Mobileye 8 Connect

Technical Installation Guide (4G) v1.3

mobileye™
An Intel Company

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1. Warnings

NOTE

- ✓ Do not connect any system component when vehicle power is On.
- ✓ All system components must be connected before turning the system power On.
- ✓ Before making the power connections, extract the Fuse from the Fuse holder and add it back only after all system components and cables are connected and before turning the vehicle power On.

1.1 General

Mobileye 8 Connect is Mobileye's new driver assistance system, containing the latest iteration in Mobileye's state-of-the-art machine vision software – the EyeQ®4 system-on-chip.

Mobileye 8 Connect alerts the driver, aurally and visually, to certain potentially dangerous situations on the road; the greater the danger, the more 'urgent' the warning.

Mobileye 8 Connect is not an automated driving system. It does not replace the driver nor allow the driver to be any less vigilant or alert to the road than he/she would otherwise be. It does not reduce the driver's responsibility for driving properly, nor his/her liability for driving improperly or unlawfully. In particular, the driver should ensure not to be distracted from the road by the Mobileye 8 Connect display unit.

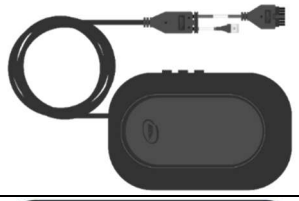
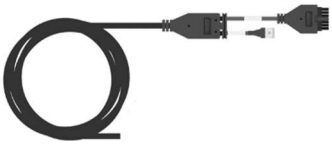
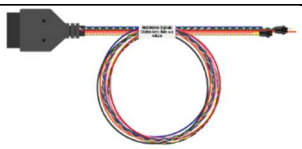
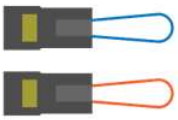
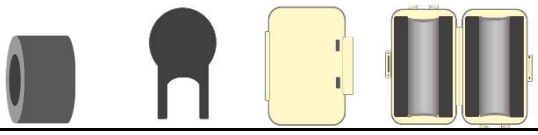
Mobileye 8 Connect works best on paved roads with clear lane markings. Even then, Mobileye cannot guarantee 100% accuracy nor the absence of false positives ('seeing' something that's not there) or false negatives (failing to 'see' something that is there), especially in adverse road or weather conditions.

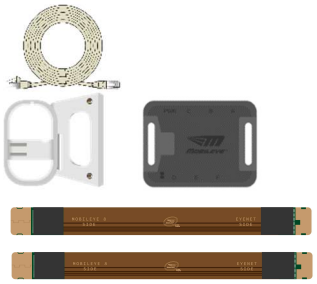
Mobileye 8 Connect is designed to detect only fully visible vehicles and fully visible pedestrians and bicycles (both in daylight and at night). It is not designed to detect crossing, oncoming, or passing vehicles.

1.2 Installation and safety instructions

- ✓ Mobileye 8 Connect installation must be carried out by an authorized Mobileye 8 Connect dealer or Installer.
- ✓ Do not transfer Mobileye 8 Connect to another vehicle after installation.
- ✓ The Mobileye 8 Connect GSM Nano SIM card will work only with the Mobileye 8 Connect unit with which it is supplied; do not use the SIM for other purposes or with other Mobileye 8 Connect units.
- ✓ Operate Mobileye 8 Connect only with 12VDC~24VDC power.
- ✓ Do not cover or obstruct the Camera Unit or Display and Control Unit.
- ✓ Use proper tools.
- ✓ Use only an LED voltage tester or digital multi meter. Do not use a light bulb voltage tester.
- ✓ Pay attention to unusual color cables, for example: yellow cables belong to air bags; two twisted wires usually belong to different (digital) sensors.
- ✓ Before disconnecting the battery or radio connectors make sure to have the radio code in hand.
- ✓ Do not disconnect any plug or connector in the vehicle while the car's ignition switch is on.
- ✓ **Use protective gloves when handling the camera unit to protect against heat burns.**

2. Component's overview

Package List	Component	Mobileye P/N
Master Camera unit		ASY0000000000805
4G Modem		PAC0000AJMODEM4G PAC0000CHMODEM4G PAC0000EUMODEM4G PAC0000INMODEM4G PAC0000NAMODEM4G PAC0000LAMODEM4G
display unit – Eyewatch		ASY000130
Main cable		CAB000400 Rev3.3
Signals cable		CAB000371 Rev6.3
CAN Reader		CAB000302 Rev.0.3
External fuse holders with 2A fuses		Fuse - ITM000205 Fuse holder (Red) - ITM000206 Fuse holder (Blue) - ITM000207
3M VHB Surface Cleaner		ITM000024
Ferrite		ITM000786 – Ring Ferrite \ ITM000777

Installer Kit			
EyeNET		Used for system installation, calibration, and configuration	EyeNET0001
TAC		used both for the main camera attachment to the windshield (reference point) and for calibration calculation	TACS00003

NOTE ➡

✓ The Mobileye EyeNET is not part of the Mobileye 8 System and is sold separately.

3. Software download & installation

Mobileye 8 Connect series uses a dedicated applications for configuration and calibration*.
The applications are part of the **Mobileye Installation Center**.
The software installer is available in our website under "support" tab or in the following direct link:

https://www.mobileye.com/support/

NOTE

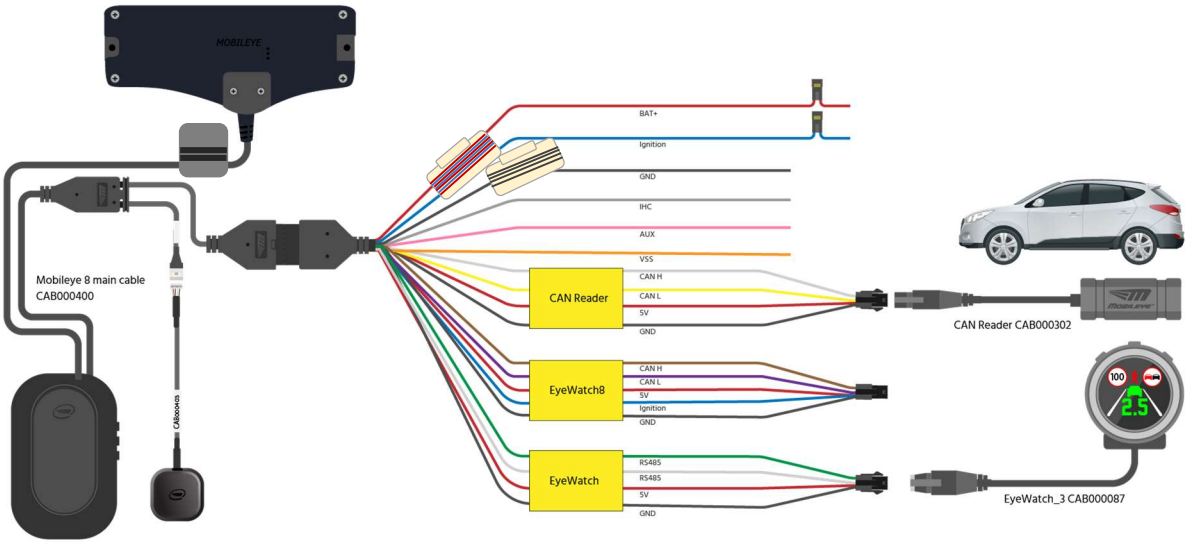
Please make sure you have Administrator Privileges before installing the Mobileye IC application, if not, please contact your IT department for further assistance.

NOTE

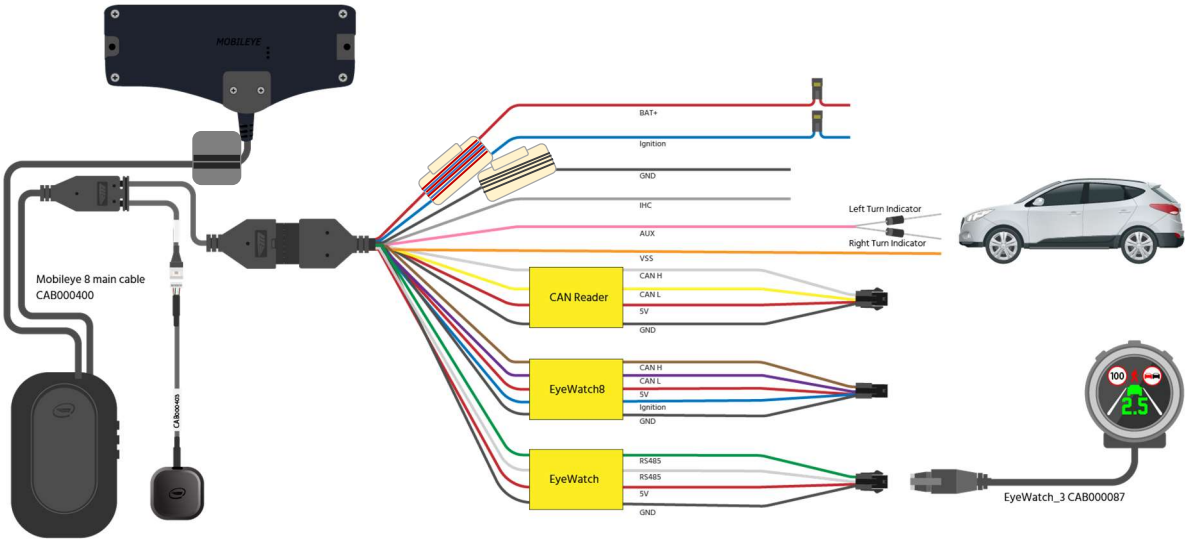
To keep the most up to date version of the IC application, login with your login details to enable to automatic update. If an update is available, follow the on-screen

4. Connection Scheme

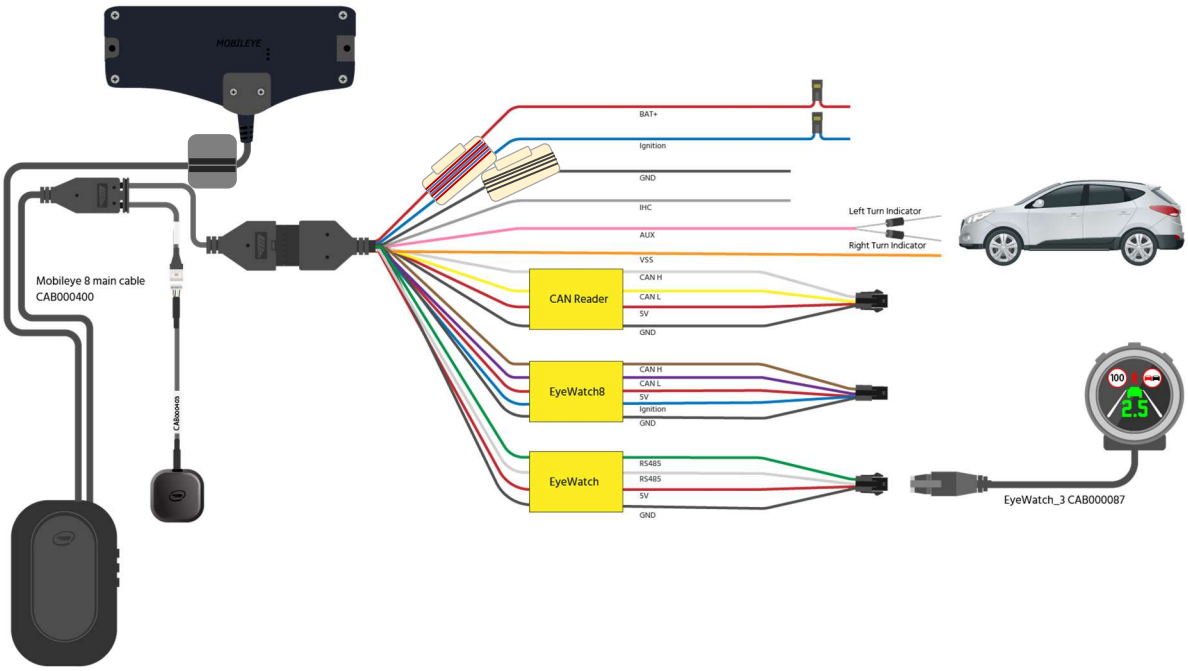
4.1 CAN-bus installation scheme



4.2 Mix installation scheme (Analog + CAN-bus)



4.3 Analog installation scheme



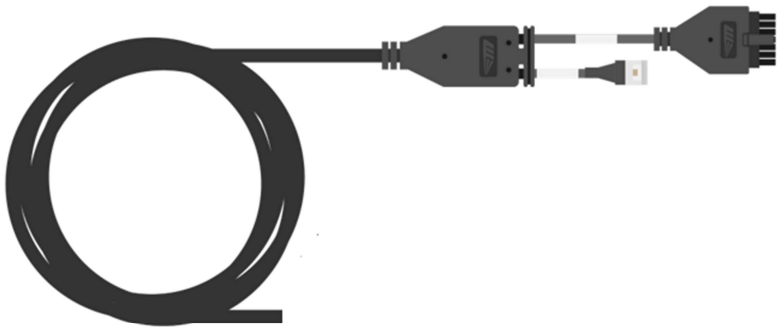
5. Connection description

The following paragraphs describe in detail the function and connections of the system's components.

5.1 Main unit connections (CAB000400 Rev3.3)

Wire Name & Function	Wire color	Connector	Connection To
Signals - (14 pin connector)	Black	J1	Vehicle signals cable (CAB000371 rev.6.3)
GPS - (5 pins White connector)	Black	P2	GPS Module and extension cable CAB00402 Rev 1.1

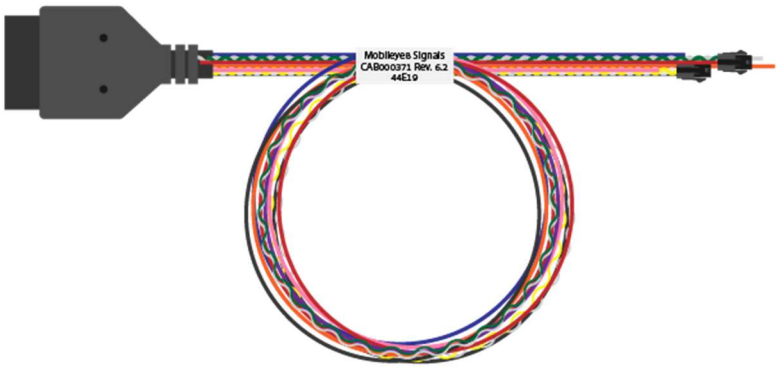
Table 1: Mobileye 8 Connect cable connections



5.2 Mobileye 8 Connect signals cable (CAB000371 Rev6.3)

The Mobileye 8 Connect signals cable splits into a few cables which connect to the vehicle power source, to the vehicle CAN-bus (Via CAN Reader connector) , to the vehicle analog speed signal, to the vehicle high-beams (for IHC), to one of the vehicle's analog signals if required (or both analog left- and right-turn indicator signals via diode), to the EyeWatch display unit (via 4 pin male connector labeled as "EyeWatch" and it contains a 6-pin female connecter labeled "EyeWatch 8" to provide future connection for new EyeWatch unit.

A detailed description of each of the wires in the analog cable can be found in the following table below:



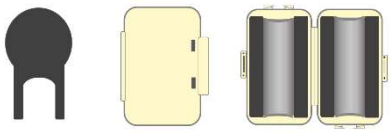
Wire Name & Function	Wire color	Connector	Connection To
BAT+ (12/24V)	Red	-	Vehicle`s constant power (Battery)
GND	Black	-	Vehicle`s GND (BAT-)
Ignition (12/24V)	Blue	-	Vehicle`s ignition signal
CAN B H	White	4pin	CAN Reader
CAN B L	Yellow	4pin	CAN Reader
5V for CAN Reader	Red	4pin	CAN Reader
GND for CAN Reader	Black	4pin	CAN Reader
VSS	Orange	-	Vehicle`s Analog speed signal
CAN A High	Purple	6pin	EyeWatch 8
CAN A Low	Brown	6pin	EyeWatch 8
5V for EyeWatch 8	Red	6pin	EyeWatch 8
GND for EyeWatch 8	Black	6pin	EyeWatch 8
AUX (Analog Input)	Pink	-	1 analog signal input (or both Left and Right Turn indicators analog input via Diode)
IHC – **(Analog Output)**	Gray	-	Vehicle`s high beams via external relay or connection to any 3rd party device
RS-485 High	Green	4pin	EyeWatch 3
RS-485 Low	White	4pin	EyeWatch 3
RS-485 GND	Black	4pin	EyeWatch 3
RS-485 5V DC	Red	4pin	EyeWatch 3

Table 2: Mobileye 8 Connect analog signals cable connection

5.3 Ferrite

5.4 Ferrite for power sources – Model 1 (ITM000777)

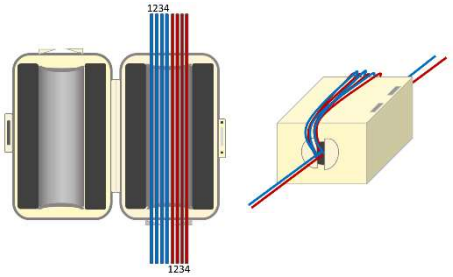
Note: The Ferrite size and shape may vary different between different Ferrite models.



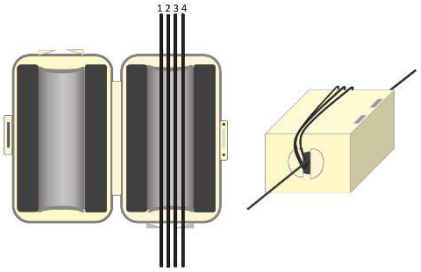
5.4.1 Instructions for Power Sources (CAB000371)

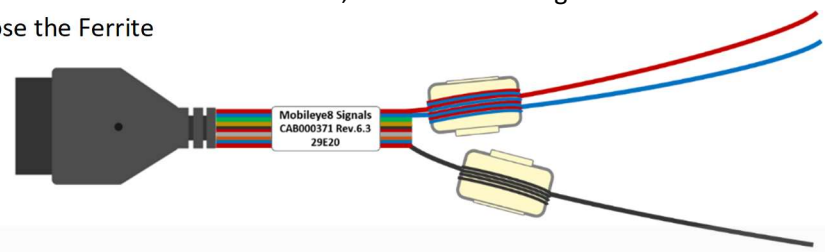
Please follow the instructions bellow for the two ferrites installation:

1. Open the Ferrite using a small flat screwdriver.
2. Place both Mobileye **BAT+** wire and **Ignition** wire (CAB000371) together inside the first Ferrite.
3. Locate the Ferrite 5cm from the Mobileye CAB000371 label
4. Wrap the BAT+ and Ignition wires through the Ferrite **4** times ***and*** around the outside of the Ferrite **3** times, as shown in the figures
5. Lock the Ferrite



6. Open the second Ferrite using the supplied Key or small flat screwdriver
7. Place the Mobileye **GND** wire in the second Ferrite (locate the Ferrite filters 5cm from the Mobileye CAB000371 label).
8. Wrap the GND wire through the Ferrite **4** times **and** around the outside of the Ferrite 3 times, as shown in the figures
9. Close the Ferrite





NOTE

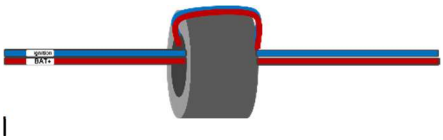
- ✓ Ferrite installation on power lines are mandatory in CE marking countries.
- ✓ Ferrite installations are not mandatory for FCC and E-Mark certificates.

5.5 Ferrite for power sources– Model 2 (ITM000786)

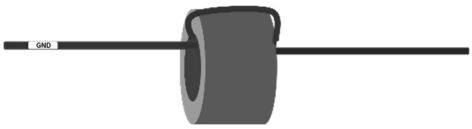
Note: The Ferrite size and shape may vary different between different Ferrite models.

5.5.1 Instructions for Power Sources (CAB000371)

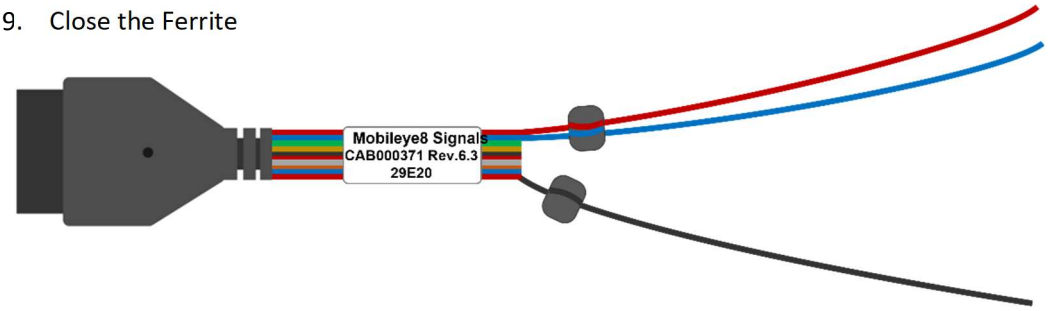
Please follow the instructions bellow for the two ferrites installation:



1. Open the Ferrite using a small flat screwdriver.
2. Place both Mobileye **BAT+** wire and **Ignition** wire (CAB000371) together inside the first Ferrite.
3. Locate the Ferrite 5cm from the Mobileye CAB000371 label
4. Wrap the BAT+ and Ignition wires through the Ferrite **2** times ***and*** around the outside of the Ferrite **1** times, as shown in the figures
5. Lock the Ferrite



6. Open the second Ferrite using the supplied Key or small flat screwdriver
7. Place the Mobileye **GND** wire in the second Ferrite (locate the Ferrite filters 5cm from the Mobileye CAB000371 label).
8. Wrap the GND wire through the Ferrite **2** times **and** around the outside of the Ferrite 1 times, as shown in the figures
9. Close the Ferrite



NOTE

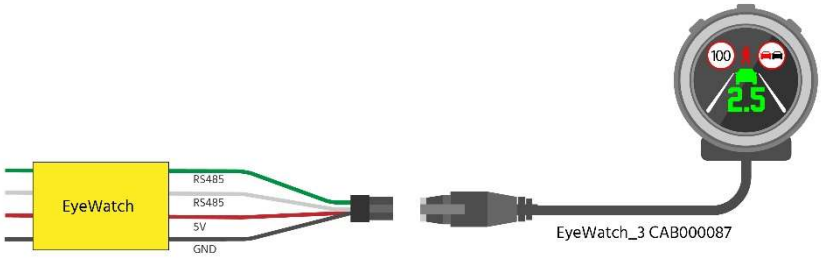
- ✓ Ferrite installation on power lines are mandatory in CE marking countries.
- ✓ Ferrite installation are not mandatory for FCC and E-Mark certificates.

5.6 EyeWatch – display and control unit (CAB000087)

The EyeWatch is connected to the Mobileye 8 Connect EyeWatch female connector (J1) using the EyeWatch connecting cable male connector (J1).

Table 3: EyeWatch connections

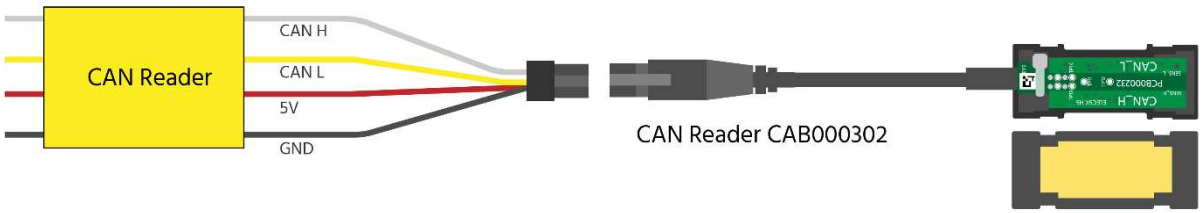
Wire name	Wire color	Connector	Connection to
EyeWatch Cable (CAB000087)	Black	J1 - Female	EyeWatch 4pin male connector in CAB000371
EyeWatch (CAB000371)	Black	J1 – Male	ME8 Signals cable 4 Pin connector for EyeWatch unit



5.7 CAN Reader – (CAB000302)

The Mobileye CAN-Sensor is a non-intrusive solution for CAN-bus connection.
The Mobileye CAN Sensor will allow you to better handle a CAN-bus reading by simply placing the sensor on the vehicle CAN-bus wires without any wire cutting or pinching.

Wire name	Wire color	Connector	Connection to
Power sources and signals cable (CAB000371)	Red, Black, Yellow and White	Male	Mobileye CAN Sensor
Mobileye CAN Sensor (CAB0003002)	Black	Female	Power sources and signals cable (CAB000371)



5.8 EyeNET – (EYENET0001)

The Mobileye 8 Connect service port female connector (P2) is used to connect to the Mobileye EyeNet short cable male connector labeled “MOBILEYE8 SIDE” (J5).

Wire name	Wire color	Connector	Connection to
EyeNET short cable (BRD000350)	Brown	Male	Mobileye 8 Connect service port
EyeNET Ethernet LAN port		Female	LAN port for Ethernet cable between the EyeNET and the PC
Mobileye 8 Connect service port		Female	EyeNET cable

Table 4: EyeNET connections

6. Guidelines

6.1 Site preparation

✓ Make sure the vehicle is parked on a flat surface (no slope).

✓ Check vehicle speed signal availability (either by CAN-bus or by Analog) to determine which type of installation will be for the Master camera (CAN, Analog, Mix).

6.2 Connecting to the vehicle's signals

NOTE

- DO NOT connect both BAT+ and Ignition to the same power source. Each lead must be connected to its appropriate source. Failure to do so will result in system malfunction.
- Identifying the vehicle's electrical signals requires having the keys in the ignition in the ACC (Accessory) position or ignition ON. Make sure the car headlights and/or any other power consuming devices/applications, e.g. air conditioning, are turned off during Mobileye 8 Connect installation to prevent battery drainage.

Please ensure to identify the Mobileye 8 Connect cables according to table below.

Identified vehicle's signals	Wires label	Wires color
Vehicle battery (Constant 12V~24V) via 2A fuse	BAT+	Red
Ignition (12V~24V) via 2A fuse	Ignition	Blue
Vehicle GND	GND	Black
CAN B High	CAN Reader	White
CAN B Low	CAN Reader	Yellow

6.3 Installing the EyeWatch

NOTE

- The EyeWatch unit should be placed in a location that does not obstruct the driver's field of vision
- The EyeWatch should not be placed in front of the air-bags operational space as it may otherwise prevent the airbag from fully opening or cause injury during air-bag activation

Select the optimal location for the EyeWatch attachment:

1. The EyeWatch should be placed on the dashboard or windshield at a location within the driver's field of view, conveniently visible while driving, and allowing access to its controls while sitting comfortably in the driver's seat (the EyeWatch mounting angle is adjustable by the installer — a Philips screwdriver is required)
2. Clean the selected location with the provided 3M VHB Surface cleaner
3. Attach the EyeWatch at the selected place (after removing the protective cover from the adhesive tape)
4. Remove the transparent protecting covering from the display surface
5. Insert the EyeWatch cable (CAB000087) behind the vehicle trimmings so that it reaches the EyeWatch connector of the Mobileye 8 Connect cable (CAB000400)

6.4 Installing the Mobileye 8 Connect main unit (camera)

NOTE

Selecting the optimal location for the main unit is critical and can affect system performance.

Please ensure to comply with the following guidelines.

- Minimum height for camera location is 1.2 meters (3.9 feet).
  Maximum height for camera location is 1.8 meter (5.9 feet).

NOTE

In extreme cases and upon approval of Mobileye support team, it is possible to install the camera above 1.8 meters BUT this will void any REM data which can affect the project target.

- The unit must be in an area of the windshield which the windshield wipers reach.
- The unit should preferably be located at the center of the windshield.
  Installing the unit off-center in a convex windshield will result an improper field of view, which will affect system performance. The camera's lens should always face straight ahead.
- Off-center installation is allowed up to 8%
  EXAMPLE: if the vehicle width is 200cm (2M), camera can be attached up to 16 cm from the windshield center (200*0.08=16). **Vehicle width in cm X 0.08 = MAX OFFSET**
- Camera roll-up is allowed up to 2°; if the camera roll is higher than 2°, the calibration will fail.
- There should be no obstruction, such as stickers or darkened windshield areas, in front of the main unit.
- In tall commercial vehicles that do not have an engine hood blocking the camera's field of view, the main unit can be placed on the lower part of the windshield; however, all the above-mentioned requirements must nonetheless be considered. In this case, you can modify the main unit cable to the "DOWN" position. "DOWN" means that after the main unit installation, the main cable exits from downwards instead of upwards (by default the cable exits upward from the "UP" position).

NOTE

Attaching the camera unit to the windshield should take place only after receiving a live streaming video during calibration process.

The following paragraphs present the function of each cable and guide you through the actual connection procedures with the vehicle's signals.

1. Identify the wires in the vehicle that carry the required electrical signals (according to the table above).
2. After identifying the required signals locations in the vehicle, pass the Mobileye 8 Connect cable (CAB000400) behind the vehicle trimmings so that it reaches all vehicle signals (it is recommended that you hang the Mobileye 8 Connect main unit on the rear-view mirror or place it on the dashboard before passing the cable behind the vehicle trimmings).
3. Firmly connect the appropriate wire from the Mobileye 8 Connect signals cable (CAB000371) to the identified vehicle signal.
4. Each wire in the Mobileye 8 Connect signals cable (CAB000371) mentioned above has a unique color. Make sure to connect the correct vehicle signal to its appropriate wire according to the table in page 12.
5. Keep the Mobileye 8 Connect EyeCAN connector & EyeWatch connectors easily accessible.

NOTE

- Connect each power source lead to its appropriate connection in the vehicle.
- Make sure the 2A fuses are kept easily accessible
- Wires colors are not guaranteed. Always double-check wires' labels
- Always check the Mobileye vehicle database for CAN-bus availability before installation is started

6.5 Installing the Mobileye 8 Connect 4G modem

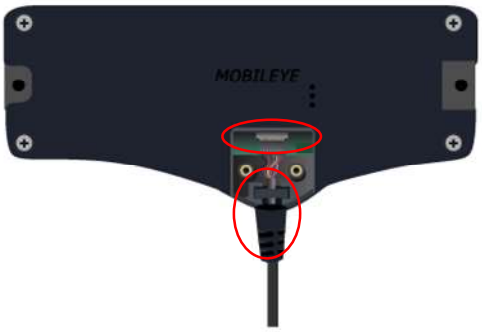
Mobileye 8 Connect uses an external 4G Modem for better cellular coverage.
The modem can be placed below the dashboard or any other location with enough space to accommodate it.
Use the tightening loops and a plastic tie to firmly position it.

To connect the 4G modem, please follow the next steps:

1. Route the 4G modem cable (CAB000405) to the destinated modem location.

2. Connect the model connector from the Modem side (see image below) and route the cable from the camera to the bottom of the dashboard trough the trimming & A/B pillar.

Route the 4G modem cable and connect it the 4G modem on the destinated connector.
Make sure the silicone rubber secure is placed in its location.



Close the 4G modem connector cover and close the 2 screw

NOTE

- ✓ Do not connect any system component when vehicle power is On.
- ✓ All system components must be connected before turning the system power On.
- ✓ Before making the power connections, extract the Fuse from the Fuse holder and add it back only after all system components and cables are connected and before turning the vehicle power On.

7. 4G Cable Ferrite Installation

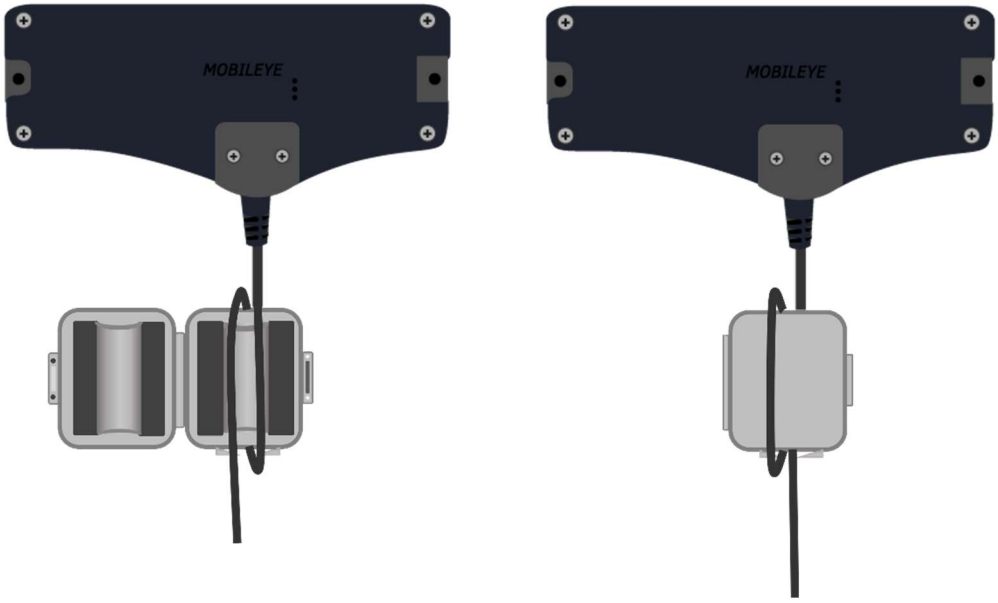
7.1 Instructions for 4G Cable Ferrite installation

NOTE

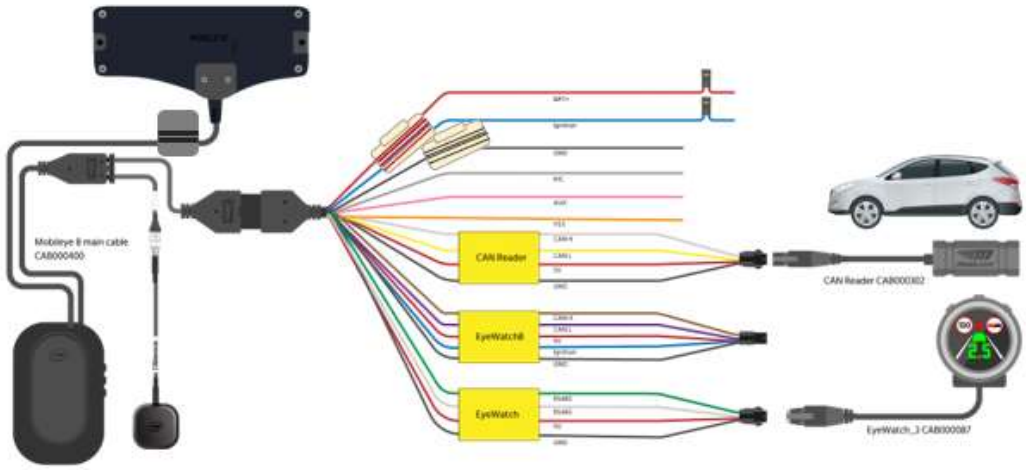
✓ Ferrite installation on Mobileye 8 Connect 4G modem cable is mandatory.

Please follow the instructions bellow for the 4G Modem ferrites installation:

1. Put the Mobileye 4G Modem cable in the third Ferrite.
2. Wrap the cable through the Ferrite 2 times and around the outside of the Ferrite 1 time



7.2 Mobileye 8 Connect 4G Connection Scheme



Note: The Ferrite size and shape may vary different between different Ferrite models.

8. Installation & Calibration procedure

8.1 Removing unit's back cover

As part of the Mobileye 8 Connect calibration process, the camera angle must be adjusted as outlined below.
To access the camera angle adjustment`s screw you must remove the main unit's back cover.

To remove the back cover:

① Using a small flat screwdriver, slide and push out the oval cover

② Using a small Philips screwdriver, unscrew the 3 screws and remove the main back cover

8.2 Communication / connection phase

Mobileye 8 Connect service port interface is used to communicate with the Mobileye system.

The EyeNET adapter enables fast connection between the Mobileye 8 Connect and Mobileye software running on a computer for system calibration and configuration.

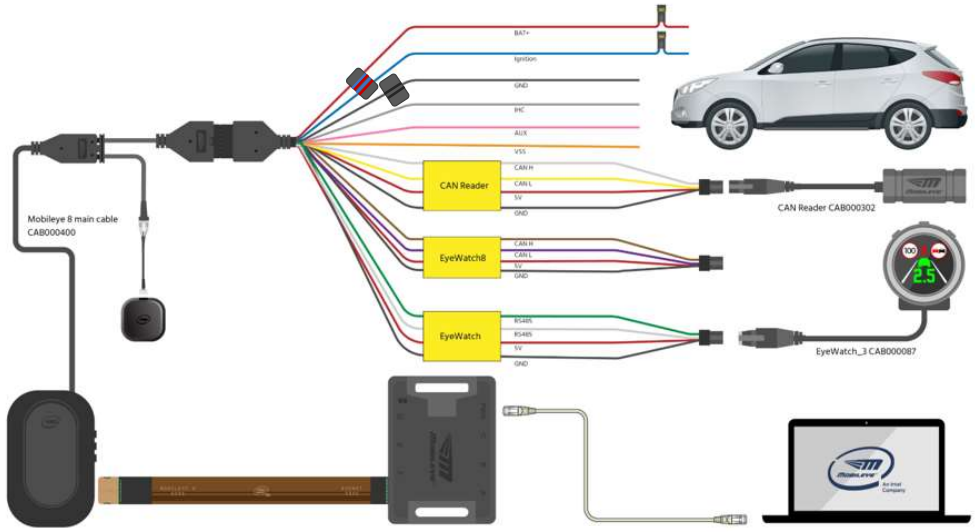


Figure 1 – connection method with EyeNET adapter

NOTE

- EyeNET connection to the Mobileye 8 Connect unit should only be performed when system power is off!
- Make sure you connect the short flex cable (BRD000350) correctly:
  - One side to the Mobileye 8 unit labeled as “MOBILEYE8 SIDE”
  - The other side to the EyeNet Box (BRD000344) labeled as “EYENET SIDE”

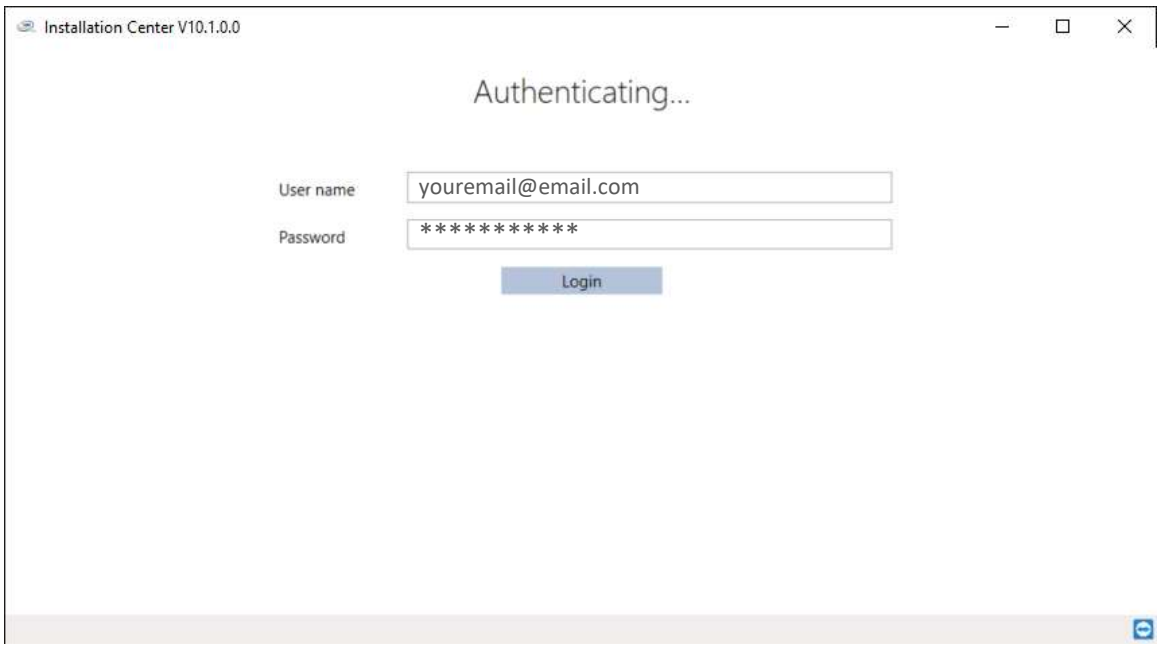
NOTE

Internet access is mandatory to configure and calibrate Mobileye 8 Connect.

8.3 System Calibration

8.3.1 Login

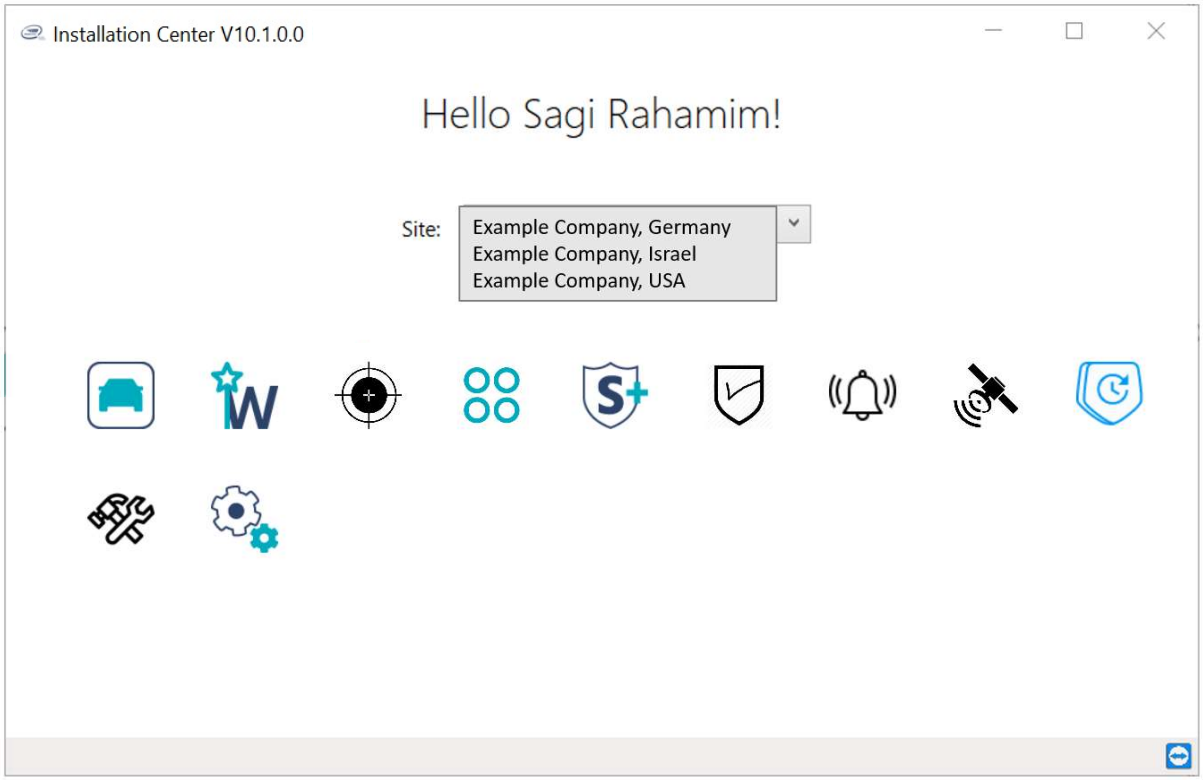
Open the Installation Center application on your computer and login using your personal login details



→ Click "Login" to continue

8.3.2 Installation site

Choose your installation site from the dropdown list



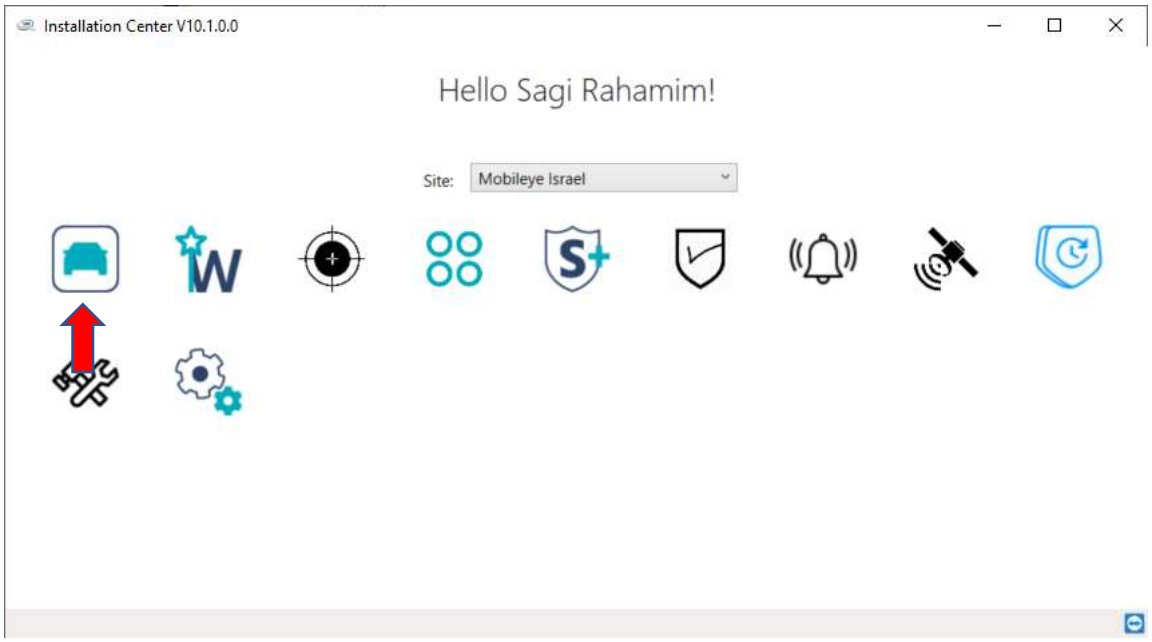
Click the vehicle database icon to open the Mobileye vehicle database and browse to find the correct profile of the vehicle you are installing.

In the vehicle database, you can find the following information:

- Vehicle make/year/model
- CAN-bus signals availability
- CAN-bus wires location + picture
- CAN-bus baud rate

NOTE

- When clicking the "vehicle database" button, no physical connection is required.
- It is possible to continue and open the IC Wizard application directly from the vehicle database.
- If you are already connected to a Mobileye 8 Connect system and have completed the physical connections, you may skip the "vehicle database" and click the "wizard" button to immediately start the installation



NOTE

When clicking the "Wizard" button you must be physically connected to a Mobileye 8 Connect system and the system power must be on to continue the calibration process. You will have an option to browse and choose the correct profile of the vehicle you are installing during a standard Wizard run as well.

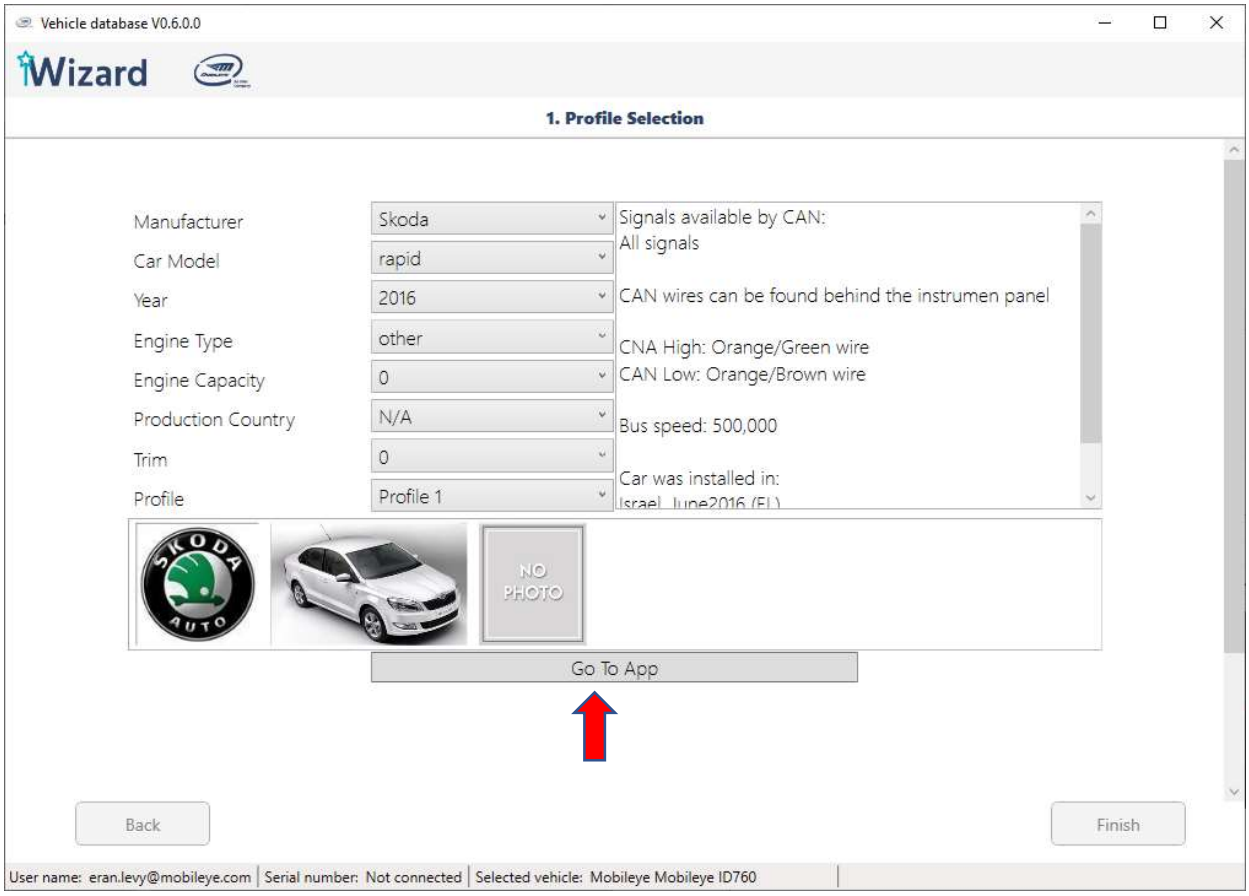
8.3.3 Vehicle selection

Choose the correct vehicle profile from the vehicle database.

The Mobileye vehicle database contain CAN information such as: available signals, CAN-bus wires location, bus speed, CAN-bus wires colors or pin number if available and pictures of the vehicle & CAN wires location.

NOTE

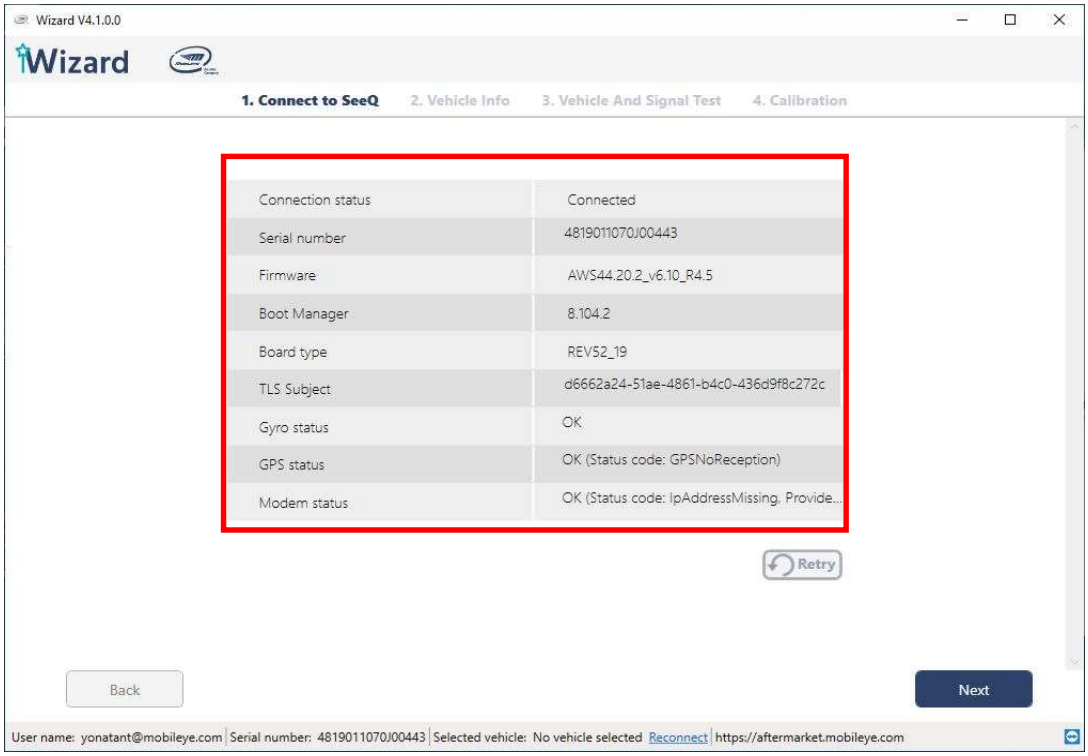
In the event the vehicle into which you are installing is not in the vehicle database, you can either try a similar profile or contact Mobileye support for help with creating a new profile.



→ Click "Go To App" to continue

8.3.4 Connection to SeeQ

The app will check:



communication status with Mobileye's system and provide system information such as:

- ❖ Connection status
- ❖ System serial number
- ❖ System firmware version

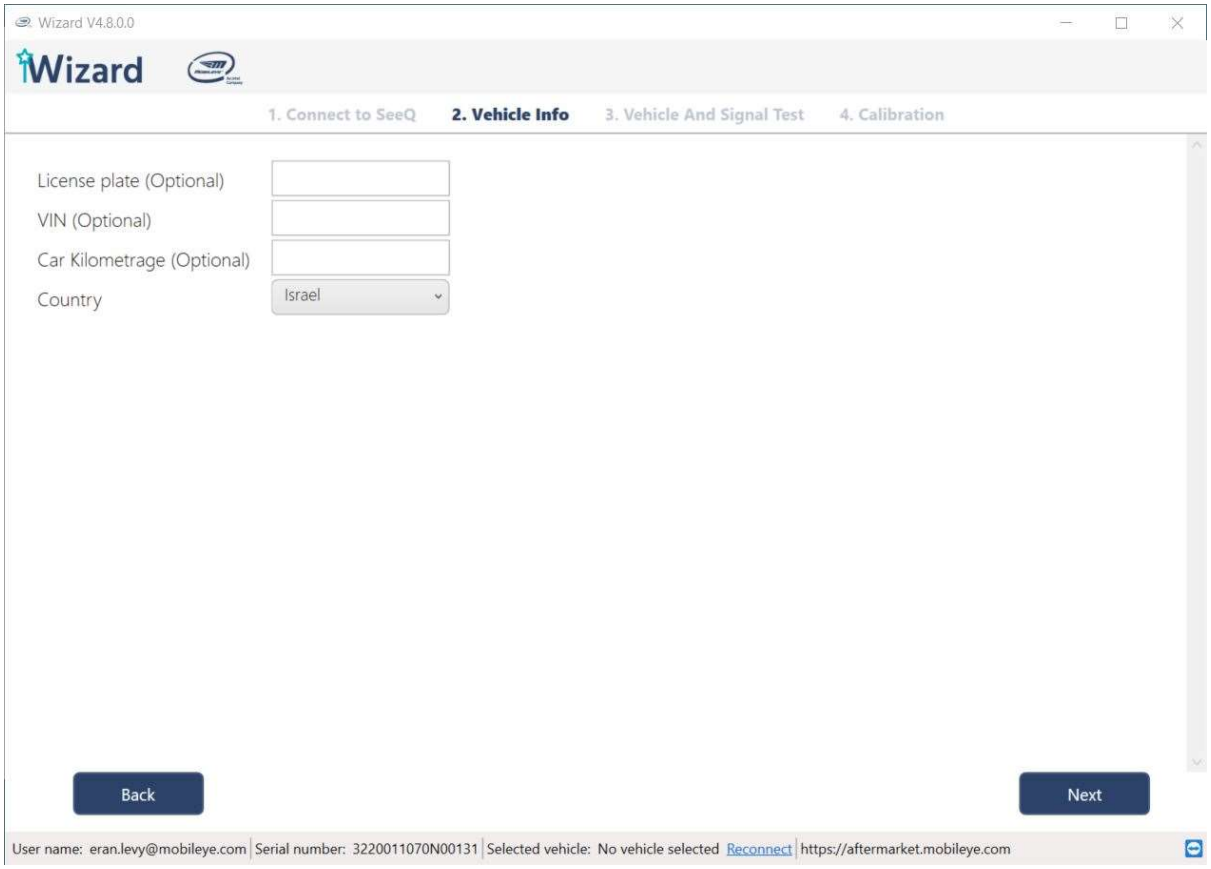
- Physical connection and communication of the below peripherals with the app
  - ❖ Gyro
  - ❖ GPS
  - ❖ GSM

NOTE

If you click the "retry" button, the app will try to reestablish communication and display the system information if successful.

→ Click "Next" to continue

8.3.5 Vehicle information

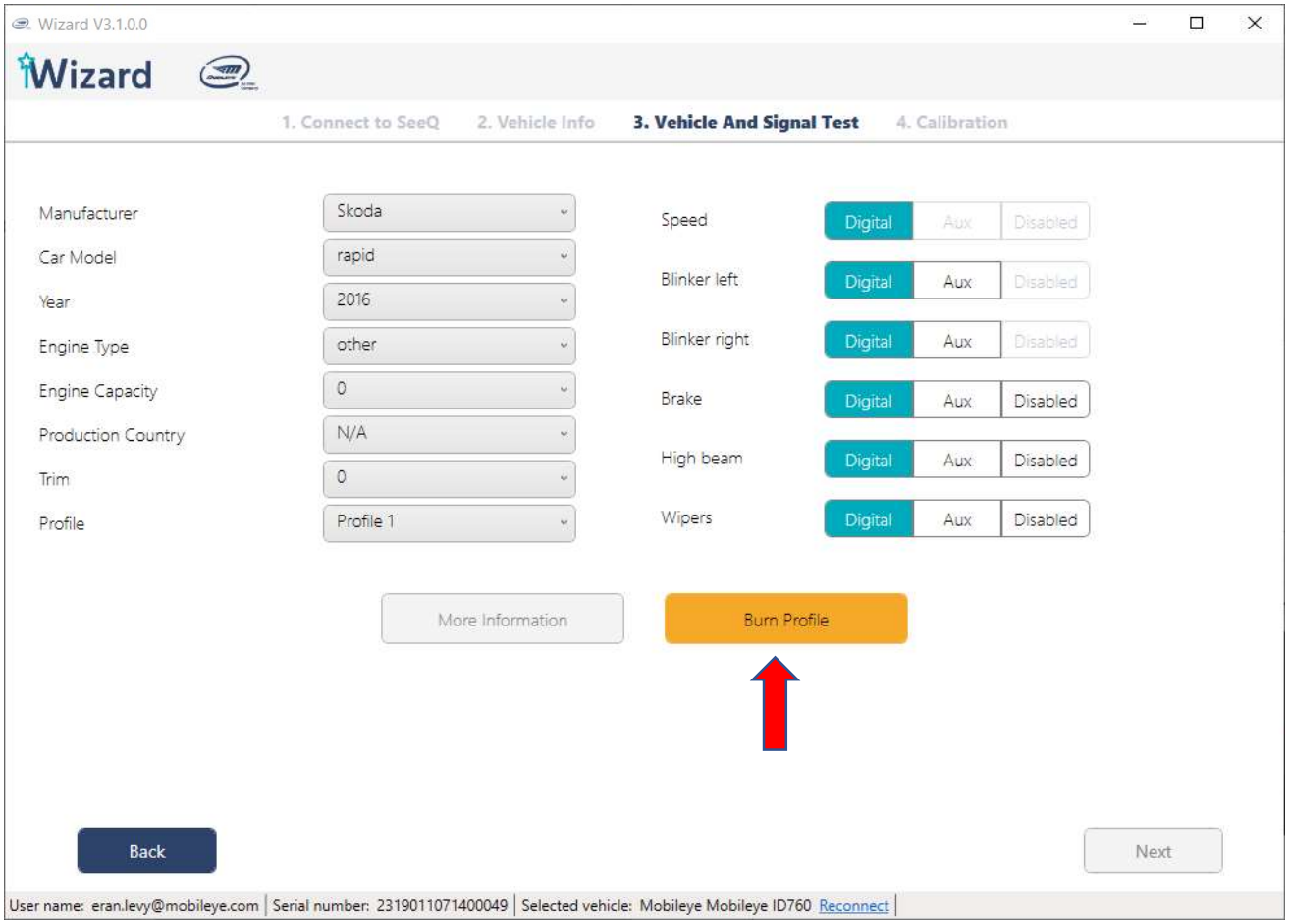


Enter the license number, VIN number and choose the country from the dropdown menu.

→ Click "Next" to continue

8.3.6 Profile selection

The software will remember and display all the vehicle and profile information you chose earlier. You can always choose a new profile or modify your earlier selection at this time.



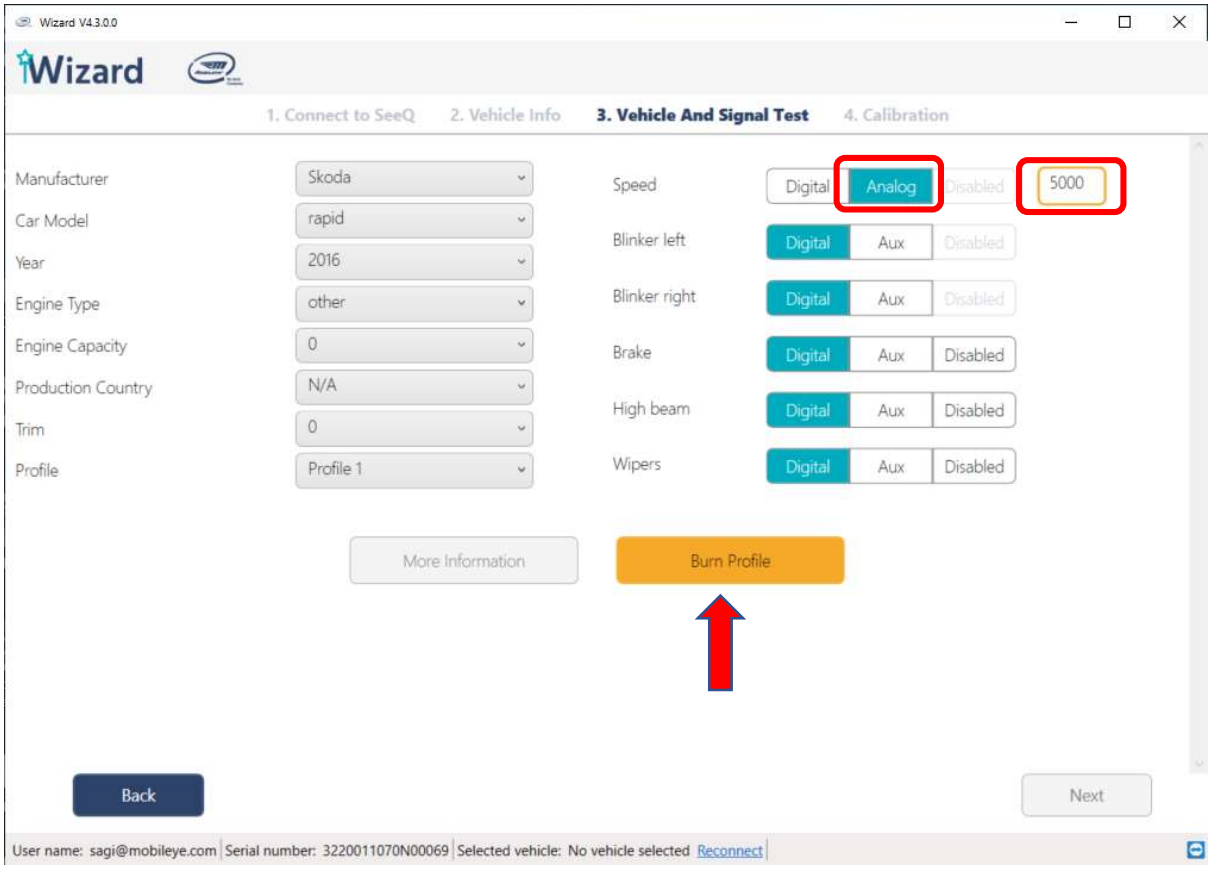
Click **→ "Burn selected profile"** to burn and save the profile data into the Mobileye system.

NOTE

- You can change and burn different profiles until finding the correct profile.
- You cannot proceed with system calibration until you pass the signals test.

8.3.7 Analog installation

In a case you install the unit in vehicle which speed is not available by CAN, please locate the VSS signal in the vehicle, choose the most similar vehicle profile from the vehicle DB and change the Speed input from "Digital" to "Analog", VSS rate field will be available to be filled according the specific VSS of the relevant vehicle.
If you don't know the vehicle VSS rate, set the value to 5000, Burn the profile as set and check the Vehicle speed vs the Mobileye Installation Center shown speed, if necessary, please adjust the rate so the speed shown will be accurate.



8.3.8 Signal Test

Verify that all signals are detected by the Mobileye system.

Activate each signal and an icon will be shown when it is detected by the Mobileye system.

Speed signal verification - drive and confirm speed indication in the Mobileye setup wizard approximately matches the speed of the car shown by the speedometer.

NOTE

- Signals activation are possible only after the speed signal is verified and marked as
- To proceed to the next step, the full signals test must be successfully completed

Click "Reset test" button if you would like to retest.

→ Click "Next" to continue

8.3.8.1 Signal Test Troubleshooting:

If the signals test failed in all or some of the inputs, please follow the next steps and press "reset test":

- Before any signal test activation, wait until the speed signal green V icon will be shown and only then test the other signals activation.
- Check your connections- make sure the CAN sensor is connected correctly.
- Try to switch CAN High and CAN Low connections- try to flip the CAN Sensor on the CAN wires and reset test again.
- Make sure you connected to the CAN wires as described in the Mobileye Vehicle Database.
- Check the chosen profile- make sure you chose the correct profile, if needed try to choose other similar profile, burn it and check the signals test again.

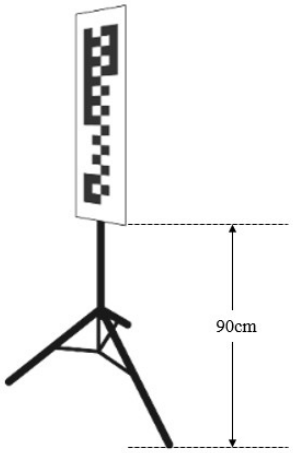
→ Click "Next" to continue

8.3.9 Calibration

8.3.9.1 Step 1 – TAC assembly

Place the TAC target in front of & exactly at the center of the vehicle.

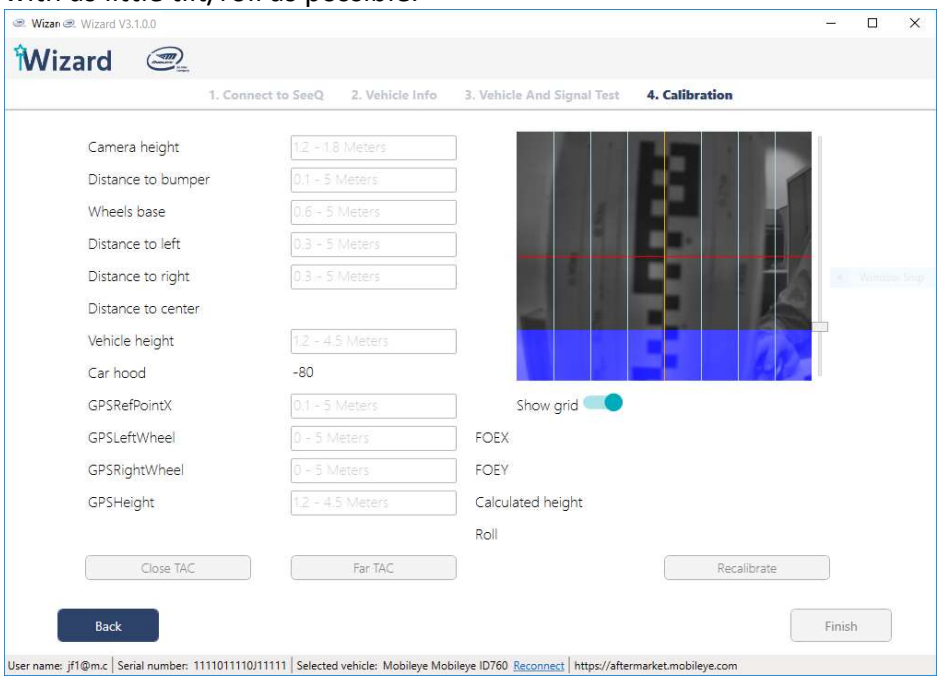
When TAC is assembled and open correctly the bottom part of the checkered board TAC should be 90 cm from ground or 165 cm if the TAC is opened and flipped to high level (depending on the camera height).
Mount the camera on the windshield according to Mobileye's guidelines as follows:



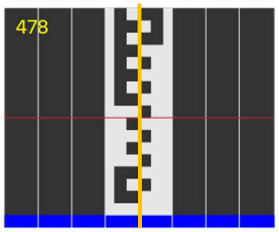
8.3.9.2 Step 2 – Camera attachment

Use the surface cleaner supplied in the kit to clean the attachment area of the windshield and then use a dry paper towel to dry the area and remove residue before attaching the camera.

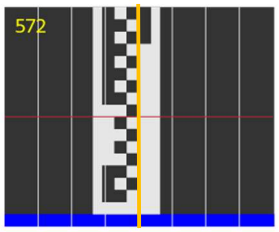
Mount the camera using the live image feed from the camera unit, showing the grid lines over the TAC target. This image feed will assist you in mounting the camera correctly and within the allowed camera tilt/roll of up to 2°. Use the grid to properly attach the camera with as little tilt/roll as possible.



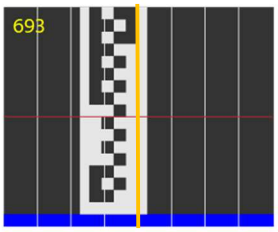
Attach the main camera unit; lining up the IC Wizard Yellow line exactly with the camera location on the TAC.
For example:
If the camera is mounted exactly in the center of the windshield, the yellow line should be in the center of the TAC target.
If the camera is mounted off-center, make sure this offset is reflected in the yellow line location on the TAC target.



Center



5cm to the right



10cm to the right

Deviation Offset

Optimal- center of the windshield, if center not possible, according to the vehicle width:

a. If the vehicle width measurement is **up to** 1.67 meters- camera can be attached up to 10cm from the windshield center **MAX**.
b. If the vehicle width measurement is **more** than 1.67 meters- camera can be attached up to 8% of the vehicle width measurement.
   Vehicle width in cm X 0.08 = MAX OFFSET

8.3.9.3 Step 3 – GPS attachment

Use the surface cleaner supplied in the kit to clean the attachment area of the windshield and then use a dry paper towel to dry the area and remove residue before attaching the GPS attachment.
Attach the GPS module mount using the 3M double-sided tape.
Make sure the GPS is facing up and attached in cleared area on the windshield.

The Mobileye GPS module can be attached at one of vehicle windshield corners in area **not** covered by the wipers and/or without any other Metal obstructions.

As the driver dashboard encapsulates various systems that may create disturbances, Mobileye recommends to install the GPS module at one of the three corners: top right and left or bottom away from the driver (refer to the drawing).

Please Note:
Validation tests were perofmed on several vehicle models.
In some models the GPS may not be fully fucntional in the Top/Bottom left corners of the windshield due to interferences from other vehicel components and a different location may be required.
We recommend each installation is completed by a run of the Peripheral Tool to verify full components functionality.

Please Note: GPS module can't be attached more than 0.49m ahead from the camera unit. (Camera distance to bumper – GPS distance to bumper < 0.49m)

9. GPS Attachment location allowed areas

Angled Windshield:

Green – GPS attachment location allowed

Red – GPS attachment location not allowed

Flat Windshield:

Green – GPS attachment location allowed

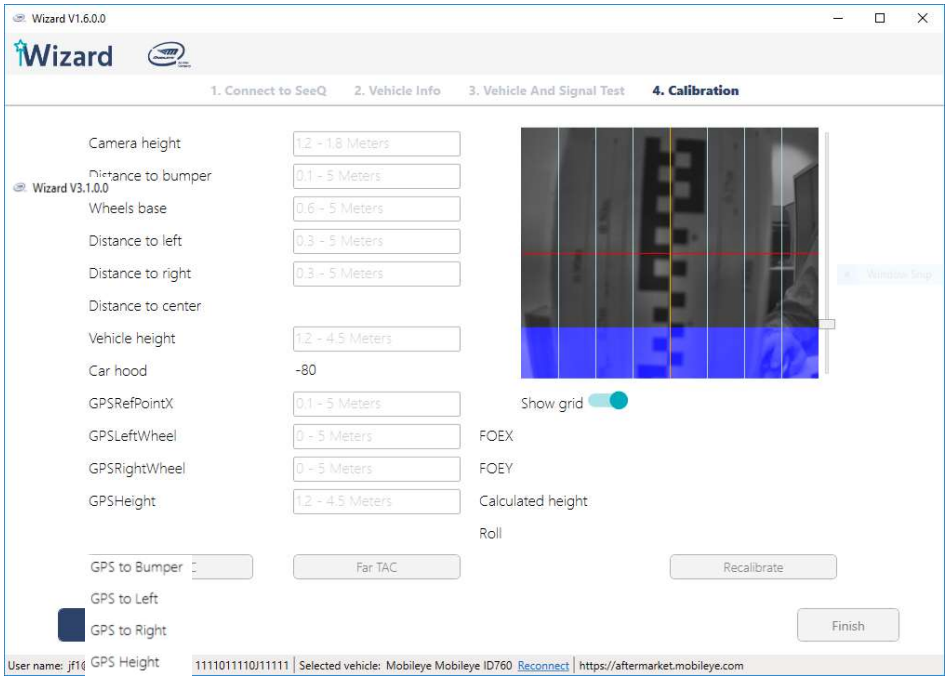
Red – GPS attachment location not allowed

9.1.1.1 Step 4 – measurements

NOTE

Entering any measurement that is not in the acceptable range or not in the correct format will be highlighted in red and will not let you continue to the next step

Enter each vehicle measurement in the correct field:

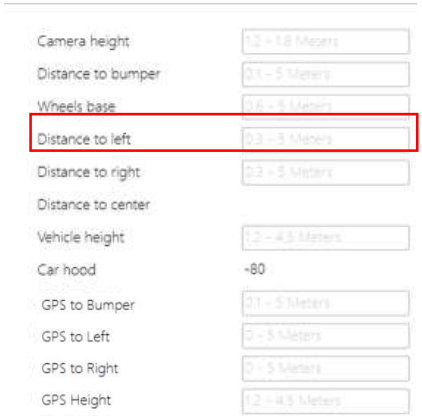


- **Camera height**

  Measure the camera height from the camera lens to the ground.

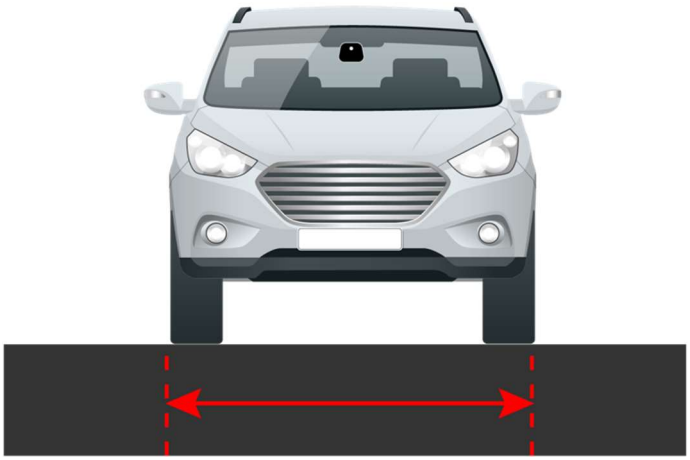
❖ **Distance to bumper** (the distance from the camera to the front bumper).

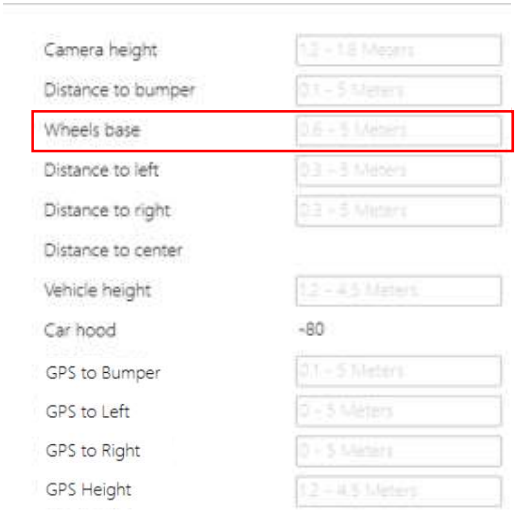
Measure the horizontal distance from the camera lens to the vehicle's front bumper edge.



❖ **Wheels Base** (width of the vehicle wheels)

Measure the distance between the outer edges of the front wheels.

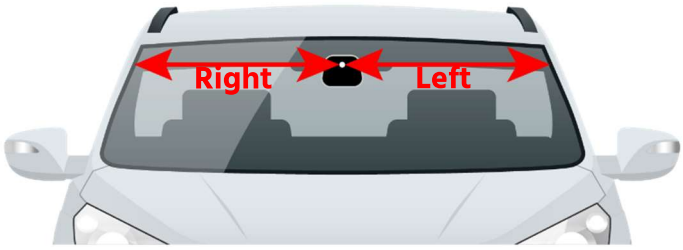


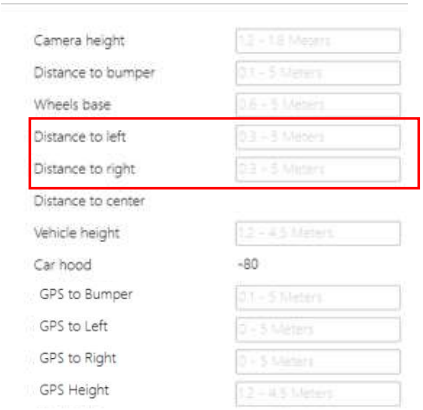


- **Distance to left, distance to right** (the camera distance from the left and right windshield edge).

  Measure the lateral distance from the camera lens to both left & right windshield edges.

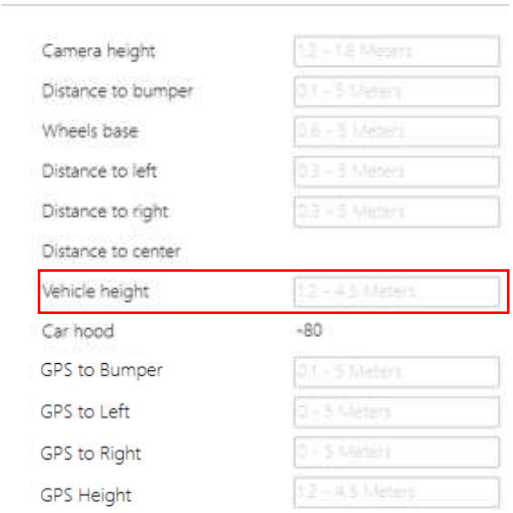
  PLEASE NOTE: Left & Right should be measure from the outside of the vehicle but should be insert to the software as driver perspective sides (see Left &Right on the illustration bellow.





- **Vehicle Height**

  Measure the distance from ground to the top of the vehicle.

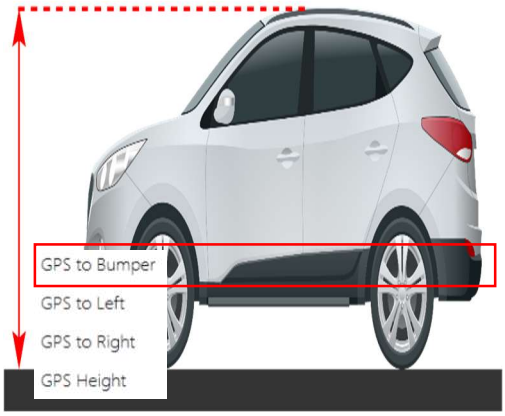


- **GPS Measurements (the GPS location)**

In this section, measure the exact GPS location on the Windshield.

GPS to Bumper measurement:

Measure the horizontal distance from the GPS unit to the vehicle's front bumper edge (Distance to Bumper)

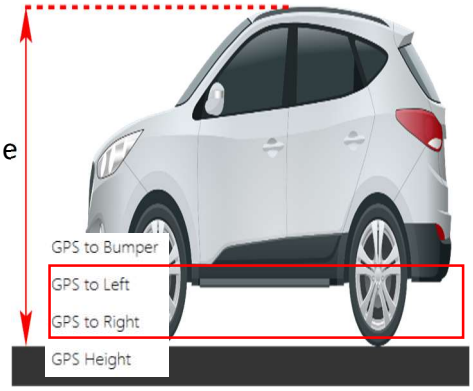


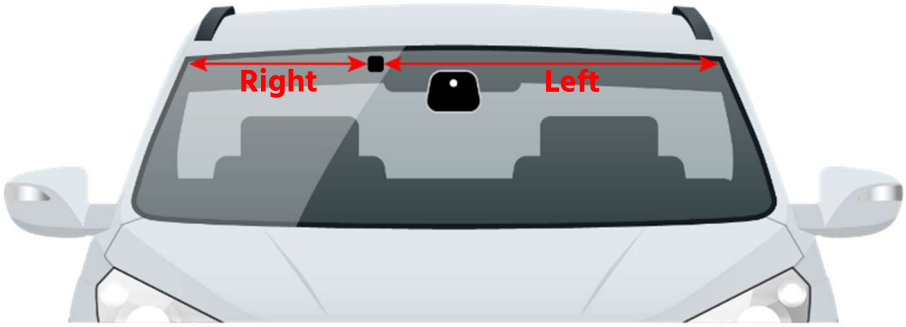
Please Note: GPS module can't be attached more than 0.49m ahead from the camera unit. (camera distance to bumper – GPS distance to bumper < 0.49m)

GPS to Left & Right Wheel measurement

Measure the GPS unit distance from Left & Right windshield edge.

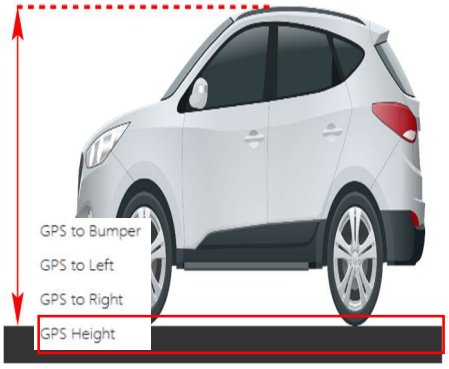
PLEASE NOTE: Left & Right should be measure from the outside of the vehicle but should be insert to the software as driver perspective sides (see Left &Right on the illustration bellow.





GPS Height measurement-

Measure the exact GPS height from to ground.

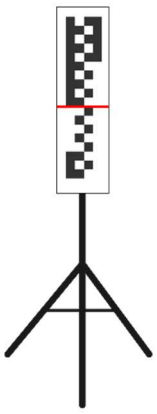


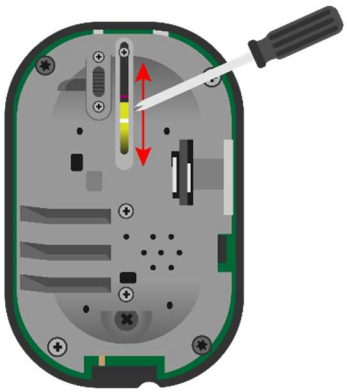
NOTE

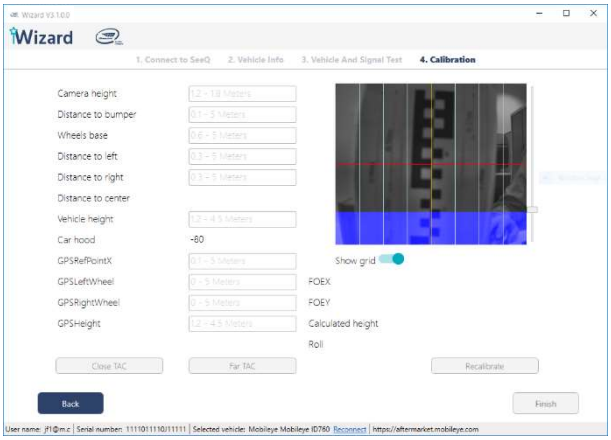
If the GPS measurements will be incorrect, the ME8 data will be useless and the installer will have to go back and set the correct measurements.

9.1.1.2 Step 5 – Camera angel adjustment

After measuring the camera height and entering it into the Wizard, mark the camera height on the TAC board using a black tape and manually adjust the camera's lens so that the RED line will be parallel to the height mark on the TAC.
Once the red line in the image is lined up with the marking you placed on the TAC, tighten the camera angle adjustment screw.



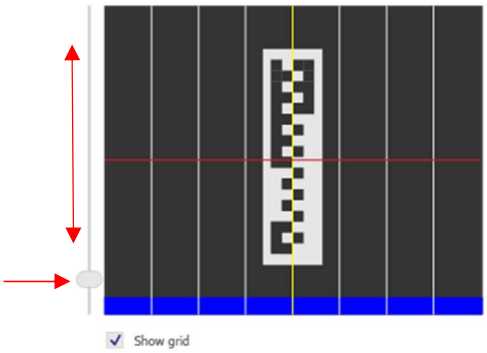




9.1.1.3 Step 6 – Car hood

Drag the scroll bar on the left side of the image to adjust the blue field and prevent the camera from 'seeing' the hood of the vehicle.

See image below:



NOTE

Perform vehicle hood calibration only if the hood poses a permanent obstruction to the camera's field of view.

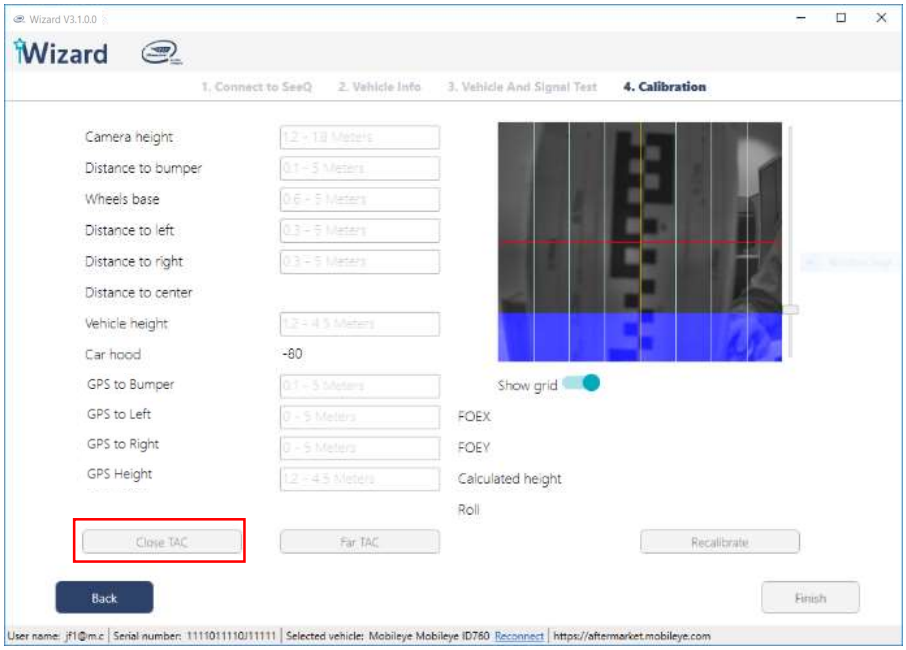
If no car engine hood is present in the image, car hood value should remain at the default value of -120

9.1.1.4 Step 7 – Calibration

Once all these measurements have been entered, 2 calibration steps are required:

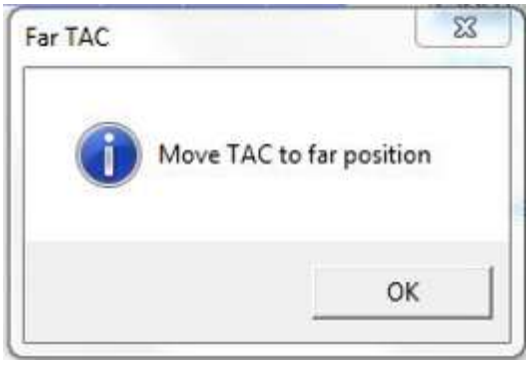
Close TAC

Place the TAC exactly in the center of the vehicle and close to the vehicle bumper.
Press “Close TAC” for close TAC calculation.

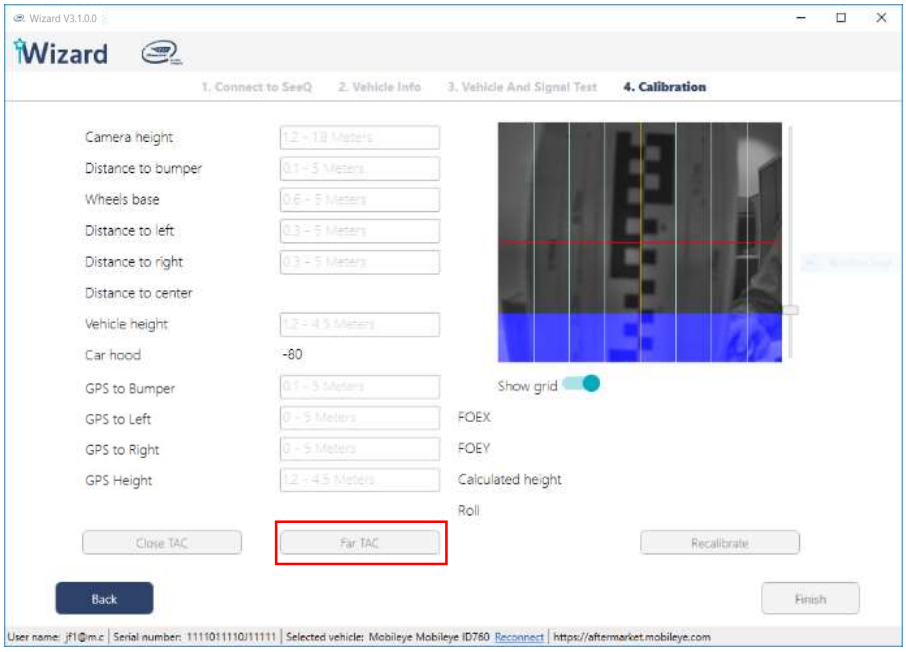


Far TAC

After the close TAC calculation has been successfully completed, a pop-message will appear.
Move the TAC 1-meter back Press “OK” and.



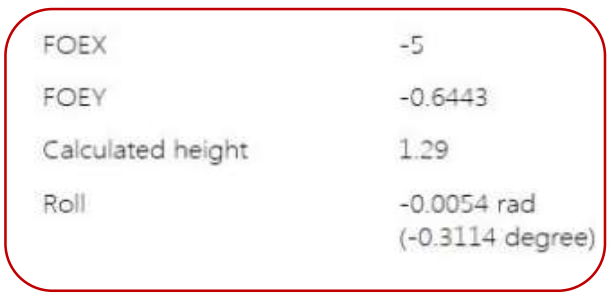
Press “Far TAC” for far TAC calculation.

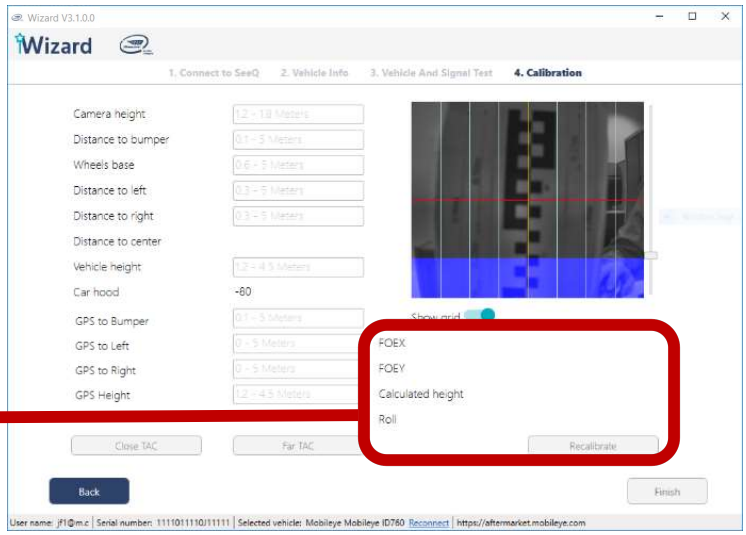


Step 9 – calibration results

Calibration results should meet the minimum requirements as follows:

1. FOE X optimal value is 0 (±15)
2. FOE Y optimal value is 0 (±10)
3. Calculated height- up to 3cm differences
4. Roll – up to 2°





If calibration results meet the minimum requirements mentioned above, calibration is completed, click “finish”

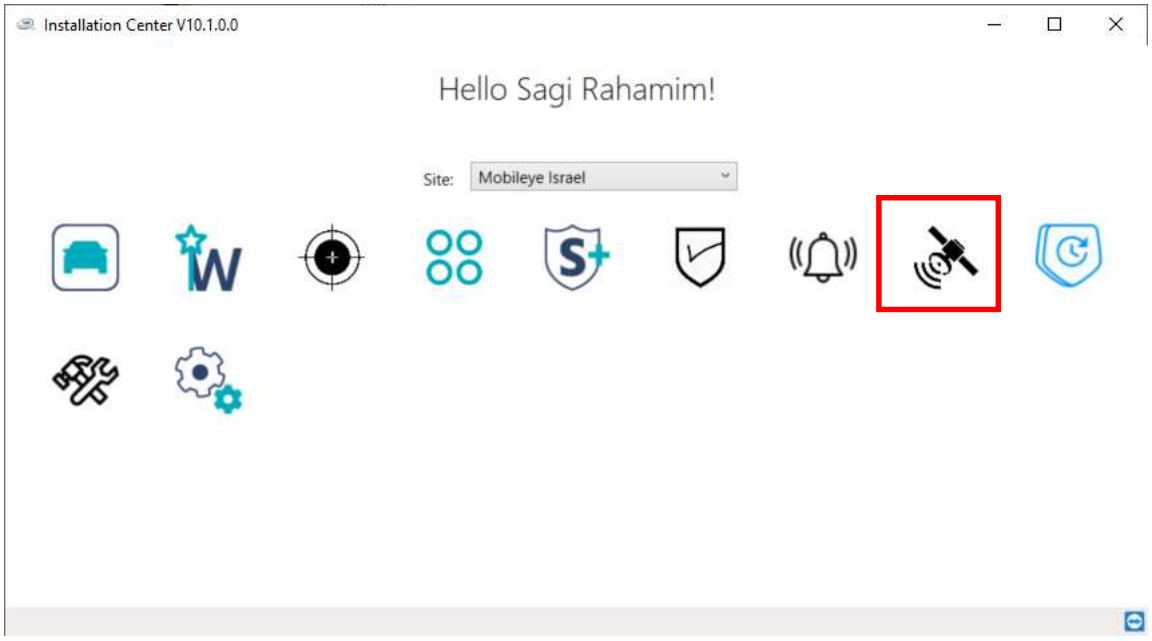
10. Validation

10.1 General

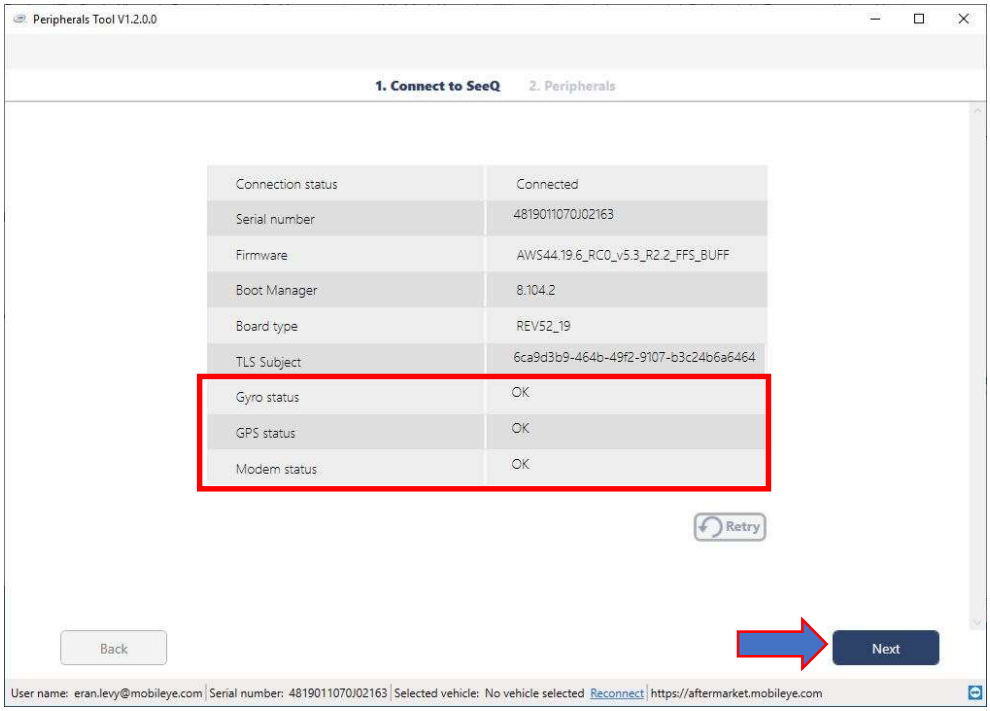
Upon completion of the system calibration, the installer MUST validate all peripherals are functional and valid using the new validation tool which can be found as part of Mobileye IC prior to releasing the vehicle after the installation.

10.2 Operation

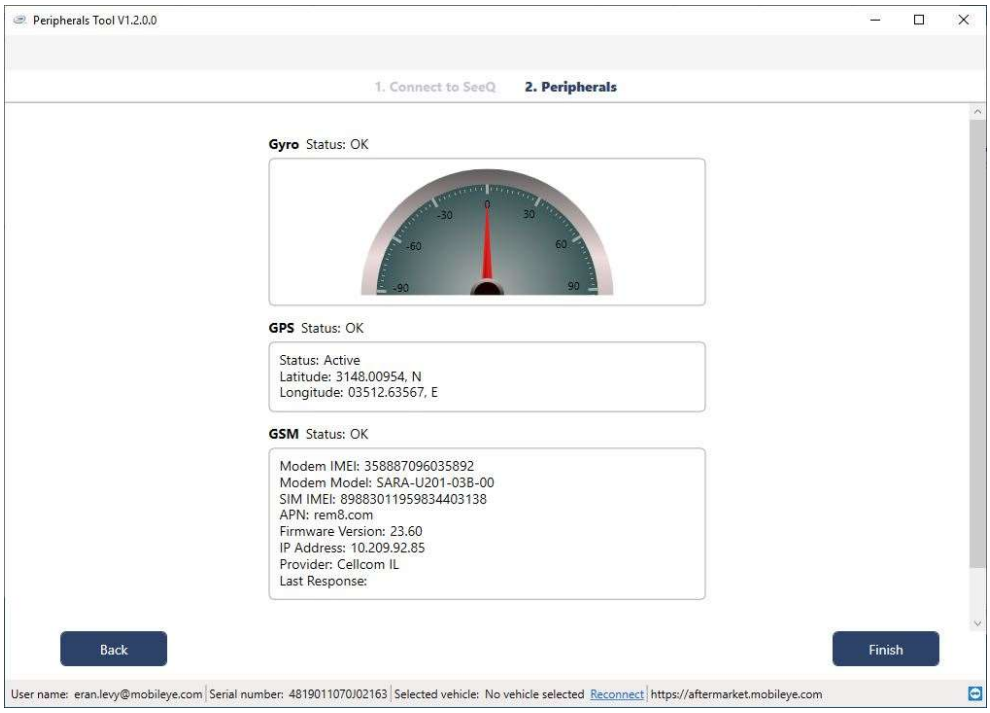
Click the icon to open the Peripherals tool



The tool will check communication with the system and display the system s/n and FW version following by the peripherals test and display the status of each component.



Click "Next" to continue to see each peripheral test results



Note that due to the installation location such as underground parking or indoor garage and GPS signal or cellular network is not available, the test status of the relevant component will pass but no valid data will be displayed.

NOTE

If any of the peripherals found faulty, the Mobileye system must be replaced to complete the installation.

11. Appendix A – 4G Modem

11.1 *Modem status*

Green LED – constant: SW ready.
Orange LED – constant: no SIM, no network.
Flashing LED – network communication good.

11.2 Technical spec

Physical Characteristics	
Length:	182mm

Width:	55mm (Slimmest); 78.6mm in connector area (Peak)
Height:	22mm
Weight:	TBD
Color:	Black
Case material:	PC/ABS
Cable length:	3000mm (±30)
Cable diameter:	6.5mm
Specification	
Protocols	LTE FDD Cat1 (10/5Mbps DL/UL), GSM/GPRS/EDGE, WCDMA up to DC HSPA+, Rel.9
Coverage area:	Global with several models LE910C1-xx
Bands:	2G: 2, 3, 5, 8 HSPA+: 1, 2, 3, 4, 5, 6, 8, 19 LTE FDD: 1, 2, 3, 4, 5, 8, 12, 13, 14, 18, 19, 20, 25, 26, 28, 28A, 66, 71
Data rates:	Up to 10Mbit/s DL Up to 5Mbit/s UL
Internet Protocol Version	IPv4 / IPv6
Transport Layer Security	SSL – several TLS
Certification	WW – depend on each model FCC /IC, PTCRB, (North America) RCM (Australia) Jade/Telec (Japan) RED/GCF (Europe) CCC/SRCC (China) Anatel (Brazil)
Telecommunications standards	TS 27.005, 27.007 and Telit Custom AT commands LTE FDD Cat.4, 3GPP release 10 compliant LTE FDD Cat.1. 3GPP release 9 compliant
Serial interface	UART (up to 3Mbps)
Power supply	3.3 to 4.4V
SIM Voltage:	1.8V
Sim size:	Nano SIM 10mm X 12.5mm X 1.2mm
Environmental Characteristics	
Operating Temperature:	-40°c to + 85°c
Storage temperature:	-40°c to + 100°c

12. Appendix A - CAN Reader

12.1 Mobileye 8 Connect CAN Reader cable (CAB000302)

The Mobileye 8 Connect CAN-Reader is a new, non-intrusive solution for CAN-bus connection. No more wrong connections, warranty violations or liability issues. The Mobileye CAN-Reader will allow you to better handle a CAN-bus reading by simply placing the Mobileye CAN-sensor on the vehicle CAN-bus wires without any wire cutting or pinching.

Benefits:

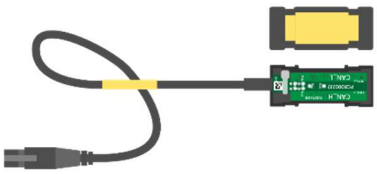
- Non-intrusive installation
- Simply install over the CAN-bus wires, no need to cut, strip, crimp or connect physically
- Read data thru the wire's isolation
- Fits most vehicles
- Supports all CAN-bus speeds
- Reliable CAN-bus data reading
- Fast and simple installation

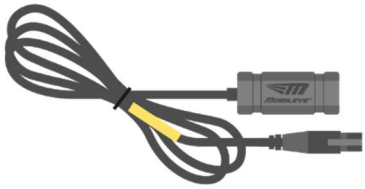
12.2 CAN Reader installation (CAB000302)

1. Identify the vehicle CAN-bus wires

2. Untwist the CAN-bus wires over about 5cm

3. Place the CAN Reader over the CAN-bus wires as labeled on the CAN Sensor module





Note: In some cases (if Er-20 shows on the EyeWatch display), you will need to switch between CAN High and CAN Low wires

12.3 Technical Spec

CAN-sensor unit	
Physical Characteristics	
Length (entire cable):	1300mm
Width:	40mm
Height:	3mm
Weight:	55g
Color:	Black
Case material:	Plastic
Electrical Characteristics	
Input voltage:	4.5-5.5VDC
Input current:	5V → 30mA
Limited power source	200mA max at normal and single fault conditions
CAN High, CAN Low:	Nominal input range: 0-5V
	Common mode input range: 7-12V
Environmental Characteristics	
Operating temperature:	-20°c to +85°c

Storage temperature:	-40°c to +105°c

Conformity	
72/245/EEC	The automotive directive for electronic equipment which can build in road vehicles
ISO 7637	Road Vehicles Electrical Disturbances
ISO 11898	CAN for high-speed communication
ISO 9141	Road vehicles – Diagnostics systems. Requirements for interchange of digital information
RoHS	Yes
WEEE	Yes
EN60950-1:2006/A1:2010	Europe Safety
ETSI 301489-1/-17	Europe EMC
FCC Verification part 15 subpart B	USA EMC

13. Appendix B – up/down configuration

Mobileye 8 Connect is based on a smart camera, which is installed on the vehicle's front windshield. To suit all vehicle models (cars, trucks, buses) the smart camera main cable has two configurations: up and down.

All Mobileye 8 Connect systems are supplied with a default up configuration. A distributer/installer can change the up/down configuration at their discretion.

Changing the Mobileye 8 Connect up/down configuration is a simple but delicate procedure.

Instructions on how to change up/down configurations are listed below:

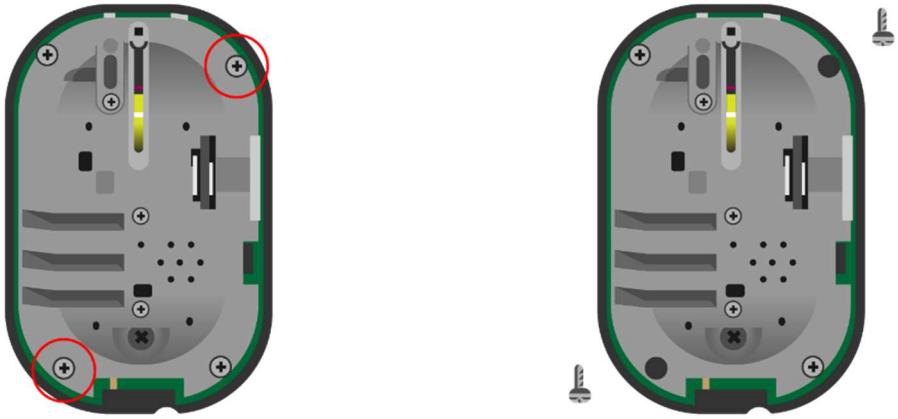
Required Tools:

- ✓ Philips Screwdriver (Tip Size = PH1)
- ✓ Flat Screwdriver (Tip Size = PH1)

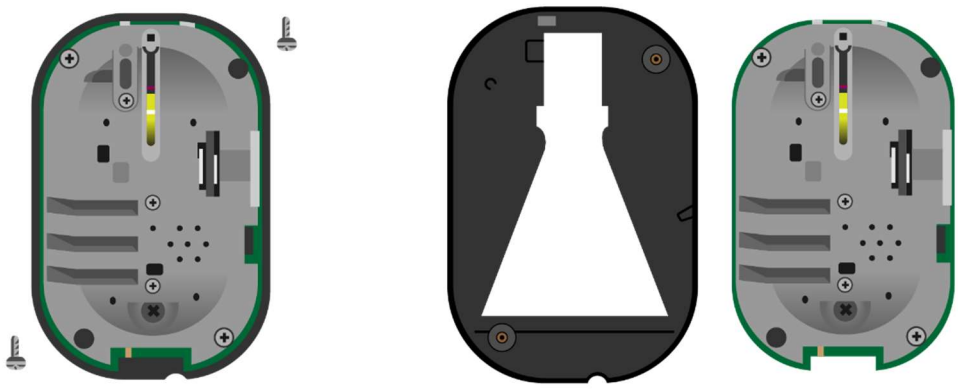
① Using s flat screwdriver, slide and push out the ellipse cover

② Using a Philips screwdriver, unscrew the 3 screws and remove the main back cover

③ Using a Philips screwdriver, unscrew to remove the main chassis from the frame



④ gently remove the chassis from the frame



Note:

Do not unscrew the upper left and lower right screws. This will void the warranty!

⑤ Remove the main cable connector and connect it to the desired configuration

Camera up position

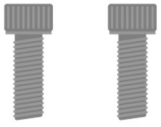
Camera down position

⑥ Once completed, reassemble all system components tightening the screws.

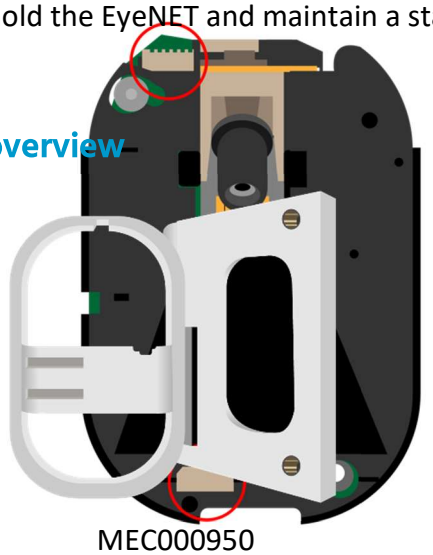
14. Appendix C – EyeNET Holder

The EyeNET holder used to hold the EyeNET and maintain a stable communication with the Mobileye system.

14.1 Component's overview

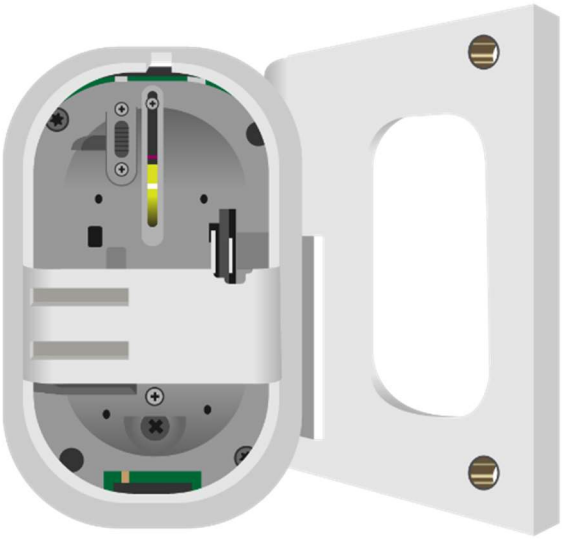
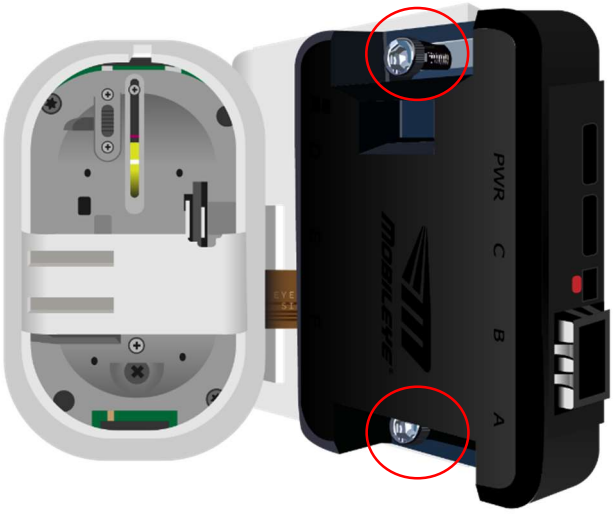


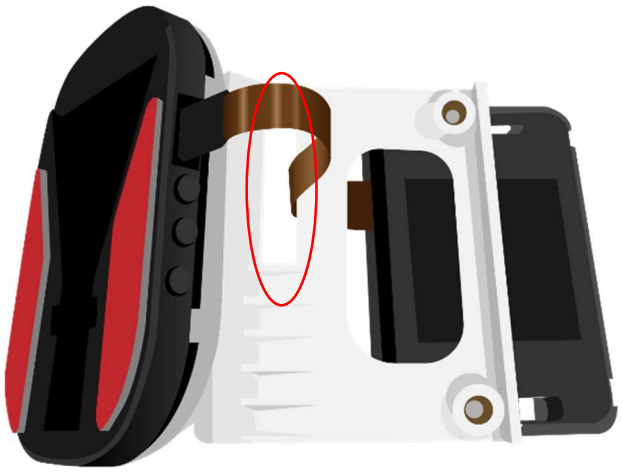
SCR000120



MEC000950

14.2 Assembly

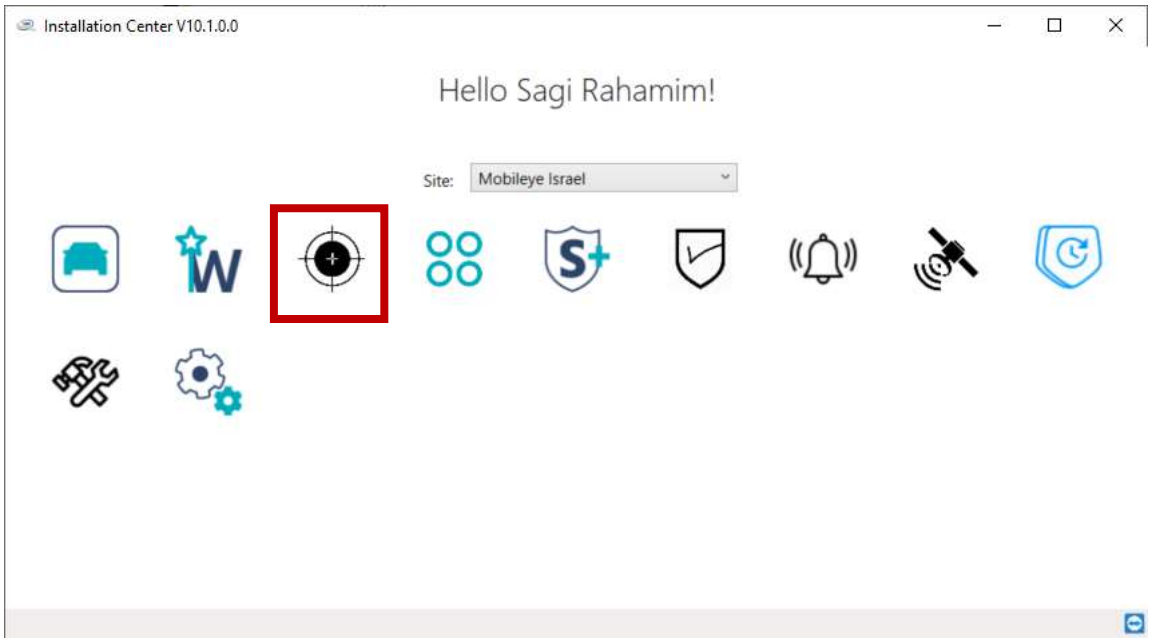
Attach the EyeNET holder on top of the system`s metal body.	
Use to 2x screws to hold the EyeNET	

Route the EyeNET flat cable trough the designated gap and connect it in both ends to the Mobileye system and the EyeNET and continue with the calibration process	

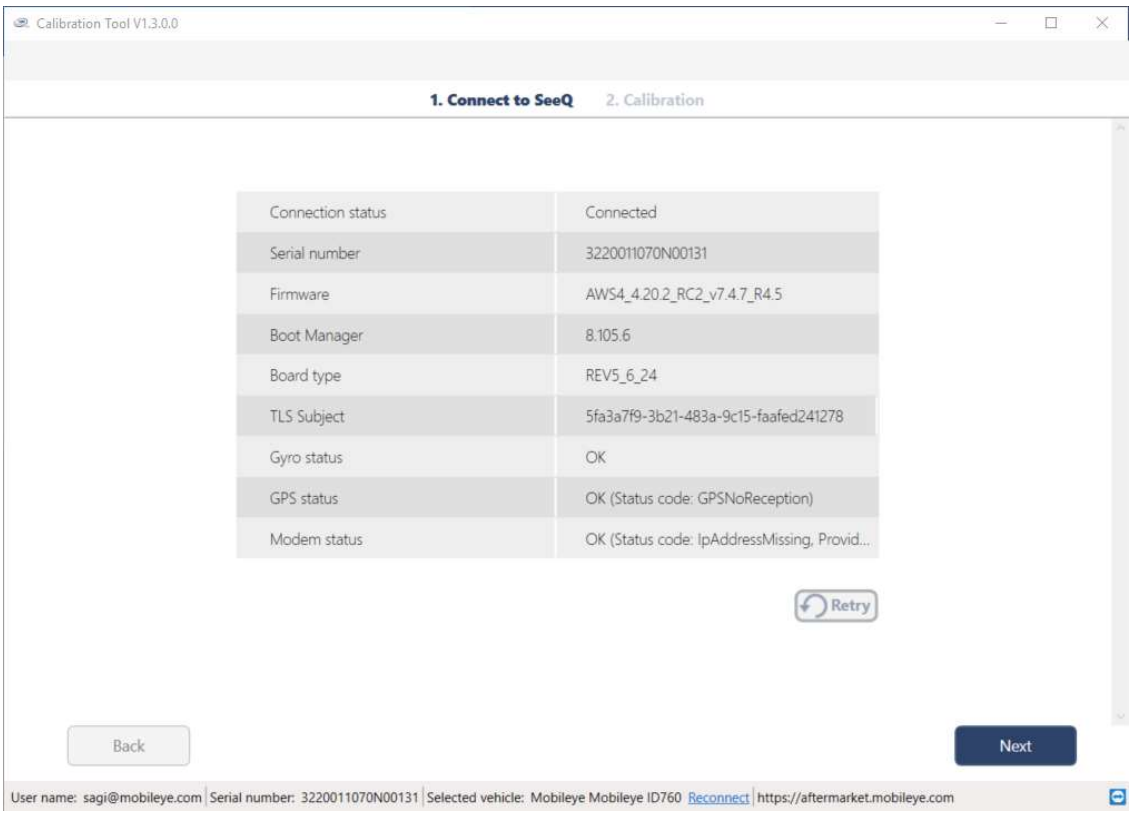
15. Appendix D – Calibration Tool

The Calibration Tool allows to recalibrate the ME8 units without deactivation vehicle profile change such as windshield replacement.

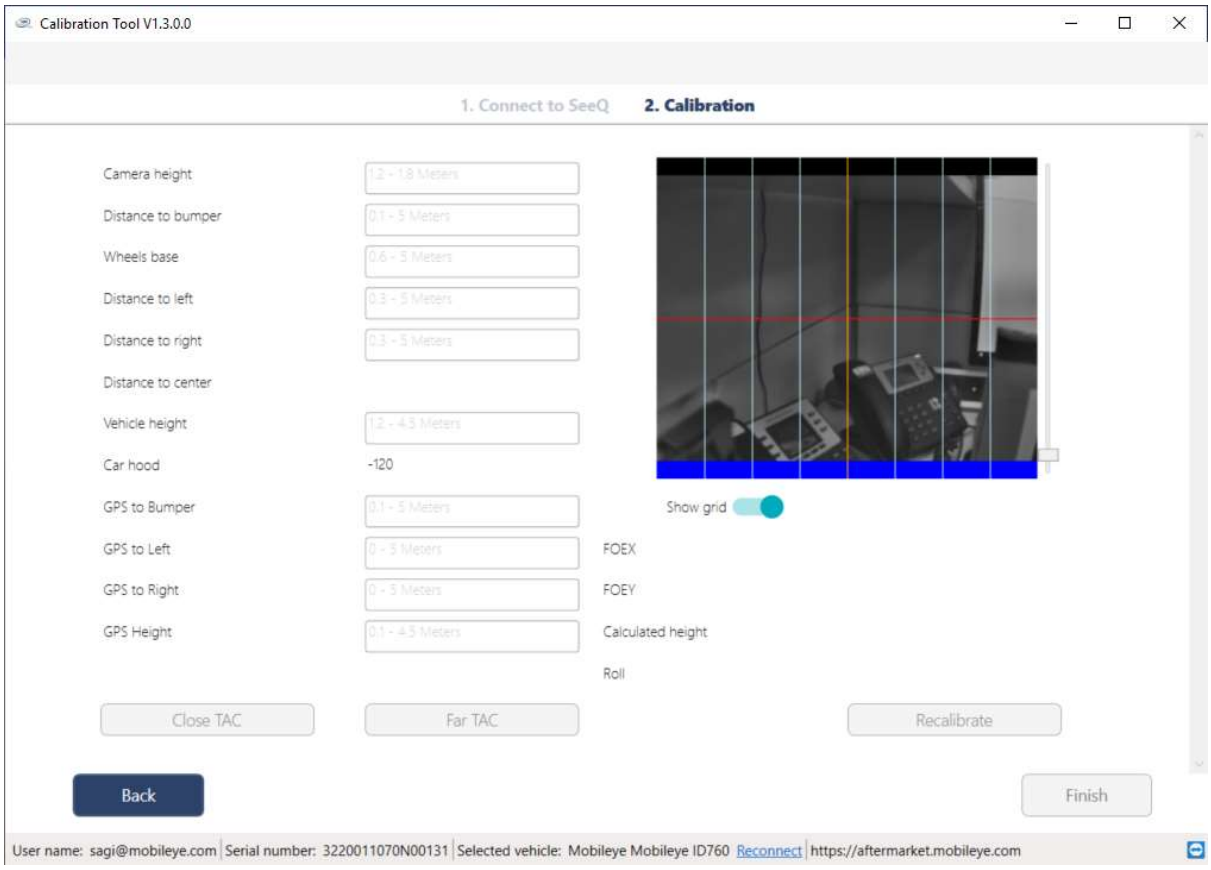
1. To use the Calibration Tool run the app from the Installation Center main screen


Installation Center V10.1.0.0
Hello Sagi Rahamim!
Site:
Mobileye Israel

2. The tool will check communication with the system and display the system s/n and FW version and display the status of each component.



3. The camera attachment, measurements and calibration slide will show.
   To attach, measure and calibrate, please refer to pages 32-42.



16. Troubleshooting

16.1 Troubleshooting

1. Installer kit:
   - Check the TAC assembly.
   - Check the EyeNET adapter and make sure the connectors are not damaged.

2. Installation issues:

   If signal test fails, check that:
   - You connected the correct CAN wires as instructed in the Mobileye Vehicle DB.
   - Make sure you selected the correct profile for the vehicle. If necessary, try to use another profile or proceed to CAN sniffing for a new profile creation.

   You can also try to switch the CAN sensor position on the vehicle CAN wires (CAN H and CAN L).

3. Calibration and software issues:

   Calibration issues can be related to the 4 parameters required.
   - If FOE X is more than ±15, check the camera location on the windshield and the position of the yellow line.
   - If FOE Y value is more than ±10, check the measured camera height, the TAC height and lens angle (red line).
   - The calculated camera height difference between what you measured and entered to the system may be up to 3cm.
   - If the roll value is more than 2°, make sure that the vehicle calibration surface is flat, and the main camera unit attachment is not rolled.
   - If you're having issues with the Installation Center installation on your laptop, make sure your laptop meets the minimum requirements.
   - Communication issues can be related to your laptop LAN Port settings. Make sure the LAN Port is set and adjust on your OS.
   - If your laptop is not equipped with a LAN Port, use an Ethernet to USB adapter (not included).

17. Technical specification

Mobileye® 8 connect™ – 4G | Technical Specification Sheet

Mobileye® 8 Connect™ Main Unit	
Physical Characteristics	
Length:	120mm
Width (without lens):	78mm
Height:	44mm
Weight:	200g
Color:	Black
Case material:	Plastic & Aluminum
Cable length (CAB000400):	3m
Cable diameter:	5.8mm (±0.2)
Electrical Characteristics	
Input voltage:	10-36VDC
Input current max:	12v > 700mA, 24v > 350mA
Max power:	8.5w
Ambient Temperature *As tested in lab with no radiation effect	
Operating temperature:	-20°c to + 60°c
Storage temperature:	-40°c to + 105°c
Vision Sensor	
Vision sensor:	OV10642 RCCC CMOS 1.3MP HDR
Active array size:	1280H x 1080V
Optical format:	1/2.56”
Pixel size:	4.2µm x 4.2µm
Dynamic range:	48° (horizontal)
Shutter type:	Rolling shutter
Responsivity:	4.8 V/lux sec (550nm)
Angle of view:	52° (horizontal) 42° (vertical)
Focus range:	5m to infinity
Image transfer rate:	36 fps
Audio Synthesizer	
SPL minimum	86dB @ 10cm
EyeQ4® Vision Processor Main Features	
Hyper-thread 64bit RISC interAptiv MIPS CPU	
1Gb Ethernet Port (Service port for EyeNET)	
128MB Flash x 2 (for code memory redundant)	
2 x 1.6GHz, 32bit LPDDR4 SDRAM interfaces	
4x MIPI CSI-2 Rx serial video and image preprocessing input ports	
1x parallel video image preprocessing input port	
3 x CAN ports (>1Mbps)	
3 x UART ports (5Mbps)	
3 x I2C Interfaces (1Mbs)	
4 x SPI interfaces	
Manufacture Standard	
Mobileye® 8 Connect manufactured in ISO/TS 16949 certified sites.	

Full System Electrical Characteristics	
Input voltage	10-36VDC
Input current (full operation)	1A @ 12V, 0.5A @ 24V
Max power consumption	12W

Warning:
Beware when removing the system after operation as it may be hot.
For your safety, please use gloves.

Mobileye® 8 connect™ - 4G | Display unit Specification Sheet

EyeWatch Display Unit	
Physical Characteristics	**EyeWatch 3**
Diameter:	49mm
Depth:	24mm Leg closed: 29mm Leg open: 66mm
Height	49mm
Weight:	46g
Color:	Black
Case material:	Plastic
Cable length:	3m
Cable diameter:	3mm (±0.15)
Electrical Characteristics	
Input voltage:	5VDC
Input current:	50mA
Ambient Temperature *As tested in lab with no radiation effect	
Operating temperature:	-20°c to +60°c
Storage temperature:	-40°c to +105°c
Operating humidity:	Up to 95%
Display Characteristics	
Screen size	1.5"
Contrast ratio	250
Surface luminance	LCD full color - 40 mcd (min)
Viewing angle	100°
Resolution	128x128 pixels
Additional Features	
Light sensor for automatic view day/night	Yes

Mobileye® 8 Connect™ 4G Cellular Module | Technical Specification

4G Cellular Module	
Physical Characteristics	
Model	Telit LE910C1
Length:	182mm
Width:	55mm (Slimmest); 78.6mm in connector area (Peak)
Height:	22mm
Weight:	Modem unit: 121.9g Modem cable: 119.3g
Color:	Black
Case material:	PC/ABS
Cable length:	3000mm (±30)
Cable diameter:	6.5mm
Specification	
Protocols	LTE FDD Cat1 (10/5Mbps DL/UL), GSM/GPRS/EDGE, WCDMA up to DC HSPA+, Rel.9
Coverage area:	Global with several models LE910C1-xx
Bands:	2G: 2, 3, 5, 8 HSPA+: 1, 2, 3, 4, 5, 6, 8, 19 LTE FDD: 1, 2, 3, 4, 5, 8, 12, 13, 14, 18, 19, 20, 25, 26, 28, 28A, 66, 71
Data rates:	Up to 10Mbit/s DL Up to 5Mbit/s UL
Internet Protocol Version	IPv4 / IPv6
Transport Layer Security	SSL – several TLS
Certification	WW – depend on each model FCC /IC, PTCRB, (North America) RCM (Australia) Jade/Telec (Japan) RED/GCF (Europe) CCC/SRCC (China) Anatel (Brazil)
Telecommunications standards	TS 27.005, 27.007 and Telit Custom AT commands LTE FDD Cat.4, 3GPP release 10 compliant LTE FDD Cat.1. 3GPP release 9 compliant
Serial interface	UART (up to 3Mbps)
Power supply	12V
SIM Voltage:	1.8V
Sim size:	Nano SIM 10mm X 12.5mm X 1.2mm
Environmental Characteristics	
Operating Temperature:	-20°c to + 60°c
Storage temperature:	-40°c to + 100°c

Mobileye® 8 Connect™ GNSS Module | Technical Specification

Receiver type	
Receive and track multiple GNSS systems	
Support satellite: GPS, GLONASS, BeiDou and QZSS signals	
Features	
Frequency of time pulse signal [1PPS]	0.25 Hz…10 MHz
module Type:	External module with antenna included
RTC using a crystal	External 32.768 kHz signal to the RTC input Clock and data backup on sleep mode
Voltage Operation:	1.65-3.6V
Dimension:	40mm x 40mm
Cable length:	450mm
Environmental Characteristics	
Operating temperature:	-20°c to + 60°c
Storage temperature:	-40°c to +100°c

Mobileye® 8 Connect™ (4G) | Certificates

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www.mobileye.com

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