

FAMILY CAR TRACKING AND MONITORING WITH OBD GPS DEVICES

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Introduction

Private passenger cars and family vehicles global market is not only huge, but it keeps growing year after year. So, the demand for responsible driving, safety, behaviour awareness, fuel efficiency, timely maintenance, auto theft risk reduction using the latest technologies. To fulfil the needs of the B2C market, here at Teltonika Telematics we have developed the practical vehicle GPS tracking, monitoring, and messaging solution.

Solution description

This solution makes it easy to connect your device to your vehicle. For installation, there is no need for additional equipment or skills, you just need to insert the device into the OBDII interface and you're done! Thanks to this solution, you can not only track the current location of the object, but also receive a wide range of standard OBDII parameters from the car's ECU, and thanks to the advanced FMB003 model, advanced OBD OEM (PID) parameters: odometer and fuel consumption parameters in real time from the available list of supported vehicles. The device sends the gathered data, combined with its GNSS location details, via a GSM network to a server for analysis. The data

can be monitored via PC, laptop, tablet or smartphone using the dedicated software or mobile app, or both.

What you need for a solution?

- **FMB003** device ([FMB003](#) is taken as example).

Other devices that work with this solution:

[FMC001](#), [FMM001](#), [FMB001](#), [FMB002](#), [FMB003](#), [FMB010](#), [FMB020](#)

- The [SIM card](#) in order to get data to your server
- [FOTA WEB](#) to remotely send the configuration to the device.

Installation



Installing the device is easy, but don't forget about [mounting recommendations](#) as well. If the location of the OBDII interface is in a hard-to-reach place, then you can always use a special cable to install the device in a convenient place. [OBDII connection extension cable](#)

Although devices have high gain antennas it's important to mount devices with stickers on top and in metal-free space. The device should be firmly fixed to the surface or cables. Please make sure, that device is not fixed to heat emitting or moving parts.

During installation please follow recommendations in order to **avoid damaging** device and vehicle:

- The device uses SELV limited power source. The nominal voltage is +12 V DC. The allowed voltage range is +10..+30V 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.
- Before unmounting the device from the vehicle, ignition **MUST** be OFF.

How to check available OBDII data?

Please follow this [tutorial](#) to check what OBD data is available from the vehicle How to check available OBDII data?

List of AVL id OBDII parameters you can find at [Wiki page](#).

Configuration

1. Prerequisites:

1.1. Read through [start guide](#)

1.2. Understanding of possible [Sleep modes](#).

2. OBD GPS trackers:



Parameter ID - Parameter name GPRS settings:

- **2001** - APN
- **2002** - APN username (if there are no APN username, empty field should be left)
- **2003** - APN password (if there are no APN password, empty field should be left)



Server settings:

- **2004** - Domain
- **2005** - Port
- **2006** - Data sending protocol (0 - TCP, 1 - UDP)

After successful GPRS/SERVER settings configuration, FMB003 device will **synchronize time** and **update records to the configured server**. Time intervals and default I/O elements can be changed by using [Teltonika Configurator](#) or [SMS parameters](#).



Data protocol settings:

- **113** - Data protocol (0 - Codec8, 1 - Codec8Extended)

Note: To get OEM parameters, you need to use [Codec8Extended](#).



Sleep settings:

- **102** - Sleep settings (0 - Disable, 1 - Gps sleep, 2 - Deep sleep, 3 - Online Deep sleep, 4 - Ultra sleep)

Note: This scenario will not work with [Deep Sleep](#) and [Ultra Sleep](#) modes, since they disable the device's GSM module to save power.



OBDII settings:

- 40000 - OBDII data activation, enabled by default (0 - Disable 1 - Enable)



- 40005 - VIN read mode, Auto by default (0 - Auto 1 - Manual)



- 40003 - Manual VIN number entry



- 40440 - OEM Fuel level, Priority "Low" (0 - Disabled 1 - Low 2 - High 3 - Panic)
- 40430 - OEM Total milage (Counted), Priority "Low" (0 - Disabled 1 - Low 2 - High 3 - Panic)
- 40410 - VIN, Priority "Low" (0 - Disabled 1 - Low 2 - High 3 - Panic)



- 40160 - Engine RPM, Priority "Low" (0 - Disabled 1 - Low 2 - High 3 - Panic)

Quickstart: From default configuration to Car sharing solution in one SMS:

```
" setparam
2001:APN;2002:APN_user;2003:APN_password;2004:Domain;2005:Port;2006:0;102:3;4
0000: 1;40005:0; 40410:1; 40160:1; 40430:1; 40440:1; 113:1"
```

This SMS will set up your device to report object location to the server and possibility for read Engine RPM, VIN and OEM parameters.

Note: Before SMS text, two space symbols should be inserted if no SMS username or password was set in SMS \ Call settings.

Parsing information

1.Prerequisites:

1.1. Open [TCP/UDP port](#)

1.2. Read Java parser [first start guide](#)

2. Parsing example:

Unparsed received data in hexadecimal stream

```
0000000000000005E08010000017716AE03D8010F0F22D720982E9C007E00120A002F1609E
F01F00150011505C80045010101FD03FE230BB5000BB60006423A0018002F430F8A4400000
901301100161200EC13FBD90F038402C7000003BD1003066802000100005F75
```

AVL Data Packet Part	HEX Code Part
Zero Bytes	00 00 00 00
Data Field Length	00 00 00 5E
Codec ID	08 (Codec 8)
Number of Data 1 (Number of Total Records)	01
Timestamp	00 00 01 77 16 AE 03 D8 (Mon Jan 18 18:07:19 UTC 2021)
Priority	01
Longitude	0F 0F 22 D7
Latitude	20 98 2E 9C
Altitude	00 7E
Angle	00 12
Satellites	0A

Speed	00 2F
Event IO ID	FD (AVL ID: 253, Name: Green driving type)
N of Total ID	16
N1 of One Byte IO	09
1'st IO ID	EF (AVL ID: 239, Name: Ignition)
1'st IO Value	01
2'nd IO ID	F0 (AVL ID: 240, Name: Movement)
2'nd IO Value	01
3'rd IO ID	15 (AVL ID: 21, Name: GSM Signal)
3'rd IO Value	05
4'th IO ID	50 (AVL ID: 80, Name: Data mode)
4'th IO Value	01
5'th IO ID	C8 (AVL ID: 200, Name: Sleep Mode)
5'th IO Value	00
6'th IO ID	45 (AVL ID: 69, Name: GNSS Status)
6'th IO Value	01
7'th IO ID	01 (AVL ID: 1, Name: Digital Input 1)
7'th IO Value	01
8'th IO ID	FD (AVL ID: 253, Name: Green driving type)
8'th IO Value	03 (01 - harsh acceleration, 02 - harsh braking, 03 - harsh cornering)
9'th IO ID	FE (AVL ID: 254, Name: Green Driving Value)
9'th IO Value	23 (Depending on green driving type: if harsh acceleration or braking - g*100 (value 123 ->1,23g). If Green driving source is "GPS" - harsh cornering value is rad/s*100. If source is "Accelerometer" - g*100.
N2 of Two Byte IO	0B
1'st IO ID	B5 (AVL ID: 181, Name: GNSS PDOP)
1'st IO Value	00 0B
2'nd IO ID	B6 (AVL ID: 182, Name: GNSS HDOP)
2'nd IO Value	00 06
3'rd IO ID	42 (AVL ID: 66, Name: External Voltage)
3'rd IO Value	3A 00
4'th IO ID	18 (AVL ID: 24, Name: Speed)
4'th IO Value	00 2F
5'th IO ID	43 (AVL ID: 67,Name: Battery Voltage)
5'th IO Value	0F 8A
6'th IO ID	44 (AVL ID: 68, Name: Battery Current)
6'th IO Value	00 00
7'th IO ID	09 (AVL ID: 9, Analog input 1)
7'th IO Value	01 30
8'th IO ID	11 (AVL ID:17, Name: Axis X)
8'th IO Value	00 16
9'th IO ID	12 (AVL ID:18, Name: Axis Y)

9'th IO Value	00 EC
10'th IO ID	13 (AVL ID:19, Name: Axis Z)
10'th IO Value	FB D9
11'th IO ID	0F (AVL ID: 15, Name: Eco score)
11'th IO Value	03 84
N4 of Four Byte IO	02
1'st IO ID	02 C7(AVL ID: 199, Name: Trip Odometer)
1'st IO Value	00 00 03 BD
2'nd IO ID	10 03(AVL ID: 16, Name: Total Odometer)
2'nd IO Value	06 68 80 20
Number of Data 2 (Number of Total Records)	01
CRC-16	00 00 5F 75

Demonstration in platform

FMBT : OBDII info



Bluetooth®'s connection to monitor OBDII parameters. Real time OBDII data, events notifications about harsh acceleration, braking, cornering, overspeeding, idling, RPM etc.

- You must connect to the device by clicking Bluetooth® icon, and selecting your device.
- Next, you need to select the OBDII info tab, where information about the car in real time will be displayed.

WIALON: Open WIALON → Open Messages → Select your device → Select the date interval → Select Message (data messages) → Select execute and you will see all the information.

