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CAIMAN

Sensor Relay Option (SRO) Installer Quick Reference Guide

CAIMAN

WIDE BEAM STOP+MOTIO
RADAR DETECTOR

Caiman_SRO-Installer_QuickRef_BE_00

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1 System Components

1.1 RS485 Interface

For the RS485 Interface, the components in the package are as follows:

1 	2 	1: CAIMAN-PLUS and 2: RD_CaimanP_Relay Or 1: CAIMAN-PRO and 2: RD_CaimanPRO_Relay
3 	4 	3: USB-to-Serial Adaptor RD_Caiman_Service_RS485-USB_Moxa 4: Bracket (suitable for the used CAIMAN version)
5 	6 	5: USB-to-Serial Adaptor Driver 6: 4 Screws
7 	8 	7: TMC Software 8: Power Supply (or Battery)

2 Hardware installation

2.1 Connecting your cable to Sensor Relay Option

Figure 1: RD_CaimanP_Relay / RD_CaimanPRO_Relay inside view

Connecting your cable to the SRO using the following connecters descriptions. Make sure, that you connect the ground of your cable with the ground shown at the Figure 1.

Connector P1

Pin	Function
1	CAN+
2	CAN-
3	RS485 Rx-
4	RS485 Rx+
5	RS485 Tx-
6	RS485 Tx+
7	NC
8	NC

Connector P2

Pin	Function
1	Ethernet Rx-

2	Ethernet Rx+
3	Ethernet Tx+
4	Ethernet Tx-
5	Supply +
6	Supply -
7	Supply -
8	Supply +

Connector P3

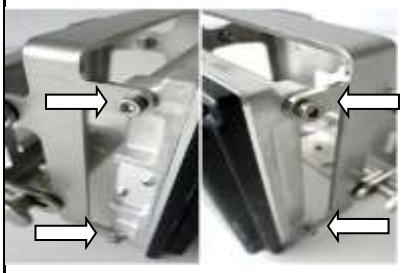
Pin	Function
1	Relay 05 Pin 1
2	Relay 05 Pin 2
3	Relay 06 Pin 1
4	Relay 06 Pin 2
5	Relay 07 Pin 1
6	Relay 07 Pin 2
7	Relay 08 Pin 1
8	Relay 08 Pin 2

Connector P4

Pin	Function
1	Relay 01 Pin 1
2	Relay 01 Pin 2
3	Relay 02 Pin 1
4	Relay 02 Pin 2
5	Relay 03 Pin 1
6	Relay 03 Pin 2
7	Relay 04 Pin 1
8	Relay 04 Pin 2

2.2 Attaching the sensor to the bracket

1. Make sure that the switch is set to full duplex.
   Note: Currently only full duplex sensors work with the SRO.

	2. Attach the SRO to the sensor using the screws.
	3. Attach the bracket to the sensor using the provided screws. Arrows on the figure indicate where the screws should go. Note: At the back of every sensor is a tag indicating the product description, serial number and the **top side** of the sensor
	4. Strap the sensor onto the pole loosely to allow for azimuth adjustments when necessary. With azimuth angle set correctly, tighten the straps.
	5. To tilt the sensor for correct elevation setting, loosen the screws on either side of the bracket and adjust the elevation setting.
	6. Note: there is an angular scale at the bracket side with increments of 2 degrees. 7. Once the desired elevation angle is obtained, secure the sensor in place by tightening the screws.

2.3 Connecting Sensor to supplied cable set

	Connect the banana plugs to a DC power supply. Voltage range must be within 24 – 32V. Red Plug = +24…32V Black Plug = Ground.

2.3.1 RS485 Interface

	1. Connect RS485 Pins to the DB-9 connector of the RS485-to-USB converter (RD_Caiman_Service_RS485-USB_Moxa)
	2. The USB connector of the RS485-to-USB converter shall be plugged into a free USB slot of your used computer.

2.3.2 Ethernet Interface

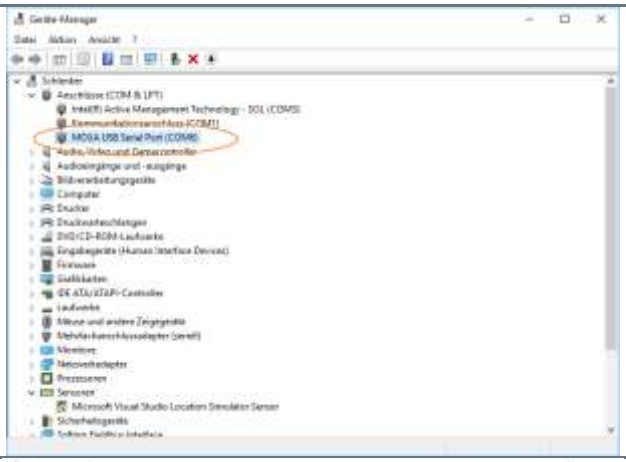
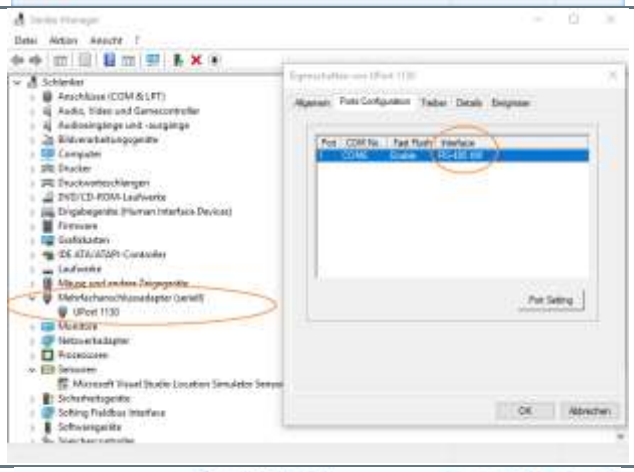
	1. Attach the Ethernet Connector into the Ethernet-Port of your PC

3 Software Usage

3.1 RS485 Interface

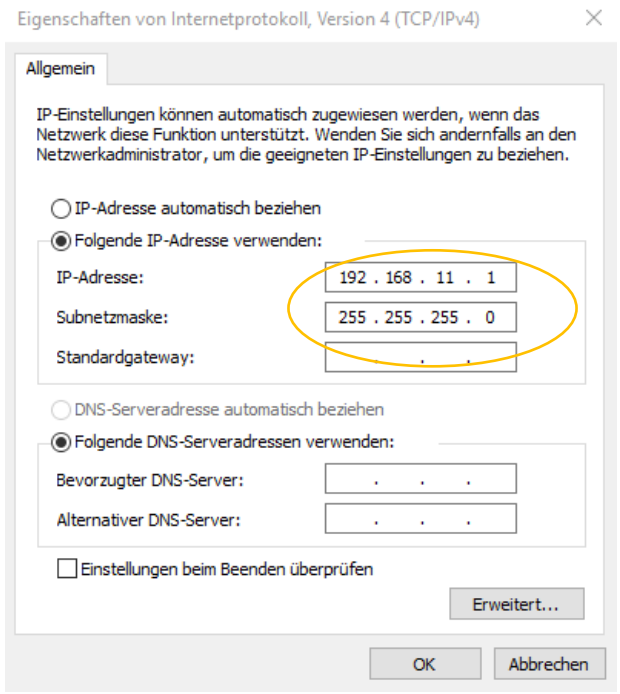
Before using the RS485-to-USB converter it is necessary to install the driver first. The latest version can be found on the homepage www.moxa.com/product/UPort_1130_1130I.htm. You find the driver under “Drivers & Software”.

For installation follow the instructions from the manual. You can find the manual on the some link under “Manual”.

	Before starting the TMC please check the Com-Port of the RS485-to-USB-adaptor. In the **Windows Device Manager → COM and LPT-Interface** can be found the actual Com-Port. Here it’s Port 6.
	Also, before starting the TMC please check, if the adaptor is set to four wire mode. In the **Windows Device Manager → multiple connection adapter → UPort 1130 → characteristics → Ports Configuration**
	If you configure a project in TMC, you have to make sure that you choose the correct port number in the dropdown box under the “Test”. Otherwise a connection is not possible.

3.2 Ethernet Interface

If you use your computer's internal Ethernet port, you do not need to do any previous installation. The most Ethernet to USB adapters are automatically recognized by Windows.



To communicate with the radar, you have to configure the IP address and subnet mask of your adaptor to **192.168.11.1** and **255.255.255.0**. After that you are ready to use the TMC.

4 Determining the Sensor position

4.1 Build a model of the intersection or highway situation using the TMC

This step happens in the office. Use a notebook PC.

At first, build a model of the intersection or highway. It can be based on CAD data, satellite pictures or on-site measurements.

Please install the latest TMC software.

To download theTMConfigurator software, go to either
https://www.swarco.com/products/detection-sensors/traffic-light-systems/caiman-pro-m
or
https://www.swarco.com/products/detection-sensors/traffic-counting/caiman-pro-i

Click *Downloads* at the bottom of the page and chose TMConfigurator Installer to download the software Traffic Management Configurator (multi-language).

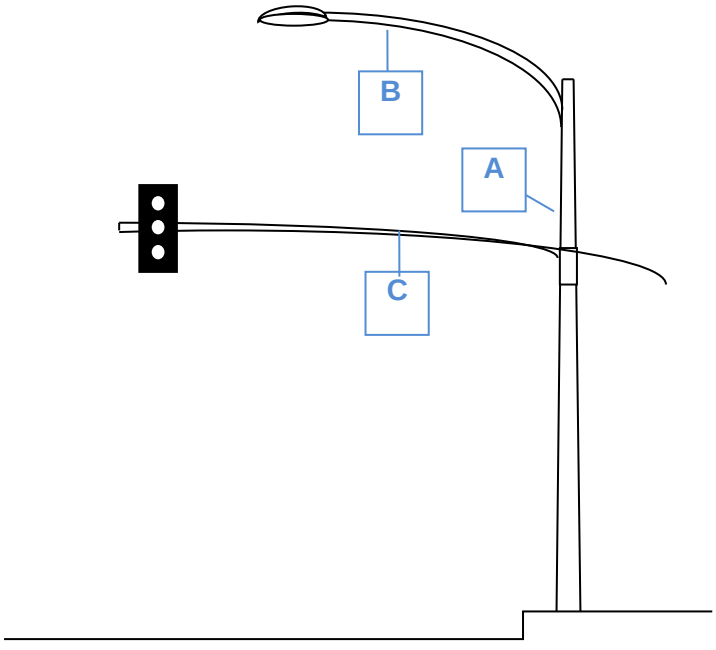
After initial registration the software can be used. For each PC a new registration is necessary.

4.1.1 Finding the optimal mounting position

The sensor should be mounted to a stiff pole. For best performance we recommend a distance of 35m to 70m to the stop bar or area of interest. If you like to use the existing infrastructure, the following positions are possible:

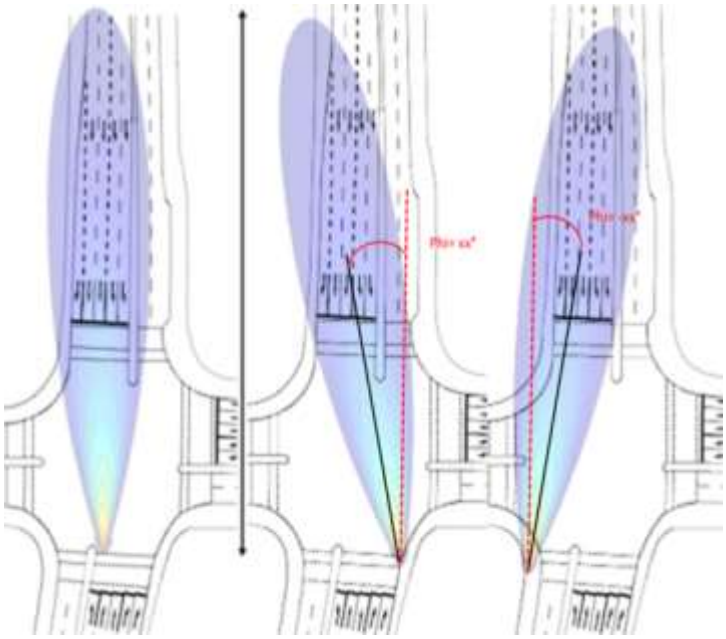
A: On Vertical Pole (optimal position)
B: Adjacent to Luminaire
C: On Mast Arm

We recommend position A for best performance, as a stiff and motion-free mounting base is required. If the structural conditions of the luminaire or the mast arm allow a stiff attachment of the sensor, position B and C are also possible alternatives.



Note:
The sensor must be mounted on a stiff and solid support. Vibration, oscillation or any kind of movement will reduce sensor performance.

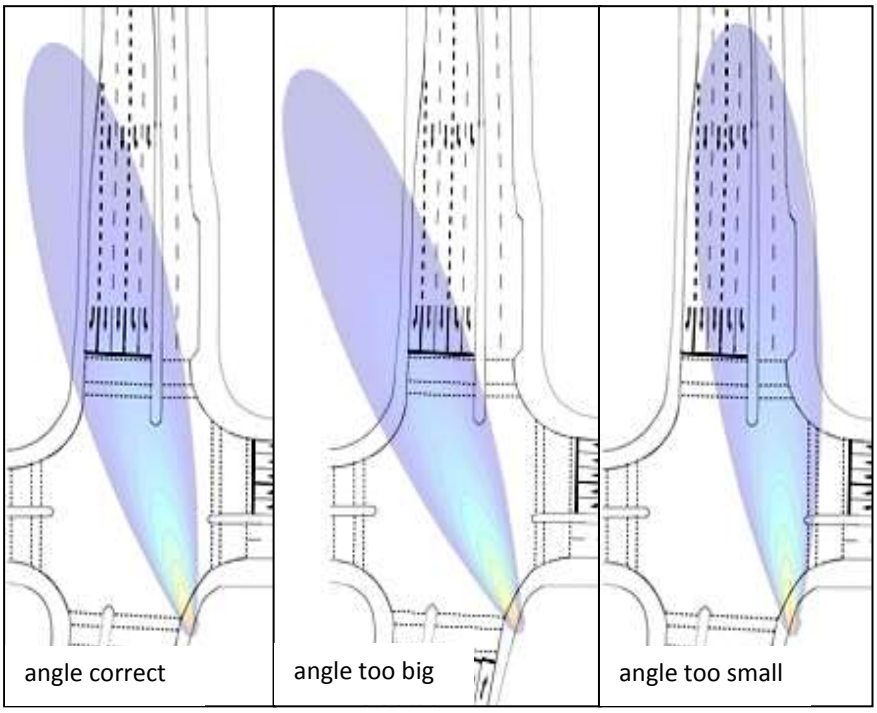
4.1.2 Finding the right mounting location



The sensor is preconfigured for a 0° orientation angle towards the lane of interest (left).

The sensor may also be configured to face the traffic at an angle, as illustrated in (center) and (right).

Note the reversed coordinate system (i.e. a positive orientation angle when panned to the left, and a negative orientation angle when panned to the right).



Choose an orientation angle that covers all the required lanes. An angle that is too big or too small will not provide the best coverage. It is recommended to use an angle between +15° and -15° degree
Pan the sensor to the left or right according to your orientation angle, towards the lanes of interest.
Tighten the strap to secure the sensor to the pole once optimal orientation angle has been determined.

Note:
For more information on the selection of appropriate orientation angles, refer to the CAIMAN Sensor Datasheet.

4.2 Find optimum Sensor Model and Alignment Angles

This step happens in the office. Use a notebook PC.

4.2.1 Sensor Alignment in TMC

4.2.1.1 Select the sensor model

Use the 3D Beam feature of the TMC to find the optimum sensor model.

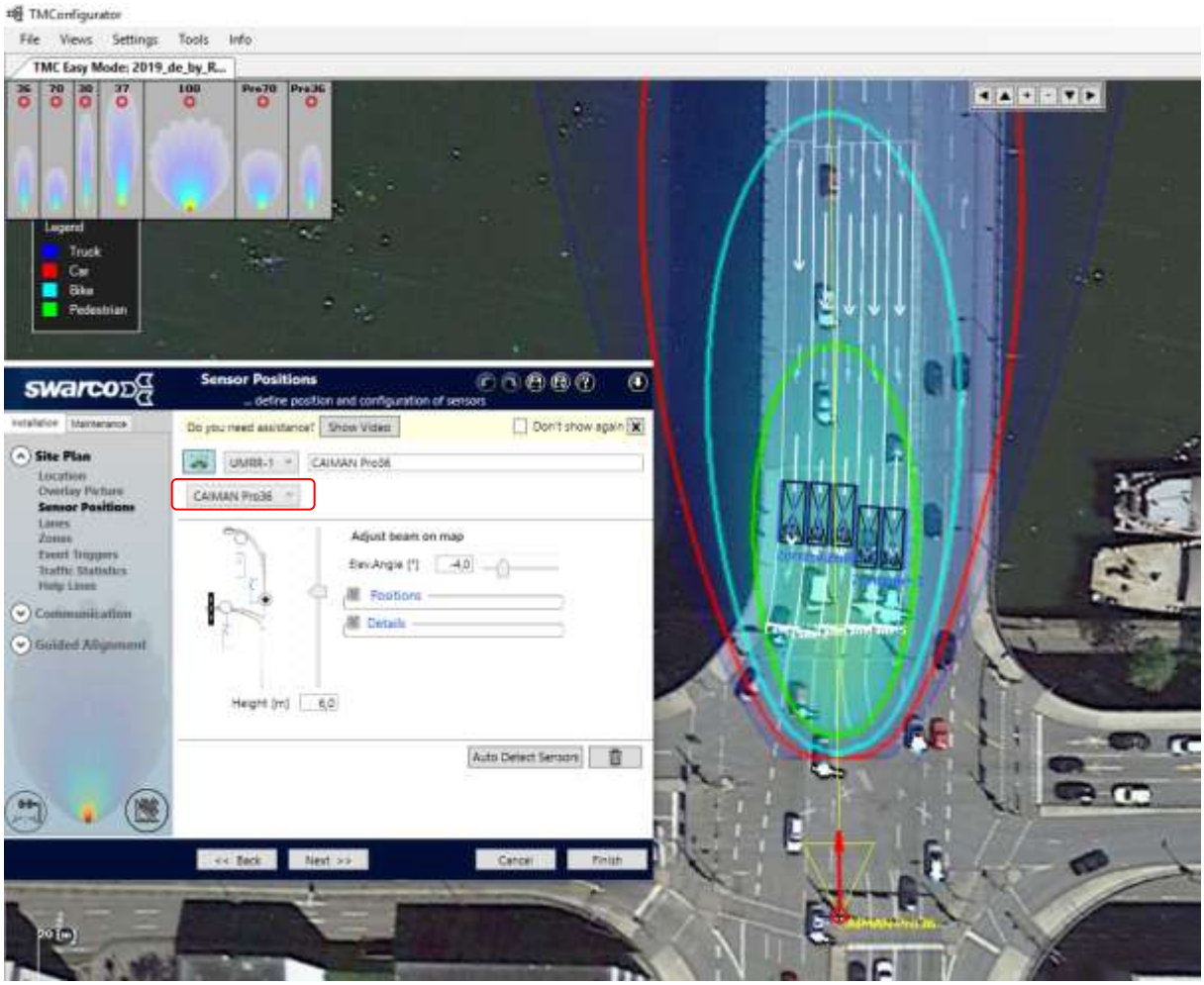


Figure 2: Select the Antenna Type

4.2.1.2 Set the mounting height

Select an appropriate mounting height. The recommended height is 6m (1-10m possible).

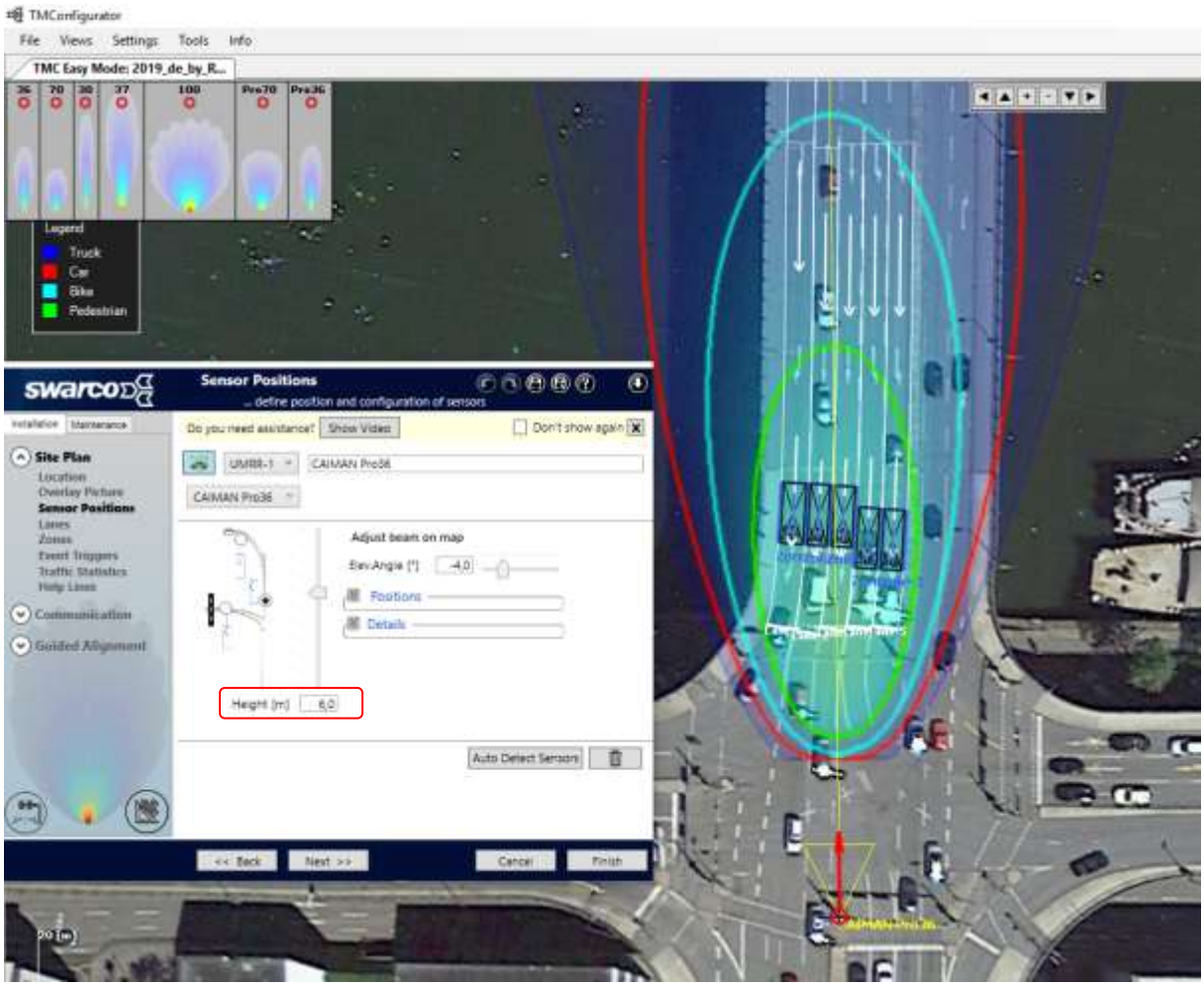


Figure 3: Select the Mounting Height

4.2.1.3 Set the Azimuth alignment angle

Modify the azimuth angle setting for best coverage of your zone of interest (stop bar or measurement line).

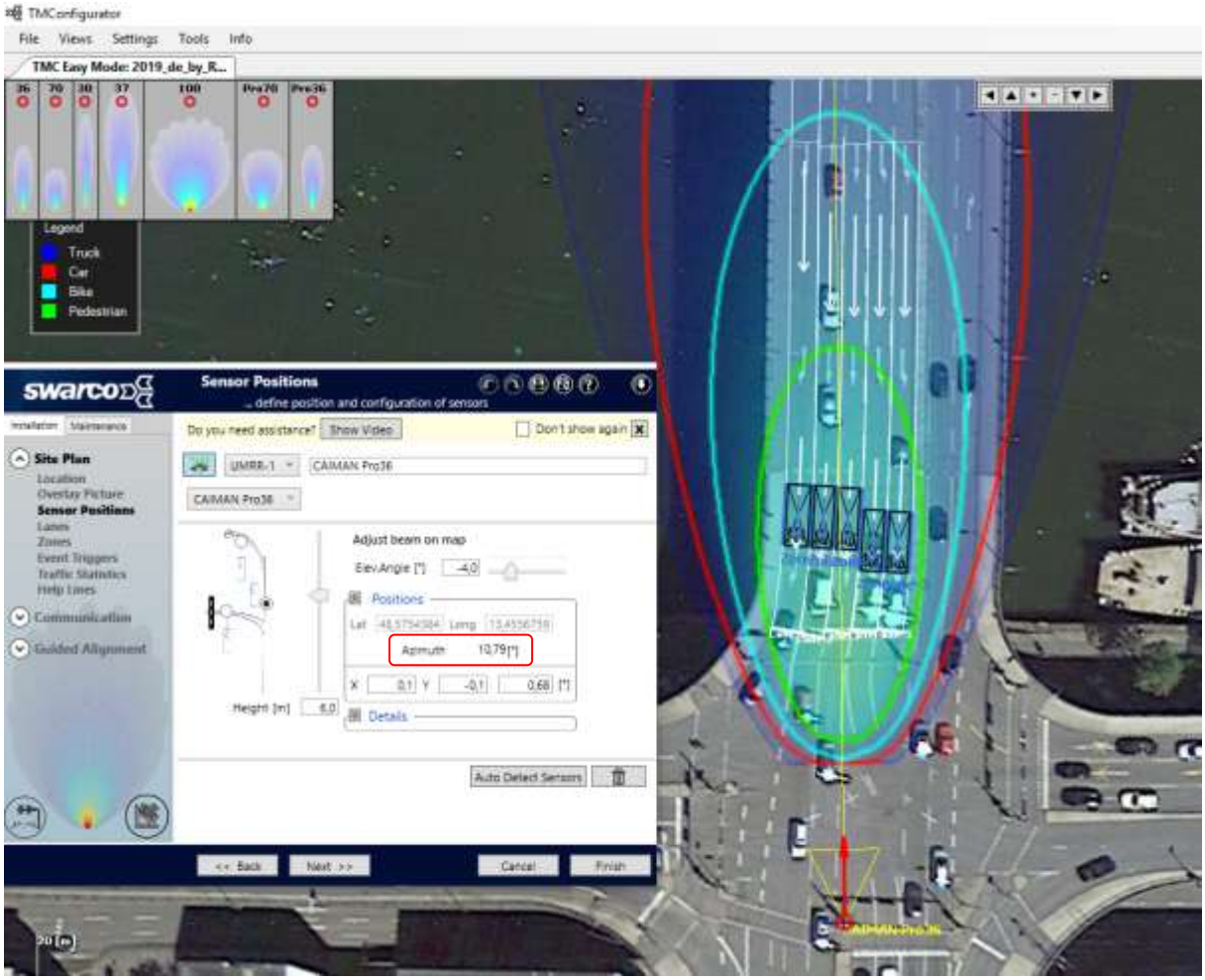


Figure 4: Modify the Azimuth Angle

4.2.1.4 Set the Elevation alignment angle

Modify the elevation angle setting best coverage of your zone of interest (stop bar or measurement line).

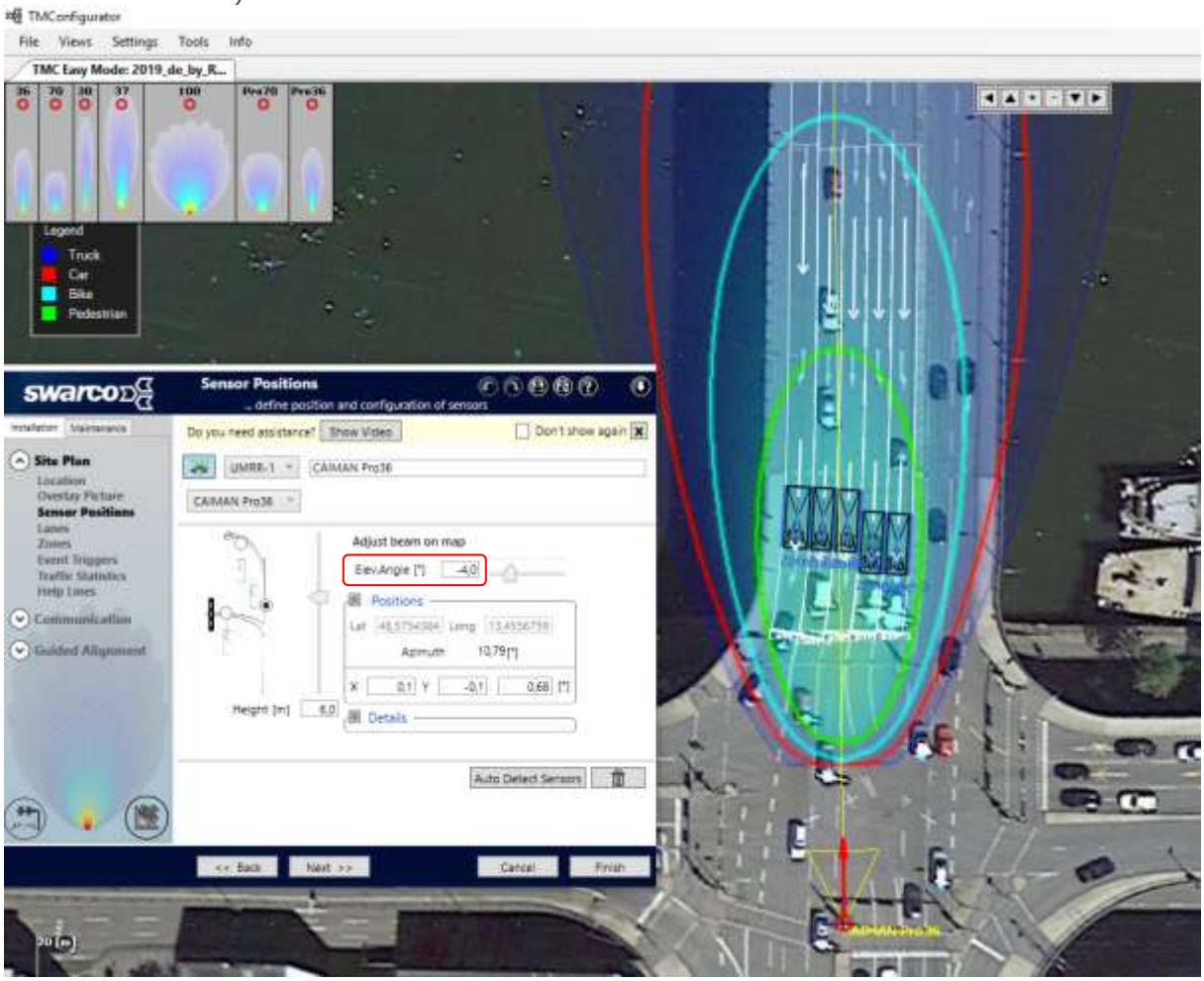


Figure 5: Modify the Elevation Angle

Repeat this procedure and modify the setting until you have found the optimum combination of mounting height, sensor type, azimuth and elevation angle.

5 Define Trigger Output

5.1 Set Lanes

After you started a project and reached the menu point “Lanes” in the Wizard, it is possible to configure the lanes.

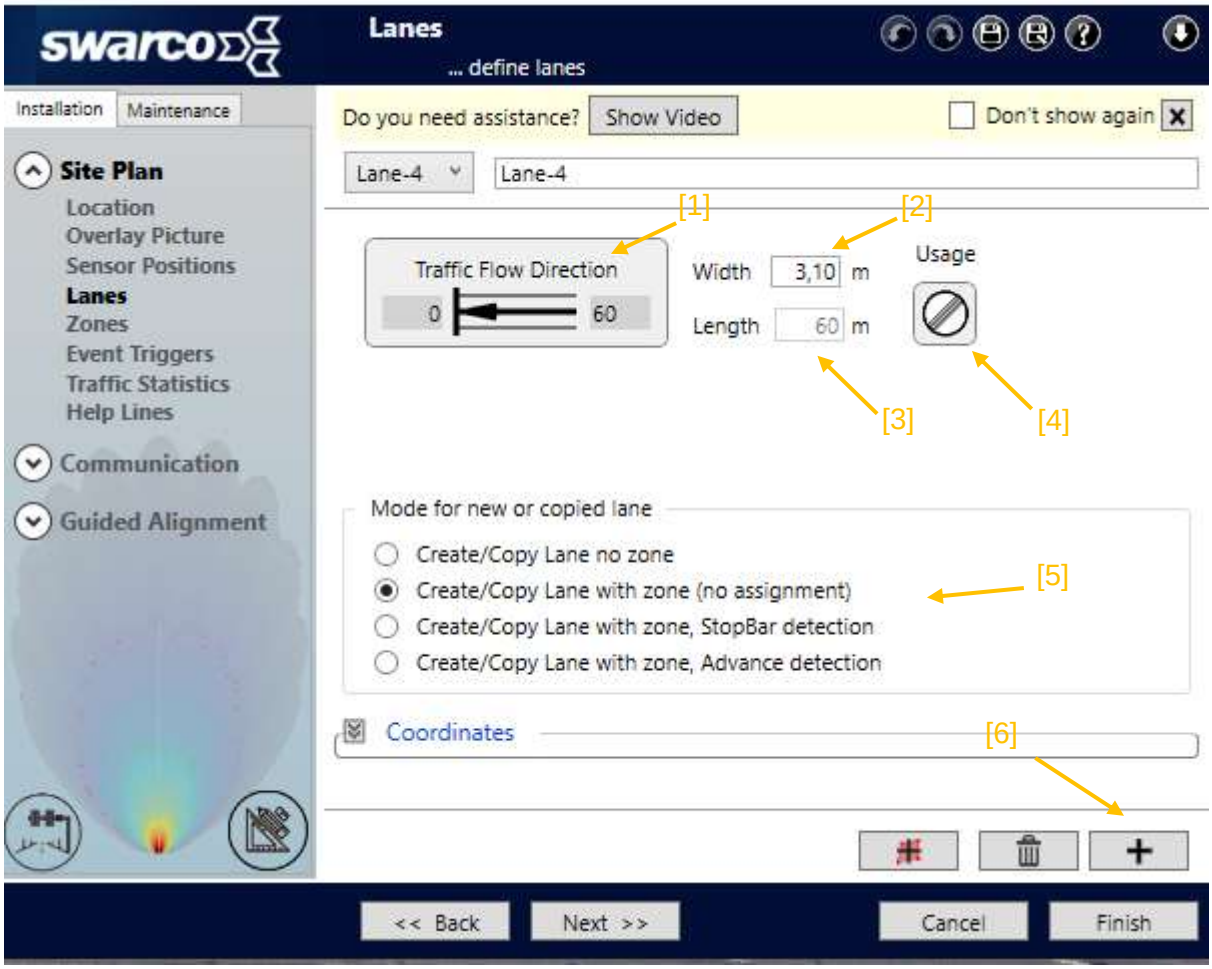


Figure 6: Lanes menu

In the lane menu you have few option to configurate. Under [1], you can manipulate the signing of the lane. The field with the number [2] shows the width of the lane. It is also possible to change the width in this field. Number [3] displays the current length. To change the value, you have to use the lane graphic. The sign number [4] allows to switch between lane for motor operated objects and the lane for pedestrians as well as bicycles.
The dropdown box with the number [5] give you the possibility to create a lane with a predefined zone. If the lane is dropped into a radar beam, it will be automatically set a stop bar trigger for this sensor.
Last but not least, number [6] pointing on the plus button to create the configured lane.
It is also possible to create the lane by drag and drop from the lane symbol.

5.2 Set Zones

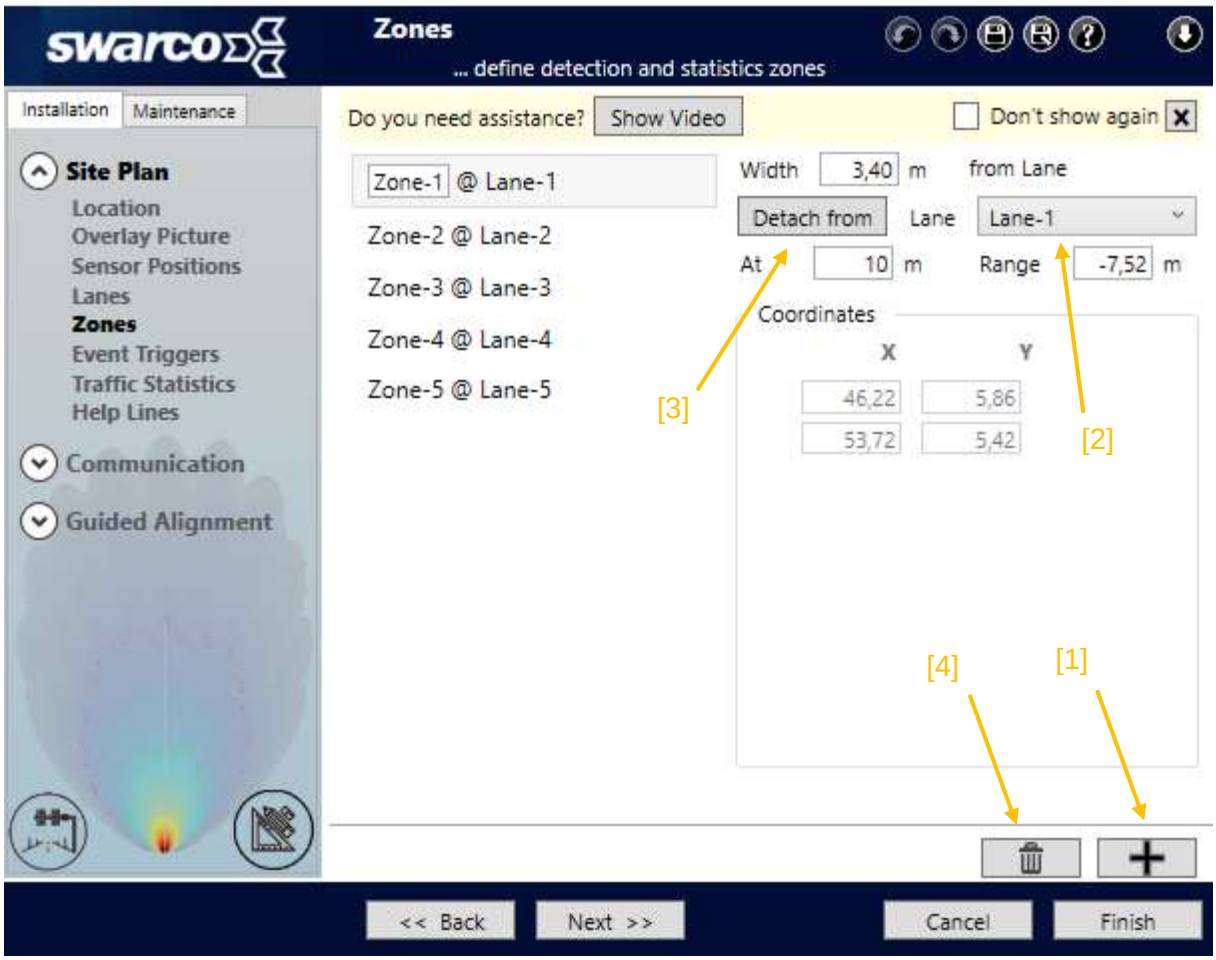


Figure 7: Zones menu

The plus button [1] allows to create a new zone. The delete button [4] deletes a marked zone. After you created a zone, it is possible attach the zone to a lane. There you have to click on the button number [3]. Also, it is possible to drag and drop the zone the preferred lane. The dropdown menu with number [2] gives you the possibility to select the lane, where you want to add the zone.
The zones are needed for triggers and statistics.
If you use a sensor with statistic module v1, you have to attach the zone to lanes. Otherwise it would not work.
In Statistic Module V2, it is possible to use the zones alone, too.

5.3 Set Triggers

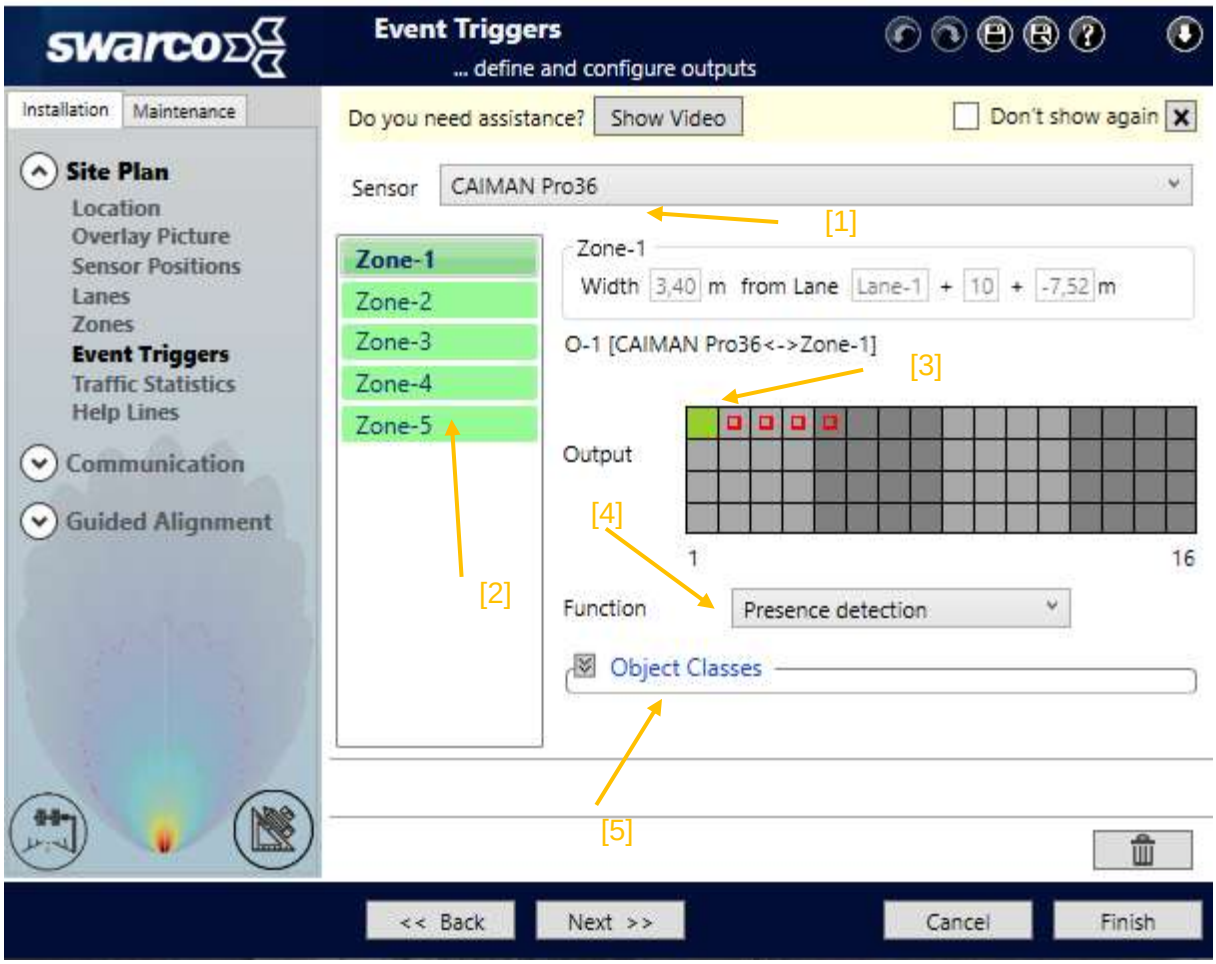


Figure 8: Event Triggers Menu

In the event triggers menu, you are able to set a trigger function to a zone. First, select the sensor the trigger should work with [1]. Now, the list under point [2] shows all zones, which are in the range of the sensor. Choose the zone, which should get a trigger function. After that, you have to define the trigger, which should be used from the sensor for this zone [3]. Under point [4], all available trigger functions displayed, which can be used.
Optional the trigger can different between the object classes. Therefor use the dropdown menu under point [5].
To finish the configuration, a simply click on the plus button is enough.

5.4 Set statistics

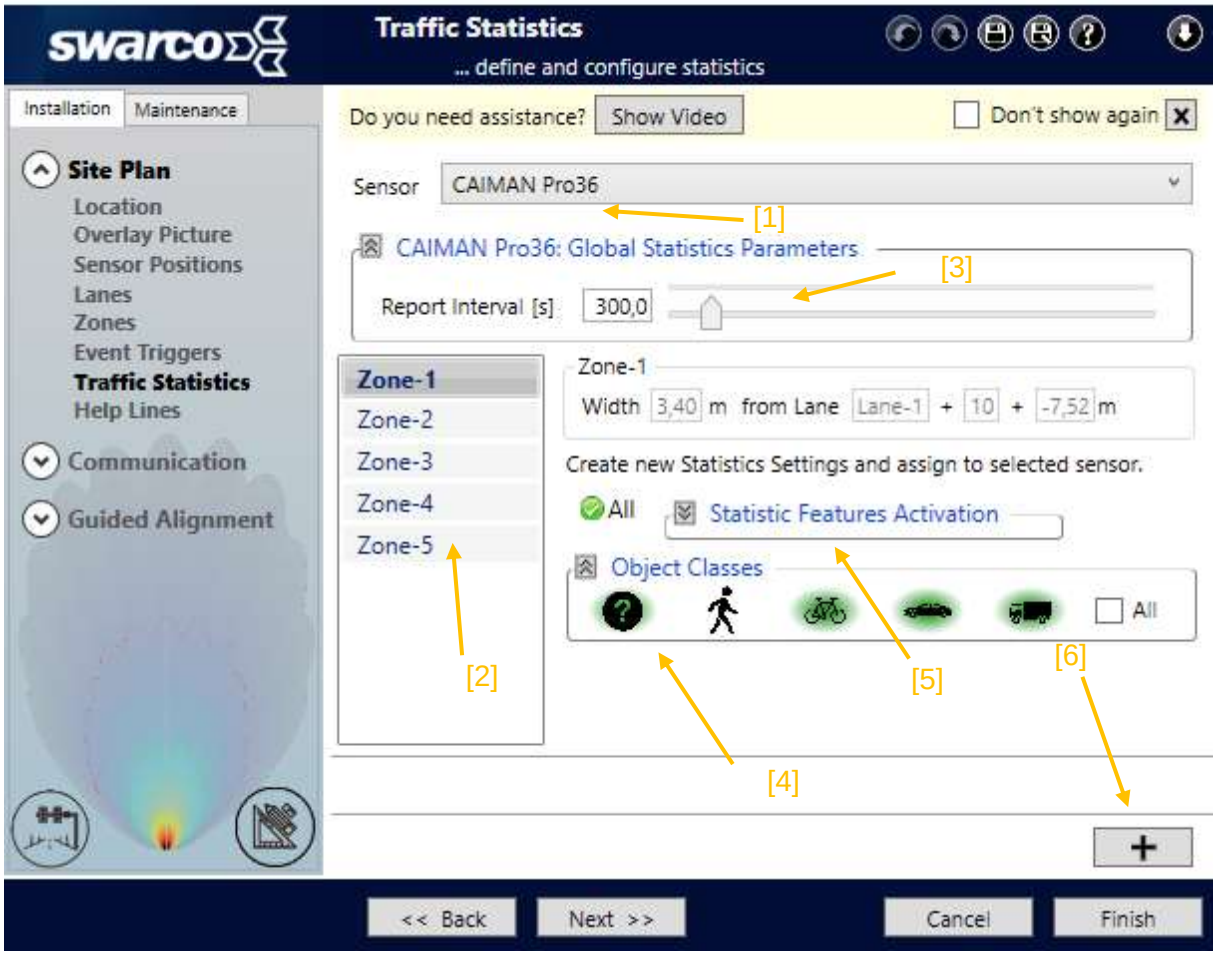


Figure 9: Traffic statistics menu

The traffic statistics menu is pretty much the same as the event triggers menu. First, you have to choose the sensor and the zone, which you want to use for statistics [1] [2]. Under point [3], the report interval time can be manipulated. The dropdown menu object classes allows to define, which classes should be included in the statistics. Also, it is possible to choose, which statistics features should be calculated [5]. Normally, all features are activated.

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