QCAM5

Configuration Guide

Macq Mobility

Disclaimer: visuals/screenshots in this guide might slightly differ with software running on the QCAM5.These differences are minor and purely aesthetic, hence do not affect core functionality of the camera.

Document version

Version number	Release date
V1	15/06/2021
V2	12/08/2021
V3	29/10/2021
V4	08/11/2021

Macq Mobility

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Overview

OVERVIEW

Access to QCAM5 web interface

Default camera network configuration

- IP address : 192.168.8.2/24
- Gateway IP : 192.168.8.1
- Second fixed IP for support : 172.23.23.23/24
- Wifi-access : 192.168.5.1 (computer directly connected to the QCAM5 via WiFi)

Computer directly connected to QCAM5

1. Connect the camera with a RJ45 cable
2. Set the IP address of the PC → 192.168.8.43 (example)
3. On a web browser, navigate to: https://192.168.8.2

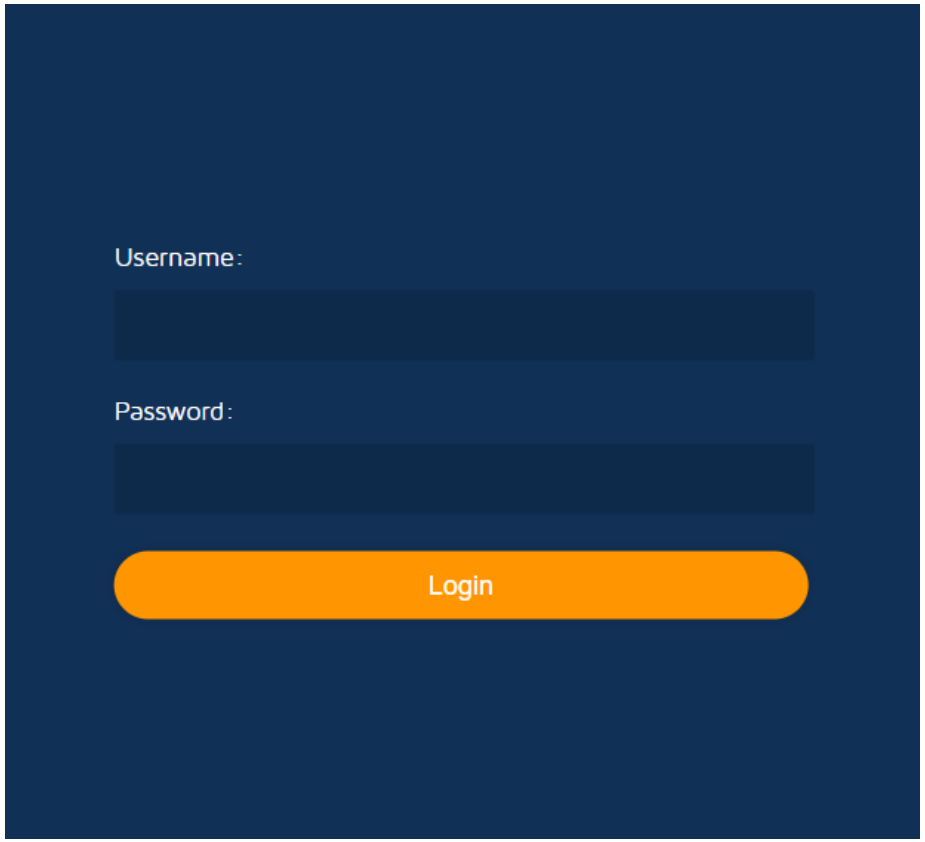
Access via a web browser

1. On a web browser, navigate to: https://[*IP address of the camera*]

OVERVIEW

Access to QCAM5 web interface

User login Interface



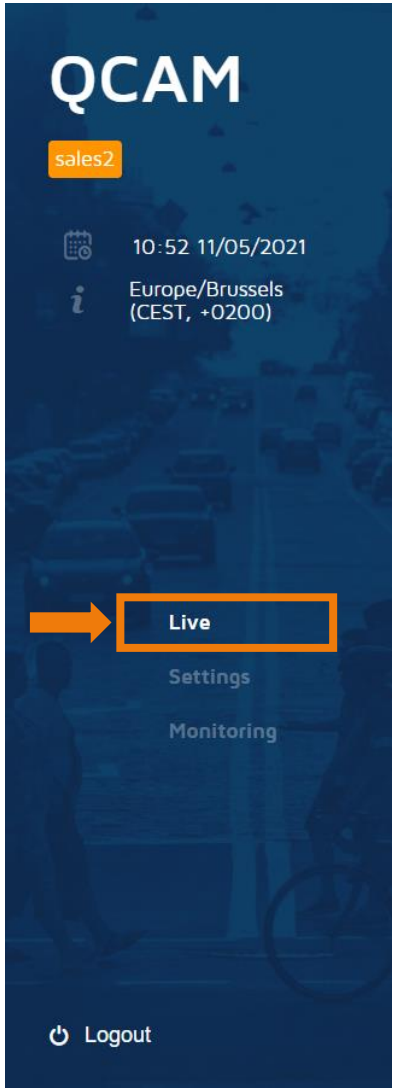
DEFAULT CREDENTIALS

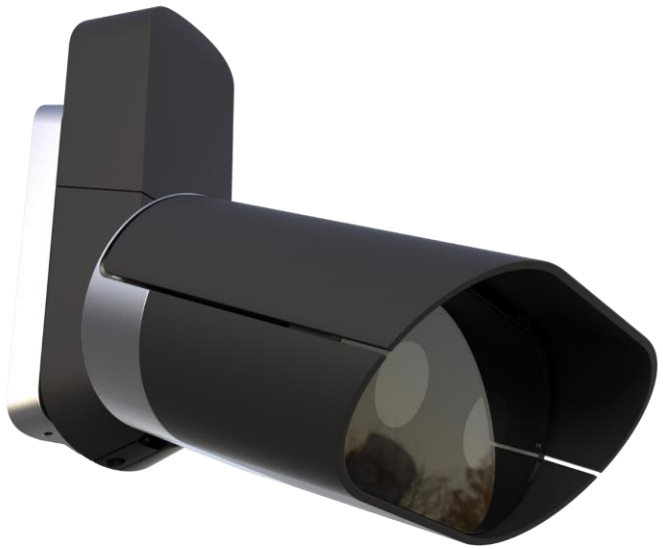
Username	admin
Password	admin

OVERVIEW

Main menu

LIVE MENU

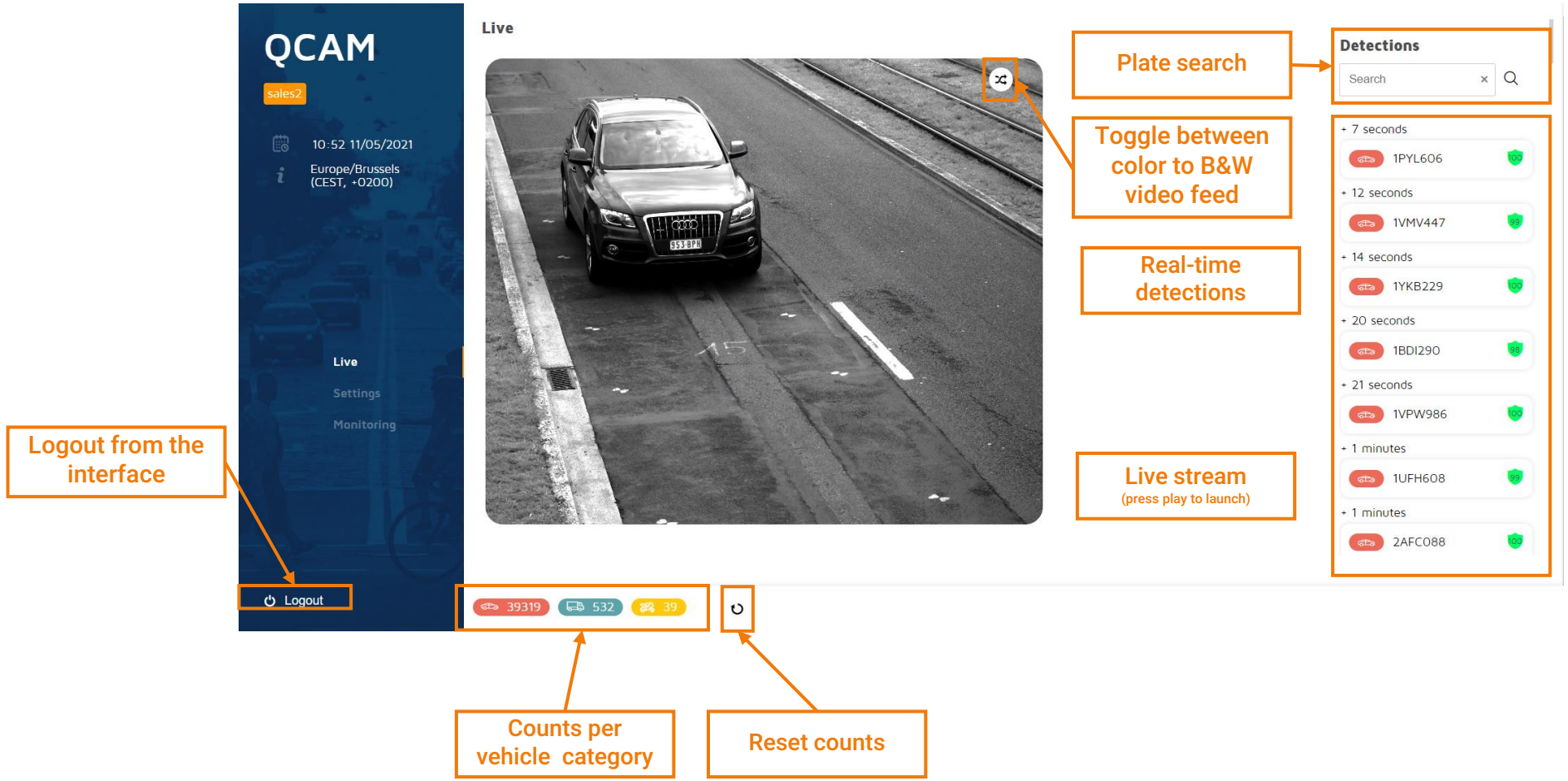




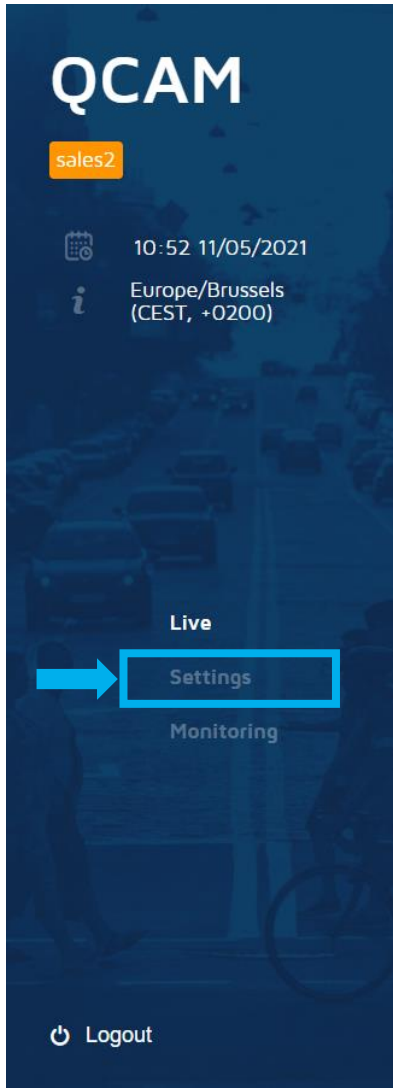
OVERVIEW

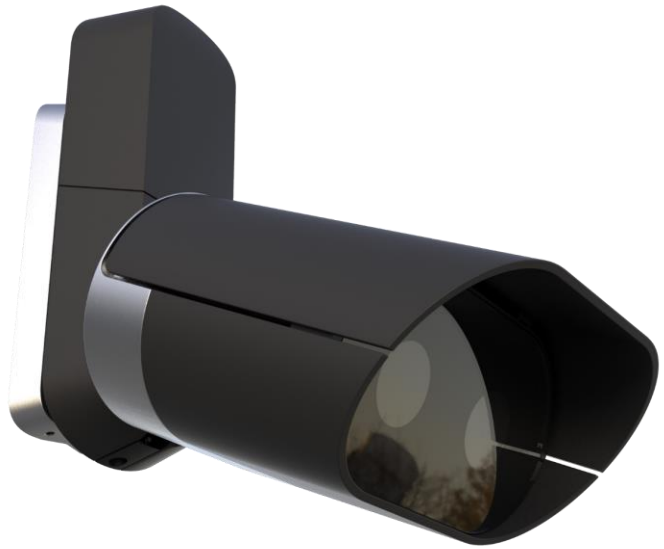
MENU PRESENTATION

Live menu



SETTINGS MENU



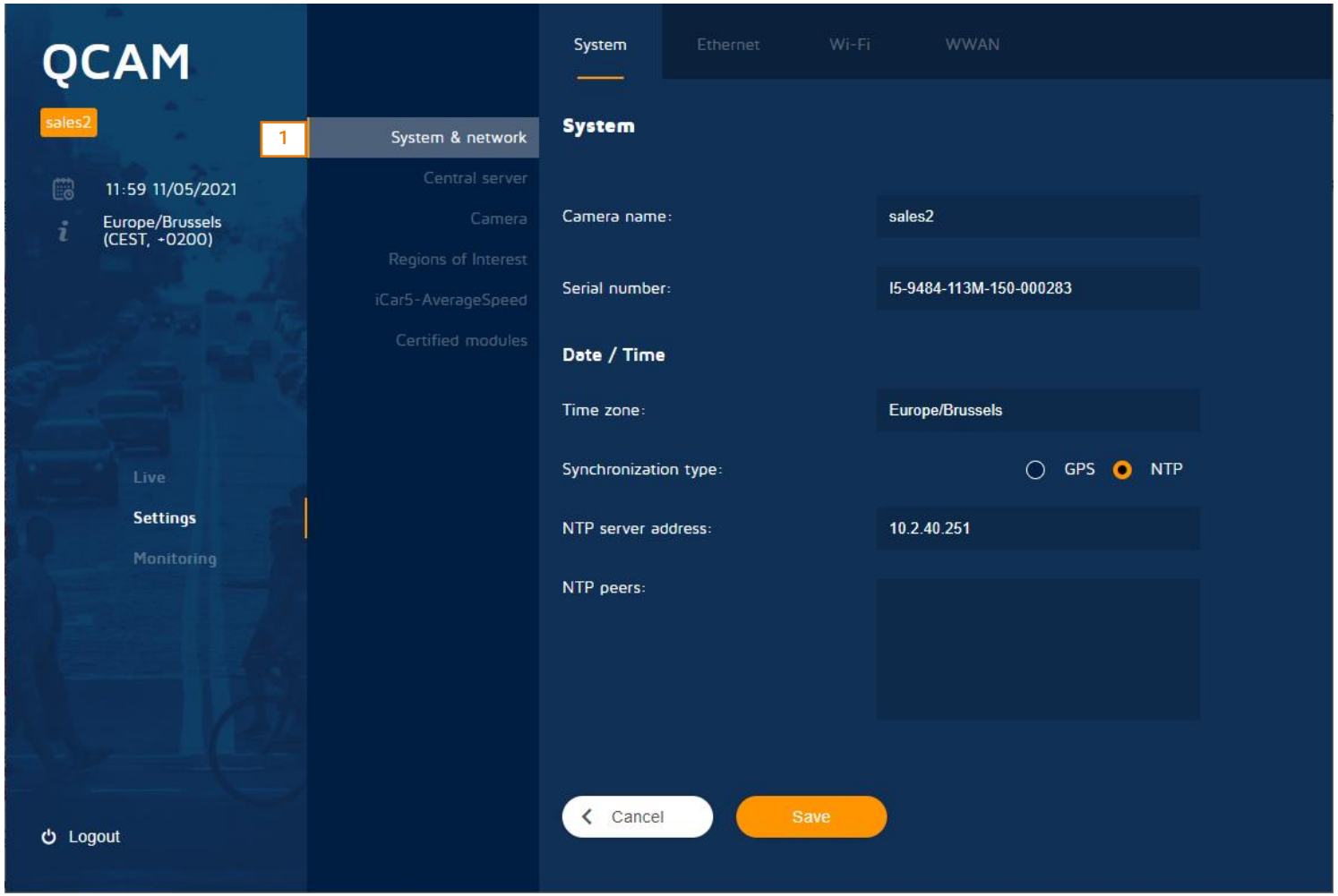


OVERVIEW

Menu presentation

Settings menu

1	**Network settings : network & date/time synchronisation settings**
2	Central server : connect camera to M³ or other server(s)
3	Camera : image settings & camera orientation
4	Region of interest : define important zones in the image
5	iCar5-AverageSpeed : average speed certified application
6	Certified modules : modules required for official certification



OVERVIEW

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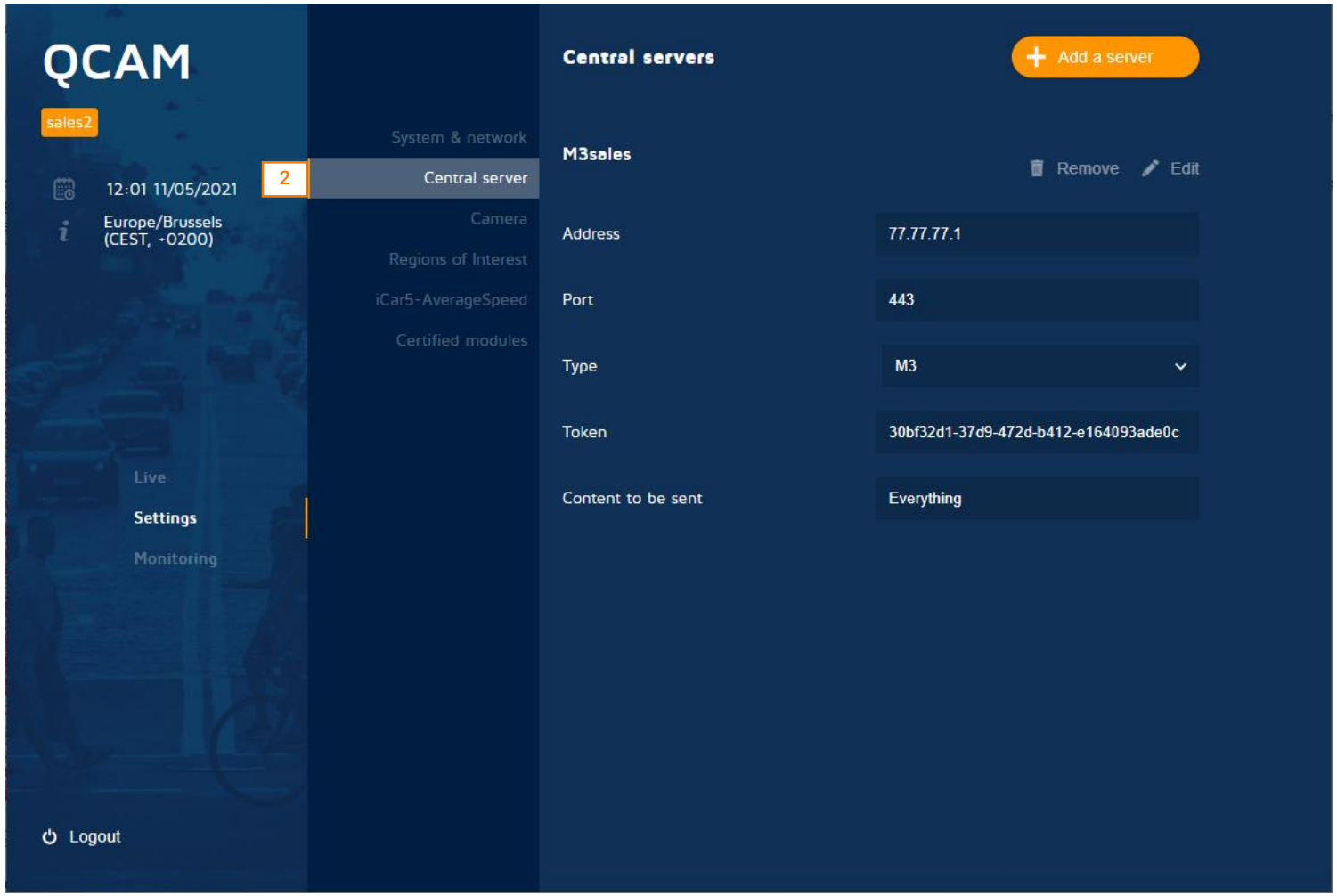

OVERVIEW

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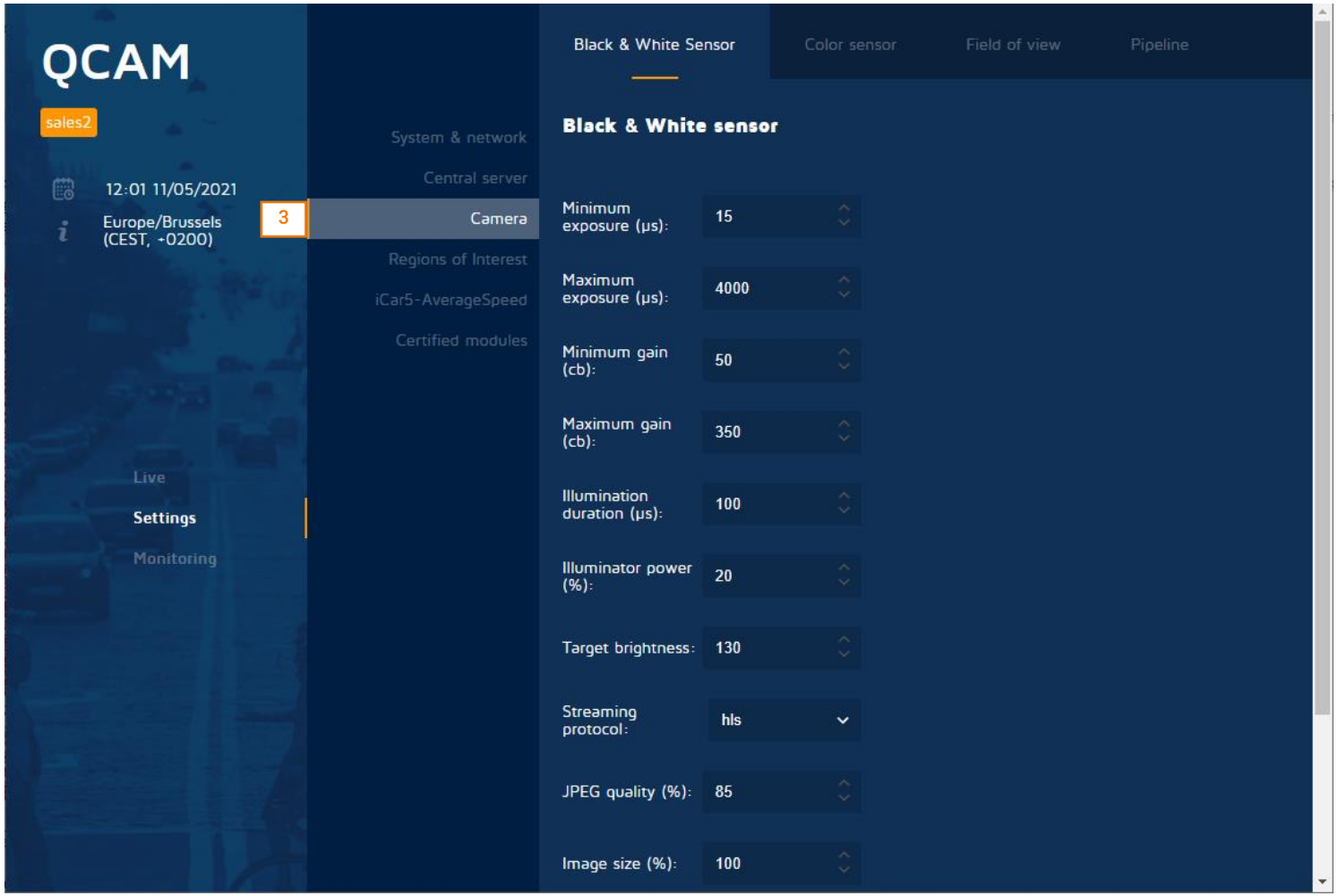

OVERVIEW

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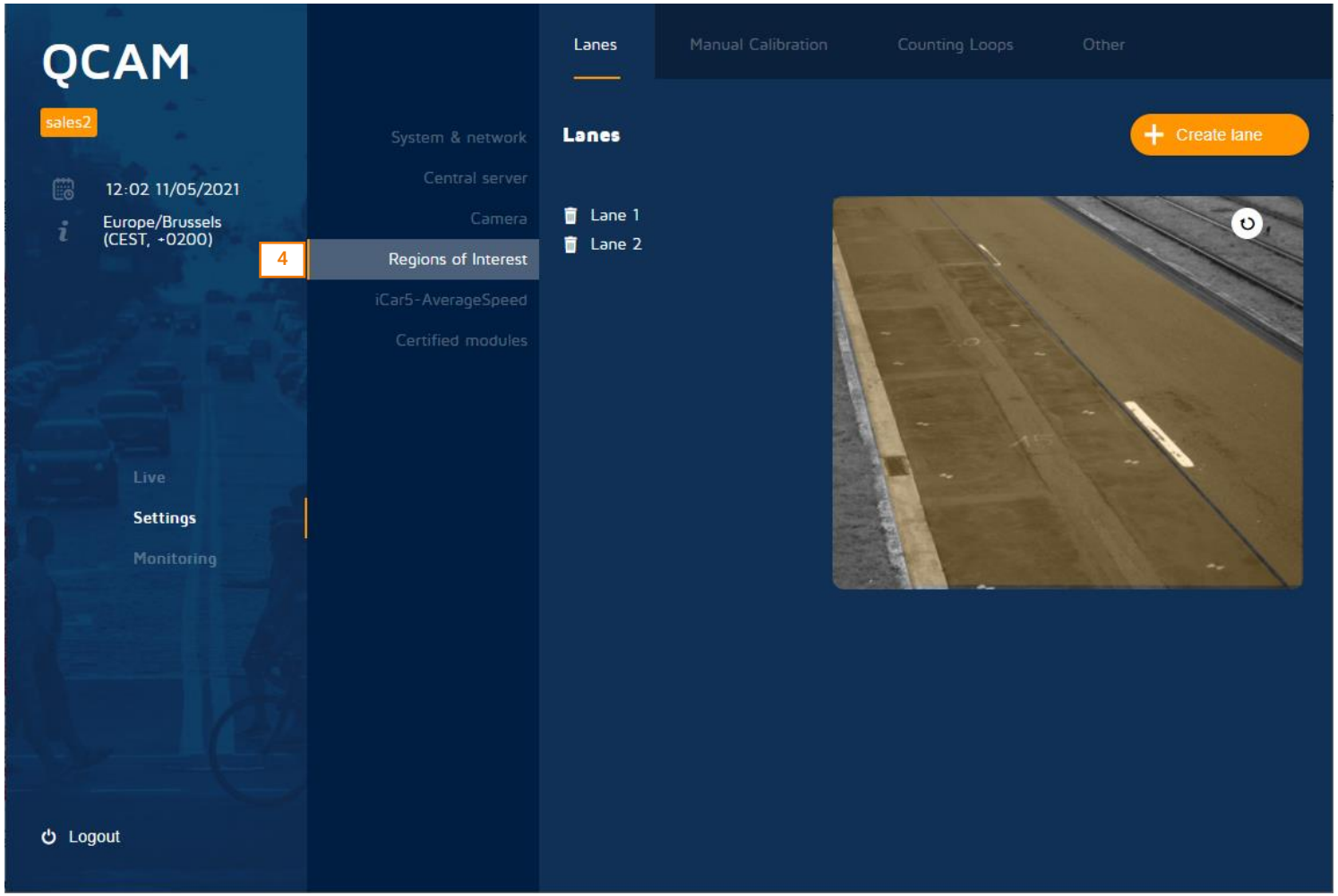

OVERVIEW

Menu presentation

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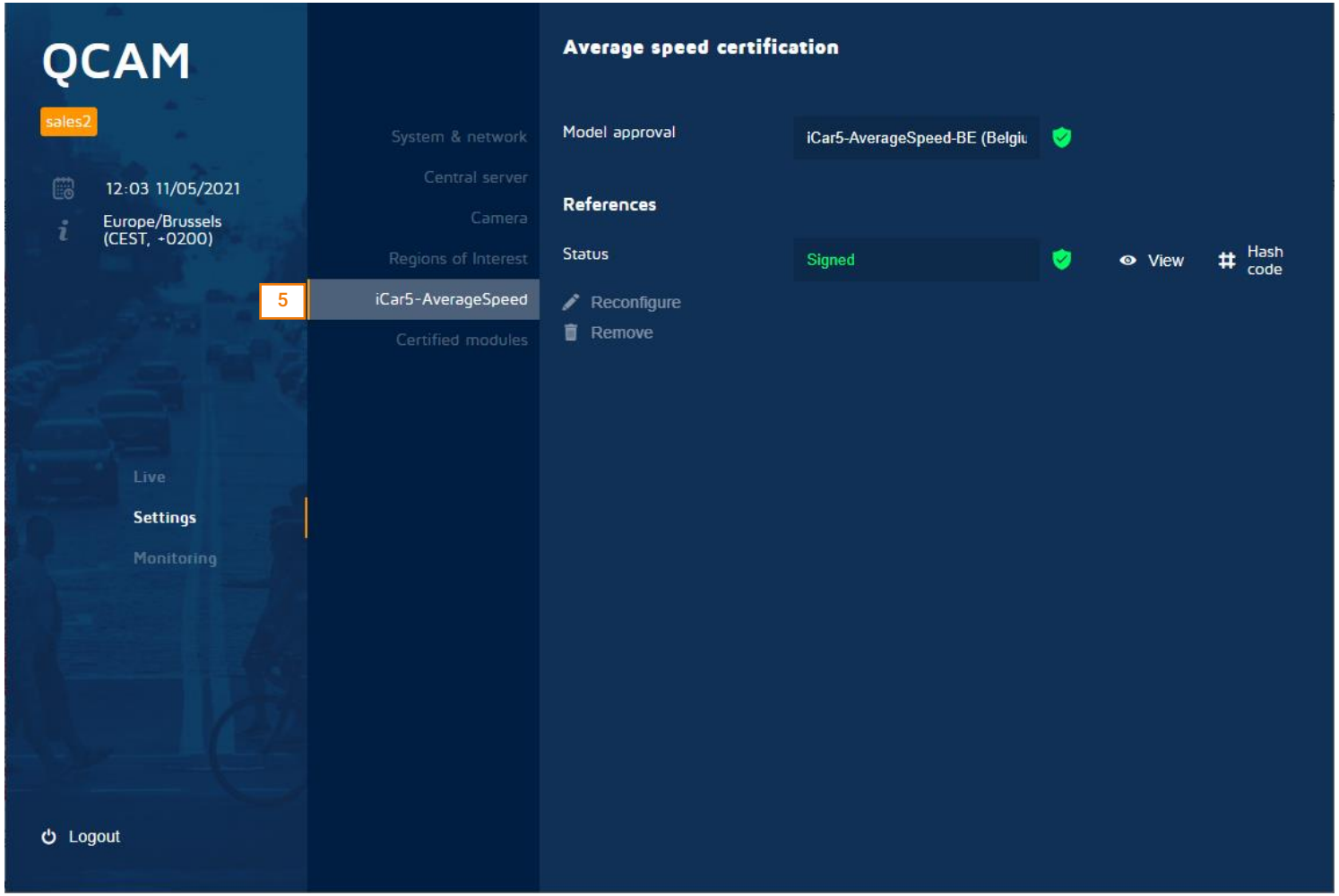

OVERVIEW

Menu presentation

Settings menu

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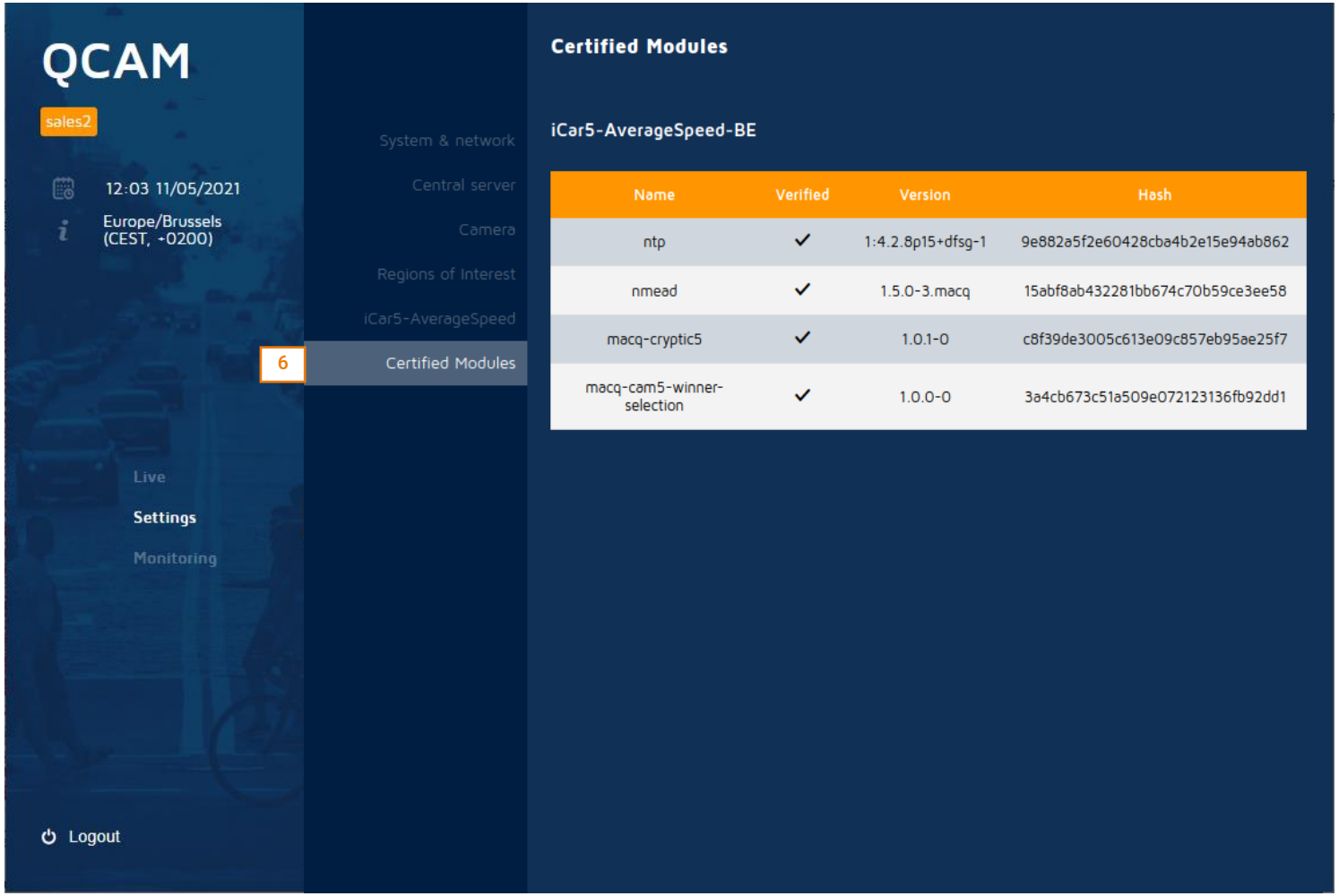
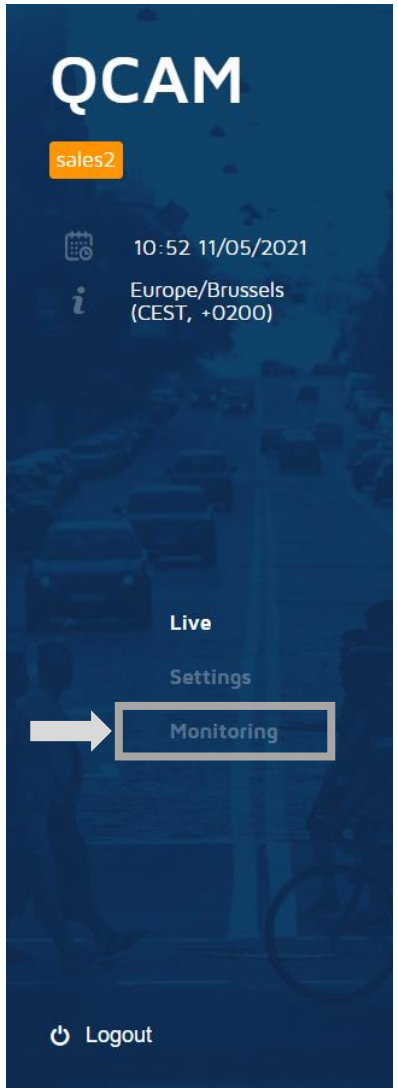
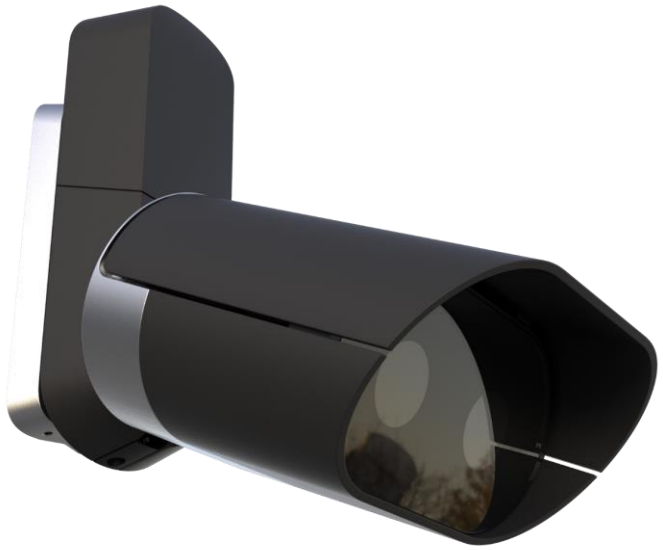


MONITORING MENU





OVERVIEW

Menu presentation

Monitoring menu

General System Information

- CPU usage
- Disk usage
- GPS
- Hardware components (e.g. illuminator)
- Macq Packages

NTP Monitoring

remote	refid	st	t	when	poll	reach	delay	offset	jitter
*10.2.40.251	193.190.198.10	3	u	304	1024	377	0.255	-3.218	2.167

Test Campaigns

Network Information

```
eth0      Link encap:Ethernet  HWaddr 00:04:4b:8c:ea:75
          inet addr:10.2.41.66  Bcast:10.2.255.255  Mask:255.255.0.0
          inet6 addr: fe80::204:4bff:fe8c:ea75/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:2166367045 errors:0 dropped:0 overruns:0 frame:0
          TX packets:2708999973 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:222731552204 (222.7 GB)  TX bytes:67029555358785 (67.0 TB)
          Interrupt:42

eth0:0    Link encap:Ethernet  HWaddr 00:04:4b:8c:ea:75
          inet addr:172.23.23.23  Bcast:0.0.0.0  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          Interrupt:42

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:545914652 errors:0 dropped:0 overruns:0 frame:0
          TX packets:545914652 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1
          RX bytes:623783567660 (623.7 GB)  TX bytes:623783567660 (623.7 GB)

tun0      Link encap:UNSPEC  HWaddr 00-00-00-00-00-00-00-00-00-00-00-00-00-00-00-00
          inet addr:77.77.77.2  P-t-P:77.77.77.2  Mask:255.255.255.0
          UP POINTOPOINT RUNNING NOARP MULTICAST  MTU:1500  Metric:1
          RX packets:587098079 errors:0 dropped:0 overruns:0 frame:0
          TX packets:984467705 errors:0 dropped:2003159 overruns:0 carrier:0
          collisions:0 txqueuelen:100
          RX bytes:32179626263 (32.1 GB)  TX bytes:1298298633873 (1.2 TB)

wlan0     Link encap:Ethernet  HWaddr 00:04:4b:8c:ea:73
          inet addr:192.168.5.1  Bcast:192.168.5.255  Mask:255.255.255.0
          inet6 addr: fe80::204:4bff:fe8c:ea73/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:64470 errors:0 dropped:0 overruns:0 frame:0
          TX packets:143 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:5438444 (5.4 MB)  TX bytes:21914 (21.9 KB)
```

Macq Mobility

Configuration

Configuration

1. **System & network**
2. M³ server connection
3. Camera settings
4. Region of interest
5. Icar5 Average speed

Macq Mobility

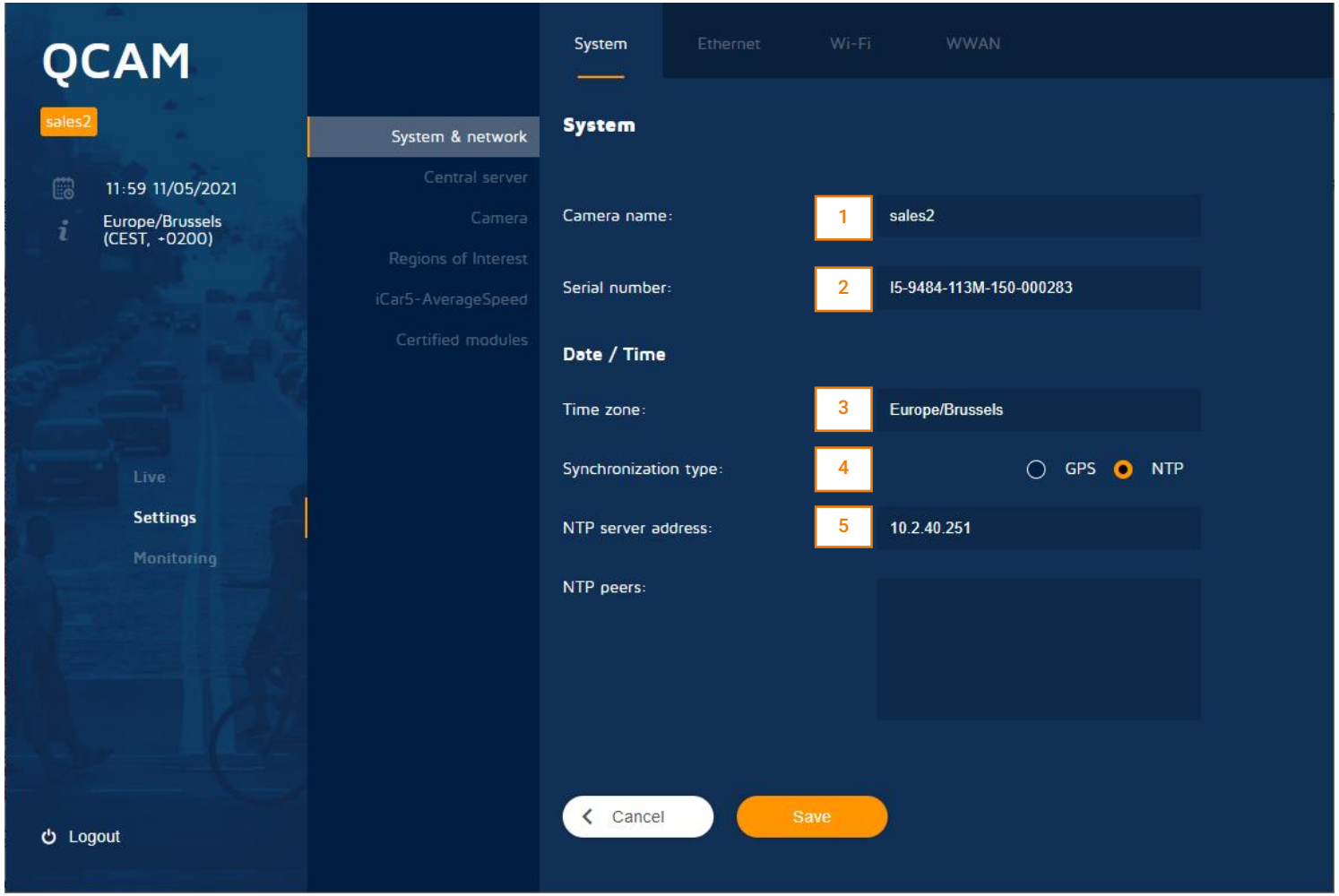
CONFIGURATION

Camera & NTP configuration

Settings menu

1. Camera name : local naming of the equipment
2. Serial Number : customised with
   - Lens type
   - Serial number
   - Usage type

   → ***Not editable***
3. Time zone
4. Synchronisation type
   - GPS : clock from GPS module
   - NTP : clock through NTP
5. NTP server address (only appears if NTP radio button is active)



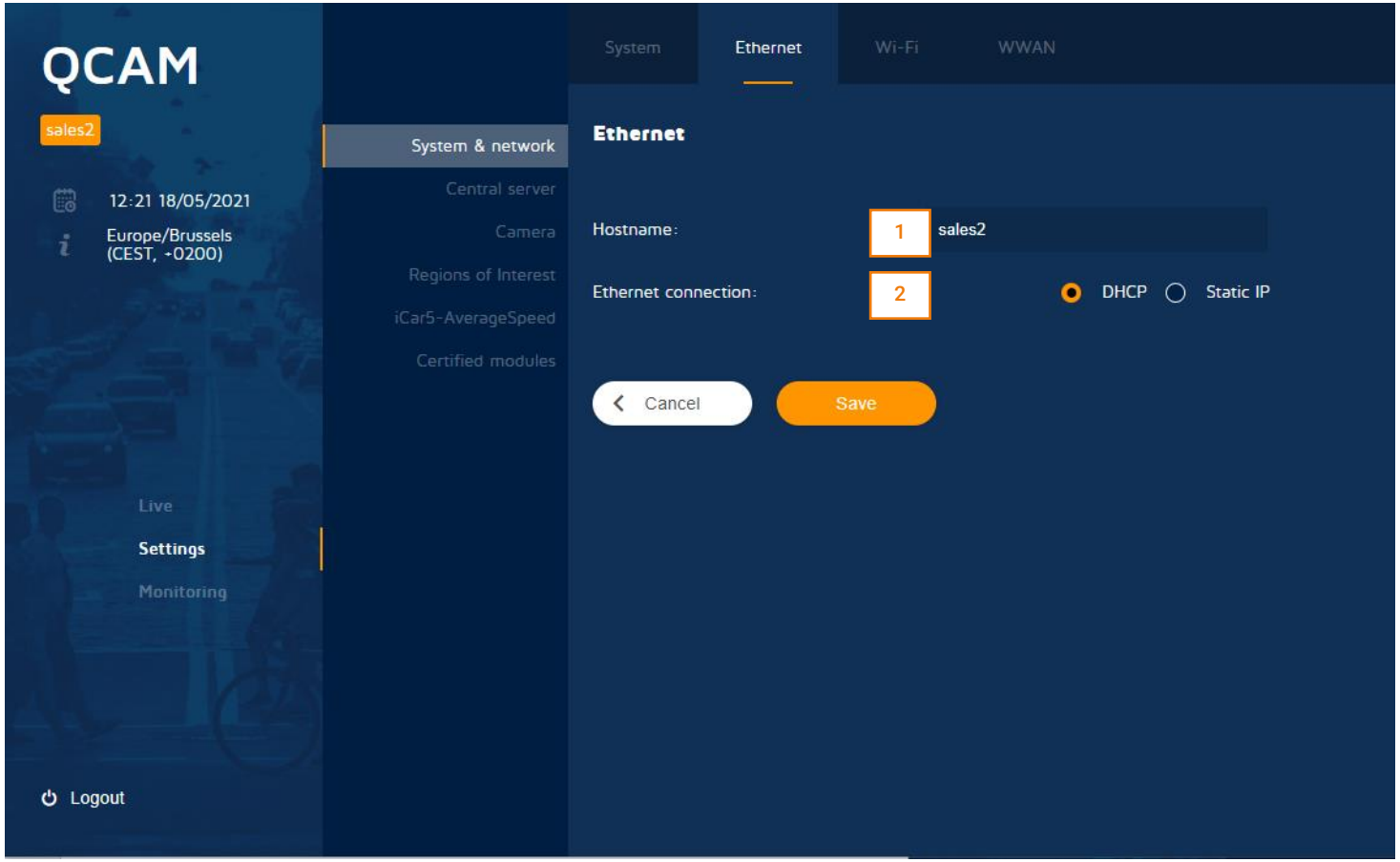
CONFIGURATION

Ethernet configuration

Settings menu

1. Camera hostname
2. Connection configuration

   (DHCP selected)



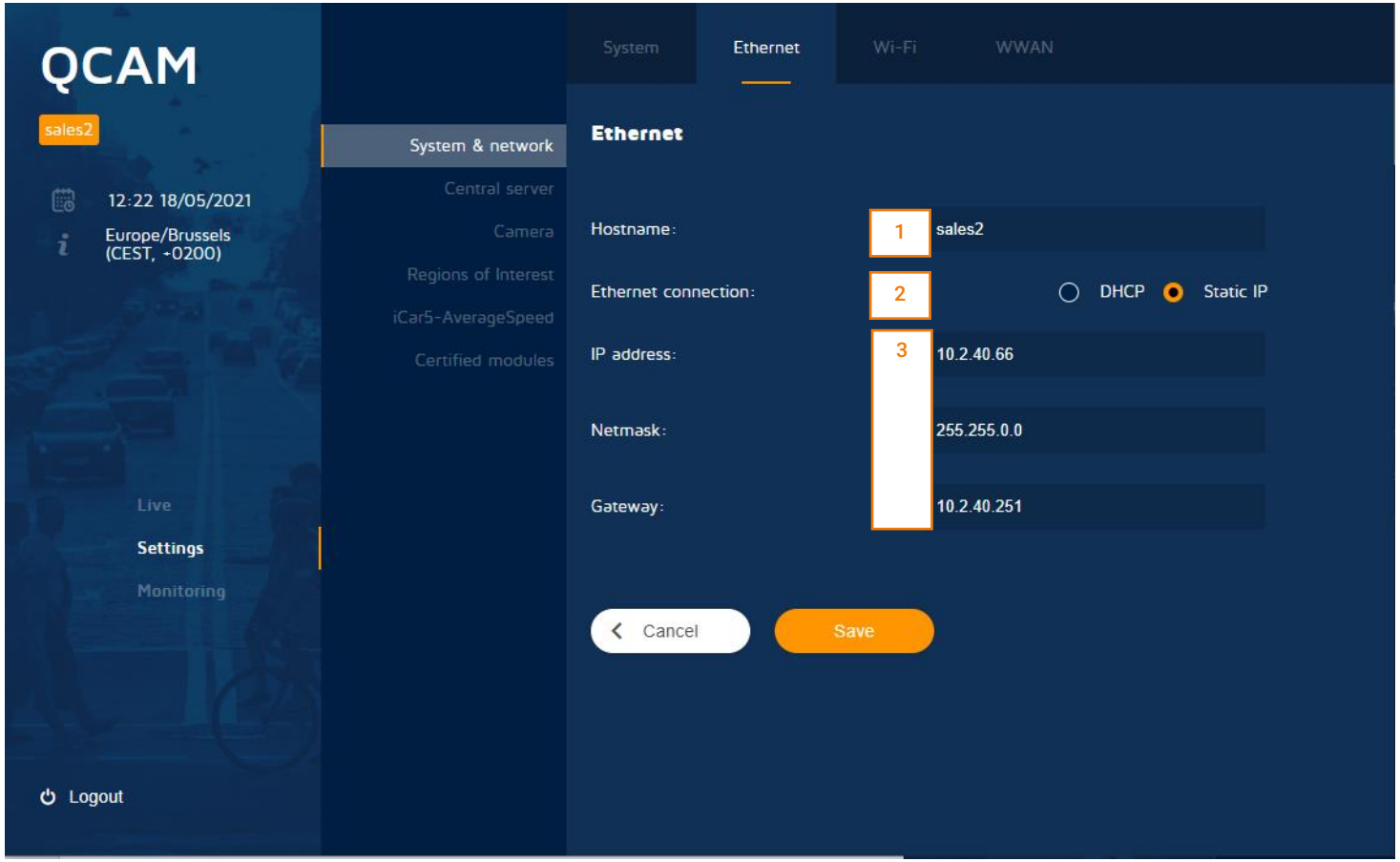
CONFIGURATION

Ethernet configuration

Settings menu

1. Camera hostname
2. Connection configuration

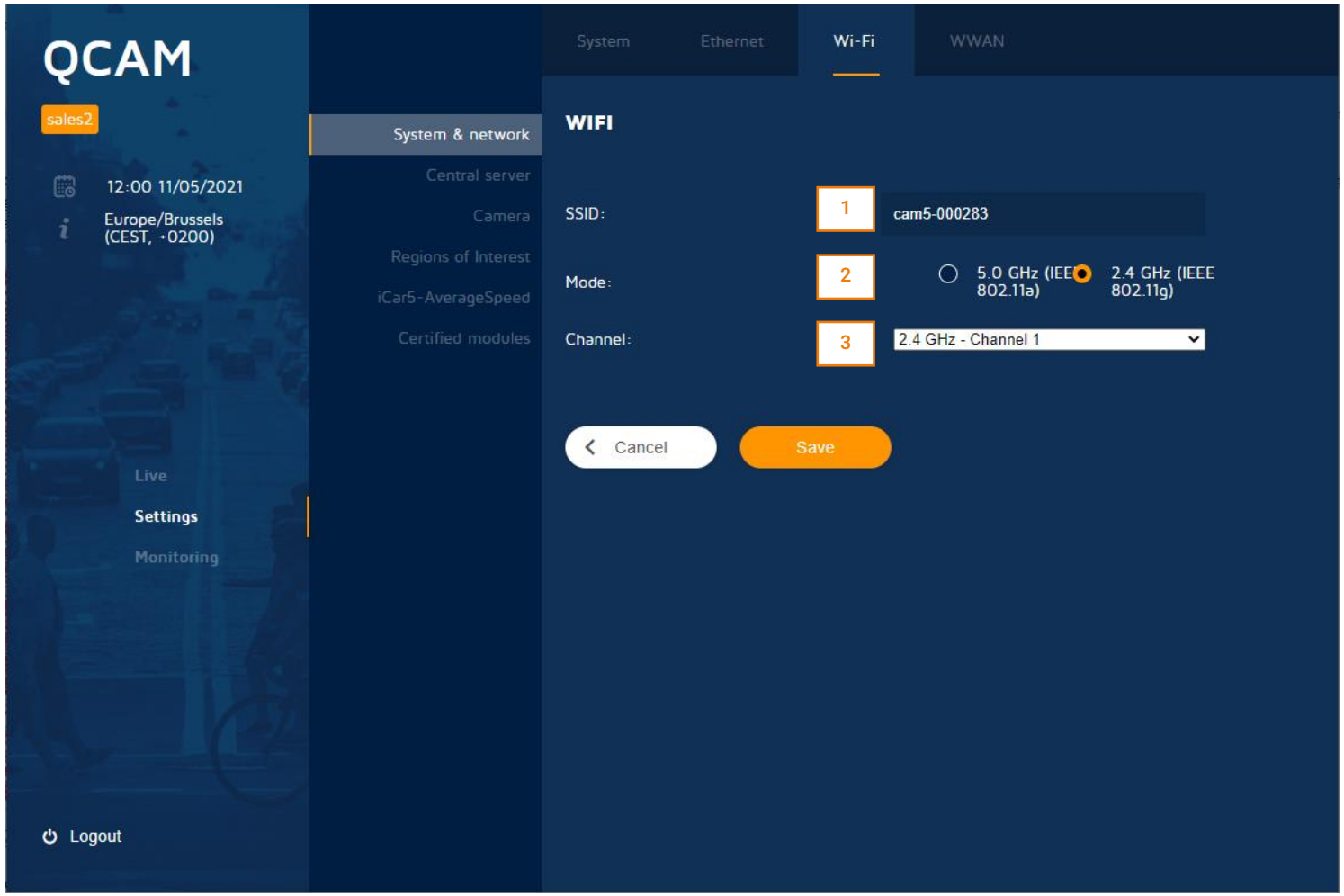
   (Static selected)
3. Static IP configuration



CONFIGURATION

Wi-Fi configuration

Settings menu



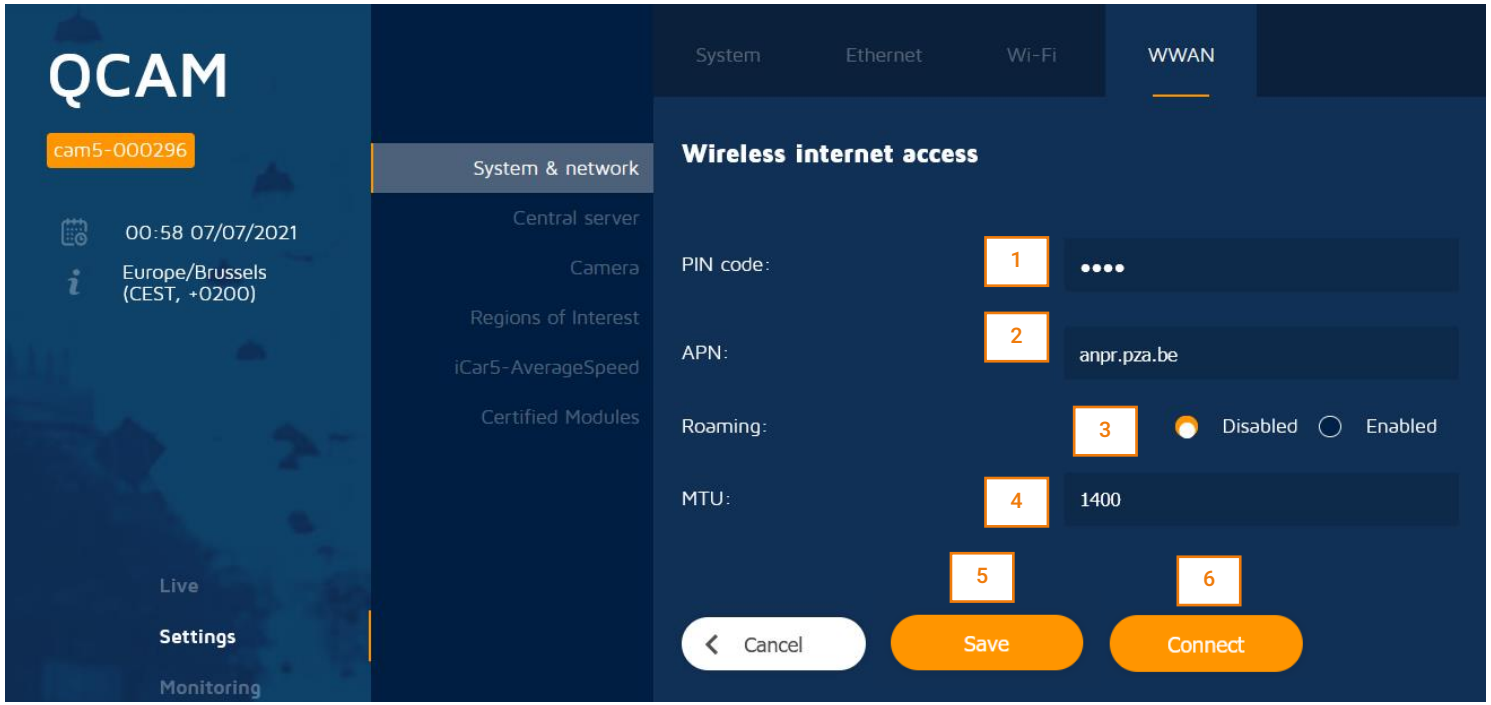
1. Wi-Fi network name (SSID)
2. Wi-Fi frequency
3. Wi-Fi channel

CONFIGURATION

4G configuration

Settings menu

1. PIN code
2. APN name
3. Roaming
4. MTU (use 1400 by default)
5. **Save** : allows the user to save the parameters without relaunching the connection
6. **Connect** : once parameters saved, click on connect to launch the connection

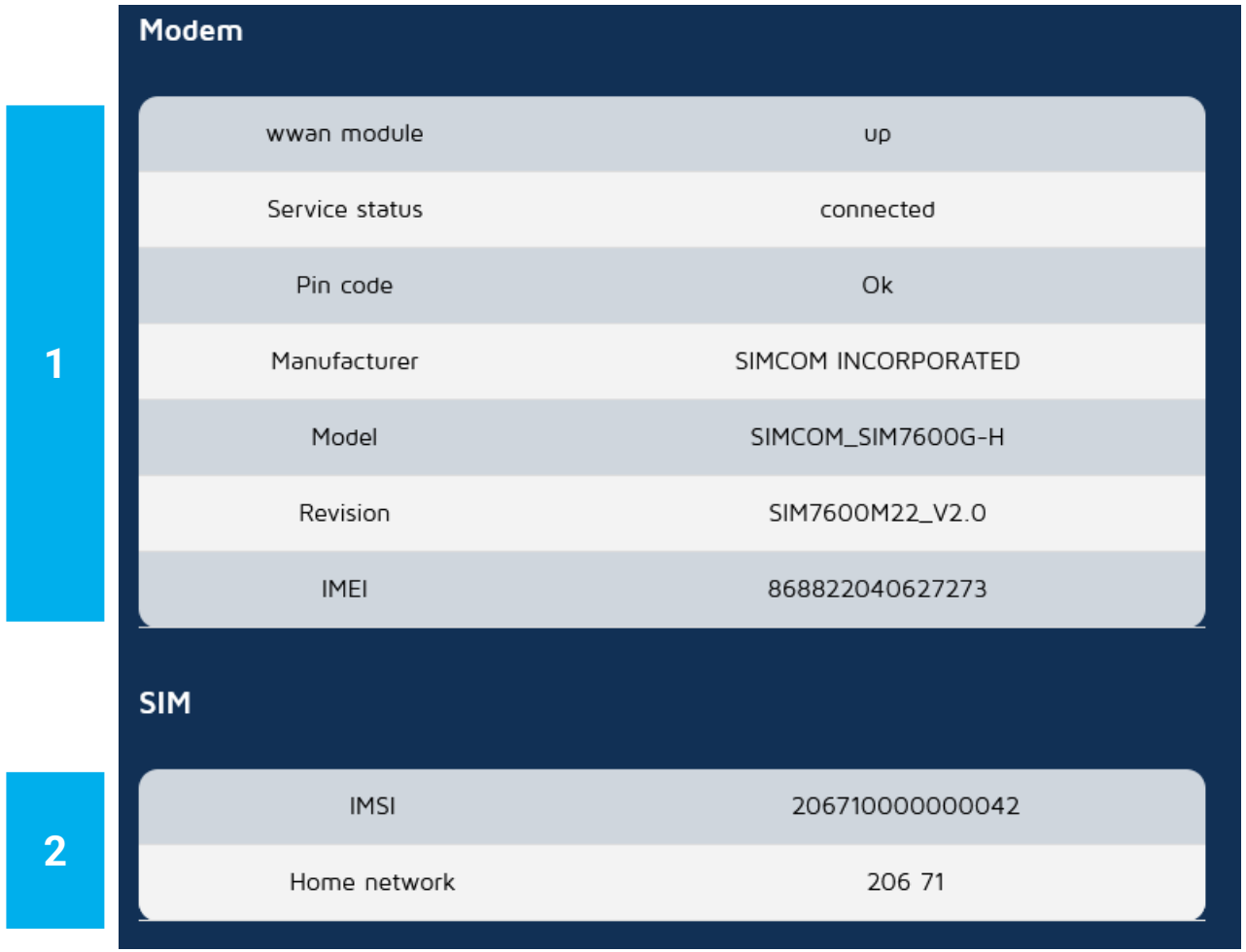


CONFIGURATION

4G configuration

Settings menu

1. Informations regarding the 4G modem and the 4G interface (WWAN)
2. Information of the SIM card



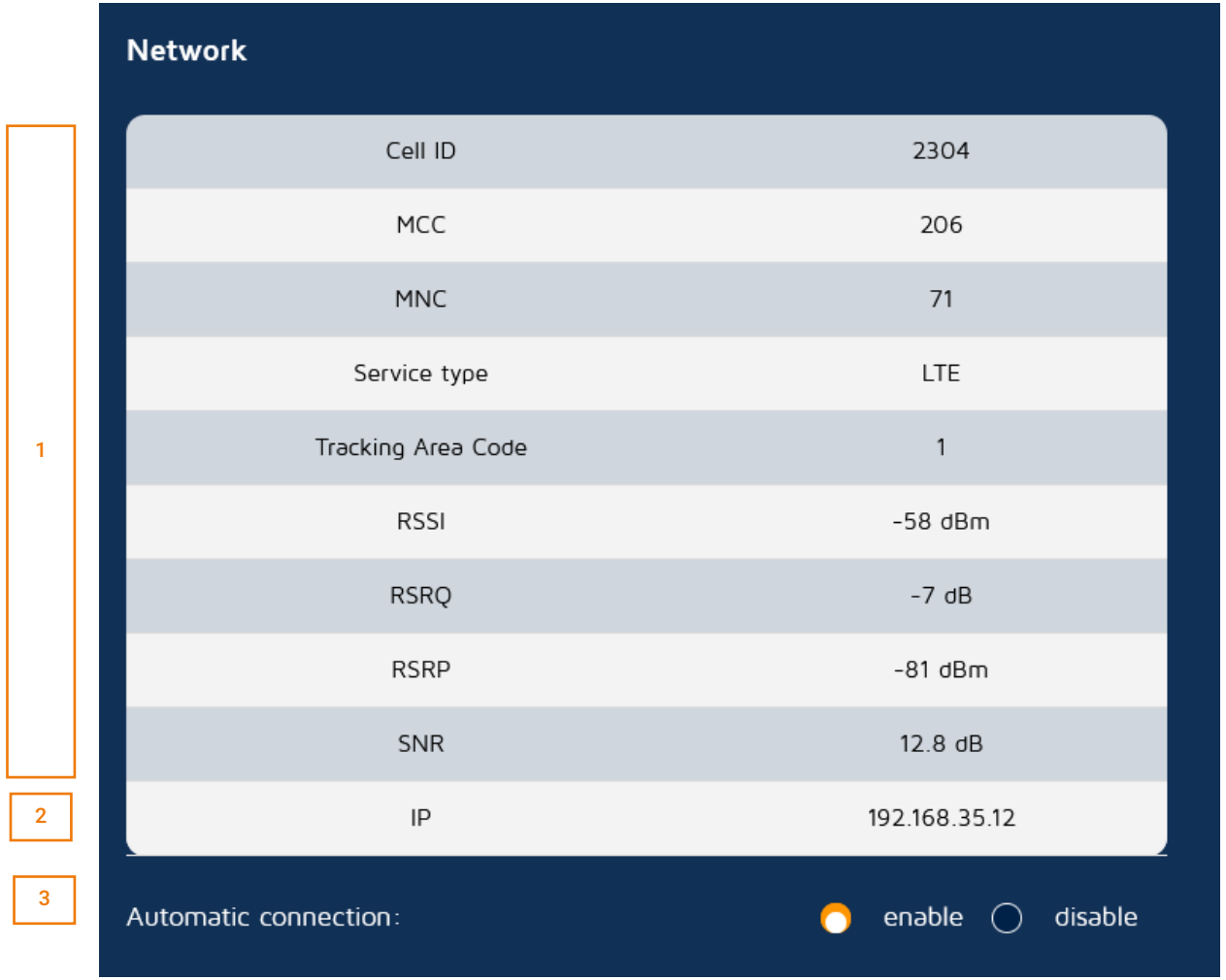
CONFIGURATION

4G configuration

Settings menu

1. Radio information (signal quality, SNR, service type,…)
2. IP of the WWAN interface
3. Automatic connection : this option should be enable when the camera is totally configured (with the SIM). It allows the camera to reconnect to the 4G network if the connection is lost

→ **Desactivate this option before changing a SIM card**, otherwise the camera will try to connect with the credentials of the old SIM card



Configuration

1. System & network
2. **M³ server connection**
3. Camera settings
4. Region of interest
5. Icar5 Average speed

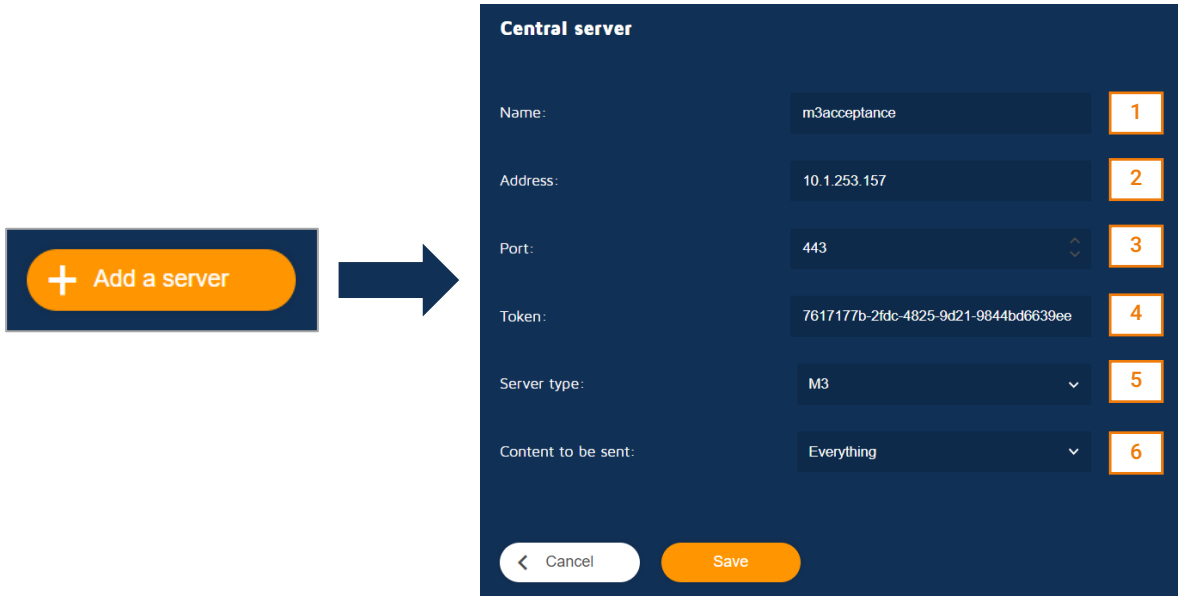
Macq Mobility

CONFIGURATION

M³ Server connection

Settings menu

This menu allows you to connect the camera to different M³ servers
→ Multiple servers are possible, depending on your needs



1. Name of the M³ server
2. IP address of M³ server
3. Port number of M³ (HTTPS : 443)
4. Token generated on the M³ server by the administrator (token generation is explained in our M³ documentation)
5. Type of server
   - Icar Manager – old version of M³
   - M³
   - Custom – if the images needs to be sent on another client's server
6. Choose the type of content that needs to be sent
   - Everything – Images + metadata (aka. detections)
   - Metadata – No images, only detections
   - B&W images + metadata
   - Color images + metadata

Once completed, click the Save button to load the connection

Configuration

1. System & network
2. M³ server connection
3. **Camera settings**
4. Region of interest
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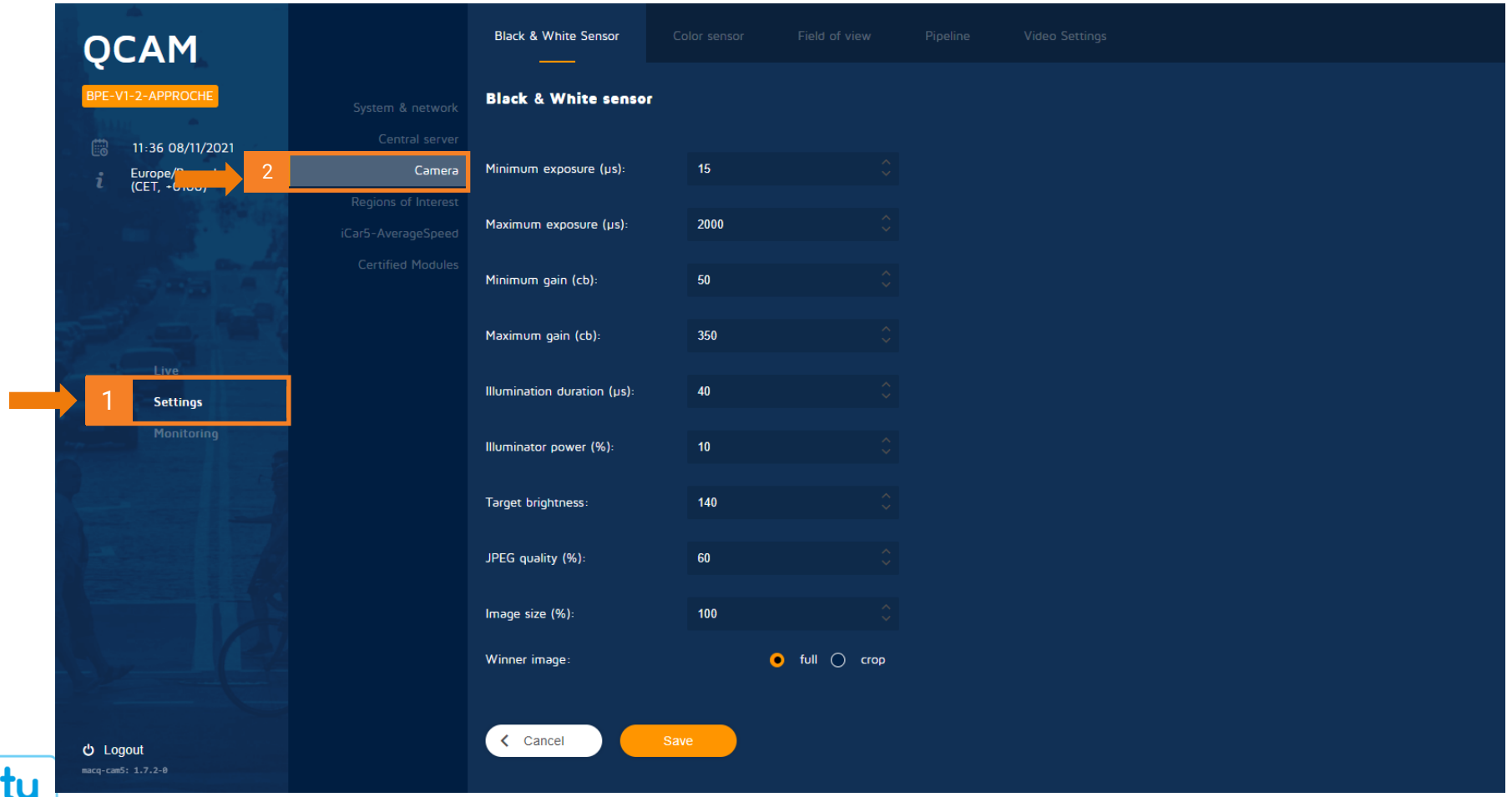
Macq Mobility

CONFIGURATION

Camera settings – access the menu

Settings menu



CONFIGURATION

Camera Settings

Settings menu

4 tabs in this menu

- Black & white sensor
  → configure the B&W sensor (exposure times, gain values, brightness, compression and image size, etc.) and illuminator

- Color sensor
  → configure the color sensor (exposure times, gain values, brightness, compression and image size, etc.)

- Field of view
  → rotate the camera by changing tilt and pan angles

- Pipeline
  →enable a software image enhancer that will modify the image received from the sensor to make it more pleasant for a human eye
  → Select appropriate license plate detection module
  → Restart/Stop the QCAM5 processing pipeline

Macq Mobility

CONFIGURATION

Camera Settings

Settings menu

	Parameter	Description	Recommended values
1	Minimum exposure	Time span during which the sensor of the camera is exposed to light when taking a picture (microseconds)	15
2	Maximum exposure		Highway (high speed vehicles): 2000 Urban: 5000
3	Minimum gain	Controls amplification of the image coming from the sensor (centibel)	10
4	Maximum gain		350
5	Illumination duration	Duration of the infrared light pulse (microseconds)	100
6	Illuminator power	Adjust the power of infrared illuminator (%)	Gantry on highway (no public lighting): 30-40 Urban pole: 10-30
7	Target brightness	Adjust average brightness of the picture (0-255)	140 (the higher this value the brighter the image)
8	Streaming protocol	hls / webrtc / no stream webrtc currently not supported (future development)	hls
9	JPEQ quality	Adjust the compression level of the picture	60
10	Image Size	Resize of the image	100

CONFIGURATION

Camera Settings

Settings menu

Winner image configuration

Full

Crop

Disclaimer: while the interface is ready to accept this functionality, the development is still planned. Release date: **tbd**

CONFIGURATION

Camera Settings – color sensor

Settings menu

	Parameter	Description	Recommended values
1	Minimum exposure	Time span during which the sensor of the camera is exposed to light when taking a picture (microseconds)	60
2	Maximum exposure		4000
3	Minimum gain	Controls amplification of the image coming from the sensor (centibel)	100
4	Maximum gain		350
5	Target brightness	Adjust average brightness of the picture (0-255)	140
6	Streaming protocol	hls / webrtc / no stream webrtc currently not supported (future development)	hls
7	JPEQ quality	Adjust the compression level of the picture	60
8	Image Size	Resize of the image	100

CONFIGURATION

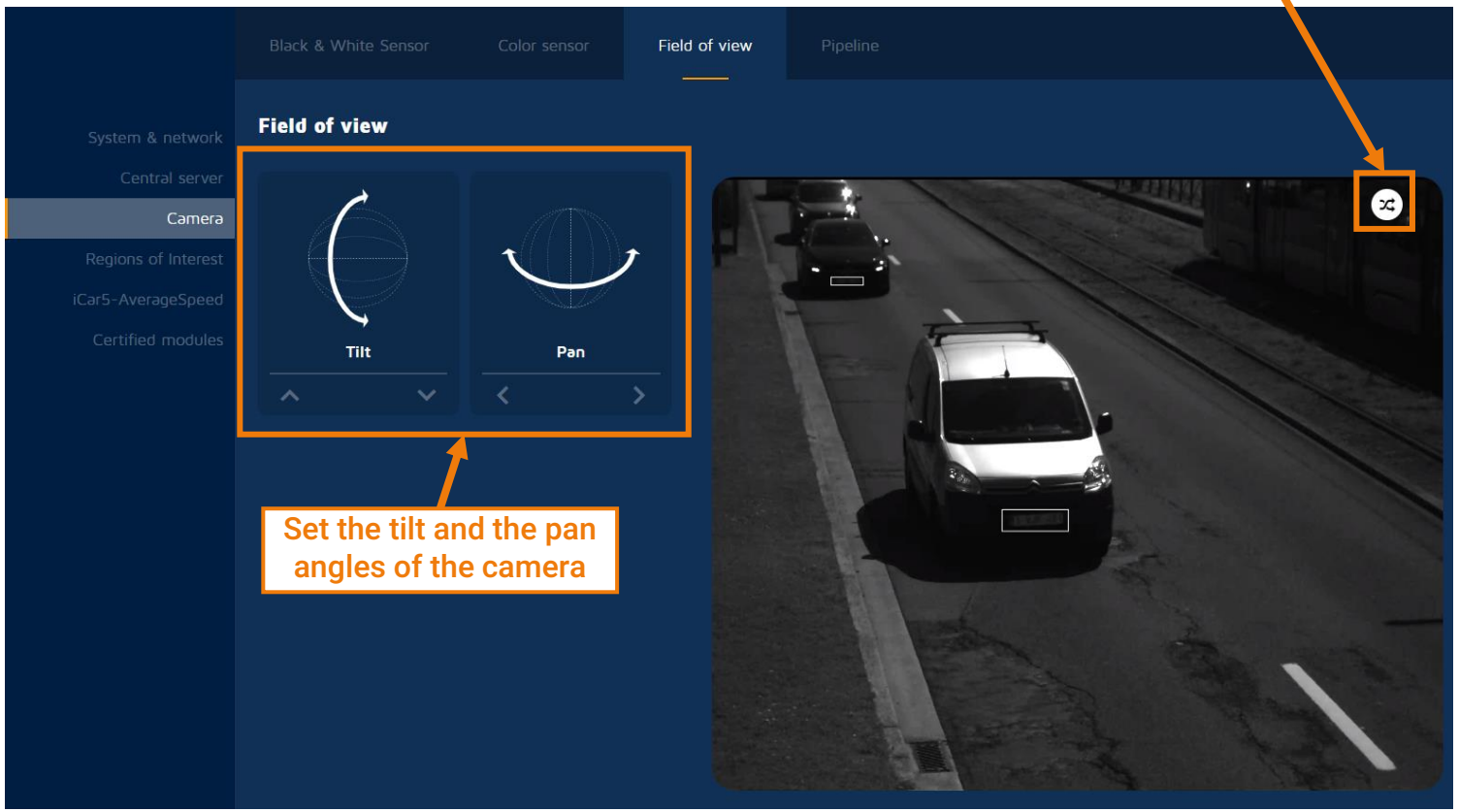
Camera Settings – field of view

Settings menu

Warning

Due to the delay caused by the HLS streaming protocol, you won't see the camera move instantly.
Adjust angles gradually when changing the position of the camera.

There is no stopping limit on the motors. If you reach the end of the maximum motion, the gears may disengage from the lead screw.



Configuration

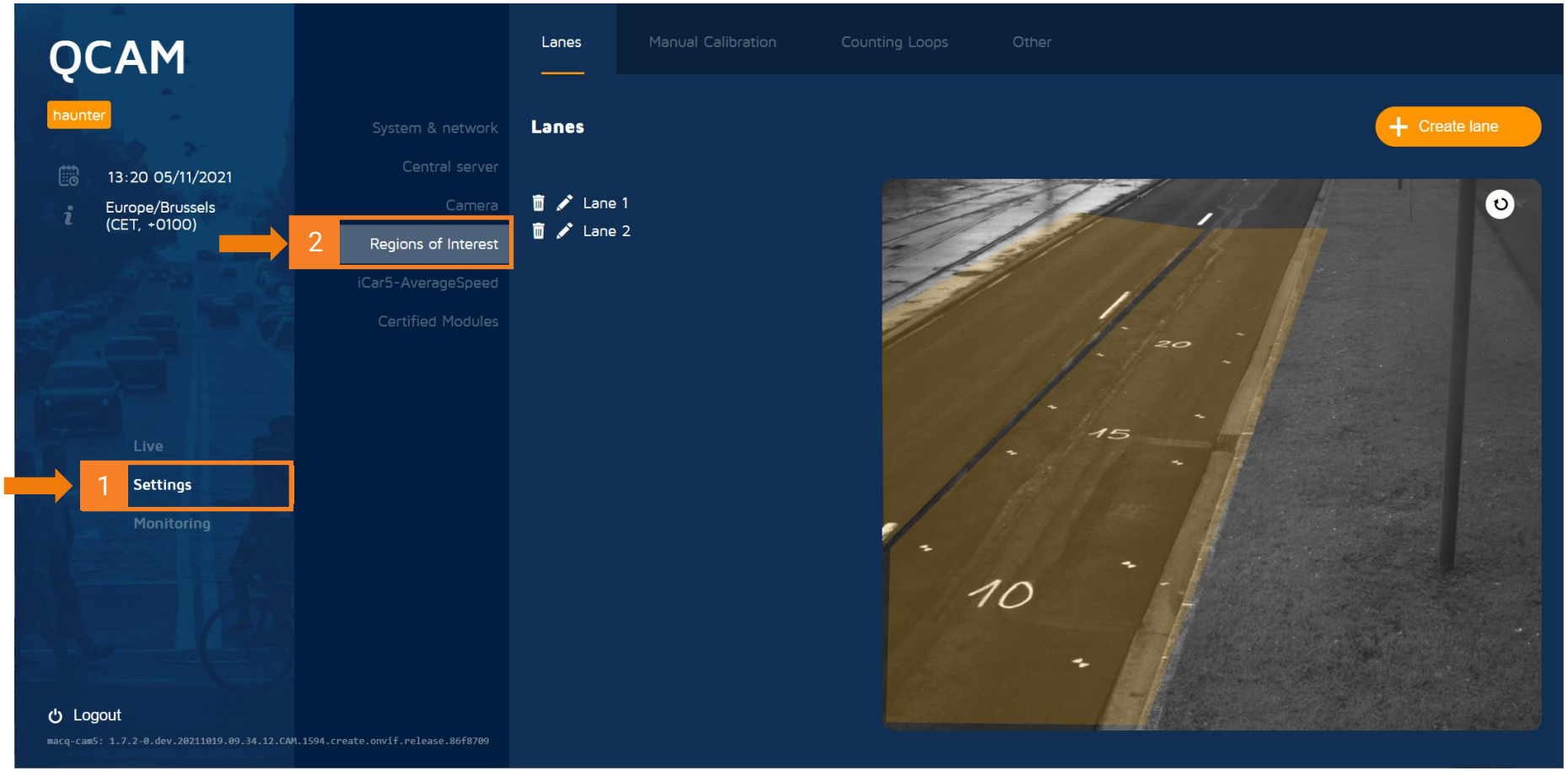
1. System & network
2. M³ server connection
3. Camera settings
4. **Region of interest**
5. Icar5 Average speed

Macq Mobility

CONFIGURATION

Region of interest – access the menu

Settings menu



CONFIGURATION

Region of interest – Lanes

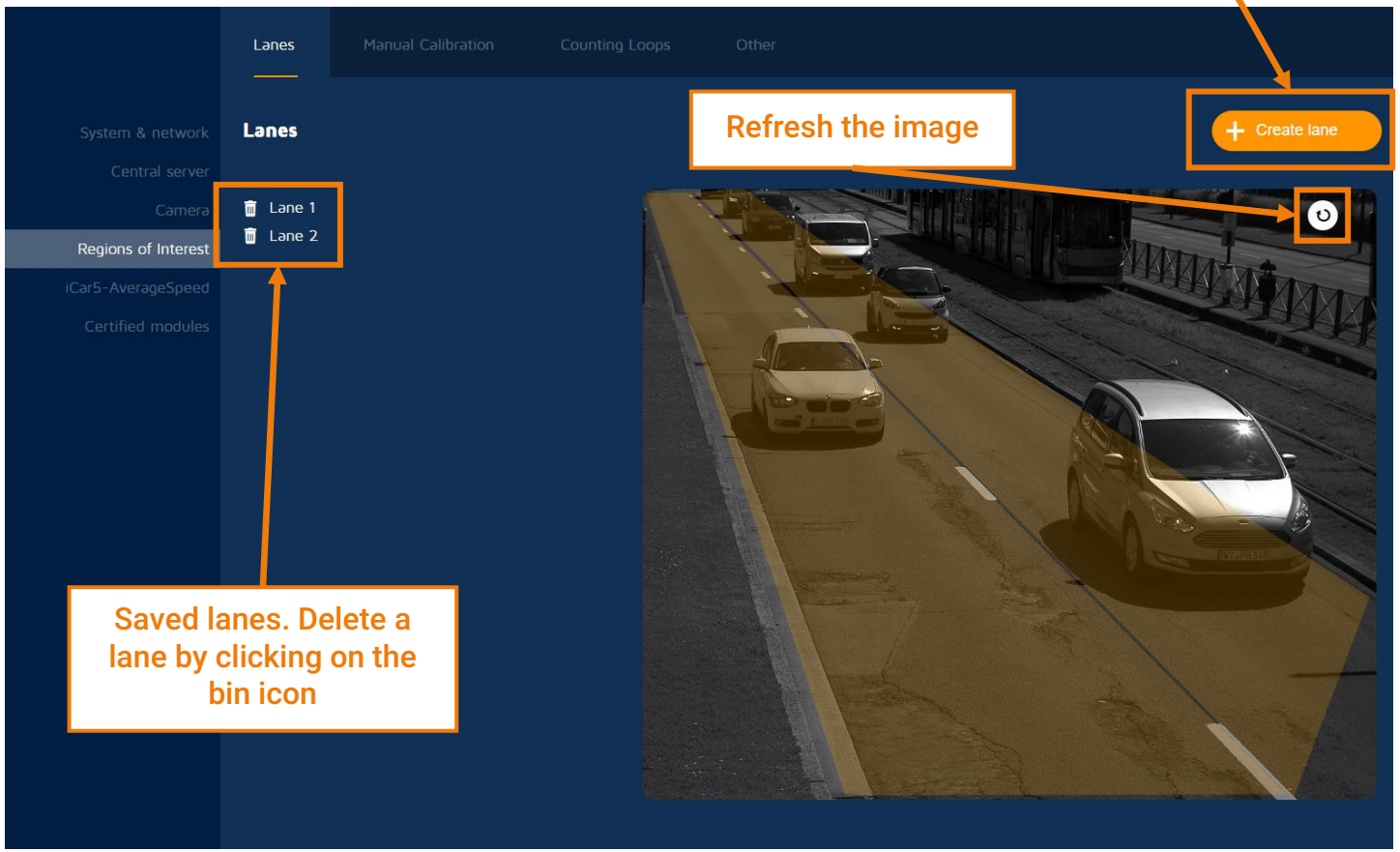
Settings menu

Lane definition (max 4)

1. Click on the **Create lane** button
2. Shape the lane directly on the preview image
3. Save your configuration

Defining Lanes

Lanes are used to identify the traffic lane in which the license plate of a vehicle spends most of its time (optional metadata field)

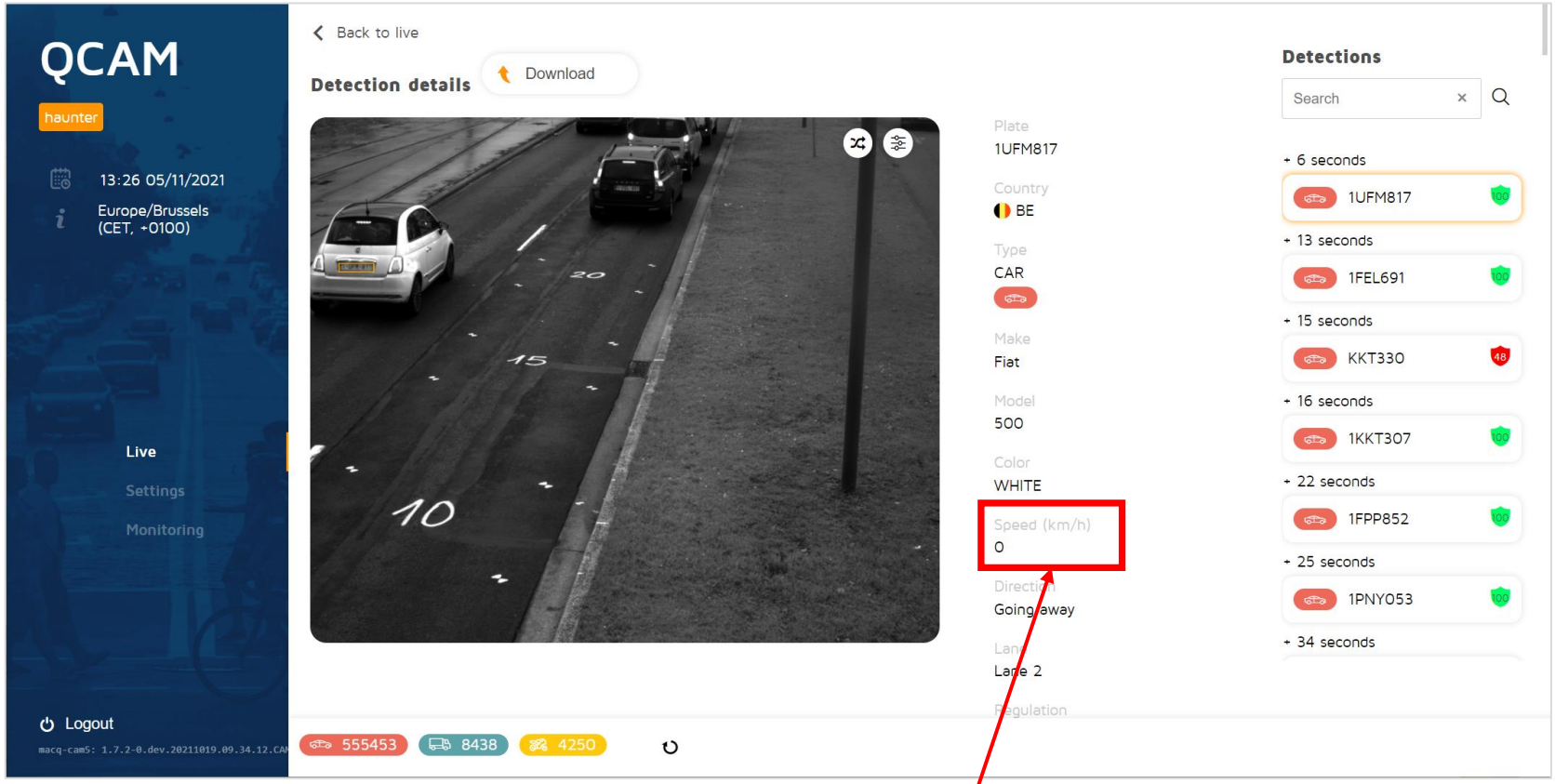


Macq Mobility

CONFIGURATION

Region of interest – Speed estimation

Settings menu

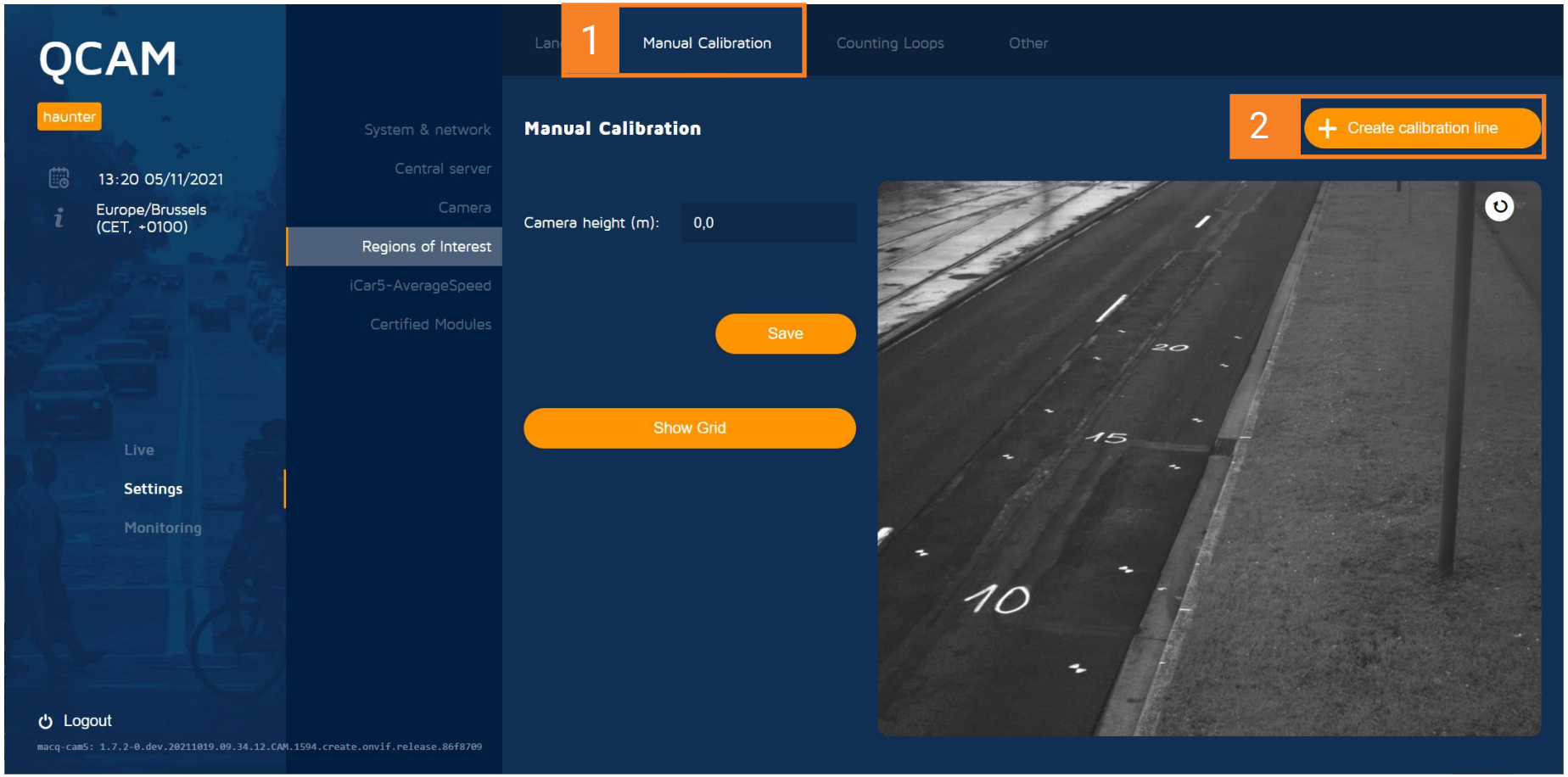


Speed estimates of 0 km/h

CONFIGURATION

Region of interest – Speed estimation

Settings menu

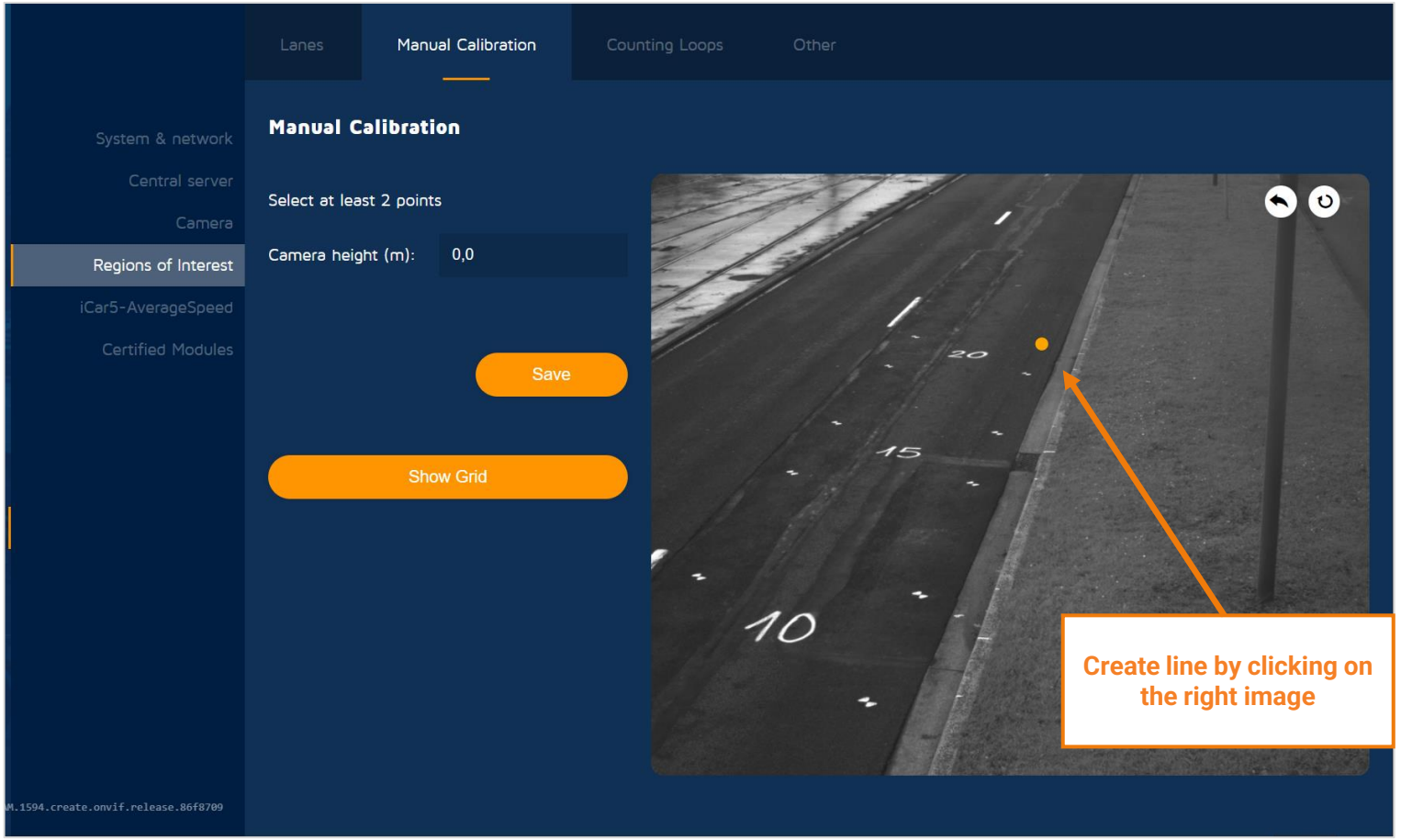


1	Create line by clicking on the right image

CONFIGURATION

Region of interest – Speed estimation

Settings menu



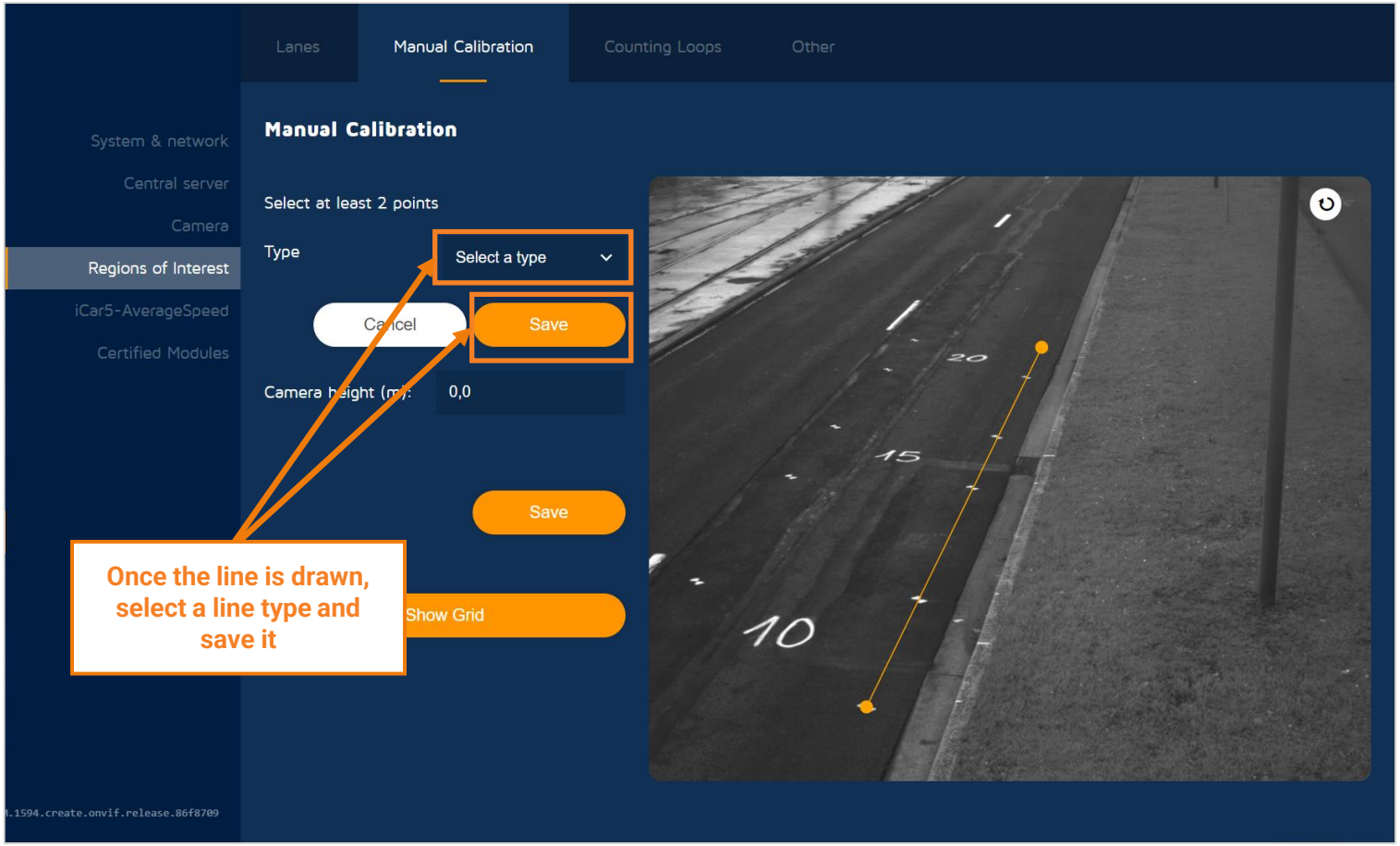
Tip

Use the zoom function for additional precision. When hovering with your mouse over the image to the right, it is possible to zoom in and out by scrolling up (zoom in) or down (zoom out).

CONFIGURATION

Region of interest – Speed estimation

Settings menu



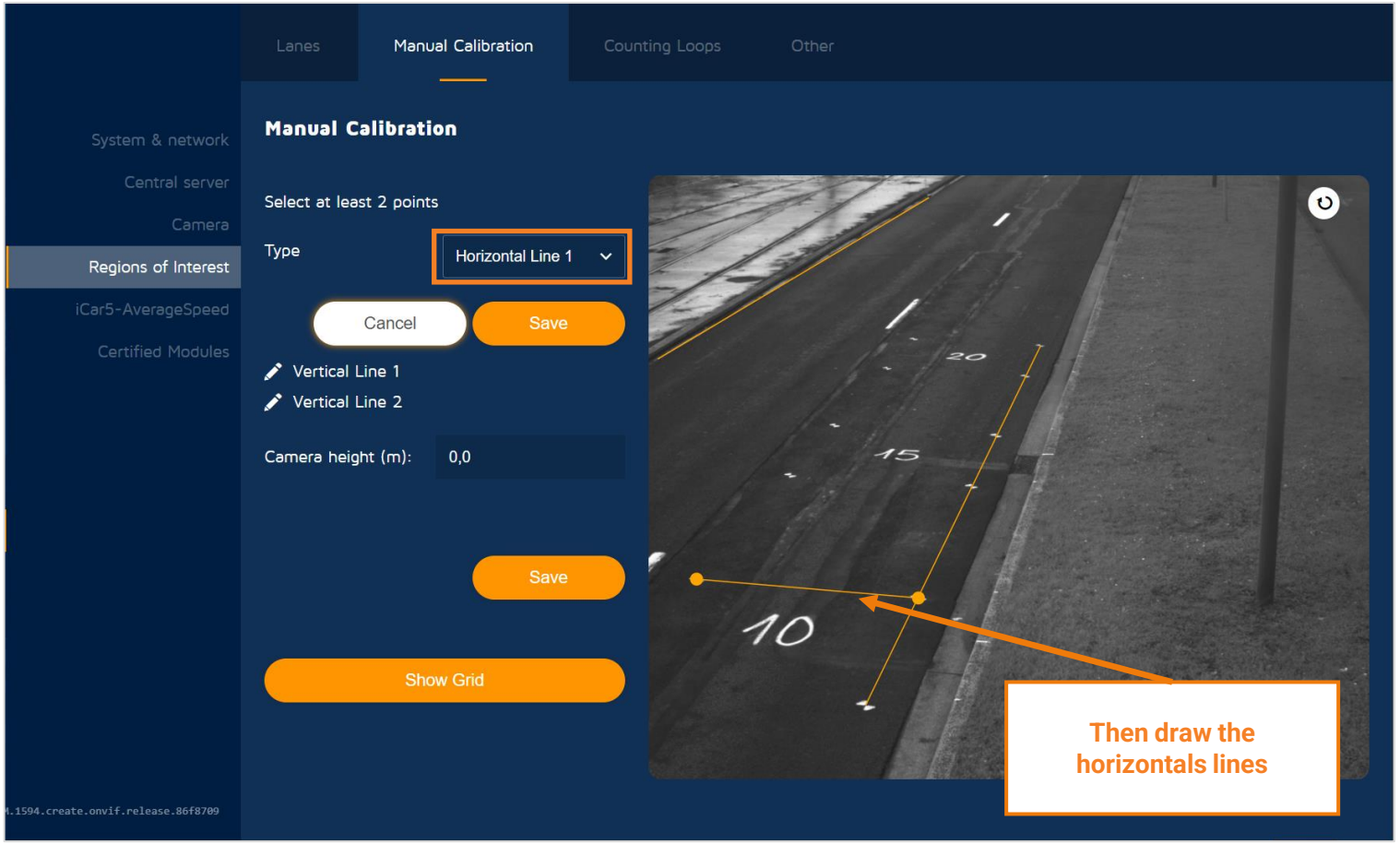
For a good calibration

- Two *vertical* and two *horizontal* lines must be created
- Vertical lines should be parallel to the road and road markings
- Horizontal lines are perpendicular to the vertical lines

CONFIGURATION

Region of interest – Speed estimation

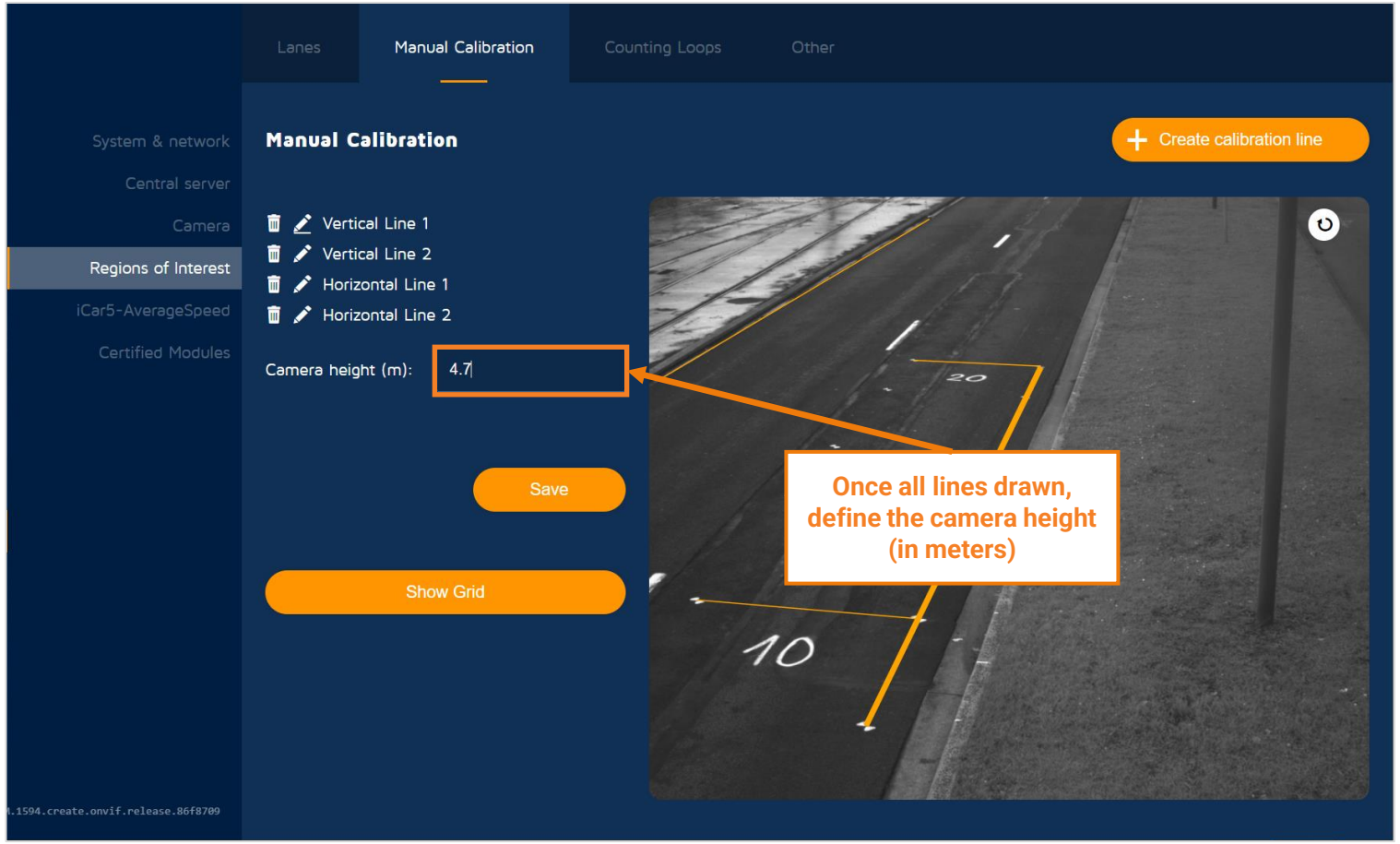
Settings menu



CONFIGURATION

Region of interest – Speed estimation

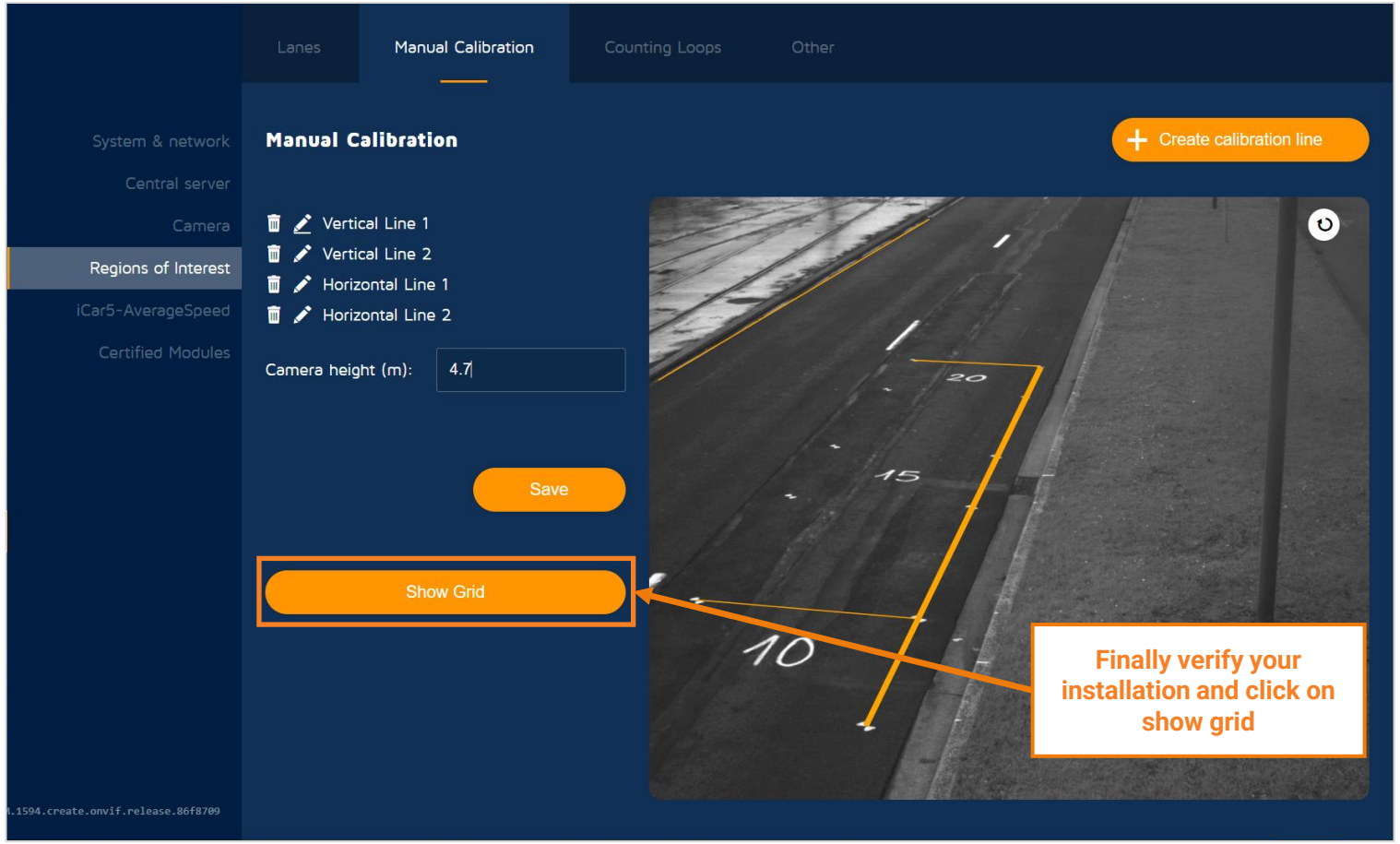
Settings menu



CONFIGURATION

Region of interest – Speed estimation

Settings menu



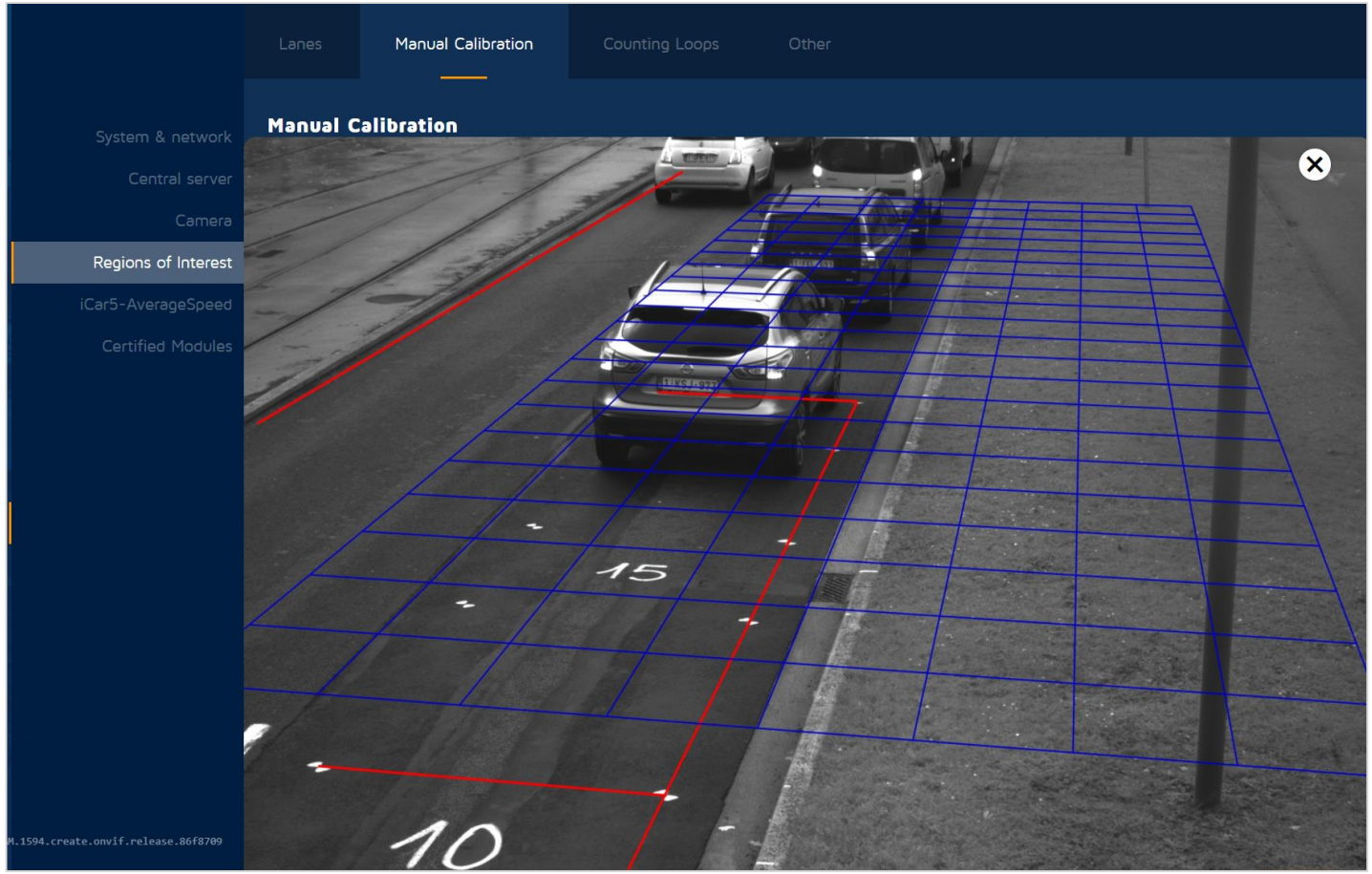
Note

Functionnality available since V1.8.0 of the camera

CONFIGURATION

Region of interest – Speed estimation

Settings menu



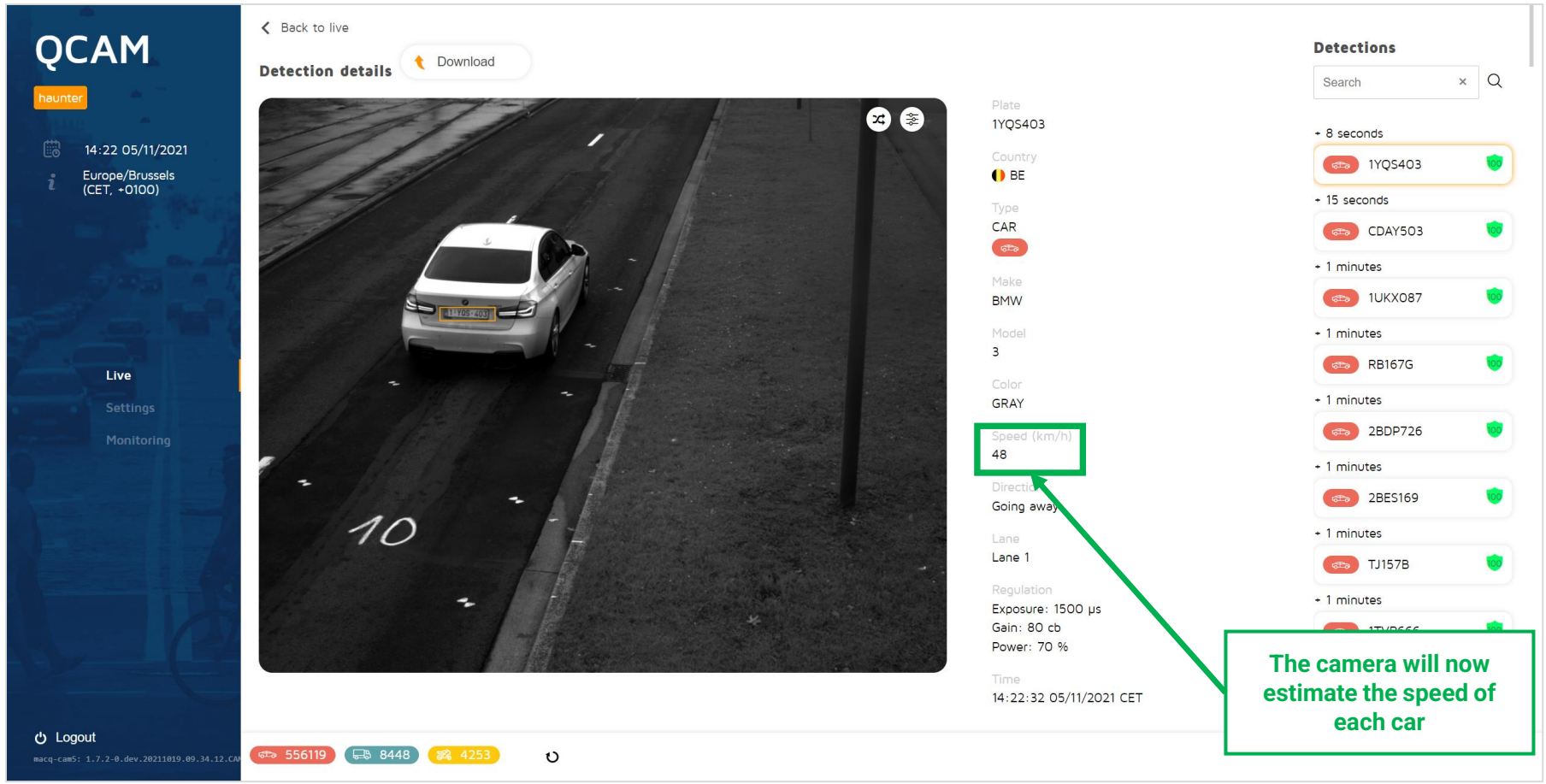
Note

Every grid cell corresponds to a 1 x 1 meter square on the road

CONFIGURATION

Region of interest – Speed estimation

Settings menu



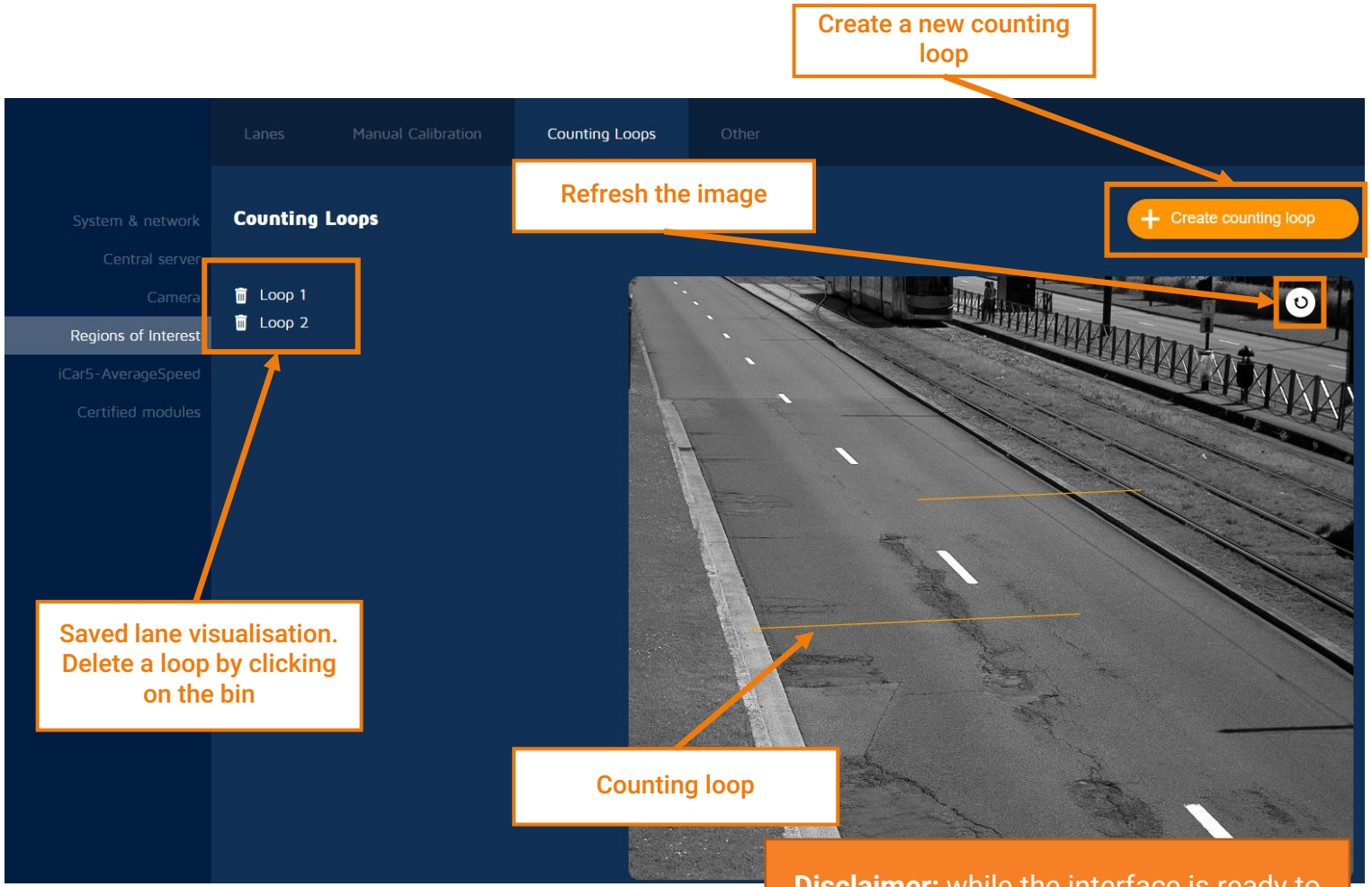
CONFIGURATION

Region of Interest – counting loop

Settings menu

Create a loop

1. Click on the **Create counting loop** button
2. Create the loop directly on the preview image
3. Save you configuration



What are counting loops?

- Counting loops are lines drawn on the screen
- The purpose of counting loops is to count the number of vehicles that cross the line

Disclaimer: while the interface is ready to accept this functionality, the development is still planned. Release date: **tbd**

CONFIGURATION

Region of interest - other

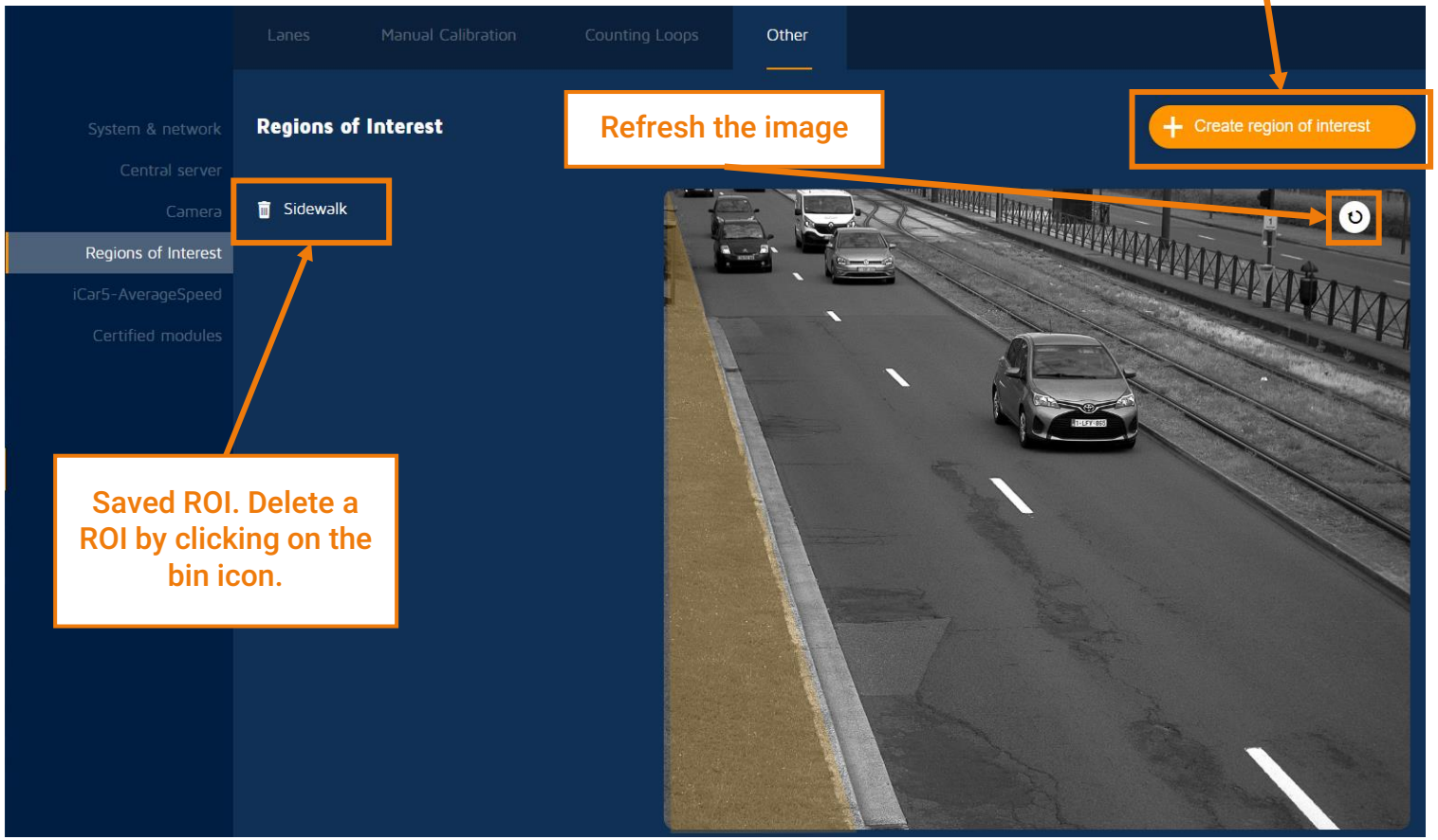
Settings menu

Create other type of regions

1. Click on the Create region of interest button
2. Shape the region directly on the preview image
3. Save your configuration

The ROI module allows you to create different types of region of interest, such as:

- Sidewalk
- Intersection
- Bicycle lane
- Safety lane
- Traffic light



Configuration

1. System & network
2. M³ server connection
3. Camera settings
4. Region of interest
5. **Icar5 Average speed**

CONFIGURATION

Average speed certification module

Settings menu

iCar5-AverageSpeed

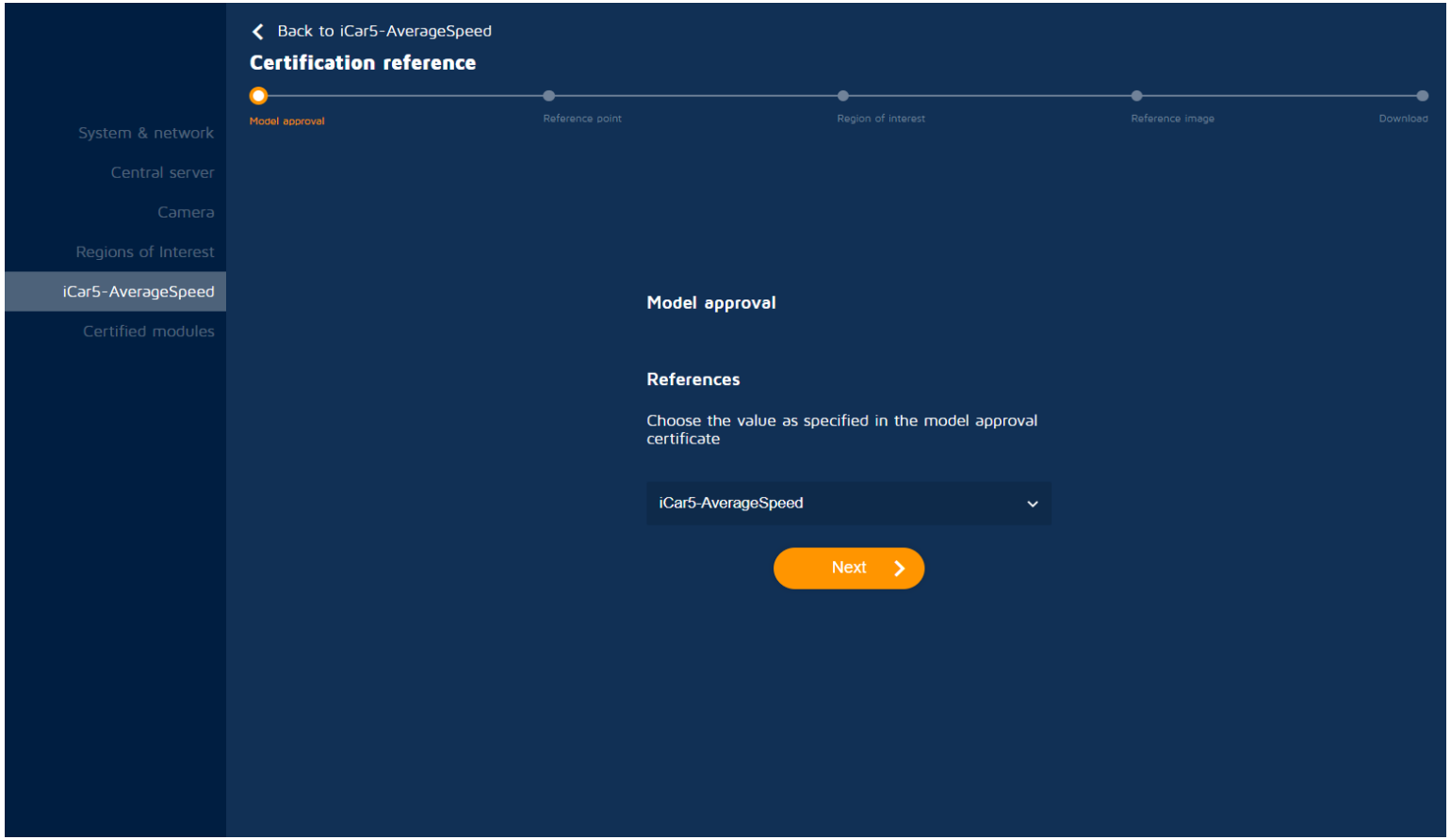
This module is used for the certified average speed application (i.e. speed control on a trajectory).

Every certified application has certified modules, listed in the section « Certified modules »

Disclaimer:

More information on the certified average speed application and its configuration can be found in the appropriate documentation.

Contact your Macq representative.

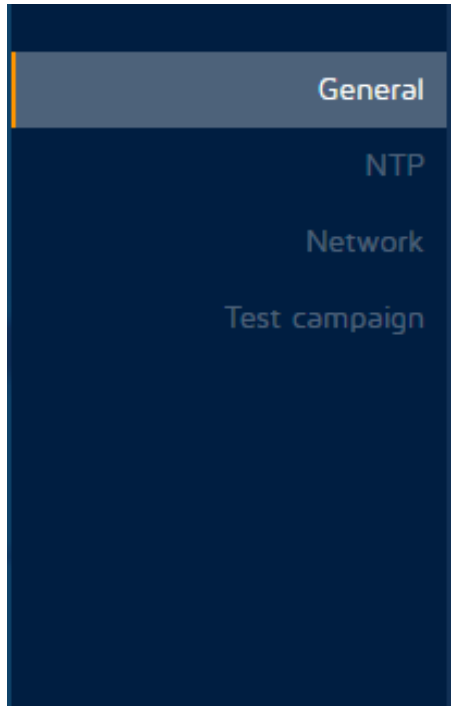


Monitoring

Monitoring

Overview

Monitoring menu

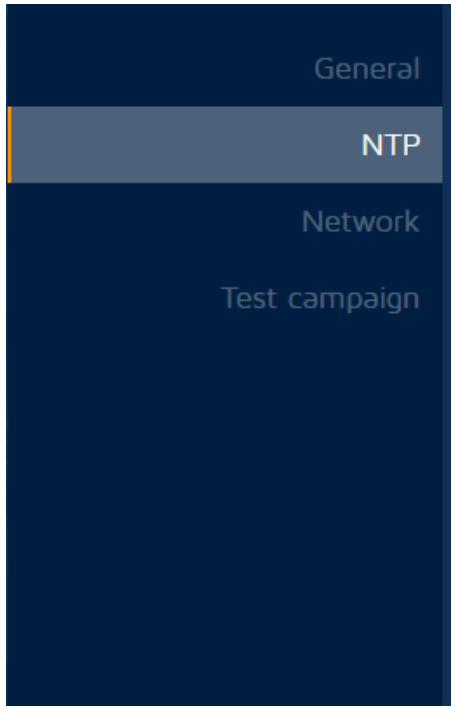


Sub menu	Content
General monitoring → general information on the system, hardware and software packages	**System** • CPU usage • Disk usage • Memory usage • GPS information **Hardware** • Illuminator • FPGA • Sensors • Power consumption • Operating temperatures • External Memory Controller (EMC) information • GPU information • TX2 module information **Software packages** • Processes uptime • Installed packages & version **Reboot button**

Monitoring

Overview

Monitoring menu

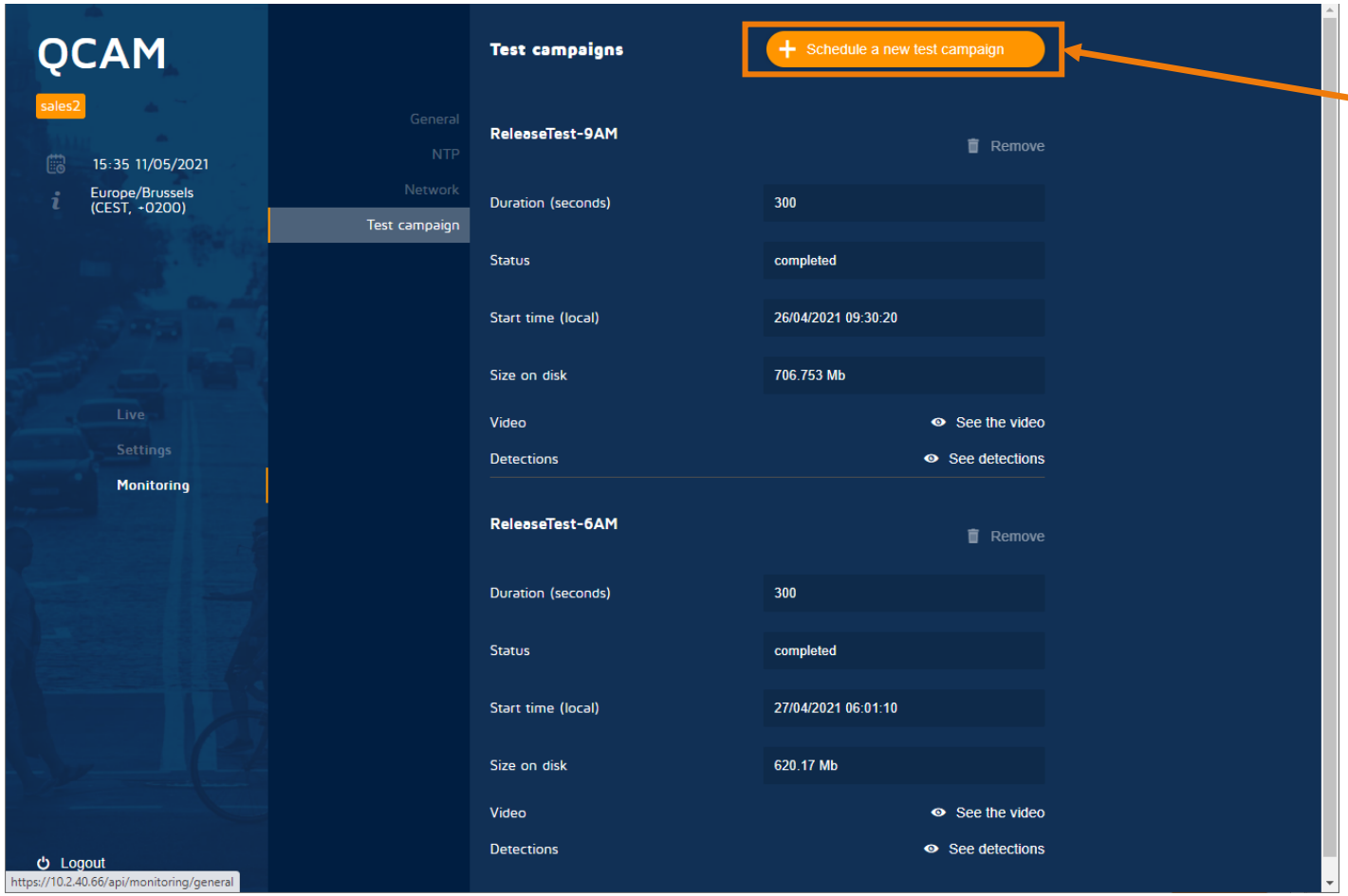


Sub menu	Content
NTP → information on the NTP synchronisation	• NTP server address • delay • offset • jitter
Network → ip addresses configured on the camera (output of the ifconfig command)	• eth0 : ethernet physical interface • lo : loopback interface, always 127.0.0.1 • wlan0 : Wi-Fi interface
Test campaign → useful when you want to record a video to perform a test campaign on the camera	

Monitoring

Test campaign page

Monitoring menu



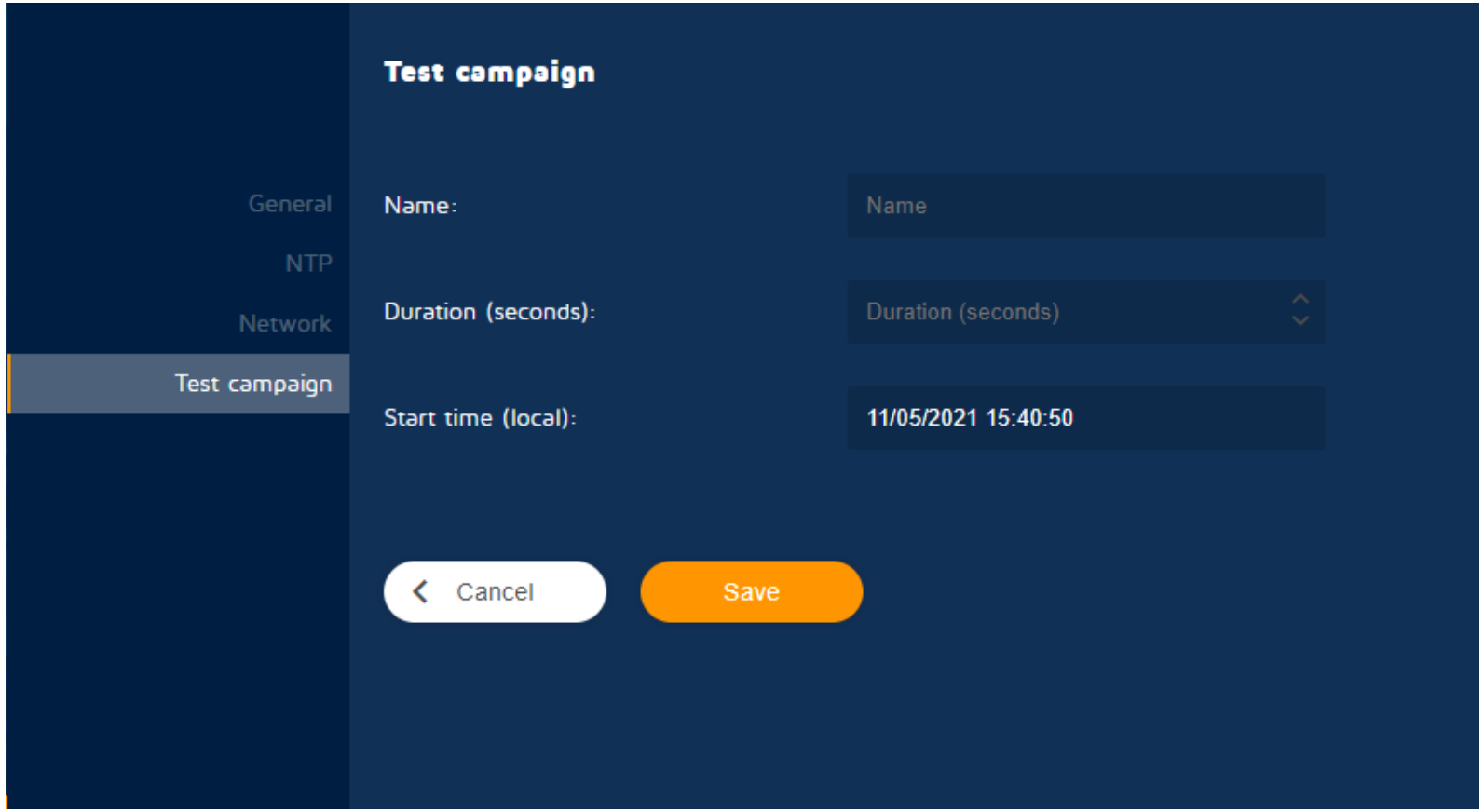
Schedule a new campaign

List of past and scheduled campaigns

Monitoring
Creating a campaign

Create test campaign

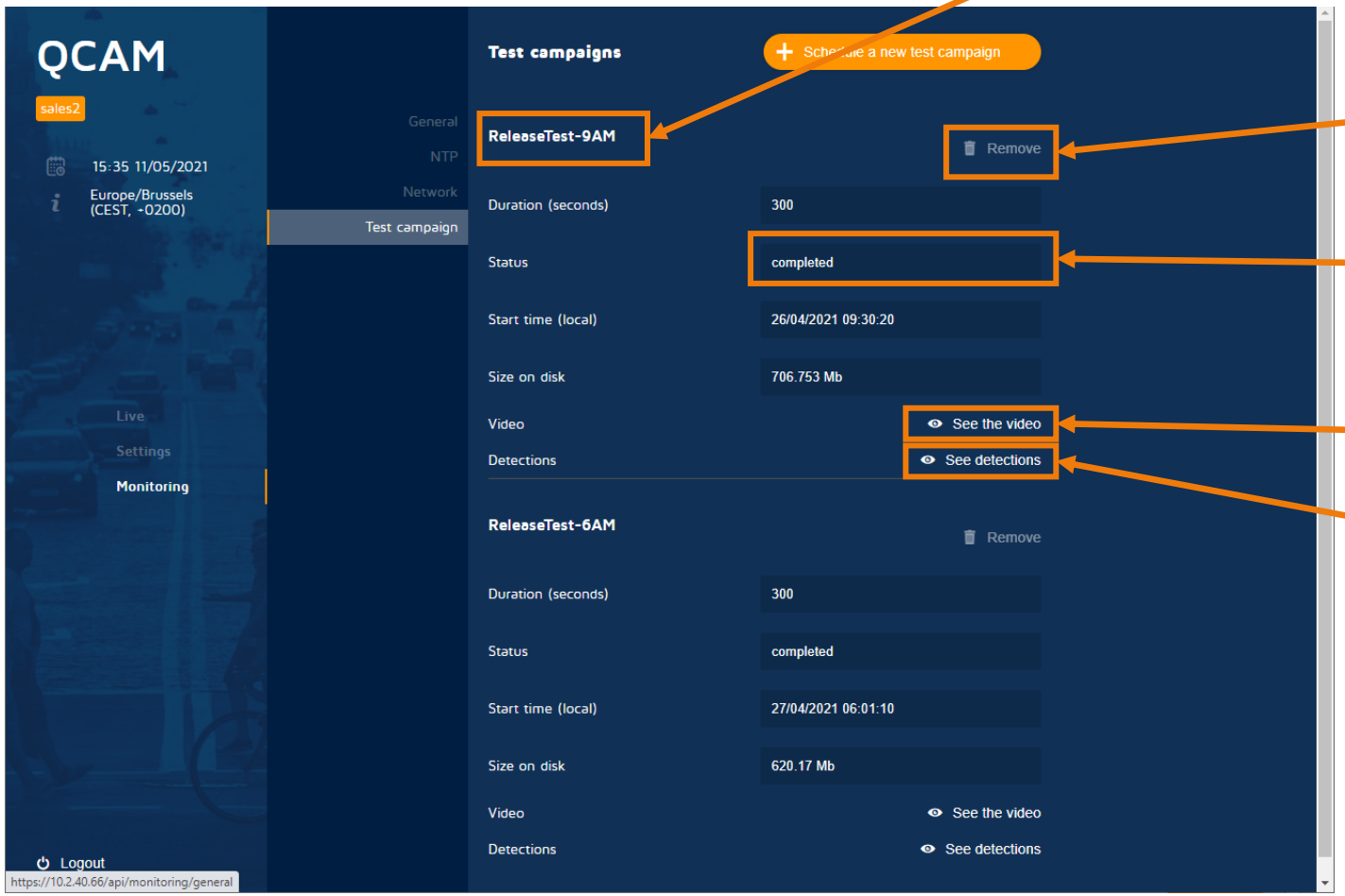
1. Provide a name for the campaign
2. Provide a duration (in seconds)
3. Put a start time
4. Click the Save button



Monitoring

Viewing test campaigns

Monitoring menu



Campaign name

Remove the test campaign and associated data
! Its your responsibility to clean up the campaign data

Status (initializing/recording/completed)

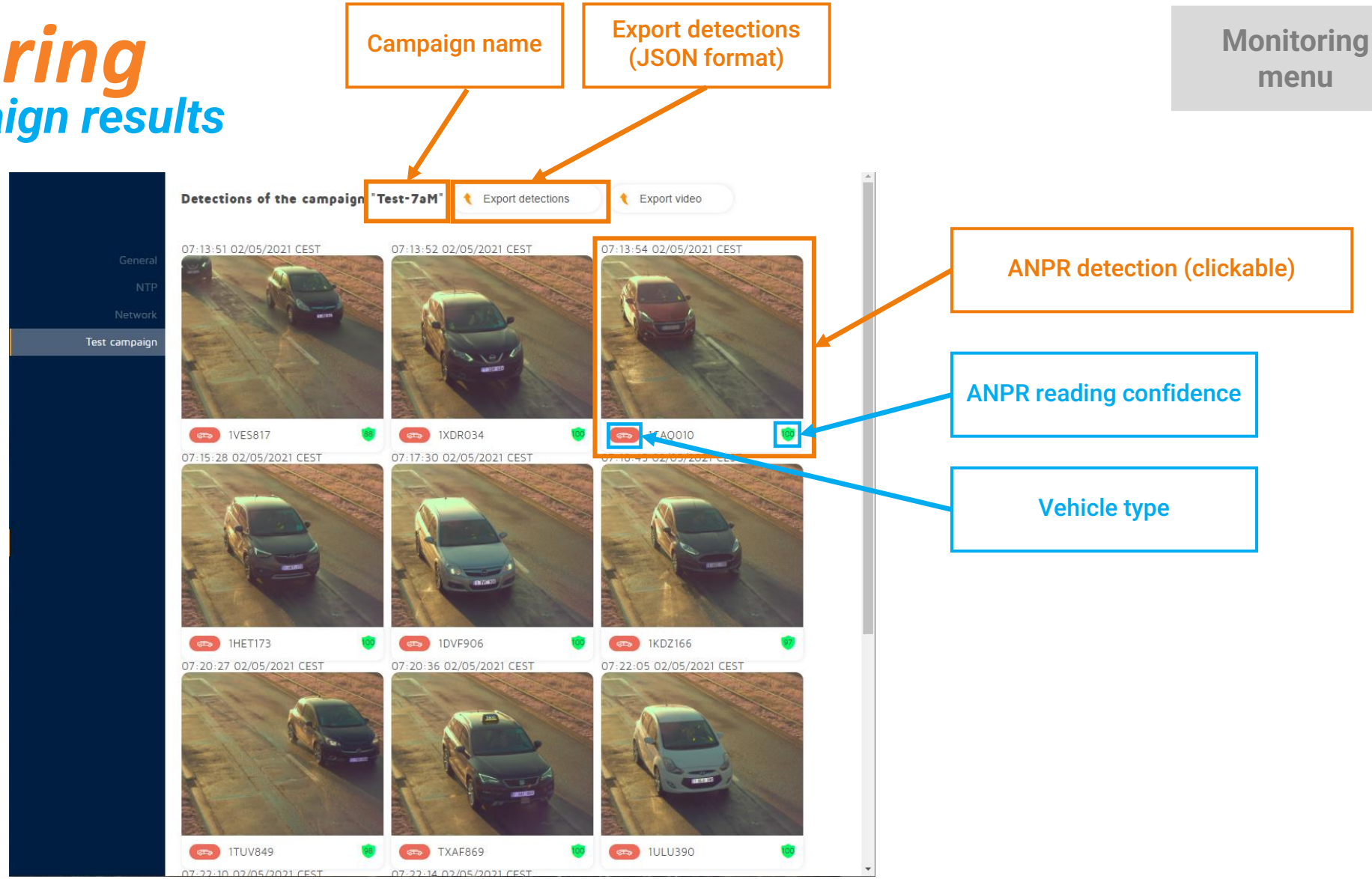
Watch recording of test campaign

View the detections

Monitoring

Test campaign results

Monitoring menu




THANK YOU