



# Vidar Axle Counting Camera **Quick Installation** Guide



This guide contains an overview of the hardware and required components, suggested scenarios and step-by-step guide for installation, and safety and maintenance instructions.

# VIDAR AXLE COUNTING CAMERA

## Quick Installation Guide

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## 1. INTRODUCTION

The Vidar Axle Counting camera scans the vehicles from the side and generates laterally directed events assembled from parts about the passing vehicles, on which additional engines can be run, for example: VAC engine (Vehicle Axle Counting). The camera employs a lateral scanning approach, generating comprehensive events that capture crucial details about passing vehicles. The Vehicle Axle Counting (VAC) engine is instrumental in accurately counting the number of axles in passing vehicles. Axle counting is critical to traffic management, providing valuable insights into traffic flow, vehicle types, and overall road usage.

The lateral scanning mechanism of the Vidar camera distinguishes it from conventional surveillance systems. Unlike traditional methods that focus on frontal or rear views, Vidar scans vehicles from the side. This lateral perspective allows a more detailed and nuanced understanding of vehicle characteristics.

After the proper settings, the following result can be achieved:



## 2. REQUIRED COMPONENTS



The box contains:

- Vidar Axle Counting Camera
- Bracket (COMBUY-OTH-0035)

Must have for camera operation:

- Power cable (EXPCAB-C01-0370-01)
- Ethernet cable (COMBUY-OTH-0440)

Required for camera operation: These are not included in the box, you can purchase them directly from Adaptive Recognition:

- Synchronized External Illuminator with Cable and Bracket (850nm)
- GPIO / Illuminator cable (EXPCAB-C01-0479)

### 3. HARDWARE INSTALLATION

For reliable and efficient operation, selecting an optimal installation site is crucial.

Please refer to the example below for a **recommended camera placement**:

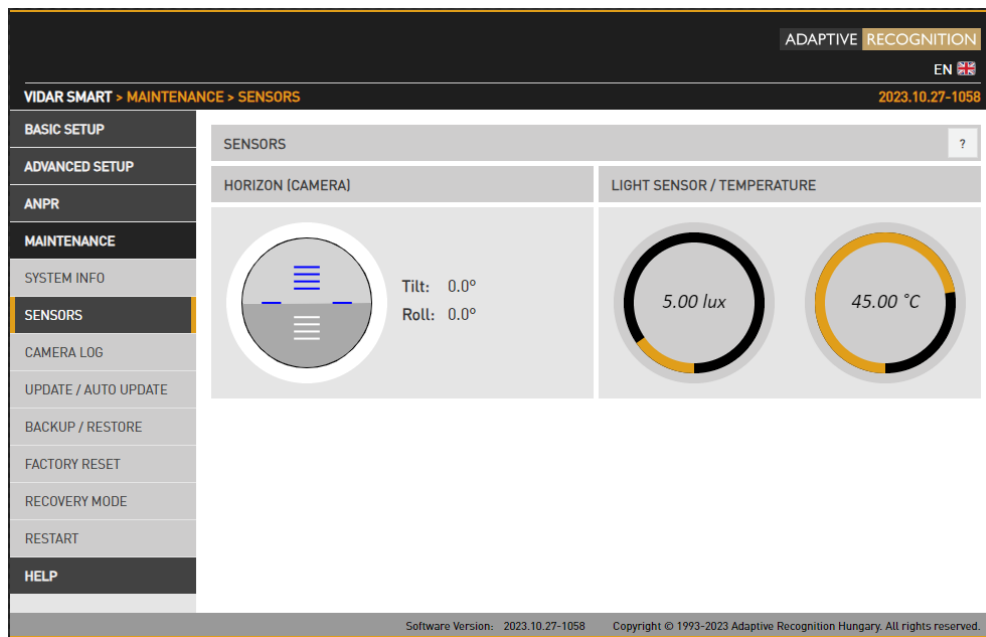
Image-Based Axle Counting with a Single, Intelligent Camera		
Placement	Transversal	Overhead
Height	1.5 - 4 m	4 - 12m
Distance from object	3.5 - 8 m	3.5 - 8 m
Tilt	0° - 10°	40 - 65°
Roll	0° (max. +/- 1°)	0° (max. +/- 1°)
Vehicle speed range	0 km/h – 120 km/h	0 km/h – 120 km/h
Maximum number of lanes	1 or 2 with opposite side	1
Camera configuration	Vidar Smart 2xHDx (1C+1BW), LT, Wide Zoom, IR+W panel, AXLE COUNTING SW included, extra IR850 recommended!	Vidar Smart 2xHDx (1C+1BW), LT, Wide Zoom, IR+W panel, AXLE COUNTING SW included, extra IR850 recommended!
Illumination (optional white)	The recommended illumination position is under the camera. The ideal lighting angle is 30 degrees.	The recommended illumination position is under the camera. The ideal lighting angle is 30 degrees.

- a) The camera has to be mounted in a horizontal position, do not rotate it in any direction!

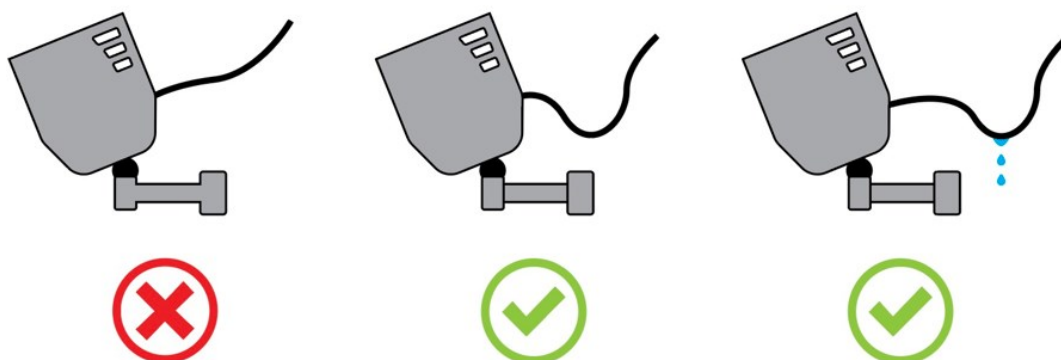


Correct camera position **Do not rotate the camera any direction from the horizontal position!**

- b) The roll must be 0°. You can check the ROLL on the camera GUI here: (Maintenance > Sensors)



- c) Connect the cables to the designated connectors. Seal the unused cable endings with end sleeves before connecting to power!
- d) Make sure the connecting cable does not lead rainwater drops into the camera housing!

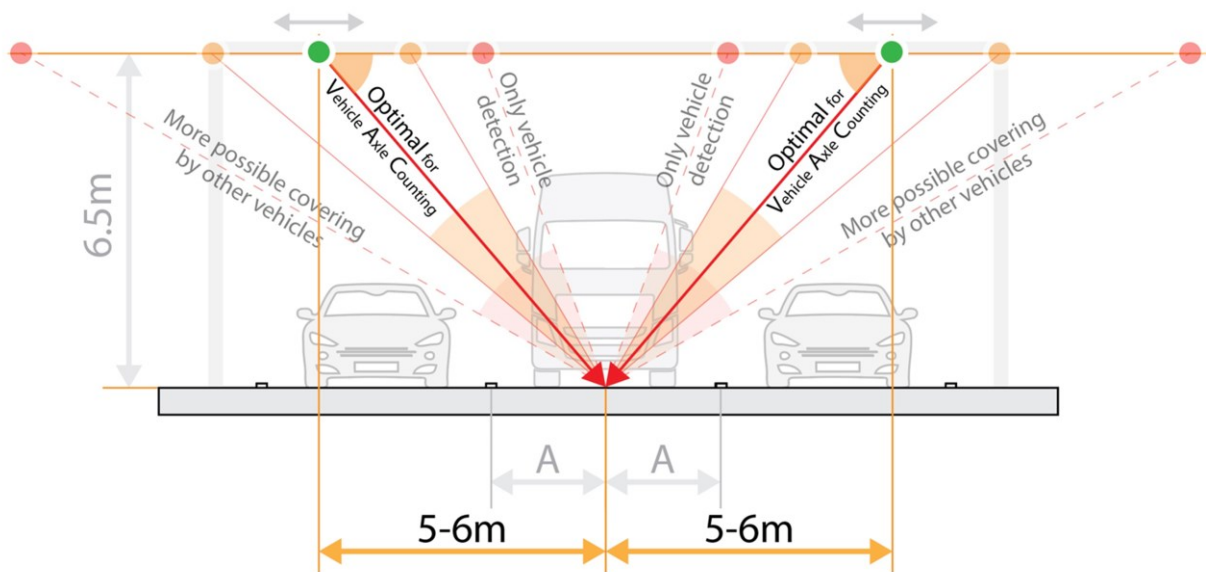


- e) Water may enter into the camera inside through not properly sealed connectors. To maintain the camera's watertightness, please ensure that connected cables are tightened properly and the unused connectors are capped.
- f) Failures due to inappropriate installation void the warranty, the accuracy and the whole operational % might be decreased!

**Important!**

**Overhead installation** - - when the camera is placed above the lane:

- Installation height: 4 - 12 m
- Maximum tracking distance for detection: 3.5 - 8 meters
- The camera can capture the closer lane or the adjacent lane
- The tilt can be up to 65°
- If the camera is monitoring the adjacent lane, there might be an occlusion due to passing vehicles
- Illuminator can be mounted under the camera with the same tilt

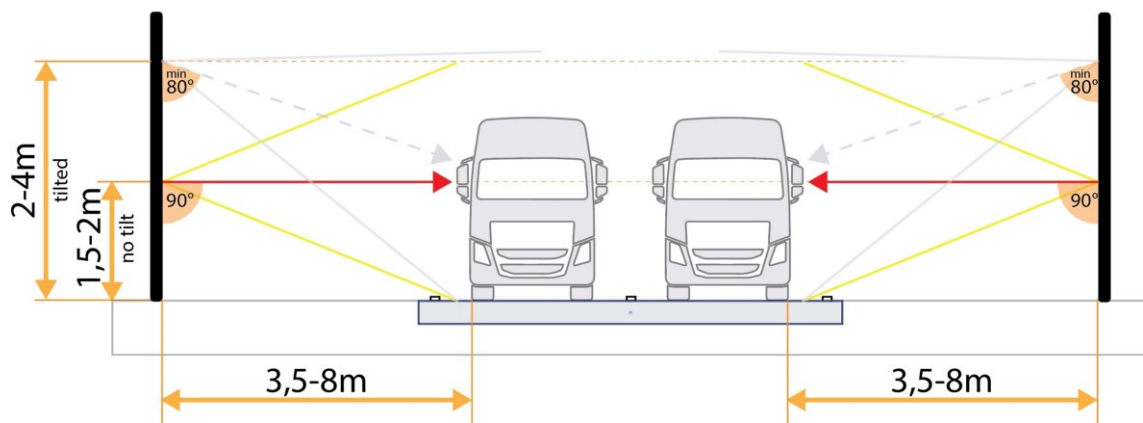


		Offset from lane center [m] – (The calculated values are for a standard lane width of 3.5 meters.)								
Camera [deg]		10	9	8	7	6	5	4	3	2
Camera height [m]	12	50	53	56	60	63	67	72	76	81
	11	48	51	54	58	61	66	70	75	80
	10	45	48	51	55	59	63	68	73	79
	9	42	45	48	52	56	61	66	72	77
	8	39	42	45	49	53	58	63	69	76
	7	35	38	41	45	49	54	60	67	74
	6	31	34	37	41	45	50	56	63	72
	5	27	29	32	36	40	45	51	59	68
4	22	24	27	30	34	39	45	53	63	

**Important!**

**Transversal installation** - when the device is installed on a pole near the road and it has to be:

- Install perpendicular to the road
- Maximum tracking distance for detection: 3.5 - 8 meters
- Installation height: 1.5 - 4 m
- The camera should always capture the closer lane
- It should not be tilted too much (max. 10°)
- The recommended installation height should always be at the lower limit, taking the conditions into account
- Illuminator can be mounted under the camera with the same tilt



The angles and distances specified in the manual were determined based on realized and operational projects. Deviation from these angles is reasonable within the limits of Adaptive Recognition knowledge base.

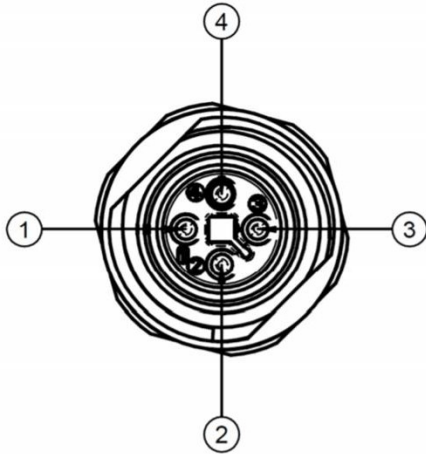
In the case of extreme installation requirements, individual assessment is necessary.

If you have a location with different conditions, please do not hesitate to contact us for more information!



## 4. CAMERA CABLE LAYOUTS

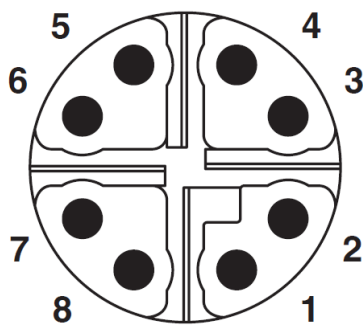
Power:  
4 pos. M12 Male



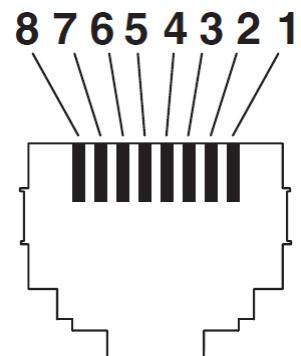
4 Pole Power Connector	
Pin	Function
1	AC_1
2	AC_1
3	AC_2
4	AC_2



Ethernet:  
(8 pos. M12 X coded, Female) ... .. RJ45

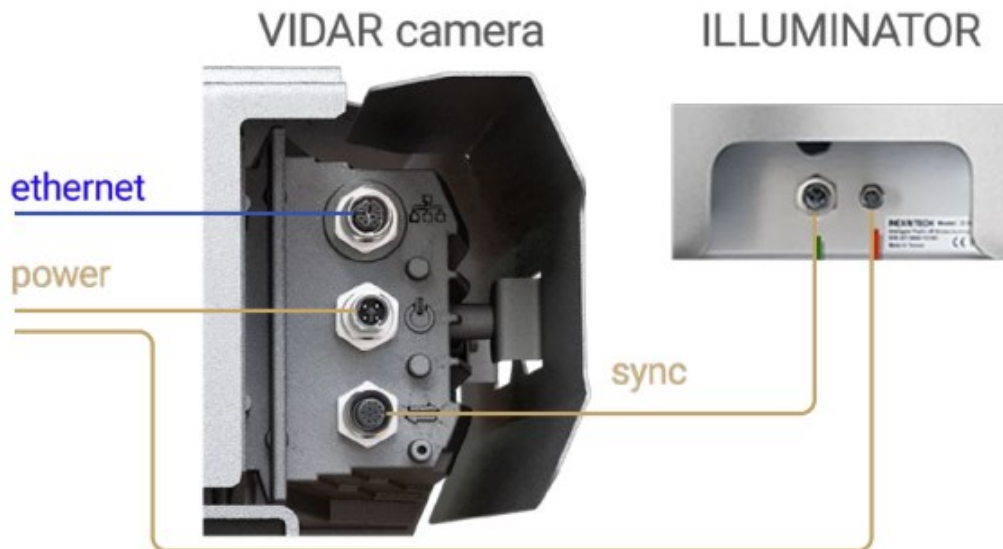


1 - D1+	(wh/or)	1
2 - D1-	(or)	2
3 - D2+	(wh/gr)	3
4 - D2-	(gr)	6
5 - D4+	(wh/br)	7
6 - D4-	(br)	8
7 - D3-	(wh/bl)	5
8 - D3+	(bl)	4

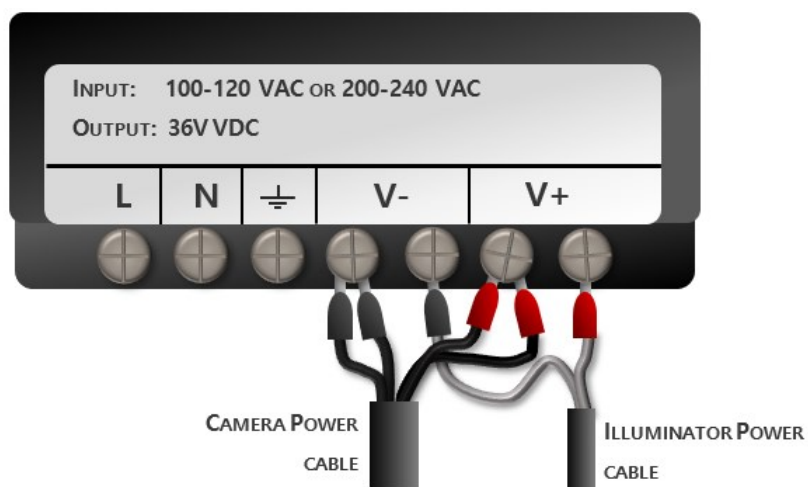


## 5. EXTERNAL ILLUMINATOR UNIT

There is a recommended option for an external illuminator, the wiring looks like this:



Connecting the 36V DC power supply should be done as per the below wiring diagram:



1. Connect Camera Power Cable black wires 1 and 2 to the power supply (V-).
2. Connect Camera Power Cable red wires 3 and 4 to the power supply (V+).
3. Connect the IR Power Cable black wire to power supply pin 5 (V-).
4. Connect the IR Power Cable red wire to power supply pin 7 (V+).

In the following section, we will demonstrate the proper setup of the camera.

## 6. ACCESSING THE CAMERA

- Ensure that the camera and the computer are connected to the same network.
- Enter an alternate IP address or set your computer's IP in the 192.0.2.x subnet, where x is an integer between 1 and 254 except 3. Set the subnet mask to 255.255.255.0.  
Beside the fix IP configuration, you can use **DHCP** based network too.
- Start a browser then enter http://192.0.2.3 address into the address bar. This is the camera's default IP address. Further information on setting up the camera can be found in the [Vidar User Manual \(Section 5\)](#).

## 7. DATE AND TIME

Current date and time and timekeeping settings are managed in the Date and Time section of the camera web interface. Users have the option to set date and time manually, or use a time synchronization protocol (NTP) which will keep time synchronized with a server over the network. For further details, please refer to the [Vidar User Manual \(Section 5.2\)](#).

The screenshot displays the 'DATE AND TIME' configuration page within the 'BASIC SETUP' section of the Vidar Smart web interface. The page includes a sidebar with navigation options: BASIC SETUP, LIVE VIEW, USERS, DATE AND TIME (highlighted), NETWORK, WIZARD, ADVANCED SETUP, ANPR, MAINTENANCE, and HELP. The main content area is titled 'DATE AND TIME' and contains the following settings:

- DATE AND TIME**: Includes a 'SAVE' button and a help icon (?).
- SYSTEM TIME**: Includes a 'GET CLIENT TIME' button.
- Date**: Input field with value '2023-11-24'.
- Time**: Input field with value '09:11:43'.
- Time zone**: Dropdown menu with value 'Etc/UTC'.
- NETWORK TIME PROTOCOL**: Includes an 'NTP client' dropdown menu with value 'Off'.

At the bottom of the page, the footer text reads: 'Software Version: 2023.11.17-1151 Copyright © 1993-2023 Adaptive Recognition Hungary. All rights reserved.'

## 8. ENGINE MANAGER

This section allows the user to manage the Carmen ANPR engines and Hardware Key Licenses used in the system.

This tool allows for installing, removing and configuring the Carmen ANPR engines used in the system.

The Install Engines tab lists the engines currently installed on the camera.

Unused engines can be removed with the “x” icon to the right. A new engine can be installed by clicking on the + icon.

Currently used engines are listed in the **Selected Engines** tab.

- **VAC engine** should be installed on the camera

ENGINE MANAGER
LICENSE MANAGER
?

**INSTALLED ENGINES**

+	Engine name	Used as
	cmanpr-7.3.13.80:vq	✘
	cmanpr-7.3.15.162:world	ANPR
	cmanpr-7.3.15.49:gen	PRE
	cmanpr-7.3.9.133:latin_vq	✘
	cmanpr-7.3.9.193:arab_vq	✘
	cmanpr-7.3.9.80:usa_vq	✘
	mmr-7.3.4.42:mmr-gen	✘
	vac-7.3.2.0:vac-gen	VAC

**SELECTED ENGINES**

Preselection engine:

ANPR engine:

VAC engine:

Hardware Key Licenses currently available in the device are listed in the License Manager section. Additional licenses (sold separately) can be installed in the Upload License menu.

You should have already received your license file from your sales contact person which will enable the latest recognition engines to run on your camera. If you do not already have your license, please contact your salesperson or ATSS (open a new support ticket) to request that it be sent to you again. This is important because the recognition engine you will install will only run if you also have the correct updated license file uploaded into your camera.

The proper selection of engines is always based on licenses. Users should search for and download the latest version containing the names.

LICENSE MANAGER

UPLOAD LICENSE

No file selected
SELECT
UPLOAD

DEVICES

<b>HW key serial</b>	<b>Dev. type</b>
2206559	USB key

LICENSES FOR DEVICE [2206559]

Lic. ID	Description	Exp. date	Lic. date
1114477	VAC	2024.12.31	2023.09.01

## 9. SETUP CAMERA

### 9.1. STREAM SETTINGS

Next, Side scan setting needs to be turned on for Sensor #1 under the Stream settings.

A selector or drop-down menu will appear, always select Sensor #1.

ADAPTIVE RECOGNITION EN

VIDAR SMART > ADVANCED SETUP > STREAM SETTINGS 2023.7.10-1151

**BASIC SETUP**

**ADVANCED SETUP**

**STREAM SETTINGS**

PRIVATE ZONES

EVENT MANAGER

ANPR

MAINTENANCE

HELP

**SOURCE SETTINGS** SAVE CHANGES ?

Synchronize to external source:  Side scan:

Warning: The VAC processing function is in use which uses the images generated by the side scanner module. The side scan function can only be changed after the VAC processing stage has been deactivated under the page ANPR Settings!

SENSOR 1	SENSOR 2
Source #1: <input type="text" value="1440x1080 @ 100 frame/s"/>	Source #1: <input type="text" value="1440x1080 @ 5 frame/s"/>
Rotation: <input type="text" value="0°"/>	Rotation: <input type="text" value="0°"/>
Horizontal mirroring: <input type="checkbox"/> Vertical mirroring: <input type="checkbox"/>	Horizontal mirroring: <input type="checkbox"/> Vertical mirroring: <input type="checkbox"/>

Side scan reduces the streaming framerate on the Sensor 1 to 10, if input framerate is higher than 40.

**ADD/REMOVE STREAM**

<b>STREAM 1</b> 1440x1080 @ 10 ... JPEG 9901	STREAM 2 1440x1080 @ 5 fr... JPEG 9902	STREAM 3 <span>×</span> 1440x1080 @ 10 ... H264 9911	<span>+</span>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**STREAM 1 SETTINGS (DEFAULT FOR SENSOR 1)**

Selected source:  Streaming port:

Image channel:  Streaming type:

Number of skipped frames:  Final framerate: 10 frame/s

Link of the stream:

RTP link:

**JPEG encoder settings for current image source**

EXIF description of JPEG file:

Using the event quality:

JPEG quality:

JPEG quality on event:

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At Sensor #1, select the highest frame rate from the drop-down menu next to the highest resolution.

**Important!**

To enable VAC option, you must enable Sidescan feature under Stream Settings menu first.

With the Sidescan function is activated for Sensor #1, the user proceeds to the ANPR menu and navigates to the ANPR settings submenu. Here, within the Processing stages sub-point, the VAC function is selected. This step ensures that the camera is configured to accurately count axles in the monitored zone.

ANPR SETTINGS		SAVE	?
PROCESSING STAGES			
ANPR:	<input checked="" type="checkbox"/>	ANPR #2:	<input type="checkbox"/>
MMR:	<input type="checkbox"/>	VAC:	<input checked="" type="checkbox"/>
Optical speed recognition:	<input type="checkbox"/>		

## 9.2. OPTICS

The first step is to set the appropriate Zoom-Focus.

It needs to focus on having a zoom setting that includes the whole vehicle in the frame. The bottom and top of the vehicle should be fully within the frame, and the image should start where the asphalt (edge of the lane) begins. We can use the Auto Focus setting for a sharper and more accurate image.

The screenshot displays the 'VIDAR SMART > BASIC SETUP > LIVE VIEW' interface. The left sidebar contains a menu with options: BASIC SETUP, LIVE VIEW (selected), USERS, DATE AND TIME, NETWORK, WIZARD, ADVANCED SETUP, ANPR, MAINTENANCE, and HELP. The main area shows a 'LIVE VIEW' window with a camera feed of a road scene. On the left side of the feed, there are 'Zoom' controls with a '+' button, a vertical slider, and a '-' button, with a '0' indicator below. Below the zoom controls are 'Auto Tracking' and 'Auto Zoom-Focus Setup' buttons. On the right side, there are 'Focus Area' controls with a '+' button, a vertical slider, and a '-' button, with a '360' indicator below. Below the focus controls are 'Auto Focus' and 'Direct Focus' buttons. At the bottom of the feed, there is a status bar: 'Sensor 1 -> Source #1 :: 1440x1080 @ 10 frame/s' and '2023-07-31 08:02:31 Europe/Budapest'. Below the feed is a navigation bar with icons for MODE, EXPOSURE, IMAGE, COLOR, OPTICS (selected), SIDE SCAN, FLASH, ADVANCED, and EXTENSIONS. At the very bottom, the footer reads: 'Software Version: 2023.7.10-1151 Copyright © 1993-2023 Adaptive Recognition Hungary. All rights reserved.'



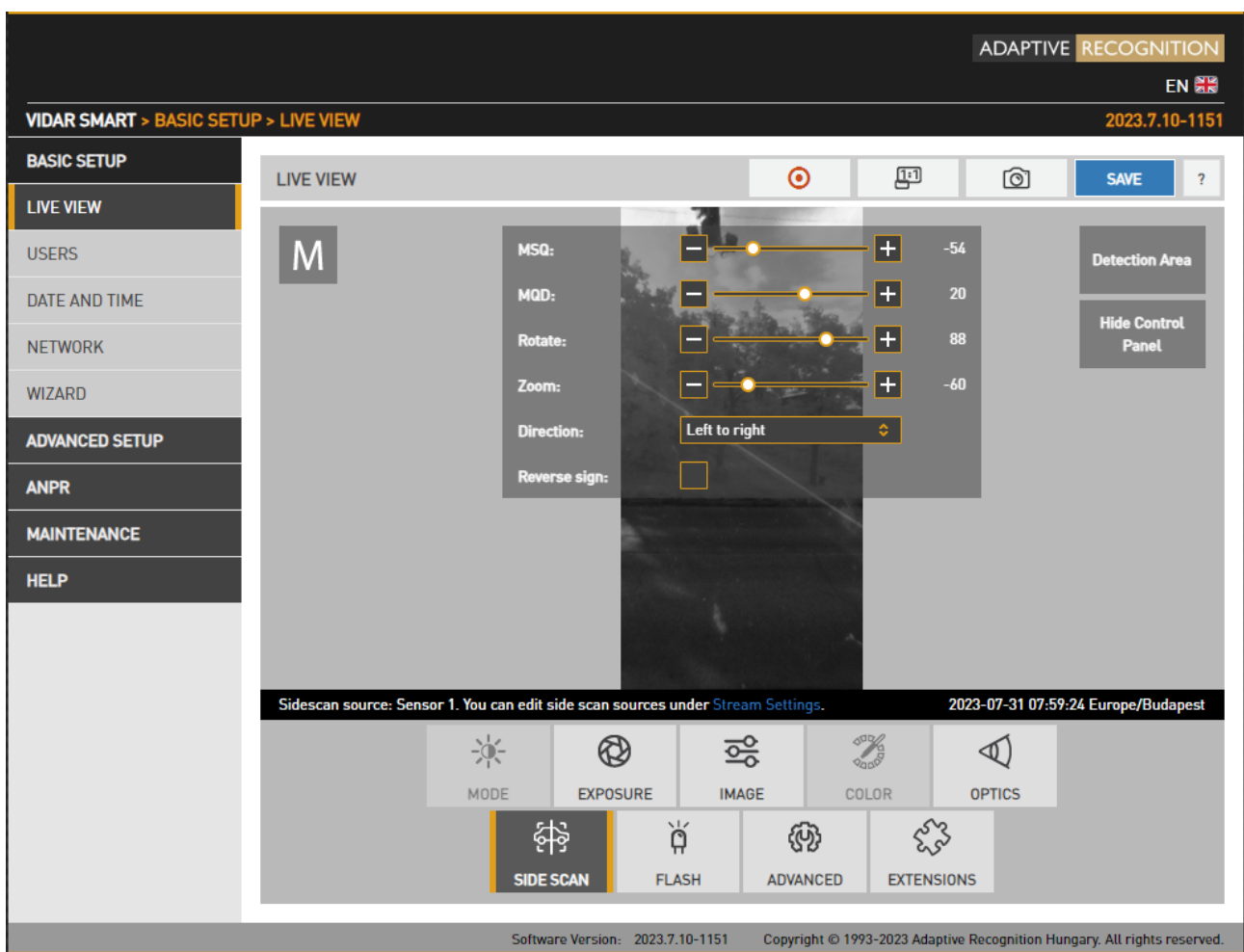
### 9.3. SIDE SCAN SETUP

Go to the Live view menu, and select the Side Scan submenu. If the lane separator is not horizontal, it is advisable to align it horizontally. If you notice any distortion in the image, use the MSQ and MQD sliders to flatten the image.

**MSQ:** it adds or removes spherical distortion occurring within the main area of image.

**MQD:** it adds or removes spherical distortion occurring within the outer edge of image.

**Rotate:** align the picture horizontally.

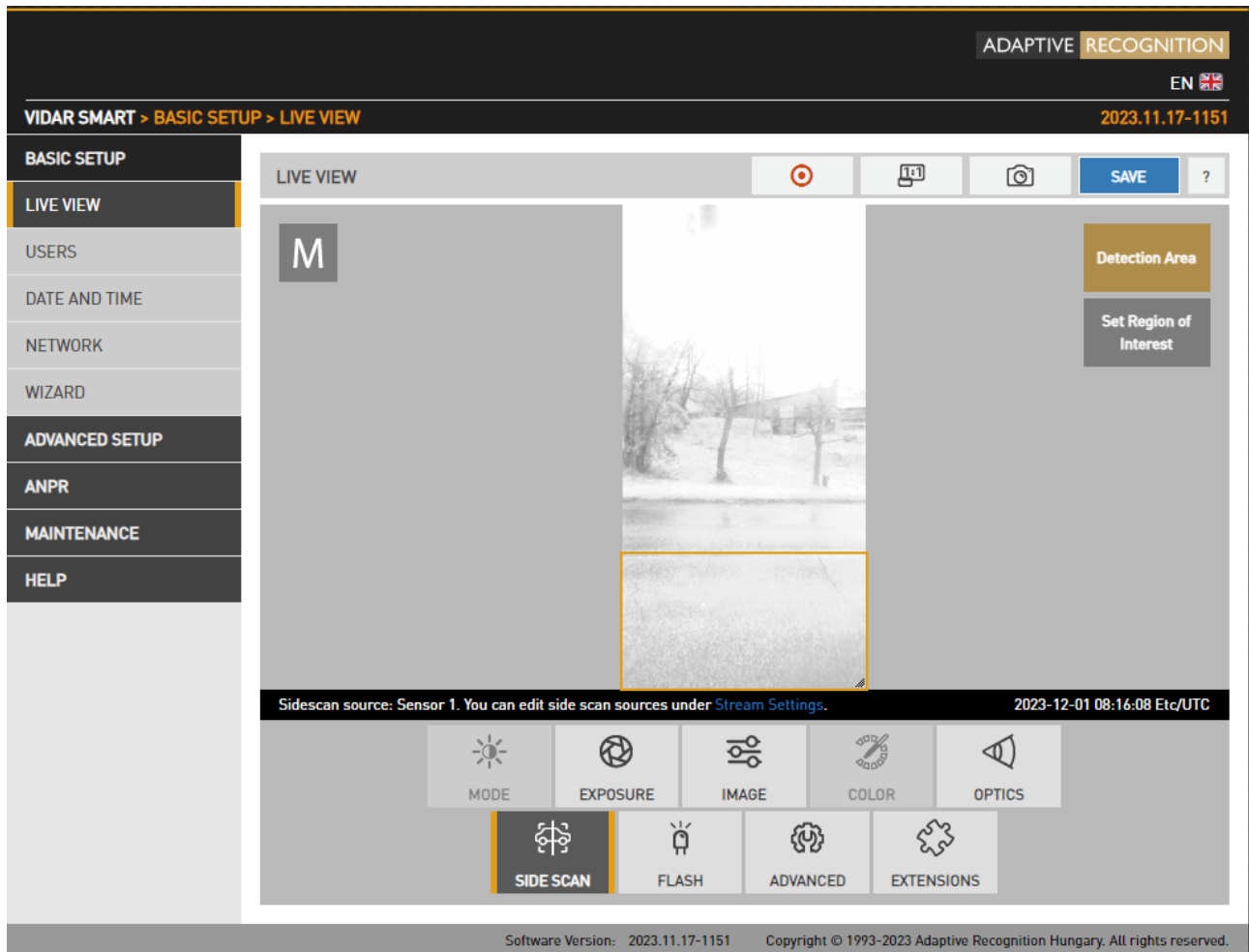


In the **Direction** section, you can select which way the camera should measure. This also depends on the installation location, it must be selected according to the specific environment. Always specify the appropriate direction.

**Reverse sign:** Due to the two directions, one appears positively (e.g., moving to the right), while the other appears negatively (e.g., moving to the left). If the user wants to see this reversed, it can swap this sign.

## 9.4. DETECTION AREA

By pressing the Detection Area button, you can set the desired detection area on the image where the vehicles pass entirely.




To achieve the best detection zone settings, the following considerations are needed:

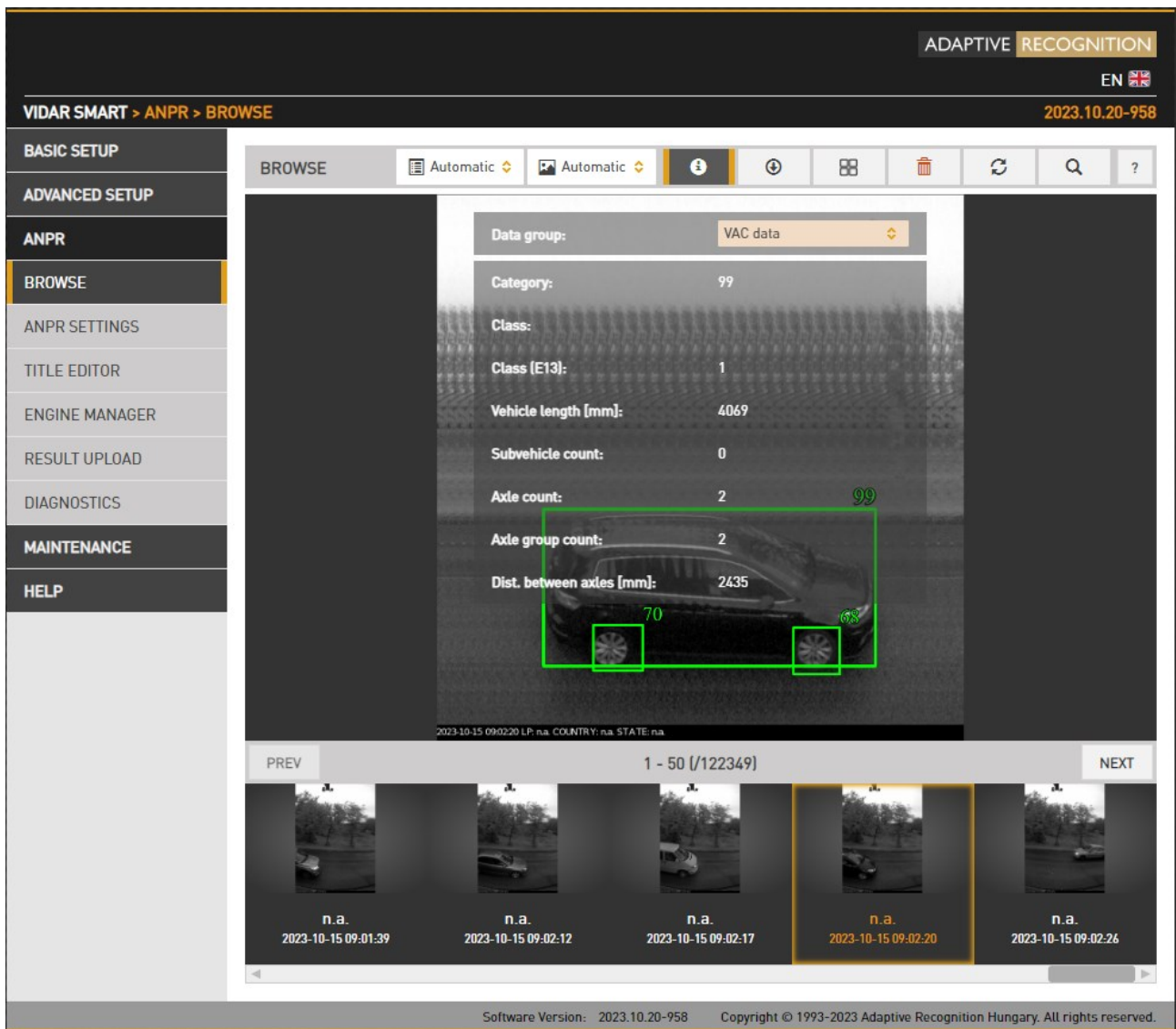
- Exclude the sky, and avoid having too much space below. If you want to see the wheels, leave a bit more space downward.
- It is more practical to focus on the wheels because, it cannot handle very homogeneous areas (e.g., truck canvas).

### 9.5. RESULT

The results can be found in the ANPR Browse menu.

If you choose the info button , and in the Data group section, the VAC data will be shown, if you choose it from the drop-down menu.

The displayed result on the image provides the number of axles, the total vehicle length, and the distance between the axles.



## 10. TROUBLESHOOTING

### ! Important!

#### Troubleshooting:

- The image is not sharp:
  - The correct configuration of the **zoom and focus** pairing is crucial to ensure that the camera captures sharp, detailed images. The typical setting for zoom is around 0, paired with the corresponding focus.
- Distortion in the image:
  - The image should be horizontal.
  - Use the MSQ and MQD sliders to flatten the image.
- No events are being generated:
  - Activate the Side scan function on Sensor 1 in the Stream Setting menu.
  - Install the VAC engine on the camera.
  - Activate VAC processing stage on ANPR Settings menu.
  - The detection area is not set properly

## Contact Information

### Headquarters:

Adaptive Recognition, Hungary Inc.  
Alkotás utca 41 HU  
1123 Budapest Hungary  
Web: [adaptiverecognition.com](http://adaptiverecognition.com)

### Service Address:

Adaptive Recognition, Hungary Inc.  
Ipari Park HRSZ1113/1 HU  
2074 Perbál Hungary  
Web: [adaptiverecognition.com/support/](http://adaptiverecognition.com/support/)

Adaptive Recognition Hungary Technical Support System (ATSS) is designed to provide you the fastest and most proficient assistance, so you can quickly get back to business.

Information regarding your hardware, latest software updates, and manuals are easily accessible for customers via our [Documents Site \(www.adaptiverecognition.com/doc\)](http://www.adaptiverecognition.com/doc) after a quick registration.

### New User

If this is your first online support request, please contact your sales representative to register you in our Support System. More help [here \(www.adaptiverecognition.com/support\)](http://www.adaptiverecognition.com/support)!

### Returning User

All registered ATSS customers receive a personal access link via e-mail. If you previously received a confirmation message from ATSS, it contains the embedded link that allows you to securely enter the support site.

