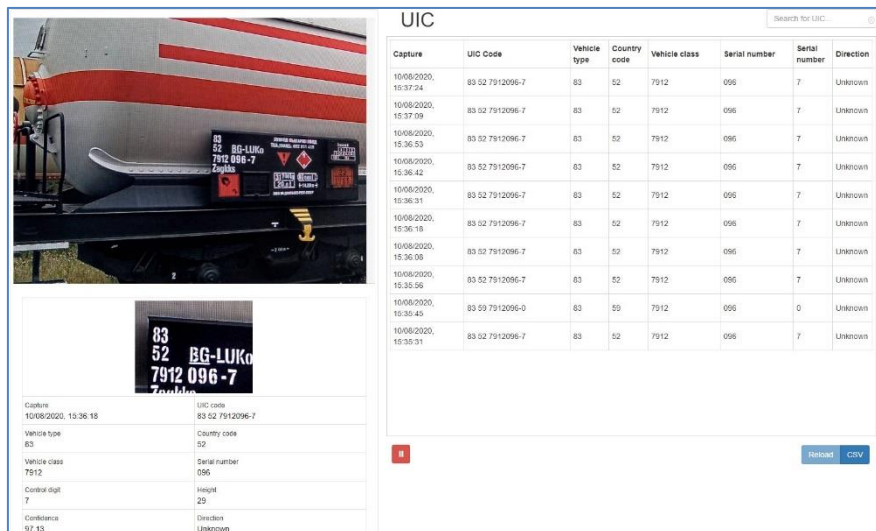
The last 20 UIC Code reads are stored in the camera's standard memory and are displayed when the UIC menu is selected.



The screenshot shows the VaxOCR Railway UIC interface. On the left is a camera view of a train with a UIC code sign. The main area displays a table of UIC code reads. A settings menu is open on the right, with the 'UIC' option highlighted.

Capture	UIC Code	Vehicle type	Country code	Vehicle class	Serial number	Serial number	Direction
10/08/2020, 15:34:26	83 52 7912096-7	83	52	7912	096		
10/08/2020, 15:34:12	83 52 7912096-7	83	52	7912	096		
10/08/2020, 15:33:58	83 52 7912096-7	83	52	7912	096		
10/08/2020, 15:33:45	83 52 7912096-7	83	52	7912	096		
10/08/2020, 15:33:34	83 52 7912096-7	83	52	7912	096	7	Unknown
10/08/2020, 15:33:21	83 52 7912096-7	83	52	7912	096	7	Unknown
10/08/2020, 15:33:02	83 52 7912096-7	83	52	7912	096	7	Unknown
10/08/2020, 15:32:48	83 52 7912096-7	83	52	7912	096	7	Unknown

By clicking on one of the reads the details are displayed:



The screenshot shows the VaxOCR Railway UIC interface with details for a specific UIC code read. The table shows the read details, and a detailed view is shown below the table.

Capture	UIC Code	Vehicle type	Country code	Vehicle class	Serial number	Serial number	Direction
10/08/2020, 15:37:14	83 52 7912096-7	83	52	7912	096	7	Unknown
10/08/2020, 15:37:09	83 52 7912096-7	83	52	7912	096	7	Unknown
10/08/2020, 15:36:53	83 52 7912096-7	83	52	7912	096	7	Unknown
10/08/2020, 15:36:42	83 52 7912096-7	83	52	7912	096	7	Unknown
10/08/2020, 15:36:31	83 52 7912096-7	83	52	7912	096	7	Unknown
10/08/2020, 15:36:18	83 52 7912096-7	83	52	7912	096	7	Unknown
10/08/2020, 15:36:08	83 52 7912096-7	83	52	7912	096	7	Unknown
10/08/2020, 15:35:56	83 52 7912096-7	83	52	7912	096	7	Unknown
10/08/2020, 15:35:49	83 59 7912096-0	83	59	7912	096	0	Unknown
10/08/2020, 15:35:31	83 52 7912096-7	83	52	7912	096	7	Unknown

Details for the selected read (10/08/2020, 15:36:18):

Capture	10/08/2020, 15:36:18	UIC code	83 52 7912096-7
Vehicle type	83	Country code	52
Vehicle class	7912	Serial number	096
Control digit	7	Height	29
Confidence	97.15	Direction	Unknown

The complete UIC code is displayed followed by the component parts:

- Vehicle type
- Country code
- Vehicle class
- Serial number
- Control / check digit

If the camera has a SD card installed, it is possible to store the OCR activity in a local database. If you have setup and formatted an SD card (see Axis documentation) and selected "Generate Database" in settings – then select the **Database** menu:

Vaxtor OCR Railway UIC

Database

Search for UIC:

1 of 1

Id	Capture	UIC code	Vehicle type	Country code	Vehicle class	Serial number	
1418	07/08/2020, 14:09:00	83 52 7912096-6	83	52	7912	096	
1417	07/08/2020, 14:08:04	83 52 7912096-7	83	52	7912	096	
1416	07/08/2020, 14:06:57	83 52 7912100-7	83	52	7912	100	
1415	07/08/2020, 14:01:25	83 52 7918096-0	83	52	7910	096	
1414	07/08/2020, 13:54:22	83 52 7912096-7	83	52	7912	096	
1413	07/08/2020, 13:51:00	83 52 7912096-7	83	52	7912	096	7
1412	07/08/2020, 13:50:49	83 59 7912096-0	83	59	7912	096	0
1411	07/08/2020, 13:50:36	83 52 7912096-7	83	52	7912	096	7
1410	07/08/2020, 13:50:25	83 59 7912096-0	83	59	7912	096	0
1409	07/08/2020, 11:48:36	83 52 7912096-6	83	52	7912	096	6
1408	07/08/2020, 11:41:41	83 52 7912096-7	83	52	7912	096	7
1407	06/08/2020, 13:42:11	83 52 7912096-7	83	52	7912	096	7
1406	06/08/2020, 13:07:53	83 52 7912096-7	83	52	7912	096	7
1405	06/08/2020, 13:06:52	83 52 7912096-7	83	52	7912	096	7
1404	06/08/2020, 13:05:51	83 52 7912096-7	83	52	7912	096	7
1403	06/08/2020, 13:04:51	83 52 7912096-7	83	52	7912	096	7
1402	06/08/2020, 13:03:50	83 52 7912096-7	83	52	7912	096	7
1401	06/08/2020, 13:02:49	83 52 7912096-7	83	52	7912	096	7

1418 items

UIC
Settings
Reporting
Database
Region of Interest
Show logfile
Upload XML Config
Download XML Config

The database can store up to 100,000 records. Once this limit is reached, new code reads will replace the oldest ones. There is a Pause / Play button at the bottom of the screen for preventing any new codes being added to the list for a short period. Pressing Play once more catches up any cached reads.

Vaxtor OCR Railway UIC

Database

Search for UIC:

1 of 27

Id	Capture	UIC code	Vehicle type	Country code	Vehicle class	Serial number	Control digit	Direction
2642	10/08/2020, 17:09:14	83 52 7912096-7	83	52	7912	096	7	Unknown
2641	10/08/2020, 17:09:10	83 59 7920967-2	83	59	7920	967	2	Unknown
2640	10/08/2020, 17:08:54	83 59 7920967-2	83	59	7920	967	2	Unknown
2639	10/08/2020, 17:08:42	83 59 7912096-0	83	59	7912	096	0	Unknown
2638	10/08/2020, 17:08:34	18 52 7912096-7	18	52	7912	096	7	Unknown
2637	10/08/2020, 17:08:21	83 59 7912096-0	83	59	7912	096	0	Unknown
2636	10/08/2020, 17:08:00	83 59 7912096-0	83	59	7912	096	0	Unknown
2635	10/08/2020, 17:07:36	83 59 7920967-2	83	59	7920	967	2	Unknown
2634	10/08/2020, 17:07:32	83 52 7912096-7	83	52	7912	096	7	Unknown
2633	10/08/2020, 17:07:23	83 59 7120967-0	83	59	7120	967	0	Unknown
2632	10/08/2020, 17:07:10	83 59 7912096-0	83	59	7912	096	0	Unknown
2631	10/08/2020, 17:07:06	83 59 7920967-2	83	59	7920	967	2	Unknown
2630	10/08/2020, 17:06:54	83 59 7912096-0	83	59	7912	096	0	Unknown
2629	10/08/2020, 17:06:41	83 52 7912096-7	83	52	7912	096	7	Unknown
2628	10/08/2020, 17:06:29	83 52 7912096-7	83	52	7912	096	7	Unknown
2627	10/08/2020, 17:06:17	83 52 7112096-5	83	52	7112	096	5	Unknown
2626	10/08/2020, 17:06:13	83 59 7912096-0	83	59	7912	096	0	Unknown
2625	10/08/2020, 17:06:00	83 52 7912096-7	83	52	7912	096	7	Unknown

2642 items

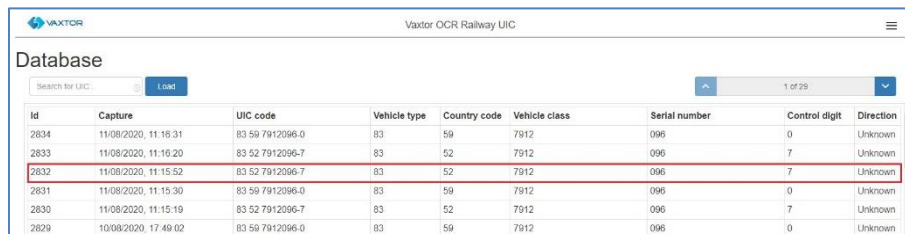
1
2
3
4
5

The Database screen comprises:

- (1) Search and Load area
- (2) Page display control
- (3) Play / Pause updating the database with new reads
- (4) Total items stored and CSV download
- (5) List of all read UIC Codes

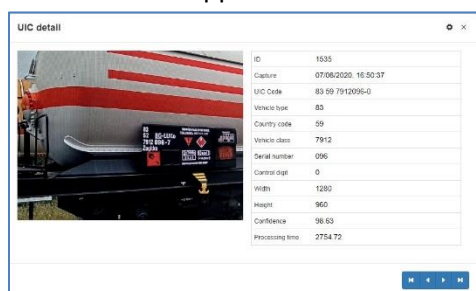
UIC Code details

1. To show item details, click on a UIC Code record.



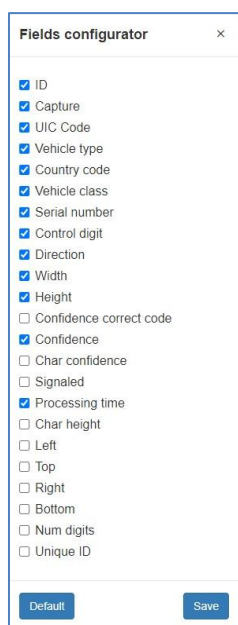
Id	Capture	UIC code	Vehicle type	Country code	Vehicle class	Serial number	Control digit	Direction
2834	11/08/2020, 11:18:31	83 59 7912096-0	83	59	7912	096	0	Unknown
2833	11/08/2020, 11:16:20	83 52 7912096-7	83	52	7912	096	7	Unknown
2832	11/08/2020, 11:15:52	83 52 7912096-7	83	52	7912	096	7	Unknown
2831	11/08/2020, 11:15:30	83 59 7912096-0	83	59	7912	096	0	Unknown
2830	11/09/2020, 11:15:19	83 52 7912096-7	83	52	7912	096	7	Unknown
2829	10/08/2020, 17:49:02	83 59 7912096-0	83	59	7912	096	0	Unknown

2. A new window appears with the read details.



Use the arrows (bottom right) to move between records.

Click on the settings icon (the cog - top right) to display a list of available fields to display:



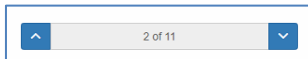
Select which ones are required and press **Save**.

Tip: selecting Processing time and Character height can be useful when first setting up a system.

Page Control

If there are more than 100 stored reads, the camera will paginate the results.

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



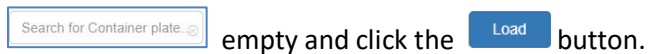
Use the UP and DOWN buttons to scroll 100 codes at a time – or click on the central part of the button (in this case on 2/11) and enter the target page directly and click on GoTo:



Search and Load UIC Codes

Load UIC Codes

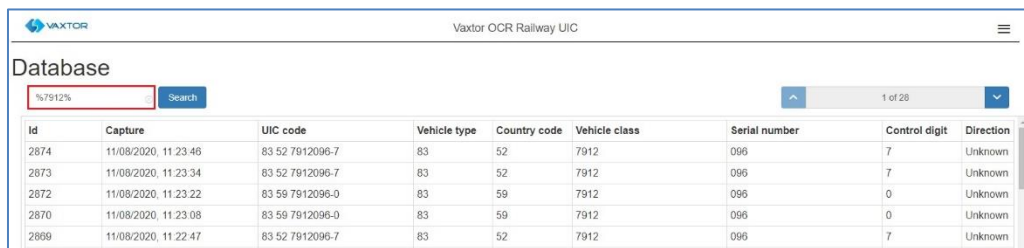
1. To load all the detected UIC Codes stored in camera, keep the Search input zone




This will refresh the list with the latest captures.

Search for UIC Codes

1. To search for a specific code or partial code stored in camera, enter the characters in the Search box and click the **Search** button. Use the symbol “%” as a wildcard character.
2. Example of searching for all UIC Codes containing the characters: ‘7912’ (Vehicle type information – 4 digits)



Id	Capture	UIC code	Vehicle type	Country code	Vehicle class	Serial number	Control digit	Direction
2874	11/08/2020, 11:23:46	83 52 7912096-7	83	52	7912	096	7	Unknown
2873	11/08/2020, 11:23:34	83 52 7912096-7	83	52	7912	096	7	Unknown
2872	11/08/2020, 11:23:22	83 59 7912096-0	83	59	7912	096	0	Unknown
2870	11/08/2020, 11:23:08	83 59 7912096-0	83	59	7912	096	0	Unknown
2869	11/08/2020, 11:22:47	83 52 7912096-7	83	52	7912	096	7	Unknown

3. To clear search criteria, click  button inside the Search window zone, and click the **Load** button.

1.15 VaxOCR Region of Interest

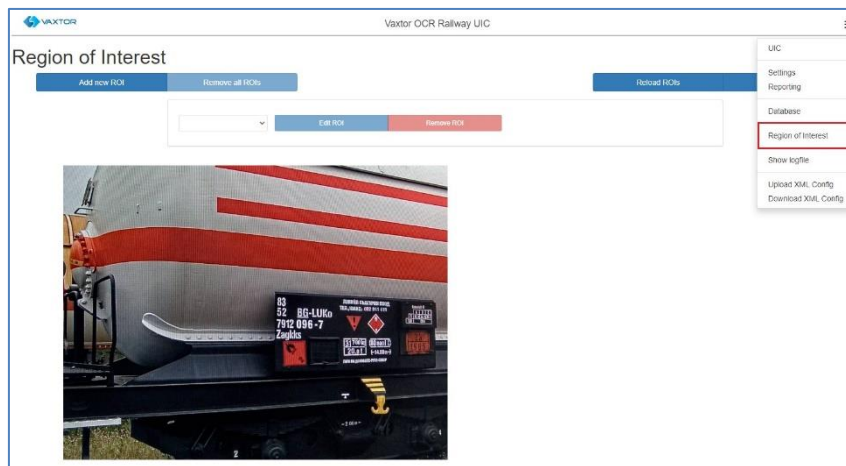
A Region of Interest (ROI), sometimes known as the Crop Zone, is used to define an area within the video frame where the OCR analytics takes place. The user can define a polygon and choose whether the area to look for codes Inside or Outside this region. The user can set multiple ROIs in complex situations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

Using an ROI can decrease OCR processing time and also reduce false positives.

So, if the camera is looking towards a tall railway wagon as in the example below, the ROI can be used to limit the OCR to the area where the codes are always seen. In this case in the bottom half of the field of view - thus reducing the processor load.

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

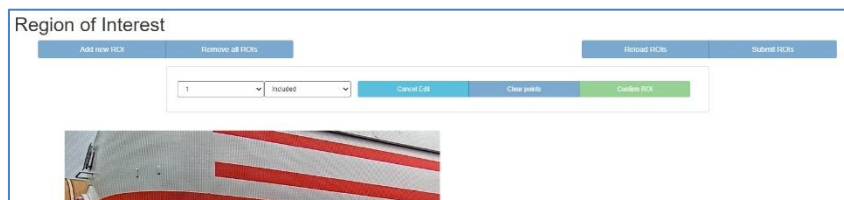
Note that the UIC Code must be in or out the ROI to pass the test.



IMPORTANT: ROIs can 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.

VaxOCR ROI: Add ROIs

1. To add a new ROI, click the main **Add new ROI** button:
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*.



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


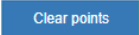


- b. To start again, click on the Clear points button.
 - c. To cancel the new ROI, click Cancel Edit button.
 - d. When you are satisfied with the shape click the Confirm ROI button.
4. Click Add new ROI to add more ROIs as required remembering to select a new ID number.
 5. ROIs are not stored on the camera until changes are submitted.

VaxOCR ROI: Remove ROIS

1. To remove all of the ROIs click Remove all ROIs button.

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.

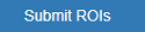
VaxOCR ROI: Edit an ROI

1. To edit an existing ROI, select the *ROI Id* from the list and click  button:
2. Move any points as required:
 - a. Add an extra point to last point added by moving the cursor and mouse click.
 - b. Or, clear all existing points  and start again.
3. To confirm changes by clicking the  button.
4. To reject any changes, click the  button.

VaxOCR ROI: Save changes

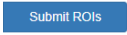
Submit current ROIs

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


- To save all ROIs, Click on the  button 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](#)).

Delete all the current saved ROIs in the Camera

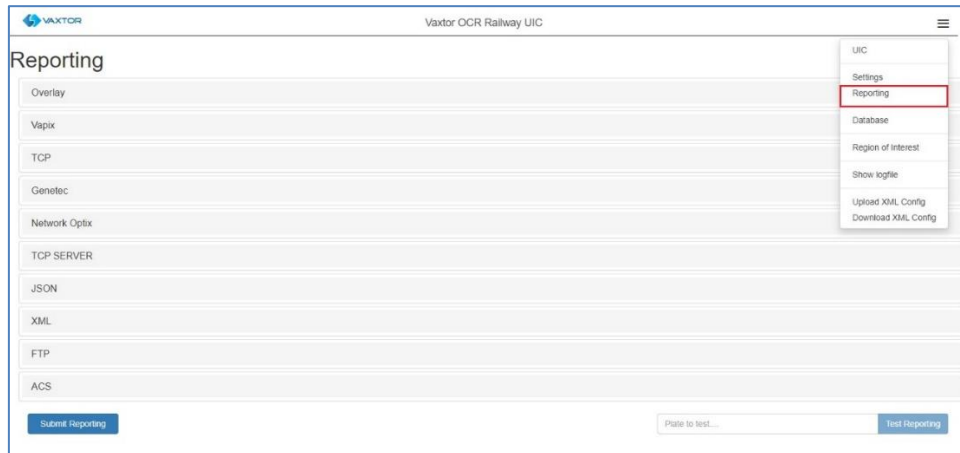
- Delete all of the ROIs individually and then click the  button.
- A confirmation message will appear. Accept to delete all of the stored ROIs and wait for the confirmation message.

VaxOCR ROI: Reload ROIs

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

1.16 VaxOCR Reporting

VaxOCR UIC can output all UIC Code reads in real time using a variety of standard protocols so that the code reads can be accepted remotely by a variety of third-party programs.



Note that the user can set 'Same plate delay' (seconds) in settings to specify a time to wait before attempting to read the same code again (see earlier in this manual).

After configuring, 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. To do this:

1. Open the reporting option menu.
2. At the bottom of the page, enter a UIC code in the "Plate to test" textbox.
3. Click "Test reporting". A confirmation will appear if the test is successful:



See the separate manual: **"VaxOCR On Camera Integration Guide"** for more details of Vapix and how to communicate with Axis's own software. Also see the separate **"VaxOCR On Camera Software Developer's Guide"** for more detailed information on the reporting options.

Note that in addition to the standard reserved words described in these manuals the new words pertinent to UIC codes are:

\$vehicletype\$	UIC Vehicle type
\$countrycode\$	UIC Country code
\$vehicleclass\$	UIC Vehicle class
\$serialnumber\$	UIC Serial number
\$uiccode\$	UIC Self check digit
\$direction\$	Direction of travel - string with possible values ("0", "1" or "2").
\$directionstr\$	Direction of travel - string with possible values ("Unknown", "Left", "Right")

See below for a full list of reserved words.

Note that this list of protocols is always being updated, contact Vaxtor for details.

1.17 Show Logfile

You can view the application's log file by going to the main Axis App screen – selecting the VaxOCR UIC App and clicking on **App Log**.



This will display a list of internal actions including any comms problems.

```

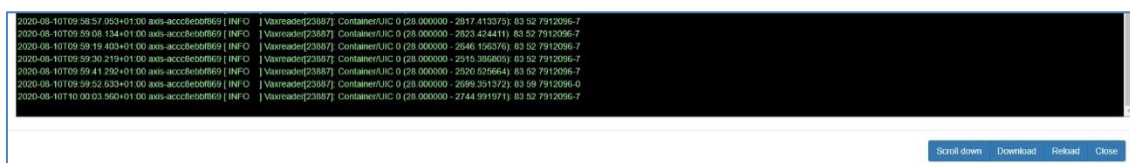
----- Contents of SYSTEM_LOG for 'Vaxreader' -----
2020-08-10T09:42:52.665+01:00 axis-acc8ebbf869 [ INFO ] Vaxreader[23887]: Container/UIC 0 (28.000000 - 2672.567972): 83 59 7912096-0
2020-08-10T09:43:03.286+01:00 axis-acc8ebbf869 [ INFO ] Vaxreader[23887]: Container/UIC 0 (28.000000 - 2649.014815): 83 59 7912096-0
2020-08-10T09:43:16.292+01:00 axis-acc8ebbf869 [ INFO ] Vaxreader[23887]: Container/UIC 0 (28.000000 - 2876.043507): 83 59 7912096-0
2020-08-10T09:43:28.231+01:00 axis-acc8ebbf869 [ INFO ] Vaxreader[23887]: Container/UIC 0 (29.000000 - 2462.680890): 83 52 7912096-7
2020-08-10T09:43:38.771+01:00 axis-acc8ebbf869 [ INFO ] Vaxreader[23887]: Container/UIC 0 (28.000000 - 2721.750613): 83 59 7912096-0
2020-08-10T09:43:53.986+01:00 axis-acc8ebbf869 [ INFO ] Vaxreader[23887]: Container/UIC 0 (29.000000 - 2547.257626): 83 52 7912096-7
2020-08-10T09:44:09.018+01:00 axis-acc8ebbf869 [ INFO ] Vaxreader[23887]: Container/UIC 0 (28.000000 - 2882.533789): 83 59 7912096-0
2020-08-10T09:44:27.077+01:00 axis-acc8ebbf869 [ INFO ] Vaxreader[23887]: Container/UIC 0 (28.000000 - 2945.471094): 83 59 7912096-0
2020-08-10T09:44:38.283+01:00 axis-acc8ebbf869 [ INFO ] Vaxreader[23887]: Container/UIC 0 (28.000000 - 2894.565338): 83 91 7912096-0
2020-08-10T09:44:50.378+01:00 axis-acc8ebbf869 [ INFO ] Vaxreader[23887]: Container/UIC 0 (29.000000 - 3339.239668): 83 52 7912096-7
2020-08-10T09:45:02.700+01:00 axis-acc8ebbf869 [ INFO ] Vaxreader[23887]: Container/UIC 0 (28.000000 - 3086.800846): 83 21 7912096-5
2020-08-10T09:45:15.160+01:00 axis-acc8ebbf869 [ INFO ] Vaxreader[23887]: Container/UIC 0 (28.000000 - 3132.069277): 83 91 7912096-0

```

You can also access this log from inside the App.



Select **Show Logfile** and a window will open showing the current logfile.



The software will write up to five logfiles of 10MB each before overwriting the earliest one and is very useful in seeing if there are any problems or for examining the reads in detail.

Use the **Scroll down** button look at the last items written.

Selecting **Reload** will refresh the display and show the latest entries to the log.

Download will save the current log in your Downloads folder on the PC that you are using to remotely access the camera.

Select **Close** when finished.

1.18 Download XML Config

Once all your App settings are complete you can use this feature to save all of these settings as a backup into your downloads folder.

The data is saved as an .xml file and may be viewed as a standard text file or even edited.

1.19 Upload XML Config

Having saved one or more .xml backups – they may be reloaded by selecting this option.

Note that these two functions are very useful if you have a lot of cameras to configure. Remember that you still might have to make small changes to each one if the camera views are different (maybe different ROIs) – and maybe the Camera ID if the cameras are all transmitting to a centralized Back Office.

Troubleshooting

Many UIC Code 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 App.

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

1.20 The VaxOCR UIC 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 Axis camera is set correctly.

1.21 The VaxOCR UIC Camera license is valid but a 'Check license' message appears.

Solution:

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

1.22 The VaxOCR UIC On Camera software is running but not reading codes.

Solution:

Check if you can see the UIC Code in the image and that the image is of good quality, not under or over exposed. As a general rule, if you as a human being can't easily read the codes - 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 area around the desired UIC Codes. 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 UIC Code 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 Video options, change the **Minimum Character Height** to 20 pixels.
2. In the Video options, change the **Maximum Character Height** to 70 pixels.

3. In the OCR options, change complexity to High but be mindful of the increase of processor power.
4. In the Region of Interest section, delete any existing **Region of Interests** (ROIs).

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

1.23 The VaxOCR UIC On Camera software is running but it does not read all of the codes.

Solution:

In the VaxOCR UIC configuration, in the Video options, check the that value of the resolution in the drop-down list is adequate. (Note for moving wagons the maximum vertical resolution should be 720. If this is not enough to read codes then zoom in slightly.

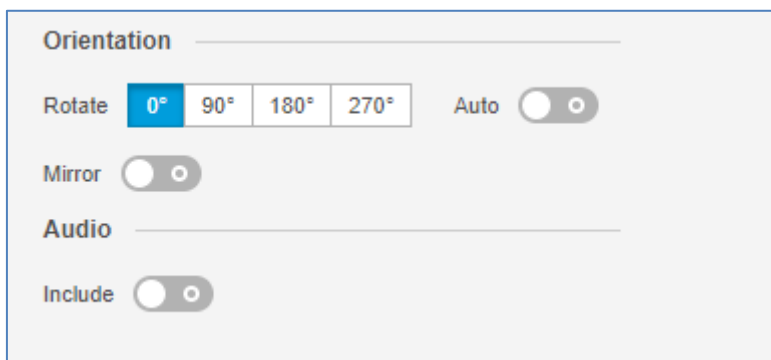
1. In the App's main options on the right – select Show logfile.
2. Scroll to the end of the log file (Scroll bottom) and look for the message:
[INFO] Vaxreader[xxxx]: -Wagon 0 (<pixel height> - <milliseconds>): <code>
and check the value of the code's character pixel height registered in the log.

1.24 Images of a wagon appear inverted.

After installing a new Axis camera, sometimes the code 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 Axis Camera Settings/ Stream section:



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

VaxOCR UIC



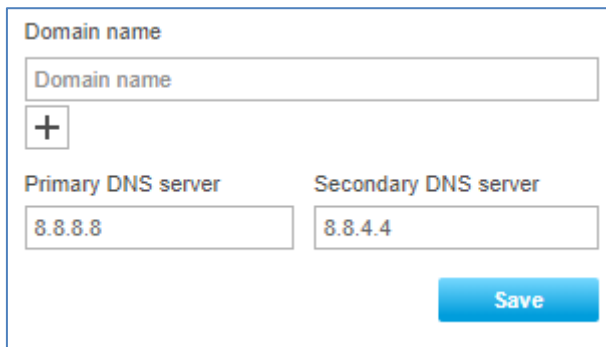
1.25 JSON or TCP setup but no codes being received

Solution

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

Go to the main Axis setting menu and select System and TCP/IP. 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.



The screenshot shows the DNS server configuration interface. It has a 'Domain name' label above a text input field. Below the input field is a plus sign icon. There are two input fields for DNS servers: 'Primary DNS server' with the value '8.8.8.8' and 'Secondary DNS server' with the value '8.8.4.4'. A blue 'Save' button is located at the bottom right of the form.

Words Available for Dynamic Text Replacement

- **\$timestamp\$**: yyyy-MM-ddTHH:mm:sszzz
- **\$date\$**: Timestamp in ISO8601 format
- **\$ocrtime\$**: OCR processing time in milliseconds
- **\$digitheight\$**: Average digit height
- **\$left\$**: Left coordinate for the text frame on the image (pixels).
- **\$top\$**: Top coordinate for the test frame on the image (pixels).
- **\$right\$**: Right coordinate for the test frame on the image (pixels).
- **\$bottom\$**: Bottom coordinate for the test frame on the image (pixels).
- **\$readconfidence\$**: Global confidence value

- **\$vehicletype\$** UIC Vehicle type
- **\$countrycode\$** UIC Country code
- **\$vehicleclass\$** UIC Vehicle class
- **\$serialnumber\$** UIC Serial number
- **\$uicode\$** UIC Self check digit
- **\$direction\$** Direction of travel - string with possible values ("0", "1" or "2")
- **\$directionstr\$** Direction of travel - string with possible values ("Unknown", "Left", "Right")

- **\$ip\$**: Camera IP address
- **\$imagesizeinbytes\$**: Size of saved complete image
- **\$image\$**: JPEG encoded in base64
- **\$patchsizeinbytes\$**: Size of the image of the recognised text (the patch image)
- **\$patch\$** JPEG of the patch image encoded in base64

Changelog

1.26 Changelog

Version 27-07/2020

- ✓ Added no report flag on manual triggers (To allow testing communication with the software without sending a result to third parties see On-Camera s/w devt manual)
- ✓ Added \$ip\$ to OcrWagons templates
- ✓ Add /delplate.cgi endpoint to delete plates from the camera DB
- ✓ Split \$confidence\$ on \$confidencecode\$ and \$readconfidence\$ for OcrWagons. \$confidencecode\$ is the validation digit \$readconfidence\$ is the global confidence value
- ✓ Ocr update.

Version 26/11/2020

- ✓ Watermark added to App settings

Ends.