



# FMB209

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Advanced waterproof tracker

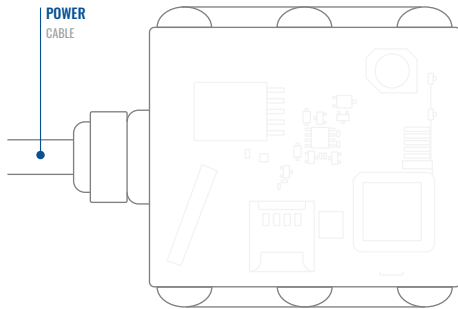
Quick Manual v1.2

# CONTENT

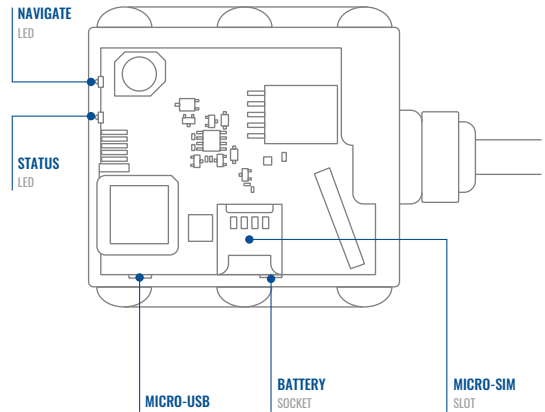
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# KNOW YOUR DEVICE

## TOP VIEW

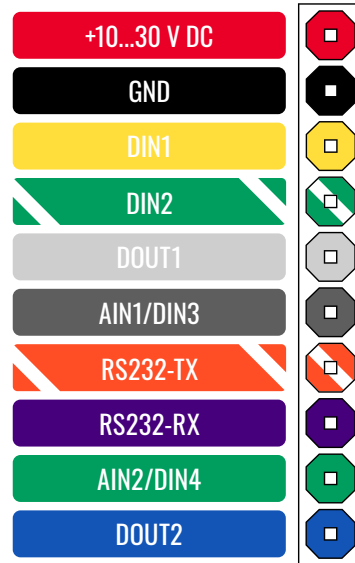


## TOP VIEW (WITHOUT COVER)



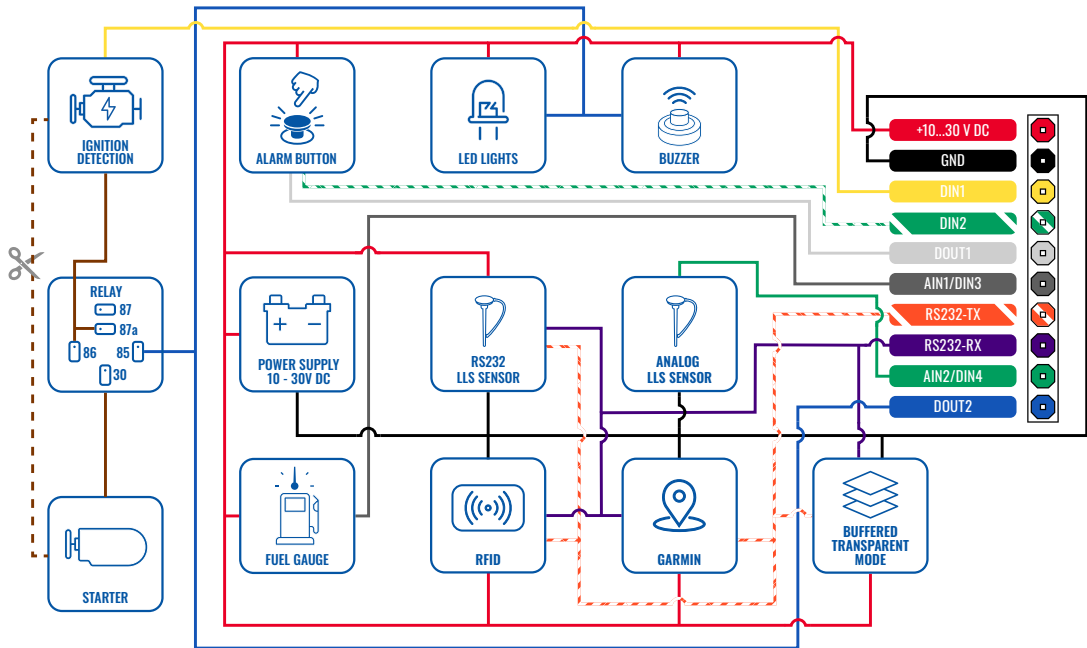
# PINOUT

PIN NAME	DESCRIPTION
VCC (10-30) V	Power supply DC (+).
GND (-)	Ground DC (-).
DIN 1	Digital input, channel 1.
DIN 2	Digital input, channel 2.
DOUT 1	Digital output, channel 1. Open collector output. Max. 0,5 A.
AIN 1 / DIN 3	Analog input, channel 1. Input range: 0-30 V DC. Digital input, channel 3
RS232 - TX	Output for data transmit through RS232
RS232 - RX	Input for data receive through RS232
AIN 2 / DIN 4	Analog input, channel 2. Input range: 0-30 V DC. / Digital input, channel 4.
DOUT 2	Digital output, channel 2. Open collector output. Max. 0,5 A.



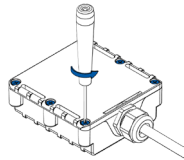
FMB209 wires

# WIRING SCHEME



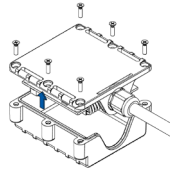
# SET UP YOUR DEVICE

## HOW TO INSERT MICRO-SIM CARD



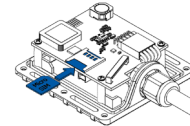
### 1 UNSCREW SCREWS

Unscrew 6 screws counterclockwise that are located on the **bottom** of the device.



### 2 COVER REMOVAL

Remove the **cover**

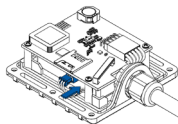


### 3 MICRO-SIM CARD INSERT

Insert **Micro-SIM** card as shown with **PIN request disabled** or read our [Wiki](#)<sup>1</sup> how to enter it later in [Teltonika Configurator](#)<sup>2</sup>. Make sure that Micro-SIM card cut-off corner is pointing forward to slot.

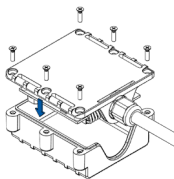
<sup>1</sup>[wiki.teltonika-gps.com/view/FMB209\\_Security\\_info](http://wiki.teltonika-gps.com/view/FMB209_Security_info)

<sup>2</sup>[wiki.teltonika-gps.com/view/Teltonika\\_Configurator](http://wiki.teltonika-gps.com/view/Teltonika_Configurator)



### 4 BATTERY CONNECTION

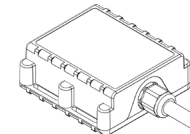
Connect **battery** as shown to device.



### 5 ATTACHING COVER BACK

After **configuration**, see "[PC Connection \(Windows\)](#)", attach **device cover back** and screw in all screws.

<sup>1</sup>Page 7, <sup>2</sup>PC Connection (Windows)



### 6 DEVICE IS READY

Device is ready to be mounted.

# PC CONNECTION (WINDOWS)

1. Power-up FMB209 with **DC voltage (10 – 30 V)** power supply using **supplied power cable**. LED's should start blinking, see "**LED indications**".
2. Connect device to computer using **Micro-USB cable** or Bluetooth connection:
  - Using Micro-USB cable
    - You will need to install USB drivers, see "**How to install USB drivers (Windows)**"<sup>1</sup>
  - Using **Bluetooth**
    - FMB209 **Bluetooth** is enabled by default. Turn on Bluetooth on your PC, then select **Add Bluetooth or other device > Bluetooth**. Choose your device named – "**FMB209\_last\_7\_imei\_digits**", without **LE** in the end. Enter default password **5555**, press **Connect** and then select **Done**.
3. You are now ready to use the device on your computer.

<sup>1</sup>[wiki.teltonika-gps.com/view/FMB209\\_LED\\_status](http://wiki.teltonika-gps.com/view/FMB209_LED_status)

<sup>2</sup>Page 7, "How to install USB drivers"

# HOW TO INSTALL USB DRIVERS (WINDOWS)

1. Please download COM port drivers from [here](#)<sup>1</sup>.
2. Extract and run **TeltonikaCOMDriver.exe**.
3. Click **Next** in driver installation window.
4. In the following window click **Install** button.
5. Setup will continue installing the driver and eventually the confirmation window will appear. Click **Finish** to complete the setup.

<sup>1</sup>[teltonika.lt/downloads/en/FMB209/TeltonikaCOMDriver.zip](http://teltonika.lt/downloads/en/FMB209/TeltonikaCOMDriver.zip)

# CONFIGURATION

At first FMB209 device will have default factory settings set. These settings should be changed according to the users needs. Main configuration can be performed via [Teltonika Configurator](#)<sup>1</sup> software. Get the latest **Configurator** version from [here](#)<sup>2</sup>. Configurator operates on **Microsoft Windows OS** and uses prerequisite **MS .NET Framework**. Make sure you have the correct version installed.

<sup>1</sup> [wiki.teltonika-gps.com/view/Teltonika\\_Configurator](http://wiki.teltonika-gps.com/view/Teltonika_Configurator)

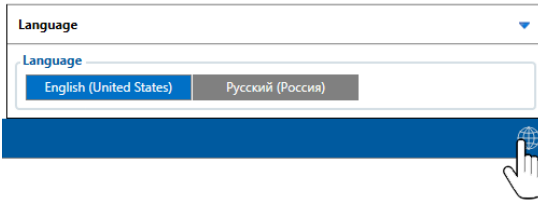
<sup>2</sup> [wiki.teltonika-gps.com/view/Teltonika\\_Configurator\\_versions](http://wiki.teltonika-gps.com/view/Teltonika_Configurator_versions)


## MS .NET REQUIREMENTS

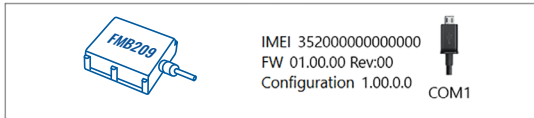
Operating system	MS .NET Framework version	Version	Links
Windows Vista			
Windows 7			
Windows 8.1	MS .NET Framework 4.6.2	32 and 64 bit	<a href="http://www.microsoft.com">www.microsoft.com</a> <sup>1</sup>
Windows 10			

<sup>1</sup> [dotnet.microsoft.com/en-us/download/dotnet-framework/net462](http://dotnet.microsoft.com/en-us/download/dotnet-framework/net462)

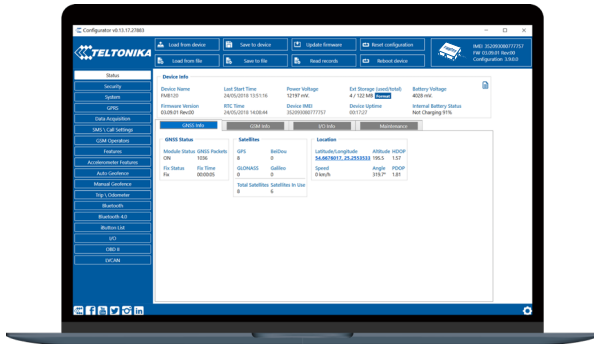




Downloaded Configurator will be in compressed archive. Extract it and launch Configurator.exe. After launch software language can be changed by clicking  in the right bottom corner.











Configuration process begins by pressing on connected device.



After connection to Configurator **Status window** will be displayed.

Various **Status window**<sup>1</sup> tabs display information about **GNSS**<sup>2</sup>, **GSM**<sup>3</sup>, **I/O**<sup>4</sup>, **Maintenance**<sup>5</sup> and etc. FMB209 has one user editable profile, which can be loaded and saved to the device. After any modification of configuration the changes need to be saved to device using **Save to device** button. Main buttons offer following functionality:

-  **Load from device** – loads configuration from device.
-  **Save to device** – saves configuration to device.
-  **Load from file** – loads configuration from file.
-  **Save to file** – saves configuration to file.
-  **Update firmware** – updates firmware on device.
-  **Read records** – reads records from the device.
-  **Reboot device** – restarts device.
-  **Reset configuration** – sets device configuration to default.

Most important configurator section is **GPRS** – where all your server and **GPRS settings**<sup>6</sup> can be configured and **Data Acquisition**<sup>7</sup> – where data acquiring parameters can be configured. More details about FMB209 configuration using Configurator can be found in our **Wiki**<sup>8</sup>.

<sup>1</sup> [wiki.teltonika-gps.com/view/FMB209\\_Status\\_info](http://wiki.teltonika-gps.com/view/FMB209_Status_info)

<sup>2</sup> [wiki.teltonika-gps.com/view/FMB209\\_Status\\_info#GNSS\\_Info](http://wiki.teltonika-gps.com/view/FMB209_Status_info#GNSS_Info)

<sup>3</sup> [wiki.teltonika-gps.com/view/FMB209\\_Status\\_info#GSM\\_Info](http://wiki.teltonika-gps.com/view/FMB209_Status_info#GSM_Info)

<sup>4</sup> [wiki.teltonika-gps.com/view/FMB209\\_Status\\_info#I2FO\\_Info](http://wiki.teltonika-gps.com/view/FMB209_Status_info#I2FO_Info)

<sup>5</sup> [wiki.teltonika-gps.com/view/FMB209\\_Status\\_info#Maintenance](http://wiki.teltonika-gps.com/view/FMB209_Status_info#Maintenance)

<sup>6</sup> [wiki.teltonika-gps.com/index.php?title=FMB209\\_GPRS\\_settings](http://wiki.teltonika-gps.com/index.php?title=FMB209_GPRS_settings)

<sup>7</sup> [wiki.teltonika-gps.com/index.php?title=FMB209\\_Data\\_acquisition\\_settings](http://wiki.teltonika-gps.com/index.php?title=FMB209_Data_acquisition_settings)

<sup>8</sup> [wiki.teltonika-gps.com/index.php?title=FMB209\\_Configuration](http://wiki.teltonika-gps.com/index.php?title=FMB209_Configuration)

# QUICK SMS CONFIGURATION

Default configuration has optimal parameters present to ensure best performance of track quality and data usage.

Quickly set up your device by sending this SMS command to it:

```
« setparam 2001:APN;2002:APN_username;2003:APN_password;2004:Domain;2005:Port;2006:0»
```

1

2

3

4

5

6

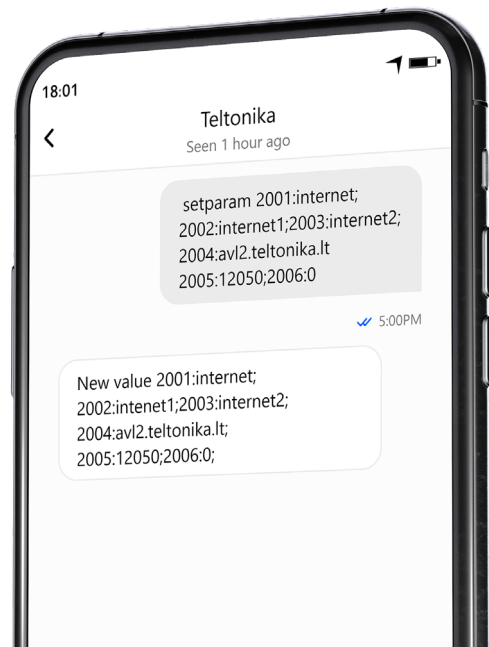
**Note:** Before SMS text, two space symbols should be inserted.

## GPRS SETTINGS:

- 1 2001 – APN
- 2 2002 – APN username (if there are no APN username, empty field should be left)
- 3 2003 – APN password (if there are no APN password, empty field should be left)

## SERVER SETTINGS:

- 4 2004 – Domain
- 5 2005 – Port
- 6 2006 – Data sending protocol (0 – TCP, 1 – UDP)



## DEFAULT CONFIGURATION SETTINGS

### MOVEMENT AND IGNITION DETECTION:



**VEHICLE MOVEMENT**  
will be detected by  
accelerometer



**IGNITION**  
will be detected by  
vehicle power voltage  
between 13,2 – 30 V

### DEVICE MAKES A RECORD ON STOP IF:



**1 HOUR PASSES**  
while vehicle is  
stationary and  
ignition is off



**EVERY 120 SECOND**  
it is sent to the server  
If device has made a  
record

### DEVICE MAKES A RECORD ON MOVING IF ONE OF THESE EVENTS HAPPEN:



**PASSES**  
300 seconds



**VEHICLE DRIVES**  
100 meters



**VEHICLE TURNS**  
10 degrees



**SPEED DIFFERENCE**  
between last coordinate  
and current position is  
greater than 10 km/h

After successful SMS configuration, FMB209 device will synchronize time and update records to configured server. Time intervals and default I/O elements can be changed by using [Teltonika Configurator](#)<sup>1</sup> or [SMS parameters](#)<sup>2</sup>.

<sup>1</sup> [wiki.teltonika-gps.com/view/Teltonika\\_Configurator](http://wiki.teltonika-gps.com/view/Teltonika_Configurator)

<sup>2</sup> [wiki.teltonika-gps.com/view/Template:FMB\\_Device\\_Family\\_Parameter\\_list](http://wiki.teltonika-gps.com/view/Template:FMB_Device_Family_Parameter_list)

# MOUNTING RECOMMENDATIONS

## CONNECTING WIRES

- 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.

## 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, measure voltage again to make sure it did not decrease.
- It is recommended to connect to the main power cable in the fuse box.
- Use 3A, 125V external fuse.

## CONNECTING IGNITION WIRE

- Be sure to check if it is a real ignition wire i. e. power does not disappear after starting the engine.
- Check if this is not an ACC wire (when key is in the first position, most of the vehicle electronics 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.

## 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 spot where loop is going to be connected.

# LED INDICATIONS

## NAVIGATION LED INDICATIONS

BEHAVIOUR	MEANING
Permanently switched on	GNSS signal is not received
Blinking every second	Normal mode, GNSS is working
Off	GNSS is turned off because: Device is not working or Device is in sleep mode
Blinking fast constantly	Device firmware is being flashed

## STATUS LED INDICATIONS

BEHAVIOUR	MEANING
Blinking every second	Normal mode
Blinking every two seconds	Sleep mode
Blinking fast for a short time	Modem activity
Off	Device is not working or Device is in boot mode

# BASIC CHARACTERISTICS

## MODULE

Name	Teltonika TM2500
Technology	GSM, GPRS, GNSS, BLUETOOTH

## GNSS

GNSS	GNSS, GPS, IRNSS, GLONASS, GALILEO, BEIDOU, QZSS
Receiver	Tracking: 33
Tracking sensitivity	-162 dBm
Accuracy	< 3 m
Hot start	< 1.5 s
Warm start	< 25 s
Cold start	< 32 s

## CELLUAR

Technology	GSM
2G bands	Quad-band 850 / 900 / 1800 / 1900 MHz
Data transfer	GPRS Multi-Slot Class 12 (up to 240 kbps), GPRS Mobile Station Class B
Data support	SMS (text/data)

## POWER

Input voltage range	10-30 V DC with overvoltage protection
Back-up battery	800 mAh Li-Ion battery (2.96 Wh)
Power consumption	At 12V < 1.4 mA ( <b>Ultra Deep Sleep</b> <sup>1</sup> ) At 12V < 3.9 mA ( <b>Deep Sleep</b> <sup>1</sup> ) At 12V < 4.6 mA ( <b>Online Deep Sleep</b> <sup>1</sup> ) At 12V < 7.1 mA ( <b>GPS Sleep</b> <sup>1</sup> ) At 12V < 28.3 mA (nominal with no load)

## BLUETOOTH

Specification	4.0 + LE
Supported peripherals	<b>Temperature and Humidity sensor</b> <sup>2</sup> , <b>Headset</b> <sup>3</sup> , <b>OBDII dongle</b> <sup>4</sup> , Inateck Barcode Scanner, Universal BLE sensors support

## INTERFACE

Digital Inputs	2
Digital Outputs	2
Analog Inputs	2

<sup>1</sup>[wiki.teltonika-gps.com/view/FMB209\\_Sleep\\_modes](http://wiki.teltonika-gps.com/view/FMB209_Sleep_modes)

<sup>2</sup>[teltonika-gps.com/products/accessories](http://teltonika-gps.com/products/accessories)

<sup>3</sup>[wiki.teltonika-gps.com/view/How\\_to\\_connect\\_Bluetooth\\_Hands\\_Free\\_adapter\\_to\\_FMB\\_device](http://wiki.teltonika-gps.com/view/How_to_connect_Bluetooth_Hands_Free_adapter_to_FMB_device)

<sup>4</sup>[wiki.teltonika-gps.com/view/How\\_to\\_connect\\_OBD\\_II\\_Bluetooth\\_Dongle\\_to\\_FMB\\_device](http://wiki.teltonika-gps.com/view/How_to_connect_OBD_II_Bluetooth_Dongle_to_FMB_device)

RS232	1
GNSS antenna	Internal High Gain
GSM antenna	Internal High Gain
USB	2.0 Micro-USB
LED indication	2 status LED lights
SIM	Micro-SIM or eSIM
Memory	128MB internal flash memory

## PHYSICAL SPECIFICATION

Dimensions	72,5 x 73 x 27,3 mm (L x W x H)
Weight	205 g

## OPERATING ENVIRONMENT

Operating temperature (without battery)	-40 °C to +85 °C
Storage temperature (without battery)	-40 °C to +85 °C
Operating humidity	5% to 95% non-condensing
Ingress Protection Rating	IP67
Battery storage temperature	-20 °C to +60 °C for 1 month -20 °C to +30 °C for 12 month
Operating humidity	5% to 95% non-condensing

Ingress Protection Rating IP67

## FEATURES

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Sensors Accelerometer

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Scenarios **Green Driving, Over Speeding detection, Jamming detection, GNSS Fuel Counter, DOUT Control Via Call**, Excessive Idling detection, Immobilizer, Unplug detection, Towing detection, Crash detection, Auto Geofence, Manual Geofence, Trip<sup>5</sup>

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Sleep modes **GPS Sleep, Online Deep Sleep, Deep Sleep, Ultra Deep Sleep**<sup>6</sup>

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Configuration and firmware update **FOTA Web**<sup>7</sup>, FOTA, **Teltonika Configurator**<sup>8</sup> (USB, Bluetooth), **FMBT mobile application**<sup>9</sup> (Configuration)

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SMS Configuration, Events, DOUT control, Debug

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GPRS commands Configuration, DOUT control, Debug

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Time Synchronization GNSS, NITZ, NTP

Fuel monitoring LLS (Analog), Digital LLS (RS232), **OBDDII dongle**<sup>10</sup>

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Ignition detection Digital Input 1, Accelerometer, External Power Voltage, Engine RPM (OBDDII dongle)

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RS232 Modes Log Mode, NMEA, LLS, LCD, RFID HID/MF7, Garmin FMI, TCP ASCII/ Binary

<sup>5</sup>[wiki.teltonika-gps.com/view/FMB209\\_Features\\_settings](http://wiki.teltonika-gps.com/view/FMB209_Features_settings)

<sup>6</sup>[wiki.teltonika-gps.com/view/FMB209\\_Sleep\\_modes](http://wiki.teltonika-gps.com/view/FMB209_Sleep_modes)

<sup>7</sup>[wiki.teltonika-gps.com/view/FOTA\\_WEB](http://wiki.teltonika-gps.com/view/FOTA_WEB)

<sup>8</sup>[wiki.teltonika-gps.com/view/Teltonika\\_Configurator](http://wiki.teltonika-gps.com/view/Teltonika_Configurator)

<sup>9</sup>[teltonika-gps.com/products/accessories](http://teltonika-gps.com/products/accessories)

<sup>10</sup>[wiki.teltonika-gps.com/view/How\\_to\\_connect\\_OBD\\_II\\_Bluetooth\\_Dongle\\_to\\_FMB\\_device](http://wiki.teltonika-gps.com/view/How_to_connect_OBD_II_Bluetooth_Dongle_to_FMB_device)

# ELECTRICAL CHARACTERISTICS

CHARACTERISTIC DESCRIPTION	VALUE			
	MIN.	TYP.	MAX.	UNIT
<b>SUPPLY VOLTAGE</b>				
Supply Voltage (Recommended Operating Conditions)	+10		+30	V
<b>DIGITAL OUTPUT (OPEN DRAIN GRADE)</b>				
Drain current (Digital Output OFF)			120	μA
Drain current (Digital Output ON, Recommended Operating Conditions)			0.5	A
Static Drain-Source resistance (Digital Output ON)			120	mΩ
<b>DIGITAL INPUT</b>				
Input resistance (DIN1)		59.9		kΩ
Input resistance (DIN2, DIN3)		67.5		kΩ
Input voltage (Recommended Operating Conditions)	0		60	V

CHARACTERISTIC DESCRIPTION	VALUE			
	MIN.	TYP.	MAX.	UNIT
Input Voltage threshold (DIN1)	7.5	7.7	8	V
Input Voltage threshold (DIN2, DIN3)	2.5	2.7	3	V

## ANALOG INPUT

Input voltage (Recommended Operating Conditions), Range 1	0		+10	V
Input resistance, Range 1			120	kΩ
Input Voltage (Recommended Operating Conditions), Range 2	0		+30	V
Input resistance, Range 2			146.7	kΩ

## OUTPUT SUPPLY VOLTAGE 1-WIRE

Supply voltage		3.8		V
Output inner resistance	450		600	Ω
Output current (U <sub>out</sub> > 3.0 V)			75	mA
Short circuit current (U <sub>out</sub> = 0)			75	mA



# SAFETY INFORMATION

This message contains information on how to operate FMB209 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 nominal voltage is +12 V DC. The allowed voltage range is +10...+30 V DC.
- To avoid mechanical damage, it is advised to transport the device in an impact-proof package. Before usage, the device should be placed so that its LED indicators are visible. They show the status of device operation.
- When connecting wires to the vehicle, the appropriate jumpers of the vehicle power supply should be disconnected.
- Before unmounting the device from the vehicle, wires must be disconnected. The device is designed to be mounted in a zone of limited access, which is inaccessible to the operator. All related devices must meet the requirements of EN 60950-1 standard. The device FMB209 is not designed as a navigational device for boats.



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



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 a predefined location.



The programming must be performed using a PC with autonomic power supply.



Installation and/or handling during a lightning storm is prohibited.



The device is susceptible to water and humidity if the device housing is not properly closed.



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.

# CERTIFICATION AND APPROVALS



This sign on the package means that it is necessary to read the User's Manual before you start using the device. Full User's Manual version can be found in our [Wiki](#)<sup>1</sup>.

<sup>1</sup> [wiki.teltonika-gps.com/index.php?title=FMB209](http://wiki.teltonika-gps.com/index.php?title=FMB209)



Hereby, Teltonika declare under our sole responsibility that the above described product is in conformity with the relevant Community harmonization: European Directive 2014/53/EU (RED).



REACH addresses the production and use of chemical substances, and their potential impacts on both human health and the environment. Its 849 pages took seven years to pass, and it has been described as the most complex legislation in the Union's history and the most important in 20 years. It is the strictest law to date regulating chemical substances and will affect industries throughout the world.



This sign on the package means that all used electronic and electric equipment should not be mixed with general household waste.

## DECLARATION OF IMEI ASSIGNMENT

The IMEI number is used by a GSM network to identify valid devices and therefore can be used for stopping a stolen phone from accessing that network. For example, if a mobile phone is stolen, the owner can call their network provider and instruct them to blacklist the phone using its IMEI number. This renders the phone useless on that network and sometimes other networks too, whether or not the phone's subscriber identity module (SIM) is changed.

## CHECK ALL CERTIFICATES

All newest certificates may be found in our [Wiki](#)<sup>2</sup>.

<sup>2</sup> [wiki.teltonika-gps.com/view/FMB209\\_Certification\\_&Approvals](http://wiki.teltonika-gps.com/view/FMB209_Certification_&Approvals)

# WARRANTY

We guarantee our products 24-month warranty<sup>1</sup> period.

All batteries carry a 6-month warranty period.

Post-warranty repair service for products is not provided.

If a product stops operating within this specific warranty time, the product can be:

- Repaired
- Replaced with a new product
- Replaced with an equivalent repaired product fulfilling the same functionality
- Replaced with a different product fulfilling the same functionality in case of EOL for the original product

<sup>1</sup> Additional agreement for an extended warranty period can be agreed upon separately.

# WARRANTY DISCLAIMER

- Customers are only allowed to return products as a result of the product being defective, due to order assembly or manufacturing fault.
- Products are intended to be used by personnel with training and experience.
- Warranty does not cover defects or malfunctions caused by accidents, misuse, abuse, catastrophes, improper maintenance or inadequate installation – not following operating instructions (including failure to heed warnings) or use with equipment with which it is not intended to be used.
- Warranty does not apply to any consequential damages.
- Warranty is not applicable for supplementary product equipment (i. e. PSU, power cables, antennas) unless the accessory is defective on arrival.
- [More information on what is RMA<sup>1</sup>](#)

<sup>1</sup> [wiki.teltonika-gps.com/view/RMA\\_guidelines](http://wiki.teltonika-gps.com/view/RMA_guidelines)