RACE NAVIGATOR

THE WAY OF DRIVING FAST

RN ONE

USER MANUAL

RACE-NAVIGATOR.COM

RN ONE
RACE NAVIGATOR

Thank you for choosing RN ONE!

Please read this manual before using the device for the first time.

Visit the website for more information:
www.race-navigator.com

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Delivery scope

Take the Race Navigator ONE out of the box and check the content:

- Race Navigator ONE
- External GPS antenna
- Windscreen holder with suction cup
- 12 V car adapter cable and 230 V charger.

Race Navigator ONE

The RN ONE appeals to all sports car drivers and motorsport professionals who drive on race tracks and wish to be able to intuitively record and analyze their drives without the need for technical expertise.

With its big touchscreen and compact, lightweight casing, the RN ONE is a system designed for intuitive usage. Two integrated cameras for track and cockpit recording render composite videos in HD quality. GPS, Wi-Fi and Bluetooth are integrated.

A number of functions are available including:

- HD (720p/30fps) video recording from 2 cameras in standard,
- Optional Full HD (1080p/30fps) video recording with additional camera,
- Cameras with wide-angle lens,
- High dynamic range microphone,
- Recording starts and ends automatically, depending on the speed,
- GPS position and speed (10 Hz),
- Acceleration sensor (20 Hz),
- Gyro sensor (roll/yaw/pitch) and compass,
- Engine speed, throttle position and more car-specific data via OBD2 or CAN connectors,
- Wireless (Wi-Fi) data/video transfer,
- Export of data/video to USB stick (USB 3.0)

RN ONE Installation

Take the suctiopn cup mount and screw it to the device**.** In the vehicle, put the suction cup of the mount below the rear-view mirror and fasten it tight to the windscreen with the clamping lever.

Make sure that the mounted RN ONE can record videos properly. In general, the best position is about 5—10 cm above the dashboard.

Adjust the RN ONE so that the top is approximately in balance. Check the position by recording a test video.

NOTE: Before every ride, check the adherence of the mount. An incorrectly installed device might get detached from the windscreen and get damaged, causing damage to the car or serious injuries to the driver.

Turning on

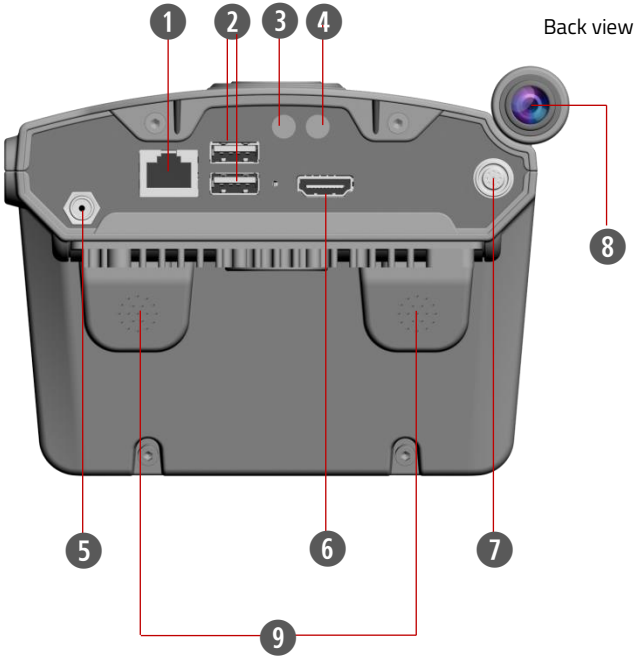
Turn the RN ONE on by pressing the Power button three seconds but no longer.

Turning off

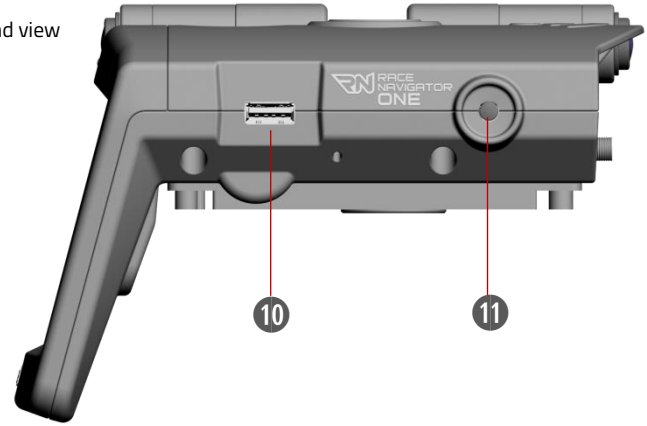
Turn the RN ONE off by pressing the Power button for a brief moment. Wait for powering off the device.

RN ONE ports description

1. LAN port (service port)
2. USB ports
3. Microphone port
4. Speaker port
5. External GPS Antenna
6. HDMI port (service port)
7. Power connector
8. Track camera
9. Speakers

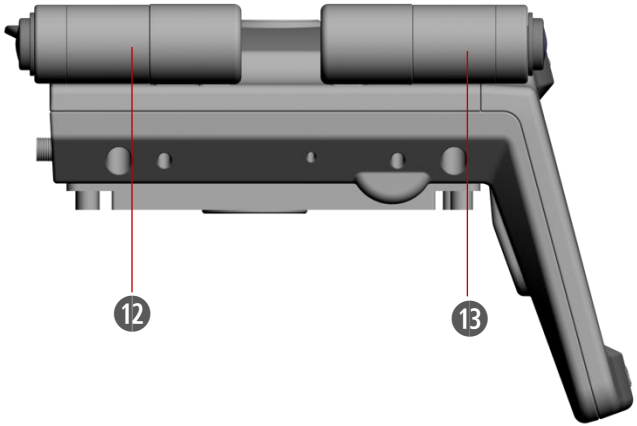


Right-hand view



10. USB port
11. Power button
12. Track camera
13. Inside camera

Left-hand view



14. Home button

Clicking the Home button in any location opens the main page of the RN ONE (the Home view, see 01. Home, page 17).

The Home button lights up green when the device is turned on.

When the recording is activated, the Home button lights up red.

Plan view

Front view

15. Control LED
16. Display

Device Configuration with Multiple Cameras

In this table it is defined what camera types can be connected to which ports depending on used cameras.
Please do not use different setups than defined below.

RN ONE Cameras Configuration	Double USB port back side, bottom blue page 12 number ❷	Double USB port back side, top black page 12 number ❷	Single USB port right side page 13 number ❿
2x HD (build in)	-	-	-
2x HD (build in) + Full HD	Full HD Use clamp: yes	-	-
2x HD (build in) + HD	-	-	HD Use clamp: no
2x HD (build in) + SD	-	SD Use clamp: yes	SD (optional)
2x HD (build in) + Full HD + SD	Full HD Use clamp: yes	SD Use clamp: no	SD/HD (optional)
2x HD (build in) + Full HD + HD	Full HD Use clamp: yes	-	HD Use clamp: no

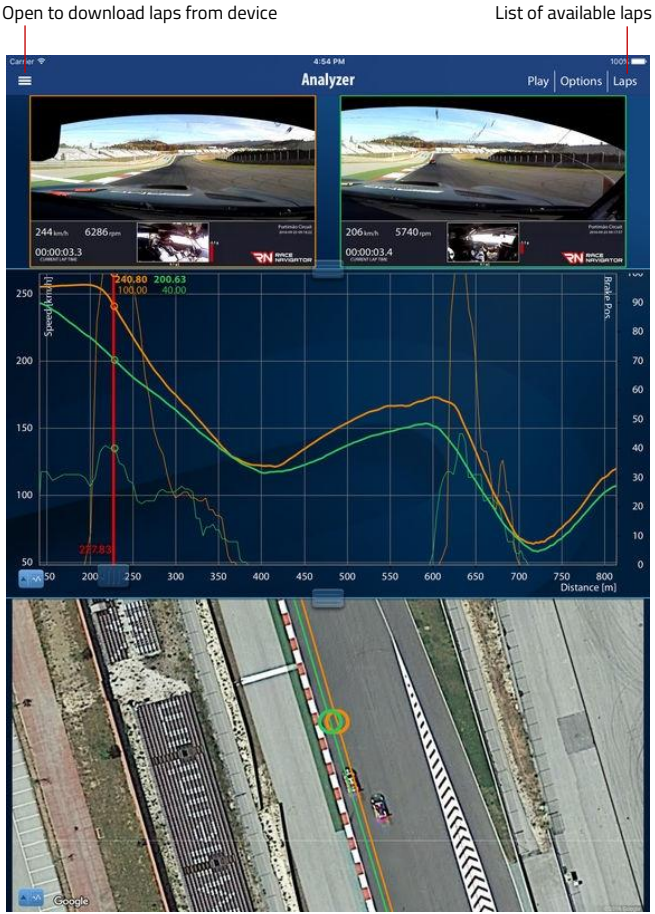
PLEASE NOTE: it is not allowed to use third party extension cables with RN cameras. Additional intersection in cables can lead to recording malfunctions. Only RN proprietary cables guarantee flawless operation.

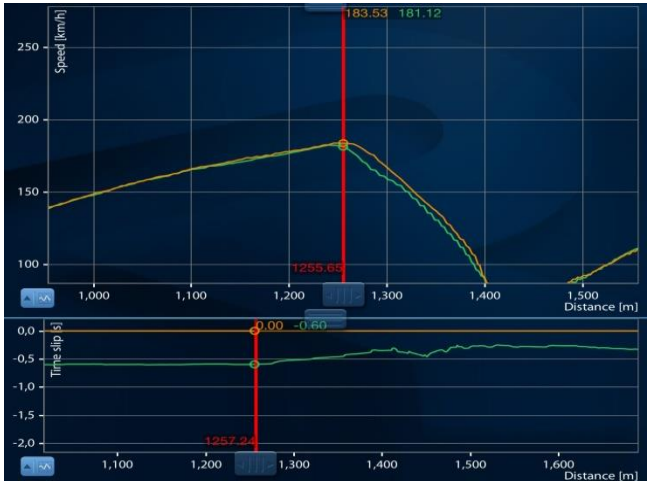
RN Analyzer APP

RN Analyzer is an extended analysis tool of the data from all Race Navigator devices.

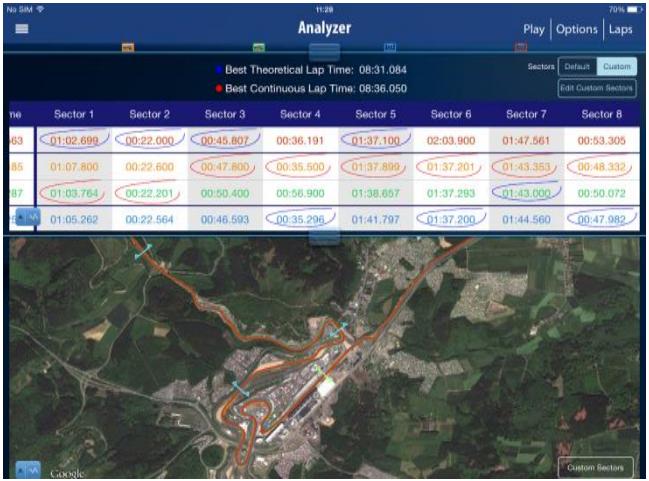
The application is very easy to use and offers a wide range of analysis options:

- The comparison of all selected laps, according to different criteria (**speed, distance, time, g-forces, OBD-II data**). You can analyze the entire track step by step by using **the blue slider.** The videos and charts are immediately **synchronized** according to the slider's position.
- An aerial perspective of the race track based on Google Maps. Your driving lines are displayed with maximum precision from an overhead view.
- A video player. Multiple videos can be played side by side in the Analyzer view synchronously or a single video in full screen mode.
- Social-networking services. You can easily share your laps with friends on Facebook, YouTube and others.





- A possibility to compare two laps (or more!) and see exactly where you are gaining or losing time.
- The section times analysis. It allows you to count your best theoretical time and best continuous time.
- Laps overview. You can compare maximum and minimum values of the data types gathered by the system.
- RN Cloud service. All laps with videos can be archived in the RN Cloud service for later use and to get more free space on your device.
  The cloud is also used to share whole laps between users and to transfer data to a new iPad.



The RN Analyzer APP is available for **free download** from the **iTunes App Store**. Use a QR code reader to access the iTunes App Store and download the application.

TECHNICAL PARAMETERS

DISPLAY			
Display size	5'' (built-in)		
VIDEO CAPABILITIES			
Recording resolution	HD, 720p at 30fps		
Stereo audio recording	✓	Manual/automatic start	✓
Wide viewing angle	✓	Real time overlay	✓
Built-in recording layouts	✓ (up to 4 cameras)	Recording format	.mp4 or .mkv (depends on mode)
HARDWARE			
WiFi	✓	Operating temperature	0°C to +70°C
3-axis Gyro and G-sensor	✓	Auto power on	✓ (depends on version)
GPS/Glonass receiver	✓	Operating humidity	5%-85%
Bluetooth	✓	Height	155 mm
USB 2.0 port	✓	Width	115 mm
USB 3.0 port	✓	Depth	165 mm
HDMI port	✓	Weight	858 g
LAN port	✓	Supply voltage range	11-16V
Internal Disk	64 GB	Power (max)	23W

1 HOME

This page is the main page of the RN ONE and is displayed when the system starts.

This view can be opened from any location by clicking the Home button.

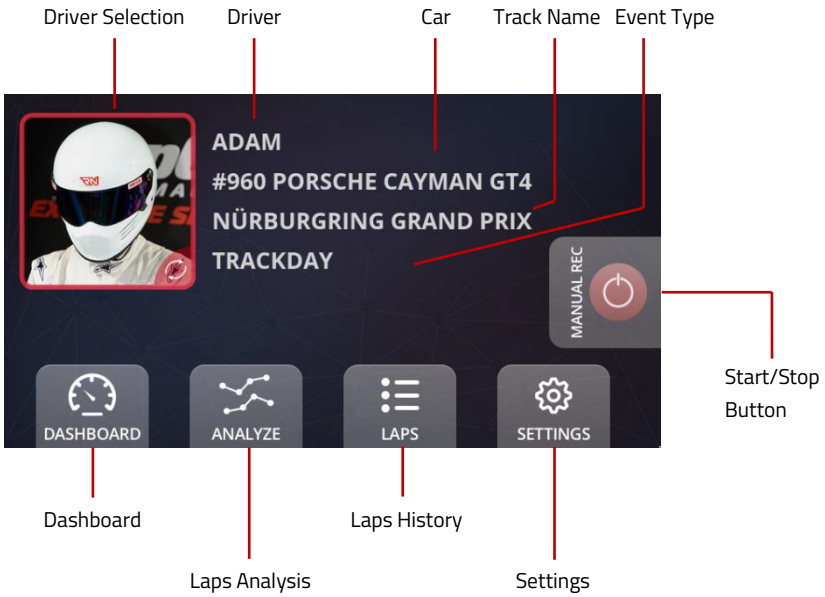
Dashboard
Press this button to open the Dashboard.

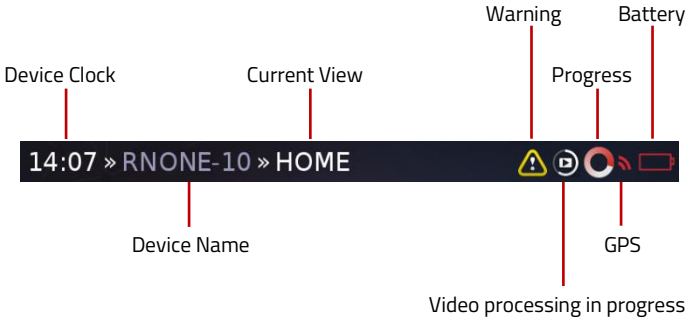
Laps Analysis (Analyze)
Analyze your laps directly on the RN ONE device.

Laps History (Laps)
All recorded laps can be found here.

Settings
Here you can specify all the settings of the RN ONE, e.g. drivers, tracks, network, etc.

Driver Selection
The currently selected driver is displayed here. The driver can be changed by clicking on the item and choosing the desired person from the list.





2 STATUS BAR

The bar at the top of the screen contains important information about the RN ONE device and its current status.

Warning

When the icon shows up, an issue occured, e.g. not enough disk space. You should check the device status by clicking on the item. You can also check the device status in the Settings > RN Device > Status.

Video processing

The icon is displayed while the recorded video file is being processed.

Progress

The animated icon shows up whenever the RN ONE device is busy.

GPS

The icon shows up when the GPS signal is lost.

Battery

The icon shows up when the power supply is disconnected. The color indicates the battery charging state.

3 DASHBOARD

The Dashboard consists of five panels.

3.1 DASHBOARD · Panel 1

Panel 1 presents the data for the current lap and the reference lap.

Gap to Reference

This is the time gap between the current lap and the reference lap, calculated for the current vehicle location on the track.

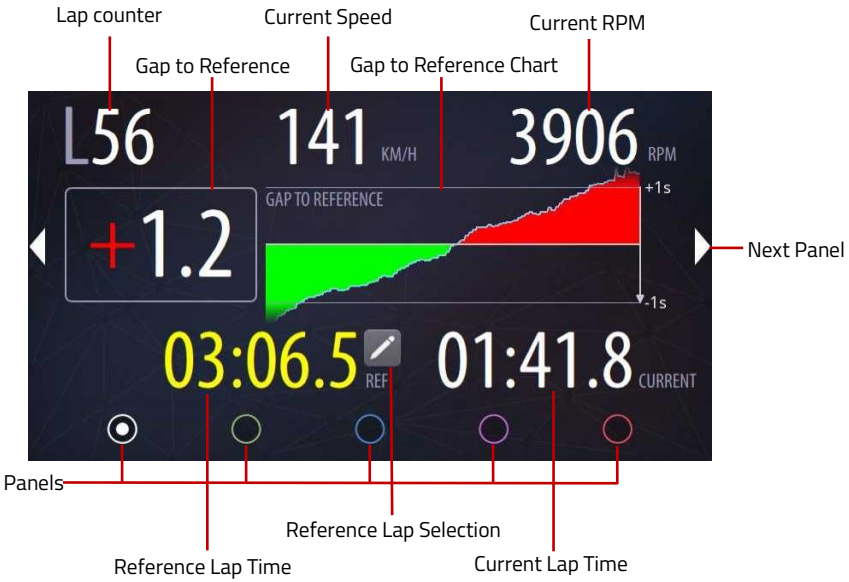
Gap to Reference Chart

The chart displays the gap for the last 20 seconds. Green color means the time advantage compared to the reference lap, red means the opposite.

Reference Lap Selection

The fastest lap is automatically selected as the reference lap. A different lap can be chosen from the laps list by clicking on the icon.

Lap Counter You can reset Lap Counter by tapping on it and confirming by tapping "Yes".



3.2 Manual Correction of Current Lap Number

If the actual lap number on the device does not match the race lap number before or during the race, it can be manually adjusted.

Lap number adjustment:

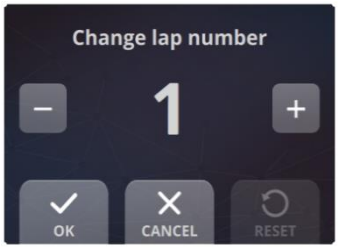
To adjust the Lap Number press on the Lap Counter.

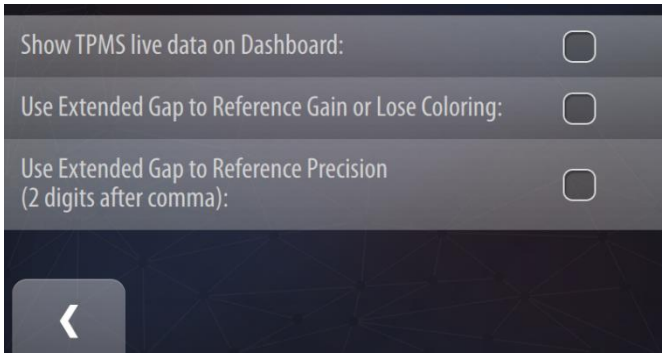
- To reset the lap counter and set its value to 0 press on the Reset button:

- To change the lap number use:

And set new lap number

by pressing OK button:





3.3 DASHBOARD · Panel 1 Additional Settings

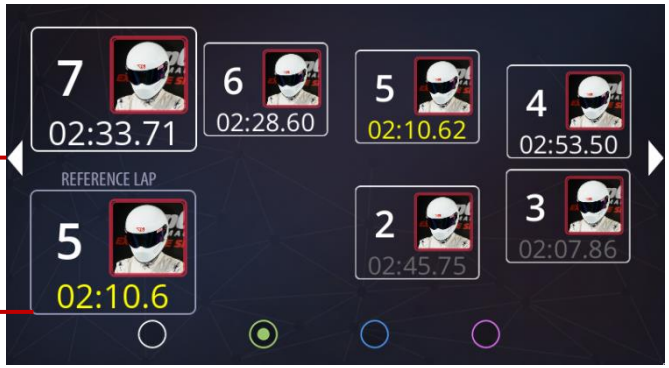
Enable the flag 'Extended Gap to Reference Gain or Lose Coloring' to display an indicator in red or green color when you are gaining or losing in time.

Enable the flag 'Use Extended Gap to Reference Precision' to display the Gap to Reference time with a two digits precision.

Green frame around the Gap to Reference time indicates you are gaining in this moment.

Red frame indicates you are losing in this moment.

The frame is displayed independently on the current Gap to Reference value.



3.4 DASHBOARD · Panel 2

Panel 2 presents the laps from the current event.

The best lap of each driver is colored yellow.

Full laps are colored white, while the others are in grey.

You can find the selected reference lap in the bottom left corner.

3.5 DASHBOARD · Panel 3

Panel 3 presents all important diagnostic information of the vehicle. It is possible to retrieve data from the OBD2 interface or from the CAN Bus. To use OBD2 interface data the RN Plug is required to be plugged into the OBD2 port in the car. With the RN Plug, information about rpm, water temperature as well as the throttle position can be read. CAN Bus provides more data channels.

3.6 DASHBOARD · Panel 4

Panel 4 presents your current speed, the time of the current lap (on the right; colored white) and the time of the reference lap (on the left, colored yellow).

3.7 DASHBOARD · Panel 5

Panel 5 presents a trip distance and the overall distance made by the currently selected car. The trip distance can be reset any time by tapping it and pressing "YES". The overall distance is the all-time distance made by the car with the RN device and cannot be reset.

Start/Stop Button

4 MANUAL RECORDING

In addition to the automatic recording possibility, you can also start and stop recording videos manually.

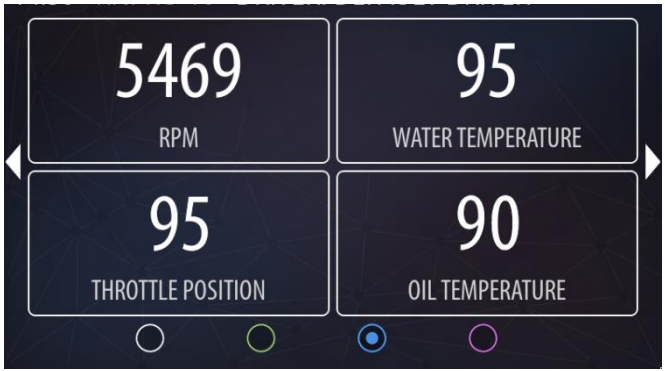
Start/Stop Button

To **start recording**, press the Start/Stop button on the right side of the Home Screen.

Press the button again to **stop recording**.

Recording can also be started with the "Home Button" on top of the device. Press the button for at least two seconds to start and stop the recording.

IMPORTANT NOTE: When switching from Auto-Start to manual recording with these shortcut buttons it means the user is responsible for starting the recording. Keep in mind to switch back to Auto-Start if you want the device to do so.



5 RECORDING WITH OBD-II DIAGNOSTIC DATA

To extend the range of the recorded and displayed data you need to have the RN PLUG.

The RN PLUG can be purchased via our online store (www.store.race-navigator.de).

- Plug **the RN PLUG** into **the OBD-II diagnostic port** in your vehicle (it is usually located in the driver footwell, under the steering wheel, on the left side).
- The OBD-II data is collected from the car while recording.
- To verify whether your car is compatible with the RN PLUG, record two laps manually, each for at least 2 minutes. Check on Panel 3 of the Dashboard if the values are available.

  If you use the **RED** version of the plug you don't need to pair it with the RN device, if you use one of the **BLACK** versions, please follow the steps below to pair first.

5.1 Connecting to RN OBD LINK Plug

Select OBD Connection

Go to Settings → Device → Additional Settings → OBD-II Settings.

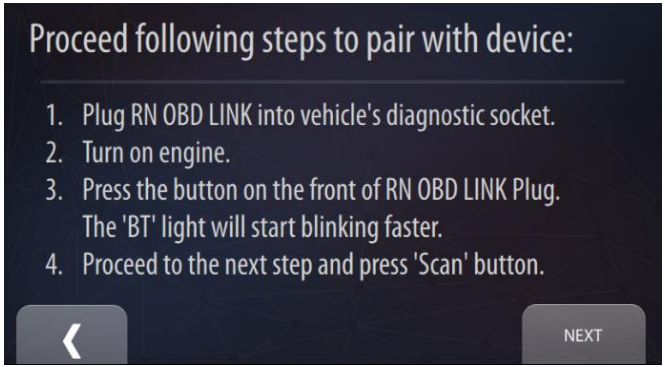
Select the RN OBD LINK Plug, if no device is paired, a yellow text is shown.

Press the RN OBD LINK Plug image or “PAIR” button to begin pairing procedure.

Pairing steps

Get Familiar with pairing steps and press

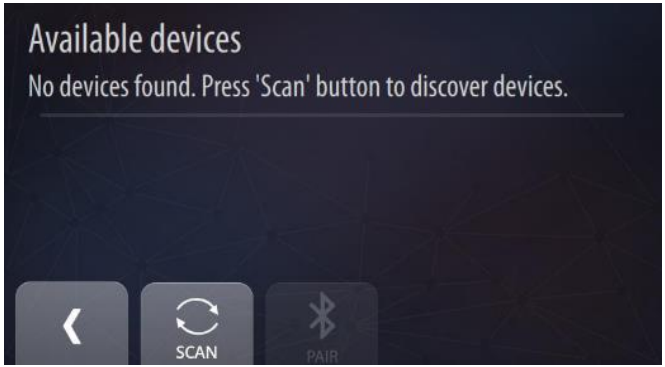
“NEXT” button to proceed.



Scan for OBD Plug

Press “Connect” button on the left side of front panel of the RN OBD LINK Plug to activate the Bluetooth discoverability.

Press “Scan” button to discover “RN OBD LINK Plug” by RN device.



Pairing

Select “RN OBD LINK Plug” from the list, then press “PAIR” button.

Pairing Confirmation

If device is paired successfully a popup message shows up with information of paired device. If you get a message that you should repeat pairing, please follow the steps once again.

Reading data

The data is read from the plug every time when the recording is ongoing.

5.2 Connecting to RN Plug BT LE

Select OBD Connection

Go to Settings → Device → Additional Settings → OBD-II Settings.

Select the RN Plug BT LE, if no device is paired, a yellow text is shown.

Press the RN Plug BT LE image or “PAIR” button to begin pairing procedure.

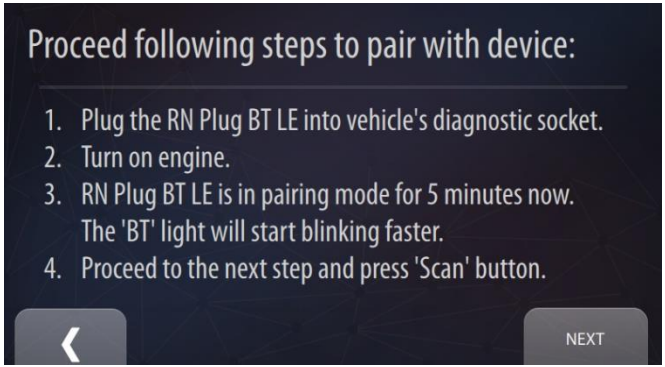
Pairing steps

Get Familiar with pairing steps and press

“NEXT” button to proceed.

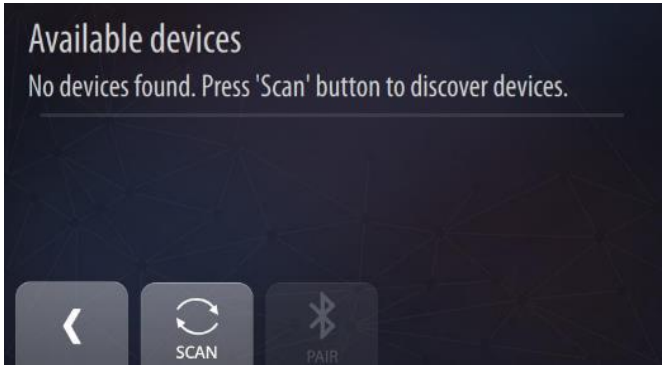
This version of RN PLUG BT doesn't have any button for setting it into pairing mode. To pair the RN PLUG just plug it into the OBD Socket of the car and turn on the ignition.

Pairing mode is automatically started and last for 5 min.



Scan for OBD Plug

Press “Scan” button to discover “RN Plug BT LE” by RN device.

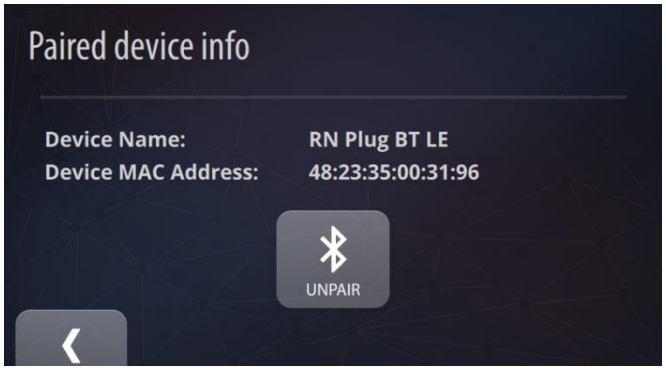


Pairing

Select “RN Plug BT LE” from the list, then press “PAIR” button.

Pairing Confirmation

If device is paired successfully a popup message shows up with information of paired device.
If you get a message that you should repeat pairing, please follow the steps once again.



Reading data

The data is read from the plug every time the recording is ongoing.

6 LAPS HISTORY (LAPS)

The laps page displays all laps in the selected event. Full laps are colored white while the others are colored grey, except for the best laps of each driver which are colored yellow.

The list can be sorted by column headers. You can change the sorting method by clicking on one of them. The current sorting column is colored red.

Clean up

There are two ways to delete laps:

1. Remove all incomplete laps.
2. Remove all laps except the top three of every driver.

Remove

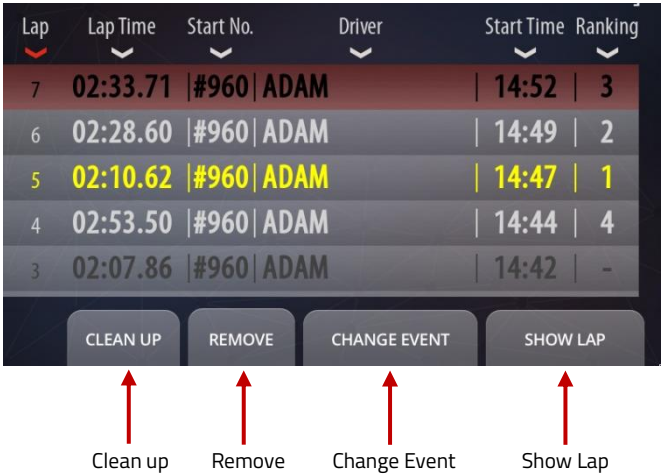
Clicking the button removes the currently selected lap. If a video file exists, it is deleted as well.

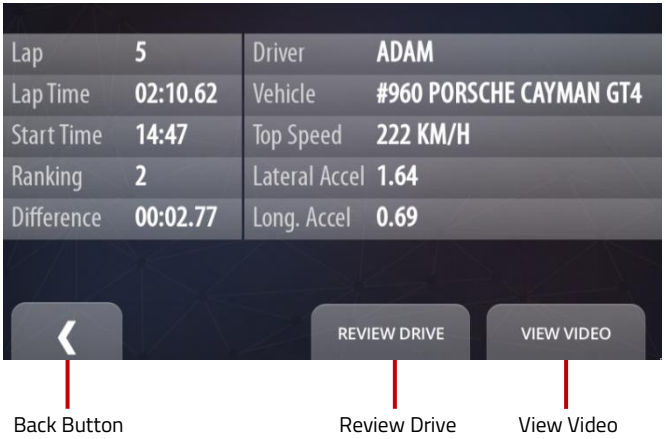
Change Event

Choose the event from the list and browse through its laps.

Show Lap

Click the button to display the lap details and the video.





6.1 LAP DETAILS

Here you can get all lap details and view the recorded video.

Back Button

You can go one step back by clicking this button.

Review Drive

Here you can watch the animation with the lap data.

View Video

By clicking the button, you can display the video.

6.2 REVIEW DRIVE

In the Lap Review mode, all lap data is simulated so you can observe it as it was displayed in real time during the lap.

You can stop the review by clicking the Stop Review Button on the right side of the Home screen.

6.3 VIDEO PLAYER

In the player you can watch the video of the selected lap.

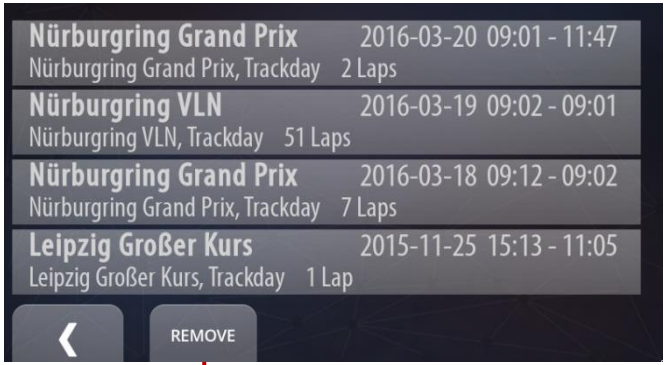
The recorded videos consist of both camera views: the outer and inner. Along with the camera views, other lap data is presented such as: track name, current time, lap time and current speed. The bars on the right and bottom edges of the inner camera present the current G-force values.

6.4 EVENTS

On this page you can find all events recorded on the device

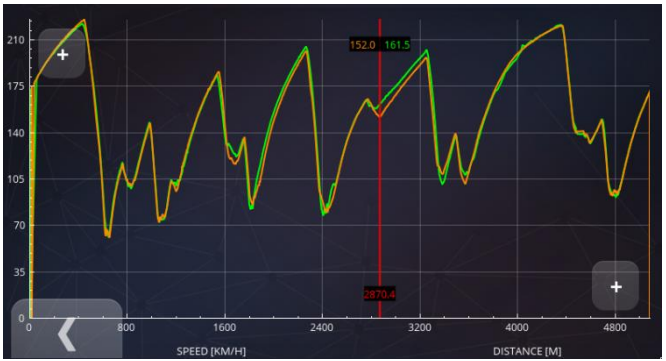
Remove Button

With this button you can remove the selected event and all its data, including the video files and incomplete laps.



Remove Button

Change Event Set Lap A/B Analyze



7 ANALYSIS

On this page you can select two laps and compare them with each other.

Full laps are colored white, while the others are in grey. The best laps of each driver are colored yellow.

Change Event

In order to select laps from different sessions for comparison, you can change the event by clicking this button.

Set Lap A/B

This button allows for selecting laps A and B. Select lap A and click the button, then select lap B. If lap A is selected, the button shows B and vice versa. Lap A is colored green and lap B is colored orange.

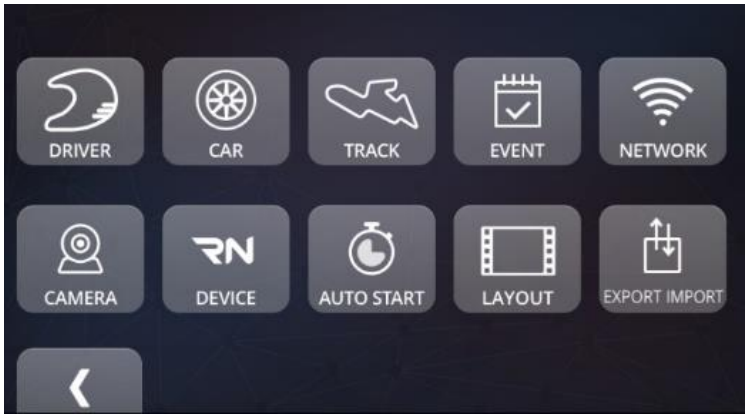
Analyze

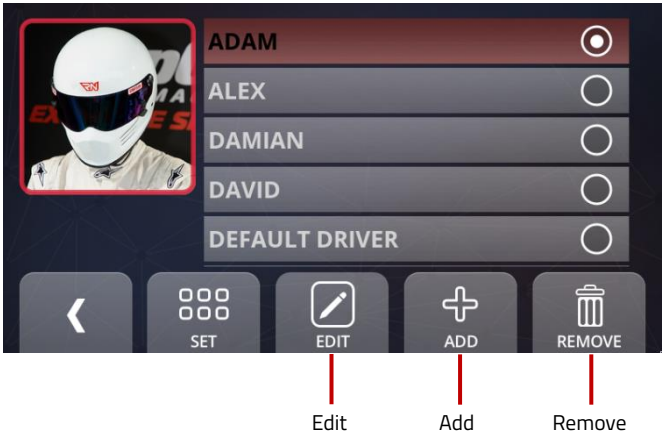
The chart displays speed with colors corresponding to the selected laps. The red line can be moved with a finger. The chart itself can be enlarged. The Plus button on the right side zooms in on the horizontal axes, whereas the left one zooms in on the vertical axes.

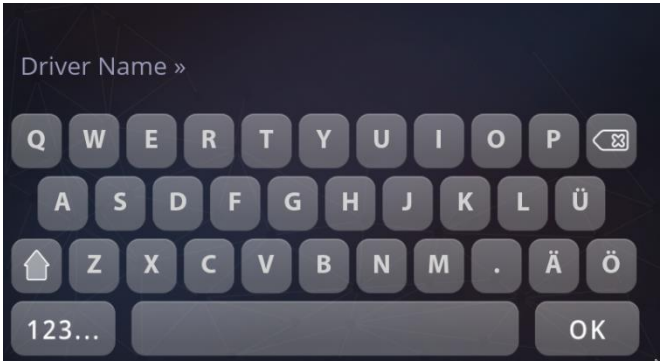
8 SETTINGS

Here you can specify all device parameters.

Driver: You can select a driver.
Car: Press this button to select a specific car.
Track
You can select a track variant.
Event
Here you can select a type of event.
Network
You can connect to the network.
Camera
Here you can check the camera views.
Device
Here you can modify other device settings.
Auto Start
By clicking the Auto Start button, you can set manual or auto recording.
Layout
This button can be used to change the video layout.
Export Video
You can export your videos to a memory stick.







9 DRIVER

Each recorded video is associated with a driver, car, track and an event.

To select a driver, go to the Settings view and click on **Driver**. You will find a list of existing users. Scroll down the list and select one. Press **Set** to confirm your selection.

Edit

You can edit an existing driver here.

Add

In order to add a new driver, press this button.

Remove

Here you can remove the selected driver.

9.1 DRIVER · Add

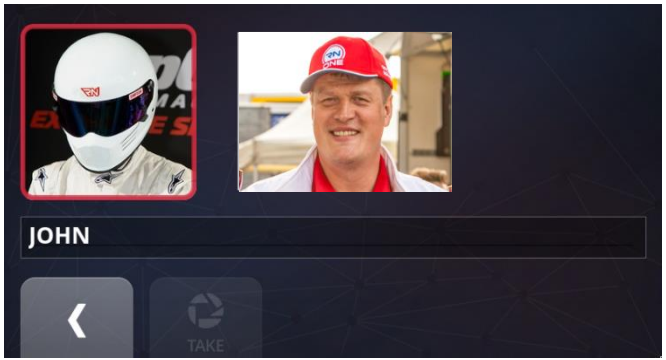
To create a new driver, click the **Add** button.

Enter the driver's name using the onscreen keyboard and confirm with **OK**.

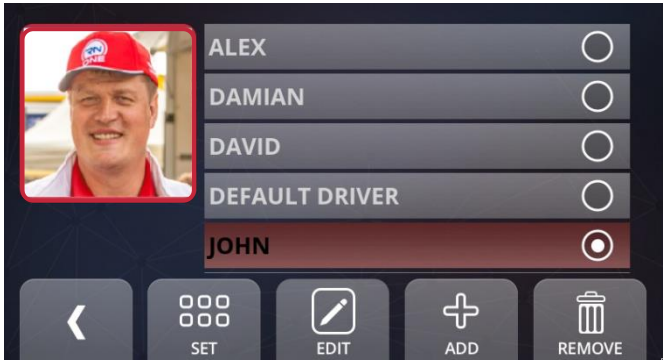
Now you can use the cockpit camera of the RN ONE to take a photo of yourself.

Press **Take** to take a picture.

Use the Back button to complete the process.



Consequently, you can find the new driver on the list and select it. Confirm your selection by pressing the **Set** button.



10 CAR

To select a car, go to the Settings view and click **Car**. There will be a list of previously added cars. Scroll down the list and select one. Press **Set** to confirm your selection.

Edit

Here you can edit the existing car options.

Add

To add a new car, press this button.

Remove

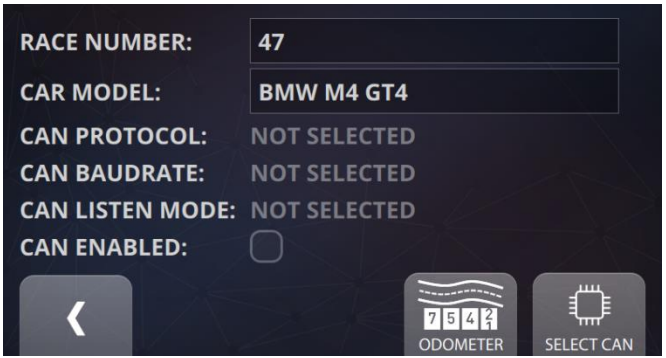
You can remove a car, except for the default vehicle which cannot be removed.

10.1 CAR · Add

To add a new car, click the **Add** button.

Enter the race number and the car model's name using the onscreen keyboard and confirm with **OK**. Use the Back button to complete the process.

Now, you can find the new car on the list and select it. Confirm your selection by pressing the **Set** button.



10.2 CAR · Configure CAN Bus

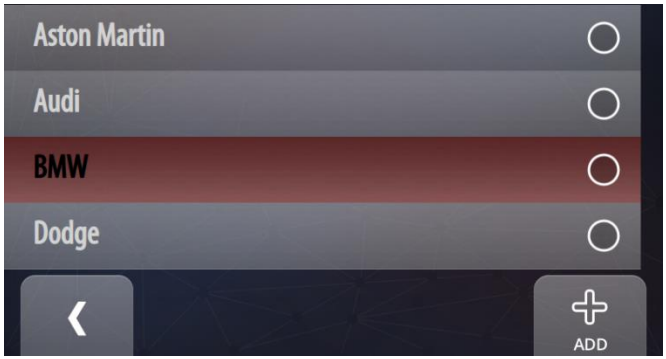
The device integrates a logging function of additional data channels from the CAN Bus of a connected vehicle. For a communication it is necessary to use an appropriate CAN cable (see picture) – please contact your supplier to get more details.

I. Setting predefined CAN protocol.

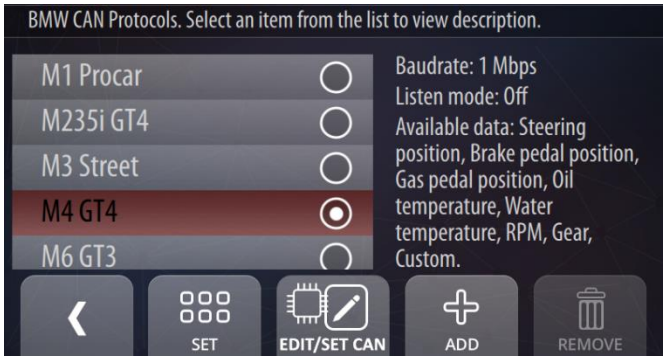
There are numerous predefined CAN protocols to choose from. To check if your car model is supported go to **Settings > Car**, select your car and click the **EDIT/SET CAN** button. To go further click the **SELECT CAN** button and scroll through available car brands.

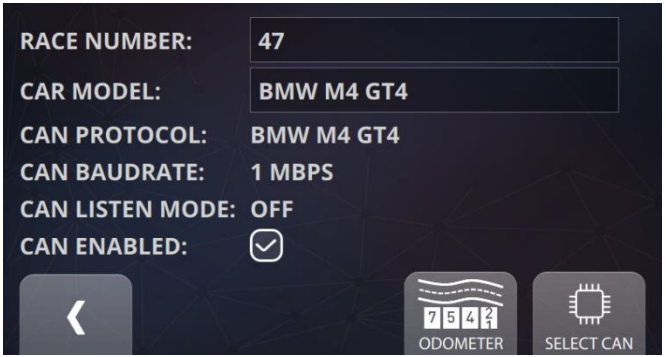
CAN ENABLED checkbox needs to be selected to activate CAN data transmission.

Click on the car brand to list available car models.



Select your car model and click SET button.





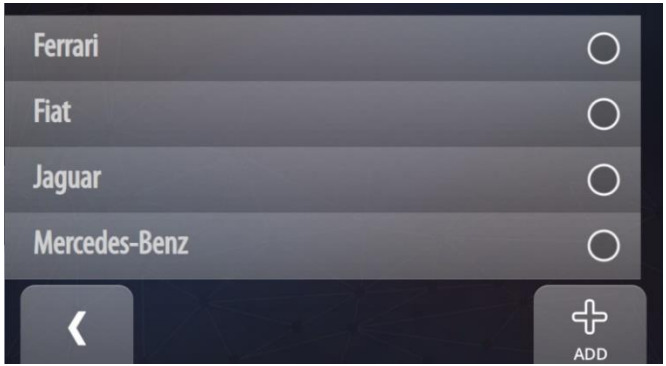
After going back to the car edit screen the name of your car is displayed as selected CAN PROTOCOL and the CAN ENABLED checkbox set. A CAN transmission can be disabled by unchecking the CAN ENABLED option. If CAN ENABLED option is selected Bluetooth communication with RN OBD Plug is disabled.

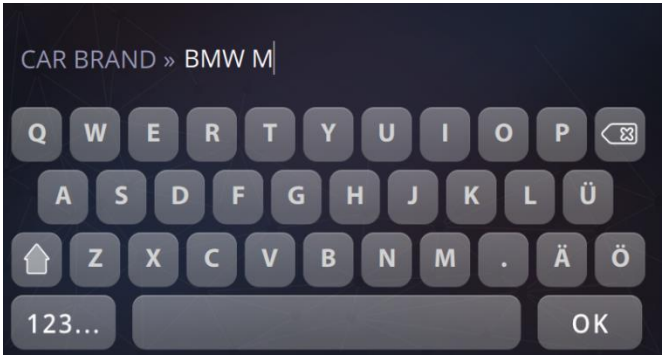
II. Setting new user-defined/custom CAN protocol.

To load a new custom CAN protocol of your car go to **Settings -> Car**, select your car and click the **EDIT/SET CAN** button.

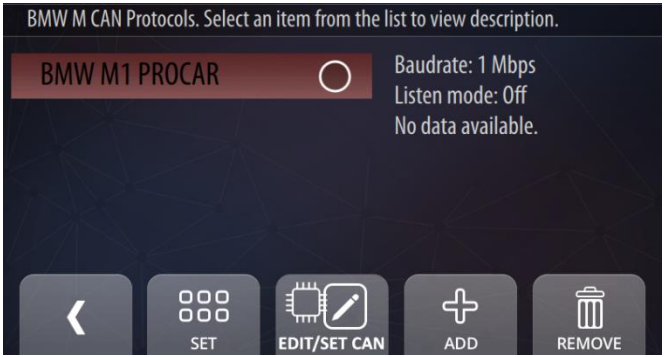
On the next screen click the **SELECT CAN** button.

Select your car brand or, if not available, click the **Add** button.





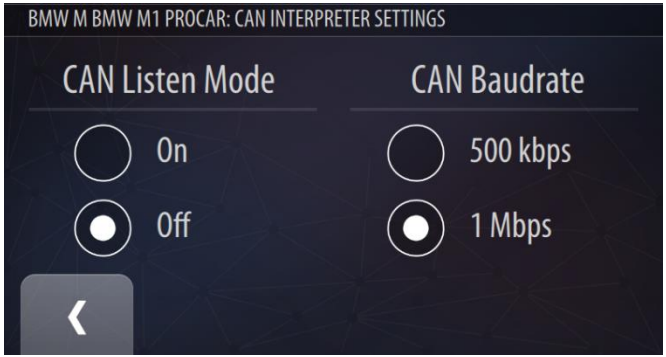
Type in the car brand and then the car model. If the brand is already available, but there is no model of your car, add it on a list of available car models.



After adding new car model it is visible on the list with current details that are unavailable right now, because there is no data loaded yet. To add a custom CAN definition select your car model and click on **EDIT/SET CAN** button.

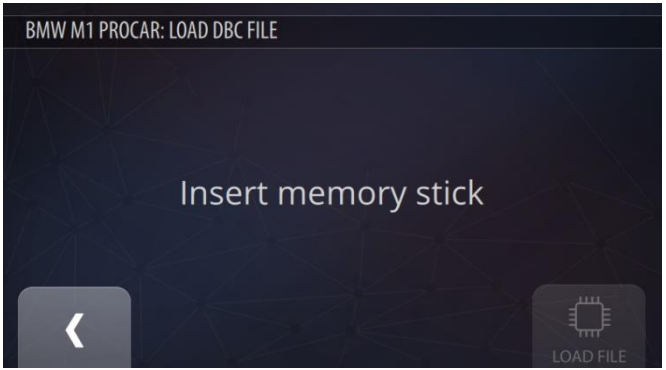
CAN details screen will appear. There is a car model on the top-left corner, current CAN baud rate on the top right corner and current CAN data signals which are empty during new CAN setup. From here you need to set two options.

EDIT CAN – allows to choose baud rate for CAN transmission and enable CAN Listen Mode. Select the correct CAN bus baud rate available in your car. It is usually 500 kbps or 1000 kbps.

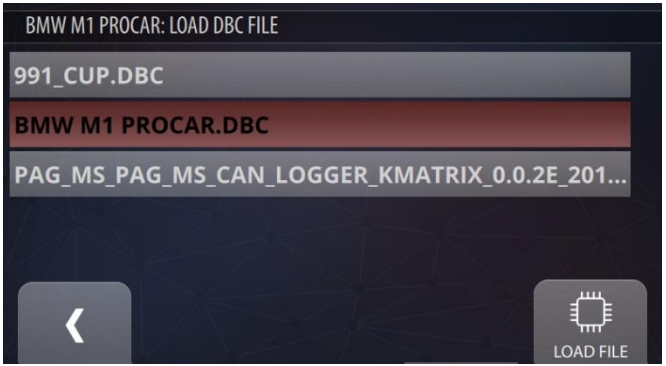


CAN Listen Mode
In the CAN "listen mode" the CAN transmitter is disabled and the Race Navigator device is not interfering with any CAN bus communication - passive reception of CAN frames.

This mode is intended for CAN bus monitoring. Please enable this flag when connecting to an unknown CAN bus or when the acknowledgement from another CAN node is not required.
When the acknowledgement is required, this mode should be disabled.



LOAD DBC – provide the file in .DBC format that includes a definition of all CAN protocol signals of your car. The system prompts to insert the memory stick with .DBC file copied directly on the stick. Prepare it and connect to one of device's USB ports.



After connecting a memory stick with .dbc file (can be more than one file), all files are available to upload. Click on the one that you would like to choose and click the 'LOAD FILE' button. After successfully loading the list of available signals from your .dbc file they will be displayed.

You can change the baud rate again at any time. You can also load a different .dbc file and the current CAN signals will be overwritten by the new ones.

If you want that your channel names are compatible with typically used channels in Race Navigator please use listed names:

steering_angle – for steering wheel angle

brake – for main brake (brake pedal position or brake pressure)

gas_pedal – for gas pedal position

rpm – for RPM value

gear – for current gear number

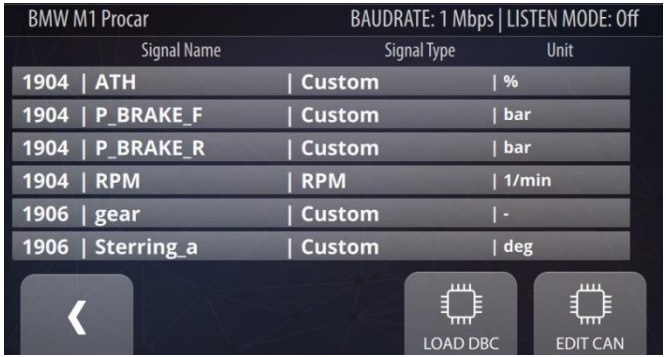
speed – for car speed available through CAN

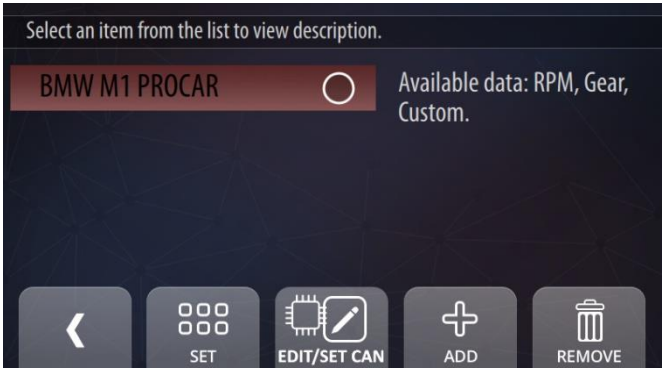
water_temp – for water temperature

oil_temp – oil temperature

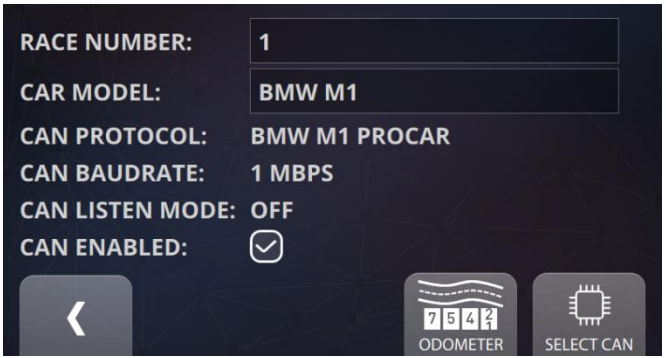
oil_pressure – oil pressure

kickdown – for kickdown signa

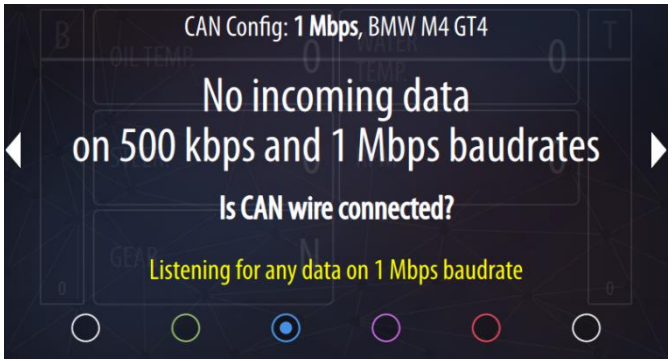




After going back you will see your car model with available signals. Don't forget to 'SET' this CAN protocol.



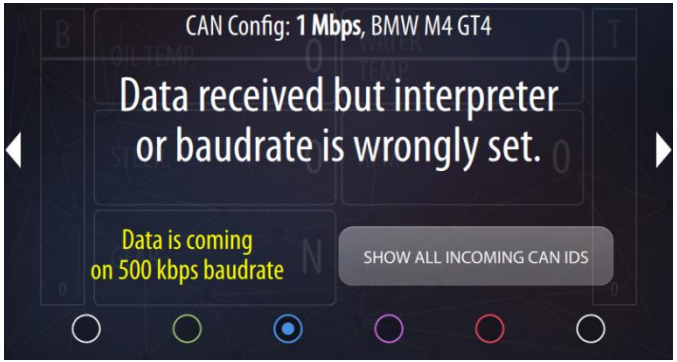
On the car settings you will see the CAN PROTOCOL name changed to the one that you recently set.



10.3 CAN Bus Diagnostics and Troubleshooting

In case of problems with the CAN Bus communication, there are diagnostic tools available to check for issues. After selecting CAN Bus interpreter for the connected car by the CAN Bus cable, open CAN Bus monitor dashboard (DASHBOARD-> Panel 3).

The communication on CAN Bus is monitored continuously here. The system scans on 500K and 1M baud rates that are most commonly used (current scanned speed is shown with yellow text). If no communication is detected, the system shows the message:
No incoming data on 500K and 1M baudrates. The reason can be a non connected CAN cable, a mistake in the connection, a broken cable or no data coming from the ECU, because of no power or an incorrect setup.



If the communication is detected but incoming data don't match with the selected CAN interpreter, then the shown message is displayed.

The reason for this issue can be a wrongly selected CAN interpreter with different CAN IDs defined or a wrong CAN Bus speed setup. Please select a correct CAN interpreter from existing ones, create a new one from the correct DBC file, change the CAN Bus speed from your interpreter or change CAN Bus speed of the sender.

It is possible to display all incoming CAN IDs by pressing SHOW ALL INCOMING CAN IDS button. Please note that the CAN IDs are displayed in the decimal system, not hexadecimal.

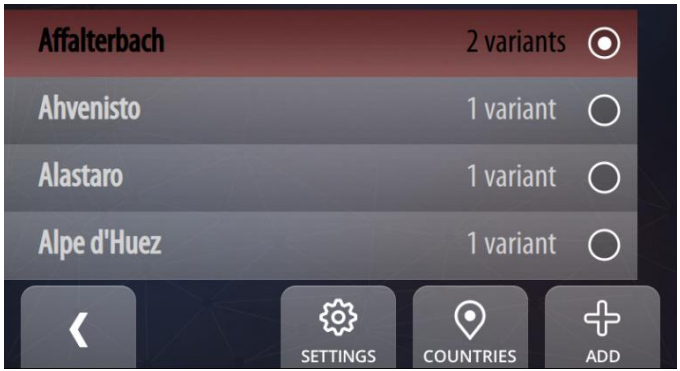
11 TRACK

All filtered tracks are displayed here.

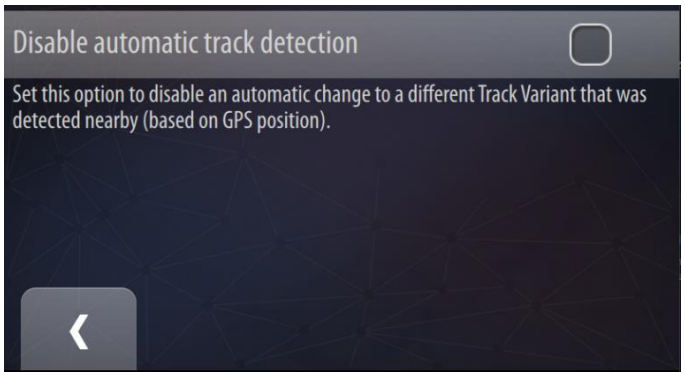
To filter the tracks by countries, just click the Countries button.

Click on the specific track to open the Track Variants view.

You can select one of the available track variants or create a new one (see 12.1 & 12.2).

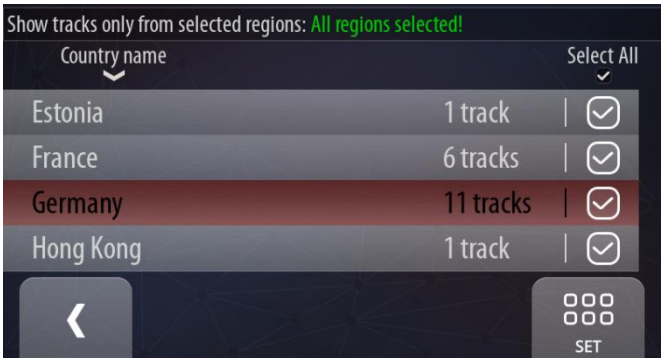


If you want to disable automatic track detection you need to access “Settings”.



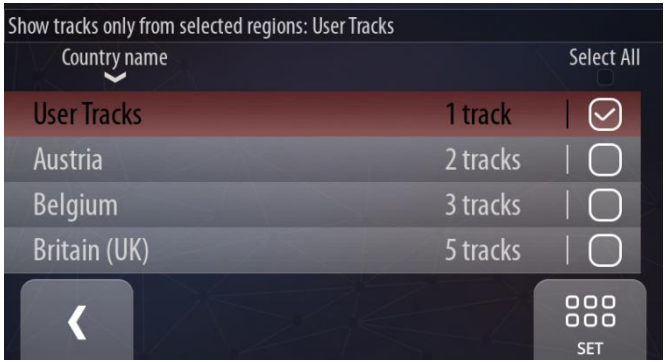
Here you can set the countries by which to filter the tracks. Select the country and click the Set button or just select the check box next to the country.

The caption on the top of the view informs about the currently selected countries.



You can quickly select (or deselect) all countries by clicking the Select All button above the check boxes.

The tracks created by the user (see 12.1 & 12.2) are listed under the 'User Tracks' filter.



11.1 TRACK VARIANTS

All available variants of the selected track are listed here. Scroll down the list and select one of them. Press **Set** to confirm your selection.

Edit

You can edit a track variant.

Add

Here you can add a new track variant.

Remove

Press the Remove button, to remove a track variant.

11.2 TRACK VARIANTS · Edit

Here you can edit the track properties like: name, track name, total distance and track width. Enter the proper values using the onscreen keyboard and confirm with **OK**. Use the Back button to complete the process.

11.3 TRACK VARIANTS · Add

If you want to add a new track, you need to record the entire route.

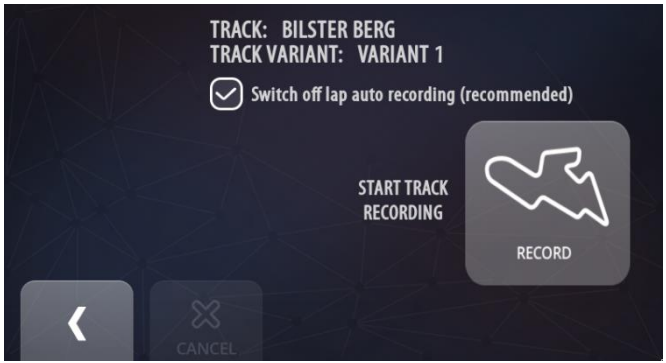
In the first step, enter the track name and press the **Record** button.

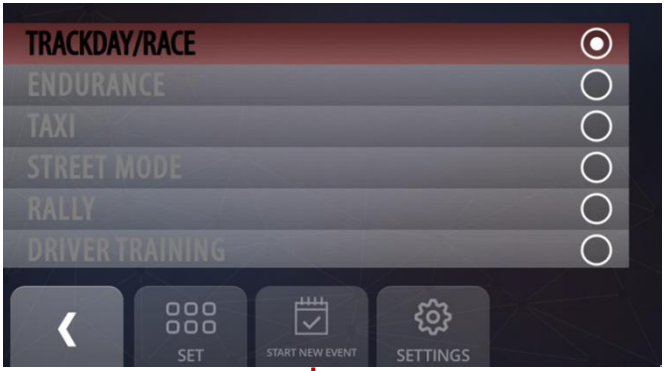
Place the car exactly on the start line, press **Start Track Recording** and drive.

The RN ONE automatically records the new track variant route when you drive. The track variant recording stops automatically without user interaction when you cross the same line as the start line. In this case the closed track variant is recorded and stored.

If you want to record an open track variant just press the record button once again when the finish line is reached.

NOTE: Make sure that the GPS signal is strong enough and an external GPS antenna is connected properly.





Start New Event

12 EVENT

All available event types are listed here. You can browse through the list and select one of them. The available types are colored white, while the ones not available are colored grey. Press **Set** to confirm your selection. Additional event types can be purchased online (store.race-navigator.de).

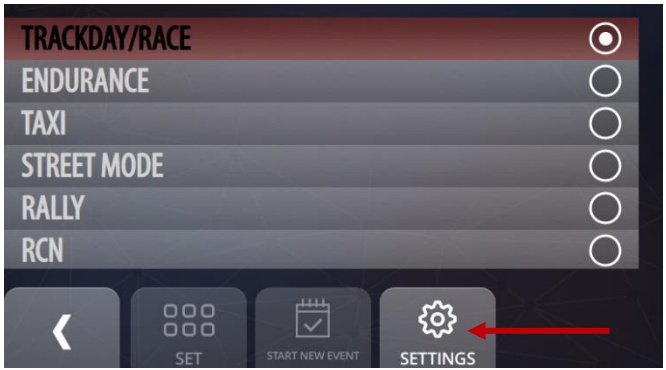
Trackday/Race is a default event type and it is always available. The other types are optional and can be purchased for an additional fee.

Start New Event

You can start a new event by clicking this button. Every event contains its own list of laps.

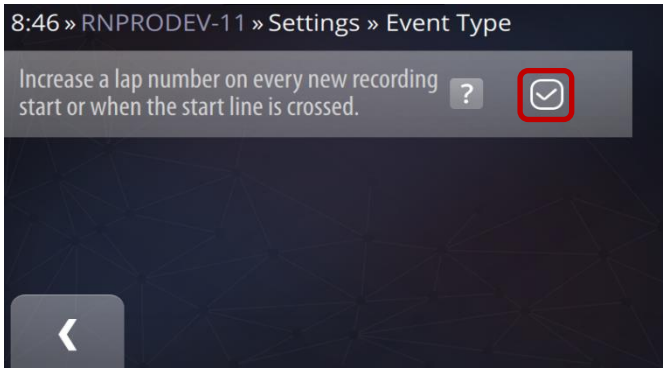
12.1 EVENT · Trackday/Race

- It is a default event type.
- All data is recorded directly on the device.
- Separate videos are prepared for each lap.
- In the auto-start mode, the recording is activated automatically and deactivated twenty seconds after the vehicle stops.



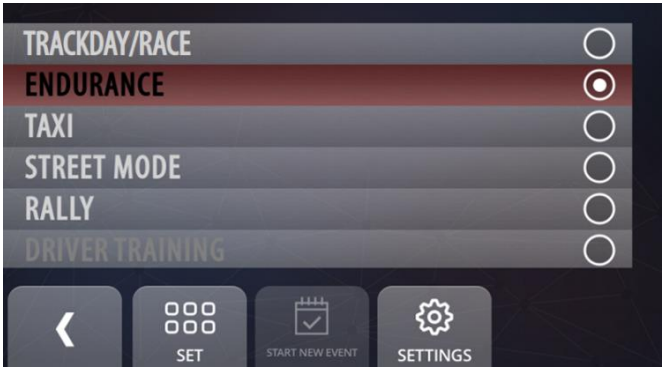
Trackday/Race Settings

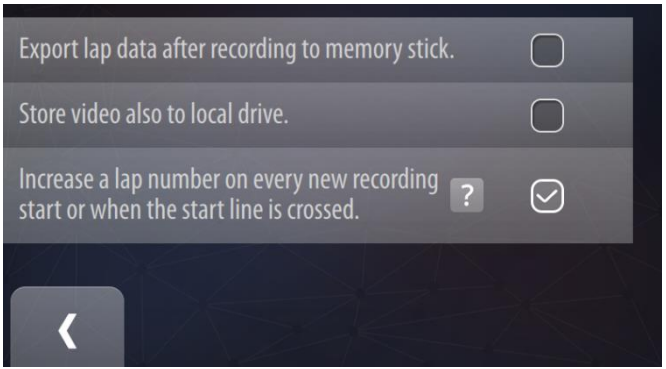
By default the current lap number is increased every time when a new recording is started and when start line is crossed. This is more convenient in most cases to keep track of all recordings and to get laps for analysis directly after stopping the car. If you prefer to have lap numbering same as during races, please deselect this checkbox.



Please note:

If you use the Variable Pit Lane Times feature from Pit Lane Monitor, this checkbox must be deselected.





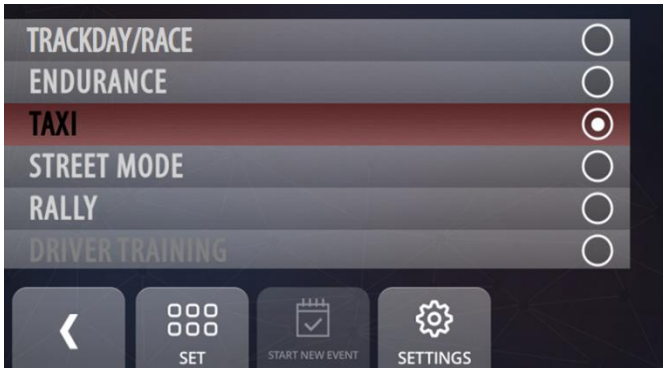
12.2 EVENT · Endurance

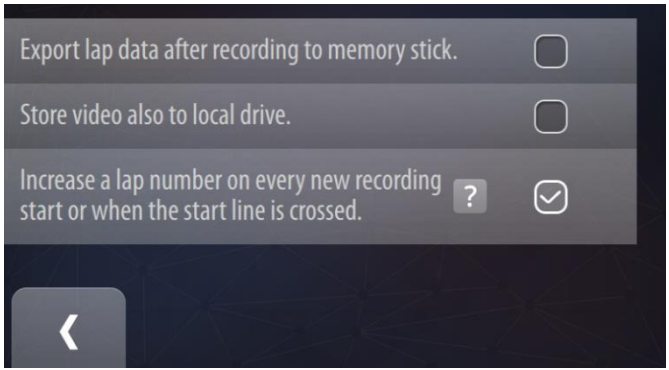
- Endurance is a special mode designed for "Endurance" events, when it is important to transfer the video recorded by the Race Navigator to the memory stick immediately during the pit stop.
- For recording purposes, it is required to have the memory stick plugged in. Otherwise, the video will not be recorded and you will be notified about the missing memory stick.
- The videos and data are recorded directly on the memory stick.
- In the auto-recording mode, the recording is activated automatically after exceeding the required speed and deactivated three seconds after the vehicle stops.
- When the red alert "**FLUSHING MEM. STICK**" disappears, you can safely remove the memory stick.

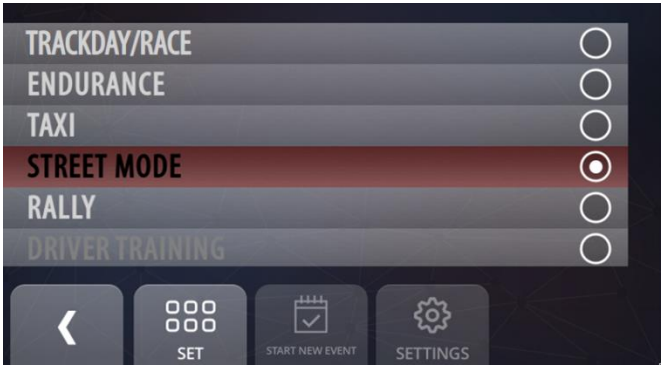
12.3 EVENT · Taxi

- Taxi is a special mode designed for "Taxi" events.
- For recording purposes, it is required to have the memory stick plugged in. Otherwise, the video will not be recorded and you will be notified about the missing memory stick.
- The videos and data are recorded directly on the memory stick and can be received immediately after the vehicle stops.
- In the auto-recording mode, the recording is activated automatically after exceeding the required speed and deactivated three seconds after the vehicle stops.
- When the red alert "**FLUSHING MEM. STICK**" disappears, you can safely remove the memory stick.

If you want your video to be stored not only on memory stick, but also on the device, you can access "Settings" and check the option: "Store video also to local drive". In order to save your lap data to the memory stick, you need to check the "Export lap data after recording to memory stick" box.







12.4 EVENT · Street Mode

- The Street Mode is an event type designed for testing your car's straight line performance.
- This mode allows you to measure the acceleration and deceleration of the vehicle during the drive.
- The event type provides a specially customized dashboard dialog where it is possible to watch the visualization of the most important measurements.
- Three different modes are available: **Acceleration test**, **Braking test** and **Distance test**.
- For each test a separate video is recorded with a proper caption.
- The recording is a bit longer than the test so that a more suitable video is obtained.
- Your tests can be analyzed later in the **RN Analyzer app** on your iPad or a PC with Windows.
- GPS Signal Quality details on screen. Best precision during measurements is when GPS Signal is above 95%

STREET MODE TEST ACTIVATION

Recording of each street mode test is starting automatically when start conditions are met. The start conditions are as follows:

- **For acceleration tests:**

If minimum speed is set to 0 km/h, a start is triggered by a high longitudinal G-Force detection and speed above 0 km/h.

If minimum speed is higher than 0 km/h a start is triggered by a speed above min. speed.

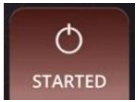
- **For braking tests:**

A start is triggered by a deceleration below top speed level.

- **For distance test (drag race mode):**

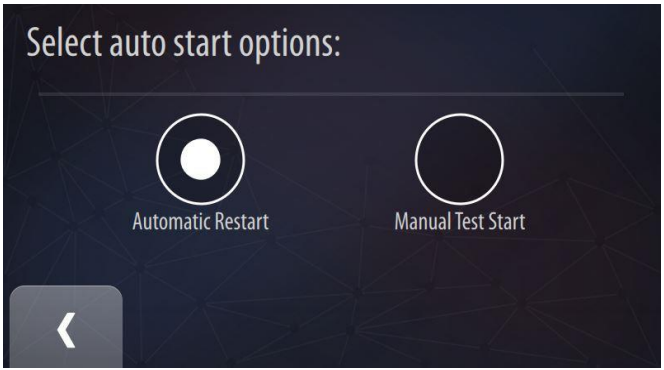
A start is triggered by a high longitudinal G-Force detection and speed above 0 km/h.

Before a test start, standby mode must be activated by pressing NOT ACTIVE. button from the dashboard. The button color will change to green and ACTIVATED. STARTED icon means that a test is carried out.



Multiple test runs

If you plan to perform more tests one by one it is possible to turn on automatic switching to ACTIVATED status after every test run. You can do it by changing the auto start mode to automatic start (from HOME→SETTINGS→AUTO START)



ACCELERATION TEST (ACCEL)

This option allows you to measure the acceleration of a car.

- To switch to the Acceleration test, click the **ACCEL** button.
- Choose one of three preconfigured speed ranges: **0-100 km/h**, **0-200 km/h**, **100-200 km/h** or define **your own range** from value A to value B.
- To define your own speed range, click the **CUSTOM** button and use the slider at the top of the dialog.
- To activate a standby before a test start press ACTIVATE button.
- When button is highlighted in green, the recording is activated and you are ready to go.
- The recording and measuring starts and stops **automatically** after reaching the selected speed ranges.
- To finish the test manually press STATUS button.

During the test, the **speed to current time chart** is being visualized in real time on the dashboard.

Acceleration test with braking

To enable this test, go to STREET MODE general settings and select Acceleration test with braking checkbox.

In this case, after reaching your maximum defined speed, the test is continued until the very end of braking, that is 0 km/h.

NOTE: The time spent while driving at a higher speed than the defined maximum **is not included** in the final measurement time. It means that the driver does not need to be concerned about exceeding the maximal defined speed because the system automatically includes only the acceleration time in the defined speed ranges and the braking time.

SETTINGS

Acceleration test with braking: Enable/Disable

BRAKING TEST

In this mode, you are provided with the same features as in the Acceleration test but the speed range is defined as descending.

- To switch to the Braking test, click the **BRAKING** button.
- Choose one of the three preinstalled speed ranges: **50-0 km/h**, **100-0 km/h**, **200-0 km/h** or define **your own range** from the customized start speed to 0 km/h.
- To define your own range, click the **CUSTOM** button and use the slider at the top of the dialog.
- To activate a standby before a test start, press ACTIVATE button.
- When button is highlighted in green, the recording is activated and you are ready to go.
- The recording and measuring starts **automatically** after crossing the defined start speed and stops when the 0 km/h speed is reached. The speed to current time chart is also available.
- To finish the test manually press STATUS button.

Braking test

DISTANCE TEST (DRAG RACE)

In this type of the Street Mode you can measure your driving time for a predefined distance.

- To switch to the Distance test, click the **DISTANCE** button.
- Choose one of three predefined distance values: **1/4 MILE, 1000 M, 2000 M** or select **your own distance value.**
- To select your own distance value, click the **CUSTOM** button and use the slider at the top of the dialog.
- To activate a standby before a test start, press ACTIVATE button.
- When button is highlighted in green, the recording is activated and you are ready to go.
- The recording and measuring **automatically** starts when the car starts driving and stops after reaching a final distance.
- To finish the test manually press STATUS button.

During the test, the **speed to current time chart** is being visualized in real time on the dashboard. The Distance test is also adequate to be used during drag races.

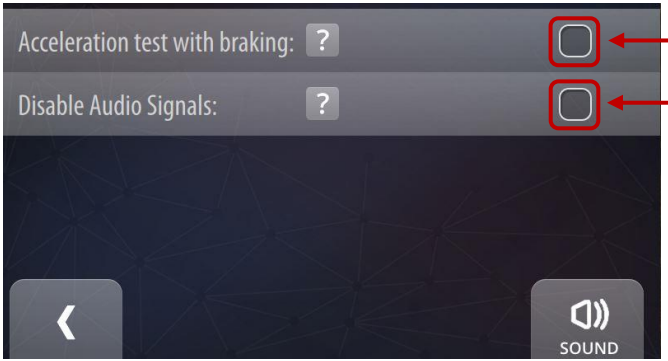
Distance test

GENERAL TESTS SETTINGS

General Settings Button

Acceleration test with braking

For more details, please refer to section about: Acceleration test with braking.



Disable Audio Signals:

In settings you can also Disable Audio Signals. Select this option to disable sound effects when starting and stopping street mode measurements.

TEST RESULTS

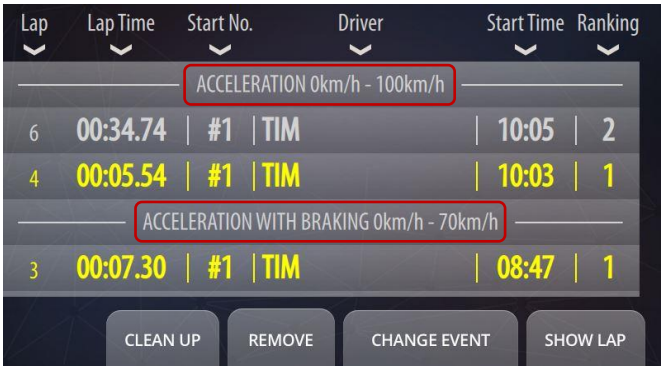
After each test a detailed table appears on a dashboard screen.

- Last: Lap time of the latest test.
- Avg: Average time of all tests in a current Event and test type (for example one speed range).
- Δ Last / Δ Best: a delta time to the last and best test time of the same test type.
- No 3: Current test number of the same test type.
- Max G: Maximum longitudinal G-Force value during measurement.

MEASURMENT LAPS LIST

Go to → HOME → LAPS

To View your Street Mode measurement laps.



SECTIONS

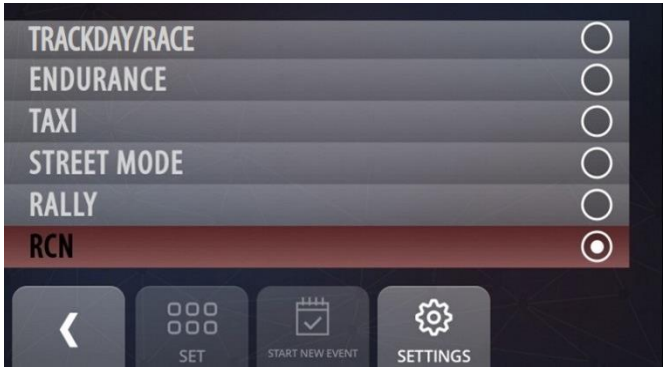
In laps list all measurements of the same type are grouped together.

Laps marked with yellow are the ones with the best (shortest) time.

12.5 EVENT · RCN Mode

The **RCN event type** is a feature prepared for the regularity driving events at the Nürburgring. There are total of 6 different racing groups predefined: the Blue, Red and Yellow defined for the two track variants Nürburgring Nordschleife and Nürburgring 24H. The RCN event helps you to track your **current lap number and type**, as well as calculating and displaying the **time difference** to your set time, shows your performance during sprint laps and displays the **countdown timer** while fueling!

The **symbolic icon** for every lap type and the **lap number** are shown on the dashboard during the race. While driving, lap types are switched **automatically** in a rulebook order, defined for the selected racing group.



The particular setups can be previewed on the **Settings**. In the RCN mode a new lap is created only when the start line is crossed, to avoid breaking the lap sequence.

Make sure that the **new event is created** before the race begins. In the auto start mode the recording starts automatically, and stops after finalizing the last lap of the RCN race when the car stops.

Six different lap types are defined in this mode**:**

1. Set Time Lap – a lap for setting the time, the measured time of this lap is used as a reference when the Confirm Lap starts.

2. Sprint Lap – a lap to drive as fast as possible, a reference time for a Sprint Lap is always the fastest lap from all laps in a current event, it can be also preselected before the race.

3. Confirm Time Lap - when starting this type of lap, the Set Time Lap is selected automatically as the reference lap. The system calculates and displays the time difference between current lap time and set lap time each second.

4. Fuel Lap - is a maximum-time lap, a countdown clock appears on the dashboard to show the driver how much time is left before incurring in penalties.

5. Out-lap - the first lap to be completed after exiting the pit lane.

6. Finish Lap - is also a maximum-time lap with a countdown, is a race final lap.

RESET RCN button

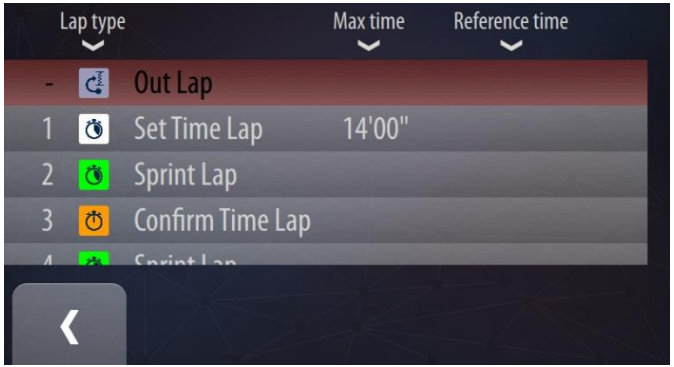
Here you can stop current RCN Event and start a new one to begin a new RCN laps sequence.

Keep recording during RCN when car stops

Unchecked is a recommended setting, if unchecked recording stops and starts automatically when the automatic recording start/stop is on, check it only if you need a complete video also while fueling, but then you need to wait longer after the race to download videos – it takes longer to process a recorded video.

SETTIME REF - Here you can select a reference lap for all the Set Time and Confirm Time Laps in current RCN event type. Reference lap can be chosen from the list of recorded laps on your device.

SPRINT REF - Here you can select a reference lap for all the Sprint Laps in current RCN event type. Reference lap can be chosen from the list of recorded laps on your device.

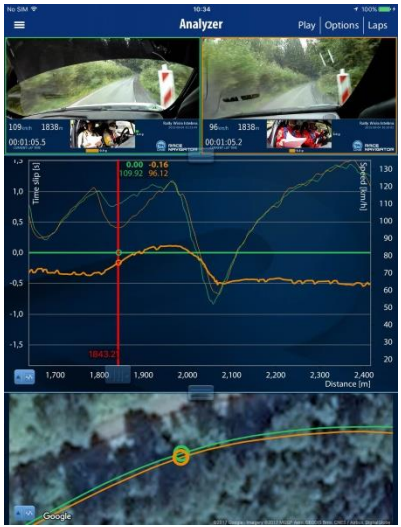


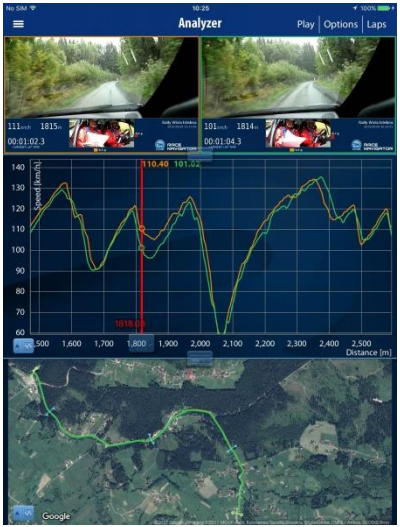
Click **DETAILS** to see all Lap types with chosen Reference time and Max time duration of laps of selected RCN event type.

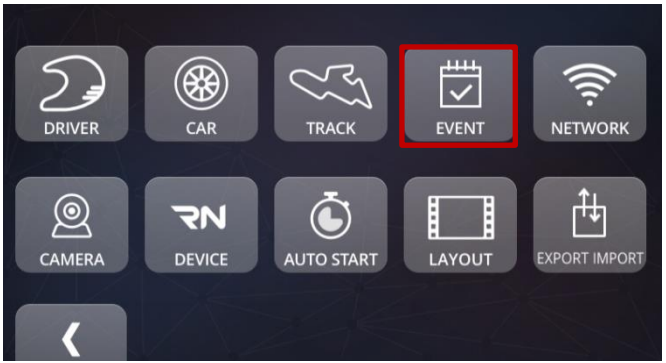
12.6 EVENT · Rally

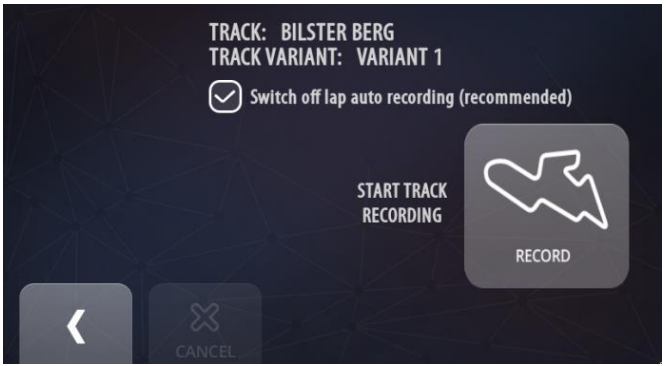
It is a specially-designed racing mode for the rally event, when conditions are often unpredictable and tend to change rapidly. Well-developed algorithms provide such system capabilities as:

- **Automatic start and stop of data and video recording** of stages – only stages are recorded, every stage gets its own video file and data, each stage has its own name and is easy to find,
- Data entry informing about the special stages,
- Automatic detection and switching between special stages,
- Automatic detection of the start and end of special stages,
- Analyzing the data between multiple runs of special stages in the RN Analyzer app,
- Measurement tool for reconnaissance,
- Full HD quality video with 2 cameras video overlay with adjustable team and sponsor logo,
- Additional parameters like water temperature, speed, pressures, time difference can be displayed on a separate screen.









Special stages recording instructions

1) Go to **SETTINGS > EVENTS** and set the **RALLY mode**.
2) Go to **SETTINGS > TRACKS** and create a new rally (track). Just press the **Add** button and follow the instructions.
3) To previously created rally, add a **new special stage** (the first **special stage**).
   - In the Track variants view press the Add button.
   - Enter the special stage name and press the Record button.
   - Place the car exactly on the start line, press the **Record** button and drive.
     The RN ONE automatically records the new special stage route when you drive.
   - Press the **Record** button once again to stop recording, when you reach the finish line.
   - The first special stage is recorded and stored.
4) Repeat the previous point for **all special stages**. The order of recording is not important.

Distance Measurement for Reconnaissance

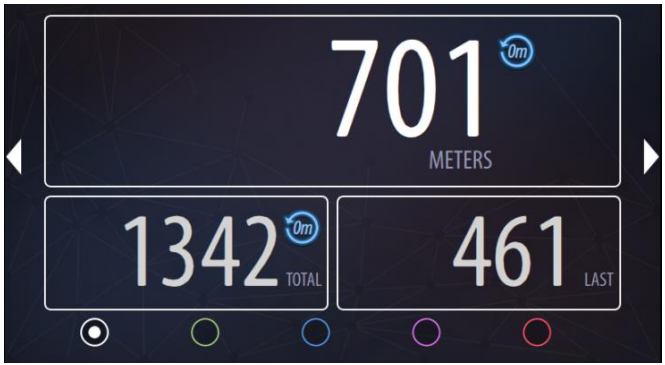
In Rally mode a specially designed **Dashboard** is available. It simplifies the measurement of distances between segments of the rally route including stages and checkpoints.

The Dashboard is divided **into three parts**:

- at the top you can see the distance travelled from the last checkpoint,
- the part on the bottom left shows you the total travelled distance,
- the part on the bottom right shows you the last saved distance.

To reset the total distance press the blue looping arrow in the bottom left part.

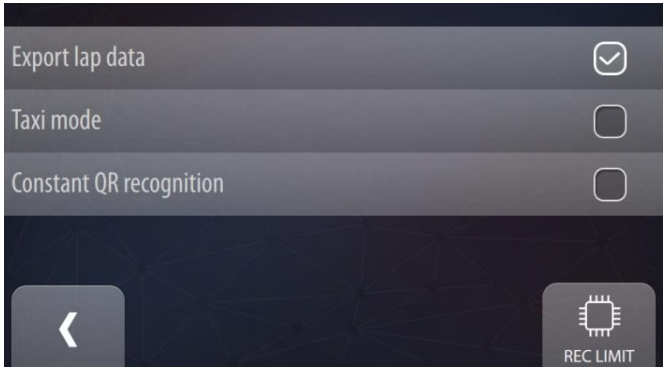
To reset the distance travelled from the last checkpoint press the blue looping arrow in the top part of the dashboard. The current counter value will be automatically displayed in the bottom right part.



Before the official start:

- connect your Race Navigator to constant power supply,
- check if you have enough storage,
- go to SETTINGS > EVENTS and set the RALLY mode,
- go to SETTINGS > AUTOSTART and set auto-recording option from 20 km/h,
- go to SETTINGS > TRACK> TRACK VARIANTS and select one of previously created special stage,.
- check cameras availability and picture in camera preview.

The start line and the finish line of every special stage will be detected automatically.



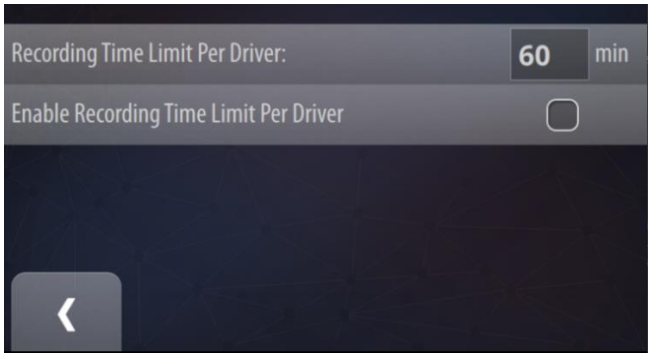
12.7 EVENT · Auto Managed

The auto managed event type is a special designed mode that cooperates with the Race Navigator Event Management System (EMS).
The EMS improves motorsport events handling with additional hardware components and dedicated software modules. It makes the event organization easier thanks to an automatization of many functions, like automatic downloading of selected or all laps from all Race Navigators in the network range, exporting videos to the cloud, providing data to RN Analyzer from the centralized server from all drivers, and many more.

For more information contact the RN Vision support please.

12.8 EVENT · Auto Managed Rec Limit

You can enable recording time limit by checking the “Enable recording time limit per driver” option. You can set the time limit in the “Recording time limit per driver” box. In effect each driver cannot have more footage recorded than previously set. The same time limit will be applied for every driver.

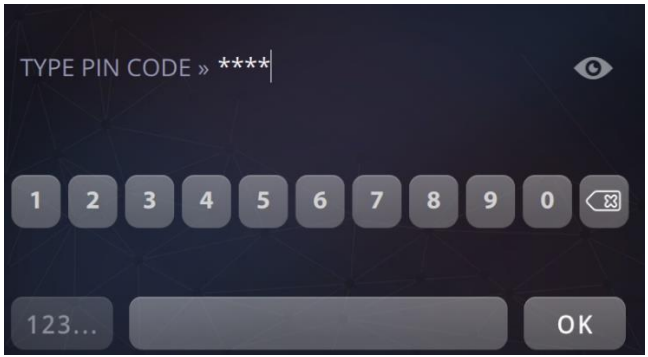


12.9 EVENT · Touristenfahrten/Live-Lap Timing Deactivated

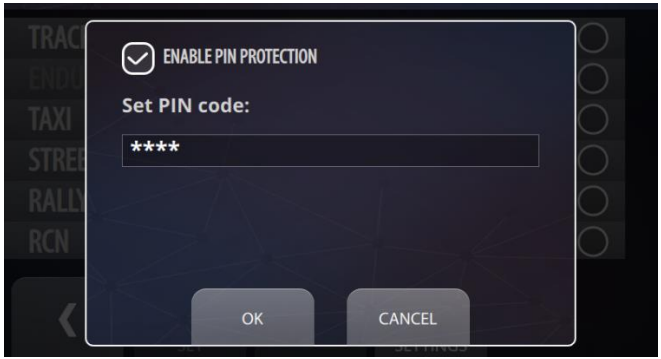
The so-called Touristenfahrten-Mode temporarily deactivates all lap timing functions of the Race Navigator. This may be necessary if the use of lap timers on a specific racetrack or during specific events is not allowed. The Touristenfahrten-Mode allows you to use your Race Navigator in compliance with such regulations.

Selecting and changing of this event type is protected by a PIN code. To enable Touristenfahrten go to SETTINGS-> EVENT and select **TOURISTENFAHRTEN** from a list and click SET button.

A default PIN is "1234".



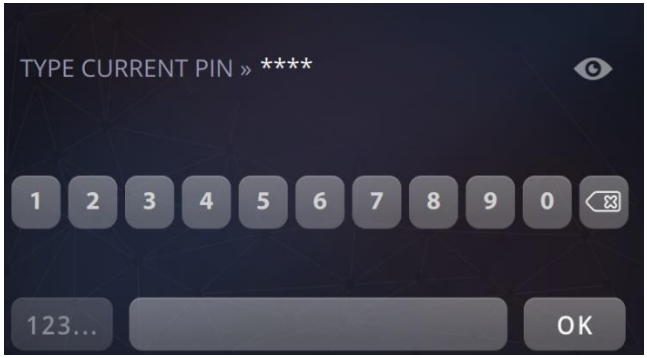
After pressing OK the event is set and active. Safety options can be changed by selecting Touristenfahrten and pressing SETTING button.



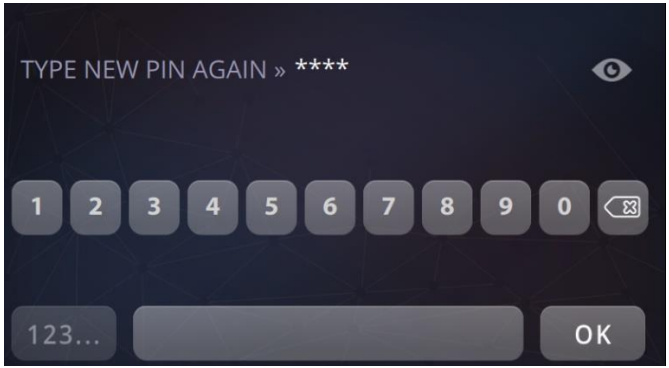
The SETTING dialog allows users to enable or disable PIN protection by selecting ENABLE PIN PROTECITON option. Changing this option also requires typing the current PIN code.

User can also change the PIN code by pressing on the text field.
Changing PIN code requires completing 3 steps:

Step 1: Type current PIN code (when changing PIN code for the first time, a default PIN "1234" has to be used). Confirm with OK button.

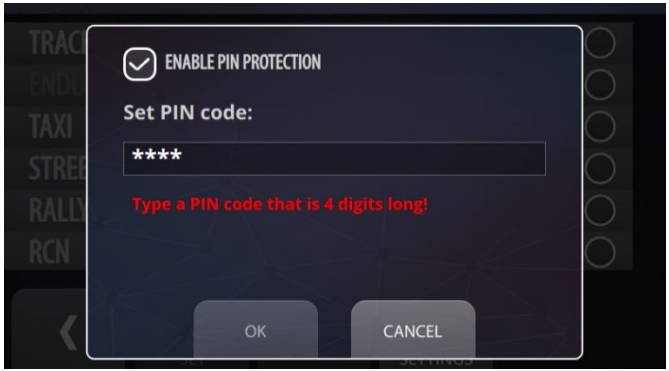


Step 2: Type new pin (must be 4 digits). Confirm with OK button.



Step 3: Confirm new PIN code by typing it again and press OK button.

When the new PIN code is correctly set, users will see the information about it under PIN code text field. To Confirm setting new PIN code click OK button, to cancel this change click CANCEL button.



In case of typing non 4 digit PIN codes or typing wrong one, this error message is displayed:

When the Touristenfahrten-Mode is enabled, lap time, reference time and time gain/loss are not shown on the display during the drive. All live-lap timing functions are disabled. In the dashboard (HOME->Dashboard) you can see current values including speed and OBD2/CAN data like RPM, water temperature and throttle position if available. After the drive, you can analyse your laps as usual with all data and times, on both the Race Navigator and using the RN Analyzer App.

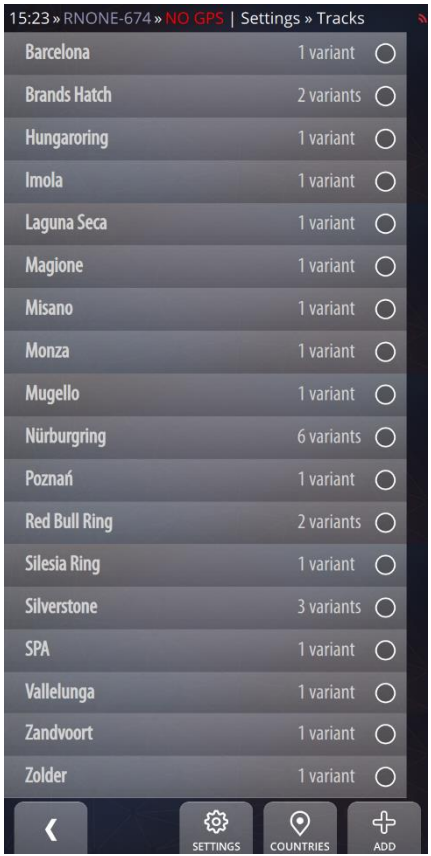
Enabling and disabling of the mode is only possible when the car is at a standstill. Only a user who knows PIN code can change event type to any other that contains current lap timing and gap time to reference lap calculation.

12.10 EVENT · Simulation

The RN Simulation Mode is a mode that activates a connection between your Race Navigator device with the racing game simulator. You can use your Race Navigator at home practicing with your simulator in the same way as you do on the track. Use real time gap to reference timing, record all data from the simulator on the RN system including videos from laps and compare them using RN Analyzer tools for Windows or iPad. Learn a new track or memorize a track that you did not visit for a long time before you go there and save a lot of time! Assetto Corsa racing simulator for PCs is the supported simulator software.

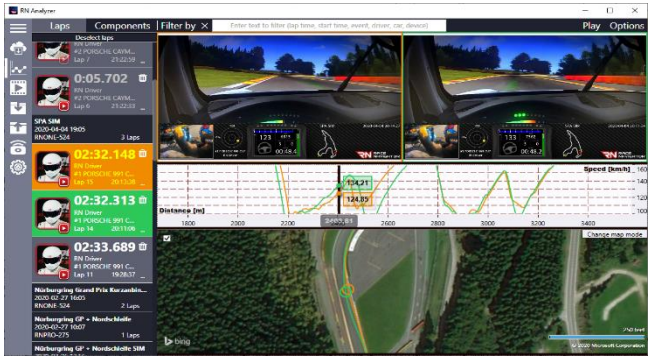
LIST OF TRACKS AVAILABLEI IN SIMULATION EVENT:

- Barcelona,
- Brands Hatch 2 Variants: GP, INDY,
- Hungaroring,
- Imola,
- Laguna Seca,
- Magione,
- Misano,
- Monza,
- Mugello,
- Nürburgring 6 Variants:
  Bridge to Gantry, Nordschleife, GP + Nordschleife, Grand Prix, Grand Prix Kurzanbindung, VLN,
- Poznań,
- Red Bull Ring with 2 variants: Red Bull, Ring, Red Bull Ring Old SL,
- Silesia Ring,
- Silverstone with 3 variants: GP, National, International,
- SPA,
- Vallelunga,
- Zandvoort,
- Zolder.



MAJOR FEATURES:

- real time gap to reference timing,
- ideal GPS coordinates matching between the simulator and real world,
- precise comparison between Simulation laps,
- precise comparison between Simulation to real live laps,
- analysis with RN Analyzer tools the same way as real life laps,
- the videos, data charts and position on the map are immediately synchronized according to the slider's position. You can choose any laps that were recorded, compare Simulation laps with each other and real laps with Simulation laps as well,
- all data is precisely synchronized and real GPS coordinates matching Simulation positions.



SIMULATION EVENT REQUIRMENTS

In order to use Simulation mode on your device:

- Purchase and install the Simulation Event on your Device.
- Download and install our RN Sim Connector Windows Application from: race-navigator.com
- Purchase and install Assetto Corsa PC game directly from Steam client or any other store
- Steam client download:

steampowered.com

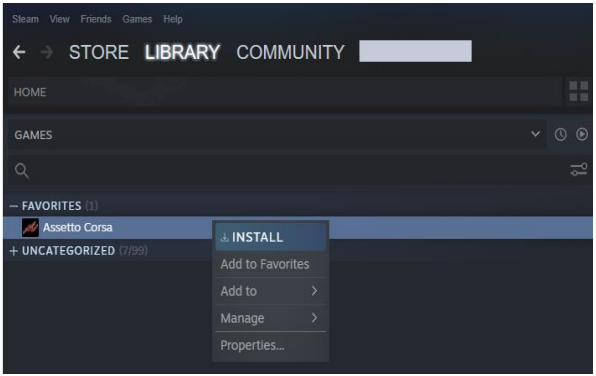
- Assetto Corsa simulator game:

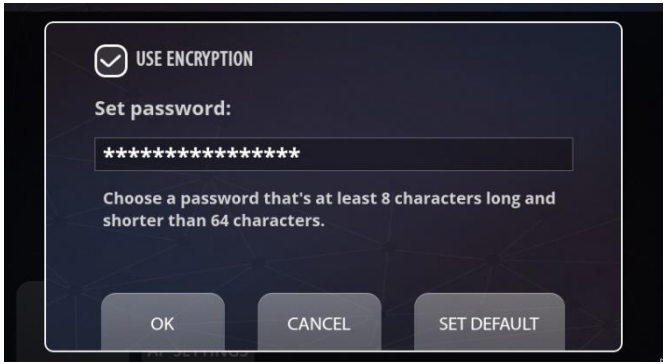
Assettocorsa.net

- For more details visit:

race-navigator.com:

https://www.race-navigator.com/en/rn-software-apps-en/





13 NETWORK

You can select one of the two available connection modes: internet connection and RN Access Point.

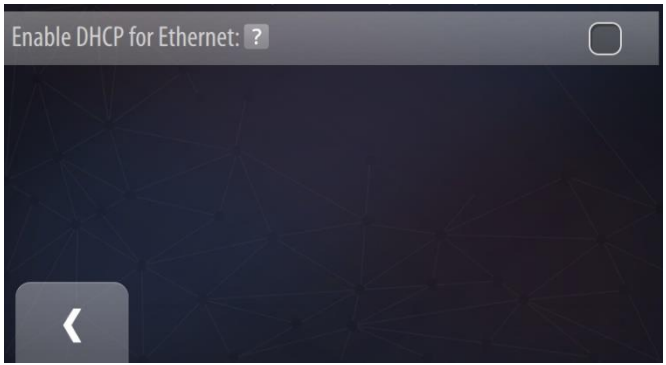
RN Access Point Mode

Click this button to create an access point for your iPad with the RN Analyzer App.

To use the encryption of the RN access point network, press the AP Settings button and select the check box at the top. The default password is: **devicename_AP_PASS**. You can also set your own password.

Internet

Click this button to open the list of available Wi-Fi networks. If you want to update your device and install the latest version of the software, you need to connect to the Internet.



Lan Settings

In order to connect Race Navigator device to local network using a LAN cable enter “LAN SETTINGS” and check the “Enable DHCP for Ethernet” box.

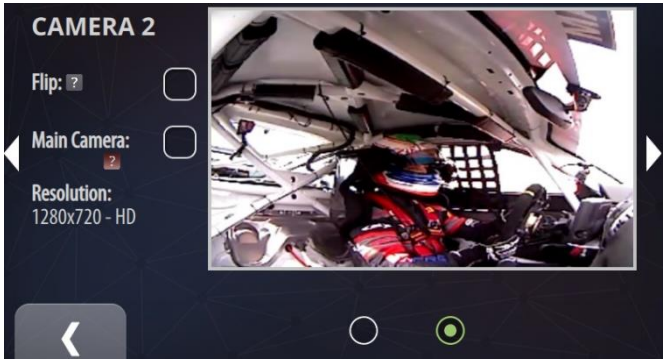
Do not enable this option when you use the Race Navigator with the Wi-Fi Dashboard connected by a LAN cable.

14 CAMERA

Here you can preview both camera views and check the resolutions.

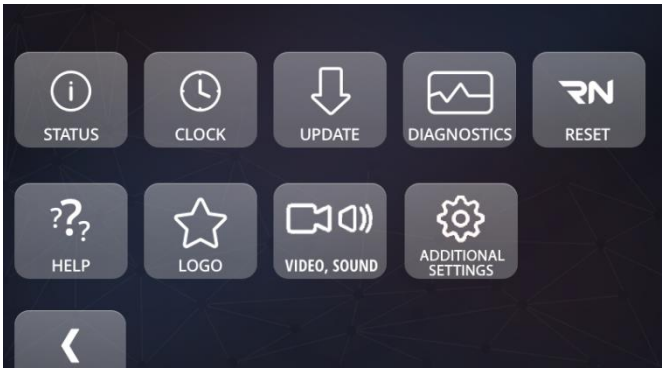
You can flip the camera view by 180 degrees by checking the “Flip” box. Use this setting when the RN camera is mounted upside down

Check the “Main Camera” box to record main video (bigger picture in the final recording) with currently displayed camera. Chosen camera must meet the requirements of the chosen video layout. Only full HD and HD cameras can be set as main camera. If there is Full HD camera connected, only this camera can be used as the main one.



When the system is equipped with more than 2 cameras (e.g. additional Full HD camera), it is possible to choose which camera is used as the secondary one.

For instance when the additional Full HD camera is connected to the RN ONE system, and the 2-cameras video layout is selected as the current video overlay, the secondary camera can be selected from available built-in cameras that is used for video recording.
Please mind that when Full HD camera is connected, it is always set as the main camera.



15 DEVICE

Here you can specify all parameters of the device.

Status

You can check the status of the device.

Clock

Here you can set date and time.

Update

Click here to install the latest version of the

Diagnostics

You can download the diagnostic data.

Reset

Here you can reset various device settings.

Help

Here you can read the descriptions of the RN PRO functions.

Logo

This option allows you to change the video logo.

Video, Sound

Here you can change video and sound settings.

Additional Settings

Here you can change units, pit lane monitor, pit lane recording zone, TPMS and OBD II plug settings.

15.1 DEVICE · Status

The basic data of the device and its components is presented here.

Edition Name
Commercial edition name of the software.

Device Name
Unique name of the RN ONE device.

Version
The version of the installed software.

Left SD/HD Video Time
Estimated remaining recording time for SD/HD quality.

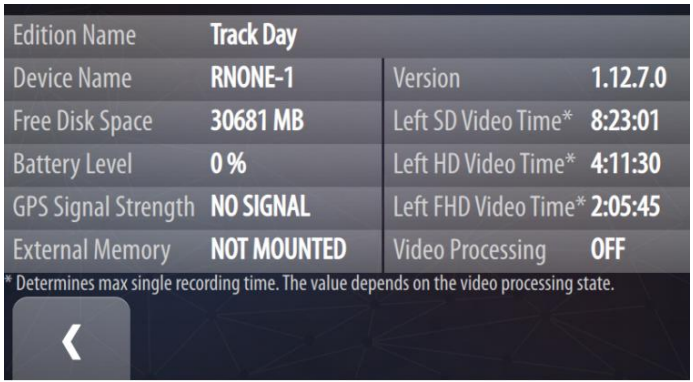
Free Disk Space
Free space on the disk.

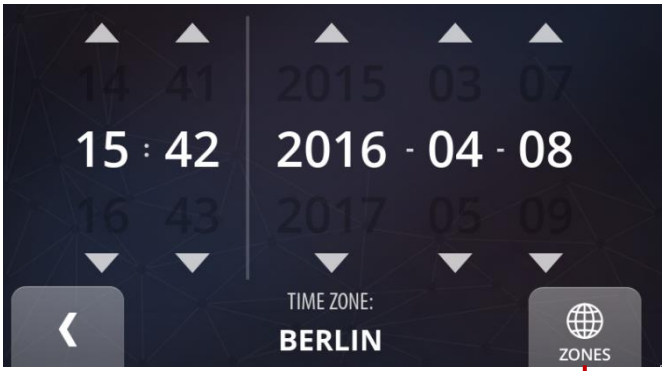
Battery Level
Here the percentage value of the battery level is displayed. When the value drops to 10%, a warning dialog pops up. When the value reaches 1%, the device shuts down.

GPS Signal Strength
The level of the GPS signal.

Video Processing
Here it is indicated whether any video files are currently being processed.

External Memory
This item indicates whether the memory stick is plugged in.





Zones

15.2 DEVICE · Clock

Here you can set the current date and time.

Zones

You can choose the proper time zone or set the time manually.

Use the Back button to complete the process.

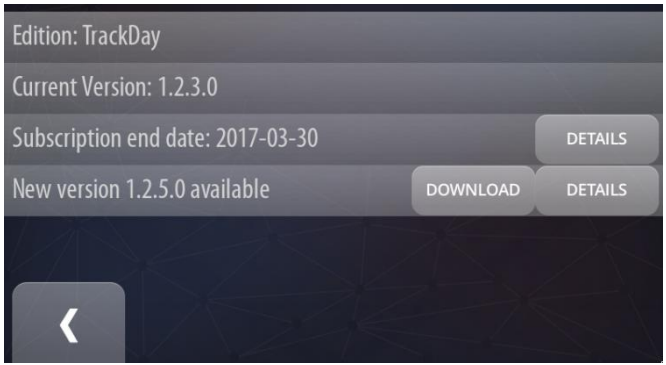
15.3 DEVICE · Update

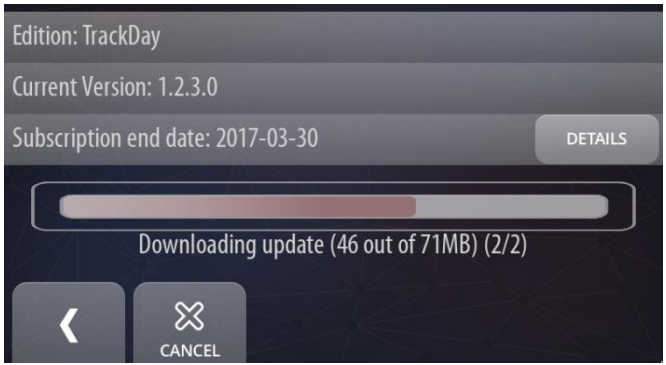
You can install the latest version of the RN ONE software on your device. Internet connection is required.

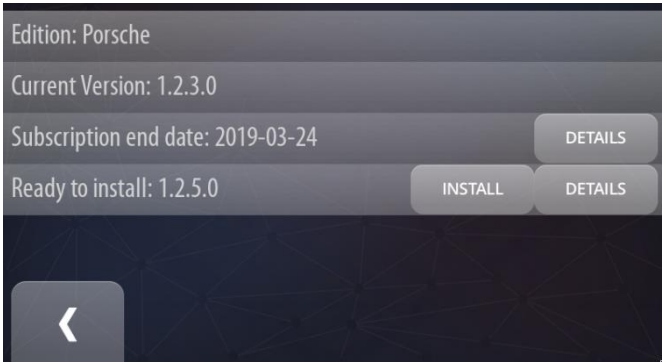
Follow the instructions below to install the latest version.

1. On the Settings page, click the **RN Device** button and then the **Update** button. Make sure that your device is connected to the Wi-Fi network (to connect, go to: Settings > Network > Internet, choose your option, and connect to your Internet network).

2. On the Updates view, click the **Download** button. The download progress is presented on the progress bar. You can also check the details of the new version by clicking the **Details** button.



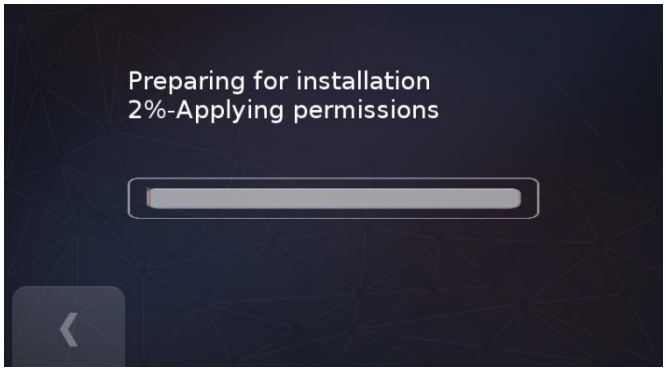




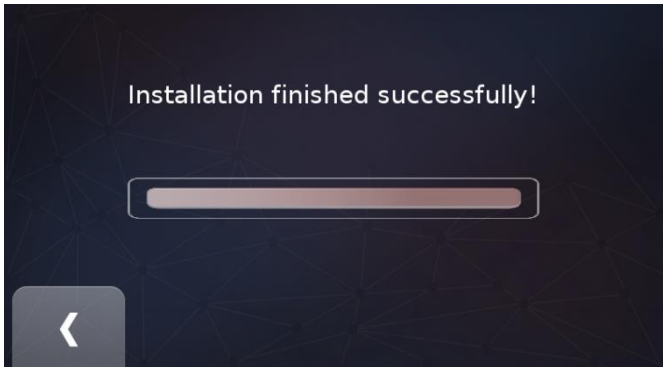
3. When the download is finished, click the **Install** button on the Updates view. Wait for the next screen.

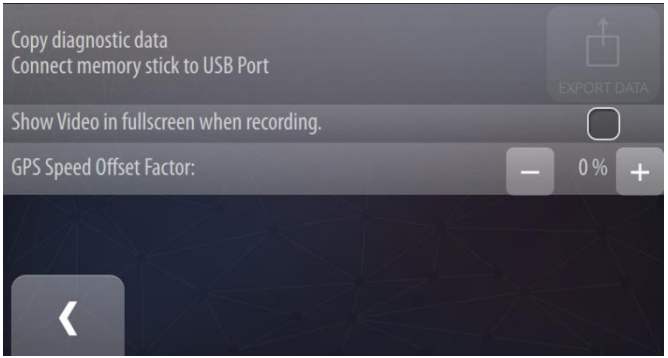
4. On the next screen, click the **Start Update** button.

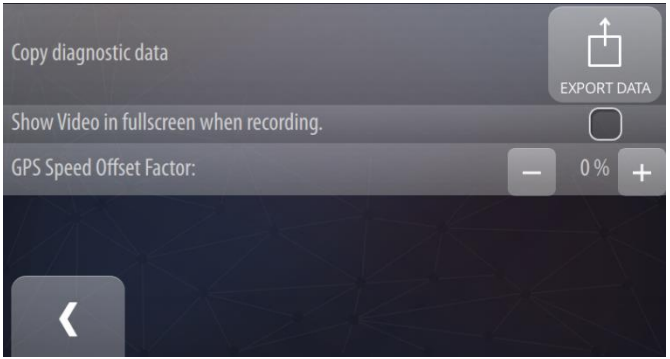
5. Installing the newest version is in progress. It may take a few minutes.



6. The finished installation is marked with a caption. Press the **Back** button to restart your device.







15.4 DEVICE · Diagnostics

Here you can copy the diagnostic data directly to the memory stick.

Press **Export Data** button to start the process.

A memory stick is required to be plugged in. Otherwise, the Export data button will be disabled and you will be notified about the missing memory stick.

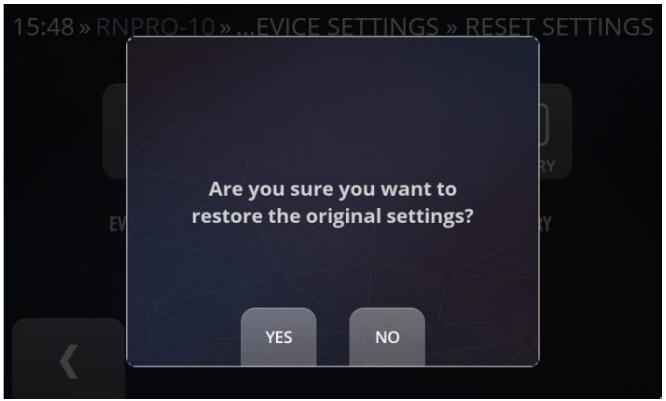
GPS Speed Offset Factor
Use it to adjust the GPS speed which is visible in the video. You can use this settings to i.e. match displayed speed to the speed on the car's speedometer.

15.5 DEVICE · RN Reset

Here you can reset various RN ONE settings and restore the device to the basic installation.

15.6 RN Reset · Reset Event Data

Press the **RN Reset** button to display the list of events. Select a particular event and press the **Remove** button to reset the event data. The operation cannot be undone.

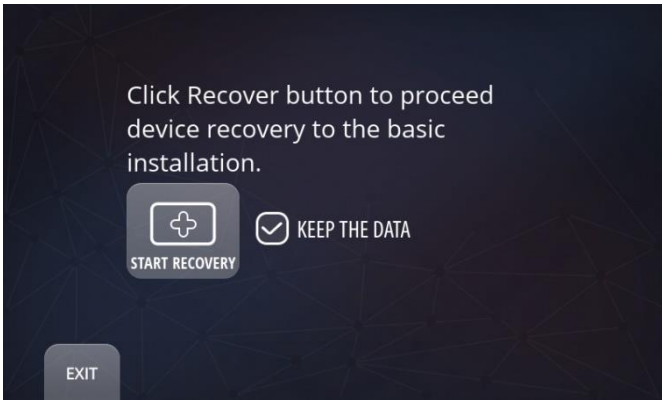


15.7 RN Reset · Factory Settings

Press the **RN Factory** button to restore the device's software to its original settings.

In the next dialog, click YES to confirm or NO to abort the operation.

The operation cannot be undone.



15.8 RN Reset · RN Recovery

Press the **RN Recovery** button to proceed with the device recovery to the basic installation. Confirm the operation by clicking the **Start Recovery** button. You can keep the data.

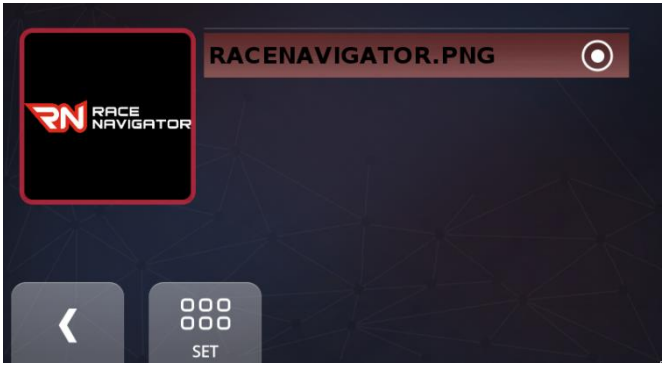
15.9 DEVICE · Help

The Race Navigator Help Content is presented here. You can read the basic descriptions of your device functions.

15.10 DEVICE · Logo

All available video logos are listed here. You can browse through the list and select one of them. Press **Set** to confirm your selection.

You can also import your own logos. All logos (in PNG/JPG/JPEG format) should be stored on the memory stick in the top directory. When you plug in the memory stick, your logos will be automatically added to the list.



15.11 DEVICE · Video, sound

Video

Click the Video button to set the video recording quality.

Different video quality options are available. The video can be recorded in:

- **High Quality** (1920x1080, ~3MB/s; 1280x768, ~1 MB/s)
- **Low Quality** (1920x1080, ~1MB/s; 1280x768, ~0,5 MB/s)

Select the option by clicking on the element. Use the Back button to complete the process.

Sound

Click the Sound button to set the sound level of the microphone and speakers.

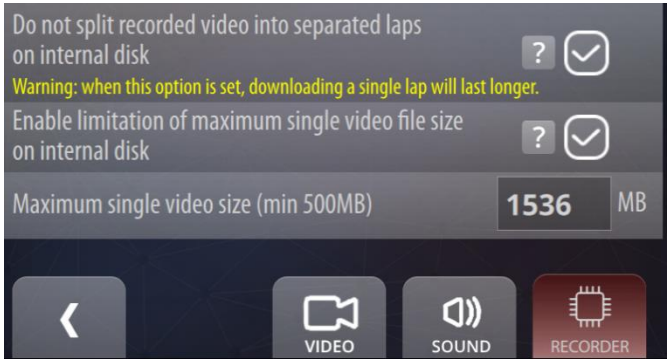
You can adjust the sound level of the microphone and speakers by clicking the '+' and '-' buttons. The default values are marked by the white line on the adjustment bars.

Recorder

If you want to have all your laps videos to be in a single video file, click the “Recorder” button and check the “Do not split recorded video into separated laps” checkbox.

If it is required to record video files that are limited in size (for instance by an external IT system) it is possible to enable the flag ‘limitation of maximum single video file size’ and set up the maximum file size.

This functionality relates only to recording to internal drive, and is not affecting recording on the external memory stick. Use this flag only if it is necessary.

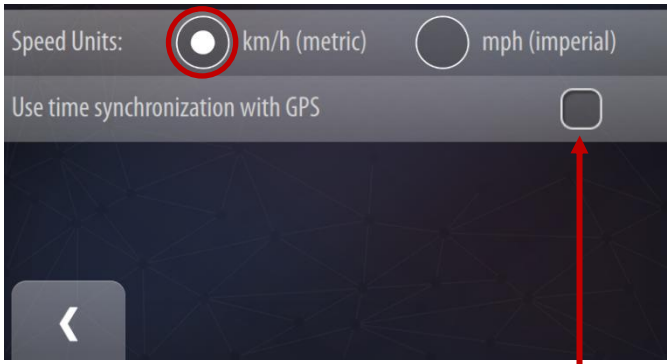


15.12 DEVICE · Additional settings · Units / Time

Units: Race Navigator system provides 2-unit types for displaying a current speed:

- **KM/H (metric)**
- **MPH (imperial)**

Select this option by pressing a unit type. The selected speed unit type is displayed on all screens (dashboards, lap list) and on video recordings. Use the Back button or Home button to complete the process.



Time synchronization:

If you check the „Use time synchronization with GPS" option, the device time is synchronized from the time provided by GPS satellites. The used Time Zone and date is not affected, only the time. Use this option only if you use several Race Navigator systems and you need the time to be synchronized between them precisely (+- 100 ms time difference).

15.13 DEVICE · Additional settings · PIT LANE MONITOR

Pit Lane Monitor functionality is accessible from:

Home View→Settings→Device→Additional Settings→Pit Lane Monitor

More details about Pit Lane Monitor can be found here: **PIT LANE MONITOR**

15.14 DEVICE · Additional settings · OBD-II Settings

OBD-II Menu is accessible from:

Home View→Settings→Device→Additional Settings→OBD-II Settings

More details about OBD-II Settings can be found here: **RECORDING WITH OBD-II DIAGNOSTIC DATA**

15.15 DEVICE · Additional settings · TPMS SETTINGS

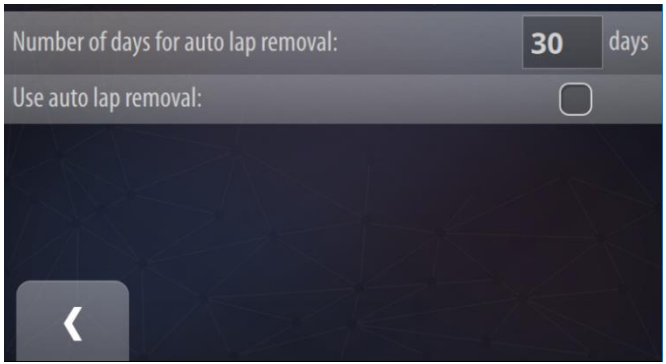
TPMS functionality is accessible from:

Home View→Settings→Device→Additional Settings→TPMS SETTINGS

More details about

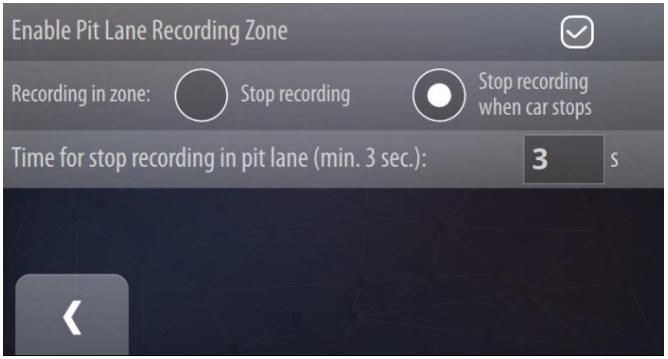
TPMS SETTINGS can be found here:

TIRE PRESSURE MONITORING SYSTEM



15.16 DEVICE · Additional settings · Auto Remove

If you check the “Use auto lap removal” option, all laps older than the value set in the “Number of days for auto lap removal” box will be automatically removed upon turning on the device.



15.17 DEVICE · Additional settings · PIT Lane REC. Zone

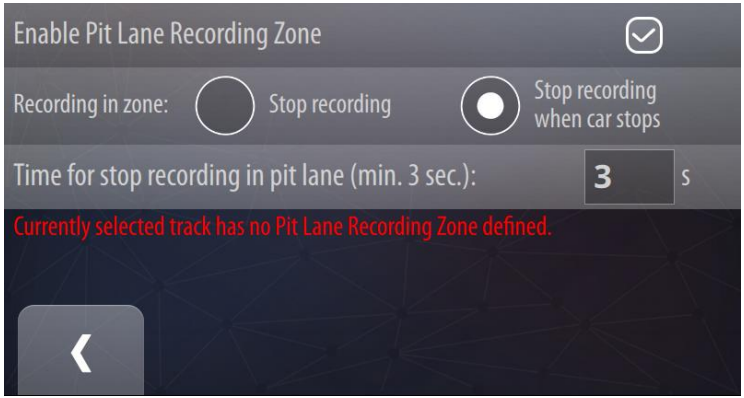
Pit Lane Recording Zone is defined as a special area on the track, usually the pit lane area. The system knows when entering and leaving happens. There are two options to choose how the system behaves in the area.

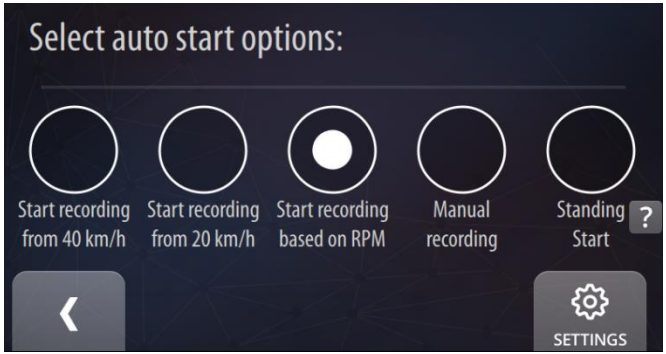
When option 'Stop recording' is set, then upon entering the zone the system triggers the device to stop video recording, and upon leaving, making the device to continue recording. This option is useful when a video content is required to be available (processed) as soon as possible after entering a pit lane. The recording process is stopped earlier so that a post processing is done faster. The drawback is that there is no video recorded in a pit lane area.

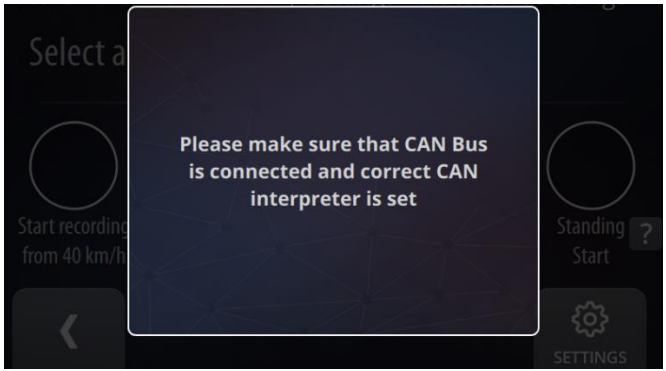
It is also possible to choose option 'Stop recording when car stops'. This option allows to stop recording faster so that the video is available earlier or the memory stick can be removed earlier.

To check if this option is available on currently selected track go to Settings > Device > Additional > Settings > Pit Lane Recording Zone. This screen informs about availability of the Zone. Red Warning at the bottom informs about a lack of the zone definition.

When the track supports the Pit Lane Recording Zone, warning disappears and after checking the option, the zone is being analyzed by the device during recording. You can disable this option to make the device record on a whole track area by unchecking it at any time.







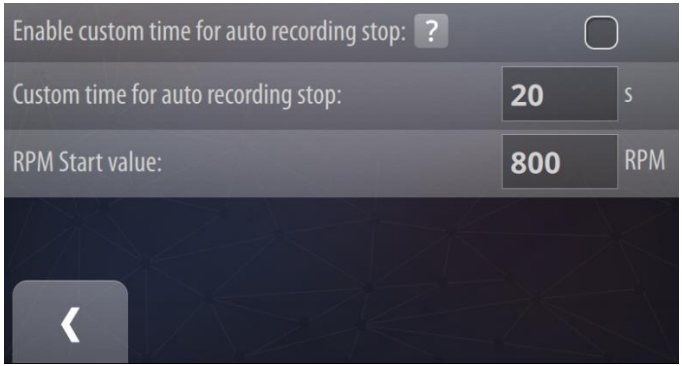
16 AUTOSTART

Different video recording modes are available. You can start recording manually which activates automatically after exceeding the required speed of 20 km/h or 40 km/h, or RPM, or you can select the Standing Start mode.

Standing Start automatically starts recording the video without any time and data when the vehicle is near the tracks start line. The data measurements are stored when the vehicle starts to drive and the G-force has exceeded a certain level. The lap recording finishes twenty seconds after the vehicle stops.

Start recording based on RPM automatically starts recording from the moment when 'RPM Start value' is reached. Please mind that the device must be properly connected to the car's CAN bus and configured.

Select the mode by clicking on the proper element. Use the Back button to complete the process.



When the vehicle stops, recording is turned off automatically. If you want to set the amount of time to pass before the recordings stops you need to check the option “Enable custom time for auto recording stop” and enter the desired amount of time in the “Custom time for auto recording stop” box.

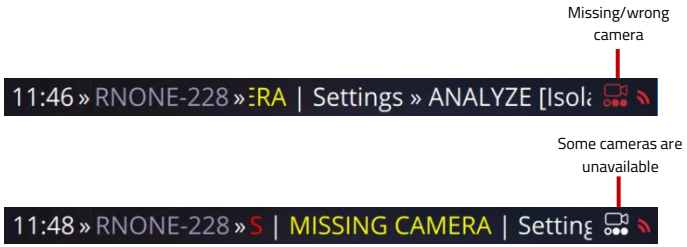
17 LAYOUT

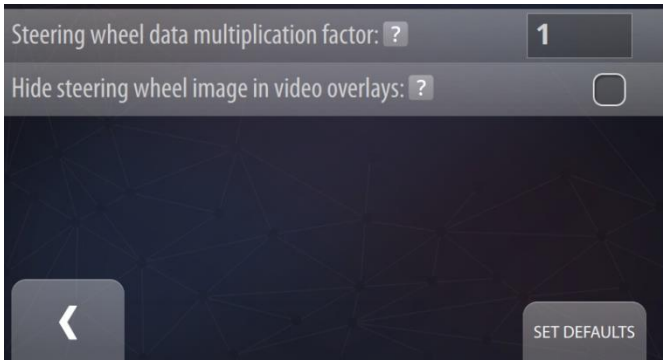
The Race Navigator system provides different video layouts available to be used in recorded videos. Swipe the layout carousel and choose a desired video layout. Below you can change the video recording format resolution:

- **HD** (always available, HD cameras are built into the device)
- **Full HD** (available only with the external Full HD camera connected)

Each video layout requires its own camera set (2 or 3 cameras, Full HD or HD resolution). Please mind that the Full HD camera is always used as a main camera and records the bigger video frame.

If any camera is missing or has an incorrect resolution, an appropriate icon is shown in the status bar. Red colored icon means that a selected layout configuration cannot work properly because of a missing or wrong camera. White colored icon with not all dots filled means that not all cameras are available for the selected layout.





17.1 LAYOUT Settings

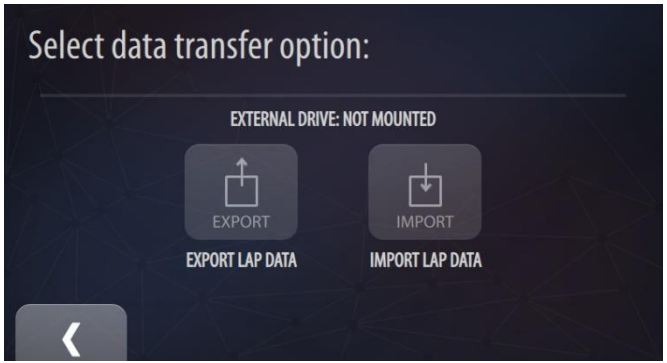
The steering wheel angle in the video overlay is multiplied by the value in the “Steering wheel data multiplication factor” box. If you want to inverse the steering wheel angle set this value to “-1”. The default value is “1”.

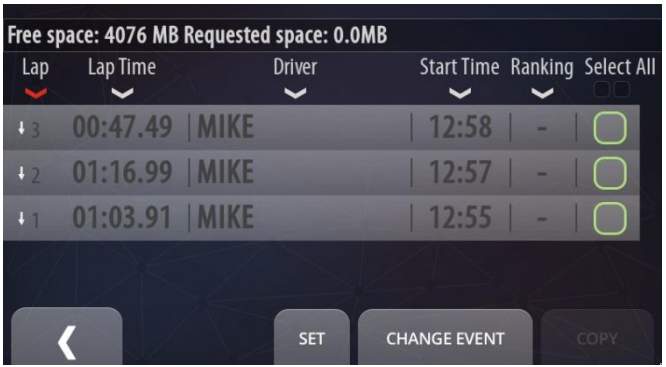
If you want to hide the steering wheel image in the video overlay check the “Hide steering wheel image in video overlays” option.

18 EXPORT IMPORT

In order to import or export data to an external drive, enter “EXPORT IMPORT” in “Settings”.

A memory stick must be plugged in. Otherwise, both buttons will be disabled and you will be notified about the missing memory stick.





18.1 EXPORT VIDEO

Here you can export the video and data directly to the memory stick.

The memory stick is required to be plugged in. Otherwise, the Copy button will be disabled and you will be notified about the missing memory stick.

Change Event

Change the event to select specific laps for export.

All laps from the selected event are listed. Full laps are colored white, while the others are colored grey, except for the best laps of each driver which are colored yellow.

The list can be sorted by the column headers. You can change the sorting method by clicking on one of them. The current sorting column is colored red.

You can find the laps on the list and select them. Confirm your selection by pressing the **Set** button. Press the **Copy** button to start the process.

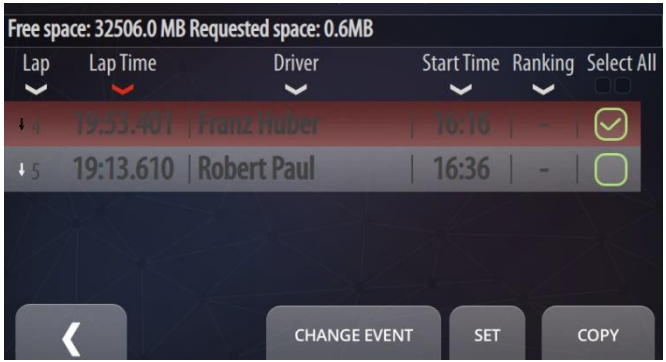
18.2 IMPORT VIDEO

Here you can import videos and data from memory stick to Race Navigator device.

Select desired event and go back. All laps from the selected event are listed. Full laps are colored white, while the others are colored grey, except for the best laps of each driver which are colored yellow.

The list can be sorted by the column headers. You can change the sorting method by clicking on one of them. The current sorting column is colored red.

You can find the laps on the list and select them. Confirm your selection by pressing the **Set** button. Press the **Copy** button to start the process.



19 PIT LANE MONITOR

The Pit Lane Monitor functionality can be activated from: HOME VIEW → SETTINGS → DEVICE → ADDITIONAL SETTINGS → PIT LANE MONITOR.

The Pit Lane Monitor allows you to achieve the optimum pit stop time thanks to automatic timers. Unnecessary time penalties due to badly timed pit stops are a thing of the past!

The Pit Lane Monitor includes the following features:

- **Overall Pit Lane Time in Race** - the system automatically records the total time spent in the pit lane during the race (all pit stops) and displays the remaining time.

- **Pit stop countdown** - the countdown is activated automatically and displayed when the car passed the pit lane entry line. The timer counts down to the optimum moment for leaving the pit box.

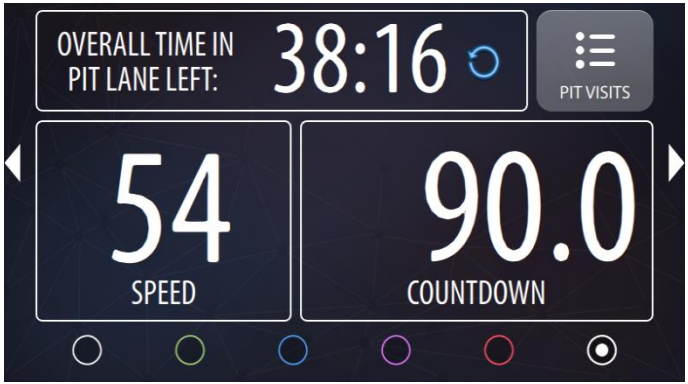
- **Time monitoring** - after the car starts from the pit box, the gap compared to the minimum pit lane time will be displayed. Time gain means that the car will leave the pit lane too early, while time loss indicates a delayed exit. This allows the driver to correct his pace in the pit lane to achieve an optimum pit stop time.

- **Speed monitoring** - the display automatically shows the current speed of the car in the pit lane. Different colors warn the driver when he is coming close to or exceeding the speed limit.

- **Pit Lane Visits** – if Pit Lane Monitor is activated, the system is saving Pit Lane Visits with their times in a table that is accessible by pressing the PIT VISITS button.

- The system automatically detects entry and exit lines of many available track variants, manual corrections or new definitions by the user are possible.

- The regulatory minimum overall pit lane time, pit lane minimum time, pit box to end line time and maximum pit lane speed can be set by the user.



19.1 Setting up Pit Lane Monitor

The Pit Lane Monitor Functionality is an additional feature that is activated for a selected device after purchasing.

When Pit Lane Monitor is activated a user can set it up.

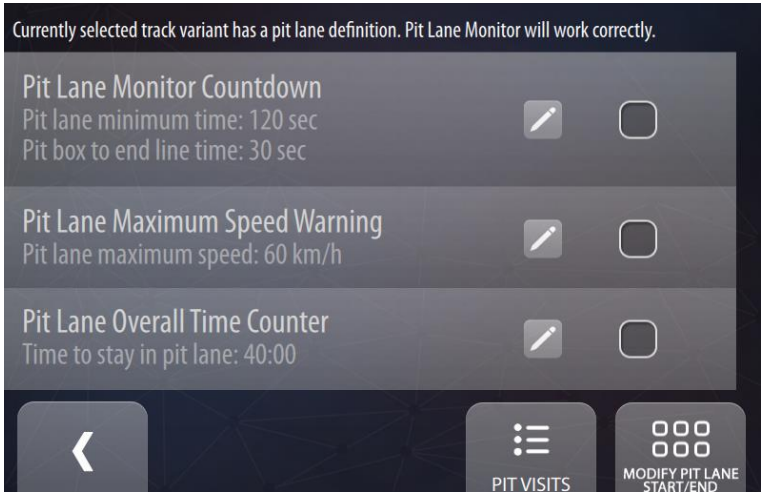
After entering Settings, at first it has to be checked if currently selected Track Variant has pit lane start and end lines defined. A notification is shown at the top of settings. If this is missing there is a possibility to add Pit Lanes manually, directly setting them in a device or importing a pit lane definition from the RN Connect app.

Adding Pit Lane Manually

For more information about adding / Editing existing Pit Lane start and end lines please refer to: **Modify Pit Lane Start/End**

19.2 Pit Lane Monitor Settings

Pit Lane Monitor Settings are split between 3 independent sections. Each of these features will be displayed on the sixth dashboard screen. Only selected features will be displayed on dashboard screen. This approach gives the user opportunity to personalize The Pit Lane Monitor to its own needs. If at least one feature is enabled, the pit lane monitor dashboard is automatically activated and informs the driver when the pit entry line is crossed. When a car exits pit lane, a previously used dashboard is shown.



Pit Lane Monitor sections:

- Pit Lane Monitor Countdown:

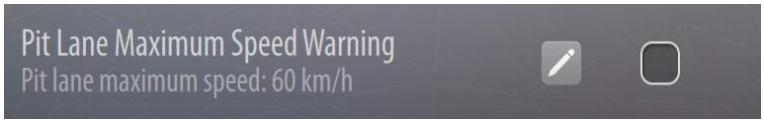
More details: **Pit Lane Monitor Countdown**

- Pit Lane Maximum Speed Warning:

More details: **Pit Lane Maximum** Speed Warning

- Pit Lane Overall time Counter:

More details: **Pit Lane Overall time Counter**

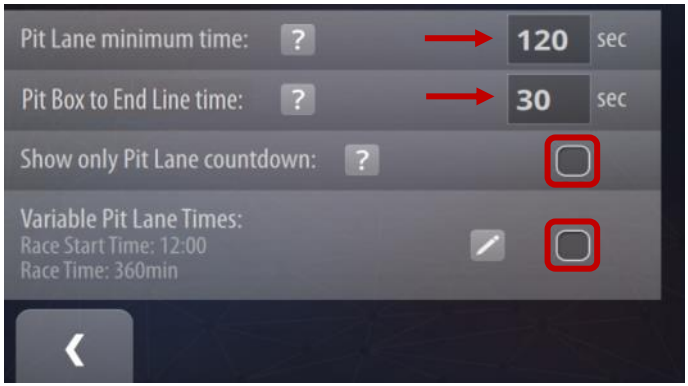


For settings press on Edit button

To Enable / Disable specific functionality use this checkbox

19.3 Pit Lane Monitor Countdown

The Pit Lane Monitor Countdown can be activated from: HOME VIEW → SETTINGS→ DEVICE ADDITIONAL → SETTINGS → PIT LANE MONITOR → Pit Lane Monitor Countdown.



Pit Lane minimum time:

Defines the time, that driver must spend in pit lane, before leaving it. Adjust by using text box.

Pit Box to end line time:

Pit Box to end line time is defined by a driver or team. This value determines the time that is needed by driver to drive from pit lane box position to end of pit lane. Adjust by using text box.

Show only Pit Lane countdown:

Enable this option to just show a pit lane time countdown between pit lane entry to exit lines. A timer that informs you when to exit your pit box position won't be displayed and a gap time to reach pit lane end line won't be calculated.

Enable / Disable by checkb
For explanation press the ? icon.

Variable Pit Lane Times

Variable Pit Lane Times feature enables a user to use different pit lane time for each pit stop. It can be set in accordance to the rules of racing series such as NLS/VLC or the 24h Nürburgring race.

When this feature is selected:

- the RN system automatically displays correct time to stay in pit lane and the pit lane counter,
- Time in pit lane is variable and is taken from a definition set in the device's settings,
- Variable times depends on current lap number and remaining race time,
- Lap number is reset automatically after race start,
- User defines race start time and duration.

In order to use Variable Pit Lane Times please set following settings:

- Race Start Time: enter the race start time. Make sure that your device has the correct time set. Adjust the race start time in case of race delay.
- Race Time: set race duration in minutes. That value is important to use correct pit lane time duration that depends on remaining race time.
- Define PIT STOP TIMES,
- Disable setting to automatically increase lap number with every new recording, so that laps are only created when crossing the starting line. Variable Pit Line Times requires proper lap numbering, same as in races.

Please change the setting under your event setting

go to: Settings → Event → Settings and deactivate "Increase a lap number on every new recording " setting.

Automatic lap number reset after race start:

- The system is resetting a lap number automatically. The reset of the lap number is dependent on the Race Start Time.
- When the Race Start Time is crossed, the car's position on track is checked. If the car passed less than 25% of the full track's distance, then the current lap number is set to 1, otherwise to 0. The car gets lap number equal 0 under this condition, because the driver is approaching a start line and has not yet started the race.
- Please note that the lap numbering can be adjusted during the race as well. Check description how to do it here: **Manual Correction of Current Lap Number**

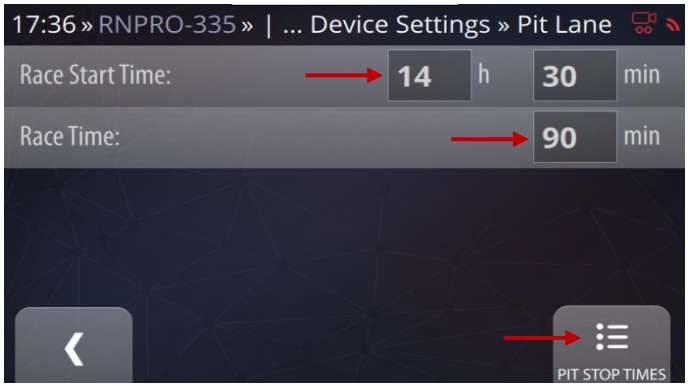
Set race start time and duration

- Race Start Time:

Tap on the text box to fill the values.

- Race Time:

Tap on the text box to fill the values.



Fill the Pit Lane durations for:

- PIT TIME FROM FIRST PIT STOP
- PIT TIME FOR LAST PIT STOP
- To add new time press ADD button

Values for PIT TIME FROM FIRST PIT STOP

Please note that in order to use this functionality both "PIT TIME FROM FIRST PIT STOP" and "PIT TIME FOR LAST PIT STOP" need to be set.

Adding new time entry:

Press ADD to create new variable pit stop times depending on the number of finished laps.

For the given number of laps completed, enter the pit time for the first pit stop and the time from the second pit stop (in seconds).

Confirm by pressing APPLY button:

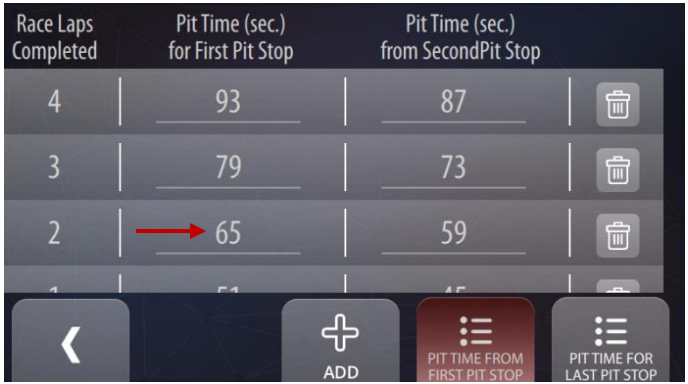
Make sure to exactly copy the official rules for the race for your race class.

Repeat the process until all variable lap times are created in accordance to the official rulebook.

Edit / Delete:

To edit press on selected time entry:

To Delete press on trash bin button:



Values for PIT TIME FOR LAST PIT STOP

Adding new time entry:

Switch to entering Pit Times for Last Pit stop by pressing PIT TIME FOR LAST PIT STOP button.

Press ADD to create new entry. Enter the remaining race time in whole minutes and the corresponding pit lane time for the last stop.

Make sure to exactly copy the official rulebook for the race for tour race class.

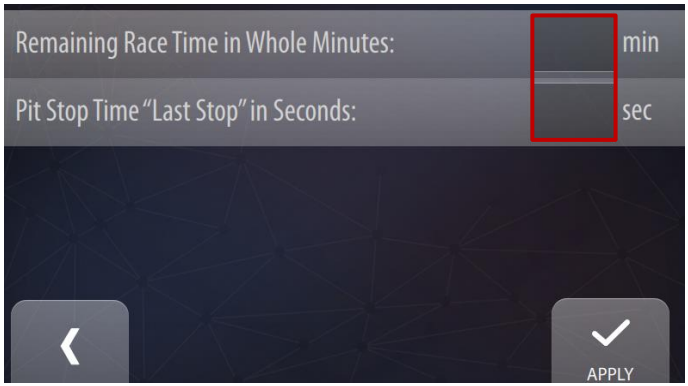
Confirm by pressing APPLY button:

Repeat the process until all rules are created.

Edit / Delete:

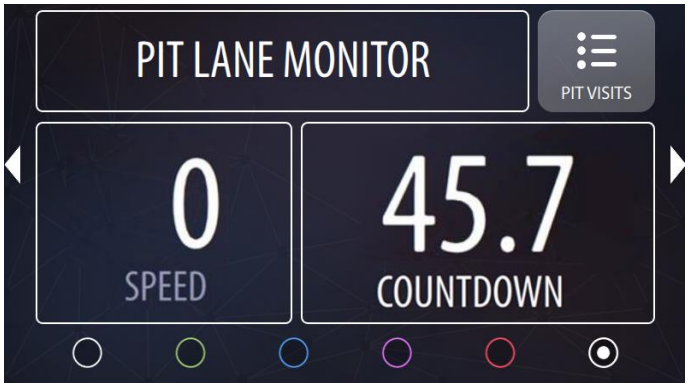
To edit press on selected time entry:

To Delete press on trash bin button:



Pit Lane Monitor Countdown Operation:

After arriving in Pit Box, countdown continues to display the time.



When the time gets closer to 0, it warns by coloring the value in yellow (below 20 secs), orange (below 5 secs) and then red (after passing 0).

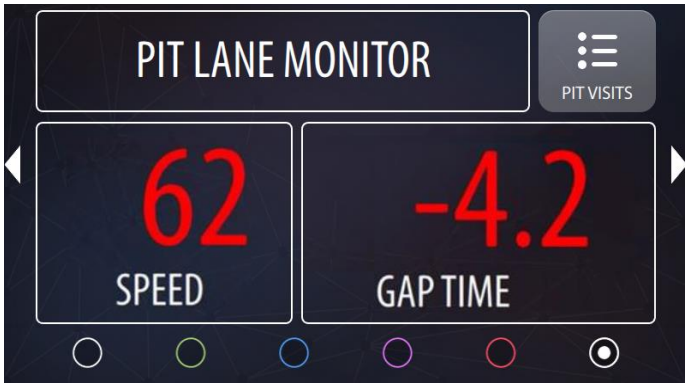
When the time reaches 0, it is the signal to leave the Pit Box. Time that is still left is the Pit Box to End Line time.

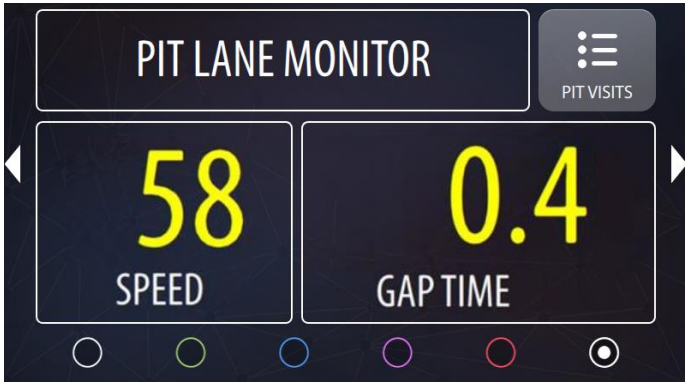
After start from Pit Box, countdown, instead of pit Box to End Line time, displays the Gap Time - real time difference between time left and estimated time, calculated using current speed and distance to Pit Lane End Line.

If the current speed is too high, driver will leave the Pit Lane earlier than expected. Gap Time is colored red and a value in seconds is negative. It is the signal to slow down and adjust the speed to displayed time.

After slowing down, the real time calculated Gap Time changes, and should be getting close to 0. When Gap Time is higher than 0, Pit Lane will be left after regulatory time that was set in Pit Lane Monitor settings (Pit Lane minimum time). After crossing Pit Lane End Line Gap Time pauses for 5 seconds and (if other dashboard panel was visible before entering Pit Lane) dashboard changes back to previously selected one.

Pit Lane Monitor colors description:
Red – limit is crossed
Orange – very close to limit
Yellow – close to limit
White – timing is OK

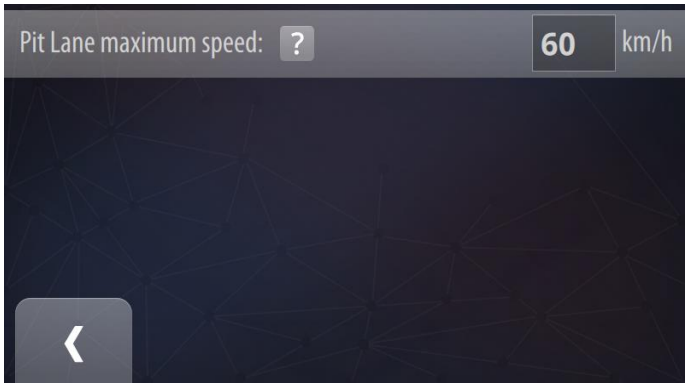




19.4 Pit Lane Maximum Speed Warning

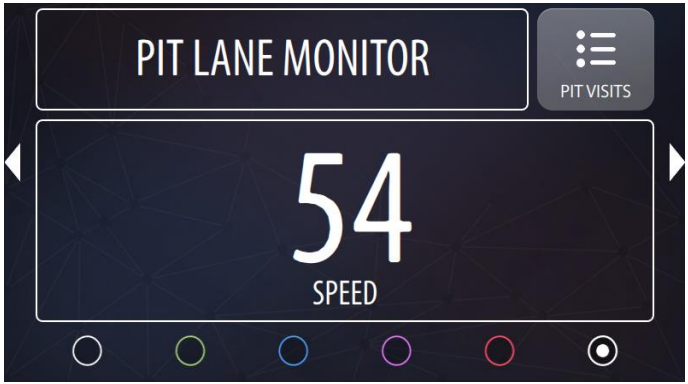
The Pit Lane maximum speed Warning can be activated from: HOME VIEW → SETTINGS → DEVICE ADDITIONAL → SETTINGS → PIT LANE MONITOR → Pit Lane Maximum Speed Warning.

For explanation press the ? icon.



Pit Lane maximum speed:

Pit Lane maximum speed is used to display warnings on a speedometer when the driver is close or exceeds it. When a speed is close to the speed limit, the speed value turns yellow, when it is crossed it turns red as shown below:



19.5 Pit Lane Overall time Counter

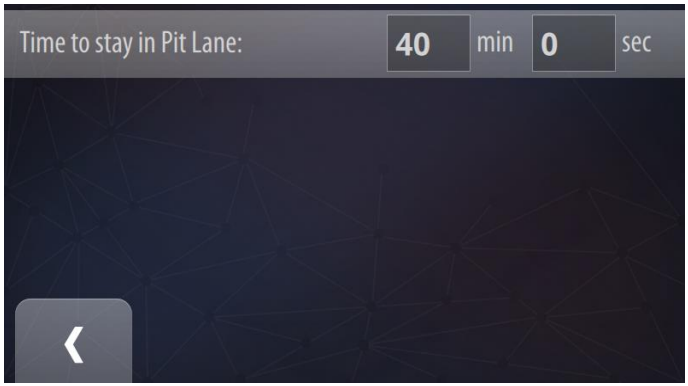
The Pit Lane Overall time Counter can be activated from: HOME VIEW → SETTINGS→ DEVICE ADDITIONAL → SETTINGS → PIT LANE MONITOR Pit Lane Overall time Counter.

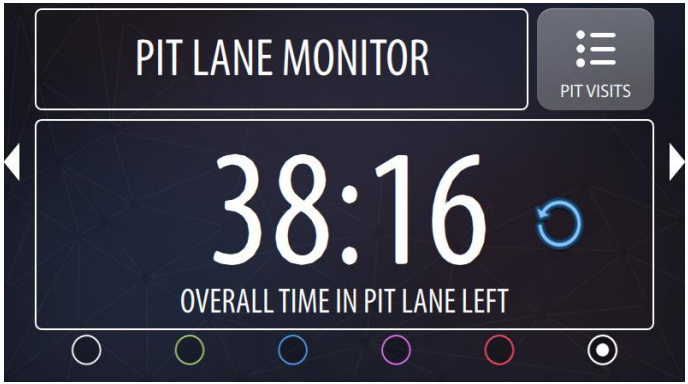
Time to stay in Pit Lane:

Defines the time, that a driver have to spend in pit lane during the whole competition.

The system automatically records the total time spent in the pit lane during the race and displays the remaining time. This way you are perfectly prepared for the new total pit time rules, for example in the Nürburgring Langstrecken Serie (NLS / VLN).

Overall time in pit lane: the countdown is activated automatically and displayed when the car passed the pit lane entry line. The timer counts down only in the pitlane (separately defined for each track variant) and displays remaining time.





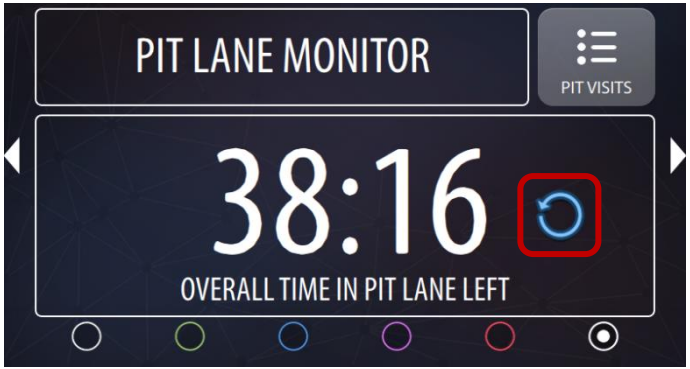
Pit Lane Overall Time Counter Reset

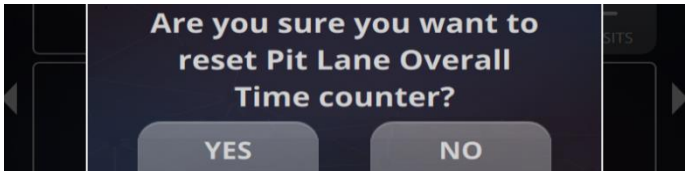
Overall Time in Pit Lane Left counter can be reset any time. It is necessary to remember to reset the counter before the race. It can be done by **starting a new event:**
SETTINGS→EVENT→START NEW EVENT

Or by using a reset button:
(blue loopoing arrow) on the pitlane dashboard (last panel).
After pressing the reset button it is necessary to choose between two options:

- **NEXT PIT LANE VISIT** – Counter is reset and will restart with the next visit in the pit lane.

- **CURRENT PIT LANE VISIT** – if the car is in the pit lane during the reset, counter will start with a value that is result of a subtraction of the overall pit lane time and current pit lane stay time. This option is useful if you forgot to reset this counter before the race and notice a wrong value during the first pit stop.





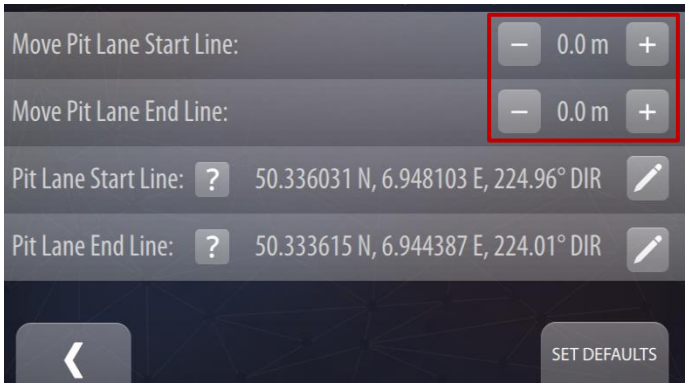
- **PLEASE NOTE -** The Pit Lane Overall Time Counter can only calculate the remaining time if the RN device is turned on while entering and exiting the pit lane. The remaining pit lane time calculation is correct if the device is turned off and turned on again during the same pit stop. It is only necessary to make sure that the device is running when the car enters and exits the pit lane. If the device turned off in the pit lane, please remember to turn it on again at least 1 minute before exiting from the pit box, so that GPS signal is available again on the pit lane exit line.

19.7 Modify Pit Lane Start/End

Pit Lane Monitor has additional setting accessible through the **MODIFY PIT LANE START/END** button on the bottom right corner. This dialog informs user about Pit Lane Start and End Line positions with its coordinates. Displayed values can be copied to any map browser in order to check its position. If the line position is not correct, user can adjust it by moving the line in direction of driving by giving the positive value in meters, and in the opposite direction of driving by giving the negative values in meters. After changing the values, new coordinates will be displayed. Again, these can be checked in any map browser.

In order to edit start or end of pit lane tap "edit" button on the right side of the corresponding values.

For explanation press the ? icon.



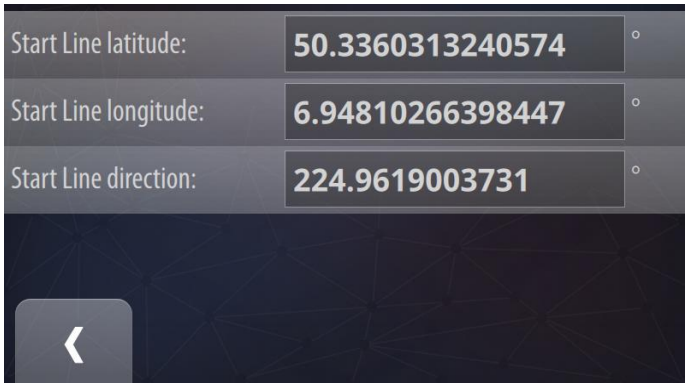
Tap on one of the text boxes to edit either line's latitude, longitude, or direction. Coordinates must be between -180° to 180° and direction between 0° and 360° where:

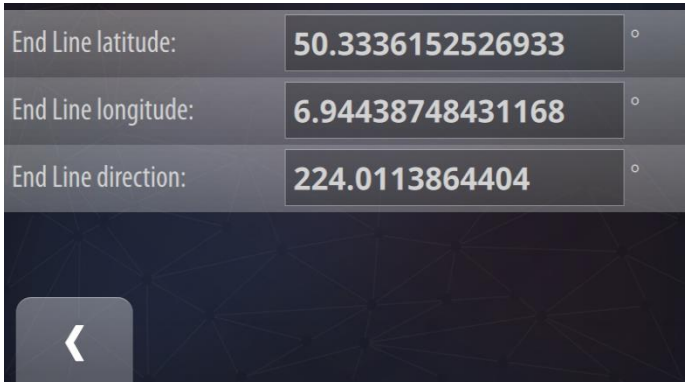
- North = 0
- East = 90
- South = 180
- West = 270

- Moving the pit lane by offset is now disabled. It works only for preinstalled pit lane definitions.

Please note:

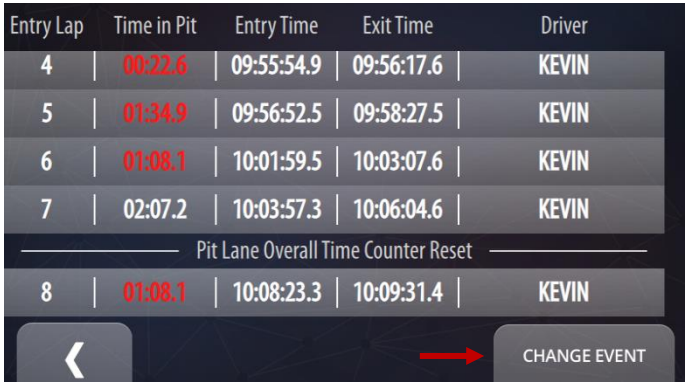
- The pit lane start and end lines can be also changed using the **RN Connect app.** Check the RN Connect manual for more information.



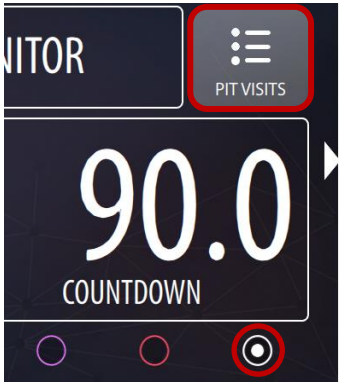


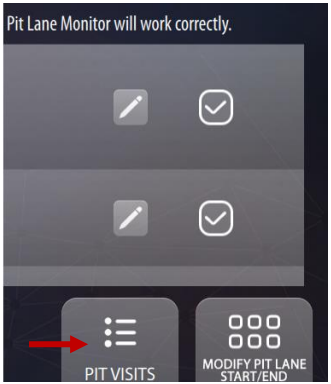
19.8 Pit Lane Visits

When Pit Lane Monitor is activated in Pit Lane Monitor settings the Race Navigator system is detecting crossing of the Pit Lane Start Line and End Line. Based on that every pit stop visit is saved.



PIT VISITS are accessible in Pit Lane Monitor Settings or directly from the Pit Lane Monitor Dashboard Screen (last panel of Dashboards). Every event has its own list.





20 TIRE PRESSURE MONITORING SYSTEM

RN Vision offers a high quality Tire Pressure Monitoring System (TPMS) that is fully compatible with RN systems. The RN TPMS is a high precision, high speed (2 Hz pressure measurement), resistant and affordable solution to measure tire pressures and achieve optimal pressure values in a moment when it is needed.

TPMS Benefits:

- Lightweight sensors (20g),
- connection output for CAN 2.0, 1Mbps or 0.5Mbps,
- 2 Hz data frequency,
- sensors sleep and wake-up mechanism adjusted to race conditions,
- high pressure accuracy: +/-20 mbar,
- sensor pressure range: 0 – 8000 mbar,
- battery lifespan: 2 full racing seasons,
- intuitive indications on RN screen about optimal pressure for each wheel,
- customizable ranges of optimal pressures and warnings,
- tire puncture alarms,
- over and under pressure warnings,
- sensors and receiver protection IP67,
- 8mm and alternative valve designs are available on request,
- 1 Receiver required for all 4 sensors,
- CE & FCC Compliant.

TPMS Typical Kit

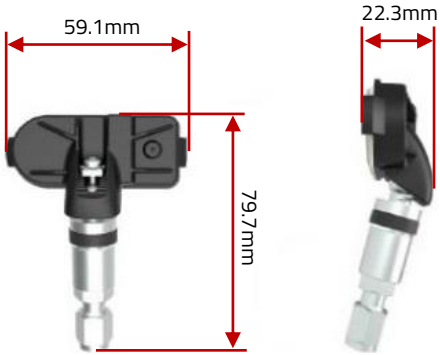
- 8-12 x sensors,
- wiring harness – different cable options, contact RN Vision team for support,
- 1 x Radio receiver.

20.1 System mounting

RN TPMS sensors have to be mounted in a standard way same as other TPMS sensors.

Please note:

- mounting must be conducted by a qualified technician to avoid damages,
- while dismounting, a technician must be notified about TPMS sensors in the wheel, to avoid damage.

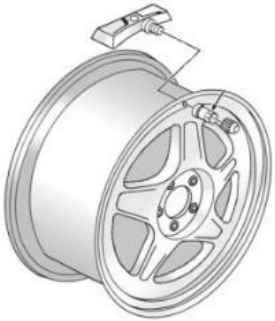


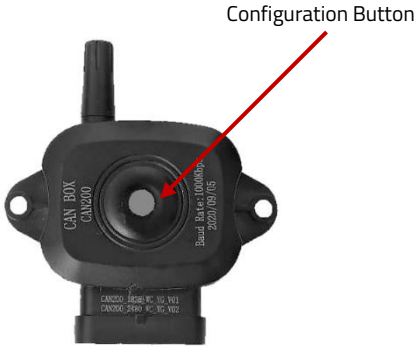
- **Receiver mounting**

RN TPMS Receiver has to be mounted inside of the car, close to the middle. Please validate sensors' signal availability after mounting wheels on the car and connecting the system. The RN system displays each wheels pressure when data is received. If data from a wheel is missing, please adjust receiver position by approximating the receiver towards wheels.

- **Receiver Configuration Button**

Please note that the TPMS Receiver is pre-programmed to work with delivered sensor kits, and pressing the configuration button of the receiver (long press) can cause reset of sensors' assignment.





Sensors positioning and identification

Each sensor from the kit has an unique identifier. Each corner has the unique ID that is pre-programmed in the receiver before delivery.

Sensors must be mounted in proper corners of a car to read values from corresponding wheels. Each sensor has appropriate label (FL, FR, RR, RL) on the sensor and on the valve.

Sensors from different sensor kits that are assigned to the same corner have the same ID. It means a user can use many sets of tires with the same TPM system. The only requirement is to mount sensors in the right corners.

20.2 Conditions for pressure data transmission

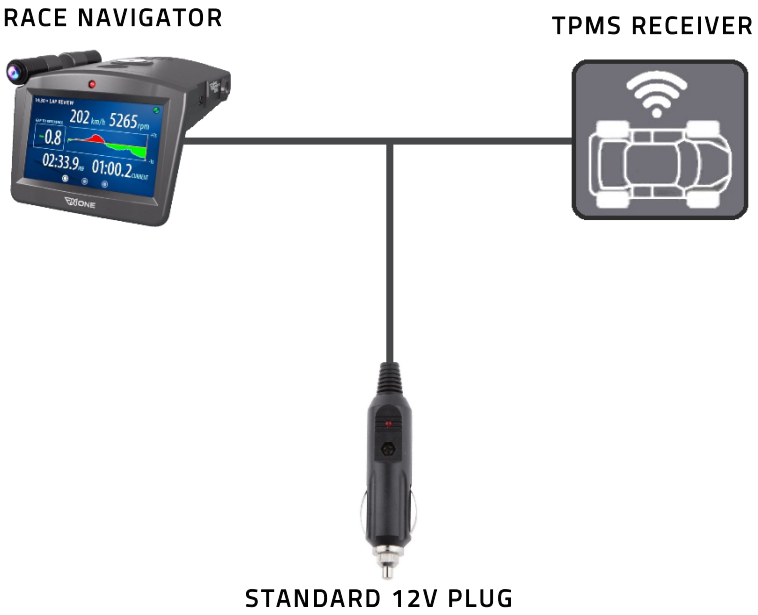
- Sensor not mounted or tire not inflated - no transmission of data.
- Tire inflated but the wheel is not rotating - measured every 60 secs and pressure changes transmitted
- Tire inflated and rotating - measured every 0.5 sec and pressure changes also transmitted
- When the wheel stops rotating for example for a pit stop the sensor will continue to measure the pressure every 0.5 sec for a further 5 minutes before the transmission time reverts back to 60 seconds.

20.3 Connecting TPMS to Race Navigator

The TPMS communicates by CAN Bus. It can be connected to the RN system as the only external device or as an additional external device together with car's ECU.

Depending on requirements, different cables have to be used. Below both trackday and racing variant is presented.

Please contact the RN Vision support to clarify cabling details.

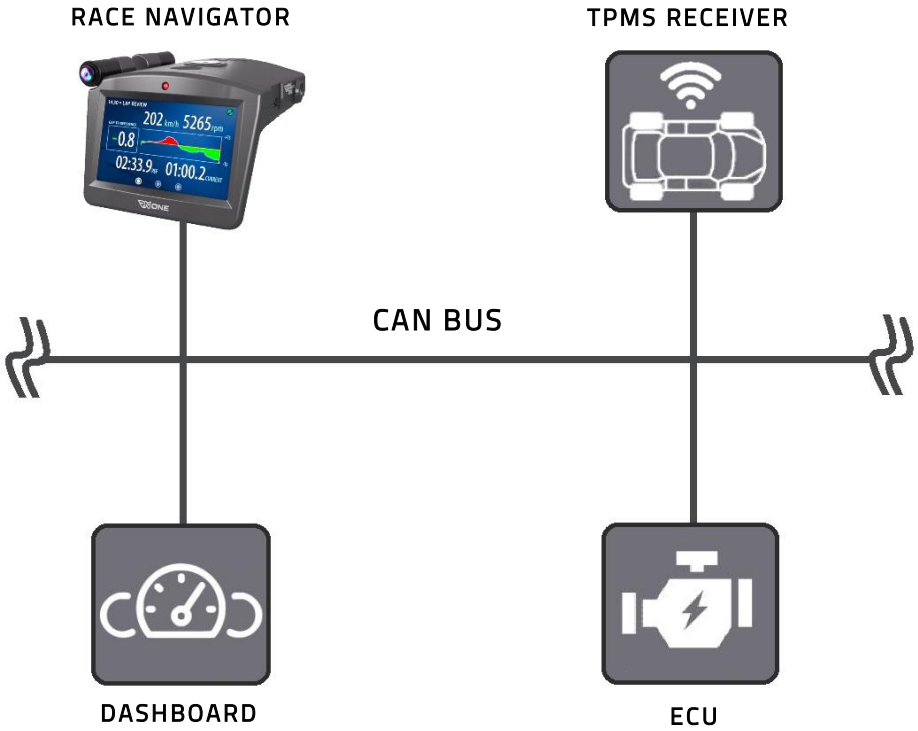


Using Trackday version

- In the trackday version the TPMS is connected directly to the RN device with a cable that must be connected to the standard 12V cigarette power socket in a car.
- Additional car data can be logged by the RN device using RN OBD Plug.

Using Racing version

- In the TPMS racing version the RN device together with RN TPMS is connected to the car's CAN Bus. Please mind that the TPMS must be ordered with the same CAN Bus speed as the CAN bus in your car. Additional car data can be logged by the RN device from the CAN Bus.



20.4 Setting up TPMS system

Enabling functionality

The Tire Pressure Monitoring System can be activated in the RN menu under:

HOME VIEW → SETTINGS → DEVICE → ADDITIONAL SETTINGS → TPMS SETTINGS

Turning TPMS ON/OFF

Select this checkbox in order to turn ON the

TPMS Functionality.

TPMS Settings

Go to TPMS Settings by pressing on this icon.

20.5 TPMS Settings

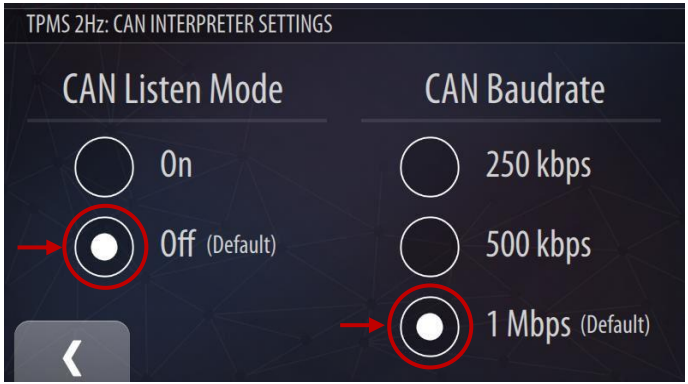
TPMS Listen Mode and CAN Bus speed

If the TPMS is the only CAN Bus device connected to the RN system, please adjust the CAN Bus settings here. Set CAN Listen Mode to OFF and set your receiver CAN Bus Speed (default is 1 Mbps).

For TPMS CAN Bus Listen Mode and Speed settings press on this button

Settings

The Default settings of TPMS are shown in this picture.



TPMS connection as additional device in the car's CAN Bus

Select the proper CAN Data Interpreter from:

HOME VIEW → SETTINGS→ CAR→ EDIT→ SELECT CAN

Settings for the listen mode and CAN bus speed are used from the selected car's protocol (under CAR's settings) if you use a connection to car's CAN bus.

20.6 Optimal Tire Pressure Settings

Optimal Tire Pressure Settings allow to set up pressures that are marked as 'optimal' in the system. To set the Optimal Pressure Range press on this Button in TPMS Settings section

Use text boxes to set the values of your need. These settings are global for each tire.

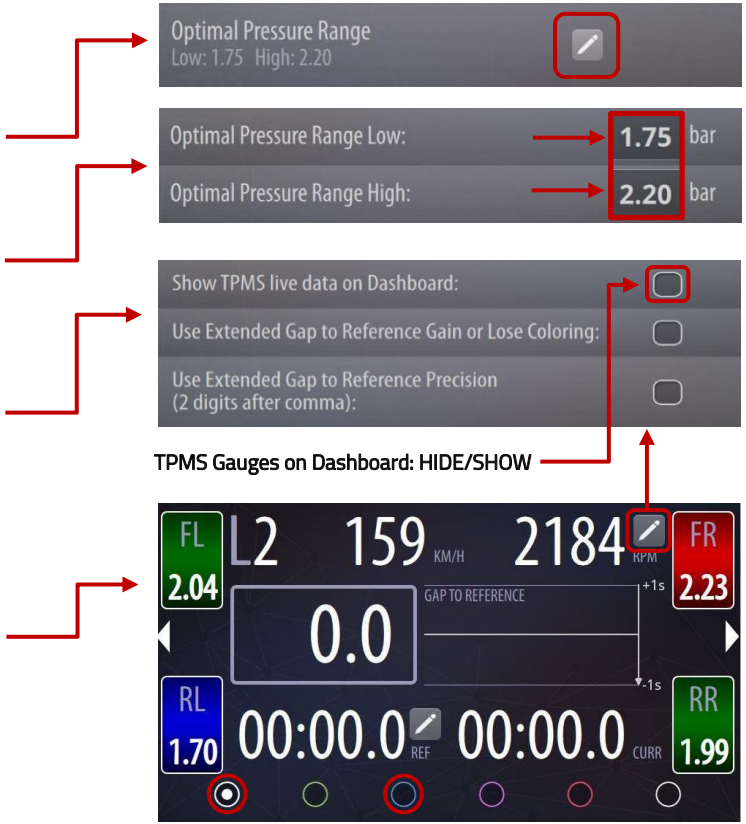
20.7 Pressure Display

Pressure values in bar are displayed inside tire images. TPMS Gauges can be found on first and third dashboard view. To hide TPMS Gauges go to dashboard settings and uncheck the "Show TPMS live data on Dashboard"

TPMS Color indicators

Pressure Gauges are colored according to previously set Optimal Pressure Range in settings.

- Green: Pressure value is between Optimal Low and Optimal High
- Blue: Pressure value is below Optimal Low.
- Red: Pressure Value is above Optimal High



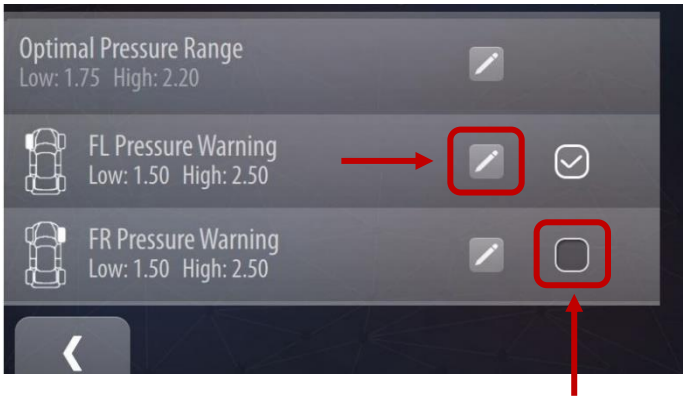
20.8 Tire Pressure Warning Settings

TPMS Pressure warnings are set separately for each tire.

You can enable or disable warning message for each tire separately.

Disabling Pressure warnings:

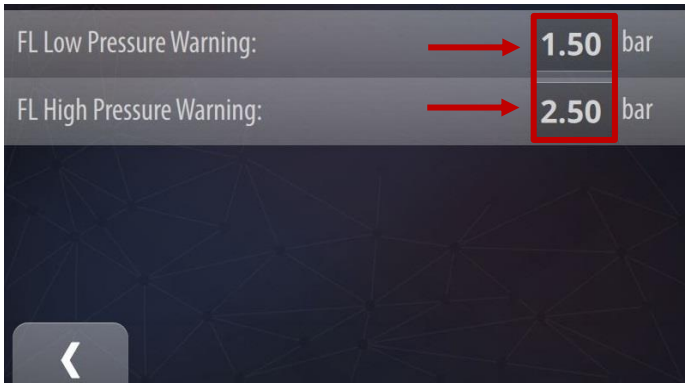
To completely disable Pressure warnings uncheck all 4 boxes.



Warning: Disable/Enable

Each tire have its own pressure range for displaying warnings. To change the values press on edit button.

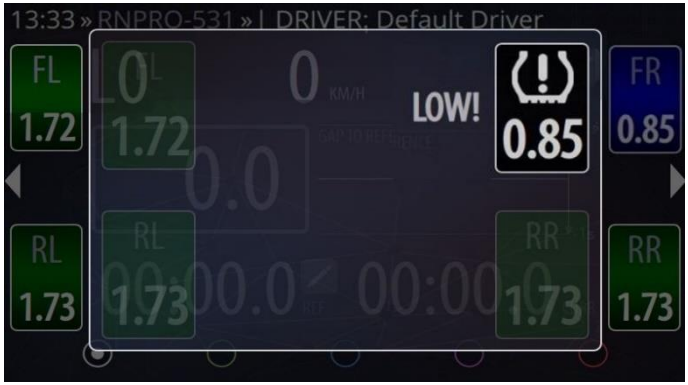
Press on these text boxes to set the chosen values of your need.



20.9 Tire Pressure Warning Messages

As soon as a single wheel pressure drops below or increases above a warning level, the alarm screen will appear to warn the driver. The screen shows a separate tire image in every corner.

The black tire image informs about too low pressure when the red one shows too high pressure alert. Only tires with pressure out of bounds are displayed in the alarm screen.



Warning Icons:

- **Pressure below limit:**

- **Pressure above limit:**

Hide Warning:

To hide Pressure warning tap anywhere on screen.

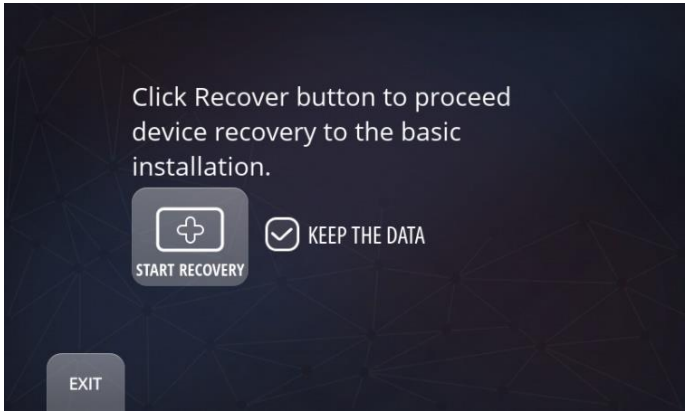
21 Troubleshooting/Recovery

The recovery mode was developed for system emergency situations that happen when a faulty state is detected. This faulty state can occur when the device lost power unexpectedly during an update process or while saving critical data or when unexpected data is stored by the system.

Recovery Procedure

In case your device is not starting properly, the Recovery screen will appear. On this screen, you can start the recovery process. Confirm the operation by clicking the Start Recovery button, with or without keeping your data (mark the checkbox if you want to keep it). This process will restore the device's software to the last valid version.

You can start by using the recovery process with keeping data enabled. The system will try to reset itself to the last valid software version. If the recovery process did not fix the issue, please contact the RN Vision team for further support.



22 More information and safety precautions

The Race Navigator is an electronic device containing electronic boards, with different sensors, cameras, and a built-in battery. The device consumes electrical power and generate heat in usage.

General notices

- For your own safety and a passengers' safety, do not operate the device's touch screen and buttons while driving,
- When a window suction mount is used, make sure that it is securely installed and that the device is in an appropriate place, so that it is not obstructing the driver's view or deployment of airbags,
- The device can become hot during usage. Be careful with the heatsink and other metal parts of the housing because they warm up to high temperatures (more than 40 °C),
- Do not expose the device to direct sunlight for an extended period of time. When a too high internal temperature is reached, the device can malfunction,
- Keep the lens of the cameras clean and make sure that no objects are blocking the camera lens.

Safety Precautions

Charging additional notes

- Use only the charger supplied with your device, usage of a different type of charger may result in malfunction and/or danger,
- Do not temper with the charging unit or internal battery
- Do not use the charger in a high moisture environment, and do not use the charger when your hands or feet are wet,
- Allow adequate ventilation around the charger when using it to operate the device or charge the battery, do not cover the charger with any objects that will reduce cooling,
- Connect the charger to a proper power source, the voltage requirements are found on the charger or in this manual,
- When using a charging cable to use a device or charge the battery, please make sure that the power source has proper parameters as specified in the requirements you can find in this manual,
- Do not use the charger or a charging cable if the cord becomes damaged,
- Do not attempt to service the unit by your own, or by a not accredited service. There are no serviceable parts inside, replace the unit if is damaged or exposed to excess moisture.

Battery additional notes

- **Caution:** this device contains a non-replaceable internal Lithium Ion battery, the battery can burst or explode, releasing hazardous chemicals. To reduce the risk of fire or burns, do not disassemble, crush, puncture, or dispose of in fire or water,
- This device needs to be recycled or disposed properly according to local law.

Caring for the device

Taking good care of your device will ensure trouble-free operation and reduce the risk of damage.

- Keep your device away from excessive moisture and extreme temperatures,
- Avoid exposing your device to direct sunlight or strong ultraviolet light for extended periods of time,
- Do not place anything on top of your device or drop objects on your device,
- Do not drop your device or subject it to severe shock,
- Do not subject your device to sudden and severe temperature changes -this could cause moisture condensation inside the unit, which could damage your device. In the event of moisture condensation, allow the device to dry out completely before use.
- The screen surface can easily be scratched. Avoid touching it with sharp objects. Non- adhesive generic screen protectors designed specifically for use on portable devices with LCD panels may be used to help protect the screen from minor scratches.
- Never clean your device while it is powered on . Use a soft, lint-free cloth to wipe the screen and the exterior of your device. Do not use paper towels to clean the screen,
- Never attempt to disassemble, repair or make any modifications to your device. Disassembly, modification or any attempt of repair could cause damage to your device and even bodily injury or property damage and will void any warranty,
- Do not store or carry flammable liquids, gases or explosive materials in the same compartment as your device, its parts or accessories,
- To discourage theft, do not leave the device and accessories in plain view in an unattended vehicle.
- overheating may damage a device.

23 Regulatory Information

The Race Navigator ONE device complies with the Electromagnetic Compatibility Directives.

CE Regulatory Information

This device complies with the Electromagnetic Compatibility Directive (2014/30/EU) issued by the Commission of the European Community. The compliance with this directive implies conformity to the following European Standards:

- PN-EN 55032:2015-09,
- PN-EN 55035:2017-09.

The manufacturer cannot be held responsible for modifications made by the User and the consequences thereof, which may alter the conformity of the product with the CE Marking.

EU Declaration of Conformity

Hereby, RN Vision GmbH, the producer, declares that this device (Race Navigator ONE v2) is in compliance with the essential requirements and other relevant provisions of Directive 2014/30/EU.

Regulatory Information USA

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Class B device notice

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/TV technician for help.

RF exposure safety

This device is a radio transmitter and receiver.

It is designed not to exceed the emission limits for exposure to radio frequency (RF) energy set by the Federal Communications Commission.

The antenna (a built-in and external) must be installed and operated with minimum distance of 20 cm between the radiator and your body.
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Regulatory Information Canada

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
Les changements ou modifications non expressément approuvés par la partie responsable de la conformité pourraient annuler l'autorisation de l'utilisateur d'utiliser l'équipement.

This device complies with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions: (1) This device may not cause interference; and (2) This device must accept any interference, including interference that may cause undesired operation of the device.
Le présent appareil est conforme aux CNR de l'ISDE applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

RN exposure safety

This device is a radio transmitter and receiver.
It is designed not to exceed the emission limits for exposure to radio frequency (RF) energy set by the ISED.
The antenna (a built-in and external) must be installed and operated with minimum distance of 20 cm between the radiator and your body.
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
Cet équièment est un émetteur et un récepteur radio.
Il est conçu pour ne pas dépasser les limites d'émission pour l'exposition à l'énergie radiofréquence (RF) établie par l'ISDE.
L'antenne doit être installé de façon à garder une distance minimale de 20 cm entre la source de rayonnements et votre corps.
L'émetteur ne doit pas être colocalisé ni fonctionner conjointement avec à autre antenneou autre émetteur.

CAN ICES-3 (B)/NMB-3(B)

This Class B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de clase B est conforme à la norme Canadienne ICES-003.

RN VISION ONE (1) YEAR LIMITED WARRANTY

ABSTRACT

RN VISION company guarantees, that during one year since the purchase of Race Navigator, the product (hardware) and its accessories are free from material and production flaws. RN VISON warranty does not include flaws, that are the result of normal usage and damages caused by incorrect use of the device or as a result of an accident. In case of a repair, please contact RN VISION or an authorized RN VISION service. **CAUTION**: This product complies with EMC directives and contains components compatible with peripheral devices, and tested screen cables used to connect the Race Navigator with peripheral devices. Make sure that you exclusively use compatible peripheral devices and screen cables used to connect the elements of the system, in order to avoid disruptions of radio or TV sets, and other electronic devices.

Declaration of compliance with EU norms

Hereby RN VISION confirms, that Race Navigator meets the requirements laid down by the R & TTE directive.

WARRANTY

The object of the warranty is a product named RACE NAVIGATOR, manufactured by RN VISION GmbH, located in Mönchengladbach in the Federal Republic of Germany. RN VISION GmbH provides warranty for Race Navigator branded products and accessories, secured in original "Race Navigator" packaging, including material and quality flaws appearing during normal usage in accordance with the instructions published by RN VISION, the technical data and other instructions concerning the Race Navigator product (see also: www.race-navigator.com). The warranty is in force for a period of ONE (1) YEAR since the date of original retail purchase, made by the purchaser being the end user ("Warranty period"). Within this warranty, the user can lay claims to RN VISION company, even in case where he bought the Race Navigator product from another seller than the RN VISION company.

Consumer protection laws

RN VISION's one year warranty is a service provided voluntarily by the manufacturer. The rights that are the result of the RN VISION's one year warranty, supplement (and do not substitute) the rights that are the result of consumer law. If the product is flawed, the consumers can choose if they want to return the product to the service within the RN VISION's one year warranty, or within the rights that are the result of consumer law.

Important: Resolutions of the RN VISION's one year warranty do not apply to claims resulting from consumer laws. More information on the consumer law can be obtained in the Office of Competition and Consumer Protection.

OBJECT OF THE WARRANTY

RN VISION company's RACE-NAVIGATOR, located at RN VISION GmbH's address in Mönchengladbach in Germany, provides warranty for the device and Race Navigator branded products and accessories, secured in original "Race Navigator" packaging, including material and quality flaws appearing during normal usage in accordance with the instructions published by RN VISION, the technical data and other instructions concerning the Race Navigator product (see also: www.race-navigator.com). The warranty is in force for a period of ONE (1) YEAR since the date of original retail purchase, made by the purchaser being the end user ("Warranty period"). Within this warranty, the user can lay claims to RN VISION company, even in case where he bought the Race Navigator product from another seller than the RN VISION company.

Caution: any claims concerning the RN VISION's one year warranty are subject to the resolutions of this warranty.

Service options depend on the country, where the service is supposed to be performed. Services for the Race Navigator ONE can be limited to the country where the device was purchased. Phone charges and international shipping charges depend on the country, where such services are performed.

Warranty resolutions and detailed information on the service are also available on the website: www.race-navigator.com.

In case of reasonable warranty claims concerning the Race Navigator, RN VISION can fix the device, replace it or reimburse the customer as the RN VISION company wishes.

The rights resulting from the RN VISION's warranty are in force, except for the cases of rights resulting from laws on consumers protection, enclosed in the civil code.

If you file a warranty claim, you'll need an application with a proof of purchase.

WHAT IS COVERED BY THIS WARRANTY?

RN VISION warrants the Race Navigator-branded hardware product and accessories contained in the original packaging ("Race Navigator") against defects in materials and workmanship when used normally in accordance with RN VISION's published guidelines for a period of ONE (1) YEAR from the date of original retail purchase by the end-user purchaser ("Warranty Period"). RN VISION's published guidelines include but are not limited to information contained in technical specifications, user manuals and service communications.

WHAT IS NOT COVERED BY THIS WARRANTY?

This warranty does not apply to any non-Race Navigator branded hardware products or any software, even if packaged or sold with Race Navigator hardware. Manufacturers, suppliers, or publishers, other than Race Navigator, may provide their own warranties to you but Race Navigator, in so far as permitted by law, provides their products "AS IS". Software distributed by RN VISION with or without the Race Navigator brand (including, but not limited to system software) is not covered by this warranty. Please refer to the licensing agreement accompanying the software for details of your rights with respect to its use. RN VISION does not warrant that the operation of the Race Navigator Product will be uninterrupted or error-free. RN VISION is not responsible for damage arising from failure to follow instructions relating to the Race Navigator Product's use.

USER'S RESPONSIBILITIES

IF SOFTWARE, DATA OR OTHER INFORMATION CAN BE STORED IN A PRODUCT OWNED BY THE USER, THEN FOR SECURITY MEASURES AND AS A PROTECTION AGAINST POSSIBLE FAILURES, THE USER SHOULD PERIODICALLY CREATE BACKUP COPIES OF SUCH INFORMATION STORED ON THE RN VISION PRODUCT'S DATA STORAGE.

Before submitting a RN VISION product to warranty repair, the user should create a backup copy of the data stored on the data storing device, delete all personal data and disable all security passwords. During the repair, the contents of the data storage of the RN VISION product can be removed, overwritten or formatted.

After completing a warranty service, a user's RN VISION product, or a replacement product will be returned to the user configured in the same way as it was configured when being purchased by the user, including proper updates. Within the warranty service, RN VISION can install software updates in the RN VISION product, that will make it impossible to restore the previous version of the software. As a result of such update, the third party software installed in the RN VISION product might not be compatible with the RN VISION product, or might not work with the RN VISION product. The responsibility of reinstalling all the remaining software and restoring the data and information lies on the user's side. This warranty

does not include recovery of data or information, or reinstalling software.

The user can submit the product for repair in a country different than the country of purchase, but the country needs to obey all necessary import and export laws and pay all the custom duties, VAT tax and all necessary taxes and charges.

CONSIDERATION OF WARRANTY CLAIMS BY RN VISION

If during the Warranty Period you submit a valid claim to RN VISION, RN VISION will, at its option,

(i) repair the RN VISION Product using new or previously used parts that are equivalent to new in performance and reliability,

(ii) replace the RN VISION Product with a product that is at least functionally equivalent to the RN VISION Product and is formed from new and/or previously used parts that are equivalent to new in performance and reliability, or

(iii) exchange the RN VISION Product for a refund of your purchase price.

When a product or part is replaced or a refund provided, any replacement item becomes your property and the replaced or refunded item becomes RN VISION's property.

A replacement part or product, or a repaired RN VISION product, assume the remaining warranty of the RN VISION Product or ninety (90) days from the date of replacement or repair, whichever provides longer coverage for you.

If the product is submitted in a country different that the country of the RN VISION product's purchase, the RN VISION manufacturer can repair or replace products or parts with comparable products or parts, consistent with the standards of the country.

HOW TO OBTAIN WARRANTY SERVICE

Please contact a RN VISION representative or an authorized RN VISION service provider. They will help determine whether your RN VISION Product requires service and, if it does, will inform you how RN VISION will provide it.

Before providing warranty services, RN VISION or RN VISION representatives may require detailed information from the user, including information on a proof of purchase, answering questions facilitating the diagnosis of possible issues, and complying with RN VISION's procedure concerning warranty services, for example acting according to an instruction concerning packaging and shipping RN VISION products, in case of a carry-in service, according to the description below.

In order to use the service and support based on this RN VISION warranty, the user does not have to prove, that the issue was present on the day of delivery, unless it's inconsistent with the issue's character.

WARRANTY SERVICE OPTIONS

RN VISION will provide warranty service as they wish and depending on circumstances, especially depending on the type of the RN VISION product, through one or more of the following options:

1) Mail-in service.

If RN VISION determines that your RN VISION Product is eligible for mail-in service, RN VISION will send you prepaid waybills and if applicable, packaging material, so that you may ship your RN VISION Product to RN VISION. Once the service is complete, RN VISION will return the RN VISION Product to you. RN VISION will pay for shipping to and from your location if all instructions are followed.

2) Do-it-yourself (DIY) parts service.

Within the DIY parts service, RN VISION will provide the user with spare product, parts or accessories, such as external GPS antenna, 12V cable – car adapter, that can be easily replaced without using tools.

CAUTION: RN VISION is not responsible for any labor costs you incur relating to DIY parts service. Should you require further assistance, contact RN VISION at the telephone number listed below. RN VISION reserves the right to change.

If DIY parts service is available in the circumstances, the following process will apply:
(a) Service where RN VISION requires return of the replaced product or part.
RN VISION may require a credit card authorization as security for the retail price of the replacement product , accessory or part and applicable shipping costs. RN VISION will ship a replacement product or part to you with installation instructions, if applicable, and any requirements for the return of the replaced product or part. If you follow the instructions, RN VISION will cancel the credit card authorization, so you will not be charged for the product or part and shipping to and from your location. If you fail to return the replaced product or part as instructed or return a replaced product or part that is ineligible for service, RN VISION will charge your credit card for the authorized amount. If you are unable to provide credit card authorization, DIY parts service may not be available to you and RN VISION will offer alternative arrangements for service.
(b) Service where RN VISION does not require return of the replaced product or part. RN VISION will ship you free of charge a replacement product or part accompanied by instructions on installation, if applicable, and any requirements for the disposal of the replaced product, accessory or part.

PRIVACY

RN VISION will maintain customer information and use it according to RN VISION Customer Privacy Policy, available at: www.race-navigator.com.

GENERAL

No RN VISION reseller, agent, or employee is authorized to make any modification, extension or addition to this warranty.
If any term is held to be illegal or unenforceable, the legality or enforceability of the remaining terms shall not be affected or impaired.
This warranty is governed by and construed under the laws of the country in which the RN VISION product purchase took place.

BATTERY

The lithium-ion battery in Race Navigator should be replaced only by RN VISION or a RN VISION Authorized Service Provider. The batteries should be recycled, or utilized separate from the domestic waste.
For more information about recycling and battery replacement services, go to:
www.race-navigator.com.

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RN ONE

THE WAY OF DRIVING FAST

RACE-NAVIGATOR.COM