

# FMB207 User Manual

V0.01



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## 1 INTRODUCTION

### 1.1 Attention



Do not disassemble the device. If the device is damaged, the power supply cables are not isolated or the isolation is damaged, before unplugging the power supply, do not touch the device.



All wireless data transferring devices produce interference that may affect other devices which are placed nearby.



The device must be connected only by qualified personnel.



The device must be firmly fastened in the predefined location.



The programming must be performed using a second class PC (with autonomic power supply).



The device is susceptible to water and humidity in environment with IP class greater than IP67.



Any installation and/or handling during a lightning storm are prohibited.



FMB207 has USB interface;

Please use cables provided with FMB207 device.

Teltonika is not responsible for any harm caused by using wrong cables for PC <-> FMB207 connection.

### 1.2 Instructions of safety

This chapter contains information on how to operate FMB207 safely. By following these requirements and recommendations, you will avoid dangerous situations. You must read these instructions carefully and follow them strictly before operating the device!

The device uses SELV limited power source. The device uses a 6 V...30 V DC power supply. The nominal voltage is 12 V DC. The allowed range of voltage is 6 V...30 V DC.

To avoid mechanical damage, it is advised to transport the FMB207 device in an impact-proof package. Before usage, the device should be placed so that its LED indicators are visible, which show the status of operation the device is in.

When installing the connection cables to the vehicle, the appropriate jumpers of the power supply of the vehicle should be disconnected.

Before dismounting the device from the vehicle, the connection cables must be disconnected.

The device is designed to be mounted in a zone of limited access, which is inaccessible for the operator. All related devices must meet the requirements of standard EN 60950-1.

The device FMB207 is not designed as a navigational device for boats.

### **1.3 Legal Notice**

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The manufacturer reserves the right to make changes and/or improvements at any time in design, functionality, parameters and electrical characteristics without any prior notice and without incurring obligations.

### **1.4 About document**

This document contains information about the architecture, possibilities, mechanical characteristics, and configuration of the FMB207 device.

Acronyms and terms used in document

PC – Personal Computer,

GPRS – General Packet Radio Service,

GPS – Global Positioning System,

GSM – Global System for Mobile Communications,

SMS – Short Message Service,

AC/DC – Alternating Current/Direct Current,

I/O – Input/Output,

SIM Card – Subscriber Identity Module for a mobile phone,

USB - Universal Serial Bus,

TCP - Transmission Control Protocol,

UDP - User Datagram Protocol,

Record – AVL data stored in FMB207 memory. AVL data contains GPS and I/O information,

AVL packet - data packet that is being sent to server during data transmission. AVL packet contains from 1 to 50 records.

## **2 BASIC DESCRIPTION**

FMB207 is a terminal with GPS and GSM connectivity, which is able to determine the object's coordinates and transfer them via the GSM network. This device is perfectly suitable for applications, which need location acquirement of remote objects. It is important to mention that FMB207 has additional inputs, which let you control and monitor other devices on remote objects. FMB207 also has a USB port for device status log output and entering configurations.

## 2.1 *Package contents*<sup>1</sup>

The FMB207 device is supplied to the customer in a cardboard box containing all the equipment that is necessary for operation. The package contains:

- FMB207 device with case and wires;
- USB cable (optional);
- Integrated Li-ion battery 3,7V, 1800 mA

## 2.2 *Basic characteristics*

### **GSM / GPRS features:**

- Teltonika TM2500 quad band module (GSM 850 / 900 / 1800 / 1900 MHz);
- GPRS class 12;
- SMS (text, data).
- Integrated GNSS receiver.
- Up to -162 dBm GNSS receiver sensitivity.

### **GNSS features:**

- Tracking: 33 / 99 acquisition channels;
- Up to -165 dBm sensitivity;
- Hot start < 1s;
- Warm start < 25s;
- Cold start < 35s;
- NMEA -183 protocol;
- GPS, GLONASS, GALILEO, BEIDOU, SBAS, QZSS, DGPS, AGPS;
- Accuracy < 3m.

### **Hardware features:**

- 128 MB internal Flash memory<sup>2</sup>;
- Built-in movement sensor;
- Integrated Li-ion battery 3,7V, 1800 mAh
- Internal High Gain GSM antenna;

### **Interface features:**

- Power supply: 6 ... 30V;
- USB port;
- 4 digital inputs;
- 2 analog input;
- LVCAN RX (INPUT 5);
- LVCAN TX (INPUT 6);
- 2 LED's indicating device status.

---

<sup>1</sup> Package content depends on Order Code, and can be customized by customer needs.

<sup>2</sup> Teltonika reserves the right to modify the functionality of the device without any prior notice.

## Special features:

- High Quality track even in high density urban canyon;
- Ready for harsh environment;
- Any element event triggers (external sensor, input, speed, etc.);
- Highly configurable data acquisition and sending;
- Multiple Geo-fence areas;
- Sleep mode;
- Deep sleep mode;
- Configurable scenarios available;
- Real-time process monitoring;
- Authorized number list for remote access;
- Firmware update over GPRS or USB port;
- Configuration update over GPRS, SMS or USB port;
- TCP/IP or UDP/IP protocol support;
- >500000 record storing;
- Overvoltage protection.

**Table 1. FMB207 Supply voltage.**

Description	Voltage	Duration
Normal operation	6-30V	Unlimited
Protection turns on, device turns off.	34V	Unlimited
Maximum voltage	<70V	Unlimited
Maximum voltage impulse	120V	10 milliseconds

## 2.3 Technical features

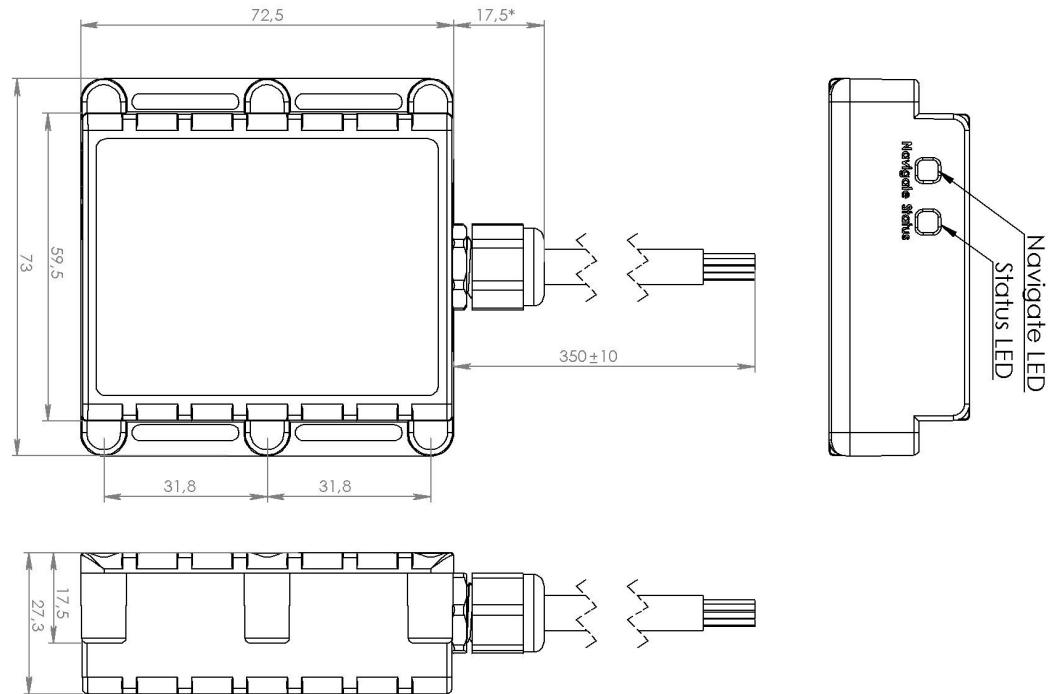
**Table 2. FMB207 specifications.**

Part name	Physical specification	Technical details
Navigation LED	LED	Power supply 6...30 V DC 1.5W Max device energy consumption: <sup>1</sup> GPRS: --- average 27,7 mA r.m.s, Nominal: --- average 23.79 mA r.m.s, GPS Sleep: --- average 6.67 mA, Online Sleep: --- average 5.83 mA, Deep Sleep: --- average 5.64 mA, <sup>2</sup> Ultra Sleep: --- average 2.52 mA, <sup>3</sup>
Modem LED	LED	Battery charge current: --- max. 207 mA, Can be charged at up to 45°C; Operation temperature: -25°C ... +55°C Storage temperature: -40°C ... +70°C
USB	Micro USB socket	Storage relative humidity 5 ... 95 % (no condensation)

<sup>1</sup> Energy consumption has been tested at 12V voltage.

<sup>2</sup> When in Deep Sleep mode, data storing and sending is not activated.

<sup>3</sup> When in Ultra Sleep mode, data storing and sending is not activated.



**Figure 1. FMB207 view & dimensions (tolerance  $\pm 2\text{mm}$ )**

## 2.4 Technical Information about internal battery

**Table 3. Li-ion batterie details.**

Internal back-up battery	Battery voltage (V)	Nominal capacity (mAh)	Power(Wh)	Charging temperature (°C)
Li-ion rechargeable battery	3,75 ~ 3,90	1800	6,75 – 7,02	0 – 45

**Table 4. Battery charging ranges.**

System voltage (V)	Charging range (V)
6	6,05 - 8
12	12,1 - 16
24	24,2 - 32

FMB207 internal battery is used for detecting external voltage disconnection.



CAUTION: RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.



Battery should not be disposed of with general household waste.  
Bring damaged or worn-out batteries to your local recycling center or dispose them to battery recycle bin found in stores.

Warranty: batteries are covered by 6 months warranty support.

## 2.5 Electrical characteristics

Table 5. FMB207 electrical characteristics.

CHARACTERISTIC DESCRIPTION	VALUE	Min.	Typ.	Max.	Unit
<b>Supply Voltage:</b>					
Supply Voltage (Recommended Operating Conditions)	6			30	V
<b>Digital Input:</b>					
Input resistance (DIN1)		59.9			kΩ
Input resistance (DIN2, DIN3, DIN4)		67.5			kΩ
Input Voltage (Recommended Operating Conditions)	0			60	V
Input Voltage threshold (DIN1)	7.5	7.7	8		V
Input Voltage threshold (DIN2, DIN3, DIN4)	2.5	2.7	3		V
<b>Analog Input:</b>					
Input Voltage (Recommended Operating Conditions), Range1	0			10	V
Input resistance, Range1		120			kΩ
Input Voltage (Recommended Operating Conditions) Range2	0			30	V
Input resistance, Range2		146.7			kΩ



Note: Analog Input error margin can increase if temperature varies.

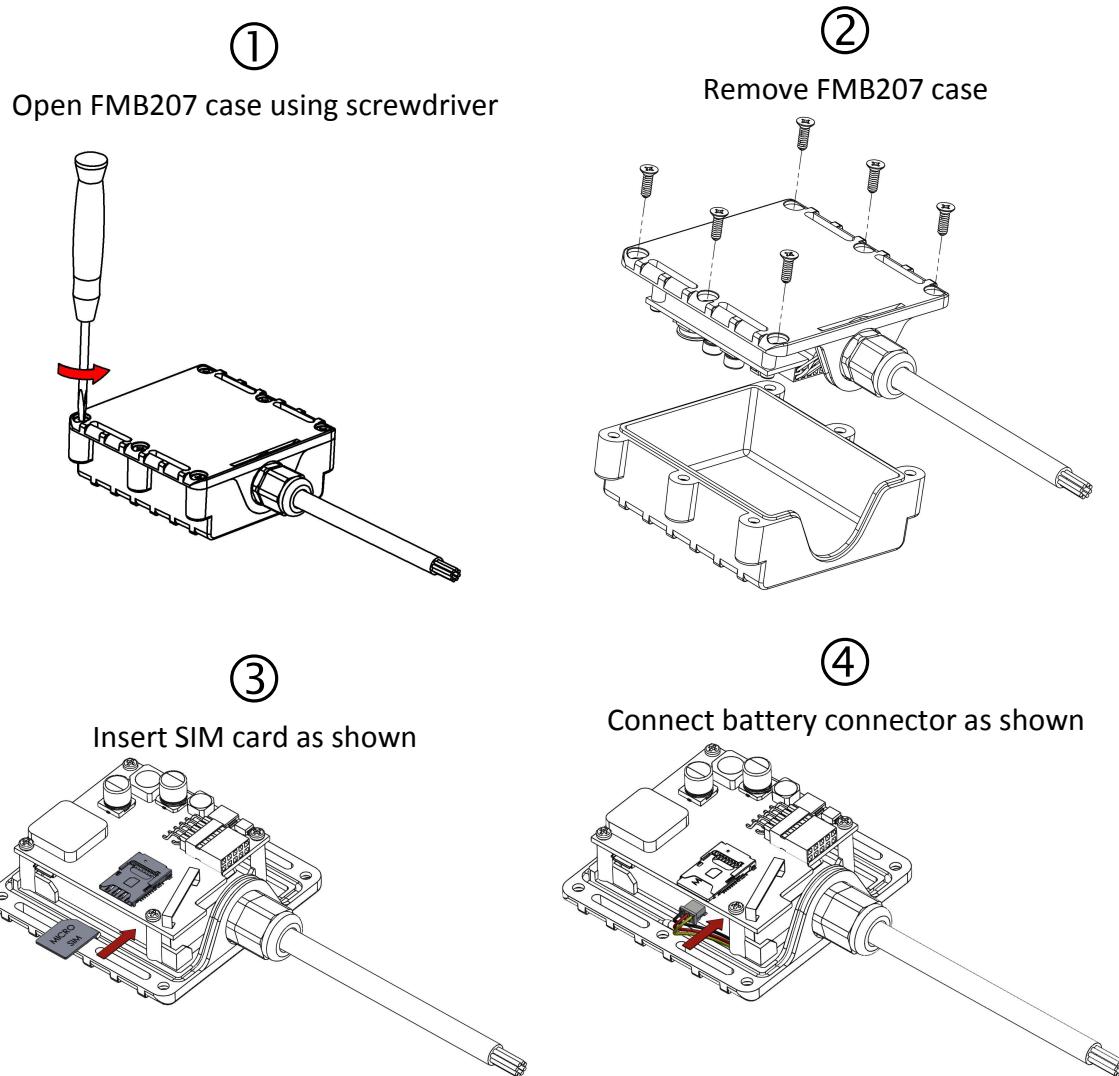
## 2.6 Absolute Maximum Ratings

Table 6. FMB207 absolute maximum ratings.

CHARACTERISTIC DESCRIPTION	VALUE	Min.	Typ.	Max.	Unit
Supply Voltage (Absolute Maximum Ratings)	-32			32	V
Drain-Source clamp threshold voltage (Absolute Maximum Ratings), ( $I_{drain} = 2\text{mA}$ )				36	V
Digital Input Voltage (Absolute Maximum Ratings)	-32			32	V
Analog Input Voltage (Absolute Maximum Ratings)	-32			32	V

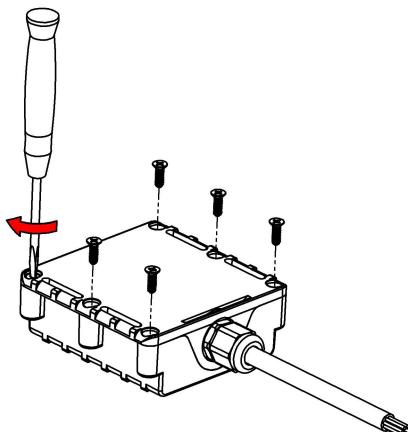
## 3 CONNECTION, PINOUT, ACCESSORIES

### 3.1 How to insert SIM card and how to connect battery into FMB207 device:



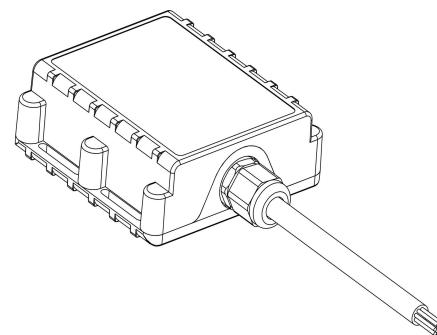
(5)

Attach case, and screw in the screws



(6)

Device is ready



Note: SIM card insertion/removal must be performed when FMB device is powered off – external voltage and battery disconnected. Otherwise SIM card might be damaged or FMB device will not detect it.

### 3.2 Installing FMB207 drivers

Table 7. Software requirements.

Operating system (OS)	Version	MS .NET Framework version
Windows XP with SP3 or later	32 bit and 64 bit	<b>MS .NET Framework 4</b> <a href="https://www.microsoft.com/en-US/Download/confirmation.aspx?id=17718">https://www.microsoft.com/en-US/Download/confirmation.aspx?id=17718</a> <a href="http://avl1.teltonika.lt/downloads/software/Framework/.NET%20Framework%204/dotNetFx40_Full_x86_x64.exe">http://avl1.teltonika.lt/downloads/software/Framework/.NET%20Framework%204/dotNetFx40_Full_x86_x64.exe</a>
	32 bit 64 bit	With <b>MS .NET Framework 4 update KB2468871-v2</b> update <a href="https://www.microsoft.com/en-us/download/details.aspx?id=3556">https://www.microsoft.com/en-us/download/details.aspx?id=3556</a> <a href="http://avl1.teltonika.lt/downloads/software/Framework/.NET%20Framework%204%20update%20KB2468871-v2/">http://avl1.teltonika.lt/downloads/software/Framework/.NET%20Framework%204%20update%20KB2468871-v2/</a> <b>NDP40-KB2468871-v2-x86.exe</b> <b>NDP40-KB2468871-v2-x64.exe or NDP40-KB2468871-v2-IA64.exe</b>
Windows Vista Windows 7 Windows 8/8.1 Windows 10	32 bit and 64 bit	<b>MS .NET Framework 4.6.2</b> <a href="https://www.microsoft.com/en-us/download/confirmation.aspx?id=53344">https://www.microsoft.com/en-us/download/confirmation.aspx?id=53344</a> <a href="http://avl1.teltonika.lt/downloads/software/Framework/.NET%20Framework%204.6.2/NDP462-KB3151800-x86-x64-AllOS-ENU.exe">http://avl1.teltonika.lt/downloads/software/Framework/.NET%20Framework%204.6.2/NDP462-KB3151800-x86-x64-AllOS-ENU.exe</a>

#### Drivers:

Please download Virtual COM Port drivers from Teltonika website:  
[https://teltonika.lt/?media\\_dl=5543](https://teltonika.lt/?media_dl=5543)

## Installing drivers:

Extract and run VCPDriver\_V1.3.1\_Setup.exe. This driver is used to detect FMB207 device connected to the computer. Click 'Next' in driver installation window (figures below):

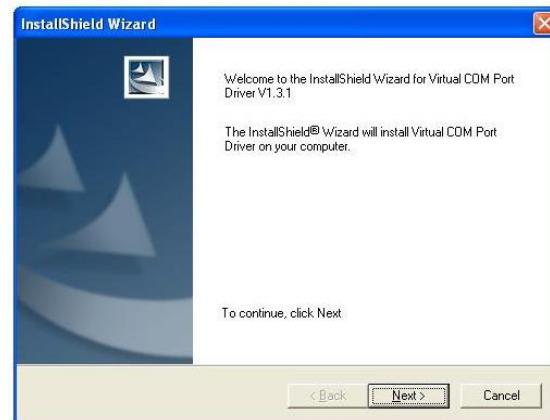


Figure 2. Driver installation window

This will launch device driver installation wizard. In the following window click 'Next' button again:



Figure 3. Driver installation window

Setup will continue installing drivers and will display a window about successful process at the end. Click 'Finish' to complete setup:



Figure 4. Driver installation window

You have now installed drivers for FMB207 device successfully.

### 3.3 Navigate LED

**Table 8. FMB207 navigation LED description.**

Behaviour	Meaning
Permanently switched on	GPS signal is not received
Blinking every second	Normal mode, GPS is working
Off	GPS is turned off because: Deep sleep mode Or GPS antenna short circuited Or Ultra deep sleep mode

### 3.4 Status LED

**Table 9. FMB207 status LED description.**

Behaviour	Meaning
Blinking every second	Normal mode
Blinking every 2 seconds	Deep sleep mode
Blinking fast for a short time	Modem activity
Blinking fast constantly	Boot mode
Off	Device is not working Or Device firmware being flashed Or Ultra deep sleep mode

### 3.5 Main cable wiring

**Table 10. FMB207 pinout description.**

Nr.	Wire Name	Description	Wire color
1	VCC (6÷30)V DC (+)	Power supply for module. Power supply range (6...30) V DC	Red
2	RX		Violet
3	TX		White/Orange
4	DIN 2	Digital input, channel 2	White/Green
5	DIN 1	Digital input, channel 1 DEDICATED FOR IGNITION INPUT	Yellow
6	GND(VCC(6÷30)V DC)(-)	Ground pin. (6÷30)V DC (—)	Dark
7	AIN 1	Analog input, channel 1. Input range: 0-30V/0-10V DC	Grey
8	AIN 2	Analog input, channel 2. Input range: 0-30V/0-10V DC	Green
9	DIN 3	Digital input, channel 3	White
10	DIN4	Digital input, channel 4	Blue

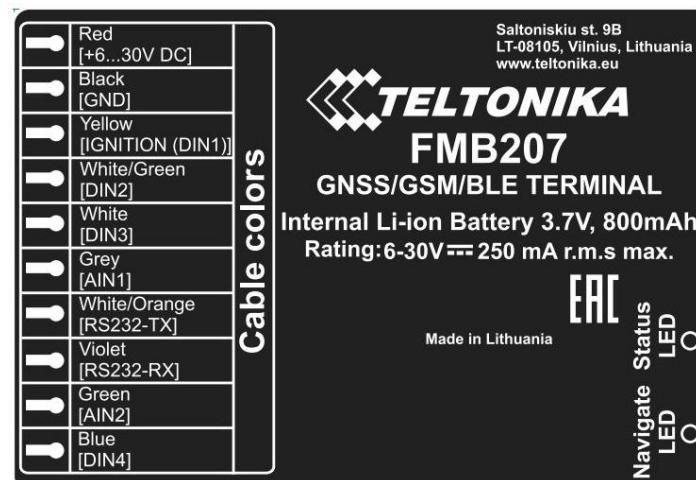


Figure 5. FMB207 sticker

### 3.6 USB connection

For connecting FMB207 device to PC, micro USB cable is used. Cable can be connected after removing cover of FMB207:

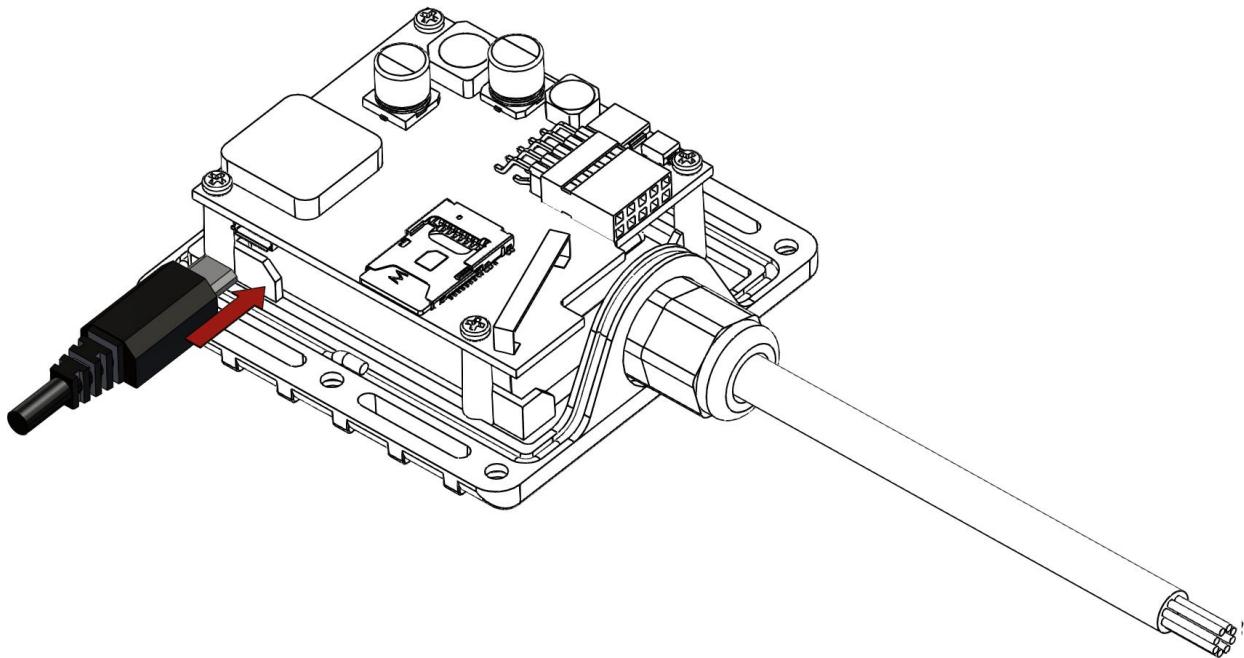


Figure 8. USB cable connection to the FMB207 device

**Please note that FMB207 device must be connected to the power supply before it can be connected to the PC!**

When FMB207 is connected to PC, it creates an USB Modem COM Port, which can be used as a system port (to flash firmware and configure the device):

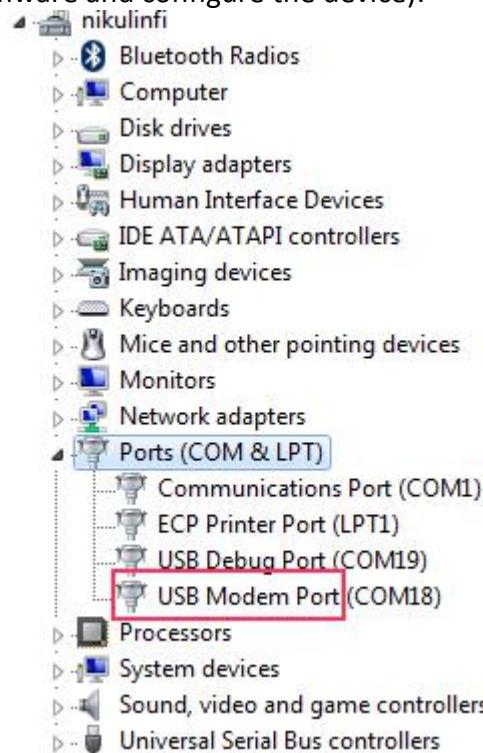


Figure 9. COM-Ports

### 3.7 Accessories



Note: Accessories are not included in device package, please order them separately.

#### Fuel Tank sensors

A fuel tank level sensor exists in most cars, which shows the approximate fuel level in the driver's indicator panel. It is possible to connect FMB207 Analog input to it (if sensor returns analogue signal proportional to fuel level). Figure shows the connection scheme to the FMB207 and fuel tank sensor. After the connection to the tank fuel level sensor, calibration is needed. Calibration is needed because most fuel tank sensors are not linear. Calibration is performed by measuring voltage dependence on volume of fuel in tank.

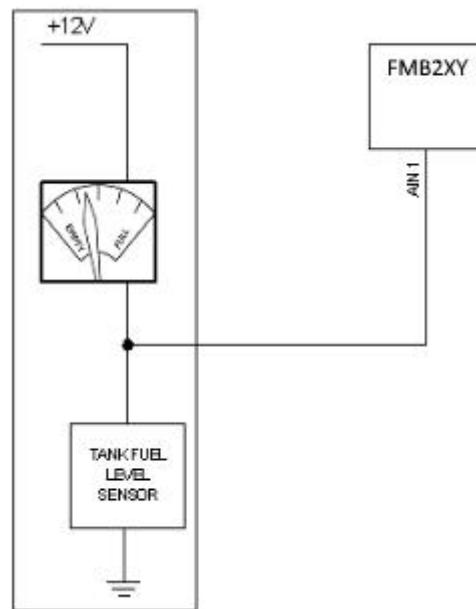


Figure 12. Fuel sensor scheme

#### Alarm buttons, door sensors, etc.

Alarm buttons, door sensors, ignition, etc. return two states: high or low voltage. Digital inputs are used to read this information. Figure below shows how to connect alarm button, door sensor, etc.

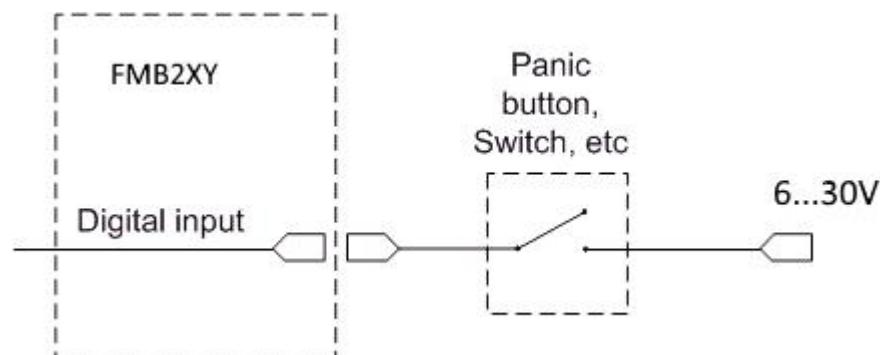


Figure 13. Panic button connection

In cases when sensor output signal is negative, an additional relay has to be installed to convert negative signal to positive.

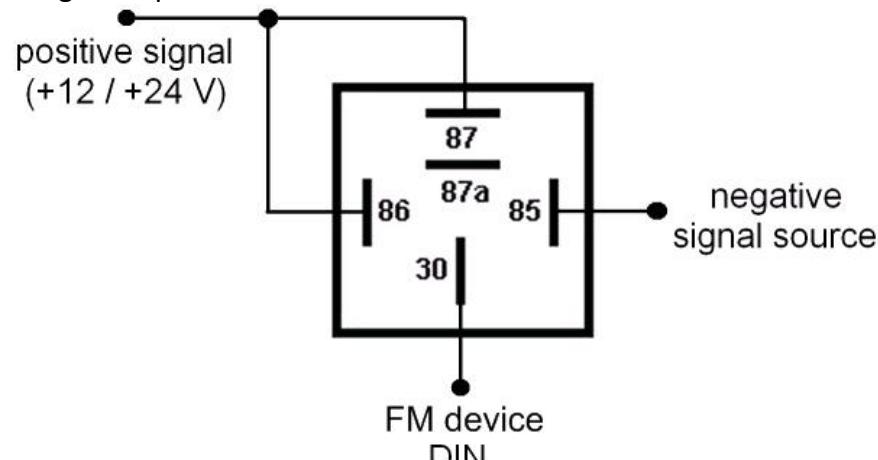


Figure 14. Inverting relay connection

## Relays

An ordinary automotive relay is used to invert input signal or to immobilize engine starter. Note, that they are available as 12 V or 24 V.

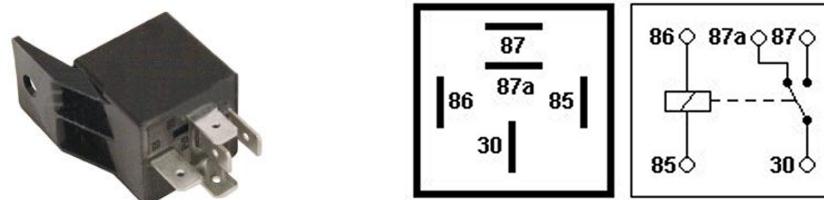


Figure 16. Automotive relay pinout

## 4 FIRMWARE

### 4.1 Updating firmware using USB cable

FMB207 functionality is always improving, new firmware versions are developed. Current module firmware version can be retrieved from Configurator. See configuration description for details.

**Contact sales manager to get the latest firmware.**

Connect FMB207 to PC with the USB cable. Launch Configurator, connect to COM port to which device is connected. To start firmware update, press “Update firmware” button in the top row, select your firmware file and press “Open”. Message prompt will appear asking “Do you really want to update firmware?”, press “Yes”. Update process may take up to several minutes.

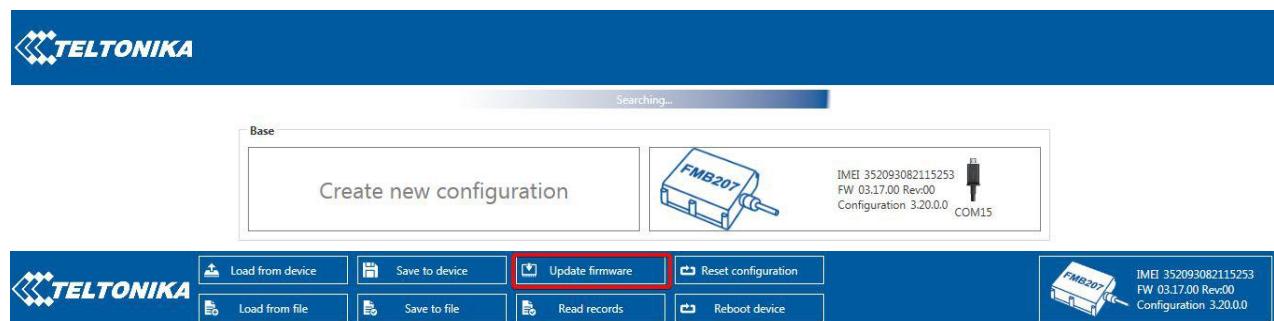


Figure 17. Firmware updater screen

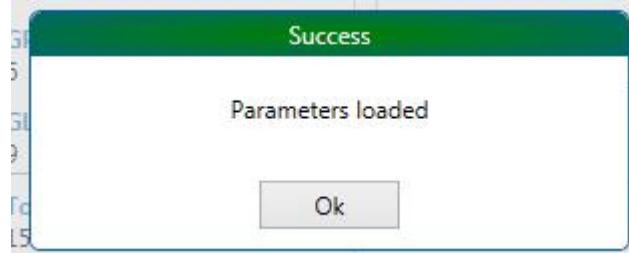


Figure 18. FMB207 firmware updating

When you see a prompt like in Figure 18, it means that the firmware is flashed to FMB207 successfully and the device is connected to the configurator. You may now start using your FMB207 device.

## 5 OPERATIONAL BASICS

### 5.1 Operational principals

FMB207 module is designed to acquire records and send them to the server. Records contain GPS data and I/O information. Module uses GPS receiver to acquire GPS data and is powered with three data acquire methods: time-based, distance-based and angle-based method. Note, that if FMB207 loses connection to GPS satellites, it continues to make records, however coordinate in these records remains the same (last known coordinate).

GPRS and SMS settings are described in later sections. FMB207 communicates with server using special data protocol.

FMB207 can be managed by SMS commands. SMS Command list is described in SMS COMMAND LIST section. Module configuration can be performed over TCP or via SMS.

## 5.2 Sleep modes

There are four sleep modes: GPS sleep, Deep sleep, Online Deep sleep and Ultra sleep modes.

### 5.2.1 GPS Sleep mode

FMB207 is able to go to GPS sleep mode after configurable Sleep timeout. This timeout (defined period) starts counting when device is in STOP mode. After timeout is reached and all conditions for GPS sleep mode are met, device goes to GPS sleep mode. While in GPS sleep mode, FMB207 turns GPS module off and it is not making new periodic records. Only event records are being recorded with last known coordinate and sent to AVL server. As a result power usage decreases allowing to save vehicle battery.

FMB207 can enter GPS sleep mode if **ALL** of these conditions are met:

- FMB207 has to be configured to work in GPS Sleep mode and sleep timeout is reached;
- Device time must be synchronized with GPS satellites;
- No movement by configured movement source or movement sensor is detected;
- Ignition (configured Ignition Source) is off.

FMB207 exits GPS sleep mode then if **ONE** of following conditions is true:

- Movement by Object Motion (Ignition, Msensor, GPS) or external movement sensor is detected;
- Ignition (configured Ignition Source) is turned on.

### 5.2.2 Deep Sleep mode

While in deep sleep mode, FMB207 sets GPS receiver to sleep mode and turns off GSM/GPRS module (it is not possible to wake up device via SMS). Despite records with last known coordinate are being saved and send to AVL server (GSM/GPRS module is turned on to send data and after that it is turned off again), power usage is decreased to save vehicle's battery. Note, that power saving depends on two configurable parameters: send period and min. record saving period.

FMB207 can enter deep sleep mode if **ALL** of these conditions are met:

- FMB207 has to be configured to work in Deep Sleep mode and Sleep timeout set;
- Device time must be synchronized with GPS satellites;
- No movement by movement sensor is detected;
- Ignition (configured Ignition Source) is off;
- Min. Record Saving Period (Data Acquisition Mode settings) must be bigger than Active Data Link Timeout parameter, that FMB207 could close GPRS link.

- Send period (Data Acquisition Mode settings) minus Active Data Link Timeout must be more than 90 sec., that FMB207 could close GPRS link for at least 90 sec.
- USB cable is not connected.

FMB207 exits deep sleep mode when if **ONE** of following conditions are true:

- Movement by movement sensor is detected;
- Ignition (configured Ignition Source) is turned on;
- USB cable is connected;

### 5.2.3 Online Deep Sleep mode

While in Online Deep Sleep mode, device works just as in Deep sleep mode, but can receive SMS messages.

FMB207 can enter Online Deep sleep mode if **ALL** of these conditions are met:

- FMB207 has to be configured to work in Online Deep Sleep mode and Sleep timeout set;
- Device time must be synchronized with GPS satellites;
- No movement by movement sensor is detected;
- Ignition (configured Ignition Source) is off;
- Min. Record Saving Period (Data Acquisition Mode settings) must be bigger than Active Data Link Timeout parameter, that FMB207 could close GPRS link.
- Send period (Data Acquisition Mode settings) minus Active Data Link Timeout must be more than 90 sec., that FMB207 could close GPRS link for at least 90 sec.
- USB cable is not connected.

FMB207 exits Online Deep sleep mode when if **ONE** of following conditions are true:

- Movement by movement sensor is detected;
- Ignition (configured Ignition Source) is turned on;
- USB cable is connected;

### 5.2.4 Ultra Sleep mode

While in Ultra sleep mode, device shuts down everything to preserve as much battery power as possible.

FMB207 can enter Ultra sleep mode if **ALL** of these conditions are met:

- FMB207 has to be configured to work in Ultra Sleep mode and Sleep timeout set;
- Device time must be synchronized with GPS satellites;
- No movement by movement sensor is detected;
- Ignition (configured Ignition Source) is off;
- Min. Record Saving Period (Data Acquisition Mode settings) must be bigger than Active Data Link Timeout parameter, that FMB207 could close GPRS link.
- Send period (Data Acquisition Mode settings) minus Active Data Link Timeout must be more than 90 sec., that FMB207 could close GPRS link for at least 90 sec.
- USB cable is not connected.

FMB207 exits Online Deep sleep mode when if **ONE** of following conditions are true:

- Movement by movement sensor is detected;

- Ignition (configured Ignition Source) is turned on;
- USB cable is connected;



Note: In order to save GPRS traffic records saved in Deep sleep and Online Deep sleep modes do not contain below listed I/O elements information:  
PDOP, HDOP, Odometer, Speedometer, Cell ID, Area Code, Temperature and GPS power

### 5.3 Virtual odometer

Virtual odometer is used to calculate traveled distance in FMB207 as separate I/O elements. When FMB207 detects movement, it starts counting distance using GNSS signal: every second it checks current location and calculates distance between current and previous point. It keeps adding these intervals until it is time to make a record, then FMB207 records its location and adds odometer value, which is equal to the sum of all distances, measured every second. There are two odometers I/O elements: Total odometer and Trip odometer.

Total odometer counts all distance traveled by vehicle. After device restart the value in this I/O element will not be erased. Total odometer value can be changed by SMS command "odoset" (SMS Command list is described in SMS COMMAND LIST section).

Trip odometer is Trip scenario element and it can be selected from two modes: Continuous and Between Records. Both modes require ignition (configured ignition source) to be turned on.

When Between Records mode is selected, when record is made, odometer resets to zero and distance calculation starts all over again.

When Continuous odometer mode is selected, all distance calculations are counted from records and sums them to one distance. Continuous odometer stops counting, when vehicle is at stop and ignition is turned off.

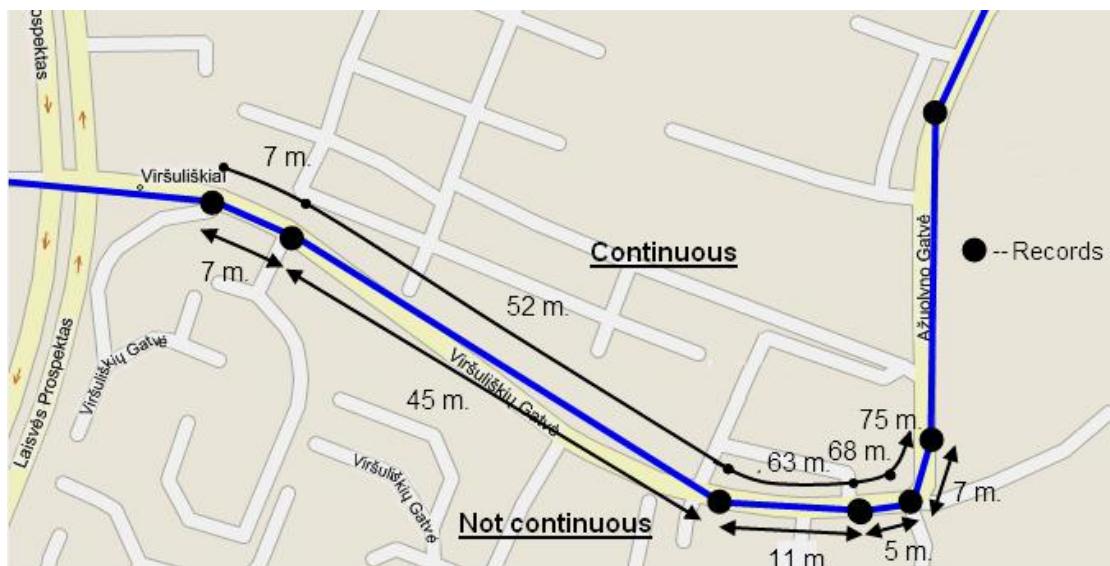


Figure 8 Odometer continuous and Not continuous distance counting parameter example

## 5.4 Features

Using available features can greatly increase FMB207 usability options.

### 5.4.1 ECO driving/Green driving Scenarios



**ECO driving/Green driving Scenarios.** Helps to prevent and inspect driver about harsh driving. Eco driving scenario continuously monitors: accelerating, braking and cornering forces depending on build in accelerometer or Green driving depending on GPS. The device inspects driver if needed. Monitoring sensitivity is configurable.

To save GPRS traffic ECO driving/Green driving event will be **generated (included into records) only** when FMB207 measured values are higher than those set in configuration, without additional I/O settings.

To prevent generating false events, harsh acceleration and harsh braking is monitored only when following conditions are fulfilled:

- Ignition is ON (configured Ignition Source)
- Vehicle speed is equal or higher than 10km/h

Harsh cornering is monitored only when following conditions are fulfilled:

- Ignition is ON (configured Ignition Source)
- Vehicle speed is equal or higher than 30km/h

**ECO driving or Green driving Scenario?** Eco driving is based on accelerometer value and Green driving based on GPS position.



PLEASE NOTE that Eco Driving functionality generally is dependent on accelerometer. Auto calibration must be done before using ECO driving scenario. All information about auto calibration described in [5.9.1.2 chapter](#).

### 5.4.2 OverSpeeding Scenario.

Helps to prevent from exceeding fixed speed and inspects driver if needed.

### 5.4.3 Jamming detection

Jamming detection shows when GSM signal jamming occurs.

### 5.4.4 Trip

Trip customizable feature enables user extended monitoring of performed trips (from engine start at present location to engine stop at arrived location), log their start and stop points, view driven total distance<sup>1</sup> and calculate eco score value.

Odometer calculation source can be selected between GNSS, OBD or LVCAN.

---

<sup>1</sup> Continuous trip odometer – total driven distance, works only in TRIP mode. Continuous distance is counted only for ONE trip. If trip is finished (stop point is detected), odometer resets to 0 (zero). Next trip will start counting from the beginning. Between Records trip odometer – another odometer that are used only in TRIP mode. In this mode distance will be counted until any record is made, then odometer will be reset to zero and started counting to next record again.



Note: Scenarios and Trip feature are activated only if ignition is on.



Note: in Excessive Idling, Jamming and Trip scenarios if Eventual Records is enabled Event will be **generated (included into send records) only** when scenario starts and finishes. If Eventual Records is disabled scenario status value is sent in each AVL record.

#### 5.4.5 GPS Fuel Counter

This functionality is meant to calculate fuel consumption based on set consumption values in different situations.

### 5.5 Accelerometer Features

#### 5.5.1 Excessive Idling

Informs you if your vehicle is stationary but engine is on for selected period of time to help you to save fuel.

#### 5.5.2 Unplug Detection

Unplug detection scenario generates event when FMB207 is unplugged from external power and plugged into external power.

#### 5.5.3 Towing Detection

Towing detection feature helps to inform driver about car deporting. FMB207 generates event when car is being towed or lifted, for example in case of vehicle evacuation.

#### 5.5.4 Crash Detection

If Crash detection is enabled, it monitors acceleration on each axis, which helps to detect an accident.

If Crash trace is disabled crash detection event will be generated (included into send record) only when scenario starts and finishes.

If Crash trace is enabled FMB207 will collect acceleration data every 40 msec. Buffer is big enough to hold data for 5 seconds and on Crash Event detection, records will be generated from this buffer, following these conditions:

- Every second Acceleration changed more than > 50mG Data will be collected and records generated 5 seconds after the event using the same conditions.
- Every generated record will have accelerometer X Y Z values included.
- Each record will have accurate timestamps in milliseconds.



Note: in Unplug Detection and Towing Detection scenarios if Eventual Records is enabled Event will be **generated (included into send records) only** when scenario starts and finishes. If Eventual Records is disabled scenario status value is sent in each AVL record.

### 5.6 Bluetooth

Bluetooth can work in two modes - *slave* or *master*.

While working as *master* mode - Bluetooth can connect to defined "hands free" or "OBDII" system.

While working as *slave* mode - Bluetooth can accept incoming connection from external device.



**NOTE: FMB207 supports ONE connection at a time.**

**NOTE: FMB001 can see up to 10 available devices. If there are more than 10, with each scanning the list may change.**

## 5.7 Auto Geofence

Auto Geofencing feature if enabled is activated automatically by turning off car ignition. Next time before driving user has to disable Auto Geofencing with digital input, by external voltage or by car Engine RPM. In case of theft car leaves Auto Geofencing zone without authorization FMB207 device automatically sends record to AVL application and SMS (if configurated).

## 5.8 Manual Geofence

Geofencing is another feature which is highly customizable and can detect wherever car enters or leaves customized areas. More about Geofencing can be read in [6.12](#) chapter.

# 6 CONFIGURATION

## 6.1 Configurator

FMB207 module has default factory settings. Settings should be changed according to your application and your GSM operator information.

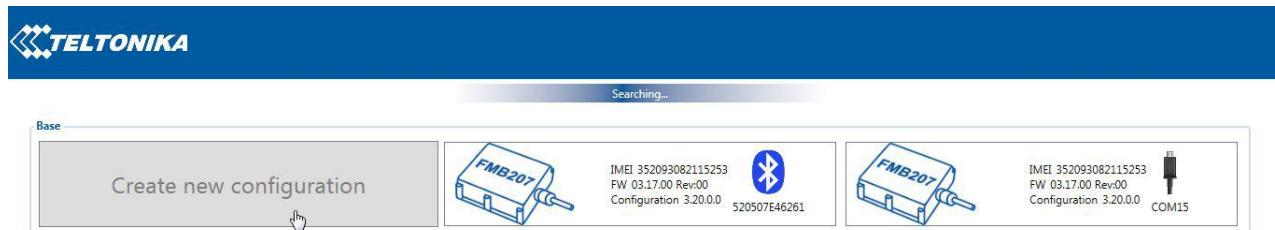
FMB207 configuration may be performed via SMS commands or configurator.

FMB207 has one user editable profile.

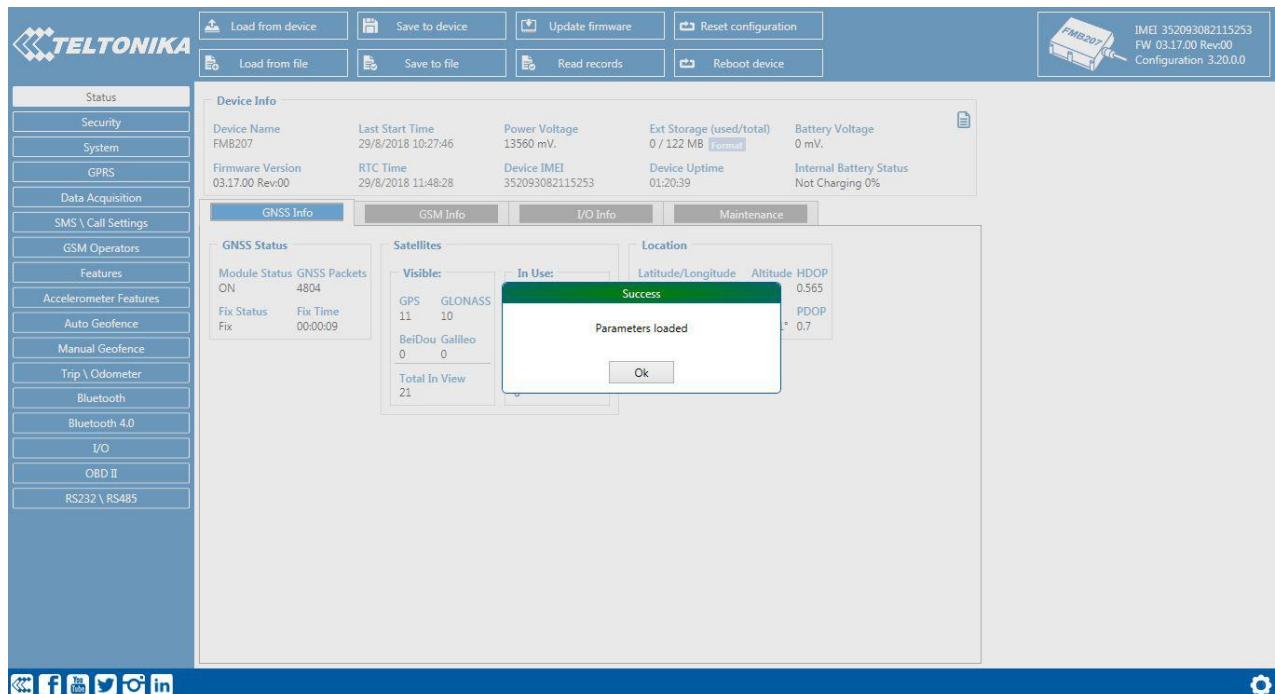
It can be configured to acquire and send data to server. If device is not able to send data to server, GSM is not available FMB207 will start storing records to flash memory. It is possible to store up to 192 000 data records with 128 Mb SD memory card (when 100 Mb are used for store records). It will send data later when GPRS is available again. Note that FMB207 can have memory full of records. In such case it will start deleting oldest records in order to save new ones. Sending all data records to server may take some time.

FMB207 configuration is performed via FMB207 Configurator program. Contact sales manager to get the latest FMB207 Configurator version. FMB207 configurator operates on Microsoft Windows OS and uses MS .NET Framework. For Windows XP you will need MS .NET Framework 4 (with MS .NET Framework 4 update KB2468871-v2) for Windows Vista, Windows 7, Windows 8.1, Windows 10 MS .NET Framework 4.6.2 or later. Please ensure that suitable MS .NET Framework version for your OS is installed on your PC before starting configurator. Latest MS .Net Framework version can be downloaded from official Microsoft web page.

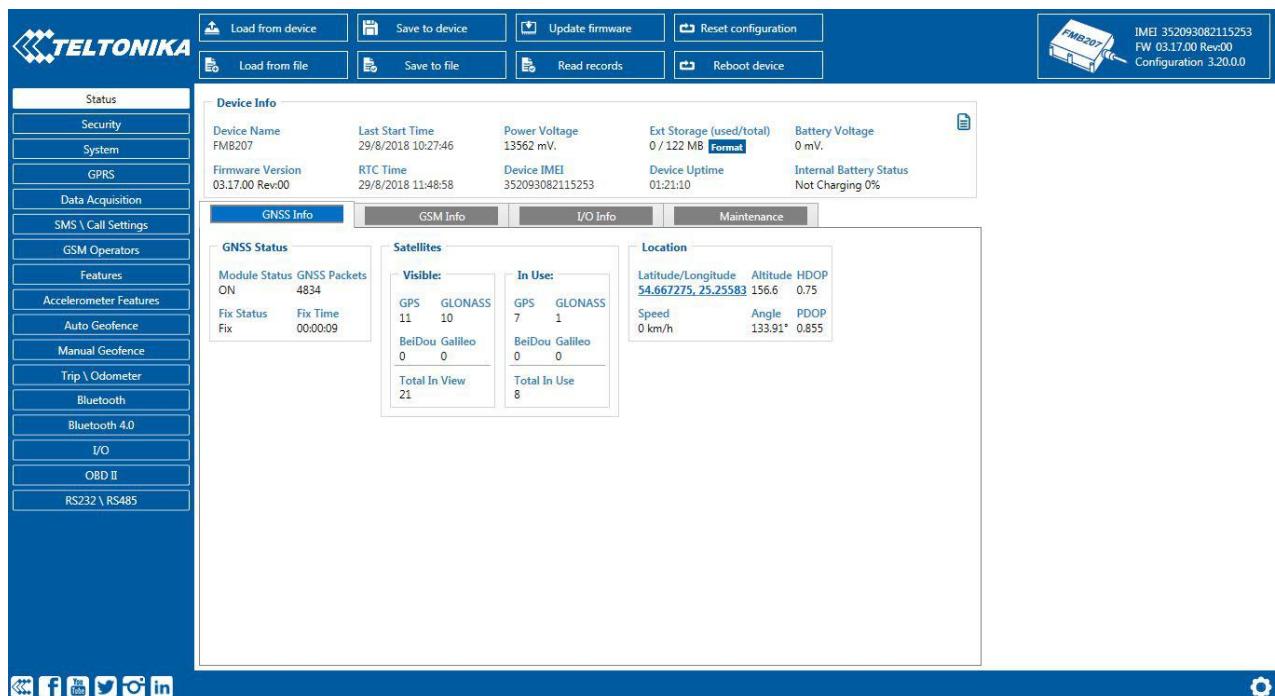
Module configuration is performed over USB cable or Bluetooth port. Configuration process starts from starting FMB207 Configurator program and then connecting to FMB207 device via Connect button located in Online menu part. FMB207 has one user editable profile, which can be loaded from device, and saved. User can also revert to default settings, by pressing Reset to defaults button. After any modification of configuration settings it has to be saved to FMB207 device, otherwise it will not be written to device.



**Figure 9 FMB207 configurator window when selecting the connection method**



**Figure 10 FMB207 configurator main window when connected to it and successfully loaded parameters**



**Figure 11 FMB207 configurator status column**

#### 6.1.1 Main Buttons description:

'Connect to device' (Figure 10) – connects device.

'Load from device' – loads configuration from device.  
 'Save to device' – save configuration to device.  
 'Load from file' – load configuration from file.  
 'Save to file' – save configuration to file.  
 'Update firmware' – update firmware on device.  
 'Reset device' – reset device configuration to default.

#### 6.1.2 Keyword SMS (GPRS) commands:

"setkey <oldkeyword> <newkeyword>" - Set new or change the keyword. Configuration should be not locked. Example:

New keyword (set):

<name>{space}<pass>{space}setkey{space}{space}<newkeyword>

Change keyword (change):

<name>{space}<pass>{space}setkey{space}<oldkeyword>{space}<newkeyword>

"delkey <keyword>" - Deletes current keyword. Configuration keyword should be configured and not locked.

Example:

<name>{space}<pass>{space}delkey{space}<keyword>

#### 6.1.3 Keyword configuration with TCP

If configuration has keyword, it will be saved to configuration file.

After TCP configuration: if keyword in configuration file does not match keyword in device, configurator will ask which keyword must be used for device.

If device is locked, keyword cannot be changed with TCP configuration.

### 6.2 Status info

Status info monitoring FMB207 real time information in 5 different positions: Device info, GNSS info, GSM info, OBD/CAN adapter info and I/O info. All this information can be saved into .HTML format with a button  whitch is in device info table top right corner.

In device info user can see device name, firmware version, last device start time, RTC Time, power voltage (mV), device IMEI, SD card free space, Device uptime, Battery voltage (mV) and internal battery status.

In GNSS info user can see:

- Real time GNSS status information: module status (ON, deep/GPS/Online sleep mode), how much GNSS packets device got from startup, what is fix status and what was last GNSS fix time.
- Satellites information: how many and what type of satellites are visible. How many and what type of satellites are used for location positioning.
- Location information: latitude, longitude, altitude, angle, HDOP, PDOP and speed.

In GSM Info user can see:

- GSM status: modem status, SIM status, GPRS status, actual operator code and GSM signal level.
- GPRS traffic: how much data has been send from device and received from device.
- Sockets information: what server domain and port is used.
- Records: how much records were sended to server from last data reset, when last record send to server was and when was last server response.
- SMS count: how much FMB207 received SMS and how much SMS was send from device.

*In OBD info user can see main information from OBD (if device connected to vehicle with OBD II Bluetooth dongle adapter): vehicle VIN code and used OBD protocol.*

In CAN Adapter info user can see main information from LV-CAN200/ ALL-CAN300 (if device connected to LV-CAN200/ ALL-CAN300): program number and LV-CAN200/ ALL-CAN300 SW version

In I/O info user can see all I/O element values from all configurable I/O elements.

### 6.3 Security info

In security section user can see SIM card and configurator keyword security information.

- User can see SIM state and now connected to device SIM card current status. If used SIM card with PIN code user can enter it here. How much attempts left to enter pin code is showed to.
- When SIM PIN code is entered correctly user can change PIN code or disable it from SIM card. When SIM PIN is disabled and user what to enable it again user must enter last used PIN code.
- For configuration security keyword can be set to configurator. Keyword can be saved in configuration file (.cfg), so there is no need to connect the device to the configurator to configure keyword. Min keyword length is 4 symbols and max length is 10 symbols. Only uppercase and lowercase letters and numbers are supported. Keyword can be configured to .cfg configuration file when device is not connected to device.

### 6.4 System settings

System settings have 9 configurable parameters:

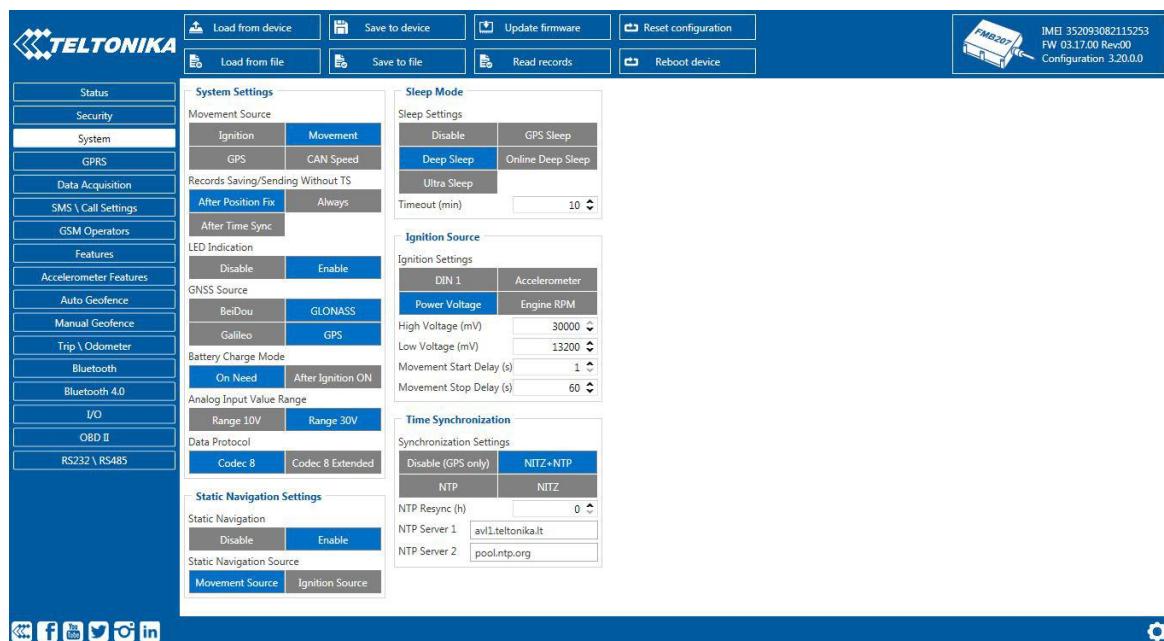
- Sleep settings, where user can choose sleep mode;
- Ignition source, where user can choose between power voltage, digital input 1, accelerometer and engine RPM as ignition sources. More than one ignition source can be selected at the same moment. User can select movement start and movement stop delay time (in seconds): those parameters are used when ignition source is accelerometer. Into ignition status take the following functionalities: power manager, eco driving, excessive idling, fuel consumption, over speeding, towing and trip functionalities.
- Object Motion Detection Settings, where user can configure 4 ways how FMB207 will detect stopped movement, and change its working mode (for working modes, read section 5.8). Other functionalities that depend from movement source: power manager, fuel consumption and trip.
- Static navigation settings, where user can turn static navigation on or off. Additional, user can chose from what source (movement or ignition) static navigation can be deactivated/activated;
- Records Settings, where user can enable or disable records when GPS is not available (no time synchronization);
- GNSS source Settings, where user can choose satellite system.
- LED indication, where user can turn on or off indication leds.
- Battery charge mode, where user can choose when battery will be charged: on need (battery will be charged anytime when it need to be charged) and after ignition ON (battery will be charged only when ignition is on).
- Analog Input value range, where user can choose analog input range 10 V or 30 V (10 V range for now works same as 30 V range).
- Time synchronization settings, where user can choose from what source (or sources) FMB207 time will be synchronized. User has choice to use only one synchronization

source by GNSS. When selected synchronization from NTP, time will be synchronized from NTP server and from GNSS. When selected synchronization from NITZ, time will be synchronized from GSM operator and GNSS. When selected synchronization from NITZ+NTP, time will be synchronized from all three sources (if it is necessary). Every time GNSS fix will be acquired time will be synchronized (if needed). User can select from what NTP server (possible to configure two servers) time will be synchronized and what time period (in hours) is used to resynchronize time.

**Table 12. Object Motion Detection Settings**

Movement Source	Vehicle on Stop mode	Vehicle Moving mode
Ignition (recommended)	If ignition (ignition source) is logic low	If ignition (ignition source) is logic high
Movement (movement sensor)	Internal movement sensor does not detect movement	Internal movement sensor detects movement
GPS	GPS fix is available and vehicle speed is lower than 5 km/h	GPS fix is available and vehicle speed is higher than 5 km/h
	While GPS fix is unavailable, Object Motion Detection Settings are working like in movement sensor	
CAN speed	If speed from BT OBDII dongle is equal 0 km/h	If speed from BT OBDII dongle is higher than 0 km/h

Static Navigation Mode is a filter, which filters out track jumps when the object is stationary. If Static navigation filter is disabled, it will apply no changes on GPS data. If Static navigation filter is enabled, it will filter changes in GPS position if no movement (configured movement source) or ignition (configured ignition source) is detected (depends on what static navigation settings is selected: movement, ignition or both sources). It allows filtering GPS jumps when object is parked (is not moving) and GPS position is still traced.



**Figure 12 System settings configuration**

In GNSS source Settings user can configure which GNSS system or systems to use.

User has choice to use only one system of GPS, Glonass, Galileo or Beidou. Also it is able to choose two or three systems together. One exception is that you can not combine Beidou and Glonass systems together.

List of configurable GNSS sources:

Beidou only	ID:01
Glonass only	ID:02
Galileo only	ID:04
Galileo+Beidou	ID:05
Galileo+Glonass	ID:06
GPS only	ID:08
GPS+Beidou	ID:09
GPS+Glonass	ID:10
GPS+Galileo	ID:12
GPS+Galileo+Beidou	ID:13
GPS+Galileo+Glonass	ID:14

GNSS source	
Beidou	Glonass
Galileo	Gps

Example of good configuration

List of **NON**-configurable GNSS sources:

Glonass+Beidou
Galileo+Glonass+Beidou
GPS+Glonass+Beidou
GPS+Galileo+Glonass+Beidou

GNSS source	
Beidou	Glonass
Galileo	Gps

Example of bad configuration

## 6.5 GPRS

'GPRS' defines main parameters for FMB207: GSM operator APN and GPRS username and password (optional – depending on operator), destination server IP and port, and allows to set protocol used for data transfers – TCP or UDP. Also all server setting and backup server mode can be selected for backup server configuration.

Backup server has 3 different modes:

- Disable: backup server is not used.
- Backup: send to backup server if main server not available (Failed to open Link) or, main server response timeout is detected 5 times in row.
- Duplicate: send records to both servers (main and backup), delete record from sd card (or RAMS) only if both servers accepted records.

Some operators use specific authentication for GPRS session – CHAP or PAP. If any of these is used, APN should be entered as 'chap:<APN>' or 'pap:<APN>'. I.e. if operator is using APN 'internet' with CHAP authentication, it should be entered as 'chap:internet'. Information about APN and authentication type should be provided by your GSM operator.

Records settings. Here user can modify if FMB207 device will send newest records first, meaning, that the most important thing is to know recent position of car, older records are being sent right after newest records arrive to AVL application.

Activate Data Link Timeout is used to set timeout of link between FMB207 and AVL application termination. If FMB207 has already sent all records it waits for new records before closing link (except Deep Sleep mode, more information in Deep Sleep mode chapter). If new records are generated in the period of this timeout, and minimum count to send is reached, they are sent to AVL application. This option is useful when GSM operator charge for link activation.

Server Response Timeout is used to set time period waiting for response from server side.

FOTA WEB settings are used for FOTA WEB server connection parameters configuration. Status enables or disables FOTA WEB functionality. In domain and port user can enter address

and port number of FOTA website. Period is used for timeout of reattempting connection to FOTA WEB server.

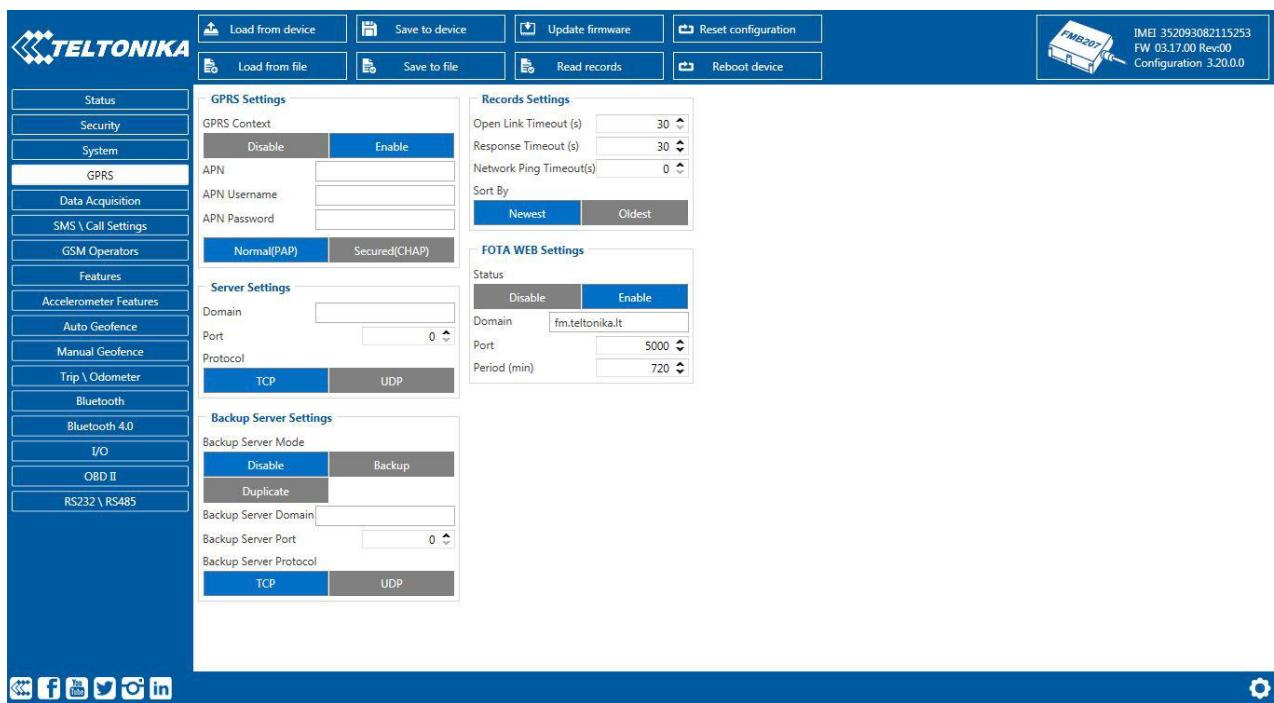


Figure 13 GPRS configuration

## 6.6 SMS/Call Settings

Essential fields in ‘SMS’ part is ‘Login’ and ‘Password’. The login and password are used with every SMS sent to FMB207. If login and password are not set, in every SMS sent to FMB207 device two spaces before command have to be used (<space><space><command>).

Command structure with set login and password:

<login><space><password><space><command>, example: “asd 123 getgps”

Phone numbers have to be written in international standard, with using “+” or without using it (in both cases number will be recognized, but when number is without “+” symbol, it will not generate IDD Prefix, which depends on location of phone). If no numbers are entered, configuration and sending commands over SMS are allowed from all GSM numbers.

SMS data sending settings allows or does not allow sending AVL data using binary SMS. AVL data will be sent by SMS only when there are no GPRS connection. This setting does not affect replies to SMS request messages – answers are always sent back to sender telephone number.

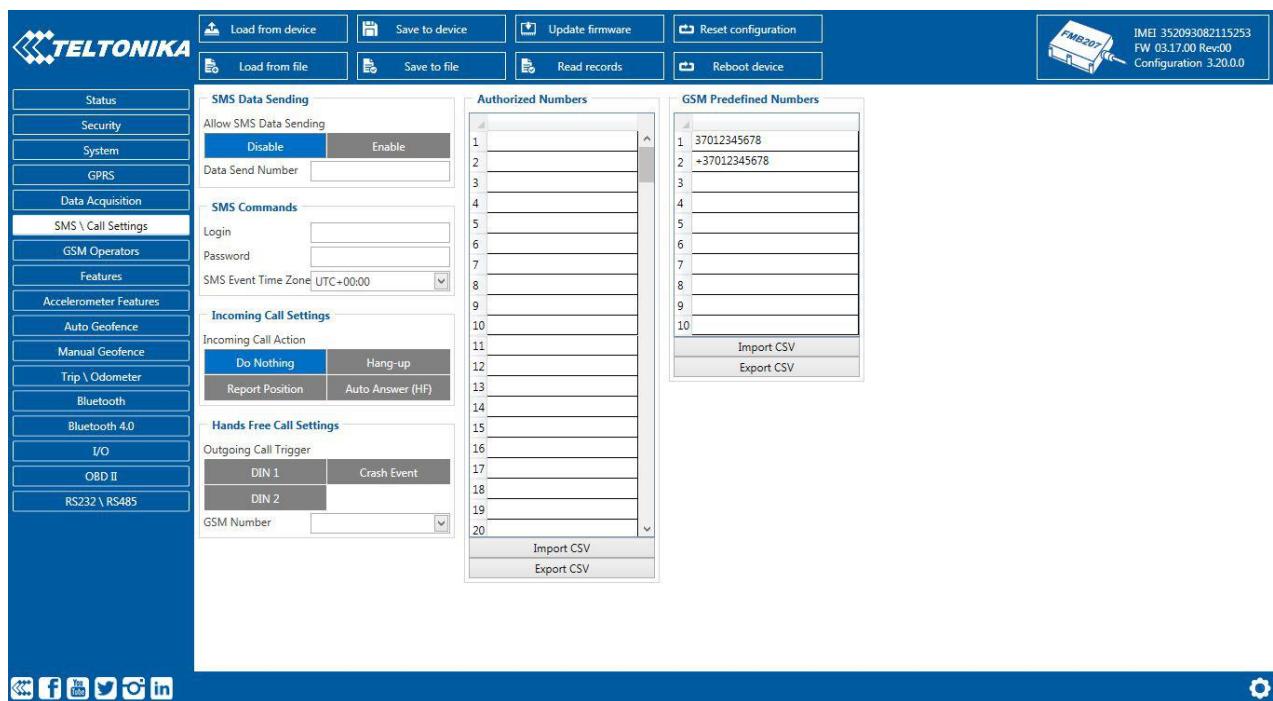


Figure 14 SMS \ call Settings configuration

### Incoming Call Settings

This parameter defines device action during incoming call:

- Do Nothing
- Hang up – automatically hang up incoming call
- Report Position – Report position to calling number via SMS
- Auto Answer (HF) – Auto answer incoming call if hands free device is connected. If hands free device is not connected, then incoming call will be hanged up.

### Hands free call functionality

When FMB207 is connected to hands free headset it can call to user defined GSM numbers.

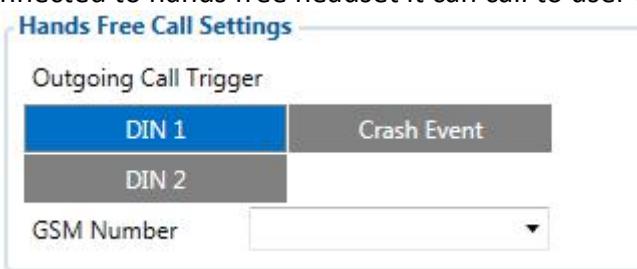


Figure 15 Hands Free Call Settings configuration for FMB207

*Outgoing Call Trigger* parameter determines which event will triggers call. FMB207 supports first for different call triggers and FMB207 supports all eight call triggers:

- None selected – disables call trigger functionality.
- DIN1 – first digital input event triggers call to user selected GSM number.
- Crash Event – crash event triggers call to user selected GSM number.
- DIN1 and Crash Event – both events triggers call to user selected GSM number.

- DIN2 – seconf digital input event triggers call to user selected GSM number.
- DIN1 and DIN2 Event – both events triggers call to user selected GSM number.
- DIN2 and Crash Event – both events triggers call to user selected GSM number.
- DIN1, DIN2 and Crash Event – all events triggers call to user selected GSM number.

### SMS Event Time Zones

FMB207 works with synchronized GPS time which is UTC+0, with this option customer can configurate his time zone and get SMS with correct time.



Note: Please do not set Data Send Number to some cell phone number, because it will not understand binary SMS. When sending a binary SMS to a phone number, which is a server phone number, the server can interpret and understand binary code, so the data can be read and you can view it on the server.



SMS login and password and authorized number list are used to protect FMB207 module from unauthorized access. Module accepts messages only from a list of authorized numbers and with proper module login and password. Phone numbers have to be written in international standard, with using "+" or without using it (in both cases number will be recognized). If no authorized numbers are entered, module accepts messages from all numbers.

### 6.7 GSM Operators, SIM1 Roaming/Home Operator list, Blacklist Operator list

Operators list – FMB207 can work in different modes (use different settings) according to the operator list defined. Operator list is used for Data Acquisition Mode switching (see Data Acquisition Mode settings chapter for more details). Modes are changed based on GSM operator FMB207 is connected to.

Roaming Operator List		Operator Black List	
1	0	1	0
2	0	2	0
3	0	3	0
4	0	4	0
5	0	5	0
6	0	6	0
7	0	7	0
8	0	8	0
9	0	9	0
10	0	10	0
11	0	11	0
12	0	12	0
13	0	13	0
14	0	14	0
15	0	15	0
16	0	16	0
17	0	17	0
18	0	18	0
19	0	19	0
20	0	20	0
<a href="#">Import CSV</a>		<a href="#">Import CSV</a>	
<a href="#">Export CSV</a>		<a href="#">Export CSV</a>	

Figure 16 SIM1 Roaming/home Operators and Operator BlackList configuration

If roaming operator list is left empty, FMB207 will automatically detect home operator. If home operator will be written to roaming operator list any part, it will be detected as home operator, not roaming. Any not written operator in roaming operator list (not home operator) will be recognized as unknown operator and FMB207 will work in **Unknown mode** (make sure it is configured to allow data sending – GPRS context is enabled).

Operator Blacklist - if user wants that FMB207 do not connect and work with a particular operator it must be written to Operator BlackList. Total 50 operators can be written to this list.

Operator Blacklist working: operator search procedure is initiated as normal every 15 minutes and tries to connect to an operator with the strongest signal. It will prioritize operators which are specified in the operator list. If no operators from the operator list are available, the device will try to connect to an operator from the blacklist. If device connects to operator from black list – best operator search procedure is initiated instantly. During the time when device is connected to Black list operator - no GPRS connection would be initiated and no data would be send via GPRS. The ability to send SMS commands to the device remains. If no suitable operator is found on both lists, the device will try to connect to a remaining available operator with the strongest signal.

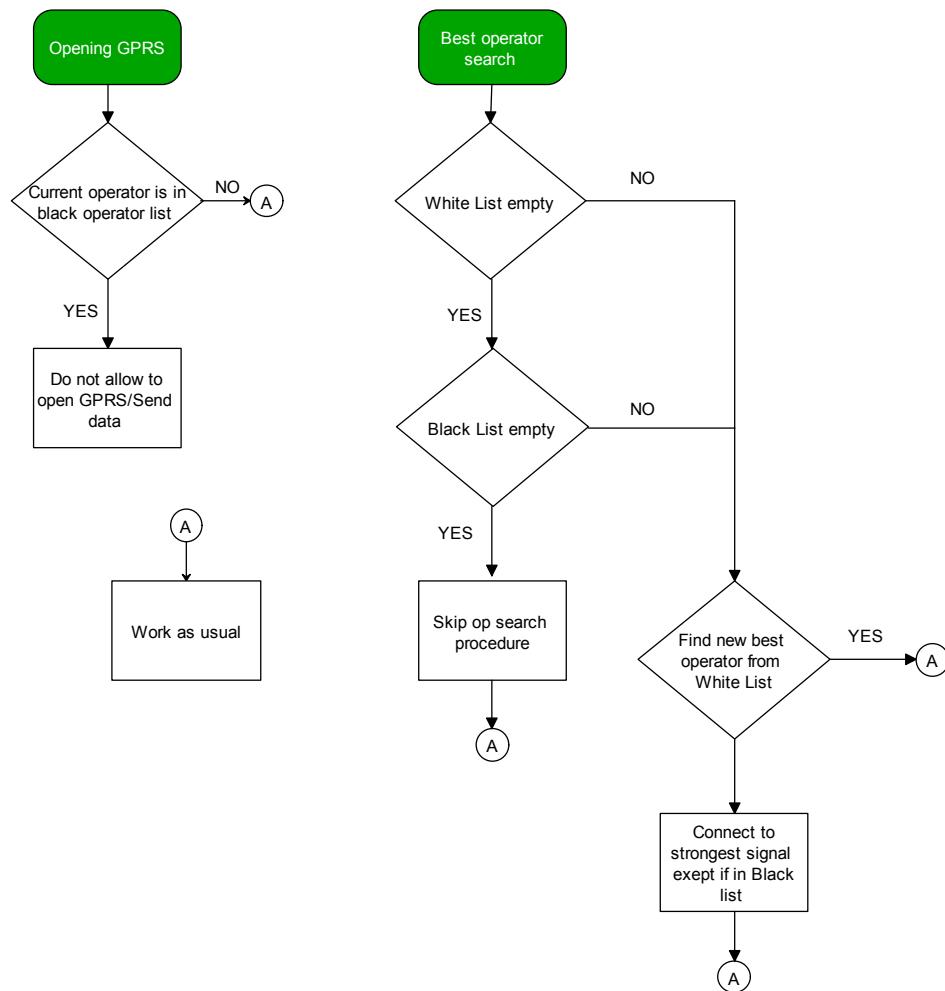


Figure 17 Operator search functionality diagram. White list is SIM1 Roaming/Home Operator lists.

## 6.8 Data Acquisition Mode settings

Data Acquisition Modes are an essential part of FMB207 device, it is also highly configurable.

By configuration user defines how records will be saved and sent. There are three different modes: Home, Roaming and Unknown. All these modes with configured data acquisition and send frequencies depend on current GSM Operator defined in Operator list (see chapter [GSM Operators, Roaming and Blacklist Operator list](#)) and are switched when GSM operator changes (e.g. vehicle passes through country boarder).

If current GSM operator is defined as Home Operator, device will work in Home Data Acquisition mode, if current operator is defined as Roaming Operator, device will work in Roaming Data Acquisition mode, and if current operator code is not written in Roaming Operator list, device will work in Unknown Acquisition mode.

This functionality allows having different AVL records acquire and send parameters values when object is moving or stands still. Vehicle moving or stop state is defined by Stop Detection Source parameter. There are 4 ways for FMB207 to switch between Vehicle on Stop and Vehicle Moving modes, see section [6.4 , Table 12. Object Motion Detection Settings](#).

FMB207 has 6 different modes. Operational logic is shown in Figure 19.

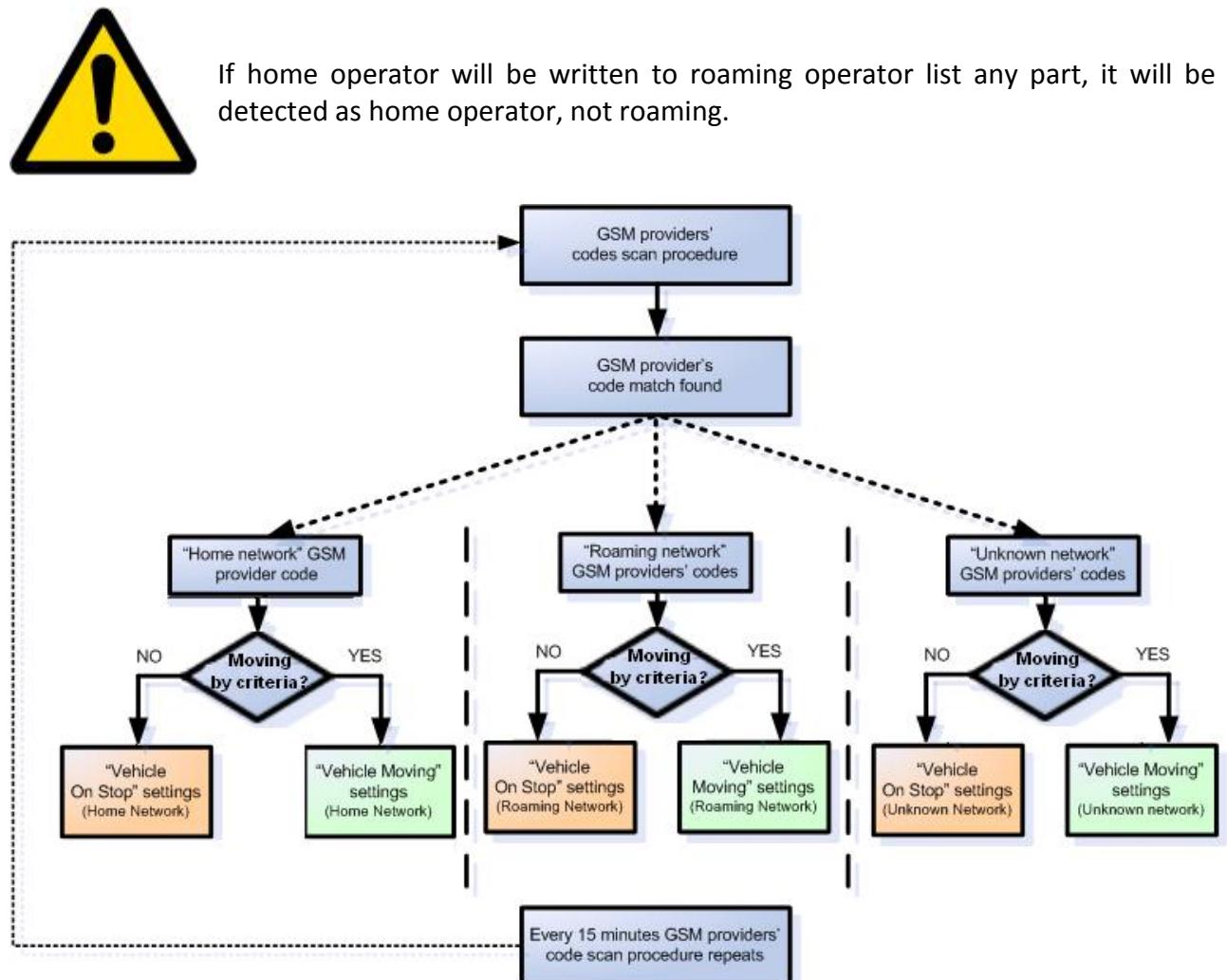


Figure 19 Data Acquisition Mode operational logic

Operator search is performed every 15 minutes. Depending on current GSM operator, Home, Roaming or Unknown mode can be changed faster than every 15 minutes. This process is separate from operator search. Movement criteria are checked every second.

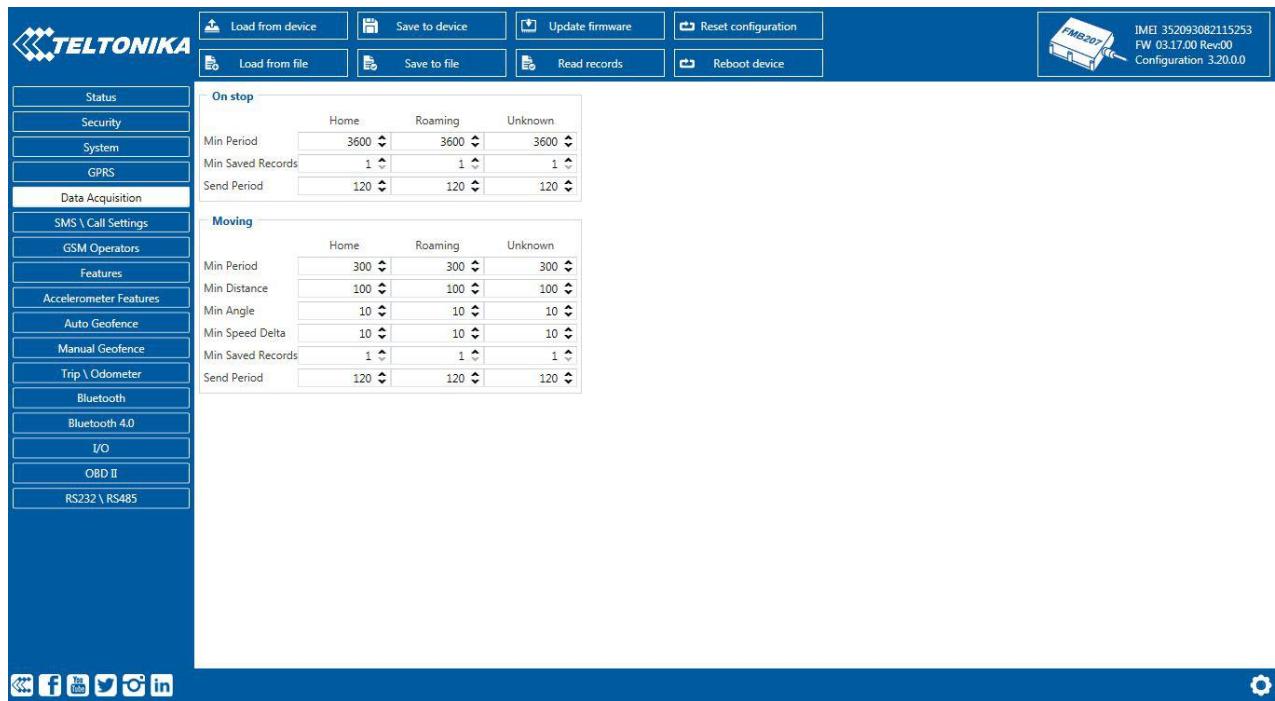


Figure 20 Data Acquisition Mode configuration

'Min Saved Records' defines minimum number of coordinates and I/O data that should be transferred with one connection to server. If FMB207 does not have enough coordinates to send to server, it will check again after time interval defined in 'Sending Period'.

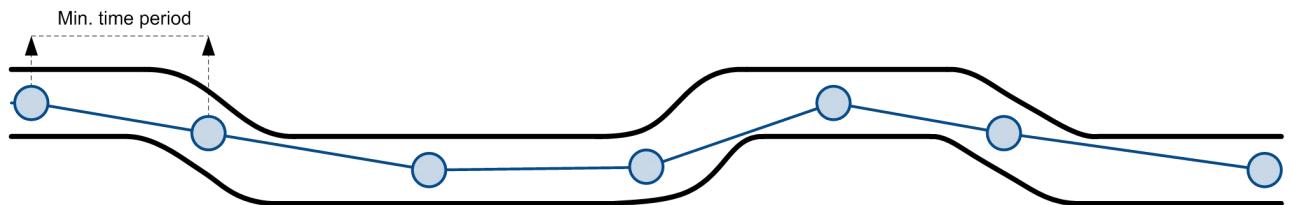
Send period – GPRS data sending to server period. Module makes attempts to send collected data to server every defined period. If it does not have enough records (depends on parameter Min. Saved Records described above), it tries again after defined time interval.



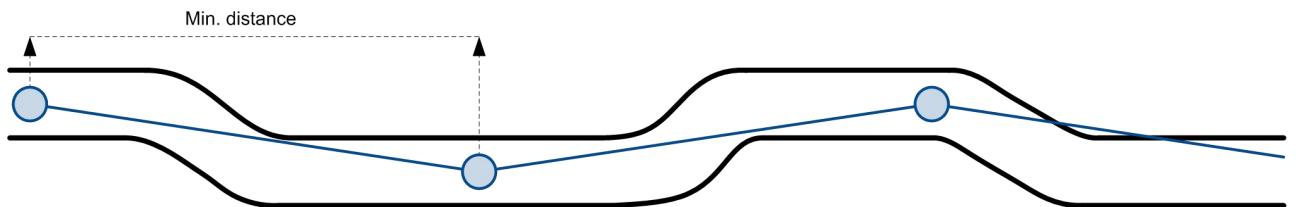
Note: Keep in mind that FMB207 operates in **GMT:0** time zone, without daylight saving.

FMB207 is able to collect records using four methods at the same time: time, distance, angle and speed based data acquisition:

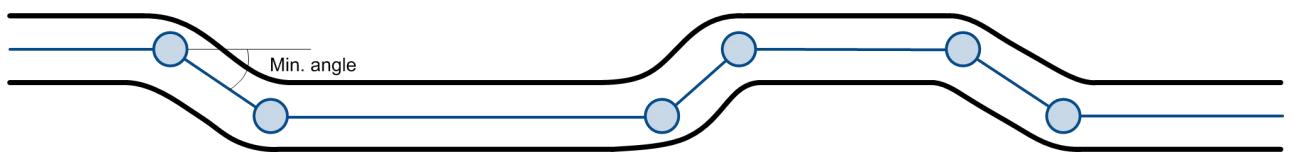
Time based data acquiring (Min. period) – records are being acquired every time when defined interval of time passes. Entering zero disables data acquisition depending on time.



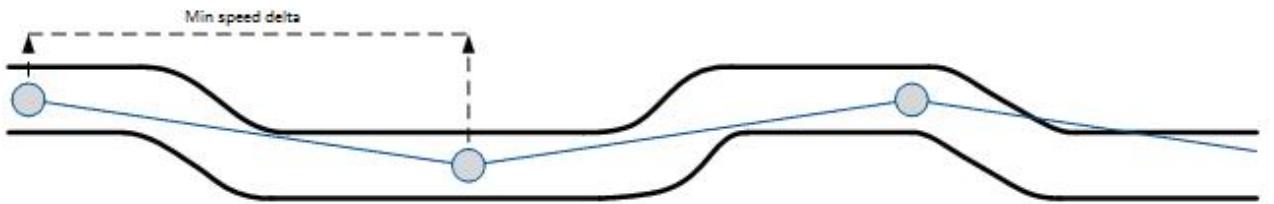
Distance based data acquiring (Min. distance) – records are being acquired when the distance between previous coordinate and current position is greater than defined parameter value. Entering zero disables data acquisition depending on distance.



Angle based data acquiring (Min. angle) – records are being acquired when angle difference between last recorded coordinate and current position is greater than defined value. Entering zero disables data acquisition depending on angle.



Speed based data acquiring (Min. Speed Delta) – records are being acquired when speed difference between last recorded coordinate and current position is greater than defined value. Entering zero disables data acquisition depending on speed.



## 6.9 Features settings

In Features window five different scenarios and GPS fuel counter are available.

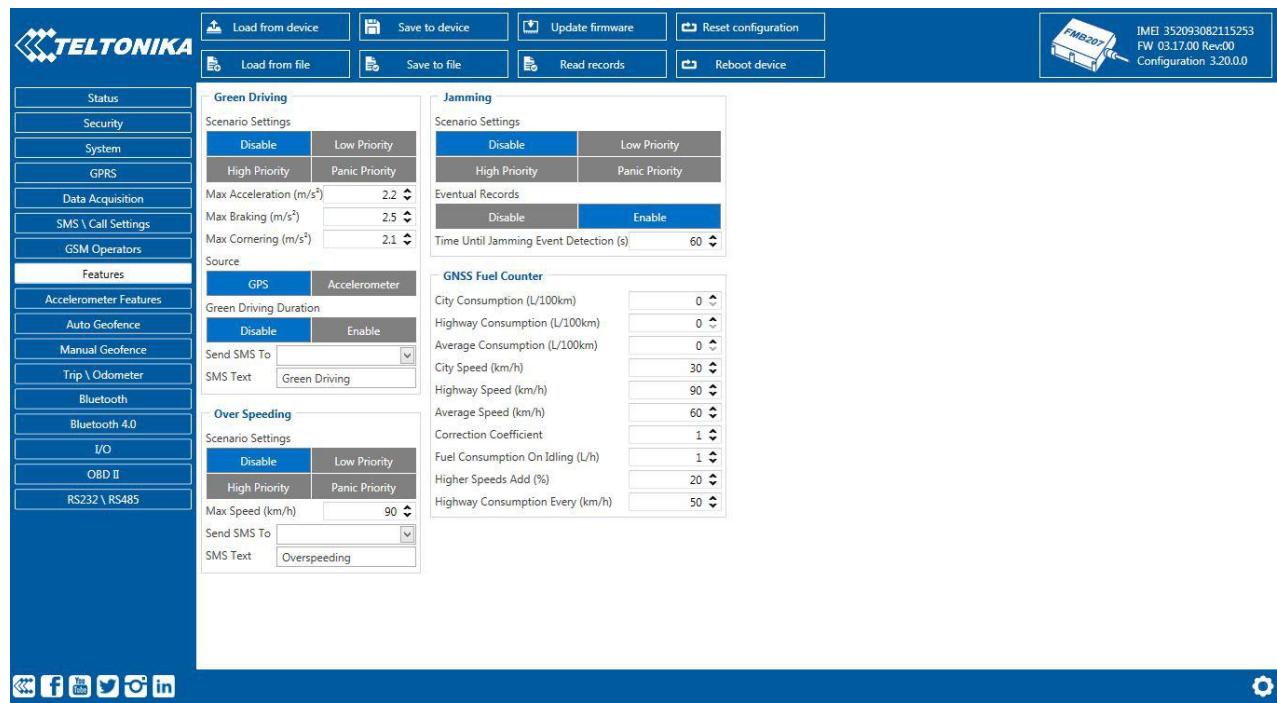


Figure 21 Scenarios configuration

### 6.9.1 Green Driving

When vehicle exceeds one of Max Acceleration, Max Braking or Max Cornering parameters value, scenario is activated, record will be generated. You can configure all three parameters in  $m/s^2$  (meter per second squared) units. Scenario is activated until current Acceleration, Braking or Cornering value decreases below parameter value.

Parameters used with Green Driving functionality.

Green Driving	
Scenario Settings	
<b>Disable</b>	<b>Low Priority</b>
<b>High Priority</b>	<b>Panic Priority</b>
Max Acceleration ( $m/s^2$ )	2.2 <input type="button" value="▲"/> <input type="button" value="▼"/>
Max Braking ( $m/s^2$ )	2.5 <input type="button" value="▲"/> <input type="button" value="▼"/>
Max Cornering ( $m/s^2$ )	2.1 <input type="button" value="▲"/> <input type="button" value="▼"/>
Source	
<b>GPS</b>	<b>Accelerometer</b>
Green Driving Duration	
<b>Disable</b>	<b>Enable</b>
Send SMS To	<input type="text"/>
SMS Text	Green Driving

Figure 22 Green Driving configuration parameters for FMB207

**Table 13. Green driving parameters description**

<b>Green driving configuration parameter name</b>	<b>Description</b>
Scenario settings	Enable/Disable Green driving functionality.
Max Acceleration Force	Value which can be reached while accelerating without triggering harsh acceleration event.
Max Braking Force	Value which can be reached while braking without triggering harsh braking event.
Max Cornering Force	Value which can be reached while cornering without triggering harsh cornering event.
Source	From what source (GPS or accelerometer) data will be collected.

#### 6.9.1.1 Data output

Green driving functionality generates events on three cases. If vehicles:

- Acceleration exceeds defined parameter value
- Deceleration (braking) exceeds defined value
- Cornering force exceeds defined value

Program continuously monitors and process data from accelerometer/GPS than decides whether harsh event is detected or not. If any of three cases are satisfied event is generated. Record is saved and sent to server (FMB207 must be configured properly). Event value is multiplied by 10 before sending/saving record to get more precision when displaying **data\***.

**\*Example.** If acceleration harsh event of 3.55 m/s<sup>2</sup> detected. Record with value  $3.55 \times 10 = 35.5$   
 $\approx 36$  will be saved and sent to server.

#### 6.9.2 Auto Calibration

1. Vehicle stopped
2. Road is straight
3. Send SMS "auto\_calibrate:set"
4. Accelerate to > 30 km/h for 5 sec.
5. FMB will send response when calibration is success.

Calibration is saved to Internal Flash, after restart should be the same

To check autocalibration status send: auto\_calibrate:get

#### 6.9.3 Over Speeding

When vehicle speed exceeds configured max speed value scenario is activated, record will be generated.

Scenario is activated until current speed decreases below parameter value.

Over Speeding	
Scenario Settings	
Disable	Low Priority
High Priority	Panic Priority
Max Speed (km/h) <input type="text" value="90"/>	
Send SMS To <input type="text"/>	
SMS Text <input type="text" value="Overspeeding"/>	

Figure 23 Over Speeding configuration parameters for FMB207

#### 6.9.4 Jamming

When jamming is detected scenario is activated, record will be generated. Jamming timeout time can be configured. After Jamming trigger count configured timeout (in seconds), jamming event will be generated after this timeout. If Jamming ends during timeout counting no event will be generated.

You can configure eventual records parameter: when he is disabled scenario status value will be appeared in each AVL record, and when he is enabled scenario

status value will be appended only to eventual records.

Jamming	
Scenario Settings	
Disable	Low Priority
High Priority	Panic Priority
Eventual Records	
Disable	Enable
Time Until Jamming Event Detection (s) <input type="text" value="60"/>	

Figure 24 Jamming configuration parameters for FMB207

#### 6.9.5 GPS Fuel Counter

##### Configuration of Fuel Consumption

1. To configure this parameters use fuel consumption norm which are presented in your car technical documentation. By default speeds for this fuel consumption norms are: City – 30 km/h, Average - 60km/h, Highway - 90 km/h. If you want, you can change it.
2. When speed are higher than highway fuel consumption speed, we add for highway fuel consumption  $x\%$  of highway fuel consumption every  $y$  km/h, by default FMB207 add 20% every 50 km/h. It means that fuel consumption is  $(1.2 * \text{Highway Fuel Consumption})$  on 140 km/h speed,  $(1.4 * \text{Highway Fuel Consumption})$  on 190 km/h speed.
3. Correction coefficient is used for correction every value of fuel consumption which is sent to server ( $\text{Used Fuel} * \text{Correction coefficient}$ ). By default it is 1, min 0.01 and max 2. For example when correction coefficient is 1 and FMB207 calculate that used fuel of 35 ml distance is 20 ml, to server will be sent value: 20 ml, if correction coefficient is 1.2 to server will be sent value:  $20 * 1.2 = 24$  ml.
4. Fuel consumption on idling used to calculate fuel consumption when ignition is on, but vehicle speed is 0 km/h. By default it is 1 l/h, min 0 and max 5 l/h. Almost in all diesel cars this parameter is less than 1.0 l/h. In gasoline cars this parameter is about 1.5 – 2.0 l/h.

**GpsFuelCounter**

City Consumption:(L/100km)	0 <input type="button" value="▲"/> <input type="button" value="▼"/>
Highway Consumption:(L/100km)	0 <input type="button" value="▲"/> <input type="button" value="▼"/>
Average Consumption:(L/100km)	0 <input type="button" value="▲"/> <input type="button" value="▼"/>
City Speed:(km/h)	30 <input type="button" value="▲"/> <input type="button" value="▼"/>
Highway Speed:(km/h)	90 <input type="button" value="▲"/> <input type="button" value="▼"/>
Average Speed:(km/h)	60 <input type="button" value="▲"/> <input type="button" value="▼"/>
Correction Coefficient	1 <input type="button" value="▲"/> <input type="button" value="▼"/>
Fuel Consumption on Idling:(L/h)	1 <input type="button" value="▲"/> <input type="button" value="▼"/>
Higher Speeds add:(%)	20 <input type="button" value="▲"/> <input type="button" value="▼"/>
Highway Consumption every:(km/h)	50 <input type="button" value="▲"/> <input type="button" value="▼"/>

Figure 28 GPS Fuel Counter configuration

## 6.10 Accelerometer Features

### 6.10.1 Excessive Idling

When vehicle stops for specific amount of time scenario is activated, record will be generated. You can configure time it takes to turn on this scenario (Time to Stopped). Scenario is activated until vehicle starts moving and keeps moving (moving is detected only from accelerometer) for amount of time that is configured. You can configure time it takes to turn OFF this scenario (Time to Stopped).

**Excessive Idling**

Scenario Settings	
Disable	Low Priority
High Priority	Panic Priority
Eventual Records	
Disable	Enable
Time To Stopped (s)	300 <input type="button" value="▲"/> <input type="button" value="▼"/>
Time To Moving (s)	5 <input type="button" value="▲"/> <input type="button" value="▼"/>
Send SMS To	<input type="text"/>
SMS Text	Idling Event

Figure 29 Excessive Idling configuration parameters for FMB207

### 6.10.2 Unplug Detection

Unplug Detection. Eventual event will be generated when FMB207 is unplugged from external power or plugged back again. User can select detection type: simple – used in cars, where power voltage is not dependant on ignition (recommended); advanced – used in cars, where power voltage is disconnected when ignition is switched off.

### Unplug Detection

#### Scenario Settings

Disable	Low Priority
High Priority	Panic Priority

#### Eventual Records

Disable	Enable
---------	--------

#### Unplug Detection Mode

Simple	Advanced
--------	----------

Make Call To:

Send SMS To:

SMS Text:  Unplug

Figure 30 Unplug detection configuration

### 6.10.3 Towing Detection

FMB207 activates towing function when these conditions are met:

1. Ignition (configured Ignition Source) is OFF.
2. Activation Timeout (set in Towing detection features) is reached.

When Activation Timeout is reached and Ignition is still in OFF state, FMB207 monitors accelerometer data. If Acceleration or Angle value reaches configured threshold for configured Duration (in ms), check Ignition state. If Ignition is still OFF during configured "Ignition check after Event Timeout" time, then event is generated. If configured - sends sms event or makes a call.

Function will be reactivated after FMB207 again detects change of Ignition state from ON to OFF.

Activation timeout – Activation timeout is time after which FMB207 turns ON Towing detection function if other requirement is met (Ignition OFF state detected). It is measured in minutes.

Event timeout – defines time period (in seconds) to check ignition state when Acceleration or Angle value reach. If towing event is generated during this time period, it

is skipped. It allows filtering out redundant towing events while entering the car.

Make Call to – if function enabled makes call to specified phone number (configured in predefined numbers).

Threshold and Angle – values used to detect towing when ignition is OFF.

Duration – defines time period to check acceleration and Angle values.

### Towing Detection

#### Scenario Settings

Disable	Low Priority
High Priority	Panic Priority

#### Eventual Records

Disable	Enable
---------	--------

Activation Timeout (min):  5

Event Timeout (s):  0

Threshold (g):  0.22

Angle (deg):  1

Duration (ms):  1000

Make Call To:

Send SMS To:

SMS Text:  Towing

Figure 19 Towing detection configuration

#### 6.10.4 Crash Detection

Crash Detection functionality can be set according to these settings:

Threshold (mg)

Duration (ms)

If accident happens and FMB207 detects acceleration value higher than set threshold value during set time period, then device will generate an event. Threshold and duration values are set depending of accident power which you want to detect. FMB207 can detect a slight tapping on the device (Threshold=100mg, Duration=1ms) or can detect severe accident (Threshold=4000mg, Duration=5ms).

Crash Trace operation:

If trace is enabled FMB will collect acceleration data every 40 msec., and in the deep-sleep mode too. Buffer is big enough to hold data for 5 seconds and on Crash Event detection, records will be generated from this buffer, following these conditions:

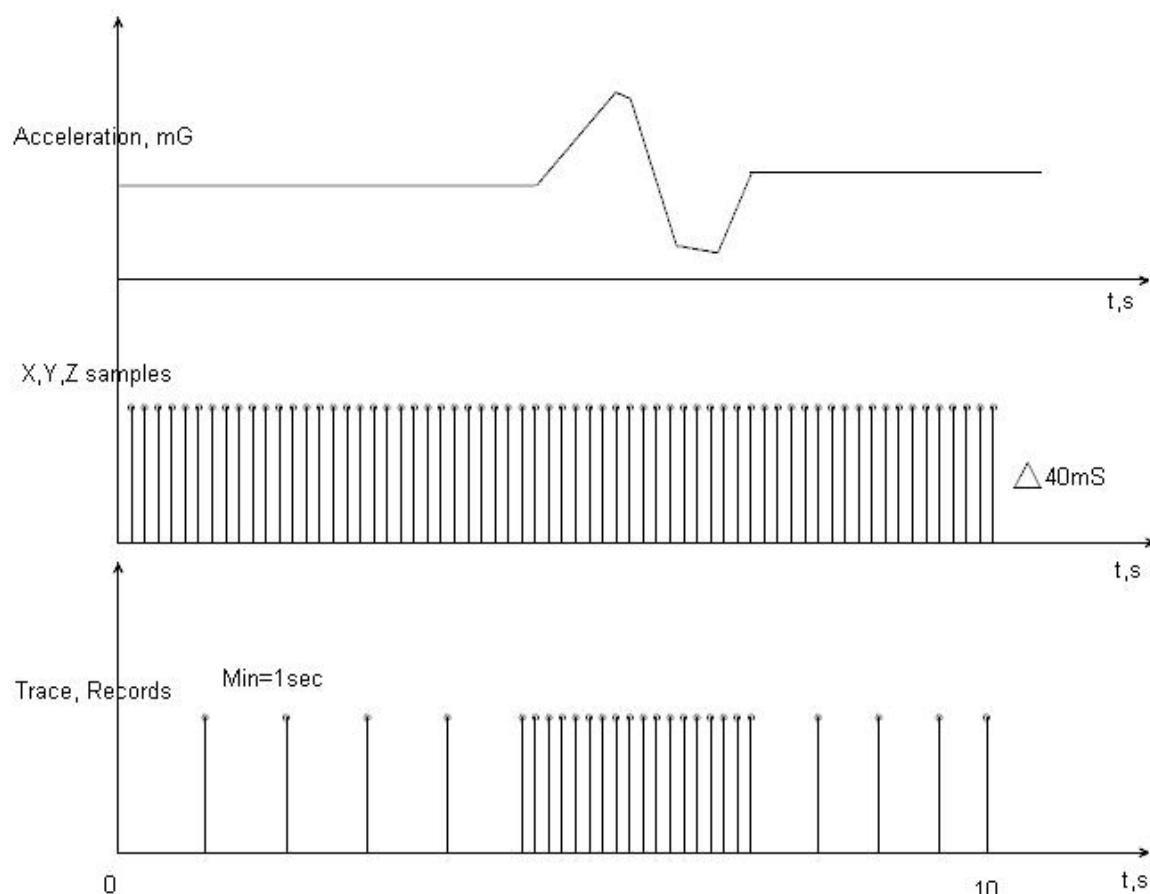
1. Every second Acceleration changed more than > 50mG.

2. Data will be collected and records generated 5 seconds after the event using the same conditions.

3. Every generated record will have accelerometer x y z values included.

4. Each record will have accurate timestamps in milliseconds.

Usually between 20 to 30 records is generated on crash event detection.



**Figure 20 example of Crash Trace logic**

**Crash**

Scenario settings	
Disable	Low Priority
High Priority	Panic Priority
Duration(ms)	5
Threshold(mg)	1500
Send SMS To	
SMS text	Crash
Crash Trace	
Disable	Enable

Figure 21 Crash detection configuration

### 6.11 AutoGeofencing settings

AutoGeofence – the last known position after movement = off. If your car's being taken away – you can be notified. The shape and size of the geofence zones are parameters. It is possibility to state whether entering in or out of the geofence triggers an asynchronous message.

AutoGeofencing option can be configured by following parameters visible in figure 22 below.

Activation Timeout (s) – when ignition is turned off and activation timeout passes, as AutoGeofence will be created around vehicle last position with set radius value.

Radius (m) – radius of circle with center device coordinates after activating AutoGeofence feature.

Deactivate By:

Digital Input 1 – If DIN1 voltage becomes equal or higher than 6,9 V it will disable AutoGeofenze Zone.

Digital Input 2 – If DIN2 voltage becomes equal or higher than 2,1 V it will disable AutoGeofenze Zone.

Digital Input 3 – If DIN3 voltage becomes equal or higher than 3,5 V it will disable AutoGeofenze Zone.

Power Voltage – if power voltage become higher that low voltage level (Ignition settings) it will disable AutoGeofenze Zone.

Engine RPM – If engine RPM became higher that 0 it will disable AutoGeofence Zone.

**Auto Geofence**

Scenario Settings	
Disable	Low Priority
High Priority	Panic Priority
Eventual Records	
Disable	Enable
Generate Event	
On Exit	On Entrance
On Both	
Activation Timeout (s)	60
Radius (m)	100
Deactivate By	
Power Voltage	Digital Input 1
Engine RPM	
Deactivate By	
Power Voltage	Digital Input 1
Digital Input 2	Digital Input 3
Engine RPM	iButton
Send SMS To	
SMS Text	
AutoGeofence	

Figure 22 Auto Geofence configuration Parameters

Feature – Priority of generated event, which will be applied to saved record.

Enter Event – Event generation on Geofence entrance.

Exit Event – Event generation on Geofence exit.

On Both - Event generation on Geofence entrance Or exit

Eventual Records – Enable or Disable Eventual Records functionality.

Note that AutoGeofencing does not require entering coordinates, instead it requires GPS visibility. If vehicle stopped and activation timeout has passed, an AutoGeofence will be created around vehicle's last position with set Radius value.

## 6.12 Manual Geofence

FMB207 has 50 configurable Geofence zones and it can generate an event when defined Geofence zone border is crossed.

Frame border – frame border is an additional border around Geofence zone. It is additional area around defined zone used to prevent false event recording when object stops on the border of the area and because of GNSS errors some records are made inside area and some – outside. Event is generated only when both borders are crossed. See **figure 23** for details: blue track is considered to have entered the area while red track is not.

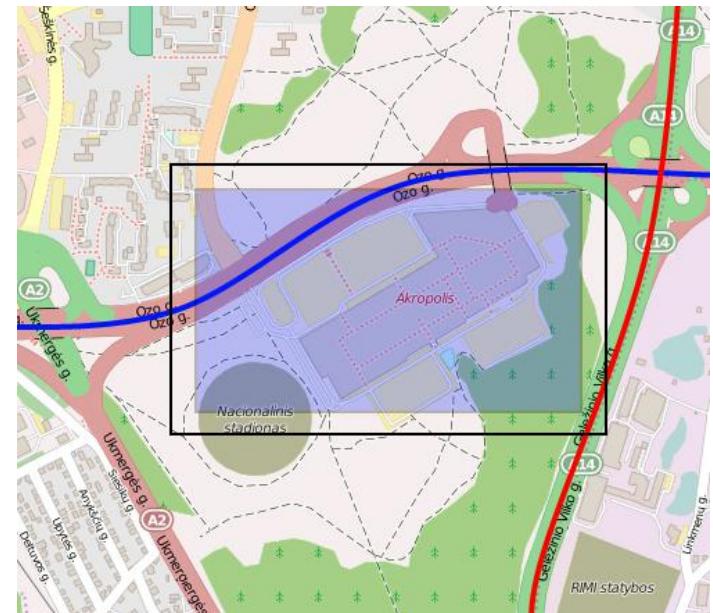
Shape – can be rectangle or circle. User can choose what geozone shape will be.

Priority – priority of Geofence event: low, high or panic. These levels define priority of event information sending to server. See I/O element description for more details about priorities in I/O settings chapter.

Generate event (On entrance, On exit, On Both) – choose when record will be generated.

Eventual records – when disabled scenario status value will be appeared in each AVL record, and when enabled scenario status value will be appended only to eventual records.

OverSpeeding – in each geozone OverSpeeding scenario can be configured separately. Regular OverSpeeding functionality and geozones OverSpeeding functionality is working independently.



X1 – geofence zone left bottom corner X coordinate (longitude); **figure 23**

Y1 – geofence zone left bottom corner Y coordinate (latitude);

X2 or R – geofence zone upper right corner X coordinate (longitude) or radius of circle when Circular zone is used (radius in meters);

Y2 – geofence zone upper right corner Y coordinate (latitude).

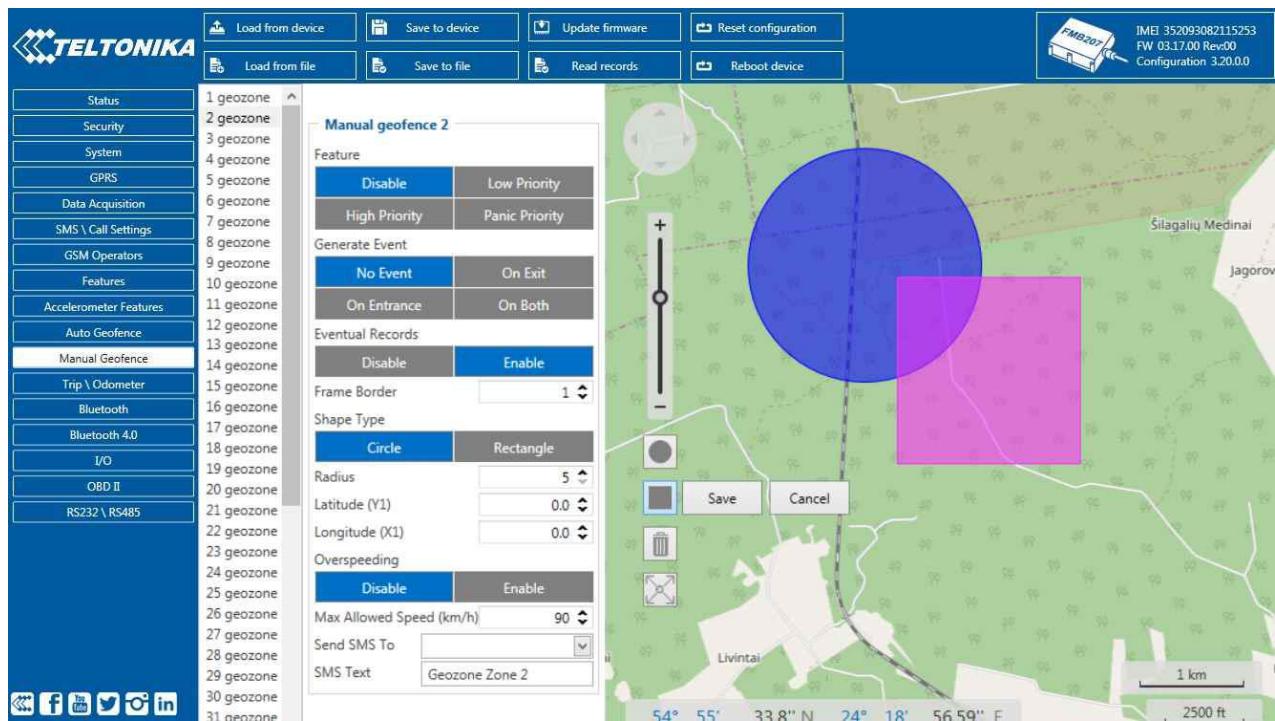


Figure 24 Geofence configuration

## 6.13 Trip \ Odometer

### 6.13.1 Trip settings

Trip window offers user to configure Trip feature. If Trip is enabled configuration of parameters are enabled.

Start Speed (km/h) – GPS speed has to be greater than the specified Start Speed in order to detect Trip Start.

Ignition OFF Timeout (s) – timeout to wait if ignition (configured ignition source) was off, to detect Trip stop.

Distance counting mode – Between Records or Continuous can be chosen. For this feature I/O Trip Odometer must be enabled.

Trip Settings	
Scenario Settings	
Disable	Low Priority
High Priority	Panic Priority
Eventual Records	
Disable	Enable
Mode	
Continuous	Between Records
Start Speed (km/h)	5
Ignition OFF Timeout (s)	60
Send SMS To	
SMS Text	Trip

Figure 25 Trip Settings configuration

If I/O Trip Odometer is enabled and Continuous distance counting variable (Mode) is set to Continuous, **Trip distance** is going to be counted continuously (**from Trip start to Trip stop**). This value is written to I/O Trip Odometer value field. When Trip is over and next Trip begins, Trip Odometer value is reset to zero. When the next trip starts counting continuously starts from the beginning again.

If I/O Trip Odometer is enabled and Continuous Distance Counting variable (Mode) is set "Between Records", then the distance is going to be counted only between every record made. This value is written to I/O Trip Odometer value field and reset to zero every new record until Trip stops. If later all Odometer values are summed up manually, the user gets the distance driven during the whole period of the Trip.

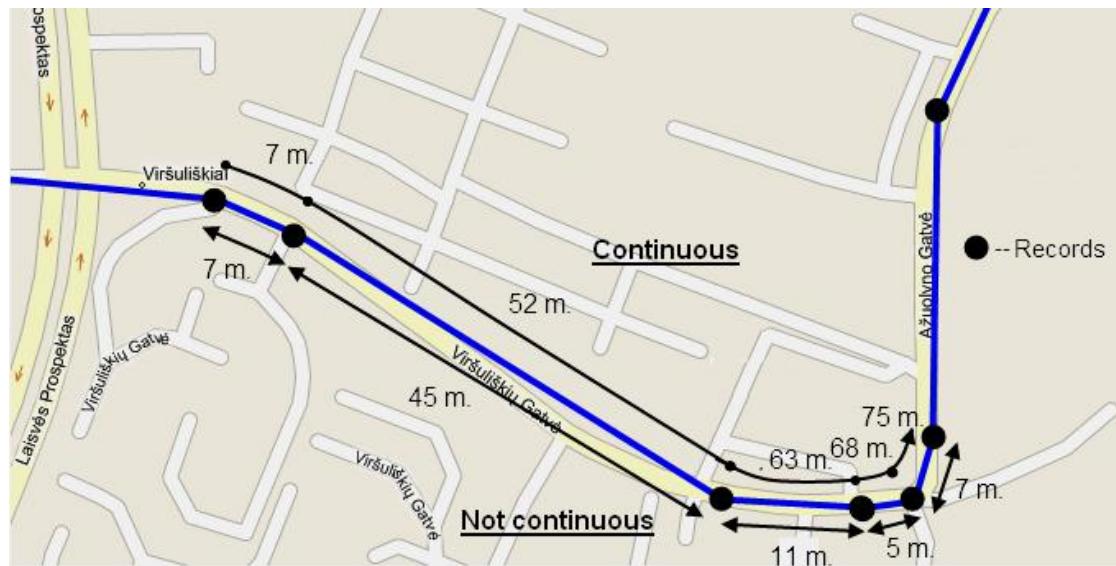


Figure 26 Continuous trip odometer and not continuous trip odometer distance counting example

### 6.13.2 Advanced Trip Settings

Advanced trip settings allow configure number of Eco Score allowed events in 100 km.

**Eco Score allowed events** – how much ECO events is allowed in 100 km. I/O Eco score must be enabled to get value into server. ECO scoring is differentiated by separate Trips.

There are six ECO evaluation events:

- Harsh acceleration
- Harsh braking
- Harsh cornering
- Over-speeding (count only events with value 1 (start) and ignore value 0(end))
- Excessive Idling (count only events with value 1 (start) and ignore value 0(end))
- High RPM

Eco score value can be from 10 (excellent) to 0.00 (very bad):

- Excellent 8.00 – 10
- Good 6.00 – 7.99
- Not Good 4.00 – 5.99
- Bad 2.00 – 3.99
- Very Bad 0.00 – 1.99

Score evaluation is calculated like this:

$$\text{Eco score} = 10 / (\text{Total events}) / (\text{Trip distance in km} * \text{Allowed events per km})$$

$$\text{Allowed events per km} = (\text{Eco Score allowed events} / 100)$$



Note: when Total events < 1, we ignore formula and then Eco score is equal to 10.

If Eco Score allowed events is configured to 0, then Eco score value can have only two values: 0 (when total events > 0) or 10 (when total events = 0).



Note: Score is updated every 1km driven or 5 minutes of trip duration.

### 6.13.3 Odometer

Calculation Source – choose odometer calculation source of GNSS, OBD or LVCAN.  
 Odometer Value –sets starting total odometer value.

Odometer	
Calculation Source	
GNSS	OBD
LVCAN	
Odometer Value(km) <input type="text" value="0"/>	

Figure 28 Odometer configuration

### 6.14 Bluetooth

General	
BT Radio	
Disable	Enable (hidden)
Enable (visible)	
Local Name	<input type="text" value="FMB207_123456"/>
Local PIN	<input type="text" value="5555"/>
Security Mode	
PIN only	PIN + MAC list
MAC list only	None

Auto Connect To External Device	
Connection Mode	
None	Hands Free
OBDII	Data Link
Inateck Scanner	
External MAC	<input type="text"/>
External Name	<input type="text"/>
External PIN	<input type="text"/>

Authorized Devices MAC List	
1	123456789010
2	
3	
4	
5	

Figure 29 bluetooth general functionality

#### 6.14.1 General functionality

General functionality configures bluetooth to work in *slave* mode. This mode allows any external device to connect to FMB207.

Parameter *BT Radio* allows user to select if he wants to enable or disable bluetooth. There are three different scenarios:

1. Disabled – bluetooth functionality will be disabled.
2. Enable (hidden) – bluetooth functionality will be enabled, but none of external devices will be able to detect FMB207 but will be able to connect.
3. Enable (visible) – bluetooth functionality will be enabled and any external device will be able to detect and connect to FMB207.
4. *Local Name* parameter lets user to declare visible name of FMB207 to external devices.
5. *Local PIN* parameter lets user to configure bluetooth PIN of FMB207 device.

FMB207 bluetooth has several different *security modes*:

- PIN only – while external device trying to connect to FMB207 only *Local PIN* will be reacquired to complete connection.
- PIN + MAC list – while external device trying to connect to FMB207 *Local PIN* and *Authorized Devices MAC List* will be checked. If external device MAC ID is in the list and correct *Local PIN* is entered then connection will be established, else FMB207 will reject connection.
- MAC list only – while external device trying to connect to FMB207 only *Authorized Devices MAC List* will be checked. If external device MAC ID is in the list then connection will be established, else FMB207 will reject connection.
- None – while external device trying to connect to FMB207 neither *Local PIN* or *Authorized Device MAC list* will be checked.

#### Auto Connection to External Device functionality

Auto connection functionality configures FMB207 as *master* device, this allows FMB207 connect to external device. FMB207 currently supports these modes:

- None – disables auto connection functionality.
- Hands Free – FMB207 starts to search external hands free headset. If FMB207 finds device which matches user defined *External MAC* or *External Name* then FMB207 will try to pair with that external device. If external device asks for PIN then FMB207 will send user defined *External PIN*. After successful pairing FMB207 will connect to paired device.
- OBDII – FMB207 starts to search external OBDII bluetooth dongle. If FMB207 finds device which matches user defined *External MAC* or *External Name* then FMB207 will try to pair with that external device. If external device asks for PIN then FMB207 will send user defined *External PIN*. After successful pairing FMB207 will connect to paired device.
- Data Link – BT Data link mode is enabled by Configurator “Data Link” parameter: When Data Link is configured and FMB has a link with server, paired device could send messages via bluetooth SPP profile directly to server. Messages will be encoded by codec12.

***NOTE: FMB2YX supports ONE connection at a time.***

***NOTE: FMB001 can see up to 10 available devices. If there are more than 10, with each scanning the list may change.***



*External Name* parameter works as substring, this allows user to enter part of the full external device name. For example, if external device name is "HandsFreeHeadset" and user enters "HandsFree" in *External*

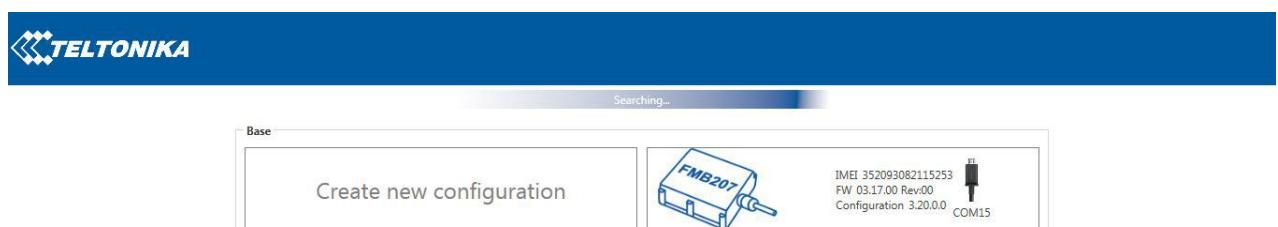
Name parameter window then FMB207 will be allowed to connect to external device named "HandsFreeHeadset".

#### 6.14.2 How to connect bluetooth Hands Free adapter to FMB device

##### 6.14.2.1 bluetooth settings configuration

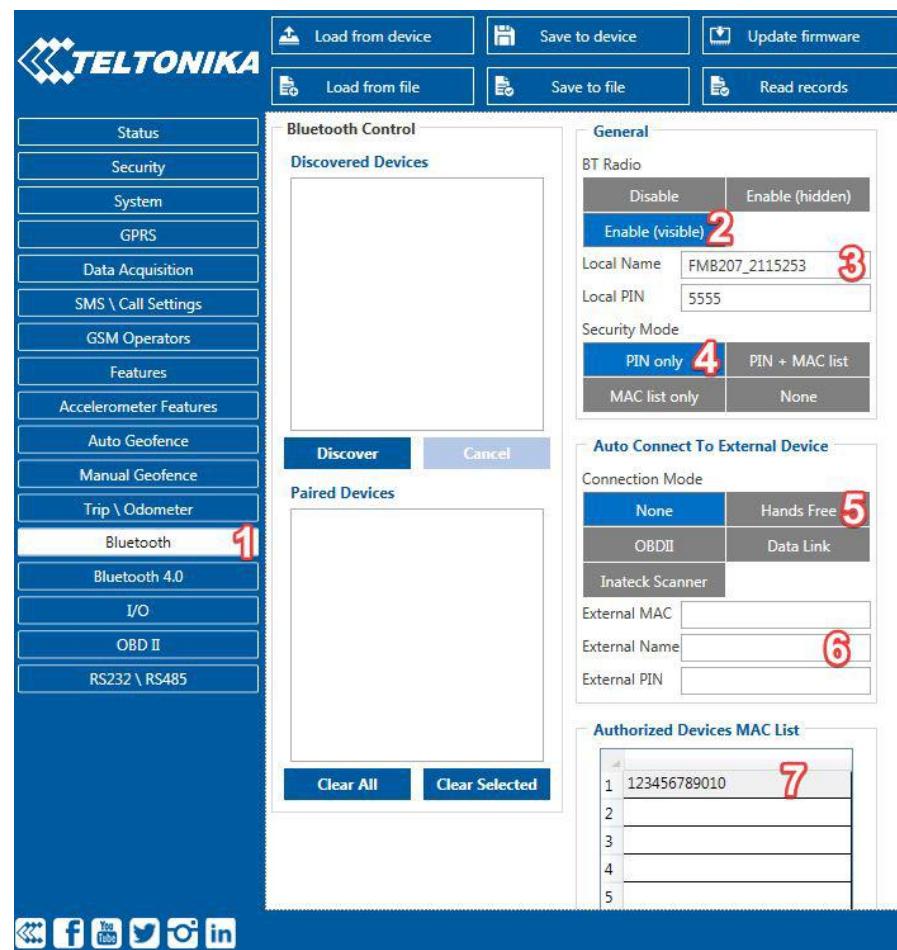
These are instructions how to easily prepare bluetooth Hands Free device connection to FMB device. First we need to configure FMB device bluetooth settings for proper connection to this hands-free unit. These are required steps:

- Connect FMB device to PC using USB cable.
- Launch **FMB Configurator** and connect to device as shown in **Figure 42** below.



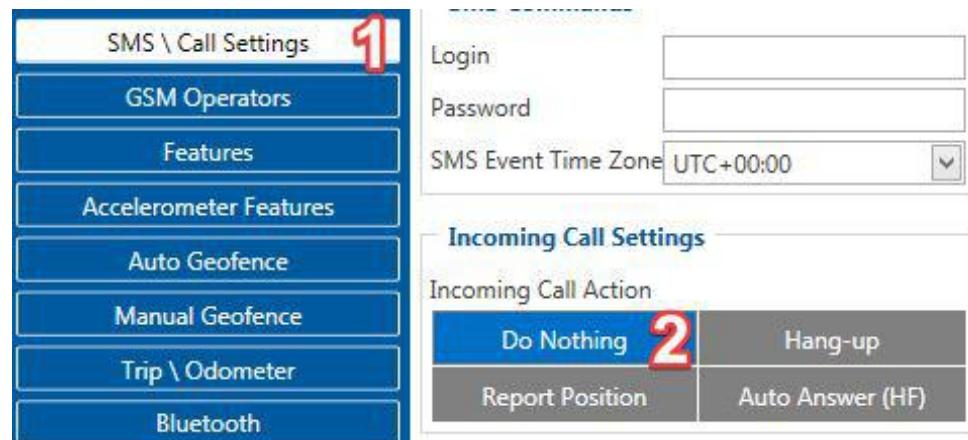
**Figure 30** FMB207 configurator connected devices window

- After successful connection to device wait few moments while device load current configuration, then go to bluetooth section that visible at **Figure 31**



**Figure 31** 1- bluetooth settings; 2 - Enable bluetooth; 3 - bluetooth local name; 4 - bluetooth security mode; 5 - Hands Free connection mode; 6 - External bluetooth device name; 7 - Authorized Devices MAC List;

- When device configuration is loaded press „bluetooth“ settings (**Figure 31 1 position**).
- Turn on BT Radio by pressing „Enable (visible)“ (**Figure 31 2 position**). „Local name“ (**Figure 31 3 position**) automatically will be “FMB207\_last 7 imei digits”, you can leave it or type your own name.
- Set Security Mode (**Figure 31 4 position**) to “PIN only” or “None” (you could select “PIN + MAC list” or “MAC list only” security mode but in this case you need to type external device MAC address in “Authorized Devices MAC List” (**Figure 31 7 position**)).
- Set connection mode to “Hands Free” (**Figure 31 5 position**).
- Set „External Name“ (**Figure 31 6 position**) as your Hands Free device name for proper device identification and connection to it. In this example Hands Free headset name is „DMH10“ but at least 2 characters are needed to recognize it and connect to it. For better and faster adapter identification in network you could enter a full device name. You could check your Hands Free adapter bluetooth name by scanning nearby bluetooth devices using mobile phone or computer with bluetooth adapter.
- Go to “SMS \ Call Settings” in left menu and set “Incomming Call Action” to “Do Nothing” visible at **Figure 32**.



**Figure 32** Incoming Call Action settings

- After all these steps press „Save to device“ to save configuration.
- Now you can disconnect FMB device from a configurator.

#### 6.14.2.2 Connecting bluetooth Hands Free adapter

After this configuration you could connect your Hands Free device to FMB device. Turn on Hands Free device then turn on its bluetooth connection for pairing following your model instructions<sup>1</sup>. Hands Free adapter should make a special sound in ear from speaker or its led identification should change to inform about successful connection<sup>2</sup>. To check if adapter is successfully connected, call to FMB device, Hands Free device should start ringing. If you later restart FMB device it will automatically connect to this adapter.

<sup>1</sup> Hands Free device bluetooth connection pairing instructions depends on specific model.

<sup>2</sup> Hands Free device notification about paired bluetooth connection depends on specific model.

#### 6.14.3 Device's log using your mobile phone.

When FMB device starts, automatically bluetooth is ON too. Take your mobile phone, go to settings>bluetooth and turn it on. Scan for near by devices, find you device in list, distinguish device by last IMEI numbers on device module. Press pair, wait until device will ask to enter pairing password, type: 5555. Paired device will show up in paired device list. Now download from play store/app store terminal for bluetooth. E.g BlueTerm. Run app, click find>connect to your paired device. Now we need to send command to FMB207 from bluetooth terminal, type: .log:1

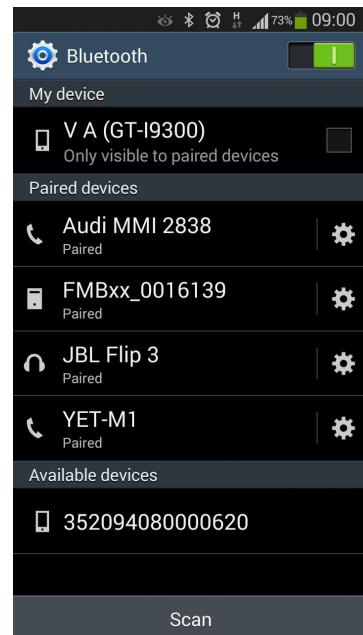
Device will respond Debug enabled and FMB207 log will how up. Do not forget to start save log file to mobile phone.

#### 6.14.4 Device debug over Android smartphone

- Scan for visible BT devices using your Android smartphone and connect to your FMB device.

Default FMB BT name: **FMB207\_last\_7\_imei\_digits**

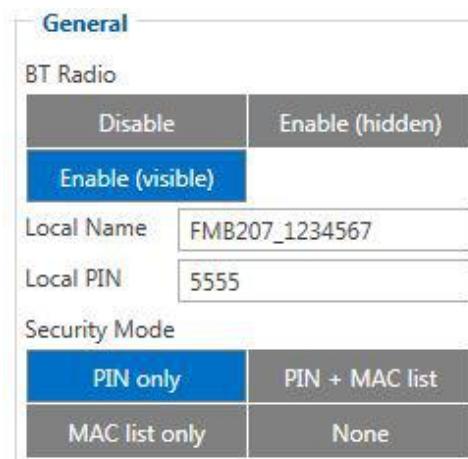
Default PIN code: **5555**



- Download “bluetooth Terminal” application. You can use link or QR code shown here:

<https://play.google.com/store/apps/details?id=com.hatflabs.btt>

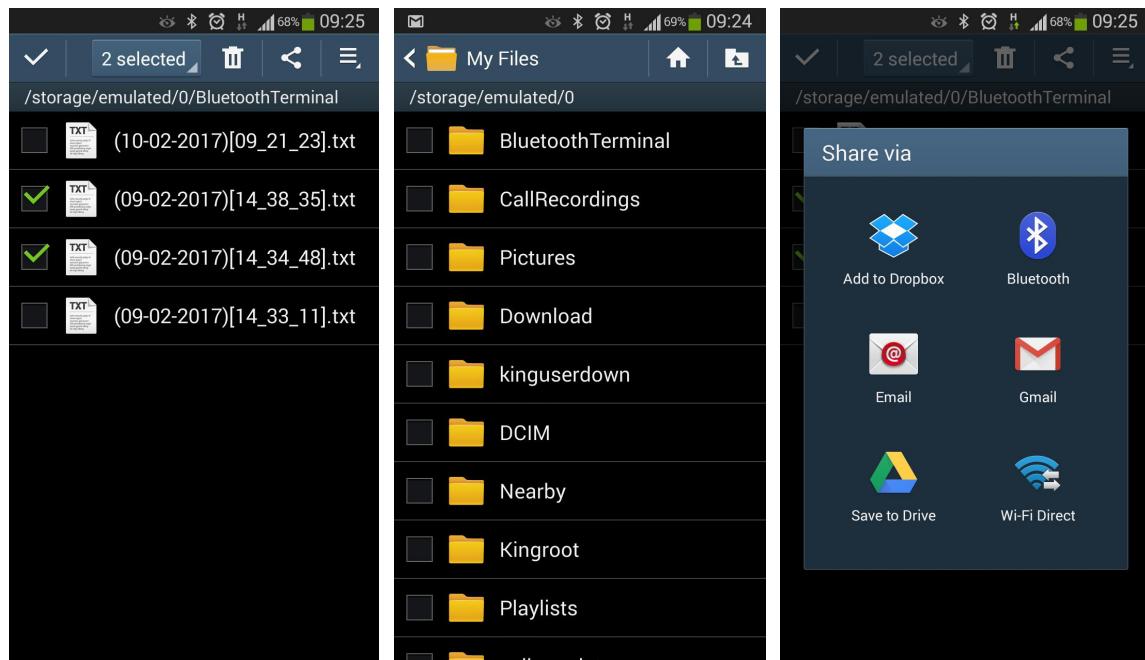




- Run bluetooth Terminal. In menu press “Connect” button and select paired FMB device. To start log check CR and enter the command in terminal: **.log:1**



- Wait ~10 minutes and press “Save” button in menu. You will find saved log file in device folder (My Files/bluetooth Terminal), select log files and press button Share via Email and send them to the Teltonika support.



In order to pair FMB device with Android smartphone, make sure that BT radio is enabled (visible) in device configuration. It can be checked via SMS command too:

**getparam 800**

The answer has to be 2, which means "Enabled and visible".



**Note:** Unfortunately it is not possible to do the same on iPhone, because there is no native SPP bluetooth profile support in iPhone.

#### 6.14.5 How to connect OBD II bluetooth Dongle to FMB device

##### 6.14.5.1 bluetooth settings configuration

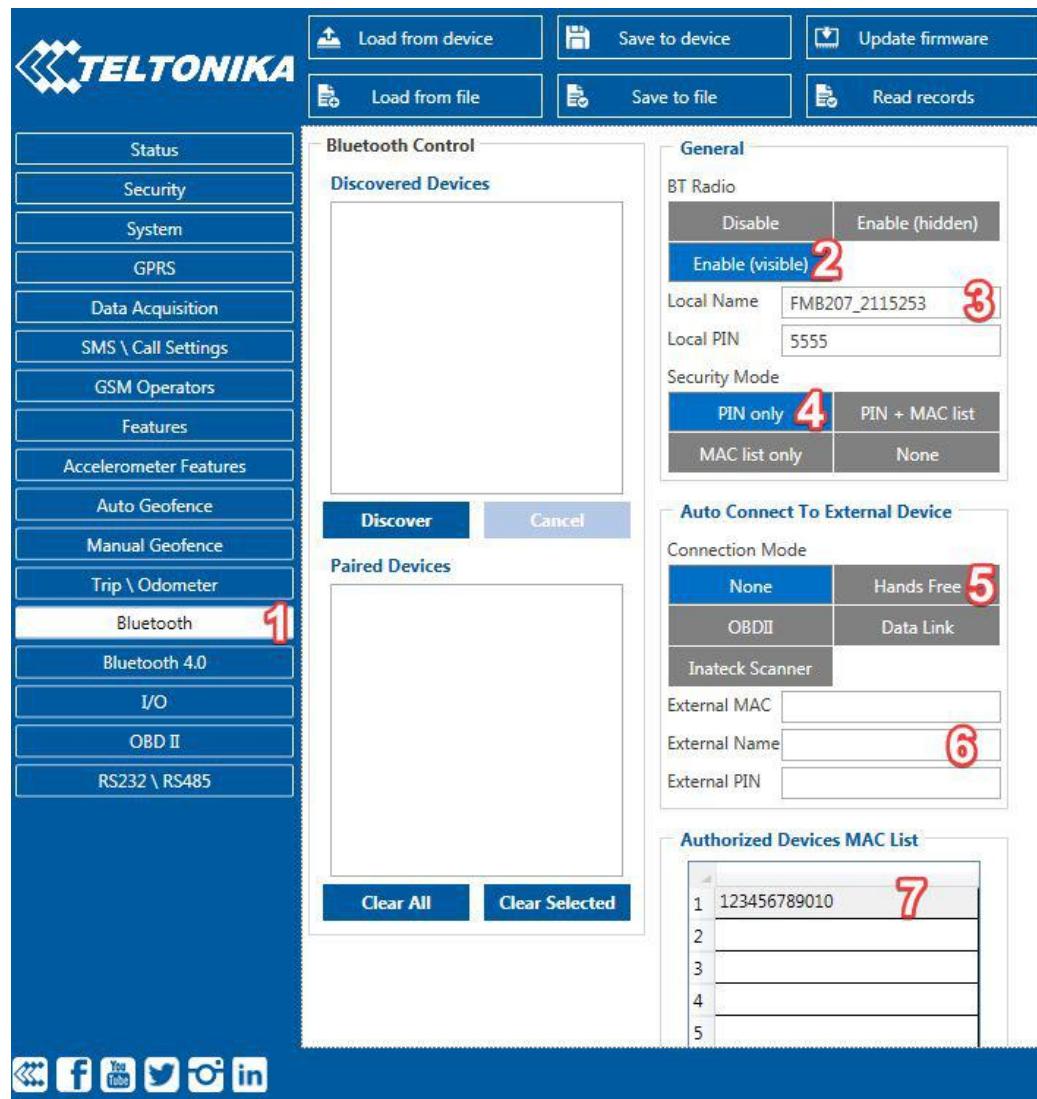
These are instructions how to easily prepare bluetooth Dongle connection to FMB device. First we need to configure FMB device bluetooth settings for proper connection to this unit. These are required steps:

- Connect FMB device to PC using USB cable.
- Launch **FMB Configurator** and connect to device as shown in **Figure 33** below.



**Figure 33** FMB207 configurator connected devices window

- After successful connection to device wait few moments while device load current configuration, then go to bluetooth section that visible at **Figure 34**.



**Figure 34** 1 - bluetooth settings; 2 - Enable bluetooth; 3 - bluetooth local name; 4 - bluetooth security mode; 5 - OBD II connection mode; 6 - External OBD II bluetooth device name; 7 - Authorized Devices MAC List; 8 - Save device configuration

- When device configuration is loaded press „bluetooth“ settings (**Figure 34 1** position).
- Turn on BT Radio by pressing „Enable (visible)“ (**Figure 34 2** position). „Local name“ (**Figure 34 3** position) automatically will be “FMB207\_last 7 imei digits”, you can leave it or type your own name.
- Set Security Mode (**Figure 34 4** position) to “PIN only” or “None” (you could select “PIN + MAC list” or “MAC list only” security mode but in this case you need to type external device MAC address in “Authorized Devices MAC List” (**Figure 34 7** position)).
- Set connection mode to “OBDII” (**Figure 34 5** position).
- Set „External Name“ as your bluetooth OBD II device name for proper device identification and connection to it. In this example OBD II device name is „DONGLE“ but at least 2 characters are needed to recognize it and connect to it. For better and faster adapter identification in network you could enter a full device name. You could check your OBD II adapter bluetooth name by scanning nearby bluetooth devices using mobile phone or computer with bluetooth adapter.

- Go to “**OBD II (bluetooth)**” in left menu and select priority and others parameters visible at **Figure 35**.

**Figure 35** OBD II bluetooth settings.

- After all these steps press „**Save to device**“ to save configuration (**Figure 34** 8 position).
- Now you can disconnect FMB device from a configurator.

#### 6.14.5.2 Connecting to bluetooth OBD II dongle

After this configuration you could connect your car OBD II dongle to FMB device. Turn on ignition then turn on its bluetooth connection. For pairing follow your dongle instructions<sup>1</sup>. OBD II device notification about paired bluetooth connection depends on specific model. If you later restart FMB device it will automatically connect to this dongle.

#### 6.14.5.3 Supported bluetooth OBD II dongles

FMB module works with bluetooth OBD II dongles which are made with **ELM327** or **STN1110** chips.

Comparison of these chips is presented in **Figure 36**.

<sup>1</sup> OBD II dongle bluetooth connection pairing instructions depends on specific model.

	ELM327 v1.4	STN1110
<b>Base microcontroller</b>	PIC18F2580	PIC24HJ128GP502
<b>Architecture</b>	8-bit	16-bit
<b>Processing speed</b>	4 MIPS	40 MIPS
<b>Flash (ROM)</b>	32 KB	128 KB
<b>RAM</b>	1.5 KB	8 KB
<b>Pin count</b>	28	28
<b>Available packages</b>	PDIP, SOIC	PDIP, SOIC, QFN
<b>Supply voltage range</b>	4.5 to 5.5V	3.0 to 3.6V <sup>1</sup>
<b>Supports all OBD-II protocols</b>	yes	yes
<b>ELM327 command set</b>	yes	yes
<b>Enhanced "ST" command set</b>	no	yes
<b>Firmware upgradeable</b>	no	yes
<b>Large OBD message memory buffer</b>	no	yes
<b>Low power mode</b>	yes	yes
<b>Supported UART baud rates</b>	9600 bps to 500 kbps	38 bps to 10 Mbps
<b>OBD message filtering</b>	basic	advanced

Figure 36 ELM327 and STN1110 comparison.

#### 6.14.6 How to connect bluetooth Low Energy device to FMB device

##### 6.14.6.1 bluetooth settings configuration

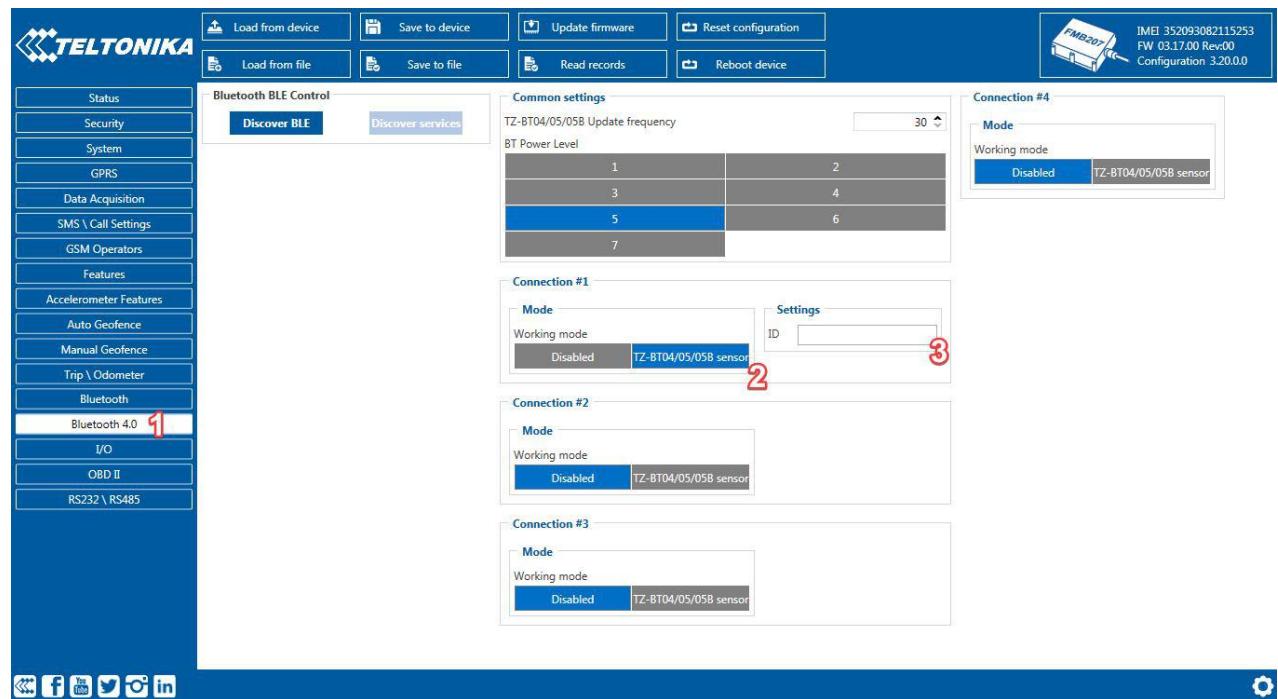
These are instructions how to easily prepare bluetooth Low energy device connection to FMB device. First we need to configure FMB device bluetooth settings for proper connection to this unit. These are required steps:

- Connect FMB device to PC using USB cable.
- Launch **FMB Configurator** and connect to device as shown in **Figure 37** below.



Figure 37 FMB207 configurator connected devices window

- After successful connection to device wait few moments while device load current configuration, then go to bluetooth section that visible at **Figure 37**.



**Figure 38** 1- bluetooth 4.0 settings; 2 - Enable bluetooth mode; 3 - bluetooth ID (MAC);

- When device configuration is loaded press „**bluetooth 4.0**“ settings (**Figure 38 1** position).
- Change BTLE Radio mode by pressing „**TZ-BT04/05 sensor**“ (**Figure 38 2** position). „**ID**“ (**Figure 38 3** position) is the sensor’s MAC address that you want to connect.
- Go to “**I/O**” in left menu and select priority and others parameters visible at **Figure 39**.

Input Name	Current Value	Units	Priority	Low Level	High Level	Event Only	Operand	Avg Const	Se
LLS 4 Temperature	0	°C	None Low High Panic	0 ▼	0 ▲	Yes No	Monitoring	1 ▲	
LLS 5 Temperature	0	°C	None Low High Panic	0 ▼	0 ▲	Yes No	Monitoring	1 ▲	
Eco Score	0		None Low High Panic	0 ▼	0 ▲	Yes No	Monitoring		
User ID	0x0000000000000000		None Low High Panic	0 ▼	0 ▲	Yes No	Monitoring		
BLE Temp #1	0	°C	None Low High Panic	0 ▼	0 ▲	Yes No	Monitoring		
BLE Temp #2	0	°C	None Low High Panic	0 ▼	0 ▲	Yes No	Monitoring		
BLE Temp #3	0	°C	None Low High Panic	0 ▼	0 ▲	Yes No	Monitoring		
BLE Temp #4	0	°C	None Low High Panic	0 ▼	0 ▲	Yes No	Monitoring		
BLE Battery #1	0	%	None Low High Panic	0 ▼	0 ▲	Yes No	Monitoring		
BLE Battery #2	0	%	None Low High Panic	0 ▼	0 ▲	Yes No	Monitoring		
BLE Battery #3	0	%	None Low High Panic	0 ▼	0 ▲	Yes No	Monitoring		
BLE Battery #4	0	%	None Low High Panic	0 ▼	0 ▲	Yes No	Monitoring		
BLE Humidity #1	0	%RH	None Low High Panic	0 ▼	0 ▲	Yes No	Monitoring		
BLE Humidity #2	0	%RH	None Low High Panic	0 ▼	0 ▲	Yes No	Monitoring		
BLE Humidity #3	0	%RH	None Low High Panic	0 ▼	0 ▲	Yes No	Monitoring		
BLE Humidity #4	0	%RH	None Low High Panic	0 ▼	0 ▲	Yes No	Monitoring		
Battery Level %	0	%	None Low High Panic	0 ▼	0 ▲	Yes No	Monitoring		
BT Status	1		None Low High Panic	0 ▼	0 ▲	Yes No	Monitoring		

**Figure 39** I/O bluetooth 4.0 sensor settings.

- After all these steps press „**Save to device**“ to save configuration.
- Now you can disconnect FMB device from a configurator.

## 6.15 SMS events

SMS events functionality allows FMB207 to send a configured SMS when an event is triggered. This event can be triggered by every I/O element.

Then any of the I/O elements is triggered, FMB207 sends a configured SMS message to a defined phone number. If SMS events is activated, but there are no numbers defined in GSM PreDefined Numbers list (**Figure 40**), then the device will not send any messages.

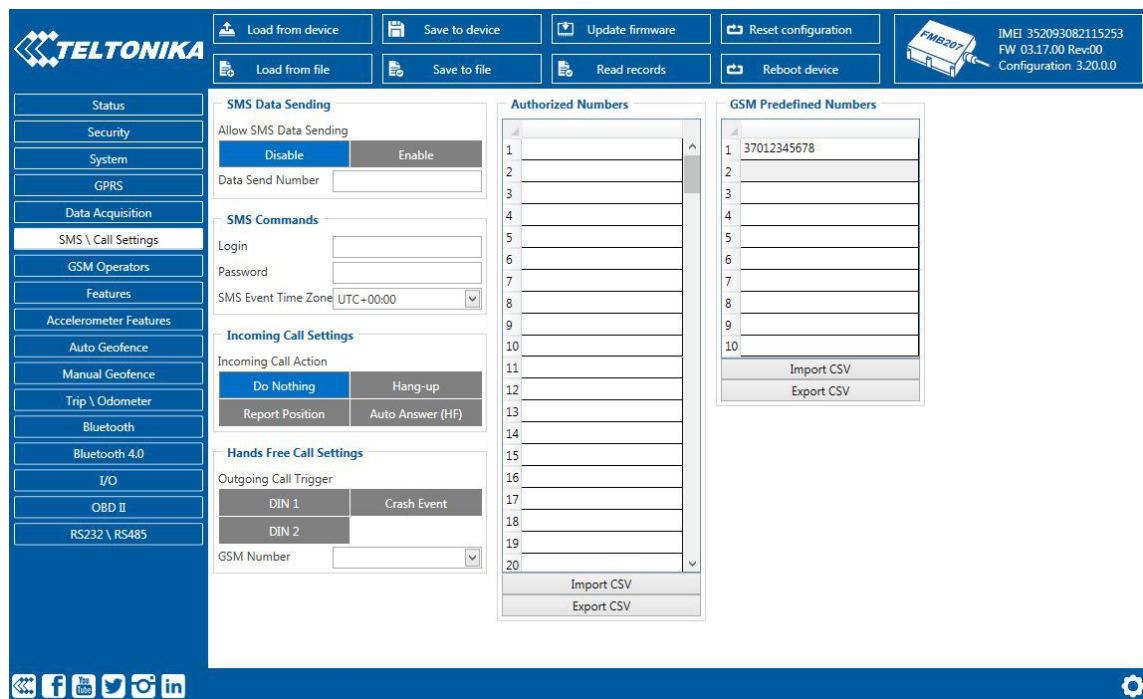


Figure 40 GSM PreDefined Numbers list

The sent SMS messages format is according to:

*"Date Time Current Coordinate Event Text"*

For example, if FMB207 is configured to send an SMS, when Ignition reaches High level, with priority High and configured to generate event on both range enter and exit (**figure 41**), then the sent SMS is:

*"2017/06/13 13:52:18 Lon:25.255537 Lat:54.667193 Ignition 1"*

The screenshot shows the configuration interface for the FMB207 device. At the top, there are several buttons: Load from device, Save to device, Update firmware, Reset configuration, Load from file, Save to file, Read records, and Reboot device. To the right, there is a device icon labeled 'FMB207' and the device's details: IMEI 352093082115253, FW 03.17.00 Rev:00, Configuration 3.20.0.0.

The left sidebar contains a navigation menu with the following items: Status, Security, System, GPRS, Data Acquisition, SMS \ Call Settings, GSM Operators, Features, Accelerometer Features, Auto Geofence, Manual Geofence, Trip \ Odometer, Bluetooth, Bluetooth 4.0, I/O, OBD II, and RS232 \ RS485. The 'I/O' item is currently selected.

The main area displays a table titled 'I/O' with the following columns: Low Level, High Level, Event Only, Operand, Avg Const, Send SMS To, and SMS Text. The 'Send SMS To' column contains a dropdown menu where the value '37012345678' is highlighted. The 'SMS Text' column contains the text 'Ignition'. There are 15 rows in the table, each corresponding to a different I/O element (nic) with various configuration settings like monitoring, priority levels (0-10), and other parameters.

**Figure 41 Configured Ignition SMS event**

The SMS Text field can be altered and any text can be entered. Maximum message length is 160 symbols (numbers, letters and symbols in ASCII, except for comma ",").

#### ATTENTION!



If FMB207 is in Deep Sleep mode and SMS event occurs with LOW priority (which does not wake up FMB207), then the device does not send the message. It is saved in device memory until it wakes up from Deep Sleep mode and GSM modem starts working normally. After it wakes up, all the messages that are saved in memory will be sent, but keep in mind that only 10 messages can be saved in memory – all other messages will not be saved, until there is room in device memory.

#### 6.16 I/O settings

When no I/O element is enabled, AVL packet comes with GNSS information only. After enabling I/O element(s) AVL packet along with GNSS information contains current value(s) of enabled I/O element.

Current value – if device is connected to configurator all current I/O values are displayed in this column.

Priority field – allows enabling I/O element and set them priority so it is added to the data packet and is sent to the server. By default 12 I/O elements with low priority are enabled: Ignition, Movement, Data Mode, GSM Signal, Sleep mode, GNSS Status, GNSS PDOP, GNSS HDOP, External Voltage, Speed, Battery Voltage and Battery Current. Priority (AVL packet priority) can be Low, High or Panic. All records made by FMB207 are regular. Regular packets are sent as Low priority records. When low priority event is triggered, FMB207 makes additional record with indication that the reason for that was I/O element change (depends from Operand configuration). When High priority is selected, module makes additional record with high priority flag and sends event packet immediately to the server by GPRS. Panic priority triggers same

actions as high priority, but if GPRS fails, it sends AVL packet using SMS data sending mode if **SMS data sending is enabled and data send number is written in SMS \ Call Settings**.

High and Low levels – define I/O value range. If I/O value enters or exits this range, FMB207 generates event. “Operand” parameter defines when to generate event: On Exit, On Entrance, On Both, On Hysteresis and On Delta Change.

Event only - when selected NO, I/O element status value will be appeared in each AVL record, and when selected YES, I/O element status value will be appended only to eventual records.

Operand – defines when event is send:

#### 6.16.1 Operand On Exit

Record is generated when actual value input increases and becomes higher than high level or decreases and become lower than low level.

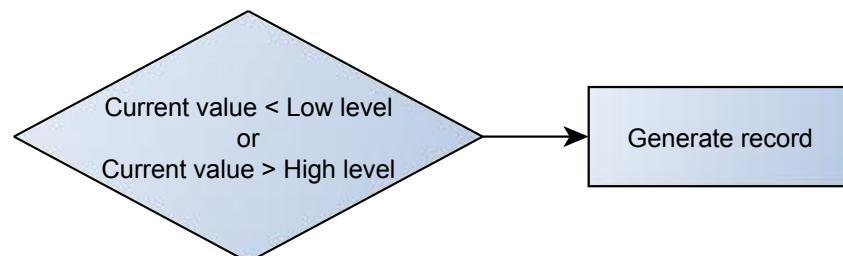


Figure 43 On Exit operand logic

#### 6.16.2 Operand On Entrance

Record is generated when actual value input increases or decreases and becomes between high and low level values.

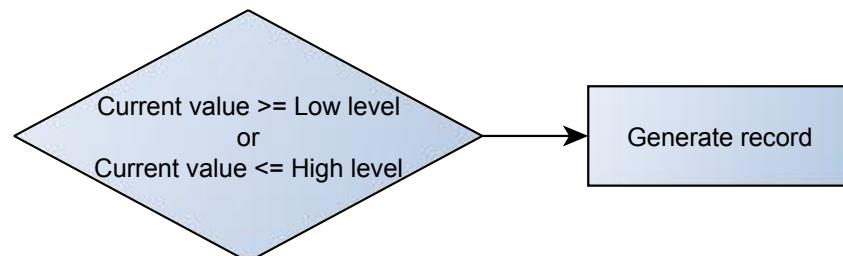


Figure 44 On Entrance operand logic

#### 6.16.3 Operand On Both

Record is generated by both (On Exit and On Entrance) operands logic at same time.

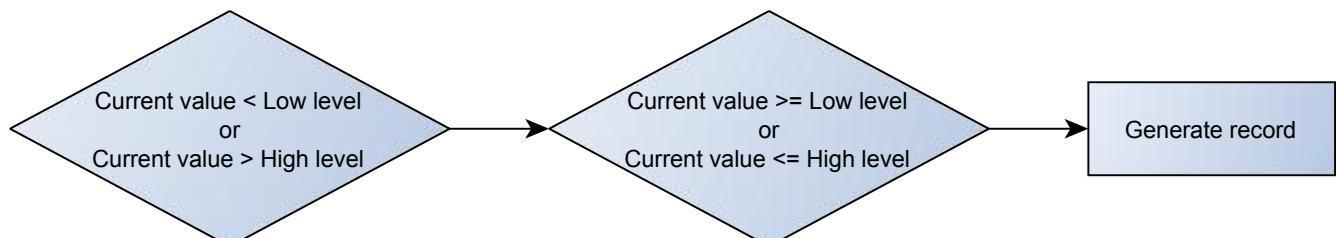
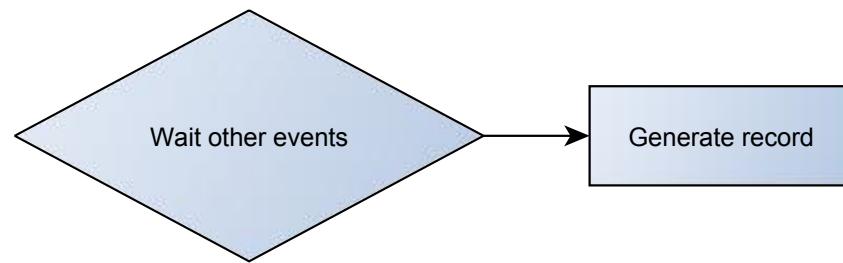


Figure 45 On Both operand logic

#### 6.16.4 Operand Monitoring

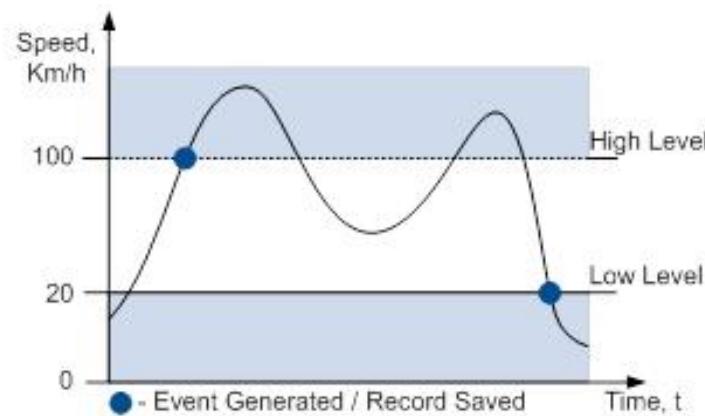
No event at all. Values are recorded only when other trigger have worked.



**Figure 46 Monitoring operand logic**

#### 6.16.5 Operand On Hysteresis

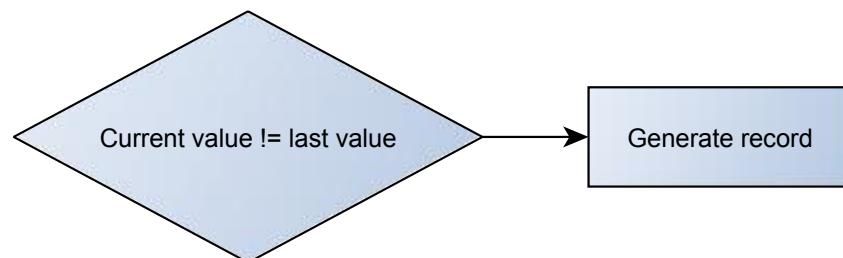
Record is generated when actual value input increases from lower than low value to higher than high level value or decreasing from higher than high level to lower than low level.



**Figure 47 Hysteresis operand logic**

#### 6.16.6 Operand On Change

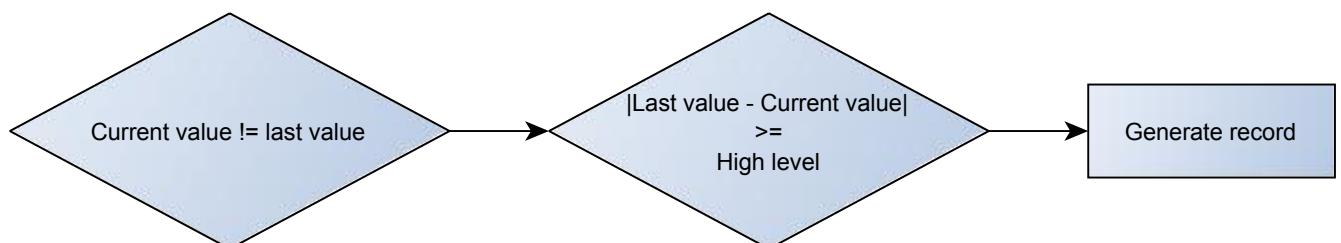
Record is generated when value changes.



**Figure 48 On change operand logic**

#### 6.16.7 Operand On Delta Change

Record is generated when value changes and absolute value of last value minus actual input value becomes equal or higher than high level value.



**Figure 49 On Delta Change operand logic**

#### 6.16.8 Avg const (Averaging parameter description)

If avg const value is 10, new value must be present for 1 second to register change to new value. Internally sampling is done every 40ms, so 25 samples are taken in second. To configure 5 seconds averaging multiply 10 by 5 yielding 50. The same logic works even if device is in deep sleep mode.

Averaging follows RC exponential curves, see image bellow:

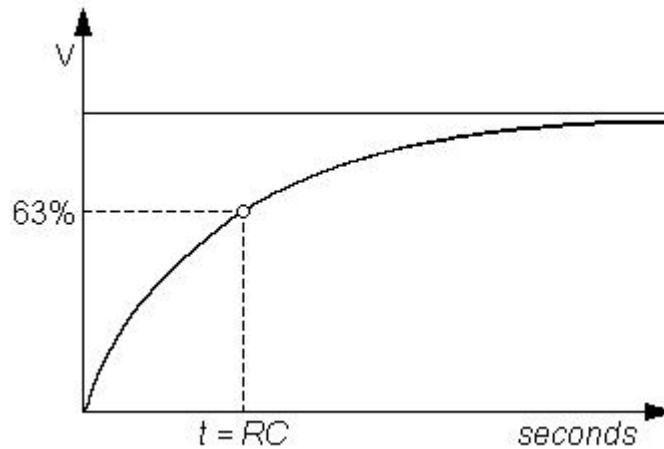


Figure 50 Averaging counting explanation

For Boolean values  $5\tau$ , values is used, that means value change is taken when new values is averaged to more then 99.3%.

#### 6.16.9 OBD II (Bluetooth) I/O elements

In OBD II (Bluetooth) column are shown I/O elements which information can be obtained from OBD II Bluetooth dongle connected to FMB207 device. All I/O configuration is the same as described in [6.17 chapter \(I/O settings\)](#), except OBD II (Bluetooth) I/O element don't have averaging constant parameter.

#### 6.16.10 RS232 parameters configuration

FMB207 device supports RS232 serial communication transmission of data standards and can be configured to work in different RS232 modes.

#### 6.16.11 External UART working mode

FMB207 supports RS232 modes. Only one mode may be selected for work at one time:

- Disable - Disable functionality;
- RS232 - Select RS232 functionality;

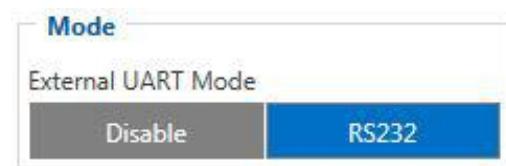


Figure 60 RS232 external UART working mode

#### 6.16.12 RS232 working mode

RS232 support several modes:

- Log Mode – suitable for debugging/logging;
- NMEA – NMEA logs are sent via RS232;
- LLS – LLS sensors support;
- LCD – external LCD support;

- RFID HID – RFID card reader support;
- RFID MF7 - RFID card reader support;
- Garmin FMI – Garmin support;
- TCP ASCII – for routing any input string from external device to server<sup>1</sup>;
- TCP Binary – for routing any binary input data from external device to server<sup>2</sup>.

#### 6.16.13 RS232 Baudrate and parity:

Every RS232 mode support different baudrates, but each mode has its own default baudrate value. Default baudrate values for each RS232 working mode are provided in table 14. Also, default parity options are provided in table 14.

<b>Mode</b>		<b>RS232 Settings</b>			
External UART Mode		Baudrate			
Disable	RS232	Default	1200		
RS232 Mode		2400	9600		
Mode		14400	19200		
Log Mode	NMEA	38400	57600		
LLS	LCD	115200			
RFID HID	RFID MF7	Parity			
Garmin FMI	TCP Ascii	Default	None		
TCP Binary	TCP Ascii Buffered	Odd	Even		
TCP Binary Buffered		Message Timestamp			
TCP Binary Mode Settings		Disable	Enable		
Prefix 1	0				
Prefix 2	0				
Prefix 3	0				
Garmin Mode Settings					
Garmin Features					
Ping Filter	Unicode filter				

Table 14. Default Baudrate and Parity by RS232 working Mode

<sup>1</sup> For more information, please contact your sales manager.

<sup>2</sup> For more information, please contact your sales manager.

Mode	RS232 default Baudrate
Log Mode	115200
NMEA	115200
LLS	19200
LCD	57600
RFID HID	57600
RFID MF7	9600
Garmin FMI	9600
TCP ASCII	115200
TCP Binary	115200

#### 6.16.14 RS232 TCP Binary mode settings

RS232 TCP Binary Mode has additional configurable parameters for advanced data filtering.

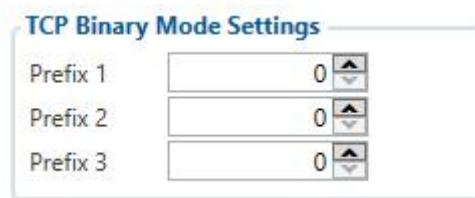


Figure 62 RS232 TCP Binary mode settings

#### 6.16.15 RS232 Garmin Mode settings

Garmin FMI mode has additional filtering capabilities. It is possible to filter Ping and Unicode packets. If Ping filter will be enabled, then Ping packets will be blocked. If Unicode filter will be enabled, then Unicode packets will not be sent to server. Both filters may be enabled for simultaneous work.



Figure 63 RS232 Garmin Mode settings

### 6.17 RS232 Interface

RS-232 supports Full Duplex communication. It means that at the same time you can send/receive Data, because it uses separate lines for transmitting and receiving data.

Most of the modes are the same as RS-485.

### 6.18 RS232 modes

In Configurator windows select RS232/RS485 window where is RS232 Settings.

Most of the modes are the same as RS-485. Same modes are: log mode, NMEA, LLS, TCP Ascii and TCP Binary. In RS232 LLS mode only one LLS fuel level sensor can be connected.

### 6.18.1 RS232 LCD mode

In this mode you can communicate with server through terminal. Link between FM and server has to be established for this functionality to work.

Mode		RS232 Settings	
External UART Mode		Baudrate	
Disable	RS232	Default	1200
		2400	9600
		14400	19200
		38400	57600
		115200	
RS232 Mode		Parity	
Mode		Default	None
Log Mode	NMEA	Odd	Even
LLS	LCD		
RFID HID	RFID MF7		
Garmin FMI	TCP Ascii		
TCP Binary	TCP Ascii Buffered		
TCP Binary Buffered			
Message Timestamp		Disable	Enable

### 6.18.2 RS232 RFID HID/RFID MF7 mode

The difference between RFID Mode and RFID MF7 Mode is that in RFID Mode FMB207 understands RFID messages that are in hexadecimal format and RFID MF7 Mode understands messages that are in decimal format. For example:

RFID Mode message – “\$aa\$02\$03\$04\$17\$89\$00\$01”

RFID MF7 Mode message – “1213141519”

The chosen mode has to correspond to the RFID reader's mode. What type of RFID is sent to FMB207 depends on the reader.

For more information about RFID ID's and devices, please contact to your local sales representative.

RS232 Mode	
Mode	
Log Mode	NMEA
LLS	LCD
RFID HID	RFID MF7
Garmin FMI	TCP Ascii
TCP Binary	TCP Ascii Buffered
TCP Binary Buffered	

### 6.18.3 RS232 GARMIN mode

Garmin provides a Fleet Management Interface Tool Kit which connected to FMB207 enables the driver to have a "screen" in their vehicle for real-time navigation, messaging, and job dispatch capabilities to help them be more efficient.

**RS232 Mode**

Mode	
Log Mode	NMEA
LLS	LCD
RFID HID	RFID MF7
<b>Garmin FMI</b>	TCP Ascii
TCP Binary	TCP Ascii Buffered
TCP Binary Buffered	

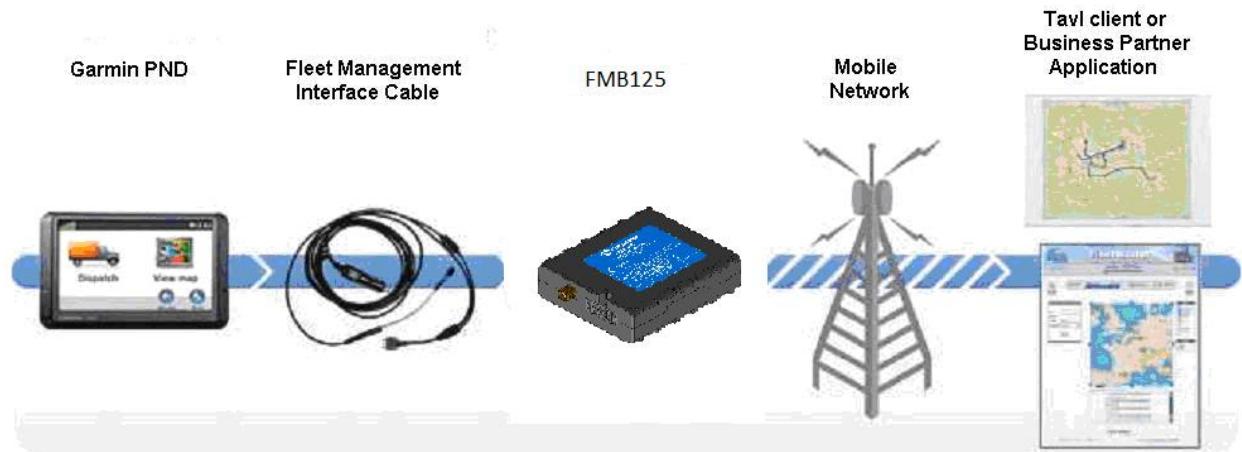
**TCP Binary Mode Settings**

Prefix 1	0 <input type="button" value="▲"/>
Prefix 2	0 <input type="button" value="▲"/>
Prefix 3	0 <input type="button" value="▲"/>

**Garmin Mode Settings**

Garmin Features	
<input style="background-color: #0070C0; color: white; width: 100px; height: 25px; border: none; font-size: 10px; padding: 2px; margin-right: 10px;" type="button" value="Ping Filter"/>	<input style="width: 100px; height: 25px; border: none; font-size: 10px; padding: 2px;" type="button" value="Unicode filter"/>

FMB207 and Garmin operational scheme is shown



### 6.19 Garmin protocols

The following is a list of protocols supported and the corresponding feature/benefit. FMB207 can fully support Fleet Management Interface (FMI) versions up to 2.1. Other or higher versions may be supported, but Teltonika is not responsible for the changes made by Garmin, which may affect the work of FMB207 and Garmin products. For more information about Garmin products and FMI versions, please go to <http://www8.garmin.com/solutions/pnd/supportedproducts.jsp>. Notice that some Garmin products use different connection cables than others.

#### 6.19.1 Standard protocols

Text Message Protocol:

- Allows text messages sent to device to be displayed in "inbox" on unit.
- Garmin can provide confirmation that message was read.
- Garmin can also provide a yes/no box below the text of the message to enable a simple quick response.
- Messages can be up to 199 characters in length.
- Messages can also be generated from device and sent to dispatch/office.
- Messages received will be notified to driver through a pop-up alert on Garmin screen.
- Garmin provides a "virtual keyboard" on device through a touch-screen format for all text communication.

#### Stop (Destination) Protocol:

- Garmin can display a list of Stops/Jobs reported to the device in a separate icon called "My Stops".
  - Driver has ability to navigate directly to Stop from list.
  - Garmin can provide status on current Stop in progress.
  - Is driver stopped at location?
  - How far has Driver progressed through the list of Stops?
  - Garmin can also provide confirmation that driver has received a particular Stop, read the details, or deleted it from list.
  - Can provide confirmation that a Stop has been completed.

#### Estimated Time of Arrival Protocol:

- Dispatcher/office can request the ETA of the current stop/job in progress.
- Garmin will notify the actual time of arrival as well as distance remaining to stop.

#### Auto-Arrival at Stop Protocol:

- This feature is used to tell the Garmin PND to automatically detect that it has arrived at a Stop and then to prompt the driver if they would like to mark the Stop as done and begin navigating to next Stop on the list.
- Auto-arrival can be determined by how long the unit is stopped close to the destination (in the event driver has to park and walk) or by how close the unit needs to be to the destination before the Auto-arrival feature is activated.

#### Data Deletion Protocol:

- Dispatch/office has the ability to wipe clean the data on the Garmin PND.
- Clean up messages in inbox/remove stops.

### 6.19.2 Enhanced protocols

#### Canned Responses/Messages:

- Fleet managers can communicate by sending up to 200 "canned" responses from server to be stored directly on Garmin devices.
  - Up to 50 of these canned responses can be utilized for any given scenarios.
  - Drivers can store up to 120 canned messages, eliminating the need to type while driving.

#### Status Protocol:

- Up-to-the-minute communications that allow drivers to automatically send status updates.

- Driver's units can store up to sixteen status indicators such as start/stop shift, on/off break, etc.

### 6.19.3 Supported features on TAVL client application

TAVL client application lets user to use the following features of GARMIN FMI:

1. Text messaging;
2. Destination message;
3. ETA request.

#### **6.19.4 Text messaging**

Text messaging feature lets user to communicate with driver (user that uses Garmin device) by sending text messages via GPRS.

#### **6.19.5 Destination message**

Destination message is used to inform a driver of a new destination. When Garmin device receives a destination message from server it displays it as "Stop" to the driver and also gives the driver ability to start navigating to the "Stop" location. New destination in Tavl client is represented as Geozone so new Geozone (as destination) has to be created first.

#### **6.19.6 ETA request message**

ETA (Estimated Time of Arrival) request message is used when user wants to know expected arrival time to currently active destination and distance (in meters) from current object location to currently active destination.

## 7 SMS COMMAND LIST

Table 11. Common SMS/GPRS commands

Command	Description	Response
getinfo	Device runtime system information	Yes
getver	Returns code version, device IMEI, modem app version, RTC time, Init time, Uptime and BT MAC address.	Yes
getstatus	Modem Status information	Yes
getgps	Current GPS data, date and time.	Yes
getio	Readout analog input,digital input and output	Yes
ggps	Returns location information with Google maps link	Yes
readio #	Returns IO status, # AVL ID	Yes
cpureset	Resets device	No
getparam #	Returns selected parameter value, # param ID	Yes
setparam #:#	Sets selected parameter value. 1.# - first ID value. 2.# - New first Parameter Value 3.# - second ID value. 4.# - New second Parameter Value 5.# - third ID value. 6.# - New third Parameter Value SMS command of limited to 160 characters.	Yes
flush #,#,#,#,#,#	Redirects device to other server. 1.# - IMEI 2.# - APN 3.# - LOGIN 4.# - PASS 5.# - IP 6.# - PORT 7.# - MODE (0-TCP/1-UDP)	Yes
countrecs	Returns records number	Yes
deleterecords	Delete all records from SD card	Yes
battery	Returns battery state info.	Yes
wdlog	Returns all information about "watch dogs" restarts.	Yes
defaultcfg	Load default configuration.	Yes
setkey # #	Add new or change current configuration keyword. If device is locked, keyword cannot be changed 1.# - old keyword (if adding new keyword space (view chapter 5.1.2)) 2.# - new keyword	Yes
delkey #	Remove existing keyword. (If device is locked, keyword cannot be changed) # - old keyword	Yes
bbread #	Return black box information (HEX value of event ID	Yes

Command	Description	Response
	and HEX value of custom data field (optional)). 1.# - returns entered number of latest events. When # is omitted the latest events are packed to single SMS.	
bbinfo #	Return same information as bbread command but additional all events timestamp is written in HEX. 1.# - returns entered number of latest events. When # is omitted the latest events are packed to single SMS.	Yes
sdformat	Format SD card.	Yes

**Table 12. SMS commands related to features**

Command	Description	Response
fc_reset	Resets fuel consumption parameters	Yes
towingreact	Towing reactivation	Yes
auto_calibrate:set	Calibrate position if car accelerate straight to > 30 km/h for 5 sec.	Yes
auto_calibrate:get	returns the state of calibration	
odoset:#	Set total odometer value. # - new odometer value in km	Yes
odoget	Display current odometer value	Yes

**Table 13. SMS commands related to Bluetooth**

Command	Description	Response
btgetlist #	Returns requested Bluetooth list. # - 0, 1 or 2 (0 – Discovered, 1 – Paired, 2 – Connected)	Yes
btscan	Starts Bluetooth scan.	Yes
btvisible #	Sets Bluetooth to visible with TMO. # - visibility TMO (from 1 to 255 seconds).	Yes
btrelease #	Disconnects from current device and pauses auto connect functionality for TMO # - none or TMO (from 1 to 255 seconds).	Yes
btunpair #	Unpair Bluetooth device. # - all, BT address (all – unpair all devices, BT address – unpair only specified MAC address).	Yes

**Table 14. SMS commands related to OBD**

Command	Description	Response
obdinfo	If connected with Bluetooth OBD dongle displays all available information from OBD.	Yes
faultcodes	If connected with Bluetooth OBD dongle display all visible fault codes.	Yes
cleardtc	Clears all vehicle stored fault codes.	No
getvin	Get vehicle VIN code, if OBD dongle is connected.	Yes

Parameter ID consists of 3 or 5 digits. Detailed list of parameters and IDs can be found in chapter 7 PARAMETER LIST.

Example: ‘**username password setparam 2001:wap**’ will change configured APN.

Example: ‘**username password setparam 2001:wap;2002:user;2003:pass**’ will change configured APN name, APN username and APN password. SMS command of limited to 160 characters.

### 7.1 getinfo

Response details	Description
RTC	RTC Time
Init	Device initialization time
UpTime	Total up time (in seconds)
PWR	Last restart reason
RST	Total restarts count
GPS	GPS receiver state. 0 – OFF, 1 – ON without fix, 2 – ON with fix, 3 – In sleep mode.
SAT	Average satellites
TTFF	Time To First Fix
TTLF	Time To Last Fix
NOGPS	How much time no GPS fix (h:min)
SR	Number of Sent Records
FG	Failed GPRS counter
FL	Failed link counter
SMS	Sent SMS Counter
REC	Records Found – number of records in the memory.
MD	Data Mode state. 0 – Home and Stop, 1 – Home and Moving, 2 – Roaming and Stop, 3 – Roaming and Moving, 4 – Unknown and Stop, 5 – Unknown and Moving

Example: “RTC:2017/6/16 7:13 Init:2017/6/16 5:44 UpTime:4744s PWR:PwrVoltage RST:0 GPS:1 SAT:0 TTFF:0 TTLF:0 NOGPS: 1:18 SR:0 FG:200 FL:0 SMS:3 REC:42 MD:1”.

### 7.2 getver

Response details	Description
Ver	Firmware version
GPS	Version of GPS module
Hw	Version of hardware
Mod	HW version modification
IMEI	Device IMEI
Init	Device initialization time
Uptime	Total up time (in seconds)
BT	Device MAC address

Example: “Ver:02.00.01\_06 GPS:AXN\_3.80\_3333\_16070400,0000,, Hw:FMB207 Mod:4 IMEI:352094082042885 Init: 2017-6-16 5:54 Uptime: 16574 BT:31F5BFE66261”.

### 7.3 getstatus

Response details	Description
Data Link	Indicate module connection to server at the moment: 0 – Not connected, 1 – connected
GPRS	Indicate if GPRS is available at the moment
Phone	Voice Call status: 0 – ready, 1 – unavailable, 2 – unknown, 3 – ringing, 4 – call in progress, 5 – asleep
SIM	SIM Status: 0-ready, 1-pin, 2-puk, 3-pin2, 4-puk2
OP	Connected to GSM Operator: numerical id of operator
Signal	GSM Signal Quality [0-5]
NewSMS	Indicate if new message received
Roaming	0 – Home Network, 1 – roaming
SMSFull	SMS storage is full? 0 – ok, 1 – SMS storage full
LAC	GSM Tower Location Area Code
Cell ID	GSM Tower Cell ID Code

Example: "Data Link: 0 GPRS: 1 Phone: 0 SIM: 0 OP: 24602 Signal: 5 NewSMS: 0 Roaming: 0 SMSFull: 0 LAC: 1 Cell ID: 3055".

### 7.4 getgps

Response details	Description
GPS	Indicates valid (1) or invalid (0) Gps data
Sat	Count of currently available satellites
Lat	Latitude (Last good Latitude)
Long	Longitude (Last good Longitude)
Alt	Altitude
Speed	Ground speed, km/h
Dir	Ground direction, degrees
Date	Current date
Time	Current GMT time

Example: "GPS:1 Sat:0 Lat:54.666042 Long:25.225031 Alt:0 Speed:0 Dir:0 Date: 2017/6/16 Time: 12:52:30".

### 7.5 getio

Response details	Description
DI1	Digital input 1 value
DI2	Digital input 2 value
DI3	Digital input 3 value
DI4	Digital input 4 value
AIN1	Analog input 1 value
AIN2	Analog input 2 value

Example: "DI1:0 DI2:0 DI3:0 DI4:0 AIN1:0 AIN2:0".

## 7.6 ggps

Response details	Description
D	Date
T	Time
S	Actual Speed
C	Latitude (Last good Latitude), Longitude (Last good Longitude)
Url	Google Maps Link

*Example (if no GNSS FIX): "GPS Data not Available. No GPS signal".*

*Example: D:17/1/9 T:12:52:30 S:0.00 C:54.666042, 25.225032 Url: <http://maps.google.com/?q=54.666042,25.225032&om=1speed:0>*

## 7.7 readio #

Response details	Description
ID	I/O element ID
Value	I/O Element value

*Example (if wrong ID): "Not supported or not enabled IO element requested".*

*Example: "Param ID:239 Value:0".*

## 7.8 getparam

Read parameter value. ID consists of 3 or 5 digits. A detailed list of parameters and identifiers can be found in this chapter next later.

*Example: ,getparam 2001' command will request APN name*

*Answer: Param ID:2001 Value:wap*

## 7.9 setparam

Read parameter value. ID consists of 3 or 5 digits. A detailed list of parameters and identifiers can be found in this chapter next later.

*Example: ,setparam 2001:wap' will change configured APN name*

*Answer: Param ID:2001 Value:wap2*

Example: 'setparam 2001:wap;2002:user;2003:pass' will change configured APN name, APN username and APN password. SMS command of limited to 160 characters.

## 7.10 flush #,#,#,#,#,#

Initiates all data sending by GPRS to specified target server. Comma separated parameters go as numbered:

1.# - IMEI

2.# - APN

3.# - GPRS LOGIN

4.# - GPRS PASSWORD

5.# - IP

6.# - PORT

7.# - MODE (0-TCP/1-UDP)

Parameters are separated by comma (no spaces needed). In case you don't need to enter parameter (APN Login/ APN Pass) – do not put space, simply put comma and write next parameter.

Parameters are separated by comma (no spaces needed). In case you don't need to enter parameter (APN Login/ APN Pass) – do not put space, simply put comma and write next parameter.

*Example: opa opa flush 353976012555151,banga,,,212.47.99.62,12050,0*

Response details	Description
FLUSH SMS Accepted	FLUSH SMS Accepted
# records found on FLASH	Number of records found on FLASH
Minimum Records to Send: #	Number of minimum saved records to send
GPRS Enabled: #	State of the GPRS connection, 0 – disabled; 1 – enabled
Time Sync: #	Indicates time synchronization on the device, 0 – not synchronized; 1 – synchronized

*Example: "FLUSH SMS Accepted. 11 records found on FLASH. Minimum Records to Send: 1. GPRS Enabled: 1. Time Sync: 1.".*

### 7.11 countrecs

Returns currently records number in SD card or device memory.

*Example (if more than 100): "more then 100 records found".*

*Example: "25 records found".*

### 7.12 deletereconds

Delete all records from SD card or device memory.

### 7.13 battery

Response details	Description
BatState	Battery connected (1) or disconnected (0) from device
FSMState	Current battery state
ChargerIC	Battery charging status
ExtV	External Voltage
BatV	Battery voltage
Batl	Battery charging current

*Example: "BatState: 1 FSMState: ACTIVE ChargerIC: OFF ExtV: 11796 BatV: 3942 Batl: 0".*

### 7.14 fc\_reset

Reset GPS fuel consumption value.

*Example: "Fuel Consumption parameters reseted".*

### 7.15 towingreact

Reactivates Towing Detection to initial state (does not wait for ignition to be OFF). Useful when generated false Towing event and needs reactivation.

**7.16 odoset:#**

Set new total odometer value in km.

*Example: "Saved Odometer Value: 5000 km".*

**7.17 odoget**

Get total odometer value in km.

*Example: "Current Odometer Value:5000 km".*

**7.18 btgetlist #**

btgetlist command needs argument what list should be printed!

*btgetlist 0; device will respond with BT\_LIST\_Discovered*

*btgetlist 1; device will respond with all paired devices*

*btgetlist 2; device will respond with connected bluetooth device*



Note: Without argument it is always 0 i.e **BT\_LIST\_Discovered**  
In FW 01.00.23 btgetlist (without args) will not respond (as unknown command).

**7.19 obdinfo**

Response details	Description
LIST of OBD info	Protocol, VIN, AdaptiveTiming value, requested PID counter, OBD application state, available vehicle PIDs, mil status, number of DTCs

*Example:*

*"Prot:0,VIN:N/A,TM:10,CNT:0,ST:OFF,P1:0x0,P2:0x0,P3:0x0,P4:0x0,MIL:0,DTC:0,IDO,Hdr:0,Phy:0".*

**7.20 faultcodes**

Response details	Description
LIST	Returns list of fault codes; response when no faults: "No fault codes detected."

*Example: "P0100,P0200,P0300,C0300,B0200,U0100".*

**7.21 setkey # #**

"setkey <oldkeyword> <newkeyword>" - Set new or change the keyword. Configuration should be not locked.

Example: New keyword (set):

<name>{space}<pass>{space}setkey{space}{space}<newkeyword>

Change keyword (change):

<name>{space}<pass>{space}setkey{space}<oldkeyword>{space}<newkeyword>

### 7.22 **delkey # #**

"delkey <keyword>" - Deletes current keyword. Configuration keyword should be configured and not locked.

Example:

```
<name>{space}<pass>{space}delkey{space}<keyword>
```

### 7.23 **bbread #**

# describes start offset and is an optional field. # of value 20 means that blackbox data is requested starting from 20<sup>th</sup> latest event. When # is omitted the latest events are packet to single SMS.

Example: X1:Y1,X2:Y2,...,Xn:Yn, where Xn – HEX value of event ID. Yn – HEX value of custom data field (optional).

### 7.24 **bbinfo #**

# describes start offset and is an optional field. # of value 20 means that blackbox data is requested starting from 20<sup>th</sup> latest event. When # is omitted the latest events are packet to single SMS.

Example: X1-Y1:Z1,X2-Y2:Z2,...,Xn-Yn:Zn, where Xn – timestamp in HEX. Yn – HEX value of event ID. Zn – HEX value of custom data field (optional).

### 7.25 **sdformat**

Format sd card (deleta all information from SD card).

## 8 Debug mode

FMB207 is able to transmit its current state when connected to PC using USB cable. It is used to detect errors and provide information to find possible solutions when operating as unexpected. Download Terminal from:

<http://avl1.teltonika.lt/Downloads/Software/Terminal.zip>.

After launching terminal change baud rate to 115200 and handshaking – none. Select COM port which is assigned to “Virtual COM Port”. Click on ‘Start Log’ button and save a new file. Then click ‘Connect’ to start receiving messages from FMB207.

Also you can log NMEA data directly. To get NMEA data, simply enter the following command into the command field: .log\_nmea:1\$0a.

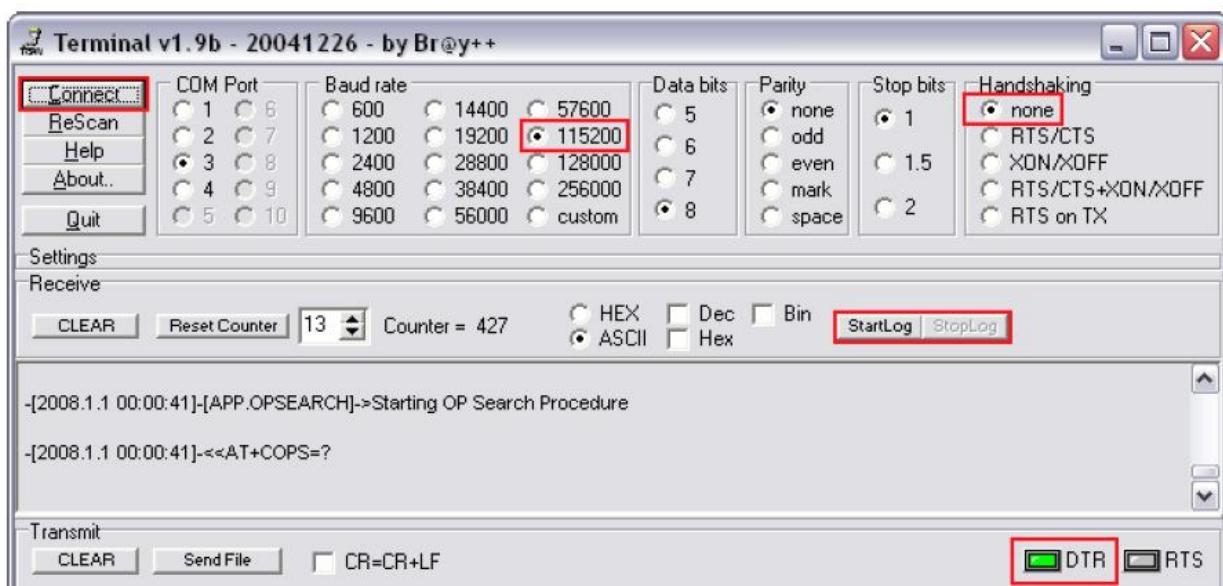


Figure 51. Terminal window for logging

## 9 Parameter List

### 9.1 Parameters value types

S8 – Signed Char  
 S8[n] – String of n Char  
 Uint8 – Unsigned Char  
 Uint16 – Unsigned Short  
 S32 – Signed Integer  
 Uint32 – Unsigned Integer  
 Uint64 – Unsigned Long Long Integer

### 9.2 System parameters

#### 9.2.1 Sleep Mode (ID=102)

Device has three sleep modes: GPS sleep, Deep Sleep and Online Deep Sleep mode. While sleep is disabled (value 0) module will never enter sleep mode, in sleep mode (value 1) module reduces level of power usage by turning GPS module to sleep, in deep sleep mode (value 2) module turns GPS module to sleep and device is deregistered from network (note, that FMB207 do not receive SMS while in deep sleep), online Deep Sleep mode (value 3) device works as in Deep Sleep mode, but without deregistering from GSM network. GSM part stays powered, so this increases power consumption. In this mode, device should received/send SMS and make/receive calls. Also not closes GPRS context, if previously opened.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	3	2	Sleep timeout (ID=103)	Uint8

### 9.2.2 Sleep timeout (ID=103)

Sleep timeout is time after which FMB207 goes to GPS sleep, Deep Sleep or Online Deep Sleep if other requirements are met. It is measured in minutes.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
1	3000	10	Sleep Mode (ID=102)	Uint8

### 9.2.3 Movement Source (ID=100)

Device can operate and change its working mode according to motion detection source: ignition (value 0), movement sensor (value 1), GPS (value 2), CAN speed (value 3).

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	3	1	-	Uint8

### 9.2.4 Static Navigation (ID=106)

When static navigation is enabled, FMB207 filters out GPS jumps, when it is not moving. When it is disabled, it does not make any changes to collected GPS data.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1	1	Static Navigation Settings (ID=112)	Uint8

### 9.2.5 Analog input value range (ID=111)

Sets AIN measurement range: 0 – 10 V, 0 – 30 V (for now 0 – 10 V range works same as 0 – 30 V range).

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1	0		Uint8

### 9.2.6 Static Navigation Settings (ID=112)

Sets static navigation exit (movement) detection sources. 1 – Movement Source, 2 – Ignition Source, 3 – both (Movement or ignition).

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
1	3	1	Static Navigation (ID=106) Movement Source (ID=100) Ignition settings (ID=101)	Uint8

### 9.2.7 Saving/Sending without time synchronization (ID=107)

When this feature is enabled (value = 1), then records can be saved and sent to server without time synchronization.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1	1		Uint8

### 9.2.8 GNSS Source (ID=109)

This parameter sets Satellite System, available values:

0 – Undefined	4 – Galileo only	9 – GPS+Beidou	14–GPS+Galileo +Glonass
2 – Glonass only	5 – Galileo+Beidou	10 – GPS+Glonass	15–GPS, Galileo, Glonass and Beidou and not allowed
1 – Beidou only	6 – Galileo+Glonass	12 – GPS+Galileo	
3 – Galileo+Beidou	8 – GPS only	13 – GPS+ Galileo + Beidou	

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	15	10		Uint8

### 9.2.9 Ignition settings (ID=101)

This parameter sets ignition source available values:

1 – Digital Input	5 – Digital Input and Power Voltage	9 – Digital Input and Engine RPM	13 – Digital Input, Power Voltage and Engine RPM
2 – Accelerometer	6 – Accelerometer and Power Voltage	10 – Accelerometer and Engine RPM	14 – Accelerometer, Power Voltage and Engine RPM
3 – Digital Input and Accelerometer	7 – Digital Input, Accelerometer and Power voltage	11 – Digital Input, Accelerometer and Engine RPM	15 – Digital Input, Accelerometer, Power voltage and Engine RPM
4 – Power voltage	8 – Engine RPM	12 – Power voltage and Engine RPM	

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
1	15	4	High voltage level (ID=104) Low voltage level (ID=105) Movement Start Delay(s) (ID=19001) Movement Stop Delay(s) (ID=19002)	Uint8

### 9.2.10 High voltage level (ID=104)

Sets high level of voltage.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0 (but)	30000	30000	Ignition settings (ID=101) Low voltage level (ID=105)	

higher than low level)				Uint16
------------------------	--	--	--	--------

#### 9.2.11 Low voltage level (ID=105)

Sets low level of voltage.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	29999 (but lower than high level)	13200	Ignition settings (ID=101) High voltage level (ID=104)	Uint16

#### 9.2.12 Movement Start Delay(s) (ID=19001)

What Accelerometer Ignition source delay will be after Ignition on.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
1	60	1	Ignition settings (ID=101) Movement Stop Delay(s) (ID=19002)	Uint8

#### 9.2.13 Movement Stop Delay(s) (ID=19002)

What Accelerometer Ignition source delay will be after Ignition off.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
5	60	60	Ignition settings (ID=101) Movement Start Delay(s) (ID=19001)	Uint16

#### 9.2.14 Led indication (ID=108)

Sets led indication: 0 – disabled, 1 – enabled

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1	1		Uint8

#### 9.2.15 Synchronization settings (ID=900)

Settings used for device internal time synchronization: 0 – GPS only, 1 – NITZ and NTP, 2 – NTP, 3 – NITZ.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	3	1	NTP Resync (ID=901) NTP server 1 (ID=902) NTP server 2 (ID=903)	Uint8

#### 9.2.16 NTP Resync (ID=901)

Periodical time synchronization. If not zero FMB207x will resynchronize time once set period expires.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	24	0	Synchronization settings (ID=900) NTP server 1 (ID=902) NTP server 2 (ID=903)	Uint8

#### 9.2.17 NTP server 1 (ID=902)

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	55 char string	avl1.teltonika.lt	Synchronization settings (ID=900) NTP Resync (ID=901) NTP server 2 (ID=903)	S8[55]

#### 9.2.18 NTP server 2 (ID=903)

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	55 char string	pool.ntp.org	Synchronization settings (ID=900) NTP Resync (ID=901) NTP server 1 (ID=902)	S8[55]

#### 9.2.19 Battery charge mode (ID=110)

Sets when charging is allowed: 0 – On Need, 1 – After Ignition ON.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1	0		Uint8

### 9.3 GPRS parameters

#### 9.3.1 Sorting (ID=1002)

Record sorting parameter is responsible for record sorting order. Value of 0 arranging data starting from newest, while value of 1 arranging data starting from oldest.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1	0	Open Link Timeout (ID=1000) Server Response Timeout (ID=1001)	Uint8

#### 9.3.2 Open Link Timeout (ID=1000)

Defines for how many seconds device will keep connection to the server after successful data transfer while waiting for a new record.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
30	259200	30	Sorting (ID=1002) Server Response Timeout (ID=1001)	Uint32

#### 9.3.3 Server Response Timeout (ID=1001)

Defines time period (in seconds) for server response to sent records.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
5	300	30	Sorting (ID=1002) Open Link Timeout (ID=1000)	Uint16



ATTENTION! Some GSM operators may disconnect the device from an active data link if the device doesn't send any data for a very long time, even if active data link timeout is set to maximum value. The amount of time that an operator keeps the link open depends solely on the operator. For example, if active data link timeout is set to maximum, 259200 seconds (72 hours), and the device sends data to server every 86400 seconds (24 hours), the operator might disconnect the link earlier and the device will have to connect to the server anew. This may cost extra, depending on the operator GPRS data charge. It is strongly recommended, when using active data link timeout, that data sending to the server should not be very rare (24 hours or more). If data sending is more frequent, then the operator will not disconnect the device from the server.

#### 9.3.4 SIM1 GPRS content activation (ID=2000)

Parameter allows or does not allow GPRS usage with SIM1. If GPRS is not allowed value is 0, if GPRS is allowed value is 1.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1	1	SIM1 SIM1 APN Name (ID=2001) SIM1 SIM1 APN username (ID=2002) SIM1 SIM1 APN Password (ID=2003)	Uint8

#### 9.3.5 SIM1 APN Name (ID=2001)

Parameter defines SIM1 GPRS Access Point Name.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	32 char string	Empty	SIM1 SIM1 GPRS content activation (ID=2000) SIM1 SIM1 APN username (ID=2002) SIM1 SIM1 APN Password (ID=2003)	S8[32]

### 9.3.6 SIM1 APN username (ID=2002)

Parameter defines SIM1 APN username. In case operator does not use username for login, value should be empty.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	30 char string	Empty	SIM1 SIM1 GPRS content activation (ID=2000) SIM1 SIM1 APN Name (ID=2001) SIM1 SIM1 APN Password (ID=2003)	S8[30]

### 9.3.7 SIM1 APN Password (ID=2003)

Parameter defines SIM1 APN password. In case operator does not use password for login, value should be empty.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	30 char string	Empty	SIM1 SIM1 GPRS content activation (ID=2000) SIM1 SIM1 APN Name (ID=2001) SIM1 SIM1 APN username (ID=2002)	S8[30]

### 9.3.8 Domain (ID=2004)

Parameter defines AVL data destination server IP address. Example: 212.47.99.62

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	55 char string	Empty	SIM1 GPRS content activation (ID=2000)	S8[55]

### 9.3.9 Target Server Port (ID=2005)

Parameter defines AVL data destination server port number. Example: 12050

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	65535	0	SIM1 GPRS content activation (ID=2000)	Uint16

### 9.3.10 Protocol (ID=2006)

Parameter defines GPRS data transport protocol. Module can use TCP or UDP transport protocol to send data to server. For TCP protocol value is 0, for UDP protocol value is 1.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1	0	SIM1 GPRS content activation (ID=2000)	Uint8

### 9.3.11 Backup Server Domain (ID=2007)

Parameter defines AVL data destination backup server IP address. Example: 212.47.99.61

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	55 char string	Empty	SIM1 GPRS content activation (ID=2000) Backup Server Mode (ID=2010)	S8[55]

### 9.3.12 Backup Server Port (ID=2008)

Parameter defines AVL data destination backup server port number. Example: 12051

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	65535	0	SIM1 GPRS content activation (ID=2000) Backup Server Mode (ID=2010)	Uint16

### 9.3.13 Backup Server Protocol (ID=2009)

Parameter defines GPRS data transport protocol. Module can use TCP or UDP transport protocol to send data to backup server. For TCP protocol value is 0, for UDP protocol value is 1.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1	0	SIM1 GPRS content activation (ID=2000) Backup Server Mode (ID=2010)	Uint8

### 9.3.14 Backup Server Mode (ID=2010)

Sets backup server mode: 0 – Disable (backup server not used), 1 – Backup (sent to backup server if main server not available), 2 – Duplicate (send records to both servers).

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	2	0	SIM1 GPRS content activation (ID=2000)	Uint8

### 9.3.15 FOTA WEB status (ID=13003)

Parameter allows or does not allow connection to FOTA WEB server.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1	1	FOTA WEB Domain (ID=13000) FOTA WEB port (ID=13001) FOTA WEB Period (min) (ID=13002)	Uint8

### 9.3.16 FOTA WEB Domain (ID=13000)

FOTA WEB server IP or DNS address.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	55 char string	85.206.140.106	FOTA WEB status (ID=13003) FOTA WEB port (ID=13001) FOTA WEB Period (min) (ID=13002)	S8[55]

### 9.3.17 FOTA WEB port (ID=13001)

FOTA WEB server port.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	65535	5000	FOTA WEB status (ID=13003) FOTA WEB Domain (ID=13000) FOTA WEB Period (min) (ID=13002)	Uint16

### 9.3.18 FOTA WEB Period (min) (ID=13002)

Period defines how often device is going to connect to server.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
30	65535	720	FOTA WEB status (ID=13003) FOTA WEB Domain (ID=13000) FOTA WEB port (ID=13001)	Uint16

## 9.4 SMS/Call settings

### 9.4.1 SMS data sending settings (ID=3000)

Parameter allows or does not allow sending AVL data using binary SMS. If SMS use is not allowed value is 0 and 1 if SMS use is allowed.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1	0	Data send number (ID=3001)	Uint8

### 9.4.2 Data send number (ID=3001)

In this field are written GSM numbers, to which will be sent Data SMS.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
Empty	16 digits	-	SMS data sending settings (ID=3000)	S8[16]

#### 9.4.3 Authorized phone numbers (ID=4000-4199)

If at least one number is entered then only those number can send messages to device.

Example: +37060012346

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
Empty	16 digits	-	SMS Login (ID=3003) SMS Password (ID=3004)	S8[16]

#### 9.4.4 GSM Predefined Numbers (ID=6000-6009)

In this field GSM numbers are written, to which will be sent "Event SMS" text message.

Example: +37060012346

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
Empty	16 digits	-	GSM number index (ID=3008) Green driving Send SMS to (ID=7034) Over Speeding Send SMS To (ID=7032) Trip Send SMS To (ID=7031) AutoGeofence Send SMS to (ID=7030) Send sms to #1-5 Geozone (ID=7025-7029), #6-50 Geozone (ID=7071-7115) Unplug send sms to (ID=7067) Towing Make Call(Sms Event Number ID) (ID=11604) Towing Send SMS (ID=7066) Crash sms send to (ID=7068) Excessive idling Send SMS To (ID=7033) I/O#1 send SMS (ID=7000) OBD II (Bluetooth) property parameters Send SMS to (ID=7038-7068)	S8[16]

#### 9.4.5 SMS Login (ID=3003)

User login is used to ensure module security. Used in every SMS that is sent to device.

Example: ba321

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
Empty	5 char	-	SMS Password (ID=3004) SMS Event Time Zone (ID=3006)	S8[5]

#### 9.4.6 SMS Password (ID=3004)

User password is used to ensure module security. Used in every SMS that is sent to device.  
Example: ab123

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
Empty	5 char	-	SMS Login (ID=3003) SMS Event Time Zone (ID=3006)	S8[5]

#### 9.4.7 Incoming call action (ID=3005)

Parameter defines action during call: 0 – do nothing, 1 – hang up, 2 – report position, 3 – Not used, 4 –Auto Answer (HF).

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	4	0		Uint8

#### 9.4.8 SMS Event Time Zone (ID=3006)

Time zone which will be used in eventual SMS messages.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
-720	840	0	SMS Password (ID=3004) SMS Login (ID=3003)	Uint16

#### 9.4.9 Hands Free Call Settings (ID=3007)

Parameter defines hands free call trigger:

FMB207: 0 – Disable, 1 – DIN1, 2 – Crash event, 3 – DIN1 and Crash event 4 – DIN2, 5 – DIN1 and DIN2, 6 – Crash event and DIN2, 7 – DIN1, Crash event and DIN2.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	7	0	GSM number index (ID=3008)	Uint16

#### 9.4.10 GSM number index (ID=3008)

Define to what number will be called after configured call trigger is activated. 0 – Disable, 1-10 – call to configured GSM Predefined Number.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	10	0	Hands Free Call Settings (ID=3007) GSM Predefined Numbers (ID=6000-6009)	Uint8

### 9.5 GSM Operators

#### 9.5.1 SIM1 Roaming Operator List (ID=5000-5049)

Parameter defines roaming operator list for SIM 1. According to this list module selects operating profile. If roaming operator list is left empty, FMB207 will automatically detect home operator. If home operator will be written to roaming operator list any part, it will be detected as home operator, not roaming. All other written operators are Preferred Roaming Operator Codes.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	999999	0	Black List (ID=5500-5549)	Uint32

### 9.5.2 Black List (ID=5500-5549)

Operator Black List - if user wants that FMB207 do not connect and work with a particular operator it must be written to Operator Black List.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	999999	0	Roaming Operator List (ID=5000-5049)	Uint32

## 9.6 Data Acquisition Modes parameters

### 9.6.1 Home Network GSM operator code “Vehicle on STOP” parameters

#### 9.6.1.1 Min Period (ID=10000)

This parameter indicates time interval in seconds in order to acquire new record. If value is 0 it means no records by min period will be saved.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	2592000	3600	Min Saved Records (ID=10004) Send Period (ID=10005)	Uint32

#### 9.6.1.2 Min Saved Records (ID=10004)

This parameter defines minimum number of records in one data packet that can be sent to server. It has higher priority than Data Send Period (ID=10005).

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
1	255	1	Min Period (ID=10000) Send Period (ID=10005)	Uint8

#### 9.6.1.3 Send Period (ID=10005)

This parameter indicates frequency (time interval in seconds) of sending data to server.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	2592000	120	Min Period (ID=10000) Min Saved Records (ID=10004)	Uint32

### 9.6.2 Home Network GSM operator code “Vehicle MOVING” parameters

#### 9.6.2.1 Min Period (ID=10050)

This parameter indicates time interval in seconds in order to acquire new record. If value is 0 it means no records by min period will be saved.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	2592000	300	Min Distance (ID=10051) Min Angle (ID=10052)	Uint32

			Min Speed Delta (ID=10053) Min Saved Records (ID=10054) Send Period (ID=10055)	
--	--	--	---	--

#### 9.6.2.2 Min Distance (ID=10051)

This parameter indicates distance in meters in order to acquire new record. Record is stored when the distance between previous records is greater than parameters value. If value is 0 it means no records by min distance will be saved.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	65535	100	Min Period (ID=10050) Min Angle (ID=10052) Min Speed Delta (ID=10053) Min Saved Records (ID=10054) Send Period (ID=10055)	Uint16

#### 9.6.2.3 Min Angle (ID=10052)

This parameter indicates angle in degrees in order to acquire new record. If angle difference between last recorded coordinate and current position is greater than defined value, new record is stored. This parameter is operational, when speed is higher than 10km/h. If value is 0 it means no records by min angle will be saved.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	180	10	Min Period (ID=10050) Min Distance (ID=10051) Min Speed Delta (ID=10053) Min Saved Records (ID=10054) Send Period (ID=10055)	Uint8

#### 9.6.2.4 Min Speed Delta (ID=10053)

This parameter indicates speed difference in order to acquire new record. If speed difference between last recorded coordinate and current position is greater than defined value, new record is stored. If value is 0 it means no records by min speed delta will be saved.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	255	10	Min Period (ID=10050) Min Distance (ID=10051) Min Angle (ID=10052) Min Saved Records (ID=10054) Send Period (ID=10055)	Uint8

#### 9.6.2.5 Min Saved Records (ID=10054)

This parameter defines minimum number of records in one data packet that can be sent to server. It has higher priority than Data Send Period (ID=10055).

Minimum	Maximum	Default value	Goes with (depends on)	Value
---------	---------	---------------	------------------------	-------

value	value		parameters	type
1	255	1	Min Period (ID=10050) Min Distance (ID=10051) Min Angle (ID=10052) Min Speed Delta (ID=10053) Send Period (ID=10055)	Uint8

#### 9.6.2.6 Send Period (ID=10055)

This parameter indicates frequency (time interval in seconds) of sending data to server.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	2592000	120	Min Period (ID=10050) Min Distance (ID=10051) Min Angle (ID=10052) Min Speed Delta (ID=10053) Min Saved Records (ID=10054)	Uint32

### 9.6.3 Roaming Network GSM operator code “Vehicle on STOP” parameters

#### 9.6.3.1 Min Period (ID=10100)

This parameter indicates time interval in seconds in order to acquire new record. If value is 0 it means no records by min period will be saved.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	2592000	3600	Min Saved Records (ID=10104) Send Period (ID=10105)	Uint32

#### 9.6.3.2 Min Saved Records (ID=10104)

This parameter defines minimum number of records in one data packet that can be sent to server. It has higher priority than Data Send Period (ID=10105).

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
1	255	1	Min Period (ID=10100) Send Period (ID=10105)	Uint8

#### 9.6.3.3 Send Period (ID=10105)

This parameter indicates frequency (time interval in seconds) of sending data to server.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	2592000	120	Min Period (ID=10100) Min Saved Records (ID=10104)	Uint32

#### 9.6.4 Roaming Network GSM operator code “Vehicle MOVING” parameters

##### 9.6.4.1 Min Period (ID=10150)

This parameter indicates time interval in seconds in order to acquire new record. If value is 0 it means no records by min period will be saved.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	2592000	300	Min Distance (ID=10151) Min Angle (ID=10152) Min Speed Delta (ID=10153) Min Saved Records (ID=10154) Send Period (ID=10155)	Uint32

##### 9.6.4.2 Min Distance (ID=10151)

This parameter indicates distance in meters in order to acquire new record. Record is stored when the distance between previous records is greater than parameter's value. If value is 0 it means no records by min distance will be saved.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	65535	100	Min Period (ID=10150) Min Angle (ID=10152) Min Speed Delta (ID=10153) Min Saved Records (ID=10154) Send Period (ID=10155)	Uint16

##### 9.6.4.3 Min Angle (ID=10152)

This parameter indicates angle in degrees in order to acquire new record. If angle difference between last recorded coordinate and current position is greater than defined value, new record is stored. This parameter is operational, when speed is higher than 10km/h. If value is 0 it means no records by min angle will be saved.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	180	10	Min Period (ID=10150) Min Distance (ID=10151) Min Speed Delta (ID=10153) Min Saved Records (ID=10154) Send Period (ID=10155)	Uint8

##### 9.6.4.4 Min Speed Delta (ID=10153)

This parameter indicates speed difference in order to acquire new record. If speed difference between last recorded coordinate and current position is greater than defined value, new record is stored. If value is 0 it means no records by min speed delta will be saved.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	255	10	Min Period (ID=10150) Min Distance (ID=10151)	Uint8

			Min Angle (ID=10152) Min Saved Records (ID=10154) Send Period (ID=10155)	
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#### 9.6.4.5 Min Saved Records (ID=10154)

This parameter defines minimum number of records in one data packet that can be sent to server. It has higher priority than Data Send Period (ID=10105).

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
1	255	1	Min Period (ID=10150) Min Distance (ID=10151) Min Angle (ID=10152) Min Speed Delta (ID=10153) Send Period (ID=10155)	Uint8

#### 9.6.4.6 Send Period (ID=10155)

This parameter indicates frequency (time interval in seconds) of sending data to server.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	2592000	120	Min Period (ID=10150) Min Distance (ID=10151) Min Angle (ID=10152) Min Speed Delta (ID=10153) Min Saved Records (ID=10154)	Uint32

### 9.6.5 Unknown Network GSM operator code “Vehicle on STOP” parameters

#### 9.6.5.1 Min Period (ID=10200)

This parameter indicates time interval in seconds in order to acquire new record. If value is 0 it means no records by min period will be saved.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	2592000	3600	Min Saved Records (ID=10204) Send Period (ID=10205)	Uint32

#### 9.6.5.2 Min Saved Records (ID=10204)

This parameter defines minimum number of records in one data packet that can be sent to server. It has higher priority than Data Send Period (ID=10205).

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
1	255	1	Min Period (ID=10200) Send Period (ID=10205)	Uint8

### 9.6.5.3 Send Period (ID=10205)

This parameter indicates frequency (time interval in seconds) of sending data to server.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	2592000	120	Min Period (ID=10200) Min Saved Records (ID=10204)	Uint32

### 9.6.6 Unknown Network GSM operator code “Vehicle MOVING” parameters

#### 9.6.6.1 Min Period (ID=10250)

This parameter indicates time interval in seconds in order to acquire new record. If value is 0 it means no records by min period will be saved.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	2592000	300	Min Distance (ID=10251) Min Angle (ID=10252) Min Speed (ID=10253) Min Saved Records (ID=10254) Send Period (ID=10255)	Uint32

#### 9.6.6.2 Min Distance (ID=10251)

This parameter indicates distance in meters in order to acquire new record. Record is stored when the distance between previous records is greater than parameter's value. If value is 0 it means no records by min distance will be saved.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	65535	100	Min Period (ID=10250) Min Angle (ID=10252) Min Speed (ID=10253) Min Saved Records (ID=10254) Send Period (ID=10255)	Uint16

#### 9.6.6.3 Min Angle (ID=10252)

This parameter indicates angle in degrees in order to acquire new record. If angle difference between last recorded coordinate and current position is greater than defined value, new record is stored. This parameter is operational, when speed is higher than 10km/h. If value is 0 it means no records by min angle will be saved.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	180	10	Min Period (ID=10250) Min Distance (ID=10251) Min Speed (ID=10253) Min Saved Records (ID=10254) Send Period (ID=10255)	Uint8

#### 9.6.6.4 Min Speed (ID=10253)

This parameter indicates speed difference in order to acquire new record. If speed difference between last recorded coordinate and current position is greater than defined value, new record is stored. If value is 0 it means no records by min speed delta will be saved.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	255	10	Min Period (ID=10250) Min Distance (ID=10251) Min Angle (ID=10252) Min Saved Records (ID=10254) Send Period (ID=10255)	Uint8

#### 9.6.6.5 Min Saved Records (ID=10254)

This parameter defines minimum number of records in one data packet that can be sent to server. It has higher priority than Data Send Period (ID=10105).

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
1	255	1	Min Period (ID=10250) Min Distance (ID=10251) Min Angle (ID=10252) Min Speed (ID=10253) Send Period (ID=10255)	Uint8

#### 9.6.6.6 Send Period (ID=10255)

This parameter indicates frequency (time interval in seconds) of sending data to server.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	2592000	120	Min Period (ID=10250) Min Distance (ID=10251) Min Angle (ID=10252) Min Speed (ID=10253) Min Saved Records (ID=10254)	Uint32

### 9.7 Features Parameters

#### 9.7.1 Green driving parameters

##### 9.7.1.1 Green driving priority (ID=11000)

Defines priority of green driving scenario: 0 – disabled, 1 – low, 2 – high, 3 – panic.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	3	0	Max Acceleration Force (ID=11004) Max Braking Force (ID=11005) Max Cornering (ID=11006)	Uint8

			Green/Eco driving (ID=11007) Green driving Send SMS to (ID=7034) Green driving SMS text (ID=8034)	
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#### 9.7.1.2 Max Acceleration Force (ID=11004)

It is max allowed acceleration force which can be reached while accelerating without triggering harsh acceleration event ( $\text{m/s}^2$ ).

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0.5	10	2.2	Green driving priority (ID=11000) Max Braking Force (ID=11005) Max Cornering (ID=11006) Green/Eco driving (ID=11007) Green driving Send SMS to (ID=7034) Green driving SMS text (ID=8034)	float

#### 9.7.1.3 Max Braking Force (ID=11005)

It is max allowed braking force which can be reached while braking without triggering harsh braking event ( $\text{m/s}^2$ ).

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0.5	10	2.5	Green driving priority (ID=11000) Max Acceleration Force (ID=11004) Max Cornering (ID=11006) Green/Eco driving (ID=11007) Green driving Send SMS to (ID=7034) Green driving SMS text (ID=8034)	float

#### 9.7.1.4 Max Cornering (ID=11006)

It is max allowed cornering angle which can be reached while cornering without triggering harsh cornering event ( $\text{m/s}^2$ ).

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0.5	10	2.1	Green driving priority (ID=11000) Max Acceleration Force (ID=11004) Max Braking Force (ID=11005)	float

			Green/Eco driving (ID=11007) Green driving Send SMS to (ID=7034) Green driving SMS text (ID=8034)	
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#### 9.7.1.5 Green/Eco driving (ID=11007)

Choose between Eco driving(accelerometer) and Green driving(gps). 0 – GPS, 1 – Accelerometer

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1	0	Green driving priority (ID=11000) Max Acceleration Force (ID=11004) Max Braking Force (ID=11005) Max Cornering (ID=11006) Green driving Send SMS to (ID=7034) Green driving SMS text (ID=8034)	Uint8

#### 9.7.1.6 Green driving Send SMS to (ID=7034)

Enable/disable sms event sending. 0 – Disable, 1-10 – sms will be sent to configured GSM number.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	10	0	Green driving priority (ID=11000) Max Acceleration Force (ID=11004) Max Braking Force (ID=11005) Max Cornering (ID=11006) Green/Eco driving (ID=11007) Green driving SMS text (ID=8034) GSM Predefined Numbers (ID=6000-6009)	Uint8

#### 9.7.1.7 Green driving SMS text (ID=8034)

Configure green driving sms event text here.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	160 char	Green Driving	Green driving priority (ID=11000) Max Acceleration Force	S8[160]

			(ID=11004) Max Braking Force (ID=11005) Max Cornering (ID=11006) Green/Eco driving (ID=11007) Green driving Send SMS to (ID=7034)	
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### 9.7.2 Overspeeding scenario parameters

#### 9.7.2.1 Overspeeding priority (ID=11100)

Defines priority of overspeeding scenario: 0 – disabled, 1 – low, 2 – high, 3 – panic.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	3	0	Max allowed Speed (ID=11104) Over Speeding Send SMS To (ID=7032) Over Speeding SMS Text (ID=8032)	Uint8

#### 9.7.2.2 Max allowed Speed (ID=11104)

It is max allowed speed which can be reached. If this value exceeded Over speeding event will occur.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	260	90	Overspeeding priority (ID=11100) Over Speeding Send SMS To (ID=7032) Over Speeding SMS Text (ID=8032)	Uint16

#### 9.7.2.3 Overspeeding Send SMS To (ID=7032)

Enable/disable sms event sending. 0 – Disable, 1-10 – sms will be sent to configured GSM number.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	10	0	Overspeeding priority (ID=11100) Max allowed Speed (ID=11104) Over Speeding SMS Text (ID=8032) GSM Predefined Numbers (ID=6000-6009)	Uint8

#### 9.7.2.4 Overspeeding SMS Text (ID=8032)

Configure over speeding sms event text here.

Minimum	Maximum value	Default value	Goes with (depends on) parameters	Value type
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<b>value</b>				
0	160 char	Overspeeding	Overspeeding priority (ID=11100) Max allowed Speed (ID=11104) Over Speeding Send SMS To (ID=7032)	S8[160]

### 9.7.3 Jamming scenario parameters

#### 9.7.3.1 Jamming priority (ID=11300)

Scenario settings: 0 – Disable, 1 – Low, 2 – High, 3 – Panic

<b>Minimum value</b>	<b>Maximum value</b>	<b>Default value</b>	<b>Goes with (depends on) parameters</b>	<b>Value type</b>
0	3	0	Jamming Eventual records (ID=11303) Time Until Jamming Event Detection(ID=11305)	Uint8

#### 9.7.3.2 Jamming Eventual records (ID=11303)

Disables or enables eventual records. 0 – Disable, 1 – Enable

<b>Minimum value</b>	<b>Maximum value</b>	<b>Default value</b>	<b>Goes with (depends on) parameters</b>	<b>Value type</b>
0	1	1	Jamming priority (ID=11300) Time Until Jamming Event Detection(ID=11305)	Uint8

#### 9.7.3.3 Time Until Jamming Event Detection(ID=11305)

After Jamming trigger count TMO (in seconds), generate event after this timeout. If Jamming End trigger is detected during counting no event will be generated.

<b>Minimum value</b>	<b>Maximum value</b>	<b>Default value</b>	<b>Goes with (depends on) parameters</b>	<b>Value type</b>
0	65535	60	Jamming priority (ID=11300) Jamming Eventual records (ID=11303)	Uint16

### 9.7.4 Immobilizer scenario parameters

#### 9.7.4.1 Scenario settings (ID=11700)

Scenario settings: 0 – Disable, 1 – Low Priority, 2 – High Priority, 3 – Panic Priority.

<b>Minimum value</b>	<b>Maximum value</b>	<b>Default value</b>	<b>Goes with (depends on) parameters</b>	<b>Value type</b>
0	3	0	Eventual records (ID=11701) Send SMS to (ID=7140) SMS text (ID=8140)	Uint8

#### 9.7.4.2 Eventual records (ID=11701)

Disables or enables eventual records. 0 – Disable, 1 – Enable

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1	1	Scenario settings (ID=11700) Send SMS to (ID=7140) SMS text (ID=8140)	Uint8

#### 9.7.4.3 Send SMS to (ID=7140)

Enable/disable sms event sending. 0 – Disable, 1-10 – sms will be sent to configured GSM number.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	10	0	Scenario settings (ID=11700) Eventual records (ID=11701) SMS text (ID=8140)	Uint8

#### 9.7.4.4 SMS text (ID=8140)

Configure Immobilizer sms event text here.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	160	Immobilizer	Scenario settings (ID=11700) Eventual records (ID=11701) Send SMS to (ID=7140)	String

### 9.7.5 Trip scenario parameters

#### 9.7.5.1 Trip priority (ID=11800)

Defines priority of trip scenario:

0 – disabled, 1 – low, 2 – high, 3 – panic

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	3	0	Eventually Records (ID=11801) Trip mode (ID=11802) Start Speed (ID=11803) Ignition Off Timeout (ID=11804) Eco Score allowed events (ID=700) Trip Send SMS To (ID=7031) Trip SMS Text (ID=8031) Odometer distance calculation source (ID=11806)	Uint8

#### 9.7.5.2 Eventually Records (ID=11801)

Disables or enables eventual records. 0 – Disable, 1 – Enable.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1	0	Trip priority (ID=11800) Trip mode (ID=11802) Start Speed (ID=11803)	Uint8

			Ignition Off Timeout (ID=11804) Eco Score allowed events (ID=700) Trip Send SMS To (ID=7031) Trip SMS Text (ID=8031) Odometer distance calculation source (ID=11806)	
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#### 9.7.5.3 Trip mode (ID=11802)

For this feature I/O ODOMETER must be enabled. If I/O ODOMETER is enabled, and mode is set to Continuous (value 0), TRIP distance is going to be counted till the end of trip, if between records mode is set, ODOMETER will count distance only between two records.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1	0	Trip priority (ID=11800) Eventually Records (ID=11801) Start Speed (ID=11803) Ignition Off Timeout (ID=11804) Eco Score allowed events (ID=700) Trip Send SMS To (ID=7031) Trip SMS Text (ID=8031) Odometer distance calculation source (ID=11806)	Uint8

#### 9.7.5.4 Start Speed (ID=11803)

This parameter represents speed (km/h), which is detected as minimum speed to indicate TRIP START and generate event.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	255	5	Trip priority (ID=11800) Eventually Records (ID=11801) Trip mode (ID=11802) Ignition Off Timeout (ID=11804) Eco Score allowed events (ID=700) Trip Send SMS To (ID=7031) Trip SMS Text (ID=8031) Odometer distance calculation source (ID=11806)	Uint8

#### 9.7.5.5 Ignition Off Timeout (ID=11804)

This parameter represents timeout to wait if ignition (ignition source) is off in order to detect TRIP STOP and generate event.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	65535	60	Trip priority (ID=11800) Eventually Records (ID=11801)	Uint16

			Trip mode (ID=11802) Start Speed (ID=11803) Eco Score allowed events (ID=700) Trip Send SMS To (ID=7031) Trip SMS Text (ID=8031) Odometer distance calculation source (ID=11806)	
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#### 9.7.5.6 Eco Score allowed events (ID=700)

How much Eco score events are allowed to generate in 100 km trip distance, that ECO score result would be excellent (10).

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	65535	10	Trip priority (ID=11800) Eventually Records (ID=11801) Trip mode (ID=11802) Start Speed (ID=11803) Ignition Off Timeout (ID=11804) Trip Send SMS To (ID=7031) Trip SMS Text (ID=8031) Odometer distance calculation source (ID=11806)	UInt16

#### 9.7.5.7 Trip Send SMS To (ID=7031)

Enable/disable sms event sending. 0 – Disable, 1-10 – sms will be sent to configured GSM number.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	10	0	Trip priority (ID=11800) Eventually Records (ID=11801) Trip mode (ID=11802) Start Speed (ID=11803) Ignition Off Timeout (ID=11804) Eco Score allowed events (ID=700) Trip SMS Text (ID=8031) Odometer distance calculation source (ID=11806) GSM Predefined Numbers (ID=6000-6009)	UInt8

#### 9.7.5.8 Trip SMS Text (ID=8031)

Configure trip sms event text here.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type

0	160	Trip	Trip priority (ID=11800) Eventually Records (ID=11801) Trip mode (ID=11802) Start Speed (ID=11803) Ignition Off Timeout (ID=11804) Eco Score allowed events (ID=700) Trip Send SMS To (ID=7031) Odometer distance calculation source (ID=11806)	S8[160]
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#### 9.7.5.9 Odometer distance calculation source (ID=11806)

Sets odometer distance calculation source: 0 – GNSS, 1 – OBD (Bluetooth dongle), 2 – LVCAN

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	2	0	Trip priority (ID=11800) Eventually Records (ID=11801) Trip mode (ID=11802) Start Speed (ID=11803) Ignition Off Timeout (ID=11804) Eco Score allowed events (ID=700) Trip Send SMS To (ID=7031) Trip SMS Text (ID=8031)	Uint8

#### 9.7.5.10 Total Odometer value (ID=11807)

Sets total odometer value (km).

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	9999999	0	I/O Total Odometer (ID=50160-50164)	Uint32

### 9.8 AutoGeofencing scenario parameters

#### 9.8.1 AutoGeofencing priority (ID=20000)

Defines priority of autogeofencing scenario:

0 – disabled, 1 – low, 2 – high, 3 – panic

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	3	0	Eventual Records (ID=20002) Activation Timeout (ID=20003) Deactivate by (ID=20005) AutoGeofence event generating (ID=20001) Radius (ID=20004) Send sms to (ID=7030) SMS Text (ID=8030)	Uint8

### 9.8.2 Eventual Records (ID=20002)

0 – disable, include parameter to all records, 1 – enable, include parameter to record only if event was generated.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1	1	AutoGeofencing priority (ID=20000) Activation Timeout (ID=20003) Deactivate by (ID=20005) AutoGeofence event generating (ID=20001) Radius (ID=20004) Send sms to (ID=7030) SMS Text (ID=8030)	Uint8

### 9.8.3 Activation Timeout (ID=20003)

Parameter represents AutoGeofencing activation timeout in seconds.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	65535	60	AutoGeofencing priority (ID=20000) Eventual Records (ID=20002) Deactivate by (ID=20005) AutoGeofence event generating (ID=20001) Radius (ID=20004) Send sms to (ID=7030) SMS Text (ID=8030)	Uint16

### 9.8.4 Deactivate by (ID=20005)

Parameter defines Autogeofence deactivation source. Value 0 - Power Voltage, 1 - Digital Input 1, 2 – Engine RPM, 3 – Digital Input 2, 4 – Digital input 3.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	5	0	AutoGeofencing priority (ID=20000) Eventual Records (ID=20002) Activation Timeout (ID=20003) AutoGeofence event generating (ID=20001) Radius (ID=20004) Send sms to (ID=7030) SMS Text (ID=8030)	Uint8

### 9.8.5 AutoGeofence event generating (ID=20001)

Generate event: 0 – on exiting zone , 1 – on entering zone; 2 – on both;

Minimum	Maximum	Default value	Goes with (depends on)	Value

value	value		parameters	type
0	2	0	AutoGeofencing priority (ID=20000) Eventual Records (ID=20002) Activation Timeout (ID=20003) Deactivate by (ID=20005) Radius (ID=20004) Send sms to (ID=7030) SMS Text (ID=8030)	Uint8

#### 9.8.6 Radius (ID=20004)

Parameter represents radius of circle with center device coordinates after activating AutoGeofence feature.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1000000	100	AutoGeofencing priority (ID=20000) Eventual Records (ID=20002) Activation Timeout (ID=20003) Deactivate by (ID=20005) AutoGeofence event generating (ID=20001) Send sms to (ID=7030) SMS Text (ID=8030)	Uint32

#### 9.8.7 AutoGeofence Send SMS to (ID=7030)

Enable/disable sms event sending. 0 – Disable, 1-10 – sms will be sent to configured GSM number.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	10	0	AutoGeofencing priority (ID=20000) Eventual Records (ID=20002) Activation Timeout (ID=20003) Deactivate by (ID=20005) AutoGeofence event generating (ID=20001) Radius (ID=20004) SMS Text (ID=8030) GSM Predefined Numbers (ID=6000-6009)	U64

#### 9.8.8 SMS Text (ID=8030)

Configure AutoGeofence sms event text here.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type

0	160	AutoGeofence	AutoGeofencing priority (ID=20000) Eventual Records (ID=20002) Activation Timeout (ID=20003) Deactivate by (ID=20005) AutoGeofence event generating (ID=20001) Radius (ID=20004) Send sms to (ID=7030)	S8[180]
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## 9.9 Manual Geofence

### 9.9.1 First Geozone parameters

First Geozone parameters configuration. All 50 geozones are configured with the same logic.

#### 9.9.1.1 #1 Geozone Manual Geofencing priority (ID=20100)

0 – disabled, 1 – low, 2 – high, 3 – panic

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	3	0	#1 Geozone Manual Geofence event generating (ID=20101) #1 Geozone Eventual Records (ID=20102) #1 Geozone Frame border (ID=20103) #1 Geozone Shape type (ID=20104) #1 Geozone Radius (ID=20105) #1 Geozone X1 (ID=20106) #1 Geozone Y1 (ID=20107) #1 Geozone X2 (ID=20108) #1 Geozone X1 (ID=20109) #1 Geozone OverSpeeding (ID=20110) #1 Geozone Max allowed speed (ID=20111)	Uint8

#### 9.9.1.2 #1 Geozone Manual Geofence event generating (ID=20101)

Generate event: 0 – No event, 1 - on exiting zone, 2 – on entering zone; 3 – on both;

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	3	0	#1 Geozone Manual Geofencing priority (ID=20100) #1 Geozone Eventual Records (ID=20102) #1 Geozone Frame border (ID=20103)	Uint8

			#1 Geozone Shape type (ID=20104) #1 Geozone Radius (ID=20105) #1 Geozone X1 (ID=20106) #1 Geozone Y1 (ID=20107) #1 Geozone X2 (ID=20108) #1 Geozone X1 (ID=20109) #1 Geozone OverSpeeding (ID=20110) #1 Geozone Max allowed speed (ID=20111)	
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#### 9.9.1.3 #1 Geozone Eventual Records (ID=20102)

0 – disable, include parameter to all records, 1 – enable, include parameter to record only if event was generated.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1	1	#1 Geozone Manual Geofencing priority (ID=20100) #1 Geozone Manual Geofence event generating (ID=20101) #1 Geozone Frame border (ID=20103) #1 Geozone Shape type (ID=20104) #1 Geozone Radius (ID=20105) #1 Geozone X1 (ID=20106) #1 Geozone Y1 (ID=20107) #1 Geozone X2 (ID=20108) #1 Geozone X1 (ID=20109) #1 Geozone OverSpeeding (ID=20110) #1 Geozone Max allowed speed (ID=20111)	Uint8

#### 9.9.1.4 #1 Geozone Frame border (ID=20103)

Frame border is an additional border around Geofence zone.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1000000	1	#1 Geozone Manual Geofencing priority (ID=20100) #1 Geozone Manual Geofence event generating (ID=20101) #1 Geozone Eventual Records (ID=20102) #1 Geozone Shape type (ID=20104) #1 Geozone Radius (ID=20105)	Uint32

			#1 Geozone X1 (ID=20106) #1 Geozone Y1 (ID=20107) #1 Geozone X2 (ID=20108) #1 Geozone X1 (ID=20109) #1 Geozone OverSpeeding (ID=20110) #1 Geozone Max allowed speed (ID=20111)	
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#### 9.9.1.5 #1 Geozone Shape type (ID=20104)

Shape type: 0 – Circle, 1 - Rectangle.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1	0	#1 Geozone Manual Geofencing priority (ID=20100) #1 Geozone Manual Geofence event generating (ID=20101) #1 Geozone Eventual Records (ID=20102) #1 Geozone Frame border (ID=20103) #1 Geozone Radius (ID=20105) #1 Geozone X1 (ID=20106) #1 Geozone Y1 (ID=20107) #1 Geozone X2 (ID=20108) #1 Geozone X1 (ID=20109) #1 Geozone OverSpeeding (ID=20110) #1 Geozone Max allowed speed (ID=20111)	Uint8

#### 9.9.1.6 #1 Geozone Radius (ID=20105)

Radius of circle when circular zone is used (radius in meters).

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
5	1000000	5	#1 Geozone Manual Geofencing priority (ID=20100) #1 Geozone Manual Geofence event generating (ID=20101) #1 Geozone Eventual Records (ID=20102) #1 Geozone Frame border (ID=20103) #1 Geozone Shape type (ID=20104) #1 Geozone X1 (ID=20106) #1 Geozone Y1 (ID=20107)	Uint32

			#1 Geozone X2 (ID=20108) #1 Geozone X1 (ID=20109) #1 Geozone OverSpeeding (ID=20110) #1 Geozone Max allowed speed (ID=20111)	
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#### 9.9.1.7 #1 Geozone X1 (ID=20106)

Geofence zone left bottom corner X coordinate (longitude).

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
-180	180	0	#1 Geozone Manual Geofencing priority (ID=20100) #1 Geozone Manual Geofence event generating (ID=20101) #1 Geozone Eventual Records (ID=20102) #1 Geozone Frame border (ID=20103) #1 Geozone Shape type (ID=20104) #1 Geozone Radius (ID=20105) #1 Geozone Y1 (ID=20107) #1 Geozone X2 (ID=20108) #1 Geozone X1 (ID=20109) #1 Geozone OverSpeeding (ID=20110) #1 Geozone Max allowed speed (ID=20111)	Double

#### 9.9.1.8 #1 Geozone Y1 (ID=20107)

Geofence zone left bottom corner Y coordinate (latitude).

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
-90	90	0	#1 Geozone Manual Geofencing priority (ID=20100) #1 Geozone Manual Geofence event generating (ID=20101) #1 Geozone Eventual Records (ID=20102) #1 Geozone Frame border (ID=20103) #1 Geozone Shape type (ID=20104) #1 Geozone Radius (ID=20105) #1 Geozone X1 (ID=20106) #1 Geozone X2 (ID=20108) #1 Geozone X1 (ID=20109)	Double

			#1 Geozone OverSpeeding (ID=20110) #1 Geozone Max allowed speed (ID=20111)	
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#### 9.9.1.9 #1 Geozone X2 (ID=20108)

Geofence zone upper right corner X coordinate (longitude).

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
-180	180	0	#1 Geozone Manual Geofencing priority (ID=20100) #1 Geozone Manual Geofence event generating (ID=20101) #1 Geozone Eventual Records (ID=20102) #1 Geozone Frame border (ID=20103) #1 Geozone Shape type (ID=20104) #1 Geozone Radius (ID=20105) #1 Geozone X1 (ID=20106) #1 Geozone Y1 (ID=20107) #1 Geozone X1 (ID=20109) #1 Geozone OverSpeeding (ID=20110) #1 Geozone Max allowed speed (ID=20111)	Double

#### 9.9.1.10 #1 Geozone X1 (ID=20109)

Geofence zone upper right corner Y coordinate (latitude).

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
-90	90	0	#1 Geozone Manual Geofencing priority (ID=20100) #1 Geozone Manual Geofence event generating (ID=20101) #1 Geozone Eventual Records (ID=20102) #1 Geozone Frame border (ID=20103) #1 Geozone Shape type (ID=20104) #1 Geozone Radius (ID=20105) #1 Geozone X1 (ID=20106) #1 Geozone Y1 (ID=20107) #1 Geozone X2 (ID=20108) #1 Geozone OverSpeeding (ID=20110)	Double

			#1 Geozone Max allowed speed (ID=20111)	
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#### 9.9.1.11 #1 Geozone OverSpeeding (ID=20110)

Enable/disable overspeeding event in geozone.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1	0	#1 Geozone Manual Geofencing priority (ID=20100) #1 Geozone Manual Geofence event generating (ID=20101) #1 Geozone Eventual Records (ID=20102) #1 Geozone Frame border (ID=20103) #1 Geozone Shape type (ID=20104) #1 Geozone Radius (ID=20105) #1 Geozone X1 (ID=20106) #1 Geozone Y1 (ID=20107) #1 Geozone X2 (ID=20108) #1 Geozone X1 (ID=20109) #1 Geozone Max allowed speed (ID=20111)	Uint8

#### 9.9.1.12 #1 Geozone Max allowed speed (ID=20111)

It is max allowed speed which can be reached in geozone (km/h).

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1000	90	#1 Geozone Manual Geofencing priority (ID=20100) #1 Geozone Manual Geofence event generating (ID=20101) #1 Geozone Eventual Records (ID=20102) #1 Geozone Frame border (ID=20103) #1 Geozone Shape type (ID=20104) #1 Geozone Radius (ID=20105) #1 Geozone X1 (ID=20106) #1 Geozone Y1 (ID=20107) #1 Geozone X2 (ID=20108) #1 Geozone X1 (ID=20109) #1 Geozone OverSpeeding (ID=20110)	Uint16

### 9.9.2 Other Geozones

Other Geozone's parameters have the same logic as shown in Geozone #1.

GeoFence Zone Number	Geofence Zone's parameters
1	20100-20111
2	20120-20131
3	20140-20151
...	...
49	21060-21071
50	21080-21091

#### 9.9.2.1 Send sms to #1-5 Geozone (ID=7025-7029), #6-50 Geozone (ID=7071-7115)

Enable/disable sms event sending. 0 – Disable, 1-10 – sms will be sent to configured GSM number.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	10	0	GSM Predefined Numbers (ID=6000-6009) SMS Text #1-5 Geozone (ID=8025-8029), #6-50 Geozone (ID=8071-8115)	Uint8

#### 9.9.2.2 SMS Text #1-5 Geozone (ID=8025-8029), #6-50 Geozone (ID=8071-8115)

Configure geozone # sms event text here.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	160	Geozone Zone #	Send sms to #1-5 Geozone (ID=7025-7029), #6-50 Geozone (ID=7071-7115)	S8[160]

## 9.10 GPS Fuel counter

This functionality is meant to calculate fuel consumption based on set consumption values in different situations.

### 9.10.1 City Consumption L/100km (ID=11900)

Consumption in the city

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	50	0	Highway Consumption L/100km (ID=11901) Average Consumption L/100km (ID=11902) City Speed [km/h] (ID=11903) Highway Speed [km/h] (ID=11904) Average Speed [km/h] (ID=11905) Correction coefficient (ID=11906) Fuel Consumption on Idling [L/h] (ID=11907) Higher Speeds Add [%] (ID=11908) Highway Consumption every km/h (ID=11909)	Double

### 9.10.2 Highway Consumption L/100km (ID=11901)

Consumption on highway

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	50	0	City Consumption L/100km (ID=11900) Average Consumption L/100km (ID=11902) City Speed [km/h] (ID=11903) Highway Speed [km/h] (ID=11904) Average Speed [km/h] (ID=11905) Correction coefficient (ID=11906) Fuel Consumption on Idling [L/h] (ID=11907) Higher Speeds Add [%] (ID=11908) Highway Consumption every km/h (ID=11909)	Double

### 9.10.3 Average Consumption L/100km (ID=11902)

Average fuel consumption of the vehicle

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	50	0	City Consumption L/100km (ID=11900) Highway Consumption L/100km (ID=11901) City Speed [km/h] (ID=11903) Highway Speed [km/h] (ID=11904) Average Speed [km/h] (ID=11905) Correction coefficient (ID=11906) Fuel Consumption on Idling [L/h] (ID=11907) Higher Speeds Add [%] (ID=11908) Highway Consumption every km/h (ID=11909)	Double

### 9.10.4 City Speed [km/h] (ID=11903)

Speed in the city

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	250	30	City Consumption L/100km (ID=11900) Highway Consumption L/100km (ID=11901) Average Consumption L/100km (ID=11902) Highway Speed [km/h] (ID=11904) Average Speed [km/h] (ID=11905) Correction coefficient (ID=11906) Fuel Consumption on Idling [L/h] (ID=11907) Higher Speeds Add [%] (ID=11908) Highway Consumption every km/h (ID=11909)	Unit64

#### 9.10.5 Highway Speed [km/h] (ID=11904)

Speed on highway

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	250	90	City Consumption L/100km (ID=11900) Highway Consumption L/100km (ID=11901) Average Consumption L/100km (ID=11902) City Speed [km/h] (ID=11903) Average Speed [km/h] (ID=11905) Correction coefficient (ID=11906) Fuel Consumption on Idling [L/h] (ID=11907) Higher Speeds Add [%] (ID=11908) Highway Consumption every km/h (ID=11909)	Unit64

#### 9.10.6 Average Speed [km/h] (ID=11905)

Average speed of the vehicle

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	250	60	City Consumption L/100km (ID=11900) Highway Consumption L/100km (ID=11901) Average Consumption L/100km (ID=11902) City Speed [km/h] (ID=11903) Highway Speed [km/h] (ID=11904) Correction coefficient (ID=11906) Fuel Consumption on Idling [L/h] (ID=11907) Higher Speeds Add [%] (ID=11908) Highway Consumption every km/h (ID=11909)	Unit64

#### 9.10.7 Correction coefficient (ID=11906)

Correction coefficient is used for correction every value of fuel consumption which is sent to server (Used Fuel \* Correction coefficient).

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0.01	2	1	City Consumption L/100km (ID=11900) Highway Consumption L/100km (ID=11901) Average Consumption L/100km (ID=11902) City Speed [km/h] (ID=11903) Highway Speed [km/h] (ID=11904) Average Speed [km/h] (ID=11905) Fuel Consumption on Idling [L/h] (ID=11907) Higher Speeds Add [%] (ID=11908) Highway Consumption every km/h (ID=11909)	Double

#### 9.10.8 Fuel Consumption on Idling [L/h] (ID=11907)

Sets fuel consumption while vehicle is idling

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	5	1	City Consumption L/100km (ID=11900) Highway Consumption L/100km (ID=11901) Average Consumption L/100km (ID=11902) City Speed [km/h] (ID=11903) Highway Speed [km/h] (ID=11904) Average Speed [km/h] (ID=11905) Correction coefficient (ID=11906) Higher Speeds Add [%] (ID=11908) Highway Consumption every km/h (ID=11909)	Double

#### 9.10.9 Higher Speeds Add [%] (ID=11908)

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	250	20	City Consumption L/100km (ID=11900) Highway Consumption L/100km (ID=11901) Average Consumption L/100km (ID=11902) City Speed [km/h] (ID=11903) Highway Speed [km/h] (ID=11904) Average Speed [km/h] (ID=11905) Correction coefficient (ID=11906) Fuel Consumption on Idling [L/h] (ID=11907) Highway Consumption every km/h (ID=11909)	Uint64

#### 9.10.10 Highway Consumption every km/h (ID=11909)

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	100	50	City Consumption L/100km (ID=11900) Highway Consumption L/100km (ID=11901) Average Consumption L/100km (ID=11902) City Speed [km/h] (ID=11903) Highway Speed [km/h] (ID=11904) Average Speed [km/h] (ID=11905) Correction coefficient (ID=11906) Fuel Consumption on Idling [L/h] (ID=11907) Higher Speeds Add [%] (ID=11908)	Uint64

## 9.11 Accelerometer Features

### 9.11.1 Unplug Detection

#### 9.11.1.1 Scenario settings (ID=11500)

Sets priority of the scenario: 0 – Disable, 1 – Low Priority, 2 – High Priority, 3 – Panic Priority

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	3	0	Eventual records (ID=11501) Unplug detection mode (ID=11502) Send sms to (ID=7067) SMS Text (ID=8067)	Uint8

#### 9.11.1.2 Eventual records (ID=11501)

If enabled, only eventual records of unplug detection will be sent. 0 – Disable, 1 – Enable

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1	1	Scenario settings (ID=11500) Unplug detection mode (ID=11502) Send sms to (ID=7067) SMS Text (ID=8067)	Uint8

#### 9.11.1.3 Unplug detection mode (ID=11502)

Sets Unplug detection mode. 0 – simple, 1 – advanced.

Simple – unplug detection according to external voltage only

Advanced – unplug detection according to: external voltage and accelerometer

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1	0	Scenario settings (ID=11500) Eventual records (ID=11501) Send sms to (ID=7067) SMS Text (ID=8067)	Uint8

#### 9.11.1.4 Unplug send sms to (ID=7067)

Enable/disable sms event sending. 0 – Disable, 1-10 – sms will be sent to configured GSM number.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	10	0	Scenario settings (ID=11500) Eventual records (ID=11501) Unplug detection mode (ID=11502) SMS Text (ID=8067) GSM Predefined Numbers (ID=6000-6009)	Uint8

### 9.11.1.5 SMS Text (ID=8067)

Configure unplug detection sms event text here.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	160	Unplug	Scenario settings (ID=11500) Eventual records (ID=11501) Unplug detection mode (ID=11502) Unplug send sms to (ID=7067)	S8[160]

### 9.11.2 Towing Detection

#### 9.11.2.1 Scenario setting (ID=11600)

0 – disabled, 1 – low, 2 – high, 3 – panic

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	3	0	Eventual Records (ID=11601) Activation Timeout (min) (ID=11602) Event Timeout (s) (ID=11603) Make Call(Sms Event Number ID) (ID=11604) Treshold (mg) (ID=11605) Angle (deg) (ID=11606) Duration (msec) (ID=11607) Towing Send SMS (ID=7066) SMS Text (ID=8066)	Uint8

#### 9.11.2.2 Eventual Records (ID=11601)

Generate event: 0 – disable; 1 – enable.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1	1	Scenario setting (ID=11600) Activation Timeout (min) (ID=11602) Event Timeout (s) (ID=11603) Make Call(Sms Event Number ID) (ID=11604) Treshold (mg) (ID=11605) Angle (deg) (ID=11606) Duration (msec) (ID=11607) Towing Send SMS (ID=7066) SMS Text (ID=8066)	Uint8

#### 9.11.2.3 Activation Timeout (min) (ID=11602)

Activation timeout is time after which FMB207 turns ON Towing detection function if other requirement is met (Ignition OFF state detected).

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	65535	5	Scenario setting (ID=11600)	Uint16

			Eventual Records (ID=11601) Event Timeout (s) (ID=11603) Make Call(Sms Event Number ID) (ID=11604) Treshold (mg) (ID=11605) Angle (deg) (ID=11606) Duration (msec) (ID=11607) Towing Send SMS (ID=7066) SMS Text (ID=8066)	
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#### 9.11.2.4 Event Timeout (s) (ID=11603)

Defines time period (in second) to check ignition state when Acceleration or Angle value reach. If towing event is generated during this time period, it is skipped. It allows to filter out redundant towing event while entering car.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	60	0	Scenario setting (ID=11600) Eventual Records (ID=11601) Activation Timeout (min) (ID=11602) Make Call(Sms Event Number ID) (ID=11604) Treshold (mg) (ID=11605) Angle (deg) (ID=11606) Duration (msec) (ID=11607) Towing Send SMS (ID=7066) SMS Text (ID=8066)	Uint8

#### 9.11.2.5 Towing Make Call(Sms Event Number ID) (ID=11604)

If function enabled makes call to specified phone number (configured in pre defined numbers).

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	10	0	GSM Predefined Numbers (ID=6000-6009) Scenario setting (ID=11600) Eventual Records (ID=11601) Activation Timeout (min) (ID=11602) Event Timeout (s) (ID=11603) Treshold (mg) (ID=11605) Angle (deg) (ID=11606) Duration (msec) (ID=11607) Towing Send SMS (ID=7066) SMS Text (ID=8066)	Uint8

#### 9.11.2.6 Threshold (mg) (ID=11605)

Value used to detect towing when ignition is OFF.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0.1	5	0.22	Scenario setting (ID=11600) Eventual Records (ID=11601) Activation Timeout (min) (ID=11602) Event Timeout (s) (ID=11603) Make Call(Sms Event Number ID) (ID=11604) Angle (deg) (ID=11606) Duration (msec) (ID=11607) Towing Send SMS (ID=7066) SMS Text (ID=8066)	Double

#### 9.11.2.7 Angle (deg) (ID=11606)

Value used to detect towing when ignition is OFF.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0.1	5	1	Scenario setting (ID=11600) Eventual Records (ID=11601) Activation Timeout (min) (ID=11602) Event Timeout (s) (ID=11603) Make Call(Sms Event Number ID) (ID=11604) Threshold (mg) (ID=11605) Duration (msec) (ID=11607) Towing Send SMS (ID=7066) SMS Text (ID=8066)	Double

#### 9.11.2.8 Duration (msec) (ID=11607)

Defines time period to check Acceleration, angle values.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
1	5000	1000	Scenario setting (ID=11600) Eventual Records (ID=11601) Activation Timeout (min) (ID=11602) Event Timeout (s) (ID=11603) Make Call(Sms Event Number ID) (ID=11604) Threshold (mg) (ID=11605) Angle (deg) (ID=11606) Towing Send SMS (ID=7066) SMS Text (ID=8066)	Uint16

### 9.11.2.9 Towing Send SMS (ID=7066)

Enable/disable sms event sending. 0 – Disable, 1-10 – sms will be sent to configured GSM number.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	10	0	GSM Predefined Numbers (ID=6000-6009) Scenario setting (ID=11600) Eventual Records (ID=11601) Activation Timeout (min) (ID=11602) Event Timeout (s) (ID=11603) Make Call(Sms Event Number ID) (ID=11604) Treshold (mg) (ID=11605) Angle (deg) (ID=11606) Duration (msec) (ID=11607) SMS Text (ID=8066)	Uint8

### 9.11.2.10 SMS Text (ID=8066)

Configure Towing detection sms event text here.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	160	Towing	Scenario setting (ID=11600) Eventual Records (ID=11601) Activation Timeout (min) (ID=11602) Event Timeout (s) (ID=11603) Make Call(Sms Event Number ID) (ID=11604) Treshold (mg) (ID=11605) Angle (deg) (ID=11606) Duration (msec) (ID=11607) Towing Send SMS (ID=7066)	S8[180]

## 9.11.3 Crash Detection

### 9.11.3.1 Scenario settings (ID=11400)

Sets priority of the scenario: 0 – Disable, 1 – Low Priority, 2 – High Priority, 3 – Panic Priority

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	3	0	Duration [ms] (ID=11401) Treshold [mG] (ID=11402) Crash trace (ID=11406) Crash sms send to (ID=7068) SMS Text (ID=8068)	Uint8

#### 9.11.3.2 Duration [ms] (ID=11401)

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1000	5	Scenario settings (ID=11400) Treshold [mG] (ID=11402) Crash trace (ID=11406) Crash sms send to (ID=7068) SMS Text (ID=8068)	Uint8

#### 9.11.3.3 Threshold [mG] (ID=11402)

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	7900	1500	Scenario settings (ID=11400) Duration [ms] (ID=11401) Crash trace (ID=11406) Crash sms send to (ID=7068) SMS Text (ID=8068)	Uint16

#### 9.11.3.4 Crash trace (ID=11406)

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1	0	Scenario settings (ID=11400) Duration [ms] (ID=11401) Treshold [mG] (ID=11402) Crash sms send to (ID=7068) SMS Text (ID=8068)	Uint8

#### 9.11.3.5 Crash sms send to (ID=7068)

Enable/disable sms event sending. 0 – Disable, 1-10 – sms will be sent to configured GSM number.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	10	0	GSM Predefined Numbers (ID=6000-6009) Scenario settings (ID=11400) Duration [ms] (ID=11401) Treshold [mG] (ID=11402) Crash trace (ID=11406) SMS Text (ID=8068)	Uint8

#### 9.11.3.6 SMS Text (ID=8068)

Configure Crash sms event text here.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	160	Crash	Scenario settings (ID=11400)	S8[160]

			Duration [ms] (ID=11401) Treshold [mG] (ID=11402) Crash trace (ID=11406) Crash sms send to (ID=7068)	
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#### 9.11.4 Excessive idling

##### 9.11.4.1 Excessive idling priority (ID=11200)

Defines priority of Excessive idling scenario:

0 – disabled, 1 – low, 2 – high, 3 – panic

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	3	0	Eventual records (ID=11203) Excessive idling minimum stop duration (ID=11205) Excessive idling minimum move duration (ID=11206) Excessive idling Send SMS To (ID=7033) Excessive idling SMS Text (ID=8033)	UInt8

##### 9.11.4.2 Eventual records (ID=11203)

Disables (0) or enables (1) eventual records with idling value.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1	1	Excessive idling priority (ID=11200) Excessive idling minimum stop duration (ID=11205) Excessive idling minimum move duration (ID=11206) Excessive idling Send SMS To (ID=7033) Excessive idling SMS Text (ID=8033)	UInt8

##### 9.11.4.3 Excessive idling time to stopped (ID=11205)

Defines minimum time in seconds of vehicle idling before scenario enables.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	3600	300	Excessive idling priority (ID=11200) Eventual records (ID=11203) Excessive idling minimum move duration (ID=11206) Excessive idling Send SMS To (ID=7033)	UInt8

			Excessive idling SMS Text (ID=8033)	
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#### 9.11.4.4 Excessive idling time to moving (ID=11206)

Defines minimum time in seconds of vehicle idling before scenario disables.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	3600	5	Excessive idling priority (ID=11200) Eventual records (ID=11203) Excessive idling minimum stop duration (ID=11205) Excessive idling Send SMS To (ID=7033) Excessive idling SMS Text (ID=8033)	UInt8

#### 9.11.4.5 Excessive idling Send SMS To (ID=7033)

Enable/disable sms event sending. 0 – Disable, 1-10 – sms will be sent to configured GSM number.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	10	0	GSM Predefined Numbers (ID=6000-6009) Excessive idling priority (ID=11200) Eventual records (ID=11203) Excessive idling minimum stop duration (ID=11205) Excessive idling minimum move duration (ID=11206) Excessive idling SMS Text (ID=8033)	UInt8

#### 9.11.4.6 Excessive idling SMS Text (ID=8033)

Configure excessive idling sms event text here.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	160	Idling Event	Excessive idling priority (ID=11200) Eventual records (ID=11203) Excessive idling minimum stop duration (ID=11205) Excessive idling minimum move duration (ID=11206) Excessive idling Send SMS To (ID=7033)	S8[160]

## 9.12 Bluetooth

### 9.12.1.1 BT Radio (ID=800)

Enables or disable Bluetooth feature. 0 – Disabled, 1 – Enable hidden, 2 – Enable visible

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	2	0	Local name (ID 801) Local PIN (ID=802) Security mode (ID=803) External MAC (ID=804) External name (ID=805) External PIN (ID=806) Connection mode (ID=807) Authorized devices MAC list (ID=830 - 834)	Uint8

### 9.12.1.2 Local name (ID 801)

Parameter defines a visible name of FMB207 device.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0 Symbols	30 Symbols	FMB207_(last 7 IMEI numbers)	BT Radio (ID=800) Local PIN (ID=802) Security mode (ID=803) External MAC (ID=804) External name (ID=805) External PIN (ID=806) Connection mode (ID=807) Authorized devices MAC list (ID=830 - 834)	S8[30]

### 9.12.1.3 Local PIN (ID=802)

Parameter Lets to configure Bluetooth PIN.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0 Symbols	4 Symbols	5555	BT Radio (ID=800) Local name (ID 801) Security mode (ID=803) External MAC (ID=804) External name (ID=805) External PIN (ID=806) Connection mode (ID=807) Authorized devices MAC list (ID=830 - 834)	String

### 9.12.1.4 Security mode (ID=803)

Parameter defines a security mode of FMBX device. 0 – PIN only, 1 – PIN and MAC, 2 – MAC only, 3 – None.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	3	0	BT Radio (ID=800) Local name (ID 801) Local PIN (ID=802) External MAC (ID=804) External name (ID=805) External PIN (ID=806) Connection mode (ID=807) Authorized devices MAC list (ID=830 - 834)	Uint8

#### 9.12.1.5 External MAC (ID=804)

Defines external device's MAC, for FMB207 to auto connect to.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0 symbols	12 symbols	0	BT Radio (ID=800) Local name (ID 801) Local PIN (ID=802) Security mode (ID=803) External name (ID=805) External PIN (ID=806) Connection mode (ID=807) Authorized devices MAC list (ID=830 - 834)	string

#### 9.12.1.6 External name (ID=805)

Defines external device's name, for FMB207 to auto connect to.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0 symbols	30 symbols	0	BT Radio (ID=800) Local name (ID 801) Local PIN (ID=802) Security mode (ID=803) External MAC (ID=804) External PIN (ID=806) Connection mode (ID=807) Authorized devices MAC list (ID=830 - 834)	string

#### 9.12.1.7 External PIN (ID=806)

Defines external device's PIN, for FMB207 to auto connect to.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0 symbols	8 symbols	0	BT Radio (ID=800) Local name (ID 801) Local PIN (ID=802) Security mode (ID=803)	string

			External MAC (ID=804) External name (ID=805) Connection mode (ID=807) Authorized devices MAC list (ID=830 - 834)	
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#### 9.12.1.8 Connection mode (ID=807)

Defines a mode in which FMB207 will connect to external devices. 0 – None,

1 – FMB207 will connect to Hands Free Headset, 2 – FMB207 will connect to OBDII Bluetooth dongle, 3 – Data Link.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	3	0	BT Radio (ID=800) Local name (ID 801) Local PIN (ID=802) Security mode (ID=803) External MAC (ID=804) External name (ID=805) External PIN (ID=806) Authorized devices MAC list (ID=830 - 834)	Uint8

#### 9.12.1.9 Authorized devices MAC list (ID=830 - 834)

Parameter allows to add an authorized devices MAC for connection to FMB207

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0 symbols	12 symbols	-	BT Radio (ID=800) Local name (ID 801) Local PIN (ID=802) Security mode (ID=803) External MAC (ID=804) External name (ID=805) External PIN (ID=806) Connection mode (ID=807)	String

### 9.13 I/O parameters

I/O properties are additional data sources which are recorded along with usual GPS data.

#### 9.13.1 I/O#1 property parameter priority Ignition (ID=50000)

Parameter defines I/O property type of priority: 0 is disabled, 1 – low, 2 – high, 3 - panic.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	3	1	I/O#1 operand (ID=50001) I/O#1 High level (ID=50002) I/O#1 Low level (ID=50003) I/O#1 Event only (ID=50004) I/O#1 averaging length (ID=50005) I/O#1 send SMS (ID=7000) I/O#1 SMS text (ID=8000)	Uint8

### 9.13.2 I/O#1 operand (ID=50001)

Parameter defines when event is sent: 0 – on range exit, 1 – on range entrance, 2 – both, 3 – monitoring, 4 – hysteresis, 5 – on changes, 6 – on delta change.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	6	0	I/O#1 property parameter priority Ignition (ID=50000) I/O#1 High level (ID=50002) I/O#1 Low level (ID=50003) I/O#1 Event only (ID=50004) I/O#1 averaging length (ID=50005) I/O#1 send SMS (ID=7000) I/O#1 SMS text (ID=8000)	Uint8

### 9.13.3 I/O#1 High level (ID=50002)

Parameter defines high value of triggered I/O property. This parameter is used to set thresholds for I/O properties to generate events.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1	0	I/O#1 property parameter priority Ignition (ID=50000) I/O#1 operand (ID=50001) I/O#1 Low level (ID=50003) I/O#1 Event only (ID=50004) I/O#1 averaging length (ID=50005) I/O#1 send SMS (ID=7000) I/O#1 SMS text (ID=8000)	Uint8

### 9.13.4 I/O#1 Low level (ID=50003)

Parameter defines low value of triggered I/O property. This parameter is used to set thresholds for I/O properties to generate events.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1	0	I/O#1 property parameter priority Ignition (ID=50000) I/O#1 operand (ID=50001) I/O#1 High level (ID=50002) I/O#1 Event only (ID=50004) I/O#1 averaging length (ID=50005) I/O#1 send SMS (ID=7000) I/O#1 SMS text (ID=8000)	Uint8

### 9.13.5 I/O#1 Event only (ID=50004)

Parameter defines when IO element value is sent: 0 – with every AVL packet, 1 – on event only. On event means that IO element value is included to AVL packet only when this particular event happens. With regular, periodic records such IO element value is not included.

Minimal value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1	0	I/O#1 property parameter priority Ignition (ID=50000) I/O#1 operand (ID=50001) I/O#1 High level (ID=50002) I/O#1 Low level (ID=50003) I/O#1 averaging length (ID=50005) I/O#1 send SMS (ID=7000) I/O#1 SMS text (ID=8000)	Uint8

#### 9.13.6 I/O#1 averaging length (ID=50005)

Parameter defines I/O property sample length to average.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	65535	10	I/O#1 property parameter priority Ignition (ID=50000) I/O#1 operand (ID=50001) I/O#1 High level (ID=50002) I/O#1 Low level (ID=50003) I/O#1 Event only (ID=50004) I/O#1 send SMS (ID=7000) I/O#1 SMS text (ID=8000)	Uint16

#### 9.13.7 I/O#1 send SMS (ID=7000)

Enable/disable sms event sending. 0 – Disable, 1-10 – sms will be sent to configured GSM number.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	10	0	GSM Predefined Numbers (ID=6000-6009) I/O#1 property parameter priority Ignition (ID=50000) I/O#1 operand (ID=50001) I/O#1 High level (ID=50002) I/O#1 Low level (ID=50003) I/O#1 Event only (ID=50004) I/O#1 SMS text (ID=8000)	Uint8

#### 9.13.8 I/O#1 SMS text (ID=8000)

Configure I/O#1 sms event text here.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	160	Ignition	I/O#1 property parameter priority Ignition (ID=50000) I/O#1 operand (ID=50001) I/O#1 High level (ID=50002) I/O#1 Low level (ID=50003) I/O#1 Event only (ID=50004) I/O#1 send SMS (ID=7000)	S8[160]

### 9.13.9 I\O elements parameters and types.

**Priority:** 0 – disabled, 1 – low, 2 – high, 3 – panic.

**Operand:** 0 – On Exit, 1 – On Entrance, 2 – On Both, 3 – Monitoring, 4 – On Hysteresis, 5 – On Change, 6 – On Delta Change.

**Event only:** 0 – No, 1 – Yes.

Table 16. Parameters for FMB207 devices

Parameter ID	Parameter Type	Default value	Value range		Parameter name
			Min	Max	
50000	Uint8	1	0	3	Ignition Priority
50001	Uint8	5	0	6	Ignition Operand
50002	Uint8	0	0	1	Ignition High level
50003	Uint8	0	0	1	Ignition Low level
50004	Uint8	0	0	1	Ignition Event only
50005	Uint16	10	0	65535	Ignition Average
7000	Uint8	0	0	10	Send SMS
8000	String	0	0	160	SMS Text
50010	Uint8	1	0	3	Movement Priority
50011	Uint8	5	0	6	Movement Operand
50012	Uint8	0	0	1	Movement High level
50013	Uint8	0	0	1	Movement Low level
50014	Uint8	0	0	1	Movement Event only
50015	Uint16	1	0	65535	Movement Average
7001	Uint8	0	0	10	Send SMS
8001	String	0	0	160	SMS Text
50020	Uint8	1	0	3	Data Mode Priority
50021	Uint8	3	0	6	Data Mode Operand
50022	Uint8	0	0	5	Data Mode High level
50023	Uint8	0	0	5	Data Mode Low level
50024	Uint8	0	0	1	Data Mode Event only
7002	Uint8	0	0	10	Send SMS
8002	String	0	0	160	SMS Text
50030	Uint8	1	0	3	GSM Signal Priority
50031	Uint8	3	0	6	GSM Signal Operand
50032	Uint8	0	0	5	GSM Signal High level
50033	Uint8	0	0	5	GSM Signal Low level
50034	Uint8	0	0	1	GSM Signal Event only
50035	Uint16	1	0	65535	GSM Signal Average
7003	Uint8	0	0	10	Send SMS
8003	String	0	0	160	SMS Text
50040	Uint8	1	0	3	Deep Sleep Priority
50041	Uint8	3	0	6	Deep Sleep Operand
50042	Uint8	0	0	2	Deep Sleep High level
50043	Uint8	0	0	2	Deep Sleep Low level
50044	Uint8	0	0	1	Deep Sleep Event only
7004	Uint8	0	0	10	Send SMS
8004	String	0	0	160	SMS Text
50050	Uint8	1	0	3	GNSS Status Priority
50051	Uint8	3	0	6	GNSS Status Operand
50052	Uint8	0	0	5	GNSS Status High level
50053	Uint8	0	0	5	GNSS Status Low level

Parameter ID	Parameter Type	Default value	Value range		Parameter name
			Min	Max	
50053	Uint8	0	0	1	GNSS Status Event only
7005	Uint8	0	0	10	Send SMS
8005	String	0	0	160	SMS Text
50060	Uint8	0	0	3	GNSS PDOP Priority
5061	Uint8	3	0	6	GNSS PDOP Operand
5062	Uint16	0	0	1000	GNSS PDOP High level
5063	Uint16	0	0	1000	GNSS PDOP Low level
5064	Uint8	0	0	1	GNSS PDOP Event only
5065	Uint16	10	0	65535	GNSS PDOP Average
7006	Uint8	0	0	10	Send SMS
8006	String	0	0	160	SMS Text
50070	Uint8	1	0	3	GNSS HDOP Priority
50071	Uint8	3	0	6	GNSS HDOP Operand
50072	Uint16	0	0	1000	GNSS HDOP High level
50073	Uint16	0	0	1000	GNSS HDOP Low level
50074	Uint8	0	0	1	GNSS HDOP Event only
50075	Uint16	10	0	65535	GNSS HDOP Average
7007	Uint8	0	0	10	Send SMS
8007	String	0	0	160	SMS Text
50080	Uint8	1	0	3	External Voltage Priority
50081	Uint8	6	0	6	External Voltage Operand
50082	Uint16	1000	0	60000	External Voltage High level
50083	Uint16	0	0	60000	External Voltage Low level
50084	Uint8	0	0	1	External Voltage Event only
50085	Uint16	10	0	65535	External Voltage Average
7008	Uint8	0	0	10	Send SMS
8008	String	0	0	160	SMS Text
50090	Uint8	1	0	3	Speed Priority
50091	Uint8	3	0	6	Speed Operand
50092	Uint16	0	0	300	Speed High level
50093	Uint16	0	0	300	Speed Low level
50094	Uint8	0	0	1	Speed Event only
50095	Uint16	1	0	65535	Speed Average
7009	Uint8	0	0	10	Send SMS
8009	String	0	0	160	SMS Text
50100	Uint8	0	0	3	GSM Cell ID Priority
50101	Uint8	3	0	6	GSM Cell ID Operand
50102	Uint32	0	0	999999	GSM Cell ID High level
50103	Uint32	0	0	999999	GSM Cell ID Low level
50104	Uint8	0	0	1	GSM Cell ID Event only
7010	Uint8	0	0	10	Send SMS
8010	String	0	0	160	SMS Text
50110	Uint8	0	0	3	GSM Area Code Priority
50111	Uint8	3	0	6	GSM Area Code Operand
50112	Uint32	0	0	999999	GSM Area Code High level
50113	Uint32	0	0	999999	GSM Area Code Low level
50114	Uint8	0	0	1	GSM Area Code Event only
7011	Uint8	0	0	10	Send SMS
8011	String	0	0	160	SMS Text

Parameter ID	Parameter Type	Default value	Value range		Parameter name
			Min	Max	
50120	Uint8	1	0	3	Battery Voltage Priority
50121	Uint8	3	0	6	Battery Voltage Operand
50122	Uint16	0	0	5000	Battery Voltage High level
50123	Uint16	0	0	5000	Battery Voltage Low level
50124	Uint8	0	0	1	Battery Voltage Event only
50125	Uint8	0	0	10	Battery Voltage Average
7012	Uint8	0	0	10	Send SMS
8012	String	0	0	160	SMS Text
50130	Uint8	1	0	3	Battery Current Priority
50131	Uint8	3	0	6	Battery Current Operand
50132	Uint16	0	0	5000	Battery Current High level
50133	Uint16	0	0	5000	Battery Current Low level
50134	Uint8	0	0	1	Battery Current Event only
50135	Uint8	0	0	10	Battery Current Average
7013	Uint8	0	0	10	Send SMS
8013	String	0	0	160	SMS Text
50140	Uint8	0	0	3	Active GSM Operator Priority
50141	Uint8	3	0	6	Active GSM Operator Operand
50142	Uint32	0	0	999999	Active GSM Operator High level
50143	Uint32	0	0	999999	Active GSM Operator Low level
50144	Uint8	0	0	1	Active GSM Operator Event only
7014	Uint8	0	0	10	Send SMS
8014	String	0	0	160	SMS Text
50150	Uint8	0	0	3	Trip Odometer Priority
50151	Uint8	3	0	6	Trip Odometer Operand
50152	Uint32	0	0	1000000	Trip Odometer High level
50153	Uint32	0	0	1000000	Trip Odometer Low level
50154	Uint8	0	0	1	Trip Odometer Event only
7015	Uint8	0	0	10	Send SMS
8015	String	0	0	160	SMS Text
50160	Uint8	0	0	3	Total Odometer Priority
50161	Uint8	3	0	6	Total Odometer Operand
50162	Uint32	0	0	10000000	Total Odometer High level
50163	Uint32	0	0	10000000	Total Odometer Low level
50164	Uint8	0	0	1	Total Odometer Event only
7016	Uint8	0	0	10	Send SMS
8016	String	0	0	160	SMS Text
50170	Uint8	0	0	3	Digital Input 1 Priority
50171	Uint8	3	0	6	Digital Input 1 Operand
50172	Uint8	0	0	1	Digital Input 1 High level
50173	Uint8	0	0	1	Digital Input 1 Low level
50174	Uint8	0	0	1	Digital Input 1 Event only
50175	Uint16	1	0	65535	Digital Input 1 Average
7017	Uint8	0	0	10	Send SMS
8017	String	0	0	160	SMS Text
50180	Uint8	0	0	3	Analog Input 1 Priority
50181	Uint8	3	0	6	Analog Input 1 Operand
50182	Uint16	0	0	30000	Analog Input 1 High level
50183	Uint16	0	0	30000	Analog Input 1 Low level

Parameter ID	Parameter Type	Default value	Value range		Parameter name
			Min	Max	
50184	Uint8	0	0	1	Analog Input 1 Event only
50185	Uint16	10	0	65535	Analog Input 1 Average
7018	Uint8	0	0	10	Send SMS
8018	String	0	0	160	SMS Text
50290	Uint8	0	0	3	Analog Input 2 Priority
50291	Uint8	3	0	6	Analog Input 2 Operand
50292	Uint16	0	0	30000	Analog Input 2 High level
50293	Uint16	0	0	30000	Analog Input 2 Low level
50294	Uint8	0	0	1	Analog Input 2 Event only
50295	Uint16	0	0	65535	Analog Input 2 Average
8118	Uint8	0	0	10	Send SMS
8117	String	0	0	160	SMS Text
50200	Uint8	0	0	3	Fuel Used GPS Priority
50201	Uint8	3	0	6	Fuel Used GPS Operand
50202	Uint32	0	0	1000000	Fuel Used GPS High level
50203	Uint32	0	0	1000000	Fuel Used GPS Low level
50204	Uint8	0	0	1	Fuel Used GPS Event only
50205	Uint16	1	0	65535	Fuel Used GPS Average
7020	Uint8	0	0	10	Send SMS
8020	String	0	0	160	SMS Text
50210	Uint8	0	0	3	Fuel Rate GPS Priority
50211	Uint8	3	0	6	Fuel Rate GPS Operand
50212	Uint32	0	0	1000000	Fuel Rate GPS High level
50213	Uint32	0	0	1000000	Fuel Rate GPS Low level
50214	Uint8	0	0	1	Fuel Rate GPS Event only
50215	Uint16	1	0	65535	Fuel Rate GPS Average
7021	Uint8	0	0	10	Send SMS
8021	String	0	0	160	SMS Text
50220	Uint8	0	0	3	Axis X Priority
50221	Uint8	3	0	6	Axis X Operand
50222	Uint16	0	-8000	8000	Axis X High level
50223	Uint16	0	-8000	8000	Axis X Low level
50224	Uint8	0	0	1	Axis X Event only
50225	Uint16	1	0	65535	Axis X Average
7022	Uint8	0	0	10	Send SMS
8022	String	0	0	160	SMS Text
50230	Uint8	0	0	3	Axis Y Priority
50231	Uint8	3	0	6	Axis Y Operand
50232	Uint16	0	-8000	8000	Axis Y High level
50233	Uint16	0	-8000	8000	Axis Y Low level
50234	Uint8	0	0	1	Axis Y Event only
50235	Uint16	1	0	65535	Axis Y Average
7023	Uint8	0	0	10	Send SMS
8023	String	0	0	160	SMS Text
50240	Uint8	0	0	3	Axis Z Priority
50241	Uint8	3	0	6	Axis Z Operand
50242	Uint16	0	-8000	8000	Axis Z High level
50243	Uint16	0	-8000	8000	Axis Z Low level
50244	Uint8	0	0	1	Axis Z Event only

Parameter ID	Parameter Type	Default value	Value range		Parameter name
			Min	Max	
50245	Uint16	1	0	65535	Axis Z Average
7024	Uint8	0	0	10	Send SMS
8024	String	0	0	160	SMS Text
50250	Uint8	0	0	3	ICCID Priority
50251	Uint8	3	0	6	ICCID Operand
50254	Uint8	0	0	1	ICCID Event only
7069	Uint8	0	0	10	Send SMS
8069	String	0	0	160	SMS Text
50260	Uint8	0	0	3	SD Status Priority
50261	Uint8	3	0	6	SD Status Operand
50262	Uint8	0	0	1	SD Status High level
50263	Uint8	0	0	1	SD Status Low level
7070	Uint8	0	0	10	Send SMS
8070	String	0	0	160	SMS Text
50400	Uint8	0	0	3	RFID Priority
50401	Uint8	3	0	6	RFID Operand
50402	Uint32	0	0	999999999	RFID High level
50403	Uint32	0	0	999999999	RFID Low level
50404	Uint8	0	0	1	RFID Event only
50405	Uint16	1	0	65535	RFID Average
7129	Uint8	0	0	10	Send SMS
8129	String	0	0	160	SMS Text
50410	Uint8	0	0	3	LLS1 Fuel Level Priority
50411	Uint8	3	0	6	LLS1 Fuel Level Operand
50412	Uint16	0	0	65535	LLS1 Fuel Level High level
50413	Uint16	0	0	65535	LLS1 Fuel Level Low level
50414	Uint8	0	0	1	LLS1 Fuel Level Event only
50415	Uint16	1	0	65535	LLS1 Fuel Level Average
7130	Uint8	0	0	10	Send SMS
8130	String	0	0	160	SMS Text
50420	Uint8	0	0	3	LLS2 Fuel Level Priority
50421	Uint8	3	0	6	LLS2 Fuel Level Operand
50422	Uint16	0	0	65535	LLS2 Fuel Level High level
50423	Uint16	0	0	65535	LLS2 Fuel Level Low level
50424	Uint8	0	0	1	LLS2 Fuel Level Event only
50425	Uint16	1	0	65535	LLS2 Fuel Level Average
7131	Uint8	0	0	10	Send SMS
8131	String	0	0	160	SMS Text
50430	Uint8	0	0	3	LLS3 Fuel Level Priority
50431	Uint8	3	0	6	LLS3 Fuel Level Operand
50432	Uint16	0	0	65535	LLS3 Fuel Level High level
50433	Uint16	0	0	65535	LLS3 Fuel Level Low level
50434	Uint8	0	0	1	LLS3 Fuel Level Event only
50435	Uint16	1	0	65535	LLS3 Fuel Level Average
7132	Uint8	0	0	10	Send SMS
8132	String	0	0	160	SMS Text
50440	Uint8	0	0	3	LLS4 Fuel Level Priority
50441	Uint8	3	0	6	LLS4 Fuel Level Operand
50442	Uint16	0	0	65535	LLS4 Fuel Level High level

Parameter ID	Parameter Type	Default value	Value range		Parameter name
			Min	Max	
50443	Uint16	0	0	65535	LLS4 Fuel Level Low level
50444	Uint8	0	0	1	LLS4 Fuel Level Event only
50445	Uint16	1	0	65535	LLS4 Fuel Level Average
7133	Uint8	0	0	10	Send SMS
8133	String	0	0	160	SMS Text
50450	Uint8	0	0	3	LLS5 Fuel Level Priority
50451	Uint8	3	0	6	LLS5 Fuel Level Operand
50452	Uint16	0	0	65535	LLS5 Fuel Level High level
50453	Uint16	0	0	65535	LLS5 Fuel Level Low level
50454	Uint8	0	0	1	LLS5 Fuel Level Event only
50455	Uint16	1	0	65535	LLS5 Fuel Level Average
7134	Uint8	0	0	10	Send SMS
8134	String	0	0	160	SMS Text
50460	Uint8	0	0	3	LLS1 Temperature Priority
50461	Uint8	3	0	6	LLS1 Temperature Operand
50462	Int8	0	-128	127	LLS1 Temperature High level
50463	Int8	0	-128	127	LLS1 Temperature Low level
50464	Uint8	0	0	1	LLS1 Temperature Event only
50465	Uint16	1	0	65535	LLS1 Temperature Average
7135	Uint8	0	0	10	Send SMS
8135	String	0	0	160	SMS Text
50470	Uint8	0	0	3	LLS2 Temperature Priority
50471	Uint8	3	0	6	LLS2 Temperature Operand
50472	Int8	0	-128	127	LLS2 Temperature High level
50473	Int8	0	-128	127	LLS2 Temperature Low level
50474	Uint8	0	0	1	LLS2 Temperature Event only
50475	Uint16	1	0	65535	LLS2 Temperature Average
7136	Uint8	0	0	10	Send SMS
8136	String	0	0	160	SMS Text
50480	Uint8	0	0	3	LLS3 Temperature Priority
50481	Uint8	3	0	6	LLS3 Temperature Operand
50482	Int8	0	-128	127	LLS3 Temperature High level
50483	Int8	0	-128	127	LLS3 Temperature Low level
50484	Uint8	0	0	1	LLS3 Temperature Event only
50485	Uint16	1	0	65535	LLS3 Temperature Average
7137	Uint8	0	0	10	Send SMS
8137	String	0	0	160	SMS Text
50490	Uint8	0	0	3	LLS4 Temperature Priority
50491	Uint8	3	0	6	LLS4 Temperature Operand
50492	Int8	0	-128	127	LLS4 Temperature High level
50493	Int8	0	-128	127	LLS4 Temperature Low level
50494	Uint8	0	0	1	LLS4 Temperature Event only
50495	Uint16	1	0	65535	LLS4 Temperature Average
7138	Uint8	0	0	10	Send SMS
8138	String	0	0	160	SMS Text
50500	Uint8	0	0	3	LLS5 Temperature Priority
50501	Uint8	3	0	6	LLS5 Temperature Operand
50502	Int8	0	-128	127	LLS5 Temperature High level
50503	Int8	0	-128	127	LLS5 Temperature Low level

Parameter ID	Parameter Type	Default value	Value range		Parameter name
			Min	Max	
50504	Uint8	0	0	1	LLS5 Temperature Event only
50505	Uint16	1	0	65535	LLS5 Temperature Average
7139	Uint8	0	0	10	Send SMS
8139	String	0	0	160	SMS Text
50510	Uint8	0	0	3	Eco Score Priority
50511	Uint8	3	0	6	Eco Score Operand
50512	Uint8	0	0	1	Eco Score High level
50513	Uint8	0	0	1	Eco Score Low level
50514	Uint8	0	0	1	Eco Score Event only
7220	Uint8	0	0	10	Send SMS
8220	String	0	0	160	SMS Text
50270	Uint8	0	0	3	Digital Input 2 Priority
50271	Uint8	3	0	6	Digital Input 2 Operand
50272	Uint8	0	0	1	Digital Input 2 High level
50273	Uint8	0	0	1	Digital Input 2 Low level
50274	Uint8	0	0	1	Digital Input 2 Event only
50275	Uint16	0	0	65535	Digital Input 2 Average
7116	Uint8	0	0	10	Send SMS
8116	String	0	0	160	SMS Text
50280	Uint8	0	0	3	Digital Input 3 Priority
50281	Uint8	3	0	6	Digital Input 3 Operand
50282	Uint8	0	0	1	Digital Input 3 High level
50283	Uint8	0	0	1	Digital Input 3 Low level
50284	Uint8	0	0	1	Digital Input 3 Event only
50285	Uint16	0	0	65535	Digital Input 3 Average
7117	Uint8	0	0	10	Send SMS
8117	String	0	0	160	SMS Text
50710	Uint8	0	0	3	Digital Input 4 Priority
50711	Uint8	3	0	6	Digital Input 4 Operand
50712	Uint8	0	0	1	Digital Input 4 High level
50713	Uint8	0	0	1	Digital Input 4 Low level
50714	Uint8	0	0	1	Digital Input 4 Event only
50715	Uint16	1	0	65535	Digital Input 4 Average
7249	Uint8	0	0	10	Send SMS
8249	String	0	0	160	SMS Text

## 9.14 OBD II (Bluetooth)

### 9.14.1 1<sup>st</sup> OBD II (Bluetooth) property parameter priority (ID=40100)

Parameter defines OBD II property type of priority: 0 is disabled, 1 – low, 2 – high, 3 - panic.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	3	0	1st OBD II (Bluetooth) property parameter operand (ID=40101) 1st OBD II (Bluetooth) property parameter High level (ID=40102) 1st OBD II (Bluetooth) property parameter Low level (ID=40103) 1st OBD II (Bluetooth) property	Uint8

			parameter Event only (ID=40104) 1st OBD II (Bluetooth) property parameters Send SMS to (ID=7038) 1st OBD II (Bluetooth) property parameters SMS Text (ID=8038)	
--	--	--	--	--

#### 9.14.2 1<sup>st</sup> OBD II (Bluetooth) property parameter operand (ID=40101)

Parameter defines when event is sent: 0 – on range exit, 1 – on range entrance, 2 – both, 3 – monitoring, 4 – hysteresis, 5 – on changes, 6 – on delta change.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	6	3	1st OBD II (Bluetooth) property parameter priority (ID=40100) 1st OBD II (Bluetooth) property parameter High level (ID=40102) 1st OBD II (Bluetooth) property parameter Low level (ID=40103) 1st OBD II (Bluetooth) property parameter Event only (ID=40104) 1st OBD II (Bluetooth) property parameters Send SMS to (ID=7038) 1st OBD II (Bluetooth) property parameters SMS Text (ID=8038)	Uint8

#### 9.14.3 1<sup>st</sup> OBD II (Bluetooth) property parameter High level (ID=40102)

Parameter defines high value of triggered OBD II property. This parameter is used to set thresholds for OBD II properties to generate events.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	255	0	1st OBD II (Bluetooth) property parameter priority (ID=40100) 1st OBD II (Bluetooth) property parameter operand (ID=40101) 1st OBD II (Bluetooth) property parameter Low level (ID=40103) 1st OBD II (Bluetooth) property parameter Event only (ID=40104) 1st OBD II (Bluetooth) property parameters Send SMS to (ID=7038) 1st OBD II (Bluetooth) property parameters SMS Text (ID=8038)	Uint8

#### 9.14.4 1<sup>st</sup> OBD II (Bluetooth) property parameter Low level (ID=40103)

Parameter defines low value of triggered OBD II property. This parameter is used to set thresholds for OBD II properties to generate events.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	255	0	1st OBD II (Bluetooth) property parameter priority (ID=40100) 1st OBD II (Bluetooth) property parameter operand (ID=40101) 1st OBD II (Bluetooth) property parameter High level (ID=40102) 1st OBD II (Bluetooth) property parameter Event only (ID=40104) 1st OBD II (Bluetooth) property parameters Send SMS to (ID=7038) 1st OBD II (Bluetooth) property parameters SMS Text (ID=8038)	Uint8

#### 9.14.5 1<sup>st</sup> OBD II (Bluetooth) property parameter Event only (ID=40104)

Parameter defines when OBD II element value is sent: 0 – with every AVL packet, 1 – on event only. On event means that OBD II element value is included to AVL packet only when this particular event happens. With regular, periodic records such OBD II element value is not included.

Minimal value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	1	0	1st OBD II (Bluetooth) property parameter priority (ID=40100) 1st OBD II (Bluetooth) property parameter operand (ID=40101) 1st OBD II (Bluetooth) property parameter High level (ID=40102) 1st OBD II (Bluetooth) property parameter Low level (ID=40103) 1st OBD II (Bluetooth) property parameters Send SMS to (ID=7038) 1st OBD II (Bluetooth) property parameters SMS Text (ID=8038)	Uint8

#### 9.14.6 1<sup>st</sup> OBD II (Bluetooth) property parameters Send SMS to (ID=7038)

Enable/Disable SMS event sending. 0 – Disable, 1-10 SMS will be sent to configured GSM number.

Minimal value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	10	0	GSM Predefined Numbers (ID=6000-6009) 1st OBD II (Bluetooth) property parameter priority (ID=40100) 1st OBD II (Bluetooth) property parameter operand (ID=40101) 1st OBD II (Bluetooth) property parameter High level (ID=40102) 1st OBD II (Bluetooth) property parameter Low level (ID=40103) 1st OBD II (Bluetooth) property parameter Event only (ID=40104) 1st OBD II (Bluetooth) property parameters SMS Text (ID=8038)	Uint8

#### 9.14.7 1<sup>st</sup> OBD II (Bluetooth) property parameters SMS Text (ID=8038)

Configure 1<sup>st</sup> OBD II (Bluetooth) I/O SMS event text here.

Minimal value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	160	Number of DTC	1st OBD II (Bluetooth) property parameter priority (ID=40100) 1st OBD II (Bluetooth) property parameter operand (ID=40101) 1st OBD II (Bluetooth) property parameter High level (ID=40102) 1st OBD II (Bluetooth) property parameter Low level (ID=40103) 1st OBD II (Bluetooth) property parameter Event only (ID=40104) 1st OBD II (Bluetooth) property parameters Send SMS to (ID=7038)	S8[160]

#### 9.14.8 All OBD II (Bluetooth) I/O elements parameters property ID

Parameter Name	Priority	Operand	High level	Low level	Event only	Send SMS to	SMS text
Number Of DTC	40100	40101	40102	40103	40104	7038	8038
Engine Load	40110	40111	40112	40113	40114	7039	8039
Coolant Temperature	40120	40121	40122	40123	40124	7040	8040
Short Fuel Trim	40130	40131	40132	40133	40134	7041	8041
Fuel Pressure	40140	40141	40142	40143	40144	7042	8042
Intake Map	40150	40151	40152	40153	40154	7043	8043
Engine RPM	40160	40161	40162	40163	40164	7044	8044
Vehicle speed	40170	40171	40172	40173	40174	7045	8045
Timing advance	40180	40181	40182	40183	40184	7046	8046
Intake air temperature	40190	40191	40192	40193	40194	7047	8047
MAF	40200	40201	40202	40203	40204	7048	8048
Throttle position	40210	40211	40212	40213	40214	7049	8049
Run time since engine start	40220	40221	40222	40223	40224	7050	8050
Distance traveled MIL on	40230	40231	40232	40233	40234	7051	8051

Parameter Name	Priority	Operand	High level	Low level	Event only	Send SMS to	SMS text
Relative fuel rail pressure	40240	40241	40242	40243	40244	7052	8052
Direct fuel rail pressure	40250	40251	40252	40253	40254	7053	8053
Commanded EGR	40260	40261	40262	40263	40264	7054	8054
EGR error	40270	40271	40272	40273	40274	7055	8055
Fuel level	40280	40281	40282	40283	40284	7056	8056
Distance traveled since codes clear	40290	40291	40292	40293	40294	7057	8057
Barometric pressure	40300	40301	40302	40303	40304	7058	8058
Control module voltage	40310	40311	40312	40313	40314	7059	8059
Absolute load value	40320	40321	40322	40323	40324	7060	8060
Ambient air temperature	40330	40331	40332	40333	40334	7061	8061
Time run with MIL on	40340	40341	40342	40343	40344	7062	8062
Time since trouble codes cleared	40350	40351	40352	40353	40354	7063	8063
Absolute fuel rail pressure	40360	40361	40362	40363	40364	7064	8064
Hybrid battery pack remaining life	40370	40371	40372	40373	40374	7065	8065
Engine oil temperature	40380	40381	40382	40383	40384	7066	8066
Fuel injection timing	40390	40391	40392	40393	40394	7067	8067
Fuel Rate	40400	40401	40402	40403	40404	7068	8068

All OBD II (Bluetooth) I/O parameters configuration settings are described in “FMB207 Protocols” document.

## 9.15 RS232

### 9.15.1 External UART working mode (ID=150)

FMB207 support RS232 modes.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	2	0	RS232 working mode (ID=151) RS232 Baudrate (ID=152) RS232 Parity (ID=153) Prefix 1 (ID=154) Prefix 2 (ID=155) Prefix 3 (ID=156) Garmin Mode Settings (ID=157)	Uint8

## 9.15.2 RS232

### 9.15.2.1 RS232 working mode (ID=151)

RS232 support several modes: 0 – log mode, 1 – NMEA, 2 – LLS, 3 – LCD, 4 – RFID HID, 5 – RFID MF7, 6 – Garmin FMI, 7 – TCP ASCII, 8 – TCP Binary.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	8	7	External UART working mode (ID=150) RS232 Baudrate (ID=152)	Uint8

			RS232 Parity (ID=153) Prefix 1 (ID=154) Prefix 2 (ID=155) Prefix 3 (ID=156) Garmin Mode Settings (ID=157)	
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### 9.15.2.2 RS232 Baudrate (ID=152)

Every RS232 mode support different Baudrate: 0 – default, 1 – 1200, 2 – 2400, 3 – 9600, 4 – 14400, 5 – 19200, 6 – 38400, 7 – 57600, 8 – 115200. Every mode default Baudrate are shown in chapter RS232 Baudrate and parity, table 14.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	8	Depend on selected Mode	External UART working mode (ID=150) RS232 working mode (ID=151) RS232 Parity (ID=153) Prefix 1 (ID=154) Prefix 2 (ID=155) Prefix 3 (ID=156) Garmin Mode Settings (ID=157)	Uint8

### 9.15.2.3 RS232 Parity (ID=153)

Every RS232 mode support different parity: 0 – default, 1 – None, 2 – Odd, 3 – Even. Every mode default parity are shown in chapter RS232 Baudrate and parity, table 14.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	3	Depend on selected Mode	External UART working mode (ID=150) RS232 working mode (ID=151) RS232 Baudrate (ID=152) Prefix 1 (ID=154) Prefix 2 (ID=155) Prefix 3 (ID=156) Garmin Mode Settings (ID=157)	Uint8

## 9.15.3 RS232 TCP Binary Mode Settings

### 9.15.3.1 Prefix 1 (ID=154)

Prefix 1 for advanced data filtering in RS232 TCP Binary mode.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	255	0	External UART working mode (ID=150) RS232 working mode (ID=151) RS232 Baudrate (ID=152) RS232 Parity (ID=153) Prefix 2 (ID=155)	Uint8

			Prefix 3 (ID=156) Garmin Mode Settings (ID=157)	
--	--	--	--	--

#### 9.15.3.2 Prefix 2 (ID=155)

Prefix 2 for advanced data filtering in RS232 TCP Binary mode.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	255	0	External UART working mode (ID=150) RS232 working mode (ID=151) RS232 Baudrate (ID=152) RS232 Parity (ID=153) Prefix 1 (ID=154) Prefix 3 (ID=156) Garmin Mode Settings (ID=157)	Uint8

#### 9.15.3.3 Prefix 3 (ID=156)

Prefix 3 for advanced data filtering in RS232 TCP Binary mode.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	255	0	External UART working mode (ID=150) RS232 working mode (ID=151) RS232 Baudrate (ID=152) RS232 Parity (ID=153) Prefix 1 (ID=154) Prefix 2 (ID=155) Garmin Mode Settings (ID=157)	Uint8

#### 9.15.4 Garmin Mode Settings (ID=157)

Garmin FMI mode has additional filtering capabilities. It is possible to filter Ping and Unicode packets. If Ping filter will be enabled, then Ping packets will be blocked. If Unicode filter will be enabled, then Unicode packets will not be sent to server. Both filters may be enabled for simultaneous work. Possible values: 0 – No filter, 1 – Ping filter, 2 – Unicode filter, 3 – Ping and Unicode filters.

Minimum value	Maximum value	Default value	Goes with (depends on) parameters	Value type
0	3	0	External UART working mode (ID=150) RS232 working mode (ID=151) RS232 Baudrate (ID=152) RS232 Parity (ID=153) Prefix 1 (ID=154) Prefix 2 (ID=155) Prefix 3 (ID=156)	Uint8

## 10 MOUNTING RECOMMENDATIONS

### 10.1 Connecting Wires

- Wires should be connected while module is not plugged in.
- Wires should be fastened to the other wires or non-moving parts. Try to avoid heat emitting and moving objects near the wires.
- The connections should not be seen very clearly. If factory isolation was removed while connecting wires, it should be applied again.
- If the wires are placed in the exterior or in places where they can be damaged or exposed to heat, humidity, dirt, etc., additional isolation should be applied.
- Wires cannot be connected to the board computers or control units.

### 10.2 Connecting Power Source

- Be sure that after the car computer falls asleep, power is still available on chosen wire. Depending on car, this may happen in 5 to 30 minutes period.
- When module is connected, be sure to measure voltage again if it did not decrease.
- It is recommended to connect to the main power cable in the fuse box.
- Use 3A, 125V external fuse.

### 10.3 Connecting Ignition Wire

- Be sure to check if it is a real ignition wire – power does not disappear while starting the engine.
- Check if this is not an ACC wire (when key is in the first position, most electronics of the vehicle are available).
- Check if power is still available when you turn off any of vehicles devices.
- Ignition is connected to the ignition relay output. As alternative, any other relay, which has power output, when ignition is on, may be chosen.

### 10.4 Connecting Ground Wire

- Ground wire is connected to the vehicle frame or metal parts that are fixed to the frame.
- If the wire is fixed with the bolt, the loop must be connected to the end of the wire.
- For better contact scrub paint from the place where loop is connected.



PAY ATTENTION! Connecting the power supply must be carried out in a very low impedance point on-board vehicle network. These points in the car are the battery terminals. Therefore, we recommend connecting the power of FMB207 (wire GND and POWER) directly to the battery terminals. Another valid option is to connect the wires to the main POWER cable inside the fuse box (if there is none, then to the power supply where the fuses of vehicle's computer are), wire GND must be connected in a special point, designed to connect GND vehicle computer. Connecting the GND at an arbitrary point to the mass of the car is unacceptable, as static and dynamic potentials on the line GND will be unpredictable, which can lead to unstable FMB207 and even its failure.

## 11 FMB2YX installation instruction

FMB2YX is the device that has internal GNSS and GSM antenna.

Internal GNSS antenna device should be mounted with the sticker view to the open sky (metal free) with not less than  $\frac{3}{4}$  of metal free area as shown in **Figure 52**.

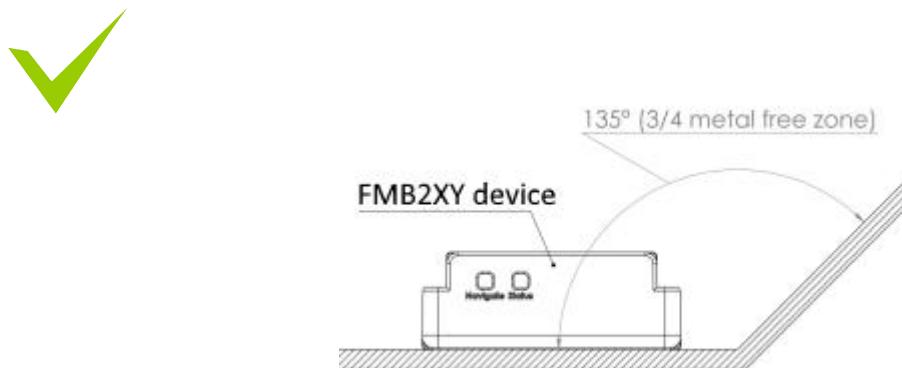


Figure 52.  $\frac{3}{4}$  metal free zone illustration

FMB2YX has IP67 protection class. Top performance is reached if mounted outside of the vehicle.

The device has 4 mounting holes on the edges, and can be tightened with screws, adhesive tape or plastic straps.

FMB2YX area with sticker and GNSS antenna is shown in **Figure 53**.

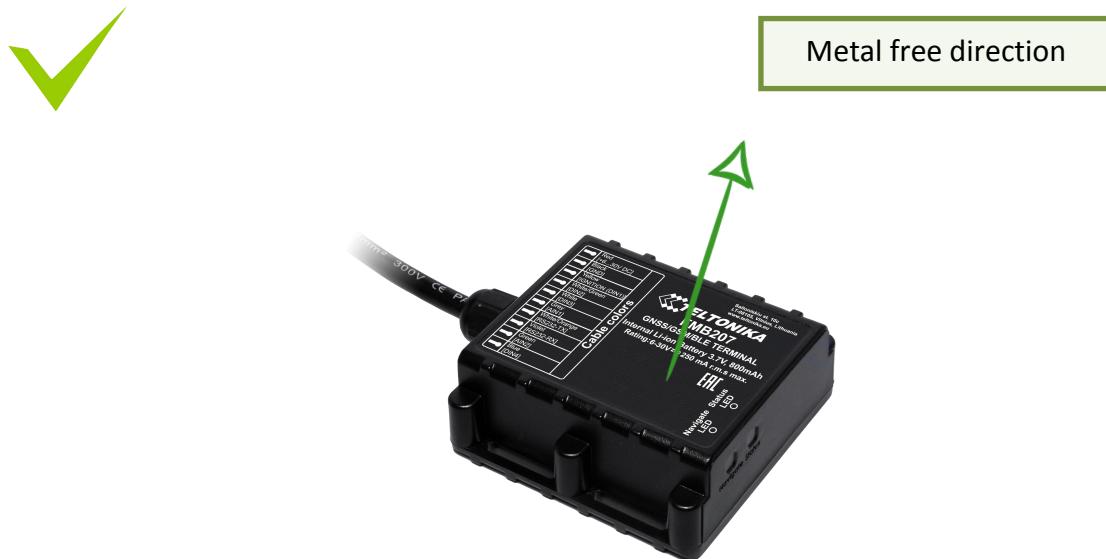


Figure 53. FMB207 view

## 11.1 Possible mounting zones

### 11.1.1 Trucks

It is strongly recommended to mount FMB207 outside of the vehicle with the sticker direction to a sky, see **Figure 54**.

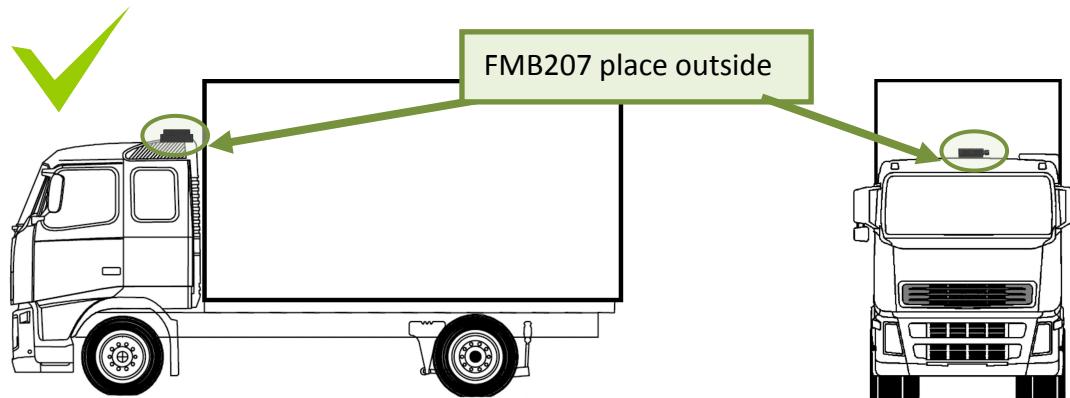


Figure 54. Possible mounting place on truck

Most commercial trucks have plastic hood in front of the vehicle.

It is recommended to mount FMB207 under the hood. Power cord output of the device should be at the bottom. If it is not possible, if a front hood is made of some kind of metal, the device can be mounted inside the car on the front panel as close as possible to the front window. See **Figure 55**.



Figure 55. Possible mounting places in trucks

### 11.1.2 Tractors

It is strongly recommended to mount FMB207 outside of the tractor with the sticker direction to a sky, see **Figure 56**.

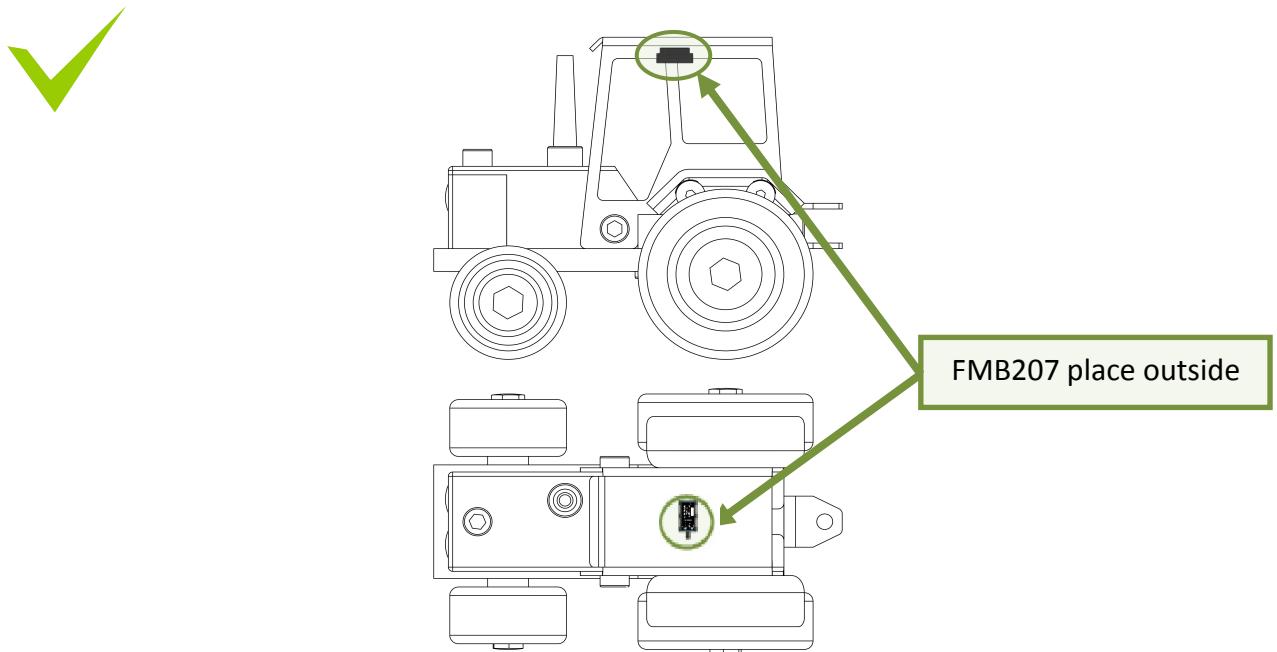


Figure 56. Possible mounting place on tractor

### 11.1.3 Motor bikes

Device should be mounted on outside

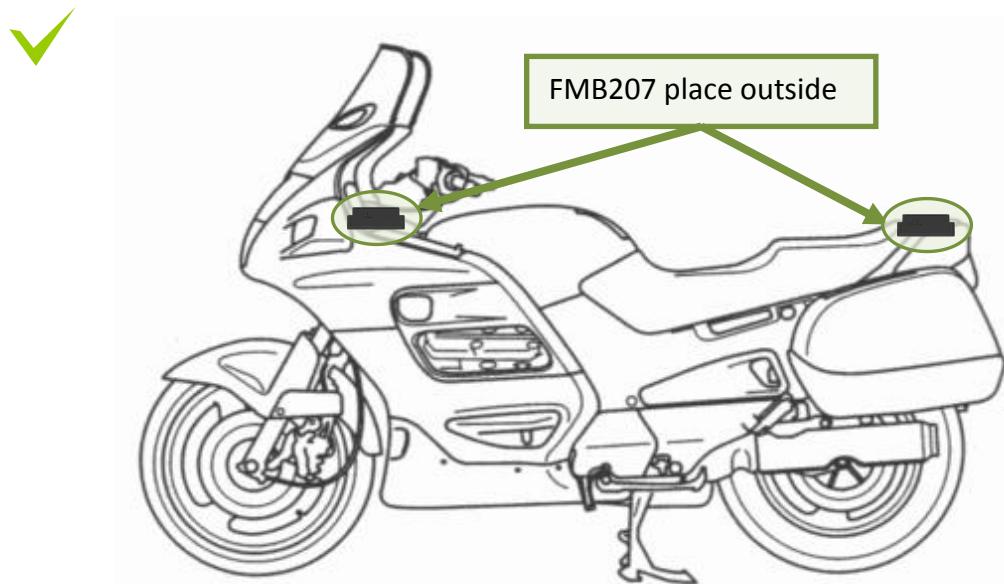


Figure 57. Possible mounting places for motorbikes

FMB207 cannot be mounted under the seat!

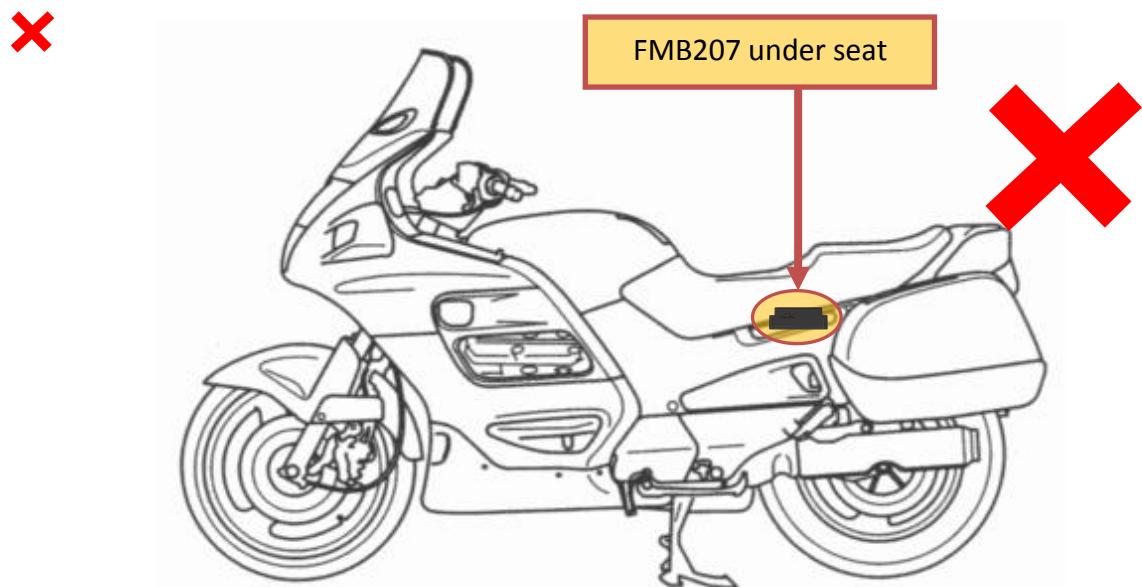


Figure 58. Not mount device under seat

#### 11.1.4 Light vehicles

Most light vehicles has oblique front window that opens most part of interior front panel.

FMB207 can be mounted under the plastic panel behind the front window, with the sticker direction to a window (sky). Look to **Figure 59**.

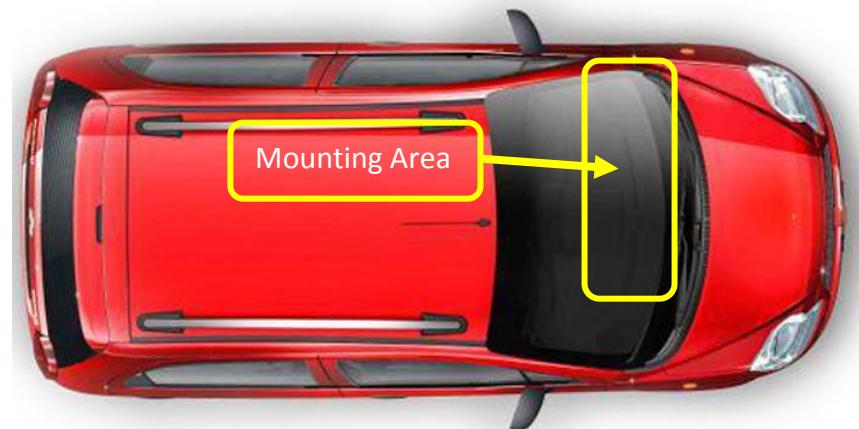


Figure 59. Light vehicle

### 11.1.5 Recommended mounting positions

1. Best FMB207 mounting position is outside of vehicle with any metal above the device.
2. Recommended deviation from horizontal axis of vehicle max 3-5°, as shown in **Figure 60**.

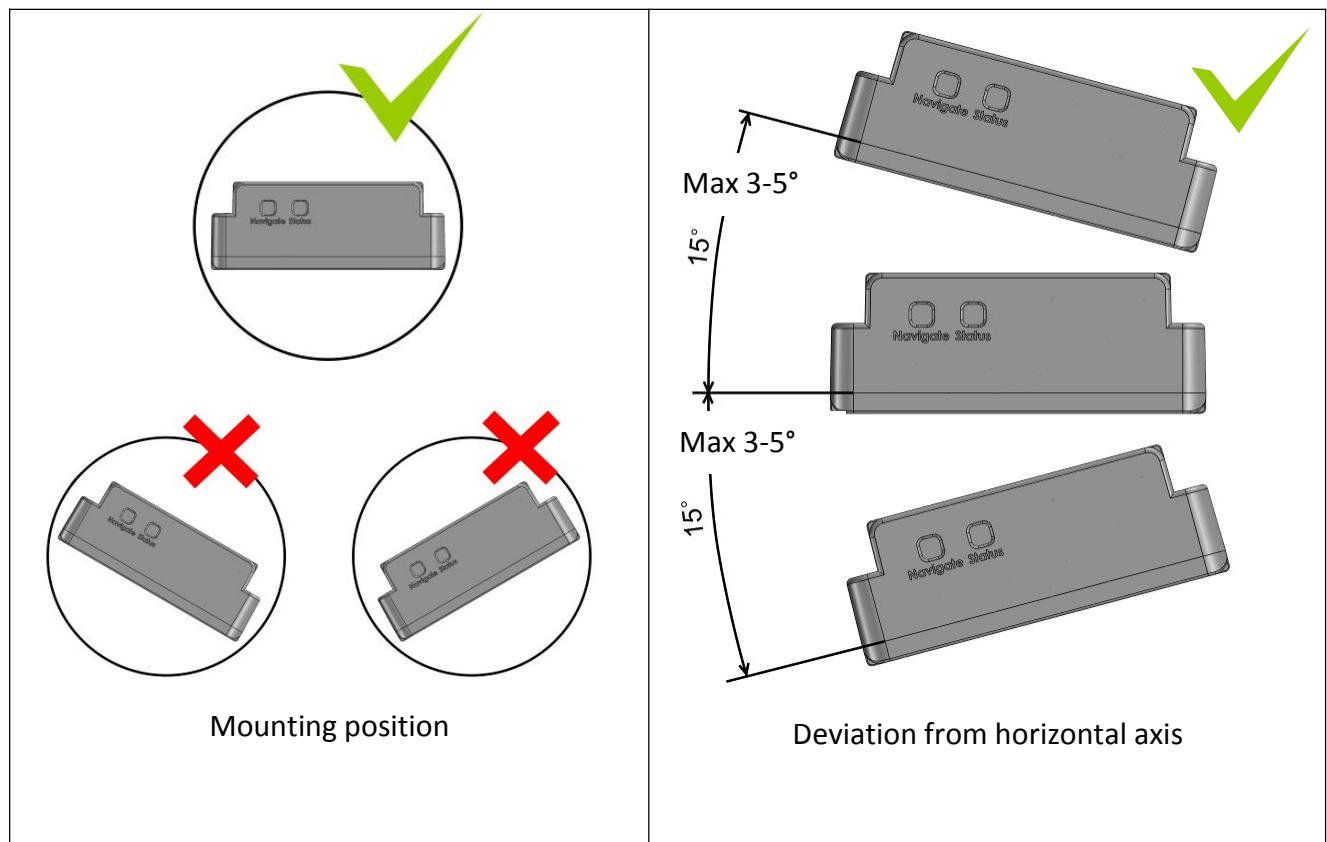


Figure 60. Mounting position and recommended deviation from horizontal axis of vehicle

Mounting position and recommended deviation from longitudinal axis of vehicle  $\pm 2^\circ$ , as shown in **Figure 60**.

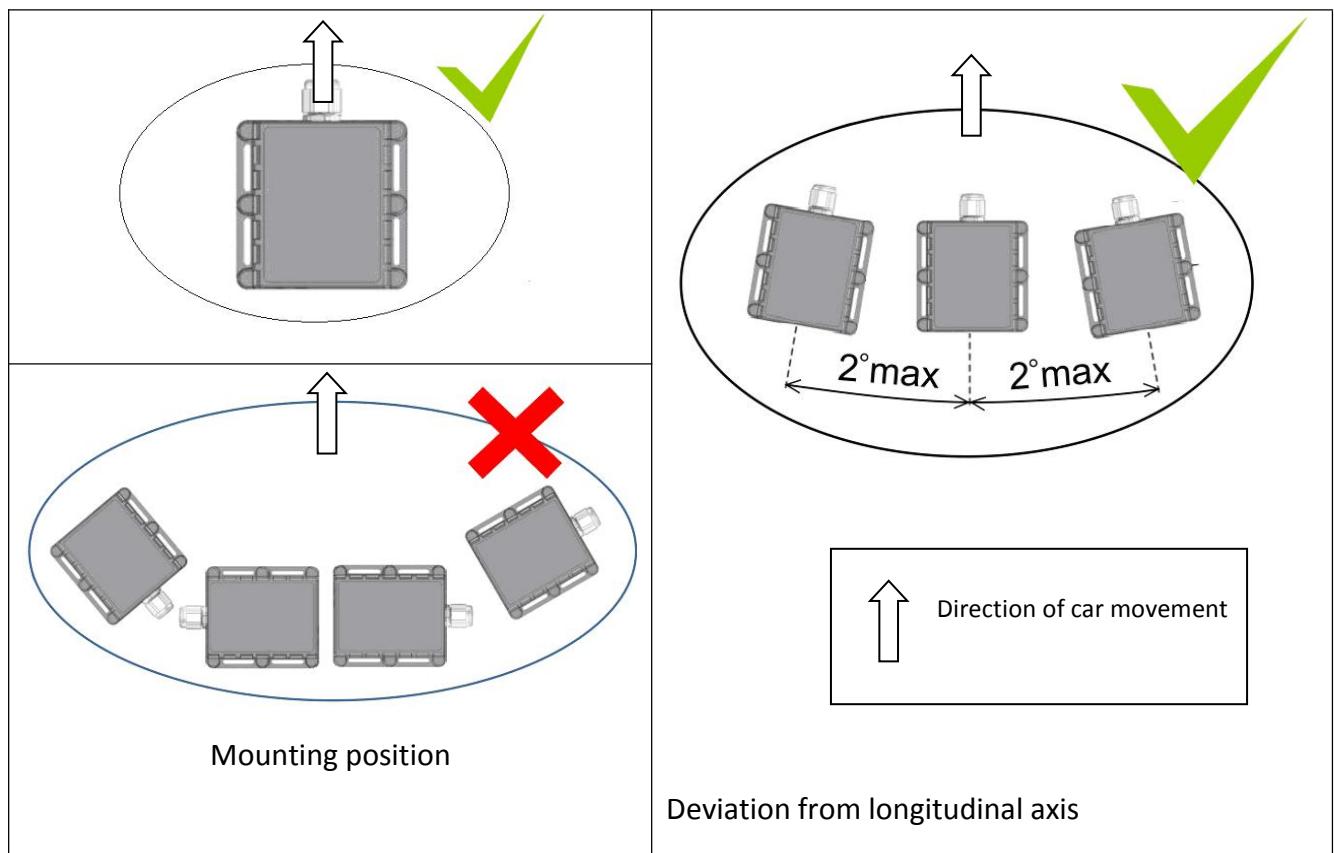


Figure 191. Mounting position and recommended deviation from longitudinal axes of vehicle

#### 11.1.6 Restrictions

- ✗ 1. FMB207 device can not be mounted inside in the vehicle door!**

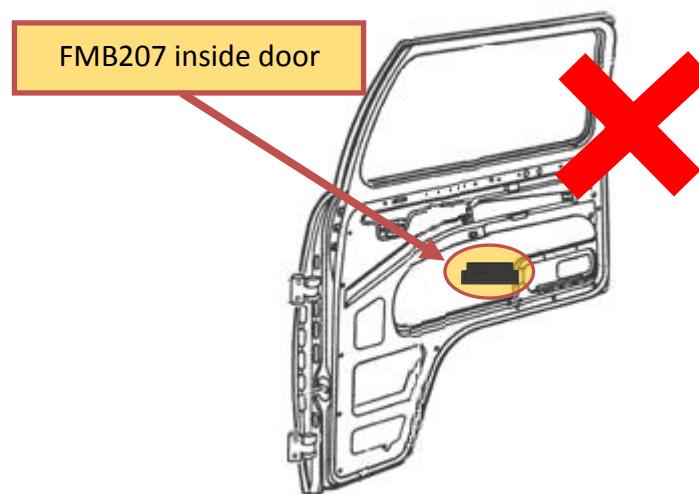


Figure 62. Not mounting FMB207 device inside door of the car

- 2. FMB207 device cannot be mounted inside the vehicle!**

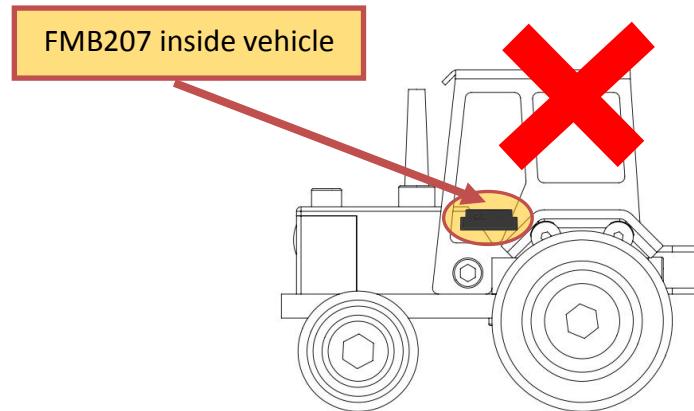


Figure 203. Not mount device inside the vehicle

#### 11.1.7 Connecting power wires

1. Device should be connected directly to battery. Power supply: 6V/12V/24V.

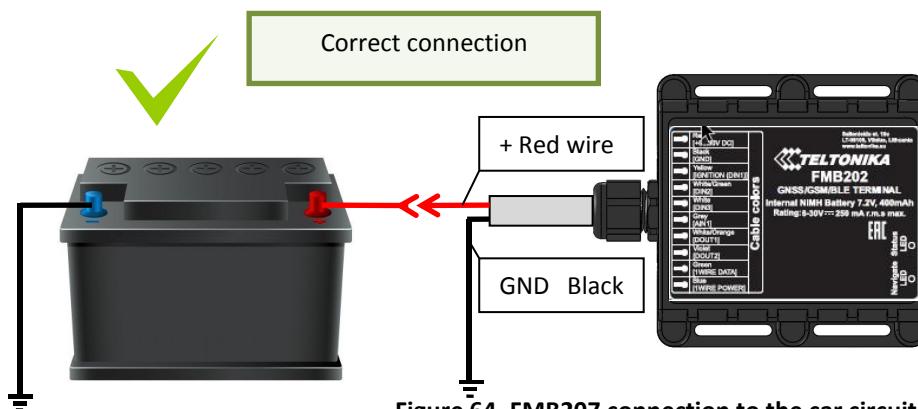


Figure 64. FMB207 connection to the car circuit

2. If FMB207 is used in 6V system and power cables are extended.

Extension cable resistance should be less than 60 mΩ in sum of both, positive and negative, wires. 30 mΩ for single wire.

#### 11.1.8 Other recommendations

1. If using Green driving function device should be mounted horizontally to work properly, see **Figure 60**.
2. If the vehicle is not used for a half of month or more it is recommended to disconnect FMB207 to save vehicle battery.

## 12 Downloading log using “Hercules” application

1 STEP:

- set special chars – ASCII
- Set PORT and start listen (screen below)

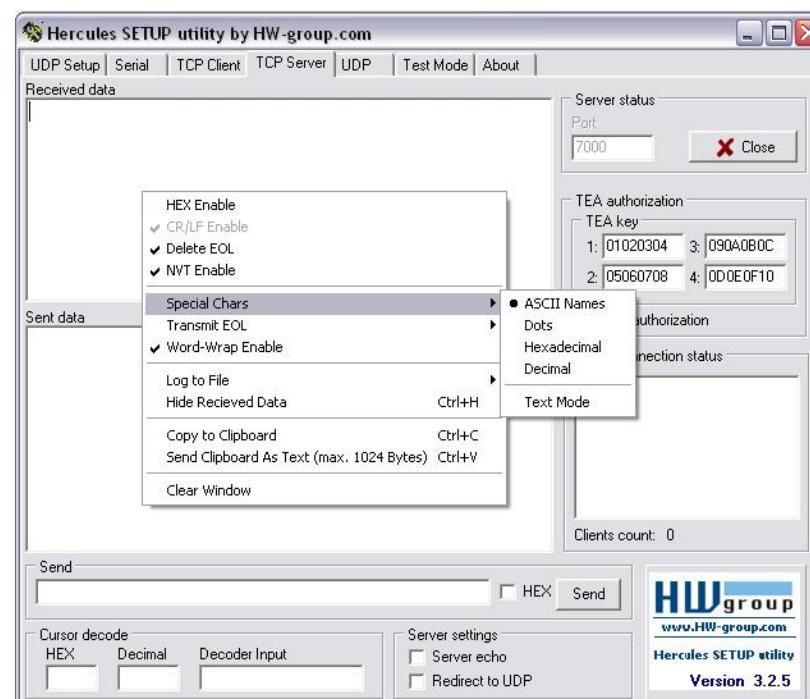


Figure 215. Set special characters to ASCII

2 STEP:

- Set directory for file download
- Enable “Log to file” as show below

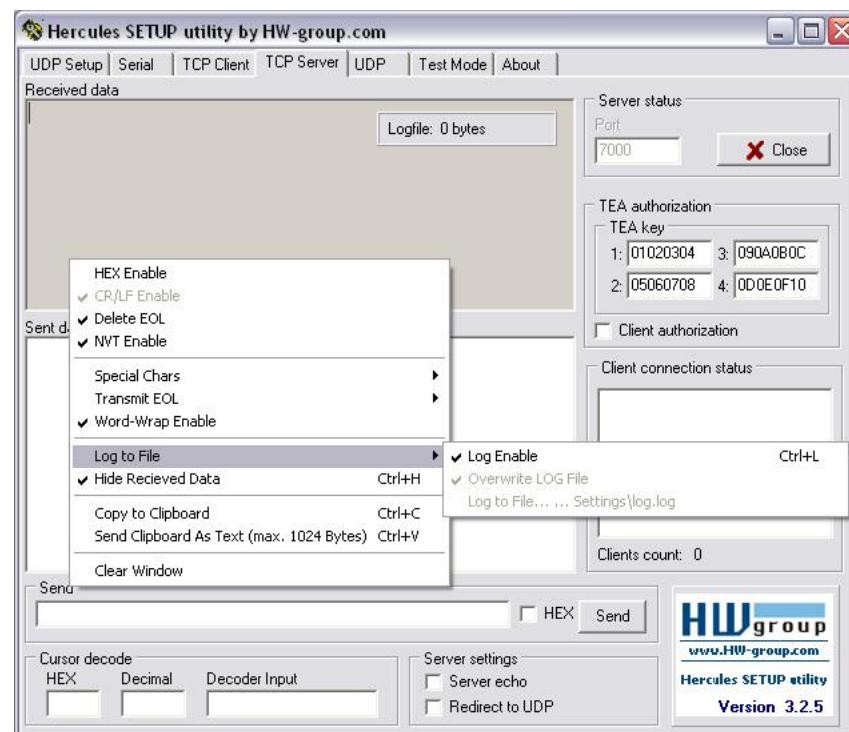


Figure 66. Enable logging with Hercules

**3 STEP:**  
“Terminal” Command sending using Hercules

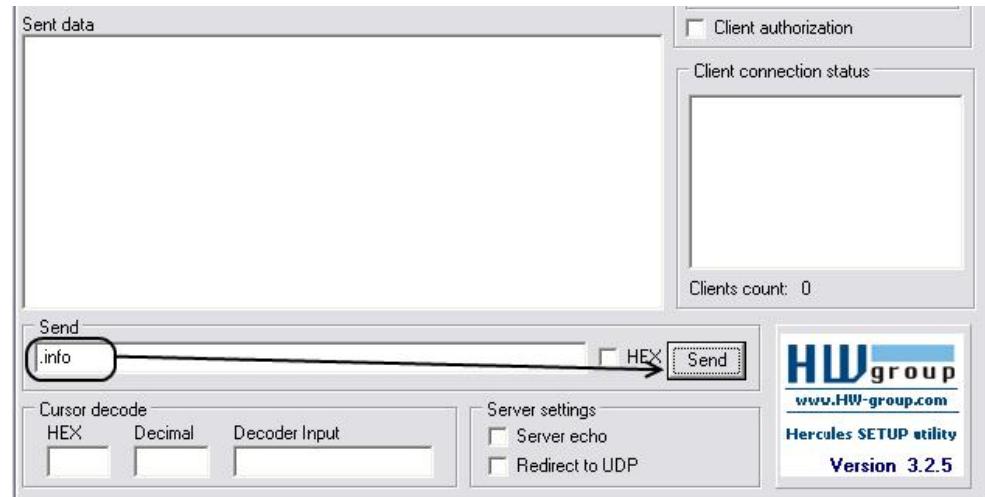


Figure 67. Send command with Hercules

## 13 CHANGE LOG

	Date	Version	Comments
1	2018.08-29	0.01	Draft Document created