

## WEM-200

SKF Wheel End Monitoring

User Manual – Quick Start



## Table of Content

<b>1 Description .....</b>	<b>4</b>
<b>2 WEM2 assembly .....</b>	<b>5</b>
<b>3 Product activation .....</b>	<b>6</b>
<b>4 Product modes .....</b>	<b>6</b>
<b>5 Download the Mobile application .....</b>	<b>8</b>
5.1 Application description.....	8
5.1.1 “Vehicles” view .....	8
5.1.1.1 “All” page.....	8
5.1.1.2 “Alarms” page .....	9
5.1.1.3 “Nearby” page .....	9
5.1.2 “My Ride” view.....	10
5.1.3 “More” view.....	10
<b>6 Product commissioning &amp; status .....</b>	<b>11</b>
6.1 Create a new vehicle : .....	13
6.2 Access to an existing vehicle .....	17
6.3 Add Sensor to a vehicle.....	18
6.4 Sensor status.....	19
<b>7 Precautions &amp; maintenance .....</b>	<b>22</b>

## Table of Content

Aucune entrée de table d'illustration n'a été trouvée.

## 1 Description

Product functionality:

WEM200 (Wheel end Monitor) – is a condition monitoring device. It monitors wheel end bearing conditions by measuring and analyzing vibrations of the wheel end bearing of the vehicle. The vehicle is generally a truck, a trailer or a bus. It provides warning in case of bearing failure detected and facilitates regular wheel end bearing condition check. Bearing status information is sent to a smart device through BLE (Bluetooth Low Energy). Additionally, the temperature is measured and transmitted through BLE. WEMs is delivered with a separated magnet which is used to wake up the product.



## 2 WEM2 assembly

Mechanical assembly on vehicle:

Please respect below mounting instructions to ensure WEM to perform proper analysis

1. Remove the rim cover (if existing)
2. Unscrew two consecutive rim nuts
3. Position the WEM on the bolts

/!\ Please mind the arrows directions. They shall target the tire.

4. Screw the wheel nuts according to standard mounting specification
5. Put back the rim cover (if existing)

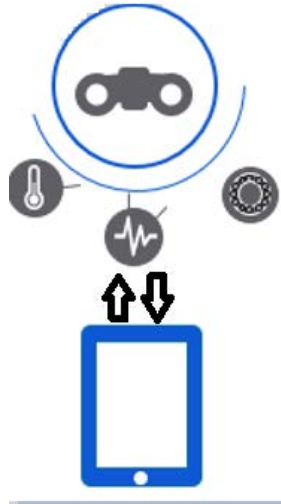


**Figure 3: mounting visualization**

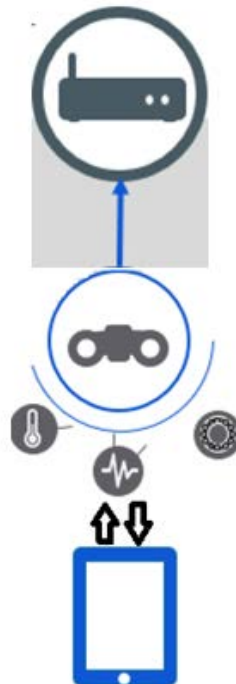
### 3 Product versions

Product is able to work in 2 ways depending of FW configuration requested by customer.

- **Mobile** : where Mobile App is the only user interface for all operations associated with WEM 200 sensor



- **Telematics** where Mobile App is used for product commissioning (including reset/remove) and user telematics system (including gateway) is used to monitor sensor WEM 200



## 4 Product activation and functions

Product can have 3 different states :

- **Transport**
- **Standstill**
- **Operating**

The product is initially received in **transport** mode : no BLE communication and no measurement

Activation of the product is done while approaching the magnet from sensor housing in the “Magnet” identified area.



Then LED is then lighting green.

In case product has been previously configured, LED lights green 1s.

If product is not configured, the LED lights green during the full configuration sequence done with mobile app.

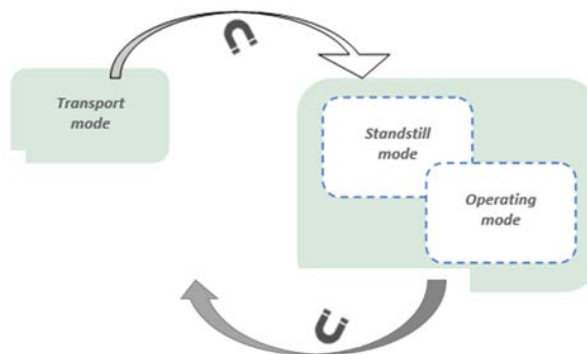
If no specific action is done and product is has not been configured the product goes back to transport after 30s.

For “**Mobile**” FW version, the product transmits BLE frame every 10s when vehicle is **standstill**

For “**Telematics**”FW version, the product transmits BLE frame every 30mn when vehicle is **operating** in movement on the road

The product handles itself the switching from standstill to operating mode according to detection of vehicle movement.

Product can be set back to transport mode approaching magnet from sensor housing.



In case of failure detection on bearing the product LED blinks red 1s ON/1s OFF for 14 days.

Product can be RESET only via mobile App as described in related chapter.

In case of failure detection on sensor itself, the product LED blinks red for 14 days 1s ON/2s OFF ;

## 5 Mobile application

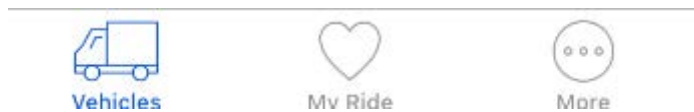
A mobile application **dedicated to iOS** smart devices has been developed by SKF.

This mobile Application is delivered by SKF in following ways:

- 1- Pilot customers: registered user of each company receives an **e-mail from SKF providing a link for download of the mobile application**
- 2- Serial phase: users can download the mobile application from Apple Store

### 5.1 Application description

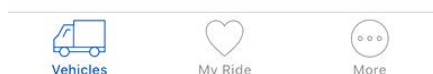
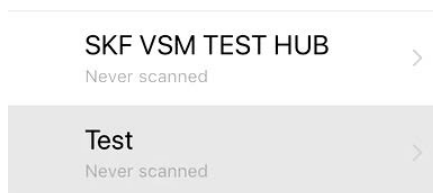
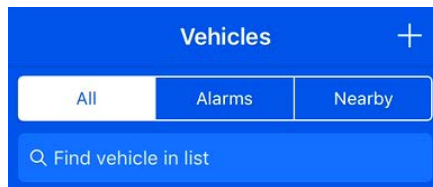
Application is made of 3 main views displayed in the bottom bar of the App :



#### 5.1.1 "Vehicles" view

##### 5.1.1.1 "All" page

it provides the list of registered vehicles from a company – vehicle could be found using the mobile app search bar

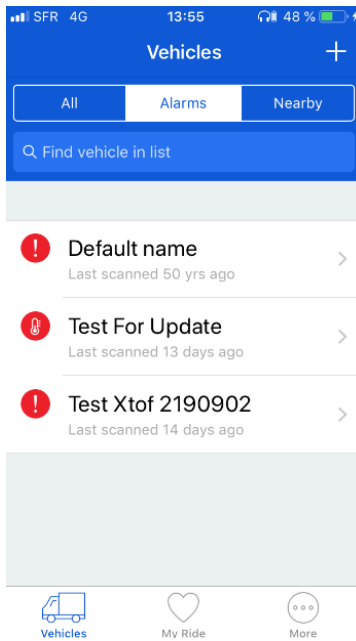


It allows to create new vehicles by clicking symbol + on top right corner



### 5.1.1.2 “Alarms” page

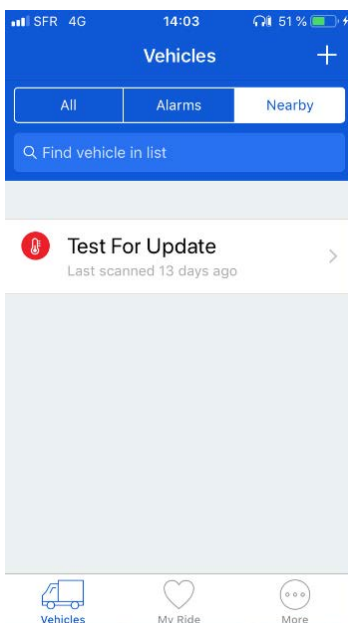
It provides the list of vehicles where a WEM2 sensor alarm have been detected



You can get access to each vehicle from the list to see its current state and detect if a sensor is still defective and its location.

### 5.1.1.3 “Nearby” page

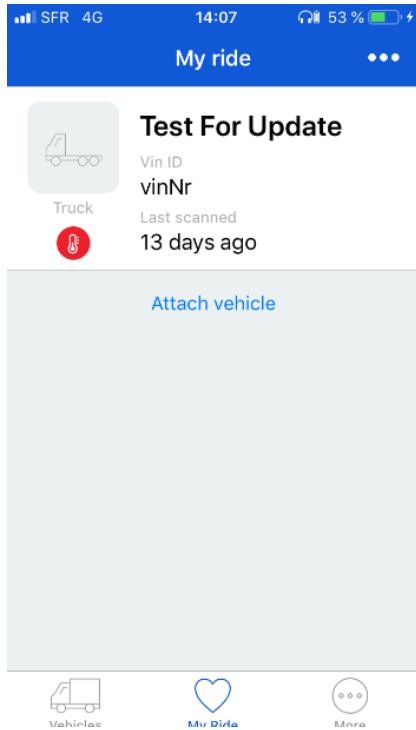
It provides the list of all vehicles detected in the close area where scanning is done by the user of the mobile app



You can get access to each vehicle from the list

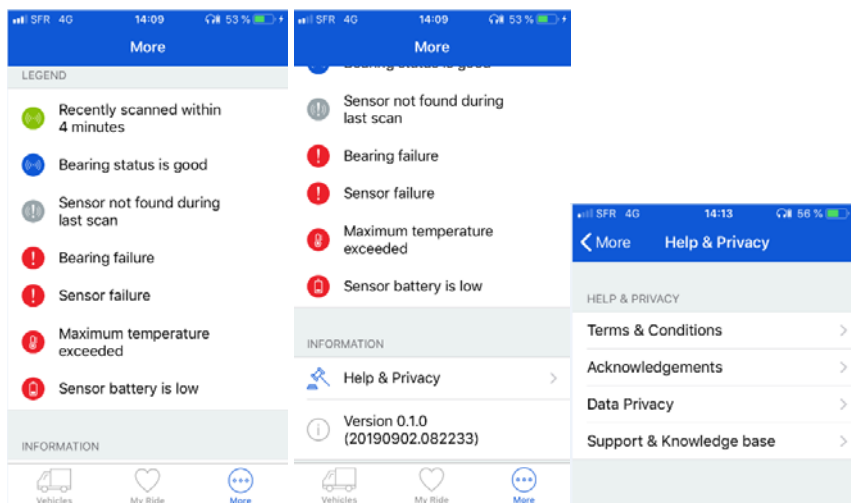
### 5.1.2 "My Ride" view

It provides option to attach 2 vehicles for instance a truck and a trailer



### 5.1.3 "More" view

It provides legend for icons used in mobile app and release version. Help & Privacy gives access to additional information.



## 6 Product commissioning & status

Unless product would be delivered preconfigured for a dedicated vehicle and a specific assembly position, commissioning has to be done by user.

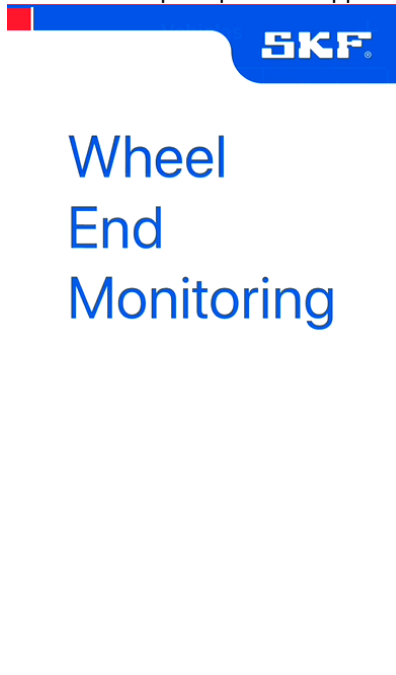
This operation has to be done **using the SKF Mobile Application working on iOS smart device** and transmitting data via Blue Tooth Low Energy (BLE) protocol.

Follow below sequence :

- 1- Activate Bluetooth on the iOS smart Device : Settings\Bluetooth\yes
- 2- Open the mobile App by clicking the related icon on the smart device



You will see a prompt of the application

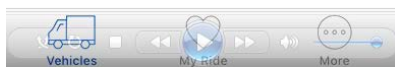
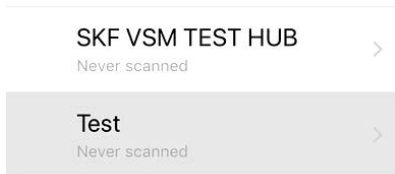
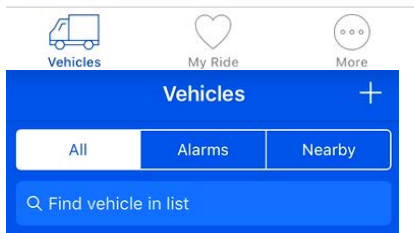


Then the mobile App will load the company vehicles already registered into the system



### Loading your vehicles

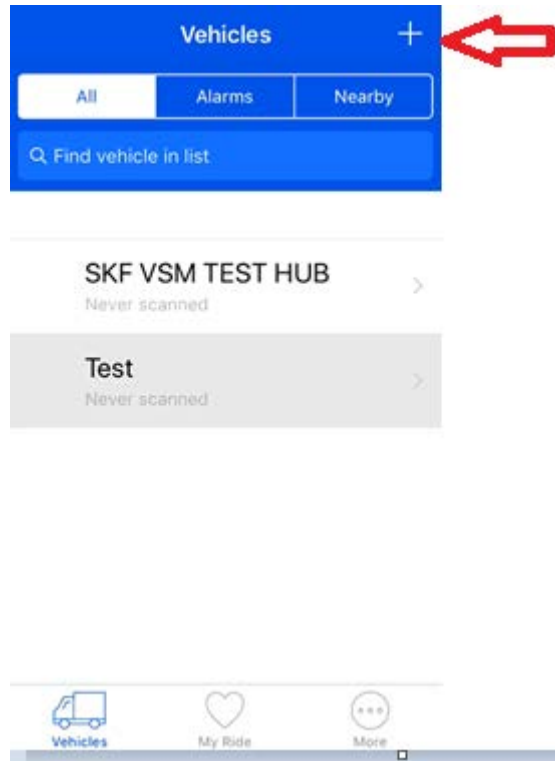
*This might take a little time*



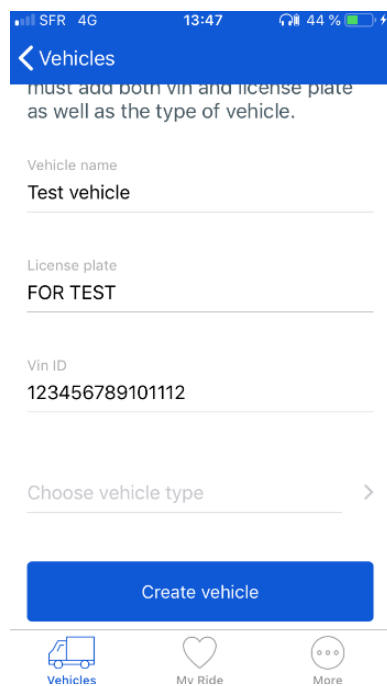
At that stage user has 2 options : Create new vehicle or access to an existing vehicle

## 6.1 Create a new vehicle :

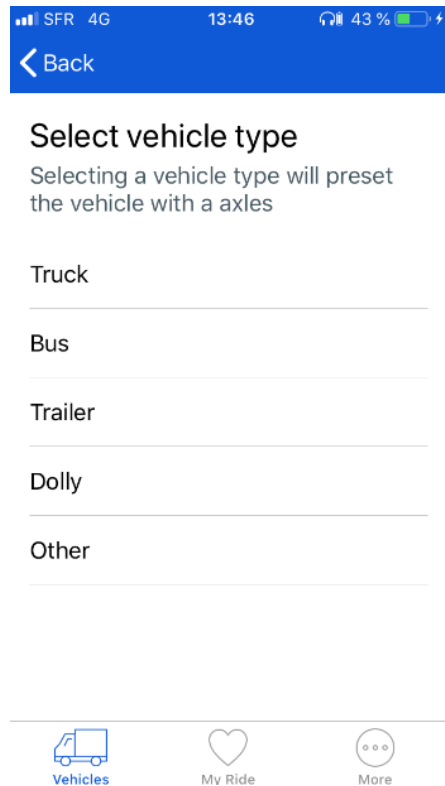
Press the “+” top right symbol



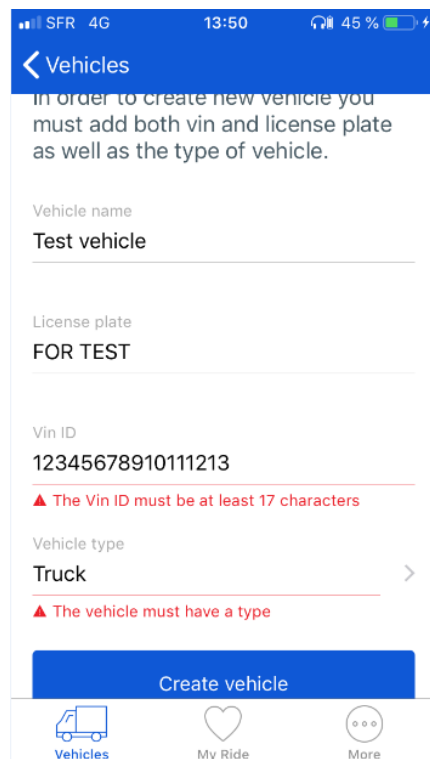
Then enter related information :



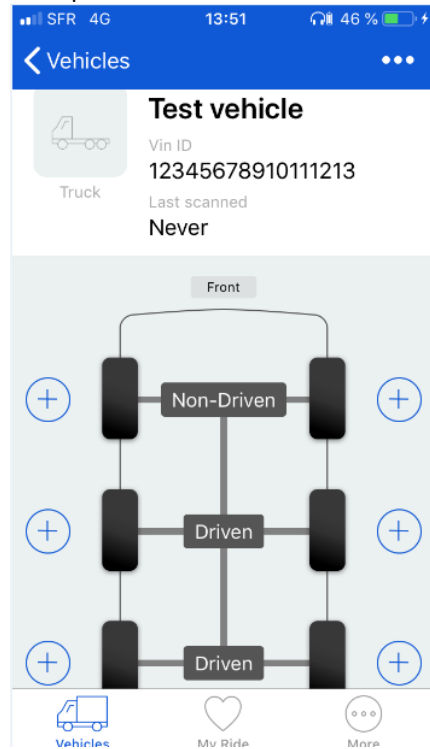
Select the vehicle type in the list



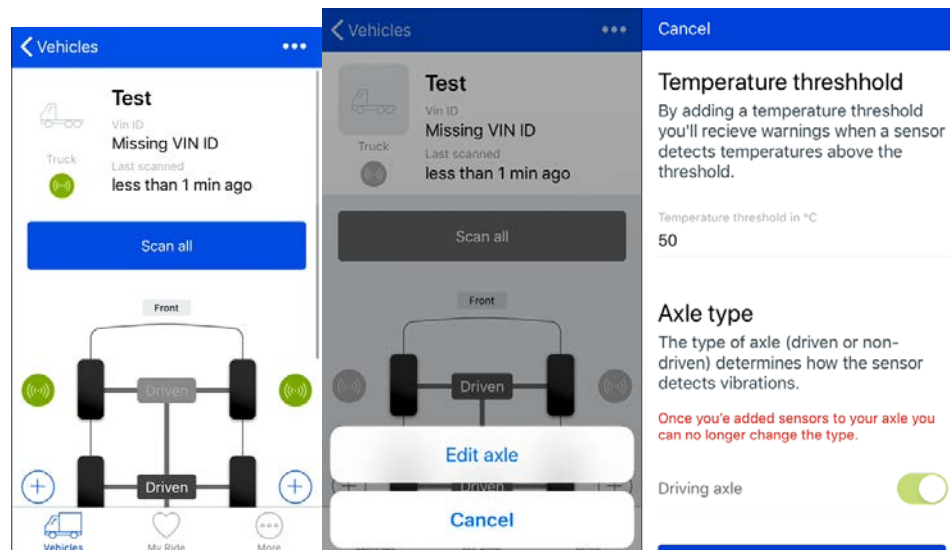
Fill in the vehicle information taking care of warnings for Vin ID and Vehicle type



Then press Create vehicle button



Each axle can then be configured by selecting driven or non-driven + specific T° threshold



Cancel

### Temperature threshold

By adding a temperature threshold you'll receive warnings when a sensor detects temperatures above the threshold.

Temperature threshold in °C

50

### Axle type

The type of axle (driven or non-driven) determines how the sensor detects vibrations.

Once you've added sensors to your axle you can no longer change the type.

Driving axle

Update axle

Cancel

detects temperatures above the threshold.

Temperature threshold in °C

5

### Axle type

The type of axle (driven or non-driven) determines how the sensor detects vibrations.

Once you've added sensors to your axle you can no longer change the type.

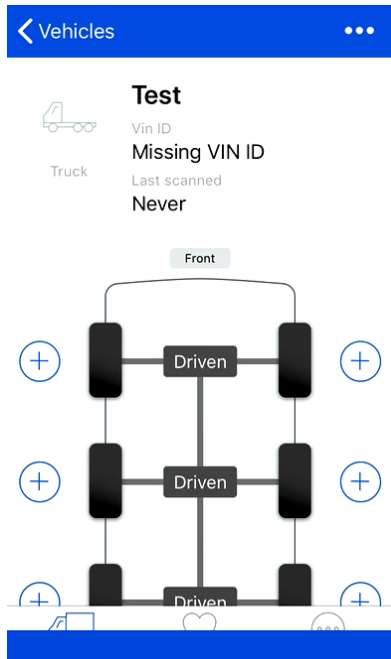
Driving axle

Update axle

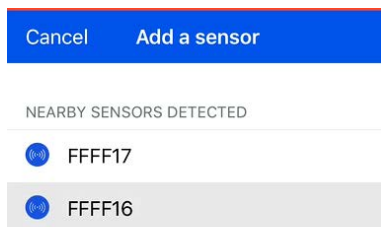


## 6.2 Access to an existing vehicle

Click on the vehicle in the list will give access to this vehicle configuration menu :



By clicking one of the + symbol you will see available sensor which are available and ready to add to the vehicle and related position selected



### 6.3 Add Sensor to a vehicle

This operation is done by selecting add sensor from the menu.

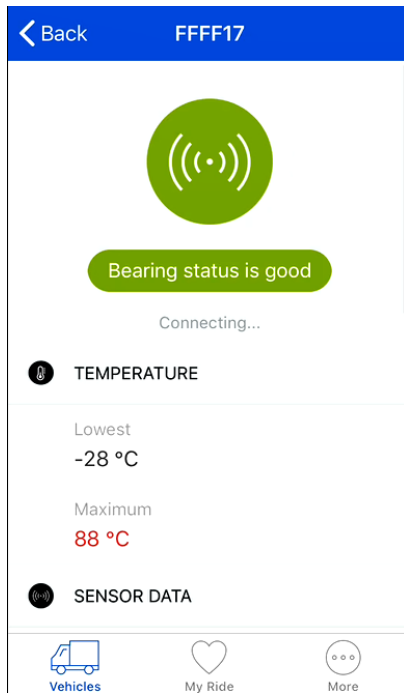
Following screens will display one by one up to the final screen where sensor is added to the vehicle at the specific selected location. The sensor icon will turn to green indicating proper commissioning



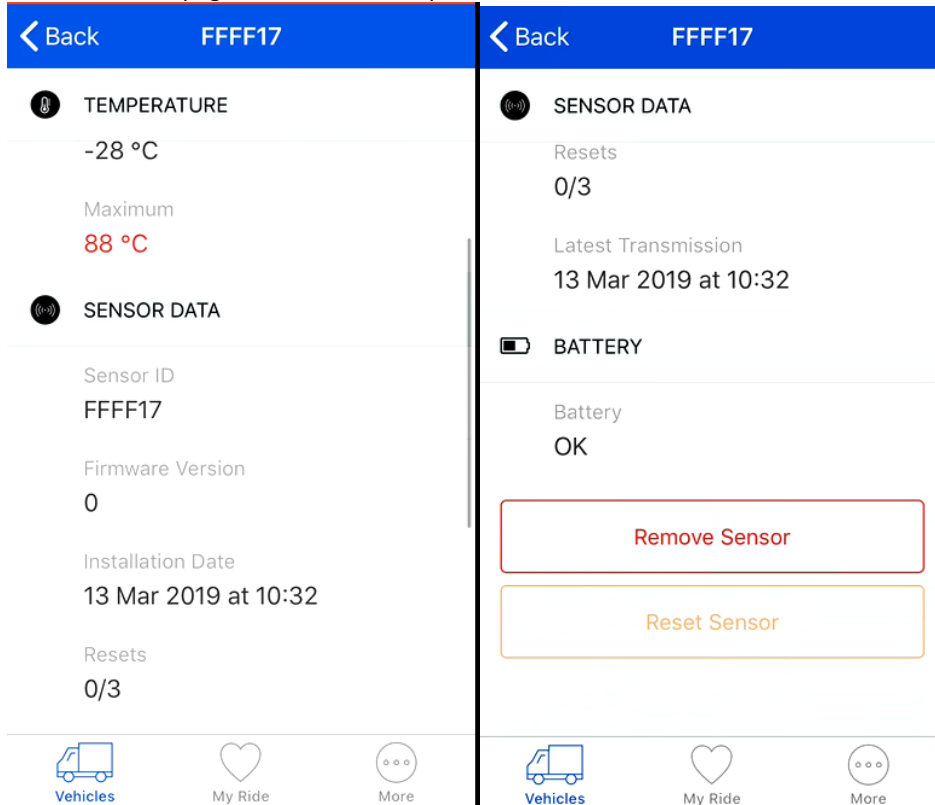
Operation could be repeated to configure and add a new sensor to vehicle.

### 6.4 Sensor status

click on the sensor icon

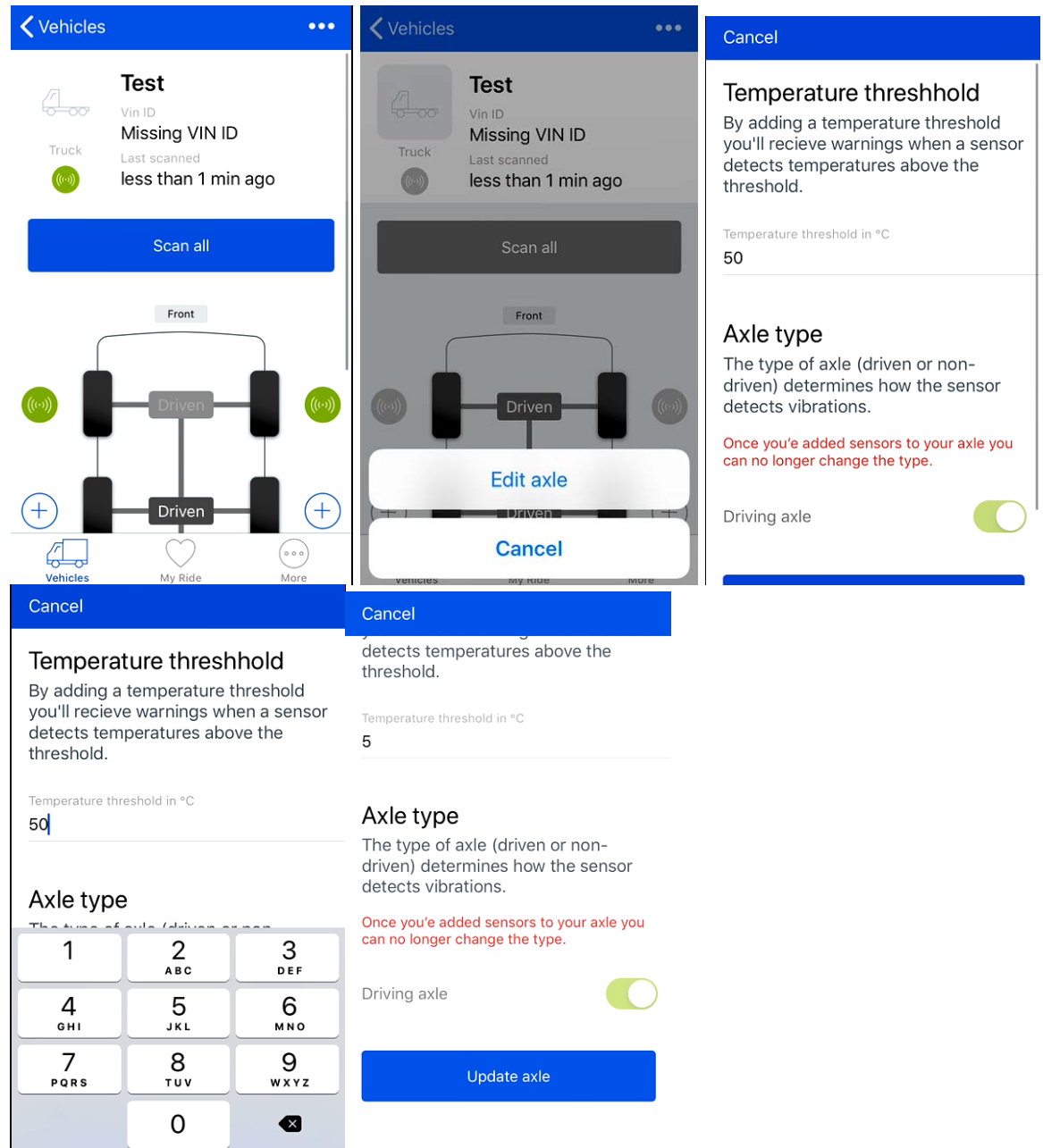


Scroll down the page to view available parameters :

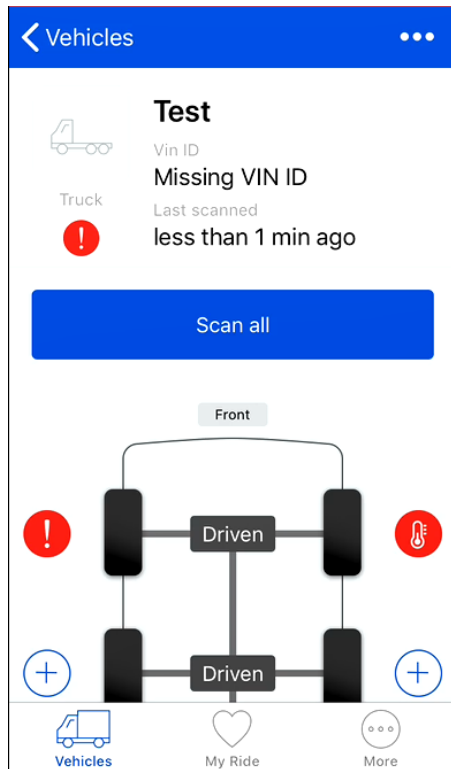


Following information are available :

- T° : sensor is providing the last measured T° value and the Maximum T° recorded in its memory  
It is possible to configure T° Alarm threshold for each axle of the vehicle by pressing the vehicle axle type in the middle of the vehicle drawing: T° threshold could be modified manually typing a new value and pressing update axle to validate



In case measured temperature would be higher than the selected threshold value, icon of the sensor will turn to red T°.



- Sensor ID : unique number identifying the sensor
- Firmware Version
- Installation date
- Resets : product could be re-initialized up to 3 times by using RESET SENSOR button on down side of the view
- Latest transmission : indicated last data transmission received from the sensor
- Battery : indicates sensor battery level

**Sensor could be removed** from a vehicle pressing the “Remove sensor” button

**Sensor could be re-initialized** up to 3 times pressing the “Reset” button

## 7 Precautions & maintenance

The WEM200 hardware is maintenance free, non-repairable and users must not attempt to open the device. Firmware updates will be possible OTA by SKF dealer.

WEM200 may need to be replaced if a fault occurs or when the battery is reaching the end of its life. If it has to be replaced it is recommended to detach the WEM200 from the vehicle by decommissioning procedure.

No significant performance degradation over time is expected, until the integral battery has reached the end of its life. Good practice is to be aware of the estimated remaining battery life, investigate any apparently anomalous readings or status errors and when needed initiate a sensor exchange.

## 8 Technical specifications

Operating temperature: from -40°C to 95°C

IP rating: IP6K 9K

Power supply: 3V

## 9 General information

### Warranty

One-year against manufacturing defects.

All other warranties after that period would be inclusive of a service agreement.

### Registered Trademarks

SKF and the SKF logo are registered trademarks of SKF SA.

The Bluetooth® word mark and logos are owned by the Bluetooth® SIG, Inc. and any use of such marks by SKF S.A. is under license.

All other trademarks mentioned in this guide are protected and are the property of their respective owners.

### FCC Compliance Statement

(§15.19 Labelling requirements)

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.

(§15.21 Information to the User)

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

(§15.105 statement)

«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 a reasonable protection against harmful interference in an industrial installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and uses in accordance with the instructions, may cause harmful interference to radio communications.

### RF Exposure Requirements

To comply with FCC RF exposure compliance requirements, the device must be installed to provide a separation distance of at least 20 cm from all persons.



Copyright © SKF2019. All rights reserved.